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Tank Farm Surveillance and Waste Status Summary Report - July 1994

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8/22/94
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TANK FARM SURVEILLANCE AND WASTE STATUS SUMMARY REPORT - JULY 1994

B. M. Hanlon

ABSTRACT

This report is the official inventory for radioactive waste stored in underground tanks in the 200 Areas at the Hanford Site. Data that depict the status of stored radioactive waste and tank vessel integrity are contained within the report. This report provides data on each of the existing 177 large underground waste storage tanks and 49 smaller catch tanks and special surveillance facilities, and supplemental information regarding tank surveillance anomalies and ongoing investigations. This report is intended to meet the requirement of U. S. Department of Energy-Richland Operations Office Order 5820.2A, Chapter I, Section 3.e. (3) (DOE-RL, 1990, Radioactive Waste Management, U. S. Department of Energy-Richland Operation Office, Richland, Washington) requiring the reporting of waste inventories and space utilization for Hanford Tank Farm Tanks.

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METRIC CONVERSION CHART		
1 inch	=	2.54 centimeters
1 foot	=	30.48 centimeters
1 gallon	=	3.80 liters
1 ton	=	0.90 metric tons

$$°F = \left(\frac{9}{5}\ °C\right) + 32$$

1 Btu/h = 2.930711 E-01 watts
(International Table)

TANK FARM SURVEILLANCE AND WASTE STATUS SUMMARY REPORT - JULY 1994 SUMMARY

Information For The Period June 1 Through June 30, 1994

Hereafter, the Summary Report month will be shown as the month following the period of information presented; i.e., data for June 1 through June 30 will be shown in the July report. This more accurately depicts the preparation month (prepared the month following the data period), and the time required for preparation, through approval, and distribution. (There will be no report shown as JUNE 1994.)

Note: Changes from the previous month are in bold print.

I. WASTE TANK STATUS

Category	Quantity	Date of Last Change
In-Service Tanks[c]	28 double-shell	10/86
Out-of-Service Tanks[a]	149 single-shell	07/88
Assumed Leaker Tanks[f]	67 single-shell	7/93
Sound Tanks	28 double-shell 82 single-shell	1986 7/93
Interim Stabilized Tanks[b,d]	106 single-shell	04/93
Not Interim Stabilized [f]	43 single-shell	04/93
Intrusion Prevention Completed[e]	98 single-shell	09/91
Watch List Tanks [g] Total	50 single-shell 6 double-shell 56 tanks	5/94[h] 6/93

[a] Although all 149 single-shell tanks were removed from service (i.e., no longer authorized to receive waste) as of November 21, 1980, the category of "Out-of-Service" was not established until July 1988.

[b] Of the 106 tanks classified as interim stabilized, 59 are listed as assumed leakers. The total of 106 interim stabilized tanks includes six tanks that do not meet current established supernatant and interstitial liquid stabilization criteria: B-104, B-110, B-111, T-102, T-112, and U-110. (These six tanks did meet the criteria in existence when they were declared interim stabilized). B-110, B-111, and U-110 are assumed leakers but surveillance data do not show an indication of a continuing leak.

[c] Six double-shell tanks listed as "in service" are currently included on the Hydrogen Watch List and are thus prohibited from receiving waste in accordance with "Safety Measures for Waste Tanks at Hanford Nuclear Reservation," Section 3137 of the National Defense Authorization Act for Fiscal Year 1991, November 5, 1990, Public Law 101-510.

[d] Of the 50 single-shell tanks on Watch Lists, 19 have been Interim Stabilized.

[e] Of the 50 single-shell tanks on Watch Lists, 28 have completed Intrusion Prevention (this category replaced Interim Isolation). See Appendix C, Tank and Equipment Codes and Status Definitions, for "Intrusion Prevention" definition.

[f] Eight of the tanks are both assumed leakers and not Interim Stabilized. See Appendix I, Leak Volume Estimates, for more details. Tank SX-102 was declared an assumed leaker in May, and reclassified as Sound in July, 1993. See "Waste Tank Investigations" section of the July 1993 report for more details.

[g] See Tables A-1 through A-5 for more information on Watch List Tanks. Ten tanks (A-101, S-102, S-111, SX-103, SX-106, TX-118, TY-104, U-103, U-105, and U-107) are currently on more than one Watch List.

[h] Dates for the Watch List tanks are "officially added to the Watch List" dates. See Table A-1, Watch List Tanks, for further information.

II. WASTE TANK INVESTIGATIONS

This section includes all single-shell tanks or catch tanks which are showing surface level or interstitial liquid level (ILL) decreases, or drywell/ lateral radiation level increases in excess of established criteria.

There were no tanks under investigation for ILL decreases or drywell/lateral radiation level increases which exceeded the criteria in June 1994.

A. Assumed Leakers or Assumed Re-leakers: (See Appendix C for definition of "Re-leaker")

This section includes all single- or double-shell tanks or catch tanks for which an off-normal or unusual occurrence report has been issued for assumed leaks or re-leaks. Tanks/catch tanks will remain on this list until either a) completion of Interim Stabilization, or b) the updated occurrence report indicates that the tank/catch tank is not an assumed leaker.

Tank 241-BX-111. This tank was declared an assumed re-leaker on April 30, 1993. Pumping of the tank commenced on October 22, 1993. Pumping was completed as of April 30, 1994. In-tank photos were taken May 19, 1994. After review of the photos, the pumping was restarted on May 25, to remove additional pumpable liquid. **Pumping activities continue; 0.7 Kgals were pumped in June, making a total of 111.1 Kgal pumped as of June 30, 1994.** (See Table E-5 footnotes for further information).

Tank 241-T-111. The surface level showed a steady decrease after the automatic FIC was repaired in August 1993. The surface level measurement after the FIC repair was 161.70 inches and continued to decrease to 161.10 inches by January 31, 1994. This was a 1.00-in decrease from the reference baseline of 162.10 inches. Off-Normal Occurrence Report RL-WHC-TANKFARM-1994-0009 was issued on February 24, 1994. This tank was declared an assumed re-leaker on February 25, 1994.

This tank had previously been Partial Interim Stabilized. Tank T-111 was added to the Organics Watch List on February 28, 1994. In-tank photos were taken April 13, 1994. Review of these photos resulted in some changes in the tank's inventory. (See Table E-5 footnotes for April 1994).

Pumping began May 17, 1994, completing a TPA milestone for the start of emergency pumping. **1.7 Kgal were pumped in June, making a total of 4.8 Kgal pumped as of June 30, 1994.** (See Table E-5 footnotes for further information).

B. Tanks with increases indicating possible intrusions:

This section includes all single-shell tanks for which the surveillance data show that the surface level or ILL has met or exceeded the increase criteria, or are still being investigated.

244-AR Tanks and Sumps: Currently, all ventilation systems at 244-AR are shut down. Based on the weight factors for the sumps and tanks, Tank 001 contains 2300 gallons, Tank 002 contains 8100 gallons (some unknown amount of sludge), Tank 003 contains 2100 gallons, and Tank 004 contains 500 gallons. Sump 003 increased to approximately 250 gallons of intrusion water (rain) over the past three months because of rainfall. Sump 003 currently contains approximately 450 gallons of water.

Tank 241-B-202. A steady increase in the surface level measurement has been observed since December 1984. The manual tape pencil plummet is contacting liquid. When the quarterly reading was obtained on October 6, 1992, the level was recorded as 144.75 inches, thus exceeding the 2.00-inch increase criteria from the established baseline of 142.50 inches. The surface level measurement was rechecked on October 9, 1992, (145.50 inches), verifying the increase and that the criteria had been exceeded. Occurrence Report RL-WHC-TANKFARM-1993-0024 was issued February 13, 1993. **The surface level measurement on June 30, 1994, was 145.75 (±0.25 inches).** The monitoring frequency has been increased from quarterly to daily. This tank is Sound, Interim Stabilized, and Intrusion Prevention completed.

Resolution status: A photo package was initiated on May 11, 1993, to investigate the possibility of an intrusion. Review of previous photos was inconclusive. New photos are required to determine the actual supernatant increase, if any. A temporary baseline was established at 145.25 inches, until the new photos are available.

Tank 241-BX-101. On September 2, 1993, the surface level increased from 10.00 to 12.00 inches, thus reaching the 1.00-Inch increase criteria from the reference baseline of 11.00 Inches. **Readings fluctuated between 10.00 and 12.00 inches during June; the surface level was 10.75 inches on June 30, 1994.** In-tank photographs show the manual tape donut plummet contacting liquid in a shallow pool. This tank is an Assumed Leaker, Interim Stabilized, and Intrusion Prevention completed.

Resolution Status: Comparison of October 1986 photos with November 1988 photos shows evidence of an ongoing intrusion. A work package was initiated October 14, 1993, to obtain in-tank photographs which will be used to inspect the area under the plummet and investigate the possible intrusion. At current manpower levels, photos in this tank should be available by October 1994.

Tank 241-BX-103. This tank has shown an erratic increase in surface level measurements since January 6, 1986. On January 18, 1993, the surface level measurement in 103-BX exceeded the 0.50-inch increase criteria from the reference baseline of 19.50 inches, and was verified on January 20, 1993. Discrepancy Report S&DA 93-522 was issued January 21, 1993. Occurrence Report RL-WHC-TANKFARM-1993-0036 was issued March 25, 1993. **The surface level measurement is currently 20.40 inches.** The FIC plummet is contacting liquid as indicated by in-tank photographs taken October 31, 1986. This tank is Sound, Interim Stabilized, and Intrusion Prevention completed.

Resolution status: The current level is greater than that prior to stabilization in November 1983. The tank was previously determined to have experienced an intrusion from 1977 to March 1983 (prior to stabilization).

Subsequent isolation was expected to halt the intrusion, however, the intrusion is apparently ongoing. A work package was initiated on May 11, 1993, to obtain in-tank photos. The photos will be used to assess the current stabilization status of the tank. A visual survey of the area was performed to determine possible paths for precipitation to enter the tank. The weather covering on the pits and risers was found in place and undamaged. The existing grade is level and revealed no obvious draining problems. Design/isolation drawing review revealed that nozzles, floor drains and some transfer lines entering the heel pit have been left open. Neighboring tank BX-101 was investigated in 1987 and recommendations were provided to halt an ongoing intrusion. Similar measures may halt the BX-103 intrusion. In-tank photos will provide verification of the intrusion. Determination of the need to provide additional isolation measures will follow. At current manpower levels, photos in this tank should be available by November 1994.

Tank 241-BY-105. Although the surface level and ILL are within the criteria limits, the data indicates unusual behavior trends that merit continued observation. The monitoring frequency has been increased from quarterly to weekly. This tank is on the ferrocyanide Watch List, an Assumed Leaker, and not yet Interim Stabilized.

Resolution Status: The surface level and ILL are displaying behavior similar to TX-113 and TX-115. The ILL is showing an increase, while the surface level measurement is showing a decrease. This phenomena could be due to either solids dissolution or formation of a depression in the solids beneath the plummet in conjunction with an intrusion. Review of previous photos indicates the liquid volume is increasing, although it cannot be verified that the solids level is decreasing. A photo package was initiated to investigate the possibility of intrusion, or solids dissolution. At current manpower levels, photos in this tank should be available by April 1995.

Tank 241-TX-111. Although the surface level and ILL measurements do not exceed the criteria, the data indicates unusual behavior trends that merit continued observation. This tank is Sound, Interim Stabilized, and Intrusion Prevention completed.

Resolution Status: The ILL trend was re-analyzed for this tank using the new "count rate" method. A steady, significant increase of 1.32 inch/year is evident. Surface level data is showing a decrease. Photos show a dry surface. The surface level decrease is expected to be caused by crumbling of the waste beneath the plummet. Overall, the waste level behavior of the tank is similar to that of TX-113 and 115. A photo package was initiated on October 13, 1993, to investigate the possibility of an intrusion. At current manpower levels, photos in this tank will be available by November 1995.

Tank 241-TX-113. Although the surface level and ILL measurements do not exceed the criteria, the data indicates unusual behavior trends that merit continued observation. This tank is an Assumed Leaker, Interim Stabilized, and Intrusion Prevention completed.

Resolution status: The technical evaluation of the alert condition in this tank was completed April 14, 1993. The results were inconclusive, with recommendation to accelerate the October 1997 waste characterization of the tank. This characterization is expected to confirm that solids are dissolving, causing an increase in ILL. Acceleration of waste

characterization is not possible. Watch List tanks have first priority for core sampling. A photo package has been written. At current manpower levels, photos in this tank will be available by December 1995. The LOW is scanned weekly.

Tank 241-TX-115. Although the surface level and ILL measurements do not exceed the criteria, the data indicates unusual behavior trends that merit continued observation. This tank is an Assumed Leaker, Interim Stabilized, and Intrusion Prevention completed.

Resolution status: The technical evaluation of the alert condition in this tank was completed April 14, 1993. The results were inconclusive, with recommendation to accelerate the October 1997 waste characterization. Waste characterization is expected to confirm that solids are dissolving, causing an increase in ILL. Acceleration of waste characterization is not possible for non-Watch List tanks. The 1981 photos show evidence of rain intrusion through a central pump pit riser. However, it cannot be concluded from the 1988 photos that the intrusion is ongoing. A photo package has been written. At current manpower levels, photos in this tank will be available by February 1996. The LOW is scanned weekly. This tank will be included in the waste characterization with TX-113.

Tank 241-TY-102. Discrepancy Report S&DA-92-489 was issued November 9, 1992, when the surface level measurement exceeded the 0.50-inch increase criteria from the established baseline of 31.40 inches. The tank has a history of intrusions and icicle-shaped mineral buildup on the FIC plummet. The FIC plummet is contacting a shallow pool of liquid. The surface level measurement on April 1, 1993, was 31.90 inches and at the increase criteria. The increase criteria of 0.50 inch, considered to be an extremely tight tolerance for this tank, was revised to 1.00 inch, which is more in line with other tanks that exhibit similar erratic surface level behavior. **The surface level measurement remained stable during June and was 31.60 inches on June 30, 1994.** This tank is Sound, Interim Stabilized, and Intrusion Prevention completed.

Resolution status: This tank is experiencing an ongoing intrusion as is evident by comparison of November 1984 photos with July 1987 photos and an increasing trend in surface level data. A visual survey was conducted to determine possible paths for precipitation to enter the tank. The grade around the tank is level and weather covering is on the pits and intact. The photo package, initiated May 17, 1993, will be required to assess the current stabilization status of the tank, and to assist in determining the possible paths of intrusion. Ongoing design/isolation drawing review revealed that nozzles, floor drains and some transfer lines entering the pump pit have been left open. Photo verification of the intrusion will determine the need to provide additional isolation measures. At current manpower levels, photos in this tank will be available by March 1996.

Catch Tanks:

241-ER-311 Catch Tank. This catch tank shows increases from precipitation and runoff. The tank currently exceeds the active tank limit of 45% volume (8000 gallons). This tank may contain up to 80% of volume capacity, (14,100 gallons, 80.00 inches) during inactive periods.

Resolution Status: A procedure is being drafted to pump this tank. The procedure is expected to be completed in September 1994.

241-E/W-151 Vent Station Catch Tank. The zip cord surface level reading exceeds the maximum operating limit of 36.00 inches. The manual tape was out of service from July 7, 1992, to December 16, 1992, when a temporary zip cord was installed. A surface level reading of 68.00 inches was obtained, exceeding the active tank limit of 50% of volume (400 gallons), or 40 inches. Discrepancy Report S&DA-92-511 was issued December 24, 1992. Transfers are not permitted until the tank is pumped and the level is within limits. A new calibrated zip cord was installed December 16, 1993, and the surface level reading went from 71.00 to 59.00 inches. Discrepancy Report 93-655 was issued December 17, 1993. The zip cord was replaced with a new manual tape on December 23, 1993. The level reading was 60.50 inches. **The surface level reading was 66.00 inches on June 30, 1994.**

Resolution status: The catch tank was sampled on December 23, 1993. The waste is to be transferred using existing cross-site lines. The required procedure is in approval stages; other documentation has been completed. **Transferring with this method could be ready by mid-August.**

241-UX-302-A Catch Tank. The surface level measurement exceeds the maximum operating limit of 50.00 inches. Discrepancy report S&DA-92-465 was issued May 12, 1992. **The current surface level reading is 68.90 inches, which exceeds the 50% of volume (8840 gallons), or 54 inches.** The FIC plummet is contacting liquid.

Resolution status: Work packages for the transfer of waste from UX-302-A and the repair of necessary instrumentation are being prepared, and the transfer of waste is being scheduled as a prestart item for the cross-site transfer. A work package has been prepared to sample/pump this catch tank. Transfer will begin after completing Vent Station transfer. **The procedure will be ready by end of September 1994. The transfer is planned for mid-November 1994.**

III. SURVEILLANCE AND WASTE TANK STATUS HIGHLIGHTS

1. Single-Shell Tanks Saltwell Jet Pumping

Tank 241-BX-110 - Saltwell jet pumping began December 4, 1993, to pump contents of this tank into 244-BX Double Container Receiver Tank (DCRT). Saltwell pumping was shut down on December 9, 1993, for repair of system air leaks. After repair of the leaks, it was determined other problems existed, resulting in a work order to modify the system to run the pump manually. It is uncertain whether any further waste can actually be pumped. A total of 4.0 Kgal has been pumped from BX-110.

Tank 241-BX-111 - Saltwell jet pumping began on October 22, 1993, to pump tank BX-111 into 244-BX Double Container Receiver Tank. Pumping was considered complete as of April 29. In-tank photos were taken on May 19, 1994. After review of photos, the pumping was restarted on May 25, to remove additional pumpable liquid. **0.7 Kgal were pumped in June, making a total of 111.1 Kgal pumped as of June 30, 1994.** (See Table E-5 footnotes for further information).

Tank 241-BY-102 - Saltwell jet pumping resumed May 30, 1994, after being suspended because of the Unreviewed Safety Question (USQ) effective April 30, 1992. Restart of the pumping completed a TPA milestone. **10.0 Kgal were pumped from this tank in June, with a total of 135.6 Kgal pumped by June 30, 1994.** (See Table E-5 footnotes for further information).

Tank 241-BY-109 - Saltwell jet pumping resumed May 31, 1994, after being suspended because of the Unreviewed Safety Question (USQ) effective April 30, 1992. (See item #5 below). Restart of the pumping completed a TPA milestone. **6.4 Kgal were pumped in June, making a total of 100.3 Kgal pumped by June 30, 1994.**

Tank-241-T-111 - Saltwell jet pumping began on May 17, 1994, completing a TPA milestone for emergency pumping. **1.7 Kgal was pumped in June, making a total of 4.8 Kgal pumped by June 30.** In-tank photos were taken May 19, 1994. (See Table E-5 footnotes for further information).

2. Tank Waste Remediation System Safety Initiatives

The U. S. Secretary of Energy has directed that six safety initiatives be implemented in the Tank Waste Remediation System Program to accelerate the mitigation/resolution of the higher priority waste tank safety issues at the Hanford Site. Forty-two milestones were established for accomplishing the initiatives.

SI-2m "Sample and characterize tank vapors from tank C-103 by June 1994."

SI-2n "Complete engineering evaluation of alternatives for treatment of tank C-103 vapor space."

SI-5d "Complete corrosion studies of SSTs to determine failure mechanisms and corrosion control options to minimize further degradation by June 1994."

The document, WHC-EP-0772, "Characterization of the Corrosion Behavior of the Carbon Steel Liner in Hanford Site Single-Shell Tanks," June 1994, looked at the corrosion failure mechanisms for single shell tanks, and provided recommendations to control or mitigate corrosion.

Five failure mechanisms were considered. The following recommendations were made to control corrosion and to assist in the resolution of outstanding safety issues:

1) **Remove as much liquid as possible, by expediting stabilization and by forced evaporation from tanks with aggressive wastes.**

2) **Add a corrosion inhibitor to sound tanks that will not be interim stabilized in the near future.**

3) **Install corrosion monitoring probes and/or coupons in tanks that have less aggressive wastes, but which are suspected of**

having liquids that do not meet waste specifications. Specific tanks were identified.

3. Process Test to Reduce Liquid Inventory in Tank 241-C-106

A Process Test to reduce liquid inventory in C-106 was completed in June 1994. An in-tank video was taken to verify the structural integrity of the tank and the condition of the liquid-sludge interface before the level was dropped. Then, approximately six inches of liquid was reduced starting March 4, 1994. A second in-tank video was taken June 15, which examined the waste surface and structural integrity at the 69-inch level. Water was added on June 17 to maintain liquid level between 70 and 74 inches. This action was part of Safety Initiative 2x and was a TPA milestone. (See also item #4 below).

4. Rising Trend in Tank 241-C-106 Temperatures

A rising trend in temperatures taken in one of two thermocouple trees in C-106 has been determined. The process test for lowering the liquid level in C-106 was completed June 15, 1994 (see item #3 above). On June 9 and 10, temperature spikes occurred in some of the thermocouples in Riser 14. Unexplained temperature cycling began June 26 and continued through the month. Temperatures exceeded the OSD 20°F maximum per day change. Discrepancy Report TFTS-94-709 was issued June 28, 1994, and Occurrence Report RL-WHC-TANKFARM-1994-0036 (Off Normal) was issued July 1 (see Occurrence Reports below for more information). An Unreviewed Safety Question screening will be done.

5. An Unreviewed Safety Question (USQ) on Dome Loadings

On June 14, 1994, an Unreviewed Safety Question (USQ) screening was initiated to determine if a dome loading situation at 241-AP is a USQ. On June 17, 1994, a USQ concerning dome loading of all double shell tanks (including Aging Waste tanks) was determined to exist. Affected are tank farms AN, AP, AW, AY, AZ, AND SY. (See Occurrence Report RL-WHC-TANKFARM-1994-0035 for further information)

6. 242-A Evaporator

The 242-A evaporator campaign 94-1 lasted 60 days, ending June 14, 1994. A total of 2417 Kgal was evaporated. A multi-year cycle, with each run lasting approximately 60 days, is being considered. There are currently 1917 Kgal of available usable tank space, mostly in tank AW-103. Tanks AW-102 and AW-106 contain evaporator operational space.

7. Implementation of New Leak Detection Operation Specification Document (OSD)

In early July 1994, a new leak detection OSD, WHC-OSD-151-T-00031, "Operating Specifications for Tank Farm Leak Detection," will be implemented. This document formalizes the leak detection actions that were started in late 1993. Single-shell tanks with the surface level measurement device contacting liquid, partial liquid, or floating crust surface, will be monitored for leak detection on a daily basis. Tanks with a solid surface will be monitored for leak detection on a weekly basis by taking neutron scan data from a Liquid

Observation Well (LOW), if an LOW is present. Tanks with a solid surface but without LOWs will not be monitored for leak detection if the tank has been stabilized, until an LOW is installed. Non-stabilized tanks will have drywell surveys taken as a backup on a monthly basis if surface or interstitial level measurement equipment is unavailable. The OSD specifies what leak detection methods are to be used for each tank, and the requirements if the readings are not taken on the required frequency or if equipment is out of service.

8. Tank SY-101 Hydrogen Mitigation

The hydrogen mixer pump installed in 241-SY-101 in July 1993, was operated 13 times during June 1994. Long term operation (level maintenance) of the mixer pump has begun. The objective of these operations is to ensure the flammable gas inventory in Tank SY-101 is as low as possible and to penetrate, excavate, and mix the sludge layer near the tank wall and bottom of the tank with the contents of the rest of the tank. Level maintenance pump operations have included one hour, 750 RPM pump runs and 25 minute, 1000 RPM excavation pump runs.

9. Tank Farms Stand Down (Administrative Hold)

On August 12, 1993, non-essential work activities in the tank farms were put on administrative hold by WHC senior management until operators, supervisors and managers are retrained to perform their duties in a safe and accountable manner. Minimal essential activities required for safety, monitoring and compliance, including the daily "pump-bumping" of the SY-101 mixer pump, will continue. The administrative hold has impacted several programmatic goals for Tank Waste Remediation System (TWRS). A letter from WHC senior management has been submitted to DOE-RL addressing these programmatic delays. Further corrective actions were addressed in a Tank Waste Remediation System Tank Farm Resumption of Work Plan, dated September 13, 1993. Contained within the Work Plan is the Integrated Schedule for reinitiating individual work activities on an ongoing basis.

Testing of the SY-101 mixer pump continues to be successfully accomplished. Many other tank farm work activities have now been fully resumed. In addition, reorganization is taking place to reduce management layers, and the Integrated Upgrade Plan of Action was issued January 31, 1994.

10. Criticality Safety Issues

On April 30, 1992, an Unreviewed Safety Question (USQ) concerning criticality safety issues in the Tank Farms was declared to be a reportable event. Unusual Occurrence report RL-WHC-TANKFARM-1992-0037 was issued. A prohibition was placed on all waste transfers into and between the tank farm facilities which is negatively affecting various Hanford programs. On September 1, 1992, the approved Justification For Continued Operations (JCO) was received. This establishes the limitations for all tanks receiving transfers and also excludes any interim stabilization of single-shell tanks until further evaluations are completed and approved by DOE-HQ. On December 15, 1992, the approved JCO was issued as WHC-SD-WM-JCO-001, "Justification for Continued Operations of Hanford High Level Waste Tanks Resulting From the Criticality USQ, 492-CRITSAS."

On March 31, 1994, DOE approved the WHC request to close the criticality USQ. This approval does not resolve the outstanding criticality safety issues pending in the tank farms. Resolution of these issues will require WHC to complete actions described in "Upgrade Activities for the Criticality Safety Program of Hanford High-Level Radioactive Waste Tank Farm," dated September 1992.

Also, the existing JCO will remain in effect until WHC completes the following: 1) Criticality Safety Evaluation Reports for single-shell and double-shell tanks; 2) Criticality Prevention Specifications; 3) Criticality operating procedures; and 4) Operator training for the revised operating procedures.

11. Occurrence Reports

RL-WHC-TANKFARM-1994-0036 (Off-Normal) - WASTE TANK SURVEILLANCE ANOMALY IN UNDERGROUND WASTE STORAGE TANK C-106 (Notification Report, 7/01/94)

Since June 25, 1994, cyclic temperature variations in tank 241-C-106 have been observed on one of two thermocouple trees. The observed temperature data is not consistent with historical data trends.

Observation of continuously monitored Tank Monitor and Control System (TMACS) data for this tank shows cyclic temperature variation on the thermocouple tree in riser #14.

Tank C-106 is a single-shell tank (SST) currently on the "High Heat Load" Watch List. This tank requires regular additions of water to maintain cooling through evaporation. In an effort to meet Washington Department of Ecology requests to reduce possible sources of leakage from SSTs, a process test on this tank was begun in March 1994. The goal was to establish a lower liquid level for the tank. Lowering the liquid level would: 1) help mitigate corrosion effects at the waste/vapor space interface, and 2) reduce the total amount of liquid that could be released to the environment should a leak occur. Subsequently, liquid levels in the tank were being lowered via evaporation when the temperature fluctuations were encountered.

Immediate actions taken included several water additions to raise the waste level to a high operating band, verification of manual thermocouple readings with the TMACS, investigation into the heating effects on the temperature instrumentation, and increased in-field monitoring frequency of tank temperatures to twice per shift.

RL-WHC-TANKFARM-1994-0035 (Unusual) - REVIEW OF RECORDS RESULTS IN DISCOVERY OF POTENTIAL VIOLATION OF 241-AP TANK FARM DOME LOADING REQUIREMENTS (10-Day Report, [latest], 6/23/94)

On June 14, 1994, during an engineering review of construction documentation for 241-AP Tank Farm, it was discovered that the dome loading for the farm was potentially not in compliance with Operating Specification Document (OSD) OSD-T-151-00007, section 7.2.4, "Dome Loading."

Calculations for 241-AP dome loading were based on soil density of 110 lbs. per cubic foot. Old records showed the wetted soil density was approximately 121 lbs. per cubic foot, resulting in the potential OSD nonconformance.

On June 14, 1994, an Unreviewed Safety Question (USQ) screening was initiated to determine if the dome loading situation at 241-AP is a USQ. On June 17, 1994, a USQ concerning dome loading of all double shell tanks (including Aging Waste tanks) was determined to exist. Affected are tank farms AN, AP, AW, AY, AZ, AND SY.

Based on preliminary analysis, this does not appear to be an imminent hazard and interim operational restrictions are in place. A Justification for Continued Operation (JCO) is being prepared.

RL-WHC-TANKFARM-1994-0005 (Off-Normal) - ALARMS FOR DOUBLE-CONTAINED RECEIVER TANKS DISCOVERED NOT INSTALLED RESULTS IN OSD NON-CONFORMANCE: OSD LIMITS FOR LEVEL/PRESSURE NOT EXCEEDED (10-Day Report [latest], 6/30/94)

On January 27, 1994, during a review of operating procedures, it was discovered that requirements of OSD-T-151-00011, "Operating Specifications for Saltwell Receiver Vessels," section 11.2.B, "Liquid Level," and section 11.2.E, "Primary Tank Pressure," had not been met.

Section 11.2.B requires a high liquid level alarm be connected to the liquid level conductivity probe. This alarm has not been installed in the Double-Contained Receiver Tanks (DCRT).

Section 11.2.E requires a high pressure alarm for the primary tank pressure. This alarm has not been installed in the DCRTs.

It has been determined that 244-TX and 244-BX are in non-conformance to the OSD, and it is assumed that the remaining DCRTs are also deficient. Tanks 244-TX, 244-S, 244-U and 244-CR are in a static condition, neither receiving or transferring waste. Tank 244-BX is being used to receive saltwell liquid. On January 28, the transfer of waste from 241-BX-111 to 244-BX DCRT was secured following verification of the non-conformance. At that time, tank pressure and liquid levels were within OSD limits.

All OSDs are being reviewed by Tank Waste Operations to ensure that adequate implementation can be demonstrated.

The root cause is inadequate administrative control. The OSD for Saltwell Receiver Vessel DCRTs was developed, issued and implemented for use by operations without an adequate field verification process. This allowed for sections of the OSD to be implemented without the necessary equipment in place for compliance.

To allow for East and West Tank Farms to complete their review of all OSDs and to ensure that adequate implementation can be demonstrated, the final report due March 11, 1994, was postponed to June 30, and has now been extended to July 15, due to the vast scope increase in review of all OSD/OSR requirements.

RL-WHC-TANKFARM-1994-0002 (OFF-NORMAL) - SOIL LOADING OF WASTE TANK 241-SY-101 EXCEEDS OPERATIONS SPECIFICATION DOCUMENT (OSD) OSD-T-151-00007 LIMIT (10-Day Report, [latest], 5/06/94)

On January 8, 1994, a tank dome survey for SY-101 was performed to determine the amount of soil and gravel on top of the dome. The results of the survey were forwarded to Waste Tank Operations (WTO) personnel on January 10, 1994.

On January 11, the survey results were reviewed and determined to be a violation of OSD-T-151-00007 had occurred in relation to soil loading for this tank. Note: There are no Operational Safety Requirements (OSR) for tank dome loading. There are 3 limits specified in the OSD, when the three are added together, they result in a violation of the first level of control.

Immediate actions were taken to restrict vehicle access to the SY Tank Farm until concurrence from Waste Tank Plant Engineering can be obtained.

In the 10-day report dated February 24, 1994, further investigation was indicated as to the cause of why no further safety review was conducted prior to the gravel addition.

On May 5, 1994, WHC conducted an extensive follow-on review to resolve differing staff opinions as to whether conditions were within the Authorization Basis. It was concluded that these conditions do involve a USQ.

The current excess soil depth does not overload the tanks. Operation of the tanks, including the hydrogen mitigation mixer pump operation, can continue to operate as long as any additional loads do not exceed the remaining load margins.

Immediate actions include surveying double-shell and single-shell tanks to verify soil cover depths in both East and West areas. Resolution of the USQ was submitted in May to clarify that the limit is the total load on the tank and not on the sources of that load.

12. Changes to the Monthly Report

(a) Appendix D, "Tank Farm Configuration, Status, and Facility Charts"

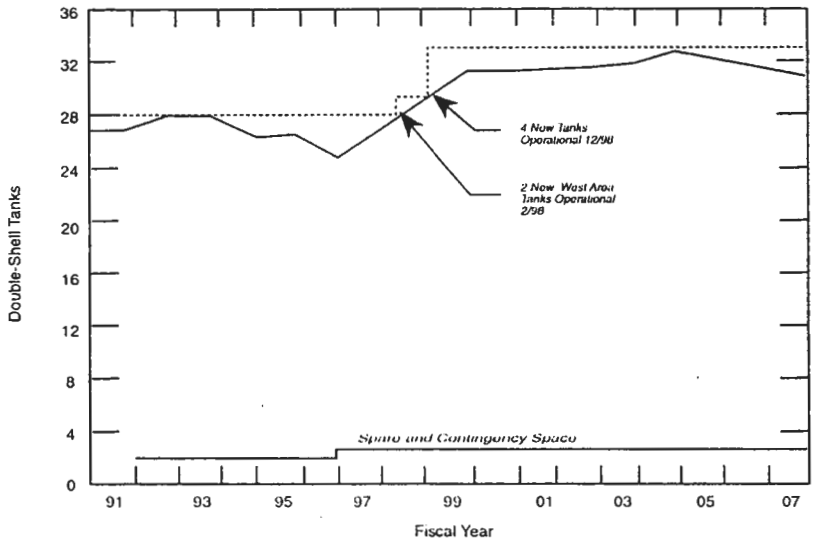
Figure D-4, "Storage and Disposal Operations - 200 Area Facilities," has been added to this appendix.

13. Following are excerpts from the WHC Tank Waste Remediation System presentation made to the Tank Structural Integrity Panel on June 10, 1994, in Seattle, Washington:

Current Planning Case

- TWRS strategy being used to formulate planning bases and initiate technology/process/facility development
- Includes both technical and programmatic assumptions/constraints
- Assumptions/constraints
  - Supernatant Pretreatment plant start-up by December 2004
  - LLW vitrification plant start-up by June 2005
  - HLW separations (enhanced sludge washing) start-up by June 2008
  - HLW vitrification plant start-up by December 2009
  - SST waste retrieval completed by September 2018
  - SST site closure completed by September 2024
  - Tank waste treatment completed by December 2028
  - Productivity challenge beginning in 1995 to reduce projected program costs in accordance with DOE funding profile

T·W·R·S Current Planning Case Storage Volume Requirements



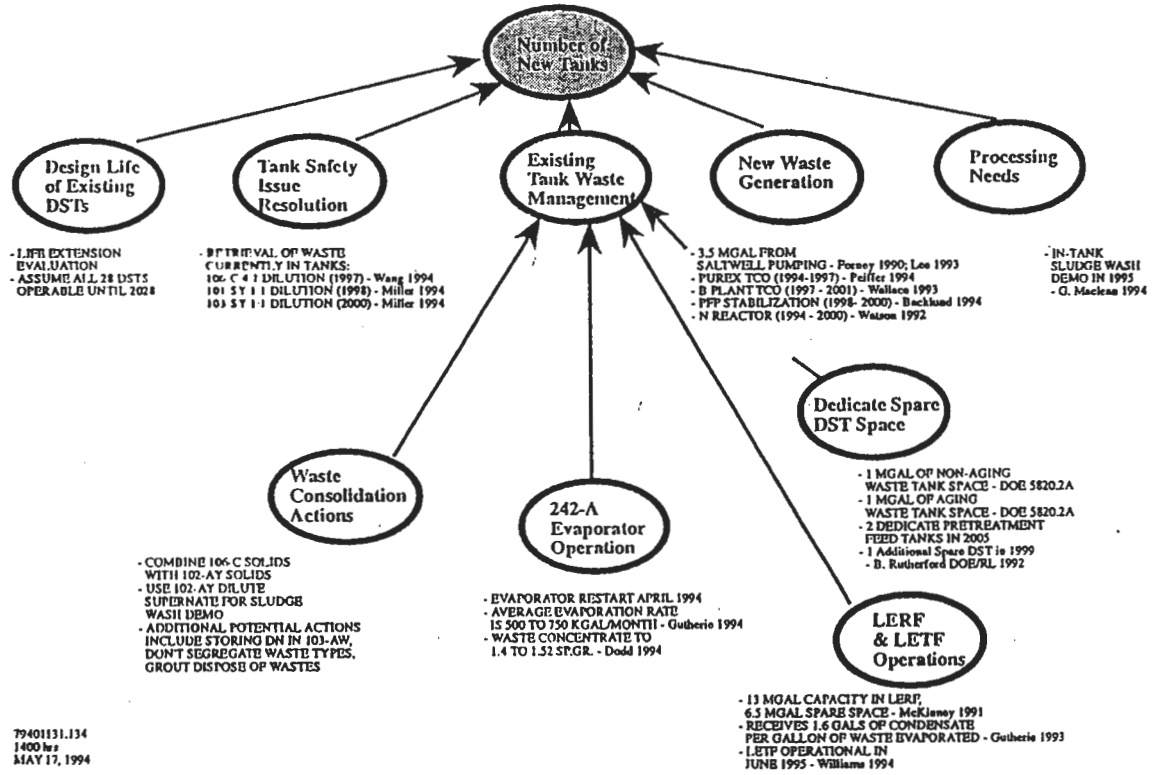
Consistent with Current Assumptions and Operational Scenarios Represented

Rev Date 1/7/94 7930404.1.134

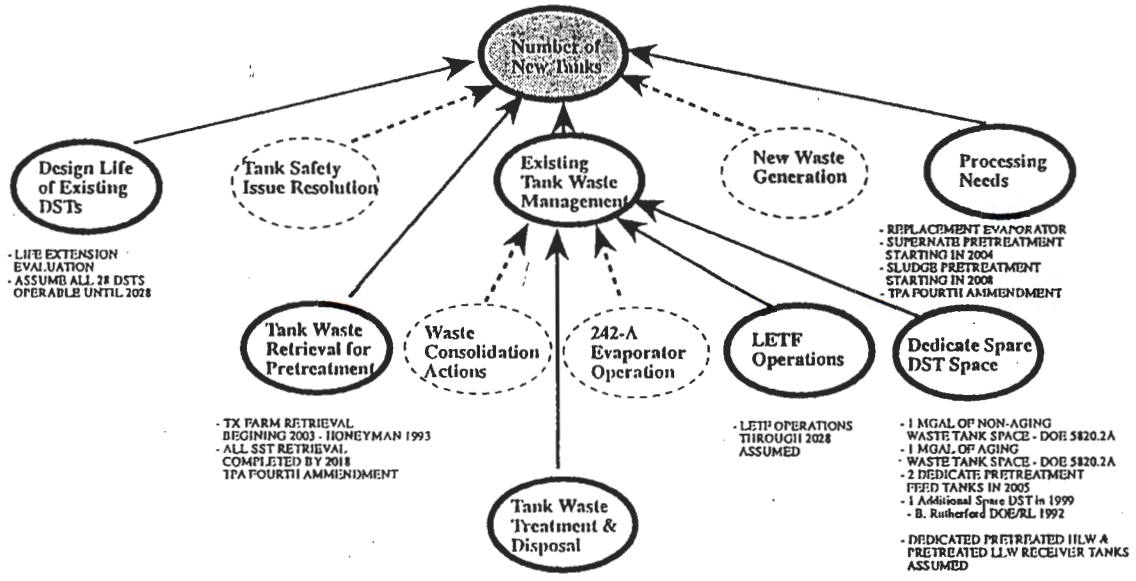
TWRS Storage Volume Uncertainties (1999 - 2004)

- Safety Requirements/number and dilution
- Evaporator Restart
  - Timing
  - Operating efficiency
- Liquid Effluent Treatment
- Tank Requirements for Pretreatment
- Retrieval Requirements/dilution
- Life extension potential of existing tanks

INFLUENCE DIAGRAM FOR NUMBER OF NEW DST (1994 - 2004)

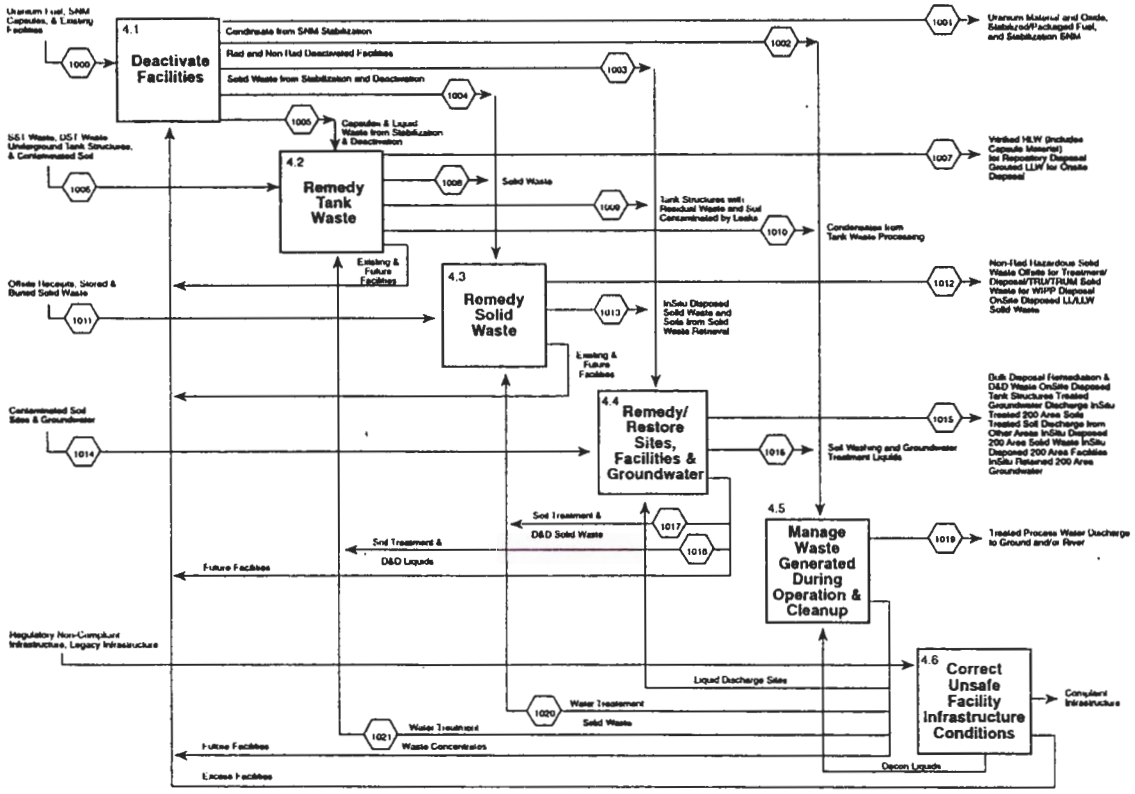


INFLUENCE DIAGRAM FOR NUMBER OF NEW DST (2004 -2028)



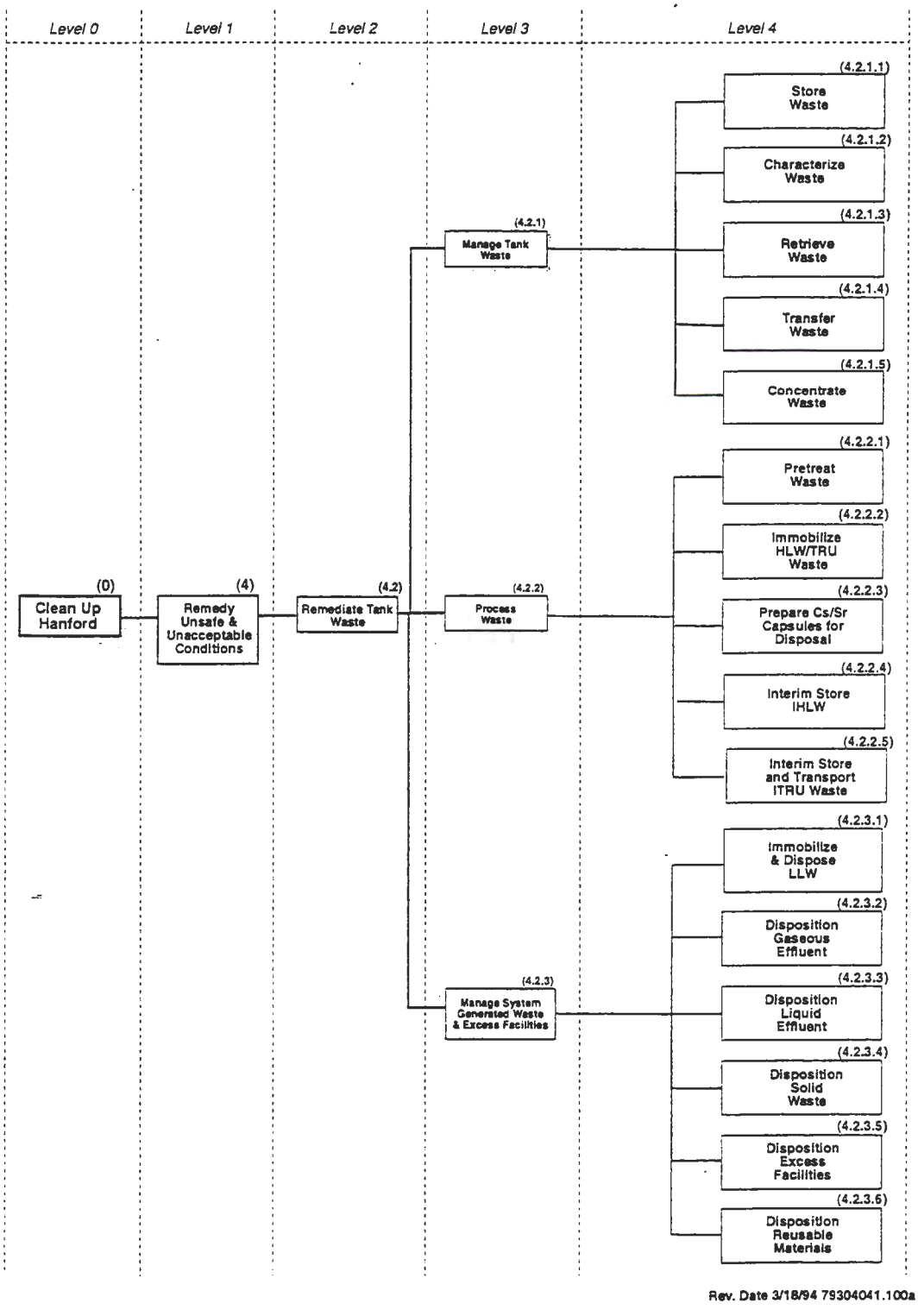
T·W·R·S Summary Function Material Flow Interactions

Based on 200 Area Disposal End State, Initial Technical Baseline For DNFSB 92-4)

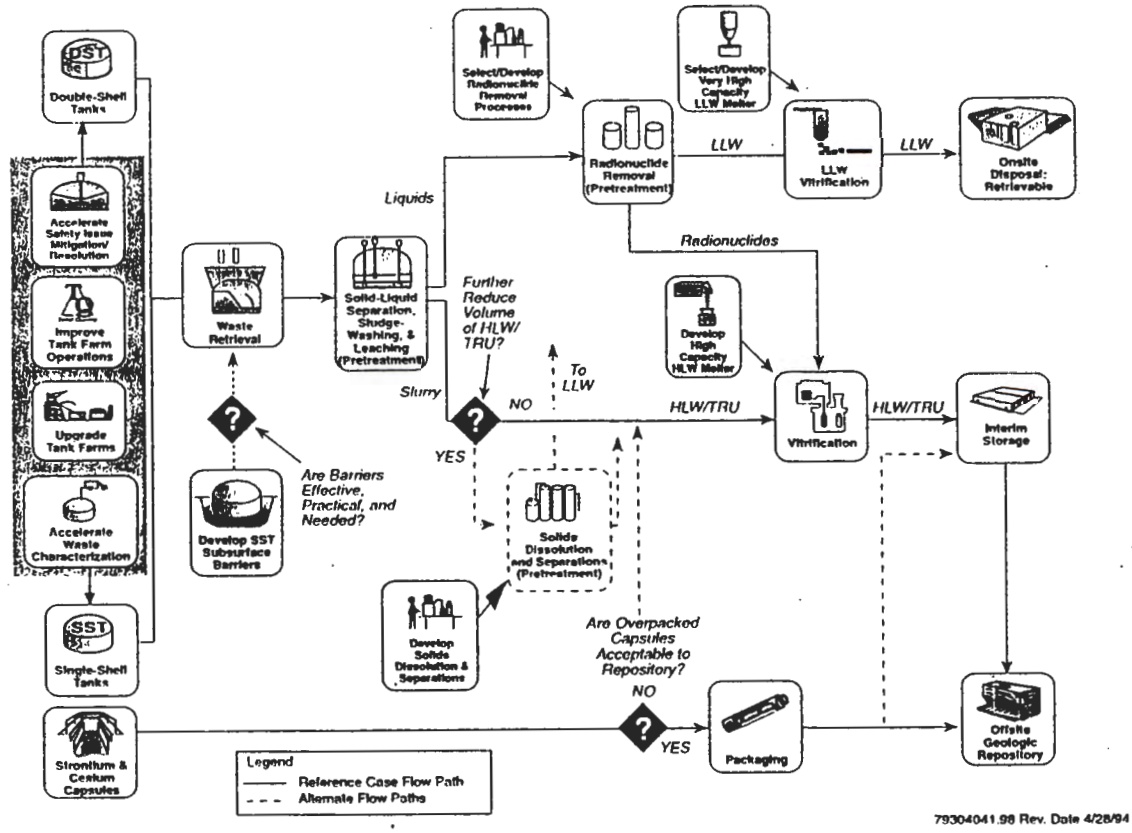


DOE/RL-92-60 Rev. 1

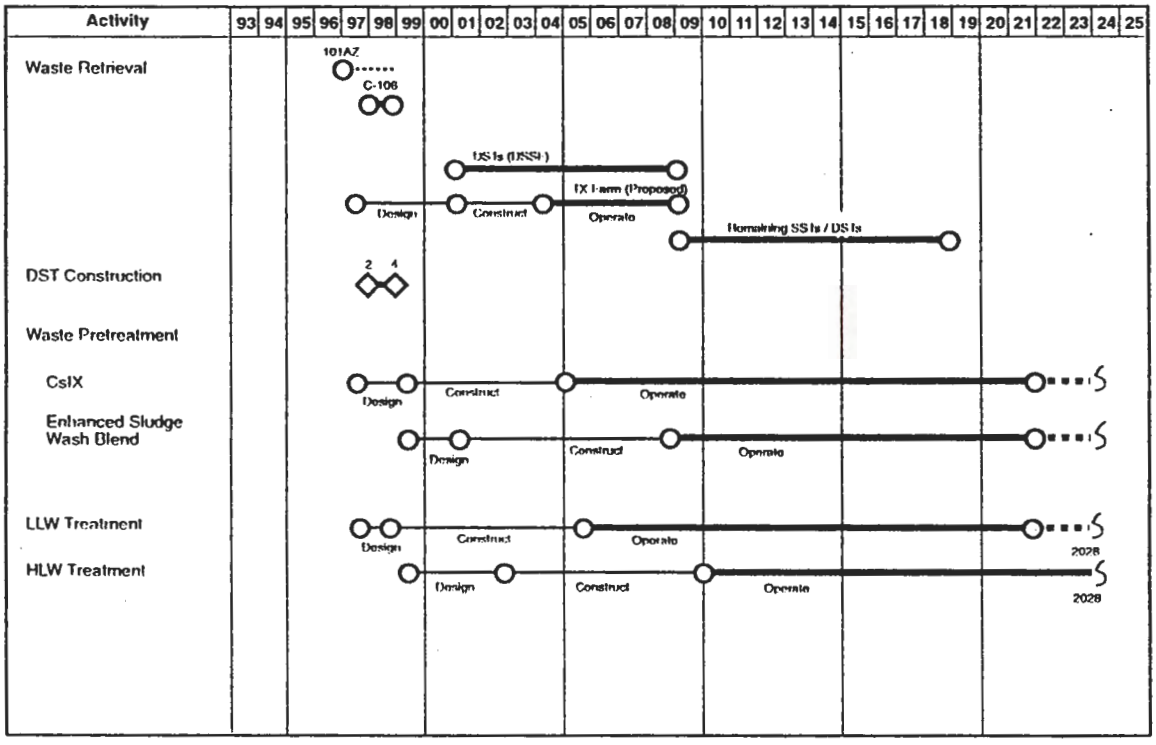
Figure 2-1. Function Hierachy



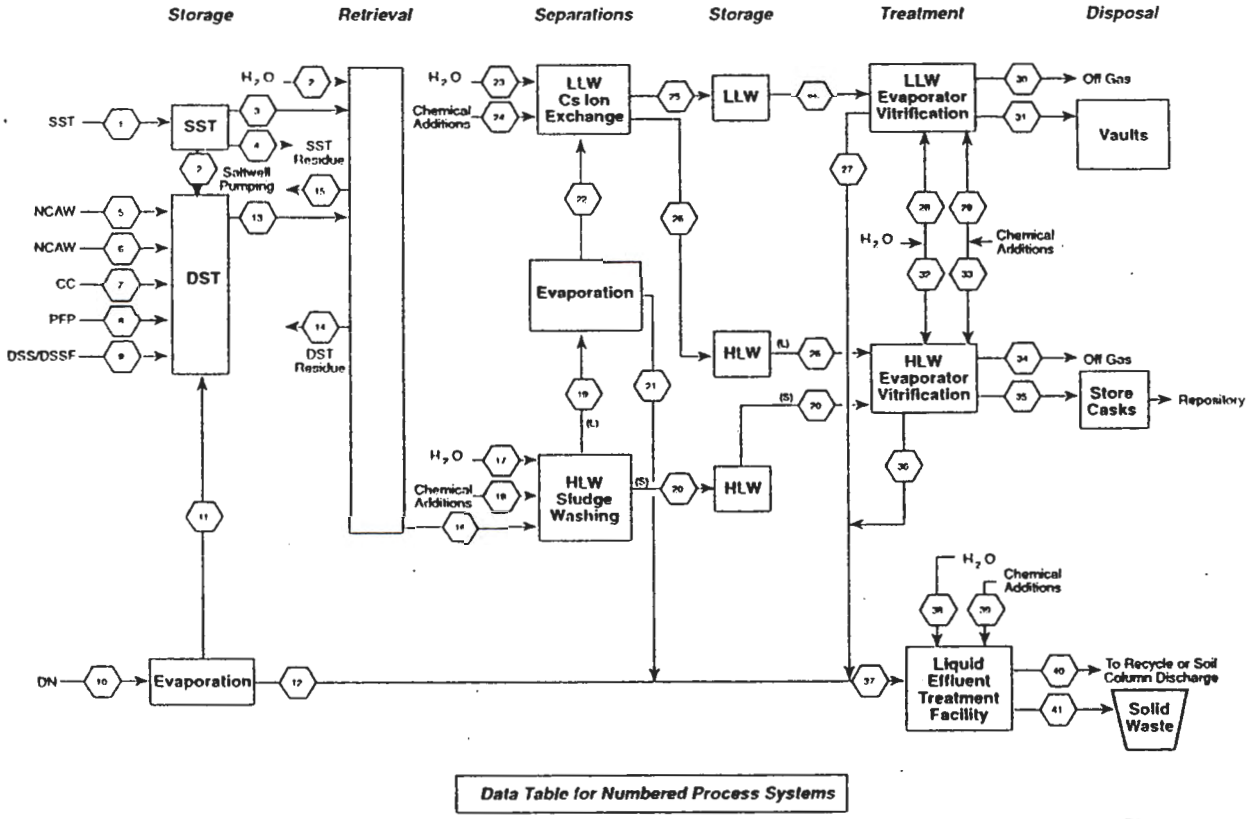
Hanford Tank Waste Remediation System Strategy



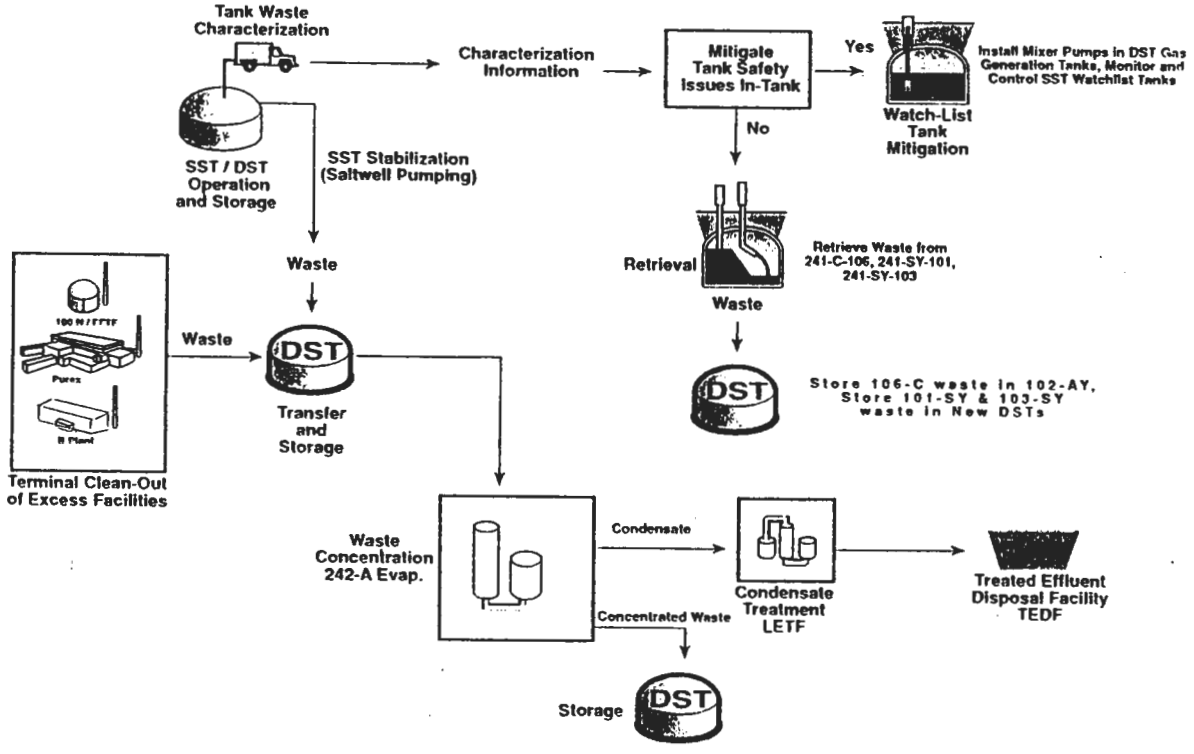
T·W·R·S Current Planning Case



TWRS Top-Level Flow Diagram



SYSTEM FUNCTIONS System Description 1994 - 2004



APPENDIX A

WASTE TANK SURVEILLANCE MONITORING TABLES

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TABLE A-1. WATCH LIST TANKS (Sheet 1 of 2)

These tanks have been identified as Watch List Tanks in accordance with Public Law 101-510, Section 3137, " Safety Measures for Waste Tanks at Hanford Nuclear Reservation," (1990). These tanks have been identified as the Priority 1 Hanford Site Tank Farm Safety Issues: "Issues/situations that contain most necessary conditions that could lead to worker (onsite) or offsite radiation exposure through an uncontrolled release of fission products, e.g., Tank SY-101."

June 30, 1994

Single-Shell Tanks Tank No.		Category	Officially Added to Watch List
A-101	(2)	Hydrogen	1/91
	(9)	Organics	5/94
AX-101	(2)	Hydrogen	1/91
AX-102	(9)	Organics	5/94
AX-103	(2)	Hydrogen	1/91
B-103	(2)	Organics	1/91
BX-102	(2)	Ferrocyanide	1/91
BX-106	(2)	Ferrocyanide	1/91
BY-103	(2)	Ferrocyanide	1/91
BY-104	(2)	Ferrocyanide	1/91
BY-105	(2)	Ferrocyanide	1/91
BY-106	(2)	Ferrocyanide	1/91
BY-107	(2)	Ferrocyanide	1/91
BY-108	(2)	Ferrocyanide	1/91
BY-110	(2)	Ferrocyanide	1/91
BY-111	(2)	Ferrocyanide	1/91
BY-112	(2)	Ferrocyanide	1/91
C-102	(9)	Organics	5/94
C-103	(2)(4)	Organics	1/91
C-106	(2)	High Heat Load	1/91
C-108	(2)	Ferrocyanide	1/91
C-109	(2)	Ferrocyanide	1/91
C-111	(2)	Ferrocyanide	1/91
C-112	(2)	Ferrocyanide	1/91

Single-Shell Tanks Tank No.		Category	Officially Added to Watch List
S-102	(2)	Hydrogen,	1/91
	(2)	Organics	1/91
S-111	(2)	Hydrogen	1/91
	(9)	Organics	5/94
S-112	(2)	Hydrogen	1/91
SX-101	(1)(2)	Hydrogen	1/91
SX-102	(1)(2)	Hydrogen	1/91
SX-103	(1)(2)	Hydrogen	1/91
	(9)	Organics	5/94
SX-104	(1)(2)	Hydrogen	1/91
SX-105	(1)(2)	Hydrogen	1/91
SX-106	(1)(2)	Hydrogen,	1/91
	(1)(2)	Organics	1/91
SX-109	(1)(2)	Hydrogen because other tanks vent thru it	1/91
T-107	(3)	Ferrocyanide	2/91
T-110	(2)	Hydrogen	1/91
T-111	(8)	Organics	2/94
TX-105	(2)	Organics	1/91
TX-118	(2)	Ferrocyanide,	1/91
	(2)	Organics	1/91
TY-101	(2)	Ferrocyanide	1/91
TY-103	(2)	Ferrocyanide	1/91
TY-104	(2)	Ferrocyanide	1/91
	(9)	Organics	5/94

Single-Shell Tanks Tank No.		Category	Officially Added to Watch List
U-103	(2)	Hydrogen	1/91
	(9)	Organics	5/94
U-105	(2)	Hydrogen	1/91
	(9)	Organics	5/94
U-106	(2)	Organics	1/91
U-107	(2)	Organics	1/91
	(6)	Hydrogen	12/93
U-108	(2)	Hydrogen	1/91
U-109	(2)	Hydrogen	1/91
U-111	(7)	Organics	8/93
U-203	(9)	Organics	5/94
U-204	(9)	Organics	5/94
50 Tanks			
Double-Shell Tanks			
Tank No.		Category	
AN-103	(1)(2)	Hydrogen	1/91
AN-104	(1)(2)	Hydrogen	1/91
AN-105	(1)(2)	Hydrogen	1/91
AW-101	(1)(5)	Hydrogen	6/93
SY-101	(1)(2)	Hydrogen	1/91
SY-103	(1)(2)	Hydrogen	1/91
6 Tanks			

Ten tanks (A-101, S-102, S-111, SX-103, SX-106, TX-118, TY-104, U-103, U-105, and U-107,) are on more than one Watch List

See footnotes next page

TABLE A-1 WATCH LIST TANKS (Sheet 2 of 2)

Footnotes:

(1) These eight single-shell tanks and the six double-shell tanks on the Watch List are actively ventilated.

Although on various dates beginning in March 1990, WHC identified tanks containing ferrocyanide, organic salts, etc., which were then added to this report as Watch List tanks, the following official notifications were made to DOE-RL:

(2) Letter 9059124, H. D. Harmon, WHC, to R. E. Gerton, DOE-RL, "Safety Measures for Waste Tanks at Hanford Site, Richland, Washington," dated January 8, 1991, identified 23 ferrocyanide tanks, 23 tanks with potential for accumulation of flammable gas, eight organic tanks, and one high heat load tank, as being Watch List tanks. (52 tanks)

The ferrocyanide and hydrogen tanks were declared Unresolved Safety Questions (USQ); the organic tanks and the high heat load tank were within the safety envelope as defined by the safety analysis reports and were not designated as USQs. On March 1, 1994, the ferrocyanide USQ was closed. See Table A-2 footnote (1) for further information.

(3) Letter 9059124.1 (revision to 9059124 above), dated February 8, 1991, added T-107 to the Ferrocyanide Watch List. (53 tanks)

(4) Tank C-103 was declared a USQ per Unusual Occurrence Report RL-WHC-TANKFARM-1992-0069, issued September 1992, because of an organic layer covering the surface. This USQ was closed May 19, 1994.

(5) Letter 9354700, J. C. Fulton, WHC, to R. E. Gerton, DOE-RL, "Addition of Tank 241-AW-101 to Flammable Gas Watch List," dated June 3, 1993, added this double-shell tank to the Watch List. (54 tanks)

(6) Letter 9353957, J. C. Fulton, WHC, to R. E. Gerton, DOE-RL, "Single-Shell Waste Tank 241-U-111," dated May 24, 1993, recommended this tank be included on the Organic Tanks Watch List. This tank was added to the Watch List on August 31, 1993.

(7) Tank U-107 was declared a USQ per Occurrence Report RL-WHC-TANKFARM-1993-0115, issued December 1993, because of an increase in slurry growth. This tank is also on the Organics Watch List.

(8) Tank T-111 was added to the Organic Salts Watch List on February 28, 1994, upon recommendation by WHC Waste Tank Safety Program.

(9) Ten tanks (A-101, AX-102, C-102, S-111, SX-103, TY-104, U-103, U-105, U-203, and U-204) were added to the Organic Salts Watch List, upon recommendation by WHC to DOE-RL, (Letter 9453328, M. A. Payne, WHC, to R. E. Gerton, DOE-RL, "Revision of the Organic Tanks Watch List," dated May 15, 1994,) and DOE-RL concurrence (Letter 94-SST-116, R. E. Gerton, DOE-RL, to President, WHC, Same Subject, dated May 25, 1994). Six of these tanks were already on the Watch List.

TABLE A-2. TANKS CONTAINING >1000 GRAM MOLE OF FERROCYANIDE (Watch List Tanks)(Sheet 1 of 2)

The Unreviewed Safety Question (USQ) associated with these tanks was closed March 1, 1994. (1)

Temperatures in these tanks did not exceed the maximum temperature criteria for June 1994.
All Watch List tanks are reviewed for increasing temperature trends. Tanks connected to TMACS are required to be monitored continuously; those not connected are required to be monitored weekly. Temperatures are taken in the waste unless indicated otherwise.

Tank No.	Riser No.	Highest Temperature Reading in Waste (F.)	Date of Reading	Readings Taken by TMACS (5)	Total Waste (inches) (6)	FeCN (2) (x1000 g mol)	Estimated Heat Load (3) (Btu/h)	(kW)	Date Declared Assumed Leaker	Interim Stabilized Date
BX-102	8	66	06/28/94	Yes	42	<1	2800	<2.93	1971	11/78
BX-106	1	66	06/30/94	Yes	24	<1	2500	<2.93	Sound	N/A
BX-106	7	66	06/28/94	Yes	24	<1	2500	<2.93	Sound	N/A
BY-103	1	80	06/30/94	Yes	153	66	5500	2.52	1973	N/A
BY-104	1	126	06/27/94	Yes	155	83	8700	1.61	Sound	1/85
BY-104	10B	114	06/11/94	Yes	155	83	8700	1.61	Sound	1/85
BY-105	10C	113	06/30/94	Yes	190	36	8700	0.97	1984	N/A
BY-105	1	120	06/11/94	Yes	190	36	8700	0.97	1984	N/A
BY-106	1	128	06/14/94	Yes	241	70	10100	0.97	1984	N/A
BY-107	1	97	06/22/94	Yes	104	42	8900	4.25	1984	7/79
BY-108	8	108	06/20/94	Yes	90	58	9200	6.74	1972	2/85
BY-110	1	118	06/30/94	Yes	152	71	6900	7.39	Sound	1/85
BY-110	10A	107	06/30/94	Yes	152	71	6900	7.39	Sound	1/85
BY-111	LOW-1	87	06/30/94	Yes	174	6	5500	10.02	Sound	1/85
BY-111	14	83	06/24/94	Yes	174	6	5500	10.02	Sound	1/85
BY-112	LOW-15	82	06/30/94	Yes	113	2	6100	<2.93	Sound	5/85
BY-112	2	88	06/27/94	Yes	113	2	6100	<2.93	Sound	5/85
C-108	5	73	06/30/94	Yes	31	25	6000	<2.93	Sound	3/84
C-108	1	75	06/30/94	Yes	31	25	6000	<2.93	Sound	3/84
C-109	8	80	06/30/94	Yes	31	30	7000	1.11	Sound	11/83
C-109	3	78	06/30/94	Yes	31	30	7000	1.11	Sound	11/83
C-111	5	73	06/30/94	Yes	28	33	6400	<2.93	1968	3/84
C-112	1	80	06/30/94	Yes	45	31	7500	<2.93	Sound	9/90
C-112	8	81	06/30/94	Yes	45	31	7500	<2.93	Sound	9/90
T-107	4	67	06/27/94	Yes	73	5	3000	<2.93	1984	N/A
TX-118 (4)	3	75	06/30/94	Yes	134	<1	4600	1.44	Sound	4/83
TY-101	4	67	06/28/94	Yes	50	23	3100	<2.93	1973	8/83
TY-103	4	68	06/30/94	Yes	66	28	4000	<2.93	1973	2/83
TY-104	4	67	06/28/94	Yes	24	12	3000	<2.93	1981	1/83
20 Tanks			Legend: TMACS = Tank Monitor & Control System							

Note: Tanks BX-110, BX-111, BY-101 and T-101 were removed from this Watch List in July 1993, per letter 93-CAB-223, John H. Anttonen, DOE-RL, to T. M. Anderson, WHC, "Resolution of Unreviewed Safety Question for Four Ferrocyanide Tanks," dated July 9, 1993.

FOOTNOTES: See next page

TABLE A-2. TANKS CONTAINING >1000 GRAM MOLE OF FERROCYANIDE (Watch List Tanks) (Sheet 2 of 2)

FOOTNOTES:

(1) Closure of the Ferrocyanide Unreviewed Safety Question (USQ) was approved in U.S. DOE Memorandum EM-36, Thomas P. Grumbly, to Manager, DOE Richland Operations Office, "Approval of the Request to Close the Ferrocyanide Unreviewed Safety Question at the Hanford High-Level Waste Tank Farms," dated March 1, 1994; and DOE-RL letter 94-SST-052, T. R. Sheridan, to President, WHC, "Closure of the Ferrocyanide Unreviewed Safety Question," dated March 4, 1994.

(2) The amount of FeCN reported in the tanks is based on WHC-SD-WM-ER-133-REV 0, "An Assessment of the Inventories of the FeCN Watch List Tanks," (Table 3-7), October 1991.

(3) The estimated heat generation rates are from WHC-EP-0709, "Estimatation of Heat Load in Waste Tanks Using Average Vapor Space Temperatures," December 1993. This document analyzed all ferrocyanide tanks.

(4) This tank also contains a high concentration (>3% wt TOC) of organic salts.

(5) This column indicates which tanks are being monitored by the Tank Monitor & Control System (TMACS); automatic temperature readings are taken continuously. Temperatures in tanks connected to TMACS but temporarily not being monitored by TMACS are taken manually.

(6) Total waste in Kgal taken from Table E-5, Inventory and Status by Tanks for SSTs. Kgal/inches calculations for the temperature tables are as follows: (waste in inches is an approximation only for these temperature tables)

$$\frac{\text{Kgal waste} - 12.5\ \text{Kgal waste}^*}{2.75\ \text{Kgal/inch}} + 12\ \text{inches}^*$$

* The bottom 12 inches in dish bottom tanks contain 12.5 Kgal. All tanks are calculated as dish bottom tanks for the temperature tables, although A and AX farms have flat bottoms. Inches are from centerline tank bottom.

TABLE A-3. TANKS WITH POTENTIAL FOR HYDROGEN OR FLAMMABLE GAS ACCUMULATION ABOVE THE FLAMMABILITY LIMIT (Watch List Tanks)

These tanks have an Unreviewed Safety Question (USQ) because of the potential consequences of a radiological release resulting from a flammable gas burn, an event not analyzed in the SST Safety Analysis Report.

Temperatures in these tanks did not exceed the applicable maximum temperature criteria for the month of June 1994.
All Watch List tanks are reviewed for increasing temperature trends. Temperatures are taken in the waste unless indicated otherwise.

Tank No.	Riser No.		Highest Temperature Reading (F.) in Waste	Date of Reading	Total Waste (3) (inches)	Monitoring Frequency	Assumed Leaked Date	Interim Stabilized Date
A-101 (2)	R-12		152	06/29/94	354	Weekly	SOUND	N/A
AX-101	R-9b		135	06/15/94	279	Weekly	SOUND	N/A
AX-103	R-13c		112	06/29/94	48	Weekly	SOUND	8/87
S-102 (2)	R-3		107	06/27/94	207	Weekly	SOUND	N/A
S-111(2)	R-4		91	06/27/94	224	Weekly	SOUND	N/A
S-112	R-4		84	06/13/94	239	Weekly	SOUND	N/A
SX-101 (5)	R-15		144	06/06/94	173	Weekly	SOUND	N/A
SX-102	R-16		151	06/27/94	206	Weekly	1993	N/A
SX-103(2)	R-2		173	06/27/94	245	Weekly	SOUND	N/A
SX-104	R-2		167	06/27/94	231	Weekly	1988	N/A
SX-105	R-2		179	06/27/94	256	Weekly	SOUND	N/A
SX-106 (2)	R-16		117	06/27/94	203	Weekly	SOUND	N/A
SX-109 (1)	R-10		147	06/27/94	98	Weekly	1965	5/81
SX-109 (1)	R-19		151	06/27/94	98	Weekly	1965	5/81
T-110	R-8		64	06/30/94	145	Weekly	SOUND	N/A
U-103(2)	R-1		87	06/27/94	178	Weekly	SOUND	N/A
U-105(2)	R-1		89	06/13/94	159	Weekly	SOUND	N/A
U-107 (2)(5)	R-1		77	06/27/94	155	Weekly	SOUND	N/A
U-108	R-1		87	06/27/94	178	Weekly	SOUND	N/A
U-109	R-1		86	06/27/94	176	Weekly	SOUND	N/A
AN-103		Double-shell tank	113	06/15/94		Weekly	SOUND	N/A
AN-104		Double-shell tank	119	06/15/94		Weekly	SOUND	N/A
AN-105		Double-shell tank	110	06/27/94		Weekly	SOUND	N/A
AW-101 (4)		Double-shell tank	102	06/27/94		Weekly	SOUND	N/A
SY-101	Riser 17b	Double-shell tank	117	06/30/94		Daily	SOUND	N/A
SY-101	Riser 17c	Double-shell tank	116	06/23/94		Daily	SOUND	N/A
SY-103		Double-shell tank	84	06/27/94		Weekly	SOUND	N/A
25 Tanks							Legend: N/A = Not Applicable	

(1) Tank SX-109 has the potential for flammable gas accumulation only because other SX tanks vent through it.
(2) Tanks A-101, S-102, S-111, SX-103, SX-106, U-103, U-105 and U-107 are also on the Organics Watch List.
(3) See footnote (6) in Table A-2 (Ferrocyanide Tanks) for Total Waste/Inches calculations. Waste in inches is an approximation for temperature tables only.
(4) Tank AW-101 was added to this list per letter 9354700, J. C. Fulton, WHC, To R. E. Gerton, DOE-RL, "Addition of Tank 241-AW-101 to Flammable Gas Watch List," dated June 3, 1993.
(5) Tank U-107 was added to this list per Unusual Occurrence Report RL-WHC-TANKFARM-0115, issued December 1993, because of an increase in slurry growth.

TABLE A-4. SINGLE-SHELL TANKS CONTAINING CONCENTRATIONS OF ORGANIC SALTS >3 WEIGHT % TOTAL ORGANIC CARBON (TOC) (Watch List Tanks) (Sheet 1 of 2)

These tanks have organic chemicals which are potentially flammable and mixtures of organic materials mixed with nitrate and nitrate salts can deflagrate. They are listed here because of their "potential for release of high level waste because of uncontrolled increases in the temperature or pressure." Double-Shell tanks have >3 Weight % TOC and are not on the Watch List because they contain mostly liquid and there is no credible organic safety concern for tanks which contain mostly liquid. The safety concern is with tanks that primarily contain solids because they could dry out and heat up, and "high organic concentrations in the tanks could support an exothermic reaction at elevated temperatures (350 degrees F/180 degrees C)." These tanks (with the exception of C-103), do not have an associated USQ because the presence of organic material was reviewed in the SST Safety Analysis Report.

Temperatures in these tanks did not exceed the applicable maximum temperature criteria for the month of June 1994. These tanks are monitored weekly. All Watch List tanks are reviewed for increasing temperature trends.

Temperatures are taken in the waste unless indicated otherwise.

Tank No.	Temperature Reading (F.) in waste	Date of Reading	Total Waste Inches (4)	Assumed Leaked Date	Interim Stabilized Date	Source of Waste	Organic Content (wt.%) (6)	$NaNO_3$ and $NaNO_2$ (wt.%)(6)	TOC (WT.%) (7)	Waste Surface Potentially Dry (8)	Last Date Sampled
A-101 (17)	152	06/29/94	354	SOUND	N/A						
AX-102 (17)	O/S	06/20/94	21	SOUND	N/A						
B-103	65	06/15/94	29	1978	2/85	First and second cycle waste from B Plant and in-tank solidification (ITS-1 & ITS-2) evaporator bottoms (11)	11.4 (9)	60.5 (9)	3.3	x	9/75
C-102 (17)	83	06/30/94	161	SOUND	N/A						
C-103 (3)	119	06/30/94	78	SOUND	N/A	PUREX and insoluble strontium-rich sluicing solids from the operation of 244-CR Vault (11)	-	-	-		9/90
S-102 (1)	107	06/27/94	207	SOUND	N/A	REDOX (11)	21.0 (10)	41.0 (10)	6.1	x	2/80
S-111 (17)	91	06/27/94	224	SOUND	N/A						
SX-103 (17)	173	06/27/94	244	SOUND	N/A						
SX-106 (1)	117	06/27/94	203	SOUND	N/A	Salt waste and first cycle condensate from REDOX, and 242-S Evaporator bottoms (11)	14.6 (9)	80.9 (9)	4.3		8/79
T-111 (12)	65	06/30/94	232	1984 Assumed Re-leaker 1994	N/A	Second cycle waste, 224 waste, Decontamination & Decommissioning operatings at T-Plant (13)	14.0 (14)	NO 3, 4.1 wet, NO 2, 0.08 (15)	4.1	x	3/94 (16)
TX-105	96	06/06/94	228	1977	9/83	) Tributyl phosphate (TBP)	12.8 (9)	52.7 (9)	3.7	x	1/81
TX-118 (2)	75	06/30/94	134	SOUND	4/83	) process waste and 242-T	20.2 (10)	50.4 (10)	5.9	x	9/81
TY-104 (17)	67	06/28/94	24	1981	11/83						
U-103 (17)	87	06/27/94	178	SOUND	N/A						
U-105 (17)	89	06/13/94	159	SOUND	N/A						
U-106	80	06/27/94	90	SOUND	N/A	) Evaporator bottoms (11)	46.6 (10)	52.4 (10)	13.6		6/77
U-107 (1)	77	06/27/94	155	SOUND	N/A	)	14.7 (9)	75.4 (9)	4.3		12/74
U-111 (5)	79	06/27/94	127	SOUND	N/A	Concentrated B Plant Waste (11)	48.2 (10)	—(10)	14.1	x	7/93
U-203 (17)	64	06/20/94	9	SOUND	N/A						
U-204 (17)	62	06/20/94	9	SOUND	N/A						
20 Tanks											

See Footnotes next page

TABLE A-4. SINGLE-SHELL TANKS CONTAINING CONCENTRATIONS OF ORGANIC SALTS >3 WEIGHT % TOTAL ORGANIC CARBON (TOC) (Sheet 2 of 2)

Footnotes:

(1) These tanks also have the potential for hydrogen or flammable gas accumulation.

(2) Tank TX-118 also contains ferrocyanide.

(3) Tank C-103 was declared a USQ because of an organic layer covering the surface, reference Unusual Occurrence Report RL-WHC-TANKFARM-1992-0069, issued September 1992.

(4) See footnote (6) in Table A-2 (Ferrocyanide Temperature Table) for Total Waste/Inches calculations. Waste inches calculations are approximations only for temperature tables.

(5) Tank U-111 was added August 31, 1993. See August 1993 Summary Highlights for information and Table A-1. "Watch List Tanks" for applicable reference.

(6) WHC, 1990, "The Kyshtym Explosion and Explosion Hazards with Nitrate-Nitrite Bearing Wastes with Acetates and Other Organic Salts," WHC-SD-LB-033, Westinghouse Hanford Company, Richland, Washington

(7) Dry wt.% basis. Calculated as wt.% sodium acetate equivalent X.2928.

(8) Due to absence of supernatant liquid.

(9) Calculated from data developed by Track Radioactive Components (TRAC) computer code, 1984.

(10) "Removal of Radionuclides from Hanford Defense Waste Solutions," RHO-SA-51, 1980, Rockwell Hanford Operations, Richland, Washington. All or part of liquid from which composition data were derived may have been transferred to double-shell tanks.

(11) WHC, 1993, "Action Plan for Responses to Abnormal Conditions in Hanford Site Radioactive Waste Tanks with High Organic Content," WHC-EP-0461, Rev. 1, Westinghouse Hanford, Richland, Washington.

(12) Tank 241-T-111 was added to the Organic Salts Watch List on February 28, 1994, upon recommendation by WHC Waste Tank Safety Program.

(13) WHC, 1990, "A History of the 200 Area Tank Farms," WHC-MR-0132, Westinghouse Hanford, Richland, Washington.

(14) Pacific Northwest Laboratories analysis on Core 33, Segment 2, dated January 14, 1994.

(15) WHC, 1993, "Single-Shell Tank Characterization, Tank T-111, Cores 31 and 33," WHC-SM-PD-024, Rev 0A, Westinghouse Hanford, Richland, Washington.

(16) Data not yet available.

(17) Ten tanks (A-101, AX-102, C-102, S-111, SX-103, TY-104, U-103, U-105, U-203, and U-204) were added to this Watch List upon the recommendation of WHC to DOE-RL on May 15, 1994, and concurrence by DOE on May 25, 1994. Sampling data not yet available.

TABLE A-5. SINGLE-SHELL TANKS WITH HIGH HEAT LOADS (>40,000 Btu/h)(Sheet 1 of 2)

High heat load tanks have temperature surveillance requirements established by SD-WM-SAR-006 REV 1, "SST Isolation Safety Analysis Report," dated January 1986, and OSD-T-151-00013 REV D-O, "Operating Specifications for Single-Shell Waste Storage Tanks," dated August 1990. While all of these tanks are considered high heat load tanks per SAR definition, only one (241-C-106) is on the High Heat Watch List.

Temperatures in these tanks did not exceed SAR or OSD requirement limits for the month of June 1994, with the exception of C-106. See footnote (2) next page. All high heat load tanks are on active ventilation unless indicated otherwise in the footnotes.
These high heat load tanks are reviewed for increasing temperature trends. Temperature are taken in the waste unless indicated otherwise.

Tank No.	Riser No. (6)	Temperature Reading (F.) in Waste	Date of Reading	Total Waste Inches (7)	Monitoring Frequency	Estimated Heat Load (1) (Btu/h)	(kW)	Date Declared Assumed Leaker	Interim Stabilized Date
A-104 (4)	R-18	187	06/09/94	18	Weekly	50000	15	1975	9/78
A-105 (4)	R-16	152	06/22/94	14	Weekly	50000	15	1963	7/79
C-106 (2)	R-8	156	06/30/94	91	Weekly	110000	32	SOUND	N/A
C-106 (2)	R-14	173	06/30/94	91	Weekly	110000	32	SOUND	N/A
SX-107	R-10	169	06/01/94	45	Monthly	42000	12	1964	10/79
SX-107	R-14	169	06/01/94	45	Monthly	42000	12	1964	10/79
SX-108	R-10	191	06/01/94	49	Monthly	45000	13	1962	8/79
SX-108	R-19	197	06/01/94	49	Monthly	45000	13	1962	8/79
SX-109 (3)	R-10	147	06/27/94	98	Weekly	50000	15	1965	5/81
SX-109 (3)	R-19	151	06/27/94	98	Weekly	50000	15	1965	5/81
SX-110	R-12	171	06/01/94	30	Monthly	42000	12	1976	8/79
SX-110	R-20	167	06/01/94	30	Monthly	42000	12	1976	8/79
SX-111	R-10	191	06/01/94	53	Monthly	44000	13	1974	7/79
SX-111	R-19	164	06/01/94	53	Monthly	44000	13	1974	7/79
SX-112	R-10	151	06/01/94	41	Monthly	43000	13	1969	7/79
SX-112	R-19	157	06/01/94	41	Monthly	43000	13	1969	7/79
SX-114	R-10	189	06/01/94	73	Monthly	58000	17	1972	7/79
SX-114	R-19	186	06/01/94	73	Monthly	58000	17	1972	7/79
10 Tanks								Legend: Tree = Thermocouple Tree	
A-105 Laterals (5)	R-1	239	06/15/94		Weekly				

Temperatures are taken in 34 thermocouples located in the laterals beneath A-105. SAR requirements (see top of table) do not apply to these temperatures; however, Westinghouse Hanford has voluntarily chosen to apply the waste temperature limits to the soil temperature for surveillance reporting.

Footnotes – see next page

TABLE A-5. SINGLE-SHELL TANKS WITH HIGH HEAT LOADS (>40,000 Btu/h)(Sheet 2 of 2)

Footnotes:

(1) High heat loads as of 1988, evaluation completed April 20, 1989 (kW = 3412 Btu/h). The predominant heat load for these tanks is from CS 137 (half life of 30 years) and SR 90 (half life of 28.1 years). Tank C-105 was re-evaluated in WHC-SD-WM-ER-189, "Thermal Analysis of Tank 241-C-105 in Support of Process Test," January 1993. Engineering Change Notice #196834, June 24, 1993, changed the status of C-105 from High Heat Load to Normal, effective July 1, 1993. Tank C-106 was re-evaluated using a revised thermal history based on the thermal transient behavior during the ventilation outage in 1992. WHC-SD-WM-ER-200 "Revised Thermal History of Tank 241-C-106," issued December 20, 1993, documents the new heat load estimate of 110,000 Btu/hr (+/-20,000 Btu/h) for this tank.

(2) Tank C-106 is on the high heat load Watch List because in the event of a leak "without water additions the tank could exceed structural temperature limits resulting in unacceptable structural damage." Generally, temperatures in riser 8 are consistent at mid-150 degrees, however, temperatures in riser 14 vary between approximately 120 and 135, also consistently. This tank is scheduled for partial retrieval starting in 1997, at which time cooling water additions will be discontinued. Starting March 7, 1994, this tank underwent a liquid-reduction process test to determine a new low level for future water addition. The process test was completed in June 1994. Approximately six inches of liquid was reduced. In-tank videos were taken to verify the integrity of the tank and the condition of the liquid-sludge interface. Treated water will be added to maintain liquid level between 70 and 74 inches.

A rising trend in one of the two thermocouple trees in C-106 was determined in June 1994. Spikes and unexplained temperature cycling continued throughout the month. Temperatures exceeded the OSD 20 degree F. maximum per day change. A Discrepancy Report was issued June 28, and an Occurrence Report was issued July 1. An Unreviewed Safety Question screening will be done. C-Farm thermocouple trees are connected to the Tank Monitor and Control System (TMACS) and are monitored continuously.

(3) SX-109 is on the hydrogen Watch List because it has the potential for flammable gas accumulation due to other SX tanks venting through it. for flammable gas accumulation due to other SX tanks venting through it.

(4) A-104/105/106 exhauster has been out of service from October 1, 1991, until August 20, 1992, when it was briefly restarted. A review study completed February 1994 concluded that based on calculated heat loads, tenk temperatures will not exceed the operating limits and structural integrity will not be compromised. The study recommended that the portable exhauster be discontinued and the heat load status for A-105 be changed from high to normal.

(5) Maximum lateral temperatures under A-105 increased 20 degrees F. by January 1992, but then dropped a few degrees and have remained fairly stable at current temperature. These temperatures are monitored weekly.

(6) Tanks A-104 and A-105
Two temperature probes are installed in risers in A-104, and six are installed in risers in A-105. These are individual probes. In A-104, the probes are in contact with the sludge; in A-105, they are in contact with the bottom of the tank (A-105 has a bulged bottom).

Tanks SX-107, 108, 109, 110, 111, 112, and 114
Each of these tanks has eight thermocouple trees, with eight thermocouples on each tree, with the exception of SX-108, which has four operational thermo-mocouples on each of two trees. Two trees are monitored in each of these SX tanks..

(7) Calculations for Total Waste Inches: see footnote (6), Table A-2 (Ferrocyanide Tanks). Waste in inches is an approximation only for temperature tables.

(8) There are 19 single-shell tanks with active ventilation (eight are on the Watch List as indicated by an asterisk):

A-104	(Also see	SX-101 *	SX-107
A-105	item #4	SX-102 *	SX-108
A-106	above)	SX-103 *	SX-109 *
C-104		SX-104 *	SX-110
C-105		SX-105 *	SX-111
C-106 *		SX-106 *	SX-112
			SX-114

TABLE A-6. NON-WATCH LIST LOW HEAT LOAD TANKS (<40,000 Btu/h)

(Page 1 of 3)

Temperatures are taken semiannually in January and July, unless otherwise indicated, in the following 91 single-shell tanks. Legend follows table.

		Highest Temperatures taken in waste		Total Waste (1)		
	Tank No.	Jul. 93	Jan. 94	Kgal	Inches	Comments
1	A-102	92	87	41	15	
2	A-103	117	114	370	135	
3	A-106	137	135	125	50	
4	AX-104	98	92	7	3	
5	B-101	108	109	113	48	
6	B-102	63	63	32	19	TC#1 O/S, reading in vapor space
7	B-104	66	65	371	142	
8	B-105	66	65	306	50	
9	B-106	62	63	117	67	TC#1 & 2 O/S
10	B-107	62	60	165	41	TC#1 thru 3 O/S, reading in vapor space
11	B-108	62	64	94	54	
12	B-109	61	63	127	97	
13	B-110	68	63	246	94	TC#1 thru 4 O/S. Reading in vapor space
14	B-111	86	86	237	19	TC#1 & 2 O/S, work order issued, historical readings erratic
15	B-112	63	64	33	7	
16	B-201	60	60	29	151	
17	B-202	61	60	27	141	
18	B-203	62	61	51	263	
19	B-204	62	61	50	258	
20	BX-101	O/S	O/S	43	27	All TCs O/S, work order issued, last reading 74 F. in 11/92
21	BX-103	O/S	O/S	66	31	All TCs O/S, last reading 77 F. in 10/92
22	BX-104	O/S	O/S	99	43	(2) No TC tree per Riser Configuration document
						Last reading 87 F. in 10/80
23	BX-105	63	66	51	26	
24	BX-107	O/S	O/S	345	133	All TCs O/S, work order issued, last reading 69 F. in 10/82
25	BX-108	63	65	26	17	
26	BX-109	77	O/S	193	78	Temp reading obtained 7/93 only, 2 attempts made 1/94
						No historical readings available
27	BX-110	68	74	199	80	Readings taken weekly, pumping began, now on hold
28	BX-111	65	69	211	84	Readings taken weekly, tank being pumped
29	BX-112	62	65	165	67	
30	BY-101	75	75	387	148	Continuous readings taken on TMACS
31	BY-102	O/S	O/S	341	131	(2) No TC tree per Riser Configuration document.
						Last reading 72 F. in 4/79
32	BY-109	O/S	O/S	423	161	(2) No TC tree per Riser Configuration document.

TABLE A-6. NON-WATCH LIST LOW HEAT LOAD TANKS (<40,000 Btu/h)

(Page 2 of 3)

Temperatures are taken semiannually in January and July, unless otherwise indicated, in the following 91 single-shell tanks. Legend follows table.

		Highest Temperatures taken in waste		Total Waste (1)		
	Tank No.	Jul. 93	Jan. 94	Kgal	Inches	Comments
33	C-101 (3)	88	86	88	39	
34	C-104 (3)	87	85	295	115	TC#1 thru 5 O/S, reading in vapor space
35	C-105 (3)	92	80	150	63	Monitored weekly, formerly on High Heat Load list
36	C-107 (3)	125	124	275	107	Monthly reading requirement per procedure, monitored weekly
37	C-110 (3)	65	66	187	75	TC#1 thru 4 O/S, reading in vapor space
38	C-201 (3)	61	56	2	13	
39	C-202 (3)	61	60	1	8	
40	C-203 (3)	60	59	5	29	
41	C-204	O/S	O/S	3	18	In-tank photos revealed no tree. Last reading obtained prior '91.
42	S-101	115	118	427	162	TC#1, 3, 5, & 6 O/S, work order issued
43	S-103	85	87	248	98	
44	S-104	104	108	294	114	
45	S-105	73	78	456	173	
46	S-106	78	81	543	205	
47	S-107	107	110	368	129	
48	S-108	85	89	604	227	
49	S-109	O/S	68	568	214	Readings available on TC#7 only
50	S-110	116	117	390	149	
51	SX-113	73	77	26	15	
52	SX-115	O/S	O/S	12	10	(2) No TC tree, per Riser Configuration document, last reading prior to 12/91
53	T-101	66	72	102	45	Formerly on ferrocyanide Watch List
54	T-102	O/S	O/S	32	19	(2) No TC tree per Riser Configuration document, last reading 68 F. in 2/81
55	T-103	59	62	27	17	
56	T-104	O/S	62	445	169	All TCs O/S, work order issued
57	T-105	O/S	O/S	98	43	(2) No TC tree per Riser Configuration document
58	T-106	59	60	21	15	
59	T-108	O/S	57	180	73	
60	T-109	O/S	O/S	58	29	All TCs O/S, work order issued, last reading 75 F. in 2/91
61	T-112	58	60	67	32	
62	T-201	59	60	29	150	
63	T-202	58	62	21	110	
64	T-203	75	64	35	182	
65	T-204	60	63	38	197	
66	TX-101	O/S	O/S	87	39	(2) No TC tree per Riser Configuration document
67	TX-102	O/S	O/S	113	49	Cable cut from tree

TABLE A-6. NON-WATCH LIST LOW HEAT LOAD TANKS (<40,000 Btu/h)

(Page 3 of 3)

Temperatures are taken semiannually in January and July, unless otherwise indicated, in the following 91 single-shell tanks. Legend follows table.

		Highest Temperatures taken in waste		Total Waste (1)		
	Tank No.	Jul. 93	Jan. 94	Kgal	Inches	Comments
68	TX-103	55	71	157	54	Cable cut from tree, readings taken by Instrument Technician
						High reading taken 1/93 was 71 F.
69	TX-104	60	65	65	31	Cable cut from tree, readings taken by Instrument Technician
70	TX-106	59	78	453	172	Cable cut from tree, readings taken by Instrument Technician
71	TX-107	60	66	36	21	Cable cut from tree, readings taken by Instrument Technician
72	TX-108	61	68	134	56	Cable cut from tree, readings taken by Instrument Technician
73	TX-109	64	94	384	147	Cable cut from tree, readings taken by Instrument Technician
						High reading taken 1/93 was 97 F.
74	TX-110	O/S	O/S	462	175	Cable cut from tree, readings taken by Instrument Technician
75	TX-111	61	79	370	142	Cable cut from tree, readings taken by Instrument Technician
						High reading taken 1/93 was 73 F.
76	TX-112	72	67	649	243	Cable cut from tree, readings taken by Instrument Technician
77	TX-113	65	72	607	228	Dial pushed inside housing, readings taken by Instr. Tech.
78	TX-114	O/S	O/S	535	202	Cable cut from TC tree
79	TX-115	67	70	640	240	Dial pushed inside housing, readings taken by Instr. Tech.
80	TX-116	O/S	O/S	631	237	(2) Tree cut off in riser per Riser Configuration document
81	TX-117	O/S	O/S	626	235	All TCs O/S, cable cut from tree
82	TY-102	O/S	60	64	31	
83	TY-105	77	79	231	91	
84	TY-106	60	59	17	14	
85	U-101	61	67	25	17	
86	U-102	81	85	374	143	
87	U-104	O/S	O/S	122	52	(2) No TC tree per Riser Configuration document
88	U-110	72	76	186	75	
89	U-112	61	63	49	25	
90	U-201	O/S	61	5	29	
91	U-202	59	61	5	29	

(1) See Table A-2 (footnote 6) for waste gallons/inches calculations.

(2) Thermocouples in nine tanks (BX-104, BY-102, BY-109, SX-115, T-102, T-105, TX-101, TX-116, and U-104) are out of service due to no TC trees in these tanks, or the thermocouples have been cut off, covered over, or are otherwise unable to function, per the Riser Configuration document. (Also see comment section above)

(3) All TC trees in C-Farm connected to TMACS on 3/31/94, except for C-204 which has no tree.

(4) T-111 was deleted from this list and added to the Organics Watch List in February 1994

(5) AX-102, C-102, U-203 and U-204 were deleted from this list and added to the Organics Watch List in May 1994.

LEGEND:

TC - Thermocouple
TMACS - Tank Monitor & Control System
O/S - Out of service
Riser Configuration document - WHC-SD-RE-TI-053, REV 8, "Riser Configuration Document for Single-Shell Tanks," dated September 1991

SUMMARY:

	Jul. 93	Jan. 94
Readings obtained in SSTs	71	76
No readings (TC trees O/S - includes nine tanks with no trees - see footnote above)	25	20
Total low heat load tanks	96	96

TABLE A-7. SINGLE-SHELL TANKS MONITORING COMPLIANCE STATUS

149 TANKS (Sheet 1 of 5)

The following table indicates whether Single-Shell tank monitoring was in compliance with the requirements as specified in the applicable documents as of the last day of the applicable month:

NOTE:
All Watch List and High Heat tank temperature monitoring is in compliance. (5)
All Dome Elevation Survey monitoring is in compliance.
All Drywell monitoring is in compliance.
Psychrometrics (2)
In-tank Photographs (3)
Pressure Monitoring (6)
CAM/RAMP Monitoring (7)
Vapor Monitoring (8)

LEGEND:	
(Shaded)	= in compliance with all applicable documentation
O/C	= out of compliance with documentation
-357	= WHC-SD-WM-TI-357, "Waste Storage Tank Status and Leak Detection Criteria"
POP	= Plant Operation Procedure TO-040-650, "Obtain/Record SST Temperatures"
M.T.	= Manual Tape
FIC	= Food Instrument Corporation
OSR/SAR	= Operations Safety Requirements/Safety Analysis Report, SD-WM-SAR-006, Rev 2, 2/86; -SAR-034, Rev 0, 6/81
OSD	= Operating Specifications Doc., OSD-T-151-00013, Rev D-0, 8/90
N/A	= Not applicable (i.e., no LOW, M.T., FIC installed)
O/S	= Out of Service
Neutron	= LOW readings taken by Neutron probe

Information as of June 30, 1994

Tank Number	Category		Temperature Readings (5)(6)	Surface Level Readings (1) (-357)		LOW Readings (-357)	Radiation Readings		Dome Elevation Surveys (OSR/SAR)
	Watch List(6)	High Heat		M.T.	FIC	Neutron	Lateral Readings (-357)	Drywell Readings (OSR/SAR)	
A-101	X				N/A				
A-102				N/A		N/A			
A-103				N/A					
A-104		X			N/A	N/A			
A-105		X			N/A	N/A			
A-106				N/A		N/A			
AX-101	X			N/A					
AX-102					N/A	N/A			
AX-103	X			N/A		N/A			
AX-104					N/A	N/A			
B-101				N/A		N/A			
B-102				N/A		N/A			
B-103	X			N/A		N/A			
B-104					N/A				
B-105					N/A				
B-106				N/A		N/A			
B-107					N/A	N/A			
B-108				N/A		N/A			
B-109					N/A	N/A			
B-110					N/A	N/A			
B-111				N/A		N/A			
B-112				N/A		N/A			
B-201					N/A	N/A			
B-202					N/A	N/A			
B-203					N/A	N/A			
B-204					N/A	N/A			
BX-101			O/C		N/A	N/A			
BX-102	X				N/A	N/A			
BX-103			O/C	N/A		N/A			
BX-104			O/S-O/C	N/A		N/A			
BX-105				N/A		N/A			
BX-106	X			N/A		N/A			
BX-107			O/C	N/A		N/A			

TABLE A-7. SINGLE-SHELL TANKS MONITORING COMPLIANCE STATUS

149 TANKS (Sheet 2 of 5)

Information as of June 30, 1994

Tank Number	Category		Temperature Readings (5)(6)	Surface Level Readings (1) (-357)		LOW Readings (-357) (9)	Radiation Readings		Dome Elevation Surveys (OSR/SAR)
	Watch List(6)	High Heat		M.T.	FIC	Neutron	Lateral Readings (-357)	Drywell Readings (OSR/SAR)	
BX-108					N/A	N/A	N/A		
BX-109			O/C	N/A		N/A	N/A		
BX-110 (4)					N/A	N/A	N/A		
BX-111 (4)					N/A		N/A		
BX-112				N/A		N/A	N/A		
BY-101 (4)				O/C	N/A		N/A		
BY-102			O/S-O/C		N/A		N/A		
BY-103	X				N/A		N/A		
BY-104	X				N/A		N/A		
BY-105	X				N/A		N/A		
BY-106	X				N/A		N/A		
BY-107	X				N/A		N/A		
BY-108	X				N/A	N/A	N/A		
BY-109			O/S-O/C	N/A			N/A		
BY-110	X				N/A		N/A		
BY-111	X				N/A		N/A		
BY-112	X				N/A		N/A		
C-101					N/A	N/A	N/A		
C-102			O/C	N/A		N/A	N/A	N/A	
C-103	X			N/A		N/A	N/A		
C-104				N/A		N/A	N/A		
C-105				N/A		N/A	N/A		
C-106 (4)	X	X		N/A		N/A	N/A		
C-107				N/A		N/A	N/A		
C-108	X				N/A	N/A	N/A		
C-109	X				N/A	N/A	N/A		
C-110					N/A	N/A	N/A		
C-111	X				N/A	N/A	N/A		
C-112	X				N/A	N/A	N/A		
C-201					N/A	N/A	N/A		
C-202					N/A	N/A	N/A		
C-203					N/A	N/A	N/A		
C-204			O/C		N/A	N/A	N/A		
S-101				N/A			N/A		
S-102	X			N/A			N/A		
S-103				N/A			N/A		
S-104					N/A	N/A	N/A		
S-105				N/A			N/A		
S-106				N/A			N/A		
S-107				N/A		N/A	N/A		
S-108							N/A		
S-109				N/A			N/A		
S-110				N/A			N/A		
S-111	X			N/A			N/A		
S-112	X			N/A			N/A		
SX-101	X			N/A			N/A		
SX-102	X			N/A			N/A		
SX-103	X			N/A			N/A		
SX-104	X			N/A		O/S-O/C	N/A		
SX-105	X			N/A			O/C		
SX-106	X			N/A			N/A		
SX-107		X			N/A	N/A	O/C		
SX-108		X			N/A	N/A	O/C		

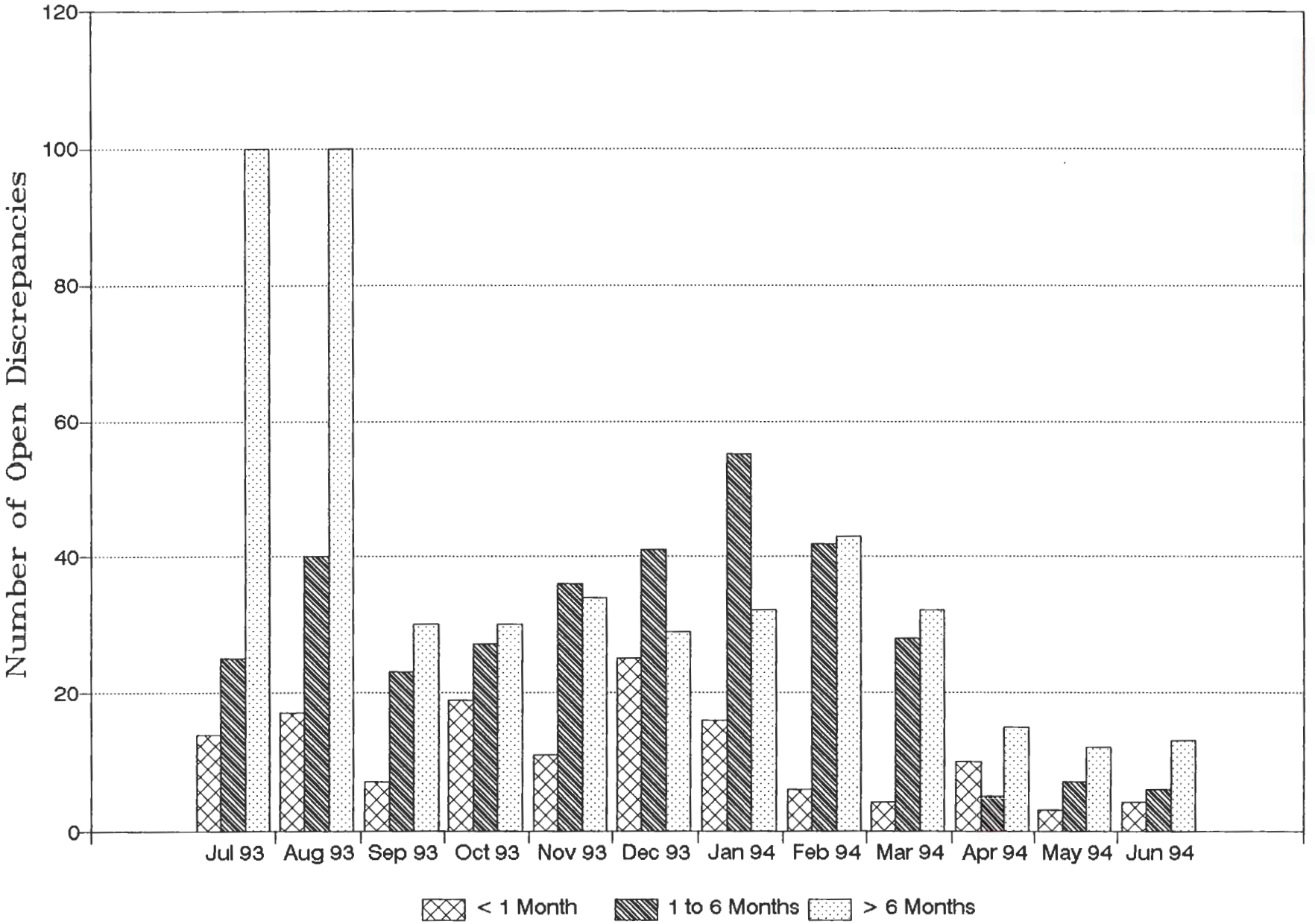

Figure 3. Discrepancy Report Status by Age

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APPENDIX B

DOUBLE SHELL TANK WASTE TYPE AND SPACE ALLOCATION

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TABLE B-1. DOUBLE-SHELL TANK WASTE TYPE AND SPACE ALLOCATION
JUNE 1994

DOUBLE-SHELL TANK INVENTORY BY WASTE TYPE		SPACE DESIGNATED FOR SPECIFIC USE	
Complexed Waste (102-AN, 107-AN, 101-SY, 103-SY) 101-AY (DC))	4.87 Mgal	Spare Tanks (3) (1 Aging & 1 Non-Aging Waste Tank)	2.28 Mgal
Concentrated Phosphate Waste (102-AP,106-AN)	1.12 Mgal	Segregated Tank Space (102-AP, 105-AP, 101-AY, 102-AN, 107-AN,)	0.59 Mgal
Double-Shell Slurry and Slurry Feed (103-AN, 104-AN, 105-AN, 105-AP, 101-AW)	5.08 Mgal	Watch List Tank Space (103-AN, 104-AN, 105-AN, 101-SY, 103-SY, 101-AW)	0.73 Mgal
Aging Waste (NCAW) at 5M Na	1.23 Mgal	Priority/Operational Tank Space (2) (101-AN, 102-SY, 102-AW, 106-AW)	1.84 Mgal
Dilute in Aging Tanks (101-AZ, 102-AZ)	0.7 Mgal		
Dilute Waste (1) (101-AN, 101-AP, 103-AP, 106-AP, 107-AP, 108-AP, 102-AW, 103-AW, 104-AW, 105-AW, 106-AW, 102-AY, 102-SY, 104-AP	8.88 Mgal	Miscellaneous Head Space	0.18 Mgal
		Total Specific Use Space	5.62 Mgal
NCRW,PFP and Settled Solids (103-AW, 105-AW, 102-SY, 102-AW, 104-AW, 106-AW, 102-AY)	1.52 Mgal		
Total Inventory=	**23.4 Mgal**		

TOTAL DOUBLE-SHELL TANK SPACE	
24 Tanks at 1140 Kgal	27.36 Mgal
4 Tanks at 980 Kgal	3.92 Mgal
	31.28 Mgal
Total Available Space	**31.28 Mgal**
Double-Shell Tank Inventory	**23.4 Mgal**
Space Designated for Specific Use	**5.62 Mgal**
Remaining Unallocated Space	**2.26 Mgal**

(1) Was reduced in volume by -0.407 Mgal this month (Evaporator Waste Volume Reduction)
(2) Reduced by Saltwell Liquid pumping, and PFP Operations
(3) 241-101-AY: A minumum liquid level is set to provide extra protection against any bottom uplifting of the tank's steel liner. WHC-SD-WM-TI-357, "Waste Storage Tank Status and Leak Detection Criteria," specifies 64 in. as the minimum surface level measurement when the annulus system is in operation, and 18 in. if the annulus ventilation system is shut down. See also OSD-T-151-0007, "Unclassified Operation Specifications for the 241 AN, 241AP, 241AW, 241AY and 241SY Tank Farms." Because of space availablility, waste is stored in 102-AY, the aging waste spare tank. In case of a leak, the contents of 102-AY will be distributed to any other DST(s) having available space. Tank 104-AP has been designated as the non-aging spare tank.

Note: Net change in total inventory since last month: -0.345 Mgal

WVPTOT

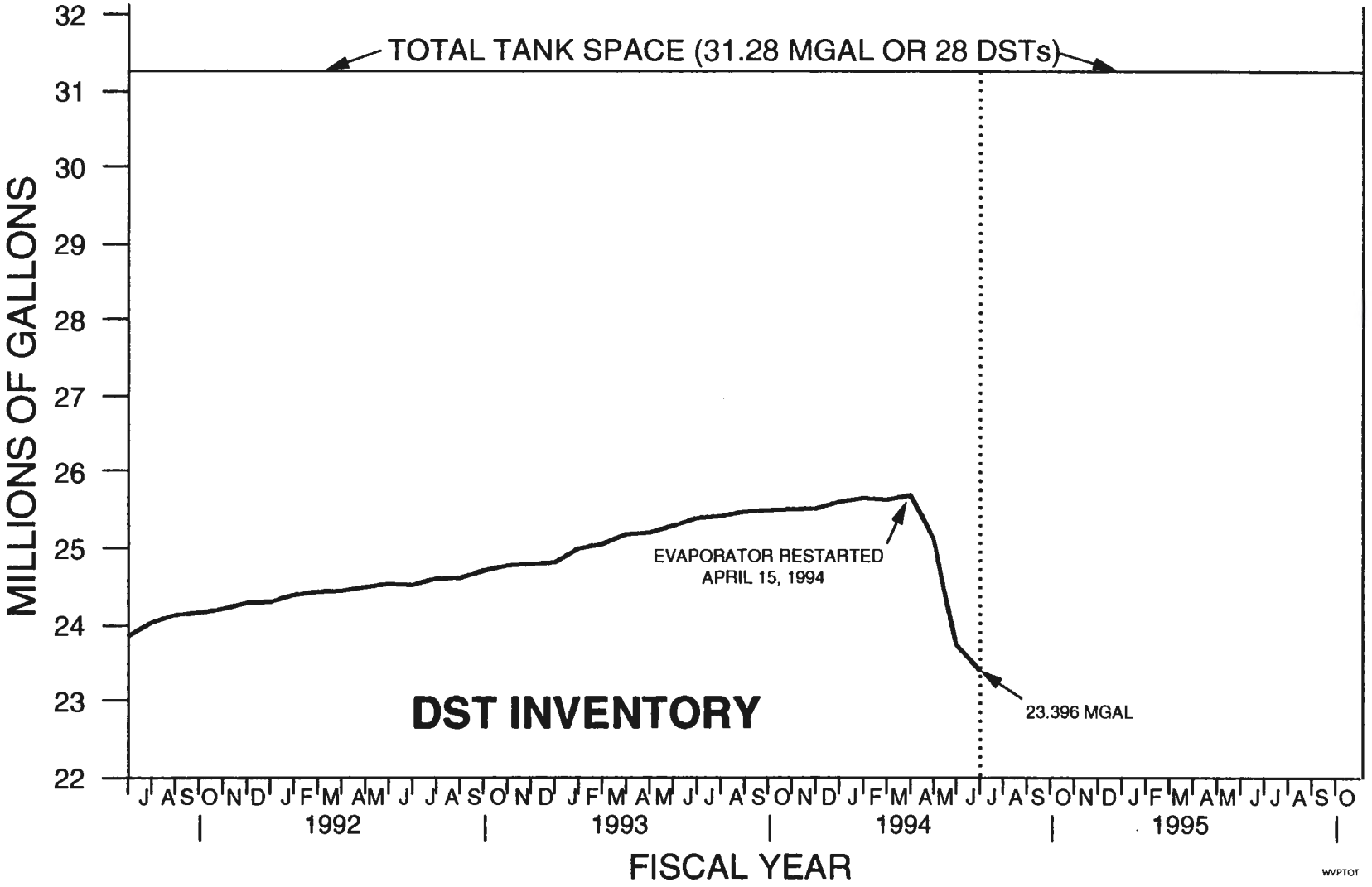
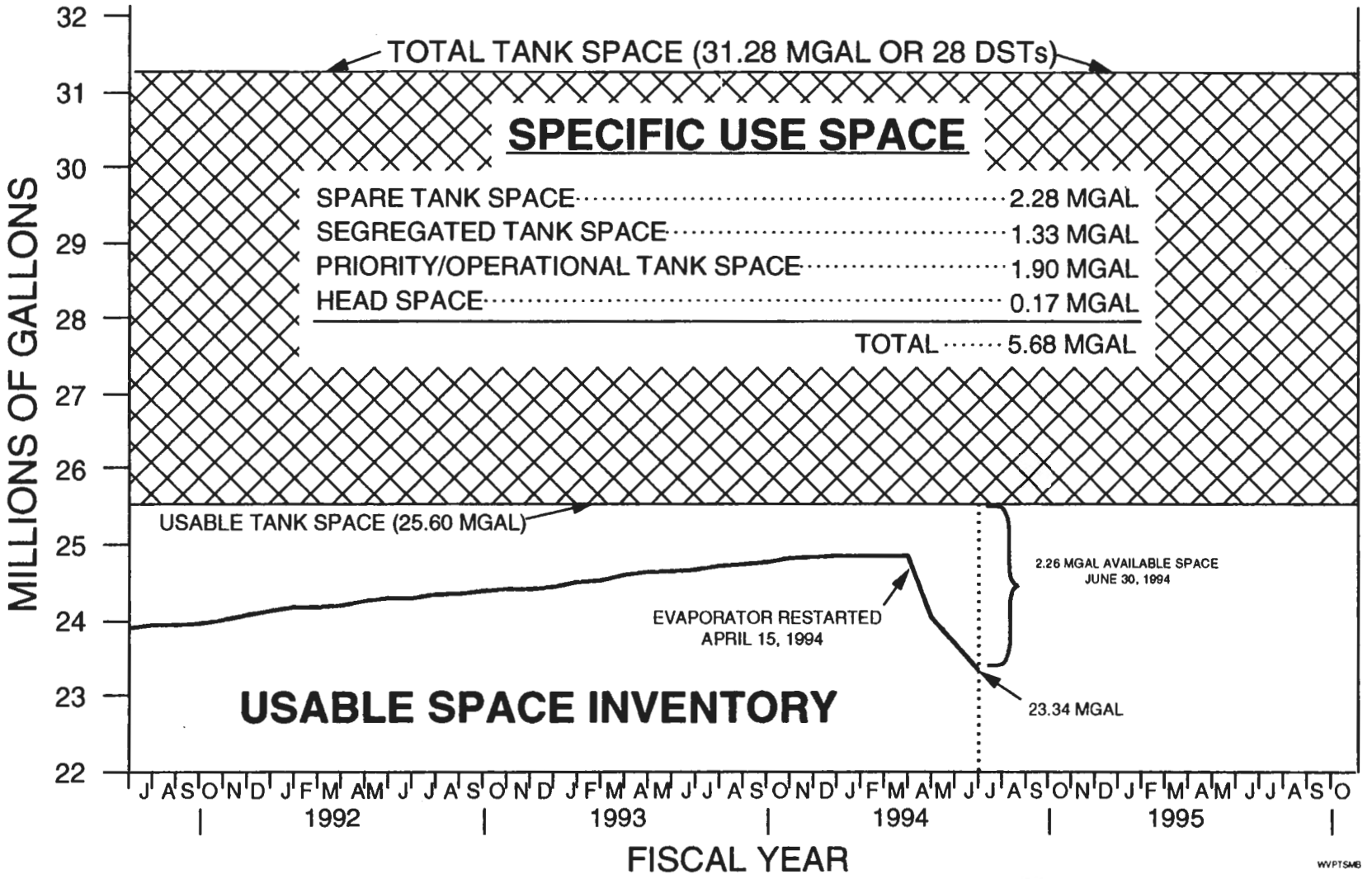
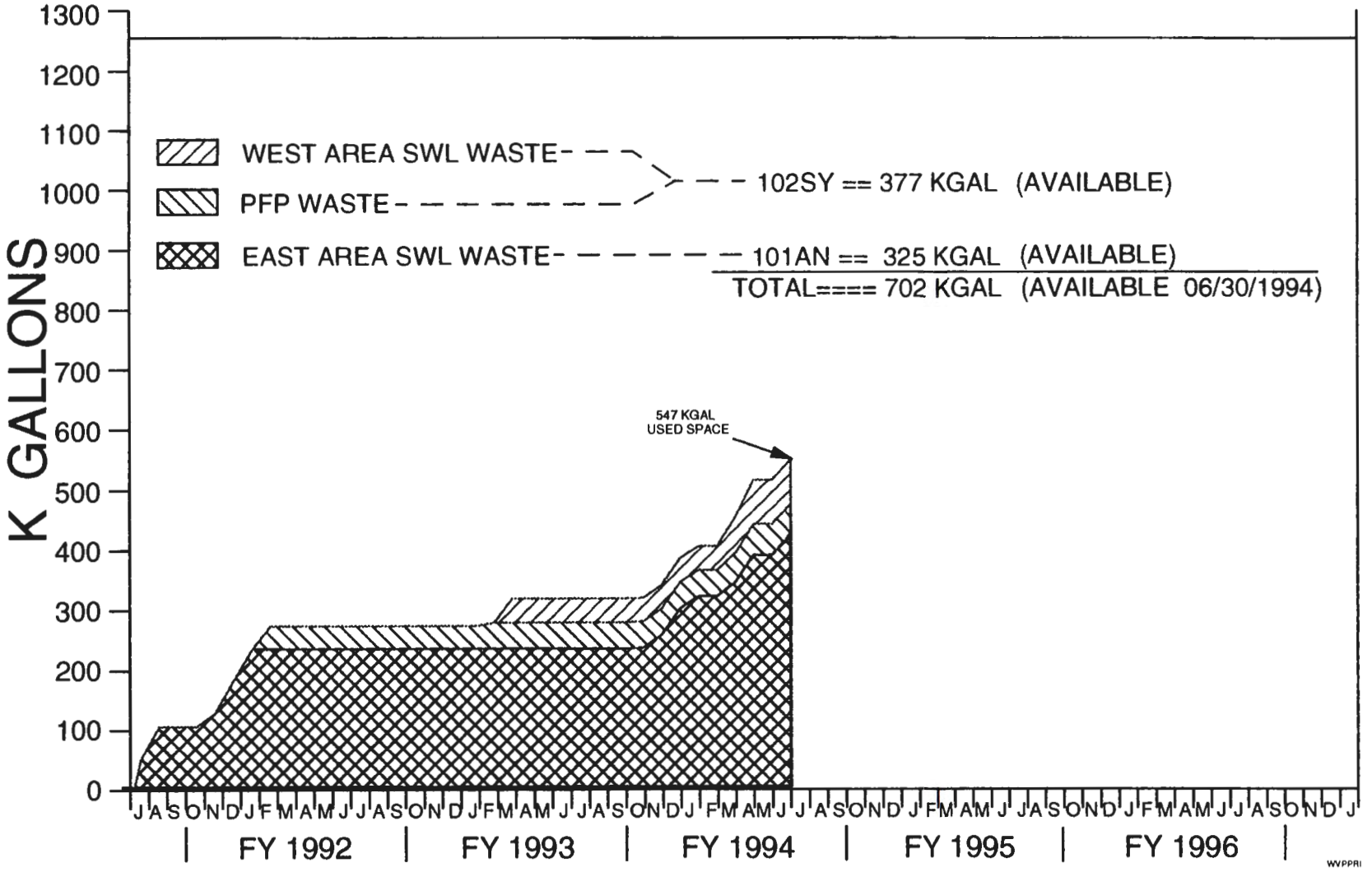


FIGURE B-1. TOTAL DOUBLE-SHELL TANK INVENTORY AND CHANGES



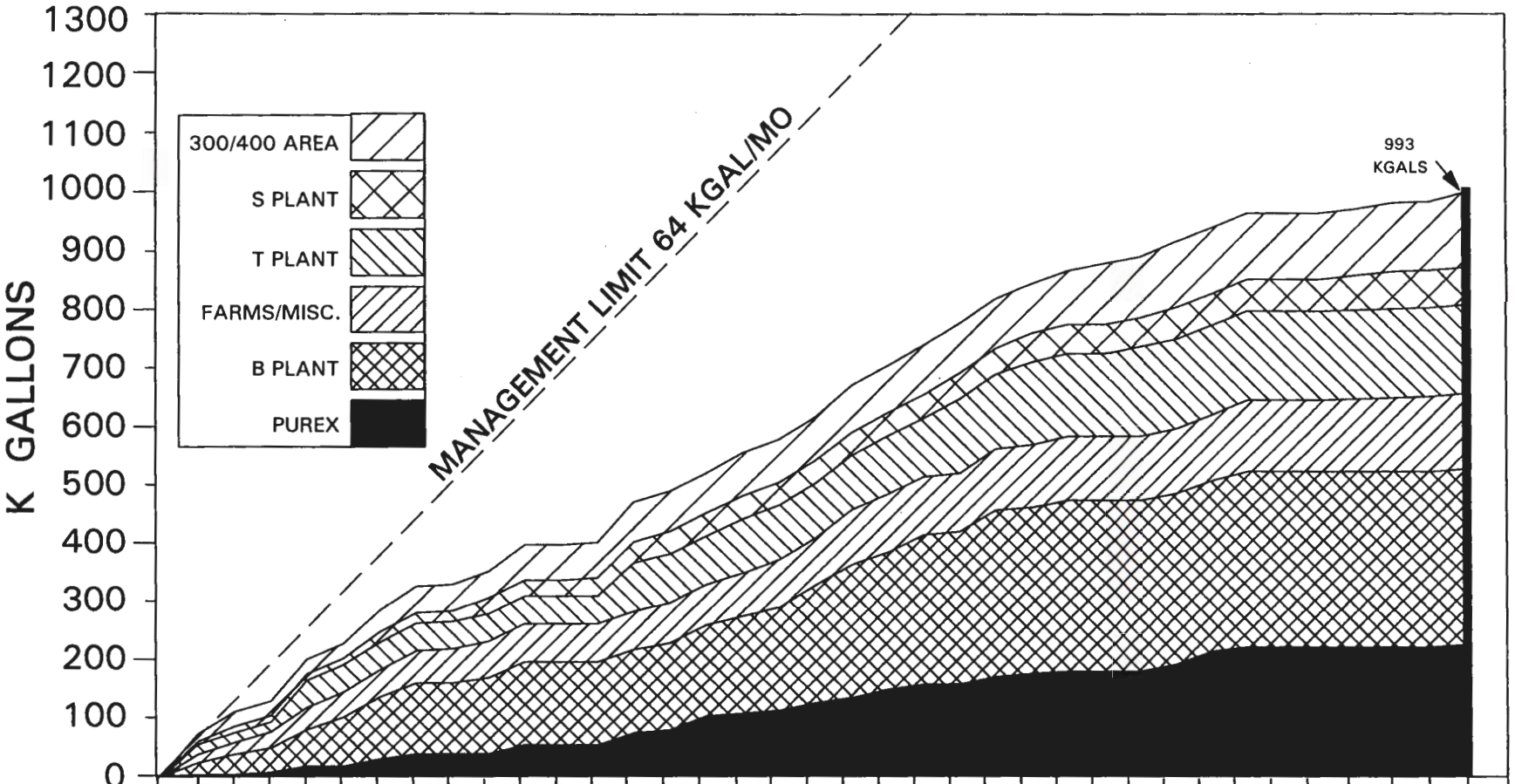
NOTE: THIS GRAPHIC DEPICTS "USABLE" TANK SPACE CHANGES; NOT TOTAL RECEIPTS TO DOUBLE-SHELL TANKS

FIGURE B-2. USABLE TANK SPACE INVENTORY AND CHANGES



NOTE: Graphic Depicts Priority Space Usage, Operational Tanks are not Included

FIGURE B-3. CONTRIBUTIONS TO PRIORITY SPACE



MONTHLY LIMIT		JUL 91	AUG 91	SEP 91	OCT 91	NOV 91	DEC 91	JAN 92	FEB 92	MAR 92	APR 92	MAY 92	JUN 92	JUL 92	AUG 92	SEP 92	OCT 92	NOV 92	DEC 92	JAN 93	FEB 93	MAR 93	APR 93	MAY 93	JUN 93	JUL 93	AUG 93	SEP 93	OCT 93	NOV 93	DEC 93	JAN 94	FEB 94	MAR 94	APR 94	MAY 94	JUN 94	JUL 94
300/400 AREA	5	13	12	0	0	0	12	8	0	0	16	0	0	7	0	0	6	0	0	5	0	5	0	0	0	7	12	0	8	0	0	0	0	0	4	0	11	
S PLANT	5	5	6	0	0	0	7	0	0	9	0	0	4	5	3	0	0	0	0	0	0	0	5	0	5	0	0	0	5	0	0	0	0	5	4	0	0	
T PLANT	6	17	0	0	30	0	0	0	0	0	0	0	0	36	0	0	10	0	0	0	7	0	26	0	14	0	0	11	0	0	0	0	0	0	0	0	0	
TANK FARM	10	14	6	8	10	5	3	9	3	4	3	0	0	0	4	0	4	8	0	13	5	0	0	6	2	3	0	0	1	1	9	0	0	2	2	2	0	
B PLANT	23	20	14	7	22	21	23	15	0	9	12	0	0	0	6	7	10	10	25	26	7	21	6	23	0	7	0	0	0	0	9	0	0	0	0	0	0	
PUREX	15	3	0	4	10	0	12	9	0	0	15	0	0	21	5	24	5	5	13	9	14	9	0	13	5	4	0	0	12	22	7	0	0	0	0	0	5	

NOTE: THIS GRAPHIC DEPICTS "USABLE SPACE" DEPLETION AND NOT TOTAL RECEIPTS TO DSTs

WVPFACIL

FIGURE B-4. COMPARISON OF FACILITY GENERATATIONS TO MANAGEMENT LIMIT

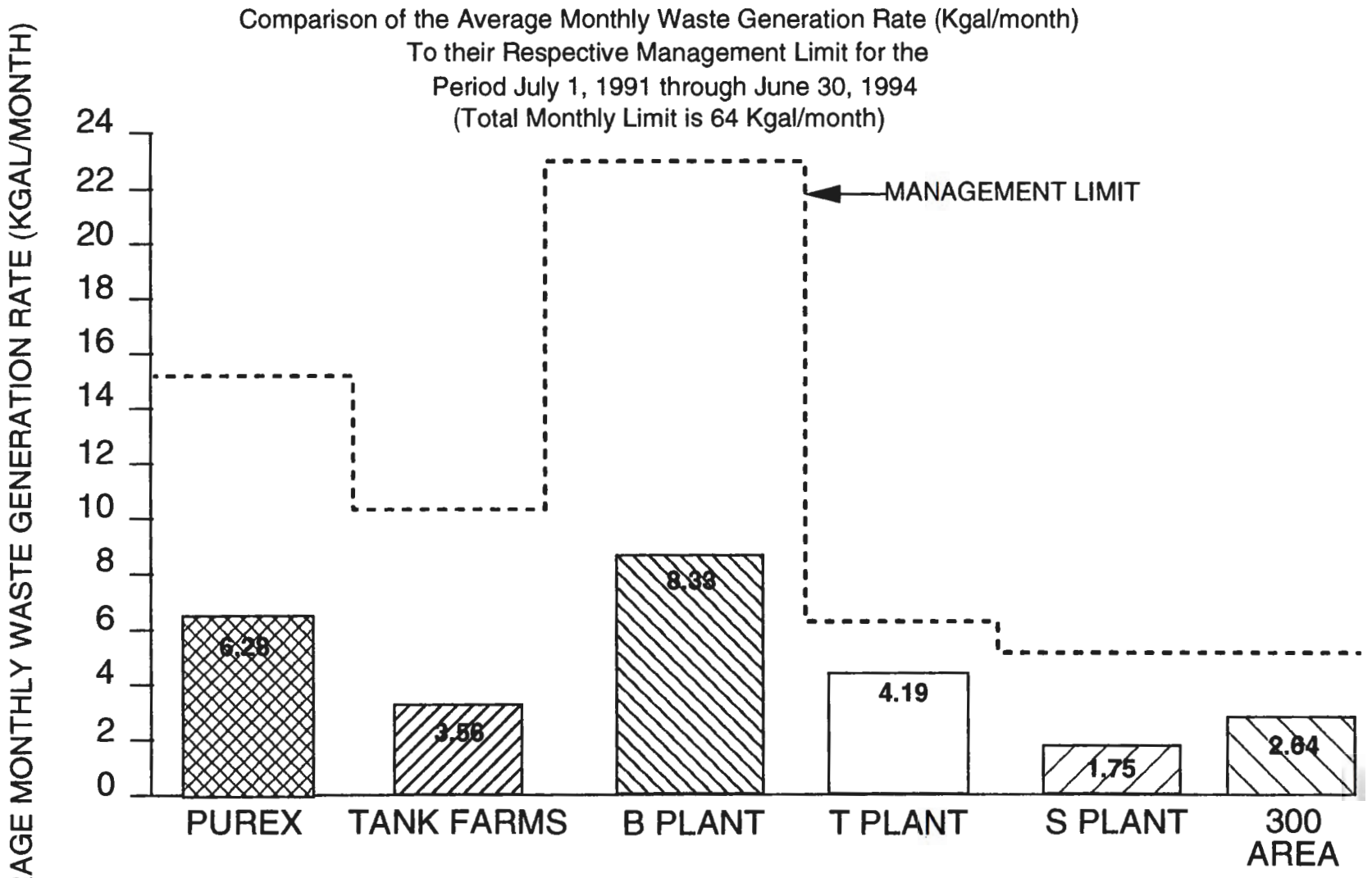


Figure B-5. Comparison of Monthly Average Waste Generation to Management Limit by Facility

WVPAVE

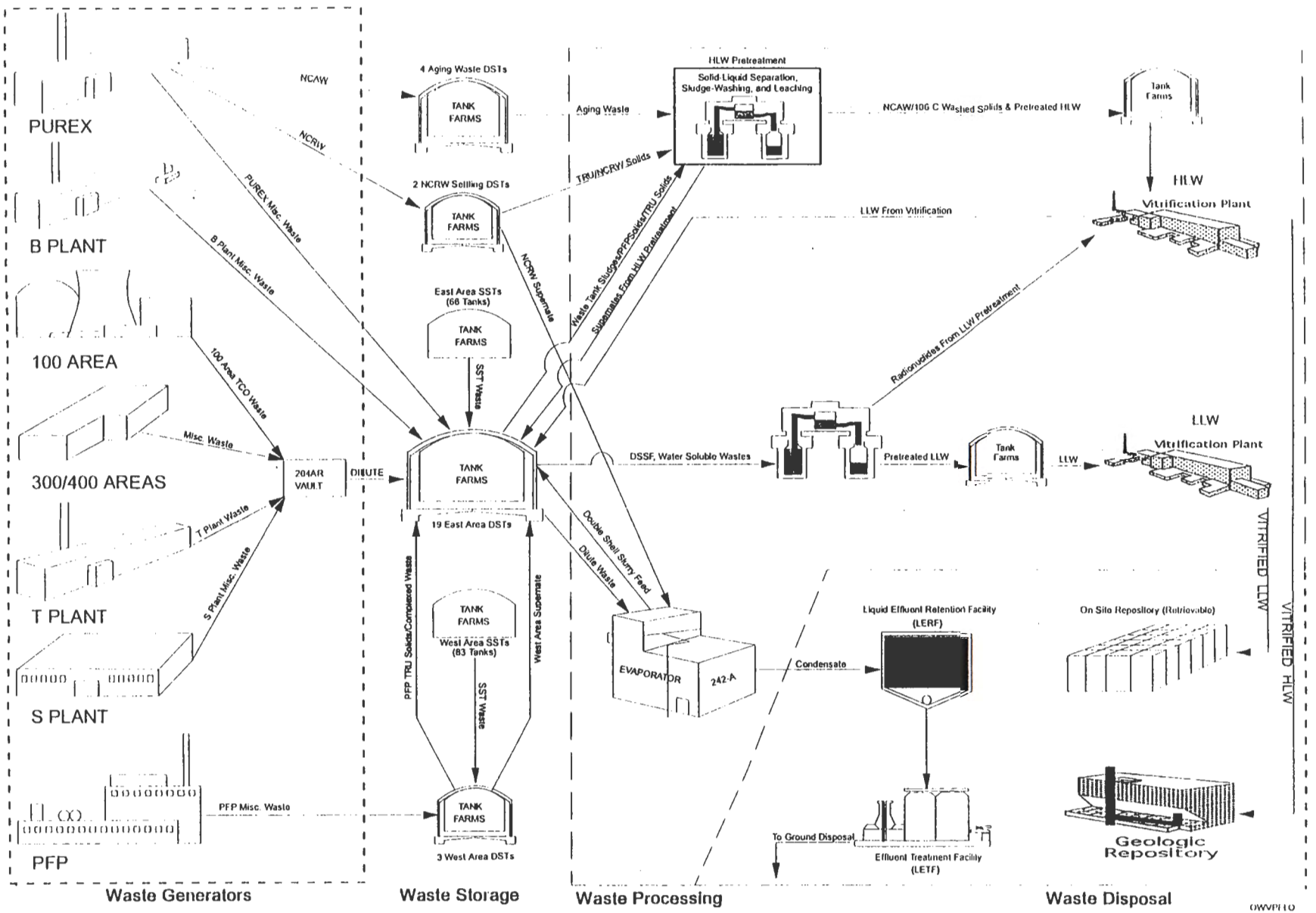


Figure B-11. Overall Waste Flow - Hanford Tank Waste Disposal

Table B-2. Double Shell Tank Waste Inventory for June 30, 1994 (page 1 of 2)

TANKS	INVENTORY	SOLIDS	TYPE	LEFT
101AW=	1125	84	DSSF	15
102AW=	82	3	DN	1058
103AW=	647	487	NCRW	493
104AW=	1123	267	DN	17
105AW=	1048	388	NCRW	92
106AW=	719	211	DN	421
101AY=	875	83	DC	105
102AY=	730	32	DN	250
101AZ=	954	35	NCAW	26
102AZ=	967	95	NCAW	13
101AN=	815	0	DN	325
102AN=	1087	89	CC	53
103AN=	953	373	DSS	187
104AN=	1060	264	DSSF	80
105AN=	1124	0	DSSF	16
106AN=	21	17	CP	1119
107AN=	1062	134	CC	78
101SY=	1100	560	CC	40
102SY=	763	133	PT/DN	377
103SY=	746	4	CC	394
101AP=	1060	0	DN	80
102AP=	1102	0	CP	38
103AP=	28	0	DN	1112
104AP=	18	0	DN	1122
105AP=	820	0	DSSF	320
106AP=	1127	0	DN	13
107AP=	1109	0	DN	31
108AP=	1131	0	DN	9
TOTAL=	23396		TOTAL	7884

TOTAL SPACE AVAILABLE	
NON-AGING	27360
AGING =	3920
TOTAL=	31280

INVENTORY CHANGE	
05/94 TOTAL	23741
06/94 TOTAL	23396
DECREASE	-345

SEGREGATED SPACE	
* 101AW=	15
102AP=	38
105AP=	320
* 101SY=	40
* 103SY=	394
101AY=	105
102AN=	53
* 103AN=	187
* 104AN=	80
* 105AN=	16
107AN=	78
TOTAL=	1326

* WATCHLIST TANKS

USABLE SPACE	
103AP=	1112
104AP=	1122
108AP=	9
103AW=	493
105AW=	92
102AY=	250
106AN=	1119
102AW=	1058
106AW=	421
TOTAL=	5676
SPARES	-2280
EVAP. OPERATION	-1140
USABLE LEFT=	2256

MISC. HEADSPACE	
101AP=	80
106AP=	13
107AP=	31
104AW=	17
101AZ=	26
102AZ=	13
TOTAL=	180

USABLE SPACE CHANGE	
05/94 TOTAL SPACE	1894
06/94 TOTAL SPACE	2256
INCREASE=	362

PRIORITY SPACE	
102SY=	377
101AN=	325
TOTAL=	702

PRIORITY SPACE CHANGE	
05/94 TOTAL SPACE	734
06/94 TOTAL SPACE	702
DECREASE=	-32

Inventory Calculation by Waste Type:

COMPLEXED WASTE		
102AN=	1087	(CC)
107AN=	1062	(CC)
101SY=	1100	(CC & DSS)
103SY=	746	(CC, DSS & SWL)
101AY=	875	(DC)
TOTAL=	4870	

NCRW SOLIDS (PD)	
103AW=	487
105AW=	388
TOTAL=	875

PFP SOLIDS (PT)	
102SY=	133
TOTAL=	133

CONCENTRATED PHOSPHATE (CP)	
106AN=	21
102AP=	1102
TOTAL=	1123

DILUTE WASTE (DN)	
101AP=	1060
103AP=	28
106AP=	1127
107AP=	1109
108AP=	1131
101AN=	815
102AW=	79
104AW=	856
106AW=	508
102AY=	698
104AP=	18
103AW=	160
105AW=	660
102SY=	630
TOTAL=	8879

NCAW (AGING WASTE) (@ 5M Na)	
101AZ=	791
102AZ=	434
AT 5M Na	1225
DN=	696
TOTAL=	1921

DSS/DSSF	
105AP=	820
103AN=	953
104AN=	1060
105AN=	1124
101AW=	1125
TOTAL=	5082

GRAND TOTALS	
CC=	3995
DC=	875
NCRW SOLIDS=	875
DST SOLIDS=	513
PFP SOLIDS=	133
CP=	1123
NCAW=	1921
DSS/DSSF=	5082
DILUTE=	8879
TOTAL=	23396

NOTE: All Values are in Kilogallons.
(*) Watch List Tanks

Table B-2. Double Shell Tank Waste Inventory for June 30, 1994

TOTAL AVAILABLE SPACE AS OF JUNE 30, 1994:			**7684**	**KGALS**
SEGREGATED TANK SPACE:	TANK	WASTE TYPE	AVAILABLE	SPACE
	* 101-AW	DSSF	15	KGALS
(*)Watch List Tanks	102-AP	CP	38	KGALS
	105-AP	DSSF	320	KGALS
	* 101-SY	CC/DSS	40	KGALS
	* 103-SY	CC/DSS	394	KGALS
	101-AY	DC	105	KGALS
	102-AN	CC	53	KGALS
	* 103-AN	DSS	187	KGALS
	* 104-AN	DSSF	80	KGALS
	* 105-AN	DSSF	16	KGALS
	107-AN	CC	78	KGALS
		TOTAL=	**1326**	**KGALS**
		AVAILABLE TANK SPACE=	7684	KGALS
		MINUS SEGREGATED SPACE=	-1326	KGALS
		TOTAL AVAILABLE SPACE AFTER SEGREGATION=	**6358**	**KGALS**
PRIORITY TANK SPACE:	TANK	WASTE TYPE	AVAILABLE	SPACE
SWL/PFP	102-SY	DN	377	KGALS
NON-COMPLEXED SWL RECEIVER	101-AN	DN	325	KGALS
		TOTAL=	**702**	**KGALS**
		AVAILABLE SPACE AFTER SEGREGATION=	6358	KGALS
		MINUS PRIORITY SPACE=	-702	KGALS
		TOTAL AVAILABLE SPACE AFTER PRIORITY=	**5656**	**KGALS**
MISCELLANEOUS HEADSPACE:	TANK	WASTE TYPE	AVAILABLE	SPACE
	101-AP	DN	80	KGALS
	106-AP	DN	13	KGALS
	107-AP	DN	31	KGALS
	104-AW	DN	17	KGALS
	101-AZ	AW	26	KGALS
	102-AZ	AW	13	KGALS
		TOTAL=	**180**	**KGALS**
		AVAILABLE SPACE AFTER PRIORITY=	5656	KGALS
		MINUS MISCELLANEOUS HEADSPACE=	-180	KGALS
		TOTAL AVAILABLE SPACE AFTER HEADSPACE=	**5676**	**KGALS**
USABLE TANK SPACE:	TANK	WASTE TYPE	AVAILABLE	SPACE
	103-AP	DN	1112	KGALS
	104-AP	DN	1122	KGALS
	108-AP	DN	9	KGALS
	103-AW	NCRW	493	KGALS
	105-AW	NCRW	92	KGALS
	102-AY	DN	250	KGALS
	106-AN	CP	1119	KGALS
EVAPORATOR FEED TANK	102-AW	DN	1058	KGALS
EVAPORATOR RECEIVER TANK	106-AW	DN	421	KGALS
		TOTAL=	**5676**	**KGALS**
		TOTAL AVAILABLE USABLE SPACE=	5676	KGALS
		MINUS EVAP. OPERATIONAL SPACE=	-1140	KGALS
		MINUS SPARE TANK SPACE=	-2280	KGALS
		TOTAL TANK SPACE AVAILABLE AFTER ALL DEDUCTIONS=	**2256**	**KGALS**

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APPENDIX C

TANK AND EQUIPMENT CODE AND STATUS DEFINITIONS

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C. TANK AND EQUIPMENT CODE/STATUS DEFINITIONS
June 30, 1994

1. TANK STATUS CODES

WASTE TYPE

AGING	Aging Waste (Neutralized Current Acid Waste [NCAW])
CC	Complexant Concentrate Waste
CP	Concentrated Phosphate Waste
DC	Dilute Complexed Waste
DN	Dilute Non-Complexed Waste
DSS	Double-Shell Slurry
DSSF	Double-Shell Slurry Feed
NCPLX	Non-Complexed Waste
PD/PN	Plutonium-Uranium Extraction (PUREX) Neutralized Cladding Removal Waste (NCRW), transuranic waste (TRU)
PT	Plutonium Finishing Plant (PFP) TRU Solids

TANK USE (DOUBLE-SHELL TANKS ONLY)

CWHT	Concentrated Waste Holding Tank
DRCVR	Dilute Receiver Tank
EVFD	Evaporate Feed Tank
SRCVR	Slurry Receiver Tank

2. SOLID AND LIQUID VOLUME DETERMINATION METHODS

F	Food Instrument Company (FIC) Automatic Surface Level Gauge
M	Manual Tape Surface Level Gauge
P	Photo Evaluation
S	Sludge Level Measurement Device

3. DEFINITIONS

WASTE TANKS - GENERAL

Waste Tank Safety Issue
A potentially unsafe condition in the handling of waste material in underground storage tanks that requires corrective action to reduce or eliminate the unsafe condition.

Watch List Tank
An underground storage tank containing waste that requires special safety precautions because it may have a serious potential for release of high level radioactive waste because of uncontrolled increases in temperature or pressure. Special restrictions have been placed on these tanks by "Safety Measures for Waste Tanks at Hanford Nuclear Reservation," Section 3137 of the *National Defense Authorization Act for Fiscal Year 1991*, November 5, 1990, Public Law 101-510, (also known as the Wyden Amendment).

WASTE TYPES

Aging Waste (AGING)
High level, first cycle solvent extraction waste from the PUREX plant (NCAW)

Concentrated Complexant (CC)
Concentrated product from the evaporation of dilute complexed waste.

Concentrated Phosphate Waste (CP)
Waste originating from the decontamination of the N Reactor in the 100 N Area. Concentration of this waste produces concentrated phosphate waste.

Dilute Complexed Waste (DC)
Characterized by a high content of organic carbon including organic complexants:

ethylenediaminetetra-acetic acid (EDTA), citric acid, and hydroxyethyl-ethylenediaminetriacetic acid (HEDTA), being the major complexants used. Main sources of DC waste in the DST system are saltwell liquid inventory (from SSTs).

Dilute Non-Complexed Waste (DN)
Low activity liquid waste originating from T and S Plants, the 300 and 400 Areas, PUREX facility (decladding supernatant and miscellaneous wastes), 100 N Area (sulfate waste), B Plant, saltwells, and PFP (supernate).

Double-Shell Slurry (DSS)
Waste that exceeds the sodium aluminate saturation boundary in the evaporator without exceeding receiver tank composition limits. For reporting purposes, DSS is considered a solid.

Double-Shell Slurry (DSSF)
Waste concentrated just before reaching the sodium aluminate saturation boundary (of 6.5 molar hydroxide) in the evaporator without exceeding receiver tank composition limits. This form is not as concentrated as DSS.

Non-complexed (NCPLX)
General waste term applied to all Hanford Site (NCPLX) liquors not identified as complexed.

PUREX Decladding (PD/PN)
PUREX Neutralized Cladding Removal Waste (NCRW) is the solids portion of the PUREX plant neutralized cladding removal waste stream; received in Tank Farms as a slurry. NCRW solids are classified as transuranic (TRU) waste.

PFP TRU Solids (PT)
TRU solids fraction from PFP Plant operations.

Drainable Interstitial Liquid (DIL)
Interstitial liquid that is not held in place by capillary forces, and will therefore migrate or move by gravity. (See also Section 4)

Supernate
The liquid above the solids in waste storage tanks. (See also Section 4)

Ferrocyanide
A compound of iron and cyanide commonly expressed as FeCN. The actual formula for the ferrocyanide anion is $[Fe(CN)_6]^{-4}$.

WASTE STATUS

In-Service Tank
The waste classification of a tank being used, or planned for use, for the storage of liquid (in excess of a minimum supernatant liquid heel) in conjunction with production and/or waste processing.

Out-of-Service Tank
A tank which does not meet the definition of an in-service tank. Before September 1988, these tanks were defined as inactive in this report. (Note: All single-shell tanks are out of service.)

INTERIM STABILIZATION (Single-Shell Tanks only)

Interim Stabilized (IS)
A tank which contains less than 50,000 gal of drainable interstitial liquid and less than 5,000 gal of supernatant liquid. If the tank was jet pumped to achieve interim stabilization, then the jet pump flow must also have been at or below 0.05 gpm before interim stabilization criteria is met.

Jet Pump
The jet pump system includes 1) a jet assembly with foot valve mounted to the base of two pipes that extend from the top of the well to near the bottom of the well casing inside the saltwell screen, 2) a centrifugal pump to supply power fluid to the down-hole jet assembly, 3) flexible or rigid transfer jumpers, 4) a flush line, and 5) a flowmeter. The jumpers contain piping, valves, and pressure and limit switches.

The centrifugal pump and jet assembly are needed to pump the interstitial liquid from the saltwell screen into the pump pit, nominally a 40-foot elevation rise. The power fluid passes through a nozzle in the jet assembly and acts to convert fluid pressure head to velocity head, thereby reducing the pressure in the jet assembly chamber. The reduction in pressure allows the interstitial liquid to enter the jet assembly chamber and mix with the power fluid. Velocity head is converted to pressure head above the nozzle, lifting power fluid, and interstitial liquid to the pump pit. Pumping rates vary from 0.05 gal to about 4 gal/min.

Saltwell Screen

The saltwell system is a 10-inch diameter saltwell casing consisting of a stainless steel saltwell screen welded to a Schedule 40 carbon steel pipe. The casing and screen are to be inserted into the 12-inch tank riser located in the pump pit. The stainless steel screen portion of the system will extend through the tank waste to near the bottom of the tank. The saltwell screen portion of the casing is an approximately 10-foot length of 300 Series, 10-inch diameter, stainless steel pipe with screen openings (slots) of 0.05 inches.

Emergency Pumping Trailer

A 45-foot Tractor-Type trailer is equipped to provide storage space and service facilities for emergency pumping equipment: this consists of two dedicated jet pump jumpers and two jet pumps, piping and dip tubes for each, two submersible pumps and attached piping, and a skid-mounted Weight Factor Instrument Enclosure (WFIE) with an air compressor and electronic recording instruments. The skid also contains a power control station for the pumps, pump pit leak detection, and instrumentation. A rack for over 100 feet of overground double-contained piping is also in the trailer.

INTRUSION PREVENTION (ISOLATION) Single-Shell Tanks only

Partially Interim Isolated (PI)

The administrative designation reflecting the completion of the physical effort required for Interim Isolation except for isolation of risers and piping that is required for jet pumping or for other methods of stabilization.

Interim Isolated (II)

The administrative designation reflecting the completion of the physical effort required to minimize the addition of liquids into an inactive storage tank, process vault, sump, catch tank, or diversion box. In June 1993, Interim Isolation was replaced by Intrusion Prevention.

Intrusion Prevention (IP)

Intrusion Prevention is the administrative designation reflecting the completion of the physical effort required to minimize the addition of liquids into an inactive storage tank, process vault, sump, catch tank, or diversion box. Under no circumstances are electrical or instrumentation devices disconnected or disabled during the intrusion prevention process (with the exception of the electrical pump), in accordance with WHC-SD-WM-SAR-006 REV 2, *Single-Shell Tank Isolation Safety Analysis Report*, March 1986.

TANK INTEGRITY

Sound

The integrity classification of a waste storage tank for which surveillance data indicate no loss of liquid attributed to a breach of integrity.

Assumed Leaker
The integrity classification of a waste storage tank for which surveillance data indicate a loss of liquid attributed to a breach of integrity.

Assumed Re-Leaker
A condition that exists after a tank has been declared as an "assumed leaker" and then the surveillance data indicates a new loss of liquid attributed to a breach of integrity.

TANK INVESTIGATION

Intrusion
A term used to describe the infiltration of liquid into a waste tank.

SURVEILLANCE INSTRUMENTATION

Drywells
Drywells are vertical boreholes with 6-in. (internal diameter) carbon steel casings positioned radially around SSTs. Periodic monitoring is done by gamma radiation or neutron sensors to obtain scan profiles of radiation or moisture in the soil as a function of well depth, which could be indicative of tank leakage. These wells range between 50 and 250 ft in depth, and are monitored between the range of 50 to 150 ft. The wells are sealed when not in use. They are called drywells because they do not penetrate to the water table and are therefore usually "dry." There are 759 drywells which are monitored on various frequencies.

Laterals
Laterals are horizontal drywells positioned under single-shell waste storage tanks to detect radionuclides in the soil which could be indicative of tank leakage. These drywells are monitored by radiation detection probes. Laterals are 4-in. inside diameter steel pipes located 8 to 10 ft below the tank's concrete base. There are three laterals per tank. Laterals are located only in A and SX farms.

Surface Levels
The surface level measurements in all waste storage tanks are monitored by manual or automatic conductivity probes, and recorded and transmitted or entered into the Computer Automated Surveillance System (CASS).

Automatic FIC
An automatic waste surface level measurement device is manufactured by the Food Instrument Company (FIC). The instrument consists of a conductivity electrode (plummet) connected to a calibrated steel tape, a steel tape reel housing and a controller that automatically raises and lowers the plummet to obtain a waste surface level reading. The controller can provide a digital display of the data

and also transmit the reading to the CASS. Some tanks have gauges connected to CASS and others are read manually.

Annulus

The annulus is the space between the inner and outer shells on DSTs only. Drain channels in the insulating and/or supporting concrete carry any leakage to the annulus space where conductivity probes are installed. Alarms from the annunciators are received by CASS. Continuous Air Monitoring (CAM) alarms are also located in the annulus. The annulus conductivity probes and radiation detectors are the primary means of leak detection for all DSTs.

Liquid Observation Well (LOW)

In-tank liquid observation wells are used for monitoring the interstitial liquid level (ILL) in single-shell waste storage tanks. The wells are usually constructed of fiberglass or TEFZEL*-reinforced epoxy-polyester resin. There are a few LOWs constructed of steel. LOWs are sized to extend to within 1 in. of the bottom of the waste tank, are sealed at their bottom ends and have a nominal outside diameter of 3.5 in. Two probes are used to monitor changes in the ILL; gamma and neutron, which can indicate intrusions or leakage by increases or decreases in the ILL. There are 58 LOWs (56 are in operation) installed in SSTs that contain or are capable of containing greater than 50,000 gal of drainable interstitial liquid, and in two DSTs only. The LOWs installed in two DSTs, (102-SY and 103-AW Tanks), are constructed of steel and are used for special, rather than routine, surveillance purposes only.

Thermocouple (TC)

A thermocouple is a thermoelectric device used to measure temperature. More than one thermocouple on a device (probe) is called a thermocouple tree. In DSTs there may be one or more thermocouple trees in risers in the primary tank. In addition, in DSTs only, there are thermocouple elements installed in the insulating concrete, the lower primary tank knuckle, the secondary tank concrete foundation, and in the outer structural concrete. These monitor temperature gradients within the concrete walls, bottom of the tank, and the domes. In SSTs, one or more thermocouples may be installed directly in a tank, although some SSTs do not have any trees installed. A single thermocouple (probe) may be installed in a riser, or lowered down an existing riser or LOW. There are also four thermocouple laterals beneath Tank 105-A in which temperature readings are taken in 34 thermocouples.

In-tank Photography

In-tank photographs may be taken to aid in resolving in-tank measurement anomalies and determine tank integrity. Photographs help determine sludge and liquid levels by visual examination.

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*TEFZEL, a trademark of E. I. du Pont de Nemours & Company

TERMS/ACRONYMS

CASS	Computer Analysis Surveillance System
OSD	Operating Specifications Document
OSR	Operational Safety Requirements (OSRs are sections in SARs - see below)
SAR	Safety Analysis Reports
TMACS	Tank Monitor and Control System
TPA	Hanford Federal Facility Consent and Compliance Order, "Washington State Department of Ecology, U. S. Environmental Protection Agency, and U. S. Department of Energy," Fourth Amendment, 1994 (Tri-Party Agreement)
USQ	Unreviewed Safety Question
Wyden Amendment	"Safety Measures for Waste Tanks at Hanford Nuclear Reservation," Section 3137 of the National Defense Authorization Act for Fiscal Year 1991, November 5, 1990, Public Law 101-510.

4. INVENTORY AND STATUS BY TANK - VOLUME CALCULATIONS/DEFINITIONS FOR TABLE E-5 (SINGLE-SHELL TANKS)

COLUMN HEADING	VOLUME CALCULATIONS/DEFINITIONS
Total Waste	Solids volume plus Supernatant liquid. Solids include sludge and saltcake (see definitions below)
Supernatant Liquid	Drainable Liquid Remaining minus Drainable Interstitial. Supernate is the clear liquid floating on the surface of the waste. Supernate is usually derived by subtracting the solids level measurement from the liquid level measurement. In some cases, the supernatant volume includes floating solid crusts because their volume cannot be measured. Photographs are useful in estimating the liquid volumes; the area of solids covered and the average depth can be estimated.

COLUMN HEADING	VOLUME CALCULATIONS/DEFINITIONS
Drainable Interstitial Liquid	Drainable Liquid Remaining minus Supernate. Drainable interstitial liquid is calculated based on the saltcake and sludge volumes, using average porosity values or actual data for each tank, when available. Interstitial liquid is liquid that fills the interstitial spaces of the solids waste. Drainable interstitial liquid is calculated based on the saltcake and sludge volumes in the tank. The sum of the interstitial liquid contained in saltcake and sludge is the initial volume of drainable interstitial liquid. The volume reported as Drainable Interstitial Liquid is the initial volume of drainable interstitial liquid minus interstitial liquid removed by pumping.
Pumped This Month	Net total gallons of liquid pumped from the tank during the month. If supernate is present, pump production is first subtracted from the supernatant volume. The remainder is then subtracted from the drainable interstitial liquid volume. The total pumped volume is subtracted from drainable liquid remaining and pumpable liquid remaining. Pump production takes into account the amount of water added to the tank during the month (if any).
Total Pumped	Cumulative net total gallons of liquid pump from 1979 to date.
Drainable Liquid Remaining	Supernate plus Drainable Interstitial. (See Supernatant Liquid and Drainable Interstitial Liquid above for definitions). The total Drainable Liquid Remaining is the sum of drainable interstitial liquid and supernate minus total gallons pumped.
Pumpable Liquid Remaining	Drainable Liquid Remaining minus undrainable heel volume. (Dish bottom tanks have a "heel" where liquids can collect: flat bottom tanks do not). (See Drainable Liquid Remaining and Pumped this Month for definitions). Not all drainable interstitial liquid is pumpable. It is assumed that drainable interstitial liquid on top of the undrainable heel in sludge or saltcake, is not jet pumpable. Therefore, pumpable interstitial liquid is the initial volume of drainable interstitial liquid minus the amount of interstitial liquid on top of the heel. The volume shown as Pumpable Liquid Remaining is the sum of pumpable interstitial liquid and supernate minus total gallons pumped.

COLUMN HEADING	VOLUME CALCULATIONS/DEFINITIONS
Sludge	Solids formed during sodium hydroxide additions to waste. Sludge usually was in the form of suspended solids when the waste was originally received in the tank from the waste generator. In-tank photographs may be used to estimate the volume.
Saltcake	Results from crystallization and precipitation after concentration of liquid waste, usually in an evaporator. If saltcake is layered over sludge, it is only possible to measure total solids volume. In-tank photographs may be used to estimate the saltcake volume.
Solids Volume Update	Indicates the latest update of any change in the solids volume.
Solids Update Source - See Footnote	Indicates the source or basis of the latest solids volume update.
Last Photo Date	Date of latest in-tank photographs taken.
See Footnotes for These Changes	Indicates any change made the previous month. A footnote explanation for the change follows the Inventory and Status by Tank section (Table E-5).

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APPENDIX D

TANK FARM CONFIGURATION, STATUS, AND FACILITY CHARTS

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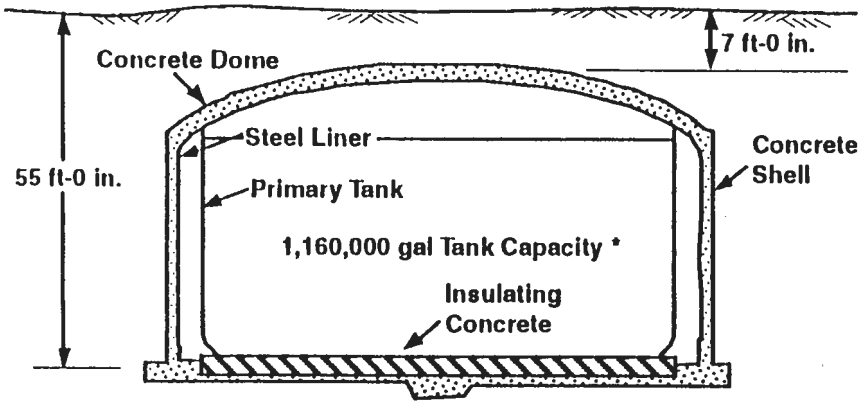
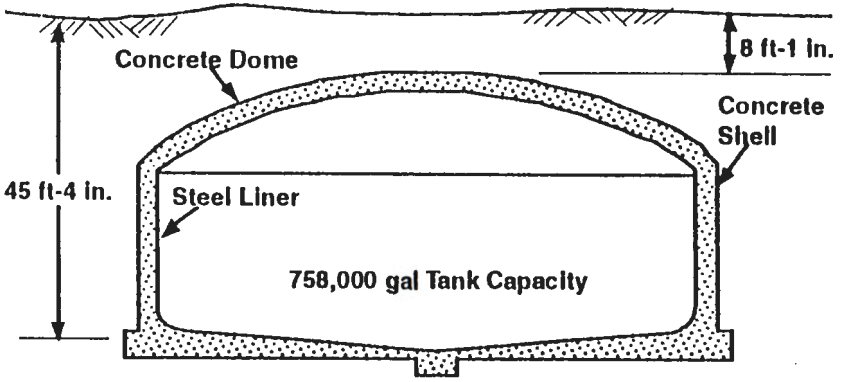
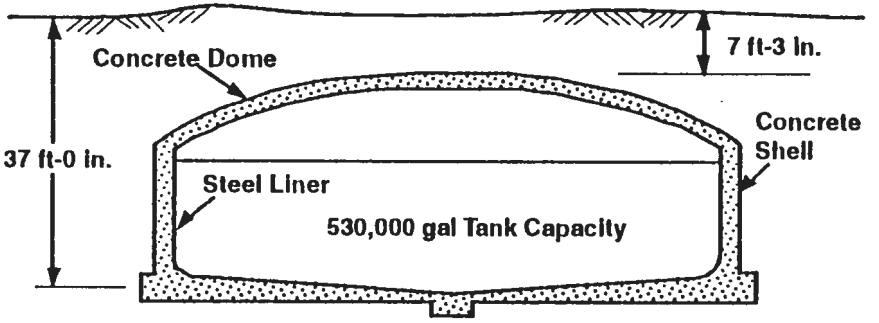


75 ft Diameter Double-Shell Tank
Tank Farms: AN, AP, AW, AY, AZ, SY

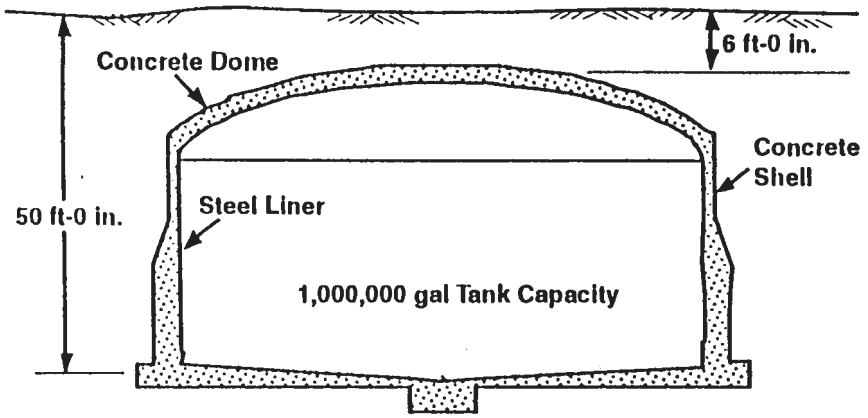
* AY and AZ Have a Tank Capacity of 1,000,000 gal



75 ft Diameter Single-Shell Tank
Tank Farms: BY, S, TX, TY

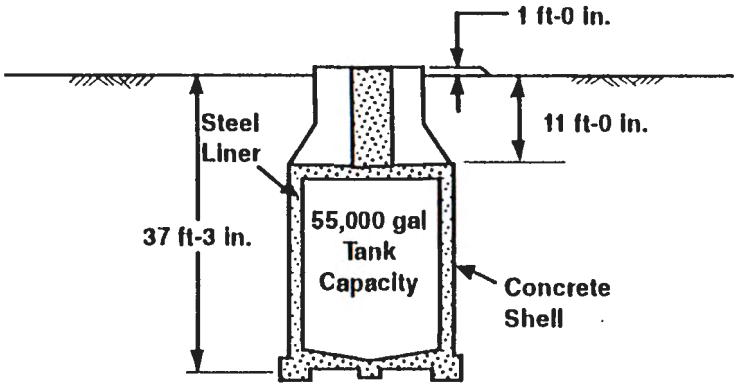


75 ft Diameter Single-Shell Tank
Tank Farms: B, BX, C, T, U



75 ft Diameter Single-Shell Tank
Tank Farms: A*, AX*, SX

* A and AX have flat bottoms



20 ft Diameter Single-Shell Tank
Tank Farms: B, C, T, U

Figure D-1. High-Level Waste Tank Configuration

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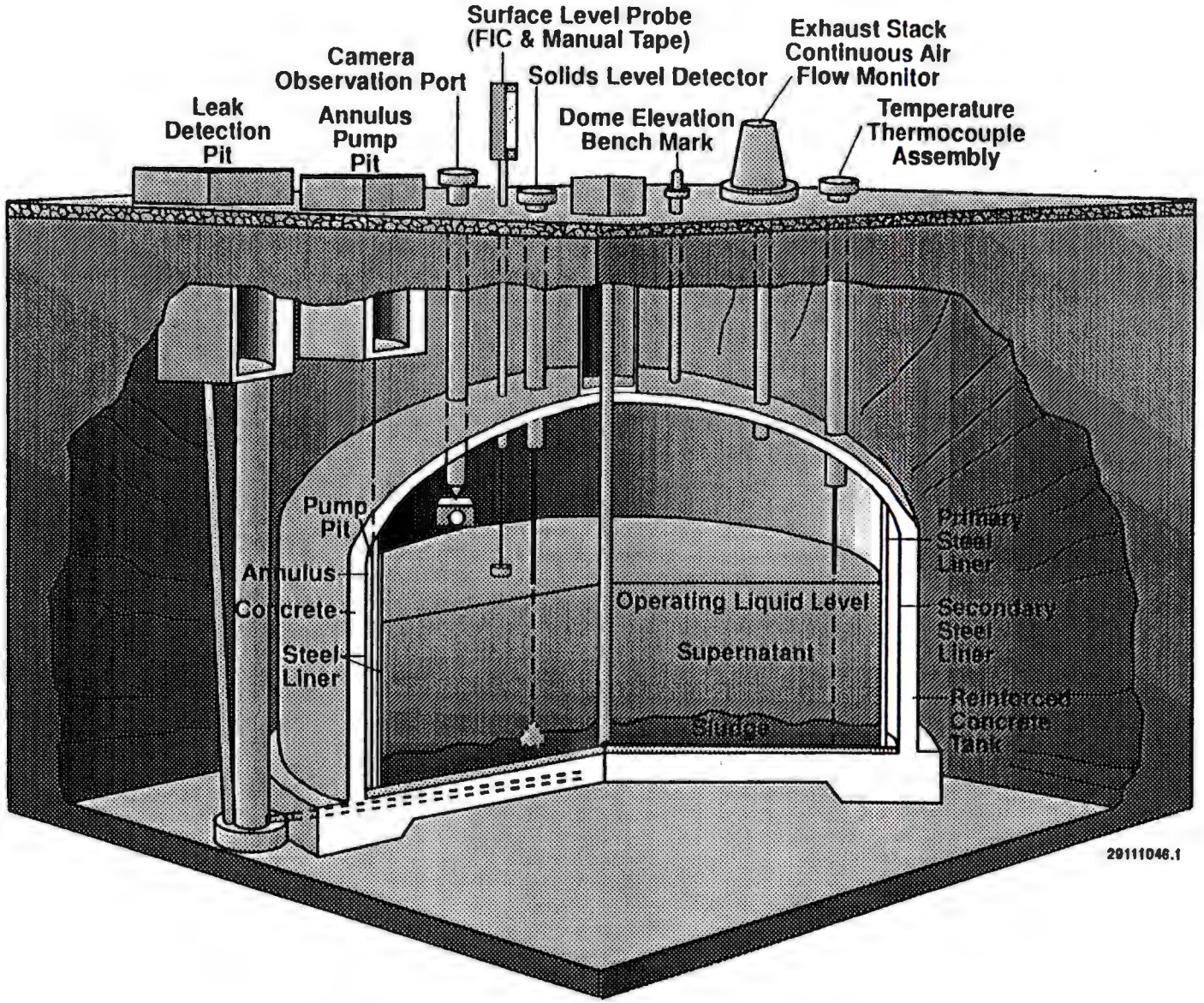

Figure D-2. Double-Shell Tank Instrumentation Configuration

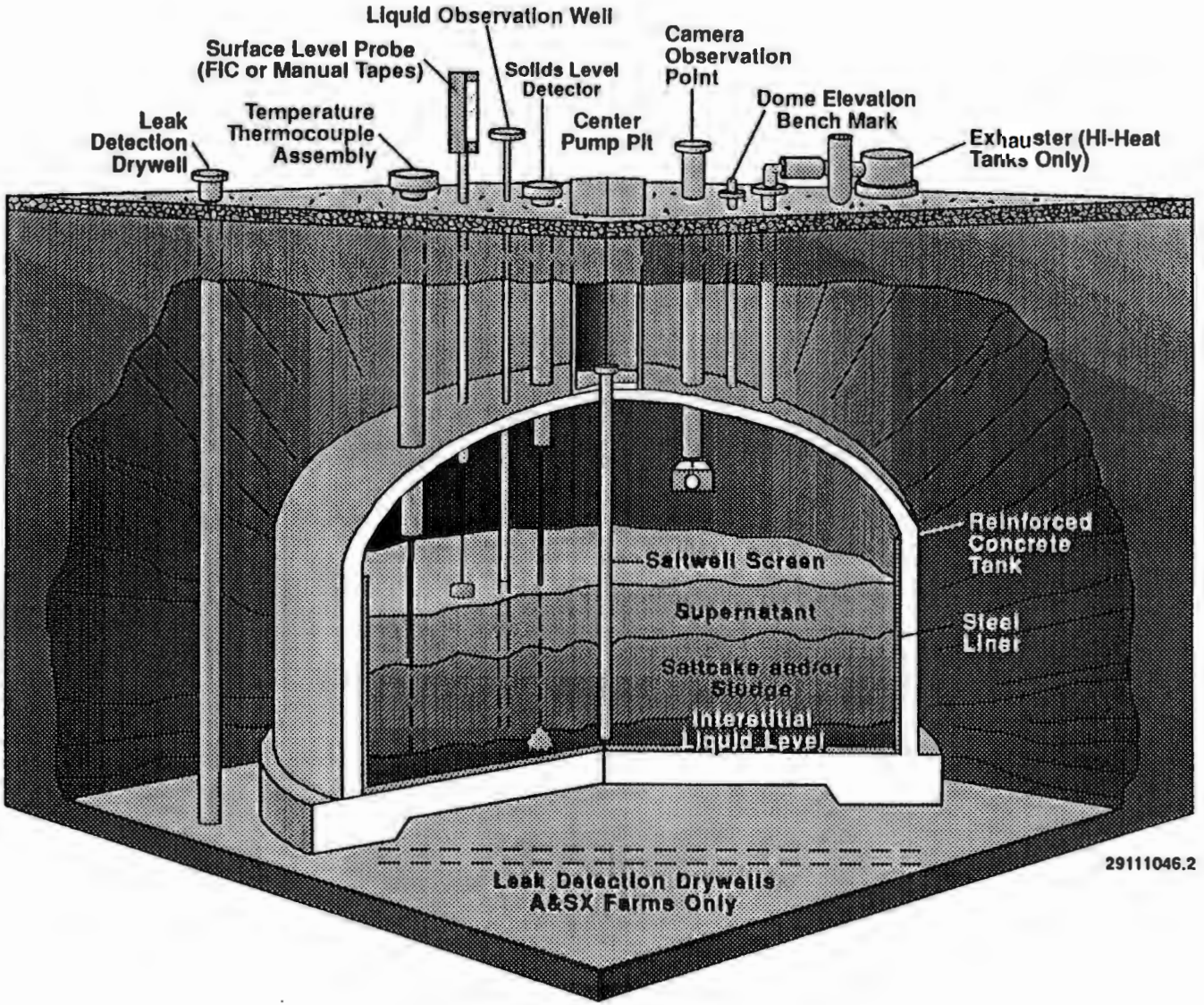

Figure D-3. Single-Shell Tank Instrumentation Configuration

Storage and Disposal Operations

200 Area Facilities

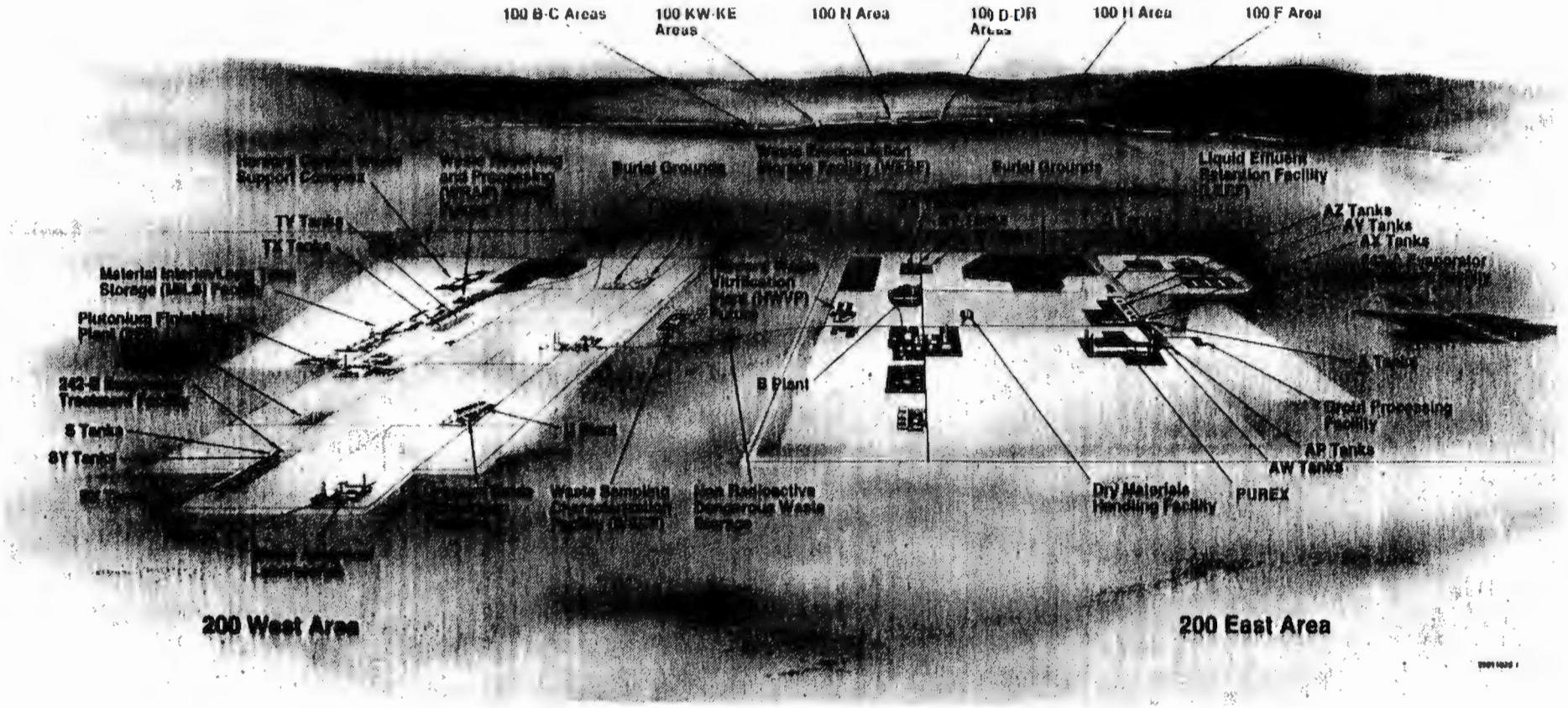

Figure D-4. Storage and Disposal Operations - 200 Area Facilities

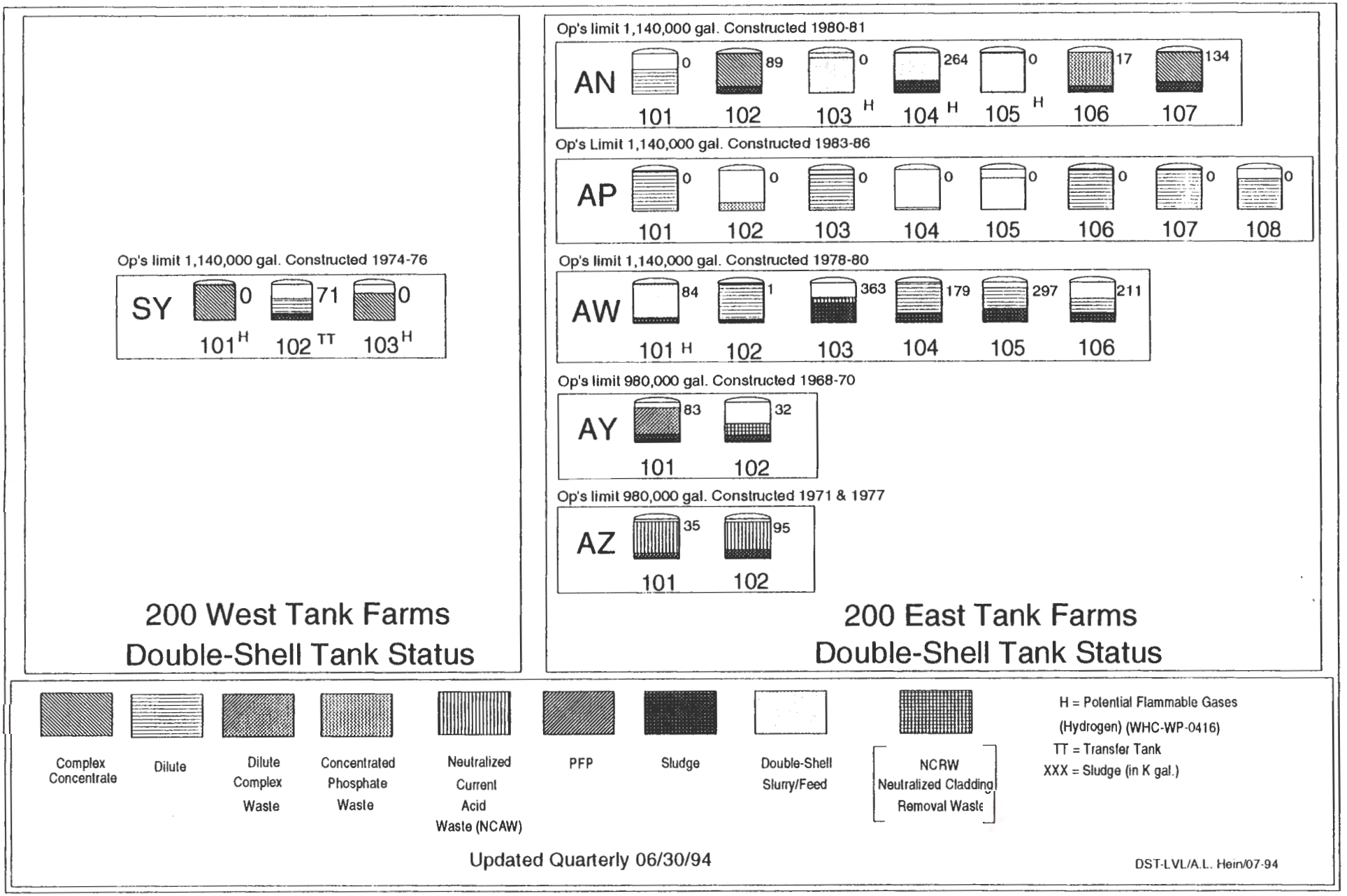

Figure D-5 Double-Shell Tank Status

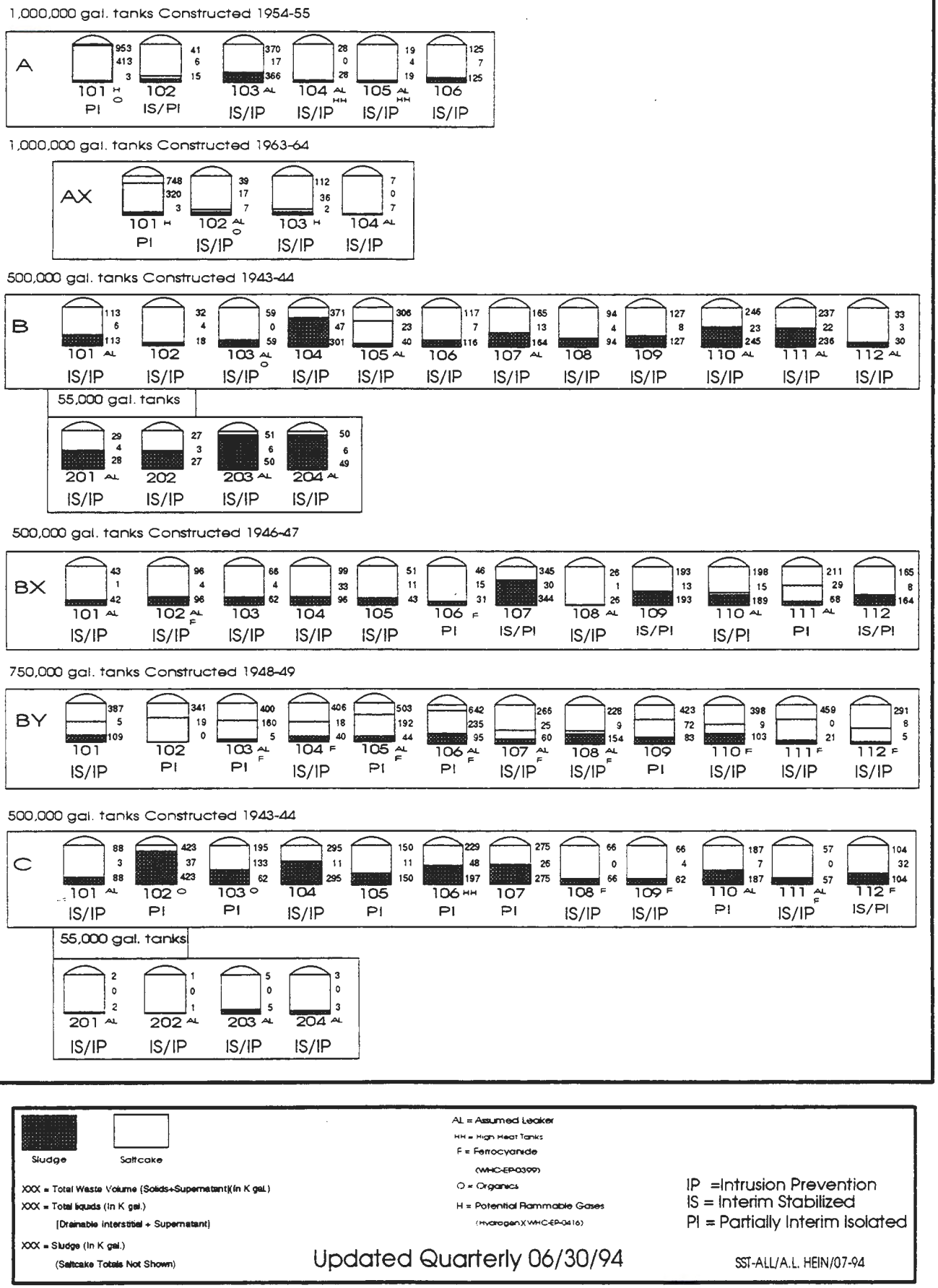

Figure D-6. 200E Single-Shell Tank Status

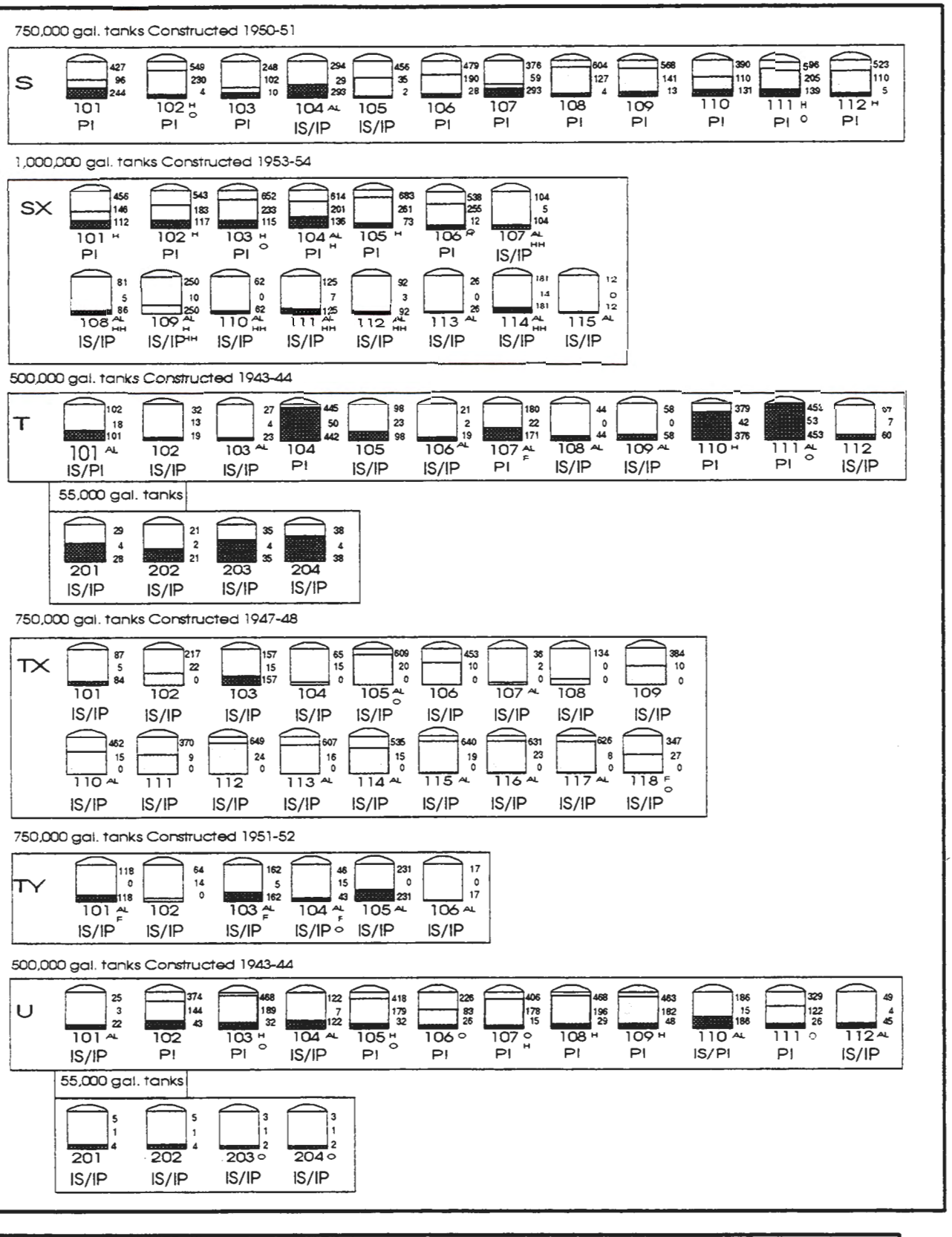

Fig. D-7. 200W Single-Shell Tank Status

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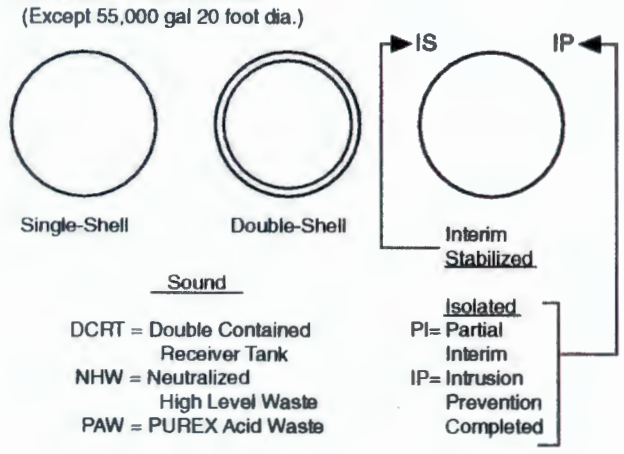
Hanford Tank Farm Facilities

200 East

Note: All single-shell tanks were removed from service (not allowed to receive waste) on or before November 21, 1980

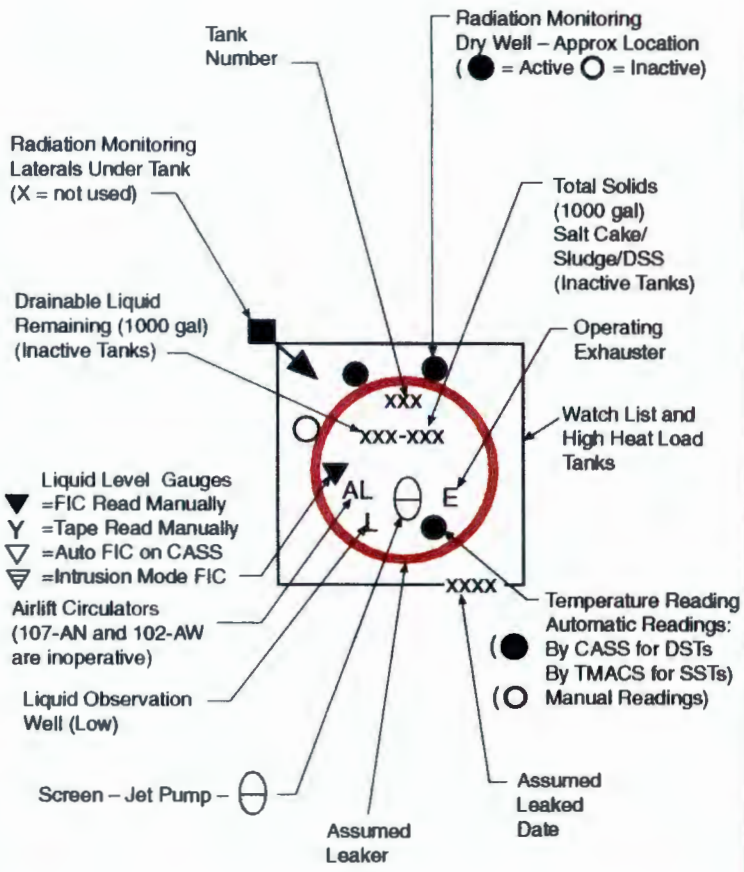
Single Walled Pipe Direct Buried

All Tanks 75 Foot Diameter
(Except 55,000 gal 20 foot dia.)



Sound

DCRT = Double Contained Receiver Tank
NHW = Neutralized High Level Waste
PAW = PUREX Acid Waste



Watch List Tanks

- Ferrocyanide
- H2/Flammable gases (109-SX has potential only-other tanks vent thru it)
- Organics
- High Heat - 106-C only on Watch List (cooling water added)

BY-Tank Farm
1948-49
12 @ 758,000 gal

B-Tank Farm
1943-44
12 @ 530,000 gal
4 @ 55,000 gal

BX-Tank Farm
1946-47
12 @ 530,000 gal

C-Tank Farm
1943-44
12 @ 530,000 gal
4 @ 55,000 gal

AN-Tank Farm
1980-81
7 @ 1,160,000 gal

AZ-Tank Farm
1971-77
(Aging Waste Tanks)
2 @
1,000,000 gal

AY-Tank Farm
1968-70
(Aging Waste Tanks) 2 @
1,000,000 gal

AX-Tank Farm
1963-64
4 @
1,000,000 gal

A-Tank Farm
1954-55
6 @
1,000,000 gal

AW-Tank Farm
1978-80
6 @ 1,160,000 gal

AP-Tank Farm
1983-86
8 @ 1,160,000 gal

244-BX DCRT
ER-152
ER-151
ER-153
CR Vault
244-A DCRT
WESF
B-Plant
AX-155
Valve Pits
AR-151
204 AR
AR Vault
AX-152
242-A Evaporator
PUREX
A-151
Grout Equip
Vault Field

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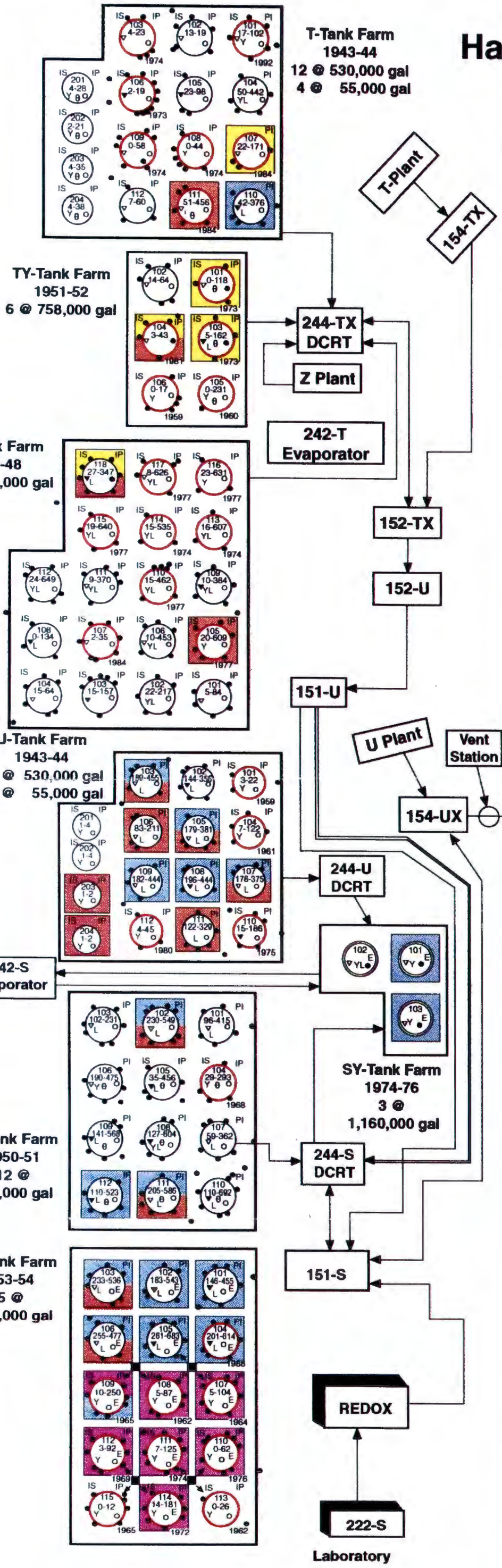
Hanford Tank Farm Facilities

200 West

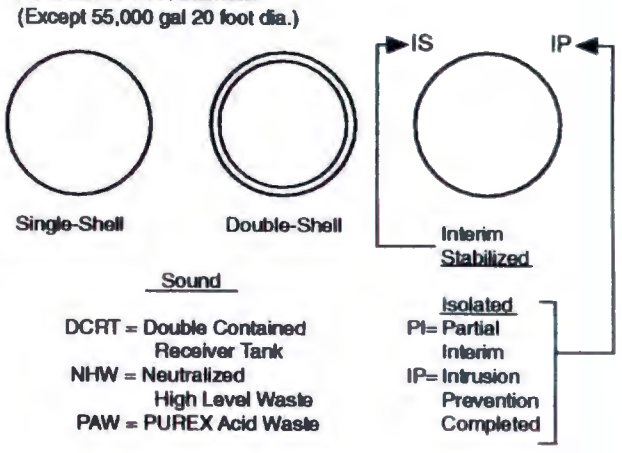
Note: All single-shell tanks were removed from service (not allowed to receive waste) on or before November 21, 1980



Double Walled Pipe

Single Walled Pipe Direct Buried

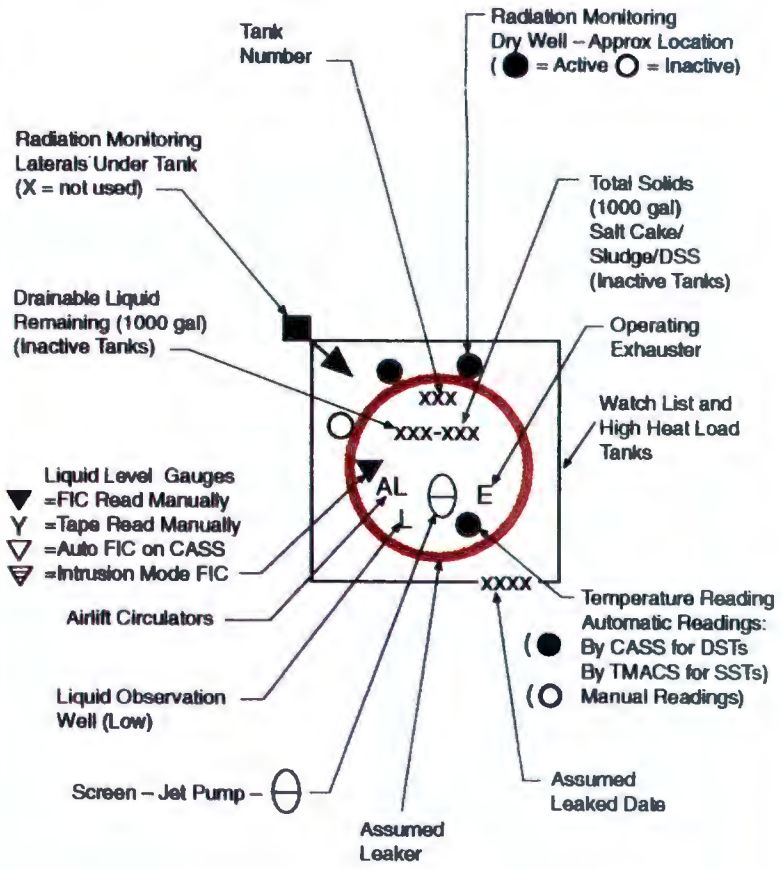
All Tanks 75 Foot Diameter
(Except 55,000 gal 20 foot dia.)



Sound

DCRT = Double Contained Receiver Tank
NHW = Neutralized High Level Waste
PAW = PUREX Acid Waste

Isolated
PI= Partial Interim
IP= Intrusion Prevention Completed



Watch List Tanks

- Ferrocyanide
- H2/Flammable gases (109-SX has potential only-other tanks vent thru it)
- Organics
- High Heat - 106-C only on Watch List (cooling water added)

Status as of June 30, 1994 - Updated Monthly
Issued by WHC/WTPE

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APPENDIX E

MONTHLY SUMMARY
TANK USE SUMMARY
INVENTORY SUMMARY BY TANK FARM
INVENTORY AND STATUS BY TANK

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TABLE E-1. MONTHLY SUMMARY

TANK STATUS

June 30, 1994

	200 EAST AREA	200 WEST AREA	TOTAL
IN SERVICE	25	3	28 (2)
OUT OF SERVICE	66	83	149
SOUND	59	51	110
ASSUMED LEAKER	32	35	67
INTERIM STABILIZED	51	55	106 (1)
ISOLATED			
PARTIAL INTERIM	21	30	51
INTRUSION PREVENTION COMPLETED	45	53	98

WASTE VOLUMES (Kgallons)

		200 EAST AREA	200 WEST AREA	TOTAL	SST TANKS	DST TANKS	TOTAL
SUPERNATANT							
AGING	Aging waste	1791	0	1791	0	1791	1791
CC	Complexant concentrate waste	1929	179	2108	3	2105	2108
CP	Concentrated phosphate waste	1106	0	1106	0	1106	1106
DC	Dilute complexed waste	792	1	793	1	792	793
DN	Dilute non-complexed waste	7323	0	7323	0	7323	7323
DN/PD	Dilute non-complex/PUREX TRU solids	1035	0	1035	0	1035	1035
DN/PT	Dilute non-complex/PFP TRU solids	0	692	692	0	692	692
DSSF	Double-shell slurry feed	3806	48	3854	57	3797	3854
NCPLX	Non-complexed waste	214	291	505	505	0	505
TOTAL SUPERNATANT		17996	1211	19207	566	18641	19207
SOLIDS							
Double-shell slurry		937	1103	2040	0	2040	2040
Sludge		8206	5927	14133	12178	1955	14133
Saltcake		6577	17529	24106	23346	760	24106
TOTAL SOLIDS		15720	24559	40279	35524	4755	40279
TOTAL WASTE		33716	25770	59486	36090	23396	59486
AVAILABLE SPACE IN TANKS		7073	811	7884	0	7884 (2)	7884
DRAINABLE INTERSTITIAL		2215	4496	6711	6272	439	6711
DRAINABLE LIQUID REMAINING		20213	5707	25920	6840	19080	25920

(1) Includes six tanks that do not meet current established supernatant and interstitial liquid stabilization criteria, B-104, 110, 111, T-102, T-112, and U-110.
(2) Includes six double-shell tanks on Hydrogen Watch List not currently allowed to receive waste, 103-AN, 104-AN, 105-AN, 101-AW, 101-SY, and 103-SY.
Note: +/- 1 Kgal differences are the result of computer rounding

TABLE E-2. TANK USE SUMMARY

June 30, 1994

TANK FARMS	IN SERVICE	OUT OF SERVICE	SOUND	ASSUMED LEAKER	ISOLATED TANKS: PARTIAL INTERIM	ISOLATED TANKS: INTRUSION PREVENTION	INTERIM STABILIZED TANKS
EAST							
A	0	6	3	3	2	4	5
AN	7 (2)	0	7	0	0	0	0
AP	8	0	8	0	0	0	0
AW	6 (2)	0	6	0	0	0	0
AX	0	4	2	2	1	3	3
AY	2	0	2	0	0	0	0
AZ	2	0	2	0	0	0	0
B	0	16	6	10	0	16	16 (1)
BX	0	12	7	5	6	6	10 (1)
BY	0	12	7	5	5	7	7
C	0	16	9	7	7	9	10
Total	25	66	59	32	21	45	51
WEST							
S	0	12	11	1	10	2	2
SX	0	15	5	10	6	9	9
SY	3 (2)	0	3	0	0	0	0
T	0	16	9	7	5	11	12 (1)
TX	0	18	10	8	0	18	18
TY	0	6	1	5	0	6	6
U	0	16	12	4	9	7	8 (1)
Total	3	83	51	35	30	59	55
TOTAL	28	149	110	67	51	98	106

(1) Includes six tanks that do not meet current established supernatant and interstitial liquid stabilization criteria (B-104, 110, 111, T-102, 112, and U-110).

(2) Six Double-Shell Tanks on the Hydrogen Tank Watch List are not currently in service (AN-103, 104, 105, AW-101, SY-101 and 103).

TABLE E-3. INVENTORY SUMMARY BY TANK FARM

June 30, 1994

TANK FARM	TOTAL WASTE	AVAIL SPACE	SUPERNATANT LIQUID VOLUMES (Kgallons) AGING	CC	CP	DC	DN	DN/PD	DN/PT	DSSF	NCPLX	TOTAL	SOLIDS VOLUME DSS	SALT SLUDGE	SALT CAKE	TOTAL
EAST																
A	1537	0	0	0	0	0	0	0	0	9	0	9	0	556	972	1528
AN	6122	1858	0	1926	4	0	815	0	0	1936	0	4681	937	504	0	1441
AP	6395	2725	0	0	1102	0	4473	0	0	820	0	6395	0	0	0	0
AW	4744	2096	0	0	0	0	1337	1035	0	1041	0	3413	0	1135	196	1331
AX	906	0	0	3	0	0	0	0	0	0	0	3	0	19	884	903
AY	1605	355	0	0	0	792	698	0	0	0	0	1490	0	115	0	115
AZ	1921	39	1791	0	0	0	0	0	0	0	0	1791	0	130	0	130
B	2057	0	0	0	0	0	0	0	0	0	15	15	0	1697	345	2042
BX	1539	0	0	0	0	0	0	0	0	0	30	30	0	1354	155	1509
BY	4744	0	0	0	0	0	0	0	0	0	0	0	0	719	4025	4744
C	2146	0	0	0	0	0	0	0	0	0	169	169	0	1977	0	1977
Total	33716	7073	1791	1929	1106	792	7323	1035	0	3806	214	17996	937	8206	6577	15720
WEST																
S	5510	0	0	0	0	0	0	0	0	17	41	58	0	1166	4286	5452
SX	4425	0	0	0	0	1	0	0	0	0	62	63	0	1254	3108	4362
SY	2609	811	0	179	0	0	0	0	692	0	0	871	1103	71	564	1738
T	2029	0	0	0	0	0	0	0	0	0	43	43	0	1980	0	1980
TX	7009	0	0	0	0	0	0	0	0	0	5	5	0	241	6763	7004
TY	638	0	0	0	0	0	0	0	0	0	3	3	0	571	64	635
U	3550	0	0	0	0	0	0	0	0	31	137	168	0	638	2744	3382
Total	25770	811	0	179	0	1	0	0	692	48	291	1211	1103	5921	17529	24553
TOTAL	59486	7884	1791	2108	1106	793	7323	1035	692	3854	505	19207	2040	14127	24106	40273

Note: +/- 1 Kgal differences are the result of computer rounding

TABLE E-4. INVENTORY AND STATUS BY TANK
DOUBLE-SHELL TANKS
June 30, 1994

TANK	TANK STATUS: WASTE MATL	TANK STATUS: TANK INTEGRTY	TANK STATUS: TANK USE	LIQUID VOLUME: EQUIVALENT WASTE INCHES	LIQUID VOLUME: TOTAL WASTE (Kgal)	LIQUID VOLUME: AVAIL SPACE (Kgal)	LIQUID VOLUME: SUPERNATANT LIQUID (Kgal)	LIQUID VOLUME: DRAINABLE INTERSTIT. (Kgal)	LIQUID VOLUME: DRAINABLE LIQUID REMAIN (Kgal)	LIQUID VOLUME: PUMPABLE LIQUID REMAIN (Kgal)	SOLIDS VOLUME: DSS SLUDGE (Kgallons)	SOLIDS VOLUME: SALT CAKE	VOLUME DETERMINATION: LIQUID VOLUME METHOD	VOLUME DETERMINATION: SOLIDS VOLUME METHOD	VOLUME DETERMINATION: SOLIDS VOLUME UPDATE	VOLUME DETERMINATION: LAST PHOTO DATE	SEE FOOTNOTES FOR THESE CHANGES
AN TANK FARM STATUS																	
AN-101	DN	SOUND	DRCVR	296.4	815	325	815	0	815	815	0	0	FM	S	08/22/89	0/ 0/ 0	
AN-102	CC	SOUND	CWHT	395.3	1087	53	998	3	1001	998	0	89	FM	S	08/22/89	0/ 0/ 0	
AN-103	DSS	SOUND	CWHT	346.5	953	187	16	0	16	16	937	0	FM	S	08/22/89	10/29/87	
AN-104	DSSF	SOUND	CWHT	385.5	1060	80	796	25	821	799	0	264	FM	S	08/22/89	08/19/88	
AN-105	DSSF	SOUND	CWHT	408.7	1124	16	1124	0	1124	1124	0	0	FM	S	10/22/84	01/26/88	
AN-106	CP	SOUND	CWHT	7.6	21	1119	4	0	4	4	0	17	FM	S	08/22/89	0/ 0/ 0	
AN-107	CC	SOUND	CWHT	386.2	1062	78	928	9	937	928	0	134	FM	S	08/22/89	09/01/88	
7 DOUBLE-SHELL TANKS				TOTALS:	6122	1858	4681	37	4718	4684	937	504	0				
AP TANK FARM STATUS																	
AP-101	DN	SOUND	DRCVR	385.5	1060	80	1060	0	1060	1060	0	0	FM	S	05/01/89	0/ 0/ 0	
AP-102	CP	SOUND	GRTFD	400.7	1102	38	1102	0	1102	1102	0	0	FM	S	07/11/89	0/ 0/ 0	
AP-103	DN	SOUND	DRCVR	10.2	28	1112	28	0	28	28	0	0	FM	S	10/13/88	0/ 0/ 0	
AP-104	DN	SOUND	GRTFD	6.5	18	1122	18	0	18	18	0	0	FM	S	10/13/88	0/ 0/ 0	
AP-105	DSSF	SOUND	CWHT	298.2	820	320	820	0	820	820	0	0	FM	S	02/02/89	0/ 0/ 0	
AP-106	DN	SOUND	DRCVR	409.8	1127	13	1127	0	1127	1127	0	0	FM	S	10/13/88	0/ 0/ 0	
AP-107	DN	SOUND	DRCVR	403.3	1109	31	1109	0	1109	1109	0	0	FM	S	10/13/88	0/ 0/ 0	
AP-108	DN	SOUND	DRCVR	411.3	1131	9	1131	0	1131	1131	0	0	FM	S	10/13/88	0/ 0/ 0	
8 DOUBLE-SHELL TANKS				TOTALS:	6395	2725	6395	0	6395	6395	0	0	0				

TABLE E-4. INVENTORY AND STATUS BY TANK
DOUBLE-SHELL TANKS
June 30, 1994

TANK STATUS				LIQUID VOLUME							SOLIDS VOLUME			VOLUME DETERMINATION				
TANK	WASTE MATL	TANK INTEGRTY	TANK USE	EQUIVALENT WASTE INCHES	TOTAL WASTE (Kgal)	AVAIL SPACE (Kgal)	SUPERNATANT LIQUID (Kgal)	DRAINABLE INTERSTIT. (Kgal)	DRAINABLE LIQUID REMAIN (Kgal)	PUMPABLE LIQUID REMAIN (Kgal)	DSS SLUDGE (Kgallons)	SALT CAKE	LIQUID VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	LAST PHOTO DATE	SEE FOOTNOTES FOR THESE CHANGES
AW TANK FARM STATUS																		
AW-101	DSSF	SOUND	CWHT	409.1	1125	15	1041	2	1043	1041	0	84	0	FM	S	10/22/84	03/17/88	
AW-102	DN	SOUND	EVFD	29.8	82	1058	81	0	81	81	0	1	0	FM	S	02/29/84	02/02/83	
AW-103	DN/PD	SOUND	DRCVR	235.3	647	493	284	37	321	299	0	363	0	FM	S	02/01/89	0/ 0/ 0	
AW-104	DN	SOUND	DRCVR	408.4	1123	17	833	49	882	860	0	179	111	FM	S	03/05/87	02/02/83	
AW-105	DN/PD	SOUND	DRCVR	381.1	1048	92	751	29	780	758	0	297	0	FM	S	03/05/87	0/ 0/ 0	
AW-106	DN	SOUND	SRCVR	261.5	719	421	423	42	465	443	0	211	85	FM	S	01/31/92	02/02/83	
6 DOUBLE-SHELL TANKS				TOTALS:	4744	2096	3413	159	3572	3482	0	1135	196					
AY TANK FARM STATUS																		
AY-101	DC	SOUND	DRCVR	318.2	875	105	792	2	794	792	0	83	0	FM	S	02/02/87	12/28/82	
AY-102	DN	SOUND	DRCVR	265.5	730	250	698	0	698	698	0	32	0	FM	S	02/10/88	04/28/81	
2 DOUBLE-SHELL TANKS				TOTALS:	1605	355	1490	2	1492	1490	0	115	0					
AZ TANK FARM STATUS																		
AZ-101	AGING	SOUND	CWHT	346.9	954	26	919	0	919	919	0	35	0	FM	S	09/30/90	08/18/83	
AZ-102	AGING	SOUND	DRCVR	351.6	967	13	872	4	876	872	0	95	0	FM	S	06/04/92	12/24/84	
2 DOUBLE-SHELL TANKS				TOTALS:	1921	39	1791	4	1795	1791	0	130	0					

TABLE E-4. INVENTORY AND STATUS BY TANK
DOUBLE-SHELL TANKS
June 30, 1994

TANK STATUS				LIQUID VOLUME							SOLIDS VOLUME			VOLUME DETERMINATION				
TANK	WASTE MATL	TANK INTEGRTY	TANK USE	EQUIVALENT WASTE INCHES	TOTAL WASTE (Kgal)	AVAIL SPACE (Kgal)	SUPERNATANT LIQUID (Kgal)	DRAINABLE INTERSTIT. (Kgal)	DRAINABLE LIQUID REMAIN (Kgal)	PUMPABLE LIQUID REMAIN (Kgal)	DSS SLUDGE (Kgallons)	SALT CAKE	LIQUID VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	LAST PHOTO DATE	SEE FOOTNOTES FOR THESE CHANGES
SY TANK FARM STATUS																		
SY-101	CC	SOUND	CWHT	400.0	1100	40	10	237	247	241	530	0	560	FM	S	01/31/92	04/12/89	
SY-102	DN/PT	SOUND	DRCVR	277.5	763	377	692	0	692	692	0	71	0	FM	S	05/12/87	04/29/81	
SY-103	CC	SOUND	CWHT	271.3	746	394	169	0	169	169	573	0	4	FM	S	10/22/84	10/01/85	
3 DOUBLE-SHELL TANKS				TOTALS:	2609	811	871	237	1108	1102	1103	71	564					
GRAND TOTAL					23396	7884	18641	439	19080	18944	2040	1955	760					

Note: +/- 1 Kgal differences are the result of computer rounding

Tank Farms	Available Space Calculations Used In This Document (Most Conservative)	Document SD-WM-TI-357* Operating Limit	Document SD-WM-TI-357* Tank Capacity	OSD-T-151-00007** Specification Limit
AN, AP, AW, SY	1,140,000 gal (414.5 in.)	1,144,000 gal (416 in.)	1,160,000 gal (421.8 in.)	1,160,500 gal (422 in.)
AY, AZ (Aging Waste)	980,000 gal (356.4 in.)	990,000 gal (360 in.)	1,000,000 gal (363.6 in.)	1,001,000 gal (364 in.)

* WHC-SD-WM-TI-357, "Waste Storage Tank Status and Leak Detection Criteria."

**WHC-OSD-T-151-00007, "Operating Specifications for 241-AN, AP, AW, AY, AZ, & SY Tank Farms."

TABLE E-5. INVENTORY AND STATUS BY TANK
SINGLE-SHELL TANKS
June 30, 1994

TANK STATUS				LIQUID VOLUME							SOLIDS VOLUME		VOLUME DETERMINATION					
TANK	WASTE MATERIAL	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER-NATANT LIQUID (Kgal)	DRAIN-ABLE INTER-STIT. (Kgal)	PUMPED THIS MONTH (Kgal)	TOTAL PUMPED (Kgal)	DRAIN-ABLE LIQUID REMAIN (Kgal)	PUMP-ABLE LIQUID REMAIN (Kgal)	SLUDGE (Kgal)	SALTCAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	SOLIDS UPDATE SOURCE SEE FOOTNOTE	LAST PHOTO DATE	SEE FOOTNOTES FOR THESE CHANGES
						++++++ A FARM STATUS ++++++												
A-101	DSSF	SOUND	/PI	953	0	413	0.0	0.0	413	390	3	950	P	F	11/21/80		08/21/85	
A-102	DSSF	SOUND	IS/PI	41	4	2	0.0	39.5	6	0	15	22	P	FP	07/27/89	(1)	07/20/89	
A-103	DSSF	ASMD LKR	IS/IP	371	5	15	0.0	111.0	20	0	366	0	-	FP	06/03/88	(1)	12/28/88	
A-104	NCPLX	ASMD LKR	IS/IP	28	0	0	0.0	0.0	0	0	28	0	M	PS	01/27/78		06/25/86	
A-105	NCPLX	ASMD LKR	IS/IP	19	0	4	0.0	0.0	4	0	19	0	P	MP	08/23/79	(1)	08/20/86	
A-106	CP	SOUND	IS/IP	125	0	7	0.0	0.0	7	0	125	0	P	M	09/07/82		08/17/86	
6 SINGLE-SHELL TANKS			TOTALS	1537	9	441	0.0	150.5	450	390	556	972						
						++++++ AX FARM STATUS ++++++												
AX-101	DSSF	SOUND	/PI	748	0	320	0.0	0.0	320	298	3	745	P	F	05/06/82		08/18/87	
AX-102	CC	ASMD LKR	IS/IP	39	3	14	0.0	13.0	17	3	7	29	F	S	09/06/88		06/05/89	
AX-103	CC	SOUND	IS/IP	112	0	36	0.0	0.0	36	3	2	110	F	S	08/19/87		08/13/87	
AX-104	NCPLX	ASMD LKR	IS/IP	7	0	0	0.0	0.0	0	0	7	0	P	M	04/28/82		08/18/87	
4 SINGLE-SHELL TANKS			TOTALS:	906	3	370	0.0	13.0	373	304	19	884						

TABLE E-5. INVENTORY AND STATUS BY TANK
SINGLE-SHELL TANKS
June 30, 1994

TANK STATUS				LIQUID VOLUME							SOLIDS VOLUME		VOLUME DETERMINATION					
TANK	WASTE MATERIAL	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER-NATANT LIQUID (Kgal)	DRAIN-ABLE INTER-STIT. (Kgal)	PUMPED THIS MONTH (Kgal)	TOTAL PUMPED (Kgal)	DRAIN-ABLE LIQUID REMAIN (Kgal)	PUMP-ABLE LIQUID REMAIN (Kgal)	SLUDGE (Kgal)	SALTCAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	SOLIDS UPDATE SOURCE SEE FOOTNOTE	LAST PHOTO DATE	SEE FOOTNOTES FOR THESE CHANGES
						++++++	B FARM STATUS		++++++									
B-101	NCPLX	ASMD LKR	IS/IP	113	0	6	0.0	0.0	6	0	113	0	P	F	04/28/82		05/19/83	
B-102	NCPLX	SOUND	IS/IP	32	4	0	0.0	0.0	4	0	18	10	P	F	08/22/85	(1)	08/22/85	
B-103	NCPLX	ASMD LKR	IS/IP	59	0	0	0.0	0.0	0	0	59	0	F	F	02/28/85	(1)	10/13/88	
B-104	NCPLX	SOUND	IS/IP	371	1	46	0.0	0.0	47	40	301	69	M	M	06/30/85	(1)	10/13/88	
B-105	NCPLX	ASMD LKR	IS/IP	306	0	23	0.0	0.0	23	0	40	266	P	MP	12/27/84	(1)	05/19/88	
B-106	NCPLX	SOUND	IS/IP	117	1	6	0.0	0.0	7	0	116	0	F	F	03/31/85	(1)	02/28/85	
B-107	NCPLX	ASMD LKR	IS/IP	165	1	12	0.0	0.0	13	7	164	0	M	M	03/31/85	(1)	02/28/85	
B-108	NCPLX	SOUND	IS/IP	94	0	4	0.0	0.0	4	0	94	0	F	F	05/31/85	(1)	05/10/85	
B-109	NCPLX	SOUND	IS/IP	127	0	8	0.0	0.0	8	0	127	0	M	M	04/08/85	(1)	04/02/85	
B-110	NCPLX	ASMD LKR	IS/IP	246	1	22	0.0	0.0	23	17	245	0	MP	MP	02/28/85	(1)	03/17/88	
B-111	NCPLX	ASMD LKR	IS/IP	237	1	21	0.0	0.0	22	16	236	0	F	F	06/28/85	(1)	06/26/85	
B-112	NCPLX	ASMD LKR	IS/IP	33	3	0	0.0	0.0	3	0	30	0	F	F	05/31/85	(1)	05/29/85	
B-201	NCPLX	ASMD LKR	IS/IP	29	1	3	0.0	0.0	4	0	28	0	M	M	04/28/82		11/12/86	
B-202	NCPLX	SOUND	IS/IP	27	0	3	0.0	0.0	3	0	27	0	P	M	05/31/85	(1)	05/29/85	
B-203	NCPLX	ASMD LKR	IS/IP	51	1	5	0.0	0.0	6	0	50	0	PM	PM	05/31/84	(1)	11/13/86	
B-204	NCPLX	ASMD LKR	IS/IP	50	1	5	0.0	0.0	6	0	49	0	P	M	05/31/84	(1)	10/21/87	
16 SINGLE-SHELL TANKS			TOTALS	2057	15	164	0.0	0.0	179	80	1697	345						

TABLE E-5. INVENTORY AND STATUS BY TANK
SINGLE-SHELL TANKS
June 30, 1994

TANK STATUS				LIQUID VOLUME							SOLIDS VOLUME		VOLUME DETERMINATION					
TANK	WASTE MATERIAL	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER-NATANT LIQUID (Kgal)	DRAIN-ABLE INTER-STIT. (Kgal)	PUMPED THIS MONTH (Kgal)	TOTAL PUMPED (Kgal)	DRAIN-ABLE LIQUID REMAIN (Kgal)	PUMP-ABLE LIQUID REMAIN (Kgal)	SLUDGE (Kgal)	SALTCAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	SOLIDS UPDATE SOURCE SEE FOOTNOTE	LAST PHOTO DATE	SEE FOOTNOTES FOR THESE CHANGES
						++++++	BX FARM STATUS		++++++									
BX-101	NCPLX	ASMD LKR	IS/IP	43	1	0	0.0	0.0	1	0	42	0	P	M	04/28/82		11/24/88	
BX-102	NCPLX	ASMD LKR	IS/IP	96	0	4	0.0	0.0	4	0	96	0	P	M	04/28/82		09/18/85	
BX-103	NCPLX	SOUND	IS/IP	66	4	0	0.0	0.0	4	0	62	0	P	F	11/29/83		10/31/86	
BX-104	NCPLX	SOUND	IS/IP	99	3	30	0.0	17.4	33	27	96	0	F	F	09/22/89	(1)	09/21/89	
BX-105	NCPLX	SOUND	IS/IP	51	5	6	0.0	15.0	11	4	43	3	F	S	09/03/86	(1)	10/23/86	
BX-106	NCPLX	SOUND	/PI	46	15	0	0.0	0.0	15	15	31	0	MP	PS	04/28/82		05/19/88	
BX-107	NCPLX	SOUND	IS/PI	345	1	29	0.0	23.1	30	23	344	0	MP	P	09/18/90	(2)	09/11/90	
BX-108	NCPLX	ASMD LKR	IS/IP	26	0	1	0.0	0.0	1	0	26	0	M	PS	07/31/79	(1)	05/05/94	
BX-109	NCPLX	SOUND	IS/PI	193	0	13	0.0	8.2	13	8	193	0	FP	P	09/17/90	(2)	09/11/90	
BX-110	NCPLX	ASMD LKR	IS/PI	198	0	15	0.0	4.0	17	6	189	9	MP	M	08/22/85	(1)	07/31/85	
BX-111	NCPLX	ASMD LKR	/PI	211	0	29	0.7	111.1	29	7	68	143	M	M	07/26/77		05/19/94	(a)
BX-112	NCPLX	SOUND	IS/PI	165	1	7	0.0	4.1	8	2	164	0	FP	P	09/17/90	(2)	09/11/90	
12 SINGLE-SHELL TANKS			TOTALS:	1539	30	134	0.7	182.9	166	92	1354	155						
						++++++	BY FARM STATUS		++++++									
BY-101	NCPLX	SOUND	IS/IP	387	0	5	0.0	35.8	5	0	109	278	P	M	05/30/84		09/19/89	
BY-102	NCPLX	SOUND	/PI	341	0	29	10.0	135.6	29	10	0	341	MP	M	08/30/91	(2)	09/11/87	(b)
BY-103	NCPLX	ASMD LKR	/PI	400	0	160	0.0	78.5	160	137	5	395	MP	M	04/03/90	(2)	09/07/89	
BY-104	NCPLX	SOUND	IS/IP	406	0	18	0.0	329.5	18	0	40	366	P	M	04/28/82		04/27/83	
BY-105	NCPLX	ASMD LKR	/PI	503	0	192	0.0	0.0	192	169	44	459	P	MP	04/28/82		07/11/86	
BY-106	NCPLX	ASMD LKR	/PI	642	0	235	0.0	0.0	235	213	95	547	P	MP	04/28/82		11/04/82	
BY-107	NCPLX	ASMD LKR	IS/IP	266	0	25	0.0	56.4	25	0	60	206	P	MP	04/28/82		10/15/86	

TABLE E-5. INVENTORY AND STATUS BY TANK
SINGLE-SHELL TANKS
June 30, 1994

TANK STATUS				LIQUID VOLUME							SOLIDS VOLUME		VOLUME DETERMINATION					
TANK	WASTE MATERIAL	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER-NATANT LIQUID (Kgal)	DRAIN-ABLE INTER-STIT. (Kgal)	PUMPED THIS MONTH (Kgal)	TOTAL PUMPED (Kgal)	DRAIN-ABLE LIQUID REMAIN (Kgal)	PUMP-ABLE LIQUID REMAIN (Kgal)	SLUDGE (Kgal)	SALTCAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	SOLIDS UPDATE SOURCE SEE FOOTNOTE	LAST PHOTO DATE	SEE FOOTNOTES FOR THESE CHANGES
BY-108	NCPLX	ASMD LKR	IS/IP	228	0	9	0.0	27.5	9	0	154	74	MP	M	04/28/82		10/15/86	
BY-109	NCPLX	SOUND	/PI	423	0	72	6.4	100.3	72	51	83	340	F	PS	08/30/91	(2)	10/15/86	(c)
BY-110	NCPLX	SOUND	IS/IP	398	0	9	0.0	213.3	9	0	103	295	M	S	09/10/79		07/26/84	
BY-111	NCPLX	SOUND	IS/IP	459	0	0	0.0	313.2	0	0	21	438	P	M	04/28/82		10/31/86	
BY-112	NCPLX	SOUND	IS/IP	291	0	8	0.0	116.4	8	0	5	286	P	M	04/28/82		04/14/88	
12 SINGLE-SHELL TANKS			TOTALS:	4744	0	761	16.4	1406.5	761	579	719	4025						
						++++++ C FARM STATUS ++++++												
C-101	NCPLX	ASMD LKR	IS/IP	88	0	3	0.0	0.0	3	0	88	0	M	M	11/29/83		11/17/87	
C-102	DC	SOUND	/PI	423	0	37	0.0	11.6	37	19	423	0	F	FP	04/28/82		05/18/76	
C-103	NCPLX	SOUND	/PI	195	133	0	0.0	0.0	133	133	62	0	F	S	10/22/90	(2)	07/28/87	
C-104	CC	SOUND	IS/IP	295	0	11	0.0	0.0	11	5	295	0	FP	P	09/22/89	(1)	07/25/90	
C-105	NCPLX	SOUND	/PI	150	0	11	0.0	0.0	11	4	150	0	F	S	05/31/85		03/13/94	
C-106	NCPLX	SOUND	/PI	229	32	16	0.0	0.0	48	42	197	0	F	PS	04/28/82		04/05/79	
C-107	DC	SOUND	/PI	275	0	26	0.0	16.3	26	20	275	0	F	S	01/30/92	(2)	00/00/00	
C-108	NCPLX	SOUND	IS/IP	66	0	0	0.0	0.0	0	0	66	0	M	S	02/24/84	(1)	12/05/74	
C-109	NCPLX	SOUND	IS/IP	66	4	0	0.0	0.0	4	0	62	0	M	PS	11/29/83		01/30/76	
C-110	DC	ASMD LKR	/PI	187	0	7	0.0	8.9	7	5	187	0	F	FMP	03/01/92	(2)	08/12/86	
C-111	NCPLX	ASMD LKR	IS/IP	57	0	0	0.0	0.0	0	0	57	0	M	S	04/28/82		02/25/70	
C-112	NCPLX	SOUND	IS/PI	104	0	32	0.0	0.0	32	26	104	0	M	PS	09/18/90	(2)	09/18/90	

TABLE E-5. INVENTORY AND STATUS BY TANK
SINGLE-SHELL TANKS
June 30, 1994

TANK STATUS				LIQUID VOLUME							SOLIDS VOLUME		VOLUME DETERMINATION					
TANK	WASTE MATERIAL	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER-NATANT LIQUID (Kgal)	DRAIN-ABLE INTER-STIT. (Kgal)	PUMPED THIS MONTH (Kgal)	TOTAL PUMPED (Kgal)	DRAIN-ABLE LIQUID REMAIN (Kgal)	PUMP-ABLE LIQUID REMAIN (Kgal)	SLUDGE (Kgal)	SALTCAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	SOLIDS UPDATE SOURCE SEE FOOTNOTE	LAST PHOTO DATE	SEE FOOTNOTES FOR THESE CHANGES
C-201	NCPLX	ASMD LKR	IS/IP	2	0	0	0.0	0.0	0	0	2	0	P	MP	03/31/82		12/02/86	
C-202	EMPTY	ASMD LKR	IS/IP	1	0	0	0.0	0.0	0	0	1	0	P	M	01/19/79		12/09/86	
C-203	NCPLX	ASMD LKR	IS/IP	5	0	0	0.0	0.0	0	0	5	0	P	MP	04/28/82		12/09/86	
C-204	NCPLX	ASMD LKR	IS/IP	3	0	0	0.0	0.0	0	0	3	0	P	MP	04/28/82		12/09/86	
16 SINGLE-SHELL TANKS			TOTALS:	2146	169	143	0.0	36.8	312	254	1977	0						
						++++++ S FARM STATUS ++++++												
S-101	NCPLX	SOUND	/PI	427	12	84	0.0	0.0	96	90	244	171	F	PS	09/16/80		03/18/88	
S-102	DSSF	SOUND	/PI	549	0	230	0.0	0.0	230	208	4	545	P	FP	04/28/82		03/18/88	
S-103	DSSF	SOUND	/PI	248	17	85	0.0	0.0	102	79	10	221	M	S	11/20/80		06/01/89	
S-104	NCPLX	ASMD LKR	IS/IP	294	1	28	0.0	0.0	29	23	293	0	M	M	12/20/84	(1)	12/12/84	
S-105	NCPLX	SOUND	IS/IP	456	0	35	0.0	114.3	35	13	2	454	MP	S	09/26/88		04/12/89	
S-106	NCPLX	SOUND	/PI	479	4	186	0.0	97.0	190	168	28	447	P	FP	12/31/93		03/17/89	
S-107	NCPLX	SOUND	/PI	376	14	45	0.0	0.0	59	52	293	69	F	PS	09/25/80		03/12/87	
S-108	NCPLX	SOUND	/PI	604	0	127	0.0	151.6	127	105	4	600	P	MP	04/28/82		03/12/87	
S-109	NCPLX	SOUND	/PI	568	0	141	0.0	111.0	141	119	13	555	F	PS	09/30/75		08/24/84	
S-110	NCPLX	SOUND	/PI	390	0	110	0.0	185.9	110	103	131	259	F	PS	05/14/92		03/12/87	
S-111	NCPLX	SOUND	/PI	596	10	195	0.0	3.3	205	134	139	447	P	FP	04/28/82		08/10/89	
S-112	NCPLX	SOUND	/PI	523	0	110	0.0	125.1	110	107	5	518	P	FP	12/31/93		03/24/87	
12 SINGLE-SHELL TANKS			TOTALS:	5510	58	1376	0.0	788.2	1434	1201	1166	4286						

TABLE E-5. INVENTORY AND STATUS BY TANK
SINGLE-SHELL TANKS
June 30, 1994

TANK STATUS				LIQUID VOLUME							SOLIDS VOLUME		VOLUME DETERMINATION					
TANK	WASTE MATERIAL	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER-NATANT LIQUID (Kgal)	DRAIN-ABLE INTER-STIT. (Kgal)	PUMPED THIS MONTH (Kgal)	TOTAL PUMPED (Kgal)	DRAIN-ABLE LIQUID REMAIN (Kgal)	PUMP-ABLE LIQUID REMAIN (Kgal)	SLUDGE (Kgal)	SALTCAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	SOLIDS UPDATE SOURCE SEE FOOTNOTE	LAST PHOTO DATE	SEE FOOTNOTES FOR THESE CHANGES
						++++++	SX FARM STATUS		++++++									
SX-101	DC	SOUND	/PI	456	1	145	0.0	0.0	146	124	112	343	P	FP	04/28/82		03/10/89	
SX-102	DSSF	SOUND	/PI	543	0	183	0.0	0.0	183	177	117	426	P	M	04/28/82		01/07/88	
SX-103	NCPLX	SOUND	/PI	652	1	232	0.0	0.0	233	211	115	536	F	S	07/15/91		12/17/87	
SX-104	DSSF	ASMD LKR	/PI	614	0	201	0.0	113.2	201	195	136	478	F	S	07/07/89		09/08/88	
SX-105	DSSF	SOUND	/PI	683	0	261	0.0	0.0	261	238	73	610	P	F	04/28/82		06/15/88	
SX-106	NCPLX	SOUND	/PI	538	61	194	0.0	0.0	255	233	12	465	F	PS	10/28/80		06/01/89	
SX-107	NCPLX	ASMD LKR	IS/IP	104	0	5	0.0	0.0	5	0	104	0	P	M	04/28/82		03/06/87	
SX-108	NCPLX	ASMD LKR	IS/IP	87	0	5	0.0	0.0	5	0	87	0	P	M	12/31/93		03/06/87	
SX-109	NCPLX	ASMD LKR	IS/IP	250	0	10	0.0	0.0	10	0	0	250	P	M	10/05/93		05/21/86	
SX-110	NCPLX	ASMD LKR	IS/IP	62	0	0	0.0	0.0	0	0	62	0	M	PS	10/06/76		02/20/87	
SX-111	NCPLX	ASMD LKR	IS/IP	125	0	7	0.0	0.0	7	0	125	0	M	PS	05/31/74		06/09/94	
SX-112	NCPLX	ASMD LKR	IS/IP	92	0	3	0.0	0.0	3	0	92	0	P	M	04/28/82		03/10/87	
SX-113	NCPLX	ASMD LKR	IS/IP	26	0	0	0.0	0.0	0	0	26	0	P	M	04/28/82		03/18/88	
SX-114	NCPLX	ASMD LKR	IS/IP	181	0	14	0.0	0.0	14	0	181	0	P	M	04/28/82		02/26/87	
SX-115	NCPLX	ASMD LKR	IS/IP	12	0	0	0.0	0.0	0	0	12	0	P	M	04/28/82		03/31/88	
15 SINGLE-SHELL TANKS			TOTALS:	4425	63	1260	0.0	113.2	1323	1178	1254	3108						

TABLE E-5. INVENTORY AND STATUS BY TANK
SINGLE-SHELL TANKS
June 30, 1994

TANK STATUS				LIQUID VOLUME							SOLIDS VOLUME		VOLUME DETERMINATION					
TANK	WASTE MATERIAL	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER-NATANT LIQUID (Kgal)	DRAIN-ABLE INTER-STIT. (Kgal)	PUMPED THIS MONTH (Kgal)	TOTAL PUMPED (Kgal)	DRAIN-ABLE LIQUID REMAIN (Kgal)	PUMP-ABLE LIQUID REMAIN (Kgal)	SLUDGE (Kgal)	SALTCAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	SOLIDS UPDATE SOURCE SEE FOOTNOTE	LAST PHOTO DATE	SEE FOOTNOTES FOR THESE CHANGES
						++++++	T FARM STATUS		++++++									
T-101	NCPLX	ASMD LKR	IS/PI	102	1	16	0.0	25.3	17	0	101	0	F	S	04/14/93		04/07/93	
T-102	NCPLX	SOUND	IS/IP	32	13	0	0.0	0.0	13	13	19	0	P	FP	08/31/84		06/28/89	
T-103	NCPLX	ASMD LKR	IS/IP	27	4	0	0.0	0.0	4	0	23	0	F	FP	11/29/83	(1)	07/02/84	
T-104	NCPLX	SOUND	/PI	445	3	47	0.0	0.0	50	44	442	0	P	MP	04/28/82		06/29/89	
T-105	NCPLX	SOUND	IS/IP	98	0	23	0.0	0.0	23	17	98	0	P	F	05/29/87		05/14/87	
T-106	NCPLX	ASMD LKR	IS/IP	21	2	0	0.0	0.0	2	0	19	0	P	FP	04/28/82		06/29/89	
T-107	NCPLX	ASMD LKR	/PI	180	9	13	0.0	0.0	22	16	171	0	P	FP	08/31/84		07/12/84	
T-108	NCPLX	ASMD LKR	IS/IP	44	0	0	0.0	0.0	0	0	44	0	P	M	04/28/82		07/17/84	
T-109	NCPLX	ASMD LKR	IS/IP	58	0	0	0.0	0.0	0	0	58	0	M	M	12/30/84	(1)	02/25/93	
T-110	NCPLX	SOUND	/PI	379	3	39	0.0	0.0	42	36	376	0	P	FP	04/28/82		07/12/84	
T-111	NCPLX	ASMD LKR	/PI	453	0	53	1.7	4.8	53	47	453	0	P	FP	04/18/94	(2)	04/13/94	(d)
T-112	NCPLX	SOUND	IS/IP	67	7	0	0.0	0.0	7	7	60	0	P	FP	04/28/82		08/01/84	
T-201	NCPLX	SOUND	IS/IP	29	1	3	0.0	0.0	4	0	28	0	M	PS	05/31/78		04/15/86	
T-202	NCPLX	SOUND	IS/IP	21	0	2	0.0	0.0	2	0	21	0	FP	P	07/12/81		07/06/89	
T-203	NCPLX	SOUND	IS/IP	35	0	4	0.0	0.0	4	0	35	0	M	PS	01/31/78		08/03/89	
T-204	NCPLX	SOUND	IS/IP	38	0	4	0.0	0.0	4	0	38	0	FP	P	07/22/81		08/03/89	
16 SINGLE-SHELL TANKS			TOTALS:	2029	43	204	1.7	30.1	247	180	1986	0						

TABLE E-5. INVENTORY AND STATUS BY TANK
SINGLE-SHELL TANKS
June 30, 1994

TANK STATUS				LIQUID VOLUME							SOLIDS VOLUME		VOLUME DETERMINATION					
TANK	WASTE MATERIAL	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER-NATANT LIQUID (Kgal)	DRAIN-ABLE INTER-STIT. (Kgal)	PUMPED THIS MONTH (Kgal)	TOTAL PUMPED (Kgal)	DRAIN-ABLE LIQUID REMAIN (Kgal)	PUMP-ABLE LIQUID REMAIN (Kgal)	SLUDGE (Kgal)	SALTCAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	SOLIDS UPDATE SOURCE SEE FOOTNOTE	LAST PHOTO DATE	SEE FOOTNOTES FOR THESE CHANGES
						++++++	TX FARM STATUS		++++++									
TX-101	NCPLX	SOUND	IS/IP	87	3	2	0.0	0.0	5	0	84	0	F	P	02/02/84	(1)	10/24/85	
TX-102	NCPLX	SOUND	IS/IP	217	0	22	0.0	94.4	22	0	0	217	M	S	08/31/84		10/31/85	
TX-103	NCPLX	SOUND	IS/IP	157	0	15	0.0	68.3	15	0	157	0	F	S	08/14/80		10/31/85	
TX-104	NCPLX	SOUND	IS/IP	65	1	14	0.0	3.6	15	0	0	64	F	FP	04/06/84		10/16/84	
TX-105	NCPLX	ASMD LKR	IS/IP	609	0	20	0.0	121.5	20	0	0	609	M	PS	08/22/77		10/24/89	
TX-106	NCPLX	SOUND	IS/IP	453	0	10	0.0	134.6	10	0	0	453	M	S	08/29/77		10/31/85	
TX-107	NCPLX	ASMD LKR	IS/IP	36	1	1	0.0	0.0	2	0	0	35	FP	FP	01/20/84	(1)	10/31/85	
TX-108	NCPLX	SOUND	IS/IP	134	0	0	0.0	13.7	0	0	0	134	P	FP	05/30/83		09/12/89	
TX-109	NCPLX	SOUND	IS/IP	384	0	10	0.0	72.3	10	0	0	384	F	PS	05/30/83		10/24/89	
TX-110	NCPLX	ASMD LKR	IS/IP	462	0	15	0.0	115.1	15	0	0	462	M	PS	05/30/83		10/24/89	
TX-111	NCPLX	SOUND	IS/IP	370	0	9	0.0	98.4	9	0	0	370	M	PS	07/26/77		09/12/89	
TX-112	NCPLX	SOUND	IS/IP	649	0	24	0.0	94.0	24	0	0	649	P	PS	05/30/83		11/19/87	
TX-113	NCPLX	ASMD LKR	IS/IP	607	0	16	0.0	19.2	16	0	0	607	M	PS	05/30/83		04/11/83	
TX-114	NCPLX	ASMD LKR	IS/IP	535	0	15	0.0	104.3	15	0	0	535	M	PS	05/30/83		04/11/83	
TX-115	NCPLX	ASMD LKR	IS/IP	640	0	19	0.0	99.1	19	0	0	640	M	S	03/25/83		06/15/88	
TX-116	NCPLX	ASMD LKR	IS/IP	631	0	23	0.0	23.8	23	0	0	631	M	PS	03/31/72		10/17/89	
TX-117	NCPLX	ASMD LKR	IS/IP	626	0	8	0.0	54.3	8	0	0	626	M	PS	12/31/71		04/11/83	
TX-118	NCPLX	SOUND	IS/IP	347	0	27	0.0	89.1	27	0	0	347	F	S	11/17/80		12/19/79	
18 SINGLE-SHELL TANKS			TOTALS:	7009	5	250	0.0	1205.7	255	0	241	6763						

TABLE E-5. INVENTORY AND STATUS BY TANK
SINGLE-SHELL TANKS
June 30, 1994

TANK STATUS				LIQUID VOLUME							SOLIDS VOLUME		VOLUME DETERMINATION					
TANK	WASTE MATERIAL	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER-NATANT LIQUID (Kgal)	DRAIN-ABLE INTER-STIT. (Kgal)	PUMPED THIS MONTH (Kgal)	TOTAL PUMPED (Kgal)	DRAIN-ABLE LIQUID REMAIN (Kgal)	PUMP-ABLE LIQUID REMAIN (Kgal)	SLUDGE (Kgal)	SALTCAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	SOLIDS UPDATE SOURCE SEE FOOTNOTE	LAST PHOTO DATE	SEE FOOTNOTES FOR THESE CHANGES
						++++++	TY FARM STATUS		++++++									
TY-101	NCPLX	ASMD LKR	IS/IP	118	0	0	0.0	8.2	0	0	118	0	P	F	04/28/82		08/22/89	
TY-102	NCPLX	SOUND	IS/IP	64	0	14	0.0	6.6	14	0	0	64	P	FP	06/28/82		07/07/87	
TY-103	NCPLX	ASMD LKR	IS/IP	162	0	5	0.0	11.5	5	0	162	0	P	FP	07/09/82		08/22/89	
TY-104	NCPLX	ASMD LKR	IS/IP	46	3	12	0.0	0.0	15	0	43	0	P	FP	06/27/90	(1)	11/03/87	
TY-105	NCPLX	ASMD LKR	IS/IP	231	0	0	0.0	3.6	0	0	231	0	P	M	04/28/82		09/07/89	
TY-106	NCPLX	ASMD LKR	IS/IP	17	0	0	0.0	0.0	0	0	17	0	P	M	04/28/82		08/22/89	
6 SINGLE-SHELL TANKS			TOTALS:	638	3	31	0.0	29.9	34	0	571	64						
						++++++	U FARM STATUS		++++++									
U-101	NCPLX	ASMD LKR	IS/IP	25	3	0	0.0	0.0	3	0	22	0	P	MP	04/28/82		06/19/79	
U-102	NCPLX	SOUND	/PI	374	18	126	0.0	0.0	144	122	43	313	P	MP	04/28/82		06/08/89	
U-103	NCPLX	SOUND	/PI	468	13	176	0.0	0.0	189	166	32	423	P	FP	04/28/82		09/13/88	
U-104	NCPLX	ASMD LKR	IS/IP	122	0	7	0.0	0.0	7	0	122	0	P	MP	04/28/82		08/10/89	
U-105	NCPLX	SOUND	/PI	418	37	142	0.0	0.0	179	157	32	349	FM	PS	09/30/78		07/07/88	
U-106	NCPLX	SOUND	/PI	226	15	68	0.0	0.0	83	61	26	185	F	PS	12/30/83		07/07/88	
U-107	DSSF	SOUND	/PI	406	31	147	0.0	0.0	178	156	15	360	F	S	12/30/83		10/27/88	
U-108	NCPLX	SOUND	/PI	468	24	172	0.0	0.0	196	174	29	415	F	S	12/30/83		09/12/84	
U-109	NCPLX	SOUND	/PI	463	19	163	0.0	0.0	182	160	48	396	F	F	11/13/77		07/07/88	
U-110	NCPLX	ASMD LKR	IS/PI	186	0	15	0.0	0.0	15	9	186	0	M	M	12/30/84	(1)	12/11/84	
U-111	DSSF	SOUND	/PI	329	0	122	0.0	0.0	122	99	26	303	PS	FPS	04/28/82		06/23/88	
U-112	NCPLX	ASMD LKR	IS/IP	49	4	0	0.0	0.0	4	0	45	0	P	MP	02/10/84	(1)	08/03/89	

TABLE E-5. INVENTORY AND STATUS BY TANK
SINGLE-SHELL TANKS
June 30, 1994

TANK STATUS				LIQUID VOLUME							SOLIDS VOLUME		VOLUME DETERMINATION					
TANK	WASTE MATERIAL	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER-NATANT LIQUID (Kgal)	DRAIN-ABLE INTER-STIT. (Kgal)	PUMPED THIS MONTH (Kgal)	TOTAL PUMPED (Kgal)	DRAIN-ABLE LIQUID REMAIN (Kgal)	PUMP-ABLE LIQUID REMAIN (Kgal)	SLUDGE (Kgal)	SALTCAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	SOLIDS UPDATE SOURCE SEE FOOTNOTE	LAST PHOTO DATE	SEE FOOTNOTES FOR THESE CHANGES
U-201	NCPLX	SOUND	IS/IP	5	1	0	0.0	0.0	1	0	4	0	M	S	08/15/79		08/03/89	
U-202	NCPLX	SOUND	IS/IP	5	1	0	0.0	0.0	1	0	4	0	M	S	08/15/79		08/08/89	
U-203	NCPLX	SOUND	IS/IP	3	1	0	0.0	0.0	1	0	2	0	M	S	08/15/79		06/13/89	
U-204	NCPLX	SOUND	IS/IP	3	1	0	0.0	0.0	1	0	2	0	M	S	08/15/79		06/13/89	
16 SINGLE-SHELL TANKS			TOTALS:	3550	168	1138	0.0	0.0	1306	1104	638	2744						
GRAND TOTAL				36090	566	6272	19	3957	6840	5362	12178	23346						

NOTES: +/- 1K gal differences are the result of rounding
Total Waste is calculated as the sum of Sludge and Saltcake plus Supernate.
The category "Interim Isolated" (II) was changed to "Intrusion Prevention" (IP) in June 1993. See section C. "Tank and Equipment Code and Status Definitions"

(1) WHC-SD-RE-TI-178 SST STABILIZATION RECORD, latest revision
(2) TANK FARMS COGNIZANT ENGINEER MONTHLY INPUT (Retained 10 yr in Monthly Summary Report author's office)

See next page for footnotes

TABLE E-5. INVENTORY AND STATUS BY TANK
SINGLE-SHELL TANKS
June 30, 1994

TANK	TANK STATUS: WASTE MATERIAL	TANK STATUS: TANK INTEGRITY	TANK STATUS: STABIL/ ISOLATION STATUS	LIQUID VOLUME: TOTAL WASTE (Kgal)	LIQUID VOLUME: SUPER-NATANT LIQUID (Kgal)	LIQUID VOLUME: DRAIN-ABLE INTER-STIT. (Kgal)	LIQUID VOLUME: PUMPED THIS MONTH (Kgal)	LIQUID VOLUME: TOTAL PUMPED (Kgal)	LIQUID VOLUME: DRAIN-ABLE LIQUID REMAIN (Kgal)	LIQUID VOLUME: PUMP-ABLE LIQUID REMAIN (Kgal)	SOLIDS VOLUME: SLUDGE (Kgal)	SOLIDS VOLUME: SALTCAKE (Kgal)	VOLUME DETERMINATION: LIQUIDS VOLUME METHOD	VOLUME DETERMINATION: SOLIDS VOLUME METHOD	VOLUME DETERMINATION: SOLIDS VOLUME UPDATE	VOLUME DETERMINATION: SOLIDS UPDATE SOURCE SEE FOOTNOTE	VOLUME DETERMINATION: LAST PHOTO DATE	VOLUME DETERMINATION: SEE FOOTNOTES FOR THESE CHANGES

Footnotes:

(a) BX-111 - Following information from Cognizant Engineer, Stabilization:
Pumping began October 22, 1993, and was completed April 29, 1993.
Total waste: 211.7 Kgal
Supernate: 0
Drainable Interstitial: 29 Kgal
Pumped this Month: 0.7 Kgal (788 gallons less 117 gallon flushes) Pumping restarted May 25, 1994, after photos taken
Total Pumped: 111.1 Kgal
Drainable Liquid Remaining: 29 Kgal
Pumpable Liquid Remaining: 7 Kgal
Sludge: 68 Kgal (no change)
Saltcake: 143 Kgal (No change)
Photos were taken May 19, 1994

(b) BY-102 - Following information from Cognizant Engineer, Stabilization:
Pumping restarted May 30, 1994
Total waste: 341 Kgal (no change)
Supernate: 0 Kgal (no change)
Drainable Interstitial Liquid: 28.7 Kgal
Pumped this Month: 10.0 Kgal (9987 gallons less 10 gallon flushes)
Total Pumped: 135.6 Kgal
Drainable Liquid Remaining: 28.7 Kgal
Pumpable Liquid Remaining: 9.7 Kgal
Sludge: 0 (no change)
Saltcake: 341 Kgal (no change)

TABLE E-5. INVENTORY AND STATUS BY TANK
SINGLE-SHELL TANKS
June 30, 1994

TANK STATUS				LIQUID VOLUME							SOLIDS VOLUME		VOLUME DETERMINATION					
TANK	WASTE MATERIAL	TANK INTEGRITY	STABIL/ ISOLATION STATUS	TOTAL WASTE (Kgal)	SUPER-NATANT LIQUID (Kgal)	DRAIN-ABLE INTER-STIT. (Kgal)	PUMPED THIS MONTH (Kgal)	TOTAL PUMPED (Kgal)	DRAIN-ABLE LIQUID REMAIN (Kgal)	PUMP-ABLE LIQUID REMAIN (Kgal)	SLUDGE (Kgal)	SALTCAKE (Kgal)	LIQUIDS VOLUME METHOD	SOLIDS VOLUME METHOD	SOLIDS VOLUME UPDATE	SOLIDS UPDATE SOURCE SEE FOOTNOTE	LAST PHOTO DATE	SEE FOOTNOTES FOR THESE CHANGES

(c) BY-109 - Following information from Cognizant Engineer, Stabilization:
Pumping restarted May 31, 1994
Total waste: 423 Kgal (no change)
Supernate: 0 Kgal (no change)
Drainable Interstitial Liquid: 71.6 Kgal
Pumped this Month: 6.4 Kgal (6739 gallons less 387 gallon flushes)
Total Pumped: 100.3 Kgal
Drainable Liquid Remaining: 71.6 Kgal
Pumpable Liquid Remaining: 50.5 Kgal
Sludge: 83 (no change)
Saltcake: 340 Kgal (no change)
Solids volume update: April 18, 1994

(d) T-111 - Following information from Cognizant Engineer, Stabilization:
Pumping began May 17, 1994
Total waste: 453
Supernate: 0 Kgal (pumping showed that the 9.0 Kgal supernate estimate was not accurate: 3.0 Kgal was more accurate.)
Drainable Interstitial Liquid: 53.2 Kgal
Pumped this Month: 1.7 Kgal (excludes flushes)
Total pumped: 4.8 Kgal
Drainable Liquid Remaining: 53.2 Kgal
Pumpable Liquid Remaining: 47.2 Kgal
Sludge: 453 Kgal
Saltcake: 0 Kgal (no change)
Solids volume update: May 31, 1994

APPENDIX F

PERFORMANCE SUMMARY

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TABLE F-1. PERFORMANCE SUMMARY (Sheet 1 of 2)

WASTE VOLUMES (Kgallons)

June 30, 1994

INCREASES/DECREASES IN WASTE VOLUMES STORED IN DOUBLE-SHELL TANKS

SOURCE		THIS MONTH	FY1994 TO DATE
B PLANT		0	9
PUREX TOTAL (1)		5	46
PFP (1)		0	7
T PLANT (1)		0	0
S PLANT (1)		0	14
300/400 AREAS (1)		11	23
SULFATE WASTE -100 N (2)		0	0
MINI-RUN (14)		0	67
TANK FARMS & SALTWELL LIQUID (6)		62	255
OTHER GAINS		12	216
Slurry increase (3)	0		
Condensate	4		
Instrument change (7)	5		
Unknown (5)	3		
OTHER LOSSES		-20	-331
Slurry decrease (3)	0		
Evaporation (4)	-20		
Instrument change (7)	-2		
Unknown (5)	-6		
EVAPORATED		-407	-2417
GROUTED		0	0
Total		-345	-2111

+/-1 Kgal differences are the result of rounding

INCREASES/DECREASES IN WASTE VOLUMES STORED IN SINGLE-SHELL TANKS

SOURCE		THIS MONTH	FY1994 TO DATE
106-C (8)	Gains	7	31
	Losses	-4	-42
Total		3 (*)	-11

(*) On June 15, 1994, C-106 completed a liquid-reduction process test to to determine a new low level for future water addition.
See Highlights in Summary Text section for more information.

CUMULATIVE EVAPORATION - 1950 TO PRESENT WASTE VOLUME REDUCTION

FACILITY	
242-B EVAPORATOR (9)	7172
242-T EVAPORATOR (1950's) (9)	9181
IN-TANK SOLIDIFICATION UNIT 1 (10)	11876
IN-TANK SOLIDIFICATION UNIT 2 (10)	15295
IN-TANK SOLID. UNIT 1 & 2 (10) (after conversion of Unit 1 to a cooler for Unit 2)	7965
242-T (Modified) (9)	24471
242-S EVAPORATOR (11)	41983
242-A EVAPORATOR (12)	67644
B PLANT (Cell 23) (13)	1185
REDOX (12)	12393
Total	199165

Note: 242-A Evaporator was restarted April 15, 1994.

Footnotes: See Next Page

TABLE F-1. PERFORMANCE SUMMARY
(Sheet 2 of 2)

Footnotes:

INCREASES/DECREASES IN WASTE VOLUMES

(1) Including Flush

(2) Sulfate waste is generated from ion exchange backflushing and sand filter clean out, resulting in sulfate waste (Na_2SO_4).

(3) Slurry increase/growth is caused by gas generation within the waste. The gas which is trapped in the waste expands in the tank causing the surface level and volume to increase. Slurry decrease results from the periodic release of gas in the waste.

(4) Aging waste tanks

(5) Unknown waste gains or losses may be the result of rounding calculations, clean water slowly leaking through a valve, changes in levels (expansion/contraction) because of ambient temperature changes, different measuring devices being used by Tank Farm operators, transfers taking place during the end of the month, Tank Farm activities such as miscellaneous water additions not associated with facility waste generation, or the addition of water which is added to aging waste tanks and then evaporated off.

(6) Includes Tank Farms miscellaneous flushes (flushes are used to "clean out" pipelines and reduce personnel exposure, reduce potential for waste incompatibility, prevent line plugging, and reduce waste content of potential spills or leaks), and saltwell liquid, which results from pumping of single-shell tanks to double-shell tanks.

(7) Liquid level measurement instrument changes from the automatic FIC to manual tape (and vice versa) result in unusual gains or losses because the manual tape may rest on an uneven crust surface giving a different reading from that of the automatic FIC. These instrument changes are made when the automatic FIC is out of service and the reading from the manual tape is used for reporting purposes. The reported reading reverts back to the automatic FIC when it is repaired.

(8) Water is periodically added 106-C to provide evaporative cooling. Losses due to evaporation are calculated assuming all losses are evaporative losses. Some drywells are monitored weekly and some are monitored every two weeks on tank 106-C. If there are any indications of a leak from this tank, the assumption that all losses are due to evaporation will be reevaluated.

WASTE VOLUME REDUCTION

(9) Currently inoperative. These evaporator systems (242-B and 242-T) were installed in 1952 in each of the two operating areas to remove water from the waste, and ran for approximately 4 yr after which both units were shut down. The 242-T Evaporator was reactivated in December 1965, and shut down again in April 1976.

(10) Currently inoperative. These two in-tank solidification (ITS) units provided in-tank heating to promote in-tank boiling or evaporation. The ITS Unit 1 started up March 1965, and ITS Unit 2 started up February 1968. In August 1971, ITS Unit 1 was converted from an evaporator to a cooler for ITS Unit 2. Both units were shut down June 1974.

(11) Currently inoperative. The 242-S Evaporator-Crystallizer was started up November 1973, and shut down March 1980, when its processing campaign was completed. It is in standby mode with no future mission. This evaporator operates under a vacuum, employing evaporative concentration with subsequent crystallization and precipitation of salt crystals.

(12) Currently operative. The 242-A Evaporator-Crystallizer was started up March 1977, and shut down April 1989 because of regulatory issues, and remained shut down for subsequent upgrading. This evaporator operates under a vacuum, employing evaporative concentration with subsequent crystallization and precipitation of salt crystals (forming saltcake). The evaporator was restarted on April 15, 1994.

(13) Currently inoperative. Additional concentration of wastes was completed by using the concentrators at REDOX and B Plant. The REDOX concentrator was used from July 1967 to June 1972, while the B Plant concentrator was used from July 1967 to February 1968.

(14) Waste generated for training and testing purposes prior to Evaporator restart.

APPENDIX G

PUMPING RECORD
LIQUID STATUS AND PUMPABLE LIQUID
REMAINING IN TANKS

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TABLE G-1. PUMPING RECORD

June 30, 1994
(Kgallons)

TANK FARMS	PUMPED THIS MONTH	PUMPED FY TO DATE	CUMULATIVE TOTAL PUMPED 1979 TO DATE	
EAST				
A	0.0	0.0	150.5	
AN	N/A	N/A	N/A	
AP	N/A	N/A	N/A	
AW	N/A	N/A	N/A	
AX	0.0	0.0	13.0	
AY	N/A	N/A	N/A	
AZ	N/A	N/A	N/A	
B	0.0	0.0	0.0	
BX	0.7	111.1	182.9	(b)
BY	16.4	100.3	1406.5	(a)
C	0.0	0.0	36.8	
Total	17.1	211.4	1789.7	
WEST				
S	0.0	0.0	788.2	
SX	0.0	0.0	113.2	
SY	N/A	N/A	N/A	
T	1.7	4.8	30.0	
TX	0.0	0.0	1205.7	
TY	0.0	0.0	29.9	
U	0.0	0.0	0.0	
Total	1.7	4.8	2167.0	
TOTAL	18.8	216.2	3956.7	

NA = Not Applicable

(a) The total volume pumped was adjusted by the Single-Shell Tanks Cognizant Engineer to account for the 14% miscalibration of the constant velocity transmitter and the amount of flush water used. DIL, DLR and PLR volumes were recalculated, based on the observed porosity in 102 and 109-BY.

(b) Recheck of data sheets for January 1994 revealed incorrect totalizer reading was used in the calculations. Recalculation corrections by Single-Shell Tanks Cognizant Engineer for January and February are included in above volumes.

TABLE G-2. LIQUID STATUS AND PUMPABLE LIQUID REMAINING IN TANKS

June 30, 1994

Waste Volumes (Kgallons)

TANK FARMS	SUPERNATANT LIQUID	DRAINABLE INTERSTITIAL LIQUID	DRAINABLE LIQUID REMAINING	PUMPABLE LIQUID REMAINING
EAST				
A	9	441	450	390
AN	4681	37	4718	N/A
AP	6395	0	6395	N/A
AW	3413	159	3572	N/A
AX	3	370	373	304
AY	1490	2	1492	N/A
AZ	1791	4	1795	N/A
B	15	164	179	80
BX	30	134	166	92
BY	0	751	751	579
C	169	143	312	254
Total	17996	2215	20213	1699
WEST				
S	58	1376	1434	1201
SX	63	1260	1323	1178
SY	871	237	1108	N/A
T	43	204	247	180
TX	5	250	255	0
TY	3	31	34	0
U	168	1138	1306	1104
Total	1211	4496	5707	3663
TOTAL	19207	6711	25920	5362 (1)

(1) Volume based on 12.5% (sludge waste) and 45% (saltcake waste) liquid in solid (porosity) value. This is a conservative (high) estimate.

Note: +/- 1 Kgal differences are the result of computer rounding

N/A = Not applicable

APPENDIX H

CATCH TANKS AND SPECIAL SURVEILLANCE FACILITIES

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TABLE H-1. EAST AND WEST AREA CATCH TANKS AND SPECIAL SURVEILLANCE FACILITIES

ACTIVE – still running transfers through the associated diversion boxes or pipeline encasements

June 30, 1994

FACILITY	LOCATION	PURPOSE (receives waste from:)	VOLUME OF CONTENTS (Gallons)	MONITORED BY	REMARKS
EAST AREA					
241-A-302-A	A FARM	A-151 DB	1774	CASS/FIC	PUMPED 08/11/92
241-ER-311	B PLANT	ER-151, ER-152 DB	8588	CASS/FIC	PUMPED 05/29/91
241-AX-152	AX FARM	AX-152 DB	3160	MANUALLY	DIAL O/S, USING ZIP CORD, PUMPED 08/29/92
241-AZ-151	AZ FARM	AZ-152 DB, AZ LOOP SEAL	2325	CASS/FIC	VOLUME CHANGES DAILY
241-AZ-154	AZ FARM	AZ-102 HTG COIL STEAM CONDENSATE	0	CASS/MT	AUTOMATIC PUMP
244-BX-TK/SMP	BX COMPLEX	DCRT - RECEIVES FROM SEVERAL FARMS	9000	MANUALLY	USING MANUAL TAPE FOR TANK
244-A-TK/SMP	A COMPLEX	DCRT - RECEIVES FROM SEVERAL FARMS	7260	MCS	
AR-204	AY FARM	RR CARS DURING TRANSFER TO REC. TKS	230	DIP TUBE	ALARMS ON CASS
A-417	A FARM	A-702 PROCESS CONDENSATE	20650	DIP TUBE	
Vent Station Catch Tank		CROSS COUNTRY TRANSFER LINE	653	MT	
WEST AREA					
241-TX-302-C	TX FARM	TX-154 DB	3952	CASS/FIC	FIC REPAIRED
241-U-301-B	U FARM	U-151, U-152, U-153, U-252 DB	6906	CASS/FIC	RETURNED TO SERVICE 12/30/93
241-UX-302-A	U PLANT	UX-154 DB	12184	CASS/MFIC	
241-S-304	S FARM	S-151 DB	3826	RS	OPERATIONAL 10/91, REPLACED S-302-A
244-S-TK/SMP	S FARM	DCRT - RECEIVES FROM SEVERAL FARMS	12759	MANUALLY	CWF
244-TX-TK/SMP	TX FARM	DCRT - RECEIVES FROM SEVERAL FARMS	8164	MANUALLY	MT

Total active facilities 16

LEGEND:
DB - Diversion Box
DCRT - Double-Contained Receiver Tank
TK - Tank
SMP - Sump
R - Usually denotes replacement
FIC - Food Instrument Corporation measurement device
RS - Robert Shaw Instrument measurement device
MFIC - Manual FIC
MT - Manual Tape
CWF - Weight Factor/SpG = Corrected Weight Factor
CASS - Computer Automated Surveillance System
MCS - Monitor and Control System
O/S - Out of Service

TABLE H-2. EAST AREA CATCH TANKS AND SPECIAL SURVEILLANCE FACILITIES

INACTIVE – no longer receiving waste transfers

June 30, 1994

FACILITY	LOCATION	RECEIVED WASTE FROM:	VOLUME OF CONTENTS (Gallons)	MONITORED BY	REMARKS
241-A-302-B	A FARM	A-152 DB	4101	CASS/MT	ISOLATED 1985, PROJECT B-138 INTERIM STABILIZED 1990
241-B-301-B	B FARM	B-151, B-152, B-153, B-252 DB	UNKNOWN	NM	ISOLATED 1985(1)
241-B-302-B	B FARM	B-154 DB	UNKNOWN	NM	ISOLATED 1985(1)
241-BX-302-A	BX FARM	BR-152, BX-153, BXR-152, BYR-152 DB	UNKNOWN	NM	ISOLATED 1985(1)
241-BX-302-B	BX FARM	BX-154 DB	UNKNOWN	NM	ISOLATED 1985(1)
241-BX-302-C	BX FARM	BX-155 DB	UNKNOWN	NM	ISOLATED 1985(1)
241-C-301-C	C FARM	C-151, C-152, C-153, C-252 DB	UNKNOWN	NM	ISOLATED 1985(1)
241-CX-70	HOT SEMI-	TRANSFER LINES	UNKNOWN	NM	ISOLATED, DECOMMISSION PROJ.
241-CX-72	WORKS	TRANSFER LINES	UNKNOWN	NM	SEE DWG H-2-95-501, 2/5/87
244-AR	A COMPLEX	DCRT - RECEIVES FROM SEVERAL FARMS	UNKNOWN	NM	BEING UPGRADED
244-BXR-TK/SMP-001	BX FARM	TRANSFER LINES	UNKNOWN	NM	INTERIM STABILIZED 1985(1)
244-BXR-TK/SMP-002	BX FARM	TRANSFER LINES	UNKNOWN	NM	INTERIM STABILIZED 1985(1)
244-BXR-TK/SMP-003	BX FARM	TRANSFER LINES	UNKNOWN	NM	INTERIM STABILIZED 1985(1)
244-BXR-TK/SMP-011	BX FARM	TRANSFER LINES	UNKNOWN	NM	INTERIM STABILIZED 1985(1)
361-B-TANK	B PLANT	DRAINAGE FROM B-PLANT	UNKNOWN	NM	INTERIM STABILIZED 1985(1)

Total East Area Inactive facilities 15

LEGEND: DB – Diversion Box
DCRT – Double-Contained Receiver Tank
MT – Manual Tape
CASS – Computer Automated Surveillance System
TK – Tank
SMP – Sump
R – Usually denotes replacement
NM – Not Monitored

(1) SOURCE: WASTE STORAGE TANK STATUS & LEAK DETECTION CRITERIA document

TABLE H-3. WEST AREA CATCH TANKS AND SPECIAL SURVEILLANCE FACILITIES

INACTIVE – no longer receiving waste transfers

June 30, 1994

FACILITY	LOCATION	RECEIVED WASTE FROM:	VOLUME OF CONTENTS (Gallons)	BY	REMARKS
241-S-302	S FARM	240-S-151 DB	2276	CASS/FIC *	ASSUMED LEAKER EPDA 85-04
241-S-302-A	S FARM	241-S-151 DB		CASS/FIC *	ASSUMED LEAKER TF-EFS-90-042
			* FIC in Intrusion mode		Partially filled with grout 2/91, determined still assumed leaker after leak test
241-S-302-B	S FARM	S ENCASEMENTS	UNKNOWN	NM	ISOLATED 1985(1)
241-SX-304(302)	SX FARM	SX-152 TRANSFER BOX, SX-151 DB	UNKNOWN	NM	ISOLATED 1985(1)
241-TX-302	TX FARM	TX-153 DB	UNKNOWN	NM	ISOLATED 1985(1)
241-TX-302-X-B	TX FARM	TX ENCASEMENTS	UNKNOWN	NM	ISOLATED 1985(1)
241-TX-302-B	TX FARM	TX-155 DB	1460	CASS/MT	NEW MT INSTALLED 7/16/93
241-TY-302-A	TY FARM	TX-153 DB	UNKNOWN	NM	ISOLATED 1985(1)
241-TY-302-B	TY FARM	TY ENCASEMENTS	UNKNOWN	NM	ISOLATED 1985(1)
244-U-TK/SMP	U FARM	DCRT - RECEIVES FROM SEVERAL FARMS	UNKNOWN	NM	NOT YET IN USE
244-UR VAULT	U FARM	TRANSFER LINES	UNKNOWN	NM	INTERIM STABILIZED, MT REMOVED 1985(1)
244-UR-TK/SMP-001	U FARM	TRANSFER LINES	UNKNOWN	NM	INTERIM STABILIZED, MT REMOVED 1985(1)
244-UR-TK/SMP-002	U FARM	TRANSFER LINES	UNKNOWN	NM	INTERIM STABILIZED, MT REMOVED 1985(1)
244-UR-TK/SMP-003	U FARM	TRANSFER LINES	UNKNOWN	NM	INTERIM STABILIZED, MT REMOVED 1985(1)
244-TXR VAULT	TX FARM	TRANSFER LINES	UNKNOWN	NM	INTERIM STABILIZED, MT REMOVED 1984(1)
244-TXR-TK/SMP-001	TX FARM	TRANSFER LINES	UNKNOWN	NM	INTERIM STABILIZED, MT REMOVED 1984(1)
244-TXR-TK/SMP-002	TX FARM	TRANSFER LINES	UNKNOWN	NM	INTERIM STABILIZED, MT REMOVED 1984(1)
244-TXR-TK/SMP-003	TX FARM	TRANSFER LINES	UNKNOWN	NM	INTERIM STABILIZED, MT REMOVED 1984(1)
361-T-TANK	T PLANT	DRAINAGE FROM T-PLANT	UNKNOWN	NM	ISOLATED 1985(1)
361-U-TANK	U PLANT	DRAINAGE FROM U-PLANT	UNKNOWN	NM	INTERIM STABILIZED, MT REMOVED 1985(1)

Total West Area inactive facilities 20

LEGEND:
DB - Diversion Box
DCRT - Double-Contained Receiver Tank
TK - Tank
SMP - Sump
R - Usually denotes replacement
FIC - Food Instrument Corporation
MT - Manual Tape
O/S - Out of Service
CASS - Computer Automated Surveillance System
NM - Not Monitored

(1) SOURCE: WASTE STORAGE TANK STATUS & LEAK DETECTION CRITERIA document

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APPENDIX I

LEAK VOLUME ESTIMATES

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TABLE I-1. SINGLE-SHELL TANK LEAK VOLUME ESTIMATES (4) (Sheet 1 of 6)

Tank No.	Date Declared Confirmed or Assumed Leaker (3)	Volume (2)(4) (Gallons)	Associated KiloCuries 137 cs (10)	Interim Stabilized Date (12)	Leak Estimate Updated	Leak Estimate Reference
241-A-103	1987	5500 (9)		6/88	1987	(j)
241-A-104	1975	500 to 2500	0.8 to 1.8 (q)	9/78	1983	(a) (q)
241-A-105 (1)	1963	10000 to 277000	85 to 760 (b)	7/79	1991	(b),(c)
241-AX-102	1988	3000 (9)		9/88	1989	(h)
241-AX-104	1977	-- (7)		8/81	1989	(g)
241-B-101	1974	-- (7)		3/81	1989	(g)
241-B-103	1978	-- (7)		2/85	1989	(g)
241-B-105	1978	-- (7)		12/84	1989	(g)
241-B-107	1980	8000 (9)		3/85	1986	(d),(f)
241-B-110	1981	10000 (9)		3/85	1986	(d)
241-B-111	1978	-- (7)		6/85	1989	(g)
241-B-112	1978	2000		5/85	1989	(g)
241-B-201	1980	1200 (9)		8/81	1984	(e),(f)
241-B-203	1983	300 (9)		6/84	1986	(d)
241-B-204	1984	400 (9)		6/84	1989	(g)
241-BX-101	1972	-- (7)		9/78	1989	(g)
241-BX-102	1971	70000	50 (l)	11/78	1986	(d)
241-BX-108	1974	2500	0.5 (l)	7/79	1986	(d)
241-BX-110	1976	-- (7)		8/85	1989	(g)
241-BX-111	1984	-- (7)		N/A	1993	(g),(r)
241-BY-103	1973	<5000		N/A	1983	(a)
241-BY-105	1984	-- (7)		N/A	1989	(g)
241-BY-106	1984	-- (7)		N/A	1989	(g)
241-BY-107	1984	15100 (9)		7/79	1989	(g)
241-BY-108	1972	<5000		2/85	1983	(a)
241-C-101	1980	20000 (9,11)		11/83	1986	(d)
241-C-110	1984	2000		N/A	1989	(g)
241-C-111	1968	5500 (9)		3/84	1989	(g)
241-C-201 (5)	1988	550		3/82	1987	(i)
241-C-202 (5)	1988	450		8/81	1987	(i)
241-C-203	1984	400 (9)		3/82	1986	(d)
241-C-204 (5)	1988	350		9/82	1987	(i)
241-S-104	1968	24000 (9)		12/84	1989	(g)
241-SX-104	1988	6000 (9)		N/A	1988	(k)
241-SX-107	1964	<5000		10/79	1983	(a)
241-SX-108 (6)	1962	2400 to 35000	17 to 140 (m) (q)	8/79	1991	(m) (q)
241-SX-109 (6)	1965	<10000	<40 (n)	5/81	1992	(n)
241-SX-110	1976	5500 (9)		8/79	1989	(g)
241-SX-111	1974	500 to 2000	0.6 to 2.4 (l) (q)	7/79	1986	(d) (q)
241-SX-112	1969	30000	40 (l)	7/79	1986	(d)
241-SX-113	1962	15000	8 (l)	11/78	1986	(d)
241-SX-114	1972	-- (7)		7/79	1989	(g)
241-SX-115	1965	50000	21 (o)	9/78	1992	(o)
241-T-101	1992	7500 (9)		4/93	1992	(p)
241-T-103	1974	<1000 (9)		11/83	1989	(g)
241-T-106	1973	115000 (9)	40 (l)	8/81	1986	(d)
241-T-107	1984	-- (7)		N/A	1989	(g)
241-T-108	1974	<1000 (9)		11/78	1980	(f)
241-T-109	1974	<1000 (9)		12/84	1989	(g)
241-T-111	1979, 1994 (13)	<1000 (9)		N/A	1994	(f)(t)
241-TX-105	1977	-- (7)		4/83	1989	(g)
241-TX-107	1984	2500		10/79	1986	(d)
241-TX-110	1977	-- (7)		4/83	1989	(g)
241-TX-113	1974	-- (7)		4/83	1989	(g)
241-TX-114	1974	-- (7)		4/83	1989	(g)
241-TX-115	1977	-- (7)		9/83	1989	(g)
241-TX-116	1977	-- (7)		4/83	1989	(g)
241-TX-117	1977	-- (7)		3/83	1989	(g)
241-TY-101	1973	<1000 (9)		4/83	1980	(f)
241-TY-103	1973	3000	0.7 (l)	2/83	1986	(d)
241-TY-104	1981	1400 (9)		11/83	1986	(d)
241-TY-105	1960	35000	4 (l)	2/83	1986	(d)
241-TY-106	1959	20000	2 (l)	11/78	1986	(d)
241-U-101	1959	30000	20 (l)	9/79	1986	(d)
241-U-104	1961	55000	0.09 (l)	10/78	1986	(d)
241-U-110	1975	5000 to 8100 (9)	0.05 (q)	12/84	1986	(d) (q)
241-U-112	1980	8500 (9)		9/79	1986	(d)
67 Tanks		<600,000 - 900,000 (8)				

N/A = not applicable (not yet interim stabilized)

FOOTNOTES: SEE NEXT PAGE

TABLE I-1. SINGLE-SHELL TANK LEAK VOLUME ESTIMATES
(Sheet 2 of 4)

Footnotes:

(1) Current estimates (see reference b) are that 610 Kgal of cooling water was added to Tank 241-A-105 from November 1970 to December 1978 to aid in evaporative cooling. In accordance with Dangerous Waste Regulations (Washington Administrative Code 173-303-070 (2)(a)(ii), as amended, Washington State Department of Ecology, 1990, Olympia, Washington), any of this cooling water that has been added and subsequently leaked from the tank must be classified as a waste and should be included in the total leak volume. In August 1991, the leak volume estimate for this tank was updated in accordance with the WAC regulations. Previous estimates excluded the cooling water leaks from the total leak volume estimates because the waste content (concentration) in the cooling water which leaked should be much less than the original liquid waste in the tank (the sludge is relatively insoluble). The total leak volume estimate in this report (10 Kgal to 277 Kgal) is based on the following (see References).

1. Reference (b) contains an estimate of 5 Kgal to 15 Kgal for the initial leak prior to August 1968.

2. Reference (b) contains an estimate of 5 Kgal to 30 Kgal for the leak while the tank was being sluiced from August 1968 to November 1970.

3. Reference (b) contains an estimate of 610 Kgal of cooling water added to the tank from November 1970 to December 1978 but it was estimated that the leakage was small during this period. This reference contains the statement "Sufficient heat was generated in the tank to evaporate most, and perhaps nearly all, of this water." This results in a low estimate of zero gallons leakage from November 1970 to December 1978.

4. Reference (c) contains an estimate that 378 to 410 Kgal evaporated out of the tank from November 1970 to December 1978. Subtracting the minimum evaporation estimate from the cooling water added estimate provides a range from 0 to 232 Kgal of cooling water leakage from November 1970 to December 1978.

	Low Estimate	High Estimate
Prior to August 1968	5,000	15,000
August 1968 to November 1970	5,000	30,000
November 1970 to December 1978	0	232,000
Totals	10,000	277,000

(2) These leak volume estimates do not include (with some exceptions), such things as: (a) cooling/raw water leaks, (b) intrusions (rain infiltration) and subsequent leaks, (c) leaks inside the tank farm but not through the tank liner (surface leaks, pipeline leaks, leaks at the joint for the overflow or fill lines, etc.), and (d) leaks from catch tanks, diversion boxes, encasements, etc.

(3) In many cases, a leak was suspected long before it was identified or confirmed. For example, reference (d) shows that Tank 241-U-104 was suspected of leaking in 1956. The leak was "confirmed" in 1961. This report lists the "assumed leaker" date as 1961. Using present standards, Tank 241-U-104 would have been declared as assumed leaker in 1956. In 1984, the criteria designations of "suspected leaker," "questionable integrity," "confirmed leaker," "declared leaker," "borderline," and "dormant," were merged into one category now reported as "assumed leaker." See reference (f) for explanation of when, how long, and how fast some of the tanks leaked. It is highly likely that there have been undetected leaks from single-shell tanks because of the nature of their design and instrumentation.

(4) There has been an effort in the past two years to reevaluate these leak volume estimates. During the FY 1993 funding reviews, this reevaluation of leak volumes was given a priority which resulted in this activity no longer being funded. The priority versus funding will be reevaluated as part of the prior to FY 1994 budget planning.

(5) The leak volume estimate date for these tanks is before the "declared leaker" date because the tank was in a "suspected leaker" or "questionable integrity" status; however, a leak volume had been estimated prior to the tank being reclassified.

(6) The increasing radiation levels in drywells and laterals associated with these three tanks could be indicative of a continuing leak or movement of existing radionuclides in the soil. There is no conclusive way to confirm these observations.

(7) Methods were used to estimate the leak volumes from these 19 tanks based on the assumption that their cumulative leakage is approximately the same as for 18 of the 24 tanks identified in footnote (10). For more details see reference (g). The total leak volume estimate for these tanks is 150 Kgal (rounded to the nearest 10 Kgal), for an average of approximately 8 Kgal for each of the 19 tanks.

TABLE I-1. SINGLE-SHELL TANK LEAK VOLUME ESTIMATES
(Sheet 3 of 4)

(8) The total has been rounded to the nearest 50 Kgal. Upperbound values were used in many cases in developing these estimates. It is likely that some of these tanks have not actually leaked.

(9) Leak volume estimate is based solely on observed liquid level decreases in these tanks. This is considered to be the most accurate method for estimating leak volumes.

(10) The curie content listed is as listed in the reference document and is not decayed to a consistent date; therefore, a cumulative total is inappropriate.

(11) Tank 241-C-101 experienced a liquid level decrease in the late 1960s and was taken out of service and pumped to a "minimum heel" in December 1969. In 1970, the tank was classified as a "questionable integrity" tank. Liquid level data show decreases in level throughout the 1970s and the tank was saltwell pumped during the 1970s, ending in April 1979. The tank was reclassified as a "confirmed leaker" in January 1980. See reference (q) and (s): refer to reference (s) for information on the potential for there to have been leaks from other C-farm tanks (specifically, C-102, C-103, and C-109).

(12) These dates indicate when the tanks were declared to be interim stabilized. In some cases, the official interim stabilization documents were issued at a later date. Also, in some cases, the field work associated with interim stabilization was completed at an earlier date.

(13) An unexplained 0.30 inch level decrease was observed in 1974 and the tank was then declared "Questionable Integrity" and removed from service. Tank T-111 was declared an assumed re-leaker on February 28, 1994, due to a decreasing trend in surface level measurement.

TABLE I-1. SINGLE-SHELL TANK LEAK VOLUME ESTIMATES
(Sheet 4 of 4)

References:

(a) Murthy, K.S., et al, June 1983, Assessment of Single-Shell Tank Residual Liquid Issues at Hanford Site, Washington, PNL-4688, Pacific Northwest Laboratory, Richland, Washington.

(b) WHC, 1991a, Tank 241-A-105 Leak Assessment, WHC-MR-0264, Westinghouse Hanford Company, Richland, Washington.

(c) WHC, 1991b, Tank 241-A-105 Evaporation Estimate 1970 Through 1978, WHC-EP-0410, Westinghouse Hanford Company, Richland, Washington.

(d) Smith, D. A., January 1986, Single-Shell Tank Isolation Safety Analysis Report, SD-WM-SAR-006, Rev. 1, Westinghouse Hanford Company, Richland, Washington.

(e) McCann, D. C., and T. S. Vail, September 1984, Waste Status Summary, RHO-RE-SR-14, Rockwell Hanford Operations, Richland, Washington.

(f) Catlin, R. J., March 1980, Assessment of the Surveillance Program of the High-Level Waste Storage Tanks at Hanford, Hanford Engineering Development Laboratory, Richland, Washington.

(g) Baumhardt, R. J., May 15, 1989, Letter to R. E. Gerton, U.S. Department of Energy-Richland Operations Office, Single-Shell Tank Leak Volumes, Westinghouse Hanford Company, Richland, Washington.

(h) WHC, 1990a, Occurrence Report, Surface Level Measurement Decrease in Single-Shell Tank 241-AX-102, WHC-UO-89-023-TF-05, Westinghouse Hanford Company, Richland, Washington.

(i) Groth, D. R., July 1, 1987, Internal Memorandum to R. J. Baumhardt, Liquid Level Losses in Tanks 241-C-201, -202 and -204, 65950-87-517, Westinghouse Hanford Company, Richland, Washington.

(j) Groth, D. R. and G. C. Owens, May 15, 1987, Internal Memorandum to J. H. Roecker, Tank 103-A Integrity Evaluation, Westinghouse Hanford Company, Richland, Washington.

(k) Campbell, G. D., July 8, 1988, Internal Memorandum to R. K. Welty, Engineering Investigation: Interstitial Liquid Level Decrease in Tank 241-SX-104, 13331-88-416, Westinghouse Hanford Company, Richland, Washington.

(l) ERDA, 1975, Final Environmental Statement Waste Management Operations, Hanford Reservation, Richland, Washington, ERDA-1538, 2 vols., U.S. Energy Research and Development Administration, Washington, D.C.

(m) WHC, 1992a, Tank 241-SX-108 Leak Assessment, WHC-MR-0300, Westinghouse Hanford Company, Richland, Washington.

(n) WHC, 1992b, Tank 241-SX-109 Leak Assessment, WHC-MR-0301, Westinghouse Hanford Company, Richland, Washington.

(o) WHC, 1992c, Tank 241-SX-115 Leak Assessment, WHC-MR-0302, Westinghouse Hanford Company, Richland, Washington.

(p) WHC, 1992d, Occurrence Report, "Apparent Decrease in Liquid Level in Single Shell Underground Storage Tank 241-T-101, Leak Suspected; Investigation Continuing," RL-WHC-TANKFARM-1992-0073, Westinghouse Hanford Company, Richland, Washington.

(q) WHC-1990b, A History of the 200 Area Tank Farms, WHC-MR-0132, Westinghouse Hanford Company, Richland, Washington.

(r) WHC, 1993, Occurrence Report, Single-Shell Underground Waste Storage Tank 241-BX-111 Surface Level Decrease and Change From Steady State Condition, RL-WHC-TANKFARM-1993-0035, Westinghouse Hanford Company, Richland, Washington.

(s) WHC, 1993a, Assessment of Unsaturated Zone Radionuclide Contamination Around Single-Shell Tanks 241-C-105 and 241-C-106, WHC-SD-EN-TI-185, REV OA, Westinghouse Hanford Company, Richland, Washington.

(t) WHC, 1994, Occurrence Report, "Apparent Liquid Level Decrease in Single Shell Underground Storage Tank 241-T-111; Declared an Assumed Re-Leaker," RL-WHC-TANKFARM-1994-0009, Westinghouse Hanford Company, Richland, Washington.

APPENDIX J

INTERIM STABILIZATION STATUS

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TABLE J-1. SINGLE-SHELL TANKS INTERIM STABILIZATION STATUS (Sheet 1 of 2)

June 30, 1994

Tank Number	Tank Integrity	Interim Stabilized Date (1)	Stabilized Method (2)(3)	Tank Number	Tank Integrity	Interim Stabilized Date (1)	Stabilized Method (2)(3)	Tank Number	Tank Integrity	Interim Stabilized Date (1)	Stabilized Method (2)(3)
A-101	SOUND	N/A		C-101	ASMD LKR	11/83	AR	T-108	ASMD LKR	11/78	AR
A-102	SOUND	08/89	SN	C-102	SOUND	N/A		T-109	ASMD LKR	12/84	AR
A-103	ASMD LKR	06/88	AR	C-103	SOUND	N/A		T-110	SOUND	N/A	
A-104	ASMD LKR	09/78	AR	C-104	SOUND	09/89	SN	T-111	ASMD LKR	N/A	
A-105	ASMD LKR	07/79	AR	C-105	SOUND	N/A		T-112	SOUND	03/81	AR
A-106	SOUND	08/82	AR	C-106	SOUND	N/A		T-201	SOUND	04/81	AR
AX-101	SOUND	N/A		C-107	SOUND	N/A		T-202	SOUND	08/81	AR
AX-102	ASMD LKR	09/88	SN	C-108	SOUND	03/84	AR	T-203	SOUND	04/81	AR
AX-103	SOUND	08/87	AR	C-109	SOUND	11/83	AR	T-204	SOUND	08/81	AR
AX-104	ASMD LKR	08/81	AR	C-110	ASMD LKR	N/A		TX-101	SOUND	02/84	AR
B-101	ASMD IKR	03/81	SN	C-111	ASMD LKR	03/84	SN	TX-102	SOUND	04/83	JET
B-102	SOUND	08/85	SN	C-112	SOUND	09/90	AR	TX-103	SOUND	08/83	JET
B-103	ASMD IKR	02/85	SN	C-201	ASMD LKR	03/82	AR	TX-104	SOUND	09/79	SN
B-104	SOUND	06/85	SN	C-202	ASMD LKR	08/81	AR	TX-105	ASMD LKR	04/83	JET
B-105	ASMD IKR	12/84	AR	C-203	ASMD LKR	03/82	AR	TX-106	SOUND	06/83	JET
B-106	SOUND	03/85	SN	C-204	ASMD LKR	09/82	AR	TX-107	ASMD LKR	10/79	AR
B-107	ASMD LKR	03/85	SN	S-101	SOUND	N/A		TX-108	SOUND	03/83	JET
B-108	SOUND	05/85	SN	S-102	SOUND	N/A		TX-109	SOUND	04/83	JET
B-109	SOUND	04/85	SN	S-103	SOUND	N/A		TX-110	ASMD LKR	04/83	JET
B-110	ASMD LKR	12/84	AR	S-104	ASMD LKR	12/84	AR	TX-111	SOUND	04/83	JET
B-111	ASMD LKR	06/85	SN	S-105	SOUND	09/88	JET	TX-112	SOUND	04/83	JET
B-112	ASMD LKR	05/85	SN	S-106	SOUND	N/A		TX-113	ASMD LKR	04/83	JET
B-201	ASMD LKR	08/81	AR	S-107	SOUND	N/A		TX-114	ASMD LKR	04/83	JET
B-202	SOUND	05/85	AR	S-108	SOUND	N/A		TX-115	ASMD LKR	09/83	JET
B-203	ASMD LKR	06/84	AR	S-109	SOUND	N/A		TX-116	ASMD LKR	04/83	JET
B-204	ASMD LKR	06/84	AR	S-110	SOUND	N/A		TX-117	ASMD LKR	03/83	JET
BX-101	ASMD LKR	09/78	AR	S-111	SOUND	N/A		TX-118	SOUND	04/83	JET
BX-102	ASMD LKR	11/78	AR	S-112	SOUND	N/A		TY-101	ASMD LKR	04/83	JET
BX-103	SOUND	11/83	AR	SX-101	SOUND	N/A		TY-102	SOUND	09/79	AR
BX-104	SOUND	09/89	SN	SX-102	SOUND	N/A		TY-103	ASMD LKR	02/83	JET
BX-105	SOUND	03/81	SN	SX-103	SOUND	N/A		TY-104	ASMD LKR	11/83	AR
BX-106	SOUND	N/A		SX-104	ASMD LKR	N/A		TY-105	ASMD LKR	02/83	JET
BX-107	SOUND	09/90	JET	SX-105	SOUND	N/A		TY-106	ASMD LKR	11/78	AR
BX-108	ASMD LKR	07/79	SN	SX-106	SOUND	N/A		U-101	ASMD LKR	09/79	AR
BX-109	SOUND	09/90	JET	SX-107	ASMD LKR	10/79	AR	U-102	SOUND	N/A	
BX-110	ASMD LKR	08/85	SN	SX-108	ASMD LKR	08/79	AR	U-103	SOUND	N/A	
BX-111	ASMD LKR	N/A		SX-109	ASMD LKR	05/81	AR	U-104	ASMD LKR	10/78	AR
BX-112	SOUND	09/90	JET	SX-110	ASMD LKR	08/79	AR	U-105	SOUND	N/A	
BY-101	SOUND	05/84	JET	SX-111	ASMD LKR	07/79	SN	U-106	SOUND	N/A	
BY-102	SOUND	N/A		SX-112	ASMD LKR	07/79	AR	U-107	SOUND	N/A	
BY-103	ASMD LKR	N/A		SX-113	ASMD LKR	11/78	AR	U-108	SOUND	N/A	
BY-104	SOUND	01/85	JET	SX-114	ASMD LKR	07/79	AR	U-109	SOUND	N/A	
BY-105	ASMD LKR	N/A		SX-115	ASMD LKR	09/78	AR	U-110	ASMD LKR	12/84	AR
BY-106	ASMD LKR	N/A		T-101	ASMD LKR	04/93	SN	U-111	SOUND	N/A	
BY-107	ASMD LKR	07/79	JET	T-102	SOUND	03/81	AR	U-112	ASMD LKR	09/79	AR
BY-108	ASMD LKR	02/85	JET	T-103	ASMD LKR	11/83	AR	U-201	SOUND	08/79	AR
BY-109	SOUND	N/A		T-104	SOUND	N/A		U-202	SOUND	08/79	SN
BY-110	SOUND	01/85	JET	T-105	SOUND	06/87	AR	U-203	SOUND	08/79	AR
BY-111	SOUND	01/85	JET	T-106	ASMD LKR	08/81	AR	U-204	SOUND	08/79	SN
BY-112	SOUND	06/84	JET	T-107	ASMD LKR	N/A					

LEGEND:
AR = Administratively interim stabilized
JET = Saltwell jet pumped to remove drainable interstitial liquid
SN = Supernate pumped (Non-Jet pumped)
N/A = Not yet interim stabilized
ASMD LKR = Assumed Leaker

Interim Stabilized Tanks	106
Not Yet Interim Stabilized	43
Total Single-Shell Tanks	149

Footnotes: See next page

TABLE J-1. SINGLE-SHELL TANKS INTERIM STABILIZATION STATUS (sheet 2 of 2)

Footnotes:

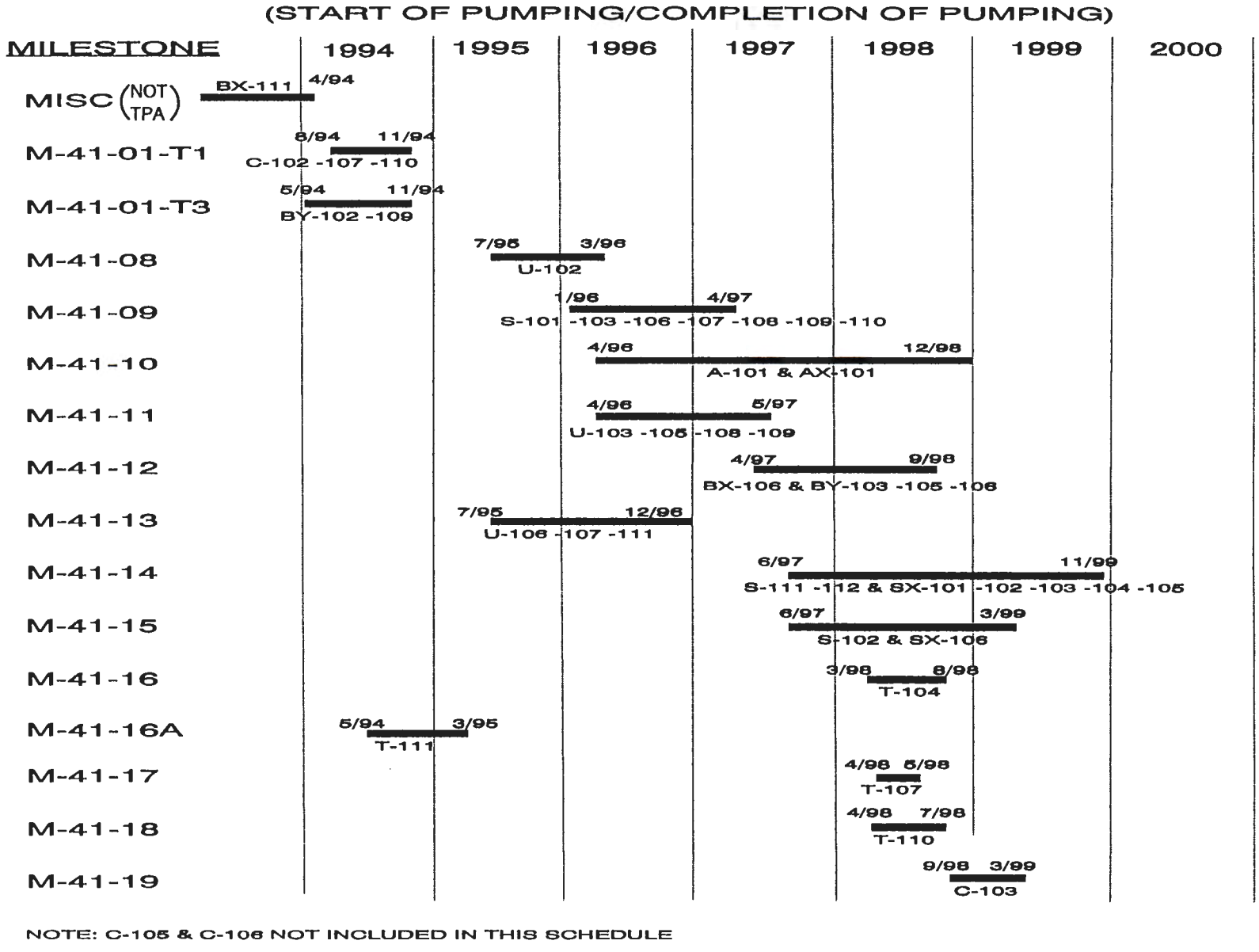
(1) These dates indicate when the tanks were actually interim stabilized. In some cases, the official interim stabilization documents were issued at a later date.

(2) The following six tanks do not meet current established supernatant and interstitial liquid interim stabilization criteria, but did meet the criteria in existence when they were declared interim stabilized :

B-104, 110, 111
T-102, 112
U-110

(3) Interim Stabilization data are missing on four tanks. These tanks were Administratively Interim Stabilized.

B-201, T-102, 112, 201



NOTE: C-105 & C-106 NOT INCLUDED IN THIS SCHEDULE

Figure J-1. Tri-Party Agreement Single-Shell Tank Stabilization Schedule

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APPENDIX K

TANK FARM OPERATIONS SAMPLING SCHEDULE STATUS

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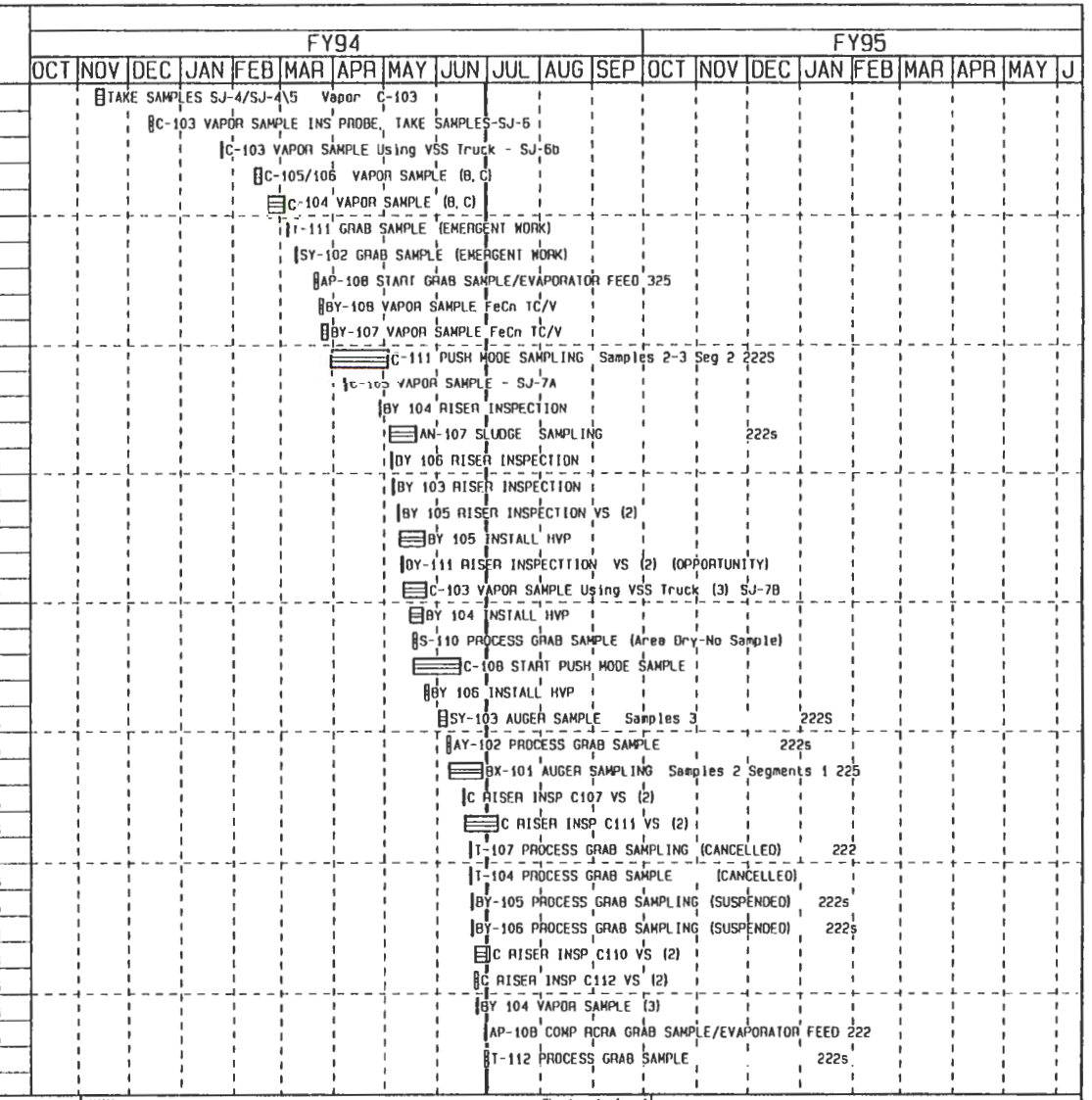
TABLE K-1. TANK FARM OPERATIONS SAMPLING SCHEDULE STATUS (Sheet 1 of 4)

ACTIVITY ID	EARLY START	EARLY FINISH	JCS
VS55-4	12NOV93A	16NOV93A	2E-92-0154
VS46-4	14DEC93A	15DEC93A	2E-92-1760
VS36-4	25JAN94A	25JAN94A	2E-93-0465
VS03-4	14FEB94A	17FEB94A	2E-93-2248
VS99-4	22FEB94A	3MAR94A	2E-93-2249
GS11-4	5MAR94A	5MAR94A	2W-94-0244
GS01-4	10MAR94A	10MAR94A	2W-94-0251
GS51-3	21MAR94A	22MAR94A	2E-94-0066
VS90-4	24MAR94A	25MAR94A	2E-94-0203
VS97-4	25MAR94A	28MAR94A	2E-94-0203
PS01-4	31MAR94A	3MAY94A	2E-92-1256
VS47-4	8APR94A	8APR94A	2E-93-0447
VSE2-3	28APR94A	28APR94A	2E-93-0203
GS55-4	4MAY94A	19MAY94A	2E-94-0066
VSE5-3	5MAY94A	5MAY94A	2E-94-0203
VSE3-3	6MAY94A	6MAY94A	2E-94-0203
VSE4-3	9MAY94A	9MAY94A	2E-93-0276
HP11-4	10MAY94A	24MAY94A	2E-93-0276
VS52-3	11MAY94A	11MAY94A	2E-94-0203
VS01-4	12MAY94A	25MAY94A	2E-94-0562
HP13-4	16MAY94A	23MAY94A	2E-93-0276
GS54-4	18MAY94A	19MAY94A	2W-94-0348
PS11-4	18MAY94A	14JUN94A	2E-92-1257
HP14-4	25MAY94A	26MAY94A	2E-93-0276
AS01-4	2JUN94A	6JUN94A	2W-93-1125
GS52-4	7JUN94A	8JUN94A	2E-94-0065
AS03-4	8JUN94A	27JUN94A	2E-93-2241
VS30-B	16JUN94A	16JUN94A	2E-93-2006
VS30-A	17JUN94A	6JUL94A	2E-93-2006
GS07-4	20JUN94A	20JUN94A	
GS10-4	20JUN94A	20JUN94A	2W-94-0506
GS02-4	21JUN94A	21JUN94A	2E-94-0035
GS15-4	21JUN94A	21JUN94A	2E-94-0684
VS30-7	23JUN94A	1JUL94	2E-93-2006
VS30-9	23JUN94A	24JUN94A	2E-93-2006
VSE2-5	24JUN94A	24JUN94A	2E-93-0276
GS51-4	29JUN94A	29JUN94A	2E-94-0064
GS53-4	29JUN94A	30JUN94A	2W-94-0670



Plot Date 20JUL94
Data Date 30JUN94
Project Start 10CT93
Project Finish 10JUL96

(C) Primavera Systems, Inc.

Activity Bar/Early Dates
Critical Activity
Progress Bar
◇/P Milestone/Flag Activity

HANI Sheet 1 of 4

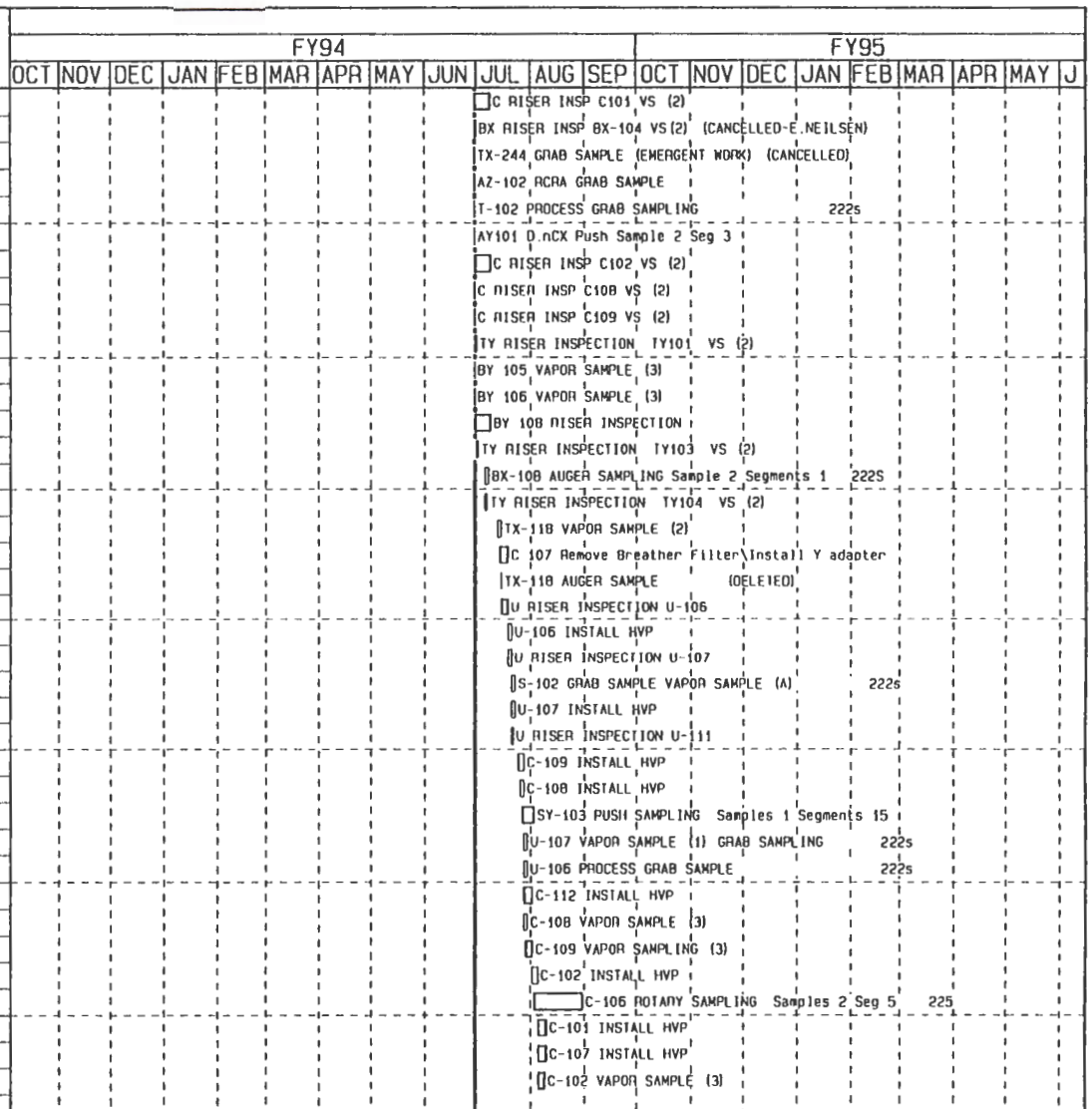
TANK FARMS OPERATIONS
BASELINE SCHED Rev 2
Summary Field Work Sched Sort ES

Developed D.Healey for D. Hamilton 373-0259

Date	Revision	Checked	Approved

TABLE K-1. TANK FARM OPERATIONS SAMPLING SCHEDULE STATUS (Sheet 2 of 4)

ACTIVITY ID	EARLY START	EARLY FINISH	JCS
VS30-2	30JUN94A	8JUL94	2E-93-2006
VS03-5	30JUN94A	30JUN94A	2E-94-0567
GS03-4	30JUN94	29JUN94	2W-94-0274
GS06-4	30JUN94	29JUN94	
GS10-4	30JUN94	29JUN94	2W-94-0513
PS24-4	30JUN94	29JUN94	
VS30-3	30JUN94	8JUL94	2E-93-2006
VS30-5	30JUN94	29JUN94	2E-93-2006
VS30-6	30JUN94	29JUN94	2E-93-2006
VS02-4	30JUN94	30JUN94	2W-94-0504
VSE4-5	30JUN94	29JUN94	2E-93-0276
VSE5-5	30JUN94	29JUN94	2E-93-0276
VSE6-3	30JUN94	8JUL94	2E-94-0203
VS02-5	1JUL94	1JUL94	2W-94-0504
AS07-4	6JUL94	7JUL94	2E-94-0571
VS02-6	6JUL94	6JUL94	2W-94-0504
VS67-4	13JUL94	14JUL94	2W-94-0506
HP29-4	14JUL94	18JUL94	2E-94-0367
AS09-4	15JUL94	14JUL94	2W-94-0621
VSC3-4	15JUL94	18JUL94	2W-94-0505
HP03-5	19JUL94	20JUL94	2W-94-0514
VSC3-5	19JUL94	20JUL94	2W-94-0505
GS14-4	21JUL94	22JUL94	2W-94-0674
HP03-6	21JUL94	22JUL94	2W-94-0514
VSC3-6	21JUL94	21JUL94	2W-94-0505
HP08-9	25JUL94	27JUL94	2E-94-0659
HP08-8	26JUL94	27JUL94	2E-94-0659
PS02-4	27JUL94	2AUG94	2W-94-0103
GS08-4	28JUL94	29JUL94	2W-94-0755
GS09-4	28JUL94	29JUL94	2W-94-0754
HP08-8	28JUL94	1AUG94	2E-94-0659
VS02-6	28JUL94	29JUL94	2E-94-0660
VS02-7	29JUL94	1AUG94	2E-94-0660
HP08-5	2AUG94	4AUG94	2E-94-0659
AS02-4	3AUG94	30AUG94	2E-93-2200
HP08-4	5AUG94	9AUG94	2E-94-0659
HP29-6	5AUG94	9AUG94	2E-94-0367
VS02-4	5AUG94	8AUG94	2E-94-0660



Plot Date 28JUL94
Data Date 30JUN94
Project Start 10CT93
Project Finish 10JUL96

Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity

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TANK FARMS OPERATIONS
BASELINE SCHED Rev 2
Summary Field Work Sched Sort ES

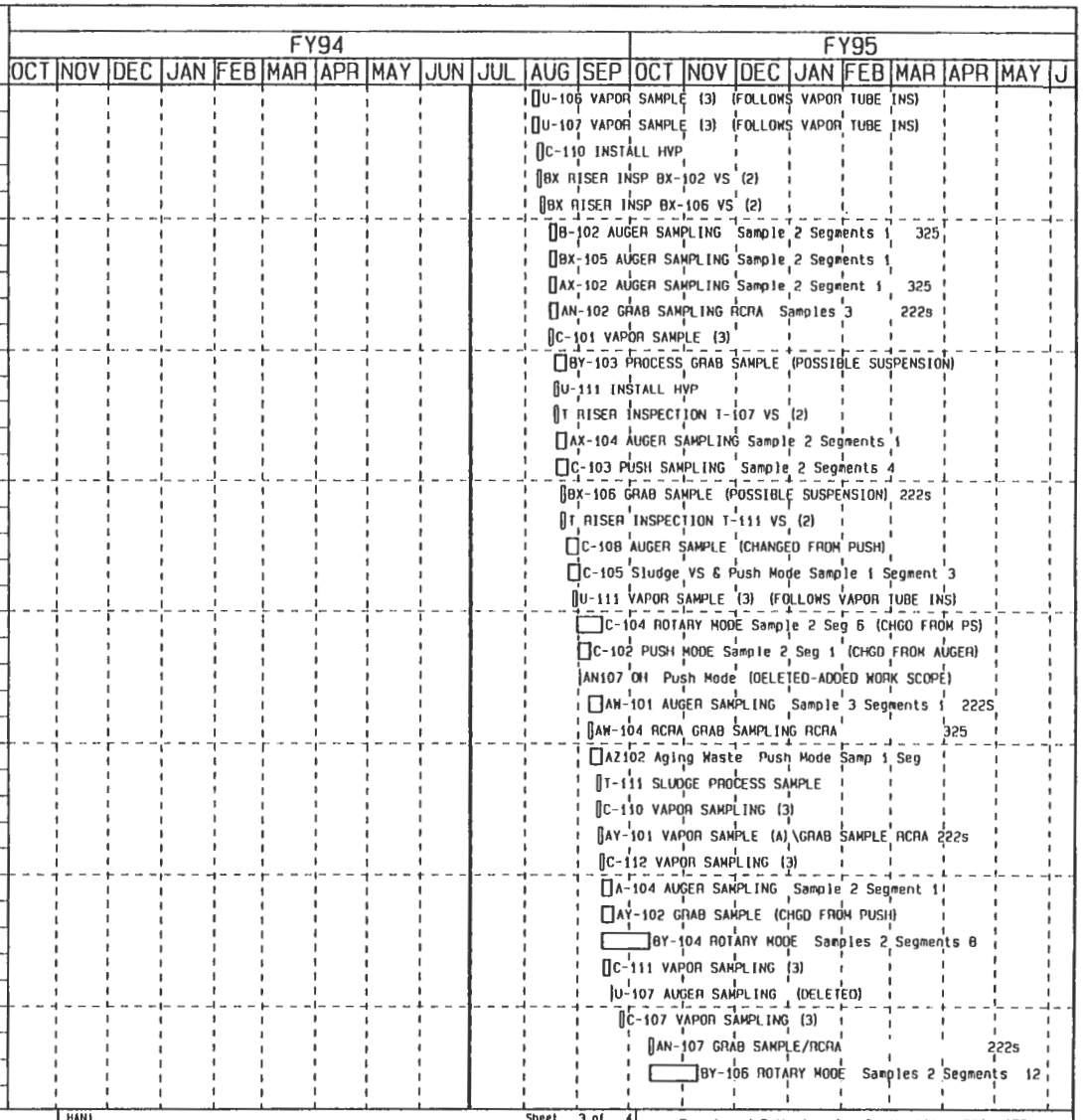
Sheet 2 of 4

Developed D.Healey for D. Hamilton 373-0259

Date	Revision	Checked	Approved

TABLE K-1. TANK FARM OPERATIONS SAMPLING SCHEDULE STATUS (Sheet 3 of 4)

ACTIVITY ID	EARLY START	EARLY FINISH	JCS
VS09-3	5AUG94	8AUG94	2W-94-0515
VS09-4	5AUG94	8AUG94	2W-94-0515
HP08-A	8AUG94	10AUG94	2E-94-0659
VS03-4	8AUG94	9AUG94	2E-94-0567
VS03-6	10AUG94	11AUG94	2E-94-0567
AS05-4	15AUG94	18AUG94	2E-93-2242
AS08-4	15AUG94	18AUG94	2E-94-0570
AS10-4	15AUG94	18AUG94	2E-94-0701
GS21-4	15AUG94	19AUG94	2E-94-0671
VS02-3	15AUG94	16AUG94	2E-94-0660
GS41-4	18AUG94	24AUG94	2E-94-0762
HP03-4	18AUG94	19AUG94	2W-94-0514
VS33-4	18AUG94	19AUG94	2W-94-0503
AS06-4	19AUG94	24AUG94	2E-94-0702
PS05-4	19AUG94	25AUG94	2E-93-0451
GS33-4	22AUG94	23AUG94	2E-94-0850
VS33-5	22AUG94	23AUG94	2W-94-0503
AS13-4	25AUG94	31AUG94	2E-92-1257
PS25-4	26AUG94	1SEP94	2E-92-1509
VS09-5	29AUG94	30AUG94	2W-94-0515
RS08-4	31AUG94	14SEP94	2E-92-1810
PS99-4	1SEP94	7SEP94	2E-93-2194
PS20-4	2SEP94	1SEP94	2E-94-0450
AS04-4	7SEP94	14SEP94	2E-94-0906
GS05-4	7SEP94	8SEP94	2E-94-0841
PS23-4	8SEP94	14SEP94	
GS24-4	12SEP94	13SEP94	
VS02-8	12SEP94	13SEP94	2E-94-0660
GS44-4	13SEP94	14SEP94	2E-94-0952
VS02-9	14SEP94	15SEP94	2E-94-0660
AS11-4	15SEP94	20SEP94	2E-94-0703
GS16-4	15SEP94	21SEP94	
RS03-4	15SEP94	120CT94	2E-94-0807
VS02-A	16SEP94	19SEP94	2E-94-0660
AS12-4	21SEP94	20SEP94	2W-94-0725
VS02-5	26SEP94	27SEP94	2E-94-0660
GS07-4	130CT94	140CT94	2E-94-0849
RS04-4	130CT94	9NOV94	2E-94-0808



Plot Date 20JUL94
Data Date 30JUN94
Project Start 10CT93
Project Finish 10JUL96

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Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity

HAN1 Sheet 3 of 4

TANK FARMS OPERATIONS
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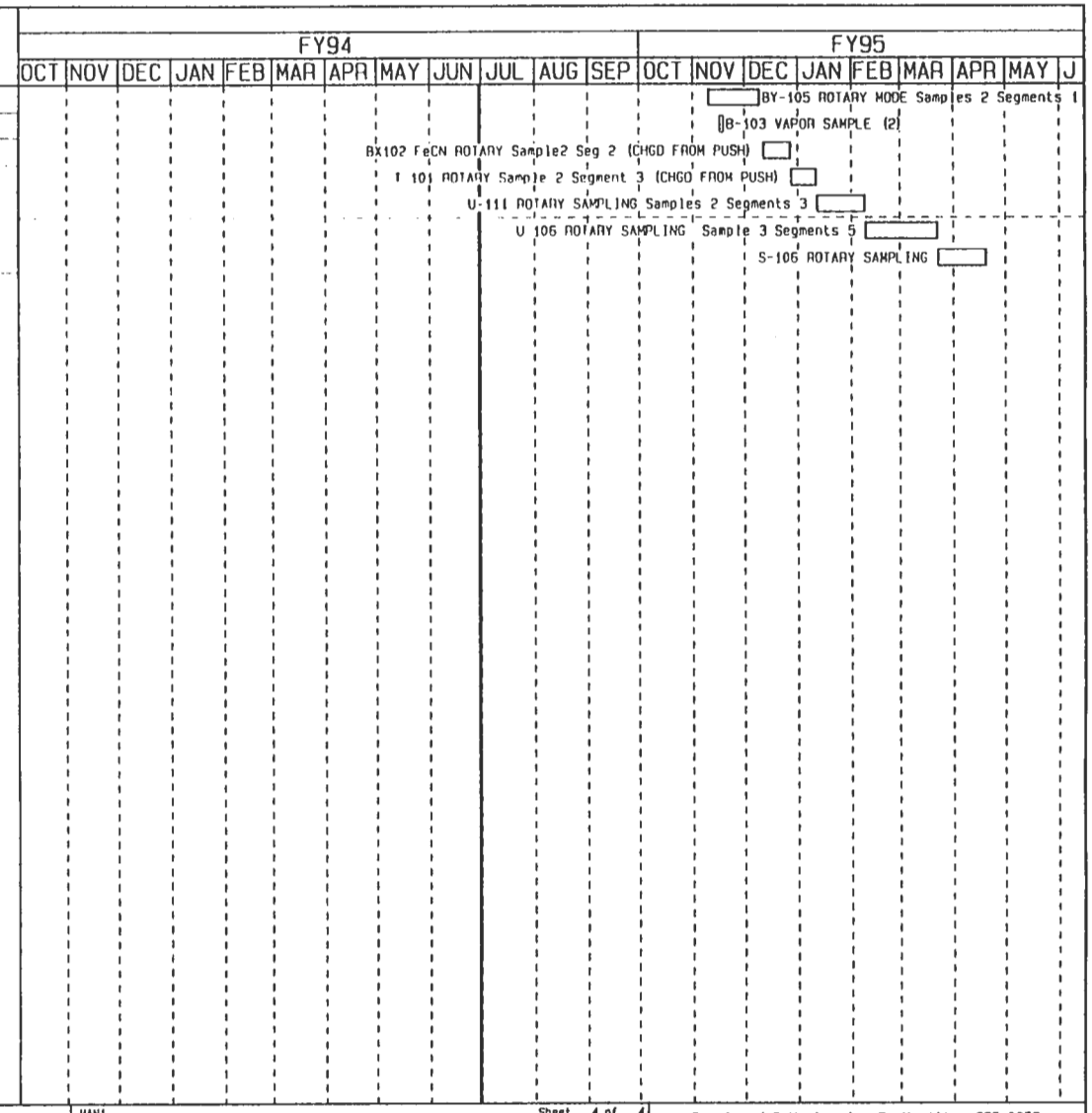
Date	Revision	Checked	Approved

TABLE K-1. TANK FARM OPERATIONS SAMPLING SCHEDULE STATUS (Sheet 4 of 4)

ACTIVITY ID	EARLY START	EARLY FINISH	JCS
RS01-4	10NOV94	9DEC94	2E-94-0809
VS45-4	17NOV94	18NOV94	2E-94-0568
RS11-4	12DEC94	27DEC94	2E-93-0490
RS12-4	28DEC94	11JAN95	2W-92-1265
RS05-4	12JAN95	8FEB95	
RS06-4	9FEB95	22MAR95	
RS07-4	23MAR95	19APR95	2W-93-0726



Plot Date 20JUL94
Data Date 30JUN94
Project Start 10CI93
Project Finish 10JUL96

Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity

HAN1 Sheet 4 of 4

TANK FARMS OPERATIONS
BASELINE SCHED Rev 2
Summary Field Work Sched Sort ES

Developed D.Healey for D. Hamilton 373-0259

Date	Revision	Checked	Approved

APPENDIX L

TANK WASTE REMEDIATION SYSTEM STRATEGY

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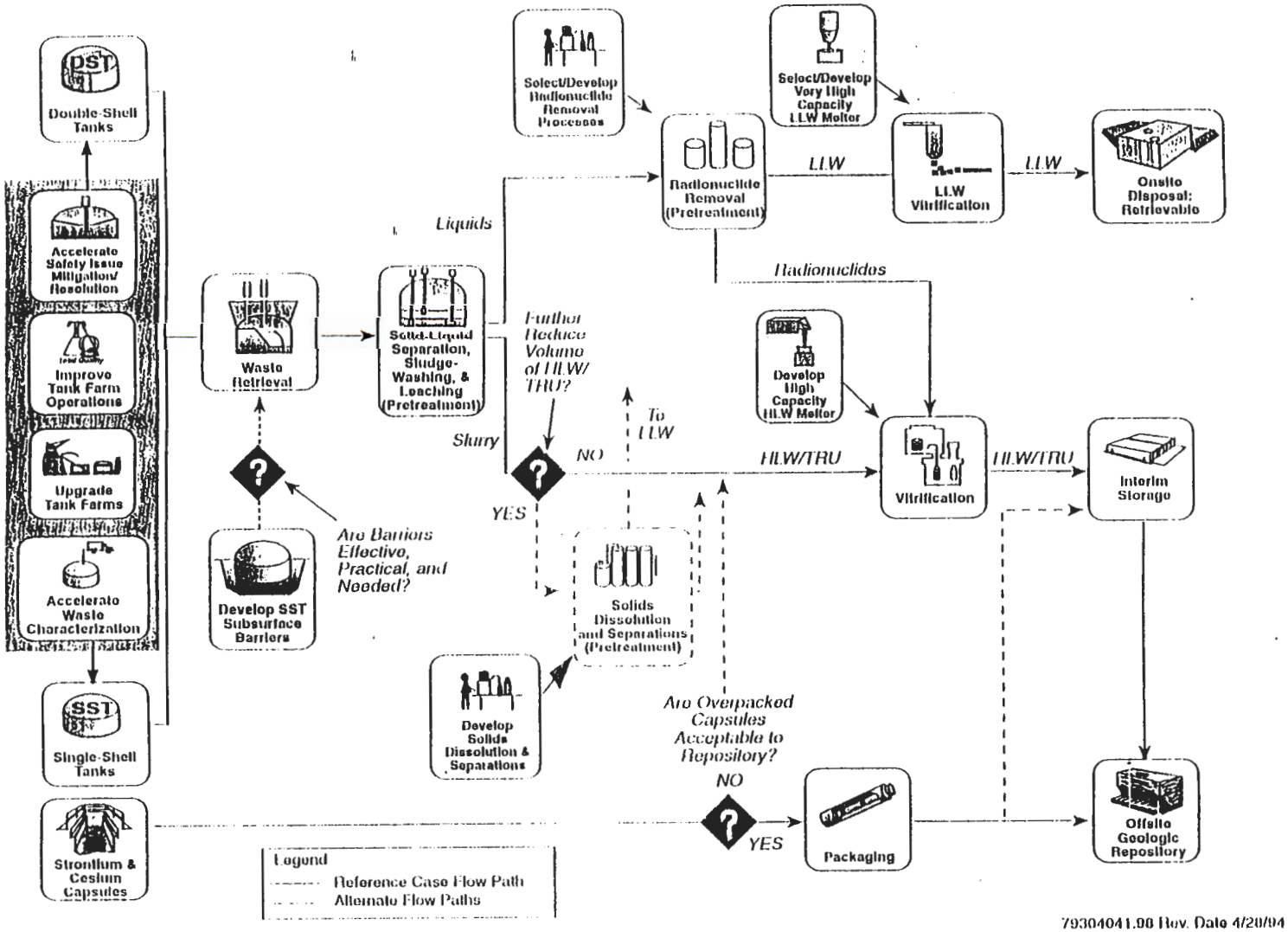
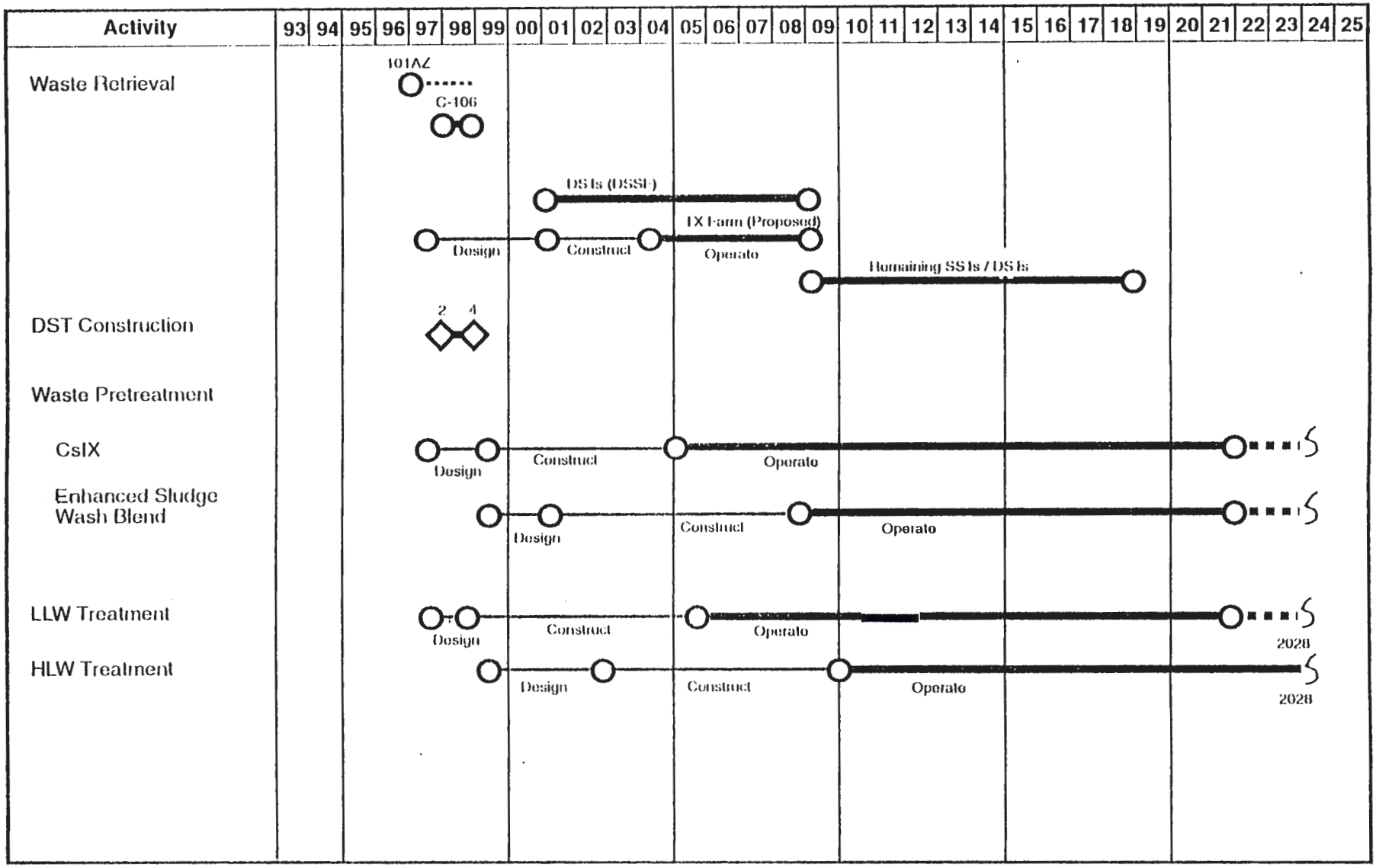


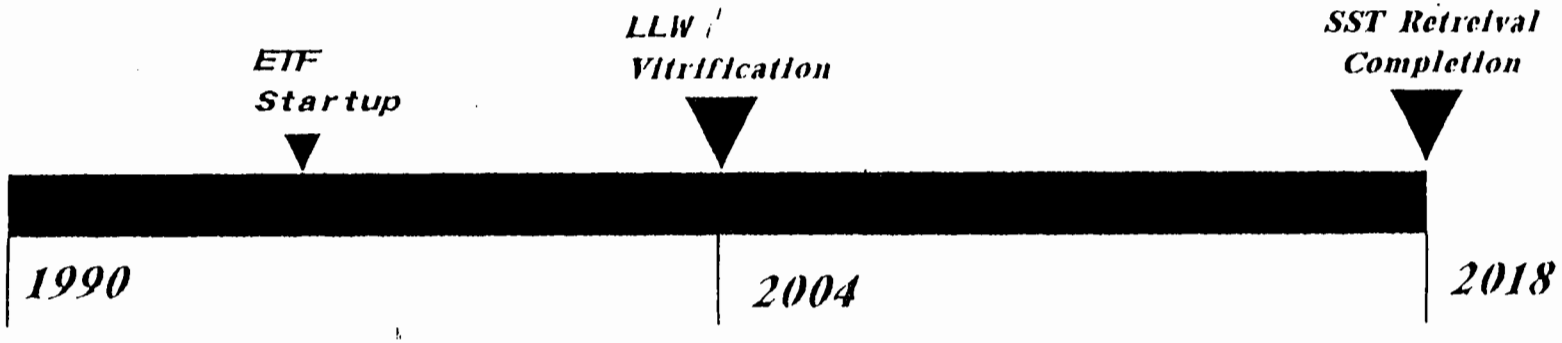
Figure L-1. Tank Waste Remediation System Strategy



Rev Date 6/3/94 79304041.120a

Figure L-2. Current Planning Case

Major Program Phases



-Safety Issue Resolution
-SST Liquid Removal
-Facility Deactivation
-Evaporator Operations

-SST Waste Retrieval
-Sludge Washing
-Cesium Removal
-LLW Vitrification

Figure L-3. Major Program Phases

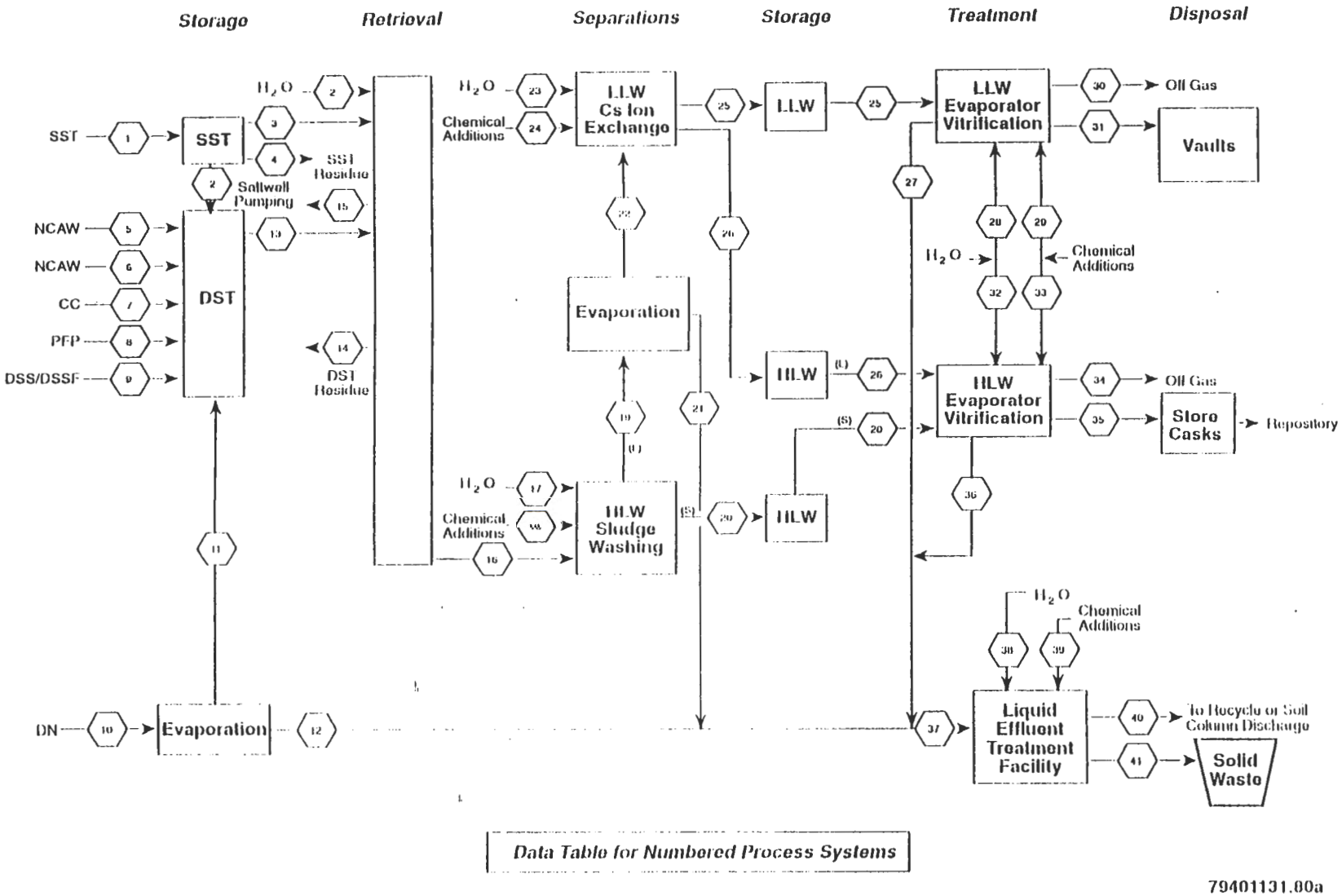


Figure L-4. Tank Waste Remediation System Top Level Flow Diagram

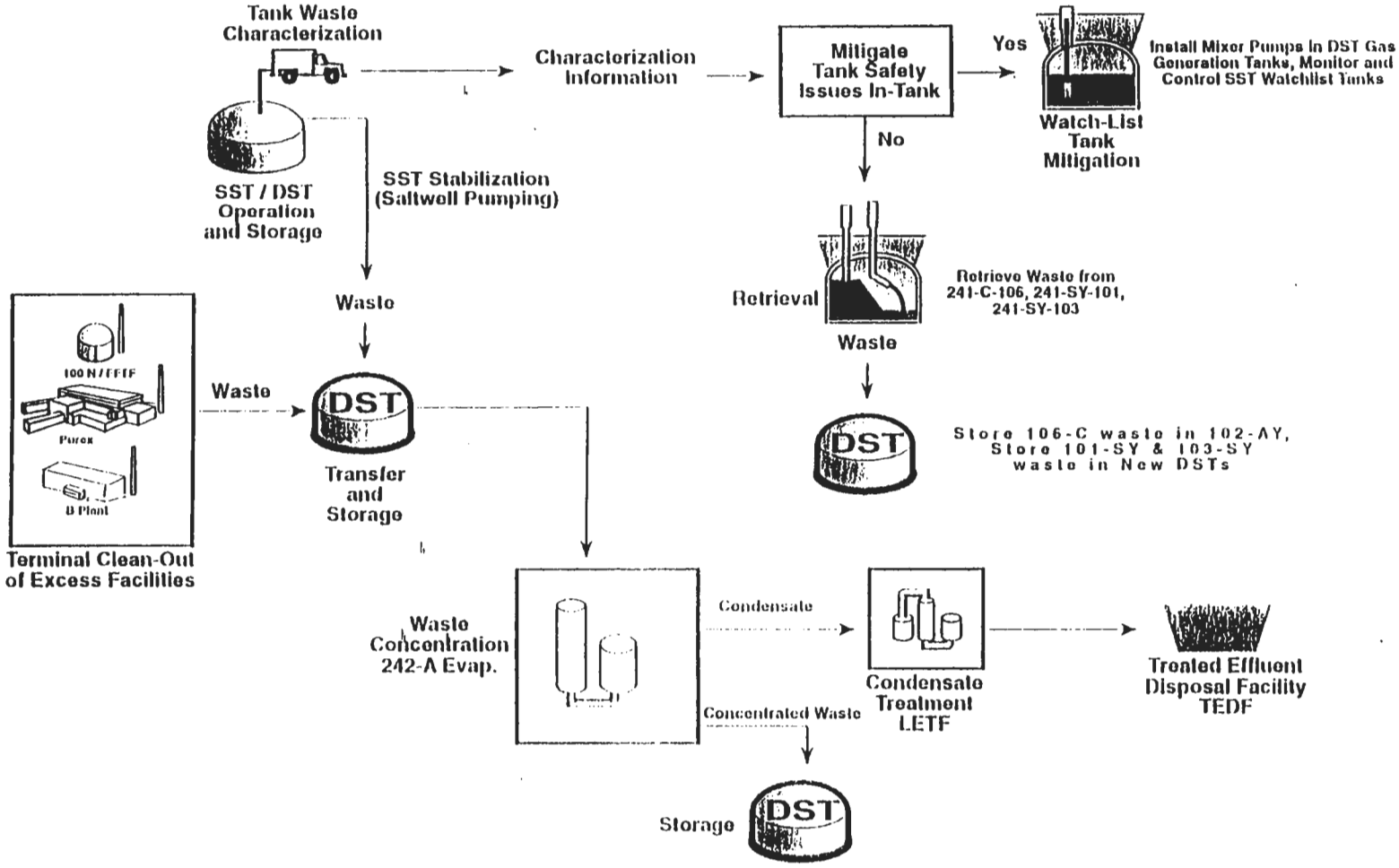


Figure L-5. System Description 1994 - 2004

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G. A. Harvey	B4-52
F. J. Heard	H0-34
D. A. Healey	S7-04
J. M. Henderson	S4-55
D. W. Hendrickson	L5-31
M. C. Higginson	A4-25
K. S. Hoeft	G1-61
M. J. Holm	R1-80
C. S. Homi	R2-12
G. P. Hopkins	N2-40
J. D. Hopkins	R2-11
B. K. Horsager	B5-24
J. H. Huber	R1-49
J. L. Huckaby	S7-15
J. V. Hurley	R4-02
J. J. Huston	S1-54
J. E. Irvin	S7-83
M. N. Islam	R3-08
M. T. Jansky	H6-26
T. D. Jarecki	S7-12
P. Jennings	S0-14
D. W. Jeppson	L5-31
R. D. Jensen	B1-58
G. D. Johnson	S7-15
L. J. Julyk	H5-56
R. A. Karnesky	H0-39
D. L. Kelly	S5-20
R. A. Kirkbride	H5-27
P. F. Kison	S2-45
C. A. Kuhlman	B3-30
N. W. Kirch	R2-11
D. B. Klos	S0-14
A. G. Krasopoulos	A4-81
M. Kummerer	H4-62
M. J. Kupfer	H5-49
E. C. Ladd	R1-19
D. R. Lance	S0-09
J. L. Lee	S7-82
J. M. Light	B4-08
D. C. Lini	H3-56
B. H. Lueck Jr.	R3-12
P. J. Mackey	B3-15
G. T. MacLean	H5-49
R. M. Marusich	H4-60
V. D. Maupin	N1-73
T. B. McCall	H0-33
K. S. McCullough	H4-70
M. H. McGrath	S4-58
J. P. Menard	R2-40
W. C. Miller	S4-55
N. J. Milliken	H4-63
W. C. Mills	S4-58
W. J. Millsap	H5-68

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G. J. Miskho	R2-50
J. R. Mobley	H5-49
T. Moleff	R1-30
S. R. Morgan	R2-50
P. M. Morant	H4-19
K. L. Morris	H5-09
A. P. Mousel	S7-12
L. D. Muhlestein	H4-64
R. L. Nelson	R4-02
R. L. Newell	E6-31
D. J. Newland	R2-36
R. Ni	S5-07
P. C. Ohl	R1-30
P. A. Olsen	R3-12
D. L. Osowski	L6-10
V. M. Pacheco	R1-51
A. L. Pajunen	H5-49
R. B. Pan	H5-53
L. D. Parchen	B3-63
G. L. Parsons	B4-52
M. A. Payne	R2-50
L. T. Pedersen	N1-46
L. D. Pennington	T4-07
C. E. Petersen	R1-30
R. S. Popielarczyk	R1-30
E. A. Porter	R2-88
R. L. Powers	R2-70
T. B. Powers	H4-66
R. K. P'Pool	T1-30
G. R. Priddy Jr.	R3-12
T. E. Rainey	R2-54
G. F. Raphael	R2-12
R. E. Raymond (3)	R2-54
I. E. Reep	R2-08
M. A. Rezvani	H5-55
D. Richardson	R2-31
S. K. Rifaey	S6-12
R. R. Rios	R1-80
W. E. Ross	S5-07
J. A. Ryan	H5-55
P. Sathyanarayana	R2-12
C. C. Scaief	L7-06
F. A. Schmorde	B2-18
J. S. Schofield	R1-67
R. D. Schreiber	R2-12
C. P. Schroeder	L7-06
K. V. Scott	H5-52
N. J. Scott-Proctor	R1-80
O. Serrano	T4-01
L. K. Severud	R2-50
M. H. Shannon	H4-61
J. E. Shapley	H4-68
T. N. Shaw	S4-55
R. A. Shea	L8-16

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E. M. Sheen	L7-05
E. J. Shen	S4-58
P. K. Shen	H0-39
D. J. Sherwood	R2-78
A. T. Shook	S2-01
E. R. Siciliano	H0-39
R. B. Simmons	R2-12
K. P. Slape	S0-11
C. M. Smith	H6-30
S. M. Stahl	H4-62
E. G. Stephan	A3-74
B. E. Stapley	R2-80
R. R. Stickney	R4-02
J. N. Strode	R2-11
D. G. Sutherland	L4-72
J. P. Summerhays	R2-88
M. J. Sutey	T4-07
S. L. Swaney	T4-07
L. M. Swanson	H5-49
C. L. Thomas	H4-19
J. F. Thompson	H5-70
J. D. Thomson	R2-76
S. R. Tifft	H6-26
J. A. Tilden	L6-12
H. Toffer	H0-38
T. T. Tran	L7-04
J. W. Tritz	B1-32
D. P. Trott	R2-86
D. A. Turner	R2-78
L. A. Tusler	R2-11
C. J. Udell	L6-12
B. D. Valenzuela	R2-12
R. E. Van der Cook	H5-27
R. J. Van Vleet	H4-63
A. O. Vance	H5-33
D. T. Vladimiroff	G7-01
F. R. Vollert	H5-09
J. A. Voogd	R4-01
G. R. Walker	B2-16
O. S. Wang	R2-78
D. L. Wegener	R1-62
R. K. Welty (3)	R1-80
G. T. Wells	H6-26
K. A. White	R2-70
R. Whitman	H5-49
R. S. Whitman	B1-59
J. H. Wicks	T4-08
D. D. Wiggins	R1-49
L. S. Williams	S4-53
C. R. Wilson	H5-52
G. R. Wilson	R2-31
M. E. Witherspoon	E6-61
D. D. Wodrich	S7-84
K. L. Woodard	R4-02

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R. D. Wojtasek	H6-27
G. D. Wright	G6-04
M. S. Wright	T3-28
W. R. Wrzesinski	R3-74
P. A. Young	R2-14
F. A. Zak	R3-01
B. D. Zimmerman	L0-06
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