67

Page 1 of 1
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Flammable Gas Tank Waste Level Reconciliation Tank 241-S-111

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Abstract: This document provides verification/reconciliation of unexplained waste level increases for tank 241-S-111 as reported in Waste Storage Tank Status and Leak Detection Criteria, Vol. 1 and 2, WHC-SD-WM-TI-356 also known as the Welty Report. Waste level increases are studied during the period from 1973 to 1980. Historical records were used to provide the verification/reconciliation.

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JUN 24 1997

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Approved for Public Release

LETTER REPORT

**FLAMMABLE GAS TANK WASTE
LEVEL RECONCILIATION
TANK 241-S-111**

WORK ORDER E40697

Prepared for

Lockheed Martin Hanford Corporation

June 1997

Prepared by

**Fluor Daniel Northwest
Richland, Washington**

LETTER REPORT

FLAMMABLE GAS TANK WASTE LEVEL RECONCILIATION TANK 241-S-111

WORK ORDER E40697

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TABLE OF CONTENTS

INTRODUCTION	1
SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS	2
APPROACH/EVALUATION	3
CLARIFICATION OF SCOPE PARAMETERS	3
HISTORICAL INFORMATION	4
DATA EVALUATION	4
1973 Data	4
1974 Data	5
1975 Data	5
1976 Data	6
1977 Data	7
1978 Data	8
1979 Data	8
1980 Data	8
Data Conclusion	8
TABLE 1	10
UNCERTAINTIES AND RECOMMENDATIONS FOR FURTHER STUDY	11
REFERENCES	12
Appendix A. Welty Report Plot and Data	
Appendix B. Waste and Level History, 1954 - 1996	
Appendix C. Waste Level History Quarterly/Monthly, 1973 - 1980	
Appendix D. Waste Level History Plots, June 1973 - December 1980	
Appendix E. Waste Level History Data, June 1973 - December 1980	
Appendix F. Occurrence Reports, 1973 - 1980	

LETTER REPORT

FLAMMABLE GAS TANK
WASTE LEVEL RECONCILIATION
TANK 241-S-111

INTRODUCTION

Fluor Daniel Northwest (FDNW) was authorized to address flammable gas issues by reconciling the unexplained surface level increases in Tank 241-S-111 (S-111, typical). The trapped gas evaluation document (ref 1) states that Tank S-111 exceeds the 25% of the lower flammable limit (LFL) criterion (ref 2), based on a surface level rise evaluation.

The Waste Storage Tank Status and Leak Detection Criteria document, commonly referred to as the "Welly Report" is the basis for this letter report (ref. 3). The Welly Report is also a part of the trapped gas evaluation document criteria. The Welly Report contains various tank information, including: physical information, status, levels, and dry wells, see Appendix A.

The unexplained waste level rises were attributed to the production and retention of gas in the column of waste corresponding to the unaccounted for surface level rise. From 1973 through 1980, the Welly Report tracked Tank S-111 transfers and reported a net cumulative change of 13.55 in. This surface level increase is from an unknown source or is unaccounted for. Duke Engineering and Services Hanford (DESH) and Lockheed Martin Hanford Corporation (LMHC) are interested in determining the validity of the unexplained surface level changes reported in the Welly Report based upon other corroborative sources of data.

The purpose of this letter report is to assemble detailed surface level and waste addition data from daily tank records, logbooks, and other corroborative data that indicate surface levels, and to reconcile the cumulative unaccounted for surface level changes as shown in the Welly Report from 1973 through 1980.

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Tank S-111 initially received waste from REDOX in 1952, and after April 1974, primarily received processed waste (slurry) from the 242-S Evaporator/Crystallizer and transferred supernate waste to Tank S-102.

The Welty Report shows a cumulative change of 13.55 in. from June 1973 through December 1980. During this period, there were unexplained increases that totaled 24.50 in., and decreases that totaled 7.6 in. in the Welty Report. FDNW focused primarily on the larger increases, and after reviewing daily records for the same period, identified an unexplained increase 40.40-in. and a decrease of 14.25 in., for a net unexplained increase of 26.15 in. (see Table 1)

From the FDNW review and comparisons of the Welty Report versus other daily records for Tank S-111, FDNW determined that the majority of the time, the Welty Report is consistent with daily records. There are slight difference between the Welty Report and the daily tank level records when comparing the larger (> 1 in.) unexplained increases. These difference could be caused by the method used to establish the baseline, by the method used to round off numbers, or by the time frame that the increase or decrease is identified.

A discrepancy exists between the Welty Report and FDNW regarding the identification of unaccounted for surface level increases and occurrence reports, and the establishment of the baseline following saltwell pumping. Increases that occurred and were evaluated by an occurrence report were ignored by the Welty Report. Surface level decreases that occurred following saltwell pumping were identified as unaccounted for decreases in the Welty Report, however they were probably a continued settlement caused by saltwell pumping of the interstitial liquids.

Because the flammable/trapped gas issue is linked to the unexplained increase in the surface level (ref 1 and 2), FDNW recommends that all occurrence reports, concerning tank waste level increases or decreases from 1970 through 1980, be reevaluated for acceptability of the evaluation as to the root cause of the occurrence. This review should include all tank farms to determine if other suspect

evaluations have been identified for waste level increases. FDNW also recommends that the Welty Report be revised to include the unexplained increases identified by the occurrence report and level increases following transfers.

APPROACH/EVALUATION

CLARIFICATION OF SCOPE PARAMETERS

The limits of this letter report were defined based on the Welty Report that exhibits data from June 1973 to July 1987. Because level data is readily available on PC-SACS, a computer-based system with data from 1981 to the present, the scope was limited to 1973 through 1980. The scope was further limited by any complete emptying of the tank between 1973 through 1980. If it was determined that the tank was emptied, the limit would be from the emptying through 1980.

FDNW evaluated the baseline as established by the Welty Report and prepared a plot of that data for Tank S-111 (see Appendix A). The top portion of this plot shows the increases and decreases of the tank waste level (in inches) versus time as stated in the Welty Report data sheets. The bottom portion of the plot shows the unexplained cumulative changes, time versus inches. As seen in the cumulative change plot, some changes are slow increases and others are rapid changes.

FDNW evaluated Tank S-111 to determine if the tank had been completely emptied during 1973 to 1980. FDNW reviewed the plot of the waste and level history (shown in Appendix B) taken from the historical tank content estimate reports (ref 4, and 5). From this graph, it was determined that there was no evidence of an empty tank during that time. FDNW observed that the plot was generated from quarterly data and felt that monthly level information might reveal additional tank activity not shown by the three-month period.

A plot (shown in Appendix C) of the tank level was created based on the waste status summary reports (ref 7 through 12). From this level plot, it was determined that Tank S-111 was not emptied

during the eight years of concern. Waste summary reports were issued quarterly basis from 1973 through September 1976, and monthly thereafter. Therefore, quarterly data were used through September 1976 and monthly reports thereafter.

HISTORICAL INFORMATION

FDNW has identified that Tank S-111 initially received waste from REDOX in the third quarter of 1952 (ref 4 and 5). Beginning April 22, 1974, Tank S-111 started receiving processed waste (slurry) from the 242-S Evaporator/Crystallizer (242-S Evaporator) and primarily pumped supernate to Tank S-102, but at times, pumped to Tank S-101. Saltwell pumping of Tank S-111 began October 17, 1975, and this waste was pumped to Tank S-107. Tank S-102 was the initial feed tank for the 242-S Evaporator, but the feed was changed to Tank SY-102 in the late 1970s.

FDNW obtained copies of Occurrence Reports 75-109 and 77-152, pertaining to Tank S-111, regarding surface levels changes from 1973 to 1980 (see Appendix F). The Welty Report referenced Occurrence Report 77-152, but overlooked report 75-109.

DATA EVALUATION

FDNW reviewed historic tank farm daily record sheets and tabulated logbook data (ref 6, 13, and 14). From these records, yearly plots of the waste surface level (see Appendix D) and data files were generated (see Appendix E). The plots and data were generated on a monthly basis when the tank was inactive, and on a daily basis when the tank was actively receiving or transferring waste. These plots and data were then compared against the Welty Report plot and data to reconcile the unexplained increases identified in the Welty Report. To reconcile the surface level increases, FDNW looked primarily at the larger (> 1 in.) unexplained increases or groups of increases.

1973 Data

Tank S-111 waste level was constant from 1952 to July 1973, with a surface level of approximately 280 in (ref 5). Daily transaction details, the Welty Report, and manual plots and records (ref 14) all

identify that the automatic tank level gauge (FIC) was calibrated on July 20, 1973. At this time, the level reading jumped and a baseline was set at 285.05 in. Between July 20, 1973, and January 1, 1974, the surface level gradually increased 286.0 in., an increase of 0.95 in. (Welty Reports, 0.95 in.) (see Table 1).

1974 Data

In January 1974, Tank S-111 began a period of high activity that continued through January 1975. On January 5 and 6, 1974, waste was pumped from Tank S-111 to Tank S-102, dropping the level to 106.3 in. For the next two months, Tank S-111 was inactive with the level remaining constant. On March 19, 1974, and April 10, 1974, more supernate was pumped to Tank S-102 bringing the tank waste level down to 89.2 in., the lowest level since the initial fill (and through 1980). On April 22, 1974, Tank S-111 started a cycle of receiving slurry from the 242-S Evaporator and pumping supernate to Tanks S-102 and S-101. This activity continued through January 17, 1975.

1975 Data

Between January and March 1, 1975, the surface level fluctuated from 262.3 in. to 272.4 in. This increase was caused by maintenance (line flushing, pump removal and reposition, FIC flushing) and by transfer activities. Beginning March 1, 1975, the surface level slowly increased from 272.4 in. to 273.2 in. on March 17, 1975, an increase of 0.8 in (Welty Report, 1.00 in.). On March 18, 1975, the level jumped to 274.7 in. (+ 1.5 in.), reported on the daily data sheets as, "apparently caused by a leaky valve...." The surface level in Tank S-111 continued increasing to 275.7 in. on April 10, 1975, an increase of 1.0 in. (Welty Report, 0.30 in.).

Between April 10 and 15, 1975, the pump in Tank S-111 was pulled, serviced, reinstalled, and waste was transferred to Tank S-101 and slurry received from the S-242 Evaporator. A baseline of 271.7 in. was established on April 17, 1975. This was the last waste transfer in or out of Tank S-111, except for saltwell pumping. The saltwell was installed on September 24, 1975, and saltwell pumping commenced October 17, 1975.

Between April 17 and October 17, 1975, the waste surface level steadily increased from 271.7 in. to 280.5 in. on August 23, 1975, decreased to 278.0 in. on September 3, 1975, and increased to 281.2 in. on September 30, 1975. The total increase of 9.5 in. between April 17, 1975, and September 30, 1975, was identified in the Welty Report as four increases of 1.6 in., 1.8 in., 3.6 in., and 2.5 in. during the same period. This 9.5 in. increase was also identified in Occurrence Report 75-109, not shown in the Welty Report. The FIC was taken out of service October 2, 1975, and manual tape measurement started October 4, 1975, with a baseline of 279.0 in. The level remained constant at 279.0 in. until October 17, 1975. A 0.75 in. decrease is stated in the Welty Report for the period from October 3 through October 17, 1975.

Following the start of saltwell pumping, the surface level dropped to 276.5 in. on October 19, 1975. From October 1975 through January 31, 1976, the surface level increased 5.75 in. to 282.25 in. (Welty Report, 5.75 in.). This increase occurred despite sporadic saltwell pumping in November and December 1975, and minor additions of water.

1976 Data

Beginning February 1, 1976, frequent saltwell pumping continued through April 1976. During this pumping activity, the surface level dropped to 241.0 in. From May 1, 1976, through November 1, 1976, levels continued a slow decline to 232.25 in., a decrease of 8.75 in. (Welty Report, 8.75 in.). This decline was likely a continued settlement following the saltwell pumping.

Saltwell pumping continued from November 9, 1976, through January 25, 1977. The FIC that was removed from service October 2, 1975, was placed back in service on November 18, 1976. The manual tape (MT) and FIC surface level readings differ considerably, 232.25 in. vrs. 213.60 in., respectively, a difference of 18.65 in. Apparent difficulty in establishing a baseline was complicated by ongoing saltwell pumping. Following a brief stopping of saltwell pumping on November 24, 1976, a baseline of 206.40 in. (MT, 232.25 in.) was confirmed on November 29, 1976. Levels slowly increased to 208.35 in. (MT, decreased 232.0 in.) on December 8, 1976, an increase of 1.95 in. (Welty Report, 1.95 in.).

1977 Data

The surface level dropped with continuation of saltwell pumping on December 10, 1976, and continued to drop to 177.1 in. (MT, 227.0 in.) on February 7, 1977, following the shutdown of saltwell pumping on January 25, 1977. This level remained constant through February 11, 1977. Flushing the Tank S-111 pump pit on February 12, 1977, contributed to an increase in the surface level to 177.8 in. Levels remained consistent in February at 177.7 in., and were 177.7 in. (MT, 225.75 in.) on March 2, 1977. On March 5, 1977, the level dropped to 177.0 in. (MT 225.50 in.), then increased to 177.3 in. (MT, 225.50 in.) on March 8, 1977, and remained unusually constant at 177.4 in. until April 22, 1977. Manual tape readings ended April 7, 1977, with a reading of 224.25 in. The FIC gauge was calibrated on April 22, 1977, and a revised level was established at 175.6 in. After the gauge was recalibrated to 175.6 in., the level continued to decrease for the next 16 hours to 173.7 in. There is a possibility that the gauge hung up and there was a slow decrease from 177.4 in. to 173.7 in., equal to a 3.6-in. decrease over six weeks, March 8, 1977, through April 23, 1977, (Welly Report, -0.4 in). The 173.7 in. surface level remained consistent through May 26, 1977.

The level increased 3.1 in. to 176.8 in., from June 1977 through September 5, 1977. The Welly Report identified a 0.1-in. increase in June 1977. Occurrence Report 77-152 identified the 3-in. increase on September 4, 1977, but the change was not indicated in the Welly Report. An FIC gauge problems was identified September 5, 1977, and the gauge was flushed and recalibrated September 7, 1977. A new waste level baseline was set at 183.2 in. and a 2.4-in. increase occurred during calibration., a 5.5-in. increase since the last calibration on April 22, 1977.

The waste level continued to increase from September to 188.35 in. on December 6, 1977, for an increase of 5.15 in. The Welly Report showed a 1.65-in. increase (apparently from Occurrence Report 77-152). Water was added to Tank S-111 on December 6, 1977, and the surface level jumped to 190.1 in. The level increased to 190.8 in. (+ 0.7 in.) on December 16, 1977, (Welly Report, +0.7 in.). Saltwell activities and water that was added on December 16, 1977, raised the

level to 191.8 in. The level fluctuated through December 31, 1977, with an increase of 0.5 in. to a level of 192.3 in.

1978 Data

From January 1, 1978, until March 1, 1978, the level increased 6.3 in. to 198.6 in. Tank S-111 saltwell pumping and flushing activities dropped the surface level to 198.2 in. on March 31, 1978. From April 1, 1978, to July 19, 1978, the surface level increased to 202.90 in., an increase of 4.7 in., with some fluctuation. The surface level remained constant throughout the remainder of 1978. The total unexplained increase for 1978 was 11.0 in. The Welty Report identified a 2.3-in. increase for June 30, 1978, and a 0.3-in. increase on July 19, 1978, for a total yearly increase of 2.6 in.

1979 Data

In 1979, the surface level remained consistent but varied from a high in January of 203.3 in. to a low in May of 202.2 in., back to a high in December of 203.2 in., and back to 202.9 in. by the end of the year. The Welty Report showed a decrease of 0.2 in. for 1979.

1980 Data

In 1980, the surface level slowly decreased throughout the year to approximately 202.0 in. on December 31, 1980, for a total yearly decrease of 0.9 in. (Welty Report, 0.3 in.).

Data Conclusion

During the eight-year evaluation of Tank S-111, the daily records were consistent with the Welty Report, in most cases. Table 1 illustrates comparison values between daily records and the Welty Report. There are three major differences between the Welty Report and the FDNW evaluation.

- On November 8, 1976, the Welty Report identified a decrease of 8.75 in. following the initial saltwell pumping activity. FDNW believes that this subsidence of 8.75 in. was a

continuation of surface level decline caused by saltwell pumping. A similar decrease occurred following saltwell pumping in 1977 when the pumping stopped on January 25, 1977, and a decreased surface level of -0.6 in. and -3.6 in. was reported on February 11, and April 22, 1977, respectively. The 3.6-in. decrease also included a change contributed to a recalibration of the FIC gauge.

- The Welty Report did not identify a change from a previous reading or a cumulative change if an occurrence report was issued. In September and December 1977, increases of 3.1 in. and 5.15 in. were shown in the daily records, while the Welty Report showed only 0.1-in. and 1.65-in. increases, based on Occurrence Report 77-152. An ironic situation occurred between May and September 1975, when the daily records indicated a 9.50-in. increase and Occurrence Report 75-109 was written for this increase. The Welty Report did not reference the occurrence report and increases of 1.6 in., 1.8 in., 3.6 in., and 2.5 in. were reported.
- Throughout 1978, daily records showed considerable increases (0.5 in., 6.3 in., and 4.7 in.) in the surface level of Tank S-111 between December 1977 and July 1978. The Welty Report identified only 2.6 in. (2.3 in. and 0.3 in.) as an unidentified increase, but showed numerous changes to the baseline elevation and contributed the increases to water additions and flushing during this same period. This difference, +8.4 in. (23,000 gal.), is hard to understand because concurrent with the water addition and flushing, saltwell pumping was ongoing. Normally, flushing and water addition are low volume (> 1,000 gal.) and daily records showed a 0.4-in. decrease in the surface level on March 31, 1978, after most of the water had been added and flushed and at the conclusion of saltwell pumping.

The Welty Report showed a total 11.05-in. decrease and a total 24.60-in. increase, for a net increase of 13.55-in. cumulative change, compared to 24.50 in. and 11.00 in. as shown in Table 1. The table does not include a minor increase of 0.1 in. on June 22, 1977, or a 0.05-in. decrease on March 18, 1974.

Daily records showed a total increase of 40.40 in. that included increases omitted by Occurrence Report 77-152 and the increases during 1978. Decreases totaled 14.25 in. and included values indicated as settlement after saltwell pumping. The net change is 26.15 in., or a 93% increase above the Welty Report.

TABLE 1
Daily Records versus Welty Report

Date	Daily Records (in.)	Welty Report (in.)	Comments
11/12/73	+0.95	+0.95	
3/18/75	+0.80	+1.00	
4/9/75	+1.00	+0.30	
5/75 - 9/75	+9.50	+1.60, 1.80, 3.60, & 2.50	Welty Report missed OR 75-109
10/16/75	0.0	-0.75	
1/31/76	+5.75	+5.75	
11/8/76	0.0 (-8.75)	-8.75	FDNW, Continued settlement following saltwell pumping shutdown 5/1/76.
12/8/76	+1.95	+1.95	
2/11/77	0.0 (-0.60)	-0.60	FDNW, Continued settlement following saltwell pumping shutdown 1/25/77.
4/22/77	0.0 (-3.60)	-0.40	FIC gauge calibration. Saltwell pumping settlement
9/7/77	+3.1	+0.10	OR 77-152, accounted for 3 in. in Welty Report.
12/5/77	+5.15	+1.65	Welty Report again referenced OR 77-152.
12/16/77	+0.70	+0.70	
12/31/77	+0.50	-	
3/1/78	+6.30	-	
3/31/78	-0.40	-	Saltwell pumping.
6/30/78	-	+2.30	
7/19/78	+4.70	+0.30	
6/20/79	-	-0.20	
12/31/79	0.0	-	
12/31/80	-0.90	-0.30	
Total Net	+40.40 /-14.25 +26.15	+24.50 /-11.0 +13.50	Note: Welty Report totals are 24.60-in increase, 11.05-in. decrease, Net 13.55-in. increase.

UNCERTAINTIES AND RECOMMENDATIONS FOR FURTHER STUDY

There are questions and concerns regarding some of the results discussed in the data reviewed. A primary concern is the evaluation of Occurrence Reports 75-109 and 77-152. These reports explain that, "The surface level increase is evaluated as a build-up of crust and growth characteristic of the salt cake. The concentrated slurry on standing and cooling will start dropping solids out which are less dense than the solution and float to the surface causing the liquid level increase." During telephone discussions, Dan Reynolds (LMHC) and Dan Herting (Numatec Hanford Corporation) both expressed doubt about this evaluation and with today's waste knowledge, it is felt that the increase was a factor of gas generation. The flammable gas issue has been a concern for a number of years and the probability of gas generation and trapped gas in Tank S-111 is not that unlikely.

The concern regarding questionable evaluation of identified unexplained increases in tank levels extends to other tanks. FDNW recommends that further studies should look at all tanks in the S and SX Tank Farms, and possibly all tank farms, to determine if the cumulative change value identified in the Welty Report for other tanks may also appear low because of the occurrence reports evaluation.

This letter report primarily looked at daily records for the specific tank being evaluated and briefly looked at daily records for the 242-S Evaporator/Crystallizer. With more review, these records could provide more detail on Evaporator operations and on the amount and types of waste pumped into the tanks. The records also identify the amount of flush water used to clean the lines after a transfer. These records could lead to a better understanding of the waste transferred to the tanks and possibly resolve some of the unknown waste additions within the tank.

Records exist on miscellaneous catch tanks and water additions to the tanks. These records were not reviewed during the FDNW evaluation because these additions are normally fairly small and insignificant; however, added together, the additions may resolve some of the concerns regarding the cumulative level increase.

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14. Tank Farm Surveillance Waste Level Manual Plots and Records, Retention Boxes 111506, 111507, and 111509.

APPENDIX A

WELTY REPORT PLOT AND DATA

PLOT GENERATED BY: R. P. Schwehr
B. D. Andres

241-S-111 WELTY REPORT DATA
1973 TO 1980

TANK: 111-S

<p>RISER AND DRY WELL LOCATIONS</p>	<p>LOCATION: 241-S COMPUTER CODE: 40-11</p> <p><u>TANK DESCRIPTION:</u> Type: Single Shell Diameter: 75 ft Height: 23 ft Capacity, gal: 758,000 Bottom, Type: Dish Volume (gal) = : (in.-12) 2,750 + 12,500 Airlift Circ: None Coils: None Exhauster: No Construction Date: 1950-51 In-Service Date: 1952 Out-Service Date:</p> <p><u>LEAK DETECTION SYSTEM:</u> Liquid Level Manual Tape: No FIC: Yes (R-3) LOW: Yes (R-16) 40-11-65</p> <p>Annulus System Exhaust Radiation Detector: N/A Leak Detection (Conductivity Probes): N/A</p> <p>Leak Detection Pit Liquid Level: N/A Specific Gravity: N/A Radiation Detector: N/A External Dry Wells: Yes (5) Laterals: None</p>
<p style="text-align: center;">TANK STATUS</p> <p>CATEGORIZED: Sound/deactivated ISOLATION: Partially (12-15-82) STABILIZATION: Primary (3-78) PROJECTED USAGE: None</p> <p>SALT WELL STATUS/HISTORY: Jet salt well pumping Installation: P-10 (10-75), Jet (1-76) Pumping Initiated: P-10 (10-75) Completion Date:</p> <p>MEAS. LEVEL (in.): 203.00 (FIC) See photo comments SOLIDS LEVEL (in.): 220.50 = 586,000 gal (04-28-82) saltcake and sludge SUPERNATANT (gal): 10,000 (RHO-RE-SR-14, 5-86) DRAINABLE INTERSTITIAL (gal): 192,000 TOTAL JET PUMPED (gal): 3,300 TOTAL PUMPABLE REMAINING: 180,000</p> <p>PHOTOGRAPHS: 7803218 (03-27-78), 90746 (04-11-80), 107169 (04-19-83), 8403157 (05-09-84) 05-09-84 photos show a heavily crusted irregular surface of saltcake around the perimeter of the tank and saltcake falling away from the liner continues to be evident. A clear liquid surface (with some exposed solids) covers the remaining surface. The FIC plummet (not visible) would appear to be contacting liquid. Liquid level appears stable from photograph comparisons.</p>	

SD-WM-TI-356
40-11-02

TANK 111-S

Liquid Level.

Date	Liquid level (in.)	Baseline ref.	Change from previous reading (in.)	Cumulative change (in.)	Comments
06/13/73	279.90				
07/10/73	279.70				Calibration
07/19/73	279.80			+0.10	Stable
07/20/73	285.05			+0.10	Calibration
11/12/73	286.00		+0.95	+1.05	Steady increase
01/03/74	286.00			+1.05	Stable
01/06/74	160.30			+1.05	Transfer
03/18/74	160.25		-0.05	+1.00	Stable
03/19/74	120.40			+1.00	Transfer
04/09/74	120.40			+1.00	Stable
03/01/75	272.30			+1.00	Active from 4/10/74 to 2/28/75
03/18/75	273.30		+1.00	+2.00	Steady increase
03/19/75	275.30			+2.00	Valve leak
04/09/75	275.60		+0.30	+2.30	Slow increase
04/17/75	271.70			+2.30	Transfer
05/17/75	273.30		+1.60	+3.90	Steady increase
06/17/75	275.10		+1.80	+5.70	Steady increase
09/23/75	278.70		+3.60	+9.30	Erratic increase
09/30/75	281.20		+2.50	+11.80	Associated with salt-well installation, FIC flushes required
10/03/75	281.20			+11.80	Stable
10/03/75	279.50			+11.80	FIC out of service
10/16/75	278.75		-0.75	+11.05	Slow decrease
10/22/75	276.50			+11.05	Transfer
01/31/76	282.25		+5.75	+16.80	Erratic increase
04/30/76	241.00			+16.80	Salt-well transfer
11/08/76	232.25		-8.75	+8.05	Steady decrease
11/17/76	214.20			+8.05	FIC (FIC now in service)
11/17/76	232.50			+8.05	Manual tape
11/29/76	206.40			+8.05	Salt-well transfers
12/08/76	208.35		+1.95	+10.00	Slowly increasing
02/04/77		177.70		+10.00	Salt-well transfer
02/11/77	177.10		-0.60	+9.40	Slowly decreasing
02/12/77	177.80			+9.40	Pump pit flush
04/22/77	177.40		-0.40	+9.00	Erratic decrease
04/22/77	175.60			+9.00	FIC QA'd
05/05/77	173.70	173.70		+9.00	Decrease associated with sludge surface

TANK 111-S

Liquid Level.

Date	Liquid level (in.)	Baseline ref.	Change from previous reading (in.)	Cumulative change (in.)	Comments
06/22/77	173.80		+0.10	+9.10	Stable
09/07/77	176.80			+9.10	Steady increase
09/09/77		183.10		+9.10	OR No. 77-152 written
11/04/77	186.30			+9.10	FIC calibrated
12/05/77	187.95		+1.65	+10.75	OR No. 77-152 final
12/08/77		190.10		+10.75	Erratic increase
12/16/77	190.80		+0.70	+11.45	Water added
12/21/77		191.50		+11.45	Erratic increase
01/18/78		193.10		+11.45	Water added
02/03/78		196.50		+11.45	Salt-well line flushes
02/14/78		197.00		+11.45	Salt-well activity, jet pump work
02/17/78		197.50		+11.45	Salt-well flush
04/27/78		199.20		+11.45	Salt-well flushing
05/30/78		199.80		+11.45	Salt-well activity and core drilling
06/30/78	202.10		+2.30	+13.75	FIC gage QA and repair
07/12/78		202.60		+13.75	Steady increase
07/19/78	202.90		+0.30	+14.05	Steam condensate
06/30/79	202.70		-0.20	+13.85	Water addition
06/10/80	202.40		-0.30	+13.55	Very slow decrease, readings fluctuate
06/15/81	202.40			+13.55	Very slow decrease, FIC erratic
06/10/82	202.65		+0.25	+13.80	Readings fluctuate from 202.70 to 201.65 in.
06/15/83	202.90		+0.25	+14.05	Erratic increase
06/21/84	203.20		+0.30	+14.35	Stable FIC erratic
05/13/85	202.90		-0.30	+14.05	Erratic increase
06/09/86	203.00		+0.10	+14.15	fluctuate from 202.50 to 203.40 in.
06/08/87	203.10		+0.10	+14.25	Erratic decrease
					Stable
					Readings fluctuate from 202.70 to 203.30 in.

TANK 111-S

Photographs on File.

Order No.	Number of views	Photo date	Synopsis		Surface level-measurement		Plummet photo No.	
			yes	no	FIC (in.)	MT (in.)	FIC	MT
713227	36	71/07/13		X				
742645	30	74/04/16		X	89.20			
742644	53	74/04/17		X	89.20			
756374	31	75/09/04		X	279.90			
771241	0	77/02/09		X	177.10			
7710006	30	77/10/05		X	184.40			
7803218	32	78/03/27		X		217.00		
90746	31	80/04/11	X		202.10	213.00	33	5
107169	32	83/04/19	X		203.00		24	
8403157	29	84/05/09		X	202.80		24	

SD-WM-TI-356
40-11-08

SUMMARY

Tank 111-S is categorized Sound/Deactivated. Past liquid level increases have not been satisfactorily explained. The tank is primary stabilized (3-78) and partially isolated (12-15-82). Several experimental liquid level gauges were installed to measure interstitial liquid. Dry well and liquid level measurement readings remained stable during the review period. Dry wells are the primary means of leak detection, since the tank contains solids.

ACTION CRITERIA

1. Dry well increase: see p. 40-00-04
2. Liquid level limits: see p. 40-00-05

APPENDIX B
WASTE AND LEVEL HISTORY
1954-1996

APPENDIX C

WASTE LEVEL HISTORY
QUARTERLY/MONTHLY
1973-1980

PLOT GENERATED BY: R. P. Schwehr
B. D. Andres

241-S-111 WASTE LEVEL HISTORY
QUARTERLY/MONTHLY
1973 TO 1980

Quarterly/Monthly Waste Volume and Level Summary
 241-S-111
 1973 to 1980

Tank Number	Date	Liquid Volume (kgal)	Sludge Volume (includes saltcake, kgal)	Total Waste Volume (kgal)	Total Waste Level (inches)	Comments	Book Number	Page Number
S111	3/31/73	620	139	759	283	REDOX waste	ARH-2794 A	8
S111	6/30/73	610	139	749	280	REDOX waste	ARH-2794 B	8
S111	9/30/73	625	139	764	285	REDOX waste	ARH-2794 C	8
S111	12/31/73	627	139	766	286	REDOX waste	ARH-2794 D	8
S111	3/31/74	172	139	311	121	Evaporator Bottoms Waste, 209 from 109U, 363 from 104BX, 381 from 105BX, 678 from 104TY, 828 to 101S, 2822 to 102S, 310 to 107S	ARH-CD-133A	8
S111	6/30/74	355	334	689	258	Evaporator Bottoms Waste, 242-S bottoms and recycle	ARH-CD-133B	8
S111	9/30/74	228	502	730	273	Evaporator Bottoms Waste, 242-S bottoms and recycle	ARH-CD-133C	8
S111	12/31/74	129	563	692	259	Evaporator Bottoms Waste, 242-S bottoms and recycle	ARH-CD-133D	8
S111	3/31/75	143	596	739	276	Evaporator Bottoms Waste, 242-S bottoms and recycle	ARH-CD-336A	8
S111	6/30/75	143	596	739	276	Evaporator Bottoms Waste, 242-S bottoms and recycle	ARH-CD-336B	8
S111	9/30/75	0	750	750	280	Salt filled	ARH-CD-336C	8
S111	12/31/75	0	750	750	280	Salt filled	ARH-CD-336D	8
S111	3/31/76	0	750	750	280	Salt filled, 73 to 107S	ARH-CD-702A	8
S111	6/30/76	0	750	750	280	Removed From Service-Salt filled, 49 t	ARH-CD-702B	8
S111	9/30/76	0	750	750	280	Inactive-Salt Well, Pumping	ARH-CD-702 I	11, 32
S111	10/1/76	0	750	750	280	Inactive-Salt Well, Pumping	ARH-CD-822 OCT	12, 32
S111	11/1/76	0	750	750	280	Inactive-Salt Well, Pumping	ARH-CD-822 NOV	12, 32
S111	12/1/76	0	623	623	234	Inactive-Salt Well, Pumping	ARH-CD-822 DEC	14, 34
S111	1/1/77	0	623	623	234	Inactive-Salt Well, Pumping	ARH-CD-822 JAN	14, 34
S111	2/1/77	0	623	623	234	Inactive-Salt Well, Pumping	ARH-CD-822 FEB	14, 34
S111	3/1/77	0	623	623	234	Inactive-Salt Well, Pumping Phase 2 P	ARH-CD-822 MAR	14, 34
S111	4/1/77	0	623	623	234	Inactive-Salt Well, Pumping Phase 2 P	ARH-CD-822 APR	14, 34
S111	5/1/77	0	623	623	234	Inactive-Salt Well, Pumping Phase 2 P	ARH-CD-822 MAY	14, 35
S111	6/1/77	0	623	623	234	Inactive-Salt Well, Pumping Phase 2 P	RHO-CD-14 JUN 77	14, 35
S111	7/1/77	0	623	623	234	Inactive-Salt Well, Pumping Phase 2 P	RHO-CD-14 JUL 77	14, 35
S111	8/1/77	0	623	623	234	Inactive-Salt Well, Pumping Phase 2 Pumping, Evaporator Feed	RHO-CD-14 AUG 77	14, 35
S111	9/1/77	0	623	623	234	Inactive-Salt Well, Pumping Phase 2 Pumping, Evaporator Feed	RHO-CD-14 SEP 77	14, 35
S111	10/1/77	0	623	623	234	Inactive-Salt Well, Pumping Phase 2 Pumping, Evaporator Feed	RHO-CD-14 OCT 77	15, 37
S111	11/1/77	0	623	623	234	Inactive-Salt Well, Pumping Phase 2 Pumping, Evaporator Feed	RHO-CD-14 NOV 77	15, 37
S111	12/1/77	0	623	623	234	Inactive-Salt Well, Pumping Phase 2 Pumping, Evaporator Feed	RHO-CD-14 DEC 77	15, 37
S111	1/1/78	0	623	623	234	Inactive-Salt Well, Pumping Phase 2 P	RHO-CD-14 JAN 78	15, 37
S111	2/1/78	0	623	623	234	Inactive-Salt Well, Pumping Phase 2 P	RHO-CD-14 FEB 78	15, 37
S111	3/1/78	0	623	623	234	Inactive-Primary Stabilized	RHO-CD-14 MAR 78	15, 37
S111	4/1/78	0	623	623	234	Inactive-Primary Stabilized	RHO-CD-14 APR 78	15, 37
S111	5/1/78	0	623	623	234	Inactive-Primary Stabilized	RHO-CD-14 MAY 78	15, 37
S111	6/1/78	0	623	623	234	Inactive-Primary Stabilized	RHO-CD-14 JUN 78	15, 38
S111	7/1/78	0	623	623	234	Inactive-Primary Stabilized	RHO-CD-14 JUL 78	20
S111	8/1/78	0	623	623	234	Inactive-Primary Stabilized	RHO-CD-14 AUG 78	20
S111	9/1/78	0	623	623	234	Inactive-Primary Stabilized	RHO-CD-14 SEP 78	20
S111	10/1/78	0	623	623	234	Inactive-Primary Stabilized	RHO-CD-14 OCT 78	20
S111	11/1/78	0	623	623	234	Inactive-Primary Stabilized	RHO-CD-14 NOV 78	20
S111	12/1/78	0	623	623	234	Inactive-Primary Stabilized	RHO-CD-14 DEC 78	20

Quarterly/Monthly Waste Volume and Level Summary
 241-S-111
 1973 to 1980

Tank Number	Date	Liquid Volume (kgal)	Sludge Volume (includes saltcake, kgal)	Total Waste Volume (kgal)	Total Waste Level (inches)	Comments	Book Number	Page Number
S111	1/1/79	0	623	623	234	Inactive-Primary Stabilized	RHO-CD-14 JAN 79	20
S111	2/1/79	0	623	623	234	Inactive-Primary Stabilized	RHO-CD-14 FEB 79	20
S111	3/1/79	0	623	623	234	Inactive-Primary Stabilized	RHO-CD-14 MAR 79	20
S111	4/1/79	0	623	623	234	Inactive-Primary Stabilized	RHO-CD-14 APR 79	20
S111	5/1/79	0	623	623	234	Inactive-Primary Stabilized	RHO-CD-14 MAY 79	20
S111	6/1/79	0	623	623	234	Inactive-Primary Stabilized	RHO-CD-14 JUN 79	20
S111	7/1/79	0	623	623	234	Inactive-Primary Stabilized	RHO-CD-14 JUL 79	20
S111	8/1/79	0	623	623	234	Inactive-Primary Stabilized	RHO-CD-14 AUG 79	20
S111	9/1/79	0	623	623	234	Inactive-Primary Stabilized	RHO-CD-14 SEP 79	20
S111	10/1/79	0	623	623	234	Inactive-Primary Stabilized	RHO-CD-14 OCT 79	20
S111	11/1/79	0	623	623	234	Inactive-Primary Stabilized	RHO-CD-14 NOV 79	20
S111	12/1/79	0	623	623	234	Inactive-Primary Stabilized	RHO-CD-14 DEC 79	20
S111	1/1/80	0	623	623	234	Inactive-Primary Stabilized	RHO-CD-14 JAN 80	20
S111	2/1/80	0	623	623	234	Inactive-Primary Stabilized	RHO-CD-14 FEB 80	20
S111	3/1/80	0	623	623	234	Inactive-Primary Stabilized	RHO-CD-14 MAR 80	20
S111	4/1/80	0	623	623	234	Inactive-Primary Stabilized	RHO-CD-14 APR 80	20
S111	5/1/80	0	623	623	234	Inactive-Primary Stabilized	RHO-CD-14 MAY 80	20
S111	6/1/80	0	623	623	234	Inactive-Primary Stabilized	RHO-CD-14 JUN 80	20
S111	7/1/80	0	623	623	234	Inactive-Primary Stabilized	RHO-CD-14 JUL 80	20
S111	8/1/80	0	623	623	234	Inactive-Primary Stabilized	RHO-CD-14 AUG 80	20
S111	9/1/80	0	623	623	234	Inactive-Primary Stabilized	RHO-CD-14 SEP 80	20
S111	10/1/80	0	623	623	234	Inactive-Primary Stabilized	RHO-CD-14 OCT 80	20
S111	11/1/80	0	623	623	234	Inactive-Primary Stabilized	RHO-CD-14 NOV 80	20
S111	12/1/80	0	623	623	234	Inactive-Primary Stabilized	RHO-CD-14 DEC 80	20

APPENDIX D

**WASTE LEVEL HISTORY PLOTS
JUNE 1973 - DECEMBER 1980**

PLOT GENERATED BY: R. P. Schwehr
B. D. Andres

241-S-111 WASTE LEVEL HISTORY
1973

241-S-111 WASTE LEVEL HISTORY
1974

D - 2

241-S-111 WASTE LEVEL HISTORY
1975

WASTE LEVEL (in.)

241-S-111 WASTE LEVEL HISTORY
1977

241-S-111 WASTE LEVEL HISTORY
1978

241-S-111 WASTE LEVEL HISTORY
1979

241-S-111 WASTE LEVEL HISTORY
1980

APPENDIX E

WASTE LEVEL HISTORY DATA
JUNE 1973 - DECEMBER 1980

DATA PREPARED BY: R. P. Schwehr
B. D. Andres

241-S-111 Waste Level History
1973 to 1980

Tank Number	Date	Transfer Source	Transfer Destination	Tank Addition Value (inches)	Tank Reduction Value (inches)	Waste Level Value (FIC/in)	Comments	Box Number	Book
S111	6/13/73					279.90		111506	#2 TF&EPC
S111	7/1/73					279.90		111506	#2 TF&EPC
S111	7/10/73					279.70	Inst. calibration	111506	#2 TF&EPC
S111	7/15/73					279.70		111506	#2 TF&EPC
S111	7/19/73					279.80		111506	#2 TF&EPC
S111	7/20/73					285.05	Inst. calibration	111506	#2 TF&EPC
S111	8/1/73					285.10		111506	#2 TF&EPC
S111	8/15/73					285.00		111506	#2 TF&EPC
S111	9/1/73					285.45		111506	#2 TF&EPC
S111	9/15/73					285.40		111506	#2 TF&EPC
S111	10/1/73					285.50		58069	
S111	10/9/73					285.55	Line flushed at 107-S	58069	
S111	10/15/73					286.00		58069	
S111	11/1/73					285.90		58069	
S111	11/15/73					286.00		58069	
S111	12/1/73					285.90		58069	
S111	12/15/73					285.95		58069	
S111	12/31/73					286.00		58069	
S111	1/1/74					286.00		58070	
S111	1/3/74					286.00			
S111	1/5/74		S102		78.6	207.40	111 pumping to 102-S	58070	
S111	1/6/74		S102		47.1	160.30	111 pumped to 102-S	58070	
S111	1/22/74					160.25		58070	
S111	1/23/74					160.40	Flush water	58070	
S111	2/1/74					160.30		58070	
S111	2/1/74					160.25		58070	
S111	3/18/74					160.25		58070	
S111	3/19/74				39.85	120.40	active	58070	
S111	4/1/74					120.40		58070	
S111	4/9/74					120.40		58070	
S111	4/10/74		S102		31.2	89.20	active. 4-12 shift reading	58070 111506	Daily LL & Book #2 TF&EPC
S111	4/21/74					89.20		58070	
S111	4/22/74			32		121.20	active	58070	
S111	4/23/74			7.3		128.50	active	58070	
S111	4/30/74					128.30		58070	
S111	5/1/74			21.45		149.75	active	58070	
S111	5/2/74			47.75		197.50	active	58070	
S111	5/3/74			44.8		242.30	active	58070	
S111	5/4/74			10.6		252.90	active	58070	
S111	5/5/74		S102		33.5	219.40	active	58070 111506	Daily LL & Book #2 TF&EPC
S111	5/6/74				57.3	162.10	active	58070	
S111	5/7/74				20.6	141.50	active	58070	
S111	5/8/74					141.45		58070	
S111	5/9/74			35.55		177.00	active	58070	
S111	5/10/74			46.4		223.40	active	58070	
S111	5/11/74			46.7		270.10	active	58070	
S111	5/12/74			2.1		272.20	active	58070	
S111	5/13/74		S102		90.1	182.10	active	58070 111506	Daily LL & Book #2 TF&EPC

241-S-111 Waste Level History
1973 to 1980

Tank Number	Date	Transfer Source	Transfer Destination	Tank Addition Value (inches)	Tank Reduction Value (inches)	Waste Level Value (FIC/in)	Comments	Box Number	Book
S111	5/14/74		S102		32.2	149.90	active	58070 111506	Daily LL & Book #2 TF&EPC
S111	5/15/74	slurry		40.7		190.60	slurry to 111-S	58070	
S111	5/16/74			49.6		240.20	active	58070	
S111	5/17/74			33.3		273.50	active	58070	
S111	5/18/74			0.25		273.75	active	58070	
S111	5/19/74				46.55	227.20	active	58070	
S111	5/20/74				87.5	139.70	active	58070	
S111	5/21/74			14.4		154.10	active	58070	
S111	5/22/74			6.9		161.00	active	58070	
S111	5/23/74			55.1		216.10	active	58070	
S111	5/24/74			54.8		270.90	active	58070	
S111	5/25/74			2.2		273.10	active	58070	
S111	5/26/74				69.4	203.70	active	58070	
S111	5/27/74			54.15		257.85	active	58070	
S111	5/28/74			13.8		271.65	active	58070	
S111	5/28/74				69.95	201.70	active, 12-8 shift reading.	58070	
S111	5/29/74			5.4		207.10	active	58070	
S111	5/30/74			52		259.10	active	58070	
S111	5/30/74			4.6		263.70	active, 4-12 & 12-8 shift readings	58070	
S111	5/31/74				2.65	261.05	active	58070	
S111	6/1/74				92	169.05	active	58070	
S111	6/2/74			42.95		212.00	active	58070	
S111	6/3/74			53.8		265.80	active	58070	
S111	6/4/74			8.6		274.40	active	58070	
S111	6/5/74				88.3	186.10	active	58070	
S111	6/6/74					185.95		58070	
S111	6/7/74			41.15		227.10	active	58070	
S111	6/8/74			47.35		274.45	active	58070	
S111	6/9/74					274.45		58070	
S111	6/10/74				76.7	197.75	active, 4-12 shift reading.	58070	
S111	6/11/74			34		231.75	active	58070	
S111	6/12/74			42.9		274.65	active, 12-8 shift reading	58070	
S111	6/13/74				49.65	225.00	active, 4-12 shift reading	58070	
S111	6/14/74			48.35		273.35	active, 12-8 shift reading	58070	
S111	6/15/74				43.3	230.05	active, 12-8 shift reading	58070	
S111	6/16/74					230.20		58070	
S111	6/17/74			44.2		274.40	active	58070	
S111	6/18/74					274.50		58070	
S111	6/19/74				17.85	256.65	active	58070	
S111	7/1/74					257.75		58070	
S111	7/2/74					257.85		58070	
S111	7/3/74					258.30	flushed 111-S - after flush 258.3	58070	
S111	7/4/74					258.50	111-S sitting on crust	58070	
S111	7/7/74					259.35		58070	
S111	7/8/74			15.35		274.70	active	58070	
S111	7/17/74					275.30		58070	
S111	7/17/74		S102		32.8	242.50	pumped 111-S to 102-S	58070	
S111	7/18/74			2.95		245.45	active	58070	
S111	7/19/74			28.9		274.35	active	58070	
S111	7/20/74			0.2		274.55	active	58070	
S111	7/22/74					274.60		58070	

241-S-111 Waste Level History
1973 to 1980

Tank Number	Date	Transfer Source	Transfer Destination	Tank Addition Value (inches)	Tank Reduction Value (inches)	Waste Level Value (FIC/in)	Comments	Box Number	Book
S111	7/23/74		S102		38.25	236.35	111-S to 102-S, 12-8 shift reading	58070	
S111	7/24/74	slurry		37.7		274.05	111-S is slurry tank, 12-8 shift reading	58070	
S111	7/25/74				31	243.05	12-8 shift reading	58070	
S111	7/26/74			32.2		275.25	active, 4-12 shift reading	58070	
S111	7/27/74				61.75	213.50	active, 12-8 shift reading	58070	
S111	7/28/74			60		273.50	active	58070	
S111	7/31/74					273.65		58070	
S111	7/31/74				30.35	243.30	active	58070	
S111	8/1/74			24.8		268.10	active	58070	
S111	8/2/74			6.4		274.50	active	58070	
S111	8/4/74					274.70		58070	
S111	8/4/74		SX101		43.6	231.10	pumping 111-S to 101-SX, 12-8 shift reading	58070	
S111	8/5/74				7.7	223.40		58070	
S111	8/5/74			6.55		229.95	active, 4-12 shift reading	58070	
S111	8/6/74				51.75	178.20	active	58070	
S111	8/7/74			96.15		274.35	active	58070	
S111	8/9/74				105.35	169.00	active	58070	
S111	8/14/74					169.90	111-S rec. slurry (beginning during 4-12 shift)	58070	
S111	8/15/74	slurry		46.75		216.65		58070 111506	Daily LL & Book #1 TFSA
S111	8/16/74	slurry		57.25		273.90	active, 4-12 shift reading	58070 111506	Daily LL & Book #1 TFSA
S111	8/18/74				49.4	224.50	active	58070	
S111	8/19/74	slurry		31.45		255.95	active	58070 111506	Daily LL & Book #1 TFSA
S111	8/20/74	slurry		18.55		274.50	active	58070 111506	Daily LL & Book #1 TFSA
S111	8/21/74				40.65	233.85	active	58070	
S111	8/22/74	slurry		40.35		274.20	active	58070 111506	Daily LL & Book #1 TFSA
S111	8/23/74		S102		39.05	235.15		58070	
S111	8/24/74			2.35		237.50	active	58070	
S111	8/25/74			36.2		273.70	active	58070	
S111	8/25/74				46.05	227.65	active, 12-8 shift reading	58070	
S111	8/27/74			47		274.65	active	58070	
S111	8/27/74				11	263.65	active, 4-12 shift reading	58070	
S111	8/28/74			7.35		271.00	active	58070	
S111	8/30/74					271.35		58070	
S111	8/31/74				29.45	241.90	active	58070	
S111	9/1/74			32.3		274.20	active	58070	
S111	9/1/74				24.95	249.25	active, 4-12 shift reading	58070	
S111	9/2/74			25.15		274.40	active	58070	
S111	9/2/74				10.55	263.85	active 4-12 shift reading	58070	
S111	9/3/74			10.35		274.20	active	58070	
S111	9/3/74				15.5	258.70	active, 4-12 shift reading	58070	
S111	9/4/74			8.6		267.30	active	58070	

241-S-111 Waste Level History
1973 to 1980

Tank Number	Date	Transfer Source	Transfer Destination	Tank Addition Value (inches)	Tank Reduction Value (inches)	Waste Level Value (FIC/in)	Comments	Box Number	Book
S111	9/5/74				27.2	240.10	active, 4-12 shift reading	58070	
S111	9/7/74			32.7		272.80	active	58070	
S111	9/11/74					273.20		58070	
S111	9/12/74		S102		40.2	233.00	111-S pumping to 102-S	58070	
S111	9/13/74					233.30		58070	
S111	9/15/74	slurry		40.6		273.90	active	58070 111506	Daily LL & Book #1 TFSA
S111	9/16/74				44.8	229.10	active	58070	
S111	9/17/74					229.35		58070	
S111	9/19/74	slurry		45.05		274.40	active	58070 111506	Daily LL & Book #1 TFSA
S111	9/20/74				45.7	228.70	active	58070	
S111	9/21/74	slurry		27.8		256.50	111-S rec slurry, 12-8 shift reading	58070	
S111	9/23/74			18.15		274.65	active	58070	
S111	9/24/74				35.85	238.80	active	58070	
S111	9/25/74			4.3		243.10	active, 12-8 shift reading	58070	
S111	9/28/74			31.25		274.35	active	58070	
S111	9/29/74		S102		39.65	234.70	pumping 111-S to 102-S, 12-8 shift reading	58070	
S111	10/1/74			38.15		272.85	active	58070	
S111	10/4/74					273.20		58070	
S111	10/4/74				29.15	244.05	active, 12-8 shift reading	58070	
S111	10/6/74			30.35		274.40	active	58070	
S111	10/6/74				32	242.40	active, 12-8 shift reading	58070	
S111	10/8/74			31.9		274.30	active	58070	
S111	10/10/74					274.60		58070	
S111	10/11/74		S102		35.5	239.10	111-S was pumped to 102-S	58070	
S111	10/12/74					239.30		58070	
S111	10/14/74			26.1		265.40	active	58070	
S111	10/18/74					266.10		58070	
S111	10/19/74			3.75		269.85	active	58070	
S111	11/1/74					271.00		58070	
S111	11/2/74					270.60	readings erratic	58070	
S111	11/7/74					271.50		58070	
S111	11/7/74				17.8	253.70	active, 12-8 shift reading	58070	
S111	11/8/74			20.45		274.15	active, 12-8 shift reading	58070	
S111	11/9/74				28.35	245.80	active, 4-12 shift reading	58070	
S111	11/10/74	slurry		27.05		272.85	active, 4-12 shift reading	58070	
S111	11/11/74				22.85	250.00	active	58070	
S111	11/12/74			24.8		274.80	active	58070	
S111	11/20/74					275.70		58070	
S111	11/20/74		S102		2.4	273.30	111S FIC flushed on days, pumped 2.5" 111S to 102S, 12-8 shift reading	58070	
S111	11/28/74					273.60		58070	
S111	11/28/74		S102		25.2	248.40	Started pumping 111-S to 102-S @ 0830 11/28/74, 4-12 shift reading	58070	
S111	11/30/74			6.9		255.30	active	58070	
S111	12/1/74					255.00		58070	
S111	12/1/74	slurry		19.4		274.40		58070	

**241-S-111 Waste Level History
1973 to 1980**

Tank Number	Date	Transfer Source	Transfer Destination	Tank Addition Value (inches)	Tank Reduction Value (inches)	Waste Level Value (FIC/in)	Comments	Box Number	Book
S111	12/2/74		S102		20.6	253.80	pumping 111-S to 102-S, 12-8 shift reading	58070	
S111	12/2/74	slurry		20.95		274.75	active, 12-8 shift reading	58070 111506	Daily LL & Book #2 TF&EPC
S111	12/3/74		S101		23.05	251.70	Pumped some 111-S to 101-S	58070	
S111	12/4/74	slurry		22.4		274.10	111-S rec slurry	58070	
S111	12/4/74				20.8	253.30	active, 12-8 shift reading	58070	
S111	12/5/74	slurry		21.35		274.65	111-S rec slurry, 4-12 shift reading	58070	
S111	12/5/74		S102		27.35	247.30	pumped 111-S to 102-S, 12-8 shift reading	58070	
S111	12/7/74			24		271.30	active	58070	
S111	12/7/74				22.2	249.10	active	58070	
S111	12/8/74			25.7		274.80	active, 4-12 shift reading	58070	
S111	12/8/74		S101		25	249.80	pumped 111-S to 101-S, 12-8 shift reading	58070	
S111	12/9/74			20.5		270.30	active, 4-12 shift reading	58070	
S111	12/10/74				24.35	245.95		58070	
S111	12/10/74			27.9		273.85	12-8 shift reading	58070	
S111	12/11/74				26.4	247.45	active, 4-12 shift reading	58070	
S111	12/12/74			13.4		260.85	active	58070	
S111	12/14/74	slurry		12.75		273.60	111-S rec slurry	58070	
S111	12/14/74				20.3	253.30	active, 4-12 shift reading	58070	
S111	12/15/74			21.3		274.60	active	58070	
S111	12/15/74				26.3	248.30		58070	
S111	12/16/74	slurry		25.9		274.20	active, 4-12 shift reading	58070 111506	Daily LL & Book #2 TF&EPC
S111	12/16/74				30.3	243.90	active, 12-8 shift reading	58070	
S111	12/17/74			30.3		274.20	active, 12-8 shift reading	58070	
S111	12/18/74				26.1	248.10	active	58070	
S111	12/19/74			25.8		273.90	active	58070	
S111	12/19/74				29.15	244.75	active, 12-8 shift reading	58070	
S111	12/20/74			29.25		274.00	active, 12-8 shift reading	58070	
S111	12/21/74		S102		27.9	246.10	pumped 111-S to 102-S	58070	
S111	12/22/74			28.3		274.40	active, 4-12 shift reading	58070	
S111	12/23/74				28.15	246.25	active	58070	
S111	12/24/74			13.9		260.15	active	58070	
S111	12/27/74					260.70	111-S rechecked, same value	58070	
S111	12/28/74			13		273.70	active, 12-8 shift reading	58070	
S111	12/29/74				25.2	248.50	active, 4-12 shift reading	58070	
S111	12/30/74	slurry		25.5		274.00	111-S rec slurry	58070	
S111	12/31/74		S102		31.3	242.70	111-S pumping to 102-S, 4-12 shift reading	58070	
S111	1/1/75	slurry		30.05		272.75	slurry receiver	58102 58072	
S111	1/2/75				24.25	248.50	active	58072	
S111	1/3/75			25.8		274.30		58072	
S111	1/4/75				29.6	244.70	active	58072	
S111	1/5/75			29.5		274.20	active	58072	
S111	1/6/75				14.2	260.00	active, 4-12 shift reading	58072	

241-S-111 Waste Level History
1973 to 1980

Tank Number	Date	Transfer Source	Transfer Destination	Tank Addition Value (inches)	Tank Reduction Value (inches)	Waste Level Value (FIC/in)	Comments	Box Number	Book
S111	1/7/75			13.55		273.55	active	58072	
S111	1/8/75		S101		14.9	258.65	111-S to 101-S, 12-8 shift reading	58072	
S111	1/9/75			15.35		274.00	active, 4-12 shift reading	58072	
S111	1/10/75				12	262.00	active	58072	
S111	1/10/75	slurry		12.4		274.40	111-S rec slurry, 4-12 shift reading	58072	
S111	1/11/75		S102		4.55	269.85	111-S to 102-S, 12-8 shift reading	58072	
S111	1/12/75				5.25	264.60	active	58072	
S111	1/13/75			9.8		274.40		58072	
S111	1/14/75		S102		7.5	266.90	111-S to 102-S	58072	
S111	1/17/75		S102		4.6	262.30	pumped 111-S to 102-S	58072	
S111	1/23/75					262.50	8-4 shift reading	58072	
S111	1/23/75					262.90	111-S raised pump and repositioned, 4-12 shift reading	58072	
S111	1/24/75					262.70		58072	
S111	2/1/75					262.85		58072	
S111	2/11/75					263.50		58072	
S111	2/12/75					263.70	raised and flushed 110-S & 111-S FIC's	58072	
S111	2/16/75					264.00	Some water to 111-S when checking CA1-2 and CA1-2A	58072	
S111	2/17/75					264.10	111-S has rec. some slurry line flush for jumper testing	58072	
S111	2/21/75			7.15		271.25	active	58072	
S111	2/24/75				1.3	269.95	active	58072	
S111	2/25/75		S101		4.05	265.90	pumped some 111-S to 101-S	58072	
S111	2/26/75		S101/2		4.3	261.60	active, 111-S pumped to 101 S, 4-12 shift reading	58072	
S111	2/27/75	slurry		10.6		272.20	active	58072 111506	
S111	3/1/75					272.40		58072	
S111	3/17/75					273.20		58072	
S111	3/18/75					274.70	Apparently a valve leak from a transfer to 110-S. 111-S FIC needs flushing	58072	
S111	3/19/75					275.30	inst checking F.I.C. Valve leaking	58072	
S111	3/20/75					274.80	tried to pump 111-S	58072	
S111	4/1/75					275.55	Baseline established 4/1/75 2 274.0 per box 111506	58072 111506	
S111	4/3/75					275.70	flushed FIC, B: 275.85, A: 275.7, 4-12 shift	58072	
S111	4/9/75					275.65		58072	
S111	4/10/75					276.15	111-S pump pulled on 8-4 shift used flush water, 4-12 shift reading	58072	
S111	4/11/75		S101		4	272.15	pumped 111-S to 101-S, 4-12 shift reading	58072	

241-S-111 Waste Level History
1973 to 1980

Tank Number	Date	Transfer Source	Transfer Destination	Tank Addition Value (inches)	Tank Reduction Value (inches)	Waste Level Value (FIC/in)	Comments	Box Number	Book
S111	4/12/75					273.80	valve suspected of leaking thru during 101-S to 102-S transfer, 12-8 shift reading.	58072	
S111	4/13/75		S101		19.5	254.30	active, 12-8 shift reading	58072 111506	
S111	4/15/75	slurry		17.45		271.75	slurry receiver, 4-12 shift reading	58072 111506	
S111	4/17/75					271.70	Baseline established per hand sheets Box 111506	58072 111506	
S111	5/1/75					272.50		58072	
S111	5/5/75					273.30	FIC flushed, B: 272.7, A: 273.3, (8-4)	58072	
S111	5/17/75					273.30		58072	
S111	5/22/75					273.50	FIC	58072	
S111	5/22/75					273.50	Sludge reading - MT	58072	
S111	6/1/75					274.10		58072	
S111	6/7/75					274.30	111-S FIC's acting up 274.3 to 275.0	58072	
S111	6/10/75					274.30	111-S readings erratic (range from 274.3 to 275.0)	58072	
S111	6/17/75					275.10		58072	
S111	6/22/75					275.80	Flushed FIC, B: 275.3, A: 275.8	58072	
S111	6/23/75					275.10		58072	
S111	6/24/75					274.70	111-S erratic, 12-8 shift reading	58072	
S111	7/1/75					275.50		58072	
S111	7/6/75					276.10	111-S double checked. Readings erratic. 4-12 shift reading	58072	
S111	7/22/75					277.20	FIC flushed, B: 277.7, A: 277.2	58072	
S111	7/23/75					276.90	FIC flushed 7-22-75	58072	
S111	8/1/75					277.05		58072	
S111	8/3/75					277.55	110 + 111 are erratic, 12-8 shift	58072	
S111	8/19/75					279.30	Salt cakes in these tanks-isolated tanks. Build up and drop.	58072	
S111	8/20/75					279.20	110-S & 111-S are very erratic	58072	
S111	8/22/75					280.30	111-S very erratic also 112-S, (4-12)	58072	
S111	8/23/75					280.50	111-S erratic	58072	
S111	8/24/75					279.70		58072	
S111	8/27/75					280.10	pictures, according to hand sheets, Box 111506	58072 111506	
S111	9/1/75					279.60		58072	
S111	9/3/75					278.00			
S111	9/2/75					278.10	111-S sludge reading these reading(s) fluctuate from day to day.	58072	
S111	9/23/75					278.70		58072	

**241-S-111 Waste Level History
1973 to 1980**

Tank Number	Date	Transfer Source	Transfer Destination	Tank Addition Value (inches)	Tank Reduction Value (inches)	Waste Level Value (FIC/in)	Comments	Box Number	Book
S111	9/24/75					279.55	Salt well installed in 111-S. Inst. dept. found that the FIC tape had unwound. This was flushed and FIC was calibrated on 9/24/75.	58072	
S111	9/25/75					278.80	erratic	58072	
S111	9/27/75					280.80	111S raised & works. The readings are very erratic. (12-8 shift)	58072	
S111	9/30/75					281.20	Exceeds maximum specification level of 281". Occurrence Report 75-109 initiated.	O.R. 75-109	
S111	10/1/75					280.65	111-S This reading has been erratic. This FIC had been calibrated on 9/29/75 the past readings have been 280.8 and as low as 278.8.	58072	
S111	10/2/75						Inst. dept. working on 111-S FIC. This FIC has been taken out of service as it is hitting dry sludge. 111-S FIC will be read as a sludge measurement tonight.	58072	
S111	10/3/75					279.75	manual tape reading (4-12)	58072	
S111	10/4/75					279.00	manual tape reading. Re-checked from 277.75.	58072	
S111	10/5/75					279.00	manual tape reading	58072	
S111	10/6/75					279.75	manual tape reading	58072	
S111	10/7/75					279.00	111-S sludge reading (manual tape) Rough sludge	58072	
S111	10/17/75					279.00	Saltwell pumping begins	58072	
S111	10/18/75		S107		0.5	278.50	manual tape, 111-S salt well to 107-S	58072	
S111	10/19/75		S107		2.25	276.25	manual tape, pumped saltwell	58072	
S111	10/21/75		S107			276.50	manual tape, 111-S to 107-S	58072	
S111	10/22/75		S107			276.25	manual tape (MT), salt well pumping 111-S to 107-S	58072	
S111	10/25/75					276.50	MT. 170, 200 and 200 gallons flush water added on 10/21, 10/23 and 10/25/75, respectively.	58072 121870	
S111	10/28/75					276.50	200 gallons water to saltwell	58072 121870	
S111	10/31/75					276.00	MT, 111-S is a sludge reading and this LL varies	58072	
S111	11/1/75					276.50	MT	58072	

241-S-111 Waste Level History
1973 to 1980

Tank Number	Date	Transfer Source	Transfer Destination	Tank Addition Value (inches)	Tank Reduction Value (inches)	Waste Level Value (FIC/in)	Comments	Box Number	Book
S111	11/3/75		S107			276.50	Added 100 gallons water, then saltwell pump to 107-S	111506 121870	
S111	11/4/75					276.25	added 100 gallons water	58072 121870	
S111	11/6/75		S107			276.50	saltwell pump to 107-S	111506	
S111	11/10/75					276.75	MT, sludge reading (4-12)	58072	
S111	11/14/75					277.25	MT, 111-S has been salt well pumped and this sometimes causes changes in LL. This reading has been from 23' 1/2" to 23' 3". This is on sludge.	58072	
S111	11/15/75					277.00	MT, sludge reading	58072	
S111	11/24/75		S107			277.00	MT, 104-S and 111-S salt wells pumped to 107-S.	58072	
S111	11/26/75					279.00	MT, Sludge. 111-S 23' 3" was our original reading when the tape was installed and since then it varies from 23' 1" to 23' 3".	58072	
S111	12/1/75					277.75	MT, 111-S tape flushed, B: 23' 3", A: 23' 1 3/4".	58072	
S111	12/2/75		S107			278.25	MT, pumping 111-S salt well to 107-S	58072	
S111	12/3/75		S107			278.25	MT, pumping 111-S salt well to 107-S	58072	
S111	12/4/75		S107			278.25	MT, pumping 111-S salt well to 107-S	58072	
S111	12/5/75					276.75	MT, 111-S as in the past after salt well pumping, some time later there will be a large change in LL reading. Recheck on 111-S LL tape is reading 23' 2".	58072	
S111	12/17/75					278.50	MT. You can get just about anything you want.	58072	
S111	12/19/75					278.75	MT. 111-S sludge reading when tape goes slack.	58072	
S111	12/24/75					279.25	MT. sludge or salt cake reading (12-8)	58072	
S111	12/31/75					279.75	MT. End of year.	58072	
S111	1/1/76					279.75	MT	58074	
S111	1/11/76					282.00	MT. Probe touches salt cake at 23' 6", then bounces into hole to 23' 4 1/2".	58074	
S111	1/27/76					282.00	MT. Flushed 111-S, B: 23' - 6", A: 23' - 6". Good solid reading.	58074	
S111	1/30/76					282.50	MT. Pump work by day shift H2O flush.	58074	

241-S-111 Waste Level History
1973 to 1980

Tank Number	Date	Transfer Source	Transfer Destination	Tank Addition Value (inches)	Tank Reduction Value (inches)	Waste Level Value (FIC/in)	Comments	Box Number	Book
S111	1/31/76					282.25	MT. Pump work.	58074	
S111	2/1/76		S107		0.75	281.50	MT. Saltwell pump to 107-S.	58074	
S111	3/1/76		S107		23.5	258.00	MT. Saltwell pump to 107-S continues.	58074	
S111	4/1/76		S107		9	249.00	MT. Saltwell pump to 107-S continues.	58074	
S111	5/1/76		S107		8	241.00	MT. Saltwell pumping to 107 S concluded. Sludge reading. MT baseline established at 241.	58074 111506	
S111	5/11/76					239.50	MT. No criteria on decrease - to be approved.	58074 111506	
S111	6/1/76					239.25	MT	58074	
S111	6/2/76					237.50	MT. Crust reading.	58074	
S111	6/16/76					236.50	MT. Sludge reading (4-12 and 12-8 shifts) - evidently the sludge is gradually settling as indicated by readings for the past 45 days.	58074	
S111	7/1/76					236.00	MT	58074	
S111	7/18/76					235.25	MT. This is a sludge level only. FIC in salt well reads 173.1.	58074	
S111	8/1/76					234.75	MT	58074	
S111	9/1/76					233.75	MT	58074	
S111	10/1/76					233.25	MT	58074	
S111	11/1/76					232.50	MT	58074	
S111	11/9/76		S107			232.25	MT. salt well to 107-S	58074	
S111	11/18/76					232.25	MT. 111-S FIC has been reactivated. It now has a micro switch installed which gives the FIC the capability of reading dry sludge.	58074	
S111	11/18/76						<div style="text-align: center;"> <u>M.T.</u> <u>F.I.C.</u> Diff. 11-17-76 232.50 214.20 18.30 11-18-76 232.25 213.60 18.65 Photos show slumping hole @ FIC. Stair step to outer edge and MT. </div>	58074	
S111	11/19/76		S107		1	212.60	FIC. MT is 232.25. Salt well to 107-S	58074	
S111	11/29/76					206.40	FIC	58074	
S111	12/1/76		S107		6.05	206.55	FIC. MT is 232.25.	58074	
S111	12/8/76					208.35		58074	
S111	12/9/76		S107		0.6	205.95	FIC. MT is 232. (4-12 readings)Tape OK. FIC is modified to read sludge, has worked well but is a little erratic, no criteria for decrease.	58074	

241-S-111 Waste Level History
1973 to 1980

Tank Number	Date	Transfer Source	Transfer Destination	Tank Addition Value (inches)	Tank Reduction Value (inches)	Waste Level Value (FIC/in)	Comments	Box Number	Book
S111	12/13/76		S107		4.55	201.40	FIC. MT is 231.5. The modified FIC keeps coming down slowly, don't know whether its due to the salt well pumping activities, the FIC is pounding a hole in the sludge, inst. problems or a combination of one or more of these.	58074	
S111	12/31/76		S107		11.2	190.20	FIC. MT is 230.25.	58074	
S111	1/1/77		S107		0.7	189.50	FIC. MT is 230.25.	61235	
S111	1/28/77		S107		11.8	177.70	FIC baseline.	61235 111506	
S111	2/1/77					177.50	FIC. MT is 227.5.	61235	
S111	2/4/77					177.20		61235	
S111	2/11/77					177.10	FIC. MT is 226.5.	61235	
S111	2/12/77					177.80	FIC. MT is 227. Day crew did a chemical & water flush of the 111S pump pit yesterday.	61235	
S111	2/16/77						FIC down for repairs. MT is 226.25.	61235	
S111	2/18/77					177.90	FIC back in service. MT is 226.25.	61235	
S111	3/1/77					177.70	FIC. MT is 225.75. New microswitch on FIC.	61235	
S111	3/9/77					177.30	FIC. Back in service after being out of service for the last few days. MT is 225.5.	61235	
S111	4/1/77					177.40	FIC. MT is 224.5.	61235	
S111	4/22/77					175.60	FIC. QA'd 111-S, B: 177.4, A: 175.6.	61235	
S111	4/24/77					173.70	FIC. Was QA'd on 4/22/77. It read 175.6 after. On 4-12 (shift) it read 174.0. The water must have softened the salt cake & the plummet is making a hole. (this entry from 4/23/77 data sheet.)	61235	
S111	5/1/77					173.70	FIC.	61235	
S111	5/5/77					173.70	FIC baseline.	61235 111509	
S111	6/1/77					173.80	FIC.	61235	
S111	6/22/77					173.80		61235	
S111	7/1/77					174.00	FIC	61235	
S111	8/1/77					174.60	FIC	61235	
S111	8/2/77					174.70	FIC. MT is 222.25.	61235	
S111	8/5/77					174.90	FIC flushed, B: 174.9, A: 174.9	61235	
S111	8/17/77					175.60	FIC flushed, B: 175.7, A: 175.6	61235	
S111	9/1/77					176.45	FIC.	61235	

**241-S-111 Waste Level History
1973 to 1980**

Tank Number	Date	Transfer Source	Transfer Destination	Tank Addition Value (inches)	Tank Reduction Value (inches)	Waste Level Value (FIC/in)	Comments	Box Number	Book
S111	9/4/77					176.80	Exceeds 3" criterion above baseline. Occurrence Report 77-152 initiated.	O.R. 77-152	
S111	9/6/77					176.80	FIC repair. Scheduled for recalibration on 9/7/77. MT is 221.5.	61235	
S111	9/7/77					183.20	FIC recalibrated.	61235	
S111	9/8/77					183.10	FIC was flushed and recalibrated on 9/7/77 @ 183.2. Baseline established @ 183.1.	61235 111509	
S111	10/1/77					184.30	FIC. MT was 221.25 on 9/30/77.	61235	
S111	10/6/77					184.70	FIC flushed, B: 185.2, A: 184.7. MT is 221.	61235	
S111	10/28/77					186.15	FIC flushed, B: 186.15, A: 186.15. Criterion exceeded.	61235 111509	
S111	11/1/77					186.30	FIC	61235	
S111	11/4/77					186.30	FIC. 4-12 shift reading . New FIC baseline.	61235 111509	
S111	12/1/77					187.90	FIC	61235	
S111	12/5/77					187.95	FIC	61235	
S111	12/6/77					191.10	FIC. 4-12 shift reading. Water added thru salt well pump. Previous LL during 8-4 shift was 188.35.	61235	
S111	12/8/77					190.00	FIC. New baseline established @ 190.1.	61235 111509	
S111	12/11/77					190.90	FIC. 111-S is a salt well TK. No criteria.	61235	
S111	12/15/77					191.40		61235	
S111	12/16/77					190.80	Added 1200 gallons water	61235 121869	
S111	12/17/77					191.90	FIC. 12-8 shift entry, 8-4 shift (day shift) value was 190.8. Water added to 111-S. Day crew work.	61235	
S111	12/21/77					191.60	FIC. Baseline established @ 191.5.	61235 111509	
S111	12/28/77					192.05	FIC. Days tried to get 111S to pump - flushes to 107S.	61235	
S111	12/31/77					192.30	FIC	61235	
S111	1/1/78					192.30	Monthly tank level - FIC	68564	
S111	1/5/78					193.65	FIC flush	111506	
S111	1/15/78					194.75	criterion exceeded	111506	
S111	1/17/78					194.75	FIC flush	111506	
S111	1/18/78					194.60	new baseline established @ 193.1	111509	
S111	1/31/78					196.35	Criterion exceeded	111506	
S111	2/1/78					196.35	Monthly tank level - FIC	68564	
S111	2/3/78					196.40	New baseline set @ 196.5	111506 111509	

**241-S-111 Waste Level History
1973 to 1980**

Tank Number	Date	Transfer Source	Transfer Destination	Tank Addition Value (inches)	Tank Reduction Value (inches)	Waste Level Value (FIC/in)	Comments	Box Number	Book
S111	2/7/78					197.00	pump repair - tried to pump.	111506	
S111	2/14/78					197.10	new baseline set @ 197.0	111506 111509	
S111	2/17/78					197.45	Installed saltwell pump. New baseline @ 197.5	111506 111509	
S111	2/27/78					198.35		111509	
S111	2/28/78					198.60	Possible back flushing - FIC	68564	
S111	3/1/78					198.60	Monthly tank level - FIC	68564	
S111	3/1/78		S107		0.05	198.55	Saltwells to S107 - FIC	68564	
S111	3/2/78		S107		0.15	198.40	Saltwells to S107 - FIC	68564	
S111	3/7/78					199.00	flush line	111506	
S111	3/9/78		S107		0.20	199.00	Saltwells to S107 - FIC	68564	
S111	3/10/78		S107		0.15	198.95	Saltwells to S107 - FIC	68564	
S111	3/13/78		S107		0.25	198.55	Saltwells to S107 - FIC	68564	
S111	3/14/78		S107		0.45	198.25	Saltwells to S107 - FIC	68564	
S111	3/16/78		S107		0.40	198.00	Saltwells to S107 - FIC. MT is 217.5	68564	
S111	4/1/78					198.20	Monthly tank level - FIC	68564	
S111	4/18/78					198.60		111506	
S111	4/21/78					198.95	core drilling	111506	
S111	4/27/78					199.20	New baseline	111506 111509	
S111	5/1/78					199.40	Monthly tank level - FIC	68564	
S111	5/12/78					199.75	FIC QA'd. New baseline set @ 199.80.	111506 111509	
S111	5/30/78					200.50	Baseline set @ 199.8 on 5/29/78	111506 111509	
S111	6/1/78					200.60	Monthly tank level - FIC	68564	
S111	7/1/78					202.10	Monthly tank level - FIC	68564	
S111	7/12/78					202.60	New baseline	111506 111509	
S111	7/18/78					202.85		111506	
S111	7/19/78					202.90	H2O added	111506	
S111	8/1/78					203.00	Monthly tank level - FIC	68564	
S111	9/1/78					203.15	Monthly tank level - FIC	68564	
S111	10/1/78					203.00	Monthly tank level - FIC	68564	
S111	11/1/78					202.90	Monthly tank level - FIC	68564	
S111	12/1/78					203.40	Monthly tank level - FIC	68564	
S111	12/31/78					202.70	Year end tank level - FIC	68564	
S111	1/1/79					202.50	Monthly tank level - FIC	74293	
S111	2/1/79					202.85	Monthly tank level - FIC	74293	
S111	3/1/79					203.15	Monthly tank level - FIC	74293	
S111	4/1/79					202.60	Monthly tank level - FIC	74293	
S111	5/1/79					202.55	Monthly tank level - FIC	74293	
S111	6/1/79					202.30	Monthly tank level - FIC	74293	
S111	7/1/79					202.70	Monthly tank level - FIC	74293	
S111	8/1/79					202.56	Monthly tank level - FIC	74293	
S111	9/1/79					202.80	Monthly tank level - FIC	74293	
S111	10/1/79					202.55	Monthly tank level - FIC	74293	
S111	11/1/79					202.50	Monthly tank level - FIC	74293	
S111	12/1/79					202.50	Monthly tank level - FIC	74293	
S111	12/31/79					202.85	year end FIC	74293	

241-S-111 Waste Level History
1973 to 1980

Tank Number	Date	Transfer Source	Transfer Destination	Tank Addition Value (inches)	Tank Reduction Value (inches)	Waste Level Value (FIC/in)	Comments	Box Number	Book
S111	1/1/80					202.80		74292	
S111	2/1/80					202.50		74292	
S111	3/1/80					202.40		74292	
S111	4/1/80					202.60		74292	
S111	5/1/80					202.40		74292	
S111	6/1/80					202.50		74292	
S111	7/1/80					202.40		74292	
S111	8/1/80					202.45		74292	
S111	9/1/80					202.40		74292	
S111	10/1/80					202.20		74292	
S111	11/1/80					202.40		74292	
S111	12/1/80					202.40		74292	
S111	12/31/80					202.20		74292	

APPENDIX F
OCCURRENCE REPORTS

75-109
77-152

OCCURRENCE REPORT

CONTRACTOR Atlantic Richfield Hanford Company		FACILITY 241-S Farm, Tank 111-S		WORK AREA 200 West
REPORT NO. 75-109	☐ PRELIMINARY 10/1/75	☐ INTERIM	☒ FINAL	DATE AND TIME OF OCCURRENCE September 30, 1975
OCCURRENCE SUBJECT VIOLATION OF LIQUID LEVEL SPECIFICATION				

1. DESCRIPTION OF OCCURRENCE AND DESIGNATION OF APPARENT CAUSE

☐ DESIGN
 ☒ MATERIAL
 ☐ PERSONNEL
 ☐ PROCEDURE
 ☐ OTHER

The liquid level in Tank 111-S has increased approximately ten inches over a period of five months to 281.1 inches and has exceeded the maximum specification level of 281.0 inches. There is no known service or process lines connected to the tank which would allow inadvertent liquid additions to the tank. The surface of the liquid is believed to be entirely covered with a thick and uneven crust similar to other S farm tanks which have seen the same type of service. Many of these tanks' liquid levels are increasing and believed to be a chemical phenomenon associated with the tank contents.

bcc: GE Backman
 (w/att)G Burton, Jr.
 HE Campbell, Jr.
 GT Dukelow
 DG Harlow
 HF Jensen
 BJ McMurray
 GC Oberg
 BJ Saveressig
 HP Shaw
 RM Smithers (2)
 GT Stocking
 JA Teal
 JH Warren
 AT White
 RA Zinsli
 Central File

2. OPERATING CONDITIONS OF THE FACILITY AT TIME OF OCCURRENCE (IF APPLICABLE)

The tank has been filled with salt cake as a result of 242-S Evaporator operations. There have been no transfers into or out of the tank since April 1975.

The tank contains an estimated 600,000 gallons of salt cake and 200,000 gallons of liquid, some of which is crusted.

3. IMMEDIATE EVALUATION, CORRECTIVE ACTION TAKEN AND RESULTS

None.

4. RECOMMENDATIONS

A. TEMPORARY CORRECTIVE ACTION

Investigation is being made to determine the best means to reduce the liquid level in the tank.

B. PERMANENT CORRECTIVE ACTION

A planned salt well system was installed on a priority basis and pumping was initiated on October 10, 1975. The liquid level was lowered below the specification value and continued pumping is expected to reduce the level even further.

C. IS DESIGN CHANGE NECESSARY?

☐ YES☒ NO

IF YES, WHEN

D. IS FURTHER EVALUATION NECESSARY?

☐ YES☒ NO

IF YES, BY WHOM

WHEN

E. PERMANENT CORRECTIVE ACTION TO BE IMPLEMENTED BY:

NAME

DATE

5. SIMILAR OCCURRENCE: BY REPORT NUMBER AND OCCURRENCE SUBJECT

None.

Att.

cc: w/att.

OJ Bennett, ERDA-RL

OJ Elgert, ERDA-RL (3)

PG Rhoades, ERDA-RL

JH Straub, ERDA-RL

G. C. Oberg	Manager, Operations Technical Support	10/28/75
ORIGINATED BY G. T. Dukelow	TITLE Manager, Tank Farm Processing	DATE 10-27-75
REVIEWED BY J. A. Teal	TITLE Manager, Tank Farm Operations	DATE 27 Oct 75
A. T. White	Manager, Quality Assurance and Safety	10/24/75
G. Burton, Jr.	VP, Production and Waste Management	10/29/75
APPROVED BY (PER CONTRACT OPERATING INSTRUCTIONS) R. M. Smithers	TITLE Manager, Tank Farm Management	DATE 10/20/75

54-3570-100R (2-75)

ATTACHMENT TO 75-109

Tank 111-S
Liquid Level Review

<u>Date</u>	<u>Liquid Level (inches)</u>		<u>Comments</u>
	<u>FIC Gauge</u>	<u>Manual Tape</u>	
4/17/75	271.70		After last transfer.
5/17/75	273.30		
6/17/75	275.10		
7/17/75	276.90		
7/29/75	277.30		
8/07/75	277.80		Pictures taken.
8/14/75	278.80		
8/21/75	279.55		
8/27/75	280.10		
8/31/75	279.60		
9/02/75	278.10		
9/07/75	278.40		
9/14/75	278.50		
9/21/75	278.30		
9/24/75	279.55		
9/26/75	280.85		Salt well casing installed.
9/27/75	280.80		FIC flushed.
9/28/75	280.80		
9/29/75	280.70		
9/30/75	281.10		FIC removed from service. Salt well pumping initiated.
10/03/75	281.20	279.50	
10/06/75		279.75	
10/11/75		278.75	
10/19/75		276.25	
10/26/75		276.50	

OCCURRENCE REPORT

HNF-SD-WM-ER-695, Rev. 0

NOV 3 1977

CONTRACTOR Rockwell Hanford Operations		FACILITY 241-S Tank Farm, Tank 111-S		WORK AREA 200 West
REPORT NO. 77-152	☐ PRELIMINARY	☐ INTERIM	☒ FINAL	
OCCURRENCE SUBJECT TANK 111-S LIQUID LEVEL INCREASE EXCEEDING CRITERION			DATE AND TIME OF OCCURRENCE September 4, 1977 9:00 am	

1. DESCRIPTION OF OCCURRENCE AND DESIGNATION OF APPARENT CAUSE

☐ DESIGN ☒ MATERIAL ☐ PERSONNEL ☐ PROCEDURE ☐ OTHER

A liquid level baseline of 173.7 inches was established on May 5, 1977 for Tank 111-S. On September 4, 1977 the liquid level measurement was 176.8 inches, exceeding the allowed 3.0 inch increase above baseline.

The liquid level measurement has continued to rise and is currently (10-28-77) 186.15 in. (Recalibration of the FIC on 9-8-77 changed the measurement from 176.80 in. to 183.10 in.)

The increase is attributed to a natural redistribution of liquid present in the salt cake and sludge.

cc: JC Cummings, DOE
OJ Elgert, DOE (3)
PG Harris, DOE
MW Tiernan, DOE
JH Straub, DOE

bcc: DC Bartholomew
JM Cashman/GT Dukelow
DJ Cockeram
JL Deichman
PJ Fritch
JH Garbrick
RJ Gimera
RS Gruhn
JM Haines (3)
RD Hammond
WF Heine

EJ Kosiancic
GC Owens
RD Prosser
JH Roecker
BJ Saueressig
HP Shaw
SP Stalos
JA Swenson
JC Womack
Central File

2. OPERATING CONDITIONS OF THE FACILITY AT TIME OF OCCURRENCE (IF APPLICABLE)

Tank 111-S is considered sound. The tank last underwent salt-well pumping on January 26, 1977. No future use of the tank is anticipated except Phase II salt-well pumping.

DISTRIBUTION SHEET

To	From	Page 1 of 1
Distribution	C. H. Brevick	Date June 24, 1997
Project Title/Work Order		EDT No. 156937
Flammable Gas Tank Waste Level Reconciliation, Tank 241-S-111 / E40697		ECN No.

Name	MSIN	Text With All Attach.	Text Only	Attach./ Appendix Only	EDT/ECN Only
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