

**TANK 6 SOLIDS VOLUME ESTIMATION AFTER THE CHEMICAL  
CLEANING AND FINAL WASH (U)**

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## TABLE OF CONTENTS

<b>Purpose</b> .....	3
<b>Background</b> .....	3
<b>Solids Mound Mapping</b> .....	3
<b>Solids Mapping Calculation Method</b> .....	3
<b>Summary</b> .....	4
<b>References</b> .....	4

**Attachment A**  
**Attachment B**  
**Attachment C**

**Tank 6 Solids Mapping Charts**  
**Tank 6 Solids Mapping Sketch**  
**Tank 6 Solids Remaining**

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## **Purpose**

The purpose of this report is to document the mapping of remaining solids in Waste Tank 6 after completion of the transfer from Tank 6 to Tank 7, following the final well water wash at the completion of the planned flowsheet for Chemical Cleaning (LWO-PIT-2006-00066).

## **Background**

To support a final water wash, well water was added to Tank 6 to bring the liquid level in the tank to 45 inches. The SMP located in risers 3 and 8 were operated during the initial part of this phase of cleaning. The first part of this transfer began on February 3 at 03:45 and ran until 06:00 when it was stopped due to decreasing flow rate in the purge ventilation system. Upon resolution of the issues associated with the purge ventilation system, the Tank 6 liquid level at that point was 26.4 inches. The Transfer resumed on March 30 at 17:00 and ended at 00:55 on March 31 with the tank at a liquid level of approximately 1 inch per visual inspection. During the pump down of Tank 6, exposed solids were observed and mapped (Attachment A)

## **Solids Mound Mapping**

The mapping of the solids was performed by monitoring Tank 6 during the transfer with 2 cameras. Cameras were installed in Risers 2 and 7. During completion of the transfer, final tank levels were determined by tank inspection using known landmarks. It was noted during the transfer that the Tank 6 radar liquid level indicator appeared to be in error by roughly three inches. At each stage of the mapping emphasis was placed on obtaining images of known landmarks to be compared to the radar readings. Analysis of images verified that the radar was off by approximately three inches.

As mounds appeared, they were mapped on sheets of paper with a scaled grid across the tank area (Attachment B). The in-tank cooling coils, tank columns, SMP columns, and the transfer pump sleeve were used as reference points to estimate exposed solids mound areas as accurately as possible.

## **Solids Mapping Calculation Method**

The exposed mound area and height are inputs in a spreadsheet to calculate the volume of the wet solids left in the tank. The data is charted in a spreadsheet to obtain a 3-D picture of the tank bottom and the mounds. The Northeast solids mound showed little change in terms of shape, size and volume from the previous mapping. The only noticeable change was that the mound shifted further east and south, towards the Valve House return coils

The estimated tank wide solids layer underneath the liquid surface remained at 0.25 inches. This estimation was based on camera inspection of well-lit areas of the tank where fine detail of the tank floor was observed. Landmarks include the hex nuts on the column bases, and the weld fixing the angled horizontal coil supports to the floor.

Based on the tank wide solids layer and the mapping of the observed mounds the remaining solid material volume calculated by the spreadsheet is 3488 gallons. This is an increase in volume from 3250 gallons recorded after the Second Chemical Cleaning phase. A probable cause of this volume increase would be the formation of solid oxalates during the time between Tank 6's transfers.

### **Summary**

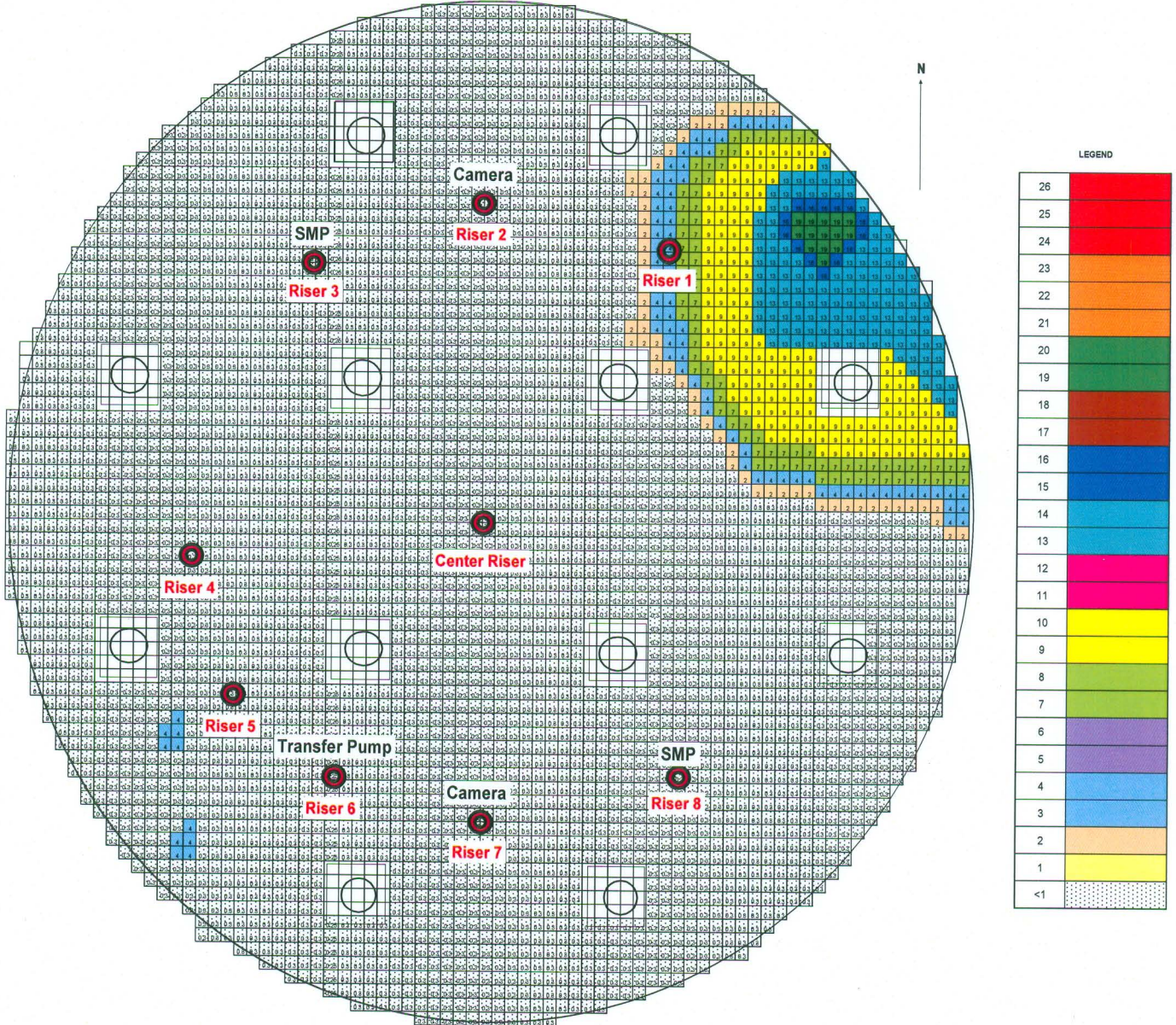
Using the solids mapping calculation, it is estimated that approximately 3488 gallons of solid material remain in Tank 6. The estimated solids volume after the Second Chemical Cleaning was approximately 3250 gallons per M-ESR-F-00159. A graph of the remaining solids after each cleaning phase is included as attachment C.

### **References**

1. M-ESR-F-00159, Tank 6 Solids Volume Estimation After The Second Chemical Cleaning
2. LWO-LWE-2009-00019 Rev. 0, Tank 6 Chemical Cleaning Final Water Wash Pump Run Strategy
3. LWO-PIT-2006-00066, "Tanks 5 and 6 Oxalic Acid Aided Heel Removal Flowsheet," revision 2, dated December 12, 2007.

Attachment A

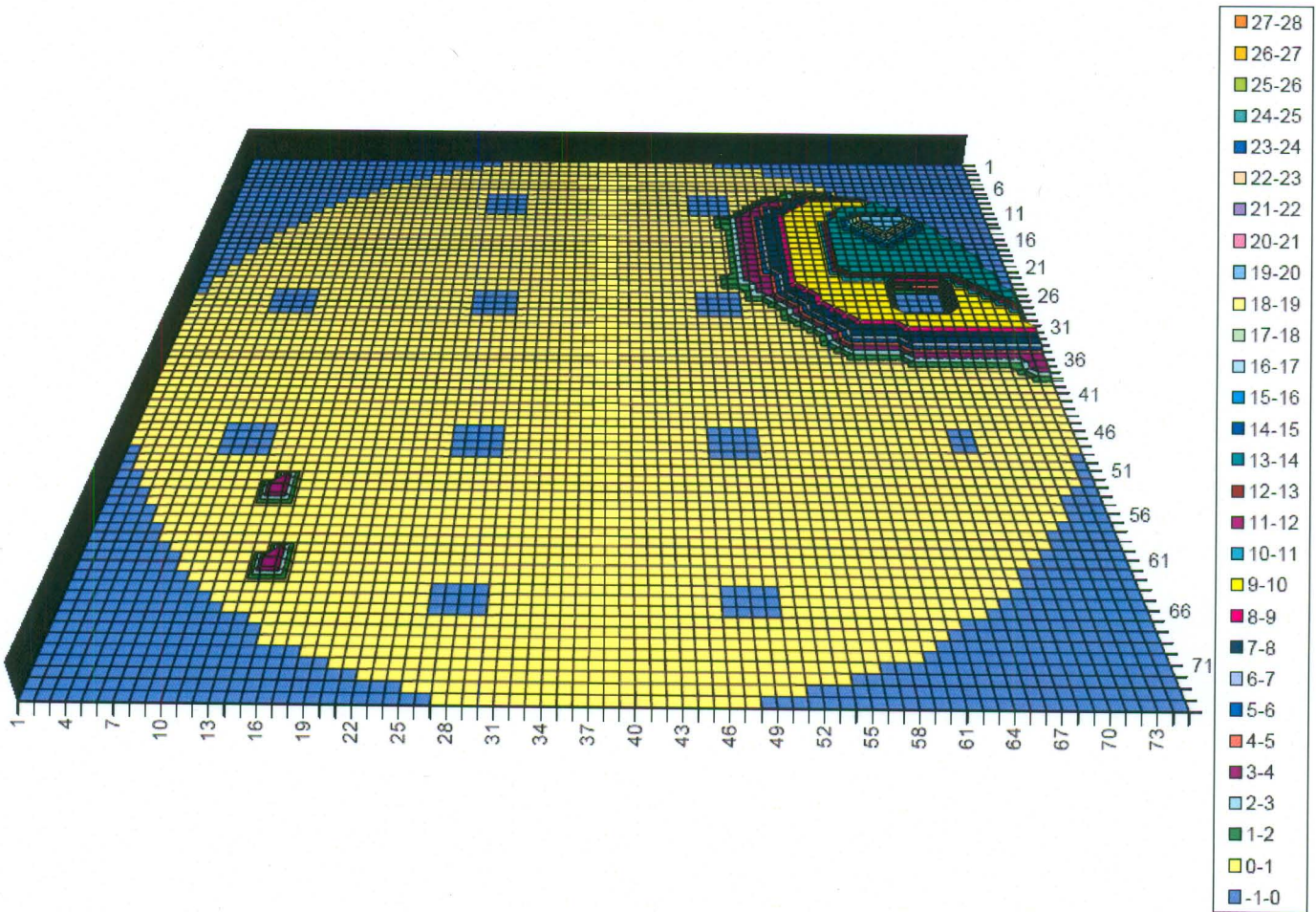
Solids Map – Plain View



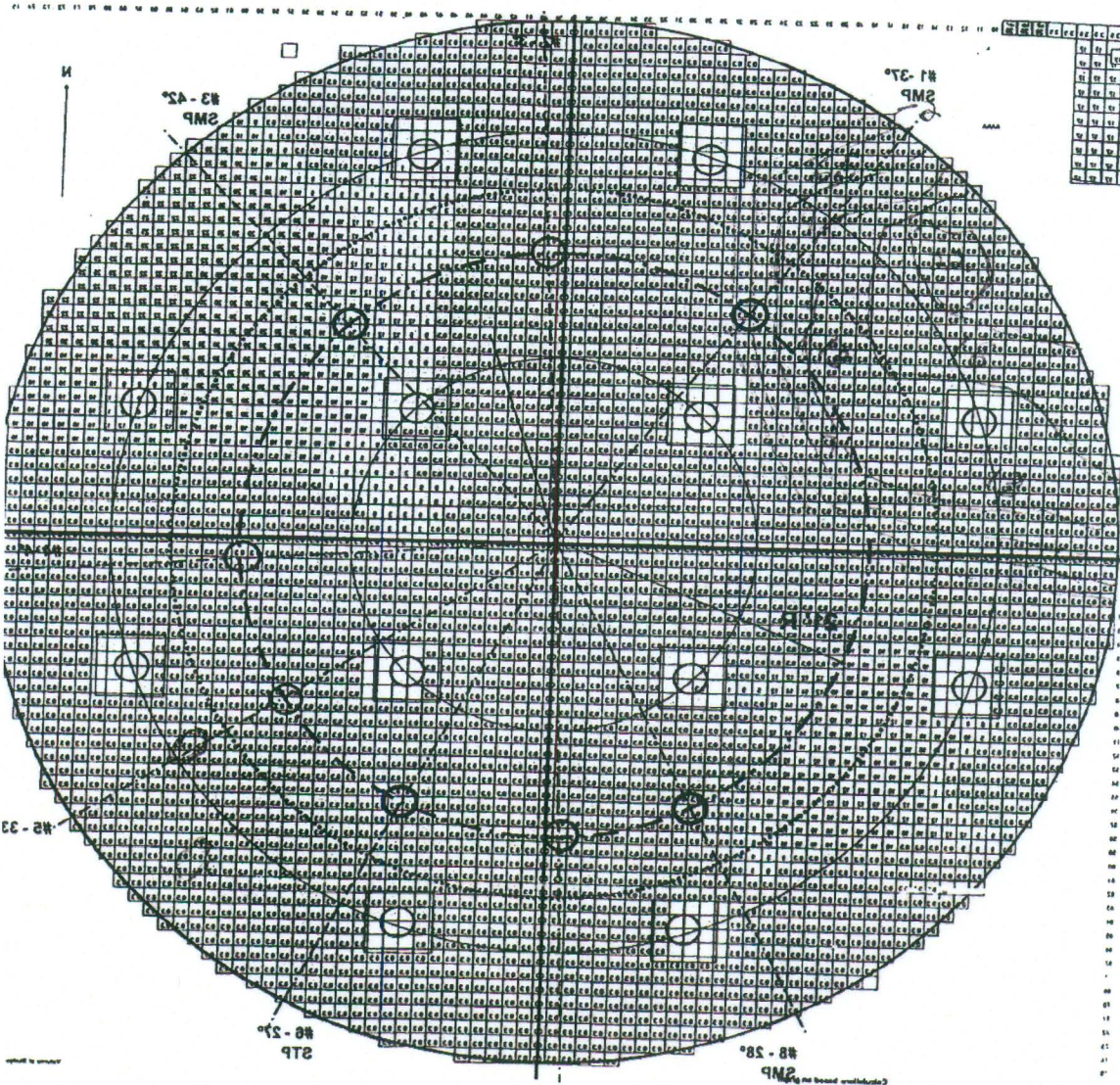
**Attachment A**

Solids Map – 3 Dimensional View

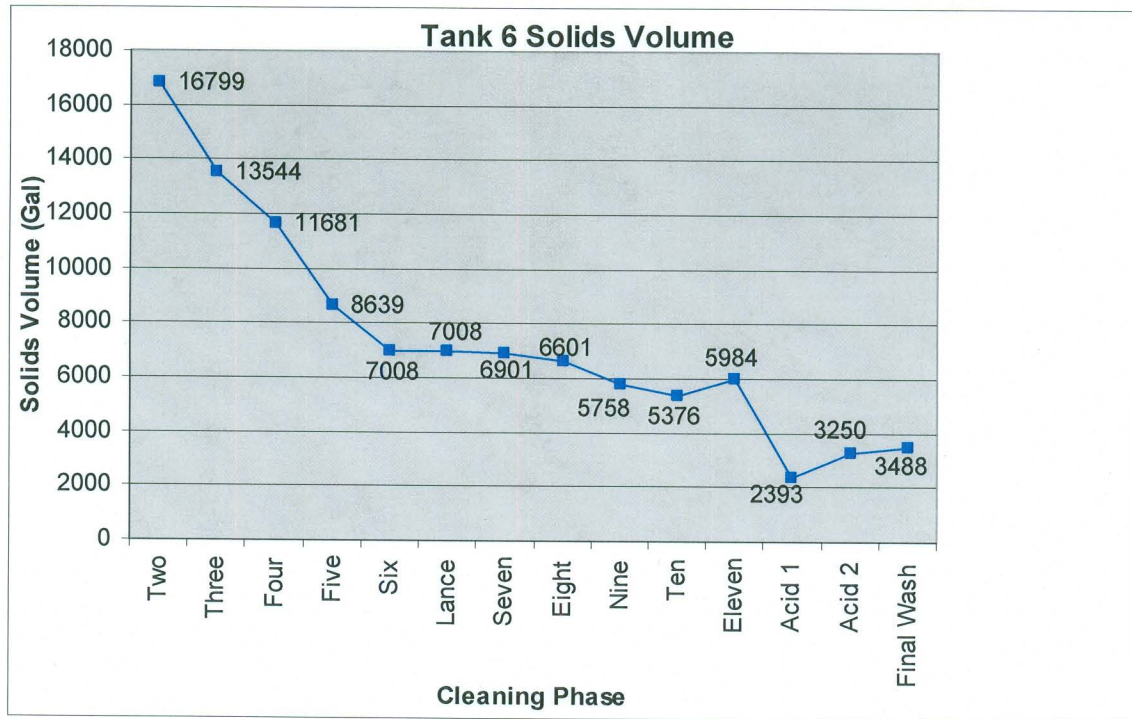
Tank 6  
03/31/09



Attachment B



Attachment C





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**Distribution**

M. D. Buxton	241-156H
J. Cantrell	704 26H
N. Chapman	704 70F
V. Chander	704 70F
V. Cordaro	704 70F
W. Ludwig	704 71F
N. Davis	766H
M. Harrell	241 108F
J. Herbert	241 108F
M. Hubbard	241 162H
W. Isom	704 26F
R. Jolly	704 70F
D. Little	766H
B. Martin	705 1C
S. Middleton	704S
L. Minor	241 100F
S. Nicholson	704 26F
K. Parkinson	703H
J. Purohit	704 71F
R. Salmon	704 26F
W. Stephens	704 26F
L. White	704 26F