

M-ESR-F-00160  
December 30, 2008  
Revision 0

**TANK 5 SOLIDS VOLUME ESTIMATION AFTER THE CHEMICAL  
CLEANING AND FINAL WASH (U)**

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**Attachment A**  
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**Tank 5 Solids Mapping Charts**  
**Tank 5 Solids Mapping Sketch**  
**Tank 5 Solids Remaining**

## **Purpose**

The purpose of this report is to document the mapping of remaining solids in Waste Tank 5 after completion of the transfer from Tank 5 to Tank 7, following the final well water wash at the completion of Chemical Cleaning.

## **Background**

To support a final water wash, well water was added to Tank 5 to bring the liquid level in the tank to 45 inches. The SMP located in riser 3 was operated during this phase of cleaning. The Tank 5 to 7 transfer began at 0900 and ended at 2252 on December 23, 2008. The final observed liquid level was 2.0 inches per visual inspection and radar reading. During the pump down of Tank 5, exposed solids mounds were observed and mapped. (Attachment A)

## **Solids Mound Mapping**

The mapping of the solids was performed by monitoring Tank 5 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 landmarks and radar. 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 solids mounds appeared to have decreased in height and significantly spread out. The Northwest mound's highest point fell from 16 to 12 inches while merging with a smaller mound south of it and spreading south towards the Riser 8.

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 3282 gallons. This is a decrease in volume from 3600 gallons recorded after the Second Chemical Cleaning phase.

## **Summary**

Using the solids mapping calculation, it is estimated that approximately 3,300 gallons of solid material remain in Tank 5. The estimated solids volume after the Second Chemical Cleaning was approximately 3600 gallons per M-ESR-F-00158. A graph of the remaining solids after each cleaning phase is included as attachment C.

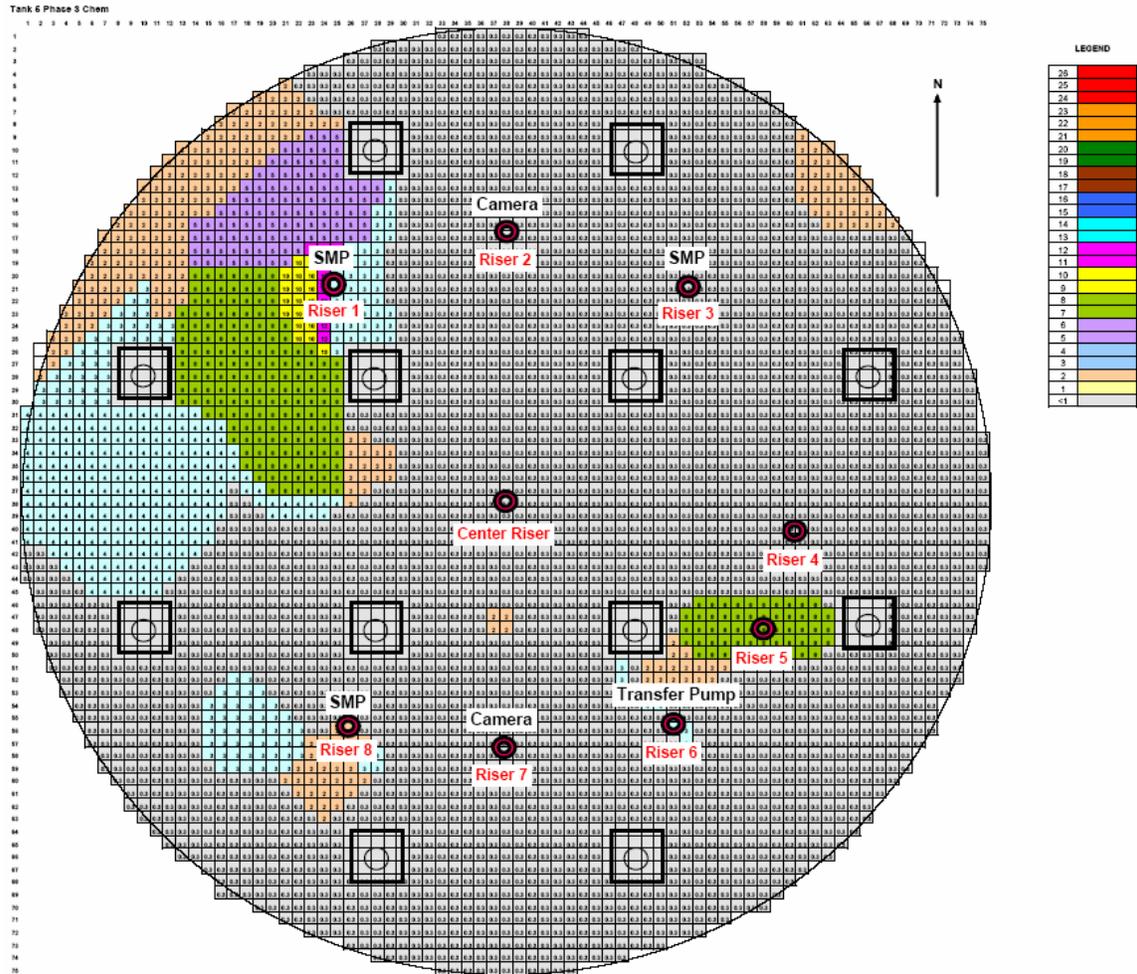
## **References**

1. M-ESR-F-00158, Tank 5 Solids Volume Estimation After The Second Chemical Cleaning
2. LWO-LWE-2008-00414 Rev. 1, Tank 5 Chemical Cleaning Final Water Wash Pump Run Strategy #2.

Attachment A

Solids Map – Plain View

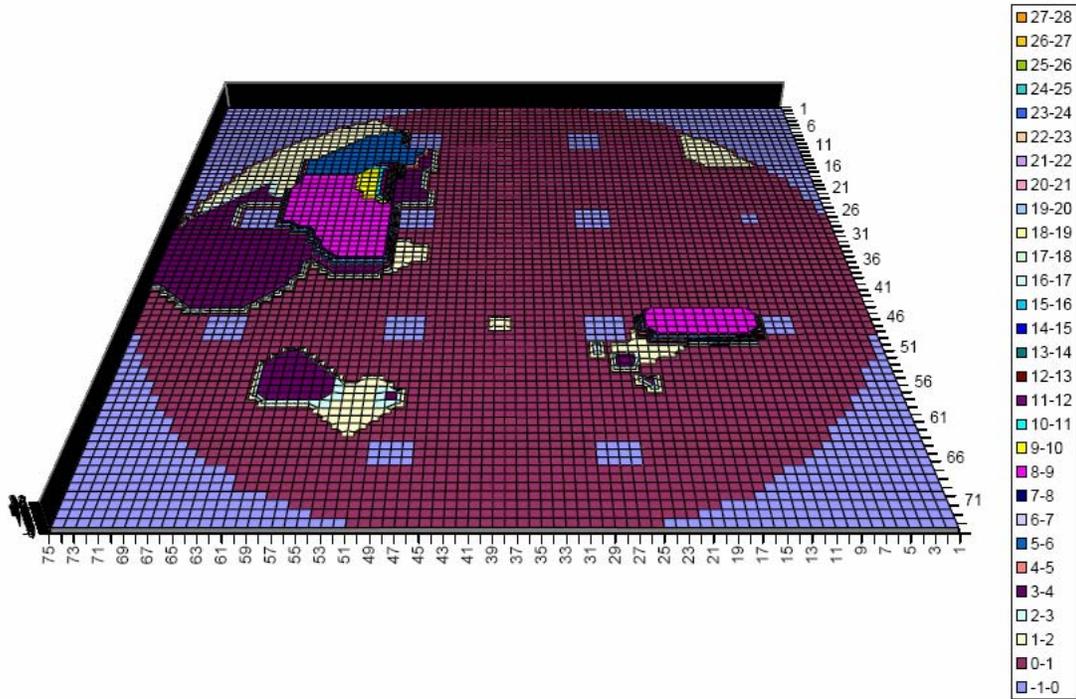
Tank 5  
12/29/2008



**Attachment A**

Solids Map – 3 Dimensional View

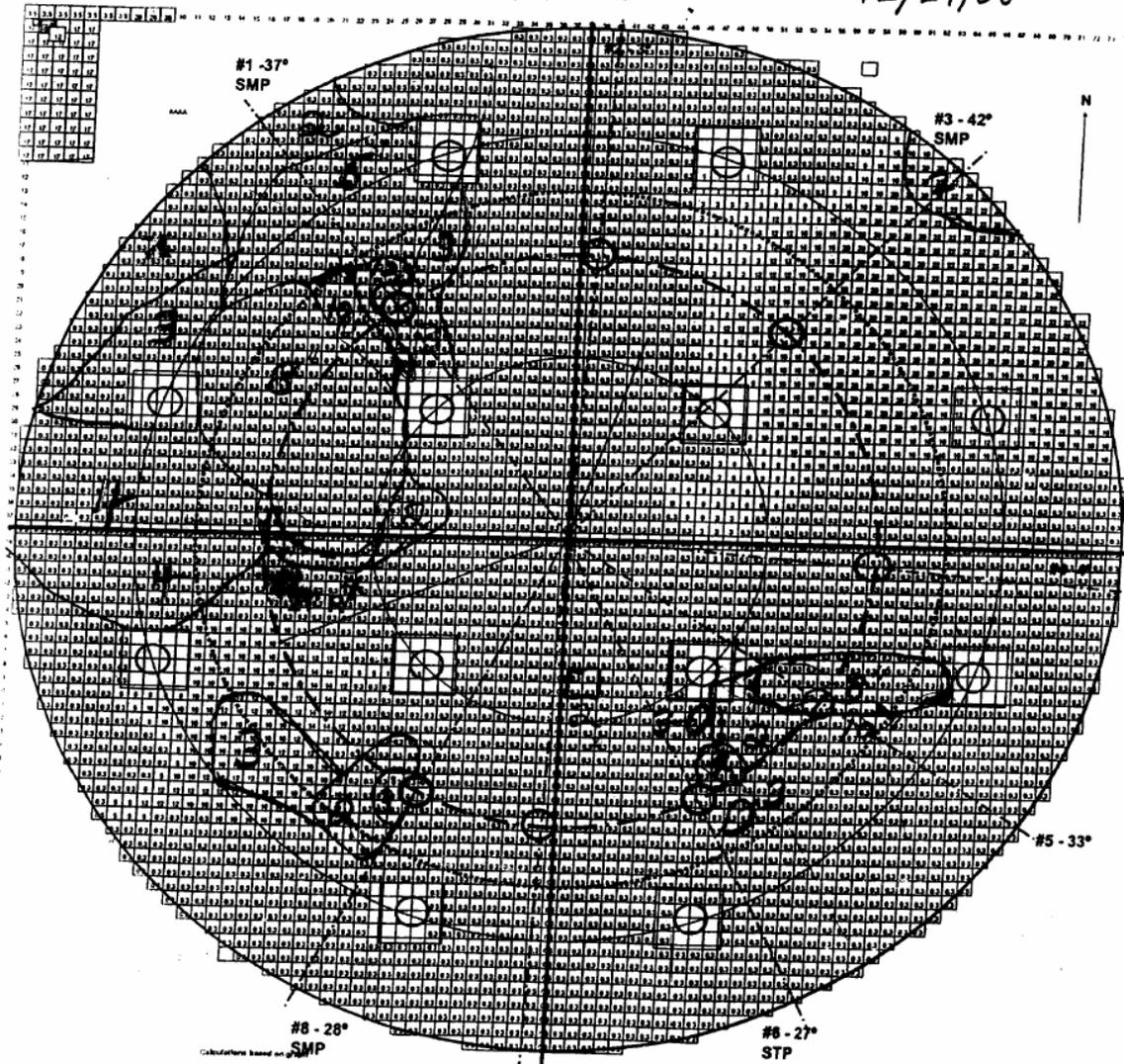
Tank 5  
12/29/08



Attachment B

TANK 5

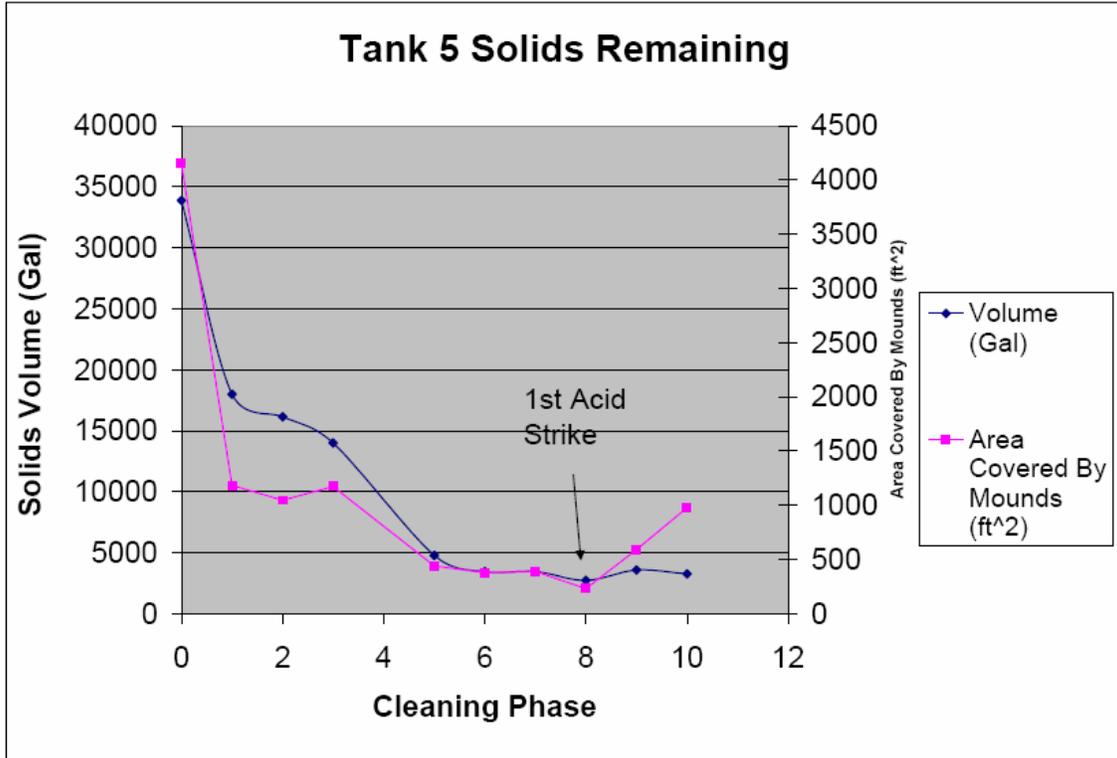
12/29/08



ODD NO. TANKS - 1, 3, 5, 7, 9, AND 11

Sample	2	10
1	7.9	10.8
2	12.0	14.8
3	16.0	18.8
4	20.0	22.8
5	24.0	26.8
6	28.0	30.8
7	32.0	34.8
8	36.0	38.8
9	40.0	42.8
10	44.0	46.8
11	48.0	50.8
12	52.0	54.8
13	56.0	58.8
14	60.0	62.8
15	64.0	66.8
16	68.0	70.8
17	72.0	74.8
18	76.0	78.8
19	80.0	82.8
20	84.0	86.8
21	88.0	90.8
22	92.0	94.8
23	96.0	98.8
24	100.0	102.8
25	104.0	106.8
26	108.0	110.8
27	112.0	114.8
28	116.0	118.8
29	120.0	122.8
30	124.0	126.8
31	128.0	130.8
32	132.0	134.8

Attachment C



**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	766H
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