

# MEMORANDUM

H.E. PAWSON R.J. TUCKER

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From C.O. OLESEN

Ref.

Subject ARSENIC SUPPRESSION

ABSTRACT - to use a constant amount of  $\text{FeCl}_3$  with varying amounts of  $\text{NH}_4\text{Cl}$  on combined samples of thickeners #6, #11, #13 to evaluate the use of  $\text{NH}_4\text{Cl}$  as an arsenic suppressant and a substitute for  $\text{NH}_4\text{OH}$ .

PROCEDURE - Samples were taken from thickeners #6, #11, #13 and combined for testing. The tested sample volumes of the combined thickeners was 2500ml. with 3 grams of  $\text{FeCl}_3$  added. These samples were agitated and then varying amounts of  $\text{NH}_4\text{Cl}$  were added to the samples and agitated again. After this final agitation the samples were analyzed for pH, Cu, Fe and As.

DATA	pH	ppm Cu	ppm Fe	ppm As
#6 thickener	6.2	ND	25	25
#11 thickener	3.5	.28	126	107
#13 thickener	6.4	ND	16	520
Combination	6.1	ND	35	119
Combination (theo.)	?	.1	52	127
Combination + $\text{FeCl}_3$	5.1	1.38	29	27

NB. - Combination ratio's #6 = 70/125, #11 = 35/125, #13 = 20/125  
- below all samples 2500ml. with 3 grams  $\text{FeCl}_3$  (or 248 ppm Fe)

AMOUNT $\text{NH}_4\text{Cl}$ (g)	pH	ppm Cu	ppm Fe	ppm As
5	5.3	1.38	17.2	22.4
7	5.2	1.92	26.4	21.0
10	5.3	1.42	15.6	23.0
15	5.3	1.95	15.6	21.5
20	5.2	2.40	25.6	20.2

## CONCLUSIONS:

- comparing the combination to the theoretical combination a decrease in iron and arsenic is noted. Comparing this to previous tests (Dec 22/75 and Sept 5/75) a reverse was noted in the arsenic level, to an increase of approximately 50ppm As.

- comparing the theoretical combination to the combination with  $\text{FeCl}_3$  added, there shows a considerable drop in the iron and arsenic levels. This same type of decrease was also noted on a previous report (page 5, Feb 16/76) Also there shows leaching of copper from the solids after the addition of  $\text{FeCl}_3$ .

- As for the  $\text{NH}_4\text{Cl}$  as an arsenic suppressant, it is not functional but this test shows us that the suppression of arsenic is pH dependant.