

MEMORANDUM

To H.E.P., R.J.T.

Date April 2, 1976

From C.Q.O.

Ref.

Subject ARSENIC SUPPRESSION

Abstract: to determine an optimum level of FeCl_3 and NH_4OH for the suppression of arsenic on the combined streams to agitator #8.

Procedure: all samples collected from the thickeners (6, 11, 13) were combined in the ration of #6 = 70/125, #11 = 35/125, and #13 = 20/125. The samples were then subjected to varying amounts of FeCl_3 and a constant amount of NH_4OH . Note that 3 different sampling days were included.

Data page 2, 3 and 4.

Conclusions to determine an optimum level of chemical addition for arsenic treatment, the arsenic in the combined streams would have to be at constant level, but they are not. Therefore a controlling factor has to be sought and from the data thickener #13 is the controlling factor. After a few more tests optimum chemical addition can be achieved in relation to thickener #13.

DATA:

A) with 8 ml NH_4OH to all samples and varying the FeCl_3

	pH	ppm Fe	ppm As
#6 thickener	6.7	4.9	31
#11 thickener	5.7	142	116
#13 thickener	6.3	6.8	430
Combination	6.1	12.3	96
Combination (theo)	?	43.6	119

Amount FeCl_3 (g)	Amount NH_4OH (ml)	pH	ppm Fe	ppm As
1.0	0	6.1	4.3	49
1.5	0	5.8	16.8	39
2.5	0	5.0	41	39
1.0	8	9.6	3.1	21
1.5	8	9.5	1.8	11
2.5	8	9.3	2.4	6

Note:

1g FeCl_3 = 103.3 ppm Fe
1.5g FeCl_3 = 155 ppm Fe
2.5g FeCl_3 = 258.3 ppm Fe

Also all samples 2000 ml

B) with 5 ml NH_4OH to all samples and varying FeCl_3

	pH	ppm Fe	ppm As
#6 thickener	6.6	1.8	27
#11 thickener	5.8	102	109
#13 thickener	6.2	3.8	1100
Combination	6.5	2.3	220
Combination (theo)	?	30.2	222

Amount FeCl_3 (g)	Amount NH_4OH (ml)	pH	ppm Fe	ppm As
1.5	0	6.1	1.6	98
2.5	0	5.7	10.3	66
3.5	0	4.9	28.0	70
1.5	5	9.1	1.4	200
2.5	5	8.9	1.1	102
3.5	5	8.6	1.3	44

Note:

1.5g FeCl_3 = 103.3 ppm Fe

2.5g FeCl_3 = 258.3 ppm Fe

3.5g FeCl_3 = 361.6 ppm Fe

Also all samples 2000 ml

C) with 2 ml NH_4OH to all samples and varying FeCl_3

	pH	ppm Fe	ppm As
#6 thickener	6.8	.68	31.5
#11 thickener	5.3	110	155
#13 thickener	6.6	1.05	580
Combination	6.2	21	160
Combination (theo)	?	31.4	154

Amount FeCl_3 (g)	Amount NH_4OH (ml)	pH	ppm Fe	ppm As
1.5	0	5.8	6.8	51.5
2.5	0	4.8	50	70.5
3.5	0	2.9	105	82.5
1.5	2	7.7	ND	23.0
2.5	2	7.4	ND	12.0
3.5	2	6.2	.30	10.0

Note:

1.5g FeCl_3 = 103.3 ppm Fe

2.5g FeCl_3 = 258.3 ppm Fe

3.5g FeCl_3 = 361.6 ppm Fe

Also all samples 2000 ml