

To R.J.M. ; A.D.C.

Date September 25, 1967

From P. Slattery

Ref. PS/mw

Subject Arsenic Suppression - Interim Report

(1) HCD Residue Treatment

Attached are the graphs of the second set of tests considering the effect of time, iron, and lime.

200 lbs. Lime per 10 Ton Day were used in each test. The arsenic in the head sample was 1273 ppm. in the solution and 8.13% in the solids.

Insufficient reagents were indicated as the pH remained too low to be effective.

(2) HCD Residue Treatment Mill Trial

HCD Alkali - 10 lb. NaOH/Day

DATE	lb. As. In No. 5 Agitator Feed	lb. Lime Used	pH of Discharge	lb. As. In Discharge
September 6	approx. 43	675	11.4	14.3
" 7	" 43	675	11.8	5.1
" 8	" 43	1100	11.0	79.5
" 9	" 43	900	9.5	73.1
" 12	43.1	900	10.0	approx. 74
" 13	40.6	675	10.4	79.0
" 14	43.9	1800	11.4	43.0
" 15	59.9	1800	11.8	33.9
TOTAL	359.5	8525	-	401.9
AVERAGE	45	1065	10.9	50

Insufficient lime is indicated with all but three of the above trial runs.

The alkali has been increased by 100 lb. Sodium Carbonate which appears to aid in reducing the lime required to raise the pH and appears more encouraging, therefore trials are continuing.

(3) Overall Arsenic Suppression During HCD Trial Runs

	lb. per Day	% of Total to Waste
Total Arsenic to waste.	468	100.0
Arsenic from #7 Thick. O'Flow	235	50.2
Arsenic from #5 Agitator Discharge	50	10.7

(Approx. Arsenic if not treated; using 10lb. NaOH per Day - 45 lb.)

Arsenic dissolved from solids (HCD Residue & Calcine Residue)	183	39.1
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(3 continued)

	pH	Assay
# 8 Agitator O'flow	11.02	-
# 7 Thickener O'flow	11.04	123.5

These averages should not be less than 11.5, indicating that more lime is required to prevent dissolution of residue arsenic, which in turn increases the lime consumption. It is not unfeasible to have an assay of 30-10 ppm when both pHs are kept up to the range of 11.5 - 11.8 steadily. (Av. of 16 sets in this range = 21.23 ppm)

The lime consumption has been raised to 1800 lb. per day to correct this.

(4) Basic Distribution of Soluble Arsenic

These are the best estimates presently available.

	Approx. Tons Current	Approx. Av. Assay ppm As. Current	Approx. lb. Arsenic Av. Max. Min.		
Dorrco Wash Thickener O'Flow	390	125	100	125	75
Mill Wash Thickener O'Flow	425	25	22	30	15
HCD Wash Thickener O'Flow	200(150-300)	250(180-700)	100	400	55
Calcine Residue Solution (To Solutions Treatment)	125	20	$\frac{5}{227}$	$\frac{10}{565}$	$\frac{2}{147}$
HCD Residue Solution	20	1200(500-4500)	$\frac{48}{275}$	$\frac{180}{735}$	$\frac{20}{167}$
Total Treated (Before Treatment)					
Other Sources:-					
Float Conc. Thickener O'Flow	900	1	2	5	1
Float Tails	2000	1	4	8	3
Sewage	130 varies	.5	.1	.2	.05
Dissolution of Arsenic From Soluble Solids After Water Treatment With Lime			95	240	20

P. Slattery

Peter Slattery
Jr. Mill Engineer

HCD Disposal

11/8/67

rpm. AS.

KEY

- 0 - No IRON
- 1 - 20 lb/hr IRON
- 2 - 40 lb/hr IRON
- 3 - 60 lb/hr IRON

KEY

- 0 - 1028 Hz
- 2 - 2400 Hz
- 4 - 4000 Hz
- 6 - 6000 Hz

1800

1000

500

1500

2000

2500

3000

3500

4000

4500

0

2

4

6

0

2

4

6

1000

2000

3000

4000