

MEMORANDUM

To H.E.Pawson; M.E.Lane; File

Date January 10, 1972

From J.L. Richardson

Ref.

Subject LIME ADDITION TO #6 O'FLOW SOLUTION

On December 28th, lime solution was added directly to the #3 thickener at a point to one side of where the #6 thickener o'flow discharged into it. Before the lime was added to this o'flow, its pH was averaging about 6.3 and its arsenic content about 29 p.p.m.

The lime addition was carried on for a period of two days, during this time the pH came up to 8.8, but the arsenic elimination was not effected.

On January 4th, the lime addition point was changed to the o'flow of the #6 thickener with the thought that with the turbulent flow through the pipe into the #3 thickener and continued turbulence at the discharge end, enough mixing action might be produced.

During the first few hours there was an increase in pH to 8.0 and the o'flow retained its normal color.

When the o'flow was sampled the following day, it was noted that the color of the solution had changed to a brownish hue. The pH of this was 7.5. I did not have time to run this sample immediately for arsenic, therefore, I assumed that because of the low pH, the arsenic level would not have changed.

During this interval, it was decided to return the system to normal, allowing the #6 thickener to discharge into #8 agitator with a consequent increase in lime consumption.

When I had time to check the sample of lime treated #6 o'flow that I had taken, I noticed that the brown color had gone and there was a brown precipitate on the bottom of the bottle. It was found that this solution only contained 8 p.p.m. in arsenic.

I am assuming that what happened was that the lime elevated the pH to a point where the iron already in the #6 thickener o'flow precipitated and in doing so occluded arsenic.

Therefore, I am of the opinion that if the pH of #6 o'flow could be carefully controlled at just slightly basic, then the iron would precipitate out of it and in doing so occlude arsenic.

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From W. L. Richardson

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The results below are of the various samples taken:

Before lime addition:

<u>Date</u>	<u>pH</u>	<u>As p.p.m.</u>
December 13 (11 a.m.)	6.4	31.4
" 14 (8:30 a.m.)	6.1	32.6
" 14 (1:30 p.m.)	6.4	30.4
" 15 (2:00 p.m.)	6.2	35.0
" 16 (9:00 a.m.)	6.5	24.6
" 21 (11:30 a.m.)	6.4	20.6
" 24 (9:00 a.m.)	6.5	31.6

Lime being added directly to #3 thickener:

<u>Date</u>	<u>pH</u>	<u>As p.p.m.</u>
December 28 (3:00 p.m.)	9.1	30.4
" 29 (9:00 a.m.)	8.6	29.6

Lime being added to #6 o'flow box:

<u>Date</u>	<u>pH</u>	<u>As p.p.m.</u>
January 4 (2:00 p.m.)	8.0	Not Tested
January 5 (8:00 a.m.)	7.5	8.0 p.p.m.

WLR/mw

W. L. Richardson

W. L. Richardson
Mill Chemist