

MEMORANDUM

To H.E. Pawson; R.J. Tucker;

Date Sept. 24/75

From C.O. Olesen

Ref. *More to see effect of cyanide destruction on copper + arsenic.*

Subject Arsenic Suppression and Acidulation of DTB

Abstract: To acidify DTB for the destruction of Cyanide, Copper and Arsenic Suppression.

Part I: The acidification of DTB with 1N H₂SO₄.

| pH | Asppm | Cuppm | CN ⁻ ppm | Removal | | |
|------|-------|-------|---------------------|---------|------|------------------|
| | | | | %As | %Cu | %CN ⁻ |
| 8.10 | 3020 | 820 | 1280 | - | - | - |
| 7.00 | 2500 | 800 | 1085 | 17.3 | 2.5 | 15.3 |
| 6.05 | 2620 | 780 | 1210 | 13.3 | 4.9 | 5.5 |
| 5.00 | 2670 | 770 | 1210 | 11.6 | 6.1 | 5.5 |
| 4.00 | 2620 | 495 | 975 | 13.3 | 39.7 | 23.9 |
| 3.05 | 2490 | 140 | 825 | 17.6 | 83.0 | 35.9 |

Part II: The Acidification of DTB and ½ hr. aeration time.

| pH | Asppm | Cuppm | CN ⁻ ppm | Removal | | |
|------|-------|-------|---------------------|---------|------|------------------|
| | | | | %As | %Cu | %CN ⁻ |
| 8.10 | 3020 | 820 | 1280 | - | - | - |
| 2.90 | 2260 | 390 | 710 | 29.5 | 52.5 | 44.6 |
| 3.70 | 2260 | 120 | 355 | 29.5 | 85.4 | 72.3* |

after aeration

Part III: The acidification of DTB to a pH of 3.0 and the addition of 30 lbs CaO/ton.

| pH | Asppm | Cuppm | CN ⁻ ppm | Removal | | |
|------|-------|-------|---------------------|---------|-----|------------------|
| | | | | %As | %Cu | %CN ⁻ |
| 12.1 | 10.2 | 615 | 1050 | 99.7 | 25 | 18 |

*Note: That upon addition of lime to the blued acidified DTB, the solution goes bluer and as the pH rises the blue solution gradually turns grey and a grey ppte then forms and leaves a clear solution.

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Conclusions:

By acidifying the DTB (part I) a sharp decrease in concentration of copper (83% removal) was attained, whereas, a decrease in the concentration of arsenic and cyanide were not so large (17% and 35% removal respectively.)

With the acidified DTB (Part II) and the introduction of $\frac{1}{2}$ hr. aeration, the concentration of copper and cyanide drops favorably (85% and 72% removed respectively.)

Taking the acidified DTB at a pH of 3.0 and adding 30 lbs CaO/ton to the system it will greatly reduce the arsenic (99.7% removed), but will not reduce the copper or cyanide sufficiently.

A probable method could be, acidify the DTB, aerate for more than $\frac{1}{2}$ hr, and then treat the supernate with lime to suppress the arsenic.