



DEPARTMENT OF
NATIONAL HEALTH AND WELFARE

IN YOUR REPLY REFER TO
OUR FILE NO. 455-10-13

Occupational Health Division
OTTAWA 4, Canada.
24 May, 1963.

Mr. M.K. Pickard,
General Manager,
Giant Yellowknife Mines Limited,
YELLOWKNIFE, N.W.T.

Dear Murray:

Jack Grainge sent along copies of your treatment plant flow sheets and from them I calculated arsenic and tonnage balances for various portions of the circuits. Most of the balances seem very good but there are a few discrepancies which need explaining.

For ease of reference I put numbers on the flow sheet next to those inputs and discharges which are used in the balance sheets. Copies of the flow sheet and of the balances for the several circuits are attached.

When sufficient data were given on the flow sheet I checked the calculations. The two sets of figures are given in Table 1 which shows the arsenic balance for the whole plant.

There are a few minor differences which are of no practical consequence but major differences for items 11 and 38 make up practically all of the 783 pounds of arsenic which, according to our figures, are unaccounted for. As you can see from Tables 3c and 5c, both arsenic and tonnage imbalances occur mainly in the "sand preparation" circuit. Table 4 shows 97 tons missing in the "flotation-roasting-calcine cyanidation" circuits. Of this, 90 tons of water disappears between item 15b and item 26b. Am I right in assuming that this vapourised during roasting? Apart from these items other balances seem fairly reasonable.

The figures written in red ink on the attached flow sheet were corrections made by your office. Perhaps figures for items 11, 36 and 38 should also have been corrected but were overlooked.

Your explanation of the difference between the calculated and the assayed content of soluble arsenic in the final effluent sounds reasonable but does not explain where the precipitated ferric arsenite should report in the circuit. Is it being discharged as suspended solid in the tailings or is it piling up in the bottom of a tank somewhere?

I am going to Geneva next week and will not be back until July 8. This should give you lots of time to work out some good answers.

Kindest regards,

Yours sincerely,

J.P. Windish
Industrial Hygienist

JFW/jr

Encl.

P.S. Aerial arsenic results are still being addressed to me at 200 Kent St. Will you please tell whoever mails them that that is not my address. Thanks.

TAILINGS CYCLATION - SAND PREPARATION

Feed Tails - 50 TPD. 0.001% = 0.0005

WTS. TAIL. 0.001% = 0.0005

THICKENING

WTS. TAIL. 0.001% = 0.0005

715 TAIL. 0.001% = 0.0005

WTS. TAIL. 0.001% = 0.0005

FLUORINATION

Feed Tails - 50 TPD. 0.001% = 0.0005

WTS. TAIL. 0.001% = 0.0005

WTS. TAIL. 0.001% = 0.0005

715 TAIL. 0.001% = 0.0005

WTS. TAIL. 0.001% = 0.0005

WTS. TAIL. 0.001% = 0.0005

WTS. TAIL. 0.001% = 0.0005

WTS. TAIL. 0.001% = 0.0005

CALLING WASH 50 TPD. 0.001% = 0.0005

WATER 100 TPD. 0.001% = 0.0005

SAND PREPARATION

WTS. TAIL. 0.001% = 0.0005

SAND 50 TPD. 0.001% = 0.0005

WTS. TAIL. 0.001% = 0.0005

CALLING WASH 50 TPD. 0.001% = 0.0005

SAND STORAGE

WTS. TAIL. 0.001% = 0.0005

SAND 50 TPD. 0.001% = 0.0005

WTS. TAIL. 0.001% = 0.0005

WTS. TAIL. 0.001% = 0.0005

TOTAL MILL EFFLUENT

1. CONCENTRATE TO FINAL TAILINGS	900 TPD	(1.98)	1.00
2. LOSS OF WATER IN FINAL TAILINGS - BEW LANE	200		52.5
3. DIST. IN 1000' TAILINGS	200		55.0
4. DIST. IN 100' TAILINGS	10 TPD	1725.5	18.0
5. CAUSTIC TO FINAL TAILINGS	900		250
6. FINAL BLEND TO FINAL TAILINGS	900		200
7. SLIME-TAILINGS TO FINAL TAILINGS	595	400.0	22.0
8. SEED DEWATER WATER	140		0.5
9. SEWAGE (est.)	1200		7.0
TOTAL TAILINGS (cont'd)	595	5938.1 6449.1 453	192.0

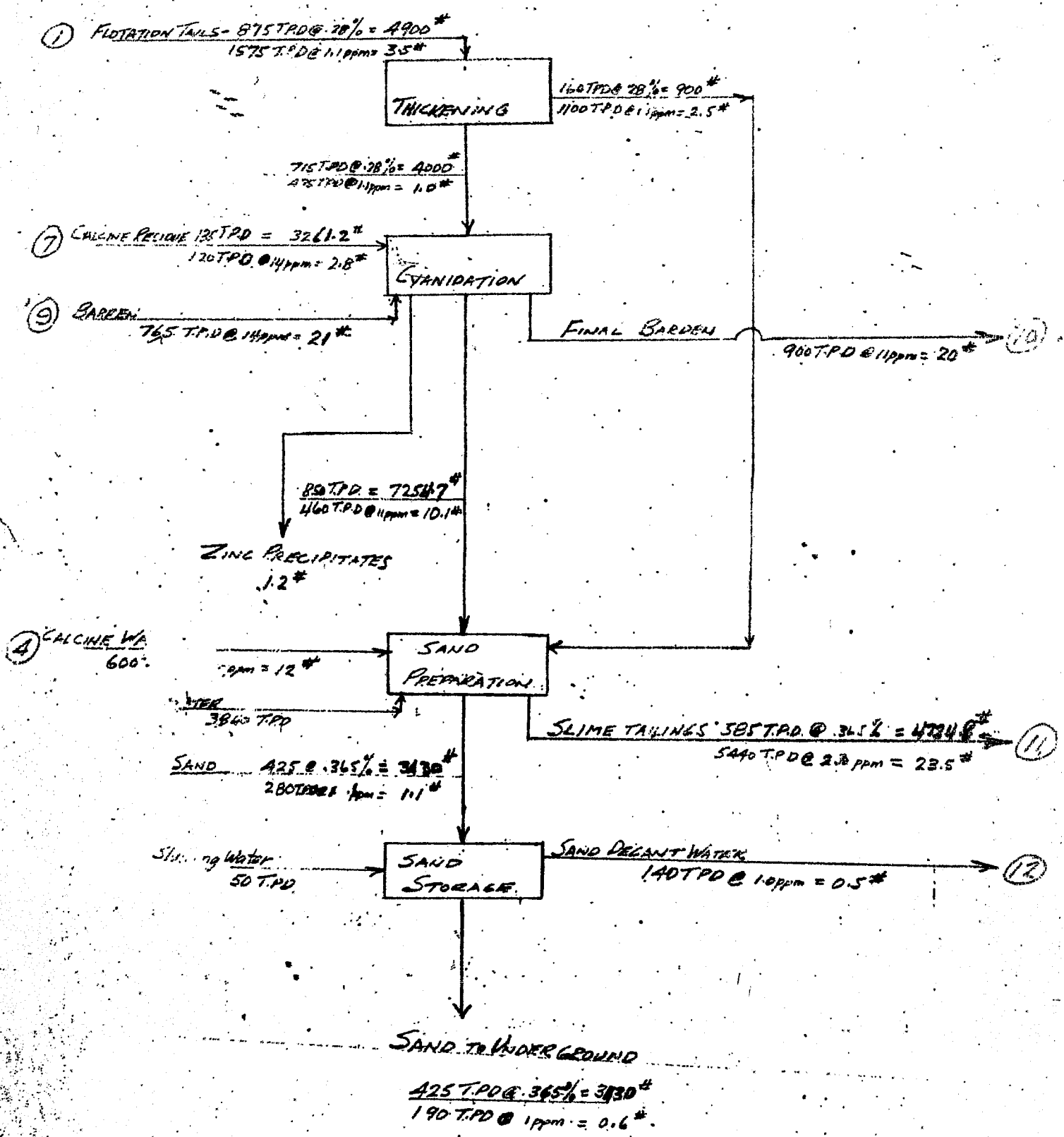
Assn. of TAILINGS @ 46 ppm
avg of 9 samples 20-60 ppm
OK for use 36

Open
100% 9/1/62

TREATMENT PLANT FLOW

SOLIDS - SOLUTIONS - ARSENIC

TAILINGS CYANIDATION - SAND PREPARATION



gmm
E.Q.F. 8/2/63

SP-2100 - SANDSTONE - ...

FLotation - ROASTING - COARSE ...

ORE - 155 TPD @ 15% = 34900#
WATER - 155 TPD

FLotation

FLotation Tailings - 875 TPD @ 20% = 49000#
1575 @ 11 ppm = 3.5%

COIL - 75 TPD @ 10% = 34900#
WATER - 990 TPD

DEWATERING

WATER TO BRICK CREEK
900 TPD @ 11 ppm = 1.0%

ROASTING

FUMS - 33 TPD @ 1519.9#

WATER - 185 TPD @ 1125% = 9375

HOT COTTAGE

WATER 475 TPD

QUENCHING

WATER - 2,619.9#

10 TPD @ 9.0% = 1800#

135 TPD @ 125% = 3757
475 TPD @ 125 ppm = 115

THICKENING

WATER TO FINAL TAILINGS
200 TPD @ 125 ppm = 50%

WATER 370 TPD

DEWATERING

WATER TO SAND PLANT
600 TPD @ 10 ppm = 12%

QUENCHING

THICKENING

WATER TO FINAL TAILINGS
250 TPD @ 110 ppm = 55%

135 TPD @ 10% = 1740#
135 TPD @ 10 ppm = 50%

135 TPD = 332.1#
45 TPD @ 10 ppm = 0.9%

CYANIDATION

WATER 126 TPD

CYANIDATION

PAST RESIDUE 10 TPD @ 10% = 1740#
25 TPD @ 10 ppm = 18.4%

CALCINE PITS 15 TPD = 3762.2#
120 TPD @ 10 ppm = 2.8%

CARPEN REED

900 TPD @ 14 ppm = 25.2%

BANK TO TAILINGS CYANIDATION
75 TPD @ 14 ppm = 21%

CARBON PRECIPITATES
3.3%

ZINC PRECIPITATES
0.54 TPD @ 33.5% = 3%

Q.M.M.
S.O.F. 8/2/57