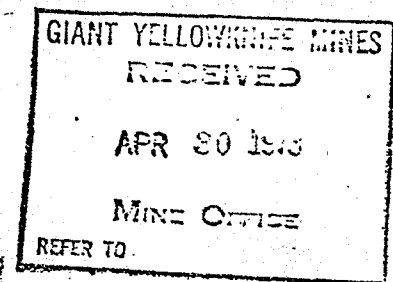


## FALCONBRIDGE NICKEL MINES LIMITED

INTER-OFFICE MEMORANDUM

DATE: April 26, 1973  
TO: A.R. Pasieka  
COPIES TO: D.R. DeLaPorte; D.J. Emery  
FROM: B.A. Ferguson  
SUBJECT: VISIT TO GIANT YELLOWKNIFE, APRIL 11 - 20, 1973



## Persons contacted:

D.J. Emery  
A.K. Campbell  
R.S. Brown  
B.F. Watson  
H. Pawson

Mine Manager.  
General Superintendent  
Mine Superintendent  
Chief Geologist  
Mill Superintendent

The visit was made at the request of Mr. D.J. Emery to review various mining proposals and operating problems, and to provide mining engineering assistance where possible.

The major subjects of concern were,

## 1. West Zone, A-Shaft.

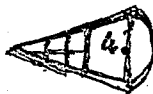
A feasibility study and mining plans are required for mining of a large low grade ore body.

## 2. Tailings disposal area.

Remaining holding capacity is insufficient for future needs.

## 3. Underground Backfilling

Mine clean-up and disposal of slimes and retention of fines in stopes.



Other underground mining projects.

Review of mining plans.

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### 1. West Zone A-Shaft

This is a large zone of scattered gold values lying within 200 ft. of surface, approximately 400 ft. long by 100-120 ft. wide. First estimates are that the orebody presently contains 466,000 tons @ .2757 oz. per ton undiluted, 89,000 tons of ore having been mined from higher grade sections of the original zone about 15 years ago. As a result, the zone contains two stoped-out volumes partially filled with gravel and waste rock, and remnants of several sub-drifts, chute and fill raises.

After allowing for a mining dilution of 20%, and including the stoped waste fill, the zone could produce approximately 600,000 tons averaging .21 oz. per ton.

The question to be resolved is whether, and under what conditions this material can be profitably mined, since it is below the present mine operating cut-off grade.

There are three possible mining alternatives,

- a) Open pit mining at a rate to satisfy the major portion of present mill capacity, essentially after present underground mining operations are completed.
- b) Underground blasthole mining with L.H.D. drawpoint mucking, to satisfy up to 40% of the present, or an expanded, mill capacity concurrent with underground operations elsewhere in the mine.
- c) Selective mining of higher grade sections now considered payable because of the higher gold price.

It is not proposed to draw any firm conclusions at this time except to state that preliminary investigations indicate that all three alternatives are practical from a mining point of view, and economically viable. A full report will be prepared, examining the alternatives and other factors to be taken into consideration in deciding upon the most suitable mining programme.

### 2. Tailings Disposal Area

The tailings disposal area at Giant reportedly contains less than one year's capacity of tailings at the present milling rate. I visited the tailings disposal area and discussed the problem with supervisory personnel at Giant. The present tailings discharge arrangement is causing an abnormal build-up of ice thickness through the winter, which is not being completely melted during the summer months. This is preventing proper settling of the solids. The ice is also taking up most of what holding capacity remains for tailings.

Further raising of the existing tailings dams would be expensive, and possibly unsafe.

I will follow up on this matter and attempt to recommend an approach for solution of this problem.

### 3. Underground Backfilling

In the light of the recent report of an investigation into the use of two-part liquid flocculants in backfilling at Falconbridge, Sudbury Operations, the question of their use at Giant was raised. The problems and cost of underground clean-up of slimes from backfilling are considerable.

I was not able to look at the problems underground at first-hand, but did discuss them at length with R.S. Brown. I viewed operations in the backfill plant with H. Pawson.

From my own experience, the solution to the problem of excessive slimes from backfilling in underground workings is to be sought firstly in the quality of the backfill product. This must be as free as possible of the fine colloidal material (less than 10-15 microns), which serves no purpose in backfilling since it remains in suspension in the decanting water. To remove this material from the mill tailing requires adequate dilution with water before subsequent thickening by the cyclones. With a very fine mill grind (which produces a large proportion of colloidal material), a second stage of dilution and thickening may be desirable. Reference is made to the attached articles on Kerr Addison and Eldorado which both have a fine mill grind, similar to Giant i.e. 77-80% -200 mesh. This suggests that dilution of the cyclone feed pulp at Giant (40% solids, single stage) may be inadequate to produce a clean backfill product.

I would suggest the following steps :-

- a) Infrastize analysis on present mill tailing and backfill product to determine the proportion of -15 micron material.
- b) Decrease feed density of the tailing pulp to 25% solids and introduce closer monitoring procedures of this density and that of the cyclone underflow.
- c) Consider a second stage of cycloning with recycling of the secondary overflow.

This may prove a more effective approach than the addition of flocculants. However, since it would double the amount of water discharged to final tailings, this approach will be dependent on a solution to item (2) above.

To: Mr. A.R. Pasieka

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#### 4. Other Underground Mining Projects

I reviewed the mine department proposals for the 1-38 area, the 131 crown pillar, and the exploration of Lower Supercrest. The proposed use of L.H.D. equipment for the mining of small high grade parcels of ore near to the surface should prove to be both practical and successful.

The decision to isolate the 131 stope from the rest of the mine workings, due to the close proximity to the tailings area, is a wise precaution. If concrete dams are to be used, then they must be designed to withstand the hydrostatic head to surface. However, normal timber fill bulkheads with adequate mousetraps for continuous draining, would allow filling of all the existing stope openings up to the working elevation, and may be more effective. The Strathcona technique for decanting during filling would work well here.

I certainly endorse the plan for development of Lower Supercrest, proposed by R.S. Brown, of a decline down from the 1100 level driven by L.H.D., and subsequent provision for skip hoisting. The economic feasibility of the project will need careful study, but I agree that the first step is to undertake the drilling programme proposed by B.F. Watson, in order to obtain some indication of the extent of the potential ore zone, before committing money to development.



B.A. Ferguson

BAF:pb