DEPARTMENT OF NATIONAL HEALTH AND WELFARE

INTRADEPARTMENTAL CORRESPONDENCE

CONFIDENTIAL

OUR FILE NO. C-455-10-13.

DATE: August 8, 1955.

REF. YOUR FILE NO. DATED

TO: Dr. K. Kay:

FROM. J. P. Windish:

SUBJECT:

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Yellowknife Trip:

A. GIANT

Mr. Dowd and I arrived in Yellowknife on the afternoon of July 6. That same afternoon, accompanied by Mr. Homulos, we visited Mr. P. N. Pitcher, General Manager of Giant Yellowknife Gold Mines Ltd.

(a) Present Operations:

Mr. Pitcher stated that the original Cottrell precipitator, installed in 1951, was designed to handle 40,000 c.f.m. of gas - the amount produced in the roasting of approximately 100 tons of concentrate per day (equivalent to approximately 800 tons of ore milled). This is the tonnage presently being handled (see appendix). The new precipitator, which went into operation during February of this year, is a duplicate of the old one. It had been planned to operate this new precipitator at a temperature above the sublimation temperature of arsenic trioxide in order to remove the gold and other dusts present in the flue gas; then to cool this cleaned gas and pass it through the old Cottrell to remove the condensed arsenic trioxide. However, when this was tried, arsenic collection efficiencies fell drastically. With the two collectors operated cold, in series, arsenic collection efficiencies averaging about 70-75% have been attained. This is the system now in operation.

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(b) Outlook for increased Tonnage

The new precipitator, when operated hot, recovered about 98% of the gold dust presently being carried by the flue gases. However, the composition of this dust was such that the mill could not extract the gold from it. Twenty ounces of gold per day (\$22,500 per month) are being lost in the flue gases just now. Mr. Pitcher stated that consequently no increase in tonnage of ore handled will be considered until the metallurgical difficulties are solved. He felt this would take at least five or six years.

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(c) Present investigations and possible operating Changes.

(i) Background

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When the first precipitator was originally installed, the only roasting units in operation were two Allis - Chalmers roasters. Collection efficiencies of the Cottrell averaged 92% or better, which was the minimum guaranteed by the sellers of the equipment. After the Dorrco roaster was installed, collection efficiencies fell to 50% or lower. It is now believed that the composition of the roaster gases influences the ability of the Cottrell to ionize the dust particles: gases from the A-C roaster, with a high SO3 content, promote ionization while gases from the Dorrco, which contain more SO2, do not. This theory was confirmed to a degree, by tests in which H2SO4 was added to the flue gas.

(ii) Proposed pilot plant Work

By this fall Giant hopes to have in operation a pilot plant to test a new system of roasting, which will produce gases having almost the same composition as those produced by the A-C roaster. Percentage recovery, by the Cottrells, of the arsenic trioxide in these gases, is expected to be high.

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(iii) Plant changes dependent on results of (ii)

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If pilot plant tests prove successful, Giant will scrap its present Dorrco and A-C roasters and switch over to the new method. This will involve a revamping of the whole plant, taking approximately two years. During this time, arsenic collection efficiencies will be about 75%.

If the new method does not work out, Giant will install spray towers to condition the gases with water, but without the addition of H2SO4. Mr. Pitcher said 92% collection efficiency can be obtained in this way.

B. CON

Later in the week I called on Mr. J.E. McMynn, Mine Manager at the Con mine. (Mr. McMynn has since been transferred to Trail. His successor is Mr. E.J. Colethorpe).

The chief point of information gained at this time was that, starting about the end of April this year, the arsenic content of both the Con and the town drinking waters rose to 0.2 p.p.m. and higher, and stayed there until early in June. This is approximately the level reached in previous years, but it has never stayed high for such a long time. So far, Con has come to no conclusion about the possible explanation of this occurrence.

C. OUR OWN WORK

By working long hours, seven days a week, Jerry and I did in 17 days as much as we did last year in 5 weeks. This should not be taken as a precedent in estimating the time that will be required to do the same work in the future.

We collected all the usual samples of grass and water, plus fifteen stack samples at Giant and nine at Con. I brought back one sample of milk from the local dairy supply.

In addition, I accompanied Mr. Ras Fraser. Safety Engineer at Giant, while he collected some of the monthly fall-pan samples which Giant at our request is now taking.

J. P. Windish.

JPW/MV.

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APPENDIX

DAILY ROASTER TONNAGES AT GIANT YELLOWKNIFE GOLD MINE - JULY 1955.

Date	Tons to	Tons to	Total
	Dorrco	A - C	tons.
1 July 2 " 3 " 4 " 5 " 6 " 7 " 8 " 9 " 10 " 11 " 12 " 13 " 13 " 14 " 15 " 16 " 17 " 18 " 19 " 20 "	$\begin{array}{c} 34.70\\ 59.03\\ 59.12\\ 60.39\\ 60.35\\ 59.93\\ 60.57\\ 60.46\\ 60.41\\ 59.73\\ 60.19\\ 60.37\\ 59.73\\ 60.19\\ 60.37\\ 59.73\\ 60.35\\ 63.05\\ 63.43\\ 62.21\\ 63.50\end{array}$	$\begin{array}{c} 8.32 \\ 42.07 \\ 50.11 \\ 42.06 \\ 29.77 \\ 33.94 \\ 21.60 \\ 44.88 \\ 42.97 \\ 59.51 \\ 44.72 \\ 57.83 \\ 58.94 \\ 45.49 \\ 75.07 \\ 41.21 \\ 32.47 \\ 43.69 \\ 30.38 \\ 41.80 \end{array}$	43.02 101.10 109.23 102.45 90.12 93.87 82.17 105.34 103.32 119.97 105.13 117.56 119.13 105.86 134.80 101.56 95.52 107.12 92.59 105.30