

O T T A W A

September 22nd, 1941.

PRELIMINARY

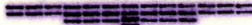
R E P O R T

of the

ORE DRESSING AND METALLURGICAL LABORATORIES.

(Investigation No. 1095) *A*

Preliminary Report on Magnetic Concentration
Tests on Ore from the Ontario Nickel Corporation Mine
at Moose Lake, Sudbury District, Ontario.



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The ore received (5 tons, September 2nd, 1941) was
a nickeliferous pyrrhotite containing chalcopyrite.

Several tests were made on the ore, the three tests
given herein being the best from the point of view of
recovery and grade of final concentrate.

TEST NO. 1.

In this test the ore was stage-crushed to -1" and the entire feed passed over the magnetic separator, the magnetics forming the concentrate and the non-magnetics forming the tailing.

Product	:Weight,:	Assays,			Recovery,		
	: per	per cent			per cent		
	: cent	: Ni	: Cu	: Insol.:	: Ni	: Cu	: Insol.
Feed	: 100.0	2.69	0.72	25.70	100.0	100.0	100.0
Conc.	: 62.2	3.14	0.60	12.22	72.6	51.8	29.6
Tailing	: 31.8	1.95	0.92	47.93	27.4	48.2	70.4

Ratio of concentration = 1.61:1.

TEST NO. 2.

The ore was stage-crushed to -1" and the -20 mesh material was screened out. The -1" +20 mesh material and the -20 mesh material were treated separately on a magnetic separator. The -1" +20 mesh magnetics were combined with the -20 mesh non-magnetics to make the final concentrate, while the -1" +20 mesh non-magnetics were combined with the -20 mesh magnetics to make the final tailing.

Product	:Weight,:	Assays,			Recovery,		
	: per	per cent			per cent		
	: cent	: Ni	: Cu	: Insol.:	: Ni	: Cu	: Insol.
Feed	: 100.0	2.69	0.72	25.70	100.0	100.0	100.0
Conc.	: 56.4	3.47	0.69	14.86	72.8	54.6	32.6
Tailing	: 43.6	1.68	0.74	39.69	27.2	45.4	67.4

Ratio of concentration = 1.77:1.

As indicated, this method resulted in a distinct improvement of the grade, with about the same recovery as in Test No. 1.

TEST NO. 3.

In this test the ore was stage-crushed to -1" and the -20 mesh material was screened out. The -1" +20 mesh material was treated on a magnetic separator and the magnetic portion was combined with all the -20 mesh material to form the final concentrate. The -1" +20 mesh non-magnetic material formed the tailing.

Product	:Weight,:	Assays,			Recovery,		
	per	per cent			per cent		
	cent	Ni	Cu	Insol.	Ni	Cu	Insol.
Feed	100.0	2.69	0.72	25.70	100.0	100.0	100.0
Conc.	66.4	3.29	0.65	13.61	81.2	60.3	35.2
Tailing	33.6	1.32	0.84	49.69	18.8	29.7	64.8

Ratio of concentration : 1.50:1.

This test gave a better recovery and a better grade than did Test No. 1; also a better recovery at a lower grade than did Test No. 2.

Summary:

Test No. 3 appears to be the best type of flow-sheet, giving the best recovery of nickel at a suitable grade. This flow-sheet is more simple than that of Test No. 2 and only slightly more complicated than in Test No. 1. It would only require the use of a double-deck screen in place of the single deck used in Test No. 1. Test No. 2 would require a double-deck screen and also a separate magnetic separation circuit.

The non-magnetic tailings from Test No. 3 are amenable to flotation. A recovery of 72 per cent of the

(Summary, cont'd) -

remaining nickel and 93.7 per cent of the remaining copper at a grade of 4.40 per cent nickel and 2.67 per cent copper.

By combining the flotation concentrate with the magnetic separator concentrate a recovery of 95.6 per cent of the nickel is indicated.

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