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OTTAWA September 2nd, 1941.

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of the

ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 1081.

Sink-and-Float Tests on a Sample of Magnesite from the Cull Dump of Canadian Refractories Limited Property at Kilmar, Quebec.

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BUREAU OF MINES
DIVISION OF METALLIC MINERALS
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CANADA
DEPARTMENT
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Shipment:

Two bags of rock, total weight 200 pounds, were received on December 15th, 1940. The sample was submitted by N. P. Pitt, Managing Director, Canadian Refractories Limited, Canada Cement Building, Phillips Square, Montreal, Quebec.

Location of Property:

The property from which this ore was taken is located at Kilmar in the Province of Quebec, about 40 or 50 miles west of Montreal.

Character of the Ore:

This series of tests was conducted on a sample of material taken from the cull dump where it had been discarded owing to its high serpentine content and resultant low grade. No microscopic examination of this shipment was made but other shipments of ore from this property have been examined and reported in Investigation No. 983, under date of March 25th, 1941.

Experimental Tests:

Sink-and-float tests were conducted on samples of this material for the purpose of rejecting as much as possible of the serpentine gangue and leaving for further treatment a product enriched in magnesite.

A density separation was therefore made at 2.80 on material having a size range of -1" +3 mesh. A size density analysis previously carried out indicated these to be the most satisfactory conditions at which the separation could be made.

The tests were carried out on a small scale, in pails, using the same medium as would be used in a large-scale operation.

The medium consists of a suspension of finely ground galena and water the density of which can be controlled to an accuracy of 0.01 by altering the proportions of galena and water.

(Continued on next page)

(Experimental Tests, cont'd) -

The results of the test are given in the following tables. The assays for magnesite have been estimated by deducting the serpentine and dolomite from 100. Serpentine and dolomite were calculated from lime and acid insoluble assays. The material finer than 3 mesh was rejected.

Table I. - Distribution of Products from Crushing.

Product	Weight, per cent	MAGNESITE Assay, per cent	MAGNESITE Distribution, per cent
S.F. feed	75.73	33.9	74.1
Fines -3 mesh	24.27	36.9	25.9
Feed sample	100.00	34.6	100.0

Table II. - Distribution of Products from S.F. Separation.

S.F. conc.	47.7	51.2	72.2
S.F. tailing	52.3	18.0	27.8
S.F. feed	100.0	33.9	100.0

Table III. - Summary of Products from Pre-Concentration.

Fines -3 mesh	24.27	36.9	25.9
S.F. tailing	39.58	18.0	20.6
Reject	63.85	25.2	46.5
S.F. conc.	36.15	51.2	53.5
Feed	100.00	34.6	100.0

The concentrate assays 3.94 per cent acid insoluble and 12.10 per cent lime.

Conclusions:

The concentrate represents recovery of material that would otherwise be wasted either by being discarded on the surface or left in place in the mine.

The product might be adapted to use as it is or it might be mixed with some higher-grade product to produce one of average grade.

The results of this test appear to indicate favourable possibilities for the process and to warrant a plant-scale test on a 5- or 10-ton lot at a later date.

The material finer than 3 mesh was screened out and rejected because it was too low-grade to be added to the sink product and would not separate satisfactorily by the sink-and-float process. The net result of the treatment is, therefore, a product ranging in size from one inch down to 3 mesh, amounting to 36.15 per cent of the weight of the ore and containing 53.5 per cent of the magnesite.

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