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O T T A W A July 5th, 1941.

R E P O R T

of the

ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 1044.

Sink-and-Float Tests on Samples of Gold Ore from the Omega Mine at Larder Lake, Ontario.

BUREAU OF MINES
DIVISION OF METALLIC MINERALS
ORE DRESSING AND
METALLURGICAL LABORATORIES

CANADA
DEPARTMENT
OF
MINES AND RESOURCES
MINES AND GEOLOGY BRANCH

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Shipment:

Five sacks of ore, net weight 315 pounds, were received on June 26th, 1941. The shipment was submitted by J. M. Carter, Mill Superintendent, Omega Gold Mines Limited, Larder Lake, Ontario.

Location of Property:

The property from which this ore was taken is located in McVittie township, in the Larder Lake mining division of Ontario.

Character of the Ore:

No microscopic examination of the present shipment has been made but a complete description of this ore is to be found in Report of Investigations No. 763 (Investigation No. 613), published in 1955.

Sampling and Assaying:

No head samples for assay were taken from the shipment received but assays calculated from the products of tests are as follows:

		Au, oz./ton
$-2" + \frac{3}{4}"$ size	-	0.162
$-\frac{3}{4}" + \frac{1}{4}"$ "	-	0.134

Experimental Tests:

Sink-and-float tests were conducted on approximately one quarter of the samples of each size of the ore as received, to determine whether or not any portion of it could be rejected as low-grade waste at this size. The results were unsatisfactory and in one case erratic, the intermediate product or secondary float being lower-grade than the fraction floated at a lower density. This is typical of our experience with gold ores treated by the sink-and-float process.

The results are described in detail as follows:

(Continued on next page)

(Experimental Tests, cont'd) -

The ore as received had been crushed through a 2" crusher setting and screened $+\frac{3}{4}$" and $-\frac{3}{4}"+\frac{1}{4}"$. The fractions were treated separately by the sink-and-float process in which a density separation was made in a galena-water suspension the gravity of which can be controlled to an accuracy of 0.01.

Separations were made at densities of 2.775 and 2.80, i.e. the fraction that sank at 2.775 was re-treated at 2.80, producing an intermediate fraction which when added to the original float indicated what could be expected if the ore were treated at the higher density.

Summary of Results:

$-\frac{3}{4}"+\frac{1}{4}"$ FRACTION.

Product	Weight, per cent	Assay, Au oz./ton	Distribution of gold, per cent
Float @ 2.775	36.2	0.04	10.8
Float @ 2.80; Sink @ 2.775	15.5	0.07	8.1
Sink @ 2.80	48.3	0.225	81.1
Feed (cal.)	100.0	0.134	100.0

$-2"+\frac{3}{4}"$ FRACTION.

Product	Weight, per cent	Assay, Au oz./ton	Distribution of gold, per cent
Float @ 2.775	17.9	0.10	11.0
Float @ 2.80; Sink @ 2.775	5.3	0.04	1.3
Sink @ 2.80	76.8	0.185	87.7
Feed (cal.)	100.0	0.162	100.0

(Concluded on next page)

(Experimental Tests, cont'd) -

Concerning the results of the test conducted on the -2"+¾" fraction, it might normally be expected that the intermediate fraction would assay higher than the float at 2.775, as is the case with the finer fraction, but owing to the more or less sporadic distribution of gold in an ore results of this sort are likely to be encountered at any time.

Conclusions:

In general, from a metallurgical viewpoint, this process is not suited to the treatment of disseminated ores, except in some cases where local conditions exert a strong influence.

This is particularly true in the case of gold ores owing to the relatively high value of small amounts of gold which can be so easily floated off in coarsely crushed ore.

In this case, 11 per cent of the gold would be lost in each of the size ranges treated if the separation is made at a density of 2.775. At the higher density the loss increases out of direct proportion to the extra elimination effected.

In view of this gold loss the process does not appear attractive.

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