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O T T A W A July 17th, 1942.

R E P O R T

of the

ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 1264.

Flotation Tests on Five Samples of Ore from the Toburn Gold Mines Limited, Kirkland Lake, Ontario.

(Copy No. 13.)

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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Flotation Tests on Five Samples of Ore from the Toburn Gold Mines Limited, Kirkland Lake, Ontario.

Shipment:

The shipment consisted of five small samples, numbered 1091 to 1095. The total weight of the samples was approximately 10 pounds.

Location of Property:

The property is located in Gauthier township in the East Kirkland Lake district, Ontario.

Purpose of the Investigation:

The samples were submitted for the purpose of determining the presence of scheelite and the recovery and grade of a scheelite concentrate obtainable by flotation of the ore.

Analysis of the Samples:

Sample No.		Tungsten trioxide, per cent
1091	"	1.86
1092	"	2.28
1093	"	0.25
1094	"	1.02
1095	"	0.70
Composite sample,		1.37

Details of Test Work:

Test No. 1. - Flotation.

A portion of the composite sample was treated by flotation. The ore was ground in a ball mill, dilution 4:3. The pulp was transferred to a flotation machine and a sulphide concentrate was recovered.

The pulp was then conditioned and floated to remove a scheelite concentrate. A further addition of reagents resulted in a scavenger concentrate.

None of the concentrates was recleaned. In practice, the scavenger concentrate would be returned to the scheelite flotation feed.

Reagents -

To the ball mill:		Lb./ton
Soda ash	-	1.0
Amyl xanthate	-	0.2
Cresylic acid	-	0.10

Grind, 85.6 per cent minus 200 mesh.

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(Test No. 1, cont'd) -

To sulphide flotation:		Lb./ton
Cresylic acid	-	0.04

A sulphide concentrate was recovered in 5 minutes.

pH, 8.6.

Then were added:

Soda ash	-	1.0
Copper sulphate	-	1.0
Amyl xanthate	-	0.2
Cresylic acid	-	0.08

A further concentrate, black in appearance, was recovered in about 7 minutes.

To scheelite flotation:

		Lb./ton
Water glass (sodium silicate)	-	1.0
Emulsol (X-1)	-	0.10
Orso	-	0.06

A scheelite concentrate was recovered in about 2 minutes.

To recover a scavenger concentrate:

Emulsol (X-1)	-	0.10
Orso	-	0.30

No cresylic acid was required.

The scavenger concentrate was recovered in about 10 minutes. The Orso was added in stages as required and appears to produce a froth without the use of cresylic acid, except that added to produce the sulphide froth.

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(Test No. 1, cont'd) -

Results:

Products	Weight, per cent	WO_3 assay, per cent	Distribution of WO_3, per cent	Ratio of concentration
Feed	100.0	1.37	100.0	
Sulphide conc.	15.2	0.66	7.3	6.6:1.
WO_3 conc.	4.3	12.07	38.2	23.0:1.
Scavenger conc.	8.1	9.06	53.5	12.3:1.
Flot. tailing	72.4	0.02	1.0	

The combined WO_3 and scavenger concentrates assayed 10.11 per cent WO_3 (by calculation).

Conclusion:

The test work indicates that a grade of concentrate acceptable for chemical treatment may be expected from ore similar to that of the shipment. The grade of combined scheelite and scavenger concentrates was about 10 per cent WO_3, with a recovery of 91.7 per cent of the scheelite in the ore.

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