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DEPARTMENT OF MINES AND RESOURCES

BUREAU OF MINES

CANADA

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Ottawa, January 11, 1947.

REPORT

of the

ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 2162.

Flotation Tests on a Sample of Copper-Gold Ore from the New Bidlamaque Mine at Bourlamaque, Quebec.

Note:

This report relates essentially to the samples as received. It shall not, nor any correspondence connected therewith, be used in part or in full as publicity or advertising matter for the sale of shares in any promotion.

(Copy No. 13.)

Bureau of Mines

Mineral Dressing and
Metallurgy Division

CANADA

DEPARTMENT
OF
MINES AND RESOURCES

Mines and Geology Branch

O T T A W A January 11, 1947.

R E P O R T

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ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 2162.

Flotation Tests on a Sample of Copper-Gold Ore from the New Bidlamaque Mine at Bourlamaque, Quebec.

Shipment:

A shipment of three bags of ore, net weight 246 pounds, was received on September 3, 1946. The shipment was submitted by P. S. Broadhurst, Mine Manager, New Bidlamaque Gold Mines Limited, Bourlamaque, Quebec.

Location of Property:

The property from which this ore was taken is located in Bourlamaque township, in northwestern Quebec.

Sampling and Assaying:

The shipment of ore was sampled, assayed and reported as follows:

Gold	-	0.08 oz./ton
Silver	-	0.21 "
Copper	-	1.80 per cent
Zinc	-	0.31 "
Iron	-	16.71 "
Arsenic	-	None detected.
Sulphur	-	7.26 per cent
Lead	-	None detected.
Nickel	-	0.10 per cent
Insoluble	-	51.60 "

Purpose of the Tests:

The object of this series of tests was to produce a copper concentrate of marketable grade carrying as much of the gold as possible.

Results of Tests:

The ore contains schist which seems to slime rather freely in lime or sodium silicate pulps but behaves quite well in a soda ash pulp with butyl xanthate. Yellow dextrine added to the flotation cell helps to keep down the slime but it also appears to depress some of the gold and silver.

Conclusions:

With a grind of about 70 per cent through 200 mesh, a concentrate can be produced that will assay about 26 per cent copper and contain about 60 to 75 per cent of the total gold.

The most satisfactory reagent combination found for this purpose during this series of tests was a soda ash pulp with butyl xanthate as collector and pine oil for frother.

In some of the earlier tests diphenyl-guanidine was used in place of butyl xanthate and caused the slime to float

(Conclusions, cont'd) -

profusely.

It may be that the sliming problem was corrected to some extent by reason of the fine ore having been exposed for some time to the action of the atmosphere. This has been known to happen in other instances.

The soda ash pulp, however, seems to keep the pyrrhotite down quite effectively and produce copper concentrates of about 26 per cent grade.

Character of the Ore:

Six polished sections were prepared and examined under a reflecting microscope for the purpose of determining the character of the ore.

Gangue -

In the polished sections gangue material is a mixture of soft, light to dark grey, fine-grained rock and white to colourless quartz in about equal proportions. In some hand specimens the rock component has a greenish colour, displays a distinct schistosity, and probably represents a silicified greenstone or chloritic schist.

Metallic Minerals -

Metallic mineralization is moderately strong in the polished sections and is represented by chalcopyrite, pyrrhotite, pyrite, sphalerite, and an unknown mineral. Of these only chalcopyrite and pyrrhotite are abundant; the others are present in very small amounts. No gold is visible in the six polished surfaces but this is not surprising since so little occurs in the ore sample.

Chalcopyrite and pyrrhotite occur in close association and in almost equal amounts as small masses and coarse to fine irregular grains disseminated unevenly through gangue. In

(Character of the Ore, cont'd) -

one section some of the pyrrhotite presents a shredded appearance with the long directions of the cross-sections parallel to the schistosity of the rock. Both minerals contain occasional small inclusions of gangue and grains of the other metallics.

Small quantities of pyrite, sphalerite, and an isotropic, unknown mineral are visible as occasional to rare small scattered grains, which are intimately associated with chalcopyrite and/or pyrrhotite. The unknown mineral is light yellow in colour and occurs in pyrrhotite as tiny, spindle- or flame-shaped inclusions, which are much too small to identify with certainty, but which, from their microscopic characteristics and modes of occurrence, suggest pentlandite.

DETAILS OF INVESTIGATION:

Test No. 1.

A number of reagent combinations were tried without success until the soda ash-butyl xanthate combination was used.

A sample of the ore was ground 70 per cent finer than 200 mesh with the following reagents and floated:

Charge to Ball Mill -

Ore	=	1000 grams at -20 mesh
Water	=	750 grams
Soda ash	=	4.0 lb./ton
Sodium cyanide	=	0.10 "

Reagents to Cell -

Butyl xanthate	=	0.10 lb./ton
Pine oil	=	0.05 "
pH	=	10.50.

The concentrate was cleaned without additional reagents.

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(Details of Investigation, cont'd) -

Results of Test No. 1:

Product	Weight, per cent	Assays Oz./ton Au	Assays Oz./ton Ag	Assays Per cent Cu	Assays Per cent Fe	Assays Per cent Insol.	Distribution, per cent Au	Distribution, per cent Ag	Distribution, per cent Cu
Copper conc.	6.39	0.48	0.96	25.98	28.40	14.62	74.31	48.57	88.0
Copper cleaner tailing	10.77	0.06	0.18	1.20			15.66	15.35	6.88
Flotation tailing	82.84	0.005	0.055	0.09			10.03	36.08	4.00
Feed (calc)	100.00	0.041	0.13	1.86			100.00	100.00	100.00

Action in the cell looked comparatively good in this test. While some gangue minerals floated in the rougher circuit they cleaned out nicely in the cleaning operation.

Test No. 2.

This test was the same in all respects as Test No. 1, except that 0.60 pound of yellow dextrine per ton was added to the cell to depress gangue minerals. It did this but also depressed the gold and silver to a considerable extent.

Results of Test No. 2:

Product	Weight, per cent	Assays Oz./ton Au	Assays Oz./ton Ag	Assays Per cent Cu	Assays Per cent Fe	Assays Per cent Insol.	Distribution, per cent Au	Distribution, per cent Ag	Distribution, per cent Cu
Copper conc.	5.20	0.82	1.44	29.45	30.86	8.54	60.61	30.83	92.65
Copper cleaner tailing	4.72	0.11	0.41	1.62			7.38	7.97	4.63
Flotation tailing	90.08	0.025	0.165	0.05			32.01	61.20	2.72
Feed (calc.)	100.00	0.07	0.24	1.65			100.00	100.00	100.00

While copper recovery is actually higher in this test than in Test No. 1, it is doubtful that the dextrine was in any way responsible for this. It is, however, thought to be definitely responsible for the better grade of the concentrate.

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