O T T A W A April 20th, 1942.

R E P O R T

of the

ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 1205.

Gravity Concentration and Amalgamation of a Gold Ore from the Pershing Manitou Gold Mines Limited, Belcourt, Abitibi County, Quebec.

(Copy No. 21.)

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:

On March 13th, 1942, a shipment of 681 pounds of ore was received at the Ore Dressing Laboratories of the Bureau of Mines, 552 Booth Street, Ottawa, Ontario, from the Pershing Manitou Gold Mines Limited. This property is located in the township of Courville, Abitibi county, Quebec, 7 miles from the village of Belcourt. The sample was submitted by Mr. J. L. E. Berthiaume, Pershing Manitou Gold Mines Limited, Belcourt, Quebec, for bulk sampling and metallurgical testing.

Characteristics of the Ore:

Six specimens were polished and examined under the reflecting microscope to determine the mineral characteristics.

General -

The metallic mineralization is sparse and is represented almost entirely by pyrite and chalcopyrite.

Pyrite -

The pyrite occurs largely as medium to coarse grains and crystals which are disseminated unevenly through the gangue.

Chalcopyrite -

The chalcopyrite occurs as small masses and coarse to fine irregular grains which are usually associated with the pyrite.

Gold -

No gold was detected under the microscope but the milling tests indicate that the gold is largely "free".

Sampling and Assaying:

A representative sample of the shipment, obtained by standard methods, assayed 0.195 ounce gold per ton.

Summary of Results:

This ore, as represented by the sample, is amenable to simple gravity concentration and amalgamation.

Details of Tests:

Three sets of tests were run on this ore, as follows: (1) amalgam plates followed by corduroy blanket concentration of the amalgam plate tails; (2) corduroy blanket concentration followed by barrel amalgamation of the blanket concentrates; and (3) jig concentration followed by corduroy blanket concentration and barrel amalgamation of both concentrates.

(Continued on next page)

(Details of Tests, cont'd) -

Test No. 1. - Amalgamation Plates and Blanket Concentration.

1,500 grams of ore was ground in a laboratory ball mill with 0.5 pound soda ash per ton and then passed over an amalgam plate. This was followed by corduroy blanket concentration of the amalgam plate tailings. The blankets were set at a slope of 2 inches to the foot.

Product	Weight, per cent	Assay, Au, oz./ton	Units, gold	Recovery of gold, per cent
Feed	100.0	0.195	2.925	100.00
Amalgam	-	-	1.834	62.89
Blanket conc.	3.2	1.50	0.710	24.26
Final tailing	96.8	0.027	0.376	12.85

Screen Analysis of Final Tailings.

Mesh		Weight, per cent
+ 35	-	1.0
- 35+ 48	-	6.2
- 48+ 65	-	11.6
- 65+100	-	16.9
-100+150	-	15.9
-150+200	-	9.7
-200	-	38.7
		100.0

Test No. 2. - Blanket Concentration and Amalgamation of Blanket Concentrates.

1,000 grams of ore was placed in a laboratory ball mill and ground for 15 minutes. No reagents were added. The ground ore was passed over corduroy blankets set at a slope of 2 inches to the foot. The blanket concentrates were barrel-amalgamated without further grinding. The mercury recovered

(Test No. 2, cont'd) -

showed no signs of fouling after amalgamation.

Product	Weight, per cent	Assay, Au, oz./ton	Units, gold	Recovery of gold, per cent
Feed	100.0	0.20	6.85	100.00
Blanket concentrate	11.3	1.57	6.09	88.90
Blanket tailing	88.7	0.025	0.76	11.10
Amalgamation:				
Amalgam tailing	11.3	0.07	0.27	3.94
Amalgam	-	-	5.82	84.96

Screen Analysis of Tailing.

Screen size	Weight, per cent
+ 48	-
- 48+ 65	2.0
- 65+100	9.1
-100+150	17.1
-150+200	15.1
-200	56.7
	100.0

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Test No. 3. - Jig and Blanket Concentration with Amalgamation of Both Concentrates.

In this test 1,000 grams of ore was ground in the laboratory ball mill for 15 minutes with no reagents added. The ground ore was treated on a jig with the jig tailing going over corduroy blankets set to a slope of 2 inches to the foot.

Product	Weight, per cent	Assay, Au, oz./ton	Units, gold	Recovery of gold, per cent
Feed	100.0	0.195	6.61	100.00
Jig and blanket concentrate	15.0	1.14	5.88	88.96
Blanket tailing	85.0	0.025	0.73	11.04
Amalgamation:				
Amalgam Tailing	15.0	0.06	0.31	4.69
Amalgam	-	-	5.57	84.27

(Test No. 3, cont'd) -

The grind in this test was the same as for Test No. 2. The jig was used to see if the tailings would be lowered by this means. However, there was no benefit in using the jig.

CONCLUSIONS:

This ore is suitable for simple gravity concentration and amalgamation.

A good recovery of the gold can be made by grinding to 100 per cent minus 35 mesh and making a corduroy blanket concentrate, followed by amalgamation of the blanket concentrate. This would give a simple flow-sheet, easily controlled, with a minimum of equipment. While plate amalgamation followed by blanket concentration gave the best results, it is considered that under actual operating conditions the results obtained by using the above flow-sheet will be equal to that obtained with the plates.

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