

O T T A W A

June 8th, 1940.

R E P O R T

of the

ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 851.

Mill Tailing from Lapa Cadillac Gold
Mines (1937) Limited,
Heva River P. O., Quebec.

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BUREAU OF MINES
DIVISION OF METALLIC MINERALS
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ORE DRESSING AND
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CANADA
DEPARTMENT
OF
MINES AND RESOURCES
MINES AND GEOLOGY BRANCH

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Mill Tailing from Lapa Cadillac Gold
Mines (1937) Limited,
Heva River P. O., Quebec.

Shipment:

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A sample of gold mill tailings, net weight 7 pounds, was received on May 17th, 1940, from the Lapa Cadillac Gold Mines (1937) Limited, Cadillac township, Quebec. The sample was submitted by M. E. Hertel, Mill Superintendent, Lapa Cadillac Gold Mines (1937) Limited, Heva River P. O., Quebec.

Sampling and Assaying:

The sample of mill tailing was riffled by the standard method and assayed as follows:

Gold	-	0.05 oz./ton
Copper	-	0.01 per cent
Sulphur	-	1.98 "
Iron	-	9.54 "
Arsenic	-	0.16 "

Purpose of the Investigation:

The purpose of the investigation was to determine where the gold losses are which cause high gold content in the cyanide tailing, that is, whether the gold is in the arsenopyrite, in the pyrite, or in the gangue.

Determination of the copper content in the mill tailing was also desired, as the copper in the ore dissolves out in the cyanide solution and is precipitated in the press, thus lowering the grade of bullion.

Experimental Investigations:

The experimental tests consisted of sizing the mill cyanide tailing by means of the Haultain infrasizer and concentrating the sized products by means of the Haultain superpanner.

Test No. 1.

A 400-gramme sample of mill tailing was screened through 200 mesh. The minus 200 mesh product was sized by means of the Haultain infrasizer.

The sized products assayed as follows:

(Continued on next page)

(Test No. 1, cont'd) -

Analyses of Sized Products:

Mesh or microns	Weight, : per : cent	GOLD		ARSENIC		Sulphide sulphur, per cent
		: Assay, : oz./ : ton	: Dis- : tr'n, : %	: Assay, : oz./ : ton	: Dis- : tr'n, : %	
+200 mesh	: 21.4	0.04	18.9	0.04	6.2	0.80
-200 " +40 microns	: 10.8	0.085	20.2	0.35	27.3	2.97
-40 +28 "	: 11.7	0.065	16.8	0.24	20.3	2.83
-28 +20 "	: 13.3	0.05	14.7	0.15	14.4	2.05
-20 +14 "	: 9.7	0.035	7.5	0.13	9.1	1.37
-14 +10 "	: 7.5	0.03	5.0	0.11	6.0	•
-10 microns	: 25.6	0.03	16.9	0.09	16.7	1.09
Total	: 100.0	0.0453	100.0	0.14	100.0	

• All of the sample was used up for gold and arsenic assays.

The plus 200 mesh product contained 18.9 per cent of the gold, 6.2 per cent of the arsenic, and assayed 0.80 per cent sulphide sulphur, while the minus 200 mesh plus 40 micron product contained 20.2 per cent of the gold, 27.3 per cent of the arsenic, and assayed 2.97 per cent sulphur. This would indicate that an appreciable amount of the gold is in the coarse gangue.

Test No. 2.

In this test, 400 grammes of cyanide mill tailing was sized as in Test No. 1 and the sized products, except the minus 10 micron product, were concentrated by means of the Haultain superpanner. The respective panner products from various sizes were combined and assayed.

(Continued on next page)

(Test No. 2, cont'd) -

Results of Panning Test:								
Product	GOLD			ARSENIC		SULPHUR		Copper, per cent
	Weight, per cent	Assay, oz./ ton	Dis- tr'n, %	Assay, %	Dis- tr'n, %	Assay, %	Dis- tr'n, %	
Mill tailing)	100.00	0.051	100.0	0.19	100.0	1.92	100.0	0.01
Panner conc.)	3.87	0.355	26.8	2.96	61.3	19.32	39.0	0.07
Panner middling)	15.38	0.05	15.0	0.07	5.7	2.83	22.6	0.01
Panner tailing)	55.26	0.04	43.2	0.07	20.7	0.83	23.9	Trace
-10 micron product	25.49	0.03	15.0	0.09	12.3	1.09	14.5	

The above results indicate that part of the gold is in the sulphide minerals, but an appreciable amount is in the gangue.

Two polished sections, prepared from panner concentrate, were examined under the reflecting microscope. The minerals present in the sections, arranged in their approximate order of decreasing abundance, are as follows: pyrrhotite, arsenopyrite, pyrite, magnetite, ilmenite(?), gangue, and chalcopyrite. All occur as irregular grains ranging from 100 microns down to 2 microns or less in size, the average being 25 to 30 microns. In general the metallic particles are entirely free both of gangue and of each other; a few grains of pyrite contain tiny inclusions of pyrrhotite. Chalcopyrite is visible only as rare grains. No native gold nor gold minerals were visible in the sections examined. As no native gold was seen and the product contained 0.355 ounce of gold per ton, it may be assumed that the gold is sub-microscopic.

Conclusions:

The gold assays of the sized products, in Test No. 1, show a gradual decrease in the gold content with decrease in the particle size of the product. 57.2 per cent of the mill tailing is plus 20 microns in size and contains 70.6 per cent of the gold in the mill tailing.

Concentrating the sized products by Haultain superpanner (Test No. 2) gave a concentrate assaying 0.355 ounce gold per ton, 2.96 per cent arsenic, and 19.32 per cent sulphur. This concentrate contained 26.8 per cent of the gold, 61.3 per cent of the arsenic and 39.0 per cent of the sulphur in the mill tailing. The panner tailing assayed 0.04 ounce gold per ton, 0.07 per cent arsenic and 0.83 per cent sulphur, and it contained 43.2 per cent of the gold, 20.7 per cent of the arsenic and 23.9 per cent of the sulphur in the mill tailing. This would indicate that not all of the gold was in the sulphide minerals.

The copper content in the mill tailing was 0.01 per cent. The amount is low, but it may be possible that the feed to the mill carries a higher amount of copper, some of it being dissolved during cyanidation and precipitated in the press, thus lowering the grade of bullion. Unless the copper contents in the feed and in the mill tailing are known, no conclusion can be drawn from an assay of mill tailing only.

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