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REPORT  
of the  
ORE DRESSING AND METALLURGICAL LABORATORIES

Report No. <sup>228</sup>....

Concentration of a silver-lead ore from the  
Slocan Silver Mines Ltd., Alamo, B.C.

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Shipment: A shipment of 200 pounds of silver-lead ore was received May 7, 1925, from the Slocan Silver Mines, Alamo, B.C. The shipment consisted of two sacks, designated as 'Lot No. 1', one sack as 'Lot No. 2' and one sack as 'Lot No. 3'

Characteristics and analysis of shipment:

The three lots represented distinct types of ores. Lot no. 1 consisted of clean siliceous ore representing 90% of the mineable ore. Lot no. 2 consisted of badly oxidized ore, containing a large amount of brown manganese oxide, representing 2% of the mineable ore. Lot no. 3 consisted of ore found near the breaks in the vein in which secondary minerals have formed, and represented 8% of the mineable ore. The analysis of the samples showed them to contain:

	Pb %	Zn %	Cu %	Ag oz/tn
Lot No. 1	1.05	0.80	0.27	37.7
Lot No. 2	2.61	0.75	2.80	349.6
Lot No. 3	0.65	0.75	1.14	150.3

Purpose of experimental tests:

The experimental tests were conducted to determine the recoveries and grade of concentrate that could be obtained by flotation on each type of ore, and on the ores when mixed in the proportions given above, so that the owners could determine whether it would be more profitable to ship the ore direct to the smelter, or concentrate it to obtain a high grade shipping

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product.

Experimental Tests

Procedure: A series of tests were made on each of the three lots, and on a composite sample made up in the proportion of the percentages of each in the run of mine. The sample cut out from each lot and from the composite lot for test purposes, was assayed for silver content only. The results are given in the following table:

Results of flotation tests:

Lot No.	Test No.	Product	Weight		Assay Ag.oz/tn	% silver values.	Remarks
			lbs	%			
1	1	Head sample			26.70		
		Concentrate	89.7	9.0	271.30	91.0	3% +100 mesh; pulp neutral. Xanthate .4 lb/tn; Pine oil to froth.
		Tailing	901.5	91.0	2.65	9.0	
	Totals	991.2	100	26.9	100.0		
	2	Concentrate	110.5	11.1	220.60	91.2	3% +100 mesh; pulp neutral. Soda ash 2 lb/tn; Xanthate .4 lb/tn. Pine oil froth.
		Tailing	883.9	88.9	2.65	8.8	
		Totals	994.4	100	26.8	100.0	
	3	Concentrate	50.9	5.6	420.60	89.4	3% +100 mesh; pulp neutral (40% coal tar) (60% c.t.c. ) .75 lb/tn 0.2 lb/tn xanthate Pine oil to froth
		Tailing	861.2	94.4	2.96	10.6	
Totals		912.1	100	26.3	100.0		
2.	1	Head sample			233.80		
		Concentrate	117.7	11.7	1600.90	78.9	-100m; pulp neutral (40% coal tar) (60% c.t.c. ) .75 lb/tn .2 lb/tn xanthate Pine oil to froth
		Tailing	884.0	88.3	56.88	21.1	
Totals	1001.7	100	238.0	100.0			
3.	1	Head sample			113.10		
		Concentrate	81.2	8.0	1086.80	77.8	3% +100m; pulp neutral (40% coal tar) (60% c.t.c. ) 1 lb/tn .2 lb/tn Xanthate; Pine oil to froth
		Tailing	930.3	92.0	27.14	22.2	
Totals	1011.5	100	112.2	100.0			
Composite sample: Lot No. 1, 90%; No. 2, 2%; No. 3, 8%; Heads Ag. 37.75							
1		Concentrate	91.2	9.0	375.00	88.3	3% +100 mesh; pulp neutral. (40% coal tar) (60% c.t.c. ) .75 lb/tn .2 lb/tn xanthate; Pine oil to froth
		Tailing	924.0	91.0	4.94	11.7	
		Totals	1015.2	100	38.2	100.0	



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Screen test - Lot No. 1 - Feed to Flotation

<u>Mesh</u>	<u>Weight gms.</u>	<u>Weight %</u>
+65	1.2	0.24
-65 +100	13.4	2.68
-100+150	66.4	13.28
-150+200	75.2	15.04
-200	343.8	68.76

Summary and Conclusions:

The results of the tests show that there is no difficulty in concentrating by flotation the ore of Lot No. 1, which represents 90% of the run of mine. The recovery was high, and in practice should exceed 90% of the silver values. It is rather difficult to determine the maximum grade of concentrate that could be obtained in mill operations, together with low tailings, from the results of these small scale tests, but as the concentrates obtained in Tests Nos. 1, 2, and 3, were not recleaned, and are only rougher concentrates, it would seem that a concentrate exceeding 500 ozs. silver to the ton could be obtained in actual plant operations. The best results were obtained in a neutral pulp with the use of a mixture of coal tar and coal tar creosote (acid), and potassium xanthate. The coal tar and creosote mixture was added to the ball mill and the xanthate in solution direct to the head of the flotation cells.

The results of the tests on Lots Nos. 2 and 3, show a low recovery. No improvement is shown in the results on the composite sample. In fact, if the recovery made on Lot No. 1 is taken as an average of 90.5%, on Lot No. 2 as 78.9%, and on Lot No. 3 as 77.8%, the calculated recovery on the composite sample should be 89.3% instead of 88.3% as obtained. This checks very closely, showing that the total recovery obtained by concentrating each type of ore separately is practically the same as when the ores are mixed and concentrated together.

From the results of the above tests, it would seem that the concentration by flotation of the ore represented by Lot. No. 1 would be a profitable operation, and it would also seem that the ores represented by Lots Nos. 2 and 3 should be shipped direct.