

10. Flotation Tests on a Gold-Silver-Copper-Lead-Zinc Ore from Vangorda Creek, Yukon Territory

A shipment of gold-silver-copper-lead-zinc ore was received from a property near Vangorda Creek, Yukon Territory. It was requested that differential flotation tests be made with a view to obtaining commercial concentrates.

The analysis of the head sample gave the following results:-

Gold	0.02 oz./ton
Silver	1.73 " "
Copper	0.20%
Lead	3.50%
Zinc	4.75%
Insoluble	35.2 %
Iron	21.1 %
Sulphur	22.2 %

Microscopic examination showed that pyrite was the most abundant metallic mineral, some of it containing some small inclusions of the other metallic minerals, particularly sphalerite. Galena and sphalerite were found to be distributed unevenly through gangue in approximately equal amounts, alone and associated with each other and pyrite. Chalcopyrite and pyrrhotite, less abundant than galena and sphalerite, were present as medium coarse to fine irregular particles, mostly disseminated through gangue with a minor amount associated with sphalerite and pyrite. Gangue consisted largely of white to clear glassy quartz which carried a minor amount of finely and unevenly disseminated calcite.

Attempts were made to make a copper concentrate before lead flotation. However, a high grade copper concentrate could not easily be made, and this work, due to the low value of copper in the head sample, was not extended.

Table VI gives the results of flotation.

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TABLE VI
Results of Flotation

Product	Weight, %	Assay, oz./ton		Assay, %			Distribution, %				
		Ag	Au	Cu	Pb	Zn	Ag	Au	Cu	Pb	Zn
Pb-recl-conc.	4.3	17.72	0.138	0.22	51.71	7.78	44.5	27.3	7.1	64.8	6.9
Pb-recl-tail.	3.4	6.95	0.076	0.53	17.64	10.9	13.8	11.9	11.3	17.5	7.7
Combined zinc concentrates	5.6	2.8	0.06	0.69	2.9	48.5	9.3	14.4	22.7	4.7	56.7
Zn-recl-tail	6.2	2.84	0.038	0.49	4.64	11.9	10.3	10.9	17.2	8.4	15.4
Zn-clean-tail	16.0	0.89	0.028	0.14	0.71	1.4	8.3	20.7	12.6	3.3	4.6
Final tail	64.5	0.37	0.005	0.08	0.07	0.65	13.8	14.8	29.1	1.3	8.7
Head (calc'd)	100.0	1.71	0.02	0.18	3.4	4.8	100.0	100.0	100.0	100.0	100.0

The initial grind was 80% minus 200 mesh.

Reagents used:

To Ball Mill—

Sodium cyanide	Lb./ton	0.5
Lime		1.0
Zinc sulphate		1.0

To Lead Flotation—

Reagent 325	0.15
Reagent 301	0.05
Dowanol 93-B-100	0.04

To Lead Re grind—

Sodium cyanide	0.05
Lime	0.20

To Lead Recleaner—

Sodium cyanide	0.02
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To Zinc Flotation—

Copper sulphate	1.0
Lime	1.5

Reagent 325	0.05
Reagent 301	0.15
Dowanol 93-B-100	0.04

To Zinc Scavenger Flotation—

Copper sulphate	0.5
Lime	0.5
Reagent 301	0.05

To Zinc Cleaners (Total)—

Lime	0.9
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The sample was not large enough to make pilot plant runs. Test work indicated that saleable lead and zinc concentrates could be made from this ore with not very high recoveries. Recoveries might be improved by using efficient means of classification and fine grinding. Initial fine grinding should be

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