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An Investigation of
THE RECOVERY OF GOLD AND SILVER
from samples of Bank's Island Ore
submitted by
FALCONBRIDGE NICKEL MINES LIMITED
Progress Report No. 2

Project No. L.R. 1616

NOTE:

This report refers to the samples as received.

The practice of this Company in issuing reports of this nature is to require the recipient not to publish the report or any part thereof without the written consent of Lakefield Research of Canada Limited.

LAKEFIELD RESEARCH OF CANADA LIMITED
Lakefield, Ontario
June 5, 1973

I N T R O D U C T I O N

Two samples of gold and silver ore from Bank's Island, B.C. were received at Lakefield on April 10, 1973. The samples were designated Bob's Zone and Discovery Zone.

Mr. J.M. Mortimer of Falconbridge Nickel Mines Limited requested that we should carry out preliminary cyanidation tests to determine the recovery of gold and silver by this method.

LAKEFIELD RESEARCH OF CANADA LIMITED



A.G. Scobie, P. Eng.,

Manager.



A.C.T. Bigg,

Project Metallurgist.

Investigation by: R.G. Irwin

S U M M A R Y

Head Assay

	<u>Au</u>	<u>Ag</u>
Bob's Zone	0.35, 0.32* oz/ton	0.33, 0.28* oz/ton
Discovery Zone	0.66, 0.68* oz/ton	1.40, 1.27* oz/ton

* Average assay as calculated from test results.

Cyanidation

Recoveries of over 90 % gold and 70 % silver were obtained on both ores, but cyanide consumption was high in all tests.

Test No.	Zone	NaCN Consumption lb/ton of feed	% Recovery	
			Au	Ag
CY-1	Bob's	10.5	90.8	71.6
CY-2	Bob's	6.80	87.1	71.5
CY-3	Discovery	5.64	92.4	75.6
CY-4	Discovery	4.68	92.0	68.5

SAMPLE PREPARATION

Seven bags of ore with a total weight of approximately 500 pounds were received at Lakefield on April 10, 1973, and given our Reference No. 7319967. The two samples consisted of minus 6 inch rock pieces and were designated Bob's Zone and Discovery Zone.

Each zone was tested separately. The samples were jaw-crushed to minus 3/8 inch, and half of each was removed by riffing and stored. The remaining halves were cone-crushed to minus 1/4 inch, and a further 1/4 was removed for storage. The final 1/4 sample of each was roll-crushed to minus 10 mesh and riffled into 1 kilogram charges for testwork.

DETAILS OF TESTS

CYANIDATION TESTS

Test No. CY-1

Purpose: To determine the amenability of the Bob's Zone ore to cyanidation.

Feed: ~ 500 grams Bob's Zone Composite sample.

Grind: 1000 grams for 40 minutes at 50 % solids in the laboratory ball mill.

Reagent Balance:

Time Hours	Added, Grams				Residual		Consumed		pH
	Actual NaCN	Ca(OH) ₂	Equivalent NaCN	CaO	Grams NaCN	CaO	Grams NaCN	CaO	
0-1	1.00	0.35	0.96	0.25	0.00	0.00	0.96	0.25	10.6-10.4
1-2	1.00	0.20	0.96	0.14	0.34	0.08	0.62	0.06	11.1-10.8
2-5	0.65	0.00	0.62	0.00	0.40	0.08	0.56	0.00	10.8-10.8
5-16	0.58	0.00	0.56	0.00	0.67	0.08	0.29	0.00	10.8-10.1
16-22	0.30	0.10	0.29	0.07	0.76	0.05	0.20	0.10	10.9-10.7
Total	-	-	3.39	0.46	-	-	2.63	0.41	-

Total Reagent Consumption:

Pounds per ton of feed

NaCN: 10.52

CaO : 1.64

Test No. CY-1 - Continued

Metallurgical Results

Product	Amount	Assay		% Distribution	
		Au	Ag	Au	Ag
Pregnant solution	2000 ml.	2.55 mg/l	1.73 mg/l	90.8	71.6
Leach residue	499.1 g.	0.030 oz/t	0.080 oz/t	9.2	28.4
Head (calculated)	499.1 g.	0.33 oz/t	0.28 oz/t	100.0	100.0

Screen Analysis

Residue

Mesh Size (Tyler)	% Retained		% Passing Cumulative
	Individual	Cumulative	
+ 100	0.1	0.1	99.9
150	0.3	0.4	99.6
200	2.0	2.4	97.6
270	3.6	6.0	94.0
400	14.9	20.9	79.1
- 400	79.1	100.0	-
Total	100.0	-	-

Test No. CY-2

Purpose: To determine the effect on Bob's Zone sample of using a lower cyanide concentration.

Feed: ~ 500 grams Bob's Zone Composite sample.

Grind: 1000 grams for 40 minutes at 50 % solids in the laboratory ball mill.

Reagent Balance:

Time Hours	Added, Grams				Residual		Consumed		pH
	Actual NaCN	Ca(OH) ₂	Equivalent NaCN	CaO	Grams NaCN	CaO	Grams NaCN	CaO	
0-1	0.50	0.35	0.48	0.25	0.00	0.00	0.48	0.25	10.6-10.4
1-2	0.50	0.20	0.48	0.14	0.06	0.04	0.42	0.10	11.1-10.8
2-5	0.44	-	0.42	-	0.07	0.03	0.41	0.01	10.8-10.2
5-16	0.43	0.10	0.41	0.07	0.22	0.03	0.26	0.07	10.8-10.4
16-22	0.27	0.05	0.26	0.04	0.35	0.01	0.13	0.06	10.6-10.5
Total	-	-	2.05	0.50	-	-	1.70	0.49	-

Total Reagent Consumption:
Pounds per ton of feed
NaCN: 6.80 CaO: 1.96

Metallurgical Results

Product	Amount	Assay		% Distribution	
		Au	Ag	Au	Ag
Pregnant solution	2000 ml.	2.34 mg/l	1.74 mg/l	87.1	71.5
Leach residue	506.3 g.	0.040 oz/t	0.080 oz/t	12.9	28.5
Head (calculated)	506.3 g.	0.31 oz/t	0.28 oz/t	100.0	100.0

Test No. CY-3

Purpose: To determine the amenability of the Discovery Zone ore to cyanidation.

Feed: ~ 500 grams Discovery Zone Composite.

Grind: 1000 grams for 40 minutes at 50 % solids in the laboratory ball mill.

Reagent Balance:

Time Hours	Added, Grams				Residual		Consumed		pH
	Actual NaCN	Ca(OH) ₂	Equivalent NaCN	CaO	Grams NaCN	CaO	Grams NaCN	CaO	
0-1	1.00	1.00	0.96	0.72	0.00	0.00	0.96	0.72	10.9-10.4
1-2	1.00	0.20	0.96	0.14	0.84	0.08	0.12	0.06	11.0-10.8
2-5	0.12	0.00	0.12	0.00	0.84	0.04	0.12	0.04	10.8-10.4
5-16	0.12	0.20	0.12	0.14	0.91	0.02	0.05	0.16	11.2-10.7
16-22	0.05	0.05	0.05	0.04	0.80	0.04	0.16	0.02	11.0-10.8
Total	-	-	2.21	1.04	-	-	1.41	1.00	-

Total Reagent Consumption:

Pounds per ton of feed

NaCN: 5.64

CaO : 4.00

Test No. CY-3 - Continued

Metallurgical Results

Product	Amount	Assay		% Distribution	
		Au	Ag	Au	Ag
Pregnant solution	2000 ml.	5.22 mg/l	7.92 mg/l	92.4	75.6
Leach residue	498.1 g.	0.050 oz/t	0.30 oz/t	7.6	24.4
Head (calculated)	498.1 g.	0.66 oz/t	1.23 oz/t	100.0	100.0

Screen Analysis

Residue

Mesh Size (Tyler)	% Retained		% Passing Cumulative
	Individual	Cumulative	
+ 100	0.1	0.1	99.9
150	0.3	0.4	99.6
200	2.3	2.7	97.3
270	4.4	7.1	92.9
400	15.9	23.0	77.0
- 400	77.0	100.0	-
Total	100.0	-	-

Test No. CY-4

Purpose: To determine the effect of using lower cyanide concentration.
 Feed: ~ 500 grams Discovery Zone Composite.
 Grind: 1000 grams for 40 minutes at 50 % solids in the laboratory ball mill.
 Reagent Balance:

Time Hours	Added, Grams				Residual		Consumed		pH
	Actual NaCN	Ca(OH) ₂	Equivalent NaCN	CaO	Grams NaCN	CaO	Grams NaCN	CaO	
0-1	0.50	1.00	0.48	0.72	0.00	0.00	0.48	0.72	10.9-10.4
1-2	0.50	0.20	0.48	0.14	0.09	0.03	0.39	0.11	11.0-10.8
2-5	0.41	0.00	0.39	0.00	0.34	0.03	0.14	0.00	10.8-10.6
5-16	0.15	0.10	0.14	0.07	0.39	0.03	0.09	0.07	10.8-10.5
16-22	0.09	0.05	0.09	0.04	0.41	0.01	0.07	0.06	10.7-10.4
Total	-	-	1.58	0.97	-	-	1.17	0.96	-

Total Reagent Consumption:
 Pounds per ton of feed
 NaCN: 4.68 CaO: 3.84

Metallurgical Results

Product	Amount	Assay		% Distribution	
		Au	Ag	Au	Ag
Pregnant solution	2000 ml.	5.48 mg/l	7.72 mg/l	92.0	68.5
Leach residue	504.8 g.	0.055 oz/t	0.41 oz/t	8.0	31.5
Head (calculated)	504.8 g.	0.69 oz/t	1.30 oz/t	100.0	100.0