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R.697. Recovery of gold from Beaconsfield tailings.

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B.M.I. Mining Pty Ltd requested that gold cyanide tests be performed on drill samples from Tasmania Mine tailings in Middle Arm, Beaconsfield, with the aim of extracting and recovering gold without further grinding.

The sample used for the test work consisted of a composite sample made (without regard to relative mass) from the unground assay discard of the following drill samples.

733801-733835 734257-734289
733931-733959 735466-735496

This head sample assayed:

As	0.16%	Pb	0.02%
Sb	<0.01%	Zn	0.05%
Cu	0.12%	S	0.68%
Mn	0.22%	Hg	2.2 g/t

The composite sample was dry then wet screened on 2 mm, with the following results:

Fraction	*% Mass*	*Ag (g/t)*	*Au (g/t)*	*% distribution Ag*	*Au*
+2 mm	1.31	<0.3	<0.3	nil	nil
-2 mm	98.69	1.1	2.4	100.0	100.0
Head	100.00	1.1	2.4	100.0	100.0

The barren +2 mm fraction was discarded and sodium cyanide gold extraction tests were performed entirely on the -2 mm fraction. Approximately 50 per cent of the +2 mm fraction consisted of broken sea shells.

METHOD

One kilogram test samples were agitated in 3 litres of water with varying concentrations of sodium cyanide (3, 6, 9 or 12 kg per tonne) for either 20 or 24 hours. pH was controlled by the addition of 3 kg per tonne of lime. Each test sample was washed with 3 litres of water prior to each test to ensure removal of soluble salts.

The gold dissolved in the sodium cyanide solutions was reclaimed by either the Denver precipitation method or by the use of activated charcoal.

RESULTS

(1) Variations in sodium cyanide concentration revealed that 6 kg per tonne was the optimum sodium cyanide concentration for the test conditions chosen.

(2) Gold recovery was found to be unaffected by increasing the agitation time from 20 to 24 hours.

(3) The use of activated charcoal as a method for removing gold from the sodium cyanide solution was found to be as proficient as the Denver precipitation method.

(4) An average value of 0.97 g of silver/tonne of ore was recovered by cyanidation (a recovery of 88.2%).

(5) An average value of 1.19 g of gold/tonne of ore was recovered by cyanidation (a recovery of 49.6%).

CONCLUSIONS

The gold and silver head values of the drill sample composite were found to be very low, namely 1.1 g per tonne of silver and 2.4 g per tonne of gold.

Cyanidation (performed without grinding) would enable the recovery of 88% of the silver and 50% of the gold.

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