

TR3-181-182 R. 326

SAVAGE RIVER — IRON ORE

BENEFICIATION BY MAGNETIC SEPARATION.

Summary.

1. In anticipation of consideration of beneficiation a weighted composite sample of ground core samples from Bore No. 1 was submitted to cleaner wet magnetic separation using a 4-inch submerged belt-type Crockett separator. The results obtained resulted in the production of a high grade magnetic concentrate with very effective elimination of undesirable impurities, particularly sulphur and phosphorus. Recovery of the magnetite was approximately 98%.

The composite untreated sample contained 41% of iron, 0.7% of sulphur, 0.07% of phosphorus and 18% of silica. The magnetic concentrate contained 65% of iron and only 0.06% of sulphur, 0.01% of phosphorus and 3.6% of silica.

2. The sample was prepared from finely ground split core samples forwarded by Rio Tinto Australian Exploration Pty. Ltd. for analysis. The size of grind may be unnecessarily fine for the most useful and economic results, but no other sample is available for further tests. Fifty-two samples were used in making up the composite which gave a mean iron value of 41%. In this composite seven low grade samples ranging from 9% to 22% of iron were included. The derived value of the remaining 45 samples was 47% of iron.

TEST DETAILS.

	PERCENT.								DISTRIBUTION.							
	Wght.	Fe	S	P	SiO ₂	Al ₂ O ₃	Mn	TiO ₂	97.8	5.2	8.6	12.5	0.2	53.0	62.1	
Magnetite Conc.	61.5	65.0	0.06	0.01	3.64	0.01	0.1	1.63	2.2	94.8	91.4	87.5	99.8	47.0	37.9	
Tailing	38.5	2.37	1.74	0.17	40.84	6.96	0.14	1.59	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
Composite	100.0	40.9	0.7	0.07	17.96	2.68	0.11	1.61	Fe	S	P	SiO ₂	Al ₂ O ₃	Mn	TiO ₂	

(Magnetic assays were conducted on the above products, the HCl soluble iron determined in the magnetic products. This procedure showed a recovery of 99.4% of the magnetite as compared with HCl soluble Fe method of 97.8%).

*Sizing Analysis of Magnetite Product.**Sizing B.S. Screen.*

+ 60	2.3%	2.3% cum.
+ 85	3.9%	6.2% cum.
+100	3.3%	9.5% cum.
+150	17.6%	27.1% cum.
+200	7.1%	34.2% cum.
-200	65.8%	100.0% cum.

The iron content of the minus 200 mesh fraction was 67.2%.

The following determinations have also been made.

PERCENT.

	CaO	MgO	H ₂ O+	H ₂ O-
Magnetic	Trace	3.46	n.d.	0.11
Non-Magnetic	3.32	27.39	8.1	0.33