

TR9-157-158

R. 459

23. BEACH SANDS, FRASER RIVER, KING ISLAND**Sample**

A sample of beach sands was received from Mr. J. Braithwaite for concentration of the cassiterite. Visual examination of the sample as received indicated that quartz was present in only minor amounts and the sample was regarded as a heavy mineral concentrate. Ilmenite and garnet appeared to be present in considerable quantity. Concentration tests were required to produce a concentrate of the valuable minerals, namely cassiterite and rutile.

Investigation

The procedure adopted was as follows:—

- (a) High intensity magnetic separation (dry) to produce a magnetic reject fraction containing the ilmenite and garnet, and a non-magnetic concentrate containing the cassiterite, rutile and zircon.
- (b) Upgrading of the non-magnetic fraction by table concentration to produce a tin, rutile, zircon concentrate and a discardable quartz tailing.

Summary

(a) The sample contains only 0.08 per cent tin of which 34.5 per cent has been recovered in a concentrate amounting to 0.15 per cent by weight and assaying 18.1 per cent tin.

(b) The main concentrate 31.59 per cent by weight contains 41.3 per cent rutile and 0.08 per cent tin. This represents a further 32.0 per cent recovery of tin making a total tin recovery of 66.5 per cent.

(c) The composite concentrate contains 0.17 per cent tin, 41.1 per cent rutile and amounts to 31.74 per cent by weight. The remainder of this product is assumed to be zircon and a separation of the rutile and zircon could be achieved by electrostatic separation.

Product	Weight	Per Cent	
		Tin	TiO ₂ (Rutile)
Magnetic Fraction (Ilmenite-garnet)	60.87	0.03	
N.M. Table Conc. 1	0.15	18.1	
N.M. Table Conc. 2	31.59	0.08	41.3
N.M. Table Conc. Comp.	31.74	0.17	41.1
N.M. Table Tailing	7.39	0.11	
	<u>100.00</u>	<u>0.08</u>	