

TR12-165-167

R. 553 PART 1

**PICKANDS MATHER & CO INTERNATIONAL—BEACH SAND
CONCENTRATION**

Samples

From their drilling of beach sands on the West Coast of Tasmania, Pickands Mather & Co International submitted samples for heavy mineral concentration. A sample was selected from each five-mile length of beach drilled.

Object

The aim of this investigation was to ascertain what heavy minerals were present and to recommend a method for concentrating the heavy minerals in samples of this type.

Investigation

It was found after table concentration of all samples except sample 780885 that there was very little heavy mineral present in them.

By passing a hand magnet through these table concentrates little magnetic material was found.

As these table concentrates were low grade, the heavy minerals were further concentrated by a heavy liquid separation using tetra bromo ethane (acetylene tetra bromide) s.g. 2.95. As the sink product from these separations in a number of cases was just over a gram in weight, these products were examined by visual spectrograph where the limits of detection for the metals sought are:—

Sn	0.1 per cent	Cr	0.1 per cent
Ti	0.01 per cent	Zr	0.1 per cent (not easily detected)

With sample 780885 where heavy minerals comprised a large proportion of the sample, the table concentrate was dry magnetically separated using the Rapid machine. The non-magnetic fraction was then assayed for the metals above.

Results

P.M. Sample No.	Location	Per Cent Weight in			Spectro. Analysis of H/L/S/K			
		T/C	N	H/L/S/K	Sn	Ti	Zr	Cr
780822	Beaches between Pieman Heads & Strahan	0.9	0.9	0.2	D	P	N	P
780830		0.6	0.6	0.1	P	P	N	P
780846		0.4	0.4	Tr.	D	P	N	P
780857		0.5	0.5	Tr.	N	P	N	N
780872		1.5	1.5	0.7	P	P	N	P
780879		0.5	0.5	0.1	N	P	N	N
780883	Ann Bay	1.0	1.0	0.6	N	P	N	D
780920	Ann Bay	1.1	1.1	0.5	P	P	N	P

Notes on Table:

- (1) Product abbreviations:

T/C = table concentrate

N = non-magnetic fraction

H/L.S/K = heavy liquid sink fraction.

- (2) Visual spectographic examination:

P = present

N = not detected

D = doubtful or uncertain.

(3) The magnetic fraction in all samples weighed less than half a gram.

(4) Where the H/L.S/K weight per cent is reported as Tr. (trace) the value is less than 0.05 as these figures have been reported to only one significant figure.

Sample 780885 from Ann Bay gave the following results:—

Per cent weight in T/C 43.4

Per cent weight in N 23.1

Per cent weight in M 20.3

(M = magnetic fraction)

Description	Assay Per Cent			
	Sn	Ti	Zr	Cr
Non-magnetic fraction ..	3.80	7.2	17.3	7.7
Head assay (by calc.)	0.88	1.7*	4.0	1.8

* as rutile, Ti in ilmenite removed on magnetic separator.

The magnetic fraction was mainly ilmenite and contained no monazite.

Conclusions

(1) Most samples contained very little heavy material, but Sample 780885 was rich in it.

(2) Where the table concentrate is below 1% in weight a greater initial weight of sample would be required, say 10 kg, if an assayable amount of heavy mineral is to be obtained.

(3) Normal tabling of all samples should be the initial step. Where low amounts of heavy mineral are found, it is suggested that table concentrates from a number of samples from the same beach be bulked for a single magnetic separation, if this is thought necessary.

(4) High grade samples would be treated as Sample 780885 was