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## 5. DRILLING FOR TIN AND WATER AT COLES BAY

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### INTRODUCTION

Earlier this year an examination was made of the Coles Bay district in an attempt to locate areas which might contain quantities of groundwater (this volume, pp. 69-71). A possible area, of basin shape, was found two miles W of Coles Bay. In view of its shape and position it was thought that the tin deposits currently being worked a little to the S might extend into the basin.

Since resistivity results indicated thick overburden in places near the southern extremity of the basin a line of holes was drilled to test the groundwater potential and locate any leads that may be present.

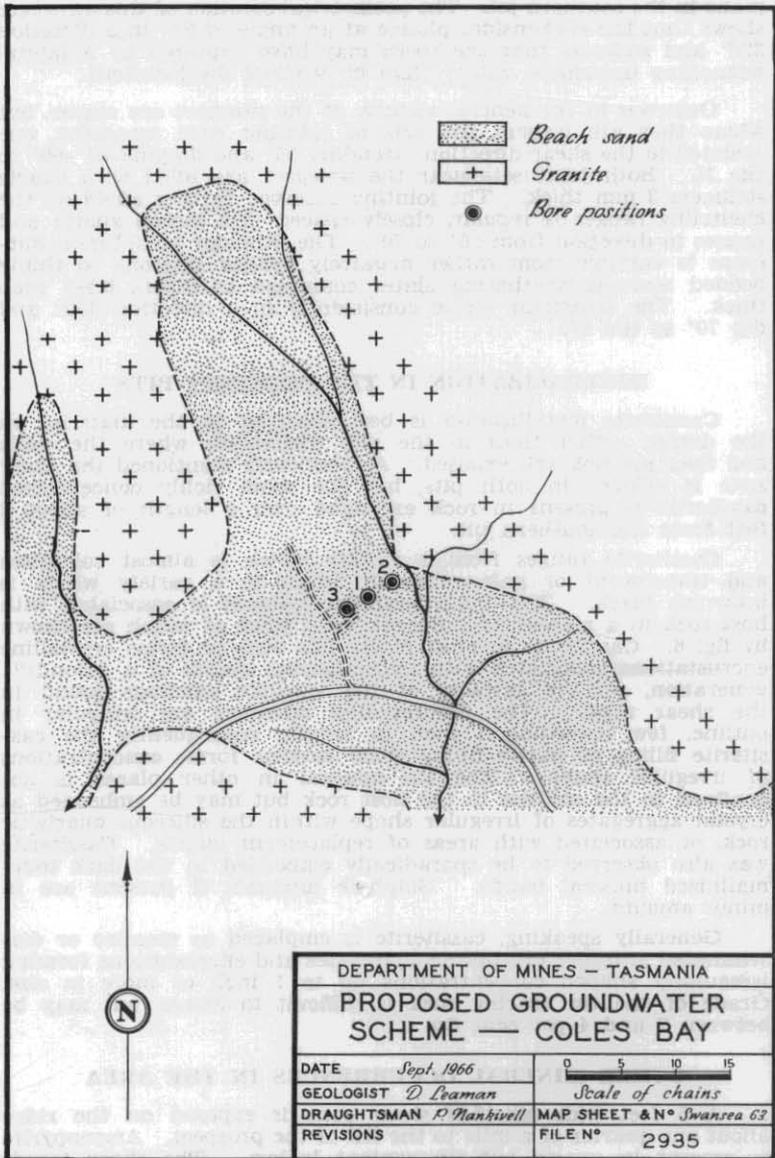


FIGURE 7

5 cm



## RESULTS OF DRILLING

Three holes were drilled, and their location is shown in fig. 7. The results are tabulated below:—

Hole No.	Total Depth feet	Yield Water g.p.h.	Depth Water feet	Log
1	49	200	15	0-1' surface soil, 1'-7' beach sand, 7'-49' granite.
2	32' 6"	100	15	0-1' soil, 1'-7' beach sand, 7'-10' decomposed granite, 10'-32' 6" granite.
3	57	80	20	0-1' 6" soil, 1' 6"-6' beach sand, 6'-14' yellow silty sand, 14'-57' granite.

Most water was recovered from the sandy material overlying the granite by leakage beneath casing. Only in the case of DH1 was any water recovered from jointed granite.

Samples of concentrate from holes 1 and 2 have been examined by G. Everard and the results are given below. No possible promise of cassiterite was given in sand from bore 3.

	Bore 1		Bore 2		
	0-5'	5'-10'	0-5'	5'-10'	10'-15'
	%	%	%	%	%
Quartz .....	55	24	60	19	62
Zircon .....	8	30	3	15	7
Tourmaline .....	5	2	5	tr	tr
Topaz .....	2	2	2	nil	1
Ilmenite .....	30	30	.....	.....	.....
Pyrite .....	.....	6	.....	.....	.....
Cassiterite .....	tr	.....	tr	40	15
Rutile .....	.....	.....	3	tr	2
Opagues .....	.....	.....	25	24	12
Total grains wt .....	82	90	47	56	230
Value p.c.y. ....	0.00	0.00	0.00	0.035	0.002

A sample of the sand from DH2 was also tested for grain size.

Fraction	Weight %	Cum. Weight %
+ 14	2.8	2.8
+ 25	3.6	6.4
+ 52	7.0	13.4
+100	54.3	67.7
+200	26.3	94.0
-200	6.0	100.0
	100.0	

### CONCLUSIONS

The results show conclusively that tin is present in trace amounts only and is unworkable economically.

Drilling has also shown that granite occurs at shallower depth than expected and that a weakness exists in the method of interpretation of resistivity probes in granite areas. Probes made before and after drilling give consistent results not in agreement with drilling. There is a suggestion that fitting resistivity results to the theoretical smooth curves is not necessarily applicable and that more attention should be paid to small gradient deflections on the curve. Fig. 8 shows the nature of such deflections and also the depth to granite in each bore hole.

As anticipated, the granite is poorly jointed and thus a poor aquifer. In the three holes drilled solid casing was used and the holes made water as a result of a leakage beneath the casing. The sands which rest upon massive granite in this location are saturated and should yield large volumes of water. It is not recommended that bores be considered. Gravel packed or screened trenches based on the granite-sand interface would be more suitable where the aquifer is thin and near the surface.

The recharge area is  $2.5 \times 10^6$  square feet. If the sand has an average thickness of 10 feet across the area, the volume is  $25 \times 10^6$  cubic feet. The principal grainsize of the sand is about 0.01 inches, and thus the porosity is approximately 40%. Thus the volume of water stored would be  $1 \times 10^7$  cubic feet which is  $6.25 \times 10^5$  gallons. Even if only half of this can be recovered the yield possible is  $3.56 \times 10^4$  gallons/hour. However, the annual recharge is only of the order of  $50 \times 10^6$ - $100 \times 10^6$  gallons and thus no more than  $1.14 \times 10^4$  gallons/hour should be withdrawn.

This basin is very promising for a groundwater supply.