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3. GEOLOGICAL INVESTIGATION AND RESULTS OF DRILLING FOR TIN, ADJACENT TO THE GEORGE RIVER

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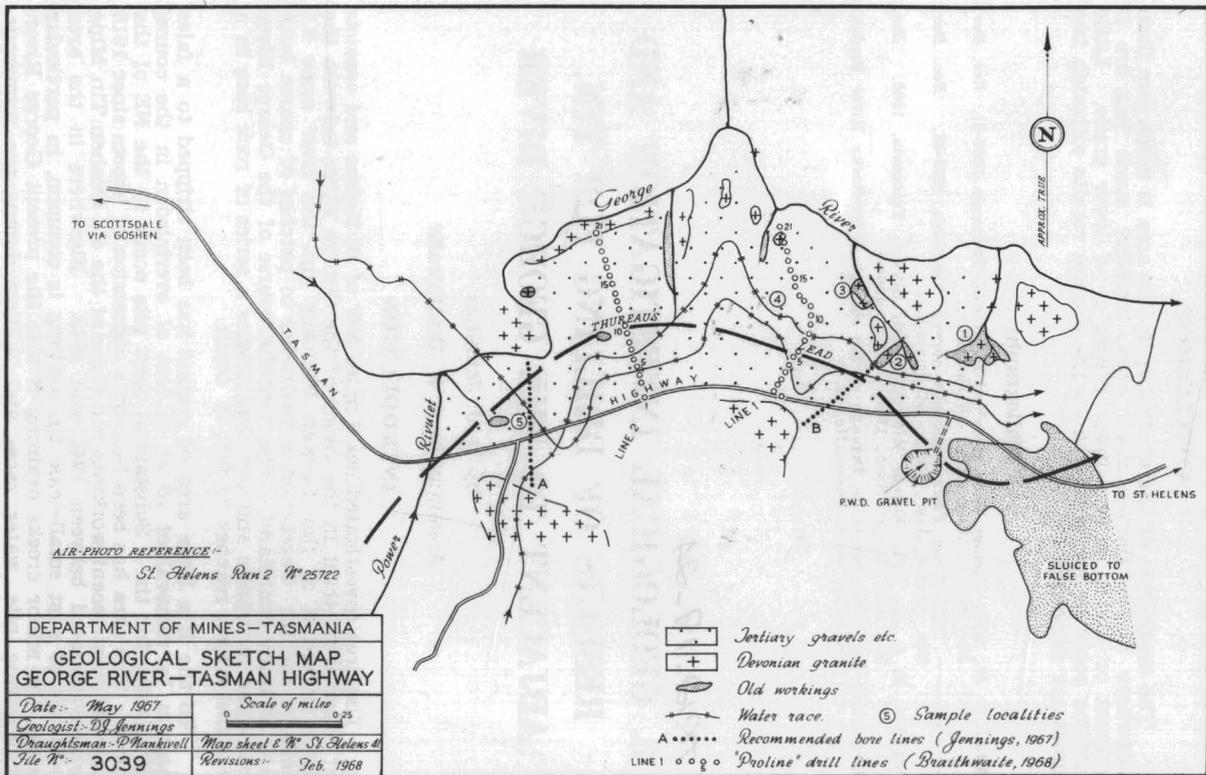
INTRODUCTION

The area investigated lies 6 miles NW of St Helens and consists of a low lying tract in the valley of the George River between the hilly terrain S of the Tasman Highway and the river some 0.5 mile to the N. Vegetation is restricted to patches of sparse bush and swampy heathland. The youthful course of the George River is incised in granite and the river crosses a series of rock bars in a channel which reaches 20 feet in depth.

To the E a large area of ground has been stripped to a false bottom by removal of 10 to 15 feet of overburden in the course of sluicing for tin. Substantial open pits occur in the NE of the block. The area has been held by a succession of lessees since 1918 but the most recent workings are those of the old Goshen Tin Mine which operated between 1940 and 1948. Elsewhere in the area evidence of past small-scale tin working is common, in particular along the minor creeks draining N into the present George River. Prospecting pits, water races and tailings dumps are numerous. Three or four major water races traverse the area, two of which have been indicated on the sketch map. They are generally in a

5 cm

FIGURE 6



good state of repair, although currently dry. Recent road reconstruction has, however, disrupted most of them. The largest has been tapped in several places to provide water for small tin prospects lower on the block. The deepest race is incised 16 to 20 feet towards the eastern end. The wooden pipes of the inverted syphon over the George River have been burnt-out on the southern bank.

The ancient course of the George River which probably ran from W to E across the block has been transferred to the present diagram from the map accompanying the account of Thureau's Lead (Jack, 1963, p. 64).

All land both S of the George River and W of Power Rivulet is privately owned, but Crown land extends downstream to the E for some two miles. Water could be provided without difficulty by pumping from the George River, but would compete with St Helens water supply for this source. Old workings could be dammed to form settling ponds for tailings, but again the inevitable discolouration of the George River would be unacceptable in the water supply for St Helens.

GEOLOGY

The bedrock of the area is Devonian granite of the coarse biotite-bearing variety, and carries a varying amount of overburden in the form of river sediments and alluvium. It probably ranges in age from Tertiary to Recent. Some of the low hills S of the road are composed of granite, but rock exposures are wide-spaced, and apparent minor depressions between hills could conceal considerable depths of sediment. The easternmost hill exposes no granite, but a capping of coarse quartz gravel exceeding 10 feet in depth is indicated in a recent P.W.D. road-materials quarry.

N of the road granite is exposed sporadically along the course of the river and in the floors and tail races of many of the old tin workings. In the NE of the area granite hills stand between the present course of the George River and the inferred course of Thureau's Lead. Across the river to the N the terrain is apparently composed of granite.

The Tertiary sediments are mainly uniform quartz sand and grit derived directly from the granite, but occasional impersistent pebble bands occur throughout the succession and some workings expose a basal pebble wash. The only large pebble deposit recognised is that in the P.W.D. quarry S of the road, but an E-W zone parallel to and N of the road carries a float of small pebbles, presumably a lag deposit overlying the lead.

CONCLUSIONS

In the report on the boring of the lower reaches of Thureau's Lead, Jack suggests that successful workings on the lead were in the superficial zones of enrichment due to surface reworking of sediments, that is concentration as late-stage lag deposits. No economic deep-seated zones were located. This could be equally true at the present level, but need not be, the present site being some one mile further upstream in the lead than the previous most westerly drilling by the Mines Department, which reached 150 feet

in depth. Periodically depositional conditions may have prevailed in the lower reaches of the old river, while erosional conditions (with possibilities of tin concentration) occurred contemporaneously upstream.

Apart from the possibilities of a major lead, with basal, intermediate or superficial zones of tin enrichment, small prospects have been worked to a false bottom (in the W) or to a basal wash horizon on granite bedrock (in the E). An attempt must be made to establish why these operations ceased.

RECOMMENDATIONS

A line of holes should be drilled on a N-S line between granite exposures towards the western end of the block, to indicate channel profile and assess tin values (line A). If anything of interest results a second drill line should be located further E on a NE-SW line between other granite exposures (line B) (See sketch map, fig. 6).

Suitable old working faces in the pits should be cleaned down and basal and intermediate wash horizons sampled, as should surface shows of "birds-eye" gravels.

SAMPLING RESULTS

Since submission of the above report a Proline Auger drilling programme and limited surface sampling have been completed. Lack of worthwhile tin values in the lead downstream prompted a shallow reconnaissance test programme, information and results of which appear as Appendix I by J. B. Braithwaite.

The possibility of Thureau's Lead passing through the area, nature of the hard substrata reached by the auger, and the possibility of better values at depth, remain in doubt.

Eight samples were collected and panned in a traverse across the area (localities (1) to (5)). The sample from locality (4) was surface gravel and the remainder were wash horizons exposed in abandoned workings. Good prospects were obtained from locality (1) with values between one and two pounds per cubic yard and a poor prospect was gained from locality (3). Only 'trace' or 'nil' values were obtained elsewhere.

References

- JACK, R., 1963.—Thureau's Deep Lead, St Helens. *Tech. Rep. Dep. Min. Tasm.*, 8, 63-71.

Appendix I

POWER RIVULET AREA—ST HELENS

The area in question is immediately E of Power Rivulet and extends from the main road to the George River and covers approximately 350 acres. A final check on possible economic tin values was required before alienation of the area.

The area has been extensively prospected by miners in the past and scattered workings show where economic values were found. It was assumed that prospectors would have investigated all the likely spots as indicated by the present topography so this campaign consisted of two lines of bores across the widest part of the area and ignoring any surface features.

The drill used was the Proline auger capable of drilling a 4½-inch hole to sixty feet in soft to medium ground. The whole sample from each hole was washed in a cradle and a final panned concentrate weighed and examined by the Mineralogist.

All holes were taken to a full depth to which the augers would safely penetrate and the nature of the bottom shown in the results is the drillers' interpretation only.

RESULTS

Bore No.	LINE 1		LINE 2	
	Depth in Feet	Bottom	Depth in Feet	Bottom
1	5	Clay	6	'Granite'
2	33	"	9	"
3	25	"	6	"
4	29	"	28	Clay
5	33	"	15	"
6	6	'Granite'
7	27	6	"
8	6	"
9	15	'Granite'	3	"
10	30	"	3	"
11	42	"	3	"
12	19	Clay	6	"
13	30	"?	6	"
14	19	'Granite'	6	"
15	21	"	6	"
16	12	"	6	"
17	12	"	6	"
18	8	"	9	"
19	18	"	6	"
20	9	"	6	"
21	12	"	3	"
22	9	"	15	"

VALUES

All bores showed traces of tin but no economic values. The greatest recoveries were from Bores 11 and 12 on Line 1 which each gave approximately ½ oz of concentrates but the concentrates were only 5% cassiterite; this represents a maximum value of ¼ oz per cubic yard.

The drill recovered a complete sample except immediately above the clay in some holes. Where there is water on top of the clay there is a tendency for a slurry to form which will not come up on the flights. The method by which only one sample is made over the whole depth speeds things up and if tin is found further holes can always be drilled to determine the horizon.

The present drilling combined with the old work in the area would indicate that no economic deposits of tin remain in the area.

The positions of proline bore holes are marked on the accompanying geological sketch map (Jennings, 1967).