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ALLUVIAL TIN DEPOSITS AT FLINDERS ISLAND

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Alluvial Tin Deposits at Flinders Island

by

I.D. Hughes 3-6-69

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ALLUVIAL TIN DEPOSITS AT FLINDERS ISLAND.

SUMMARY.

A recent drilling campaign has indicated a Tertiary lead at Tanners Bay of average depth of 26 feet, containing 315,000 cubic yards averaging about 1 lb. to the yard. Extensions to this lead could not be proved owing to a flow of Tertiary basalt, which may cover further reserves but which was too difficult to penetrate during the present campaign.

At Pats River, the presence of a tin-bearing portion of the lead (10 oz./c.yd. -depth 27 feet) was located on a line, 3,000 feet from the previous lead intersection.

At Boyes Hill, near Whitemark, two holes failed to intersect payable ground near some old workings.

No drilling was carried out at Officer Creek or Leventhorpe Creek.

GENERAL INFORMATION AND BACKGROUND.

Flinders is a large island (50 x 20 miles) lying between Victoria and Tasmania in the eastern part of Bass Strait. It is serviced from Tasmania by frequent air and sea transport. There are about 1,500 inhabitants mostly engaged in farming. The climate is mild and pleasant, most rain falling in the winter months.

The Island consists largely of Siturian slates and quartzites intruded by granite (the source of the tin) but there are many alluvial deposits and, in the past, tin has been won from Tertiary leads in 4 different localities. Tin production has been small and sporadic, operators being hampered by lack of water for sluicing purposes.

In recent years, the Tasmanian Department of Mines has stimulated interest in these alluvial tin deposits and four investigations have taken place.

1. Geologists from the Department of Mines conducted a geological survey of the more promising areas and indicated the position of tin bearing alluvial leads.

2. A proline drilling campaign by Kathleen Investments Pty. Ltd. defined more exactly the position of these leads and revealed their depth, but gave no reliable estimate of tin values.

3. A scout boring campaign conducted by K. McMahon Pty. Ltd., on behalf of Flinders Island Minerals (a part Hobart, part Flinders Island Syndicate) was undertaken by percussion (G.33) drill. Although some interesting tin values were revealed, this Company recommended that no further work should be done and furnished a very incomplete report.

4. It was felt that, though the McMahon report was discouraging, its very incompleteness warranted a further limited drilling campaign to check the following points.

a. Due to the inexperience of the investigators, it was felt that tin values shown may be lower than actual values. In other words the drillers may not have got all the tin in the samples up the hole and also may have lost some in dressing. Bores were put down to check, not on exact sites but 50 feet either side and the values from this campaign are certainly higher.

b. Again, due to inexperience, it was thought that perhaps all holes shown as bottomed, may have not. However, except for one hole shown as "bottoming" in basalt, the estimate of soft granite as bottom seems to have been correct.

c. At Tanners Bay, where good values were shown, no holes were put down to the east of these. At Pats River, the "A" line was not taken across the lead (due to soft ground).

d. The bores were not levelled, so no sections could be drawn. (A correction of these four factors, could and has altered reserve estimates).

e. Factors that might add value to estimates of working costs were omitted; e.g. nature of heavy minerals, size of wash etc.

THE ALLUVIAL TIN AREAS.

There are four areas where alluvial tin has been worked; Tanners Bay, Pats River (including Officer Creek), Leventhorpe Creek, Boyes, Hill.

1. Tanners Bay.
Although no detailed records of past production from Flinders Island are

available, it appears, from the size of the workings, that most production was from here. The old workings were only about 15 feet deep and before the present drilling campaign, it was difficult to know the direction of the Tertiary stream. Now it appears that these alluvial deposits accumulated in a Tertiary lake with an uneven soft granite bottom, under very stagnant conditions. In the northern part of the lake, a basalt flow covered the bottom to a depth of more than ten feet. The tin occurs in the bottom few feet in a loose black slurry of wash (averaging 1 inch), clay, sand, wood and pyrite. Where the pyrite is plentiful, cementing gravel and replacing wood, there is little tin. Other heavy minerals associated with the tin are topas, plemaste and sparse ilmerite. The tin is of fine to medium grain size.

Above the tin bearing material is fairly barren coarse sand with some tight white clay beds. This sand becomes hard on exposure to air but it would not be difficult ground to move. The surface is clear with a few stunted trees and yakka furns. The water table varies from 3 to 10 feet but rises in the wet season. One hole continued to flow over the top for some days after drilling. Eleven bores (305 feet) were put down during the present campaign and ten bores (280 feet) during the previous one.

The results of the two campaigns are combined in the following account. In assessing results the very high value of one hole (96 oz./c.yd.) was included but it is felt that this is more than offset by the possible underestimation of the first campaign. It would appear that there are some inch jutters interspersed with some average and low value ground. pick a

A. LINE (North of Old Workings)

Four holes drilled here showed some good wash and plentiful pyrite but poor tin values. Values could occur between TAI and TAEI (146 feet) or west of TA2.

B. LINE (500' North of A Line)

This was the best line and 7 bores showed an average of 1 lb. per c. yd. over 400 feet and an average depth of 25 feet. The values occur in the bottom 5-10 feet and the overburden is coarse sand.

D. LINE (1,000' N. of "B" Line)

Six Bores averaging 29 feet, showed tin values occurring over a narrower width (100 feet).

E. LINE (500' N. of "D" Line)

One hole showed weathered basalt, 10 feet in width at a depth of 31 feet and beneath this, soft granite. This hole was apparently off the lead and no wash was encountered.

F. LINE (500' N. of "E" Line)

Two bores encountered basalt at about 30 feet. This was not penetrated beyond few feet.

RESULTS.

With the somewhat limited drilling pattern it is only possible to give indicated reserves. This appears to be a lacustrine deposit, rather than a well defined stream lead of constant values. The tin was laid down under stagnant conditions and values are apt to be irregular with some patches of very rich ground. The Tertiary lead itself is very large but, the tin-bearing portion is limited. If we assume a width of 400 feet at line B and less than 100 feet at lines A. and D. and connect these up then with a depth of 9 yards, a length of 500 yards and a width of 70 yards the yardage would be 315,000 c. yds. The average grade may be 1 lb. to c. yd. or 140 tons of tin oxide.

2. Pats River.

This lead, on the other hand, is a well defined stream deposit of several hundred feet in width. Appreciable tin deposits only seem to occur over a width of about 100 feet in this lead. The tin again occurs in the bottom few feet, but here conditions have not been stagnant, there is little pyrite or lignite or clay and the wash is larger (up to 3"). Overburden consists of coarse sand, with some small clay beds. Ilmarite occurs freely from top to bottom.

The previous campaign proved tin (11 oz./c.yd.) over about 100 feet in width and 37 feet deep in one line only and, because of boggy conditions did not cross the lead in the second line. Two bores were put down during the present programme on this second line ("A" line) and again showed tin of 10 oz./c.yd - depth 27 feet over about 100 feet.

If we assume that the lead is consistent in tin values between two old workings and of the value shown in the two bores; then the length is 1,800 yards, the width 30 yards and the depth 10 yards or 540,000 c. yds. of 10 oz./c.yd. or 150 tons of tin oxide.

3. Boyes Hill.

Just east of Whitemark a narrow bed of very large wash containing coarse tin occurs near the top of a basalt topped hill. Some years ago this was worked in a small way. Because of the contour of the country this is only a small remnant of a former stream deposit. As the wash is covered with basalt, it was not possible to drill just above it. Two holes were put down a little distance away but both bottomed on granite at 5 feet. This deposit may be rich but it is too small to be considered by a Company.

4. Officer Creek.

These leads are quite small and near the source of the tin. However, judging by prospects that could be washed nearby, it was hoped that they would be rich in tin. However the previous campaign showed poor results, so no drilling was carried out there.

5. Leventhorpe Creek.

No drilling was carried out here in either campaign due to difficulty of access. However the larger flat below the old workings still remains a worthy target for future investigations.

RECOMMENDATIONS.

It is unfortunate that the present programme was not able to confirm the writers opinion that the Tanners Bay was a large tinfield. There is a possibility that this may be so, under some basalt or even north of the basalt but to prove this would require a much more ambitious programme. Meantime some good tin values have been revealed in a limited area and this small area may be worthy of exploitation. Normal sluicing methods may not be suitable because of lack of surface water. (the indicated reserves are too small to consider bringing water from the sea). However there may be sufficient underground water to use by utilising a gravel pump, return water and the old workings as a water storage.

There are thus three alternatives.

1. A feasability study to consider the production of tin from the two small partly proved deposits - that is about 300 tons of tin in all of grades of 1 lb. and 10 oz. per c. yd.

2. A further more ambitious programme of testing at Tanners Bay.

3. Abandonment of the project.

However either 1. or 2. could be carried out in conjunction with the testing of Cape Barren Island tin deposits (held by the same syndicate) where larger reserves are expected.

TERENCE D. HUGHES.

3RD JUNE, 1969.

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DRILLING RESULTS.

TA1E (143'E of TA1)

0-6'	Black Clay	Water at 7 ft.
6-12'	Coarse Sand	Value 0-16'.
12-16'	Clay, Lignite, Wood, Pyrite	0.8 oz./c.yd.
	Few Wash Stones	of 70% Conc.
16-17'	Soft Granite	

TA2A (50'W of TA1)

0-12	Sand, some very fine	Water at 10 ft.
12-14	Black Sand, Clay, Wood, Pyrite	Value 0-27'.
14-15	Black Sand, Clay, Wood, Pyrite -	0.2 oz./c.yd.
	Some Wash	
15-20	Gravel and Sand and Pyrite	
	Little Quartz Wash	
20-27	Gravel and Sand, Much Pyrite some	
	cemented	
27	Soft Granite	

TB1E (145'E of TB1)

0-3	Clay	Water at 5 ft.
3-5	Sand	Value 0-19'.
5-12	Sand, Few Small Quartz Wash Stones	9 oz./c.yd.
12-19	Black Clay, Sand, Lignite and Wash	
	Much Pyrite	
19-25	Soft Granite - Brown Stained	

TB1EA (62'E of TB1)

0-5	Black Mud, Little Sand	Water at 3 ft.
5-10	Coarse Sand, Some Clay	Value 0-17'.
10-12	Sand	98 oz./c.yd.
12-17	Sand and Wash	
.7'	Soft Granite	

TB1A (50'W of TB1)

0-6	Sand	Water at 11 ft.
6-10'	Fine Sand and Clay	(Then to top of hole).
10-17	Coarse Running Sand	Value 0-27'.
17-27	Clay, Wood, Sand, Small Wash	23 oz./c.yd.
27	Soft Granite (½" to 1")	

TB2A (50'W of TB2)

0-5	Coarse Sand	Water at 7 ft.
5-15	Coarse Sand, Partly Cemented	Value 0-31'.
15-19	Coarse Running Sand	6 oz./c.yd.
19-31	Black Sand, Gravel, Wash, Wood	
31	Soft Granite	

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TDEA (50'E of TDI)

0-2	Surface Clay	Water at 5 ft.
2-5	Fine Sand and Clay	Then continued to flow
5-10	Coarse Sand	over top.
10-15	Coarse Sand, Little Clay	Value 0-27'.
15-27	Sand, Pyrite, Little Wash	1 oz./c.yd.
27'	Soft Granite	

TDIA (50'W of TDI)

0-9	Stiff White Clay	Water at 9 ft.
9-11	Coarse White Sand	Value 0-29'.
11-28	Black Slurry, Coarse Sand, Wood	6 oz./c.yd.
	Pyrite Cementing Gravel	
28-29	Wash	
29'	Soft Granite	

TD2A (50'W of TD2)

0-9'	Sandy Clay	Water at 10 ft.
9-15'	Sand	Value Trace.
15-25'	Sand, Wood	
25-31	Sand	
31'	Soft Granite	

TFI (530' from TD2 By 350°)

0-5	Fine Sand	Water at 15 ft.
5-6	Reddish Clay	Value Trace.
6-15	Yellow-White Clay	
15-16	Coarse Sand	
16-25	Black Clay, Little Wood	
25-31	Coarse Sand, Clay, Little Wood	
	Weathered Basalt Boulders	
31-41	Weathered Basalt	
41-42	Granite Sand, Some Pyrite	
42'	Granite Soft	

TF2 (50'W of TFI)

0-15'	Hard Clay	Water at 20'.
15-20	Clay, Coarse Sand	Value Trace.
20-31	Black Sand, Gravel, Little	
	Wood, Pyrite	
31-32	Hard Basalt	

PA9A (50' from PA8 & PA9)

0-24'	Fine and Coarse Sand with Clay Seams	Water at 5 ft.
24-27'	Wash, Sand (Granite, Mathinna & Quartz) Wash up to 3"	Value 0-27'. 10 oz./c.yd.
27-28'	Soft Green Granite	

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PA8A (50' from PA7 and PA8)

0-10	Coarse Sand	Water at 5 ft.
10-20	Sand with Small Pebbles	Value 0-27'.
20-25	Clay and Sand	1 oz./c.yd.
25-27	Wash and Sand	
27'	Soft Granite.	

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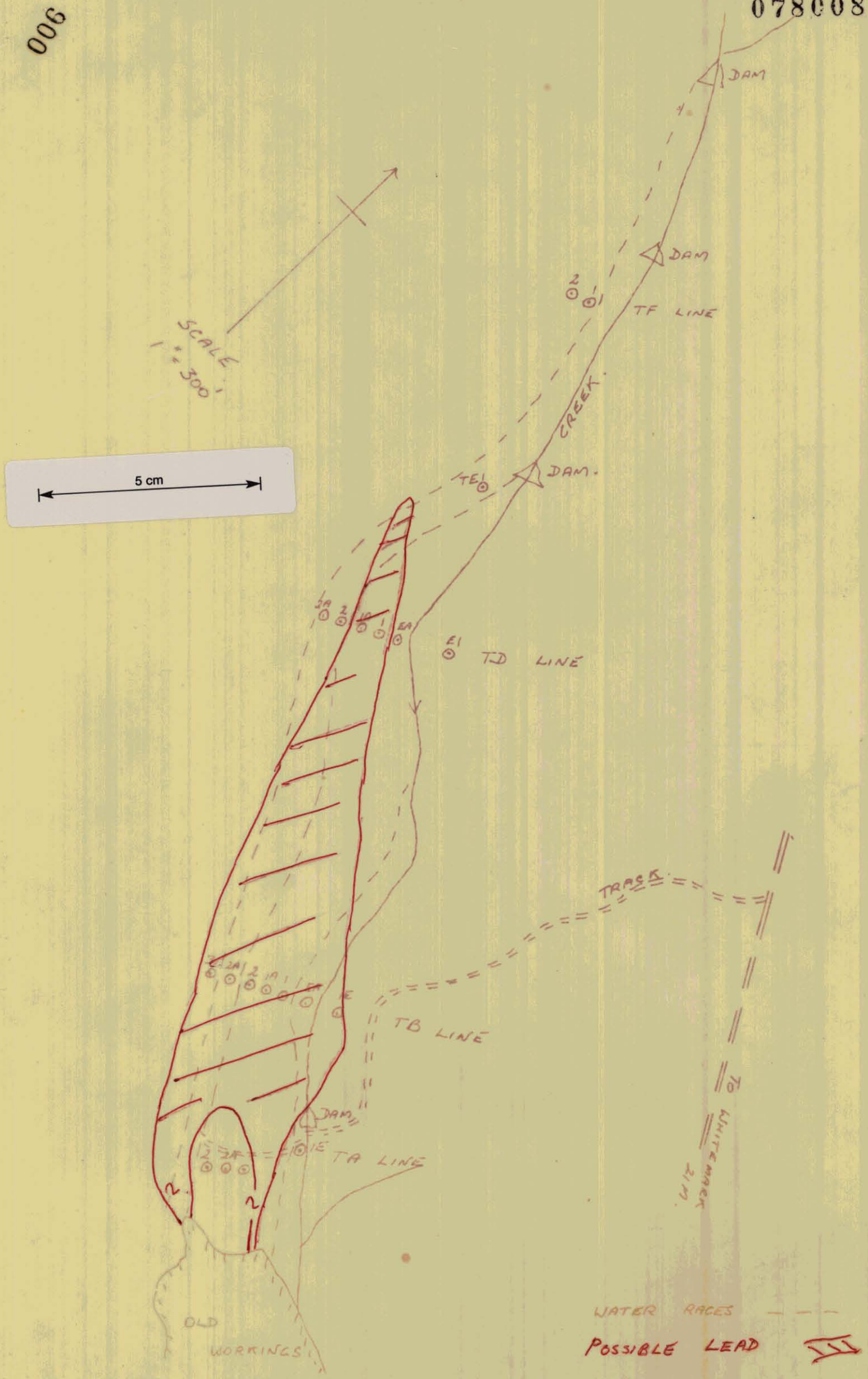

PLAN

TANNERS BAY

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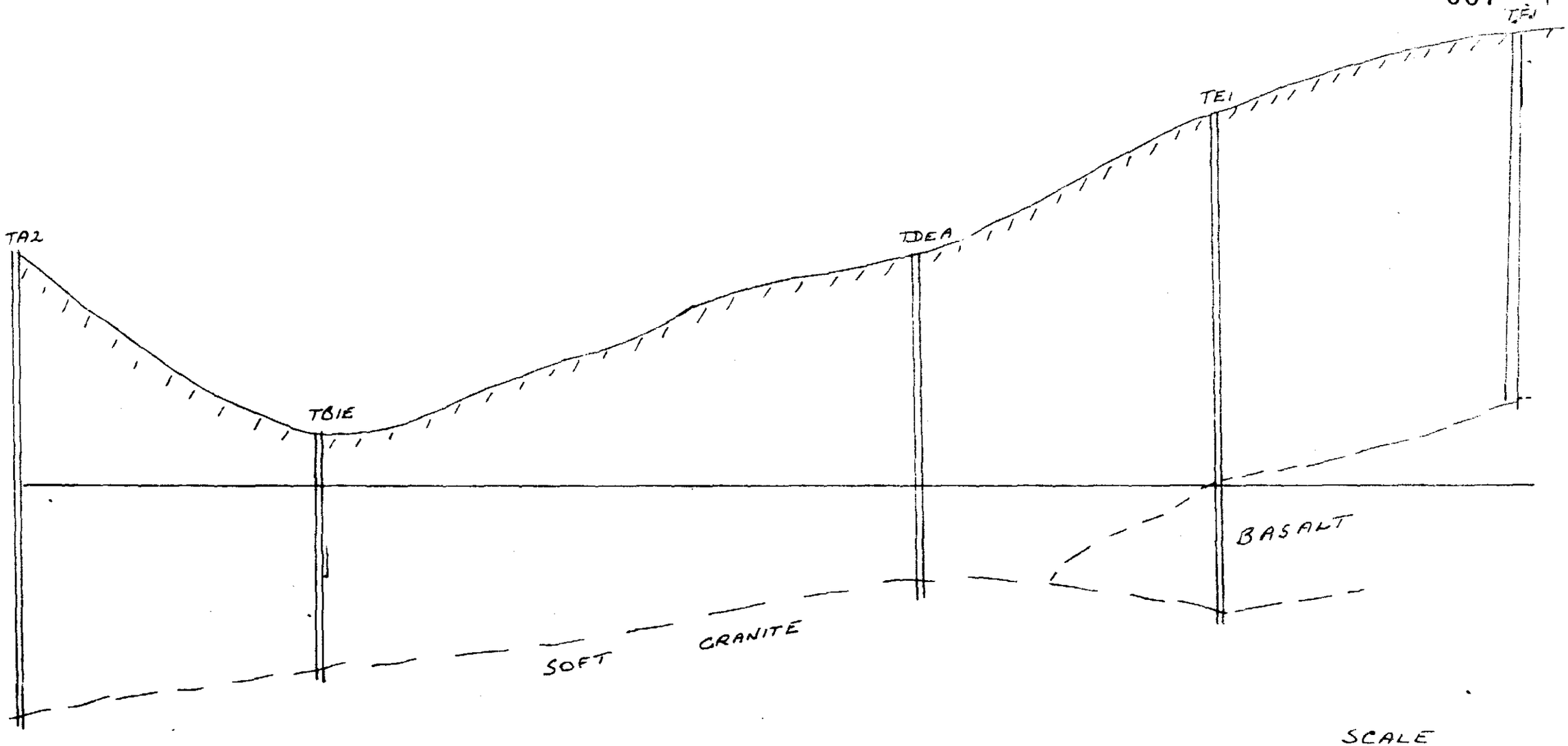

TANNERS BAY

LONGITUDINAL SECTION

SCALE

HORIZ 1" = 50'

VERT 1" = 10'

5 cm

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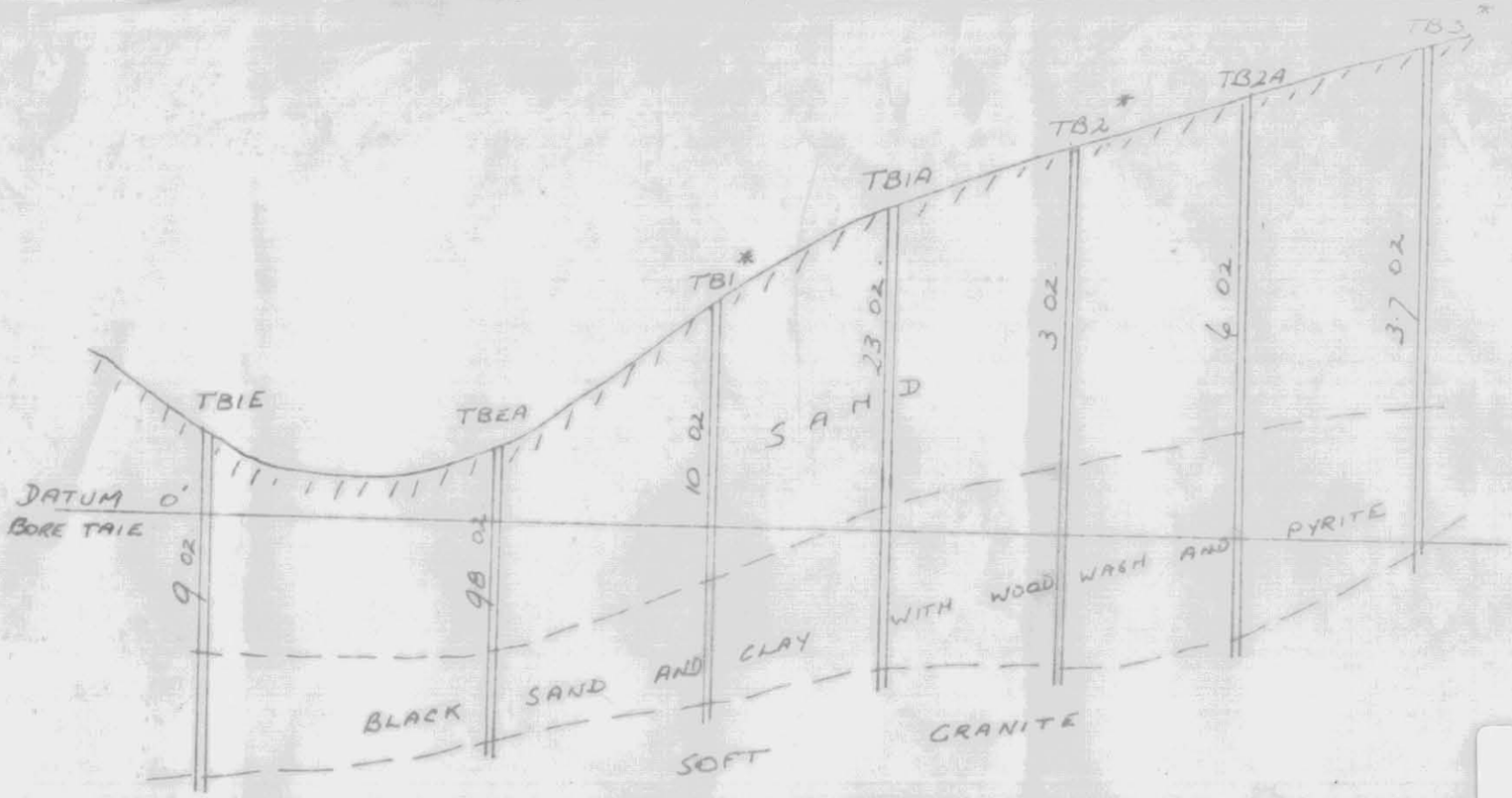

SCALE

HORIZ. 1" = 50'
VERT 1" = 10'

VALUES oz/c yd 70% conc

* PREVIOUS BORES

5 cm

TANNERS BAY.

CROSS SECTION LINE TB.

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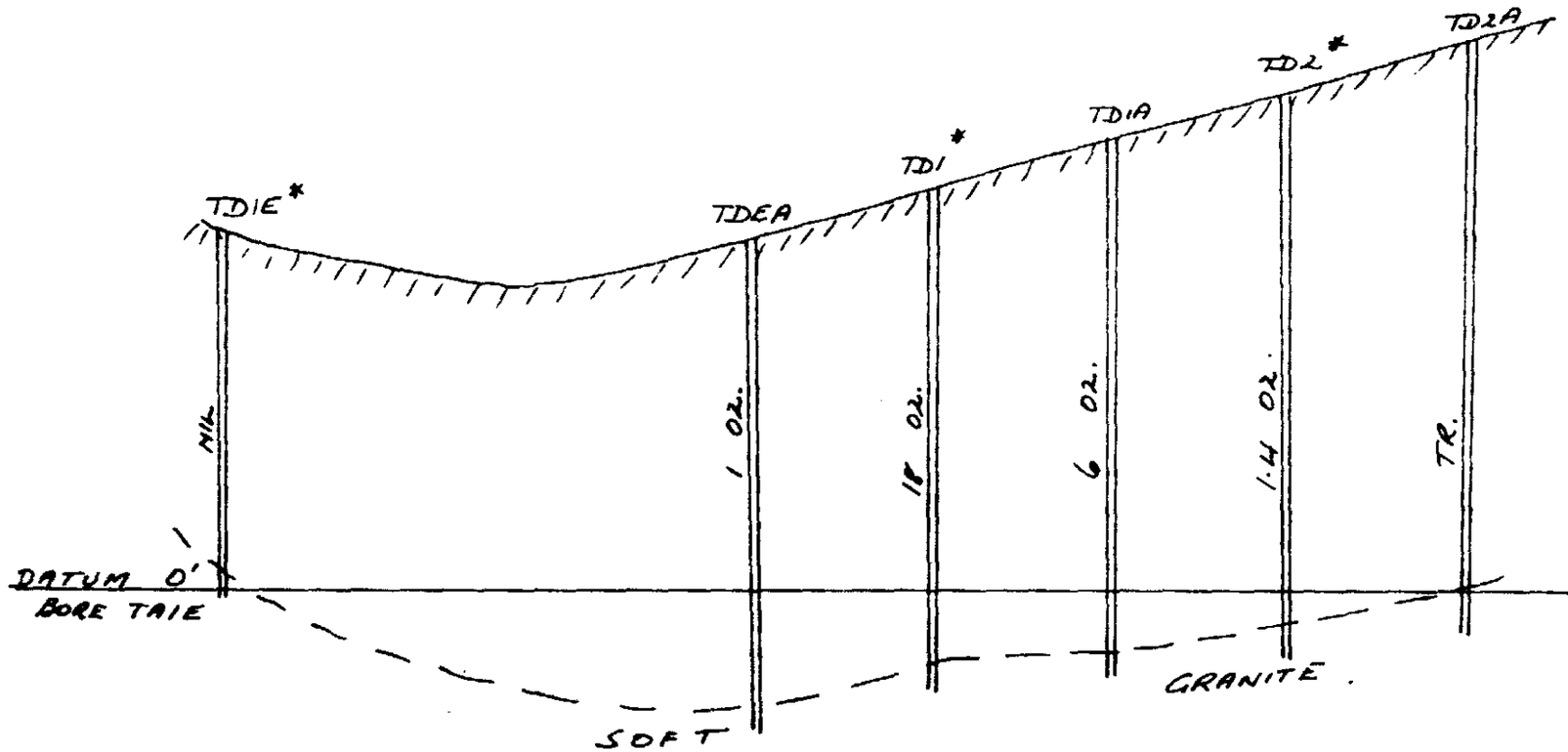

SCALE
HORIZ. 1" = 50'
VERT. 1" = 10'

VALUES
OZ/C.YD. 70% CON.

* PREVIOUS BOR.

TANNERS BAY

CROSS SECTION LINE TD.

5 cm

600