NORTHERN TERRITORY GEOLOGICAL SURVEY REPORT G.S. 78/23

DIAMOND DRILLING INVESTIGATIONS, 1977, BIG JULIE TIN MINE, N.T.

by

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1. SUMMARY

Following a request for drilling assistance at the Big Julie Tin Mine, geological investigations in the form of mapping and sampling were carried out. Subsequently a diamond drilling programme of 4 holes totalling 220 metres was completed.

Diamond drilling indicated that mineralized quartz-hematite veins were of very limited depth extent and geological mapping indicated that mineralization was localized at intersections of the quartz-hematite veins. The one significant mineralized zone in D.D.H.2 appears to lie on such an intersection of veins.

No medium to large scale tin mineralization has been indicated by diamond drilling and no further drilling investigations are warranted.

2. INTRODUCTION

A request for drilling assistance at ML 257A was made by the leaseholder J.M. James in early 1976. Geological investigations by Mines Branch officers delineated three mineralized quartz-hematite veins and surface samples from these veins gave some significant tin and gold values. Subsequently four diamond drill holes totalling 220 metres were drilled in July and August, 1977 to test the strike and depth extent of the quartz-hematite lodes.

3. LOCATION AND ACCESS

Map: McKinlay River 1:100 000 Topographic Sheet 5271 Series R621
Co-ordiantes: Lat. 13° 19' 45"
Long. 131° 49' 15"
Universal Grid Reference: HL056248
Vehicle access from Darwin is by the Stuart Highway to the Fountainhead turn-off and then by gravel road via Mt. Wells. The lease is about 30 kilometres from Mt. Wells on the Mt. Harris road. The McKinlay River crossing 13 kilometres from Mt. Wells is impassable for much of the "wet" season.

4. GEOLOGY

The geology and mineralization have been previously described by Newton (1977) and are here briefly summarized.

The Big Julie Tin Mine is situated within relatively flat dipping sediments (locally) of the Lower Proterozoic Masson Formation. The regional strike of the sediments is roughly north-south. Tin and gold mineralisation occurs within a series of narrow, near vertical quartz-hematite veins which strike between 330° and 345° magnetic. Shallow source magnetic anomalies in the area may be due to granitic cusps, a possible source of the mineralization.

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5. DIAMOND DRILLING RESULTS

Four diamond drill holes totalling 220 metres were completed by Mines Branch. Core recovery was generally good although in some quartz - hematite intersections only small amounts of broken material were recovered. All drill core was geologically logged, 70 drill sludge samples and 26 split core samples were forwarded to the East Point Laboratories, Department of the Northern Territory. The samples were assayed for tin, gold and silver.

D.D.H. 1 was depressed 45° on a bearing of 70° magnetic. This hole was placed to test, at depth, one and possibly two quartz - hematite veins striking 343°M. (marked 2 and 3 on plate 2.) The only intersection of note was a vein of quartz with iron boxworks between 11.75 and 11.85 metres which assayed 0.46% tin. Surface tin mineralization in veins 2 and 3 is not apparent at depth in this hole, although a barren quartz - hematite vein intersected between 33.2 and 33.3 metres may represent the depth extension of vein 3.

D.D.H. 2 was depressed 45° on a bearing of 70° magnetic and was again placed to test veins 2 and 3 and also any northern extension at depth of vein 1. A red - brown ironstone with veinlets of quartz - hematite material was intersected between 18.8 and 19.5 metres. This intersection assayed 0.63% tin and 5 gm/tonne gold and appears to represent the depth extension of vein 2. No other significant intersections were noted in this hole. Many high sludge sample assays in this hole between 20 and 60 metres with values between 400 and 4300 ug/gm.tin are not reflected in the drill core. A probable explanation is that these values indicate material lost from the mineralized intersection 18.8 - 19.5 metres, suggesting values for this intersection may be higher than indicated.

D.D.H. 3 was depressed 45° on a bearing of 60° and was placed to test the main workings at depth (vein 1 on plate 2). Only minor intersections of mineralization were noted in this hole. Between 10.6 and 11.9 metres iron boxworks in siltstone assayed 0.15% tin (10.9 - 11.9 metres) and between 12.6 and 12.7 metres quartz - hematite veinlets in siltstone assayed 0.25% tin. In the interval 15 - 15.5 metres, an assay of 6 gm./tonne gold was obtained in siltstone with narrow veinlets and fractures filled with quartz - hematite - limonite material. None of the above intersections are related to known surface workings. A quartz - hematite vein assaying 0.15% tin intersected between 36.6 and 36.7 probably represents the depth extention of vein 1.

D.D.H. 4 was depressed 45° on a bearing of 60° and was placed to test the southern and depth extent of vein 1. No significant quartz - hematite veins were noted in the drill core.

6. CONCLUSIONS AND RECOMMENDATIONS

Diamond drilling at the Big Julie Tin Mine has realized only one significant intersection of tin and gold mineralization in D.D.H. 2 between 18.8 and 19.5 metres. This intersection shows marginal values only, 0.63% tin and 5 gm./tonne gold, although there is an indication that these values may be depleted due to core loss.

The drilling programme has shown the mineralized quartz - hematite veins to be patchy in values, with generally very limited depth extent. It is of note that the two most significant workings lie on the projected intersections of veins 1 and 3 and veins 1 and 2 respectively. (The tin and gold mineralization between 18.8 and 19.5 metres lies close to the latter intersections). Such intersections probably represent localized zones of enriched mineralization.

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The generally poor drilling results and the probable localization of mineralization at quartz- hematite vein intersections indicate that no further testing of individual veins by diamond drilling is warranted at this time.

7. REFERENCES

Hays, J., 1960 The geology of the Mount Harris tinfield, Northern Territory. Bur. Miner. Resour. Aust. Rec. 1960/2

Newton, A.W. 1977 Big Julie Tin Mine, Mt. Masson Area, N.T., N.T. Geol. Surv. Rept. GS77/5 (unpublished).

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APPENDIX I

DIAMOND DRILL HOLE ASSAYS

Big Julie Tin Mine N.T.

Sludge and split core samples were analysed using the Atomic Absorption Spectrophotometer at the East Point Laboratory, Department of the Northern Territory, Darwin. All the results are in micrograms per gram.

Detection limits are as follows:-

Sn	100	micrograms/	gram
Au	0.1	"	"
Ag	1	"	"

A minus sign (-) preceding a number indicates the value is less than the detection limit.

BIG JULIE TIN MINE

D.D.H. 1 SLUDGE SAMPLES

	Sn	Au	Ag
20 - 22	100	- .1	1
24	200	- .1	- 1
26	100	- .1	- 1
28	- 100	- .1	- 1
30	800	- .1	- 1
32	100	- .1	- 1
34	300	- .1	- 1
36	100	- .1	- 1
38	200	- .1	- 1
40	100	- .1	- 1
42	- 100	- .1	- 1
44	- 100	- .1	- 1
46	- 100	- .1	- 1
48	- 100	- .1	- 1
50	- 100	- .1	- 1
52	- 100	- .1	1
54	- 100	- .1	- 1
56	400	- .1	- 1
58	- 100	- .1	- 1
60	- 100	- .1	1

D.D.H. 2 SLUDGE SAMPLES

20- 22	1500	.2	2
24	1800	.2	2
26	600	- .1	1
28	4300	.2	1
30	1200	- .1	1
32	400	- .1	1
34	1900	- .1	2
36	2400	- .1	1
38	1100	.2	3
40	1150	- .1	2
42	900	- .1	2
44	900	.2	2
46	1600	.2	3
48	400	- .1	1
50	800	- .1	- 1
52	1200	- .1	- 1
54	600	- .1	- 1
56	500	- .1	- 1
58	500	- .1	- 1
60	450	- .1	- 1

BIG JULIE TIN MINE

D.D.H.3 SLUDGE SAMPLES

	Sn	Au	Ag
20 - 22	450	- .1	- 1
24	300	- .1	1
26	150	- .1	- 1
28	100	- .1	- 1
30	100	- .1	- 1
32	- 100	- .1	- 1
34	- 100	- .1	- 1
36	- 100	- .1	1
38	100	- .1	3
40	- 100	- .1	3
42	- 100	- .1	4
44	- 100	- .1	5
46	- 100	- .1	3
48	- 100	- .1	2
50	200	- .1	1

D.D.H. 4 SLUDGE SAMPLES

20 - 22	100	.1	1
24	400	.1	2
26	200	.1	2
28	100	.1	3
30	100	.1	2
32	100	.1	2
34	100	.1	3
36	100	.1	2
38	100	.1	2
40	100	.1	1
42	100	.1	1
44	100	.1	1
46	100	.1	1
48	100	.1	1
50	100	.1	1

BIG JULIE TIN MINE

SPLIT CORE SAMPLES

D.D.H. 1

	Sn	Au	Ag
11.75 - 11.85	4600	.2	1
30.0 - 30.15	200	- .1	- 1
33.20 - 33.30	600	- .1	- 1
36.75 - 37.00	-100	- .1	- 1
39.0 - 39.55	-100	- .1	1
39.85 - 40.00	-100	- .1	- 1

D.D.H. 2

4.7 - 4.8	530	.2	1
7.55	120	- .1	- 1
18.8 - 19.5	6250	5.0	2
23.5 - 24.9	- 100	- .1	- 1
33.25 - 33.80	120	- .1	- 1
34.8 - 35.2	- 100	- .1	- 1
47.3 - 47.45	- 100	- .1	- 1
59.4 - 59.7	- 100	- .1	1
59.3 - 59.4	- 100	- .1	- 1

D.D.H. 3

10.9 - 11.9	1500	.9	- 1
12.6 - 12.7	2500	- .1	- 1
15.0 - 15.5	850	6.0	1
20.85 - 21.0	150	- .1	- 1
22.45 - 22.55	- 100	- .1	- 1
34.4 - 34.7	- 100	- .1	- 1
36.6 - 36.7	1500	- .1	4
44 - 44.3	- 100	- .1	2
45 - 45.1	- 100	- .1	- 1

D.D.H. 4

19.0 - 19.2	- 100	- .1	1
50.2 - 50.3	100	- .1	- 1

APPENDIX II

Geological Drill Log Summaries

Big Julie Tin Mine N.T.

D.D.H.'s 1 - 4.

INTERVAL (metres)	BIG JULIE D.D.H. 1
0 - 3	No recovery.
3 - 6.10	Cream-grey oxidised and chloritized siltstone some micaceous fragments, with some coarser sandstone sections, some narrow red-brown shale bands. Moderately fractured with iron-staining on some fractures. Some narrow boxworked sections after pyrite.
6.10- 7.40	Very broken, partly silicified, partly chloritized siltstone, some iron-rich boxwork material.
7.40- 8.25	Cream-grey oxidised siltstone & shale, some sections partly silicified. A few fractures.
8.25- 10.45	Highly fractured and broken zone of similar material to above.
10.45- 11.75	As for 7.40-8.25.
11.75- 11.85	Quartz vein with boxwork, much limonite, hematite & geothite.
11.85- 14.05	Fawn, oxidised, silicified siltstone, some iron-filled fractures & veinlets, some narrow quartz bands (less than 1cm wide).
14.05- 14.80	White, oxidised & very friable shale.
14.80- 24.60	Cream & mid red brown, oxidised interbedded siltstones & shales, remnants of pyrite cubes in most sections, some sections partly silicified, some sections highly friable.
24.60- 25.65	Light grey silicified siltstone, (cubic pyrite cavities fairly common).
25.65- 60.00	Oxidised, grey & red-brown interbedded siltstones & shales, some partly silicified sections, evidence of pyrite cubes throughout, some iron-stained fractures. Bedding approx. 45° to drill hole direction. 30.00-30.15m. Hematite & limonite boxworks in silicified siltstone. 33.20-33.30m. Quartz-hematite vein. 36.75-37.00m. Altered, boxworked, partly silicified siltstone. 39.00-39.55m. Broken, altered material, some quartz veinlets, clayey material, some limonitic gossan, mica flakes. 39.85-40.00m. Similar to above. Other narrow iron-enriched and altered zones occur. Below 47.5m. some dark grey shales are in evidence and below 57m. some grey-black partly oxidised pyritic shales were noted.

INTERVAL (metres)

BIG JULIE D.D.H.2

0 - 3 No core recovery

3 - 50.35 Cream-fawn interbedded siltstone & shales, predominantly shale (talc-slate), highly oxidised, some iron-filled veinlets and fractures, some shale sections very broken and friable, some narrow bands of red-brown shale less than 2cm. thick, some thicker bands to 10cm. below 25m. Remnants of pyrite cubes seen intermittently throughout core.
4.7-4.8m. Band of quartz-hematite-limonite material with traces of gold associated with dark brown iron material.
7.55m. Some broken quartz material.
18.8-19.5m. Red-brown ironstone with veinlets of quartz-hematite material and some clayey, limonite gossan noted in this interval.
33.25-33.8m. Red-brown and grey siltstone with veinlets of quartz-hematite material.
34.8-35.2m. As above but red-brown material predominates.
35.2-40.4m. Very broken, friable cream and then red clayey shale. Highly altered and oxidised.
47.3-47.35m. Hematite-limonite gossan material.

50.35-60.1 Dark grey oxidised, carbonaceous (?), pyritic shale, abundant large cubic cavities after pyrite, no fresh pyrite observed.
59.3-59.4m. Iron-rich section.
59.4-59.7m. Band of coarse, grey greywacke.

BIG JULIE D.D.H.3

INTERVAL (metres)	
0 - 3	No core recovery
3 -46.5	Cream, fawn, oxidised interbedded shales & siltstones, (predominantly shales,) some bands of partially silicified siltstone, some narrow bands of red-brown shale below 12 metres. Large cubes after pyrite noted throughout much of core. Some iron-filled fractures & veinlets.

3 - 7.5 m. Mainly highly oxidised cream-fawn shale - very broken & friable.
10.60-11.90 m. Mainly siltstone with abundant fractures filled with limonite-hematite boxworks.
12.60-12.70 m. Partly silicified siltstone with abundant cubes after pyrite. Narrow quartz-hematite veinlets.
15.0 -15.5 m. Silicified siltstone with narrow veinlets & fractures containing quartz-hematite-limonite material.
20.85-21.0 m. Red-brown iron-rich section.
22.5 m. Narrow band of hematite enriched material.
34.40-34.70 m. Red-brown iron-rich siltstone band.
36.0 -37.3 m. Very broken & friable shale material.
36.6 -36.7 m. Quartz-hematite vein
37.3 -40.3 m. No core recovery
41.8 m. Pink clayey band (altered shale) seen in previous holes but not noted. - Very broken & friable.
44 -44.3 m. Cream shale with abundant cavities after pyrite and narrow band (3cm.) of hematite-limonite boxwork material at 44m.
45.0 -45.1 m. Iron-rich & boxwork material.

46.5 -50.3	Dark grey oxidised? carbonaceous pyritic shale, many cubic cavities after pyrite. No pyrite observed.

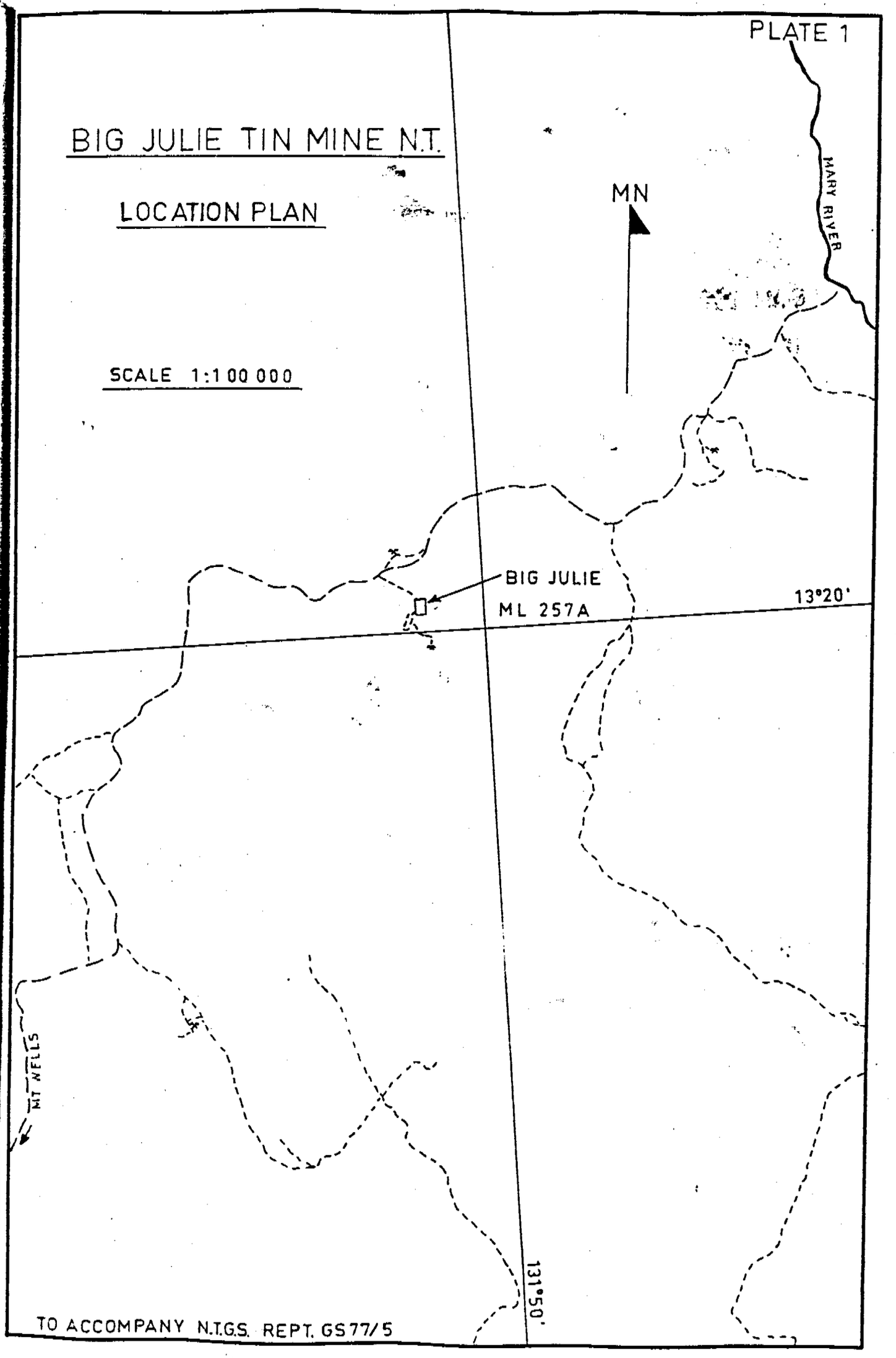
BIG JULIE D.D.H. 4

INTERVAL (metres)	
0 - 3	No core recovery.
3 -47.4	Cream, fawn, oxidised interbedded <u>shales & siltstones</u>, (predominantly shales,) some bands of partially silicified siltstone, some narrow bands of red-brown shale below 12 metres. Large cubes after pyrite noted throughout much of core. Some iron-filled fractures & veinlets. 19 -19.2 m. Red-brown & grey siltstone, some boxworks after pyrite. 28 -29 m. Cream & brown claystone (altered shale), very broken and friable. 31.7 -32.35m. Cream claystone very broken & friable. 34.4 -35.05m. Very broken cream-fawn claystone (altered shale). 35.05-36.30m. Pink claystone (altered shale) very broken and friable below 35.6. 38.1 -38.6 m. Light red-brown claystone (very broken & friable in part). Many narrow very broken & friable sections between 27 & 47.40 m. 42.55-47.40m. Note poor core recovery.
47.40-50.30	Dark grey <u>pyritic, carbonaceous shale</u>, soft & powdery (as in previous holes). Some cubic cavities after pyrite. Narrow veinlets (less than 2cm.) of hematite-limonite materials. No pyrite observed. 50.2-50.3m. Hematite-limonite material

PLATE 1

BIG JULIE TIN MINE N.T.

LOCATION PLAN



TO ACCOMPANY N.T.G.S. REPT. GS77/5

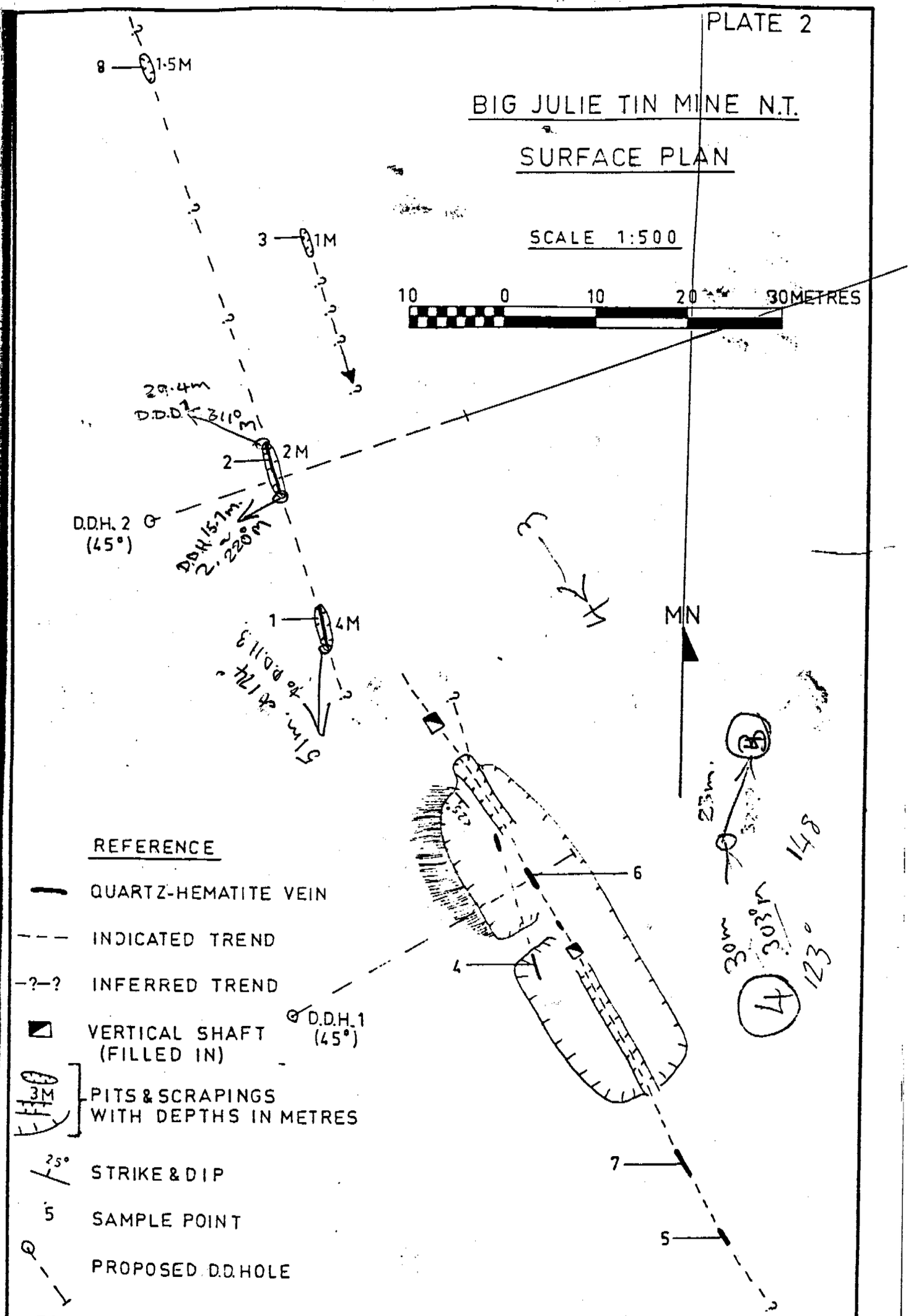
PLATE 2

BIG JULIE TIN MINE N.T.

SURFACE PLAN

SCALE 1:500

10 0 10 20 30METRES



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