TR20.62.76

6. Great Northern Plain: a possible dredging area.

J.B. Braithwaite

The Great Northern Plain is an area to the north-west of Gladstone bounded on the south by granite hills and on the north by dolerite hills. The Ringarooma River flows westwards along the edge of the granite and then turns north to the Fosters Marsh area (figure 14).

PREVIOUS INVESTIGATIONS

There have been a large number of workings in and along the edge of the granite and some produced quite large amounts of tin from both eluvial and alluvial deposits. Extensive drilling has been carried out on the unworked portion of the plain but the only major deposit proved is that known as the Scotia lead which appears to originate from the Scotia and possibly the Lochaber workings.

Isolated deposits of economic grade have been found in a few bores but they do not appear to follow any regular pattern. In 1967 the Dorset Dredge started boring on a line running east across the Ringarooma River. Only holes 13 and 14 showed any appreciable amounts of tin and the Department of Mines continued the boring programme to try to discover whether there was any lateral extension of these higher tin values. None was found but a low grade area was discovered further east and to the north of the original line.

DRILLING AND SAMPLING (see APPENDIX 1)

The bores are on a 152 x 183 m grid so they can only be regarded as scout bores but they indicate 6 160 000 m^3 and 595 t of tin metal in an area of 45 ha. The average depth is 14 m and average grade 136 g/m^3.

The bottom contours indicate that the deposit is on a terrace.

Details of ore grade are presented in Tables 1-4 and Figure 15, drill logs in Table 4 and mineralogical determinations (by G.B. Everard) in Table 5.

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[28 February 1975]

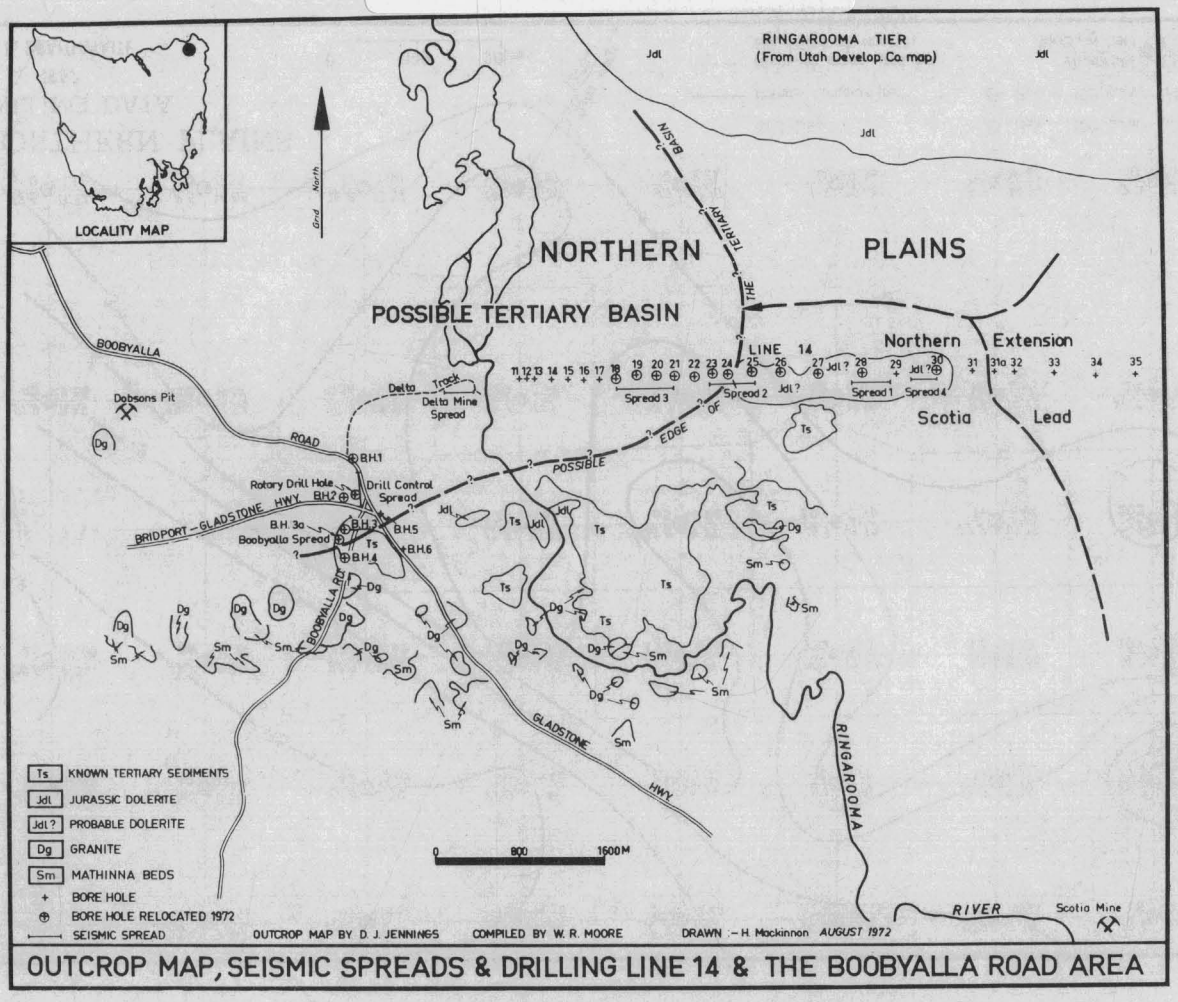
5 cm
LOCALITY MAP
Grid North
RINGAROOMA TIER
(From Utah Develop. Co. map)
Jdl
NORTHERN
PLAINS
POSSIBLE TERTIARY BASIN
TERTIARY BASIN
THE
LINE 14
Northern Extension
Spread 1
Spread 2
Spread 3
Spread 4
Scotia Lead
Delta Track
Delta Mine Spread
Dobsons Pit
BOOBYALLA ROAD
BRIDPORT – GLADSTONE HWY
Rotary Drill Hole
Drill Control Spread
Boobyalla Spread
B.H.1
B.H.2
B.H.3
B.H.3a
B.H.4
B.H.5
B.H.6
POSSIBLE EDGE OF
BOOBYALLA RIVER
GLADSTONE HWY
RINGAROOMA RIVER
Scotia Mine
Ts KNOWN TERTIARY SEDIMENTS
Jdl JURASSIC DOLERITE
Jdl? PROBABLE DOLERITE
Dg GRANITE
Sm MATHINNA BEDS
BORE HOLE
BORE HOLE RELOCATED 1972
SEISMIC SPREAD
0 800 1600M
OUTCROP MAP BY D. J. JENNINGS
COMPILED BY W. R. MOORE
DRAWN :- H. Mackinnon AUGUST 1972
OUTCROP MAP, SEISMIC SPREADS & DRILLING LINE 14 & THE BOOBYALLA ROAD AREA

Figure 14.

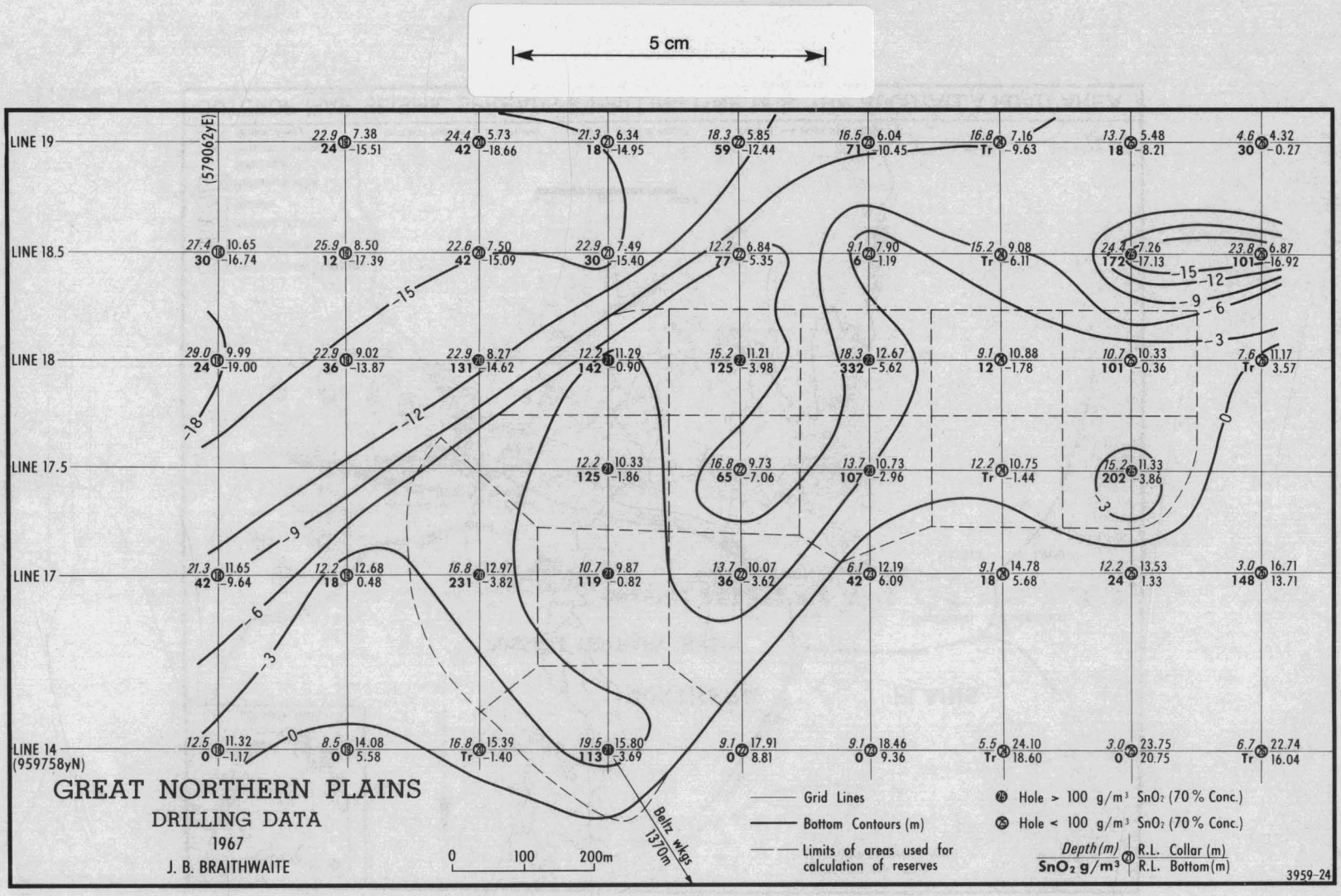
5 cm
LINE 19
LINE 18.5
LINE 18
LINE 17.5
LINE 17
LINE 14
(959758yN)
(579062yE)
GREAT NORTHERN PLAINS
DRILLING DATA
1967
J. B. BRAITHWAITE
0 100 200m
Beltz wkgs 1370m
Grid Lines
Bottom Contours (m)
Limits of areas used for calculation of reserves
Hole > 100 g/m³ SnO₂ (70 % Conc.)
Hole < 100 g/m³ SnO₂ (70 % Conc.)
Depth(m) / SnO₂ g/m³ | R.L. Collar (m) / R.L. Bottom(m)
3959-24

Figure 15.

APPENDIX 1

Progress report on drilling at Great Northern Plain.

The area, which had not been drilled before, was selected on the writer's preference and was also recommended by R. Hare and Associates, the consultants to Storeys Creek Tin N.L. The initial scout boring is on a 305 x 183 m grid and it was proposed to drill intermediate bores in any likely areas.

DRILLING METHODS

The drilling is being carried out with the Speedstar 55 using percussion only and 150 mm I.D. casing. The casing is driven 0.3 m at a time and a core measurement taken inside the casing. The core is then broken up with a chisel bit and pumped out with a piston type bailer. Great care is taken to see that neither the chisel nor the bailer go past the drive shoe. Samples are collected in 1.5 m sections washed in a cradle and panned to a concentrate of approximately 50% cassiterite. The bucket measurement of the sample is recorded as the number of millimetres settled in a 200 *l* drum (theoretical value 17.5 mm) and the core of each 1.5 m recorded (theoretical value 2.44 m). The driller records the formation in the appropriate column, and the tin washer records his opinion under 'Remarks'. Concentrates are sent to Launceston to be weighed and assayed and the mass in grams of concentrate, and concentrate adjusted to 70% Sn are recorded on the log sheet together with the grade calculated from the theoretical pipe volume.

BOTTOM

The bottom sediment is mainly a stiff clay with bands of carbonaceous matter, is definitely older than the alluvial deposits and has been drilled to 45 m without any detectable change in lithology.

Samples of the carbonaceous material have been sent to Adelaide for age determination*. This material is too hard to drive casing in, and is an ideal dredging bottom.

TIN CONCENTRATES

The washing method is aimed at recovering as much of the tin as possible and sizing analyses indicate that 20% is between 100# and 150# and up to 10% -150#. In my opinion this method is preferable to having the tin washer produce 70% concentrates and assuming that the dredge will recover the same percentage as the panner.

I understand that the concentrates produced by the dredge contain only about 6% -100# cassiterite and I would consider it essential that an effort be made to determine what the losses are, as jigs should recover practically all +150# and even some finer cassiterite. With all the dredges I have been associated with, it has been the custom to run continuous samples of jig discharge and also to drill the tailings to pick up undredged bottom and stone chute losses.

TIN CONTENT

An initial group of seven contiguous bores showed grades ranging from 113-332 g/m^3 giving an average grade of 172 g/m^3 over a depth of 15 m and a

*Samples form Line 18, holes 19 and 20 were dated as Quaternary by Harris, 1968.

volume of approximately 6 500 000 m^3. Further drilling has extended the area but reduced the grade slightly.

FUTURE PROGRAMME

Further drilling much beyond Line 19 is prevented by a deep swamp but some bores on line 19.5 may be possible, and the check bores on Lines 14.5, 17.5 and 18.5 will then be drilled. The bore positions shown on the plan are those laid out but there have been some variations owing to swampy ground and actual bore positions and collar levels will be picked up by the surveyor.

[13 December 1967]

Table 1. GREAT NORTHERN PLAIN DRILLING

Line	Hole	RL Collar (m)	RL Bottom (m)	RL Water Table (m)	Depth (m)	70% SnO_2 conc. (g/m^3)
14	18	11.32	-1.17		12.5	Nil
	19	14.08	5.58		8.5	Nil
	20	15.39	-1.40		16.8	Trace
	21	15.80	-3.69		19.5	113
	22	17.91	8.81		9.1	Nil
	23	18.46	9.36		9.1	Nil
	24	24.10	18.60		5.5	Trace
	25	23.75	20.75		3.0	Nil
	26	22.74	16.04		6.7	Trace
17	18	11.65	-9.64		21.3	42
	19	12.68	0.48		12.2	18
	20	12.97	-3.82		16.8	231
	21	9.87	-0.82		10.7	119
	22	10.07	-3.62		13.7	36
	23	12.19	6.09		6.1	42
	24	14.78	5.68	10.4	9.1	18
	25	13.53	1.33		12.2	24
	26	16.71	13.71		3.0	148
17.5	21	10.33	-1.86		12.2	125
	22	9.73	-7.06		16.8	65
	23	10.73	-2.96		13.7	107
	24	10.75	-1.44	8.2	12.2	Trace
	25	11.33	-3.86	9.4	15.2	202
18	18	9.99	-19.00		29.0	24
	19	9.02	-13.87		22.9	36
	20	8.27	-14.62		22.9	131
	21	11.29	-0.90		12.2	142
	22	11.21	-3.98		15.2	125
	23	12.67	-5.62		18.3	332
	24	10.88	1.78		9.1	12
	25	10.33	-0.36		10.7	101
	26	11.17	3.57		7.6	Trace
18.5	18	10.65	-16.74		27.4	30
	19	8.50	-17.39	5.5	25.9	12
	20	7.50	-15.09	4.9	22.6	42
	21	7.49	-15.40	4.9	22.9	30
	22	6.84	-5.35	4.9	12.2	77
	23	7.90	-1.19	5.5	9.1	6
	24	9.08	-6.11	6.7	15.2	Trace
	25	7.26	-17.13	2.7	24.4	172
	26	6.87	-16.92	4.3	23.8	101
19	19	7.38	-15.51		22.9	24
	20	5.73	-18.66		24.4	42
	21	6.34	-14.95	4.0	21.3	18
	22	5.85	-12.44	3.4	18.3	59
	23	6.04	-10.45	3.0	16.5	71
	24	7.16	-9.63	4.6	16.8	Trace
	25	5.48	-8.21	3.0	13.7	18
	26	4.32	-0.27	2.7	4.6	30

Table 2. GREAT NORTHERN PLAIN: GRADE OF 70% CASSITERITE CONCENTRATES (g/m^3)

LINE	18.5	18					17.5				17	
HOLE	22	20	21	22	23	25	21	22	23	25	20	21
Depth (m)												
0.0 - 1.5	-	6	6	6	6	-	-	-	-	47	6	6
1.5 - 3.0	-	6	6	-	-	-	-	-	-	47	6	6
3.0 - 4.6	-	12	6	-	-	-	24	6	-	18	Tr	6
4.6 - 6.1	-	47	6	12	-	-	12	6	6	83	Tr	6
6.1 - 7.6	42	6	131	12	6	77	95	148	65	18	24	208
7.6 - 9.1	297	6	279	77	30	279	534	6	166	89	125	344
9.1 - 10.7	184	-	386	504	154	356	314	59	160	249	1477	101
10.7 - 12.2	83	-	291	142	154	-	42	83	504	706	718	-
12.2 - 13.7	-	-	-	89	142	-	-	142	53	653	136	-
13.7 - 15.2	-	-	-	380	1637	-	-	237	-	113	53	-
15.2 - 16.8	-	-	-	-	742	-	-	36	-	-	30	-
16.8 - 18.3	-	-	-	-	1115	-	-	-	-	-	-	-
18.3 - 19.8	-	47	-	-	-	-	-	-	-	-	-	-
19.8 - 21.3	-	1151	-	-	-	-	-	-	-	-	-	-
21.3 - 22.9	-	522	-	-	-	-	-	-	-	-	-	-
Average grade	77	129	142	125	332	101	125	65	107	202	231	119

Table 3. GREAT NORTHERN PLAIN: B.S.S. SIZING ANALYSES OF CONCENTRATES (CUMULATIVE % Sn)

LINE	17	17.5	17.5	18.5	18.5	18.5	19	19	19	19	17.5	19
HOLE	24-26	25	22-24	26	18-24	25	20	21-22	23	24-26	21	19
+52#	6.1		6.6	14.2	28.1	30.4	2.8	17.4		2.1	23.5	
+72#	28.5		31.0	45.9	58.0	61.0	16.1	50.5	17.4	16.0	53.2	
+100#	72.2		68.7	80.0	82.6	83.0	56.5	79.9	43.9	54.9	79.8	
+150#	93.6		90.0	94.1	94.5	94.4	84.6	93.2	75.2	84.9	91.9	
+200#	98.7		97.6	98.6	98.9	98.9	96.3	98.6	95.7	97.5	97.4	
-200#	100.0		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	

Table 4. GREAT NORTHERN PLAIN: DRILLING LOGS

Depth (m)	Bucket (mm)	Core (m)	Cassiterite (g) Actual	Cassiterite (g) 70% conc.	Grade (g/m^3) 70% conc.	Description
Line 14 Hole 21						
0.0 - 1.5	114					Soil and fine sand
1.5 - 3.0	102	1.32				Fine sand
3.0 - 4.6	102	1.96				Fine clayey sand
4.6 - 6.1	89	2.11				Clayey sand
6.1 - 7.6	76	2.46				Fine sand
7.6 - 9.1	114	2.46				Fine sand
9.1 - 10.7	140	2.54	233	61		Fine sand
10.7 - 12.2	127	2.51				Fine sand
12.2 - 13.7	152	2.06				Silty sand and wood
13.7 - 15.2	114	2.26				Clayey drift
15.2 - 16.8	127	2.54				Wash (nearly all tin here)
16.8 - 18.3	76	2.44				Clay and stone
18.3 - 19.2						Clay
19.2 - 19.5						Dolerite (probably boulders)
Totals			233	61		
0.0 - 18.3					113	
Line 17 Hole 20						
0.0 - 0.9	64		3.1	0.23	5	Fine sand
0.9 - 1.5		1.68				Cemented sand
1.5 - 3.0	76		3.3	0.28	6	Cemented sand
3.0 - 4.6	102	1.98	1.8	0.19	2	Fine sand
4.6 - 6.1	102	1.83	1.2	0.08	2	Fine sand
6.1 - 7.6	102	1.96	5.5	1.06	24	Gravel and clay
7.6 - 9.1	114	2.64	8.9	5.7	125	Cemented gravelly wash
9.1 - 10.7	102	2.69	66.3	66.5	1477	Cemented gravelly wash
10.7 - 12.2	152	2.69	35.0	32.4	718	Cemented gravelly wash
12.2 - 13.7	152	2.72	9.7	6.3	136	Drift
13.7 - 15.2	127	2.72	4.7	2.5	53	Wash
15.2 - 16.8	102	2.41	10.8	1.2	27	Wash, stone and clay
16.8 - 19.8						Clay
Totals			150.3	116.4		
0.0 - 16.8					231	

Table 4 - continued

Depth (m)	Bucket (mm)	Core (m)	Cassiterite (g) Actual	Cassiterite (g) 70% conc.	Grade (g/m^3) 70% conc.	Description
Line 17 Hole 21						
0.0 - 0.6	76		2.9	0.23	6	Soil
0.6 - 1.5						
1.5 - 3.0	76	1.52	1.8	0.25	6	Fine sand
3.0 - 4.6	51	1.88	3.1	0.33	6	Fine sand
4.6 - 5.3	89	1.98	44.7	6.3	142	Fine sand
5.3 - 6.1						Silty sand
6.1 - 7.2	127	1.75	14.4	9.2	208	Silty sand
7.2 - 7.6						Wash
7.6 - 9.1	152	2.67	21.2	15.5	344	Wash
9.1 - 10.1	76	2.31	12.6	4.6	101	Wash
10.1 - 10.7						Clay
10.7 - 13.1						Clay
Totals			100.7	36.4		
0.0 - 10.7					119	
Line 17 Hole 22						
0.0 - 0.6						Silty sand
0.6 - 1.5						Clay
1.5 - 3.0	51	2.31	8.5	5.5	125	Wash
3.0 - 4.6	89	2.39	3.2	0.4	6	Fine sand
4.6 - 6.1	102	1.93	2.5	0.4	12	Clayey gravel
6.1 - 7.6		2.26	5.9	1.2	24	Clayey gravel
7.6 - 9.1		2.26	12.8	1.0	24	Clay
9.1 - 10.7	152	2.79	9.1	2.1	47	Wash
10.7 - 12.2	152	2.77	51.5	4.4	95	Wash
12.2 - 13.7	152					Wash
13.7 - 16.8						Clay
Totals			93.5	15.0		
0.0 - 13.7					36	

Table 4 - continued

Depth (m)	Bucket (mm)	Core (m)	Cassiterite (g) Actual	Cassiterite (g) 70% conc.	Grade (g/m^3) 70% cons.	Description
Line 17.5 Hole 22						
0.0 - 1.5	152		3.5	0.14		Soil and clay
1.5 - 3.0						Sandy clay
3.0 - 4.6	76		3.5	0.21	6	Gravel
4.6 - 6.1	102		8.6	0.36	6	Gravel
6.1 - 7.6	127		26.6	6.60	148	Clay, wood and sand
7.6 - 9.1	102		4.0	0.40	6	Wash
9.1 - 10.7	76		43.9	2.67	59	Wash
10.7 - 12.2	114		38.8	3.82	83	Fine sand
12.2 - 13.7	114		36.8	6.32	142	Fine sand wash from 13.11 m
13.7 - 15.2	127	2.26	39.5	10.60	237	Wash
15.2 - 16.8	102	2.39	86.9	1.94	36	Clay and gravel from 16.15 m
16.8 - 19.8						Clay bottom
Totals			292.1	33.06		
0.0 - 16.8					65	
Line 17.5 Hole 23						
0.0 - 1.5	152		3.9	0.14		Soil and clay
1.5 - 3.0		1.42				Clayey gravel
3.0 - 4.6	76	1.70	2.0	0.05		Clayey gravel
4.6 - 6.1	102	1.75	2.7	0.17	6	Fine sand
6.1 - 7.6	127	2.01	22.4	2.93	65	Gravel
7.6 - 9.1	102	2.11	27.3	7.44	116	Gravel
9.1 - 10.7	76	2.06	31.0	7.15	160	Gravel
10.7 - 12.2	102	2.18	74.9	22.60	326	Gravel, clay and wood from 11.89 m
12.2 - 13.7	102	1.98	13.1	2.30	53	Clay, gravel and wood.
13.7 - 15.2	127	2.26	20.2			Sticky clay
15.2 - 18.3						Clay bottom
Totals			198.4	42.78		
0.0 - 13.7					107	

Table 4 - continued

Depth (m)	Bucket (mm)	Core (m)	Cassiterite (g) Actual	Cassiterite (g) 70% conc.	Grade (g/m^3) 70% conc.	Description
Line 17.5 Hole 24						
0.0 - 1.5						Soil and clay
1.5 - 3.0		1.65				Silty sand
3.0 - 4.6	102	1.73	4.6	0.29		Gravel from 3.66 m
4.6 - 6.1	76	1.96	1.8	0.07		Silty sand
6.1 - 7.6	51	1.85	4.7	0.27		Silty sand
7.6 - 9.1	51	1.60	9.6	0.79		Gravel from 8.53 m
9.1 - 10.7	51	2.06	13.7	0.45		Gravel
10.7 - 12.2	76	2.18	11.5	0.20		Clay and gravel
12.2 - 15.2						Clay bottom
Totals			45.9	2.07		
0.0 - 12.2					Trace	
Line 17.5 Hole 25						
0.0 - 1.5	152		4.3	4.2	587	Soil and clayey gravel from 0.6 m
1.5 - 3.0		1.73			47	Clayey gravel
3.0 - 4.6	102	1.78	1.6	0.9	18	Clayey gravel
4.6 - 6.1	102	2.08	5.4	3.8	83	Silty clay
6.1 - 7.6	102	1.96	1.6	0.9	18	Silty clay
7.6 - 9.1	51	1.78	27.3	4.1	89	Silty sand
9.1 - 10.7	76	1.75	35.8	11.1	249	Silty sand
10.7 - 12.2	127	2.01	77.6	31.7	706	Fine sand and wood
12.2 - 13.7	127	2.08	105	29.4	653	Wash from 12.80-13.41 m
13.7 - 15.2	51	1.55	50.6	5.1	113	Clay and gravel to 14.02 m
15.2 - 16.8						Clay bottom from 14.02 m
Totals			309.2	91.2		
0.0 - 15.2					202	

Table 4 - continued

Depth (m)	Bucket (mm)	Core (m)	Cassiterite (g) Actual	Cassiterite (g) 70% conc.	Grade (g/m^3) 70% conc.	Description
Line 18 Hole 20						
0.0 - 0.6	127		3.8	0.32	71	Soil
0.6 - 1.5						Sand
1.5 - 3.0	102	1.60	4.1	0.25	5	Sand
3.0 - 4.6	102	1.75	26.3	6.25	14	Clayey sand
4.6 - 6.1	114	1.80	11.5	2.25	50	Clayey sand
6.1 - 7.6	127	1.75	3.6	0.39	8	Sand
7.6 - 9.1	102	2.03	3.4	0.17	4	Sand
9.1 - 10.7	102	1.93	1.5	0.07	2	Clayey sand
10.7 - 12.2	152	2.06	2.8	0.05	1	Silty sand
12.2 - 13.7	127	2.08	3.6	0.03	1	Silty sand
13.7 - 15.2	102	2.03	2.0	0.02	1	Silty sand
15.2 - 16.8						Clay
16.8 - 18.3		2.08				
18.3 - 19.8	64	1.80	10.2	2.09	46	
19.8 - 21.3	102	2.13	65.7	51.90	1151	
21.3 - 22.9	102	1.60	31.3	23.65	522	Wash clay at 22.25 m
22.9 - 24.4						Clay bottom
Totals			169.8	87.44		
0.0 - 22.9					129	
Line 18 Hole 21						
0.0 - 1.5	152		3.6	0.23	5	Sand
1.5 - 3.0		1.88				Sand
3.0 - 4.6	102	1.73	3.2	0.23	5	Sand, clay from 3.96 m
4.6 - 7.1	127	1.93	2.7	0.23	5	Clayey sand from 5.18 m
7.1 - 7.6	51	1.52	12.7	5.90	131	Clayey sand
7.6 - 9.1	127	2.06	20.4	12.47	279	Sand
9.1 - 10.7	102	2.21	23.6	17.33	386	Sand
10.7 - 12.2	114	2.18	20.9	13.02	291	Sand, clay from 11.28 m
12.2 - 13.7						Clay
13.7 - 15.2						Clay, wood, pyrite from 12.80 m
Totals			87.4	49.43		
0.0 - 13.7					142	

Table 4 - continued

Depth (m)	Bucket (mm)	Core (m)	Cassiterite (g) Actual	Cassiterite (g) 70% conc.	Grade (g/m^3) 70% conc.	Description
Line 18 Hole 22						
0.0 - 0.6	127		2.3	0.24	5	Soil
0.6 - 1.5						Sand
1.5 - 3.0	?	1.55	3.9	0.16	4	Sand
3.0 - 4.6	102	1.88	1.4	0.07	1	Sand and silty clay
4.6 - 6.1	127	2.31	9.4	0.47	11	Sand
6.1 - 7.6	76	2.29	6.3	0.46	10	Sand
7.6 - 9.1	127	2.11	8.9	3.46	77	Sand
9.1 - 10.7	76	2.03	31.8	22.7	504	Wash
10.7 - 12.2	51	1.80	10.1	6.5	142	Fine sand
12.2 - 13.7	114	2.13	9.5	3.9	89	Gravelly sand
13.7 - 14.3	76	2.21	24.6	17.2	380	Gravelly sand
14.3 - 15.2						Clay and mudstone
15.2 - 18.3						
Totals			108.2	55.2		
0.0 - 15.2					125	
Line 18 Hole 23						
0.0 - 1.5	178		7.6	0.29	6	Soil and cemented sand
1.5 - 3.0		1.65				Fine sand
3.0 - 4.6	102	1.75	3.6	0.08		Fine sand
4.6 - 6.1	?	1.73	3.5	0.10		Clayey sand
6.1 - 7.6	?	1.96	5.0	0.39	6	Clayey sand
7.6 - 9.1	?	1.83	11.9	1.36	30	Clayey gravel
9.1 - 10.7	76	1.93	14.4	6.90	154	Clayey gravel wash from 10.06 m
10.7 - 12.2	102	2.06	16.3	6.85	154	Wash
12.2 - 13.7	102	2.24	15.0	6.40	142	Wash
13.7 - 15.2	152	2.36	105.1	72.60	1637	Wash
15.2 - 16.8	127	2.34	47.4	33.40	742	Wash
16.8 - 18.3	51	2.36	118.9	50.10	1098	Clayey gravel
						Clay bottom
Totals			348.7	178.47		
0.0 - 18.3					332	

Table 4 - continued

Depth (m)	Bucket (mm)	Core (m)	Cassiterite (g) Actual	Cassiterite (g) 70% conc.	Grade (g/m^3) 70% conc.	Description
Line 18 Hole 24						
0.0 - 1.5			5.0	0.43		Soil and sand
1.5 - 3.0	127	1.68				Sand
3.0 - 4.6	?	1.98	3.9	0.53		Sand
4.6 - 6.1	102	1.80	3.1	0.34		Sand
6.1 - 7.6	152	1.91	14.8	0.90		Pebbly gravel from 7.01 m
7.6 - 9.1		2.03	29.0	0.78		Silty clay
9.1 - 10.7	76	2.06				Silty clay
10.7 - 12.2	102	2.16				Wash to clay at 11.89 m
12.2 - 15.2						Clay bottom
Totals			55.8	2.98		
0.0 - 9.1					12	
Line 18 Hole 25						
0.0 - 1.5	203		4.7	0.08		Soil and cemented sand
1.5 - 3.0						Sand
3.0 - 4.6	102		6.0	0.07		Sand
4.6 - 6.1	102		2.2	0.12		Sand
6.1 - 7.6	102		23.2	3.38	77	Clayey sand
7.6 - 9.1	76	1.96	41.2	12.42	279	Clayey sand
9.1 - 10.7		2.16	64.0	16.10	356	Wash to 10.06 m
10.7 - 13.7						Clayey bottom
Totals			141.3	32.17		
0.0 - 13.7					101	

Table 5. GREAT NORTHERN PLAIN: MINERALOGICAL DETERMINATIONS, LINE 14, HOLE 20. (G.B. Everard)

Sample	*Depth (m)*	*Mass (g)*	*Magnetite*	*Quartz*	*Zircon*	*Topaz*	*Rutile*	*Tourmaline*	*Pyrite*	*Cassiterite*
					Per cent					
Sand and clay	0.0 - 1.5	2.8	20	55	15	5	5	Trace	Trace	
Sand and clay	1.5 - 3.0	2.0	25	45	20	2	8			
Sandy clay	3.0 - 4.6	4.8	30	30	30	2	4	4		
Sand	4.6 - 6.1	4.4	50	7	30	Trace	13	Trace	Trace	Trace
Sand	6.1 - 7.6	3.9	40	5	50	1	3	Trace	1	Trace
Sand	7.6 - 9.1	23.3	40	15	30	2	8		5	
Sand	9.1 - 10.7	28.0	20	50	20	5	5	Trace	5	
Sand	10.7 - 12.2	16.9	60	25	7	5	1	Trace	Trace	2
Sand	12.2 - 13.7	46.1	15	55	10	3	2	Trace	15	Trace
Sand	13.7 - 15.2	29.7	25	10	15	7	3	Trace	40	Trace
Wash	15.2 - 16.8	77.7	30	15	7.5	5	2.5		10	30
Wash and clay	16.8 - 18.3	12.5	75		12.5	Trace	Trace	Trace	Trace	12.5