

1948/24
Copy 2

COMMONWEALTH OF AUSTRALIA.

DEPARTMENT OF SUPPLY AND SHIPPING.
BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS.

Record No. 1948/24.

Geological Series No. 7A.

By D. E. Gardner.



BMR PUBLICATIONS COMPACTUS
(NON-LENDING-SECTION)

B R O A D B E A C H A R E A

(Bored by Students).

1948/24
Copy 1

Southport 704
& Southport.

XXXXXXXXXXXXXXXXXXXX Seabank Lane,
XXXXXXXXXXXXXXXXXXXX Southport Q.
84QAN/1

23rd. March 1948.

The Chief Geologist.

BMR PUBLICATIONS COMPACTUS
(NON-LENDING-SECTION)

Beach Sands Investigation.

Progress Report on the
Southport-Joolangatta Area.

1948/24



1. Boring commenced in the Broadbeach area on an East-West line 500 feet South of the Northern boundary of D622. Subsequent boring was carried out along lines 1300 feet, 2100 feet, 2900 feet, 4500 feet, 6125 feet, 7740 feet, 9300 feet, and 10900 feet South of the Northern boundary of D622. A plan showing the positions of the bores on lines 500 S to 4500 S, and sections of bore-lines 500 S to 2900 S, are given at the back of this report.

2. Bore holes were put down to water level using a post-hole digger. When the sand brought up from the borehole appeared to contain an appreciable quantity of heavy mineral, it was sampled by quartering.

Samples were dried and weighed and their ^{volumes} values determined. The samples were then concentrated by panning, and the weights and volumes of the concentrates determined. The percentage compositions of some of the concentrates were determined by grain counting.

3. Estimates of the tonnages of heavy-mineral concentrates, the average grades of the heavy-mineral bearing sands and the average thicknesses of overburden, are tabulated in this report as follows:-

Table 1. - For the total area bounded on the North by the 500 S bore-line and on the South by the 2900 S bore line.

Table 2. - For the Crown land lying within this area.

Table 3. - For the portions of leases lying within this area.

The percentage compositions of the heavy-mineral concentrate obtained from various samples given in Table 4.

Estimates of the tonnages of each heavy mineral in each of the areas dealt with in Tables 1, 2, and 3 respectively, are given in Tables 4, 5, and 6. The percentage compositions used in calculating the tonnages were those determined by grain counting. Corrections could be made after sizing the concentrates. This would reduce the figures given for Monazite and increase the figures for Garnet.

4. The Appendix at the back of this report gives the data from which the figures of Tables 1 to 6 were calculated. Thus, Tables A(i) to A(iv) give details of the sampling, the quantities of heavy-mineral concentrate in each sample, and the total weight of heavy-mineral concentrate per borehole.

Tables B(i) to B(iv) give an estimate of the weight of heavy-mineral concentrate in a strip 1 yard wide along each bore-line.

Tables C(i) to C(iv) furnished an estimate of the volume of the

Southport 704
& Southport.

XXXXXXXXXXXXXXXXXXXX Seabank Lane,
XXXXXXXXXXXXXXX Southport Q.
S/Q&N/1.

The Chief Geologist.

Beach Sands Investigation Cont.

mineral-bearing sand in a strip 1 yard wide along each bore-line.

Tables D(i) to D(iv) gives details of overburden with an estimate of the average thickness of overburden along each bore-line.

Tables E(i) to E(iv) provide estimates of the quantities of heavy mineral in the portions of leases included within the bored area.

Tables F(i) to F(iv) provide the data from which the average grades of the mineral-bearing sands within the Crown land area were calculated.

Table G gives the results of grain count analysis of the concentrate from samples on each bore-line, and an estimate of the average percentage composition of the heavy-mineral concentrate.

5. The figures given in Tables 1 to 6 are estimates based on the results of boring along lines 800 feet apart. The fact that significant quantities of mineral-bearing sand were intersected in all bores (excepting bore 3, line 1300 S) indicates that the distribution of mineral across each bore-line and throughout the area, is reasonably uniform.
6. At a later date, an estimate will be forwarded of the quantities of higher grade heavy-mineral bearing sand which could be won by selective mining.

824.

D.E.GARDNER.

TABLE 1.

TONNAGE OF HEAVY MINERAL CONCENTRATE.

GRADE OF MINERAL-BEARING SANDS? AND AVERAGE THICKNESS OF OVERBURDEN.

Total area included between Bore Lines 500 S and 2900 S.

Bore Lines.	Average Weight of Heavy Mineral per 1 yard strip parallel to bore lines. (lbs.)	Distance between Bore Lines. (Feet)	Total Weight of Heavy Mineral between Bore Lines (Tons)	Volume of Mineral-Bearing Sands		Average Grade of Mineral-Bearing Sand (Lbs. per Cu. Yard)	Length of Bore Line (Feet)	Average Thickness of Overburden. (feet)
				Average per 1 yard Strip. (Cu. Yards)	Total (Cu. Yds)			
500 S and 1300 S	64,609	800	7,700	220.45	57,800	287 285	544	9.1) 9.5) 9.9)
1300 S and 2100 S	37,154	800	4,400	181.7	48,400	302 205	470	9.9) 8.8) 8.3)
2100 S and 2900 S	96,746	800	11,500	678.05	180,800	107 143	622	8.3) 5.9) 4.6)
Total 500 S to 2900 S		2400	23,600		287,000	184		7.7

TABLE 2.

TONNAGE OF HEAVY MINERAL CONCENTRATE, GRADE OF MINERAL-BEARING SANDS, AND AVERAGE THICKNESS OF OVERBURDEN
IN CROWN LAND BETWEEN BORE LINES 500 S and 2900 S.

Bore Lines	Weight of Heavy Mineral.		Volume of Mineral-Bearing Sand (Cu. Yards)		Average Grade lb. per cu. yard.		Length of Bore Line Ft.	Average Depth of Overburden (feet)	
	1 yd. strip along Bore Line (lbs.)	Total between Lines (Tons)	1 yd. strip along Bore Line	Total between Bore Lines	Along Bore Line	Between Bore Lines		Along Bore Line	Between Bore Lines.
500 S	74,847		260.8		287		544	9.1	
and		7,200		50,400		320			9.6
1300 S	47,678		110.6		439		319	10.4	
1300 S	47,678		110.6		439		319	10.4	
and		3,700		31,400		266			9.6
2100 S	14,328		125.2		115		394	9.0	
2100 S	14,328		125.2		115		394	9.0	
and		3,600		46,800		123			8.0
2900 S	46,030		225.5		123		238	5.9	
Total 500 S to 2900 S		14,500		128,600		221			8.8

TABLE 3.

**TONNAGE OF HEAVY MINERAL CONCENTRATE, GRADE OF MINERAL BEARING SAND, AND AVERAGE THICKNESS OF OVERBURDEN
ON THE PORTIONS OF LEASES BETWEEN BORE LINES 500 S and 2900 S**

Bore Lines	Weight of Heavy Mineral.		Volume of Mineral-Bearing Sand (Cu. Yards)		Average Grade lbs. per cu. yard.		Length of Bore Line Ft.	Average Depth of Overburden (Feet)	
	1 yd. strip along Bore Line. (lbs.)	Total Between Lines (Tons)	1 yd. strip along Bore Line	Total Between Bore Lines	Along Bore Line	Between Bore Lines		Along Bore Line	Between Bore Lines.
500 S and 1300 S	6,690	525	69.5	7,400	96	159	156	9.0	8.8
1300 S and 2100 S	5,612	730	58.1	17,000	96	96	228	6.2	7.3
2100 S and 2900 S	127,523	7,900	947.3	134,000	135	132	798	4.2	4.6
Total 500 S to 2900 S		9,155		158,400		129			5.2

TABLE 4.

TONNAGES OF EACH OF THE HEAVY MINERALS IN THE AREA ENCLOSED BETWEEN THE 500 S AND THE 2900 S BORE LINES.
 ESTIMATED FROM PERCENTAGE COMPOSITION BY GRAIN COUNTING.

Between Lines	Tonnage of Heavy Mineral Concentrate	Tonnage of					
		Zircon	Rutile	Ilmenite	Garnet	Mongazite	Other Minerals.
500 S & 1300 S	7,700	2494	2918	1886	115	25.4	282
1300 S & 2100 S	4,400	1425	1567	1078	66	14.5	149
2100 S & 2900 S	11,500	3725	4358	2217	172	58.0	390
Total 500 S & 2900 S	23,600	7644	8843	5781	353	77.9 1233	801

31.3

37.9

24.5

5.2

TABLE 5.**ESTIMATED TONNAGES OF EACH HEAVY MINERAL ON THE CROWN LAND ENCLOSED BETWEEN THE BORE LINES.**

Between Lines	Tonnage of Heavy Mineral Concentrate	Tonnage of					
		Zircon	Rutile	Ilmenite	Garnet	Monazite	Other Minerals.
500 S & 1300 S	7,200	2532	2728	1764	108	23.8	244
1300 S & 2100 S	3,700	1198	1402	906	55	12.2	126
2100 S & 2900 S	3,600	1166	1364	882	54	11.9	122
Total 500 S & 2900 S	14,500	4696	5494	3552	217	47.9	492

TABLE 6.

ESTIMATED TONNAGES OF EACH HEAVY MINERAL ON THE PORTIONS OF LEASES BETWEEN BORE LINES 500 S AND 2900 S.

Between Lines	Tonnage of Heavy Mineral Concentrate	Tonnage of					
		Zircon	Rutile	Ilmenite	Garnet	Monzonite	Other Minerals
500 S & 1300 S	500	162	190	122	7	1.6	18
1300 S & 2100 S	700	227	265	172	11	2.3	25
2100 S & 2900 S	7,900	2,559	2,994	1,935	118	26.1	268
Total 500 S & 2900 S	9,100	2,948	3,449	2,229	136	30.0	309

APPENDIX

TABLE A(1).

QUANTITIES OF HEAVY MINERAL INTERSECTED IN BORES.

Line 500 S.

Bore No.	Sample No.	Lab. No.	Depth		lbs./cu. yd.	Wt. per cent	Average.
			From	To			
1.	1.	12225	11' 10"	12'	302	10.65	) 192 lbs./c.yd.))))) over 3' 9".
	2.	12226	12' 2"	12' 5"	437	14.8	
	3.	12227	13'	14' 1"	442	15.0	
	4.	12228	14' 3"	14' 4"	203	7.2	
	5.	12229	15'	15' 11"	174	6.1	
	6.	12230	15' 6"	15' 7"	513	16.6	
2.	1.	12231	5' 6"	5' 10"	987	31.8	) 913 lbs./c.yd.)))) over 4' 2") 743 lbs/ c.yd. over 5' 5"
	2.	12232	6'	7' 4"	1124	34.8	
	3.	12233	7' 6"	8' 3"	715	20.0	
	4.	12234	8' 7"	9' 8"	1303	40.4	
	5.	12235	10' 1"	10' 11"	262	9.2	
3.	1.	12236	9'	9' 5"	102	3.6	) 22 lbs/c.yd.)) over 6'
	2.	12237	13' 10"	14'	489	15.1	
	3.	12238	14' 10"	15'	140	5.3	
4.	1.	12239	8' 6"	8' 8"	174	6.3	) 536 lbs/c.yd.)) over 6") 140 lbs c. yd over 3' 5"
	2.	12240	9' 6"	10' 0"	536	17.5	
	3.	12241	10' 4"	11'	100	3.5	
	4.	12242	11' 3"	11' 11"	122	6.4	

TABLE A(1) CONTINUED

Core No.	Sample No.	Lab. No.	Depth		lbs./cu. yd.	Wt. per cent	Average.
			From	To			
5.	1.	L2243	5' 3"	5' 9"	392	13.7	} 214 lbs/c.yd. over 7' 3" } 807 lbs/c.yd. over 1' 9"
	2.	L2244	11'	12' 9"	807	26.1	
6.	1.	L2245	5' 9"	6' 6"	405	14.4	} 1812 lbs/c.yd. over 10" } 301 lbs/c.yd. over 7' 1"
	2.	L2246	7'	7' 10"	1812	53.0	
	3.	L2247	8' 6"	8' 9"	141	5.1	
	4.	L2248	9' 10"	10'	302	10.8	
	5.	L2249	10' 2"	10' 11"	187	6.8	
	6.	L2250	12' 4"	12' 10"	190	6.8	
7.	1.	L2251	11' 5"	11' 10"	181	6.7	} 440 lbs/c.yd. over 2' 5" } 791 lbs/c.yd. over 1' 3"
	2.	L2252	12' 7"	13' 1"	1460	44.5	
	3.	L2253	13' 5"	13' 10"	621	20.8	
8.	1.	L2254	5'	5' 7"	1389	42.3	} 1389 lbs/c.yd. over 7" } 186 lbs/c.yd. over 5' 4"
	2.	L2255	5' 9"	6' 5"	172	6.3	
	3.	L2256	7' 8"	7' 9"	204	7.7	
	4.	L2257	10'	10' 4"	134	4.9	

APPENDIX.

TABLE A(1) CONTINUED

Bore No.	Sample No.	Lab. No.	Depth		lbs/c.u.yd.	Wt. per cent	Average.	
			From	To				
9.	1.	L2258	11' 3"	12' 4"	615	20.9	) 615 lbs/c.yd. over 1' 1"	) 325 lbs/ c. yd. over 2' 3"
	2.	L2259	13' 3"	13' 6"	264	9.5		
10.	1.	L2260	15' 3"	16' 3"	136	4.8	) 454 lbs/ c. yd. over 3' 2"	) 1956 lbs/c.yd. over 8"
	2.	L2261	17' 9"	18' 5"	1956	54.8		
11.	1.	L2262	6' 3"	8' 2"	220	10.0	) 69 lbs/ c. yd. over 8' 2"	)
	2.	L2263	12' 2"	12' 6"	152	5.5		
	3.	L2264	13' 2"	13' 5"	149	5.2		
	4.	L2265	13' 6"	13' 11"	232	8.2		
	5.	L2266	14' 3"	14' 4½"	190	6.7		
12.	1.	L2267	12' 9"	13' 7"	1192	36.	) 864 lbs/c.yd. over 2' 0"	) 515 lbs/ c. yd. over 3' 5"
	2.	L2268	13' 10"	14' 3"	952	30.1		
	3.	L2269	14' 6"	14' 9"	1351	40.4		
	4.	L2270	16'	16' 2"	186	6.6		

APPENDIX

TABLE 2(11)

LINE 1300 S

QUANTITIES OF HEAVY MINERAL INTERSECTED IN BORAS

Bore No.	Sample No.	Lab. No.	Depth		lbs./cu. yd.	Wt. per cent.	Average.
			From	To			
1.	1.	L2740	4' 6"	4' 9"	314	11.2	) 1000 lbs/c.yd. over 8" 37 lbs/c yd. over 10'1
	2.	L2741	8' 10"	9' 0"	210	7.7	
	3.	L2742	10' 6"	10' 8"	1000	5.8	
	4.	L2743	12' 8"	13'	254	9.3	
	5.	L2744	14' 3"	14' 7"	35	1.3	
2.	1.	L2745	9' 6"	10' 3"	685	40.8	) 685 lbs/c.yd. over 9"
3.	1.	L2746	12' 0"	12' 4"	111	4.5	) 260 lbs/ c. yd. over 1'8"
	2.	L2747	12' 0"	13' 6"	595	21.6	
4.	1.	L2748	5' 6"	6' 1"	412	14.9	) 59 lbs/d.yd. over 7'10"
	2.	L2749	9' 2"	9' 5"	193	7.1	
	3.	L2751	12' 9"	13' 4"	301	10.8	

APPENDIX

TABLE A(11) CONTINUED

Bore No.	Sample No.	Lab. No.	Depth		lbs./cu. yd.	Wt. Per cent.	Average
			From	To			
5.	1.	12272	12' 6"	12' 10"	77	2.9	) 69 lbs/c.yd.) over 2'10"
	2.	12273	15'	15' 4"	507	18.5	
							) 507 lbs/c.yd., over 4"
6.	1.	12274	8' 2"	8' 5"	119	4.7	) 924 lbs/c.yd.) over 1'9"
	2.	12275	8' 11"	9' 11"	1558	49.0	
							) 1558 lbs/c.yd., over 1'0"
7.	1.	12276	11'	11' 5"	226	8.0	) 226 lbs/c.yd. over 5"
8.	1.	12277	10'	10' 3"	850	27.9	))) 826 lbs/c.yd. over 3'0"
	2.	12278	11' 3"	11' 7"	675	22.7	
	3.	12279	12'	13'	2004	55.7	
9.	1.	12280	11' 6"	12'	298	10.2	))) 189 lbs/c.yd.) over 5'11"
	2.	12281	15'	15' 2"	330	11.7	
	3.	12282	15' 11"	16' 11"	665	22.6	
	4.	12283	17' 3"	17' 5"	1510	44.4	
							) 611 lbs/c.yd., over 1'6"

TABLE A(11) CONTINUED.

Bore No.	Sample No.	Lab. No.	Depth		lbs/cu.yd.	Wt. percent.	Average.
			From	To			
10.	1.	L2284	9'	9' 6"	565	19.98	) 909 lbs/c.yd. over 4'2"
	2.	L2285)	10'11"	13' 2"	1396)	42.8	
	3.	L2286)			2378)	64.4	
11.	1.	L2287	13'	13' 1"	389	13.4	) 389 lbs/c.yd. over 1"
15.	1.	L2288	9'	9' 8"	398.8	14.0	) 224 lbs/c.yd.) 1169 lbs/c.yd. over 4'8" over 8"
	2.	L2289	13'	13' 8"	1169.	36.2	

APPENDIX

TABLE A(111)

1300 S.

QUANTITIES OF HEAVY MINERAL INTERSECTED IN BORES.

Bore No.	Sample No.	Lab. No.	Depth		lbs./cu.yd.	Wt. per cent	Average.
			From	To			
1.	1.	12290	6' 6"	6' 8"	569	21.0	) 569 lbs/c.yd. over 2" 131 lbs/c.yd. over 2'10"
	2.	12291	7'	7' 6"	359	12.6	
	3.	12292	9'	9' 4"	293	10.1	
2.	1.	12293	6'	6' 5"	248	9.0	) 111 lbs/c.yd. over 5'6"
	2.	12294	9' 6"	9' 9"	231	8.0	
	3.	12295	10'	10' 6"	786	24.8	
	4.	12296	11' 6"	11' 8"	441	24.0	
4.	1.	12297	10'	10' 6"	193	7.0	) 33 lbs/c.yd. over 3'1"
	2.	12298	13'	13' 1"	53	1.9	
5.	1.	12299	6' 9"	6'10 $\frac{1}{2}$ "	969	32.3	) 969 lbs/c.yd. over 1 $\frac{1}{2}$ "
6.	1.	12300	9' 2"	9'10"	264	8.4	) 264 lbs/c.yd. over 8"
7.	1.	12301	10'	10' 4"	76	2.9	) 23 lbs/c.yd. over 1' 9"
	2.	12302	11' 6"	11' 9"	63	2.2	

APPENDIX.

TABLE A(111)

CONTINUED.

Bore No.	Sample No.	Lab. No.	Depth		lbs/cu.yd.	Wt. percent.	Average.	
			From	To				
8.	1.	L2303	5' 3"	5' 6"	321	10.9	) 608 lbs/c.yd. over 1'6"	) 261 lbs/c.yd. over 4'9"
	2.	L2304	6' 6"	8' 2"	608	20.0		
	3.	L2305	9' 3"	9' 6"	164	5.7		
	4.	L2306	10'	10' 2"	640	17.3		
9.	1.	L2307	13'	13' 11"	715	22.9	) 715 lbs/c.yd. over 11"	
10.	1.	L2308	9'	9' 3"	250	9.0	) 24 lbs/c.yd. over 3'1"	
	2.	L2309	12'	12' 1"	150	5.2		
11.	1.	L2310	10'	10' 3"	330	11.9	) 1539 lbs/c.yd. over 4"	) 137 lbs/c.yd. over 4'4"
	2.	L2311	14'	14' 4"	1539	45.8		
12.	1.	L2312	6'	6' 1½"	260	8.5	) 260 lbs/c.yd. over 1½"	

APPENDIX.

TABLE A(IV)

2900 S.

QUANTITIES OF HEAVY MINERAL INTERESTED IN BONES.

Bore No.	Sample No.	Lab. No.	Depth From To		lbs/cu.yd.	Wt. per cent	Average.
1.	1.	12313	0	5' 6"	12	9.6	) 158 lbs/c.yd. over 14' 9"
	2.	12314	6' 6"	11' 6"	170	6.5	
	3.	12315	11' 6"	13'	311	36.6	
	4.	12316	13'	14' 3"	257	9.2	
	5.	12317	Not recorded in rough log book.		57	1.6	
2.	1.	12318	9' 6"	13' 6"	83	3.0	) 884 lbs/c.yd. over 6' 3"
	2.	12319	13' 6"	14' 3"	1105	35.4	
	3.	12320	14' 3"	18' 9"	64	2 1/4	
3.	1.	12321	0	6'	89	3.6	) 436 lbs/c.yd. over 12' 0"
	2.	12322	6'	8' 6"	943	26.7	
	3.	12323	8' 6"	10' 6"	835	26.3	
	4.	12324	11' 6"	12' 6"	1351	33.7	
4.	1.	12325	0	10' 6"	44	1.7	) 70 lbs/c.yd. over 10' 3"
	2.	12326	10' 6"	15'	64	2.3	
	3.	12327	15'	15' 5"	879	27.4	
	4.	12328	15' 5"	16' 3"	32	1.2	

APPENDIX

TABLE A(IV) CONTINUED.

Bore No.	Sample No.	Lab. No.	Depth		lbs./cu.yd.	Wt. per cent	Average.
			From	To			
5.	1.	L2329	0	6' 6"	57	3.2	) 45 lbs/c.yd. over 16' 0"
	2.	L2330	7' 6"	11' 0"	39	1.6	
	3.	L2331	11' 0"	12' 0"	69	2.6	
	4.	L2332	12' 0"	14' 6"	25	1.0	
	5.	L2333	14' 6"	16' 0"	50	1.9	
6.	1.	L2334	0'	6' 4"	58	1.6	) 143 lbs/c.yd. over 13' 0"
	2.	L2335	6' 4"	9' 0"	308	1.1	
	3.	L2336	9' 0"	13' 0"	167	6.1	
7.	1.	L2337	11' 6"	13' 6"	103	3.7	) 103 lbs/c.yd. over 2' 0"
8.	1.	L2338	8' 6"	11' 6"	95	3.8	) 95 lbs/c.yd. over 3' 0"
9.	1.	L2339	0	10' 0"	26	.9	) 52 lbs/c.yd. over 15' 3"
	2.	L2340	10' 0"	15' 3"	43	1.6	
10.	1.	L2341	7' 6"	10' 9"	323	11.2	) 217 lbs/c.yd. over 3' 3"
	2.	L2342	9' 0"	10' 9"	126	4.8	

APPENDIX .

TABLE A(iv)

CONTINUED.

BORE NO.	Sample No.	Lab. No.	Depth		lbs/c.yd.	Wt. per cent	Average.
			From	To			
11.	1.	12343	13' 6"	13' 9"	81	1.4	) 73 lbs/c.yd. over 4' 0"
	2.	12344	13' 9"	16' 6"	106	3.9	
12.	1.	12345	0'	8' 0"	81	1.2	) 81 lbs/c.yd. over 13' 6"
	2.	12346	8' 0"	13' 6"	153	5.7	
13.	1.	12347	11' 0"	15' 6"	186	6.8	) 209 lbs/c.yd. over 5' 6"
	2.	12348	15' 6"	16' 6"	312	11.0	
14.	1.	12349	6' 6"	8' 11"	215	7.8	) 408 lbs/c.yd. over 7' 3"
	2.	12350	8' 11"	13' 9"	637	31.4	
15.	1.	12351	0'	11' 11"	55	2.0	) 55 lbs/c.yd. over 11' 11"
	2.	-	11' 11"	18' 0"	-	-	
16.	1.	12352	9' 9"	16' 6"	110	4.1	) 110 lbs/c.yd. over 6' 9"

APPENDIX

TABLE A(iv)

CONTINUED.

Bore No.	Sample No.	Lab. No.	Depth		lbs/cu.yd.	Ht. per cent	Average.
			From	To			
17.	1.	12353	12' 3"	13' 0"	16	.6	) 16 lbs/cu.yd. over 5' 9"
18.	-	-	-	-	-	-	
19.	1.	-	0"	5' 6"	-	-	
20.	-	-	-	-	-	-	

APPENDIX

TABLE B(1)

500 S.

WEIGHT OF MINERAL IN 1 YARD STRIP ALONG BORE LINE.

Bore Nos.	lbs. of Mineral per sq. yd. at bore	Average lbs. wt. of Mineral per sq. yd. between bores	Distance between bores in yards	Wt. of Mineral in 1 yd. strip between bores (lbs)
1. 2.	240 1541	790	13	10,270
2. 3.	1341 4	672	10	6,720
3. 4.	4 158	31	11.7	945
4. 5.	158 535	346	13	4,498
5. 6.	535 711	623	10.3	6,438
6. 7.	711 354	532	16.3	8,689
7. 8.	354 334	344 352	20.3 21	6,995 6,936
8. 9.	334 244	289	24	6,936

APPENDIXTABLE B(1) CONTINUED.

Bore Nos.	lbs/ sq Mineral per sq. yd. at bore	Average lbs. wt. of Mineral per sq. yd. between bores	Distance between bores in yards	Wt. of Mineral in 1 yd. strip between bores (lbs).
9. 10.	244 479	361	22.7	8,183
10. 11.	479 242	360	25.7	9,240
11. 12.	242 585	414	14.3	5,934
Total for Line			181.3	74,647

APPENDIX

TABLE B(11)

1300 S.

WEIGHT OF HEAVY MINERAL IN 1 YARD STRIP ALONG BORE LINE.

Bore Nos.	lbs. of Mineral per sq. yd. at bore	Average lbs. wt. of Mineral per sq. yd. between bores	Distance between bores in yards	Wt. of Mineral in 1 yd. strip between bores (lbs).
4. 1.	154 124	139	11.7	1,622
1. 3.	124 144	134	9.7	1,295
3. 2.	144 171	157	9.	1,413
2. 5.	171 65	118	28.3	3,343
5. 6.	65 539	302	18.7	5,637
6. 7.	539 31	285	13.	3,420
7. 8.	31 823	423	6.3	2,711
8. .	823 375	600	23.7	14,200

APPENDIX

TABLE B(11) CONTINUED.

Bore Nos.	Lbs. of Mineral per sq. yd. at bore	Average lbs. wt. of Mineral per sq.yd. between bores.	Distance between bores in yards	Wt. of Mineral in 1 yd. strip between bores (lbs).
9.	375	819	18.3	15,015
10.	1233			
10.	1233	805	3.7	2,985
15.	348			
15.	318	180	15.3	2,760
11.	11.			
Total for Line			156.7	54,368

APPENDIX

TABLE B(111)

2100 S.

WEIGHT OF MINERAL IN 1 YARD STRIP ALONG BORE LINE.

Bore Nos.	lbs. of Mineral per sq. yd. at bore	Average lbs. wt. of Mineral per sq. yd. between bores	Distance between bores in yards	Wt. of Mineral in 1 yd. strip between bores (lbs).
1.	124	167	14.	2,895
2.	210			
2.	210	105	12.3	1,295
3.	0			
3.	0	16	16.7	267
4.	33			
4.	33	36	23	823
5.	40			
5.	40	49	16.7	817
6.	59			
6.	59	36	18.	681
7.	13			
7.	13	110	13.7	2055
8.	207			
8.	207	212	14.	3675
9.	218			

APPENDIX.

TABLE B(111)

CONTINUED.

Bore Nos.	lbs. of Mineral per sq. yd. at bore	Average lbs. wt. of Mineral per sq. yd. between bores	Distance between bores in yards	Wt. of Mineral in 1 yd. strip between bores (lbs).
9.	218	121	14.	2,094
10.	24			
10.	24	111	22.2 (23.7)	2,427
11.	198			
11.	198	104	25.3 (26.5)	2,739
12.	11			
Total for Bore line			207.3	19,940

APPENDIX

TABLE B(iv)

2900 S.

WEIGHT OF MINERAL IN 1 YARD STRIP ALONG BORE LINE.

Bore Nos.	lbs. of Mineral per sq. yd. at bore	Average lbs. wt. of Mineral per sq. yd. between bores	Distance between bores in yards	Wt. of Mineral in 1 yd. strip between bores (lbs).
1.	782	687	20	13,740
2.	592			
2.	592	1168	29	33,872
3.	1744			
3.	1744	1061	27	23,647
4.	379			
4.	379	309	32	9,888
5.	240			
5.	240	450	293	12,613
6.	620			
6.	620	344	15	5,160
7.	69			
7.	69	82	17.7	1,449
8.	95			
8.	95	129	19.	2,451
9.	163			

APPENDIX

TABLE B(iv) CONTINUED

Bore Nos.	lbs. of Mineral per sq. yd. at bore	Average lbs. wt. of Mineral per sq. yd. between bores	Distance between bores in yards	Wt. of Mineral in 1 yd. strip between bores (lbs).
9.	163	199	51.3	10,215
10.	235			
10.	235	166	15.3	2,545
11.	97			
11.	97	230	12.	2,760
12.	364			
12.	364	362	28.7	10,951
13.	401			
13.	401	693	24.3	16,863
14.	986			
14.	986	820	18.3	15,033
15.	655			
15,	655	451	16.3	7,366
16.	247			
Total for Line.			1066	173,553

APPENDIX

TABLE C (1) 500 S. VOLUME OF MINERAL-BEARING SAND IN 1 YARD STRIP ALONG BORE LINE.

Bore Nos.	Depth Sampled (yds)	Area of Cross-section of strip at bore (sq.yds)	Average area of Cross-section between bores (sq.yds)	Distance between bores (yds.)	Volume of strip (c.yds).
1.	5/4	5/4	110/72	13	19.9
2.	65/36	65/36			
2.	65/36	65/36	137/72	10	19.
3.	0.2	0.2			
3.	0.2	0.2	113/72	35/3	18.3
4.	41/36	41/36			
4.	41/36	41/36	131/72	13	23.6
5.	5/2	5/2			
5.	5/2	5/2	175/72	31/3	25.1
6.	85/36	85/36			
6.	85/36	85/36	114/72	49/3	25.9
7.	29/36	29/36			
7.	29/36	29/36	93/72	61/3	26.3
8.	16/9	16/9			
8.	16/9	16/9	91/72	24	30.3
9.	3/4	3/4			

APPENDIX

TABLE C(1)

CONTINUED

Bore Nos.	Depth Sampled (yds)	Area of Cross-section of strip at bore (sq.yds)	Average area of Cross-section between bores (sq.yds)	Distance between bores (yds)	Volume of Strip (c.yds).
9.	3/4	3/4	65/72	68/3	20.5
10.	19/18	19/18			
10.	19/18	19/18	68/36	77/3	24.2
11.	49/18	49/18			
11.	49/18	49/18	139/72	43/3	27.7
12.	41/36	41/36			

Total volume of strip sampled along line = 200.8 c. yds.

APPENDIX

TABLE C(11)

1300 S.

VOLUME OF 1 YARD STRIP OF MINERAL-BEARING SAND ALONG BORE LINE

Bore Nos.	Depth Sampled (yds)	Area of Cross-section of strip at bore (sq.yds)	Average area of Cross-section between bores (sq.yds)	Distance between bores (yds.)	Volume of Strip (c.yds.)
4.	47/18	47/18	3	35/3	35
1.	121/36	121/36			
1.	121/36	121/36			
3.	20/36	20/36	47/24	29/3	19
3.	20/36	20/36	29/72	27/3	3.6
2.	9/36	9/36			
2.	9/36	9/36			
5.	34/36	34/36	45/72	29 60 55/3 25	11.9 16.9 5.0
5.	34/36	34/36	55/72	58/3	14.3
6.	21/36	21/36			
6.	21/36	21/36	13/36	36/3	4.3
7.	5/36	5/36			
7.	5/36	5/36	41/72	19/3	3.6
8.	1	1			
8.	1	1	107/72	71/3	35.1
9.	71/36	71/36			

D.C. 3/1

APPENDIX

TABLE C(ii)

CONTINUED

Bore Nos.	Depth Sampled (yds)	Area of Corrs-section of strip at bore (sq.yds)	Average area of Cross-section between bores (sq.yds)	Distance between bores (yds).	Volume of Strip (c. yds)
9.	71/36	71/36	121/72	55/3	30.8
10.	50/36	50/36			
10.	50/36	50/36	53/36	11/3	5.4
15.	56/36	56/36			
15.	56/36	56/36	57/72	46/3	12.1
11.	1/36	1/36			

Total volume of strip sampled alongline - 180.1 c. yds.

APPENDIX

TABLE C(111)

21008.

VOLUME OF 1 YARD STRIP OF MINERAL-BEARING SAND ALONG BORE LINE

Bore Nos.	Depth Sampled (yds)	Area of Cross-section of strip at bore (sq.yds)	average area of Cross-section between bores (sq.yds)	Distance between bores (yds)	Volume of strip (c.yds).
↑ 1. 2.	34/36 68/36	34/36 68/36	51/36	52/3	24.6
2. 3.	68/36 0	68/36 0	34/36	37/3	11.7
0.6.31. 3. 4.	0 37/36	0 37/36	37/72	50/3	8.6
4. 5.	37/36 1/24	37/36 1/24	77/144	69/3	12.3
✓ 5. 6.	1/24 8/36	1/24 8/36	19/144	20' 50/3 30'	0.9 2.2 1.3
6. 7.	8/36 21/36	8/36 21/36	29/72	54/3	7.3
7. 8.	21/36 57/36	21/36 57/36	39/36	56/3	20.2

APPENDIX

TABLE C(III) CONTINUED

Bore Nos.	Depth Sampled (yds)	Area of Cross-section of strip at bore (sq.yds).	Average area of Cross-section between bores (sq.yds)	Distance between bores (yds)	Volume of strip (c.yds).
8.	57/36	57/36	34/36	52/3	16.4
9.	11/36	11/36			
9.	11/36	11/36	24/36	52/3	11.7
10.	37/36	37/36			
10.	37/36	37/36	89/72	71/3	29.2
11.	52/36	52/36			
11.	52/36	52/36	107/72	79/3	39.1
12.	1/24	1/24			

Total volume of strip sampled along line - 183.3 c.yds.

APPENDIX

TABLE C (iv)

2900 S.

VOLUME OF MINERAL-BEARING SAND IN 1 YARD STRIP ALONG BORE LINE.

Bore Nos.	Depth Sampled (yards)	Area of Cross-section of strip at bore (sq.yds)	Average area of Cross-section between bores (sq.yds)	Distance between bores (yds)	Volume of strip (c.yds)
1.	59/12	59/12	84/24	20	70
2.	25/12	25/12			
2.	25/12	25/12	73/24	29	88.2
3.	4	4			
3.	4	4	113/24	27	127.1
4.	65/12	65/12			
4.	65/12	65/12	129/24	32	172.0
5.	16/3	16/3			
5.	16/3	16/3	116/24	88/3	141.8
6.	13/3	13/3			
6.	13/3	13/3	60/24	15	37.5
7.	2/3	2/3			
7.	2/3	2/3	20/24	53/3	14.7
8.	1	1			
8.	1	1	73/24	19	57.8
9.	61/12	61/12			

APPENDIX

TABLE C(IV) CONTINUED.

Bore Nos.	Depth Sampled (yards)	Area of Cross-section of strip at bore (sq.yds)	Average area of Cross-section between bores (sq.yds)	Distance between bores (yds)	Volume of strip (c.yds)
9.	61/12	61/12	74/24	154/3	158.3
10.	13/12	13/12			
10.	13/12	13/12	29/24	46/3	18.5
11.	4/3	4/3			
11.	4/3	4/3	70/24	12	35
12.	9/2	9/2			
12.	9/2	9/2	76/24	25 61	26.4 90.8 64.4
13.	22/12	22/12			
13.	22/12	22/12	51/24	73/3	51.7
14.	29/12	29/12			
14.	29/12	29/12	230/72	55/3	58.6
15.	143/36	143/36			
15.	143/36	143/36	224/72	49/3	50.8
16.	9/4	9/4			

Total Volume of strip sampled along line - 1172.8 c. yds.

CROWN LAND

APPENDIX

TABLE D(1)

500 S LINE.

OVERBURDEN.

Bore No.s	Depth of Overburden		Distance between bores (feet)	Depth Overburden x Distance.
	At Bore (feet)	Average (feet)		
1.	11' 10"	8' 8"	39	338
2.	5' 6"			
2.	5' 6"	7' 3"	30	217.5
3.	9'			
3.	9'	8' 9"	35	306.25
4.	8' 6"			
4.	8' 6"	6' 10"	39	266.5
5.	5' 3"			
5.	5' 3"	5' 6"	31	170.5
6.	5' 9"			
6.	5' 9"	8' 7"	49	420.6
7.	11' 5"			
7.	11' 5"	8' 3"	61	503.25
8.	5'			

APPENDIX

TABLE D(1) CONTINUED

Bore No.s	Depth of Overburden		Distance between bores (feet)	Depth Overburden x Distance.
	At Bore (feet)	Average (Feet)		
8.	5'	8' 2"	72	560.
9.	11' 3"			
9.	11' 3"	13' 3"	68	901
10.	15' 3"			
10.	15' 3"	10' 9"	77	627.75
11.	6' 3"			
11.	6' 3"	9' 6"	43	408.5
12.	12' 9"			
Total			544	4939.85

Average - 9.1 feet over whole bore line.

APPENDIX.

TABLE D(11) 1500 S LINE

OVERBURDEN

Bore Nos.	Depth of Overburden		Distance between bores (feet)	Depth Overburden x Distance.
	At Bore (feet)	Average (feet)		
4.	5' 6"	5'	35	17.5
1.	4' 6"			
1.	4' 6"			
3.	12'			
3.	12'	8' 3"	29	230.75
2.	9' 6"			
2.	9' 6"			
2.	9' 6"			
5.	12' 6"	10' 9"	27	290.25
5.	12' 6"			
6.	8' 2"			
6.	8' 2"			
7.	11'	11'	65	660 --- 275
7.	11'			
8.	10'			
8.	10'			
5.	12' 6"	10' 4"	56	578.6
6.	8' 2"			
6.	8' 2"			
7.	11'			
7.	11'	9' 7"	38	345
8.	10'			
8.	10'	10' 6"	19	199.5
8.	10'			

D.C. 31

APPENDIX

TABLE (D11) CONTINUED.

Bore Nos.	Depth of Overburden At Bore (feet)	Average (feet)	Distance between bores (feet)	Depth Overburden x Distance.
8.	10'			
9.	11' 6"	10' 9"	71	763.25
9.	11' 6"			
10.	9'	10' 3"	55	563.75
10.	9'			
15.	9'	9'	11	99
15.	9'			
15.	9'			
11.	13'	11'	46	506
Total for base line			470	4695.10

Average - 9.9 feet of overburden.

APPENDIX

TABLE D(111)

2100 S LINE

OVERBURDEN

Bore Nos.	Depth of Overburden		Distance between bores (feet)	Depth Overburden x Distance.
	At Bore (feet)	Average (feet)		
1.	6' 6"	6' 3"	52	325
2.	6'			
2.	6'	5'	37	111
3.	0			
3.	0	5'	50	250
4.	10'			
4.	10'	8' 5"	69	580.9
5.	6' 9"			
5.	6' 9"	8'	50	400
6.	9' 2"			
6.	9' 2"	9' 7"	54	517.5
7.	10'			
7.	10'	7' 8"	53	429.3
8.	5' 3"			

APPENDIX

TABLE D(111) CONTINUED

Bore Nos.	Depth of Overburden At Bore (feet)	Average (feet)	Distance between bores (feet)	Depth Overburden x Distance
8.	5' 3"	9' 2"	52	476.6
9.	13'			
9.	13'	11'	52	572
10.	9'			
10.	9'	9' 6"	71	674.5
11.	10'			
11.	10'	8'	79	632
12.	6'			
Total			622	4966.6

Average - 8.5 feet of overburden.

APPENDIX

TABLE D(iv) 2900 S LINE OVERBURDEN

Bore Nos.	Depth of Overburden At Bore (feet)	Average (feet)	Distance between bores (feet)	Depth Overburden x Distance.
1.	8' (est)	8' 9"	60	525
2.	9' 6"			
2.	9' 6"	4' 9"	87	413.25
3.	0			
3.	0	0	51 57	0
4.	0			
4.	0	0	88	0
5.	0			
5.	0	0	88	0
6.	0			
6.	0	5' 9"	45	258.75
7.	11' 6"			
7.	11' 6"	10'	53	530
8.	8' 6"			

↑
WASES.

APPENDIX

TABLE D (iv) CONTINUED

Depth Overburden x Distance.	4763.16
Distance between bores (feet)	1036
Total	

Average = 4.6 feet of overburden.

Bore Nos.	Depth of Overburden		Distance between bores (feet)	Depth Overburden x Distance
	At Bore (feet)	Average (feet)		
8.	8' 6"	4' 3"	57	242.25
9.	0			
9.	0			
10.	7' 6"	3' 9"	154	577.5
10.	7' 6"	10'	46	460
11.	12' 6"			
11.	12' 6"	6' 3"	56	225
12.	0			
12.	0	5' 6"	86	473
13.	11'		(25 — (61	(157.5 — (335.5
13.	11'	8' 9"	73	633.75
14.	6' 6"			
14.	6' 6"	3' 3"	55	178.75
15.	0			
15.	0	4' 11"	49	240.9
16.	9' 9"			

APPENDIX

TABLE E (1)

500 S LINE

CALCULATION OF TOTAL MINERAL BORES 1 to 8 TO GET ESTIMATE OF MINERAL N.W. CORNER OF DC31

Bore Nos.	Total Wt. of Mineral in 1 yd. strip (lbs)
1 - 2	10,270
2 - 3	6,720
3 - 4	945
4 - 5	4,498
5 - 6	6,438
6 - 7	8,689
7 - 8	6,995
Total Weight Along Line.	44,555

Suppose a uniform increase on tonnage from 6690 at 1300 S to 44555 at 500 S.

Increase = 37,860 lbs.

Weight Mineral at North end of DC 31.

$$= \frac{655}{170} \times 37860 + 6690 = 18938 \text{ lbs.}$$

Distance from 500 S to North end of DC 31 275'.

Total Weight of Mineral in N.W. Corner of DC 31

$$\frac{1}{2} (18938 + 6690) \times \frac{55}{3} \times \frac{1}{2240} \text{ Tons.}$$

$$= 525 \text{ Tons.}$$

Total Weight of Mineral between 500 S and 1300 S outside leases:

$$7,700 - 525 = 7,175 \text{ tons}$$

APPENDIX

TABLE E (11)

LINE 1300 S MINERAL WITHIN LEASES & AVERAGE GRADE

DC 31

BORE 4, 1, 3, 2 & 65' BETWEEN BONES 2 & 5

Bore Nos.	Total Wt. of Mineral in 1 Yd. Strip (lbs)	Volume of Strip Cu. Yds.
4 - 1	1,622	35
1 - 3	1,295	19
5 - 2	1,413	3.6
2 and 60' towards 5	$\frac{60 \times 10030}{85 \times 3}$ = 2,360	$\frac{60}{85} \times \frac{169}{1}$ = 12
Total along Line	6,690 lbs.	69.6 cu.yds.
Total Weight on Crown Land along Line	54368 - 6690 = 47678	

Average Grade

$$= \frac{6690}{69.6}$$

$$= 96 \text{ lbs/cu.yd.}$$

APPENDIX

TABLE # (111) 2100 S MINERAL WITHIN LEASES BORE 1, 2, 3, 4, 5, and 20 ft. TOWARDS BORE 6 in DC 51

Bore Nos.	Total Wt. of Mineral in 1 Yd. Strip (lbs)
1 - 2	2,895
2 - 3	1,295
3 - 4	267
4 - 5	323
5 & 20ft. towards 6	$\frac{20}{50} \times \frac{817}{1}$ = 326.8
Total Weight along Line	5,612 lbs.
Total Weight along Line in Crown Land	19940 - 5612 = 14,328

Total weight of Mineral in DC 51 Between 1500 S & 2100 S.

$$\frac{1}{2} (5612 + 6696) \times \frac{800}{5} \times \frac{1}{2260}$$

= 730 Tons.

Total Weight of Mineral between 1500 S and 2100 S on Crown Land

$$4425 - 730$$

= 4700 Tons.

APPENDIX

TABLE E (iv) LINE 2900 S MINERAL WITHIN LEASES. BORES 1 to 12 and 25ft. of Distance from 12 to 13 included in DC 31 ML 180

Bore Nos.	Total Wt. of Mineral in 1 yd. Strip (lbs)
1 - 2	13,740
2 - 3	35,372
3 - 4	28,647
4 - 5	9,888
5 - 6	12,613
6 - 7	5,160
7 - 8	1,449
8 - 9	2,451
9 - 10	10,815
10 - 11	2,545
11 - 12	2,760
12 and 25ft. towards 13	$\frac{25 \times 10951}{25} = \frac{10951}{1}$
Total Mineral	127523
Total Weight along Line in Crown Land	173553 - 127523 = 46,030

Total Weight of Mineral in ML180 & DC 31 between 2100 S & 2900 S

$$= \frac{1}{2} (5612 + 127523) \times \frac{800 \times 1}{3 \times 2240}$$

= 7900 Tons

Total Weight of Mineral between 2100 S & 2900 S on Crown Land

$$= 11,517 - 7924$$

= 3600 Tons.

APPENDIX

TABLE F(1) VOLUME OF MINERAL-BEARING SANDS IN NORTH-WEST CORNER OF DC 31

Volume of Strip at 500 S Bores 1 - 8

Bore nos.	Volume of Strip Cu.Yds.
1 - 2	19.9
2 - 3	9.9
3 - 4	7.6
4 - 5	23.6
5 - 6	25.1
6 - 7	25.9
7 - 8	26.3
Total	138.3 Cu.Yds.

Volume of Strip at 1300 S = 69.6 cu.yds.

Volume of Strip at 500 S
Bores 1 to 8 = 138.3 cu.yds.

Increase in Volume of Strip
from 1300 S to 500 S = 68.7 cu.yds.

Suppose Uniform increase in Volume.

Volume at Northern end DC31 = $\frac{.55}{.170} \times \frac{68.7}{1} + 69.6$
= 91.8 cu.yds.

Distance from 1300 S to North end of DC31 = 275'

Volume of N.W. corner DC = $\frac{1}{3}(69.6 + 91.8) \times \frac{275}{3}$

= 7400 cu. yds.

APPENDIX

TABLE F(11) 1300 S AVERAGE GRADE OF MINERAL-BEARING SAND IN GROWN LAND IN A 1 YARD STRIP ALONG BORE LINE.

BORES 5 & 15 EAST OF BORE 5 & BORES WEST OF BORE 5.

Bore Nos.	Volume of Strip Cu.Yds.
5 & 15' East	$\frac{43}{72} \times \frac{15}{3}$
=	3.0
5 & 6	14.3
6 & 7	4.3
7 & 8	5.6
8 & 9	35.1
9 & 10	30.8
10 & 15	5.4
15 & 11	12.1
Total	108.6

Weight of Mineral = 4767 lbs.

Average Grade = $\frac{47678}{108.6}$

< 439 lbs/cu.yd.

APPENDIX

TABLE F(111) 2100 S AVERAGE GRADE OF MINERAL-BEARING BED IN CROWN LAND ON A 1 YARD WIDE STRIP ALONG BORE LINE

BORES 6 & 20 FT. EAST OF BORE 6 & ALL BORES WEST OF BORE 6

Bore Nos.	Volume of Strip Cu.Yds.
6 & 20' West	$\frac{6 \times 2.2}{10} = 1.32$
6 & 7	7.3
7 & 8	20.2
8 & 9	16.4
9 & 10	11.7
10 & 11	29.2
11 & 12	39.1
Total	125.2 Cu.Yds.

Weight of Mineral = 14,328 lbs.

Average Grade = $\frac{14328}{125.2}$

= 115 lbs/cu.yd.

APPENDIX

TABLE F(1v) 2900 S AVERAGE GRADE OF MINERAL-BEARING SAND IN CROWN LAND IN A STRIP 1 YARD WIDE ALONG BORE LINE.

BORES 13 & 61' EAST OF BORE 13 & BORES WEST OF 13.

Bore Nos.	Volume of Strip Cu.Yds.
13 & 61' East	$\frac{61 \times 92}{88}$
	= 65.2
13 & 14	52.7
14 & 15	151.4
15 & 16	116.7
Total Along Strip	365.0 cu.yds.
&&	

$$\text{Average Grade} = \frac{41,030}{365}$$

$$= 126 \text{ lbs/cu.yd.}$$

APPENDIX

TABLE G

PERCENTAGE COMPOSITIONS BY GRAIN COUNT

<u>Line</u>	<u>Bore</u>	<u>Percentage Compositions</u>					
		<u>Zircon</u>	<u>Rutile</u>	<u>Ilmenite</u>	<u>Garnet</u>	<u>Monazite</u>	<u>Others</u>
500 S	1	31.25	38.75	24.8	1.5	0.2	3.4
	2	30.1	36.8	25.8	1.4	0.4	6.3
	3	27.1	36.6	26.4	2.8	0.1	7.5
	4	27.9	35.3	27.6	1.6	0.3	6.5
	5	30.7	36.2	25.9	1.8	0.53	4.9
	6	31.1	34.0	28.1	1.5	0.4	4.4
500 S Average Per cent	6 bores	29.7	36.3	26.4	1.8	0.33	5.5
1300S	4	39.9	39.9	23.6	1.4	0.24	3.6
2100S	8	35.4	37.8	23.7	1.4	0.4	1.7
2900S	6	33.7	37.6	24.4	1.3	0.35	2.7
Average per cent	4 Lines	32.4	37.9	24.5	1.5	0.33	3.4

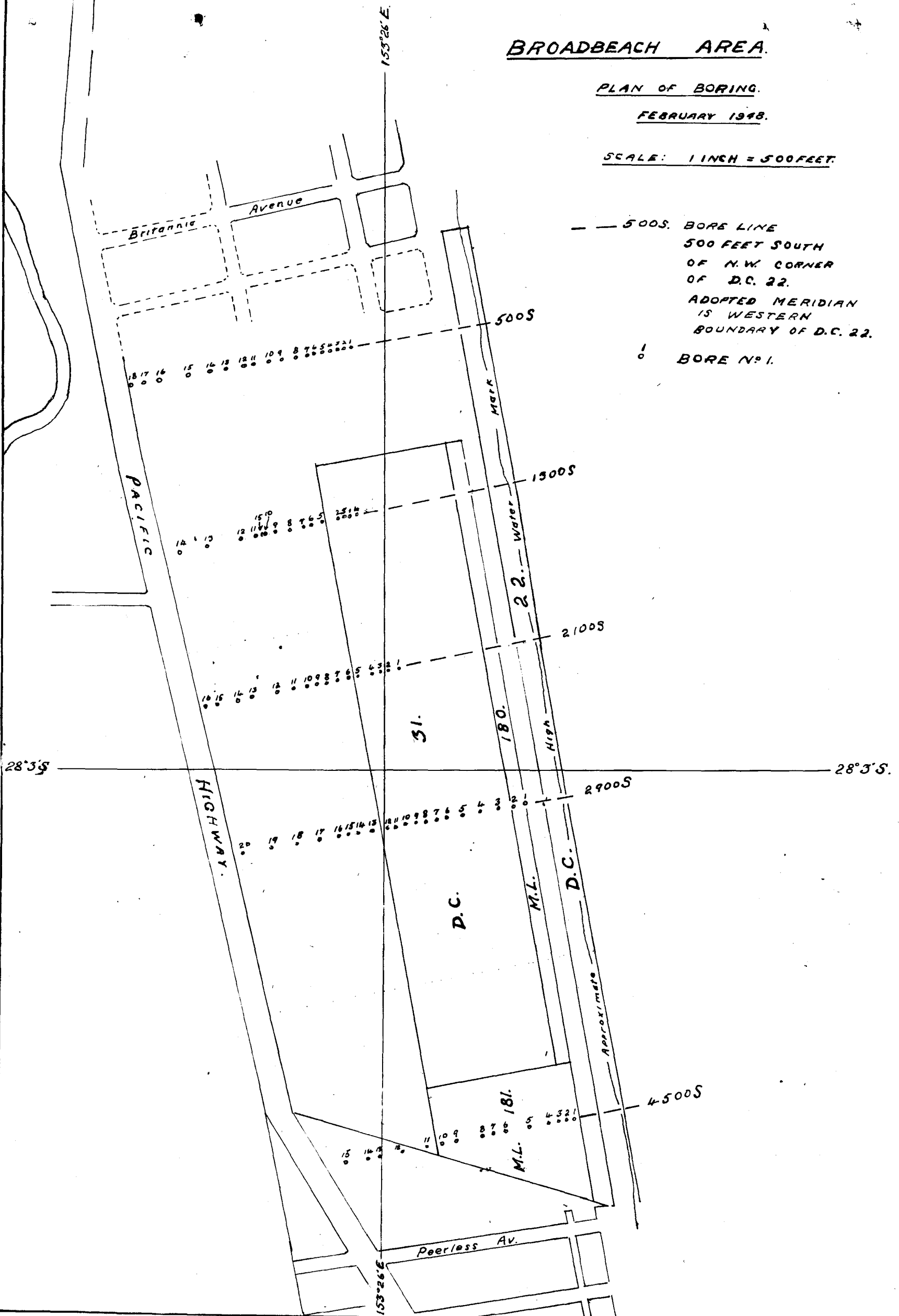
BROADBEACH AREA.

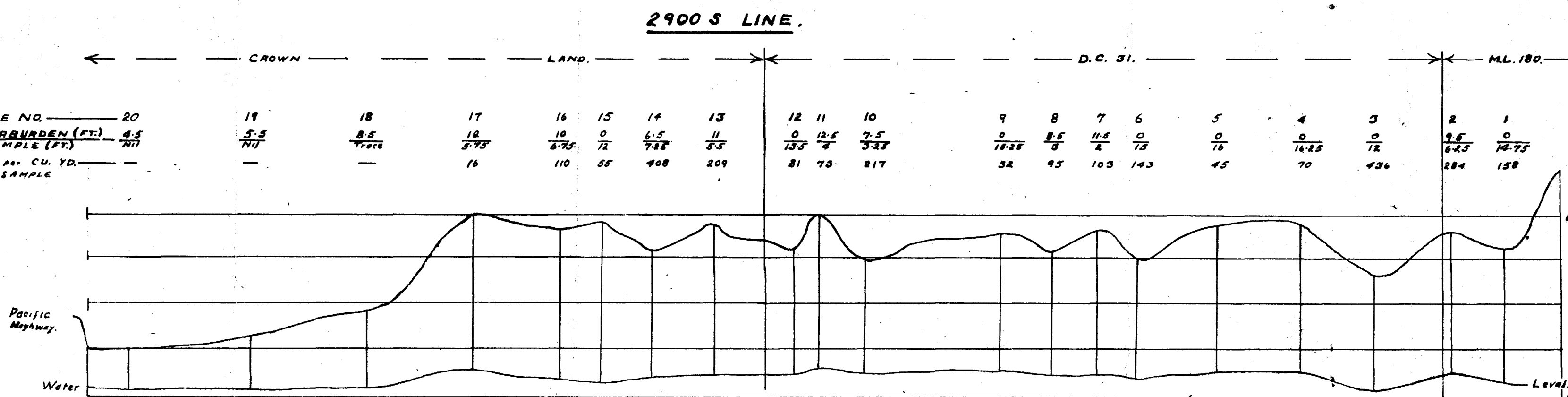
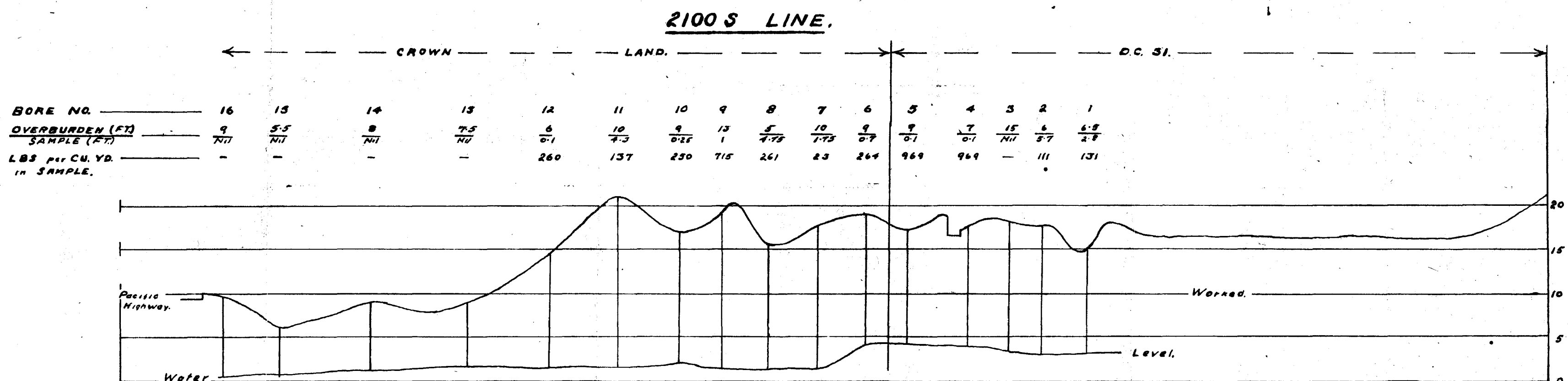
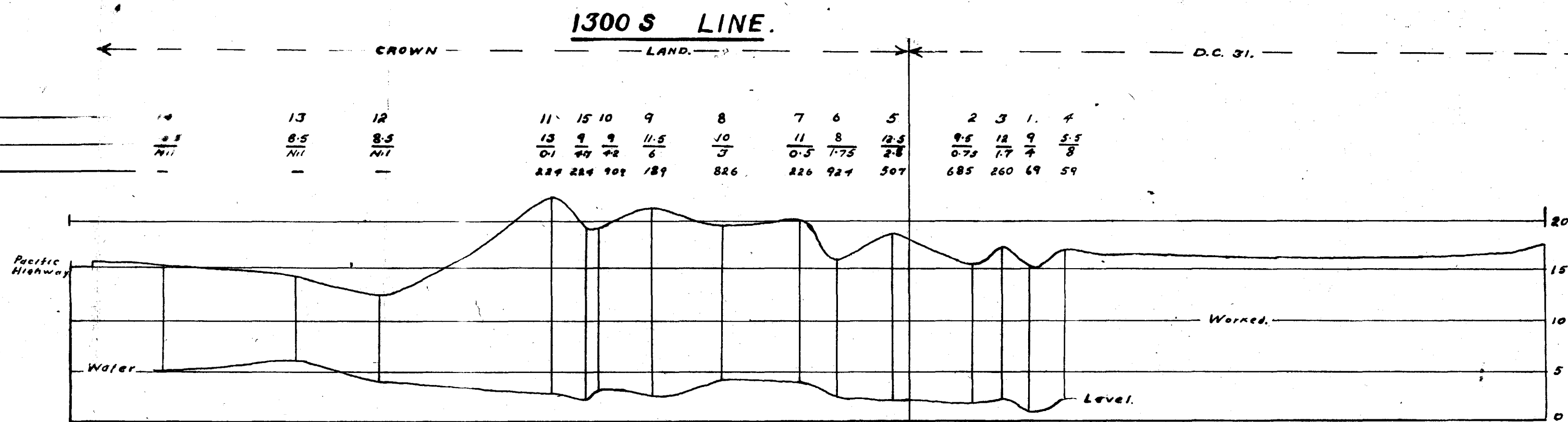
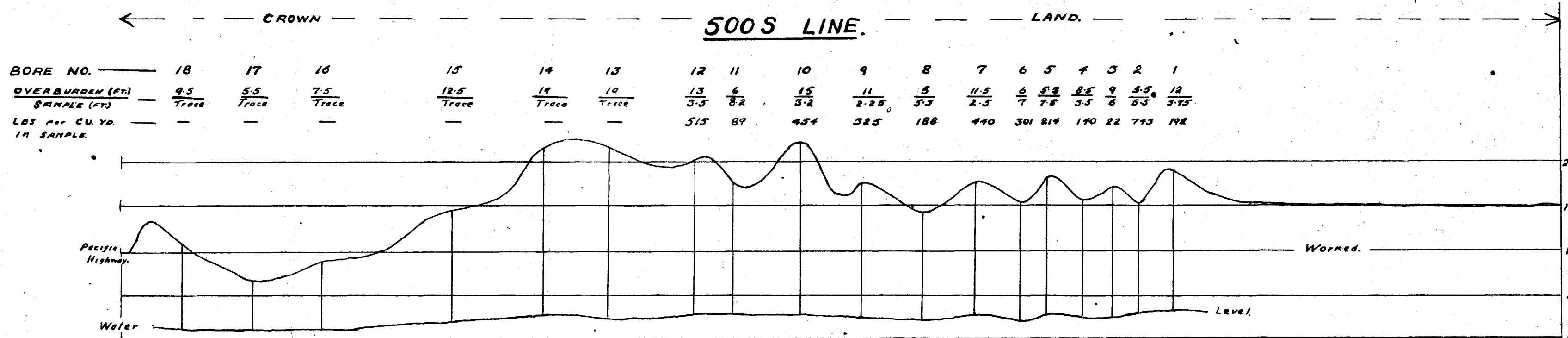
PLAN OF BORING.

FEBRUARY 1948.

SCALE: 1 INCH = 500 FEET.

— 500S. BORE LINE
500 FEET SOUTH
OF N.W. CORNER
OF D.C. 22.
ADOPTED MERIDIAN
IS WESTERN
BOUNDARY OF D.C. 22.
! BORE N° 1.





BROADBEACH AREA.

SECTIONS ALONG BORE LINES.

Scale: Horizontal — 0 50 100 Ft.
Vertical — 1 inch = 10 feet.

Levels Referred to State Datum, approx 3 Ft. above M.L.W.