

COMMONWEALTH OF AUSTRALIA.

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

~~REPORT NO.~~

RECORDS 1951/24.

RESULTS OF DRILLING, OAKLANDS-COORABIN COAL-FIELD, 1950.

by

N. H. Fisher.

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SUMMARY

The boring campaign carried out during 1950 by the Petroleum Technology section of the Bureau proved the existence over an area of 25 square miles in the Oaklands-Coorabin coalfield of approximately 793,000,000 tons of coal with an average calorific value of 9150 B.Th.U. per lb. Thickness of the coal intersected in the bores ranged from 18 to 59 feet and depth to the coal from 186 to 565 feet.

COAL ANALYSES

Seven bores were put down during 1950 and their positions, together with those of earlier bores, are shown on the attached plan. Analyses of the coal are set out in Table I (Note: There are no analyses from Bore S1, Parish of Clear Hill as core recovery from this bore was poor and Bore S2 was put down alongside in order to obtain better samples of the coal).

In the table and on the accompanying plan coal of less than 8,000 B.Th.U per lb. calorific value has in general been excluded unless it is only a small section included in a much greater thickness of better coal, as in Bore S2.

Gaps in the analyses are due mostly to poor core recoveries over these sections. In most of the gaps coal was recorded but insufficient was available for analysis. For the purpose of computing the average analyses the following assumptions have been made.

Bore S2, Parish of Clear Hill, the section from 258 to 259 feet, recorded as 66% ash has no calorific value.
The gap between 271 and 272 feet, which is recorded as coal, is of the same value as that from 272 to 273 feet.

Bore S3, Parish of Clear Hill, Gaps in the record from 362 to 363, 374'6" to 377', 378'6" to 379', 385 to 392 feet are recorded as coal and are regarded as consisting of coal of the same calorific value as the section immediately above each gap. The section 377' to 378'6" feet analysed as 60.5% ash, is considered to have no calorific value.

Bore S4, Parish of Clear Hill. The gaps 575 to 576 feet and 583 to 584 feet are regarded as being of the same value as the sections above each one; coal is recorded to 592 feet and this is taken as the bottom of usable coal.

TABLE I.

Analyses of Coal from bores in the area proved by 1950 boring during

Bore No. S2 Parish of Clear Hill.

Depth (from ground surface)	Moisture %	Vol. Matter %	Fixed C. %	Ash %	Calorific Value B. Th. U. per lb.	Thickness and Average. Cal. Value.
214' - 231'	12.3	25.5	44.2	18.0	8680	
231' - 246'	12.1	26.0	51.2	10.7	9830	
246' - 258'	12.4	24.3	46.3	16.8	8780	59'6"
258' - 259'	5.2	13.3	15.2	66.4	-	8878
259' - 263'	11.1	21.0	28.0	29.9	7270	
263' - 264'	13.4	29.3	44.0	13.3	5920	
264' - 271'	12.1	28.6	45.4	13.9	9530	
272' - 273'6"	9.9	28.7	42.2	19.2	9060	

Bore No. S3 Parish of Clear Hill.

341' - 354'6"	11.4	27.6	42.9	18.1	8920	
334'6" - 362'	10.7	27.2	48.7	13.4	9710	
363' - 374'6"	11.2	25.7	49.4	13.7	9710	55'
377' - 378'6"	5.2	16.2	18.1	60.5	-	9004
379' - 385'	13.0	25.2	46.0	15.8	9090	
392' - 396'	10.5	28.2	43.7	17.6	9250	

Bore No. S4 Parish of Clear Hill.

565' - 575'	9.9	28.4	42.4	19.3	8940	
576' - 583'	11.6	24.9	44.8	18.7	8960	22'
584' - 585'	12.3	25.6	48.0	14.1	4950	9017

(Coal to 587 feet, poor core recovery)

Bore No. S5 Parish of Clear Hill.

370' - 376'	12.3	29.5	43.9	14.3	9390	
376' - 382'	12.8	28.8	47.6	10.8	9730	18'6"
382' - 388'6"	11.3	25.8	41.5	21.4	8450	9157

Bore N. S1 Parish of Cunambill.

186' - 191'	12.9	24.7	44.9	17.5	8120	
191' - 196'	13.0	26.5	51.7	8.8	9910	21'
196' - 202'6"	13.1	25.7	51.0	10.2	9710	9229
202'6" - 205'	12.6	26.3	52.2	8.9	10050	
205' - 207'	10.5	21.2	42.8	25.0	6720	

Bore No. S2 Parish of Cunambill.

277'6" - 294'6"	13.6	27.3	43.2	15.9	8680	
294'6" - 300'	13.4	28.7	44.5	13.4	8980	
300' - 309'	10.5	29.4	46.7	13.4	5970	
309' - 317'6"	10.9	28.1	46.1	14.9	9320	
317'6" - 324'	11.5	29.7	48.0	10.8	9950	9198
324' - 330'3"	12.9	30.3	40.8	16.0	9150	

Bore No. 4 Parish of Cunambill (N.S.W. Mines Dept.)

266'3" - 282'6"	11.7	27.1	47.4	13.8	10250	
282'9" - 295'3"	12.6	23.9	48.5	15.0	9766	36'
296'3" - 302'3"	11.5	24.8	50.0	15.7	9379	9581

Bore J Parish of Clear Hill (B.M.R.)

311' - 323'	11.5	27.6	47.8	13.1	9800	
323' - 335'	12.5	25.7	50.1	11.7	9910	48'
335' - 341'	11.5	22.3	46.4	19.8	9010	9190
342'6" - 359'	12.8	28.0	45.5	13.7	9520	

GEOLOGICAL RESULTS

The boring campaign has not contributed greatly to our geological knowledge of the field because (1) We are uncertain as to the position in the bores of the Permian-Tertiary contact. (2) The wide spacing of the bores makes it difficult to determine whether faulting or folding is responsible for changes in level of the seam.

However the following geological results are of interest.

- (1) Deep bore S1. penetrated basement rock at 1193 feet, thus proving a thickness of Permian beds of at least 990 feet.
- (2) Permian marine foraminifera were found in the cuttings from Bore No. S1, Parish of Clear Hill, at 560 feet, in S4, Parish of Clear Hill, at 552 to 564 feet and in S5, Parish of Clear Hill, at 503-505 feet.
- (3) Examination and analysis of the core from 298 to 301 feet in bore No. S5 indicate that this represents a seam of coal in the Permian and that the criteria used in the field for determining the base of the Tertiary (placed tentatively at 335 or 369 feet in this bore) are at least in some cases unreliable.
- (4) Evidence is insufficient to postulate a fault across the centre of the field to account for the unexpectedly high position of the coal in Bore S5. A corresponding high area occurs in Bores S1, Parish of Clear Hill, and S1, Parish of Gunambil, suggesting that an east west fold axis passing just south of Oaklands may be responsible.
- (5) The quality of the coal is fairly consistent. Calorific value of the clean coal is usually between 9500 and 9900, but the average value is reduced to about 9150 by the presence of thin bands of shaly material, some of which might be eliminated by selective mining.
- (6) The area around Bore S1, Parish of Clear Hill, is interesting for consideration as an open-cut area, with 60 feet of coal under 214 feet of overburden. The occurrence of water in the Oaklands-Coorabin field is discussed in Sturmfels (1950) report.

RECOMMENDATIONS FOR FUTURE BORING.

Any future boring that is done on the Oaklands-Coorabin field should be planned with three objectives.

- (1) To determine the extent of the coal-bearing area.
- (2) To obtain as much information as possible about the structure and occurrence of the coal seams.
- (3) To test the geophysical results.

It is considered that these objectives would best be served by holes at the following sites.

- SP21 (1) Site 5, Plan G46/5, 7 miles south-east of Oaklands, between Wangamong and Daysdale.
- g. L. (2) On the position of the figure "- 6" on the same plan, 5 miles south-easterly from site No. 5
- SP3 (3) Immediately south of Oaklands, midway between S1 and S5. (This is to be preferred to Site G1 plan G46/5, as it would also test the possibility of an east-west anticline in this area).
- SP6 (4) 2 miles west of S5.
- S5 (5) If (4) does not contain any coal, a hole midway between it and S5.
- SP1/2 (6) One mile east of S1 (Parish of Clear Hill). This would serve the double purpose of helping to define both the eastern edge of the basin and also the high area indicated by hole S1.
- SPs 9/14/4 (7) Sites 2, 3, and 4, plan G46/5.
- g. f. (8) A site in the north-western extension of the basin about 12 miles N.W. of Oaklands.
- g. f. (9) A site in the gravity high, about the position of the "r" in Sanger, plan G46/5.

g. f. (10) Site 1, plan G46/5, 1 mile west of Clear Hill, S. 1/2

The information from the bores is summarized below -

<u>Bore No.</u>	<u>Parish</u>	<u>Thickness of Overburden</u>	<u>Thickness of Coal</u>	<u>Av. B.Th.U. per lb.</u>
S2	Clear Hill	214'	59'6" (44')	8878 (9099)
S3	"	541'	55'	9004
S4	"	565'	22'	9017
S5	"	370'	18'6"	9157
S1	Gunambil	186'	21'	9229
S2	"	277'6"	52'9"	9198
Bore No. 4	"	266'	36'	9581
Bore J	Clear Hill	311'	48'	9190

Bore No. 5 is not included as it did not penetrate the full thickness of the coal.

COMPUTATION OF RESERVES.

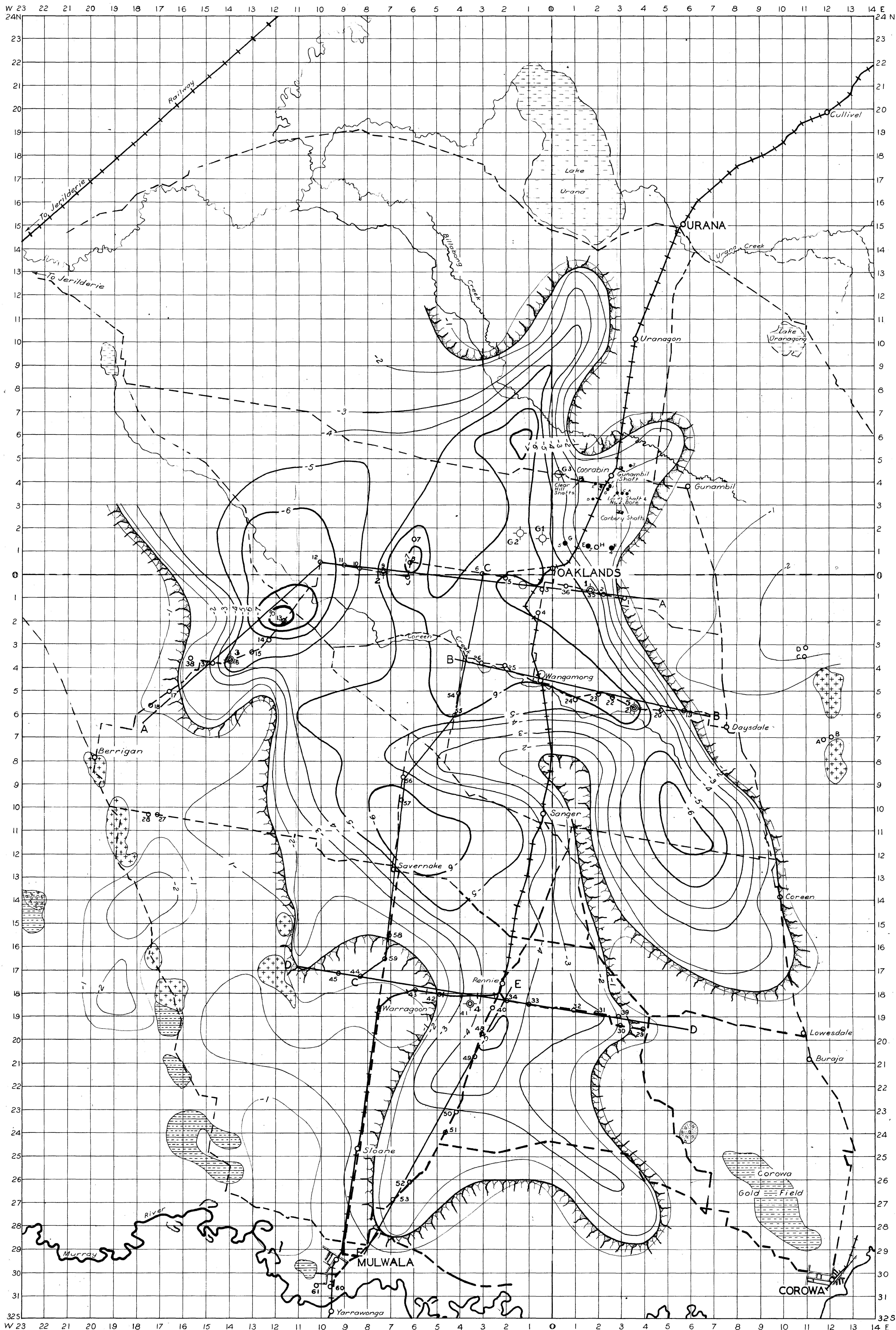
For calculation of reserves the bores listed above may be considered to have proved continuity of coal over an area approximately 5 miles by 5 miles. This block is not connected for purposes of calculation with that around Lane's Shaft near Coorabin, because of the unsatisfactory results from Bore D, 1 mile south-west of Lanes Shaft (see plan). Reserves at Coorabin therefore remain unchanged as stated in Sturmfels (1950) report at 100,000 tons actual and about 2,000,000 tons probable.

In accordance with accepted practice the limits of the area for which probable reserves are calculated are taken as being one mile beyond existing intersections in bore holes, except that coal is assumed to be continuous from the westerly holes S4 and S5 to the easterly holes, a distance of 2½ miles (S4 to No. 5); also to the east of the most easterly bores the limit of reserves has been taken at ½ mile instead of 1 mile, because the coal seam is rising in this direction and it is possible that it may terminate at the Pre-Tertiary surface not far east of bores No. 4 and S1 and S2, Parish of Gunambil.

The results of the boring so far suggest a thick section of coal along the eastern part of the basin, pinching out or being affected by pre-Tertiary erosion towards the east and thinning gradually to the west. The area has therefore been divided into a westerly (10.5 sq. miles) and an easterly section (15 sq. miles) with average thicknesses of coal of 20 feet and 45 feet respectively, and these are the figures used for estimating probable tonnages. (With bores as widely spaced as these it is futile to attempt to calculate reserves to a high order of accuracy by introducing refinements of method which have only mathematical significance). On the above figures, and using a factor of 1400 tons per acre-foot, the total probable reserves proved by the 1950 boring amount to 605,000,000 tons in the eastern block and 188,000,000 tons in the western block, a total of approximately 793,000,000 tons with an average calorific value of about 9150 B.Th.U per lb. This coal apparently exists as one seam without definite breaks. It is not possible to estimate recoverable quantities without knowledge of the mining method that might be employed.

REFERENCE

Sturmfels E.K. 1950 Preliminary Report on Geology and Coal
Resources of Oaklands - Coorabin Coalfield,
New South Wales.
Commonw. of Aust. Bur.Min.Res.Geol.&Geophys.
Rep. No. 3.



LEGEND

- Sand with Pebbles
- Granite
- Slates (on the surface saturated basaltic and sandstones with quartzite beds)
- Sandstones with breccia
- Shafts
- A Seismic Profiles
- Seismic Shot Point
- Bore (also B)
- Recommended Test Site (also G1)
- Approximate rim of sedimentary basin

GEOPHYSICAL SURVEY AT OAKLANDS, N.S.W.

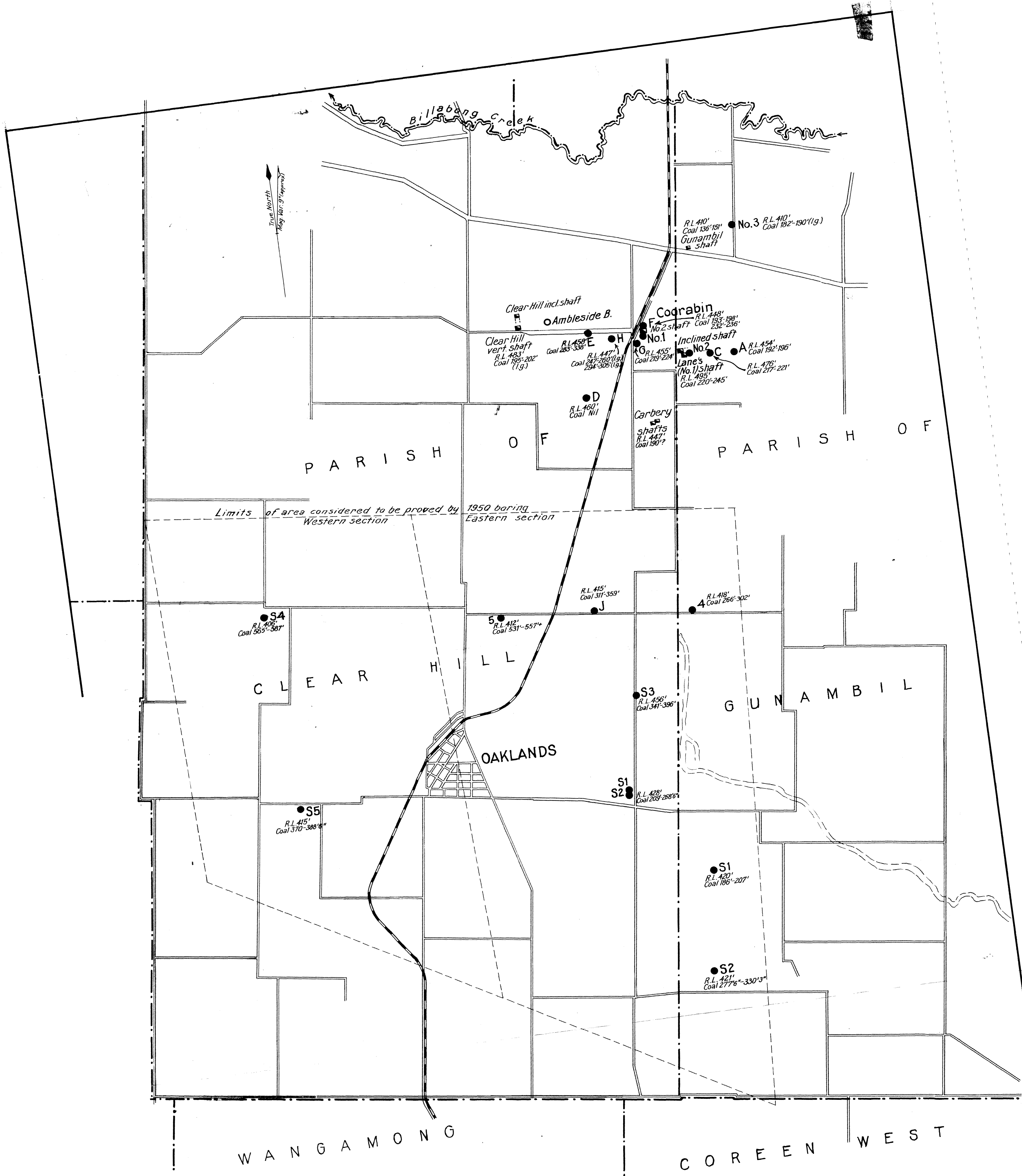
RESIDUAL GRAVITY CONTOURS

Contour Interval 1.0 milligals

Scale 0 1 2 3 4 5 6 7 8 miles

G46/5

Geophysical Section, Bureau of Mineral Resources, Geology and Geophysics



SKETCH PLAN
showing
POSITIONS OF EXISTING BORES
OAKLANDS - COORABIN COALFIELD

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