DEPARTMENT OF MINES
SOUTH AUSTRALIA

GEOLOGICAL SURVEY
GEOPHYSICS DIVISION

SEISMIC REFRACTION INVESTIGATIONS IN THE POLDA BASIN

by

P.M. McINERNEY
GEOPHYSICIST
GEOPHYSICAL SERVICES SECTION

Rept.Bk.No. 77/74
G.S. No. 5899
D.M. No. 112/69
E.L. No. 280

8th July, 1977.

CONTENTS

PLANS

DEPARTMENT OF MINES
SOUTH AUSTRALIA

Rept.Bk.No. 77/74
G.S. No. 5899
D.M. No. 112/69
E.L. No. 280

SEISMIC REFRACTION INVESTIGATIONS IN THE POLDA BASIN

ABSTRACT

A seismic cross-section along the Lock-Tuckey portion of the Polda Basin shows that bedrock is between 600 m and 900 m deep. Bedrock probably consists of either Mt. Wedge type grits and conglomerates or weathered crystalline basement. The basin sediments can be separated into five main layers, most of which persist along the entire section, each with a quite distinct and uniform seismic velocity. These units probably correlate with sediments of particular ages. The top two layers (100-300 m thick) consist of Tertiary and Jurassic gravels, sands, silts and clays, with many carbonaceous horizons. These are underlain by claystones of unknown age, which correlate with the next two seismic horizons (100-250 m thick). Below the claystones is a thick layer of sediments (up to 500 m) which are unlikely to be Mt. Wedge type grits and conglomerates, and may be Mesozoic or Palaeozoic sediments not previously encountered in the Polda Basin. A potential coal horizon occurs immediately above the claystones, and since the top of the claystones is a seismic refractor, this method should be a useful exploration tool in other parts of the Polda Basin.

The section lacks structural detail due to the low density of data points, but one structural feature of particular interest halfway between Lock and Tuckey is a broad depression of the horizons about 7 km across. This region could be prospective for coal in the upper part of the section. The section also indicates a possible north-south channel about 11 km east of Lock. This could be a favourable environment for accumulation of sedimentary uranium.

A second seismic traverse north of Mt. Wedge was difficult to interpret because of velocity inversion and poor quality data due to surface calcrete and adverse weather conditions. A time-depth section shows that bedrock dips shallowly westward, and at one point is probably faulted. A drillhole on the downthrown side of the fault did not intersect coal of any significance.

INTRODUCTION

The Polda Basin is an east-west trough extending across Eyre Peninsula from near Cleve in the east to Elliston on the west coast. The basin continues offshore from Elliston across the continental shelf. The entire onshore part is blanketed by Quaternary aeolianites of variable thickness, but the probable extent of the basin is outlined in a general way on the regional Bouguer gravity anomaly map (Plan No. S12606).

The basin is being examined as part of a wide-ranging coal exploration programme in South Australia. As early as 1910, beds of lignitic clay were located in the Hd. Barwell by E. & W.S. boring operations, and in the 1920's a 30 m exploratory shaft was sunk about 15 km west of Lock (Dickinson, 1944). Later drilling programmes in the basin for hydrogeological, stratigraphic and uranium exploration purposes intersected highly carbonaceous sands, silts and lignites of Late Jurassic and Early to Middle Tertiary age.

To assist the further evaluation of the basin's coal potential, stratigraphic drillholes were proposed for two areas of particular interest viz:

(i) northwest of Mt. Wedge, where a shallow sequence of sapropelic sediments had been intersected (Harris and Foster, 1972);

and (ii) the Lock-Tuckey portion of the basin, where Chevron Exploration Corporation drilled many holes to 150 m, but the complete section was never penetrated.

Prior to drilling, a seismic refraction survey was requested to determine depth to bedrock, and any structural information that could be obtained. A discontinuous traverse was shot along the Lock-Tuckey road (Plan No. 77-48), and a second traverse was made along a northwest-southeast track north of Mt. Wedge (Plan No. 77-47). This work was carried out in late October, 1976, and preliminary seismic cross-sections were prepared to assist in siting the holes.

The results from these stratigraphic holes (Mucka Cudla 1 and Tuckey 1) and from subsequently drilled coal exploration holes (particularly Polda 5 and Polda 8) have been incorporated into this report in order to provide a more meaningful interpretation of the seismic results than could be made at the time the sections were first prepared.

GEOLOGY

Basement

In a regional context the onshore Polda Basin lies within the Gawler Block and is surrounded and probably underlain by older Precambrian basement. The time of formation of the basin is uncertain, but basement faulting and subsidence possibly began in Late Precambrian or Cambrian times (Morgan, 1974).

Older basement metamorphics and metasediments outcrop extensively just east of the basin in the Cleve Uplands, and at scattered points north of the basin. Warrow Quartzite, which forms the prominent Darke Ranges, was possibly encountered in some of Chevron's drill holes in the eastern portion of the basin and is also present in the Tooligie Range south of Lock. The conglomerates, grits and sandstones outcropping near Cleve and at Blue Range are probably younger basement rocks (Corunna Conglomerate equivalents). Precambrian granites outcrop at Bramfield, around Cocata Hill north of the basin, and have been intersected in drill holes beneath basin sediments both east and west of Lock (Morgan, 1974, Painter, 1970).

Basin Stratigraphy

Recent reports by Harris and Foster (op cit.) and Morgan (op cit.) discuss the stratigraphy and palynology of the Basin and only a brief summary will be included here.

Precambrian(?)

Coarse cross-bedded sandstones, grits and conglomerates outcropping at Mt. Wedge and Talia caves possibly overlie basement granites. They probably underlie the Jurassic sequence in the basin.

Jurassic

Late Jurassic sediments (Polda Formation) have been intersected in a number of drill holes throughout the basin. Lithologies range from poorly sorted coarse grey sands to fine dark grey carbonaceous sands, silts and clays with occasional lignites.

Tertiary

Two Tertiary units have been recognised in the basin. The Middle Eocene Poelpena Formation has been at least partly penetrated in many bores in the basin, although it is absent in places. The unit is lithologically similar to the Polda Formation, although the sediments are commonly dark brown. The sapropelic sediments northwest of Mt. Wedge belong to this unit. A younger unnamed unit of Middle Miocene (?) age has been recognised in the eastern part of the basin (Harris, 1973). The lithologies of this unit range from coarse grey sands and clays through carbonaceous sands and clays to lignites.

Quaternary

The calcareous cemented dune sands of the Bridgewater Formation occur at or near the surface over almost the entire basin. The unit forms the main aquifer in the groundwater basins west of Lock, and ranges in thickness from a few metres to over 180 m near the coast. Surface outcrops are usually strongly cemented calcrete, which is widespread for about 60 km inland from the west coast. Further east a thin calcrete (up to 10 m) is generally covered by Recent soils and siliceous dune sands with interdunal claypans.

Basin Structure

The structure of the basin is not well known. Of the many observation bores drilled between Elliston and Lock only a small proportion entered bedrock, these being mainly around the shallow margins of the basin. Rowan's (1968) Bouguer gravity anomaly map shows a major gravity low extending inland from the coast, just north of Elliston, to the edge of the Cleve Uplands. A shorter branch extends northeasterly from the coast (Plan No. S12606). Nelson (1972) used vertical electrical soundings and drill hole data to prepare a map of preliminary basement contours in the Elliston to Polda area. Although this map is a structure contour map, and does not show sediment thickness, it is nevertheless clear that the gravity anomaly is related mainly to a thickening of sediments.

Similarly, further east between Lock and Tuckey sediment thickness increases rapidly across the northern and southwestern edges of the gravity low. Morgan (1974) suggests "the northern margin is ..... block faulted while the southern margin shelves rapidly over downthrown basement rocks". The thickness of sediments in the middle of the gravity low is not known, but Chevron drilled many holes to 150 m without entering bedrock.

METHODS AND EQUIPMENT USED

The seismic equipment consisted of a 24-channel S.I.E. PT 100 recording seismograph with an electrostatic camera. Shotholes were drilled by a contract driller using a large truck-mounted rotary-percussion rig capable of drilling a 6.7 m hole without adding drill-rods. The traverses were firstly chained and pegged at intervals of 366 m (1,200 ft.), equal to the length of the seismic cables. Virtually all work was done using 4-cable spreads with 61 m (200 ft.) geophone spacings. AN60 blasting gelignite was used as a source of energy.

On the Lock-Tuckey line bedrock refractions could only be obtained by shooting off the end of the spread. Generally 3 cable-lengths (1,097 m) off-end with 12.8 kg charges in 6 m shotholes was satisfactory, but for deeper portions of the basin shots had to be placed up to 6 cable-lengths (2,195 m) off-end, with 28.8 kg charges divided equally between two holes. For most spreads additional near-surface information was obtained from shots at or near the ends of the spread, using 3.2 kg charges in 4 m shotholes. Unfortunately this was not done in two places, resulting in a less reliable interpretation for these parts.

It had been planned to obtain a continuous bedrock profile but the necessity for large off-end shots due to the depth, together with the limited quantity of explosive available, made this prohibitive. Detailed coverage was obtained at the Lock end of the traverse, but along most of the line, gaps of 1-8 cable-lengths (366 m - 2,926 m) were left between adjacent spreads. Spread locations are marked on Plan No. 77-48.

Bedrock was much shallower along the Mt. Wedge line, and a continuous profile was obtained by shooting at both ends of a 4-cable spread (61 m geophone spacing) with 6.4 kg charges in 4 m shotholes. Half the spread was moved after each pair of shots. The work in this area was hampered by:

(i) sheet calcrete on the surface;

(ii) windy conditions and some rain;

and (iii) the limited quantity of explosive.

The data collected were not good, but were sufficiently reliable to produce a time-depth section (see "Interpretation Methods").

INTERPRETATION METHODS

The seismic records were timed and plotted as time-distance graphs, which were then analysed to determine the apparent velocities of all refractors identified. Beyond this point the data from the two areas were handled differently.

Lock-Tuckey

Individual time-distance graphs yield erroneous velocities and intercept times* if a refractor is dipping. By averaging the apparent values observed from shots in both directions (i.e. up-dip and down-dip) more correct values were obtained for each particular refractor. Generally there were sufficient data to calculate a unique list of reliable average values at each end of most spreads. For the deeper refractors on some spreads, however, only one average velocity and intercept time could be calculated reliably and these values were used at both ends of the spread. Conventional seismic refraction equations were then used to determine depths to all refractors along the line. In some cases the seismic velocity of the uppermost layer had to be assumed. For the spreads centred on pegs 22 and 39 no near-surface information was obtained, and intercept-times were converted to interpreted depths by means of "depth conversion factors" calculated from adjacent spreads.

Sources of Error

The errors involved in producing a time-distance graph are normally small. Distances of geophones from shot-points are usually quite accurate, and the first breaks on the records can be timed to within ± 1 millisecond. Some breaks are not sharp and cannot be picked with this accuracy, but these are a minority.

Further small random errors are introduced in interpreting the time-distance graphs to produce a seismic velocity cross-section.

---

*Intercept time = 2 x time-depth, where time-depth is a measure of the depth of a refractor (in time).

(i) A small correction factor should be calculated for each shot to allow for the fact that shots were fired some 4-6 m below ground surface. This was not done, as the corrections are small in relation to the large intercept times observed. Horizons would be slightly deeper than calculated.

(ii) Velocities and intercept times can be slightly in error despite the compensating effect of averaging up-dip and down-dip shots.

(iii) Vertical velocities can be as much as 10% slower than the horizontal velocities measured by the refraction method. Such anisotropy would make horizons shallower than calculated.

(iv) At each of pegs 28 and 39 a particular layer was not detected, although present in adjacent areas (Plan No. 77-49). The unit could be present, but be too thin to be represented on the time-distance graph - a hidden layer. The method of Hawkins and Maggs (1961) was used to compute the maximum thickness for such a hidden layer that could be present without detection and this is represented by the dashed lines on the section. Whether the units are present, as suggested, or lens out, the overall shape of the section is not greatly changed.

It must be stressed that these errors and uncertainties are mainly small in relation to the overall section. A more important factor affecting the reliability of the section is the density of coverage, and in three places, in the vicinities of pegs 22, 39 and 91, more data should have been collected in order to provide a more sound interpretation.

Mt. Wedge (Mucka Cudla)

As stated in "Methods and Equipment Used" the seismic records obtained at Mt. Wedge were not good, and furthermore the surface capping of sheet calcrete produced a velocity inversion, whereby the velocity of the lower velocity sediments between the calcrete and the bedrock could not be measured.

Bedrock velocities and intercept times were obtained, and also the method of reciprocal analysis (Hawkins, 1961) was used to calculate time-depths beneath as many geophone locations as possible. These results are presented as a time-depth profile (Plan No. 77-49), the shape of which should resemble the shape of the bedrock profile if the overlying sediments have a uniform seismic velocity.

Two holes were subsequently drilled along this traverse. In Mucka Cudla 1 (sited at peg 6W) the surface calcrete is 12 m thick, below which there are 98 m of sediments. Bedrock is at 110 m. Since the calcrete velocity at this point is 2590 m/s and the time-depth to the bedrock refractor is 67.5 ms, then the sediments must have a seismic velocity of about 1560 m/s. Using this velocity at peg 5E, where Polda 5 was drilled, yields a bedrock refractor depth of 84 m. A micaceous claystone and shale, quite different from the overlying sediments, was intersected at this depth. This material might be weathered bedrock.

This figure (i.e. 1560 m/s) could probably be used to calculate a reliable "interpreted depth" section from the time-depth section, but this was not done as the drilling information was not available at the time the plans were prepared.

RESULTS

Lock-Tuckey

The Lock-Tuckey results are presented as a seismic velocity cross-section (Plan No. 77-49). Drillholes located along the section are also shown. As stated above, more data would have been desirable at certain points, and in general the low density of sampling has probably resulted in an over-simplified section. Despite these deficiencies, the refraction method has been able to detect a number of distinctive horizons which persist across the entire section, each with seismic velocities varying between narrow limits, as indicated in the following table.

	Average Velocity (m/s)		Standard Deviation	Number of Measures
V_0	1110	$\pm$	130	15
V_1	1970	$\pm$	80	22
V_2	2220	$\pm$	45	7
V_3	2550	$\pm$	85	12
V_4	3010	$\pm$	230	16
V_5	4370	$\pm$	360	13

In general the author feels that the main seismic units correlate with particular formations, the sediments of the older deeper formations being more compacted and thus having faster seismic velocities. Note that if sediments of different ages have been compacted to a similar degree it is possible that the boundary between them will not be a seismic refractor. This situation may exist between the lithologically similar Jurassic and Tertiary sediments of this area.

The uppermost refractor may or may not represent an unconformity between older and younger sediments. Chevron's lithological logs generally show a change near this boundary from yellow sands with clay and sandy clay interbeds to gravels, sandy gravels, sands and clays. In LDH 37, located about 1 km east of peg 91, Morgan (1974) places a boundary between Middle Miocene and Middle Eocene sediments at 39 m, which correlates with the seismic horizon at a depth of 45 m at peg 91. A Middle Eocene assemblage occurs just below the boundary (Harris, 1973). In LDH 35, however, Morgan places the same boundary at 158 m, in contrast with the same seismic horizon at 30 m. Palynological work was not done on this hole so the boundary may have been wrongly located by Morgan. Alternatively, this top refractor might simply be related to the present weathering surface. The gamma-ray logs in all holes show a high count at about the same depth as the seismic boundary. These radioactivity anomalies were also observed by Moulton (1969) and were attributed to a local abundance of uranium leached from the oxidized zone and deposited at the top of a reducing environment, about 30 m below surface. He also noted a change in colour, from tan and brown in the oxidized zone to grey below it (cf. "yellow sands" above). A detailed examination of drill core and cuttings should indicate which of these alternatives is the correct interpretation.

The small lens of 1875 m/s material near peg 30 is probably due to a local abundance of gravel beds, as observed in LDH 19. Examination of Chevron's lithological logs indicates that these coarse sediments may have been deposited in a north-south channel scoured into the underlying sediments. The only nearby drillhole where a similar amount of gravel was observed was in LDH 12, to the north of LDH 19. More importantly, traces of mafic minerals, particularly magnetite, were recorded in LDH 19 and three other holes to the north (including LDH 12), whilst in other nearby holes no heavy minerals were noted. These sediments must have been derived from the magnetite rich Warramboo/Kopi iron deposits which lie directly north of this zone. The volume of these northern derived sediments is probably relatively small since their areal extent is limited and in cross-section the lower velocity sediments appear as only a small lens. The gravels and sands of LDH 19 actually extend some 50 m below the interpreted lower boundary of these lower velocity sediments, but this is probably due to a lack of detail in the seismic results. Note that the bulk of the sediments deposited during the later part of the basin's history were probably derived from the east. Chevron's lithological logs indicate that in the top 150 m of section there is an overall decrease in particle size of sediments from east to west, and furthermore feldspars were noted in some of the easternmost holes.

The sediments of the next main layer (V_1 = 1970 m/s) range from gravels and sands to silts, clays and carbonaceous clays. Despite this lithological heterogeneity the seismic unit has quite a uniform velocity along the entire section - there is a slight trend of increasing velocity from east to west, which may be due to the fineness of sediments to the west. The age of these sediments is uncertain. Middle Eocene assemblages occur at 45 m and 70 m in LDH 37 and at 110 m in LDH 20 (3.4 km north of peg 62). In the more recently drilled holes, Tuckey 1 and Polda 8, carbonaceous clays of Jurassic age have been identified, in both cases within the bottom 70 m of the V_1 layer (W. Harris, G. Meyer, pers. comm.). In Tuckey 1 a Tertiary assemblage has been identified at about 40 m. It appears that this layer consists of both Tertiary and Jurassic sediments, which have very similar elastic properties such that the top of the Jurassic section is not a recognisable seismic refractor.

Only one drillhole, Polda 8, has penetrated below the V_1 layer. A pebbly claystone was intersected from 168 m to 195 m, and this was underlain by claystone to 265 m, the total depth of the hole (G. Meyer, pers. comm.). These two lithological units are probably the V_2 = 2220 m/s layer and the V_3 = 2550 m/s layer respectively. Neither Tuckey 1 nor LDH 22 appear to have intersected the V_3 layer further east, although, as stated above, carbonaceous clays were intersected at the bottom of Tuckey 1 similar to those observed just above the clay horizons in Polda 8. The V_2 layer extends to the west from Polda 8, and is probably the same pebbly claystone which underlies the coal horizon in the area of the Lock coal prospect (11 km west of Lock). The age of these claystones is unknown.

The bottom two refractors have not been penetrated by drilling, so only a tentative interpretation can be made on the basis of their seismic velocities, and the results of seismic work in other parts of the basin. These other results are derived from:

(i) the Mt. Wedge (Mucka Cudla) traverse, where the 3940 m/s bedrock refractor coincided with Mt. Wedge type grits in Mucka Cudla 1 (W. Harris, pers. comm.);

(ii) the Colton reconnaissance seismic survey (Coppin, 1967) where refractor velocities of 3350 and 4110 m/s were recorded at depths of 80 and 230 m respectively. Mt. Wedge type grits were intersected in Colton 1 below c 110 m (D. Hos, pers. comm.). Coppin's work also revealed a probable crystalline basement refractor (4940 m/s) at a depth of 690 m;

(iii) seismic work in the centre of the offshore portion of the basin (Smith, 1967), where a shallow section with low velocities (2000-3000 m/s) was underlain by a westerly dipping refractor (c 4500 m/s). An even deeper refractor (6400 m/s) was interpreted to represent Archaean basement. Smith interpreted the lower velocity sediments to be of Tertiary age, these being underlain by possible Proterozoic to Lower Palaeozoic sediments. A similar sequence of refraction velocities were reported from later work in the offshore part of the basin (Ingall, 1971).

On the basis of these results, the V_4 = 3010 m/s layer is unlikely to be Mt. Wedge type grits, and instead might be Mesozoic or Palaeozoic sediments not previously encountered in the Polda Basin. The V_5 = 4370 m/s layer could be grits of the Mt. Wedge type, or might be weathered basement.

The recent drilling in the Lock area has indicated that a potential coal horizon occurs at the bottom of the V_1 layer, but to date only carbonaceous clays have been intersected in the Lock-Tuckey portion of the basin. Furthermore, the particular horizon is 100-300 m deep, and even if coal were present it might not be economically recoverable. Nevertheless, the apparent relationship between the potential coal horizon and the base of the V_1 layer suggests that the seismic refraction method could be used to explore for areas where the potential coal horizon is shallower.

One structural feature of particular interest is the depression of horizons between pegs 30 and 50. If this structure existed during deposition it may have been a favourable environment for coal-forming swamps in the upper part of the section.

Mt. Wedge

For reasons discussed earlier, only a time-depth section could be produced from the Mt. Wedge data (Plan No. 77-49). The section indicates that bedrock dips shallowly westward and is probably faulted in the vicinity of peg 3E. Subsequent drilling (Mucka Cudla 1 and Polda 5) showed that the bedrock consists of Mt. Wedge type grits, these being overlain by Tertiary sediments and some 10 m of calcrete. From the drillhole control and time depths at those sites, a velocity of 1560 m/s was computed for the Tertiary sediments. This figure could be used to calculate depths from the time-depth section.

The Tertiary sands, silts and clays include the sapropelic sequence which had been previously intersected in the area. No coal of any significance was found.

RECOMMENDATIONS

A deep stratigraphic drill hole (600 m - 900 m) would be necessary in order to provide a more exact geologically related interpretation of the deeper part of the Lock-Tuckey seismic section, although from the point of view of exploring for economically recoverable mineral deposits such a hole could hardly be justified. There are two areas where much shallower investigations could be warranted. Firstly, the depression of strata between pegs 30 and 50 on the Lock-Tuckey line might be prospective for coal in the upper part of the section. Secondly, the proposed north-south channel in the vicinity of peg 30 should be further investigated as it may be a favourable environment for the accumulation of sedimentary uranium.

Philip M McInerney

PMMcI:JS
8th July, 1977.

PHILIP M. McINERNEY
GEOPHYSICIST

REFERENCES

COPPIN, R.J., 1967: Report on Colton reconnaissance refraction seismic survey. SADM unpublished report RB 65/71.

DICKINSON, S.B., 1944: Untitled report re brown coal occurrence, Hd. Barwell. SADM unpublished report RB 21/299.

HARRIS, W.K., 1973: Chevron Exploration Corporation palynological examination of selected drill holes, Polda Basin, Eyre Peninsula, E.L. 37. SADM unpublished report Pal.Rept. 13/73.

HARRIS, W.K. & FOSTER, C.B., 1972: Stratigraphy and palynology of the Polda Basin, Eyre Peninsula. Mineral Resour. Rev., S. Aust., 136: 56-78.

HAWKINS, L.V., 1961: The reciprocal method of routine shallow seismic refraction investigations. Geophysics, 16(6) : 806-819.

HAWKINS, L.V. & MAGGS, D., 1961. Nomograms for determining maximum errors and limiting conditions in seismic refraction survey with a blind zone problem. Geophysical Prospecting, 9(4) : 526-532.

INGALL, L.N., 1971: Interpretation report Polda Basin second marine seismic survey E.P.P. 13 South Australia. SADM Envelope 1726 (Open File).

MORGAN, P.J., 1974: Final report, exploration of E.L. 37, Lock area, South Australia. SADM Envelope 2256 II, (Open File).

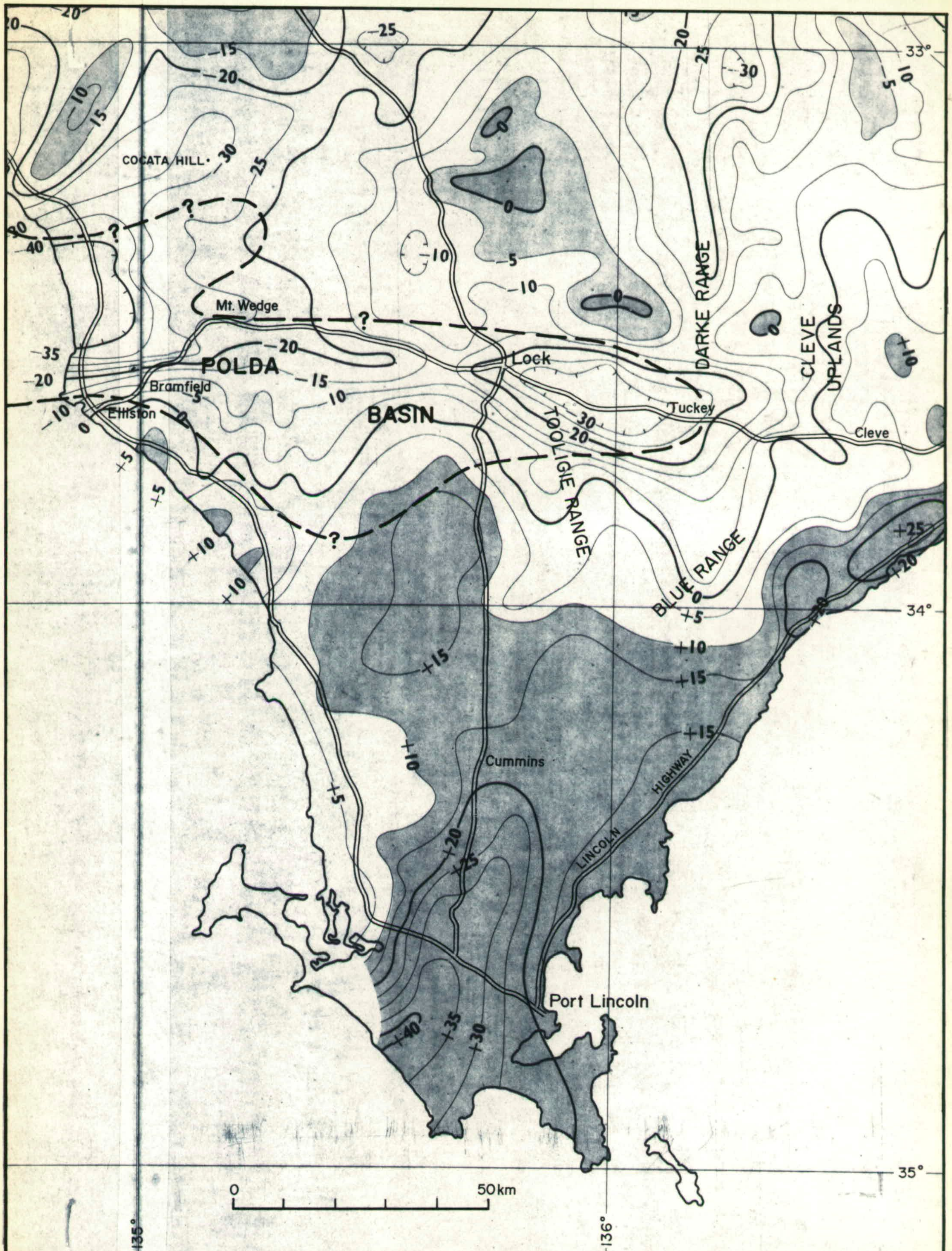
MOULTON, G.F., 1969: Final report of exploration on Special Mining Leases 158 and 163. SADM Envelope 1108 (Open File).

NELSON, R.G., 1972: A review of geophysical work in the Polda Basin, Eyre Peninsula. Mineral Resour. Rev., S. Aust., 136 : 91-98.

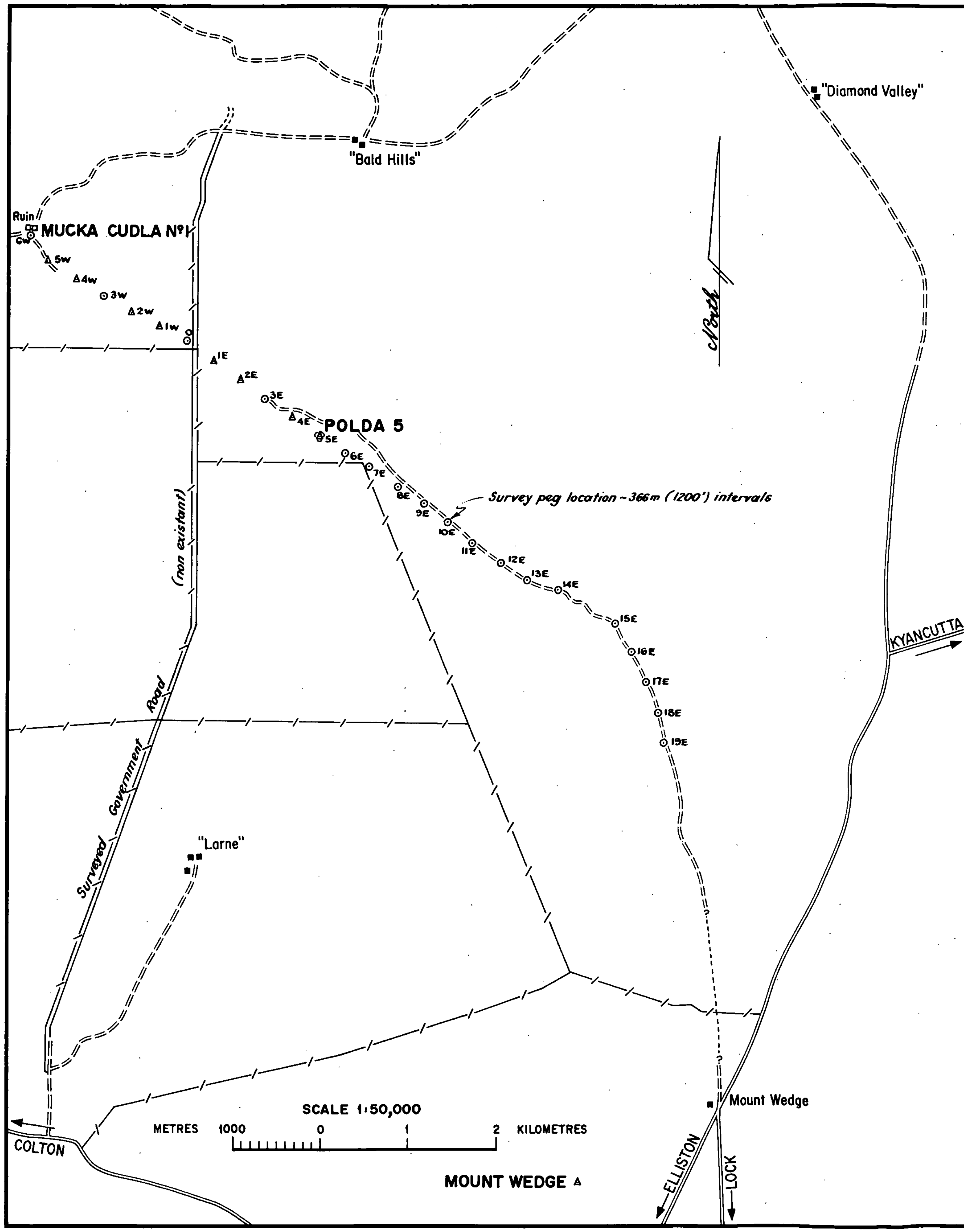
PAINTER, J.A.C., 1970: Groundwater basins of County Musgrave, Eyre Peninsula. Mineral Resour. Rev., S. Aust., 133 : 52-79.

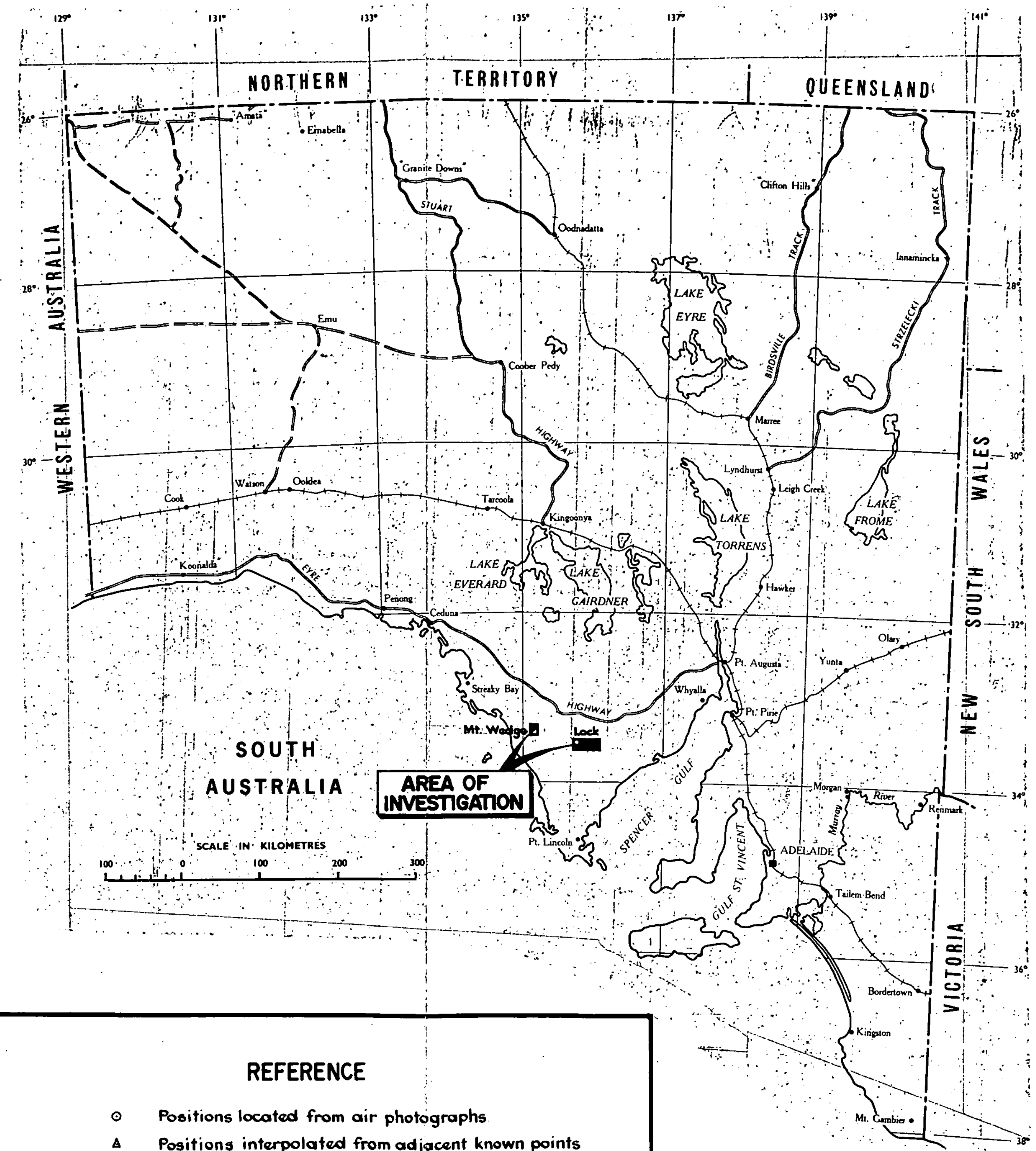
ROWAN, I.S., 1968: Regional gravity survey of Kimba and Elliston. 1:250 000 Map areas. Mineral Resour. Rev., S. Aust., 128 : 26-32.

SMITH, R., 1967: Final report S.A. shelf R-1 marine seismic survey O.E.L. 38. SADM Envelope 759 (Open File).



GEOPHYSICAL SERVICES	DEPARTMENT OF MINES – SOUTH AUSTRALIA	SCALE. 1: 1000000
COMPILED : P. Mcl.	POLDA BASIN SEISMIC INVESTIGATION GRAVITY CONTOURS – SOUTHERN EYRE PENINSULA	DATE: 2 · 3 · 77
DRN : A.F. | CKD.		PLAN NUMBER: S12606

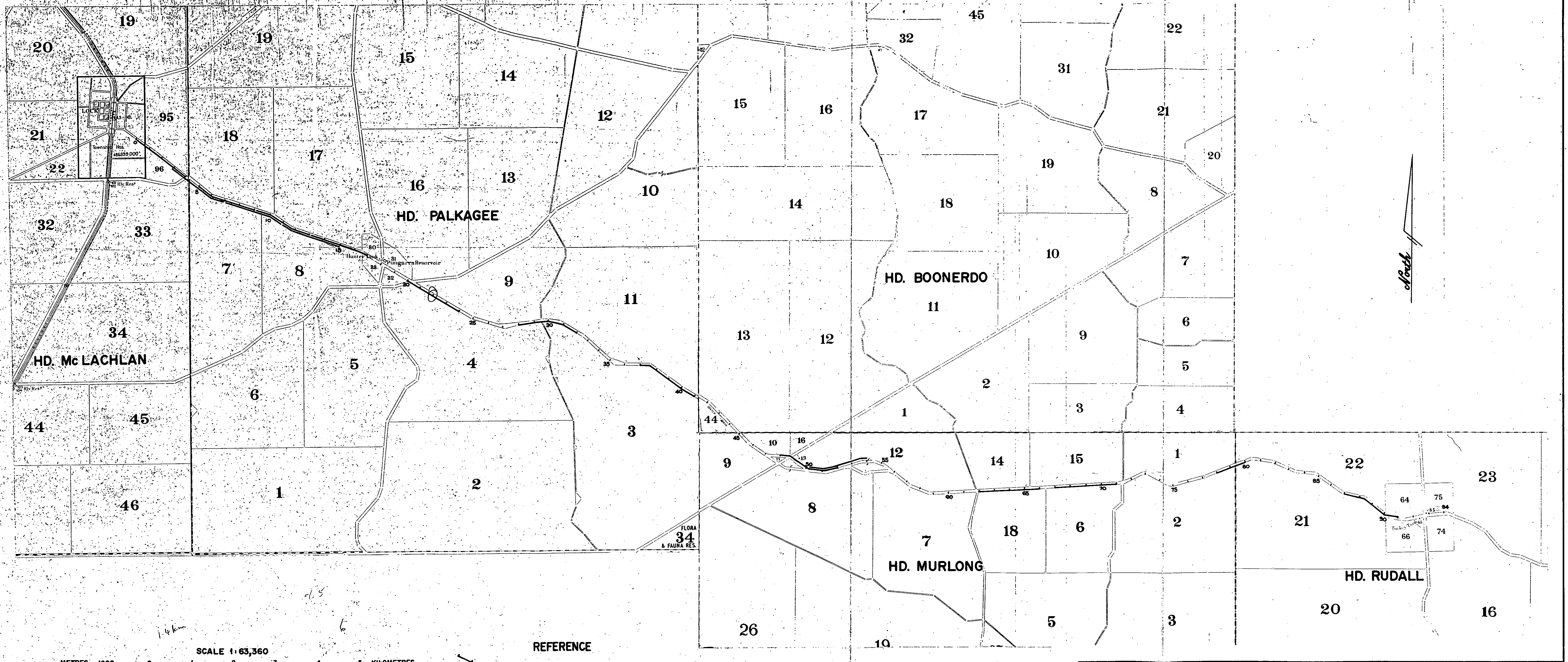




REFERENCE

- ⊙ Positions located from air photographs
- Δ Positions interpolated from adjacent known points
- ═══ Roads
- = = = Tracks
- —\— Fences

	DEPARTMENT OF MINES – SOUTH AUSTRALIA	SCALE: AS SHOWN
COMPILED: P. McI.	POLDA BASIN SEISMIC INVESTIGATION LOCATION OF MOUNT WEDGE (MUCKA CUDLA) SEISMIC TRAVERSE	DATE: JANUARY 1977
DRN: L.C. CKD. A.F.		PLAN NUMBER:
GEOPHYSICAL SERVICES		77-47



	DEPARTMENT OF MINES–SOUTH AUSTRALIA	SCALE: 1:63 360
COMPILED: P. McI.	POLDA BASIN SEISMIC INVESTIGATION	DATE: JANUARY 1977
DRN: L.C. CKD: A.F.	LOCATION OF LOCK–TUCKEY SEISMIC TRAVERSE	PLAN NUMBER: 77-48
GEOPHYSICAL SERVICES		

60


WEST
EAST
POLDA 8
LDH 18
LDH 19
LDH 35
TUCKEY 1
LDH 22
Locations of seismic spreads
Survey peg locations - 366m (1200 ft) intervals
LOCK-TUCKEY
INTERPRETED DEPTH (metres-relative to surface)
These interpreted depths were converted from intercept-times by 'depth conversion factors' calculated from adjacent spreads.
N.B. This 'hidden layer' may or may not be present between the limits as shown
N.B. This unit was not detected here, but may be present between the maximum limits shown - a 'hidden layer'
Seismic velocity (m/sec)
NORTH-WEST
SOUTH-EAST
MT. WEDGE (MUCKA-CUDLA)
TIME DEPTH (milliseconds)
Bedrock velocity (m/s)
Weathered bedrock velocity ?
REFERENCE
(3010) Seismic velocity (m/s) estimated from adjacent spreads
Reliable data points.
Less reliable data points.
DEPARTMENT OF MINES - SOUTH AUSTRALIA
POLDA BASIN SEISMIC INVESTIGATION
LOCK-TUCKEY & MOUNT WEDGE (MUCKA-CUDLA)
SEISMIC SECTIONS
GEOPHYSICAL SERVICES
COMPILED: P.McE
DRN: L.C.
CKD:
DATE: JANUARY '77
DIRECTOR OF MINES
PLAN NUMBER
77-49