

Rept. Bk. No. 60/128
G.S. No. 3175
D.M. 1086/63 B



DEPARTMENT OF MINES
SOUTH AUSTRALIA
GEOLOGICAL SURVEY
EXPLORATION GEOPHYSICS SECTION

PRELIMINARY REPORT OF RESISTIVITY SURVEY - WAIKERIE AREA

by

J. J. Hussin
Geophysicist

23rd June, 1965

D.M. 1086/63 B

60/128

DEPARTMENT OF MINES
SOUTH AUSTRALIA

PRELIMINARY REPORT OF RESISTIVITY SURVEY -

WAIKERIE AREA

by

J. J. Hussin
Geophysicist

EXPLORATION GEOPHYSICS SECTION

PLAN REFERENCES

<u>Figure</u>	<u>Title</u>	<u>Plan No.</u>
1	Waikerie Area - Location Plan	65-685
2	Electrical Sounding Graphs	65-686

Rept. Bk. No. 60/128
G.S. No. 3175
D.M. 1086/63 "B"

23rd June, 1965

DEPARTMENT OF MINES
SOUTH AUSTRALIA

PRELIMINARY REPORT OF RESISTIVITY SURVEY - WAIKERIE AREA

ABSTRACT

In May 1965 an exploratory resistivity survey showed that geophysical-hydrogeological correlation of the sedimentary formations near Waikerie was possible. Further work at closer intervals is warranted.

INTRODUCTION

The Hydrology Section requested an exploratory resistivity survey to determine the degree of correlation possible between formation resistivities and the actual sedimentary formations in the Waikerie area. Of importance is a clay horizon causing the upper soil to retain saline waters, thus being detrimental to orchards in the area.

METHOD AND EQUIPMENT

The Geoscience I.P. transmitter capable of two amperes output was used in conjunction with a Hewlett Packard voltmeter and filter. The resistivity depth probing technique adopted was the Schlumberger electrical sounding method with the current electrode spacing expanded from six to six hundred feet.

RESULTS

Of the twenty three depth probes carried out, thirteen were at earlier bore sites for correlative purposes. The remaining ten probes were spaced between bore sites. The locations are shown in Figure 1.

Graphs of three electrical soundings are presented in Figure 2. ES 27 was performed at bore site number 1 and shows good correlation with the low resistivity clay and silty marl horizons.

This correlation is possible because there is no high resistivity surface formation causing suppression of the true resistivity values as is the case in ES 32 and 33. In these latter two cases the surface resistivities are of the order of 300 and 80 ohm metres respectively. Since the curves decrease in value with depth to below two ohm metres, it is extremely difficult to produce the correct depth and actual resistivity values. Only by using accurate bore log information concerning the stratigraphy and salinities and a close interval of electrical soundings can a solution to these problems be achieved.

CONCLUSIONS AND RECOMMENDATIONS

Preliminary interpretation of the twenty three electrical soundings carried out during May, 1965, shows that geophysical-hydrogeological correlation in the Waikerie area is possible provided spacing between electrical soundings is close enough to pick up lateral variations in the stratigraphy.

It is therefore recommended that further geophysical surveying be carried out in this area with sufficient coverage to establish a correlation between bore logs.

J. J. Hussin

J. J. Hussin
Geophysicist

per
B.S.M.

EXPLORATION GEOPHYSICS SECTION

JJH:AGK
23/6/65

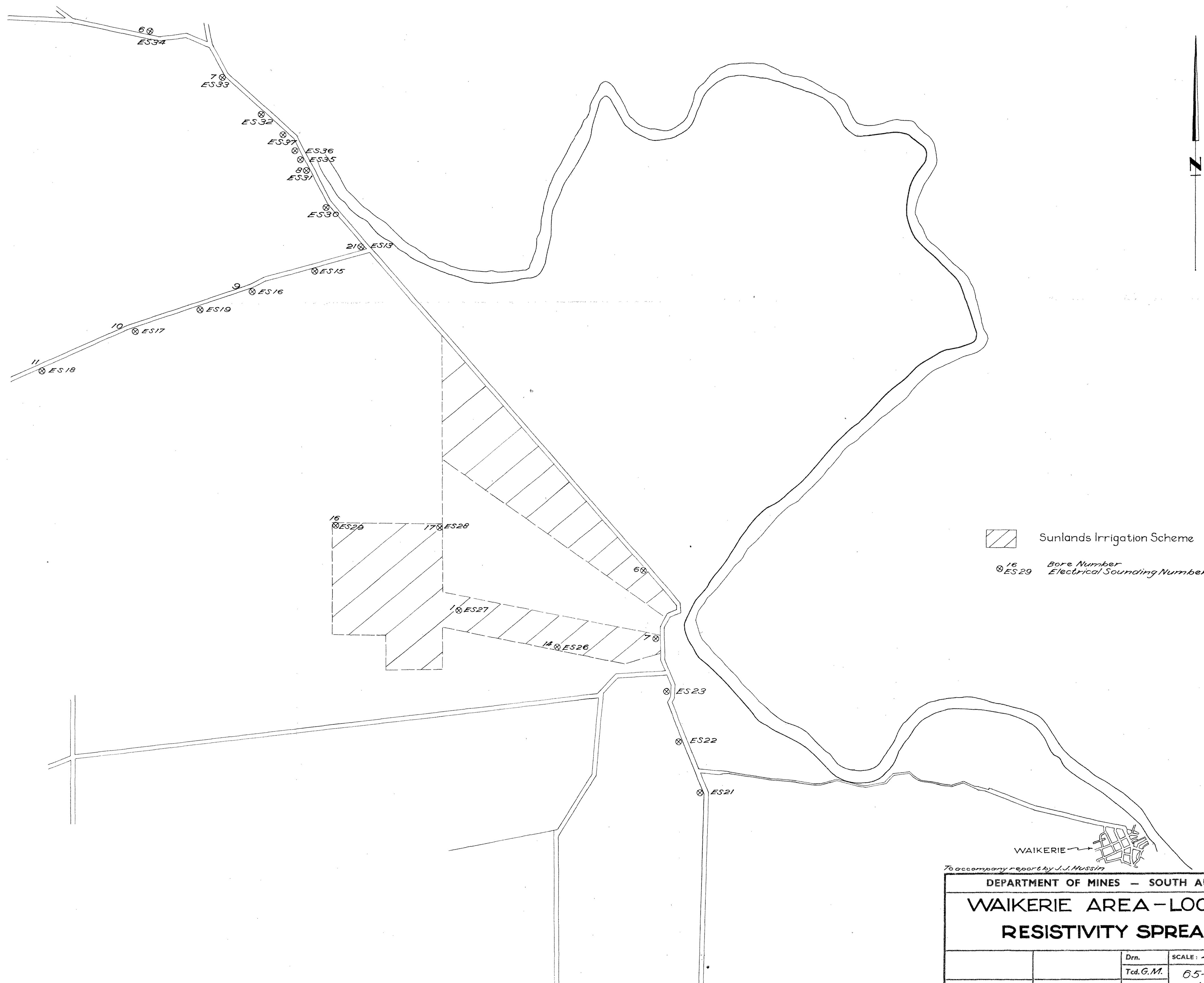


FIG. 1

To accompany report by J.J. Hussin

DEPARTMENT OF MINES — SOUTH AUSTRALIA

WAIKERIE AREA — LOCATION

RESISTIVITY SPREADS

Drn.	SCALE: 40 chns to 1 inch
Tcd. G.M.	65-685
Ckd.	Ja3
Exd.	DATE: 25.6.65

Director of Mines

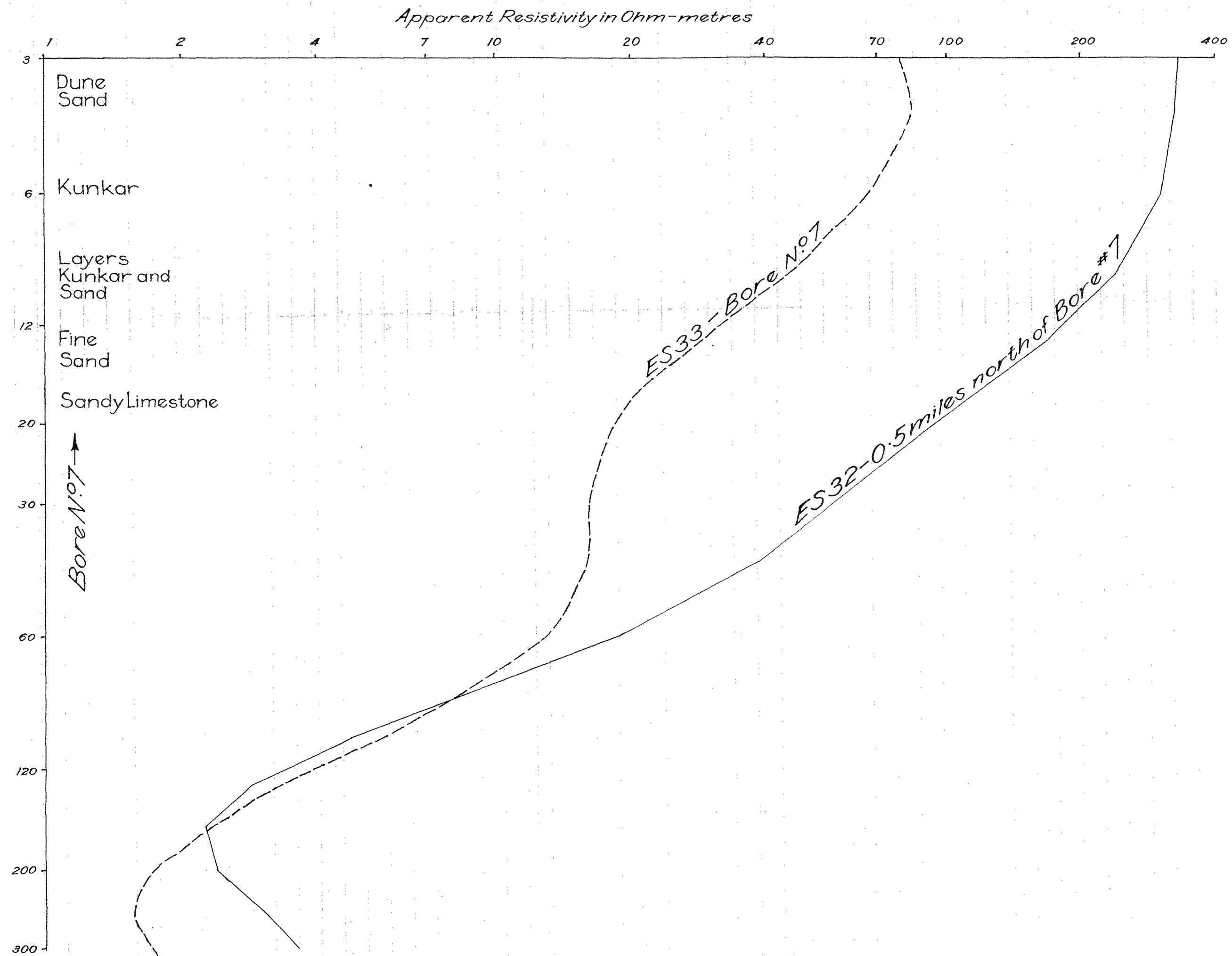
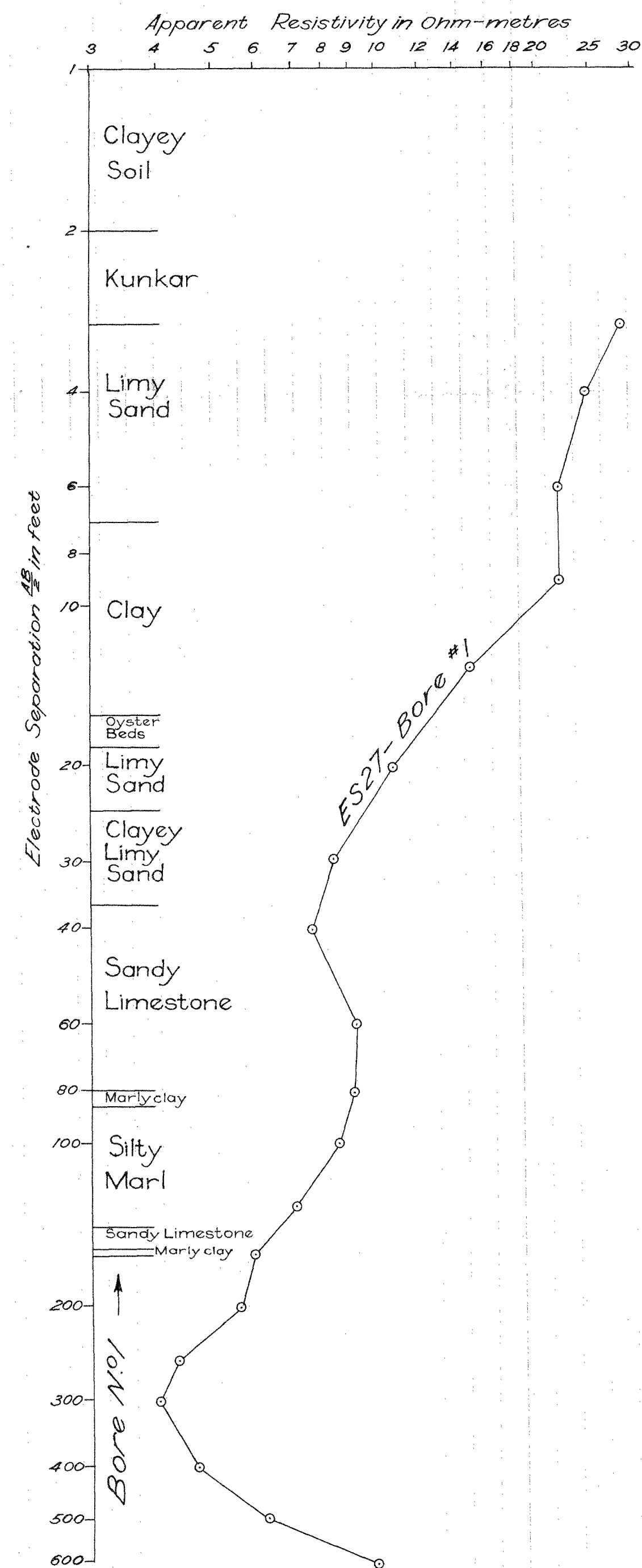


FIG. 2

To accompany report by J.J. Hussin

DEPARTMENT OF MINES — SOUTH AUSTRALIA

ELECTRICAL SOUNDING GRAPHS

WAIKERIE RESISTIVITY SURVEY

Director of Mines		Drm.	SCALE: As above
		Tcd. G.M.	65-686
		Ckd.	JSB
		Exd.	DATE: 24.6.65