

Rept. Bk. No. 61/65  
G.S. No. 3245  
D.M. 684/65



**DEPARTMENT OF MINES**  
**SOUTH AUSTRALIA**  
GEOLOGICAL SURVEY  
MINERAL RESOURCES DIVISION

SAND DEPOSIT

Section 363, Hundred Willunga

- Monier Besser Pty. Ltd. -

by

R. K. Johns  
Supervising Geologist

DEPARTMENT OF MINES  
SOUTH AUSTRALIA

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- I Geological logs of auger holes
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<u>Plan No.</u>	<u>Title</u>	<u>Scale</u>
65-878	Sand deposit, Section 363, Hd. Willunga (Screenings Pty. Ltd.) Contour and bore location plan, cross sections	100 feet to 1 inch
65-926	Graphs - screen sizing analysis	-

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6th September, 1965.

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INTRODUCTION

Auger drilling has been undertaken on behalf of Monier Besser Pty. Ltd. on section 363, Hundred Willunga, to determine the extent of construction sand in this locality. The property adjoins that previously tested (Johns, 1965) and is situated some 31 miles south of Adelaide and less than one mile north east of Maslin Bay (see locality plan, 65-878).

As time available for drilling was limited boreholes were widely spaced. The samples were logged by J.N. Gramsie and the writer and were submitted to AMDEL for screen sizing analysis and determination of clay contents; these results are appended.

Reference

JOHNS, R.K. 1965 Sand deposit, Sec. 364, Hundred Willunga (unpublished Dept. of Mines report).

GEOLOGICAL SETTING

The North Maslin Sands of Eocene age are being exploited in a number of areas in the Maslin Bay locality for the provision of construction sand. The basal Tertiary sands were deposited in the Willunga Basin on an undulating surface of Upper Proterozoic sediments; weathered shales outcrop along the margin of the basin at Ochre Cove and along the valley occupied by Pedlar Creek.

North Maslin Sands exceed 80 feet in thickness and these are overlain by dominantly marine sediments. All are obscured at the surface by soil, calcareous clays, sandy clays and clays.

#### THE SAND DEPOSIT

Varicoloured, predominantly quartz sands, containing variable amounts of clay and occasional clay lenses, are exposed in a number of pits in this locality. Testing by the Department of Mines at these and in adjacent areas has shown that the grain size of the sands varies rapidly, both vertically and laterally. Rounded pebbles and cobbles are common throughout the sequence, particularly near the base of the formation.

#### Drilling

Scout drilling was undertaken during the period August 6th - 12th, 1965 when nine bores were drilled by means of a "Gemco" power auger, the aggregate footage being 508 feet. The depth of penetration was governed by the limitations of the plant in holes nos. 1A and 6 (90 ft.). Bedrock (weathered shale) was intersected in bores nos. 4 (75 ft.) and 7 (42 ft.). Elsewhere boring was discontinued because of incidence of gravel.

Overburden ranges from 3 ft. to 39 ft. in thickness and includes soil, sandy clay and clay. The greatest cover of overburden was encountered near the hill top (39 ft. in bore 1A) and in the gully which parallels the southern boundary of the property (27 ft. in bore 5); unexpectedly, gravel was encountered in bore 8 at 36 ft. without disclosing sand.

In the area drilled the bed of sand rests on an almost plane bedrock surface which pitches southwesterly at a low angle so that, in contrast to section 364 which adjoins to the east, the most depressed parts of the property are underlain by sand. In a seismic survey shot hole located near the southwestern corner of section 363, 125 ft. of sand were penetrated.

The bed of sand exceeds 100 ft. in thickness but it has been reduced to about 50 ft. near the northern boundary and has been almost completely eroded in the southeastern sector. Sand which is generally similar to that previously tested was penetrated in boring as follows:

<u>Bore No.</u>	<u>From</u>	<u>To</u>	<u>Thickness (feet)</u>
1A	39	90+	51+
2	9	39+	30+
3	3	63+	60+
4	3	75	72
5	27	33+	6+
6	15	90+	75+
7	4	42	38

The geological logs appended to this report indicate variations in grain size, clay content and colour and the results are illustrated in the cross sections (plan no. 65-878).

#### Sieve Analyses

Samples, excluding overburden and enclosed clay lenses (bore 3, 19-21 ft.) were bulked or, in several cases, split according to changes in grain size and submitted to AMDEL for screen sizing - the results are tabulated in the appendix and these have been expressed graphically in plan no. 65-926.

As expected, the sand is comparable to that being currently produced from pits in the locality.

Clay content ranges from 7.8 to 25.6%.

### Reserves

Possible reserves of sand within sec. 363, Hundred Willunga total 3,800,000 cub. yds. under 760,000 cub. yds. of overburden. These figures have been derived from measurement of the areas of the cross sections, including the data previously determined for the adjoining section, without provision for batters and using the southernmost bores on each line as the limit in this direction.

### CONCLUSIONS

Boring has confirmed extensions of the sand deposit previously explored near the northwestern margin of the Willunga Basin near Maslin Bay.

Possible reserves of sand are assessed at 3,800,000 cub. yds. under 760,000 cub. yds. of overburden.

The sand is similar to that exploited elsewhere in this locality and will require washing to remove a proportion of the finer sand grades and clay to conform with specifications for tile and block making.

Further drilling will be required to delimit the sand in the gully prior to construction of dams and more detailed exploration to define the base of the sand elsewhere is recommended.

*R. K. Johns*

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Supervising Geologist  
MINERAL RESOURCES DIVISION

RKJ:AGK  
6/9/65

APPENDIX I

Bore 1

PROJECT: MONIER BESSER PTY. LTD.

SECTION: 363      HUNDRED: Willunga

R.L.: 967      DEPTH: 15 feet      DRILLER: K. Kalmar

LOGGED BY: J. Cramsie      DATE: 10.8.65

DEPTH (Feet)

DESCRIPTION

From	To	
0	3	Silty clay soil; greyish-fawn, semicohesive.
3	6	Sandy clay; light brown, semicohesive.
6	12	Sandy clay; mid brown, semicohesive.
12	15	Fine sand; clayey, red-brown.

BORE COMPLETED AT 15 Feet OWING TO  
LOSS OF FLIGHTS.

BORE 1A

PROJECT: MONIER BESSER PTY. LTD.

SECTION: 363

HUNDRED: Willunga

R.L.: 967

DEPTH: 90 feet

DRILLER: K. Kalmar

LOGGED BY: J. Cramsie

DATE: 10.8.65

DEPTH (FEET)

DESCRIPTION

From	To	
0	3	Silty clay soil; fawn, semi-cohesive.
3	6	Silty clay; mid brown, cohesive.
6	9	Clay and sandy clay, fawn, semi-cohesive.
9	12	Sandy clay; orange, semi-cohesive.
12	15	Fine sand; clayey, orange, poorly cohesive.
15	21	Sandy clay; fawn to mid brown, semi-cohesive.
21	24	Sandy clay; mottled orange-brown-fawn, cohesive.
24	27	Sandy clay; orange-brown, poorly cohesive; minor very angular quartzite pebbles up to $\frac{1}{2}$ inch.
27	33	Fine sand; red-brown, slightly clayey; minor siltstone and quartzite granules.
33	36	Clay; fawn mottled brown, cohesive.
36	39	Sandy clay; fawn, semi-cohesive.
39	51	Medium sand; light brown, non-cohesive. Minor clay from 39' - 42'.
51	63	Medium sand; yellow brown, minor clay bands.
63	69	Coarse sand; orange-brown, poorly sorted, angular fragments.
69	72	Coarse sand; light brown, greater proportion coarse particles.
72	78	Coarse sand; red-brown, poorly sorted.
78	90	Fine sand; red-brown, minor coarse particles.



BORE 2

PROJECT: MONIER BESSER PTY. LTD.

SECTION: 363

HUNDRED: Willunga

DRILLER: K. Kalma

R.L.: 981

DEPTH: 39 ft.

LOGGED BY: R.K. Johns

DATE: 12.8.1965.

LOG

DEPTH (FEET)

DESCRIPTION

<u>From</u>	<u>To</u>	
0	3	Light brown clay with calcareous nodules.
3	7	Brown clay.
7	9	Yellow-brown clayey sand.
9	21	Yellow-brown fine to medium grained sand, little clay.
21	33	Brown-yellow medium grained clayey sand becoming coarse grained and gritty; occasional rounded quartz pebbles to $\frac{3}{4}$ inch.
33	39	Yellow brown clean coarse sand.

BORE 3

PROJECT: MONIER BESSER PTY. LTD.

SECTION: 363 HUNDRED: Willunga

DRILLER: K. Kalmar

R.L.: 934 DEPTH: 63 ft.

LOGGED BY: R.K. Johns

DATE: 12.8.65

LOG

DEPTH (FEET)

DESCRIPTION

<u>From</u>	<u>To</u>	
0	3	Dark brown clayey sand.
3	19	Yellow brown fine to coarse and gritty sand.
19	21	Grey brown clay.
21	24	Yellow brown quartz grit.
24	42	Yellow-brown coarse gritty sand.
42	45	Brown quartz grit, little clay.
45	50	Red brown coarse, somewhat clayey, grit; grains are rounded and range from 1/8 to 1/4 inch diam.
50	63	Red brown quartz grit, little clay.

BORE 4

PROJECT: MONIER BESSER PTY. LTD.

SECTION: 363

HUNDRED: Willunga

DRILLER: K. Kalm

R.L.: 959

DEPTH: 90 ft.

LOGGED BY: R.K. Johns

DATE: 12.8.65

LOG

DEPTH (FEET)

DESCRIPTION

From To

0	1	Brown soil.
1	3	Pale brown-grey sandy clay.
3	20	Yellow-brown fine to coarse and gritty sand; occasional rounded quartz pebbles to $\frac{3}{4}$ inch.
20	43	Orange, yellow, brown medium to coarse grained sand.
43	75	Yellow brown coarse to gritty quartz sand.
75	90	Weathered purple shale (bedrock).

BORE 5

PROJECT: MONIER BESSER PTY. LTD.

SECTION: 363

HUNDRED: Willunga

DRILLER: K. Kalma:

R.L.: 888

DEPTH: 33 ft.

LOGGED BY: R.K. Johns

DATE: 12.8.1965

LOG

DEPTH (FEET)

DESCRIPTION

From      To

0	3	Brown clayey sand.
3	27	Dark brown clay.
27	33	Brown coarse sand, little clayey.

BORE 6

PROJECT: MONIER BESSER PTY. LTD.

SECTION: 363

HUNDRED: Willunga DRILLER: K. Kalmar

R.L.: 914

DEPTH: 90 ft.

LOGGED BY: R.K. Johns

DATE: 13.8.1965

LOG

DEPTH (FEET)

DESCRIPTION

From

To

0	2	Dark brown clayey sand.
2	3	Brown clay.
3	9	Light yellow brown sandy clay.
9	15	Brown clay
15	33	Yellow brown fine to medium grained sand, clayey.
33	36	Yellow brown fine to coarse sand, little clay; occasional rounded quartz pebbles to $\frac{1}{2}$ inch diam.
36	48	Yellow fine to medium grained sand.
48	70	Pale yellow to white, fine to medium grained sand
70	90	Orange-yellow fine to medium grained sand.

BORE 7

PROJECT: MONIER BESSER PTY. LTD.

SECTION: 363

HUNDRED: Willunga

DRILLER: K. Kalmar

R.L.: 930

DEPTH: 51 ft.

LOGGED BY: R.K. Johns

DATE: 13.8.65

LOG

DEPTH (FEET)

<u>From</u>	<u>To</u>	<u>DESCRIPTION</u>
0	2	Dark brown sand.
2	4	Light yellow-brown clayey sand.
4	37	Yellow brown fine to coarse sand; gritty 18 to 27 feet and 30 to 36 feet.
37	42	Red brown fine to coarse sand.
42	51	Purple, grey, brown weathered shale (bedrock).

BORE 8

PROJECT: MONIER BESSER PTY. LTD.

SECTION: 363

HUNDRED: Willunga

DRILLER: K. Kalmar

R.L.: 904

DEPTH: 36 ft.

LOGGED BY: R.K. Johns

DATE: 13.8.1965

LOG

DEPTH (FEET)

DESCRIPTION

From      To

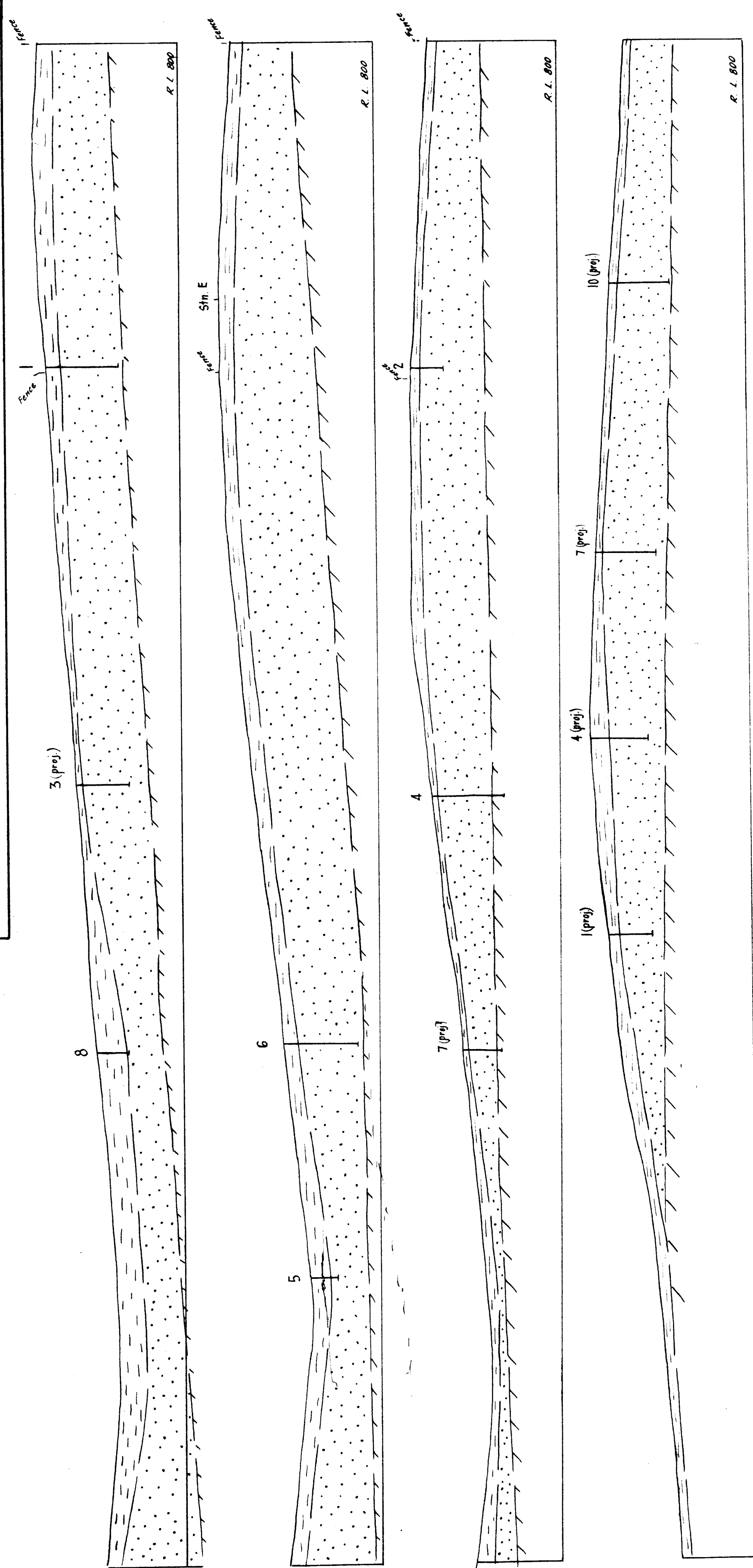
0	2	Dark brown clayey sand.
2	27	Brown sandy clay.
27	<u>36</u>	Red-brown-yellow gritty clay. Rounded quartzite pebbles 3 inches diameter near base.

# APPENDIX II

## SCREEN SIZING ANALYSIS AND CLAY DETERMINATION BY S. ARMSTRONG AND G. SINICA, AMDEL

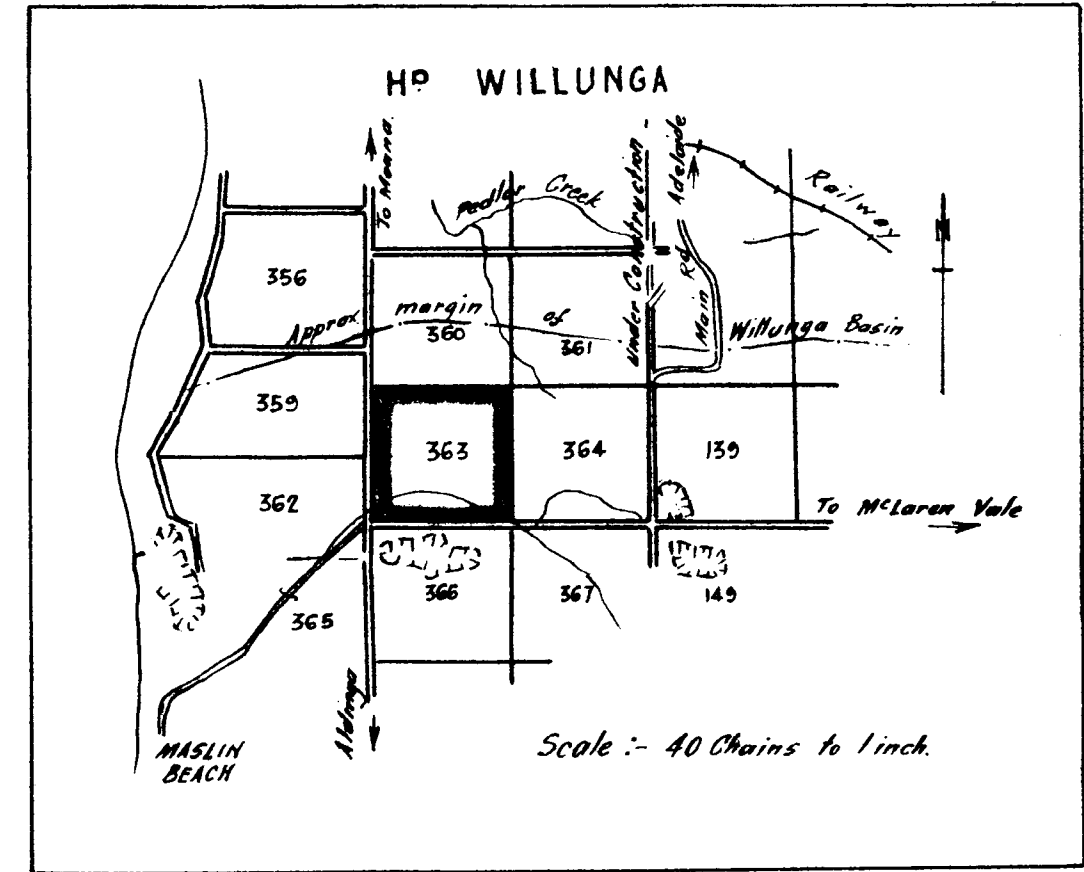
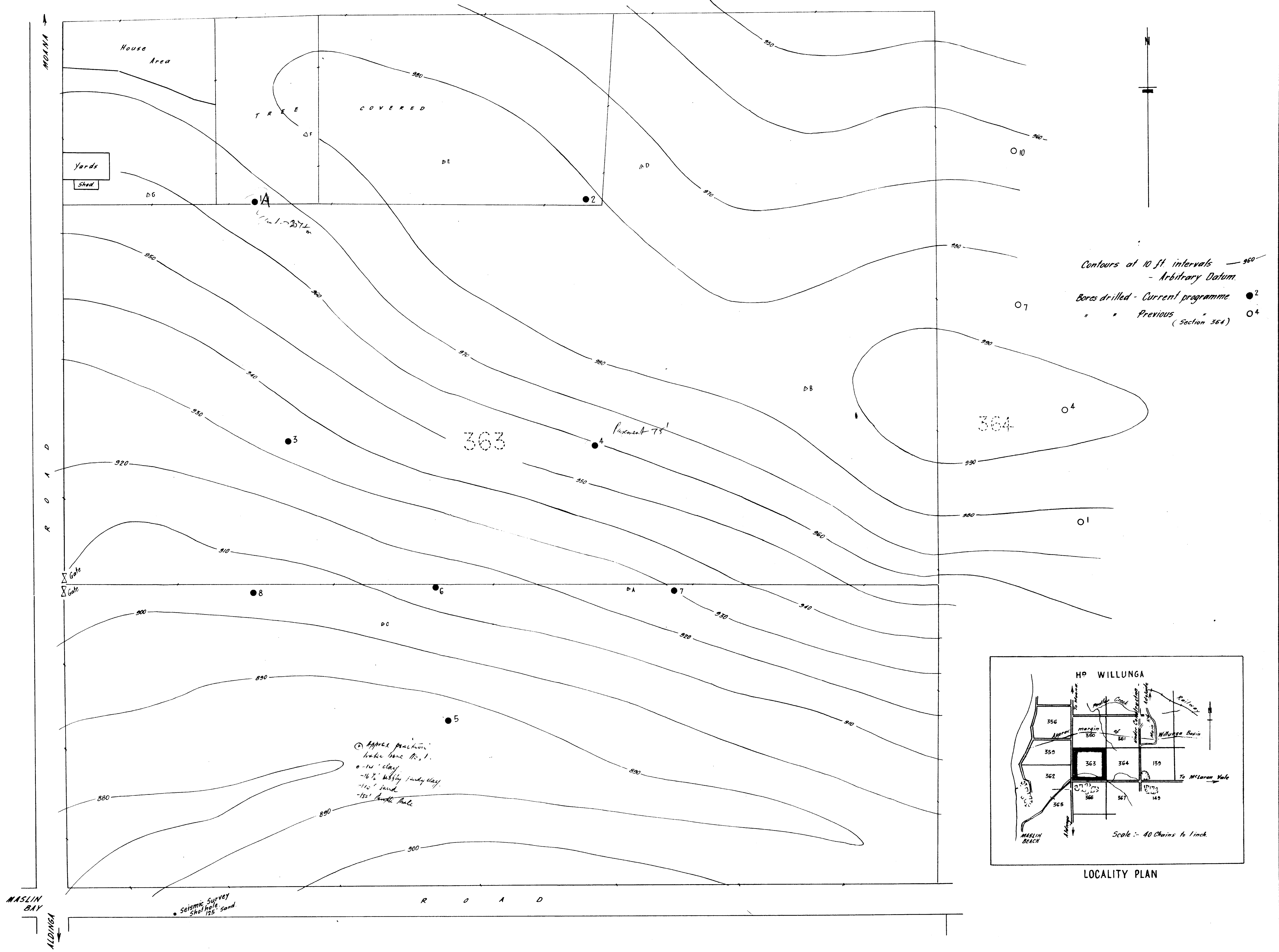
Nominal Screen Aperture	Mesh BSS Equivalent	Cumulative weight Retained (%)										
		Bore 1A			Bore 2	Bore 3		Bore 4	Bore 5	Bore 6		Bore 7
		39-63	63-78	78-90	9-39	3-19	21-63	3-75	27-33	15-33	33-90	4-42
9.51 m.m.	3/8 inch	nil	nil	nil	nil	nil	nil	nil	9.5	nil	0.4	nil
4.76 "	3/16 "	nil	nil	nil	0.5	nil	nil	nil	10.1	nil	0.4	0.9
2.40	7 mesh	Tr.	0.4	0.6	1.0	0.5	5.0	0.7	10.5	nil	0.4	2.4
1.20	14 "	0.6	18.6	7.8	2.3	2.7	34.4	9.9	11.2	0.2	0.6	12.9
600 microns	25 "	7.8	49.6	23.4	10.6	7.8	59.4	36.4	15.9	1.8	4.7	32.4
300 "	52 "	45.0	70.4	38.6	36.0	21.2	76.8	63.5	36.4	17.7	34.8	57.2
150 "	100 "	77.6	84.0	71.4	65.6	62.3	84.4	83.0	67.2	55.9	72.8	79.9
75 "	200 "	82.6	87.6	83.2	78.0	80.5	88.4	88.5	82.9	71.1	84.3	86.2
Clay content (%)		11.4	7.8	9.0	18.8	18.0	10.8	10.8	14.8	25.6	12.4	10.0





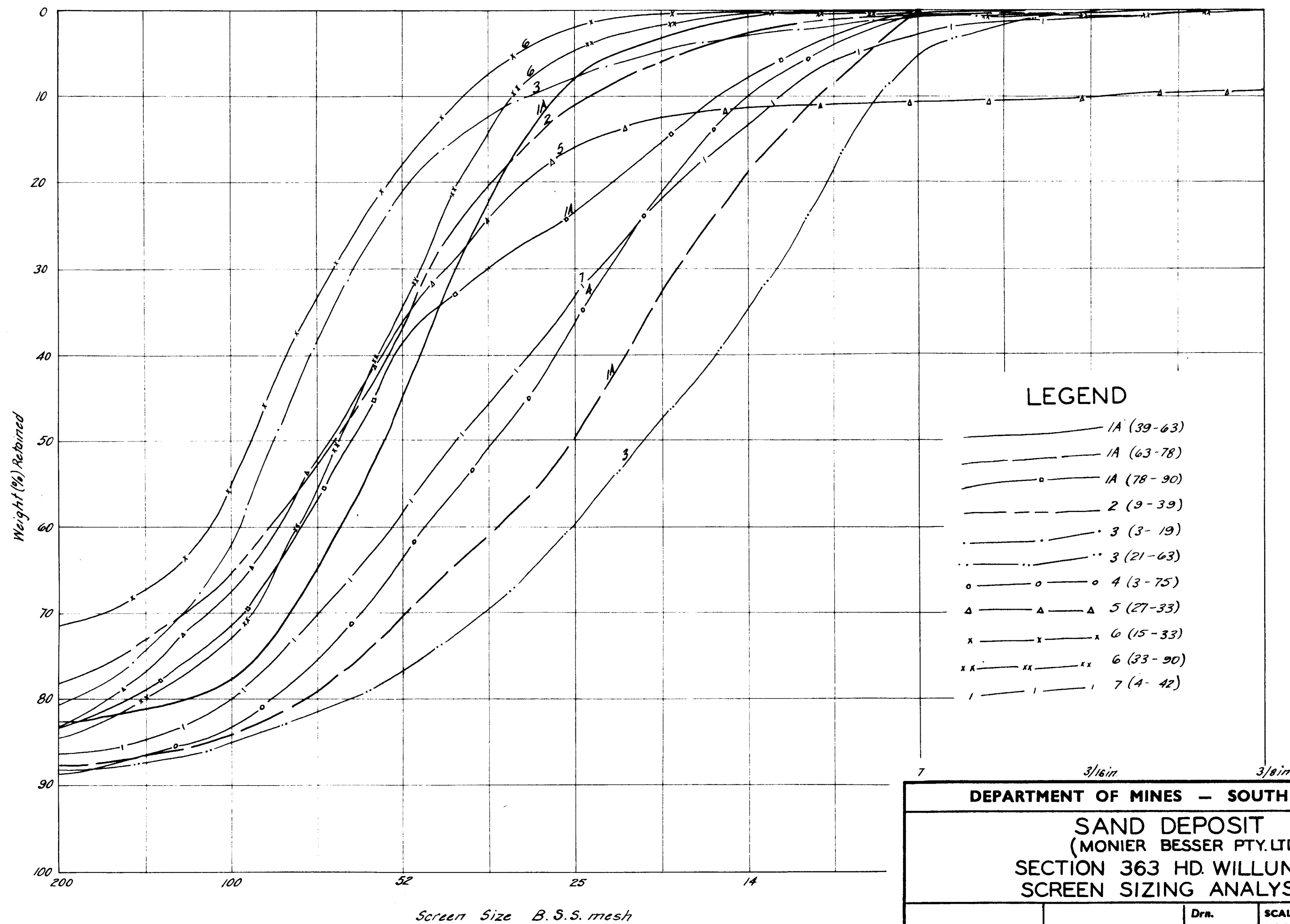
# LEGEND

QUATERNARY	Overburden	
	Soil, Sandy clay, clay	
TERTIARY	North Maslin Sands	
	Sand, grit (clayey & gravelly in part)	
UPPER PROTEROZOIC	Bedrock	
	Purple, grey & brown weathered shales	



Associated Drawing					No.	No.	Amendment	Exd.	Date	Req. No.	D.M.	Compiled from	S.A. DEPT. OF MINES				SAND DEPOSIT - SEC. 363 HP WILLUNGA (SCREENINGS PTY. LTD.) CONTOUR & BORE LOCATION PLAN				Approved		Passed		Director of Mines		Dnn.		Tcd.		Ckd.		Exd.		Scale: 100 feet to 1 inch.		65 - 878		Hall.		Date 17. 8. 65	
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Stadia Survey by B. Frost 11.8.65 F.B.N. 349 To accompany report by R.K. Johns.



To accompany report by K. Johns

DEPARTMENT OF MINES — SOUTH AUSTRALIA

SAND DEPOSIT  
(MONIER BESSER PTY. LTD)  
SECTION 363 HD. WILLUNGA  
SCREEN SIZING ANALYSIS

Director of Mines		Drn.	SCALE:
		Tcd. B.L.S.	65-926
		Ckd. L.V.W.	
		Exd.	DATE: 24-8-65

Ho 11