DEPARTMENT OF MINES
SOUTH AUSTRALIA

Report on

TEST BORING OF TERTIARY SAND DEPOSIT

MINERAL SECS. 1293, 1294 and PART SEC. 365, HD. WILLUNGA

(A.B.M. NOARLUNGA SAND CO.)

by

J. G. Olliver
Geologist

NON METALLICS SECTION
GEOLOGICAL SURVEY

CONTENTS

Plan No.	Title	Scale
63-506	Sand Deposit, Location of Boreholes M.S. 1293, 1294 & Pt. Sec. 365, Hd. Willunga (A.B.M. - Noarlunga Sand Co.) Plan and sections	1 inch = 100 ft
S 3396	Graph of Sieve Analyses	-

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(A.B.M. NOARLUNGA SAND CO.)

1. ABSTRACT

At least 1¾ million cubic yards of basal Tertiary (Nort Maslin) sands can be obtained by extending the present quarry to the eastern boundary of the lease. Overburden, represented by Pliocene to Recent sediments, is estimated at 675,000 cubic yards. The sands rest on an undulating surface of Permian clay. Provided the top finer and more clayey layers are rejected as overburden, the sand will be suitable for all building purposes. Further boring is required to prove the sand remaining in the south-east corner of the lease.

2. INTRODUCTION

Following a request from Mr. K.J. Kennedy (A.B.M. Noarlunga Sand Co.), the sand pit at Maslin Beach, 5 miles south of the township of Noarlunga and 30 miles by road south of Adelaide, was surveyed on 2nd, 3rd and 17th April, 1963. The property of approximately 70 acres, consists of mineral sections 1293 and 1294 and part section 365, Hd. Willunga, Co. Adelaide.

Almost 4 million tons of building sand have been removed since operations began in 1928.

Eight Gemco machine auger holes, which are located on the accompanying plan no. 63-506, were bored east of the present quarry between 9th April and 3rd May, 1963. Complete geological logs of the boreholes are appended as well as the logs of 8 Proline machine auger holes bored on the eastern boundary of the property in November 1960 (Johns 1962).

Samples of potential building sand were submitted to the Australian Mineral Development Laboratories for sieve analysis and the determination of clay content, the results of which are also appended and compared graphically with standard

specifications on plan no. S 3396.

Previous Reports

Cornelius, H.S. (1929)	The Noarlunga Sand Co. Ltd. Mining Review 50, p. 100-101.
Johns, R.K. (1962)	Sand Deposit - Maslin Beach Mining Review 114, p. 115-124.
Miles, K.R. (1945)	Noarlunga Sand Deposit Mining Review 81, p. 85-89.
Olliver, J.G. (1961)	Test Drilling of Tertiary Sand Deposit. Mining Review 111, p. 101-109.
Reynolds, M. (1953)	The Cainozoic Succession of Maslin and Aldinga Bays, S.A. Trans. Roy. Soc. S.Aust. 76, p. 114-1
Ward L.K. General Notes (1928)a (1928)b.	Mining Review 47, p. 32 " " 48, p. 28.

3. REGIONAL GEOLOGY

The quarry is situated in the sea cliffs at Maslin Beach, on the north-west rim of the Willunga Basin. The ground falls away from the highest point, 170 feet above sea level, at the northern end of the property to a creek along the south-east boundary which drains into the sea via the Canyon.

Precambrian bedrock, represented by Marinoan slates and quartzites, outcrops along the coastal cliffs north of the quarry and in Pedlar Creek.

The quarry exposes the type section for the basal Tertiary North Maslin Sands (Reynolds 1953). The younger Tertiary sediments form the sea cliffs to the south.

In the quarry the Tertiary strata cover light variecoloured clays of Permian age. Overburden is represented by Recent to Pleistocene mottled clays often marked at the base by Pliocene mottled clayey sands which are lateritic in parts. (Johns 1962).

4. RESULTS OF BORING

The results of the 8 holes bored by the Gemco machine auger are summarised below and represented graphically - on cross sections plan no. 63-506.

Borehole No.	Overburden	Potential Building Sand	Depth to Bedrock
1	72 feet	72 to 108 = 36 feet	-
2	69 "	69 " 108 = 39 "	-
3	60 "	60 " 108 = 48 "	-
4	27 "	27 " 102 = 75 "	(?) 102 fee
5	18 "	18 " 105 = 87 "	105 fee
6	14 "	14 " 107 = 93 "	107 "
7	12 "	12 " 70 = 58 "	70 "
8	12 "	12 " 60 = 48 "	60 "

Dark brown surface sand and loam is underlain by an intermittent kunkar horizon. The bulk of the overburden consists of a series of clayey sediments, green, grey, brown and red-brown with lenses of red and yellow sand.

The Pliocene laterite horizon was detected only in borehole no. 7 as a pink ferruginous sandstone at a depth of 10 to 11 feet.

Overburden increases from 12 feet in borehole no. 8 to the north with height above sea level reaching a maximum of 72 feet in borehole no. 1 (see longitudinal section S-S' plan no. 63-506). Overburden was deeper in boreholes nos. 1, 2 and 3 than the projected intersection using data from the quarry face and the Proline boreholes along the eastern boundary. Either the Pleistocene clays thicken as indicated on cross sections A-A', B-B', and C-C', or the upper layer of the North Maslin sands is too clayey for exploitation in these boreholes.

The North Maslin Sands are characterised by variations in colour, grain size, degree of sorting and clay content both laterally and vertically. Colour varies from off-white to yellow- and red-brown. The sands, which are quartzose, unfossiliferous and free from organic matter, range from fine even-grained sands to gravel lenses which contain rounded quartz pebbles up to 2 inches in diameter. Thin discontinuous bands of

white clay, sandy in parts were intersected in all boreholes.

The maximum thickness of sand, 93 feet, was penetrated in borehole no. 6.

The North Maslin Sands cover grey, light pink and purple clays, with sandy layers and occasional pebbles, of Permian age (Reynolds 1953). These clays, which are freshly exposed in excavations for a new loading bin in the south end of the quarry, are underlain by fine white well-sorted sand.

The base of the sand was not reached in boreholes nos. 1, 2 and 3. The wet pink clayey sand from 102 feet in borehole no. 4 is regarded as Permian.

The undulating nature of the top of the Permian as exposed in the quarry floor is reflected in the borehole data (longitudinal section S-S'). At the south end of the quarry, the Permian-Tertiary boundary is about 30 feet above sea level but drops to 10 feet in the centre and rises steeply at the north face where the younger sediments abut the Precambrian bedrock. In boreholes nos. 7 and 8, the Permian was intersected at 27.2 and 23.7 feet R.L. respectively; falling to 3 feet below sea level in boreholes nos. 5 and 6 and rising to 18.5 feet above sea level in borehole no. 4.

5. RESULTS OF SIEVE ANALYSES

All samples were finer than British Standard Specification 882 (1954): Concrete fine aggregate, with an excess of material passing 100 mesh (see graph - plan no. S 3396; the sample from borehole no. 6 having the maximum excess of 10.8% by weight. The samples from boreholes nos. 6 and 7 also show an excess passing 52 mesh. However the uppermost sand layers in these boreholes were very fine to fine grained and therefore should be rejected. The most suitable grading was obtained from borehole no. 3.

The clay content varies from 3.0% in borehole no. 7 to 9.6% in borehole no. 2, with a weighted mean for all samples of 6.1% by weight. The sample with the highest clay content, borehole no. 2, represents only the top 39 feet of sand. The deeper sediment is expected to have a lower clay content.

Screening is necessary to remove the oversize (pebbles greater than ¼ inch in diameter) which is usable as coarse aggregate.

6. RESERVES

Boring has proved 1¾ million cubic yards of potential building sand covered by 675,000 cubic yards of overburden. These figures are related to the area between the quarry face and the eastern boundary and from the northern boundary fence to cross section F-F' as outlined on the cross-sections plan no. 63-506.

Total reserves would be somewhat larger as boreholes nos. 1, 2 and 3 did not reach the base of the sand. The depth of sand below boreholes nos. 1, 2 and 3 is estimated at 37, 32 and 17 feet respectively.

Further sand is available in the low-lying south-eastern portion of the property as 48 feet of sand was intersected in borehole no. 8.

7. CONCLUSIONS

Coarse, poorly sorted basal Tertiary (North Maslin) sands with clayey and gravelly layers were deposited on a gently undulating surface of Permian clays.

1¾ million cubic yards of sand are available below 675,000 cubic yards of Pliocene to Recent overburden, which thickens to the north.

The gradings of the samples are slightly finer than standard specifications for concrete fine aggregate, with the clay content averaging 6.1% by weight.

With the rejection of the clayey and the very fine uppermost layers, the sand will be suitable for all building purposes.

Total reserves within the lease would be somewhat higher as 3 boreholes failed to penetrate the full extent of sand, while the deposit has not been tested in the south-eastern part of the property.

J. G. Olliver
Geologist
NON METALLICS SECTION

JGO:AGK
24/5/63

APPENDIX I

GEOLOGICAL LOGS OF BOREHOLES

LOG OF GEMCO BOREHOLE NO. 1

PROJECT: A.B.M. NOARLUNGA SAND CO.

SEC.: 365 **HD.:** Willunga **CO.:** Adelaide

R.L.: 158.8 feet **DEPTH:** 108 feet **DRILLER:** D. Kakoske

LOGGED BY: J.G. Olliver **DATE:** 3/5/63

Depth (feet) From	To	Description
0	6	Dark brown loam over kunkar.
6	24	Grey to pale brown clay, slightly sandy.
24	30	Orange fine clayey sand.
30	60	Light brown clay, finely sandy with orange clayey sand from 36 to 38 feet.
60	72	Red-brown clay, finely sandy from 66 to 72 feet.
72	84	Pale yellow-brown coarse sand with grit and a few ½ inch poorly rounded pebbles.
84	102	Light brown poorly sorted sand, clayey in parts.
102	108	Buff sand, finer than 84 to 102 feet.

Limit of plant at 108 feet.

LOG OF GEMCO BOREHOLE NO. 2

PROJECT: A.B.M. NOARLUNGA SAND CO.

SEC.: 365 **HD.:** Willunga **CO.:** Adelaide

R.L.: 153.8 feet **DEPTH:** 108 feet **DRILLER:** D.Kakoschk

LOGGED BY: J.G. Olliver **DATE:** 1/5/63

Depth (feet) From	To	Description
0	12	Minor loam over light grey-green clay, finely sandy.
12	24	Mottled light grey and brown clay, finely sandy.
24	25	Light red-brown sand slightly clayey
25	30	Light brown very clayey fine sand
30	36	Pale yellow fine sand, slightly clayey.
36	48	Light yellow-brown clay, finely sandy.
48	51	Red-brown clay.
51	69	Yellow-brown clay, sandy in parts.
69	108	Yellow-brown poorly sorted sand, generally coarse with minor grit, slightly clayey in parts with occasional thin seams of white clay.

Limit of plant at 108 feet.

LOG OF GEMCO BOREHOLE NO. 3

PROJECT: A.B.M. NOARLUNGA SAND CO.

SEC.: 365 HD.: Willunga CO.: Adelaide

R.L.: 137.9 feet DEPTH: 108 feet DRILLER: D. Kakoschke

LOGGED BY: J.G. Olliver DATE: 30/4/63

Depth (feet) From	To	Description
0	3	Dark brown loam over light brown limey clay.
3	6	Light yellow-brown very clayey sand.
6	12	Light red clayey fine sand.
12	24	Buff slightly to very clayey sand with white sandy clay at the base.
24	27	Yellow sand, slightly clayey.
27	33	Pale brown fine sand to sandy clay.
33	36	Red-brown and grey mottled clay.
36	42	Yellow-brown clay, slightly sandy.
42	60	Yellow-brown clayey fine sand to sandy clay at depth, with minor coarse sand to grit.
60	66	Yellow-brown clayey sand
66	108	Yellow-brown to light brown sand fine and well sorted at the top becoming coarse, poorly sorted and gritty with depth. Minor thin clayey bands throughout.

Limit of plant at 108 feet.

LOG OF GEMCO BOREHOLE NO. 4

PROJECT: A.B.M. NOARLUNGA SAND CO.

SEC.: 365 **HD.:** Willunga **CO.:** Adelaide

R.L.: 120.5 feet **DEPTH:** 102 feet **DRILLER:** A.S. Donne

LOGGED BY: J.G. Olliver **DATE:** 8/4/63

Depth (feet) From	To	Description
0	3	Dark brown loam, sandy to gravelly.
3	6	Loam, soft kunkar fragments and grey-green clay.
6	9	Dark brown sandy clay.
9	12	Light yellow to grey-brown clay, sandy to very sandy.
12	21	Grey-green clay silty to sandy.
21	27	Dark red-brown to yellow-brown slightly sandy clay.
27	30	Yellow-brown fine sand to silt, slightly clayey (represents the top of the North Maslin sands).
30	33	Yellow-brown fine sand with minor grit.
33	63	Light yellow brown to red-brown poorly sorted coarse sand.
63	72	Pale yellowish brown sand finer than from 33 to 63 feet.
72	84	Light yellow-brown coarse sand with rounded gravel up to 1 inch.
84	102	Buff to off-white sand, poorly sorted but finer than from 72 to 84 feet. Wet at base and pinkish.

Limit of plant at 102 feet.

LOG OF GEMCO BOREHOLE NO. 5

PROJECT: A.B.M. NOARLUNGA SAND CO.

SEC.: 365 **HD.:** Willunga **CO.:** Adelaide

R.L.: 111.1 feet **DEPTH:** 108 feet **DRILLER:** A.S. Donne

LOGGED BY: J.G. Olliver **DATE:** 9/4/63

Depth (feet) From	To	Description
0	3	Fine surface sand and dark brown loam sandy to gravelly.
3	6	Minor kunkar and grey-green clay.
6	12	Grey-green clay, slight sandy to gritty, becoming dark brown from 10 to 12 feet.
12	18	Dark red-brown to brown clay, slightly sandy.
18	24	Light red-brown fine sand (representing the top of the North Maslin sands).
24	27	Light yellow-brown fine sand, slightly clayey with a white sandy clay layer.
27	30	Off-white silt to fine sand.
30	33	Light yellow-brown poorly sorted sand.
33	45	Light red-brown coarse sand to grit.
45	93	Light yellow to off white coarse sand, with gravel up to 2 inches becoming more gravelly with depth; from 66 to 78 feet; Bands of white clay from 90 to 93 feet.
93	105	Light yellow to off white sand, slightly clayey.
105	108	Wet light pink clayey sand.

Limit of plant at 108 feet.

LOG OF GEMCO BOREHOLE NO. 6

PROJECT: A.B.M. NOARLUNGA SAND CO.

SEC.: 365 **HD.:** Willunga **CO.:** Adelaide

R.L.: 103.5 feet **DEPTH:** 108 feet **DRILLER:** D. Kakoschke

LOGGED BY: J.G. Olliver **DATE:** 23/4/63

Depth (feet) From	To	Description
0	3	Brown loamy sand over dark brown sandy clay.
3	6	Minor kunkar and dark brown clay.
6	9	Dark grey-green clay.
9	14	Dark brown clay.
14	15	Yellow fine to medium grained sand (top of the North Maslin sands).
15	18	Very fine pale pink sand.
18	30	Pale yellow to pale yellow-brown predominantly fine sand, slightly clayey.
30	33	Light orange-brown sand, slightly clayey.
33	36	Mid brown sand coarser than 30 to 33 feet, seam of white clay.
36	51	Brown coarse sand to grit with clay as coating and minor bands of fine very clayey sand, white andyellow.
51	54	Brown coarse sand to gravel ($\frac{1}{2}$ inch rounded quartz pebbles).
54	63	Light red-brown poorly sorted sand up to $\frac{1}{4}$ inch grit - damp.
63	66	As 54 to 63 feet but with 2 inch well rounded quartz pebbles
66	69	Rounded gravel with grit and mid brown clay up to 3 inch pebbles.
69	107	Buff to off white medium grained sand slightly clayey and gritty in parts. Damp, below 99 feet. Seams of white clay from 99 to 102 feet.
107	108	Pale purple clay (Permian)

Limit of plant at 108 feet.

LOG OF GEMCO BOREHOLE NO. 7

PROJECT: A.B.M. NOARLUNGA SAND CO.

SEC.: 365 **HD.:** Willunga **CO.:** Adelaide

R.L.: 97.2 feet **DEPTH:** 72 feet **DRILLER:** D.Kakoschke

LOGGED BY: J.G. Olliver **DATE:** 24/4/63

Depth (feet) From	To	Description
0	6	Fine surface sand, dark brown clay and minor kunkar.
6	9	Mid brown to yellow-brown fine sand and sandy clay.
9	12	White slightly clayey sandstone and pink ferruginous sandstone with red-brown fine slightly clayey sand. (representing the top of the North Maslin sands).
12	15	Light brown poorly sorted sand, with minor grit and occasional 1 inch angular quartz pebbles.
15	36	Off white, buff to yellow fine to medium grained sand with occasional hard thin bands of white siltstone.
36	45	Yellow to off white coarse poorly sorted with minor grit (slightly coarser with depth).
45	48	Yellow gritty sand.
48	57	Pale brown to pale red-brown coarse poorly sorted sand with minor grit.
57	66	As for 48 to 57 feet but gritty and gravelly with rounded quartz pebbles up to 2 inches from 60 to 66 feet.
66	70	Pale brown clayey sand.
70	72	Light purple sandy clay with thin white and yellow bands (Permian).

Bore stopped at 72 feet.

LOG OF GEMCO BOREHOLE NO. 8

PROJECT: A.B.M. NOARLUNGA SAND CO.

SEC.: 365 **HD.:** Willunga **CO.:** Adelaide

R.L.: 83.7 feet **DEPTH:** 63 feet **DRILLER:** D.Kakoschke

LOGGED BY: J.G. Olliver **DATE:** 26/4/63

Depth (feet) From	To	Description
0	6	Brown sandy clay and minor kunkar.
6	12	Red-brown sandy clay; with red-brown sand at base.
12	18	Light orange fine to medium grained sand with coarser grains.
18	33	Off white to yellow with depth poorly sorted sand.
33	39	Yellow coarse gritty sand with a few 1 inch quartz pebbles from 36 to 39 feet.
39	60	Light red-brown coarse, poorly sorted, sand, with rounded quartz pebbles up to 2 inches from 45 to 48 feet and 54 to 60 feet and clayey at the base.
60	63	Light purple sandy clay.

Bore stopped at 63 feet.

LOG OF PROLINE BOREHOLE NO. 2

PROJECT: CONCRETE INDUSTRIES (S.A.) PTY. LTD.

SEC.: 365 HD.: Willunga CO.: Adelaide

R.L.: 146.2 feet DEPTH: 76 feet DRILLER: A.S. Donne

LOGGED BY: R.K. Johns DATE:

Depth (feet) From	To	Description
0	4	Travertinous clay
4	14	Green-brown clay.
14	16	Brown clayey sand
16	32	Fine orange-brown sand with clay
32	38	Orange-brown silty clay.
38	76	Brown sandy clay.

Boring discontinued at 76 feet.

LOG OF PROLINE BOREHOLE NO. 3

PROJECT: CONCRETE INDUSTRIES (S.A.) PTY. LTD.

SEC.: 365 **HD.:** Willunga **CO.:** Adelaide

R.L.: 102.7 feet **DEPTH:** 76 feet **DRILLER:** A.S. Don

LOGGED BY: R.K. Johns **DATE:**

Depth (feet) From	To	Description
0	2	Sandy loam.
2	6	Sandy clay with travertine fragments.
6	10	Mustard-brown clayey sand
10	76	Light brown fine to coarse and gritty sand.

Boring discontinued at 76 feet.

LOG OF PROLINE BOREHOLE NO. 4

PROJECT: CONCRETE INDUSTRIES (S.A.) PTY. LTD.

SEC.: 365 **HD.:** Willunga **CO.:** Adelaide

R.L.: 82.8 feet **DEPTH:** 54 feet **DRILLER:** A.S. Denne

LOGGED BY: R.K. Johns **DATE:**

Depth (feet) From	To	Description
0	2	Brown sandy loam.
2	6	Travertinous fine sand.
6	8	Fine orange-brown sand.
8	21½	Light-to dark-grey clay.
21½	32	Red-brown clay.
32	40	Coarse grit with clay.
40	46	Fine to coarse and gritty sand.
46	54	Fine to coarse sand with quartz pebbles up to 1½ inches, little clay.

Boring discontinued at 54 feet.

LOG OF PROLINE BOREHOLE NO. 7

PROJECT: CONCRETE INDUSTRIES (S.A.) PTY. LTD.

SEC.: 365 HD.: Willunga CO.: Adelaide

R.L.: 91.8 feet DEPTH: 73 feet DRILLER: A.S. Donne

LOGGED BY: R.K. Johns DATE:

Depth (feet) From	To	Description
0	2	Brown sandy clay
2	10	Brown limey clay
10	14	Clayey sand
14	42	Fine to coarse sand with grit
42	60	Pale-yellow fine sand
60	73	Fine to coarse sand.

Boring discontinued at 73 feet.

LOG OF PROLINE BOREHOLE NO. 8

PROJECT: CONCRETE INDUSTRIES (S.A.) PTY. LTD.

SEC.: 365 **HD.:** Willunga **CO.:** Adelaide

R.L.: 86.3 feet **DEPTH:** 58 feet **DRILLER:** A.S. Donne

LOGGED BY: R.K. Johns **DATE:**

Depth (feet) From	To	Description
0	4	Brown sandy loam.
4	12	Brown clayey sand with travertine.
12	14	Fine to coarse sand and grit.
14	18	Brown sandy clay
18	58	Fine to coarse gritty sand with occasional quartz pebbles.

Boring discontinued at 58 feet.

LOG OF PROLINE BOREHOLE NO. 9

PROJECT: CONCRETE INDUSTRIES (S.A.) PTY. LTD.

SEC.: 365 **HD.:** Willunga **CO.:** Adelaide

R.L.: 121.0 feet **DEPTH:** 76 feet **DRILLER:** A.S. Donne

LOGGED BY: R.K. Johns **DATE:**

Depth (feet) From	To	Description
0	1	Brown sandy loam
1	6	Light-brown travertinous clay
6	20	Dark-brown clay.
20	22	Fine yellow-brown sand with little clay.
22	28	Fine yellow-brown sand
28	76	Fine to coarse and gritty sand.

Boring discontinued at 76 feet.

LOG OF PROLINE BOREHOLE NO. 10

PROJECT: CONCRETE INDUSTRIES (S.A.) PTY. LTD.

SEC.: 365 **HD.:** Willunga **CO.:** Adelaide

R.L.: 138.0 feet **DEPTH:** 76 feet **DRILLER:** A.S. Donne

LOGGED BY: R.K. Johns **DATE:**

Depth (feet) From	To	Description
0	4	Brown sandy loam.
4	12	Light brown sandy clay
12	20	Fine off-white sand
20	32	Pale brown clay
32	38	Red-brown clay
38	44	Fine-medium orange-brown sand
44	61	Fine orange-brown sand
61	76	Fine to coarse and gritty sand

Boring discontinued at 76 feet.

LOG OF PROLINE BOREHOLE NO. 25

PROJECT: CONCRETE INDUSTRIES (S.A.) PTY. LTD.

SEC.: 365 HD.: Willunga CO.: Adelaide

R.L.: 94.6 feet DEPTH: 72 feet DRILLER: A.S.Donn

LOGGED BY: R.K. Johns DATE:

Depth (feet) From	To	Description
0	2	Brown loam
2	10	Travertine
10	14	Brown sandy clay
14	70	Fine to coarse and gritty sand.
70	72	White clay.

Boring discontinued at 72 feet.

APPENDIX II

RESULTS OF SIEVE ANALYSES

APPENDIX II - RESULTS OF SIEVE ANALYSES

Weight percent

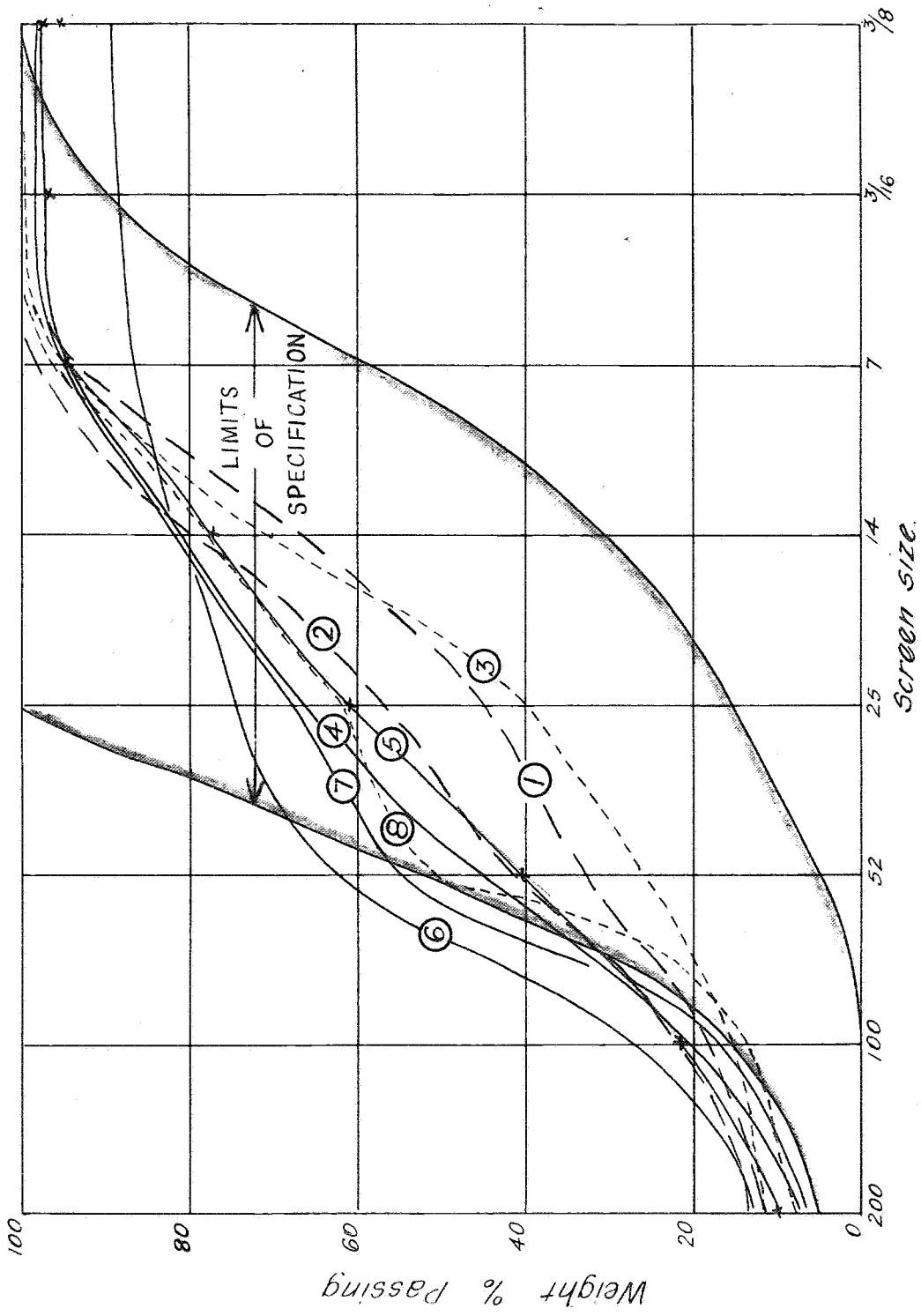
Bore No.	1	2	3	4	5	6	7	8
Depth (feet)	72-108	69-108	60-108	30-102	18-105	14-107	12-70	12-60
Mesh B.S.S.								
+ $\frac{3}{8}$ inch	-	-	-	2.1	2.3	11.0	2.6	-
-$\frac{3}{8}$ + 3/16 inch	0.3	-	-	Nil	0.6	0.5	0.2	0.4
-3/16 + 7 mesh	6.0	2.0	4.5	2.5	2.8	2.2	1.9	3.5
- 7 + 14 "	27.3	18.8	23.9	14.0	18.0	5.1	15.1	19.0
-14 + 25 "	21.6	22.4	31.9	16.0	15.7	6.9	13.8	15.5
-25 + 52 "	12.5	16.2	14.5	21.0	20.4	11.1	11.6	11.6
-52 +100 "	14.3	20.0	10.1	24.9	19.2	37.4	37.9	36.5
-100 +200 "	6.9	8.0	3.9	12.5	11.8	13.8	10.2	6.0
-200	11.1	12.6	11.2	7.0	9.2	12.0	6.7	7.5
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Clay Content	6.0	9.6	5.2	5.6	6.0	7.6	3.0	5.6

PLATES

Plate 1. East face of quarry showing North Maslin Sands capped by Pliocene laterite (3-4 feet thick) on the level above which the drag line (top right) is stripping overburden.

Plate 2. North-East face of quarry showing cross-bedded North Maslin Sands. Bulldozer pushing sand to loading bin.

Bore No°	Depth (feet.)
1	72 - 108
2	69 - 108
3	60 - 108
4	30 - 102
5	18 - 105
6	14 - 107
7	12 - 70
8	12 - 60



To accompany report by J.G.Olliver.

S.A. DEPARTMENT OF MINES

Approved Director	Passed	Drn. J.G.O. Tce. D.W.M. Ckd. Exd.	SAND DEPOSITS MS 1293, 1294 AND Pt Sec 365 B.S.S. 882 (1954) - CONCRETE FINE AGGREGATE (A.B.M. NOARLUNGA SAND)	D.M. Reg.	Scale — S 3396 No 9 Date 20-5-63


QUATERNARY
Recent
Alluvial clays with sands & gravels
White siliceous & calcareous back-shore beach dunes
Pleistocene
Mottled clays
TERTIARY
Pliocene
Freshwater gravels & sandstones, frequently lateritized
Oligocene to Miocene
Port Willunga beds — Bryozoal sands & limestones
Blanche Point Marls — Marls & Sands
Tortachilla Formation — Fossiliferous Glaucomitic limestone
Eocene
South Maslin Sands — Dark green to purplish blue glaucomitic sand with rounded grains of limonite
Eocene
North Maslin Sands — White & brown quartz sand
PALAEOZOIC
Permian
Glacio fluvial clays
PROTEROZOIC
Marinoan
Chocolate, purple, brown, & lesser grey & green slates with thin quartzites & dolomites.
LOCALITY PLAN
Scale: 1 mile to 1 inch
To Noarlunga
To McLaren Vale
To Aldinga
MOANA
OCHRE PT.
BLANCHE PT.
Flat topped dump
Gravel dump
Old dump
Dump
Loam Pit
Dump
Telephone line
Powerline
THE CANYON
Coast line
Road
Fill
Sea level
LEGEND FOR SECTION
Quaternary
Pleistocene — Recent
Soil, Kunkar, sands & clays
Tertiary
Pliocene
Laterite, sands & grits
Eocene
North Maslin Sands
Permian
Clays
Machine Auger Bore Holes
Gemco [6]
Proline (3)
Geological Boundary
Inferred
Reserves based on areas margined thus
LEGEND FOR PLAN
Gemco borehole
G4 No 102' Depth
Proline borehole
P3 No 76' Depth
Contour (Interval 10 feet)
Datum — Sealevel (approx)
SCALE
feet 100 50 0 100 200 300 feet
To accompany report by J.G. Olliver

S.A. DEPT. OF MINES

SAND DEPOSIT
M.Sects. 1293 & 1294 & Pt.Sec. 365, Hd Willunga
A. B. M. Noarlunga Sand Co.
PLAN & SECTIONS

Associated Drawing	No.	No.	Amendment	Exd.	Date

Req. No.
D.M.
Compiled from

Approved | Passed
Director of Mines

Drn.
Tcd. G.M.
Ckd.
Exd.

Scale: As above
63-506
Ha 9
Date 21.5.63