

1983/64. The groundwater resources of the Southport Lagoon spit

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A survey of the groundwater resources of the Southport sandspit [DM975830] was made during the period 7-10 March 1983.

Ten auger holes were drilled with the trailer-mounted Triefus auger rig, the water quality and water table depth determined, and at the same time sand samples were taken for the estimation of heavy mineral content.

The holes were drilled in numerical order in the positions indicated on Figure 1.

Hole	Standing water level (m)	Depth of hole (m)	Salinity (mg/l NaCl*)	Topography
1	2.28	3.04 dol	380	swale
2	2.28	3.81 dol	500	swale
3	3.4	8.38	3300	dune
4	4.57	8.23	1100	swale
5	2.28	7.31	1600	swale
6	4.57	8.38	320	dune
7	3.65	6.10	900	swale
8	1.54	8.23	200 foul	dune
9	2.13	2.74 dol	370 foul	swale
10	2.28	3.20 dol	450	dune

* by PHOX conductivity meter

'dol' indicates bottomed in dolerite or dolerite gravel

'foul' indicates high H₂S organic content

Grain size samples were taken from Holes 1, 2, 5, 8, 9, and 10 and the results are given in Appendix 1.

A chemical analysis of water from Hole 1 is given in Appendix 2.

The survey has shown that groundwater is obtainable in many parts of the spit and that salinity rises above potable limits only within 30 m of high tide mark. This is characteristic of recent sandspits in areas of medium to high rainfall.

The resource is to some extent limited by the shallow bottom of the sand body in Holes 1, 2, 9, and 10 and greater yields would probably be available from those holes with deeper sand. The presence of organic matter in the sand deposit is sufficient to limit the use of the water and is not predictable in distribution.

[5 December 1983]

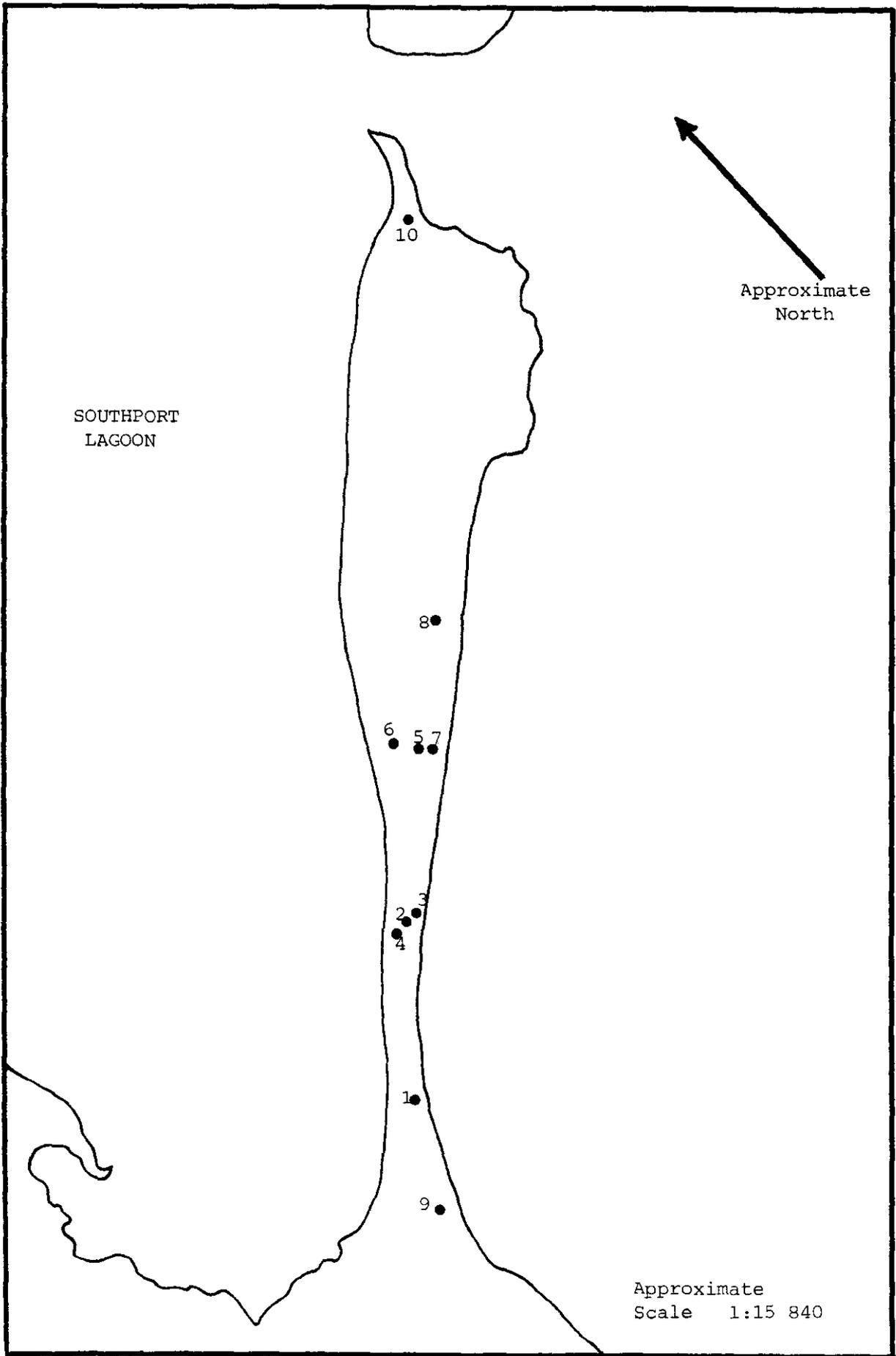


Figure 1. Location of bore holes, Southport Spit

APPENDIX 1

Analysis of water, Hole 1

Registered Number	830405
pH	6.5
Conductivity ($\mu\text{S}/\text{cm}$)	660
<i>Item</i>	<i>mg/l</i>
CO_3	Nil
HCO_3	244
Cl	118
SO_4	150
SiO_2	8.0
Ca	100
Mg	10
Fe	<0.1
Al	<0.2
K	2.0
Na	84
TDS	490
Hardness (permanent)	92
Hardness (temporary)	200
Alkalinity as CaCO_3	200

Date 15.3.83

Locality Southport Lagoon, Hole 1.

Analysis by M. Frith, Department of Mines, Launceston

APPENDIX 2

Sizing analysis of sand samples

Hole 1

<i>Sieve size</i>	<i>Mass (%)</i>	<i>Mass Cum. (%)</i>
+2.36 mm	11.57	11.57
+1.18 mm	6.25	17.83
+600 μm	2.46	20.28
+300 μm	10.20	30.48
+212 μm	42.09	72.57
+150 μm	22.96	95.53
+ 75 μm	4.35	99.89
+ 38 μm	0.04	99.93
- 38 μm	0.07	100.00

Hole 2

<i>Sieve size</i>	<i>Mass (%)</i>	<i>Mass Cum. (%)</i>
+2.36 mm	0.20	0.20
+1.18 mm	0.20	0.39
+600 μm	1.22	1.62
+300 μm	12.59	14.20
+212 μm	42.36	56.56
+150 μm	39.13	95.69
+ 75 μm	4.21	99.90
+ 38 μm	0.05	99.95
- 38 μm	0.05	100.00

Hole 3

<i>Sieve size</i>	<i>Mass (%)</i>	<i>Mass Cum. (%)</i>
+2.36 mm	0.11	0.11
+1.18 mm	0.15	0.26
+600 μm	0.67	0.93
+300 μm	7.24	8.18
+212 μm	41.93	50.11
+150 μm	44.32	94.44
+ 75 μm	5.45	99.89
+ 38 μm	0.07	99.96
- 38 μm	0.04	100.00

Hole 8

<i>Sieve size</i>	<i>Mass (%)</i>	<i>Mass Cum. (%)</i>
+2.36 mm	0.46	0.46
+1.18 mm	0.04	0.50
+600 μm	0.04	0.54
+300 μm	1.73	2.27
+212 μm	26.27	28.54
+180 μm	35.04	63.58
+150 μm	25.81	89.38
+ 75 μm	10.38	99.77
+ 38 μm	0.08	99.85
- 38 μm	0.15	100.00

Appendix 2 (continued)

Hole 9

<i>Sieve size</i>	<i>Mass (%)</i>	<i>Mass Cum. (%)</i>
+1.18 mm	0.05	0.05
+600 μm	0.79	0.84
+300 μm	10.37	11.22
+212 μm	47.87	59.08
+150 μm	36.70	95.79
+ 75 μm	4.11	99.89
+ 38 μm	0.05	99.95
- 38 μm	0.05	100.00

Hole 10

<i>Sieve size</i>	<i>Mass (%)</i>	<i>Mass Cum. (%)</i>
+2.36 mm	2.76	2.76
+1.18 mm	1.19	3.96
+600 μm	2.90	6.86
+300 μm	28.66	35.52
+212 μm	44.18	79.70
+150 μm	18.59	98.29
+ 75 μm	1.64	99.93
+ 38 μm	0.03	99.97
- 38 μm	0.03	100.00

This sample was subjected to heavy liquid separation at S.G. 2.92.
 The heavy mineral content was found to be 1.07%
 The heavy mineral seemed to be mostly ferromagnesian.