

PETER H. STITT & ASSOCIATES PTY. LTD.

MINING AND GEOLOGICAL CONSULTANTS

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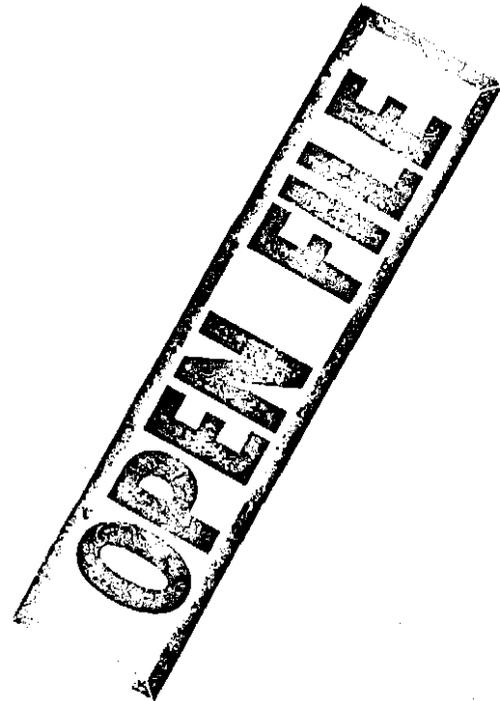
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REPORT NO 26/88



E.L. 2/87



Annual Report on Exploration Completed in the
Smithton-Robbins Island Areas of
North-Western Tasmania
to 4.10.88

Prepared for National Mineral Sands Pty. Ltd.

A. Dove
October, 1988

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001

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File

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S Y N O P S I S

1. AIM

To examine the Tasmanian north west coast around Smithton and Robbins Island for economic heavy mineral sand occurrences.

2. REASON

Recent increases in the price of mineral sand commodities, particularly rutile and zircon, have been caused by shortages of supply. Price rises combined with technological advances have given impetus to examination of areas previously considered to be attractive.

3. SUMMARY & CONCLUSIONS

3.1 E.L. 2/87 covers 247 km² of the Tasmanian north west coast around Smithton, covering Perkins and Robbins Islands.

3.2 A study of aerial photographs covering the licence area was completed and is shown as Figure 2 of this report.

3.3 Field investigations were carried out on three traverse lines using hand drill methods.

3.4 A number of scout holes were also drilled throughout the tenement.

3.5 Heavy mineral assay results are recorded in Appendix 2.

3.6 Mineralogical study of three heavy mineral composites is shown in Appendix 3 and as Table 1.

3.7 There is little variation in heavy mineral grades across the tenement, with most intervals grading less than 0.5% H.M.

3.8 Mineralogy shows little variation, with rutile and zircon values very low.

3.9 As yet Robbins Island has not been looked at, due to landowner difficulties.

3.10 Results would need to be substantially higher for Robbins Island to be a prospective target.

4. RECOMMENDATION

The company should review its position before any further work is undertaken in the area.

5. INTRODUCTION

A programme of exploration was carried out by Peter H. Stitt & Associates on behalf of National Mineral Sands Pty. Ltd. (formerly Butlers No. 27 Pty. Ltd.) on the north coast of Tasmania around Smithton.

Exploration was directed at testing the coastal dunes for heavy mineral sand deposits, containing economic minerals; particularly rutile, leucoxene, ilmenite (TiO_2 raw materials), zircon and monazite. In addition exploration was to be carried out in order to recognise any other detrital minerals if they occurred in economic quantities.

During the past two years the world market has been dominated by a short fall in supply to meet the demand, particularly for TiO_2 pigment minerals, zircon and rare earth heavy minerals. As a consequence the price for these minerals has risen to historically high levels. Predictions for the future supply and price of titanium and zirconium raw materials is one of buoyancy.

Recent advances in technology and understanding of heavy mineral deposits has caused a re-evaluation of prospective areas. Chief points of advancement are:

- . Lower grade deposits are now economic.
- . Exploration methods have been developed particularly with regard to quantitative assessment of low grade areas.
- . Mineralogical determinations have seen the employment of the scanning electron microscope to identify minerals difficult to optically identify; particularly distinguishing black rutile from other black opaque minerals and identification of rare earth element minerals.
- . Mining technology has advanced, for example in dredging and dredge cutters, to lower costs and to make difficult areas now mineable.
- . Metallurgical treatment has seen the development of new spirals with

higher throughput and suited to lower grade ore. Magnetic separators are now capable of more finely tuned separations to upgrade ilmenite and chromite products which have been rejected in the past.

- . Overall efficiency of the industry has advanced in order to meet market requirements.

The initial programme was based on the study of topographic maps and aerial photographs, and consisted of hand drilling a number of regular spaced holes along three traverse lines, and a number of scout holes within the E.L.

6. TENEMENT INFORMATION

Exploration Licence 2/87 is held by National Mineral Sands Pty. Ltd. It covers an area of 247 square kilometres in the land district of Wellington in the vicinity of Smithton and Robbins Island, on the north coast of Tasmania.

The area comprises:

Private Property	135.9 km ²
State Forests	10 ha
Crown Land	200 km ²

The area excludes 10 ha Crown Reserves.

The area includes 2.5 km² of the Stanley Urban Conservation Area; Australian Heritage Act Registered Entry.

The area of Robbins Island was the subject of objection, lodged by the landowners. Robbins Island Pty. Ltd. believed that they had private mineral rights granted originally to the Van Dieman's Land Company, now owned in freehold by Robbins Island Pty. Ltd.

The matter was settled in the Wardens Court on 9/9/87 where the Warden was satisfied that neither the Objector nor its Predecessors in Title hold or ever held mining rights over the subject land other than for the purpose of quarrying and raising stone etc. for its own building purposes.

Subsequently approaches to the Directors of the company for access to the island has met with resistance. This is further complicated as access to the island is restricted to a tidal channel crossing. To safely negotiate

this channel, assistance is required from the landowner, who crosses it regularly.

7. PREVIOUS WORK

During 1969 Ken McMahon & Partners Pty. Ltd. on behalf of Naracoopa Rutile Ltd., conducted a reconnaissance survey on the coast of Robbins Island, which falls within EL 2/87. A number of holes were drilled in the beach sand deposits of the island, however heavy mineral concentrations were small and considered uneconomic.

The drilling was confined to a series of overlapping parabolic lines on the north-east coast of the island adjacent to the shoreline and ignored the older inland strandline systems.

8. AERIAL PHOTOGRAPHY INTERPRETATION

Aerial photograph interpretation using the most recently available black and white photography from the Tasmanian Department of Lands was carried out over the E.L. Details are as follows.

Scale:	1:42 000
Date:	31.1.83
Run 1A	Nos. 149 to 156
1	Nos. 126 to 138
2	Nos. 205 to 215
3	Nos. 108 to 133
Date:	14.1.82
Run 91	Nos. 203 to 208

The interpretation map (Figure 2) shows sufficient geographic features to enable location using the 1:100,000 topographic series. Distortion between photographs has created some problems in preparing these composites and is reflected by variation in the angle and length of some tenement boundaries.

The following points are noteworthy.

- . There is excellent strandline development, particularly Robbins Island, Perkins Island, Anthony Beach and Black River Beach.
- . The mineralogy for a sample from Anthony Beach is shown on Figure 2.
- . Older strandline systems are apparent on inland areas to the east and west of Smithton. Even though some of these areas have been subjected to agricultural activity and the surface topographic relief modified, the geomorphological features are still apparent on the aerial photos.

9. FIELD INVESTIGATIONS

9.1 Survey

Drillholes where possible have been located along straight traverse lines, generally oriented north-south, running perpendicular to the strike of the strandlines or coastline. Where possible the traverse lines have been located along existing roads and tracks in order to minimize disturbance and allow ease of access during the reconnaissance stage.

All traverse lines were surveyed by tape and compass, with abney level determination of surface topography. As well as the traverse lines a number of scout holes were located throughout the tenement.

The three traverse lines are designated Seven Mile Beach (S.M.), Black River Beach (B.R.) and Perkins Island (P.I.), while the scout holes are Smithton (S) and East Inlet (E.I.) (see Figure 2).

9.2 Drilling

All drilling for the main programme was by hand auger and hand operated cased sludging, using Dormer Engineering equipment. Holes were hand augered to water table using 50 mm. diameter hand auger. When water table was reached 50 mm. casing was inserted into the hole and the hole was advanced by sludging using a whistle top sludger on aluminium extension rods.

Drilling was completed at rock basement, pebbles, shell or thick clay layers. Where there was no impediment to drilling, holes were terminated at 10m. depth, since hand drilling below this depth becomes increasingly slow.

Samples from the drilling were bagged at 1 or 2 metre intervals.

Where possible samples obtained by sludging were weighed in the field to check on weight variation due to sand boiling into the casing.

The drilling was carried out using a Tasmanian field crew, with a total of forty-seven drill holes and 251.4m. drilled for 168 samples.

A brief descriptive log is prepared for each drill hole and where relevant, includes heavy mineral assay data. The borehole logs are presented in Appendix 1 of this report.

9.3 Traverse Line Summaries

Black River Beach:

The Black River traverse line incorporated eight (8) drill holes, with the maximum depth 10 metres and the minimum 4.5 metres. Two additional drill holes were located approximately 1.5 kilometres further along the beach. A total of 72.2 metres was drilled, and 29 samples collected.

Rock or shell was encountered in six of the ten drill holes, and two were terminated due to caving of the drill hole walls.

Perkins Island:

The Perkins Island traverse incorporated twelve (12) drill holes, with a maximum depth of 10.0 metres and a minimum of 3.8 m. A total of 63.4 m. was drilled and 26 samples collected. Every hole (except PI-2) was terminated due to shell.

The Perkins Island samples showed more potential for heavy mineral concentrations than Black River Beach, however in both cases the amount of mineral is small.

Seven Mile Beach

The Seven Mile beach traverse incorporated 12 drill holes covering a distance of 2.3 kilometres running inland from the beach.

Indurated layers were encountered in all holes, and often caused drilling problems. The maximum depth obtained was 10.0 metres and the minimum was 1.0 metre.

A total of 74 metres was drilled and 68 samples collected.

Heavy mineral concentrates were observed in drill holes over the first couple of hundred metres inland from the beach.

10. LABORATORY INVESTIGATIONS

Preliminary samples were taken from Anthony Beach and were assayed for heavy minerals by Gold Coast Assay Services, Currumbin, Queensland. The procedure was the same as the one used by R.H.F. Laboratories for the bulk of the samples that followed. The procedure is outlined below.

1. Dry samples as received.
2. Weigh and record weight.
3. Screen on a coarse sieve (say 2 mm.) to break up agglomerated lumps.
4. Riffle split approximately 100 gm working sample.
5. Re-pack balance of sample.
6. Weigh working sample.
7. Screen on 600 micron sieve (or coarser sieve as directed) and weigh plus 600 micron fraction.
8. Using TBE, separate heavy minerals.
9. Dry and weigh heavy minerals.
10. Calculate heavy minerals as a percentage of the sample weighed in Step 6 above.
11. Package heavies for despatch.

Results are reported in Appendix 2.

The heavy minerals for each interval have been bulked together to form composite samples for each drill hole. Mineralogical analysis was carried out on two of these samples by Applied Petrographic Services, Sydney, N.S.W.

The method adopted for mineralogical study was:

1. Magnetically separate the heavy concentrate into:
 - . hand magnetics
 - . 0.5 amp Frantz magnetics
 - . 0.9 amp Frantz magnetics
 - . 1.2 amp Frantz magnetics
 - . 1.2 amp Frantz non magneticsusing a Frantz magnetic separator with forward slope of 25° and side tilt of 18° .
2. Weigh each magnetic fraction.
3. Optically identify mineral grains and point count a minimum 500 points for each magnetic fraction.
4. In the case of results obtained from a sample of beach concentrates presented in Figure 2, mineralogical analysis was by electron microprobe.

Mineralogical results as reported are weight percent of magnetic fractions and volume percent for the optically point counted grains. The total percentage for the whole sample is a combination of weight and volume, as reported by Applied Petrographic Services.

One sample from Anthony Beach was subject to a mineralogical study by electron microprobe. Results are shown on figure 2.

Mineralogical analyses are presented in Appendix 3.

11. RESULTS AND DISCUSSION

Thirty one (31) of the Fifty (50) drillholes have been analysed; three (3) from Seven Mile Beach, ten (10) from Black River Beach, twelve (12) from Perkins Island, four (4) from Smithton and two (2) from East Inlet. The scattered nature of the testing was done to give an idea of the variation (if any) of the grades over the tenement. Similarly mineralogy was carried out on three composite samples, as shown in Appendix 3, to give details on mineral variation.

In general there is very little variation in heavy mineral grades across the tenement. With the exception of SM-0, all intervals analysed had grades of less than 0.5% H.M., with the majority of the drillholes averaging less than 0.2%.

A comparison of mineralogy (Table 1) also shows little variation across the licence. Rutile and zircon values are very low in the Perkins Island and Black River Beach composite. The increase in rutile and zircon values in the Anthony Beach composite is due to analyses by SEM, which more accurately distinguishes leucoxene from altered ilmenite and black rutile from ilmenite.

The results to date indicate that the area has limited potential for economic mineral sand occurrence despite the favourable geomorphology of coastal sand deposits. To date Robbins Island remains untested due to access and landowner difficulties as previously noted in Section 6. However results obtained to date are not encouraging and would need to be substantially higher for Robbins Island to be a prospective target.

TABLE 1
COMPARISON OF MINERALOGY

MINERAL	PERKINS ISLAND	BLACK RIVER BEACH	ANTHONY BEACH
MAGNETITE	<1	<1	-
ILMENITE	10	9	16.4
LEUCOX. ILMENITE	3	3	-
IRON OXIDES	5	11	-
GARNET	3	2	-
TOURMALINE	21	17	-
STAUROLITE	-	<1	-
EPIDOTE	1	1	-
ALUMINO - SILICATES	4	3	-
OTHER SILICATES	22	21	63.8
RUTILE	1	1	7.3
LEUCOXENE	28	32	8.6
ZIRCON	2	<1	8.8
QUARTZ	<1	<1	-
PYRITE	<1	-	-
CORUNDUM	<1	-	-
SHELL	<1	<1	-
MONAZITE	<1	<1	-

* Anthony Beach samples tested using SEM.

12. APPENDICES

12.1 Drillhole Descriptive Logs

Seven Mile Beach - S.M.

Black River Beach - B.R.

Perkins Island - P.I.

Smithton - S.

East Inlet - E.I.

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: E.L.2/87

AREA: SEVEN MILE BEACH

LINE NO: 1 HOLE NO: SM 0

LOGGED BY: ANDREW DOVE

DATE DRILLED: October, 1987

020

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, white, contains fine shell. Traces of H.M.			
1 - 2		AS ABOVE, traces of H.M.		0.04	0.46
2 - 3		AS ABOVE.			
		STARTED SLUDGING AT 2.5m.			
3 - 4		SAND, fine to medium grained, light grey, abundant fine shell, some coarse shell.		0.24	0.46
4 - 5		AS ABOVE, becoming greyer, traces of H.M.			
5 - 6		AS ABOVE, grey		0.19	0.47
6 - 7		SAND, fine grained, grey, contains fine shell, traces of H.M. Some clay.			
7 - 8		AS ABOVE		0.06	0.82
8 - 9		AS ABOVE.		0.02	0.56
		END OF HOLE. 9.0m.			
		Average			0.55

17

727021

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: E.L. 2/87

AREA: SEVEN MILE BEACH

LINE NO: 1

HOLE NO: SM 10

LOGGED BY: ANDREW DOVE

DATE DRILLED:

October, 1987

001

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine grained organic, becoming orange at base.		1.54	0.28
1 - 2		SAND, fine grained, white, slightly organic, contains abundant shell.			
		STARTED SLUDGING			
2 - 3		SAND, fine grained, white, abundant fine and coarse shell.		0.16	0.25
3 - 4		AS ABOVE, traces of H.M.			
4 - 5		AS ABOVE.			
5 - 6		SAND, fine grained, grey, abundant fine shell.		0.19	0.27
6 - 7		AS ABOVE.			
7 - 8		AS ABOVE.		0.12	0.41
8 - 9		AS ABOVE.			
9 - 10		AS ABOVE, Slightly lighter colour.		0.02	0.29
		END OF HOLE. 10.0m.			
		Average			0.3

18

927022

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: E.L. 2/87

AREA: SEVEN MILE BEACH

LINE NO: 1

HOLE NO: SM 20

LOGGED BY: ANDREW DOVE

DATE DRILLED:

October, 1987

002

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained organic			
1 - 2		SAND, fine to medium grained, slightly organic then white, contains shell.			
2 - 3		STARTED SLUDGING SAND, fine grained, grey, abundant fine shell.			
3 - 4		AS ABOVE			
4 - 5		AS ABOVE, contains some pebbles.			
5 - 6		SAND, fine to medium grained, grey, contains abundant shell.			
6 - 6.2		AS ABOVE.			
		END OF HOLE. Too hard.			

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424023

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: E.L. 2/87

AREA: SEVEN MILE BEACH

LINE NO: 1 HOLE NO: SM 30

LOGGED BY: ANDREW DOVE

DATE DRILLED: October, 1987

023

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained slightly organic then white.			
1 - 2		SAND, fine to medium grained, white. STARTED SLUDGING			
2 - 3		SAND, fine grained, light grey, abundant fine shell.			
3 - 4		AS ABOVE.			
4 - 5		AS ABOVE.			
5 - 6		AS ABOVE, slightly darker.			
6 - 7		AS ABOVE.			
7 - 7.5		AS ABOVE.			
		END OF HOLE. 7.5m.			

20

727024

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: E.L.2/87

AREA: SEVEN MILE BEACH

LINE NO: 1 HOLE NO: SM 40

LOGGED BY: ANDREW DOVE

DATE DRILLED: October, 1987

004

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained organic brown then white.			
1 - 2		SAND, fine to medium grained, reddish brown. STARTED SLUDGING			
2 - 3		SAND, fine grained, white with abundant fine orange shell, trace of H.M. contains mica.			
3 - 4		SAND, fine grained amber with abundant shell.			
4 - 5		SAND, fine grained, light grey with abundant fine shell.			
5 - 6		AS ABOVE.			
6 - 7		AS ABOVE.			
7 - 8		AS ABOVE.			
8 - 9		SAND, fine grained, light grey, minor shell fragments.			
9 - 10		AS ABOVE.			
		END OF HOLE. 10m.			

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727025

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: E.L. 2/87

AREA: SEVEN MILE BEACH

LINE NO: 1 HOLE NO: SM 50

LOGGED BY: ANDREW DOVE

DATE DRILLED: October, 1987

025

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine grained, white, contains black organic matter.		0.48	0.52
1 - 2		SAND, fine grained, orange-brown.			
2 - 3		AS ABOVE.			
		STARTED SLUDGING			
3 - 4		SAND, fine grained light grey, abundant fine shell.		0.17	0.28
4 - 5		AS ABOVE.			
5 - 6		AS ABOVE.		0.41	0.23
6 - 7		AS ABOVE.			
7 - 8		AS ABOVE.		0.23	0.40
8 - 9		AS ABOVE.			
9 - 10		AS ABOVE.		0.48	0.40
		END OF HOLE. 10m.			
		Average			0.37

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: E.L. 2/87

AREA: SEVEN MILE BEACH

LINE NO: 1 HOLE NO: SM 60

LOGGED BY: ANDREW DOVE

DATE DRILLED: October, 1987

026

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, white contains black organics.			
1 - 2		SAND, fine grained, black. STARTED SLUDGING			
2 - 3		SAND, fine, dark grey, contains fine shell.			
3 - 4		AS ABOVE, slightly lighter colour.			
4 - 5		AS ABOVE, also coarser shell.			
5 - 6		AS ABOVE.			
6 - 7		SAND, fine grained, light grey, abundant fine shell.			
7 - 8		AS ABOVE.			
8 - 9		AS ABOVE, hit mud at base. END OF HOLE. 9.0m.			

23

727027

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: E.L. 2/87

AREA: SEVEN MILE BEACH

LINE NO: 1

HOLE NO: SM 70

LOGGED BY: ANDREW DOVE

DATE DRILLED:

October, 1987

007

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, dark grey at top then light grey at base. STARTED SLUDGING			
1 - 2		SAND, fine to medium grained, light grey, contains clay.			
2 - 3		SAND, fine to medium grained, light grey.			
3 - 4		AS ABOVE, contains fine shell.			
4 - 4.2		AS ABOVE. END OF HOLE. 4.2m. Kept sludging in.			

24

727028

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: E.L. 2/87

AREA: SEVEN MILE BEACH

LINE NO: 1

HOLE NO: SM 110

LOGGED BY: ANDREW DOVE

DATE DRILLED:

October, 1987

028

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, dark brown at top then amber, light brown at base.			
		STARTED SLUDGING			
1 - 2		SAND, fine to medium grained, grey contains clay.			
		END OF HOLE. 2.0m. Clay.			

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: E.L.2/87

AREA: SEVEN MILE BEACH

LINE NO: 1 HOLE NO: SM 130

LOGGED BY: ANDREW DOVE

DATE DRILLED: October, 1987

009

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, dark grey organic, contains clay. END OF HOLE. 1.0m.			

CLIENT: NATIONAL MINERAL SANDS
 AREA: SEVEN MILE BEACH
 LOGGED BY: ANDREW DOVE

TITLE NO: E.L. 2/87
 LINE NO: 1 HOLE NO: SM 170
 DATE DRILLED: October, 1987

030

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, dark grey organic. STARTED SLUDGING			
1 - 1.5		SAND, fine to medium grained, dark brown contains clay. END OF HOLE. 1.5m. Clay			

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: 2/87

AREA: SEVEN MILE BEACH

LINE NO: 2 HOLE NO: SM 0

LOGGED BY: ANDREW DOVE

DATE DRILLED: October, 1987

001

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, amber, fine shell.			
1 - 2		AS ABOVE.			
		STARTED SLUDGING			
2 - 3		SAND, fine to medium grained, amber at top then light grey, abundant shell.			
3 - 4		SAND, fine to medium grained, dark grey, abundant shell.			
4 - 5		AS ABOVE.			
		END OF HOLE. 5.0m.			

28

727032

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: E.L. 2/87

AREA: SEVEN MILE BEACH

LINE NO: 2 HOLE NO: SM 5

LOGGED BY: ANDREW DOVE

DATE DRILLED: October, 1987

032

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, brown organic, amber at base, abundant shell.			
1 - 2		SAND, fine to medium grained, amber, abundant shell.			
2 - 3		AS ABOVE.			
3 - 4		AS ABOVE.			
		STARTED SLUDGING			
4 - 5		SAND, fine to medium grained, light grey, abundant fine shell and coarse shell, contains wood.			
5 - 6		AS ABOVE.			
6 - 6.5		AS ABOVE, a lot of coarse shell.			
		END OF HOLE. 6.5m. Hole sludging in.			

29

727033

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: E.L. 2/87

AREA: SEVEN MILE BEACH

LINE NO: 2 HOLE NO: SM 15

LOGGED BY: ANDREW DOVE

DATE DRILLED: October, 1987

003

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, light grey organic at top then amber.			
1 - 1.5		SAND, fine to medium grained, amber, abundant fine and coarse shell.			
		END OF HOLE. 1.5m Rock.			

30

727034

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 2/87

AREA: BLACK RIVER BEACH

LINE NO: 1

HOLE NO: BR4

LOGGED BY: ANDREW DOVE

DATE DRILLED: March, 1988

005

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1.0		SAND, fine to medium grained, amber. Some fine shell			
1.0 - 2.0		AS ABOVE		0.02	0.06
2.0 - 3.0		AS ABOVE			
3.0 - 4.0		AS ABOVE. Abundant fine orange shell. Started sludging 3.8m. Some very coarse shell		0.71	0.04
4.0 - 5.0		AS ABOVE (small bag)			
5.0 - 6.0		AS ABOVE		9.68	0.05
6.0 - 7.0		AS ABOVE, sand becoming finer			
7.0 - 8.0		AS ABOVE, fine grained.		3.11	0.03
8.0 - 9.0		AS ABOVE		0.10	0.07
9.0 - 10.0		AS ABOVE END OF HOLE 10.0m.		1.96	0.03
		AVERAGE			0.05

32

727036

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 2/87

AREA: BLACK RIVER BEACH

LINE NO: 1 HOLE NO: BR8

LOGGED BY: ANDREW DOVE

DATE DRILLED: March, 1988

006

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1.0		SAND, fine grained, white. Contains some fine shell.		0.04	0.11
1.0 - 2.0		AS ABOVE			
2.0 - 3.0		AS ABOVE			
3.0 - 4.0		AS ABOVE, becoming darker in colour. Greyish-orange.		0.02	0.18
4.0 - 5.0		AS ABOVE, orange			
5.0 - 6.0		AS ABOVE. Amber.		0.01	0.04
6.0 - 7.0		AS ABOVE.		0.01	0.12
7.0 - 8.0		AS ABOVE, finer.			
8.0 - 9.0		AS ABOVE			
9.0 - 10.0		AS ABOVE. Orange at base.		0.02	0.16
		END OF HOLE 10m.			
		AVERAGE			0.12

33

727037

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 2/87

AREA: BLACK RIVER BEACH (Start of old dune system)

LINE NO: 1

HOLE NO: BR12

LOGGED BY: ANDREW DOVE

DATE DRILLED: March, 1988

007

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1.0		SAND, fine grained, white. Some wood fragments.		0.05	0.12
1.0 - 2.0		AS ABOVE, contains fine shell fragments.			
2.0 - 3.0		AS ABOVE		0.11	0.02
3.0 - 4.0		AS ABOVE, becoming amber.			
4.0 - 4.5		AS ABOVE		0.06	0.06
		Hole kept caving in to 3.0m.			
		END OF HOLE 4.5m.			
		AVERAGE			0.07

34

727038

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 2/87

AREA: BLACK RIVER BEACH

LINE NO: 1 HOLE NO: BR16

LOGGED BY: ANDREW DOVE

DATE DRILLED: March, 1988

008

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1.0		SAND, fine grained, grey then goes into amber.			
1.0 - 2.0		SAND. fine to v. fine grained, light brown.		0.16	0.02
2.0 - 3.0		AS ABOVE, becoming whiter with depth.		0.04	0.04
3.0 - 4.0		SAND, fine to v. fine grain, white-light brown mottle.		0.04	0.04
4.0 - 4.7		AS ABOVE		0.04	0.03
		END OF HOLE 4.7m.			
		Hole kept caving in. Tried putting water down hole but went back to 3.0m.			
		AVERAGE			0.03

35

727039

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 2/87

AREA: BLACK RIVER BEACH

LINE NO: 1

HOLE NO: BR20

LOGGED BY: ANDREW DOVE

DATE DRILLED: March, 1988

609

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1.0		SAND, fine to very fine grained, grey.			
1.0 - 2.0		SAND, fine to v. fine grained, amber.		0.11	0.09
2.0 - 3.0		AS ABOVE			
3.0 - 4.0		AS ABOVE, becoming whiter with depth.		0.08	0.06
4.0 - 5.0		AS ABOVE, white.			
5.0 - 6.0		AS ABOVE		0.01	0.07
6.0 - 7.0		AS ABOVE			
7.0 - 8.0		AS ABOVE, containing some fine shell fragments.		0.21	0.17
		Hit very coarse shell 8.0m.			
		END OF HOLE 8.0m.			
		AVERAGE			0.10

36

727040

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 2/87

AREA: BLACK RIVER BEACH

LINE NO: 1 HOLE NO: BR24

LOGGED BY: ANDREW DOVE

DATE DRILLED: March, 1988

040

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1.0		SAND, fine to v. fine grained. Grey, organic.		0.07	0.08
1.0 - 2.0		SAND. fine grained, brown.			
2.0 - 3.0		AS ABOVE		0.01	0.12
3.0 - 4.0		SAND, fine grained, white. Orange mottle.			
4.0 - 5.0		AS ABOVE, becoming white. White at base.		0.03	0.10
5.0 - 6.0		SAND, fine grained, white, abundant fine shell.			
6.0 - 7.0		AS ABOVE		0.01	0.03
7.0 - 8.0		AS ABOVE			
8.0 - 9.0		AS ABOVE		0.01	0.03
		END OF HOLE 4.0m. Hit very coarse shell.			
		AVERAGE			0.08

37

727041

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 2/87

AREA: BLACK RIVER BEACH

LINE NO: 1

HOLE NO: BR28

LOGGED BY: ANDREW DOVE

DATE DRILLED: March, 1988

041

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1.0		SAND, fine to v. fine grained. Grey, organic.		0.10	0.08
1.0 - 2.0		SAND, fine grained, light brown.			
2.0 - 3.0		AS ABOVE, light brown-dark brown mottle.		0.03	0.09
3.0 - 4.0		AS ABOVE, becoming lighter with depth - orange-amber base.			
4.0 - 5.0		SAND, fine grained, orange-amber. White at base.		0.01	0.13
5.0 - 6.0		AS ABOVE, white. Abundant fine shell.			
6.0 - 7.0		SAND, fine grained, white-orange-light brown mottle.		0.02	0.17
		END OF HOLE 8m.			
		Hit rock			
		AVERAGE			0.11

38

727042

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 2/87

AREA: BLACK RIVER BEACH

LINE NO: 2 HOLE NO: BRO

LOGGED BY: ANDREW DOVE

DATE DRILLED: March, 1988

042

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1.0		SAND, fine to medium grained, amber, abundant fine shell.		1.24	0.18
1.0 - 2.0		AS ABOVE Started sludging 1.4m.			
2.0 - 3.0		AS ABOVE			
3.0 - 4.0		AS ABOVE, abundant coarse shell, becoming grey.		4.13	0.09
4.0 - 5.0		AS ABOVE, less coarse shell, grey.			
5.0 - 5.5		AS ABOVE, hit very coarse shell.		2.46	0.09
		END OF HOLE 5.5m. Coarse shell			
		AVERAGE			0.12

39

727043

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 2/87

AREA: BLACK RIVER BEACH

LINE NO: 2

HOLE NO: BR4

LOGGED BY: ANDREW DOVE

DATE DRILLED: March, 1988

043

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1.0		SAND, fine to very fine grained, abundant very fine shell. Amber.		0.02	0.06
1.0 - 2.0		AS ABOVE, becoming slightly coarser.			
2.0 - 3.0		AS ABOVE, hit grey horizon half way down.			
3.0 - 4.0		SAND, fine grained, amber-grey mottle. Abundant fine shell.		0.03	0.11
4.0 - 5.0		AS ABOVE, amber.			
5.0 - 6.0		AS ABOVE.		0.01	0.04
6.0 - 6.8		AS ABOVE, hit coarse shell		0.18	0.23
		END OF HOLE 6.8m. Hit very coarse shell			
		AVERAGE			0.09

40

727044

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 2/87

AREA: PERKINS ISLAND

LINE NO: 1 HOLE NO: PIO

LOGGED BY: ANDREW DOVE

DATE DRILLED: March, 1988

41

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 2.0		SAND, fine to medium grained, amber, black, white mottle. Organic at top.		0.14	0.28
2.0 - 4.0		SAND, fine to medium grained, light brown-orange.		0.02	0.41
4.0 - 6.0	7.0	SAND, fine to medium grained, amber. Abundant fine shell. H.M. traces. Started sludging 5.0m.		0.30	0.13
6.0 - 7.0	3.5	SAND, fine to medium grained, light grey. H.M. present Abundant fine shell.		0.84	0.19
7.0 - 8.0	5.5	AS ABOVE, coarse shell at base. END OF HOLE 8.0m. Coarse shell.			
		AVERAGE			0.25

41

727043

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 2/87

AREA: PERKINS ISLAND

LINE NO: 1 HOLE NO: P18

LOGGED BY: ANDREW DOVE

DATE DRILLED: March, 1988

045

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 2.0	3.5	SAND, fine to medium grained, grey. Dark grey at top - organics. Started sludging		0.59	0.17
2.0 - 3.0		SAND, fine to medium grey, light grey. H.M. present		0.53	0.15
3.0 - 4.0		AS ABOVE, hit coarse shell at base. END OF HOLE 4.0m. Coarse shell			
AVERAGE					0.16

42

727046

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 2/87

AREA: PERKINS ISLAND

LINE NO: 1 HOLE NO: PI16

LOGGED BY: ANDREW DOVE

DATE DRILLED: March, 1988

C46

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 2.0		SAND, fine to medium grained, grey to orange. Organic at top.		0.05	0.12
2.0 - 3.0		SAND, fine to medium grained, greyish brown, slightly organic. Started sludging		0.31	0.11
3.0 - 4.0	3.5	SAND, fine to medium grained, light grey. H.M. present Fine shell present.			
4.0 - 5.0	3.0	AS ABOVE, some coarse shell.		0.51	0.20
5.0 - 6.0	5.0	AS ABOVE			
6.0 - 6.6		AS ABOVE END OF HOLE 6.6m. Wouldn't go down.		0.26	0.10
		AVERAGE			0.14

43

727047

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 2/87

AREA: PERKINS ISLAND

LINE NO: 1 HOLE NO: PI24

LOGGED BY: ANDREW DOVE

DATE DRILLED: March, 1988

647

44

727048

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 2.0		SAND, fine to medium grained, grey-orange mottle - organic at top.		0.17	0.27
2.0 - 4.0		SAND, fine to medium grained, amber to orange.		0.02	0.16
4.0 - 6.0		SAND, fine to medium grained, white. Abundant fine shell. H.M. traces.		0.01	0.18
6.0 - 8.0		AS ABOVE, some coarse shell. Started sludging 7.5m.		0.13	0.17
8.0 - 9.0	5.0	AS ABOVE, coarse shell, H.M. trace.		1.1	0.10
9.0 - 10.0		AS ABOVE, grey at base, some coarse shell. END OF HOLE 10.0m.			
		AVERAGE			0.15

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 2/87

048

AREA: PERKINS ISLAND

LINE NO: 1 HOLE NO: PI32N

LOGGED BY: ANDREW DOVE

DATE DRILLED: March, 1988

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 2.0		SAND, fine to medium grained, grey - white at base, organic at top. Started sludging.		0.27	0.20
2.0 - 3.0	3.0	SAND, fine to medium grained, light grey, fine shell, H.M. present		0.70	0.13
3.0 - 4.0	5.5	AS ABOVE, some coarse shell			
4.0 - 4.5	2.3	AS ABOVE END OF HOLE 4.5m. Wouldn't go down. Probably some shell.		0.30	0.19
		AVERAGE			0.17

45

727049

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 2/87

AREA: PERKINS ISLAND

LINE NO: 1 HOLE NO: PI40N

LOGGED BY: ANDREW DOVE

DATE DRILLED: March, 1988

049

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 2.0		SAND, fine to medium grained, grey at top. Amber at base. Organic at top.		0.08	0.16
2.0 - 3.0		SAND, fine to medium grained. Light grey. Started sludging		0.15	0.17
3.0 - 4.0	3.2	SAND, fine to medium grained, grey. Abundant shell. H.M. at trace.			
4.0 - 4.7	1.75	AS ABOVE, coarse shell. END OF HOLE 4.7m. Coarse shell.		0.42	0.17
		AVERAGE			0.17

46

727050

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 2/87

AREA: PERKINS ISLAND

LINE NO: 1 HOLE NO: PI48N

LOGGED BY: ANDREW DOVE

DATE DRILLED: March, 1988

050

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 2.0		SAND, fine to medium grained, grey. Organic at top. Amber at base. Started sludging 2.0m.		0.18	0.14
2.0 - 3.0	3.2	SAND, fine to med. grained, grey. Abundant fine shell. H.M. trace.		0.24	0.14
3.0 - 4.0	2.8	AS ABOVE			
4.0 - 4.2		AS ABOVE, coarse shell. END OF HOLE 4.2m. Coarse shell.		0.42	0.14
		AVERAGE			0.14

47

727051

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 2/87

AREA: PERKINS ISLAND

LINE NO: 1 HOLE NO: P156N

LOGGED BY: ANDREW DOVE

DATE DRILLED: March, 1988

001

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 2.0		SAND, fine to medium grained, amber-brown mottle.		0.05	0.17
2.0 - 3.0		SAND, fine to med. grained, light grey. H.M. Trace			
		Started sludging 3.0m.		0.13	0.12
3.0 - 4.0	2.4	AS ABOVE. Abundant fine shell			
4.0 - 5.0	3.2	AS ABOVE		0.30	0.10
5.0 - 5.3		AS ABOVE, coarse shell.			
		END OF HOLE 5.3m. Shell			
		AVERAGE			0.13

48

727082

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 2/87

AREA: PERKINS ISLAND

LINE NO: 1 HOLE NO: PI64N

LOGGED BY: ANDREW DOVE

DATE DRILLED: March, 1988

052

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 2.0		SAND, fine to med. grained, dark brown-amber mottle, organics at top Started sludging		0.14	0.19
2.0 - 3.0	3.2	SAND, fine to med. grained, light grey. Abundant fine shell.		0.64	0.22
3.0 - 4.0	4.0	AS ABOVE			
4.0 - 4.3	1.6	AS ABOVE END OF HOLE 4.3m. Shell		0.42	0.19
		AVERAGE			0.20

49

727053

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 2/87

AREA: PERKINS ISLAND

LINE NO: 1 HOLE NO: 69N

LOGGED BY: ANDREW DOVE

DATE DRILLED: March, 1988

053

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 2.0		SAND, fine grained, amber.		0.09	0.34
2.0 - 3.0		SAND, fine to medium grained, light grey. H.M. trace Started sludging		0.07	0.26
3.0 - 3.8	3.2	AS ABOVE, abundant fine shell END OF HOLE 3.8m. Shell			
		AVERAGE			0.30

50

727054

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: EL 2/87

AREA: PERKINS ISLAND

LINE NO: 1 HOLE NO: PI79N

LOGGED BY: ANDREW DOVE

DATE DRILLED: March, 1988

004

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 2.0		SAND, fine to medium grained, amber. Slightly organic at top. Started sludging		0.01	0.18
2.0 - 3.0	3.6	SAND, fine to medium grained, grey. Abundant fine shell.		0.31	0.15
3.0 - 4.0	4.4	AS ABOVE, some coarse shell.			
		END OF HOLE 4.0m. Shell			
		AVERAGE			0.17

51

727055

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: E.L. 2/87

AREA: SMITHTON

LINE NO: HOLE NO: S 1

LOGGED BY: ANDREW DOVE

DATE DRILLED: October, 1987

015

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, greenish brown at top, organic, white at base.			
		STARTED SLUDGING			
1 - 2		SAND, fine to medium grained, light grey, indurated layer.		0.03	0.08
		END OF HOLE. 2.0m. Inudrated.			
		Average			0.08

53

727057

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: E.L. 2/87

AREA: SMITHTON

LINE NO: HOLE NO: S 2

LOGGED BY: ANDREW DOVE

DATE DRILLED: October, 1987

057

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, brown, organic. STARTED SLUDGING			
1 - 2		SAND, fine to medium grained, light brown, muddy.		0.36	0.05
2 - 2.6		AS ABOVE, contains fine and very coarse shell. END OF HOLE. 2.6m. Shell.		0.42	0.15
		Average			0.07

54

727058

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: E.L. 2/87

AREA: SMITHTON

LINE NO: HOLE NO: S 3

LOGGED BY: ANDREW DOVE

DATE DRILLED: October, 1987

058

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, dark grey, organic.			
1 - 2		SAND, fine to medium grained, grey, started sludging 1.5m., coarse shell at base.			
2 - 2.5		AS ABOVE, abundant coarse shell.			
		END OF HOLE. 2.5m. Shell.			

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: E.L. 2/87

AREA: SMITHTON

LINE NO: HOLE NO: S 4

LOGGED BY: ANDREW DOVE

DATE DRILLED: October, 1987

059

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, dark grey organic. STARTED SLUDGING			
1 - 2		SAND, fine to medium grained, grey, muddy.			
2 - 2.9		AS ABOVE, contains abundant coarse shell. END OF HOLE. 2.9m. Coarse Shell.			

56

727060

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: E.L. 2/87

AREA: SMITHTON

LINE NO: HOLE NO: S 5

LOGGED BY: ANDREW DOVE

DATE DRILLED: October, 1987

060

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, dark grey, organic.			
1 - 2		SAND, fine to medium grained, brown, slightly indurated.		0.41	0.04
		STARTED SLUDGING			
2 - 3		SAND, fine to medium grained, light brown.		0.76	0.22
3 - 3.3		AS ABOVE.			
		END OF HOLE. 3.3m. Inudrated.			
		Average			0.11

57

727061

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: E.L. 2/87

AREA: SMITHTON

LINE NO: HOLE NO: S 6

LOGGED BY: ANDREW DOVE

DATE DRILLED: October, 1987

CGI

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, dark grey, organic, light grey at base.			
1 - 2		SAND, fine to medium grained, brown. STARTED SLUDGING			
2 - 3		AS ABOVE, indurated and clay. END OF HOLE. 3.0m.			

58

727062

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: E.L. 2/87

AREA: SMITHTON

LINE NO: HOLE NO: S 7

LOGGED BY: ANDREW DOVE

DATE DRILLED: October, 1987

002

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, dark grey, organic. STARTED SLUDGING			
1 - 2		SAND, fine to medium grained, grey, contains clay.		0.70	0.08
2 - 3		AS ABOVE, contains shell.		0.54	0.53
		END OF HOLE. 3.0m. Coarse shell and rock.			
		Average			0.23

59

725063

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: E.L.2/87

AREA: SMITHTON

LINE NO: HOLE NO: S 8

LOGGED BY: ANDREW DOVE

DATE DRILLED: October, 1987

003

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, grey, clayey. END OF HOLE. 1.0m. Clay.			

09

727064

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: E.L. 2/87

AREA: EAST INLET

LINE NO: HOLE NO: EI 0

LOGGED BY: ANDREW DOVE

DATE DRILLED: October, 1987

004

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, white contains black organics.			
1 - 2		SAND, fine to medium grained, black organic, indurated.		0.14	0.04
		END OF HOLE. 2.0m. Indurated.			
		Average			0.04

61

727063

CLIENT: NATIONAL MINERAL SANDS

TITLE NO: E.L. 2/87

AREA: EAST INLET

LINE NO: HOLE NO: EI 1

LOGGED BY: ANDREW DOVE

DATE DRILLED: October, 1987

605

Interval (m)	Wet Wt. (kg)	Description	% Slime	% +600 um	% H.M.
0 - 1		SAND, fine to medium grained, brown organic, light grey at base.			
1 - 1.4		SAND, fine to medium grained black indurated.		0.65	0.25
		END OF HOLE. 1.4m Indurated.			
		Average			0.25

62

727066

686

12.2 Appendix 2

Results of Laboratory Heavy Mineral Separations



Gold Coast Assay Services



20 WHEELER CRESCENT, CURRUMBIN, GOLD COAST, QUEENSLAND, AUSTRALIA
POSTAL ADDRESS: P.O. BOX 31 CURRUMBIN, QUEENSLAND, 4223.
TELEPHONE: (075) 34 7255. TELEX: AA40451

LABORATORY REPORT

SOURCE: PETER H. STITT & ASSOCIATES PTY. LTD.

SAMPLE: 8 sand samples for Heavy Mineral separation.

Heavy Mineral Separation
at S.G. 2.97 (TBE)

Sample	%H/M
A 1½ MS	0.294%
A 2 MS 400	0.814%
B 1½ MS	0.154%
No. 1	0.070%
No. 2	0.027%
No. 3	0.036%
No. 4	0.079%
No. 5	0.025%

Signatory.....

C.H. RAHNER
(C.H. RAHNER)

PHYSICAL SEPARATIONS & X.R.F ANALYSIS

DETRITAL HEAVY MINERAL SUITES
GENERAL LABORATORY ANALYSIS



008 SMITHTON
SEVEN MILE
EL 2/87

65

727069

SM0	0-2.0	0.04	99.96	0.46
"	2.0-4.0	0.24	99.76	0.46
"	4.0-6.0	0.19	99.81	0.47
"	6.0-8.0	0.06	99.94	0.82
"	8.0-9.0	0.02	99.98	0.56
SM10	0-2.0	1.54	98.46	0.28
"	2.0-4.0	0.16	99.84	0.25
"	4.0-6.0	0.19	99.81	0.27
"	6.0-8.0	0.12	99.88	0.41
"	8.0-10.0	0.02	99.98	0.29
SM50	0-2.0	0.48	99.52	0.52
"	2.0-4.0	0.17	99.83	0.28
"	4.0-6.0	0.41	99.59	0.23
"	6.0-8.0	0.23	99.77	0.40
"	8.0-10.0	0.48	99.52	0.40

BLACK RIVER BEACH (Line 1)

BR-4	0-2m	0.02	99.98	0.06
	2-4m	0.71	99.29	0.04
	4-6m	9.68	90.32	0.05
	6-8m	3.11	96.89	0.03
	8-9m	0.10	99.90	0.07
	9-10m	1.96	98.04	0.03
BR-8	0-2m	0.04	99.96	0.11
	2-4m	0.02	99.98	0.18
	4-6m	0.01	99.99	0.04
	6-8m	0.01	99.99	0.12
	8-10m	0.02	99.98	0.16

BLACK RIVER BEACH (Line 2)

BR-0	0-2m	1.24	98.76	0.18
	2-4m	4.13	95.87	0.09
	4-5.5m	2.46	97.54	0.09
BR-4	0-2m	0.02	99.98	0.06
	2-4m	0.03	99.97	0.11
	4-6m	0.01	99.99	0.04
	6-6.8m	0.18	99.82	0.23

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BLACK RIVER BEACH (LINE 1)

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BR-0	0-2m	0.41	99.59	0.07
	2-4m	8.39	91.61	0.05
	4-5.7m	9.51	90.49	0.08
BR-12	0-2m	0.05	99.95	0.12
	2-4m	0.11	99.89	0.02
	4-4.5m	0.06	99.94	0.06
BR-16	0-2m	0.16	99.84	0.02
	2-4m	0.04	99.96	0.04
	4-4.7m	0.04	99.96	0.03
BR-20	0-2m	0.11	99.89	0.09
	2-4 m	0.08	99.92	0.06
	4-6m	0.01	99.99	0.07
	6-8m	0.21	99.79	0.17
BR-24	0-2 m	0.07	99.93	0.08
	2-4m	0.01	99.99	0.12
	4-6m	0.03	99.97	0.10
	6-8m	0.01	99.99	0.03
	8-9m	0.01	99.99	0.03
BR-28	0-2m	0.10	99.90	0.08
	2-4m	0.03	99.97	0.09
	4-6m	0.01	99.99	0.13
	6-8m	0.02	99.98	0.17

PI-0	0-2m	0.14	99.86	0.28
	2-4m	0.02	99.98	0.41
	4-6m	0.30	99.70	0.13
	6-8m	0.84	99.16	0.19
PI-8	0-2m	0.59	99.41	0.17
	2-4m	0.53	99.47	0.15
PI-16	0-2m	0.05	99.95	0.12
	2-4m	0.31	99.69	0.11
	4-6m	0.51	99.49	0.20
	6-6.6m	0.26	99.74	0.10
PI-24	0-2m	0.17	99.83	0.27
	2-4m	0.02	99.98	0.16
	4-6m	0.01	99.99	0.18
	6-8m	0.13	99.87	0.17
	8-10m	1.1	98.90	0.10
PI-32	0-2m	0.27	99.73	0.20
	2-4m	0.70	99.30	0.13
	4-4.5m	0.30	99.70	0.19
PI-40	0-2m	0.08	99.92	0.16
	2-4m	0.15	99.85	0.17
	4-4.7m	0.42	99.58	0.17
PI-48	0-2m	0.18	99.82	0.14
	2-4.0m	0.24	99.76	0.14
	4.0-4.2m	0.42	99.58	0.14
PI-56	0-2m	0.05	99.95	0.17
	2-4m	0.13	99.87	0.12
	4-5.3m	0.30	99.70	0.10
PI-64	0-2m	0.14	99.86	0.19
	2-4m	0.64	99.36	0.22
	4-4.3m	0.42	99.58	0.19
PI-69	0-2m	0.09	99.91	0.34
	2-3.8m	0.07	99.93	0.26
PI-79	0-2m	0.01	99.99	0.18
	2-4m	0.31	99.69	0.15
PI-89	0-2m	0.11	99.89	0.25
	2-4m	0.09	99.91	0.17

OTHER AREAS

E10	0-2.0m	0.14	99.86	0.04
E11	0-1.4m	0.65	99.35	0.25
S1	0-2.0m	0.03	99.97	0.08
S2	0-2.0m	0.36	99.64	0.05
	2.0-2.6m	0.42	99.58	0.15
S5	0-2.0m	0.41	99.59	0.04
	2.0-3.3m	0.76	99.24	0.22
S7	0-2.0m	0.70	99.30	0.08
	2.0-3.0m	0.54	99.46	0.53

12.3 Appendix 3

Mineralogical Examination

Perkins Island

Seven Mile beach

APPLIED PETROGRAPHIC SERVICES

SPECIALIZING IN PETROGRAPHIC ANALYSIS OF GEOLOGICAL AND INDUSTRIAL SAMPLES

P.O. Box 257
Strawberry Hills
Sydney, N.S.W. 2012

2A RAILWAY AVENUE
STANMORE
NSW 2048

Phone: (02) 516 4808

CLIENT: PETER H. STITT & ASSOC. PTY LTD

DATE: 23.9.88

SAMPLE DETAILS: PERKINS ISLAND (1)

JOB NO.: APS M 122

PI 0, PI 8, PI 16, PI 24, PI 32, PI 40.

	TOTAL	HAND MAGS	0.5A MAGS	0.9A MAGS	1.2A MAGS	1.2A NON MAGS
MAGNETITE	<1	40	-	-	-	-
ILMENITE	10	-	76	11	-	-
LEUCOX. ILMENITE	3	-	-	5	5	-
IRON OXIDES	5	60	3	8	6	-
CHROMITE	-	-	-	-	-	-
GARNET	3	-	12	3	2	-
TOURMALINE	21	-	2	36	34	<1
STAUROLITE	-	-	-	-	-	-
EPIDOTE	1	-	-	2	1	-
ROCK FRAGMENTS	-	-	-	-	-	-
ALUMINO-SILICATES	4	-	-	-	-	12
OTHER SILICATES	22	-	7	35	40	-
RUTILE	1	-	-	-	-	3
LEUCOXENE	28	-	-	-	-	79
ZIRCON	2	-	-	-	-	4
QUARTZ	<1	-	-	-	-	1
PYRITE	<1	-	-	-	1	1
CORUNDUM	<1	-	-	-	-	<1
SHELL	<1	-	-	-	11	<1
APATITE	-	-	-	-	-	-
MONAZITE	<1	-	-	<1	<1	<1
SHEELITE	-	-	-	-	-	-
CASSITERITE						
WEIGHT	1.7664g	0.0047g	0.0956g	0.9846g	0.0577g	0.6238g
%	100%	0.3%	5.4%	55.7%	3.3%	35.3%
NO. OF POINTS			556	511	546	514

073

APPLIED PETROGRAPHIC SERVICES

SPECIALIZING IN PETROGRAPHIC ANALYSIS OF GEOLOGICAL AND INDUSTRIAL SAMPLES

P.O. Box 257
Strawberry Hills
Sydney, N.S.W. 2012

2A RAILWAY AVENUE
STANMORE
NSW 2048

Phone: (02) 516 4808

CLIENT: PETER H. STITT & ASSOC. PTY LTD

DATE: 23.9.88

SAMPLE DETAILS: BLACK RIVER BEACH

JOB NO.: APS M 122

BR 0, BR 4, BR 8, BR 12, BR 16, BR 20, BR 24, BR 28.

	TOTAL	HAND MAGS	0.5A MAGS	0.9A MAGS	1.2A MAGS	1.2A NON MAGS
MAGNETITE	<1	10	-	-	-	-
ILMENITE	9	-	72	10	-	-
LEUCOX. ILMENITE	3	-	-	5	8	-
IRON OXIDES	11	90	6	15	23	1
CHROMITE	-	-	-	-	-	-
GARNET	2	-	9	2	-	-
TOURMALINE	17	-	-	29	27	1
STAUROLITE	<1	-	<1	<1	-	-
EPIDOTE	1	-	-	2	2	-
ROCK FRAGMENTS	-	-	-	-	-	-
ALUMINO-SILICATES	3	-	-	-	-	8
OTHER SILICATES	21	-	13	37	27	-
RUTILE	1	-	-	-	-	2
LEUCOXENE	32	-	-	-	-	86
ZIRCON	<1	-	-	-	-	1
QUARTZ	<1	-	-	-	-	1
PYRITE	-	-	-	-	-	-
CORUNDUM	-	-	-	-	-	-
SHELL	<1	-	-	-	13	<1
APATITE	-	-	-	-	-	-
MONAZITE	<1	-	-	<1	<1	-
SCHEELITE	-	-	-	-	-	-
CASSITERITE						
WEIGHT	2.6274g	0.0605g	0.1203g	1.3789g	0.0838g	0.9839g
%	100%	2.3%	4.6%	52.5%	3.2%	37.4%
NO. OF POINTS			510	550	560	556

WALKER
ISLAND

ROBBINS
ISLAND

EL 2/87

AMG335050E,
5444700N

PASSAGE

ROBBINS

Montagu •

PERKINS
ISLAND

Perkins
Channel

PERKINS BAY

Anthony Beach

Stanley • The Nut
Circular Head

AMG 355600E
5487000N

East Inlet

• Smithton

5 cm

SCALE 1:50000

0 1 2 3 4 5 km

AMG REFERENCE POINTS ADDED

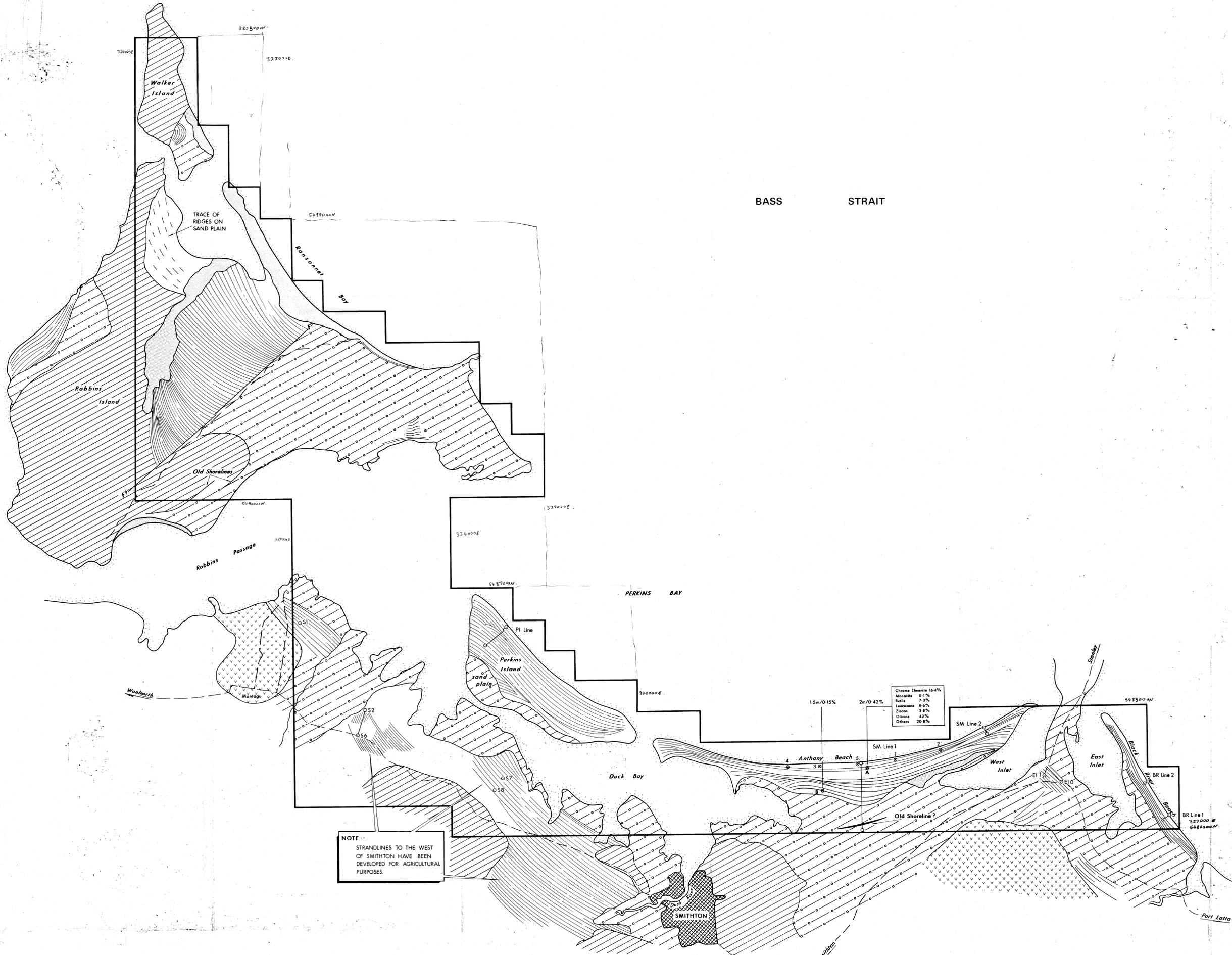
727075

NATIONAL MINERAL SANDS P/L
EL 2/87
LOCATION MAP

Author: A.DOVE	Date: SEPT. '88	Fig. No.: 1
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7733

88-2869



BASS STRAIT



5cm

LEGEND

- Aeolian Sand Dunes
- Beach Ridge Strandlines
- Sand Plain & Alluvial Delta
- Track / Road
- Basement
- Volcanics
- Drillhole

SCALE 1:42 000

0 800 1600 2400 3200 4000 m.

727076

NATIONAL MINERAL SANDS P/L
 EL 2/87 TASMANIA
AIR PHOTO INTERPRETATION
SMITHTON TO ROBINS ISLAND
 Author: G. LEE Date: SEPT. '88 Figure: 2

NOTE:-
 STRANDLINES TO THE WEST
 OF SMITHTON HAVE BEEN
 DEVELOPED FOR AGRICULTURAL
 PURPOSES.

Chrome Irons	16.4%
Monazite	0.1%
Rutile	7.3%
Leucosene	8.0%
Zircon	3.8%
Olivine	42%
Others	20.4%

88-2869