

Open File Envelope

No. 9578

EL 2538

BORDERTOWN

ANNUAL AND RELINQUISHMENT REPORT FOR THE PERIOD 18/8/98 TO 17/8/99

Submitted by

Minotaur Gold NL
1999

© 17/8/99

This report was supplied as part of the requirement to hold a mineral or petroleum exploration tenement in the State of South Australia.
PIRSA accepts no responsibility for statements made, or conclusions drawn, in the report or for the quality of text or drawings.
This report is subject to copyright. Apart from fair dealing for the purposes of study, research, criticism or review as permitted under the Copyright Act, no part may be reproduced without written permission of the Chief Executive of Primary Industries and Resources South Australia, GPO Box 1671, Adelaide, SA 5001.

Enquiries: Customer Services
Ground Floor
101 Grenfell Street, Adelaide 5000

Telephone: (08) 8463 3000
Facsimile: (08) 8204 1880



**PRIMARY INDUSTRIES
AND RESOURCES SA**

Minotaur Gold

Strand Minerals NL

A.C.N. 061 559 840

A.C.N. 078 729 325

Minotaur Gold NL

1A Gladstone Street, Fullarton 5063, South Australia

Tel: +61 8 8338 3333

Fax: +61 8 8338 3233

Email mingold@ozemail.com.au

EL 2538 BORDERTOWN

**FIRST ANNUAL TECHNICAL
AND RELINQUISHMENT REPORT**

**FOR THE PERIOD
18TH AUGUST 1998 TO 17TH AUGUST 1999**

**H. S. R. FREEMAN
PROJECT GEOLOGIST**

**A.P. BELPERIO
CHIEF GEOLOGIST**

6th November 1999

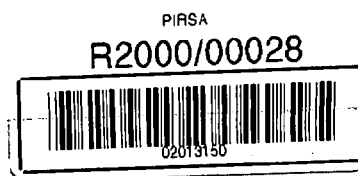
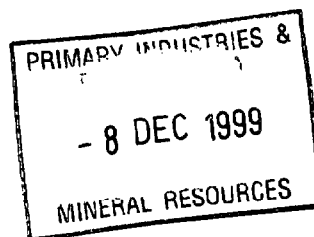
MAP REFERENCE:

1:250,000 MAP SHEET NARACOORTE SJ 54-2

1:100,000 MAP SHEETS KEITH 6925, CANAWIGARA

7025, NARACOORTE 7024

**DISTRIBUTION: MINOTAUR GOLD NL
PIRSA**



CONTENTS

1.0	INTRODUCTION	3
2.0	GEOLOGICAL SETTING AND PREVIOUS WORK	4
3.0	WORK COMPLETED	5
4.0	RESULTS	6
5.0	CONCLUSION	6
6.0	REFERENCES	7

FIGURES

- Figure 1** **Location of EL 2358 Bordertown, Areas A, B and C**

- Figure 2** **Palaeogeography of the Bordertown area**

TABLES

- Table 1** **Aircore drillhole locations**

- Table 2** **%HM Results**

APPENDIX

Geological logs

1.0 INTRODUCTION

This is the combined first annual technical report and final relinquishment report for the Bordertown Project area (EL 2358). The location of the licence, comprising Areas A, B and C and with a total area of approximately 1041km², is shown in **Figure 1**.

The ground was acquired by Southern Diamonds, a wholly owned subsidiary of Minotaur Gold, on 18th August 1998 to explore for high grade, strandline-related, heavy mineral accumulations in the Pliocene Parilla Sand. Southern Diamonds subsequently changed its name to Strand Minerals NL.

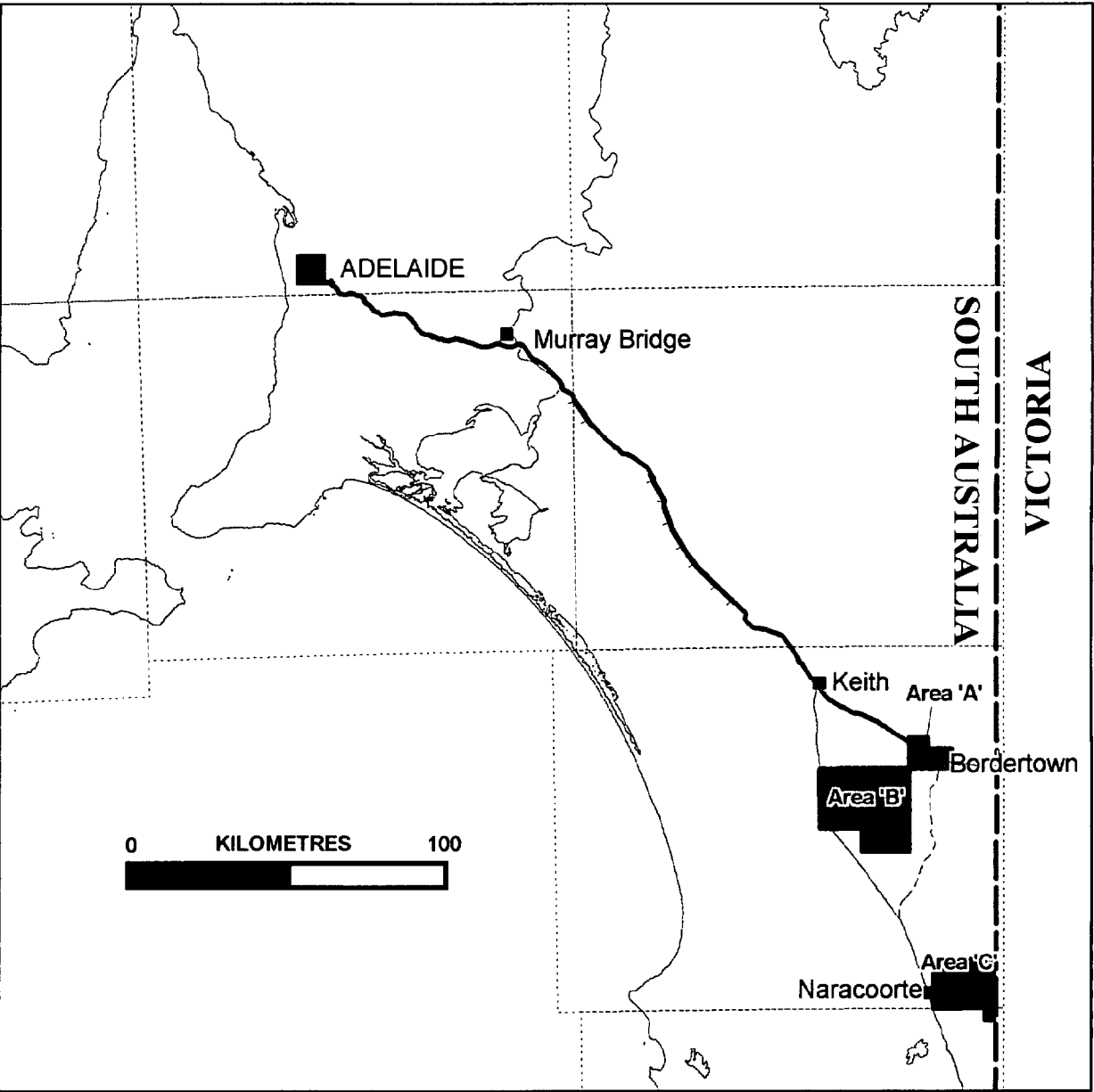


Figure 1 Location of EL 2358 Bordertown, Areas A, B and C

2.0 GEOLOGICAL SETTING AND PREVIOUS WORK

The licence areas lie in the SW corner of the intracratonic Tertiary-Quaternary Murray Basin, comprising fluvial and shallow marine sediments. The main lithologies observed in outcrop and from drilling include:

- Cambro-Ordovician felsic intrusives and volcanics.
- Eocene-Miocene marine limestone (Gambier Limestone)
- Pliocene marginal marine, transgressive to regressive, fine to coarse Parilla-Loxton sands which disconformably overlie the Miocene marine carbonates
- Pleistocene aeolian calcarenites and barrier shoreline deposits.

The Parilla Sand, the primary target for economic concentrations of heavy minerals, is present both in outcrop and in the subsurface for all three areas. Previous investigations by Belperio and Bluck (1990), Bluck (1989), Creelman (1989) and Richards and Jenke (1986) had highlighted the presence of a suitable suite of heavy minerals (albeit in low grades), and a palaeo-shoreline system capable of concentrating the heavy minerals into more suitable grade strandline-related accumulations. Former strandlines (**Figure 2**) are present on the east side of Bordertown, and to the southwest where they become increasingly calcareous before merging with the Pleistocene calcareous dune systems of the Coorong coastal plain. Coastal palaeogeography and morphodynamics are considered conducive to the concentration of heavy mineral sands in the palaeo swash zone (Belperio, 1999).

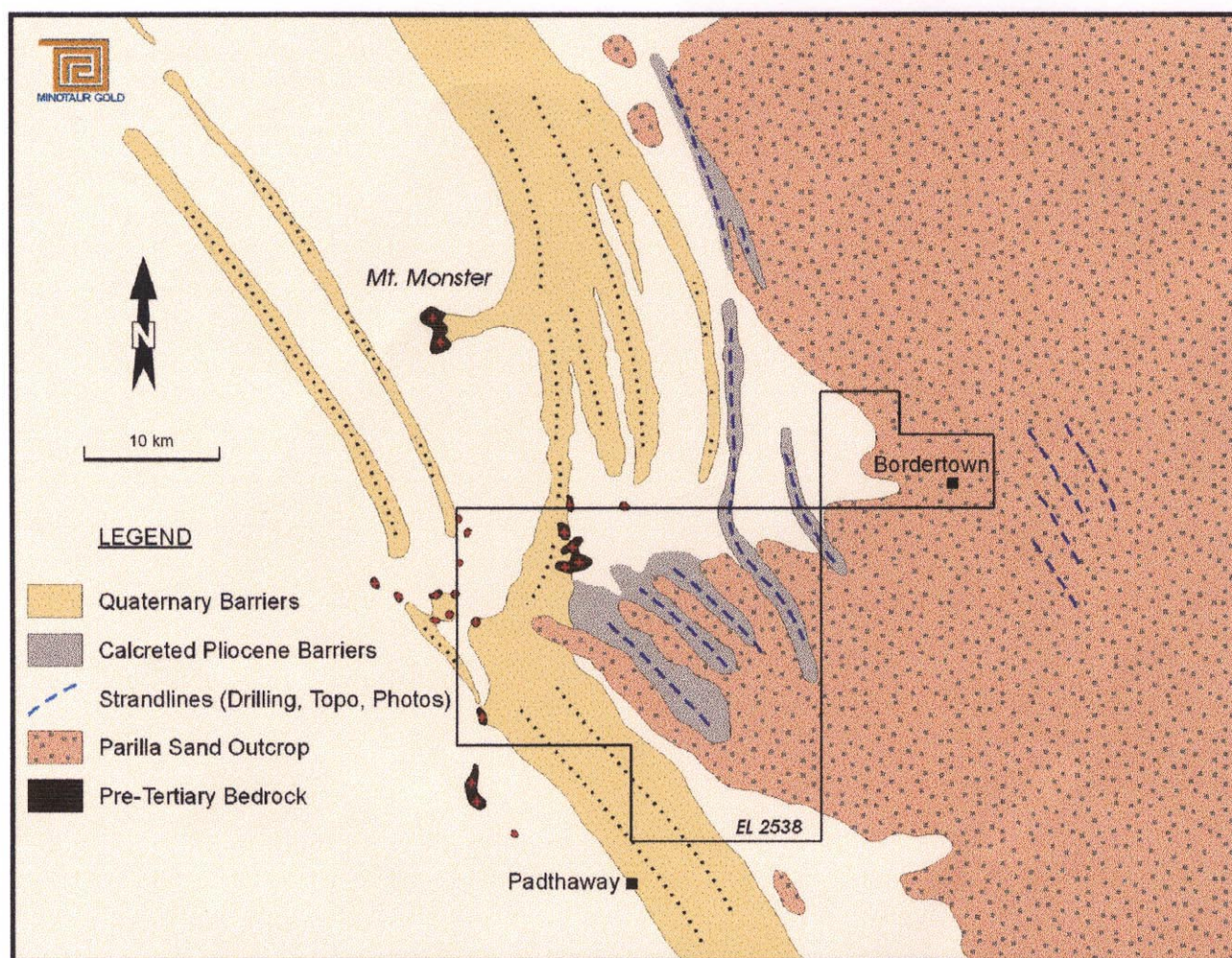


Figure 2 Palaeogeography of the Bordertown Area

3.0 WORK COMPLETED

Previous exploration revealed only modest mineral sand grades (best 4m @ 1.1% from 6-10m) within the licence area. Previous drilling had tested zones of outcropping Parilla Sand. An aircore drilling was proposed to test the seaward slopes of the Pliocene calcreted barriers (Figure 2) at a number of roadside localities.

A reverse circulation aircore drilling program of 23 holes for 556 metres was completed in April 1999. Vertical holes were drilled on road verges at 10 localities in Areas A and B. Drillhole locations were recorded using a Garmin GPS with ±100m accuracy. Split samples (approx. 1kg) were collected at 1m intervals and logged on site. Samples with visible heavy minerals were submitted to AMDEL Laboratories for assay. Drillholes were backfilled immediately upon completion of drilling and any disturbance cleaned up to its former state.

A summary of aircore drillhole collars is given in Table 1 and in digital form (collars.txt). Geological logs are given in Appendix 1. Subsamples of all drillholes were lodged with PIRSA Core Library.

Location	Hole ID	Easting (mE) *	Northing (mN) *	RL (m)	Dip	DEPTH
		AMG Zone 54	AGD 84	approx.	deg.	(m)
"Pikes"	BT-1	482270	5983480	93	-90	22
"Pikes"	BT-2	482160	5983060	88	-90	24
Creecoona Nth	BT-3	481650	5981990	91	-90	20
Wirrega	BT-4	464675	5973920	79	-90	22
Wirrega	BT-5	464200	5973700	76	-90	25
Wirrega	BT-6	463950	5973550	72	-90	24
Wirrega	BT-7	463700	5973440	70	-90	18
Changwa	BT-8	460900	5973600	63	-90	16
"Para-Gum"	BT-9	459770	5972490	66	-90	24
"Para-Gum"	BT-10	459590	5972195	75	-90	23
"Para-Gum"	BT-11	459500	5972000	68	-90	30
Swede Flat	BT-12	451000	5963190	95	-90	42
Swede Flat	BT-13	450550	5963010	75	-90	29
Challa Downs	BT-14	453300	5968000	75	-90	30
Challa Downs	BT-15	453500	5968200	80	-90	30
Challa Downs	BT-16	453700	5968400	84	-90	30
Thornton Park	BT-17	468100	5977360	70	-90	24
Thornton Park	BT-18	468470	5977350	80	-90	18
Wampoony	BT-19	459880	5975980	65	-90	18
Wampoony	BT-20	459480	5975930	58	-90	15
Wangoola Downs	BT-21	451870	5973775	75	-90	15
Christmas Rocks	BT-22	446550	5974870	75	-90	33
Christmas Rocks	BT-23	447020	5974800	68	-90	24

Table 1 Aircore drillhole localities (* coordinates not DGPS)

4.0 RESULTS

A suite of variably-cemented quartz, quartz-carbonate and calcarenite sands consistent with a dune sand to strandline sand origin were intersected by the drilling. In general, grain size increased downhole from dune to littoral facies, and carbonate content increased in a westerly direction across the tenement. The latter reflects increasing aridity and increasing dilution of terrestrially-sourced sediment by continental shelf-sourced bioclastics with decreasing age of individual barriers from east to west.

Seven samples were submitted for heavy mineral analysis at AMDEL Laboratories Ltd (Adelaide). Portions of the -3.35+0.038mm fraction were separated using tetrabromoethane (SG 2.96). Generally poor results were obtained with a best result from BT-3 of 1m @ 0.52%HM from 13m depth. No differentiation of the heavy mineral suite has been undertaken. All results are given in Table 2 and in digital format (HM_results.txt).

The best heavy mineral concentrations intersected came from variably cemented quartz-carbonate sand and calcarenite. Only one intersection was associated with medium to coarse grained sand: BT-1, 11-12m.

HOLE ID	Depth from (m)	Depth to (m)	Result (Total -3.35mm)
BT-1	11	12	1m @ 0.28% HM
BT-1	20	21	1m @ 0.34% HM
BT-3	13	14	1m @ 0.52% HM
BT-11	20	21	1m @ 0.13% HM
BT-11	23	24	1m @ 0.18% HM
BT-13	16	17	1m @ 0.35% HM
BT-22	24	25	1m @ 0.26% HM

Table 2 %HM Results

5.0 CONCLUSION

Drilling has confirmed a barrier origin for the remnant linear structures between Bordertown and Padthaway with relict strandlines becoming increasingly dominated by carbonate bioclasts and carbonate cement from east to west across the tenement.

Given the poor results obtained from drilling across the seaward slope of most of the barriers (no drillholes returning >1%HM), potential for high grade heavy mineral deposits appears limited.

6.0 REFERENCES

Belperio, A. P. (1999). Geographic and tectonic controls on heavy mineral sand exploration targets in the Murray Basin. *Australian Institute of Geoscientists Bulletin* 26: 15-20.

Belperio, A. P. & Bluck, R. G. (1990). Coastal palaeogeography and heavy mineral sand exploration targets in the western Murray Basin. *The AusIMM Proceedings* 295: 5-10.

Bluck, R. G. (1989). Demis Pty Ltd EL 1555 Woorloo Hill. Reports for the period 9/1/89 to 9/7/89. *MESA Open File Report* ENV 8173.

Creelman, R. A. (1989). Burmine Ltd EL 1425 Bordertown. Progress and Relinquishment reports. *MESA Open File Report* ENV 6937, 8160.

Richards, M. N. & Jenke, G. P.(1986). CRA Ltd EL 1309 Kiama. Progress and Final reports to 14/1/86. *MESA Open File Report* ENV 6509.

Appendix 1

HOLE ID	FROM (m)	TO (m)	LITHOLOGICAL DESCRIPTION
BT-1	0	3	b2 clayey sand
BT-1	3	13	yb3-ob4 medium-coarse sand
BT-1	13	14	y2 calcareous sand
BT-1	14	18	yb3-ob7 medium-coarse sand
BT-1	18	21	o5 fine-(medium) sand
BT-1	21	22	yo6 medium-coarse cemented sand
BT-2	0	5	ab5,b2,ob4 clayey sand
BT-2	5	9	or5 coarse sand / fine gravel
BT-2	9	11	y2-o6 fine-(medium) sand
BT-2	11	13	ob6 medium-coarse sand
BT-2	13	17	o5 fine-(medium) sand
BT-2	17	24	y3 limestone, bryozoal
BT-3	0	2	b4-rb6 clay, sandy clay
BT-3	2	13	o5 medium quartz sand
BT-3	13	19.5	o5 fine quartz sand
BT-3	19.5	20	y3 limestone, bryozoal
BT-4	0	2	ab5 sandy clay, cemented sand, carbonate
BT-4	2	4	a2 calcrete, clay, micaceous clayey sand
BT-4	4	8	rb6 micaceous, calc sand, clayey fine sand
BT-4	8	15	w1 fine-medium carbonate-cemented micaceous sand
BT-4	15	19	ra4-a2 fine-medium sand, fine gravel
BT-4	19	22	ga2 weathered granodiorite
BT-5	0	7	ob6 calc, clayey fine sand, sandy clay
BT-5	7	24	yb3-ob6 micaceous fine sand, carbonate-cemented
BT-5	24	25	w1 limestone, bryozoal
BT-6	0	7	aob5 clayey fine sand
BT-6	7	19	rb-ob fine sand, carbonate cemented
BT-6	19	24	y3 limestone, bryozoal
BT-7	0	8	a-yrb sandy clay, clayey fine sand
BT-7	8	14	rb-ob fine sand, (carbonate)cemented
BT-7	14	18	y4 limestone, bryozoal
BT-8	0	3	clayey fine sand
BT-8	3	6	y5 fine sand , ironstone gravel
BT-8	6	11	y4 fine cemented sand
BT-8	11	16	y3 calc fine sand, calcarenite
BT-9	0	16	(clayey) fine-medium sand, cemented
BT-9	16	24	calcareous fine sand, calcarenite
BT-10	0	21	clayey fine sand
BT-10	21	23	calc fine sand, calcarenite
BT-11	0	3	fine quartz sand, ironstone, calcrete
BT-11	3	17	fine-(medium) quartz sand, cemented
BT-11	17	30	calc fine sand, calcarenite, (coal)

Appendix 1

HOLE ID	FROM (m)	TO (m)	LITHOLOGICAL DESCRIPTION
BT-12	0	5	fine quartz sand
BT-12	5	19	(clayey) fine-medium carbonate-quartz sand, cemented
BT-12	19	37	medium-coarse quartz sand
BT-12	37	42	fine carbonate-quartz sand
BT-13	0	2	ap2 calcrete, fine sand
BT-13	2	29	fine carbonate-cemented carbonate-quartz sand
BT-14	0	7	fine siliceous sand
BT-14	7	18	fine carbonate-quartz sand, calcarenite, cemented
BT-14	18	22	fine-medium calcarenite
BT-14	22	30	fine quartz-carbonate sand
BT-15	0	6	fine quartz sand, Fe, clay micaceous, calcrete
BT-15	6	30	carbonate-cemented fine quartz-carbonate sand (micaceous)
BT-16	0	1	fine siliceous sand
BT-16	1	10	clayey fine quartz-carbonate sand
BT-16	10	30	fine quartz-carbonate sand, cemented
BT-17	0	6	(carbonate) sandy clay
BT-17	7	9	clayey sand
BT-17	9	18	ob5-yb5 clayey quartz-carbonate fine sand
BT-17	18	24	y4 limestone
BT-18	0	1	calcareous fine sand
BT-18	1	18	fine quartz-carbonate sand, cemented
BT-19	0	2	ob4 clayey sand
BT-19	2	16	y3-ob5 carbonate-cemented, fine carbonate-quartz sand
BT-19	16	18	y4 limestone
BT-20	0	9	calcareous sandy clay, clayey sand
BT-20	9	15	y4 limestone
BT-21	0	9	calcareous sandy clay, clayey sand
BT-21	9	15	y5 limestone
BT-22	0	1	calcrete
BT-22	1	23	wi1-y1 fine-(medium) quartz-carbonate sand
BT-22	23	30	ra3-rb6 carbonate-cemented medium siliceous sand, Fe
BT-22	30	33	wy1 fine-medium quartz-(carbonate) sand
BT-23	0	2	fine siliceous sand
BT-23	2	8	wi1-y1 fine-(medium) quartz-carbonate sand
BT-23	8	19	(clay), calcareous medium-(fine) quartz sand, cemented
BT-23	19	24	y1 fine-medium quartz-carbonate sand (calcarenite)

Appendix 1

COLOUR CODES

w	white	1	very pale
y	yellow	2	pale
r	red	3	light
b	brown	4	medium light
p	purple	5	moderate
i	pink	6	dusky
a	grey	7	very dusky
g	green	8	dark
		9	very dark