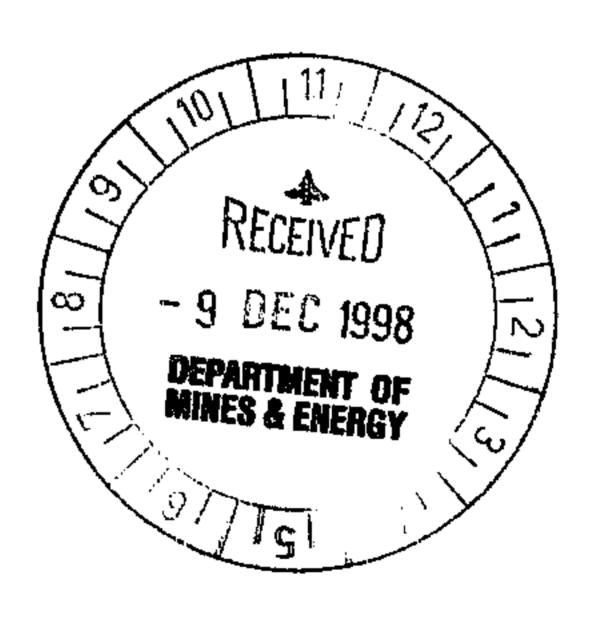
#### STOCKDALE PROSPECTING LIMITED

#### **TANAMI**

EXPLORATION LICENCE 9683 FINAL REPORT

> M.I.MILLIKAN DECEMBER, 1998

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## Stockdale Prospecting Limited

PROJECT NAME:

TANAMI PROJECT (8631)

a De Beers company

TITLE:

Tanami

Exploration Licence 9683

Final Report

**AUTHOR:** 

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EDITED/APPROVED: B.J.McClenaghan

DATE:

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PLACE: Darwin

1.250,000 MAP SHEET NAME & NO:

Tanami (SE 52-15)

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ABSTRACT:

Exploration activities conducted over EL 9683 during the time of tenure involved the collection of reconnaissance heavy mineral samples and the interpretation of 1989 NTGS aeromagnetic survey data. Six acromagnetic anomalies were selected within EL 9683 and each anomaly was ground inspected and sampled.

Full sample results are available and no indicator minerals of interest were recovered. Heavy mineral samples collected over the aeromagnetic anomalies failed to recover kimberlitic indicator minerals.

The licence area is considered to have little potential to host an economic diamond deposit and has been surrendered.

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#### **SUMMARY**

Exploration Licence:

9683

Date Granted:

18/12/96

Relinquishment Date:

30/11/98

Area:

219 Blocks (705 km<sup>2</sup>)

Occupant:

Stockdale Prospecting Limited

Operator:

Stockdale Prospecting Limited

Commodities Sought:

Diamonds

Exploration:

Exploration activities conducted over EL 9683 during the time of tenure involved the collection of reconnaissance heavy mineral samples and the interpretation of 1989 NTGS aeromagnetic survey data. Six aeromagnetic anomalies were selected within EL 9683 and each anomaly was ground inspected and sampled.

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## STOCKDALE PROSPECTING LIMITED EXPLORATION LICENCE 9683 FINAL REPORT

#### 1. INTRODUCTION

Exploration licence 9683 lies on the central region of the Tanami 1:250,000 map sheet (SE52-15). The licence covers an area of just over 705 km<sup>2</sup> some 720 km south-west of Katherine.

Stockdale Prospecting Limited conducted a programme of helicopter assisted reconnaissance heavy mineral sampling and reviewed data from a 1989 NTGS aeromagnetic survey over the licence area. Treatment and examination of the samples collected during reconnaissance exploration revealed no indicator minerals of interest. Exploration procedures and sample results are detailed in this report.

#### 2. TENURE

The project area falls within the Breaden and Tanami 1:100,000 map sheets encompassing parts of the Suplejack Downs Pastoral Station. Tenure details for EL 9683 are outlined in Table 1 and the location of the licence is shown in Map 1.

TABLE 1: TENURE DETAILS

DATE GRANTED (BLOCK	5) (km²)
<b>EL 9683</b> 20/09/96 18/12/96 219	705

Stockdale Prospecting Limited is both the occupant and operator of exploration licence 9683.

### 3. <u>GEOLOGY</u> (summarised from Hodgson, (1975) with reference to Page *et al*, (1995) and Shaw *et al*, (1995))

The majority of the rock units exposed in the project area are of Middle Proterozoic age and form part of the Birrindudu Basin. The Birrindudu Basin overlies the tectonic province of the Granites-Tanami Block and an approximation of stratigraphy is as follows:

#### Archaean

The Granites-Tanami Block has been described by Page et. al. (1995) and Shaw et. al. (1995) as being Archaean in age. The oldest rocks exposed over this ancient block belong to the Tanami Complex; they are tightly folded low grade metasediments and metavolcanics. The Tanami Complex crops out in two small isolated areas just to the north-east and north-west of the licence area and are mapped as the Nongra and Nanny Goat Creek Beds.

#### Lower Proterozoic

The Lower Proterozoic Pargee Sandstone crops out as a north-west trending belt to the west of the licence area, consisting of interbedded silicified sublithic, lithic, and quartz arenites, conglomerate and greywacke. The sublithic arenites and porphyritic acid lavas of the Mount Winnecke Formation crops out to the north-east of the project area and is intruded by the Winnecke Granophyre. The tightly folded and steeply dipping sublithic and quartz arenites of the Supplejack Downs Sandstone can be found just to the north-east of the licence area.

#### Middle Proterozoic

The Granites-Tanami Block is overlain unconformably by the Middle Proterozoic Birrindudu Group, which comprises the Gardiner Sandstone, Talbot Well Formation and Coomarie Sandstone. The medium grained sublithic and quartz arenites of the Gardiner Sandstone dominate the exposed geology in EL 9683, forming resistant monadnocks throughout the gentle undulating land surface. The Talbot Well Formation, consisting of stromatolitic chert (silicified limestone), chert arenites, mudstones and arenites, conformably succeeds the Gardiner Sandstone. This is conformably overlain by the Coomarie Sandstone, which is exposed on the southern portion of the licence area.

#### Cambrian (Lower)

The Lower Cambrian Wiso Basin Antrim Plateau Volcanics (APV) are distributed to the east of the licence area. The APV typically consists of massive porphyritic and tholeittic basalt, which has been intensely weathered and capped by surficial duricrusts and aeolian sands.

#### Cainozoic (Regolith-Landform)

Pisolitic laterites (duricrusts) and unconsolidated aeolian sand dominate the regolith and are common throughout the licence area. The majority of bedrock in EL 9683 is covered by sand cover. The duricrusts form the surface of the physiographic unit, referred to as the Sturt Plateau, and are found to cap basaltic mesas.

#### 4. <u>LIAISON</u>

Prior to the commencement of the work programme Bob Savage and family of Suplejack Downs station were contacted. Close relations were maintained with station personnel during the course of the work programme. Topographic 1:100,000 sampling maps were marked with the current AAPA register of ethnographic sites. All registered and recorded sites were avoided during the sampling programme.

#### 5. EXPLORATION

#### 5.1 Reconnaissance Heavy Mineral Sampling

Reconnaissance heavy mineral samples were collected at an approximate density of 1: 3 km<sup>2</sup>. A total of 236 heavy mineral reconnaissance samples, consisting of 64 stream samples and 175 loam samples, were collected over EL 9683 during the first year of tenure. Sample locations are shown on Map 2.

Stream samples were collected from all available drainages within EL 9683 using a helicopter to provide access. Dendritic drainage development in the area is extremely poor, so loam samples were collected on a 2km staggered grid pattern to improve sample coverage, also using a helicopter to provide access. Vehicle loam samples at a 1km spacing were collected along available tracks to further improve sample coverage. Sample details are listed in Table 2.

TABLE 2: RECONNAISSANCE SAMPLING DETAILS

Exploration Licence	Stream Samples	Heli-loam Samples	Vehicle loam Samples
	BT4314-4345 (32)	BT0001-0013 (13)	BT4104-4106 (3)
0600	BT4348-4351 (4)	BT0018-0019 (2)	
9683	BT4353-4357 (5)	BT0021-0051 (31)	
	BT4366-4384 (19)	BT0053, BT0056 (2)	
	BT4562-4565 (4)	BT0060, BT0222 (2)	
		BT0224-0235 (12)	
		BT0267-0270 (4)	
		BT0272-0273 (2)	
		BT0275-0276 (2)	
		BT0327-0355 (29)	
		BT0357-0400 (44)	
		BT0885 (1)	
		BT4044-4065 (22)	·
		BT4078, BT4081 (2)	
		BT4088, BT4094 (2)	
		BT4429 (1)	
		BT4924 (1)	
TOTAL	64	172	3

#### 5.2 Treatment and Examination of Heavy Mineral Samples

Sample treatment for heavy mineral kimberlitic indicators occurred at Stockdale's treatment plant in Darwin, where the samples were washed and screened to remove unwanted size fractions. The samples were then concentrated using heavy medium separation to obtain a heavy mineral concentrate. The heavy mineral concentrates were despatched to Stockdale's Melbourne laboratory. At the Melbourne laboratory the concentrated material was cleaned and prepared for optical examination under microscopes for the recovery of kimberlitic indicator minerals and heavy metallic minerals.

#### 5.3 Heavy Mineral Reconnaissance Sample Results

Full results from the reconnaissance sampling became available in the middle of the year. Chromite grains were recovered from two samples. These chromites were considered to be of little interest and not worthy of further investigation. A sample listing of the reconnaissance samples containing indicator minerals is displayed in Appendix 1.

#### 5.4 Geophysical/Remote Sensing Investigations

In 1989 the NTGS flew a regional geophysical survey over the northern regions of the Granites-Tanami Block at a flight line spacing of 500m in a N-S direction, combining company magnetic data where available. Hard copy plots and digital data were obtained of this survey and preliminary interpretation by SPL's geophysical department for discrete dipole anomalies suggestive of kimberlite intrusives selected six anomalies over EL 9683. Each generated anomaly was ground inspected and sampled during the course of the work programme. Anomaly locations are shown on Map 2.

To improve the magnetic resolution over the "of interest" magnetic anomaly STR015, a detailed UTS Fletcher magnetic surveys was flown. The detailed aeromagnetic survey was flown at a 50m flight line spacing in a N-S direction, with a mean terrain clearance of 15-20m on a two square kilometre grid. After the assessment of the detailed magnetic data the anomaly was recommended for further work and was consequently loam sampled during the second year of tenure. Loam sampling aimed at recovering kimberlitic indicator minerals is therefore considered to be an appropriate and reliable technique for determining whether the magnetic anomaly is due to the presence of a kimberlite intrusion. The collected loam sample (BP1806) did not contain indicator minerals and no further work is warranted. Appendix 2 displays the TMI contour plot for anomaly STR015.

Two remote sensing anomalies were generated through the interpretation of available spectral data over the licensed area. Both anomalies were ground inspected and sampled with a loam sample in a 5-star pattern (displayed as samples BP1808 and BP1824). Sample locations are displayed on Map 2. No indicator minerals were recovered from the examination of the samples collected over the anomalies and no further work is warranted.

#### 6. EXPENDITURE

Total expenditure for EL 9683 was \$149 275, as allocated in Table 3.

TABLE 3: EXPENDITURE EL 9683

EXPLORATION EXPENDITURE FOR EL 9683	A second second of the beginning of the second of the seco
Operational Staff Costs	28416
General Operational Expenses	7548
Transport and Travel	42180
Tenement Costs	8152
Central Treatment Plant	13320
Lab Treatment	3774
Lab Examination	5994
Contractors Geophysical	705
Geophysical Services	2632
Remote Sensing	1396
Drafting/Data Processing	5632
Regional Administration	13320
Head Office Administration	12876
Capital Expenses	3330
TOTAL	\$149 275

#### 7. SUMMARY

Exploration activities conducted over EL 9683 during the time of tenure involved the collection of helicopter-assisted reconnaissance heavy mineral samples and the interpretation of a 1989 NTGS geophysical survey. Six aeromagnetic anomalies were selected within EL 9683 and each anomaly was ground inspected and sampled.

Full sample results are now available and no indicator minerals of interest were recovered. Heavy mineral samples collected over the aeromagnetic anomalies and spectral remote sensing anomalies failed to recover indicator minerals. The licence area is considered to have little potential to host an economic diamond deposit and has been surrendered.

**M.I.MILLIKAN** 

Staff Geologist Darwin, NT

#### 8. <u>REFERENCES</u>

Hodgson, I.M., (1975), **Tanami, Northern Territory**. 1:250,000 geological series-explanatory notes, sheet SE/52-15 international index. D.M.E and B.M.R, NT.

Page, R.W., Sun, S.S., Blake, D.H., Edgecombe, D.R., & Pearcey, D.P., (1995), **Exposed Late-Archaean Basement Terrains in the Granite-Tanami Region, Northern Territory**. GEOLOGICAL SOCIETY OF AUSTRALIA, ABSTRACTS No. 41, 13th Australian Geological Convention, Canberra, February 1996.

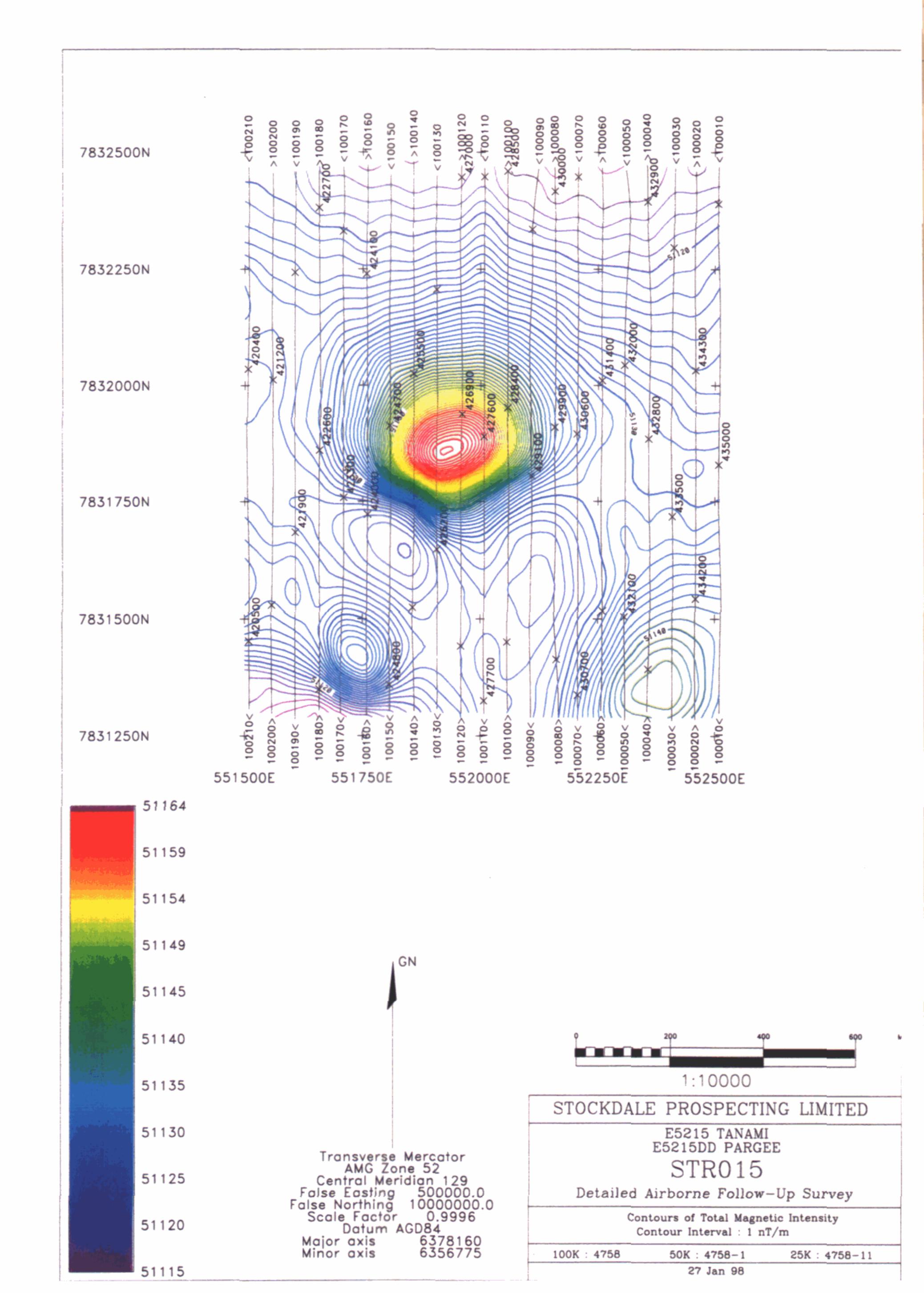
Shaw, R.D., Wellman, P., Gunn, P., Whitaker, A.J., Tarlowski, C., & Morse, M.P., (1995), Australian Crustal Elements Map. AGSO Research Newsletter 23, pages 1-3.

## APPENDIX 1: HEAVY MINERAL SAMPLE RESULTS, EL9683

EL 9683

SAMPLES	CHROMITES	DIAMONDS
BT0048	1	0
BT4065	1	0
	2	0

## APPENDIX 2: TMI CONTOUR PLOT FOR STR015



## MAPS

