



**ANNUAL REPORT  
EXPLORATION LICENCE  
EL23393  
ARUNTA PROJECT  
NORTHERN TERRITORY**

**FOR THE YEAR ENDED  
6th March 2005**

Prepared by:  
Andrew Johnstone  
Project Manager

Submitted by:

---

Jeremy Read  
Managing Director  
Discovery Nickel Limited  
ACN 29 104 924 423

DISTRIBUTION:

NT DBIRD Darwin

Discovery Nickel Limited (digital)

## SUMMARY

---

This report summarises work carried out on Exploration License 23393, Arunta Project, Northern Territory for the year ended 6 March 2005.

Through compilation efforts, Falconbridge (Australia) Pty Limited identified the north-central Arunta as being favourable to host Proterozoic, intrusive related, magmatic Ni-Cu-PGE sulphide mineralization, analogous to the giant Voiseys Bay nickel-copper deposit in Canada. The area has seen little historic work and has not been the focus of dedicated nickel sulphide exploration in recent years. In December 2003, Discovery Nickel Limited acquired 100% interest in EL23393 and other Falconbridge tenements following the successful listing of Discovery Nickel on the Australian Stock Exchange.

Most significant nickel-copper massive sulphide deposits are extremely good conductors. Discovery Nickel's exploration approach relies heavily on airborne electromagnetic (AEM) surveying, followed up by ground EM to define targets. Falconbridge commissioned an AEM survey over the Arunta tenements in early 2003 and after analysis of the Falconbridge AEM results, Discovery Nickel Limited commissioned a ground EM (SMARTEM) survey focused on the highest priority target areas. The results did not highlight any strong anomalies/basement conductors that warranted drill testing on EL 23393.

## TABLE OF CONTENTS

|     |   |                                     |
|-----|---|-------------------------------------|
| 1   | INTRODUCTION.....                             | 5                                   |
| 2   | PROPERTY DESCRIPTION AND TENURE.....          | 6                                   |
| 3   | ACCESSIBILITY AND INFRASTRUCTURE .....        | 6                                   |
| 4   | GEOLOGICAL SETTING .....                      | 6                                   |
| 5   | NICKEL RELATED MINERAL OCCURRENCES.....       | 8                                   |
| 6   | EXPLORATION RATIONALE .....                   | 9                                   |
| 7   | PREVIOUS EXPLORATION .....                    | 9                                   |
| 8   | EXPLORATION COMPLETED DURING THE PERIOD ..... | 10                                  |
| 8.1 | Land Access Issues.....                       | 10                                  |
| 8.2 | Airbourne magnetic interpretation.....        | 10                                  |
| 8.3 | Ground Em Surveying and interpretation .....  | 12                                  |
| 8.4 | Drilling.....                                 | 12                                  |
| 9   | WORK PROGRAM.....                             | 13                                  |
| 10  | EXPENDITURE.....                              | 13                                  |
| 11  | CONCLUSIONS .....                             | 13                                  |
| 12  | REFERENCES.....                               | <b>ERROR! BOOKMARK NOT DEFINED.</b> |

## LIST OF TABLES

|                                 |   |
|---------------------------------|---|
| Table 1 - Tenement Details      | 4 |
| Table 2 - Expenditure Details   | 8 |
| <i>Discovery Nickel Limited</i> | 3 |

## **LIST OF FIGURES**

|   |    |
|---|----|
| Figure 1: Arunta Project location map showing tenement holding  | 1  |
| Figure 2: Total Magnetic Intensity (TMI) - North Arunta   | 2  |
| Figure 4: Regional Gravity - North Arunta   | 4  |
| Figure 5: 1VD TMI (greyscale) over the 1VD gravity – Arunta Project   | 5  |
| Figure 6: Regional Geology – North Arunta Project   | 8  |
| Figure 7: Late time conductors identified in the GEOTEM survey displayed on a psuedocolor image of the reduced to the pole, Total Magnetic Intensity. | 11 |
| Figure 8: 1VD aeromagnetics with EM anomalies within project area, the colored areas show gridded Geotem data channel Bz12.                           | 12 |

## **APPENDIX A**

MOVING LOOP SMARTEM, ANOMALIES: B18, B19, B20, B21

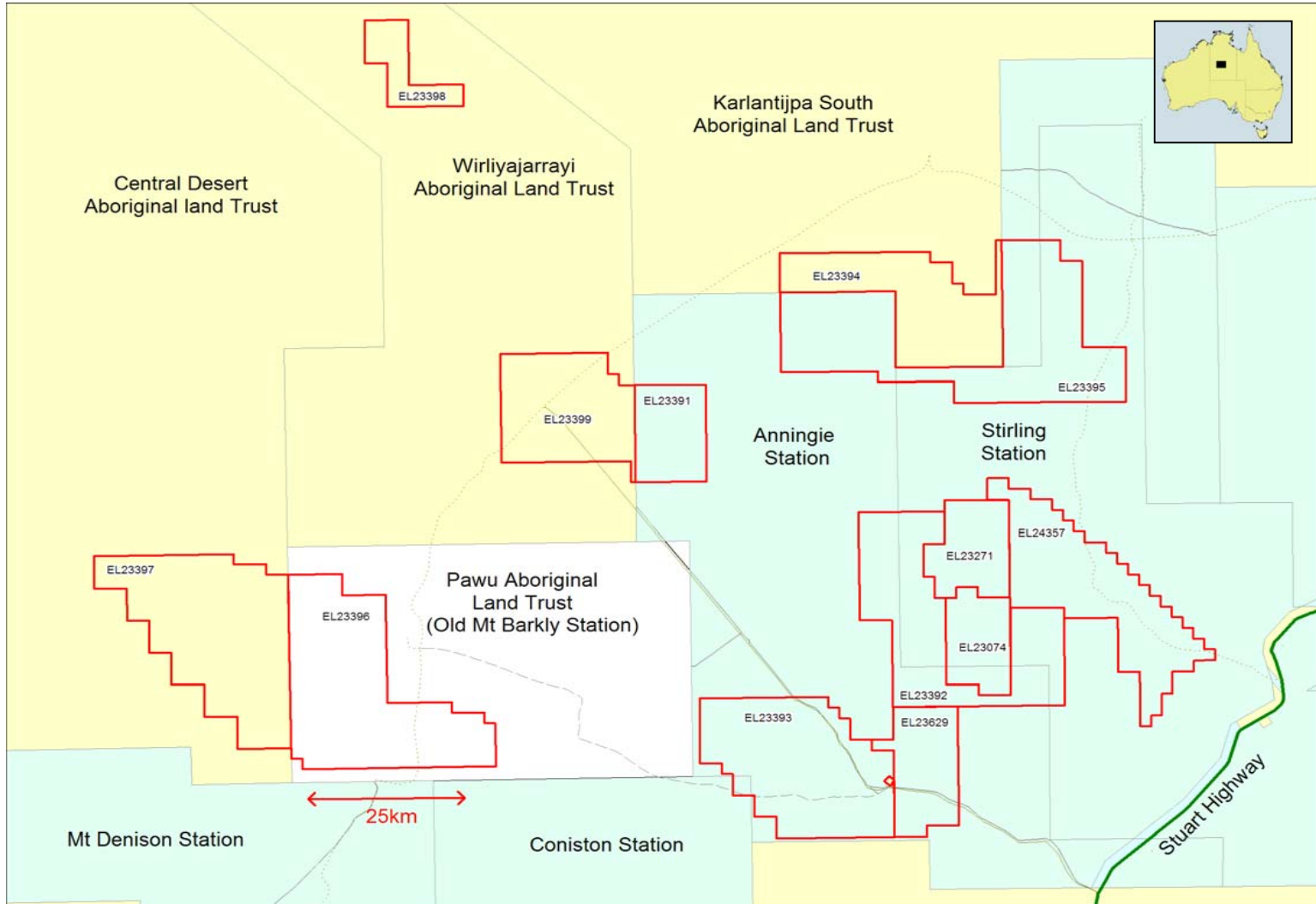
## 1 INTRODUCTION

This report summarises work carried out on Exploration License 23393, Arunta Project, Northern Territory for the year ended 6 March 2005.

The Arunta Project is located approximately 250km N-NW of Alice Springs in the Northern Territory. The North Arunta Province is dominated by a series of sulphidic Proterozoic sedimentary sequences on an Archean/Proterozoic boundary zone that have been intruded by late mafic sills. Quaternary and Tertiary cover of variable thickness, conceal large areas of bedrock in the area and although the region has seen some exploration for a variety of commodities (including gold, copper, iron ore, and diamonds) the evaluation of the nickel potential of the area has been very limited to date.

During regional compilations by Falconbridge the area was recognised to have potential when the Barrow Creek nickel sulphide occurrence 75-100km east of the project area was noted in regional assessment files. Also, rumours of success in the Andrew Young belt to the south prompted further assessment of the NTGS geophysical and geological datasets. These compilations flagged major regional structures coincident with interpreted mafic bodies in the project area that had potential for nickel sulphides and hence tenement applications were made (**Fig. 2, 3, 4, 5 and 6**).

Work completed in the area to date includes negotiating a land access agreement with the Traditional Owners, compilation of historic and regional datasets, ground EM survey, interpretation of ground EM results, magnetic data interpretation. This annual report provides a summary of the work completed on EL23393 for the year ended 6 March 2005.



**Figure 1: Arunta Project location map showing tenement holding.**

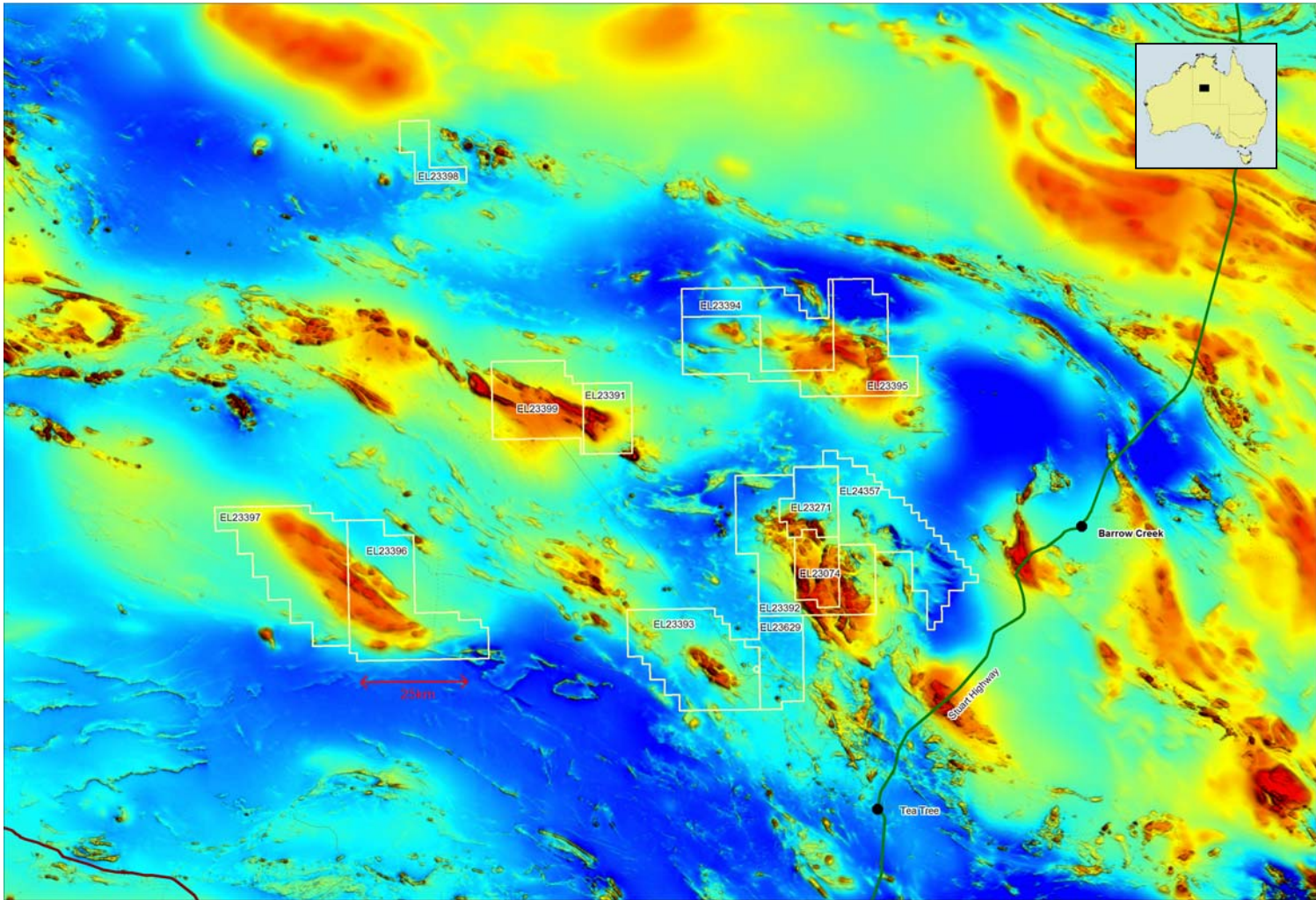


Figure 2: Total Magnetic Intensity (TMI) - North Arunta.





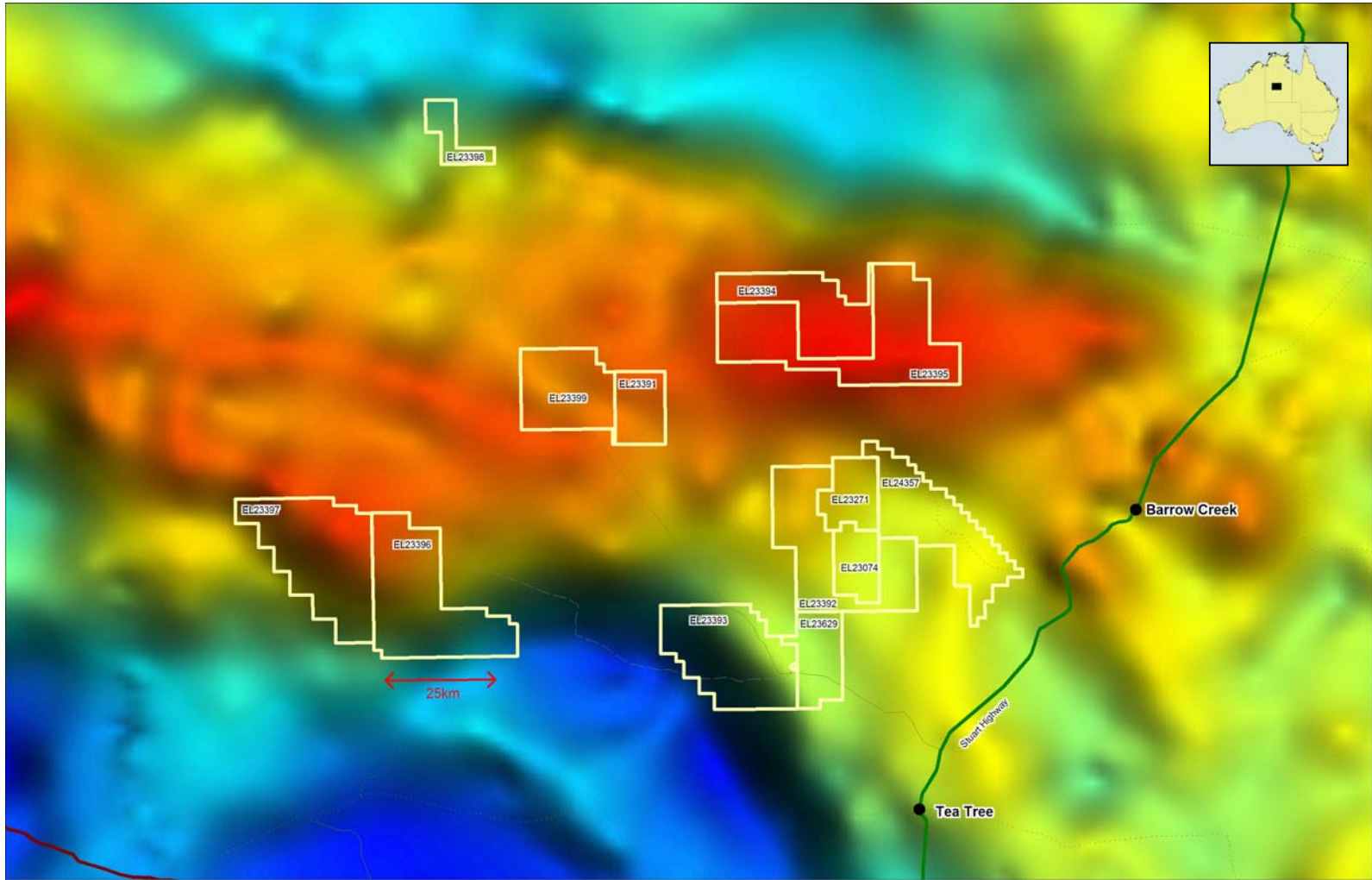


Figure 4: Regional Gravity - North Arunta.

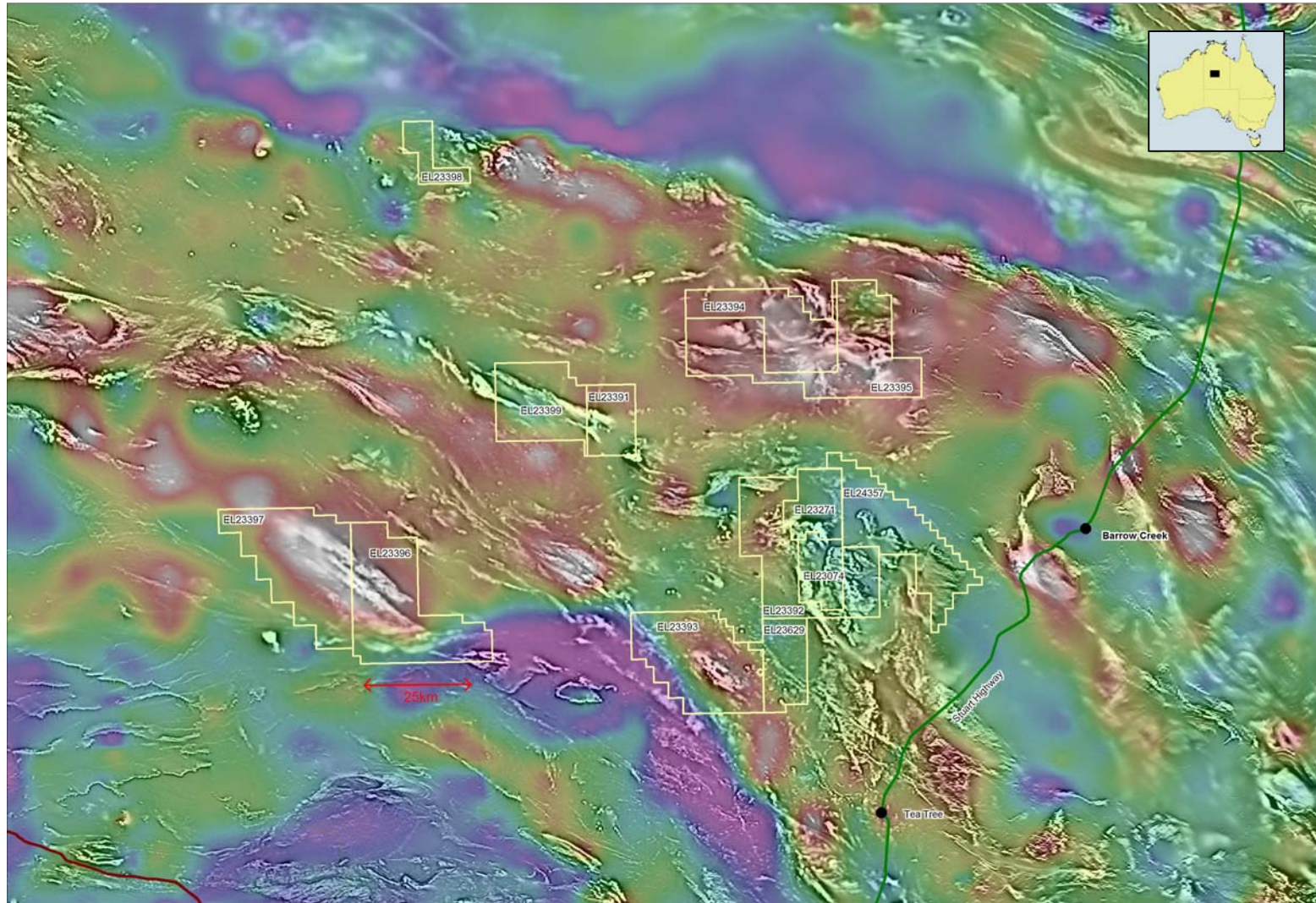


Figure 5: 1VD TMI (greyscale) over the 1VD gravity – Arunta Project.

## 2 PROPERTY DESCRIPTION AND TENURE

EL 23393 forms part of Discovery Nickel's Arunta Project, which includes other granted tenements 23392, 23393, 23271, 23074, 23391, 23629 and 24357. Details for tenement EL23393 are shown in **Table 1**.

EL 23393 of 181 sub-blocks and area 577.2sq km, was originally granted to Falconbridge on 7 March 2003 for a period of six years. However, 100% ownership was transferred to Discovery Nickel Limited following the successful listing of Discovery Nickel Limited on the Australian Stock Exchange in December 2003 and pursuant to a Heads of Agreement dated 15 October 2003.

**Table 1 - Tenement Details.**

| EL    | Sub-blocks | Grant Date | Expiry Date | Expenditure Commitment Yr 1 |
|-------|------------|------------|-------------|-----------------------------|
| 23393 | 181        | 17.02.03   | 16.02.09    | \$23240                     |

The tenement is located approximately 235km N-NW of Alice Springs in the Northern Territory and covers portions of the Mt Peake (SF53-05), 1:250,000 map sheet (**Figure 1**). It lies within the Stirling and/or Anningie Perpetual Pastoral Leases and is subject to Native Title. Access to the area is facilitated by the Central Land Council (CLC) through an Exploration Deed.

## 3 ACCESSIBILITY AND INFRASTRUCTURE

The project area can be accessed via the all weather Alice Springs - Darwin highway. Additional roads extend up to 100km west of the highway through the project area and are accessible by the use of four wheel drive vehicles. A new railway line to Darwin and a major gas pipeline both parallel the Stuart Highway (**Figure 1**).

The region is considered remote, however the area is quite arable with numerous bores supporting livestock on the stations. 50km to the south is the Ti-Tree table grape region producing over \$15 million dollars worth of grapes annually.

#### 4 GEOLOGICAL SETTING

The project area lies within the north-central portion of the Paleoproterozoic Arunta Province. The stratigraphy of the Arunta province comprises relics of 2500 Ma Archaean basement overlain by >1800 Ma Palaeoproterozoic, turbiditic sequences of greywacke, quartz, sandstone, siltstone and shale along with mafic rocks and their high-grade metamorphic equivalents. The Arunta also has minor calc-silicates and meta-felsic volcanic units. During the Barramundi Orogeny, the sedimentary units were intruded by mafic rocks which have been deformed and in places metamorphosed to amphibolite facies. During the closing stages of the Barramundi Orogeny (~1830 Ma) granite plutons intruded rocks of the Arunta Province.

In the tenement areas, rocks of the Palaeoproterozoic Lower Hatches Group, Reynolds Range Group, undifferentiated granite/granite gneiss and gabbro-dolerite occur (**Fig. 6**). Neoproterozoic to Palaeozoic rocks of the Georgina Basin cover the Palaeoproterozoic rocks in the south to southeast. Cainozoic sediments also cover parts of the tenements.

Locally, Quaternary and Tertiary cover sequences of variable depth (range from a few metres to in excess of 100m) conceal the basement rocks. As outlined below the area has been subject to a number of drilling campaigns (predominately shallow RAB holes) and of specific interest to this project; mafic/ ultramafic units were encountered within and adjacent to these tenements.

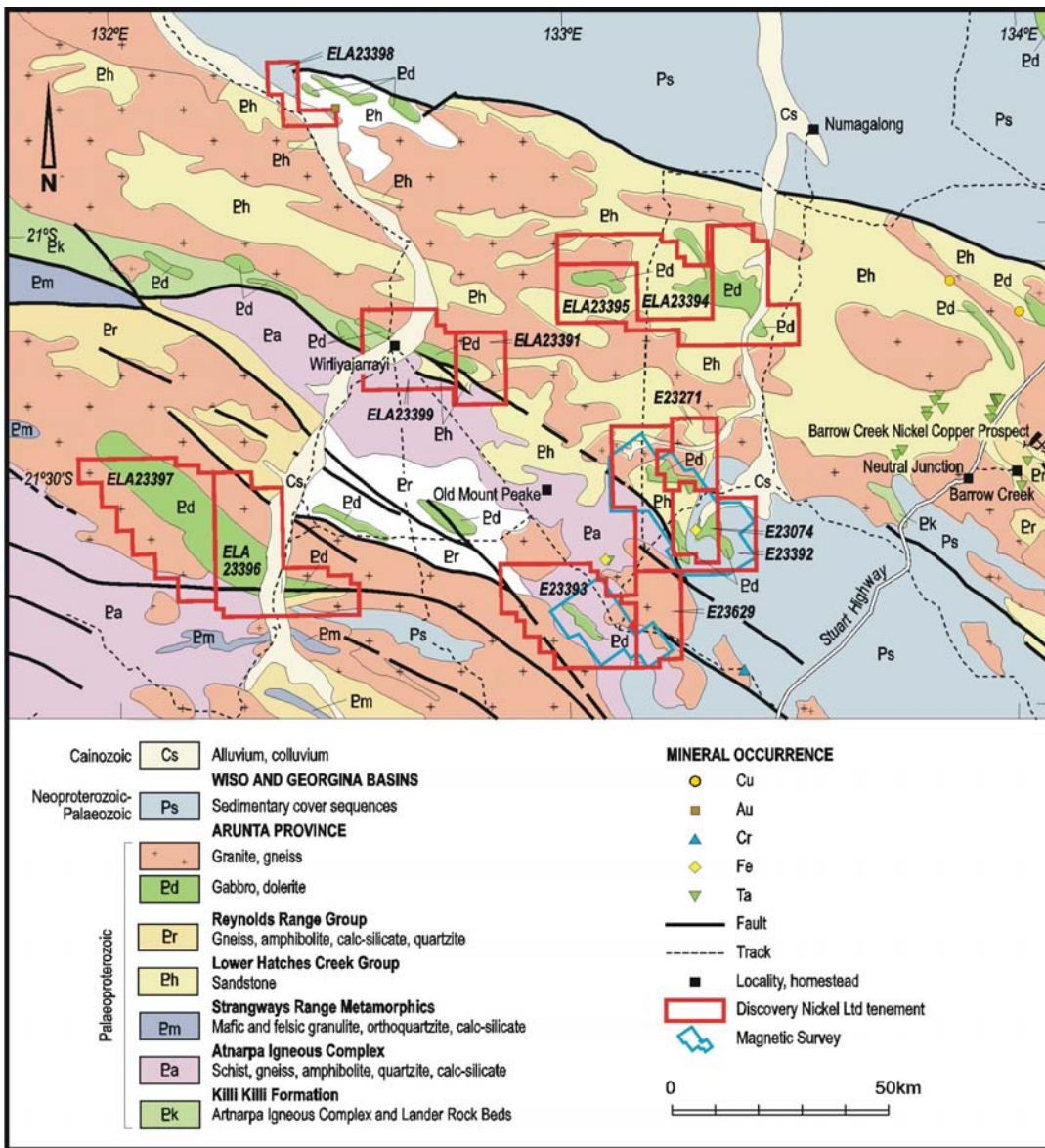


Figure 6: Regional Geology – North Arunta Project

## 5 NICKEL RELATED MINERAL OCCURRENCES

Approximately 100 km to the east of the project area lies the “Barrow Creek” or “Prospect D” occurrence discovered by Kewanee Exploration in the early 1970’s during a diamond drillhole program (total of 11 holes). The best intersection is 0.9m averaging 4.65% Ni and 1.36% Cu. An inferred resource of 3,163,800 tonnes bearing 0.56% Cu and 0.19% Ni with a cut-off grade of 0.2% Cu was calculated in 1974 (not to JORC specifications).

The zone is described as a small massive nickeliferous sulphide intersection situated on the south-western limit of a thin mafic/ultramafic sill or dyke (1.4km by 20m) which intruded Proterozoic basin sediments (greywackes and pelites). The sill/dyke is a pyroxenite-rich unit that bears sulphide nickel up to 0.6% and significant copper levels of up to 2% in the matrix. The 'massive sulphide' intersection was observed in the NT core library in Alice Springs by a former Falconbridge Geologist (Neil Provins) and was described as highly oxidized, indicating that the nickel grades might be enhanced due to supergene weathering effects.

## **6 EXPLORATION RATIONALE**

Falconbridge targeted the Arunta area for Proterozoic, intrusive hosted, magmatic Ni-Cu-PGE sulphide mineralization. During 1997-98, the Arunta Project area was recognised to bear some potential when the Barrow Creek nickel sulphide occurrence was noted in a regional assessment of the area. A review of the available NTGS geological and geophysical datasets identified major regional structures coincident with interpreted mafic bodies (rarely exposed) visible on areomagnetics (**Fig. 2**). Based on these criteria in conjunction with the favourable re-assessment of the area by the NTGS, it was concluded that the Arunta was favourable for magmatic Ni-Cu-PGE deposits. The location of the Barrow Creek sulphide occurrence on the inferred structural trend to the east and the interpreted thickening of mafic bodies from Barrow Creek in the direction of the Arunta project were other criteria used in area selection.

Also, preliminary reviews of historic exploration work revealed that mafic/ultramafic units were drilled by WMC in the mid 1990's adjacent these tenements. Anomalous nickel and copper results were noted in several holes with the best intervals being 5m @ 0.63% Ni, 3m @ 0.42% Ni & 0.52% Cu. In addition, regional soil geochemistry programs have identified several high Ni soil anomalies.

## **7 PREVIOUS EXPLORATION**

The region has been partially explored for a variety of commodities including nickel, gold, copper, iron ore, bauxite and diamonds, with some areas experiencing limited or no work. There is no record of a focused Ni exploration program in the tenement areas. The following is a brief summary of historic work reviewed to date.

- In the early 1970's CRA conducted Uranium exploration in the area. Work including geological mapping, photo interpretation, air and ground magnetics followed by rotary drilling and borehole logging. CRA resumed exploration in 1979 and over a four year period completed airborne magnetics/radiometrics, drainage geochemistry, soil and rock chip geochemistry and limited diamond drilling.
- Between 1991 and 1997 WMC completed work focussed on gold exploration that included data compilation, surface geochemical sampling, XRD analyses, geological/regolith mapping, gravity surveys, airborne magnetics/radiometrics, IP/TEM surveys and ground magnetics. Anomalies were then followed up with an Auger/RC drill program (Lulofs, 1998).
- In 1997 WMC optioned the ground to Aberfoyle who completed further rock chip sampling, soil sampling and vacuum drilling on the properties (Ashby and Schusterbauer, 1998). Aberfoyle withdrew from the JV and WMC surrendered their properties in 1998.
- Between December 2001 and October 2003, Falconbridge (Australia) negotiated an access agreement, compiled historic and regional datasets and flew priority areas with airborne electromagnetic/magnetic (GEOTEM) surveys.

## **8 EXPLORATION COMPLETED DURING THE PERIOD**

Exploration completed within EL23629 included the following:

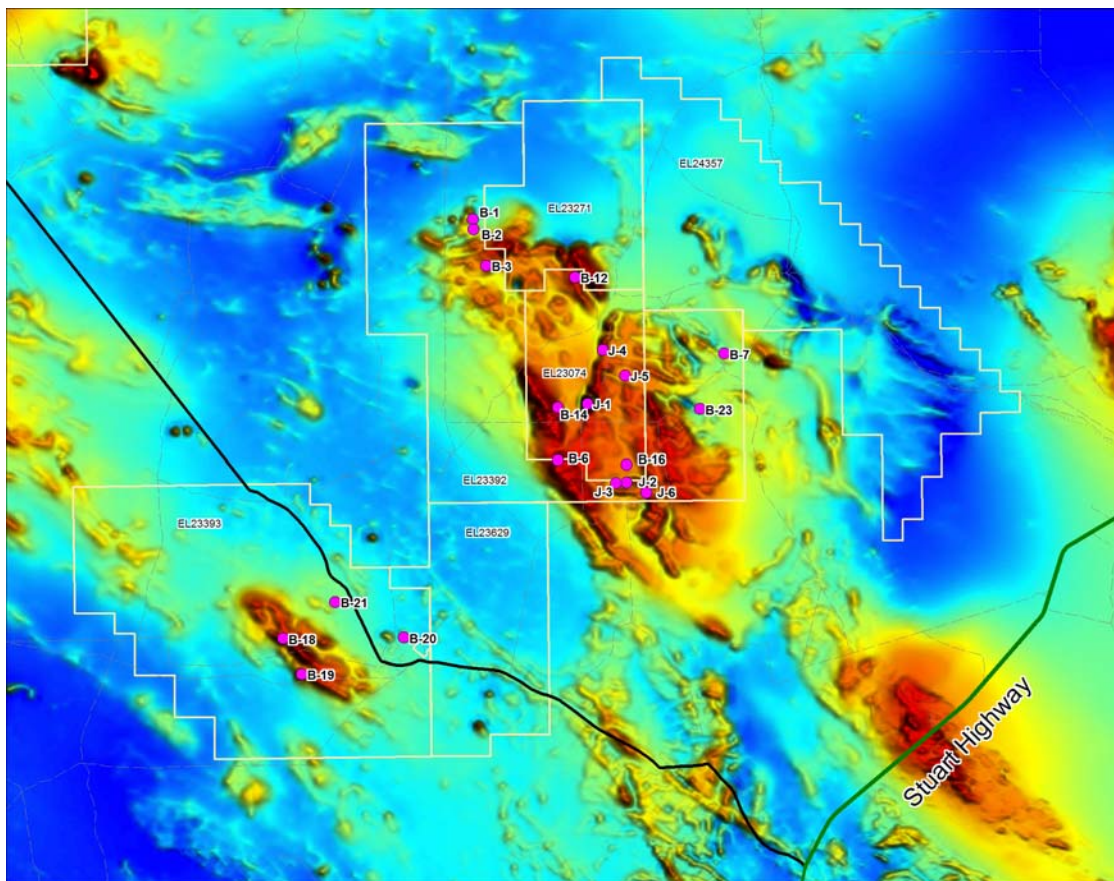
- Interpretation of airborne EM data.
- Interpretation of the aeromagnetic data.
- Completion of ground EM survey (SMARTEM)

### **8.1 Land Access Issues**

Extensive correspondence and meetings with the Central Land Council to facilitate access and the grant of several tenements was undertaken by Falconbridge. Currently a land access agreement is in place with the Traditional Owners that facilitates access to EL 23393.

## 8.2 Aeromagnetic Survey Interpretation and Modelling

The aeromagnetic data from the Arunta project area was also interpreted in conjunction with the interpretation of the airborne EM (GEOTEM) data. The targets selected, denoted by J prefix, were picked from the magnetic data collected during the GEOTEM survey. No significant magnetic targets were selected for this phase of work (Fig. 7).

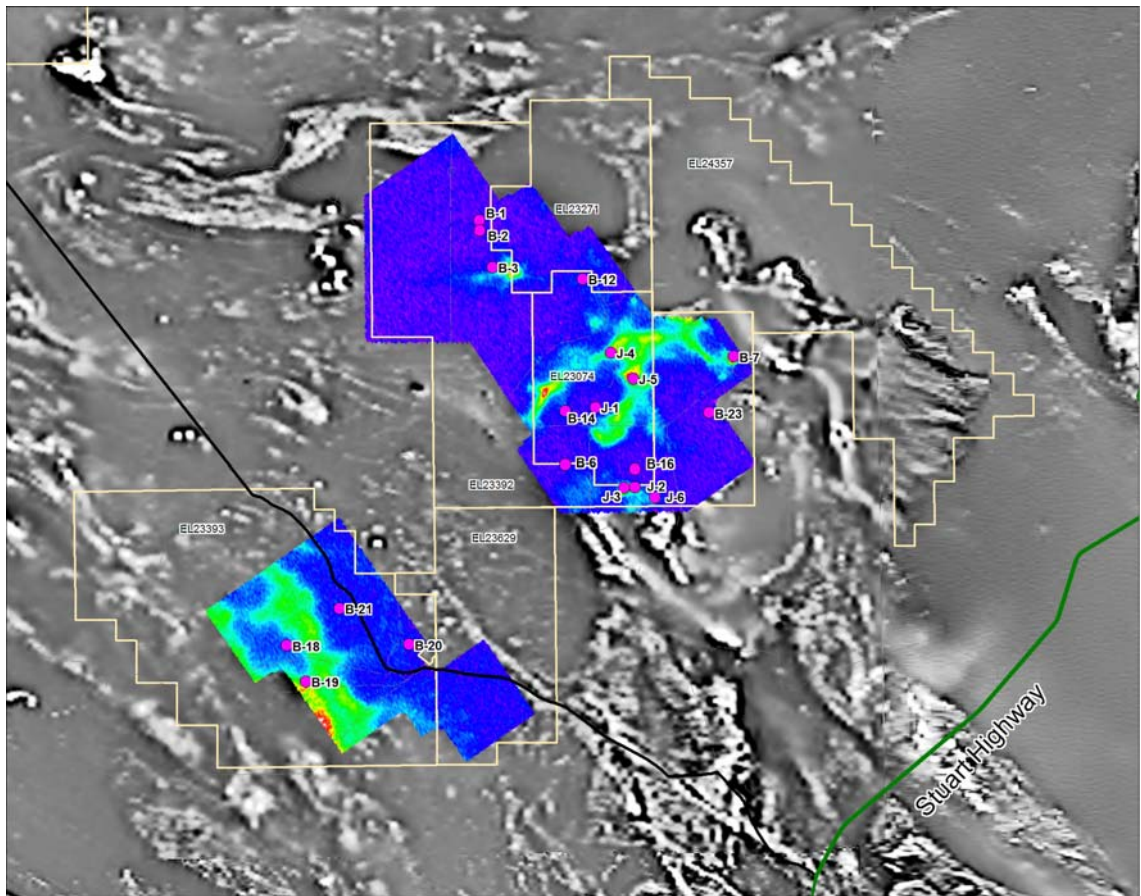


**Figure 7: Late time conductors identified in the GEOTEM survey and followed up by the moving loop SMARTEM survey, displayed on a pseudocolour image of the reduced to the pole, Total Magnetic Intensity.**



### 8.3 Ground EM

Reprocessing and interpretation of GEOTEM data by DNL identified a number of bedrock conductors. A selection of these conductors were followed up with more detailed moving loop ground EM (Smartem) surveying in April 2004 by Quantec (Brisbane) (**Fig. 8**), four of these bedrock conductors on tenement EL 23393. Moving loop Smartem was collected along lines over anomalies with a 100m sample spacing. Results are summarised in **Appendix A**. Unfortunately the ground EM showed the GEOTEM anomalies were caused by shallow overburden conductors and not bedrock conductors. Consequently, no drilling of the EM conductors was recommended.



**Figure 8: 1VD aeromagnetics with EM picks within project area, the colored areas show gridded Geotem data channel Bz12.**

## 8.4 Drilling

No Drilling was undertaken on tenement EL23393 during 2004. However, holes were drilled on adjacent tenements EL23352 and EL23071, testing ground EM conductors.

## 9 **WORK PROGRAM 2005**

Discovery Nickel now intends to reassess the GEOTEM over EL's 23393 in light of the significant new sulphide system discovered on EL 23392 to the north. By using its GEOTEM signature we should be able to define new targets in the GEOTEM on EL 23393. DNL plans to cover new GEOTEM bedrock conductors with ground EM. If ground EM confirms conductive features such as bedrock conductors then RC or diamond drill testing of the bedrock features will be undertaken.

## 10 **EXPENDITURE**

Annual expenditure for each tenement is summarised in **Table 2**.

**Table 2 - Expenditure Details.**

| Expenditure Details          | EL 23393         |
|------------------------------|------------------|
| Ground EM Survey             | \$ 1,593         |
| Contractors / Consultants    | \$ 3,565         |
| Ground Geophysics            | \$ 6,050         |
| Salary / Wages               | \$ 6,700         |
| Travel Costs                 | \$ 60            |
| Accommodation                | \$ 167           |
| Annual Rent                  | \$ 1,991         |
| Administration and Overheads | \$ 6,000         |
| <b>TOTAL</b>                 | <b>\$ 26,126</b> |

## 11 **CONCLUSIONS AND RECOMMENDATIONS**

The 2004 work program on the North Arunta properties successfully advanced the project on several fronts. The regional compilation helped to prioritize targets and establish parameters for the AEM program. Results from the AEM survey

unfortunately did not identified any targets on EL 23393 worthy of further follow-up. However, results on adjacent Arunta Project Tenements have confirmed the potential of the area. This encouragement will help focus targeting on 23323 during 2005.

## 12 REFERENCES

Ascough, G., 2003: Northern Arunta Project Northern Territory. Exploration Licences 23391, 13392, 23393, 23394, 23395, 23396, 23397, 23398, 23399, 23629, 23074 and 23271, Project Progress Report for the Period ending June 1<sup>st</sup> 2003.

Unpublished Falconbridge Ltd Internal Report.

Ashby, J. and Schusterbauer, J., 1998 Annual Report for Exploration Licences 7557, 7558, 7559, 8869, 8870 and 8874, for the Period 12/12/96-11/12/97. Mt Peake District NT Ti Tree Project, Aberfoyle Resources Limited Open File CR19980060

Lulofs, D. 1998, Surrender Report for Exploration Licences 7557, 7558, 7559, 8869 and 8874 Ti Tree Project NT 12/12/91-24/02/98, Western Mining Corporation, Open File CR990028

Northern Territory Geological Survey, 2002. The Arunta Province: open file exploration licence drillhole and geochemical data. Northern Territory Geological Survey, Record 2002-009.

Johnstone, A.2004. Annual Report Exploration License 23629, Arunta Project. Northern Territory. Discovery Nickel Limited.

**APPENDIX A**

MOVING LOOP SMARTEM, ANOMALIES: B18, B19, B20, B21



