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## 1. SUMMARY

Work completed on EL51/94 Clark Valley comprises a helimagnetic survey and compilation of previous exploration data.

Preliminary interpretation of the helimag data suggests that Tyndall Group stratigraphy mapped on the eastern slopes of Mount Sorell continues south into the Lower Clark Valley.

Compilation and re-interpretation of previous exploration data has defined a narrow 800m zone of anomalous Zn soil geochemistry associated with shale and possible mafic volcanics at the Western Sequence - CVC contact. The southern strike extent of this zone has not been tested.

A programme of gridding, ground EM, wacker sampling, stream sediment geochemistry and reconnaissance mapping is planned.

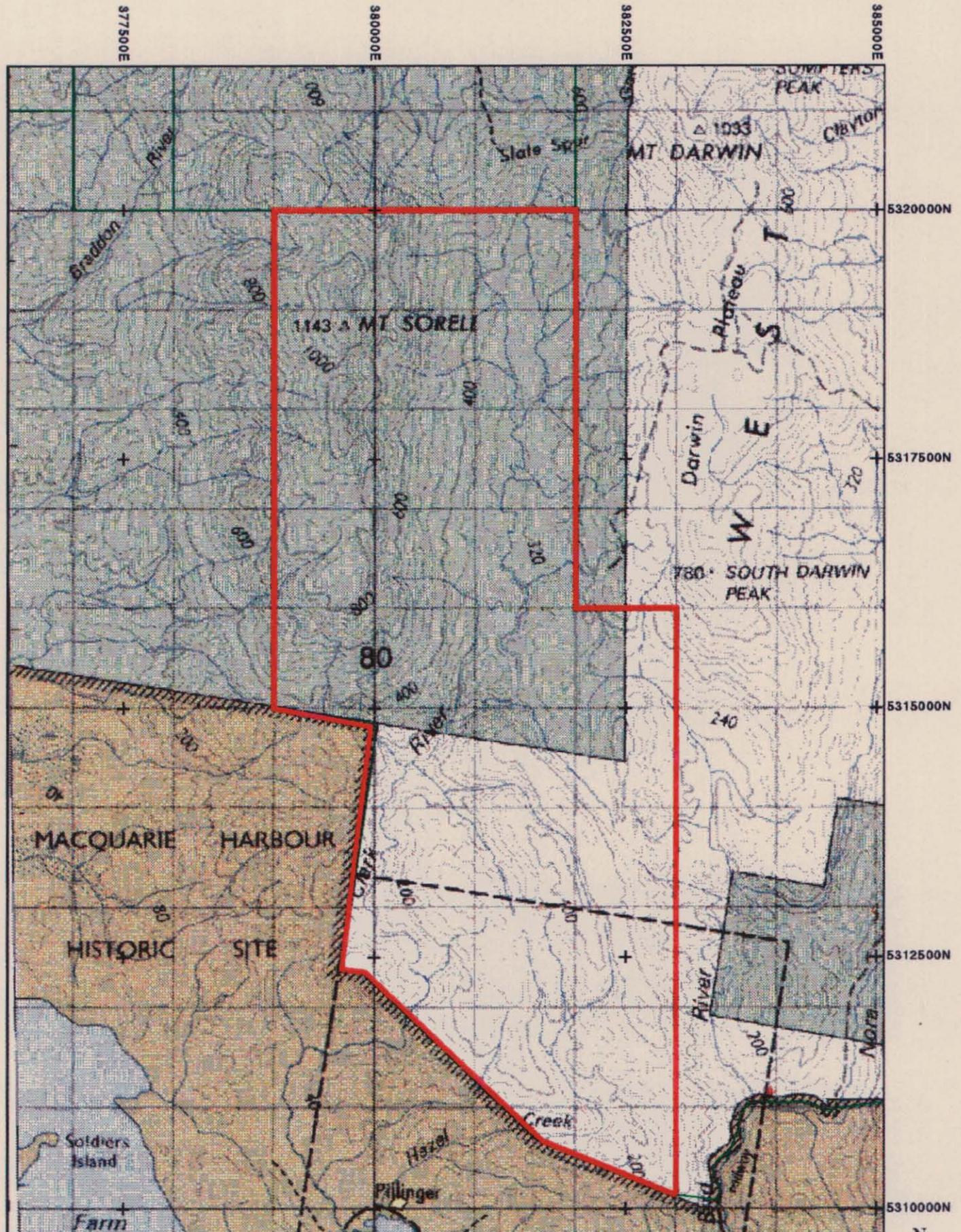
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## 2. INTRODUCTION

Exploration licence 51/94 Clark Valley was granted to Aberfoyle Resources Ltd. on 20 January 1995. The licence is located 20km south of Queenstown and covers the Middle to Upper Clark River catchment from the eastern slopes of Mount Sorell to the western slopes of the Darwin Plateau (Fig.1).

The area was taken up on the basis that probable Tyndall Group time equivalent sequences were present in the Middle-Upper Clark Valley, indicating prospectivity for Cambrian VHMS style mineralisation of Hellyer-Rosebery type. Further potential was also seen in the poorly understood and underexplored volcanoclastic-epiclastic sequence of the Lower Clark Valley.

The following report documents exploration on this licence for the period January 1995 to December 1996.



**ABERFOYLE RESOURCES LIMITED**  
EXPLORATION DIVISION

TASMANIA  
EL51/94 Clark Valley

Locality Map  
Algorithm: CLVI

Compiled: RHL

Printed: IX-738

Traced:

Checked: RHL

Plate No. CL.V1

REVISIONS			
Iss.	Date	Iss.	Date

Map Projection: TMANGSS  
Geoidic Datum: AGD66

Location Code:      Scale: 1:50000      Date: October 1995

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Figure 1

### 3. PREVIOUS EXPLORATION

Modern exploration of the current EL51/94 area began in 1956-57 when Mount Lyell flew a helicopter EM-magnetic survey over the Middle Clark Valley, west of the South Darwin workings.

Reconnaissance exploration for Rosebery style VHMS deposits was conducted by BHP-EZ on EL13/65 from 1968-75 and included a helicopter TURAIR-magnetic survey, mapping and limited stream sediment sampling of the Upper Clark Valley.

The area was taken up by Mount Lyell as EL21/76 which was subsequently merged into an enlarged EL9/66 in 1978. Work in the Clark Valley included gridding, stream sediment, soil and rock chip geochemistry, IP and ground magnetics with most geophysical anomalies attributed to black shales (Hutton 1978).

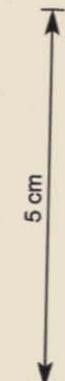
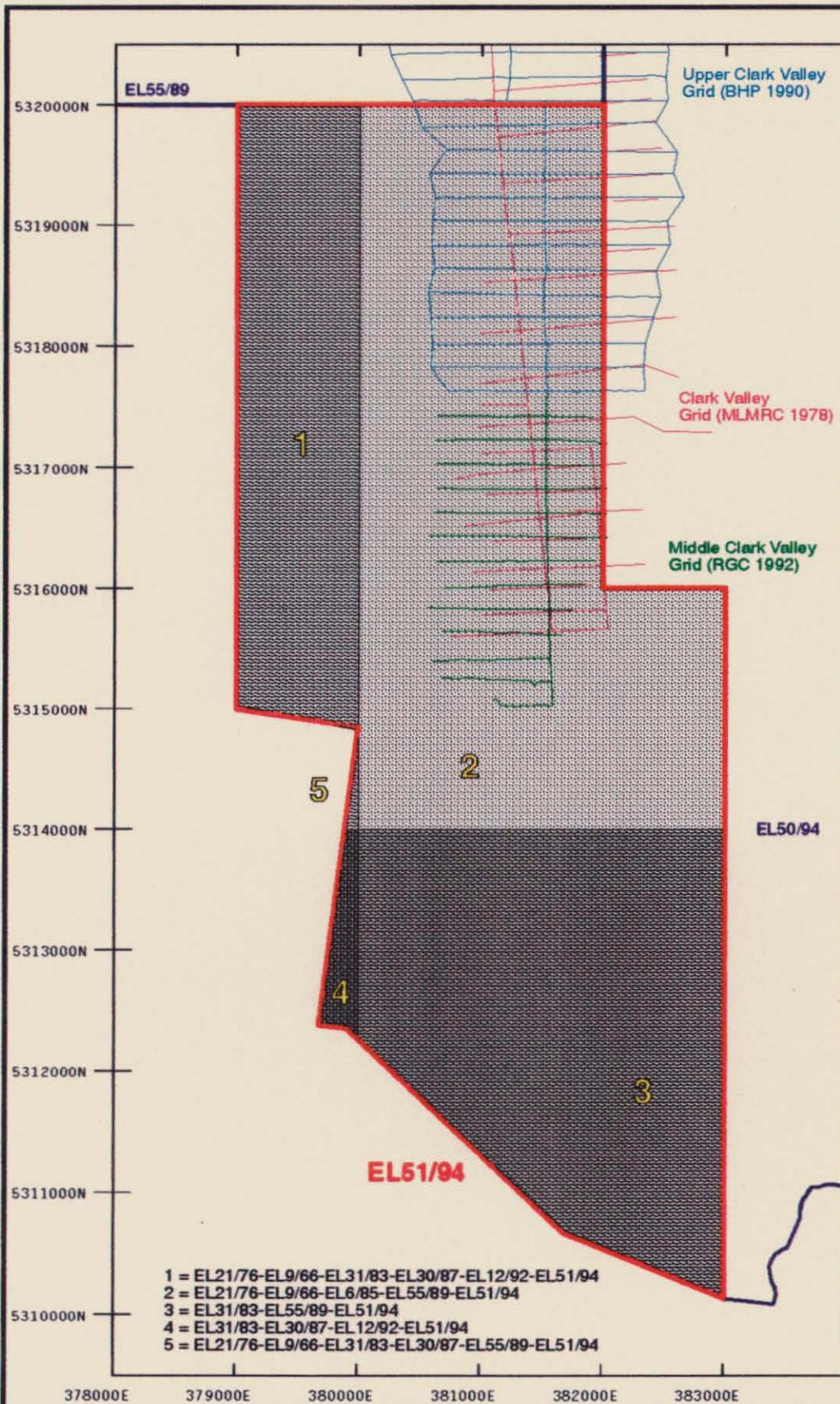
From 1983-1989 parts of the Clark Valley were held on EL31/83 (Cyprus-Amoco), EL6/85 (EZ) and EL30/87 (New Holland Mining NL) but no exploration work was conducted.

BHP returned to the area in 1989, when they were granted EL55/89. This was combined for reporting purposes with an adjacent EL102/87 covering the Garfield Valley and areas to the north. Exploration was primarily directed at massive PbZn sulfides, with particular emphasis on the Western Sequence. A large 200m-spaced grid was established over the Garfield area and Upper Clark Valley with geological mapping and some rock chip sampling carried out. Blanket UTEM coverage of the grid was achieved in 1990, covering the CVC - Western Sequence - Tyndall Group interval as far south as 17600N. No anomalies attributable to massive sulfides were recognised in the Clark Valley (Cameron & Read 1991).

RGC Exploration re-entered the area in 1991 as joint venture partners to BHP on EL55/89 and EL102/87. Their focus was on establishing a detailed understanding of the geology through a multi-disciplinary approach, with the aim of recognising particular stratigraphic targets. They extended the Clark Valley grid south to 15000N and carried out soil and rock chip sampling and mapping (Halley 1994).

Former tenement holdings over the current licence area and the location of previous exploration grids is shown in Figure 2. Details of previous exploration are given in Table 1.

**EL51/94  
CLARK VALLEY**  
FORMER GRIDS &  
TENURE HISTORY



1km

**Aberfoyle Resources Limited**  
EXPLORATION DIVISION

Figure 2

REVISIONS			
Init.	Date	Init.	Date

**EL51/94 Clark Valley  
Former Grids &  
Tenure History**

Compiled: RHL  
 Drawn: JX730  
 Checked :  
 File Name: c\_clv5.cdr  
 Plate No.: C\_CLV5

Location Code :

Scale: 1:50000

Date: December 1995

TABLE 1: EL51/94 - PREVIOUS EXPLORATION					
Years	EL	Company	Work	Details	Reference
1956-57		Mount Lyell	Geophysics:	RONKA helicopter EM, aeromagnetic survey	
1957-72	No work in this period				
1968-69	EL13/65	BHP	Geochemistry:	limited stream sediment	
1972-74	EL13/65	BHP	Geophysics: Geochemistry:	helicopter TURAIR-magnetic survey stream sediment	Ruddock 1974
1974-75	EL13/65	EZ	Access: Geology: Geochemistry:	gridding, camp mapping stream sediment	Williams 1975
1975-77	No work in this period				
1977-78	EL21/78	Mount Lyell	Access: Geology: Geophysics: Geochemistry:	track cutting, gridding (Imperial Clark Valley Grid) mapping, sampling, petrology gradient array IP (Scintrex), proton magnetica (Scintrex) detailed soil, rockchip	Hutton 1978
1978-79	EL9/66	Mount Lyell	Access: Geophysics: Geochemistry:	grid extension gradient array IP (Scintrex), proton magnetica (Scintrex) detailed soil, rockchip, stream sediment	Reid et al 1979
1979-90	No work in this period				
1990-91	EL55/89	BHP	Access: Geology: Geophysics: Geochemistry:	gridding (Upper Clark Valley - Garfield Valley Grid) mapping, sampling, petrology UTEM survey (Lamontagne) rockchip	Cameron & Read 1991
1991-94	EL55/89	RGC	Access: Geology: Geochemistry:	grid extension (Middle Clark Valley Grid) mapping, sampling soil, rockchip	Halley 1994
1994-95	EL51/94	Aberfoyle	Geophysics: Geology:	helimagnetic survey (UTS) data compilation	This Report

## 4. GEOLOGY

### 4.1 STRATIGRAPHY

Regional geology of the Clark Valley area is shown in Figure 3, taken from Mount Read Volcanics Project Map 6.

The oldest rocks in the area are CVC feldspar phyric rhyolitic-dacitic lavas which are interbedded with narrow bands of black siltstone and are locally intruded by the Cambrian Darwin Granite. Haematite-magnetite veining is present and the sequence has been sheared and metamorphosed to lower greenschist facies. Disseminated copper mineralisation is associated with this

sequence on the crest of the West Coast Range, adjacent to the Darwin Granite.

To the west, the CVC interfingers with but is largely overlain by the Western Sequence: a mixed west facing succession of quartz feldspar phyric rhyolitic lavas, mica-bearing conformable sub-volcanic sills, epiclastics and mass flow crystal-rich volcanoclastics.

A review of previous mapping, soil geochemistry and IP data indicates that a 50-100m thick black shale unit is present at the base of the Western Sequence from 15600N to 17000N and marks the transition from feldspar phyric to quartz-feldspar phyric volcanics. Five soil geochemical samples over a strike length of 1000m define a distinctive soil geochemical unit within this shale sequence. The five samples are characterised by high  $\text{Fe}_2\text{O}_3$  (av. 17.8%), Ti (8500ppm),  $\text{P}_2\text{O}_5$  (0.4%), V (374ppm) and Co (30ppm): high Ti/Zr (32.9) and moderate  $\text{P}_2\text{O}_5/\text{TiO}_2$  (0.30) suggest this may be a geochemical Suite II type andesite or basalt. The package appears to be terminated to the south by a large dextral fault zone (see below).

Tyndall Group volcanoclastic conglomerates conformably overly the Western Sequence on the lower slopes of Mount Sorell. Minor volcanoclastic sandstone and siltstone are present in this sequence to the north. The conglomerates form a distinctive magnetic unit with magnetic intensity apparently decreasing to the south.

Siliciclastic conglomerate and sandstone of the Owen Conglomerate conformably overlies the Tyndall Group on the lower slopes of Mount Sorell. In the southeast of the licence, Owen Conglomerate and Gordon Limestone form a south plunging anticline and appear to directly overlie the CVC.

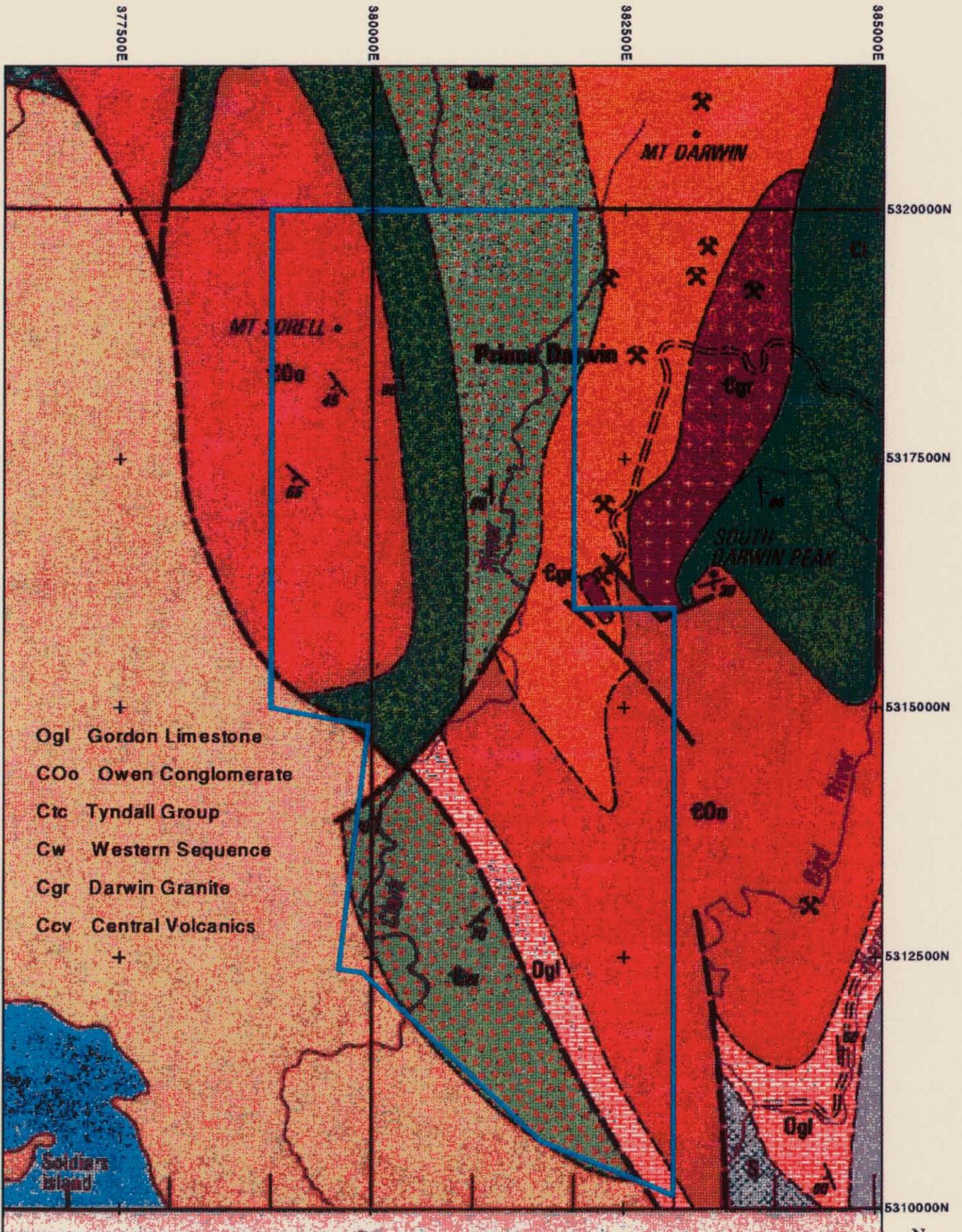
A poorly understood sequence of ?volcanoclastics/epiclastics is mapped in the Lower Clark Valley. This package has been correlated with the Western Sequence and is covered by Tertiary sediments to the southwest.

#### **4.2 STRUCTURE**

The Clark Valley sequence is a broadly conformable steeply west dipping and facing succession from CVC to Owen Conglomerate. Bedding indicators are rare and the dominant fabric is a NNW trending regional Devonian cleavage.

Mapped faults are shown in Figure 3. A NW trending fault set at the southern end of the Darwin Granite is also evident as a prominent magnetic feature which continues to the northwest.

The NE trending fault ("Clark Fault") mapped at the southern end of the Darwin Granite is a major feature which continues as a magnetic and Landsat TM



- + Ogl Gordon Limestone
- COo Owen Conglomerate
- Ctc Tyndall Group
- Cw Western Sequence
- Cgr Darwin Granite
- Ccv Central Volcanics
- +

**ABERFOYLE RESOURCES LIMITED**  
EXPLORATION DIVISION

TASMANIA  
EL51/94 Clark Valley

Regional Geology  
Algorithm: CLV2

Compiled: RHL

Printed: JX-730

Traced:

Checked: RHL

Plate No. CLV2

5 cm



Figure 3

REVISIONS			
Init.	Date	Init.	Date

Map Projection: TMAG55  
Geodetic Datum: AGD66

Location Code:      Scale: 1:50000      Date: October 1995

lineament to the southwest. The zone has consistent dextral offset and juxtaposes two discrete stratigraphic domains: to the north approximately 1000m of Western Sequence - Tyndall Group stratigraphy is present, but to the south the CVC is apparently overlain directly by Owen Conglomerate. This stratigraphic variation may indicate early syn-depositional activity on this structure.

#### **4.3 CORRELATION**

The Western Sequence of the Clark Valley occupies the same stratigraphic interval as the Lower-Middle Tyndall Group elsewhere in the MRV, ie. between felsic CVC volcanics and Upper Tyndall Group volcanoclastic conglomerates.

The shale-andesite package at the base of the Western Sequence marks the transition from feldspar phyric CVC rhyodacites to quartz-feldspar phyric rhyolites and is thus a possible Lower Tyndall Group correlate of similar epiclastic horizons at Basin Lake and White Spur.

Most of the Western Sequence in the Clark Valley area consists of massive rhyolite which is similar to the Middle Tyndall Group stratigraphy in the Henty-Newton Creek area.

Figures 4 and 5 summarise these possible correlations, and indicates the perceived mineral potential of the various stratigraphic units.

Preliminary inspection of recently acquired helimag data strongly suggests that volcanoclastics in the Lower Clark Valley includes magnetic Upper Tyndall Group units and thus may include the regionally prospective Lower Tyndall Group stratigraphic interval.

### **5. WORK COMPLETED**

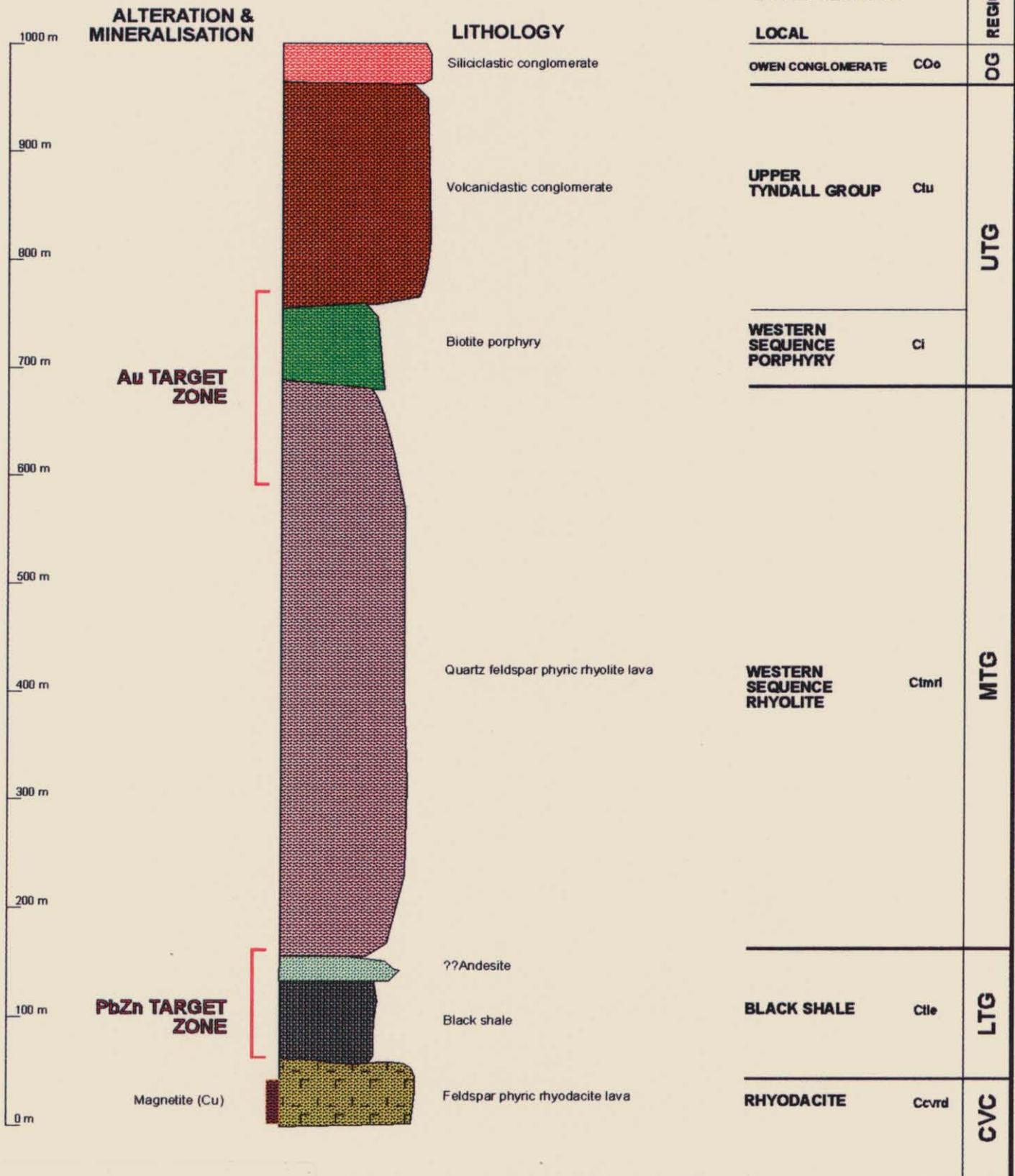
#### **5.1 HELIMAGNETIC SURVEY**

Helimagnetics has been used by Aberfoyle elsewhere in the MRV as an aid to geological and structural interpretation for areas with glacial cover, poor exposure or limited access.

Initial interpretation of the 1981 Mines Department aeromagnetic data indicated that significant lithological and structural information would be gained from a detailed survey of the Clark Valley.

In January-February 1995 a 244 line kilometre survey was flown by UTS - a Perth (WA) based company - using a helicopter sting mounted magnetometer. This configuration was expected to minimise terrain effects which had severely degraded the 1981 Mines Department survey in this area. East - west oriented

# STRATIGRAPHY: CLARK VALLEY 16000N



5 cm

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EXPLORATION DIVISION

Figure 4

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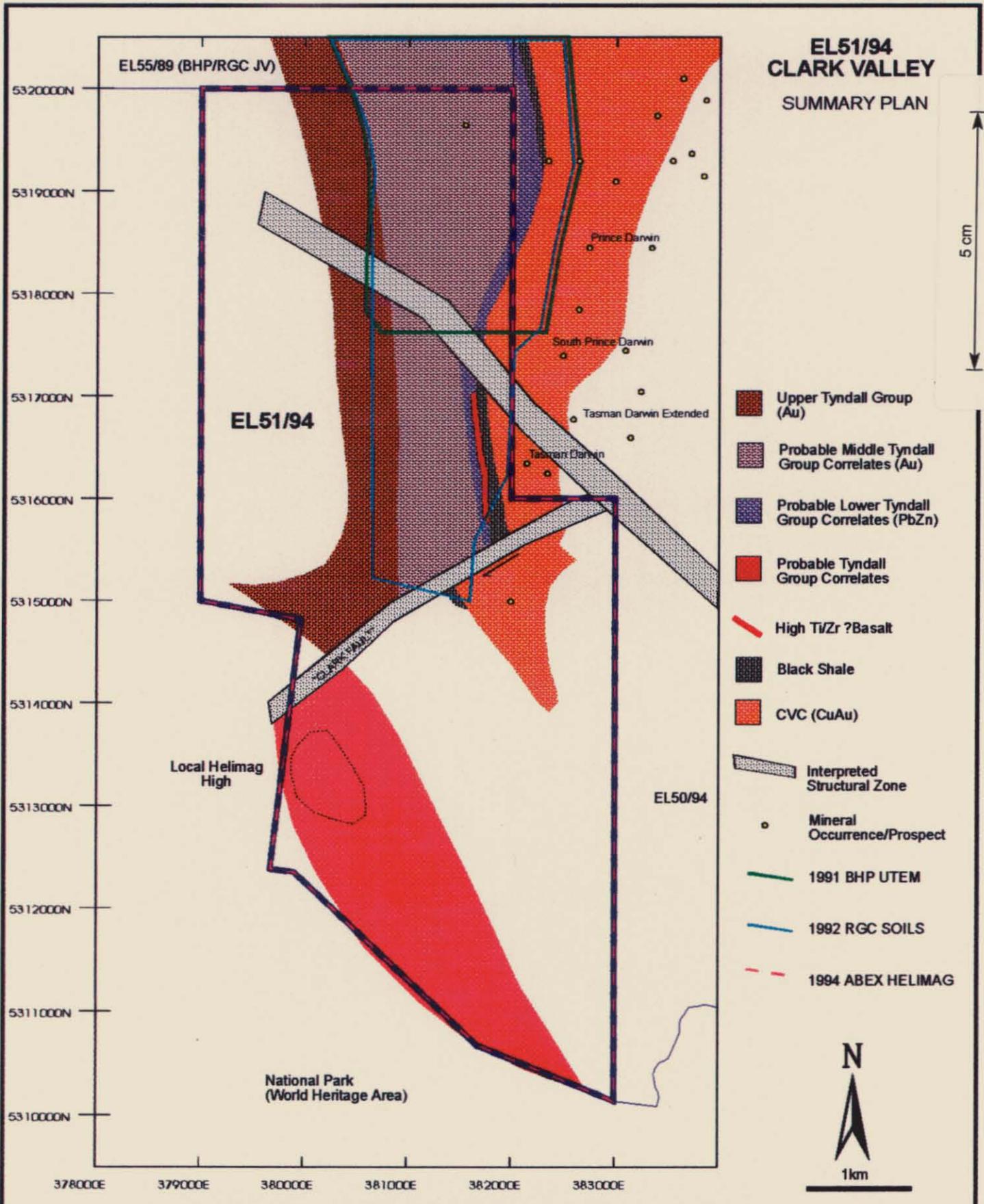
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STRATIGRAPHIC SECTION  
CLARK VALLEY - 16000N

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Location Code:

Scale 1:5000

Date: January 1996



**Aberfoyle Resources Limited**  
EXPLORATION DIVISION

Figure 5

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RHL	8/1/86		

**EL51/94 Clark Valley**  
**SUMMARY PLAN**

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Drawn: JX730
Checked: RHL
File Name: c_clv3.cdr
Plate No.: C_CLV3

Location Code :

Scale: 1:50000

Date: October 1995

flight lines were spaced at 100m with a nominal terrain clearance of 60m. Flight lines/verification contours and a coloured contour plan of magnetic intensity are shown in plates CLV9 and CLV11.

The survey was flown in conjunction with adjacent licence holders Platinum Search NL and RGC Exploration to reduce mobilisation costs.

Full geological interpretation of survey results has not been completed at the time of writing and will be included in a future report. Preliminary inspection of the gridded data, however, indicates that the magnetic units in the Lower Clark Valley are Middle to Upper Tyndall Group equivalents, offset SSW by a NNE-SSW trending zone corresponding in part to the "Clark Fault" (see above - Fig.6).

## 6. FUTURE WORK

Work proposed for the coming year is summarised in Figure 7 and includes the following:

### Geology

- Gridding for access (12 line km) and EM/wacker sampling (37 line km)
- Reconnaissance mapping of the Lower-Middle Clark Valley

### Geochemistry

- 5.5 line kilometre bedrock wacker sampling
- Stream sediment survey of Lower-Middle Clark Valley.

### Geophysics

- Interpretation and modelling of helimagnetic data.
- 30 line kilometre EM survey using Aberfoyle's Zonge Equipment

A helicopter supported field camp will be established for this work, which is scheduled for February-March 1996.

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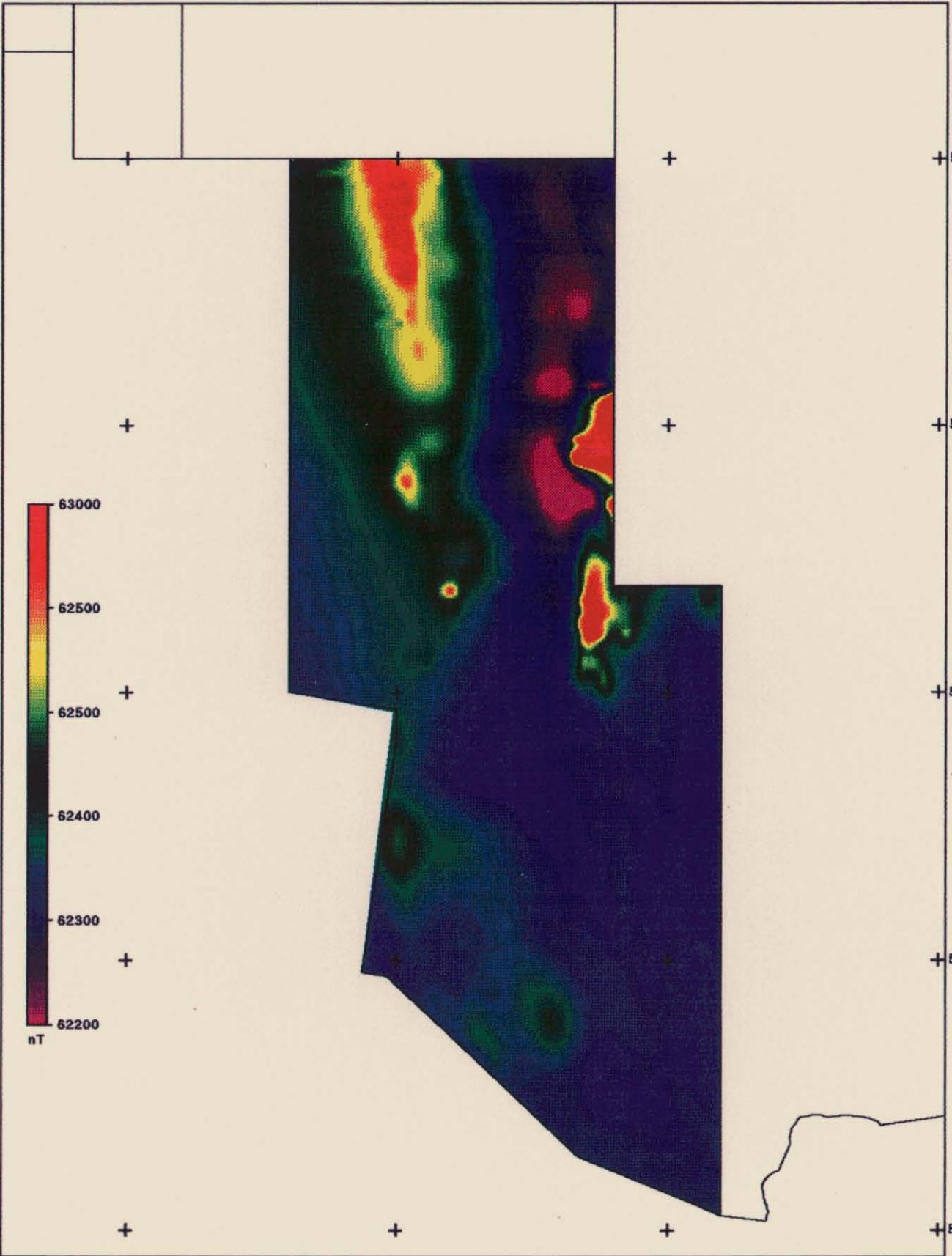
726010

377500E

380000E

383500E

385000E



+ 532000N

+ 5317500N

+ 5315000N

+ 5312500N

+ 5310000N

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REVISIONS			
Int.	Date	Int.	Date
Map Projection: TMAMGS5			
Geoidetic Datum: AGD46			
Location Code:			

TASMANIA  
Mount Read Volcanics  
**EL51/94 Clark Valley**  
Hellmagnetic Image  
Algorithm: CLV8

Scale: 1:50000  
Date: December 1993

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Printed: IX-730  
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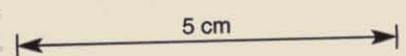
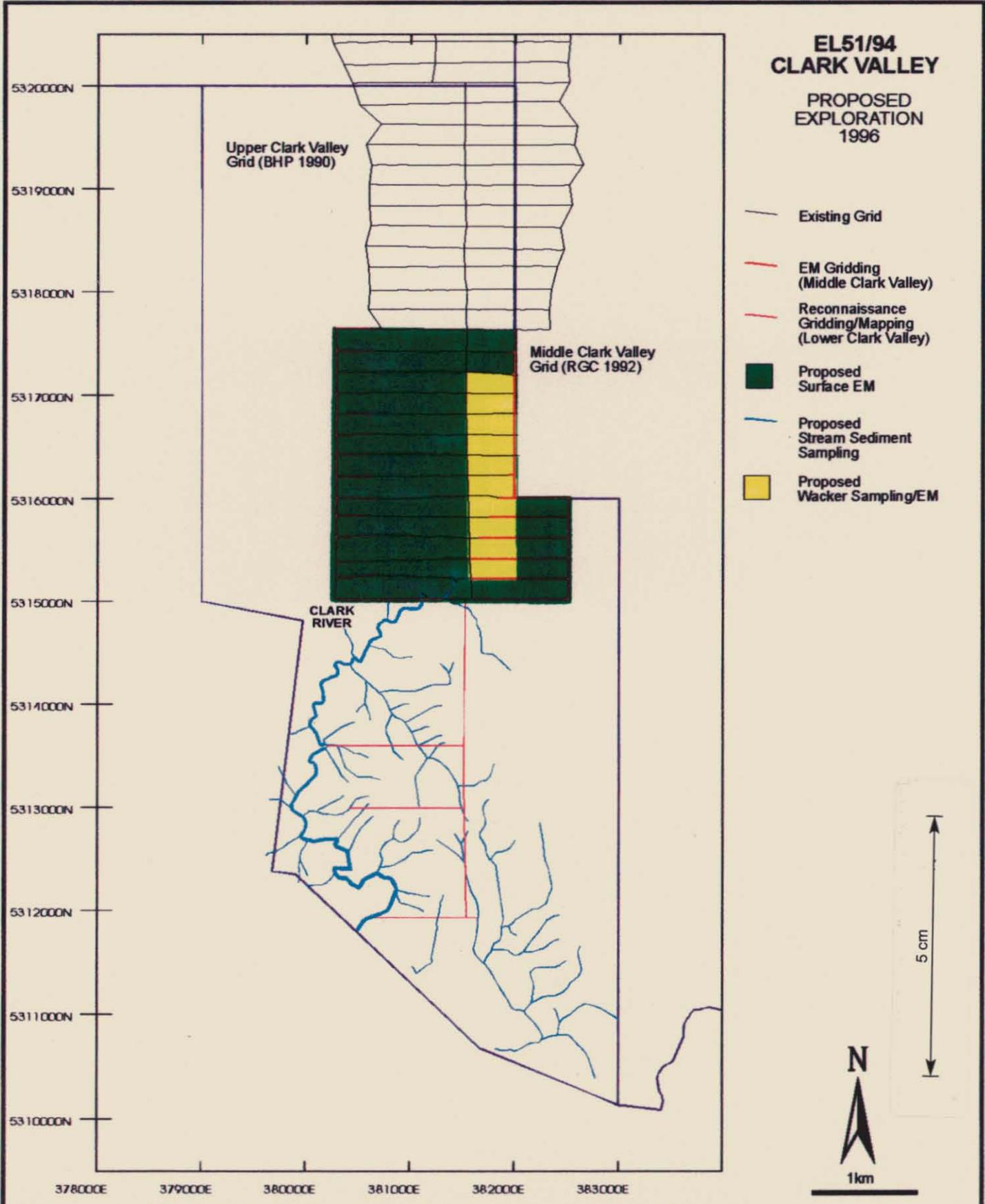


Figure 6



**Aberfoyle Resources Limited**  
EXPLORATION DIVISION

Figure 7

REVISIONS			
Init.	Date	Init.	Date
RHL	8/1/96		

**EL51/94 Clark Valley**

**Proposed Exploration  
1996**

Compiled: RHL  
 Drawn: JX730  
 Checked :  
 File Name: c\_clv4.cdr  
 Plate No.: C\_CLV4

Location Code :

Scale: 1:50000

Date: October 1995

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**Reid, K.O., Meares, R.M.D., & Walter, A.C., 1979. EL9/66 Annual Report 1978-79. Mount Lyell Co.**

**Ruddock, I., 1974. Final Report EL13/65 Jukes-Darwin. Int. Nickel Aust. Ltd.**

**Williams, R.E., 1975. Jukes-Darwin area (EL13/65 and SPL 140). EZ Company.**

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145° 35' 00"

145° 37' 30"

378000E  
5328000N

388000E  
5328000N

5327500N

5325000N

5322500N

5320000N

5317500N

5315000N

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378000E

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387500E

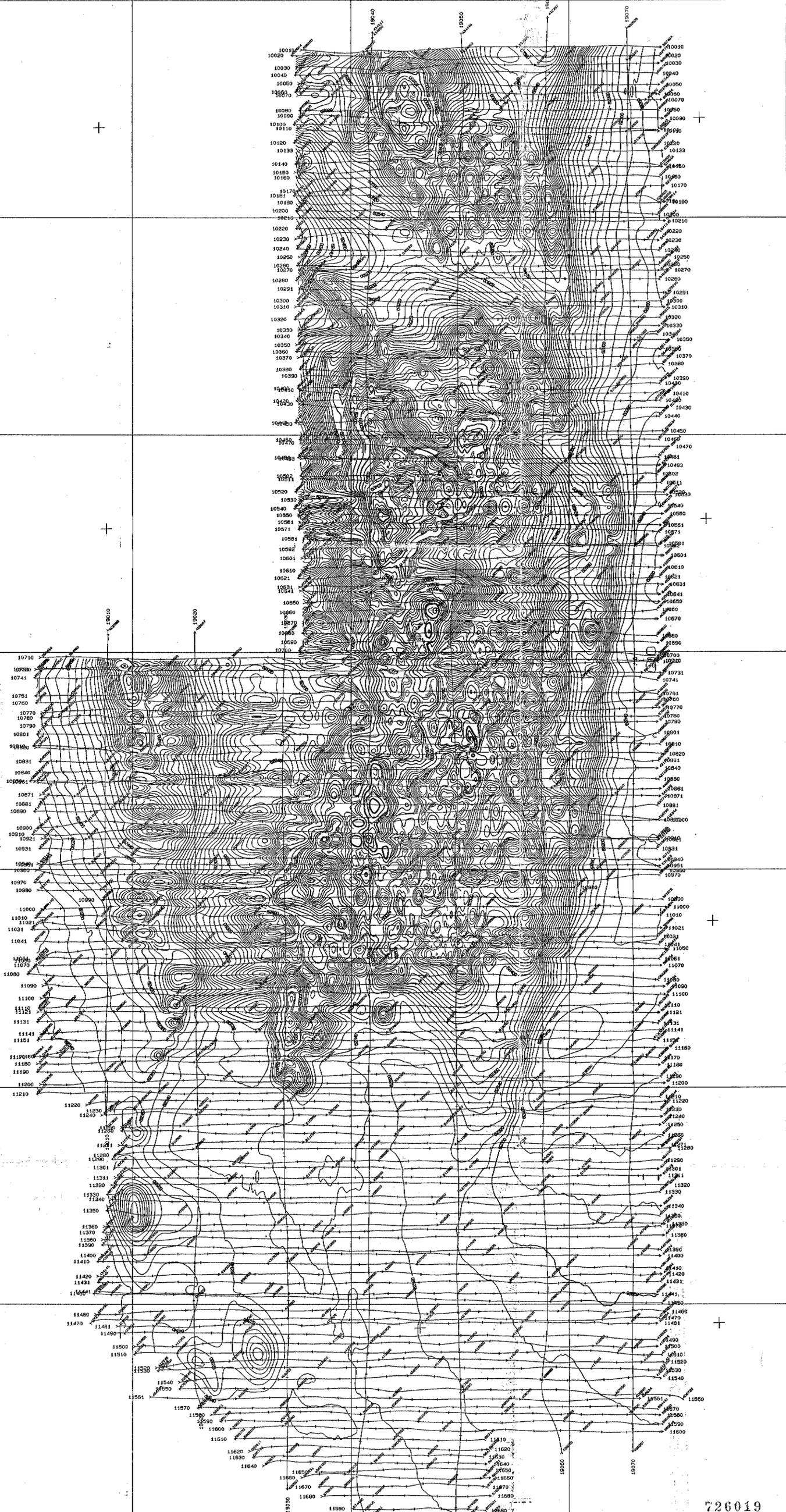
388000E  
5309000N

42° 12' 30"

42° 15' 00"

42° 17' 30"

42° 20' 00"



726019

**96-3827**

TECHNICAL AND PROGRESS REPORT 1995 FOR  
EL 51/94 CLARK VALLEY -  
ABERFOYLE RESOURCES- LEWIS R

5 cm

**Aberfoyle Resources Limited**  
EXPLORATION DIVISION

REVISIONS			
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WESTERN TASMANIA  
**EL 51/94 CLARK VALLEY**  
**1995 HELIMAG SURVEY**  
**FLIGHT LINES AND VERIFICATION CONTOURS**

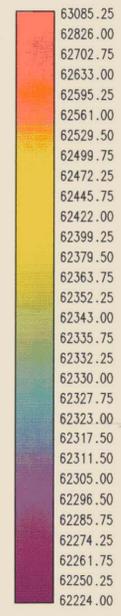
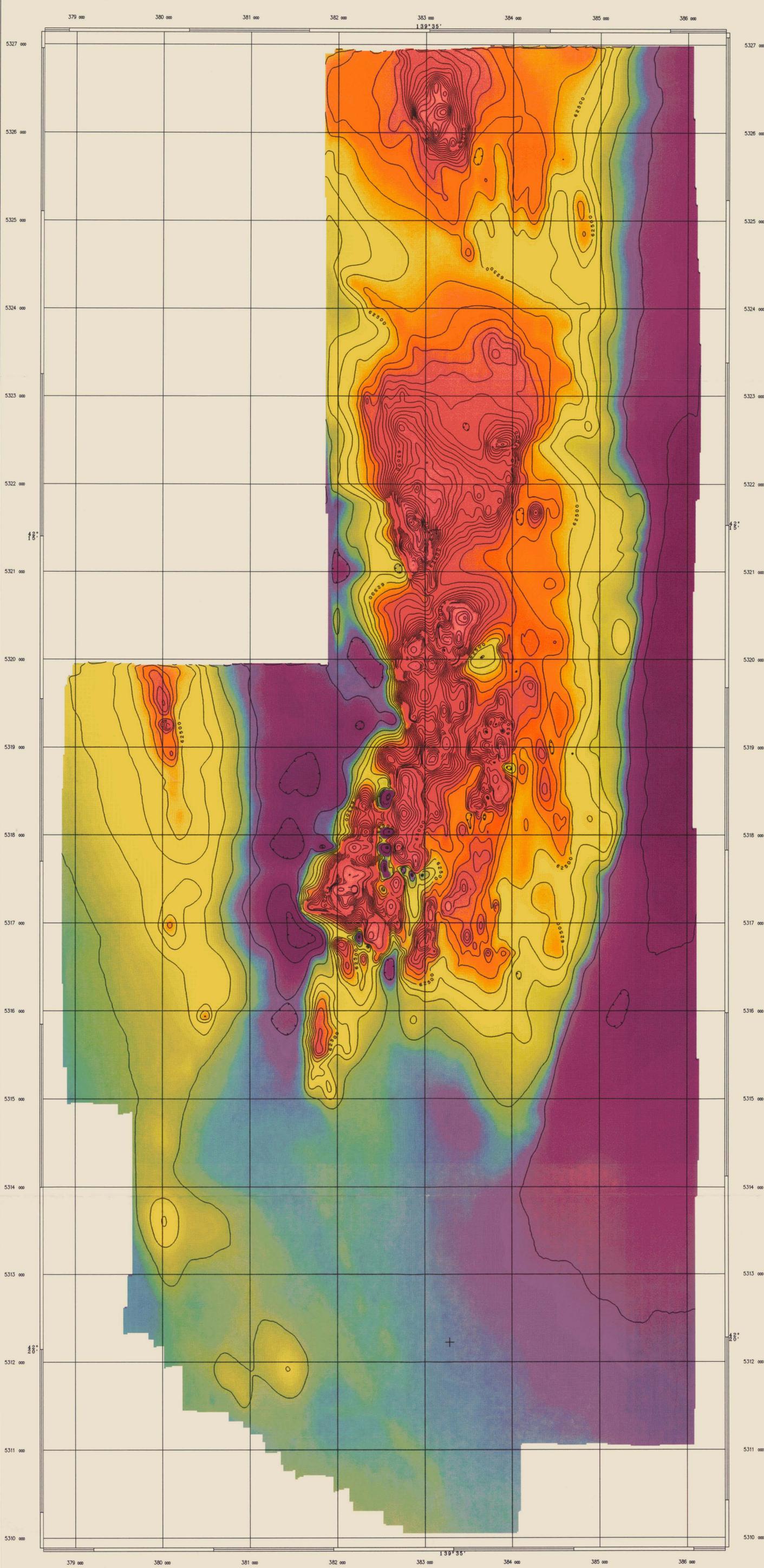
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Date : February 1995

Plate No. : CLV9



**96-3827**

TECHNICAL AND PROGRESS REPORT 1996 FOR  
 E.L.51/94 CLARK VALLEY  
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<b>Aberfoyle Resources Limited</b> EXPLORATION DIVISION		Compiled : JS Drawn : JS Traced : JS Checked : JS Plate No. : CLV1
<b>WESTERN TASMANIA</b> <b>E.L.51/94 CLARK VALLEY</b> <b>1995 HELIMAG SURVEY</b> <b>COLOURED CONTOUR PLAN</b>		Scale : 1:25000 Date : JANUARY 1996
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