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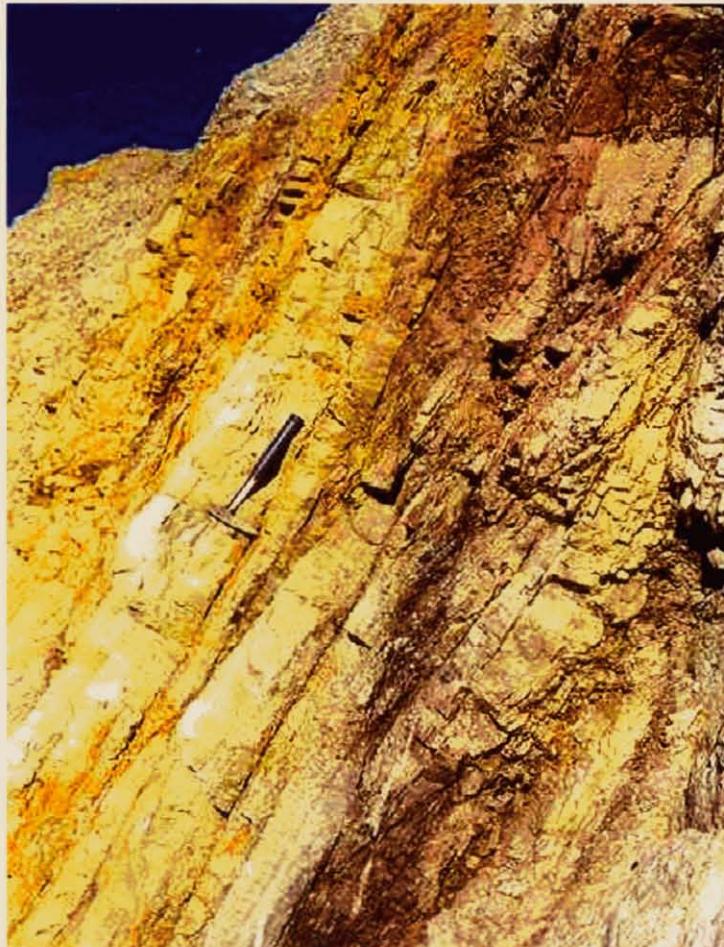
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MT CARELESS EL 31/96  
ANNUAL & PARTIAL RELINQUISHMENT  
REPORT  
1999

MINERAL RESOURCES	
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Overtured Ordovician sediments, Jetsons Quarry, west of the Bald Tier Fault – looking south (Photo J.G. Purvis).

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Annual & Partial Relinquishment Report 1999 - Mt  
Careless - EL 31/96  
Allstate Explorations NL\*  
Hills, P.B.

EL31/96

P.B. Hills  
October 1999

**MT CARELESS  
EL 31/96  
ANNUAL & PARTIAL RELINQUISHMENT REPORT 1999**

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Honours Thesis Abstract – D.J. Atchison

## 1. SUMMARY

The 41 skm EL 31/96 (Mt Careless) covers Ordovician sediments 12 km south of the Beaconsfield Gold Mine.

Interpretation of data generated over the past 3 years by Hart, Large and Stanton-Cook (1997), Atchison (1998) and Purvis (1998) has been reviewed in light of developments in understanding of the geology of the entire district between the Badger Head Block and the Tamar River which Elliot, Woodward and Gray (1993) defined as the Beaconsfield Block. The review has relied on a number of sources external to EL 31/96 and particularly those discussed by Hills and MacDonald (1999).

Particular findings of the review reflect upon the perceived prospectivity of the licence including

- recognition of the Bald Tier Fault as the expression of the basement thrust separating the Badger Head and Beaconsfield Blocks (perhaps more correctly the Badger Head and Beaconsfield Allochthons) of Elliot, Woodward and Gray (1993),
- the consequent recognition that the lower Palaeozoic rocks of the Mt Careless massif form part of the Badger Head Block and not the Beaconsfield Block as had previously been supposed, and
- the possibility that the lower Palaeozoic rocks of the two blocks, although correlateable in a Tasmania-wide sense, were not necessarily juxtaposed at the time of deposition and did not necessarily experience a similar geological history in all respects.

Purvis (1998) considered that the rocks east of the Bald Tier Fault were more prospective for Tasmania Reef-style mineralisation than those to the west. The current author concurs with that opinion and it forms the basis for the decision which has been taken by Allstate Explorations NL to relinquish that portion of EL 31/96 which occurs west of the Bald Tier Fault. The remaining tenement totals 12 skm, exploration of which will be planned following examination of the recent aeromagnetic data which is keenly awaited.

## 2. INTRODUCTION

EL 31/96 (Mt Careless) lies 12 km south of Beaconsfield in northern Tasmania (figure 1). The 41 skm licence is 100% owned by Allstate Explorations NL. It was taken up in late 1996 to search for Beaconsfield-style quartz vein gold deposits within Ordovician sediments considered correlates of those at the Beaconsfield Mine.

The EL covers the Supply River headwaters. The terrain is rugged with only foot access through dense vegetation in the central 50% of the licence. The eastern part of the EL is undulating farmland with Ordovician rocks shallowly buried beneath Permian cover.

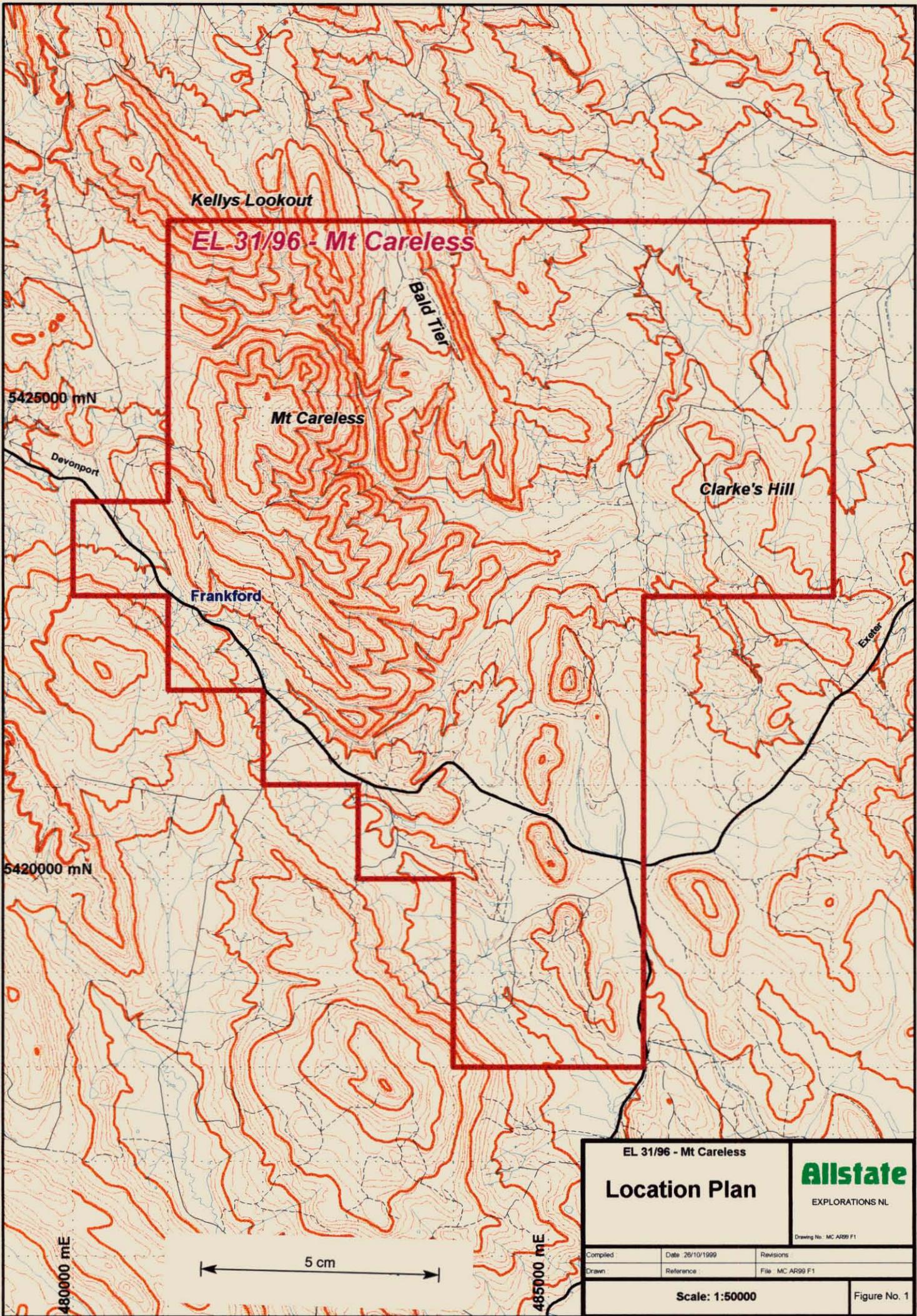
There are no records of mineral deposits or previous mining within the EL although several old workings, mostly on quartz veins and therefore presumably for gold, have been found by Allstate's field surveys. Extensive quarrying occurs at several places, excavating silica, sand and gravel for concrete aggregate and road-base materials.

Mt.Careless was largely ignored by mineral explorers prior to 1996. BHP held the area under EL 14/65 in 1965-67 and sampled two small stream catchments for basemetals without significant results (Gebert, 1967). In 1988 the area was covered by a regional aeromagnetic survey for Beaconsfield Gold Mines Limited

Allstate Explorations NL commenced exploration on EL 31/96 in November 1996. Work including a BLEG stream sediment survey augmented by limited rock sampling and mapping, was reported by Hart, Large and Stanton-Cook (1997).

Purvis (1998) undertook detailed mapping of creek traverses and quarry exposures, rock sampling, limited -80mesh stream sediment sampling, lithogeochemical and petrological studies and a structural interpretation using airphotos and re-imaged 1988 aeromagnetic data. He worked in the field and to a degree collaborated with Atchison (1998) who completed a B.Sc. Honours Thesis at the University of Tasmania entitled "*Geology and Structure of the Mt Careless area, Frankford, Northern Tasmania*". The abstract of this thesis is included in appendix 1.

No field work was conducted during the 1999 reporting year. A decision on future work is awaiting the release of aeromagnetic data flown by AGSO over the 1998/99 summer which was originally due in August 1999. A new release date of November 1999 has been advised. The current report is a precis of the authors' interpretation of work completed to date as it reflects upon the prospectivity of the Mt Careless area. It is prepared with the benefit of knowledge gained from extensive exploration undertaken throughout the district by Allstate Explorations NL and its partner in the Beaconsfield Mine Joint Venture, Beaconsfield Gold NL, on several Joint Venture and individual exploration licences.



EL 31/96 - Mt Careless		<b>Allstate</b> EXPLORATIONS NL
<b>Location Plan</b>		
<small>Drawing No. MC AR99 F1</small>		
<small>Compiled</small>	<small>Date: 26/10/1999</small>	<small>Revisions</small>
<small>Drawn</small>	<small>Reference</small>	<small>File: MC AR99 F1</small>
<b>Scale: 1:50000</b>		<b>Figure No. 1</b>

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### 3. LAND TENURE

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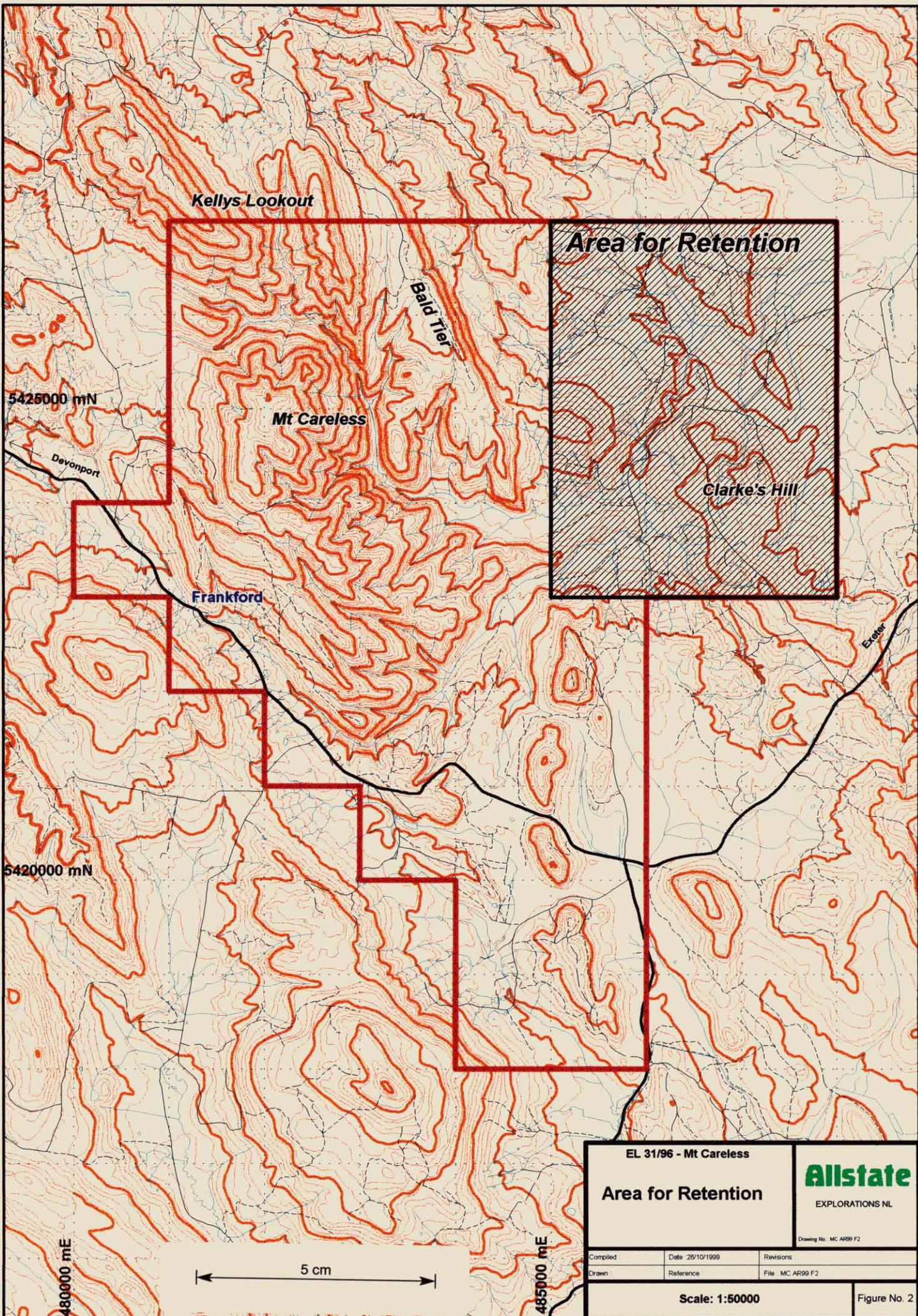
EL 31/96 (Mt Careless) of 41 skm was granted to Allstate Explorations NL on 8th November 1996. The licence is due to expire on 8th November 2001.

The expenditure commitment for the first three years tenure was \$71,750. This commitment was met during the first two years of the licence and expenditure has been limited to time-written management during the third year.

The granted area of EL 31/96 covers 41 skm of Crown Land, State Forest - Multiple Use Forest Land, State Forest - Informal Reserve, and private property.

Within the EL boundaries but excluded from it are 101 ha of Mining Leases (the silica gravel quarries), the 344 ha Mt Careless Forest Reserve and a 25 ha Crown Reserve.

It is the intention of Allstate Explorations NL to relinquish a total of 29 skm of the licence. The area for retention totals 12 skm and is illustrated in figure 2. The retained area is defined as that area encompassed within a boundary commencing at 485000E, 5427000N and continuing east to 488000E and then south to 5423000N and then west to 485000E and then north to the point of commencement.



EL 31/96 - Mt Careless		 Allstate EXPLORATIONS NL <small>Drawing No. - MC AR99 F2</small>
Area for Retention		
Compiled	Date 20/10/1999	Revisions
Drawn	Reference	File MC AR99 F2
Scale: 1:50000		Figure No. 2

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## 4. GEOLOGY

### 4.1 INTRODUCTION

The geology of the Mt Careless area was first mapped in detail by Gulline, Bravo and Naqvi (1973). Little further attention was shown to the area prior to the establishment of the current EL which saw the commencement of reconnaissance work by Hart, Large and Stanton-Cook (1997) and broad scale mapping by Purvis (1998) and Atchison (1998).

### 4.2 STRUCTURAL FRAMEWORK

The preferred model for the regional geology of northern Tasmania from Port Sorell to the Tamar River is based on the work of Elliot, Woodward and Gray (1993). Those authors divided the region into three allochthonous blocks thrust over one another from the northeast. Broadly, the blocks (perhaps more correctly allochthons) as defined by Elliot, Woodward and Gray (1993) comprise

- the supposed Cambrian sequences and associated igneous rocks of the Port Sorell area - the Port Sorell Block,
- the Precambrian quartzwacke siltstones and sandstones of the Badger Head area - the Badger Head Block,
- the entire lower Palaeozoic sequence east of the Badger Head Block stretching to the Tamar River - the Beaconsfield Block.

The model of Elliot, Woodward and Gray (1993) stated that the Badger Head Block was fault-bounded and implied that it was comprised entirely of the Precambrian rocks. Gulline, Bravo and Naqvi (1973) and Gulline (1981) recognised the obvious correlation of the siliciclastic sediments of the Mt Careless massif with the Denison Group of western Tasmania. Elliot, Woodward and Gray (1993) did not comment upon the finding of Gulline (1981) that these rocks overlie the Precambrian rocks unconformably. Subsequent mapping by Atchison (1998) and Purvis (1998) has however, confirmed Gulline's work. Given broad acceptance of the model of Elliot, Woodward and Gray (1993) which is supported by the current author, the implications of the unconformity are two-fold. Firstly, the Badger Head Block does indeed include lower Palaeozoic strata. Secondly, the substantial basement thrust separating the Badger Head Block from the Beaconsfield Block is located east of the Mt Careless massif.

Gulline (1981) briefly discussed the apparent differences between the Mt Careless rocks and those located south of Winkleigh. However, their discussion was limited and was never intended to have a regional focus. Purvis (1998) in particular recognised the significance of the Bald Tier Fault as representing recent reactivation of an earlier thrust. He noted synclinal drag folding of the Denison Group sediments in Jetson's Quarry (485350E 5422350N) as evidence of east block up movement on the Bald Tier Fault pre-dating the post-Permian east side down movement now topographically evident (see cover photograph).

Further, Purvis (1998) observed from aeromagnetic data that the Bald Tier

Fault runs along the sharp western boundary of the of the buried SE extension of the Anderson's Creek Ultramafic Complex. It is consistent with the models of Berry and Crawford (1988) and Crawford and Berry (1992) that such a thrust should form the base and thus the western margin of the Anderson's Creek Ultramafic Complex. Consequently, it follows that the Bald Tier Fault is the western margin of the Beaconsfield Block. No age for the thrusting is considered here but in any case this is likely to have been a multi-phase event and is a debate beyond the scope of the current discussion.

The model for the Bald Tier Fault serves to place the enigmatic metasediments which crop out along the western margin of the Anderson's Creek Ultramafic Complex at the eastern margin of the Badger Head Block. This is consistent with the unconformity inferred between the metasediments and the Precambrian rocks by Green (1959). Gee and Legge (1979) suggest that the unit is contact metamorphosed by the Anderson's Creek Ultramafic Complex. However, this is unlikely given the expected sea-floor origin of the Complex, the reported occurrence of stromatolites in the metasediments (Banks, in Jago and Brown, 1989) and the tectonic models now being advanced by most authors. Recent field investigation supports inclusion of these rocks as correlates of the Dundas Group (Blyth's Creek Formation) rocks in the district (c.f. MacDonald, 1999). Purvis (1998) also mapped a sequence of sandstone, siltstone and minor limestone at 482500E 5426000N which he likened to the Blyth's Creek Formation at Beaconsfield. These rocks occupy the same stratigraphic position as the metasedimentary rocks discussed herein.

#### 4.3 STRATIGRAPHY

Atchison (1998) and Purvis (1998) defined a local stratigraphy for the Mt Careless area in the field. Atchison (1998) in particular described the lithologies in detail and endeavoured to establish a formal stratigraphy for the lower Palaeozoic rocks of the Mt Careless area which he named the Mt Careless SubGroup. However, these workers endeavoured to apply their stratigraphy to the entire area of EL 31/96 whereas the current author considers it appropriate to restrict the use of the Mt Careless stratigraphy to the Lower Palaeozoic rocks cropping out west of the Bald Tier Fault. In essence then and in recognition of the earlier discussion, the Mt Careless Subgroup is reserved for the Denison Group correlates and associated rocks of the Badger Head Block.

East of the Bald Tier Fault the Lower Palaeozoic rocks show much greater affinity with similar rocks at Beaconsfield and are described hereafter in terms of the stratigraphic nomenclature summarised by Hills and MacDonald (1999) and reserved for the Denison Group Correlates and associated rocks of the Beaconsfield Block.

To this end the Blyth's Creek Formation correlates described by Purvis (1999) from 482000E 5426000N are defined as the Kelly's Lookout Formation and as discussed, this formation is extended to include the metasedimentary sequence west of the Anderson's Creek Ultramafic Complex. The Kelly's Lookout Formation is thus the Dundas Group correlate within the Badger Head Block. The Denison Group correlates in the Badger Head Block are described as the Mt Careless Subgroup by Atchison (1998). This subgroup comprises the

Frankford Formation, the Supply River Sandstone and the Reid's Creek Siltstone after Atchison (1998) and Purvis (1998). These units are at this point loosely correlated with the Cabbage Tree Conglomerate, Salisbury Hill Formation and Eaglehawk Gully Formation within the Beaconsfield Block respectively.

There is no correlate of the Gordon Group within the Badger Head Block at Mt Careless. Gulline, Bravo and Naqvi (1973) mapped a small occurrence of limestone on Bald Tier at 483400E 5427300N. This limestone was relocated by Atchison (1999) who recognised that it occurred within the Supply River Sandstone. Similar occurrences of limestone occur within the upper section of the Salisbury Hill Formation and throughout the Eaglehawk Gully Formation at Beaconsfield. Correlates of the Mathinna Group are also absent from the Badger Head Block.

The stratigraphy with interpretation after Atchison (1998) and Purvis (1998) is summarised and correlated with the stratigraphy of Hills and MacDonald (1999) in the following table.

Western Tasmania Association	<b>Badger Head Block</b>	<b>Beaconsfield Block</b>	Eastern Tasmania Association
	Formation/ Association	Formation/ Association	
	Unknown	Corn Hill Beds	Mathinna Group
Gordon Group	Unknown	Flowery Gully Limestone	
Denison Group	* Reid's Creek Siltstone	Eaglehawk Gully Formation	
	* Supply River Sandstone	Salisbury Hill Formation	
	* Frankford Formation	Cabbage Tree Conglomerate	
Dundas Group	Kelly's Lookout Formation	Blyth's Creek Formation	
Local Basement	Badger Head Formation (PC)	Anderson's Creek Ultramafic Complex (€)	

Table 1. Comparative stratigraphy of the Badger Head and Beaconsfield Blocks of northern Tasmania after Hills and MacDonald (1999), MacDonald (1999), Atchison (1998) and Purvis (1998).

#### 4.4 IMPLICATIONS

Implications of the foregoing discussion are

- The lower Palaeozoic rocks of Mt Careless are autochthonous with respect to the Precambrian Badger Head Group and therefore occur within the Badger Head Block as established by Elliot, Woodward and Gray (1993).
- The lower Palaeozoic rocks of the Clarke's Hill area south of Winkleigh occur within the Beaconsfield Block of Elliot Woodward and Gray (1993).
- The lower Palaeozoic rocks are correlateable across the Bald Tier Fault in time and depositional environment and this correlation may be extended regionally across Tasmania through the Dundas, Denison, Gordon and Mathinna Groups.

\* Reids Ch Sst + Supply R Sst + Frankford Fm = "Mt Careless Subgroup"

- However, the rocks were not locally juxtaposed at the time of deposition.

The foregoing discussion says little about the prospectivity of the Badger Head Block for mesothermal Tasmania Reef style gold deposits. It is noteworthy however that the discussion does establish a somewhat disparate geological history for the lower Palaeozoic rocks either side of the Bald Tier Fault. It is entirely plausible that differences in basement chemistry, in hydrothermal plumbing regimes or indeed in rock chemistry might make the geology west of the Bald Tier Fault less prospective. In any case, field investigations by Hart, Large and Stanton-Cook (1997) and Purvis (1998) have failed to locate any indication of the presence of economic gold mineralisation in the area despite locating numerous historical workings and undertaking large scale sampling programmes.

The prospectivity of EL 31/96 east of the Bald Tier Fault remains largely untested. However, the current understanding of the spatial geology as discussed herein enhances interest in the magnetic interpretation in the Clarke's Hill area discussed by Purvis (1998) and this will be pursued.

## 5. RECOMMENDATIONS

Any future plans and recommendations await the release of pending AGSO aeromagnetic data. This data was originally due in August 1999 but release has reportedly been delayed until November 1999.

Despite the delay in obtaining the data, it is recommended that the area west of the Bald Tier Fault be relinquished. This recommendation is in line with the foregoing discussion on the geology of EL 31/96 and reflects on the likely prospectivity for the discovery of Tasmania Reef style gold mineralisation through conventional exploration during the limited remaining tenure of the licence. The area to be retained totals 12 skm.

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## 6. EXPENDITURE

### 11.1 1999 EXPENDITURE

Little work was undertaken on EL 31/96 (Mt Careless) for the year to 8 November 1999. Minor costs were incurred meeting final commitments to Honours Student David Atchison. The abstract of his thesis is appended to this report. Time and resources costs were also incurred in the analysis of data and preparation of this report. Total costs including those discussed and administrative costs are estimated at \$5,000. Expenditure on the EL since its granting in November 1996 is estimated to total **\$81,422** against an expenditure requirement during the first three years of the Licence of **\$71,750**.

### 11.2 PROPOSED FUTURE EXPENDITURE

The future of EL 31/96 has yet to be determined and is awaiting the release of AGSO aeromagnetic data originally scheduled for August 1999. Allstate Explorations NL has determined that a total of 29 skm in the western portion of the EL will be relinquished in any case. The rationale for that decision rests with the current understanding of the Geology of the Mt Careless area as outlined above.

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**APPENDIX 1**

**HONOURS THESIS ABSTRACT – D.J. ATCHISON**

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## ABSTRACT

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A regional mapping program over 22 square kilometers in the Mt Careless area was carried out to determine the potential for Beaconsfield style gold mineralisation in Mt Careless EL 31/96. The area is composed of an upward fining sequence of Ordovician siliciclastic conglomerates, sandstones and siltstone, correlated to the Denison Group. The sequence laps unconformably onto Proterozoic sediments of the Badger Head Group and youngs to the southeast. It differs from other Ordovician sequences of northern Tasmania by the absence of Gordon Group correlates.

Sediments have been derived from the Proterozoic Badger Head Group, and the Cambrian Mt Read Volcanics and Andersons Creek ultramafic complex. Deposition of the Mt Careless Subgroup is marked by a transition in depositional environments, from fluvial to possible shoreline deposits at the base of the sequence, and subwave base to intertidal deposits at the top. Conodonts of Caradoc age, recorded half way up the succession, limit the age of the Mt Careless Subgroup.

The Mt Careless area is characterised by two NNE striking thrust faults, formed during the Middle Devonian Tabberabberan Orogeny. Thrusting resulted in the repetition of basal units towards the top of the sequence, and is related to thrusting in the Beaconsfield area. Two folding events influenced the Mt Careless area, and occur as NNE-NNW (F1) and SE (F2) plunging folds. Northwest striking normal faults (D3) and northwest and northeast striking wrench faults (F4) have offset lithological contacts and earlier deformation structures.

Whole rock analysis and immobile element studies suggests the Mt Careless Subgroup is geochemically similar to the Cabbage Tree Formation of Beaconsfield. Sediments have compositions compatible with derivation from the same source, and are proposed to represent proximal and distal deposits of equivalent stratigraphic units. Although both areas have similar deformation histories, the absence of D2 through-going shears in the Mt Careless area reduces the potential for Beaconsfield style gold mineralisation.

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