NEWNHAM EXPLORATION & MINING SERVICES

EL 10/96
ANDERSONS CREEK AREA
NORTHERN TASMANIA

ANNUAL REPORT
TO END APRIL, 1997

Prepared for:

Allegiance Mining NL
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20 May, 1997

TEXT

APPENDICES:

1. SUMMARY

Allegiance Mining NL holds Exploration Licence 10/96 of 18 square kilometres at Andersons Creek, near Beaconsfield.

The licence allows Allegiance to explore only for nickel and cobalt, and is limited to a depth of 30 metres below surface.

Previous exploration in this area by several other organisations had identified a lateritic resource occurring in four areas, estimated to contain 6 Mt 1.04 %Ni and 0.06 %Co.

During the past twelve months, Allegiance has undertaken the following work in order to further evaluate this resource:

- thoroughly collated all existing exploratory data
- designed a drilling program to further assess the resource
- negotiated access to the area for the purposes of drilling
- completed 549 m of RAB (air-core) drilling in 51 holes.

Results from this drilling were not available at the time of writing this report.

Given sufficient assay encouragement, further geological and metallurgical studies will be undertaken in 1997-1998.

Expenditure for the twelve months to end April, 1996 was $65,671.

Anticipated expenditure for 1997-1998 will be a minimum $50,000.

2. LAND TENURE

EL 10/96 was granted to Allegiance Mining NL on 28 June, 1996 for nickel and cobalt, to a vertical depth of 30 metres.

Other parties hold exploration licences with reference to all minerals below 30 m, and to all minerals other than Ni and Co above 30 m.

A complex arrangement of other mining tenements, crown lands and private property overlay the area, and are specified in a special access report attached as Appendix A.

Crown Land classifications are designed specifically to maximise protection of two rare and endangered plant species.

Despite the complexity of the land tenure, all parties involved have proved most co-operative in assisting Allegiance with the performance of their exploration work in this area.

Access in this area is extremely good, being serviced by a network of sealed and unsealed roads and tracks.

3. WORK COMPLETED

3.1 Data Collation:

Substantial exploration work has been completed in the Andersons Creek area during the past 30 years. Prior to undertaking any further work in the area, Allegiance undertook a thorough collation of this previous data. Results of this work are contained in a report attached as Appendix B.

This report highlighted an identified lateritic resource of 6 Mt 1.04 %Ni, 0.06 %Co, occurring in four adjacent but discrete areas.

3.2 Drilling Program Design:

It was decided to further evaluate this identified resource by way of a drilling program. The three objectives of this program were to:

- validate some of the earlier drilling data
- test for modest extensions of the known deposits in order to increase resources
- provide samples for mineralogical and metallurgical studies

In order to minimise environmental sensitivity in the region, it was decided to site as many holes as possible on existing tracks and roads and to use a small, low impact track-mounted rig.

Prior to locating these holes, relevant existing tracks and roads were surveyed by licenced surveyors Campbell Smith, Phelps, Pedley Pty Limited of Launceston.

Selected sites were then reviewed with government agencies to ensure environmental acceptability.

Details of the recommended program are attached as Appendix C.

3.3 Drilling Program:

Fifty-one RAB (air-core) holes totalling 549 m were completed in February-March, using a Scout 250 owned by Tas Diamond Drillers Pty Ltd.

All holes were vertical. Samples were taken at 1.0 m intervals, weighed, and sub-sampled for assaying by Amdel in Adelaide.

Samples were freighted to Adelaide by Tasmanian Freight services in tie-wire sealed sacks.

Remaining samples are stored in a locked shed at Beaconsfield.

All drilling operations were supervised by Mick McKeown of McKeown Mining Services.

The holes were distributed over the four known resource areas on the following basis:

Scotts Hill	9
Mt Vulcan	8
Barnes Hill	17
Barnes Hill South	17

Logging of holes and assaying of samples is not yet completed and the outcome of the program is thus not discussed further in this report.

4. WORK PLANNED

The following work is envisaged for the next 12-month period:

(i) completion of assaying, including multi-element scanning

(ii) surveying of all drill sites

(iii) collation and reporting of drilling program, including a resource potential report

(iv) petrographic and mineralogical work on selected samples

(v) laboratory test work on selected composite intervals

(vi) completion of further drilling program if the resource potential estimate is sufficiently encouraging

5. EXPENDITURE

Total expenditure for the 12-month period to end April, 1997 was $65,671.

On the basis of the above recommended work program, the following expenditure is budgeted for the 12-month period ending April, 1998:

Stage I		
Assaying	5,000	
Surveying	3,000	
Reporting & Management	12,000	
Petrology/Mineralogy	4,000	
Laboratory Testing	16,000	
Stage Total		40,000
Stage II		
Additional Drilling (1000 m core and RC)	60,000	
Assaying/Surveying	10,000	
Petrology/Mineralogy	10,000	
Metallurgical Testing	50,000	
Management	20,000	
Stage Total		150,000
Stage I & II Total		**$ 190,000**

Stage II work would depend on encouraging outcomes from Stage I.

APPENDIX A:

"EL 10/96
INITIAL REPORT ON
EXPLORATION ACCESS
AND NICKEL-COBALT
POTENTIAL"

BY
LA NEWNHAM
APRIL, 1996

NEWNHAM EXPLORATION & MINING SERVICES

EL 10/96

ANDERSON CREEK AREA
TASMANIA

INITIAL REPORT ON EXPLORATION ACCESS

AND

NICKEL-COBALT POTENTIAL

Prepared for:

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April 11, 1996

1. SUMMARY & RECOMMENDATIONS

1.1 Summary

(a) Known Ni-Co resources on E.L.10/96 occur in four discrete bodies:

- Barnes Hill
- Barnes Hill South
- Scotts Hill
- Mt Vulcan

Previous estimates have indicated a combined resource of 6 Mt 1% Ni 0.06 Co.

(b) The commodity specific *strata* title offered by Mineral Resources Tasmania should be workable and not suffer undue impediment from other explorers.

(c) **Barnes Hill** deposit lies on both private land and an existing Mining Lease held by Boral. An access and compensation agreement with the private landowner will be necessary before work can commence on that property. An agreement with Boral will be necessary also.

This resource probably extends off EL10/96 onto Resolute-Samantha ground.

(d) **Barnes Hill South** lies on private property. Comments as for Barnes Hill apply. This deposit is close to tenement boundary.

(e) **Mt Vulcan** deposit occurs within a Recommended Area for Protection, primarily in place to protect a small plant. Exploration under stringent conditions will be possible. The conditions should not prove too onerous to the responsible explorer.

(f) **Scotts Hill** deposit lies just outside the Dans Hill RAP and private property. However, it is partly covered firstly by a small gravel reserve which, after further investigation and negotiation, should not prevent exploration, and secondly by a Prospecting Claim which (verbal advice) has been relinquished.

(g) Hence all the known Ni-Co resources are theoretically available for further exploration and development subject to concluding agreements with private owners, lease holders and government agencies.

(h) Scope may exist for extensions of the known resources, either as lateral extensions of the laterite or depth extensions into weathered bedrock.

1.2 Recommendations

In chronological sequence, Allegiance should

(a) proceed with the Licence application

(b) establish a detailed resource data base, assess results and design further exploration programs in order to both better define the resources and test for extensions.

(c) commence negotiations with the various stakeholders in the region.

2. INTRODUCTION

Allegiance Metals N.L. has been invited to formally apply for E.L.10/96 at Andersons Creek, in northern Tasmania. The Licence when granted will apply only to the first 30 metres below surface and only for nickel and cobalt within that 30 metre zone.

Land classification in the Andersons Creek area is complex, and this, combined with the unusual *strata title* nature of E.L.10/96, has the potential to confuse exploration and possible future mining.

This report addresses these issues. It does not seek to assess or evaluate the known Ni-Co resources. That should be the task of a following report.

299015

E.L. 10/96

ALLEGIANCE MINING N L
(Ni and Co in top 30 metres)

RESOLUTE SAMANTHA LTD
(All minerals except for Ni and Co in top 30 metres of area offered to Allegiance Mining N L)

5 cm

18 skm

59 skm

3. DATA PRESENTATION AND EVALUATION

Attached to this report are two maps of E.L10/96, presented side-by-side on the one sheet, for ease of comparison.

The right-hand map illustrates **geology**, approximate drill hole locations and known Ni-Co and Cr resource areas.

The left-hand map illustrates the various **land classifications** within the boundaries of E.L.10/96.

3.1 Comments on Geology Plan:

The surface geology shown on this plan was acquired from various sources, including State 1" = 1 mile geological map, CRA mapping and input from this writer.

The only features highlighted (in color) are the known Ni-Co resource areas and the Cr resource areas.

Because the Allegiance Licence only relates to Ni-Co, it seemed important to determine the likely coflict between these resources and others.

Fortunately the areas of Ni-Co resources are quite distinct from those of Cr.

This is probably because the Cr resources are Tertiary detrital concentrations in beach sediment environments, whilst the Ni-Co resources exist both in lateritic profiles developed on weathered ultramafics and in partially decomposed ultramafic bedrock.

It is therefore difficult to envisage conflict between exploration and development by Allegiance, and other explorers in the area.

Plotting of the resource areas on this map was quite difficult. Existing data on both the Cr and Ni-Co resources was poorly recorded. Thus the resource outlines as shown should be regarded as indicative only and not scaled from or used in quantitative resource estimates.

Two observations are relevant:

(a) The next stage of work on this Licence should be the thorough collation of a resource data base, into which the disparate available data is properly drawn, presented, assessed and then commented upon - including recommendations for further resource definition and evaluation.

(b) Scope exists for the definition of resources additional to the 6Mt 1%Ni defined to date. These additional resource options exist both in laterites and weathered bedrock and should be addressed in the resource study (a) above.

3.2 Land Status Plan

The land status plan shows the E.L. to be covered by both Crown and Private land. The Crown land is variously classified.

The main areas of **private land** relevant to the known Ni-Co resource areas are in the east and the north.

In the east, approximately half the Barnes Hill Ni-Co and the complete Barnes Hill South Ni-Co resource areas lie on private land. This is not a problem and in fact can be an advantage. Exploration and mining are permitted on private land but must be preceded by negotiation of an access and compensation agreement with the landowner. This agreement must be concluded in writing and lodged with MRT.

In the north, private property comes very close to the Scotts Hill Ni-Co resource area, and it is probable that the resource may extend north onto this property. Hence, once the Licence is granted, it will be necessary to come to negotiated agreement with several land owners in the region. This would logically best be done after the detailed collation of the resource data base recommended in 3.1 (a) above.

Most of the **Crown Land** is classified either as Multiple Use Forest (MUF) or Recommended Area for Protection (RAP), both administered by Forestry Commission. Several reserves and mining tenements also exist.

Superimposed over much of the Licence area is the Mt Vulcan - Simmonds Hill Australian Heritage Act Registered Entry. This AHA area covers both private and Crown land and is shown dotted on the plan. It has not been highlighted in color because whilst AHA areas do affect some conditions of exploration access, this classification does not represent significant impediment to access.

The prime reason for the AHA and Dans Hill RAP areas is to protect two plant species:

- *Tetratheca gunnii*
- *Epacris virgata*

The defined locations of these plants as shown on the map represent the most recent data received from the Forestry Commission.

Tetratheca is present in only three known locations and none of these occur over the Ni-Co areas.

Epacris is more widely distributed including parts of the Scotts Hill and Mt Vulcan Ni-Co resource areas. If the Barnes Hill deposit extended further north than shown, then any such extension would also be in an *Epacris* area.

The **Dans Hill RAP** covers the Mt Vulcan Ni-Co resource and any probable eastern and southern extensions of Scotts Hill resource. Exploration on a RAP is possible but is subject to program approval and quite strict conditions. With good planning and supervision, a RAP should not be seen as an exploration disincentive.

There are two **gravel reserves** on E.L.10/96. The northern-most one covers an important part of the

Scotts Hill resource. The status of this reserve is not known - it is probably held by the West Tamar Council and may in fact have lapsed. Gravel Reserves may or may not be subject to the Mining Act. If they are not subject to the Act, they can be brought back under the Act by application. They are usually held by government authorities for road works and can generally be accessed for exploration by negotiation.

The existence of this gravel lease is not seen as an impediment at Scotts Hill but its status will have to be determined prior to work in that area.

The **water reserve** on the southern end of E.L.10/96 will be exluded from the E.L. but does not cover any of the known Ni-Co resources.

There are several existing **mining tenements** which will be excluded from the E.L.

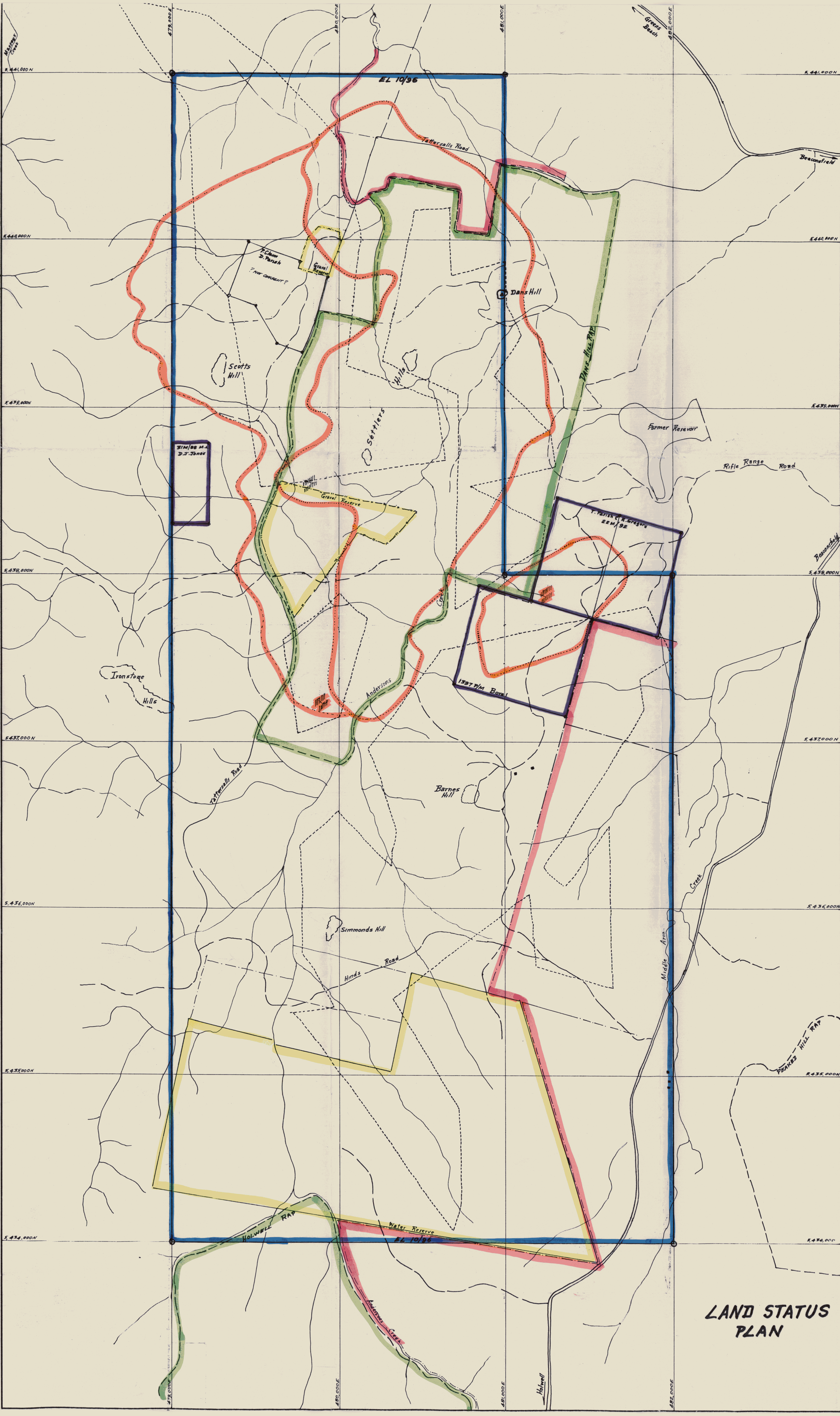
1397 P/M held by Boral, covers a NW section of the Barnes Hill Ni-Co resource. Boral probably holds the lease for its Tertiary gravels and it would be important to enter into an agreement with Boral on this lease. Anynorthern extensions of the Barnes Hill resource will largely be on this lease.

22 M/92 held by T. Parish and R Gregory lies to the north of Barnes Hill resource and has no foreseeable impact on work in this area.

Similarly 31 M/88 held by D.J. Jones should not impact on work on the Ni-Co resource.

The Prospecting Claim held by D. Parish near Scotts Hill overlaps part of the Scotts Hill Ni-Co resource. However, MRT advised (pers. comm.) that the claim was not renewed.

Finally, it should be noted that the Barnes Hill Ni-Co resource probably extends east off E.L.10/96 and any future eastern extensions of either that resource or the Barnes Hill South resource will fall on ground currently held by Resolute-Samantha.



LAND STATUS PLAN

LAND STATUS MAP – KEY

- Mining and Exploration tenements
- Private property
- Recommended Areas for Protection (RAP)
- Reserves
- Mt. Vulcan – Simmonds Hill Australian Heritage Act – Registered Entry.
- "Tetratheca gunnii"
- "Epacris virgata" – definite
- – probable
- Major roads
- Minor roads
- Tracks
- Creeks
- Prominent Hills

Published Chromite Resources
(?some since mined?)

		%
South Rifle Range Prospect	233,000 tonnes	15.1 Chromite
North Rifle Range Prospect	200,000 tonnes	7.5% chromite
Barnes Hill	234,000 tonnes	12.4%

Published Ni-Co Resources (KIS)

	tonnes	Ni%	Co.%
Barnes Hill	3,274,000	1.03	0.07
Barnes Hill South	982,000	1.25	0.07
Mt. Vulcan	1,344,000	0.95	0.05
Scotts Hill	510,000	0.98	0.06

GENERAL NOTES

These composite plans have been constructed by combining data from a variety of sources. The accuracy and currency of these sources is not always evident. This applies particularly to the land status map which was compiled from CRA, Forestry Commission and MRT maps. Changes in this type of data is difficult to monitor.

Thus if work is planned in specific areas, relevent land status data should be thoroughly acquired.

GEOLOGY MAP – KEY

Basic geology from CRA Map dated Nov. 94, MRT Report Ref 95 – 3724

The CRA map was modified from various MRT maps dated 1979, 81, 93.

Quaternary	Qa	River alluvium and marsh
	Qt	Gravel talus
Tertiary	Cc	Partially consolidated conglomerate
	Ts	Sand, clay, gravel
	TPI	Pisolitic ironstone
Permian	P	Masseys Creek Group – mudstone, pebbly siltstone and sandstone
Ordovician	Oct	Cabbage Tree Formation quartz sandstone
Cambrian	Єs	Slate
Precambrian	pЄ	Badger Head Group – sandstone, slate, phyllite

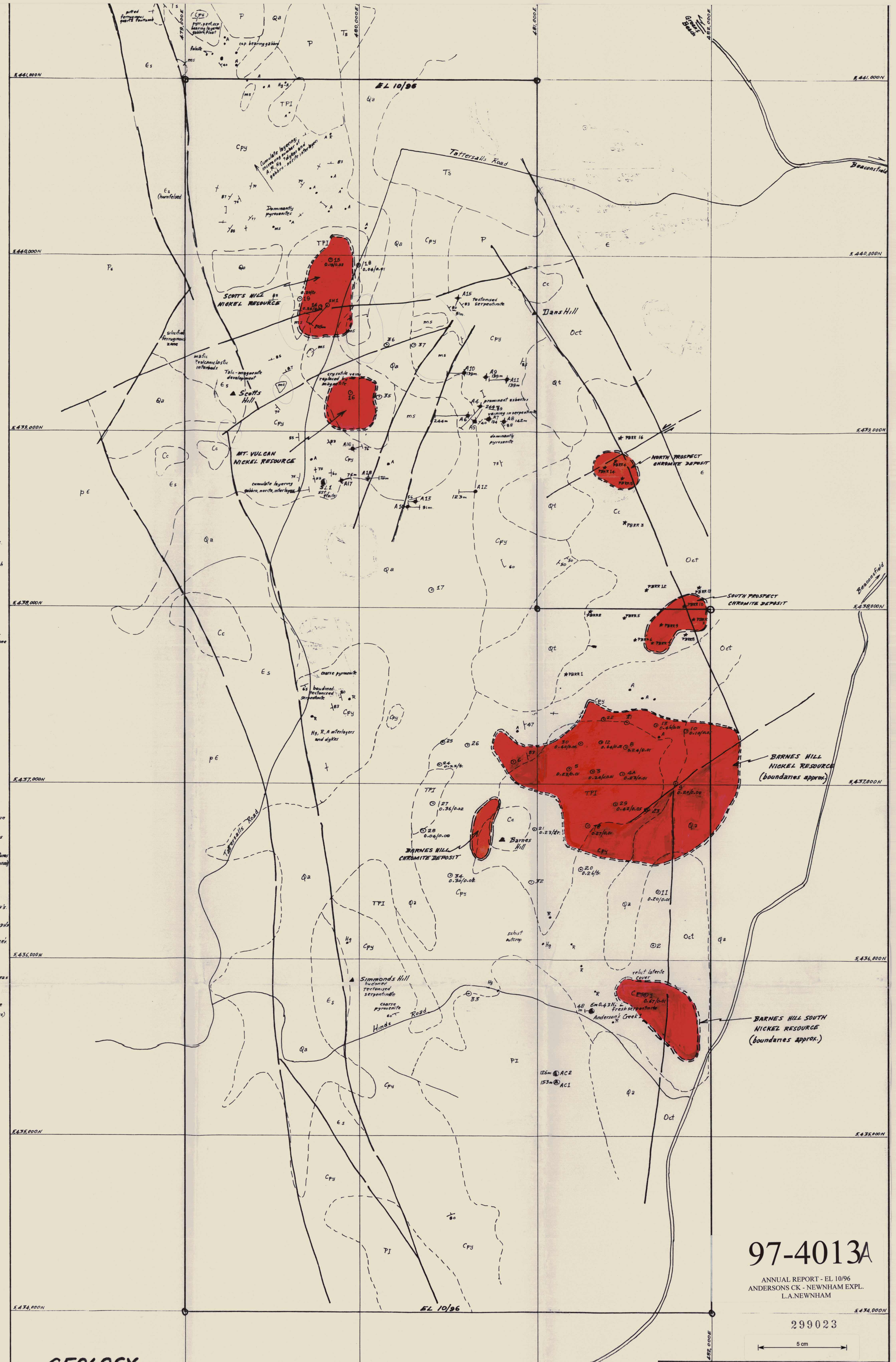
Andersons Creek Ultramafic Complex

Cambrian	Cpy	Serpentinite, localised pyroxenite and gabbro norite
	Hg	Hornblende gabbro
	A	Albitite
	R	Rodingite
	ms	Included septum of metamorphic rocks.

- Strike and dip of layering (bedding)
- Strike and dip of strain foliation
- Geological boundaries
- Major interpreted structures (after LAN from various sources)

Drilling

- SH1 — BHP cored hole
- AC3 — Mines Department DDH's.
- King Island Scheelite DDH's Ni/Co in bedrock
- A5 — Allstate Explorations DDH's.
- TBRR9 — Mines Department percussion holes.
- Chromite resource areas
- Nickel – Cobalt resource areas. (approx boundaries)
- Major road
- Minor road
- Prominant hill



GEOLOGY PLAN

97-4013A

ANNUAL REPORT - EL 10/96
ANDERSONS CK - NEWNHAM EXPL.
L.A.NEWNHAM

299023

5 cm

NEWNHAM EXPLORATION AND MINING SERVICES	
ALLEGIANCE METALS N.L. E.L. 10/96 ANDERSON CREEK AREA NORTHERN TASMANIA	DRAWN: L.A.Newnham
	DRAFTSPERSON:
	DATE: March 96
	FILE No.
SCALE: 1:10,000 (0 – 600m)	FIG. No.

APPENDIX B:

"EL 10/96 NICKEL-COBALT RESOURCE POTENTIAL ASSESSMENT"

BY
LA NEWNHAM
MAY, 1996

NEWNHAM EXPLORATION & MINING SERVICES

E.L. 10/96

ANDERSONS CREEK PROJECT

TASMANIA

NICKEL-COBALT RESOURCE

POTENTIAL ASSESSMENT

Prepared for:

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May 22, 1996

IMPORTANT NOTE

This report has not been prepared for inclusion in any public document concerning the assessment or valuation of mineral resources on E.L. 10/96.

The report is intended firstly as a collation of relevant previous work on the area and secondly to identify opportunities for expanding the resource base.

CONTENTS

1. SUMMARY

E.L. 10/96 applied for by Allegiance Metals N.L. covers a belt of Cambrian ultramafic rocks lying west of Beaconsfield in northern Tasmania. Deep weathering of these ultramafics has resulted in the concentration of Ni and Co in the weathered bedrock and the overlying derived clay zone.

Extensive previous exploration of variable quality has defined four areas of significant Ni-Co concentration:

- Scotts Hill
- Mt Vulcan
- Barnes Hill
- Barnes Hill South

Collectively these four areas were estimated by King Island Scheelite to contain 6 Mt 1.04 % Ni, 0.06 % Co. On the basis of available data, this estimate appears reasonable. The resource all lies above 30 m. and would be opencuttable. The mineralogy of the four resource areas is variable as is the nature and depth of overburden.

Approximately 5 Mt of these resources lie within E.L. 10/96, with approximately 1 Mt of the Barnes Hill resource extending into 1397 P/M held by Boral.

For the following reasons, the KIS resource estimate should be classified as an inferred resource:

(a) absence of some drill logs and assay sheets
(b) lack of good survey data and base maps
(c) no systematic metallurgical test work

Potential exists to locate extensions of each of the known resource blocks. This potential should be tested by good quality RC drilling following negotiations with firstly Boral for a development agreement on the Barnes Hill resource and secondly the private property owner for access rights on the Barnes Hill South deposit. A program of metallurgical test work should be initiated on samples from this drilling.

Scope exists to also locate distinct new Ni-Co deposits on E.L. 10/96. However, apart from some initial planning and minor sampling, more advanced exploration programs should only follow receipt of encouraging results from the extension testing programs described above.

No attempt has been made at this stage to design drilling programs for the purpose of evaluating either existing resource block extensions or new deposit potential.

2. TENURE and LAND CLASSIFICATION

E.L. 10/96 applies to an 18 sq kilometre area lying west of Beaconsfield in the vicinity of Andersons Creek (Fig 1). The licence is currently in the permitting stage and should be granted towards the end of June 96.

It is anticipated that the Licence will be granted under the new Mineral Resources Development Act. As such, it will be granted for a five year period.

Tenure in the Licence area was addressed in the recent report titled:

> "E.L. 10/96 Andersons Creek Area, Tasmania. Initial Report on Exploration Access and Nickel-Cobalt Potential", by L.A. Newnham, 11 Apr 96.

This report highlighted key access features of the four Ni-Co potential resource areas defined to date; viz:

Scotts Hill Area: Partially covered by a Prospecting Licence, which MRT advised had lapsed. This was confirmed by the writer at MRT on 28 May 96.

Vulcan Area: Lies within the Dans Hill Recommended Area for Protection. This area is available for exploration, but under strict guidelines.

Barnes Hill Area: Part of this area extends into Mining Lease 1397 P/M held by Boral. Access to any Ni-Co resources in that lease area will require an agreement with Boral.

Barnes Hill South: Lies entirely on private land and an access and compensation agreement will be necessary prior to any work on that area.

The last three factors are not considered insurmountable or particularly difficult in pursuing Ni-Co resource evaluation and development objectives on E.L. 10/96.

3. GEOLOGY

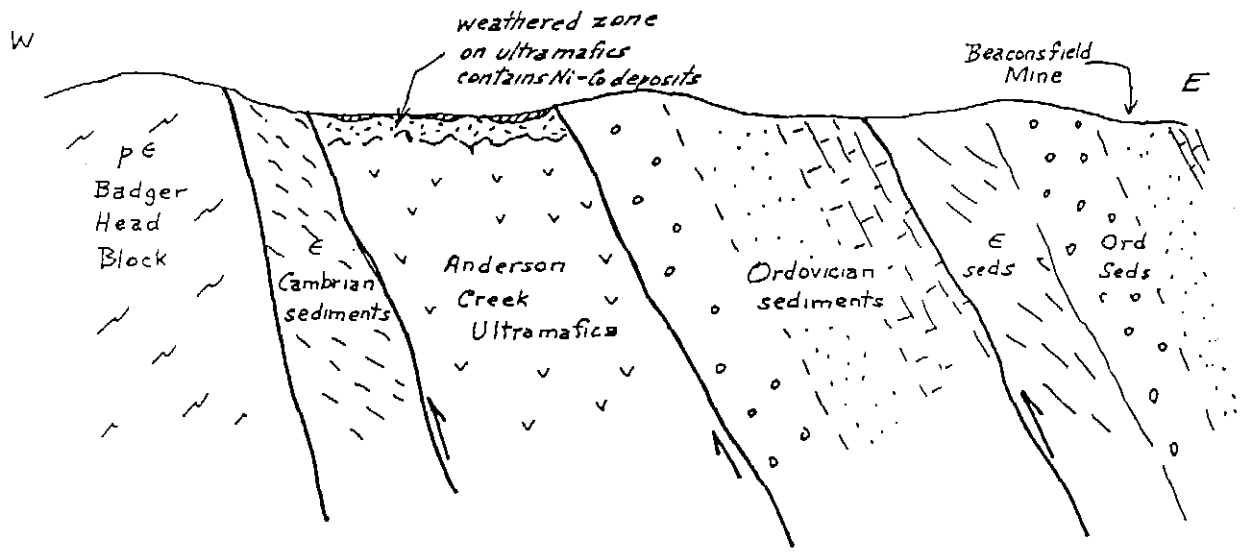
E.L. 10/96 is held by Allegiance Metals N.L. for the purpose of evaluating the Ni-Co mineralisation present in the top 30 m. of the Andersons Creek Complex (ACC) of ultramafic rocks and its weathering derivatives.

The ACC is a layered (?) wedge of Cambrian ultramafic rocks consisting of serpentinite, pyroxenite and gabbro. It has been thrust into a sequence of Cambrian sediments lying on the eastern margin of the Badger Head Precambrian block. Septa of Cambrian sediments are caught up in the complex.

Upper Palaeozoic tectonism has resulted in Ordovician Cabbage Tree Formation sediments being thrust over the eastern margin of the ultramafics.

Aeromagnetics (Austirex 1988) defined the ACC as being a NNW trending lozenge shaped body approximately 20 kms. long and up to 3 kms. wide. It outcrops over a NNW length of 6.5 kms., a width of 1.5 km., and plunges to the north and south beneath Permian sediments.

The ACC has been extensively and variably altered. Serpentinisation is pervasive, and probably reflects alteration of peridotites and gabbros. However, in the Scotts Hill area, a pyroxenite (enstatite) has been described as having been replaced by amphibole and then altered to talc, magnetite and calcite.



SCHEMATIC REGIONAL SECTION THROUGH ANDERSONS CREEK COMPLEX

In the Barnes Hill South area, a rock called rodingite has been formed as the result of lime metasomatism of coarse hornblende gabbro prior to serpentinisation.

The fresh members of this ultramafic complex contained variably amounts of nickel, chrome and cobalt, in differing mineralogical forms.

Variable weathering profiles with differing mineral assemblages and metal concentrations developed on the various fresh members of the ultramafic complex.

Further weathering and fluviatile action in the Tertiary resulted in the formation of extensive gravel deposits. These are enriched in chromite but essentially devoid of Ni-Co.

An appreciation of the ultramafic weathering profiles is important because they contain most of the higher grade Ni-Co. The following descriptions are taken from various KIS and CRA reports:

In the **Barnes Hill-Mt Vulcan area**, the weathering profile consists of an upper zone of secondary iron oxides (goethite, hematite, limonite) overlying a clay rich zone dominated by smectite, weathered serpentinite and chlorite, which in turn overlies fresh serpentinite.

KIS concluded that meteoric waters periodically leached soluble ions from the surface (lateritic) zone and enriched these ions (Ni) in the clay zone at the base of the weathering profile. They subdivided a typical weathering profile as follows:

Laterites	Pisolitic Zone	Hard ironstone with red clay matrix
(Enrichment in Fe oxides & reduction in clays ↑	Ferruginous Red Zone	Soft chocolate-red clay, pisolitic grains and black ironstone
	Limonitic Yellow Zone	Soft yellow-orange clay, some red clay
	Mottled Zone	Soft bright red, brown, yellow, purple clay with black and white specks

Clays	Transition Zone	Soft decomposed serpentinite, dark-light green, minor red clay
	Bleached Zone	Soft, pale yellow-green serpentinite with some magnetite.
Serpentinite	Fresh Zone	Moderately hard dark green serpentinite

Most of the Ni > 1 % occurs in the Transition Zone and to a slightly lesser extent in the Mottled and Bleached Zones. The Ni is largely contained in clay (smectite), serpentinite and chlorite.

In the **Scotts Hill area**, the pyroxenite has been extensively replaced by amphibole, then altered to talc and magnesite and calcite, which has then weathered to clay and chlorite.

Ni is contained in talc, chlorite, serpentinite.

In the **Barnes Hill South** area, work completed in the late 1950s by Enterprise Exploration suggests the Ni (up to 3 %) is concentrated in weathered serpentinite adjacent to rodingite dykes in this area. Rodingite formed as a result of lime metasomatism of coarse hornblende-gabbro dykes, prior to pervasive serpentinisation.

Garnierite (hydrous nickel silicate) was developed as colloform growth layers often associated with opal.

KIS believed that the secondary enrichment of Ni was very variable and was deepest adjacent to rodingite dykes because of the high relative permeability in these contact zones.

Ni in the Barnes Hill South area was therefore thought to occur as garnierite, in serpentinite, chlorite and hydrated iron oxides.

Thus, in the three areas, Scotts Hill, Barnes Hill-Mt Vulcan, and Barnes Hill South, Ni possibly occurs as different species, concentrated in different hosts in the weathering profiles of different ultrabasic protors.

However, whilst there is mineralogical and host variation, a common feature is that the greatest concentration of Ni occurs in thick clay-partly decomposed serpentinite zones towards the base of the weathering profile. Substantial tonnages of this favourable zone are only likely to exist beneath the protective cover of either laterites, or Tertiary gravels, either of which may be concealed beneath Quaternary sediments.

For readers wishing to acquire a greater understanding of the geology of this area a bibliography follows, and the papers by Anthony, Clayton et al, Maher and Simmons et al, are recommended.

4. PREVIOUS EXPLORATION

A substantial amount of exploration has been undertaken on the Andersons Creek ultramafic complex.

This has mainly been directed at the Ni and Cr and asbestos resources of the area, and in this regard it is important to remember that these three are concentrated in quite separate geological environments:

- the **chromite** is concentrated in Tertiary (transported/fluvatile) gravels, sands, etc.
- the **nickel** is concentrated in the insitu weathered ultramafics
- the **asbestos** is only developed in fresh serpentinite

A considerable proportion of the earlier work is very poorly presented. Data bases are commonly deficient and maps inacurate or incomplete. This made collation very difficult.

A striking feature of much of the previous work was that successive companies/organisations rarely collated, referred to or utilised data from previous exploration campaigns.

An attempt has been made to collate as much previous data as possible onto the attached two 1 : 5,000 scale plans.

Fig 2 illustrates, in a rather complex but detailed fashion, most of the previous work results, concentrating mainly on drilling, pitting, trenching and some surface sampling.

Fig 3 simplifies the data from Fig 2 and shows only that data considered most relevent to the search by Allegiance for a commercial Ni-Co resource in the top 30 metres. Hence, this plan shows principal geological boundaries, and the results of deeper drill holes.

Following is a brief comment on significant past exploration programs. More detailed reports are listed in the bibliography.

4.1 Department of Mines Exploration:

1929 Program:

In 1929, the DOM drilled 13 holes at Mt Vulcan, 6 at Barnes Hill and 2 on Scotts Hill, primarily to locate chromite resources.

It is not known if these were auger or cored holes.

With the exception of three holes on Barnes Hill, all were < 15 m.

Assaying was extensive, and results are available. However, the only plan of the holes that could be located was of the Mt Vulcan drilling and this plan had no scale or north point, so was unuseable. Similarly there were no lithological logs of the holes.

No attempt has therefore been made to plot this data on the attached figures.

Diamond Drill Hole SL 1:

On the CRA plans, they show a DDH called SL 1, which stands for Beaconsfield South Lode 1. This hole was drilled by the DOM around about 1920-30, and is so plotted by CRA because that is how it appears on the drill hole data base of Mineral Resources Tasmania.

However, this writer is certain that DDH Beaconsfield South Lode 1 was drilled to test the South Lode on the Beaconsfield Mine and has been inaccurately entered into the MRT computerised data base.

This view is supported by the fact that it was drilled to 168 m. in sandstones and quartzites (Cabbage Tree Formation), and yet CRA plots it in ultrabasics.

DDH SL 1 has therefore not been plotted on the accompanying plans.

DDH Andersons Creek No 1:

This hole was drilled in 1960 by DOM to test the Ni values in weathered and serpentinised ultrabasics adjacent to rodingite dykes in the Barnes Hill South area. Work by Enterprise Exploration (see below) in the area

pointed to a concentration of garnierite (hydrous Ni silicate) in these geological settings.

The exact location of the drill hole is not known and its position as shown should be considered approximate - it was sited on the north side of Hinds Road, near the Barnes Hill Road junction.

In the clay zone (weathered serpentinite) the hole intersected 0-5.7 vertical metres 0.6 Ni.

Adjacent to two rodingite dykes, it intersected 4 m. 0.7 Ni.

DDHs AC 1 and AC 2:

These holes were drilled south of Andersons Creek No 1 to test the nature of the serpentinite beneath Permian cover.

The exact locations of the holes are unknown because they were referenced to old lease pegs. Thus, their positions as shown on the accompanying plans are approximate only.

The holes both intersected serpentinite at depths > 100 m. No serpentinite weathering profiles were intersected and fresh serpentinite assayed 0.2-0.3 Ni in both holes.

The importance of these holes is that they support the view of Summons et al, that most weathering and lateritisation of the ultramafic, ie, the Ni concentrating process, was post Permian. If this is correct, then areas of Permian cover have no deeper, enriched, Ni potential.

1979-80 Rifle Range Program:

The DOM drilled 16 percussion holes in two areas known as Rifle Range North and Rifle Range South testing Tertiary sediments in these areas for chromite to provide additional resources for the Northern Chromite plant.

These resources lie outside the eastern boundary of E.L. 10/96 (plotted as PBRR series holes on plans) but are shown because the holes generally passed from Tertiary gravels into serpentinite clays and then into weathered serpentinite at depths typically 10-20 m. Thus information from these holes is useful when extrapolated back into 10/96.

Unfortunately, the DOM did not assay the clays or weathered serpentinite for Ni-Co, and the samples have been discarded. This is a great pity.

4.2 Enterprise Exploration Company Pty Ltd:

In 1957, EEC was attracted to the area by the encouraging Ni values being obtained by the Ben Lomond Mining company in the area now known as Barnes Hill South.

They augered 57 drill holes, spaced at 30 centres on three lines 270 m. apart in this area (see plans).

The most southerly line obtained the best results:

Line 1:	Length	300 m.
	Av depth	3 m.
	Av assay	1.1 Ni

The best hole on this line assayed 1.35 Ni over 4.5 m.

Ten high Ni samples assayed trace Co.

CSIRO and DOM studies suggested the Ni was present as garnierite.

Results from Lines 2 and 3 to the north were much poorer:

Line 2:	Length	450 m.
	Av depth	4.5 m.
	Av assay	0.4 Ni
Line 3:	Length	660 m.
	Av depth	2.1 m.
	Av assay	0.5 Ni

It is important to note that these holes were augered and were said to bottom on "hard rock". The deepest hole on Line 1 was only 6 m. "Hard rock" to an auger may well have been weathered serpentinite or a rodingite dyke. A later cored hole drilled adjacent to Line 1 by KIS intersected Ni values > 1 % to 18 m.

Following these initial three lines, EEC then completed a further 7 widely spaced lines of auger holes over ultrabasic areas in the general Barnes Hill-Scotts Hill area. A total of 90 shallow holes on 60 m. centres were completed on these lines and results were very low (Fig 2).

However, it is important to note that very few (if any) of these holes would have penetrated the Ni-Co depleted pisolitic section of the lateritic profiles tested. They are, therefore, of little value in assessing the Ni-Co potential of the deeper clay zone and are not shown (in general) on Fig 3.

4.3 BHP Exploration:

Between 1965-1967, BHP explored the region for a variety of commodities including Fe, limestone, silica, Ni, Co, Cr. Their work commenced with an aeromagnetic survey followed up by ground magnetic surveys.

A magnetic anomaly on Scotts Hill was tested by DDH SH 1. The exact location and orientation of this hole is not known and its location as shown must be considered approximate only.

It intersected 91 m. of quartzite, interpreted as a septum of Cambrian sediments, before passing through a fault zone into serpentinite. Samples from the fault zone, subsequently assayed by CRA, averaged 1 g/t Au over 3 m.

BHP then turned their attention to testing lateritic areas for Ni-Co by way of boring (auger?/percussion?) and excavation. The following work was completed (Fig 2):

Mt Vulcan:	four bores, three excavations
Scotts Hill:	two bores, two excavations
Barnes Hill:	five bores, eleven excavations

Bore holes reached depths up to 25 m. and generally bottomed in bedrock. Logs and assay sheets are available. Locations shown on Fig 2 were obtained by scale-changing BHP base maps which were based on geography and not co-ordinated. Thus, all drill hole locations are approximate only.

Excavations were up to 6 m. deep and thus generally did not extend beyond the depleted pisolitic laterite zone.

BHP then completed 99 pits along 17 lines over gravel areas testing primarily for Cr. Pits were up to 3.5 m. deep and whilst samples were assayed for Ni and Co, they generally would not have reached the Ni-Co enriched deeper clay zones. The approximate locations of these pits are therefore shown on Fig 2 but (with a few exceptions) not on Fig 3.

4.4 King Island Scheelite:

Between 1967-68, KIS completed 37 cored drill holes testing the area for its nickel silicate potential. On the results of 24 of these holes a total resource of 6.1 Mt 1.04 % Ni, 0.06 % Co was estimated to occur in four discrete areas. Details of this estimate are presented in Table 1. Parameters used were 0.7 Ni cut-off, and density 1.8. Tonnages have been rounded by this writer.

The average composition of the mineralisation from the first 17 holes was determined by KIS as follows:

Ni	1.06
Co	0.06
Cr	0.38
Mg	4.9
Fe	20.6
SiO_2	39.9
CaO	4.0
Al_2O_3	6.3

The cores from these programs are held by MRT in Hobart.

Mineralogical and chemical studies were conducted by AMDEL in conjunction with International Technical Services Limited who then further reviewed possible metallurgical treatment options and financial aspects of the deposits.

Concern exists regarding the locations of some of the drill holes. Drill hole location plans, especially for holes 18-37 are poor, variable and confusing. Hole locations as shown on CRA plans are occasionally at variance with this writer's interpretation of the KIS plans.

Logs and assay sheets were located for holes 1-17 but not for holes 18-37. Data for this latter group of holes was, therefore, scaled off sections.

The KIS drilling confirmed that the Ni-Co was concentrated in the clay and weathered serpentinite zone beneath the leached lateritic zone.

KIS used a density factor of 20 cu. feet to the long ton which converts to 1.8 tonnes/cubic metre. That is a reasonable factor for clay. However, serpentine has a density of 2.78, and most mafic-ultramafic rocks 3.0-3.1. Thus decomposed serpentinites in the lower sections of the clay zones may have densities varying between, say, 2.0-2.5.

In general, the KIS data is the most useful acquired to date in this area because it was deep, cored, and was thoroughly tested.

4.5 Allstate Explorations:

In 1971-72 Allstate drilled 15 cored holes and developed a number of costeans in the Mt Vulcan-Dans Hill area as part of an asbestos evaluation program.

The cores are currently held by MRT in Hobart. Because the holes and trenches were specifically completed for asbestos exploration, samples were not assayed for Ni or any other metals, nor were they logged in a manner which contributes to Ni-Co assessment.

Thus no information, including whether core was recovered, exists in the literature on the top (weathered) sections of the holes. The cores should be inspected.

4.6 Northern Chromite:

During the period 1969-81 Northern Chromite evaluated the chromite resources in the general Barnes Hill-Rifle Range area. The primary source of the chromite is the ultramafic complex. However, it is only concentrated in the laterite weathering profile and more particularly in Tertiary alluvial/eluvial gravels and sands.

Chromite production commenced in the late 70s based on reserves on the western flank of Barnes Hill.

With the imminent depletion of these reserves, the DOM undertook a percussion drilling program in the Rifle Range area (see 4.1 above).

In 1981, Summons calculated the Northern Chromite reserves as:

Rifle Range South:	230,000 t	15.1 % Chromite
Rifle Range North:	200,000 t	7.5
Barnes Hill	230,000 t	12.4

Very little attention was paid to the Ni-Co resources in these areas, and no useful data was generated apart from the existence of a deeper serpentinite clay zone in the Rifle Range area.

4.7 Beaconsfield Gold Mines:

In 1988, as part of a regional project, BGM completed a detailed aeromagnetic survey over the licence area.

This survey accurately defined the boundaries of the ultramafic but does not provide information of value to an assessment of Ni-Co resources in the weathered zone.

4.8 CRA Exploration:

Between 1994-95 CRA held the area as part of their renewed exploration interest in large "low grade" nickel sulfide deposits. With this objective in mind, they thoroughly evaluated previous work in the area, undertook various surface rock-chip sampling programs, and completed a small IP survey.

Whilst their reports are thorough and comprehensive, they do not significantly contribute to an evaluation of the Ni-Co potential of weathered ultramafics because their target was different.

Two useful outcomes of their work were:

(a) A sample of green weathered serpentinite taken near Hinds Road (481750E, 435350N) assayed 1.7 % Ni.

A sample taken from this same cutting by DOM in 1956 averaged 0.65 Ni.

(b) Fresh/relatively fresh outcropping ultramafics where sampled elsewhere on the Licence area were < 1 % Ni.

5. RESOURCE POTENTIAL

The basic purpose of this report is two-fold:

- to review existing information on the Ni-Co resource in the top 30 m.
- to identify opportunities for defining additional Ni-Co resources.

5.1. Status of Mineralisation Definition

Section 4 outlined the previous work completed, and the results are presented on Fig 2.

Those elements of this previous work which are particularly relevent to the Ni-Co resource potential are presented on Fig 3.

The resource of 6 Mt 1.04 Ni 0.06 Co quoted by KIS was based (apparently) only on their drilling data.

Fig 3 allows the KIS data to be supplemented with data from other companies, and the resource outlines shown on this plan reflect an interpretation of the combined information.

Each of the four potential resource areas is considered in more detail below.

5.1.1 Scotts Hill

On the basis of three holes, KIS estimated a resource as follows:

0.5 Mt	0.98 Ni	0.06 Co
1.8 Mt	overburden	
15 m.	depth to resource	

(tonnage figures rounded by this writer)

The three holes presumably were:

KIS 14:	13.4-17.4 m.	4.0 m 0.9 Ni
KIS 15:	19.8-22.2 m	2.4 m. 1.21 Ni
KIS 19:	7.5-12.0 m	4.5 m. 0.6 Ni

Hole 18 to the east of 15 was only 5 m. deep and didn't intersect significant grades.

There are 2 BHP boreholes in the general area. BHP 2 lies between KIS 14 and KIS 19 and was reported as intersecting 22 m. laterite < 0.01 Ni, whilst BHP 1 lies east of KIS 14 and intersected 21 m. laterite which included 10.5 m. 0.7 Ni.

Neither the geology nor the intersections tend to closely support the KIS data and there **may be** some location errors.

By drawing an appropriate line around these holes as shown on Fig 3, assuming a vertical thickness of 4 m., a density of 2.0, a tonnage figure of between 0.5-0.6 Mt is obtained. A weighted average grade of KIS 14 and 15 is 1.02 Ni.

Allowing for the influence of adjacent holes, the KIS potential resource estimate for Scotts Hill is reasonable.

5.1.2 Mt Vulcan

On the basis of three holes, KIS estimated a resource as follows:

1.3 Mt	0.95 Ni	0.05 Co
1.5 Mt	overburden	
6 m.	depth to resource	

The three holes are presumably:

KIS 16:	8.5-17.4 m.	8.9 m. 1.10 Ni
KIS 35:	3.0- 9.6 m.	6.6 m. 0.73 Ni
KIS 36(?):	3.0- 7.2 m.	4.2 m 0.68 Ni

There are also 4 BHP boreholes to the immediate south which have an impact on this resource:

BHP 1:	4.5- 7.5 m.	3.0 m. 0.98 Ni (stopped in 1.02 Ni)
BHP 2:	4.5-11.0 m.	6.5 m. 0.71 Ni
BHP 3:		1.5 m. 0.35 Ni (in Laterite)
BHP 4:	12 - 17.4 m	5.4 m. 0.4 Ni

Using the outline shown on Fig 3, and a density of 2, a thickness of 9 m. must be used to get 1.3 Mt. Thus, if the grade and width of KIS 16 is attributed to the whole block, then the resource potential quoted is reasonable.

However, other holes suggest it is more likely the potential resource block has a greater area, generally thinner and possibly slightly lower grade than KIS 16, ie, the overall tonnage estimate is reasonable but the grade may be lower, say 0.9 Ni.

5.1.3 Barnes Hill

On the basis of 16 holes, KIS estimated a resource as follows:

3.3 Mt	1.03 Ni	0.07 Co
3.4 Mt.	overburden	
9 m.	depth to resource	

No resource estimate plan could be located but the holes used were probably:

KIS 22	6.0-16.4 m.	10.4 m.	0.73 Ni
KIS 31	4.5-20.6 m.	16.1 m.	1.21 Ni
KIS 13:	7.5-13.0 m.	5.5 m.	0.99 Ni
KIS 10:	0- 4.5 m.	4.5 m.	0.7 Ni
KIS 30:	2.2- 5.5 m.	3.3 m.	1.01 Ni
KIS 12:	12.0- 26.5 m.	14.5 m.	0.7 Ni
		(Incl. 3.6 m.	1.38 Ni)
KIS 8:	9.5-19.2 m.	9.7 m.	1.34 Ni
KIS 5:	1.5- 5.1 m.	3.6 m.	0.81 Ni
KIS 3:	11.6-16.1 m.	4.5 m.	1.0 Ni
KIS 4A:	6.0- 9.0 m.	3.0 m.	0.88 Ni
KIS 9:	1.2- 2.1 m.	0.9 m.	0.66 Ni
KIS 6:	1.8- 6.0 m.	4.2 m.	0.75 Ni
KIS 22:	5.4- 9.6 m.	4.2 m.	0.78 Ni
KIS 21:	?		
KIS 7B:	4.8- 8.4 m.	3.6 m.	0.77 Ni
KIS 20:	2.7-10.2 m.	7.5 m.	0.81 Ni

The last seven holes in this list all lie to the south of the main deposit or on its SE and SW flanks. They are fairly low grade holes and arguably should only be included in the main resource if material 0.7-0.8 % Ni is considered potentially commercial.

The main KIS resource block is supported by BHP holes 2, 3, and 4:

BHP 2:	12-19.0 m.	7 m. 0.92 Ni (stopped in 1.08 Ni)
BHP 3:	18-22 m.	4 m. 1.02 Ni (stopped in 1.04 Ni)
BHP 4:	16.5-20.1 m.	3.6 m. 1.3 Ni (stopped in 1.45 Ni)

BHP 1A intersected 12.5 m. 0.5 Ni in amongst some high grade KIS holes.

A confusing point is the BHP holes each intersected an average 15 m. laterite overburden whilst the KIS holes in that area were typically 8-9 m. The KIS holes are more reliable because they were cored.

Using the higher grade outline shown on Fig 3, a density of 2 and an average thickness of 9 m., then a potential resource of 3.0-3.5 Mt appears reasonable.

If the drill indicated lower grade material to the south is included, then the resource tonnes could be significantly higher.

5.1.4 Barnes Hill South

On the basis of only 2 holes, KIS estimated a resource as follows:

1.0 Mt	1.25 Ni	0.07 Co
0.4 Mt	overburden	
3 m.	depth to resource	

The holes used were probably:

KIS 1:	2.1-18.0 m.	15.9 m. 1.18 Ni (incl. 10.5 m.1.48 Ni)
KIS 2:	0-12.6 m.	12.6 m. 0.3 Ni

Fig 3 also shows KIS 33 within this block (taken from a poor quality KIS plan). However, CRA show this hole as plotting to the west of the resource block. Because of its uncertain location, it should be ignored.

Hole KIS 2 lies to the north of the potential resource. One row of shallow EEC boreholes traversed the potential resource and these averaged 1 % Ni. However, the deepest hole was only 6 m. (cf) KIS 1 which was high grade to 18 m.

Using the outline shown on Fig 1, a thickness of 10 m., and a density of 2, the KIS resource estimate is conservative.

5.1.5 Classification of Resources:

Whilst the KIS resource estimates appear reasonable, and are supported by cored drilling programs completed by competent people, they should only be classified as **inferred resources** as defined in the "Australasian Code for Reporting of Identified Mineral Resources and Ore Reserves".

The reasons for this are:

- Drill logs and assay sheets for holes 18-37 were not located.
- Accurate survey data or maps for hole collars were not located.

Should this data be located, it might be possible to elevate some of the resources to the indicated resource category.

Further, the resources at Mt Vulcan and Barnes Hill South have been determined on a minimal number of drill holes. Both resources require additional drilling before they can be elevated to the indicated category.

5.2 Additional Resource Potential:

Considerable scope exists on E.L. 10/96 to define Ni-Co resources additional to those inferred by KIS. This additional resource potential should be considered under two headings:

- extensions to known resources
- new deposits

Location	No of Holes	Tonnes ('M)	Ni %	Co %	Overburden t. (tonnes)	Av Depth (m.)
Barnes Hill	16	3.3	1.03	0.07	3.4	9
Barnes Hill South	2	1.0	1.25	0.07	0.4	3
Mt Vulcan	3	1.3	0.95	0.05	1.5	6
Scotts Hill	3	0.5	0.98	0.06	1.8	15
TOTALS	24	6.1	1.04	0.06	7.1	-

Table 1: KIS 1968 Resource Estimate

5.2.1 Extensions to Known Resources:

Scope exists to extend each of the four known resource blocks. These opportunities are highlighted in this report, but specific work programs have not been designed - that should be the subject of a further report, and would be determined by factors such as:

- need to confirm existing resources
- commercial necessity to define additional resources
- sample quality and quantity for metallurgical work
- land access

Scotts Hill:

Potential exists for relatively modest extensions of the Scotts Hill resource to the north, west and east, beneath the fairly thick laterite cover.

Mt Vulcan:

Potential exists for significant extensions of the Mt Vulcan resource to the south and east beneath laterite cover.

The laterite may extend further east than shown on plans, beneath Quaternary river alluvium.

This resource block and any extensions as suggested above lie within the Dans Hill RAP. That will require a sensitive approach to further exploration but will not prohibit or restrict such work.

Barnes Hill:

Potential exists for the high grade resource area shown on Fig 3 to have modest extensions in all directions. To the north and west, the laterite cover apparently cuts out, so potential would be restricted to the clay zone and weathered bedrock.

It must be noted that the northern third of the Barnes Hill resource lies within 1397 P/M held by Boral, and any extensions in this direction will largely be on their lease.

Clearly, it is important for Allegiance to enter into negotiations with Boral before any further evaluation of the Barnes Hill resources is undertaken.

Scope exists for modest extensions of the resource as shown to extend south and east beneath laterite cover. However, existing drilling data suggests major extensions > 1 % Ni in these directions is unlikely.

Barnes Hill South:

The Barnes Hill South area is different to the other three resource areas in that the Ni mineralogy is different and there is no significant laterite cover. The resource is shallow and the grades so far indicated are good.

The resource potential is limited to the east by Ordovician sediments and to the west by Permian cover. To the south there is extensive Quaternary cover but there is no reason why the resource shouldn't continue beneath that.

Sampling by CRA and DOM along Hinds Road suggests high Ni values in outcrop.

To the north, shallow boring (too shallow?) and **one** drill hole gave low values.

The Barnes Hill South area is viewed as having potential for substantial resource extensions. The area is entirely on private land and an access and compensation agreement will be necessary prior to undertaking any further exploration - this should not be a problem.

5.2.2 Possible New Deposits:

There are commercial and geological limitations on the scope for locating new Ni-Co resources on E.L. 10/96.

Current thinking (A Firek - pers. comm.) is that deposits need to be > 1 % Ni and > 0.1 % Co.

These deposits will most probably be restricted to weathered ultramafic rocks. Previous work on the Andersons Creek Complex has given no indication that fresh or shallow weathered ultramafics will exceed 1 % Ni.

The east and west limits of the ultramafic are shown on Fig 3. Lateritisation and deep weathering appear to have been largely post-Permian, which would mean the Permian covered areas to the north and south have low resource potential.

The Scotts Hill, Mt Vulcan and Barnes Hill resources all occur beneath a veneer of lateritised ultramafic from which Ni-Co have been leached and possibly concentrated in the deeper clay zone. This suggests that the clay zones beneath laterites have high resource potential. Such areas are limited and are usually present above those possible extension areas described in section 5.2.1 above.

A thin laterite zone north and east of Simmonds Hill has not been effectively tested at depth but some pitting in this area suggests the weathering profile is thin.

The Barnes Hill South resource illustrates that resources are not only present in clay zones beneath laterites but may also be present in deeply weathered, relatively shallow ultramafics. It is reasonable to expect such areas to have been sampled by previous pitting and boring unless covered by Quaternary sediments.

Thus, some areas of Quaternary cover sediments present opportunities for resource discovery, eg:

- south of Barnes Hill South
- between Barnes Hill and Mt Vulcan
- east of Mt Vulcan and Barnes Hill

These opportunities can only be tested by drilling. Surface sampling is unlikely to achieve anything positive that has not already been achieved by extensive previous work.

6. RECOMMENDATIONS

An inferred resource of 6 Mt 1.04 Ni, 0.06 Co exists in four deposits on the Andersons Creek Complex.

Approximately 1 Mt of this resource lies on a Boral lease, ie, not held by Allegiance.

Opportunities exist to firstly define **extensions** of each of the four resource blocks and secondly to locate **new deposits**. It is suggested that both of these opportunities be pursued **but priority be given to defining extensions**.

The following work is recommended in chronological sequence:

6.1 Resource Extensions:

(i) Negotiate an agreement with Boral for rights to the Ni-Co resources on 1397 P/M. This should be possible because Boral probably are interested only in the Tertiary gravels.

(ii) Design drilling programs (RC) to test for extensions of each of the four resource blocks.

(iii) Conclude an access and compensation agreement with the property owner(s) at Barnes Hill South.

(iv) Agree with Government the Mt Vulcan work program in the RAP area.

(v) Undertake the agreed drilling programs.

(vi) Complete metallurgical tests on appropriate samples from these programs

6.2 New Resources:

(i) Inspect and assay the drill cores (if available) from the weathered sections of the Allstate drill hole series (A1-A18). This may provide useful data on the area between Mt Vulcan-Barnes Hill.

(ii) Design some widely spaced RC drill test lines on areas of Quaternary cover as an initial test of these areas.

(iii) Design drill tests of the lateritic area at Simmonds Hill.

(iv) Complete and assess the above drilling programs.

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NEWNHAM EXPLORATION AND MINING SERVICES
ALLEGIANCE METALS N.L
E.L. 10/96
ANDERSONS CREEK PROJECT
COLLATION OF PREVIOUS SAMPLING.
DRAWN: L.A.Newnham
DRAFTSPERSON:
DATE:
FILE No.
FIG. No.
SCALE: 1:5,000 0m 300m
INDEX
BHP Boreholes (1967)
BHP DDH (1966)
BHP Test pits
BHP Excavations
DOM DDH (1960)
DOM DDH (1970)
DOM Drill hole (1979-80)
Enterprise Exploration Borehole (1957) - Depth - Ni %
King Island Scheelite DDH's 1967-68.
Allstate DDH (1970)
wbr weathered bedrock
lat laterite
house
Data compiled from variety of reports in Mineral Resources Tas. Library
97-4013B
29055
ANNUAL REPORT - EL 10/96
ANDERSONS CK - NEWNHAM EXPL.
L.A.NEWNHAM
Tattersalls Road
Andersons Creek
Frenchmans Quarry (in weathered Serp.)
Scotts Hill
Mt Vulcan
Dans Hill
Hills
Settlers
Terrazzo Quarry
Beaconsfield Resevoir
Rifle Range Road
Bruins Pond
Brandy Pond
Gravel pits
Greens Beach
Beaconsfield
Beetree
Barnes Hill
Simmonds Hill
Ironstone Hills
Hinds Road
Water Race
Middle Arm Creek
Blythe Creek
Holwell
Ilfracombe
E.L. 10/96
Scotts Hill Mines Dept. drilled Two holes in 1929 Data too poor to be used.
Mt Vulcan 13 Shallow holes drilled 1920 by Mines Dept. Data is essentially un-useable
Barnes Hill Mines Dept. drilled six holes 1929: Data too poor to be useful.
These two holes drilled 1970 by Mines Dept. Locations very approximate.
Location from CRA plan. No assay data.
LINE 1 (Average 2.6m 0.96Ni)
LINE 2 (Average 1.6m 0.81Ni)
LINE 3 (Average 2.1m 0.52Ni)
LINE 4 (Average 1.3m 0.23Ni)
LINE 5 (Average 1.6m 0.21Ni)
LINE 6 (Average 1.8m 0.3Ni)
LINE 7 (Average 1.4m 0.22 Ni)
LINE 8 (Average 1.4m 0.2 Ni)
Excavations 1-4 Clays below 3.5m >0.5Ni laterites above 3.5m <0.5Ni
Excavations 5-9 Deep red-green clays below 3m generally >0.5Ni
Andersons Creek No.1 (1960) Top 5.7v.m. 0.6Ni (weath. sepp.) Top 30v.m. 0.39Ni
DOM Trench sample (1956) (30m sample) 0.47Ni
DOM Sample (1956) 0.42Ni (Serp. o/c. in water race)
DOM Samples (1956) 0.45Ni, 0.65Ni
AC2 Top of serp. 120m. below surface 15m. 0.25Ni Permian cover
AC1 Top of serp. 144m. below surf. beneath Permian cover. 10m. 0.23Ni
5,440,000N
5,439,000N
5,438,000N
5,437,000N
5,436,000N
5,435,000N
480,000E
481,000E
482,000E
483,000E

APPENDIX C:

"EL 10/96 RECOMMENDED INITIAL DRILLING PROGRAM"

BY
LA NEWNHAM
JUNE, 1996

299057

97-4013C

NEWNHAM EXPLORATION & MINING SERVICES

E.L. 10/96

ANDERSONS CREEK PROJECT

TASMANIA

RECOMMENDED INITIAL DRILLING PROGRAM

Prepared for:

Allegiance Metals NL
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June 18, 1996

CONTENTS

1. SUMMARY

An R.C. drilling program totalling 1010 m. is proposed on the Andersons Creek (E.L. 10/96) Ni-Co Prospect.

The drilling program would achieve three objectives:

- Better define the four existing resource areas
- Test for modest extensions of the resource
- Provide samples for metallurgical test work.

The total program would take four months to complete at an estimated cost of $77,000.

The actual drilling should ideally be undertaken in drier weather, say Spring.

2. PROJECT OBJECTIVES

Previous drilling at Andersons Creek inferred a resource of 6.1 Mt 1.04% Ni 0.06 % Co.

An assessment of existing data by this writer (Report dated 22 May 96) concluded:

(a) this inferred estimate is reasonable

(b) scope exists to define modest extensions to this resource

(c) the existing resource data base is somewhat deficient in that drill holes and other data points have not been surveyed and well presented on acceptable maps

(d) very little metallurgical work has been undertaken which reflects currently available extractive technology

In response to these principal conclusions, this proposed drilling program has three main objectives:

(i) **Elevate the resource data base** by better defining the inferred resource areas, and checking several previous drill holes. To achieve this objective, all drill holes must be professionally surveyed and plotted.

(ii) **Test for modest extensions** of the four inferred resource areas.

Whilst there exists a range of resource targets within E.L. 10/96, it is recommended at this early stage of the project that knowledge of the district be acquired steadily by stepping out drill holes only modest distances from the current inferred resource areas.

(iii) Provide adequate **samples for initial metallurgical test work**. Because of the variable nature of the material in the four resource areas, at least one sample should be acquired from each area for testing.

3. PRE-DRILLING WORK

Several tasks have to be sequentially completed prior to the commencement of drilling:

3.1 Program Acceptance:

The drilling proposal defined in this report requires discussion, modification if necessary, and acceptance by Allegiance.

3.2 Access Agreements:

Two access agreements are required.

At Barnes Hill, an agreement is required with Boral. I have previously suggested this agreement should be framed around Boral retaining all rights to the Tertiary gravels, and possibly some (low) level of revenue from the underlying Ni-Co resource.

At Barnes Hill South, an access and compensation agreement will be required with the private landowner. This agreement should only cover the exploration phase of activities and should be based around rehabilitation of any damage caused. A small dollar payment per drill hole may be prudent.

3.3 Site Selection and Surveying:

Once the general program has been approved, drill sites will have to be marked out on the ground, taking best advantage of existing tracks and placed in such a way as to minimise environmental disturbance.

Selected sites should then be surveyed by licenced surveyor. Depending on the conditions encountered, this could be by either GPS or stadia methods.

Once the proposed sites are surveyed, the pattern should be reviewed, modified if necessary, and resurveyed where modified.

3.4 Statutory Approvals:

Before any drilling can commence, approval from Mineral Resources Tasmania will be required. Because drilling within a RAP is proposed, Government representatives will require a site inspection of proposed drill holes. They will also require the private landowner agreement be in place.

This approval process could take 2-4 weeks.

3.5 Drilling Quotes:

A formal quotation will be required prior to commencement of drilling. Unfortunately, there is only one contractor in Tasmania who has a rig suitable for this work, viz. Diamond Drilling (Tas) Pty Ltd.

Despite the lack of competitive bidding, DDT will not exploit this situation, and I regard their prices as competitive when compared with mainland costs for similar work.

3.6 Timing:

Because RC drilling is recommended, this program should ideally be undertaken in drier weather, viz, Spring.

4. DRILLING PROGRAM

4.1 Drilling Method:

There are essentially two realistic choices of drilling method: coring, or reverse circulation (RC). Coring produces a "positive" sample but is 3 times the cost of RC and takes much longer to complete. The advantage of coring is that the samples are more useful for geological interpretation and advanced metallurgical studies.

To produce a reliable, high quality sample, RC must be undertaken with a face sampling hammer, preferably in dry ground. If the hole intersects high water flows or wet clays, the sample quality suffers. The RC sample is mainly fine powder and some rock chips.

In this first pass program, RC is recommended, provided excessively wet conditions are not encountered. In later programs, a percentage of holes should be cored for geological interpretation and metallurgical purposes.

4.2 Sample Management and Personal Requirements:

The drilling would probably be completed with a 118 mm hammer, producing about 20 kg of sample/metre of hole.

A sample should be taken every metre, riffled to produce a subsample and a retained sample.

It is recommended the subsample be asayed by Amdel in Adelaide for Ni, Co and other agreed elements.

Based on assay data, composited samples for metallurgical work can be made up from the retained samples.

The amount of sample acquired from a 1000 m. drilling program is approximately 20 tonnes and an undercover storage shed near Beaconsfield will be required.

An RC drill rig is operated by a two person crew. During drilling, a geologist and sampler are required to supervise the work, collect, riffle and transport the samples.

4.3 Scotts Hill Resource:

Nine (9) drill holes are proposed, each approximately 25 m long, totalling 225 m.

Holes 1, 2, 3 are 150 m. apart along the northern margin of the current resource area. As such, they will better define this margin and indicate if resource extensions further north are possible.

Holes 4, 6 will similarly test the western and eastern margins. Hole 6 is close to KIS DDH 18 which only went to 5 m. depth.

Hole 5 is 70 m. south of KIS 15 and is designed to further test the central section of the resource and support the results of KIS 15.

Hole 7 is midway between KIS 14 and KIS 19 (100 m. from each) and will provide useful data on the SW resource margin.

Hole 8 is 150 m. south of KIS 14 in an area mapped as a sedimentary septa. However, drilling data in this general area doesn't support this interpretation. The hole will test for southern resource extensions, even a possible resource link to the Vulcan Resource.

Hole 9 is 100 m. east of KIS 14 and 60 m. west of BHP 1 (position approx). It will provide data on the SE margin of the resource block.

4.4 Vulcan Resource:

Eight (8) drill holes are proposed, each approximately 20 m. long, totalling 160 m.

Holes 10, 11, 12 are spaced on 150 m. centres and will test the northern, north-east, north-west extensions of the resource.

Holes 8 and 11 combined will test possible links between Scotts Hill and Vulcan.

Hole 13 is shown 50 m. north of KIS 16 and will further test the central section of the resource and support the results of KIS 16.

Holes 14, 15 will test the eastern and western margins respectively.

The previous BHP holes 1, 2, 3, 4 on the southern section of the resource, whilst useful, are essentially ignored because of the drilling method and lack of survey information.

Holes 16, 17 are 100 m. apart and lie 100 m. south of Hole 15 and KIS 35 respectively. They will test the southern margin of the resource block.

All Vulcan drilling is within the Dans Hill RAP.

4.5 Barnes Hill Resource:

Fourteen (14) drill holes are proposed, averaging 25 m. but up to 30 m., totalling 350 m.

The pattern is essentially designed to supplement the existing KIS and BHP patterns by filling in large gaps and testing margins and possible extensions.

Holes 18, 19, 20, 21 will test the northern resource margin and indicate possible extensions. Holes 18, 19 lie on Boral M.L. 1397 P/M. Holes 20, 21 lie on private property.

Holes 22, 25 lie on Crown Land and will test the western resource margin.

Hole 26 (Crown Land) will infill a large gap in the middle of the resource block.

Holes 23, 24, 27 will test the eastern margin and all lie on private land.

Holes 29, 30 (Crown Land) will test the southern margin.

Hole 28 (Crown Land) will test a large, previously untested, area of laterite to the south-west.

Hole 31 (private land) will similarly test a large area of laterite to the south-east.

Clearly, the above program cannot be undertaken without agreements with Boral and private land owners.

4.6 Barnes Hill South:

Eleven (11) drill holes are proposed, averaging 25 m., totalling 275 m. All holes would be on private property.

Holes 32, 33, 34, 35 are designed to test the northern margin of the resource.

Holes 37, 38 will test the eastern and western margins respectively.

Hole 36 is in the centre of the resource block. It is shown as close to KIS 33; however there are serious doubts about the location of that hole.

Holes 39, 40 will test the southern margin of the resource block.

Holes 41, 42 are designed to test for southerly extensions of the resource towards the quarry outcrop which has previously returned encouraging assays.

5. POST-DRILLING WORK

A sample storage facility near Beaconsfield will be necessary.

Sub-samples should be assayed by Amdel in Adelaide. Agreed metallurgical samples can be composited from remaining sample material and forwarded for testwork as directed.

Drilling results should be CAD plotted for a professional-looking job.

If results are encouraging and the project looks like advancing further, drilling data should then be placed into a computerised data base.

Some drill site rehabilitation work will be required as the program progresses. With careful site selection and best-practice drilling methods, this should not be a major task.

6. BUDGET

The following budget notes are provided for the above described program:

	$
Drilling:	
Total 1010 m. RC drilling with UDR 650 rig and 118 mm hammer, will cost approximately $32/m. To this must be added moving time, delays, etc. Estimated average cost $35/m	35,350
Drill Mobilisation/demobilisation:	
Transporting rig to and from the area.	2,000
Drill Site Preparation:	
The UDR 650 is a self-propelled, tracked rig. Minimum site preparation is necessary. However some allowance for site preparation and rehabilitation work is wise.	2,000
Site Surveying:	
Cost of surveying all drill sites once marked out by geologist.	3,000
Compensation:	
17 drill holes lie on private land and some cash compensation will probably be required. Estimated $50/site	1,000

Drilling Consumables:

1,000 samples will be taken; cost of sample bags, tags, buckets, tape, safety gear, etc. $2/sample

2,000

Assaying:

Possibly 500 samples to assay $20/sample

10,000

Management:

Pre-drilling -
Marking out sites, statutory negotiations, landowner negotiations, assisting surveyor, organising drillers, sheds, sampling, assaying.
(1 week: $2,000)

Drilling -
2 persons full-time
(3-4 weeks: $10,000)

Post-drilling -
Rehabilitation, sampling, logging, plotting, reporting
(1 week: $2,000)

14,000

Drafting:

CAD drafting of results 5,000

Expenses:

Shed hire ($700)
Sample freight ($1,000)
Vehicle hire (6 weeks x 400 = 2,400 km @ $0.35/km = $840)

2,500

TOTAL **$76,850**

	Month 1	2	3	4	TOTALS
Drilling	-	10,000	25,350	-	35,350
Mob/Demob	-	1,000	1,000	-	2,000
Site Prep	-	1,000	1,000	-	2,000
Surveying	-	3,000	-	-	3,000
Compensation	-	-	1,000	-	1,000
Consumables	-	2,000	-	-	2,000
Assaying	-	-	4,000	6,000	10,000
Management	2,000	4,000	6,000	2,000	14,000
Drafting	-	-	-	5,000	5,000
Expenses	500	700	800	500	2,500
TOTALS	2,500	21,700	39,150	8,500	76,850

DRILLING PROGRAM SCHEDULE & BUDGET

97-4013C

ANNUAL REPORT - EL 10/96
ANDERSONS CK - NEWNHAM EXPL.
L.A.NEWNHAM

NEWNHAM EXPLORATION AND MINING SERVICES

ALLEGIANCE METALS N.L.
E.L. 10/96
ANDERSONS CREEK AREA
RECOMMENDED INITIAL DRILLING PROGRAM

DRAWN: L.A.Newnham
DRAFTSPERSON:
DATE: June 96
FILE No.
FIG. No. 3

SCALE: 1:5,000 (0m, 100m, 300)

-INDEX-

GEOLOGY

- Qa : Quaternary alluvium and marsh
- Qt : Gravel talus
- Cc : Tertiary poorly consolidated conglomerate
- Ts : Tertiary sand, clay, gravels
- TPI : Pisolitic Ironstone
- P : Permian sandstone, mudstone, siltstone
- Oet : Ordovician Cabbage Tree Formation
- Es : Cambrian Slate
- pE : Precambrian sandstone, slate, phyllite
- Cpy : Andersons Creek Ultramafic Complex. Serpentinite localised pyroxenite, gabbro, norite
- ms : included septa of metamorphic rocks

Young secondary cover rocks
Weathered Cpy ?
Older cover rocks

DRILLING — TESTING

- BHP Boreholes (1967)
- King Island Scheelite DDH (1967-68)
- Allstate DDH (1970)
- BHP DDH (1966)
- Enterprise Exploration bore hole
- DOM DDH (1960)
- DOM DDH (1970)
- DOM Drill holes (1980)
- BHP test pits (1967)
- BHP Excavations (1967)
- Pre resource Ni Co mineralisation boundaries ?— indicates directions for possible extensions of mineralisation

299071 — Location of Proposed Drill Holes

EL 10/96