



**PROTO**

RESOURCES & INVESTMENTS LTD

**BARNES HILL PROJECT  
TASMANIA  
EL17/2006**

ANNUAL REPORT  
8<sup>TH</sup> AUGUST 2009 TO 7<sup>TH</sup> AUGUST 2010

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**Note: All figures and grids are according to the GDA94 datum and MGA94 grid system.**



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## **SUMMARY**

The Barnes Hill Project (EL17/2006) is located in northern Tasmania, 5km west of the township of Beaconsfield. The exploration licence covers an area of 79km<sup>2</sup>.

The main focus of Proto Resources & Investments Ltd (“Proto” or “the Company”) at the Barnes Hill Project is laterite nickel-cobalt mineralisation. The project area contains a 12.5Mt Australasian Joint Ore Reserves Committee (JORC) compliant indicated resource at 0.83% Ni & 0.07% Co (Douglas McKenna and Partners Pty Ltd, A. Jannink 2006). This resource is made up of three interconnected mineral deposits known as Barnes Hill, Mt Vulcan and Scott’s Hill. The laterite resources are wholly covered by licence EL17/2006, owned and managed by Proto.

Since purchase of the project, Proto has reclassified the previously defined mineral resource to JORC indicated status, secured historical databases including drilling and geochemistry, purchased detailed Satellite imagery including ASTER multi channel and Quick-bird visual band (60cm cell) datasets, undertaken an extensive aircore and diamond resource drilling program, commenced metallurgical testwork, completed a regional soil sampling program, undertaken flora & fauna studies, completed Aboriginal heritage and European heritage surveys, been granted an adjoining exploration licence (EL53/2008) to the west of the Barnes Hill exploration licence, lodged a mining lease application (1872P/M) over the Barnes Hill nickel deposit and surrounding area and commenced studies for submission of a Development Proposal and Environmental Management Plan (DPEMP).

Work planned for the coming year will include completion of a new resource estimate for the Barnes Hill deposit using the information obtained during resource drilling completed this reporting period and continued metallurgical testing (bulk sampling). In addition, work will continue on obtaining grant of Mining Lease 1872P/M and submission of the Development Proposal and Environmental Management Plan (DPEMP) for the Barnes Hill project.

The Barnes Hill Project is the priority focus of Proto and joint venture partner Metals Finance Corporation. The partners aim to develop an open pit mining operation at Barnes Hill with processing and production of nickel and cobalt metals on site.

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## 1 INTRODUCTION

The Barnes Hill Project is located in northern Tasmania and contains a 12.5 million tonne (Mt) Australasian Joint Ore Reserves Committee (“JORC”) compliant indicated resource at 0.83% Nickel (Ni) and 0.07% Cobalt (Co). The resource is made up of three interconnected resources known as the Barnes Hill, Mt Vulcan and Scott’s Hill deposits (Figure 1).

Recent advances in leaching techniques and the proximity of the project to grid power, roads, water, port facilities and a work force make the Barnes Hill Project a valuable addition to Proto’s asset register. The project comes with a clear development path focused on upgrading confidence in the current resource estimate and metallurgical testing of the ore to determine the most viable processing technique.

A large resource drilling program consisting of 549 aircore drill holes (BHA076 – BHA625) and 16 diamond drill holes (BHD001 – BHD016) was completed at the Barnes Hill deposit this reporting period. Final assay results have been received from all drilling work and external consultants Snowden Mining Services are in the process of completing a resource estimate based on historical drilling data and the new drilling data.

During the year a Notice of Intent was lodged for the Barnes Hill project with the board of the Environmental Protection Authority (EPA). In February 2010 DPMP Guidelines were received from the EPA Board. Proto and its consultants are working to gather the material required and hope to submit the DPMP for the Barnes Hill project by the end of 2010.

## 2 PROPERTY DESCRIPTION AND TENURE

The Barnes Hill tenement EL17/2006 covers an area of 79km<sup>2</sup> and was granted on 8<sup>th</sup> August 2006 for a period of five years.

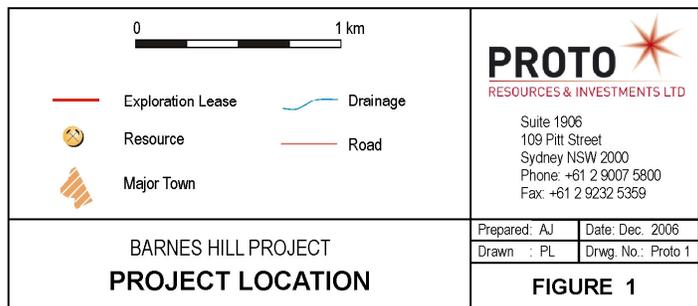
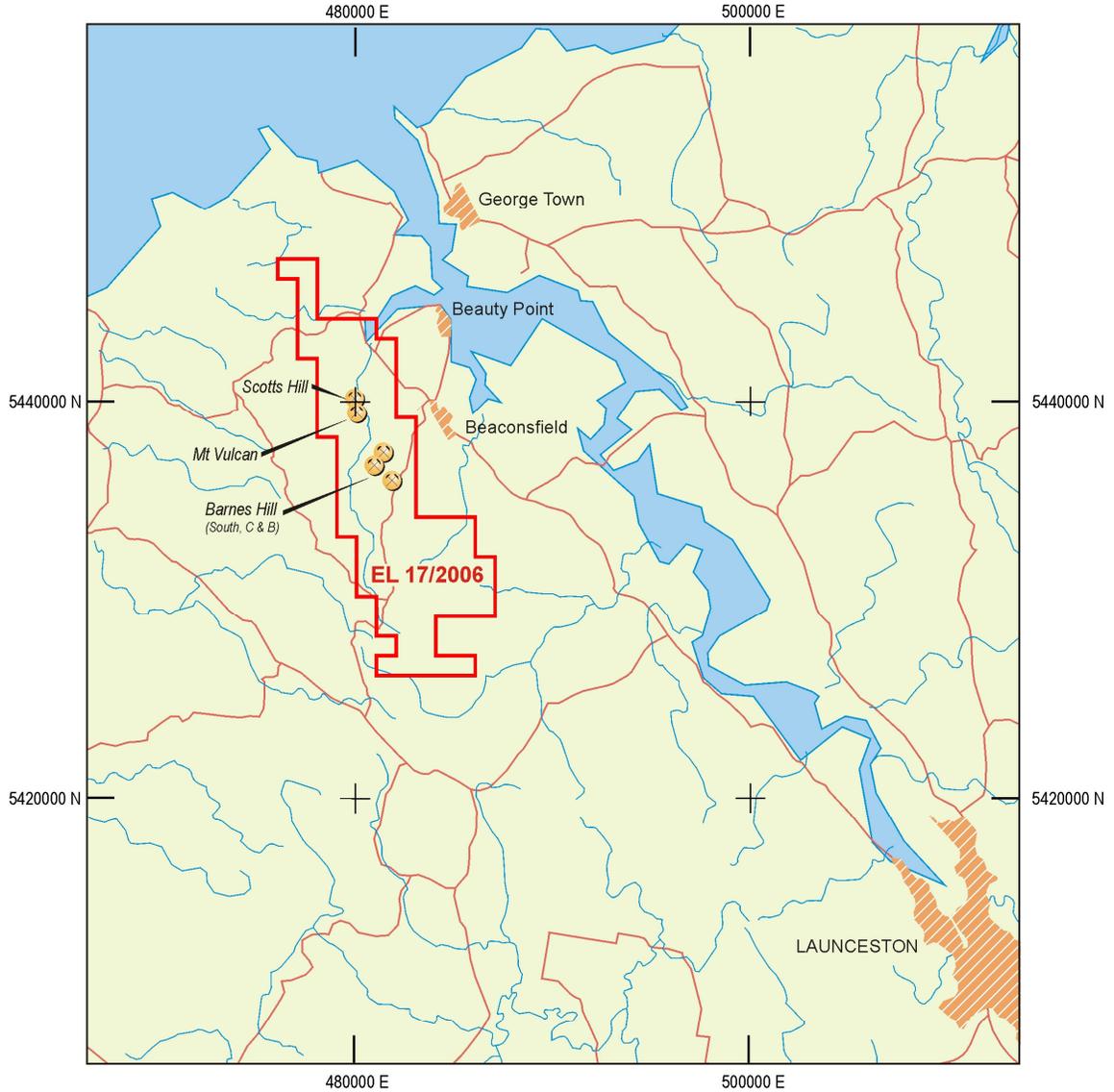
The land status plan shows EL17/2006 is covered by both Crown and Private Land. The Crown Land is variously classified. The main areas of private land relevant to the known Ni-Co resource areas are in the east and the north. Exploration and mining are permitted on Private Land but must be preceded by negotiation of an access and compensation agreement with the landowner. This agreement must be concluded in writing and lodged with Mineral Resources Tasmania (MRT).

Most of the Crown Land is classified either as Multiple Use Forest (“MUF”) or Recommended Area for Protection (“RAP”), both administered by the Forestry Commission. Several reserves and mining tenements also exist within the area of EL17/2006.

Superimposed over much of the licence area is the Mt Vulcan - Simmonds Hill Australian Heritage Act (“AHA”) Registered Entry. This AHA area covers both Private and Crown Land. 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 Recommended Area for Protection (“RAP”) areas is to protect two plant species: *Tetratheca gunni* and *Epacris virgata*.

Exploration on a RAP is possible, and has occurred during past exploration, but is subject to program approval and conditions. With good planning and supervision, a RAP should not be an impediment to exploration activities.

There are gravel reserves on EL 17/2006. Gravel Reserves may or may not be subject to the Mining Act. They are usually held by government authorities for road works and can generally be accessed for exploration by negotiation.



### **3 ACCESS AND INFRASTRUCTURE**

The Barnes Hill EL17/2006 licence is located approximately 30km north of Launceston and 5km west of Beaconsfield near the Tamar River in northern Tasmania.

The Barnes Hill tenement can be accessed via a number of gazetted roads on the western side of the Tamar River. The Barnes Hill resource can be directly accessed using either Hinds or Tattersall's roads, just west of Beaconsfield.

A wide range of infrastructure and heavy industry occurs in the district including the nearby Beaconsfield Gold mining operation, the Bell Bay Power Station, the Temco Magnesium Refinery and the Bell Bay Alumina Refinery. The area also has deep water port facilities at Bell Bay and Beauty Point along with rail facilities. The regional City of Launceston has a population of over 90 thousand people and offers all the services of a major regional city including airport, university and advanced engineering facilities.

### **4 ENVIRONMENTAL CONSIDERATIONS**

Allegiance Mining, Jervois Mining and Placeco Australia have all recognised and tabled the existence of endangered flora species in the Barnes Hill area, including *Tetratheca gunni* and *Epacris virgata*.

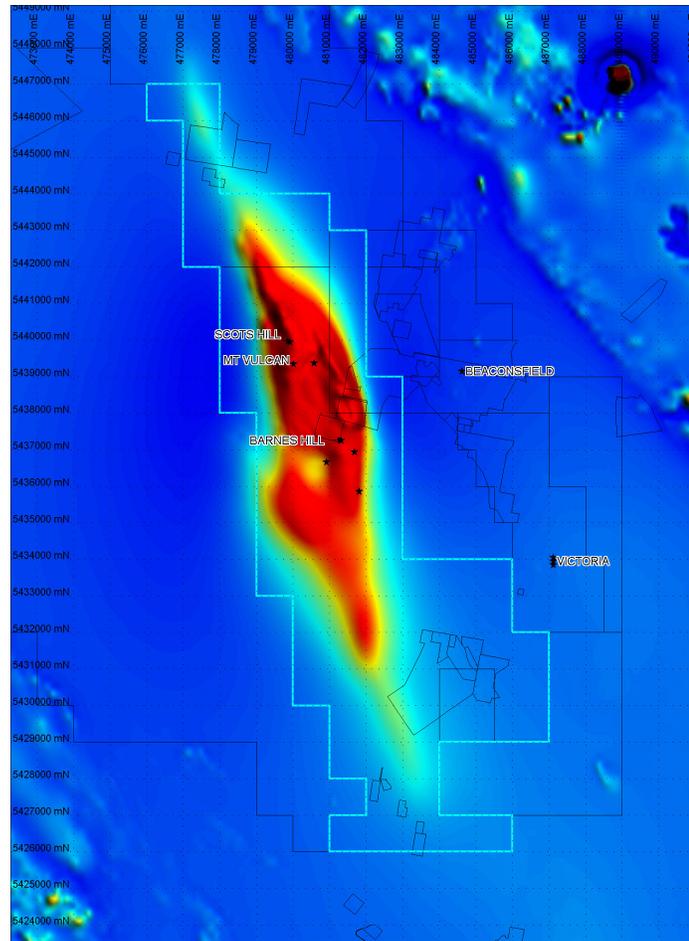
From existing work it seems *Tetratheca gunni* is present in only three known locations, none of these occurring over the Ni-Co resource areas. *Epacris virgata* is more widely distributed including parts of the Scott's Hill and Mt Vulcan Ni-Co resource areas.

Proto has engaged North Barker Ecosystem Services to assist with environmental assessment and requirements for exploration permitting. A "Botanical Survey and Fauna Habitat Assessment" report by North Barker on the three nickel-cobalt laterite deposit areas was included in the previous annual report for EL17/2006.

### **5 GEOLOGICAL SETTING**

The Barnes Hill tenement sits in the Badger Head region of northern Tasmania, an important structural location, considered to be the area in which the Tamar Fracture System separates the western and eastern Tasmanian terrains. The area has a complex nature, a result of thrusting during the Devonian and later normal faulting in the Jurassic and Tertiary. The Precambrian Badger Head Block possibly overlies younger units of the Cambrian Port Sorell Block. The Andersons Creek Ultramafic Complex is considered to be a thrust slice caught up in this deformation. The magnetic data over the area is dominated by the response of the Anderson Creek Ultramafic Complex with much of the surrounding geology having only subtle responses (Figure 2). Gravity is also dominated by the considerable differences in density between the Precambrian, Cambrian and later Devonian and Permian units. The Devonian geology also contains granites of that age with stark density contrasts to surrounding units especially the ultramafics.

Further to the east Ordovician Cabbage Tree Formation is thrust over the Anderson Creek Complex (ACC), and further east again the Beaconsfield Gold field sits on the western side of the Tamar River in possibly a zone of Devonian aged Mathinna beds. The Beaconsfield gold mineralisation has a similar nature to Victorian quartz reef gold systems.



**Figure 2 Barnes Hill EL17/2006 with total magnetic intensity as background clearly showing extent of the Andersons Creek Complex**

### 5.1 Tenement Geology / Nickel Laterite Geology

**Precambrian** metamorphosed graywackes and sub-graywackes outcrop along the western extremities of EL 17/2006.

**Cambrian** aged schist's and micaceous sandstone are found faulted against the Precambrian Badger Head stratigraphy and Andersons Creek Ultramafic Complex to the east. These units are considered similar to the Sorell Block characterised by sandstones, graywackes, siltstones and slates.

**The Andersons Creek Complex (ACC)** is a layered wedge of Cambrian mafic and ultramafic stratigraphy consisting mainly 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. The Andersons Creek Complex is probably Early Cambrian in age (neo-Cambrian) and one of 15 discrete ultramafic/mafic complexes found mainly on the north west and west coasts of Tasmania.

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

Aero-magnetics show the ACC as being a NNW trending lozenge shaped body approximately 20 km long and up to 3 km wide (Figure 2). It outcrops over a NNW length of 6.5 km, 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. In the Scott's Hill area, a pyroxenite has been described as having been replaced by amphibole and then altered to talc, magnetite and calcite.

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.

Various weathering profiles with differing mineral assemblages and metal concentrations are developed on the ultramafic complex. An appreciation of the ultramafic weathering profile is important because they contain most of the higher grade Ni-Co mineralisation. 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 (Table 1). 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. A typical weathering profile is listed in Table 1.

**Table 1 Idealised Barnes Hill Laterite Profile**

<u>Laterites</u>	Pisolitic Zone	Hard ironstone with red clay matrix
	Ferruginous Red Zone	Soft red clay, pisolitic grains and black ironstone
	Limonitic Yellow Zone	Soft yellow-orange clay with some red clay
	Mottled Zone	Soft bright red, brown, yellow, purple clay with black and white specks
<u>Clays</u>	Transition Zone	Soft decomposed green serpentinite with minor red clay
	Bleached Zone	Soft, pale yellow green serpentinite with some magnetite.
<u>Serpentinite</u>	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 Scott's Hill area, the pyroxenite has been extensively replaced by amphibole, then altered to talc, magnesite and calcite which has then weathered to clay and chlorite. Ni is contained in talc, chlorite and 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. Secondary enrichment of Ni was highly 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, Scott's 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 ultramafic areas. However, whilst there is mineralogical and host variation, a common feature is that the greatest concentration of Ni occurs in thick clay within partly decomposed serpentinite zones towards the base of the weathering profile. Substantial tonnages of this favorable 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.

**Ordovician Junee Group** consists of sandstone, siltstone, slate, limestone, quartzites and quartz conglomerates. Locally the tenement covers the Blyth's Creek Formation and Cabbage Tree Conglomerate, Caroline Creek Sandstone and Gordon Limestone all of the Junee Group.

**Permian Sediments** are reasonably abundant in the tenement area lying unconformably over older stratigraphy. Units include the Quamby, Golden Valley, Mersey, Woodbridge and Ferntree groups and Cygnet Coal measures.

**Tertiary Sediments** consist mainly of sandy clays and sandstones and north of Beaconsfield white quartz gravels. The laterite formed over the Andersons Creek Complex Ultramafics was formed in the Tertiary.

**Igneous Rocks** other than the Anderson Creek Complex, include minor Jurassic dolerite and Tertiary Basalt. Tertiary basalt overlies Tertiary sediments in most cases. Both dolerite and basalt form magnetic features in the regional magnetic data, however their responses are much less significant than the major ACC response.

## 6 EXPLORATION HISTORY

Substantial exploration has been carried out over the last 50 years. A summary table below has been compiled by assessing old reports and specifically compilations made by Lindsay Newham (1997). King Island Scheelite (KIS), Allegiance Mining and Jervois Mining completed most of the recent work on the Barnes Hill Ni-Co Laterite.

**Table 2 Summary of historic exploration activities**

Company	Start	Finish	Focus	Work Completed	Results	Conclusion	Report/EL
Jervois Mining	2001	2004	Ni, Co	Re-assaying, campsite sampling for met work	12.5 Mt at 1.07%Ni combined (Ni Co)	spending and budget pressure meant area dropped to focus on other projects	ETA 504
Allegiance	1996	2000	Ni, Co	Historical data compilation, Shallow drilling, Resource calculation environmental studies, metallurgical studies, 116 air core and 8 diamond holes		Low Ni prices and restricted tenement meant re focus on other projects	97_4013
CRA Exploration	1994	1995	NiS	Rock Chip surveys and IP survey	Rock chip sample 1.7% Ni in Serpentinite	not considered economic.	EL35/92
Placeco Australia	1988	1988	PGM, Au	Rock Chips composite sand samples	Failed to detect economic quantities of target minerals	No sampling of Laterite	EL 18/87
Northern Chromite	1969	1981	Cr	Cr production on western flank of Barnes hill, drilling at Rifle Range south	660,000t at 12% Cr defined at Rifle Range and Barnes Hill	Mined Cr no Ni production	
Department of Mines	1979	1980	Cr	16 percussion holes, serpentinite clays intersected but not tested		Reconnaissance Cr drilling	
Allstate Exploration	1971	1972	Ashb	15 Core holes and trenching	tope weathered section (Laterite not sampled)	No Ni Focus	
King Island Scheelite	1968	1969	Ni, Co, Cr	37 Holes , metallurgy test work resource calculation, environmental studies	6.014 long tonnes @1.04%ni and 0.06% Co	sub economic in terms of size	69_544
BHP Minerals	1965	1967	Fe, Ni, Cu, Zn, Mb, Cr, limestone	Stream sediment sampling, aero magnetic survey, Drilling, trenching, 99 - 3m deep pits	Drilling intersected magnetite bearing serpentinite. (CRA re-sampling gave 3m at 1g/t)	Sub economic mineral grades in all elements tested.	67_465
Consolidated Zinc	1957	1958	Ni	Series of auger samples at 100ft and 200ft intervals focused on previous work by Ben Lomond mining intervals resulting in	Intersected Ni grades between 1.2 to 1.8%	Didn't meet expected grade of 2.5%Ni considered economic at time.	58_0195

Ben Lomond Mining	1955	1956	Ni	Reconnaissance Sampling	Results showed Ni rich clays developed on Mafics/serpentinites were more wide spread than previously known.	JV sort with Consolidated Zinc.	
Department of Mines	1929	1929	Ni	13 holes - location information sketchy	Difficulty in locating holes	Reconnaissance Ni laterite drilling	

## 6.1 Barnes Hill Nickel Laterite Resource

Previous explorers of the Barnes Hill laterite have drilled 161 holes including 37 diamond drill holes for approximately 580 meters in the late 1960's. More recently, Allegiance Mining drilled 1178.4 meters in 116 aircore holes along with eight diamond drill holes in 1997. The laterites have been drilled at a density of 100 to 150 meter centres.

The nickel laterite is developed above serpentinites of the Andersons Creek Ultramafic Complex. Three separate deposits are known in the area, Barnes Hill, Mt Vulcan and Scott's Hill.

Resources have been calculated using both King Island Scheelite and Allegiance Mining assay data. The lithologies are based on re-logging of the Allegiance Mining chip trays. A summary of the resources is given below:

**Table 3 Combined Resources for the Barnes Hill, Mt Vulcan and Scott's Hill Deposits**

Lithology	Ni %	Co %	Tonnes	%Ni Equivalent	Percentage		
					Tonnes	Ni	Co
Hematite	0.63	0.12	167,657	1.05	1.3%	1.0%	2.3%
Limonite	0.39	0.12	794,699	0.81	6.4%	3.0%	11.3%
Saprolite	0.88	0.07	9,213,728	1.13	73.8%	77.7%	75.9%
Weathered Serpentinite	0.82	0.04	2,301,870	0.96	18.5%	18.3%	10.5%
<b>Totals</b>	<b>0.83</b>	<b>0.07</b>	<b>12,477,955</b>	<b>1.07</b>			

The parameters used in the calculations were:

Area	Plan Polygonal Blocks
Volume	Area x drill thickness
Density	1.8
Minimum Thickness	2m
Cut-off Grade	0.6% Ni Equivalent (= %Ni + 3.5 x %Co)
Assay Grade	Averaged per drill hole
Minimum Overburden	1m
Overburden Ratio	0.9:1

From the calculations above it can be extrapolated that 96% of the nickel and 86.4% of the cobalt occur in the saprolite and weathered serpentinite lithologies. Furthermore, the Barnes Hill saprolite and weathered serpentinite holds 8.3 million tonnes (66.8% of total tonnage) containing 72.5% of the nickel and 57.4% of the cobalt. (Douglas McKenna & Partners Pty Ltd)

## 6.2 Barnes Hill Metallurgy

Allegiance Mining submitted nine composite samples to Amdel Laboratories for high pressure acid leach metallurgical testing (two from Scott's Hill, three from Mt Vulcan and four from Barnes Hill). The samples averaged 1.16% nickel oxide (0.91% nickel) and 920ppm cobalt. Lithologically this composition is fairly close to the resources calculated above, although the nickel and cobalt grades are slightly higher.

The results of the High Pressure Acid Leach ("HPAL") testing were good (especially when considered as preliminary testwork) with high recoveries and low acid consumption. Tests were done at 2400°C and 2600°C producing the following average recoveries after two hours of leaching:

**Table 4 HPAL Testwork Results for the Barnes Hill, Mt Vulcan and Scott's Hill Deposits**

Temperature	Recovered Ni	Recovered Co	Acid Consumption (kg/t)
2400 °C	89%	83%	397
2600 °C	92%	93%	326

## 6.3 Previous Exploration By Proto Resources & Investments Ltd

Exploration completed by Proto since grant of EL17/2006 has included:

- completion of a high level review of the Barnes Hill Project and drillhole database by Snowden Mining Industry Consultants,
- an aircore drilling program (17 holes for 202m) completed to validate historic drilling results and to provide samples for metallurgical testwork,
- planning of a resource drilling program at Barnes Hill,
- detailed flora and fauna assessment of the resource areas by North Barker Ecosystem Services,
- cutting and assaying of some historic diamond core holes held at the MRT Rockstore in Mornington,
- ongoing metallurgical testwork at HRL Testing in Brisbane,
- a regional soil sampling program consisting of 429 samples taken along 400m spaced east-west lines,
- the first phase of a resource drilling program which consisted of 75 aircore drill holes (BHA001 – 075) for 1,080m,
- Aboriginal heritage and European heritage surveys of the mining area and
- Column leach testwork on further aircore drilling samples from the Barnes Hill deposit.

For a more detailed description of Proto's previous exploration activities at the Barnes Hill EL17/2006 project the reader is referred to previous annual reports by the company.

## **7 EXPLORATION COMPLETED DURING THE PERIOD**

Exploration completed during the reporting period has included a major resource drilling program at the Barnes Hill Ni-Co deposit using aircore and diamond drilling, further flora and fauna assessment of the mining lease application area by North Barker Ecosystem Services, commencement of resource estimation at the Barnes Hill deposit by external consultants Snowden Mining Services and preparation for further metallurgical testwork.

### **7.1 Aircore Drilling Program**

During the reporting period Proto completed a major resource drilling program at the Barnes Hill nickel-cobalt deposit. The program reduced drill hole spacings across the majority of the current resource area to 50m x 50m. A close spaced (10m spaced) program of grade control drilling along an east-west and north-south line was also completed to verify grade and thickness variations at the deposit (holes BHA478 – BHA582).

This aircore drilling program consisted of 549 drill holes for a total of 4,839m. The hole numbers completed were BHA076 through to BHA625. Hole number BHA288 was not drilled. The drilling program was completed by Tasmanian Drilling Services of Hobart using a truck mounted aircore drill rig. The holes were all completed at the Barnes Hill nickel laterite deposit. All holes were drilled vertically. Collar locations were obtained using hand held GPS units.

A plan showing drill hole locations is given as Figure 3 while best nickel intercepts are tabulated below. Collar locations and assay results are included as Appendix A. One metre grab samples were taken from each metre of drilling and sent to ALS Laboratories in Adelaide for assay by technique ME-XRF12.

Encouraging nickel and cobalt intercepts were returned from drilling as expected. Best results are tabulated below in Table 5. All drill hole collars were plugged and any rubbish was removed from the drill site areas.

### **7.2 Diamond Drilling Program**

During the reporting period Proto also completed a diamond drilling program consisting of 16 drill holes for a total of 461m. The hole numbers completed were BHD001 through to BHD016. All core was PQ size. The drilling program was completed by Edrill Pty Ltd of Wynyard using a track mounted UDR200 drill rig. The holes were all completed at the Barnes Hill nickel laterite deposit. All holes were drilled vertically. Collar locations were obtained using hand held GPS units.

The diamond drilling program was completed to gain drill core from mineralised and non-mineralised parts of the Barnes Hill deposit for bulk density testwork purposes and to twin existing aircore drill holes for quality control purposes.

A plan showing drill hole locations is given as Figure 4 while best intercepts are tabulated below. A table with collar locations, bulk density results and assay results is included as Appendix B. Following completion of bulk density testing one metre half core samples were taken from each metre of drilling and sent to ALS Laboratories in Adelaide for assay by technique ME-XRF12.

Encouraging nickel and cobalt intercepts were returned from drilling as expected. Best results are tabulated below in Table 6. All drill hole collars were plugged and any rubbish was removed from the drill site areas.

**Table 5 Best Nickel & Cobalt Aircore Drill Hole Intercepts**

Hole ID	Northing	Easting	Dip	Max Depth	Depth From	Depth To	Width (m)	Ni %	Co %
BHA096	5437150	481250	Vertical	13	9	13	4	1.1	0.064
BHA124	5436900	481075	Vertical	13	3	13	10	1.0	0.078
BHA139	5437400	481275	Vertical	10	6	10	4	1.14	0.052
BHA141	5437150	481400	Vertical	19	14	19	5	1.0	0.13
BHA146	5437000	481325	Vertical	22	6	22	16	1.4	0.048
BHA148	5437050	481400	Vertical	15	8	15	7	1.0	0.07
BHA151	5437100	481425	Vertical	11	4	11	7	1.2	0.099
BHA153	5437100	481325	Vertical	24	11	24	13	1.5	0.092
BHA179	5437050	481500	Vertical	13	1	13	12	1.1	0.061
BHA231	5437100	481675	Vertical	15	11	15	4	1.0	0.026
BHA235	5437150	481500	Vertical	17	5	16	11	1.2	0.068
BHA247	5436650	481200	Vertical	5	0	5	5	1.2	0.14
BHA306	5437200	481725	Vertical	6	0	6	6	1.3	0.040
BHA313	5437150	481550	Vertical	22	14	22	8	1.0	0.036
BHA321	5436450	481250	Vertical	10	5	9	4	1.1	0.087
BHA323	5436400	481275	Vertical	9	1	9	8	1.1	0.13
BHA340	5436101	481534	Vertical	11	1	9	8	1.1	0.026
BHA341	5436052	481755	Vertical	7	0	7	7	1	0.072
BHA344	5436042	481604	Vertical	4	1	4	3	1.5	0.063
BHA349	5436003	481622	Vertical	3	0	3	3	1.3	0.12
BHA350	5436000	481568	Vertical	11	2	11	9	1.2	0.056
BHA372	5435950	481754	Vertical	3	0	3	3	1.4	0.054
BHA373	5435948	481707	Vertical	10	1	10	9	1.1	0.025
BHA377	5435998	481317	Vertical	15	8	15	7	1.0	0.054
BHA380	5435950	481496	Vertical	4	0	4	4	1.5	0.090
BHA382	5436001	481788	Vertical	4	1	4	3	1.4	0.074
BHA403	5436714	481278	Vertical	5	1	5	4	1.1	0.037
BHA404	5436707	481232	Vertical	5	2	5	3	1.0	0.069
BHA441	5436241	481751	Vertical	4	1	4	3	1.1	0.059
BHA451	5435895	481625	Vertical	5	0	5	5	1.1	0.069
BHA454	5435850	481749	Vertical	4	0	4	4	1.2	0.020
BHA462	5435645	481751	Vertical	6	3	6	3	1.8	0.17
BHA598	5436757	481491	Vertical	5	1	4	3	1.04	0.048
BHA600	5436655	481295	Vertical	3	0	3	3	1.05	0.05
BHA606	5436094	481245	Vertical	9	3	9	6	1.05	0.088
BHA615	5436153	481753	Vertical	11	3	11	8	1.04	0.081
BHA624	5436153	481244	Vertical	8	5	8	3	1.1	0.033

\*0.5% Ni lower cutoff

\*Minimum intercept 2m

\*Maximum internal dilution 2m

\*All samples 1m grab samples

**Table 6 Best Nickel & Cobalt Diamond Drill Hole Intercepts**

Hole ID	Northing	Easting	Dip	Max Depth	Depth From	Depth To	Width (m)	Ni %	Co %
BHD001	5437460	481546	Vertical	55.6	11	22	11	0.95	0.034
BHD001	5437460	481546	Vertical	55.6	28	31	3	0.58	0.013
BHD002	5437313	481521	Vertical	24.6	11	24.6	13.6	0.93	0.06
BHD003	5437355	481394	Vertical	33.1	9	20	11	0.68	0.04
BHD004	5437221	481460	Vertical	51.1	9	30	21	0.66	0.057
BHD005	5437054	481497	Vertical	28.6	4.6	12	7.4	1.06	0.044
BHD006	5437057	481303	Vertical	40.2	6	16.2	10.2	0.74	0.032
BHD007	5436909	481364	Vertical	22.6	6	16	10	0.63	0.036
BHD008	5436791	481241	Vertical	31.6	4.6	8	3.4	0.59	0.043
BHD009	5437056	481150	Vertical	24.2	6	11	5	0.84	0.137
BHD010	5437169	480932	Vertical	24.1	7.6	17	9.4	0.64	0.045
BHD011	5436741	481121	Vertical	21.1	6.65	11	4.35	0.52	0.065
BHD013	5436006	481305	Vertical	25.6	8	14	6	0.77	0.048
BHD014	5436042	481764	Vertical	16.6	1	10	9	0.61	0.023
BHD015	5435952	481701	Vertical	30.1	1	12	11	0.75	0.009
BHD015	5435952	481701	Vertical	30.1	15	24	9	0.85	0.011
BHD016	5436059	481814	Vertical	18.3	2	10.6	8.6	1.22	0.064

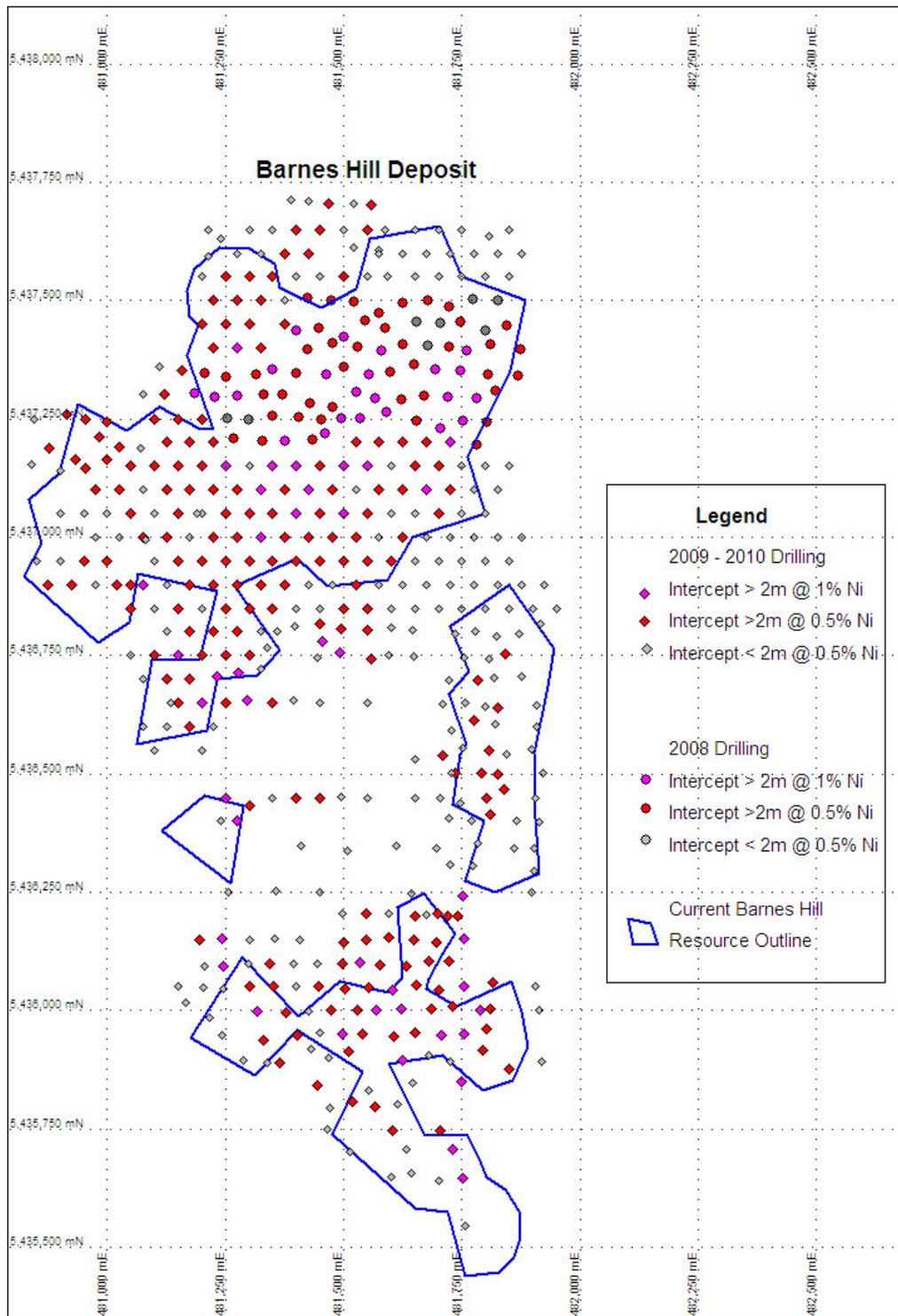
\*0.5% Ni lower cutoff

\*Maximum internal dilution 2m

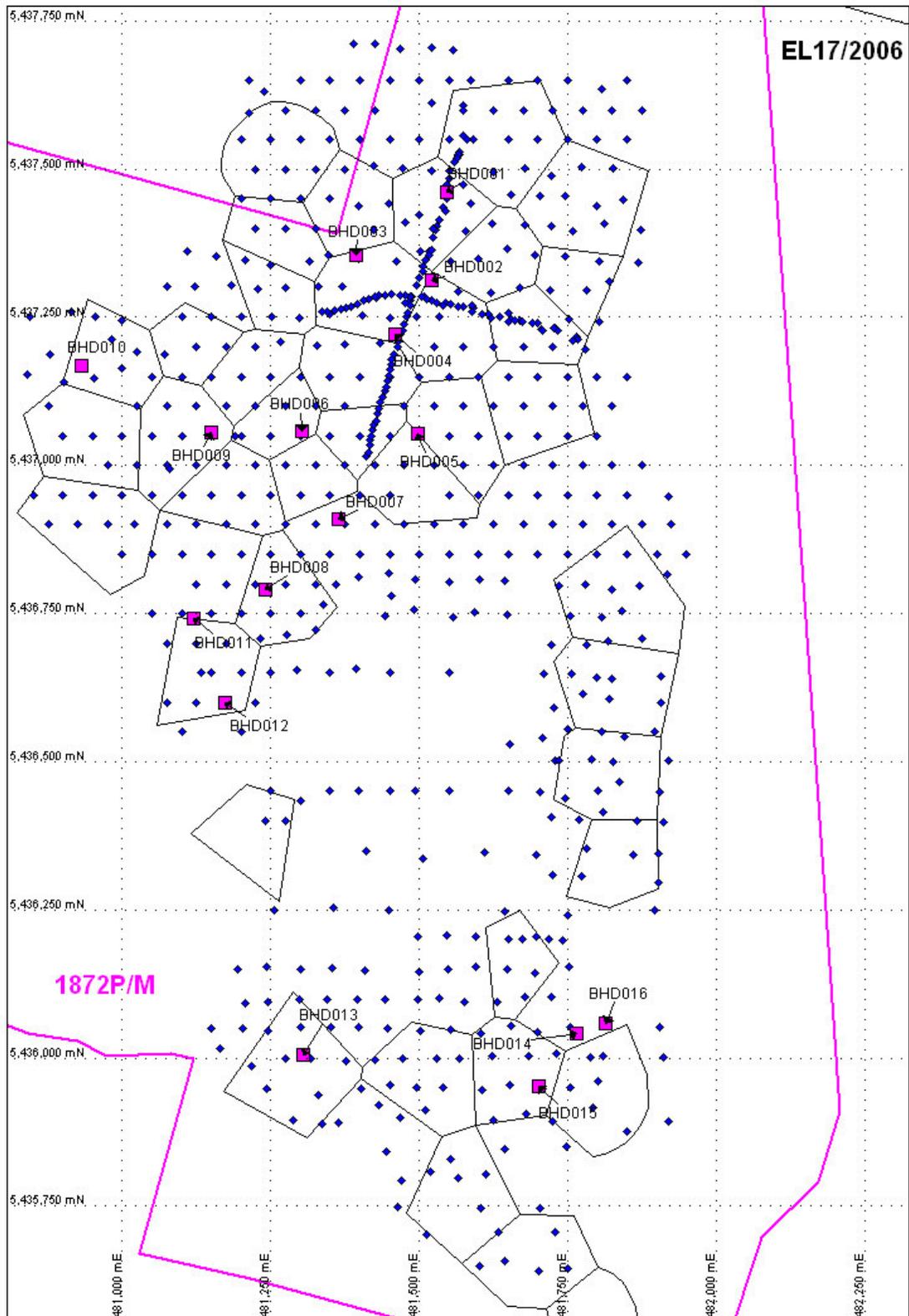
\*Minimum intercept 2m

\*All samples half core

\*Includes zones of core loss



**Figure 3 Detailed location of aircore drill holes completed at Barnes Hill during the reporting period.**



**Figure 4** Detailed location of diamond drill holes completed at Barnes Hill during the reporting period. Diamond holes shown as pink squares. Aircore holes shown as blue diamonds. Polygons of current Barnes Hill resource shown.

### **7.3 Flora & Fauna Surveys**

A detailed flora and fauna assessment of the resource areas was completed last reporting period by North Barker Ecosystem Services to allow the drilling program completed during this period to be approved. During this reporting period field days were spent confirming the distribution of *Tetratheca gunni* and *Epacris virgata* within the area of the newly applied for Mining Lease (1872P/M) and assessing the damage done across the area by a bushfire that burnt out a large section of exploration licence EL17/2006.

### **7.4 Resource Estimation**

Following return of all assay results from the aircore and diamond drilling program at the Barnes Hill deposit and completion of the project database Proto appointed consultants Snowden Mining Services to begin the estimation of an updated resource at the Barnes Hill deposit. This will involve the preparation of a 3D block model based on data from the recent drill-out at Barnes Hill and historical drilling data. The estimation of the resource will be based on the full database of 625 aircore drill holes and 16 diamond drill holes that were completed at Barnes Hill by Proto.

The estimation will involve statistical and spatial analysis of nickel and cobalt horizons and resource estimation using kriging into a 3D block model. This estimation will include required unfolding of the vertical profile. The result will be an update and validated resource to a high standard of geological confidence. This level of confidence aims to provide a rigorous basis for the feasibility study into mining Barnes Hill.

Following from completion of resource estimation mine planning and pit optimization studies will commence to provide data to assist with the DPEMP for the Barnes Hill Project.

### **7.5 Metallurgical Testwork**

Column leach testwork studies have been previously completed on aircore sample material from Barnes Hill by HRL testing in Brisbane. In addition further aircore sample material has been sent to Australian Bio Refining for further testwork with results pending.

The aims of these further tests are:

1. Leachability of the ore
  - Ni recovery over time
  - Co recovery over time
  - Fe recovery over time
  - Mg recovery over time
  - Physical characteristics of ore after leaching
  - Start state head grade
  - End state head grade
  - bulk density of the samples before and after leaching
2. Acid/water consumption
  - total Kg of acid per tonne of ore
  - acid consumption over time
  - water consumption
3. Makeup of PLS

- Daily narrow analysis (Ni, Co, Fe, Mg, free acid)
  - Broad spectrum analysis weekly (Ni, Co, Fe, Mg, Al, As, Ca, Cl, Cr, Cu, K, Mn, Mo, Na, P, Pb, S, Si, Ti, V, Zn, free acid)
4. Parameters
- 80-90% Ni recovery from ore
  - max 60 day leach
  - an average of about 50 GPL H2SO4 as the leach solution
  - vat leaching - liquor introduced at the bottom and percolating up.
  - 3 vats in isolation with different ore head grades in each
  - PLS bled at about 5 GPL tenor
  - Storage of bulk PLS @ 5 GPL Ni for further testing - the PLS from the 3 vats to be stored separately.

The next phase of metallurgical testwork will involve collection of 3 to 4 twenty tonne bulk samples of mineralised ore material from the Barnes Hill deposit. It is anticipated that this bulk sampling will occur following completion of the resource estimate for the Barnes Hill deposit later this calendar year.

It is anticipated that results of these tests will be reported in the next EL17/2006 annual report.

## 8 EXPENDITURE

Expenditure from 8<sup>th</sup> August 2009 to 7<sup>th</sup> August 2010 is tabulated below for the Barnes Hill EL17/2006 licence.

**Table 7 Expenditure 8 August 2009 to 7 August 2010.**

<b>Administration</b>	\$87,251
<b>Geology - Personnel/Equipment</b>	\$565,237
<b>Gridding</b>	\$21,565
<b>Geochemistry</b>	\$146,165
<b>Geophysics</b>	\$400
<b>Drilling</b>	\$319,986
<b>Feasibility Studies</b>	\$311,833
<b>Land Access Costs</b>	\$15,653
<b>Rehabilitation</b>	\$454
<b>Safety</b>	\$150
<b>Other – Rental Fees, Drafting</b>	\$38,721
<b>TOTAL - ELIGIBLE</b>	<b>\$1,507,415</b>

## 9 PROPOSED EXPLORATION

A variety of activities are proposed to be undertaken at the Barnes Hill Project in the coming term including:

- Resource estimation of the Barnes Hill Ni-Co deposit using newly acquired Proto drilling data and historical drilling data
- Continued metallurgical testwork including bulk sampling and pilot scale testwork
- Submission of the DPEMP for the project

## 10 KEY REFERENCES

**Douglas McKenna and Partners Pty Ltd, 2006**, JORC Indicated category confirmation letter for Barnes Hill, Scotts and Mt Vulcan Resources EL 18/2006 Beaconsfield, Tasmania. (Author A Jannink), (12 December 2006)

**Douglas McKenna and Partners Pty Ltd, 2005**, Final Report EL 1/2001 Beaconsfield, Tasmania. **Jervois Mining Limited** (13 March 2005)

**Douglas McKenna and Partners Pty Ltd, 2005**, Annual Report EL 1/2001 Beaconsfield, Tasmania. **Jervois Mining Limited** (March 2005)

**Douglas McKenna and Partners Pty Ltd, 2004**, Annual Report EL 1/2001 Beaconsfield, Tasmania. **Jervois Mining Limited** (March 2004)

**Douglas McKenna and Partners Pty Ltd, 2003**, Annual Report EL 1/2001 Beaconsfield, Tasmania. **Jervois Mining Limited** (March 2003)

**Douglas McKenna and Partners Pty Ltd, 2002**, Annual Report EL 1/2001 Beaconsfield, Tasmania. **Jervois Mining Limited** (March 2002)

**Douglas McKenna and Partners Pty Ltd, 2002**, Budget and Program for Bulk Sample Collection of Nickel/Cobalt Laterite EL 1/2001 Beaconsfield, Tasmania. **Jervois Mining Limited** (January 2002)

**Morrison, K C, Hofto V, Davidson J K, 1988**, Annual Report Year 1 Exploration Licence 18/87 – Andersons Creek, **Placeco Australia Pty Ltd** (June 1988)

**Newnham, L A, 1997** Annual Report EL 10/96 Andersons Creek Area, Northern Tasmania. **Allegiance Mining NL** (20 May 1997)

**Newnham, L A, 2000** Final Report EL 10/96 Andersons Creek Area, Northern Tasmania. **Allegiance Mining NL** (20 April 2000)

**Proto Resources and Investments Limited, 2006**, ASX Release: Barnes Hill Resource Announcement (18 December 2006).

**Proto Resources and Investments Limited, 2006**, ASX Release: Barnes Hill Resource Announcement (19 December 2006).

**Proto Resources and Investments Limited, 2007**, ASX Release: Short Form Prospectus Barnes Hill Resource Announcement (15 March 2007).

## **Appendix 1 Aircore Drilling Collar Locations & Assay Results**

- a. Collar Locations**
- b. Geological Logging Data**
- c. Assay Results**

## **Appendix 2 Diamond Drilling Collar Locations & Assay Results**

- a. Collar Locations**
- b. Geological Logging Data**
- c. Assay Results**
- d. Bulk Density Testing**