PROTO
RESOURCES & INVESTMENTS LTD

EL27413, EL27617 & EL27618

2nd ANNUAL REPORT for WAVE HILL

FOR THE YEAR ENDED 14 March 2012

Group Report Number: GR215/11

Commodity: Nickel, Copper & Platinum Group Elements

Compiled by: Maryanne Muir

Title Holders: Proto Resources & Investments Ltd (Operator)

Map Sheet: 1:250,000 Wave Hill SE 52-08
1:250,000 Victoria River SE 52-04
1:100,000 Camfield 5164 38/2
1:100,000 Montejinni 5264 32/6
1:100,000 Burgoyne 5263 38/3
1:100,000 Junjamininji 5162 38/5
1:100,000 Watson 5062 38/4

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ProtoResources & Investments Ltd

EL27413, EL27617 & EL27618 Annual Report for Wave Hill for the Year Ending 14 March 2012

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Abstract

The Wave Hill Project is located approximately 300km southwest of Katherine in the Northern Territory. The region is dominated by the Cambrian-age Antrim Plateau Volcanics which are part of the Kalkarindji Flood Basalt Province. The Kalkarindji Volcanic Group is considered to be analogous to the Nadezhdinsky series (Norilsk basalts) which host the world's largest Ni-Cu-PGE deposits at Norilsk in Russia.

Exploration activities conducted by Proto Resources & Investments Ltd (Proto) and their JV partners are based on the possibility of the Antrim Plateau Volcanics hosting economic "Norilsk-style" Ni-Cu-PGE mineralisation. Jones (2010)

Previous work by ProtoResources & Investments Ltd on the Wave Hill Exploration Licences has included regional re-imaging of available data and a ZTEM survey over EL 27618. The Queensland University of Technology and Open University review concluded that the Kalkarindji Continental Flood Basalts needed a comprehensive assessment to conclude whether they represent a potential Norilsk type analogue.

Work during the reporting period has included the interpretation of the ZTEM Airborne survey, FLTEM ground geophysics survey and interpretation over EL27618. The QUT/Open University collaboration has been confirmed with the secondment of the volcanologist Dr Mike Widdowson to head the projects and the construction of a database to help identify further targets in the Northern Territory and a field trip to the Waterloo and Wave Hill Regions has been completed.

Proto Resources considers the exploration across the Wave Hill group of ELs to be necessarily linked in order to generate meaningful targets for follow up work. This high risk exploration requires the development of a careful understanding of the Antrim Plateau Volcanics across a large area in order to generate potential targets, particularly given the depth of cover and formation hypotheses being pursued. It is still important to keep these ELs contiguous to support Mike Widdowson's (in association with the Open University/QUT) vulcanology work planned for the coming year which includes follow up of the current report on the Antrim Plateau Volcanics. Reassessment of these ELs by Proto may lead to the tenement being offered for Joint Venture to a prospective partner.

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1. INTRODUCTION

The Wave Hill Project is located approximately 300km southwest of Katherine in the Northern Territory. The region is dominated by the Cambrian-age Antrim Plateau Volcanics which are part of the Kalkarindji Flood Basalt Province. The Kalkarindji Volcanic Group is considered to be analogous to the Nadezhdinsky series (Norilsk basalts) which host the world's largest Ni-Cu-PGE deposits at Norilsk in Russia.

Exploration activities conducted by Proto Resources & Investments Ltd (Proto) and their JV partners are based on the possibility of the Antrim Plateau Volcanics hosting economic "Norilsk-style" Ni-Cu-PGE mineralisation. Jones (2010)

2. PROPERTY DESCRIPTION AND TENURE

The Wave Hill Project comprises three granted exploration licences (ELs 27413, 27617 & 27618) which cover a combined area of 3,469 square kilometres. A fourth licence is held in its Application stage, ELA 27414 and is contiguous with the other three. The licences are held 100% by Proto Resources & Investments Ltd. See Table below for further details on grant dates. Jones (2010)

Table 1: Tenement Details

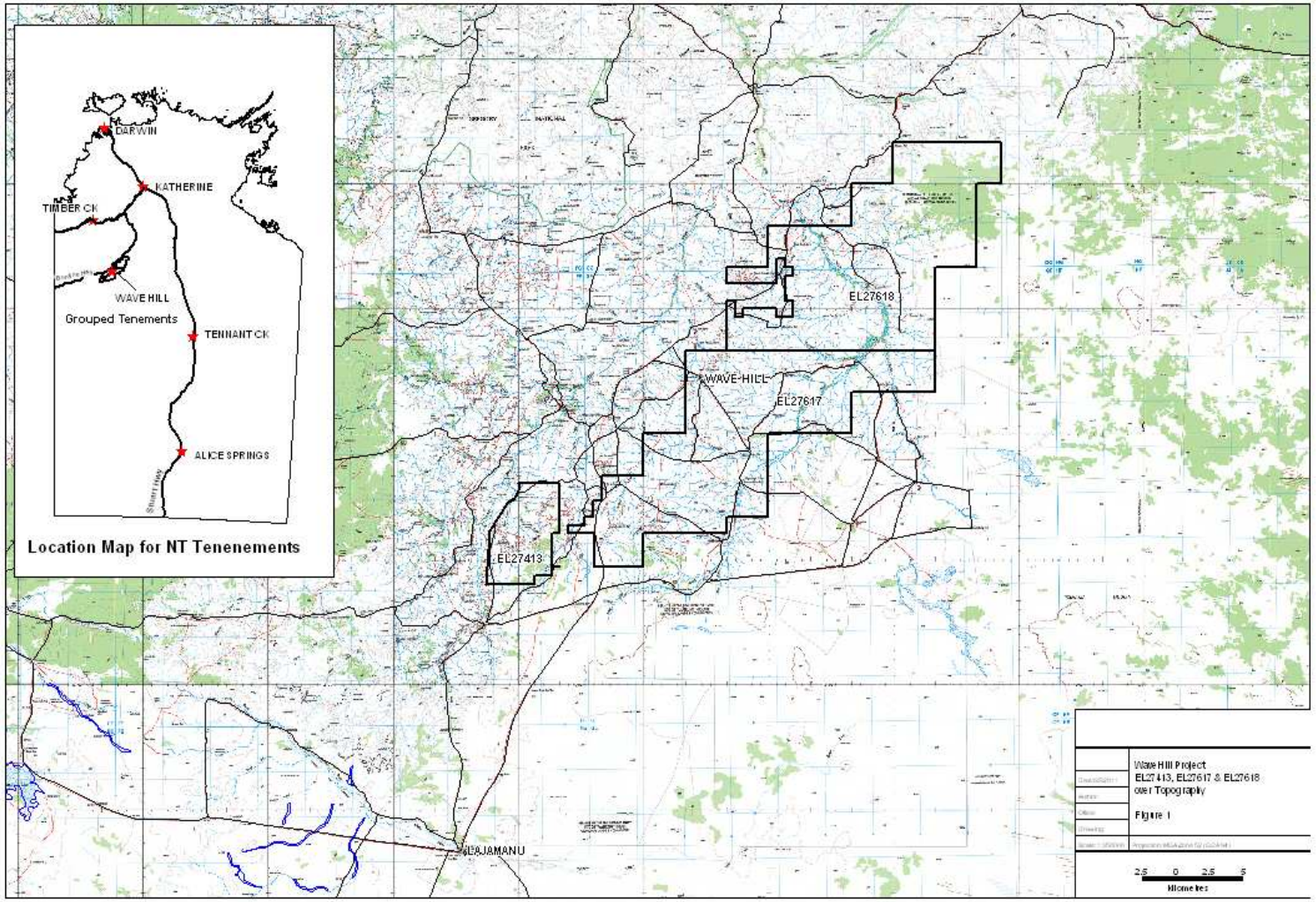
Title	Status	Grant/Application	Expiry	Area (Sq Km)	Current Rent	Expenditure
EL 27413	GRANTED	15/04/2010	14/04/2016	277	$ 2155.00	$ 25,000.00
ELA 27414	**APPLICATION**	17/06/2009		359	$ NA	**$ 50,000.00**
EL 27617	GRANTED	13/05/2010	12/05/2016	1,593	$ 9995.00	$ 25,000.00
EL 27618	GRANTED	13/05/2010	12/05/2016	1,599	$ 9995.00	$ 35,000.00

During the first half of 2011 Group Reporting was requested and granted by the Department of Resources – Minerals and Energy with the new Report dates as follows 15th March to 14th March the following year. The Group Reporting Number is GR215/11.

3. ACCESSIBILITY AND INFRASTRUCTURE

The Wave Hill Project tenements are located approximately 550km south of Darwin and 300km southwest of Katherine in the Northern Territory. The tenements are accessed from Katherine via the Victoria Highway and then the Buntine Highway (Figure 1). Accommodation is available at Top Springs Road House located 50km north of the project area along the Buntine Highway. The licence lies within the Wave Hill Station, Camfield Station and Cattle Creek Station Perpetual Pastoral Lease.

Figure 1: Location of Wave Hill Tenements on local topography with inset showing location relative to Katherine. Plans in GDA94.



4. GEOLOGICAL SETTING

Jones (2010) states that a large portion of the Wave Hill Project area is covered by basalts of the Cambrian-aged Antrim Plateau Volcanics. In addition to the basalts, small areas are covered by sedimentary units of Proterozoic Wattie Group with other areas of younger laterite, sand Dune cover and black soil plains.

The area is covered by the WAVE HILL & VICTORIA RIVER 1:250,000 map sheet and explanatory notes. Also the 1:100,000 mapsheets are as follows,

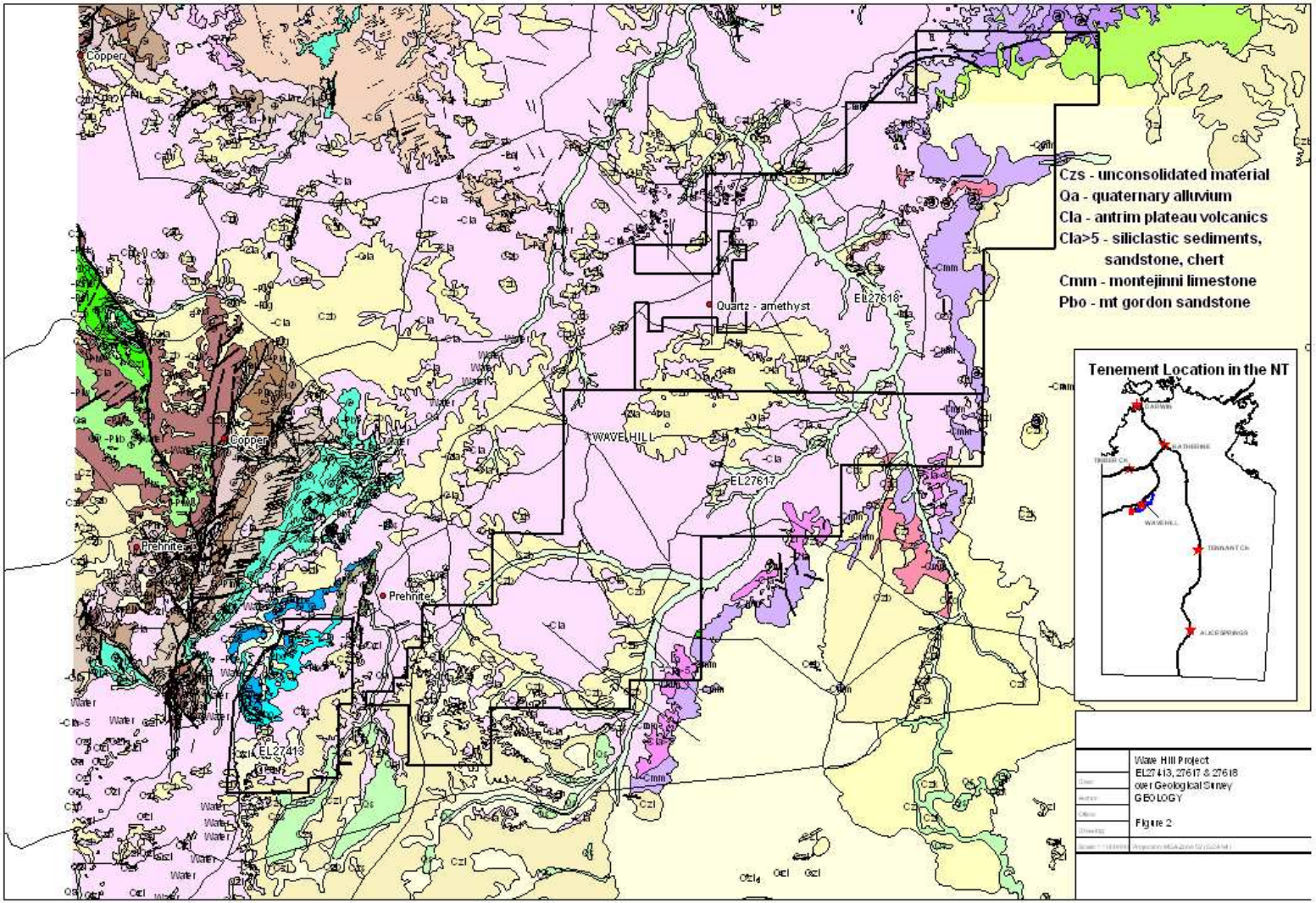
EL27618/27617	5163	CAMFIELD	1:100,000 38/2
EL27618	5264	MONTEJINNI	1:100,000 32/6
EL27618/27617	5263	BURGOYNE	1:100,000 38/3
EL27617	5162	JUNJAMININJI	1:100,000 38/5
EL27617/27413	5062	WATSON	1:100,000 38/4

The project area is transected by the northeast trending Neave Fault. The Neave Fault is a major structure that is believed to have been active for a long period of time. The fault is an important part of Proto Resources Exploration strategy to locate a Norilsk Style Deposit. The Antrim Plateau Volcanics make up part of the Kalkarindji Volcanic Group Continental Flood Basalt Province. This province is considered analogous to continental flood basalts in other parts of the world, most importantly the Nadezhdinsky series (Norilsk basalts) which host the world's largest Ni-Cu-PGE deposits at Norilsk in Russia. The PGE, Ni and Cu depletion from the Nadezhdinsky series has been attributed to assimilation of continental crust, which stimulated sulphide segregation, thus sequestering the chalcophile elements from the basaltic magma. The correspondingly low PGE and Ni values for the Kalkarindji basalts may indicate a similar process took place (Glass, 2002).

The recorded mineral occurrences around the Wave Hill Project area lie adjacent to the tenements and include copper, Prehnite and quartz amethyst.

The location of Antrim Basalt vents has proved difficult to establish. Based on vent location in other continental flood basalt provinces these vents could be widely scattered. The only potential Antrim vent is located on EL 27618 at the western termination of the Wave Hill Rille, a >120 km long, 0.4 – 4 km wide and approximately 50 m deep trough (Bultitude, 1971; Gole, 2003). This trough represents a thermal erosion channel formed by the last basalt lava flow that vented from the intersection of a NW fracture system and the NE trending Neave Fault on EL 27618.

Figure 2: Regional surface geology from NT 1:250, 000 mapping. Plan in GDA 94



5. PREVIOUS EXPLORATION

Jones (2010) has completed a comprehensive study of the previous exploration completed in the region and is as follows. The Wave Hill Project area has been the subject of various exploration programs since the 1960's through to the present day although the majority of recorded exploration has consisted of only minor field work. The table below provides brief information on historic activities in the project area. From review of the historic exploration reports the most relevant work to Proto's target style was completed by Metals Exploration NL and AusQuest Limited.

Metals Exploration NL undertook widespread stream sediment sampling exploring for copper deposits. This work did identify several small areas of copper anomalism within Proto's Wave Hill project area. These copper anomalies were not followed up by further sampling.

AusQuest Limited's work was also targeting Ni-Cu-PGE deposits and interpretation of geophysics identified a potential Antrim volcanic vent near Wave Hill and also a possible intrusive sill beneath Antrim basalts southwest of Wave Hill Homestead. No work was undertaken around the volcanic vent locality. The interpreted sill was covered by ground EM but no drilling was completed.

Table 2: Review of Exploration in the Wave Hill Region

Date	Company	Target	Activities
2001 - 2005	AusQuest Limited	Ni-Cu-PGE & diamonds	Geophysical modelling, TEM survey, interpretation of regional magnetics, wholerock geochem, identification of Antrim basalt vent at Wave Hill, magnetic feature SW of Wave Hill interpreted as a sill beneath Antrim cover but no EM anomaly.
1996 -1998	Stockdale Prospecting Limited	Diamonds	Air Mag interpretation, heavy mineral samples taken, possible kimberlite indicators found and one diamond recovered in Proto project area.
1995 - 1996	R. Armfield	Diamonds	Landsat TM & air photo interpretation. Large circular anomaly defined in project area which has a corresponding gravity high. No field work undertaken.
1993 - 1994	Aradon Pty Ltd	Gemstones - prehnite & quartz	Gemstone prospecting and small scale mining.
1989 - 1992	Gerard Pauley	Gemstones - prehnite, agate & amethyst	Looking for gemstones and establishing a gemstone cutting company using samples from Wave Hill area.
1978 - 1979	Anaconda Australia Inc	Base metals	Most work off project area. On project area minor rock chip samples. No anomalies defined.
1971 - 1972	Murramulla - Gurindji Co Pty Ltd	Base metals	Air photo interpretation and 60 rock analyses. No anomalies.
1968 - 1970	Metals Exploration NL / Freeport Australia Inc	Cu	Widespread stream sediment sampling for Cu covering project area. Small areas of Cu anomalism defined.

For the first reporting period between 15-03-2011 to 14-03-2011, Wave Hill work included:

- Regional re-imaging of available data – an image Atlas was produced of the data available from the NTGS and reprocessed by Southern Geoscience Consultants.
- QUT / Open University Collaboration organised.
- ZTEM (Z-axis Tipper Electromagnetic System) survey was undertaken over EL27618 where 549 line kilometres were completed.

6. EXPLORATION COMPLETED DURING THE REPORTING PERIOD 15TH MARCH 2011 TO 14TH MARCH 2012.

Work during the reporting period has included:

- Finalisation of the ZTEM airborne survey
- FLTEM ground geophysics survey and interpretation
- Open University (UK) QUT collaboration confirmed and field visits completed.

6.1 Open University (UK) Collaboration

During October research sponsorship was finalised. Leading volcanologist Dr Mike Widdowson of the Open University (UK) was seconded to an exploration collaboration centred on ProtoResources & Investments Ltd Waterloo Project with visits to the Wave Hill exploration licences for field checking of various sites of interest. The collaboration will involve a PhD student whose aim will be to combine data to constrain the 'broader geological setting and evolution on the Antrim Plateau Volcanics'. The PhD is titled "Architecture, chemostratigraphy and economic prospectivity of the Central Kalkarindji Flood basalt Province, Australia." The programme will involve support for a database, a "virtual spatial framework" of structural geology, geochemistry and already identified geophysical anomalies used to site future exploration in the Northern Territory. The project will be funded jointly with Open University (UK) from October 1, 2011 to 30 September 2014.

A report titled "The Kalkarindji Flood Basalt Province of Australia: comparisons with the Siberian Traps CFBP and associated Noril'sk Ni-Cu-PGE mineralisation" has been produced and is to be found in Appendix 1 as "Kalkarindji Flood Basalt Report Murphy, Widdowson, Clark & Hepple.pdf" file.

An earlier report (from 2009) provided by Martin Gole and Associates (MGole Neave Fault memo.pdf) is also found in Appendix 1. This report describes the Potential Significance of the Neave Fault for Antrim-hosted Magmatic Ni-Cu-PGE Sulphides.

A reconnaissance trip was made to Wave Hill with the express purpose of identifying the "Vent Site" postulated by Gole (2009). Four sites were visited, no evidence of a volcanic vent was apparent and an aerial search revealed no obvious features that might represent a vent - a detailed description of the visit is found in Appendix 1 in the report titled "The Kalkarindji Flood Basalt Province of Australia: comparisons with the Siberian Traps CFBP and associated Noril'sk Ni-Cu-PGE mineralisation".

6.2 ZTEM Airbourne Geophysical Survey

The ZTEM airbourne geophysical programme commenced during December 2010. The processing will be completed during February 2011. The survey covered Lindeman's Bore (EL25307) and the Wave Hill Tenements (Els 27413, 27617 and 217618) for a total of 957 line kilometres at 1 kilometre line spacing.

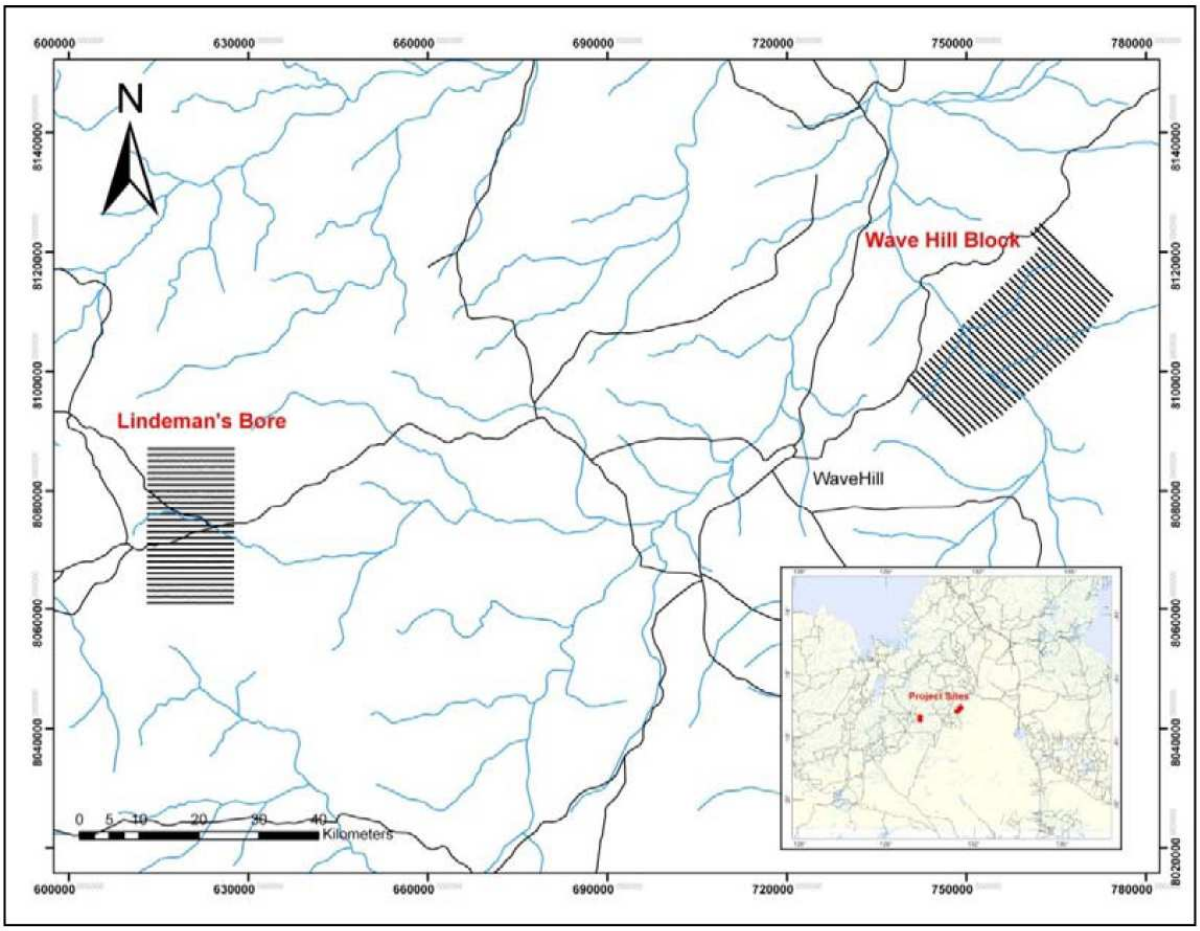


Figure 2 – Survey Blocks Location showing grind orientation and surveyed areas.

Figure 3: ZTEM Survey Blocks Location showing grid orientation and surveyed areas.

6.2.1 The ZTEM Survey

Helicopter-Borne Z-Axis Tipper Electromagnetic (ZTEM) and Aeromagnetic Geophysical Survey at EL27618 outlined "small anomalies and deeper resistivity breaks, particularly in the low frequencies that are associated with the main magnetic anomaly"

In order to fully test the results a 2D forward modelling was performed over the area. "This used a sub-horizontal conductive body (at 250, 500 and 750m depth) with a 2000x500m size and 1000S (siemens) conductance. The surrounding host rocks were postulated to be highly resistive (2000 ohm-m) and over burden was anticipated to be conductive (0-20S). The 2D forward modelling suggested that the ZTEM survey technique could prove an effective tool provided that the overburden is not overly conductive and the targets are situated <500-750m depth." (Swensson, Carl., 2011-04-20, Stock Exchange Announcement).

ZTEM tipper measurements have delineated various anomaly trends sub parallel and perpendicular to flight lines with in EL27618. The most prominent and largest positive anomaly perpendicular to survey lines is located in the centre close to the south east side and strikes SW-NE with better contrasting patterns at lower frequencies. The magnetic image defines an elongated, magnetic anomaly with a ZTEM lineament (A trend). 2D inversion relating to the A-trend showed shallow (<200m) weakly conductive features below this magnetic anomaly that could be responding to structural controls. (Swensson, Carl., 2011-04-20, Stock Exchange Announcement).

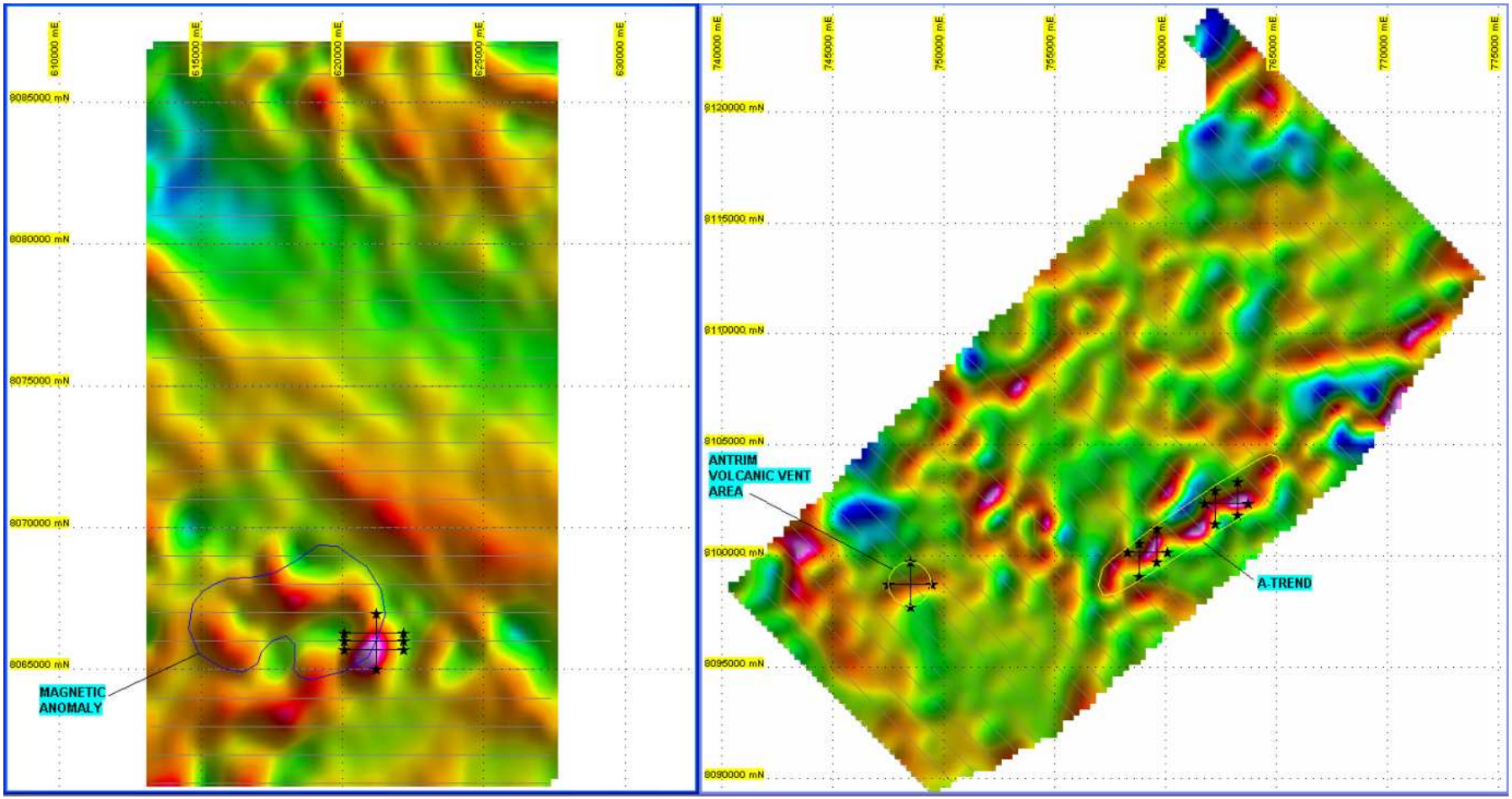


Figure 4: EL25307 and EL27618 ZTEM Surveys – images showing targets

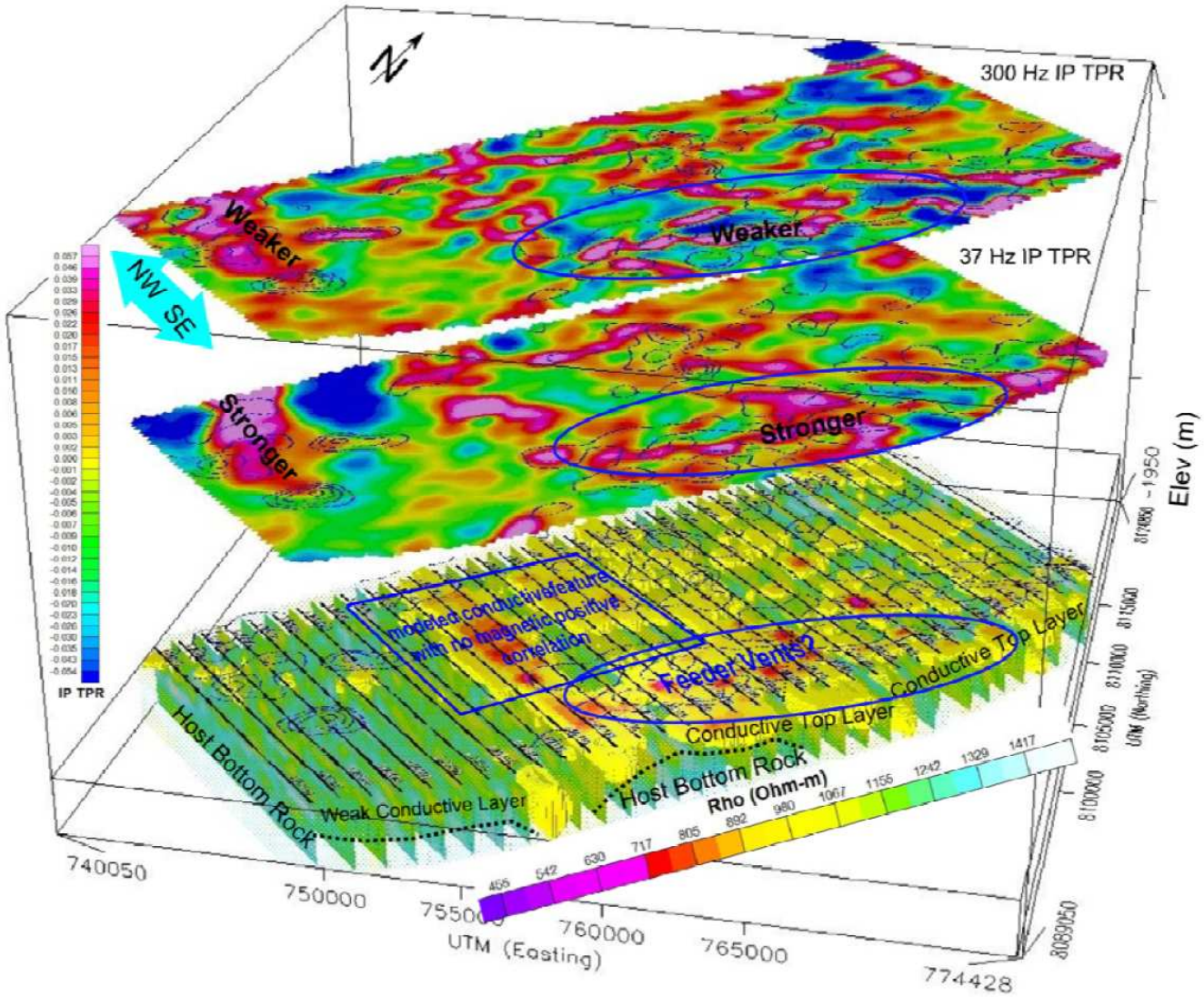


Figure 5: EL27618 – Wave Hill 2D Resistivity Inversions in 3D view

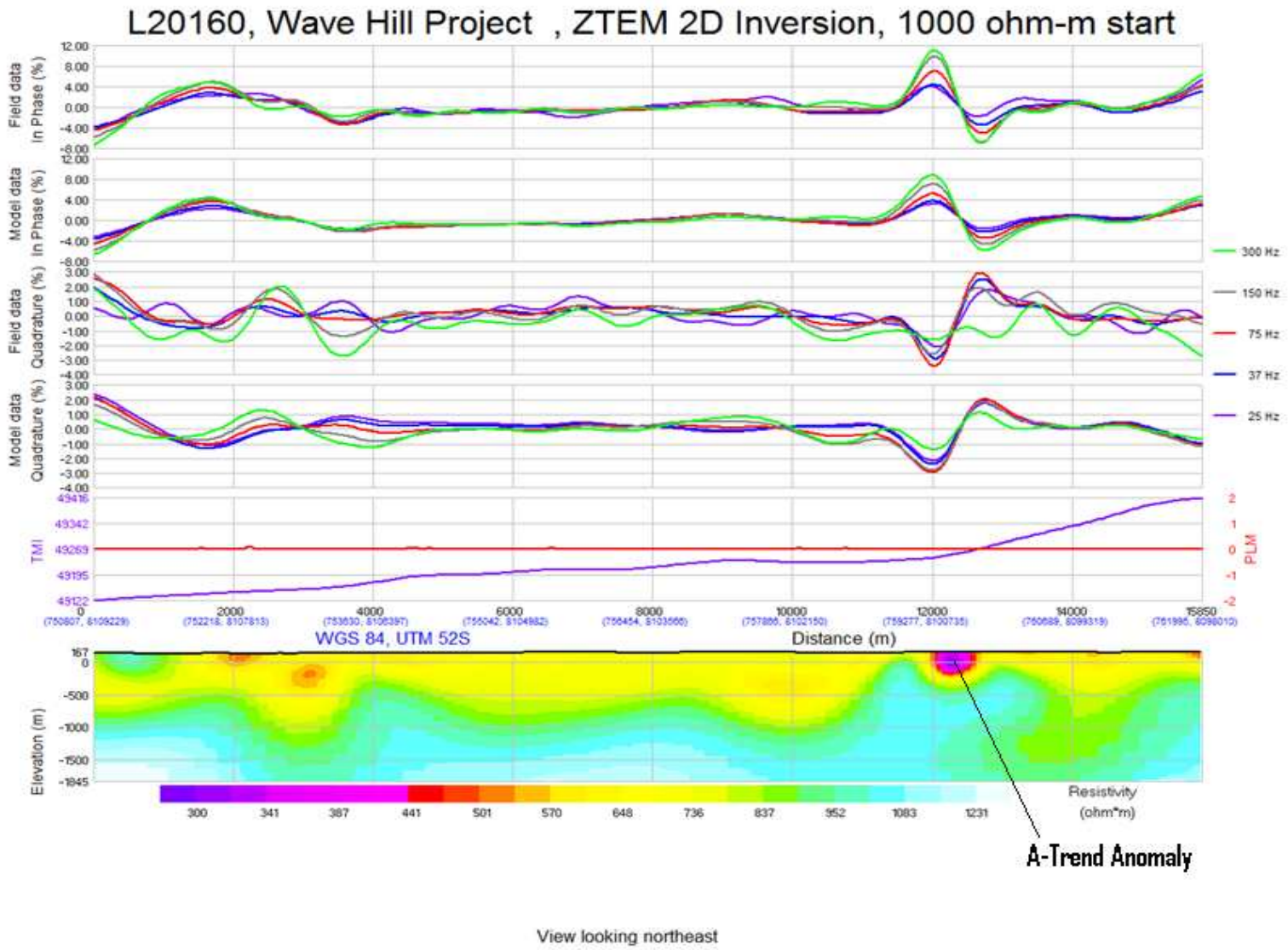


Figure 6: Wave Hill ZTEM 2D Inversion Section (L20160) Over the Main A- trend Anomaly

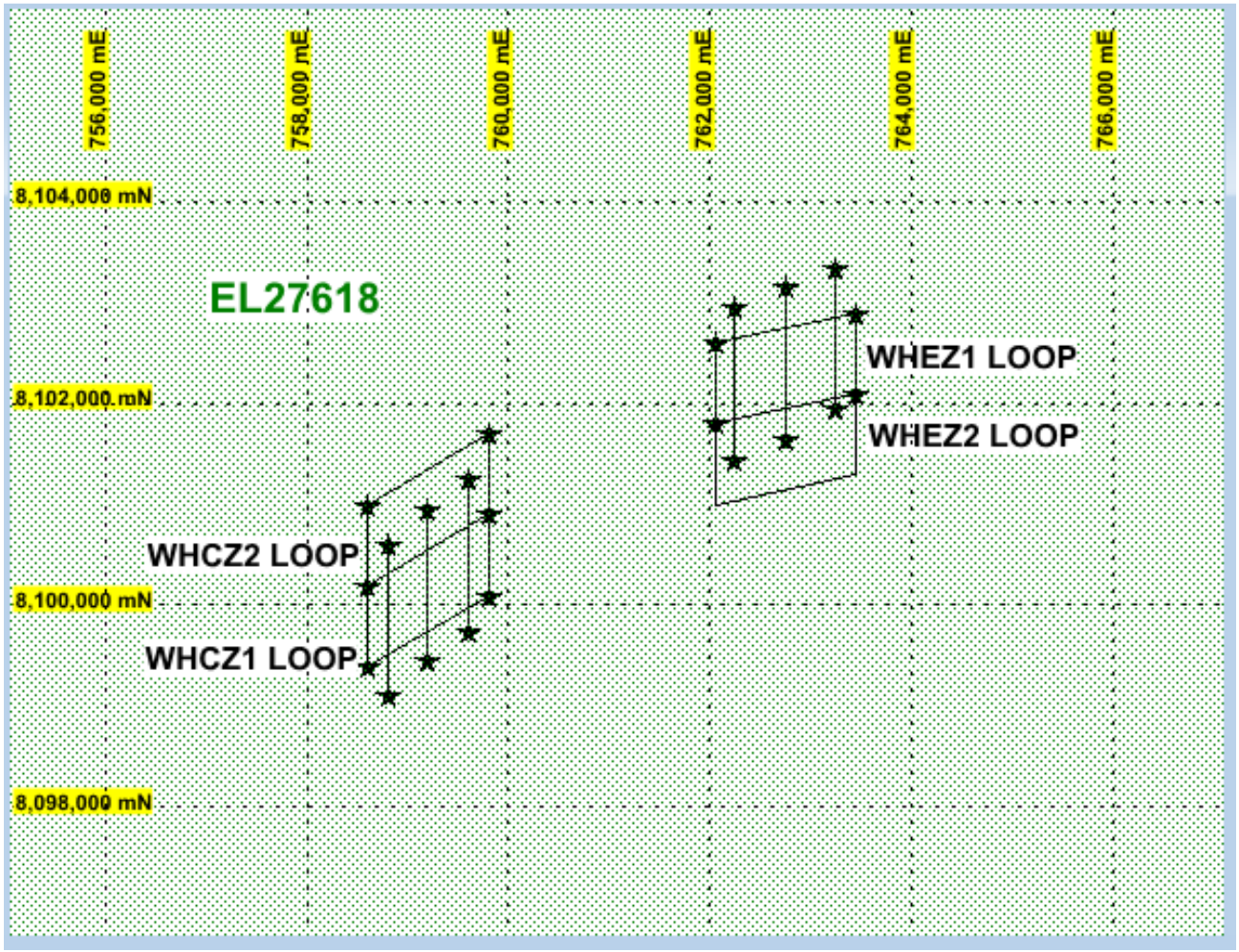
6.3 FLTEM Ground Geophysical Survey

During September/October 2011 four Fixed Loop TEM (FLTEM) surveys were completed by Outer Rim Exploration Services Pty Ltd on EL27618. The aim of the survey was to confirm whether legitimate bedrock conductive sources were present in and outline bedrock anomalies associated with the ZTEM anomalism identified in the earlier survey.

"All data was acquired with a Crone PEM Coil (dB/dt) combined with a Crone PEM receiver working at a base frequency of 1.67Hz. The large transmitter loops (both 1000x1000m) utilised during this programme were powered by a Crone PEM transmitter working at ~20A current (single turn loops)." Peebles, P., 2011 -11-04, Stock Exchange Announcement.

A total of 12 survey lines were completed (3 per loop) and total coverage equated to 18km, 192 stations.

Figure 7: Wave Hill Project Ground EM Lines Location



7. CONCLUSIONS AND RECOMMENDATIONS

2011-2012 provided Proto Resources & Investments the opportunity to follow through with data obtained from December 2010 ZTEM Airbourne geophysical survey.

An anomaly from the ZTEM survey was identified. This was followed up with a FLTEM ground geophysical survey which failed to identify any solid targets.

During October research sponsorship was finalised confirming that leading volcanologist Dr Mike Widdowson of the Open University (UK) was seconded to an exploration collaboration centred on ProtoResources & Investments Ltd Waterloo Project. The collaboration will involve a PhD student and will involve support for a database, a “virtual spatial framework” of structural geology, geochemistry and already identified geophysical anomalies used to site future exploration in the Northern Territory.

Proto Resources considers the exploration across the Wave Hill group of ELs to be necessarily linked in order to generate meaningful targets for follow up work. This high risk exploration requires the development of a careful understanding of the Antrim Plateau Volcanics across a large area in order to generate potential targets, particularly given the depth of cover and formation hypotheses being pursued. It is still important to keep these ELs contiguous to support Mike Widdowson’s (in association with QUT) vulcanology work planned.

2012-2013 should see these Exploration Licences reassessed and possibly offered for Joint Venture.

8. REFERENCES

Bultitude RJ, 1971. The Antrim Plateau Volcanics, Victoria River district, Northern Territory. *BMR Record 1971/069*.

Gole M, 2003. Wave Hill EL 22812 Annual Report for the period 18/10/02 to 18/10/03, Northern Territory. *AusQuest Limited.*

Glass, LM., 2002. Petrogenesis and geochronology of the North Australian Kalkarinji low-Ti Continental Flood Basalt Province, PhD Thesis MFM GLA.7.

Jones, A., 2010. Wave Hill Project Summary, Northern Territory. Proto Resources & Investments In House Report.

Muir, M., 2011. 1st Annual Report Wave Hill, 15 March to 14 March 2011. ProtoResources & Investements. NTGS Annual Report.

Appendix 1 – Reports

Data
- **Kalkarindji Flood Basalt Report Murphy, Widdowson, Clark & Hepple.pdf**
- **MGole Neave Fault memo.pdf**

Appendix 2 – Ground Geophysics

Data - See Attached “Proto_WH_EL27413AnnualReport” for FLTEM data.

Appendix 3 – NT Research Secondment Progress

Data – See following file.

STOCK EXCHANGE ANNOUNCEMENT

May 14, 2012

NT Research Secondment Progress

ASX Release Stock Code: PRW

Proto Resources & Investments Ltd ("Proto", "the Company") is pleased to update on geological research in the Northern Territory. The sponsorship of leading volcanologist Dr Mike Widdowson commenced six months ago, and has provided strong inputs into Proto's exploration across the Northern Territory, which now extends into northern Western Australia. Geochemical work is underway led by Dr David Murphy to better understand development of the basalts, with results already received greatly informing Proto's Northern Territory exploration programme.

Executive Summary

- Dr Mike Widdowson has completed the first six months of geological research into Vulconology of the Antrim Plateau Volcanics (APV). Dr Widdowson, together with a PhD student jointly funded by The Open University, UK, have commenced a program of work that will culminate in sophisticated geochemical analysis including sulphur isotope analysis and Ar/Ar dating. The secondment will support the integrated database of structural geology, geochemistry and already identified geophysical anomalies that is being used to site upcoming drilling in the Northern Territory.

- Analytical results (XRF and ICP-MS) of sampled eruptive units at Waterloo reveal them to be predominately evolved low Ti-tholeiitic basaltic andesites and basaltic trachy-andesites, with relatively high K, Na and Si and low Ca and Ti. This distinctive element enriched geochemical signature is very rare amongst large igneous province tholeiitic basalts, and may be the function of significant crustal contamination. If so, the Waterloo and wider Kalkarindji province represent an analogue to the Noril'sk-Talnakh Ni-Cu deposits.

- The prospectivity of the Argyle Corridor and Ord Basin East projects, secured by Proto under a recent option agreement, has also been significantly enhanced by the research outcomes achieved to date. The research demonstrates that the basalts are particularly thick in this area suggesting a major eruptive centre thereby enhancing the potential for Norilsk-Talnakh style Cu-Ni mineralisation. These projects also are considered prospective for copper and diamonds.

Progress of the Exploration Collaboration

Proto Resources & Investments Ltd ("Proto", "the Company") is pleased to announce progress under the research sponsorship (including linked professional secondment of leading volcanologist Dr Mike Widdowson) that is investigating Proto's Northern Territory tenements. Dr Widdowson has been seconded to Proto as part of an exploration collaboration that included the funding of a dedicated PhD project focused on the Waterloo project area. Waterloo is being explored under Proto's joint venture with Peak Mining and Exploration Limited ("Peak") and is situated approximately 80km southeast of Kununurra in the Kimberley region of the Northern Territory. Waterloo sits within the extensive Antrim Plateau Volcanics

and comprises two granted exploration licenses (EL27416 and EL27420) and two applications (EL28504 and EL28505) that sit near the major structural feature, the Blackfellow Creek Fault. This work builds on the geochemical database, that has already been the subject of work by a team from the Queensland University of Technology ("QUT") led by Dr David Murphy.

The reconnaissance and analytical work conducted at QUT and the Open University will be presented at two major geoscience venues: The annual American Geophysical Union ("AGU") Fall Meeting in San Francisco, USA (December 2011), and at the Volcano and Magmatics Studies Group ("VMSG") Annual Meeting at Durham University, UK (January 2012).

The current exploration and research project is an industry-academia partnership between Proto Resources, The Open University, UK, and QUT, Brisbane. The project is centred upon the Kalkarindji Continental Flood Basalt Province ("CFBP"). This is the world's most ancient CFBP for which significant thicknesses of the lava succession still remain preserved (Figure 1): many of the thickest, most complete and extensive successions are located in the Waterloo and Limbunya areas (Figure 2) which are currently under investigation by Proto Resources. The extensive volcanic remnants currently of interest to Proto are commonly collectively termed the 'Antrim Plateau Volcanics' ("APV"), and form a substantial sub-region of the wider Kalkarindji province (Figure 1).

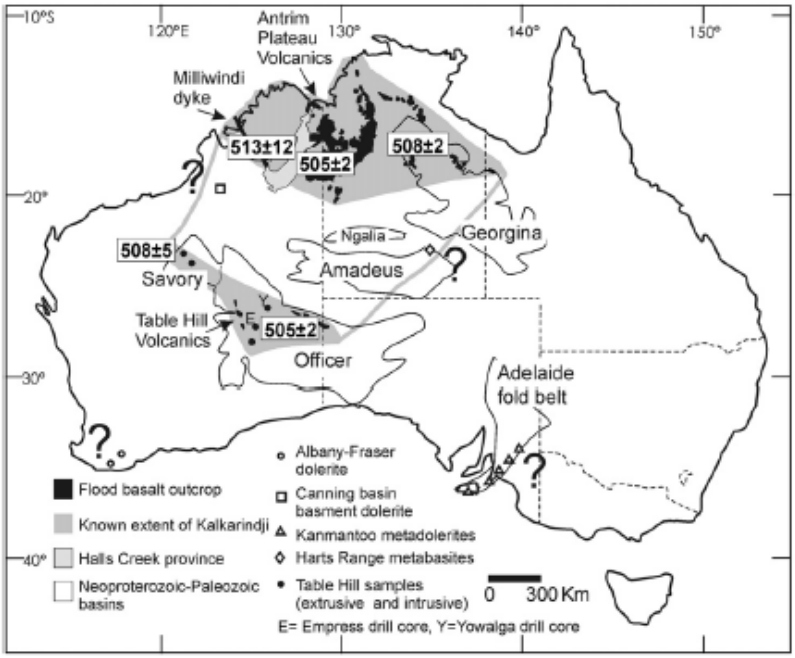


Figure 1 – Currently known extent of the Kalkarindji CFBP and associated igneous suites in Australia, and position of the Antrim Volcanic Province (APV) lava succession in Northern Territories.

Figure 2 – Key regions where APV crops out in NT and WA. Blue markers are locations of known exploration in the area. Green markers show locations of samples collected as part of the Blackfellow Creek field study.

Proto Resources interest in the Kalkarindji CFBP succession stems from its potential for hosting significant mineralization. Flood basalts are derived from the partial melting of Earth's mantle. Once generated, the melt migrates towards the surface as a magma, or else become stored in chambers within the crust (>1 - 10 km depth); these chambers are then tapped by shallow conduits (dykes), and the magma is erupted at the surface as lavas. Importantly, this 'plumbing system' allows the hot magma to interact with the continental crust, and scavenge elements from it. Those lavas which contain significant amounts of scavenged contaminants are termed 'contaminated lavas'. However, highly contaminated lavas are a rarity in most CFBP successions; but the Siberian Traps (Russia), and the Kalkarindji are notable exceptions to this rule. Importantly, the Siberian Traps host the Noril'sk-type deposits which are among the world's most commercially significant mineral reserves. The challenge in Australia is to determine whether the Kalkarindji flood basalt province hosts similar mineral wealth to that of the Siberian example.

Waterloo Field Reconnaissance

Field reconnaissance and follow-up laboratory research (September 2010 - August 2011) in the north-western part of the Waterloo region of NT has delivered several important findings. The APV, within the Waterloo area, is overlain by the Headleys Limestone (and the equivalent Montejinni Limestone to the south-east, Wave Hill area). Together, these sediments indicate that during, and immediately after eruption, this part of the basalt province remained topographically low and an active depocentre. Importantly, the encapsulating sedimentary succession (pre- and post-APV) contain potential sources of, and host sites for, mineralization.

Furthermore, analytical results (XRF and ICP-MS) of the sampled eruptive units reveal them to be predominantly evolved low Ti-tholeiitic basaltic andesites and basaltic trachy-andesites, with relatively high K, Na and Si and low Ca and Ti (Figure 3). The lavas also demonstrate extreme crustal signatures with Th/Nb >1, enrichment in Pb and depletion in Sr (Figure 4). Importantly, this distinctive Low-Ti character, and incompatible element enriched geochemical signature, are far removed from typical large igneous province tholeiitic basalts found elsewhere in the world, and implies significant crustal involvement during the genesis of the

Waterloo, APV and the wider Kalkarindji, basalt stratigraphy. Further, the high Si content and low Ca and Ti content is considered indicative of a high volatile content during crystallization. The atypical geochemistry of the Kalkarindji basalts is likely due to either derivation from a hydrous metasomatised mantle source, or due to the assimilation of significant quantities of hydrous crustal material during passage through the continental crust. If the latter, then the chemistry of the Kalkarindji effectively mimics that of the mineral-rich Siberian example.

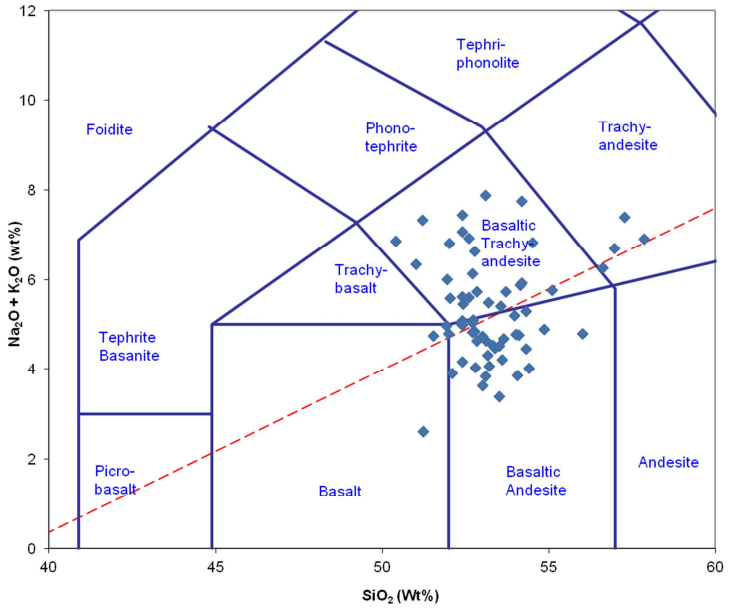


Figure 3 – Total alkali-silica diagram used to classify igneous rock types. Analysed Waterloo (Blackfellow Creek) samples are shown as green diamonds.

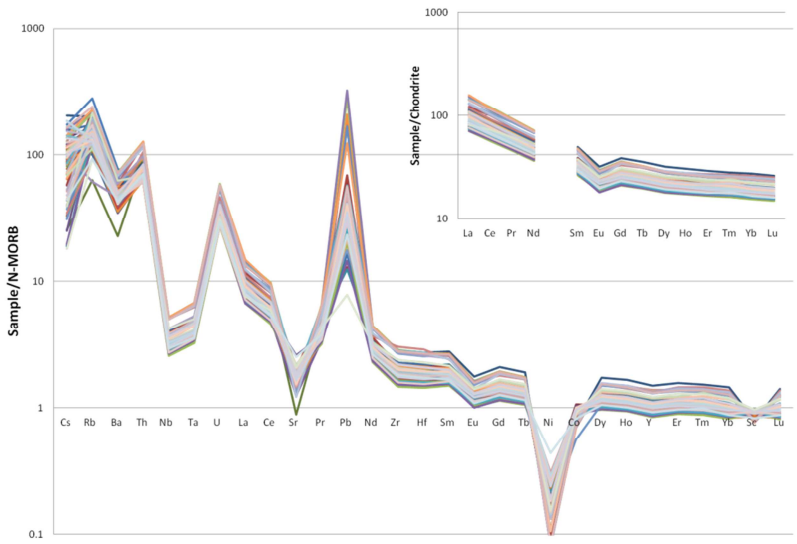


Figure 4 – Trace element and Rare Earth Element (REE) compositions of analysed Waterloo samples.

Panton Basin Field and Argyle Corridor Reconnaissance

Field trip reconnaissance (20th September – 3rd October, 2011) was conducted by Dr Mike Widdowson (The Open University, Milton Keynes, UK) and Dr David Murphy (QUT, Brisbane, Australia). This was to investigate key basaltic successions and geophysical anomalies identified within, and around the eastern side of the Ord Basin area (and Panton sub-basin, in

particular) where the APV outcrop occurs. As announced on March 16, 2012 Proto has entered into an option agreement to acquire 70% of the Argyle Corridor and Ord Basin East Projects covering the Panton sub-basin of the Ord Basin. As part of this work the team also visited the NTGS core archive.

The work to date has identified several exploration targets that will be further explored for in the area including:

- Magmatic – Nor'ilsk-type Ni, Cu, and PGE in association with APV: The northern part of the Panton basin is likely to contain the thickest preserved sections of the APV succession (c. 1000 m of extrusive volcanics). Work conducted by QUT and the Open University in the Waterloo area to the north, demonstrate at least 400 m of succession in the region currently under investigation (i.e., Newry and Rosewood Stations). Further, data from archive BMR boreholes in the Waterloo area (Waterloo #1 and #2;) demonstrate a substantial subsurface basalt succession. Given these thicknesses, the Panton Basin and adjacent Waterloo regions are more likely to contain the original focus of extrusive volcanism. Importantly, establishing the occurrence of Nor'ilsk-type mineralization requires the identification of either, intrusive magmatic bodies, feeder dykes, or vent systems. These are more likely to occur nearer the original focus of magmatic activity.

- A major lineament feature within the region, termed the Argyle Corridor, is apparent as a structural complex consisting of a series of en-echelon NW – SE trending faults. This is notable because the existence of the Argyle diamondiferous pipe (Argyle Diamond mine) is postulated to be the result of emplacement along a zone of structural weakness created by the intersection of the Argyle Corridor and the recognised SW-NE trending Halls Creek Fault zone. It is argued that where the Argyle Corridor is elsewhere intersected by other major SW – NE faults, these zones of weakness likewise could have been exploited by magmatism (antrim volcanic intrusions), emplacement of sister diamondiferous intrusions, or else provided the loci for movement of hydrothermally-driven mineralising fluids. If further reconnaissance work within the Panton Basin proves promising, then this will become a priority for future attention and detailed exploration.

- The concurrence of the APV in contact with reactive rock types such as limestone and sulphidic shale sequences provide potential analogues of the Keeweenawan copper deposits. This potential has been demonstrated historically by a number of exploration companies including Metals Exploration NL, Amoco Minerals Australia Ltd and CRA Exploration Ltd amongst others although, to date, none of these occurrences have proven economic.

Geochemical and Analytical Research

Following advertisement and recruitment of the Proto Resources/Open University jointly-funded PhD research project, Peter Marshall, a post-graduate from Leeds University was selected. Peter started his employment at the Open University in September, and undertook a month-long visit to QUT during November 2011. During this visit, Peter worked closely with co-supervisor, Dr David Murphy (QUT) and the two Masters students, Nathaniel Clark and Benjamin Gray, who are currently engaged in Proto Resources funded research projects on the APV.

Peter spent time collating and updating the existing APV sample database (collected in the Waterloo field area by Drs. Murphy and Widdowson, and the Masters students). In addition, the Waterloo (i.e., Blackfellow Creek) sample set was placed into a new geospatial database,

which now contains all known exploration within the Kalkarindji province. The eventual aim is to give a graphical view of how each sample set relates to one another in a geographical as well as stratigraphical sense. This database will be fundamental to understanding the volcanic architecture across Kalkarindji CFBP province.

Using volcanological techniques developed during fieldwork by the QUT team, sampling of the BMR Waterloo cores (Waterloo #1 and #2) was conducted at GeoScience Australia in Canberra: a total of 145 samples were taken (at 1.5 m intervals throughout the borehole depth of c. 300 m). The aim of this sampling was to compare the vertical stratigraphy of the core material with that derived from field data. A further sub-set of 12 samples were then selected from throughout the whole core length. These 12 were selected on their suitability for thin-sectioning and geochemical analysis, which included assessing samples for levels of alteration.

A similar exercise was performed on the Limbunya #1 core material (sunk during the same program as the Waterloo boreholes in 1971; Figures 5 and 6). The BMR Limbunya #1 hole is located c. 150 km south of both Waterloo holes. These samples have been shipped to the UK, and will be analysed during the coming months by XRF for major and trace element geochemistry, and a sub-set selected for isotopic (Sr and Nd) analysis.

Figure 5 – A selection of the samples from Limbunya #1 core. Each sample contains 1.5 m of core, sampled as aggregated chips. Each box contains c. 25 m of core.

Figure 6 – Vesiculated flow top at a depth of 71.3 – 71.6 m in Limbunya #1 core. The white marks are calcite amygdales which have in-filled the gas vesicles which formed within the flow top.

Further to this, an additional targeted Masters-level project is under negotiation for September 2012 – June 2013, which will aim to investigate and document the magnetostratigraphy of the APV succession. Results will aid in establishing a detailed chronology of magnetic fluctuations during the eruption of the APV. This will aid in: (1) improving the tectonic interpretation of the widely northern Australian continental area and, (2) developing a stratigraphic correlation tool which can then be extended throughout the Kalkarindji CFBP.

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