



JAGUAR MINERALS LIMITED

MT JUKES PROJECT; EL 51/2008  
ANNUAL REPORT FOR THE PERIOD  
16 DECEMBER 2008 – 15 DECEMBER 2009  
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Distribution:  
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**KEY WORDS:**

Copper-gold, base metals, Mt Jukes, Mt Darwin, Jukes Pty, East Darwin, VHMS, Mount Read Volcanics, Central Volcanic Complex, Tyndal Group, Great Lyell Fault, geochemistry.

**1:25,000 MAPSHEETS:**

Owen	3833
Darwin	3832
Engineer	3831
Teepookana	3632
Gormanston	3834

**DATUM**

AGD 66 Zone

## EXECUTIVE SUMMARY

EL51/2008 was granted to Jaguar Minerals Ltd by the Minister of Mines on the 16th December 2008.

Located south of Queenstown, the tenement covers approximately 130km<sup>2</sup> of Mount Read Volcanics.

Work to date includes compilation of historical data, and two geochemical surveys close to infrastructure on the North Jukes Grid and the east Darwin grid.

Two small Pb-Zn anomalies were delineated on the North Jukes Grid.

A narrow 1.5 km zone of Au-Cu-Ag anomalism was delineated on the East Darwin Grid (just west of previous Newcrest geochemical grids) as well as several areas of strong alteration.

## CONTENTS

<b>EXECUTIVE SUMMARY .....</b>	<b>3</b>
<b>1.0 INTRODUCTION .....</b>	<b>6</b>
<b>2.0 LOCATION .....</b>	<b>7</b>
<b>3.0 TENEMENT DETAILS .....</b>	<b>8</b>
<b>4.0 GEOLOGY OVERVIEW .....</b>	<b>9</b>
4.1 Miners Ridge Sequence .....	10
4.2 Mount Read Volcanics .....	10
4.2.1 Central Volcanic complex .....	10
4.2.2 Western Volcano-sedimentary Sequence .....	10
4.2.3 Darwin Granite .....	10
4.2.4 Tyndal Group .....	10
4.3 Owen Group .....	11
4.4 Gordon Limestone .....	11
4.5 Eldon Group .....	11
4.6 Structure .....	11
<b>5.0 WORK COMPLETED .....</b>	<b>12</b>
5.1 Historical Mineral Exploration .....	12
5.1.1 Jukes –Darwin area .....	12
5.1.1.1 Jukes-Darwin mid 1950's-early1970's .....	12
5.1.1.2 Jukes-Darwin Early to Mid 1970's .....	12
5.1.1.3 Jukes-Darwin Mid-Late 1970's .....	13
5.1.1.4 Jukes-Darwin 1980's .....	13
5.1.1.5 Jukes- Darwin Early-Mid 1990's .....	13
5.1.1.6 Jukes-Darwin Mid-Late 1990's .....	13
5.1.1.7 Jukes-Darwin 2002-2007 .....	13
5.1.2 Garfield area .....	13
5.1.2.1 Garfield 1980's .....	13
5.1.2.2 Garfield 1989-1991 .....	13
5.1.2.3 Garfield 1991-1996 .....	13
5.1.2.4 Garfield 2002-2007 .....	14
5.1.3 Mt Huxley-Mt Ellen-Nasty Knob area .....	14
5.1.3.1 Mt Huxley-Mt Ellen-Nasty Knob area Early to mid 1980's .....	14
5.1.3.2 Mt Huxley-Mt Ellen-Nasty Knob area late 1980's-early1990's .....	14
5.1.3.3 Mt Huxley-Mt Ellen-Nasty Knob area mid 1990's .....	14
5.1.3.4 Mt Huxley-Mt Ellen-Nasty Knob area 2002-2007 .....	14
5.2 Work completed by Jaguar Minerals Ltd .....	14
5.2.1 Historical data compilation .....	14
5.2.2 Geochemical program .....	15
5.2.2.1 North Jukes Grid 16 .....	15
5.2.2.2 East Darwin Grid .....	18
5.2.2.3 Rehabilitation .....	21
<b>6.0 EXPENDITURE .....</b>	<b>21</b>
<b>7.0 CONCLUSIONS AND RECOMMENDATIONS .....</b>	<b>21</b>
7.1 North Jukes Grid .....	21
<b>7.2 EAST DARWIN GRID .....</b>	<b>22</b>
<b>8.0 REFERENCES .....</b>	<b>23</b>

## LIST OF FIGURES

Figure 1:	Regional Location Map, Mt Jukes Project	6
Figure 2:	Map of Tenement, Mt Jukes Project	7
Figure 3:	Tenure, Mt Jukes Project	8
Figure 4:	Regional Geology, Mt Jukes	9
Figure 5:	Idealised Cross Section through the Mt Darwin area	11
Figure 6:	North Jukes sample sites and horizons over local interpreted geology	16
Figure 7:	Selected geochemical results with previous geophysics and geochemistry	17
Figure 8:	East Darwin sample sites and horizons over local interpreted geology	19
Figure 9:	Selected geochemical results with previous geochemistry	20

## LIST OF TABLES

Table 1:	MT Jukes Expenditure 2008-2009	21
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## LIST OF APPENDICES

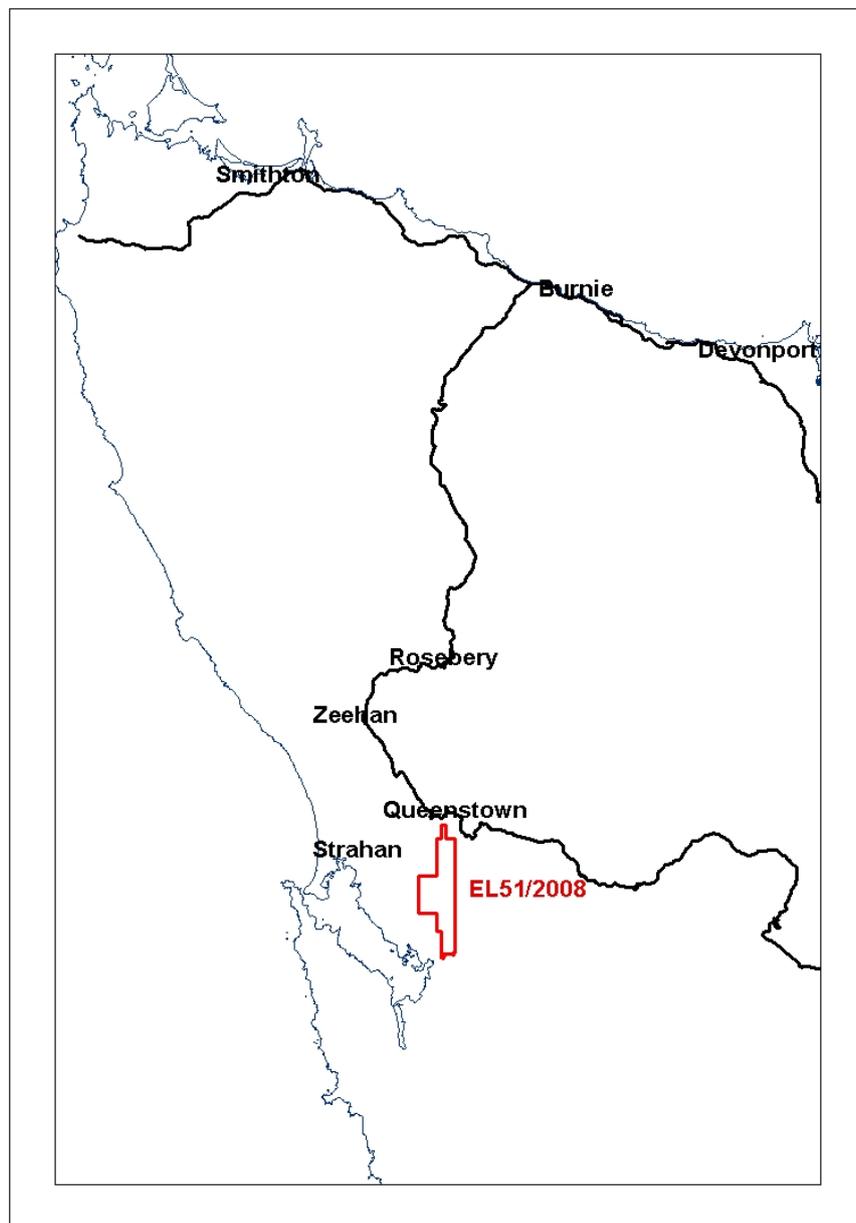
Appendix 1a:	North Jukes Sample Locations and Horizons	27
Appendix 1b:	North Jukes Copper Geochemistry	28
Appendix 1c:	North Jukes Gold Geochemistry	29
Appendix 1d:	North Jukes Silver Geochemistry	30
Appendix 1e:	North Jukes Lead Geochemistry	31
Appendix 1f:	North Jukes Zinc Geochemistry	32
Appendix 1g:	North Jukes Manganese Geochemistry	33
Appendix 1h:	North Jukes Thallium Geochemistry	34
Appendix 2a:	East Darwin Sample Locations and Horizons	36
Appendix 2b:	East Darwin Copper Geochemistry	37
Appendix 2c:	East Darwin Gold Geochemistry	38
Appendix 2d:	East Darwin Silver Geochemistry	39
Appendix 3a:	North Jukes Geochemistry Data	40
Appendix 3b:	East Darwin Geochemistry Data	40

## 1.0 INTRODUCTION

EL51/2008, "Mt Jukes", is located south of Queenstown in north west Tasmania. The tenement is host to 95 recorded mineral occurrences, mostly copper-gold occurrences within the Late Cambrian Mount Read Volcanics (MRV's).

Jaguar Minerals Ltd ("Jaguar", "the Company") are targeting Volcanogenic mineralisation within the MRV's, with copper-gold (Prince Lyell) and gold (Henty style) being the principle targets. Drilling is extremely limited within the tenement considering the amount of recorded mineralisation present.

Work during the reporting period has consisted of compiling historical data, prospect ranking, and two geochemical surveys on high priority prospects. Historical data compilation is an ongoing process.



**Figure 1.** Regional location map, Mt Jukes Project.

## 2.0 LOCATION

EL51/2008 is located 2km south of the Mt Lyell Mining lease, Queenstown, NW Tasmania. The topography is dominated by the West Coast Range, and is steep, rugged, and often wet. Vegetation varies from sparse low scrub to thick forest.

Access into the tenement is by the "Mt Jukes road", a bituminized road developed by HydroTasmania to service the Crotty and Darwin dams, which are located on Lake Burbury (Figure 2). Other tracks occur in the tenement but are generally in a poor state of repair, leaving the majority of the tenement inaccessible by large motor-vehicles.

The John Butters power station is situated 3km east of the Mt Jukes tenement within the applied for Miners Ridge tenement (EL12/2009). Power lines run north from the John Butters power station through the Miners Ridge tenement.

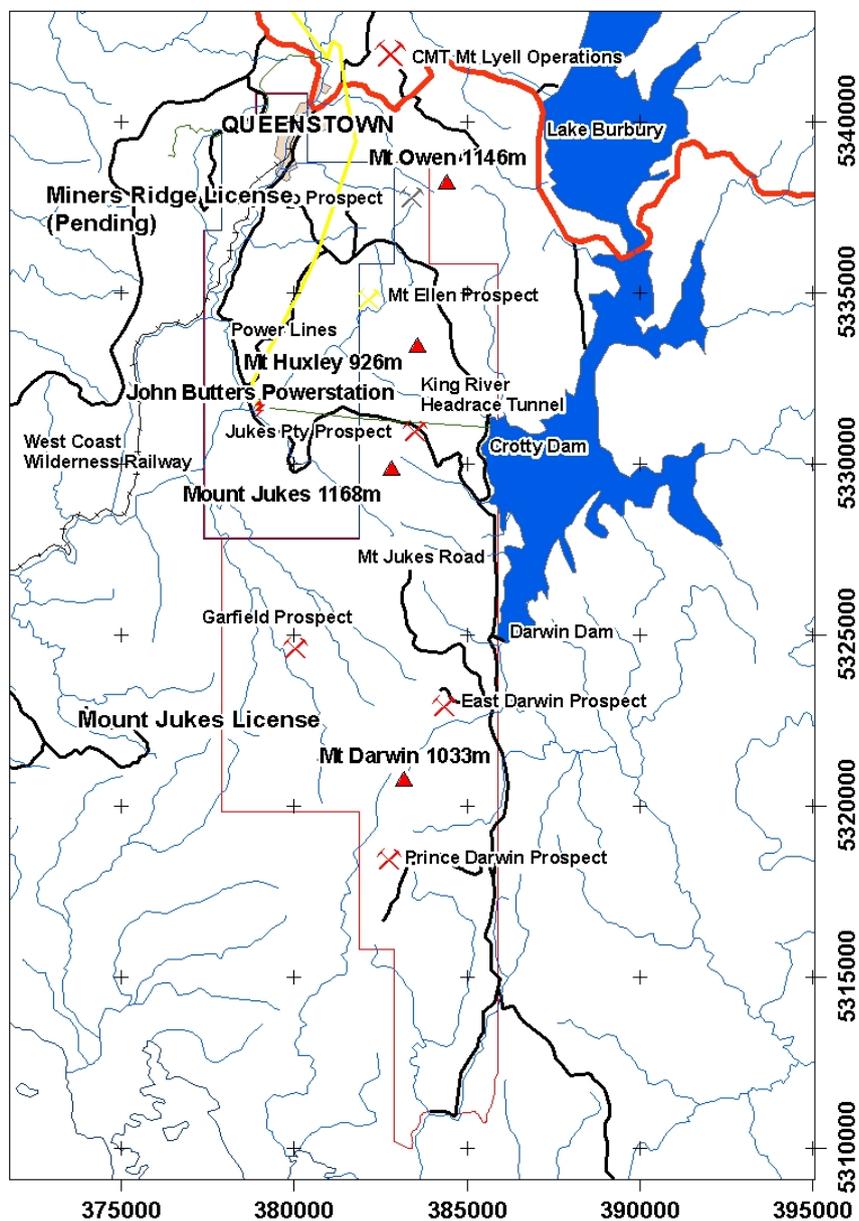


Figure 2. Map of tenement, Mt Jukes

### 3.0 TENEMENT DETAILS

Jaguar applied for the tenement through the ERA process. The tenement was awarded to Jaguar by the Minister for Mines on the 16th of December 2008.

EL51/2008 covers an area of 129.86 Km<sup>2</sup>. Land Tenure is comprised of proposed regional reserve, regional reserve, state forest, informal reserve-state forest and HydroTasmania (HEC) land (Refer Figure 3 below).

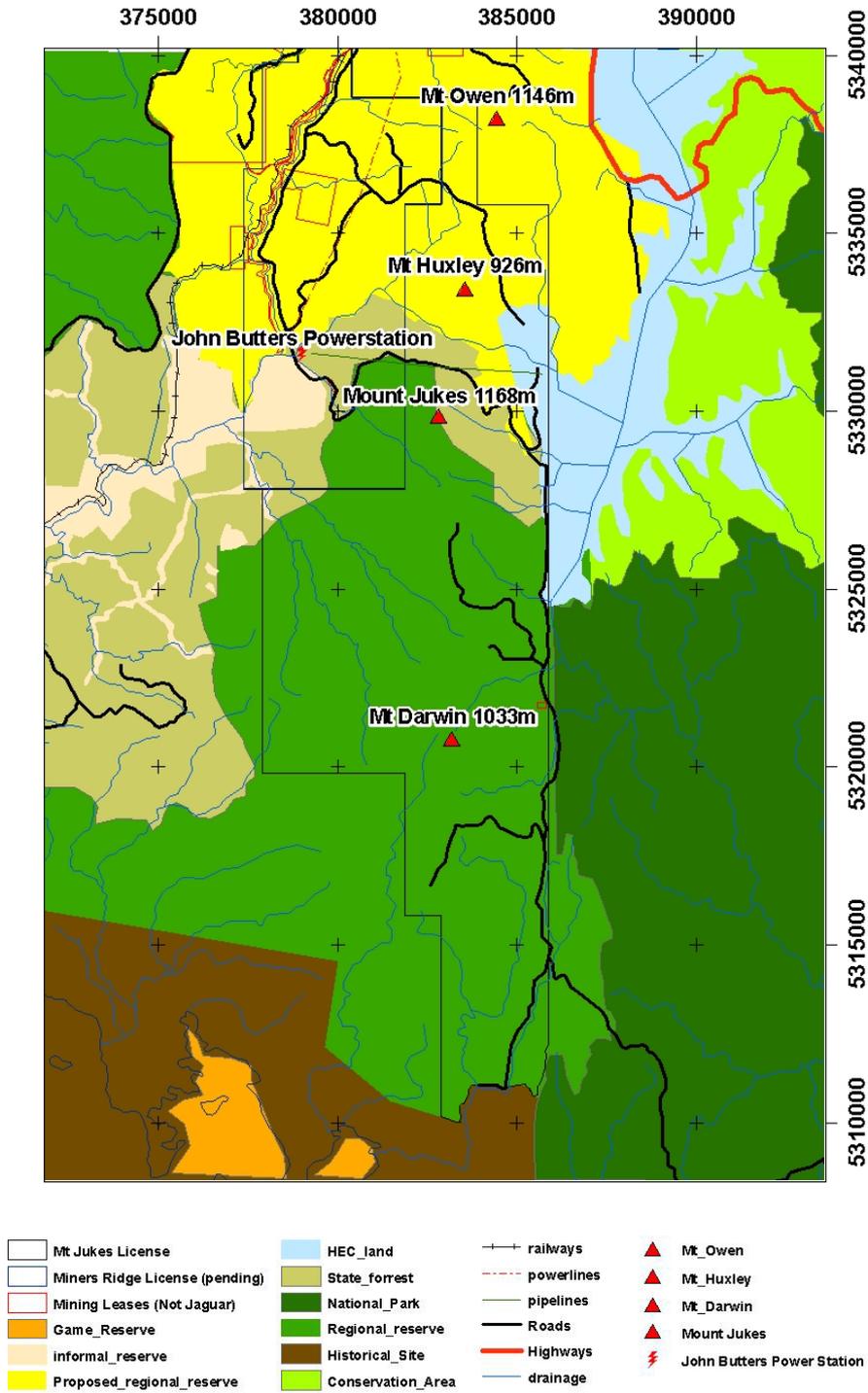


Figure 3. Tenure and land use, Mt Jukes Project

### 4.0 GEOLOGY OVERVIEW

Regionally the license covers the southern part of the Late Cambrian Mt Read Volcanics (MRV's). The MRV's are subdivided into three main units in EL51/2008; the Central volcanic complex (CVC), Western Volcano-sedimentary Sequence (WVS) and the Tyndal group. Late Cambrian–Early Ordovician siliciclastic conglomerates and associated sedimentary rocks belonging to the Owen Group are present within EL51/2008. Small amounts of Ordovician Gordon Limestone and Silurian Eldon Group lithologies occur in the east of the tenement (figure 4). The stratigraphy of the area is illustrated in figure 5 and discussed below.

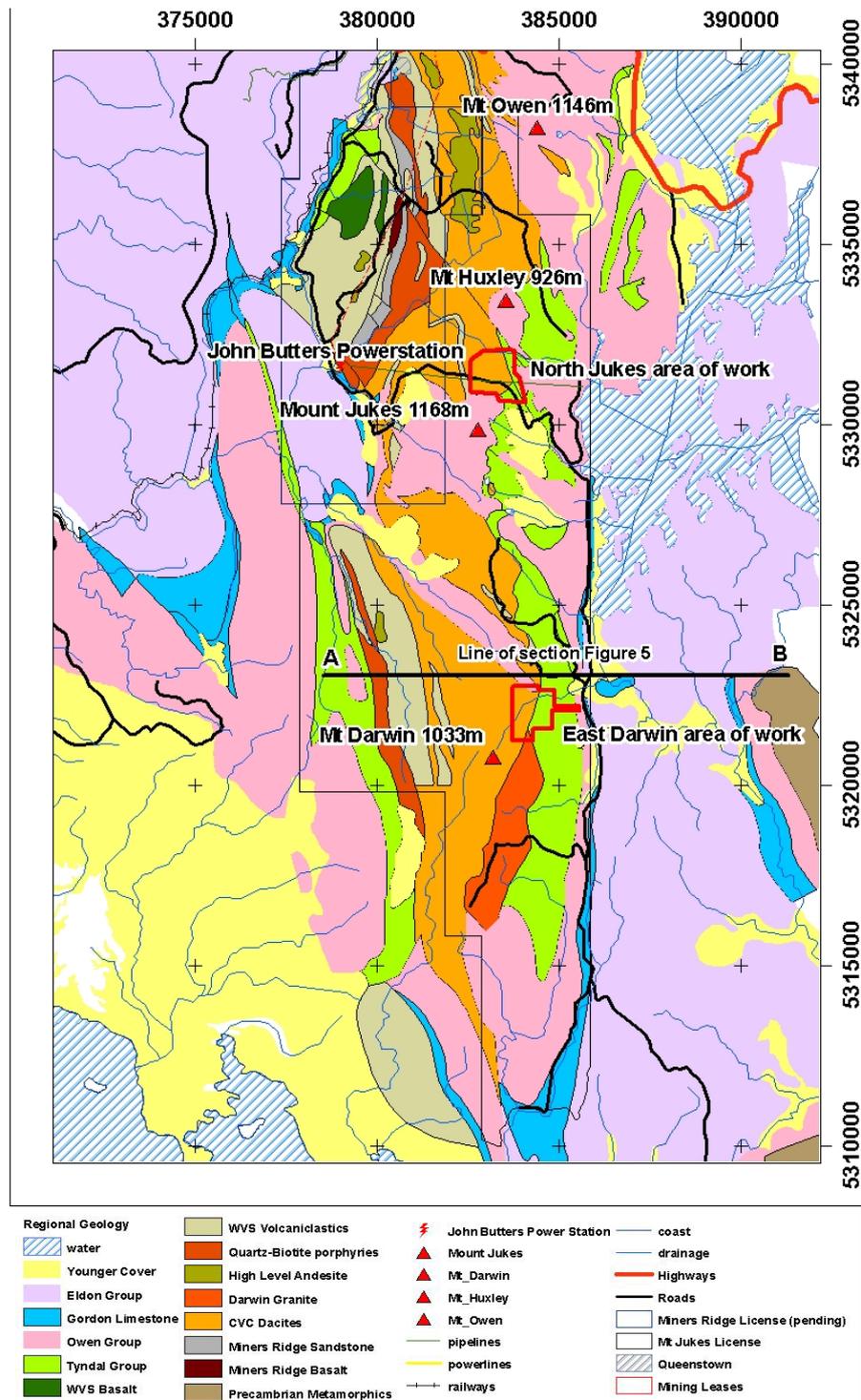


Figure 4. Regional geology, Mt Jukes Project

## **4.1 Miners Ridge Sequence**

The Miners Ridge Sequence is found to the north west of EL51/2008 exposed in the core of the Miners Ridge anticline. These rocks are considered to be basement to the MRV's of probable Late Proterozoic-Early Cambrian age (Corbett, 2002) and are the only such rocks in the area. The basalt has a low TiO<sub>2</sub> signature with depleted REE's consistent with the allochthonous Cleveland-Waratah association (McClenaghan and Findlay, 1993; Seymour and Calver, 1995).

## **4.2 Mount Read Volcanics**

The Mount Read Volcanics are a group of medium to high K, calc-alkaline, post-collisional, felsic-andesitic volcanics (Corbett, 1992; Crawford et al., 1992). U-Pb zircon ages and numerous fossil occurrences constrain the age of the MRV's from early Middle Cambrian to early Late Cambrian (Seymour et al., 2007). In EL51/2008 the MRV's are comprised of three main units; Central Volcanic Complex (CVC), Western Volcano-sedimentary Sequence (WVS) and the Tyndal group.

### **4.2.1 Central Volcanic Complex**

The CVC locally is comprised of a mixture of competent feldspar phyric rhyodacite lavas and synvolcanic intrusives, with minor volcanoclastic units including volcanoclastic breccias and volcanoclastic sandstones. Andesite porphyries, lavas and volcanoclastics are found near the top of the CVC sequence, as are Quartz-Biotite porphyries. The rhyodacite lavas/intrusives often display spherulitic texture. Alteration is variable with K-feldspar+hematite+barite alteration developed in competent rhyodacites near Mt Darwin, strong sericite+pyrite+silica alteration developed in volcanoclastics near East Darwin, and pervasive intense chlorite alteration is seen in road cuttings at the Jukes Pty prospect (This report; Corbett, 1992; Morrison, 2002).

### **4.2.2 Western Volcano-sedimentary Sequence**

The WVS is found in the west of EL51/2008. The unit is typically composed of interbedded tuffaceous mass-flow deposits, turbiditic sandstones (of volcanic provenance), shard-rich tuffaceous mudstone, micaceous siltstone and graphitic black shale (Corbett, 1992). Large proportions of Quartz-Biotite porphyries are present and andesite units occur near the top of this sequence. The andesites are locally an important mineralisation host (e.g. Garfield andesite, 12Mt @ 0.3% Cu (Seymour et al., 2007)), and has parallels with Prince Lyell mineralisation (Halley, 1996).

### **4.2.3 Darwin Granite**

The Darwin Granite intrudes the eastern flank of the CVC's and is composed of two main phases; a pink granite phase and a white granite phase, and two minor phases; microgranite (sometimes graphic (Morrison, 2002)) and quartz porphyry. The granite is a highly fractionated phanerocrystalline I-Type magnetite series equigranular granite (Crawford et al., 1992), and has been dated to 510 +64, -21Ma (Adams et al., 1985). Aeromagnetic data suggests the Darwin Granite underlies the whole northerly trending belt from Mt Darwin to Mt Jukes (Leaman and Richardson, 1989) and this is coincident with the dominant k-feldspar-sericite-chlorite alteration (Wyman, 2001) throughout the area

### **4.2.4 Tyndal Group**

The Tyndal group unconformably overlies CVC group rocks in the East of the tenement. The rocks are typically quartz bearing, and contain a basal conglomerate, locally containing clasts of Darwin Granite at East Darwin. This may indicate a period of uplift in the early Late Cambrian prior to deposition of the Tyndal group (Morrison, 2002)) to polymict lithic volcanoclastic sandstone (Wyman, 2001).

### 4.3 Owen Group

The Owen Group is a Cambro-Ordovician unit composed of a series of coarse quartzite pebble conglomerates of Precambrian metamorphic provenance (east of the Mt Jukes Project), sandstones and siltstones. The unit rests unconformably on Tyndal Group rocks in the South Darwin Peak area, and also rest unconformably on CVC rocks further to the west (Corbett, 1976).

### 4.4 Gordon Limestone

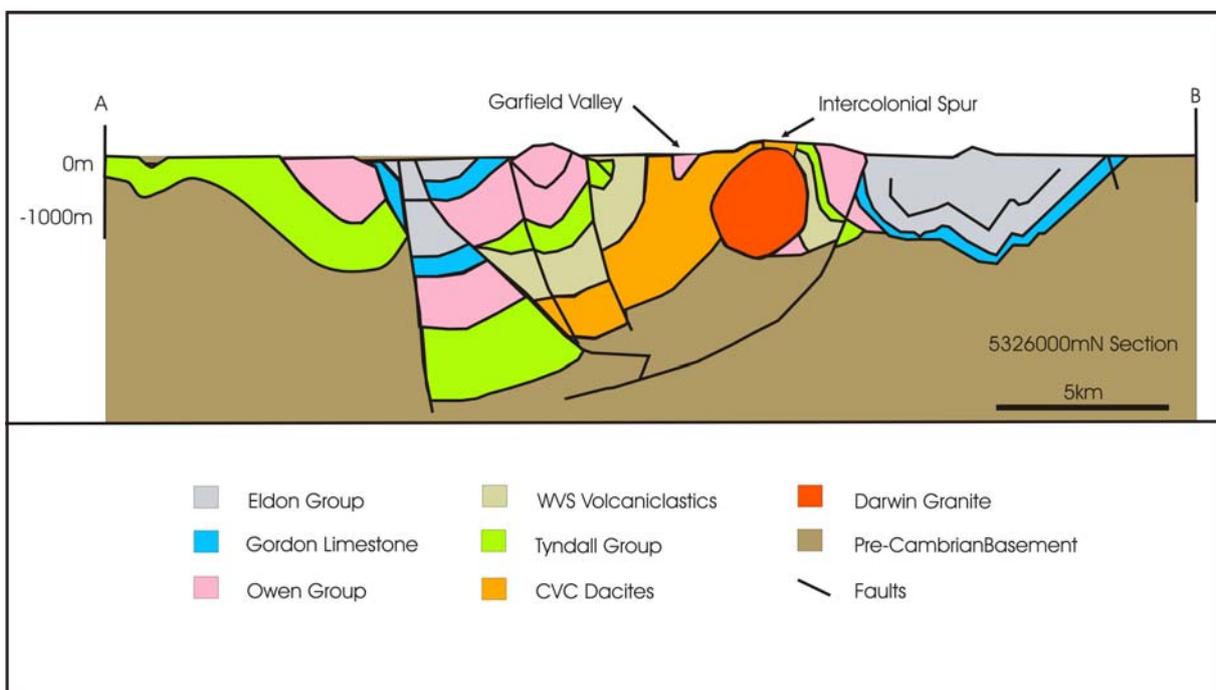
The Ordovician Gordon Group above the Pioneer Sandstone is a shallow-marine to peritidal, platform succession of predominately micritic, dolomitic limestone. The Gordon Group carbonate sequence is an important ore host for skarn mineralisation associated with intrusion of Late Devonian–Early Carboniferous granitoids (Seymour *et. al.*, 2007). It is also locally quarried for road building.

### 4.5 Eldon Group

The Silurian Eldon Group is locally disconformable and erosional on the Gordon Group. The lower part of the succession is dominated by shallow-marine quartz sandstone (Crotty and Florence Formations); the upper succession is dominated by a thick, shelf-facies shale unit with minor limestone identified locally as the Bell Shale and correlates (Seymour *et. al.*, 2007).

### 4.6 Structure

Several important structural relationships exist in the Mt Jukes area. Morrison (2002) interpreted the Great Lyell Fault (GLF) to be extending down southwards through the tenement. The GLF is an important mineralising structure in the Mt Lyell field. North west trending faults transect the tenement as indicated by magnetic images and geological relationships. These are interpreted by the author to be synvolcanic



**Figure 5.** Idealised cross section through the Mt Darwin area. Modified after Berry and Keele (1993).

extensional faults, and potentially mineralizing.

Evidence for at least two phases of deformation are apparent on the tenement. The earliest phase is interpreted from the erosional unconformity present at the CVC-Tyndal boundary, where the Tyndal Group is composed of a basal conglomerate containing CVC clasts with a well deformed penetrative cleavage (Wyman, 2001), taken as evidence for deformation prior to uplift and erosion. This corresponds to the Delamerian Orogeny, (510-490 Ma, Berry, 1995), and the intrusion of the Darwin Granite (after CVC deposition and before or simultaneous with Tyndal deposition), and north-south compression (Solomon, 1981; Jones, 1993). Reactivation of earlier extensional faults as reverse faults accompanied the inversions.

The Middle Devonian Tabberabberan Orogeny tightened existing Cambrian folds with an overall development of north-south trending folds. North west trending folds are evident in the Owen Group in the Mt Jukes area. This is considered by Berry (1995) to be due to fold propagation in the competent Owen Group along pre-existing (Cambrian structures).

## **5.0 WORK COMPLETED**

The Mt Jukes area has seen several generations of prospecting and mineral exploration extending back to the late 1890's. A brief summary of historical work is presented below with relevant key references included.

### **5.1 Historical mineral exploration**

The first prospecting license in the Mt Jukes area was pegged in 1897 over what is now known as the Jukes Pty. This caused a flood of prospecting in the area and several other leases were taken up in 1897 (Twelvetrees, 1900; Hills, 1914). The area was serviced by the town of Crotty (now under Lake Burbury) and prospecting suffered a set back in 1903 when the Crotty smelters were shut down (Blainey, 2000) and the town was abandoned. The area was difficult to access and prospecting all but ceased after this.

Modern exploration in this ERA started in the 1950's following the lead of historic prospectors.

Previous mineral exploration is presented below, grouped by three main areas for simplicity.

#### **5.1.1 The Jukes-Darwin area**

##### **5.1.1.1 Jukes-Darwin mid 1950's-early1970's**

A few companies held the tenement area during this period. Mt Lyell Mining and Railway (MLMR) joined with Electrolytic Zinc Australasia (EZ) to form Lyell E Z Explorations (LEE). LEE (Hudspeth and Scott, 1959), United States Metals Refining Company (USMRF) (Gilfilian, 1967) and BHP (Corbett and Cuffley, 1970) conducted mapping, took rock samples from old workings, soil samples, and conducted aeromagnetics and airborne EM. Two holes in the Lake jukes area were drilled with no desirable results. BHP drilled one hole at Prince Darwin with poor results (records were unattainable for drilling).

##### **5.1.1.2 Jukes-Darwin Early to Mid 1970's**

BHP joint ventured with International Nickel Australia Limited (INAL) (Ruddock, 1974) conducting IP surveys targeting two areas for drilling; East Darwin having three holes drilled under the existing workings reporting no increase of grade with depth, and Jukes proprietary having one hole reporting similar results, warranting no further investigation

by INAL.

#### **5.1.1.3 Jukes-Darwin Mid-Late 1970's**

EZ (Williams, 1975) took up the ground again and conducted mapping and geochemistry. Extensive regional mapping was proposed, but the tenement changed hands to MLMR (Hutton and Wilson, 1978) before this was completed.

#### **5.1.1.4 Jukes-Darwin 1980's**

Jukes Proprietary was identified as a drilling target for MLMR and four holes were drilled under the old workings. The best result was 13.4m @ 1.6% Cu and 1.6g/t Au (Hutton et. al., 1982). Meanwhile EZ conducted a gold specific geochemistry sampling program over the Southern Darwin area (Gardner, 1988).

#### **5.1.1.5 Jukes- Darwin Early-Mid 1990's**

Jukes Proprietary was evaluated by RGC (Halley et al., 1996). A drill hole was recommended in the northern end of the prospect, but this never went ahead. Geochemical sampling along a new road crossing in the Jukes proprietary area demonstrated a broad zone of anomalous copper-gold.

#### **5.1.1.6 Jukes-Darwin Mid-Late 1990's**

CMT acquired the ground in 1998 but became insolvent, no work was done on the area by CMT (Godsall, 2001).

#### **5.1.1.7 Jukes-Darwin 2002-2007**

Newcrest Mining held the tenement lease and conducted stream sediment samples, rock chip samples, CSAMT surveys, and follow up drill holes over the Jukes Darwin area testing the concept that Tyndall group rocks east of the CVC may be covering mineralization. Only two weak anomalies were identified; at Lake Jukes and the other South of East Darwin. NCT001 drilled on the Lake Jukes CSAMT anomaly intersected no geochemical anomalism. NCT002 which tested the CSAMT anomaly near East Darwin intersected a zone of resedimented massive sulphide fragmentals. Soil Geochemistry at East Darwin revealed a Au-Cu-As anomaly, it was proposed by Kitto(2007) to follow this up with either ground EM or subsequent drilling, but no further fieldwork was carried out leaving this target untested.

### **5.1.2 Garfield area**

The Garfield area wasn't considered for exploration until the 1980's, possibly due to the inaccessibility of the area.

#### **5.1.2.1 Garfield 1980's**

Goldfields commenced mapping and geochemical sampling in the area during the early 1980's which led to the drilling of two holes at Snake Spur. The results of these holes were deemed to be disappointing by Goldfields and no further work was conducted (Fitzgerald and Cartwright, 1986).

#### **5.1.2.2 Garfield 1989-1991**

BHP obtained the ground and conducted a UTEM survey targeting and drilling a conductor which turned out to be non mineralised (Cameron and Read, 1991).

#### **5.1.2.3 Garfield 1991-1996**

BHP joint ventured with Goldfields and conducted further mapping and geochemistry sampling. This second phase of mapping/geochemistry in the area, lead to the discovery of the Garfield Prospect, which is a sub-economic body of Prince Lyell (Disseminated Copper) type mineralization. Goldfields drilled 12 holes over this body (Halley et al., 1996).

#### **5.1.2.4 Garfield 2002-2007**

Newcrest Mining completed 3.9km's of CSAMT surveys over the Garfield prospect with disappointing results delineating only a shallow conductive body over previously identified mineralization. Also the CSAMT survey failed to identify the main mineralization zone intersected in RGC's GAR002 hole. One hole was completed by Newcrest over the Garfield prospect which failed to determine the 200m wide anomaly observed at the surface, and held poor mineralization (Kitto, 2007).

#### **5.1.3 Mt Huxley-Mt Ellen-Nasty Knob area.**

##### **5.1.3.1 Mt Huxley-Mt Ellen-Nasty Knob area Early to mid 1980's**

An IP anomaly identified by Goldfields was drilled in the mid 80's, which intersected weak Zinc-Lead mineralization. Significant alteration was noted in the area by Goldfields (Fitzgerald and Cartwright, 1986).

##### **5.1.3.2 Mt Huxley-Mt Ellen-Nasty Knob area late 1980's-early1990's**

BHP conducted UTEM surveys of the area with poor results and sampled old workings (Cameron and Read, 1991).

##### **5.1.3.3 Mt Huxley-Mt Ellen-Nasty Knob area mid 1990's**

RGC reported an alteration zone on Mountain Maid with weakly anomalous Gold (Halley et al., 1996).

##### **5.1.3.4 Mt Huxley-Mt Ellen-Nasty Knob area 2002-2007**

Newcrest Mining conducted reconnaissance geological mapping at Mountain Maid, Nasty Knob and Mt Ellen reporting encouraging evidence of mineralization in the form of stratabound Mn-Fe oxides over a minimum strike length of 400m. 3 holes were drilled over this area. NCT003 returned modest intervals of Zn-Pb mineralization including 24m @ 0.55% Zn & 0.37% Pb. NCT005 returned low grade gold mineralization associated with magnetite destruction: 43m @0.23 g/t Au (Kitto et al., 2007)

#### **5.2 Work Completed by Jaguar Minerals Ltd**

During the reporting period Jaguar has compiled and converted historical data into a workable GIS format with the aim of generating targets on both a prospect by prospect basis and a regional basis. Results of this are a ranking of prospects and the geochemical sampling and geological mapping of two grids which were close to infrastructure (this was considered a necessity in winter months); North Jukes and East Darwin.

##### **5.2.1 Historical data compilation**

Time was spent compiling historical data available online from the MRT website (<http://www.mrt.tas.gov.au>), digitizing the data into a GIS format, and interpreting the data resulting in a ranked series of prospects.

The ranking of previous prospects (95 are present on the tenement) has resulted in 5 key prospects based on Jaguars exploration philosophy and the tenor and amount of previous exploration completed. The key prospects are; Mt Ellen (Gold), Mt Huxley-Nasty Nob (Base Metals), Jukes Pty /North Jukes (Copper-Gold), East Darwin (Copper-Gold), Prince Darwin (Copper-Gold).

##### **5.2.2 Geochemical program**

The North Jukes and East Darwin grids were set up to extend/infill previous geochemical grids from past workers. The field work was conducted from August-October. As a result it was deemed necessary to conduct safe fieldwork near existing infrastructure (i.e. good roads). The Sampling program is discussed below. Figure 4 illustrates the

locations of the North Jukes Grid and the East Darwin Grid.

#### **5.2.2.1 North Jukes Grid**

A total of 124 mixed c-horizon and rock chip samples were taken on 50m sample spacings and 200m line spacings over a 6.9 km grid (including base lines), and assayed for Cu, Pb, Zn, Ba, Cr, Fe, Mo, Ni, S, As, Sn, W, K, Ca, Mn, Mg, Co (by Optical Emission Spectrometry, Genalysis code A/OES), and Au, Ag, Tl, Sb (by Mass Spectrometry, Genalysis code B/MS). Samples were dispatched by Tasfreight to Genalysis laboratories Adelaide via Sergeants of Burnie on the 8<sup>th</sup> August 2009, and results were returned by Genalysis on the 8<sup>th</sup> of September 2009.

Rogers Exploration Services (RES) collected 53 rockchips, 64 satisfactory B or C horizon soil samples and 9 A horizon soil samples (Figure 6). The A horizon soil samples may be extremely leached of elements, but may also be contaminated from upslope soils or debris.

The geochemical grid was designed to extend known geochemical anomalism (from the 1982 MLMR grid), north in the CVC's, and test the Tyndal group which lies south of the original grid. The sampling did not further extend known Cu-Au mineralisation. However; two unrelated Pb-Zn-Ag anomalies (somewhat associated with Mn and Tl also) were delineated in the north and south of the grid (refer to Figure 7 for North Jukes geochemistry figures, Appendix 3 a for North Jukes geochemistry data) .

Rogers Exploration Services (RES) cut and sampled the North Jukes Grid. Lines were cut to one person width with a chainsaw. Samples were taken with a hand auger, or rock hammer where applicable.

### **Geology**

The North Jukes grid and surrounding areas were mapped as part of the program. The bulk of the geology is composed of feldspar phyric dacites and associated autoclastic breccias belonging to the CVC (figure 6 below). Tyndal group quartz-rich volcaniclastic sandstones are found in faulted contact with the CVC's in the east of the grid area. Owen group rocks occur unconformably overlying the Tyndal group rocks and faulted (?) against CVC rocks in the area. Quartz porphyries pervade the CVC dacites. Strong pottassic and chloritic alteration dominates the CVC's in the east of the grid, with magnetite breccias associated with the strongest pottassic alteration. Alteration is consistent with a mineralising intrusive at depth. Wyman (2001) postulates the intrusive is the Darwin Granite.

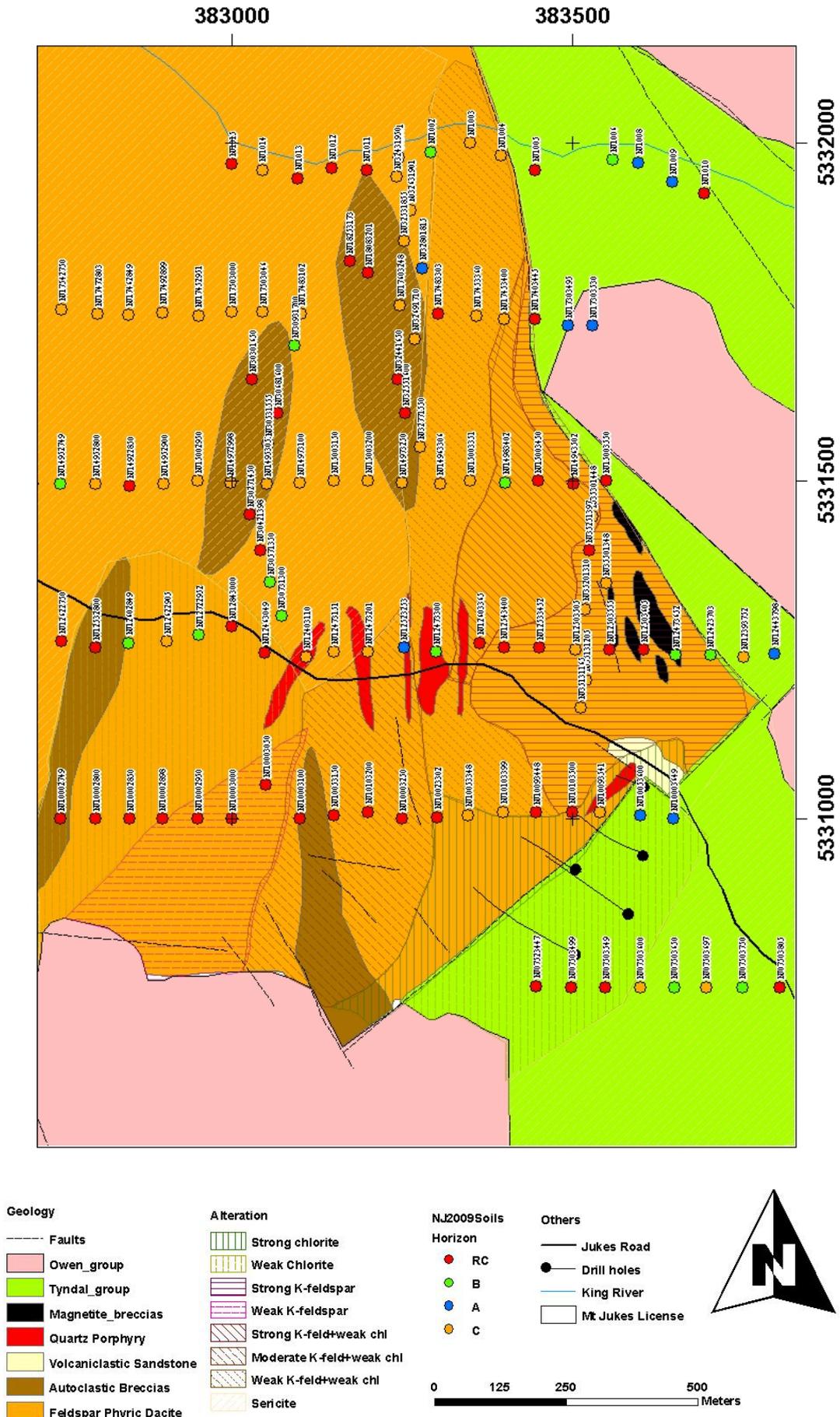


Figure 6. North Jukes sample sites and horizons over local interpreted geology.

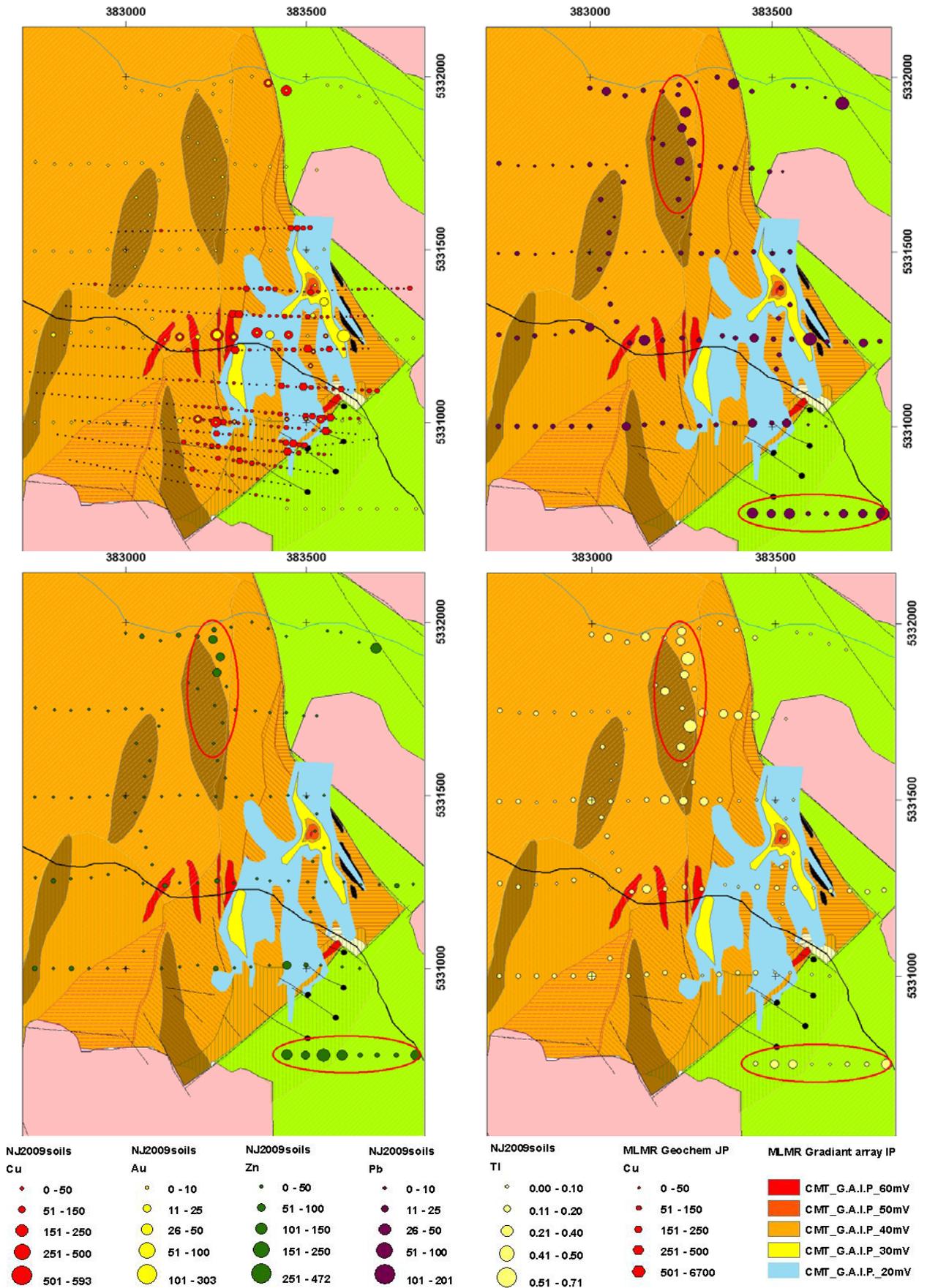


Figure 7. Selected geochemical results with previous geophysics and geochemistry (MLMR).

### 5.2.2.2 East Darwin Grid

A total of 166 mixed c-horizon and rock chip samples were taken on 50m sample spacings and (roughly) 150-200m line spacings over a 10.8km grid and assayed for Cu, Pb, Zn, Ba, Cr, Fe, Mo, Ni, S, As, Sn, W, K, Ca, Mn, Mg, Co (by Optical Emission Spectrometry, Genalysis code A/OES), and Au, Ag, Tl, Sb (by Mass Spectrometry, Genalysis code B/MS).

Samples were dispatched by Tasfreight to Genalysis laboratories Adelaide via Sergeants of Burnie on the 22<sup>nd</sup> September 2009, and results were returned by Genalysis on the 20<sup>th</sup> of October 2009.

RES took 59 rock chips, 94 acceptable B or C horizon samples and 4 A horizon samples (Figure 8).

The East Darwin grid was designed to extend and infill a previous Newcrest grid which was cut and sampled in 2005. The topography is steep and the vegetation thick until the plateau is reached.

The geochemical survey delineated a narrow 1.5km Cu-Au-Ag anomaly trending roughly NE, which is possibly structurally controlled. There is a much higher tenor of Cu-Au mineralisation than the previous Newcrest survey, with maximum Au value 285ppm (maximum Newcrest gold value was 68ppm), and maximum Cu value 3466ppm (maximum Newcrest Cu value 330ppm). Refer to Figure 9 for East Darwin geochemical plans and Appendix 3 b for East Darwin geochemical data.

RES cut and sampled the North Jukes Grid. Lines were cut to one person width with a chainsaw. Samples were taken with a hand auger, or rock hammer where applicable.

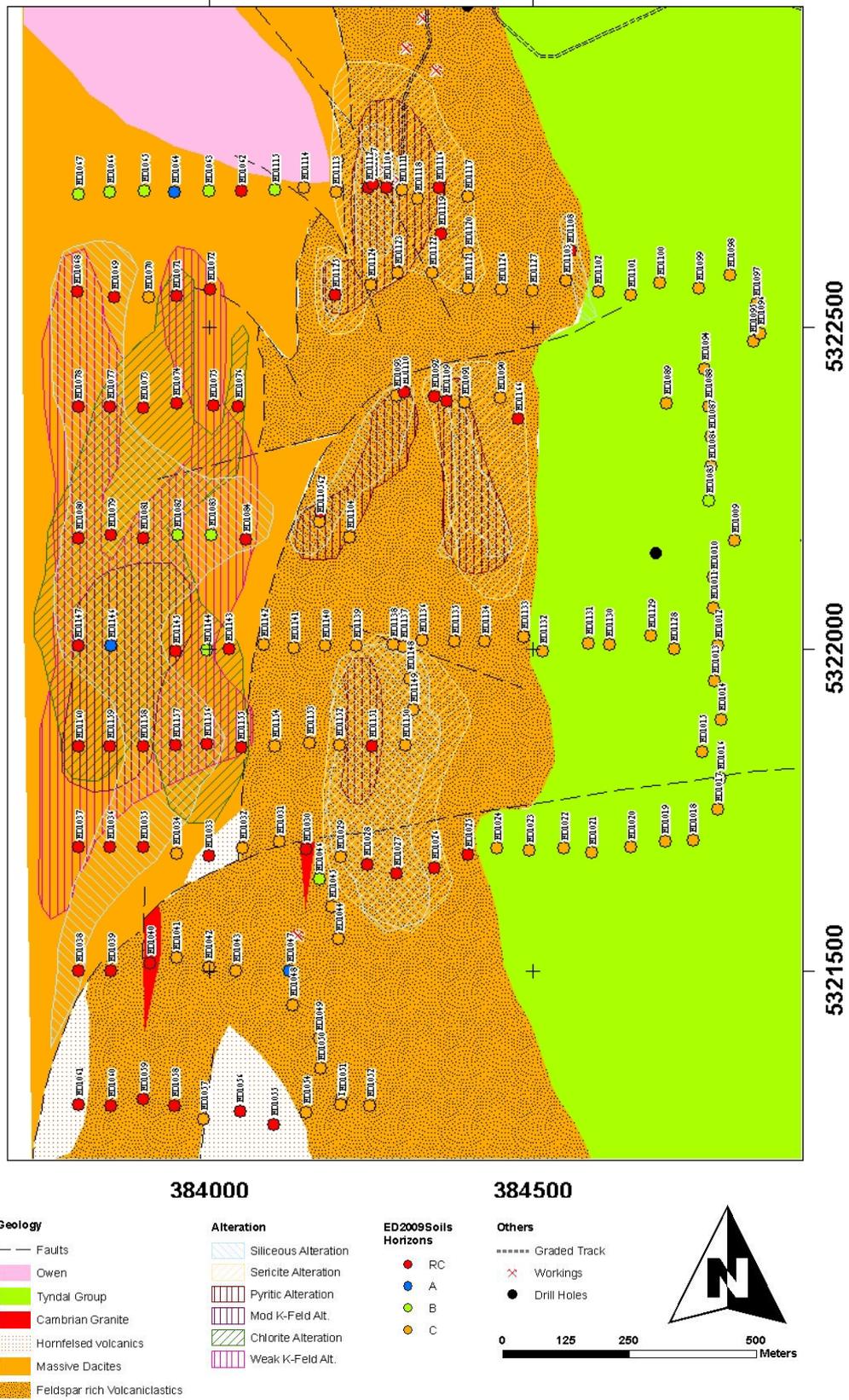
The A horizon samples should be treated with caution due to severe near surface leaching and the possibility of contamination from upslope material.

Gaps in the sample lines are due to a large series of vertical ravines, gullies and cliffs in the Tunnel Cirque area. This has potentially left out important areas from sampling, access could possibly be attained from walking up Allans Creek which runs through this steep section.

## Geology

Figure 8 illustrates the interpreted geology along with the distribution of sample horizons

The geology is comprised of massive spherulitic feldspar phyric dacite lavas and intrusives (CVC group) which dominate the plateau. A mixed sequence of feldspar phyric volcanoclastic breccias and sandstones with minor lavas are in faulted contact with the CVC dacites and comprise the eastern slopes of the Mt Darwin range. Quartz phyric volcanoclastic sandstones belonging to the Tyndal Group unconformably overly the feldspar phyric volcanoclastics and dacites. The massive spherulitic dacites are variably altered by silica+k-feldspar+hematite+chlorite+barite. The feldspar rich volcanoclastic sequence is variably altered by silica+sericite+pyrite+chlorite. The alteration is lensoidal and conformable with stratigraphy. The quartz rich volcanoclastics are mostly affected by sericitic alteration which is probably a regional feature.



**Figure 8.** East Darwin sample sites and horizons over local interpreted geology.

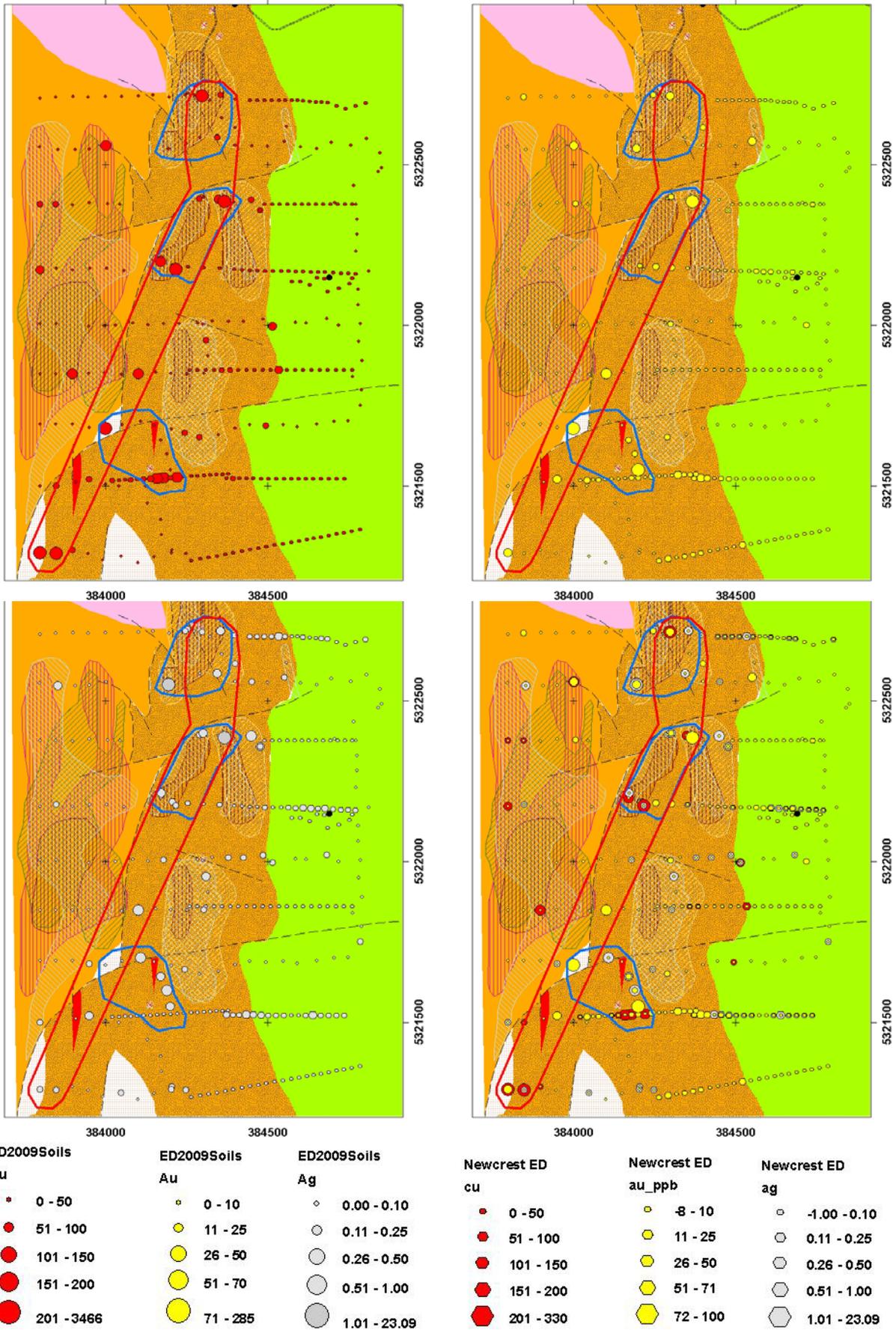


Figure 9. Selected geochemical results with previous geochemistry (Newcrest).

### 5.2.2.3 Rehabilitation

A total of 17.7 km of access was cut during the reporting period. Access was cut using a chainsaw to a maximum width of 1m. Large trees were avoided. Flagging was removed. A total of 290 mixed soil and rock chips were taken during the reporting period using a hand auger or rock hammer where necessary. Augured samples were backfilled. All rubbish was removed from the grids.

## 6.0 EXPENDITURE

**Table 1.** Mt Jukes expenditure 2008-2009

Description	Expenditure
Salaries, wages and oncosts, contractors.	43,478
Geological	21,858
Geochemical studies, rock chip assays, Ground geophysics	65,345
Hire Vehicles, Fuel & Oil	5,987
Travel & Accommodation	11,705
Field stores/Camp Consumables	1,845
Telephone, Postage & Radio	993
Freight	409
Storage Costs	84
Maps Books Publications & Aerial Photo's	1,497
Stationary, Computer Supplies & Studies	3,154
Training Courses & Conferences	133
<b>Total</b>	<b>\$156,488</b>

## 7.0 CONCLUSIONS AND RECOMMENDATIONS.

Results from the two geochemical sampling programs will be discussed separately.

### 7.1 North Jukes grid

The North Jukes 2009 geochemical sampling program by Jaguar revealed two zones of anomalous base metal enrichment.

- The northern zone of base metal anomalism has a Pb-Zn-Ag-Tl-Mn association, and is mapped as being in CVC volcanics and volcaniclastics.
- The southern zone of base metal anomalism has a Pb-Zn-Ag-Tl association, and is mapped as being in Tyndal group quartz rich volcaniclastics.
- In addition, the North Jukes grid contains untested geochemical (Cu-Au) and geophysical (I.P) anomalies from previous explorers (Hutton et al., 1982) (refer to Figure 7).

## 7.2 East Darwin Grid

The East Darwin 2009 geochemical sampling program has revealed a narrow 1.5km Cu-Au-Ag anomaly that is possibly controlled by the faulted contact between CVC dacites and feldspar rich volcanoclastics. In addition to this, three areas of Cu-Au-Ag anomalism occur in association with the larger narrow anomaly (figure 9).

Newcrest intersected re-sedimented VHMS clasts in the drill hole NCT002 (Tedder and Morrison, 2005). The re-sedimented clasts were hosted by a volcanoclastic unit, possibly Tyndal group, and the presence of these clasts and extensive stratiform sericite-silica-pyrite-chlorite alteration in feldspar phyrlic volcanoclastics and associated Cu-Au-Ag anomalism warrants follow up exploration.

Prospect generation studies will continue within EL51/2008. Data compilation and field checking is ongoing from the voluminous database. High priority prospects identified at Mt Ellen, Mt Huxley-Nasty Nob and Prince Darwin require further fieldwork including mapping, sampling and geophysics before drill targeting can begin.

Modern deep penetrating regional geophysical surveys such as Versatile Transient Electromagnetics are also being considered over the MRV sequence. The applicability of Airborne Electromagnetics to the style of mineralisation expected in the tenement is also being considered.

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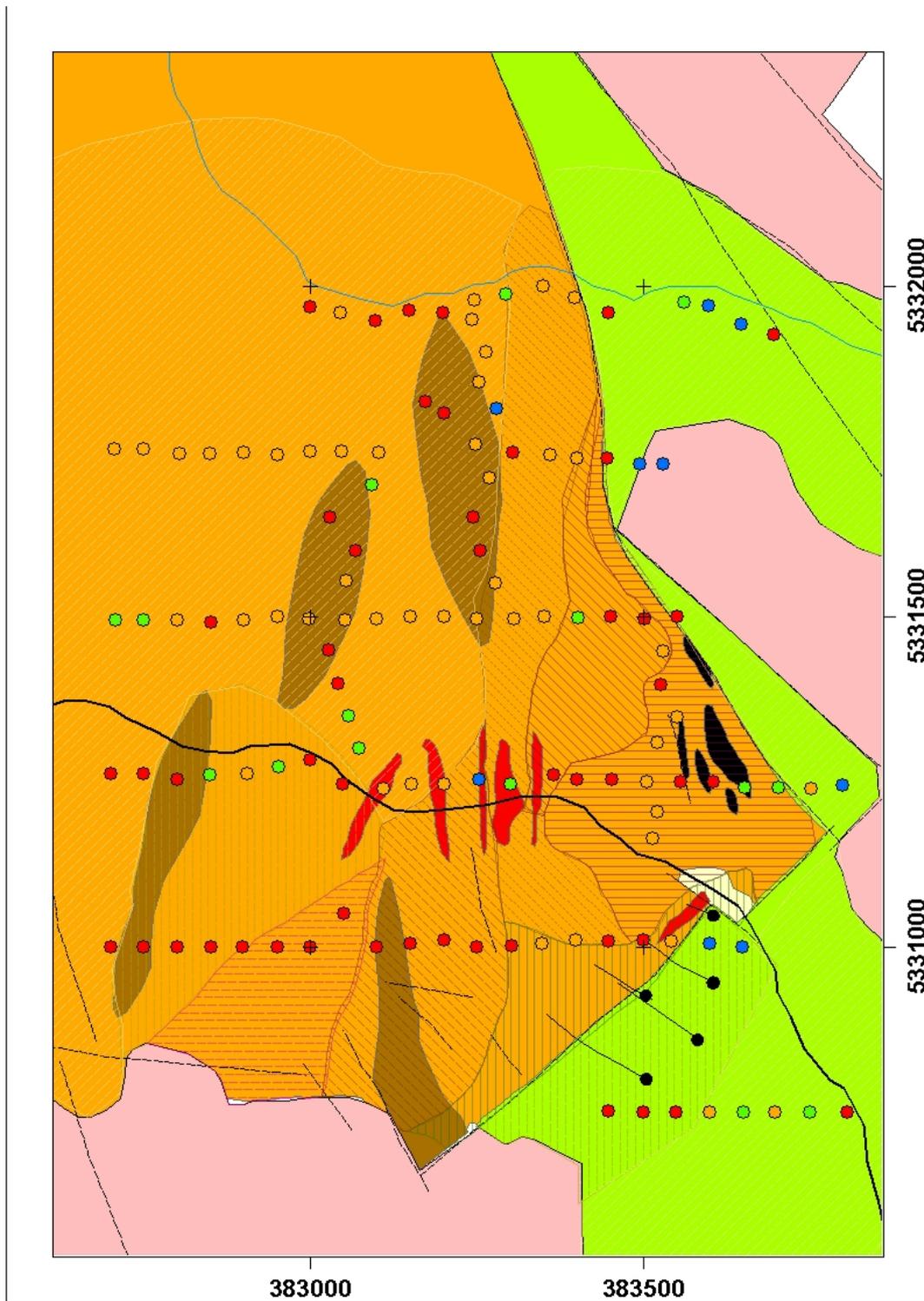
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# **Appendix 1: North Jukes Geochemistry**

# Appendix 1 A: Sample locations and Horizons



**Geology**

- Faults
- █ Owen\_group
- █ Tyndal\_group
- █ Magnetite\_breccias
- █ Quartz Porphyry
- █ Volcaniclastic Sandstone
- █ Autoclastic Breccias
- █ Feldspar Phyric Dacite

**Alteration**

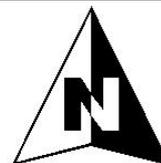
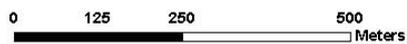
- █ Strong chlorite
- █ Weak Chlorite
- █ Strong K-feldspar
- █ Weak K-feldspar
- █ Strong K-feld+weak chl
- █ Moderate K-feld+weak chl
- █ Weak K-feld+weak chl
- █ Sericite

**NJ2009Soils**

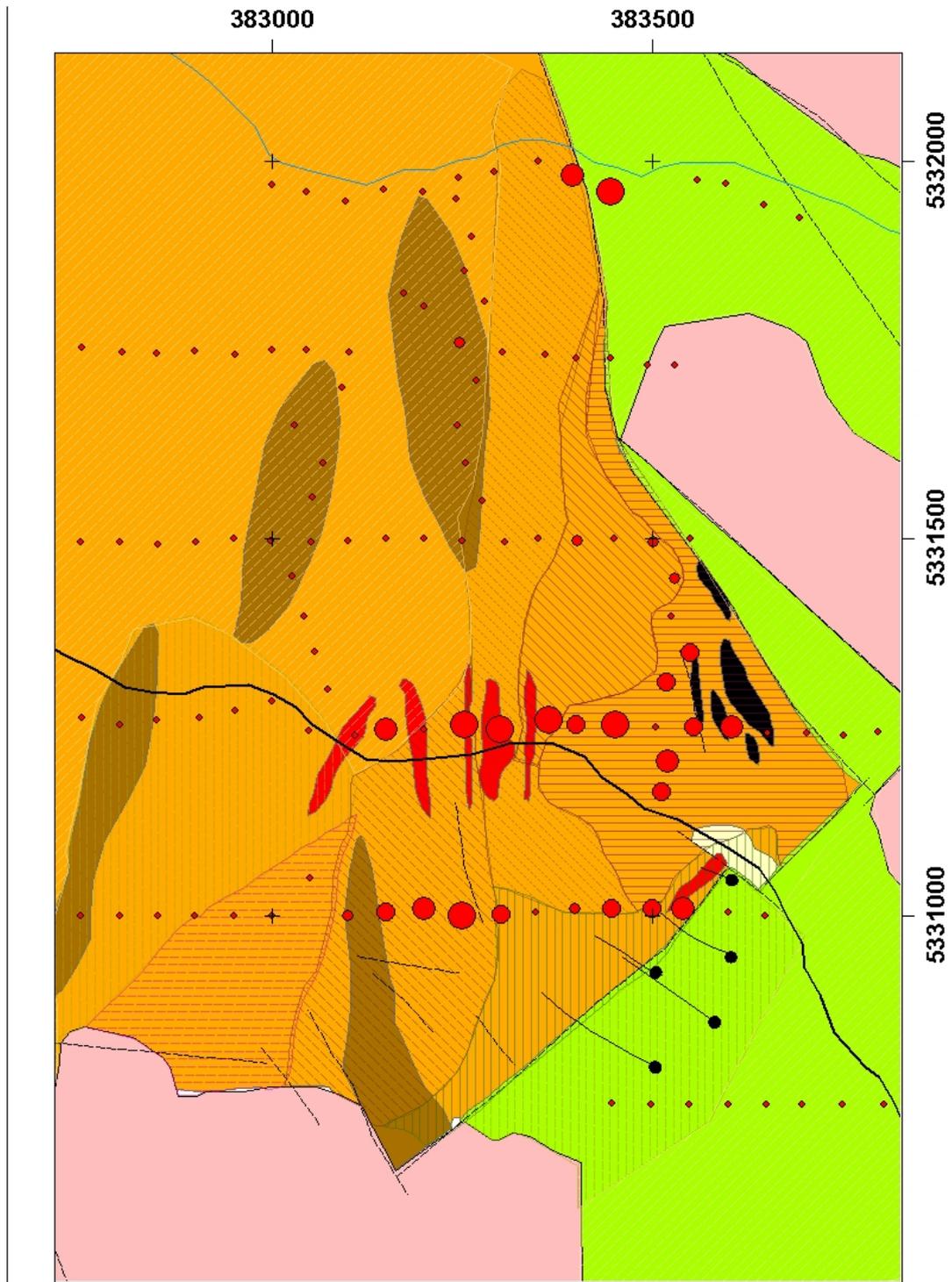
- Horizon**
- RC
  - B
  - A
  - C

**Others**

- Jukes Road
- Drill holes
- King River
- Mt Jukes License



# Appendix 1 B: Copper Geochemistry



**Geology**

- Faults
- Owen\_group
- Tyndal\_group
- Magnetite\_breccias
- Quartz Porphyry
- Volcaniclastic Sandstone
- Autoclastic Breccias
- Feldspar Phyric Dacite

**Alteration**

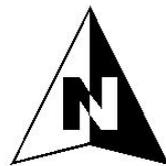
- Strong chlorite
- Weak Chlorite
- Strong K-feldspar
- Weak K-feldspar
- Strong K-feld+weak chl
- Moderate K-feld+weak chl
- Weak K-feld+weak chl
- Sericite

**NJ2009soils**

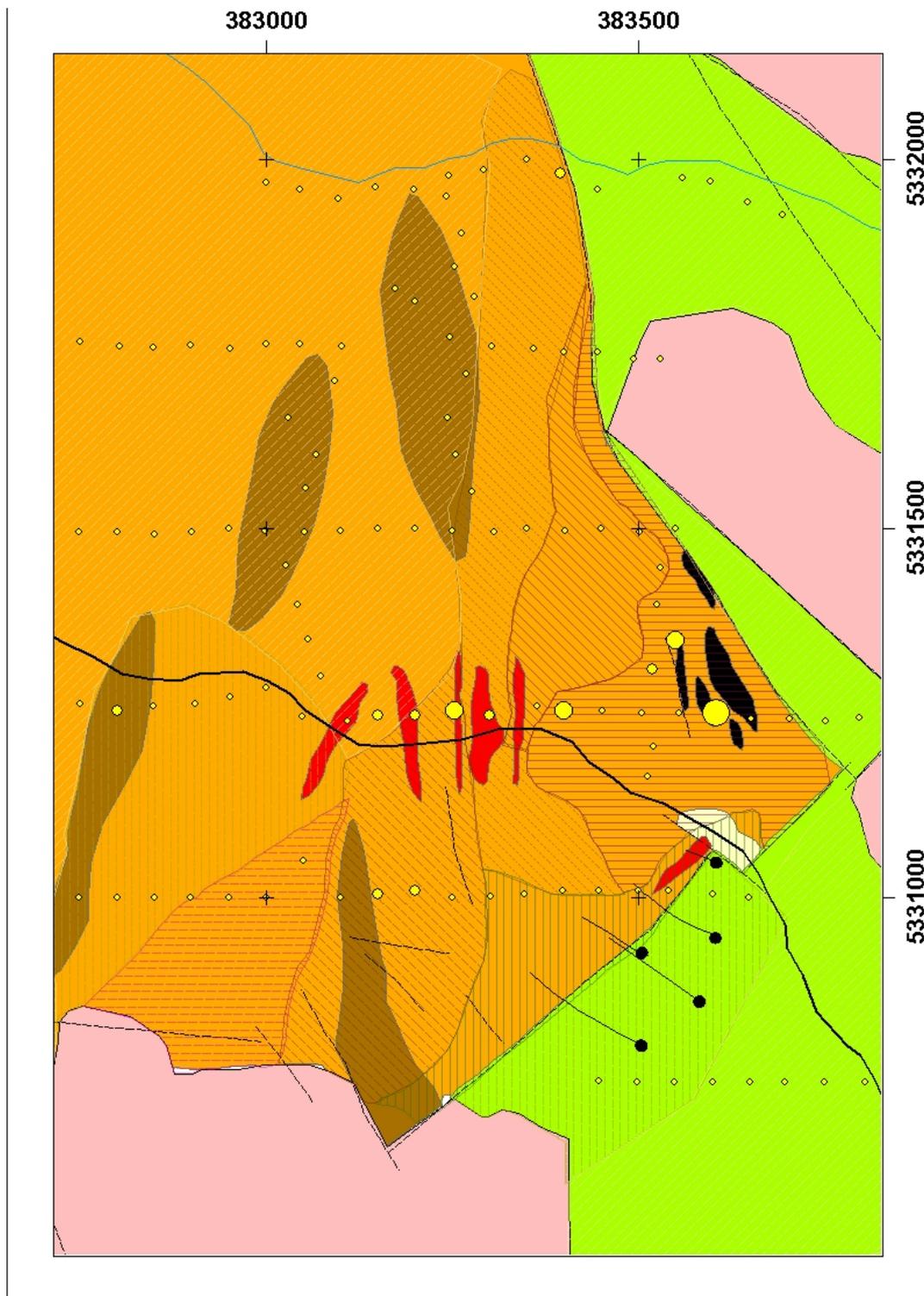
- Cu**
- 0 - 25
  - 26 - 50
  - 51 - 100
  - 101 - 200
  - 201 - 593

**Others**

- Jukes Road
- Drill holes
- King River
- Mt Jukes License



# Appendix 1 C: Gold Geochemistry



### Geology

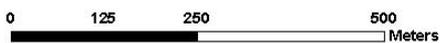
- Faults
- Owen\_group
- Tyndal\_group
- Magnetite\_breccias
- Quartz Porphyry
- Volcaniclastic Sandstone
- Autoclastic Breccias
- Feldspar Phyrlic Dacite

### Alteration

- Strong chlorite
- Weak Chlorite
- Strong K-feldspar
- Weak K-feldspar
- Strong K-feld+weak chl
- Moderate K-feld+weak chl
- Weak K-feld+weak chl
- Sericite

### N.J.2009soils

- Au
- 0 - 10
  - 11 - 25
  - 26 - 50
  - 51 - 100
  - 101 - 303

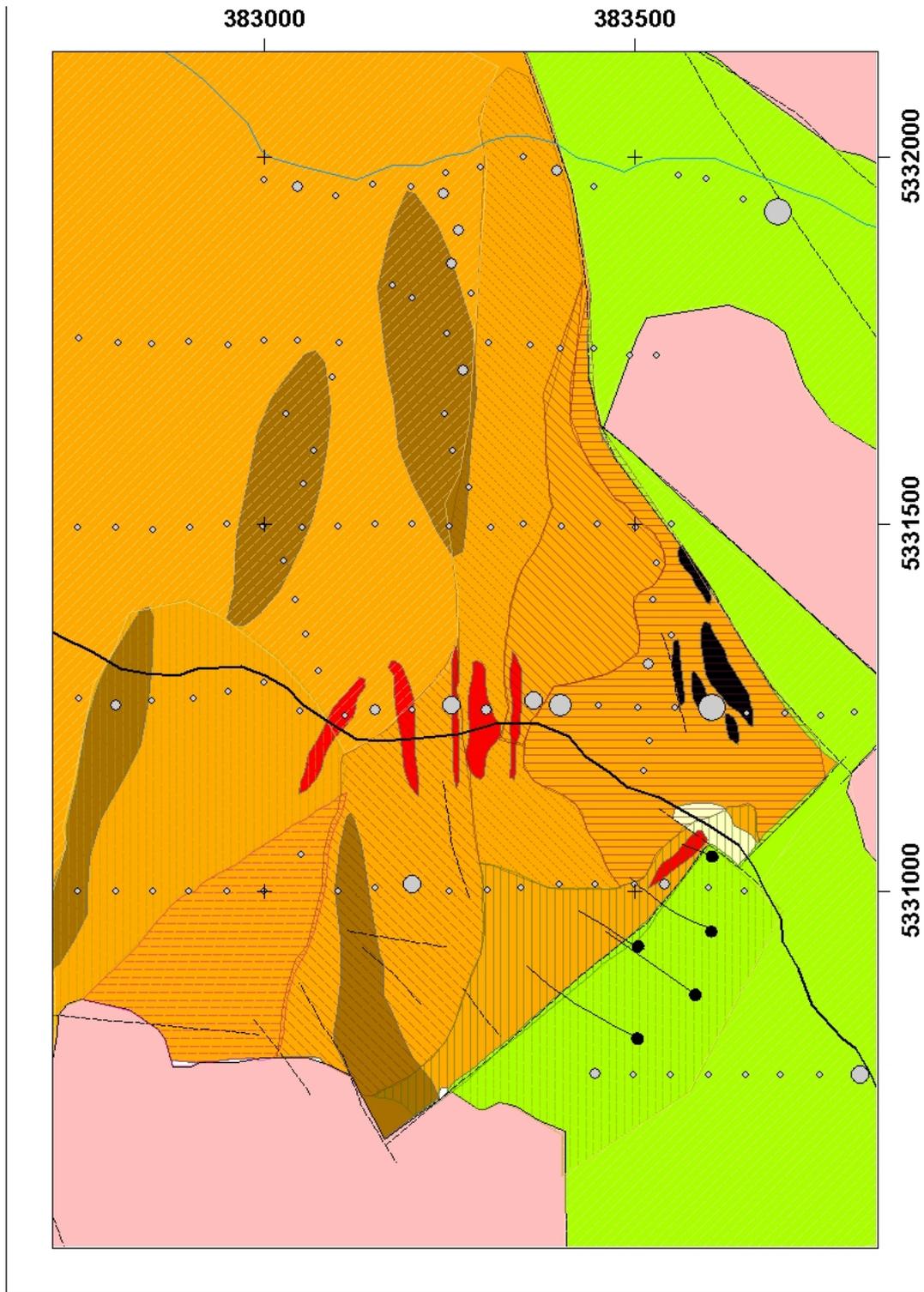


### Others

- Jukes Road
- Drill holes
- King River
- Mt Jukes License



# Appendix 1 D: Silver Geochemistry



**Geology**

- Faults
- Owen\_group
- Tyndal\_group
- Magnetite\_breccias
- Quartz Porphyry
- Volcaniclastic Sandstone
- Autoclastic Breccias
- Feldspar Phyrlic Dacite

**Alteration**

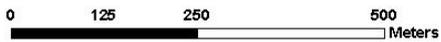
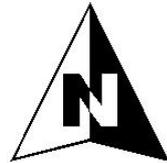
- Strong chlorite
- Weak Chlorite
- Strong K-feldspar
- Weak K-feldspar
- Strong K-feld+weak chl
- Moderate K-feld+weak chl
- Weak K-feld+weak chl
- Sericite

**N.J.2009 soilsAmendex**

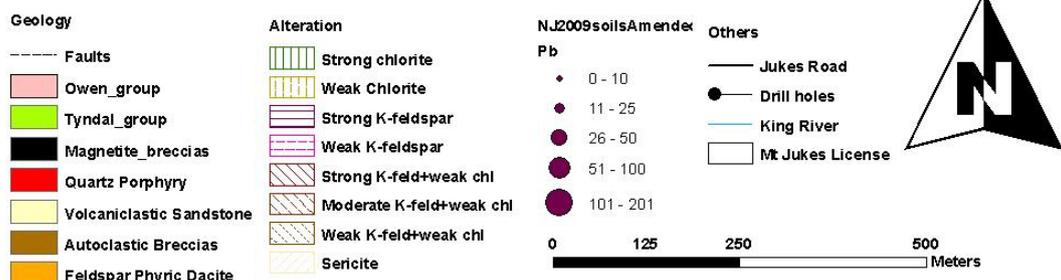
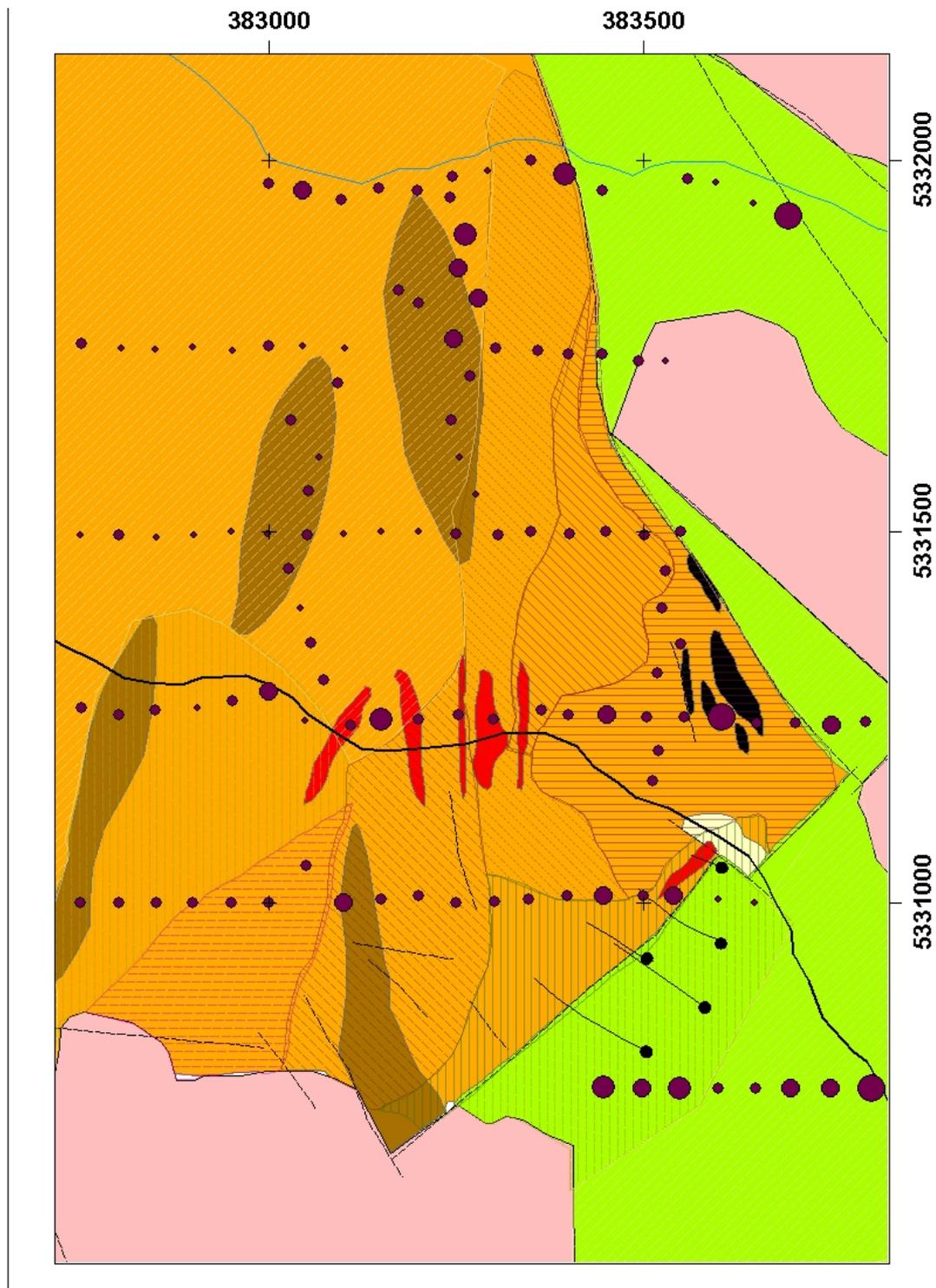
- Ag**
- 0.00 - 0.10
  - 0.11 - 0.25
  - 0.26 - 0.50
  - 0.51 - 1.00
  - 1.01 - 5.40

**Others**

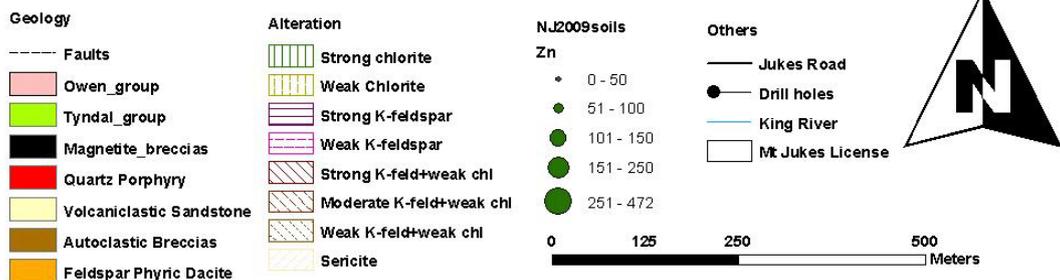
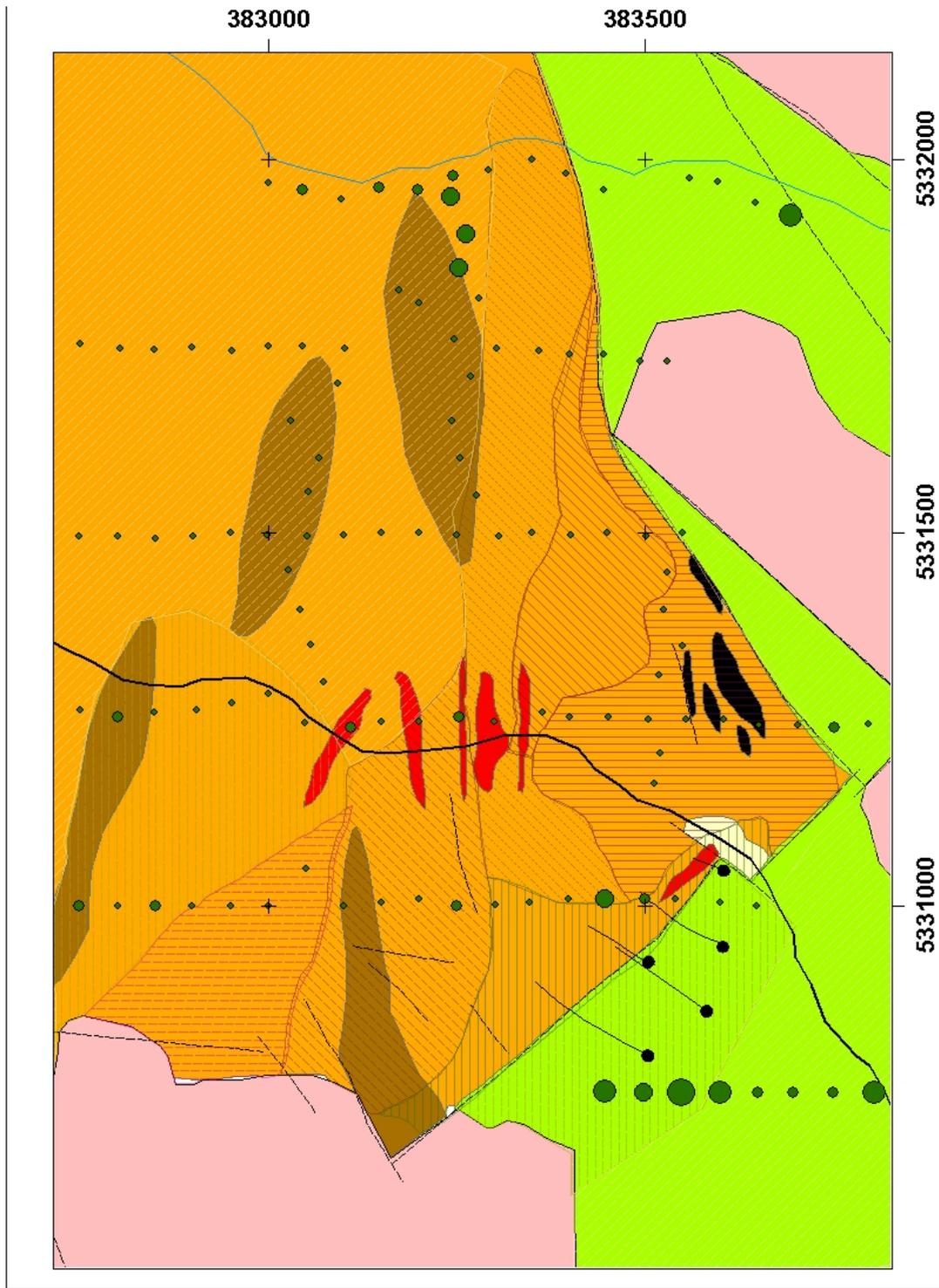
- Jukes Road
- Drill holes
- King River
- Mt Jukes License



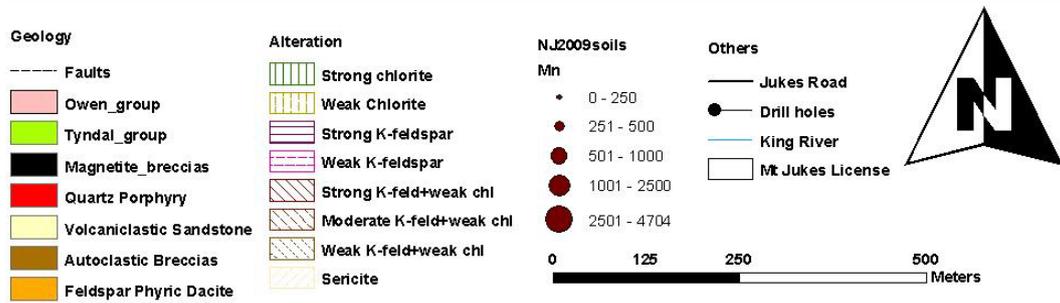
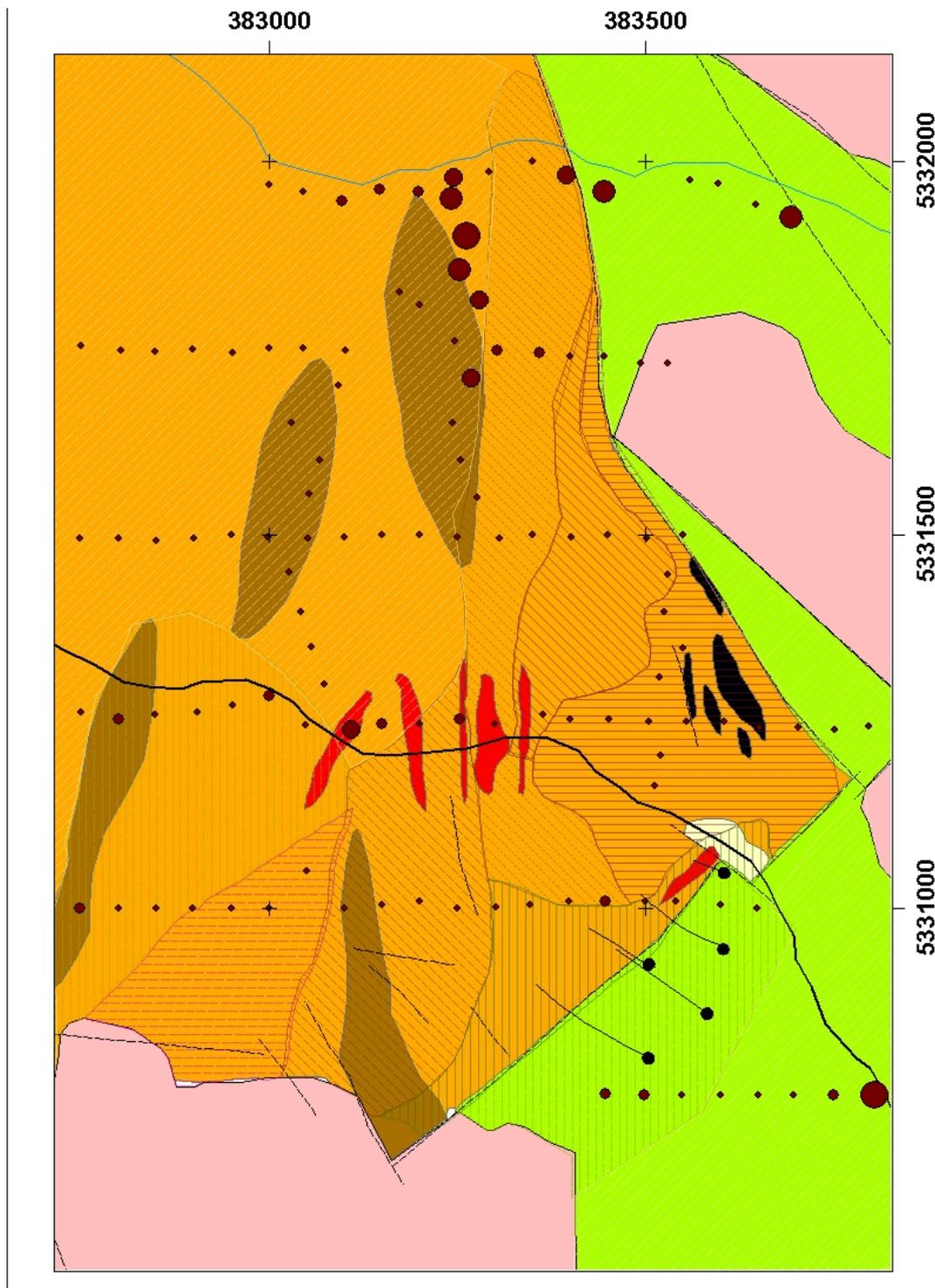
# Appendix 1 E: Lead Geochemistry



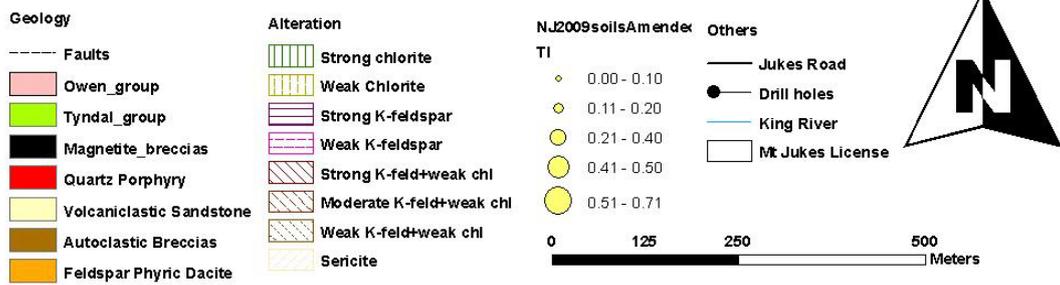
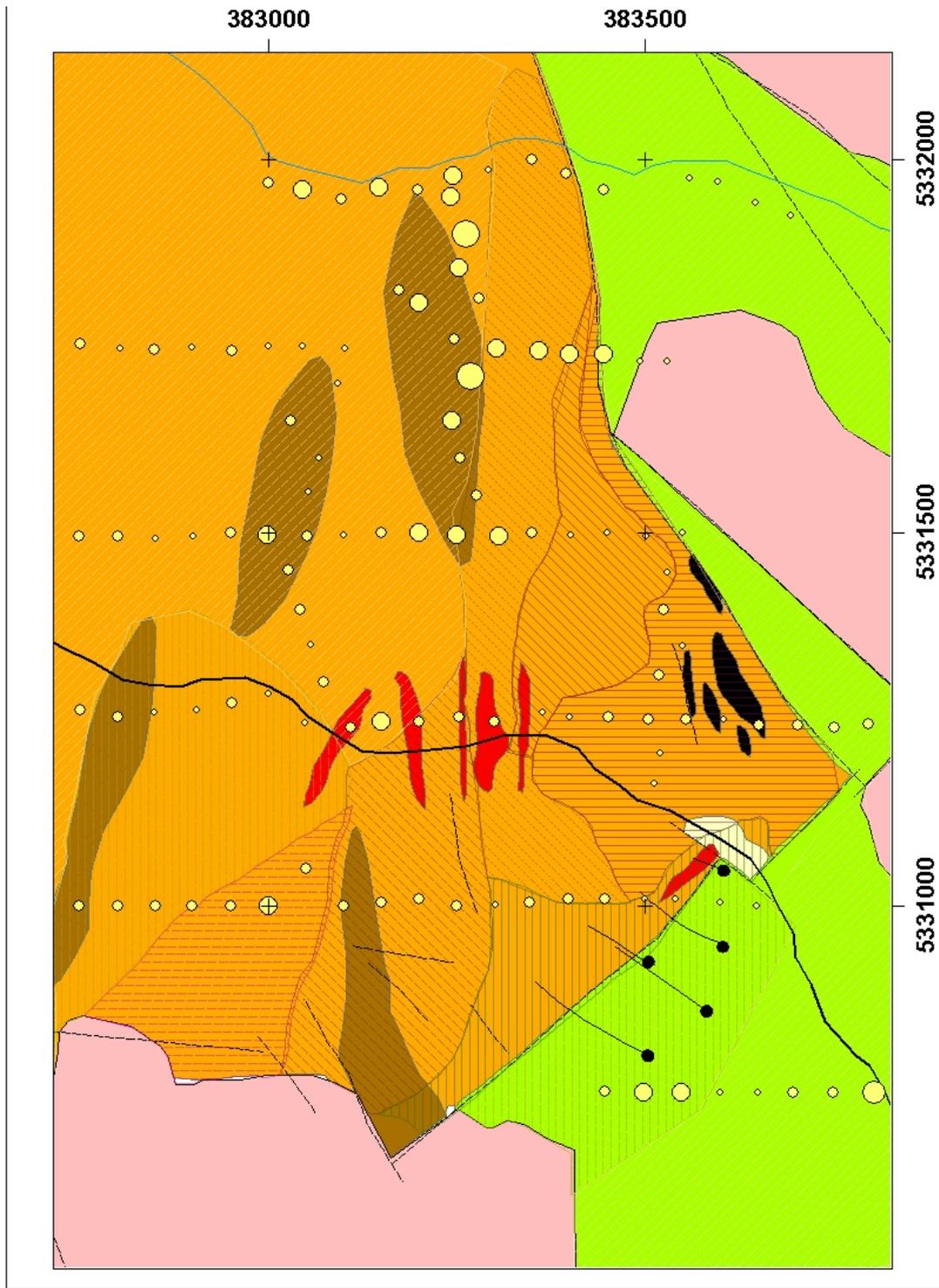
# Appendix 1 F: Zinc Geochemistry



# Appendix 1 G: Manganese Geochemistry

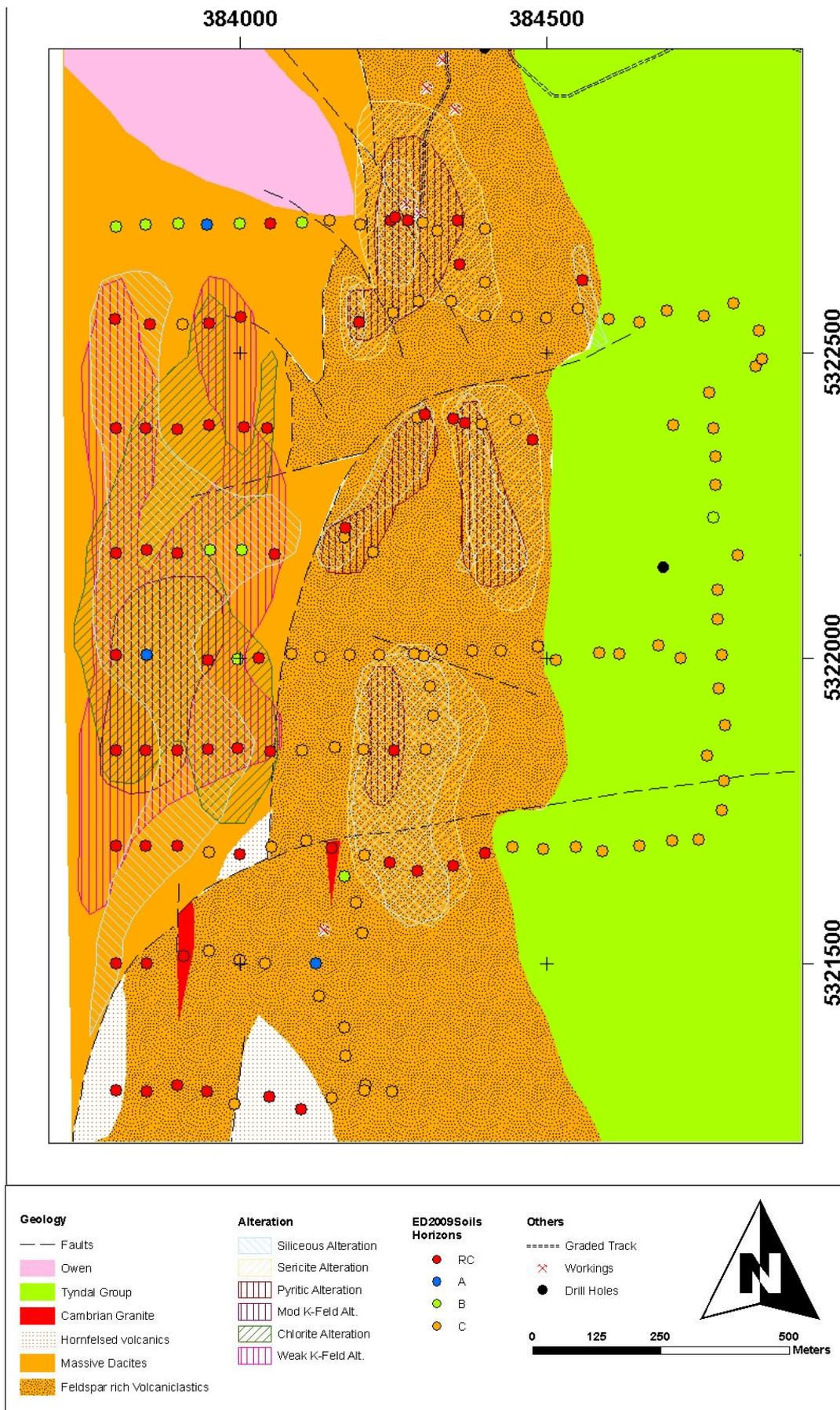


# Appendix 1 H: Thallium Geochemistry

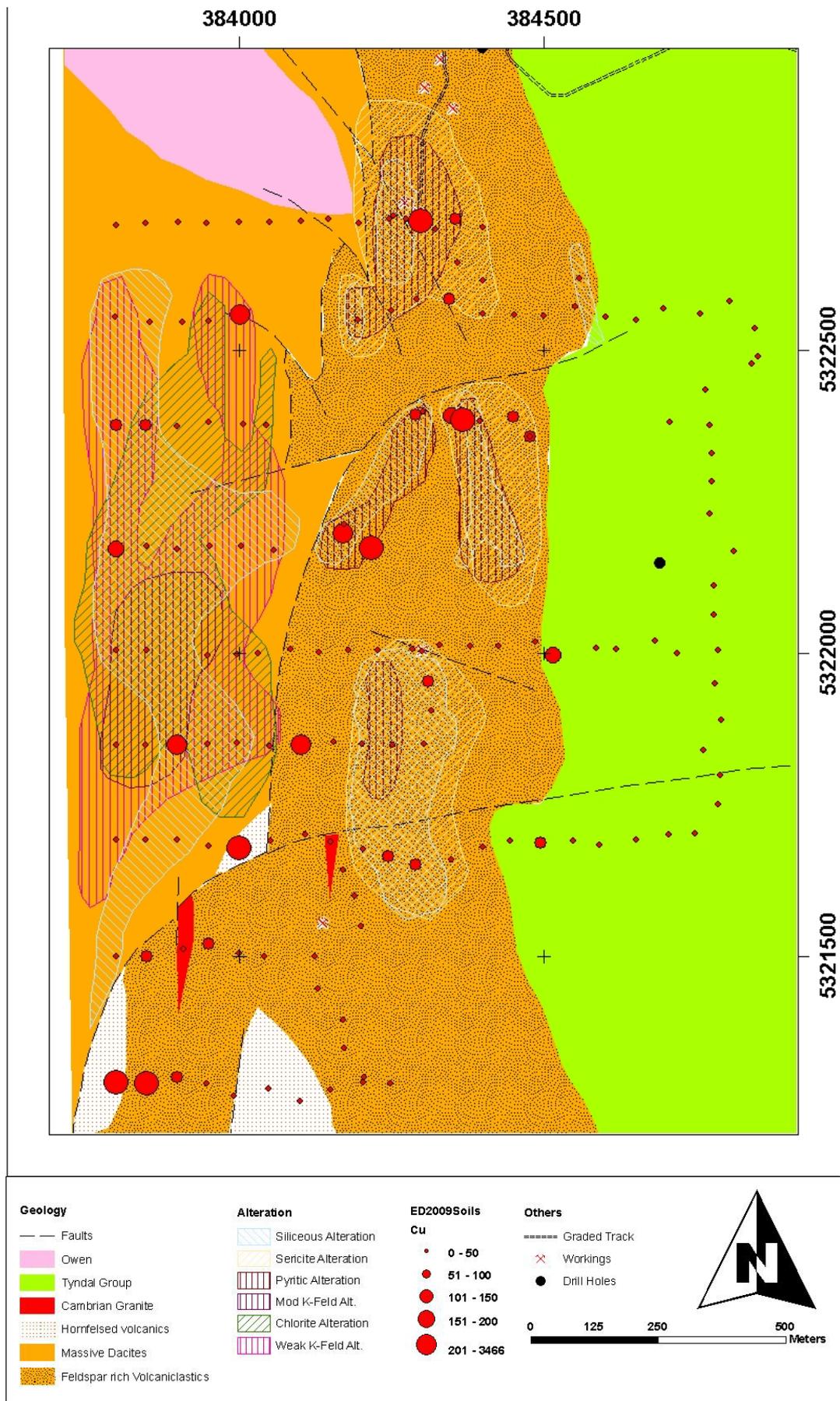


# **Appendix 2: East Darwin Geochemistry**

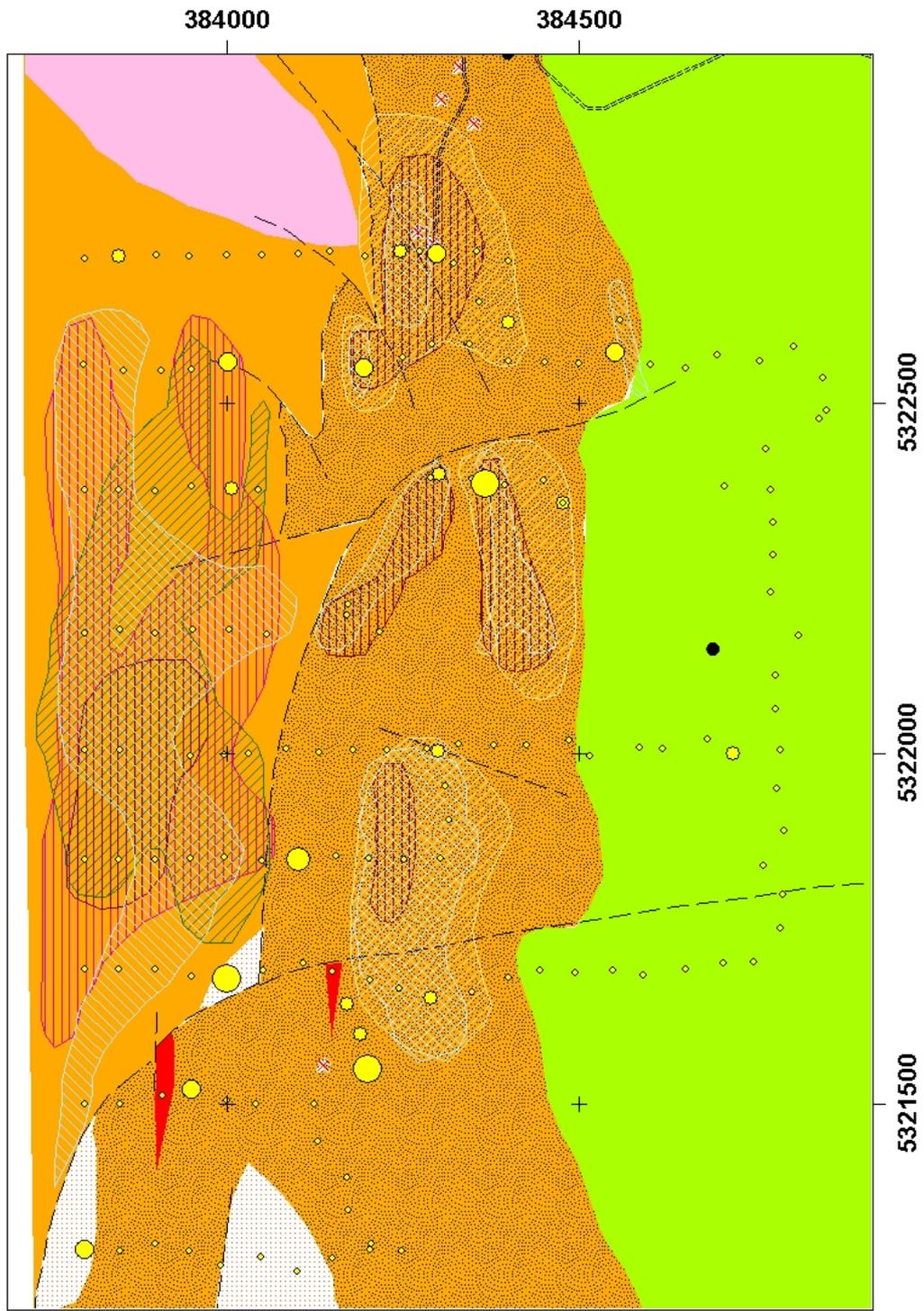
## Appendix 2 A: Sample locations and horizons



# Appendix 2 B: Copper Geochemistry



# Appendix 2 C: Gold Geochemistry



**Geology**

- Faults
- Owen
- Tyndal Group
- Cambrian Granite
- Hornfelsed volcanics
- Massive Dacites
- Feldspar rich Volcaniclastics

**Alteration**

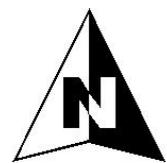
- Siliceous Alteration
- Sericite Alteration
- Pyritic Alteration
- Mod K-Feld Alt.
- Chlorite Alteration
- Weak K-Feld Alt.

**ED2009Soils**

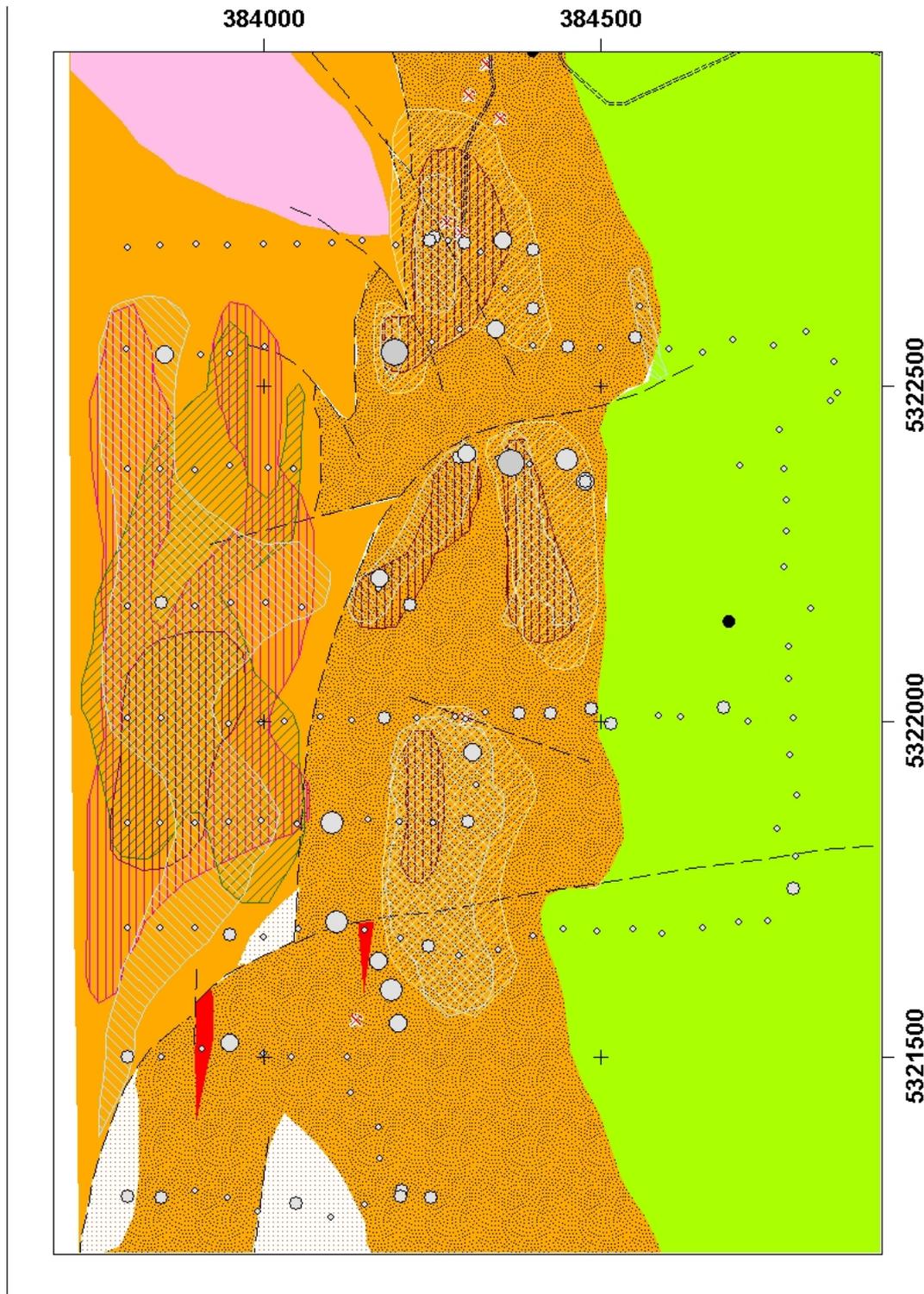
- Au**
- 0 - 10
  - 11 - 25
  - 26 - 50
  - 51 - 70
  - 71 - 285

**Others**

- Graded Track
- Workings
- Drill Holes



# Appendix 2 D: Silver Geochemistry



**Geology**

- Faults
- Owen
- Tyndal Group
- Cambrian Granite
- Hornfelsed volcanics
- Massive Dacites
- Feldspar rich Volcaniclastics

**Alteration**

- Siliceous Alteration
- Sericite Alteration
- Pyritic Alteration
- Mod K-Feld Alt.
- Chlorite Alteration
- Weak K-Feld Alt.

**ED2009 Soils**

- Ag**
- 0.00 - 0.10
  - 0.11 - 0.25
  - 0.26 - 0.50
  - 0.51 - 1.00
  - 1.01 - 23.09

**Others**

- Graded Track
- ⊗ Workings
- Drill Holes



# **Appendix 3: Geochemistry Data**