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## 1. SUMMARY

CRA Exploration Pty. Limited (CRAE) is exploring EL 36/92 for bulk low-grade Ni mineralisation hosted by the Cambrian Mafic-Ultramafic Heazlewood River (HRC) and Mount Stewart (MSC) Complexes. Cambrian hydrothermal Cu-Au mineralisation hosted by the low Ti tholeiitic basalt sequence is a secondary target.

One hundred and thirty-two drainage sediment samples were collected from within the Heazlewood licence area and submitted for multi-element geochemical analysis. Sampling identified two adjacent catchments (total 0.35 sq km area) shedding anomalous (>3000 ppm) Ni. The catchments covers the Caudry's Hill Orthopyroxenite Sequence, and are included within the **Fenton's Knob** prospect area. Inspection and selective rock chip sampling of both catchments has been undertaken - results from geochemical analysis of rock chips are awaited.

The **Duffs Hill** prospect area covers Cu-Au-Ag-Pb-Zn mineralised Devonian faults within a 0.5 sq km fault bounded low-Ti tholeiitic basalt sequence. Channel rock chip sampling of adits exploiting this mineralisation returned a best result of 8.0% Cu, 7.6% Pb, 3.8% Zn, 64 g/t Ag & 5.8 g/t Au (sample 3989140, Adit 2W). Mineralisation has a steeply dipping, narrow-tabular, discontinuous geometry - and low tonnage potential. Results from soil sampling within the Duffs Hill prospect area and drainage sediment sampling preclude the presence of primary high grade Cambrian hydrothermal mineralisation, and no further work is warranted within the **Duffs Hill** prospect area.

A total of 73 reconnaissance rock chip samples were taken for geochemical analysis within the licence area. Best result from sampling was 0.165 g/t Au from a sample of vein quartz within the low-Ti tholeiitic basalt sequence. Despite the results of work within the **Duffs Hill** prospect area, Cambrian hydrothermal Cu-Au mineralisation within the low-Ti tholeiitic basalt sequence remains a valid target.

The major focus for exploration in 1995 will be identifying and evaluating the source of the Ni anomalies in drainage sediment geochemistry data at **Fenton's Knob**.

## 2. INTRODUCTION

EL 36/92 Heazlewood was granted on the 6th of March 1993 for an initial tenure of one year. An application for one year renewal was granted in 1994 giving an expiry date of 5th March 1995. An application for a further one year renewal accompanies this report. The exploration licence encompasses an area of 109 sq km and is located on the Arthur River 7915 and Pieman 7914 1:100,000 map sheets as shown in Plan Tv 645. This report details all exploration activities conducted within EL 36/92 by CRAE during 1994.

CRA Exploration is exploring Heazlewood EL36/92 for low grade Ni deposits. Exploration activities by CRAE elsewhere in Australia have led to the recognition that certain types of ultramafic complex may host low-grade Ni mineralisation in a form that offers superior metallurgical characteristics to the conventional pyrrhotite-pentlandite ores. While the mechanism to produce this style of mineralisation is not yet understood, serpentine development and low Fe may be key requirements. CRAE is investigating the development of this type of Ni mineralisation within the HRC and MSC.

Cambrian hydrothermal Cu-Au mineralisation within tholeiitic basalts is a secondary target generated by recognition of Cambrian hydrothermal geochemical signatures and textures.

### 3. RECOMMENDATIONS

Identify the source of the anomalies in drainage sediment geochemical data within the **Fenton's Knob** prospect area. High sample density drainage sampling, soil sampling, IP-resistivity survey, and ground magnetic survey may be trialled along existing grid lines in an attempt to recover the Ni bearing stratigraphic horizon/structure.

Anomalies identified in this work may be tested by shallow, scout diamond drill holes.

### 4. REGIONAL GEOLOGY

#### 4.1 Regional Geological Setting

The Heazlewood River and Mount Stewart Complexes are two of several mafic-ultramafic complexes occurring within Cambrian volcano-sedimentary troughs in western Tasmanian. The HRC and MSC are located within the northern part of the Dundas Trough which comprises Eocambrian and Cambrian volcanic and sedimentary sequences, and is host to most of Tasmania's ultramafic complexes.

The mafic-ultramafic complexes are allochthonous bodies that were tectonically emplaced during the middle Cambrian (Brown, 1986). In general, there is a predominance of olivine and orthopyroxene cumulates, locally abundant gabbroic dykes and sills, and an association between the cumulates and two volcanic suites - boninite and low Ti-tholeiitic basalts. This association is consistent with a forearc tectonic provenance, cf. Mariana forearc (Crawford & Berry, 1991).

#### 4.2 Geology of the HRC

Recent accounts of the geology of the HRC were summarised by Peck and Keays (1990) - that summary is presented below. The distribution of rocks types is shown in Fig.1.

- The largest (50 sq km) and least dismembered ultramafic complex in Tasmania.
- Initially emplaced during the Middle Cambrian and subsequently re-emplaced during an episode of compressional deformation during the Devonian (Rubenack, 1973; Brown, 1986).
- Consists of 5 km (max.) of layered ultramafic cumulates and cross cutting gabbroic rocks and 3 km (max.) of overlying low-Ti tholeiitic basalt and boninite (Brown, 1986).
- Hosts a tonalite complex and probable tectonic melanges (Creenaune, 1980).
- Cumulate layering is well developed in many parts of the complex and trends NE with near vertical dips (young to the E).
- Variably serpentinised.
- Cut by many faults and shear zones which trend NW, N and NE (parallel to layering).
- A major NS fault divides the complex into western and eastern sections (Peck & Keays, 1990).

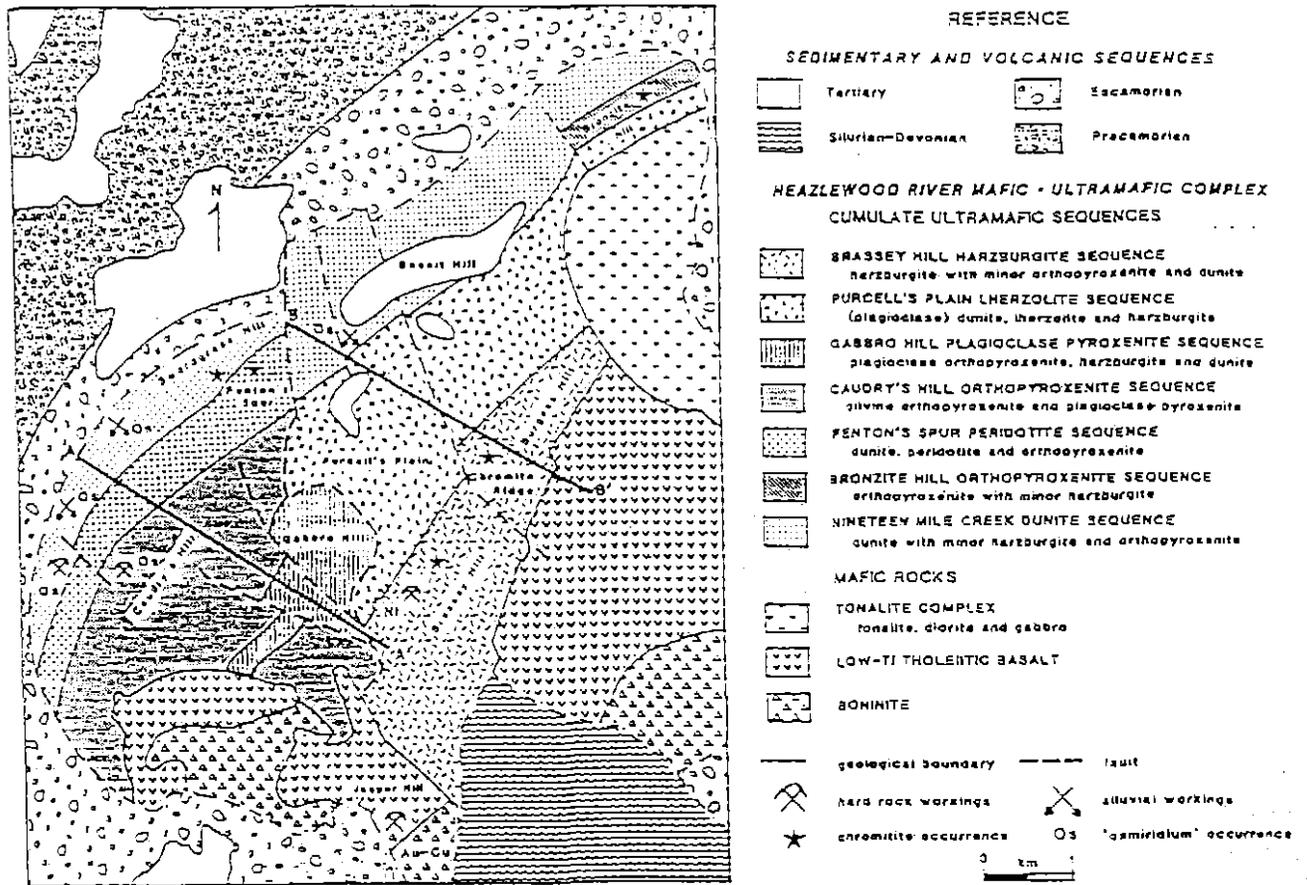


Figure 1 Generalized geology of the Heazlewood River Complex. Ultramafic sequences mapped by D. C. Peck (unpub.). Geology of the volcanic and sedimentary units is derived from Rubenach (1973) and Brown (1986).

5 cm

#### 4.2.1 Western Cumulates

The western section represents the product of two major cycles. The earliest cycle produced a sequence:

Nineteen Mile Creek dunite  
Fenton's Spur peridotite  
Cawdry's Hill pyroxenite

The subsequent cycle produced the Gabbro Hill Plagioclase pyroxenite.

Both cycles show an upward (easterly) increase in opx at the expense of ol. Dunite and harzburgite are the predominant rock types at the base of the succession. Orthopyroxenite and plagioclase websterite are most common at intermediate levels, and postcumulus cpx and plg occur at the top of both successions.

A strong Fe enrichment trend in spinel composition over the lower-most 3 km of the system suggests that the western section has evolved as a closed system. On a finer scale, sharp reversals in spinel composition, and well developed rhythmic layering is consistent with several periods of magma addition.

#### 4.2.2 Eastern Cumulates

By contrast, the large numbers of compositional reversals and absence of protracted fractionational trends in spinel composition suggest the eastern succession evolved as an open system.

The nature of the contacts between the Nineteen Mile Creek dunite sequence and Bronzite Hill orthopyroxenite sequence with the Purcell's Plain Lherzolite sequence is unclear. The Bronzite Hill sequence is correlated with the orthopyroxenite-rich parts of the Nineteen Mile Creek sequence. However, neither the Purcell's Plain sequence nor the Brassey Hill harzburgite sequence can be correlated with the cumulate successions of the western section.

The Purcell's Plain Lherzolite comprises a basal dunite-harzburgite succession and an overlying rhythmically layered plagioclase dunite-plagioclase peridotite succession. It is conformably overlaid by the Brassey Hill sequence which is made up of several cyclic units comprising dunite (base), poikilitic harzburgite, olivine orthopyroxenite, and orthopyroxenite (top).

#### 4.2.3 Mafic Dykes

Three suites of dykes are recognised within the cumulate sequences:

- (i) fine grained gabbro-norite
- (ii) medium grained leucogabbro-norite & anorthosite
- (iii) coarse grained & pegmatitic gabbro-norite and plagioclase pyroxenite

Dykes are generally less than one metre thick and tabular (type i - up to 200 m thick). Dykes are common in the *eastern section* and intrude the Gabbro Hill, Cawdry's Hill, and Brassey Hill sequences in the *western section*.

#### 4.2.4 Volcanics

Creenaune (1980) and Brown *et al.* (1980) identified two distinctive volcanic suites within the HRC. The low-Ti tholeiitic basalts and high-Mg andesite - analogous to modern boninite lava (Brown & Jenner, 1989). Contacts between the volcanic rocks and cumulate sequences are assumed to be faulted - although most contacts are not well exposed, and most faults are inferred (Peck, 1990).

### 5. MINERALISATION

The HRC and MSC have a long history of mineral exploration and mining. The area was initially explored during the late 1800's when gold prospectors were working alluvial deposits of the Savage River - immediately to the west of the complexes. Exploration began in earnest in 1889 when a road was constructed between Waratah and the Heazlewood River. In the late 1890's exploration delineated several minor mineral deposits, including Ni at the Lord Brassey Mine, Cu-Au at Jasper Hill, and many minor Pb-Zn occurrences scattered throughout the Heazlewood area. In the first 20 years of this century the HRC and MSC were mined for alluvial Os-Ir alloy deposits; during that period, the HRC became the world's major supplier of Os and Ir. [from Peck (1990)]

#### 5.1 Nickel

The Lord Brassey Mine consists of about 300 m of driving on the summit of Brassey Hill. Nickel mineralisation consists of heazlewoodite ( $Ni_3S_2$ ) and lesser amounts of pentlandite; both oxidising at the surface to zaraitite.

Nickel minerals and magnetite were probably emplaced during the serpentinization of the original pyroxenite. Mineralisation is hosted by shears that probably acted as fluid pathways during serpentinization. Shears are orientated NE and mine development followed three of them. The mine has no recorded history of production. [from Hughes (1965)]

#### 5.2 Copper-Gold

Cu-Au mineralisation was exploited in two workings on Jasper Hill - the Old Jasper and New Jasper Lodes. Copper mineralisation involves stringer-style chalcopyrite and is associated with quartz and jasper gangue. Copper occurs as coarse grained "blebby" to massive chalcopyrite within strongly silicified amygdoidal basalt. Later alteration has resulted in bornite, covellite, chalcocite, native Cu and Cu-Fe alloy replacing chalcopyrite. Au alloys and Ag tellurides occur as isolated inclusions within chalcopyrite, and appear to have formed by exsolution from chalcopyrite or coprecipitation with chalcopyrite. On a larger scale mineralisation is fracture controlled.

The Cu mineralisation at Jasper Hill is believed to represent a Cambrian hydrothermal system that evolved during extrusion of the low-Ti lavas (Groves, 1966; Rubenach, 1973). The absence of carbonate gangue and the presence of jasper in the lodes has been cited as evidence against a genetic link between the mineralisation and the emplacement of Devonian granites (Groves, 1966). A Cambrian age for mineralisation is supported by minor chalcopyrite and pyrrhotite mineralisation in low-Ti basalts from other parts of the study area. The sulphides occur in association with quartz gangue as vesicle-fillings and locally appear to have replaced amygdales. These minor occurrences are not related to fractures or joints and their distribution is not controlled by Devonian faults.

Drilling at Jasper Hill by Metals Exploration has proven that some lodes are clearly fault controlled. These lodes probably represent Cambrian hydrothermal mineralisation remobilised (upgraded???) during Devonian deformation. [from Peck (1990)]

### 5.3 Silver-Lead-Zinc

Early prospectors discovered several small galena occurrences within the Heazlewood area that were similar in appearance to structurally-controlled Ag-Pb-Zn mineralisation at the Magnet Mine (Groves, 1965). Many shallow workings were found in association with these occurrences - particularly on Brassey Hill. The mineralisation consists of banded galena-siderite-ankerite occurring as fracture filling in sheared and brecciated serpentinite. The distribution of the occurrences is related to northwest-trending Devonian faults and is probably analogous to the Magnet Mine deposit which is interpreted to have formed as a consequence of the emplacement of the Meredith granite (Groves, 1965). [from Peck (1990)]

### 5.4 Platinum Group Elements

Platinum group elements (PGE) were mined from streams draining the Nineteen Mile Creek dunite sequence; Older Tertiary gravels beneath Tertiary basalt on Reversal Hill; and Loughnan Creek within the MSC. Mining within the HRC yielded a recorded production of 15,000 ounces of Os-Ir alloy (Jenning *et al.*, 1967). Nuggets were thought to be of magmatic origin because they were not cemented by secondary material and were locally intergrown with chromite (Twelvetrees, 1914). Occurrences of Pt-Au alloys and rare diamonds with alluvial Os-Ir alloy deposits are also recorded.

A hard rock Os-Ir alloy occurrence was discovered and worked by W. Caudry on the western side of Caudry's Hill (1914). Two short adits, an open cut, and a 100 m long 1-2x1-2 m trench targeted a "magmatic schlieren lode" (Twelvetrees, 1914), from which about 250 ounces of Os-Ir alloy was extracted (Hughes, 1965). Reinvestigation of this area by Metals Exploration Ltd. failed to detect similar PGE mineralisation, and noted the trench was excavated along a NW-trending fault (Peck, 1990) - this observation throws doubt on the primary magmatic nature of the mineralisation. Similar Os-Ir alloy occurrences in structural planes in serpentine were described by Reid (1921) at Mt. Stewart.

## 6. PREVIOUS EXPLORATION

The Heazlewood licence area was explored primarily for PGE mineralisation by Metals Exploration Ltd between November 1985 and December 1989. Secondary targets were Ni and Au-Cu. A large portion of the licence area was explored by Comstaff Pty Ltd between 1963 and October 1984. A wide range of commodities were investigated, including Ni and Au-Cu. Other exploration companies explored areas included in the Heazlewood licence area prior to, and during this period.

## 7. WORK UNDERTAKEN

### 7.1 Reconnaissance Rock Chip Sampling

During the reporting period, 73 outcrop, subcrop, and float rock chip grab samples were collected as part of a reconnaissance rock chip geochemical sampling program. Samples weighing 1-2 kg were sent to:

ALS where they were crushed, pulverised, and analysed for Cu Pb Zn Ag As Fe Mn Co Ni by IC586 (HF/HNO<sub>3</sub>/HCl digest - ICP) and  $\pm$ Au  $\pm$ Pt  $\pm$ Pd by PM 217 (50 g fire - AAS).

or

Analabs where they were dried, crushed, pulverised (GPO33) and analysed for Cu Pb Zn Ag Ni Co Fe Mn Bi by GA140 (0.3 g aqua regia/perchloric acid digest - AAS), As by HA140 (hydride generation - AAS), Au Pt Pd by GG316 (50 g fire - AAS), and S by OM613 (Leco).

All rock chip sample locations are shown on Plans Tv 644, 887 and 900. Sample ledgers and laboratory reports for samples collected during the reporting period are included in Appendix I. Results for samples 4140801-847 are not reported.

Significant results from sampling are:

0.165 g/t Au in a sheared (low-Ti tholeiitic) basalt adjacent the Mt. Elizabeth Track - 3530588.

4.2% Pb, 3.8% Zn & 476 g/t Ag in ore from the abandoned Mt. Stewart Mine - 3989162. Mineralisation at Mt. Stewart is hosted by quartz-carbonate veins and is probably related to the emplacement of Devonian granites (Groves, 1966).

Three rock chip samples submitted for geochemical analysis were also submitted for petrological description. Samples were sent to R.N. England for transmitted and reflected light thin section preparation and description. Petrological laboratory reports for these samples are included in Appendix II.

## 7.2 Drainage Sediment Sampling

One hundred and twelve drainage sediment samples were collected for geochemical analysis within the Heazlewood licence area during March 1994. The sampling program covered the HRC and MSC with a sample density of approximately one sample per sq km of catchment. Drainage sampling was undertaken because of poor coverage of the HRC or absence of Ni results in competitor's drainage sediment data. The program was designed to provide a vector to Ni sulphide mineralisation and establish a geochemical signature for important lithologies. Follow-up drainage sampling (20 samples) in catchments with unaccounted anomalous geochemistry was undertaken during December 1994.

Drainage sediment was wet -80# sieved in the field to give a 200 g, -180 micron sample. Samples were sent to ALS where they were dried and analysed for  $\pm$ Ag,  $\pm$ As,  $\pm$ Bi,  $\pm$ Cd,  $\pm$ Cu,  $\pm$ Hg,  $\pm$ Mo,  $\pm$ Pb,  $\pm$ Sb, and  $\pm$ Zn by IC588 (acid digest/solvent extraction, ICP); Ca, Fe, Al, Mg, Mn, Na,  $\pm$ P, Ti, Co, Cr, Ni, W, Ba, V, Cu, Pb, Zn and  $\pm$ Zr by IC587 (mixed acid digest using HF, ICP); and  $\pm$ Au by PM219 (50 g fire assay/solvent extraction, AAS). Results from sampling are presented in Appendix III. Sample locations are shown on Plan Tv 644.

### *Discussion of results from March sampling*

Bivariate scatterplots between elements indicate some scavenging of Co, Ni and Zn by Fe and Mn. For each of Co, Ni and Zn, higher values depart from the scavenging correlation - and probably represent "real" anomalies independent of Fe and Mn scavenging.

Nickel correlates well with Co (two anomalous high Co values depart from the correlation), and poorly with Cu. Copper correlates well with Zn. Nickel and Co correlate moderately well with Mg, although anomalous high Ni and Co values and an anomalous high Mg population depart from the correlation.

Factor analysis of the data set minus Hg (one sample above detection limit), Cr (chromite not dissolved in acid digest), and Cu, Pb, Zn IC588 (Cu,Pb, Zn IC587 included), yielded six factors:

#### *Factor 1                      Zn-Fe-Mn-Co-Mg-Ni-(V)*

Samples with elevated Factor 1 values include in the catchment they test ultramafic rocks. Samples 3989118, 3530702, 750, & 747 have anomalous Ni-Co values, and were followed up during December sampling.

#### *Factor 2                      Cu-As-Bi-(Cd)*

Samples with anomalous Factor 2 values were taken from the Whyte River which includes the abandoned Cleveland Sn (Cu, W, Bi, Mo) mine within its catchment. Elevated Factor 2 values of samples taken from Blindmans Creek have anomalous Cu values. Blindmans Creek drains Cambrian basic-intermediate volcanics mapped by Williams and Turner (1973) at the eastern edge of the sampled area. Detailed drainage sampling in this area by Comstaff consistently yielded similar results for catchment which included Cambrian basic-intermediate volcanics; which suggests this regionally anomalous Cu value is background for the basic-intermediate volcanics. Follow-up investigation of anomalies is not warranted.

#### *Factor 3                      P-Ti-W-Zr*

Samples with anomalous Factor 3 values include in the catchment they test the Meredith Granite (Williams & Turner, 1973).

*Factor 4 Al-Ca-Na-(V)*

Samples with anomalous Factor 4 values include in the catchment they test coarse, low-Ti tholeiitic basalts (Peck & Keays, 1990; Williams & Turner, 1973). Catchments including the Tonalite Complex, low Ti-tholeiitic basalts, and boninites mapped by Peck and Keays (1990) generally have elevated Factor 4 values.

*Factor 5 Pb-Ag-Cd-Sb*

Samples with anomalous Factor 5 values have within the catchment they test abandoned vein hosted Pb, Ag,  $\pm$ Zn mines. Samples 3530735, 744, & 3989118 test the catchment which contains the Mount Stewart vein hosted Pb-Ag mine. Sample 3530709 tests the catchment which contains the New Jasper vein hosted Cu, Au, Ag mine and ?Heazlewood vein hosted Pb, Ag, Zn mine. Samples 3989128 & 124 test the catchment which contains the Godkin(?) vein hosted Pb, Ag, Zn mine. Follow-up investigation of anomalies is not warranted.

*Factor 6 Au*

Samples with anomalous Factor 6 values either:

Test catchment containing abandoned vein hosted Au,  $\pm$ Cu,  $\pm$ Ag mines.

Test catchment containing alluvial Os, Ir, Au workings.

Test Thirteen Mile Creek, which is contaminated by the Corinna Road.

Are unaccounted for.

Samples 3530709 & 712 test the catchment which contains the New Jasper ?vein hosted Cu, Au, Ag mine. The catchment of 3530712 also contains two small Cu mines. Samples 3989111 & 3530781 test the catchment which contains the Leven Creek Au mine. Sample 3530752 tests catchment which is included in the Bald Hill alluvial Ir, Os, Au field. Samples 3530715 & 716 test the Thirteen Mile Creek which is adjacent, and probably contaminated by the Corinna Road. Unaccounted Factor 6 anomalies have Au values <0.03 ppm. Follow-up investigation of anomalies is not warranted.

*Anomalies not accounted for in review of Factors*

Drainage geochemistry Mg values greater than 10% indicate catchment with a large component of Caudry's Hill Orthopyroxenite (Peck & Keays, 1991).

*Comparison with competitor geochemistry*

Comstaff drainage geochemical data over the Mount Stewart Complex, which is more detailed than CRAE data, shows catchments shedding anomalous Ni. An evaluation of Comstaff drainage anomaly follow up is planned.

*Discussion of results from December sampling*

Follow-up investigation of catchments with unaccounted anomalous geochemistry from March sampling was aimed at better delineating the area shedding anomalous Ni-Co and identifying the mineralisation style(s). This involved repeat and more detailed drainage sampling, and reconnaissance rock chip sampling.

The catchment tested by anomalous sample 3989118 - *Factor 1* was observed to have a significant laterite component. The primary Ni-tenor of the Anderson's Creek Ultramafic Complex - Beaconsfield, has been shown to be significantly upgraded in some zones of the superimposed lateritic weathering profile. The high Zn-Fe-Co-Ni-Cr geochemical signature of sample 3989118 and repeat sample 3530792 is probably sourced from laterite within the catchment they test. No further work is warranted within this catchment.

The catchment of anomalous sample 3530702 - *Factor 1* was observed to have a significant laterite component. Laterite is probably responsible for the high Co-Mn-Fe-Ni geochemical signature of this sample and follow-up samples 3530793-796. No further work is warranted within this catchment.

Anomalous samples 3530750 & 747 - *Factor 1* highlighted a two sq km zone within the Fenton's Spur Peridotite Sequence shedding anomalous Ni (1684 & 1890 ppm) and Co (187 & 179 ppm). The catchment of 3530750 includes the Fenton's Knob shear related Ni-sulphide occurrence. Both catchments are also included in the Bald Hill alluvial Ir-Os-Au field. Of 15 follow-up drainage sediment samples (3989196-200, 3530782-791), two (3530783 & 3989196) have Ni values >3000 ppm. These samples define a 0.35 sq km catchment within the **Fenton's Knob** prospect area. This catchment includes the western slope of Reversal Hill where there is prominent serpentine and magnetite/pyrrhotite development.

Selective grab rock chip sampling was carried out along three Metals Exploration (ME) gridlines traversing the catchment of sample 3989196 in an attempt to identify a Ni source. Rock chip samples were submitted for multi-element geochemical analysis. Results are awaited. No obvious source was observed - although serpentinite breccia similar to the Fenton's Knob occurrence outcrops along line 2800N.

ME tested the catchment of sample 3530783 by channel rock chip sampling in bedrock trenches (8 & 9). Broad Ni anomalies in excess of 3000 ppm were identified in the east of trenches 8 and 9. Investigation of these anomalies showed that they correspond to subcropping "skeletal chalcidony" - the product of lateritic weathering of ultramafic rock. This rock is absent west of the anomalies across a major N-S fault. The high Ni tenor of drainage sediment sample 3530783 may reflect lateritic material within the catchment it tests. Lateritic weathered rock chip samples from this area were submitted for multi-element geochemical analysis. Results are awaited.

### 7.3 Duffs Hill Prospect

The low-Ti tholeiitic basalt sequence was identified during the first year of tenure as being prospective for Cambrian hydrothermal Cu-Au mineralisation after disseminated copper was observed in basalts from several locations, and high Cu-Au values were returned from sampling of basalt mullock at Duffs Hill. The **Duffs Hill** prospect area covers a fault bounded sequence of low-Ti tholeiitic basalts with significant, localised Au-Cu-Ag-Zn-Pb mineralisation. Several adits have exploited this mineralisation.

Work undertaken during the reporting period aimed at determining the extent and style of mineralisation at **Duffs Hill**, and evaluating its potential as a CRAE target. This work involved channel rock chip sampling in adits and opportunistic soil sampling across the basalt sequence. The geology and work undertaken within the **Duffs Hill** prospect area is summarised in Plan Tv 887.

Forty-five channel rock chip samples were collected over one and two metre intervals along selected adit walls. Samples weighing 1-2 kg were sent to Analabs where they were dried, crushed, pulverised (GPO33) and analysed for Cu Pb Zn Ag Ni Co Fe Mn Bi by GA140 (0.3 g aqua regia/perchloric acid digest - AAS), As by HA140 (hydride generation - AAS), Au Pt Pd by GG316 (50 g fire - AAS), and S by OM613 (Leco). Sample ledgers and laboratory reports are included in Appendix I.

Sampling returned a best result of: 8.0% Cu, 7.6% Pb, 3.8% Zn, 64 g/t Ag & 5.8 g/t Au (sample 3989140, Adit 2W). Mineralisation occurs along a fault and has a steeply dipping, narrow-tabular, discontinuous geometry. The orientation of the mineralised structure is consistent with Devonian faulting (Plan Tv 888). The rocks are strongly qz-chl-carb altered and have preserved relict disseminated chromite indicative of a primary mafic-ultramafic lithology. The alteration assemblage is consistent with Devonian granite related mineralisation.

Twenty-nine soil samples were collected at 25 m intervals along five ridge and spur traverses across the basalt sequence and adjacent harzburgite sequence. Samples were extracted by hand auger from depths up to 1 m. At each site, a 1 kg sample of C-horizon soil was collected from hole bottom. Samples were sent to Analabs where they were dried, pulverised (GPO33) and analysed for Cu Pb Zn Ag Ni Co Fe Mn Bi by GA140 (0.3 g aqua regia/perchloric acid digest - AAS), As by HA140 (hydride generation - AAS), Au Pt Pd by GG316 (50 g fire - AAS), and S by OM613 (Leco). Sample ledgers and laboratory reports are included in Appendix IV.

Sampling tested the basalt sequence for Cu-Au mineralisation in the vicinity of, and at a distance from known mineralised faults. Best result from sampling was 193 ppm Cu (sample 3989464), which was taken downslope of Adit 2W. Gold values were less than 5 ppm. Cu, Pb, Zn and As anomaly plots of results are shown on Plans Tv 889-92. Copper results away from known mineralised faults were generally between 30-60 ppm, which is consistent with results for unmineralised low-Ti tholeiitic basalt intersected at Jasper Hill by Metals Exploration.

Elevated soil sample results correspond to known mineralised faults with small tonnage potential. A primary high grade Cambrian hydrothermal mineralisation signature is absent in soil (and drainage) geochemical data. The presence of incompatible Au-Cu and Ag-Pb-Zn mineralisation in faults is probably the product of Devonian granite related Ag-Pb-Zn bearing fluids remobilising/enhancing Cu-Au from the basalt sequence or distal Cambrian hydrothermal Cu-Au mineralisation.

In the absence of evidence indicating primary high grade Cambrian hydrothermal mineralisation, no further work is warranted within the **Duffs Hill** prospect area.

## 8. ENVIRONMENT AND REHABILITATION

Activities conducted during the reporting period had no impact on the environment. No rehabilitation was necessary.

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#### KEYWORDS

Copper, Nickel, Gold, PGE, Cambrian, Devonian, Hydrothermal,  
Geology, Mineralisation, Rock Geochemistry, Basalt, Ultrabasic, Fault,  
Chemical Analysis, Geological Mapping Detailed.

LOCATION

Burnie	1:250,000	SK55-3
Arthur River	1:100,000	7915
Pieman	1:100,000	7914

LIST OF DPO'S

77209, 77214, 77215, 77226, 77227.

LIST OF FIGURES

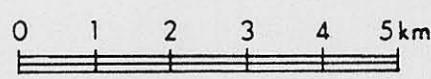
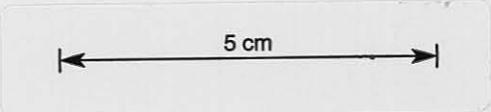
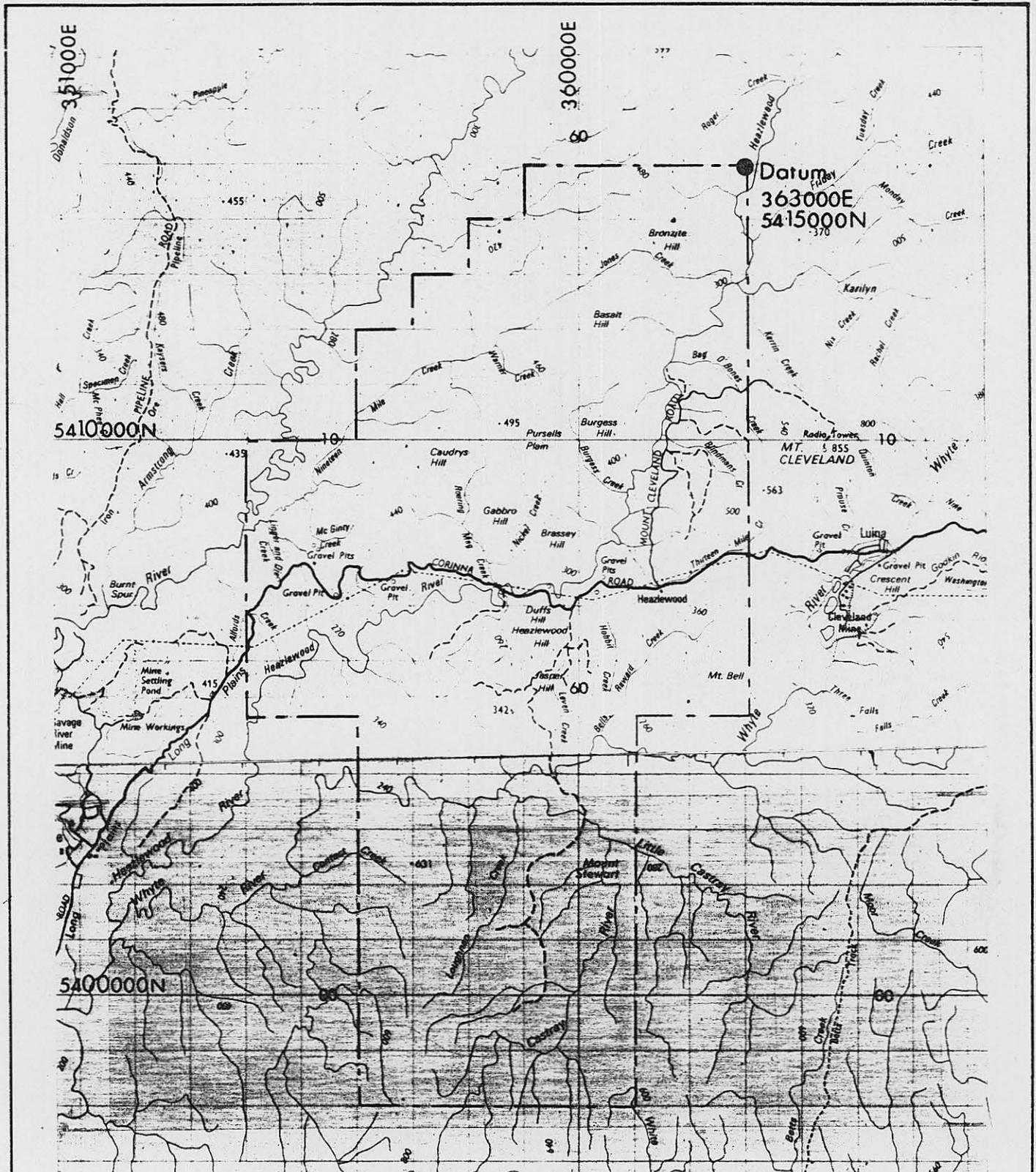
Figure One - Generalised Geology of the Heazlewood River Complex.

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Tv 645	Heazlewood EL 36/92 - Location Plan	1:100,000
Tv 644	Heazlewood EL 36/92 - Sample and Prospect Location Plan	1:25,000
Tv 887	Heazlewood EL 36/92 - Duffs Hill Prospect Compilation Plan	1:2,500
Tv 900	Heazlewood EL 36/92 - Fenton's Knob Prospect Rock Chip Sample Locations	1:10,000
Tv 888	Heazlewood EL 36/92 - Stereographic Projection of Mapped Structures	
Tv 889	Heazlewood EL 36/92 - Duffs Hill Prospect C-horizon Soil Samples - Cu ppm	1:2,500
Tv 890	Heazlewood EL 36/92 - Duffs Hill Prospect C-horizon Soil Samples - Pb ppm	1:2,500
Tv 891	Heazlewood EL 36/92 - Duffs Hill Prospect C-horizon Soil Samples - Zn ppm	1:2,500
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- Appendix II - Petrology laboratory reports
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- Appendix IV - Geochemical soil sample ledgers and laboratory reports

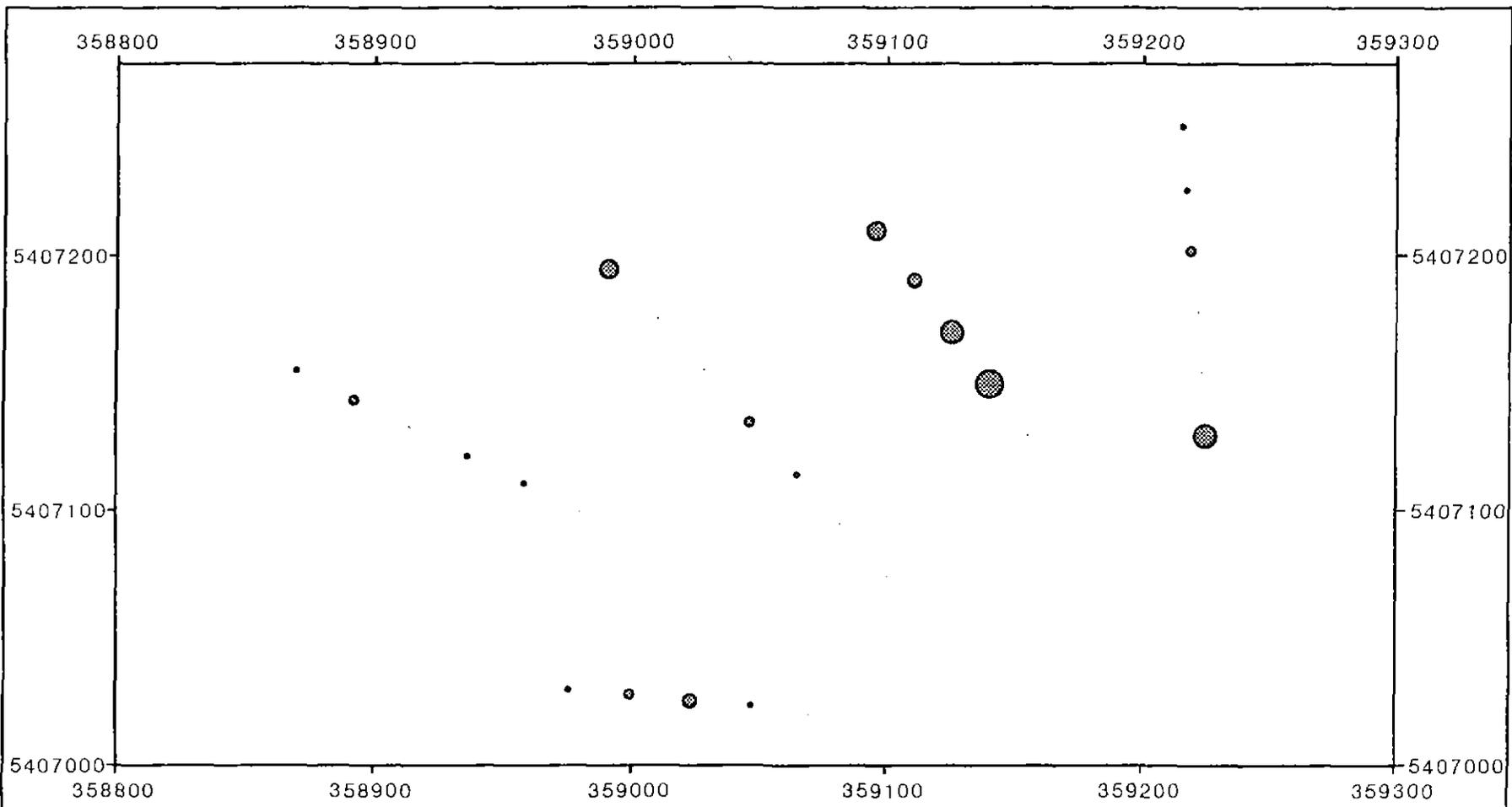


**CRA EXPLORATION PTY. LIMITED**

**HEAZLEWOOD EL 36/92**

**LOCATION PLAN**

Ref.: 7915, 7914	Scale: 1:100 000
Author: R. Parkinson	Report No.: 20626
Drawn: S. Brook	Plan No.: Tv 645

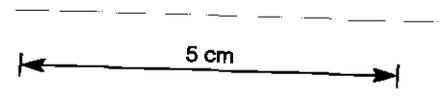


- - 20
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  - 20-20
  - 20-30
- 
- 30-40
  - ⊗ 40-60
  - ⊗ 60-130
  - ⊗ 130-172
  - ⊗ +172

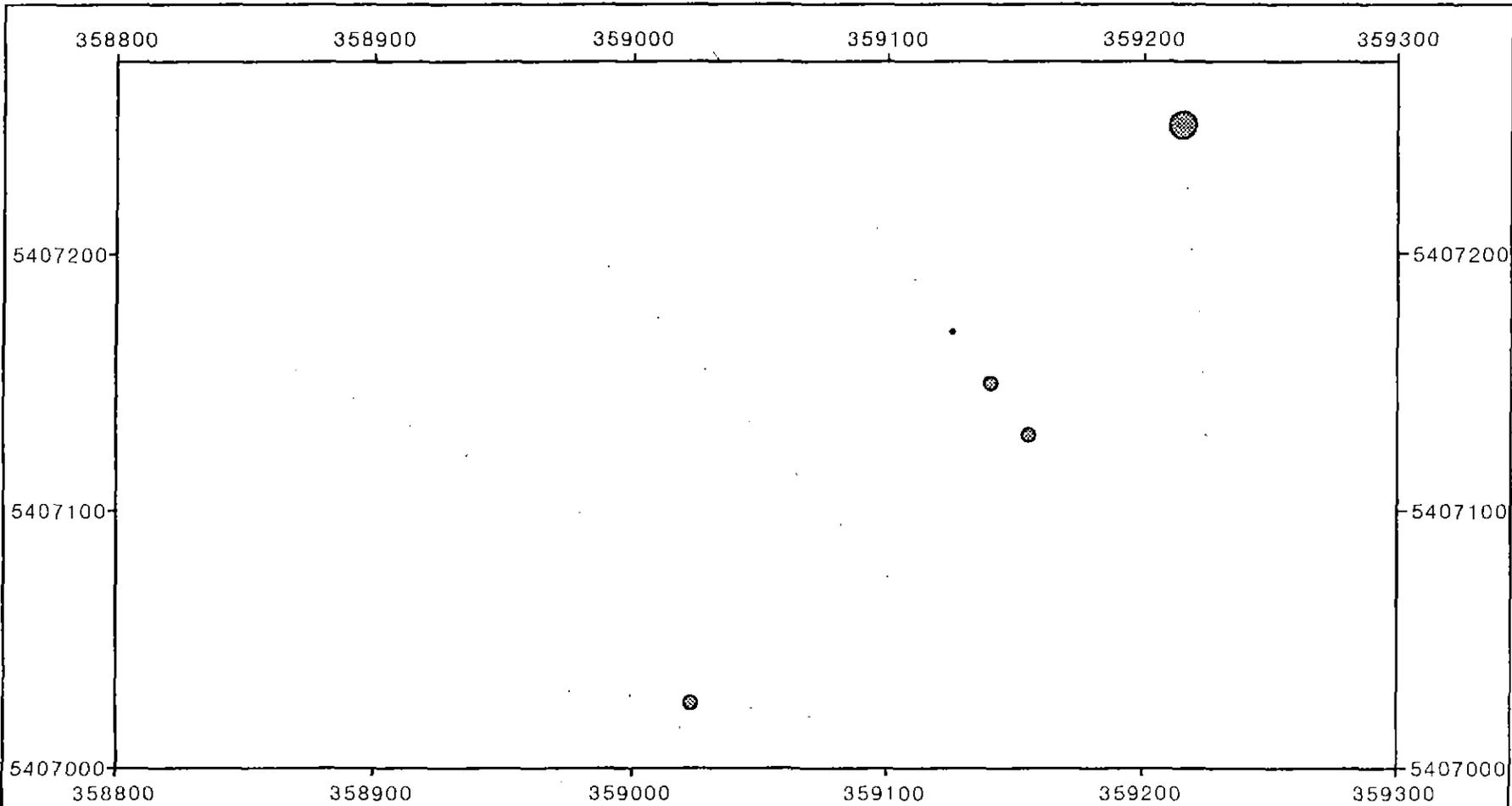
CRA EXPLORATION PTY. LIMITED		
HEAZLEWOOD EL 36/92		
<b>C-horizon Soil Samples - Cu ppm</b>		
Geol: S.Maher	Scale: 1:2500	Report: 20626
Drawn: S.Maher	Date: 01/20/95	Plan: Tv 889

DUFFS HILL PROSPECT

jmap 10m



818019



- 20-26
- ⊗ 26-31
- ⊙ 31-36
- ⊚ 36-41
- 15-20
- 10-15
- 5-10
- 5

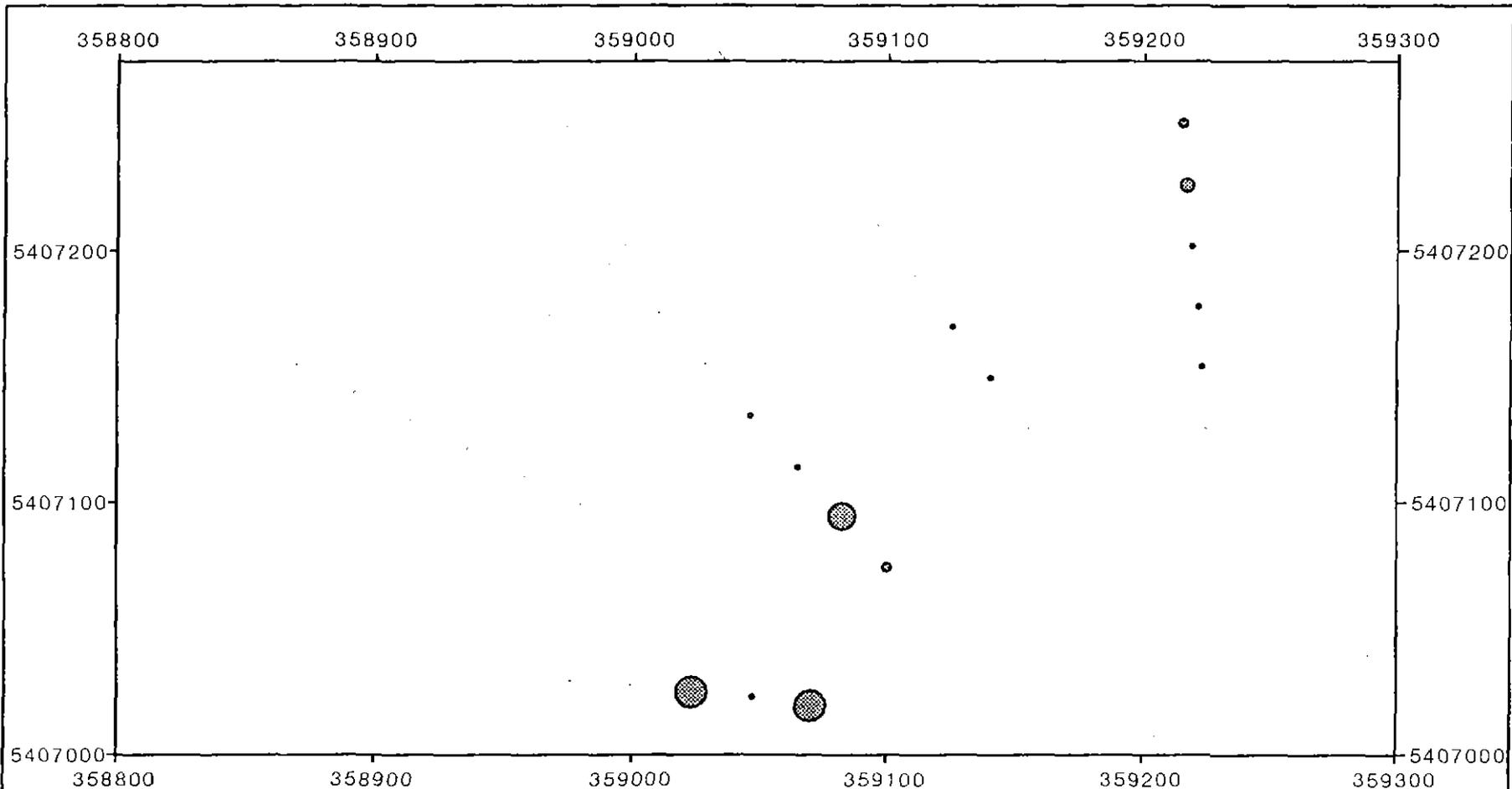
DUFFS HILL PROSPECT

jmap 10m

5 cm

CRA EXPLORATION PTY. LIMITED		
HEAZLEWOOD EL 36/92		
<b>C-horizon Soil Samples - Pb ppm</b>		
Geol: S.Maher	Scale: 1:2500	Report: 20626
Drawn: S.Maher	Date: 01/20/95	Plan: Tv 890

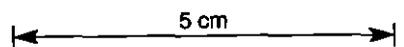
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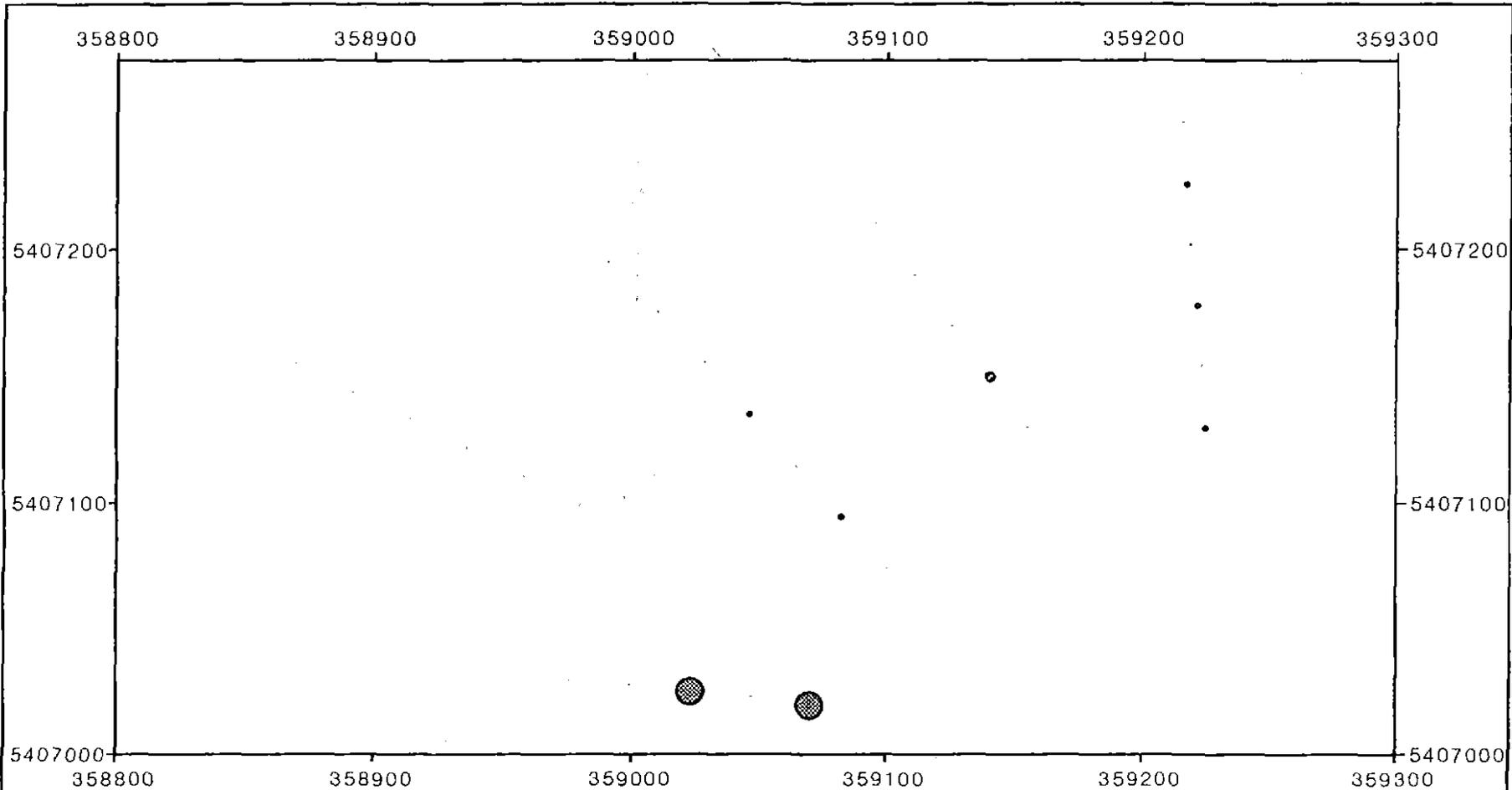
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  - 57-72
  - 72-87
- 
- ◉ 87-101
  - ◐ 101-116
  - ◑ 116-131
  - ◒ 131-146
  - ◓ +146

CRA EXPLORATION PTY. LIMITED		
HEAZLEWOOD EL 36/92		
<b>C-horizon Soil Samples - Zn ppm</b>		
Geol: S.Maher	Scale: 1:2500	Report: 20626
Drawn: S.Maher	Date: 01/20/95	Plan: Tv 891

DUFFS HILL PROSPECT



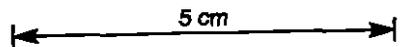
818021



- -1.2
- 1.2-2.3
- 2.3-3.5
- 3.5-4.6
- 4.6-5.8
- 5.8-6.9
- 6.9-8.1
- 8.1-9.2
- +9.2

CRA EXPLORATION PTY. LIMITED		
HEAZLEWOOD EL 36/92		
<b>C-horizon Soil Samples - As ppm</b>		
Geol: S.Maher	Scale: 1:2500	Report: <b>20626</b>
Drawn: S.Maher	Date: 01/20/95	Plan: Tv 892

DUFFS HILL PROSPECT



818022

APPENDIX I

GEOCHEMICAL ROCK SAMPLE LEDGERS AND LABORATORY  
REPORTS

CRAE Exploration Pty. Limited GEOCHEMICAL SAMPLE LEDGER: ROCK

Project: Tasmanian ultramafic N: Map Sheets  
 Tenement: EL 36/92 250,000: SK55-3  
 DPO: 77214 100/25,000: 7914, 7915/3439-41, 3639-41.

Sampler: SM & LV  
 Date: 30.3.1994

Units ppm % ppm % ppm % ppm %  
 Det.Limit: 2 0.01 3 0.01 2 0.01 1 10  
 Method: GA140 GA104 GA140 GA104 GA140 GA104 GA140 GA104

SAMPLE No.	EASTAMG	NORTHAMG			EL	PROSP.	sampleTYPE	ROCKtype	NOTES	Qu	Qu	Pb	Pb	Zn	Zn	Ag	Ag
3530567	359125	5407095	Adit 2W	0-1m (south)	36/92	Duffs Hill	channel chip-adit wall	Serpentinised extrusive	0m: southern end wall. Prominent slickensides, calcite amygdaloids common, trace geothite.	62	-	33	-	428	-	<1	-
3530568	359125	5407095	west wall	1-2m	36/92	Duffs Hill	channel chip-adit wall	Serpentinised extrusive	Prominent slickensides, calcite amygdaloids common, trace geothite and vein quartz.	224	-	32	-	874	-	2	-
3530569	359125	5407095	trends 140 mag	2-3m	36/92	Duffs Hill	channel chip-adit wall	Serpentinised extrusive	Prominent slickensides, calcite amygdaloids common, trace geothite and vein quartz.	368	-	171	-	911	-	1	-
3530570	359125	5407095		3-4m	36/92	Duffs Hill	channel chip-adit wall	Serpentinised extrusive	Prominent slickensides, calcite amygdaloids common, trace geothite and vein quartz.	427	-	385	-	872	-	2	-
3530571	359125	5407095		4-5m	36/92	Duffs Hill	channel chip-adit wall	Serpentinised extrusive	Prominent slickensides, calcite amygdaloids common, trace geothite and vein quartz.	285	-	854	-	762	-	<1	-
3530572	359125	5407095		5-6m	36/92	Duffs Hill	channel chip-adit wall	Serpentinised extrusive	Calcite amygdaloids common, trace geothite and vein quartz. Trace malachyte.	978	-	566	-	1475	-	<1	-
3530573	359125	5407095		6-7m (north)	36/92	Duffs Hill	channel chip-adit wall	Serpentinised extrusive	Calcite amygdaloids common, trace geothite and vein quartz. Trace malachyte.	1836	-	3964	-	2936	-	2	-
3530574	357500	5406310			36/92		grab-outcrop	Arkose arenite	Prom. fragmented feldspar, lesser mafic material and spinel. Trace silver sulphide.	12	-	10	-	72	-	<1	-
3530575	356250	5407000			36/92		grab-outcrop	Vein quartz	Trace silver sulphide and chlorite (after host) in gabbro host.	40	-	42	-	57	-	<1	-
3530576	359215	5407195	Adit 1E	0-2m (south)	36/92	Duffs Hill	channel chip-adit wall	Serpentinised pyroxenite	0m: southern end wall.	5	-	<3	-	40	-	<1	-
3530577	359215	5407195	trends ?	2-4m	36/92	Duffs Hill	channel chip-adit wall	Serpentinised pyroxenite		14	-	<3	-	40	-	<1	-
3530578	359215	5407195		4-6m	36/92	Duffs Hill	channel chip-adit wall	Serpentinised pyroxenite		3	-	<3	-	57	-	<1	-
3530579	359215	5407195		6-8m	36/92	Duffs Hill	channel chip-adit wall	Serpentinised pyroxenite		4	-	<3	-	67	-	<1	-
3530580	359215	5407195		8-10m	36/92	Duffs Hill	channel chip-adit wall	Serpentinised pyroxenite	Minor anorthosite dyke.	5	-	<3	-	69	-	<1	-
3530581	359215	5407195		10-12m	36/92	Duffs Hill	channel chip-adit wall	Weathered pyroxenite		16	-	<3	-	87	-	<1	-
3530582	359215	5407195		12-14m	36/92	Duffs Hill	channel chip-adit wall	Weathered pyroxenite		10	-	<3	-	66	-	<1	-
3530583	359215	5407195		14-16m	36/92	Duffs Hill	channel chip-adit wall	Weathered pyroxenite		8	-	68	-	177	-	<1	-
3530584	359215	5407195		16-18m	36/92	Duffs Hill	channel chip-adit wall	Weathered serpentinite		5	-	25	-	258	-	<1	-
3530585	359215	5407195		18-20m	36/92	Duffs Hill	channel chip-adit wall	Weathered serpentinite		7	-	<3	-	59	-	<1	-
3530586	359215	5407195		20-22m (north)	36/92	Duffs Hill	channel chip-adit wall	Weathered serpentinite	Minor clay	8	-	22	-	89	-	<1	-
3530587	362000	5412950			36/92		grab-outcrop	Sheared tonalite	Boudined/sheared rock. In vicinity of sluicing drain network.	12	-	<3	-	35	-	<1	-
3530588	361875	5410565			36/92		grab-outcrop	Sheared, sulphidic mafic volcanic.	Slickensided serpentinous partings with minor pyrrhotite in a fine mafic rock with plag. zones (possible associated hellyerite/zaratite).	3	-	<3	-	50	-	<1	-

818024

Analabs, Cocece Tasmania.

Units % ppm % ppm ppm ppm ppm ppm ppm ppm % %  
 Det Limit: 0.01 0.01 3 0.01 3 3 0.5 50 0.008 0.008 0.008 0.005 0.005  
 Method: GA140 GA104 GA140 GA104 GA140 GA140 HA140 GA140 GG314 GG314 GG314 OM613 OM613

	Fe	Fe	Mn	Mn	Co	Ni	As	As	Au	Pd	Pt	S	S(R)
3530567	-	6.41	1243	-	28	100	20.5	-	0.013	<0.008	<0.008	0.01	0.01
3530568	-	8.41	1179	-	37	109	37	-	0.037	<0.008	<0.008	0.005	-
3530569	-	8.05	1026	-	37	121	30	-	0.008	<0.008	<0.008	0.005	-
3530570	-	6.47	1149	-	26	106	16.5	-	0.013	<0.008	<0.008	0.01	-
3530571	-	6.69	1142	-	28	88	15	-	0.105	<0.008	<0.008	0.01	-
3530572	-	5.98	1444	-	27	92	9	-	0.024	<0.008	<0.008	0.005	0.01
3530573	-	6	1098	-	28	92	9	-	0.252	0.015	<0.008	0.015	-
3530574	4.08	-	217	-	12	35	2	-	<0.008	<0.008	<0.008	0.01	-
3530575	2.69	-	668	-	22	117	4	-	0.01	<0.008	<0.008	0.34	0.32
3530576	4.35	-	1084	-	34	165	1.5	-	<0.008	<0.008	<0.008	0.01	-
3530577	3.77	-	1323	-	30	161	1.5	-	<0.008	<0.008	<0.008	0.015	-
3530578	-	7.81	1609	-	36	160	1.5	-	<0.008	<0.008	<0.008	0.01	-
3530579	4.18	-	1462	-	32	148	1.5	-	<0.008	<0.008	<0.008	0.005	-
3530580	-	7.74	1874	-	48	250	2.5	-	<0.008	<0.008	<0.008	0.01	-
3530581	-	9.47	2096	-	54	244	1.5	-	<0.008	<0.008	<0.008	0.01	-
3530582	-	8.3	3736	-	53	251	2.5	-	<0.008	<0.008	<0.008	0.015	-
3530583	-	7.07	1576	-	41	221	2	-	<0.008	<0.008	<0.008	0.01	-
3530584	4.26	-	1189	-	44	204	2	-	<0.008	<0.008	<0.008	0.01	-
3530585	3.81	-	1064	-	44	209	2	-	<0.008	<0.008	<0.008	0.01	-
3530586	-	6.22	1187	-	41	301	4.5	-	0.011	<0.008	<0.008	0.01	0.01
3530587	2.77	-	464	-	19	115	0.5	-	<0.008	<0.008	<0.008	0.015	-
3530588	-	6.39	1104	-	95	1028	1.5	-	0.165	<0.008	<0.008	0.03	-

818025

CRAE Exploration Pty. Limited GEOCHEMICAL SAMPLE LEDGER: ROCK

Project: Tasmanian ultramafic Ni Map Sheets Sampler: SM & LV  
 Tenement: EL 36/92 250,000: SK55-3 Date: 30.3.1994  
 DPO: 77214 100/25,000: 7914, 7915/3439-41, 3639-41.

Units ppm % ppm % ppm % ppm ppm  
 Del.Limit: 2 0.01 3 0.01 2 0.01 1 10  
 Method: GA140 GA104 GA140 GA104 GA140 GA104 GA140 GA104

SAMPLE No.	EAST AMG	NORTH AMG	EL	PROSP.	sample TYPE	ROCK type	NOTES	Cu	Cu	Pb	Pb	Zn	Zn	Ag	Ag
3530589	360950	5407950	36/92		composite grab-float	Sulphidic basalt	Medium basalt with trace disseminated and wispy seams of pyrite & chalcopyrite.	115	-	<3	-	131	-	<1	-
3530590	361000	5412600	36/92		grab-outcrop	Serpentinite breccia	White carbonate cements slickensided serpentinite fault breccia.	4	-	<3	-	44	-	<1	-
3530591	358815	5403390	36/92		grab-outcrop	Sulphidic basalt	Locally silicified (nodular) fine grained, chloritic, mafic rock with 3% arsenopyrite-pyrite-chalcopyrite.	51	-	22	-	163	-	<1	-
3530592	358905	5403480	36/92		grab-float	Sulphidic mafic breccia	Fine grained mafic breccia cemented by 2% (arseno)pyrite.	191	-	<3	-	65	-	<1	-
3530593	358525	5399240	36/92		grab-outcrop	Serpentinite	Serpentinised ?dunite w/ chloritic partings.	8	-	<3	-	44	-	<1	-
3530594	359530	5399050	36/92		grab-outcrop	Pyroxenite	Medium grained pyroxenite w/ 2% 2mm disseminated spinel.	8	-	<3	-	44	-	<1	-
3530595	357585	5402390	36/92		sel.grab-subcrop	Pyritic pyroxenite	Silicified pyroxenite w/ 2-3% pyrite as blebs and disseminations.	95	-	3	-	62	-	<1	-
3530596	358850	5402635	36/92		grab-outcrop	Serpentinised peridotite	Fine-medium grained, serpentinised, olivine-plagioclase bearing rock.	9	-	<3	-	75	-	<1	-
3530597	355200	5406585	36/92		sel grab-outcrop	Tonalite	Fine-medium grained tonalite. ?Trace disseminated 2mm pentlandite.	22	-	20	-	74	-	<1	-
3530598	359250	5405220	36/92		comp.grab-adit wall	Basalt	Leven Creek Au mine. Fine grained basalt w/ amygdalae. Graphite lined partings host azurite-malachyte.	682	-	<3	-	85	-	<1	-
3530599	359125	5407090	36/92	Duffs Hill	comp.grab-outcrop	Gossan	Gossanous goethite, from trench above adit 2W.	30	-	<3	-	358	-	<1	-
3530600	359125	5407090	36/92	Duffs Hill	comp.grab-outcrop	Sulphidic qtz rock	Boxworked silica-?epidote rock with 2% pyrite-chalcopyrite and rare vein quartz.	14	-	<3	-	161	-	<1	-
3989101	357880	5401480	36/92		grab-outcrop	Quartz-tourmaline vein		10	-	<3	-	13	-	<1	-
3989103	358990	5400010	36/92		grab-outcrop	Chromite-rich dunite.		8	-	<3	-	53	-	<1	-
3989123	360410	5402060	36/92		grab-outcrop	Calc-silicate	L.green-white, medium grained calc-silicate w/ amphibole-qtz-?feldspar.	26	-	11	-	43	-	<1	-
3989135	359125	5407095	36/92	Duffs Hill	channel chip-adit wall	Sulphidic foliated silicified rock	Sphalerite-chalcopyrite-goethite-malachyte-azurite-chalcocite bearing, strongly foliated, pervasively silicified rock. Mineralisation confined to 0-50cm, strongly foliated (40/80 mag) lensoidal zone with minor vein quartz.		2.32	-	0.6	-	0.83	36	-
3989136	359125	5407095	36/92	Duffs Hill	channel chip-adit wall	Sulphidic foliated silicified rock	Sphalerite-chalcopyrite-goethite-malachyte-azurite-chalcocite bearing, strongly foliated, pervasively silicified rock. Mineralisation confined to 0-50cm, strongly foliated (40/80 mag) lensoidal zone with minor vein quartz.		4.45	-	0.39	-	7.8	32	-

Analabs. Coode Tasmania.

Units % % ppm % ppm ppm ppm ppm ppm ppm ppm % %  
 Del.Limit: 0.01 0.01 3 0.01 3 3 0.5 50 0.008 0.008 0.008 0.005 0.005  
 Method: GA140 GA104 GA140 GA104 GA140 GA140 HA140 GA140 GG314 GG314 GG314 OM613 OM613

	Fe	Fe	Mn	Mn	Co	Ni	As	As	Au	Pd	Pt	S	S(R)
3530589	-	8.15	907	-	31	68	2	-	<0.008	0.026	<0.008	0.045	0.045
3530590	-	5.37	723	-	82	1067	2	-	<0.008	<0.008	<0.008	0.02	-
3530591	4.29	-	478	-	36	146	4.5	-	<0.008	<0.008	<0.008	0.16	0.14
3530592	-	7.86	842	-	51	90	3	-	<0.008	<0.008	<0.008	0.26	0.26
3530593	-	4.67	688	-	95	2041	2	-	<0.008	<0.008	<0.008	0.015	-
3530594	-	4.92	711	-	92	1825	1	-	<0.008	<0.008	<0.008	0.01	-
3530595	4.27	-	904	-	28	63	9	-	<0.008	<0.008	<0.008	0.25	-
3530596	3.71	-	482	-	98	1825	17.5	-	<0.008	<0.008	<0.008	0.01	-
3530597	3.02	-	575	-	12	39	5	-	<0.008	<0.008	<0.008	0.02	-
3530598	-	10	2778	-	95	506	5.5	-	<0.008	0.012	<0.008	0.015	0.01
3530599	-	8.92	2239	-	170	2256	11	-	<0.008	<0.008	<0.008	0.015	-
3530600	-	5.89	1838	-	76	968	1.5	-	<0.008	<0.008	<0.008	0.02	-
3989101	0.59	-	38	-	<3	28	1	-	<0.008	<0.008	<0.008	0.015	-
3989103	-	4.65	757	-	99	1670	5.5	-	<0.008	<0.008	<0.008	0.01	-
3989123	1.39	-	276	-	22	143	1	-	<0.008	<0.008	<0.008	0.01	-
3989135	-	12	4431	-	88	424	15.5	-	0.215	0.011	<0.008	0.065	-
3989136	-	8.33	1214	-	48	128	16.5	-	1.3	<0.008	<0.008	5.95	-

818027

CRAE Exploration Pty. Limited GEOCHEMICAL SAMPLE LEDGER: ROCK

Project: Tasmanian ultramafic Ni Map Sheets  
 Tenement: EL 36/92 250,000: SK55-3  
 DPO: 77214 100/25,000: 7914, 7915/3439-41, 3639-41.

Sampler: SM & LV  
 Date: 30.3.1994

Units ppm % ppm % ppm % ppm ppm  
 Det.Limit: 2 0.01 3 0.01 2 0.01 1 10  
 Method: GA140 GA104 GA140 GA104 GA140 GA104 GA140 GA104

SAMPLE No.	EASTAMG	NORTHAMG			EL	PROSP.	sampleTYPE	ROCKtype	NOTES								
										Cu	Cu	Pb	Pb	Zn	Zn	Ag	Ag
3989137	359125	5407095	trends 140 mag	2-3m	36/92	Duffs Hill	channel chip-adit wall	Sulphidic foliated silicified rock	Sphalerite-chalcopryrite-goethite-malachyte-azurite-chalcoite bearing, strongly foliated, pervasively silicified rock. Mineralisation confined to 0-50cm, strongly foliated (40/80 mag) lensoidal zone with minor vein quartz.	-	1.52	-	1.04	-	1.1	10	-
3989138	359125	5407095		3-4m	36/92	Duffs Hill	channel chip-adit wall	Veined chloritic rock	Chloritic rock with prominent fabric defined by qtz-carbonate micro-veining. Strong silicification.	-	0.51	-	5.3	-	5.22	5	-
3989139	359125	5407095		4-5m	36/92	Duffs Hill	channel chip-adit wall	Veined chloritic rock	Chloritic rock with prominent fabric defined by qtz-carbonate micro-veining. Strong silicification.	2270	-	1617	-	2925	-	<1	-
3989140	359125	5407095		5-6m	36/92	Duffs Hill	channel chip-adit wall	Sulphidic, silicified ?basalt	Silicified, malachyte-azurite-chalcoite-goethite bearing chloritic ?basalt.	-	8	-	7.63	-	3.86	-	64
3989141	359125	5407095		6-7m	36/92	Duffs Hill	channel chip-adit wall	Sulphidic, silicified ?basalt	Silicified, malachyte-azurite-chalcoite-goethite bearing hydraulically brecciated chloritic ?basalt.	2521	-	577	-	2077	-	1	-
3989142	359125	5407095		7-8m	36/92	Duffs Hill	channel chip-adit wall	Sulphidic, silicified ?basalt	Locally silicified, chloritic ?basalt with malachyte-azurite staining.	-	0.85	745	-	3855	-	11	-
3989143	359125	5407095		8-9m	36/92	Duffs Hill	channel chip-adit wall	Sulphidic, silicified ?basalt	Locally silicified, chloritic ?basalt with prominent malachyte-azurite staining.	-	0.95	-	0.97	-	1.19	-	128
3989144	359125	5407095		9-10m	36/92	Duffs Hill	channel chip-adit wall	Sulphidic, silicified ?basalt	Locally silicified, chloritic ?basalt with malachyte-azurite staining.	2928	-	873	-	867	-	5	-
3989145	359125	5407095		10-11m	36/92	Duffs Hill	channel chip-adit wall	Sulphidic, silicified ?basalt	Locally silicified, chloritic ?basalt with prominent malachyte-azurite staining.	2556	-	419	-	627	-	12	-
3989146	359125	5407095		11-12m	36/92	Duffs Hill	channel chip-adit wall	Sulphidic, silicified ?basalt	Locally silicified, chloritic ?basalt with malachyte-azurite staining.	1841	-	64	-	569	-	6	-
3989147	359125	5407095		12-13m	36/92	Duffs Hill	channel chip-adit wall	Sulphidic, silicified ?basalt	Locally silicified, chloritic ?basalt with malachyte-azurite staining.	1735	-	145	-	975	-	9	-
3989148	359120	5407190	Adit 1W	0-2m (south)	36/92	Duffs Hill	channel chip-adit wall	Silicified green rock	Pervasively silicified green rock with qtz-goethite micro-veining. Prominent slickensides.	20	-	14	-	109	-	<1	-
3989149	359120	5407190	trends 120 AMG	2-4m	36/92	Duffs Hill	channel chip-adit wall	Silicified mafic rock	Pervasively silicified green rock with qtz-goethite micro-veining and fine chromite disseminations. Trace very fine grained ?sulphides. Prominent slickensides.	16	-	17	-	224	-	<1	-
3989150	359120	5407190		4-6m	36/92	Duffs Hill	channel chip-adit wall	Silicified mafic rock	Silicified chloritic rock with qtz-goethite micro-veining and fine chromite disseminations. Trace very fine grained ?sulphides. Prominent slickensides.	20	-	11	-	280	-	<1	-
3989151	359120	5407190		6-8m	36/92	Duffs Hill	channel chip-adit wall	Silicified mafic rock	Silicified chloritic rock with qtz-goethite micro-veining and fine chromite disseminations. Trace very fine grained ?sulphides. Prominent slickensides.	115	-	85	-	438	-	<1	-
3989152	359120	5407190		8-10m	36/92	Duffs Hill	channel chip-adit wall	Fine grained mafic rock	Weathered fine grained pyroxene bearing mafic rock.	419	-	63	-	497	-	<1	-
3989153	359120	5407190		10-12m (north)	36/92	Duffs Hill	channel chip-adit wall	Fine grained mafic rock	Weathered fine grained pyroxene bearing mafic rock.	401	-	108	-	616	-	2	-
3989154	359145	5407120	Adit 3W	0-2m (south)	36/92	Duffs Hill	channel chip-adit wall	Serpentinite	Slickensided, carbonate veined serpentinite.	14	-	<3	-	82	-	<1	-

818028

Analabs, Coee Tasmania.

Units: % % ppm % ppm ppm ppm ppm ppm ppm ppm % %  
 Del.Limit: 0.01 0.01 3 0.01 3 3 0.5 50 0.008 0.008 0.008 0.005 0.005  
 Method: GA140 GA104 GA140 GA104 GA140 GA140 HA140 GA140 GG314 GG314 GG314 OM613 OM613

	Fe	Fe	Mn	Mn	Co	Ni	As	As	Au	Pd	Pt	S	S(R)
3989137	-	7.34	1181	-	30	179	3	-	5.67	0.028	<0.008	0.42	-
3989138	-	6.97	1078	-	34	128	7	-	3.23	<0.008	<0.008	0.25	-
3989139	-	7.1	1110	-	30	105	7	-	0.082	<0.008	<0.008	0.06	-
3989140	-	8.07	747	-	21	86	5	-	5.81	0.011	<0.008	2.95	-
3989141	-	7.98	1463	-	42	175	4	-	0.095	<0.008	<0.008	0.02	-
3989142	-	6.91	1871	-	62	337	4	-	0.134	<0.008	<0.008	0.11	-
3989143	-	6.88	1991	-	70	389	25.5	-	0.655	<0.008	<0.008	0.45	-
3989144	-	10.5	-	0.59	118	1192	-	1220	0.058	<0.008	<0.008	0.035	-
3989145	-	8.05	3385	-	96	844	-	720	0.07	<0.008	<0.008	0.03	0.025
3989146	-	6.84	1643	-	37	338	32.5	-	0.026	0.009	<0.008	0.03	-
3989147	-	7.61	1969	-	50	335	28.5	-	0.021	0.01	<0.008	0.02	-
3989148	-	7.41	928	-	51	436	4.5	-	<0.008	<0.008	<0.008	0.01	-
3989149	-	9.4	2909	-	93	1100	10	-	<0.008	<0.008	<0.008	0.01	-
3989150	-	7.3	1345	-	95	1093	5.5	-	<0.008	<0.008	<0.008	0.02	-
3989151	-	9.59	3575	-	118	1714	-	180	0.009	0.008	<0.008	0.05	-
3989152	-	5.84	1328	-	30	138	21	-	0.016	<0.008	<0.008	0.015	-
3989153	-	5.43	754	-	22	110	11.5	-	0.035	<0.008	<0.008	0.015	0.015
3989154	-	4.66	754	-	55	600	4.5	-	<0.008	<0.008	<0.008	0.01	-

818029

CRAE Exploration Pty. Limited GEOCHEMICAL SAMPLE LEDGER: ROCK

Project: Tasmanian ultramafic Ni Map Sheets  
 Tenement: EL 36/92 250,000: SK55-3  
 DPO: 77214 100/25,000: 7914, 7915/3439-41, 3639-41.

Sampler: SM & LV  
 Date: 30.3.1994

Units ppm % ppm % ppm % ppm ppm  
 Det Limit: 2 0.01 3 0.01 2 0.01 1 10  
 Method: GA140 GA104 GA140 GA104 GA140 GA104 GA140 GA104

SAMPLE no.	EASTAMG	NORTHAMG			EL	PROSP.	sampleTYPE	ROCKtype	NOTES	Qu	Qu	Pb	Pb	Zn	Zn	Ag	Ag
										ppm	%	ppm	%	ppm	%	ppm	ppm
3989155	359145	5407120	trends ?	2-4m	36/92	Duffs Hill	channel chip-adit wall	Serpentinite	Slickensided, carbonate veined serpentinite.	20	-	<3	-	89	-	<1	-
3989156	359145	5407120		4-6m	36/92	Duffs Hill	channel chip-adit wall	Serpentinite	Slickensided, carbonate veined serpentinite.	19	-	3	-	111	-	<1	-
3989157	359145	5407120		6-8m	36/92	Duffs Hill	channel chip-adit wall	Serpentinite	Slickensided, carbonate veined serpentinite. Locally silicified, qtz veined.	55	-	63	-	205	-	<1	-
3989158	359145	5407120		8-10m	36/92	Duffs Hill	channel chip-adit wall	Serpentinite	Slickensided, carbonate veined serpentinite. Locally silicified, qtz veined.	93	-	133	-	188	-	<1	-
3989159	359145	5407120		10-12m	36/92	Duffs Hill	channel chip-adit wall	Serpentinite	Slickensided, carbonate veined serpentinite. Locally silicified, qtz veined.	263	-	643	-	411	-	1	-
3989160	359145	5407120		12-14m	36/92	Duffs Hill	channel chip-adit wall	Serpentinite	Slickensided, carbonate veined serpentinite with qtz amygdales. Locally silicified and qtz veined. Trace malachyle.	2769	-	238	-	329	-	3	-
3989161	359145	5407120		14-16m (north)	36/92	Duffs Hill	channel chip-adit wall	Serpentinite	Slickensided, carbonate veined serpentinite with qtz amygdales. Locally silicified and qtz veined. Trace malachyle.	1394	-	631	-	795	-	<1	-
3989162	359060	5401905			36/92		comp.grab-mullock	Sulphidic qtzite breccia	Mount Stewart Ag-Pb Mine. Vein quartz-galena-pyrite-chalcopyrite-sphalerite-tzaiderite cement qtzite breccia.	667	-	-	4.22	-	3.77	-	476

818030

Analabs, Cooeu Tasmania.

Units % % ppm % ppm ppm ppm ppm ppm ppm ppm % %  
 Def.Limit: 0.01 0.01 3 0.01 3 3 0.5 50 0.008 0.008 0.008 0.005 0.005  
 Method: GA140 GA104 GA140 GA104 GA140 GA140 HA140 GA140 GG314 GG314 GG314 OM613 OM613

	Fe	Fe	Mn	Mn	Co	Ni	As	As	Au	Pd	Pt	S	S(R)	
3989155	-	6.49	1162	-		44	372	1.5	-	<0.008	<0.008	<0.008	0.015	-
3989156	-	7.94	1250	-		60	292	32	-	<0.008	<0.008	<0.008	0.02	-
3989157	-	8.54	3020	-		55	434	36	-	<0.008	<0.008	<0.008	0.015	-
3989158	-	6.4	1943	-		32	100	7.5	-	<0.008	0.011	<0.008	0.01	-
3989159	-	4.71	994	-		26	126	15	-	0.012	0.011	<0.008	0.02	-
3989160	-	5.87	1547	-		28	77	5.5	-	0.012	0.01	<0.008	0.02	0.02
3989161	-	5.62	1476	-		29	93	8.5	-	<0.008	<0.008	<0.008	0.015	-
3989162	-	19.3	-		11	15	88	43.5	-	<0.008	<0.008	<0.008	3.3	-

818031

CRA Exploration Pty. Limited GEOCHEMICAL SAMPLE LEDGER: ROCK						LAB: Inchcape Testing Services Pty. Ltd. (Analabs).													
Project: Tasmanian ultramafic		Map Sheets		Geologist: S.Maher		Units		ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	
Tenement: EL 36/92		250,000, SK55-3		Date: December, 1994		Det.Limit:		2	3	2	1	0.1	3	10	3	3	0.005	0.5	
DPO# 77227		100/25,000: 7914, 7915/3439-41, 3639-41.				Method		GA140	GA140	GG313	HA140								
SAMPLEno.	EASTAMG	NORTHAMG	PROSP	sampleTYPE	ROCKtype	NOTES	Cu	Pb	Zn	Ag	Fe(1)	Mn	Bi	Co	Ni	Au	As		
3989450	359250	5407000	Duffs Hill	rep grab - o/c	Peridotolite	Mg, massive pyroxene (minor plag) bearing rock. Minor coarse pyroxenite veins.	4	<3	34	<1	6.9	745	<10	92	1174	<0.005	<0.5		
3989451	359246	5407017	Duffs Hill	rep grab - o/c	Peridotolite	Mg, massive pyroxene (minor plag) bearing rock. Minor coarse pyroxenite veins.	5	<3	45	<1	6.8	886	<10	89	1520	<0.005	<0.5		
3989452	359242	5407034	Duffs Hill	rep grab - o/c	Peridotolite	Mg, massive pyroxene (minor plag) bearing rock. Minor coarse pyroxenite veins. Trace silver sulphide disseminations. Rare disseminated chromite.	4	<3	39	<1	7	892	<10	86	1423	<0.005	<0.5		
3989453	359238	5407051	Duffs Hill	rep grab - o/c	Serpentinite	Massive serpentinite with irregular serpentinite-magnetite seams.	5	<3	38	<1	6	882	<10	92	1287	<0.005	<0.5		
3989454	359235	5407070	Duffs Hill	rep grab - o/c	Peridotolite	M-cg, massive pyroxene (minor plag) bearing rock. Trace silver sulphide seams. Rare disseminated chromite and serpentinite-magnetite seams. Above talus slope.	5	<3	36	<1	6	820	<10	87	1547	<0.005	<0.5		
3989473	360380	5402355		sel grab - float	Pisolite	Goethite cemented pisolite with relict cg pyroxenite. From stream sed. sample 3530792 location.	8	<3	51	<1	12.5	114	<10	159	218	<0.005	28.6		

818032

APPENDIX II

PETROLOGY LABORATORY REPORTS

PETROGRAPHIC NOTES FOR 3 SAMPLES  
FROM THE HEAZLEWOOD RIVER ULTRAMAFIC COMPLEX

Prepared for Simon Maher, CRA Exploration Pty. Ltd..

3530559. Brecciated, degraded low-Ti basalt with low-T quartz-calcite-chalcopyrite veins.

The host rock is dominated by very fine 50-400  $\mu\text{m}$  laths of albitised plagioclase. Semi-radiating clusters and some very fine peg-shaped terminations suggest quench crystallisation. 50-200  $\mu\text{m}$  masses of <5- $\mu\text{m}$  chlorite flakes (20%) and <150- $\mu\text{m}$  anhedral quartz (10%) replace interstitial glass or pyroxenes. The quartz may be crystallised chalcedony. Minor <5-mm patchy calcite is mostly a replacement, but in one place forms a 2.5-mm ?amygdale. Very minor <1.5-mm subhedral pyrite is disseminated in the host rock. Anhedral <30- $\mu\text{m}$  rutile and sphene are very rare: this is consistent with Peck & Keays' (1990) name, "low-Ti tholeiite".

In a stockwork of <5-mm high-level veinlets, 5- $\mu\text{m}$  chert forms early crusts, followed by 0.5-mm strained prismatic quartz (crystallised chalcedony?), then <1-mm stubby prismatic quartz, and finally <2-mm interstitial calcite and quite abundant chalcopyrite. <1.5-mm subhedral pyrite occurs with the coarse chalcopyrite, but is less than half as common. The early crusts and minor veinlets of chert also contain very minor <200- $\mu\text{m}$  subhedral calcite and <10- $\mu\text{m}$  chalcopyrite. Some prismatic quartz contains rare 0.1-mm rosettes of a brown sheet silicate resembling stilpnomelane.

Rare high-density primary fluid inclusions in stubby prismatic quartz probably formed at low T.

The quartz textures indicate rapid cooling, perhaps where a vein system opened onto the ocean floor, or at a later stage at shallow depth.

3530561. Cu-mineralised, altered, unevenly vesiculated low-Ti basalt.

Most of the sample consists of 0.1-0.4 mm rosettes of length-fast fibres which could be albite or a zeolite, and minor chlorite. Interstices between the rosettes are filled with 0.1-0.2 mm anhedral quartz and masses of fine chlorite. In part of the sample the fibrous phase seems to fill abundant 0.1-1 mm irregular vesicles, with the framework replaced by massive, fine, isotropic chlorite. Disseminated <30- $\mu\text{m}$  rutile is extremely rare.

Quite prominent irregular cavities up to a few mm across are filled with 0.2-2 mm anhedral quartz and rare calcite.

Anhedral 2-100  $\mu\text{m}$  chalcopyrite (3%) is disseminated through the host rock. Coarser chalcopyrite up to 1 mm is a minor phase in the quartz cavity fillings. Some of this coarse quartz has vapour inclusions suggesting boiling.

3530562. Massive bornite ore; from the same area as 3530503.

This rock consists of 30-150  $\mu\text{m}$  anhedral and stubby prismatic quartz (50%), 30-200  $\mu\text{m}$  haematized magnetite (3%) and massive interstitial bornite (40%). Inclusions of <30- $\mu\text{m}$  anhedral carbonate and bornite coated with covellite are common in quartz.

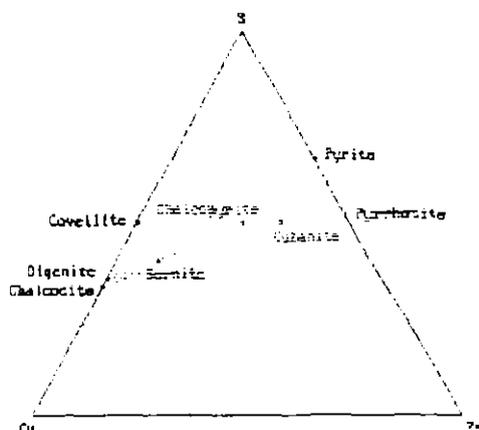
Very minor <0.1-mm bleb-shaped inclusions of galena in bornite may have exsolved from it on cooling. A number of other features developed during cooling and under supergene conditions. Ubiquitous but minor submicron to 30- $\mu\text{m}$  thick lamellae and lenses of chalcopyrite clearly exsolved from bornite. Complete alteration of magnetite to <200- $\mu\text{m}$  tabular and anhedral haematite is probably supergene. Very minor covellite forms grain-boundary films between haematite and bornite. At one end of the sample bornite is heavily weathered to a very fine mixture of covellite and goethite, with a few small masses of fibrous malachite. Veinlets a few  $\mu\text{m}$  across of this material are quite common in bornite.

Chalcopyrite exsolution from bornite shows that it cooled from a more FeS-rich composition (see Fig. 1), and is not a supergene mineral.

My calculations show that bornite-magnetite is stable at moderate pH in a very low-S ( $\text{H}_2\text{S}$ -dominant) system at, say 250°. At  $10^{-4}\text{M}$   $\text{H}_2\text{S}$ , pyrite is stable at  $\log f_{\text{O}_2} > -32.35$  but only at very low pH. The stable Fe phases at moderate pH are haematite at  $\log f_{\text{O}_2} > 34.3$  or magnetite between that value and -41.5 (QFM). The stable Cu phase is chalcopyrite at  $\log f_{\text{O}_2} > -37.2$ , and bornite below that value; the bornite field expands very rapidly as the  $\text{H}_2\text{S}$  content of the fluid drops further.

These conditions are probably more appropriate to a reaction zone near serpentinised ultramafic rocks than to a hydrothermal vent on a basaltic ocean floor, where the fluid usually contains enough S to stabilised pyrite and chalcopyrite.

Fig. 1. Some phases in the system Cu-Fe-S at 25°. The dotted region shows the compositional field of bornite at 300° (Barnes, 1979; p. 375). Bornite which formed in equilibrium with chalcopyrite or cubanite (intermediate solid solution) at 250° would retreat towards  $\text{Cu}_5\text{FeS}_4$ , and exsolve minor chalcopyrite with cooling.



## REFERENCES

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PECK, D.C. & R.R. KEAYS (1990). Geology, geochemistry, and platinum group element-chromitite occurrences in the Heazlewood River Complex, Tasmania. Econ. Geol., 85, 765-793.

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(077)735407  
February 24, 1994

APPENDIX III

GEOCHEMICAL DRAINAGE SEDIMENT SAMPLE LEDGERS AND  
LABORATORY REPORTS

## KEY TO GEOCHEMICAL DRAINAGE SAMPLING LEDGER

### HEADER DATA - Soil Explanatory

SAMPLE No. CRAE 7 figure number.

### LOCATION

Co-ords.: AMG or grid co-ordinates

remember if grid co-ordinates used at least 2 points should have AMG co-ords. (for metrication of grid sample numbers.)

### SAMPLE TYPE

1. Stream Sediment Sample.
2. Panned Concentrate Sample.
3. Bulk Sediment Sample.
4. Clay Sample (suspended silt.)
5. Loam Sample.
6. Magnetic Fraction.
7. Water Sample.
8. Miscellaneous Sample.

- .1 Sized by mesh sieves.
- .2 Sized by millimetre sieves.
- .3 Not sized.

3.2 Bulk sample sized by millimetre sieves.

SAMPLE SIZE Minisize, maxisize - data from sieve sizes used.

SAMPLE DESCRIPTION Percentage of gravel, sand, silt/clay and organic matter at the sample size.

### SITE DESCRIPTION

Catchment: Size in square kilometres.

Contamination:

1. No apparent contamination.
2. Urban e.g. Houses, rubbish, etc.
3. Roads, tracks, railways, dams, stone quarries, etc.
4. Metalliferous Mine, workings or tailings in catchment area.
5. Rubbish (man made) if separate from 2.
6. Agricultural e.g. Fertilisers, cattle yards, heavy cultivation, animal faeces or remains.
7. Natural dilution from banks of creek.

### Site Rating:

- |             |                   |
|-------------|-------------------|
| 1. Good     | 3. Poor           |
| 2. Moderate | 4. Unsatisfactory |

### Banks:

- |              |                       |
|--------------|-----------------------|
| 1. Alluvial  | 3. Alluvial/Colluvial |
| 2. Colluvial | 4. No defined channel |

### Flow:

- |          |         |
|----------|---------|
| 1. Dry   | 3. Slow |
| 2. Pools | 4. Fast |

Width: Width of channel in metres.

### ROCK TYPE

1. Conglomerate
2. Breccia
3. Greywacke
4. Arkose
5. Sandstone
6. Siltstone
7. Shale
8. Black Shale
9. Mudstone

21. Limestone
22. Dolomite
23. Banded Iron Formation
24. Carbonatic Shale
25. Chert

31. Pegmatite
32. Granite
33. Porphyritic Granite
34. Adamellite
35. Granodiorite
36. Diorite
37. Gabbro
38. Peridotite
51. Rhyolitic lava
52. Rhyolitic pyroclastics
53. Trachyte
54. Andesitic lava
55. Andesitic pyroclastics
56. Basaltic lava
57. Basaltic pyroclastics
58. Dolerite

66. Quartzite
67. Hornfels
68. Marble
69. Slate
70. Phyllite
71. Schist
72. Amphibolite
73. Gneiss

86. Quartz veins
87. Gneisen
88. Gossan
89. Ironstone
90. Laterite

818038

Project: Tasmania - Ultramafic NI

Map Sheets

Sampler: SM & LV

Tenement: EL 36/92

250,000: SK55-3

Date: March 1994

100/25,000: 7914, 7915/3439-41, 3639-41.

DPO: 77215

SAMPLE No.	LOCATION		DPO#	SAMPLE description						SITE description						ROCK type			GEOLOGICAL observations
	co-ords			type	size		proportion			catchment	contam.	site rating	banks	flow	width	float			
	AMGE	AMGN			min.	max.	gravel	sand	silt/clay							organic	mej.	min.	
3989102	358960	5400020	77215	1.1	180u	60	35	4	1	7	2	3	3	1	89	-	-	Abundant ironstone float, dunite outcrop with vein and disseminated chromite.	
3989104	3589030	5400140	77215	1.1	180u	60	45	6	0	7	1	1	3	1.5	86	89	-	38 Abundant rounded quartz gravels	
3989105	359660	5400210	77215	1.1	180u	40	65	3	2	7	2	3	3	2	38	-	-	38 Dunitic and fine grained pyroxenite float, dunite outcrop.	
3989106	359910	5400080	77215	1.1	180u	30	66	3	1	1	1	1	4	3	32	38	-	32 Coarse grained granite float, abundant rounded quartz and feldspar gravels. Granite outcrop.	
3989107	358965	5401225	77215	1.1	180u	40	55	6	0	4	2	3	3	1	32	67	-	67 Contact-mel. dunite + f.gr. pyroxenite. Sluice channels present.	
3989108	358290	5401270	77215	1.1	180u	25	70	6	0	7	1	3	3	1	32	-	-	Granitic float + rounded quartz gravels.	
3989109	357950	5402050	77215	1.1	180u	15	77	8	0	1	1	1	3	1	32	26	-	Weakly hematitic microgranite float.	
3989110	359620	5404180	77215	1.1	180u	30	56	10	6	4	3	3	4	7	25	5	-	56 Olivine basalt outcrop, strongly weathered.	
3989111	359610	5404220	77215	1.1	180u	40	62	6	2	7	2	2	3	2	56	5	25	No outcrop, very close to #110.	
3989112	362230	5409900	77215	1.1	180u	10	40	40	10	1	1	1	3	2	38	66	58	No outcrop.	
3989113	361540	5410120	77215	1.1	180u	10	70	15	6	1	1	3	4	2	68	38	56	38 Medium grained (plag. poor) pyroxenite outcrop.	
3989114	361700	5411400	77215	1.1	180u	5	70	25	0	1	1	1	3	3	25	37	-	Ab. jasperite float, minor tonalite float.	
3989115	361650	5411460	77215	1.1	180u	5	60	35	0	1	1	1	3	7	36	25	-	Quartz-diorite outcrop, trace of calcite veining.	
3989116	361840	5411910	77215	1.1	180u	10	65	30	6	1	2	2	3	2	37	58	-	38 Quartz-Gabbro outcrop (quartz<5%).	
3989117	360420	5402350	77215	1.1	180u	17	80	3	0	1	2	1	3	6	32	71	1	71 Quartz-sericite-chlorite schist, lesser conglomerate outcrop.	
3989118	360360	5402385	77215	1.1	180u	26	60	5	10	7	3	4	3	1	89	32	1	1 Very flat drainage through gravelly ironstone soil. Poorly sorted sub-angular conglom. outcrop.	
3989119	360640	5401050	77215	1.1	180u	15	80	5	0	1	1	3	3	1	32	-	-	32 Ab. quartz gravel, large c.gr. granite boulders.	
3989120	360580	5401080	77215	1.1	180u	10	66	6	0	1	2	2	4	5	32	-	-	32 As above.	
3989121	360410	5402060	77215	1.1	180u	16	65	20	0	1	1	3	3	4	32	-	-	32 Med. f.gr. microgranite? with green amphiboles present (petrology sample). Trace of greisen veins.	
3989122	360350	5402060	77215	1.1	180u	22	70	5	3	1	2	3	3	1	32	67	-	32 Fine grained green-white 'calc-silicate', some hornfels float.	
3989124	362060	5406390	77215	1.1	180u	3	60	36	2	1	1	3	3	1	5	66	37 56?	Orange-yellow clay soil, could be derived from basalt.	
3989125	362090	5406440	77215	1.1	180u	16	70	10	5	1	1	3	3	2	37	5	-	No outcrop.	
3989126	360950	5405820	77215	1.1	180u		36	65	0	1	1	1	3	1	6	6	-	Clean, white fine silt-sand in creek. Minor decomposed fine-grained quartzarenite float.	
3989127	360940	5405060	77215	1.1	180u			95	5	7	3	2	3	1	9	-	-	No outcrop, very little float, silt-mud.	
3989128	361000	5406070	77215	1.1	180u	10	76	15	0	1	1	3	3	2	5	-	-	Weathered green-brown fine gr. quartzarenite float. Ab. clean sands in creek.	
3989129	358600	5407110	77215	1.1	180u	20	75	5	0	1	2	3	3	6	38	56	-	38 Med. - fine grained (plag. poor) pyroxenite outcrop.	
3989130	358880	5407190	77215	1.1	180u	66	90	3	2	3	3	1	3	1	38	-	-	38 Weathered ilmonitic, strongly sheared pyroxene-serpentine outcrop.	
3989131	359180	5407630	77215	1.1	180u	75	22	3	0	1	2	3	3	1	38	-	-	38 Fine grained saccharoidal pyroxenite outcrop.	
3989132	359670	5407280	77215	1.1	180u	15	80	5	0	1	1	3	4	5	38	37	72	38 Dark green-black actinolite rich med. gr. pyroxenite outcrop.	
3989133	359720	5407160	77215	1.1	180u	16	80	5	0	1	2	3	3	1.5	38	37	-	38 Med. gr. pyroxenite outcrop; trace plag.	
3989134	359530	5407050	77215	1.1	180u	35	60	10	5	7	2	2	3	1	38	-	-	38 Dark green-black calc-rich serpentinised ultramafic.	
3530701	366830	5408015	77215	1.1	180u	75	20	4	1	1	7	3	2	3	2	38	-	-	38 Layered pyroxenite minor plag. Prominent chr & magn.
3530702	359375	5409520	77215	1.1	180u	80	16	3	2	1.3	7	2	3	2	1	38	-	-	38 Layered plag/pyrox bearing rock. Prom chr & magn.
3530703	359065	5408810	77215	1.1	180u	70	20	9	1	0.8	7	2	2	2	1	38	-	-	38 Coarse pyroxenite & gabbro. Prom chr & magn.
3530704	358650	5407785	77215	1.1	180u	70	24	4	2	1	7	2	3	3	2	38	-	-	38 No outcrop.
3530705	358365	5407600	77215	1.1	180u	25	70	6	0	0.8	1	1	3	3	1	37	-	-	37 Fine gabbro outcrop. Prom spinel in samp.
3530706	357965	5408635	77215	1.1	180u	60	37	2	1	1	1	1	4	1	38	-	-	38 Strongly serp/sheared magnetic dunite?, gabbro to S. Prom spinel in samp.	
3530707	357865	5408520	77215	1.1	180u	75	20	4	1	1	1	1	3	2	38	-	-	38 Weakly serp/magnetic pyroxenite. Trace plag.	
3530708	358020	5409285	77215	1.1	180u	20	77	2	1	1.5	1	1	4	1	38	-	-	38 Withrd serp-pyroxenite outcrop. Prom spinel in sample.	
3530709	358835	5406230	77215	1.1	180u	20	60	27	3	0.8	4.7	3	2	3	0.5	56	38	-	No outcrop. Old Jasper Mine in catchment. Sulphidic basalt float.
3530710	358750	5406200	77215	1.1	180u	20	50	28	2	0.7	7	2	2	3	0.5	56	-	-	No outcrop. Prominent chromite in sample.
3530711	358720	5406160	77215	1.1	180u	4	60	46	1	0.9	1	1	2	3	0.5	56	-	-	No outcrop.
3530712	358670	5407200	77215	1.1	180u	30	65	5	0	0.8	1	1	2	4	1	38	56	86	No outcrop.
3530713	358610	5406770	77215	1.1	180u	30	65	5	0	1	7	2	2	4	1	5	86	-	5 Coarse poorly sorted sandstone outcrop.
3530714	357720	5406140	77215	1.1	180u	65	49	2	0	1	7	2	1	4	1	86	38	56	38 Prominent spinels in samples.
3530715	361660	5407430	77215	1.1	180u	60	35	6	0	1	7	2	1	4	2	66	25	-	No outcrop. Basalt has ferruginous pits after sulphide?
3530716	362375	5407820	77215	1.1	180u	30	65	5	0	2.3	7	1	2	4	2.5	66	-	-	No outcrop.
3530717	366060	5407346	77215	1.1	180u	30	67	3	0	0.9	1	1	2	3	1	38	86	-	38 Sheared pyroxenite outcrop.
3530718	356186	5406800	77215	1.1	180u	37	60	3	0	0.8	1	2	2	3	3	38	86	-	38 Medium grained pyroxenite with sigmoidal quartz veins (3-4cm) outcrop.
3530719	362000	5412950	77215	1.1	180u	60	46	5	0	1	4	1	1	4	2	37	-	-	37 Sluicing drains upstream. Sheared gabbro outcrop.

818039



Project: Tasmania - Ultramafic Ni  
Tenement: EL 36/92

Map Sheets  
250,000: SK55-3  
100/25,000: 7914, 7915/3499-41, 3639-41.

Sampler: SM & LV  
Date: March 1994  
DPO: 77215

SAMPLE No.	LOCATION		DPO#	SAMPLE Description		SITE Description					ROCK Type			GEOLOGICAL Observations						
	co-ords			type	size	proportion	catchment	contam.	site rating	banks	flow	width	float		outcrop					
	AMGE	AMGN		min.	max.	gravel	send	silt/clay	organic				min.	min.						
3530720	362540	5412610	77215	1.1	180u	5	90	5	0	off EL	1	1	3	4	6	9	25	5	37	Dolerite outcrop.
3530721	361375	6412196	77215	1.1	180u	10	70	5	15	1.1	7	2	3	3	2	37	36	-	37	Sheared and quartz veined dolerite outcrop.
3530722	361850	6410845	77215	1.1	180u	35	45	18	2	1.4	7	1	3	3	6	25	35	-	38	Fine-medium grained pyroxene bearing rock (minor plagioclase) - locally silicified outcrop.
3530723	361875	6410565	77215	1.1	180u	30	55	5	10	0.8	1	2	2	3	1	56	-	-	-	No outcrop.
3530724	360950	6407950	77215	1.1	180u	25	65	5	5	1	1	2	2	4	2	56	38	-	-	No outcrop. Sulphidic basalt float. Trace disseminated pyrite & chalcocopyrite.
3530725	360830	6408155	77215	1.1	180u	20	74	4	2	1	1	1	3	4	1.5	56	-	-	-	No outcrop. Weathered basalt float.
3530726	360465	6408230	77215	1.1	180u	20	70	4	6	1	7	2	2	3	1	56	-	-	56	Fine grained very mafic rock.
3530727	360465	6408145	77215	1.1	180u	5	75	5	15	1	1	1	3	4	7	37	66	-	37	Gabbro outcrop.
3530728	360895	6408660	77215	1.1	180u	0	70	30	0	1	1	1	3	3	5	37	26	6	37	Medium gabbro outcrop.
3530729	360696	6409105	77215	1.1	180u	0	65	15	20	1.3	2	2	3	4	1	38	-	-	38	Mela-gabbro-norite outcrop.
3530730	361325	6409700	77215	1.1	180u	10	85	5	0	1	1	1	3	3	5	56	37	38	56	Fine grained mafic rock outcrop.
3530731	361260	6413475	77215	1.1	180u	45	50	6	0	0.8	7	2	2	3	0.5	38	-	-	38	Dunite outcrop. Alluvial Os-Ir workings downstream.
3530732	361225	6413435	77215	1.1	180u	45	50	6	0	0.8	1	1	1	3	1	38	-	-	38	Dunite outcrop. Alluvial Os-Ir workings downstream.
3530733	360830	6413380	77215	1.1	180u	45	50	5	0	2	1	1	1	3	1	38	-	-	38	Coarse pyroxenite outcrop. Alluvial Os-Ir workings downstream.
3530734	368580	6403820	77215	1.1	180u	0	50	50	0	0.4	1	1	3	3	2	56	25	-	-	No outcrop. Prominent basalt float. Possible contamination from Whyte Rv.
3530735	368815	6403390	77215	1.1	180u	50	48	2	0	1	7.4	2	3	4	2	32	56	-	-	No outcrop. Medium qtz-bio bearing rock and locally silicified sulphidic basalt float. Alluvial workings downstream.
3530736	368905	6403480	77215	1.1	180u	20	77	3	0	1	7	1	3	4	4	32	56	38	38	Locally silicified medium grained pyrox-plagioclase bearing rock outcrop. High qtz dilution of sample.
3530737	368700	6404000	77215	1.1	180u	30	65	6	0	1	1	1	1	3	0.5	56	-	-	-	No outcrop. Fine olivine bearing rock float.
3530738	368795	6403965	77215	1.1	180u	20	75	4	1	7.4	1	2	3	3	7	25	-	-	-	No outcrop. Cleveland mine in catchment.
3530739	368525	6399240	77215	1.1	180u	40	57	3	0	3.5	1	1	3	4	2	38	32	-	38	Chloritic serpentinite outcrop. Sample diluted by granitic qtz.
3530740	368540	6399310	77215	1.1	180u	40	57	3	0	2	1	1	3	4	2	38	32	-	38	Chloritic serpentinite outcrop. Sample diluted by granitic qtz.
3530741	369530	6399050	77215	1.1	180u	40	50	1	9	1.7	1	1	3	4	3	38	32	-	38	Massive medium grained pyroxenite outcrop. Sample diluted by granitic qtz.
3530742	369625	6399020	77215	1.1	180u	40	50	3	7	1.5	1	2	2	3	0.5	38	32	-	38	Massive medium grained pyroxenite outcrop. Sample diluted by granitic qtz.
3530743	367585	6402390	77215	1.1	180u	10	80	10	0	1	1	1	2	4	1.5	38	25	6	38	Silicified sulphidic pyroxenite outcrop. Sulphide is pyrite (2%).
3530744	368850	6402635	77215	1.1	180u	10	85	5	0	1.7	4	1	2	4	2.5	38	90	86	38	Ol-plagi-serp bearing rock outcrop, prominent white mica. Pb-Ag or W mine in
3530745	360000	6403315	77215	1.1	180u	10	85	5	0	0.9	1	1	1	3	5	16	-	-	-	No outcrop.
3530746	360630	6402860	77215	1.1	180u	10	85	5	0	1	1	1	1	3	3	66	-	-	-	No outcrop.
3530747	367020	6410330	77215	1.1	180u	30	55	5	10	1	3	3	3	3	0.5	38	-	38	-	Pyroxenite-dunite outcrop with spinel banding. Creeks runs along track-sample diluted by locally derived material.
3530748	365200	6406585	77215	1.1	180u	10	85	5	0	0.8	1	1	3	3	7	36	38	-	36	Tonalite outcrop with possible trace peridotite disseminations.
3530749	355150	6406600	77215	1.1	180u	10	85	5	0	1	1	1	2	4	0.5	38	-	-	36	Tonalite outcrop.
3530750	367650	6411340	77215	1.1	180u	50	45	6	0	0.9	1	1	2	4	1	38	-	-	38	Serpentinized dunite outcrop, prominent spinel.
3530751	357730	6411450	77215	1.1	180u	60	35	2	3	1.2	4	2	1	3	1.5	38	56	72	38	Serpentinite with prominent spinel outcrop. Tert? basalt float. Os-Ir alluvial workings in catchment.
3530752	358520	6411710	77215	1.1	180u	40	50	4	6	1	4	2	1	3	1	38	-	-	38	Sheared serpentinite outcrop.
3530753	368490	6411775	77215	1.1	180u	60	33	6	2	1	3	3	2	3	1	38	-	-	38	Sheared serpentinite outcrop.
3530754	366040	6410370	77215	1.1	180u	50	43	5	2	1.3	1.1	1	3	4	1	38	-	-	38	Sheared serpentinite outcrop.
3530755	365990	6410440	77215	1.1	180u	30	60	5	5	1.7	4	1	1	4	2	38	72	56	38	Sheared serpentinite outcrop. Os-Ir alluvial workings in catchment.
3530756	365230	6409045	77215	1.1	180u	60	47	3	0	0.9	4	2	3	3	3	6	38	36	6	Strongly foliated hematitic Cambrian siltstone outcrop. Alluvial workings in catchment.
3530757	365275	6409200	77215	1.1	180u	50	35	6	10	1.3	4	1	3	3	4	38	6	36	38	Sheared serp. outcrop. Alluvial workings in catchment.
3530758	354415	6408490	77215	1.1	180u	10	20	70	0	1	1	1	2	3	1	69	66	-	69	Slate outcrop.
3530759	354430	6408550	77215	1.1	180u	30	47	3	20	1	4	2	2	4	4	69	66	38	69	Slate outcrop. Alluvial workings in catchment.
3530760	367830	6407290	77215	1.1	180u	20	72	6	3	1	7	1	1	3	7	38	37	-	38	Fine grained pyroxenite outcrop w/ localised serpentinite.
3530761	364965	6405745	77215	1.1	180u	20	70	3	7	1	1	1	3	4	6	3	-	-	3	M. micaceous sed? rock outcrop w/ detrital qtz & spinel.
3530762	364915	6405660	77215	1.1	180u	10	65	10	15	1	1	1	1	3	1	36	3	-	-	No outcrop. Tonalite float.
3530763	354640	6405800	77215	1.1	180u	20	60	10	10	1.4	1	1	2	3	1	69	66	56	69	Slate and F. chloritic basalt w/ qtz outcrop.
3530764	366905	6406970	77215	1.1	180u	50	40	2	8	0.8	1	2	1	3	0.7	38	-	-	38	Wthrd F dunite outcrop. M pyroxenite float.
3530765	366926	6406900	77215	1.1	180u	50	40	2	8	7	2	1	3	0.7	38	-	-	38	Wthrd F dunite outcrop. M pyroxenite float.	
3530766	366845	6406065	77215	1.1	180u	20	77	3	0	1	1	1	3	3	7	6	38	-	6	Hematitic siltstone outcrop.
3530767	366150	6406160	77215	1.1	180u	20	77	3	0	1	1	1	3	3	6	38	37	-	38	Massive M. pyroxenite outcrop.
3530768	366195	6408145	77215	1.1	180u	40	50	4	6	1	1	1	1	3	1	38	37	-	-	No outcrop.
3530769	366765	6406045	77215	1.1	180u	20	70	10	0	0.8	1	1	1	3	0.5	5	9	56	6	Foliated pelite outcrop. Greywacke float contains detrital? feld and spinel.

818041



Project: Tasmania - Ultramafic Ni  
 Tenement: EL 36/92

Map Sheets  
 250,000: SK55-3  
 100/25,000: 7914, 7915/3439-41, 3639-41

Sampler: SM & LV  
 Date: March 1994  
 DPO: 77215

SAMPLE No.	LOCATION		DPO#	SAMPLE description					SITE description							ROCK type			GEOLOGICAL observations	
	co-ords			type	size		proportion			catchment	contam.	site rating	banks	flow	width	float				outcrop
	AMGE	AMGN			min.	max.	gravel	sand	silt/clay							organic	maj.	min.		
3530770	363040	6413720	77215	1.1	180u	40	57	3	0	1	7	1	1	4	6	58	3	36	58	
3530771	362890	6414600	77215	1.1	180u	10	85	5	0	1	1	1	1	3	5	66	69	-	-	
3530772	382716	6414600	77215	1.1	180u	0	20	40	40	1.4	1	2	4	2	3	-	-	-	-	
3530773	362560	6413110	77215	1.1	180u	10	30	10	60	1	7	2	1	3	1	58	-	-	58	M. dolerite outcrop.
3530774	359920	6410680	77215	1.1	180u	40	50	5	5	1	7	1	1	3	1.5	38	-	-	38	Plag. pyroxenite and lesser serpentinite/dunite outcrop.
3530775	359850	6410610	77215	1.1	180u	10	40	30	20	1.3	7	1	1	3	1.5	38	-	-	38	Plag. pyroxenite and lesser serpentinite/dunite outcrop.
3530776	357535	6403630	77215	1.1	180u	10	80	10	0	1.2	1	1	3	3	2	56	-	-	38	Chloritic basalt float.
3530777	357485	6403605	77215	1.1	180u	5	85	10	0	1	1	1	1	4	3	66	56	37	38	Pyroxenite outcrop.
3530778	358060	6403465	77215	1.1	180u	75	20	5	0	0.9	1	2	3	3	2	38	-	-	38	Pyroxenite outcrop.
3530779	356805	6403945	77215	1.1	180u	30	60	10	0	0.6	1	1	2	4	1	38	-	-	38	F. plag. pyroxenite outcrop.
3530780	367025	6404000	77215	1.1	180u	30	60	10	0	0.6	7	2	1	3	0.6	66	-	-	66	VF. mafic rock. Sample may be contaminated by Whyte Rv flood sediment.
3530781	359675	6404945	77215	1.1	180u	30	60	5	5	1	7	1	1	3	1	56	-	-	-	Sulphidic basalt float. Sulphides are disseminated py.



CRA Exploration Pty. Limited GEOCHEMICAL DRAINAGE SAMPLING LEDGER

Project: Tasmania - Ultramafic Ni

Map Sheets

Sampler: SM & VM

Tenement: EL 36/92

250,000: SK55-3

Date: November 1994

100/25,000: 7914, 7915/3439-41, 3639-41.

DPO: 77226

SAMPLE No.	LOCATION		DPO#	SAMPLE description						SITE description						ROCK type			GEOLOGICAL observations	
	co-ords			type	size		proportion		catchment	contam.	site rating	banks	flow	width	float			outcrop		
	AMGE	AMGN			min.	max.	gravel	sand							sill/clay	organic	float			min.
3989196	358200	5411500	77226	1.1	180u	60	35	3	2		4	1	2	4	0.5	38		38	Abundant chromite. Serpentinite o/c. Alluvial Os-Ir workings in catchment.	
3989197	357700	5411400	77226	1.1	180u	0	60	30	10		4.7	2	2	1	1	38		38	Abundant chromite. Serpentinite o/c. Alluvial Os-Ir workings in catchment.	
3989198	357230	5411275	77226	1.1	180u	60	30	5	5		1	1	2	3	0.5	38		38	Serpentinite o/c.	
3989199	357740	5410955	77226	1.1	180u	60	35	3	2		3	1	2	4	0.5	38		38	Serpentinised massive ?dunite with 5% chromite o/c. Catchment includes Fenton's Knob and earth disturbance.	
3989200	357735	5410920	77226	1.1	180u	0	60	25	15		3	2	2	4	0.5	38		38	Serpentinised massive ?dunite with 5% chromite o/c. Catchment includes Fenton's Knob and earth disturbance.	
3530782	357610	5410950	77226	1.1	180u	30	50	5	15		7	2	1	4	0.4	38		38		
3530783	358060	5410840	77226	1.1	180u	10	80	17	3		1	1	1	4	1.5	38		38	Layered pyroxenite-peridotite o/c.	
3530784	358240	5410630	77226	1.1	180u	10	50	30	20		7	2	1	3	0.5	38				
3530785	358210	5410575	77226	1.1	180u	30	25	5	40		1	2	1	4	1	38		38	Layered pyroxenite-peridotite o/c.	
3530786	357610	5410515	77226	1.1	180u	50	40	10	0		1	2	1	4	1	38		38	Pyroxene-minor plag bearing o/c.	
3530787	357430	5410520	77226	1.1	180u	50	40	10	0		3	2	1	4	1	38		38	Chromite bearing serpentinite o/c.	
3530788	357360	5410600	77226	1.1	180u	50	30	10	10		1	2	2	3	1.5	38		38	Chromite bearing serpentinite o/c.	
3530789	357205	5410425	77226	1.1	180u	40	50	5	5		3	3	1	4	1	38		38	Chromite bearing serpentinite ?dunite o/c.	
3530790	357200	5410390	77226	1.1	180u	20	40	10	30		1	3	1	3	0.4	38		38		
3530791	356985	5410345	77226	1.1	180u	40	40	15	5		3	2	1	3	1	38			Float is cemented by sandy material in creek.	
3530792	360380	5402355	77226	1.1	180u	45	45	10	0		1	1	1	4	0.5	38	90	38	Prominent laterite float - relict pyroxenite	
3530793	359400	5409520	77226	1.1	180u	20	70	10	0		1	1	1	4	0.5	37	38	37	Layered gabbro o/c.	
3530794	359240	5409625	77226	1.1	180u	20	70	10	0		1	1	1	4	0.4	90	37	38	37	Significant pisolitic material in creek. Prominent chromite in sample.
3530795	359165	5409625	77226	1.1	180u	20	70	10	0		1	1	1	4	0.4	90	37	38	37	Significant pisolitic material in creek. Prominent chromite in sample.
3530796	359115	5409620	77226	1.1	180u	20	70	10	0		1	1	1	4	0.4	90	37	38	37	Significant pisolitic material in creek. Prominent chromite in sample.

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LABORATORY: Australian Laboratory Services P/L

Method:	IC587	IC587	IC587	IC587	IC587	IC587	IC587	IC587	IC587	IC587	IC587	IC587	IC587	IC587	IC587
Element:	Cu	Pb	Zn	Fe	Mn	Co	Cr	Al	Ba	Ca	Mg	Na	Ni	Ti	V
Unit:	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Det Limit:	5	5	5	100	5	5	5	100	10	100	100	100	5	10	10
3989196	21	-5	91	98500	1500	211	1050	2500	-10	700	117000	200	3700	231	12
3989197	23	-5	413	126000	1930	263	55700	16900	-10	1300	77900	200	1850	231	231
3989198	17	-5	126	89300	1380	135	4380	2800	-10	700	70600	100	2140	99	21
3989199	7	-5	260	115000	2510	244	24710	10700	11	1600	75600	200	2130	209	109
3989200	29	-5	247	219000	4670	432	22010	16400	21	1300	66300	200	2610	318	127
3530782	24	-5	307	192000	2940	375	35500	15600	20	1300	54100	200	1760	215	169
3530783	5	-5	84	109000	2490	298	1670	3500	-10	1400	127000	200	3250	200	22
3530784	8	-5	151	123000	963	197	9070	5200	-10	800	69300	200	2090	247	43
3530785	-5	-5	416	101000	1330	198	42810	19900	-10	4400	44100	200	1180	264	201
3530786	9	-5	898	146000	1490	272	103100	41400	-10	3600	41500	200	761	374	609
3530787	9	-5	290	86800	1490	155	25800	11900	-10	4200	48500	200	861	166	155
3530788	20	-5	201	84700	1000	169	16510	7300	-10	800	130000	100	2760	125	87
3530789	12	-5	346	105000	1880	203	37800	15300	-10	2300	66300	100	1150	191	206
3530790	14	-5	171	165000	1040	174	17900	9300	-10	1600	95400	100	1430	84	96
3530791	10	-5	213	87700	1440	157	17500	8100	-10	2600	87600	100	1410	111	101
3530792	18	12	596	98600	1400	139	46700	20500	25	3600	39200	1500	714	804	167
3530793	16	-5	221	82200	3630	226	16400	20600	44	6300	23200	500	881	859	117
3530794	13	-5	315	85500	1950	191	23300	16600	18	2200	13500	300	752	1420	122
3530795	18	-5	505	129000	3450	268	84000	46000	23	5600	26200	400	604	1020	383
3530796	10	-5	500	85200	1200	179	71000	30100	-10	4600	17600	200	300	800	410

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APPENDIX IV

GEOCHEMICAL SOIL SAMPLE LEDGERS AND LABORATORY  
REPORTS

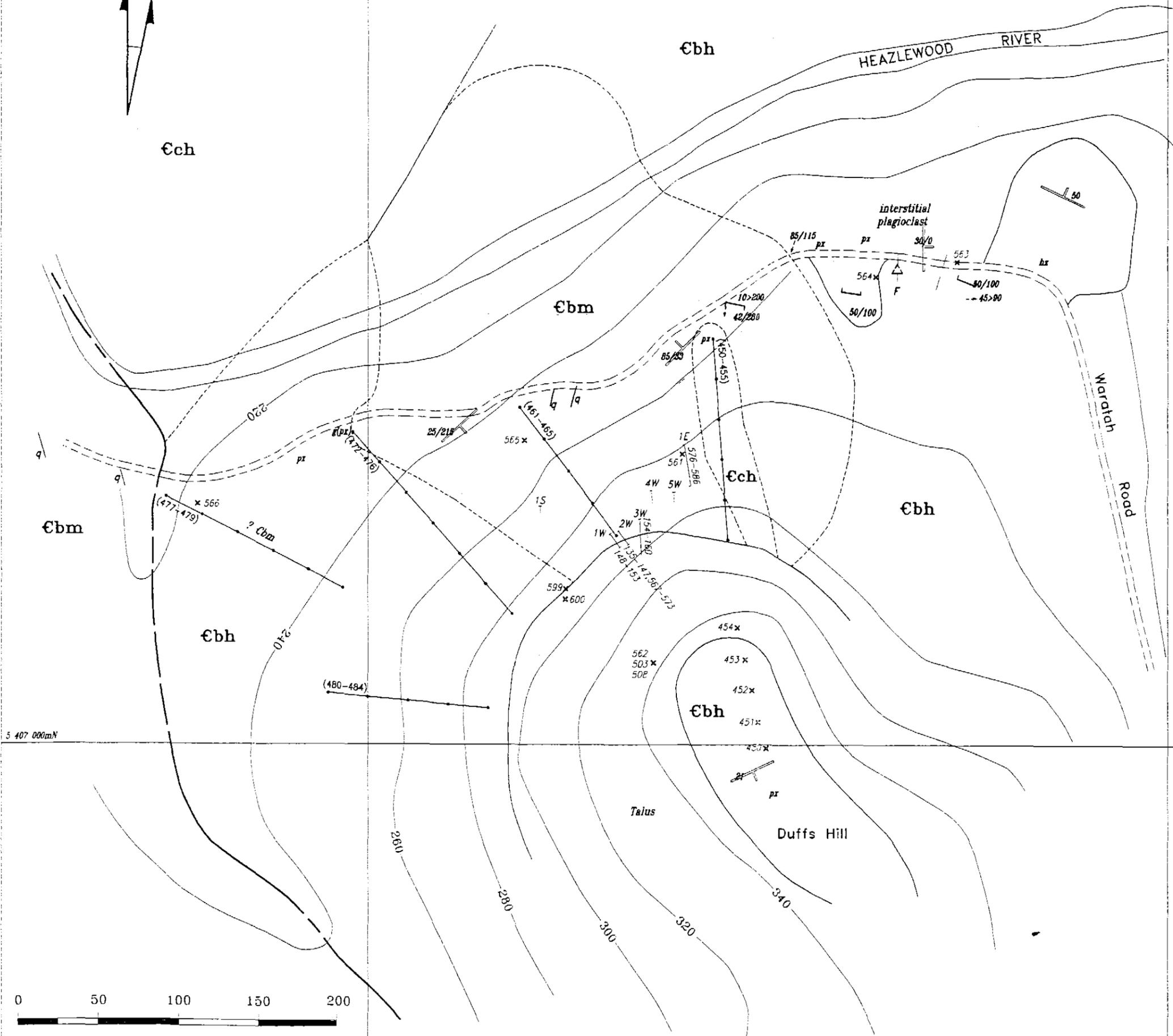
CRAE Exploration Pty. Limited GEOCHEMICAL SAMPLE LEDGER: SOIL																										
Project Ultramafic Ni, Tasmania				Map Sheet				Samples: SM & VM				LAB: Incharge Testing Services Pty. Ltd. (Analab)														
Tenement: EL 3692				250,000 5K55-3				Date: December, 1994																		
DPO# 77227				100/25,000: 7914, 7915/3439-41, 3839-41.																						
SAMPLE No	EASTING	NORTHING	PROSP.	sample TYPE	SOIL type	horizon	colour	texture	depth(m)	comments	ppm		ppm		%		%		ppm		ppm		ppm		ppm	
											Cu	Pb	Zn	Ag	Re	Fe(1)	Mn	Co	Ni	Cr	Au	Au(R)	Bi	As		
										Power Pole Ridge. Base of talus slope. Transported downslope.																
3989455	359225	5407130	Duff's Hill	hand auger	transported		orange	clay	0.90		150	6	39	<1	-	6.4	1079	150	862	<1	<0.005	-	1	4		
3989456	359223	5407154	Duff's Hill	hand auger	residual	7C	orange	clay	1.00	Adjacent fmg pyroxene-minor plagioclase bearing o/c.	6	<3	58	<1	4.89	-	1345	70	877	<1	<0.005	-	<1	<0.5		
3989457	359221	5407178	Duff's Hill	hand auger	residual	C	green	friable clay	0.80	Adjacent m-fg pyroxene-minor plagioclase bearing o/c. with late gabbro veins.	12	<3	69	<1	-	14.5	9743	273	1943	1	<0.005	-	<1	3.6		
3989458	359219	5407202	Duff's Hill	hand auger	residual	C	green	friable clay	0.60	Adjacent of pyroxenite. Adit 1E - 20m (245M).	39	3	63	<1	-	9.8	3625	123	1198	<1	<0.005	-	<1	1.5		
3989459	359217	5407228	Duff's Hill	hand auger	residual	C	yellow-green	gritty friable clay	0.45	Adjacent of pyroxenite.	25	<3	99	<1	-	14.8	3278	201	1453	<1	<0.005	-	2	4.2		
3989460	359215	5407250	Duff's Hill	hand auger	residual	7C	orange	friable clay	0.80	Adjacent fmg pyroxene-minor plagioclase bearing o/c.	29	46	83	<1	-	16.3	1055	198	1219	<1	<0.005	1/S	<1	3.3		
3989461	359095	5407210	Duff's Hill	hand auger	residual	C	orange	gritty friable clay	1.50	Middle Ridge - on Waratah Road.	78	<3	54	<1	-	6.3	1204	87	302	<1	<0.005	-	<1	2.6		
3989462	359110	5407190	Duff's Hill	hand auger	residual	7C	orange	gritty friable clay	0.50		45	8	53	<1	-	5.3	637	39	264	<1	<0.005	-	<1	3		
3989463	359125	5407170	Duff's Hill	hand auger	residual	7C	orange	gritty friable clay	0.50	Adit 1S - 26m (220M).	148	17	68	<1	-	6	558	52	334	<1	<0.005	-	<1	2.9		
3989464	359140	5407150	Duff's Hill	hand auger	?transported		orange	gritty friable clay	0.50	Transported downslope.	183	30	71	<1	-	5.9	887	52	323	<1	<0.005	-	<1	5.7		
3989465	359155	5407130	Duff's Hill	hand auger	transported		orange	gritty friable clay	0.70	Adjacent costean-goesan-Adit 2W. Rock chips are silicified UM. Talus 5m upslope.	4	27	47	<1	-	16	546	68	424	<1	<0.005	-	<1	2.5		
3989466	359100	5407075	Duff's Hill	hand auger	?transported		orange	gritty clay	0.70	Cat Ridge - below scree slope. Fg green serpentinite. Sample taken adjacent trench and ?massive ox.	12	<3	86	<1	-	5.9	162	55	740	<1	<0.005	-	<1	1.5		
3989467	359082	5407095	Duff's Hill	hand auger	?transported		brown	gritty clay	0.70	Transported downslope. Float massive pyroxene (plagioclase) bearing rock.	16	<3	139	<1	-	12.3	2688	236	812	<1	<0.005	-	<1	3.5		
3989468	359064	5407115	Duff's Hill	hand auger	residual	C	yellow-green	gritty clay	0.70	Rock chips are lg serpentinite.	28	<3	66	<1	-	6.2	630	80	376	<1	<0.005	-	<1	2.2		
3989469	359046	5407135	Duff's Hill	hand auger	residual	C	yellow-green	gritty clay	0.70	Rock chips are lg serpentinite.	37	15	59	<1	-	6.4	771	70	521	<1	<0.005	-	<1	4.3		
3989470	359028	5407155	Duff's Hill	hand auger	residual	C	yellow-green	gritty clay	0.70	Rock chips are lg serpentinite.	11	<3	48	<1	4.4	-	1021	57	408	<1	<0.005	<0.005	<1	1.5		
3989471	359010	5407175	Duff's Hill	hand auger	residual	7B-C	yellow-green	gritty clay	0.70	Float: cumulate pyroxene (plagioclase) bearing rock.	19	<3	37	<1	-	9	526	64	357	<1	<0.005	-	<1	1.1		
3989472	358990	5407195	Duff's Hill	hand auger	residual	C	orange	gritty friable clay	2.00	Adjacent Waratah Road. Rock chips are amygdaloid of pyroxene (plagioclase) bearing basalt.	83	<3	54	<1	-	10.6	631	56	287	<1	<0.005	-	<1	1.9		
3989473	358870	5407165	Duff's Hill	hand auger	residual	C	orange	gritty friable clay	1.00	At junction of Waratah Rd and Creek - Dog Ridge. Amygdaloid fg. pyroxene-plagioclase bearing basalt.	21	<3	51	<1	-	7.6	2364	226	258	<1	<0.005	-	<1	<0.5		
3989475	358892	5407144	Duff's Hill	hand auger	residual	C	orange	gritty friable clay	1.00	Amygdaloid fg. pyroxene-plagioclase bearing basalt.	30	<3	52	<1	-	9.4	934	76	171	<1	<0.005	-	<1	7.4		
3989476	358914	5407133	Duff's Hill	hand auger	residual	C	orange	gritty friable clay	1.00	Amygdaloid fg. pyroxene-plagioclase bearing basalt.	8	<3	27	<1	-	8.1	2115	143	224	<1	<0.005	-	<1	2.1		
3989477	358936	5407122	Duff's Hill	hand auger	residual	C	orange	gritty friable clay	1.00	Amygdaloid fg. pyroxene-plagioclase bearing basalt.	22	<3	44	<1	-	8.6	132	52	272	<1	<0.005	-	<1	1.1		
3989478	358958	5407111	Duff's Hill	hand auger	residual	C	orange	gritty friable clay	1.00	Amygdaloid fg. pyroxene-plagioclase bearing basalt.	25	<3	50	<1	-	9.2	212	47	265	<1	<0.005	-	<1	0.9		
3989479	358980	5407100	Duff's Hill	hand auger	?residual	7CB	orange	gritty clay	0.70	Amygdaloid fg. pyroxene-plagioclase bearing basalt.	19	<3	36	<1	-	8.3	1212	106	212	<1	<0.005	-	<1	1.4		
3989480	358975	5407030	Duff's Hill	hand auger	?residual	7CB	orange	rocky clay	0.65	Base of steep slope ?Transported downslope. Plagioclase-pyroxene rock chips.	29	5	35	<1	-	5.2	296	25	187	<1	<0.005	-	<1	1.5		
3989481	358999	5407028	Duff's Hill	hand auger	residual	C	mottled orange	gritty friable clay	0.70	Fg pyroxene-plagioclase bearing ?basalt.	36	<3	37	<1	-	8.4	3068	341	274	<1	<0.005	-	<1	2.1		
3989482	358023	5407026	Duff's Hill	hand auger	?residual	7BC	mottled orange	gritty friable clay	0.50	Fg pyroxene-plagioclase bearing ?basalt.	57	26	153	<1	-	9.1	728	93	524	<1	<0.005	-	<1	10.4		
3989483	359047	5407024	Duff's Hill	hand auger	?residual	7BC	mottled orange	gritty friable clay	0.50	Fg pyroxene-plagioclase bearing ?basalt.	26	7	70	<1	-	6.3	969	77	502	<1	<0.005	-	<1	2		
3989484	359070	5407020	Duff's Hill	hand auger	transported	A	brown	sandy loam	0.80	?Transported downslope. Scree slope 30m upslope.	17	15	161	<1	-	17.4	3247	251	1333	<1	<0.005	-	<1	9.9		

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5 407 500mN

359 000mE

359 500mE

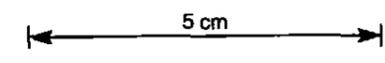


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### GEOLOGICAL LEGEND

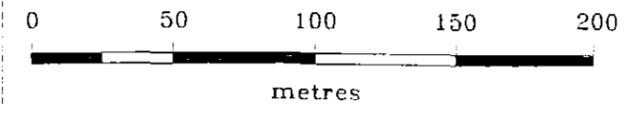
Cambrian Heazlewood Mafic-Ultramafic Complex

- €bm** Low Ti Tholeiitic Basalt
- €ch** Caudry's Hill Pyroxenite Sequence
- €bh** Brassy Hill Harzburgite Sequence
- px* Pyroxenite
- hx* Harzburgite
- g(px)* Coarse Gabbro Dyke
- Quartz vein
- Layering orientation
- Fracture orientation
- Slickenslide orientation
- Fault, Breccio
- Lithological Boundary Position accurate  
Position approximate
- Topographic contour - 20m interval
- Soil sampling traverse  
4\_\_\_ : Prefixed by 3989\_\_\_
- Rock chip sample location and Number  
1\_\_\_, 4\_\_\_ : Prefixed by 3989\_\_\_  
5\_\_\_, 6\_\_\_ : Prefixed by 3530\_\_\_
- Adit Location  
Channel rockchip sampling traverse  
1\_\_\_ : Prefixed by 3989\_\_\_  
5\_\_\_ : Prefixed by 3530\_\_\_

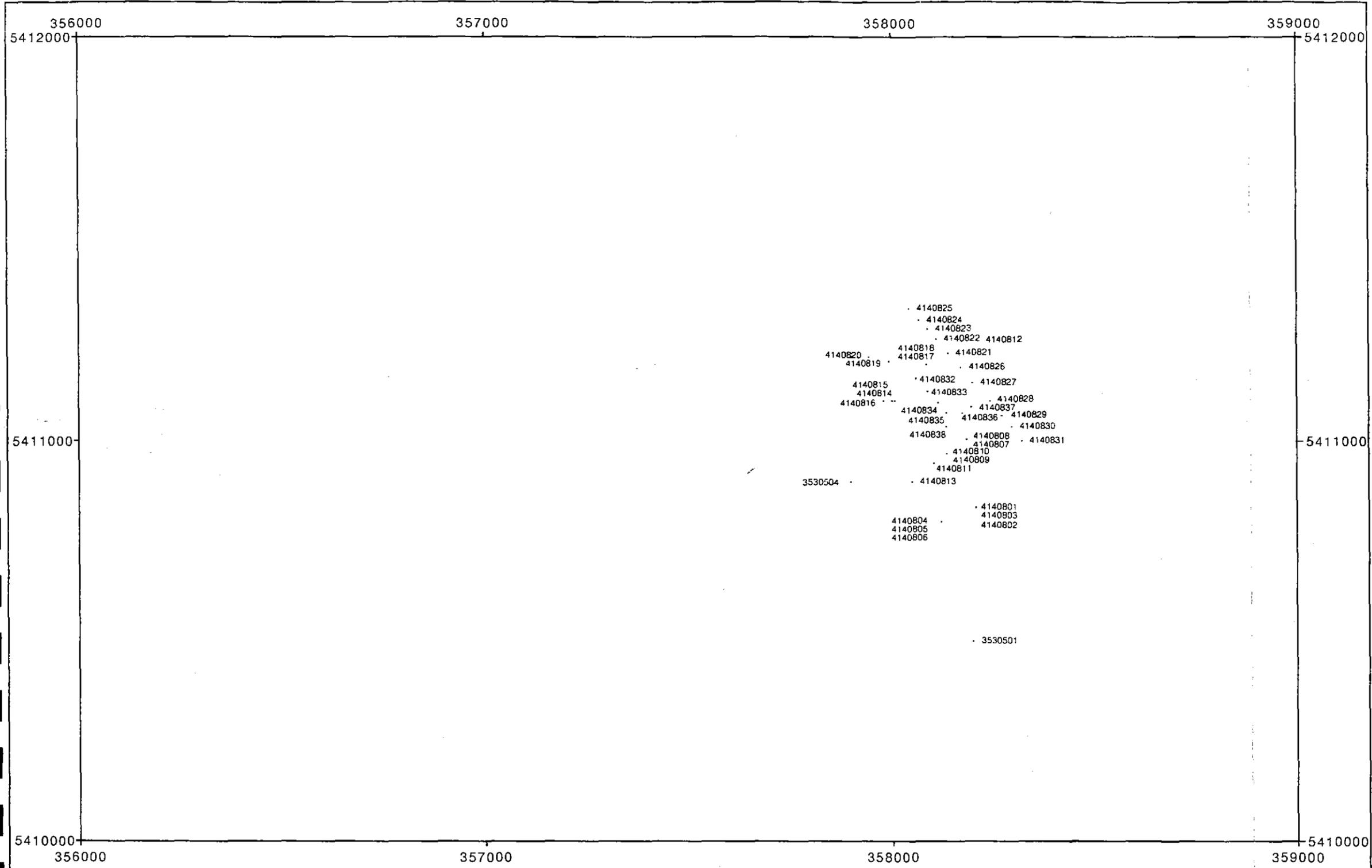


CRA EXPLORATION PTY. LIMITED

## HEAZLEWOOD EL 36/92 Duffs Hill Prospect Compilation Plan



Ref.: Burnie SK 55-03	File: Tv887r
Scale: 1 : 2500	Date: January 1995
Author: S. Maher	Report No.: 20626
Drawn: R. Traverso	Plan No. Tv 887



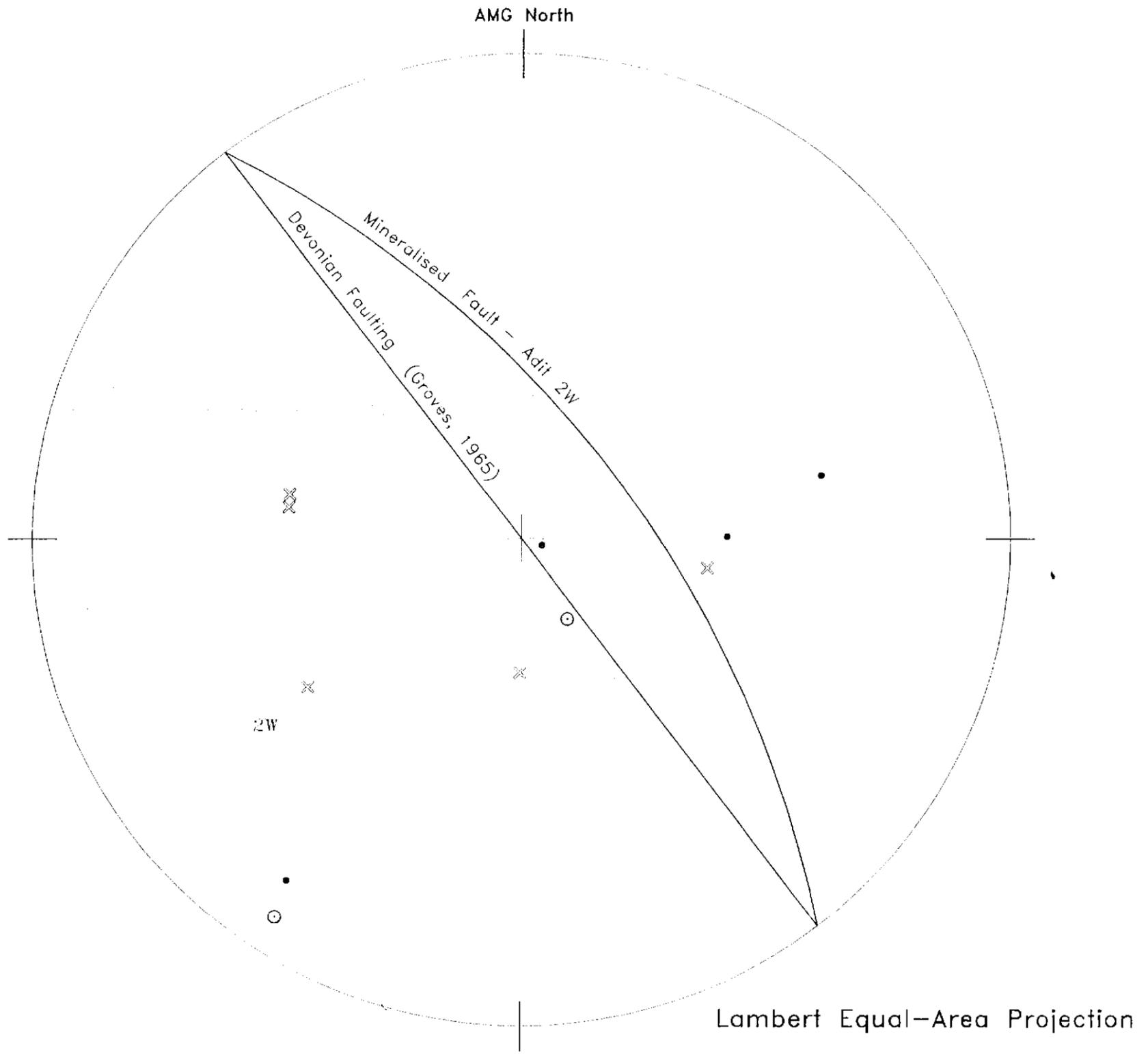
FENTONS KNOB PROSPECT

jmap

100m

5 cm

CRA EXPLORATION PTY. LIMITED		
HAZLEWOOD EL 36/92		
<b>ROCK CHIP SAMPLE LOCATIONS</b>		
Geol: SM	Scale: 1:10,000	Report: 20626
Drawn: SM	Date: 2/10/1995	Plan: Tv 900



- Poles to:
- ⊙ Layering in €bm
  - × Fracture/Fault
  - 2W Mineralised Fault - Adit 2W

- Lineations:
- Slickensides

5 cm

CRA EXPLORATION PTY. LIMITED	
<b>HEAZELWOOD EL 36/92</b> <b>Duffs Hill Prospect</b> <b>Stereographic Projection</b> <b>of Mapped Structures</b>	
Ref.: Burnie SK 55-03	File: Tv888r
Scale: ?? scale ??	Date: January 1995
Author: Simon Maher	Report No.: <b>20626</b>
Drawn: R. Traverso	Plan No.: Tv 888

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5 415 000mN

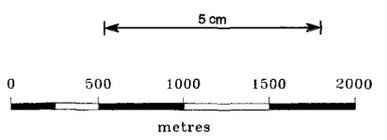
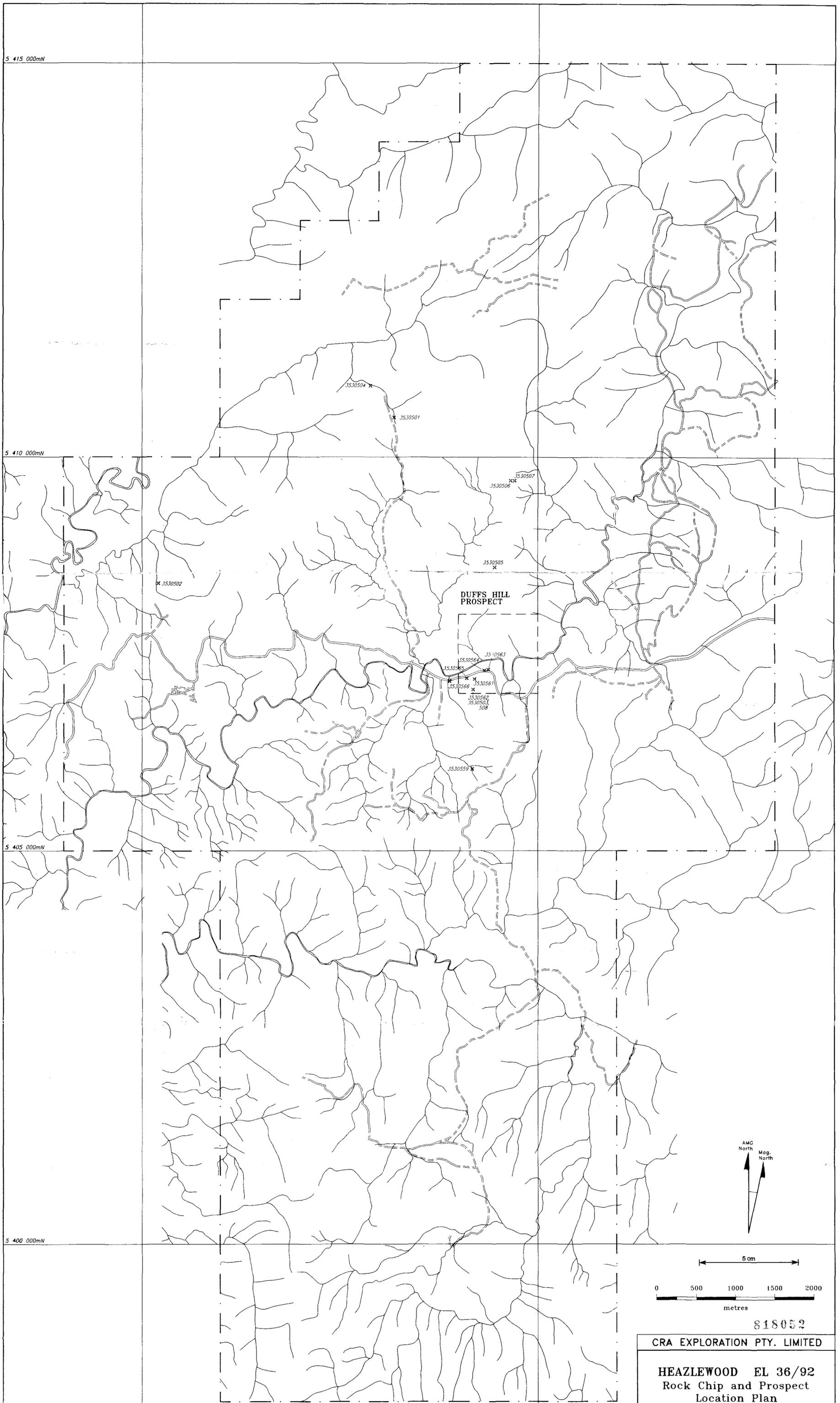
5 410 000mN

5 405 000mN

5 400 000mN

355 000mE

360 000mE



818032

CRA EXPLORATION PTY. LIMITED

**HEAZLEWOOD EL 36/92**  
**Rock Chip and Prospect**  
**Location Plan**

Ref.: SK 55-03	File: Hazwood\644
Scale: 1 : 25000	Date: Feb. 1994
Author: S. Maher	Report No.: 20626
Drawn: R Traverso	Plan No.: Tv 644