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CRA EXPLORATION PTY. LIMITED
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**Third Annual Report
For The Period Ending 15th April, 1996
EL 43/92 Melba Flats, Tasmania**

EL 43/92
See folio
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96-3884

ANNUAL REPORT 1996 - MELBA FLATS
CRA - EL 43/92 - MAHER S

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CRAE Report No. 21143

Abstract

CRAE's nickel exploration programme has continued at Melba Flats EL 43/92. Work in the current reporting period has included a review of all previous drilling, soil sampling, deep overburden sampling, IP geophysics, detailed helimag survey and an Honours research project.

Geophysical surveys have downgraded potential for significant massive sulphides. However, an 800m long Ni-Cu soil geochemical anomaly has been identified. The geochemical response is greater and more continuous than that over the known massive sulphide lenses. Disseminated sulphides were observed in a soil sample for the geochemical trend.

It is recommended that two 150m drillholes test the soil anomaly for disseminated sulphide mineralisation.

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1. Conclusions and Recommendations

Significant massive sulphide accumulations could reasonably be expected to respond to the EM, IP and magnetic geophysical surveys undertaken by CRAE. Lack of geophysical response therefore downgrades the potential for large massive-sulphide bodies in the immediate vicinity of the known sulphide lenses.

However, an 800m long Ni-Cu soil geochemical anomaly parallel and to the W of the North Cuni-Genet's Winze area is a newly identified target that may reflect a disseminated sulphide body. Indeed, visible sulphides were observed in a soil sample along this trend. The anomaly was not tested by the IP survey.

Two shallow drillholes would be adequate to investigate the potential for economic disseminated sulphide mineralisation.

2. Introduction

EL 43/92 was taken out to explore for bulk tonnage disseminated Ni-Cu (PGE-Au) sulphide resources.

A number of high-grade massive Ni-Cu (-PGE-Au) sulphide lenses are known within the Melba Flats Licence area. Massive sulphide lenses identified to date are up to 75m long, 60m wide, 1m thick and commonly exceed 15% combined Ni + Cu. Mineralisation is generally hosted by dolerite sills within steeply E dipping uncorrelated Cuni stratigraphy - interbedded mudstone, siltstone, volcanoclastic lithicwacke and quartzwacke (Plan Tv 680).

EL 43/92 was granted to CRA Exploration Pty. Limited (CRAE) on the 16th of April, 1993 for an initial tenure of one year over an area of 16 sq km. Two one year renewals of the EL were granted giving an expiry date of 15th April, 1996.

EL 43/92 is located on the Pieman 7914 1:100,000 map sheet (Plan Tv 675). Its geographic centre is approximately 9 km north of Zeehan.

The aim of this report is to describe work undertaken during the third twelve month period.

3. Review of Previous Work

3.1 Prior to Current Tenement

Cu and Ni mineralisation was discovered in the Melba Creek area in 1893. A detailed history of the exploration within the Melba Flats EL area is detailed in Taylor & Burger (1952) and Ellis (1987). A summary of mining lease activity up to 1961 is given in Brown (1992). A review of drilling within the Melba Flats area is included as Appendix I.

3.2 During Current Tenement

3.2.1 Fixed Wing Airborne TEM (QUESTEM) Survey

Data collected over the Melba Flats licence area was of poor quality given very high background resistivities and higher than normal flying height due to topography. The most prominent response was a 2 km strike length anomaly to the east of the Cu-Ni workings corresponding to a 50 m wide carbonaceous black shale unit. Poor conductors are associated with the known massive sulphide pods at the abandoned Nickel Reward, Vaudeau and North Cuni mines. A 300 m moderate conductor was interpreted to extend SE of the abandoned Nickel Reward mine.

3.2.2 Review of Tasmanian Mines Department Gravity Data - 1988

Data indicated a 0.6 mgal anomaly coincident with untested mineralised dolerite (identified by wacker sampling) west of the North Cuni mine.

3.2.3 Mineralogy

Petrology of 14 rock chip samples and 21 drill core samples indicated:

- chalcopyrite-pentlandite-pyrrhotite-millerite are the main relicts of the primary massive sulphide assemblage
- violerite and pyrite are supergene
- preserved sulphide textures are consistent with an epigenetic origin for mineralisation
- dolerite mineralogy is consistent with hydrous parental magmas which are incompatible with significant magmatic sulphide formation.

3.2.4 Dolerite Whole Rock Geochemistry

Whole rock analysis of 6 "host dolerite" samples indicated the "host dolerite" suite is probably correlatable with the mafic rocks of the Henty Dyke Swarm and the Henty Fault Wedge. These rocks are associated with extension related to tholeiitic magnetism late in the history of the Mount Read Volcanics magmatic event.

3.2.5 Rock Chip Geochemistry

104 rock chip samples were collected within the Melba Flats licence area for geochemical analysis. 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 Cr As \pm Mn by GA140 (0.3 g aqua regia/perchloric acid digest - AAS). Samples with greater than 0.3(0.5)% Ni were additionally analysed for Au Pt Pd by GG316 (50 g fire assay - AAS). All sample locations are shown on Plans Tv 950 & 951. Geochemical sample ledgers and laboratory reports are included in Appendix II.

3.2.6 Line Cutting and Gridding

34 line km of line cutting and gridding was undertaken. Gridlines (plus other culture) is shown on Plan Tv 954.

3.2.7 North Cuni-Genet's Winze Prospect

Ground PROTEM Survey

Protem data collected on the North Cuni-Genet's Winze grid indicates several conductors (Plan Tv 952). The most prominent conductor corresponds to the position of the "eastern dolerite" massive Cu-Ni sulphide lode. Parallel conductors to the west have not been tested by drilling.

Ground Magnetic Survey

10.5 line km of data collected on the North Cuni-Genet's Winze grid indicate some known massive sulphide mineralisation is weakly magnetic (Plan Tv 679). West of known mineralisation at the North Cuni mine, weak-discontinuous magnetic anomalies correspond to an untested dolerite sill (identified by wacker sampling).

Diamond Drilling 5 holes - 455m Figures 1-5

Massive sulphide was intersected in four holes.

Bhole	width m	Ni %	Cu %	Pd ppm	Pt ppm	Au ppm	From m
MF01	0.70	9.3	4.5	1.4	0.9	0.8	48.50
MF03	0.50	7.7	2.9	1.1	1.1	1.1	24.60
MF04	0.80	7.8	10.3	1.6	1.2	1.9	37.75
MF05	1.95	0.4	0.6	0.3	0.2	0.2	73.65

MF05 intersected disseminated pentlandite-chalcopyrite in a previously untested dolerite sill.

3.2.8 Nickel Reward-Vaudeau Prospect

Ground PROTEM Survey

Data from the survey covering the Nickel Reward-Vaudeau Grid is significantly affected by culture - making geological interpretation impossible.

Ground Magnetic Survey

9.0 line km of data collected on the Nickel Reward-Vaudeau grid indicate that the massive sulphide lodes at the abandoned Nickel Reward and Vaudeau mines are non magnetic (Plan Tv 678).

Diamond Drilling 2 holes - 38 m Figure 6-7

Holes failed to intersect the targeted massive sulphide sheet intersected in previous drilling. Review of drilling data indicates this sheet probably dips very steeply to the NW.

4. Exploration Completed in the 12 Months Ending 16th April, 1996

4.1 Review of Drilling

Results from a review of all drilling within the Melba Flats licence area are given in Appendix I. The review indicated potential for extensions to known mineralisation in the North Cuni, the Deveraux, and the Nickel Reward mine areas.

DD94MF05, 140 m south of detailed drilling at the North Cuni mine, intersected disseminated sulphide in an uncorrelated dolerite unit. A weak Ni-Cu soil geochemistry anomaly (up to 750 ppm Ni, typically 250 ppm Ni) extends 600 m south from the North Cuni mine, and is close to the interpreted position of this dolerite. Weak ground EM and ground magnetic anomalies correspond to this soil anomaly over 300m (open to the south).

The Deveraux Mine mineralisation is untested at depth, and to the SE and NW of the Deveraux shaft. Soil geochemistry and initial CRAE helimagnetic data suggests the extent of (subcropping) mineralisation is less than 120m.

Known mineralisation in the Nickel Reward Mine area is hosted by two dolerite units, and is small and extensively drill tested. Mineralisation is untested to the SW of the Nickel Reward shaft. Detailed CRAE soil geochemistry and helimagnetic data suggests the extent of (subcropping) mineralisation in this direction is less than 50m.

4.2 Soil/Bedrock Geochemistry

The most significant anomaly from 1180 samples collected by CRAE and captured competitor data (2500 samples) is 850m long (open to the north). Cu-Ni values are higher (up to 1866 ppm Cu & 1881 ppm Ni) than those over known mineralisation 80 m to the west at the North Cuni mine. This anomaly has not been tested by drilling, has coincident but patchy ground TEM and magnetic anomalies, and offers the best potential to represent the targeted resource. Plans Tv 947 and 948 show CRAE soil/bedrock Ni and Cu anomalism. Plans Tv 947 and 948 show combined CRAE-CSR-EZ soil/bedrock Ni and Cu anomalism.

CRAE samples were collected on grid lines at 10 m intervals in the vicinity of known mineralisation, and at 20-25 m intervals away from known mineralisation. 1062 B and C-horizon soil samples were collected by hand auger from depths up to 2 m and 118 bedrock samples were collected by wacker from depths up to 7.4 m. Samples weighing 0.2-1 kg were sent to Analabs where they were dried, crushed, pulverised (GPO33) and analysed for Cu Pb Zn Ag Ni Co Fe Cr As \pm Mn by GA140 (0.3 g aqua regia/perchloric acid digest - AAS). Samples with greater than 0.3% Ni were additionally analysed for Au Pt Pd by GG316 (50 g fire assay - AAS). Sample locations are shown on Plan Tv 946. Geochemical ledgers for all samples are included in Appendix III.

4.3 Orientation IP-Resistivity Survey

Data indicates weak chargeability responses corresponding to known Cu-Ni sulphide mineralisation. However, if these responses are indicative of responses due to mineralisation, it would be very difficult to discriminate between mineralisation responses and the noisy background of the Cuni stratigraphy.

Drilling has shown that the massive Cu-Ni sulphide mineralisation is typically overlain by disseminated Cu-Ni sulphide. An orientation IP-resistivity survey was undertaken within the North Cuni-Genet's Winze and South Cuni prospect areas over known massive Cu-Ni sulphide mineralisation to determine whether this style of mineralisation is able to be discriminated by the IP method. Systematic coverage of the Cuni stratigraphy was planned if the orientation survey showed the mineralisation was able to be discriminated. Approximately 2.8 line km of data were collected along three lines:

- 5366700N (365750-6850E) - profiling known mineralisation at the abandoned South Cuni mine
- 5867700N (365750-6850E) - profiling discontinuous mineralisation between the abandoned North Cuni and Genet's Winze mines
- 5367000N (365750-6850E) - 300 m north of the abandoned South Cuni mine

Data is shown on Plans Tv 1002, Tv 1001, Tv 999, Tv 1000.

4.4 Heliborne Magnetic Survey

Detailed heliborne magnetic data was collected over the Cuni stratigraphy with the objective of detecting pyrrhotite bearing massive sulphide mineralisation. Approximately 110 line km of data were collected along 40 m spaced E-W lines over a 1.6 x 2.8 km area including the known massive Cu-Ni sulphide occurrences. Unfortunately due to this survey being part of the Gordon Limestone-Zeehan survey final results have not yet been received at the time of writing.

4.5 Research Project

Geology Honours student Philip Greenhill completed a study on the Geological setting and mineralisation of the Cuni Cu/Ni deposits. His thesis is appended (Appendx 4).

5. Environment and Rehabilitation

All drill sites and access tracks were rehabilitated on completion of the drilling. Additionally, the Vaudeau - North Cuni track was repaired.

1994-95 cut lines are rehabilitating quickly. 1.0x0.8x0.3 m pits spaced at 50 m intervals along three gridlines were refilled on completion of the IP survey. Auger holes from soil sampling were refilled at the time sampling.

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7. Location

Queenstown	SK55-05	1:250,000
Pieman	7914	1:100,000
Dundas	3636	1:25,000

8. Keywords

Cambrian, Copper, Nickel, PGE, Gold, Soil Sampling, Soil Analysis, Ground IP Survey, Aerial Magnetic Survey, Disseminated, Massive, Dolerite, Diamond Drilling.

9. DPO Register

77223, 77699.

**CRA Exploration Pty Limited
DPO Register**

EL 43/92 Melba Flats

DPO Number	LAB Batch Number	LAB	DPO Location	Office Date	Geologist	Tenement Name	Sample Type	Number of Samples	250,000 Map Sheet	100,000 Map Sheet
77223	10361	Analabs	Zeehan	10/8/94	S Maher	Melba Flats	Half DD Core	5	SK55-5	7914
77699	10986	Analabs	Zeehan	2/6/95	S Maher	Melba Flats	Rock	17	SK55-5	7914
77231	10739	Analabs	Zeehan	27/2/95	S Maher	Melba Flats	Soil	377	SK55-5	7914
77233	10831	Analabs	Zeehan	7/4/95	S Maher	Melba Flats	Soil	276	SK55-5	7914
77353	9900	Analabs	Zeehan	5/12/93	T Aravanis	Melba Flats	Soil	29	SK55-5	7914
77355	9956	Analabs	Zeehan	15/12/93	T Aravanis	Melba Flats	Soil	100	SK55-5	7914
77359	10098	Analabs	Zeehan	17/3/94	T Aravanis	Melba Flats	Soil	134	SK55-5	7914
77361	10144	Analabs	Zeehan	13/4/94	T Aravanis	Melba Flats	Soil	72	SK55-5	7914
77364	10218	Analabs	Zeehan	28/5/94	T Aravanis	Melba Flats	Soil	91	SK55-5	7914
77366	10305	Analabs	Zeehan	11/7/94	T Aravanis	Melba Flats	Soil	65	SK55-5	7914
71516	8960	Analabs	Zeehan	24/8/92	RGP	Melba Flats	Rock	18	SK55-5	7914
71540	9347	Analabs	Zeehan	4/3/93	RGP	Melba Flats	Rock	58	SK55-5	7914
71541		Martin Gole	Zeehan	11/3/93	RGP	Melba Flats	Petrology	11	SK55-5	7914
77352	BE1382	Analabs	Zeehan	18/11/93	T Aravanis	Melba Flats	Rock	39	SK55-5	7914
77354	9901	Analabs	Zeehan	5/12/93	T Aravanis	Melba Flats	Rock	17	SK55-5	7914
77358	10099	Analabs	Zeehan	17/3/94	T Aravanis	Melba Flats	Rock	14	SK55-5	7914
77360	10143	Analabs	Zeehan	13/4/94	T Aravanis	Melba Flats	Rock	19	SK55-5	7914
77370	10333	Analabs	Zeehan	30/4/94	T Aravanis	Melba Flats	Rock	5	SK55-5	7914

HOLE No.	DD94MF01	TOT DEPTH	62.25m
CO-ORDS	366437.2E	5367771.0N	~200m ASL
ORIENTATION		AZIMUTH	INCLINATION
		320° AMG	-45°
SURVEY DATA	DEPTH	AZIMUTH	INCLINATION
	62.00m	316°AMG	-44°
EST. RECOVERY		95.35%	

LAB	Analabs	DPO No.	77365
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PROSPECT	North Cuni - Genet's Winze
TENEMENT	Melba Flats EL 43/92
SHEET	Queenstown SK55-05
LOGGED BY	T Aravanis

DRILLERS	Tasmanian Diamond Drillers
RIG TYPE	Longyear 38
START	28 June 1994
COMPLETE	1 July 1994

OBJECT

DD94MF01 was drilled within 5m of DD04, a 1930 Mines Department diamond drill hole. Poor records for DD04 reported only a single assay of ~1.07m massive sulphide @ 10.1% Ni and 5.5% Cu. Although disseminated sulphides within the gabbro were reported in DD04, no assays were taken.

The aim of DD94MF01 was to test the proposal that significant disseminated Cu/Ni sulphides occurred within the gabbro, making a viable target for CRAE.

RESULT

The hole intersected a sequence of sediments (red, green and grey shale and greywacke) surrounding a 9.8m of gabbro with trace to minor disseminated sulphides, overlying a 70cm interval of massive sulphide.

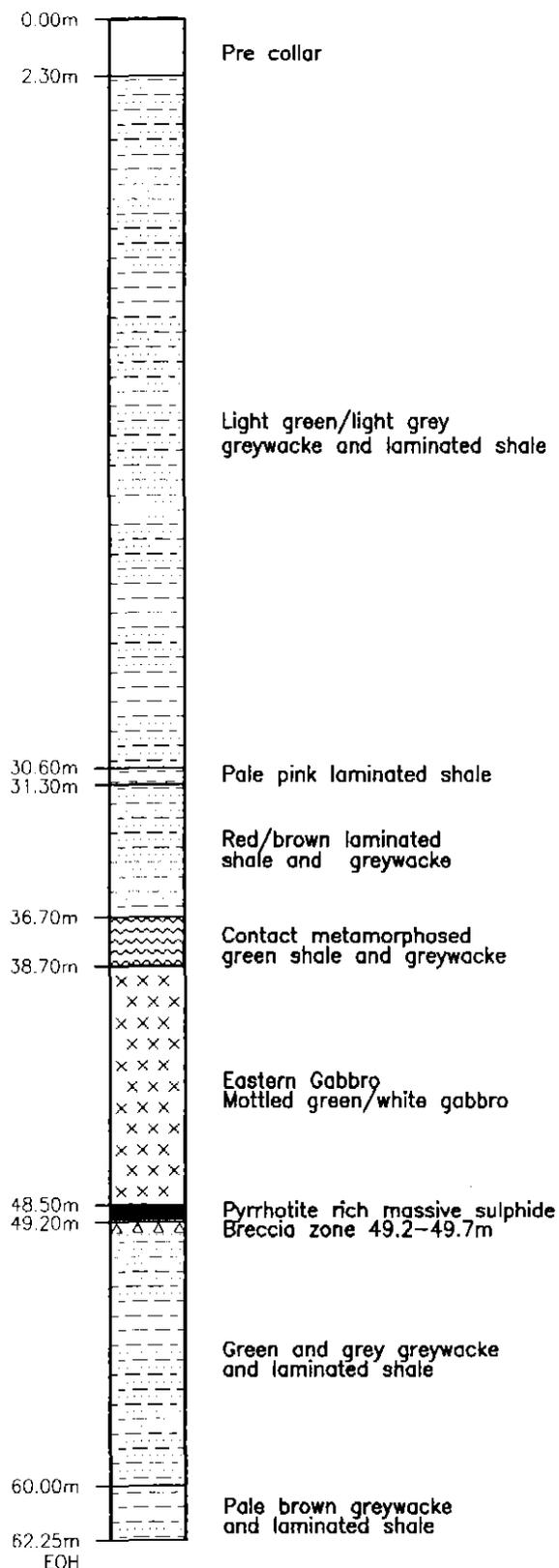
MINERALISATION

The gabbro was found to contain trace amounts of chalcopyrite, pyrite and possibly pentlandite increasing with depth becoming sulphide blebs. An 70cm interval of massive sulphide (mainly pyrrhotite, chalcopyrite and pentlandite) was encountered at the base of the gabbro assaying 9.30% Ni, 4.50% Cu, 0.83ppm Au, 0.85ppm Pt and 1.40ppm Pd.

Trace sphalerite and galena associated with calcite veining was observed in the sediments below the gabbro dyke.

DISCUSSION

The results of DD94MF01 were disappointing due to the lack of significant disseminated Ni and Cu mineralisation in the gabbro dyke.



HOLE No.	DD94MF02	TOT DEPTH	115.50m
CO-ORDS	366437.6E	5367770.5N	~200m ASL
ORIENTATION		AZIMUTH	INCLINATION
		320° AMG	-60°
SURVEY	DEPTH	AZIMUTH	INCLINATION
DATA	115.50m	308°AMG	-59°
EST. RECOVERY		96.98%	

PROSPECT	North Cuni - Genet's Winze
TENEMENT	Melba Flats EL 43/92
SHEET	Queenstown SK55-05
LOGGED BY	T Aravanis

DRILLERS	Tasmanian Diamond Drillers
RIG TYPE	Longyear 38
START	1 July 1994
COMPLETE	8 July 1994

LAB	Analabs	DPO No.	77365
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OBJECT

DD94MF02 was drilled below DD94MF01 to test the continuation of the eastern "mineralised" gabbro and continue to a parallel gabbro dyke referred to as barren by previous explorers.

RESULT

DD94MF02 encountered a similar sequence of greywacke and shale to DD94MF01 although there is some evidence for reverse faulting below the eastern gabbro. The western "barren" gabbro was intersected ~33m below the eastern gabbro.

MINERALISATION

The eastern or upper gabbro was found to contain only trace disseminated pyrite, chalcopyrite, and pentlandite, averaging 326ppm Ni and 86ppm Cu over 13.65m.

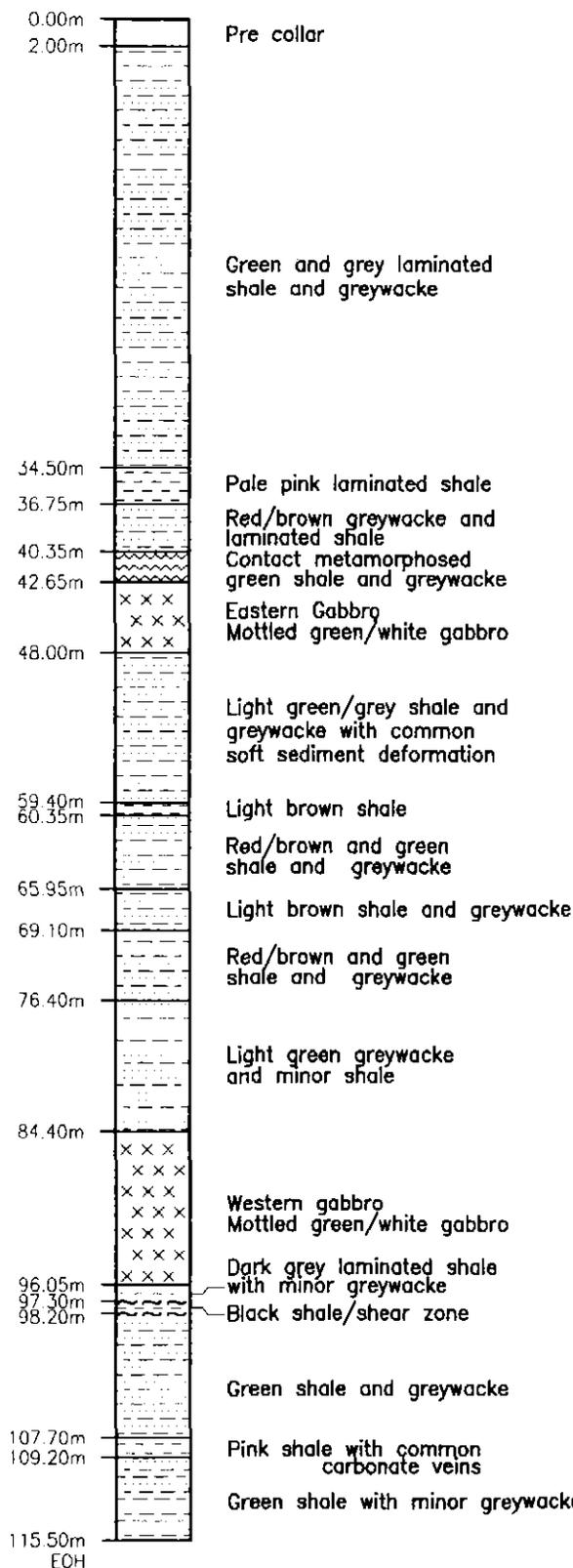
Similarly unspectacular assays were returned from the lower gabbro dyke.

A 1m wide calcite vein encountered at 108.2m assayed 1.00% Zn and 0.20% Pb.

DISCUSSION

The upper or eastern gabbro intersected in DD94MF02 was 5.35m, whilst in DD94MF01 the dyke was over 12m. Allowing for differences in dip angles, the eastern gabbro appears to be thinning down dip. The results from DD94MF01 & 2 are consistent with the previous drilling results, indicating that the massive sulphide lens associated with the eastern "mineralised" gabbro only occurs with the thicker portions of the dyke.

As the gabbro dyke and sediments are of Cambrian age, it is not unreasonable to assume the gabbro was near flat lying at the time of intrusion. It is proposed that sulphides crystallising out solution during cooling had settled in palaeo topographic lows and thus coinciding with thicker portions of gabbro. The significance of this hypothesis is that, it is likely that further localised massive sulphide lenses should exist within the eastern gabbro and possibly in parallel gabbro dykes.



HOLE No.	DD94MF03	TOT DEPTH	82.50m
CO-ORDS	366340E	5367700N	~207m ASL
ORIENTATION		AZIMUTH	INCLINATION
		300° AMG	-45°
SURVEY DATA	DEPTH	AZIMUTH	INCLINATION
	18.00m	286°AMG	-44°
	82.00m	292°AMG	-45°
EST. RECOVERY		93.64%	
LAB	Analabs	DPO Nos.	77223 & 77367

PROSPECT	North Cuni - Genet's Winze
TENEMENT	Melba Flats EL 43/92
SHEET	Queenstown SK55-05
LOGGED BY	T Aravanis

DRILLERS	Tasmanian Diamond Drillers
RIG TYPE	Longycar 38
START	9 July 1994
COMPLETE	13 July 1994

OBJECT

DD94MF03 was drilled between the North Cuni and Genet's Winze workings, testing a structural target where the strike of the gabbro dykes and sediments swings from N/S to NE. DD94MF03 was to test the eastern "mineralised" gabbro and continue to the western "barren" gabbro. Old diamond drill hole MFP 130, collared 20m to the east (azimuth 270 deg AMG) intersected 3.05m @ 4.28% Ni, 2.65% Cu, 7.5% Zn and 3.1% Pb.

RESULT

A similar sequence of sediments noted in DD94MF02 was encountered. Although the eastern "mineralised" gabbro was not intersected, the western "barren" gabbro dyke was encountered as expected.

MINERALISATION

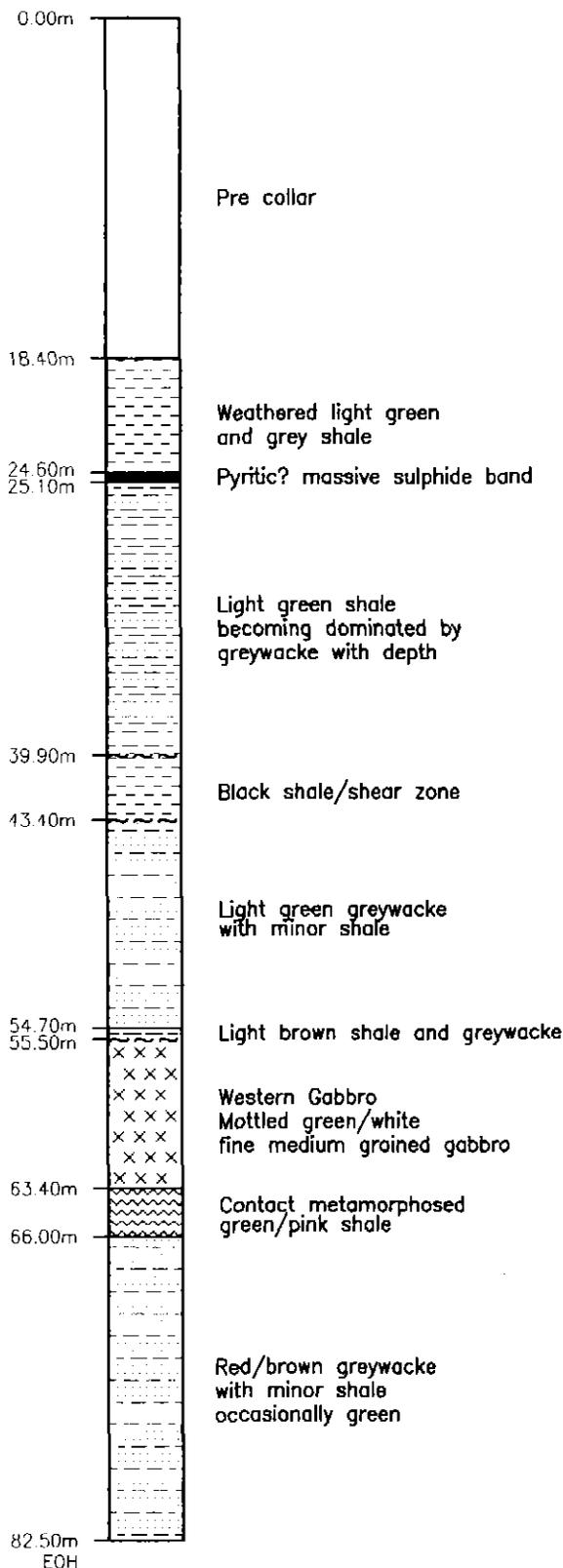
A 50cm band of pyritic? massive sulphide surrounded within sediments assayed 7.71% Ni, 2.91% Cu and 1154ppm Co.

The upper 1.55m of the western gabbro contained abundant carbonate veining with sphalerite and galena mineralisation, (0.45% Zn & 0.39% Pb). A similar association with carbonate veining was observed with the sediments immediately below the western gabbro, (2.6m @ 0.56% Zn)

DISCUSSION

Although the failure of DD94MF03 to intersect the eastern gabbro could be the result of the deep pre collar, offset due to fault is a more likely explanation.

The supprisingly high assays returned from the band of pyritic? massive sulphides is worthy of further investigation. A number of "pyritic lodes" and "pyritic black shale" were identified, (via EM & SP surveys and costeaming), through out the EL. A "pyritic lode" 20m to the west and parallel to the South Cuni Cu/Ni mineralisation is the most notable known pyritic zone. There is no record of these pyritic zones being assayed for Cu or Ni.



HOLE No.	DD94MF04	TOT DEPTH	75.00m
CO-ORDS	366360E	5367660N	~210m ASL
ORIENTATION		AZIMUTH	INCLINATION
		270° AMG	-45°
SURVEY	DEPTH	AZIMUTH	INCLINATION
DATA	75.00m	266°AMG	-43.5°
EST. RECOVERY		92.46%	

LAB	Analabs	DPO No.	77368
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PROSPECT	North Cuni - Genet's Winze
TENEMENT	Melba Flats EL 43/92
SHEET	Queenstown SK55-05
LOGGED BY	T Aravanis

DRILLERS	Tasmanian Diamond Drillers
RIG TYPE	Longyear 38
START	15 July 1994
COMPLETE	20 July 1994

OBJECT

DD94MF04 was drilled to test the North Cuni mineralisation beneath the north drive of the North Cuni workings and to compare Cu and Ni grades in previous diamond drill holes EM3 and MFP132. In addition, the hole was to test the "barren western gabbro" encountered in the last 15cm of MFP132.

RESULT

The hole intersected a sequence of sediments and gabbro similar to that encountered in DD94MF02 and MFP132. A six metre true width intersection of the mineralised gabbro was intersected including an 80cm interval of massive sulphide. The "barren western gabbro", (~ 5.5m wide) was found to be severely altered, probably due to carbonate veining.

MINERALISATION

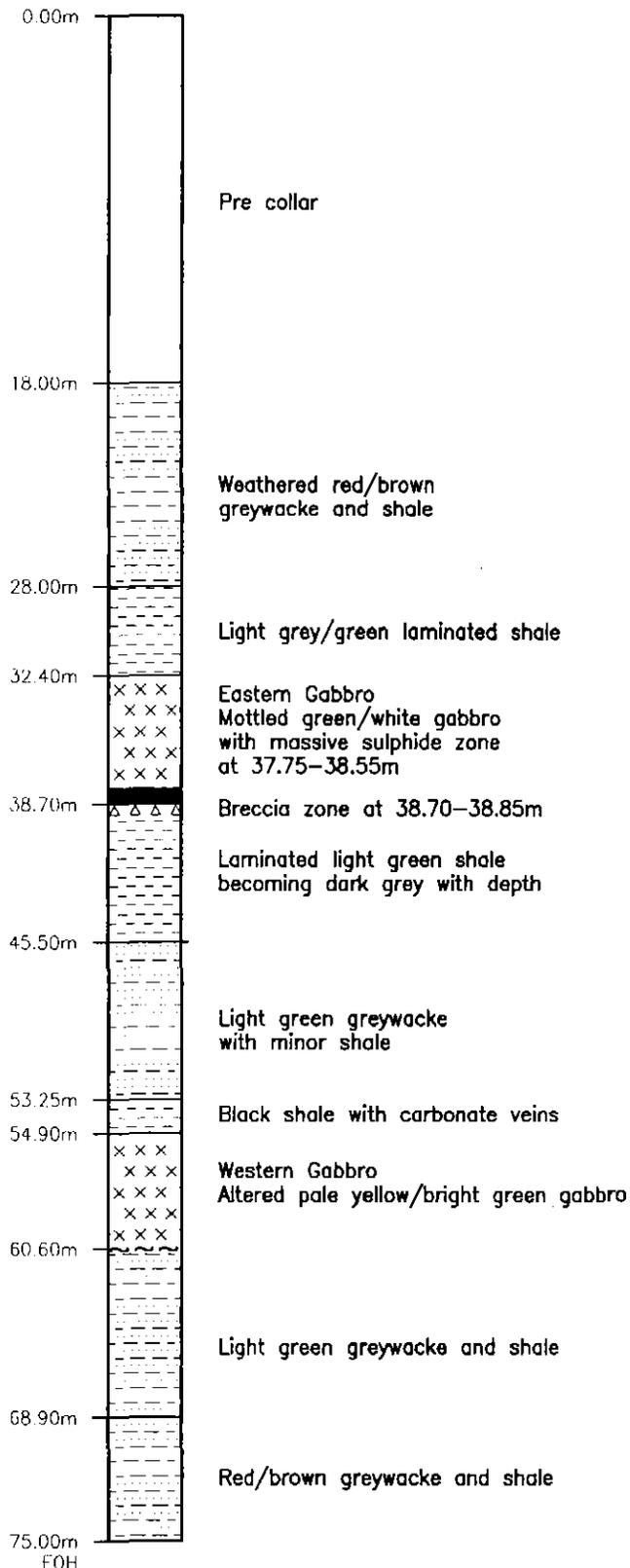
The upper gabbro contained trace disseminated sulphides, (mainly pyrite and chalcopyrite) increasing with depth to approximately 10%. The only disseminated sulphides of economic significance (0.47% Ni & 0.48% Cu), came from an 85cm interval immediately above the massive sulphide zone. The predominately chalcopyrite rich massive sulphide assayed 7.75% Ni and 10.30% Cu.

The lower or "western barren" gabbro contained trace chalcopyrite. Common sphalerite and galena mineralisation were associated with calcite veining (4.6m @ 0.59% Zn and 0.33% Pb).

A black shale unit with carbonate veining immediately above the lower gabbro dyke assayed 1.65m @ 2.29% Pb & 1.98% Zn.

DISCUSSION

Both EM3 and MFP132, drilled above and below the north drive respectively, intersected ~9.5m of gabbro which contained disseminated ore (EM3 - 4.6m @ 1.5% Ni & 1.5% Cu; MFP132 - 4.6m @ 0.41% Ni & 0.56% Cu). DD94MF04 drilled between the previous holes, (~5m down dip from the drive), encountered 6.3m of gabbro, including the massive sulphide zone. The significance of massive sulphide mineralisation being intersected in a thinner portion of the dyke is not known.



HOLE No.	DD94MF05	TOT DEPTH	82.20m
CO-ORDS	366390E	5367450N	~200m ASL
ORIENTATION		AZIMUTH	INCLINATION
		270° AMG	-45°
SURVEY	DEPTH	AZIMUTH	INCLINATION
DATA	82.00m	269° AMG	-45.5°
EST. RECOVERY		97.90%	

LAB	Analabs	DPO No.	77369
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PROSPECT	North Cuni - Genet's Winze
TENEMENT	Melba Flats EL 43/92
SHEET	Queenstown SK55-05
LOGGED BY	T Aravanis

DRILLERS	Tasmanian Diamond Drillers
RIG TYPE	Longyear 38
START	22 July 1994
COMPLETE	26 July 1994

OBJECT

DD94MF05 was drilled to test a weak EM conductor at 366350E 5367740N extending south from the North Cuni mine. In addition, the hole would be extended to encounter the "western barren" gabbro.

RESULT

The same sequence of sediments was intersected as in previous drilling. As well as the eastern gabbro, a 4m true width section of the "barren western dyke" mixed with contact metamorphosed sediments was encountered. A third gabbro approximately 2m wide with significant amount of disseminated sulphides was intersected below the western gabbro.

MINERALISATION

The upper gabbro was found to contain trace amounts of chalcopyrite, pyrite and possibly pentlandite (6.6m @ 276ppm Ni). Rare sulphide blebs were observed near the bottom contact of the gabbro.

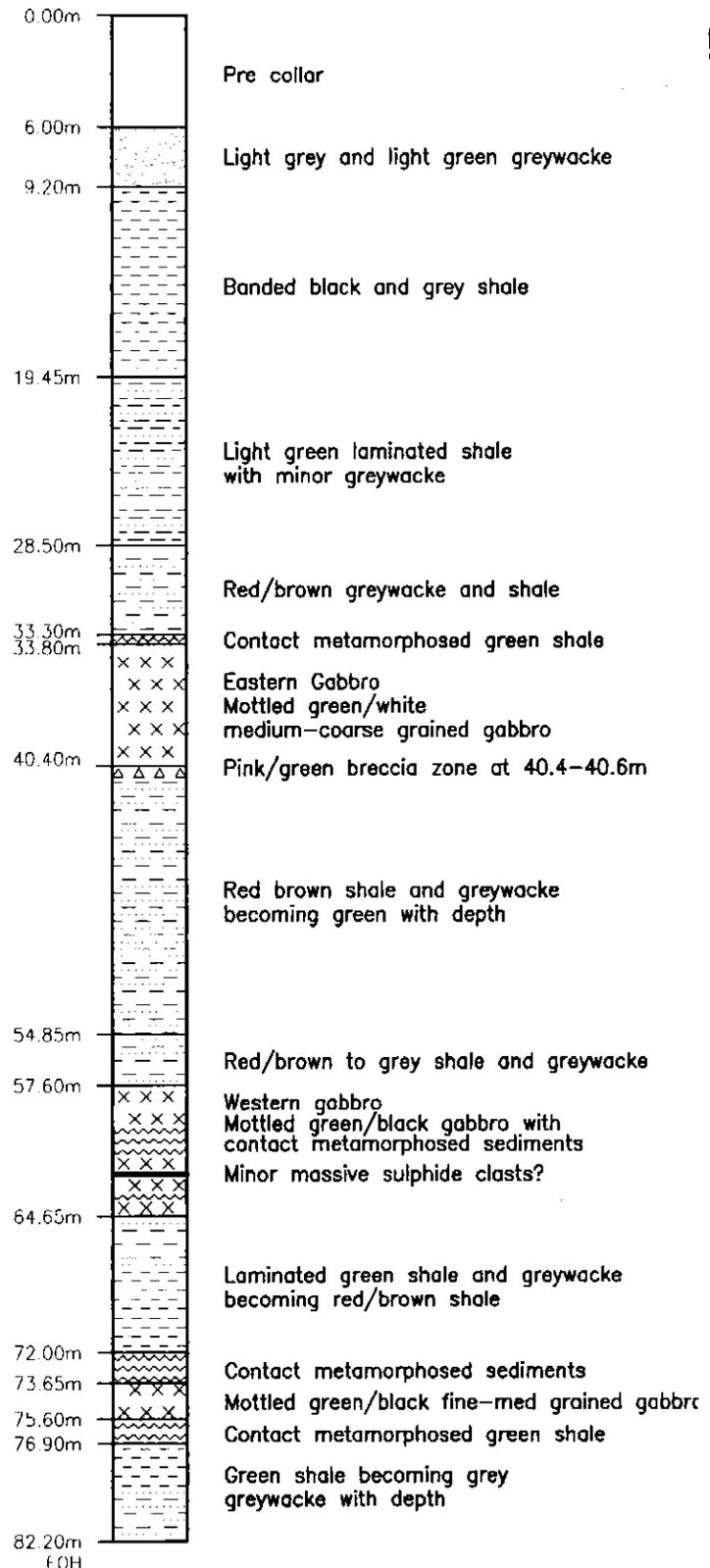
The second or "barren western gabbro" contained trace chalcopyrite and pyrite. A small massive sulphide clast? consisting mainly of finely laminated pyrite was encountered towards the bottom of the western gabbro (0.25m @ 0.26% Zn & 0.15% Pb). Minor sphalerite and galena mineralisation was observed in association with calcite veining through out the western gabbro.

Significant disseminated pyrite, chalcopyrite and pentlandite?, assaying 1.95m @ 0.44% Ni and 0.63% Cu, were observed in the lower gabbro.

DISCUSSION

Although no cause for the weak EM anomaly was observed in the hole it is proposed that minor massive mineralisation associated with the upper gabbro exists above the DD94MF05.

A sudden decrease in core axis to bedding angles below the second gabbro ("barren western dyke") suggest a possible thickening of the dyke beneath the DD94MF05 (i.e. below 366350E). Significant massive sulphide mineralisation associated with the thickening of the dyke may be an alternative explanation for the EM anomaly.



0m

CRA EXPLORATION PTY. LIMITED
DRILL-HOLE SUMMARY LOG

EL NAME: Melba Flats HOLE NAME: DD95MF06
 EL NUMBER: EL 43/92 PROSPECT: Nickel Reward
 DATE DRILLED: 22.2.1995
 LOGGED BY: S. Maher

AMG EAST: 366307E GRID EAST: 366307E
 AMG NORTH: 5365815 N GRID NORTH: 5365815N
 RL: 242 TOTAL DEPTH: 22.3m

DEPTH AZIM. (MAG) INCLIN.
 0m 234' -50'

10m

OBJECTIVES OF HOLE:

To gain more detailed structural and stratigraphic information, plus information on the mineralisation style in the vicinity of the Nickel Reward shafts.
 To repeat the intersection of M13: 7.9m @ 10.0% Ni, 2.9% Cu.

LITHOLOGICAL SUMMARY:

DFROM	DTO	COMMENTS
0	3.50m	Clay and transported gravel.
3.50	18.55m	Weathered olive green volcanoclastic greywacke beds grading at top to laminated mudstone.
18.55	19.75m	Olive green, medium grained gabbro.
19.75	22.30m	olive green and dark grey volcanoclastic greywacke beds grading at top to laminated mudstone.

MINERALISATION SUMMARY:

DFFROM	DTO	COMMENTS
9.90	18.55m	<<1% disseminated pyrite in fine and coarser grained sedimentary rocks.
19.75	22.30m	" "

20m

CONCLUSIONS:

MF06 did not intersect the massive sulphide sheet intersected in M13 because:

- MF06 is orientated sub parallel to the massive sulphide sheet which dips steeply to the NW.
- MF06 is located 10m NW of M13.

CRA EXPLORATION PTY. LIMITED
DRILL-HOLE SUMMARY LOG

EL NAME: Melba Flats HOLE NAME: DD95MFO7
 EL NUMBER: EL 43/92 PROSPECT: Nickel Reward
 DATE DRILLED: 24.2.1995
 LOGGED BY: S. Maher

AMG EAST: 366293E GRID EAST: 366293E
 AMG NORTH: 5365800N GRID NORTH: 5365800N
 RL: 2 TOTAL DEPTH: 15.35m
 DEPTH AZIM. (MAG) INCLIN.
 0m 53' -52'

OBJECTIVES OF HOLE:

To gain more detailed structural and stratigraphic information, plus information on the mineralisation style in the vicinity of the Nickel Reward shafts.
 To repeat the intersection of M15: 8.1m @ 5.7% Ni, 1.7% Cu.

LITHOLOGICAL SUMMARY:

DFROM	DTO	COMMENTS
0	15.35m	Olive green volcaniclastic greywacke beds grading at top to laminated mudstone.

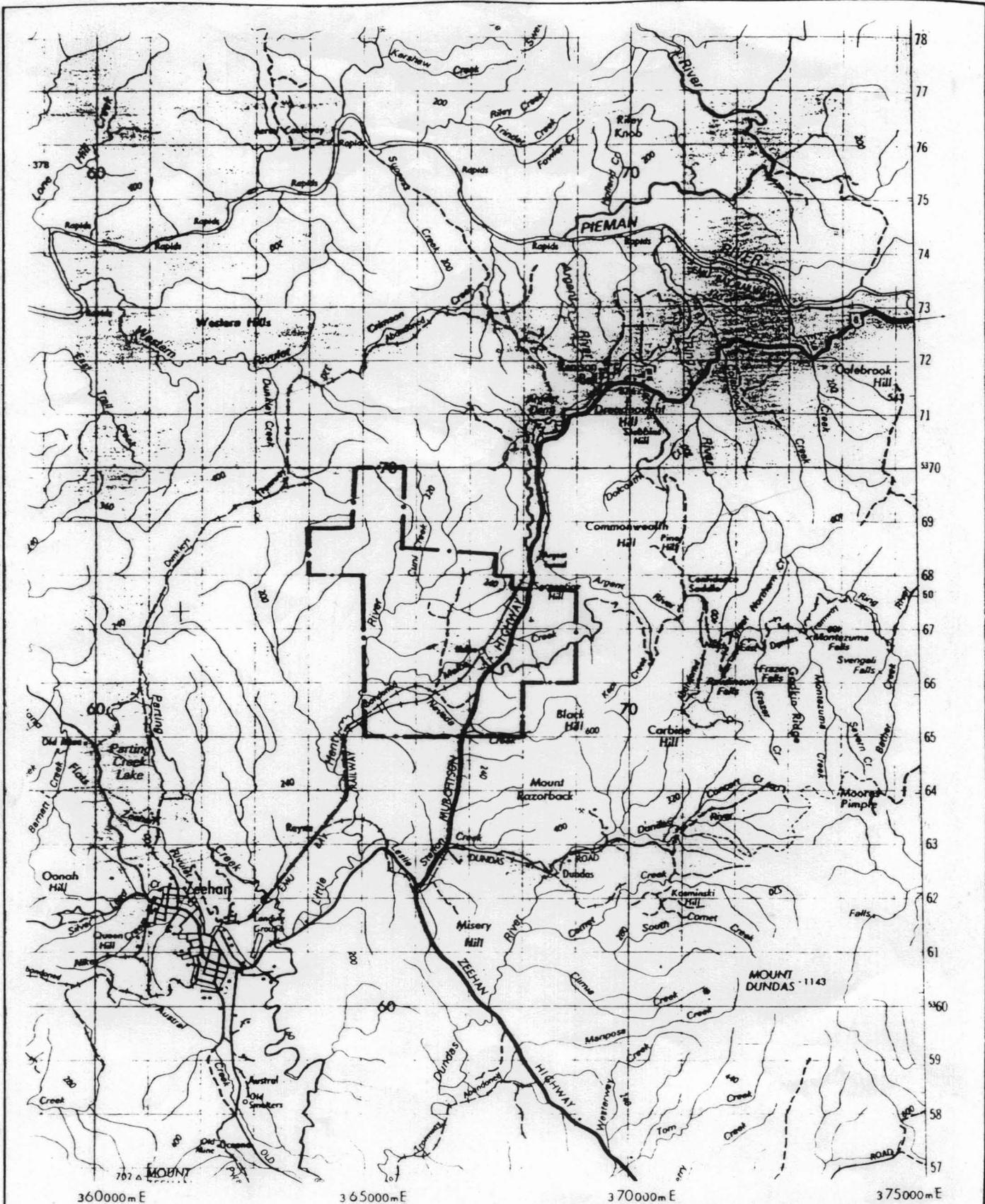
MINERALISATION SUMMARY:

DFROM	DTO	COMMENTS
0	15.35m	Trace pyrite in selvages of quartz veins and disseminations in fine and coarser grained sedimentary rocks.

CONCLUSIONS:

MFO7 did not intersect the massive sulphide sheet intersected in M15 because:

- MFO7 is orientated sub parallel to the sulphide sheet which dips steeply to the NW.
- MFO7 is located 4m NW of M15.



96-3884

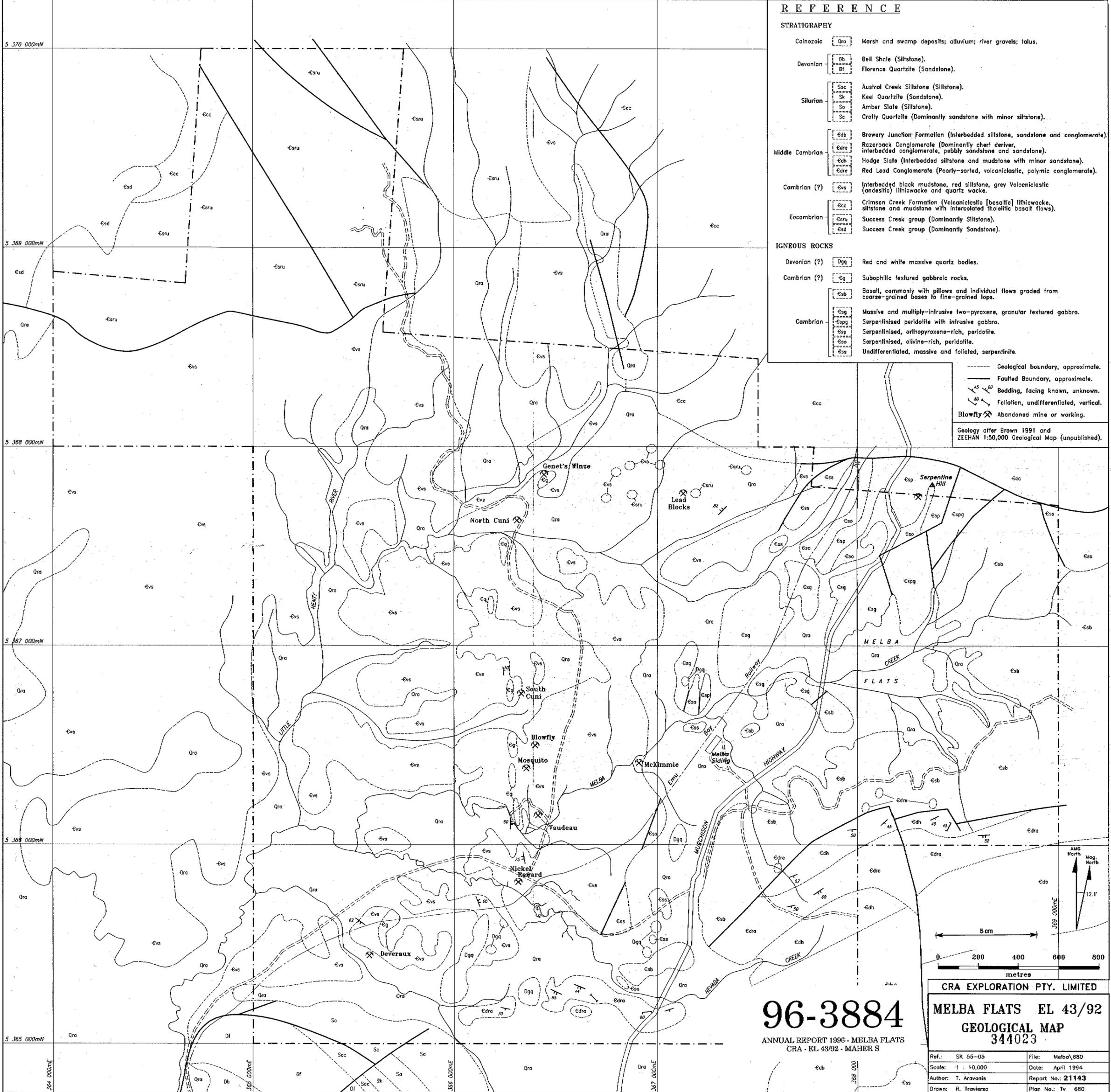
ANNUAL REPORT 1996 - MELBA FLATS
CRA - EL 43/92 - MAHER S

CRA EXPLORATION PTY. LIMITED

MELBA FLATS EL 43/92

LOCATION PLAN 344022

Ref. SK55-5	Scale 1:100 000
Author: T Aravanis	Report No. 21143
Drawn: A Jelen MAR'94	Plan No. Tv 675



REFERENCE

STRATIGRAPHY

- Cainozoic Qra Marsh and swamp deposits; alluvium; river gravels; talus.
- Devonian Db Bell Shale (Siltstone).
Df Florence Quartzite (Sandstone).
- Silurian Soc Austral Creek Siltstone (Siltstone).
Sk Keel Quartzite (Sandstone).
So Amber Slate (Siltstone).
Sc Crofty Quartzite (Dominantly sandstone with minor siltstone).
- Middle Cambrian Edb Brewery Junction Formation (Interbedded siltstone, sandstone and conglomerate).
Edra Razorback Conglomerate (Dominantly chert derived, interbedded conglomerate, pebbly sandstone and sandstone).
Edh Hodge Slate (Interbedded siltstone and mudstone with minor sandstone).
Edre Red Lead Conglomerate (Poorly-sorted, volcanoclastic, polygenic conglomerate).
- Cambrian (?) Evs Interbedded black mudstone, red siltstone, grey volcanoclastic (andesitic) lithicwacke and quartz wacke.
- Eocambrian Ecc Crimson Creek Formation (Volcanoclastic [basaltic] lithicwacke, siltstone and mudstone with intercalated tholeiitic basalt flows).
Ecsu Success Creek group (Dominantly Siltstone).
Esd Success Creek group (Dominantly Sandstone).

IGNEOUS ROCKS

- Devonian (?) Dgg Red and white massive quartz bodies.
- Cambrian (?) Eg Subophitic textured gabbroic rocks.
- Esb Basalt, commonly with pillows and individual flows graded from coarse-grained bases to fine-grained tops.
- Cambrian Esg Massive and multiply-intrusive two-pyroxene, granular textured gabbro.
Espg Serpentinised peridotite with intrusive gabbro.
Esp Serpentinised, orthopyroxene-rich, peridotite.
Eso Serpentinised, olivine-rich, peridotite.
Ess Undifferentiated, massive and foliated, serpentinite.

- Geological boundary, approximate.
 - Faulted Boundary, approximate.
 - Bedding, facing known, unknown.
 - Foliation, undifferentiated, vertical.
 - Blowfly X Abandoned mine or working.
- Geology after Brown 1991 and ZEEHAN 1:50,000 Geological Map (unpublished).

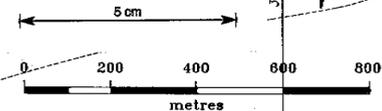
96-3884

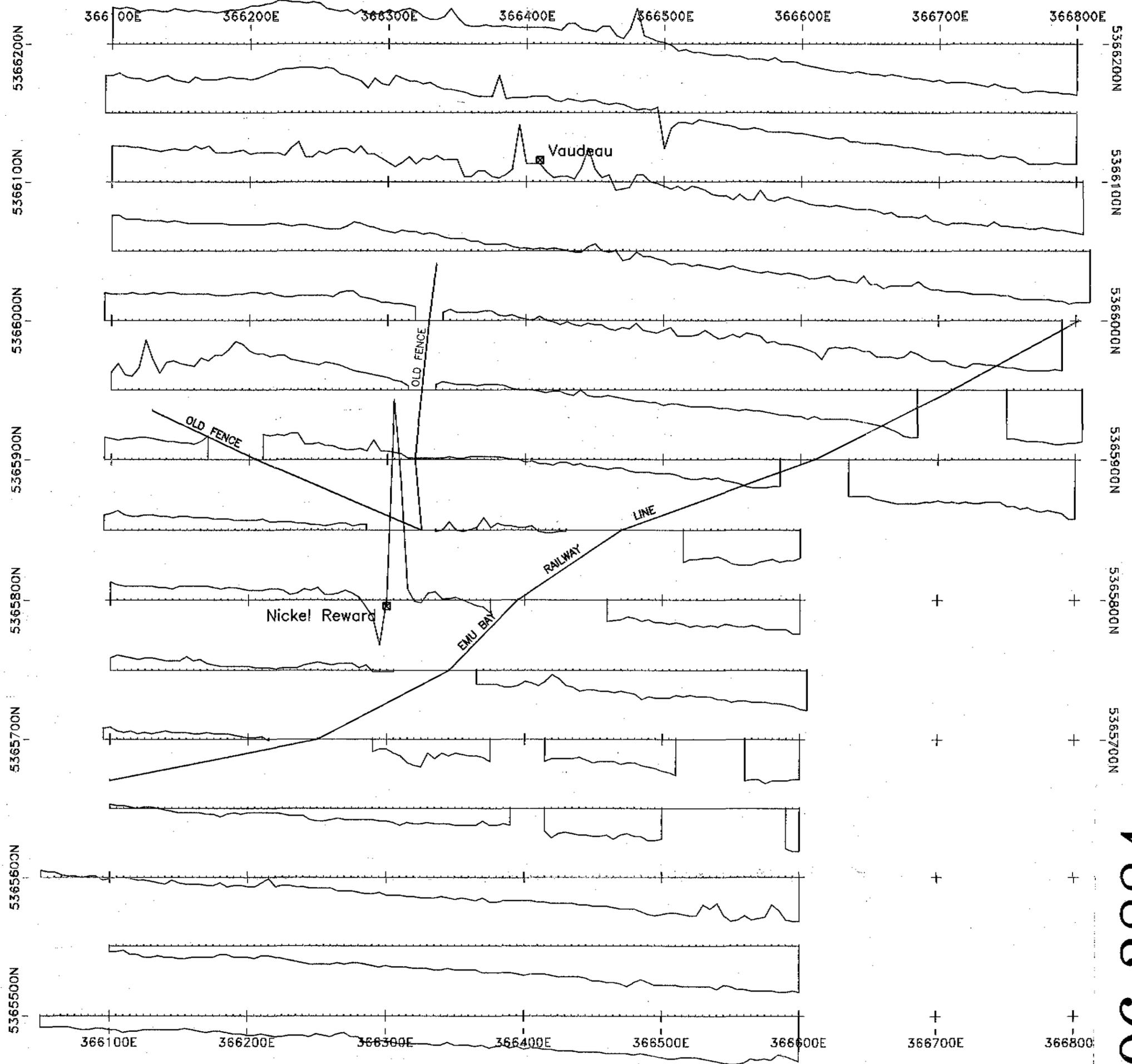
ANNUAL REPORT 1996 - MELBA FLATS
CRA - EL 43/92 - MAHER S

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MELBA FLATS EL 43/92
GEOLOGICAL MAP
344023

Ref.: SK 55-05	File: Melba\680
Scale: 1 : 10,000	Date: April 1994
Author: T. Aravanja	Report No.: 21143
Drawn: R. Travieso	Plan No.: Tv 680

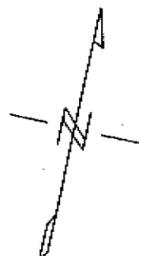




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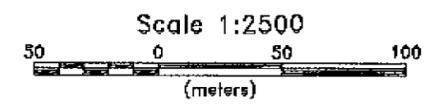
344024



MAG N

MAG North = 12° AMG

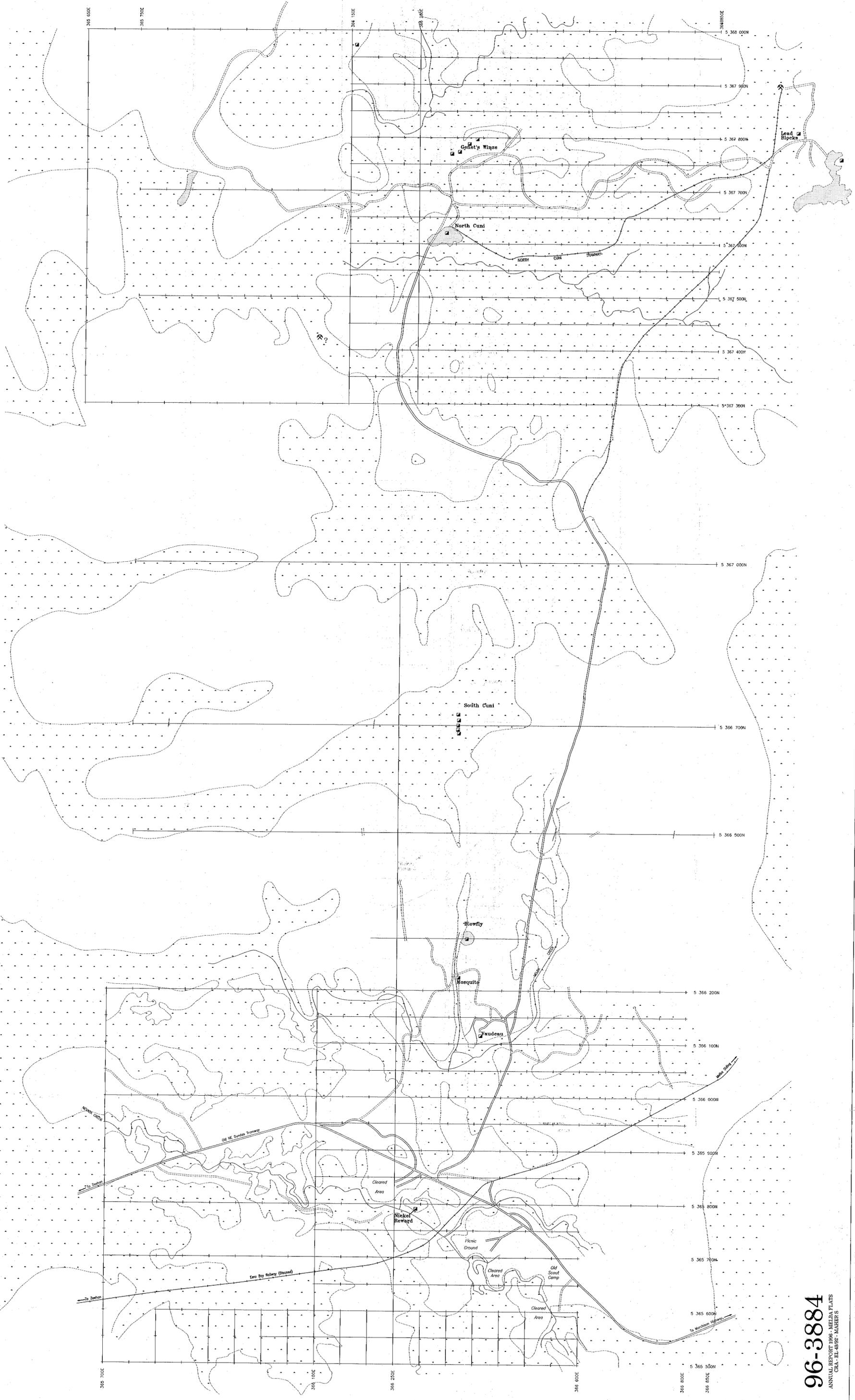
☒ Shaft
Base Level: 62225 nT
Vertical Scale: 75 nT/cm



5 cm

CRA EXPLORATION PTY. LIMITED		
MELBA FLATS EL 43/92		
NICKEL REWARD - VAUDEAU		
GROUND MAGNETIC STACKED PROFILES		
QUEENSTOWN SK55-05		
GEO: S.Maher	SCALE: 1:2500	REPORT: 21143
DRAWN: T.S.	DATE: May '95	PLAN: Tv 678

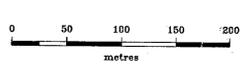
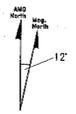
96-3884



96-3884
ANNUAL REPORT 1998 - MELBA FLATS
CRA - EL 43/92 - MELBA FLATS

LEGEND

- Creeks
- Tracks
- Disused Tracks
- Disused Tramway
- Cleared Area
- Soil Developed Over Bedrock
- Alluvium Overlying Bedrock
- Old Workings
- North Cuni
- Shaft
- CRAE Gridline



CRA EXPLORATION PTY. LIMITED	
MELBA FLATS EL 43/92	
344025 Cuni Culture Plan	
Ref.: SK 55-5	File: Tv954
Scale: 1 : 2500	Date: May 1995
Author: S. Maher	Report No.: 21143
Drawn: T. Sargeant	Plan No.: Tv 954

3911775 *

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3911771 * 3911777 *
3911773 * 3911772 *

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3184286 *
3184290 *
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3911770 *

* 3911769

3184296 3184298
3911703 3528462 3184296
3184297 3911706 3911702
3911704 3184300 3911708 *
3911705 3911701 3528463 * 3184295

* 3911767

* 3911795

* 3911778

3757290 * 3757300

3911799
3911798
* 3911800
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* 3911794 3911793
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3911747 ** 3911748

3911752 3528461 3308019
3911751 * 3528459 3308020
3528460 * * 3308021

* 3911755 3911755
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3184279 *

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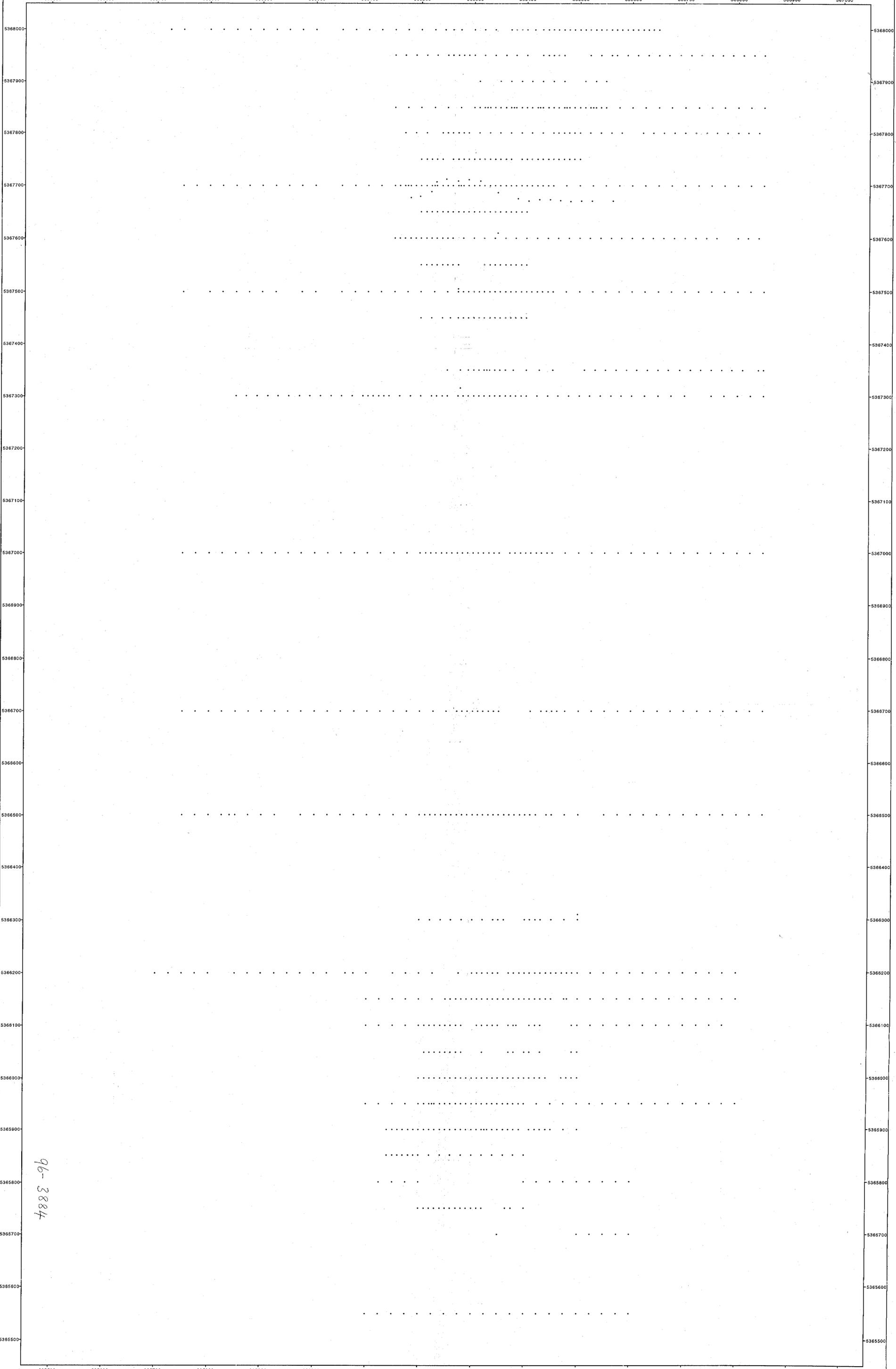
3911757
* 3911758



96-3884
ANNUAL REPORT 1996 - MELBA FLATS
CRA - EL 43/62 - MAHER S

CRA EXPLORATION PTY LIMITED			
MELBA FLATS EL 43/62			
ROCK CHIP SAMPLE LOCATION PLAN			
344027			
Geol: S Meher	Scale: 1:2,500	Report: 21143	
Drawn:	Date: 5/1/95	Plan: Tv 951	

ALL SAMPLES
map 10m



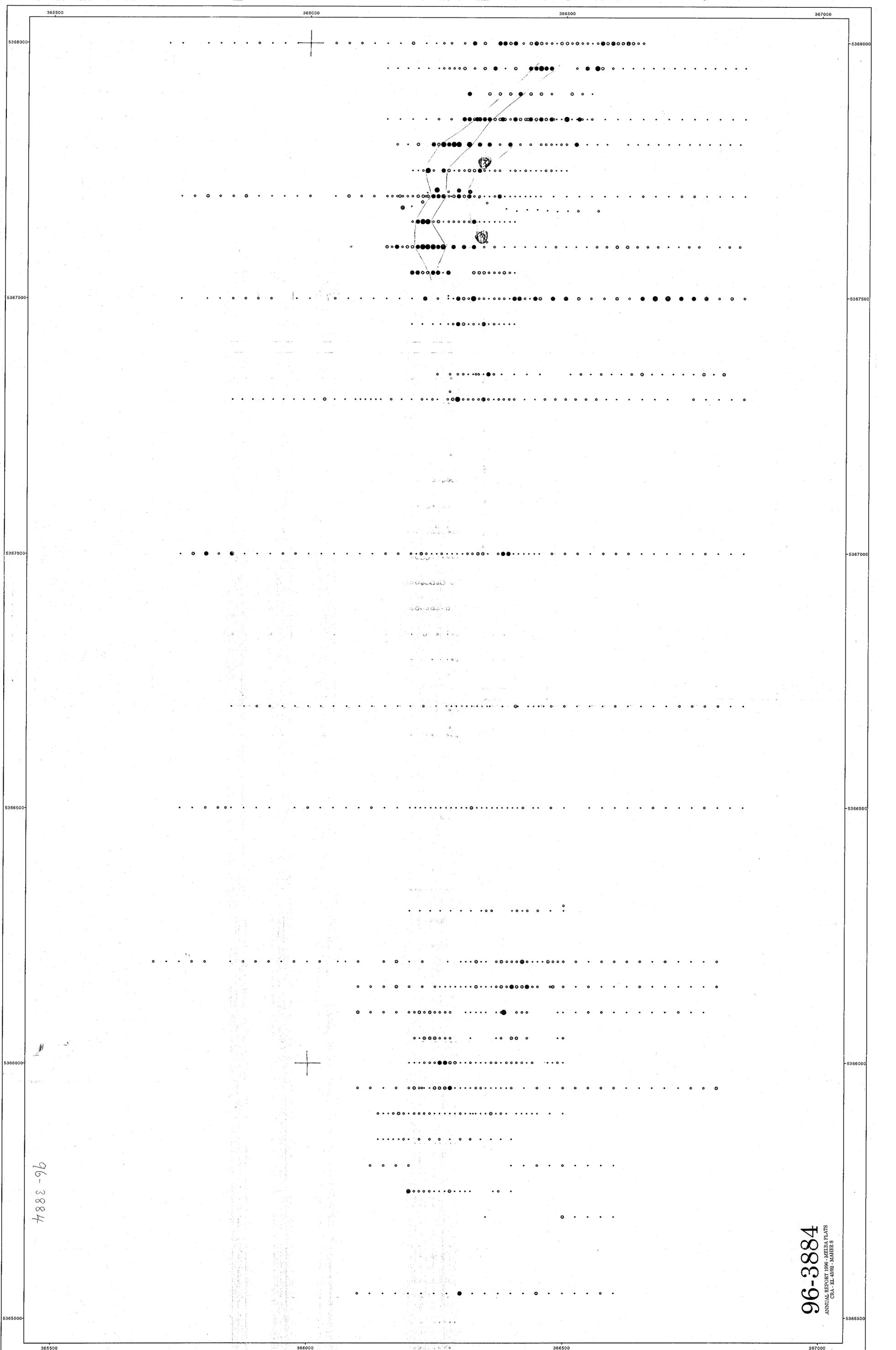
96-3884

5 cm

96-3884

ANNUAL REPORT 1996 - MELBA FLATS
CRA - EL 4392 - BAIHER S

CRA EXPLORATION PTY. LIMITED		
MELBA FLATS EL 4392		
SOIL & WACKER SAMPLE LOCATIONS		
Cun. 34 1023		
Geol: S.Maher	Scale: 1:2500	Report: 21143
Drawn:	Date: 4/12/95	Plan: T/ 946



96-3884

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ANNUAL REPORT 1996 - MELBA FLATS
CRA - EL 4392 - MAHER S

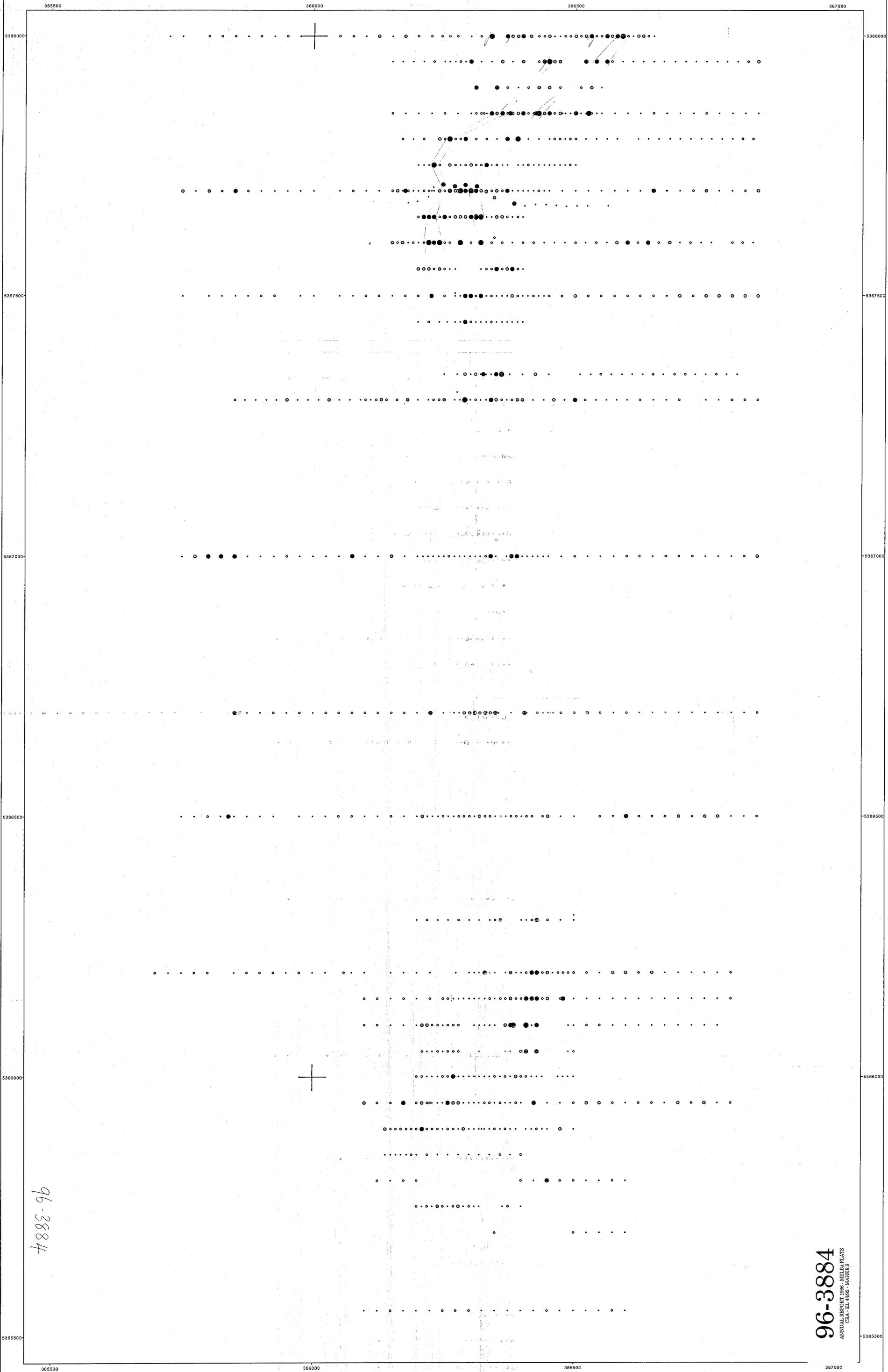
- -59
- 59-59
- 59-59
- 59-119
- 119-196
- 196-330
- ◐ 330-580
- ⊗ 580-950
- ⊕ +950

5 cm

34029

CRA EXPLORATION PTY. LIMITED		
MELBA FLATS EL43/92		
Soil Geochemistry Ni ppm		
Geol: S. Maher	Scale: 1:2500	Report: 21143
Drawn:	Date: 22/5/95	Plan: TV 947

ALL AUGER & WACKER SAMPLES
10m



96-3884

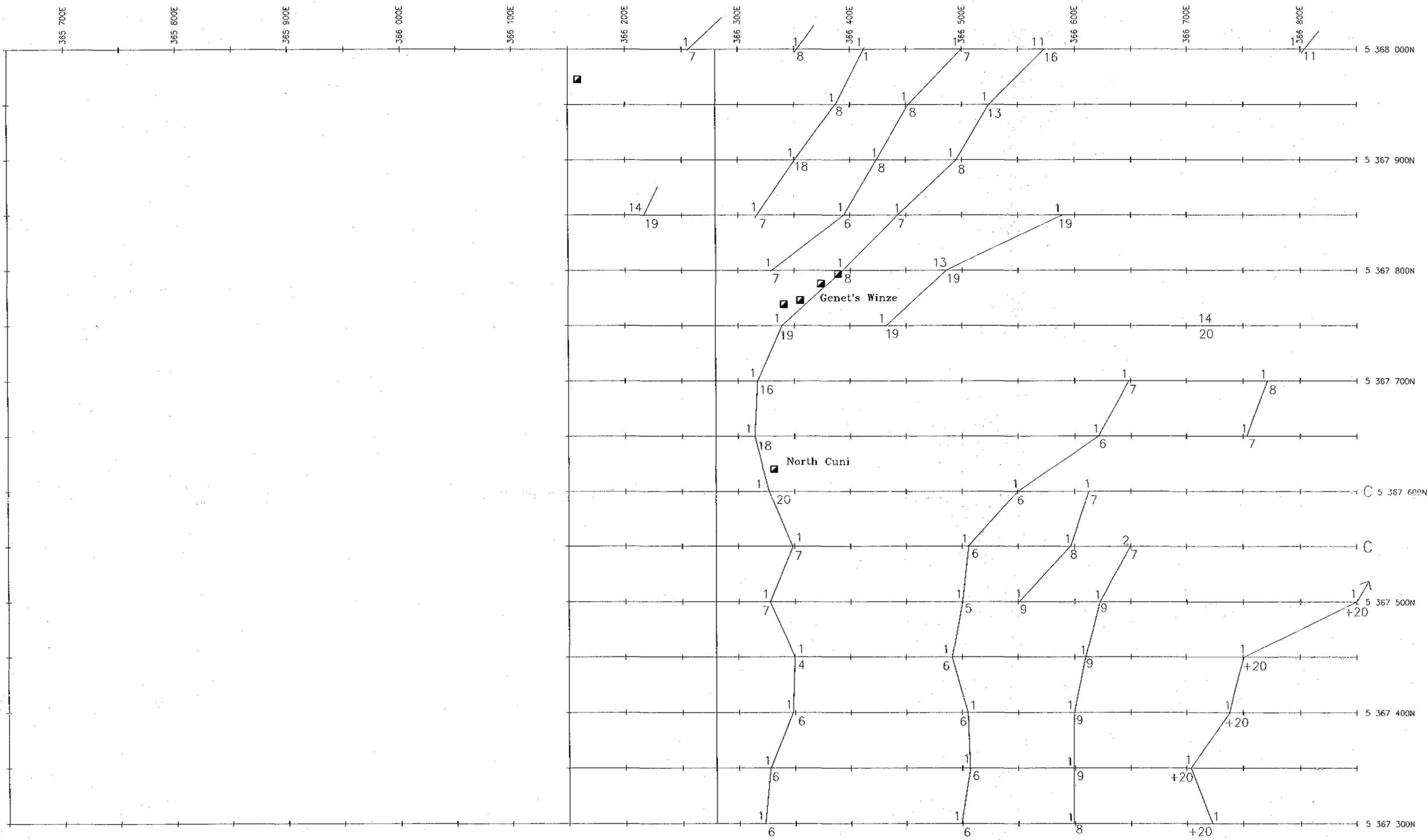
96-3884
 ANNUAL REPORT 1996 MELBA FLATS
 CRA - EL 4982 - MAHER'S

- 98-138
- 57
- 57-57
- 57-57
- 57-98
- 138-217
- 217-440
- 440-767
- 767

344030
 5 cm

ALL AUGER & WACKER SAMPLES
 jmsp 10m

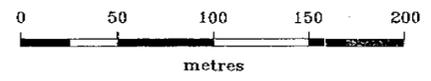
CRA EXPLORATION PTY. LIMITED			
MELBA FLATS EL49/92		CUNI	
Soil Geochem.		Cu ppm	
Geol: S.Maher	Scale: 1:2500	Report: 21143	
Drawn:	Date: 22/5/96	Plan: TV 948	



Lead Blocks

LEGEND

- 1 - First channel anomaly detected
- 6 - Last channel anomaly detected
- North Cuni Shafts
- Gridline
- Off line conductor

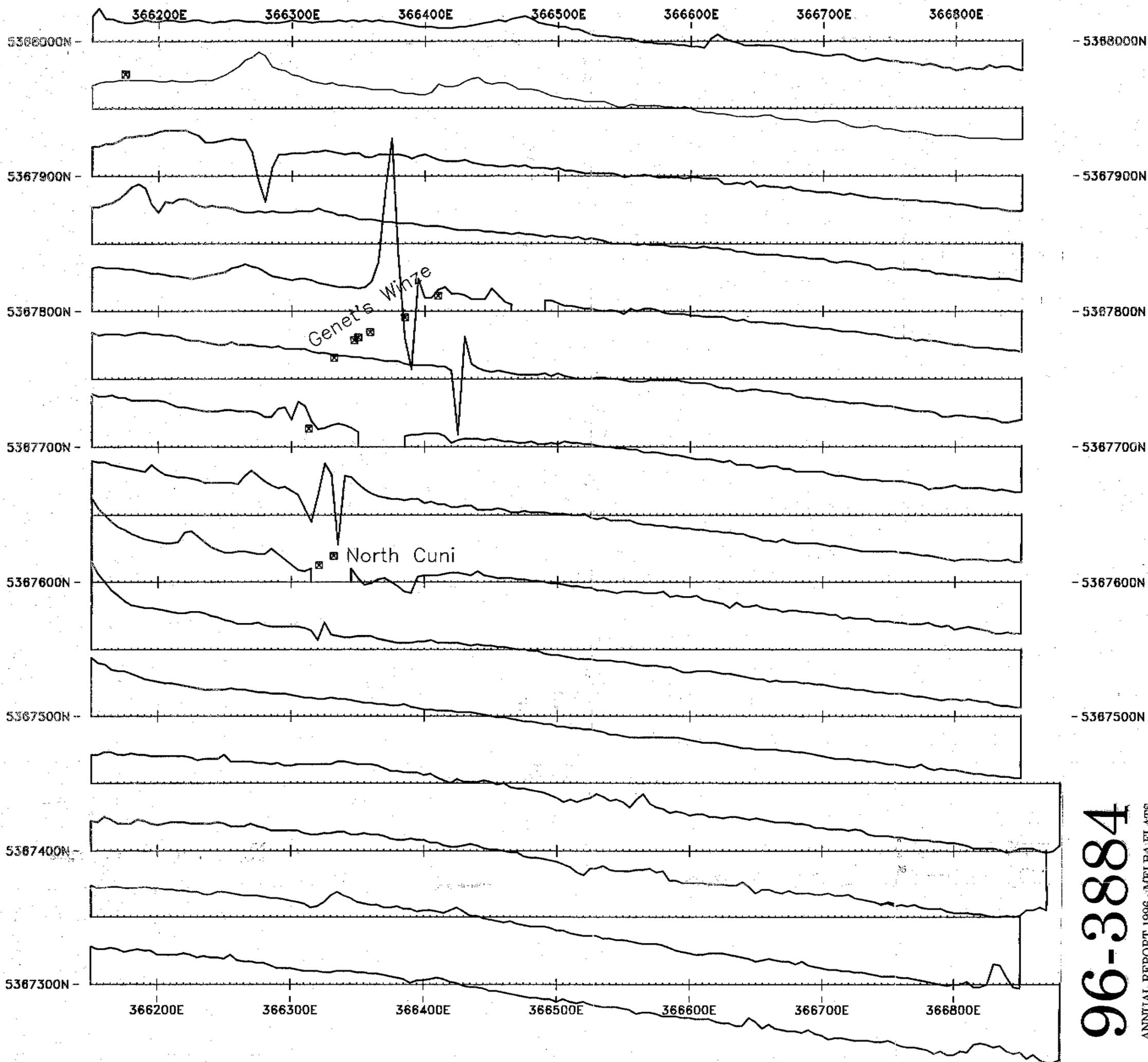


5 cm

96-3884
 ANNUAL REPORT 1996 - MELBA FLATS
 CRA - EL 43/92 - MAHER S

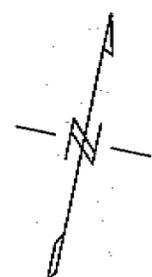
344031

CRA EXPLORATION PTY. LIMITED	
MELBA FLATS EL 43/92	
North Cuni - Genet's Winze Grid	
PROTEM interpretation	
Ref.: SK 55-5	File: Tv952
Scale: 1 : 2500	Date: May 1995
Author: S. Maher	Report No.: 21143
Drawn: T. Sargeant	Plan No.: Tv952



96-3884

ANNUAL REPORT 1996 - MELBA FLATS
CRA - EL 43/92 - MAHER S

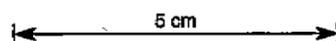
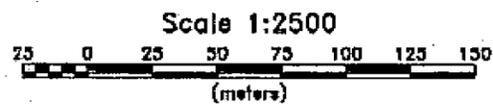


MAG N

MAG North = 12° AMG

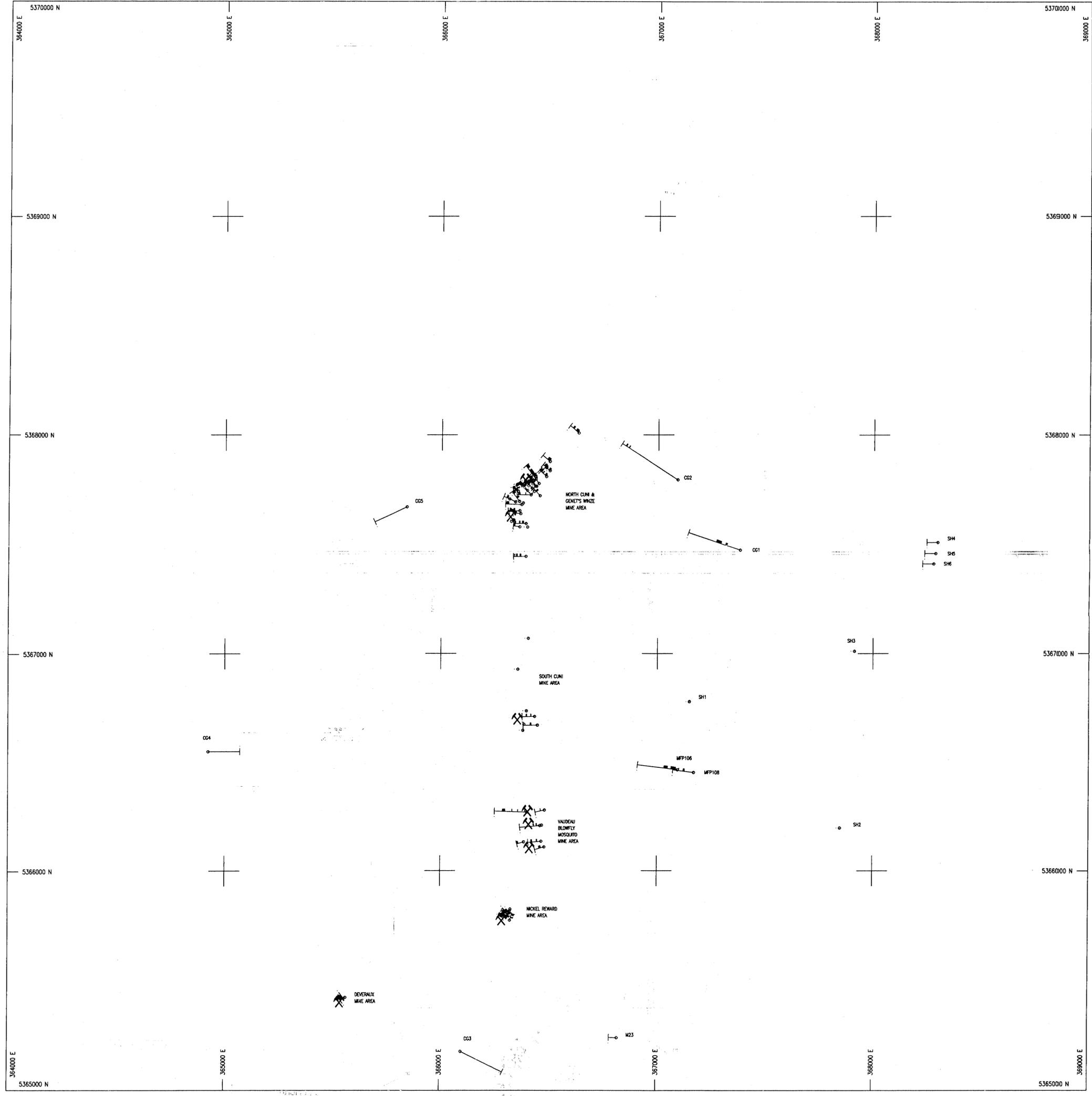
☒ Shaft

Vertical Scale: 75 nT/cm
Base Level: 62300 nT



344032

CRA EXPLORATION PTY. LIMITED		
MELBA FLATS EL 43/92		
NORTH CUNI - GENET'S WINZE		
GROUND MAGNETIC STACKED PROFILES		
QUEENSTOWN SK55-05		
GEO: S.Maher	SCALE: 1:2500	REPORT: 21143
DRAWN: T.S.	DATE: May '95	PLAN: Tv 679



HOLES PLOTTED

TOTAL		B9	
CG1	CG2	CG3	CG4
CG5	DD01	DD02	DD03
DD04	DD05	DD06	DD07
DD08	DD09	DD10	DD11
DD12	DD13	DD14	DD15
DD16	DD17	EM1	EM2
EM3	EM4	EM5	GW0
GW1	GW2	GWS1	GWS2
GWS3	GWS4	M10	M11
M12	M13	M14	M15
M16	M17	M18	MF01
MF02	MF03	MF04	MF05
MF06	MF07	MF106	MF108
MF109	MF110	MF111	MF112
MF113	MF114	MF118	MF120
MF122	MF126	MF127	MF128
MF129	MF130	MF131	MF132
MF133	MF134	MF135	MF136
MF137	MF138	MF139	MF140
MF141	MF142	MF143	MF144
MF145	MF146	MF147	MF148
MF149	MF150	MF151	MF152
MF153	MF154	MF155	MF156
MF157	MF158	MF159	MF160
MF161	MF162	MF163	MF164
MF165	MF166	MF167	MF168
MF169	MF170	MF171	MF172
MF173	MF174	MF175	MF176
MF177	NCS1	NCS2	SH1
SH2	SH3	SH4	SH5
SH6			

Abandoned Cu-Ni mine

Diamond drill hole

Dolerite/massive sulphide intersection

96-3884

ANNUAL REPORT 1986 - MELBA FLATS
CRA - EL 43/92 - MAHER S

5 cm

SCALE 1 : 10000

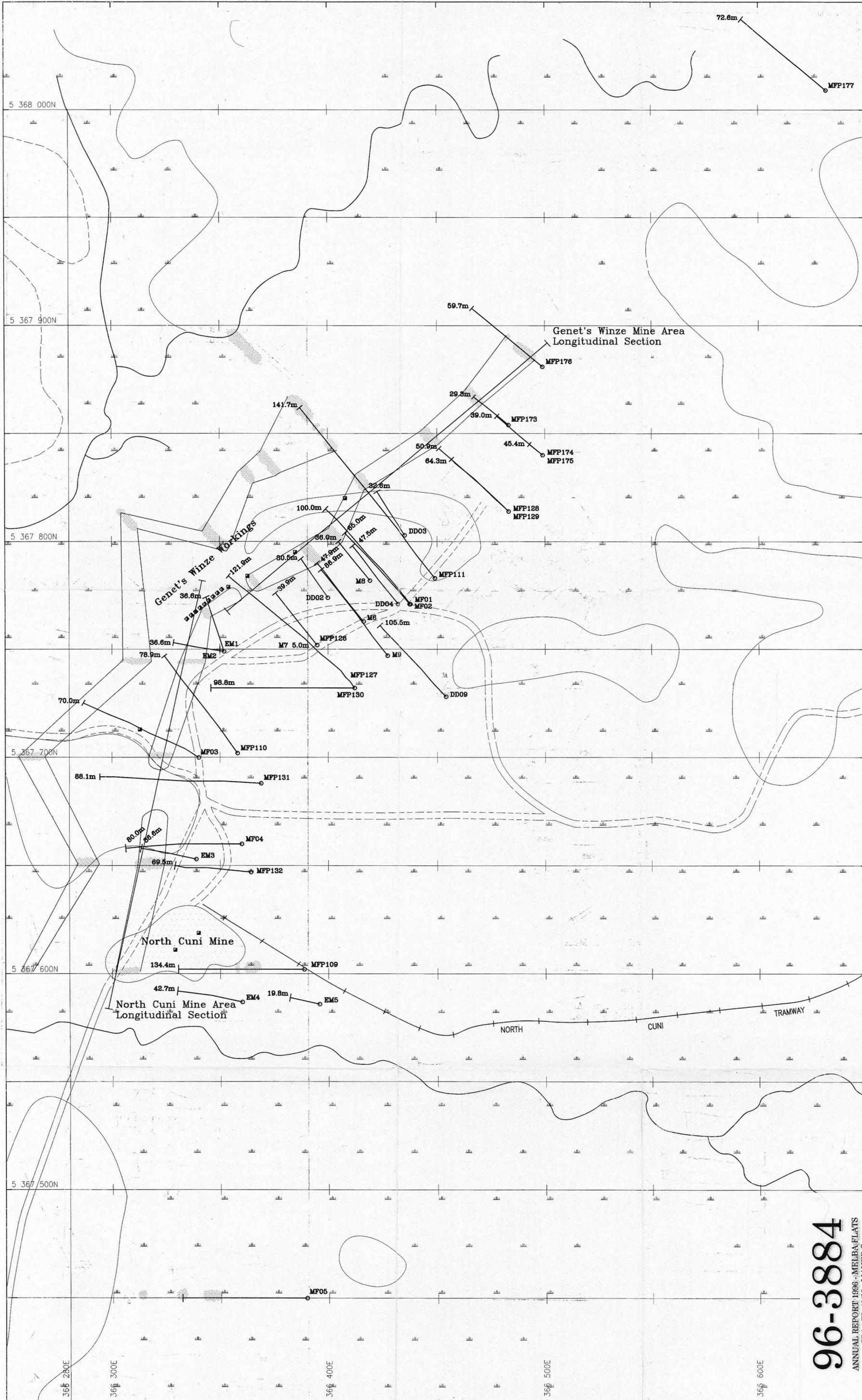
100 0 100 200 300 400 M

344033

AZIMUTH (DEG) = 0

CRA EXPLORATION PTY. LIMITED
MELBA FLATS EL 43/92
DRILL HOLE LOCATION PLAN

Holein1 3.13.00	24-AUG-1995	12:43:29
PLOTTED BY: S. Maher	REPORT NO.: 21143	
CHECKED BY:	Plan Tv 979	

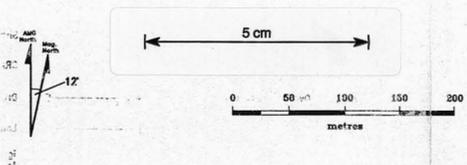


96-3884
 ANNUAL REPORT 1996 - MELBA FLATS
 CRA - EL 43/92 - MAHER S

96-3884
 7885-96

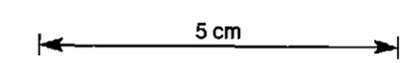
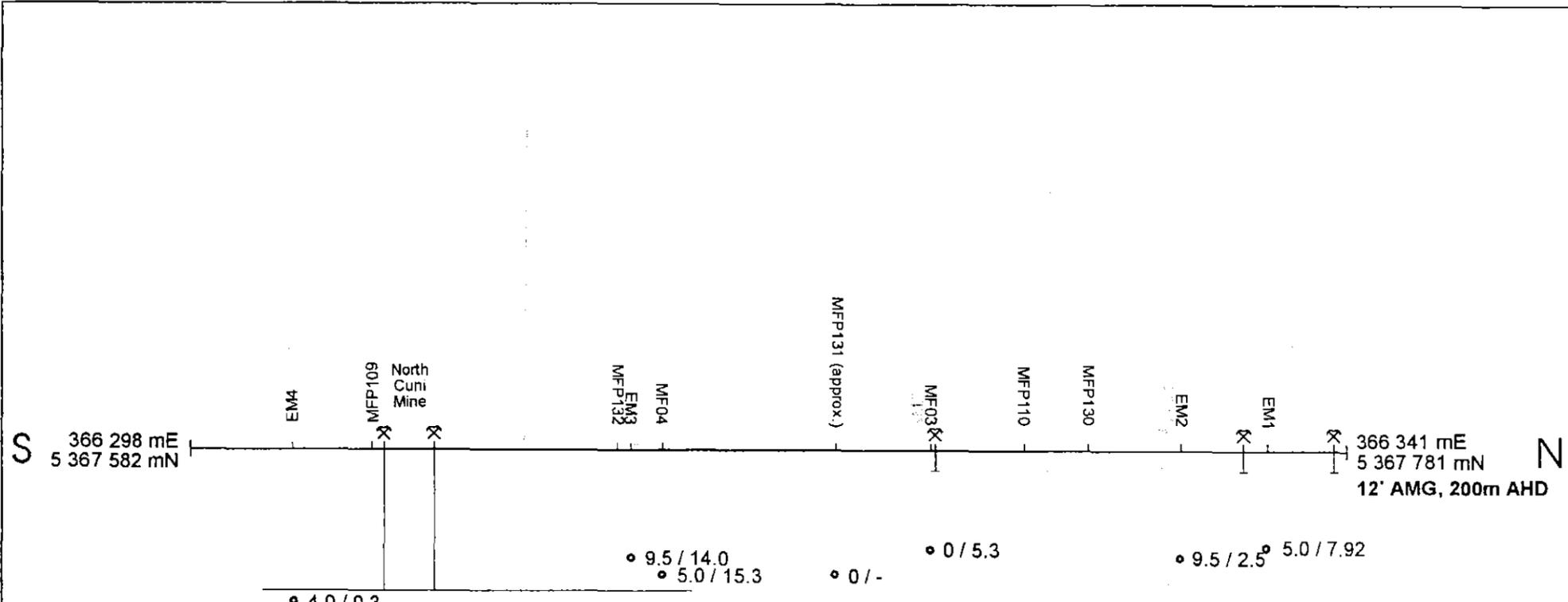
LEGEND

- Creek
- Tracks
- Disused Tracks
- Disused Tramway
- Cleared Area
- Soil Developed Over Bedrock
- Alluvium Overlying Bedrock
- Shaft
- CRAE Gridline
- Drill Hole
- Longitudinal Section Position
- Igb Intersection in drilling projected to surface from cross section



344034

CRA EXPLORATION PTY. LIMITED	
MELBA FLATS EL 43/92	
North Cuni - Genet's Winze Prospect	
North Cuni & Genet's Winze Mine Area	
Drill Hole Compilation Plan	
Ref.: SK 55-5	File: Tv953
Scale: 1 : 1000	Date: August 1995
Author: S. Maher	Report No.: 21143
Drawn: T. Sargeant	Plan No.: Tv 953



96-3884

ANNUAL REPORT 1996 - MELBA FLATS
CRA - EL 43/92 - MAHER S



344035

- Base of Eastern Dolerite
- 5.0 / 7.92 True dolerite width(m)/grade width product(m%)*
- (*True mineralisation width(m) x [Ni% + Cu%])

CRA EXPLORATION PTY. LIMITED

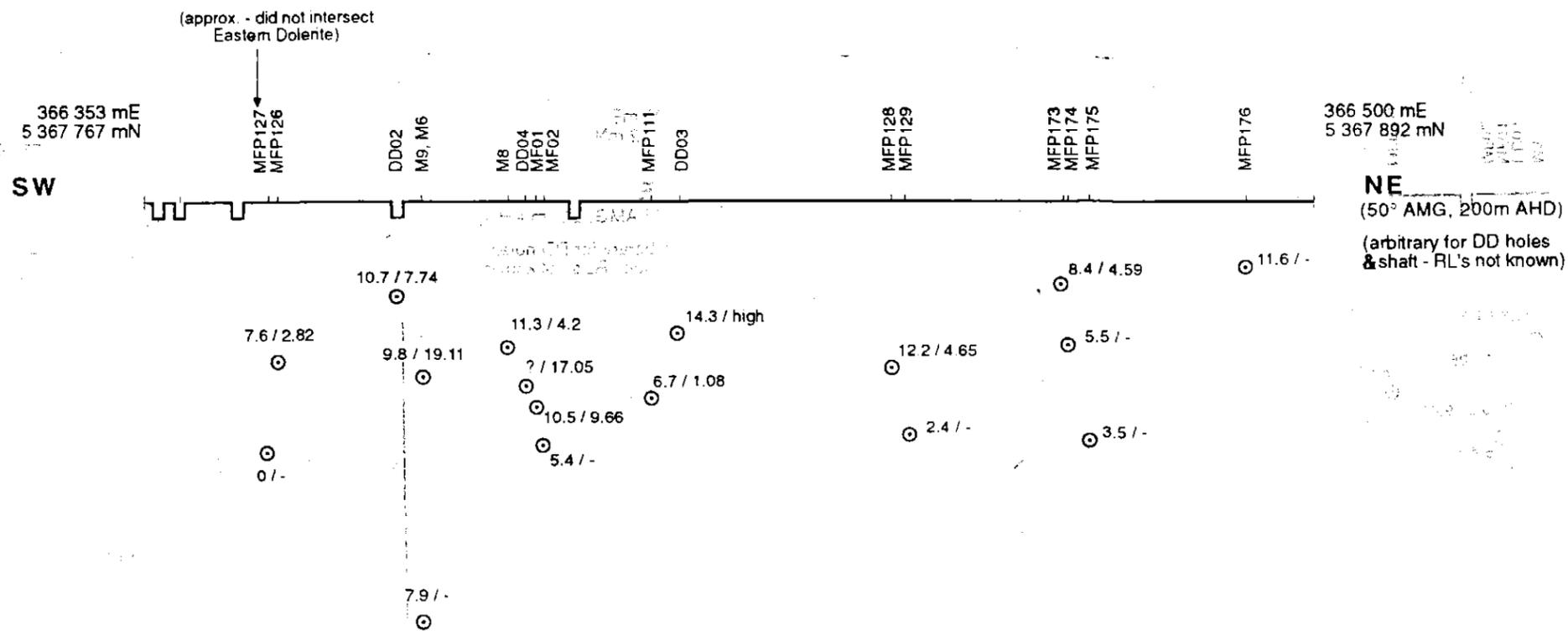
MELBA FLATS EL 43/92
North Cuni - Genet's Winze Prospect
VERTICAL LONG. SECTION
EASTERN DOLERITE
North Cuni Mine Area

Author: Simon Maher	Reference: SK 55-05
Drawn: Tony Sargeant	File Name: Tv969.cdr
Date: July 1995	Report No: 21143
Scale: 1:1000	Plan No: Tv969

- Projection to surface indicates the Eastern Dolerite strikes 12° AMG at North Cuni.
- True widths assume a dip on the Eastern Dolerite and mineralisation of ~ 50°.
- Using a 1.0% combined Ni/Cu cut-off.

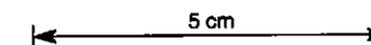
- MFP 131 Did not intersect E Dolerite
- MFP109 5m@ 0.4% Ni, 0.4% Cu
- EM4 0.9m@ 0.6% Ni, 0.3%Cu
- MFP132 4.6m@ 0.4% Ni, 0.6% Cu
- EM3 6.1m@ 1.2% Ni, 1.1% Cu
- MF04 0.8m@ 7.8% Ni, 10.3% Cu
0.9m@ 0.5% Ni, 0.5% Cu
- MF03 Did not intersect E Dolerite
0.5m@ 7.7% Ni, 2.9% Cu
- MFP110 3.1m@ 4.3% Ni, 2.7% Cu
- MFP130 No significant mineralisation
- EM2 1.2m@ 0.5% Ni, 0.7% Cu
0.6m@ 1.0% Ni, 0.7% Cu
- EM1 4.4m@ 1.7% Ni, 0.1% Cu
- omitted holes MF05 2.0m@ 0.4% Ni, 0.6% Cu
Probably can't correlate to E Dolerite - 130m S of section.
- EM5 Did not intersect E Dolerite
- DD10 Probably did not intersect E Dolerite

Incomplete records indicate reported production from the North Cuni mine to be 960t @ 10.5% - 17.0% Ni & 5.5% - 6.5% Cu.



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CRA - EL 43/92 - MAHER S



CRA EXPLORATION PTY. LIMITED

EL43/92 - MELBA FLATS
North Cuni - Genet's Winze Prospect
Vertical Long. Section - Eastern Dolerite
Geret's Winze Mine Area

344036

Author : Simon Maher	Reference : SK5505
Drawn : Dean Oliver	File Name : Tv970
Date : August 1995	Report No : 21143
Scale : 1:1000	Plan No : Tv970

DD03	several feet @ 3.6%Ni, 2.5 - 3.5%Cu
MFP111	1.2m @ 0.3% Ni, 0.6% Cu
MFP128	3.1m @ 1.0% Ni, 0.5% Cu
MFP129	possibly not assayed
MFP173	2.7m @ 0.9% Ni, 0.8% Cu
MFP174	not a ssayed
MFP175	possibly not assayed
MFP176	not assayed
MFP126	1.2m @ 0.6% Ni, 1.3% Cu
DD02	0.9m @ 6.0% Ni, 2.6% Cu possible additional low grade mineralisation
M6	4.9m @ 2.3% Ni, 1.6% Cu
M9	-
M8	2.1m @ 1.0% Ni, 1.0% Cu
DD04	1.1m @ 10.0% Ni, 5.5% Cu
MF01	0.7m @ 9.3% Ni, 4.5% Cu
MF02	-
MFP127	did not intersect eastern dolerite
MFP177	not assayed - probably can't correlate to E dolerite shown on adjoining N sheet

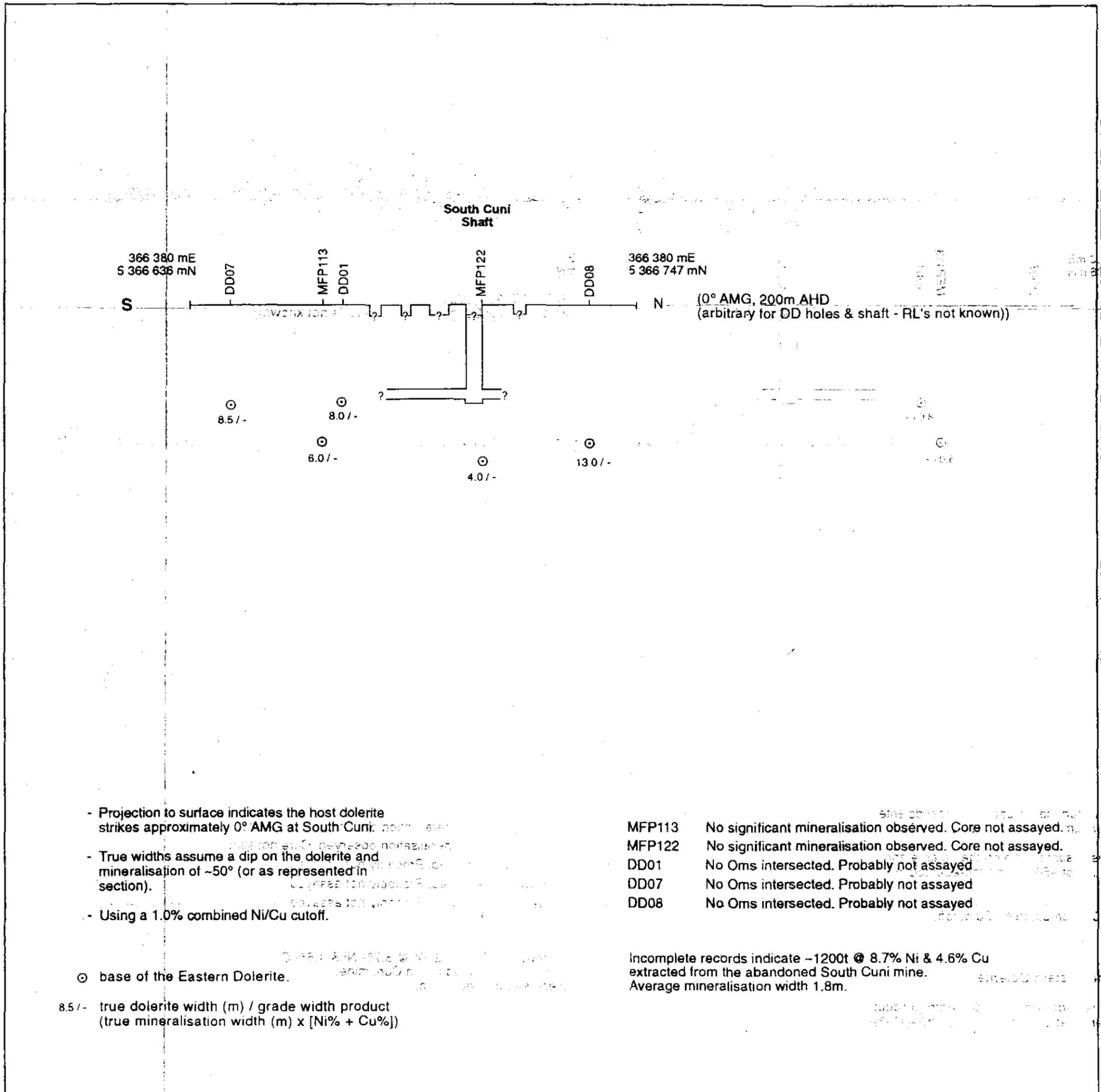
Omitted Holes	
M7	did not intersect dolerite
DD09	probably did not intersect E dolerite

- Projection to surface indicates the Eastern Dolerite strikes 50° AMG at Genet's Winze. Parasitic folding in the SW introduces an error to true width calculations in this area.
- True widths assume a dip on the Eastern Dolerite and mineralisation of ~ 50°.
- Using a 1.0% combined Ni/Cu cutoff.

⊙ base of the host dolerite.

9.8 / 19.11 true dolerite width (m) / grade width product (m%)*

*(true mineralisation width (m) x [Ni% + Cu%])



5 cm

96-3884

ANNUAL REPORT 1996 - MELBA FLATS
CRA - EL 43/92 - MAHER S



1:1000

- Projection to surface indicates the host dolerite strikes approximately 0° AMG at South Cuni.
- True widths assume a dip on the dolerite and mineralisation of ~50° (or as represented in section).
- Using a 1.0% combined Ni/Cu cutoff.

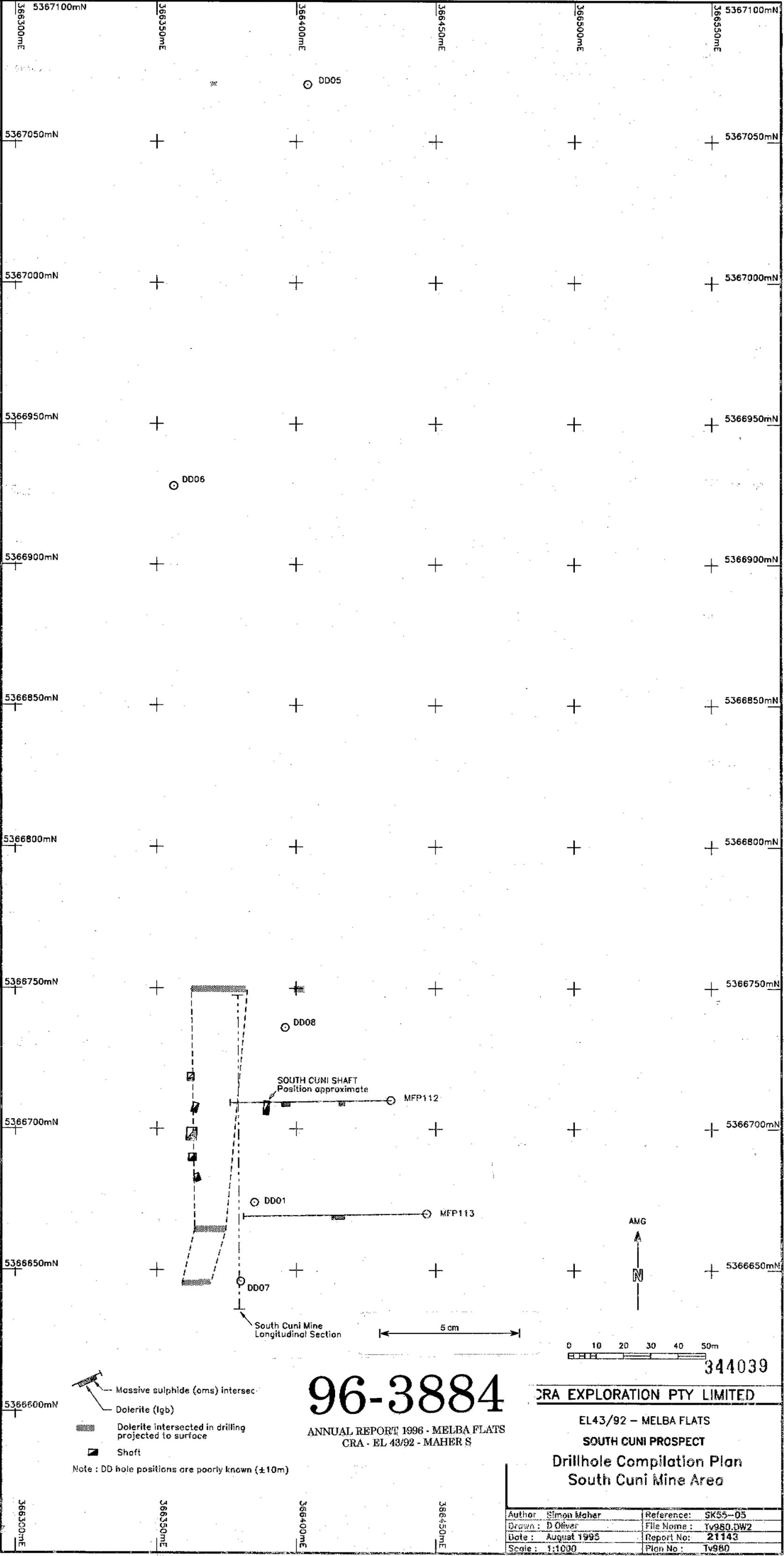
MFP113	No significant mineralisation observed. Core not assayed.
MFP122	No significant mineralisation observed. Core not assayed.
DD01	No Oms intersected. Probably not assayed.
DD07	No Oms intersected. Probably not assayed.
DD08	No Oms intersected. Probably not assayed.

Incomplete records indicate ~1200t @ 8.7% Ni & 4.6% Cu extracted from the abandoned South Cuni mine. Average mineralisation width 1.8m.

⊙ base of the Eastern Dolerite.

8.5/- true dolerite width (m) / grade width product
(true mineralisation width (m) x [Ni% + Cu%])

CRA EXPLORATION PTY. LIMITED	
EL43/92 - MELBA FLATS South Cuni Prospect Vertical Long. Section - Host Dolerite South Cuni Mine Area	
Author : Simon Maher	Reference : SK5505
Drawn : Dean Oliver	File Name : Tv973
Date : August 1995	Report No : 21143
Scale : 1:1000	Plan No : Tv973



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CRA - EL 43/92 - MAHER S

CRA EXPLORATION PTY LIMITED

EL43/92 - MELBA FLATS
SOUTH CUNI PROSPECT

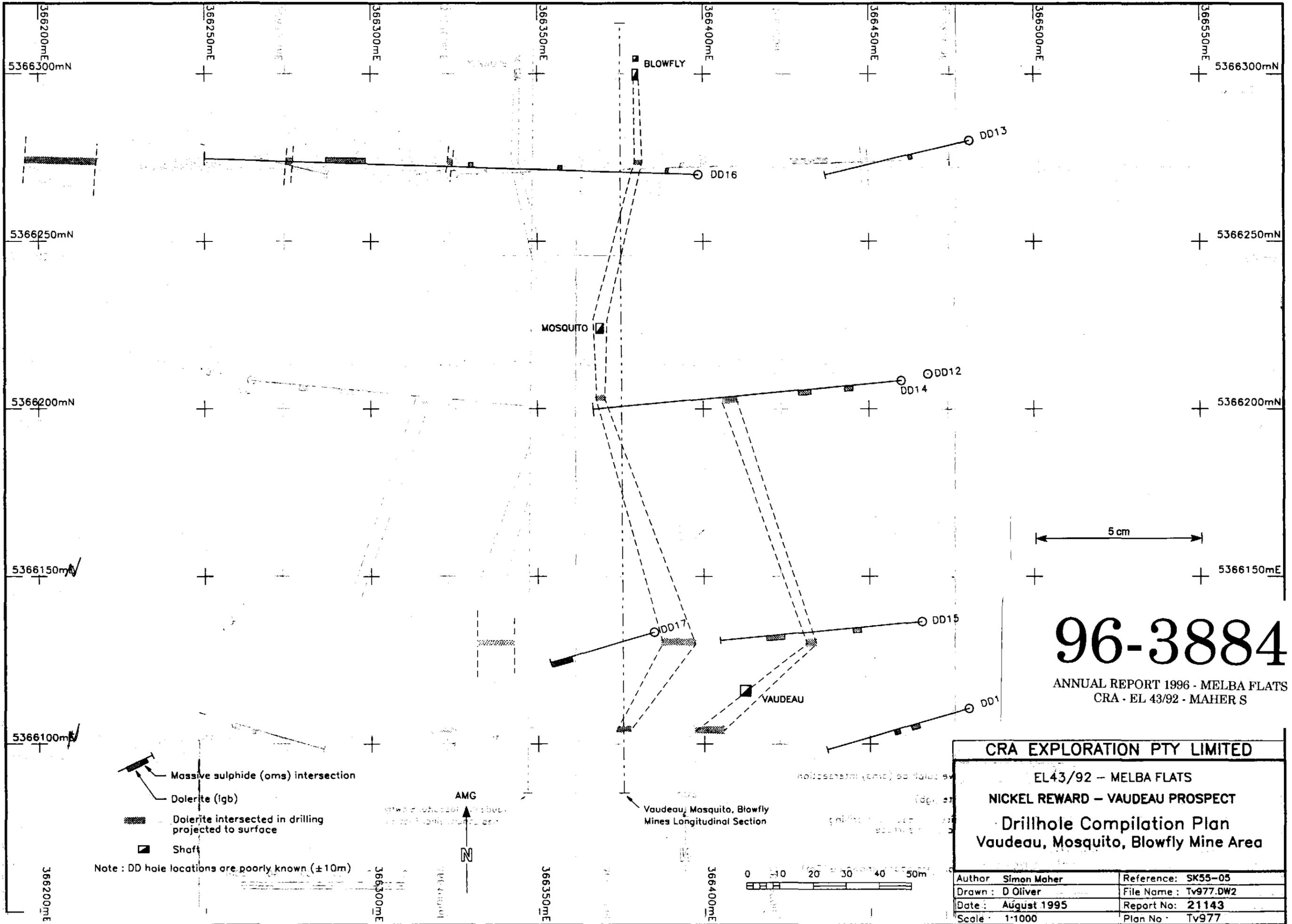
**Drillhole Compilation Plan
South Cuni Mine Area**

- Massive sulphide (oms) intersec.
- Dolerite (lgb)
- Dolerite intersected in drilling projected to surface
- Shaft

Note : DD hole positions are poorly known ($\pm 10m$)

Author: Simon Maher	Reference: SK55-05
Drawn: D Oliver	File Name: Tv980.DW2
Date: August 1995	Report No: 21143
Scale: 1:1000	Plan No: Tv980

344039



96-3884

ANNUAL REPORT 1996 - MELBA FLATS
CRA - EL 43/92 - MAHER S

5 cm

CRA EXPLORATION PTY LIMITED

EL43/92 - MELBA FLATS
NICKEL REWARD - VAUDEAU PROSPECT
Drillhole Compilation Plan
Vaudeau, Mosquito, Blowfly Mine Area

Author: Simon Maher	Reference: SK55-05
Drawn: D Oliver	File Name: Tv977.DW2
Date: August 1995	Report No: 21143
Scale: 1:1000	Plan No: Tv977

344036

365500mE

365550mE

365600mE

5365500mN

5365500mN

5365450mN

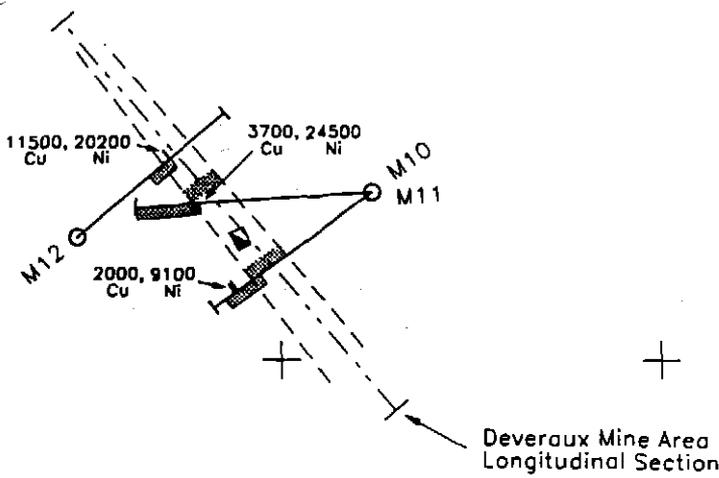
5365450mN

5365400mN

5365400mN

5365350mN

5365350mN

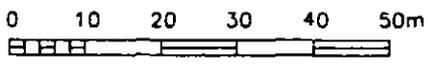


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ANNUAL REPORT 1996 - MELBA FLATS
CRA - EL 43/92 - MAHER S



5 cm



- Massive sulphide intersection
Cu(ppm), Ni(ppm)
- Dolerite intersection
- Dolerite intersected in drilling
projected to surface
- Shaft

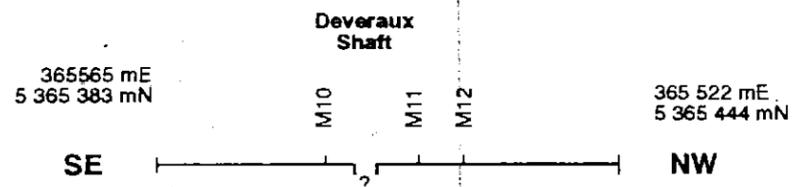
Note : AMG coordinates of holes & shaft are approximate only

CRA EXPLORATION PTY LIMITED

EL43/92 – MELBA FLATS
NICKEL REWARD – VAUDEAU PROSPECT
Drillhole Compilation Plan
Deveraux Mine Area

Author : S Maher	Reference: SK55-05
Drawn : D Oliver	File Name : Tv976.DW2
Date : August 1995	Report No: 21143
Scale : 1:1000	Plan No : Tv976

344041



(320° AMG, 200m AHD
(arbitrary -relative levels not known))

4.5/1.1
2.5/2.3
3.0/0.6

- Projection to surface indicates the host dolerite strikes approximately 320° AMG in this area.
- True widths assume a dip on the mineralisation + dolerite of 80 - 90° (see cross sections).
- Because sulphide mineralisation is at the NE margin of the host dolerite in holes M12 & M11, the NE margin is defined as the dolerite base for this long section.
- Using a 1.0% combined Ni/Cu cutoff.

⊙ base of the host dolerite.

4.5 / 1.1 true dolerite width (m) / grade width product (m%)*

* (true mineralisation width (m) x [Ni% + Cu%])

M10 2.0m @ 0.9% Ni, 0.2% Cu (true width 1.0m)
M11 1.2m @ 2.5% Ni, 0.4% Cu (true width 0.8m)
M12 0.3m @ 2.0% Ni, 1.2% Cu (true width 0.2m)

No production records exist for Deveraux. Selected ore samples assayed 6.6% Ni & 18.1% Cu. 0.3m thick Oms crops out on the NW face of the Deveraux Shaft.

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0 25 50m

1:1000

5 cm

CRA EXPLORATION PTY. LIMITED

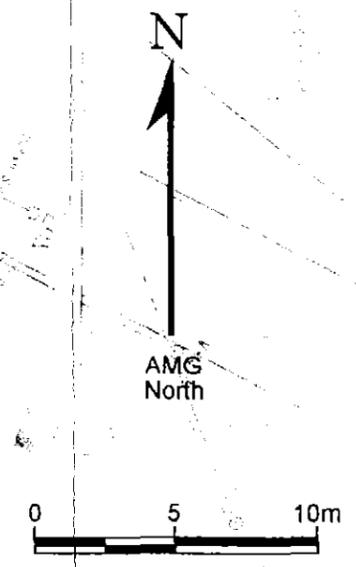
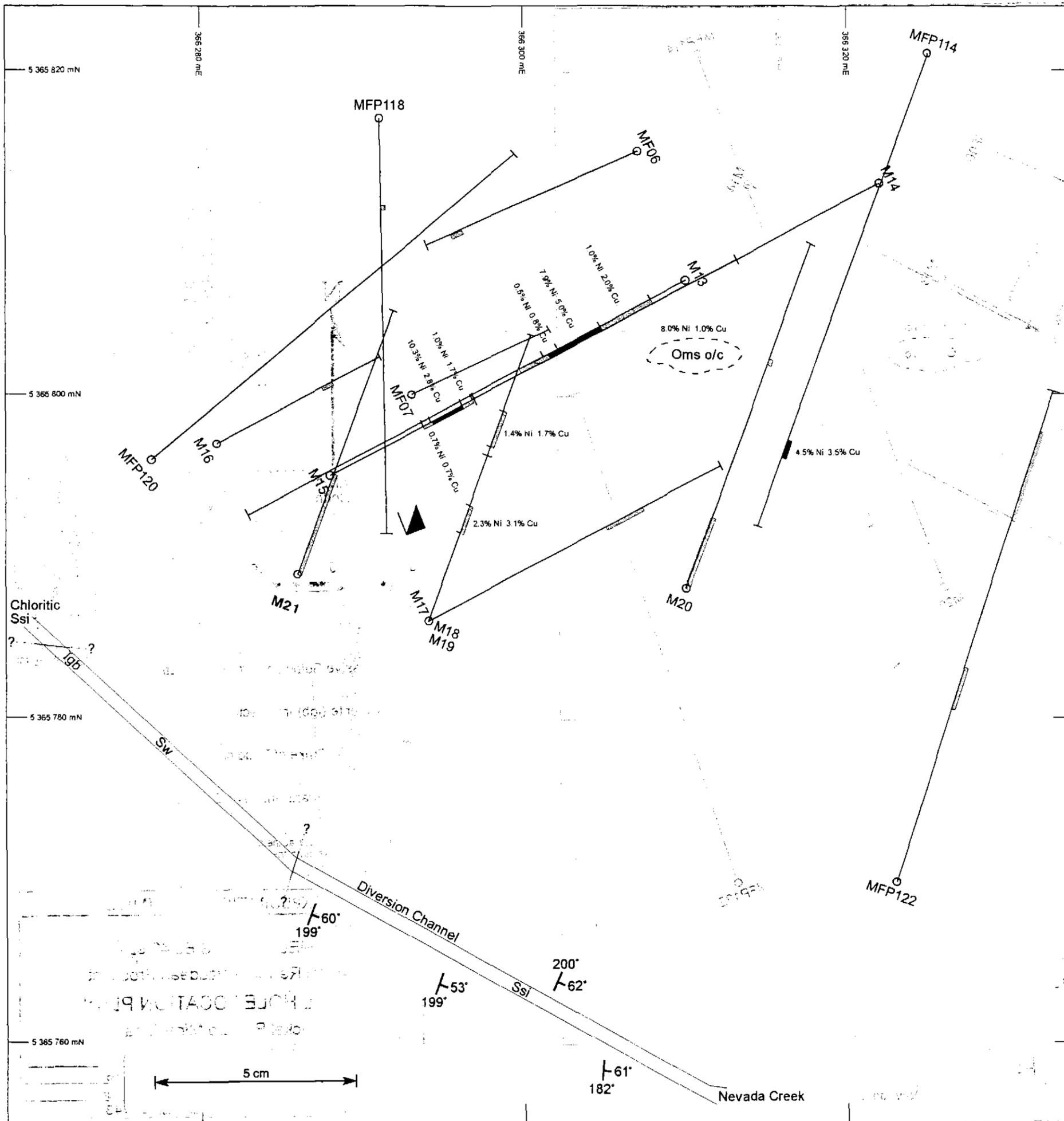
EL43/92 - MELBA FLATS

Nickel Reward - Vaudeau Prospect

Vertical Long. Section - Host Dolerite
Deveraux Mine Area

Author: Simon Maher	Reference: SK5505
Drawn: Dean Oliver	File Name: Tv971
Date: August 1995	Report No: 21143
Scale: 1:1000	Plan No: Tv971

344042



- Massive Sulphide (Oms) Intersection
- Dolerite (lgb) Intersection
- Dip and Strike of Bedding
- Nickel Reward Shaft No. 2

M21 probably terminates at the base of lgb in old workings
M17 may have an azimuth the same as M18 and M19

CRA EXPLORATION PTY. LIMITED	
MELBA FLATS EL 43/92	
Nickel Reward - Vaudeau Prospect	
DRILL HOLE LOCATION PLAN	
Nickel Reward Mine Area	
Author: Simon Maher	Reference: SK 55-05
Drawn: Tony Sargeant	File Name: Tv945.cdr
Date: July 1995	Report No: 21143
Scale: 1:250	Plan No: Tv945

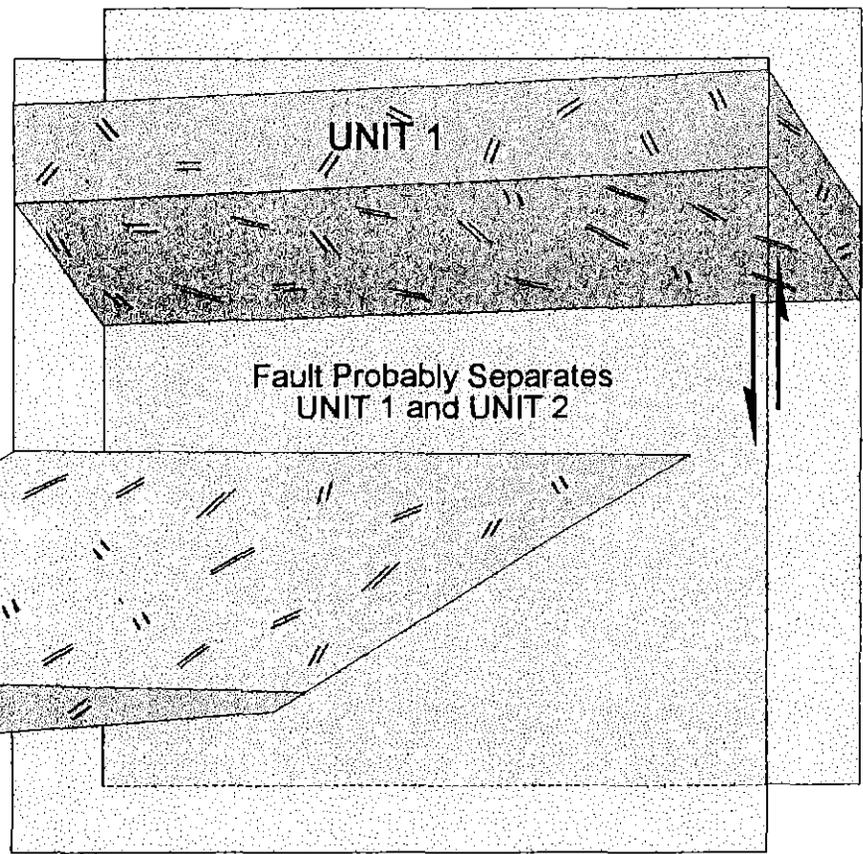
96-3884
 ANNUAL REPORT 1996 - MELBA FLATS
 CRA - EL 43/92 - MAHER S

344043

- In the NW, UNIT 1 Either:
- Is Faulted Out.
 - Is very Steeply Dipping (Untested at Depth).
 - Pinches Out.

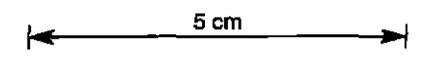
SW

UNIT 1 and UNIT 2 are untested in the SW.



Decreasing Grade

NE



- In the NNE, UNIT 1 Either:
- Comes to Surface Beneath Thick Gravel Cover.
 - Is Faulted Out.
 - Pinches Out.

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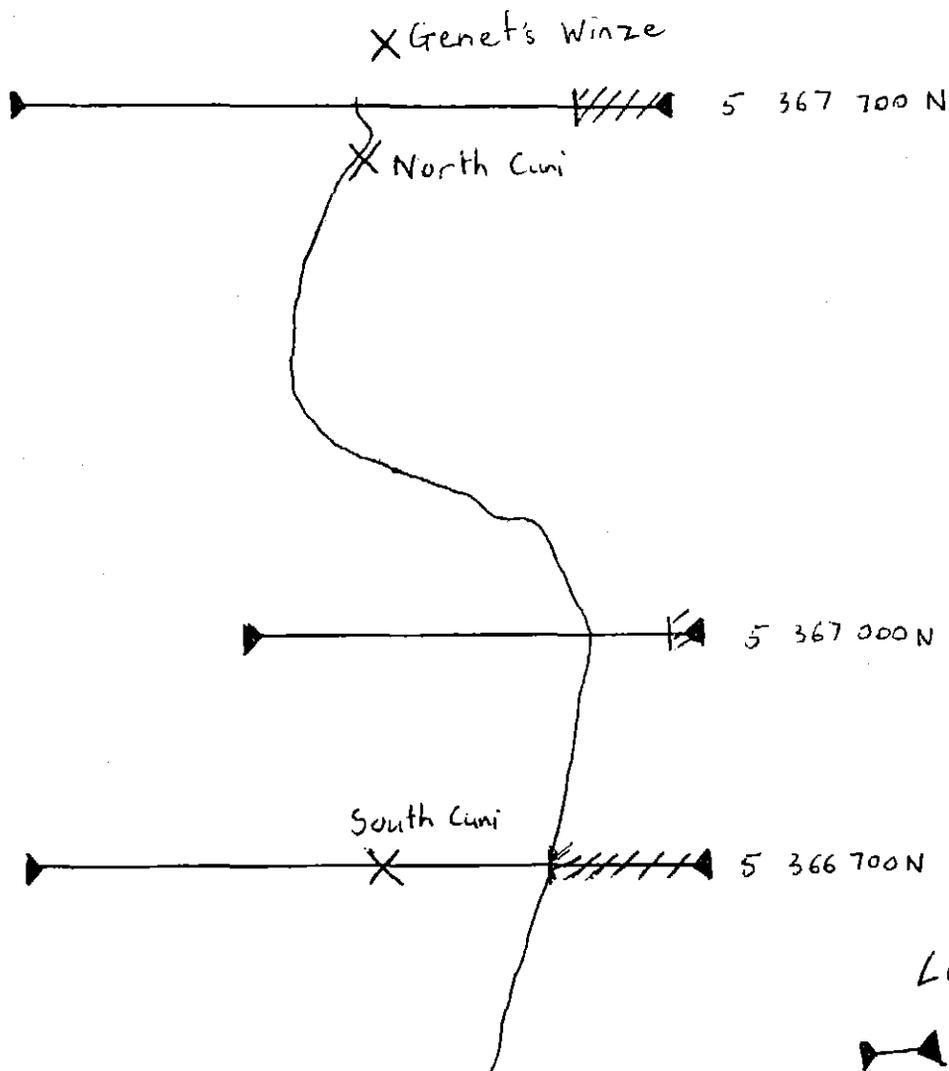
Approximate Scale 1:500

344044

CRA EXPLORATION PTY. LIMITED

EL43/92 MELBA FLATS
Nickel Reward - Vaudeau Prospect
Interpreted Dolerite Geometry
Nickel Reward Mine Area

Author: Simon Maher	Reference: Queenstown SK55-05
Drawn: Tony Sargeant	File Name: Tv982.cdr
Date: September 1995	Report No: 21143
Scale: 1:500 approx.	Plan No: Tv982



Legend

- IP Lines
 - Old workings (with name)
 - Track
 - Interpreted black shale
- 0 200 metres

Melba Flats EL43/92
 Cuni Prospect
 Location of IP Lines

1:10 000 plan Tv1002
 Report No. 21143

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ANNUAL REPORT 1996 - MELBA FLATS
 CRA - EL 43/92 - MAHER S

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ANNUAL REPORT 1996 - MELBA FLATS
CRA - EL 43/92 - MAHER S

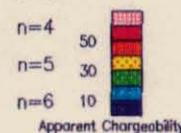
65900 E 66000 E 66100 E 66200 E 66300 E 66400 E 66500 E 66600 E 66700 E



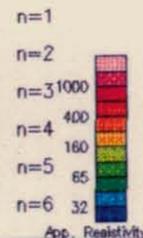
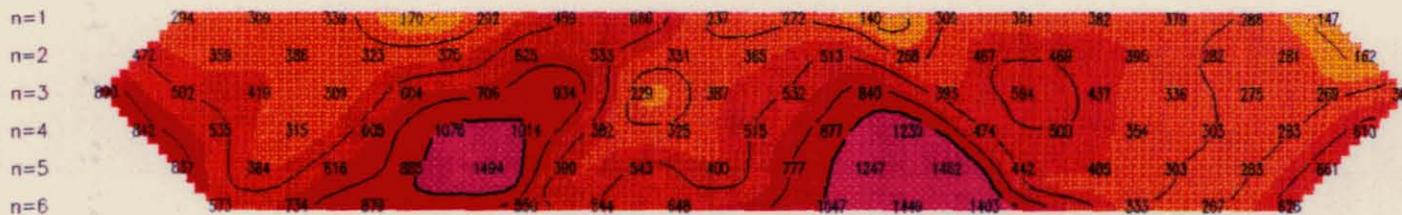
5 cm

LEGEND

n=1	Array	:Dipole - Dipole
n=2	Dipole Length	:50m
n=3	Surveyed by	:Zonge Engineering
n=4	Survey Date	:March 1995
n=5	Job #	:257
n=6	Transmitter	:GGT-10
	Receiver	:Zonge GDP-16
	Timing Sequence	:2 sec on / 2 sec off
	Client	:CRA Exploration
	TN	:Too Noisy



65900 E 66000 E 66100 E 66200 E 66300 E 66400 E 66500 E 66600 E 66700 E



50 0 50 100
(meters)

CRA EXPLORATION PTY LIMITED

Melba Flats.
Induced Polarisation Pseudosections
Line 67700N.

TASMANIA NE SK-55 Dundas 3636

geophysicist: J.M.T	scale: 1:5000	report no: 21143
drawn: J.M.T	date: October 1995	plan no: Tv 999

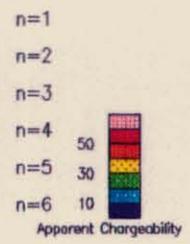
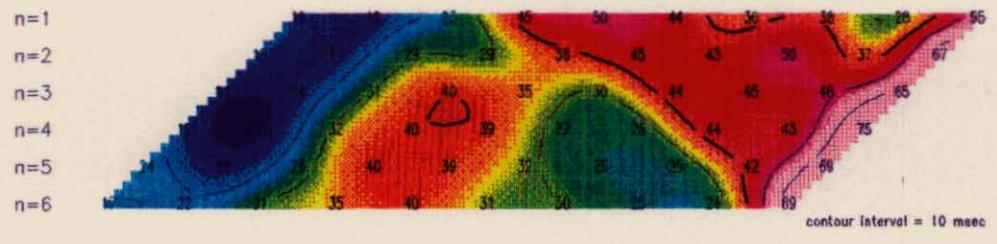
344045

344047

5 cm

66200 E 66300 E 66400 E 66500 E 66600 E 66700 E

Apparent Chargeability
(msec)

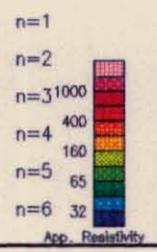
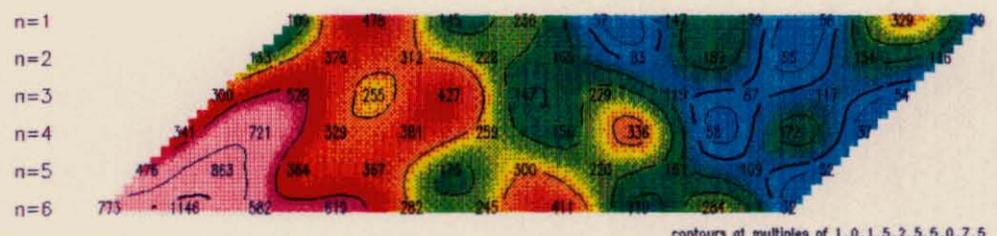


LEGEND

Array :Dipole - Dipole
 Dipole Length :50m
 Surveyed by :Zonge Engineering
 Survey Date :March 1995
 Job # :257
 Transmitter :GGT-10
 Receiver :Zonge GDP-16
 Timing Sequence :2 sec on / 2 sec off
 Client :CRA Exploration
 TN :Too Noisy

66200 E 66300 E 66400 E 66500 E 66600 E 66700 E

Apparent Resistivity
(ohm. metres)



50 0 50 100
(meters)

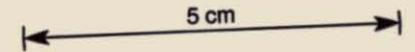
CRA EXPLORATION PTY LIMITED		
Melba Flats. Induced Polarisation Pseudosections Line 67000N.		
TASMANIA NE SK-55 Dundas 3636		
geophysicist: J.M.T	scale: 1:5000	report no: 21143
drawn: J.M.T	date: October 1995	plan no: Tv 1000

96-3884

ANNUAL REPORT 1996 - MELBA FLATS
CRA - EL 43/92 - MAHER S

96-3884

ANNUAL REPORT 1996 - MELBA FLATS
CRA - EL 43/92 - MAHER S

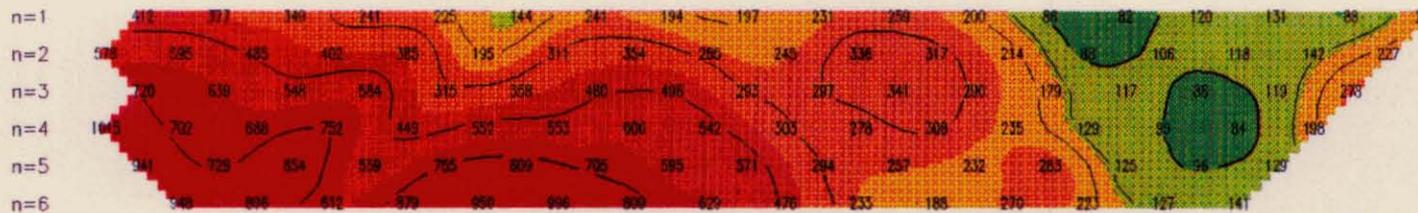


South Cuni

65900 E 66000 E 66100 E 66200 E 66300 E 66400 E 66500 E 66600 E 66700 E

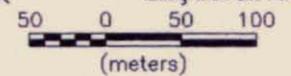
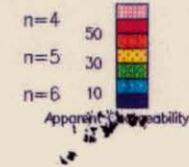


65900 E 66000 E 66100 E 66200 E 66300 E 66400 E 66500 E 66600 E 66700 E

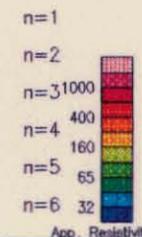


LEGEND

n=1 Array :Dipole - Dipole
n=2 Dipole Length :50m
n=3 Surveyed by :Zonge Engineering
n=4 Survey Date :March 1995
n=5 Job # :257
n=6 Transmitter :GGT-10
Receiver :Zonge GDP-16
Timing Sequence :2 sec on / 2 sec off
Client :CRA Exploration
TN :Too Noisy
Mining shaft and name



CRA EXPLORATION PTY LIMITED		
Melba Flats. Induced Polarisation Pseudosections Line 66700N.		
TASMANIA NE 5K-55 Dundas 3636		
geophysicist: J.M.T	scale: 1:5000	report no: 21143
drawn: J.M.T	date: October 1995	plan no: Tv 1001



344048

344050

Appendix I

Review of Drilling

REVIEW OF DRILLING: CUNI STRATIGRAPHY EL 43/92 MELBA FLATS

Simon Maher

INTRODUCTION

The aim of this review is to compile all data from drilling undertaken within the current Melba Flats licence area important to exploring for dolerite associated Cu-Ni sulphide mineralisation.

CONCLUSIONS AND RECOMMENDATIONS

Dolerite sills/units are known at two levels of the Cuni stratigraphy. There is no recorded significant Cu-Ni sulphide mineralisation in dolerites adjacent the thrust fault contact with the Serpentine Hill Ultramafic Complex. Known Cu-Ni sulphide mineralisation in dolerites located 1000 m west of the thrust fault contact is confined to dolerites exploited by the abandoned Genet's Winze, North Cuni, South Cuni, Vaudeau, Mosquito, Blowfly, Nickel Reward, and Deveraux mines.

Two sheets of significant Cu-Ni sulphide mineralisation are hosted by the "Eastern Dolerite" sill in the North Cuni-Genet's Winze mine area. The southern sheet, exploited by the North Cuni mine, has an 80 m strike extent and is open at 70 m depth. The northern sheet has a 230 m strike extent and 40 m depth extent. Potential for additional sheets or an extension to the southern sheet was indicated by hole MF05, 140 m south along strike of the southern sheet, which intersected disseminated sulphide in an uncorrelated dolerite unit. Soil geochemistry, ground EM and CRAE helimagnetic data should give an indication of the extent of mineralisation in this area. If this is significant, drill testing of anomalies should be considered.

The Deveraux mine mineralisation is untested at depth, and to the SE and NW of the Deveraux shaft. Soil geochemistry and CRAE helimagnetic data should give an indication of the strike extent of the near surface mineralisation. If this is significant, further work in the Deveraux mine area should be considered.

Little potential exists for extensions to known mineralisation within the Vaudeau-Mosquito-Blowfly and South Cuni mine areas. Known mineralisation is small - typically less than 35 m strike extent, 30 m depth, and 3 m thickness. No further work in these area should be considered unless new mineralisation is indicated by soil geochemistry and/or helimagnetic data.

Known mineralisation in the Nickel Reward mine area is hosted by two dolerite units, and is small and extensively drill tested. Mineralisation is untested to the SW of the Nickel Reward shaft. Soil geochemistry and helimagnetic data should give an indication of the extent and continuity of mineralisation in this direction. If this is significant, further work in the Nickel Reward mine area should be considered.

RESULTS

Tables 1 and 2 summarise the results of all drilling and production from abandoned Cu-Ni mines within the Melba Flats licence area. Drill hole and mine locations are shown on Plan Tv 979.

Dolerite sills/units have been intersected by drilling at two levels of the Cuni stratigraphy. The Cuni stratigraphy is N-S striking and typically youngs east. The true stratigraphic positions of these levels is probably complicated by folding and faulting.

Drilling in the east of the Cuni stratigraphy adjacent the thrust fault contact with the Serpentine Hill Ultramafic Complex, (holes CG1&2, MFP106&108, and SH1), intersected several dolerite units which are probably broadly comagmatic with dolerite intersected in CRAE drilling in the North Cuni-Genet's Winze mine area (Crawford, 1994). Geochemical analysis of some of these dolerites gave background Cu-Ni values. Phillip Greenhill (pers. comm.) is in the process of assaying selected dolerite with disseminated sulphide from SH1.

Drilling 1000 m west of the thrust fault contact about the abandoned Cu-Ni mines (76 holes) intersected several dolerite sills/units within Cuni stratigraphy. All known significant Cu-Ni sulphide mineralisation is associated with dolerite sills/units exploited by the abandoned Cu-Ni mines.

North Cuni-Genet's Winze prospect area

Plan Tv 953 shows the location of drillholes in the North Cuni-Genet's Winze mine area, and the projected position at surface of dolerite intersected in drilling. Plans Tv 969 & 970 show vertical longitudinal sections of the base of the "Eastern Dolerite" intersected in drilling in this area.

Results from drilling in the North Cuni-Genet's Winze mine area indicate two sheets of significant Cu-Ni sulphide mineralisation hosted by the "Eastern Dolerite" sill. The southern sheet, exploited by the North Cuni mine, has an 80 m strike extent and is open at 70 m depth. The northern sheet has a 230 m strike extent and 40 m depth extent. Separating the sheets is a narrow zone where the "Eastern Dolerite" sill is absent or Cu-Ni grades are low. This zone corresponds to an inflexion in the Eastern Dolerite and is probably related to structural complication.

Cu-Ni sulphide mineralisation was reported in one uncorrelated dolerite unit. Potential for additional sheets or an extension to the southern sheet was indicated by hole MF05, 140 m south along strike of the southern sheet, which intersected significant disseminated Cu-Ni sulphide in an uncorrelated dolerite unit. Soil geochemistry, ground EM and CRAE helimagnetic data should give an indication of the extent of mineralisation in this area. If this is significant, drill testing of anomalies should be considered.

South Cuni prospect area

Plan Tv 980 shows the location of drillholes in the vicinity of the abandoned South Cuni mine, and the projected position at surface of dolerite intersected in drilling. Plan Tv 973 shows a vertical longitudinal section of the base of the "Host Dolerite" intersected in drilling in this area.

Drill results preclude the presence of a large semi-continuous Cu-Ni sulphide sheet in the host dolerite to the South Cuni mine mineralisation. Known mineralisation is small (25x30x1.8 m), podi-tabular, and well defined by drilling. Possible small extensions to known mineralisation may be present as shallow lenses. If present, these should be detectable in soil geochemistry and helimagnetic data.

Cu-Ni sulphide mineralisation was not reported in parallel dolerite units tested by drilling.

Nickel Reward-Vaudeau prospect area*Vaudeau-Mosquito-Blowfly mine area*

Plan Tv 977 shows the location of drillholes in the vicinity of the abandoned Vaudeau-Mosquito-Blowfly mines, and the projected position at surface of dolerite intersected in drilling. Plan Tv 972 shows a vertical longitudinal section of the base of the "Host Dolerite" intersected in drilling in those area.

Drill results preclude the presence of a large semi-continuous Cu-Ni sulphide sheet in the host dolerite to the Vaudeau-Mosquito-Blowfly mine mineralisation. Known mineralisation is small (35x25x<3 m), podi-tabular, and well defined by drilling. Possible small extensions to known mineralisation may be present as shallow lenses. If present, these should be detectable in soil geochemistry and helimagnetic data.

Cu-Ni sulphide mineralisation was not reported in parallel dolerite units tested by drilling.

Deveraux mine area

Plan Tv 976 shows the location of drillholes in the vicinity of the abandoned Deveraux mine, and the projected position at surface of dolerite intersected in drilling. Plan Tv 971 shows a vertical longitudinal section of the base of the "Host Dolerite" intersected in drilling in this area.

Little information is recorded on the nature and extent of mineralisation in and about the Deveraux mine. The "Host Dolerite" to the Deveraux Cu-Ni sulphide mineralisation is sub-vertical and strikes NW. The three holes drilled in the Deveraux mine area (M10,11,12) intersected significant Cu-Ni sulphide mineralisation within the "Host Dolerite" - best intersection was M11: 0.8 m (true width) @ 2.5% Ni and 0.4% Cu. The dolerite is untested at depth, and to the SE and NW of the Deveraux shaft and M10, 11, and 12 drill holes. EZ soil geochemistry and CRAE helimagnetic data should give an indication of the strike extent of the near surface mineralisation. If this is significant, further work in the Deveraux mine area should be considered.

Nickel Reward mine area

Plan Tv 945 shows the location of drillholes in the vicinity of the abandoned Nickel Reward mine. Two dolerite units (Unit 1 and Unit 2) host significant Cu-Ni sulphide mineralisation. Massive sulphide intersected in MFP114: 1.5 m @ 4.5% Ni & 3.5% Cu, is uncorrelated.

Unit 1 hosts massive Cu-Ni sulphide. Best intersections are M15: 4.5 m @ 7.8% Ni & 2.5% Cu and M13: >8.8 m @ 3.9% Ni & 3.3% Cu (true widths not known). The stratigraphy to the SE, NW, and NE of M13 and M15 has been extensively drilled - there is no potential for extensions to Unit 1 in the NW and NE. Extensions to Unit 1 may be located:

- NW of M13 and M15 as a steeply NW dipping shoot
- SW of M15 as a shallow, thin-tabular shoot representing a horizontal fault slither, hinge, or NW dipping shoot

Unit 2, a second dolerite or SE extension to Unit 1, contains disseminated Cu-Ni sulphide. Drill intersections of Unit 2 indicate significant mineralisation over 7 m SE of M13 and M15 - M18: 3.3 m @ 1.4% Ni & 1.7% Cu, M19: 4.3 m @ 2.3% Ni & 3.1% Cu. Grade probably decreases to the SE (M17 and MFP122 - no assays despite observed disseminated sulphide). Extensions to the mineralised Unit 2 may be located SW of M18 and M19.

Soil geochemistry and helimagnetic data should give an indication of the extent and continuity of mineralisation SW of the Nickel Reward shaft. If this is significant, further work in the Nickel Reward mine area should be considered.

Plan Tv 982 shows the interpreted geometry of dolerite Units 1 & 2, this geometry is discussed below.

Dolerite with significant massive sulphide intersected in M13 and M15 (Unit 1) has a tabular lensoidal geometry which:

- is flat lying in the NE-SW plane
- comes to surface, or is displaced by faulting, or pinches out before M14 in the NE
- is untested SW of M15
- pinches out, or is very steeply dipping to the NW or SE (massive sulphide outcrop and shafts in the SE suggest a NW dip), or is displaced by faulting before holes in the NW

M18 and M19 did not intersect Unit 1 near surface indicating Unit 1 either:

- pinched out before M18 and M19
- came to surface NW of M18 and M19
- is dipping to the SE in this area and is intersected at depth in M18 and M19
- is displaced by a NW dipping fault NW of M18 and M19

Dolerite intersected at depth in M18, M19, M17 & MFP122 (Unit 2) has a tabular lensoidal geometry which:

- is flat lying between (shallow SW dip near M18 and M19)
- pinches out or is displaced by faulting to the NE
- pinches out before M13 and M15, or has a very steep NW dip NW of M17 and M18, or is correlatable with Unit 1 - and has a moderate SE dip to the SE of M13 and M15, or is displaced by a NW dipping fault NW of M18 and M19
- is untested SW of M18 and M19.

Dolerite intersected in M20 may be a partially eroded remnant of flat lying Unit 1. The lower dolerite intersected in MFP122 is probably an additional dolerite unit.

CRA EXPLORATION PTY. LIMITED MELBA FLATS EL 43/92 SUMMARY OF DRILL HOLE INFORMATION

HOLE	LOCATION	COMPANY	DATE	COLLAR INFORMATION					DEPTH m	COMMENTS	INTERSECTION INFORMATION							REFERENCES	CORE HELD BY TDM	
				EAST AMG	NORTH AMG	RL m AHD	AZIM. AMG	INCL.			LITHOLOGY	SIGNIFICANT MINERALISATION								
												from m	to m	lith.	from m	to m	Ni %			Cu %
DD02	Genet's Winze	CNMC	1930	366400	5367774	?	325	-45	30.5	12.2	22.0	Igb	21.9	22.8	6.0	2.6	Disseminated sulphide not assayed.	Horvath, 1957	N	
DD03	Genet's Winze	CNMC	1930	366435	5367803	?	327	-45	32.6	22.0	22.9	Oms								
										17.1	22.9	Igb	22.9	23.8	6.0	3.0	Approximate. Incomplete records.	Horvath, 1957	N	
										22.9	23.8	Oms								
										23.8	31.4	Igb								
DD04	Genet's Winze	CNMC	1930	366432	5367771	?	322	-45	47.5	42.8	43.9	Oms	42.8	43.9	10.1	5.5	Disseminated sulphide not assayed.	Horvath, 1957	N	
DD09	Genet's Winze	GMA	1939-40	366454	5367728	?	317	-65	105.5	59.4	60.4	Igb					No significant mineralisation.	Horvath, 1957	N	
										64.0	73.5	Igb								
DD10	Genet's Winze	GMA	1939-40	366376	5367695	?	360	-90	54.9	47.2	50.9	Igb					No significant mineralisation.	Blake, 1952	N	
EM1	Genet's Winze	EM	1953	366352	5367749	?	341	-45	36.6	18.0	24.1	Igb	21.3	24.1	1.7	0.1	Core loss in dyke.	Horvath, 1957		
EM2	Genet's Winze	EM	1953	366352	5367749	?	280	-50	36.6	13.4	22.3	Igb	20.1	21.3	0.5	0.7	Poor core recovery.	Horvath, 1957		
										22.5	24.7	Igb	24.1	24.7	1.0	0.7				
EM3	Genet's Winze	EM	1953	366339	5367653	?	280	-45	36.6	17.4	26.8	Igb	21.3	25.9	1.5	1.5		Horvath, 1957		
M6	Genet's Winze	MSL	1955	366416	5367763	?	322	-45	47.9	32.6	41.5	Igb	37.5	40.9	0.7	1.1		Horvath, 1957	Y 1909	
										41.5	42.4	Oms	41.5	42.4	9.7	4.3				
M7	Genet's Winze	MSL	1956	366416	5367763	?	360	-90	56.7								No significant mineralisation.	Horvath, 1957	Y 1910	
M8	Genet's Winze	MSL	1956	366419	5367782	?	322	-50	36.0	20.7	32.0	Igb	27.1	29.2	0.9	1.0	Additional trace disseminated sulph.	Horvath, 1957	Y 1906	
M9	Genet's Winze	MSL	1956	366427	5367747	?	323	-55	86.9	78.9	86.9	Igb					Best assay: 0.2% Ni.	Horvath, 1957	Y 1912	
MF01	Genet's Winze	CRAE	1994	366437	5367771	?	320	-46	62.3	38.7	48.5	Igb	45.7	46.2	0.6	0.7		Muher, 1995	Y CRAE	
										48.5	49.2	Oms	48.5	49.2	9.3	4.5	0.8 Au, 1.4 Pd, 0.8 Pt (ppm).			
MF02	Genet's Winze	CRAE	1994	366438	5367771	?	320	-60	115.5	42.7	48.0	Igb					Best assay: <0.1% Ni.	Muher, 1995	Y CRAE	
										82.4	97.0	Igb								
MFPI26	Genet's Winze	EZ	1968	366395	5367752	197	321	-40	39.9	29.0	36.6	Igb	33.5	34.8	0.6	1.3	29.0-30.8m 0.6 ppm Au.	Griffiths, 1968		
MFPI27	Genet's Winze	EZ	1968	366412	5367732	197	322	-50	121.9	0.0	3.1	Igb					No significant Cu-Ni assays.	Burton, 1970		
										78.2	92.7	Igb								
										94.2	115.8	Igb								
MFPI28	Genet's Winze	EZ	1968	366483	5367814	197	312	-30	50.9	10.1	12.2	Igb	42.4	45.7	1.0	0.5		Burton, 1970		
										36.0	48.2	Igb								
MFPI29	Genet's Winze	EZ	1968	366483	5367814	197	312	-60	64.3	9.1	12.8	Igb					No significant Cu-Ni assays.	Burton, 1970		
										40.8	43.3	Igb								
MFPI30	Genet's Winze	EZ	1968	366412	5367732	197	270	-48	98.8	37.0	38.3	Igb					No significant Cu-Ni assays.	Burton, 1970		
										76.2	90.8	Igb								
MFPI31	Genet's Winze	EZ	1968	366369	5367688	198	272	-30	88.9	71.6	82.5	Igb					No significant Cu-Ni assays.	Burton, 1970		
MFPI32	Genet's Winze	EZ	1968	366364	5367647	199	274	-60	69.5	42.4	51.5	Igb	46.9	51.5	0.4	0.6		Burton, 1970		
										69.3	69.5	Igb								
MFPI73	Genet's Winze	EZ	1973	366483	5367854	199	309	-45	29.3	10.2	18.6	Igb	15.9	18.6	0.9	0.8	11.6-13.1m 1.7ppm Au.	Burton, 1973		
MFPI74	Genet's Winze	EZ	1973	366499	5367840	?	309	-45	39.0	0.9	2.4	Igb					No significant Cu-Ni assays.	Burton, 1973		
										8.5	9.8	Igb								
										28.4	33.8	Igb								
MFPI75	Genet's Winze	EZ	1973	366499	5367840	?	309	-80	45.4	0.0	6.1	Igb					No significant Cu-Ni assays.	Burton, 1973		
										25.3	29.3	Igb								
										36.3	40.5	Igb								
MFPI76	Genet's Winze	EZ	1973	366499	5367881	?	309	-45	59.7	4.6	16.2	Igb					No significant Cu-Ni assays.	Burton, 1973		
										19.2	21.0	Igb								

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CRA EXPLORATION PTY. LIMITED MELBA FLATS EL 43/92 SUMMARY OF DRILL HOLE INFORMATION

HOLE	LOCATION	COMPANY	DATE	COLLAR INFORMATION						DEPTH m	COMMENTS	INTERSECTION INFORMATION							REFERENCES	CORE HELD BY TDM
				EAST AMG	NORTH AMG	RL m AHD	AZIM. AMG	INCL.				LITHOLOGY	SIGNIFICANT MINERALISATION							
											from m	to m	lith.	from m	to m	Ni %	Cu %	comments		
MFPI77	Genet's Winze	EZ	1973	366632	5368009	?	309	-45	72.6		8.5	25.0	Igb					No significant Cu-Ni assays.	Burton, 1973	
											42.7	51.0	Igb							
MFP110	Genet's Winze	EZ	1965	366358	5367702	197	323	-45	78.9		26.5	32.0	Igb	30.5	33.5	4.3	2.7		Burton, 1970	
											32.0	33.5	Oms							
											26.5	35.1	Igb							
											62.5	78.0	Igb							
MFPI11	Genet's Winze	EZ	1965	366449	5367783	198	322	-45	141.7		37.8	44.5	Igb	43.9	44.5	0.5	0.8		Burton, 1970	
											66.1	71.3	Igb							
											74.7	76.2	Igb							
											81.4	83.8	Igb							
											85.0	103.8	Igb					Not assayed.		
											121.0	139.0	Igb					Not assayed.		
EM4	North Cuni	EM	1953	366360	5367587	?	280	-45	42.7		33.2	37.5	Igb	36.6	36.9	0.9	0.7		Horvath, 1957	
EM5	North Cuni	EM	1953	366396	5367586	?	280	-45	19.8	Not completed?									Robinson, 1959	
MF03	North Cuni	CRAE	1994	366340	5367700	?	300	-45	82.5		24.6	25.1	Oms	24.6	25.1	7.7	2.9	1.1 Au, 1.1 Pd, 1.0 Pt (ppm)	Maher, 1995	Y CRAE
											55.5	63.4	Igb							
MF04	North Cuni	CRAE	1994	366360	5367660	?	270	-45	75.0		32.4	37.8	Igb	36.9	37.75	0.5	0.5		Maher, 1995	Y CRAE
											37.8	38.6	Oms	37.75	38.55	7.8	10.3			
											38.8	38.7	Igb							
											54.9	60.6	Igb							
MF05	North Cuni	CRAE	1994	366390	5367450	?	270	-45	82.2		33.8	40.4	Igb	73.65	75.6	0.4	0.6	0.2Au, 0.3Pd, 0.2Pt (ppm).	Maher, 1995	Y CRAE
											57.6	58.3	Igb							
											58.7	59.2	Igb							
											61.0	62.1	Igb							
											62.1	62.4	Oms							
											63.1	63.4	Igb							
											73.7	75.6	Igb							
MFPI09	North Cuni	EZ	1965	366389	5367602	?	270	-65	134.4		27.1	36.6	Igb	70.0	75.0	0.4	0.5		Griffiths, 1968	
											40.5	43.0	Igb							
											65.7	75.0	Igb							
											112.3	122.2	Igb							
DD01	South Cuni	CNMC	1930	366385	5366674	?	272	-90	31.1	Location approximate.	13.1	24.9	Igb					Probably not assayed.	Blake, 1952	N
DD05	South Cuni	CNMC	1930	366404	5367070	?	272	-90	43.9	Location approximate.	40.8	42.4	Igb					Probably not assayed.	Burton, 1970	N
DD06	South Cuni	CNMC	1930	366356	5366928	?	272	-90	43.9	Location approximate.								Probably not assayed.	Burton, 1970	N
DD07	South Cuni	CNMC	1930	366380	5366646	?	272	-90	47.5	Location approximate.	13.4	25.6	Igb					Probably not assayed.	Blake, 1952	N
DD08	South Cuni	CNMC	1930	366396	5366736	?	272	-90	53.6	Location approximate.	17.8	35.1	Igb					Probably not assayed.	Blake, 1952	N
MFPI12	South Cuni	EZ	1965	366434	5366710	199	269	-45	81.7	Location approximate.	23.5	26.2	Igb					Not assayed.	?ledgers	
											51.2	55.5	Igb							
											23.5	26.2	Igb							
											51.2	55.5	Igb							
MFPI13	South Cuni	EZ	1965	366447	5366670	199	269	-45	93.3	Location approximate.	42.1	48.2	Igb					Not assayed.	?ledgers	
											42.1	48.1	Igb							
DD11	Vaudeau	GMA	1939-40	366480	5366110	203	254	-70	131.2	Location approximate.	46.3	53.0	Igb					Best assay: 0.1%Ni.	Blake, 1952	N
											64.9	67.4	Igb							
											67.4	68.4	Oms							

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CRA EXPLORATION PTY. LIMITED MELBA FLATS EL 43/92 SUMMARY OF DRILL HOLE INFORMATION

HOLE	LOCATION	COMPANY	DATE	COLLAR INFORMATION						DEPTH m	COMMENTS	INTERSECTION INFORMATION						REFERENCES	CORE HELD BY TDM				
				EAST		NORTH		RL m AHD	AZIM. AMG			INCL.	LITHOLOGY			SIGNIFICANT MINERALISATION							
				AMG	AMG	AMG	AMG						from m	to m	lith.	from m	to m			Ni %	Cu %	comments	
DD12	Mosquito	GMA	1939-40	366468	5366210	206	0	-90	95.7	Location approximate.	46.0	47.7	Igb						Probably not assayed.	Blake, 1952	N		
DD13	Blowfly	GMA	1939-40	366481	5366280	207	257	-70	131.1	Location approximate.	52.3	54.2	Igb						Probably not assayed.	Blake, 1952	N		
DD14	Mosquito	GMA	1939-40	366460	5366208	207	265	-48	140.2	Location approximate.	22.3	25.8	Igb						Probably not assayed.	Blake, 1952	N		
DD15	Vaudeau	GMA	1939-40	366466	5366136	206	265	-47	90.2	Location approximate.	41.8	46.5	Igb						Best assay: 0.1%Ni.	Blake, 1952	N		
DD16	Blowfly	GMA	1939-40	366399	5366270	211	272	-45	210.6	Location approximate.	28.2	31.1	Igb						Probably not assayed.	Blake, 1952	N		
DD17	Vaudeau	GMA	1939-40	366385	5366133	206	254	-45	46.3	Location approximate.	61.1	69.0	Igb						Best assay: 0.1%Ni.	Blake, 1952	N		
M10	Deveraux	MSL	1956	365562	5365422	?	234	-50	40.2	Location approximate.	13.0	13.6	Igb						Probably not assayed.	Blake, 1952	N		
M11	Deveraux	MSL	1956	365562	5365422	?	266	-45	43.6	Location approximate.	58.8	59.7	Igb	34.1	35.1	0.9	0.3			Horvath, 1957	Y 1913		
											96.3	97.7	Igb	32.0	32.9	Oms	32.0	33.2	2.5	0.4		Horvath, 1957	Y 1914
											142.2	158.5	Igb	32.9	35.7	Igb							
M12	Deveraux	MSL	1956	365523	5365416	?	50	-45	36.0	Location approximate.	36.3	43.6	Igb	22.6	22.9	2.0	1.2				Horvath, 1957	Y 1915	
No.1	Vaudeau	?	1914	?	?	?	?	?	?	Limited information.	18.6	22.9	Igb						Limited information.	Blake, 1952			
No.2	Vaudeau	?	1914	?	?	?	?	?	?	Limited information.	15.2	18.3	Oms						Limited information.	Blake, 1952			
No.3	Vaudeau	?	1914	?	?	?	?	?	?	Limited information.	30.5	30.8	Oms						Limited information.	Blake, 1952			
No.4	Vaudeau	?	1914	?	?	?	?	?	?	Limited information.									Limited information.	Blake, 1952			
No.5	Vaudeau	?	1914	?	?	?	?	?	?	Limited information.									Limited information.	Blake, 1952			
No.6	Blowfly	?	1914	?	?	?	?	?	?	Limited information.									Limited information.	Blake, 1952			
No.7	Blowfly	?	1914	?	?	?	?	?	?	Limited information.									Limited information.	Blake, 1952			
M13	Nickel Reward	MSL	1956	366310	5365807	?	242	-45	43.3		3.4	8.5	Igb	3.4	8.5	1.0	2.0		14.0-16.4m sign. sulph. not assayed.	Horvath, 1957	Y? 1911		
											8.5	13.7	Oms	8.5	12.2	7.9	5.0						
											13.7	16.4	Igb	12.2	14.0	0.5	0.8						
M14	Nickel Reward	MSL	1957	366322	5365813	?	242	-45	40.2		9.1	10.1	Igb	9.1	9.8	0.7	0.7			Horvath, 1957	Y 1917		
M15	Nickel Reward	MSL	1957	366288	5365795	?	62	-45	40.2		10.1	13.1	Oms	9.8	13.1	10.3	2.8			Horvath, 1957			
											13.1	14.3	Igb	13.1	14.3	1.0	1.7						
M16	Nickel Reward	MSL	1957	366281	5365797	?	62	-55	19.8		12.8	14.0	Igb						No sign. assays.	Horvath, 1957			
M17	Nickel Reward	MSL	1957	366294	5365786	?	62	-45	29.0		17.7	21.3	Igb						Not assayed.	Horvath, 1957	Y? 1916		
M18	Nickel Reward	MSL	1957	366294	5365786	?	20	-45	26.5		16.2	19.5	Igb	16.2	19.5	1.4	1.7			Horvath, 1957	Y? 1916		
M19	Nickel Reward	MSL	1957	366294	5365786	?	20	-65	25.9		13.7	18.0	Igb	13.7	18	2.3	3.1			Horvath, 1957			
M20	Nickel Reward	MSL	1957	366310	5365788	?	20	-45	32.0		0.0	6.7	Igb						Trace sulphide, probably not assayed.	Robinson, 1959	Y? 1919		
											20.7	21.3	Igb										
M21	Nickel Reward	MSL	1957	366286	5365789	?	20	-45	10.1	?Ended in shaft.	0.0	10.1	Igb						Probably not assayed.	Robinson, 1959			
MF06	Nickel Reward	CRAE	1995	366307	5365815	202	246	-50	22.3		18.6	19.8	Igb						No sign. Cu-Ni assays.	Maier, 1995	Y CRAE		
MF07	Nickel Reward	CRAE	1995	366293	5365800	?	65	-52	15.4											Maier, 1995	Y CRAE		
MFP114	Nickel Reward	EZ	1965-66	366325	5365821	?	200	-36	40.2		32.6	34.1	Oms	32.6	34.1	4.5	3.5			?ledgers			
MFP116	Nickel Reward	EZ	1965-66	?	?	?	?	?	?	No information.									No information.	?ledgers			
MFP118	Nickel Reward	EZ	1965-66	366291	5365817	?	179	-40	32.9		7.0	7.3	Igb						Not assayed.	?ledgers			
MFP120	Nickel Reward	EZ	1965-66	366277	5365796	?	50	-40	36.2											?ledgers			

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CRA EXPLORATION PTY. LIMITED MELBA FLATS EL 43/92 SUMMARY OF DRILL HOLE INFORMATION

HOLE	LOCATION	COMPANY	DATE	COLLAR INFORMATION						COMMENTS	INTERSECTION INFORMATION					REFERENCES	CORE HELD BY TDM			
				EAST	NORTH	RL	AZIM.	INCL.	DEPTH		LITHOLOGY	SIGNIFICANT MINERALISATION								
				AMG	AMG	m AHD	AMG		m			from m	to m	lith.	from m			to m	Ni %	Cu %
MFP122	Nickel Reward	EZ	1965-66	366323	5365770	?	18	-50	41.5		15.9	19.5	lgb					Rare sulph. not assayed.	?ledgers	
	had additional boreholes prior to 1964. No mineralisation encountered.										31.4	38.4	lgb							
CG1	Lead Blocks	CSR	1981	367380	5367480	?	289	-45	356.6		94.1	103.3	lgb					No sign. Cu-Ni assays.	Macnamara, 1981	Y 11639
											133.8	166.4	lgb					Rare cpy-pyr.		
CG2	Lead Blocks	CSR	1981	367090	5367800	?	302	-46.5	440.0		386.2	388.7	lgb					No sign. Cu-Ni assays.	Macnamara, 1981	Y 11640
											406.8	412.2	lgb							
L1-L9	Lead Blocks	EZ	?	?	?	?	?	?	?	No information.								No information.	Ellis, 1987	
MFP106	Duke of York	EZ	1965	367095	5366467	200	277	-45	259.1	Location approximate.	13.1	43.3	lgb					Not assayed.	?ledgers	
											67.5	90.5	lgb							
MFP108	Duke of York	EZ	1965	367170	5366455	204	277	-44	123.5	Location approximate.	106.7	109.9	lgb					lgb not assayed.	?ledgers	
											95.1	99.7	lgb					Best SHUC assay: 0.1%Cu.		
											91.4	91.7	lgb							
											67.5	83.2	lgb							
											58.5	65.7	lgb							
M23	Serpentine Hill UC	MSL	1957	366820	5365240	?	272	-45	51.8									Best SHUC assay: 0.4% Ni.	Horvath, 1957	Y? 1920
SH1	Serpentine Hill UC	TMD	198?	367149	5366780	222	360	-90	671.5		266.4	277.5	lgb					Not routinely assayed.	Brown, 1991	Y ?
											296.6	297.6	lgb							
											300.0	307.9	lgb							
											399.0	422.5	lgb							
											428.5	433.0	lgb							
SH2	Serpentine Hill UC	TMD	198?	367850	5366199	263	360	-90	150.0										Brown, 1991	Y ?
SH3	Serpentine Hill UC	TMD	198?	367914	5367011	236	360	-90	140.0										Brown, 1991	Y ?
SH4	Serpentine Hill UC	TMD	198?	368298	5367516	335	270	-60	101.5										Brown, 1991	Y ?
SH5	Serpentine Hill UC	TMD	198?	368289	5367464	332	270	-60	101.5										Brown, 1991	Y ?
SH6	Serpentine Hill UC	TMD	198?	368281	5367416	326	270	-60	101.5										Brown, 1991	Y ?
CG3	Regional	CSR	1986	366100	5365177	217	116	-50	331.3										Ellis, 1986	Y 9216
CG4	Regional	CSR	1986	364925	5366550	182	90	-50	226.7										Ellis, 1986	Y 9217
CG5	Regional	CSR	1986	365840	5367678	190	246	-50	256.0										Ellis, 1986	Y 9218

	<u>Shaft Depth</u> (m)	<u>Drive Length</u> (m)	<u>Ore Width</u> (m)	<u>Comments</u>
Genet's Winze	3	-	?	Worked over a strike extent of 21.3m between 1921-31.
North Cuni	24.4	76.2	0.9	Worked between 1912-14 and 1931-32.
South Cuni	22.9	29.3	0-1.4	Worked until 1914. Production from the G.W.-N.C.-S.C. mines to 1914 is estimated at 1170 tonnes. Assays for half of this ore indicated grades >5% Cu and >10% Ni.
Blowfly	?	?	?	Almost worked out by 1914. 275 tonnes of ore extracted. The lode has a 18.2m strike extent at surface, and 10.7m strike extent at the base of the shaft.
Mosquito	?	?	?	No record of total production. 51 tonnes of ore extracted in 1914.
Vaudeau	21.3lev. 37.2lev.	24.1 9.1	? 0.9	Worked between 1912-14 and was reopened for short periods between 1938-48. Total production is reported to be 3818 tonnes @ 10% Ni and 5% Cu.
Nickel Reward	6.1	?	?	Production was small and graded between 8-12% Ni and 3-5% Cu.
Devereaux	?		0.3-0.5	No production records. Selected assay of ore indicated 5.5% Ni, and 18.1% Cu.

Table 2. Summary of production and mineralisation characteristics from the abandoned Cu-Ni mines within the Melba Flats licence area (after Blisset, 1962).

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Appendix II

Rock Chip Geochemistry Sample Ledger and Laboratory Reports

CRA EXPLORATION PTY. LIMITED MELBA FLATS EL 43/92 ROCK GEOCHEMISTRY (PLUS PETROLOGY LOCATION) LEDGER AUG '95

Sampno	AMGE	AMGN	DPO	SampType	Report	Prospect	MRTLith	FieldID	Texture	Alt/Min	Colour	Comments
3308019	366450	5366150	71516	ROCK		VAUDEAU	Es	Eb?	Ds	Py	DV	Py 2-5%. Massive basalt?
3308020	366450	5366150	71516	ROCK		VAUDEAU	Es	Igb	Ds	Py	DV	Py 2-5%. Massive basalt?
3308021	366450	5366150	71516	ROCK		VAUDEAU		Oms	MsBs	PyCpPoNi	Y	Massive sulphide.
3313768	368250	5367900	71540	ROCK		SERPENTINE HILL	Esu	Ius	Sh		V	
3313769	368200	5367600	71540	ROCK		SERPENTINE HILL	Esu	Ius	Sh		V	
3528456	366280	5365820	71540	ROCK		NICKEL REWARD	Egm	Oms		Py	DVE	Pyroxenite?
3528457	366280	5365820	71540	ROCK		NICKEL REWARD	Egm	Iu	BxSh	Py		Mullock heap
3528458	366280	5365820	71540	ROCK		NICKEL REWARD	Egm	IuIgb			VG	Pyroxenite
3528459	366400	5366140	71540	ROCK		VAUDEAU	Egm	IuIgb			GV	Mullock heap
3528460	366400	5366140	71540	ROCK		VAUDEAU	Egm	Igb		Py		Mullock heap 5-10%Py
3528461	366400	5366140	71540	ROCK		VAUDEAU	Egm		Ma	PyCpGa		Mullock heap
3528462	366280	5367620	71540	ROCK		NORTH CUNI	Egm	Iu?Ssh?	DiVn	Py		Mullock heap
3528463	366280	5367620	71540	ROCK		NORTH CUNI	Egm	OmsOvq	Bx	PyGaCp		Mullock heap
3528464	367080	5367850	71540	ROCK		LEAD BLOCKS	Etl	SbxSsi?	MaSi	Ga		Mullock heap
3528465	367080	5367850	71540	ROCK		LEAD BLOCKS	Etl		MaWe	Ga		Mullock heap
3528466	367080	5367850	71540	ROCK		LEAD BLOCKS	Etl	Ssi	SiWe	Su		Mullock heap
3528470	367900	5367010	71540	ROCK		SERPENTINE HILL	Eba	SifFu?	WeFe			
3528471	367920	5367060	71540	ROCK		SERPENTINE HILL	Eba	Im		Py		
3528472	367960	5367120	71540	ROCK		SERPENTINE HILL	Eba	Eb				
3528473	368020	5367220	71540	ROCK		SERPENTINE HILL	Eba	Im	Vn			
3528474	368080	5367320	71540	ROCK		SERPENTINE HILL	Eba	Ma				
3528475	368240	5367380	71540	ROCK		SERPENTINE HILL	Eba	ImMa	Lm			85s/085
3528476	368340	5367580	71540	ROCK		SERPENTINE HILL	Eba	ImIus				
3528477	368400	5367640	71540	ROCK		SERPENTINE HILL	Eba	IgbIm	Al			
3528478	368540	5367880	71540	ROCK		SERPENTINE HILL	Eba	Ius			V	
3528483	366400	5366140	71541	ROCK		VAUDEAU	Egm	Im	Di	Su		Mullock heap
3528484	366400	5366140	71541	ROCK		VAUDEAU	Egm	Oms		Cp		Mullock heap
3184279	366320	5366090	77352	ROCK	19636	VAUDEAU	Evs	Sw	Bx?		G	Pet. - 77351.
3184280	366390	5366130	77352	ROCK	19636	VAUDEAU	Egm	Igb	Fo	PyCp	MG	Mullock heap
3184281	366390	5366130	77352	ROCK	19636	VAUDEAU	Egm	Igb	VnFoDs	PyCp	G	Vfg sulph. <<1%
3184282	366390	5366130	77352	ROCK	19636	VAUDEAU	Etl	Ssi	FiFr	Py?	G	Mine slate
3184283	366390	5366130	77352	ROCK	19636	VAUDEAU	Egm	Igb	AIDs	PySu	MGV	Mullock heap
3184284	366390	5366130	77352	ROCK	19636	VAUDEAU	Egm	Igb	WeDs	PySu	DV	Mullock heap. Pet. - 77351.
3184285	366390	5366130	77352	ROCK	19636	VAUDEAU	Etl	Ssi	Vs	SdSp?Ga	N	Mullock heap
3184286	366350	5367770	77352	ROCK	19636	GENET'S WINZE	Egm		We	Cs	OLV	Mullock heap
3184287	366350	5367770	77352	ROCK	19636	GENET'S WINZE	Egm		We	Cs	MOV	Mullock heap
3184288	366350	5367770	77352	ROCK	19636	GENET'S WINZE	Etl	Ssi	VnBd	PyPo?Cp?	DG	Mullock heap

CRA EXPLORATION PTY. LIMITED MELBA FLATS EL 43/92 ROCK GEOCHEMISTRY (PLUS PETROLOGY LOCATION) LEDGER AUG '95

Sampno	Ag ppm	Au ppm	Co ppm	Cr ppm	Cu ppm	Fe%	Mn ppm	Ni ppm	P ppm	Pb ppm	Pd ppm	Pt ppm	S%	V ppm	Zn ppm	k X10-5SI
3308019				325	3350	11.2		4950								
3308020				265	4550	9.76		2900								
3308021				155	30400	2.83		89400							95	
3313768	COL		80	587	4			1851		-3				-5	42	
3313769	COL		58	1112	6			776		3				25	46	
3528456	8	0.482	680	220	16600			22600		39	0.224	0.478	13.9	207	92	
3528457	1		37	95	1911			1159		34				155	182	
3528458	1		46	447	1264			1854		30				377	180	
3528459	COL		58	341	208			377		-3				268	119	
3528460	1		140	335	3176			4401		10				281	132	
3528461	9	1.27	1280	197	72100			35800		298	1.25	0.618	31.4	84	1178	
3528462	1		72	113	1885			1162		25				189	160	
3528463	221		94	119	2589			1403		41400				50	175000	
3528464	13		14	37	126			22		2000				15	21900	
3528465	33		4	10	52			-3		15000				-5	7500	
3528466	1		27	139	40			78		82				212	275	
3528470	COL		27	1764	48			271		-3				13	79	
3528471	COL		21	305	27			69		18				71	86	
3528472	COL		78	1471	12			1000		19				40	85	
3528473	COL		27	274	98			231		5				43	69	
3528474	COL		12	84	8			53		-3				31	37	
3528475	COL		69	886	3			772		4				24	64	
3528476	COL		87	1497	13			1362		-3				24	68	
3528477	COL		31	943	5			230		-3				10	35	
3528478	COL		89	2819	-2			1706		-3				21	80	
3528483																
3528484																
3184279	2		13		168	8.3		81		137				143	40	
3184280	4		84		4630	9.3		2410		521				168	60	
3184281	2		19		94	8.15		108		13				85	50	
3184282	2		29		189	7.3		171		16				140	40	
3184283	2		60		1240	7.69		1170		6				83	30	
3184284	5	0.28	206		11200	13.87		9680		34	0.46	0.33		318	70	
3184285	48		11		1320	12.49		176		2760				182000	40	
3184286	59		459		278000	18.43		4200		135				3620	30	
3184287	59	2.15	712		265000	18.99		8330		112	6.13	3.06		446	20	
3184288	2		37		4240	12.92		534		108				147	50	

CRA EXPLORATION PTY. LIMITED MELBA FLATS EL 43/92 ROCK GEOCHEMISTRY (PLUS PETROLOGY LOCATION) LEDGER AUG '95

Sampno	AMGE	AMGN	DPO	SampType	Report	Prospect	MRTLith	FieldID	Texture	Alt/Min	Colour	Comments
3184289	366350	5367770	77352	ROCK	19636	GENET'S WINZE	Egm	Im	We		DG	Slickenside. Soft
3184290	366350	5367770	77352	ROCK	19636	GENET'S WINZE	Egm	Im	DsVs	Su		F grained.Slickensides. Pet. - 77351.
3184291	366350	5367770	77352	ROCK	19636	GENET'S WINZE	Etl?			CpNiCs	MVN	Hard bk groundmass. Pet. - 77351.
3184292	366150	5365920	77352	ROCK	19636	WEST VAUDEAU	Etl	Sw	We		V	Volc. derived.
3184293	366155	5365920	77352	ROCK	19636	WEST VAUDEAU	Etl	Ssi	Bd		LKO	
3184294	366170	5365910	77352	ROCK	19636	WEST VAUDEAU	Etl	Sw	We		V	Volc. derived.
3184295	366320	5367610	77352	ROCK	19636	NORTH CUNI	Egm	Oms	VsBx	GaSpSdQtz		Mullock heap
3184296	366320	5367610	77352	ROCK	19636	NORTH CUNI	Egm	Omslgb?	VsBx	GaSpPyQtz	MVG	Mullock heap
3184297	366320	5367610	77352	ROCK	19636	NORTH CUNI	Egm	Oms		PyNiBo		Mullock heap
3184298	366320	5367610	77352	ROCK	19636	NORTH CUNI	Egm	lgb	We		MVG	Mullock heap. Pet. - 77351.
3184299	366320	5367610	77352	ROCK	19636	NORTH CUNI	Egm	lgb	Ds	PyNiPo?	MVG	Mullock heap. Pet. - 77351.
3184300	366320	5367610	77352	ROCK	19636	NORTH CUNI	Etl	Ssi	Bd		LG	Fine laminations
3911701	366320	5367610	77352	ROCK	19636	NORTH CUNI	Egm	Oms	Vn	GaSpPy		F grained. Mullock
3911702	366320	5367610	77352	ROCK	19636	NORTH CUNI	Egm	lgb	DsVs	PyCp	DV	F grained. Mullock. Pet. - 77351.
3911703	366320	5367610	77352	ROCK	19636	NORTH CUNI	Egm	lgb	MaVn		DG	F grained. Mullock
3911704	366320	5367610	77352	ROCK	19636	NORTH CUNI	Egm	lgb	Fo	Py?	MGW	Mullock heap
3911705	366320	5367610	77352	ROCK	19636	NORTH CUNI	Egm	Oms	Ma	CpNi?		Mullock heap
3911706	366320	5367610	77352	ROCK	19636	NORTH CUNI	Egm	Oms	Ma	Py		Mullock heap
3911746	366390	5366130	77354	ROCK	19636	VAUDEAU	Egm	lu	Ds	SuPy	DG	Mullock heap
3911751	366335	5366150	77354	ROCK	19636	VAUDEAU	Egm	lgb	We		MLVY	Exposed in trench
3911752	366335	5366150	77354	ROCK	19636	VAUDEAU	Etl	Sw	We		V	Exposed in trench
3911753	366335	5366100	77354	ROCK	19636	VAUDEAU	Etl	SwSsi			V	Intercatated Siltstone
3911754	366390	5366130	77354	ROCK	19636	VAUDEAU	Egm	lgb	Ds	NiPy	DVG	Mullock heap
3911755	366390	5366130	77354	ROCK	19636	VAUDEAU	Egm	lgb	Ds	PyNi	DVG	Mullock heap
3911756	366390	5366130	77354	ROCK	19636	VAUDEAU	Egm	lgbOvq	Ds	PySu	DVG	Mullock heap
3911747	366075	5366200	77358	ROCK	20795	VAUDEAU	Etl	SwSsh	Lm		V	Contains clasts of Ssh
3911748	366080	5366200	77358	ROCK	20795	VAUDEAU	Etl	Sw			DV	
3911749	366650	5366000	77358	ROCK	20795	VAUDEAU	Clt	We	We	MnHe	BN	Contains angular qtz Cg. 15 cm diam.
3911750	366635	5366000	77358	ROCK	20795	VAUDEAU	Clt	We	We	MnHe	BN	Contains angular qtz Cg
3911757	366140	5365520	77358	ROCK	20795	NICKEL REWARD	Dgq			VnVu	WK	All veins in one plane
3911758	366140	5365520	77358	ROCK	20795	NICKEL REWARD	Dgq			VnVuFe	WK	Veins are crosscutting. Some Fe stained vugs
3911759	366160	5365850	77358	ROCK	20795	NICKEL REWARD	Egm	Im	WeFe	Qtz Vn	DV	Soft . Float from hill.
3911760	366160	5365865	77358	ROCK	20795	NICKEL REWARD	Egm	Im	Ds	PyNiCpy	MDVN	Soft
3911761	366160	5365865	77358	ROCK	20795	NICKEL REWARD	EgmEtl?	lgbSw			V	Soft. Ssh interbedded?
3911762	366075	5365865	77358	ROCK	20795	NICKEL REWARD	Egm	lgb		FoVn	V	Asbestos type vein. Soft. Pits after sulphides
3911763	366165	5365865	77358	ROCK	20795	NICKEL REWARD	Egm	lgb		We	DV	Interbedded with Sw & Ssh
3911764	366175	5365870	77358	ROCK	20795	NICKEL REWARD	Egm	lgb		VuVnFo	DV	Pink/brown veins. Minor qtz veins. Rare Cpy

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CRA EXPLORATION PTY. LIMITED MELBA FLATS EL 43/92 ROCK GEOCHEMISTRY (PLUS PETROLOGY LOCATION) LEDGER AUG '95

Sampno	Ag ppm	Au ppm	Co ppm	Cr ppm	Cu ppm	Fe%	Mn ppm	Ni ppm	P ppm	Pb ppm	Pd ppm	Pt ppm	S%	V ppm	Zn ppm	k X10-SSI
3184289	1		20		427	17.54		229		33					119	90
3184290	2		31		3640	15.18		409		38					122	60
3184291	5	1.3	1360		230000	20.08		9080		89	0.25	0.34			255	20
3184292	1		51		521	11.17		200		19					197	30
3184293	1		26		216	11.29		100		10					105	10
3184294	1		37		176	10.78		136		25					144	40
3184295	780		41		3290	1.87		1390		227000					128000	10
3184296	790	0.22	408		25100	4.86		21900		84200	0.58	0.51			61500	30
3184297	1360	0.17	73		218000	18.75		5610		19300	1.82	0.95			16400	50
3184298	19	0.4	115		9800	9.92		5210		567	0.48	0.39			495	60
3184299	8	0.12	139		5090	11.74		5170		141	0.22	0.14			181	80
3184300	3		19		1150	8.47		274		148					122	30
3911701	530	0.08	183		24400	4.01		9180		26500	0.27	0.22			38900	10
3911702	10	0.38	737		26500	20.44		29000		498	0.32	0.3			356	60
3911703	4		30		756	12.14		521		98					147	40
3911704	4		124		3770	11.26		4830		53					146	40
3911705	25	1.45	1600		96000	38.76		2720		98	0.22	0.94			214	10300
3911706	74	2.2	34		313000	27.37		512		397	8.59	7.26			576	10
3911746	1		93	221	3967	17.3		2551		26					234	90
3911751	-1		43	195	90	11.3		354		-3					116	35
3911752	-1		9	145	225	11.1		94		12					85	30
3911753	-1		27	127	54	10.6		91		-3					125	30
3911754	-1		84	332	453	10.5		1432		6					208	40
3911755	-1		90	320	112	12.3		1743		6					247	30
3911756	-1		64	226	108	11.3		1514		6					209	20
3911747	-1		28	130	45	9.47		83		36					158	50
3911748	-1		28	189	58	9.34		100		31					184	60
3911749	-1		29	95	20	47.7		10		26					243	40
3911750	-1		26	51	13	52.4		9		-3					233	55
3911757	-1		-3	11	10	1.21		-3		-3					9	3
3911758	-1		3	8	24	0.97		3		3					27	4
3911759	-1		17	89	43	9.75		75		538					523	40
3911760	-1		28	170	15	10.4		94		4					136	45
3911761	-1		25	110	13	9.88		93		-3					147	40
3911762	-1		6	103	27	7.19		32		27					53	19
3911763	-1		14	103	59	7.68		85		-3					116	28
3911764	-1		20	107	13	8.67		70		-3					119	36

344065

CRA EXPLORATION PTY. LIMITED MELBA FLATS EL 43/92 ROCK GEOCHEMISTRY (PLUS PETROLOGY LOCATION) LEDGER AUG '95

Sampno	AMGE	AMGN	DPO	SampType	Report	Prospect	MRTLith	FieldID	Texture	Alt/Min	Colour	Comments
3911765	366175	5365870	77358	ROCK	20795	NICKEL REWARD	EgmEtl	IgbSwSsh	Ds	Cpy?Ni?	DVN	
3911766	366275	5365785	77358	ROCK	20795	NICKEL REWARD	Etl?	Sw		Fo	DV	From diversion channel
3911767	366275	5367560	77360	ROCK	20795	NORTH CUNI	Egm	Igb	Ds	Py?	DG	
3911768	366320	5367620	77360	ROCK	20795	NORTH CUNI	Egm	Igb	WeDs	Py?Ns	DG	
3911769	366800	5367685	77360	ROCK	20795	NORTH CUNI	Etl	Sw	We		V	
3911770	366270	5367750	77360	ROCK	20795	GENET'S WINZE	Egm	Igb	WeDs	Ns		Costean
3911771	366385	5367800	77360	ROCK	20795	GENET'S WINZE	Egm	Igblu	Lm	Ds	DG	Shaft
3911772	366385	5367795	77360	ROCK	20795	GENET'S WINZE	Egm	lu		DsNs		Shaft
3911773	366370	5367780	77360	ROCK	20795	GENET'S WINZE	Egm	Igb	WeVn	Ds	MVY	Shaft. D soft Vn
3911774	366280	5367895	77360	ROCK	20795	NORTH CUNI	Egm	Igb		DsNsPy	G	Med grain
3911775	366150	5367915	77360	ROCK	20795	NORTH CUNI	Egm	Oms		GaSpQzPy		
3911776	366725	5368000	77360	ROCK	20795	NORTH CUNI	Etl	Sbs	Lm	Py	DGN	Float
3911777	366385	5367795	77360	ROCK	20795	GENET'S WINZE	Egm	Igb	We		G	Shaft. Med grain
3911778	366880	5367450	77360	ROCK	20795	NORTH CUNI	Egm	Igbldo			MVB	
3911779	366880	5367450	77360	ROCK	20795	NORTH CUNI	Egm	Igbldo			MVB	
3911786	366330	5366750	77366	ROCK	20795	SOUTH CUNI	Egm	lu	WeVs	CpPyQz	ANY	Fine grained pyroxinite?. Pet. - 77367.
3911787	366330	5366750	77366	ROCK	20795	SOUTH CUNI	Egm	lu		CpNi?	DGS	Fine grained pyroxinite?. Pet. - 77367.
3911788	366330	5366750	77366	ROCK	20795	SOUTH CUNI	Oms	lu	Bn	PyNi	ALYN	Fine grained pyroxinite?. Pet. - 77367.
3911789	366330	5366750	77366	ROCK	20795	SOUTH CUNI	Egm	lu	Fe	DsNi?Cp	DG	F g pyrox with fine sulph needles (millerite?)
3911790	366330	5366750	77366	ROCK	20795	SOUTH CUNI	Oms	lu	We	CcCp	ABNPY	Chalcocite
3911791	366330	5366750	77366	ROCK	20795	SOUTH CUNI	Egm	lu	We	CcPy	APN	
3911792	366330	5366750	77366	ROCK	20795	SOUTH CUNI	Oms	lu		CcNi?Py	ANS	Pet. - 77367.
3911793	366330	5366750	77366	ROCK	20795	SOUTH CUNI		Gs	We?		RN	Pet. - 77367.
3911794	366330	5366750	77366	ROCK	20795	SOUTH CUNI	Om	lu	We	SuNiPy	BY	Bronze coloured finr xtals with Py
3911795	366090	5367430	77366	ROCK	20795	NORTH CUNI	Etl	Sbs		SpQtzGa	AWDRS	Old workings
3911796	366150	5367200	77370	ROCK	20795	NORTH CUNI	Etl	Sw	W spots		V	Medium grained
3911797	366150	5367200	77370	ROCK	20795	NORTH CUNI	Etl	Sw	W spots		V	Medium grained
3911798	366150	5367200	77370	ROCK	20795	NORTH CUNI	Etl/Egm?	Sw/Igb?	We		GN	
3911799	366150	5367200	77370	ROCK	20795	NORTH CUNI	Egm?	Igb?	Po		MBG	
3911800	366150	5367200	77370	ROCK	20795	NORTH CUNI	Etl/Egm?	Ssh/Igb?			MWN	Fine grained W shale with gabbro?
3757299	366840	5367350	77231	ROCK	20795	NORTH CUNI	Eg	Igb	Ds	Ni Po?	G	Medium grained Igb with Ds o/c.
3757300	366850	5367350	77231	ROCK	20795	NORTH CUNI	Eg	Igb	Ds	Ni Po?	G	Medium grained Igb with Ds o/c.
4144162	366380	5366300	77233	ROCK		SOUTH CUNI	Eg	CsgOms		NiPy		From wall of Blowfly shaft.
4144163	366380	5366300	77233	ROCK		SOUTH CUNI	Eg	Oms		NiPy		Mullock from Blowfly shaft.
4144164	366380	5366300	77233	ROCK		SOUTH CUNI	Eg	Oms		NiPy		Mullock from Blowfly shaft.
4144165	366310	5365802	77233	ROCK		NICKEL REWARD	Eg	Oms		CpPy		Oms outcrop adjacent the Nickel Reward shaft.

344066

CRA EXPLORATION PTY. LIMITED MELBA FLATS EL 43/92 ROCK GEOCHEMISTRY (PLUS PETROLOGY LOCATION) LEDGER AUG '95

Sampno	Ag ppm	Au ppm	Co ppm	Cr ppm	Cu ppm	Fe%	Mn ppm	Ni ppm	P ppm	Pb ppm	Pd ppm	Pt ppm	S%	V ppm	Zn ppm	k X10-5SI
3911765	-1		27	115	55	9.08		82		4					115	43
3911766	-1		58	186	222	13.2		354		12					257	40
3911767	-1		94	327	3061	13.3		2488		-3					97	45
3911768	22	1.54	222	417	42100	12.8		8500		452	1.44	1.9			216	32
3911769	-1		41	194	141	12		128		49					227	
3911770	-1		73	455	220	8.88		697		530					230	
3911771	-1		23	90	235	13.5		108		33					91	53
3911772	1		39	106	1693	17.7		666		23					131	90
3911773	2	0.105	69	314	6600	13.6		3464		167	0.29	0.365			146	50
3911774	-1		15	70	245	7.13		44		7					75	27
3911775	1460		10	13	9100	2.04		6		313000					211000	7
3911776	-1		7	67	59	5.18		26		272					201	15
3911777	-1		27	122	747	13.7		441		140					144	48
3911778	-1		37	55	70	12.4		70		81					225	
3911779	-1		30	25	119	15		34		28					269	
3911786	153	2.56	192	131	140000	13	454	24700		269	8.78	1.72			308	
3911787	28	0.356	1065	261	44400	16.9	404	31500		49	0.418	0.224			122	
3911788	26	0.491	2746	64	104000	15.2	240	77000		31	0.551	0.354			118	
3911789	-1	0.136	78	165	13300	18.4	1135	4186		219	0.504	0.36			372	
3911790	-1	0.557	1497	100	37800	32.2	26	102000		59	0.96	1.28			164	
3911791	-1	0.23	1177	62	30500	26	52	104000		53	1.14	1.16			227	
3911792	-1	0.56	1810	257	38200	32.8	92	45000		38	0.323	0.78			73	
3911793	10	0.952	489	316	1210	40.3	728	35300		83	2.7	1.64			84	
3911794	3	0.726	975	24	37400	38.9	10	37600		62	0.235	1.15			68	
3911795	510		31	8	105	1.46	163	105		266000					236000	
3911796	-1		6	130	60	10.5	598	60		4					108	
3911797	-1		16	109	9	12	514	78		13					107	
3911798	-1		16	141	11	12.1	640	84		10					105	
3911799	-1		20	137	14	11.5	634	70		7					108	
3911800	-1		14	132	27	7.4	386	47		51					71	
3757299	-1		18	13	55	9.6	525	4		9					60	
3757300	-1		29	53	57	8.4	760	30		8					91	
4144162	103		10	49	168000	42.7	17	220		44					96	
4144163	28		170	141	367000	20.2	108	2997		96					61	
4144164	28	0.268	244	38	414000	18	14	5081		54	3.059	1.133			49	
4144165	2	0.752	683	456	10300	26.5	21	80000		102	1.759	1.058			128	

344087

CRA EXPLORATION PTY. LIMITED MELBA FLATS EL 43/92 ROCK GEOCHEMISTRY (PLUS PETROLOGY LOCATION) LEDGER AUG '95

Sampno	AMGE	AMGN	DPO	SampType	Report	Prospect	MRTLith	FieldID	Texture	Alt/Min	Colour	Comments
5466501	366270	5365786	77699	ROCK		NICKEL REWARD						3m channel sample in diversion channel.
5466502	366272	5365784	77699	ROCK		NICKEL REWARD					VO	3m channel sample in diversion channel.
5466503	366275	5365782	77699	ROCK		NICKEL REWARD					RGB	3m channel sample in diversion channel.
5466504	366277	5365780	77699	ROCK		NICKEL REWARD					O	3m channel sample in diversion channel.
5466505	366280	5365779	77699	ROCK		NICKEL REWARD					LB	3m channel sample in diversion channel.
5466506	366282	5365777	77699	ROCK		NICKEL REWARD					WBO	3m channel sample in diversion channel.
5466507	366285	5365775	77699	ROCK		NICKEL REWARD					OBW	3m channel sample in diversion channel.
5466508	366287	5365773	77699	ROCK		NICKEL REWARD					PBW	3m channel sample in diversion channel.
5466509	366290	5365772	77699	ROCK		NICKEL REWARD					BP	3m channel sample in diversion channel.
5466510	366292	5365770	77699	ROCK		NICKEL REWARD					PNB	3m channel sample in diversion channel.
5466511	366295	5365768	77699	ROCK		NICKEL REWARD					PWNB	3m channel sample in diversion channel.
5466512	366297	5365767	77699	ROCK		NICKEL REWARD					GVPN	3m channel sample in diversion channel.
5466513	366300	5365765	77699	ROCK		NICKEL REWARD					BPN	3m channel sample in diversion channel.
5466514	366302	5365763	77699	ROCK		NICKEL REWARD					LPB	3m channel sample in diversion channel.
5466515	366305	5365761	77699	ROCK		NICKEL REWARD					BP	3m channel sample in diversion channel.
5466516	366307	5365760	77699	ROCK		NICKEL REWARD					NPB	3m channel sample in diversion channel.

341083

CRA EXPLORATION PTY. LIMITED MELBA FLATS EL 43/92 ROCK GEOCHEMISTRY (PLUS PETROLOGY LOCATION) LEDGER AUG '95

Sampno	Ag ppm	Au ppm	Co ppm	Cr ppm	Cu ppm	Fe%	Mn ppm	Ni ppm	P ppm	Pb ppm	Pd ppm	Pt ppm	S%	V ppm	Zn ppm	k X10-5SI
5466501	1		46	1215	480	15.2	1024	359		39					255	
5466502	1		30	666	747	18	615	347		18					142	
5466503	-1		51	157	582	17.6	2502	422		21					295	
5466504	-1		52	257	1081	16.6	2450	533		18					301	
5466505	1		30	1196	1479	20.3	973	437		28					159	
5466506	1		14	171	168	13	415	231		29					119	
5466507	1		47	205	148	9.6	1803	237		51					250	
5466508	1		41	69	117	10	1570	155		22					201	
5466509	1		24	112	110	14.2	831	94		21					124	
5466510	1		12	57	90	12.1	194	91		76					96	
5466511	1		23	38	62	10	325	97		126					127	
5466512	1		21	56	78	12.6	322	93		18					116	
5466513	1		16	41	97	12.6	371	54		15					91	
5466514	1		20	70	93	14.4	353	106		56					151	
5466515	1		22	84	94	10.8	380	83		9					132	
5466516	1		14	62	73	10.6	271	51		9					81	

344069

344070

Appendix III

Soil Geochemistry Sample Ledger and Laboratory Reports

Samno	DPO	Report	Prospect	AMGE	AMGN	SampType	Horizon	Depth	Bedrock?	MRTLth	FieldID	Texture	Al/Min	Colour	Comments	k x10 ⁻⁵ SI	Ag ppm	Au ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Mn ppm	Ni ppm	Pb ppm	Pd ppm	Pt ppm	Zn ppm
3757239	77231	20795	NC-GW	366560	5367800	S	AC	0.5			El	Cy		VB		13	-1		4	108	15	8.5	269	34	17		90	
3757240	77231	20795	NC-GW	366580	5367800	S	AC	0.5			El	Cy		VB		11	-1		3	48	43	4.98	244	17	14		79	
3757241	77231	20795	NC-GW	366620	5367800	S	C	0.5			El	Cy		G		9	-1		4	57	25	2.46	182	34	31		77	
3757242	77231	20795	NC-GW	366640	5367800	S	C	0.5			El	Cy		G		7	-1		3	55	19	2.03	193	20	23		57	
3757243	77231	20795	NC-GW	366660	5367800	S	AC	0.1			El	Cy		G		5	-1		3	91	24	0.93	83	11	69		36	
3757244	77231	20795	NC-GW	366680	5367800	S	AC	0.1			El	Cy		G		20	-1		6	101	26	1.82	110	19	41		58	
3757245	77231	20795	NC-GW	366700	5367800	S	AC	0.1			El	Cy		G		10	-1		5	217	17	2.43	201	26	22		60	
3757246	77231	20795	NC-GW	366720	5367800	S	AC	0.1			El	Cy		G		14	-1		7	146	35	2.56	174	28	33		80	
3757247	77231	20795	NC-GW	366740	5367800	S	C?	0.5			El	Cy		G	Alluvial sediment cover. trans.?	8	-1		8	130	24	3.14	193	30	43		82	
3757248	77231	20795	NC-GW	366760	5367800	S	C	0.4			El	Cy		G		5	-1		3	76	39	1.39	72	25	73		86	
3757249	77231	20795	NC-GW	366780	5367800	S	C	0.4			El	Cy		G		5	-1		8	102	39	3.27	241	29	48		92	
3757250	77231	20795	NC-GW	366800	5367800	S	C	0.2			El	CySbs		N		5	-1		4	69	37	3.43	181	16	41		81	
3757251	77231	20795	NC-GW	366820	5367800	S	C	0.4			El	Cy		G		6	-1		8	78	91	3.03	190	31	81		97	
3757252	77231	20795	NC-GW	366840	5367800	S	C	0.4			El	Cy		G		7	-1		15	102	95	4.78	323	39	52		151	
3757253	77231	20795	NC-GW	366280	5367600	S	C	0.6			El	Cy		V		11	-1		34	4308	445	6.8	346	200	151		273	
3757254	77231	20795	NC-GW	366300	5367600	S	C	0.4			El	Cy		V	trans.?	7	-1		33	2803	96	4.53	345	252	170		351	
3757255	77231	20795	NC-GW	366320	5367600	S	C	0.6			El	Cy		O	trans.?	12	-1		22	3955	768	8.9	510	375	98		140	
3757256	77231	20795	NC-GW	366340	5367600	S	C	0.6			El	Cy		O	trans.?	6	-1		17	7000	78	2.44	278	73	114		142	
3757257	77231	20795	NC-GW	366360	5367600	S	C	0.6			El	Cy	Ovq	O		8	-1		17	420	78	2.58	123	64	195		125	
3757258	77231	20795	NC-GW	366380	5367600	S	C	0.6			El	Cy		G		7	-1		5	1055	29	1.38	95	31	28		49	
3757259	77231	20795	NC-GW	366400	5367600	S	C	0.6			El	Cy		G		8	-1		8	820	71	2.2	172	56	27		66	
3757260	77231	20795	NC-GW	366420	5367600	S	C	0.6			El	Cy		O		17	-1		3	203	57	10.5	38	43	17		75	
3757261	77231	20795	NC-GW	366440	5367600	S	C	0.6			El	Cy		O		20	-1		3	114	21	3.91	29	16	33		30	
3757262	77231	20795	NC-GW	366460	5367600	S	C	0.6			El	Cy		O		7	-1		3	206	11	2.85	41	5	51		26	
3757263	77231	20795	NC-GW	366480	5367600	S	C	0.6			El	CySsh				14	-1		23	134	41	6.5	324	69	103		146	
3757264	77231	20795	NC-GW	366500	5367600	S	C	0.6			El	Cy		V		10	-1		11	107	71	3.69	237	42	85		131	
3757265	77231	20795	NC-GW	366520	5367600	S	C	0.6			El	Cy		O		8	-1		8	92	34	3.33	182	52	114		249	
3757266	77231	20795	NC-GW	366540	5367600	S	C	0.6			El	Cy		N		8	-1		12	710	69	3.29	318	36	63		68	
3757267	77231	20795	NC-GW	366560	5367600	S	C	0.6			El	Cy		G		5	-1		12	272	34	2.09	192	108	11		69	
3757268	77231	20795	NC-GW	366580	5367600	S	C	0.6			El	Cy		G		6	-1		22	141	133	4	352	117	14		330	
3757269	77231	20795	NC-GW	366600	5367600	S	C	0.6			El	Cy		G		6	-1		56	1371	146	3.68	105	192	76		450	
3757270	77231	20795	NC-GW	366620	5367600	S	C	0.9			El	CySbs		N		7	-1		37	4426	95	3.16	217	134	138		271	
3757271	77231	20795	NC-GW	366640	5367600	S	C	0.9			El	Cy		GN		5	-1		16	319	200	3.32	63	75	134		674	
3757272	77231	20795	NC-GW	366660	5367600	S	C	0.9			El	Cy		GN		12	-1		25	258	81	4.82	526	101	34		412	
3757273	77231	20795	NC-GW	366680	5367600	S	C	0.9			El	Cy		GN		12	-1		29	118	103	7.6	629	88	31		266	
3757274	77231	20795	NC-GW	366700	5367600	S	C	0.9			El	Cy		V		8	-1		16	217	34	3.8	450	45	71		331	
3757275	77231	20795	NC-GW	366720	5367600	S	C	0.9			El	Cy		V		6	-1		23	280	62	3.83	574	49	108		528	
3757276	77231	20795	NC-GW	366740	5367600	S	C	0.9			El	Cy		V		10	-1		27	290	38	7.5	510	87	24		570	
3757277	77231	20795	NC-GW	366760	5367600	S	C	0.9			El	Cy		V		12	-1		24	306	39	7.2	352	83	217		209	
3757278	77231	20795	NC-GW	366800	5367600	S	C	0.9			El	Cy		NG	780E Alluvium>1m	11	-1		31	94	89	4.1	452	57	24		364	
3757279	77231	20795	NC-GW	366820	5367600	S	C	0.9			El	Cy		NG		11	-1		24	241	78	8.2	578	62	217		338	
3757280	77231	20795	NC-GW	366840	5367600	S	C	0.9			El	Cy		NG		13	-1		28	191	45	9.2	595	102	136		426	
3757281	77231	20795	NC-GW	366470	5367350	S	C	0.7			El	Cy		G		10	-1		10	196	26	2.36	296	45	19		81	
3757282	77231	20795	NC-GW	366490	5367350	S	C	0.7			El	Cy		G		5	-1		13	331	431	1.75	50	79	5		186	
3757283	77231	20795	NC-GW	366510	5367350	S	C	0.7			El	Cy		N		12	-1		3	182	35	8	593	42	6		86	
3757284	77231	20795	NC-GW	366530	5367350	S	C	0.8			El	Cy		G		16	-1		33	312	56	7.5	717	89	6		121	
3757285	77231	20795	NC-GW	366550	5367350	S	AC	0.6			El	CySw		V		15	-1		18	563	63	3.97	385	55	3		83	
3757286	77231	20795	NC-GW	366570	5367350	S	AC	0.6			El	Cy		V		13	-1		31	305	34	8.1	612	89	5		130	

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SamNo	DPO	Repon	Prospect	AMGE	AMGN	SampType	Horizon	Depth	Bedrock?	MRTLith	FieldID	Texture	Al/Min	Colour	Comments	k x10-5SI	Ag ppm	Au ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Mn ppm	Ni ppm	Pb ppm	Pd ppm	Pt ppm	Zn ppm
3757287	77231	20795	NC-GW	366590	5367350	S	C	0.5		EtI	Cy	N				12	-1		7	775	41	2.98	361	24	9		60	
3757288	77231	20795	NC-GW	366610	5367350	S	C	0.5		EtI	Cy	G				8	-1		8	142	33	1.8	60	25	35		57	
3757289	77231	20795	NC-GW	366630	5367350	S	C	0.4		EtI	Cy	G				15	-1		32	244	29	6.9	793	83	17		122	
3757290	77231	20795	NC-GW	366650	5367350	S	C	0.9		EtI	Cy	G				8	-1		41	146	91	6.1	516	147	34		2803	
3757291	77231	20795	NC-GW	366670	5367350	S	BC	0.5		EtI	Cy	O				8	-1		3	482	41	7.1	45	29	38		53	
3757292	77231	20795	NC-GW	366690	5367350	S	C	0.6		EtI	Cy	N				5	-1		4	454	87	2	112	27	64		143	
3757293	77231	20795	NC-GW	366710	5367350	S	C	0.6		EtI	Cy	N				7	-1		7	863	87	7.5	104	15	11		69	
3757294	77231	20795	NC-GW	366730	5367350	S	C	0.6		EtI	Cy	N				5	-1		5	754	26	2.53	56	10	19		49	
3757295	77231	20795	NC-GW	366750	5367350	S	C	0.6		EtI	Cy	N				15	-1		6	1663	29	4.78	121	16	15		185	
3757296	77231	20795	NC-GW	366770	5367350	S	C	0.6		EtI	Cy	N				13	-1		69	3759	78	8.5	264	146	21		281	
3757297	77231	20795	NC-GW	366790	5367350	S	C	0.6		EtI	Cy	N				10	-1		15	792	53	4.96	293	42	31		159	
3757298	77231	20795	NC-GW	366810	5367350	S	C	0.6		EtI	Cy	N				75	-1		49	2268	41	21.6	697	121	66		691	
3991653	77231	20795	NC-GW	366320	5368000	S	C	0.6		EtI	Cy	V				7	-1		17	196	83	5.8	117	232	107		433	
3991654	77231	20795	NC-GW	366340	5368000	S	C	0.6		EtI	Cy	V				9	-1		24	220	747	5.8	662	169	107		873	
3991655	77231	20795	NC-GW	366415	5368000	S	C	0.6		EtI	Cy	V				10	-1		54	92	105	4.56	166	99	92		316	
3991656	77231	20795	NC-GW	366150	5367950	S	C	0.4		EtI	CySsh	V				11	-1		13	170	50	7.5	408	49	854		216	
3991657	77231	20795	NC-GW	366170	5367950	S	AB	0.6		EtI	Cy	B				9	-1		3	112	13	3.97	107	9	9		45	
3991658	77231	20795	NC-GW	366190	5367950	S	B	0.9		EtI	Cy	O		Minor Vq.		5	-1		-3	165	56	7	87	16	26		71	
3991659	77231	20795	NC-GW	366210	5367950	S	B	0.9		EtI	Cy	O		Minor Vq.		5	-1		4	134	29	3.33	46	32	40		79	
3991660	77231	20795	NC-GW	366230	5367950	S	C	0.7		EtI	Cy	O				6	-1		6	184	70	7.9	81	41	53		182	
3991661	77231	20795	NC-GW	366320	5367950	S	C	0.6		EtI	CySsh	V				8	-1		44	91	29	6.6	211	109	64		519	
3991662	77231	20795	NC-GW	366340	5367950	S	C	0.6		EtI	CySsh	V				11	-1		56	116	29	7.1	545	152	54		540	
3991663	77231	20795	NC-GW	366360	5367950	S	C	0.6		EtI	Cy	OV				11	-1		57	288	119	18.3	744	250	86		805	
3991664	77231	20795	NC-GW	366380	5367950	S	C	0.6		EtI	Cy	OV				11	-1		9	188	25	5.6	85	28	38		96	
3991665	77231	20795	NC-GW	366400	5367950	S	C	1		EtI	CySsh	V				7	-1		114	125	103	3.59	258	184	27		491	
3991666	77231	20795	NC-GW	366430	5367950	S	C	1		EtI	CySsh	V				13	-1		117	121	64	7.6	670	272	48		564	
3991667	77231	20795	NC-GW	366440	5367950	S	C	0.7		Egm	Cylgb	V		Relict lgb texture.		30	-1		136	164	174	15.8	856	377	4		467	
3991668	77231	20795	NC-GW	366450	5367950	S	C	0.7		Egm	Cylgb	V		Relict lgb texture.		25	-1		116	531	917	15.1	1080	985	68		760	
3991669	77231	20795	NC-GW	366460	5367950	S	C	0.7		Egm	Cylgb	V		Relict lgb texture.		15	-1		151	191	127	9.6	662	442	78		1211	
3991670	77231	20795	NC-GW	366470	5367950	S	C	0.7		Egm	Cylgb	V		Relict lgb texture.		37	-1		98	420	116	22.1	4111	487	15		515	
3991671	77231	20795	NC-GW	366520	5367950	S	C	0.8		EtI	CySsh	R				7	-1		21	50	186	6.3	111	66	333		192	
3991672	77231	20795	NC-GW	366540	5367950	S	C	0.7		EtI	Cy	VR				10	2		28	72	248	11.6	766	233	1016		817	
3991673	77231	20795	NC-GW	366560	5367950	S	C	0.9		EtI	CySsh	DV				11	-1		56	507	431	6.9	642	1692	20		1594	
3991674	77231	20795	NC-GW	366570	5367950	S	C	0.9		EtI	CySsh	DV				7	-1		24	92	93	3.62	293	158	54		533	
3991675	77231	20795	NC-GW	366590	5367950	S	C	0.9		EtI	CySsh	DV				7	-1		12	153	48	3.97	521	70	21		141	
3991676	77231	20795	NC-GW	366610	5367950	S	C	0.9		EtI	CySsh	DV				13	-1		18	92	18	4.78	435	57	29		117	
3991677	77231	20795	NC-GW	366630	5367950	S	C	0.9		EtI	CySsh	DV				15	-1		5	71	21	7.1	370	49	17		130	
3991678	77231	20795	NC-GW	366650	5367950	S	C	0.7		EtI	Cy	O				10	-1		8	75	14	8.8	101	24	18		62	
3991679	77231	20795	NC-GW	366670	5367950	S	C	0.7		EtI	Cy	O				8	-1		4	84	26	7.5	65	21	8		42	
3991680	77231	20795	NC-GW	366690	5367950	S	C	0.7		EtI	Cy	O				9	-1		-3	55	47	8.9	38	25	9		44	
3991681	77231	20795	NC-GW	366710	5367950	S	C	0.7		EtI	Cy	O				6	-1		-5	96	9	4	82	16	11		39	
3991682	77231	20795	NC-GW	366730	5367950	S	C	0.7		EtI	Cy	O				12	-1		3	106	16	7.8	104	22	16		61	
3991683	77231	20795	NC-GW	366750	5367950	S	C	0.7		EtI	Cy	O				10	-1		4	98	15	4.39	66	20	46		39	
3991684	77231	20795	NC-GW	366770	5367950	S	C	0.7		EtI	Cy	O				10	-1		13	167	32	11.1	203	57	39		74	
3991685	77231	20795	NC-GW	366790	5367950	S	C	0.7		EtI	Cy	O				11	-1		11	153	42	10	203	55	61		71	
3991686	77231	20795	NC-GW	366810	5367950	S	BC?	0.7		EtI		W				5	-1		3	132	30	2.82	37	56	165		56	

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Samno	DPO	Report	Prospect	AMGE	AMGN	SampType	Horizon	Depth	Bedrock?	MRTLith	FieldID	Texture	Al/Min	Colour	Comments	k x10-SS1	Ag ppm	Au ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Mn ppm	Ni ppm	Pb ppm	Pd ppm	Pt ppm	Zn ppm
3991687	77231	20795	NC-GW	366830	5367950	S	BC?	0.8		Ell	Cy	O			Cap cover.	8	-1		-3	135	82	14	37	38	67			69
3991688	77231	20795	NC-GW	366850	5367950	S	BC?	0.8		Ell	Cy	O			Cap cover.	10	-1		-3	118	108	9.8	24	52	265.3			50
3991689	77231	20795	NC-GW	366170	5367800	S	B	1		Ell	Cy	O			150E > 1m alluvium. Trans.?	10	-1		16	165	67	8.1	164	78	122			201
3991690	77231	20795	NC-GW	366190	5367800	S	B	1		Ell	Cy	O			Trans.?	11	-1		11	166	52	9.7	155	41	165			135
3991691	77231	20795	NC-GW	366210	5367800	S	B	1		Ell	Cy	O			Trans.?	9	-1		16	163	75	4.74	180	123	131			217
3991692	77231	20795	NC-GW	366310	5367800	S	C	0.7		Ell	CySsh	DV				15	-1		77	103	79	7.9	251	709	42			1067
3991693	77231	20795	NC-GW	366330	5367800	S	C	0.7		Ell	CySsh	DV				10	-1		22	213	79	2	180	237	424			1061
3991694	77231	20795	NC-GW	366350	5367800	S	C	1		Ell	CySw	DV				15	-1		30	177	33	10.6	382	261	8			623
3991695	77231	20795	NC-GW	366370	5367800	S	C	1		Ell	CySw	DV				12	-1		6	201	200	7.1	235	95	30			72
3991696	77231	20795	NC-GW	366390	5367800	S	C	0.7		Ell	Cy	V			Contam. from G.W. shaft - V Ssh.	13	-1		28	137	1124	10.4	492	490	20			526
3991697	77231	20795	NC-GW	366410	5367800	S	C	0.6		Ell	Cy	V				15	-1		16	208	31	10.8	500	68	18			83
3991698	77231	20795	NC-GW	366430	5367800	S	C	0.6		Ell	Cy	V				9	-1		13	245	27	11.7	513	59	16			71
3991699	77231	20795	NC-GW	366520	5367800	S	C	0.6		Ell	Cy	V				20	-1		60	241	46	13.3	1255	328	313			510
3991700	77231	20795	NC-GW	366540	5367800	S	C	0.6		Ell	Cy	V				6	-1		7	61	37	4.16	169	31	30			63
3991923	77231	20795	NC-GW	365850	5367300	S	C	0.8		Ell	Cy	O				11	-1		7	338	66	13.7	53	35	22			48
3991924	77231	20795	NC-GW	365870	5367300	S	C	0.8		Ell	Cy	O				10	-1		4	265	45	10.4	32	31	18			40
3991925	77231	20795	NC-GW	365890	5367300	S	C	0.8		Ell	Cy	O				2	-1		3	232	43	7	38	37	24			45
3991926	77231	20795	NC-GW	365910	5367300	S	C	0.5		Ell	Cy	O			Significant quartz. Trans.?	19	-1		-3	56	11	1.55	49	7	9			15
3991927	77231	20795	NC-GW	365930	5367300	S	C	0.5		Ell	Cy	O			Significant quartz. Trans.?	52	-1		3	119	21	6.5	54	6	3			23
3991928	77231	20795	NC-GW	365950	5367300	S	C	0.6		Ell	Cy	O				12	-1		4	173	113	16.9	40	27	3			50
3991929	77231	20795	NC-GW	365970	5367300	S	C	0.6		Ell	Cy	O			Prominent Vqtz.	12	-1		3	169	37	9.4	32	29	8			29
3991930	77231	20795	NC-GW	365990	5367300	S	C	0.6		Ell	Cy	O				20	-1		-3	110	24	7.4	31	12	22			25
3991931	77231	20795	NC-GW	366010	5367300	S	C	0.6		Ell	Cy	N				15	-1		7	53	25	4.98	206	50	67			53
3991932	77231	20795	NC-GW	366030	5367300	S	C	0.6		Ell	Cy	N				17	-1		98	301	109	9.8	760	161	71			880
3991933	77231	20795	NC-GW	366050	5367300	S	C	0.8		Ell	Cy	O				8	-1		6	219	52	13.1	41	28	153			40
3991934	77231	20795	NC-GW	366070	5367300	S	C	0.8		Ell	Cy	O				12	-1		5	205	37	9.1	92	20	27			39
3991935	77231	20795	NC-GW	366090	5367300	S	C	0.8		Ell	Cy	O				14	-1		7	170	56	20.7	82	26	25			59
3991936	77231	20795	NC-GW	366110	5367300	S	C	0.9		Egm	Cylgb	MOW				14	-1		4	202	47	4.96	22	41	36			27
3991937	77231	20795	NC-GW	366100	5367300	S	C	0.9		Ell	Cy	O				14	-1		3	179	95	17.8	122	35	26			40
3991938	77231	20795	NC-GW	366120	5367300	S	C	0.9		Egm	Cylgb	MOW				16	-1		4	407	95	20.5	24	35	48			64
3991939	77231	20795	NC-GW	366130	5367300	S	C	0.7		Ell	Cy	O				15	-1		5	318	125	26.5	48	30	72			83
3991940	77231	20795	NC-GW	366140	5367300	S	C	0.7		Ell	Cy	R				12	-1		5	174	96	17	49	37	156			65
3991941	77231	20795	NC-GW	366160	5367300	S	C	0.7		Ell	Cy	O				13	-1		5	218	92	12.3	33	65	221			132
3991942	77231	20795	NC-GW	366180	5367300	S	C	0.8		Ell	Cy	MOW				12	-1		-3	52	136	7.2	34	47	29			31
3991943	77231	20795	NC-GW	366200	5367300	S	BC	1		Ell	CySsh	W				11	-1		-3	45	56	0.78	42	47	24			26
3991944	77231	20795	NC-GW	366220	5367300	S	C	1		Ell	Cy	V				23	-1		22	85	34	11.1	281	62	28			110
3991945	77231	20795	NC-GW	366240	5367300	S	C	0.9		Ell	Cy	V				10	-1		11	139	96	13.2	421	66	7			72
3991946	77231	20795	NC-GW	366250	5367300	S	C	0.7		Ell	Cy	V			Track @ 6200E.	14	-1		3	106	32	7.6	117	18	4			39
3991947	77231	20795	NC-GW	366270	5367300	S	C	0.7		Ell	Cy	V				13	-1		8	88	49	7.5	262	62	-3			63
3991948	77231	20795	NC-GW	366280	5367300	S	BC	1		Egm	CylgbSw	W				6	-1		6	274	56	1.69	35	145	13			39
3991949	77231	20795	NC-GW	366290	5367300	S	C	1		Ell	Cy	G				14	-1		16	119	75	2.7	621	69	15			113
3991950	77231	20795	NC-GW	366300	5367300	S	C	1		Ell	Cy	G				18	-1		15	120	41	7.9	763	96	22			135
3991951	77231	20795	NC-GW	366310	5367300	S	C	0.7		Ell	CySw	V				20	-1		23	216	32	7.6	526	96	144			137
3991952	77231	20795	NC-GW	366320	5367300	S	C	1		Ell	Cy	G			Gravel cover > 1m @ 6320E.	8	-1		10	87	48	3.04	198	51	6			63
3991953	77231	20795	NC-GW	366340	5367300	S	C	1		Egm	Cylgb	MGW				24	-1		49	248	147	8.6	1022	276	-3			145

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CRA EXPLORATION PTY. LIMITED MELBA FLATS EL 43/92 SOIL GEOCHEMISTRY AUG '95

SamNo	DPO	Report	Prospect	AMGE	AMGN	SamptType	Horizon	Depth	Bedrock?	MRTLinh	FicldID	Texture	Alt/Min	Colour	Comments	k x10-5SI	Ag ppm	Au ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Mn ppm	Ni ppm	Pb ppm	Pt ppm	Pt ppm	Zn ppm
3991954	77231	20795	NC-GW	366350	5367300	S	C	0.6		EtI	CySsh	G				13	-1		5	49	38	1.25	48	54	12		36	
3991955	77231	20795	NC-GW	366360	5367300	S	C	0.7		EtI	Cy	G				17	-1		6	34	60	3.62	194	48	19		81	
3991956	77231	20795	NC-GW	366370	5367300	S	C	1		EtI	Cy	R				21	-1		22	66	50	4.95	214	71	-3		139	
3991957	77231	20795	NC-GW	366380	5367300	S	C	0.6		EtI	Cy	G				16	-1		26	140	70	4.9	288	75	-3		256	
3991958	77231	20795	NC-GW	366390	5367300	S	C	0.6		EtI	Cy	G				10	-1		3	73	32	0.98	35	50	11		37	
3991959	77231	20795	NC-GW	366400	5367300	S	C	0.6		EtI	Cy	R				13	-1		6	53	133	3.12	64	91	16		65	
3991960	77231	20795	NC-GW	366420	5367300	S	C	1		EtI	Cy	G				13	-1		4	52	38	1.2	39	35	13		32	
3991961	77231	20795	NC-GW	366440	5367300	S	C	1		EtI	Cy	G				10	-1		11	472	30	2.69	164	42	4		54	
3991962	77231	20795	NC-GW	366460	5367300	S	C	0.5		EtI	Cy	N				19	-1		52	212	100	10.9	404	114	-3		229	
3991963	77231	20795	NC-GW	366480	5367300	S	C	0.6		EtI	Cy	G				8	-1		17	199	38	6.1	387	69	-3		87	
3991964	77231	20795	NC-GW	366500	5367300	S	C	0.5		EtI	Cy	N				18	-1		29	78	140	4.89	255	104	15		254	
3991965	77231	20795	NC-GW	366520	5367300	S	C	0.5		EtI	Cy	V				22	-1		35	258	62	8.7	593	97	-3		132	
3991966	77231	20795	NC-GW	366540	5367300	S	C	0.5		EtI	Cy	V				7	-1		24	257	53	5.2	452	74	-3		98	
3991967	77231	20795	NC-GW	366850	5367300	S	BC	1.5		EtI	CySsh	O				16	-1		4	133	63	6.4	85	79	77		41	
3991968	77231	20795	NC-GW	366825	5367300	S	BC	1.5		EtI	CySsh	O				155	-1		3	412	66	15.7	102	31	60		69	
3991969	77231	20795	NC-GW	366800	5367300	S	BC	1.5		EtI	CySsh	O				14	-1		18	62	90	4.57	685	45	-3		47	
3991970	77231	20795	NC-GW	366775	5367300	S	C	0.5		EtI	Cy	G				12	-1		7	68	42	1.89	60	26	209		35	
3991971	77231	20795	NC-GW	366750	5367300	S	C	0.6		EtI	Cy	N				18	-1		29	352	30	8.8	477	77	15		330	
3991972	77231	20795	NC-GW	366700	5367300	S	C	0.8		EtI	Cy	O				17	-1		3	205	92	19.7	42	24	599		121	
3991973	77231	20795	NC-GW	366675	5367300	S	C	0.9		EtI	Cy	MOW				11	-1		3	68	44	4.2	36	33	13		24	
3991974	77231	20795	NC-GW	366650	5367300	S	C	0.6		EtI	Cy	G				12	-1		5	29	21	1.05	67	53	11		34	
3991975	77231	20795	NC-GW	366625	5367300	S	C	0.6		EtI	Cy	G				11	-1		16	454	76	3.14	506	55	13		129	
3991976	77231	20795	NC-GW	366600	5367300	S	C	0.4		EtI	Cy	G				16	-1		15	454	36	3.38	326	47	10		69	
3991977	77231	20795	NC-GW	366580	5367300	S	C	0.5		EtI	Cy	N				12	-1		5	282	22	1.72	132	12	17		45	
3991978	77231	20795	NC-GW	366560	5367300	S	C	0.5		EtI	Cy	N				18	-1		24	277	36	6.7	599	68	11		105	
3991979	77231	20795	NC-GW	366200	5367300	S	C	1		EtI	Cy	V				17	-1		14	81	41	6.8	238	56	68		92	
3991980	77231	20795	NC-GW	366220	5367300	S	C	1		EtI	Cy	R				16	-1		8	39	21	4.77	103	30	73		55	
3991981	77231	20795	NC-GW	366230	5367300	S	C	1		EtI	Cy	R			Track @ 6240E.	19	-1		4	96	78	12.2	58	37	78		79	
3991982	77231	20795	NC-GW	366250	5367300	S	C	1		EtI	Cy	O				15	-1		3	67	98	8	7.1	13	2605		86	
3991983	77231	20795	NC-GW	366270	5367300	S	C	1		EtI	Cy	N				10	1		-3	47	38	1.29	84	28	83		44	
3991984	77231	20795	NC-GW	366290	5367300	S	C	0.8		Egm	Igb	MGW				26	2	0.078	135	277	4799	9.9	739	6213	6	0.212	0.1	78
3991985	77231	20795	NC-GW	366300	5367300	S	C	1		EtI	Cy	R				4	-1		14	44	27	2.53	338	56	14		64	
3991986	77231	20795	NC-GW	366310	5367300	S	C	1		EtI	Cy	N				15	-1		40	197	81	7.3	593	108	20		359	
3991987	77231	20795	NC-GW	366320	5367300	S	C	1		Egm	Igb	V				18	-1		17	247	30	6	694	81	30		129	
3991988	77231	20795	NC-GW	366330	5367300	S	C	0.8		EtI	Cy	R				18	-1		16	122	49	6.4	256	69	27		106	
3991989	77231	20795	NC-GW	366340	5367300	S	C	0.8		EtI	Cy	R				11	-1		4	40	20	2.2	72	31	7		34	
3991990	77231	20795	NC-GW	366350	5367300	S	C	1		EtI	Cy	GN				6	-1		9	55	103	1.73	94	61	-3		42	
3991991	77231	20795	NC-GW	366360	5367300	S	C	0.8		EtI	Cy	V				1	-1		6	216	16	1.66	104	28	7		42	
3991992	77231	20795	NC-GW	366370	5367300	S	C	0.8		EtI	Cy	V				14	-1		7	119	22	2.86	139	59	4		105	
3991993	77231	20795	NC-GW	366380	5367300	S	C	0.8		EtI	Cy	V				12	-1		10	166	58	5.31	235	39	8		85	
3991994	77231	20795	NC-GW	366390	5367300	S	C	0.8		EtI	Cy	V				13	-1		9	131	113	2.13	194	76	8		52	
3991995	77231	20795	NC-GW	366400	5367300	S	C	0.8		EtI	Cy	V				10	-1		13	441	23	3.26	204	39	3		60	
3991996	77231	20795	NC-GW	366200	5367450	S	BC	0.7		EtI	Cy	O				12	-1		10	159	36	7.2	184	37	923		72	
3991997	77231	20795	NC-GW	366220	5367450	S	C	1		EtI	Cy	O				20	-1		-3	298	95	25.3	26	17	85		67	
3991998	77231	20795	NC-GW	366240	5367450	S	C	0.7		EtI	Cy	R				15	-1		7	231	37	7.6	93	40	328		102	
3991999	77231	20795	NC-GW	366255	5367450	S	BC	0.8		EtI	Cy	OW				9	-1		-3	179	30	3.29	31	15	360		33	
3992000	77231	20795	NC-GW	366270	5367450	S	C	0.9		EtI	Cy	O				10	1		-3	220	54	9.1	105	39	41		38	
4143201	77231	20795	NC-GW	366280	5367450	S	C	1		EtI	Cy	V				17	-1		20	139	43	11.2	1091	104	37		64	
4143202	77231	20795	NC-GW	366290	5367450	S	C	0.8		EtI	Cy	O				20	-1		36	801	182	10.8	640	345	56		68	

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Samno	DPO	Report	Prospect	AMGE	AMGN	SampType	Horizon	Depth	Bedrock?	MRTLith	FicldID	Texture	Alb/Min	Colour	Comments	k s (10-SSI)	Ag ppm	Au ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Mn ppm	Ni ppm	Pb ppm	Pd ppm	Pt ppm	Zn ppm
4143203	77231	20795	NC-GW	366300	5367450	S	C	0.9		Etl	Cy	G				19	-1		19	286	77	7.1	809	136	36		171	
4143204	77231	20795	NC-GW	366310	5367450	S	C	0.8		Etl	Cy	R				13	-1		12	104	20	2.53	382	44	16		67	
4143205	77231	20795	NC-GW	366320	5367450	S	C	0.8		Etl	Cy	G				15	-1		25	213	37	7.5	691	93	15		163	
4143206	77231	20795	NC-GW	366330	5367450	S	C	0.8		Etl	Cy	K				10	-1		-3	71	17	0.81	40	11	22		26	
4143207	77231	20795	NC-GW	366340	5367450	S	C			Egm	Igb	V			F.g ? Igb R.F.s.	15	-1		51	638	79	7.7	795	293	4		297	
4143208	77231	20795	NC-GW	366350	5367450	S	C	0.7		Etl	Cy	V			Minor V.qtz.	16	-1		18	143	44	5	368	56	-3		96	
4143209	77231	20795	NC-GW	366360	5367450	S	C	0.8		Etl	Cy	V				14	-1		50	163	25	7.1	375	74	4		204	
4143210	77231	20795	NC-GW	366370	5367450	S	C	0.5		Etl	Cy	G				9	-1		7	173	44	2.34	172	19	12		49	
4143211	77231	20795	NC-GW	366380	5367450	S	C	0.5		Etl	Cy	G				17	-1		8	159	28	4.71	278	35	10		75	
4143212	77231	20795	NC-GW	366390	5367450	S	C	0.6		Etl	Cy	V			Adjacent MRIS collar.	8	-1		3	151	20	1.53	88	12	13		30	
4143213	77231	20795	NC-GW	366400	5367450	S	C	0.6		Etl	Cy	V				9	-1		5	207	22	2.51	114	17	9		48	
4143214	77231	20795	NC-GW	366200	5367550	S	C	0.8		Etl	CySsh	R				13	-1		177	240	107	4.04	322	289	51		1572	
4143215	77231	20795	NC-GW	366210	5367550	S	C	0.9		Etl	Cy	G				20	-1		116	231	101	8.7	580	246	26		1992	
4143216	77231	20795	NC-GW	366220	5367550	S	C	0.9		Etl	Cy	G				14	-1		63	243	99	3.82	383	149	1342		1259	
4143217	77231	20795	NC-GW	366230	5367550	S	C	0.9		Etl	Cy	G				16	-1		57	381	79	7.4	691	131	74		2652	
4143218	77231	20795	NC-GW	366240	5367550	S	C	0.8		Egm	Cylgb	V				15	-1		108	918	119	6.8	711	560	137		1833	
4143219	77231	20795	NC-GW	366250	5367550	S	C	0.8		Egm	Cylgb	G				18	-1		108	590	82	7.6	385	223	35		893	
4143220	77231	20795	NC-GW	366260	5367550	S	C	0.8		Egm	Cylgb	G				11	-1		21	4603	25	2.19	175	54	60		812	
4143221	77231	20795	NC-GW	366270	5367550	S	C	0.8		Etl	Cy	G			Track @ 6272-79E.	20	-1		122	7000	42	5.9	296	389	57		673	
4143222	77231	20795	NC-GW	366320	5367550	S	C	0.4		Etl	Cy	G				24	-1		36	650	55	9.2	647	163	-3		256	
4143223	77231	20795	NC-GW	366330	5367550	S	C	0.4		Etl	Cy	G				20	-1		67	342	61	8.5	598	133	25		338	
4143224	77231	20795	NC-GW	366340	5367550	S	C	0.4		Etl	Cy	G				13	-1		47	435	79	4.96	549	129	-3		418	
4143225	77231	20795	NC-GW	366350	5367550	S	C	0.4		Etl	CySsh	G				10	-1		29	563	207	2.31	82	101	220		438	
4143226	77231	20795	NC-GW	366360	5367550	S	C	0.4		Etl	CySsh	G				15	-1		22	720	71	6.4	326	84	35		303	
4143227	77231	20795	NC-GW	366370	5367550	S	C	0.6		Etl	CySsh	MWN				10	-1		16	131	112	1.28	42	61	94		96	
4143228	77231	20795	NC-GW	366380	5367550	S	C	0.6		Etl	CySsh	MWN				9	-1		15	385	161	1.31	64	137	323		78	
4143229	77231	20795	NC-GW	366390	5367550	S	C	0.6		Etl	CyGs	G				16	-1		43	426	66	8.2	371	85	79		205	
4143230	77231	20795	NC-GW	366400	5367550	S	C	0.6		Etl	CyGs	G				16	-1		16	612	23	3.71	223	52	49		110	
4143231	77231	20795	NC-GW	366200	5367650	S	C	0.7		Egm	Cylgb	G				13	-1		24	183	58	4.56	295	95	13		254	
4143232	77231	20795	NC-GW	366210	5367650	S	C	0.7		Egm	Cylgb	G				18	-1		68	781	194	8.5	1001	566	9		883	
4143233	77231	20795	NC-GW	366220	5367650	S	C	0.8		Etl	CyGsSsh	G				20	-1		116	168	217	6.7	514	633	84		900	
4143234	77231	20795	NC-GW	366230	5367650	S	C	0.5		Egm	Cylgb	MWV				19	-1		104	690	285	9.2	1158	699	38		766	
4143235	77231	20795	NC-GW	366240	5367650	S	C	0.6		Etl	Cy	BV				13	-1		12	257	61	3.16	282	75	93		95	
4143236	77231	20795	NC-GW	366250	5367650	S	C	0.9		Etl	CySsh	R				13	2		7	216	140	7.9	85	145	289		150	
4143237	77231	20795	NC-GW	366260	5367650	S	C	0.9		Etl	CySsh	R				15	2		8	137	72	4.33	144	43	150		64	
4143238	77231	20795	NC-GW	366270	5367650	S	C	0.8		Etl	Cy	O				22	-1		5	289	129	16.5	82	69	96		113	
4143239	77231	20795	NC-GW	366280	5367650	S	C	0.8		Etl	Cy	O				12	-1		5	496	130	12.3	62	106	133		90	
4143240	77231	20795	NC-GW	366290	5367650	S	C	0.8		Etl	CySsh	MOY				15	-1		4	220	122	10.1	49	78	92		63	
4143241	77231	20795	NC-GW	366300	5367650	S	b	0.9		Etl	CySsh	MOV				15	-1		5	156	143	6.8	91	91	48		44	
4143242	77231	20795	NC-GW	366310	5367650	S	AB	0.7		Etl	Ssi	B			Adjacent trench.	70	1		4	254	716	10.4	36	88	43		43	
4143243	77231	20795	NC-GW	366320	5367650	S	B?	0.7		Etl	Cy	O			Track @ 6323-28	20	-1		3	772	648	11.3	60	463	29		50	
4143244	77231	20795	NC-GW	366330	5367650	S	C	0.8		Etl	Cy	MOW			Minor Vq.	17	-1		3	173	39	4.43	50	57	21		37	
4143245	77231	20795	NC-GW	366340	5367650	S	B	0.5		Etl	Cy	B				16	-1		11	182	35	10.6	215	45	14		73	
4143246	77231	20795	NC-GW	366350	5367650	S	B	0.9		Etl	CySsh	K				14	-1		3	164	112	10.4	59	55	31		44	
4143247	77231	20795	NC-GW	366360	5367650	S	B	0.9		Etl	CySsh	MOW				16	-1		-3	247	116	12.1	36	12	144		87	
4143248	77231	20795	NC-GW	366370	5367650	S	B			Etl	CySsh	MOR				17	-1		4	221	66	14	79	46	18		62	
4143249	77231	20795	NC-GW	366380	5367650	S	B	0.9		Etl	Cy	O				12	-1		3	185	42	6.9	40	37	13		43	
4143250	77231	20795	NC-GW	366390	5367650	S	C	0.8		Etl	CySsh	MOW				13	-1		-3	104	75	9	27	17	39		23	

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SamNo	DPO	Report	Prospect	AMGE	AMGN	SampType	Horizon	Depth	Bedrock?	MRTLinh	FieldID	Texture	Alv/Min	Colour	Comments	k x10-SS1	Ag ppm	Au ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Mn ppm	Ni ppm	Pb ppm	Pd ppm	Pt ppm	Zn ppm
4143251	77231	20795	NC-GW	366400	5367750	S	B	0.5		EtI	Cy			MWO		10	-1		3	104	58	3.67	33	17	41		1121	
4143252	77231	20795	NC-GW	366400	5367750	S	C	0.4		EtI	CySsh			G		15	-1		24	223	41	8.6	867	82	9		120	
4143253	77231	20795	NC-GW	366390	5367750	S	BC	0.6		EtI	CyWss			W		7	-1		4	171	37	0.78	62	21	9		64	
4143254	77231	20795	NC-GW	366370	5367750	S	C	0.5		EtI	Ssh			G		20	-1		24	240	55	3.84	322	87	37		340	
4143255	77231	20795	NC-GW	366360	5367750	S	C	0.5		EtI	Ssh			G		15	-1		14	273	50	4.75	542	75	49		127	
4143256	77231	20795	NC-GW	366350	5367750	S	C	0.5		EtI	Ssh			G		14	-1		14	194	93	3.17	423	49	29		704	
4143257	77231	20795	NC-GW	366340	5367750	S	C	0.5		EtI	Ssh			G		9	-1		8	109	43	1.98	230	103	44		117	
4143258	77231	20795	NC-GW	366330	5367750	S	BA	0.5		EtI	Cy			BO		13	-1		39	466	144	9	840	370	39		208	
4143259	77231	20795	NC-GW	366320	5367750	S	C			EtI	Cy			V	Minor Vq.	25	-1		11	223	97	4.63	311	174	45		432	
4143260	77231	20795	NC-GW	366310	5367750	S	C			EtI	Cy			V		20	-1		14	183	72	7.2	400	130	34		252	
4143261	77231	20795	NC-GW	366300	5367750	S	C	0.7		EtI	Cy			BV		14	-1		11	217	107	9.6	265	70	27		538	
4143262	77231	20795	NC-GW	366290	5367750	S	C	0.7		EtI	Cy			BV		25	1		19	200	81	9.1	300	66	104		128	
4143263	77231	20795	NC-GW	366280	5367750	S	BC	0.6		EtI	Cy			MOW	Minor Vq.	15	-1		10	169	51	8.5	251	47	54		80	
4143264	77231	20795	NC-GW	366270	5367750	S	BC	0.6		EtI	Cy			MOW		14	-1		16	350	79	7.6	317	149	66		195	
4143265	77231	20795	NC-GW	366260	5367750	S	C	0.6		Egm	Cylgb			V		15	-1		36	469	116	9	421	292	94		342	
4143266	77231	20795	NC-GW	366240	5367750	S	B	0.5		EtI	Cy			OV		20	2		11	283	85	9.8	567	105	926		478	
4143267	77231	20795	NC-GW	366230	5367750	S	C	0.5		EtI	Cy			DV		25	2		40	1600	621	8.7	477	896	654		1196	
4143268	77231	20795	NC-GW	366220	5367750	S	C	0.5		EtI	Cy			DV		20	-1		22	150	41	8	393	81	256		543	
4143269	77231	20795	NC-GW	366210	5367750	S	AC	0.5		EtI	Cy	Ovq		B		18	-1		11	234	32	3.38	204	42	179		131	
4143270	77231	20795	NC-GW	366200	5367750	S	AC	0.5		EtI	Cy	Ovq		B		15	-1		7	148	16	2.76	123	21	83		59	
4143271	77231	20795	NC-GW	366310	5367900	S	C	0.6		EtI	CySbs			N		12	4		101	184	212	8.7	472	392	175		44400	
4143272	77231	20795	NC-GW	366350	5367900	S	AC	0.2		EtI	SsilCst			B		200	12		251	236	165	9.5	191000	119	945		953	
4143273	77231	20795	NC-GW	366370	5367900	S	C	0.4		EtI	Cy			DV		24	1		56	281	87	9.8	2111	128	106		890	
4143274	77231	20795	NC-GW	366390	5367900	S	C	0.6		EtI	Cy			DP		25	-1		71	110	46	7.8	376	150	105		949	
4143275	77231	20795	NC-GW	366410	5367900	S	C	0.5		EtI	CySsh			DV		20	-1		145	139	58	7.2	316	312	15		786	
4143276	77231	20795	NC-GW	366430	5367900	S	C	0.5		EtI	CySsh			DV		18	-1		34	153	108	7.1	436	122	123		422	
4143277	77231	20795	NC-GW	366450	5367900	S	C	0.5		EtI	CySsh			DV		17	1		26	198	109	6.2	358	125	161		376	
4143278	77231	20795	NC-GW	366470	5367900	S	C	0.5		EtI	CySsh			DV		13	-1		26	129	93	6.3	395	107	314		602	
4143279	77231	20795	NC-GW	366510	5367900	S	C	0.5		EtI	CySsh			DV		14	1		61	180	80	3.8	281	142	253		620	
4143280	77231	20795	NC-GW	366530	5367900	S	B	0.5		EtI	Cy			MO		12	2		8	188	129	3.2	122	95	534		327	
4143281	77231	20795	NC-GW	366550	5367900	S	C	0.5		EtI	Cy			MO		9	2		9	86	42	10	234	53	384		1244	
4143282	77231	20795	NC-GW	366125	5368000	S	C	0.6		EtI	Sw			G		13	1		13	241	104	6.6	318	42	256		392	
4143283	77231	20795	NC-GW	366100	5368000	S	C	0.6		EtI	Sw			G		16	-1		13	135	28	7.5	289	73	69		177	
4143284	77231	20795	NC-GW	366075	5368000	S	B	0.6		EtI	Cy			MO		15	-1		20	123	78	9.4	138	60	241		940	
4143285	77231	20795	NC-GW	366050	5368000	S	C	0.6		EtI	Cy			MO		25	4		14	140	90	20.3	410	59	527		1467	
4143286	77231	20795	NC-GW	366000	5368000	S	B	0.5		EtI	Cy			MO	Trick @ 6010E	20	-1		5	177	36	9	61	17	48		62	
4143287	77231	20795	NC-GW	365975	5368000	S	B	0.5		EtI	Cy			MO		16	-1		4	149	30	6.6	59	17	97		36	
4143288	77231	20795	NC-GW	365950	5368000	S	B	0.5		EtI	Cy			MO		24	-1		10	210	84	15.4	124	32	13		58	
4143289	77231	20795	NC-GW	365925	5368000	S	B	0.5		EtI	Cy			MO		15	-1		4	108	25	4.05	65	13	8		24	
4143290	77231	20795	NC-GW	365900	5368000	S	B	0.5		EtI	CyCst			MO		25	-1		144	193	97	17.9	12000	60	44		139	
4143291	77231	20795	NC-GW	365875	5368000	S	B	0.7		EtI	Cy			O		14	-1		6	181	52	14.7	65	10	24		50	
4143292	77231	20795	NC-GW	365850	5368000	S	B	0.7		EtI	Cy			O		15	-1		18	225	67	16.3	110	24	127		92	
4143293	77231	20795	NC-GW	365825	5368000	S	B	0.7		EtI	Cy			O		13	-1		11	170	74	14.2	86	33	36		68	
4143294	77231	20795	NC-GW	365800	5368000	S	C	0.8		EtI	CySsh			Ro		11	-1		6	170	65	9.1	57	15	18		38	
4143295	77231	20795	NC-GW	365750	5368000	S	B	0.5		EtI	Cy			VO		15	-1		-3	176	43	7.5	22	10	8		21	
4143296	77231	20795	NC-GW	365725	5368000	S	B	0.5		EtI	Cy			VO		10	-1		3	208	43	7.8	36	14	5		33	
4143297	77231	20795	NR-V	366800	5366200	S	C	0.4		EtI	Cy			G		10	-1		13	184	64	2.58	208	85	156		224	
4143298	77231	20795	NR-V	366775	5366200	S	C	0.4		EtI	Cy			G		12	-1		22	181	31	4.5	399	57	56		264	
4143299	77231	20795	NR-V	366750	5366200	S	C	0.5		EtI	CySsh			G		14	-1		7	166	22	2.54	187	33	40		121	

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Samno	DPO	Report	Prospect	AMGE	AMGN	Samptype	Horizon	Depth	Bedrock?	MRTLith	FieldID	Texture	Alt/Min	Colour	Comments	k x10-SS1	Ag ppm	Au ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Mn ppm	Ni ppm	Pb ppm	Pt ppm	Zn ppm
4143300	77231	20795	NR-V	366725	5366200	S	C	0.6		Eil	Cy	V				18	-1		12	157	17	6	321	38	15	57	
4143301	77231	20795	NR-V	366700	5366200	S	C	0.6		Eil	CySsh	V				18	-1		29	184	40	10.2	538	92	20	108	
4143302	77231	20795	NR-V	366675	5366200	S	B?	0.6		Eil	Cy	OB				13	-1		8	130	17	2.46	182	33	34	40	
4143303	77231	20795	NR-V	366650	5366200	S	C	1		Eil	Cy	V				25	-1		15	206	106	9	618	90	284	264	
4143304	77231	20795	NR-V	366625	5366200	S	C	1		Eil	Cy	OV				9	5		15	249	63	6.8	257	98	177	114	
4143305	77231	20795	NR-V	366600	5366200	S	BC	0.9		Eil	Cy	O				19	-1		21	306	101	11.3	309	94	12	108	
4143306	77231	20795	NR-V	366575	5366200	S	BC	0.8		Eil	Cy	OV				14	-1		14	307	127	13.5	173	101	11	57	
4143307	77231	20795	NR-V	366550	5366200	S	B	0.4		Eil	Cy	O				31	-1		7	695	20	4.1	148	25	12	35	
4143308	77231	20795	NR-V	366525	5366200	S	BC	0.3		Eil	Cy	OV				12	-1		33	241	94	11.2	411	83	10	152	
4143309	77231	20795	NR-V	366500	5366200	S	BC	0.6		Eil	Cy	OV				22	-1		21	590	69	10.7	256	78	19	110	
4143310	77231	20795	NR-V	366300	5366200	S	B	0.4		Eil	Cy	O				10	-1		6	99	34	7.4	60	26	11	48	
4143311	77231	20795	NR-V	366275	5366200	S	B	0.2		Eil	Cy	O			Side of steep hill.	14	-1		4	68	26	4.78	30	22	16	28	
4143312	77231	20795	NR-V	366225	5366200	S	C	0.8		Eil	Cy	V			Creek @ 250E	30	-1		19	321	53	6.9	272	69	25	122	
4143313	77231	20795	NR-V	366200	5366200	S	B	0.3		Eil	Cy	OV				40	-1		8	121	33	7	86	27	12	46	
4143314	77231	20795	NR-V	366175	5366200	S	C	1		Eil	Cy	V				2	-1		27	346	49	6.5	205	143	79	308	
4143315	77231	20795	NR-V	366150	5366200	S	BC	1		Eil	Cy	BV				1	-1		16	841	53	2.23	226	76	42	166	
4143316	77231	20795	NR-V	366100	5366200	S	BC	0.8		Eil	Cy	OV			Swamp @ 6125. Trans.?	22	-1		27	440	55	9.2	322	78	39	138	
4143317	77231	20795	NR-V	366075	5366200	S	BC	0.2		Eil	Cy	B				25	-1		6	51	18	4.31	95	11	22	32	
4143318	77231	20795	NR-V	366050	5366200	S	AB	0.6		Eil	Cy	B				20	-1		13	145	61	10.9	135	52	23	79	
4143319	77231	20795	NR-V	366025	5366200	S	B	0.6		Eil	Cy	O				14	-1		14	602	52	11.4	159	66	18	70	
4143320	77231	20795	NR-V	366000	5366200	S	BC	0.8		Eil	Cy	OV				14	-1		15	147	32	6.6	217	46	6	77	
4143321	77231	20795	NR-V	365975	5366200	S	B	0.8		Eil	Cy	BV				15	-1		24	411	60	9	309	64	11	91	
4143322	77231	20795	NR-V	365950	5366200	S	BC	0.5		Eil	Cy	O			Trans.?	35	-1		13	419	29	7.4	199	44	21	62	
4143323	77231	20795	NR-V	365925	5366200	S	AC	1		Eil	Cy	BV			Trans.?	6	-1		27	429	64	2.92	222	112	22	180	
4143324	77231	20795	NR-V	365900	5366200	S		0.8		Qha	CcyCg	B			Plus rounded pebbles.	23	-1		28	1396	58	4.58	338	92	22	158	
4143325	77231	20795	NR-V	365875	5366200	S	C	0.8		Eil	Cy	OV				18	-1		24	535	69	9.6	303	84	20	119	
4143326	77231	20795	NR-V	365850	5366200	S		0.1		Qha	Ccy	BO				53	-1		14	492	49	13.3	298	47	31	76	
4143327	77231	20795	NR-V	365800	5366200	S	BC	0.8		Eil	Cy	O			No sample @ 3625E - rock.	14	-1		24	449	96	10.7	332	106	28	147	
4143328	77231	20795	NR-V	365775	5366200	S		0.9		Qha	Ccy	O				20	-1		21	471	85	7.3	247	76	31	103	
4143329	77231	20795	NR-V	365750	5366200	S	C	0.4		Eil	Cy	O			Trans.?	30	-1		18	275	38	9.2	299	49	18	81	
4143330	77231	20795	NR-V	365725	5366200	S		0.2		Qha	Ccy	B			Plus rounded pebbles.	80	-1		10	465	25	7.3	242	25	13	60	
4143331	77231	20795	NR-V	365700	5366200	S		0.7		Qha	Ccy	O			Significant quartz.	60	-1		21	530	70	9.2	280	71	26	99	
4143332	77231	20795	NR-V	366500	5366100	S	BC	0.4		Eil		BV				150	-1		18	185	42	6.2	374	47	30	94	
4143333	77231	20795	NR-V	366525	5366100	S	BC	0.4		Eil	Cy	ON				240	-1		108	428	58	26.9	7000	27	44	76	
4143334	77231	20795	NR-V	366550	5366100	S	BC	0.2		Eil	Ssh	BO				5	-1		28	179	61	5.3	257	83	29	162	
4143335	77231	20795	NR-V	366575	5366100	S	C	0.5		Eil	Ssh	OVW				7	-1		23	218	54	9	402	85	8	96	
4143336	77231	20795	NR-V	366600	5366100	S	B	0.3		Eil	Cy	O				16	-1		5	150	16	9.6	137	16	45	29	
4143337	77231	20795	NR-V	366625	5366100	S	AB	0.4		Eil	Cy	O				28	-1		9	153	39	12	228	36	172	87	
4143338	77231	20795	NR-V	366650	5366100	S	A	0.4		Eil	Cy	B			Significant quartz.	78	-1		7	132	28	3.47	211	27	62	78	
4143339	77231	20795	NR-V	366675	5366100	S	BC	0.4		Eil	Cy	BW				20	-1		4	55	39	2.72	180	35	458	122	
4143340	77231	20795	NR-V	366700	5366100	S	BC	0.4		Eil	CySsh	GB				14	-1		9	98	46	3.06	95	28	31	49	
4143341	77231	20795	NR-V	366725	5366100	S	C	0.3		Eil		GB				17	-1		29	158	40	10.3	637	87	29	192	
4143342	77231	20795	NR-V	366750	5366100	S		0.2		Qha	CcyCg	BW				4	-1		3	52	33	0.59	70	11	18	67	
4143343	77231	20795	NR-V	366775	5366100	S		0.2		Qha	CcyCg	BW				3	-1		3	302	40	1.05	120	6	14	25	
4143344	77231	20795	NR-V	366200	5366100	S	C	0.5		Egm	CyIgb	V				15	-1		20	224	51	3.88	363	73	45	130	

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SamNo	DPO	Repon	Prospect	AMGE	AMGN	SampType	Horizon	Depth	Bedrock?	MRTLith	FieldID	Texture	Alt/Min	Colour	Comments	k x10-SSl	Ag ppm	Au ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Mn ppm	Ni ppm	Pb ppm	Pd ppm	Pt ppm	Zn ppm
4143343	77231	20795	NR-V	366175	5366100	S	B	0.5		Etl	Cy	OW				1	-1		7	395	48	1.47	107	73	29		85	
4143346	77231	20795	NR-V	366150	5366100	S	B	1		Etl	Cy	OV				14	-1		15	378	49	3.57	162	110	25		80	
4143347	77231	20795	NR-V	366125	5366100	S	BC	0.9		Etl	Cy	OV				19	-1		25	348	82	4.52	334	113	46		143	
4143348	77231	20795	NR-V	366100	5366100	S	B	1		Etl	Cy	OV				12	-1		18	241	63	5.3	232	122	29		93	
4143349	77231	20795	NR-V	366490	5366200	S	BC	0.8		Etl	Cy	WV				45	-1		21	561	61	9.7	328	102	19		115	
4143350	77231	20795	NR-V	366480	5366200	S	BC	0.6		Etl	Cy	OV				30	-1		22	364	65	9.3	323	91	14		129	
4143351	77231	20795	NR-V	366470	5366200	S	BC	0.6		Etl	Cy	OV				20	-1		24	277	86	7.3	291	129	18		142	
4143352	77231	20795	NR-V	366340	5366200	S	B	0.5		Etl	Cy	O				15	-1		-3	138	49	12.1	29	58	10		33	
4143353	77231	20795	NR-V	366330	5366200	S	B	0.5		Etl	Cy	O				13	-1		-3	603	199	19.5	38	154	-3		75	
4143354	77231	20795	NR-V	366320	5366200	S	C	0.6		Etl	CySsh	RB				30	-1		10	174	33	10.8	116	43	9		52	
4143355	77231	20795	NR-V	366310	5366200	S	BC	0.4		Etl	Cy	VB				84	-1		10	159	47	9.7	120	46	8		64	
4143356	77231	20795	NR-V	366490	5366100	S		0.4		Qha	CyCg	B				19	-1		11	354	32	4.23	258	45	26		100	
4143357	77231	20795	NR-V	366430	5366100	S	C	0.4	Y	Etl	Ssh	O			Composite grab from cutting	18	-1		8	103	145	11.9	530	106	31		118	
4143358	77231	20795	NR-V	366420	5366100	S	C	0.4	Y	Etl	Ssh	O				30	-1		22	71	55	10.1	658	89	8		121	
4143359	77231	20795	NR-V	366410	5366100	S	BC	1.2		Etl	Cy	MYO				170	-4		21	280	817	13.7	392	114	856		132	
4143360	77231	20795	NR-V	366380	5366100	S	C	0.1		Etl	Cy	G			Locally transported	17	-1		9	93	224	7.7	253	103	26		82	
4143361	77231	20795	NR-V	366370	5366100	S	C	0.8		Etl	Cy	MWG				14	-1		-3	53	112	2.15	52	39	16		35	
4143362	77231	20795	NR-V	366350	5366100	S	BC	0.4		Etl	CySsh	BV			Locally transported	69	-1		10	107	38	10.4	80	42	8		51	
4143363	77231	20795	NR-V	366340	5366100	S	BC	0.4		Etl	CySsh	BV				140	-1		7	80	40	9.1	72	32	6		48	
4143364	77231	20795	NR-V	366330	5366100	S	BC	0.6		Etl	CySsh	BV				53	-1		11	147	23	11.6	123	41	12		60	
4143365	77231	20795	NR-V	366320	5366100	S	C	0.4		Etl	Cy	WO				35	-1		-3	51	42	3.21	47	6	87		22	
4143366	77231	20795	NR-V	366310	5366100	S	BC	0.3		Etl	Cy	RB				300	-1		-3	82	22	4.25	34	8	118		20	
4143367	77231	20795	NR-V	366280	5366100	S	C	0.6		Etl	Cy	OV				130	-1		27	485	87	13.3	383	66	33		126	
4143368	77231	20795	NR-V	366270	5366100	S	BC	0.5		Etl	CySsh	OV				25	-1		26	294	86	11.6	343	101	20		129	
4143369	77231	20795	NR-V	366260	5366100	S	BC	0.9		Etl	Cy	OV				20	-1		29	278	62	9.1	366	100	14		126	
4143370	77231	20795	NR-V	366250	5366100	S	C	0.7		Etl	CySsh	V			Possibly transported - rare rounded pebbles.	20	-1		19	253	42	6.6	318	72	22		98	
4143371	77231	20795	NR-V	366240	5366100	S	C	0.7		Etl	CySsh	V				15	-1		25	479	64	4.94	437	131	17		159	
4143372	77231	20795	NR-V	366230	5366100	S	C	0.7		Etl	CySsh	V				20	-1		32	331	77	3.36	358	91	17		159	
4143373	77231	20795	NR-V	366220	5366100	S	C	0.7		Etl	CySsh	V				12	-1		46	1260	105	4.05	357	124	25		193	
4143374	77231	20795	NR-V	366210	5366100	S	C	0.7		Etl	CySsh	V				27	-1		33	262	104	4.51	443	109	96		189	
4143375	77231	20795	NR-V	366500	5366050	S		1.2		Qha	Ccy	V				15	-1		36	342	86	4.03	471	111	22		173	
4143376	77231	20795	NR-V	366490	5366050	S	B	0.5		Etl	Cy	OB				13	-1		4	321	14	2.04	77	28	16		30	
4143377	77231	20795	NR-V	366600	5365800	S	B	1		Etl	Cy	OW				15	-1		-3	13	6	1.42	57	18	19		20	
4143378	77231	20795	NR-V	366575	5365800	S	B	0.9		Etl	Cy	O				13	-1		4	65	88	5.2	100	55	28		57	
4143379	77231	20795	NR-V	366550	5365800	S	B	0.5		Etl	Cy	O				9	-1		-3	64	46	11.1	36	25	-3		35	
4143380	77231	20795	NR-V	366525	5365800	S	B	0.7		Etl	Cy	B				10	-1		-3	44	40	8.4	33	23	12		25	
4143381	77231	20795	NR-V	366500	5365800	S	C	0.7		Etl	Cy	V				9	-1		17	214	57	4.14	368	73	24		134	
4143382	77231	20795	NR-V	366475	5365800	S	C	1.2		Etl	Cy	O				10	-1		26	99	89	2.6	61	57	20		94	
4143383	77231	20795	NR-V	366450	5365800	S	B	1		Etl	Cy	O			Trans.?	20	-1		10	118	157	11.5	106	60	464		322	
4143384	77231	20795	NR-V	366425	5365800	S	B	1.2		Etl	Cy	O				10	-1		8	116	53	6.7	160	55	167		183	
4143385	77231	20795	NR-V	366400	5365800	S		1		Qha	Ccy	OG				13	-1		7	169	74	10.4	159	39	97		74	
4143386	77231	20795	NR-V	366200	5365800	S	C	1		Etl	Cy	K				15	-1		23	315	90	7.4	247	110	41		179	
4143387	77231	20795	NR-V	366175	5365800	S	BC	0.6		Etl	CySbs	VON			Trans.?	11	-1		12	320	59	5.4	259	65	68		135	
4143388	77231	20795	NR-V	366150	5365800	S	C	0.7		Etl	CySsh	V				11	-1		21	276	52	4.36	242	75	39		200	
4143389	77231	20795	NR-V	366125	5365800	S	C	1		Etl	CySsh	V				15	-1		43	108	66	5.3	256	75	36		183	

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SamNo	DPO	Report	Prospect	AMGE	AMGN	SamptType	Horizon	Depth	Bedrock?	MRTLith	FieldID	Texture	Alp/Min	Colour	Comments	k x10-SSl	Ag ppm	Au ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Mn ppm	Ni ppm	Pb ppm	Pu ppm	Pi ppm	Zn ppm
4143390	77233	NR-V	366400	5365700	S	C	0.4			EtI	Cy			B		20	-1		-3	160	28	5.4	144	28	78		110	
4143391	77233	NR-V	366575	5365700	S	C	0.6			EtI	Cy			B		10	-1		12	170	44	8.4	277	54	86		166	
4143392	77233	NR-V	366550	5365700	S	C	0.4			EtI	Cy			B	Adjacent road.	140	-1		12	153	56	8.2	323	45	128		154	
4143393	77233	NR-V	366525	5365700	S	C	0.5			EtI	Cy			VB		10	-1		9	261	33	4.99	165	53	80		133	
4143394	77233	NR-V	366500	5365700	S	B	1			EtI	Cy			V		10	-1		9	181	60	4.71	213	123	175		291	
4143395	77233	SC	366850	5367000	S	B	1			EtI	Cy			O		10	-1		3	117	136	11.5	74	10	38		39	
4143396	77233	SC	366825	5367000	S	C?	1			EtI	Cy			MWO		10	-1		-3	52	70	5.2	25	25	38		10	
4143397	77233	SC	366800	5367000	S	C	0.5			EtI	Cy			V		50	-1		5	188	42	8.4	262	27	22		36	
4143398	77233	SC	366775	5367000	S	C	0.8			EtI	Cy			G		8	-1		3	90	27	1.63	112	59	87		47	
4143399	77233	SC	366750	5367000	S	C	0.8			EtI	Cy			G		7	-1		-3	124	15	0.24	-3	42	24		22	
4143400	77233	SC	366725	5367000	S	C	0.8			EtI	Cy			G		3	-1		-3	215	73	0.53	87	27	25		29	
4144102	77233	NC-GW	365925	5367500	S	C	0.6			EtI	Ssh			G		20	-1		30	666	60	5.4	699	87	235		620	
4144103	77233	NC-GW	365900	5367500	S	BC	0.8			EtI	Ssh			OV		31	-1		10	949	63	13.8	209	87	100		97	
4144104	77233	NC-GW	365875	5367500	S	C?	1			EtI	Cy			V	Alluvium?	16	-1		11	617	31	4.07	198	60	106		120	
4144105	77233	NC-GW	365850	5367500	S	BC	0.7			EtI	Cy			VO		31	-1		12	901	48	11.1	453	98	95		148	
4144106	77233	NC-GW	365825	5367500	S	BC	0.6			EtI	Ssh			OV		33	-1		11	314	47	9.4	356	57	81		109	
4144107	77233	NC-GW	365800	5367500	S	B?	0.6			EtI	Cy			O	Alluvium?	17	-1		14	838	36	6.2	246	39	102		128	
4144108	77233	NC-GW	365750	5367500	S	BC	0.4			EtI	Sw			OV		26	-1		6	241	24	11.4	116	12	23		28	
4144109	77233	NR-V	366240	5365800	S	B?	0.9			EtI	Cy			OV	Alluvium?	13	-1		11	371	59	2.78	127	123	110		110	
4144110	77233	NR-V	366230	5365800	S	C?	0.6			EtI	Sw			VO	Alluvium?	21	-1		5	191	38	6.8	259	48	98		111	
4144111	77233	NR-V	366200	5365800	S	C?	0.6			EtI	Ssh			V	Alluvium?	18	-1		5	169	60	7.3	286	66	90		166	
4144112	77233	NR-V	366270	5365800	S	C	0.8			EtI	Sw			V		16	-1		10	992	81	6.9	529	144	57		190	
4144113	77233	NR-V	366280	5365800	S	C	0.8			EtI	Sw			V		20	-1		26	210	285	7.3	617	332	45		224	
4144114	77233	NR-V	366310	5365800	S	C	0			Egm	Oms	Gs	NiCs	N	No sample @ 5290: 300E, alluvium >1m.	5	4	0.492	583	30	6902	23.5	27	115(XX)	91	0.845	0.753	16
4144115	77233	NR-V	366320	5365800	S	C?	0.4			EtI	Ssh			V	Alluvium?	8	-1		12	213	55	5.6	201	120	92		162	
4144116	77233	NR-V	366340	5365800	S	C?	0.4			EtI	Ssh	Vq		V	No sample @ 5330E, alluvium >1m.	10	-1		8	610	54	3.9	192	115	136		150	
4144117	77233	NR-V	366350	5365800	S	C?	0.6			EtI	Ssh			V	Alluvium?	10	-1		14	272	60	5.4	260	74	121		199	
4144118	77233	NR-V	366360	5365800	S	C?	0.6			EtI	Ssh			V	Alluvium?	8	-1		15	614	50	5.3	254	89	110		176	
4144119	77233	NR-V	366370	5365800	S	C	1.3			EtI	Sw			V		5	-1		39	243	94	2.57	78	188	176		650	
4144120	77233	NR-V	366380	5365700	S	B	0.6			EtI	Cy			O		10	-1		15	122	116	12.5	171	35	43		111	
4144121	77233	NR-V	366390	5365700	S	C	0			EtI	Ssh			OW		12	-1		-3	86	208	13.4	54	29	27		64	
4144122	77233	NR-V	366400	5365700	S	C	0			EtI	Ssh			OW		12	-1		-3	69	72	8	33	16	37		52	
4144123	77233	NR-V	366410	5365700	S	C	0			EtI	Ssh			OW		21	-1		-3	135	57	8.7	33	15	18		36	
4144124	77233	NR-V	366420	5365700	S	C	0.6			EtI	Ssh			R		7	-1		-3	75	37	10.5	80	24	20		28	
4144125	77233	NR-V	366430	5365700	S	C	0.3			EtI	Ssh			O		109	-1		-3	124	60	9.7	31	30	54		31	
4144126	77233	NR-V	366350	5365700	S	C	0.8			EtI	Ssh			V		10	-1		4	138	70	9.2	141	33	180		73	
4144127	77233	NR-V	366200	5365750	S	C	1.3			EtI	Cy			V		9	-1		21	250	61	4.12	205	197	133		619	
4144128	77233	NR-V	366210	5365750	S	C	0.6			EtI	Sw			V		8	-1		-3	155	41	2.5	77	62	23		72	
4144129	77233	NR-V	366220	5365750	S	C	0.7			EtI	Cy			G		4	-1		10	79	92	0.83	18	90	16		504	
4144130	77233	NR-V	366230	5365750	S	C	0.7			EtI	Ssh			R		6	-1		16	128	23	5.3	388	75	12		84	
4144131	77233	NR-V	366240	5365750	S	C	0.8			EtI	Ssh			W		9	-1		4	138	107	9.5	226	108	30		52	
4144132	77233	NR-V	366250	5365750	S	C	0.8			EtI	Ssh			R		7	-1		-3	66	75	6.6	53	12	16		14	
4144133	77233	NR-V	366260	5365750	S	C	0.8			EtI	Ssh			R		5	-1		-3	247	44	5.7	85	49	18		30	
4144134	77233	NR-V	366270	5365750	S	C	0.7			EtI	Sw			R		8	-1		-3	201	64	9.6	31	27	44		17	
4144135	77233	NR-V	366280	5365750	S	C	0			EtI	Sw			V		29	-1		24	115	113	13.3	486	134	25		205	
4144136	77233	NR-V	366290	5365750	S	B	1			EtI	Cy			O		6	-1		-3	101	27	6.3	39	19	51		15	

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SamNo	DPO	Repon	Prospect	AMGE	AMGN	SampType	Horizon	Depth	Bedrock?	MRTLith	FieldID	Texture	Al/Min	Colour	Comments	k x 10 ⁻⁵ SI	Ag ppm	Au ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Mn ppm	Ni ppm	Pb ppm	Pd ppm	Pt ppm	Zn ppm
4144137	77233	NR-V	366300	5365750	S	B	0.5			Est	Cy			B		10	-1		14	117	62	9.6	133	51	23		66	
4144138	77233	NR-V	366310	5365750	S	C	0.8			Est	Ssh			V		10	-1		14	364	49	7.4	188	51	58		112	
4144139	77233	NR-V	366320	5365750	S	B	0.5			Est	Ssh			V		20	-1		6	232	40	7.7	202	28	47		81	
4144140	77233	NR-V	366365	5365750	S	C	0.5			Est	Sbs	DSpy		N		6	-1		14	550	35	2.52	117	29	65		67	
4144141	77233	NR-V	366375	5365750	S	C	0.5			Est	Sbs	DSpy		N		5	-1		38	573	57	4.24	212	73	54		199	
4144142	77233	NR-V	366400	5365750	S	C	0.6			Est	Ssh			V		16	-1		10	177	36	7.9	157	17	55		88	
4144143	77233	NR-V	366410	5366000	S	C?	0.8			Egm	Igb			V	Alluvium?	11	-1		22	943	62	4.23	335	97	29		148	
4144144	77233	NR-V	366420	5366000	S	C	0.8			Est	Ssh			V		15	-1		14	260	44	5.2	254	83	35		130	
4144145	77233	NR-V	366430	5366000	S	C	0.8			Est	Ssh			V		11	-1		11	271	28	5.3	271	38	69		105	
4144146	77233	NR-V	366440	5366000	S	C	0.8			Est	Ssh			V		11	-1		7	81	47	3.9	207	112	53		67	
4144147	77233	NR-V	366470	5366000	S	C	0.5			Est	Sbs			N	No sample @ 6450, 60E.	14	-1		18	59	25	6.4	291	46	64		178	
4144148	77233	NR-V	366480	5366000	S	C	0.7			Est	Sbs			N		7	-1		4	84	31	7.1	97	13	45		17	
4144149	77233	NR-V	366490	5366000	S	C	0.7			Est	Sbs			N		18	-1		33	98	54	13.7	541	117	44		96	
4144150	77233	NR-V	366500	5366000	S	C	0.5			Est	Sw			V		86	-1		6	120	55	10.4	246	32	44		54	
4144151	77233	NR-V	366240	5366050	S	C	1.3			Est	Sw			V		14	-1		32	329	86	7.3	527	135	34		250	
4144152	77233	NR-V	366230	5366050	S	C	1.3			Est	Sw			V		14	-1		27	239	55	7.5	826	139	26		205	
4144153	77233	NR-V	366220	5366050	S	B	1			Est	Ssh			O		7	-1		7	53	42	5.7	137	25	23		43	
4144154	77233	NR-V	366210	5366050	S	B	1			Est	Ssh			V		15	-1		26	280	93	11.7	406	81	28		116	
4144155	77233	NR-V	366320	5366050	S	C	1			Est	Ssh			V		13	-1		15	104	40	2.59	109	49	149		458	
4144156	77233	NR-V	366400	5366050	S	C	1.3			Egm	Igb?			V			-1		40	645	109	4.58	369	157	29		147	
4144157	77233	NR-V	366320	5366050	S	C?	1			Est	Cy			V	Alluvium?	21	-1		10	557	42	5.6	207	45	30		72	
4144158	77233	NR-V	366410	5366050	S	C	1			Est	Sw			V		11	-1		25	393	139	5.7	255	180	17		133	
4144159	77233	NR-V	366370	5366050	S	C	0.5			Est	Sbs			N		18	-1		3	68	25	1.23	77	27	79		26	
4144160	77233	NR-V	366380	5366050	S	C	1			Est	Ssh	Py		V		12	-1		22	315	32	6	374	62	23		130	
4144161	77233	NR-V	366430	5366050	S	C	1			Est	Cy			G		12	-1		18	176	190	4.81	140	111	57		144	
4144301	77233	SC	366405	5366700	S	C	0.7			Est	Ssh			G		5	-1		10	115	430	1.48	47	129	47		109	
4144302	77233	SC	366380	5366700	S	B	1			Est	Cy			O		10	-1		3	141	48	12.3	41	13	17		16	
4144303	77233	SC	366355	5366700	S	B	1			Est	Cy			O		30	-1		4	181	95	15	60	8	18		23	
4144304	77233	SC	366330	5366700	S	C	1			Est	Ssh			V		10	-1		8	76	76	14.5	172	40	66		35	
4144305	77233	SC	366850	5366500	S	B	1			Est	Ssh	OG		OG		10	-1		-3	142	78	9.8	96	34	106		38	
4144306	77233	SC	366825	5366500	S	C	0.7			Est	Sbs			N		9	-1		3	74	31	4.81	129	37	116		32	
4144307	77233	SC	366800	5366500	S	B	0.7			Est	Ssh	OG		OG		10	-1		8	544	33	5.7	178	37	44		67	
4144308	77233	SC	366775	5366500	S	B	0.7			Est	Ssh	OG		OG		10	-1		10	291	127	8.3	114	67	29		121	
4144309	77233	SC	366750	5366500	S	B	0.7			Est	Ssh			O		30	-1		5	202	98	17	59	38	20		44	
4144310	77233	SC	366725	5366500	S	B	0.7			Est	Ssh			O		50	-1		4	109	62	9.4	88	32	32		35	
4144311	77233	SC	366700	5366500	S	B	0.7			Est	Ssl			O		10	-1		6	202	111	14.2	45	45	62		63	
4144312	77233	SC	366675	5366500	S	B	0.7			Est	Ssh			O		10	-1		4	142	64	10	18	69	174		106	
4144313	77233	SC	366650	5366500	S	B	0.7			Est	Ssh			O		10	-1		6	130	87	14.3	46	58	25		49	
4144314	77233	SC	366625	5366500	S	B	0.7			Est	Ssh			O		50	-1		3	185	61	13.3	44	23	58		55	
4144315	77233	SC	366600	5366500	S	B	0.7			Est	Ssh			O		10	-1		4	166	178	15.4	31	32	49		58	
4144316	77233	SC	366575	5366500	S	B	0.7			Est	Ssh			O		10	-1		4	168	90	9.2	22	48	29		40	
4144317	77233	SC	366550	5366500	S	B	0.7			Est	Ssh			O		20	-1		7	162	67	9.9	76	42	44		40	
4144318	77233	SC	366500	5366500	S	C	1			Est	Sbs	PyDs		N		9	-1		4	51	39	1.6	85	20	4		20	
4144319	77233	SC	366475	5366500	S	C	1			Est	Cy			W		8	-1		5	159	35	3.68	8	63	46		15	
4144320	77233	SC	366450	5366500	S	C	1			Est	Cy			W		10	-1		4	170	116	8	14	58	115		16	
4144321	77233	SC	366440	5366500	S	C	1			Est	Ssh			R		10	-1		3	116	61	17.3	83	33	32		33	
4144322	77233	SC	366420	5366500	S	C	1			Est	Ssh			RW		10	-1		5	123	92	5.9	25	69	7		22	
4144323	77233	SC	366410	5366500	S	B	1			Est	Cy			O		20	-1		6	66	63	8.7	27	15	10		23	

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Samno	DPO	Report	Prospect	AMGE	AMGN	SampType	Horizon	Depth	Bedrock?	MRTLith	FieldID	Texture	Alv/Min	Colour	Comments	k x (O-SS)	Ag ppm	Au ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Mn ppm	Ni ppm	Pb ppm	Pd ppm	Pt ppm	Zn ppm
4144324	77233	SC		366400	5366500	S	C	1		Ent	Ssh	O				20	-1		-3	105	48	9.6	30	10	17		27	
4144325	77233	SC		366390	5366500	S	C	1		Ent	Ssh	R				10	-1		5	124	71	13.5	47	18	16		27	
4144326	77233	SC		366380	5366500	S	B	1		Ent	Ssh	O				10	-1		-3	128	90	11.6	21	36	16		37	
4144327	77233	SC		366370	5366500	S	C	1		Ent	Ssh	V				20	-1		8	61	55	5.9	220	48	20		50	
4144328	77233	SC		366360	5366500	S	C	1		Ent	Ssh	V				10	-1		8	79	53	5	161	47	25		38	
4144329	77233	SC		366350	5366500	S	B	1		Ent	Cy	OW				8	-1		3	84	20	3.17	21	28	13		12	
4144330	77233	SC		366340	5366500	S	C	1		Ent	Ssh	R				30	-1		4	150	64	10.7	16	33	21		40	
4144331	77233	SC		366330	5366500	S	C	0.5		Ent	Ssh	Vq	R			20	-1		3	73	96	13.2	49	12	25		49	
4144332	77233	SC		366320	5366500	S	B	0.5		Ent	Cy	O				20	-1		3	286	100	11.6	91	119	13		36	
4144333	77233	SC		366310	5366500	S	B	0.5		Ent	Cy	O				10	-1		-3	86	31	7.8	20	8	59		17	
4144334	77233	SC		366300	5366500	S	C	0.7		Ent	Ssh	R				10	-1		-3	75	93	10.4	24	3	475		44	
4144335	77233	SC		366290	5366500	S	B	0.7		Ent	Ssh	O				10	-1		4	123	60	13.4	19	9	72		29	
4144336	77233	SC		366280	5366500	S	B	0.7		Ent	Ssh	O				10	-1		3	113	61	18.4	21	14	29		65	
4144337	77233	SC		366270	5366500	S	B	0.7		Ent	Ssh	O				10	-1		4	86	27	7.1	19	17	24		21	
4144338	77233	SC		366260	5366500	S	B	0.7		Ent	Ssh	O				10	-1		5	101	24	7.2	23	40	43		34	
4144339	77233	SC		366250	5366500	S	B	0.8		Ent	Cy	O				10	-1		-3	102	62	6.7	17	30	15		22	
4144340	77233	SC		366240	5366500	S	B	1		Ent	Ssh	ii	O			9	-1		-3	123	40	7.4	17	22	14		28	
4144341	77233	SC		366230	5366500	S	B	1		Ent	Ssh	ii	O			10	-1		-3	79	20	5.2	18	15	17		13	
4144342	77233	SC		366220	5366500	S	B	0.8		Ent	Cy	O				10	-1		-3	138	55	15.3	21	19	33		33	
4144343	77233	SC		366210	5366500	S	B	0.8		Ent	Cy	O				10	-1		6	208	125	16.9	19	57	171		40	
4144344	77233	SC		366200	5366500	S	B	0.8		Ent	Cy	O				10	-1		3	263	52	8.6	35	23	33		27	
4144345	77233	SC		366175	5366500	S	C	1		Ent	Sw	R				10	-1		8	171	23	5.3	229	47	22		65	
4144346	77233	SC		366150	5366500	S	C	1		Ent	Ssh	WO				16	-1		5	113	82	15.9	50	16	90		62	
4144347	77233	SC		366125	5366500	S	CB	1		Ent	Ssh	RO				31	-1		5	167	53	20	56	85	156		149	
4144348	77233	SC		366100	5366500	S	CB	1		Ent	Ssh	RO				17	-1		6	309	44	12.7	61	24	45		40	
4144349	77233	SC		366075	5366500	S	BC	1		Ent	Ssh	RO				28	-1		4	207	59	17.3	35	15	69		43	
4144350	77233	SC		366050	5366500	S	C	1		Ent	Ssh	R				30	-1		5	229	68	25.4	55	10	32		32	
4144351	77233	SC		366025	5366500	S	BC	1		Ent	Ssh	G				7	-1		6	109	50	8.9	31	30	21		11	
4144352	77233	SC		366000	5366500	S	C	0.5		Ent	SshSw	O				8	-1		-3	130	50	6.7	85	60	12		20	
4144353	77233	SC		365975	5366500	S	C	0.6	Y	Ent	Ssh	G				9	-1		9	109	22	5.4	143	25	7		34	
4144354	77233	SC		365925	5366500	S	C	1		Ent	Ssh	V			5950E > 1m alluvium.	13	-1		12	141	57	5.5	131	42	59		71	
4144355	77233	SC		365900	5366500	S	C	1		Ent	Ssh	O				11	-1		-3	169	51	6.5	17	18	34		30	
4144356	77233	SC		365875	5366500	S	C	1		Ent	Ssh	O				9	-1		-3	101	28	3.42	34	14	52		20	
4144357	77233	SC		365850	5366500	S	C	1		Egpm	Igb	VO				23	-1		7	106	39	5.4	100	41	8		50	
4144358	77233	SC		365840	5366500	S	C	1	Y	Ent	Sw	G				12	-1		24	144	218	6.4	236	79	8		160	
4144359	77233	SC		365825	5366500	S	C	1	Y	Ent	Sw	G				18	-1		5	107	39	2.8	73	69	7		109	
4144360	77233	SC		365800	5366500	S	C	1	Y	Ent	Sw	G				12	-1		24	166	57	4.97	275	99	7		84	
4144361	77233	SC		365775	5366500	S	C	1		Ent	Sw	DG				15	-1		10	212	47	11.7	130	53	13		69	
4144362	77233	SC		365750	5366500	S	C	0.7	Y	Ent	Ssh	G				5	-1		5	75	36	2.27	66	37	47		53	
4144363	77233	SC		366200	5366300	S	B	0.7		Ent	Cy	O				23	-1		3	69	56	9.2	30	32	95		25	
4144364	77233	SC		366220	5366300	S	B	0.7		Ent	Ssh	O				12	-1		3	98	58	9.5	26	11	266		25	
4144365	77233	SC		366240	5366300	S	B	0.7		Ent	Ssh	O				9	-1		5	114	51	9.8	21	26	65		16	
4144366	77233	SC		366260	5366300	S	B	0.7		Ent	Ssh	O				9	-1		5	84	48	8.2	20	34	28		20	
4144367	77233	SC		366280	5366300	S	B	0.6		Ent	Ssh	O				14	-1		5	152	88	13.1	37	42	24		40	
4144368	77233	SC		366300	5366300	S	C	0.5		Ent	Sw	R				11	-1		5	162	35	14.3	30	39	24		13	
4144369	77233	SC		366320	5366300	S	B	0.7		Ent	Cy	O				10	-1		4	87	19	5.8	22	21	10		9	
4144370	77233	SC		366340	5366300	S	C	0.8		Ent	Ssh	WO				8	-1		-3	59	40	4.14	23	45	16		15	
4144371	77233	SC		366350	5366300	S	C	0.8		Ent	Ssh	BG				8	-1		-3	64	72	0.97	27	62	23		10	

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SamNo	DPO	Report	Prospect	AMGE	AMGN	SamptType	Horizon	Dpth	Bedrock?	MRTLith	FieldID	Texture	Al/Min	Colour	Comments	k x10-SSI	* Ag ppm	Au ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Mn ppm	Ni ppm	Pb ppm	Pd ppm	Pt ppm	Zn ppm
4144372	77233	SC	366360	5366300	S	C	0.6			Eil	Sw	G				20	-1		18	208	110	8.3	328	111	14		162	
4144373	77233	SC	366400	5366300	S	C	0.5			Eil	Ssh	DsPy	R			8	-1		6	80	47	5.2	138	49	29		31	
4144374	77233	SC	366410	5366300	S	C	0.8			Eil	SshCy	GV				14	-1		10	72	29	6	615	66	31		53	
4144375	77233	SC	366420	5366300	S	B	1			Eil	SshCy	O				13	-1		5	133	69	10.9	32	37	48		45	
4144376	77233	SC	366430	5366300	S	B	1			Eil	SshCy	O				18	-1		7	387	203	14.6	25	107	63		83	
4144377	77233	SC	366450	5366300	S	B	0.2			Eil	Cy	Vq	O			29	-1		6	77	9	3.3	33	9	23		12	
4144378	77233	SC	366475	5366300	S	CB	0.6			Eil	Sw	GO				13	-1		11	202	45	10	122	37	30		48	
4144379	77233	SC	366500	5366300	S	C?	0.4			Eil	Sw	V			Alluvium?	511	-1		18	304	25	5.4	392	52	48		90	
4144380	77233	NC-GW	366125	5367700	S	C	0.8			Eil	SshCy	V				18	-1		17	113	33	8.6	808	86	379		178	
4144381	77233	NC-GW	366100	5367700	S	V	0.4			Eil	Sw	V				18	-1		25	195	37	7.8	839	85	25		132	
4144382	77233	NC-GW	366175	5367700	S	V	0.4			Eil	Sw	V				23	-1		28	150	85	9.4	938	129	69		660	
4144383	77233	NC-GW	366150	5367700	S	CB	0.6			Eil	Cy	NO				14	-1		8	139	40	12.7	249	19	94		46	
4144384	77233	NC-GW	366100	5367700	S	C	0.4			Eil	Sw	VO				17	-1		22	162	55	12.4	528	82	65		130	
4144385	77233	NC-GW	365975	5367700	S	B	0.3			Eil	Cy	Vq	OB			15	-1		5	96	5	2.81	86	6	36		39	
4144386	77233	NC-GW	365950	5367700	S	C?	0.7			Eil	Cy	V			Alluvium?	6	-1		10	125	16	2.09	165	27	70		103	
4144387	77233	NC-GW	365925	5367700	S	C	0.8			Eil	Sw	V				6	-1		11	143	25	2.82	167	52	64		79	
4144388	77233	NC-GW	365900	5367700	S	C	0.7	Y		Eil	Ssh	V				21	-1		23	95	45	6.6	562	54	40		150	
4144389	77233	NC-GW	365875	5367700	S	C	0.7			Eil	Ssh	V				20	-1		47	252	72	4.96	346	167	20		505	
4144390	77233	NC-GW	365850	5367700	S	C	0.6			Eil	Ssh	O				14	-1		23	235	143	12.6	185	95	109		269	
4144391	77233	NC-GW	365825	5367700	S	C	0.9			Eil	Ssh	V				6	-1		9	178	59	1.62	57	83	18		86	
4144392	77233	NC-GW	365800	5367700	S	C	1			Eil	Sw	V				32	-1		84	137	103	14.2	1649	154	63		420	
4144393	77233	NC-GW	365775	5367700	S	C	1			Eil	Sw	V				10	-1		29	105	55	8.1	731	84	42		150	
4144394	77233	NC-GW	365750	5367700	S	C	0.8			Eil	Sw	O				6	-1		5	116	129	3.86	77	58	81		71	
4144395	77233	NC-GW	366125	5367500	S	C	0.8			Eil	Ssh	OG				21	-1		15	186	74	11.9	169	57	55		68	
4144396	77233	NC-GW	366100	5367500	S	C	0.8			Eil	Ssh	O				19	-1		7	306	75	14.3	50	45	129		58	
4144397	77233	NC-GW	366075	5367500	S	C	0.8			Eil	Sw	V				14	-1		13	232	42	12.3	143	35	56		31	
4144398	77233	NC-GW	366050	5367500	S	C	0.5			Eil	Sw	NG				24	-1		32	147	48	11.9	786	99	738		274	
4144399	77233	NC-GW	366000	5367500	S	C	0.6			Eil	Sw	V			Hard bedrock not sampled @ 6025E.	20	-1		11	616	32	3.41	147	29	67		83	
4144400	77233	NC-GW	365975	5367500	S	C	0.5			Eil	Ssh	WV				10	-1		9	853	25	1.55	93	25	648		66	
4144401	77233	SC	366700	5367000	S	C	0.9			Eil	Cy	G				8	-1		10	241	78	2.5	196	39	20		49	
4144402	77233	SC	366675	5367000	S	C	0.7			Eil	SshCy	G				6	-1		8	35	87	1.57	62	19	31		49	
4144403	77233	SC	366650	5367000	S	C	0.7			Eil	SshCy	G				10	-1		11	150	31	4.22	281	51	36		72	
4144404	77233	SC	366625	5367000	S	C	1			Eil	SshCy	V				7	-1		32	132	62	7.4	573	88	28		143	
4144405	77233	SC	366600	5367000	S	C	0.8			Eil	SwCy	MVO				10	-1		34	147	62	9.5	597	95	21		97	
4144406	77233	SC	366575	5367000	S	C	0.8			Eil	SwCy	MVO				10	-1		50	203	48	9.4	893	103	25		122	
4144407	77233	SC	366550	5367000	S	C	0.7			Eil	SshCy	N				6	-1		9	227	40	3.56	291	24	51		32	
4144408	77233	SC	366525	5367000	S	C	0.6			Eil	SshCy	MVO				10	-1		23	157	33	6.2	471	86	25		122	
4144409	77233	SC	366500	5367000	S	C	0.9			Eil	SshSwCy	MOV B				10	-1		14	284	58	8.8	692	94	23		95	
4144410	77233	SC	366475	5367000	S	C	1			Eil	Cy	N				10	-1		10	167	47	8.3	242	61	33		72	
4144411	77233	SC	366450	5367000	S	C	1			Eil	SshCy	N				9	-1		-3	85	22	1.04	59	2	28		15	
4144412	77233	SC	366440	5367000	S	C	1.2			Eil	SshCy	G				7	-1		4	130	32	2.41	198	48	15		59	
4144413	77233	SC	366430	5367000	S	C	1			Eil	Cy	O				8	-1		-3	140	45	3.23	40	32	19		33	
4144414	77233	SC	366420	5367000	S	C	1			Eil	Cy	O				10	-1		-3	129	41	4.67	28	33	12		44	
4144415	77233	SC	366410	5367000	S	C	1			Eil	Cy	O				5	-1		-3	110	15	1.4	28	21	234		17	
4144416	77233	SC	366400	5367000	S	C	0.8			Eil	SshCy	G				6	-1		-3	62	7	0.91	51	5	11		18	
4144417	77233	SC	366390	5367000	S	C	1.1			Egm	lgbCy	V				20	-1		40	403	292	8.6	976	248	30		120	
4144418	77233	SC	366380	5367000	S	C	1.2			Egm	lgbCy	V				20	-1		49	723	150	8.3	903	432	18		98	
4144419	77233	SC	366370	5367000	S	C	1			Egm	lgbCy	Ds Ni	V			10	-1		12	160	35	1.96	249	61	10		88	

*all < D.L.

*Less than Detection Limit

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Samno	DPO	Report	Prospect	AMGE	AMGN	SampType	Horizon	Depth	Bedrock?	MRTLith	FieldID	Texture	Alt/Min	Colour	Comments	k x10-SSl	Ag ppm	Au ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Mn ppm	Ni ppm	Pb ppm	PJ ppm	Pt ppm	Zn ppm
4144420	77233	SC	366350	5367000	S	C	1			Etl	SshCy			R		8	-1		-3	148	21	2.9	55	17	18		15	
4144421	77233	SC	366340	5367000	S	C	1			Egm	IgbCy			V		10	-1		32	339	261	2.35	133	193	18		124	
4144422	77233	SC	366330	5367000	S	C	1			Etl	SshCy			V		6	-1		54	151	74	4.49	282	194	22		70	
4144423	77233	SC	366320	5367000	S	C	1			Etl	SshCy			V		10	-1		18	125	31	4.79	777	76	17		95	
4144424	77233	SC	366310	5367000	S	C	1			Etl	SshCy	Ds	Py	V		9	-1		7	119	36	3.56	180	59	15		76	
4144425	77233	SC	366300	5367000	S	C	1			Etl	SshCy			V		1	-1		7	61	47	2.22	140	39	23		36	
4144426	77233	SC	366290	5367000	S	C	1			Etl	SshCy			V		10	-1		10	112	31	2.69	211	50	15		74	
4144427	77233	SC	366280	5367000	S	C	1			Etl	SshCy			WV		2	-1		4	110	30	1.17	88	25	43		80	
4144428	77233	SC	366270	5367000	S	C	1			Etl	SshCy			W		4	-1		-3	102	18	0.55	28	23	4		17	
4144429	77233	SC	366260	5367000	S	C	1			Egin	IgbCy			O		7	-1		4	519	73	1.45	31	86	52		64	
4144430	77233	SC	366250	5367000	S	C	1			Etl	SwCy			W		5	-1		-3	159	17	0.27	18	48	230		30	
4144431	77233	SC	366240	5367000	S	C	1			Etl	SshCy			V		7	-1		-3	144	30	1.47	127	30	234		85	
4144432	77233	SC	366230	5367000	S	C	1			Etl	SshCy			V		10	-1		16	252	44	4.69	452	112	368		233	
4144433	77233	SC	366220	5367000	S	C	1			Etl	SwCy			V		10	-1		30	371	41	9.3	699	131	125		148	
4144434	77233	SC	366210	5367000	S	C	1			Etl	SshCy			V		10	-1		9	169	39	3.68	311	55	45		72	
4144435	77233	SC	366200	5367000	S	C	1			Etl	SshCy			V		4	-1		12	164	44	4.06	298	88	44		204	
4144436	77233	SC	366175	5367000	S	C	1			Etl	SwCy			V		9	-1		11	194	33	5	246	66	24		162	
4144437	77233	SC	366150	5367000	S	C	1			Etl	SshCy			V		4	2		13	216	99	3.26	222	88	279		488	
4144438	77233	SC	366125	5367000	S	C	1			Etl	SwCy			V		7	-1		7	168	21	1.97	185	42	34		74	
4144439	77233	SC	366100	5367000	S	C	1			Etl	Sbs			N		8	-1		8	124	47	5	242	44	29		92	
4144440	77233	SC	366075	5367000	S	C	1			Etl	SshCy			G		10	-1		4	83	146	2.51	209	39	348		223	
4144441	77233	SC	366050	5367000	S	C	1			Etl	SshCy			WY		8	-1		4	110	16	1.51	68	46	47		41	
4144442	77233	SC	366025	5367000	S	C	1			Etl	SshCy	Ds	Py	R		10	-1		13	69	17	2.15	237	47	29		57	
4144443	77233	SC	366000	5367000	S	C	1			Etl	SshCy			V	N-S line @ 6000E.	9	-1		5	63	23	2.06	175	33	28		64	
4144444	77233	SC	365975	5367000	S	C	1			Etl	SshCy			V		8	-1		6	234	26	2.49	253	75	31		69	
4144445	77233	SC	365950	5367000	S	C	1			Etl	SshCy			V		15	-1		10	131	88	6.7	634	63	34		74	
4144446	77233	SC	365925	5367000	S	C	1			Etl	SshCy			V		8	-1		12	79	26	4.02	576	49	32		59	
4144447	77233	SC	365900	5367000	S	C	1			Etl	SshCy			W		7	-1		-3	81	10	0.85	64	25	20		21	
4144448	77233	SC	365875	5367000	S	C	1			Etl	SshCy			W		6	-1		6	84	29	3.31	353	48	19		52	
4144449	77233	SC	365850	5367000	S	C	1			Etl	SbsCy	Ds	Py	N		4	-1		95	127	371	3.8	211	238	45		248	
4144450	77233	SC	365825	5367000	S	C	1			Etl	SbsCy	Ds	Py	N		10	-1		44	117	157	6.5	299	103	29		64	
4144451	77233	SC	365800	5367000	S	C	1			Etl	SbsCy	Ds	Py	N	N-S line (8975N 5700E) @ 5800E.	10	-1		107	107	155	10	298	203	24		587	
4144452	77233	SC	365775	5367000	S	C	1			Etl	SbsCy			N		10	-1		37	329	134	8.3	485	141	28		163	
4144453	77233	SC	365750	5367000	S	B	0.1			Etl	Cy			B	Line is incorrectly numbered 6500N in west.	90	-1		3	168	34	14	200	28	172		74	
4144454	77233	SC	366850	5366700	S	BC	0.5			Etl	SshCy			MOG		8	-1		-3	85	68	6.6	31	-1	47		6	
4144455	77233	SC	366825	5366700	S	C	0.5			Etl	SshCy			MOG		5	-1		-3	63	23	1.89	28	-1	38		9	
4144456	77233	SC	366800	5366700	S	C	1			Etl	SshCy			G		10	-1		-3	183	32	0.57	25	82	22		21	
4144457	77233	SC	366775	5366700	S	C	0.5			Etl	SshCy			V		20	-1		21	163	45	8.2	750	99	25		130	
4144458	77233	SC	366750	5366700	S	C	0.5			Etl	SshCy			V		10	-1		11	179	45	4.34	340	111	21		81	
4144459	77233	SC	366725	5366700	S	C	0.5			Etl	SshCy			MOG		5	-1		-3	138	41	1.95	20	82	20		14	
4144460	77233	SC	366700	5366700	S	C	0.5			Etl	SshCy			W		6	-1		-3	89	9	0.94	27	25	16		10	
4144461	77233	SC	366675	5366700	S	B	0.2			Etl	SshCy	Vq		MOW		6	-1		4	34	-2	0.93	35	1	11		7	
4144462	77233	SC	366650	5366700	S	B	2			Etl	SshCy			O		7	-1		3	83	46	4.52	32	14	21		26	
4144463	77233	SC	366625	5366700	S	B	0.5			Etl	SshCy			O		8	-1		4	115	5	3.21	57	21	18		17	
4144464	77233	SC	366600	5366700	S	C	0.5			Etl	SshCy			G		10	-1		14	205	79	4.27	333	104	120		67	

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Samno	DPO	Report	Prospect	AMGE	AMGN	SampType	Horizon	Depth	Bedrock?	MRTLith	FieldID	Texture	Alt/Min	Colour	Comments	k x10-SSl	Ag ppm	Au ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Mn ppm	Ni ppm	Pb ppm	Pd ppm	Pt ppm	Zn ppm
4144465	77233	SC		366575	5366700	S	C	0.5		Ent	SshCy	G				8	-1		-3	51	8	1.81	43	-1	52		14	
4144466	77233	SC		366550	5366700	S	C	0.5		Ent	Cy	O				70	-1		-3	228	61	10.2	25	34	52		47	
4144467	77233	SC		366525	5366700	S	C	0.5		Ent	SbsCy	N				10	-1		3	119	135	6.2	29	20	37		19	
4144468	77233	SC		366500	5366700	S	C	1		Ent	SshCy	G				15	-1		14	140	74	7.2	398	85	22		74	
4144469	77233	SC		366475	5366700	S	C	0.5		Ent	SshCy	V				10	-1		17	138	81	7.4	370	73	23		82	
4144470	77233	SC		366460	5366700	S	C	0.5		Ent	SshCy	V				10	-1		6	95	31	4.38	263	36	191		73	
4144471	77233	SC		366450	5366700	S	C	1		Ent	SshCy	V				10	-1		-3	51	18	2.11	141	5	28		28	
4144472	77233	SC		366440	5366700	S	C	1		Ent	SshCy	V				10	-1		12	68	27	3.66	286	48	23		79	
4144473	77233	SC		366430	5366700	S	C	1		Ent	SshCy	V				20	-1		8	77	81	4.37	315	41	21		122	
4144474	77233	SC		366410	5366700	S	C	1		Ent	SshCy	V				10	-1		16	49	27	2.32	283	43	22		96	
4144475	77233	SC		366350	5366700	S	C	0.7		Ent	SbsCy	N			Thick South Cuni mullock cover 6410-6350E.	10	-1		-3	56	144	3.22	150	36	48		31	
4144476	77233	SC		366340	5366700	S	C	0.6		Ent	Ssh	VG				15	-1		5	76	116	6.3	325	42	30		55	
4144477	77233	SC		366330	5366700	S	C	0.6		Ent	Ssh	VG				10	-1		6	62	184	4.81	253	26	70		59	
4144478	77233	SC		366320	5366700	S	C	0.6		Ent	Ssh	VG				10	-1		6	82	108	5.9	200	31	24		37	
4144479	77233	SC		366310	5366700	S	C	0.6		Ent	Ssh	VG				10	-1		6	76	250	4.1	123	20	16		30	
4144480	77233	SC		366300	5366700	S	C	0.6		Ent	Ssh	VG				10	-1		6	59	101	3.4	147	30	18		44	
4144481	77233	SC		366290	5366700	S	C	0.5		Ent	Sbs	N				10	-1		10	82	102	7.1	231	38	27		53	
4144482	77233	SC		366280	5366700	S	C	0.5		Ent	Ssh	G				10	-1		9	73	41	3.91	218	31	14		42	
4144483	77233	SC		366270	5366700	S	C	0.5		Ent	Sw	V				10	-1		7	92	34	3.47	205	38	40		84	
4144484	77233	SC		366250	5366700	S	C	0.5		Ent	Sw	V				10	-1		6	89	37	3.73	261	37	12		45	
4144485	77233	SC		366225	5366700	S	B	1		Ent	Ssh	W				6	-1		16	152	290	3.97	258	94	16		252	
4144486	77233	SC		366200	5366700	S	C	0.5		Ent	Sss	R				9	-1		7	116	32	2.34	71	46	20		31	
4144487	77233	SC		366175	5366700	S	B	1		Ent	Ssh	O				10	-1		6	57	58	7	73	27	108		54	
4144488	77233	SC		366150	5366700	S	B	1		Ent	Ssh	O				10	-1		6	296	96	18.5	23	36	55		81	
4144489	77233	SC		366125	5366700	S	B	1		Ent	Ssh	O				10	-1		3	168	79	11.7	58	18	25		44	
4144490	77233	SC		366100	5366700	S	B	1		Ent	Ssh	O				20	-1		-3	176	84	19.4	35	25	46		44	
4144491	77233	SC		366075	5366700	S	B	1		Ent	Ssh	O				10	-1		6	141	70	16.5	46	15	42		28	
4144492	77233	SC		366050	5366700	S	B	1		Ent	Ssh	O				10	-1		-3	155	58	15.4	27	15	40		27	
4144493	77233	SC		366025	5366700	S	C	1		Ent	Ssh	R				10	-1		7	133	80	15.1	148	34	22		73	
4144494	77233	SC		366000	5366700	S	B	1		Ent	Ssh	O				10	-1		3	96	14	3.12	35	13	26		15	
4144495	77233	SC		365975	5366700	S	B	1		Ent	Ssh	O				20	-1		4	143	61	12.2	30	22	14		25	
4144496	77233	SC		365950	5366700	S	C	0.4		Ent	Ssh	R				20	-1		5	79	14	3.68	46	17	20		25	
4144497	77233	SC		365925	5366700	S	C	0.5		Ent	Ssh	V				10	-1		9	121	67	4.44	201	60	26		119	
4144498	77233	SC		365900	5366700	S	C	0.6		Ent	Sw	V				20	-1		22	197	12	8.8	558	95	15		114	
4144499	77233	SC		365875	5366700	S	C	0.5		Ent	Ssh	G				8	-1		5	57	11	2.05	241	27	18		33	
4144500	77233	SC		365850	5366700	S	C	0.5		Ent	Ssh	G				10	-1		12	102	180	3.98	377	29	18		122	
3911707	77353	19636	NR-V	366480	5366150	S	C	0.7		Ent	CySsh	YV			Mines Dept grav sln. on road	50	-1		42	1113	266	10.9	154	23			122	
3911708	77353	19636	NC-GW	366410	5366150	S	C	0.5		Ent	CySsh	Ovq			Next to 3328459-61 (ROCK)	19	-1		4	68	76	12.4	100	59			51	
3911709	77353	19636	NR-V	366385	5366100	S	C	0.1		Ent	CySsh	SI			Taken from E/W costan full of water	350	-1		50	229	1737	10.9	792	29			175	
3911710	77353	19636	NR-V	366300	5366310	S	C	0.4		Ent	SshCy	V			From CSR 6400E 6250N	24	-1		30	417	50	7.07	104	6			126	
3911711	77353	19636	NR-V	366450	5366300	S	BC	0.4		Ent	CySsh	YO			On hill	20	-1		-3	156	64	9.36	72	150			90	
3911712	77353	19636	NC-GW	366275	5367315	S	C	1.1		Ent	CySsh	LGVO			From CSR 6200E 7300N	19	-1		19	120	37	7.18	74	3			84	
3911713	77353	19636	NC-GW	366270	5367505	S	B	0.4		Ent	Cy	O			Star picket "S1899". Treats?	13	-1		-3	153	10	6.7	9	50			24	

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SamNo	DPO	Report	Prospect	AMGE	AMGN	SampType	Horizon	Depth	Bedrock?	MRTLith	FictiID	Texture	AlvMin	Colour	Comments	k x 10 ⁻⁵ SI	Ag ppm	Au ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Mn ppm	Ni ppm	Pb ppm	Pu ppm	Pt ppm	Zn ppm
3911714	77353	19636	NC-GW	366345	5367610	S	C	0.4		Est	Ssh	V			20 m E of Nonh Cuni shaft	20	-1		13	334	69	4.18	82	835			223	
3911715	77353	19636	NC-GW	366345	5367687	S	C	0.5		Est	CySsh	B			0E - Mines Dept gravity traverse stn.	13	-1		-3	286	133	15.1	94	34			66	
3911716	77353	19636	NC-GW	366329	5367698	S	C	0.4		Est	CySsh	B			20W - Mines Dept gravity traverse stn.	20	-1		-3	314	123	17.6	83	9			142	
3911717	77353	19636	NC-GW	366312	5367709	S	C	0.5		Est	CySsh	DB			40W - Mines Dept gravity traverse stn.	19	-1		-3	165	251	16.1	227	26			76	
3911718	77353	19636	NC-GW	366290	5367711	S	C	0.8		Est	CySsh	B			60W - Mines Dept gravity traverse stn.	20	-1		5	181	423	18.7	300	46			55	
3911719	77353	19636	NC-GW	366269	5367709	S	C	0.8		Est	CySsh	DPB			80W - Mines Dept gravity traverse stn.	15	-1		7	150	139	13	113	1338			85	
3911720	77353	19636	NC-GW	366247	5367712	S	C	0.9		Est	CySsh	MLV			100W - Mines Dept gravity traverse stn.	26	-1		38	769	352	12.1	964	102			95	
3911721	77353	19636	NC-GW	366229	5367707	S	BC	0.7		Est	Cy	MGV			120W - Mines Dept gravity traverse stn.	12	-1		6	116	51	3.32	44	87			87	
3911722	77353	19636	NC-GW	366219	5367688	S	C	0.7		Est	Cy	MLV			140W - Mines Dept gravity traverse stn.	16	-1		25	139	21	6.02	139	41			407	
3911723	77353	19636	NC-GW	366198	5367680	S	C	0.7		Est	CySsh	DPB			160W - Mines Dept gravity traverse stn.	16	-1		19	102	25	9.31	57	14			115	
3911724	77353	19636	NC-GW	366180	5367677	S	C	0.4		Est	CySsh	GLV			180W - Mines Dept gravity traverse stn.	20	-1		31	371	53	10.5	244	43			110	
3911725	77353	19636	NC-GW	366383	5367675	S	C	0.4		Est	CySsh	B			40E - Mines Dept gravity traverse stn.	18	-1		-3	128	190	13.1	39	69			74	
3911726	77353	19636	NC-GW	366403	5367671	S	BC	0.7		Est	CySsh	B			60E - Mines Dept gravity traverse stn.	12	-1		-3	129	42	6.77	44	23			23	
3911727	77353	19636	NC-GW	366424	5367673	S	C	0.6		Est	CySsh	LVG			80E - Mines Dept gravity traverse stn.	20	-1		13	99	22	11	58	69			110	
3911728	77353	19636	NC-GW	366444	5367673	S	BC	0.6		Est	Cy	G			100E - Mines Dept gravity traverse stn.	11	-1		-3	66	15	3.92	23	14			25	
3911729	77353	19636	NC-GW	366465	5367672	S	C	0.4		Est	Cy	LVG			120E - Mines Dept gravity traverse stn.	20	-1		6	199	12	4.3	25	12			47	
3911730	77353	19636	NC-GW	366483	5367670	S	BC	0.2		Est	Cy	LGB			140E - Mines Dept gravity traverse stn.	15	-1		4	117	20	2.82	29	24			43	
3911742	77353	19636	NC-GW	366503	5367671	S	BC	0.3		Est	Ssh	P			160E - Hit bedrock	15	-1		13	167	15	5.83	50	11			70	
3911743	77353	19636	NC-GW	366523	5367671	S	BC	0.6		Est	CySsh	P			180E - Over Ssh?	19	-1		17	160	17	9.09	61	9			86	
3911744	77353	19636	NC-GW	366444	5367673	S	BC	0.6		Est	Cy	G			100E - Mines Dept gravity traverse stn.	11	-1		-3	66	15	3.92	23	14			25	
3911745	77353	19636	NR-V	366440	5366130	S	C	1.5		Est	CySsh	PB			Next to 3528459-61 (ROCK)	16	-1		4	68	76	12.4	100	59			51	

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Samno	DPO	Report	Prospect	AMGE	AMGN	SampType	Horizon	Depth	Bedrock?	MRTLith	FieldID	Texture	Alt/Min	Colour	Comments	k x 10 ⁻⁵ SI	Ag ppm	Au ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Mn ppm	Ni ppm	Pb ppm	Pd ppm	Pt ppm	Zn ppm
3911745	77355	19636	NC-GW	366363	5367671	S	C	0.8		Etl	CySsh	LV			220E - Mines Dept gravity traverse stn.	25	-1		11	111	30	9.51		76	23			80
3912901	77355	19636	NR-V	366100	5365950	S	C?	2		Etl	Cy	O			Trans.?	10	-1		30	264	104	13.1		116	8			128
3912902	77355	19636	NR-V	366125	5365950	S	BC?	1.3		Etl	CyMsl	O			Msl rock fragments, Trans.?	290	-1		13	308	96	16		63	-3			95
3912903	77355	19636	NR-V	366150	5365950	S	C	1.5		Etl	Cy	POG			On track	10	-1		-3	117	94	7.34		22	31			21
3912904	77355	19636	NR-V	366175	5365950	S	C	1.1		Etl	CyMsl	O			Msl rock fragments	20	-1		11	193	169	20.4		78	4			75
3912905	77355	19636	NR-V	366200	5365950	S	B	1.5		Etl	Cy	B			Track at 190E	20	-1		12	284	81	16.2		74	4			93
3912906	77355	19636	NR-V	366225	5365950	S	B	0.7		Etl	Cy	O				90	-1		13	223	77	12.2		61	-3			94
3912907	77355	19636	NR-V	366250	5365950	S	BC	0.8		Etl	Cy	BR			After sulphides? Trans.?	20	-1		16	235	41	17		134	22			116
3912908	77355	19636	NR-V	366260	5365950	S	C	1		Etl	Cy	PO				30	-1		13	2725	364	15.4		155	5			89
3912909	77355	19636	NR-V	366270	5365950	S	C	1		Etl	Cy	PO				10	-1		23	613	123	15.1		173	16			99
3912910	77355	19636	NR-V	366280	5365950	S	C	1		Etl	Cy	POVG			Rock fragments	20	-1		46	848	110	11.1		519	11			131
3912911	77355	19636	NR-V	366290	5365950	S	C	1		Etl	Cy	POVG			Rock fragments	10	-1		6	164	42	7.75		58	15			81
3912912	77355	19636	NR-V	366300	5365950	S	C?	0.8		Etl	CyMsl	PVG			Green Msl rock fragments.	10	-1		55	153	12	2.61		40	13			40
3912913	77355	19636	NR-V	366310	5365950	S	C?	0.7		Etl	CyMsl	PVG			Green Msl rock fragments.	10	-1		-3	152	24	1.17		27	31			18
3912914	77355	19636	NR-V	366320	5365950	S	C?	0.8		Etl	CyMsl	PVG			Green Msl rock fragments.	0	-1		-3	92	20	1.26		25	10			22
3912915	77355	19636	NR-V	366330	5365950	S	C?	0.8		Etl	CyMsl	PVG			Green Msl rock fragments.	10	-1		8	157	60	3.58		81	22			79
3912916	77355	19636	NR-V	366340	5365950	S	C	0.7		Etl	Cy	PVG			From swamp. V rock fragments	10	-1		10	147	70	7.17		67	29			77
3912917	77355	19636	NR-V	366350	5365950	S	C	1.2		Etl	CyMsl	PG			Primary Msl foliation recognized	0	-1		-3	41	10	0.94		16	77			20
3912918	77355	19636	NR-V	366360	5365950	S	B	1.1		Etl	Cy	MLBO				10	-1		7	105	58	9.61		44	199			66
3912919	77355	19636	NR-V	366370	5365950	S	B	1.1		Etl	Cy	MLBO				220	-1		9	158	42	12.2		51	21			77
3912920	77355	19636	NR-V	366380	5365950	S	BC	0.5		Etl	CySw	O			On outcrop. Extension of Vaudou ridge	30	-1		19	112	19	10.4		57	5			95
3912921	77355	19636	NR-V	366390	5365950	S	B	1.3		Etl	Cy	MNO			Trans.?	10	2		-3	57	62	6.78		4	76			21
3912922	77355	19636	NR-V	366400	5365950	S		0.8		Qha	Cg	N			Swampy broad gully	10	-1		4	222	23	6.2		70	42			89
3912923	77355	19636	NR-V	366425	5365950	S	BC	0.3		Etl	CySw	B			Track at 425E. Sample taken at 430E	10	-1		5	192	174	2.75		45	61			76
3912924	77355	19636	NR-V	366450	5366150	S	C	0.4		Etl	CySsh	P				20	-1		13	143	129	11.8		70	19			88
3912925	77355	19636	NR-V	366430	5366150	S	BC	0.4		Etl	Cy	O				70	-1		12	360	250	13		201	28			110
3912926	77355	19636	NR-V	366420	5366150	S	B	1.5		Etl	Cy	PV				30	-1		26	141	161	10		139	7			130
3912927	77355	19636	NR-V	366410	5366150	S	BC	0.8		Etl	CySsh	PV			Green Ssh fragments	20	-1		48	228	155	8.29		169	16			180
3912928	77355	19636	NR-V	366400	5366150	S	B	2		Etl	Cy	PV			Very soft at EOH	10	-1		22	105	63	4.39		199	4			120
3912929	77355	19636	NR-V	366390	5366150	S	B/C	1.3		Etl	CySsh	PV				20	-1		12	200	86	9.82		98	9			77
3912930	77355	19636	NR-V	366380	5366150	S	BC	1.3		Etl	CySsh	OV			Green Ssh RF	30	-1		13	242	106	11.8		152	20			106
3912931	77355	19636	NR-V	366370	5366150	S	C	0.9		Etl	Cy	PV			1 m west of old trench	30	-1		15	133	76	6.36		63	-3			84
3912932	77355	19636	NR-V	366360	5366150	S	C?	0.7		Etl	Cy	O			Cl at 363E	10	-1		-3	84	86	7.55		19	10			41
3912933	77355	19636	NR-V	366350	5366150	S	C	1		Etl	CySsh	O				10	-1		4	108	56	7.61		57	34			39
3912934	77355	19636	NR-V	366340	5366150	S	BC	0.7		Etl	Cy	O				20	-1		5	204	71	14.9		46	-3			69

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SamNo	DPO	Report	Prospect	AMGE	AMGN	SampType	Horizon	Depth	Bedrock?	MRTLith	FieldID	Texture	AlvMin	Colour	Comments	k x10-SS1	Ag ppm	Au ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Mn ppm	Ni ppm	Pb ppm	Pt ppm	Zn ppm
3912935	77355	19636	NR-V	366330	5366150	S	C?	0.4		Est	Cy			O	Adjacent to lgb flout and Sss outcrop	130	-1		17	325	43	10	132	-3			68
3912936	77355	19636	NR-V	366320	5366150	S	C	0.4		Est	CySsh			VB	Top of hill	20	-1		14	152	22	9.53	44	-3			63
3912937	77355	19636	NR-V	366310	5366150	S	BC	0.3		Est	Cy			B	Poor C horizon developed	50	-1		4	115	12	6.49	16	4			36
3912938	77355	19636	NR-V	366300	5366150	S	AC	0.2		Est	CySsh			B	Track at 6298E	130	-1		6	124	23	7.41	15	10			41
3912939	77355	19636	NR-V	366290	5366150	S	C	0.6		Est	CySsh			PO		40	-1		4	136	35	8.84	16	4			38
3912940	77355	19636	NR-V	366280	5366150	S	C	0.9		Est	CySsh			VB	Creek at 6275E	20	-1		6	149	27	4.8	30	7			48
3912941	77355	19636	NR-V	366270	5366150	S	BC	1.2		Est	CySsh			LG	Gravels may be assoc. with creek. Trans.?	20	-1		10	420	24	2.45	40	22			76
3912942	77355	19636	NR-V	366260	5366150	S		0.3		Qha	CcyCg			OB	Black Ssh and qtz fragments	60	-1		16	224	63	9.74	48	11			90
3912943	77355	19636	NR-V	366250	5366150	S	BC	0.9		Est	Cy			OV		20	-1		20	694	58	8.54	104	12			110
3912944	77355	19636	NR-V	366450	5365950	S	C	0.7		Est	Cy			G		20	-1		18	210	23	5.16	79	26			169
3912945	77355	19636	NR-V	366475	5365950	S	C	0.4		Est	Ssh			LBG	Water at EOH	10	-1		4	118	14	1.12	11	54			38
3912946	77355	19636	NR-V	366500	5365950	S	B	2		Est	Cy			O		20	-1		16	241	71	13.6	77	29			104
3912947	77355	19636	NR-V	366525	5365950	S	B	1.9		Est	Cy			O	On Hill	10	-1		8	249	111	8	109	16			57
3912948	77355	19636	NR-V	366350	5365950	S	B	1		Est	Cy			O	Very hard to penetrate. On hill.	10	-1		5	298	124	16.9	65	21			73
3912949	77355	19636	NR-V	366575	5365950	S	B	1.1		Est	Cy			O	Very hard to penetrate. On hill.	10	-1		3	232	86	14.2	81	23			95
3912950	77355	19636	NR-V	366600	5365950	S	B	0.6		Est	Cy			LB	Very hard to penetrate.	20	-1		10	196	46	6.66	80	114			53
3912951	77355	19636	NR-V	366625	5365950	S	B?	1		Est	Cy			PO	Very hard to penetrate.	10	-1		-3	151	66	9.54	23	33			24
3912952	77355	19636	NR-V	366650	5365950	S	B	0.9		Est				MOW	Very hard to penetrate. trans.?	10	-1		-3	141	64	12	21	18			38
3912953	77355	19636	NR-V	366675	5365950	S	BC	0.8		Est	SbsCy			DG	Graphitic	10	-1		-3	60	28	1.11	9	22			17
3912954	77355	19636	NR-V	366700	5365950	S	C	1.5		Est	Cy			MOW	Very hard to penetrate. 705E railway line	20	-1		4	385	123	15.5	54	8			204
3912955	77355	19636	NR-V	366725	5365950	S	BC	0.9		Est	Cy			MKO	Very hard to penetrate. Trans.?	20	-1		-3	225	82	15.5	30	7			46
3912956	77355	19636	NR-V	366750	5365950	S	B	1.5		Est	Cy			OK		10	-1		-3	400	119	7.07	80	20			21
3912957	77355	19636	NR-V	366775	5365950	S	BC?	1.2		Est	Cy			LG	Rock fragments? Trans.?	20	-1		15	168	40	7.33	88	55			165
3912958	77355	19636	NR-V	366800	5365950	S	BC	1.8		Est	Cy			PV	Water at 1.5 m	20	-1		14	164	57	5.14	130	42			97
3912959	77355	19636	NR-V	366225	5366150	S	C	1		Est	CySshSss			OV	Ssh Sss and qtz rock fragments. Trans.?	20	-1		19	1127	64	6.63	109	20			130
3912960	77355	19636	NR-V	366200	5366150	S	C	0.8		Egm	CylgbMstSss			OV	Trans.?	20	-1		27	620	53	4.39	116	12			155
3912961	77355	19636	NR-V	366175	5366150	S	C	1.1		Est	CySbs			V	Qtz with N shale. Trans.?	70	-1		41	487	67	4.51	127	9			211
3912962	77355	19636	NR-V	366150	5366150	S	BC	0.8		Est	CySss			V		60	-1		14	864	44	6.24	60	14			96
3912963	77355	19636	NR-V	366125	5366150	S	C	0.8		Est	CySss			VO	Qtz with V Sss	20	-1		15	475	64	9.64	81	28			103
3912964	77355	19636	NR-V	366100	5366150	S	B	0.6		Est	Cy			LOV	Creek cross at 536095E	20	-1		17	746	68	9.7	91	22			101
3912965	77355	19636	NR-V	366475	5366150	S	B	0.8		Est	Cy			PB		10	-1		14	252	81	6.89	75	22			94
3912966	77355	19636	NR-V	366500	5366150	S	B	1		Est				OV		10	-1		8	147	30	3.8	63	22			62
3912967	77355	19636	NR-V	366525	5366150	S	B	0.4		Est	CySss			OV	Creek at 6515E	30	-1		9	583	38	7.9	53	9			68
3912968	77355	19636	NR-V	366550	5366150	S	C	0.9		Est	CySbsSsh			GV	Qtz, green and black Ssh	20	-1		15	653	39	3.08	77	24			115
3912969	77355	19636	NR-V	366575	5366150	S	BC	0.8		Est	Cy			GV		5	-1		5	896	28	2.66	24	112			85

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Samno	DPO	Report	Prospect	AMGE	AMGN	SampType	Horizon	Depth	Bedrock?	MRTLith	FieldID	Texture	Alt/Min	Colour	Comments	k x10-SS1	Ag ppm	Au ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Mn ppm	Ni ppm	Pb ppm	Pi ppm	Pt ppm	Zn ppm
3912970	77355	19636	NR-V	366600	5366150	S	BC	0.6		Etl	Cy			V	Green Sss	10	-1		13	748	27	2.8		35	265		111	
3912971	77355	19636	NR-V	366625	5366150	S	B	0.3		Egm	Cylgb			G	Qtz & lgb. Trans.?	10	-1		4	614	25	1.41		13	32		59	
3912972	77355	19636	NR-V	366650	5366150	S	BC	0.5		Etl	CySbs			V	Qtz & black Ssh. Trans.?	20	-1		25	249	41	6.4		72	39		207	
3912973	77355	19636	NR-V	366675	5366150	S		0.6		Qhu	Ccy			OV		10	-1		13	197	28	5.49		42	44		126	
3912974	77355	19636	NR-V	366700	5366150	S	BC	0.7		Etl	Cy			V	Quartz.	10	-1		6	164	19	2.74		38	74		81	
3912975	77355	19636	NR-V	366725	5366150	S	B	0.7		Etl	CySw			VY		10	-1		4	198	20	1.88		38	291		97	
3912976	77355	19636	NR-V	366750	5366150	S		0.3		Qhu	CyCg					3	-1		-3	278	37	0.86		14	176		34	
3912977	77355	19636	NR-V	366775	5366150	S	B	0.4		Etl	Sbs			N		2	-1		7	185	48	3.05		22	436		75	
3912978	77355	19636	NR-V	366800	5366150	S	B	2.1		Etl	Cy			O		3	-1		-3	266	77	2.39		81	99		30	
3912979	77355	19636	NC-GW	366150	5367700	S	BC	0.4		Egm	CySshlgb			O	Trans.?	20	-1		3	190	15	3.77		11	48		62	
3912980	77355	19636	NC-GW	366175	5367700	S	B	2.1		Etl	Cy			O	On slight hill	10	-1		11	501	147	8.19		162	152		198	
3912981	77355	19636	NC-GW	366200	5367700	S	B	0.7		Etl	Cy			B		10	-1		10	217	24	8.3		40	13		97	
3912982	77355	19636	NC-GW	366225	5367700	S	B	0.9		Etl	CySss			VPB	Quartz. Trans.?	10	-1		17	150	41	4.1		62	37		151	
3912983	77355	19636	NC-GW	366250	5367700	S	B	0.9		Etl	Cy			GO		20	-1		31	225	65	5.55		157	92		236	
3912984	77355	19636	NC-GW	366275	5367700	S	B	0.9		Etl	Cy			O		5	-1		-3	193	116	5.24		25	927		43	
3912985	77355	19636	NC-GW	366300	5367700	S	BC	0.4		Egm	Cylgb			VO		40	-1		3	308	382	9.4		88	40		90	
3912986	77355	19636	NC-GW	366310	5367700	S	B	0.3		Etl	Cy			O	Quartz. Trans.?	833	-1		6	322	364	14.2		267	36		63	
3912987	77355	19636	NC-GW	366320	5367700	S	B	1.1		Etl	Cy			O		10	-1		3	160	128	10.1		71	23		85	
3912988	77355	19636	NC-GW	366330	5367700	S	B	0.7		Etl	Cy			O	Near road	10	-1		-3	260	85	12.3		79	12		122	
3912989	77355	19636	NC-GW	366340	5367700	S	B	1		Etl	CyMsl			OP		20	-1		-3	250	95	19.6		55	22		235	
3912990	77355	19636	NC-GW	366350	5367700	S	BC	1.4		Etl	Cy			O		10	-1		3	175	110	16		52	63		150	
3912991	77355	19636	NC-GW	366360	5367700	S	B	0.8		Etl	Cy			O		10	-1		3	293	78	10.5		80	47		62	
3912992	77355	19636	NC-GW	366370	5367700	S	B	2.1		Etl	Cy			OV		10	-1		26	269	144	9.39		204	20		174	
3912993	77355	19636	NC-GW	366380	5367700	S	B	1.3		Etl	Cy			OV			-1		-3	102	28	2.56		31	26		39	
3912994	77355	19636	NC-GW	366390	5367700	S	BC	1.4		Etl	CySss			OV			-1		-3	79	13	1.87		16	70		24	
3912995	77355	19636	NC-GW	366400	5367700	S	B	0.7		Etl	Cy			O			-1		3	105	13	3.47		13	25		25	
3912996	77355	19636	NC-GW	366410	5367700	S	BC	0.3		Etl	CySss			V			-1		-3	144	8	1.46		7	16		18	
3912997	77355	19636	NC-GW	366420	5367700	S	BC	0.6		Etl	CySss			V			2		-3	91	12	0.85		9	25		20	
3912998	77355	19636	NC-GW	366430	5367700	S	C	0.4		Etl	Ssh			V	Fresh bedrock		-1		16	118	63	8.54		53	7		111	
3912999	77355	19636	NC-GW	366440	5367700	S	C	0.7		Etl	Ssh			V	Bedrock?		-1		10	158	32	3.63		33	48		66	
3913000	77355	19636	NC-GW	366450	5367700	S	BC	0.3		Etl	CySss			B			-1		10	183	17	4.8		34	9		72	
3753301	77359	20795	NC-GW	366475	5367700	S	C	0.3		Etl	Ssh			VB	Trans.?	14	-1		6	154	33	2.57		25	12		55	
3753302	77359	20795	NC-GW	366500	5367700	S	C	0.7		Etl	SshSss			B	Trans.?	11	-1		-3	89	25	1.54		11	17		56	
3753303	77359	20795	NC-GW	366525	5367700	S	BC	0.4		Etl	SstSss			B	Trans.?	14	-1		12	106	23	4.06		35	25		80	
3753304	77359	20795	NC-GW	366550	5367700	S	B	0.4		Etl	Cy			BO	Trans.?	14	-1		3	144	7	3.4		14	19		36	
3753305	77359	20795	NC-GW	366575	5367700	S	B	0.3		Etl	Cy			LB	Trans.?	10	-1		-3	108	6	1.58		6	12		24	
3753306	77359	20795	NC-GW	366600	5367700	S	BC	0.6		Etl	Cy			OB	On track. Trans.?	14	-1		10	116	17	9.38		38	13		63	
3753307	77359	20795	NC-GW	366625	5367700	S		0.3		Qhu	Cg			O		11	-1		-3	90	14	2.61		5	15		21	
3753308	77359	20795	NC-GW	366650	5367700	S	BC	1.9		Etl	Cy		DsPy	NG		6	-1		23	102	195	2.46		76	60		41	
3753309	77359	20795	NC-GW	366675	5367700	S		0.3		Qhu	Ccy			B	Compact dry	6	-1		-3	76	7	1.19		16	17		15	
3753310	77359	20795	NC-GW	366700	5367700	S	C	0.3		Etl	Sbs			N		7	-1		-3	69	30	1.65		17	119		29	
3753311	77359	20795	NC-GW	366725	5367700	S	AC	0.2		Etl	Ssh			LBO	Trans.?	6	-1		6	214	62	3.55		78	45		113	
3753312	77359	20795	NC-GW	366750	5367700	S	AC	0.3		Etl	Sbs			NG	Trans.?	13	-1		22	322	100	4.57		81	91		484	
3753313	77359	20795	NC-GW	366775	5367700	S	A	0.2		Etl	Cy			GB	Trans.?	6	-1		-5	527	43	1.63		17	92		56	
3753314	77359	20795	NC-GW	366800	5367700	S	B	0.2		Qhu	Cg			B	Trans.?	52	-1		6	214	25	3.34		29	119		92	
3753315	77359	20795	NC-GW	366150	5367850	S	B	0.4		Etl	Cy			O		17	-1		13	185	58	10.6		34	136		124	
3753316	77359	20795	NC-GW	366175	5367850	S	AB	0.4		Etl	Cy			O	Trans.?	19	-1		12	103	41	10.9		20	269		361	
3753317	77359	20795	NC-GW	366200	5367850	S	AC	0.2		Egm	lgb			B		52	-1		19	121	29	7.07		42	77		183	

SamNo	DPO	Report	Prospect	AMGE	AMGN	SampType	Horizon	Dcpth	Bedrock?	MRTLith	FieldID	Texture	Alt/Min	Colour	Comments	k x10-SSI	Ag ppm	Au ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Mn ppm	Ni ppm	Pb ppm	Pd ppm	Pt ppm	Zn ppm
3753318	77359	20795	NC-GW	366225	5367850	S	B	0.6		Etl	Cy	O		Dry		20	-1		5	197	19	9.13		29	66		135	
3753319	77359	20795	NC-GW	366250	5367850	S		0.4		Qha	CyCg	O				20	-1		-3	200	19	8.88	98	13	55		52	
3753320	77359	20795	NC-GW	366275	5367850	S		0		Etl	SshSw	LG		From old loessian		20	-1		24	83	28	7.56	568	87	15		138	
3753321	77359	20795	NC-GW	366300	5367850	S		0		Etl	Clt	NO		Out of creek		19	-1		114	94	27	11.5	125100	285	26		806	
3753322	77359	20795	NC-GW	366310	5367850	S	C	0.4		Etl	Cy	V				9	-1		160	200	77	6.01	1223	315	147		1341	
3753323	77359	20795	NC-GW	366320	5367850	S	B	0.5		Etl	CySsh	P		Trans.?		25	-1		61	159	74	10	16700	184	119		764	
3753324	77359	20795	NC-GW	366330	5367850	S	C	0.9		Etl	Cy	VB				17	-1		53	101	5	13.3	548	265	-3		666	
3753325	77359	20795	NC-GW	366340	5367850	S	C	0.5		Etl	Clt	RP				25	3		210	168	203	21.9	17620	216	1648		2812	
3753326	77359	20795	NC-GW	366350	5367850	S		0.4		Qha	Cy	BV		Trans.?		30	-1		70	66	116	10.5	71700	109	276		939	
3753327	77359	20795	NC-GW	366360	5367850	S	B	0.3		Etl	CltSshCy	B		Trans.?		19	18		44	62	379	12.2	57600	167	6100		1500	
3753328	77359	20795	NC-GW	366370	5367850	S	C	0.2		Etl	CySsh	V				7	-1		62	150	79	3.01	546	157	39		910	
3753329	77359	20795	NC-GW	366380	5367850	S	BC	0.4		Etl	CySsh	V		Trans.?		4	-1		32	410	102	2.92	490	146	31		798	
3753330	77359	20795	NC-GW	366390	5367850	S	BC	0.4		Etl	CyCltSsh	V		Trans.?		10	2		26	270	121	3.47	1379	97	46		705	
3753331	77359	20795	NC-GW	366400	5367850	S	B	0.3		Etl	Clt	MON		Trans.?		19	3		478	41	352	2.48	30500	376	30		1128	
3753332	77359	20795	NC-GW	366410	5367850	S	C	1.5		Etl	CySsh	V				17	-1		46	340	94	8.22	738	141	93		586	
3753333	77359	20795	NC-GW	366420	5367850	S	C	0.8		Etl	CySsh	V				19	-1		45	128	95	6.25	1203	171	220		347	
3753334	77359	20795	NC-GW	366430	5367850	S	C	1.8		Etl	CySw	V				49	9		52	161	493	16.8	13600	312	7		910	
3753335	77359	20795	NC-GW	366440	5367850	S	C	1.1		Etl	CySsh	V		Quartz. Trans.?		14	-1		52	169	112	7.12	975	170	273		490	
3753336	77359	20795	NC-GW	366450	5367850	S	C	1.6		Etl	CySsh	VP				14	-1		70	154	111	5.78	510	231	242		511	
3753337	77359	20795	NC-GW	366460	5367850	S	C	1.5		Etl	Cy	VP				16	-1		55	137	92	5.66	521	132	172		470	
3753338	77359	20795	NC-GW	366470	5367850	S	C	0.9		Egm	CyIgb	V				14	-1		38	195	134	4.2	520	226	151		323	
3753339	77359	20795	NC-GW	366480	5367850	S	C	0.4		Etl	CySsh	V				6	-1		20	166	36	2.49	280	52	36		164	
3753340	77359	20795	NC-GW	366490	5367850	S	C	0.6		Etl	CySsh	V				10	-1		8	129	37	2.62	362	29	29		89	
3753341	77359	20795	NC-GW	366500	5367850	S	C	0.5		Etl	Cy	V		Hard		26	-1		142	851	175	9.44	573	770	13		837	
3753342	77359	20795	NC-GW	366510	5367850	S	B	0.4		Qha	Cg	B				17	-1		7	118	34	11	259	19	78		110	
3753343	77359	20795	NC-GW	366520	5367850	S	C	0.1		Etl	Clt	BN				30	-1		34	68	12	50.04	25100	10	81		176	
3753344	77359	20795	NC-GW	366530	5367850	S	B	0.4		Etl	B	B				11	-1		18	137	58	4.86	622	63	176		349	
3753345	77359	20795	NC-GW	366540	5367850	S		0.5		Qha	Cg	AB				5	-1		-3	105	21	0.96	76	9	212		48	
3753346	77359	20795	NC-GW	366550	5367850	S	C	0.3		Etl	NC	G		Trans.?		8	-1		3	93	25	1.07	78	9	37		30	
3753347	77359	20795	NC-GW	366575	5367850	S		0.3		Qha	Cg	BV				6	-1		3	100	28	1.66		11	37		35	
3753348	77359	20795	NC-GW	366600	5367850	S	C	0.3		Etl	Ssh	Ds				10	-1		5	67	31	2.48		26	119		60	
3753349	77359	20795	NC-GW	366625	5367850	S	B	1.1		Etl	Cy	OB		Trans.?		15	-1		8	103	37	9.46		48	15		80	
3753350	77359	20795	NC-GW	366650	5367850	S	B	1		Etl	Cy	OR		Trans.?		14	-1		3	166	84	10.6		32	11		31	
3753351	77359	20795	NC-GW	366675	5367850	S		0.4		Qha	Cg	B				30	-1		10	149	26	9.42		39	6		48	
3753352	77359	20795	NC-GW	366700	5367850	S	B	0.9		Etl	Cy	B				20	-1		9	97	19	11		42	7		68	
3753353	77359	20795	NC-GW	366725	5367850	S	BC	0.3		Etl	Ssh	LB				16	-1		6	94	15	5.71		20	18		38	
3753354	77359	20795	NC-GW	366750	5367850	S	BC	0.4		Etl	Ssh	DG				11	-1		8	123	73	3.68		40	250		96	
3753355	77359	20795	NC-GW	366775	5367850	S	C	0.3		Etl	Ssh	DG		Several attempts		6	-1		3	98	27	1.91		21	36		40	
3753356	77359	20795	NC-GW	366800	5367850	S	BC	0.3		Etl	Ssh	DG		Trans.?		7	-1		4	100	33	2.24		24	63		47	
3753357	77359	20795	NC-GW	366825	5367850	S		0.4		Qha	Cg	G				8	-1		3	61	45	0.88		20	122		47	
3753358	77359	20795	NC-GW	366850	5367850	S	C	0.4		Etl	CySbs	DG				6	-1		-3	74	41	1.06		14	134		37	
3753359	77359	20795	NC-GW	366825	5367700	S	BC	1.1		Etl	CySsh	O		Very hard. Near bedrock?		16	-1		10	163	82	16.8		46	64		108	
3753360	77359	20795	NC-GW	366850	5367700	S	B	2.1		Etl	Cy	MOY		Trans.?		12	-1		7	211	98	12.1		52	73		123	
3753361	77359	20795	NC-GW	366150	5367500	S	B	1.8		Etl	Cy	BW				11	-1		5	338	50	8.8		34	18		38	
3753362	77359	20795	NC-GW	366175	5367500	S	B	1.5		Etl	Cy	B				20	-1		4	151	70	16.8		26	9		67	
3753363	77359	20795	NC-GW	366200	5367500	S	B	1.5		Etl	Cy	OB				20	-1		3	143	69	13.1		27	190		92	
3753364	77359	20795	NC-GW	366225	5367500	S	B	1		Etl	Cy	O				17	-1		21	536	190	12.2		270	58		201	
3753365	77359	20795	NC-GW	366250	5367500	S	B	1.1		Etl	Cy	BV				24	-1		12	213	79	15.1		66	57		88	

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SamNo	DPO	Report	Prospect	AMGE	AMGN	SampType	Horizon	Depth	Bedrock?	MRTLith	FieldID	Texture	Alt/Min	Colour	Comments	k x10-5SI	Ag ppm	Au ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Mn ppm	Ni ppm	Pb ppm	Pt ppm	Zn ppm
3753366	77359	20795	NC-GW	366270	5367500	S	B	0.2		Etl	Cy	G		Next to road	12	-1		3	147	19	1.3	78	7	21		32	
3753367	77359	20795	NC-GW	366280	5367500	S	B	0.8		Etl	Cy	OB		Dry	12	-1		7	117	14	5.44	202	27	18		35	
3753368	77359	20795	NC-GW	366290	5367500	S	B	0.1		Etl	Cxp	NOB		Trans.?	240	-1		7	527	166	14.8	308	287	58		52	
3753369	77359	20795	NC-GW	366300	5367500	S	B	1		Etl	Cy	V			24	-1		10	185	236	9.04	523	138	35		72	
3753370	77359	20795	NC-GW	366310	5367500	S	BC	0.5		Etl	CySsh	VB		Trans.?	18	-1		22	225	67	4.33	532	86	16		98	
3753371	77359	20795	NC-GW	366320	5367500	S	C	0.4		Egm	Igb	V	DsPy	Two attempts	25	-1		94	944	246	11.2	728	632	11		167	
3753372	77359	20795	NC-GW	366330	5367500	S	C	0.7		Etl	CySsh	B			16	-1		41	136	38	5.45	451	104	4		123	
3753373	77359	20795	NC-GW	366340	5367500	S	B	0.3		Etl	Ssh	VP			20	-1		26	212	65	5.68	493	78	5		126	
3753374	77359	20795	NC-GW	366350	5367500	S	C	0.4		Etl	SshCy	VG			14	-1		9	654	54	3.34	194	34	8		83	
3753375	77359	20795	NC-GW	366360	5367500	S	B	0.5		Qha	Cg	V			40	-1		34	127	43	8.16	454	99	18		232	
3753376	77359	20795	NC-GW	366370	5367500	S	BC	0.2		Etl	Sw	V			24	-1		26	149	39	7.96	535	78	9		106	
3753377	77359	20795	NC-GW	366380	5367500	S		0.4		Qha	IgbCg	V			20	-1		34	142	119	6.9	104	179			236	
3753378	77359	20795	NC-GW	366390	5367500	S	C	0.4		Etl	Ssh	VG			13	-1		11	151	92	4.13	52	22			91	
3753379	77359	20795	NC-GW	366400	5367500	S	C	1		Etl	CySsh	V			22	-1		104	23300	36	4.97	327	105			411	
3753380	77359	20795	NC-GW	366410	5367500	S	C	1.2		Etl	CySsh	VPN			23	-1		71	21000	35	5.49	282	61			344	
3753381	77359	20795	NC-GW	366420	5367500	S	C	0.5		Etl	CySw	VP			14	-1		36	316	61	4.5	89	18			183	
3753382	77359	20795	NC-GW	366430	5367500	S	C	0.7		Etl	CySsh	VP			10	-1		15	117	28	2.55	46	13			79	
3753383	77359	20795	NC-GW	366440	5367500	S	C	1.1		Etl	SshSw	VPN			28	-1		86	18700	41	6.68	439	46			364	
3753384	77359	20795	NC-GW	366450	5367500	S	C	0.7		Etl	CySsh	VP			15	-1		57	1725	73	5.12	123	186			339	
3753385	77359	20795	NC-GW	366475	5367500	S	C	1.2		Etl	CySw	V			19	-1		124	1678	88	11	201	9			315	
3753386	77359	20795	NC-GW	366500	5367500	S	C	1		Etl	Cy	DsPy	NG		19	-1	-0.005	48	1076	77	6.64	196	138	24	-0.005	-0.05	202
3753387	77359	20795	NC-GW	366525	5367500	S	C	1		Etl	CySsh	V			13	-1	-0.005	67	735	68	4.2	251	155	24	-0.005	-0.05	251
3753388	77359	20795	NC-GW	366550	5367500	S	C	0.7		Etl	Sbs	DsPy	N		9	-1	-0.005	13	1163	44	2.46	151	47	42	-0.005	-0.05	148
3753389	77359	20795	NC-GW	366575	5367500	S	C	0.8		Etl	CySsh	V			17	-1	-0.005	25	768	44	7.46	557	85	46	-0.005	-0.05	161
3753390	77359	20795	NC-GW	366600	5367500	S	C	0.5		Etl	CySsh	V			15	-1	-0.005	48	2019	63	5.59	526	134	111	-0.005	-0.05	521
3753391	77359	20795	NC-GW	366625	5367500	S	C	1.1		Etl	CySsh	VG			13	-1	-0.005	49	2505	70	2.45	210	109	97	-0.005	-0.05	239
3753392	77359	20795	NC-GW	366650	5367500	S	C	0.8		Etl	CySbsSsh	VN			22	1	-0.005	90	29300	81	4.37	441	250	213	-0.005	0.06	544
3753393	77359	20795	NC-GW	366675	5367500	S	BC	0.9		Etl	CySsh	VB			20	-1	0.009	301	17800	47	4.61	422	844	205	-0.005	-0.05	592
3753394	77359	20795	NC-GW	366700	5367500	S	C	1.4		Etl	CySsh	NV			50	-1	-0.005	168	29300	80	5.88	1254	589	144	0.008	-0.05	425
3753395	77359	20795	NC-GW	366725	5367500	S	C	0.8		Etl	CySsh	NVB			41	-1	-0.005	126	20800	95	9.13	517	508	104	0.006	-0.05	593
3753396	77359	20795	NC-GW	366750	5367500	S	C	1.6		Etl	Cy	V			15	-1	-0.005	183	4164	86	3.2	228	494	278	0.007	-0.05	563
3753397	77359	20795	NC-GW	366775	5367500	S	C	1.6		Etl	CySsh	V			18	-1	-0.005	107	1142	60	7.97	516	268	79	-0.005	-0.05	274
3753398	77359	20795	NC-GW	366800	5367500	S	BC	1.3		Etl	Cy	WV			6	-1	-0.005	3	90	36	1.41	87	29	38	-0.005	-0.05	33
3753399	77359	20795	NC-GW	366825	5367500	S	C	0.5		Etl	CySsh	DG			19	-1	-0.005	24	212	99	8.7	397	46	68	-0.005	-0.05	645
3753400	77359	20795	NC-GW	366850	5367500	S	C	0.4		Etl	CySbs	N		Trans.?	90	-1	-0.005	15	156	54	4.78	197	35	20	-0.005	-0.05	165
3987501	77359	20795	NC-GW	366250	5367350	S	BC	1.1		Etl	Cy	VB		Trans.?	23	-1		34	155	52	8.76	84	-3			182	
3987502	77359	20795	NC-GW	366275	5367350	S	C	1		Etl	CySsh	VB		Hard to penetrate	15	-1		26	157	41	6.08	74	-3			107	
3987503	77359	20795	NC-GW	366300	5367350	S	C	0.9		Etl	CySsh	VP		Hard to penetrate	15	-1		26	156	40	5.41	75	5			121	
3987504	77359	20795	NC-GW	366325	5367350	S	BC	1.5		Etl	Cy	VB		Trans.?	12	1		10	188	405	11	116	1499			567	
3987505	77359	20795	NC-GW	366350	5367350	S	BC	1.9		Etl	Cy	V		Trans.?	16	-1		102	452	217	8.48	502	-3			220	
3987506	77359	20795	NC-GW	366375	5367350	S	C	0.8		Etl	SshCy	V			10	-1		16	136	53	3.79	47	10			60	
3987507	77359	20795	NC-GW	366400	5367350	S	C	1		Etl	SshCy	V			13	-1		7	126	36	2.65	52	-3			64	
3987508	77359	20795	NC-GW	366425	5367350	S	B	0.8		Etl	Cy	O		Trans.?	18	-1		5	73	106	12.5	23	-3			72	
3987509	77359	20795	NC-GW	366450	5367350	S	C	0.6		Etl	SshCy	LV			7	-1		6	215	46	1.99	35	10			53	
3987510	77359	20795	NR-V	366400	5366000	S	C	0.9		Etl	CySsh	V			17	-1		26	242	91	4.77	95	12			174	
3987511	77359	20795	NR-V	366390	5366000	S	C	0.1		Etl	CySsh	VB			24	-1		36	432	123	5.86	105	11			185	
3987512	77359	20795	NR-V	366380	5366000	S	C	0.4		Egm	CySshIgb	Ds		Trans.?	17	-1		13	273	48	3.55	48	55			110	
3987513	77359	20795	NR-V	366370	5366000	S		1		Qha	IgbCg	VN			28	-1		26	218	66	6.32	83	18			149	
3987514	77359	20795	NR-V	366360	5366000	S	C	0.6		Egm	CyIgb	V			23	-1		22	376	33	5.88	87	24			121	

SamNo	DPO	Report	Prospect	AMGE	AMGN	SampType	Horizon	Depth	Bedrock?	MRTLith	FieldID	Texture	Al/Min	Colour	Comments	k x10-SS1	Ag ppm	Au ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Mn ppm	Ni ppm	Pb ppm	Pd ppm	Pt ppm	Zn ppm
3987515	77359	20795	NR-V	366350	5366000	S	B	1		Eil	Cy	OB		Trans.?	13	-1		4	74	58	4.07	41	45				45	
3987516	77359	20795	NR-V	366340	5366000	S	B	0.6		Eil	Cy	O		Trans.?	18	-1		10	179	29	7.83	31	22				45	
3987517	77359	20795	NR-V	366330	5366000	S	B	0.4		Eil	Cy	OV		Trans.?	15	-1		13	148	25	4.7	48	190				62	
3987518	77359	20795	NR-V	366320	5366000	S	B	0.6		Eil	Cy	LB		Trans.?	17	-1		8	119	29	1.62	74	15				39	
3987519	77359	20795	NR-V	366310	5366000	S	BC	0.4		Eil	CySh	VB			11	-1		14	425	27	2.87	40	19				82	
3987520	77359	20795	NR-V	366300	5366000	S	BC	0.6		Eil	CySh	VB		Trans.?	13	-1		16	202	25	2.96	58	38				74	
3987521	77359	20795	NR-V	366300	5365900	S	B	1.1		Eil	Cy	WG		Trans.?	13	-1		11	94	19	2.06	77	17				46	
3987522	77359	20795	NR-V	366325	5365900	S	B	0.3		Eil	Cy	VB			20	-1		18	155	41	6.69	56	20				71	
3987523	77359	20795	NR-V	366350	5365900	S	B	0.7		Eil	Cy	OV		Trans.?	17	-1		6	161	76	8.87	53	17				57	
3987524	77359	20795	NR-V	366360	5365900	S	BC	1.4		Eil	Cy	BV			16	-1		17	172	51	4.72	171	25				77	
3987525	77359	20795	NR-V	366370	5365900	S	B	0.7		Eil	Cy	OB		Trans.?	18	-1		18	114	66	11.9	45	36				73	
3987526	77359	20795	NR-V	366380	5365900	S	B	0.3		Eil	Cy	OB			20	-1		18	116	54	8.97	62	196				98	
3987527	77359	20795	NR-V	366390	5365900	S	B	0.5		Eil	Cy	OB		Trans.?	9	-1		6	99	17	1.66	9	589				19	
3987528	77359	20795	NR-V	366410	5365900	S	C	0.9		Eil	Cy	VB			9	-1		6	69	16	1.43	18	272				25	
3987529	77359	20795	NR-V	366420	5365900	S	C	1.1		Eil	CyCst	RNY			13	-1		6	128	28	7.54	10	44				27	
3987530	77359	20795	NR-V	366430	5365900	S	BC	1.1		Eil	CyCst	O		Trans.?	24	-1		8	359	97	16.5	29	32				71	
3987531	77359	20795	NR-V	366440	5365900	S	B	0.6		Eil	Cy	OB		Trans.?	22	-1		10	325	56	11.4	46	37				63	
3987532	77359	20795	NR-V	366450	5365900	S	B	0.3		Eil	Cy	B			18	-1		5	146	26	4.58	16	14				24	
3987533	77359	20795	NR-V	366475	5365900	S	B	1		Eil	Cy	O			17	-1		8	336	132	9.34	47	110				191	
3987534	77359	20795	NR-V	366500	5365900	S		1		Qha	CcyCg	OLB			11	-1		7	151	30	1.79	40	25				67	
3987535	77361	20795	NR-V	366210	5365950	S	B	2		Eil	CySw	LVRB			19	-1		29	116	123	13.4	129	-3				126	
3987536	77361	20795	NR-V	366220	5365950	S	B	0.8		Eil	CySw	LVO			40	-1		22	208	93	11.1	84	3				147	
3987537	77361	20795	NR-V	366230	5365950	S	BC	0.4		Eil	CySh	RB			25	-1		14	150	34	10.6	48	4				72	
3987538	77361	20795	NR-V	366240	5365950	S	B	1.4		Eil	Cy	DBO			15	-1		4	158	34	13.8	33	5				33	
3987539	77361	20795	NR-V	366200	5366000	S	B	0.9		Eil	Cy	LVO			17	-1		13	229	94	14.4	56	-3				55	
3987540	77361	20795	NR-V	366210	5366000	S	B	1.4		Eil	Cy	OB			20	-1		8	281	65	19.3	45	-3				53	
3987541	77361	20795	NR-V	366220	5366000	S	B	1.3		Eil	Cy	YW			10	-1		5	46	18	3.6	39	8				41	
3987542	77361	20795	NR-V	366230	5366000	S	B	0.8		Eil	Cy	MLOV			21	-1		11	220	31	8.6	94	15				101	
3987543	77361	20795	NR-V	366240	5366000	S	B	0.8		Eil	Cy	B			20	-1		24	163	19	10	75	23				87	
3987544	77361	20795	NR-V	366250	5366000	S	B	1.1		Egm	Cylgb	LOV			30	-1		26	148	70	13	104	69				177	
3987545	77361	20795	NR-V	366260	5366000	S	BC	1.3		Eil	CyOvq	OB			20	-1		33	586	59	11.3	394	31				99	
3987546	77361	20795	NR-V	366270	5366000	S	BC	0.9		Egm	Cylgb	OB			20	-1		21	2699	216	10.2	376	4				102	
3987547	77361	20795	NR-V	366280	5366000	S	C	1.6		Egm	Cylgb	LVC			20	-1		41	293	53	7.81	176	25				100	
3987548	77361	20795	NR-V	366290	5366000	S	B	1		Eil	Cy	LOG			20	-1		30	743	44	6.59	156	21				109	
3987549	77361	20795	NR-V	366140	5365900	S	B	1.3		Eil	Cy	YB			19	-1		18	220	99	14.1	75	9				137	
3987550	77361	20795	NR-V	366150	5365900	S	YB	1		Eil	Cy	YB			10	-1		6	152	71	11.1	23	63				60	

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SamNo	DPO	Report	Prospect	AMGE	AMGN	SampType	Horizon	Depth	Bedrock?	MRTLith	FieldID	Texture	Al/Min	Colour	Comments	k x 10 ⁻⁵ SSI	Ag ppm	Au ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Mn ppm	Ni ppm	Pb ppm	Pd ppm	Pt ppm	Zn ppm
3987551	77361	20795	NR-V	366170	5365900	S	BC	0.6		EtI	CySw			YB	Minor Sw R.F.'s	10	-1		6	178	60	9.11	32	16			54	
3987552	77361	20795	NR-V	366170	5365900	S	C	0.2		EtI	Sw			DPB	Volcaniclastic sed.	40	-1		44	158	79	13.2	118	4			139	
3987553	77361	20795	NR-V	366180	5365900	S	C	0.2		EtI	Sw			DB	Organic-rich soil. + R.F.'s	40	-1		33	240	82	12.7	119	12			154	
3987554	77361	20795	NR-V	366190	5365900	S	B	1.2		EtI	Cy			MOB		20	-1		21	208	79	12.9	75	4			89	
3987555	77361	20795	NR-V	366200	5365900	S	B	0.7		EtI	Cy			YB	Limonic clay.	25	-1		12	148	58	8.6	52	5			79	
3987556	77361	20795	NR-V	366210	5365900	S	C	0.3		EtI	SwCy			YBV	Weathered Sw.	22	26		19	166	156	16.9	89	1946			1699	
3987557	77361	20795	NR-V	366220	5365900	S	C	0.2		EtI	Sw			B	Mixed RB and V graywacke Sw.	30	-1		28	234	68	9.58	99	39			142	
3987558	77361	20795	NR-V	366230	5365900	S	B	1		EtI	Cy			LBOB	Clayey soil. no R.F.'s	15	-1		27	218	68	11.3	63	51			87	
3987559	77361	20795	NR-V	366240	5365900	S	B	1.3		EtI	CySw			OB		20	-1		12	282	60	8.69	59	77			162	
3987560	77361	20795	NR-V	366250	5365900	S	C	0.8		EtI	CySsh			MOB	Minor shale R.F.'s.	50	-1		13	233	53	9.84	45	85			128	
3987561	77361	20795	NR-V	366260	5365900	S	C	1.2		EtI	CySsh			LOB	Green shale fragments.	22	-1		13	211	67	9.55	55	65			126	
3987562	77361	20795	NR-V	366270	5365900	S	C	1.1		EtI	CySsh			OB	Strongly weathered green shale frags.	15	-1		5	147	66	8.92	36	55			65	
3987563	77361	20795	NR-V	366280	5365900	S	B	1		EtI	Cy			OB	Limonic clay.	10	-1		-3	131	53	7.18	23	174			40	
3987564	77361	20795	NR-V	366290	5365900	S	B	1.2		EtI	Cy			YB	Limonic clay.	20	-1		6	71	115	10.2	36	41			60	
3987565	77361	20795	NR-V	366310	5365900	S	B	0.6		EtI	Cy			LGY	Change in soil type from previous sample.	10	-1		5	44	8	2.2	35	27			35	
3987566	77361	20795	NR-V	366320	5365900	S	B	0.8		EtI	Cy			OBV	Limonic clay. green clay intercalations.	15	-1		7	141	44	7.41	57	163			64	
3987567	77361	20795	NR-V	366330	5365900	S	C	0.3		EtI	Cy	Ovq		LB	Ab. coarse grained vein Qtz present.	15	-1		-3	103	7	1.37	10	16			33	
3987568	77361	20795	NR-V	366340	5365900	S	B	0.6		EtI	Cy	Ovq		LOG	Minor Qtz vein frags.	10	-1		-3	112	2	2.61	29	-3			20	
3987569	77361	20795	NR-V	366400	5365850	S	B	0.5		EtI	Cy	Ovq		LOB	Quartz vein frags.	40	-1		51	85	71	9.03	15	1089			125	
3987570	77361	20795	NR-V	366380	5365850	S	B	0.3		EtI	Cy			YB	Limonic clay.	15	-1		5	103	28	6.62	30	22			41	
3987571	77361	20795	NR-V	366360	5365850	S	B	0.9		EtI	Cy			OB	Trace of speckled LV clay.	30	-1		5	160	57	7.25	30	197			86	
3987572	77361	20795	NR-V	366340	5365850	S	B	1.1		EtI	Cy			OBM	Plastic mottled clay.	15	-1		6	185	47	9.94	39	30			60	
3987573	77361	20795	NR-V	366320	5365850	S	B	0.6		EtI	Cy			LV	Green Sw float nearby indicates a change in rock-type from previous sample.	20	-1		18	187	39	6	114	51			147	
3987574	77361	20795	NR-V	366300	5365850	S	B	0.5		EtI	Cy			MOB	Compacted clay.	20	-1		18	125	11	8.13	65	14			113	
3987575	77361	20795	NR-V	366280	5365850	S	B	0.4		EtI	Cy			LOB	Coarse gr. Qtz frags. present.	28	-1		8	105	18	5.12	26	32			48	
3987576	77361	20795	NR-V	366260	5365850	S	B	1		EtI	CySsh			OB	Minor rounded shale R.F.'s. Trans.?	17	-1		21	390	36	7.21	108	83			232	
3987577	77361	20795	NR-V	366240	5365850	S	B	1.5		Egm	CyEb			MOB	Sub-rounded basalt? R.F.'s. Trans.?	15	-1		16	341	43	5.1	80	86			136	
3987578	77361	20795	NR-V	366220	5365850	S	B	1.6		EtI	CySsh			LVB	Rounded shale frags. within plastic compacted clay. Trans.?	16	-1		22	256	60	5.11	118	100			237	

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SamNo	DPO	Report	Prospect	AMGE	AMGN	SampType	Horizon	Depth	Bedrock?	MRTLith	FieldID	Texture	Al/Min	Colour	Comments	k x10-5Si	Ag ppm	Au ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Mn ppm	Ni ppm	Pb ppm	Pd ppm	Pt ppm	Zn ppm
3987579	77361	20795	NR-V	366200	5365850	S	B	0.4		Etl	CySsh			LB	Ab. rounded shale frags. purple shale R.F.'s. Trans.?	45	-1		9	285	27	5.98		34	57			59
3987580	77361	20795	NR-V	366190	5365850	S	B	0.9		Etl	CySsh			OB	Limonitic clay. minor rounded shale R.F.'s. Trans.?	15	-1		19	211	66	8.85		85	71			202
3987581	77361	20795	NR-V	366180	5365850	S	C	0.3		Egm	luCy			DG	Fine grained pyroxenite frags.	13	-1		8	253	36	3.93		32	61			79
3987582	77361	20795	NR-V	366170	5365850	S	BC	0.2		Etl	CySsh			LVB	Sub-rounded shaley R.F.'s. Trans.?	20	-1		13	227	23	6.2		53	31			131
3987583	77361	20795	NR-V	366160	5365850	S	BC	0.6		Egm	luCy			LBO	Pyroxenite outcrop nearby. sub-rounded lu frags. within clay.	15	-1		14	219	34	6.74		56	56			127
3987584	77361	20795	NR-V	366150	5365850	S	B	0.3		Etl	CySsh			LB	Sub-rounded green shale R.F.'s. Trans.?	40	-1		17	211	37	6.39		56	48			156
3987585	77361	20795	NR-V	366140	5365850	S	C	0.5		Egm	Cylu			LGV	Fgr. pyroxenite R.F.'s. Trans.?	10	-1		7	206	25	3.46		50	40			71
3987586	77361	20795	NR-V	366100	5365550	S	C	0		Etl	SshCy			LGV	Green shale. ferruginous fractures.	13	-1		21	93	13	8.01		100	35			102
3987587	77361	20795	NR-V	366125	5365550	S	B	1.7		Etl	CySsi			GB		10	-1		-3	97	37	2.45		17	32			26
3987588	77361	20795	NR-V	366150	5365550	S	B	0.5		Etl	Cy			OY	Limonitic compacted clay.	25	-1		6	230	61	13		37	27			51
3987589	77361	20795	NR-V	366175	5365550	S	B	0.7		Etl	Cy			YB	Compacted limonitic clay.	15	-1		7	306	56	12.5		34	3			50
3987590	77361	20795	NR-V	366200	5365550	S	B	0.8		Etl	Cy			OB		10	-1		3	236	51	9.12		51	42			45
3987591	77361	20795	NR-V	366225	5365550	S	B	0.3		Etl	Cy			YB	Compacted, org. rich limonitic clay.	45	-1		8	172	22	7.13		33	40			40
3987592	77361	20795	NR-V	366250	5365550	S	B	2		Etl	Cy			MYBW		10	-1		-3	55	87	7.86		17	18			26
3987593	77361	20795	NR-V	366275	5365550	S	B	0.7		Etl	Cy			YB	Strongly limonitic compacted clay.	15	-1		4	265	78	12.8		48	49			53
3987594	77361	20795	NR-V	366300	5365550	S	B	0.8		Etl	CySw			EG	Speckled clay-weathered green Sw.	10	-1		93	152	67	3.63		226	5			2614
3987595	77361	20795	NR-V	366325	5365550	S	B	0.5		Etl	CySsh			G		14	-1		16	102	17	4.11		40	5			72
3987596	77361	20795	NR-V	366350	5365550	S	B	0.5		Etl	CySsh			LG	Shale-derived clay.	4	-1		8	117	24	2.33		22	10			43
3987597	77361	20795	NR-V	366375	5365550	S	B	0.7		Etl	Cy			LG	Organic-rich, lesser qtz gravel. Trans.?	5	-1		13	138	20	3.08		41	6			67
3987598	77361	20795	NR-V	366400	5365550	S	B	0.3		Qha	CyCg			B	Org. rich Cbs. ccy + qtz frags.	3	-1		5	87	13	1.06		10	8			24
3987599	77361	20795	NR-V	366425	5365550	S	A	0.4		Etl	Cy			DBG	Org. rich clayey soil. minor qtz gravel/sands. Trans.?	4	-1		-3	134	16	1.08		10	14			26
3987600	77361	20795	NR-V	366450	5365550	S	B	1.1		Etl	Cy			MGW	compacted clay.	10	-1		49	321	75	2.77		193	21			1409
3991501	77361	20795	NR-V	366475	5365550	S	C	0		Etl	Cst			BN	Cellular goethite outcrop.	30	-1		19	164	13	35.9		5	50			172

Samno	DPO	Report	Prospect	AMGE	AMGN	SampType	Horizon	Depth	Bedrock?	MRTLith	FieldID	Texture	Alt/Min	Colour	Comments	k x 10 ⁻⁵ SI	Ag ppm	Au ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Mn ppm	Ni ppm	Pb ppm	Pd ppm	Pt ppm	Zn ppm
3991502	77361	20795	NR-V	366500	5365550	S	B	0.3		Etl	CySsh			LVB	Compacted clay-derived from pale coloured shale.	10	-1		3	126	8	2.75		4	54			72
3991503	77361	20795	NR-V	366525	5365550	S	C	0.7		Etl	CySsh			LVO		19	-1		19	84	35	5.84		42	-3		78	
3991504	77361	20795	NR-V	366550	5365550	S	C	0.3		Etl	SshCy			YB	Highly limonitic part. We Ssh.	20	-1		5	135	38	9.76		24	18			51
3991505	77361	20795	NR-V	366575	5365550	S	B	0.4		Etl	Cy			LVO	Compacted clay.	17	-1		43	340	65	8.72		100	10		170	
3991506	77361	20795	NR-V	366600	5365550	S	B	1.5		Etl	Cy			OVG	Mixed grey-green compacted clay.	18	-1		5	173	40	6.75		45	23		92	
3991507	77364	20795	NC-GW	366550	5367850	W		0.9	Y	Etl	Ssi			LGv		25	-1		34	130	48	8.7	417	86	46		331	
3991508	77364	20795	NC-GW	366525	5367850	W		1	Y	Etl	Ssi			LGv		29	-1		61	380	823	11.7	1176	294	175		353	
3991509	77364	20795	NC-GW	366500	5367850	W		1	Y	Etl	Ssi		Fe	LGv		14	-1		45	196	56	8.3	965	114	38		248	
3991510	77364	20795	NC-GW	366475	5367850	W		1	Y	Etl	Ssi			RP		30	-1		53	194	51	7.6	1201	118	36		237	
3991511	77364	20795	NC-GW	366450	5367850	W		6.4	Y	Egm	Igb			GV		26	3		44	119	237	15.1	2388	423	164		791	
3991512	77364	20795	NC-GW	366425	5367850	W		4	Y	Etl	Ssi			MBVO		26	-1		85	164	185	21.3	32000	142	82		501	
3991513	77364	20795	NC-GW	366400	5367850	W		0.6	Y	Etl	SwSsi			LYB	DBN Fe Mn Vn	12	4		134	83	169	4.64	57500	194	333		874	
3991514	77364	20795	NC-GW	366375	5367850	W		1.1	Y	Etl	Sw			LOB		26	2		35	201	153	9.5	40000	331	45		977	
3991515	77364	20795	NC-GW	366350	5367850	W		1.1	Y	Egm	Igb			MYDB	Chromite grains upto 5mm	23	-1		59	197	69	9.8	66000	401	125		1750	
3991516	77364	20795	NC-GW	366325	5367850	W		4.1	Y	Egm	Igb			YB	Chromite grains upto 7mm	21	-1		81	142	72	9.3	47000	351	51		1050	
3991517	77364	20795	NC-GW	366300	5367850	W		1.2	Y	Etl	Mst			YB		17	-1		42	113	39	8.7	1101	218	53		738	
3991518	77364	20795	NC-GW	366275	5367850	W		1	Y	Etl	Ssi			VG		30	-1		39	165	48	9.3	568	103	42		183	
3991519	77364	20795	NC-GW	366250	5367850	W		1	Y	Etl	Sw			LVB		28	-1		29	210	89	11.5	572	100	74		155	
3991520	77364	20795	NC-GW	366250	5367500	W		4	Y	Etl	Sbs		Ds	N	2% Ds Py	13	-1		34	158	99	6.8	259	97	48		152	
3991521	77364	20795	NC-GW	366225	5367500	W		2.2	Y	Etl	Sbs			N	Ds Py	13	-1		54	147	98	7.3	336	128	81		328	
3991522	77364	20795	NC-GW	366200	5367500	W		4	Y	Egm	Eb			YB	Poss We basalt/dio	14	-1		8	243	107	8.4	128	68	51		70	
3991523	77364	20795	NC-GW	366775	5367500	W		7	Y	Etl	Ssi			LGv	0.5 mm chloritic clots	20	-1		42	206	98	7.5	458	132	37		147	
3991524	77364	20795	NC-GW	366750	5367500	W		5.2	Y	Etl	SsiCy			DG	4% Ds Py	15	-1		38	130	115	7.2	366	83	67		114	
3991525	77364	20795	NC-GW	366725	5367500	W		2	Y	Etl	Ssi			DG	Ds Py	19	-1		34	174	92	7.9	250	94	39		119	
3991526	77364	20795	NC-GW	366700	5367500	W		1.2	Y	Etl	Ssi			DG	4% Ds Py	17	-1		33	99	116	6.9	303	83	67		123	
3991527	77364	20795	NC-GW	366675	5367500	W		1	Y	Etl	Sw			LEG		32	-1		36	534	31	9	285	132	163		135	
3991528	77364	20795	NC-GW	366650	5367500	W		2	Y	Etl	CySw			LGW		9	-1		-3	99	47	0.96	68	11	439		44	
3991529	77364	20795	NC-GW	366625	5367500	W		1.7	Y	Etl	Sw			LGW		20	-1		56	250	81	5.1	311	110	115		108	
3991530	77364	20795	NC-GW	366600	5367500	W		1.5	Y	Etl	Sw			LEG		25	-1		48	266	70	7.6	563	127	47		171	
3991531	77364	20795	NC-GW	366575	5367500	W		0.8	Y	Etl	Ssi			LEG		33	-1		39	99	63	7.4	517	92	42		195	
3991532	77364	20795	NC-GW	366550	5367500	W		1.4	Y	Etl	Sbs		Ds	N	5% Ds Py	12	-1		43	134	90	4.96	188	93	55		314	
3991533	77364	20795	NC-GW	366525	5367500	W		1.7	Y	Etl	Ssi			EG		20	-1		33	148	72	7.1	403	75	33		126	
3991534	77364	20795	NC-GW	366500	5367500	W		0.6	Y	Etl	Sw			MG		18	-1		85	276	110	7.1	264	207	38		487	
3991535	77364	20795	NC-GW	366250	5366050	S	BC	1		Etl	Cy			V	No RF	19	-1		32	256	38	6.5	310	120	58		353	
3991536	77364	20795	NC-GW	366260	5366050	S	BC	1.3		Egm	IgbCy			V	Trans.?	16	-1		20	353	67	4.3	288	93	48		145	
3991537	77364	20795	NC-GW	366270	5366050	S	B	1		Egm	CyIgbSbsSsi			V	Trans.?	24	-1		24	408	84	4.56	289	99	54		162	
3991538	77364	20795	NC-GW	366280	5366050	S	B	1.7		Egm	Igb			V	Rounded Ssi & Sbs	30	-1		29	296	80	5.8	420	101	42		164	
3991539	77364	20795	NC-GW	366600	5368000	S	C	0.4		Etl	CySsi			V		11	-1		18	197	44	3.86	319	63	36		124	
3991540	77364	20795	NC-GW	366590	5368000	S	C	0.8		Egm	IgbCy			N		17	-1		68	153	511	4.75	658	228	91		2030	
3991541	77364	20795	NC-GW	366580	5368000	S	C	0.5		Egm	IgbCy			DV		30	-1		20	191	199	7.8	923	141	98		145	
3991542	77364	20795	NC-GW	366570	5368000	S	BC	0.6		Egm	SwIgbSsi			G		13	-1		7	198	63	5	148	84	89		299	
3991543	77364	20795	NC-GW	366560	5368000	S	BC	0.7		Etl	CySsi			O		70	-1		10	213	144	7	117	71	179		305	
3991544	77364	20795	NC-GW	366550	5368000	S	BC	0.6		Etl	CySsi			P	Next to c.k.	60	-1		7	196	82	6.3	98	44	607		134	

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Samno	DPO	Repon	Prospect	AMGE	AMGN	SamgType	Horizon	Depth	Bedrock?	MRTLith	FictID	Texture	Al/Min	Colour	Comments	k x10-SSi	Ag ppm	Au ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Mn ppm	Ni ppm	Pb ppm	Pd ppm	Pt ppm	Zn ppm
3991543	77364	20795	NC-GW	366540	5368000	S	B	0.9		Egm	CylgbSsi				Next to ck. Trans.?	18	-1		24	241	93	8.5	293	104	241			288
3991546	77364	20795	NC-GW	366530	5368000	S	BC	1		Etl	CySsi					14	-1		26	346	237	9.3	171	109	501			318
3991547	77364	20795	NC-GW	366520	5368000	S	C	1		Etl	CySsi			O		28	-1		27	192	110	8.3	349	123	260			349
3991548	77364	20795	NC-GW	366510	5368000	S		0.8		Qha	CcyCg			O		20	-1		21	202	90	9.4	310	89	249			251
3991549	77364	20795	NC-GW	366500	5368000	S	BC	1		Egm	lgbSsi			O	Trans.?	25	-1		27	241	101	10.6	457	142	574			509
3991550	77364	20795	NC-GW	366490	5368000	S		1.1		Qha	Cg			V	Close to bedrock?	29	-1		38	257	86	8.3	469	121	220			566
3991551	77364	20795	NC-GW	366480	5368000	S	B	1.1		Etl	CySw			P	Next to ck.	20	-1		7	242	62	6.6	124	43	56			97
3991552	77364	20795	NC-GW	366470	5368000	S	B	1.1		Etl	Cy			P	Next to ck. Trans.?	20	-1		29	183	47	5.1	234	70	126			191
3991553	77364	20795	NC-GW	366460	5368000	S	C?	0.7		Etl	SsiCy			O	Next to ck. Trans.?	31	-1		20	322	51	8.6	370	101	89			134
3991554	77364	20795	NC-GW	366450	5368000	S	B	1.9		Etl	CySsi			V		11	-1		63	272	120	2.51	144	140	46			303
3991555	77364	20795	NC-GW	366440	5368000	S	B	1.9		Etl	Cy			V	Next to ck. Trans.?	22	-1		122	230	94	5.9	542	197	38			483
3991556	77364	20795	NC-GW	366430	5368000	S	B	1		Etl	Cy			V	Next to ck.	39	-1		64	236	84	6.8	562	161	48			461
3991557	77364	20795	NC-GW	366400	5368000	S	B	1.4		Etl	Cy			MVW	Pass Ds in V Ccy above	36	-1		163	564	152	7.4	684	505	33			475
3991558	77364	20795	NC-GW	366390	5368000	S	B	2		Etl	Cy			MGVW	Trans.?	10	-1		21	396	128	2.68	180	162	577			1370
3991559	77364	20795	NC-GW	366380	5368000	S	C	2		Etl	Cy			MVW		26	-1		144	317	99	8.9	478	370	44			2220
3991560	77364	20795	NC-GW	366370	5368000	S	B	0.5		Etl	Cy			DV		14	-1		83	419	345	4.66	498	418	177			2290
3991561	77364	20795	NC-GW	366300	5368000	S	B	0.5		Etl	Cy			O	Trans.?	13	-1		10	203	48	7.4	60	87	83			112
3991562	77364	20795	NC-GW	366275	5368000	S	B	0.7		Etl	Cy			Y	Trans.?	13	-1		23	183	83	12	143	75	82			351
3991563	77364	20795	NC-GW	366245	5368000	S	B	1.2		Etl	Cy			MOYW	Trans.?	10	-1		11	241	80	10.7	107	43	101			324
3991564	77364	20795	NC-GW	366225	5368000	S	B	1.4		Etl	Cy			MOYR	Trans.?	11	-1		9	496	79	11	126	58	64			180
3991565	77364	20795	NC-GW	366200	5368000	S	B	1.5		Etl	Cy			V		23	-1		29	275	67	7.7	326	126	45			697
3991566	77364	20795	NC-GW	366175	5368000	S	B	1		Etl	CySbk			N	In gully	9	-1		23	179	104	5.9	295	57	139			201
3991567	77364	20795	NC-GW	366150	5368000	S		0.2		Etl	Clk			RB		1180	-1		36	151	19	46.5	1788	8	498			425
3991568	77364	20795	NC-GW	366260	5368000	S	BC	0.5		Etl	CySsi			YV	Next to eastern	13	-1		20	150	92	9.9	214	81	234			404
3991569	77364	20795	NC-GW	366390	5367750	S	AC	0.3		Etl	Sw			MGVO	Minor trans material	8	-1		8	403	37	2.14	172	27	31			52
3991570	77364	20795	NC-GW	366410	5367750	S	AC	0.3		Etl	Sw			MGVO	Minor trans material	12	-1		11	305	57	2.98	213	31	35			65
3991571	77364	20795	NC-GW	366420	5367750	S	B	0.9		Etl	Cy			G	We G Ssi in overturned tree	15	-1		28	210	49	4.64	811	79	41			135
3991572	77364	20795	NC-GW	366430	5367750	S	AB	0.4		Etl	Cy			V	Minor trans material	15	-1		11	248	23	1.72	187	35	52			55
3991573	77364	20795	NC-GW	366440	5367750	S	B	0.4		Etl	CySsi			BR	Minor trans material	15	-1		16	172	37	2.91	203	49	42			84
3991574	77364	20795	NC-GW	366450	5367750	S	B	0.4		Etl	CySsi			BR	Minor trans material	9	-1		7	134	21	2.44	76	26	41			55
3991575	77364	20795	NC-GW	366460	5367750	S	B	1		Etl	Cy			BR		20	-1		26	174	33	7.4	332	94	53			133
3991576	77364	20795	NC-GW	366470	5367750	S	B	1.9		Etl	Cy			MOW	Trans.?	5	-1		4	327	33	1.2	15	71	47			38
3991577	77364	20795	NC-GW	366480	5367750	S	B	1.2		Etl	Cy			WG	Trans.?	7	-1		-3	85	49	1.2	25	51	64			39
3991578	77364	20795	NC-GW	366490	5367750	S	B	0.7		Etl	CySsi			O	Trans.?	10	-1		-3	123	68	6.7	44	38	56			56
3991579	77364	20795	NC-GW	366500	5367750	S	B	0.7		Etl	CySsi			O	Trans.?	13	-1		6	142	43	6.4	50	35	42			51
3991580	77364	20795	NC-GW	366360	5367350	S	B	0.8		Etl	Cy			DG	Trans.?	6	-1		4	208	745	0.67	24	67	39			33
3991581	77364	20795	NC-GW	366340	5367350	S	B	1		Etl	Cy			DG		9	-1		6	150	27	3.02	75	23	32			43
3991582	77364	20795	NC-GW	366320	5367350	S	B	1		Etl	Cy			DG		10	-1		4	256	44	2.02	53	71	352			41
3991583	77364	20795	NC-GW	366320	5367350	S	B	0.9		Etl	CySsiSw			B		5	-1		-3	333	35	1.45	37	42	310			59
3991584	77364	20795	NC-GW	366310	5367350	S	B	1.1		Etl	Cy			MNLG		5	-1		4	208	110	0.82	35	43	30			154
3991585	77364	20795	NC-GW	366290	5367350	S	B	1.3		Etl	Cy			P		9	-1		10	217	122	1.57	60	62	27			195
3991586	77364	20795	NR-V	366450	5366200	S	B	1.5		Etl	Cy			O	Trans.?	22	-1		5	143	100	11.9	41	46	78			119

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SamNo	DPO	Rcpn	Prospect	AMGE	AMGN	SampType	Horizon	Depth	Bedrock?	MRTLth	FieldID	Texture	Al/Min	Colour	Comments	k x10-SSl	Ag ppm	Au ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Mn ppm	Ni ppm	Pb ppm	Pd ppm	Pt ppm	Zn ppm
3991587	77364	20795	NR-V	366440	5366200	S	B	1		Etl	Cy	DO			Trans.?	25	-1	5	295	95	12.4	31	58	70			66	
3991588	77364	20795	NR-V	366430	5366200	S	B	1.1		Etl	Cy	MOY				20	-1	7	220	264	14	31	68	59			96	
3991589	77364	20795	NR-V	366420	5366200	S	B	0.8		Egm	Cylgb	MVW			Relic lgb texture	24	-1	35	270	155	8.8	20	317	39			108	
3991590	77364	20795	NR-V	366420	5366200	S	B	2		Egm	Cylgb	B			lgb from 0.8 - 1.9 m	11	-1	20	404	104	6.4	302	198	46			86	
3991591	77364	20795	NR-V	366410	5366200	S	B	1		Etl	Cy	MOV				18	-1	12	245	76	7.9	255	112	42			99	
3991592	77364	20795	NR-V	366400	5366200	S	B	0.8		Etl	CySsi	VB			Track at 366408E	16	-1	16	164	18	5.3	484	84	37			85	
3991593	77364	20795	NR-V	366390	5366200	S	BC	0.7		Etl	CySsi	VB				13	-1	8	124	50	5.5	291	107	36			81	
3991594	77364	20795	NR-V	366380	5366200	S	B	0.8		Etl	Cy	OV			Costean at 366375E	23	-1	17	260	132	9.5	237	172	53			99	
3991595	77364	20795	NR-V	366370	5366200	S	BC	0.7		Etl	CySsi	VB			Next to Mosquito Shalt?	24	-1	21	162	47	8.9	489	88	44			102	
3991596	77364	20795	NR-V	366350	5366200	S	B	1.2		Etl	Cy	LGY			No sample at 360E due to Cg in ck at 362E	7	-1	6	123	9	1.66	33	49	36			33	
3991597	77364	20795	NR-V	366460	5366200	S	B	0.9		Etl	Cy	O				13	-1	10	141	44	5.3	118	45	40			69	
3911598	77366	20795	NC-GW	366300	5367700	W	B	1.9	Y	Etl	CySsh	PDO				20	-1	13	147	468	15.1	245	172	130			168	
3911599	77366	20795	NC-GW	366290	5367700	W	B	2.8	Y	Etl	Cy	DOP			Hard	30	-1	24	172	345	12.8	631	315	350			266	
3911600	77366	20795	NC-GW	366280	5367700	W	B	7.4	Y	Etl	Cy	OPYN			Hard	19	17	50	178	766	11.3	17000	160	21300			369	
3911601	77366	20795	NC-GW	366270	5367700	W	C	1.5	Y	Etl	CySsh	P				18	-1	5	105	104	10	145	78	4023			89	
3911602	77366	20795	NC-GW	366260	5367700	W	C	3	Y	Etl	CySwSsh	P				18	-1	20	167	201	10.5	293	252	820			158	
3911603	77366	20795	NC-GW	366250	5367700	W	BC	3	Y	Etl	CySw	LVV			Minor DG Ccy after Ssh	12	-1	33	153	92	5.8	690	236	43			234	
3911604	77366	20795	NC-GW	366240	5367700	W	BC	6	Y	Etl	CySw	MVW				25	-1	68	372	120	7.9	912	460	27			363	
3911605	77366	20795	NC-GW	366230	5367700	W	BC	1.1	Y	Etl	CySsh	PYO			Hard	15	-1	28	117	48	6.7	404	155	48			138	
3911606	77366	20795	NC-GW	366220	5367700	W	BC	0.8	Y	Etl	CySw	MPVW			Predominantly P	22	-1	29	125	59	7.7	435	138	16			177	
3911607	77366	20795	NC-GW	366210	5367700	W	BC	2.5	Y	Egm	Cylgb	BV				22	-1	39	102	76	6.7	559	178	157			898	
3911608	77366	20795	NC-GW	366200	5367700	W	BC	1	Y	Egm	Cylgb	BV			Predominantly B	24	-1	26	201	33	8.1	414	85	27			135	
3911609	77366	20795	NC-GW	366190	5367700	W	B	1.5	Y	Etl	CySsh	PYB			Some vegetation matter	20	-1	19	156	36	10.2	366	84	24			111	
3911610	77366	20795	NC-GW	366180	5367700	W	B	2.2	Y	Etl	Cy	YLG				40	-1	19	184	65	10.3	479	84	73			151	
3911611	77366	20795	NC-GW	366170	5367700	W	B	1	Y	Etl	CySw	YOLG				30	-1	20	213	36	11.5	985	117	155			129	
3911612	77366	20795	NC-GW	366160	5367700	W	B	2.5	Y	Egm	Cylgb	YMVW				26	-1	41	94	122	10.2	806	88	395			431	
3911613	77366	20795	NC-GW	366150	5367700	W	B	3.1	Y	Egm	Cylgb	MVW				35	-1	66	17	60	10.5	851	60	25			460	
3911614	77366	20795	NC-GW	366150	5367600	W	B	2	Y	Etl	CySsh	MDGLV			Very hard.	14	-1	48	107	105	2.72	106	126	88			169	
3911615	77366	20795	NC-GW	366160	5367600	W	BC	5	Y	Egm	CylgbSsh	DVVVG			DV rock fragments; lgb?	20	-1	20	145	89	6.4	189	84	751			309	
3911616	77366	20795	NC-GW	366170	5367600	W	BC	1.8	Y	Egm	Cylgb	MDVW				30	-1	65	344	104	8.9	830	474	21			141	
3911617	77366	20795	NC-GW	366180	5367600	W	C	1.5	Y	Etl	Ssh	LV				25	-1	38	88	27	8.3	580	103	45			132	
3911618	77366	20795	NC-GW	366190	5367600	W	BC	1.7	Y	Etl	CySw	MLVW				30	-1	41	146	63	7.9	447	133	28			215	
3911619	77366	20795	NC-GW	366200	5367600	W	B	2.4	Y	Etl	CySsh	VLG				15	-1	35	44	55	4.17	196	135	23			172	
3911620	77366	20795	NC-GW	366210	5367600	W	C	5.4	Y	Egm	CySwlgb	DV				30	-1	70	131	91	9.4	669	477	107			948	
3911621	77366	20795	NC-GW	366220	5367600	W	C	0.5	Y	Egm	lgb	DS			Mag. anomaly	37	-1	106	416	1866	8.3	980	1881	21			184	
3911622	77366	20795	NC-GW	366230	5367600	W	B	1.5	Y	Egm	Cylgb	DSNi			Ext. G with Ni sulphides.	32	-1	74	420	422	8.9	864	1354	24			498	
3911623	77366	20795	NC-GW	366240	5367600	W	BC	3.3	Y	Egm	Cylgb	MDVBW				30	-1	93	376	466	9.1	1018	1111	8			303	
3911624	77366	20795	NC-GW	366250	5367600	W	B	3.3	Y	Egm	Cylgb	VB			Angular Cg, some large 2mm white mica plates.	34	-1	32	182	69	16.4	352	433	17			1035	
3911625	77366	20795	NC-GW	366260	5367600	W	B	2	Y	Etl	CySsh	DVDG				27	-1	55	189	79	7	429	890	45			1159	
3911626	77366	20795	NC-GW	366240	5367800	W	BC	1.7	Y	Etl	CySsh	GPG			Ssh. white mica present.	33	-1	47	107	109	9.2	448	226	35			666	

SamNo	DPO	Repon	Prospect	AMGE	AMGN	SampType	Horizon	Depth	Bedrock?	MRTLith	FieldID	Texture	Alt/Min	Colour	Comments	k x10-5Si	Ag ppm	Au ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Mn ppm	Ni ppm	Pb ppm	Pd ppm	Pt ppm	Zn ppm
3911627	77366	20795	NC-GW	366250	5367800	W	C	1.4	Y	Etl	Ssh			GV	Fresh (unweathered) sample.	39	-1		42	102	76	6.8	635	164	21			236
3911628	77366	20795	NC-GW	366260	5367800	W	C	4.6	Y	Egm	Cylgb			VB		35	-1		93	730	1295	13.6	869	976	26			410
3911629	77366	20795	NC-GW	366270	5367800	W	B	3	Y	Etl	CySsh			GV	No R.F.s present.	40	-1		90	212	83	17.5	3312	384	20			1109
3911630	77366	20795	NC-GW	366280	5367800	W	B	4	Y	Etl	CySsh			EG	Clay after We shale.	27	-1		274	154	88	12.8	1754	797	24			1259
3911631	77366	20795	NC-GW	366290	5367800	W	BC	7.1	Y	Egm	Cylgb			VG	Granular textured clay.	28	-1		112	913	264	14.4	1963	1029	30			1066
3911632	77366	20795	NC-GW	366450	5367800	W	C	5	Y	Etl	CySsh			LGE	Ssh. partially We.	22	-1		41	113	33	6.7	864	75	26			294
3911633	77366	20795	NC-GW	366460	5367800	W	C	5	Y	Etl	CySsh			LG	Ssh. monotonous.	14	-1		18	94	64	5.9	715	80	34			456
3911634	77366	20795	NC-GW	366470	5367800	W	C	3.1	Y	Etl	CySsh			LG	Ssh. monotonous.	31	-1		37	192	85	8.6	936	112	43			359
3911635	77366	20795	NC-GW	366480	5367800	W	C	1	Y	Etl	CySsh			LGE	Ssh frags.	18	-1		17	60	41	7	470	58	9			152
3911636	77366	20795	NC-GW	366490	5367800	W	C	1	Y	Etl	CySsh			OR	Ssh frags.	20	-1		28	105	60	6.2	471	75	19			158
3911637	77366	20795	NC-GW	366500	5367800	W	C	1.2	Y	Etl	CySsh			RG	Ssh frags.	21	-1		34	152	61	5.2	571	90	47			241
3911638	77366	20795	NC-GW	366250	5367950	W	BC	7.2	Y	Egm	IgbCy			VW	Speckled granular Cy after Igb.	18	-1		36	17	42	13.7	475	49	22			340
3911639	77366	20795	NC-GW	366260	5367950	W	BC	5.5	Y	Egm	IgbCy			YV	Weathered Igb.	40	-1		42	14	42	21.3	562	81	3			752
3911640	77366	20795	NC-GW	366270	5367950	W	C	0.9	Y	Egm	Igb		DsFe	OV	Limonitic (after Pyrite), no vis sulphides.	105	-1		139	-7	55	16.6	951	96	22			616
3911641	77366	20795	NC-GW	366280	5367950	W	C	2.5	Y	Egm	Igb			LGV		31	-1		41	283	72	9.6	1094	87	93			451
3911642	77366	20795	NC-GW	366290	5367950	W	BC	1.5	Y	Egm	Igb		Fe	BV	Limonitic Igb.	21	7		7	106	47	10.9	305	61	542			870
3911643	77366	20795	NC-GW	366300	5367950	W	C	1.6	Y	Egm	Igb		Fe	VGB	Limonitic Igb	24	-1		48	176	138	8.2	450	143	143			666
3911644	77366	20795	NC-GW	366570	5368000	W	C	2.8	Y	Etl	Sw			GV	Feldspathic sandstone/Sw	19	-1		32	134	100	7.1	446	264	96			1754
3911645	77366	20795	NC-GW	366580	5368000	W	BC	2	Y	Etl	Ssh			LGM	Ssh frags. minor OB Cy.	13	-1		10	58	57	3.42	142	44	69			79
3911646	77366	20795	NC-GW	366590	5368000	W	C	1.6	Y	Etl	Sw			LGE	Ssh frags.	25	-1		70	207	71	7.9	1323	277	115			480
3911647	77366	20795	NC-GW	366600	5368000	W	C	1	Y	Etl	Ssh			LG	Ssh. unmineralised.	28	-1		32	105	62	11.2	1169	120	24			213
3911648	77366	20795	NC-GW	366610	5368000	W	C	1.1	Y	Etl	Sw			LGW	Sw. volcanic derived.	30	-1		39	81	26	7.7	923	151	19			208
3911649	77366	20795	NC-GW	366620	5368000	W	C	1.8	Y	Etl	Sw			LGE	Sw (volcaniclastic)	23	-1		56	325	129	9.6	1307	492	7			238
3911650	77366	20795	NC-GW	366630	5368000	W	C	2.9	Y	Etl	Ssh			LG	Ssh	23	-1		21	132	106	7.9	601	152	23			668
3911651	77366	20795	NC-GW	366640	5368000	W	C	2.5	Y	Etl	Ssh			LEG	Ssh frags.	17	-1		28	87	90	9	990	99	29			832
3911652	77366	20795	NC-GW	366650	5368000	W	C	2.5	Y	Etl	Ssh			LPG	Ssh. minor purplish interbeds.	25	-1		58	135	52	8.1	640	118	14			325

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Appendix IV

**Honours Thesis by Phil Greenhill B.Sc
The Geological Setting and Mineralisation of the CUNI Cu/Ni Deposits
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344099

The Geological Setting and Mineralisation of the CUNI Cu/Ni Deposits

Phil Greenhill B.Sc.



A research thesis submitted in partial fulfilment of the
requirements of the degree of Bachelor of Science with Honours

Centre for Ore Deposit and Exploration Studies

Geology Department, University of Tasmania

NOVEMBER 1995

Abstract:

The Cuni Cu-Ni mines are located ~ 6km north-east of the township of Zeehan on the west coast of Tasmania in the north-east/south-west trending Paleozoic rifted basin, the Dundas Trough, that separates the Precambrian Tyennan Massif to the east from the Rocky Cape Massif to the west. The trough is filled by a series of sediments that include the Eo-Cambrian Success Creek and Crimson Creek Formation, and the Cambrian Dundas Group.

Previous studies on host sediments in the Cuni area classified them as an unassigned unit stratigraphically between the Crimson Creek Formation and the Dundas Group. Based on lithological similarities and evidence from the analysis of detrital chrome spinel grains showing high percentages of TiO₂ (>0.5wt%), they are shown to be correlates of the Crimson Creek Formation.

The Cuni deposits are hosted by two parallel gabbroic bodies termed the Eastern and Western Gabbros. Both are intensely hydrothermally altered and have undergone greenschist metamorphism. They occur as concordant fault controlled bodies over a north-south strike length of approximately 2km. Wholerock analyses shows the gabbros were derived from a primitive tholeiitic magma with average MgO (13wt%), FeO_{total} (12wt%) TiO₂ (~0.80wt%), Ni (>300ppm), and Cr (>660ppm). Comparisons with other tholeiitic intrusive events in the region using REE plots and trace element ratios indicate similarities with both the Henty dyke swarm, and correlates of the Crimson Creek tholeiites, however a more definitive grouping is restricted by a lack of comprehensive comparative data.

The eight Cuni copper/nickel mines/prospects were last operated in 1948 with a maximum of 6500 tonnes of copper/nickel and 2240 tonnes of silver/lead/zinc ore being mined. Ore grades average 9.7% nickel and 4.7% copper. The ore occurs as massive pentlandite, chalcopyrite, pyrrhotite, pyrite and minor millerite ore in the base of the Eastern Gabbro and as disseminated ore within the Western Gabbro.

The style of mineralisation at Cuni is most similar to the gabbroid class of copper-nickel deposits, having Ni:Cu ratios (<3:1) and increased PGE content, however genetically the Cuni deposits are unique and unrelated to the Serpentine Hill ultramafic/mafic complex. The deposits are proposed to have formed by shallow emplacement of oxidised metal rich magma into the Crimson Creek Formation where reduction due to assimilation of sulphur resulted in sulphide segregation. Individual deposits formed by remobilisation and deposition of sulphides within thicker parts of the Eastern gabbro, with variations in Cu:Ni ratios and ore mineralogy reflecting localised chemical changes.

Acknowledgements:

F.S. Pettijohn, a sedimentologist in the 1950's stated " There is nothing as sobering as an outcrop". Sober was not a state to be in when visiting the Cuni Field, and many was the time that the thought of getting extremely unsober was imminently more appealing than another fight through Tea-tree regrowth and cutting grass. However sanctity prevailed and the end of the year, and subsequently the reason for ever visiting the area again, has come to an end. This project has benefitted from the generous input of many people and institutions and they include:

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Chapter One: Introduction

1.1 Location and Access:

The Cuni or Five Mile copper/nickel field lies 6km northeast of the township of Zeehan in western Tasmania. The Emu Bay Railway line and the Murchison Highway form the eastern boundary of the field, and access is gained via the abandoned Northeast Dundas Tramline. The northernmost prospects are accessed by an abandoned branch line off the Northeast Dundas Tramway (Fig. 1.1).

The Cuni field lies in a marshy topographic depression that remains wet all year round. It is thickly vegetated with secondary regrowth, that consists of cutting grass (*Gahnia grandis*), tea-tree (*Leptospernum sp.*), and associated wet sclerophyll scrub. Outcrop is restricted to a few road cuttings, and abandoned mine workings. Recent exploration grids by CRAE have improved access.

1.2 Mining history:

The Cuni field has had a sporadic mining history, with five main periods of exploration and mining since the initial leases were granted in 1893. Initial interest in the region lasted five years and involved the granting of five leases for copper and nickel exploration, and the sinking of a shaft to an unknown depth at Nickel Reward (Taylor and Burgess, 1952), (Fig. 1.1). The second period of activity began in 1909 and continued until 1914. At this time the Emu Bay Railway had been laid connecting Zeehan with Burnie, and the Northeast Dundas Tramway connected Zeehan with Williamsford. The completion of the branch line in 1911 from the Northeast Dundas Tramway to Griffiths siding, that serviced the lead/zinc mine at Lead Blocks, allowed easy access to the Cuni

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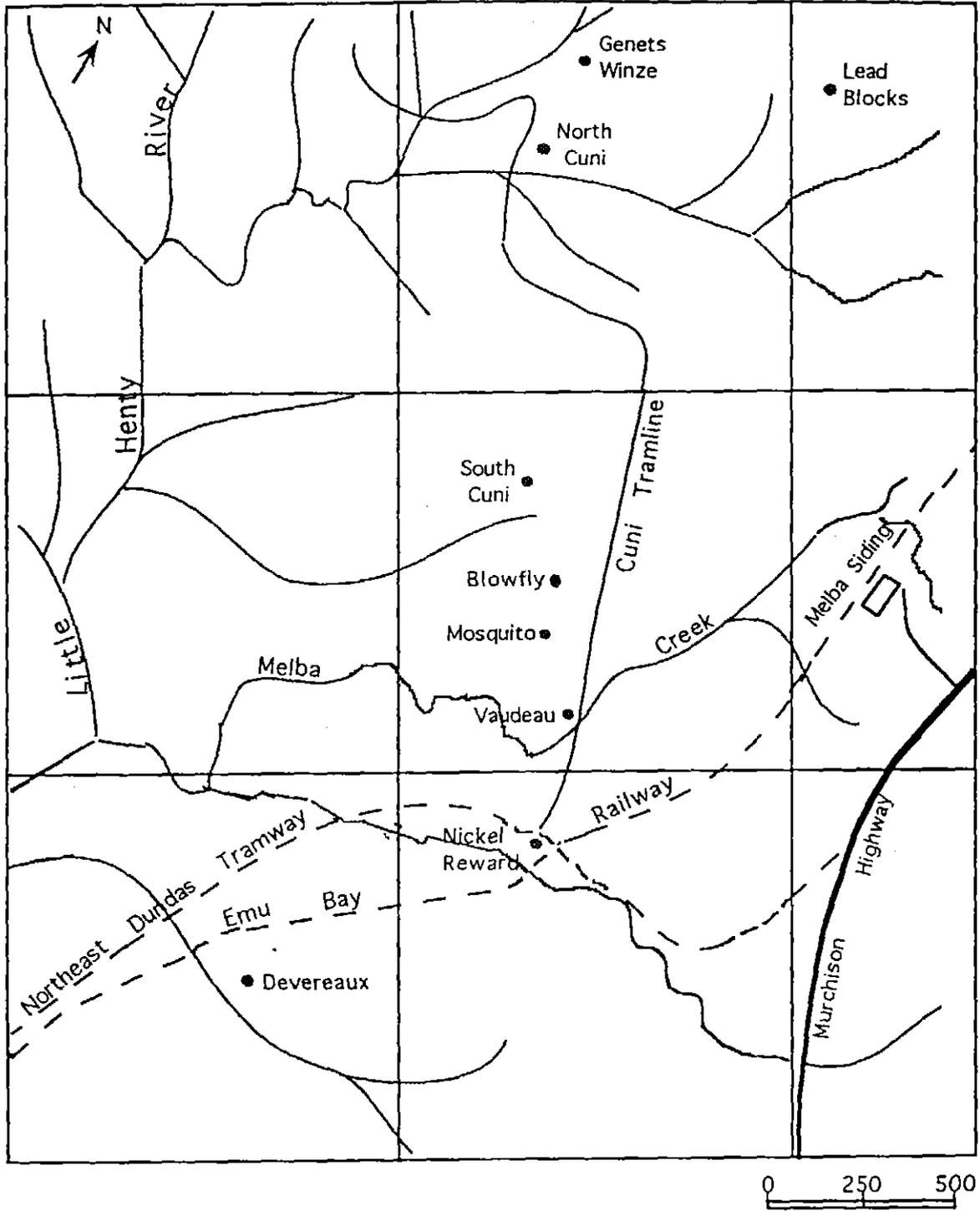


Figure 1.1: Map of the Cuni area accessed via the Murchison Highway, the Northeast Dundas Tramway and the Cuni Tramline. Also shown are the positions of each of the Cu/Ni prospects and the Lead Blocks Ag/Pb/Zn mine. (redrafted after Brown, 1991).

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prospects (Taylor and Burgess, 1952). A further five leases were granted for copper and nickel during this period, with three transferred to mining leases in 1913.

The three mines, later termed the North Cuni, South Cuni and Vaudeau respectively, continued active mining until 1914, when the outbreak of World War I closed operations (Reid, 1925; Nye and Blake, 1938). Interest in the north Cuni field was renewed in 1928 following a geophysical survey over the area. This interest resulted in the recommencement of work at North Cuni and the development of Genets Winze. Flooding proved to be a problem and forced mining to cease in 1932 (Nye and Blake, 1938; Taylor and Burgess, 1952). In 1938 the Vaudeau Shaft was reopened and 277 tonnes of ore mined. Similarly, in 1946 the Vaudeau mine was reopened for 2 years and another 750 tonnes of ore was obtained before operations were abandoned, due to lack of available markets.

Since 1948 exploration has been limited primarily to geophysical surveys which have continued to isolate possible targets, particularly in the North Cuni area. No single target, however, has proven large enough to warrant further work.

1.3 Previous Work:

Since the discovery of nickel and copper mineralisation at Cuni considerable effort has been made to understand the controls on mineralisation and potential for finding further deposits. Investigations by both the Bureau of Mineral Resources, and Mineral Resources Tasmania, have included geophysical surveys and diamond drilling. In all, some 60 diamond drill holes have been drilled in the Cuni field, along with 16 geophysical surveys. The latter range from equipotential surveys conducted in 1931, to more recent magnetic and electrical surveys (Richardson, 1992).

Reports on the geology of the Cuni copper/nickel field by Mineral Resources Tasmania have presented conflicting evidence on the

affiliation of the sediments and gabbros. The sediments in the Cuni region have been described as a series of interbedded grey and black slates, grey quartz-feldspar tuffs, and red slates and tuffs (Reid 1925); as purple, grey, and green slates and breccias (Nye and Blake, 1938; Blake, 1952); as shales, argillites and tuffs (Taylor and Burgess, 1952); and as argillites and greywackes (Anon., 1969). From these descriptions they have then been classified as: Dundas Series (Read, 1925; Nye and Blake, 1938), the Pieman Group (Taylor and Burgess, 1952), the Dundas Group (Blake, 1952), and the Crimson Creek Formation (Anon., 1969).

The mafic intrusives have been described as late Silurian gabbros, norites and pyroxenites (Reid, 1925), as Devonian dolerites or fine gabbros (Nye and Blake, 1938; Taylor and Burgess, 1952), and as Lower to Middle Cambrian mafic to ultramafic intrusives (Anon., 1969).

Recent work on the geology of the Cuni area was by the Mineral Resources Tasmania during the remapping of the Zeehan map sheet in 1989-90. Work done during this time coincided with a detailed study and drilling program of the Serpentine Hill Ultramafics. One of these holes (SH1) passed through the ultramafics and into the underlying sediments to a depth of 670 meters. Brown (1992) classified these sediments as Rosebery Group correlates based on the lack of detrital pyroxene, the presence of andesitic volcanolithic clasts and 45m of black graphitic shales. The gabbroic dykes were tentatively affiliated with Serpentine Hill Ultramafic complex gabbros based on field relationships (Brown, 1994).

1.4 Aims

A significant amount of mining and exploration has been undertaken in the Cuni field, yet the geology of the area and the controls on the mineralisation are still poorly understood. In this study three major concerns will be addressed:

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- 1). The mineralogy and geochemistry of the mineralised gabbros and their affiliation to other mafic volcanic events in western Tasmania.
- 2). Determine the affiliate of the Cuni sedimentary package intruded by the mineralised gabbros.
- 3). Determine the source of copper and nickel mineralisation allowing a genetic model for Cuni style of mineralisation to be proposed.

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Chapter Two: Geological Setting

2.1 Regional Geology:

Historically the Cuni or Five Mile deposits have been economically prospective for their anomalous copper and nickel mineralisation. However, stratigraphic and relative age relationships, structural history and ore genesis remain unresolved.

The Cuni deposits occur within the NE-trending Dundas Trough in western Tasmania (Fig. 2.1). The Dundas Trough formed as a result of extension of the Precambrian basement (Berry, 1994), and is bounded to the west and east by the Rocky Cape and Tyennan massifs, respectively.

The Rocky Cape massif is locally represented by the Oonah Formation. To the west of Cuni it has been divided into two subdivisions. The lower subdivision is a succession of interbedded fine- to very fine-grained, muscovitic quartz sandstone with medium- to coarse-grained quartzwacke and mudstone (Turner, 1989). The upper subdivision consists of carbonate, sandstone, fine conglomerate and volcanoclastic lithic wacke interbedded with laminated siltstone and mudstone. Regional metamorphism is minor ranging up to lower greenschist facies (Turner, 1989).

The Tyennan region extends from Cradle Mountain in the northwestern central highlands to the south coast. It has undergone distinctly higher grades of metamorphism than the Rocky Cape region and has been divided into two main assemblages accordingly. The first of these is a quartz-chlorite pelite assemblage that contains only greenschist facies mineral assemblages. Sedimentary structures

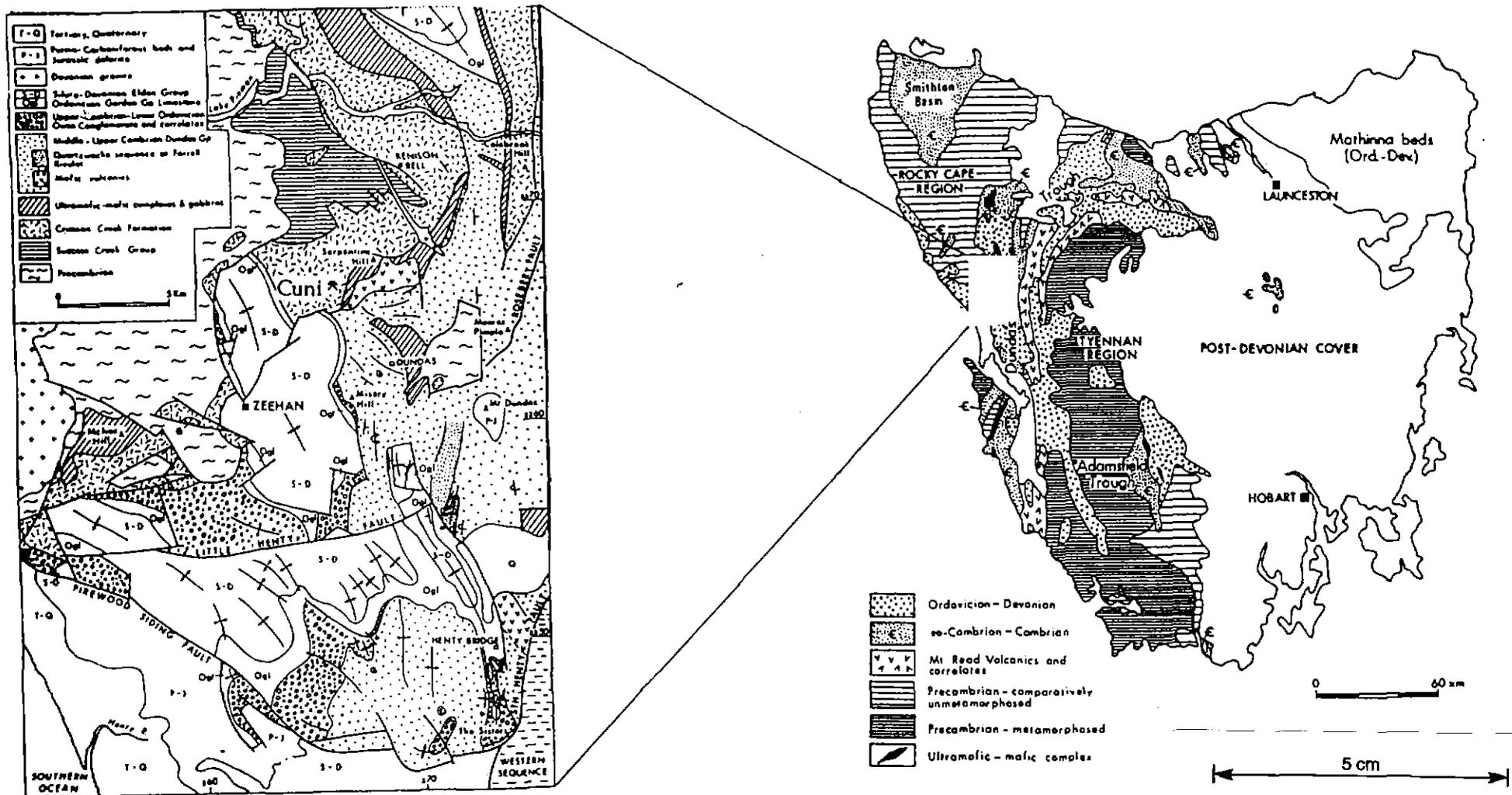


Figure 2.1: Map of the regional geology of the west coast of Tasmania, showing the Tyennan and Rocky Cape Regions and the Dundas Trough. Inset shows the Cuni prospects in relation to the local geology and the township of Zeehan. (after Brown, 1989; Corbett, 1989).

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have largely been retained and their gross lithology indicate deposition in a tidally dominated shallow-shelf sea (Boulter, 1989). The second assemblage is a garnetiferous schist-quartzite assemblage. It consists of equal proportions of massive schistose quartzite and coarse grained schist. Quartzite units form thick discontinuous slabs that contain no sedimentary structures. The schist has been divided into garnet-mica schist, mica-schist and garnet-mica-kyanite gneiss and contains occasional amphibolite boudins. This second assemblage has undergone metamorphism up to amphibolite facies (Turner, 1989).

Two separate rock units of Eo-Cambrian-Cambrian age parallel the margins of the basin, indicating a two stage rift phase (Brown, 1986; Berry, 1994). The first of these rock units consists of the Success Creek Group and the Crimson Creek Formation. They are separated from the underlying Oonah formation by a structural and metamorphic unconformity and a sedimentation hiatus (Brown, 1986).

The Success Creek Group consists of approximately 1000m of shallow water sediments, divided into three main formations. The basal formation comprises an immature polymict conglomerate, which is gradationally overlain by interbedded quartz sandstone, minor siltstone, and conglomerate of the Dalcoath Formation (Brown, 1986). This is conformably overlain by the upper Success Creek Member which consists of laminated siltstone, mudstone and dolomite of the Renison Mine Sequence (Morrison, 1982).

The Crimson Creek Formation is a 5000m thick succession of turbiditic volcanoclastic sandstones and laminated siltstone/mudstones interbedded with mafic volcanics (Brown, 1986). The Crimson Creek Formation is conformable with the Success Creek Group in the Renison Mine area

Stratigraphically above, and thrust over the Crimson Creek Formation are layered ophiolite sheets (Berry and Crawford, 1988).

The sheets consist of three lithologically distinct units: a basal Layered Pyroxenite-Dunite succession; an intermediate Layered Dunite-Harzburgite succession; and an upper Layered Pyroxenite-Peridotite and associated Gabbro succession (Brown, 1986).

Sitting with a faulted contact on the ultramafics are 3800m of middle-Middle Cambrian to late-Late Cambrian Dundas Group sediments (Jago and Brown, 1989). The Dundas Group is divided into two successions: a lower succession, which is sparsely fossiliferous and consists of interbedded conglomerates, sandstones, and mudstones; and an upper succession that consists of a fossiliferous turbidite sequence (Brown, 1986; Jago and Brown, 1989).

Lying along the western margin of the Tyennan region, and interfingering westward with the Dundas Group are the Mt. Read Volcanics. This 10-15km wide belt consists of interbedded coherent and incoherent volcanics that extend from Elliot Bay in the southwest of the state to Sheffield in the north. They host a number of world class polymetallic VHMS deposits (e.g. Mt. Lyell, Roseberry, Hellyer, Hercules, Que River) and remain highly prospective (Corbett, 1992).

The middle late-Cambrian to early Ordovician Denison Group unconformably overlies the Dundas Group and the Mt Read Volcanics (McNeill and Corbett, 1992). It has a measured thickness of up to 2000m and has been divided into two formations: the Owen Conglomerate and the Pioneer Beds. The Owen Conglomerate consists of pebble to boulder sized Precambrian derived quartz clasts and in the case of the lowermost conglomerate, volcanic derived clasts, interbedded with sand grade beds throughout the sequence (Jukes Conglomerate; Banks, 1989). The Pioneer Beds are the uppermost member of the Denison Group and consist of 10-20m of graded, interbedded sandstone and siltstone.

Conformably overlying the Denison Group is the Gordon Group. This sequence of interbedded limestones and dolomitic limestones is the

upward fining continuance of the Denison Group and has a measured thickness at Zeehan of approximately 500m (Banks & Burrett, 1989).

Stratigraphically above and conformably overlying the Denison Group is the Eldon Group of Silurian to Devonian age. In the Zeehan area it has been subdivided into five formations, which consist of 1750m of interbedded shallow-marine quartz sandstones and mudstones (Baillie, 1989; Brown, 1986).

A number of granitoid bodies were emplaced during the Middle-Devonian to the Early Carboniferous. The Heemskirk, Pine Hill, and Meredith bodies are the most significant within the region, all of which are economically important sources of tin mineralisation.

Rocks of Carboniferous and younger ages are less well represented in the central portion of the Dundas Trough. Some Permian aged sediments do unconformably overlie Devonian and Cambrian aged rocks in places, but, subsequent erosion has restricted these outcrops to areas where they are capped by Jurassic dolerite (Brown et al., 1994).

Quaternary glaciation has removed all evidence of Tertiary deposition in Western Tasmania except for isolated basalt flows around Granville Harbour. Erosion of these sediments due to high rainfall and steep slopes, has led to the development of a thin soil cover and deposits of interbedded Quaternary sands and gravels.

2.2 Regional Tectonics:

The structural history of the west coast of Tasmania is extremely complex with at least five separate deformation events being recognised as having occurred within the Cuni region. These range in age from the Precambrian to the Cretaceous. The earliest is the polyphase Penguin Orogeny that occurred at 700-50Ma. This event

is recognised as having four distinct phases and is seen in both the Tyennan and the Rocky Cape Regions. It occurred prior to rifting and consequent passive margin formation of the Dundas Trough (Berry, 1994).

During the Early to Middle Cambrian a second deformation event resulted in the collision of the passive margin of eastern Australia with an oceanic arc. This caused mafic-ultramafic ophiolite sheets to be thrust into the Dundas Trough, and over the Crimson Creek Formation (Crawford and Berry, 1992).

The middle-Middle Cambrian is also regarded as the onset of the multi-stage Delamerian orogeny, and the start of the post collisional felsic/intermediate volcanism of the Mt. Read Volcanics (Berry 1994). The Dundas Trough through the late Cambrian is thought to have been a half graben within which the acid volcanism of the Mt. Read Volcanics was concentrated along the eastern margin (Berry & Crawford, 1988; Berry, 1994). The Delamerian continued into the Ordovician during which time the half graben structures were infilled by the siliciclastic sequences of the Denison Group. These sequences are thickest near their eastern boundary and represent the onset of stable tectonic conditions that continued into the middle Devonian (Berry, 1994).

The middle Devonian in western Tasmania is characterised by pre-granitoid emplacement deformation of the Tabberabberan Orogeny. The earliest folds were controlled by Cambrian structures that were north trending. This caused tightening of pre-existing folds which in turn led to the formation of WNW-trending later stage folds (Berry, 1994).

Any structures developed during the Mesozoic and the Cenozoic are due to the breakup of Gondwana. This event resulted in the development of major grabens elsewhere in the state, but is less evident in the Cuni region.

Chapter Three: Stratigraphy

3.0 Cuni Sediments:

3.1 Introduction

The most recent mapping by the Department of Resources and Energy during the updating of the Zeehan map sheet in the late 1980's led Brown (1992), to report that sediments that hosted the Cuni mineral field differed markedly from the Crimson Creek Formation. As a result they were grouped as a separate package and placed at a stratigraphic level between the Eo-Cambrian Crimson Creek formation and the Cambrian Dundas Group.

3.2 Local geology:

The Cuni sediments are surrounded by four different rock formations that represent a range of ages and environments of deposition. Eo-Cambrian rocks of the Crimson Creek Formation occur immediately to the north of the Cuni field, while the Cambrian Dundas Group and the Siluro- Devonian Eldon group lie to the south and east. The early Cambrian Serpentine Hill Ultramafic Complex forms the western boundary of the Cuni region (Fig.3.1).

The Crimson Creek Formation consists of a turbiditic sequence of interbedded mudstones and volcanoclastic sandstones (Brown, 1982; Haines, 1991). The type section on the Pieman River has a measured thickness of approximately 4000m (Brown, 1986). At Cuni, sediments of the Crimson Creek Formation outcrop as steep forested ridges to the north with a proposed thrust fault separating them from the Cuni sediments

The Eldon Group to the south are in faulted contact with the Cuni sediments and form an east-west trending ridge, in the south-east of the Cuni Field. The group consists of a package of

conglomerates, sandstones and mudstones which consists of six formations; the Crotty Formation, Amber Formation, Keel Formation, Austral Creek Formation, Florence Formation, and Bell Shale (Blissett, 1962; Brown, 1986; Baillie, 1989). Thicknesses range from 2300m in the Strahan-Queenstown area to ~1700m in the Cuni region (Baillie, 1989).

Sediments of the Dundas Group are in faulted contact with the Cuni Sediments in the south-eastern corner of the Cuni Field. At this location, dominantly chert derived, interbedded conglomerate, pebbly sandstone and sandstone of the Razorback Conglomerate outcrops, forming low lying hills (Brown, 1991).

3.3 Previous Interpretations:

Brown (1991) based his identification of the Cuni sediments as a separate unit on two main observations. The first was the presence of an andesitic volcanic detrital component within the volcanoclastic sediments, and the second was the occurrence of nearly 50m of carbonaceous mudstone. He stated, "that neither the type of volcanism, nor the carbonaceous mudstone and associated mineralisation, are characteristic of sedimentary rocks from the Crimson Creek Formation".

3.4 This study:

Due to a lack of suitable outcrop in the Cuni area, studies of the Cuni sediments were restricted to diamond drill core.

More than 60 shallow diamond drill holes have been drilled in and around the mineralisation yet only one deep, (>200m), diamond drill hole has been taken from the Cuni sediments. This has led to the following subdivision of units being based almost entirely on this deep hole, DDHSH1.

This hole was drilled by the Department of Resources and Energy to the west of Melba Siding in 1989 (Fig. 3.1). It was collared in the ultramafics of the Serpentine Hill Ultramafic complex, and drilled through approximately 290m of sheared serpentinite after dunite and then a further 400m of the underlying Cuni

Sediments which were intruded by four gabbroic bodies. A sheared contact separated the two main units. The hole was ended in an interbedded siltstone and dolomitic unit. Re-logging of recent drilling by CRAE proximal to the mineralisation has also been undertaken (Appendix 3.1). The following subdivisions have been made on the basis of both hand specimen and thin section description. Microscope slides used were provided by Dr. A.V. Brown from the Department of Resources and Energy.

3.5 Stratigraphy:

The Cuni sediments can be divided into four main lithologically distinct units:

The basal unit is of undetermined thickness. It occurs as a 9m section in the base of DDHSH1, and consists of an interbedded sequence of light grey dolomite and grey/black mudstone. The dolomite is massive and beds have a maximum thickness of 1.20m. The mudstone interbeds are laminated to finely bedded and reach a maximum thickness of 1.4m. Bedding is at 60° to the core long axis. Minor pyrrhotite mineralisation occurs as isolated veinlets and small clasts in the mudstone units.

Conformably overlying the dolomitic unit is the first of two muddy lithic sandstone units within the Cuni sediments. This unit is approximately 160m thick and has a consistent dip of 60-65°. It consists of rhythmically layered olive-green muddy sandstone and mudstone beds with rare carbonate beds. The sandstone and mudstone units occur as a series of fining upward sequences, while the carbonate beds occur within some of the black mud-rich dominated facies. Beds occur as normally graded cycles that vary in thickness and range from 1-2cm up to a measured maximum of 1.75m. The sandy units consist of; up to 40 modal percent igneous quartz; 30 modal percent polycrystalline quartz, microcrystalline quartz, and mafic volcanic lithics; with minor amounts of mudstone lithics and feldspar. Grainsize varies within each cycle with clasts in the coarser basal portions of the beds

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ranging up to 0.50mm in diameter. Clasts are dominantly sub-angular to sub-rounded with some igneous quartz and polycrystalline clasts being well rounded. Scours and flame structures are common at the base of the sandier beds. Two separate carbonate vein sets crosscut bedding at 45° and 65° respectively. They range in thickness up to a maximum of 20cm and are unmineralised. Mineralisation consists of minor amounts of pyrrhotite and pyrite restricted to fracture planes within the sandier beds. Evidence of shearing in the mudstone beds is seen as a mineral lineation in thin section.

The third lithological unit consists of 45m of unfossiliferous carbonaceous mudstone, minor fine grained sandstone, and carbonaceous grey mudstone. It is divided up into two black mudstone packages of 26m and 76m thickness, with the upper package being intruded by two separate gabbroic bodies. The packages are separated by a distinctive 2m thick, thinly bedded grey mudstone. The lower black mudstone forms the fining upwards continuance of the underlying volcanoclastic sandstone unit. It is uniformly laminated and exhibits little sedimentary structure. Core bedding axes intersect at 35°.

The upper black mudstone is lithologically similar to the lower one with the exception of an increase in carbon content represented by the occurrence of a distinctive graphitic sheen adjacent to the gabbroic contacts. X-ray diffraction analysis of the mudstones by Brown (1991) showed them to contain in excess of 50% amorphous carbon.

Quartz/carbonate and calcite veining regularly occur in both of the black mudstone units. They occur as at least two separate vein sets with an early stage containing 1-2% pyrrhotite and a later set containing small amounts of pyrrhotite and pyrite. The earlier stage cuts across bedding at an angle of 25° to the core bedding axis while the later stage is steeper and averages between 50°-75°. Thicknesses of separate veins range up to a maximum of 6cm.

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Intense shearing sub-parallel to bedding has disrupted the vein sets and gives a sinistral sense of movement. The shearing has also caused brecciation of thin fine-grained sandstone, causing clasts to align parallel to the shear direction. Mineralisation has also been elongate along the shear direction in some instances resulting in the formation of fine pyrrhotite veinlets.

The fourth unit consist of 85m of rhythmically bedded olive green and purple volcanoclastic muddy sandstones, mudstones and carbonate that have a uniform dip of 40-45°. It comformably overlies unit three and is lithologically identical to unit two. The sandstones and mudstones form a series of fining upward cycles that increase in thickness up hole up to a maximum of 5m. The sandier beds consist of 40 modal percent sub-angular to rounded igneous quartz, 25% mafic volcanic clasts, 20% polycrystalline quartz, 10-15% mudstone lithic clasts and minor feldspar. Chlorite makes up a notable part of the matrix, exceeding 30% in some samples. Grainsizes range up to 0.50mm in diameter in the coarser sandy beds. Rip-up clasts and flame structures of underlying mudstone are common at the base of the sandier beds. The mudstone ranges in thickness from 1-2cm at the top of graded beds to units that measure up to 7m in thickness that are dominated by laminated black and grey mudstone beds.

The carbonate within unit four is restricted to a single metamorphosed fine-grained pink bed that is 0.90m thick. This unit has also been identified in CRA Exploration drillhole DDH94MFO2, and may represent a marker unit for the region.

Veining is dominated by a barren calcite vein set and a mineralised quartz/carbonate vein set. The barren veins dip at approximately 40° to the long core axis and rarely exceed 0.5cm in thickness. The quartz/carbonate veins contain some pyrrhotite with minor amounts of chalcopyrite, galena and sphalerite. They dip at 20-35° and range in thickness up to 4cm.

A summary of the relationships between the units identified within the Cuni sediments is shown in Figure 3.2.

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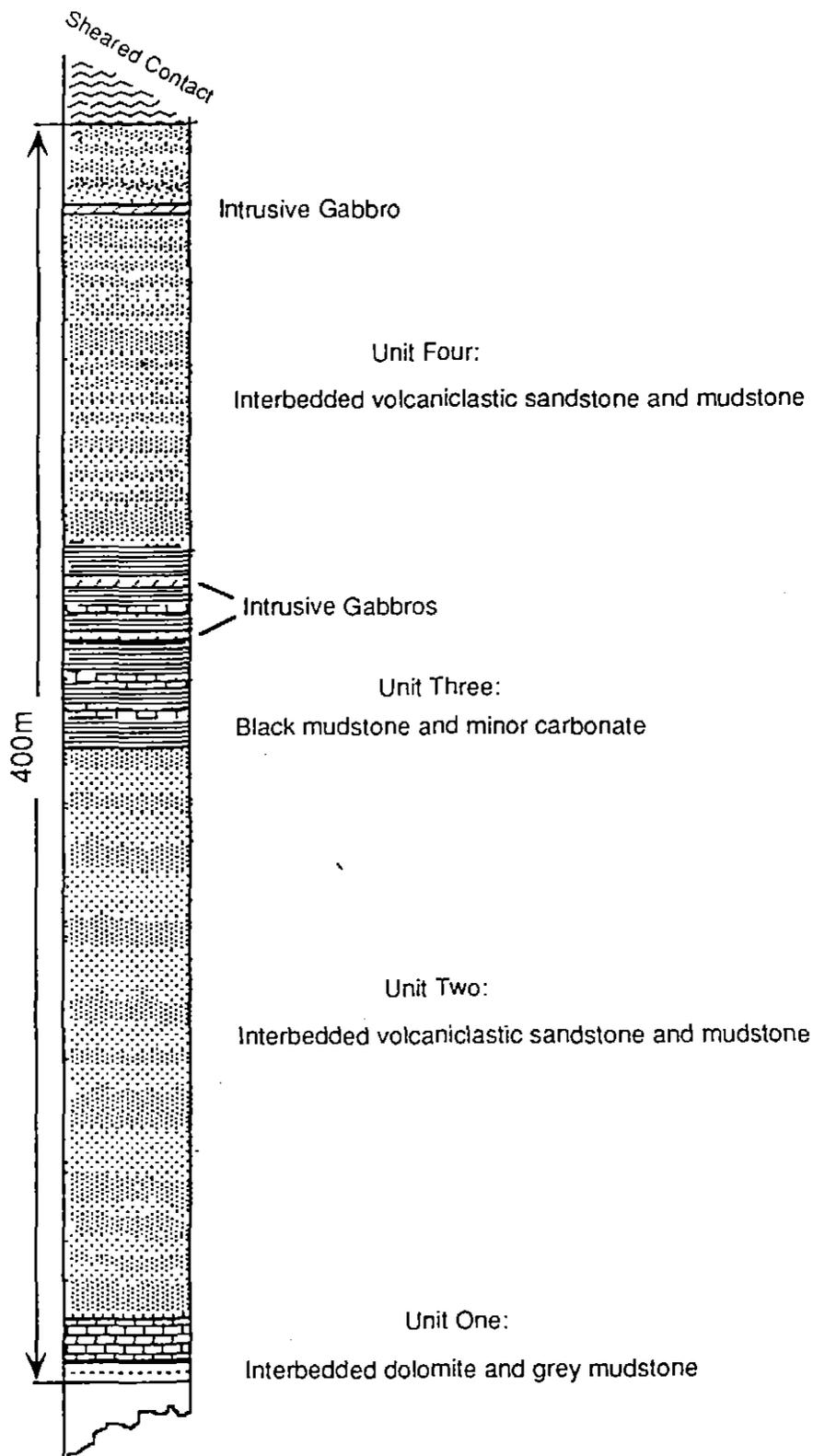


Figure 3.2: Representative stratigraphic column showing the four units of the Cuni Sediments.

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3.6 Environment of Deposition:

An environment of deposition for unit 1 is restricted as the base of the unit was not seen. However, as it is dominated by dolomite interbedded with minor mudstone a shallow water environment is proposed.

Volcaniclastic muddy sandstone and mudstone units 2 and 4 have similar depositional environments. They represent a cyclical depositional process of fine sandstone and mudstone that continues over a prolonged period. This is analogous to turbidite formation and the sequences of fining upward units are similar in style to the massive graded sandstone and mudstone of classic Bouma A and B divisions (Boggs, 1987). Occasional carbonate beds and distinctive colour changes within the units suggest deposition took place in a shallow water environment.

The thick package of black mudstones and associated thin beds of calcareous mudstone of unit 3, indicate an extended period of quiet deep water deposition. As the unit occurs between two volcanolithic turbidite sequences it could either represent a period of sea level change, or a shift in the position of the turbidite fan.

3.7 Discussion:

There are many similarities between the Cuni sediments and the Crimson Creek Formation that outcrops further to the north. These include similarity in lithological units and interpreted depositional environment, as well as a similar partially volcanic provenance. Work by Morrison (1982), Haines (1991), and Morrison (1993), on the Success Creek Group and the Crimson Creek Formation within the Renison Mine sequence has resulted in a detailed stratigraphy being compiled (Fig. 3.3). Morrison (1993) divided the lower 900m of the Crimson Creek Group into four main sedimentary units, each of which consists of an upward fining package of sandstone, mudstone, and limestone. Coarser sandstone units within the Crimson Creek Formation have a mafic volcanogenic provenance and have been described

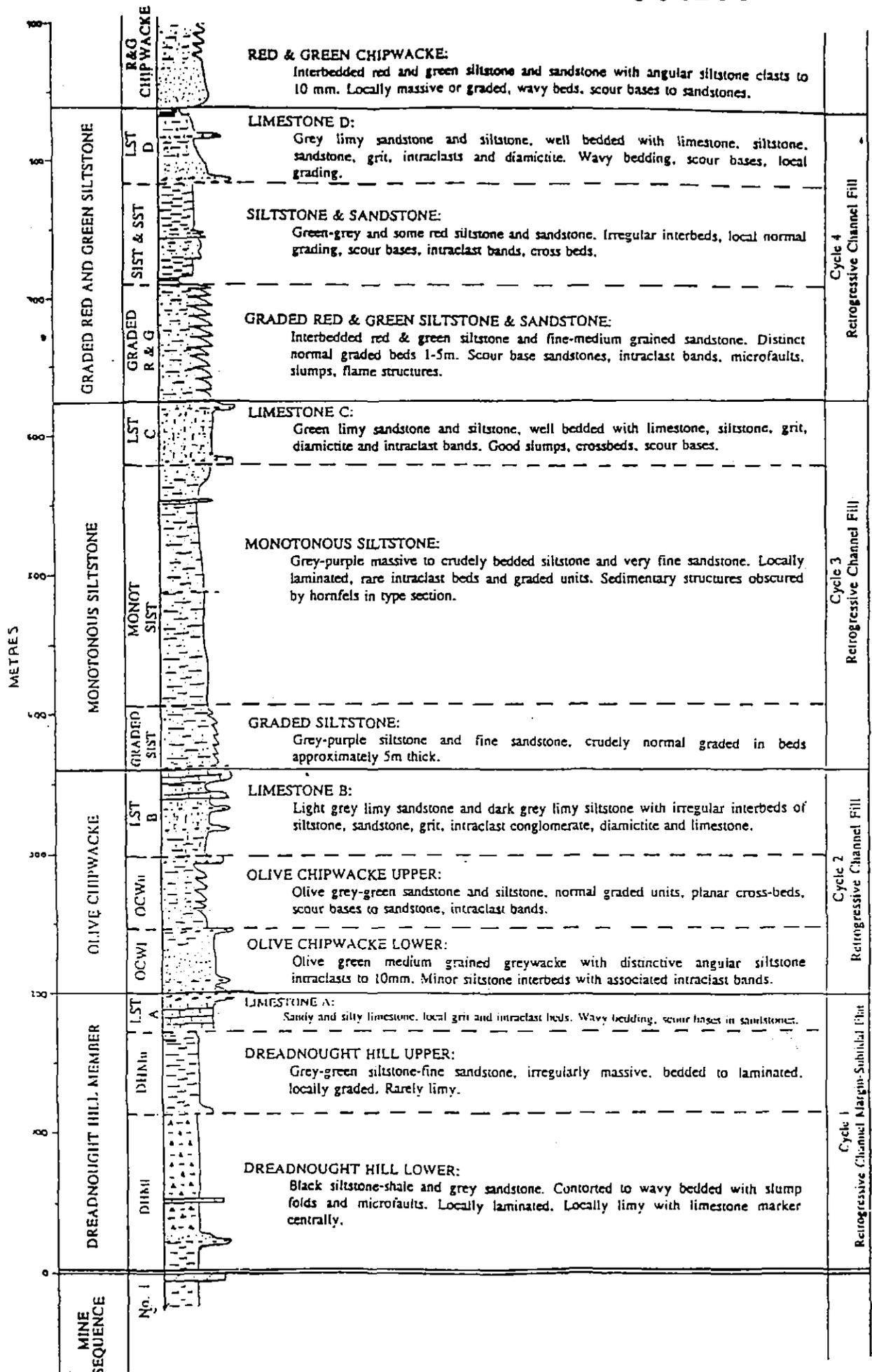


Figure 3.3: Stratigraphic section and description of the lowermost 900m of the Crimson Creek Formation within the Renison Mine sequence. (after Morrison, 1993)

by Haines (1991), as comprising poorly sorted fragments of fine grained basalt, clinopyroxene, feldspar and opaques. Colour variations have also been noted within the Crimson Creek Formation with distinctive purple and olive green coloured units being suggested by Brown(1986) and Haines (1991) as reflecting oxidation state controlled by differing amounts of volcanoclastic material.

A similar association is noted within the Cuni sediments. Volcanoclastic sandstones contain similar detrital grains as the Crimson Creek Formation with the dominant volcanic component consisting of mafic clasts. Detrital clinopyroxene grains are notably absent from the Cuni sediments, however, as clinopyroxene is unstable the occurrence of chlorite in the matrix could indicate that it was originally present (Boggs, 1987). An andesitic component within the Cuni sediments as identified by Brown (1991), was not positively identified during the course of this study and the problem of whether it is in fact volcanic or rather a partly altered fine grained siliceous sediment, remains unresolved. The carbonate units that occur within the Crimson Creek are not well represented within the Cuni sediments, although unit one may be the top of one of Morrison's sedimentary cycles (Morrison, 1993). Lateral distribution of the limestone units and the black shales of the contorted subunit within the Renison Sequence have been shown to be erratic with the result that only general correlations can be made between units (Morrison, 1993). Following a similar argument, the thick (~90m) package of graphitic black mudstones of unit three can be correlated with either the Upper Contorted unit of Morrison (1982) or similar black mudstone unit within the Crimson Creek Formation.

Comparisons with other sediment packages within the region such as the Dundas Group, the Success Creek Group or the Roseberry Group as suggested by Brown (1991), are not supported by the lithological characteristics of the Cuni Sediments. Affiliations with units of the Dundas Group can be ruled out on the basis of major lithological differences. These

include the fossiliferous nature of the Dundas Group, the occurrence of felsic to intermediate detritus (Brown, 1986; Jago and Brown, 1989).

The sediments of the Success Group also show markedly different lithological characteristics in comparison with the Cuni sediments. The sediments within the Success Creek Group were deposited in shallow water as evidenced by conglomerates and quartz-rich sandstones and contain neither a volcanic detrital component, nor a black mudstone facies such as is seen within the Cuni sediments (Brown, 1986).

The Roseberry Group has been described as being contemporaneous with the Mt. Read Volcanics and is proposed to be a Dundas Group correlate (Green, 1983; Brown, 1986). This is supported by the occurrence of a significant proportion of felsic volcanic detritus within the conglomeratic and volcanoclastic muddy sandstone units. Mafic volcanic detritus, such as occurs within the Cuni sediments has not been reported as occurring within any of the five recognised formations, or within any correlates, of the Roseberry Group.

Chapter Four: Igneous Rocks

4.1 Cuni Gabbro:

4.1.1 Introduction:

Two compositionally similar gabbros host the Cu/Ni mineralisation at Cuni. Of these, only the eastern body ("Eastern Gabbro"), has been mined, and the "Western Gabbro" has been previously determined to be uneconomic. Recent work, (Ellis, 1987; Maher, 1995) has recognised several gabbroic bodies parallel to the two main gabbros; however they are unmineralised and are restricted to the northern part of the Cuni field.

The two main gabbros occur as a series of five concordant, pod-shaped bodies over a north-south strike length of approximately 2km, and both dip at approximately 60° to the east. Both dykes have a tendency to pinch out at around 30m depth (Robinson, 1959). They are also discontinuous along strike, with the extent of each pod controlled by a series of north-west directed faults that dip to the south-west, which gives the bodies a southerly pitch (Reid, 1925). The thickness of the gabbroic bodies varies along strike with the Eastern Gabbro ranging up to 10m, and the Western Gabbro up to 12m thick (Maher, 1995).

Contact relationships between the eastern and western gabbro and the host sediments vary along strike. In places, chilled margins and baked sediments indicate contact metamorphism, whereas in others, the margins are faulted, as evidenced by quartz and quartz/carbonate veining. Interfingering relationships between the gabbro and the host sediments also occur, with xenoliths of sediment occurring within parts of the Western Gabbro.

Compositional layering was not recognised either in the limited outcrop or in drillcore.

Again due to the low lying nature of the area, a thick soil and vegetative cover restricted access to samples of either of the two gabbros. Therefore samples were picked up off ore dumps and taken from drill core.

4.2 Mineralogy:

4.2.1 Textures:

Grainsize of both gabbroic bodies increases away from their margins. Pervasive hydrothermal alteration and/or metamorphism has destroyed most of the primary textures of the gabbros. Alteration is particularly well developed in the Western Gabbro intersected in diamond drillhole MF04 by C R A E in recent drilling (see later).

4.2.2 Primary Mineralogy:

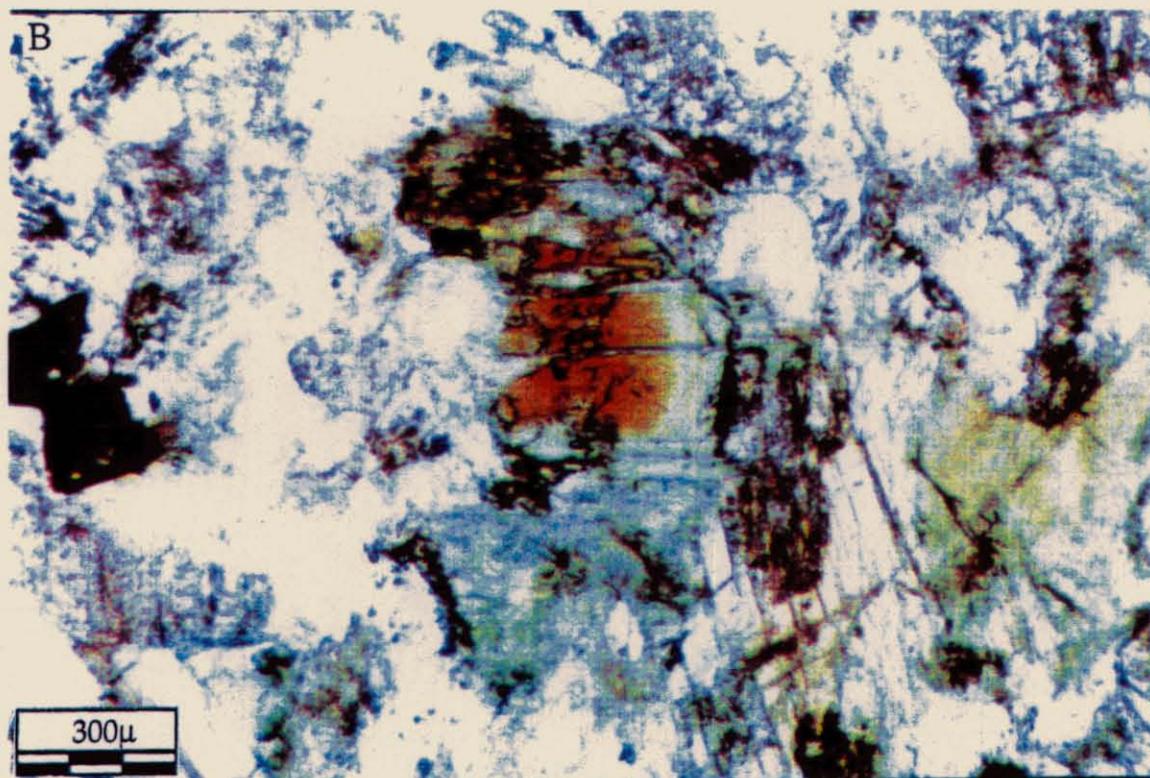
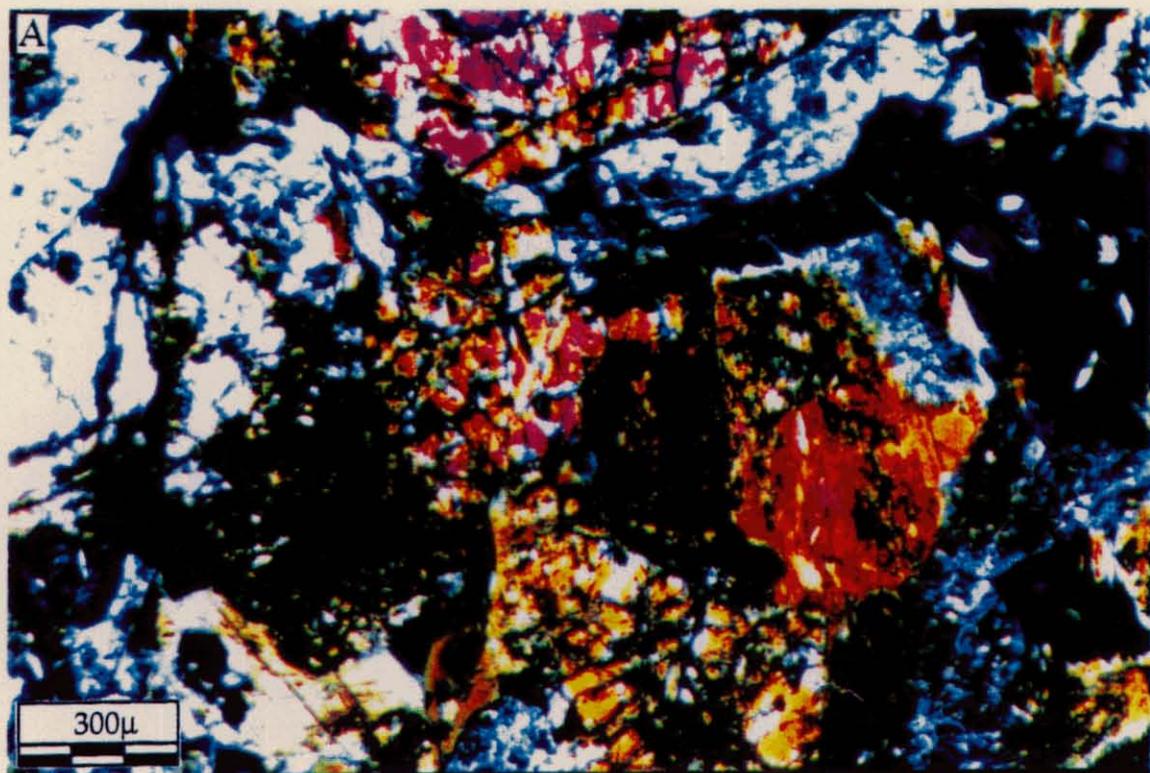
Olivine: No primary olivine is preserved within either the Eastern or Western gabbros. However in the lower parts of the Western Gabbro relict olivine crystal shapes are pseudomorphed by polycrystalline quartz. Further evidence for olivine having been a primary magmatic phase is shown geochemically by an increase in MgO in the basal parts of the sills, that is not accompanied by an increase in modal pyroxene, the only other significant Mg bearing mineral in the sills. The former olivine grains are mainly 0.25-0.50mm long and make up approximately 1-2 modal percent of the lower part of the Western Gabbro.

Clinopyroxene: Primary clinopyroxene is scarce in both sills, with most being altered to chlorite. Most of the fresher grains have been fractured and altered to some degree, however their optical continuity shows that the original grains were mainly euhedral and have a subophitic relationship with plagioclase (Plate 4.1). Marginal

A) Plate 4.1: Primary augite showing a sub-ophitic texture with altered plagioclase from Eastern Gabbro. Sample MF02-43.3.

B) Plate 4.2: Zoned late-magmatic edenitic hornblende from Western Gabbro. Sample MF02-82.8.

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transitions from mainly colourless clinopyroxene to pleochroic amphibole occur at the edges of some clinopyroxene grains, with the latter grading from brown into green toward the grain margin. Grainsize varies with the proximity of the sill margin and ranges up to 5mm in diameter in the interiors of the sills.

Amphibole; Amphibole occurs both as a primary and a secondary phase in both sills. Primary amphibole is euhedral to subhedral in shape and shows distinct zoning from a brown core region to a pale greenish margin (Plate 4.2). The margin, in turn, often grades into actinolite. Secondary amphibole is restricted to the green variety only, and usually forms fringes around the margins of clinopyroxenes.

Distribution of the amphibole through the dykes could not be determined due to the extensive alteration, and therefore any concentration of the H₂O-rich late magmatic fluids towards the top of the sills could not be proven.

Plagioclase: All original plagioclase in the Eastern and Western Gabbros has been altered, and as a result, primary textures are often largely obliterated. The modal content of plagioclase changes across both intrusions with a notably higher percentage occurring toward the top of each sill. Individual crystals are elongate and tabular, changing in grain size from 0.10mm lathes in the finer-grained margins to elongate crystals 4mm long, in the coarser parts of the sills.

In the coarser sections of both sills, plagioclase, sub-ophitically enclosed in fresh and altered clinopyroxene, has been analysed on the microprobe as consisting of a mixture of albite, carbonate and sericite.

FeTi oxides: FeTi oxide minerals make up between 1-2% of the assemblage of the gabbroic bodies. There is little modal difference between the two bodies, however the FeTi oxides in the Western

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gabbro are slightly more equant and euhedral when compared with the Eastern gabbro. Hydrothermal alteration has resulted in exsolution textures, in which magnetite has exsolved from FeTi oxide along octahedral planes, and resulting ilmenite is largely altered to leucoxene. Reflected light microscopy showed that relict Fe-Ti-oxides are always composed of at least two distinct phases, and subsequent microprobe analysis identified them as being mainly composed of magnetite, titanomagnetite, and ilmenite.

4.2.3 Alteration Mineralogy:

As little primary mineralogy is preserved, both the Eastern and Western Gabbros are made up largely of secondary alteration mineral assemblages. These include albite, sericite and carbonate after plagioclase; chlorite, quartz and actinolite after pyroxene and hornblende, and leucoxene after Fe/Ti oxides. These assemblages, particularly the occurrence of fibrous actinolite fringes on the margins of some clinopyroxenes, indicate a greenschist facies metamorphic grade, implying recrystallisation around 300° C (Yardley, 1989).

Alteration processes have also introduced sulphide minerals into the gabbros, with discrete euhedral to subhedral pyrite, chalcopyrite, and pentlandite occurring in varying amounts in both the Western and Eastern bodies.

4.3 Mineral Chemistry:

4.3.1 Introduction:

In order to determine the geochemical history and affinities of the primary melt compositions, 47 clinopyroxene crystals and 21 primary amphibole crystals from samples of both the Eastern and Western Gabbro were analysed using the Cameca SX-50 microprobe at the Central Science Laboratory, University of Tasmania.

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4.3.2 Clinopyroxenes:

Representative analyses of clinopyroxenes from samples taken across the Eastern and Western gabbroic sills are presented in Table 4.1. The crystals were fresh and optically homogenous, and in most cases represented the only preserved magmatic phase within the variably altered and metamorphosed mineral assemblages. Each crystal was analysed, where possible, for a minimum of two spot analyses in order to check for compositional zoning effects during crystallisation.

Point	MFO5-36.8	MFO5-36.8	MFO1-47.7	MFO1-47.7	MFO1-43.3	MFO1-43.3
Mineral	CPX R3 CORE	CPX R3 RIM	CPX R7 CORE	CPX R7 RIM	CPX R3 CORE	CPX R3 RIM
Na ₂ O	0.287	0.354	0.283	0.33	0.291	0.279
MgO	15.67	16.491	14.798	14.097	15.272	15.348
Al ₂ O ₃	2.149	2.32	4.025	4.282	3.885	3.779
SiO ₂	51.627	51.976	50.066	49.449	50.562	50.413
P ₂ O ₅	0.408	0.37	0.398	0.325	0.35	0.415
K ₂ O	0.005	0.019	0	0	0	0
CaO	21.521	21.688	21.572	21.326	22.14	21.783
TiO ₂	0.653	0.32	0.884	1.099	0.611	0.627
Cr ₂ O ₃	0.258	0.304	0.267	0.314	0.87	0.848
MnO	0.216	0.17	0.225	0.265	0.12	0.175
FeO	7.501	6.51	7.956	8.804	6.228	6.322
NiO	0.032	0	0	0.043	0.068	0.088

Table 4.1: Representative microprobe analyses of three clinopyroxene grains from samples MFO5-36.8, MFO1-47.7, and MFO1-43.3 of Cuni gabbro.

4.3.3 Results:

Structural formulae for the pyroxene analyses were calculated on the basis of 6 oxygens and analyses are plotted on a CaSiO₃-MgSiO₃-FeSiO₃ diagram (Fig. 4.1). They are predominantly augite, with a slight overlap into the diopside field. The pyroxenes are compositionally unzoned to slightly normally zoned. Mg# exhibits nominal changes across individual grains from both the Western and Eastern gabbros, however there is a notable difference in the

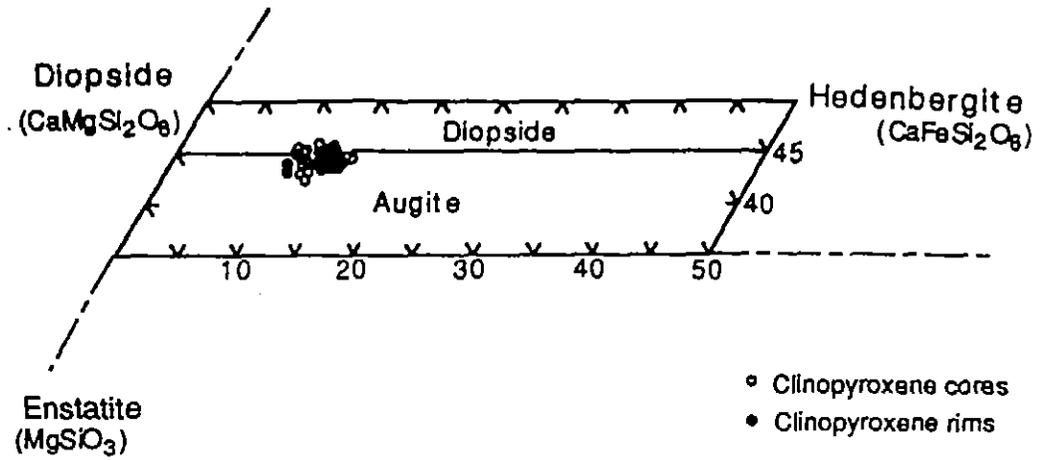


Figure 4.1: Plot of clinopyroxene compositions from the Cuni gabbros on a Enstatite-Wollastonite-Ferrosilite diagram. Clinopyroxene cores shown as open circles, rims as closed circles. (after Deer et al., 1992).

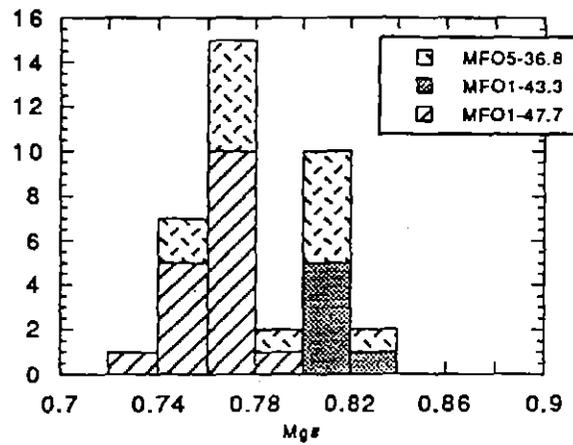


Figure 4.2: Plot of the changes in Mg# for clinopyroxene grains from samples MFO5-36.8, MFO1-43.3, and MFO1-47.7 of Cuni gabbro.

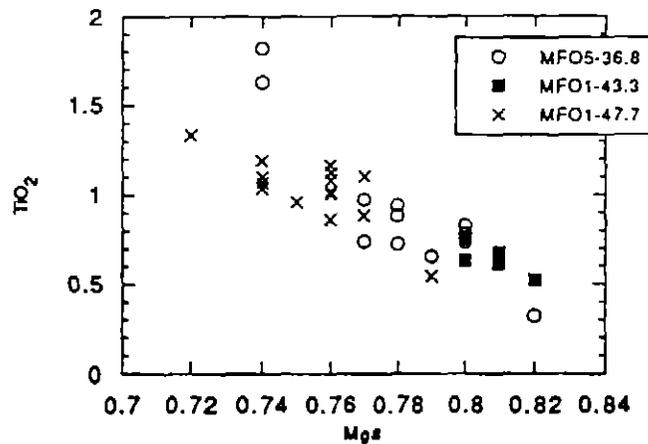


Figure 4.3: Plot of TiO_2 vs Mg# for clinopyroxene grains from Cuni gabbro samples MFO5-36.8, MFO1-43.3, and MFO1-47.7.

samples taken from 43.3m and 47.7m in the Eastern gabbro (Fig. 4.2). The clinopyroxene within sample MFO1-43.3 show a higher average Mg# (~81), when compared with MFO1-47.7 (Mg#~77), while samples from MFO5-36.8 form a spread of values between the two. Relationships between TiO₂ and Mg# for each of the samples show an inverse trend with TiO₂ decreasing with an increase in Mg# (Fig. 4.3). The behaviour of Mg# within clinopyroxenes from both the Western and Eastern gabbros is consistent with fractionation of the original melt composition, with TiO₂ concentrations showing similar trends.

4.4 Amphiboles:

Analyses of amphibole grains were undertaken in order to compare with other late stage amphiboles from other intrusions. Both the centre and margins of 21 amphibole crystals were analysed in order to determine any chemical change during crystallisation. Analyses are given in Appendix 4.3.

4.4.1 Results:

Due to the microprobe not analysing for Fe₂O₃ the analyses were recalculated on the basis of 23 oxygens and then normalised to 13 cations excluding (Ca+Na+K), using Si+Ti+Al+Fe+Mn+Mg=13 cations (13ECNK), (Leake,1978; Cosca, 1991). This formula unit contains eight tetrahedral sites and corresponds to half and one quarter of the unit cell for monoclinic and orthorhombic amphiboles respectively.

Following the criteria of Leake (1978), the amphiboles plot in the edenitic hornblende field with a slight overlap into the edenite field (Figure 4.4). From the tabulated data, Mg shows a slight depletion trend from the core to the rim of most amphibole grains while Fe shows an opposite trend. Other elements such as Si, Ti, Na, and Al are less uniform and show both a slight increase and decrease across different grains, possibly reflecting localised changes in chemistry within the melt.

Calcic Amphiboles; $(Ca + Na)_B \geq 1.34$; $Na_B < 0.67$

$(Na + K)_A \geq 0.050$; $Ti \leq 0.50$; $Fe^3 \leq Al^{VI}$

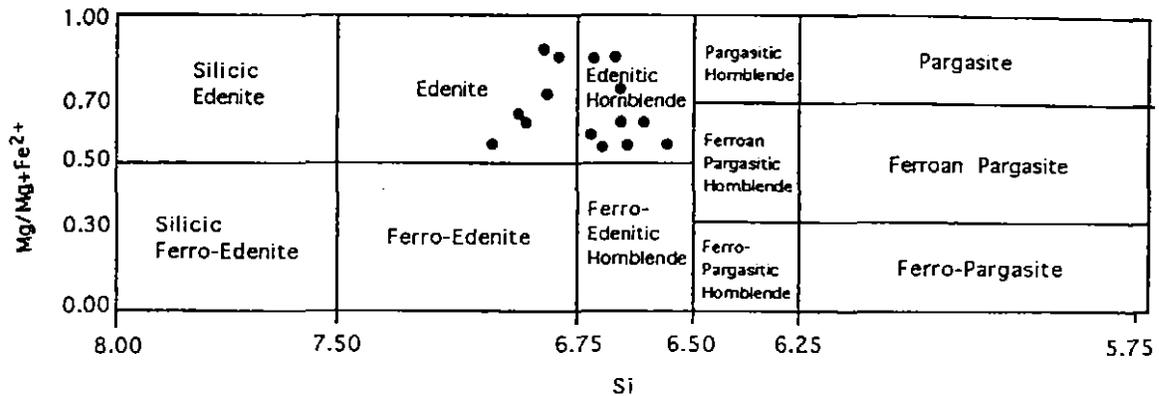


Figure 4.4: Classification diagram of the amphiboles from the Cuni gabbroic intrusives with individual analyses represented by closed circles. Redrafted after Leake (1978).

4.4.2 Discussion:

Analyses of amphibole from igneous rocks rarely exceed Si 7.50 in the half unit cell Leake (1971), yet textural evidence of the edenitic hornblende and edenite from the Cuni gabbroic intrusives suggests that they are of primary origin (Crawford, 1995; Gole, 1994). It is proposed that the amphibole within the gabbro did not crystallize primarily from the magma and rather replaced magmatic pyroxene at a temperature below the liquidus. The slight depletion in Mg is recording closed system fractionation of pockets of trapped melt in the plagioclase-augite±olivine crystal framework of the near-solidified gabbro. Variations in the Na content as shown by the spread of compositions between edenitic hornblende and edenite, along with minor fluctuations in the content of Al, Ti, and Si are likely to be due to fluctuations in the fluid phase at the time of crystallisation. Other variables such as pressure, temperature, f_{O_2} and mineral buffers could also contribute in defining cation content and may also play a major part in determining final compositions (Haslam, 1968; Offler, 1984).

4.5 Clinopyroxene composition as an indicator of magmatic affinities:

4.5.1 Introduction:

Initial work by Kushiro (1960); Le Bas (1962) and Verhoogen (1962) and later studies by Nisbet and Pearce (1977), Weiblen et al. (1982), Leterrier et al. (1982), and Beccaluva et al. (1989), has shown that the composition of clinopyroxenes can be a reliable petrogenetic indicator. From plots of numerous elements against one another from many different suites of mafic rocks, a series of fields have been derived and from these it is possible to classify the affinities of the host rock based on the geochemical signatures of the clinopyroxenes (Le Bas, 1962; Leterrier, 1982). Using the microprobe analyses of clinopyroxenes from the Cuni gabbros (Appendix 4.1), similar plots were made in an attempt to determine their magmatic affinities.

4.5.2 Results:

An initial plot of $\text{SiO}_2\%$ versus $\text{Al}_2\text{O}_3\%$ (Nisbet and Pearce 1977), shows that the clinopyroxenes occur within a host that is mainly subalkaline, with a slight overlap into the alkaline field (Fig. 4.5). This assignment to the subalkaline suite is supported by plots of Ti versus Ca+Na, which classify the Cuni Gabbros as being either tholeiitic or calcalkaline (Fig. 4.6). It is difficult to further separate these alternatives using clinopyroxene chemistry alone, as the essential difference between calc-alkaline and tholeiitic suites relate largely to initial differences in primary oxidation state and volatile (mainly H_2O) content (Wilson, 1989). As the Cuni gabbros did not crystallize primary amphibole until very late in their magmatic history, this might support a tholeiitic parentage for these rocks.

4.6 Whole Rock Geochemistry:

4.6.1 Introduction

There were four main objectives of the geochemical study carried out on the intrusive bodies at Cuni. They were:

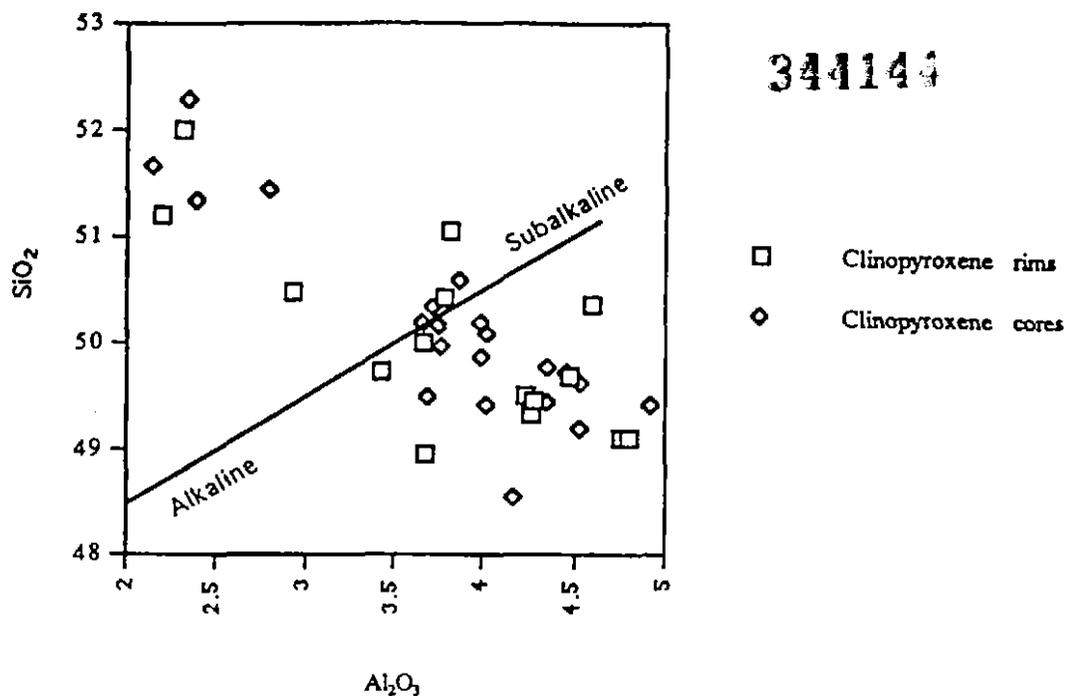


Figure 4.5: SiO_2 versus Al_2O_2 plot to determine affiliations of the Cuni magma. Fields after Nisbet and Pearce (1977).

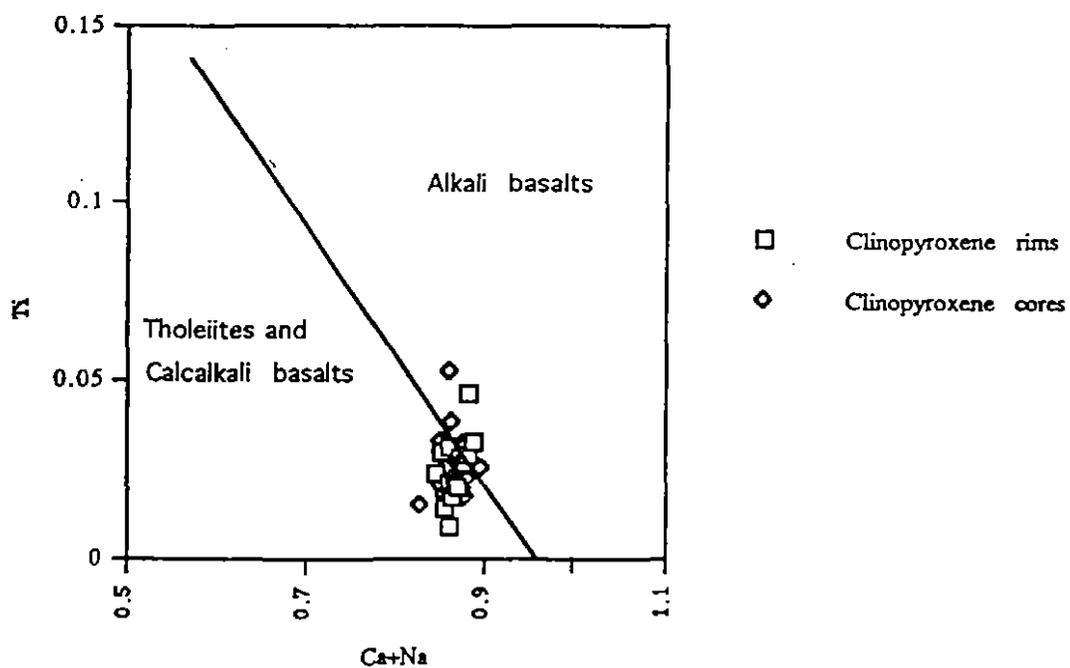


Figure 4.6: Ti versus Ca+Na plot to determine the magmatic affiliations of the Cuni gabbros. Fields after Leterrier et al. (1982).

- 1) To characterize the major and trace element compositions of the sills and test whether they are vertically differentiated.
- 2) To compare the upper and lower (Eastern and Western) sills and determine whether they are likely to be comagmatic.
- 3) To determine the magmatic affinities of the intrusives and whether they are tholeiitic or alkaline.
- 4) To correlate with other mafic intrusives in the region to relate the Cuni gabbros to a definitive magmatic event in Western Tasmania.

Sampling involved the careful selection of least altered and texturally homogenous rocks from drill core recently drilled by C R A Exploration. Individual samples were selected to minimise the amount of carbonate/quartz veining. A total of 7 samples of the intrusive at Cuni were analysed, together with 4 samples of gabbroic intrusives from the Mineral Resources Tasmania diamond drill hole SH1 (see Chapter 3). Wholerock analytical data kindly supplied by C R A Exploration and analyses of other mafic intrusives from within the region by other workers, have also been utilised.

4.6.2 Methods:

Samples were crushed to <5mm in diameter using the steel jaw crusher and approximately 500g of sample collected. This fraction was then divided using a splitting sieve and 14g of unoxidised sample was retained. These chips were then ground in a porcelain mill for three minutes, to fine powder.

From the powder, fused discs and pressed powder pills were prepared following the techniques discussed by Norrish and Chappell (1975). These were then analysed on a Philips automated X-ray Fluorescence Spectrometer, at the University of Tasmania.

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Ignition losses were determined by reweighing the samples after 2g of the powder was heated in a platinum crucible at 1000°C for ten hours.

Major element data has been recalculated to 100%, on a volatile-free basis to facilitate comparisons of variably altered samples. Minor and trace element data is presented as parts per million (ppm).

Four Cuni gabbro samples,(MFO2-43.0, MFO2-47.7, MFO2-82.8, and MFO5-36.8), were submitted to Helen Waldron at Bequerel Laboratories for high precision REE analysis. The elements analysed were: La, Ce, Nd, Sm, Eu, Tb, Ho, Yb, and Lu. The results were normalised to chondrite using values from Taylor and Gorton (1977).

4.6.3 Results:

A complete list of analytical results is given in Appendix 4.2.

The seven samples of Cuni gabbro are taken from three traverses across both the Western and Eastern gabbros. Samples MFO2-43.0 and MFO2-47.7 are both from the Eastern gabbro at depths of 43.0m and 47.7m respectively. Samples MFO5-34.3, MFO5-36.8, and MFO5-40.0 are from the Eastern gabbro at depths of 34.3m, 36.8m and 40.0m. Samples MFO2-82.80 and MFO2-93.50 are from depths of 82.8m and 93.50m from the Western gabbro. Four C R A Exploration samples were included in this study. Samples 3757233 and 3757234 were from drillhole MFO2 at depths of 43.20 and 85.60m and were taken from the Eastern and Western gabbros respectively. Samples 3757235 and 3757236 are from drillhole MFO5 at depths of 40.10m and 57.80m and are also from the Eastern and Western sills.

The Cuni gabbros have undergone greenschist facies metamorphic alteration and therefore only some of the elements can be used when attempting to interpret the chemistry of the rocks. Hydrothermal alteration and subsequent addition of K- and Cu/Ni/Fe- rich fluids is evidenced by the presence of fuchsite

within carbonate altered gabbro in DD1994MFO3 and disseminated and massive copper/nickel and iron sulphides within both gabbroic intrusives. The elements that are considered to be essentially immobile in this style of alteration include Ti, Zr, Y, P, Nb and the REE (Barrett and MacLean, 1994).

Comparisons of Mg, Fe, Na, and Cr for samples taken across the Eastern and Western gabbroic sills in drillhole MFO2 show an increase in Mg, Fe, and Cr in the stratigraphically lower samples and a higher level of Na in the upper samples. Mg# values across both dykes show very little change, with small increases in the Eastern and Western gabbro from MFO2 and a similar small increase toward the centre of the Eastern gabbro in MFO5. Samples from drillhole MFO5 reflect the fact that the upper and lower samples were taken from close to the sill margins, and probably represent more liquid compositions away from the fractionated central section of the sill. The Mg, Fe, and Cr enrichment and Na depletion trends infer that some limited vertical differentiation has taken place in the Eastern and Western gabbroic sills. This is explained as a consequence of the more Fe- and Mg-rich early crystallising minerals such as olivine and pyroxene settling toward the base of the sill and the more sodium-rich plagioclase being concentrated towards the top. High Cr levels in the basal portions of both sills reflect the occurrence of Cr-spinel which is also an early crystallising phase, often associated with olivine.

In summary, a small but significant increase in Mg# downward in the Western sill indicates that limited accumulation of clinopyroxene+olivine±Cr-spinel has occurred in the lower part of this sill. It is likely that similar fractionation occurred in the similarly-thick Eastern sill, but strong hydrothermal alteration limited sampling to locations too close to the upper and lower margins of this body to make a useful judgement.

Similar major, trace and rare element abundances indicate the Eastern and Western gabbroic intrusives are comagmatic.

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Both sills have similarly high average MgO (12.7wt%), high average total FeO (11.7wt%), and TiO₂ contents between 0.7 and 0.9 wt%. Nickel concentrations are within the same range of 295-595ppm.

Trace element ratios for both the Eastern and Western gabbro also have similar values. Ti/Zr for the Eastern gabbro range from 154-230 ppm while the Western gabbro ranges from 110-168 ppm. Both gabbros have similar Ti/V values ranging between 24.5-33.3 ppm. Other ratios such as Nb/Y, Zr/Nb and Zr/Y also show similar ranges for both gabbros indicating that they are most probably comagmatic. These observations are supported by petrographical descriptions of the rocks discussed earlier (see Section 4.1.2).

In addition to determining the magmatic affinities of the Cuni gabbros using clinopyroxene chemistry (Section 4.2), additional plots were undertaken using the results of wholerock analyses. Following the work of Winchester and Floyd, (1976), plots of P₂O₅ vs Zr, Nb/Y vs Zr/P₂O₅, and TiO₂ vs Zr/P₂O₅, indicate that the Cuni gabbroic intrusives are of tholeiitic affinities (Figures 4.7; 4.8; 4.9).

Due to the primitive nature of the Cuni gabbros, comparisons with other mafic volcanic suites in the region, such as the Henty Dyke Swarm and the Crimson Creek and related tholeiites, is difficult. However, similar rocks with high MgO and FeO occur as part of the Henty Dyke Swarm (R8), and correlates of the Crimson Creek tholeiites at Double Cove (DC13). The sample from Double Cove also has low TiO₂ (~0.80wt%), high Ni and Cr, and similar levels of Zr (37ppm) all of which are comparable with values from the Cuni gabbros. Direct comparison between plots of various immobile trace element ratios had limited success in differentiating a definitive Cuni gabbro correlate. Plots of Zr/Y vs Ti/Zr tend to group the data with the Henty dyke swarm to a greater degree than with Crimson Creek tholeiites and their correlates, while others such as Ti/V vs Nb/Y place the Cuni gabbros in more of a transition between the two. (Fig. 4.10; 4.11).

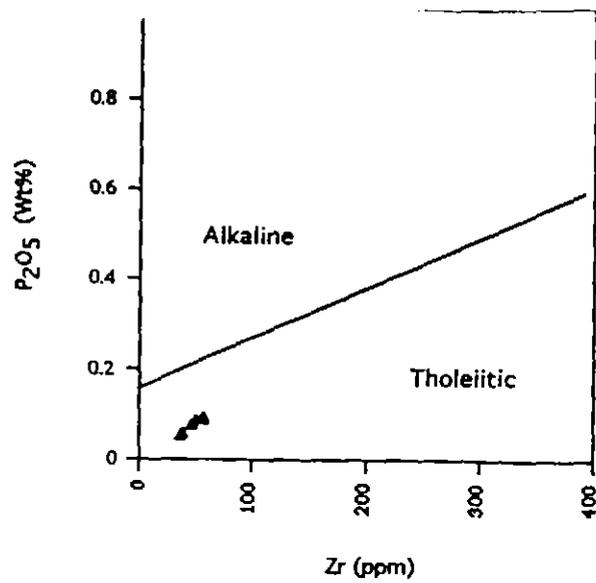


Figure 4.7: P_2O_5 versus Zr diagram to determine the magmatic affiliation of the Cuni gabbros using wholerock geochemical data. Redrafted after Winchester and Floyd (1976).

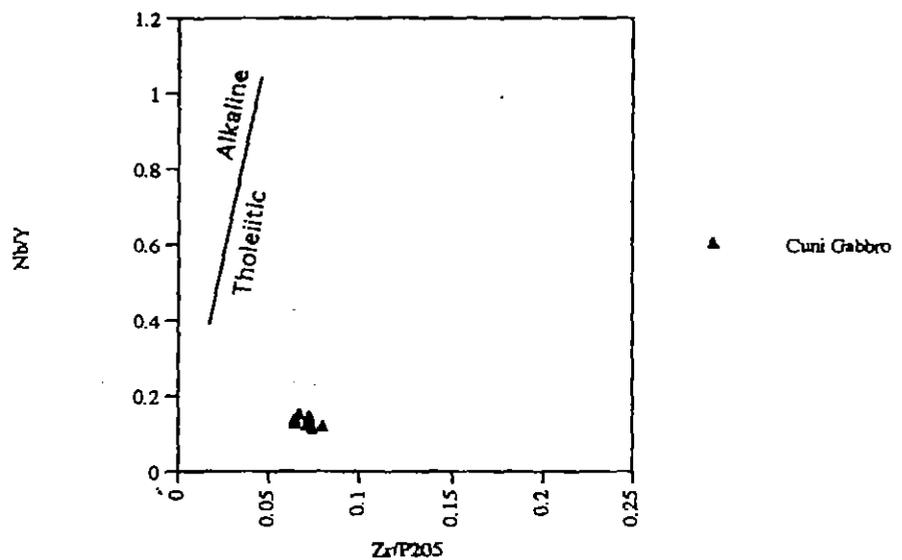


Figure 4.8: Nb/Y versus Zr/P_2O_5 plot to determine the magmatic affinities of the Cuni gabbros from wholerock geochemical data. Redrafted from Winchester and Floyd (1977).

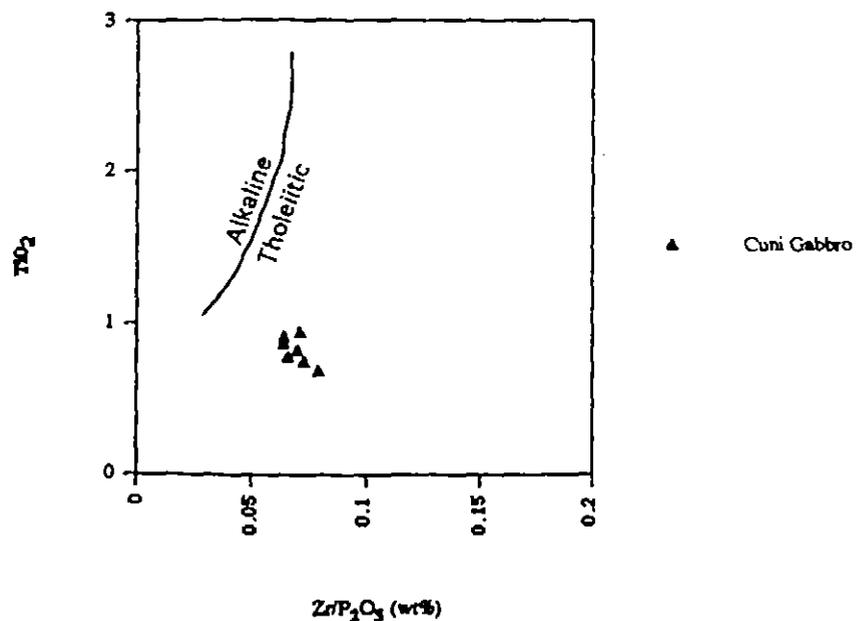


Figure 4.9: TiO_2 versus Zr/P_2O_5 plot to determine the affinities of the Cuni gabbros from wholerock geochemical data. Redrafted from Winchester and Floyd (1977).

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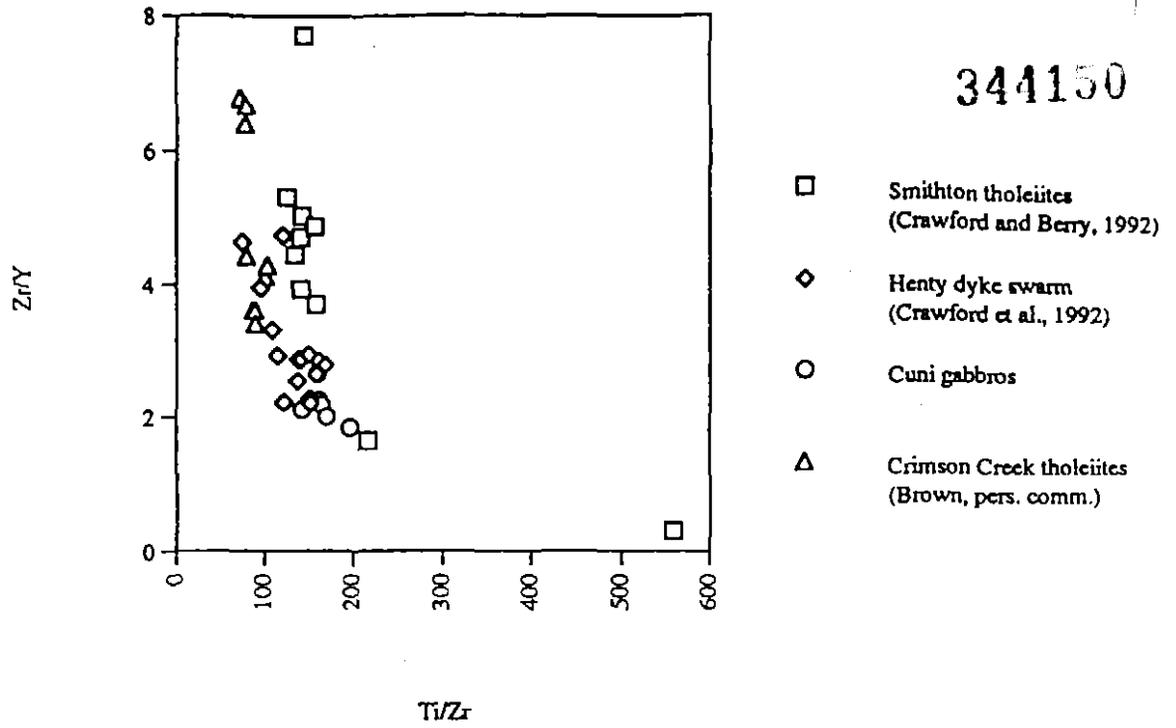


Figure 4.10: Zr/Y versus Ti/Zr plot of trace element data from Cuni gabbros plotted against similar data from the Smithton tholeiites, Henty Dyke Swarm and Crimson Creek tholeiites to determine possible affinities.

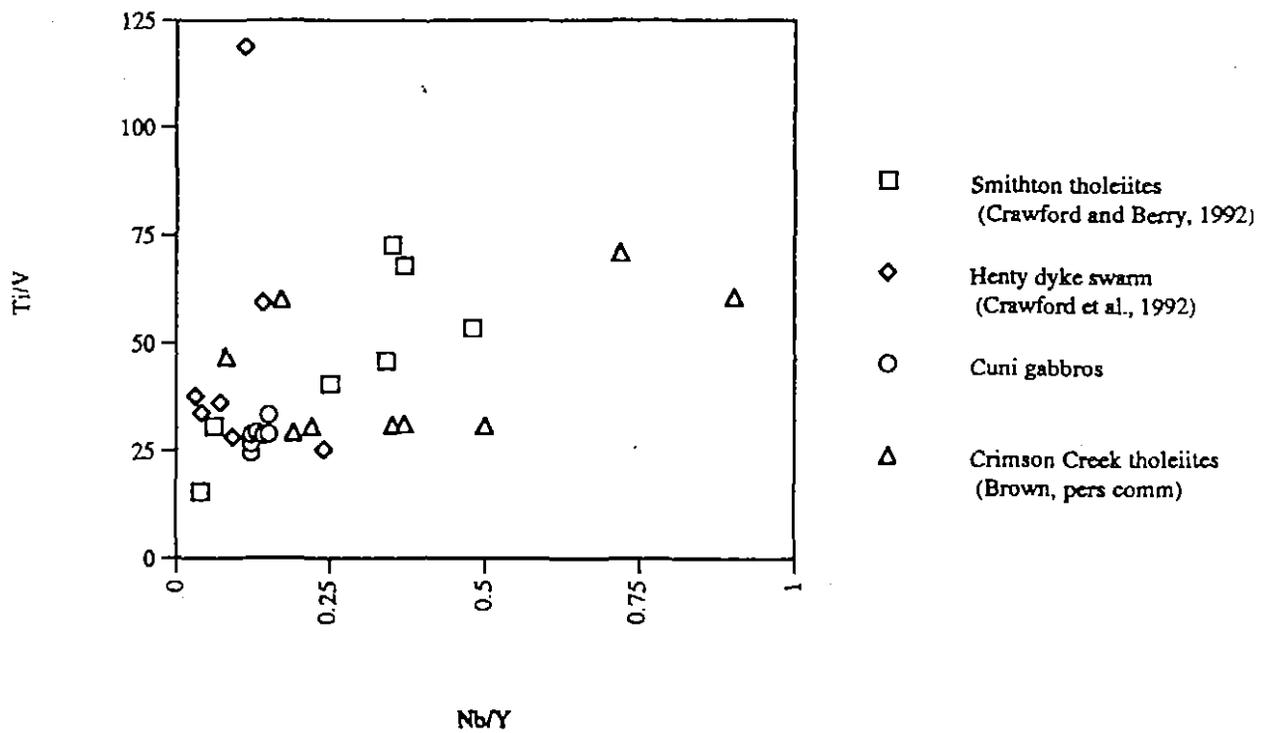


Figure 4.11: Ti/V versus Nb/Y plot of trace element data from the Cuni gabbros plotted against the Smithton tholeiites, Henty Dyke Swarm and the Crimson Creek tholeiites to determine possible affinities.

The REE data adds limited support to the Henty dyke swarm being a correlate of the Cuni gabbros. Chondrite normalised plots of the data are flat lying with a slight enrichment in the LREE. Values range from approximately 10× chondrite to a maximum of 25× chondrite (Fig. 4.12). Comparative REE data is restricted to the Henty fault wedge and the Henty dyke swarm, with no data being available for Crimson Creek gabbros. Comparative plots with the Crimson Creek basalts show marked differences and have as a result been discounted from this discussion (Brown, pers. comm.). Comparison with the Henty dyke swarm and Henty fault wedge shows similar LREE enrichment. In comparison with the Cuni gabbros, values are slightly higher with respect to chondrite ranging up to 50× chondrite and 30 chondrite for the Henty fault wedge and Henty dyke swarm respectively (Fig. 4.13). Combined with the slightly more flat-lying overall pattern seen for the Cuni gabbros a grouping with the Henty dyke swarm is difficult and further data from the Crimson Creek gabbros is needed before a definitive judgement is made.

4.6.4 Discussion:

The Eastern and Western gabbros at Cuni occur as comagmatic bodies. From geochemical and petrographic analyses they show some signs of vertical differentiation with noticeable increases in the earlier phase elements such as Mg, Fe, Cr and Ni seen in the basal portions of both bodies. The opposite is also true for Na, K and Sr with changes reflecting the minor increase in plagioclase at the top of the sills. Similar distribution of elements across both sills along with the same primary mineralogy suggest that the two sills are comagmatic. They are primitive melts as inferred from their high percentages of Mg and Fe and have been derived from crystallisation at low pressure from a tholeiitic to subalkalic magma. Both bodies have undergone extensive metamorphism as evidenced by the high amounts of chlorite occurring both interstitially and as pseudomorphs of clinopyroxene. Hydrothermal alteration has also had a marked effect on both gabbros and the occurrence of chrome-rich micas and disseminated sulphides.

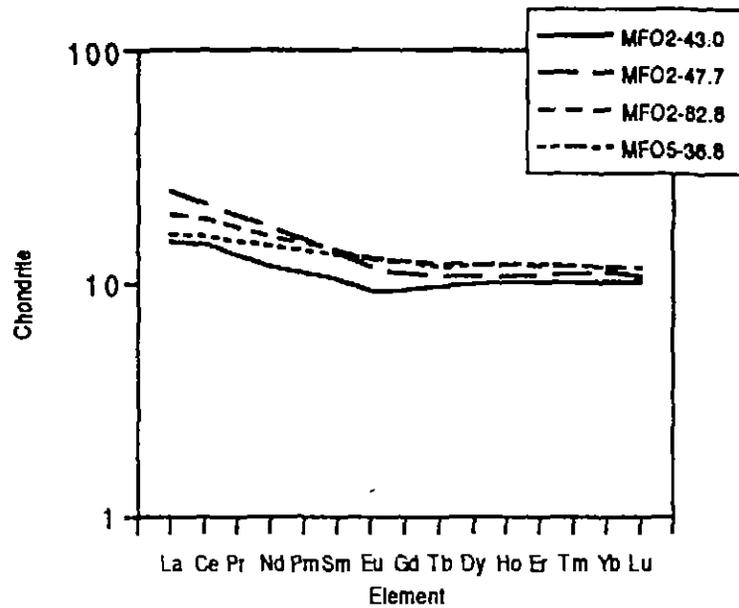


Figure 4.12: Chondrite normalised plot of rare earth element data from analyses of samples MFO2-43.0, MFO2-47.7, MFO2-82.8, and MFO5-36.8 from the Cuni gabbro. Elements analysed include La, Ce, Nd, Sm, Eu, Tb, Ha, Yb, and Lu.

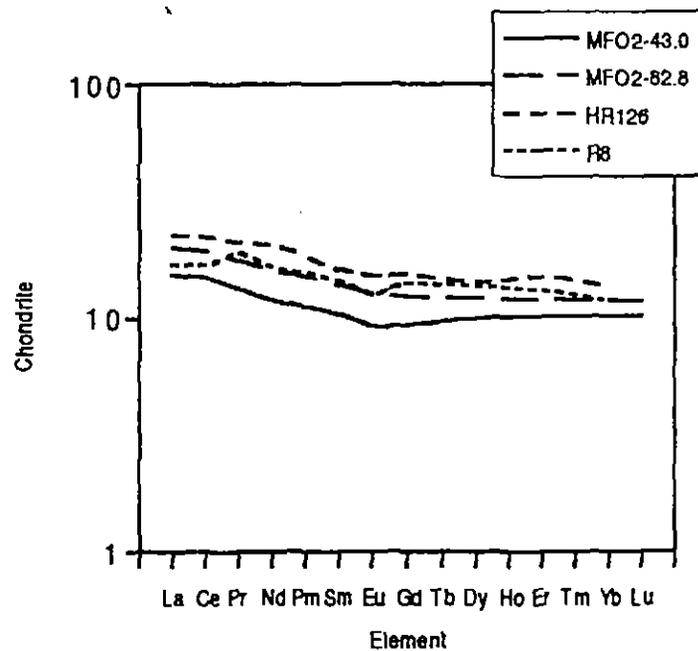


Figure 4.13: Chondrite normalised rare earth element plot comparing the Cuni gabbros with samples from the Henty Fault Wedge (R8) and the Henty Dyke Swarm (HR126).

Comparisons of the Cuni gabbros with other mafic intrusives within the region using geochemical evidence suggest that they have similar origins as both the Crimson Creek gabbros and correlates and the mafic intrusives of the Henty Dyke Swarm. These observations are supported by similar major and trace element abundances in samples from both suites, and REE patterns that show similar flat lying trends with slight rare earth enrichment. Although a number of similarities between both the Henty dyke swarm and the Crimson Creek gabbros and correlates have been shown, a correlation with either suite, is restricted by the following:

- 1) Lack of REE data from the Crimson Creek gabbros for comparison with the patterns for the Cuni gabbros and the Henty dyke swarm.
- 2) Relatively small data set of poorly constrained samples.
- 3) Restriction of the timing of emplacement beyond after the diagenesis of the Crimson Creek Formation.

Chapter Five: Heavy Mineral Separate Analyses

5.1 Heavy Mineral Separate Analyses:

5.1.1 Introduction:

Heavy mineral separate analyses were undertaken on the Cuni sedimentary rocks with the purpose of determining whether they are affiliated with the Crimson Creek Group, the Dundas Group or some other sedimentary package.

If the Cuni sedimentary rocks were of Dundas Group affiliation a significant mafic/ultramafic and felsic volcanic detrital component would be expected. Erosion of the ultramafic/mafic sheets would be expected to yield significant quantities of chrome spinel and magnetite detritus (Mange and Maurer, 1992). In addition, the active felsic volcanism of the Mt. Read Volcanics that was coincident with the deposition of the Dundas Group would be expected to contribute substantial quantities of euhedral zircons.

If the Cuni sedimentary package is affiliated with the Crimson Creek Formation a dominantly basaltic detrital component would be expected (Brown, 1986; Haines, 1991). Significant proportions of the heavy minerals would be expected to be ilmenite and other Fe and Ti oxides rather than Cr-rich spinel because the ultramafic material had not been emplaced at this stage.

5.1.2 Methods:

The method of sample preparation is discussed in Appendix 5.1. After physical separation, the heavy mineral fraction was mounted in resin on microscope slides. Identification followed the line counting method (Mange and Maurer, 1992). A maximum of two hundred opaque and transparent grains were identified on each slide.

Additional samples (SH1MS, MFO4-45.8, and MFO3-81.0), were prepared solely to separate chrome spinel grains for microprobe analyses. This required the sieved samples to be pre-treated with concentrated HCl acid before being placed in the heavy liquids. The acid dissolved any hematite and removed iron coatings on some quartz grains, both of which had caused significant identification problems during the earlier analyses. Preparation then continued as described in Appendix 5.1.

5.1.3 Results:

Initial heavy mineral separate analyses of four samples, (MFO1, 4009, SH1MS, MFO3-81.0), are shown in Table 5.1.

Heavy mineral grains	MFO1	4009	SH1MS	MFO3-81.0
Zircons(round)		2		
Zircons(euhedral)	2	6	12	8
Epidote		2	5	
Chlorite	26	25	12	22
Goethite	2	29	6	
Carbonate	14	2	3	3
Pyrite		2	7	
Chalcopyrite	35	2		
Ilmenite	16	20	27	11
Fe-oxides	24	47	17	62
Quartz	10		27	24
Apatite	6	1	13	9
Tourmaline	2			5
Ti-rich	38		57	51
contaminants			14	
Total Grains	198	155	200	193

Table 5.1: Heavy mineral grains identified from four samples of sandstone from the Cuni sedimentary sequence.

Results indicate significant amounts of Fe-rich and Ti-rich opaque grains in all of the four samples. Samples MFO1, 4009, and MFO3-81.0 have similar proportions of each grain type, whereas SH1MS has significantly greater proportions of euhedral zircon and apatite. The Ti-rich grains include sphene and titanomagnetite and the Fe-oxide grouping consist of both

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hematite and magnetite. The contaminants that occur in sample SH1MS were analysed by microprobe and contain high iron and tungsten, consistent with them being contamination from the jaw crusher. No grains of chromite were recognised in any of these samples and therefore further sample preparation and analyses were required in order for them to be isolated.

5.2 Chrome Spinel Analyses:

5.2.1 Introduction.

The composition of chrome spinel is commonly used as a tectono-magmatic indicator (Arai, 1992; Kepezhinskas, 1993). Several studies have shown that chrome spinel compositions vary systematically as a function of magma composition (Arai, 1992). As a result it has been possible to differentiate between basaltic suites, ophiolites and plutonic complexes, based on chrome spinel composition (Allan, 1992; Arai, 1992; Kepezhinskas, 1993). Most of the discriminations between basalts are made plotting TiO_2 against ratios such as $Cr\# [=Cr/(Cr+Al)]$, $Mg\# [=Mg/(Mg+Fe^{2+})]$, and $Fe^{3+\#} [=Fe^{3+}/(Cr+Al+Fe^{3+})]$. From these ratios island-arc basalts, intraplate basalts, MORB, and boninites can all be distinguished and plot in separate fields (Arai, 1992). The chemistry of detrital grains of chrome spinel within sediments has also been used successfully to assess provenance (Press, 1986; Arai and Hisada, 1992).

5.2.2 This Study:

Following studies of chrome spinel from the Ultramafic/Mafic Complexes in western Tasmania by Brown (1986), and from the Miners Ridge sandstone by Dower (1991), attempts were made to determine whether the provenance of the Cuni sedimentary rocks could be distinguished by their chrome spinel chemistry. If the sediments were of Dundas Group affiliation they would be expected to contain chrome spinel that had been sourced from the underlying 'ophiolite sheets'. In contrast, if the sedimentary package belongs to the Crimson Creek Formation it would be expected to contain fewer grains of chrome spinel, and those that do occur should have a tholeiitic basaltic signature.

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Brown (1986) showed that chromites from the ophiolite sheets have a high Cr/(Cr+Al) (>70), and work by Brown and Jenner (1989) on boninites showed Cr/(Cr+Al) values for these rocks were closer to 80. Studies on the Serpentine Hill Ultramafic/Mafic Complex, showed that the Layered Pyroxenite-Dunite (LPD) succession had an average Cr#=63.9 and Mg#=48.9, the orthopyroxene-rich unit of the Layered Pyroxenite-Peridotite and associated Gabbro (LPG) succession has an average Cr#=62.0 and Mg#=48.9, whereas in the olivine-rich fraction Cr# values average 59.2 (Brown, 1986). Analyses of detrital chromite in the Miners Ridge Sandstone, south of Queenstown, gave average Cr# 70-80 with occasional values exceeding Cr#=90 (Dower, 1991).

To determine the possible source of the chrome spinel from the Cuni sediments, analyses were compared with Cr# and Mg# values from (Brown, 1986; Brown and Jenner, 1989; and Haines, 1991), and ratios of TiO₂ versus Cr#, and TiO₂ versus Fe^{3+#} from Arai (1992).

5.2.3 Results:

Seven chromite grains were identified from the three samples prepared and these were subsequently analysed using the Cameca microprobe located at the Central Science Laboratory, University of Tasmania (Appendix 5.2).

A plot of Cr# against Mg# shows that the detrital spinel grains fall within the MORB field and are distinct from both boninitic sources and the mixed boninitic/MUC source proposed for the Miners Ridge sandstone (Haines, 1991; Figure 5.1). Plotting of TiO₂ against Fe^{3+#} shows that the chrome spinels have an intraplate affiliation (Figure 5.2), whereas a plot of TiO₂ against Cr# indicate an affinity toward a tholeiitic source (Figure 5.3).

5.3 Discussion:

Based on the results of the heavy mineral separate analyses the Cuni sediments do not appear to be affiliated with the Dundas

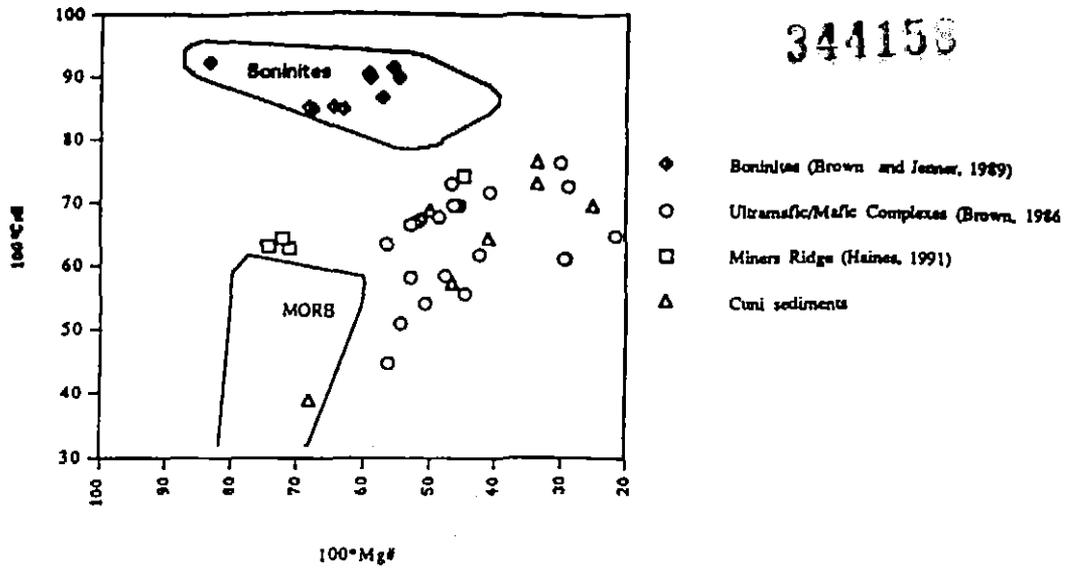


Figure 5.1: 100*Cr/(Cr+Al) versus 100*Mg/(Mg+Fe²⁺) for the Cuni spinels compared with spinels from other sources on the west coast of Tasmania.

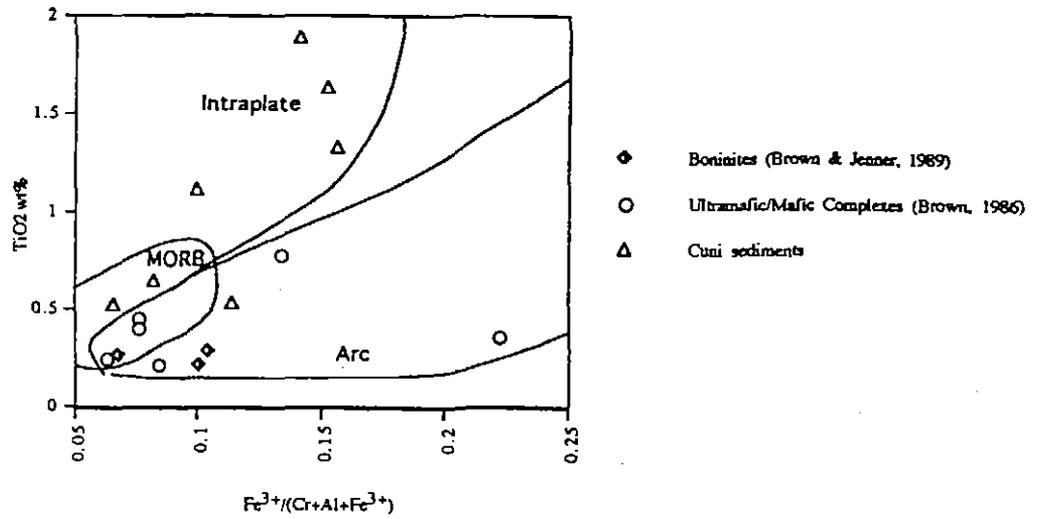


Figure 5.2: Plot of TiO₂ vs Fe³⁺/(Cr+Al+Fe³⁺) to determine the magmatic affinities of chrome spinels from the Cuni sediments. Fields after Arai (1992).

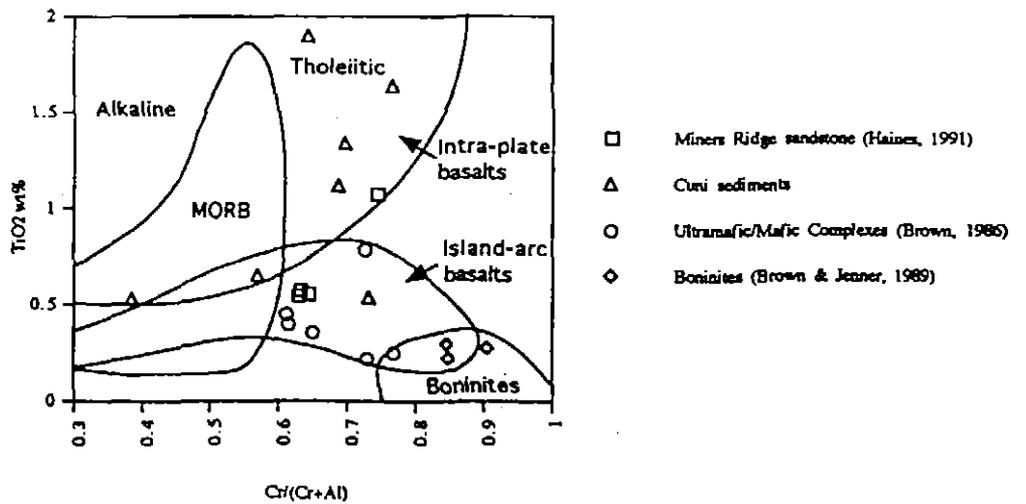


Figure 5.3: Plot of TiO₂ vs Cr/(Cr+Al) to determine the magmatic association of the chrome spinels from the Cuni sediments. Fields after Arai (1992).

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Group and are more likely to be correlates of the Crimson Creek Formation. The evidence for this correlation includes:

1) The Dundas Group is sourced from both the ultramafic/mafic ophiolite sheets from the west and the felsic to intermediate Mt. Read volcanics from the east (Brown, 1986; Jago and Brown, 1989), yet neither elevated quantities of chrome spinel or euhedral zircons were significant components of the samples analysed with the exception of sample (SH1MS). A possible source of the anomalous euhedral zircons within this sample has not been determined and may be related to evidence of felsic volcanism mapped as occurring to the west of the Cuni region (Brown, 1994).

2) The heavy mineral separates contained significant quantities of ilmenite and other Fe and Ti-oxides consistent with a high mafic volcanic detrital component for the sandstones.

3) The chrome spinel grains have low average Cr# and Mg# values compared with the boninites and layered successions of the ultramafic complexes from the area.

4) The chrome spinels fall within the fields for intraplate tholeiites in plots of TiO_2 vs Cr# and TiO_2 vs $\text{Fe}^{3+\#}$.

It would appear plausible, therefore, that the limited number of chrome spinel grains were sourced from the Crimson Creek tholeiites and that the Cuni sediments are affiliates of the Crimson Creek Formation, supporting the observations made in Chapter 3.

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Chapter Six: Mineralisation

6.1 Introduction:

Since the discovery of copper in 1893, until the last mining operations in 1948, approximately 6500t of copper/nickel ore and 2236t of silver/lead ore have been mined from eight separate Cu/Ni deposits, in the Cuni Mineral Field (Williams, 1958; Fig. 6.1). Ore is hosted in the footwall or immediately below the basal contact of a single mafic dyke that ranges from dolerite to fine grained gabbro (Taylor and Burger, 1952; Maher, 1995). The deposits are discontinuous and range in size from 10-50m in length, 0.5-2m in width, and 6.5m-40m deep (Anon., 1969). The massive sulphide consists of pyrrhotite (Fe_{1-x}S), pentlandite ($\text{Fe,Ni}_9\text{S}_8$) and chalcopyrite (CuFeS_2) with lesser amounts of pyrite (FeS_2), marcasite (FeS_2), millerite (NiS) and violarite (Nye and Blake, 1938; Williams, 1958). Ore grades average 9.7% nickel and 4.7% copper (Taylor and Burger, 1952).

Two types of ore are distinguished within the field (Williams, 1958):

1. High grade pentlandite-pyrrhotite ore at North Cuni, South Cuni, Genets Winze, Blowfly, Mosquito and the Vaudeau mine (Fig. 6.1).
2. High grade millerite ore at the Nickel Reward and Devereaux prospects, together with low grade millerite mineralisation at South Cuni (Fig. 6.1).

A brief summary of the mining history of each of the prospects and mines, and ore descriptions including a paragenetic history for North Cuni, South Cuni, Vaudeau, and Nickel Reward are discussed below. Due to lack of available samples petrographic

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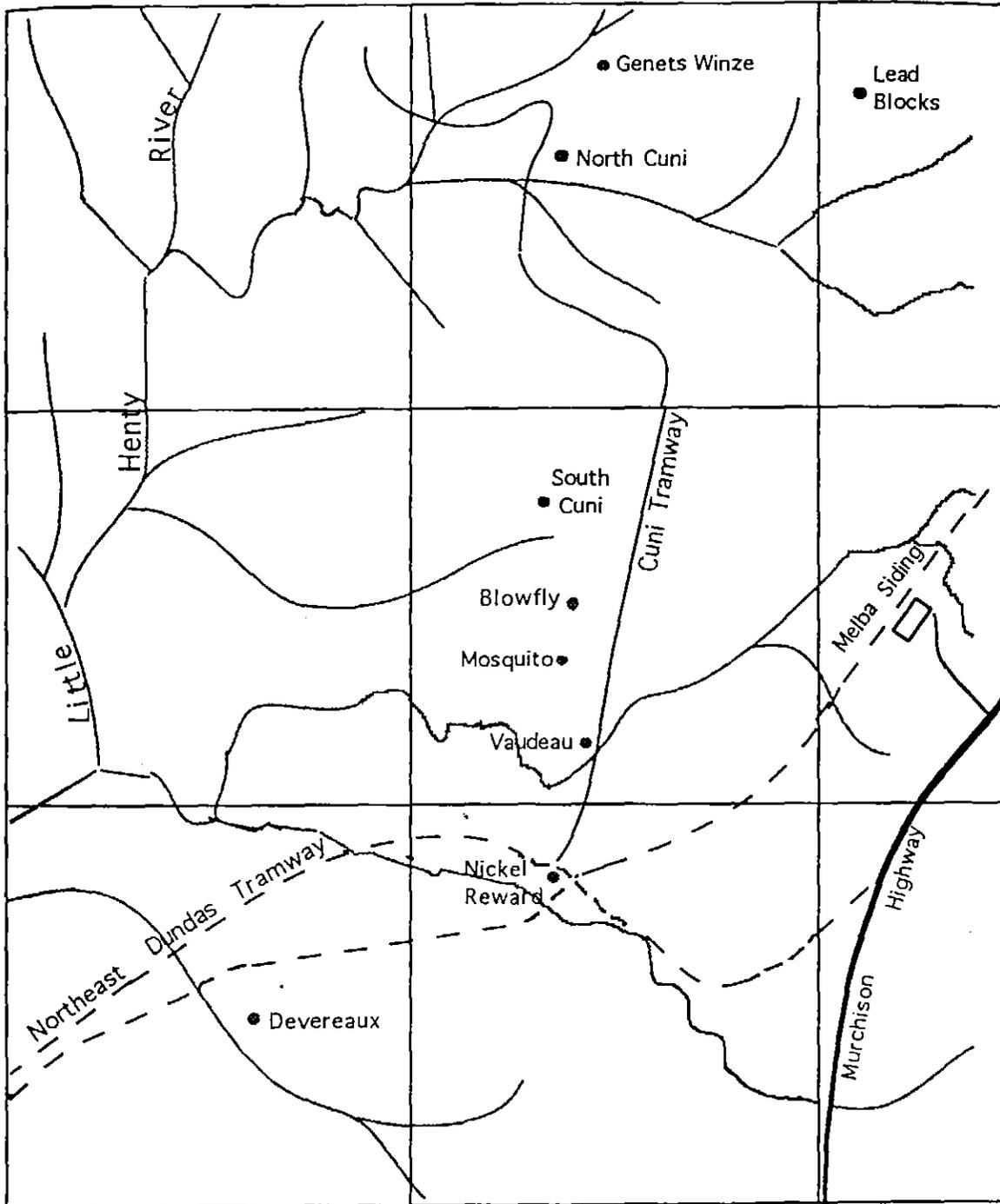


Figure 6.1: Map of the Cuni area showing the position of the Cuni Cu/Ni mines and prospects. Redrafted after Brown (1991).

descriptions and paragenetic sequences were not determined for Genets Winze, Devereaux, Blowfly and Mosquito.

6.2 North Cuni Mine:

6.2.1 Mining History:

The North Cuni mine is situated at the northern end of the Cuni field. Access is gained via the abandoned Cuni Tramway which branches off the Northeast Dundas Tramway (Fig. 6.1).

The North Cuni shaft was sunk in 1912 by the Dundas-Cuni Mining Co. Ltd., with the initial bulk sample sent to England assaying 17.00% Ni and 6.45% Cu (Brown, 1991). Two main periods of mining followed: the first lasting until 1914, and the second from 1929 until 1931. Tonnages for the earliest period of mining are unknown, but approximately 960t of ore was removed in the later period at an average grade of 10-17% Ni and 5.50-8.50% Cu (Taylor and Burger, 1952).

Recent diamond drilling by CRAE to test the northern extension of the mineralisation at North Cuni intersected 0.50m of pyritic massive sulphide @ 7.71% Ni and 2.91% Cu in hole DD94MFO1 and 0.80m of massive sulphide @ 7.75% Ni and 10.30% Cu in DD94MFO4 (Maher, 1995). Previous ore reserve estimates at North Cuni indicate potential for approximately 12 700t of ore @ 2.91% Ni and 1.99% Cu (Burton, 1970).

6.2.2 Petrography and Paragenesis:

In handspecimen the copper/nickel ore at North Cuni occurs as massive primary sulphide, with minor secondary copper and nickel minerals consisting of violarite $(\text{Ni,Fe})_3\text{S}_4$ and malachite $\text{Cu}_2(\text{OH})_2\text{CO}_3$. In thin section the ore is massive and consists of 40% pyrite, 30% chalcopyrite, 10% pentlandite/vioiarite, and 1% pyrrhotite, with minor (<1%) magnetite and galena. Compositional banding is evident in some sections due to deformed pyrrhotite; the result of late stage tectonism. Gangue

mineralogy consists of quartz, chlorite, and carbonate which make up 10-30 modal% of the ore.

Pyrite constitutes ≥ 40 modal% of the total ore. It occurs as euhedral grains (≤ 0.50 mm) and as massive aggregations. The euhedral grains represent an early phase of pyrite formation coincident with magnetite and surrounded by later stage sulphides (Plate 6.1). Massive pyrite appears to replace pyrrhotite and due to lack of uniform textural habit constitutes a supergene assemblage.

Subhedral to anhedral grains (≤ 1 mm) of *Chalcopyrite* rim euhedral pyrite and magnetite. Concentrations of chalcopyrite vary from a maximum of 1 modal% in the disseminated sulphide of the Western Gabbro and upper parts of the Eastern Gabbro, to 30 modal% percent in the massive sulphide of the Eastern Gabbro. Like pyrite, it occurs as a supergene mineral and remobilisation of the primary chalcopyrite has resulted in fine trails throughout much of the ore. Supergene processes have resulted in the formation of secondary copper minerals such as covellite and digenite as rims around some of the chalcopyrite (Plate 6.2).

Little *pentlandite* remains in the North Cuni ore due to alteration to violarite. Pentlandite rarely exceeds 2 modal%, while violarite can constitute up to 7 modal%. Grain sizes vary up to 0.50mm in diameter. Based on the fact that it rims early euhedral pyrite, the pentlandite is thought to have precipitated in equilibrium with chalcopyrite, while violarite formed as a secondary mineral after pentlandite.

Pyrrhotite has a modal abundance that rarely exceeds 1% and typically is preserved as small inclusions (< 0.5 mm) within primary chalcopyrite.

Magnetite occurs in trace amounts (< 1 modal%) as euhedral grains up to 1mm in diameter, and has straight contact

relationships with euhedral pyrite suggestive of primary textural relationships (Plate 6.1).

Significant *galena* (40 modal%), associated with minor sphalerite, occurs in late stage quartz veins in one sample of North Cuni ore which post date the chalcopyrite mineralisation (Plate 6.3).

The paragenesis of the North Cuni massive sulphide ore is summarised in Table 6.1. Pyrite and magnetite characterise the earliest stage of sulphide formation, followed by pyrrhotite, chalcopyrite, and pentlandite that comprise the main ore formation phase. Stage three represents a supergene enrichment phase and consists of pyrite, violarite, covellite and digenite after primary chalcopyrite, pentlandite and pyrrhotite. Stage four is related to veining and is characterised by quartz gangue and galena.

Mineral	Stage 1	Stage 2	Stage 3	Stage 4
Pyrite	√	×	√	×
Pyrrhotite	×	√	×	×
Chalcopyrite	×	√	×	×
Pentlandite	×	√	×	×
Violarite	×	×	√	×
Covellite/Digenite	×	×	√	×
Magnetite	√	×	×	×
Sphalerite	×	×	×	√
Galena	×	×	×	√
Gangue	×	√	√	√

Table 6.1: Summary of the paragenesis of the various stages of ore and gangue formation at the North Cuni Prospect, western Tasmania.

6.3 Genets Winze:

6.3.1 Mining History:

Genets Winze is the northernmost of the Cuni prospects and lies 200m to the north-northeast of the North Cuni Mine (Fig. 6.1). This prospect was opened by Copper-Nickel Mining Company in

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1929 for a period of two years alongside the redevelopment of the North Cuni mine. Ore was stoped out to a depth of 3m over a length of 25m but production figures and grades were not recorded. (Taylor and Burger, 1952).

Drilling by CRAE, (Fig. 6.1) intersected 0.70m of massive sulphide assaying 9.30% Ni and 4.50% Cu (DD94MFO1), but a second drillhole (DD94MFO2) only intersected trace disseminated pyrite, chalcopyrite and pentlandite averaging 326ppm Ni, and 86ppm Cu over a 13.60m interval.

6.4 South Cuni Mine:

6.4.1 Mining History:

The South Cuni mine is located midway along the line of Cuni prospects, west of the Cuni Tramway and historically it was serviced by a spur line that ran of the Cuni Tramway, but it is now accessed via a CRAE cut grid (Fig 6.1).

The South Cuni mine was operated by the Dundas Cuni Mines Ltd. from 1913 to 1914 for a total of 1189t of ore at 10.37-11.57% Ni and 5.12-5.53% Cu. All production was from the eastern body and subsequent drilling by the Copper Nickel Mining Company in 1930 showed that the orebody does not extend along strike or at depth (Anon. 1969).

A second body was detected 30 m to the west of the South Cuni Shaft by a geophysical survey conducted by Imperial Geophysical Experimental Survey in 1928. Trenching identified a 1m band of pyrite and other oxidised material but no mining occurred.

6.4.2 Petrography and Paragenesis:

Samples of oxidised banded ore are readily available at the South Cuni Mine. In thin section the ore occurs as massive sulphide consisting of >60 modal% chalcopyrite and 40 modal% violarite with minor pyrite(<1 modal%) and millerite (<1 modal%). Gangue minerals consist of quartz, chlorite and actinolite.

Chalcopyrite is the most abundant sulphide mineral in the South Cuni Mine (>60 modal%) and forms both euhedral and ubiquitous anhedral intergrowths with other ore and gangue minerals. Euhedral chalcopyrite grains (≤ 5 mm) contain inclusions of millerite and pyrite suggesting that primary chalcopyrite deposition post dated earlier sulphide phases. Coarse-grained polycrystalline quartz associated with primary chalcopyrite show allotriomorphic textures representing equilibrium. The anhedral chalcopyrite is fine grained compared with the early chalcopyrite and occurs as aggregate closely associated with chlorite, actinolite and polycrystalline quartz.

Pyrite and Millerite occur as fine grained (0.10mm), ragged anhedral inclusions within larger primary chalcopyrite grains and to a lesser degree within violarite. They represent the earliest stage of sulphide mineralisation at South Cuni, but rarely exceed 1 modal%.

Little *pentlandite* is evident in South Cuni massive sulphides, however, *violarite* represents up to 40 modal% of the ore. Violarite grains are pitted, fractured and pseudomorph relatively coarse grained (0.50mm) pentlandite. Inclusion of pyrite, and lesser millerite within the violarite, indicate that pentlandite post dated the earliest sulphide phase. Allotriomorphic or 'mutual-boundary' textures with chalcopyrite indicate a similar timing of deposition (Plate 6.4).

The paragenesis of the South Cuni massive sulphide ore is summarised in Table 6.2. The earliest stage of sulphide mineralisation is characterised by pyrite, millerite and associated quartz gangue. Stage 2 consists of the main ore minerals chalcopyrite and pentlandite in equilibrium with coarse grained polycrystalline quartz, and stage 3 comprises remobilised chalcopyrite, chlorite and actinolite.

Mineral	Stage 1	Stage 2	Stage 3
Pyrite	√	×	×
Chalcopyrite	×	√	√
Pentlandite	×	√	×
Millerite	√	×	×
Gangue	√	√	√

Table 6.2: Summary of the of ore and gangue mineral paragenesis at the South Cuni Prospect, western Tasmania

6.5 Vaudeau:

6.5.1 Mining History:

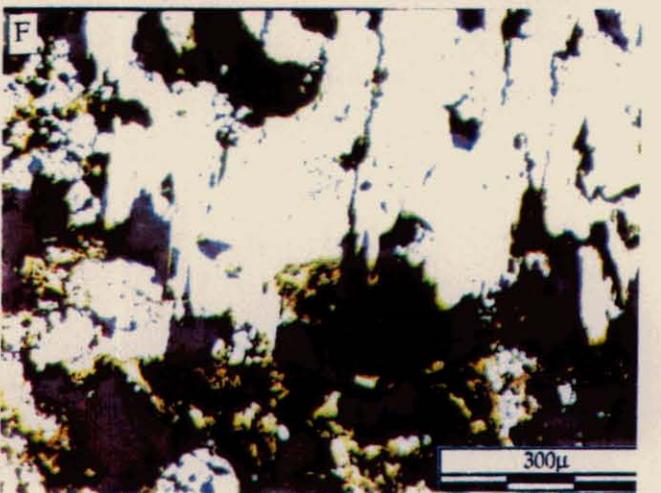
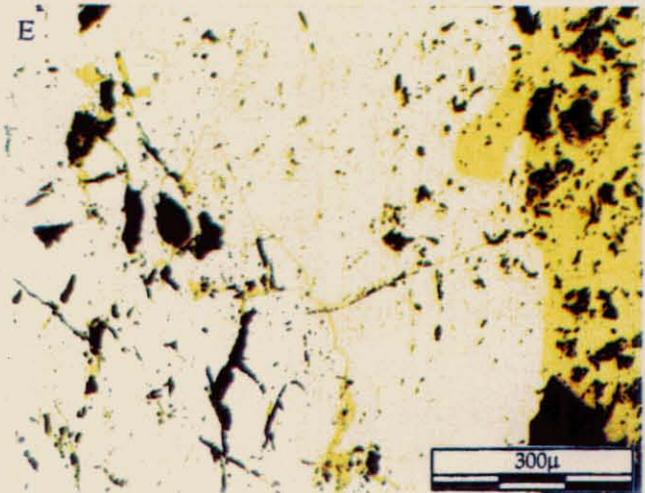
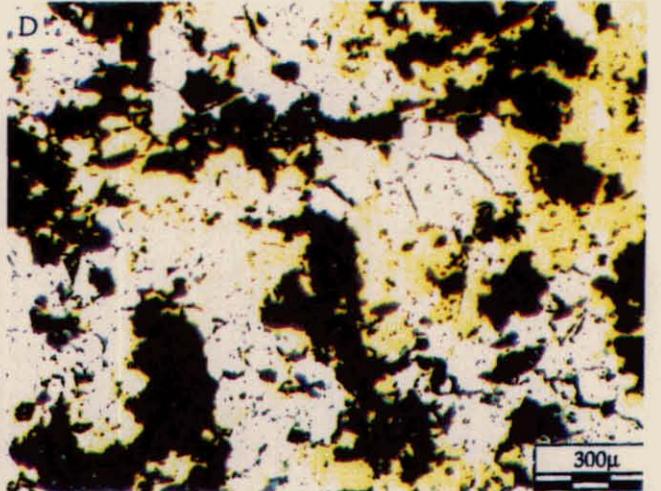
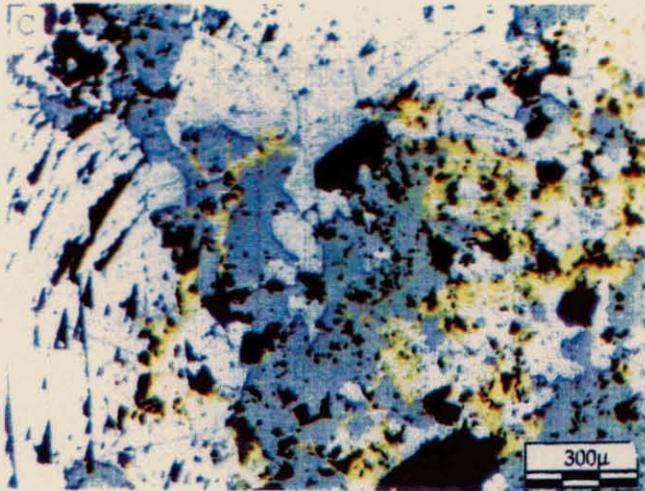
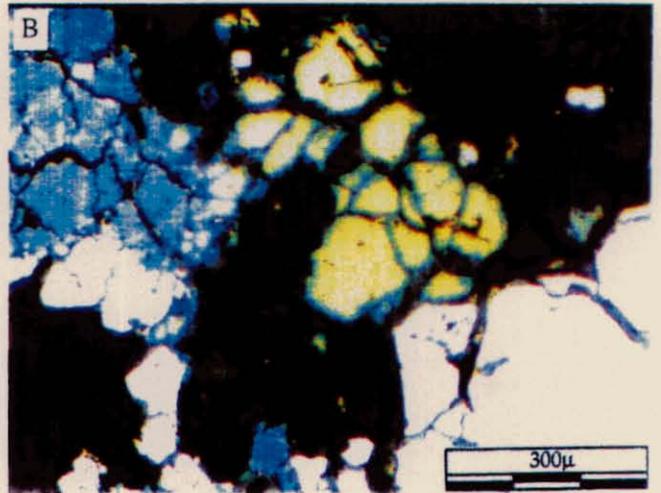
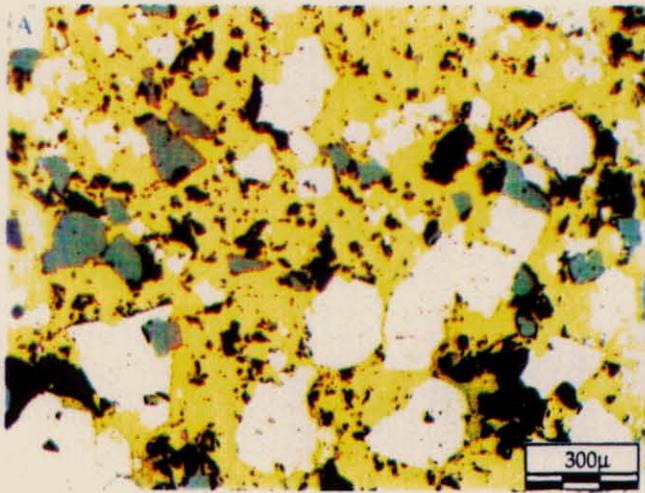
The Vaudeau Mine is situated at the southern end of the Cuni field 200m north of the Northeast Dundas Tramway, and is accessed by the Cuni Tramway (Fig. 6.1). The mine had three separate periods of mining activity. The first involved the Copper-Nickel Prospecting Syndicate from 1912 to 1914 who sank a shaft to a depth of approximately 39m, with drives developed at 21m and 37m levels (Reid, 1925; Taylor and Burger, 1952). The second period of mining was conducted by the Australian Nickel Company in 1938 when they reopened the Vaudeau shaft and raised a further 278t of ore. Finally, Lead and Nickel (Zeehan) Ltd. dewatered the shaft from 1946 to 1948 and stoped of approximately 750t of ore.

Total production from the Vaudeau shaft is estimated at 3900t, with metal values ranging from 8-11% Ni and 4-14% Cu (Taylor and Burger, 1952).

6.5.2 Petrography and Paragenesis:

The only available ore specimens from the Vaudeau shaft came from the Tasmanian Museum & Art Gallery. In handspecimen the ore is variably oxidised to secondary iron minerals but pyrite, chalcopyrite and pyrrhotite are evident. Thin sections of the ore contain variable amounts of chalcopyrite (5-10 modal%), pyrite (5 modal%), pentlandite (20 modal%), millerite (5 modal%) and

- A) Plate 6.1: Early phase euhedral pyrite (pale yellow) and magnetite (grey), surrounded by later stage chalcopyrite (bright yellow). North Cuni Mine.
- B) Plate 6.2: Secondary copper minerals covellite and digenite forming rims around chalcopyrite as a result of supergene processes. North Cuni Mine.
- C) Plate 6.3: Galena (light grey) and minor sphalerite (medium grey) associated with late stage quartz veining shown infiltrating earlier chalcopyrite (bright yellow). North Cuni Mine.
- D) Plate 6.4: Pitted violarite (creamy white) after pentlandite, associated with coincident primary chalcopyrite. South Cuni Mine.
- E) Plate 6.5: Pyrrhotite (white) and pentlandite (pale yellow) showing cusp and caries textures, with pentlandite being reabsorbed by later stage chalcopyrite (yellow). Vaudeau Mine.
- F) Plate 6.6: Primary millerite (pale creamy yellow) rimming early euhedral pyrite (white) and rimmed by later stage chalcopyrite (yellow) and carbonate gangue (grey). Nickel Reward Prospect.



pyrrhotite (≤ 45 modal%). The gangue (≤ 25 modal%) consists predominantly of carbonate and minor polycrystalline quartz.

Pyrite and magnetite occur as 0.2-0.30mm euhedral grains within chalcopyrite and constitute up to 5 modal% of the ore. Intergrowths of the two minerals suggest coeval precipitation, and their textural relationships with other ore minerals indicates that they represent the earliest stage of ore formation.

Pyrrhotite constitutes ≤ 45 modal% of the Vaudeau sulphide ore and occurs as aggregates of grains up to 0.5mm in diameter. Pyrrhotite is subhedral to anhedral in form and has undergone considerable fracturing. Isolated euhedral pyrite grains with resorption textures, occur within some larger grains of pyrrhotite, indicating that the pyrrhotite represents a later stage of mineralisation.

Chalcopyrite (5-10 modal%) is subhedral to anhedral in form and occurs as an interstitial mineral within fractures in pyrrhotite. Absorption textures with pentlandite suggest it formed at a later stage (Plate 6.5).

Pentlandite within Vaudeau is closely associated with pyrrhotite. It occurs as discrete grains (0.05mm to 0.10mm) and aggregates (1.0mm) which constitute ≤ 20 modal% of the ore. Secondary alteration to violarite is minor, suggesting supergene processes were minimal (Plate 6.5).

Millerite is the second nickel bearing ore mineral at the Vaudeau Mine after pentlandite. It forms anhedral masses up to 0.2mm that constitute a maximum modal abundance of 5%. Emulsion intergrowth textures with chalcopyrite suggest that the millerite formed as a secondary mineral after pentlandite.

The paragenesis of the Vaudeau massive sulphide ore is summarised in Table 6.3.

The earliest stage of mineralisation consists of coeval magnetite and pyrite associated with quartz. Stage 2 is characterised by

pyrrhotite, pentlandite and associated carbonate, and Stage 3 comprises chalcopyrite and millerite and polycrystalline quartz.

Mineral	Stage 1	Stage 2	Stage 3
Pyrite	√	×	×
Chalcopyrite	×	×	√
Pyrrhotite	×	√	×
Pentlandite	×	√	×
Magnetite	√	×	×
Millerite	×	×	√
Gangue	√	√	√

Table 6.3: Summary of ore and gangue paragenesis at the Vaudeau Mine, western Tasmania.

6.6 Nickel Reward:

6.6.1 Mining History:

Nickel Reward is situated 150m to the south of the Vaudeau Mine (Fig. 6.1), and was the first Cuni deposit to be mined. It was pegged in 1893 and a shaft sunk to a depth of 6m in 1894. Ore was reported to be 0.5-2m wide and extend for 10m with a grade of 8-12% Ni and 3-5% Cu (Reid, 1925; Blake, 1952).

6.6.2 Petrography and Paragenesis:

The massive sulphide ore at Nickel Reward differs from other Cuni prospects in that its major nickel sulphide is primary millerite. Ore samples were obtained from the Tasmanian Museum & Art Gallery collection and in hand specimen pyrite is the dominant sulphide mineral with minor pyrrhotite. In thin section the main sulphide minerals are pyrite (45 modal %), chalcopyrite (10-15 modal%), pyrrhotite (20 modal%) and millerite (15 modal%). The dominant gangue mineral is quartz associated with early sulphides.

Pyrite dominates Nickel Reward ore (45 modal%), consisting of euhedral grains (0.1mm) and more massive aggregates. Euhedral

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pyrite (1-2 modal%) is rimmed by all other sulphides and represents the earliest sulphide phase. The more massive pyrite pseudomorphs earlier sulphide, probably pyrrhotite, and appears to be related to later supergene process.

Millerite at Nickel Reward, based on the size of individual grains and their euhedral to subhedral form, is primary in origin consisting of grains up to 4mm across (Plate 6.6). It is the only nickel bearing sulphide at the prospect and ≤ 15 modal% of the ore. Rare inclusions of early euhedral pyrite suggest that crystallisation of millerite occurred after early sulphide phases (Plate 6.6). Mobilisation and recrystallisation of minor amounts of millerite are associated with chalcopyrite and related to supergene processes.

Chalcopyrite constitutes 10-15 modal% of the ore and forms as irregular rims around primary millerite and pyrrhotite. There is no textural evidence of primary chalcopyrite in the Nickel Reward Prospect. Its occurrence is a result of supergene enrichment.

Pyrrhotite occurs as a series of fractured composite grains (0.5mm) that constitutes 20 modal% of the ore. Overgrowth relationships with the other sulphides indicate that pyrrhotite formed after millerite and before secondary pyrite and chalcopyrite.

The paragenesis of the Nickel Reward massive sulphide ore is summarised in Table 6.4.

Pyrite and quartz gangue constitute the earliest mineralisation phase which is post dated by primary millerite. Stage 3 is characterised by pyrrhotite, while the final stage of ore formation comprises pyrite, chalcopyrite, and millerite.

Mineral	Stage 1	Stage 2	Stage 3	Stage 4
Pyrite	√	×	×	√
Chalcopyrite	×	×	×	√
Millerite	×	√	×	√
Pyrrhotite	×	×	√	×
Gangue	√	×	√	√

Table 6.4: Summary of ore and gangue mineral paragenesis at the Nickel Reward prospect, western Tasmania.

6.7 Devereaux Prospect:

6.7.1 Mining History:

The Devereaux Prospect is offset 750m to the southwest of the other Cuni prospects, and the lode strikes to the southeast rather than to the north (Fig. 6.1).

The Devereaux Prospect was pegged in 1925 and while trenching and shallow holes exposed a 45cm thickness of unaltered sulphide over an unknown strike length, no production was ever carried out. Analysed samples are strikingly different to the rest of the Cuni prospects, in that copper contents exceed nickel; 13-18% Cu to 5-9% Ni (Taylor and Burger, 1952). Gold, silver and platinum values were also notable, giving values of 0.03, 1.2, and 0.13 oz. per ton respectively (Reid, 1925; Blake, 1952).

6.8 Mosquito & Blowfly Shafts:

6.8.1 Mining History:

The Mosquito and Blowfly shafts are approximately 150m to the north of the Vaudeau Shaft (Fig. 6.1).

They were mined by the Copper-Nickel Prospecting Syndicate between 1913 and 1914 alongside operations at the Vaudea Mine. Both were exhausted of ore during this time, with 52 tons of ore being raised from Mosquito, and approximately 300 tons from Blowfly. Assay results from both deposits are not available.

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6.9 Summary:

The copper/nickel mineralisation at Cuni occurs as both massive and disseminated sulphide. The massive sulphide occurs in the basal sections of the Eastern Gabbro and rarely in the immediate footwall sediments. Disseminated sulphide occurs in the Eastern gabbro but is more pronounced in the Western gabbro.

The massive sulphides have been divided by Williams (1958) into two groups:

Group 1: includes the North Cuni, Genets Winze, South Cuni, Vaudeau, Mosquito and Blowfly mines. All of these mines contain Cu/Ni ore that formed following a similar paragenetic sequence. The earliest recognisable ore phase consists of euhedral pyrite and quartz, which is followed by chalcopyrite, pentlandite and pyrrhotite. Later supergene enrichment processes remobilised some of the earlier phases causing them to alter texturally and chemically. Examples include the change in form of chalcopyrite, and the formation of secondary sulphides such as violarite after pentlandite, together with covellite and digenite after chalcopyrite.

Group 2: differs from Group 1 on two counts, and includes the Nickel Reward and Devereaux prospects. The first difference is the higher copper to nickel ratio at Nickel Reward and Devereaux and the second, is the occurrence of primary millerite at Nickel Reward. Both occurrences suggest differences in the fluid chemistry responsible for formation of the two prospects relative to the remainder of the Cuni Mineral Field.

Chapter Seven: Isotope Geochemistry

7.1 Sulphur Isotopes:

Preliminary sulphur isotope investigations were undertaken to aid in understanding the processes by which Cu/Ni mineralisation formed in the gabbroic sills at Cuni. To achieve this, sampling of pyritic host sediments and mineralisation from a number of the prospects at Cuni, as well as diamond drill core from recent holes drilled under the prospects was undertaken. This was done with the intention of determining a background sulphur value from sediments with which mineralisation could be compared. However, due to the breakdown of laser ablation equipment, detailed study of sulphur isotope signatures from the deposits was not possible. Consequently only two conventional sulphur isotope analyses were performed.

7.1.1 Method:

The two samples were drilled and submitted to the Central Science Laboratory (CSL) where they were analysed using conventional sulphur isotope techniques by Mr. Mike Powell. In this process they were combusted with excess Cu_2O in vacuo to produce SO_2 (Robinson & Kusakabe, 1975), and the sulphur gas separated to determine the $^{34}\text{S}/^{32}\text{S}$ ratios. The results are expressed in standard δ per mil (‰) notation relative to the Canyon Diablo Troilite (CDT), and calculated as:

$$\delta^{34}\text{S}_{\text{sample}} = \frac{\{(^{34}\text{S}/^{32}\text{S})_{\text{sample}} - (^{34}\text{S}/^{32}\text{S})_{\text{standard}}\} * 1000\text{‰}}{(^{34}\text{S}/^{32}\text{S})_{\text{standard}}}$$

The analytical uncertainty is estimated to be ± 0.2 per mil (‰). Internal standards used in the Central Science Laboratory are homogenous galenas from Broken Hill ($\delta^{34}\text{S} = 3.2\text{‰}$), Roseberry ($\delta^{34}\text{S} = 12.4\text{‰}$) and Tullah ($\delta^{34}\text{S} = 15.2\text{‰}$), together with an SO_2

reference gas ($\delta^{34}\text{S} = \text{CDT}$). All standards were calibrated against the international sphalerite standards IAEA NZ1 and NBS 123 ($\delta^{34}\text{S}$ values of 1.83‰ and 4.34‰ respectively). Conventional sulphur isotope ratio measurements were performed using a VG Micromass 602D mass spectrometer.

7.1.2 Results:

Analyses were undertaken on isolated cubic pyrite grains that occurred within a mudstone unit of the Cuni host sediments. Both samples were up to 5mm in size and were taken from diamond drill holes DD94MFO4, and DDHSH1 respectively (Fig. 7.1).

The results from the conventional sulphur isotope analyses are shown in table (7.1). Samples 3649 and 3650 have $\delta^{34}\text{S}$ values of 3.8‰ and 5.6‰, respectively.

Sample No.	Mineral	Style of Mineralisation	$\delta^{34}\text{S}$ (‰)
3649	Pyrite	Sedimentary	3.8
3650	Pyrite	Sedimentary	5.6

Table 7.1: Sulphur isotope values for samples of sedimentary pyrite, Cuni, western Tasmania.

7.1.3 Discussion:

The $\delta^{34}\text{S}$ values of 3.8‰ and 5.6‰ obtained from analysis of the pyrite from the Cuni sedimentary rocks are inferred to be of igneous origin. This is based on comparisons made with $\delta^{34}\text{S}$ values obtained from work on other deposits and sediments in western Tasmania. Pyritic sediments from the west coast have previously been analysed by Yaxley (1981) and Jack (1989), and as part of extensive sulphur isotope studies on massive sulphide and vein related deposits occurring within the Mt. Read Volcanics (Solomon et al., 1969; Solomon et al., 1988).

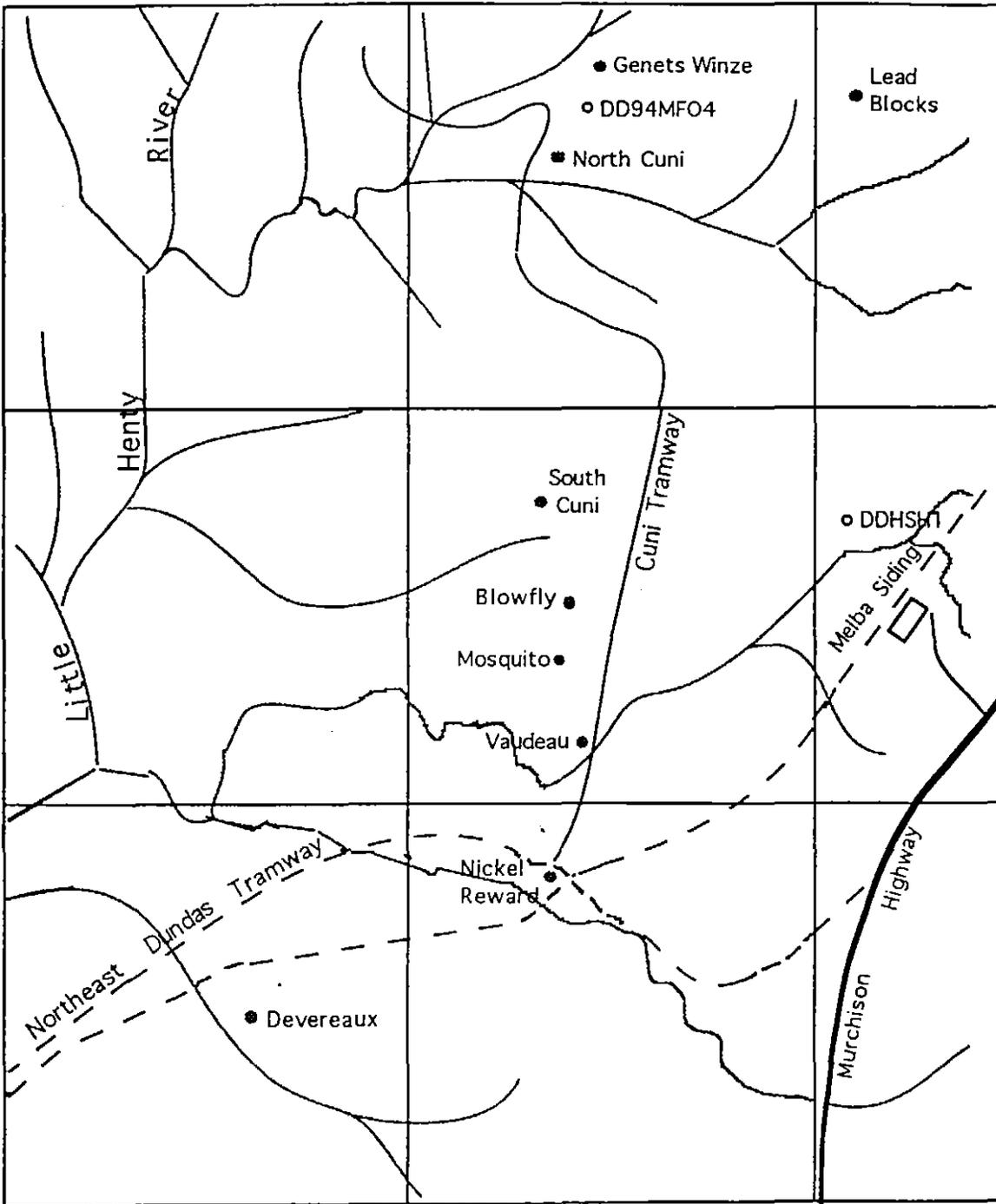


Figure 7.1: Map of the Cuni area showing the position of the drillholes, from which pyrite samples for sulphur isotope analyses were taken. Redrafted after Brown (1991).

$\delta^{34}\text{S}$ values for pyrite from Precambrian aged sediments at Balfour and from Cambrian aged shales at Que River, along with other Cambrian aged pyrite from selected volcanic hosted massive sulphide deposits on the west coast are shown in Figure 7.2. Pyrite occurring within sediments ranges from approximately 15‰ to 20‰, while pyrite within sulphide deposits ranges from -5‰ to 13‰. Selected values from the wallrocks of the Roseberry and Hercules sulphide deposits range up to 23‰.

The small data-set from the Cuni area does not allow for conclusive interpretations that the sulphur within the sediments associated with the Cu/Ni mineralisation was sedimentary or igneous in origin. The highest $\delta^{34}\text{S}$ value ($\delta^{34}\text{S}=5.6\text{‰}$) is within the range of the majority of sulphide minerals from each paragenetic stage along the major faults at Renison (Kitto, 1994). The lower value ($\delta^{34}\text{S}=3.8\text{‰}$) is more typical of sulphur signatures seen in the footwall sediments of Cambrian massive sulphide deposits (Solomon et al., 1969; Ohmoto, 1979; Solomon et al., 1988). Both values indicate that magmatic fluids may have been active during pyrite formation in the sediments. More detailed interpretations of the results is restricted due to a lack of available data at this stage.

7.1.4 Further Work:

A number of problems remain unsolved. These include:

- 1) the definitive $\delta^{34}\text{S}$ values for both the massive and disseminated Cu/Ni-sulphide mineralisation in the gabbroic sills and in the immediate underlying sediments.
- 2) a more detailed investigation of the pyritic sediments away from any influence the emplacement of the gabbroic sills may have had, to assist in determining a value for sedimentary sulphide within the immediate region.
- 3) further, as indicated in petrographic descriptions of the gabbros (Gole, 1994; Crawford, 1995), the presence of graphite within some thin sections suggest that the melt may have

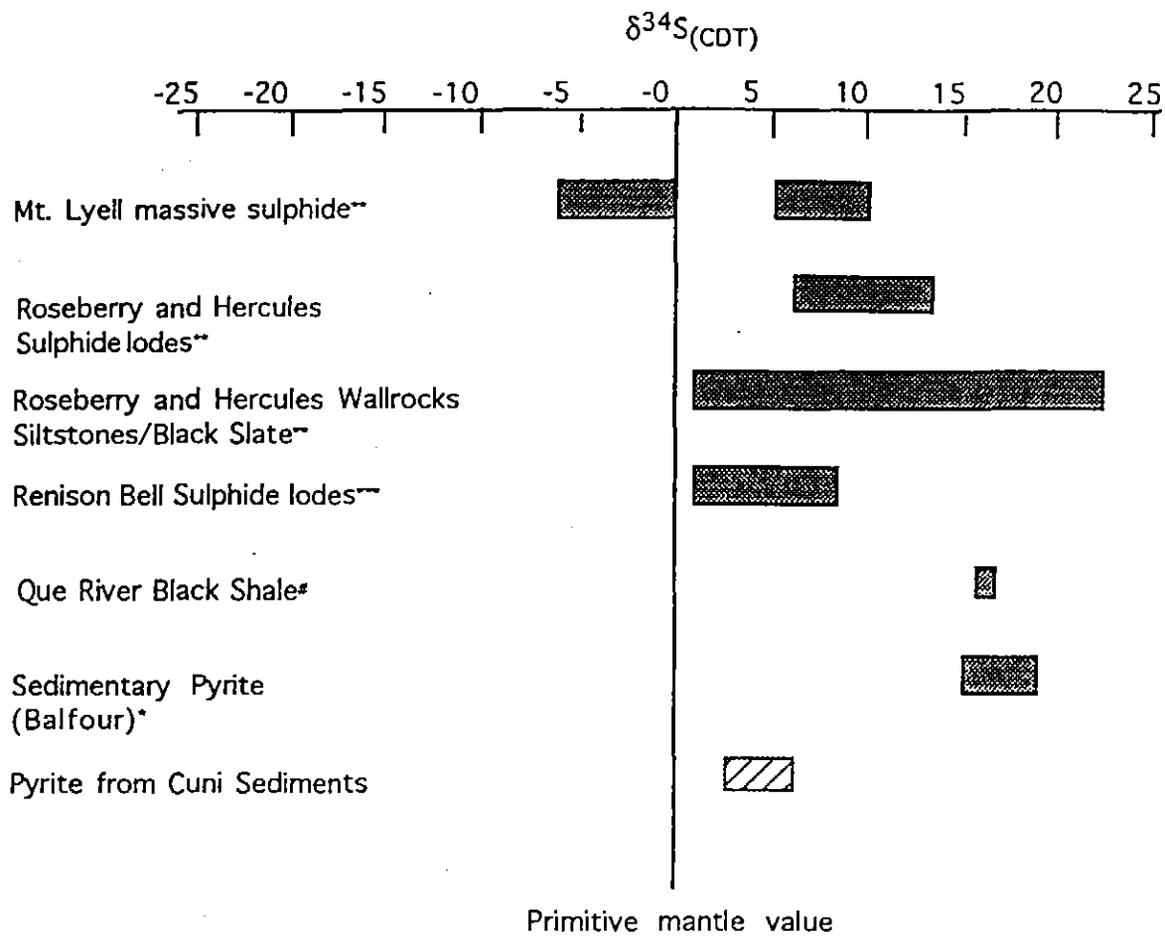


Figure 7.2: Table comparing $\delta^{34}\text{S}$ values of the sedimentary pyrite from Cuni with $\delta^{34}\text{S}$ values of pyrite from sulphide deposits and other sediments from the west coast of Tasmania. (*) denotes values taken from Yaxley (1981), (**) denotes values taken from Solomon et al. (1969) and Solomon et al. (1989), (***) denotes values taken from Kitto (1995), (#) denotes value taken from Jack (1989).

incorporated some sediments during the course of its emplacement (Peltonen, 1995).

7.2 Lead Isotopes:

Lead isotopes have been used widely throughout western Tasmania, to distinguish between Cambrian volcanic-hosted massive sulphide deposits and Devonian-Carboniferous granitoid emplacement related deposits (Gemmell, 1993; Gulson et al., 1987; Fig.7.3). Furthermore, it has been shown that lead isotopic composition of large deposits remains almost constant in a metallogenic province allowing application of the principle of target isotopic ratios to mineral exploration (Jones and Evans, 1985).

Limited lead isotope studies have previously been carried out in the Cuni area and at the request of CRAE, a further sample of galena from the Lead Blocks mine was analysed as part of this study.

The sample of galena from this study was drilled out and submitted to Dr. Neil McNaughton at the Key Centre for Teaching and Research in Strategic Mineral Deposits, at the University of Western Australia.

7.2.1 Analytical Procedure:

Galena sample and concentrate was dissolved in 3M HCl and processed through an anion-exchange resin bed to purify the Pb, as described by Ho et al. (1994). Mass spectrometric analyses were performed on a VG354 multi-collector mass spectrometer housed at Curtin University, Western Australia, with data normalised to NBS-981, and Broken Hill galena Pb used as a reference standard. Analytical uncertainty is $\pm 0.15\%$ (95% confidence level) in all ratios (McNaughton, pers. comm.).

7.2.2 Results:

The results of the analysis of samples of galena from Lead Blocks and Mosquito are shown in table 7.2. Analyses of sample 4007 as part of this study give the following values: $^{206}\text{Pb}/^{204}\text{Pb}=18.596$, $^{207}\text{Pb}/^{204}\text{Pb}=15.617$, and $^{208}\text{Pb}/^{204}\text{Pb}=38.439$. Included in the same table are Pb isotope results for Lead Blocks and the Mosquito Cu/Ni mine from Jones and Evans (1985).

UWA No.	Sample No.	$^{206}\text{Pb}/^{204}\text{Pb}$	$^{207}\text{Pb}/^{204}\text{Pb}$	$^{208}\text{Pb}/^{204}\text{Pb}$
Kitto-1 gn	4007	18.596	15.617	38.439
N/A	LeadBlocks	18.555	15.635	38.455
N/A	Mosquito 1	18.151	15.583	37.881
N/A	Mosquito 2	18.177	15.595	37.936

Table 7.2: Lead isotope result for galena from the Lead Blocks Ag/Pb/Zn and Mosquito Cu/Ni mines, Cuni, western Tasmania.

7.2.3 Discussion:

Previous work carried out by Jones & Evans (1985) as part of their study on the regional mineralisation around the Renison Tin Mine included samples of galena from the Lead Blocks vein style Ag/Pb/Zn mine and the Mosquito Cu/Ni prospect. Their results show a distinctively different signature for the Mosquito prospect when compared with Lead Blocks and other prospects in the region. Furthermore when these, and the Lead Blocks isotope results from this study are compared with other Cambrian and Devonian-Carboniferous deposits in western Tasmania, the Lead Blocks lies within the Devonian vein-style mineralisation field and the Mosquito prospect defines a field distinct from both the Cambrian and Devonian isotopic fields (Fig. 7.4). Both galena samples from Mosquito are less radiogenic than the Cambrian massive sulphides suggesting a more primitive source for the galena or a variation in the U-Th-Pb characteristics of the source (Gulson et al., 1987).

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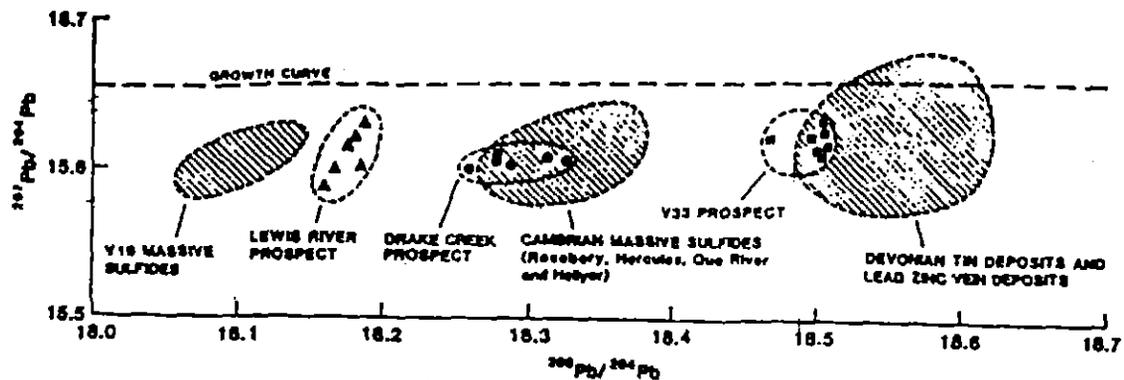


Figure 7.3: Lead isotope plot of some western Tasmanian Cambrian massive sulphide and Devonian vein-style mineralisation (after Gulson et al. 1987).

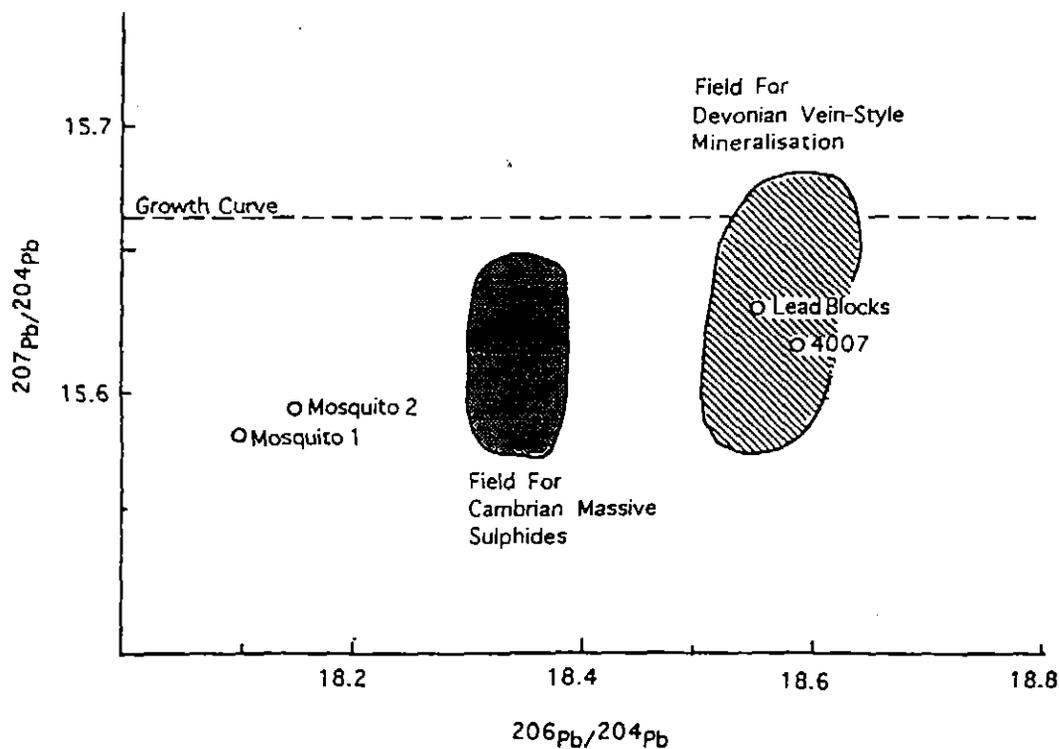


Figure 7.4: Plot of Pb isotope data for galena from Mosquito Cu/Ni prospect and Lead Blocks Ag/Pb/Zn. Data taken from this study and Jones and Evans (1985). Fields after Gulson et al. (1987)

These results are supported by the primary sulphide mineralogy of Mosquito (see Chapter 6.), which differs markedly from both the Devonian vein related sulphides and the Cambrian massive sulphides. This difference, together with Pb isotopes infers a different source for lead at the Mosquito prospect. Geochemical studies on the host rocks of the Mosquito prospect indicate that they are derived from a primitive tholeiitic magma (Chapter 4) and therefore are a potential source for the addition of less radiogenic lead into the ore forming system. The Precambrian basement that forms the Dundas Trough and underlies the Mosquito prospect is another potential source, with the less radiogenic lead isotope values of galena possibly reflecting an earlier age of formation when compared with the Cambrian isotopic values.

Chapter Eight: Conclusions

The following conclusions can be made from the work undertaken in this study:

The Cuni sediments are proposed to be correlates of the Crimson Creek Formation, based on lithological similarities between the two sedimentary packages. These include similar sedimentary rock units and mafic volcanic detrital components. Detrital clinopyroxene that occurs within the Crimson Creek Formation, does not occur within the Cuni sedimentary rocks and may be explained by the high quantities of chlorite possibly formed from clinopyroxene breakdown. Such a process may have occurred as a result of tectonic processes or emplacement of the Pine Hill granite and associated massive quartz bodies that outcrop to the north east and south east of the Cuni area (Brown et al. 1994).

The 90m thick black mudstone unit that dominates the Cuni sediment package (Unit 3), and interbedded dolomites and grey mudstones (Unit 1), have textural and lithological characteristics similar to units within the Crimson Creek Formation. The black mudstone unit is thicker than any similar unit measured within the Renison Mine Sequence and may, therefore, represent localised variation within the Dundas Trough. Similar arguments may be used for the dolomite and interbedded mudstone, as variations in thickness and lateral continuance have been documented within the dolomitic units at Renison (Haines, 1991; Morrison, 1993).

The second line of evidence supporting the Cuni sedimentary rocks as being Crimson Creek Formation correlates is based on heavy mineral separate analyses. Elevated quantities of mafically derived grains such as ilmenite, Fe-oxide including magnetite and hematite,

and other Ti-rich grains such as titanomagnetite, sphene and rutile support a mafic volcanic provenance for the sediments. Increased quantities of chrome-rich spinel and euhedral zircons would be expected if the sediments were deposited after the emplacement of the ultramafic ophiolite sheets and contemporaneously with felsic volcanism of the Mt. Read Volcanics. Analyses of chrome spinel were shown to contain high TiO_2 (>0.50wt%). Plotted on a TiO_2 against Cr# diagram (Arai, 1992), the grains fall within a tholeiitic field. Such a grouping combined with the low quantities of spinel, discounts an affiliation with sediments derived from an ultramafic source and supports the notion of the Cuni sediment package being affiliated with the Crimson Creek Formation.

The gabbroic bodies at Cuni intrude the sedimentary rocks as a series of concordant sills. Igneous layering is not recognised due to intense hydrothermal alteration and metamorphism, however vertical differentiation is evident from geochemical data. Geochemical and petrographical evidence supports the Eastern and Western gabbros being comagmatic. Primary mineralogy and textures of both bodies consist of subophitic diopside/augite, plagioclase feldspar, edenite to edenitic hornblende with lesser amounts of Fe-Ti oxide and pseudomorphed olivine. The Eastern and Western gabbros are geochemically primitive having high MgO (13wt%) and $\text{FeO}_{\text{Total}}$ (12wt%), and low P_2O_5 (<0.2wt%), combined with TiO_2 (~0.8wt%), Ni (>300ppm), and Cr (>660ppm). Plots of SiO_2 versus Al_2O_3 , and Ti versus Ca+Na for analyses of clinopyroxenes from the Cuni gabbros indicate a tholeiitic magmatic affinity, which is supported by similar plots using wholerock geochemical data. Comparison with other mafic volcanic suites in the region using major, trace and rare earth elements (REE) show similarities with Henty Dyke Swarm tholeiites and correlates of the Crimson Creek Formation at Double Cove on Sorell Peninsula in the Smithton Trough. Samples of the most primitive rocks from both, have similarly high Mg and FeO, with the Double Cove sample exhibiting similarly high Ni, Cr and V. Plots of trace element ratios show that the Cuni gabbros group with both suites, and cannot be definitively

classified as either Henty Dyke Swarm or Crimson Creek correlate. A more conclusive classification would require further analytical work on both the Henty Dyke Swarm and correlates of the Crimson Creek gabbros with a purpose of recognising any generations of mafic intrusives that may have geochemical signatures comparable with the Cuni gabbros. Timing relationships between the Cuni Gabbros and the host sediments are uncertain. Absolute dating may resolve this issue.

The copper and nickel mineralisation at Cuni occurs as both massive and disseminated sulphide. The massive sulphide mineralisation is hosted within the basal portion, and immediately below the basal contact of the Eastern Gabbro and disseminated sulphide occurs within the Western Gabbro. The primary ore assemblage at Cuni is typical of mafic hosted copper/nickel deposits and consists of pentlandite, chalcopyrite, pyrrhotite, and pyrite with violarite, millerite and minor galena, covellite and digenite.

The Cuni deposits are small and together have produced approximately 6500t of ore, yet grades are anomalously high in comparison to other deposits and therefore have proven to be highly prospective. Average ore values for the Cuni deposits are 9.7% Ni and 4.7% Cu, compared with 0.66% Cu and 0.17% Ni at the Duluth Complex, Minnesota (Ripley, 1986), 0.66% Cu and 0.42% Ni in the Vammala Nickel Belt, Finland (Peltonen, 1995), and 0.7% Cu and 1.2% Ni at the Jinchuan deposit, China (Chai and Naldrett, 1992).

All mafic hosted copper nickel deposits are divided into two main groups based on host rock lithologies. The first of these are the dunite-peridotite hosted deposits. (Ross and Travis, 1981). Nickel to copper ratios of mineralisation within these styles of deposit are high and typically range from 15 to 30:1. Examples of dunite-peridotite deposits include the komatiite related deposits at Kambalda, Western Australia and the Thompson-Wabowden mobile zone, Manitoba, Canada (Marston et al., 1981).

The second group of mafic hosted copper-nickel deposits are the gabbroid class and include intrusive mafic-ultramafic complexes and large layered intrusions. In comparison with the dunite-peridotite class, the gabbroid class of deposits have much lower Ni:Cu ratios (<3:1) and increased PGE content. Examples of gabbro hosted Ni-Cu deposits are the Jinchuan deposit in China, deposits associated with the Duluth Complex in Minnesota, U.S.A., and the Vammala Nickel Belt in Finland.

The Cuni copper/nickel deposits can not be easily classified into either of the two main copper-nickel deposit groups, however, low Ni/Cu ratios (<2) and a gabbroic host suggest they are affiliated with Group 2. The literature has no record of Cu/Ni deposits forming independently within a gabbro body that is not related to an associated mafic/ultramafic intrusive and therefore on the evidence of this study the Cuni deposits are unique.

On the basis of higher TiO₂ (0.8wt%) and enriched LREE the Cuni gabbros do not resemble the gabbros associated with the Serpentine Hill mafic/ultramafic complex and therefore the sulphide mineralisation is either related to a second sub-surface ultramafic body or has a different genetic mechanism for formation.

Correlations with primitive end members of the Henty Dyke Swarm and Crimson Creek gabbros correlates at Double Cove, suggest that the Cuni gabbros formed in a tectonic setting involving limited extension (Crawford et al. 1992) and as a result it is more likely that the Cuni gabbros are related to a shallowly emplaced parent magma.

Aeromagnetic surveys flown over the North Cuni area by the Department of Mines in 1981, and followed up by infill ground magnetics by CSR in the same year, recognised a significant anomaly at approximately 700-800 m depth. Secondary anomalies were also recognised and modelled to depths of 250-300 metres (Ellis, 1985; Maher, 1994). These may either represent ultramafic bodies or gabbros related to mineralisation at Cuni. A series of parallel dykes

in the area adds further evidence supporting a model which is unrelated to mafic/ultramafic complexes (Ellis, 1987; Maher 1994).

Sulphide deposition in the Cuni deposits is proposed to follow similar processes that occur in gabbro hosted Cu-Ni deposits associated with mafic/ultramafic complexes such as the New Celebration Dyke, Western Australia and the Vammala Nickel Belt, Finland.

The Eastern and Western Gabbros have a maximum measured thickness of 12m and while the Ni concentrations are high (>300ppm) it remains debatable as to whether Cu/Ni-rich massive sulphides up to 1.00 thick can form by a process of immiscible sulphide segregation such as occurs in larger scale gabbro-hosted deposits (Peltonen, 1995). It is proposed that the sulphide was introduced and deposited after the Eastern Gabbro intruded the Crimson Creek sediment package. Supporting evidence includes the presence of compositional banding in some massive sulphide and its occurrence in the underlying sedimentary rocks.

The massive Cu/Ni sulphide formation in the Eastern Gabbro is thought to have involved a two stage process. The initial stage comprises the shallow level emplacement of oxidised metal-rich magmas that either contained indigenous sulphur or assimilated it from graphite-rich pyritic sediments. Stage two is characterised by the addition of a second pulse of magma into the chamber and the subsequent remobilisation and emplacement of sulphide along lines of weakness parallel to the margins of the gabbroic bodies.

Variations in the Cu:Ni ratios and mineralogy such as seen at Nickel Reward and Devereaux are explained by fluctuations in the chemistry and temperature of Cu/Ni sulphide formation. The occurrence of primary millerite and lack of pentlandite may be explained by higher values of $f(O_2)$ which favour the partitioning of Ni^{2+} into the sulphide melt at the expense of Fe^{2+} leading to low sulphur to nickel ratios (Campbell and Barnes, 1984). The higher

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copper:nickel ratio at the Deveraux Prospect may be explained as a consequence of the sulphides being precipitated from a supercooled magma with the higher Cu content precipitating more rapidly than the remaining sulphide minerals, maintaining effective equilibrium with the smallest volume of magma (Campbell and Naldrett, 1979).

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Appendix 3.1

344198

Sheet No. 1.....

Drill Core Log

Hole No. SH.1....

Coordinates S. 366.780.....N Azimuth ...82° to 275°... Depth 677.42m
367.149.....E

Depth (m)		Core Description	Special Features	Sample Number	Depth (m)
From	To				
279.07	282.0	BASE OF SHEARED BLACK SERPENTINITE			
281.90		GABBRO.			
282.0	286.0	LAMINATED GREY SLTSTONE.			
286.0	294.0	ALTERED GABBRO.	Qtz/CARBONATE VEINS 45° to LCA.	SH163.	293.10.
294.0	306.18	INTERBEDDED GREY/BLACK/GREEN SANDSTONE/MUDSTONE. BEDDING @ 35° to L.C.A.	297.10 - MINERALISATION IN Qtz/CALCITE VEIN (90. cpy, sph). 302.92 Qtz/CARB. VEIN. C.A/V = 35°.		
306.18	307.94	GABBRO. - FAULTED TOP CONTACT C.A/F = 15°	307.47. CALCITE VEIN C/V = 40°.		
307.94	313.16	INTERBEDDED BLACK M'ST/CALCAREOUS M'ST.			
313.16	316.0	INTERBEDDED GREEN SS/M'ST WITH BLACK MUDSTONE - TOP CONTACT SHEARED/FRACTURED 2.5cm Thick C/F = 17°	315.0 Qtz/CARB VEINS. 1) C/V = 40° (BARREN) 2) C/V = 20° (Pb)		
316.0	323.40	BLACK MUDSTONE + MINOR CARBONATE. C/BEDDING = 45° C/CARBONATE VEIN = 25°	SOME RARE Pb MINERALISATION.		
323.40	324.06	SERIES OF INTERBEDDED GREEN/PINK. SANDSTONES/MUDSTONES.	VEINING. C/CARB 1) 35° 2) SUB. VERT.		

344199

Sheet No. 2.....

Drill Core Log

Hole No. SH1....

Coordinates ...S 366.780...N Azimuth ...82° to 275... Depth 677.46.m
367.....149...E

Depth (m)		Core Description	Special Features	Sample Number	Depth (m)
From	To				
329.10	334.80	Dominantly Green Sandstone. - First M'st appears. 329.58m.	* GENERAL LACK OF ANY MINERALISATION		
334.80	348.97	Sst/M'st. FINING UPWARD SETS - TURBIDITES. RANGING IN THICKNESS FROM 1-2m	- SOME MINOR RD ALONG FRACTURE PLANES. @ 355.10m + CURIC PYRITE (DISSEMINATED) @ 342.10m.		
348.97	349.61	Pink Laminated M'st.			
			354.80 Fault with associated Bx.		
355.25	356.12	Pink S'st.	C/Fault = 10°		
			358.72. Last of Pink colouration.		
361.23	363.32	Finning Upward Sequence. Green medium grained S'st up to laminated green M'st	* Erosional contacts between sets. Rip up clasts and flakes at base of coarse beds.		
362.52	369.0	Series of S'st/M'st fining upward sequences. C/B = 10°			
369.0	369.67	Black Mudstone.			
370.40	383.13	Interbedded olive green S'st/M'st.	RD dominant in veins		
376.06	400.0	Intensely veined black mudstone - laminated to finely bedded. C/B = 45°	C/Pd veins = 20° C/CARB veins = 35°		

344200

Sheet No. 3.....

Drill Core Log

Hole No. SK1.....

Coordinates S 366.780 mN Azimuth ... 82° to 275° Depth 677.46 m
 367.149 mE

Depth (m)		Core Description	Special Features	Sample Number	Depth (m)
From	To				
384.50	384.75	Pb VEINS DOMINANT.			
394.58	400.0	DISTINCTIVE SPOTTING (CARBONATE) INTERBEDDED WITH FINELY LAMINATED BLACK SHALES.			
400.0	401.20	ALTERED ZONE, PALE GRAY HORNFELS. CONTACT METAMORPHISM.	FRACT AT TOP OF HORNFELS C/F = 10°		
401.20	422.43	MEDIUM GRAINED GABBRO - 422.43 - 50 Qtz/CARB VEIN - 422.50 - 60 PALE GRAY HORNFELS.	SOME CALCITE VEINING. INCREASING TOWARD TOP.	SH1G2.	417.85.
421.60	427.63	Pb-RICH BLACK MUDSTONE.			
427.70	435.17	COARSE GRAINED, HIGHLY ALTERED GABBRO - BASE OF INTRUSIVE INTERFINGERS WITH GRAPHITIC BLACK SHALE UNITS.	SALMON-PINK FELDSPAR - ALBITE??	SH1G2.	429.70
435.17	509.60	BLACK MUDSTONE + MINOR CARBONATE. * NOTE INCREASINGLY GRAPHITIC TOWARD GABBRO. C.A/SUBSTR = 35°	436.82 Pb/Zn in 2.5cm BAND OF GABBRO. 446.82 3cm Qtz/CARB VEIN C/V = 45°		
481.40	483.20	COARSER GRAY M'ST C.A/BEDDING = 35°	473.87 Qtz/CARB VEIN 3cm THICK C/V = 60°		

Drill Core Log

Coordinates 5.366.780..... m.N Azimuth ... 32° - 275°..... Depth 677.46 m
 367.149..... m.E

Depth (m)		Core Description	Special Features	Sample Number	Depth (m)
From	To				
503.7.	504.7.	BRECCIATED ZONE			
508.56	508.83.	BRECCIATED ZONE SANDSTONE CLASTS IN BLACK M'ST.			
510.0	511.60	INTERBEDDED S'ST / M'ST.			
511.60	516.40	FINELY LAMINATED / MINERALISED BLACK MUDSTONE.			
516.40	517.40	BRECCIATED S'ST / M'ST.			
517.40	522.30	NINE SMALL FINING UPWARDS SEQUENCES. S'ST / GRAY M'ST. C/BEDDING = 30° C/Fault = 60°	SANDSTONE DOMINANT UP TO 75cm THICK.		
522.30	523.60	MASSIVE OLIVE GREEN LITHIC S'ST. C.A / VEIN = 35°.			
523.60	527.54.	INTERBEDDED S'ST / BLACK M'ST. * MAXX COLOUR CHANGE FROM BLACK / BROWN TO OLIVE GREEN @ 525.00	S'ST - PURPLISH / PINK M'ST - BLACK → GRAY 522.50 4cm BAND OF BRECCIATED S'ST.		
527.54.	543.5	S'ST / BLACK M'ST. + CALCITE VEINS. C/VEINS = 50°	MINERALISATION. COY + OTHER IN CH/ CHLORITE / CARB. VEIN @ 541.820.		

Drill Core Log

Coordinates5.366.780.....mN Azimuth ...82° to ...275°... Depth 677.46m

.....367.149.....mE

Depth (m)		Core Description	Special Features	Sample Number	Depth (m)
From	To				
543.5	545.0	DISTINCTIVE 'CHEAT LIKE', LAMINATED PINKISH BROWN, HIGHLY SILICIFIED M'ST	? MARKER BED?		
545.0	547.90	GRADED BED., S'ST TO BLACK M'ST. BRECCIATED UNIT 545.85 → 546.20m.			
547.90	556.0	8x TURBIDITE SEQUENCES OF VARYING THICKNESS. LITHIC S'ST / LAMINATED GREY/GREEN/ BLACK M'ST. C/BEDDING = 40° C/VEINS = 15° Fault Related. 30° - 20cm OF CALCITE VEIN BRECCIA AT BASE OF UNITS.	MINERALISATION: PYRITE ON FRACTURE PLANES.		
556.0	588.2	1x GRADED BED. 566.0 - 588.2 PALE OLIVE GREEN/BROWN MASSIVE S'ST DOMINANT C/BEDDING = 50° C/VEINS = 60°	SOME PYRITE DISSEMINATED WITHIN RARE CALCAREOUS BEDS.		
588.2	596.40	SHEARED BLACK MUDSTONE. CALCITE VEINING @ 588.25m 8-9pp/cm MINERALISATION: Pb + Py both disseminated and in veinlets. - SOME CLASTS OF S'ST IN UNIT.	GRADED BOUNDARY.		
596.40	600.70	S'ST UNIT CONTAINING RIPUP CLASTS OF M'ST AND RARE CARBONATE. C/VEINS 1) = 15° 2) = 15°			

Drill Core Log

Coordinates 5 366 780 m N Azimuth 82° to 275° Depth 677.46 m
 367 149 E

Depth (m)		Core Description	Special Features	Sample Number	Depth (m)
From	To				
600.80	607.0	INTERBEDDED S'ST/M'ST WITH RARE CARBONATE WITHIN MUDSTONE BEDS. C/BEDDING = 60° C/CALCITE VEINS = 45° C/FAULT = 30°	SOME Pb + Py IN BLACK MUDS.		
607.0	608.0	CARBONATE (DOLOMITE)			
608.0	618.0	SERIES OF GRADED S'ST/M'ST INTERBEDS. C/BEDDING = 40°			
618.0	622.40	OXIDISED ZONE. 620.30 Qtz CONGLOMERATE BED REMAINS	GREEN CLAYS + MOTTLE = FLUORITE		
622.40	638.60	TERRAZZITES: SET OF 40 SEPARATE FINING UPWARD SEQUENCES. LITHIC S'ST / GREY/BLACK M'ST. C/BEDDING = 65° C/VEINS = 45° SEQUENCES VARY IN THICKNESS 1-2cm UP TO 1.70m. MINERALIZATION: SOME Pb/Zn ON FRACTURES. MINOR Pb + Py IN VEINS.			
638.60	649.60	SHEARED BLACK M'ST., CONTAINING CLASTS OF SST AND MINOR CARBONATE. C/BEDDING = 55°			
649.60	652.0	BRECCIATED PALE GREEN S'ST FINING UP TO GREY/BLACK MUDSTONE CONTAINING DISSEMINATED Pb.			

Appendix 4.1

Recalculated clinopyroxene data

344206

Point	MF05 36.8 R1	R2 CPX CORE	R3 CPX CORE	R4 CPX CORE
Mineral	PX	PX	PX	PX
Na2O	0.4	0.32	0.29	0.33
MgO	13.79	15.17	15.67	15.16
Al2O3	4.17	3.99	2.15	3.77
SiO2	48.51	50.17	51.63	49.93
P2O5	0.28	0.19	0.41	0.26
K2O	0.05	0.06	0	0.07
CaO	20.9	21.86	21.52	21.78
TiO2	1.82	0.82	0.65	0.77
Cr2O3	0.03	0.71	0.26	0.69
MnO	0.27	0.2	0.22	0.14
FeO	8.82	6.68	7.5	6.58
NiO	0.02	0.01	0.03	0.06
CalcTotal	99.06	100.18	100.33	99.56
OxNum	6	6	6	6
Si	1.838	1.861	1.914	1.864
Al	0.186	0.174	0.094	0.166
Fe2	0.279	0.207	0.233	0.205
Mg	0.779	0.839	0.866	0.844
Ca	0.834	0.858	0.834	0.858
Na	0.029	0.023	0.021	0.024
K	0.002	0.003	0	0.004
Ti	0.052	0.023	0.018	0.022
P	0.009	0.006	0.013	0.008
Mn	0.009	0.006	0.007	0.004
Cr	0.001	0.021	0.008	0.02
Ni	0.001	0	0.001	0.002
mg	73.606	80.179	78.831	80.429
Total Cat	4.01	4.016	3.995	4.013
Ox Equiv	6	6	6	6
New Fe2O3	*	*	*	*
New FeO	*	*	*	*
New Calc Total	*	*	*	*
Reallo Code	1	1	1	1
Enstatite	41.176	44.04	44.824	44.253
Ferrosilite	14.765	10.887	12.037	10.768
Wollastonite	44.058	45.073	43.14	44.978

Recalculated clinopyroxene data

R5 CPX CORE PX	R7 CPX CORE PX	R10 COX CORE PX	MF01 47.7 R2 PX	R3 CPX PX
0.35	0.4	0.29	0.31	0.34
15.88	15.35	14.58	14.31	14.07
2.39	4.46	3.7	4.92	3.73
51.32	49.69	49.46	49.38	50.31
0.31	0.47	0.41	0.37	0.43
0.01	0.02	0.04	0.02	0.01
21.25	21.65	22.33	22.05	21.34
0.73	0.78	0.88	1.1	1.19
0.33	0.42	0.36	0.34	0.13
0.25	0.25	0.09	0.19	0.24
7.12	6.75	7.16	7.78	8.84
0	0.02	0.03	0.05	0.05
99.95	100.27	99.34	100.81	100.67
6	6	6	6	6
1.906	1.845	1.86	1.832	1.872
0.105	0.195	0.164	0.215	0.163
0.221	0.21	0.225	0.241	0.275
0.879	0.849	0.817	0.791	0.78
0.829	0.836	0.878	0.857	0.828
0.025	0.029	0.021	0.023	0.025
0	0.001	0.002	0.001	0
0.02	0.022	0.025	0.031	0.033
0.01	0.015	0.013	0.011	0.014
0.008	0.008	0.003	0.006	0.008
0.01	0.012	0.011	0.01	0.004
0	0.001	0.001	0.001	0.001
79.904	80.206	78.41	76.635	73.939
4.004	4.008	4.007	4.008	3.99
6	6	6	6	6
.
.
.
1	1	1	1	1
45.571	44.809	42.564	41.872	41.431
11.461	11.058	11.72	12.766	14.603
42.967	44.132	45.715	45.362	43.966

R13 CPX PX	R4 CPX PX	R4 CPX1-3a PX	R7 CPX/CORE PX	R8 CPX PX
0.23	0.28	0.29	0.28	0.34
15.93	14.49	14.37	14.8	14.39
2.34	4.53	4.54	4.03	4.26
52.26	49.6	49.16	50.07	49.45
0.39	0.39	0.35	0.4	0.38
0.01	0.01	0.01	0	0.02
21.12	21.86	21.84	21.57	21.19
0.55	1	1.12	0.88	1.07
0.19	0.34	0.36	0.27	0.27
0.25	0.25	0.19	0.22	0.34
7.62	8.12	7.93	7.96	8.82
0.01	0.01	0.04	0	0.02
100.9	100.88	100.22	100.47	100.54
6	6	6	6	6
1.922	1.84	1.836	1.86	1.845
0.101	0.198	0.2	0.176	0.187
0.234	0.252	0.248	0.247	0.275
0.873	0.802	0.8	0.82	0.8
0.812	0.848	0.856	0.838	0.827
0.016	0.02	0.021	0.02	0.025
0	0	0.001	0	0.001
0.015	0.028	0.032	0.025	0.03
0.012	0.012	0.011	0.013	0.012
0.008	0.008	0.006	0.007	0.011
0.006	0.01	0.011	0.008	0.008
0	0	0.001	0	0
78.837	76.086	76.357	76.828	74.411
3.988	4.007	4.011	4.002	4.01
6	6	6	6	6
.
.
.
1	1	1	1	1
45.489	42.147	42.029	43.032	42.06
12.211	13.247	13.014	12.979	14.464
42.3	44.607	44.957	43.99	43.475

Recalculated clinopyroxene data

R1 CPX PX	R1 CPX1-3a PX	R6 CPX/CORE PX	R6 CPX/CORE PX	MFO1 43.3 R5 PX
0.29	0.29	0.37	0.33	0.29
14.45	14.51	13.67	13.97	15.37
4.35	4.36	4.02	3.99	3.67
49.75	49.41	49.38	49.84	50.16
0.35	0.32	0.36	0.34	0.38
0	0.01	0	0.02	0
21.72	21.69	21.32	21.7	21.95
1.01	1.08	1.33	1.04	0.67
0.27	0.3	0.07	0.18	0.86
0.22	0.24	0.26	0.27	0.18
8.26	7.99	9.3	8.95	6.22
0.04	0.02	0.01	0.03	0.08
100.69	100.24	100.09	100.66	99.85
6	6	6	6	6
1.848	1.843	1.854	1.859	1.866
0.191	0.192	0.178	0.175	0.161
0.257	0.249	0.292	0.279	0.194
0.8	0.807	0.765	0.777	0.853
0.847	0.85	0.839	0.849	0.855
0.021	0.021	0.027	0.024	0.021
0	0.001	0	0.001	0
0.028	0.03	0.038	0.029	0.019
0.011	0.01	0.012	0.011	0.012
0.007	0.008	0.008	0.009	0.006
0.008	0.009	0.002	0.005	0.025
0.001	0.001	0	0.001	0.002
75.721	76.394	72.388	73.555	81.495
4.007	4.011	4.003	4.008	4.002
6	6	6	6	6
.
.
.
1	1	1	1	1
42.043	42.328	40.368	40.763	44.845
13.481	13.079	15.398	14.656	10.183
44.476	44.593	44.234	44.581	44.973

Recalculated clinopyroxene data

344210

R3 CPX CORE	R9 CPX	R10 CPX/END
PX	PX	PX
0.29	0.33	0.35
15.27	15.79	15.18
3.88	2.8	3.75
50.56	51.41	50.13
0.35	0.34	0.34
0	0	0.08
22.14	21.8	21.42
0.61	0.63	0.75
0.87	0.47	0.81
0.12	0.28	0.18
6.23	6.97	6.88
0.07	0.03	0
100.4	100.83	99.87
6	6	6
1.869	1.895	1.867
0.169	0.121	0.164
0.193	0.215	0.214
0.842	0.867	0.843
0.859	0.843	0.837
0.021	0.023	0.025
0	0	0.004
0.017	0.017	0.021
0.011	0.011	0.011
0.004	0.009	0.006
0.025	0.014	0.024
0.002	0.001	0
81.382	80.158	79.721
4	4.006	4.006
6	6	6
.	.	.
.	.	.
.	.	.
1	1	1
44.464	45.052	44.497
10.172	11.152	11.319
45.364	43.796	44.184

Recalculated clinopyroxene data

344211

Point	R3 CPX RIM	R1 CPX1 RIM	R2 CPX RIM	R3 CPX RIM
Mineral	PX	PX	PX	PX
Na2O	0.28	0.29	0.3	0.35
MgO	15.35	15.26	14.55	16.49
Al2O3	3.78	2.2	3.43	2.32
SiO2	50.41	51.19	49.71	51.98
P2O5	0.41	0.29	0.26	0.37
K2O	0	0	0.04	0.02
CaO	21.78	21.43	21.47	21.69
TiO2	0.63	0.74	0.97	0.32
Cr2O3	0.85	0	0.22	0.3
MnO	0.17	0.2	0.22	0.17
FeO	6.32	8.25	7.93	6.51
NiO	0.09	0	0	0
CalcTotal	100.08	99.86	99.11	100.52
OxNum	6	6	6	6
Si	1.87	1.912	1.873	1.914
Al	0.165	0.097	0.152	0.101
Fe2	0.196	0.258	0.25	0.201
Mg	0.849	0.85	0.817	0.905
Ca	0.844	0.842	0.853	0.837
Na	0.02	0.021	0.022	0.025
K	0	0	0.002	0.001
Ti	0.017	0.021	0.028	0.009
P	0.013	0.009	0.008	0.012
Mn	0.005	0.006	0.007	0.005
Cr	0.025	0	0.007	0.009
Ni	0.003	0	0	0
mg	81.23	76.731	76.581	81.87
Total Cat	3.995	4.006	4.011	4.006
Ox Equiv	6	6	6	6
New Fe2O3	*	*	*	*
New FeO	*	*	*	*
New Calc Total	*	*	*	*
Reallo Code	1	1	1	1
Enstatite	44.933	43.584	42.563	46.611
Ferrosilite	10.383	13.217	13.016	10.322
Wollastonite	44.684	43.2	44.422	43.067

Recalculated clinopyroxene data

R4 CPX RIM PX	R5 CPX RIM PX	R7 CPX RIM PX	R10 CPX RIM/ PX	R4 CPX1-3b PX
0.53	0.3	0.47	0.25	0.31
14.31	15.23	15.32	14.72	14.19
3.68	2.93	4.6	3.66	4.76
48.95	50.46	50.33	50	49.09
0.1	0.35	0.39	0.27	0.41
0.07	0.06	0.05	0.01	0
21.01	21.74	21.68	21.76	22.27
1.63	0.72	0.75	0.94	1.17
0.01	0.35	0.47	0.25	0.27
0.35	0.21	0.16	0.26	0.24
8.76	7.73	6.66	7.45	7.93
0	0	0.03	0	0
99.41	100.09	100.92	99.57	100.63
6	6	6	6	6
1.848	1.883	1.852	1.871	1.828
0.164	0.129	0.199	0.161	0.209
0.276	0.241	0.205	0.233	0.247
0.805	0.847	0.84	0.821	0.788
0.844	0.85	0.835	0.858	0.867
0.039	0.022	0.034	0.018	0.023
0.004	0.003	0.002	0.001	0
0.046	0.02	0.021	0.026	0.033
0.003	0.011	0.012	0.009	0.013
0.011	0.007	0.005	0.008	0.008
0	0.01	0.014	0.007	0.008
0	0	0.001	0	0
74.438	77.829	80.388	77.882	76.127
4.037	4.012	4.009	4.006	4.01
6	6	6	6	6
.
.
.
1	1	1	1	1
41.811	43.69	44.693	42.935	41.422
14.358	12.446	10.903	12.193	12.99
43.831	43.864	44.404	44.871	45.588

Recalculated clinopyroxene data

R4 CPX1-3c PX	R7 CPX/RIM PX	R8 CPX2 PX	R1 CPX1-3b PX	R1 CPX1-3c PX
0.32	0.33	0.29	0.29	0.29
14.31	14.1	14.65	14.18	14.3
4.8	4.28	4.47	4.23	4.27
49.08	49.45	49.66	49.49	49.32
0.36	0.33	0.38	0.31	0.36
0	0	0	0.02	0.03
21.18	21.33	21.22	21.92	21.89
1.08	1.1	0.86	1.02	0.96
0.38	0.31	0.29	0.36	0.22
0.25	0.26	0.2	0.19	0.16
8.25	8.8	8.36	8.16	8.55
0.08	0.04	0.04	0.03	0.03
100.09	100.33	100.4	100.2	100.37
6	6	6	6	6
1.835	1.848	1.849	1.849	1.843
0.211	0.189	0.196	0.186	0.188
0.258	0.275	0.26	0.255	0.267
0.797	0.785	0.813	0.79	0.797
0.83	0.837	0.827	0.861	0.858
0.023	0.024	0.021	0.021	0.021
0	0	0	0.001	0.001
0.03	0.031	0.024	0.029	0.027
0.011	0.01	0.012	0.01	0.011
0.008	0.008	0.006	0.006	0.005
0.011	0.009	0.008	0.011	0.006
0.002	0.001	0.001	0.001	0.001
75.55	74.055	75.758	75.587	74.879
4.007	4.008	4.006	4.01	4.015
6	6	6	6	6
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.
.
1	1	1	1	1
42.297	41.394	42.796	41.438	41.458
13.688	14.502	13.694	13.384	13.908
44.015	44.104	43.51	45.178	44.634

Appendix 4.2

Cuni gabbro wholerock geochemistry

(Wt%)	MFO2-43.0	MFO2-47.7	MFO5-34.3	MFO5-36.8	MFO5-40.0	MFO2-82.80	MFO2-93.50
SiO2	46.31	44.75	45.66	43.38	43.77	38	42.83
TiO2	0.73	0.92	0.85	0.75	0.9	0.8	0.67
Al2O3	16.88	16.1	16.79	14.45	16.21	14.62	14.35
Fe2O3	12.56	13.93	12.4	13.19	13.98	11.84	13.17
MnO	0.26	0.2	0.18	0.24	0.27	0.25	0.24
MgO	10.92	14.07	12.61	12.94	12.44	9.95	15.77
CaO	2.49	0.24	1.27	5.78	1.87	9.27	2.23
Na2O	2.46	1.36	2.97	2.71	3.37	2.51	0.13
K2O	2.08	1.01	0.67	0.49	0.24	0.87	1.09
P2O5	0.05	0.08	0.08	0.07	0.09	0.08	0.05
La	4.81	7.9	7	5.17	8	6.3	6
Ce	12.08	18	9	13.1	7	15.6	12
Nd	7.12	10.5	5	8.75	6	9.57	5
Nb	2.3	3.2	3.1	3.2	3.6	3.4	2.4
Zr	37	58	52	47	58	57	40
Sr	139	58	135	158	148	216	59
Ba	556	345	265	159	102	310	492
Cr	748	1158	667	663	768	686	1174
V	297	319	289	226	314	301	234
Sc	55	43	41	26	46	39	32
Rb	90	42	29	19	9	43	64
Y	20	22	24	21	26	27	20
Th	<1.5	<1.5	<1.5	<1.5	2.2	<1.5	<1.5
Ni	295	542	350	406	449	340	596
Sm	2	2.6		2.56		2.67	
Eu	0.67	0.85		0.93		0.92	
Tb		0.53		0.58		0.6	
Ho	0.74	0.79		0.89		0.88	
Yb	2.12	2.32		2.41		2.47	
Lu	0.33	0.35		0.34		0.38	

344215

344216

Appendix 4.3

Amphibole microprobe data

344217

Point	SH1G1 R1 HN/	R1 HORN RIM	R6 HORN COR	R6 HORN RIM	R4 HORN COR
Mineral	AM	AM	AM	AM	AM
Na2O	2.1	1.62	1.21	1.52	1.66
MgO	10.75	10.76	10.83	10.61	11.05
Al2O3	9.09	8.74	8.18	8.09	8.34
SiO2	43.56	44.43	45.49	45.52	44.69
P2O5	0.11	0.1	0.08	0.15	0.11
K2O	0.39	0.37	0.3	0.12	0.38
CaO	10.35	10.4	11.05	11.02	10.54
TiO2	1.67	1.05	0.55	0.25	0.82
Cr2O3	0.04	0.05	0.06	0	0.28
MnO	0.17	0.19	0.16	0.2	0.28
FeO	17.96	18.96	18.44	19.03	18.18
NiO	0.16	0.05	0	0.04	0.02
CalcTotal	96.34	96.72	96.37	96.54	96.36
OxNum	23	23	23	23	23
Si	6.656	6.765	6.914	6.928	6.814
Al	1.636	1.568	1.466	1.451	1.499
Fe2	2.296	2.414	2.345	2.422	2.319
Mg	2.45	2.441	2.454	2.407	2.512
Ca	1.67	1.675	1.782	1.765	1.7
Na	0.622	0.477	0.357	0.447	0.491
K	0.075	0.072	0.059	0.023	0.074
Ti	0.192	0.12	0.063	0.029	0.094
P	0.015	0.012	0.011	0.019	0.014
Mn	0.022	0.025	0.02	0.026	0.037
Cr	0.005	0.007	0.007	0	0.033
Ni	0.019	0.007	0.001	0.005	0.002
mg	51.62	50.278	51.139	49.849	52.003
Total Cat	15.643	15.571	15.467	15.504	15.575
Ox Equiv	23	23	23	23	23
New Fe2O3	*	*	*	*	*
New FeO	*	*	*	*	*
New Calc Total	*	*	*	*	*
Reallo Code	1	1	1	1	1

Amphibole microprobe data

R4 HORN RIM	MFO1 47.7 R5	R5 HORN/RIM	R11 HORN	R13 HORN/EN	MFO1 43.3 R6
AM	AM	AM	AM	AM	AM
2.21	2.5	2.73	2.82	2.34	2.37
10.23	15.72	14.87	15.55	15.71	15.58
10.4	7.07	7.46	7.85	7.19	6.68
47.47	47.39	46.08	45.02	47.4	47.35
0.17	0.16	0.14	0.17	0.21	0.22
0.31	0.16	0.43	0.6	0.14	0.1
9.96	10.57	10.56	10.95	10.56	10.36
0.64	1.36	2.47	2.9	1.41	1.65
0.04	0	0.04	0.14	0.04	0.01
0.19	0.21	0.27	0.2	0.19	0.22
15.89	11.72	11.78	10.49	12.1	11.15
0.01	0.13	0.17	0.12	0.11	0.02
97.52	96.98	96.99	96.82	97.41	95.69
23	23	23	23	23	23
6.991	6.951	6.802	6.653	6.93	7.01
1.806	1.222	1.298	1.367	1.24	1.165
1.957	1.437	1.455	1.297	1.48	1.381
2.245	3.437	3.271	3.425	3.425	3.438
1.537	1.628	1.639	1.698	1.611	1.597
0.63	0.71	0.781	0.809	0.663	0.68
0.058	0.029	0.081	0.113	0.027	0.018
0.071	0.15	0.274	0.322	0.155	0.183
0.021	0.02	0.018	0.021	0.026	0.028
0.024	0.026	0.033	0.025	0.023	0.028
0.004	0	0.004	0.016	0.005	0.001
0.001	0.015	0.021	0.015	0.013	0.002
53.434	70.512	69.218	72.536	69.825	71.341
15.325	15.607	15.659	15.742	15.572	15.504
23	23	23	23	23	23
.
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.
1	1	1	1	1	1

Amphibole microprobe data

344219

R6 HORN repe	R13 HORN?	R1 HORN/COR	R1 HORN/RIM	R2 HORN/COR	R2 HORN/RIM
AM	AM	AM	AM	AM	AM
2.34	1.98	2.83	2.83	0	2.67
15.75	14.59	15	15.53	15.1	15.69
6.65	8.75	8.06	7.46	8.76	8.2
47.04	46.29	44.38	45.45	44.01	45.28
0.21	0.24	0.19	0.16	0.17	0.19
0.1	0.1	0.5	0.55	0.66	0.29
10.64	11.25	10.89	10.97	10.55	10.53
1.64	0.93	3.23	3.19	2.8	1.49
0.08	0.01	0.05	0.02	0	0
0.28	0.25	0.2	0.19	0.2	0.24
11.01	12.16	10.73	10.57	11.26	11.27
0.09	0.02	0.03	0.06	0.05	0
95.84	96.57	96.1	96.97	93.56	95.85
23	23	23	23	23	23
6.968	6.833	6.615	6.698	6.673	6.74
1.161	1.522	1.415	1.296	1.565	1.439
1.364	1.501	1.337	1.303	1.428	1.403
3.478	3.211	3.333	3.412	3.413	3.481
1.643	1.729	1.699	1.7	1.676	1.639
0.672	0.566	0.817	0.808	0	0.771
0.019	0.019	0.094	0.102	0.128	0.055
0.183	0.104	0.362	0.354	0.319	0.167
0.027	0.03	0.024	0.02	0.022	0.024
0.035	0.032	0.026	0.024	0.025	0.03
0.009	0.001	0.006	0.003	0	0
0.01	0.002	0.004	0.007	0.006	0
71.827	68.153	71.364	72.371	70.507	71.281
15.543	15.52	15.708	15.706	15.234	15.726
23	23	23	23	23	23
.
.
.
1	1	1	1	1	1

Amphibole microprobe data

R7 HORN/COR	R7 HORN/RIM	R4 HORN/COR	R4 HORN/RIM/END
AM	AM	AM	AM
2.17	2.42	2.48	2.97
16.2	15.14	15.26	15.26
7.13	8.32	7.65	8.08
47.62	46.23	45.62	45.02
0.21	0.2	0.21	0.19
0.1	0.07	0.44	0.47
10.61	10.96	11.04	10.99
0.8	1.3	3.13	3.17
0.01	0.02	0.02	0
0.26	0.2	0.2	0.19
11.28	11.83	10.6	11.02
0.05	0.08	0.04	0.13
96.45	96.78	96.7	97.5
23	23	23	23
6.994	6.81	6.727	6.62
1.234	1.445	1.33	1.4
1.386	1.457	1.307	1.355
3.548	3.325	3.354	3.346
1.625	1.689	1.7	1.691
0.617	0.692	0.71	0.846
0.018	0.013	0.083	0.088
0.089	0.144	0.347	0.351
0.026	0.024	0.026	0.024
0.033	0.026	0.026	0.024
0.001	0.003	0.002	0
0.006	0.009	0.005	0.015
71.914	69.533	71.964	71.182
15.551	15.613	15.591	15.736
23	23	23	23
.	.	.	.
.	.	.	.
.	.	.	.
1	1	1	1

344221

Recalculated amphibole data

5

		SH1G1 R1 HN/	R1 HORN RIM	R6 HORN COR	R6 HORN RIM	R4 HORN COR	R4 HORN RIM	MFO1 47.7 R5
SiO2	Si	6.52974081	6.59482902	6.77790182	6.79033603	6.67370685	6.94048654	6.83310734
TiO2	Al	1.47025919	1.40517098	1.22209818	1.20966397	1.32629315	1.05951346	1.16689266
Al2O3	Fe3+	0	0	0	0	0	0	0
FeO	Sum in T	8	8	8	8	8	8	8
MnO								
MgO	Al	0.13696558	0.12501184	0.2154993	0.21378597	0.1427261	0.73401671	0.03552573
CaO	Fe3+	0.94692408	1.20126771	0.94842873	0.95443509	1.07327514	0.37967774	0.84190991
Na2O	Ti	0.1882695	0.11721197	0.06163075	0.02804687	0.09209288	0.070373	0.14747753
K2O	Mg	2.40158641	2.38024235	2.4048582	2.35877262	2.45923896	2.22909203	3.37804753
Cl	Fe2+	1.30466864	1.15237746	1.34938958	1.41968801	1.19724878	1.56330979	0.5713908
F	Mn	0.02158579	0.02388866	0.02019344	0.02527144	0.03541815	0.02353072	0.02564849
	Ca	0	1.4086E-15	0	2.7686E-15	6.5226E-16	1.5474E-15	1.2837E-16
Total	Sum in C	5	5	5	5	5	5	5
O = Cl,F	Fe2+	0	0	0	0	0	0	0
	Mn	2.5535E-15	0	2.1441E-15	0	0	0	0
Total	Ca	1.66242714	1.65407335	1.76415124	1.76142764	1.68652033	1.56035789	1.63305466
	Na	0.33757286	0.34592665	0.23584876	0.23857236	0.31347967	0.43964211	0.36694534
	Sum in B	2	2	2	2	2	2	2
	Ca	0	0	0	0	0	0	0
	Na	0.27281796	0.12032767	0.11373024	0.20108387	0.16718864	0.18689037	0.33201441
	K	0.07458543	0.07006647	0.05702718	0.02283766	0.07239718	0.05782474	0.02943288
	Sum in A	0.34740339	0.19039414	0.17075742	0.22392152	0.23958582	0.24471511	0.3614473
Mg/Mg+Fe2+		0.65	0.67	0.64	0.62	0.68	0.59	0.86

344222

Recalculated amphibole data

R5 HORN/RIM	R11 HORN	R13 HORN	MF01 43.3 R6	R6 HORN	R13 HORN	R1 HORN/COR	R1 HORN/RIM	R2 HORN/COR
6.73240562	6.60733881	6.79872267	6.90072495	6.86831329	6.72853129	6.57000929	6.65416728	6.46191687
1.26759438	1.35892474	1.20127733	1.09927505	1.13168671	1.27146871	1.40740274	1.28825939	1.51711593
0	0.03373644	0	0	0	0	0.02258797	0.05757333	0.0209672
8	8	8	8	8	8	8	8	8
0.01799209	0	0.01513984	0.04902626	0.01358648	0.22871972	0	0	0
0.54692877	0.39365167	0.95961115	0.76459434	0.74754182	0.75844821	0.34911105	0.29538736	1.47646587
0.27140021	0.32009177	0.15209801	0.18084816	0.18008687	0.101665	0.35961403	0.35124159	0.30918859
3.23780323	3.40120775	3.35820227	3.38394946	3.42724398	3.16060387	3.30941801	3.3885427	3.30421749
0.89246138	0.86018531	0.49186461	0.59442311	0.5969109	0.7197821	0.95677736	0.94126568	-0.11474625
0.03341432	0.02486349	0.02308414	0.02715867	0.03462995	0.0307811	0.02507955	0.02356267	0.02487431
0	0	0	1.9013E-15	0	0	3.2405E-15	0	4.4756E-16
5	5	5	5	5	5	5	5	5
0	0	0	0	0	0	0	0	0
1.6653E-16	1.7E-16	6.6266E-16	0	2.4286E-15	-5.8981E-17	0	6.4532E-16	0
1.65316393	1.72198516	1.62295733	1.61781437	1.66463343	1.75218443	1.72743122	1.72091989	1.65980343
0.34683607	0.27801484	0.37704267	0.38218563	0.33536657	0.24781557	0.27256878	0.27908011	0
2	2	2	2	2	2	2	2	1.65980343
0	0	0	0	0	0	0	0	0
0.42655843	0.52449584	0.27375422	0.28755047	0.32712334	0.31024188	0.53978602	0.52431075	0
0.08015074	0.11234497	0.02561877	0.01859328	0.01862791	0.01854447	0.09443435	0.10273154	0.12363323
0.50670917	0.63684081	0.29937299	0.30614375	0.34575124	0.32878635	0.63422037	0.6270423	0.12363323
0.78	0.79	0.87	0.85	0.85	0.82	0.77	0.78	

Recalculated amphibole data

344223

R2 HORN/RIM	R7 HORN/COR	R7 HORN/RIM	R4 HORN/COR	R4 HORN/RIM	
6.60765557	6.84581967	6.70388807	6.68054931	6.572	
1.39234443	1.15418033	1.29611193	1.31945069	1.391	
0	0	0	0	0.037	
8	8	8	8	8.000	
0.01908606	0.05483069	0.1269731	0.00191489	0.000	
0.94370766	1.03442828	0.7862382	0.37714231	0.366	
0.16352444	0.0864931	0.14177565	0.3447122	0.348	
3.4122874	3.47082534	3.27197832	3.33037476	3.320	
0.43172815	0.3217619	0.64846821	0.92104749	0.943	
0.02966629	0.03166069	0.02456653	0.02480835	0.023	
0	0	1.4468E-15	8.4308E-16	0.000	
5	5	5	5	5.000	
0	0	0	0	0.000	
3.747E-16	2.3592E-16	0	0	0.000	
1.64650688	1.63435218	1.70297242	1.73228827	1.719	
0.35349312	0.36564782	0.29702758	0.26771173	0.281	
2	2	2	2	2.000	
0	0	0	0	0.000	
0.40200409	0.23924221	0.38342655	0.43647722	0.560	
0.05399086	0.01834076	0.01295037	0.08220361	0.088	
0.45599496	0.25758297	0.39637692	0.51868082	0.647	
0.88	0.91	0.84	0.85	0.78	

Appendix 5.1

Chrome spinel analyses

344225

Wt%	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7
SiO2	0.1038	0.0536	0.0527	0.1152	0.6603	0.0575	0.0582
TiO2	1.1151	1.8901	1.3309	0.5257	0.5377	1.6375	0.6472
Al2O3	14.6674	15.7351	12.7782	33.9656	11.6097	9.7822	21.0381
Cr2O3	48.4905	42.3605	43.9194	32.0631	47.4139	48.2129	42.047
Fe2O3	6.5167	8.7771	9.7915	4.0785	7.1636	9.8355	5.1776
MgO	10.1542	8.1311	4.8508	15.5385	6.0772	6.4044	9.6217
MnO	0.307	0.3391	0.2928	0.1817	1.5762	0.4712	0.3879
FeO	18.228	20.9769	25.6841	13.1414	21.2393	22.6783	19.6694
NiO	0.0765	0.1103	0.1042	0.1705	0.0655	0.2788	0.1233
ZnO	0.0478	0.0272	0.0836	0.0528	0.8187	0.0464	0.0292
Si	0.0485	0.025	0.0246	0.0539	0.3086	0.0269	0.0272
Ti	0.6685	1.1331	0.7979	0.3151	0.3223	0.9817	0.388
Al	7.7629	8.328	6.763	17.9767	6.1446	5.1774	11.1346
Cr	33.1776	28.9834	30.05	21.9378	32.441	32.9876	28.7689
Fe3+	4.558	6.1391	6.8485	2.8527	5.0105	6.8793	3.6214
Mg	6.1241	4.9039	2.9255	9.3714	3.6652	3.8626	5.8029
Mn	0.2378	0.2626	0.2268	0.1407	1.2207	0.3649	0.3004
Fe	14.1689	16.3057	19.9646	10.215	16.5096	17.6282	15.2894
Ni	0.0601	0.0867	0.0819	0.134	0.0515	0.2191	0.0969
Zn	0.0384	0.0218	0.0672	0.0424	0.6577	0.0373	0.0235
Total	99.7069	98.401	98.8882	99.8329	97.162	99.4047	98.7997
Mg/Mg + Fe2+	49.82	40.86	25.18	67.82	33.772	33.48	87.2
Cr/(Cr +Al)	68.92	64.36	69.75	38.77	73.26	76.78	57.28
(Fe+Mn)/(Fe+M	50.6	59.53	75.03	32.49	67.83	66.98	53.92

Appendix 5.2

Heavy Mineral Separate Methods:

Method 1: Heavy Mineral Separation

Sedimentary rocks are crushed in a jaw crusher and sieved to 65 μ -125 μ . Approximately 20g of the fraction is washed, dried, then placed into a clean, stopcock controlled funnel. Heavy liquid (Tetrabromoethane) is added and filled to within 1cm of the top of the funnel. The mixture is left and stirred every hour. The segregated sample is filtered through filter paper and thoroughly rinsed with acetone then dried and mounted in resin.

Method 2: Chrome spinel separation

In order to separate chromite from the other grains, a rare earth magnet is used to manually lift the more magnetic fraction. This fraction should include any chromite grains along with any magnetite, and magnetic hematite. The fraction is then treated with heated, concentrated hydrochloric acid to dissolve the hematite and hematite-coated quartz grains. The residue is rinsed and separated following the process described in Method 1. Chrome spinel grains may then be analysed using a microprobe.

344228

Appendix 6.0

Phil Greenhill

Cuni gabbros sediments

Honours 1995

Catalog #	Field #	Rock description	AMG grid	DDH	Depth (m)	Locality	Preparations
131288	S. Cuni 1	cpy,pn,py,po,ml ore	366350 5366750			South Cuni Mine	PB
131289	S. Cuni 2	cpy,pn,py,po,ml ore	366350 5366751			South Cuni Mine	PB
131290	S. Cuni 3	cpy,pn,py,po,ml ore	366350 5366752			South Cuni Mine	PB
131291	MFO1 32.0	mafic volcanic derived sandstone	366437 5369300	DD94MF01	32	Cuni prospects	CR,H
131292	MFO1 49.0	cpy,pn,py,po ore	366437 5369301	DD94MF01	49	Cuni prospects	2R,PB
131293	MFO2 43.0	hydrothermally altered hb gabbro	366437 5367770	DD94MFO2	43	Cuni prospects	CR,TS,PD
131294	MFO2 47.7	hydrothermally altered hb gabbro	366437 5367771	DD94MFO2	47.7	Cuni prospects	CR,TS
131295	MFO2 82.8	hydrothermally altered hb gabbro	366437 5367772	DD94MFO2	82.8	Cuni prospects	CR,TS
131296	MFO2 93.5	hydrothermally altered hb gabbro	366437 5367773	DD94MFO2	93.5	Cuni prospects	CR,TS,PD
131297	MFO3 81.0	mafic volcanic derived sandstone	366340 5367700	DD94MF03	81	Cuni prospects	CR,H
131298	MFO5 34.3	hydrothermally altered hb gabbro	366390 5367450	DD94MF05	34.3	Cuni prospects	CR,TS,PD
131299	MFO5 36.8	hydrothermally altered hb gabbro	366390 5367451	DD94MF05	36.8	Cuni prospects	CR,TS
131300	MFO5 40.0	hydrothermally altered hb gabbro	366390 5367452	DD94MF05	40	Cuni prospects	CR,TS,PD
131301	4003	mafic volcanic derived sandstone	366410 5366220			rd-cutting S of Vaudeau Shaft	CR,H,PD
131302	4009	mafic volcanic derived sandstone	366300 5367500			North Cuni Mine	CR,H
131303	SH1G1	hydrothermally altered hb gabbro	367149 5366780	DDHSH1	417.8	300m NW of Melba Siding	CR,PD
131304	SH1G2	hydrothermally altered hb gabbro	367149 5366781	DDHSH2	430	300m NW of Melba Siding	CR,PD
131305	SH1G3	hydrothermally altered hb gabbro	367149 5366782	DDHSH3	293.1	300m NW of Melba Siding	CR,PD
131306	SH1G4	hydrothermally altered hb gabbro	367149 5366783	DDHSH4	306.5	300m NW of Melba Siding	CR,PD
131307	SH1MS	mafic volcanic derived sandstone	367149 5366784	DDHSH5	569.32	300m NW of Melba Siding	CR,PD,H
Additional samples of ore from the Nickel Reward Prospect, Vaudeau Mine, and North Cuni Mine							
are kept at the Tasmania Museum and Art Gallery collection.							

Preparations: PB = Polished Block, CR = crushed sample, H = heavy mineral separate slide
 TS = Thin section, PD = Powdered Disc.