460001

PASMINCO MINING

ROSEBERY

E.L. 11/85

YOLANDE J.V.

90-3159

ANNUAL REPORT

TO

20th JULY, 1990

VOLUME I

AMG REFERENCE POINTS ADDED

G.W. JENKINS

1st AUGUST, 1990

460002

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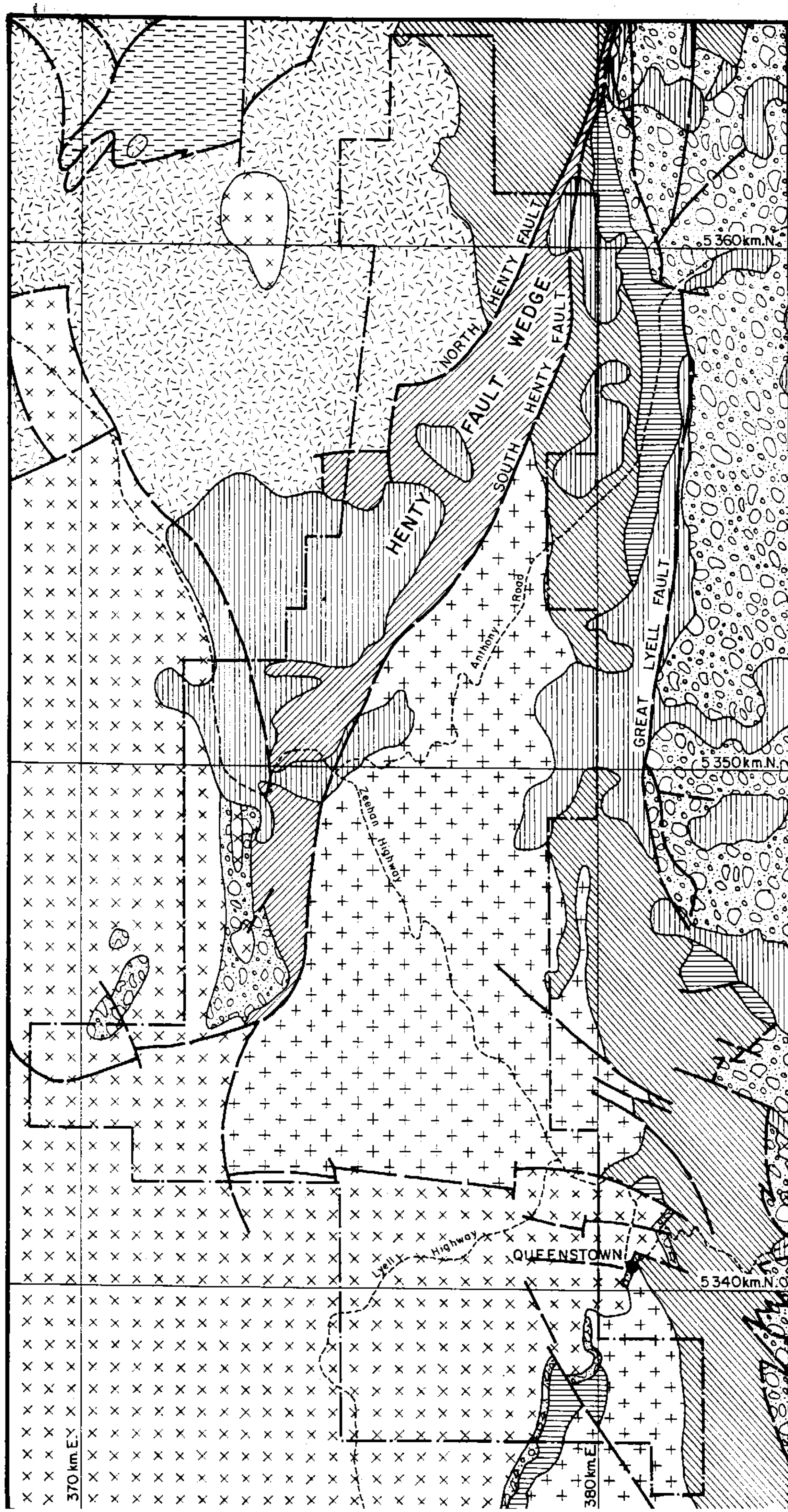

LEGEND

QUATERNARY
- Glacial deposits, alluvium, talus.

ORDOVICIAN to JURASSIC
- Undifferentiated, mainly sediments.

LATE CAMBRIAN to EARLY ORDOVICIAN
- OWEN CONGLOMERATE: Conglomerate and sandstone.

CAMBRIAN
- DUNDAS GROUP: Volcanics and sediments with minor intrusives.
- TYNDALL GROUP: Volcanics and sediments.
- HENTY FAULT WEDGE: Andesitic and basaltic volcanics, sediments, with ultramafic and mafic intrusives.
- CENTRAL VOLCANIC COMPLEX: Volcanics and sediments with minor felsic porphyry and mafic intrusives.
- WESTERN SEQUENCE/YOLANDE RIVER SEQUENCE: Volcanics and sediments with felsic porphyry intrusives.

PRECAMBRIAN
- Quartzite and slate.

Faults.

Geological boundary.

E.L. boundary.

Major road.

5 cm

N.B.: Taken from map 6, Geological Compilation Map of the Mt. Read Volcanics and associated rocks, Hellyer to South Darwin Peak. Department of Mines, Tasmania.

For more details, see map 6.

SCALE

0 1 2 3 4 5 6 7 8

kilometres

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FIGURE 2
SIMPLIFIED REGIONAL GEOLOGY

Compiled = G.W.J.	Date = 30-6-90	PLAN No.
Drawn = N.W.D.S.	Scale = 1:100,000	A3-519-0031

SUMMARY

Preliminary investigation of an area of mafic and andesitic rocks near the southern part of the Henty Gorge has revealed a number of anomalous responses which need to be followed up. The setting is suitable for a polymetallic base metal sulphide deposit. Hostile terrain and poor outcrop necessitate careful planning of field work.

The Newton Creek-Henty Canal area is highly prospective for a polymetallic base metal sulphide deposit or a Henty Prospect type gold deposit, and needs to be investigated further. The possibility of a joint venture with C.R.A.-Aberfoyle on the adjoining E.L. 5/85 should be considered.

1.0. INTRODUCTION.

1.1. Location and Access

E.L. 11/85 is located between Queenstown and Rosebery in Western Tasmania (Fig. 1), and covers an area of 151 sq.km. within the Cambrian Mt. Read Volcanics.

Main access is from the Queenstown-Zeehan Highway and the Hydro Electric Commission's Anthony Road, with a number of minor tracks leading from these to various parts of the tenement. Much of the tenement is covered by thick vegetation; cut lines and walking tracks allow the only access to these areas. Rosebery was used as the base for exploration during 1989-90.

1.2. Tenement and Land Status

E.L. 11/85 was granted to Amoco Minerals Australia Company on August 20th, 1985. The title was subsequently transferred to Cyprus Minerals Australia Company. Exploration was undertaken under the terms of a joint venture agreement with the Mineral Resources Division of the Electrolytic Zinc Company of Australasia Limited which subsequently became Norgold, a part of North Broken Hill-Peko Limited.

During 1988-89 Pasminco Mining - Rosebery assumed management control of the licence under the terms of a new pending joint venture agreement to operate the licence for three years. Since 1st July, 1990, Pasminco Exploration has become the operator of this joint venture. Both Pasminco Mining and Pasminco Exploration are divisions of Pasminco Australia Limited (formerly known as the Electrolytic Zinc Company of Australasia Limited).

Cyprus Gold is currently transferring its interest in the tenement to Hudspeth and Company Pty. Limited.

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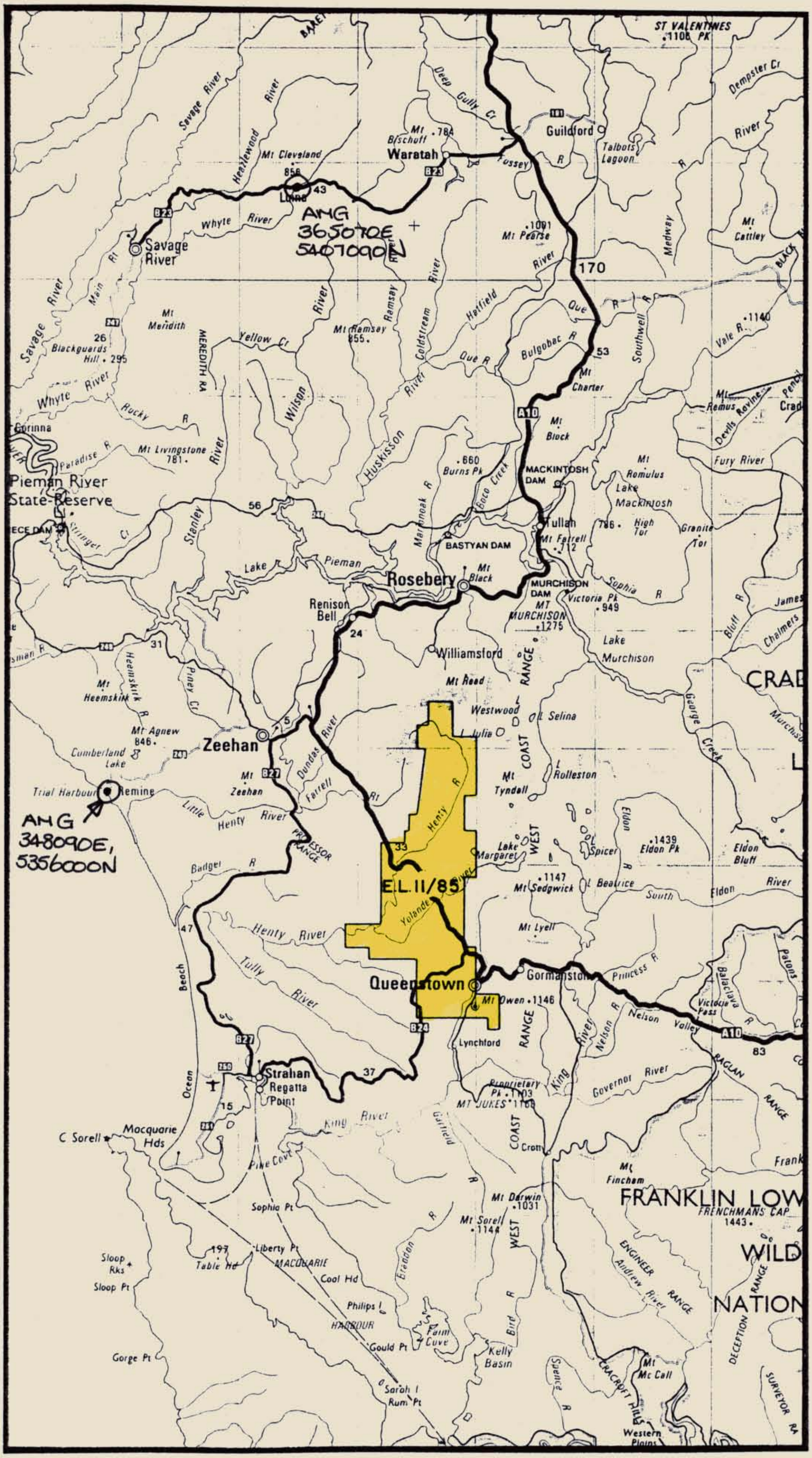

AMG REFERENCE POINTS ADDED

Figure 1. Locality

Geopeko Exploration Limited, a division of North Broken Hill-Peko, now maintains the Norgold interest. Under the terms of the current joint venture agreement, Hudspeth and Geopeko are both diluting their interest to 25% each while Pasminco earns a 50% equity in the licence.

On 1st March 1988, the tenement boundaries were revised, decreasing its area from 150 to 145 sq km. During 1988-89, another boundary revision took place as part of the Mines Department's policy of aligning boundaries with the Australian Map Grid. This affected the northern and western boundaries. The area of the tenement was increased to 151 square kilometres during the process. All maps in this report show the revised boundaries. The current schedule of the licence boundary is in Appendix 9.

The land status at present is uncommitted Crown land or land vested in the Hydro Electric Commission. A large part of the northern region of the E.L. has been nominated for inclusion on the register of the National Estate. The nomination is numbered 017510 in the system of the Australian Heritage Commission, and is known as the Dundas/Henty Rain Forest Area.

1.3. Regional Geology and Known Mineral Deposits

The geology within and near E.L. 11/85 is shown in simplified form in Figure 2. Most of the area is underlain by rocks which form part of the Mt. Read Volcanics. The northern part of the E.L. comprises sediments, volcanics and intrusives which have been assigned variously to the Central Volcanic Complex, Dundas Group and Tyndall Group.

To the north of the tenement, the Henty Fault Zone, a major NNE trending crustal structure, bifurcates. Its two southern extensions within the tenement, the North and South Henty Faults, enclose an area of volcanics, intrusives and sediments known as the Henty Fault Wedge. These rocks are not readily correlated with other sequences of the Mt. Read Volcanics. In the central and southern parts of the tenement, volcano-sedimentary rocks of the Western Volcanic sequence occur, intruded in places by large bodies of felsic porphyry. The far southern and eastern parts of the tenement include rocks of the Central Volcanic Complex and Tyndall Group. Some of the western and southern areas of the tenement are covered by Ordovician and Siluro-Devonian sediments. Quaternary glacial sediments of varying depths occur as cover in many parts of the tenement.

Numerous mineral deposits occur within and close to the Henty Fault Zone north of the tenement. It is extremely likely that this represents a deep zone of crustal weakness and high heat flow active in Cambrian time, providing flow paths for mineralising fluids.

Prospecting around the turn of the century located numerous mineral occurrences through the tenement. Gold, base metals and barite are assumed to have been the target commodities. There is no written record of the majority of old workings. Those of relevance to later sections of this report are shown in Figure 3, and include:

- the Henty Adits, a set of three short adits driven into rocks of the Henty Fault Wedge at the bottom of the Henty Gorge, which yielded lead, zinc and silver

- Howard's Anomaly, near the Central Volcanic Sequence/Tyndall Group contact, reported to contain silver and barium with minor lead and zinc

- Tyndall Mine, at a similar stratigraphic level to Howard's Anomaly, reported to contain lead, zinc, copper, silver and minor arsenic

- Line 30N Prospect Pit, reported to contain zinc, lead, silver and minor copper.

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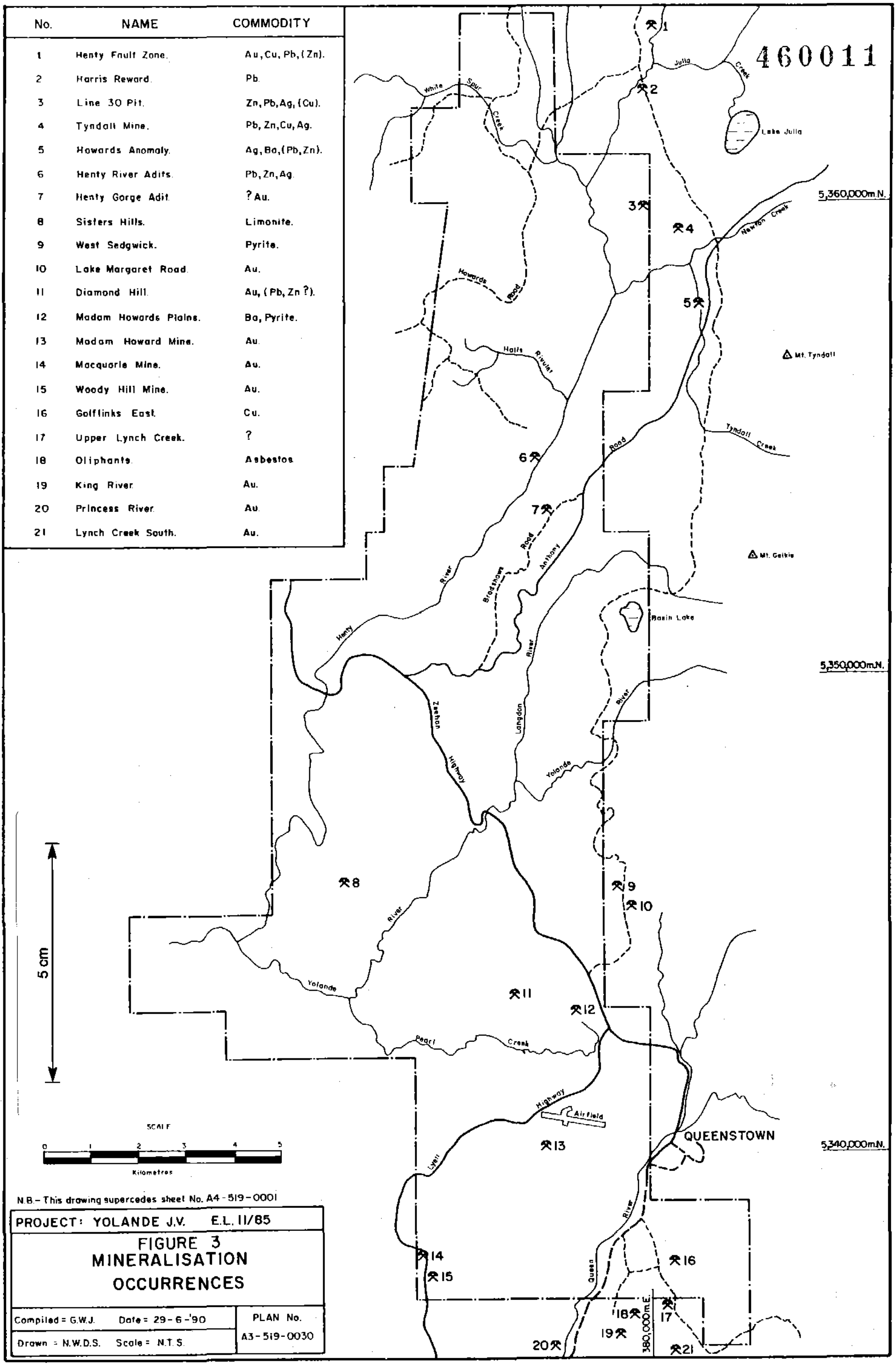
No.	NAME	COMMODITY
1	Henty Fault Zone.	Au, Cu, Pb, (Zn).
2	Harris Reward.	Pb.
3	Line 30 Pit.	Zn, Pb, Ag, (Cu).
4	Tyndall Mine.	Pb, Zn, Cu, Ag.
5	Howards Anomaly.	Ag, Ba, (Pb, Zn).
6	Henty River Adits.	Pb, Zn, Ag.
7	Henty Gorge Adit.	? Au.
8	Sisters Hills.	Limonite.
9	West Sedgwick.	Pyrite.
10	Lake Margaret Road.	Au.
11	Diamond Hill.	Au, (Pb, Zn ?).
12	Madam Howards Plains.	Ba, Pyrite.
13	Madam Howard Mine.	Au.
14	Macquarie Mine.	Au.
15	Woody Hill Mine.	Au.
16	Golflinks East.	Cu.
17	Upper Lynch Creek.	?
18	Oliphants.	Asbestos.
19	King River.	Au.
20	Princess River.	Au.
21	Lynch Creek South.	Au.



N.B. – This drawing supercedes sheet No. A4-519-0001

PROJECT: YOLANDE J.V. E.L. 11/85	
FIGURE 3 MINERALISATION OCCURRENCES	
Compiled = G.W.J. Date = 29-6-'90	PLAN No.
Drawn = N.W.D.S. Scale = N.T.S.	A3-519-0030

1.4. Previous Exploration

In the 1950s, the Mount Lyell Company, Rio Tinto and Pickands Mather became involved in exploration for massive sulphides in the area.

From 1966 to 1983, the Mount Lyell Company held E.L. 9/66 and E.L. 41/71, for some of that period in joint venture with Getty Oil Development Company. Details of areas covered are contained in a comprehensive compilation by Getty Oil. Soil geochemistry and electrical geophysics were the main methods used, with detailed follow-up leading to the discovery of the Henty Fault Prospect. Further south, in the Henty Gorge, the Henty Adits were investigated in detail, and five diamond drill holes were completed to test the area for extensions of the sulphide lenses. The best intersection was 12 metres of 4.22% Pb, 1.84% Zn and 16 g/t Ag. Information on the Henty Adits area is contained in the normal Company reports and in an unpublished M.Sc. thesis by R.M.D. Meares at James Cook University. In 1983/84, a four man review team (F.G. Fitzgerald, M.T. Jones, R.A. Poltock, J.G. Purvis) recommended the relinquishment of large areas of E.L. 9/66, in line with new Mines Department regulations.

Following the granting of E.L. 11/85 to Cyprus, concurrent exploration of the area was carried out by Cyprus and E.Z. Gold and base metals were the primary exploration targets, with platinoids and tin being minor targets.

Cyprus undertook an EM37 survey to test the Henty Adits area, but obtained no significant results. However, it was noted that the prospective horizon remains open to the north.

E.Z. carried out rock chip, stream sediment and panned concentrate sampling on part of the North Henty Fault. Results were disappointing, with weakly anomalous results obtained by any one sampling method not supported by other methods.

On the premise that the rocks of the Henty Fault Wedge have a close lithological affinity with those of the Que River Sequence, E.Z. investigated part of the Henty Fault Zone south of the Henty Adits on a new grid (E.Z. Henty Grid), using rock chip, stream sediment, panned concentrate and soil sampling methods. In addition, trial V.L.F. and ground magnetic surveys were carried out to locate the South Henty Fault. Geochemically anomalous samples were only located in the area west of the South Henty Fault, that is, within the Henty Fault Wedge. Base metal anomalies were confined to igneous rocks rather than in sedimentary units. Gold values were low in all samples. V.L.F. signals from the Henty Gorge were generally too weak to define the South Henty Fault. Recommendations were to improve access from the west of the area, to carry out additional gridding, mapping and sampling, and to reinterpret aeromagnetic data in order to define areas of alteration.

Cyprus investigated several areas of E.L. 11/85 during 1987 and 1988. The results are summarised below.

Rock chip, stream sediment and panned concentrate sampling was undertaken in creeks west of the E.Z. Henty Grid, with no significant results.

An area of seven square kilometres in the southeast corner of E.L. 11/85, at Lynchford, was sampled for gold and base metals. Anomalous gold in stream sediments was attributed to the old King River Mine area south of the tenement. Weakly anomalous gold and base metal values were attributed to high background levels in andesitic volcanics rather than economic mineralisation.

Sampling was undertaken at the Macquarie and Woody Hill gold mines, in the southwest of E.L. 11/85. Gold values between 0.02 and 0.105 ppm, with low arsenic and base metal values, were obtained. Ground conditions were considered unsafe for complete sampling of the old adits. Streams draining the area were sampled and showed weakly anomalous gold.

The old East Tyndall grid of Mt. Lyell/Getty Oil was investigated for reported coincident I.P. and soil lead anomalies which had not been adequately tested. However, the only mineralisation located during a field traverse was minor pyrite in andesites.

The Bradshaws Road Pyrite Zone, east of the tenement boundary, was sampled in a road cutting. Weakly anomalous base metals were found, with no silver, gold or arsenic.

Old pits and trenches at Cliffords Creek, near Sisters Hills, were sampled, with no significant results.

The main focus of Cyprus exploration was in the north and northeast of E.L. 11/85, around the Newton Creek area. Alteration zones along the North and South Henty Faults were examined for gold and base metals, and ultramafic material adjacent to the North Henty Fault was examined for platinoids. Rock chip, stream sediment and panned concentrate sampling was used, as well as some wacker sampling of bedrock in areas of shallow cover. Anomalous gold and base metal values were found in a number of samples. Most anomalous samples were from pyrite-sericite-chlorite altered areas associated with faults, or from ultramafic material near the North Henty Fault. The maximum values of 1.87% Pb, 2.44% Zn and 0.55ppm Au (sample 217304) were from a quartz-sulphide vein in the South Henty Fault. Follow-up work in the area 5360000-5361000mN, 379000-380000mE was recommended.

2.0. EXPLORATION PHILOSOPHY.

2.1. Exploration Targets.

Targets for mineral exploration are:

- polymetallic base metal deposits of volcanogenic massive sulphide type, of Cambrian age, containing reserves of at least 15Mt of 20% base metals with gold and silver credits, similar to the Rosebery, Que River and Hellyer deposits

- gold associated with the Henty Fault in systems similar to that at Renison Goldfields'/Little River Goldfields' Henty Fault Prospect to the north.

2.2. Rationale.

It has been suggested that rocks of the Henty Fault Wedge occur in a similar stratigraphic position to those of the Que River sequence (McDonald, 1985). The lithological similarity of the andesites around Halls Rivulet to those in the Que-Hellyer area, as well as the presence of mafic volcanics in both areas, supports the idea that the two areas are of a similar age and/or stage of volcanic evolution. The proximity to major faults enhances the prospectivity of the Henty Fault Wedge. The inaccessibility of much of the area has resulted in it being investigated in only a cursory fashion by exploration companies in the past.

Hydrothermal alteration, particularly pyrite-sericite-chlorite, has been regarded and sought as an indicator of probable proximity to base metal sulphide mineralisation. In the Newton Creek area, such alteration occurs in several places, including along the South Henty Fault. Poltock (1988) recorded elevated levels of base metals and gold in the area, which is thus regarded as highly prospective.

Gravity measurements in the Rosebery area have shown strong density contrasts between mineralised and unmineralised areas. The gravity method can potentially detect such density contrasts at depths of up to 600 metres. Consequently, gravity was chosen as a primary method for seeking large unexposed alteration systems containing massive sulphide deposits, in preference to electrical/electromagnetic geophysics. It was intended to use these methods to follow up significant gravity anomalies in detail.

3.0. EXPLORATION ACTIVITY

3.1. Henty River Grid

3.1.1. Aims

The aims of the first year of a three year plan were to undertake surface grid mapping, to locate any evidence of alteration and/or mineralisation, and to carry out geophysical surveys as an aid to defining these. Magnetic and gravity methods were to be used on a semi-regional scale with later follow-up of anomalous responses by detailed gravity and electrical/electromagnetic surveys.

3.1.2. Work Completed

3.1.2.1. ACCESS

In order to carry out the above, it was first necessary to improve access to the area. An old logging track which joins the Zeehan Highway at Ewart Creek was reopened for dry weather four wheel drive access for about 1.5 kilometres, with the remainder of the track opened for walking access as far as AMG 375000mE.

Access to the northernmost and southernmost parts of the new grid was satisfactory using existing four wheel drive tracks from Howards Road and the Zeehan Highway respectively. It was necessary to repair a bridge on Howards Road near the Mt. Dundas turn-off.

Access work was carried out by W. Lawson, and by L.H. & J.L. Procter.

3.1.2.2. GRID LINES

Map 1 shows grid lines in the area. The old Tyndall and Henty River grids dating from Mt. Lyell-Getty Oil's work on E.L. 9/66 were completely overgrown and unusable. A new grid was established parallel to A.M.G. with the intention of providing maximum line of sight for the surveying necessary for gravity corrections, but with clearing of vegetation restricted to the limitations imposed by environmental guide-lines. East-west grid lines were slope corrected and marked at 20 metre intervals. The old Tyndall grid lines 6S and 16S were reopened to provide access from Bradshaws Road to the east.

Line cutting was carried out by Purton Brothers.

3.1.2.3. SURVEYING

The main baseline at 375000mE was marked at approximately 20 metre intervals and the stations were surveyed by compass traverse and levelling in preparation for gravity measurements. Several other stations around the grid area were surveyed as control points. Survey data are given in Appendix 1.

The work was carried out by surveyors from the Rosebery mine.

It was intended to have far more of the grid surveyed by the time of this report; however, the work was delayed for over six months when the surveyors were removed to work at Mt. Black on a project related to the northern end of the Rosebery orebody.

3.1.2.4. MAPPING AND SAMPLING

Approximately half of the grid was mapped and rock chip sampled where possible. Areas covered are shown by sample locations on Maps 2 and 3. In most places, outcrop was nonexistent, hence the large gaps between samples. Areas of alteration were particularly sought after.

Selected samples were examined petrographically as an aid to mapping and interpretation.

Lines 1400N, 1600N, 5200N and 5600N were sampled by Wacker portable percussion drill at 20 metre spacings. This proved to be a very successful method, as the drill was able to penetrate the soil and glacial cover to recover samples of bedrock and lower C horizon at almost all locations. The cover was generally less than 5 metres thick. The Wacker samples were still being examined for lithology at the time of production of this report; assaying of these samples is still to be carried out.

3.1.2.5. ASSAYS

Rock chip samples were split by diamond saw and the bulk of each cleaned sample dispatched for analysis.

In addition to the routine elements Cu, Pb, Zn, Ag, Au, numerous other elements were analysed. Some of these were not relevant but were included as part of the 'Gold + 26' package, a 27 element neutron activation analysis (NAA) procedure offered by Becquerel Laboratories. Important elements not able to be analysed by NAA were analysed by induction coupled plasma-optical emission spectroscopy (ICP-OES). The combination of these methods provided a far more economical way of obtaining analyses of gold plus a large number of other elements than the 'conventional' methods of fire assay and atomic absorption spectroscopy.

Sample preparation involved jaw crushing, disc grinding, riffle splitting and ring mill pulverising to 70μm.

Results were received as paper copy and in digital form via MODEM or floppy disc for rapid transfer to spreadsheet programs.

3.1.2.6. DIAMOND DRILL CORE EXAMINATION

Diamond drill core from holes HR1, HR2, HR3 and HR5, drilled by Mt. Lyell-Getty Oil to test the Henty Adits mineralisation, was obtained from the Mt. Lyell company and examined to determine characteristics of the mineralisation. Selected intervals from DDH HR2 were re-assayed, and lead isotope measurements were carried out.

Core from the Mines Department's Bradshaws Road BH1 stratigraphic diamond drill hole was examined for comparison with surface lithologies, and to identify potentially mineralised stratigraphic horizons.

3.1.2.7. MAGNETIC SUSCEPTIBILITY MEASUREMENTS

The magnetic susceptibility of sawn slabs of rock chip samples was measured using a Scintrex SM5 magnetic susceptibility meter. This was done to allow a more quantitative evaluation of aeromagnetic data. Results are included in Appendix 2.

3.1.2.8. STATISTICAL EVALUATION OF PREVIOUS RESULTS

The assay results of earlier surveys in the area by E.Z. and Cyprus Gold were obtained in digital form and compiled as spreadsheets. Simple statistical analysis was applied to determine anomalous levels of base metals, precious metals and indicator elements.

3.1.2.9. REPORTS BY CONSULTANTS

Dr. D. Leaman of Leaman Geophysics was engaged to report on publicly available aeromagnetic and gravity data, with particular reference to probable areas of alteration. The report appears in Appendix 6. A preliminary report on a recently flown high resolution aeromagnetic survey appears in Appendix 7.

Dr. A. Crawford of the University of Tasmania's Geology Department reported on the stratigraphic affiliations and tectonic implications of rocks of the Henty Fault Wedge based on unpublished immobile and rare earth element data. His report is in Appendix 8.

3.1.3. Results Received

3.1.3.1. GEOLOGY

Maps 4 and 5 display geological fact, while Maps 6 and 7 show interpretive geology, which is discussed in Section 3.1.4. Appendix 2 contains a compilation of lithologies.

No attempt has been made to differentiate units (except for gabbroic intrusives) within the basaltic sequence shown on Map 7 due to the scarcity of outcrop relative to the rapidity of lithological changes which were observed in Bradshaws Road DDH BH1.

The observed lithologies are briefly described below.

3.1.3.1.1. Northern and Eastern Area of Grid

Descriptions commence at the gabbro and progress eastward.

The gabbro varies in grainsize, with units of microgabbro as well as that of coarser grainsize. The coarsest unit observed has 3-5mm grainsize and occurs adjacent to the north-south fault which separates the gabbro from the ultramafic; it is a useful marker. Most of the gabbros contain approximately 50% plagioclase and 50% mafic minerals. The original composition of the plagioclase cannot be determined due to albitisation (attributed to Devonian metamorphism), but is assumed to have been An>50. Mafics consist mainly of clinopyroxene with occasional orthopyroxene. In a few samples, relict olivine is visible. Some samples show intrusion of microgabbro by gabbro or vice versa. Minor sericitisation of feldspar and chloritisation of mafic minerals is present in most samples; some are strongly sericite-chlorite altered with silicification in addition. No differentiation of units within the gabbroic sequence on Map 7 has been attempted due to low sample density.

The ultramafic unit, which takes the form of a sliver on the eastern side of a north-south fault, is strongly serpentinised, with a crude foliation visible in places. Material resembling gossan (Sample 81732) occurs in places, presumably due to alteration associated with the adjacent fault.

The basalt east of the ultramafic is strongly weathered, and outcrops as clayey material with occasional fresher pieces preserved. Whether it is intrusive or extrusive cannot be determined from the available outcrop.

The three bands of andesite vary in degree of weathering. Fresh samples consist principally of fine grained plagioclase and chloritised mafics or glass. The plagioclase was presumably originally andesine, but is now albitised, as are the plagioclases in almost all the rocks in the grid area. Some of the andesites are even grained, but most are porphyritic, containing phenocrysts of plagioclase and pyroxene up to 3mm in size. A distinctive characteristic of the andesites in this area is the presence of up to 3% opaques consisting mainly of iron and titanium oxides. They have been informally named 'Halls Rivulet andesites' (A.J. Crawford, 1989, pers. comm.).

The unit of 'epiclastics' consists of variably grainsized material, mainly coarse. Mafic minerals are common. Greywacke is a frequently observed lithology, while fine grained possibly tuffaceous material is also present. One sample of greywacke (81731) contains patches, possibly clasts, of fine grained pyrite up to 8mm in size.

The 'siltstone and shale' unit, as implied by the name, contains finer grainsized material. The siltstones are possibly tuffaceous, while the shale is predominantly dark coloured and shows some accumulation of iron minerals on fracture surfaces.

The 'sediments including tuff' are predominantly felsic. Grainsize is variable, generally medium. The unit was mapped as 'felsic tuff' by Corbett (1986).

The intrusive basalt is a very fine, even grained massive rock which is relatively featureless in outcrop. It consists of plagioclase with chloritised glass and mafics.

The 'andesite with minor sediments' consists of both even grained and porphyritic andesite as described earlier, with frequent intercalations of usually tuffaceous sediment. The Henty Adits mineralisation occurs in a horizon near the eastern boundary of the unit.

The final unit mapped east of the andesites consists of siltstones and shales, frequently haematitic. The westernmost part of this unit is also host to lenses of the Henty Adits mineralisation.

3.1.3.1.2. Southern and Western Area of Grid

The boundary between the main area of gabbro in the central west and northwest of the grid and the basaltic sequence in the southwest is not well constrained due to poor outcrop. The gabbroic intrusive body west of the kink in the South Henty Fault is similar in composition to the main gabbroic body, but is generally finer grained. Evidence of intrusion of microgabbro by gabbro or vice versa is visible here also. The southern body of gabbro which outcrops on the Zeehan Highway is coarse grained, and of similar composition to the other gabbros.

The basaltic sequence consists of intercalated basalts and epiclastics with minor sandstone, siltstone and shale of uncertain provenance. The epiclastics are generally of medium grainsize with angular to subrounded grains of various compositions, including lithic fragments. The basalts are of three types, as observed in Bradshaws Road DDH BH1. The first type is dark coloured, even grained, massive and devoid of features such as banding. It is interpreted as being of intrusive origin. The second type is feldspar phyric amygdaloidal basalt which shows chilled margins at its contacts with medium to coarse grained epiclastic. It also has fracturing with predominantly carbonate fill within it and particularly concentrated near the boundaries with epiclastic material. This type is interpreted as pillow basalt, with the epiclastic material having later filled the interpillow cavities. The carbonate, some of which fills small interpillow cavities which were presumably blocked off from the supply of epiclastic material, is attributed to early marine or marine phreatic cementation. The third type of basalt, a variant of the second, is feldspar phyric amygdaloidal basalt which displays hyaloclastite textures, implying intrusion into wet sediment. Beds of epiclastic with no basalt reflect a distal facies with respect to eruptive centres; as expected, these are of finer grainsize than the material directly associated with the extrusive basalts.

The only outcrop of basalt which could be interpreted as extrusive occurs on Line 2400N at about 4500E (sample 81923). Other outcrops observed lacked suitable exposure for such interpretation.

3.1.3.2. ROCK CHIP GEOCHEMISTRY

Full analysis results are given in Appendices 2 and 3. Results for the main elements of interest are plotted on Maps 8, 9, 10 and 11.

Anomalous levels of Cu, Pb, Zn, Ag, Au, As and Ba were initially determined by simple statistical analysis of earlier results (presented by Mathison, 1987 and Poltock, 1988) using the value (mean+2σ), where σ is standard deviation, as the lower level for an anomalous response for a particular element. Anomalous cutoff levels were found to be Cu 600ppm, Pb 360ppm, Zn 760ppm, Ag 1.6ppm, Au 30ppb using all samples or 110ppb using only the samples in which gold was detected (detection limit 10ppb), As 170ppm, Ba 1200ppm.

The anomalous levels determined using only samples from the new Henty River Grid (excluding Henty Adits drill core) were Cu 230ppm, Pb 210ppm, Zn 450ppm, As 31ppm, Ba 1300ppm, Co 150ppm, Ni 600ppm, Cr 940ppm, Fe 15%, Mn 3200ppm. Ag was not detected, and there were insufficient samples in which Au was detected to carry out the calculations. The levels, except for Ba, are below the levels determined on the basis of earlier analyses. This is attributed to the fact that samples from the altered and weakly mineralised areas at Newton Creek are included in the earlier results. The more recently determined anomalous levels will be used in this section of this report. Results for the Henty Adits drill core are not included in these calculations, and will be discussed separately in Section 3.1.3.3.

The results are summarised below.

ELEMENT	RANGE	MEAN	ANOMALOUS LEVEL	NUMBER ANOMALOUS
Cu	0-811 ppm	53	230	8
Pb	0-570 ppm	29	210	5
Zn	0-1507 ppm	148	450	6
As	0-64 ppm	7.4	31	2
Ba	0-3200 ppm	431	300	6
Sb	0-5.7 ppm	1.3	4.7	1
Co	0-740 ppm	33	147	1
Ni	0-2354 ppm	118	602	5
Cr	7.1-2970 ppm	237	938	5
Fe	0-57 %	5.7	14.6	1
Mn	42-12300 ppm	972	3180	4

Individual anomalous samples are tabulated on the following three pages.

TABLE 1 - Summary of Analyses of Anomalous Samples

Sample	ppm Cu	ppm Pb	ppm Zn	ppb Au	ppm Ba	ppm As	ppm Sb	ppm Co	ppm Ni	ppm Cr	% Fe	ppm Mn
81710	-	-	449	-	-	-	-	-	-	-	-	-
81715	-	-	-	-	1900	-	-	-	-	-	-	-
81717	-	511	-	-	-	-	-	-	-	-	-	-
81719	-	-	-	-	1500	32	-	-	-	-	-	-
81732	-	-	-	-	-	-	-	740	1167	-	57	5385
81733	-	-	-	-	-	-	-	-	2354	1310	-	-
81734	-	-	-	-	-	-	-	-	1261	1230	-	-
81735	-	-	-	-	-	-	-	-	1214	-	-	-
81738	266	-	-	-	-	-	-	-	-	-	-	-
81768	424	-	-	-	-	-	-	-	-	-	-	-
81769	570	-	-	-	-	-	-	-	-	-	-	-
81770	244	570	-	-	-	-	-	-	-	-	-	-
81771	365	-	-	-	-	-	-	-	-	-	-	-
81782	-	219	486	-	-	-	-	-	-	-	-	-
81841	-	-	-	130	-	-	-	-	-	-	-	-
81850	-	-	630	29	-	-	-	-	-	-	-	-
81854	-	-	-	13	-	-	-	-	-	-	-	-
81867	-	371	1507	42	3200	-	5.7	-	-	-	-	-
81869	244	-	-	-	-	-	-	-	-	-	-	-
81872	-	-	-	-	-	64	-	-	-	-	-	-
81873	-	-	-	-	-	-	-	-	-	-	-	3619
81878	-	-	465	-	-	-	-	-	-	-	-	-
81884	-	-	447	-	-	-	-	-	-	-	-	-
81890	243	-	-	-	-	-	-	-	-	-	-	-
81897	-	-	-	-	-	-	-	-	-	-	-	12300
81901	-	-	-	-	-	-	-	-	2970	-	-	-
81910	-	-	-	-	1400	-	-	-	-	-	-	-
81915	321	-	-	-	-	-	-	-	-	-	-	-
81916	-	-	-	-	-	-	-	-	-	-	-	3850
81918	-	-	-	-	-	-	-	-	593	1650	-	-
81920	-	-	-	-	-	-	-	-	-	1080	-	-
81924	-	-	-	-	2400	-	-	-	-	-	-	-
81926	150	515	435	-	-	-	-	-	-	-	-	-

TABLE 2 - Comments and Recommendations for Anomalous Samples

Sample	Comments	Additional Work Required
81710	Quarts-feldspar phyric tuff from andesitic sequence in northern part of grid area.	None
81715	Siltstone from same unit as 81717. May be indicative of alteration.	Further sampling. Vehicular access exists.
81717	Interbedded siltstone and shale. No alteration visible in hand specimen.	As for 81715
81719	Siltstone and shale.	As for 81715
81732	Weathered ultramafic with gossanous appearance, adjacent to major fault.	None
81733	Serpentinised ultramafic, adjacent to major fault.	None
81734	Serpentinised ultramafic, adjacent to major fault.	None
81735	Serpentinised ultramafic, adjacent to major fault.	None
81738	Weathered basalt adjacent to minor fault.	None
81768	Altered siltstone	Further investigation. Remote part of grid.
81769	Strongly altered gabbro. Sericitisation, silicification, some chloritisation. Manganese oxides visible in polished section.	As for 81768
81770	Altered gabbro	As for 81768
81771	Altered gabbro	As for 81768
81782	Basalt with quartz veining	Further sampling of adjacent creek out-crops.
81841	Sandstone from basaltic sequence in southern part of grid. No visible alteration.	Further sampling, preferably by Wacker
81850	Altered andesite near northward extension of host horizon to Henty Adits mineral-isation. Note presence of gold; none has been detected at the Henty Adits.	Check adjacent Wacker samples.

TABLE 2 - Comments and Recommendations for Anomalous Samples (Cont)

Sample	Comments	Additional Work Required
81854	Altered andesite 200m west of Henty Adits. Coincides with magnetic anomaly.	Further sampling, preferably by Wacker
81867	Microgabbro. Part of elongate gabbroic body intruded along South Henty Fault extension.	Further sampling of adjacent creek outcrops. Check adjacent Wacker samples
81869	Dolerite	Check adjacent Wacker samples.
81872	Altered andesite near northward extension of host horizon to Henty Adits mineralisation.	Check adjacent Wacker samples
81873	Altered andesite near northward extension of host horizon to Henty Adits mineralisation	Check adjacent Wacker samples.
81878	Floater of greywacke	None
81884	Microgabbro	Sampling of adjacent outcrops. Low priority
81890	Microgabbro, no visible alteration.	None
81897	Microgabbro	Sampling of adjacent outcrops. Low priority
81901	Epiclastic	None
81910	Gabbro, no visible alteration	None
81915	Lithic tuff	None
81916	Brecciated lithic tuff	None
81918	Microgabbro. Anomalous elements may indicate more primitive magma.	None
81920	Basalt with coarse epiclastic	None
81924	Epiclastic, no visible alteration	None
81926	Feldspar phyric basalt with epiclastic, with veinlets of quarts-sericite-chlorite alteration. Traces of chalcopyrite, galena and sphalerite visible in polished section.	Further sampling, preferably by Wacker

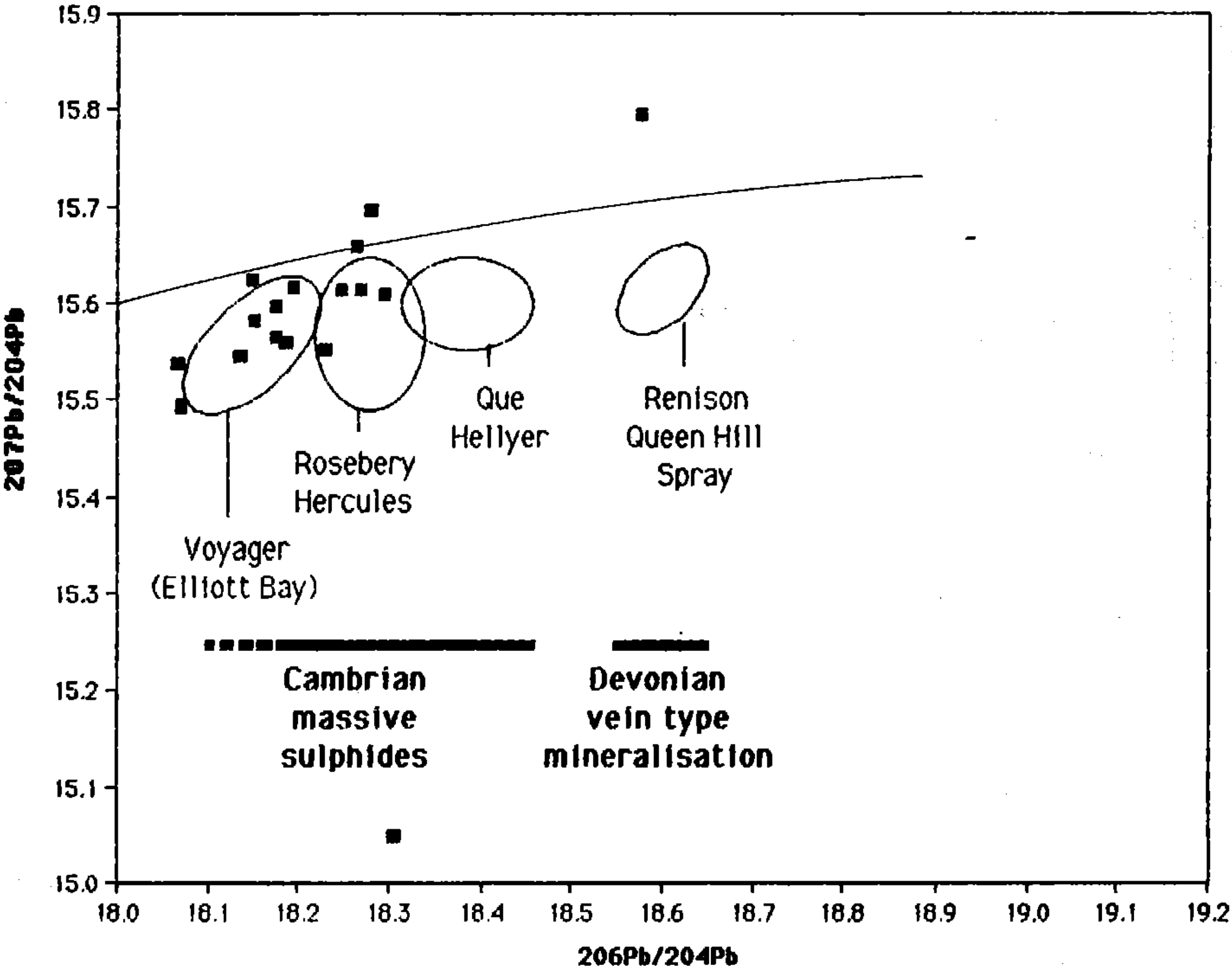


Figure 4. Lead isotopes of Henty Adits mineralisation (shown as black squares). Data for Cambrian and Devonian deposits from Gulson et al. (1987).

3.1.3.3. HENTY ADITS MINERALISATION

Drill core from the Henty Adits was examined in hand specimen and petrographically. The mineralisation is clearly epigenetic, frequently concentrated in veins, but also disseminated. The implied paragenetic sequence is (1) sericite + very fine grained quartz; (2) epidote ± sulphides ± coarse quartz; (3) chlorite + very fine grained quartz; (4) coarse carbonate ± chlorite ± quartz ± sericite. The host to the mineralisation is strongly altered andesite or fine grained sediment, as documented by Meares (1980). Alteration is pervasive and intense.

Assay results are in Appendices 2 and 3, for samples 81794 to 81820. The most prominent characteristic is the absence of gold. Levels of arsenic are elevated relative to samples from the Henty River Grid, while sodium shows a marked depletion in the most strongly mineralised interval.

Lead isotope results are plotted in Figure 4, and given in full in Appendix 3.

3.1.4. Discussion

It is apparent that two main sequences exist in the Henty River Grid area of the Henty Fault Wedge, that is, a predominantly andesitic sequence in the northeast and a basaltic, or mafic, sequence in the southwest. Geochemically, these sequences have different characteristics. The andesites are high-K calcalkaline lavas directly comparable with the Que River footwall andesites, while the basalts are tholeiitic, and show characteristics of the early rifting stages of magmatic arcs to form backarc or interarc basins (Crawford, 1989). Crawford makes it clear that several magma suites are represented in the basaltic sequence.

Whether or not the intrusive basalts observed in Bradshaws Road DDH BH1 represent feeders for some of the extrusive basalts is conjectural at this stage, although Crawford (1989) reported a similarity between the basalts in his data set and those of the Henty Dyke Swarm to the north.

The extrusive basalts are interpreted as having erupted subaqueously. This is supported by the evidence of fracturing at the extremely fine grained chilled margins, indicative of very rapid cooling, by the presence of early diagenetic marine cements in the fractures and interstices, and by the close association with basalts intruded into wet sediments. As such, they provide a suitable environment for sea floor exhalative volcanogenic massive sulphide deposits.

The gabbros in the central, western and northwestern parts of the grid are regarded as intruding the basaltic sequence, and possibly representing the deeper magmas from which some of the later basalts originated. The one sample mapped as dolerite (81869) displays the well developed felted texture frequently found in dolerites; other samples of similar grainsize have more equant grains and are regarded as microgabbro. The coarse gabbro which occurs along the north-south fault adjacent to the ultramafics in the north of the grid is regarded as representing magma from deeper parts of the system. Its proximity to a major fault suggests that this fault may have been an active site of extension during intrusion of the gabbros, providing a plane along which intrusion occurred.

At about 5356000mN 376000mE, a north-south fault disappears to the south under glacial cover (Corbett, 1986). Leaman (1989) proposed, on the basis of gravity and magnetic data, that this fault extends as far south as the South Henty Fault, joining it where the South Henty Fault kinks at 5352500m N 376100mE (Fig. 5). The idea that this occurs is borne out by preliminary interpretation of new high resolution aeromagnetic data flown this year (Section 3.3; Appendix 7); the probable trace of this fault shows clearly on the magnetic contour map.

460033

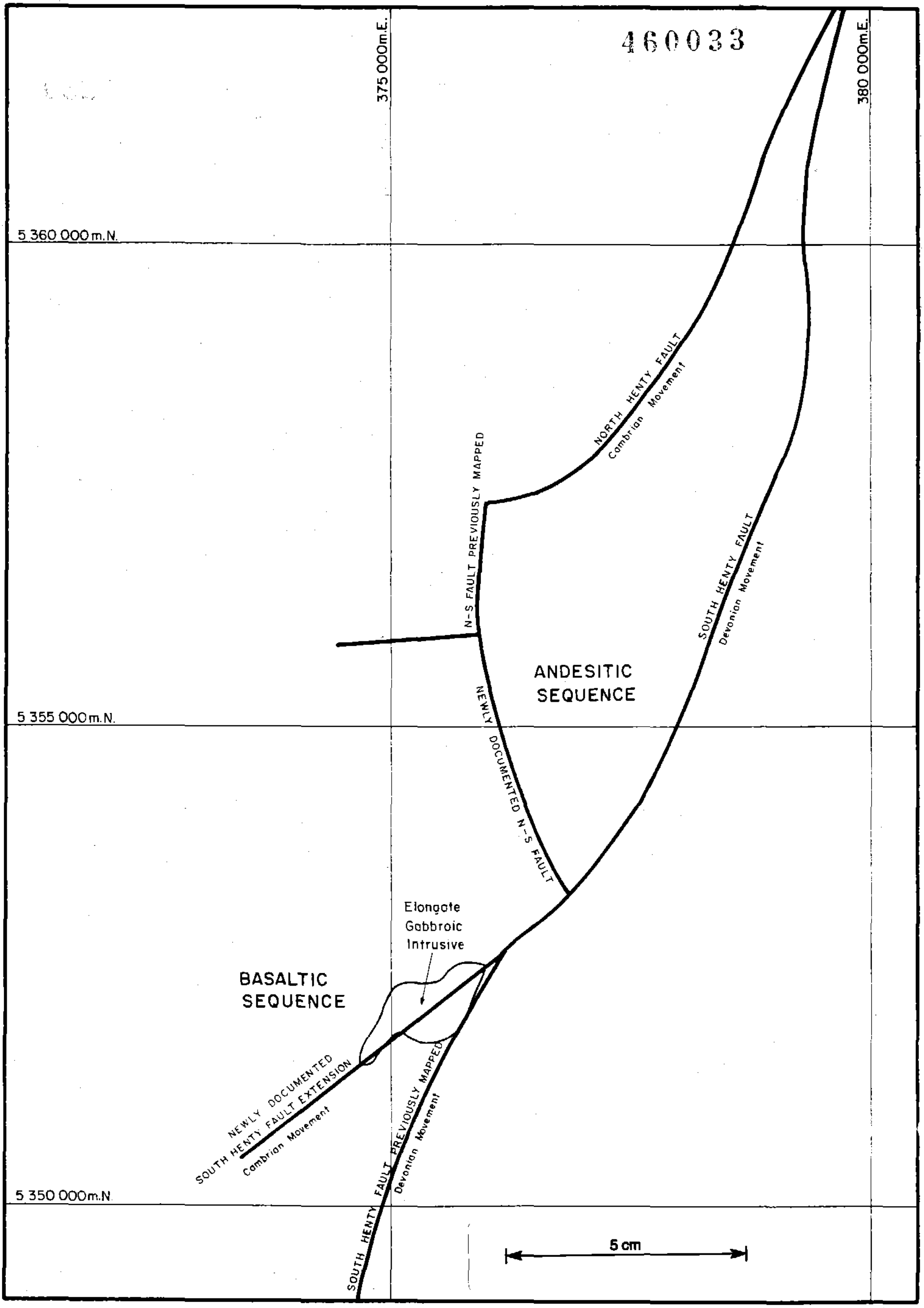


Figure 5. — STRUCTURAL INTERPRETATION SCALE = 1: 50,000

Crawford (1989) also suggested the possibility of a major unmapped fault separating the basaltic and andesitic sequences of the Henty Fault Wedge. The presence of the coarsest gabbro along the fault (mentioned earlier) is further support for its interpretation as a major structure. There now seems little doubt that the fault extends south to the South Henty Fault. It is not shown on Map 7, as the new magnetic data had not arrived at the time of drafting. Figure 5 shows the new interpretation.

The area of gabbro mapped at about 5352000mN 375500mE appears to extend southwest from the kink in the South Henty Fault; it is elongate in this direction. The new magnetic contour map shows a linear feature projecting southwest beyond the southwestern corner of this gabbro, approximately in line with the southwesterly projection of the South Henty Fault beyond the kink. The Henty River is approximately linear along part of this projection. It is proposed that a fault extends from the kink in the South Henty Fault along its southwesterly projection to at least 373000mE. Leaman (1990) has independently suggested an extension of the South Henty Fault itself along this path. It is further proposed that this fault was active during Cambrian time (an idea also suggested independently of this report by Leaman (1990)), providing a zone of weakness along which the gabbroic body which is elongate southwest-northeast was intruded. This time of movement contrasts with the original interpretation of Leaman (1989), who proposed that movement along the North Henty Fault occurred mainly during Cambrian time and movement along the South Henty Fault (as mapped by Corbett (1986)) occurred mainly during Devonian time. Leaman (1990) revised his original assessment, considering that the older movement occurred along the newly proposed extension of the South Henty Fault. It is possible that the newly proposed pattern of faults is a repeat on a smaller scale of the bifurcation of the North and South Henty Faults to the north; Cambrian movement occurred on the (newly proposed) northern branch, and Devonian movement on the previously mapped southern branch which is suggested by Leaman (1990) to be a more recent transverse structure. The fact a large fault branches south-southwest from the kink is not in doubt; there is ample evidence, including a large interval of fault breccia in Bradshaws Road DDH BH1.

The presence of a major fault with Cambrian movement greatly increases the prospectivity of the adjacent basaltic sequence. The anomalous analysis values on Line 1000N are probably related to this fault, as is the pyrite-sericite veining at Line 1200N, 4300E, and should be followed up as a matter of high priority.

In the northeast of the grid, the geology is interpreted as being substantially as mapped by Corbett (1986) with a few variations in lithology. An important point is that the trace of bedding is interpreted as swinging slightly to the west as it approaches the South Henty Fault. This may reflect drag along the South Henty Fault. It contrasts with the interpretation of previous workers, who have shown the bedding swinging east.

The Henty Adits mineralisation occurs near the contact of an andesitic unit and sediments. It was previously noted that this prospective horizon is open to the north. The assay results for lines 5200N and 5600N reflect the extension of this horizon; assay results for wacker samples should define it more clearly.

Leaman (1990) noted an anomalous magnetic feature 200m west of the adits. It may be significant that gold was detected at this point, albeit at low level (13 ppb). Gold was also detected at low level on line 5600N at about the same stratigraphic position. These results may reflect another mineralised horizon.

The lead isotope results show a Cambrian age for the lead at the Henty Adits. However, it is apparent from Figure 4 that the isotopic character of the lead is closer to that of the mineralisation at Elliott Bay than to the major massive sulphides elsewhere in the Mt. Read Volcanics. The Henty Adits mineralisation definitely did not originate from a deep source such as a granite pluton during Devonian time.

The vein style of the Henty Adits mineralisation, and its proximity to the South Henty Fault, suggest an association with fluids moving along the fault. The lack of gold argues against it being part of a volcanogenic massive sulphide system. The postulated predominantly Devonian movement of the South Henty Fault favours the idea that the Henty Adits mineralisation is a red herring, and represents mineralisation from a Cambrian source which has been remobilised during Devonian time into fractures associated with the South Henty Fault. If this is the case, the original Cambrian mineralisation should be a primary target rather than the small amount of mineralisation at the adits. It is proposed that this Cambrian mineralisation may lie south and west of the adits near the position of the anomalous magnetic response noted by Leaman (1990); the presence of small amounts of gold at this level is a point in favour of a Cambrian polymetallic sulphide deposit. Further investigation is needed, in particular, wacker samples from this stratigraphic level on lines 5200N and 5600N should be examined carefully.

460037

3.2. Newton Creek

3.2.1. Aims

The aim of the work was to follow up anomalous base metal and gold values reported by Poltock (1988, 1989).

3.2.2. Work Completed

3.2.2.1. MAPPING AND SAMPLING

The area around 5360000mN 379750mE was examined for surface evidence of alteration and mineralisation away from exposures in the Henty Canal. An area of pyrite-sericite-chlorite-silica alteration was mapped about the abandoned Line 30N Pit. This area was rock chip sampled. Water from the pit was analysed for metals, with a view to draining the pit to allow examination of its walls.

3.2.2.2. ACCESS

A drill hole was proposed to test this area of alteration, and an access track and drill pad were cleared by excavator in such a manner as to facilitate rehabilitation. The drilling proposal was suspended when control of the E.L. was taken over by the newly formed Pasminco Exploration.

3.2.2.3. SURVEY

The Hydro Electric Commission was engaged to produce 1:1,000 scale topographic maps with 1m contour intervals of the area, in order to provide up to date base plans as well as elevations for approximate gravity measurements.

3.2.2.4. ELECTRICAL GEOPHYSICS

Dipole-dipole induced polarisation measurements were carried out over 5 line km comprising three lines arranged longitudinally over two faults and the Line 30N Pit alteration zone. Surtec Geophysics carried out the survey. The longitudinal configuration was suggested by

Dr. J. Bishop because of success with the method at the Henty Fault prospect to the north. Details of the survey and its interpretation by Mitre Geophysics are in Appendix 5.

3.2.3. Results Received

3.2.3.1. GEOLOGY AND ALTERATION

The extent of outcrop of the Line 30N Pit alteration is shown on Map 12. As silicification and alteration make identification of the original lithologies difficult, they are interpreted as being volcanics of the upper part of the Central Volcanic Complex or basal Tyndall Group. The boundary between the Central Volcanic Complex and Tyndall Group is in this vicinity. To the south near this boundary are the Tyndall Mine and Howard's Anomaly, previously mentioned in Section 1.4.

Alteration consists of disseminations and veinlets of pyrite, sericite, chlorite and quartz. In places, veins of coarse quartz up to 50cm wide occur. The zone is strongly foliated approximately parallel to the regional stratigraphy which strikes 310°-330°M and dips 80°E to vertical. A second faint foliation trends approximately 350°M, and may be related to the 'Canal Fault' mapped by Poltock (1988). The alteration zone seems to disappear under glacial cover to the northwest and southeast, possibly due to a decreased amount of silicification allowing increased erosion. Alternatively, it may be truncated by faults; this will be discussed later.

3.2.3.2. GEOCHEMISTRY

Samples 81934 to 81971 (excluding 81941, 81942) are rock chip samples over the alteration zone and nearby. Map 13 shows sample locations, and Map 14 shows geochemistry. Full analytical results are in Appendices 2 and 3.

The highest assay values occur in material from about the prospect pit (sample 81943 to 81947; only 81943 appears on map) and about 200m to the northwest. Sporadic high values occur elsewhere. Maximum values for each element (not necessarily in the same sample) are Cu 2150ppm, Pb 1600ppm, Zn 1250ppm, Ag 3ppm, Au 1030ppb, As 150ppm, Bi 20ppm, Cd 7ppm.

3.2.4. Discussion

It is considered significant that the Line 30N Pit alteration occurs at approximately the same stratigraphic level as the Tyndall Mine and Howard's Anomaly, that is, near the top (as mapped by Corbett (1986)) of the Central Volcanic Complex. The presumed change in tectonic and volcanic activity which gave rise to the Tyndall Group caused the passage of mineralising fluids at about this time.

The line 30N Pit alteration shows strong foliation, suggesting some structural control in addition to the implied stratigraphic control on the mineralisation. Leaman (1990) noted an east-west displacement immediately north of the zone; this implied fault should be investigated further.

In terms of geochemistry, it is significant that elevated levels of gold occur in the Line 30N Pit alteration, while arsenic levels are low. This argues against vein type mineralisation. The elevated levels of the base metals combined with gold suggest proximity to a hydrothermal system of volcanogenic massive sulphide type. The lack of gold at the Tyndall Mine and Howard's Anomaly, and the high gold levels at the Henty Fault Prospect to the north, may reflect a broad paragenetic sequence over several kilometres, with proximal lead-zinc in the south and distal gold in the north. If this is the case, the area immediately east of E.L. 11/85 at the relevant stratigraphic level is highly prospective for base metals, and the possibility of a joint venture with C.R.A. - Aberfoyle should be investigated, as suggested by Poltock (1988, 1989).

IP results over the Line 30N Pit alteration showed elevated chargeability and slightly decreased resistivity, but not enough in the opinion of Bishop (1990) to define a drill target. However, Bishop (1986) noted that disseminated sulphides with minor silicification may have no resistivity response, and PFE should be the most relevant parameter. This alteration zone is silicified, accounting for the slight resistivity response. In addition, the possibility exists that the sub-surface alteration was off line with respect to the IP line. Irvine (1974) interpreted a shallow zone of strong chargeability and low resistivity at the position of the alteration zone on Line 30N. It is not considered by any means that the Line 30N pit alteration should be discounted on the basis of the IP.

Other geophysical methods, including gravity, should be applied. It would also be desirable to drill the implied sub-surface extension of the alteration in order to test the mineralisation, obtain fresh material, confirm the structure and provide a position for down hole geophysics. Such a drill hole was proposed in May, 1989, but suspended when operations were taken over by Pasminco Exploration.

IP Line 2, which followed the implied trace of the 'Canal Fault' of Poltock (1988), showed a significant response south of the Henty Canal. Sulphides are visible in a cutting at the canal some 40m west of the IP line; it is suggested that these extend to the southeast, and account for the IP response where they cross line 2 at about 600N. Bishop (1990) has suggested that the graphitic shale mapped by Poltock (1988) east of line 2 may account for the IP response; however, this shale bed dips steeply east, and its strike would carry it away from line 2 at the anomalous point. Exposure in the Henty Canal should be carefully examined for evidence of an east-west fault which may have displaced the shale back towards line 2. Such a displacement is not considered likely, as its sense of movement would be opposite to that of the large east-west displacement implied by the magnetic evidence immediately south of here. The anomalous IP response should be investigated further using other geophysical methods.

Line 3, which followed the South Henty Fault, showed the strongest response directly under the Henty Canal. Slightly elevated base metal and gold values were recorded in samples from the canal wall by Poltock (1988). However, the position of the mineralisation beneath the canal would make it very difficult to mine unless a major deposit could be proved at sufficient depth not to affect the H.E.C's operations. This zone is thus regarded as having low priority in any follow-up.

3.3. Aerial Surveys

3.3.1. Airborne Magnetic and Radiometric Survey

Geo Instruments of Sydney carried out a high resolution airborne magnetic and radiometric survey over the northern part of E.L. 11/85. Preliminary results and technical details are given in Appendix 7.

3.3.2. Aerial Photography and Photogrammetry

Monochrome aerial photographs of the northern part of E.L. 11/85 were produced by the Hydro Electric Commission's photogrammetry section. Photography was at 1:22,000 and 1:10,000 scales.

Subsequently, Associated Surveys (Vic.) Pty. Ltd. produced topographic maps at 1:5,000 scale with a 5 metre contour interval.

The photogrammetry section of the Hydro Electric Commission produced topographic maps of the Newton Creek-Henty Canal area at 1:1,000 scale with a 1 metre contour interval.

4. CONCLUSIONS

The andesitic sequence in the northeast of the grid has the potential to be host to a polymetallic massive sulphide deposit. It is likely that the Henty Adits mineralisation represents remobilisation of metals from such a deposit.

The basaltic sequence in the southwest of the grid has the potential to host Kuroko style mineralisation. There is evidence of extensional tectonics during emplacement of the basalts and gabbros. The newly documented extension of the South Henty Fault may have provided a locus for mineralisation.

The rocks near the Central Volcanic Complex - Tyndall Group contact at Newton Creek may be host to a polymetallic massive sulphide deposit. Alteration in the area and anomalous base metal and gold values support this possibility.

5. RECOMMENDATIONS

Anomalous responses in the Henty River Grid area should be followed up as detailed in Table 2. Sampling by Wacker is a suitable method in areas of poor outcrop.

The large magnetic anomaly near the centre of the grid should be investigated to determine whether it represents a faulted block of material similar to the Bradshaw's Road sequence, an area of sediments, or a massively altered area.

The Henty Adits area needs to be investigated in more detail. A series of short diamond drill holes should be made using Nick Poltock's portable drill. These holes should be placed to test the continuity of the sulphide lenses mapped by Meares (1980), and their northward extension. The anomalous magnetic feature 200 metres west of the adits should be investigated. Wacker sampling is the preferred method in this area of poor outcrop.

Gravity measurements are needed in the Henty River Grid area. Surveyed stations exist along the 75,000E baseline for this purpose. Barometric levelling, with appropriate controls, can be used on cross lines for a first pass.

At Newton Creek, the Line 30N Pit alteration zone needs to be followed up. At least one diamond drill hole should be put through the alteration at depth to test its metal values, lithology and structure, and to provide a site for down hole geophysical measurements. A gravity survey should be carried out over the area to delineate alteration systems at depth. Electromagnetic measurements should also be made over the Line 30N Pit alteration, and over the anomaly at 600N on IP line 2.

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APPENDIX 1.

SURVEY DATA

460047

SURVEYED STATIONS			
HENTY RIVER GRID			
X,Y coordinates obtained by compass traverse.			
R.L. calculations incomplete at time of compilation.			
STATION NUMBER	NORTHING	EASTING	R.L.
Y14	355580.932	375278.037	-
Y15	355559.402	375276.636	-
Y16	355535.925	375269.581	-
Y17	355516.758	375266.639	-
Y18	355496.371	375262.035	-
Y19	355471.558	375257.109	-
Y20	355452.787	375254.228	-
Y21	355431.076	375249.125	-
Y22	355398.325	375244.098	-
Y23	355376.181	375239.097	-
Y24	355356.072	375235.307	-
Y25	355333.613	375230.849	-
Y26	355311.841	375226.527	-
Y27	355287.169	375221.406	-
Y28	355265.425	375217.421	-
Y29	355240.16	375211.715	-
Y30	355220.808	375208.049	-
Y31	355201.18	375208.036	-
Y32	355183.58	375201.82	-
Y33	355160.117	375195.871	-
Y34	355138.663	375191.319	-
Y35	355118.957	375187.942	-
Y36	355096.695	375183.523	-
Y37	355079.001	375178.428	-
Y38	355056.397	375175.562	-
Y39	355031.815	375170.254	-
Y40	355005.282	375163.444	-
Y41	354961.516	375154.355	-
Y42	354944.731	375152.07	-
Y43	354920.889	375146.753	-
Y44	354897.888	375141.226	-
Y45	354873.922	375136.516	-
Y46	354851.863	375131.834	-
Y47	354829.903	375126.482	-
Y48	354804.853	375121.221	-
Y49	354786.748	375116.134	-
Y50	354763.141	375111.287	-
Y51	354737.764	375106.568	-
Y52	354714.157	375100.714	-
Y53	354692.899	375097.308	-
Y54	354672.359	375091.09	-
Y55	354648.405	375086.518	-
Y56	354623.653	375081.121	-
Y57	354599.296	375076.46	-
Y58	354572.733	375069.5	-
Y59	354549.533	375063.991	-
Y60	354530.597	375060.29	-

STATION NUMBER	NORTHING	EASTING	R.L.
Y61	354503.084	375052.362	-
Y62	354479.908	375048.016	-
Y63	354453.606	375043.091	-
Y64	354425.283	375036.277	-
Y65	354399.821	375031.034	-
Y66	354386.526	375029.469	-
Y67	354355.304	375021.659	-
Y68	354337.071	375017.481	-
Y69	354312.793	375013.77	-
Y70	354293.817	375010.237	-
Y71	354264.389	375003.447	-
Y72	354242.17	375000.482	-
Y73	354216.987	374994.346	-
Y74	354196.179	374993.65	-
Y75	354164.143	374992.648	-
Y76	354142.172	374993.868	-
Y77	354120.967	374994.325	-
Y78	354093.665	374993.12	-
Y79	354070.762	374993.925	-
Y80	354045.964	374992.028	-
Y81	354024.408	374991.527	-
Y82	354002.872	374992.261	-
Y83	353985.995	374992.637	-
Y84	353961.267	374991.468	-
Y85	353937.016	374990.802	-
Y86	353912.686	374989.882	-
Y87	353883.324	374989.349	-
Y88	353859.273	374988.472	-
Y89	353839.229	374987.711	-
Y90	353812.837	374987.058	-
Y91	353785.411	374985.5	-
Y92	353761.76	374985.646	-
Y93	353741.026	374985.211	-
Y94	353725.886	374985.158	-
Y95	353706.881	374984.129	-
Y96	353683.851	374985.055	-
Y97	353664.005	374984.424	-
Y98	353638.764	374984.52	-
Y99	353614.781	374984.851	-
Y100	353587.251	374983.422	-
Y101	353574.795	374983.284	-
Y102	353541.614	374984.381	-
Y103	353535.071	374981.343	-
Y104	353512.072	374982.565	-
Y105	353483.354	374983.548	-
Y106	353457.427	374983.09	-
Y107	353433.863	374985.928	-
Y108	353408.66	374985.487	-
Y109	353385.015	374986.109	-
Y110	353361.875	374985.974	-
Y111	353338.219	374986.365	-
Y112	353313.199	374984.408	-

STATION NUMBER	NORTHING	EASTING	R.L.
Y113	353288.094	374987.241	-
Y114	353256.192	374986.095	-
Y115	353226.767	374988.78	-
Y116	353202.681	374989.233	-
Y117	353163.46	374991.429	-
Y118	353117.184	374989.595	-
Y119	353073.911	374990.873	-
Y120	353040.958	374992.673	-
Y121	353005.736	374992.736	-
Y122	352979.525	374992.898	-
Y123	352955.09	374992.273	-
Y124	352929.279	374993.147	-
Y125	352907.499	374992.692	-
Y126	352883.582	374993.085	-
Y127	352856.761	374993.287	-
Y128	352824.368	374993.93	-
Y129	352790.982	374993.328	-
Y130	352760.108	374992.962	-
Y131	352727.32	374995.764	-
Y132	352703.716	374994.879	-
Y133	352678.354	374995.553	-
Y134	352652.884	374994.827	-
Y135	352623.945	374994.798	-
Y136	352616.184	375000.793	-
Y137	352593.646	375001.722	-
Y138	352570.603	375000.765	-
Y139	352547.305	375001.467	-
Y140	352524.125	375000.791	-
Y141	352498.171	375002.013	-
Y142	352474.526	375002.012	-
Y143	352446.826	375001.562	-
Y144	352419.634	375002.611	-
Y145	352389.513	375001.688	-
Y146	352361.88	375003.592	-
Y147	352341.152	375002.28	-
Y148	352311.628	375002.393	-
Y149	352290.893	375000.645	-
Y150	352256.072	375001.291	-
Y151	352235.641	375003.145	-
Y152	352217.124	375001.813	-
Y153	352193.782	375001.296	-
Y154	352169.761	375002.28	-
Y155	352146.902	375002.096	-
Y156	352123.473	375001.638	-
Y157	352091.332	375001.005	-
Y158	352063.252	375001.309	-
Y159	352039.975	375001.776	-
Y160	352003.031	375003.001	-
Y161	351973.693	375004.016	-
Y162	351928.477	375003.771	-
Y163	351892.003	375003.517	-
Y164	351855.806	375004.692	-

STATION NUMBER	NORTHING	EASTING	R.L.
Y165	351826.665	375005.017	-
Y166	351798.96	375004.508	-
Y167	351767.671	375004.361	-
Y168	351753.334	375005.135	-
Y169	351715.534	375005.023	-
Y170	351687.677	375005.825	-
Y171	351676.757	375001.66	-
Y172	351651.445	375005.832	-
Y173	351624.198	375005.584	-
Y174	351597.834	375006.825	-
Y175	351567.039	375007.38	-
Y176	351532.282	375008.363	-
Y177	351513.063	375007.725	-
Y178	351492.573	375006.995	-
Y179	351463.662	375008.233	-
Y180	351447.275	375007.28	-
Y181	351421.55	375010.939	-
Y182	351398.658	375007.486	-
Y183	351366.973	375007.497	-
Y184	351336.157	375007.17	-
Y185	351316.233	375006.541	-
Y186	351291.276	375005.967	-
Y187	351263.234	375004.607	-
Y188	351244.325	375006.675	-
Y189	351216.825	375004.038	-
Y190	351190.135	375002.513	-
Y191	351174.704	375000.698	-
Y192	351155.794	375001.802	-
Y193	351131.835	375001.479	-
Y194	351109.749	375001.202	-
Y195	351091.191	375000.787	-
Y196	351072.953	375001.355	-
Y197	351053.874	375000.574	-
Y198	351026.894	375000.688	-
Y199	351006.507	375000.566	-
Y200	350978.549	375000.682	-
Y201	350958.116	375000.98	-
Y202	350934.144	375001.422	-
Y13	350908.316	375001.848	-
Y12	350884.755	375001.346	-
Y11	350860.811	375000.208	-
Y10	350836.681	374999.705	-
Y9	350814.019	374999.223	-
Y8	350788.761	374999.348	-
Y7	350767.099	374999.644	-
Y6	350743.736	374999.555	-
Y5	350722.271	374999.098	-
Y4	350699.008	374998.807	-
Y3	350677.067	374999.683	-
Y2	350658.101	374999.113	-
Y1	350638.354	374999.901	-

APPENDIX 2.

COMPILATION OF RESULTS

SAMPLE COORDINATES, TYPES AND THIN SECTIONS.

SAMPLE TYPE: ROCK CHIP OUTCROP[R], ROCK CHIP SUBCROP[S], ROCK CHIP FLOAT[F], CORE[C], STREAM[SS], PANNED CONCENTRATE[P], WACKER BEDROCK SAMPLE[W], CHECK[K], WATER[H], MISSING SAMPLE[NS]

NORMAL THIN SECTION[T], POLISHED THIN SECTION[PT], POLISHED BLOCK[P], NONE[-]

Unspecified R.L. values are given as zero.

SAMPLE NO.	NORTHING	EASTING	R.L.	TYPE	SECTION TYPE	MAGNETIC SUSCEPTIBILITY (CGS units X10-3)
81701	355240.236	377538.163	309.2498	C	T	
81702	355240.516	377540.854	305.5284	C	T	
81703	355241.37	377549.044	294.2024	C	PT	
81704	355243.146	377566.068	270.6605	C	PT	
81705	355246.446	377597.716	226.8936	C	T	
81706	355248.068	377613.277	205.3742	C	PT	
81707	355175	377350	0	0	T	0
81708	355170	377300	0	0	T	0
81709	355171	377300	0	0	T	0.07
81710	355203	377180	0	0	T	0
81711	355240	377120	0	0	T	0.95
81712	355242	377100	0	0	T	0
81713	355275	376990	0	0	T	0
81714	355273	376926	0	0	T	0
81715	355315	376870	0	0	-	0
81716	355434	376925	0	0	-	0
81717	355482	376833	0	0	T	0
81718	355522	376835	0	0	-	0
81719	355651	376820	0	0	-	0
81720	355673	376810	0	0	T	0.1
81721	355722	376686	0	0	T	0
81722	355734	376579	0	0	T	0
81723	355788	376554	0	0	T	0
81724	355600	375355	0	0	-	
81725	355600	375560	0	S	-	0.1
81726	355600	375700	0	F	-	0
81727	355600	375720	0	F	-	0
81728	355600	376040	0	0	T	0
81729	355600	376560	0	S	-	0.07
81730	355600	376520	0	S	-	
81731	355600	375360	0	S	T	0.6
81732	356420	375960	0	S	-	
81733	356420	375970	0	0	-	16
81734	356423	375990	0	0	-	2.5
81735	356410	376020	0	0	-	0.1
81736	356400	376031	0	0	-	
81737	356385	376049	0	0	-	0
81738	356375	376060	0	0	-	
81739	356310	376098	0	0	-	0
81740	356305	376100	0	0	-	0
81741	356280	376105	0	0	-	0
81742	356260	376118	0	0	-	0
81743	356248	376152	0	0	-	0
81744	356245	376185	0	0	-	0
81745	356240	376213	0	0	-	0

81746	356233	376221	0	0	-	
81747	356186	376369	0	0	T	0
81748	356170	376374	0	0	-	0
81749	356150	376389	0	0	T	0
81750	355528	375268	0	0	T	0
81751	355119	375188	0	S	-	
81752	355079	375178	0	F	-	0
81753	354955	375153	0	F	-	
81754	354884	375138	0	S/F	T	
81755	354687	375095	0	S	T	0.08
81756	354634	375083	0	F	T	0
81757	354609	375078	0	S	T	0
81758	354581	375072	0	S	-	0
81759	354531	375060	0	F	T	0
81760	354490	375050	0	F	-	0
81761	354377	375025	0	F	-	0.12
81762	354350	375020	0	F	T	0
81763	354294	375010	0	F	T	0
81764	355200	375400	0	F	-	0
81765	355200	375580	0	F	-	0
81766	355200	375660	0	S	T	0
81767	353796	374986	0	F	-	0
81768	353751	374985	0	F	PT	0
81769	353726	374985	0	S	PT	0
81770	353689	374985	0	S	PT	0
81771	353542	374984	0	F	PT	0
81772	353535	374981	0	F	PT	0.1
81773	353338	374986	0	F	-	0
81774	353266	374986	0	F	-	0
81775	353246	374986	0	F	-	0.08
81776	350250	374300	0	0	-	0
81777	350250	374650	0	0	-	0
81778	352513	375002	0	S	-	0
81779	352261	375001	0	F	-	0
81780	351716	375005	0	0	-	0
81781	351677	375002	0	F	-	0
81782	351678	375002	0	0	PT	0
81783	350800	374895	0	S	-	
81784	350800	374792	0	F	-	1.9
81785	350800	374745	0	S	-	
81786	350800	374658	0	F	T	
81787	350800	374637	0	S	T	0.07
81788	350800	374485	0	0	T	
81789	350800	374383	0	S	-	0.75
81790	350800	374295	0	0	T	
81791	350800	374260	0	F	-	0
81792	354292.239	377676.55	121.4306	C	T	
81793	354308.309	377651.782	88.6271	C	T	
81794	354332.224	377614.924	39.812	C	-	
81795	354332.952	377613.802	38.326	C	-	
81796	354333.68	377612.68	36.84	C	-	
81797	354344.964	377595.289	13.807	C	-	
81798	354345.692	377594.167	12.321	C	-	

81799	354346.42	377593.045	10.835	C	-	
81800	354347.148	377591.923	9.349	C	-	
81801	354347.876	377590.801	7.863	C	-	
81802	354348.604	377589.679	6.377	C	-	
81803	354349.332	377588.557	4.891	C	-	
81804	354350.06	377587.435	3.405	C	-	
81805	354350.788	377586.313	1.919	C	-	
81806	354351.516	377585.191	0.433	C	-	
81807	354355.156	377579.581	-6.997	C	-	
81808	354355.884	377578.459	-8.483	C	-	
81809	354356.612	377577.337	-9.969	C	-	
81810	354357.34	377576.215	-11.455	C	-	
81811	354358.068	377575.093	-12.941	C	-	
81812	354358.796	377573.971	-14.427	C	-	
81813	354359.524	377572.849	-15.913	C	-	
81814	354360.252	377571.727	-17.399	C	-	
81815	354360.98	377570.605	-18.885	C	-	
81816	354361.708	377569.483	-20.371	C	-	
81817	354362.436	377568.361	-21.857	C	-	
81818	354371.9	377553.775	-41.175	C	-	
81819	354372.628	377552.653	-42.661	C	-	
81820	354373.356	377551.531	-44.147	C	-	
81821	354323.706	377628.051	57.1982	C	T	
81822	354341.087	377601.264	21.71995	C	T	
81823	354345.819	377593.971	12.06095	C	PT	
81824	354345.874	377593.887	11.9495	C	PT	
81825	354347.512	377591.362	8.606	C	PT	
81826	354355.52	377579.02	-7.74	C	PT	
81827	354355.738	377578.683	-8.1858	C	PT	
81828	354372.701	377552.541	-42.8096	C	T	
81829	350650	373650	0	0	-	
81830	351080	374090	0	0	-	
81831	351100	374165	0	0	-	
81832	351100	374170	0	0	-	
81833	351090	374095	0	0	-	
81834	351095	374110	0	0	-	
81835	351100	374115	0	0	-	
81836	351100	374120	0	0	-	
81837	351105	374120	0	0	-	
81838	351225	374340	0	0	-	
81839	351220	374340	0	0	-	
81840	351000	374715	0	S/F	-	0.78
81841	351000	374640	0	S	-	0.5
81842	351000	374475	0	F	PT	0
81843	351000	374422	0	S	PT	0
81844	351000	374320	0	S	PT	0
81845	351000	374275	0	S	-	0.5
81846	351000	374260	0	0	T	0.87
81847	351000	374160	0	S	T	0.3
81848	355200	377680	0	0	T	
81849	355200	377600	0	F	T	0.44
81850	355200	377601	0	0	T	0
81851	354400	377680	0	0	PT	0

81852	354400	377480	0	0	T	0
81853	354400	377425	0	F/S	-	0
81854	354400	377405	0	S	PT	0
81855	354400	377225	0	0	-	
81856	354400	377115	0	0	T	0
81857	355200	376500	0	S	-	0.27
81858	355200	376460	0	S	-	0
81859	355200	376200	0	0	T	0.07
81860	355200	376065	0	0	T	0
81861	351600	373330	0	F/S	PT	0.1
81862	351600	373440	0	S	PT	0.85
81863	351600	373580	0	F	-	
81864	351600	373625	0	S	-	0
81865	351600	374000	0	S	-	0
81866	351600	374100	0	S	-	0
81867	351600	374720	0	0	T	1.2
81868	351600	374820	0	S	T	0.75
81869	351600	374960	0	0	T	5.55
81870	355600	377440	0	S	T	0
81871	355600	377510	0	S	-	0.3
81872	355600	377580	0	S	PT	0.1
81873	355600	377581	0	S	T	0.1
81874	355600	377595	0	S	T	0
81875	355600	377630	0	S	-	
81876	350800	375265	0	S	-	1.8
81877	351800	373260	0	S	T	1.3
81878	351800	373380	0	F	-	0.08
81879	351800	374060	0	F	-	0.15
81880	351800	374460	0	F/S	-	0
81881	351800	374540	0	0	T	0.64
81882	351800	374620	0	S	-	0.4
81883	351800	374740	0	S	T	0.83
81884	351800	374940	0	0	T	0.18
81885	352000	373320	0	F	-	3.2
81886	352000	373600	0	S/F	-	0
81887	352000	374490	0	0	T	0.07
81888	352000	374760	0	S	-	0
81889	352200	374580	0	S	T	0.12
81890	352200	375020	0	S	-	
81891	352200	375240	0	S	-	0
81892	352200	375330	0	F	-	0
81893	352200	375410	0	S	-	0.09
81894	352205	375430	0	0	T	0
81895	352200	375540	0	S	-	0
81896	352200	375730	0	S/F	-	0
81897	352200	375800	0	0	T	0.08
81898	352200	375900	0	0	T	
81899	352250	376040	0	0	T	
81900	351800	375220	0	S	-	0
81901	351800	375610	0	S	-	0
81902	351800	375740	0	0	-	
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81907	352000	375590	0	0	T	
81908	352000	375580	0	F/S	T	0
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81917	352400	375925	0	F	-	0
81918	352400	375700	0	0	T	0.07
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81920	352400	375475	0	0	T	0.07
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81923	352400	374490	0	0	T	0
81924	352400	374000	0	S	-	0
81925	352600	375820	0	F	-	0.1
81926	352600	375720	0	0	T(2)	0
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81929				K	-	
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81931				K	-	
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81933				K	-	
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83368	355200	376080	0	W	-	
83369	355200	376060	0	W	-	
83370	355200	376040	0	W	-	
83371	355200	376020	0	W	-	
83372	355200	376000	0	W	-	
83373	355200	375980	0	W	-	
83374	355200	375960	0	W	-	
83375	355200	375940	0	W	-	
83376	355200	375920	0	W	-	
83377	355200	375900	0	W	-	
83378	355200	375880	0	W	-	
83379	355200	375860	0	W	-	
83380	355200	375860	0	K	-	
83381	355200	375840	0	W	-	
83382	355200	375820	0	W	-	
83383	355200	375800	0	W	-	
83384	355200	375780	0	W	-	
83385	355200	375760	0	W	-	
83386	355200	375740	0	W	-	
83387	355200	375720	0	W	-	
83388	355200	375700	0	W	-	
83389	355200	375680	0	W	-	
83390	355200	375660	0	W	-	
83391	355200	375640	0	W	-	
83392	355200	375620	0	W	-	
83393	355200	375600	0	W	-	
83394	355200	375580	0	W	-	
83395	355200	375560	0	W	-	
83396	355200	375540	0	W	-	
83397	355200	375520	0	W	-	
83398	355200	375500	0	W	-	
83399	355200	375480	0	W	-	
83400	355200	375480	0	K	-	
83401	355200	375460	0	W	-	
83402	355200	375440	0	W	-	
83403	355200	375420	0	W	-	
83404	355200	375400	0	W	-	
83405	355200	375380	0	W	-	
83406	355200	375360	0	W	-	
83407	355200	375340	0	W	-	
83408	355200	375320	0	W	-	
83409	355200	375300	0	W	-	
83410	355200	375280	0	W	-	

83411	355200	375260	0	W	-	
83412	355200	375240	0	W	-	
83413	355200	375220	0	W	-	
83414	355200	375200	0	W	-	
83415	355600	375280	0	W	-	
83416	355600	375300	0	W	-	
83417	355600	375320	0	W	-	
83418	355600	375340	0	W	-	
83419	355600	375360	0	W	-	
83420	355600	375360	0	K	-	
83421	355600	375380	0	W	-	
83422	355600	375400	0	W	-	
83423	355600	375420	0	W	-	
83424	355600	375440	0	W	-	
83425	355600	375460	0	W	-	
83426	355600	375480	0	W	-	
83427	355600	375500	0	W	-	
83428	355600	375520	0	W	-	
83429	355600	375540	0	W	-	
83430	355600	375560	0	W	-	
83431	355600	375580	0	W	-	
83432	355600	375600	0	W	-	
83433	355600	375620	0	W	-	
83434	355600	375640	0	W	-	
83435	355600	375660	0	W	-	
83436	355600	375680	0	W	-	
83437	355600	375700	0	W	-	
83438	355600	375720	0	W	-	
83439	355600	375740	0	W	-	
83440	355600	375740	0	K	-	
83441	355600	375760	0	W	-	
83442	355600	375780	0	W	-	
83443	355600	375800	0	W	-	
83444	355600	375820	0	W	-	
83445	355600	375840	0	W	-	
83446	355600	375860	0	W	-	
83447	355600	375880	0	W	-	
83448	355600	375900	0	W	-	
83449	355600	375920	0	W	-	
83450	355600	375940	0	W	-	
83451	355600	375960	0	W	-	
83452	355600	375980	0	W	-	
83453	355600	376000	0	W	-	
83454	355600	376020	0	W	-	
83455	355600	376040	0	W	-	
83456	355600	376060	0	W	-	
83457	355600	376080	0	W	-	
83458	355600	376100	0	W	-	
83459	355600	376120	0	W	-	
83460	355600	376120	0	K	-	
83461	355600	376140	0	W	-	
83462	355600	376160	0	W	-	
83463	355600	376180	0	W	-	

83464	355600	376200	0	W	-	
83465	355600	376220	0	W	-	
83466	355600	376240	0	W	-	
83467	355600	376260	0	W	-	
83468	355600	376280	0	W	-	
83469	355600	376300	0	W	-	
83470	355600	376320	0	W	-	
83471	355600	376340	0	W	-	
83472	355600	376360	0	W	-	
83473	355600	376380	0	W	-	
83474	355600	376400	0	W	-	
83475	355600	376420	0	W	-	
83476	355600	376440	0	W	-	
83477	355600	376460	0	W	-	
83478	355600	376480	0	W	-	
83479	355600	376500	0	W	-	
83480	355600	376500	0	K	-	
83481	355600	376520	0	W	-	
83482	355600	376540	0	W	-	
83483	355600	376560	0	W	-	
83484	355600	376580	0	W	-	
83485	355600	376600	0	W	-	
83486	355600	376620	0	W	-	
83487	355600	376640	0	W	-	
83488	355600	376660	0	W	-	
83489	355600	376680	0	W	-	
83490	355600	376700	0	W	-	
83491	355600	376720	0	W	-	
83492	355600	376740	0	W	-	
83493	355600	376760	0	W	-	
83494	355600	376780	0	W	-	
83495	355600	376800	0	W	-	

SAMPLE LITHOLOGIES

SAMPLE NO.	LITHOLOGY
81701	Feldspar phyric andesite lava, altered
81702	Feldspar phyric andesite lava, altered
81703	Andesite, strongly altered
81707	Basalt
81708	Quartz-feldspar phyric tuff
81709	Crystal-lithic tuff
81710	Quartz-feldspar phyric tuff
81711	Andesite
81712	Andesite lava (Hall's Rivulet andesite)
81713	Andesite lava (Hall's Rivulet andesite)
81714	Very fine grained epiclastic
81715	Feldspathic fine grained sandstone/siltstone
81716	Felsic epiclastic
81717	Very fine grained epiclastic
81718	Fine grained epiclastic
81719	Interbedded shale and siltstone/fine sandstone
81720	K feldspar phyric epiclastic, possibly tuff, with rare lithic clasts.
81721	Andesite lava
81722	Andesite (Halls Rivulet andesite)
81723	Very fine grained epiclastic
81724	Gabbro
81725	Gabbro
81726	Gabbro
81727	Gabbro
81728	Gabbro
81729	Greywacke
81730	Greywacke
81731	Greywacke
81732	Weathered ultramafic
81733	Ultramafic
81734	Ultramafic
81735	Ultramafic
81736	Weathered ?basalt
81737	Weathered ?basalt
81738	Weathered ?basalt
81739	Fault breccia
81740	?Basalt
81741	Siltstone
81742	Epiclastic (?felsic tuff)
81743	Epiclastic, coarse
81744	Felsic epiclastic
81745	Felsic epiclastic
81746	Greywacke
81747	Feldspar phyric andesite
81748	Epiclastic, coarse
81749	Feldspar phyric andesite
81750	Altered gabbro
81751	Gabbro
81752	Gabbro
81753	Glacial quartzite

81754 Microgabbro
81755 Microgabbro
81756 Microgabbro
81757 Tholeiitic basalt
81758 Microgabbro
81759 Basalt
81760 Epiclastic
81761 Gabbro
81762 Microgabbro
81763 Microgabbro
81764 Gabbro
81765 Gabbro
81766 Gabbro with microgabbro
81767 Gabbro
81768 Altered siltstone
81769 Altered gabbro
81770 Altered gabbro
81771 Altered gabbro
81772 Altered gabbro
81773 Andesite
81774 Gabbro
81775 Basalt
81776 Epiclastic (?tuff)
81777 Gabbro
81778 Polymict breccia
81779 Breccia (sedimentary)
81780 Siltstone
81781 Andesite
81782 Basalt
81783 Epiclastic
81784 Basalt, feldspar phyric
81785 Altered epiclastic
81786 Basalt
81787 Greywacke
81788 Vesicular basalt
81789 Greywacke
81790 Basalt
81791 Greywacke
81792 Andesite
81793 Siltstone, metamorphosed and altered
81821 Greywacke
81822 Andesite lava, altered
81823 Siltstone/shale, mineralised
81824 Siltstone, mineralised
81825 Andesite, mineralised
81826 Andesite, mineralised
81827 Andesite, strongly altered
81840 Coarse epiclastic with pyrite veining
81841 Sandstone
81842 Andesite with disseminated pyrite
81843 Basalt with epiclastic
81844 Altered siltstone
81845 Coarse epiclastic

81846 Siltstone
81847 Coarse sandstone
81848 Andesite
81849 Altered andesite
81850 Altered andesite
81851 Siltstone
81852 Epiclastic
81853 Andesite
81854 Altered andesite
81855 Siltstone and sandstone
81856 Tuff
81857 Coarse epiclastic
81858 Greywacke
81859 Gabbro
81860 Gabbro
81861 Altered gabbro
81862 Feldspar phyric amygdaloidal basalt
81863 Basalt
81864 Feldspar phyric amygdaloidal basalt + greywacke
81865 Epiclastic
81866 Greywacke
81867 Microgabbro
81868 Microgabbro
81869 Dolerite
81870 Feldspar phyric andesite
81871 Sandstone
81872 Altered andesite
81873 Altered andesite
81874 Andesite
81875 Shale
81876 Siltstone with shale interbeds
81877 Feldspar phyric basalt
81878 Greywacke
81879 Altered basalt
81880 Sandstone
81881 Basalt
81882 Basalt
81883 Altered basalt
81884 Microgabbro
81885 Feldspar phyric basalt
81886 Epiclastic (may be glacial float)
81887 Feldspar phyric vesicular basalt
81888 Feldspar phyric basalt
81889 Sandstone
81890 Microgabbro
81891 Gabbro
81892 Basalt
81893 Microgabbro
81894 Gabbro
81895 Gabbro
81896 Gabbro
81897 Microgabbro
81898 Altered siltstone

81899 Altered basalt
81900 Gabbro
81901 Epiclastic
81902 Siltstone
81903 Silicified siltstone
81904 Microgabbro
81905 Sandstone
81906 Gabbro and microgabbro
81907 Gabbro and microgabbro
81908 Gabbro
81909 Gabbro
81910 Gabbro
81911 Microgabbro
81912 Altered gabbro
81913 Gabbro
81914 Microgabbro
81915 Lithic tuff
81916 Brecciated lithic tuff
81917 Microgabbro
81918 Microgabbro
81919 Gabbro
81920 Basalt with coarse epiclastic
81921 Feldspar phyric basalt
81922 Basalt with epiclastic
81923 Feldspar phyric amygdaloidal pillow basalt with interpillow coarse epiclastic
81924 Epiclastic
81925 Epiclastic
81926 Feldspar phyric basalt with epiclastic
81927 Amygdaloidal basalt
81928 Altered volcanic
81929 Altered volcanic
81930 Altered volcanic
81931 Altered volcanic
81932 Altered volcanic
81933 Altered volcanic
81934 Altered volcanic
81935 Altered volcanic
81936 Altered volcanic
81937 Altered volcanic
81938 Altered volcanic
81939 Altered volcanic
81940 Altered volcanic
81943 Altered volcanic
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81946 Altered volcanic
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81951 Altered volcanic
81952 Altered volcanic
81953 Altered volcanic

81954 Altered volcanic
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81961 Altered volcanic
81962 Altered volcanic
81963 Altered volcanic
81964 Altered volcanic
81965 Altered volcanic
81966 Altered volcanic
81967 Altered volcanic
81968 Altered volcanic
81969 Altered volcanic
81970 Altered volcanic
81971 Altered volcanic
83001 Fine sandstone, possibly glacial.
83002 Microgabbro.
83003 Epiclastic, subrounded quartz + angular feldspar 5%, mafic lithics 1%, matrix 94%. Clasts to 5mm.
83004 Fine grained sandstone, poorly sorted & rounded, quartz 5% (subrounded), feldspar 70% (angular Kspar + plag), mafic & felsic lithics 24% (subrounded), very fine grained opaques 1%.
83005 Fine grained sandstone, poorly sorted & rounded, quartz 5% (subrounded), feldspar 70% (angular Kspar + plag), mafic & felsic lithics 24% (subrounded), very fine grained opaques 1%.
83006 Epiclastic, subrounded quartz + angular feldspar 5%, mafic lithics 1%, matrix 94%. Clasts to 5mm.
83007 Basalt with epiclastics, as for 83003. Presumably pillow basalt. Possibly some sulphides- sediments discoloured.
83008 Basalt with epiclastics, as for 83003. Presumably pillow basalt. Possibly some sulphides- sediments discoloured.
83009 Basalt with epiclastics, as for 83003. Presumably pillow basalt. Possibly some sulphides- sediments discoloured.
83010 Basalt.
83011 Basalt with epiclastics, as for 83003. Presumably pillow basalt. Possibly some sulphides- sediments discoloured.
83012 Feldspar phyric basalt, angular feldspar crystals to 1mm 5%, very fine grained magnetite 1%, groundmass 94%. Weathered in places to orange clay.
83013 Feldspar phyric basalt, angular feldspar crystals to 1mm 5%, very fine grained magnetite 1%, groundmass 94%.
83014 Basalt.
83015 Feldspar phyric basalt, crystals to 1mm 2%.
83016 Basalt.
83017 Glacial float.
83018 Microgabbro, feldspar 60%, mafics 40%.
83019 Microgabbro, feldspar 60%, mafics 40%.
83020 Microgabbro, feldspar 60%, mafics 40%, finer grained (0.5mm) than 83018, 83019.
83021 Epiclastic, well rounded weathered clasts to 1mm of ?feldspar + lithics in very fine grained matrix.

83022 Epiclastic, well rounded weathered clasts to 1mm of ?feldspar + lithics in very fine grained matrix. Blue grey colour - possibly same unit as exposed on Zeehan Highway to south.

83024 Epiclastic, well rounded weathered clasts to 1mm of ?feldspar + lithics in very fine grained matrix. Blue grey colour, very indurated, quartz rich.

83025 Dolerite, even grained plagioclase laths 70%, mafics 30%. Grainsize 0.3mm.

ANALYSIS RESULTS

Methods: AAS=atomic absorption spectroscopy, ICP=induction coupled plasma with optical emission spectroscopy, NAA=neutron activation analysis, FA=fire assay

0=below detection limit, --=not analysed

ELEMENT:	Cu	Cu	Pb	Pb	Zn	Zn	Zn	Ag	Ag	Ag	Au	Au	Au Rpt
UNITS:	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppb	ppb	ppb
DETECTION:	5	2	100	4	5	100	2	5	1	5	5	1	2
METHOD:	ICP	AAS	ICP	AAS	ICP	NAA	AAS	NAA	AAS	ICP	NAA	FA	FA
SAMPLE NO.													
81707	8	-	0	-	82	120	-	0	-	-	0	-	-
81708	42	-	0	-	114	180	-	0	-	-	0	-	-
81709	13	-	0	-	52	0	-	0	-	-	0	-	-
81710	21	-	0	-	449	530	-	0	-	-	0	-	-
81711	188	-	120	-	149	260	-	0	-	-	0	-	-
81712	31	-	0	-	136	220	-	0	-	-	0	-	-
81713	25	-	0	-	62	0	-	0	-	-	0	-	-
81714	54	-	0	-	130	230	-	0	-	-	0	-	-
81715	21	-	0	-	41	0	-	0	-	-	0	-	-
81716	15	-	0	-	44	0	-	0	-	-	0	-	-
81717	14	-	511	-	46	0	-	0	-	-	0	-	-
81718	21	-	0	-	20	0	-	0	-	-	0	-	-
81719	71	-	0	-	234	280	-	0	-	-	0	-	-
81720	31	-	0	-	149	260	-	0	-	-	0	-	-
81721	25	-	133	-	323	390	-	0	-	-	0	-	-
81722	49	-	0	-	142	240	-	0	-	-	0	-	-
81723	21	-	0	-	39	0	-	0	-	-	0	-	-
81724	9	-	0	-	97	170	-	0	-	-	0	-	-
81725	11	-	0	-	34	130	-	0	-	-	0	-	-
81726	16	-	0	-	47	140	-	0	-	-	0	-	-
81727	11	-	0	-	38	150	-	0	-	-	0	-	-
81728	19	-	0	-	35	110	-	0	-	-	0	-	-
81729	19	-	0	-	87	160	-	0	-	-	0	-	-
81730	41	-	134	-	130	180	-	0	-	-	0	-	-
81731	28	-	0	-	107	170	-	0	-	-	0	-	-
81732	0	-	0	-	74	0	-	0	-	-	0	-	-
81733	5	-	0	-	37	0	-	0	-	-	0	-	-
81734	7	-	0	-	83	160	-	0	-	-	0	-	-
81735	8	-	0	-	90	150	-	0	-	-	0	-	-
81736	24	-	0	-	176	260	-	0	-	-	0	-	-
81737	121	-	0	-	167	260	-	0	-	-	6	-	-
81738	266	-	0	-	162	210	-	0	-	-	0	-	-
81739	73	-	0	-	125	190	-	0	-	-	0	-	-
81740	6	-	0	-	82	160	-	0	-	-	0	-	-
81741	9	-	0	-	27	0	-	0	-	-	0	-	-
81742	15	-	0	-	172	230	-	0	-	-	0	-	-
81743	52	-	0	-	144	210	-	0	-	-	0	-	-
81744	7	-	0	-	32	0	-	0	-	-	0	-	-
81745	33	-	0	-	53	0	-	0	-	-	0	-	-
81746	60	-	0	-	245	300	-	0	-	-	0	-	-
81747	13	-	0	-	364	420	-	0	-	-	0	-	-
81748	30	-	0	-	201	250	-	0	-	-	0	-	-
81749	33	-	0	-	141	200	-	0	-	-	0	-	-

	Cu	Cu	Pb	Pb	Zn	Zn	Zn	Ag	Ag	Ag	Au	Au	Au Rpt
81750	9	-	0	-	35	120	-	0	-	-	0	-	-
81752	10	-	0	-	30	0	-	0	-	-	0	-	-
81753	11	-	0	-	8	0	-	0	-	-	0	-	-
81754	15	-	0	-	24	120	-	0	-	-	0	-	-
81755	0	-	0	-	78	160	-	0	-	-	0	-	-
81756	35	-	0	-	68	150	-	0	-	-	0	-	-
81757	11	-	0	-	43	140	-	0	-	-	0	-	-
81758	89	-	0	-	46	120	-	0	-	-	0	-	-
81759	12	-	0	-	46	160	-	0	-	-	0	-	-
81760	15	-	0	-	75	160	-	0	-	-	0	-	-
81761	14	-	0	-	60	140	-	0	-	-	0	-	-
81762	0	-	0	-	48	140	-	0	-	-	0	-	-
81763	0	-	0	-	55	160	-	0	-	-	0	-	-
81764	5	-	0	-	33	110	-	0	-	-	0	-	-
81765	0	-	0	-	29	0	-	0	-	-	0	-	-
81766	22	-	0	-	39	110	-	0	-	-	0	-	-
81767	7	-	0	-	59	150	-	0	-	-	0	-	-
81768	424	-	0	-	133	190	-	0	-	-	0	-	-
81769	811	-	0	-	175	230	-	0	-	-	0	-	-
81770	244	-	570	-	185	230	-	0	-	-	0	-	-
81771	365	-	0	-	143	210	-	0	-	-	0	-	-
81772	123	-	0	-	128	200	-	0	-	-	0	-	-
81773	71	-	0	-	64	130	-	0	-	-	0	-	-
81774	24	-	0	-	154	210	-	0	-	-	0	-	-
81775	84	-	0	-	86	170	-	0	-	-	0	-	-
81778	8	-	0	-	107	170	-	0	-	-	0	-	-
81779	15	-	0	-	132	210	-	0	-	-	0	-	-
81780	62	-	0	-	181	250	-	0	-	-	0	-	-
81781	106	-	0	-	250	330	-	0	-	-	0	-	-
81782	67	-	219	-	486	550	-	0	-	-	0	-	-
81783	43	-	0	-	130	200	-	0	-	-	0	-	-
81784	57	-	0	-	284	360	-	0	-	-	0	-	-
81785	21	-	0	-	64	120	-	0	-	-	0	-	-
81786	44	-	0	-	101	200	-	0	-	-	0	-	-
81787	84	-	0	-	142	200	-	0	-	-	0	-	-
81788	12	-	0	-	60	110	-	0	-	-	0	-	-
81789	188	-	0	-	165	240	-	0	-	-	0	-	-
81790	32	-	0	-	31	130	-	0	-	-	0	-	-
81791	14	-	0	-	124	190	-	0	-	-	0	-	-
81794	-	-	-	-	-	500	-	0	-	-	0	-	-
81795	-	-	-	-	-	530	-	0	-	-	0	-	-
81796	-	-	-	-	-	370	-	0	-	-	0	-	-
81797	-	-	-	-	-	1900	-	0	-	-	0	-	-
81798	-	-	-	-	-	9400	-	0	-	-	0	-	-
81799	-	-	-	-	-	9200	-	0	-	-	0	-	-
81800	-	-	-	-	-	12300	-	10.8	-	-	0	-	-
81801	-	-	-	-	-	18600	-	32	-	-	0	-	-
81802	-	-	-	-	-	37700	-	10.4	-	-	0	-	-
81803	-	-	-	-	-	34200	-	9	-	-	0	-	-
81804	-	-	-	-	-	5000	-	0	-	-	0	-	-
81805	-	-	-	-	-	7100	-	0	-	-	0	-	-
81806	-	-	-	-	-	730	-	0	-	-	0	-	-

	Cu	Cu	Pb	Pb	Zn	Zn	Zn	Ag	Ag	Ag	Au	Au	Au Rpt
81807	-	-	-	-	-	1400	-	0	-	-	0	-	-
81808	-	-	-	-	-	1900	-	0	-	-	0	-	-
81809	-	-	-	-	-	2800	-	0	-	-	0	-	-
81810	-	-	-	-	-	940	-	0	-	-	0	-	-
81811	-	-	-	-	-	640	-	0	-	-	0	-	-
81812	-	-	-	-	-	730	-	0	-	-	0	-	-
81813	-	-	-	-	-	2300	-	0	-	-	0	-	-
81814	-	-	-	-	-	1700	-	0	-	-	0	-	-
81815	-	-	-	-	-	670	-	0	-	-	0	-	-
81816	-	-	-	-	-	380	-	0	-	-	0	-	-
81817	-	-	-	-	-	330	-	0	-	-	0	-	-
81818	-	-	-	-	-	490	-	0	-	-	0	-	-
81819	-	-	-	-	-	450	-	0	-	-	0	-	-
81820	-	-	-	-	-	420	-	0	-	-	0	-	-
81840	21	-	109	-	325	430	-	0	-	0	0	-	-
81841	27	-	0	-	139	190	-	0	-	0	130	-	-
81842	-	60	-	130	-	-	350	-	0	-	-	-	-
81843	-	100	-	120	-	-	285	-	0	-	-	-	-
81844	13	-	100	-	132	210	-	0	-	0	0	-	-
81845	66	-	0	-	213	320	-	0	-	0	0	-	-
81846	13	-	145	-	109	210	-	0	-	0	0	-	-
81847	11	-	105	-	333	390	-	0	-	0	0	-	-
81848	74	-	0	-	284	360	-	0	-	0	0	-	-
81849	26	-	0	-	328	430	-	0	-	0	0	-	-
81850	90	-	128	-	630	730	-	0	-	0	29	-	-
81851	20	-	105	-	301	390	-	0	-	0	0	-	-
81852	5	-	0	-	64	110	-	0	-	0	0	-	-
81853	6	-	0	-	288	350	-	0	-	0	0	-	-
81854	14	-	0	-	284	350	-	0	-	0	13	-	-
81855	24	-	0	-	118	200	-	0	-	0	0	-	-
81856	12	-	0	-	125	160	-	0	-	0	7.1	-	-
81857	17	-	0	-	127	210	-	0	-	0	0	-	-
81858	14	-	0	-	168	240	-	0	-	0	0	-	-
81859	9	-	0	-	172	290	-	0	-	0	0	-	-
81860	0	-	0	-	43	140	-	0	-	0	0	-	-
81861	-	250	-	40	-	-	275	-	0	-	-	-	-
81862	-	85	-	50	-	-	190	-	0	-	-	-	-
81863	-	90	-	25	-	-	135	-	0	-	-	-	-
81864	-	20	-	10	-	-	150	-	0	-	-	-	-
81865	-	10	-	10	-	-	155	-	0	-	-	-	-
81866	9	-	0	-	106	200	-	0	-	0	0	-	-
81867	109	-	371	-	1507	1500	-	0	-	0	42	-	-
81868	15	-	0	-	101	180	-	0	-	0	0	-	-
81869	244	-	0	-	137	230	-	0	-	0	0	-	-
81870	116	-	0	-	296	370	-	0	-	0	0	-	-
81871	54	-	0	-	279	330	-	0	-	0	0	-	-
81872	48	-	191	-	403	450	-	0	-	0	0	-	-
81873	14	-	0	-	134	200	-	0	-	0	0	-	-
81874	64	-	0	-	199	310	-	0	-	0	0	-	-
81875	71	-	0	-	197	290	-	0	-	0	0	-	-
81876	75	-	0	-	140	210	-	0	-	0	0	-	-
81877	32	-	0	-	54	140	-	0	-	0	0	-	-

460076

	Cu	Cu	Pb	Pb	Zn	Zn	Zn	Ag	Ag	Ag	Au	Au	Au Rpt
81878	-	10	-	15	-	-	465	-	0	-	-	-	-
81879	13	-	0	-	52	130	-	0	-	0	0	-	-
81880	-	145	-	25	-	-	105	-	0	-	-	-	-
81881	66	-	0	-	135	240	-	0	-	0	0	-	-
81882	9	-	0	-	87	180	-	0	-	0	0	-	-
81883	108	-	0	-	97	190	-	0	-	0	0	-	-
81884	86	-	100	-	447	520	-	0	-	0	0	-	-
81885	-	305	-	80	-	-	185	-	0	-	-	-	-
81886	-	30	-	20	-	-	130	-	0	-	-	-	-
81887	38	-	0	-	123	220	-	0	-	0	0	-	-
81888	52	-	0	-	166	240	-	0	-	0	0	-	-
81889	31	-	0	-	160	260	-	0	-	0	8	-	-
81890	243	-	0	-	130	200	-	0	-	0	0	-	-
81891	15	-	0	-	212	280	-	0	-	0	0	-	-
81892	-	5	-	5	-	-	160	-	0	-	-	-	-
81893	9	-	0	-	166	270	-	0	-	0	0	-	-
81894	29	-	0	-	43	110	-	0	-	0	0	-	-
81895	14	-	0	-	71	160	-	0	-	0	0	-	-
81896	-	50	-	55	-	-	205	-	0	-	-	-	-
81897	7	-	0	-	140	280	-	0	-	0	0	-	-
81898	12	-	0	-	73	110	-	0	-	0	0	-	-
81899	7	-	0	-	45	0	-	0	-	0	0	-	-
81900	119	-	0	-	79	150	-	0	-	0	0	-	-
81901	8	-	0	-	82	120	-	0	-	0	0	-	-
81902	15	-	0	-	86	130	-	0	-	0	0	-	-
81903	21	-	0	-	51	0	-	0	-	0	0	-	-
81904	-	10	-	15	-	-	80	-	0	-	-	-	-
81905	-	5	-	40	-	-	100	-	0	-	-	-	-
81906	116	-	0	-	89	190	-	0	-	0	0	-	-
81907	103	-	0	-	83	170	-	0	-	0	0	-	-
81908	-	10	-	10	-	-	145	-	0	-	-	-	-
81909	-	20	-	5	-	-	40	-	0	-	-	-	-
81910	8	-	0	-	118	230	-	0	-	0	0	-	-
81911	0	-	0	-	86	200	-	0	-	0	0	-	-
81912	-	5	-	10	-	-	45	-	0	-	-	-	-
81913	5	-	0	-	52	0	-	0	-	0	0	-	-
81914	8	-	0	-	55	130	-	0	-	0	0	-	-
81915	321	-	0	-	194	240	-	0	-	0	0	-	-
81916	-	63	-	0	-	0	30	0	0	-	0	-	-
81917	-	15	-	10	-	-	165	-	0	-	-	-	-
81918	14	-	0	-	113	170	-	0	-	0	0	-	-
81919	-	30	-	15	-	-	150	-	0	-	-	-	-
81920	20	-	141	-	304	360	-	0	-	0	0	-	-
81921	69	-	0	-	167	260	-	0	-	0	0	-	-
81922	17	-	0	-	93	170	-	0	-	0	0	-	-
81923	29	-	0	-	68	140	-	0	-	0	0	-	-
81924	8	-	0	-	116	180	-	0	-	0	0	-	-
81925	10	-	0	-	85	170	-	0	-	0	0	-	-
81926	150	-	515	-	435	550	-	0	-	0	0	-	-
81927	-	30	-	60	-	-	140	-	0	-	-	-	-
81928	9	-	0	-	79	130	-	0	-	0	0	-	-
81929	-	15	-	10	-	-	145	-	0	-	-	-	-

	Cu	Cu	Pb	Pb	Zn	Zn	Zn	Ag	Ag	Ag	Au	Au	Au Rpt
81930	-	25	-	15	-	-	115	-	0	-	-	-	-
81931	12	-	100	-	65	130	-	0	-	0	0	-	-
81932	76	-	154	-	657	800	-	0	-	0	0	-	-
81933	69	-	530	-	128	220	-	0	-	0	0	-	-
81934	-	4	-	20	-	-	78	-	0	-	-	3	0
81935	-	19	-	430	-	-	1020	-	1	-	-	65	90
81936	-	9	-	990	-	-	520	-	0	-	-	8	-
81937	-	2150	-	310	-	-	320	-	7	-	-	1030	760
81938	-	58	-	24	-	-	280	-	0	-	-	110	140
81939	-	60	-	640	-	-	830	-	3	-	-	330	250
81940	-	13	-	62	-	-	550	-	0	-	-	15	-
81943	-	62	-	300	-	-	590	-	1	-	-	110	110
81944	-	12	-	480	-	-	610	-	1	-	-	130	140
81945	-	6	-	100	-	-	410	-	0	-	-	260	220
81946	-	19	-	100	-	-	360	-	0	-	-	70	90
81947	-	7	-	260	-	-	450	-	0	-	-	190	180
81948	-	75	-	12	-	-	230	-	3	-	-	8	-
81949	-	13	-	4	-	-	60	-	1	-	-	5	-
81950	-	7	-	76	-	-	410	-	0	-	-	13	-
81951	-	2	-	330	-	-	165	-	2	-	-	10	-
81952	-	52	-	700	-	-	620	-	2	-	-	85	95
81953	-	18	-	62	-	-	82	-	1	-	-	16	-
81954	-	115	-	165	-	-	130	-	3	-	-	355	440
81955	-	66	-	1500	-	-	580	-	2	-	-	13	-
81956	-	5	-	92	-	-	190	-	0	-	-	2	-
81957	-	3	-	75	-	-	98	-	2	-	-	5	-
81958	-	40	-	300	-	-	400	-	1	-	-	2	-
81959	-	9	-	26	-	-	100	-	0	-	-	0	-
81960	-	3	-	12	-	-	46	-	0	-	-	0	-
81961	-	380	-	680	-	-	290	-	3	-	-	28	18
81962	-	40	-	810	-	-	1250	-	1	-	-	9	-
81963	-	5	-	44	-	-	54	-	1	-	-	0	-
81964	-	10	-	15	-	-	20	-	1	-	-	0	-
81965	-	16	-	5	-	-	35	-	0	-	-	0	-
81966	-	20	-	22	-	-	8	-	0	-	-	38	20
81967	-	18	-	1600	-	-	1120	-	2	-	-	55	44
81968	-	22	-	32	-	-	760	-	2	-	-	0	-
81969	-	17	-	105	-	-	62	-	0	-	-	0	-
81970	-	13	-	20	-	-	38	-	2	-	-	0	-
81971	-	20	-	40	-	-	16	-	1	-	-	0	-

ANALYSIS RESULTS

Methods: AAS=atomic absorption spectroscopy, ICP=induction coupled plasma with optical emission spectroscopy, NAA=neutron activation analysis, FA=fire assay

0=below detection limit, -=not analysed

ELEMENT:	As	As	Ba	Sb	Bi	Cd	Cd	Te	Se	Ca	Mg	Na	Na	K	K
UNITS:	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	%	%	ppm	ppm	%
DETECTION:	0.1	50	100	0.1	10	30	0.5	20	5	0.005	0.002	0.002	50	500	0.1
METHOD:	NAA	AAS	NAA	NAA	AAS	NAA	AAS	NAA	NAA	ICP	ICP	NAA	ICP	ICP	NAA
SAMPLE NO.															
81707	3.8	-	970	0.8	-	0	-	0	3.2	0.115	0.602	0.81	-	-	3.5
81708	0	-	920	0.7	-	0	-	0	0	0.252	1.36	2.62	-	-	2.2
81709	11	-	540	0.7	-	0	-	0	10	0.027	0.754	0.22	-	-	3.6
81710	10	-	140	1.3	-	0	-	0	0	0.276	1.82	2.18	-	-	2.3
81711	3.4	-	410	1.1	-	0	-	0	0	4.03	2.21	3.39	-	-	1.1
81712	2.2	-	1000	0.6	-	0	-	0	0	2.7	2.63	3.36	-	-	2.2
81713	7.8	-	900	0.7	-	0	-	0	7	0.082	0.554	0.47	-	-	4
81714	12	-	1100	0.8	-	0	-	0	0	3.67	2.55	2.11	-	-	2.2
81715	3.6	-	1900	0.5	-	0	-	0	0	0.045	0.421	0.84	-	-	4.8
81716	0	-	290	0.8	-	0	-	0	0	0.045	0.442	0.81	-	-	2.1
81717	25	-	210	3.3	-	0	-	0	0	0.029	1.07	0.17	-	-	1.8
81718	0	-	130	1.1	-	0	-	0	0	0.038	0.093	0.07	-	-	0.6
81719	32	-	1500	1.7	-	0	-	0	0	0.069	3.3	1.4	-	-	3.9
81720	3.9	-	620	0.9	-	0	-	0	0	0.511	2.53	3.64	-	-	0.8
81721	2.7	-	410	0.6	-	0	-	0	0	0.113	2.88	1.2	-	-	1.9
81722	17	-	510	13	-	0	-	0	0	4.6	2.12	2.55	-	-	1.6
81723	3	-	560	0.8	-	0	-	0	12	0.14	0.795	2.25	-	-	2.8
81724	2.9	-	200	0.8	-	0	-	0	0	3.15	4.82	0.52	-	-	1
81725	0	-	300	1.1	-	0	-	0	0	5.67	6.07	2	-	-	0.6
81726	0	-	0	0	-	0	-	0	0	4.92	6.95	3.17	-	-	0
81727	0	-	0	0.4	-	0	-	0	0	3.43	4.48	4.41	-	-	0
81728	0	-	0	0.4	-	0	-	0	0	13.42	5.66	0.15	-	-	0
81729	11	-	390	1.1	-	0	-	0	0	4.94	1.68	2.44	-	-	1.6
81730	26	-	340	2.6	-	0	-	0	0	1.7	1.41	1.2	-	-	0.8
81731	6	-	520	1.3	-	0	-	0	0	2.2	1.59	3.34	-	-	1.9
81732	2.7	-	140	0	-	0	-	0	0	0.049	0.336	0	-	-	0
81733	0	-	0	0.5	-	0	-	0	0	0.024	22.15	0	-	-	0
81734	0	-	0	1.8	-	0	-	0	0	0.401	20.95	0	-	-	0
81735	4.2	-	100	0.6	-	0	-	0	0	0.818	21.43	0	-	-	0
81736	7.8	-	230	1	-	0	-	0	0	0.058	3.91	0.64	-	-	0
81737	10	-	0	1.6	-	0	-	0	0	0.031	3.09	0.39	-	-	0
81738	8.6	-	0	1.3	-	0	-	0	0	0.052	7.17	0	-	-	0
81739	2.1	-	0	0.9	-	0	-	0	0	0.049	5.12	0.73	-	-	0
81740	0	-	280	0.7	-	0	-	0	0	0.044	8.96	0	-	-	0
81741	0	-	640	0.6	-	0	-	0	0	0.025	0.696	0.12	-	-	2.7
81742	3	-	630	0.9	-	0	-	0	0	0.014	1.75	0.66	-	-	2.5
81743	0	-	210	1.3	-	0	-	0	0	0.02	0.807	0.05	-	-	3.1
81744	0	-	170	1.5	-	0	-	0	0	0.091	0.566	0.02	-	-	3.1
81745	5.2	-	350	1.2	-	0	-	0	0	0.035	0.615	0.04	-	-	3.3
81746	3.1	-	0	0.6	-	0	-	0	0	0.043	3.94	0.22	-	-	1.2
81747	0	-	0	0.8	-	0	-	0	0	0.299	2.98	3.54	-	-	0.4
81748	6.9	-	240	2	-	0	-	0	0	0.027	2.68	0.26	-	-	0.8
81749	4	-	630	1.5	-	0	-	0	0	2	1.71	0.72	-	-	2

	As	As	Ba	Sb	Bi	Cd	Cd	Te	Se	Ca	Mg	Na	Na	K	K
81750	3.2	-	430	1	-	0	-	0	0	6.14	4.84	2.22	-	-	1.1
81752	2.5	-	190	0.9	-	0	-	0	0	2.35	2.86	0.78	-	-	1
81753	0	-	110	1	-	0	-	0	0	0.067	0.171	0.04	-	-	0.8
81754	0	-	200	0	-	0	-	0	0	4.18	2.4	5.32	-	-	0
81755	0	-	320	0	-	0	-	0	0	2.77	4.43	2.61	-	-	1
81756	2.5	-	390	0.9	-	0	-	0	0	4.15	5.15	2.3	-	-	1.4
81757	0	-	0	0.4	-	0	-	0	0	2.47	3.43	4.84	-	-	0
81758	3.1	-	0	0.6	-	0	-	0	0	3.96	4.45	3.58	-	-	0.7
81759	5.5	-	140	0.8	-	0	-	0	0	3.06	3.41	4.62	-	-	0
81760	4.6	-	0	1.2	-	0	-	0	0	2.91	2.87	5.02	-	-	0.7
81761	3.4	-	270	0.8	-	0	-	0	0	3.55	4.86	2.39	-	-	1.2
81762	0	-	0	0.5	-	0	-	0	0	3.08	3.61	4.68	-	-	0
81763	0	-	170	0.6	-	0	-	0	0	3.25	3.51	4.93	-	-	0.9
81764	0	-	230	0.8	-	0	-	0	0	4.97	6.92	2.07	-	-	0
81765	0	-	0	0	-	0	-	0	0	6.26	6.91	0.93	-	-	0
81766	0	-	0	0.6	-	0	-	0	0	6.52	6.49	0.81	-	-	0
81767	0	-	190	0	-	0	-	0	0	3.38	4.94	3.38	-	-	0.8
81768	10	-	140	0.6	-	0	-	0	0	0.073	2.47	0.05	-	-	1.6
81769	3	-	190	0.4	-	0	-	0	0	0.043	3.39	0.1	-	-	1.3
81770	28	-	180	1	-	0	-	0	0	0.033	1.7	0.05	-	-	1.8
81771	4.8	-	200	0.8	-	0	-	0	0	0.096	4.12	0.5	-	-	0.9
81772	2.6	-	150	0.7	-	0	-	0	0	0.151	4.01	0.83	-	-	1
81773	10	-	170	1.5	-	0	-	0	0	2.27	4.37	3.8	-	-	0
81774	10	-	0	4.2	-	0	-	0	0	0.044	4.63	0.03	-	-	0
81775	6.6	-	580	0.9	-	0	-	0	0	1.92	4.4	1.3	-	-	1.4
81778	8.1	-	0	4.9	-	0	-	0	0	0.124	4.02	1.7	-	-	0.7
81779	8	-	0	1.9	-	0	-	0	0	0.076	4.8	0.78	-	-	0
81780	13	-	290	2.2	-	0	-	0	0	1320	2.81	0.76	-	-	1.8
81781	18	-	290	2.8	-	0	-	0	0	3.22	2.61	3.56	-	-	0
81782	6.5	-	160	1.7	-	0	-	0	0	0.142	2.49	3.85	-	-	0.7
81783	22	-	430	4.3	-	0	-	0	0	1.26	3.87	3.01	-	-	0.7
81784	3.9	-	460	1.3	-	0	-	0	0	0.95	1.27	5.29	-	-	1.4
81785	2.8	-	620	11	-	0	-	0	0	0.111	0.555	0.77	-	-	3.4
81786	5.3	-	220	1.3	-	0	-	0	0	0.059	6.42	1.9	-	-	0.6
81787	6.4	-	360	0.7	-	0	-	0	0	0.069	1.7	1.4	-	-	1.3
81788	6	-	140	1.2	-	0	-	0	0	0.058	0.648	2.03	-	-	1.1
81789	2.8	-	760	1	-	0	-	0	0	0.109	1.35	3.98	-	-	1.5
81790	3.1	-	0	0.5	-	0	-	0.0**	0	0.042	0.247	3.4	-	-	0.9
81791	7.7	-	560	0.6	-	0	-	0	0	0.246	0.982	1.4	-	-	1.7
81794	46	-	500	2.9	-	0	-	0	0	-	-	1.7	-	-	1.7
81795	47	-	520	2.7	-	0	-	0	0	-	-	1.3	-	-	2.3
81796	31	-	430	2.4	-	0	-	0	0	-	-	1	-	-	2.3
81797	47	-	0	1.2	-	33	-	0	0	-	-	1.1	-	-	1.1
81798	63	-	0	4.3	-	94	-	0	0	-	-	0.32	-	-	1.8
81799	77	-	0	6.1	-	87	-	0	0	-	-	0.18	-	-	2.2
81800	42	-	0	10	-	110	-	0	0	-	-	0.072	-	-	2.3
81801	45	-	0	6	-	170	-	0	0	-	-	0.44	-	-	4
81802	3.9	-	0	5.6	-	340	-	0	0	-	-	0.058	-	-	1.9
81803	2.7	-	0	7.2	-	330	-	0	0	-	-	0.1	-	-	1.9
81804	26	-	0	2.1	-	65	-	0	0	-	-	1	-	-	2.2
81805	13	-	0	6.9	-	100	-	0	0	-	-	1.5	-	-	2.8
81806	19	-	130	1.2	-	0	-	0	0	-	-	2.37	-	-	2.5

	As	As	Ba	Sb	Bi	Cd	Cd	Te	Se	Ca	Mg	Na	Na	K	K
81807	19	-	360	0.34	-	0	-	0	0	-	-	3.4	-	-	3.1
81808	10	-	310	0.71	-	0	-	0	0	-	-	2.61	-	-	3.3
81809	5	-	240	0.84	-	52	-	0	0	-	-	1.9	-	-	3
81810	21	-	310	0.6	-	0	-	0	0	-	-	2.94	-	-	3.3
81811	11	-	300	0.9	-	0	-	0	0	-	-	3.25	-	-	2.6
81812	19	-	450	0.82	-	0	-	0	0	-	-	2.33	-	-	3.7
81813	19	-	440	0.9	-	35	-	0	0	-	-	3.18	-	-	3.7
81814	7.3	-	470	0.59	-	38	-	0	0	-	-	2.44	-	-	4.2
81815	5.9	-	420	0.69	-	0	-	0	0	-	-	4.54	-	-	2.9
81816	6.4	-	400	0.46	-	0	-	0	0	-	-	4.74	-	-	3.1
81817	16	-	240	0.62	-	0	-	0	0	-	-	4.66	-	-	2.8
81818	3.9	-	210	0.9	-	0	-	0	0	-	-	2.8	-	-	1
81819	3.5	-	360	0.94	-	0	-	0	0	-	-	2.76	-	-	1.3
81820	4.5	-	500	0.66	-	0	-	0	0	-	-	2.85	-	-	0.85
81840	3.7	-	820	0.75	-	0	-	-50	0	0.99	2.57	-	29100	12500	-
81841	3.6	-	640	0.6	-	0	-	-50	0	0.055	0.493	-	709	22800	-
81842	-	0	-	-	0	-	0	-	-	-	-	-	-	-	-
81843	-	0	-	-	0	-	0	-	-	-	-	-	-	-	-
81844	-2	-	1200	0.36	-	0	-	-50	0	0.123	0.561	-	16800	30000	-
81845	3.4	-	690	1.1	-	0	-	-50	0	0.985	1.08	-	38500	19000	-
81846	6.4	-	1000	0.73	-	0	-	-50	0	0.133	0.682	-	28700	22200	-
81847	9.3	-	440	2.5	-	0	-	-50	0	3.42	1.91	-	15700	11500	-
81848	5.6	-	370	1	-	0	-	-50	0	4.96	3.66	-	27300	5831	-
81849	12	-	270	1.7	-	0	-	-50	0	1.67	2.59	-	23200	2348	-
81850	14	-	900	1.7	-	0	-	-50	0	2.93	3.62	-	19800	7282	-
81851	5	-	330	0.5	-	0	-	-50	0	0.244	1.38	-	37500	8417	-
81852	2.3	-	470	0.49	-	0	-	-50	0	0.055	0.622	-	1817	36500	-
81853	2.2	-	600	0.47	-	0	-	-50	0	0.085	1.78	-	17400	13200	-
81854	-2	-	1400	0.3	-	0	-	-50	0	0.118	3	-	16600	32900	-
81855	15	-	760	1.3	-	0	-	-50	0	1.74	2.49	-	20900	27300	-
81856	8.6	-	1000	1.6	-	0	-	-50	0	0.16	1.11	-	24400	25000	-
81857	2.3	-	420	1.1	-	0	-	-50	0	0.212	2.56	-	23500	16700	-
81858	5.1	-	880	1.8	-	0	-	-50	0	3.44	2.49	-	15700	19200	-
81859	3.4	-	380	0.44	-	0	-	-50	0	1.66	3.11	-	50600	791	-
81860	-2	-	0	-0.2	-	0	-	-50	0	6.39	7.85	-	6755	1794	-
81861	-	0	-	-	0	-	1	-	-	-	-	-	-	-	-
81862	-	0	-	-	0	-	0.5	-	-	-	-	-	-	-	-
81863	-	0	-	-	0	-	0	-	-	-	-	-	-	-	-
81864	-	0	-	-	0	-	0	-	-	-	-	-	-	-	-
81865	-	0	-	-	0	-	0	-	-	-	-	-	-	-	-
81866	5.7	-	280	0.68	-	0	-	-50	0	0.155	1.75	-	39900	7652	-
81867	13	-	3200	5.7	-	0	-	-50	0	3.87	3.23	-	30700	10800	-
81868	3.8	-	420	0.73	-	0	-	-50	0	1.65	2.38	-	27500	9459	-
81869	7	-	520	0.64	-	0	-	-50	0	1.03	1.8	-	30500	15200	-
81870	2.7	-	390	-0.2	-	0	-	-50	0	0.529	3.86	-	2200	11100	-
81871	12	-	210	0.69	-	0	-	-50	0	0.605	1.8	-	35800	4274	-
81872	64	-	0	0.75	-	0	-	-50	0	0.084	4.95	-	3899	4723	-
81873	25	-	300	1.8	-	0	-	-50	0	0.169	2.32	-	415	18700	-
81874	18	-	290	0.84	-	0	-	-50	0	0.055	5.32	-	5121	18500	-
81875	6.6	-	340	1.7	-	0	-	-50	0	0.032	3.78	-	284	26900	-
81876	3.3	-	550	1.5	-	0	-	-50	0	0.164	1.87	-	6638	30600	-
81877	4.4	-	530	0.29	-	0	-	-50	0	3.41	2.95	-	33600	17300	-

	As	As	Ba	Sb	Bi	Cd	Cd	Te	Se	Ca	Mg	Na	Na	K	K
81878	-	0	-	-	0	-	0	-	-	-	-	-	-	-	-
81879	6.9	-	1200	4.5	-	0	-	-50	0	5.55	1.75	-	11300	35800	-
81880	-	0	-	-	0	-	0	-	-	-	-	-	-	-	-
81881	3.8	-	780	0.69	-	0	-	-50	0	4.8	6.61	-	15900	18400	-
81882	4.3	-	610	0.58	-	0	-	-50	0	4.48	5.33	-	14300	12500	-
81883	5.7	-	520	2.7	-	0	-	-50	0	4.14	3.37	-	24900	9169	-
81884	7.7	-	520	2.1	-	0	-	-50	0	0.781	3.12	-	26200	8800	-
81885	-	0	-	-	0	-	0	-	-	-	-	-	-	-	-
81886	-	0	-	-	0	-	0	-	-	-	-	-	-	-	-
81887	3.5	-	940	0.3	-	0	-	-50	0	1.16	1.89	-	35100	19000	-
81888	5.4	-	670	0.91	-	0	-	-50	0	0.17	1.02	-	13700	17700	-
81889	14	-	770	1.9	-	0	-	-50	0	5.97	6.13	-	153	17500	-
81890	5.7	-	660	3.8	-	0	-	-50	0	0.226	3.74	-	4361	23600	-
81891	2.2	-	340	1.9	-	0	-	-50	0	0.077	3.11	-	3894	13200	-
81892	-	0	-	-	0	-	0	-	-	-	-	-	-	-	-
81893	-2	-	400	0.48	-	0	-	-50	0	0.88	4.2	-	26000	5303	-
81894	-2	-	0	0.5	-	0	-	-50	0	0.164	1.18	-	21500	2770	-
81895	4.4	-	410	0.46	-	0	-	-50	0	2.78	4.78	-	11200	13100	-
81896	-	0	-	-	0	-	0	-	-	-	-	-	-	-	-
81897	-2	-	170	0.46	-	0	-	-50	0	3.35	3.21	-	44400	1583	-
81898	2.3	-	270	1	-	0	-	-50	0	0.138	0.724	-	822	27000	-
81899	4.7	-	240	1.7	-	0	-	-50	0	1.11	0.527	-	1376	33100	-
81900	2.5	-	100	1.5	-	0	-	-50	0	0.053	11.77	-	293	4512	-
81901	14	-	0	3.6	-	0	-	-50	0	1.54	11.11	-	641	0	-
81902	4	-	480	1	-	0	-	-50	0	1.86	2.3	-	1203	25300	-
81903	7.2	-	600	1.7	-	0	-	-50	0	1.03	0.438	-	1330	31800	-
81904	-	0	-	-	0	-	0	-	-	-	-	-	-	-	-
81905	-	0	-	-	0	-	0	-	-	-	-	-	-	-	-
81906	3.8	-	130	0.35	-	0	-	-50	0	6.2	5.42	-	10500	1280	-
81907	2.8	-	140	0.5	-	0	-	-50	0	4.72	2.82	-	22300	1346	-
81908	-	0	-	-	0	-	0	-	-	-	-	-	-	-	-
81909	-	0	-	-	0	-	0	-	-	-	-	-	-	-	-
81910	14	-	1400	0.81	-	0	-	-50	0	3.08	5.72	-	16400	16500	-
81911	-2	-	160	-0.2	-	0	-	-50	0	1.76	5.27	-	33100	7388	-
81912	-	0	-	-	0	-	0	-	-	-	-	-	-	-	-
81913	-2	-	130	0.59	-	0	-	-50	0	4.88	8.42	-	7004	2889	-
81914	2.4	-	120	0.54	-	0	-	-50	0	6.68	5.64	-	10600	2164	-
81915	5	-	150	0.37	-	0	-	-50	0	0.125	5.18	-	3991	11000	-
81916	5.3	-	300	1.7	-	0	-	-50	0	0.091	0.435	-	1135	34600	-
81917	-	0	-	-	0	-	0	-	-	-	-	-	-	-	-
81918	10	-	190	1.6	-	0	-	-50	0	2.31	5.35	-	6430	4077	-
81919	-	0	-	-	0	-	0.5	-	-	-	-	-	-	-	-
81920	-2	-	0	1.7	-	0	-	-50	0	0.146	7.15	-	1995	0	-
81921	3.8	-	500	0.55	-	0	-	-50	0	0.919	2.05	-	36500	7375	-
81922	4.5	-	560	1.3	-	0	-	-50	0	3.48	2.04	-	25300	11400	-
81923	3.6	-	810	1.6	-	0	-	-50	0	2.85	1.42	-	23900	16900	-
81924	3.5	-	2400	0.54	-	0	-	-50	0	0.884	1.14	-	9546	40900	-
81925	-2	-	440	0.92	-	0	-	-50	0	0.086	2.27	-	786	25600	-
81926	-2	-	220	3.2	-	0	-	-50	0	3.7	3.55	-	26900	1662	-
81927	-	0	-	-	0	-	0.5	-	-	-	-	-	-	-	-
81928	-2	-	1200	0.52	-	0	-	-50	0	0.127	0.459	-	12300	27100	-
81929	-	0	-	-	0	-	0	-	-	-	-	-	-	-	-

	As	As	Ba	Sb	Bi	Cd	Cd	Te	Se	Ca	Mg	Na	Na	K	K
81930	-	0	-	-	0	-	0	-	-	-	-	-	-	-	-
81931	5.5	-	920	0.71	-	0	-	-50	0	0.156	0.581	-	27300	22900	-
81932	5.7	-	530	0.55	-	0	-	-50	0	2.92	3.47	-	19700	6649	-
81933	5.8	-	300	7.9	-	0	-	-50	0	4.54	2.97	-	31500	5343	-
81934	-	0	-	-	0	-	3	-	-	-	-	-	-	-	-
81935	-	50	-	-	0	-	5	-	-	-	-	-	-	-	-
81936	-	0	-	-	0	-	0	-	-	-	-	-	-	-	-
81937	-	150	-	-	0	-	3	-	-	-	-	-	-	-	-
81938	-	0	-	-	0	-	3	-	-	-	-	-	-	-	-
81939	-	100	-	-	0	-	3	-	-	-	-	-	-	-	-
81940	-	50	-	-	0	-	2	-	-	-	-	-	-	-	-
81941	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
81942	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
81943	-	0	-	-	0	-	3	-	-	-	-	-	-	-	-
81944	-	0	-	-	0	-	2	-	-	-	-	-	-	-	-
81945	-	50	-	-	0	-	1	-	-	-	-	-	-	-	-
81946	-	50	-	-	0	-	0	-	-	-	-	-	-	-	-
81947	-	50	-	-	10	-	5	-	-	-	-	-	-	-	-
81948	-	0	-	-	15	-	3	-	-	-	-	-	-	-	-
81949	-	0	-	-	0	-	0	-	-	-	-	-	-	-	-
81950	-	50	-	-	0	-	3	-	-	-	-	-	-	-	-
81951	-	0	-	-	10	-	0	-	-	-	-	-	-	-	-
81952	-	50	-	-	10	-	6	-	-	-	-	-	-	-	-
81953	-	0	-	-	10	-	0	-	-	-	-	-	-	-	-
81954	-	50	-	-	20	-	5	-	-	-	-	-	-	-	-
81955	-	0	-	-	0	-	5	-	-	-	-	-	-	-	-
81956	-	0	-	-	0	-	0	-	-	-	-	-	-	-	-
81957	-	0	-	-	10	-	4	-	-	-	-	-	-	-	-
81958	-	100	-	-	20	-	0	-	-	-	-	-	-	-	-
81959	-	0	-	-	0	-	2	-	-	-	-	-	-	-	-
81960	-	0	-	-	0	-	3	-	-	-	-	-	-	-	-
81961	-	50	-	-	15	-	6	-	-	-	-	-	-	-	-
81962	-	0	-	-	0	-	2	-	-	-	-	-	-	-	-
81963	-	0	-	-	0	-	7	-	-	-	-	-	-	-	-
81964	-	100	-	-	0	-	2	-	-	-	-	-	-	-	-
81965	-	50	-	-	0	-	1	-	-	-	-	-	-	-	-
81966	-	0	-	-	0	-	5	-	-	-	-	-	-	-	-
81967	-	50	-	-	0	-	1	-	-	-	-	-	-	-	-
81968	-	150	-	-	10	-	1	-	-	-	-	-	-	-	-
81969	-	50	-	-	10	-	1	-	-	-	-	-	-	-	-
81970	-	0	-	-	0	-	0	-	-	-	-	-	-	-	-
81971	-	0	-	-	15	-	3	-	-	-	-	-	-	-	-

ANALYSIS RESULTS

Methods: AAS=atomic absorption spectroscopy, ICP=induction coupled plasma with optical emission spectroscopy, NAA=neutron activation analysis, FA=fire assay

0=below detection limit, -=not analysed

ELEMENT:	Co	Co	Ni	Ni	Cr	Fe	Fe	Fe	Mn	Mn	Ti	Zr	Y	Al
UNITS:	ppm	ppm	ppm	ppm	ppm	%	%	ppm	ppm	ppm	ppm	ppm	ppm	%
DETECTION:	1	4	10	4	1	0.01	0.05	4	15	4	10	5	1	0.01
METHOD:	NAA	AAS	ICP	AAS	NAA	NAA	AAS	AAS	ICP	AAS	ICP	ICP	ICP	ICP
SAMPLE NO.														
81707	2.8	-	0	-	12	1	-	-	226	-	2111	-	20	-
81708	15	-	21	-	78	4	-	-	527	-	2652	-	21	-
81709	2.2	-	10	-	20	1	-	-	136	-	1777	-	31	-
81710	9.4	-	29	-	130	5	-	-	608	-	5610	-	22	-
81711	38	-	29	-	61	8	-	-	1157	-	8454	-	31	-
81712	27	-	48	-	160	8	-	-	1042	-	4360	-	29	-
81713	3.2	-	11	-	17	2	-	-	136	-	1635	-	34	-
81714	25	-	46	-	180	8	-	-	243	-	4449	-	42	-
81715	0	-	0	-	13	1	-	-	143	-	1486	-	22	-
81716	1.4	-	10	-	22	1	-	-	94	-	1651	-	29	-
81717	2.3	-	27	-	110	2	-	-	211	-	3821	-	23	-
81718	1.2	-	12	-	15	0	-	-	42	-	1406	-	17	-
81719	14	-	43	-	81	6	-	-	561	-	5766	-	26	-
81720	23	-	49	-	170	5	-	-	723	-	4604	-	23	-
81721	28	-	25	-	64	6	-	-	492	-	5266	-	22	-
81722	25	-	46	-	160	6	-	-	671	-	4374	-	31	-
81723	2.4	-	10	-	22	2	-	-	175	-	1626	-	34	-
81724	41	-	283	-	574	4	-	-	724	-	1441	-	7	-
81725	43	-	179	-	420	5	-	-	833	-	1538	-	10	-
81726	41	-	240	-	707	4	-	-	694	-	2246	-	15	-
81727	27	-	139	-	280	3	-	-	644	-	2573	-	15	-
81728	29	-	212	-	853	3	-	-	971	-	494	-	3	-
81729	9.5	-	19	-	60	5	-	-	516	-	6378	-	26	-
81730	3.5	-	53	-	96	5	-	-	662	-	3528	-	20	-
81731	11	-	19	-	53	5	-	-	692	-	6083	-	30	-
81732	740	-	1167	-	110	57	-	-	5385	-	80	-	10	-
81733	140	-	2354	-	1310	10	-	-	375	-	114	-	1	-
81734	127	-	1261	-	1230	6	-	-	2193	-	1225	-	4	-
81735	103	-	1214	-	420	5	-	-	2539	-	2008	-	6	-
81736	46	-	287	-	410	7	-	-	531	-	3078	-	13	-
81737	47	-	323	-	290	9	-	-	464	-	3067	-	10	-
81738	28	-	128	-	78	7	-	-	484	-	2151	-	12	-
81739	32	-	215	-	180	5	-	-	141	-	2433	-	13	-
81740	40	-	214	-	26	6	-	-	412	-	3273	-	15	-
81741	3.9	-	18	-	75	1	-	-	139	-	1944	-	36	-
81742	23	-	21	-	80	4	-	-	269	-	5956	-	17	-
81743	17	-	65	-	34	5	-	-	177	-	6125	-	22	-
81744	1.4	-	12	-	64	1	-	-	77	-	2033	-	32	-
81745	2.3	-	12	-	150	1	-	-	102	-	2849	-	24	-
81746	24	-	60	-	360	6	-	-	648	-	6221	-	15	-
81747	28	-	76	-	56	5	-	-	778	-	5193	-	28	-
81748	24	-	66	-	170	8	-	-	516	-	4977	-	35	-
81749	29	-	67	-	190	6	-	-	906	-	5177	-	24	-

	Co	Co	Ni	Ni	Cr	Fe	Fe	Fe	Mn	Mn	Ti	Zr	Y	Al
81750	25	-	165	-	480	3	-	-	750	-	1146	-	9	-
81752	21	-	102	-	240	4	-	-	435	-	1396	-	10	-
81753	1.6	-	15	-	22	1	-	-	54	-	651	-	6	-
81754	18	-	70	-	24	3	-	-	482	-	2286	-	17	-
81755	40	-	165	-	320	5	-	-	870	-	2575	-	15	-
81756	37	-	144	-	310	5	-	-	1023	-	1900	-	13	-
81757	28	-	99	-	180	5	-	-	736	-	3040	-	23	-
81758	20	-	112	-	360	5	-	-	917	-	3426	-	20	-
81759	26	-	54	-	140	4	-	-	849	-	2261	-	16	-
81760	20	-	69	-	100	4	-	-	790	-	3100	-	20	-
81761	35	-	114	-	528	8	-	-	1137	-	4340	-	20	-
81762	20	-	89	-	180	4	-	-	858	-	2970	-	19	-
81763	24	-	90	-	180	4	-	-	989	-	2824	-	19	-
81764	40	-	240	-	500	4	-	-	781	-	1163	-	8	-
81765	41	-	233	-	648	4	-	-	760	-	1168	-	8	-
81766	44	-	229	-	582	5	-	-	809	-	1151	-	8	-
81767	33	-	166	-	250	4	-	-	687	-	2257	-	18	-
81768	27	-	36	-	38	6	-	-	1620	-	2724	-	13	-
81769	38	-	97	-	230	7	-	-	2329	-	2769	-	12	-
81770	18	-	44	-	100	6	-	-	1148	-	2776	-	15	-
81771	37	-	93	-	260	8	-	-	2940	-	2586	-	12	-
81772	31	-	58	-	90	7	-	-	2050	-	2843	-	15	-
81773	55	-	163	-	380	5	-	-	213	-	2679	-	22	-
81774	55	-	248	-	975	8	-	-	1155	-	904	-	9	-
81775	40	-	161	-	290	5	-	-	882	-	2557	-	13	-
81778	37	-	227	-	629	7	-	-	808	-	2509	-	12	-
81779	42	-	291	-	763	7	-	-	299	-	2685	-	8	-
81780	44	-	132	-	190	7	-	-	1301	-	8758	-	32	-
81781	48	-	64	-	67	7	-	-	1215	-	6704	-	32	-
81782	26	-	53	-	53	5	-	-	324	-	5419	-	10	-
81783	31	-	75	-	220	8	-	-	915	-	8246	-	18	-
81784	21	-	14	-	23	5	-	-	834	-	6286	-	28	-
81785	11	-	21	-	63	4	-	-	365	-	7501	-	31	-
81786	50	-	69	-	340	8	-	-	743	-	5038	-	9	-
81787	19	-	73	-	280	5	-	-	652	-	6103	-	20	-
81788	4.7	-	12	-	31	3	-	-	132	-	2991	-	34	-
81789	27	-	11	-	29	5	-	-	413	-	4788	-	28	-
81790	0	-	0	-	10	1	-	-	98	-	2190	-	39	-
81791	10	-	50	-	180	3	-	-	577	-	5268	-	20	-
81794	60	-	-	-	290	9.87	-	-	-	-	-	-	-	-
81795	63	-	-	-	290	10.5	-	-	-	-	-	-	-	-
81796	56	-	-	-	280	9.48	-	-	-	-	-	-	-	-
81797	59	-	-	-	180	10.8	-	-	-	-	-	-	-	-
81798	73	-	-	-	160	12.7	-	-	-	-	-	-	-	-
81799	85	-	-	-	120	12.7	-	-	-	-	-	-	-	-
81800	50	-	-	-	170	8.24	-	-	-	-	-	-	-	-
81801	48	-	-	-	480	3.2	-	-	-	-	-	-	-	-
81802	42	-	-	-	400	10.8	-	-	-	-	-	-	-	-
81803	42	-	-	-	360	10.2	-	-	-	-	-	-	-	-
81804	37	-	-	-	120	9.1	-	-	-	-	-	-	-	-
81805	27	-	-	-	38	7.56	-	-	-	-	-	-	-	-
81806	30	-	-	-	23	8.21	-	-	-	-	-	-	-	-

	Co	Co	Ni	Ni	Cr	Fe	Fe	Fe	Mn	Mn	Ti	Zr	Y	Al
81807	30	-	-	-	370	5.35	-	-	-	-	-	-	-	-
81808	27	-	-	-	360	6.32	-	-	-	-	-	-	-	-
81809	20	-	-	-	350	8.55	-	-	-	-	-	-	-	-
81810	47	-	-	-	360	7.46	-	-	-	-	-	-	-	-
81811	35	-	-	-	390	9.73	-	-	-	-	-	-	-	-
81812	40	-	-	-	380	6.3	-	-	-	-	-	-	-	-
81813	42	-	-	-	400	6.04	-	-	-	-	-	-	-	-
81814	28	-	-	-	410	5.29	-	-	-	-	-	-	-	-
81815	30	-	-	-	370	4.2	-	-	-	-	-	-	-	-
81816	30	-	-	-	370	3.9	-	-	-	-	-	-	-	-
81817	37	-	-	-	370	4.2	-	-	-	-	-	-	-	-
81818	40	-	-	-	50	11.2	-	-	-	-	-	-	-	-
81819	43	-	-	-	52	11.4	-	-	-	-	-	-	-	-
81820	40	-	-	-	47	10.5	-	-	-	-	-	-	-	-
81840	22	-	23	-	66	6.07	-	-	1080	-	6843	154	19	9.48
81841	14	-	56	-	210	4.5	-	-	373	-	6656	139	25	6.2
81842	-	35	-	40	-	-	4.9	-	-	1250	-	-	-	-
81843	-	35	-	20	-	-	7.56	-	-	1475	-	-	-	-
81844	5.6	-	19	-	20	2.6	-	-	430	-	2226	245	44	6.48
81845	11	-	17	-	44	4.5	-	-	285	-	4944	261	33	9.11
81846	3.7	-	18	-	37	3.7	-	-	396	-	3494	327	43	7.44
81847	12	-	12	-	28	5.81	-	-	703	-	5379	125	28	9
81848	39	-	35	-	38	7.29	-	-	1919	-	5136	57	24	9.48
81849	23	-	34	-	42	8.82	-	-	2451	-	5938	144	25	9.56
81850	40	-	29	-	32	7.89	-	-	1555	-	5591	64	25	9.58
81851	27	-	50	-	490	4.4	-	-	1255	-	5191	122	17	9.36
81852	3.6	-	10	-	56	2.5	-	-	192	-	3311	123	22	7.33
81853	12	-	22	-	77	3.7	-	-	474	-	3606	121	15	6.11
81854	19	-	16	-	55	5.64	-	-	737	-	5314	172	39	8.98
81855	12	-	33	-	120	4.8	-	-	1149	-	5079	179	24	8.24
81856	8.4	-	29	-	33	3	-	-	370	-	1640	133	44	6.47
81857	22	-	20	-	67	5.93	-	-	738	-	6494	167	26	9.32
81858	19	-	21	-	64	5.92	-	-	840	-	6240	147	29	8.85
81859	20	-	89	-	130	4.4	-	-	1293	-	3200	95	18	9.12
81860	47	-	285	-	551	5.57	-	-	970	-	1032	20	7	8.75
81861	-	35	-	45	-	-	5	-	-	620	-	-	-	-
81862	-	45	-	45	-	-	6.41	-	-	950	-	-	-	-
81863	-	40	-	75	-	-	5	-	-	760	-	-	-	-
81864	-	40	-	95	-	-	5.41	-	-	810	-	-	-	-
81865	-	25	-	25	-	-	5.54	-	-	255	-	-	-	-
81866	12	-	16	-	46	5.28	-	-	504	-	4866	196	27	9.05
81867	32	-	51	-	79	5.72	-	-	1293	-	4439	69	20	10.1
81868	28	-	39	-	46	6.58	-	-	1004	-	7607	181	31	9.54
81869	35	-	13	-	7.1	9.29	-	-	863	-	9065	110	39	8.71
81870	30	-	34	-	45	7.9	-	-	1232	-	7047	177	23	9.89
81871	9.1	-	21	-	13	6.85	-	-	1540	-	8504	271	33	8.88
81872	25	-	84	-	600	7.08	-	-	2254	-	3869	179	17	6.51
81873	20	-	45	-	440	5.75	-	-	3619	-	3183	164	19	6.65
81874	46	-	81	-	180	7.55	-	-	1878	-	6722	75	12	10.3
81875	27	-	80	-	330	8.6	-	-	1210	-	9139	164	18	9.36
81876	35	-	101	-	250	11.6	-	-	855	-	23000	33	39	8.68
81877	31	-	36	-	30	6.8	-	-	830	-	5882	84	22	8.2

	Co	Co	Ni	Ni	Cr	Fe	Fe	Fe	Mn	Mn	Ti	Zr	Y	Al
81878	-	25	-	30	-	-	6.03	-	-	1800	-	-	-	-
81879	22	-	25	-	19	7.3	-	-	1222	-	3594	51	15	8.86
81880	-	45	-	70	-	-	8.31	-	-	935	-	-	-	-
81881	46	-	122	-	310	6.38	-	-	1179	-	3400	40	16	8.43
81882	45	-	145	-	400	6.62	-	-	980	-	3947	46	13	10
81883	43	-	61	-	73	7.08	-	-	939	-	4327	57	17	11.4
81884	38	-	70	-	130	6.1	-	-	1503	-	5206	121	23	9.66
81885		65	-	45			13.2	-	-	1050	-	-	-	-
81886		30	-	30			7.22	-	-	710	-	-	-	-
81887	15	-	12	-	16	6.33	-	-	1971	-	6887	159	31	9.9
81888	21	-	0	-	11	8.3	-	-	1016	-	9672	292	32	8.86
81889	45	-	148	-	470	5.8	-	-	1135	-	3349	46	18	8.51
81890	37	-	210	-	480	5.69	-	-	280	-	2204	64	13	9.96
81891	36	-	110	-	190	7.63	-	-	922	-	2295	69	8	10.4
81892	-	60	-	300	-	-	5.88	-	-	540	-	-	-	-
81893	26	-	60	-	83	5.31	-	-	958	-	1974	58	10	8.73
81894	10	-	13	-	32	3.2	-	-	311	-	2558	136	8	5.39
81895	37	-	93	-	220	6.6	-	-	1077	-	1377	53	12	7.41
81896	-	25	-	65	-	-	3.91	-	-	580	-	-	-	-
81897	31	-	49	-	41	5	-	-	12300	-	2011	70	12	8.92
81898	13	-	28	-	28	5	-	-	749	-	6463	197	22	7.31
81899	7	-	13	-	19	2.2	-	-	1043	-	3022	185	44	7.17
81900	52	-	148	-	85	7.03	-	-	1044	-	956	25	5	10.1
81901	74	-	540	-	2970	7.32	-	-	1104	-	1471	20	8	4.46
81902	23	-	118	-	210	5.89	-	-	1225	-	5969	136	25	8.09
81903	6.7	-	15	-	21	2.1	-	-	559	-	2095	126	25	7.41
81904	-	25	-	25	-	-	4.34	-	-	745	-	-	-	-
81905	-	20	-	20	-	-	3.53	-	-	360	-	-	-	-
81906	55	-	110	-	360	8.91	-	-	1491	-	4794	26	24	7.86
81907	43	-	62	-	84	7.93	-	-	1271	-	6149	60	23	6.81
81908	-	25	-	35	-	-	6.05	-	-	820	-	-	-	-
81909	-	10	-	20	-	-	2.75	-	-	150	-	-	-	-
81910	38	-	247	-	470	4.6	-	-	876	-	2212	68	17	9.28
81911	32	-	128	-	280	4.6	-	-	648	-	2681	62	13	8.94
81912	-	15	-	75	-	-	2.05	-	-	150	-	-	-	-
81913	43	-	252	-	906	5.05	-	-	890	-	1864	46	13	6.67
81914	39	-	200	-	410	5.68	-	-	1006	-	1821	40	12	8.38
81915	45	-	148	-	290	7.79	-	-	1483	-	2289	58	11	9.04
81916	27	-	-	38	44	6.96	-	-	3580	-	7028	200	32	8.34
81917		45	-	135			7.37	-	-	790	-	-	-	-
81918	60	-	593	-	1650	7.27	-	-	1217	-	1117	28	7	8.42
81919	-	25	-	50	-	-	3.7	-	-	700	-	-	-	-
81920	47	-	207	-	1080	6.24	-	-	1250	-	1906	72	11	6.02
81921	39	-	97	-	240	6.35	-	-	1553	-	5338	136	21	8.22
81922	22	-	27	-	86	6.28	-	-	1111	-	5078	165	29	8.27
81923	18	-	26	-	78	5.47	-	-	830	-	4999	138	24	7.74
81924	5.9	-	0	-	23	3.8	-	-	500	-	4191	252	33	6.82
81925	23	-	46	-	130	6.21	-	-	590	-	4326	74	3	7.4
81926	44	-	47	-	45	8.18	-	-	2501	-	6	51	26	8.35
81927	-	50	-	300	-	-	5.6	-	-	1000	-	-	-	-
81928	3.7	-	12	-	15	2.1	-	-	360	-	1718	203	34	5.39
81929	-	40	-	95	-	-	6.02	-	-	795	-	-	-	-

	Co	Co	Ni	Ni	Cr	Fe	Fe	Fe	Mn	Mn	Ti	Zr	Y	Al
81930	-	30	-	40	-	-	7.26	-	-	750	-	-	-	-
81931	2.4	-	17	-	34	3.1	-	-	350	-	3296	305	34	5.53
81932	47	-	28	-	33	8.11	-	-	1573	-	5407	56	35	9.04
81933	35	-	48	-	84	6.35	-	-	1266	-	4209	53	21	9.36
81934	-	8	-	4	-	-	-	39500	-	70	-	-	-	-
81935	-	14	-	8	-	-	-	70000	-	900	-	-	-	-
81936	-	16	-	6	-	-	-	71000	-	2250	-	-	-	-
81937	-	24	-	8	-	-	-	140000	-	760	-	-	-	-
81938	-	12	-	5	-	-	-	76500	-	660	-	-	-	-
81939	-	24	-	18	-	-	-	128000	-	1560	-	-	-	-
81940	-	20	-	8	-	-	-	98000	-	1140	-	-	-	-
81943	-	25	-	10	-	-	-	106000	-	10700	-	-	-	-
81944	-	32	-	14	-	-	-	142000	-	15600	-	-	-	-
81945	-	24	-	4	-	-	-	110000	-	12400	-	-	-	-
81946	-	18	-	8	-	-	-	75000	-	3750	-	-	-	-
81947	-	35	-	18	-	-	-	134000	-	670	-	-	-	-
81948	-	36	-	20	-	-	-	58500	-	660	-	-	-	-
81949	-	14	-	8	-	-	-	21500	-	165	-	-	-	-
81950	-	20	-	10	-	-	-	86500	-	1620	-	-	-	-
81951	-	10	-	8	-	-	-	33000	-	460	-	-	-	-
81952	-	12	-	6	-	-	-	62000	-	410	-	-	-	-
81953	-	8	-	8	-	-	-	41000	-	105	-	-	-	-
81954	-	10	-	18	-	-	-	64000	-	1040	-	-	-	-
81955	-	16	-	5	-	-	-	35500	-	640	-	-	-	-
81956	-	20	-	8	-	-	-	43000	-	490	-	-	-	-
81957	-	8	-	6	-	-	-	28500	-	240	-	-	-	-
81958	-	30	-	24	-	-	-	77000	-	1000	-	-	-	-
81959	-	10	-	6	-	-	-	29000	-	340	-	-	-	-
81960	-	6	-	6	-	-	-	16900	-	130	-	-	-	-
81961	-	10	-	8	-	-	-	55000	-	145	-	-	-	-
81962	-	22	-	5	-	-	-	75500	-	4100	-	-	-	-
81963	-	8	-	4	-	-	-	17100	-	120	-	-	-	-
81964	-	0	-	0	-	-	-	10900	-	42	-	-	-	-
81965	-	8	-	10	-	-	-	5100	-	12	-	-	-	-
81966	-	0	-	0	-	-	-	14000	-	66	-	-	-	-
81967	-	8	-	5	-	-	-	12800	-	36	-	-	-	-
81968	-	26	-	6	-	-	-	71500	-	2300	-	-	-	-
81969	-	5	-	4	-	-	-	33000	-	220	-	-	-	-
81970	-	8	-	15	-	-	-	19500	-	74	-	-	-	-
81971	-	6	-	8	-	-	-	26000	-	56	-	-	-	-

ANALYSIS RESULTS

Methods: AAS=atomic absorption spectroscopy, ICP=induction coupled plasma with optical emission spectroscopy, NAA=neutron activation analysis, FA=fire assay

0=below detection limit, -=not analysed

ELEMENT:	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
UNITS:	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
DETECTION:	0.5	1	10	10	0.2	0.5	10	5	5	10	2	2	0.5	0.2
METHOD:	NAA	NAA	ICP	ICP	NAA	NAA	ICP	ICP	ICP	ICP	ICP	ICP	NAA	NAA
SAMPLE NO.														
81707	17	39	0	11	1.8	0	0	0	0	0	2	0	3.5	0.7*
81708	58	110	0	34	7.3	1.5	0	0	0	0	2	0	2.4	0.5
81709	50.9	110	10	39	1.4	0.6	0	0	5	0	3	0	3.7	0.7*
81710	41	51	0	28	7.1	1.4	0	0	0	0	2	0	2.7	0.5
81711	14	31	0	17	6.1	1.5	0	0	6	0	3	0	3	0.5
81712	35	74	0	29	7.6	1.3	0	0	5	0	2	0	2.8	0.5
81713	34	73	0	28	1.2	0.7	0	0	5	0	3	0	4	0.7*
81714	49	100	10	40	11	1.5	0	0	7	0	4	0	3.8	0.7
81715	38	84	0	29	7.4	0.9	0	0	0	0	2	0	3.3	0.7
81716	61.6	130	11	48	12	1	0	0	5	0	2	0	3.4	0.6
81717	27	56	0	20	5.7	0.8	0	0	0	0	2	0	3.5	0.6
81718	44	93	0	34	9.3	1.2	0	0	0	0	0	0	2.5	0.4
81719	31	59	0	24	7.8	1.6	0	0	0	0	2	0	3.2	0.5
81720	34	68	0	24	7.2	1.3	0	0	0	0	2	0	2.8	0.5
81721	25	50	0	19	6.4	1.3	0	0	0	0	2	0	2.8	0.5
81722	42	82	0	31	8.7	1.5	0	0	5	0	2	0	3.2	0.6
81723	84.9	140	13	50	1.3	1.4	0	0	6	0	3	0	4.2	0.8*
81724	5.2	12	0	0	1.5	0	0	0	0	0	0	0	0.7	0
81725	5.7	13	0	0	2	0.7	0	0	0	0	0	0	1.2	0
81726	10	27	0	10	3.5	0	0	0	0	0	0	0	1.7	0.3
81727	11	25	0	10	3.5	0	0	0	0	0	0	0	1.5	0.2
81728	1.9	3.8	0	0	0.6	0	0	0	0	0	0	0	0	0
81729	28	56	0	24	6.6	1.3	0	0	0	0	2	0	2.7	0.5
81730	26	51	0	18	4.7	1.1	0	0	0	0	2	0	2	0.3
81731	39	82	0	31	8.3	1.3	0	0	5	0	2	0	3.1	0.5
81732	14	6.5	0	12	2.2	0	0	0	0	0	0	0	0.8	0
81733	1.1	0	0	0	0	0	0	0	0	0	0	0	0	0
81734	2.2	6.9	0	0	0.79	0	0	0	0	0	0	0	0	0
81735	4.4	26	0	0	1.3	0	0	0	0	0	0	0	0.5	0
81736	10	11	0	11	3	0.5	0	0	0	0	0	0	1.7	0.3
81737	6.8	37	0	0	2.2	0	0	0	0	0	0	0	1.5	0.2
81738	18	39	0	15	3.7	0	0	0	0	0	0	0	1.5	0.2
81739	17	47	0	13	3.9	0	0	0	0	0	0	0	3.4	0.7
81740	25	130	0	20	5.8	0.9	0	0	0	0	0	0	1.9	0.4
81741	71.6	55	16	58	13	1.6	0	0	6	0	3	0	4.1	0.8
81742	26	31	0	23	6.3	1.5	0	0	0	0	2	0	2.6	0.5
81743	15	93	0	14	4.5	1	0	0	0	0	2	0	3.1	0.5
81744	49	66	11	38	9.4	1.4	0	0	5	0	3	0	3.5	0.6
81745	37	14	0	27	6.1	1	0	0	0	0	2	0	3	0.5
81746	6.9	34	0	0	1.7	0	0	0	0	0	2	0	2.6	0.5
81747	24	50	0	23	6.1	0.8	0	0	5	0	3	0	2.8	0.5
81748	28	58	0	23	5.7	1	0	0	5	0	3	0	3.1	0.6
81749	38	64	0	29	7	1.6	0	0	5	0	3	0	2.9	0.5

	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
81750	6	12	0	0	1.8	0	0	0	0	0	0	0	0.8	0
81752	14	23	0	10	2.7	0.6	0	0	0	0	0	0	1	0
81753	15	30	0	0	2.8	0	0	0	0	0	0	0	1.2	0.2
81754	13	29	0	13	4	1	0	0	0	0	0	0	1.5	0.3
81755	11	23	0	10	3.3	0.5	0	0	0	0	0	0	1.4	0.2
81756	7.2	14	0	0	1.9	0.5	0	0	0	0	0	0	1.4	0.2
81757	21	43	0	17	5	0.8	0	0	0	0	2	0	2.1	0.4
81758	16	34	0	15	4.3	0.9	0	0	0	0	2	0	1.8	0.3
81759	11	24	0	0	3.3	0	0	0	0	0	0	0	1.7	0.3
81760	20	41	0	16	4.7	1.1	0	0	0	0	2	0	2	0.3
81761	17	36	0	14	4.5	0.9	0	0	0	0	2	0	2.2	0.4
81762	16	33	0	14	4.2	0.8	0	0	0	0	2	0	2	0.3
81763	16	33	0	13	4.2	0.9	0	0	0	0	2	0	1.8	0.3
81764	6.7	14	0	0	1.8	0.6	0	0	0	0	0	0	0.9	0
81765	5.9	12	0	0	1.8	0	0	0	0	0	0	0	1	0
81766	5.9	12	0	0	1.6	0	0	0	0	0	0	0	0.9	0
81767	15	33	0	12	4.1	0.8	0	0	0	0	0	0	1.9	0.3
81768	22	24	0	16	4.1	0.7	0	0	0	0	0	0	1.4	0.2
81769	8.4	11	0	0	2.6	0	0	0	0	0	0	0	1.5	0.3
81770	21	29	0	18	4.9	0.7	0	0	0	0	0	0	1.6	0.3
81771	13	26	0	0	2.8	0	0	0	0	0	0	0	1.3	0.3
81772	18	37	0	15	3.9	0	0	0	0	0	0	0	1.6	0.3
81773	36	39	0	30	10	0	0	0	0	0	2	0	2.8	0.5
81774	7.3	8	0	0	1.8	0	0	0	0	0	0	0	0.9	0
81775	13	31	0	0	3.4	0.7	0	0	0	0	0	0	1.5	0.3
81778	17	31	0	10	3.8	0.6	0	0	0	0	0	0	1.7	0.3
81779	15	31	0	11	3.2	0.6	0	0	0	0	0	0	1.4	0.2
81780	32	73	0	32	8.6	1.7	0	0	0	0	3	0	3.2	0.6
81781	19	36	0	19	6.5	1.3	0	0	0	0	3	0	3.4	0.5
81782	8	13	0	0	2.9	0.7	0	0	0	0	0	0	1.5	0.2
81783	5.4	14	0	0	3.4	0.7	0	0	0	0	2	0	2.3	0.4
81784	33	65	0	26	7.4	1.8	0	0	5	0	3	0	3.6	0.6
81785	37	65	0	25	7.6	1.6	0	0	0	0	2	0	3.4	0.7
81786	2.9	5.7	0	0	1.7	0.6	0	0	0	0	0	0	1.8	0.2
81787	36	71	0	27	6.7	1.2	0	0	0	0	0	0	1.8	0.4
81788	67	130	0	48	11	1.7	0	0	5	0	3	0	3.8	0.7
81789	81.4	120	0	41	10	1.7	0	0	0	0	2	0	3.7	0.7
81790	52.1	95	10	48	11	1	0	0	6	0	4	0	3.9	0.8
81791	29	53	0	23	5.5	1.2	0	0	0	0	0	0	1.9	0.4
81794	31	69	-	-	9.2	1.6	-	-	-	-	-	-	3.5	0.6
81795	43	92	-	-	12	2.3	-	-	-	-	-	-	4.3	0.8
81796	33	73	-	-	9.4	1.8	-	-	-	-	-	-	3.5	0.7
81797	20	40	-	-	6.6	1.5	-	-	-	-	-	-	3.4	0.6
81798	27	52	-	-	7.4	1.4	-	-	-	-	-	-	3.4	0.6
81799	25	48	-	-	5.9	1.2	-	-	-	-	-	-	3.4	0.6
81800	28	52	-	-	6.1	1.7	-	-	-	-	-	-	2.6	0.4
81801	24	47	-	-	5.3	1.3	-	-	-	-	-	-	1.5	0.2
81802	18	37	-	-	4.2	1.2	-	-	-	-	-	-	1.6	0
81803	19	37	-	-	4.1	1.2	-	-	-	-	-	-	2	0
81804	46	95	-	-	11	2.1	-	-	-	-	-	-	3.1	0.5
81805	48	100	-	-	11	2.4	-	-	-	-	-	-	3.6	0.6
81806	50	100	-	-	12	1.8	-	-	-	-	-	-	4	0.7

	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
81807	15	31	-	-	4.9	0.92	-	-	-	-	-	-	2	0.3
81808	12	24	-	-	3.8	0.85	-	-	-	-	-	-	1.4	0.3
81809	11	23	-	-	3.8	1.1	-	-	-	-	-	-	1.7	0.3
81810	18	35	-	-	5.3	1.1	-	-	-	-	-	-	2.1	0.3
81811	15	31	-	-	5.1	0.91	-	-	-	-	-	-	2.1	0.4
81812	13	28	-	-	4.5	1.1	-	-	-	-	-	-	1.6	0.3
81813	14	31	-	-	5	1.3	-	-	-	-	-	-	1.6	0.2
81814	18	39	-	-	5.9	1.3	-	-	-	-	-	-	1.5	0.3
81815	14	29	-	-	4.8	0.89	-	-	-	-	-	-	1.8	0.3
81816	13	29	-	-	4.6	0	-	-	-	-	-	-	1.8	0.2
81817	16	39	-	-	5.6	1.1	-	-	-	-	-	-	1.9	0.3
81818	14	27	-	-	5.5	1.2	-	-	-	-	-	-	3	0.5
81819	13	26	-	-	5.5	1.5	-	-	-	-	-	-	3	0.5
81820	14	28	-	-	5.4	1.3	-	-	-	-	-	-	2.8	0.5
81840	20	44	-	-	4.5	0.74	-	-	-	-	-	-	2	0.49
81841	34	53	-	-	6.3	1.2	-	-	-	-	-	-	2.7	0.55
81844	53.8	100	-	-	13	2.8	-	-	-	-	-	-	3.9	0.8
81845	46	93	-	-	8.8	1.5	-	-	-	-	-	-	3.2	0.71
81846	69.9	120	-	-	10	1.3	-	-	-	-	-	-	4	0.84
81847	34	63	-	-	6.9	1.2	-	-	-	-	-	-	2.8	0.51
81848	11	22	-	-	3.9	1.1	-	-	-	-	-	-	1.8	0.31
81849	26	53	-	-	6.1	1.7	-	-	-	-	-	-	2.6	0.5
81850	12	24	-	-	4.5	1.2	-	-	-	-	-	-	2.5	0.44
81851	20	41	-	-	5	1.4	-	-	-	-	-	-	1.5	0.29
81852	27	59	-	-	5.5	0.71	-	-	-	-	-	-	3	0.57
81853	25	47	-	-	4.5	1	-	-	-	-	-	-	1.5	0.27
81854	34	65	-	-	7.7	1.2	-	-	-	-	-	-	3.1	0.62
81855	22	48	-	-	4.7	1	-	-	-	-	-	-	2.3	0.45
81856	42	91	-	-	10	0.61	-	-	-	-	-	-	4.2	0.86
81857	16	100	-	-	4.6	0.92	-	-	-	-	-	-	3.1	0.52
81858	29	61	-	-	6.5	1.5	-	-	-	-	-	-	2.7	0.53
81859	13	33	-	-	3.4	1	-	-	-	-	-	-	1.5	0.31
81860	3.3	4.4	-	-	1.1	-0.5	-	-	-	-	-	-	0.7	0
81866	32	63	-	-	6.7	1.5	-	-	-	-	-	-	2.9	0.55
81867	16	32	-	-	4	1.3	-	-	-	-	-	-	1.7	0.33
81868	31	60	-	-	6.8	1.7	-	-	-	-	-	-	3.2	0.59
81869	26	57	-	-	8.8	2.3	-	-	-	-	-	-	3.3	0.63
81870	22	44	-	-	4.5	1.2	-	-	-	-	-	-	2.5	0.5
81871	44	90	-	-	8.9	1.3	-	-	-	-	-	-	3.4	0.71
81872	114	180	-	-	14	2.4	-	-	-	-	-	-	1.6	0.33
81873	83.9	150	-	-	11	2.2	-	-	-	-	-	-	1.9	0.38
81874	3.6	12	-	-	1.3	0.61	-	-	-	-	-	-	1.6	0.29
81875	32	64	-	-	7.3	1.7	-	-	-	-	-	-	3	0.54
81876	52.1	110	-	-	12	2.9	-	-	-	-	-	-	4.3	0.84
81877	18	38	-	-	5.6	1.5	-	-	-	-	-	-	2	0.41
81879	17	29	-	-	4.6	1.3	-	-	-	-	-	-	1.4	0.25
81881	8.7	17	-	-	2.9	0.9	-	-	-	-	-	-	1.5	0.25
81882	5.3	11	-	-	2.4	0.89	-	-	-	-	-	-	1.4	0.21
81883	12	24	-	-	3.3	1.1	-	-	-	-	-	-	1.5	0.29
81884	24	44	-	-	5.4	1.4	-	-	-	-	-	-	2.6	0.48
81887	23	54	-	-	6.9	1.4	-	-	-	-	-	-	4	0.74
81888	25	58	-	-	6	1.1	-	-	-	-	-	-	4.1	0.81

	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
81889	10	21	-	-	3.1	0.81	-	-	-	-	-	-	1.7	0.29
81890	8	13	-	-	1.9	0	-	-	-	-	-	-	1.3	0.26
81891	9.3	18	-	-	1.9	0	-	-	-	-	-	-	1.3	0
81893	7.9	16	-	-	1.8	0	-	-	-	-	-	-	1.1	0
81894	17	32	-	-	2.6	0	-	-	-	-	-	-	1.4	0.25
81895	8	15	-	-	2	0	-	-	-	-	-	-	1.3	0.26
81897	11	18	-	-	2.1	0	-	-	-	-	-	-	1	0
81898	21	42	-	-	4.4	0.85	-	-	-	-	-	-	2.7	0.47
81899	42	79	-	-	9	1.4	-	-	-	-	-	-	4.2	0.8
81900	4.1	6.9	-	-	1	0	-	-	-	-	-	-	0.88	0
81901	2.2	6.8	-	-	1.1	0	-	-	-	-	-	-	1	0.24
81902	34	67	-	-	7.4	1.4	-	-	-	-	-	-	3	0.53
81903	45	81	-	-	6.4	1	-	-	-	-	-	-	2.9	0.54
81906	6.4	14	-	-	2.6	0.5	-	-	-	-	-	-	2.5	0.42
81907	12	25	-	-	2.6	0.83	-	-	-	-	-	-	2.7	0.55
81910	13	25	-	-	3.1	0.69	-	-	-	-	-	-	1.5	0.28
81911	9.5	22	-	-	2.8	0	-	-	-	-	-	-	1.3	0.22
81913	9.5	20	-	-	2.8	0	-	-	-	-	-	-	1.3	0.2
81914	7	16	-	-	1.9	0	-	-	-	-	-	-	1.3	0.21
81915	11	21	-	-	2.5	0	-	-	-	-	-	-	1.3	0.24
81916	39	72	-	-	7.6	1.4	-	-	-	-	-	-	3.4	0.67
81918	5.4	13	-	-	1.2	0	-	-	-	-	-	-	0.75	0
81920	15	29	-	-	2.6	0.55	-	-	-	-	-	-	1.1	0.21
81921	21	42	-	-	5.6	1.1	-	-	-	-	-	-	2.6	0.45
81922	30	57	-	-	6.5	1.4	-	-	-	-	-	-	3.1	0.55
81923	29	54	-	-	5.9	1.4	-	-	-	-	-	-	2.6	0.48
81924	41	80	-	-	8.4	1.4	-	-	-	-	-	-	3.7	0.73
81925	3.7	6.4	-	-	1	0	-	-	-	-	-	-	0.86	0
81926	11	21	-	-	4.5	1.4	-	-	-	-	-	-	2.8	0.48
81928	38	72	-	-	9	1.9	-	-	-	-	-	-	3.8	0.71
81931	79.2	120	-	-	11	1.7	-	-	-	-	-	-	4.2	0.87
81932	17	31	-	-	6.2	1.5	-	-	-	-	-	-	3.1	0.49
81933	16	27	-	-	4.4	1.4	-	-	-	-	-	-	2	0.39

ANALYSIS RESULTS

Methods. AAS=atomic absorption spectroscopy, ICP=induction coupled plasma with optical emission spectroscopy, NAA=neutron activation analysis, FA=fire assay

0=below detection limit, -=not analysed

ELEMENT:	Br	Cs	Hf	Ir	Mo	Rb	Sc	Sn	Ta	Th	U	W
UNITS:	ppm	ppm	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
DETECTION:	2	1	1	20	5	20	0.1	200	1	0.5	2	2
METHOD:	NAA	NAA	NAA	NAA	NAA	NAA	NAA	NAA	NAA	NAA	NAA	NAA
SAMPLE NO.												
81707	0	7.5	7	0	0	250	8.7	0	1.8	30	6.3	0
81708	2	2.2	5.5	0	0	75	13.1	0	1.7	23	3.5	0
81709	0	8	5	0	0	220	7.5	0	1.4	29	7.5	0
81710	0	4.8	4.7	0	0	150	24.6	0	2	11	0	0
81711	0	1.8	2	0	0	42	34.3	0	1.7	4.3	0	0
81712	0	2.1	5	0	0	95	27.8	0	1.8	12	0	0
81713	0	4.1	6.6	0	0	210	7.2	0	1.2	29	7.1	0
81714	0	2.3	5.5	0	0	100	26.8	0	2	13	0	0
81715	0	3.9	6.4	0	0	230	6.8	0	2.3	31	5	0
81716	0	3.9	6.6	0	0	170	7.1	0	2.1	25	4.4	0
81717	0	2.7	3.9	0	0	110	13.4	0	1.2	10	3.5	0
81718	0	1	6.1	0	0	22	5.2	0	1.6	24	3.3	0
81719	0	3.6	4	0	0	170	27.3	0	0	10	0	0
81720	3	0	5.4	0	0	49	26.7	0	2.8	14	0	0
81721	0	3.4	4.9	0	0	110	27.1	0	1.4	11	0	0
81722	2.1	1.5	5.4	0	0	43	24.8	0	1.5	14	0	0
81723	0	4.5	6.8	0	0	180	7.3	0	1.3	29	8.3	0
81724	10	2	0	0	0	28	26.5	0	0	1.7	0	0
81725	2.7	1.3	0	0	0	0	40	0	0	1.3	0	0
81726	0	1.1	2.5	0	0	0	34.7	0	2.1	4.3	0	0
81727	3.3	0	2.6	0	0	0	31.1	0	3.6	4.5	0	0
81728	2.1	0	0	0	0	0	27	0	0	0	0	0
81729	3.9	1.7	4.2	0	0	40	22.7	0	0	11	0	0
81730	5.6	0	4.5	0	0	43	12.1	0	1.3	10	4.6	0
81731	3.2	1.1	5.7	0	0	56	18.2	0	1.9	14	0	0
81732	0	1.1	0	0	0	29	1.9	0	0	0.7	0	0
81733	0	0	0	0	0	0	5	0	0	0	0	0
81734	0	0	0	0	0	0	15.9	0	0	1.5	0	0
81735	8.5	0	1.3	0	0	0	17.8	0	0	2.3	0	0
81736	5.5	1.8	2.6	0	0	0	41.8	0	1	4.7	0	0
81737	0	0	2.3	0	0	0	42.2	0	0	4.6	0	0
81738	0	0	2.6	0	0	0	21.2	0	0	5.3	0	0
81739	0	0	4	0	0	0	21.1	0	0	6.8	0	0
81740	0	2.3	3.7	0	0	0	23.5	0	1	6.7	0	0
81741	2.6	3.8	6.8	0	0	120	8.2	0	2.2	29	6.3	0
81742	3.4	4.8	5.3	0	0	120	28.1	0	1.4	11	0	0
81743	0	7.3	5.7	0	0	150	30.5	0	1.2	12	3.2	0
81744	0	8.8	5.8	0	0	170	9	0	1.1	21	5.1	0
81745	6.3	4.5	5	0	0	180	12.3	0	1.7	15	3.2	0
81746	4.9	0	6.2	0	0	32	23.8	0	0	14	2.5	0
81747	0	1.6	4.7	0	0	21	23.4	0	1.1	10	0	0
81748	6.3	3.1	6.9	0	0	64	22.4	0	1.6	19	5.5	0
81749	3.7	2.1	6.2	0	0	85	28.5	0	1	15	3.7	0

	Br	Cs	Hf	Ir	Mo	Rb	Sc	Sn	Ta	Th	U	W
81750	3.1	1.7	1	0	0	63	31	0	0	2.1	0	0
81752	2.2	1.5	2.2	0	0	47	18.7	0	1.1	3.5	0	0
81753	0	1.4	4.1	0	0	42	3	0	0	3.7	0	0
81754	0	0	2.6	0	0	0	25.2	0	2	5.6	0	0
81755	11	0	1.6	0	0	0	34.3	0	2.2	4.4	0	0
81756	2	0	1.4	0	0	57	35.3	0	0	2.1	0	0
81757	2.5	0	3.3	0	0	0	29	210	1.4	6.5	0	0
81758	4.9	0	2.7	0	0	0	28.9	0	1.4	5.6	0	0
81759	4.1	2.2	1.7	0	0	0	33.5	0	1.3	3.6	0	0
81760	2.7	0	2.9	0	0	0	30.8	0	1.3	6	0	0
81761	4.5	1.3	3	0	0	30	30.8	240	1.9	5.3	0	0
81762	4.5	0	2.8	0	0	0	32.8	0	1.7	5.6	0	0
81763	0	0	2.4	0	0	23	34.1	0	1	4.7	0	0
81764	2	2.2	0	0	0	0	30.5	0	0	1.8	0	0
81765	2.6	2.3	1.2	0	0	0	35.1	0	0	1.7	0	0
81766	3.6	1.2	0	0	0	0	34.3	0	0	1.6	0	0
81767	0	0	2.3	0	0	33	33.2	0	0	4.3	0	0
81768	0	1.2	2.9	0	0	68	23.8	0	0	6.3	0	0
81769	0	0	2.8	0	0	62	24.3	0	0	6	0	0
81770	0	1.3	2.6	0	0	74	21.2	0	0	5.9	0	0
81771	2.6	1.1	2.9	0	0	51	24.7	0	1.1	6.7	2.1	0
81772	2.5	2.2	2.9	0	0	38	25.9	0	1.1	5.9	2.2	0
81773	6.6	0	1.4	0	0	0	23	0	1.9	5.9	0	0
81774	0	3.6	1.4	0	0	0	19	0	0	3.9	0	0
81775	4.4	1	2.2	0	0	84	35.5	0	0	5.1	2.7	0
81778	7.6	0	3	0	0	44	25.3	0	0	5.5	0	0
81779	7.2	0	2.7	0	0	22	26	0	0	4.9	0	0
81780	0	6.9	5.4	0	0	110	28.1	0	2	10	0	0
81781	0	0	2.8	0	0	0	35.5	0	1.3	5.4	0	0
81782	0	0	3	0	0	0	22.4	0	0	4.7	0	0
81783	7.6	2.7	3.7	0	0	21	35.9	0	0	3.5	0	0
81784	12	0	4.9	0	0	0	22.8	0	0	13	0	0
81785	3.3	6.8	5.1	0	0	180	27.5	0	1	12	2.7	0
81786	7.6	1.3	1.5	0	0	33	42.8	0	0	1	0	0
81787	2.7	1.7	7.2	0	0	58	19.1	0	1.7	11	0	0
81788	3	2.3	7.3	0	0	48	8.2	0	2.2	18	5.2	0
81789	2.1	1.2	6.6	0	0	56	17.4	0	0	16	3.1	0
81790	0	2.5	7.7	0	0	0	10.7	0	2.9	22	4.8	0
81791	0	1.8	5.7	0	0	63	13.3	0	0	8.3	0	0
81794	0	7.3	5.8	0	0	88	38.7	0	2	8.8	0	0
81795	0	6.2	6.1	0	0	120	40	0	3	9.2	0	0
81796	0	5.4	5.3	0	0	110	35	0	3	8.9	0	0
81797	0	1.9	3	0	0	52	36.4	0	0	5.4	0	0
81798	0	2.8	3.4	0	0	98	35.1	0	1	7.4	0	0
81799	0	4.7	3.7	0	0	110	30.5	0	0	7.9	0	0
81800	0	3.6	3.4	0	0	130	22.5	0	0	7.2	0	0
81801	0	5.3	3.7	0	0	200	17.5	0	2	6.8	3	0
81802	0	4.2	3.5	0	0	120	33.1	0	0	6	0	0
81803	0	4.2	3.1	0	0	110	29.4	0	0	6.4	0	0
81804	0	3.9	5.6	0	0	120	23	0	1	13	3	0
81805	0	4.6	6.9	0	0	120	21	0	0	16	7	0
81806	0	4.2	6.5	0	0	110	24.2	0	2	16	0	0

	Br	Cs	Hf	Ir	Mo	Rb	Sc	Sn	Ta	Th	U	W
81807	0	4.3	2.6	0	0	160	42.4	0	2	4.4	0	0
81808	0	7.4	2.9	0	0	160	28.1	0	0	4.1	0	0
81809	0	6.2	2.7	0	0	180	27.1	0	1	4.5	2	0
81810	0	5.4	2.5	0	0	170	36.2	0	0	4.1	0	0
81811	0	3.5	2.5	0	0	110	46.6	0	1	4.4	0	0
81812	0	6.1	3.1	0	0	190	32.7	0	1	4.6	0	0
81813	0	6.6	2.9	0	0	190	36.2	0	0	4.7	0	0
81814	0	5.5	2.4	0	0	220	34.6	0	0	4.7	0	0
81815	0	4.1	3.2	0	0	130	34.7	0	2	4.1	0	0
81816	0	4.3	2.5	0	0	140	37.6	0	2	4.2	0	0
81817	0	4.5	3	0	0	110	41.1	0	2	4.9	0	0
81818	0	2.2	2.5	0	0	58	38.8	0	1	3.5	0	0
81819	0	3.1	2.5	0	0	64	41.3	0	2	3.8	0	0
81820	0	1.5	2.3	0	0	46	39.6	0	2	3.9	0	0
81840	11	0	4.7	0	0	32	24.8	-500	3.8	10	0	0
81841	0	5.4	7.7	0	0	130	15.5	-500	0	12	0	0
81844	0	1.2	7.4	0	0	92	10	-500	2.3	22	2.1	0
81845	2.3	3.1	6.9	0	0	75	15.6	-500	0	17	0	0
81846	0	2.3	8.3	0	0	0	9.2	-500	3.5	22	4.8	0
81847	2.3	0	4.7	0	0	44	20.5	-500	1.4	11	0	0
81848	0	1.4	1.3	0	0	35	31.3	-500	4.7	3.3	0	0
81849	3.8	1.2	4.7	0	0	22	22.6	-500	0	10	0	0
81850	0	1.5	1.9	0	0	27	34.3	-500	0	3.9	0	0
81851	2.2	2.7	3.6	0	0	48	33.5	-500	2.9	5.8	0	0
81852	0	4.2	11	0	0	190	10	-500	2.2	19	4.4	0
81853	3.4	2	3.3	0	0	37	12.1	-500	1.2	7.4	0	0
81854	0	3.2	4.7	0	0	95	22.8	-500	1.5	10	0	0
81855	2.6	0	5.2	0	0	120	17.4	-500	2.9	11	0	0
81856	0	0	4.9	0	0	67	7.1	-500	3	27	5.4	0
81857	2.9	2.2	4.9	0	0	97	23.5	-500	3.5	11	3.6	0
81858	0	1.8	4.7	0	0	56	23	-500	2.3	10	0	0
81859	2.5	0	2.5	0	9	0	31.3	-500	4.2	4.4	0	0
81860	2.9	1.9	-1	0	0	0	39.1	-500	0	1	0	0
81866	6.4	2.1	5.2	0	0	28	18.9	-500	3.9	12	2.1	0
81867	0	2.6	2	0	0	41	27.4	-500	1.6	4.4	0	0
81868	5	0	5.8	0	0	35	26.1	-500	3.1	10	0	0
81869	0	2.2	2.7	0	0	25	30.6	-500	2	8.5	0	0
81870	5.1	1.6	5	0	0	57	22.7	-500	0	11	0	0
81871	4.5	0	7.5	0	0	0	22.1	-500	2	17	0	0
81872	6.5	0	4.6	0	0	46	38.3	-500	1.5	36	3.3	0
81873	0	2.7	4.7	0	0	80	24.2	-500	0	32	6.7	0
81874	2.6	2.4	2.2	0	0	100	46	-500	0	2.5	0	0
81875	3.1	5	5.1	0	0	140	38.3	-500	2.1	8.3	0	0
81876	2.5	9.1	8.3	0	0	150	43.5	-500	2.3	6.9	0	0
81877	2.6	2	2.6	0	0	38	25.9	-500	1.3	8.2	0	0
81879	8	0	1.5	0	0	94	21.6	-500	0	6.5	0	0
81881	0	2.6	1	0	0	74	36.3	-500	2.3	3	0	0
81882	9	0	1.3	0	0	33	43.2	-500	1.2	3.3	0	0
81883	11	0	1.8	0	0	49	31.4	-500	0	4.3	0	0
81884	2.7	2.5	4.1	0	0	37	24.8	-500	2.5	7.5	0	0
81887	6.4	2.2	5.1	0	0	61	22.2	-500	1.9	13	2.3	0
81888	5.2	2	9.2	0	0	59	20.9	-500	2.5	20	3.7	0

	Br	Cs	Hf	Ir	Mo	Rb	Sc	Sn	Ta	Th	U	W
81889	0	2.6	1.5	0	0	65	41.5	-500	0	3.1	0	0
81890	12	2.7	1.6	0	0	110	32.5	-500	0	3.8	0	0
81891	7.8	2.6	2.8	0	0	63	42.3	-500	0	5	0	0
81893	6.5	0	4.2	0	0	0	30.3	-500	1.7	4.4	0	0
81894	0	0	5.9	0	0	0	12.7	-500	2.7	7.9	0	2.2
81895	7.7	0	2.2	0	0	55	42.9	-500	0	2.5	0	0
81897	0	0	2.1	0	0	0	37.3	-500	2.9	3.7	0	0
81898	0	5.6	5.7	0	0	130	10.5	-500	1.4	13	3.7	0
81899	0	3.3	8.5	0	0	140	8.5	-500	2.1	20	4.2	0
81900	2.4	0	-1	0	0	24	47.6	-500	0	1.3	0	0
81901	2.5	0	-1	0	0	0	31.9	-500	0	1.8	0	0
81902	2.5	5.5	4.6	0	0	120	26	-500	1.6	11	0	0
81903	0	3.1	6.2	0	0	140	6	-500	1.2	19	3.6	0
81906	0	0	1.5	0	0	0	61.6	-500	1.3	1.5	0	0
81907	0	2.3	2.3	0	0	0	40.6	-500	1.1	6.7	0	0
81910	0	2.9	1.9	0	0	62	31	-500	1.5	3.9	0	0
81911	2.6	0	1.9	0	0	0	32.7	-500	3.8	4.7	0	0
81913	3.7	1.2	1.7	0	0	27	32.8	-500	0	3.6	0	0
81914	0	1.7	1	0	0	0	36.7	-500	1.4	1.7	0	0
81915	2.1	1.2	1.8	0	0	57	32.7	-500	0	3.4	0	0
81916	0	4.3	5.9	0	0	160	21.4	-500	1.2	12	0	0
81918	0	1	1.3	0	0	34	28.8	-500	0	2	0	0
81920	0	0	2.4	0	0	0	29.1	-500	0	5	0	0
81921	0	0	4.6	0	0	0	25.2	-500	1.3	8.5	2.4	0
81922	0	1.4	5	0	0	48	22.3	-500	1.4	12	0	0
81923	2	2.5	4.3	0	0	70	18.9	-500	1.2	11	2.1	0
81924	0	1.4	7.8	0	0	170	13.4	-500	1.3	17	4	0
81925	2.2	2.1	3.3	0	0	130	38.8	-500	0	4.2	0	0
81926	0	1.7	2.2	0	0	25	38.1	-500	1.3	3.6	0	0
81928	0	2.3	6.5	0	0	110	8.5	-500	1.5	20	4.2	0
81931	0	1.8	9	0	0	50	10	-500	1.4	22	3.8	0
81932	0	0	2.2	0	0	46	35.3	-500	0	3.8	0	0
81933	0	1.5	1.9	0	0	0	30.1	-500	1.8	4.3	0	0

0 090 460096

PASMINCO MINING

ROSEBERY

E.L. 11/85
YOLANDE J.V.

ANNUAL REPORT

TO

20th JULY, 1990

90-3159

VOLUME II

G.W. JENKINS
1st AUGUST, 1990

APPENDIX 3.

ASSAY SHEETS

ANALABS

A division of Macdonald Hamilton & Co. Pty Ltd

Phone (09) 458 7999 — 52 Murray Road, Welshpool, W.A. 6106 — Telex AA92560

Fax (09) 351 8858

ANALYTICAL REPORT No. 27.1.08.06825

THIS REPORT MUST BE READ IN CONJUNCTION WITH THE ACCOMPANYING ANALYTICAL DATA

Pasminco Mining Rosebery
P.O. Box 21
Rosebery
Tasmania 7470

ORDER No.	PROJECT
901345	419000

DATE RECEIVED	RESULTS REQUIRED
01/02/90	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
8	19/02/90	1	27

STATE OF SAMPLES REFER BELOW	SAMPLE NUMBERS	PRE-TREATMENT: DRY	CRUSH	SPLIT	PULVERISE	SIEVE	OTHER SEE REMARKS	NONE	ANALYSIS: REFER TO ANALYSIS SECTION	PREPARATION	METHOD
	81794/81820	SC Prep: 00?,010,011,012,013,016							Au,Ag,As,Ba,Br,Ce,Co,Cr,Cs,Eu,Fe,Hf,Ir,La,Lu,Mo		

RESULTS TO

CHIEF GEOLOGIST
PASMINCO MINING - ROSEBERY
P O BOX 21
ROSEBERY
TAS 7320

RESULTS TO

Mr G Jenkins
Pasminco Mining Rosebery
P O Box 21
Rosebery
Tas 7470

REMARKS

STATE OF SAMPLES	
whole core	WC
split core	SC
cutting	CU
rock	Ro
soil	SO
pulp	PU
water	WA
tissue	TI
stream sediment	SS
heavy mineral	HM

ANALYSIS — PREPARATION			
perchloric acid	A1	cold acid	CA
hydrochloric acid	A2	specific sulphide	SS
nitric acid	A3	other mixed acids	Ma
aqua regia	A4	alkaline attack	AA
nitric-perchloric	A5	volatilization	VO
HF mixture	A6	ignition	IG
HF under pressure	A7	pressed powder (XRF)	PP
fusion	A8	glass fusion (XRF)	GF

ANALYSIS — METHOD	
atomic absorbtion	AAS
x-ray fluorescence	XRF
spectrophotometry	SPEC
colorimetry	COL
chromatography	CHR
titration	TTN
other chemicals means	CHEM
miscellaneous	MISC
fluorescence	FLUOR
inductively coupled plasma	ICP

AUTHORISED OFFICER ________

460098

ANALABS

A Division of Inchcape [illegible]

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
098	27.1.08.06825	20/02/90	901345	1 OF 8

TUBE No.	SAMPLE No.	Na	K	Sc	Cr	Fe	Co	Zn	As	Se
1	81794	1.700	1.70	38.7	290	9.870	60	500	46.0	<5
2	81795	1.300	2.30	40.0	290	10.500	63	530	47.0	<5
3	81796	1.000	2.30	35.0	280	9.480	56	370	31.0	<5
4	81797	1.100	1.10	36.4	180	10.800	59	1900	47.0	<5
5	81798	0.320	1.80	35.1	160	12.700	73	9400	63.0	<5
6	81799	0.180	2.20	30.5	120	12.700	85	9200	77.0	<5
7	81800	0.072	2.30	22.5	170	8.240	50	12300	42.0	<5
8	81801	0.440	4.00	17.5	480	3.200	48	18600	45.0	<5
9	81802	0.058	1.90	33.1	400	10.800	42	37700	3.9	<5
10	81803	0.100	1.90	29.4	360	10.200	42	34200	2.7	<5
11	81804	1.000	2.20	23.0	120	9.100	37	5000	26.0	<5
12	81805	1.500	2.80	21.0	38	7.560	27	7100	13.0	<5
13	81806	2.370	2.50	24.2	23	8.210	30	730	19.0	<5
14	81807	3.400	3.10	42.4	370	5.350	30	1400	19.0	<5
15	81808	2.610	3.30	28.1	360	6.320	27	1900	10.0	<5
16	81809	1.900	3.00	27.1	350	8.550	20	2800	5.0	<5
17	81810	2.940	3.30	36.2	360	7.460	47	940	21.0	<5
18	81811	3.250	2.60	46.6	390	9.730	35	640	11.0	<5
19	81812	2.330	3.70	32.7	380	6.300	40	730	19.0	<5
20	81813	3.180	3.70	36.2	400	6.040	42	2300	19.0	<5
21	81814	2.440	4.20	34.6	410	5.290	28	1700	7.3	<5
22	81815	4.540	2.90	34.7	370	4.200	30	670	5.9	<5
23	81816	4.740	3.10	37.6	370	3.900	30	380	6.4	<5
24	81817	4.660	2.80	41.1	370	4.200	37	330	16.0	<5
25	81818	2.800	1.00	38.8	50	11.200	40	490	3.9	<5

Results in ppm unless otherwise specified
T = element present but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

AUTHORISED OFFICER

460099

ANALABS

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
099	27.1.08.06825	20/02/90	901345	2 OF 8

TUBE No.	SAMPLE No.	Na	K	Sc	Cr	Fe	Co	Zn	As	Se
1	81819	2.760	1.30	41.3	52	11.400	43	450	3.5	<5
2	81820	2.850	0.85	39.6	47	10.500	40	420	4.5	<5
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	0.002	0.05	0.1	1	0.005	1	100	0.1	5
24	UNITS	%	%	ppm	ppm	%	ppm	ppm	ppm	ppm
25	METHOD	1801	1801	1801	1801	1801	1801	1801	1801	1801

Results in ppm unless otherwise specified
T = element present, but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

AUTHORISED OFFICER

460100

ANALARS

A Division of Inchcape Inspection and Testing Services Australia Pty Ltd

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
100	27.1.08.06825	20/02/90	901345	3 OF 8

TUBE No.	SAMPLE No.	Br	Rb	Mo	Ag	Cd	Sn	Sb	Te	Cs
1	81794	<2	86	<5	<5	<30	<200	2.90	<20	7.30
2	81795	<2	120	<5	<5	<30	<200	2.70	<20	6.20
3	81796	<2	110	<5	<5	<30	<200	2.40	<20	5.40
4	81797	<2	52	<5	<5	33	<200	1.20	<20	1.90
5	81798	<2	98	<5	<5	94	<200	4.30	<20	2.80
6	81799	<2	110	<5	<5	87	<200	6.10	<20	4.70
7	81800	<2	130	<5	<5	110	<200	10.00	<20	3.60
8	81801	<2	200	<5	<5	170	<200	6.00	<20	5.30
9	81802	<2	120	<5	<5	340	<200	5.60	<20	4.20
10	81803	<2	110	<5	<5	330	<200	7.20	<20	4.20
11	81804	<2	120	<5	<5	65	<200	2.10	<20	3.90
12	81805	<2	120	<5	<5	100	<200	6.90	<20	4.60
13	81806	<2	110	<5	<5	<30	<200	1.20	<20	4.20
14	81807	<2	160	<5	<5	<30	<200	0.34	<20	4.30
15	81808	<2	160	<5	<5	<30	<200	0.71	<20	7.40
16	81809	<2	180	<5	<5	52	<200	0.84	<20	6.20
17	81810	<2	170	<5	<5	<30	<200	0.60	<20	5.40
18	81811	<2	110	<5	<5	<30	<200	0.90	<20	3.50
19	81812	<2	190	<5	<5	<30	<200	0.82	<20	6.10
20	81813	<2	190	<5	<5	35	<200	0.90	<20	6.60
21	81814	<2	220	<5	<5	38	<200	0.59	<20	5.50
22	81815	<2	130	<5	<5	<30	<200	0.69	<20	4.10
23	81816	<2	140	<5	<5	<30	<200	0.46	<20	4.30
24	81817	<2	110	<5	<5	<30	<200	0.62	<20	4.50
25	81818	<2	58	<5	<5	<30	<200	0.90	<20	2.20

Results in ppm unless otherwise specified
T = element present, but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

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ANALABS

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
101	27.1.08.06825	20/02/90	901345	4 OF 8

TUBE No.	SAMPLE No.	Br	Rb	Mo	Ag	Cd	Sn	Sb	Te	Cs
1	81819	<2	64	<5	<5	<30	<200	0.94	<20	3.10
2	81820	<2	46	<5	<5	<30	<200	0.66	<20	1.50
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22										
23	DETECTION	2	20	5	5	30	200	0.05	20	1.00
24	UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
25	METHOD	1801	1801	1801	1801	1801	1801	1801	1801	1801

Results in ppm unless otherwise specified
T = element present, but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
102	27.1.08.06825	20/02/90	901345	5 OF 8

TUBE No.	SAMPLE No.	Ba	La	Ce	Sm	Eu	Yb	Lu	Hf	Ta
1	81794	500	31.0	69	9.2	1.60	3.5	0.7	5.80	2
2	81795	520	43.0	92	12.0	2.30	4.3	0.8	6.10	3
3	81796	430	33.0	73	9.4	1.80	3.5	0.7	5.30	3
4	81797	<100	20.0	40	6.6	1.50	3.4	0.6	3.00	<1
5	81798	<100	27.0	52	7.4	1.40	3.4	0.6	3.40	1
6	81799	<100	25.0	48	5.9	1.20	3.4	0.6	3.70	<1
7	81800	<100	28.0	52	6.1	1.70	2.6	0.4	3.40	<1
8	81801	<100	24.0	47	5.3	1.30	1.5	0.2	3.70	2
9	81802	<100	18.0	37	4.2	1.20	1.6	<0.2	3.50	<1
10	81803	<100	19.0	37	4.1	1.20	2.0	<0.2	3.10	<1
11	81804	<100	46.0	95	11.0	2.10	3.1	0.5	5.60	1
12	81805	<100	48.0	100	11.0	2.40	3.6	0.7	6.90	<1
13	81806	130	50.0	100	12.0	1.80	4.0	0.7	6.50	2
14	81807	360	15.0	31	4.9	0.92	2.0	0.3	2.60	2
15	81808	310	12.0	24	3.8	0.85	1.4	0.2	2.90	<1
16	81809	240	11.0	23	3.8	1.10	1.7	0.3	2.70	1
17	81810	310	18.0	35	5.3	1.10	2.1	0.3	2.50	<1
18	81811	300	15.0	31	5.1	0.91	2.1	0.4	2.50	1
19	81812	450	13.0	28	4.5	1.10	1.6	0.3	3.10	1
20	81813	440	14.0	31	5.0	1.30	1.6	0.2	2.90	<1
21	81814	470	18.0	39	5.9	1.30	1.5	0.2	2.40	<1
22	81815	420	14.0	29	4.8	0.89	1.8	0.3	3.20	2
23	81816	400	13.0	29	4.6	<0.50	1.8	0.2	2.50	2
24	81817	240	16.0	39	5.6	1.10	1.9	0.3	3.00	2
25	81818	210	14.0	27	5.5	1.20	3.0	0.5	2.50	1

Results in ppm unless otherwise specified
T = element present, but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
IUJ	27.1.08.06825	20/02/90	901345	6 OF 8

TUBE No.	SAMPLE No.	Ba	La	Ce	Sm	Eu	Yb	Lu	Hf	Ta
1	81819	360	13.0	26	5.5	1.50	3.0	0.5	2.50	2
2	81820	500	14.0	28	5.4	1.30	2.8	0.5	2.30	2
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22										
23	DETECTION	100	0.5	1	0.2	0.50	0.5	0.2	1.00	1
24	UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
25	METHOD	1801	1801	1801	1801	1801	1801	1801	1801	1801

Results in ppm unless otherwise specified
T = element present, but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

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A Division of Inchcape Inspection and Testing Services Australia Pty Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.06825	20/02/90	901345	7 OF 8

TUBE No.	SAMPLE No.	W	Ir	Au	Th	U				
1	81794	<2	<20	<5	8.8	<2				
2	81795	<2	<20	<5	9.2	<2				
3	81796	<2	<20	<5	8.9	<2				
4	81797	<2	<20	<5	5.4	<2				
5	81798	<2	<20	<5	7.4	<2				
6	81799	<2	<20	<5	7.9	<2				
7	81800	<2	<20	<5	7.2	<2				
8	81801	<2	<20	<5	6.8	3				
9	81802	<2	<20	<5	6.0	<2				
10	81803	<2	<20	<5	6.4	<2				
11	81804	<2	<20	<5	13.0	3				
12	81805	<2	<20	<5	16.0	7				
13	81806	<2	<20	<5	16.0	<2				
14	81807	<2	<20	<5	4.4	<2				
15	81808	<2	<20	<5	4.1	<2				
16	81809	<2	<20	<5	4.5	2				
17	81810	<2	<20	<5	4.1	<2				
18	81811	<2	<20	<5	4.4	<2				
19	81812	<2	<20	<5	4.6	<2				
20	81813	<2	<20	<5	4.7	<2				
21	81814	<2	<20	<5	4.7	<2				
22	81815	<2	<20	<5	4.1	<2				
23	81816	<2	<20	<5	4.2	<2				
24	81817	<2	<20	<5	4.9	<2				
25	81818	<2	<20	<5	3.5	<2				

Results in ppm unless otherwise specified
T = element present, but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.06825	20/02/90	901345	8 OF 8

TUBE No.	SAMPLE No.	W	Ir	Au	Th	U				
1	81819	<2	<20	<5	3.8	<2				
2	81820	<2	<20	<5	3.9	<2				
3										
4										
5										
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21										
22										
23	DETECTION	2	20	5	0.5	2				
24	UNITS	ppm	ppb	ppb	ppm	ppm				
25	METHOD	1801	1801	1801	1801	1801				

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

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460107

BECQUEREL LABORATORIES Pty. Limited

LUCAS HEIGHTS RESEARCH LABORATORIES NEW ILLAWARRA RD, LUCAS HEIGHTS, NSW

P.O. BOX 93
MENAI, NSW, 2234

FACSIMILE COVER NOTE

TO: Greg Jenkins, Pasminco, Rosebery DATE: 26/2/90

FROM: Helen Waldron Number of pages 1 (including this sheet)

RE: SAMPLES SUBMITTED VIA ANALABS (27.1.08.6825), BECQUEREL JOB 861.

NAA results for Ag - longer decay period & increased count time (as for our research package).

Pasminco sample no.	Ag ppm
81800	10.8
81801	32
81802	10.4
81803	9.0
All other samples	< 5

i.e. all sample with % levels of Zn, have detecable Ag, as expected.

Silver is not readily activated, hence the high D.L. of 5-10 ppm. It has a long half -life and therefore is best analysed several weeks after irradiation. Becquerel's Au + 26 package includes elements with both long and short half-lives analysed using a compromise of irradiation period, decay time and counting time, to give a useful multielement geochemical anlaysis for a reasonable cost with minimal turnaround time. For samples where the best possible D.L. are required, specific irradiation parameters and multiple counting schedules are used.

Silver is vunerable, particularly in Sc-rich samples, when analysed using our routine Au + 26 package. Background problems may arise from the close proximity of the Ag & Sc peaks. This usually causes an elevation of D.L. for Ag to 10 or more ppm. The Sc tail in these samples has interfered with the background for Ag on the early count, but the relevant peaks and backgrounds are resolved with further decay and longer counting times.

We have been considering removing Ag from the list of elements making up our Au + 26 (?25) package and offering it as a "look see" element with a D.L. of 10 ppm. Your samples confirm the merit of this change. Please advise us in future if Ag is of particular interest and we can endeavour to improve our Ag data, as above.

Telephone (02) 543 2644. Facsimile (02) 543 2655. Telex AA 24562

A 107 460108

ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.
Phone (09) 458 7999 52 Murray Road, Welshpool, W.A. 6106 Telex AA92560
FAX: 004 31 8890

ANALYTICAL REPORT No. 27.1.08.06948

THIS REPORT MUST BE READ IN CONJUNCTION WITH THE ACCOMPANYING ANALYTICAL DATA

Pasminco Mining Rosebery
P.O. Box 21
Rosebery
Tasmania 7470

ORDER No.	PROJECT
901307	419000

DATE RECEIVED	RESULTS REQUIRED
20/03/90	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
4	27/04/90	1	82

STATE OF SAMPLES	PRE-TREATMENT								ANALYSIS		
REFER BELOW	SAMPLE NUMBERS	DRY	CRUSH	SPLIT	PUL-VERISE	SIEVE	OTHER SEE REMARKS	NONE	REFER TO ANALYSIS SECTION	PREPARATION	METHOD
	<817,07/50,52/75,78/91	RO	Prep: 004,010,011,012,013,016						Cu,Pb,Ni,Mn,Ca,Mg/201		
	<817,07/50,52/75,78/91	RO							Au,Ag,As,Ba,Br,Ce.Co,Cr,Cs,Eu,Fe,Hf,Ir,La,Lu,Mo		
	<817,07/50,52/75,78/91	RO	Prep: 004,010,011,012,013,016						Ti,Zn,Y,Pr,Nd,Gd,Tb,Dy,Ho,Er,Tm,/201		

RESULTS TO

Mr G Jenkins
Pasminco Mining Rosebery
P O Box 21
Rosebery
Tas 7470

RESULTS TO

CHIEF GEOLOGIST
PASMINCO MINING - ROSEBERY
P O BOX 21
ROSEBERY
TAS 7320

REMARKS

STATE OF SAMPLES		ANALYSIS — PREPARATION				ANALYSIS — METHOD	
whole core	WC	perchloric acid	A1	cold acid	CA	atomic absorbtion	AAS
split core	SC	hydrochloric acid	A2	specific sulphide	SS	x-ray fluorescence	XRF
cutting	CU	nitric acid	A3	other mixed acids	Ma	spectrophotometry	SPEC
rock	Ro	aqua regia	A4	alkaline attack	AA	colorimetry	COL
soil	SO	nitric-perchloric	A5	volatilization	VO	chromatography	CHR
pulp	PU	HF mixture	A6	ignition	IG	titration	TTN
water	WA	HF under pressure	A7	pressed powder (XRF)	PP	other chemicals means	CHEM
tissue	TI	fusion	A8	glass fusion (XRF)	GF	miscellaneous	MISC
stream sediment	SS					fluorescence	FLUOR
heavy mineral	HM					inductively coupled plasma	ICP

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108 460109

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'A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.06948	27/04/90	901307	1 OF 4

TUBE No.	SAMPLE No.	Cu	Pb	Ni	Mn	Ca	Mg	Ti	Y	Pr
1	81707	8	<100	<10	226	0.115	0.602	2111	20	<10
2	81708	42	<100	21	527	0.252	1.360	2652	21	<10
3	81709	13	<100	10	136	0.027	0.754	1777	31	10
4	81710	21	<100	29	608	0.276	1.820	5610	22	<10
5	81711	188	120	29	1157	4.030	2.210	8454	31	<10
6	81712	31	<100	48	1042	2.700	2.630	4360	29	<10
7	81713	25	<100	11	136	0.082	0.554	1635	34	<10
8	81714	54	<100	46	243	3.670	2.550	4449	42	10
9	81715	21	<100	<10	143	0.045	0.421	1486	22	<10
10	81716	15	<100	10	94	0.045	0.442	1651	29	11
11	81717	14	511	27	211	0.029	1.070	3821	23	<10
12	81718	21	<100	12	42	0.038	0.093	1406	17	<10
13	81719	71	<100	43	561	0.069	3.300	5766	26	<10
14	81720	31	<100	49	723	0.511	2.530	4604	23	<10
15	81721	25	133	25	492	0.113	2.880	5266	22	<10
16	81722	49	<100	46	671	4.600	2.120	4374	31	<10
17	81723	21	<100	10	175	0.140	0.795	1626	34	13
18	81724	9	<100	283	724	3.150	4.820	1441	7	<10
19	81725	11	<100	179	833	5.670	6.070	1538	10	<10
20	81726	16	<100	240	694	4.920	6.950	2246	15	<10
21	81727	11	<100	139	644	3.430	4.480	2573	15	<10
22	81728	19	<100	212	971	13.420	5.660	494	3	<10
23	81729	19	<100	19	516	4.940	1.680	6378	26	<10
24	81730	41	134	53	662	1.700	1.410	3528	20	<10
25	81731	28	<100	19	692	2.200	1.590	6083	30	<10

Results in ppm unless otherwise specified
T = element present: but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.06948	27/04/90	901307	2 OF 4

TUBE No.	SAMPLE No.	Cu	Pb	Ni	Mn	Ca	Mg	Ti	Y	Pr
1	81732	<5	<100	1167	5385	0.049	0.336	80	10	<10
2	81733	5	<100	2354	375	0.024	22.150	114	1	<10
3	81734	7	<100	1261	2193	0.401	20.950	1225	4	<10
4	81735	8	<100	1214	2539	0.818	21.430	2008	6	<10
5	81736	24	<100	287	531	0.058	3.910	3078	13	<10
6	81737	121	<100	323	464	0.031	3.090	3067	10	<10
7	81738	266	<100	128	484	0.052	7.170	2151	12	<10
8	81739	73	<100	215	141	0.049	5.120	2433	13	<10
9	81740	6	<100	214	412	0.044	8.960	3273	15	<10
10	81741	9	<100	18	139	0.025	0.696	1944	36	16
11	81742	15	<100	21	269	0.014	1.750	5956	17	<10
12	81743	52	<100	65	177	0.020	0.807	6125	22	<10
13	81744	7	<100	12	77	0.091	0.566	2033	32	11
14	81745	33	<100	12	102	0.035	0.615	2849	24	<10
15	81746	60	<100	60	648	0.043	3.940	6221	15	<10
16	81747	13	<100	76	778	0.299	2.980	5193	28	<10
17	81748	30	<100	66	516	0.027	2.680	4977	35	<10
18	81749	33	<100	67	906	2.000	1.710	5177	24	<10
19	81750	9	<100	165	750	6.140	4.840	1146	9	<10
20	81752	10	<100	102	435	2.350	2.860	1396	10	<10
21	81753	11	<100	15	54	0.067	0.171	651	6	<10
22	81754	15	<100	70	482	4.180	2.400	2286	17	<10
23	81755	<5	<100	165	870	2.770	4.430	2575	15	<10
24	81756	35	<100	144	1023	4.150	5.150	1900	13	<10
25	81757	11	<100	99	736	2.470	3.430	3040	23	<10

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
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— = element not determined

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A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.06948	27/04/90	901307	3 OF 4

TUBE No.	SAMPLE No.	Cu	Pb	Ni	Mn	Ca	Mg	Ti	Y	Pr
1	81758	89	<100	112	917	3.960	4.450	3426	20	<10
2	81759	12	<100	54	849	3.060	3.410	2261	16	<10
3	81760	15	<100	69	790	2.910	2.870	3100	20	<10
4	81761	14	<100	114	1137	3.550	4.860	4340	20	<10
5	81762	<5	<100	89	858	3.080	3.610	2970	19	<10
6	81763	<5	<100	90	989	3.250	3.510	2824	19	<10
7	81764	5	<100	240	781	4.970	6.920	1163	8	<10
8	81765	<5	<100	233	760	6.260	6.910	1168	8	<10
9	81766	22	<100	229	809	6.520	6.490	1151	8	<10
10	81767	7	<100	166	687	3.380	4.940	2257	18	<10
11	81768	424	<100	36	1620	0.073	2.470	2724	13	<10
12	81769	811	<100	97	2329	0.043	3.390	2769	12	<10
13	81770	244	570	44	1148	0.033	1.700	2776	15	<10
14	81771	365	<100	93	2940	0.096	4.120	2586	12	<10
15	81772	123	<100	58	2050	0.151	4.010	2843	15	<10
16	81773	71	<100	163	213	2.270	4.370	2679	22	<10
17	81774	24	<100	248	1155	0.044	4.630	904	9	<10
18	81775	84	<100	161	882	1.920	4.400	2557	13	<10
19	81778	8	<100	227	808	0.124	4.020	2509	12	<10
20	81779	15	<100	291	299	0.076	4.800	2685	8	<10
21	81780	62	<100	132	1301	1320.0	2.810	8758	32	<10
22	81781	106	<100	64	1215	3.220	2.610	6704	32	<10
23	81782	67	219	53	324	0.142	2.490	5419	10	<10
24	81783	43	<100	75	915	1.260	3.870	8246	18	<10
25	81784	57	<100	14	834	0.950	1.270	6286	28	<10

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

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A Division of Inchcape Inspection and Testing Services Australia Pty Ltd.

460112

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
[redacted]	27.1.08.06948	27/04/90	901307	4 OF 4

TUBE No.	SAMPLE No.	Cu	Pb	Ni	Mn	Ca	Mg	Ti	Y	Pr
[redacted]	81785	21	<100	21	365	0.111	0.555	7501	31	<10
[redacted]	81786	44	<100	69	743	0.059	6.420	5038	9	<10
[redacted]	81787	84	<100	73	652	0.069	1.700	6103	20	<10
[redacted]	81788	12	<100	12	132	0.058	0.648	2991	34	<10
5	81789	188	<100	11	413	0.109	1.350	4788	28	<10
[redacted]	81790	32	<100	<10	98	0.042	0.247	2190	39	10
[redacted]	81791	14	<100	50	577	0.246	0.982	5268	20	<10
[redacted]										
[redacted]										
10										
[redacted]										
[redacted]										
[redacted]										
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15										
[redacted]										
17										
[redacted]										
[redacted]										
20										
[redacted]										
22										
[redacted]	DETECTION	5	100	10	15	0.005	0.002	10	1	10
[redacted]	UNITS	ppm	ppm	ppm	ppm	%	%	ppm	ppm	ppm
25	METHOD	201	201	201	201	201	201	201	201	201

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

AUTHORISED OFFICER ____ [signature]

[redacted] 112

ANALABS

A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.

460113

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
[redacted]	27.1.08.06948	27/04/90	901307	1 OF 4

TUBE No.	SAMPLE No.	Nd	Gd	Tb	Dy	Ho	Er	Tm	Zn	Zn
[redacted]	81707	11	<10	<5	<5	<10	2	<2	120.0	82
[redacted]	81708	34	<10	<5	<5	<10	2	<2	180.0	114
[redacted]	81709	39	<10	<5	5	<10	3	<2	<100.0	52
[redacted]	81710	28	<10	<5	<5	<10	2	<2	530.0	449
[redacted]	81711	17	<10	<5	6	<10	3	<2	260.0	149
[redacted]	81712	29	<10	<5	5	<10	2	<2	220.0	136
[redacted]	81713	28	<10	<5	5	<10	3	<2	<100.0	62
[redacted]	81714	40	<10	<5	7	<10	4	<2	230.0	130
[redacted]	81715	29	<10	<5	<5	<10	2	<2	<100.0	41
10	81716	48	<10	<5	5	<10	2	<2	<100.0	44
[redacted]	81717	20	<10	<5	<5	<10	2	<2	<100.0	46
[redacted]	81718	34	<10	<5	<5	<10	<2	<2	<100.0	20
[redacted]	81719	24	<10	<5	<5	<10	2	<2	280.0	234
[redacted]	81720	24	<10	<5	<5	<10	2	<2	260.0	149
15	81721	19	<10	<5	<5	<10	2	<2	390.0	323
[redacted]	81722	31	<10	<5	5	<10	2	<2	240.0	142
17	81723	50	<10	<5	6	<10	3	<2	<100.0	39
[redacted]	81724	<10	<10	<5	<5	<10	<2	<2	170.0	97
[redacted]	81725	<10	<10	<5	<5	<10	<2	<2	130.0	34
20	81726	10	<10	<5	<5	<10	<2	<2	140.0	47
[redacted]	81727	10	<10	<5	<5	<10	<2	<2	150.0	38
22	81728	<10	<10	<5	<5	<10	<2	<2	110.0	35
[redacted]	81729	24	<10	<5	<5	<10	2	<2	160.0	87
[redacted]	81730	18	<10	<5	<5	<10	2	<2	180.0	130
[redacted]	81731	31	<10	<5	5	<10	2	<2	170.0	107

[redacted]

Results in ppm unless otherwise specified
T = element present but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

AUTHORISED OFFICER

113 460114

ANALABS

A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.06948	27/04/90	901307	2 OF 4

TUBE No.	SAMPLE No.	Nd	Gd	Tb	Dy	Ho	Er	Tm	Zn	Zn
1	81732	12	<10	<5	<5	<10	<2	<2	<100.0	74
2	81733	<10	<10	<5	<5	<10	<2	<2	<100.0	37
3	81734	<10	<10	<5	<5	<10	<2	<2	160.0	83
4	81735	<10	<10	<5	<5	<10	<2	<2	150.0	90
5	81736	11	<10	<5	<5	<10	<2	<2	260.0	176
6	81737	<10	<10	<5	<5	<10	<2	<2	260.0	167
7	81738	15	<10	<5	<5	<10	<2	<2	210.0	162
8	81739	13	<10	<5	<5	<10	<2	<2	190.0	125
9	81740	20	<10	<5	<5	<10	<2	<2	160.0	82
10	81741	58	<10	<5	6	<10	3	<2	<100.0	27
11	81742	23	<10	<5	<5	<10	2	<2	230.0	172
12	81743	14	<10	<5	<5	<10	2	<2	210.0	144
13	81744	38	<10	<5	5	<10	3	<2	<100.0	32
14	81745	27	<10	<5	<5	<10	2	<2	<100.0	53
15	81746	<10	<10	<5	<5	<10	2	<2	300.0	245
16	81747	23	<10	<5	5	<10	3	<2	420.0	364
17	81748	23	<10	<5	5	<10	3	<2	250.0	201
18	81749	29	<10	<5	5	<10	3	<2	200.0	141
19	81750	<10	<10	<5	<5	<10	<2	<2	120.0	35
20	81752	10	<10	<5	<5	<10	<2	<2	<100.0	30
21	81753	<10	<10	<5	<5	<10	<2	<2	<100.0	8
22	81754	13	<10	<5	<5	<10	<2	<2	120.0	24
23	81755	10	<10	<5	<5	<10	<2	<2	160.0	78
24	81756	<10	<10	<5	<5	<10	<2	<2	150.0	68
25	81757	17	<10	<5	<5	<10	2	<2	140.0	43

Results in ppm unless otherwise specified
T = element present: but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

AUTHORISED OFFICER

114 460115

ANALABS

A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.06948	27/04/90	901307	3 OF 4

TUBE No.	SAMPLE No.	Nd	Gd	Tb	Dy	Ho	Er	Tm	Zr	Zn
1	81758	15	<10	<5	<5	<10	2	<2	120.0	46
2	81759	<10	<10	<5	<5	<10	<2	<2	160.0	46
3	81760	16	<10	<5	<5	<10	2	<2	160.0	75
4	81761	14	<10	<5	<5	<10	2	<2	140.0	60
5	81762	14	<10	<5	<5	<10	2	<2	140.0	48
6	81763	13	<10	<5	<5	<10	2	<2	160.0	55
7	81764	<10	<10	<5	<5	<10	<2	<2	110.0	33
8	81765	<10	<10	<5	<5	<10	<2	<2	100.0	29
9	81766	<10	<10	<5	<5	<10	<2	<2	110.0	39
10	81767	12	<10	<5	<5	<10	<2	<2	150.0	59
11	81768	16	<10	<5	<5	<10	<2	<2	190.0	133
12	81769	<10	<10	<5	<5	<10	<2	<2	230.0	175
13	81770	18	<10	<5	<5	<10	<2	<2	230.0	185
14	81771	<10	<10	<5	<5	<10	<2	<2	210.0	143
15	81772	15	<10	<5	<5	<10	<2	<2	200.0	128
16	81773	30	<10	<5	<5	<10	2	<2	130.0	64
17	81774	<10	<10	<5	<5	<10	<2	<2	210.0	154
18	81775	<10	<10	<5	<5	<10	<2	<2	170.0	86
19	81778	10	<10	<5	<5	<10	<2	<2	170.0	107
20	81779	11	<10	<5	<5	<10	<2	<2	210.0	132
21	81780	32	<10	<5	<5	<10	3	<2	250.0	181
22	81781	19	<10	<5	<5	<10	3	<2	330.0	250
23	81782	<10	<10	<5	<5	<10	<2	<2	550.0	485
24	81783	<10	<10	<5	<5	<10	2	<2	200.0	130
25	81784	26	<10	<5	5	<10	3	<2	360.0	284

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

AUTHORISED OFFICER

115 460116

ANALABS

A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.06948	27/04/90	901307	4 OF 4

TUBE No.	SAMPLE No.	Nd	Gd	Tb	Dy	Ho	Er	Tm	Zn	Zn
1	81785	25	<10	<5	<5	<10	2	<2	120.0	64
2	81786	<10	<10	<5	<5	<10	<2	<2	200.0	101
3	81787	27	<10	<5	<5	<10	<2	<2	200.0	142
4	81788	48	<10	<5	5	<10	3	<2	110.0	60
5	81789	41	<10	<5	<5	<10	2	<2	240.0	165
6	81790	48	<10	<5	6	<10	4	<2	130.0	31
7	81791	23	<10	<5	<5	<10	<2	<2	190.0	124
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	10	10	5	5	10	2	2	100.0	5
24	UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
25	METHOD	201	201	201	201	201	201	201	1801	201

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
116	27.1.08.06948	27/04/90	901307	1 OF 4

TUBE No.	SAMPLE No.	Au	Ag	As	Ba	Br	Ce	Co	Cr	Cs
1	81707	<5.0	<5.0	3.8	970.0	<2.0	39.0	2.8	12.0	7.5
2	81708	<5.0	<5.0	<2.0	920.0	2.0	110.0	15.0	78.0	2.2
3	81709	<5.0	<5.0	11.0	540.0	<2.0	110.0	2.2	20.0	8.0
4	81710	<5.0	<5.0	10.0	140.0	<2.0	51.0	9.4	130.0	4.8
5	81711	<5.0	<5.0	3.4	410.0	<2.0	31.0	38.0	61.0	1.8
6	81712	<5.0	<5.0	2.2	1000.0	<2.0	74.0	27.0	160.0	2.1
7	81713	<5.0	<5.0	7.8	900.0	<2.0	73.0	3.2	17.0	4.1
8	81714	<5.0	<5.0	12.0	1100.0	<2.0	100.0	25.0	180.0	2.3
9	81715	<5.0	<5.0	3.6	1900.0	<2.0	84.0	<1.0	13.0	3.9
10	81716	<5.0	<5.0	<2.0	290.0	<2.0	130.0	1.4	22.0	3.9
11	81717	<5.0	<5.0	25.0	210.0	<2.0	56.0	2.3	110.0	2.7
12	81718	<5.0	<5.0	<2.0	130.0	<2.0	93.0	1.2	15.0	1.0
13	81719	<5.0	<5.0	32.0	1500.0	<2.0	59.0	14.0	81.0	3.6
14	81720	<5.0	<5.0	3.9	620.0	3.0	68.0	23.0	170.0	<1.0
15	81721	<5.0	<5.0	2.7	410.0	<2.0	50.0	28.0	64.0	3.4
16	81722	<5.0	<5.0	17.0	510.0	2.1	82.0	25.0	160.0	1.5
17	81723	<5.0	<5.0	3.0	560.0	<2.0	140.0	2.4	22.0	4.5
18	81724	<5.0	<5.0	2.9	200.0	10.0	12.0	41.0	574.0	2.0
19	81725	<5.0	<5.0	<2.0	300.0	2.7	13.0	43.0	420.0	1.3
20	81726	<5.0	<5.0	<2.0	<100.0	<2.0	27.0	41.0	707.0	1.1
21	81727	<5.0	<5.0	<2.0	<100.0	3.3	25.0	27.0	280.0	<1.0
22	81728	<5.0	<5.0	<2.0	<100.0	2.1	3.8	29.0	853.0	<1.0
23	81729	<5.0	<5.0	11.0	390.0	3.9	56.0	9.5	60.0	1.7
24	81730	<5.0	<5.0	26.0	340.0	5.6	51.0	3.5	96.0	<1.0
25	81731	<5.0	<5.0	6.0	520.0	3.2	82.0	11.0	53.0	1.1

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

AUTHORISED OFFICER

460117

ANALABS

A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
117	27.1.08.06948	27/04/90	901307	2 OF 4

TUBE No.	SAMPLE No.	Au	Ag	As	Ba	Br	Ce	Co	Cr	Cs
1	81732	<5.0	<5.0	2.7	140.0	<2.0	6.5	740.0	110.0	1.1
2	81733	<5.0	<5.0	<2.0	<100.0	<2.0	<2.0	140.0	1310.0	<1.0
3	81734	<5.0	<5.0	<2.0	<100.0	<2.0	6.9	127.0	1230.0	<1.0
4	81735	<5.0	<5.0	4.2	100.0	8.5	26.0	103.0	420.0	<1.0
5	81736	<5.0	<5.0	7.8	230.0	5.5	11.0	46.0	410.0	1.8
6	81737	6.0	<5.0	10.0	<100.0	<2.0	37.0	47.0	290.0	<1.0
7	81738	<5.0	<5.0	8.6	<100.0	<2.0	39.0	28.0	78.0	<1.0
8	81739	<5.0	<5.0	2.1	<100.0	<2.0	47.0	32.0	180.0	<1.0
9	81740	<5.0	<5.0	<2.0	280.0	<2.0	130.0	40.0	26.0	2.3
10	81741	<5.0	<5.0	<2.0	640.0	2.6	55.0	3.9	75.0	3.8
11	81742	<5.0	<5.0	3.0	630.0	3.4	31.0	23.0	80.0	4.8
12	81743	<5.0	<5.0	<2.0	210.0	<2.0	93.0	17.0	34.0	7.3
13	81744	<5.0	<5.0	<2.0	170.0	<2.0	66.0	1.4	64.0	8.8
14	81745	<5.0	<5.0	5.2	350.0	6.3	14.0	2.3	150.0	4.5
15	81746	<5.0	<5.0	3.1	<100.0	4.9	34.0	24.0	360.0	<1.0
16	81747	<5.0	<5.0	<2.0	<100.0	<2.0	50.0	28.0	56.0	1.6
17	81748	<5.0	<5.0	6.9	240.0	6.3	58.0	24.0	170.0	3.1
18	81749	<5.0	<5.0	4.0	630.0	8.7	64.0	29.0	190.0	2.1
19	81750	<5.0	<5.0	3.2	430.0	3.1	12.0	25.0	480.0	1.7
20	81752	<5.0	<5.0	2.5	190.0	2.2	23.0	21.0	240.0	1.5
21	81753	<5.0	<5.0	<2.0	110.0	<2.0	30.0	1.6	22.0	1.4
22	81754	<5.0	<5.0	<2.0	200.0	<2.0	29.0	18.0	24.0	<1.0
23	81755	<5.0	<5.0	<2.0	320.0	11.0	23.0	40.0	320.0	<1.0
24	81756	<5.0	<5.0	2.5	390.0	2.0	14.0	37.0	310.0	<1.0
25	81757	<5.0	<5.0	<2.0	<100.0	2.5	43.0	28.0	180.0	<1.0

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

AUTHORISED OFFICER

460118

118

ANALABS

A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.06948	27/04/90	901307	3 OF 4

TUBE No.	SAMPLE No.	Au	Ag	As	Ba	Br	Ce	Co	Cr	Cs
1	81758	<5.0	<5.0	3.1	<100.0	4.9	34.0	20.0	360.0	<1.0
2	81759	<5.0	<5.0	5.5	140.0	4.1	24.0	26.0	140.0	2.2
3	81760	<5.0	<5.0	4.6	<100.0	2.7	41.0	20.0	100.0	<1.0
4	81761	<5.0	<5.0	3.4	270.0	4.5	36.0	35.0	528.0	1.3
5	81762	<5.0	<5.0	<2.0	<100.0	4.5	33.0	20.0	180.0	<1.0
6	81763	<5.0	<5.0	<2.0	170.0	<2.0	33.0	24.0	180.0	<1.0
7	81764	<5.0	<5.0	<2.0	230.0	2.0	14.0	40.0	500.0	2.2
8	81765	<5.0	<5.0	<2.0	<100.0	2.6	12.0	41.0	648.0	2.3
9	81766	<5.0	<5.0	<2.0	<100.0	3.6	12.0	44.0	582.0	1.2
10	81767	<5.0	<5.0	<2.0	190.0	<2.0	33.0	33.0	250.0	<1.0
11	81768	<5.0	<5.0	10.0	140.0	<2.0	24.0	27.0	38.0	1.2
12	81769	<5.0	<5.0	3.0	190.0	<2.0	11.0	38.0	230.0	<1.0
13	81770	<5.0	<5.0	28.0	180.0	<2.0	29.0	18.0	100.0	1.3
14	81771	<5.0	<5.0	4.8	200.0	2.6	26.0	37.0	260.0	1.1
15	81772	<5.0	<5.0	2.6	150.0	2.5	37.0	31.0	90.0	2.2
16	81773	<5.0	<5.0	10.0	170.0	6.6	39.0	58.0	380.0	<1.0
17	81774	<5.0	<5.0	10.0	<100.0	<2.0	8.0	55.0	975.0	3.6
18	81775	<5.0	<5.0	6.6	580.0	4.4	31.0	40.0	290.0	1.0
19	81778	<5.0	<5.0	8.1	<100.0	7.6	31.0	37.0	629.0	<1.0
20	81779	<5.0	<5.0	8.0	<100.0	7.2	31.0	42.0	763.0	<1.0
21	81780	<5.0	<5.0	13.0	290.0	<2.0	73.0	44.0	190.0	6.9
22	81781	<5.0	<5.0	18.0	290.0	<2.0	36.0	48.0	67.0	<1.0
23	81782	<5.0	<5.0	6.5	160.0	<2.0	13.0	26.0	53.0	<1.0
24	81783	<5.0	<5.0	22.0	430.0	7.6	14.0	31.0	220.0	2.7
25	81784	<5.0	<5.0	3.9	460.0	12.0	65.0	21.0	23.0	<1.0

Results in ppm unless otherwise specified
T = element present but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

AUTHORISED OFFICER

460119

119

ANALABS

A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.06948	27/04/90	901307	4 OF 4

TUBE No.	SAMPLE No.	Au	Ag	As	Ba	Br	Ce	Co	Cr	Cs
1	81785	<5.0	<5.0	2.8	620.0	3.3	65.0	11.0	63.0	6.8
2	81786	<5.0	<5.0	5.3	220.0	7.6	5.7	50.0	340.0	1.3
3	81787	<5.0	<5.0	6.4	360.0	2.7	71.0	19.0	280.0	1.7
4	81788	<5.0	<5.0	6.0	140.0	3.0	130.0	4.7	31.0	2.3
5	81789	<5.0	<5.0	2.8	760.0	2.1	120.0	27.0	29.0	1.2
6	81790	<5.0	<5.0	3.1	<100.0	<2.0	95.0	<1.0	10.0	2.5
7	81791	<5.0	<5.0	7.7	560.0	<2.0	53.0	10.0	180.0	1.8
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	5.0	5.0	2.0	100.0	2.0	2.0	1.0	5.0	1.0
24	UNITS	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
25	METHOD	1801	1801	1801	1801	1801	1801	1801	1801	1801

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

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A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.06948	27/04/90	901307	1 OF 4

TUBE No.	SAMPLE No.	Eu	Fe	Hf	Ir	La	Lu	Mo	Rb	Sb
1	81707	<0.5	1.90	7.0	<20.0	17.0	0.7	<1.0	250.0	0.8
2	81708	1.5	4.50	5.5	<20.0	58.0	0.5	<5.0	75.0	0.7
3	81709	0.6	1.70	5.0	<20.0	50.9	0.7	<14.0	220.0	0.7
4	81710	1.4	5.49	4.7	<20.0	41.0	0.5	<5.0	150.0	1.3
5	81711	1.5	8.63	2.0	<20.0	14.0	0.5	<5.0	42.0	1.1
6	81712	1.3	8.08	5.0	<20.0	35.0	0.5	<5.0	95.0	0.6
7	81713	0.7	2.20	6.6	<20.0	34.0	0.7	<13.0	210.0	0.7
8	81714	1.5	8.33	5.5	<20.0	49.0	0.7	<5.0	100.0	0.8
9	81715	0.9	1.50	6.4	<20.0	38.0	0.7	<5.0	230.0	0.5
10	81716	1.0	1.50	6.6	<20.0	61.6	0.6	<5.0	170.0	0.8
11	81717	0.8	2.70	3.9	<20.0	27.0	0.6	<5.0	110.0	3.3
12	81718	1.2	0.62	6.1	<20.0	44.0	0.4	<5.0	22.0	1.1
13	81719	1.6	6.65	4.0	<20.0	31.0	0.5	<5.0	170.0	1.7
14	81720	1.3	5.46	5.4	<20.0	34.0	0.5	<5.0	49.0	0.9
15	81721	1.3	6.24	4.9	<20.0	25.0	0.5	<5.0	110.0	0.6
16	81722	1.5	6.37	5.4	<20.0	42.0	0.6	<5.0	43.0	13.0
17	81723	1.4	2.00	6.8	<20.0	84.9	0.8	<11.0	150.0	0.8
18	81724	<0.5	4.60	<1.0	<20.0	5.2	<0.2	<5.0	28.0	0.8
19	81725	0.7	5.29	<1.0	<20.0	5.7	<0.2	<5.0	<20.0	1.1
20	81726	<0.5	4.40	2.5	<20.0	10.0	0.3	<5.0	<20.0	<0.2
21	81727	<0.5	3.90	2.6	<20.0	11.0	0.2	<5.0	<20.0	0.4
22	81728	<0.5	3.50	<1.0	<20.0	1.9	<0.2	<5.0	<20.0	0.4
23	81729	1.3	5.00	4.2	<20.0	28.0	0.5	<5.0	40.0	1.1
24	81730	1.1	5.06	4.5	<20.0	26.0	0.3	<5.0	43.0	2.6
25	81731	1.3	5.00	5.7	<20.0	39.0	0.5	<5.0	56.0	1.3

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

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A Division of Inchcape Inspection and Testing Services Australia Pty Ltd

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.06948	27/04/90	901307	2 OF 4

TUBE No.	SAMPLE No.	Eu	Fe	Hf	Ir	La	Lu	Mo	Rb	Sb
1	81732	<0.5	57.60	<1.0	<20.0	14.0	<0.2	<5.0	29.0	<0.2
2	81733	<0.5	10.20	<1.0	<20.0	1.1	<0.2	<5.0	<20.0	0.5
3	81734	<0.5	6.29	<1.0	<20.0	2.2	<0.2	<5.0	<20.0	1.8
4	81735	<0.5	5.25	1.3	<20.0	4.4	<0.2	<5.0	<20.0	0.6
5	81736	0.5	7.33	2.6	<20.0	10.0	0.3	<5.0	<20.0	1.0
6	81737	<0.5	9.92	2.3	<20.0	6.8	0.2	<5.0	<20.0	1.6
7	81738	<0.5	7.07	2.6	<20.0	18.0	0.2	<5.0	<20.0	1.3
8	81739	<0.5	5.47	4.0	<20.0	17.0	0.7	<5.0	<20.0	0.9
9	81740	0.9	6.47	3.7	<20.0	25.0	0.4	<5.0	<20.0	0.7
10	81741	1.6	1.60	6.8	<20.0	71.6	0.8	<5.0	120.0	0.6
11	81742	1.5	4.70	5.3	<20.0	26.0	0.5	<5.0	120.0	0.9
12	81743	1.0	5.01	5.7	<20.0	15.0	0.5	<5.0	150.0	1.3
13	81744	1.4	1.00	5.8	<20.0	49.0	0.6	<5.0	170.0	1.5
14	81745	1.0	1.50	5.0	<20.0	37.0	0.5	<5.0	180.0	1.2
15	81746	<0.5	6.38	6.2	<20.0	6.9	0.5	<5.0	32.0	0.6
16	81747	0.8	5.95	4.7	<20.0	24.0	0.5	<5.0	21.0	0.8
17	81748	1.0	8.87	6.9	<20.0	28.0	0.6	<5.0	64.0	2.0
18	81749	1.6	6.64	6.2	<20.0	38.0	0.5	<5.0	85.0	1.5
19	81750	<0.5	3.50	1.0	<20.0	6.0	<0.2	<5.0	63.0	1.0
20	81752	0.6	4.60	2.2	<20.0	14.0	<0.2	<5.0	47.0	0.9
21	81753	<0.5	1.40	4.1	<20.0	15.0	0.2	<5.0	42.0	1.0
22	81754	1.0	3.40	2.6	<20.0	13.0	0.3	<5.0	<20.0	<0.2
23	81755	0.5	5.28	1.6	<20.0	11.0	0.2	<5.0	<20.0	<0.2
24	81756	0.5	5.60	1.4	<20.0	7.2	0.2	<5.0	57.0	0.9
25	81757	0.8	5.17	3.3	<20.0	21.0	0.4	<5.0	<20.0	0.4

Results in ppm unless otherwise specified
T = element present: but concentration too low to measure
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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.06948	27/04/90	901307	3 OF 4

TUBE No.	SAMPLE No.	Eu	Fe	Hf	Ir	La	Lu	Mo	Rb	Sb
1	81758	0.9	5.57	2.7	<20.0	16.0	0.3	<5.0	<20.0	0.6
2	81759	<0.5	4.80	1.7	<20.0	11.0	0.3	<5.0	<20.0	0.8
3	81760	1.1	4.90	2.9	<20.0	20.0	0.3	<5.0	<20.0	1.2
4	81761	0.9	8.22	3.0	<20.0	17.0	0.4	<5.0	30.0	0.8
5	81762	0.8	4.90	2.8	<20.0	16.0	0.3	<5.0	<20.0	0.5
6	81763	0.9	4.70	2.4	<20.0	16.0	0.3	<5.0	23.0	0.6
7	81764	0.6	4.50	<1.0	<20.0	6.7	<0.2	<5.0	<20.0	0.8
8	81765	<0.5	4.50	1.2	<20.0	5.9	<0.2	<5.0	<20.0	<0.2
9	81766	<0.5	5.39	<1.0	<20.0	5.9	<0.2	<5.0	<20.0	0.6
10	81767	0.8	4.50	2.3	<20.0	15.0	0.3	<5.0	33.0	<0.2
11	81768	0.7	6.94	2.9	<20.0	22.0	0.2	<5.0	68.0	0.6
12	81769	<0.5	7.90	2.8	<20.0	8.4	0.3	<5.0	62.0	0.4
13	81770	0.7	6.61	2.6	<20.0	21.0	0.3	<5.0	74.0	1.0
14	81771	<0.5	8.99	2.9	<20.0	13.0	0.3	<5.0	51.0	0.8
15	81772	<0.5	7.91	2.9	<20.0	18.0	0.3	<5.0	38.0	0.7
16	81773	<0.5	5.18	1.4	<20.0	36.0	0.5	<5.0	<20.0	1.5
17	81774	<0.5	8.53	1.4	<20.0	7.3	<0.2	<5.0	<20.0	4.2
18	81775	0.7	5.75	2.2	<20.0	13.0	0.3	<5.0	84.0	0.9
19	81778	0.6	7.34	3.0	<20.0	17.0	0.3	<5.0	44.0	4.9
20	81779	0.6	7.04	2.7	<20.0	15.0	0.2	<5.0	22.0	1.9
21	81780	1.7	7.34	5.4	<20.0	32.0	0.6	<5.0	110.0	2.2
22	81781	1.3	7.97	2.8	<20.0	19.0	0.5	<5.0	<20.0	2.8
23	81782	0.7	5.26	3.0	<20.0	8.0	0.2	<5.0	<20.0	1.7
24	81783	0.7	8.15	3.7	<20.0	5.4	0.4	<5.0	21.0	4.3
25	81784	1.8	5.43	4.9	<20.0	33.0	0.6	<5.0	<20.0	1.3

Results in ppm unless otherwise specified
T = element present, but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

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A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.06948	27/04/90	901307	4 OF 4

TUBE No.	SAMPLE No.	Eu	Fe	Hf	Ir	La	Lu	Mo	Rb	Sb
1	81785	1.6	4.80	5.1	<20.0	37.0	0.7	<5.0	180.0	11.0
2	81786	0.6	8.25	1.5	<20.0	2.9	0.2	<5.0	33.0	1.3
3	81787	1.2	5.34	7.2	<20.0	36.0	0.4	<5.0	58.0	0.7
4	81788	1.7	3.50	7.3	<20.0	67.0	0.7	<5.0	48.0	1.2
5	81789	1.7	5.91	6.6	<20.0	81.4	0.7	<5.0	56.0	1.0
6	81790	1.0	1.60	7.7	<20.0	52.1	0.8	<5.0	<20.0	0.5
7	81791	1.2	3.70	5.7	<20.0	29.0	0.4	<5.0	63.0	0.6
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22	Elevated Detection Limits for Mo Due to Uranium Fission									
23	DETECTION	0.5	0.05	1.0	20.0	0.5	0.2	5.0	20.0	0.2
24	UNITS	ppm	%	ppm	ppb	ppm	ppm	ppm	ppm	ppm
25	METHOD	1801	1801	1801	1801	1801	1801	1801	1801	1801

Results in ppm unless otherwise specified
T = element present: but concentration too low to measure
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— = element not determined

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.06948	27/04/90	901307	1 OF 4

TUBE No.	SAMPLE No.	Sc	Se	Sm	Ta	Th	U	W	Yb	Cd
1	81707	8.70	<5.0	3.20	1.8	30.0	6.3	<2.0	3.5	<10.0
2	81708	13.10	<5.0	7.30	1.7	23.0	3.5	<2.0	2.4	<10.0
3	81709	7.50	<5.0	10.00	1.4	29.0	7.5	<2.0	3.7	<10.0
4	81710	24.60	<5.0	7.10	2.0	11.0	<2.0	<2.0	2.7	<10.0
5	81711	34.30	<5.0	6.10	1.7	4.3	<2.0	<2.0	3.0	<10.0
6	81712	27.80	<5.0	7.60	1.8	12.0	<2.0	<2.0	2.8	<10.0
7	81713	7.20	<5.0	7.00	1.2	29.0	7.1	<2.0	4.0	<10.0
8	81714	26.80	<5.0	11.00	2.0	13.0	<2.0	<2.0	3.8	<10.0
9	81715	6.80	<5.0	7.40	2.3	31.0	5.0	<2.0	3.3	<10.0
10	81716	7.10	<5.0	12.00	2.1	25.0	4.4	<2.0	3.4	<10.0
11	81717	13.40	<5.0	5.70	1.2	10.0	3.5	<2.0	3.5	<10.0
12	81718	5.20	<5.0	9.30	1.6	24.0	3.3	<2.0	2.5	<10.0
13	81719	27.30	<5.0	7.80	<1.0	10.0	<2.0	<2.0	3.2	<10.0
14	81720	26.70	<5.0	7.20	2.8	14.0	<2.0	<2.0	2.8	<10.0
15	81721	27.10	<5.0	6.40	1.4	11.0	<2.0	<2.0	2.8	<10.0
16	81722	24.80	<5.0	8.70	1.5	14.0	<2.0	<2.0	3.2	<10.0
17	81723	7.30	<5.0	12.00	1.3	29.0	6.3	<2.0	4.2	<10.0
18	81724	26.50	<5.0	1.50	<1.0	1.7	<2.0	<2.0	0.7	<10.0
19	81725	40.00	<5.0	2.00	<1.0	1.3	<2.0	<2.0	1.2	<10.0
20	81726	34.70	<5.0	3.50	2.1	4.3	<2.0	<2.0	1.7	<10.0
21	81727	31.10	<5.0	3.50	3.6	4.5	<2.0	<2.0	1.5	<10.0
22	81728	27.00	<5.0	0.60	<1.0	<0.5	<2.0	<2.0	<0.5	<10.0
23	81729	22.70	<5.0	6.60	<1.0	11.0	<2.0	<2.0	2.7	<10.0
24	81730	12.10	<5.0	4.70	1.3	10.0	4.6	<2.0	2.0	<10.0
25	81731	18.20	<5.0	8.30	1.9	14.0	<2.0	<2.0	3.1	<10.0

Results in ppm unless otherwise specified
T = element present, but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

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A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.06948	27/04/90	901307	2 OF 4

TUBE No.	SAMPLE No.	Sc	Se	Sm	Ta	Th	U	W	Yb	Cd
1	81732	1.90	<5.0	2.20	<1.0	0.7	<2.0	<2.0	0.8	<10.0
2	81733	5.00	<5.0	<0.20	<1.0	<0.5	<2.0	<2.0	<0.5	<10.0
3	81734	15.90	<5.0	0.79	<1.0	1.5	<2.0	<2.0	<0.5	<10.0
4	81735	17.80	<5.0	1.30	<1.0	2.3	<2.0	<2.0	0.5	<10.0
5	81736	41.80	<5.0	3.00	1.0	4.7	<2.0	<2.0	1.7	<10.0
6	81737	42.20	<5.0	2.20	<1.0	4.6	<2.0	<2.0	1.5	<10.0
7	81738	21.20	<5.0	3.70	<1.0	5.3	<2.0	<2.0	1.5	<10.0
8	81739	21.10	<5.0	3.90	<1.0	6.8	<2.0	<2.0	3.4	<10.0
9	81740	23.50	<5.0	5.80	1.0	6.7	<2.0	<2.0	1.9	<10.0
10	81741	8.20	<5.0	13.00	2.2	29.0	6.3	<2.0	4.1	<10.0
11	81742	28.10	<5.0	6.30	1.4	11.0	<2.0	<2.0	2.6	<10.0
12	81743	30.50	<5.0	4.50	1.2	12.0	3.2	<2.0	3.1	<10.0
13	81744	9.00	<5.0	9.40	1.1	21.0	5.1	<2.0	3.5	<10.0
14	81745	12.30	<5.0	6.10	1.7	15.0	3.2	<2.0	3.0	<10.0
15	81746	23.80	<5.0	1.70	<1.0	14.0	2.5	<2.0	2.6	<10.0
16	81747	23.40	<5.0	6.10	1.1	10.0	<2.0	<2.0	2.8	<10.0
17	81748	22.40	<5.0	5.70	1.6	19.0	5.5	<2.0	3.1	<10.0
18	81749	28.50	<5.0	7.00	1.0	15.0	3.7	<2.0	2.9	<10.0
19	81750	31.00	<5.0	1.80	<1.0	2.1	<2.0	<2.0	0.8	<10.0
20	81752	18.70	<5.0	2.70	1.1	3.5	<2.0	<2.0	1.0	<10.0
21	81753	3.00	<5.0	2.80	<1.0	3.7	<2.0	<2.0	1.2	<10.0
22	81754	25.20	<5.0	4.00	2.0	5.6	<2.0	<2.0	1.5	<10.0
23	81755	34.30	<5.0	3.30	2.2	4.4	<2.0	<2.0	1.4	<10.0
24	81756	35.30	<5.0	1.90	<1.0	2.1	<2.0	<2.0	1.4	<10.0
25	81757	29.00	<5.0	5.00	1.4	6.5	<2.0	<2.0	2.1	<10.0

Results in ppm unless otherwise specified
T = element present but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

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A Division of Inchcape Inspection and Testing Services Australia Pty Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.06949	27/04/90	901307	3 OF 4

TUBE No.	SAMPLE No.	Sc	Se	Sm	Ta	Th	U	W	Yb	Cd
1	81758	28.90	<5.0	4.30	1.4	5.6	<2.0	<2.0	1.8	<10.0
2	81759	33.50	<5.0	3.30	1.3	3.6	<2.0	<2.0	1.7	<10.0
3	81760	30.80	<5.0	4.70	1.3	6.0	<2.0	<2.0	2.0	<10.0
4	81761	30.80	<5.0	4.50	1.9	5.3	<2.0	<2.0	2.2	<10.0
5	81762	32.80	<5.0	4.20	1.7	5.6	<2.0	<2.0	2.0	<10.0
6	81763	34.10	<5.0	4.20	1.0	4.7	<2.0	<2.0	1.8	<10.0
7	81764	30.50	<5.0	1.80	<1.0	1.8	<2.0	<2.0	0.9	<10.0
8	81765	35.10	<5.0	1.80	<1.0	1.7	<2.0	<2.0	1.0	<10.0
9	81766	34.30	<5.0	1.60	<1.0	1.6	<2.0	<2.0	0.9	<10.0
10	81767	33.20	<5.0	4.10	<1.0	4.3	<2.0	<2.0	1.9	<10.0
11	81768	23.80	<5.0	4.10	<1.0	6.3	<2.0	<2.0	1.4	<10.0
12	81769	24.30	<5.0	2.60	<1.0	6.0	<2.0	<2.0	1.5	<10.0
13	81770	21.20	<5.0	4.90	<1.0	5.9	<2.0	<2.0	1.6	<10.0
14	81771	24.70	<5.0	2.80	1.1	6.7	2.1	<2.0	1.3	<10.0
15	81772	23.90	<5.0	3.90	1.1	5.9	2.2	<2.0	1.6	<10.0
16	81773	23.00	<5.0	10.00	1.9	5.9	<2.0	<2.0	2.8	<10.0
17	81774	19.00	<5.0	1.80	<1.0	3.9	<2.0	<2.0	0.9	<10.0
18	81775	35.50	<5.0	3.40	<1.0	5.1	2.7	<2.0	1.5	<10.0
19	81778	25.30	<5.0	3.80	<1.0	5.5	<2.0	<2.0	1.7	<10.0
20	81779	26.00	<5.0	3.20	<1.0	4.9	<2.0	<2.0	1.4	<10.0
21	81780	28.10	<5.0	8.60	2.0	10.0	<2.0	<2.0	3.2	<10.0
22	81781	35.50	<5.0	6.50	1.3	5.4	<2.0	<2.0	3.4	<10.0
23	81782	22.40	<5.0	2.90	<1.0	4.7	<2.0	<2.0	1.5	<10.0
24	81783	35.90	<5.0	3.40	<1.0	3.5	<2.0	<2.0	2.3	<10.0
25	81784	22.80	<5.0	7.40	<1.0	13.0	<2.0	<2.0	3.6	<10.0

Results in ppm unless otherwise specified
T = element present, but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

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A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.06948	27/04/90	901307	4 OF 4

TUBE No.	SAMPLE No.	Sc	Se	Sm	Ta	Th	U	W	Yb	Cd
1	81785	27.50	<5.0	7.60	1.0	12.0	2.7	<2.0	3.4	<10.0
2	81786	42.80	<5.0	1.70	<1.0	1.0	<2.0	<2.0	1.8	<10.0
3	81787	19.10	<5.0	6.70	1.7	11.0	<2.0	<2.0	1.8	<10.0
4	81788	8.20	<5.0	11.00	2.2	18.0	5.2	<2.0	3.8	<10.0
5	81789	17.40	<5.0	10.00	<1.0	16.0	3.1	<2.0	3.7	<10.0
6	81790	10.70	<5.0	11.00	2.9	22.0	4.8	<2.0	3.9	<10.0
7	81791	13.30	<5.0	5.50	<1.0	8.3	<2.0	<2.0	1.9	<10.0
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	0.10	5.0	0.20	1.0	0.5	2.0	2.0	0.5	10.0
24	UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
25	METHOD	1801	1801	1801	1801	1801	1801	1801	1801	1801

Results in ppm unless otherwise specified
T = element present but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

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A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.06948	27/04/90	901307	1 OF 4

TUBE No.	SAMPLE No.	K	Na	Te	Sn					
1	81707	3.5	0.81	<10.0	<200.0					
2	81708	2.2	2.62	<10.0	<200.0					
3	81709	3.6	0.22	<10.0	<200.0					
4	81710	2.3	2.18	<10.0	<200.0					
5	81711	1.1	3.39	<10.0	<200.0					
6	81712	2.2	3.36	<10.0	<200.0					
7	81713	4.0	0.47	<10.0	<200.0					
8	81714	2.2	2.11	<10.0	<200.0					
9	81715	4.8	0.84	<10.0	<200.0					
10	81716	2.1	0.81	<10.0	<200.0					
11	81717	1.8	0.17	<10.0	<200.0					
12	81718	0.6	0.07	<10.0	<200.0					
13	81719	3.9	1.40	<10.0	<200.0					
14	81720	0.8	3.64	<10.0	<200.0					
15	81721	1.9	1.20	<10.0	<200.0					
16	81722	1.6	2.55	<10.0	<200.0					
17	81723	2.8	2.25	<10.0	<200.0					
18	81724	1.0	0.52	<10.0	<200.0					
19	81725	0.6	2.00	<10.0	<200.0					
20	81726	<0.4	3.17	<10.0	<200.0					
21	81727	<0.4	4.41	<10.0	<200.0					
22	81728	<0.4	0.15	<10.0	<200.0					
23	81729	1.6	2.44	<10.0	<200.0					
24	81730	0.8	1.20	<10.0	<200.0					
25	81731	1.9	3.34	<10.0	<200.0					

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.06948	27/04/90	901307	2 OF 4

TUBE No.	SAMPLE No.	K	Na	Te	Sn					
1	81732	<0.4	<0.02	<10.0	<200.0					
2	81733	<0.4	<0.02	<10.0	<200.0					
3	81734	<0.4	<0.02	<10.0	<200.0					
4	81735	<0.4	<0.02	<10.0	<200.0					
5	81736	<0.4	0.64	<10.0	<200.0					
6	81737	<0.4	0.39	<10.0	<200.0					
7	81738	<0.4	<0.02	<10.0	<200.0					
8	81739	<0.4	0.73	<10.0	<200.0					
9	81740	<0.4	<0.02	<10.0	<200.0					
10	81741	2.7	0.12	<10.0	<200.0					
11	81742	2.5	0.66	<10.0	<200.0					
12	81743	3.1	0.05	<10.0	<200.0					
13	81744	3.1	0.02	<10.0	<200.0					
14	81745	3.3	0.04	<10.0	<200.0					
15	81746	1.2	0.22	<10.0	<200.0					
16	81747	0.4	3.54	<10.0	<200.0					
17	81748	0.8	0.26	<10.0	<200.0					
18	81749	2.0	0.72	<10.0	<200.0					
19	81750	1.1	2.22	<10.0	<200.0					
20	81752	1.0	0.78	<10.0	<200.0					
21	81753	0.8	0.04	<10.0	<200.0					
22	81754	<0.4	5.32	<10.0	<200.0					
23	81755	1.0	2.61	<10.0	<200.0					
24	81756	1.4	2.30	<10.0	<200.0					
25	81757	<0.4	4.84	<10.0	210.0					

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.06948	27/04/90	901307	3 OF 4

TUBE No.	SAMPLE No.	K	Na	Te	Sn					
1	81758	0.7	3.58	<10.0	<200.0					
2	81759	<0.4	4.62	<10.0	<200.0					
3	81760	0.7	5.02	<10.0	<200.0					
4	81761	1.2	2.39	<10.0	240.0					
5	81762	<0.4	4.68	<10.0	<200.0					
6	81763	0.9	4.93	<10.0	<200.0					
7	81764	<0.4	2.07	<10.0	<200.0					
8	81765	<0.4	0.93	<10.0	<200.0					
9	81766	<0.4	0.81	<10.0	<200.0					
10	81767	0.8	3.38	<10.0	<200.0					
11	81768	1.6	0.05	<10.0	<200.0					
12	81769	1.3	0.10	<10.0	<200.0					
13	81770	1.8	0.05	<10.0	<200.0					
14	81771	0.9	0.50	<10.0	<200.0					
15	81772	1.0	0.83	<10.0	<200.0					
16	81773	<0.4	3.80	<10.0	<200.0					
17	81774	<0.4	0.03	<10.0	<200.0					
18	81775	1.4	1.30	<10.0	<200.0					
19	81778	0.7	1.70	<10.0	<200.0					
20	81779	<0.4	0.78	<10.0	<200.0					
21	81780	1.8	0.76	<10.0	<200.0					
22	81781	<0.4	3.56	<10.0	<200.0					
23	81782	0.7	3.85	<10.0	<200.0					
24	81783	0.7	3.01	<10.0	<200.0					
25	81784	1.4	5.29	<10.0	<200.0					

Results in ppm unless otherwise specified
T = element present but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.06948	27/04/90	901307	4 OF 4

TUBE No.	SAMPLE No.	K	Na	Te	Sn					
1	81785	3.4	0.77	<10.0	<200.0					
2	81786	0.6	1.90	<10.0	<200.0					
3	81787	1.3	1.40	<10.0	<200.0					
4	81788	1.1	2.03	<10.0	<200.0					
5	81789	1.5	3.98	<10.0	<200.0					
6	81790	0.9	3.40	<10.0	<500.0					
7	81791	1.7	1.40	<10.0	<200.0					
8										
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10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	0.4	0.02	10.0	200.0					
24	UNITS	%	%	ppm	ppm					
25	METHOD	1801	1801	1801	1801					

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

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A division of MacDonald Hamilton & Co. Pty. Ltd.
Phone (09) 458 7999 52 Murray Road, Welshpool, W.A. 6106 Telex AA92560
FAX: 004 31 8890

ANALYTICAL REPORT No. 27.1.08.07105

THIS REPORT MUST BE READ IN CONJUNCTION WITH THE ACCOMPANYING ANALYTICAL DATA

Pasminco Mining Rosebery
P.O. Box 21
Rosebery
Tasmania 7470

ORDER No.	PROJECT
901318	419000

DATE RECEIVED	RESULTS REQUIRED
22/05/90	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
4	20/06/90	1	94

STATE OF SAMPLES	SAMPLE NUMBERS	PRE-TREATMENT: DRY	CRUSH	SPLIT	PULVERISE	SIEVE	OTHER SEE REMARKS	NONE	ANALYSIS: REFER TO ANALYSIS SECTION	PREPARATION	METHOD
	Various	RO Prep: 008,010,011,012,013,016							Au,Ag,As,Ba,Br,Ce,Co,Cr,Cs,Eu,Fe,Hf,Ir,La,Lu,Mo		
	Various	RO							Ag,Al,Ca,Cu,K,Mg,Mn,Na,Ni,Pb,Ti,Y,Zn,Zr/201		
	Various	RO Prep: 008,010,012,013,016							Cu,Pb,Zn,Ag,Bi,Cd,Ni,As,Fe,Mn,Co/101		
	Various	RO							Ti/207		

RESULTS TO

Mr G Jenkins
Pasminco Mining Rosebery
P O Box 21
Rosebery
Tas 7470

RESULTS TO

CHIEF GEOLOGIST
PASMINCO MINING - ROSEBERY
P O BOX 21
ROSEBERY
TAS 7320

REMARKS

STATE OF SAMPLES	
whole core	WC
split core	SC
cutting	CU
rock	Ro
soil	SO
pulp	PU
water	WA
tissue	TI
stream sediment	SS
heavy mineral	HM

ANALYSIS — PREPARATION			
perchloric acid	A1	cold acid	CA
hydrochloric acid	A2	specific sulphide	SS
nitric acid	A3	other mixed acids	Ma
aqua regia	A4	alkaline attack	AA
nitric-perchloric	A5	volatilization	VO
HF mixture	A6	ignition	IG
HF under pressure	A7	pressed powder (XRF)	PP
fusion	A8	glass fusion (XRF)	GF

ANALYSIS — METHOD	
atomic absorbtion	AAS
x-ray fluorescence	XRF
spectrophotometry	SPEC
colorimetry	COL
chromatography	CHR
titration	TTN
other chemicals means	CHEM
miscellaneous	MISC
fluorescence	FLUOR
inductively coupled plasma	ICP

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A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.07105	20/06/90	901318	1 OF 8

TUBE No.	SAMPLE No.	Cu	Cu	Pb	Pb	Zn	Zn	Ag	Ag	Bi
1	81840	—	21	—	109	—	325	—	<5	—
2	81841	—	27	—	<100	—	139	—	<5	—
3	81844	—	13	—	100	—	132	—	<5	—
4	81845	—	66	—	<100	—	213	—	<5	—
5	81846	—	13	—	145	—	109	—	<5	—
6	81847	—	11	—	105	—	333	—	<5	—
7	81848	—	74	—	<100	—	284	—	<5	—
8	81849	—	26	—	<100	—	328	—	<5	—
9	81850	—	90	—	128	—	630	—	<5	—
10	81851	—	20	—	105	—	301	—	<5	—
11	81852	—	5	—	<100	—	64	—	<5	—
12	81853	—	6	—	<100	—	288	—	<5	—
13	81854	—	14	—	<100	—	294	—	<5	—
14	81855	—	24	—	<100	—	118	—	<5	—
15	81856	—	12	—	<100	—	125	—	<5	—
16	81857	—	17	—	<100	—	127	—	<5	—
17	81858	—	14	—	<100	—	168	—	<5	—
18	81859	—	9	—	<100	—	172	—	<5	—
19	81860	—	<5	—	<100	—	43	—	<5	—
20	81866	—	9	—	<100	—	106	—	<5	—
21	81867	—	109	—	371	—	1507	—	<5	—
22	81868	—	15	—	<100	—	101	—	<5	—
23	81869	—	244	—	<100	—	137	—	<5	—
24	81870	—	116	—	<100	—	296	—	<5	—
25	81871	—	54	—	<100	—	279	—	<5	—

Results in ppm unless otherwise specified
T = element present but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.07105	20/06/90	901318	2 OF 8

TUBE No.	SAMPLE No.	Cu	Cu	Pb	Pb	Zn	Zn	Ag	Ag	Bi
1	81872	—	48	—	191	—	403	—	<5	—
2	81873	—	14	—	<100	—	134	—	<5	—
3	81874	—	64	—	<100	—	199	—	<5	—
4	81875	—	71	—	<100	—	197	—	<5	—
5	81876	—	75	—	<100	—	140	—	<5	—
6	81877	—	32	—	<100	—	54	—	<5	—
7	81879	—	13	—	<100	—	52	—	<5	—
8	81881	—	66	—	<100	—	135	—	<5	—
9	81882	—	9	—	<100	—	87	—	<5	—
10	81883	—	108	—	<100	—	97	—	<5	—
11	81884	—	86	—	100	—	447	—	<5	—
12	81887	—	38	—	<100	—	123	—	<5	—
13	81888	—	52	—	<100	—	166	—	<5	—
14	81889	—	31	—	<100	—	160	—	<5	—
15	81890	—	243	—	<100	—	130	—	<5	—
16	81891	—	15	—	<100	—	212	—	<5	—
17	81893	—	9	—	<100	—	166	—	<5	—
18	81894	—	29	—	<100	—	43	—	<5	—
19	81895	—	14	—	<100	—	71	—	<5	—
20	81897	—	7	—	<100	—	140	—	<5	—
21	81898	—	12	—	<100	—	73	—	<5	—
22	81899	—	7	—	<100	—	45	—	<5	—
23	81900	—	119	—	<100	—	79	—	<5	—
24	81901	—	8	—	<100	—	82	—	<5	—
25	81902	—	15	—	<100	—	86	—	<5	—

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
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— = element not determined

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.07105	20/06/90	901318	3 OF 8

TUBE No.	SAMPLE No.	Cu	Cu	Pb	Pb	Zn	Zn	Ag	Ag	Bi
1	81903	—	21	—	<100	—	51	—	<5	—
2	81906	—	116	—	<100	—	89	—	<5	—
3	81907	—	103	—	<100	—	83	—	<5	—
4	81910	—	8	—	<100	—	118	—	<5	—
5	81911	—	<5	—	<100	—	86	—	<5	—
6	81913	—	5	—	<100	—	52	—	<5	—
7	81914	—	8	—	<100	—	55	—	<5	—
8	81915	—	321	—	<100	—	194	—	<5	—
9	81916	—	63	—	<100	—	30	—	<5	—
10	81918	—	14	—	<100	—	113	—	<5	—
11	81920	—	20	—	141	—	304	—	<5	—
12	81921	—	69	—	<100	—	167	—	<5	—
13	81922	—	17	—	<100	—	93	—	<5	—
14	81923	—	29	—	<100	—	68	—	<5	—
15	81924	—	8	—	<100	—	116	—	<5	—
16	81925	—	10	—	<100	—	85	—	<5	—
17	81926	—	150	—	515	—	435	—	<5	—
18	81928	—	9	—	<100	—	79	—	<5	—
19	81931	—	12	—	100	—	65	—	<5	—
20	81932	—	76	—	154	—	657	—	<5	—
21	81933	—	69	—	530	—	128	—	<5	—
22	81842	60	—	130	—	350	—	<0.5	—	<10
23	81843	100	—	120	—	285	—	<0.5	—	<10
24	81861	250	—	40	—	275	—	<0.5	—	<10
25	81862	85	—	50	—	190	—	<0.5	—	<10

Results in ppm unless otherwise specified
T = element present: but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

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A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.07105	20/06/90	901318	4 OF 8

TUBE No.	SAMPLE No.	Cu	Cu	Pb	Pb	Zn	Zn	Ag	Ag	Bi
1	81863	90	--	25	--	135	--	<0.5	--	<10
2	81864	20	--	10	--	150	--	<0.5	--	<10
3	81865	10	--	10	--	155	--	<0.5	--	<10
4	81878	10	--	15	--	465	--	<0.5	--	<10
5	81880	145	--	25	--	105	--	<0.5	--	<10
6	81885	305	--	80	--	185	--	<0.5	--	<10
7	81886	30	--	20	--	130	--	<0.5	--	<10
8	81892	5	--	5	--	160	--	<0.5	--	<10
9	81896	50	--	55	--	205	--	<0.5	--	<10
10	81904	10	--	15	--	80	--	<0.5	--	<10
11	81905	5	--	40	--	100	--	<0.5	--	<10
12	81908	10	--	10	--	145	--	<0.5	--	<10
13	81909	20	--	5	--	40	--	<0.5	--	<10
14	81912	5	--	10	--	45	--	<0.5	--	<10
15	81917	15	--	10	--	165	--	<0.5	--	<10
16	81919	30	--	15	--	150	--	<0.5	--	<10
17	81927	30	--	60	--	140	--	<0.5	--	<10
18	81929	15	--	10	--	145	--	<0.5	--	<10
19	81930	25	--	15	--	115	--	<0.5	--	<10
20										
21										
22	Zr,Y & Ti Data is Acid Soluble									
23	DETECTION	5	5	5	100	5	5	0.5	5	10
24	UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
25	METHOD	101	201	101	201	101	201	101	201	101

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.07105	20/06/90	901318	5 OF 8

TUBE No.	SAMPLE No.	Cd	Ni	Ni	As	Fe	Mn	Mn	Co	Al
1	81840	—	—	23	—	—	—	1080	—	9.48
2	81841	—	—	56	—	—	—	373	—	6.20
3	81844	—	—	19	—	—	—	430	—	6.48
4	81845	—	—	17	—	—	—	285	—	9.11
5	81846	—	—	18	—	—	—	396	—	7.44
6	81847	—	—	12	—	—	—	703	—	9.00
7	81848	—	—	35	—	—	—	1919	—	9.48
8	81849	—	—	34	—	—	—	2451	—	9.56
9	81850	—	—	29	—	—	—	1555	—	9.58
10	81851	—	—	50	—	—	—	1255	—	9.36
11	81852	—	—	10	—	—	—	192	—	7.33
12	81853	—	—	22	—	—	—	474	—	6.11
13	81854	—	—	16	—	—	—	737	—	8.98
14	81855	—	—	33	—	—	—	1149	—	8.24
15	81856	—	—	29	—	—	—	370	—	6.47
16	81857	—	—	20	—	—	—	738	—	9.32
17	81858	—	—	21	—	—	—	840	—	8.85
18	81859	—	—	89	—	—	—	1293	—	9.12
19	81860	—	—	285	—	—	—	970	—	8.75
20	81866	—	—	16	—	—	—	504	—	9.05
21	81867	—	—	51	—	—	—	1293	—	10.11
22	81868	—	—	39	—	—	—	1004	—	9.54
23	81869	—	—	13	—	—	—	863	—	8.71
24	81870	—	—	34	—	—	—	1232	—	9.89
25	81871	—	—	21	—	—	—	1540	—	8.88

Results in ppm unless otherwise specified
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— = element not determined

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
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TUBE No.	SAMPLE No.	Cd	Ni	Ni	As	Fe	Mn	Mn	Co	Al
1	81872	—	—	84	—	—	—	2254	—	6.51
2	81873	—	—	45	—	—	—	3619	—	6.65
3	81874	—	—	81	—	—	—	1878	—	10.26
4	81875	—	—	80	—	—	—	1210	—	9.36
5	81876	—	—	101	—	—	—	855	—	8.68
6	81877	—	—	36	—	—	—	830	—	8.20
7	81879	—	—	25	—	—	—	1222	—	8.86
8	81881	—	—	122	—	—	—	1179	—	8.43
9	81882	—	—	145	—	—	—	980	—	10.04
10	81883	—	—	61	—	—	—	939	—	11.41
11	81884	—	—	70	—	—	—	1503	—	9.66
12	81887	—	—	12	—	—	—	1971	—	9.90
13	81888	—	—	<10	—	—	—	1016	—	8.86
14	81889	—	—	148	—	—	—	1135	—	8.51
15	81890	—	—	210	—	—	—	280	—	9.96
16	81891	—	—	110	—	—	—	922	—	10.41
17	81893	—	—	60	—	—	—	958	—	8.73
18	81894	—	—	13	—	—	—	311	—	5.39
19	81895	—	—	93	—	—	—	1077	—	7.41
20	81897	—	—	49	—	—	—	12300	—	8.92
21	81898	—	—	28	—	—	—	749	—	7.31
22	81899	—	—	13	—	—	—	1043	—	7.17
23	81900	—	—	148	—	—	—	1044	—	10.08
24	81901	—	—	540	—	—	—	1104	—	4.46
25	81902	—	—	118	—	—	—	1225	—	8.09

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.07105	20/06/90	901318	7 OF 8

TUBE No.	SAMPLE No.	Cd	Ni	Ni	As	Fe	Mn	Mn	Co	Al
1	81903	—	—	15	—	—	—	559	—	7.41
2	81906	—	—	110	—	—	—	1491	—	7.86
3	81907	—	—	62	—	—	—	1271	—	6.81
4	81910	—	—	247	—	—	—	876	—	9.28
5	81911	—	—	128	—	—	—	648	—	8.94
6	81913	—	—	252	—	—	—	890	—	6.67
7	81914	—	—	200	—	—	—	1006	—	8.38
8	81915	—	—	148	—	—	—	1463	—	9.04
9	81916	—	—	38	—	—	—	3580	—	8342.0
10	81918	—	—	593	—	—	—	1217	—	8.42
11	81920	—	—	207	—	—	—	1250	—	6.02
12	81921	—	—	97	—	—	—	1553	—	8.22
13	81922	—	—	27	—	—	—	1111	—	8.27
14	81923	—	—	26	—	—	—	830	—	7.74
15	81924	—	—	<10	—	—	—	500	—	6.82
16	81925	—	—	46	—	—	—	590	—	7.40
17	81926	—	—	47	—	—	—	2501	—	8.35
18	81928	—	—	12	—	—	—	360	—	5.39
19	81931	—	—	17	—	—	—	350	—	5.53
20	81932	—	—	28	—	—	—	1573	—	9.04
21	81933	—	—	48	—	—	—	1266	—	9.36
22	81842	<0.5	40	—	<100	4.90	1250	—	35	—
23	81843	<0.5	20	—	<100	7.56	1475	—	35	—
24	81861	1.0	45	—	<100	5.00	620	—	35	—
25	81862	0.5	45	—	<100	6.41	950	—	45	—

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
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TUBE No.	SAMPLE No.	Cd	Ni	Ni	As	Fe	Mn	Mn	Co	Al
1	81863	<0.5	75	—	<100	5.00	760	—	40	—
2	81864	<0.5	95	—	<100	5.41	810	—	40	—
3	81865	<0.5	25	—	<100	5.54	255	—	25	—
4	81878	<0.5	30	—	<100	6.03	1800	—	25	—
5	81880	<0.5	70	—	<100	8.31	935	—	45	—
6	81885	<0.5	45	—	<100	13.20	1050	—	65	—
7	81886	<0.5	30	—	<100	7.22	710	—	30	—
8	81892	<0.5	300	—	<100	5.88	540	—	60	—
9	81896	<0.5	65	—	<100	3.91	580	—	25	—
10	81904	<0.5	25	—	<100	4.34	745	—	25	—
11	81905	<0.5	20	—	<100	3.53	360	—	20	—
12	81908	<0.5	35	—	<100	6.05	820	—	25	—
13	81909	<0.5	20	—	<100	2.75	150	—	10	—
14	81912	<0.5	75	—	<100	2.05	150	—	15	—
15	81917	<0.5	135	—	<100	7.37	790	—	45	—
16	81919	0.5	50	—	<100	3.70	700	—	25	—
17	81927	0.5	300	—	<100	5.60	1000	—	50	—
18	81929	<0.5	95	—	<100	6.02	795	—	40	—
19	81930	<0.5	40	—	<100	7.26	750	—	30	—
20										
21										
22	Zr,Y & Ti Data is Acid Soluble									
23	DETECTION	0.5	10	10	100	0.05	5	15	5	0.01
24	UNITS	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	%
25	METHOD	101	101	201	101	101	101	201	101	201

Results in ppm unless otherwise specified
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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
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TUBE No.	SAMPLE No.	Ca	Mg	Na	Ti	Ti	Y	Zr		
1	81840	9895	2.570	29100	6843	--	19	154		
2	81841	547	0.493	709	6656	--	25	139		
3	81844	1227	0.561	16800	2226	--	44	245		
4	81845	9845	1.080	38500	4944	--	33	261		
5	81846	1330	0.682	28700	3494	--	43	327		
6	81847	34200	1.910	15700	5379	--	28	125		
7	81848	49600	3.660	27300	5136	--	24	57		
8	81849	16700	2.590	23200	5938	--	25	144		
9	81850	29300	3.620	19800	5591	--	25	64		
10	81851	2443	1.380	37500	5191	--	17	122		
11	81852	551	0.622	1817	3311	--	22	123		
12	81853	850	1.780	17400	3606	--	15	121		
13	81854	1176	3.000	16600	5314	--	39	172		
14	81855	17400	2.490	20900	5079	--	24	179		
15	81856	1604	1.110	24400	1640	--	44	133		
16	81857	2117	2.560	23500	6494	--	26	167		
17	81858	34400	2.490	15700	6240	--	29	147		
18	81859	16600	3.110	50600	3200	--	18	95		
19	81860	63900	7.850	6755	1032	--	7	20		
20	81866	1549	1.750	39900	4866	--	27	196		
21	81867	38700	3.230	30700	4439	--	20	69		
22	81868	16500	2.380	27500	7607	--	31	181		
23	81869	10300	1.800	30500	9065	--	39	110		
24	81870	5291	3.860	2200	7047	--	23	177		
25	81871	6050	1.800	35800	8504	--	33	271		

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.07105	20/06/90	901318	2 OF 4

TUBE No.	SAMPLE No.	Ca	Mg	Na	Ti	Ti	Y	Zr		
1	81872	840	4.950	3899	3869	—	17	179		
2	81873	1688	2.320	415	3183	—	19	164		
3	81874	551	5.320	5121	6722	—	12	75		
4	81875	318	3.780	284	9139	—	18	164		
5	81876	1637	1.870	6638	>10000	2.30	39	33		
6	81877	34100	2.950	33600	5882	—	22	84		
7	81879	55500	1.750	11300	3594	—	15	51		
8	81881	48000	6.610	15900	3400	—	16	40		
9	81882	44800	5.330	14300	3947	—	13	46		
10	81883	41400	3.370	24900	4327	—	17	57		
11	81884	7807	3.120	26200	5206	—	23	121		
12	81887	11600	1.890	35100	6887	—	31	159		
13	81888	1698	1.020	13700	9672	—	32	292		
14	81889	59700	6.130	153	3349	—	18	46		
15	81890	2262	3.740	4361	2204	—	13	64		
16	81891	770	3.110	3894	2295	—	8	69		
17	81893	8800	4.200	26000	1974	—	10	58		
18	81894	1642	1.180	21500	2558	—	8	136		
19	81895	27800	4.780	11200	1377	—	12	53		
20	81897	33500	3.210	44400	2011	—	12	70		
21	81898	1376	0.724	822	6463	—	22	197		
22	81899	11100	0.527	1376	3022	—	44	185		
23	81900	533	11.770	293	956	—	5	25		
24	81901	15400	11.110	641	1471	—	8	20		
25	81902	18600	2.300	1203	5969	—	25	136		

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
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TUBE No.	SAMPLE No.	Ca	Mg	Na	Ti	Ti	Y	Zr		
1	81903	10300	0.438	1330	2095	--	25	126		
2	81906	62000	5.420	10500	4794	--	24	26		
3	81907	47200	2.820	22300	6149	--	23	60		
4	81910	30800	5.720	16400	2212	--	17	68		
5	81911	17600	5.270	33100	2681	--	13	62		
6	81913	48800	8.420	7004	1864	--	13	46		
7	81914	66800	5.640	10600	1821	--	12	40		
8	81915	1250	5.180	3991	2289	--	11	58		
9	81916	910	0.435	1135	7028	--	32	200		
10	81918	23100	5.350	6430	1117	--	7	28		
11	81920	1460	7.150	1995	1906	--	11	72		
12	81921	9191	2.050	36500	5339	--	21	136		
13	81922	34800	2.040	25300	5078	--	29	165		
14	81923	28500	1.420	23900	4999	--	24	138		
15	81924	8837	1.140	9546	4191	--	33	252		
16	81925	859	2.270	786	4326	--	3	74		
17	81926	37000	3.550	26900	<10	--	26	51		
18	81928	1269	0.459	12300	1718	--	34	203		
19	81931	1558	0.581	27300	3296	--	34	305		
20	81932	29200	3.470	19700	5407	--	35	56		
21	81933	45400	2.970	31500	4209	--	21	53		
22	81842	--	--	--	--	--	--	--		
23	81843	--	--	--	--	--	--	--		
24	81861	--	--	--	--	--	--	--		
25	81862	--	--	--	--	--	--	--		

Results in ppm unless otherwise specified
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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.07105	20/06/90	901318	4 OF 4

TUBE No.	SAMPLE No.	Ca	Mg	Na	Ti	Ti	Y	Zr		
1	81863	—	—	—	—	—	—	—		
2	81864	—	—	—	—	—	—	—		
3	81865	—	—	—	—	—	—	—		
4	81878	—	—	—	—	—	—	—		
5	81880	—	—	—	—	—	—	—		
6	81885	—	—	—	—	—	—	—		
7	81886	—	—	—	—	—	—	—		
8	81892	—	—	—	—	—	—	—		
9	81896	—	—	—	—	—	—	—		
10	81904	—	—	—	—	—	—	—		
11	81905	—	—	—	—	—	—	—		
12	81908	—	—	—	—	—	—	—		
13	81909	—	—	—	—	—	—	—		
14	81912	—	—	—	—	—	—	—		
15	81917	—	—	—	—	—	—	—		
16	81919	—	—	—	—	—	—	—		
17	81927	—	—	—	—	—	—	—		
18	81929	—	—	—	—	—	—	—		
19	81930	—	—	—	—	—	—	—		
20										
21										
22	Zr,Y & Ti Data is Acid Soluble									
23	DETECTION	50	0.002	50	10	0.01	1	5		
24	UNITS	ppm	%	ppm	ppm	%	ppm	ppm		
25	METHOD	201	201	201	201	207	201	201		

Results in ppm unless otherwise specified
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A division of MacDonald Hamilton & Co. Pty. Ltd.

Phone (09) 458 7999 52 Murray Road, Welshpool, W.A. 6106 Telex AA92560

FAX: 004 31 8890

ANALYTICAL REPORT No. 27.1.08.07105

THIS REPORT MUST BE READ IN CONJUNCTION WITH THE ACCOMPANYING ANALYTICAL DATA

Pasminco Mining Rosebery
P.O. Box 21
Rosebery
Tasmania 7470

ORDER No.	PROJECT
901318	419000

DATE RECEIVED	RESULTS REQUIRED
22/05/90	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
4	16/07/90	1	94

STATE OF SAMPLES (REFER BELOW)	SAMPLE NUMBERS	PRE-TREATMENT: DRY	CRUSH	SPLIT	PUL-VERISE	SIEVE	OTHER SEE REMARKS	NONE	ANALYSIS: REFER TO ANALYSIS SECTION	PREPARATION	METHOD
	Various	RO	Prep: 006,010,011,012,013,016						Au,Ag,As,Ba,Br,Ce,Co,Cr,Cs,Eu,Fe,Hf,Ir,La,Lu,Mo		
	Various	RO							Ag,Al,Ca,Cu,K,Mg,Mn,Na,Ni,Pb,Ti,Y,Zn,Zr/201		
	Various	RO	Prep: 006,010,012,013,016						Cu,Pb,Zn,Ag,Bi,Cd,Ni,As,Fe,Mn,Co/101		
	Various	RO							Ti/207		

RESULTS TO

Mr G Jenkins
Pasminco Mining Rosebery
P O Box 21
Rosebery
Tas 7470

RESULTS TO

CHIEF GEOLOGIST
PASMINCO MINING - ROSEBERY
P O BOX 21
ROSEBERY
TAS 7320

REMARKS

STATE OF SAMPLES	
whole core	WC
split core	SC
cutting	CU
rock	Ro
soil	SO
pulp	PU
water	WA
tissue	TI
stream sediment	SS
heavy mineral	HM

ANALYSIS — PREPARATION			
perchloric acid	A1	cold acid	CA
hydrochloric acid	A2	specific sulphide	SS
nitric acid	A3	other mixed acids	Ma
aqua regia	A4	alkaline attack	AA
nitric-perchloric	A5	volatilization	VO
HF mixture	A6	ignition	IG
HF under pressure	A7	pressed powder (XRF)	PP
fusion	A8	glass fusion (XRF)	GF

ANALYSIS — METHOD	
atomic absorbtion	AAS
x-ray fluorescence	XRF
spectrophotometry	SPEC
colorimetry	COL
chromatography	CHR
titration	TTN
other chemicals means	CHEM
miscellaneous	MISC
fluorescence	FLUOR
inductively coupled plasma	ICP

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
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TUBE No.	SAMPLE No.	K								
1	B1840	12500								
2	B1841	22800								
3	B1844	30000								
4	B1845	19000								
5	B1846	22200								
6	B1847	11500								
7	B1848	5831								
8	B1849	2348								
9	B1850	7282								
10	B1851	8417								
11	B1852	36500								
12	B1853	13200								
13	B1854	32900								
14	B1855	27300								
15	B1856	25000								
16	B1857	16700								
17	B1858	19200								
18	B1859	791								
19	B1860	1794								
20	B1866	7652								
21	B1867	10800								
22	B1868	9459								
23	B1869	15200								
24	B1870	11100								
25	B1871	4274								

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
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TUBE No.	SAMPLE No.	K								
1	B1872	4723								
2	B1873	18700								
3	B1874	18500								
4	B1875	26900								
5	B1876	30600								
6	B1877	17300								
7	B1879	35800								
8	B1881	18400								
9	B1882	12500								
10	B1883	9169								
11	B1884	8800								
12	B1887	19000								
13	B1888	17700								
14	B1889	17500								
15	B1890	23600								
16	B1891	13200								
17	B1893	5303								
18	B1894	2770								
19	B1895	13100								
20	B1897	1583								
21	B1898	27000								
22	B1899	33100								
23	B1900	4512								
24	B1901	<500								
25	B1902	25300								

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
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TUBE No.	SAMPLE No.	K								
1	B1903	31800								
2	B1906	1280								
3	B1907	1346								
4	B1910	16500								
5	B1911	7388								
6	B1913	2889								
7	B1914	2164								
8	B1915	11000								
9	B1916	34600								
10	B1918	4077								
11	B1920	<500								
12	B1921	7375								
13	B1922	11400								
14	B1923	16900								
15	B1924	40900								
16	B1925	25600								
17	B1926	1662								
18	B1928	27100								
19	B1931	22900								
20	B1932	6649								
21	B1933	5343								
22	B1842	—								
23	B1843	—								
24	B1861	—								
25	B1862	—								

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

AUTHORISED OFFICER [signature]

460150

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ANALABS

A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.07105	16/07/90	901318	4 OF 4

TUBE No.	SAMPLE No.	K									
1	B1863	—									
2	B1864	—									
3	B1865	—									
4	B1878	—									
5	B1880	—									
6	B1885	—									
7	B1886	—									
8	B1892	—									
9	B1896	—									
10	B1904	—									
11	B1905	—									
12	B1908	—									
13	B1909	—									
14	B1912	—									
15	B1917	—									
16	B1919	—									
17	B1927	—									
18	B1929	—									
19	B1930	—									
20											
21											
22	Zr,Y & Ti Data is Acid Soluble										
23	DETECTION	500									
24	UNITS	ppm									
25	METHOD	201									

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

AUTHORISED OFFICER [signature]

N E U T R O N A C T I V A T I O N A N A L Y S I S

150

NEUTRON ACTIVATION ANALYSIS REPORT

Date: 14-06-90

PASMINCO ORDER No: 901318 SAMPLE Nos: 81840-81933
BECQUEREL JOB # 001 (ANALABS JOB CODE:27.1.08.7105)
NOTE: - A NEGATIVE SIGN INDICATES "LESS THAN".
- RESULTS ARE IN PARTS PER MILLION (ppm) UNLESS OTHERWISE INDICATED.
- FOR ANY QUERIES PLEASE CONTACT BECQUEREL LABORATORIES.

ELEMENT	DL	# 81840	# 81841	# 81844	# 81845	# 81846	# 81847	# 81848	# 81849	# 81850	# 81851
ANTIMONY	.2	.75	.60	.36	1.10	.73	2.50	1.00	1.70	1.70	.50
ARSENIC	2.0	3.70	3.60	-2.00	3.40	6.40	9.30	5.60	12.00	14.00	5.00
BARIUM	100.0	820.0	640.0	1200.0	690.0	1000.0	440.0	370.0	270.0	900.0	330.0
BROMINE	2.0	11.00	-2.00	-2.00	2.30	-2.00	2.30	-2.00	3.80	-2.00	2.20
CADMIUM	30.0	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00
CERIUM	2.0	44.00	53.00	100.00	93.00	120.00	63.00	22.00	53.00	24.00	41.00
CAESIUM	1.0	-1.00	5.40	1.20	3.10	2.30	-1.00	1.40	1.20	1.50	2.70
CHROMIUM	5.0	66.0	210.0	20.0	44.0	37.0	28.0	38.0	42.0	32.0	490.0
COBALT	1.0	22.00	14.00	5.60	11.00	3.70	12.00	39.00	23.00	40.00	27.00
EUROPIUM	.5	.74	1.20	2.80	1.50	1.30	1.20	1.10	1.70	1.20	1.40
GOLD, ppb	5.0	-5.0	130.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	29.0	-5.0
HAFNIUM	1.0	4.70	7.70	7.40	6.90	8.30	4.70	1.30	4.70	1.90	3.60
IRIDIUM, ppb	20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0
IRON, %	.05	6.070	4.500	2.600	4.500	3.700	5.810	7.290	8.820	7.890	4.400
LANTHANUM	.5	20.00	34.00	53.80	46.00	69.90	34.00	11.00	26.00	12.00	20.00
LUTETIUM	.2	.49	.55	.80	.71	.84	.51	.31	.50	.44	.29
MOLYBDENUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
RUBIDIUM	20.0	32.0	130.0	92.0	75.0	-20.0	44.0	35.0	22.0	27.0	48.0
SAMARIUM	.20	4.50	6.30	13.00	8.80	10.00	6.90	3.90	6.10	4.50	5.00
SCANDIUM	.10	24.80	15.50	10.00	15.60	9.20	20.50	31.30	22.60	34.30	33.50
SELENIUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
SILVER	5.0	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
TANTALUM	1.0	3.80	-1.00	2.30	-1.00	3.50	1.40	4.70	-1.00	-1.00	2.90
TELLURIUM	50.0	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00
THORIUM	.5	10.00	12.00	22.00	17.00	22.00	11.00	3.30	10.00	3.90	5.80
TIN	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0
TUNGSTEN	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
URANIUM	2.0	-2.00	-2.00	2.10	-2.00	4.80	-2.00	-2.00	-2.00	-2.00	-2.00
YTTERBIUM	.5	2.00	2.70	3.90	3.20	4.00	2.80	1.80	2.60	2.50	1.50
ZINC	100.0	430.0	190.0	210.0	320.0	210.0	390.0	360.0	430.0	730.0	390.0

BQ BECQUEREL LABORATORIES
LUCAS HEIGHTS RESEARCH LABORATORIES NEW ILLAWARRA RD. LUCAS HEIGHTS. NSW
Telephone: (02) 543 2644
Facsimile: (02) 543 2655
P.O. BOX 93
MENAI, NSW. 2234

N E U T R O N   A C T I V A T I O N   A N A L Y S I S

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BECQUEREL JOB # 001

ELEMENT	DL	# 81852	# 81853	# 81854	# 81855	# 81856	# 81857	# 81858	# 81859	# 81860	# 81866
ANTIMONY	.2	.49	.47	.30	1.30	1.60	1.10	1.80	.44	-.20	.68
ARSENIC	2.0	2.30	2.20	-2.00	15.00	8.60	2.30	5.10	3.40	-2.00	5.70
BARIUM	100.0	470.0	600.0	1400.0	760.0	1000.0	420.0	880.0	380.0	-100.0	280.0
BROMINE	2.0	-2.00	3.40	-2.00	2.60	-2.00	2.90	-2.00	2.50	2.90	6.40
CADMIUM	30.0	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00
CERIUM	2.0	59.00	47.00	65.00	48.00	91.00	100.00	61.00	33.00	4.40	63.00
CAESIUM	1.0	4.20	2.00	3.20	-1.00	-1.00	2.20	1.80	-1.00	1.90	2.10
CHROMIUM	5.0	56.0	77.0	55.0	120.0	33.0	67.0	64.0	130.0	551.0	46.0
COBALT	1.0	3.60	12.00	19.00	12.00	8.40	22.00	19.00	20.00	47.00	12.00
EUROPIUM	.5	.71	1.00	1.20	1.00	.61	.92	1.50	1.00	-.50	1.50
GOLD, ppb	5.0	-5.0	-5.0	13.0	-5.0	7.1	-5.0	-5.0	-5.0	-5.0	-5.0
HAFNIUM	1.0	11.00	3.30	4.70	5.20	4.90	4.90	4.70	2.50	-1.00	5.20
IRIDIUM, ppb	20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0
IRON, %	.05	2.500	3.700	5.640	4.800	3.000	5.930	5.920	4.400	5.570	5.280
LANTHANUM	.5	27.00	25.00	34.00	22.00	42.00	16.00	29.00	13.00	3.30	32.00
LUTETIUM	.2	.57	.27	.62	.45	.86	.52	.53	.31	-.20	.55
MOLYBDENUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
RUBIDIUM	20.0	190.0	37.0	95.0	120.0	67.0	97.0	56.0	-20.0	-20.0	28.0
SAMARIUM	.20	5.50	4.50	7.70	4.70	10.00	4.60	6.50	3.40	1.10	6.70
SCANDIUM	.10	10.00	12.10	22.80	17.40	7.10	23.50	23.00	31.30	39.10	18.90
SELENIUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
SILVER	5.0	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
TANTALUM	1.0	2.20	1.20	1.50	2.90	3.00	3.50	2.30	4.20	-1.00	3.90
TELLURIUM	50.0	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00
THORIUM	.5	19.00	7.40	10.00	11.00	27.00	11.00	10.00	4.40	1.00	12.00
TIN	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0
TUNGSTEN	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
URANIUM	2.0	4.40	-2.00	-2.00	-2.00	5.40	3.60	-2.00	-2.00	-2.00	2.10
YTTERBIUM	.5	3.00	1.50	3.10	2.30	4.20	3.10	2.70	1.50	.70	2.90
ZINC	100.0	110.0	350.0	350.0	200.0	160.0	210.0	240.0	290.0	140.0	200.0

BQ BECQUEREL LABORATORIES
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Telephone: (02) 543 2644 P.O. BOX 93
Facsimile: (02) 543 2655 MENAI, NSW, 2234

N E U T R O N   A C T I V A T I O N   A N A L Y S I S

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BECQUEREL JOB # 001

ELEMENT	DL	# 81867	# 81868	# 81869	# 81870	# 81871	# 81872	# 81873	# 81874	# 81875	# 81876
ANTIMONY	.2	5.70	.73	.64	-.20	.69	.75	1.80	.84	1.70	1.50
ARSENIC	2.0	13.00	3.80	7.00	2.70	12.00	64.00	25.00	18.00	6.60	3.30
BARIUM	100.0	3200.0	420.0	520.0	390.0	210.0	-100.0	300.0	290.0	340.0	550.0
BROMINE	2.0	-2.00	5.00	-2.00	5.10	4.50	6.50	-2.00	2.60	3.10	2.50
CADMIUM	30.0	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00
CERIUM	2.0	32.00	60.00	57.00	44.00	90.00	180.00	150.00	12.00	64.00	110.00
CAESIUM	1.0	2.60	-1.00	2.20	1.60	-1.00	-1.00	2.70	2.40	5.00	9.10
CHROMIUM	5.0	79.0	46.0	7.1	45.0	13.0	600.0	440.0	180.0	330.0	250.0
COBALT	1.0	32.00	28.00	35.00	30.00	9.10	25.00	20.00	46.00	27.00	35.00
EUROPIUM	.5	1.30	1.70	2.30	1.20	1.30	2.40	2.20	.61	1.70	2.90
GOLD, ppb	5.0	42.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
HAFNIUM	1.0	2.00	5.80	2.70	5.00	7.50	4.60	4.70	2.20	5.10	8.30
IRIDIUM, ppb	20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0
IRON, %	.05	5.720	6.580	9.290	7.900	6.850	7.080	5.750	7.550	8.600	11.600
LANTHANUM	.5	16.00	31.00	26.00	22.00	44.00	114.00	83.90	3.60	32.00	52.10
LUTETIUM	.2	.33	.59	.63	.50	.71	.33	.38	.29	.54	.84
MOLYBDENUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
RUBIDIUM	20.0	41.0	35.0	25.0	57.0	-20.0	46.0	80.0	100.0	140.0	150.0
SAMARIUM	.20	4.00	6.80	8.80	4.50	8.90	14.00	11.00	1.30	7.30	12.00
SCANDIUM	.10	27.40	26.10	30.60	22.70	22.10	38.30	24.20	46.00	38.30	43.50
SELENIUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
SILVER	5.0	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
TANTALUM	1.0	1.60	3.10	2.00	-1.00	2.00	1.50	-1.00	-1.00	2.10	2.30
TELLURIUM	50.0	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00
THORIUM	.5	4.40	10.00	8.50	11.00	17.00	36.00	32.00	2.50	8.30	6.90
TIN	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0
TUNGSTEN	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
URANIUM	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	3.30	6.70	-2.00	-2.00	-2.00
YTTERBIUM	.5	1.70	3.20	3.30	2.50	3.40	1.60	1.90	1.60	3.00	4.30
ZINC	100.0	1500.0	180.0	230.0	370.0	330.0	450.0	200.0	310.0	290.0	210.0

BQ BECQUEREL LABORATORIES

LUCAS HEIGHTS RESEARCH LABORATORIES NEW ILLAWARRA RD. LUCAS HEIGHTS, NS

Telephone: (02) 543 2644 P.O. BOX 9

Facsimile: (02) 543 2655 MENAI, NSW, 223

NEUTRON ACTIVATION ANALYSIS

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BECQUEREL JOB # 001

ELEMENT	DL	# 81877	# 81879	# 81881	# 81882	# 81883	# 81884	# 81887	# 81888	# 81889	# 81890
ANTIMONY	.2	.29	4.50	.69	.58	2.70	2.10	.30	.91	1.90	3.80
ARSENIC	2.0	4.40	6.90	3.80	4.30	5.70	7.70	3.50	5.40	14.00	5.70
BARIUM	100.0	530.0	1200.0	780.0	610.0	520.0	520.0	940.0	670.0	770.0	660.0
BROMINE	2.0	2.60	8.00	-2.00	9.00	11.00	2.70	6.40	5.20	-2.00	12.00
CADMIUM	30.0	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00
CERIUM	2.0	38.00	29.00	17.00	11.00	24.00	44.00	54.00	58.00	21.00	13.00
CAESIUM	1.0	2.00	-1.00	2.60	-1.00	-1.00	2.50	2.20	2.00	2.60	2.70
CHROMIUM	5.0	30.0	19.0	310.0	400.0	73.0	130.0	16.0	11.0	470.0	480.0
COBALT	1.0	31.00	22.00	46.00	45.00	43.00	38.00	15.00	21.00	45.00	37.00
EUROPIUM	.5	1.50	1.30	.90	.89	1.10	1.40	1.40	1.10	.81	-.50
GOLD, ppb	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	8.0	-5.0
HAFNIUM	1.0	2.60	1.50	1.00	1.30	1.80	4.10	5.10	9.20	1.50	1.60
IRIDIUM, ppb	20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0
IRON, %	.05	6.800	7.300	6.380	6.620	7.080	6.100	6.330	8.300	5.800	5.690
LANTHANUM	.5	18.00	17.00	8.70	5.30	12.00	24.00	23.00	25.00	10.00	8.00
LUTETIUM	.2	.41	.25	.25	.21	.29	.48	.74	.81	.29	.26
MOLYBDENUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
RUBIDIUM	20.0	38.0	94.0	74.0	33.0	49.0	37.0	61.0	59.0	65.0	110.0
SAMARIUM	.20	5.60	4.60	2.90	2.40	3.30	5.40	6.90	6.00	3.10	1.90
SCANDIUM	.10	25.90	21.60	36.30	43.20	31.40	24.80	22.20	20.90	41.50	32.50
SELENIUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
SILVER	5.0	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
TANTALUM	1.0	1.30	-1.00	2.30	1.20	-1.00	2.50	1.90	2.50	-1.00	-1.00
TELLURIUM	50.0	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00
THORIUM	.5	8.20	6.50	3.00	3.30	4.30	7.50	13.00	20.00	3.10	3.80
TIN	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0
TUNGSTEN	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
URANIUM	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	2.30	3.70	-2.00	-2.00
YTTERBIUM	.5	2.00	1.40	1.50	1.40	1.50	2.60	4.00	4.10	1.70	1.30
ZINC	100.0	140.0	130.0	240.0	180.0	190.0	520.0	220.0	240.0	260.0	200.0

BECQUEREL LABORATORIES
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P.O. BOX 93
MENAI. NSW. 2234

NEUTRON ACTIVATION ANALYSIS

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BECQUEREL JOB # 001

ELEMENT	DL	# 81891	# 81893	# 81894	# 81895	# 81897	# 81898	# 81899	# 81900	# 81901	# 81902
ANTIMONY	.2	1.90	.48	.50	.46	.46	1.00	1.70	1.50	3.60	1.00
ARSENIC	2.0	2.20	-2.00	-2.00	4.40	-2.00	2.30	4.70	2.50	14.00	4.00
BARIUM	100.0	340.0	400.0	-100.0	410.0	170.0	270.0	240.0	100.0	-100.0	480.0
BROMINE	2.0	7.80	6.50	-2.00	7.70	-2.00	-2.00	-2.00	2.40	2.50	2.50
CADMIUM	30.0	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00
CERIUM	2.0	18.00	16.00	32.00	15.00	18.00	42.00	79.00	6.90	6.80	67.00
CAESIUM	1.0	2.60	-1.00	-1.00	-1.00	-1.00	5.60	3.30	-1.00	-1.00	5.50
CHROMIUM	5.0	190.0	83.0	32.0	220.0	41.0	28.0	19.0	85.0	2970.0	210.0
COBALT	1.0	36.00	26.00	10.00	37.00	31.00	13.00	7.00	52.00	74.00	23.00
EUROPIUM	.5	-.50	-.50	-.50	-.50	-.50	.85	1.40	-.50	-.50	1.40
GOLD, ppb	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
HAFNIUM	1.0	2.80	4.20	5.90	2.20	2.10	5.70	8.50	-1.00	-1.00	4.60
IRIDIUM, ppb	20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0
IRON, %	.05	7.630	5.310	3.200	6.600	5.000	5.000	2.200	7.030	7.320	5.890
LANTHANUM	.5	9.30	7.90	17.00	8.00	11.00	21.00	42.00	4.10	2.20	34.00
LUTETIUM	.2	-.20	-.20	.25	.26	-.20	.47	.80	-.20	.24	.53
MOLYBDENUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
RUBIDIUM	20.0	63.0	-20.0	-20.0	55.0	-20.0	130.0	140.0	24.0	-20.0	120.0
SAMARIUM	.20	1.90	1.80	2.60	2.00	2.10	4.40	9.00	1.00	1.10	7.40
SCANDIUM	.10	42.30	30.30	12.70	42.90	37.30	10.50	8.50	47.60	31.90	26.00
SELENIUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
SILVER	5.0	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
TANTALUM	1.0	-1.00	1.70	2.70	-1.00	2.90	1.40	2.10	-1.00	-1.00	1.60
TELLURIUM	50.0	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00
THORIUM	.5	5.00	4.40	7.90	2.50	3.70	13.00	20.00	1.30	1.80	11.00
TIN	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0
TUNGSTEN	2.0	-2.00	-2.00	2.20	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
URANIUM	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	3.70	4.20	-2.00	-2.00	-2.00
YTTERBIUM	.5	1.30	1.10	1.40	1.30	1.00	2.70	4.20	.88	1.00	3.00
ZINC	100.0	280.0	270.0	110.0	160.0	280.0	110.0	-100.0	150.0	120.0	130.0

BQ BECQUEREL LABORATORIES

LUCAS HEIGHTS RESEARCH LABORATORIES NEW ILLAWARRA RD, LUCAS HEIGHTS, NS

Telephone: (02) 543 2644

Facsimile: (02) 543 2655

P.O. BOX 9(

MENAI, NSW, 223-

N E U T R O N   A C T I V A T I O N   A N A L Y S I S

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BECQUEREL JOB # 001

ELEMENT	DL	# 81903	# 81906	# 81907	# 81910	# 81911	# 81913	# 81914	# 81915	# 81916	# 81918
ANTIMONY	.2	1.70	.35	.50	.81	-.20	.59	.54	.37	1.70	1.60
ARSENIC	2.0	7.20	3.80	2.80	14.00	-2.00	-2.00	2.40	5.00	5.30	10.00
BARIUM	100.0	600.0	130.0	140.0	1400.0	160.0	130.0	120.0	150.0	300.0	190.0
BROMINE	2.0	-2.00	-2.00	-2.00	-2.00	2.60	3.70	-2.00	2.10	-2.00	-2.00
CADMIUM	30.0	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00
CERIUM	2.0	81.00	14.00	25.00	25.00	22.00	20.00	16.00	21.00	72.00	13.00
CAESIUM	1.0	3.10	-1.00	2.30	2.90	-1.00	1.20	1.70	1.20	4.30	1.00
CHROMIUM	5.0	21.0	360.0	84.0	470.0	280.0	906.0	410.0	290.0	44.0	1650.0
COBALT	1.0	6.70	55.00	43.00	38.00	32.00	43.00	39.00	45.00	27.00	60.00
EUROPIUM	.5	1.00	.50	.83	.69	-.50	-.50	-.50	-.50	1.40	-.50
GOLD, ppb	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
HAFNIUM	1.0	6.20	1.50	2.30	1.90	1.90	1.70	1.00	1.80	5.90	1.30
IRIDIUM, ppb	20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0
IRON, %	.05	2.100	8.910	7.930	4.600	4.600	5.050	5.680	7.790	6.960	7.270
LANTHANUM	.5	45.00	6.40	12.00	13.00	9.50	9.50	7.00	11.00	39.00	5.40
LUTETIUM	.2	.54	.42	.55	.28	.22	.20	.21	.24	.67	-.20
MOLYBDENUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
RUBIDIUM	20.0	140.0	-20.0	-20.0	62.0	-20.0	27.0	-20.0	57.0	180.0	34.0
SAMARIUM	.20	6.40	2.60	2.60	3.10	2.80	2.80	1.90	2.50	7.60	1.20
SCANDIUM	.10	6.00	61.60	40.60	31.00	32.70	32.80	36.70	32.70	21.40	28.80
SELENIUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
SILVER	5.0	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
TANTALUM	1.0	1.20	1.30	1.10	1.50	3.80	-1.00	1.40	-1.00	1.20	-1.00
TELLURIUM	50.0	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00
THORIUM	.5	19.00	1.50	6.70	3.90	4.70	3.60	1.70	3.40	12.00	2.00
TIN	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0
TUNGSTEN	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
URANIUM	2.0	3.60	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
YTTERBIUM	.5	2.90	2.50	2.70	1.50	1.30	1.30	1.30	1.30	3.40	.75
ZINC	100.0	-100.0	190.0	170.0	230.0	200.0	-100.0	130.0	240.0	-100.0	170.0

BECQUEREL LABORATORIES
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460157

NEUTRON ACTIVATION ANALYSIS

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BECQUEREL JOB # 001

ELEMENT	DL	# 81920	# 81921	# 81922	# 81923	# 81924	# 81925	# 81926	# 81928	# 81931	# 81932
ANTIMONY	.2	1.70	.55	1.30	1.60	.54	.92	3.20	.52	.71	.55
ARSENIC	2.0	-2.00	3.80	4.50	3.60	3.50	-2.00	-2.00	-2.00	5.50	5.70
BARIUM	100.0	-100.0	500.0	560.0	810.0	2400.0	440.0	220.0	1200.0	920.0	530.0
BROMINE	2.0	-2.00	-2.00	-2.00	2.00	-2.00	2.20	-2.00	-2.00	-2.00	-2.00
CADMIUM	30.0	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00	-30.00
CERIUM	2.0	29.00	42.00	57.00	54.00	80.00	6.40	21.00	72.00	120.00	31.00
CAESIUM	1.0	-1.00	-1.00	1.40	2.50	1.40	2.10	1.70	2.30	1.80	-1.00
CHROMIUM	5.0	1080.0	240.0	86.0	78.0	23.0	130.0	45.0	15.0	34.0	33.0
COBALT	1.0	47.00	39.00	22.00	18.00	5.90	23.00	44.00	3.70	2.40	47.00
EUROPIUM	.5	.55	1.10	1.40	1.40	1.40	-.50	1.40	1.90	1.70	1.50
GOLD, ppb	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
HAFNIUM	1.0	2.40	4.60	5.00	4.30	7.80	3.30	2.20	6.50	9.00	2.20
IRIDIUM, ppb	20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0
IRON, %	.05	6.240	6.350	6.280	5.470	3.800	6.210	8.180	2.100	3.100	8.110
LANTHANUM	.5	15.00	21.00	30.00	29.00	41.00	3.70	11.00	38.00	79.20	17.00
LUTETIUM	.2	.21	.45	.55	.48	.73	-.20	.48	.71	.87	.49
MOLYBDENUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
RUBIDIUM	20.0	-20.0	-20.0	48.0	70.0	170.0	130.0	25.0	110.0	50.0	46.0
SAMARIUM	.20	2.60	5.60	6.50	5.90	8.40	1.00	4.50	9.00	11.00	6.20
SCANDIUM	.10	29.10	25.20	22.30	18.90	13.40	38.80	38.10	8.50	10.00	35.30
SELENIUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
SILVER	5.0	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
TANTALUM	1.0	-1.00	1.30	1.40	1.20	1.30	-1.00	1.30	1.50	1.40	-1.00
TELLURIUM	50.0	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00	-50.00
THORIUM	.5	5.00	8.50	12.00	11.00	17.00	4.20	3.60	20.00	22.00	3.80
TIN	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0
TUNGSTEN	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
URANIUM	2.0	-2.00	2.40	-2.00	2.10	4.00	-2.00	-2.00	4.20	3.80	-2.00
YTTERBIUM	.5	1.10	2.60	3.10	2.60	3.70	.86	2.80	3.80	4.20	3.10
ZINC	100.0	360.0	260.0	170.0	140.0	180.0	170.0	550.0	130.0	130.0	800.0

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ACO158

NEUTRON ACTIVATION ANALYSIS

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BECQUEREL JOB # 001

ELEMENT	DL	# 81933	# 81849x2	# 81873x2	# 81897x2
ANTIMONY	.2	7.90	1.80	1.80	-.20
ARSENIC	2.0	5.80	13.00	27.00	-2.00
BARIUM	100.0	300.0	150.0	370.0	240.0
BROMINE	2.0	-2.00	2.30	-2.00	-2.00
CADMIUM	30.0	-30.00	-30.00	-30.00	-30.00
CERIUM	2.0	27.00	51.00	150.00	21.00
CAESIUM	1.0	1.50	-1.00	2.90	-1.00
CHROMIUM	5.0	84.0	45.0	460.0	45.0
COBALT	1.0	35.00	25.00	19.00	34.00
EUROPIUM	.5	1.40	1.60	2.00	.55
GOLD, ppb	5.0	-5.0	-5.0	-5.0	-5.0
HAFNIUM	1.0	1.90	4.50	4.90	2.30
IRIDIUM, ppb	20.0	-20.0	-20.0	-20.0	-20.0
IRON, %	.05	6.350	9.120	5.920	5.080
LANTHANUM	.5	16.00	26.00	86.40	11.00
LUTETIUM	.2	.39	.47	.40	-.20
MOLYBDENUM	5.0	-5.0	-5.0	-5.0	-5.0
RUBIDIUM	20.0	-20.0	34.0	97.0	-20.0
SAMARIUM	.20	4.40	6.40	11.00	2.10
SCANDIUM	.10	30.10	23.20	25.20	37.90
SELENIUM	5.0	-5.0	-5.0	-5.0	-5.0
SILVER	5.0	-5.00	-5.00	-5.00	-5.00
TANTALUM	1.0	1.80	2.10	1.00	3.50
TELLURIUM	50.0	-50.00	-50.00	-50.00	-50.00
THORIUM	.5	4.30	10.00	33.00	3.30
TIN	500.0	-500.0	-500.0	-500.0	-500.0
TUNGSTEN	2.0	-2.00	-2.00	-2.00	-2.00
URANIUM	2.0	-2.00	-2.00	5.00	-2.00
YTTERBIUM	.5	2.00	2.60	1.90	1.30
ZINC	100.0	220.0	390.0	190.0	250.0

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158

460159

ANALABS

A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.

Phone (09)4587999 | 52 Murray Road, Welshpool, W.A. 6106 | Fax (09) 4582922

ANALYTICAL REPORT No. 730.0.01.73527

THIS REPORT MUST BE READ IN CONJUNCTION WITH THE ACCOMPANYING ANALYTICAL DATA

INVOICE TO:
G Jenkins
Pasminco Mining Rosebery
Geology Department
PO Box 21
Rosebery TAS 7470

ORDER No.	PROJECT
901346	419000

DATE RECEIVED	RESULTS REQUIRED
19/02/90	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
1	27/02/90	1	18

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
81794/809,81814,81817	PU Prep :	Pb/101,601,104
81794/809,81814,81817	PU Prep :	Pb6:4,Pb7:4,Pb8:4/223

RESULTS TO:
Chief Geologist
Pasminco Mining Rosebery

PO Box 21
Rosebery TAS 7470

RESULTS TO:
G Jenkins
Pasminco Mining Rosebery
Geology Department
PO Box 21
Rosebery TAS 7470

RESULTS TO:

REMARKS

AUTHORISED OFFICER

ANALABS

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No	PAGE
	730.0.01.73527	27/02/90	901346	1 OF 1

TUBE No	SAMPLE No.	Pb	Pb	Pb	Pb6:4	Pb7:4	Pb8:4			
1	81794	85	–	–	18.067	15.538	37.670			
2	81795	125	–	–	18.175	15.598	37.858			
3	81796	90	–	–	18.149	15.626	37.968			
4	81797	1150	–	–	18.577	15.796	38.584			
5	81798	>5000	–	1.60	18.305	15.050	38.074			
6	81799	>5000	–	2.13	18.295	15.609	37.871			
7	81800	>5000	–	3.80	18.228	15.554	37.567			
8	81801	>5000	6.1	–	18.070	15.495	37.242			
9	81802	>5000	–	4.40	18.152	15.582	37.502			
10	81803	>5000	–	4.50	18.136	15.546	37.433			
11	81804	>5000	–	0.77	18.248	15.615	38.065			
12	81805	>5000	–	2.54	18.268	15.614	37.742			
13	81806	730	–	–	18.070	15.493	37.152			
14	81807	455	–	–	18.185	15.561	37.661			
15	81808	290	–	–	18.195	15.617	37.882			
16	81809	340	–	–	18.262	15.660	37.948			
17	81814	610	–	–	18.175	15.565	37.513			
18	81817	230	–	–	18.278	15.697	38.055			
19										
20										
21										
22										
23	DETECTION	5	0.1	0.01	0.000	0.000	0.000			
24	UNITS	ppm	%	%	–	–	–			
25	METHOD	101	601	104	223	223	223			

Results in ppm unless otherwise specified
T = element present, but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

AUTHORISED OFFICER D. Hall

CLASSIC LABORATORIES LTD
Osman Place, Thebarton, South Australia 5031
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460161

Mr G Jenkings
Pasminco Mining Rosebery
Electrolytic Zinc Company of Australia
P.O. Box 21
ROSEBERY TAS 7470

FINAL ANALYSIS REPORT

Your Order No: 901316 Our Job Number : 0AD1536

Samples received : 22-MAY-1990 Results reported : 30-MAY-1990
No. of samples : 2
Report comprises a cover sheet and pages G1, W1

This report relates specifically to the samples tested in so far as that the samples as supplied are truly representative of the sample source.

Note:
If you have any enquiries please contact Mr David Eardley-Harris quoting the above job number.

Approved Signatory:

D. Eardley-Harris
for
Dr John Kikkert
General Manager - Adelaide

CC Chief Geologist Rosebery

Report Codes:
N.A. - Not Analysed.
L.N.R. - Listed But Not Received.
I.S. - Insuffcent Sample.

Distribution Codes:
CC - Carbon Copy
EM - Electronic Media
MM - Magnetic Media

"RELIABLE ANALYSES AT COMPETITIVE COST"

CLASSIC LABORATORIES LTD

REPORT : 0AD1536
PAGE : W1

Results in micrograms/L

SAMPLE ID	Ba	Ag	Au	Cd	Cu	Pb	Zn
81941	<20	<0.2	<0.5	<0.1	2.5	<0.5	1.0
81942	<20	<0.2	<0.5	<0.1	1.5	<0.5	1.5
BLK	<20	<0.2	<0.5	<0.1	<0.5	<0.5	1.0
	WAT 3A	WAT 3A	WAT 3A	WAT 3A	WAT 3A	WAT 3A	WAT 3A

CLASSIC LABORATORIES LTD

Page G1

Client Ref. 901316 Report 0AD1536

Sample ID	Sb
Code	WAT 4
Results in	ug/L
Blank.	<5
81941	5
81942	20

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460164

Mr G Jenkins
Pasminco Mining Rosebery
Electrolytic Zinc Company of Australia
P.O. Box 21
ROSEBERY TAS 7470

FINAL ANALYSIS REPORT

Your Order No: 901317 | Our Job Number : 0AD1538

Samples received : 22-MAY-1990 | Results reported : 29-MAY-1990
No. of samples : 13
Report comprises a cover sheet and pages 1 to 3

This report relates specifically to the samples tested in so far as that the samples as supplied are truly representative of the sample source.

Note:
If you have any enquiries please contact Mr David Eardley-Harris quoting the above job number.

Approved Signatory:

Dr John Kikkert
General Manager - Adelaide

CC	Chief Geologist	Rosebery
MM	Mr G Jenkins	Rosebery

Report Codes:
N.A. - Not Analysed.
L.N.R. - Listed But Not Received.
I.S. - Insuffcient Sample.

Distribution Codes:
CC - Carbon Copy
EM - Electronic Media
MM - Magnetic Media

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CLASSIC LABORATORIES LTD

Job: 0AD1538
O/N: 901317

ANALYTICAL REPORT

Sample	Bi	Cd	Co	Cu	Fe	Mn	Ni
81934	<10	3	8	4	3.95%	70	4
81935	<10	5	14	19	7.00%	900	8
81936	<10	<1	16	9	7.10%	2250	6
81937	<10	3	24	2150	14.0%	760	8
81938	<10	3	12	58	7.65%	660	5
81939	<10	3	24	60	12.8%	1560	18
81940	<10	2	20	13	9.80%	1140	8
81943	<10	3	25	62	10.6%	1.07%	10
81944	<10	2	32	12	14.2%	1.56%	14
81945	<10	1	24	6	11.0%	1.24%	4
81946	<10	<1	18	19	7.50%	3750	8
81947	10	5	35	7	13.4%	670	18
81950	<10	3	20	7	8.65%	1620	10
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detn Limit	10	1	4	2	4	4	4
Scheme	AAS1	AAS1	AAS1	AAS1	AAS1	AAS1	AAS1
Upper Scheme					AAS1C	AAS1C	

CLASSIC LABORATORIES LTD

Job: 0AD1538
O/N: 901317

ANALYTICAL REPORT

Sample	Pb	Zn	Au Avg	Au	Au Rp1	Au SS1
81934	20	78	2	3	<2	--
81935	430	1020	75	65	90	--
81936	990	520	8	8	--	--
81937	310	320	895	1030	760	--
81938	24	280	125	110	140	--
81939	640	830	290	330	250	--
81940	62	550	15	15	--	--
81943	300	590	110	110	110	--
81944	480	610	135	130	140	--
81945	100	410	240	260	220	--
81946	100	360	80	70	90	--
81947	260	450	185	190	180	--
81950	76	410	13	13	--	--
Units	ppm	ppm	ppb	ppb	ppb	ppb
Detn L	4	2	1	1	2	2
Scheme	AAS1	AAS1	FA3	FA3	FA3	FA3

CLASSIC LABORATORIES LTD

Job: 0AD1538
O/N: 901317

ANALYTICAL REPORT

Sample	Ag	As
81934	<1	<50
81935	1	50
81936	<1	<50
81937	7	150
81938	<1	<50
81939	3	100
81940	<1	50
81943	1	<50
81944	1	<50
81945	<1	50
81946	<1	50
81947	<1	50
81950	<1	50
Units	ppm	ppm
Detn L	1	50
Scheme	AAS2	AAS2

CLASSIC LABORATORIES LTD
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Mr G Jenkins
Pasminco Mining Rosebery
Electrolytic Zinc Company of Australia
P.O. Box 21
ROSEBERY TAS 7470

F I N A L A N A L Y S I S R E P O R T

Your Order No: 901353 Our Job Number : 0AD1902

Samples received : 19-JUN-1990 Results reported : 27-JUN-1990
No. of samples : 23
Report comprises a cover sheet and pages 1 to 3

This report relates specifically to the samples tested in so far as that the samples as supplied are truly representative of the sample source.

Note:
If you have any enquiries please contact Mr David Eardley-Harris quoting the above job number.

Approved Signatory:

D. Eardley-Harris
for

John Waters
Technical Manager - Adelaide

CC	Chief Geologist	Rosebery
MM	Mr G Jenkins	Rosebery

Report Codes:
N.A. - Not Analysed.
L.N.R. - Listed But Not Received.
I.S. - Insuffcent Sample.

Distribution Codes:
CC - Carbon Copy
EM - Electronic Media
MM - Magnetic Media

"RELIABLE ANALYSES AT COMPETITIVE COST"

CLASSIC LABORATORIES LTD

Job: 0AD1902
O/N: 901353

ANALYTICAL REPORT

Sample	Bi	Cd	Co	Cu	Fe	Mn	Ni
81948	15	3	36	75	5.85%	660	20
81949	<10	<1	14	13	2.15%	165	8
81951	10	<1	10	2	3.30%	460	8
81952	10	6	12	52	6.20%	410	6
81953	10	<1	8	18	4.10%	105	8
81954	20	5	10	115	6.40%	1040	18
81955	<10	5	16	66	3.55%	640	5
81956	<10	<1	20	5	4.30%	490	8
81957	10	4	8	3	2.85%	240	6
81958	20	<1	30	40	7.70%	1000	24
81959	<10	2	10	9	2.90%	340	6
81960	<10	3	6	3	1.69%	130	6
81961	15	6	10	380	5.50%	145	8
81962	<10	2	22	40	7.55%	4100	5
81963	<10	7	8	5	1.71%	120	4
81964	<10	2	<4	10	1.09%	42	<4
81965	<10	1	8	16	5100	12	10
81966	<10	5	<4	20	1.40%	66	<4
81967	<10	1	8	18	1.28%	36	5
81968	10	1	26	22	7.15%	2300	6
81969	10	1	5	17	3.30%	220	4
81970	<10	<1	8	13	1.95%	74	15
81971	15	3	6	20	2.60%	56	8
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
DL	10	1	4	2	4	4	4
Scheme	AAS1	AAS1	AAS1	AAS1	AAS1	AAS1	AAS1
Upper Scheme					AAS1C		

CLASSIC LABORATORIES LTD

Job: 0AD1902
O/N: 901353

ANALYTICAL REPORT

Sample	Pb	Zn	Au Avg	Au	Au Rp1	Au SS1
81948	12	230	4	8	--	<2
81949	4	60	5	5	--	--
81951	330	165	10	10	--	--
81952	700	620	90	85	95	--
81953	62	82	16	16	--	--
81954	165	130	400	355	440	--
81955	1500	580	13	13	--	--
81956	92	190	2	2	--	--
81957	75	98	5	5	--	--
81958	300	400	2	2	--	--
81959	26	100	<1	<1	--	--
81960	12	46	<1	<1	--	--
81961	680	290	22	28	18	--
81962	810	1250	9	9	--	--
81963	44	54	<1	<1	--	--
81964	15	20	<1	<1	--	--
81965	5	35	<1	<1	--	--
81966	22	8	28	38	20	--
81967	1600	1120	48	55	44	--
81968	32	760	<1	<1	--	--
81969	105	62	<1	<1	--	<2
81970	20	38	<1	<1	--	--
81971	40	16	<1	<1	--	--
Units	ppm	ppm	ppb	ppb	ppb	ppb
DL	4	2	1	1	2	2
Scheme	AAS1	AAS1	FA3	FA3	FA3	FA3

CLASSIC LABORATORIES LTD

Job: 0AD1902
O/N: 901353

ANALYTICAL REPORT

Sample	Ag	As
81948	3	<50
81949	1	<50
81951	2	<50
81952	2	50
81953	1	<50
81954	3	50
81955	2	<50
81956	<1	<50
81957	2	<50
81958	1	100
81959	<1	<50
81960	<1	<50
81961	3	50
81962	1	<50
81963	1	<50
81964	1	100
81965	<1	50
81966	<1	<50
81967	2	50
81968	2	150
81969	<1	50
81970	2	<50
81971	1	<50
Units	ppm	ppm
DL	1	50
Scheme	AAS2	AAS2

APPENDIX 4. PETROLOGY

PETROGRAPHIC DESCRIPTION

SAMPLE NUMBER: 81701 (DDH HR5, 167.8m)

SECTION TYPE: Normal thin section

ROCK NAME: Altered plagioclase phyric andesite lava

PETROGRAPHIC DESCRIPTION:

Plagioclase (approximately oligoclase composition) 30%, as corroded subhedral phenocrysts up to 5mm. Extensively sericitised in places along twin planes resembles perthitic texture at first glance. Mainly albite twinning, also pericline and minor Carlsbad twinning. Plagioclase is also silicified in places to very fine grained (~20µm) aggregates of quartz with minor needle shaped grains of an accessory mineral (?rutile) to 10µm.

Other phenocrysts up to 2mm of equant shape may have been pyroxene, but are strongly altered, containing aggregates of radiating clusters of ?quartz about cores of sericite as well as some chlorite. Still other ghosts of equant phenocrysts contain coarser quartz aggregates. All the ghosts of phenocrysts have embayed boundaries due to reaction with mineralising fluids.

Matrix 70% is very fine grained sericite + quartz (?+ feldspar). Quartz + ?feldspar occurs in lenticular 100µm aggregates with a sericitic matrix. Abundant chlorite, possibly with high chromium content (lavender-purple colour). Chlorite is also concentrated in two 3mm wide crosscutting veins with sericite and minor quartz. Also pervading the section are irregular 100µm veins which at first glance appear opaque on low power but are in fact very fine grained carbonate. This carbonate also occurs along selvages of chlorite veins and at the margins of phenocrysts. Veins about 10µm wide of sericite + quartz represent the final episode of alteration; these are relatively straight, and crosscut all other features. Some earlier irregular 10µm veins of sericite crosscut plagioclase phenocrysts but terminate at the boundary with the matrix.

Suggested alteration paragenesis: (1) early sericite + quartz, (2) chlorite veining and pervasive chloritisation, (3) carbonate alteration, (4) late sericite + quartz.

PETROGRAPHIC DESCRIPTION

SAMPLE NUMBER: 81702 (DDH HR5, 172.4m)

SECTION TYPE: Normal thin section

ROCK NAME: Epidote altered plagioclase phyric andesite lava

PETROGRAPHIC DESCRIPTION:

In relatively unaltered material, glomerocrysts to 3mm of plagioclase (individual grains 0.2-0.5mm) of approximately oligoclase composition, in groundmass of finer individual plagioclase laths (30% of total rock). Epidote replaces pyroxene (relict pieces visible) as equant 100-300µm grains (20% of total). K feldspar as corroded embayed grains (15% of total). Quartz as very fine scattered grains (<5% of total).

In altered veined material, sericitic alteration of feldspars, which appears to terminate at boundary with groundmass. Extensive veins and networks of epidote (10µm grainsize) and fine grained carbonate (<5µm grainsize) + sericite alteration corrodes and embays phenocrysts. These are in turn cut by coarse (~1mm) carbonate as veins; the veins also contain chlorite (which lacks the lavender-purple colour of that in 81701) as well as minor fine grained quartz + sericite. The white spots observed in hand specimen are aggregates of very fine carbonate.

Minor opaques occur in epidote veined areas and are possibly sulphides; traces of galena were observed in hand specimen.

Suggested alteration paragenesis: (1) sericitic alteration of feldspar (2) epidote + fine grained carbonate (+ sericite) veining (3) opaques (4) very fine grained carbonate aggregates (white spots) (5) coarse carbonate + chlorite (+ quartz + sericite).

PETROGRAPHIC DESCRIPTION

SAMPLE NUMBER: 81703 (DDH HR5, 186.4m)

SECTION TYPE: Polished thin section

ROCK NAME: Strongly altered plagioclase phyric andesite lava

PETROGRAPHIC DESCRIPTION:

Original mineralogy obscure, but probably very fine grained feldspar + quartz + glass. Relict heavily corroded feldspar phenocrysts are visible in places.

Alteration minerals are epidote, quartz, chlorite, carbonate, minor sericite. Epidote occurs as elongate grains up to 3mm with the coarser grains in and about veins and finer grains disseminated. Quartz occurs as coarse (up to 5mm) euhedral crystals in veins and as fine scattered aggregates; many of the grains in these aggregates have sutured boundaries. Carbonate occurs as very coarse single crystals in veins. Chlorite occurs as 100μm radiating clusters in veins and also scattered through the rock and associated with fine grained quartz. Sericite is disseminated.

Galena occurs in fractures in coarse quartz and is also disseminated. One grain of galena occurs in a fracture which crosscuts some epidote grains and is closed by others. Apparently galena is associated with epidote alteration in this specimen. Chalcopyrite occurs as inclusions in galena and is also disseminated. Pyrite is disseminated, associated with chalcopyrite. Sphalerite is disseminated, and contains chalcopyrite disease.

Suggested alteration paragenesis: (1) sericite + very fine quartz, (2) coarse quartz + epidote + sulphides, (3) chlorite + very fine quartz, (4) coarse carbonate veining.

PETROGRAPHIC DESCRIPTION

SAMPLE NUMBER: 81728

SECTION TYPE: Normal thin section

ROCK NAME: Gabbro

PETROGRAPHIC DESCRIPTION:

Altered plagioclase 50%, altered clinopyroxene 50%.

Coarse grainsize (1-10mm), relatively equigranular.

Alteration consists of extensive sericitisation and silicification of plagioclase, with chloritisation in places. Silica grainsize 5µm, sericite 5-500µm, chlorite 100-1000µm. Coarser sericite occurs along and about veins, which also contain quartz. Vein width 10-50µm. Minor red colour about veins is a weathering/oxidation effect. Bulk of alteration is pervasive.

SAMPLE NUMBER: 81731

SECTION TYPE: Normal thin section

ROCK NAME: Greywacke

PETROGRAPHIC DESCRIPTION:

Clasts 50%, very fine grained matrix 50%.

Clasts 0.2-2.0mm, predominantly angular, poorly sorted, mainly random orientation, with a few clusters in subparallel orientation. Clasts consist of: quartz, including aggregates of quartz grains with sutured boundaries; extensively sericitised K feldspar and lesser plagioclase; biotite, partly chloritised; orthopyroxene, partly chloritised; lithic fragments.

Matrix is extensively chloritised and to a lesser extent silicified.

Opaques (unidentified, but pyrite observed in hand specimen) up to 100µm, 1% of total, appear contemporaneous with chloritisation. They occur in the matrix and to a lesser extent corroding some clasts.

PETROGRAPHIC DESCRIPTION

SAMPLE NUMBER: 81747

SECTION TYPE: Normal thin section

ROCK NAME: K feldspar phyric andesite ("Halls Rivulet andesite")

PETROGRAPHIC DESCRIPTION:

Plagioclase 35%, chlorite 40%, K feldspar 15%, opaques 5%, quartz 5%, traces zircon, ?rutile.

Plagioclase occurs as groundmass of interlocking 50-500µm laths with interstitial chlorite (probably after glass).

Chlorite also occurs in some phenocrysts.

K feldspar (zoned sanidine) occurs as 1-3mm phenocrysts, partly sericitised.

Quartz grains 10-100µm, filling interstices and cavities in groundmass. Quartz contains inclusions of opaques, zircon and ?rutile needles.

Opaques (unidentified) occur in groundmass and phenocrysts, in some places along fractures in phenocrysts.

Red/orange colour about recent fractures is a weathering/oxidation effect.

SAMPLE NUMBER: 81749

SECTION TYPE: Normal thin section

ROCK NAME: K feldspar phyric andesite ("Halls Rivulet andesite")

PETROGRAPHIC DESCRIPTION:

Chloritised/sericitised plagioclase 30%, chloritised mafics 40%, K feldspar 10%, quartz 5%, weathered iron rich opaques 5%.

Strongly weathered, but apparently the same lithology as 81747. Groundmass of interlocking 100µm plagioclase laths is just visible. Strong pervasive chloritisation, more than for 81747. Some quartz is later groundmass silicification. Quartz contains traces of rutile.

PETROGRAPHIC DESCRIPTION

SAMPLE NUMBER: 81792

SECTION TYPE: Normal thin section

ROCK NAME: Andesite

PETROGRAPHIC DESCRIPTION:

Plagioclase 40%, chloritised mafics/glass 30%, K feldspar 10%, quartz 1%.

Plagioclase occurs as interlocking subparallel laths, strongly sericitised and silicified, grainsize 50-100µm. Interstitial mafics/glass completely chloritised. K feldspar has similar grainsize to plagioclase, and is strongly sericitised. Opaques have 1-10µm grainsize and occur as inclusions in all other minerals. Late veining by chlorite and opaques, veins up to 2mm wide, with some evidence of shear along veins.

SAMPLE NUMBER: 81793

SECTION TYPE: Normal thin section

ROCK NAME: Metamorphosed siltstone

PETROGRAPHIC DESCRIPTION:

Quartz 20%, sericitised pelitic material 65%, carbonate alteration spots 10%, opaques 5%.

Quartz grainsize 10-100µm, angular grains, with long axis of most grains parallel to foliation in pelitic layers. Bedding defined by quartz-rich layers; foliation cuts bedding in this section at about 5°. Ends of quartz grains corroded by sericite.

Carbonate alteration occurs as 1mm spots with irregular edges preferentially replacing pelitic material; some quartz grains and opaques remain within alteration spots. In places, carbonate spots with relict foliation have been rotated during their formation.

Foliation is defined by parallel orientation of 1-10µm grains of strongly sericitised pelitic material.

Opaques 10-100µm grainsize, many elongate parallel to foliation.

PETROGRAPHIC DESCRIPTION

SAMPLE NUMBER: 81821

SECTION TYPE: Normal thin section

ROCK NAME: Greywacke

PETROGRAPHIC DESCRIPTION:

Quartz 50%, K feldspar 5%, lithic fragments 20%, chloritised matrix 25%, opaques <1%.

Quartz grains 30-300μm, angular to subrounded, randomly oriented and distributed.

K feldspar grains 30-300μm, angular to subrounded, randomly oriented and distributed.

Lithics as for quartz and K feldspar, consist of quartzite and siltstone/shale.

Predominantly clast supported; matrix is subordinate. Matrix is chloritised, presumably pelitic material. Chlorite foliation wraps around clasts.

Opaques 10-200μm, unidentified, scattered through matrix.

SAMPLE NUMBER: 81822

SECTION TYPE: Normal thin section

ROCK NAME: Altered andesite lava

PETROGRAPHIC DESCRIPTION:

Quartz 2%, altered plagioclase 60%, altered mafics 30%, opaques 3%, feldspar + ?pyroxene phenocrysts 5%.

Plagioclase grainsize 200μm, interlocking laths with preferred orientation. Strongly sericite altered. Mafics 100-200μm altered to iron oxides and chlorite. Opaques 20-200μm, irregularly shaped. Phenocrysts 1mm, feldspar + mafics, both strongly sericitised, mafics chloritised also. Quartz 20-40μm interstitial to plagioclase.

PETROGRAPHIC DESCRIPTION

SAMPLE NUMBER: 81823

SECTION TYPE: Polished thin section

ROCK NAME: Mineralised siltstone/shale

PETROGRAPHIC DESCRIPTION:

Quartz 10%, altered pelitic material 68%, epidote 1%, carbonate 1%, opaques 20% (pyrite 1%, sphalerite 9%, galena 10%, trace chalcopyrite).

Quartz grainsize 10-200µm, irregularly shaped grains, as single grains isolated in pelitic material, and as aggregates often associated with sulphides. Pelitic material grainsize 2-20µm, as chlorite- and sericite-rich bands 10mm wide. In one chlorite-rich band, relict bedding is preserved as isolated folds of sericite-rich material; transposition of bedding is suggested. Minerals in general are aligned in layers parallel to foliation. Epidote occurs as 500µm aggregates. Carbonate occurs as cross cutting veins, some containing sulphide.

Sulphides are interstitial to translucent minerals; most areas of sulphide have cuspate margins. Galena is quite coarse (500µm) in a quartz-rich layer, finer disseminated in pelitic layers. Coarse galena encloses a few smaller (50-100µm) round sphalerite grains which may represent an earlier stage of mineralisation. Sphalerite is generally finer than and in layers distinct from galena. Some sphalerite is translucent dark brown to amber (low iron content), and some is chalcopyrite diseased; this is opaque (high iron content). Sphalerite tends to be disseminated in pelitic layers to a greater extent than galena. Pyrite occurs as subhedral grains to 200µm, often enclosing small grains of galena. One 50µm grain of chalcopyrite was observed with galena, pyrite and sphalerite in a 5mm area of coarse carbonate.

PETROGRAPHIC DESCRIPTION

SAMPLE NUMBER: 81824

SECTION TYPE: Polished thin section

ROCK NAME: Mineralised siltstone

PETROGRAPHIC DESCRIPTION:

Quartz 20%, altered pelitic material 58%, carbonate 2%, opaques 20% (pyrite 1%, sphalerite 10%, galena 9%).

Quartz 10-100µm, scattered in pelitic material as irregularly shaped grains, and as vein fill associated with sulphides. Pelitic material is heavily chloritised and silicified with original textures completely obscured; shearing in places. Carbonate up to 1mm grainsize in 5mm aggregates containing minor quartz and sulphides.

Sulphides occur mainly in a quartz rich layer. Galena grainsize 20-500µm, interstitial to other minerals, with larger grains enclosing a few round grains of sphalerite. Sphalerite grainsize 20-50µm, dark amber translucent to opaque, with minor chalcopyrite disease, and containing minor euhedral pyrite and galena grains up to 5µm. Sphalerite generally occurs in layers distinct from galena-rich layers. A few 50-100µm wide veins approximately parallel to foliation contain sphalerite, galena and pyrite. Pyrite grainsize up to 100µm, containing a few 10-20µm sphalerite and galena grains.

PETROGRAPHIC DESCRIPTION

SAMPLE NUMBER: 81825

SECTION TYPE: Polished thin section

ROCK NAME: Mineralised andesite

PETROGRAPHIC DESCRIPTION:

Quartz 10%, carbonate 30%, chlorite + sericite 40%, opaques 20% (galena 15%, sphalerite 5%).

Strongly altered and foliated, with a few areas of relict texture characteristic of andesite visible. Quartz grainsize up to 100µm, irregularly shaped grains, probably a recrystallisation or alteration product. Chloritic and sericitic material, 10-50µm grainsize, is arranged parallel to foliation. Carbonate grainsize up to 1mm, occurs in layers or veins parallel to foliation. A few 100µm sericite veins crosscut foliation at a low angle.

Sulphides are associated with quartz and carbonate. A 5-15mm wide band of galena is vein fill; vein quartz occurs at the margins, followed by carbonate, with galena at the centre. Other sphalerite and galena is 10-100µm grainsize, disseminated in fine grained material but still clearly late stage. It is associated with quartz and carbonate.

PETROGRAPHIC DESCRIPTION

SAMPLE NUMBER: 81826

SECTION TYPE: Polished thin section

ROCK NAME: Mineralised andesite

PETROGRAPHIC DESCRIPTION:

Plagioclase 60%, chloritised mafics 10%, sericite 20%, quartz 5%, chlorite 5%, opaques 1% (sphalerite, galena, traces pyrite and chalcopyrite).

Plagioclase grainsize 20-200µm, interlocking laths, strongly sericitised. Chloritised mafics occur in areas of plagioclase. Sericite is pervasive. Quartz occurs as isolated 50µm grains and as aggregates of 10-50µm grains in veins up to 1mm wide with chlorite, carbonate, opaques. Chlorite, sericite alignment defines foliation. Carbonate grainsize up to 500µm, occurs in veins.

Opaques occur in veins with carbonate, postdating carbonate, and as rare 10µm mainly pyrite grains disseminated in the original less altered material. Sphalerite is amber to brown translucent with minor chalcopyrite disease.

SAMPLE NUMBER: 81827

SECTION TYPE: Polished thin section

ROCK NAME: Strongly altered andesite

PETROGRAPHIC DESCRIPTION:

Plagioclase 20%, sericite 40%, chlorite 20%, carbonate 10%, quartz 4%, pyroxene 1%, epidote 4%, opaques 1%.

Plagioclase occurs as interlocking laths 20-200µm, strongly sericitised. Chlorite both disseminated (altered mafics and/or glass) and in veins. Sericite pervasive with parallel alignment defining foliation. Quartz occurs as scattered 20µm grains. Pyroxene (relict) is associated with feldspar. Epidote distributed throughout the specimen. Opaques are disseminated and consist of sphalerite, galena and traces of pyrite. Opaques are generally associated with carbonate. Carbonate occurs as very fine grained (10µm) aggregates in veins.

PETROGRAPHIC DESCRIPTION

SAMPLE NUMBER: 81755

SECTION TYPE: Normal thin section

ROCK NAME: Gabbro

PETROGRAPHIC DESCRIPTION:

Pyroxene 10%, biotite 30%, plagioclase 60%. Sericite 30% of total.

Even grained texture.

Pyroxene grainsize 10-400µm, tabular crystals, some relict in biotite. Biotite 100-600µm, in 1-2mm aggregates, intergrown with and replacing pyroxene. Plagioclase 0.2-1.0mm as interlocking laths, also interlocking with pyroxene and to some extent biotite. Original plagioclase composition not clear due to albitisation.

SAMPLE NUMBER: 81750

SECTION TYPE: Normal thin section

ROCK NAME: Altered gabbro

PETROGRAPHIC DESCRIPTION:

Pyroxene 20%, plagioclase (strongly sericitised and silicified) 78%, relict olivine 2%.

Strong pervasive sericitisation, chloritisation, silicification. Original grainsize 0.2-2.0mm.Pyroxene is embayed and mostly chloritised. Very few original grains of plagioclase remain; replaced by aggregates of 1-10µm sericite and silica. Crosscut by veins of finer grained (10-100µm) aggregates of altered pyroxene and plagioclase, veins 0.1-2.0mm wide. Some late stage 100µm wide quartz veins also exist.

PETROGRAPHIC DESCRIPTION

SAMPLE NUMBER: 81754

SECTION TYPE: Normal thin section

ROCK NAME: Microgabbro

PETROGRAPHIC DESCRIPTION:

Plagioclase (An45-50) 80%, pyroxene 20%.

Grainsize 0.1-1.0mm, seriate textured.

Pyroxene intergranular, embayed, mostly altered to chlorite. Plagioclase sericitised and silicified. Minor late stage 0.1mm wide quartz veins.

SAMPLE NUMBER: 81756

SECTION TYPE: Normal thin section

ROCK NAME: Microgabbro

PETROGRAPHIC DESCRIPTION:

Orthopyroxene 5%, clinopyroxene 35%, plagioclase 60%.

Grainsize 0.1-1.0mm, seriate textured. Largest grains are of plagioclase. Most grains around 200μm.

Pyroxenes intergranular to plagioclase laths. Pyroxenes chloritised, chlorite 20% of total rock. Plagioclase sericitised and silicified. A few rare 1-2mm phenocrysts of Carlsbad and albite twinned plagioclase, sericitised.

PETROGRAPHIC DESCRIPTION

SAMPLE NUMBER: 81757

SECTION TYPE: Normal thin section

ROCK NAME: Tholeiitic (plagioclase and pyroxene phyric) basalt

PETROGRAPHIC DESCRIPTION:

Plagioclase 60%, relict olivine 2%, pyroxene 35%, opaques 3%.

Porphyritic texture. Groundmass 10-100µm, phenocrysts 0.4-2.0mm.

Groundmass consists of interlocking plagioclase laths and chloritised intergranular (?intersertal) mafics and/or glass. Phenocrysts consist of pyroxene, plagioclase and relict olivine. A few 3mm glomerocrysts of relict olivine, pyroxene and plagioclase occur. Plagioclase (both groundmass and phenocrysts) is partly sericitised, and mafics (as phenocrysts) are partly chloritised. Crosscut by 0.5mm wide late stage Kfeldspar+pyroxene+quartz veins.

SAMPLE NUMBER: 81759

SECTION TYPE: Normal thin section

ROCK NAME: Microgabbro

PETROGRAPHIC DESCRIPTION:

Grainsize 0.1-1.0mm, seriate textured.

Pyroxene chloritised, intergranular to plagioclase. All grains elongate and anhedral. Plagioclase sericitised and albitised. Plagioclase laths subhedral with weak embayment of boundaries.

PETROGRAPHIC DESCRIPTION

SAMPLE NUMBER: 81762

SECTION TYPE: Normal thin section

ROCK NAME: Microgabbro

PETROGRAPHIC DESCRIPTION:

Pyroxene 60%, plagioclase 40%.

Grainsize 0.1-1.0mm, a few (<1%) 1mm phenocrysts, most grains <0.5mm. A few (1%) glomerocrysts of coarse plagioclase + pyroxene.

Mafics partly chloritised, plagioclase partly sericitised and albitised. Minor veins of finer grained pyroxene + plagioclase provide evidence of re-intrusion.

SAMPLE NUMBER: 81763

SECTION TYPE: Normal thin section

ROCK NAME: Microgabbro

PETROGRAPHIC DESCRIPTION:

Pyroxene 30%, plagioclase 68%, opaques (?weathered mafics) 2%.

Grainsize 0.1-1.0mm, a few glomerocrysts 1mm, most grains 0.5mm.

Pyroxene partly chloritised, plagioclase partly sericitised. "Glomerocrysts" may in fact be evidence of re-intrusion of coarse material.

PETROGRAPHIC DESCRIPTION

SAMPLE NUMBER: 81766

SECTION TYPE: Normal thin section

ROCK NAME: Gabbro (intruded by microgabbro)

PETROGRAPHIC DESCRIPTION:

Pyroxene 50%, plagioclase 50%.

Grainsize of most of sample 0.2-2.0mm. Cut by a 10mm vein of 50-500µm material.

Pyroxene is mainly clinopyroxene, some grains twinned, partly chloritised and weathered. Plagioclase strongly sericitised and silicified; in most grains, only the outer rim remains, and the interior consists of fine grained (1-20µm) quartz + sericite. Fine grained vein has similar composition, with calcic plagioclase (An45-50).

SAMPLE NUMBER: 81768

SECTION TYPE: Polished thin section

ROCK NAME: Siltstone

PETROGRAPHIC DESCRIPTION:

Quartz+feldspar 30%, sericite 65%, opaques (oxides) 5%.

Grainsize 5-50µm.

Grains anhedral, some quartz grains subrounded. A few coarser (up to 1mm) relict angular clasts now consisting of sericite. No layering visible. Minor chlorite veining. Opaques are Mn, ?Fe oxides.

PETROGRAPHIC DESCRIPTION

SAMPLE NUMBER: 81769

SECTION TYPE: Polished thin section

ROCK NAME: Altered gabbro

PETROGRAPHIC DESCRIPTION:

Quartz 40%, chlorite 30%, sericite 25%, opaques 5%.

Grainsize 0.1-1.0mm.

Quartz grains angular. Sericite appears to outline original plagioclase, chlorite outlines original mafics. Opaques are Mn, ?Fe oxides. No layering visible.

APPENDIX **5**.

INDUCED POLARISATION SURVEY

MITRE GEOPHYSICS PTY LTD
MINERAL EXPLORATION AND ENGINEERING CONSULTANTS
BUGGS LANE ELLIOTT TASMANIA 7325 PHONE 004-363143

REPORT ON IP SURVEY,

E.L. 11/85 (YOLANDE).

for

Pasminco Exploration, Tasmania.

INTRODUCTION

Three lines of dipole-dipole IP have been carried out in the northern part of the Yolande licence. Two of the lines were located on faults, with the third following alteration along a stratigraphic horizon. RGC's Henty Fault gold prospect, currently under a feasibility study, lies some 3 kms to the north of the E.L. boundary and the main target of the survey was for a similar style of mineralisation. The gold at the Henty Fault deposit is associated with a number of lenses of disseminated pyrite which apparently closely parallel the Fault. Thus the IP lines were placed along the faults and potential host horizons.

This report presents the survey data and makes some summary comments on the results.

SURVEY DETAILS

The survey was carried out by Surtec Geosurveys in June, 1990. The dipole-dipole array was employed, reading to n=6 with a Huntec mark 4 receiver. A transmitting cycle of 2 secs on, 2 secs off was used with a 50msec delay and a window width of 150msecs. Noise levels were low and the data quality is good. The contractor's plots of apparent resistivity and total chargeability are included with this report.

INTERPRETATION

Line 1

This line was designed to cover a zone of pyrite-sericite-chlorite alteration at the southern end and to follow the inferred stratigraphy to the north. The target here was probably as much VMS as for gold and a drill hole has been tentatively proposed by the project geologist (G. Jenkins) to test this area in the vicinity of an old prospecting pit (the 'line 30N' pit).

The survey recorded some slightly elevated chargeabilities in the region of the pit, but the results have not defined a drill target. The response may be due to off-line mineralisation and a series of across-strike lines are suggested if there are other reasons for persisting here. However, there is little indication of a significant body of sulphide in the regional IP covering this area (Bishop, 1986)*.

At the northern end of line 1 a strong chargeability anomaly was partially defined; ie, the source of this response lies to the north of the survey coverage. This has been completely covered by line 3 which converges with line 1 in this region and is further discussed below.

The resistivity pseudosection is fairly uniform with the bulk of the values ranging between 1500 and 3500ohm-m. However values do decrease at the southern end of the line; possibly due to a thickening of the overlying glacial till.

Line 2

This line covered the 'Canal Fault', which is subsidiary and sub parallel to the main Henty Fault. Disseminated sulphides have been observed on the west side of the fault near where it crosses the HEC canal; ie, at about 750N on line 2.

A good chargeability response, with slightly lower resistivities, was recorded between 500N and 700N. The source may be due to a greater concentration of the sulphides observed in the canal, extending to the south. An alternative cause, or at least contribution to the response, is a sequence of graphitic shales which lie to the east.

---

* Bishop, J.R., 1986. Re-evaluation of the West Tyndall IP survey, E.L. 11/85. Mitre Geophysics report MG86/10 for the EZ company.

Line 3

This line overlies the 'South Henty Fault'. Previous mapping by R. Poltock has indicated that the surveyed area overlies a zone of alteration.

A well defined chargeability anomaly, with no corresponding resistvity response was recorded between 650 and 850N. This is the zone partially defined by line 1. A source of significant size, probably disseminated pyrite, is suggested at shallow depth, if not outcropping.

To the south, some elevated values (20+msecs) occur at depth beneath 00N. These may be due to either a dissemination of sulphides in the fault or to a more concentrated occurrence paralleling the traverse. It is worth noting that 00N lies on line 30N of the East Tyndall grid. An IP survey carried out along this line in the 1960's did not extend far enough west to cover the fault, however values were increasing slightly at the western end of the survey (Bishop, 1986).

CONCLUSIONS AND RECOMMENDATIONS

The IP survey has defined what is likely to be a significant body of sulphide on the South Henty Fault, at the intersection of IP lines 1 and 3. A relatively shallow source is indicated. Some rock chip sampling has already been carried out in this area (see 1:10,000 scale map by R. Poltock) and it is possible that the IP zone has also been defined geochemically. If it has, and it is anomalous in gold, then the IP may be useful for further investigation (and if it is not, then the zone is merely one of a number of barren pyrite deposits within the Mt Read Volcanics).

If the zone subcrops and has not been defined geochemically, then two or three short holes are recommended. The first two holes could be targeted to pass 50m beneath 700N and 800N on line 3.

A somewhat similar situation applies to the anomaly defined on line 2. This is adjacent to, but not coincident with, outcropping disseminated sulphides which have been geochemically sampled (to the north of 700N). However, the centre of this zone, below 600N, does not appear to have been tested.

The line 1 survey along the zone of alteration across line 30N has not revealed any substantial body of sulphide and, in concert with the conclusions from Bishop (1986) on the earlier IP surveys, no further work is recommended here.

PET/MG90/07

J.R. Bishop
July, 1990.

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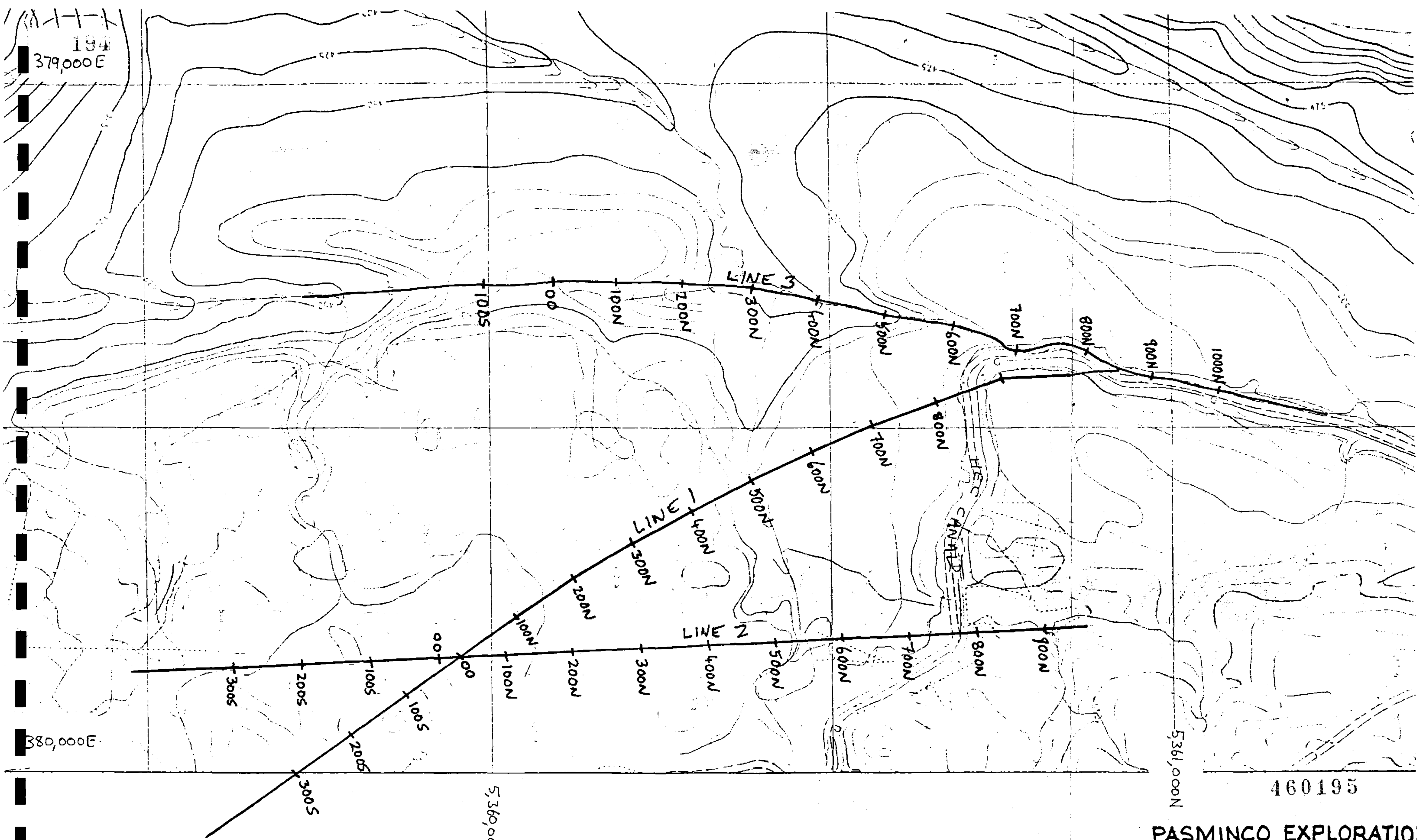
Figure 1. Location plan (1:5,000 scale).

Figure 2. Line 1 IP & resistivity pseudosection.

Figure 3. Line 2 IP & resistivity pseudosection.

Figure 4. Line 3 IP & resistivity pseudosection.



460195

PASMINCO EXPLORATIO

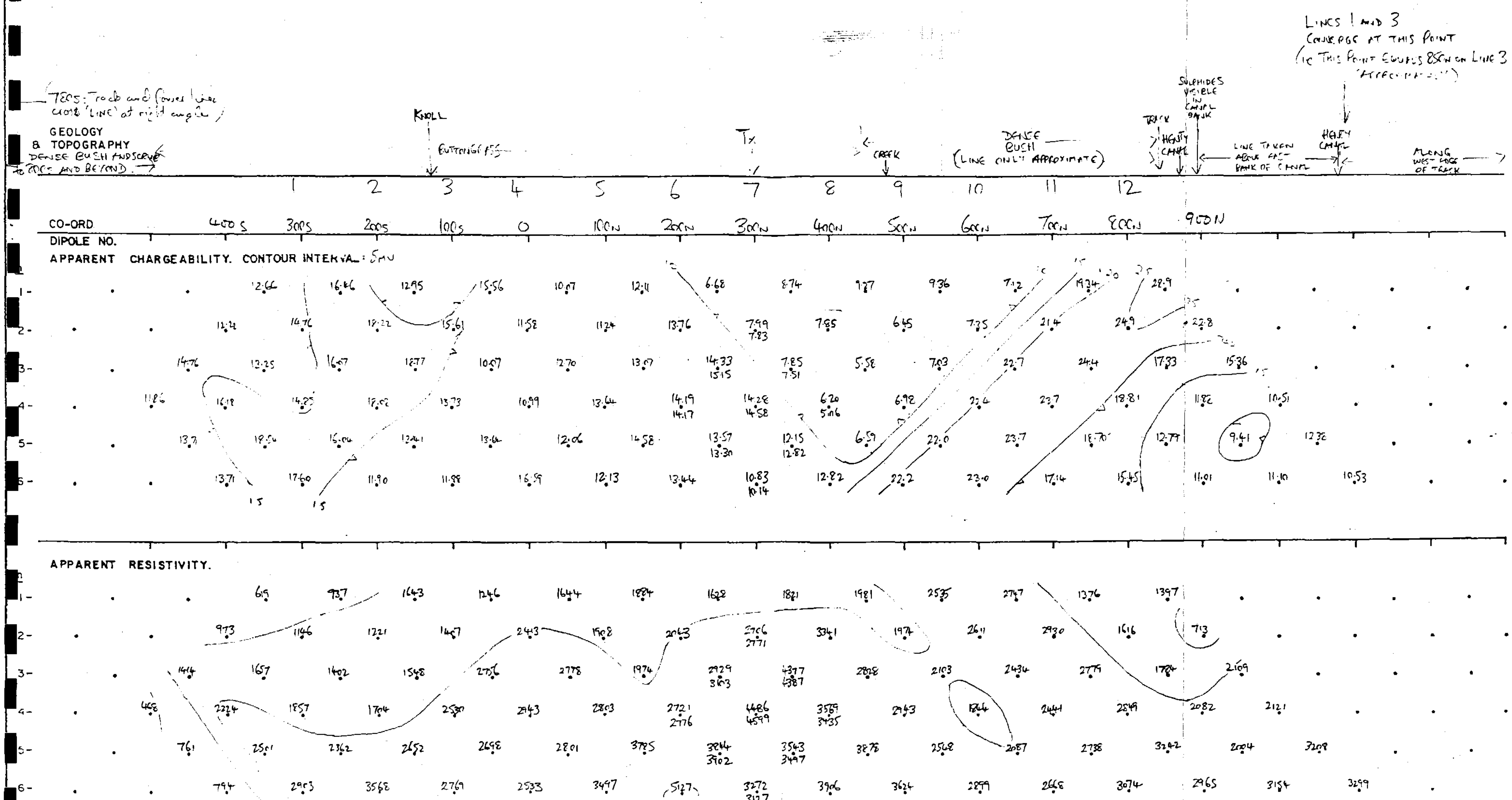
E.L. 11/85 (YOLANDE)

IP Survey

Survey Location Plan

ref: PET/MG90/07 Scale 1:5,000 Fig 1

460196



Resistivity Contour Intervals : 500, 1000, 2000, 5000

LINE 1
HENTY FAULT

Contractor : P. LIST (SURTEC)
Date : 8-10/6/90
Timing : 2 sec
Transmitter : HUNTEC
Receiver : HUNTEC Mk 4
Integration time : 150 ms
Array : DIPOLE-DIPOLE
Dipole length : 100m
Delay : 5 ms

5 cm

ABOVE DATA OBTAINED USING Aluminium Foil FOR CURRENT ELECTRODES

PASMINCO	
Yolande, E.L. 11/85	
I.P. / RESISTIVITY SURVEY	
SCALE 1:5000	DATE June '90
AUTHOR PL	DRAWN
OFFICE	FEP No.
DRG No	FIG. No. 2

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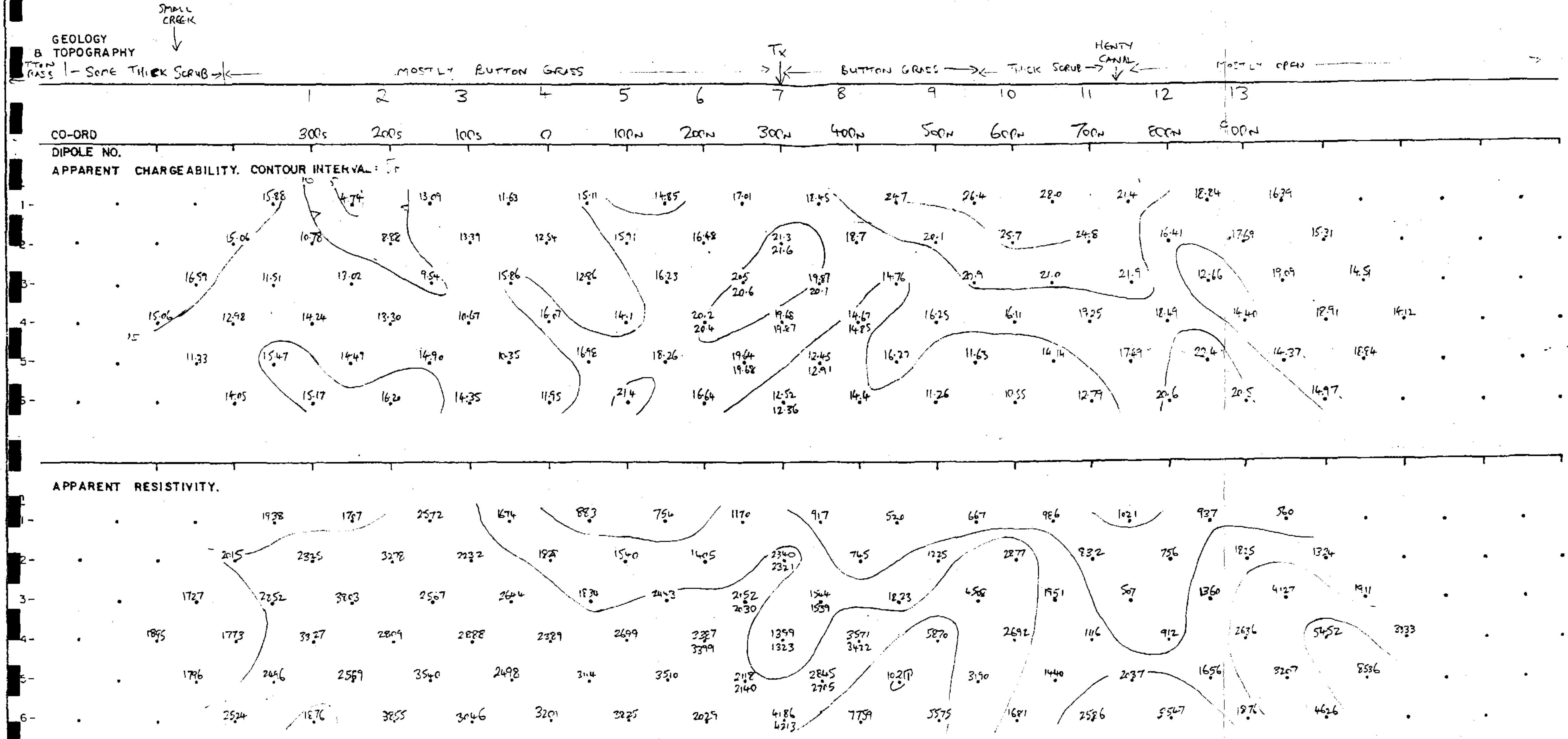


Resistivity Contour Intervals: 1000, 2000, 5000, 10000.

Contractor: P. LIST (SURTEC)
Date: 5-7/6/90
Timing: 2 SEC
Transmitter: HUNTEC
Receiver: HUNTEC MK 4
Integration time: 150ms.
Array: DIPOLE-DIPOLE
Dipole length: 100m.
D Rec. 50m

ABOVE DATA OBTAINED USING Aluminium Foil FOR CURRENT ELECTRODES

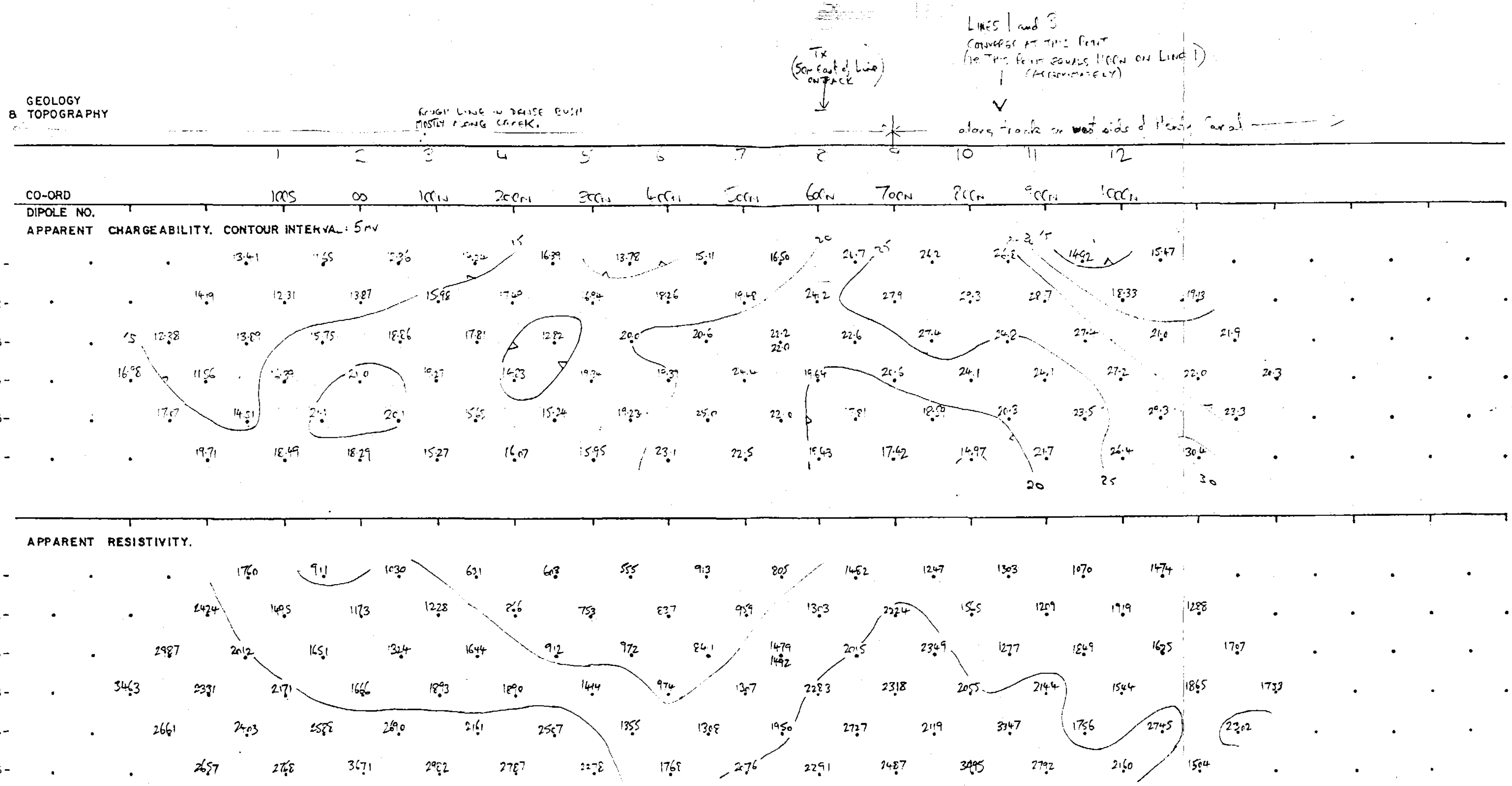
5 cm

LINE 2
HENTY FAULT

PASMINCO	
Yolande, E.L. 11/85	
I.P. /RESISTIVITY SURVEY	
SCALE 1:5000	DATE June '90
AUTHOR PL	DRAWN
OFFICE	REP. No.
DRG No.	FIG No. 3

13?

460198



Resistivity Contour Intervals: 1000, 2000

Contractor: P. LIST (SURTEC)
Date: 11–13/6/90
Timing: 2 sec
Transmitter: HUNTEC
Receiver: HUNTEC MK4
Integration time: 150ms
Array: Dipole Dipole
Dipole length: 100m
Delay 50ms

ABOVE DATA OBTAINED USING Aluminium Foil FOR CURRENT ELECTRODES

5 cm

LINE 3
HENTY FAULT

PASMINCO	
Yolande, E.L. 11/85	
I.P. /RESISTIVITY SURVEY	
SCALE 1:5000	DATE June '90
AUTHOR PL	DRAWN
OFFICE	REP.NO.
DRG No	FIG NO. 4

APPENDIX 6.

MAGNETIC AND GRAVITY INTERPRETATION

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460200

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TELEPHONE: (002) 240319

GRAVITY AND MAGNETIC INTERPRETATION OF EL 11/85 : YOLANDE RIVER

for
PASMINCO MINING
by
Dr. D.E. Leaman

September 1989

YOLANDE

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INTRODUCTION

EL 11/85, Yolande River, is located west of the Great Lyell Fault in western Tasmania and extends from Lynchford toward White Spur east of Mt Dundas (see Figure 1).

A review of magnetic data, supported if possible by gravity data, was requested for this licence area. Particular consideration was to be given to the location and identification of significant alteration volumes and mapping of gabbroic intrusives where present.
The area between the North and South Henty Faults and between the South Henty Fault and the Zeehan Highway was to be studied most intensively.

It was hoped that such a review might provide some clarification of mapping problems, indicate the distribution of some units, assist exploration focus and indicate the nature and position of major structures.
Particular topics posed for review included:

a) the extent of gabbro beneath glacials north of the Henty River,
b) the scale of any alteration associated with mineralisation near the Henty River Adits (377800 mE, 5354700 mN) and whether any signature is apparent,
c) general assessment to locate altered rock suites, especially south of the Henty River Adits,
d) whether any anomalous character can be associated with some old IP targets near 377500, 5352500.

The interpretation and review provided in this report represents a basic assessment within the resolution of the available data.
Sufficient analysis has been completed to indicate the structural and stratigraphic setting, alteration anomalies and those sites worthy of further work. The review was intended to provide support for the 1989-90 field season and does not necessarily represent a complete treatment of the available data.

Review has been completed on a regional basis;
a) North of 5350 000 mN (special emphasis)
b) Between the Firewood Siding Fault and the Henty River
c) Near Lynchford.

DATA USED FOR ANALYSIS

Magnetic data have been extracted from the 1981 aeromagnetic survey of western Tasmania by the Department of Mines (Corbett et al, 1982; Leaman, 1986a). This survey was flown with E-W lines, a nominal line spacing of 500 m, a sample interval of about 40 m and a specified terrain clearance of 150 m. The terrain clearance specification was rarely met in the Henty River or Lynchford areas. The line data as observed has been presented in Figures 2, 3, 4, 5 and 6 for the area between 5350 000 and 5360 000 mN. Contours of the magnetic field in this zone are shown in Figure 7 and for the remainder of the EL in Figure 17.

Due to erratic terrain - source - sensor relationships no reliable quantitative modelling can be undertaken with this data. Data as presented in Figures 2 to 7 have been used for qualitative inspection and source continuity studies since they represent the highest available resolution. All modelling has been based on corrected data. Since correction results in some small loss in resolution for source continuity and relativity studies this is not significant for bulk or structural assessments. The lines selected for modelling were corrected and projected to the lowest level for which the sensor could have cleared the terrain and which the data observed allowed reliable upward and downward continuation processing. This level varied from 750 to 1000 ASL depending on line used.

Gravity data were extracted from the TASGRAV (Richardson and Leaman, 1987) and the MTREAD (e.g. Leaman, 1986b) data bases of the Department of Mines.
Raw Bouguer anomalies have not been utilised due to the large mantle and deep crustal components which must be incorporated in any models; for a small area these force awkward modelling proportions. The mantle model generated by Leaman (1988a) and known as MANTLE-88 has been used to create a true residual map free of filter distortions. The Henty River portion is shown in Figure 8. The nominal station spacing for this area is about 1 km but significant gaps exist in this region. This spacing limits resolution of the data set and its application.

Some elements of previous interpretations (e.g., Leaman, 1986 a, b; 88b) have been introduced in order to provide background for this specific review and a foundation for evolution of concepts specific to this EL.

INTERPRETATION

THE HENTY RIVER AREA

Figures 7 and 8, of magnetic and gravity data respectively, present very different views of the region SE of Mt Dundas. There are few obvious similarities or correlations.

Contours of the magnetic field reveal four distinct tracts; between the North and South Henty Faults north of 5354 000 mN, N-S at about 381 000, 378 000 and 373500 mE. All features have limited strike extent. Near Mt Dundas and north of Howards Road the field is stable and virtually non anomalous.
The largest responses are associated with the exposed ultramafics near the North Henty Fault (376, 5356) although the field pattern has greater areal extent than would be expected if the exposed materials represented the total source cross section. It is particularly interesting that the largest anomalies lie in the zone between the faults but that this pattern is terminated near 376 000 mE. Virtually all strong responses are associated with the North Henty Fault, where this has been mapped.

Although the map of residual Bouguer anomalies has poorer definition there is clear character and no direct correlation with the magnetic map. A large positive anomaly dominates the region between the South Henty Fault west of 376 000 mE and the Zeehan Highway. Small parts of the South Henty Fault appear to be reflected in the anomaly pattern but the field is controlled by a major E-W trending feature at 5356 500 mN. There is little counterpart for such a structure in the mapping of Corbett (1986) or anyone else who has worked on this EL. The only fragment of an E-W structure which has been mapped bounds a gabbroic body near 375, 5356. The spine of positive anomalies which extend from 374, 5349 to 375, 5355 is continued, in diminished form, along the North Henty Fault. There can be little doubt, given the magnetic and gravity responses, that the major structure in the region is the North Henty Fault and that this has engaged both basement and Cambrian ultramafics. The gravity responses are definitive in this respect since the field pattern generally ignores exposed geological trends and structures and therefore reflects basement features. The gradients indicate that basement is also relatively shallow north of the North Henty Fault and some Precambrian rocks are exposed on the northern and western slopes of Mt Dundas.

The two surveys also suggest that the known faults may have little penetration, or cause little dislocation, of basement or older Cambrian structures. This is especially true of the South Henty Fault; the North Henty Fault clearly has some elements of Cambrian motion.

The rock suites north and west of the North Henty Fault, on Mt Dundas, are less dense than most other units in the region and virtually non magnetic. This is consistent with straightforward sedimentary sections of the Dundas Group or many parts of Precambrian basement. The sequence, or depth of basement, on Mt Dundas is not great.

The materials between the North and South Henty Faults east of 376 000 mE are strongly magnetised and generally denser than other units in the region. This is consistent with a mafic sequence dominated by gabbros and basalts. The very strong magnetic responses and the patchiness of the positive anomalies does indicate a significant volume of ultramafic rocks is also present.

Gabbroic and basaltic units are known to occur west of the South Henty Fault south and west of 376, 5353. Much of this area is blanketed by glacial deposits. The gravity and magnetic fields would suggest that very large volumes of these materials are present, at shallow depth, and that their distribution is not as might have been predicted from the limited exposures available.

Detailed consideration of the magnetic profiles (Figures 2 to 6) enables production of a source distribution or magnetic texture map (Figure 9). This compilation reveals many of the source and structural characteristics of the area.
The North Henty Fault is unambiguously identified and can be mapped westward south of Mt Dundas. The form of the structure, as shown in plan, is suggestive of displacement or regeneration about a hinge near 376, 5357. A cross-cutting structure extending N-S can be detected at about this easting. The subtle, presumably alteration or oxidation, responses associated with this feature can only be seen in profile form; contour presentation destroys the information. South of 5357 000 mN this structure has been mapped and its east face carries ultramafics. The texture map shows, however, that the structure extends beyond the 1500 m mapped to reach the South Henty Fault near its large kink at 376, 5352 500. This would indicate that this N-S structure at 376 000 mE and the South Henty Fault carry equivalent motions of the same age and that these disrupt an older structure represented by the North Henty Fault which involved displacement of Cambrian ultramafics. I believe the North Henty Fault to represent the essentially Cambrian component of movement on the Henty Fault Zone while the South Henty Fault and its northern splay represents the Devonian component. This is the only way in which such a net of large structures can juxtapose distinct rock suites and interlock movements. Such an hypothesis would also imply that the South Henty Fault carries wrench movement principally while the North Henty Fault was originally a thrust and part of the system which elevated the Dundas basement block. This view is consistent with at least part of the movement history described by Berry (1989). He has noted that the Henty Fault zone has undergone at least five movements; one an east-moving thrust, others sinistral wrenches. Devonian sinistral motion on the South Henty Fault and its splay at 376 000 mE would explain the offset of the North Henty Fault.

Apart from the source dislocations obviously related to the primary faults some lesser terminations of source or strike trends may be observed.

The magnetic texture pattern shown in Figure 9 identifies units with positive magnetic contrast. The width and position of pattern elements is approximate and within the precision allowed by sampling, line spacing and terrain clearance errors. Width estimates may be affected by subjective judgments or interference between sources but the pattern indicates the continuity and extent of the sources present.
The source group west and south of 376 000 mE and 5356 000 mN consists of gabbros and basalts. This zone consists of two parts, west and east of an approximately N-S feature at about 374 000 mE. The strongest magnetic responses lie to the west of this feature.

The texture pattern identifies a number of truncation effects. Some are related to the South Henty Fault or the N-S structures at 374 and 376 000 mE. Others are E-W, or nearly so. Four features of this type are present in the data coverage represented by Figures 2 to 6; at 5356 200, 5353 500, 5351 500 and 5349 500 mN. Each trends about 80 degrees east and the positions quoted are constrained by the line spacing of 500 m. Some positional uncertainty is inevitable but there can be no doubt that some major changes are implied at moderate depths near these northings. The most significant changes appear to be related to the corridor bounded by features at 5351 500 and 5353 500 mN.

Although disruptive effects can be noted no definitive mineralisation signatures can be described. No features can be associated with mineralisation at Henty Fault, Henty River Adits or Tyndall Mine. This may reflect limited data coverage, small sources or terrain factors.

Tracing of source patterns can, however, identifiy some anomalous responses. These are indicated in Figure 9 and most lie in the block west of the N-S splinter from the South Henty Fault at 376 000 mE.

Corbett (1986) has mapped some alteration in the area, e.g., 379, 5354 500, and this does yield a magnetic character change. It may in fact be associated with a small E-W offset and include the Henty River Adits mineralisation but there is insufficient data to establish all such relationships. Some alteration responses may be present along the South Henty Fault but, other than south of 5353 000 mN, this is not significant. The largest pockets of alteration identified lie within the primary corridor defined above. One of these pockets includes some old IP targets.

These qualitative conclusions would suggest that further exploration should be concentrated near these areas of implied alteration within the corridor about 5352 000 mN.

Simple inspection of the data followed by careful deduction indicates a complex structural pattern and history. Many of the mapped structural fragments are certainly interlinked and some connecting features can be defined. Since some of these features may control, or have controlled, mineralisation an attempt has been made to understand them. Earlier regional interpretations (Leaman, 1986a, b; 1988b) have indicated a complex fault pattern involving east and west moving thrust blocks and major offsets. The detailed work described above clarifies some of these features and relationships.
Within the context of this review and the available data some quantitative refinements have been effected. These are outlined in Figures 10 to 15. The models are intended to suggest some of the feasible options and much more work would be required before all the related issues and problems could be defined or resolved.

Modelling of magnetics line 1210 is shown in Figure 10. The location of each line is shown in Figure 9. Faults east of Farrell Rivulet or Ewart Creek have been labelled and may be located in each figure. Ewart Creek structuring is only evident in the wider gravity models and occurs at about 371-373 000 mE.
In Figure 10, a large mafic source can be shown to occupy the volume between the North and South Henty Faults. Both faces must dip west (also Berry, 1989). Other fault projections are indicated and the Dundas Block may be soled by mafic rocks. Simple 2D models cannot resolve the fault relationships at about 374 500 mE but a structure is evident at 376 000 mE. Option 1 suggests that this is relatively low angle and extends beneath the Dundas Block. The magnetic anomaly could be produced by such low angle slices or by sub vertical stepping by a cross cutting feature at 374 500. The profile does require that a, probably folded, mafic slab link faults bounding the Dundas Block and the North Henty Fault. This is consistent with inferences drawn above on the basis of plan relationships.
Gravity modelling of this line in extended form is consistent (Figure 14). Care should be taken when comparing or reviewing the models to ensure that similar features or dips are related. There is considerable and variable vertical exaggeration. The gravity data, although demanding a far more comprehensive treatment than provided, do show that parts of the Dundas Block are detached and that there are several skins of mafic rocks. The low angle magnetic option is also indicated by the gravity model. The mafic slab connection faults B and C at 376 000 mE has not been resolved or included in this coarse model but the profile suggests that it is real and present. The model is not rigorous in the region of Ewart Creek and simply indicates the style of relationships present and the approximate rock/unit volumes.
Ultramafics appear to present a slightly negative contrast with respect to the bulk of the Cambrian volcanic suites and this property can be closely linked with magnetic responses. Contrasts are sufficient to fully resolve the structure but gaps in gravity coverage should be minimised before any such analysis is undertaken.

By line 1140 (Figure 11) the structure is more confined and two fault elements are closely opposed. The same style of solution is still required to balance responses but the ultramafic component is more restricted. Two options are shown in the figure and cannot be separated at this alignment; the wedge of ultramafics could be vertical or offset at moderate depth. The slight shoulder in the magnetic profile at 375 000 mE could indicate that such an offset is more likely but tests indicated that the form of the gabbro could also generate a similar anomaly.

At line 1115 (Figure 15) the gravity field suggests a similar contraction of the structure in terms of the fault components but a very large volume of gabbroic or basaltic rocks is implied west of the South Henty Fault and its splays; or south of the old thrust uplift based on the North Henty Fault. The model suggests the volumes and attitudes involved but limited control of the data set precludes more detailed analysis. The ultramafics appear as a dipping skin between two large mafic blocks.

Magnetic profile 1080 (Figure 12) presents a much simpler interpretation; largely due to its location south of the main fault complex and northing of the splay intersection for implied Devonian movements on the South Henty Fault. The wedge of gabbroic rocks is separated from all other materials and the South Henty Fault system and its splays. Minor sources east of the South Henty Fault can be associated with some pyroclastic and volcanic units. Quite small volumes are implied.

Magnetic profile 1050 (Figure 13) is very similar to 1080. It does, however, indicate the nature of the anomalous zone west of the South Henty Fault near the southern side of the magnetic corridor previously described (see also Figure 16).

Although the quantitative modelling undertaken has been limited to 2D sections and based on data of restricted coverage it does confirm the qualitative inspection described above. It certainly suggests the manner in which the various faults are related and the scale and attitude of both the faults and large mafic bodies.

The interpretation is summarised in Figure 16.

ZEEHAN HIGHWAY AREA

The magnetic field across this region NW of Queenstown is shown in Figure 17.
Anomalous responses are not easily identified due to the variability of mapped and known units and lithologies. Tuff and lithicwacke units are generally non magnetic but parts are magnetised - e.g., at 376 000 mE, 5344 500 mN, and this may imply concealed or unmapped quartz feldspar porphyries.

Quartz feldspar poprhyries present varied responses according to composition or alteration. Extrusives with interbedded sediments are strongly magnetised while massive units are not. A patchy pattern is associated with those massive units mapped with rare quartz phenocrysts and this may mean misidentification or alteration. Since the general response is neutral, strong anomalies such as the one observed at 378 200, 5345 000 implies presence of extrusive lithologies or alteration and the site should be inspected.
Andesites are not especially magnetic unless altered and this property may be demonstrated immediately east of the EL at 379 500 mE from 5342 500-5344 500 mN.

LYNCHFORD AREA

The magnetic field in the Lynchford area, south of Queenstown, is shown in Figure 17.
This data has been extensively reviewed previously in two studies commissioned for the Mt Read Volcanics Project and the conclusions remain untested (Leaman, 1987; 1988c).

Leaman (1987) suggested, using both gravity and magnetic data, that the sequence south of Queenstown is isoclinally folded (approximately) over an old basement high with primary Cambrian to Devonian basin development occurring in the region of the fault system along the Queen River. The present fault is probably part of the rejuvenated structuring associated with basin inversion in Tabberabberan times. The inferred relationships are indicated in Figures 18 and 19. The same study suggested a first order fracture pattern, which although consistent with surface mapping, is more comprehensive than mapping would imply (Figure 20). Mineralisation within the region also appears to be associated with a pronounced E-W corridor as indicated by magnetic data. See Figure 21, from Leaman (1988c). Some anomalous features were identified in these studies which lie within EL 11/85 and these should be inspected.

The area between the Zeehan Highway and Lynchford portions of the EL contains exposed Siluro-Devonian rocks. Previous work suggests that this sequence is up to 5 km thick a little to the west and the style of magnetic responses evident are consistent with such a view. Any potential mineralisation could only be related to major intrusives or fault systems within the section and none are known or can be inferred from present data away from the margins of the structure near the Queen River or along the Firewood Siding Fault.

SUMMARY AND CONCLUSIONS

Analysis of extant gravity and magnetic data within EL 11/85 confirms a variable and complex structural environment.

Within the Henty River segment of the EL an interlocked fault pattern has been established. The patterns are compatible with the inferences of Berry (1989) from other parts of the Henty Fault system and suggest that the South Henty Fault is essentially a relatively young (Devonian) wrench and that it is connected to a N-S splay which passes toward Williamsford east of Mt Dundas. The North Henty Fault represents the older movements on the structure and incorporates slivers of ultramafics. It is essentially an older east directed thrust which has introduced the Dundas Block and been subsequently folded. The magnetic and gravity data enable the relationships between these faults to be established with some confidence. Some sympathetic structures are also present and the structural combine has introduced or bounded some large mafic masses. These are mainly trapped between the North and South Henty Faults but the largest gabbro body lies west of the South Henty splays (see Figure 16). Precambrian basement lies at shallow depth north of 5356 000 mN.
Although the data indicate a number of distinct and anomalous structural terminations there is little evidence of general alteration or mineralisation. Most alteration responses are concentrated in an E-W magnetic corridor between 5351 000 and 5353 500 mN but east of the gabbro-limiting structure at about 374 000 mE. A magnetic alteration response is identifiable for the mapped pyritic alteration near 379 000 mE, 5354 500 mN. Several anomalous responses, in terms of the mafic sequence west of the river within the corridor, should be examined. The alteration zones east of the river within the corridor should be carefully reviewed. Electrical surveys may not prove viable west of the river depending on the properties of the glacial material although the present work does not suggest thicknesses in excess of 100 m. The form of the cover is erratic (see suggestions in Figure 13).
Experience elsewhere would suggest that detailed geochemistry, gravity and magnetic surveys across the corridor might prove the most cost effective means of exploration initially with targets reviewed electrically prior to drilling.

Some anomalous magnetic responses have been noted in the Zeehan Highway central section of the EL. Confirmation of lithology in the general locations is advised before any other work can be contemplated. Such ground review might also suggest if any alteration has occurred. If this is indeed the case then the magnetic data could be used to define the form and volume of alteration and suggest the location of a survey grid.

A mineralised, magnetics-located corridor has been identified in the Lynchford area. This contains some altered volcanics and these should be inspected.

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460212

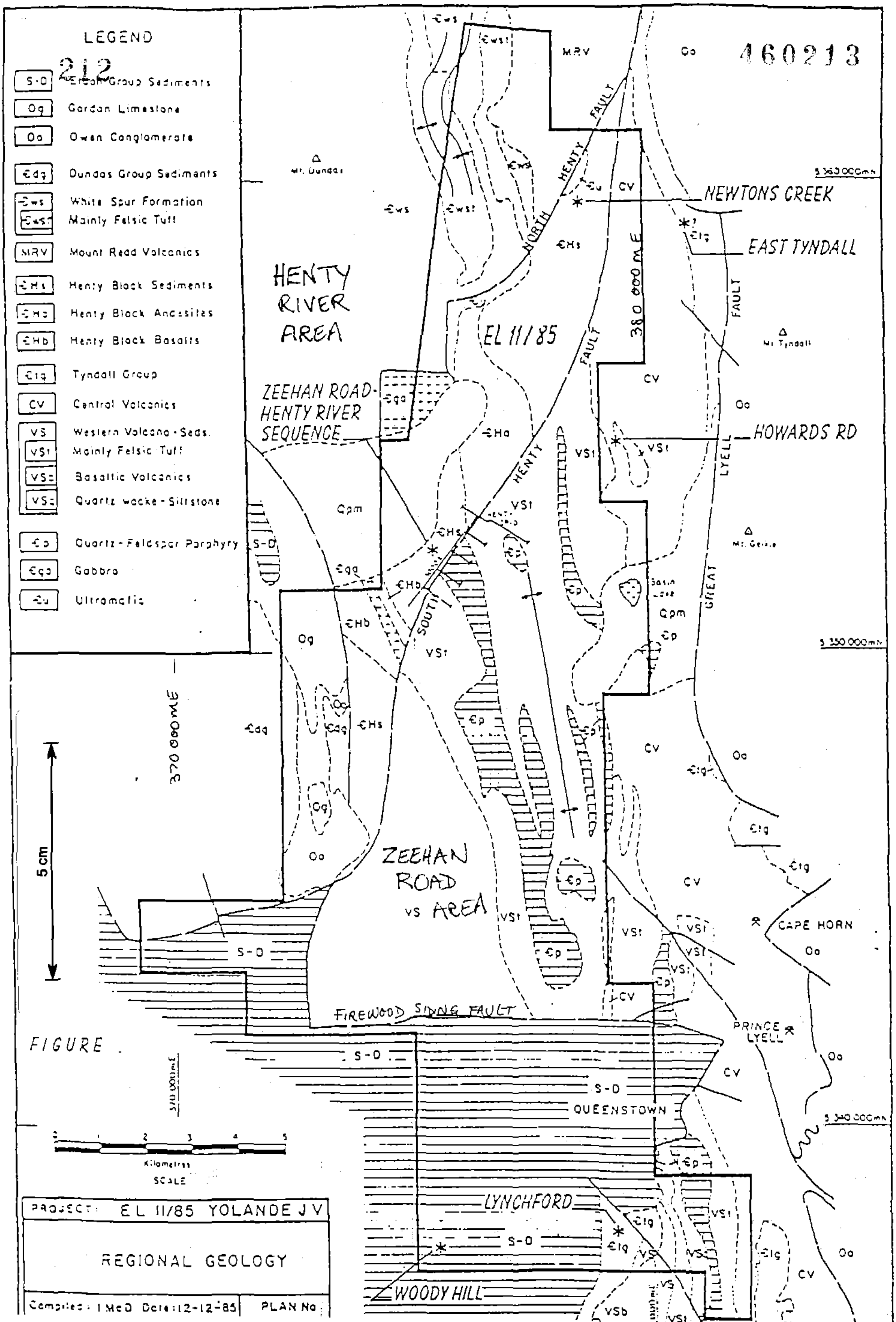
Report submitted on behalf of
Leaman Geophysics
by

D. Leaman

Dr. D.E. Leaman, B.Sc., Ph.D
M.Aus.I.M.M., M.M.I.C.A

11-9-89

460213

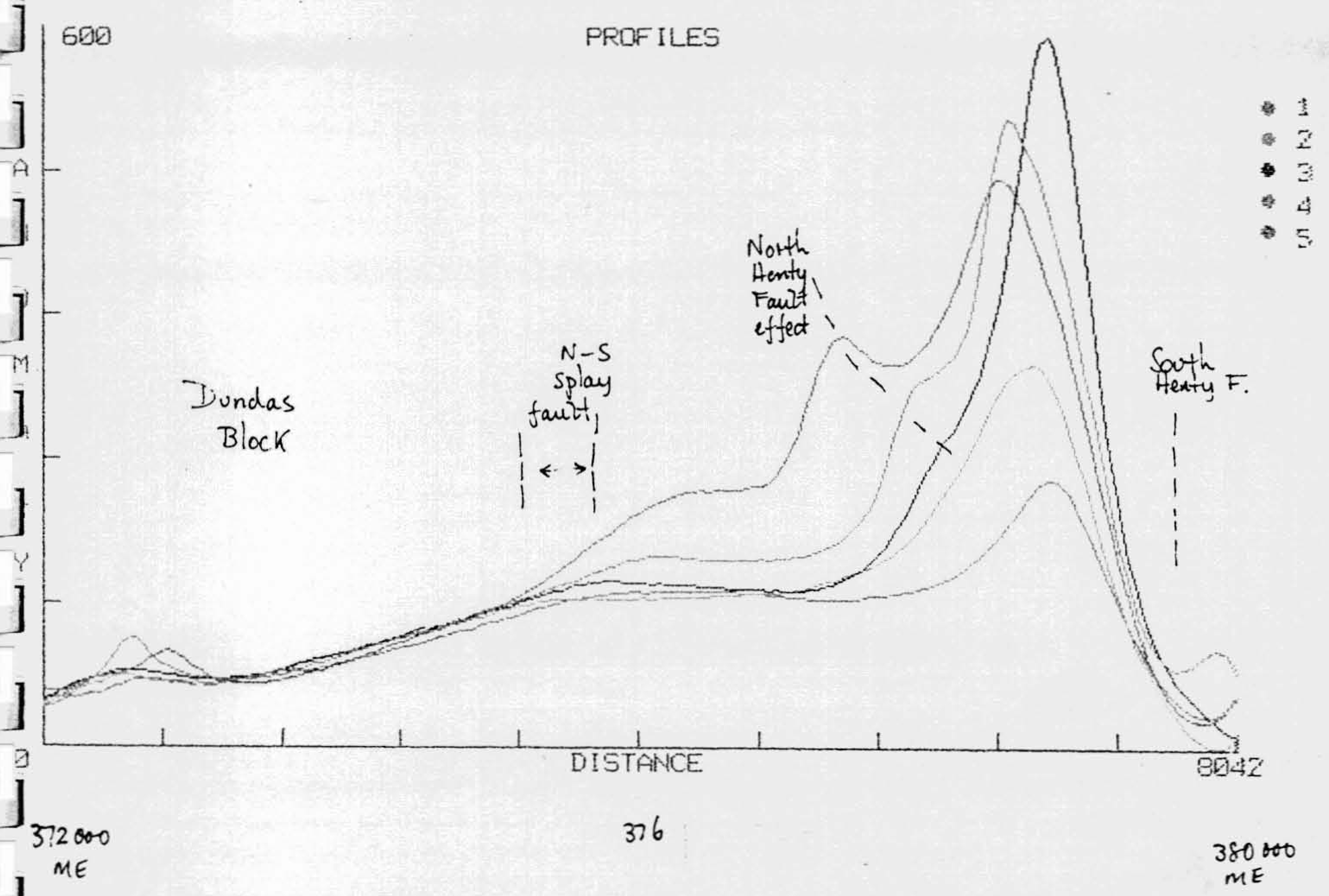


LOCATION AND GEOGRAPHIC REFERENCE : EL 11/85 YOLANDE RIVER

FIGURE 1

LEAMAN GEOPHYSICS
G.P.O. Box 320 D,
Hobart, Tasmania 7001

1 B:M1221 YOLANDE RIVER PROJECT LINE 1221
2 B:M1210 YOLANDE RIVER PROJECT LINE 1210
3 B:M1200 YOLANDE RIVER PROJECT LINE 1200
4 B:M1190 YOLANDE RIVER PROJECT LINE 1190
5 B:M1180 YOLANDE RIVER PROJECT LINE 1180
ZERO SHIFT :-33.7



1981 Mines Department aeromagnetic survey
PROFILES FOR LINES 1180 TO 1221 (5358-5360N)

FIGURE 2

LEAMAN GEOPHYSICS
G.P.O. Box 320 D,
Hobart, Tasmania 7001

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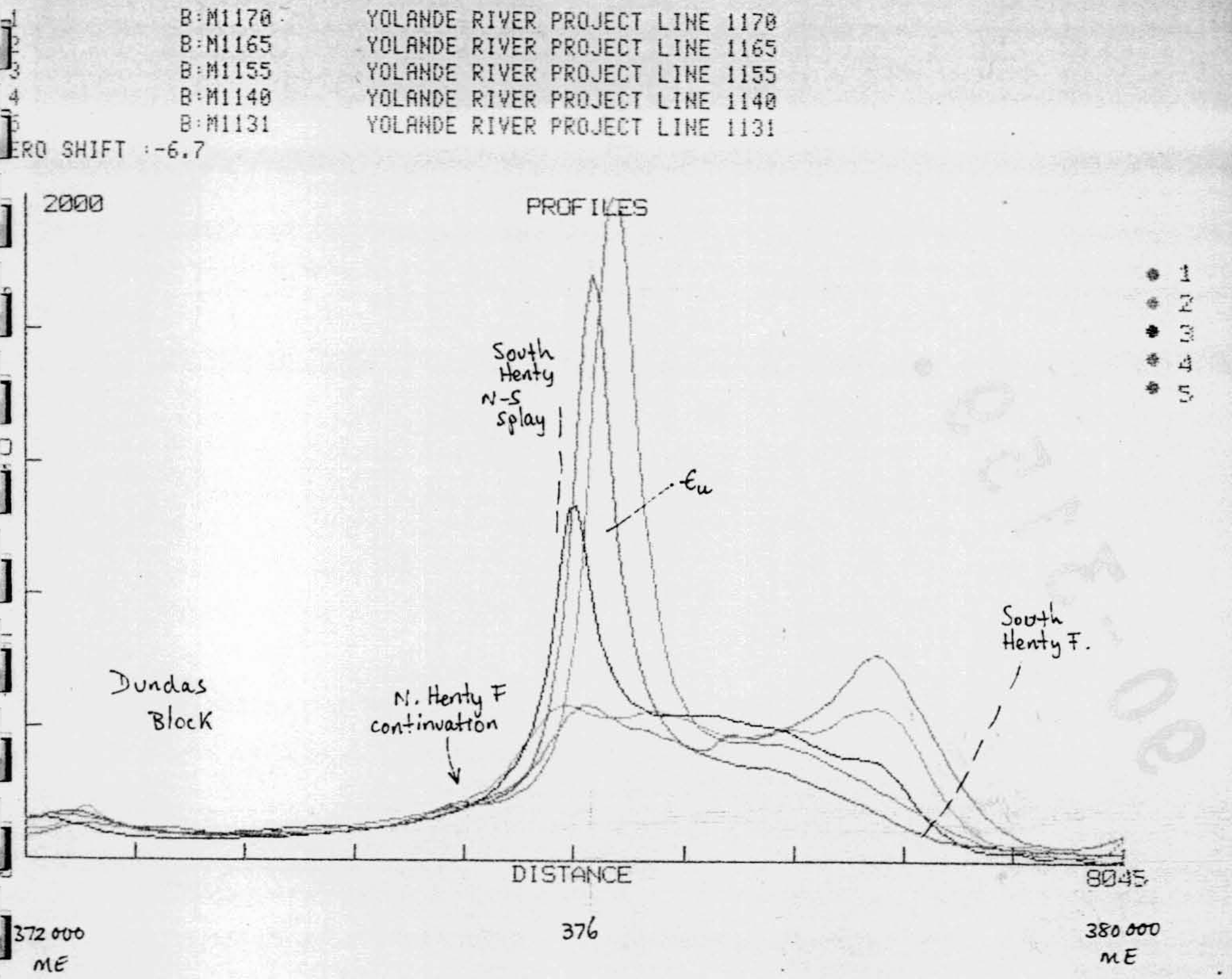

1981 Mines Department aeromagnetic survey
PROFILES FOR LINES 1131 TO 1170 (53555-53573N) FIGURE 3

LEAMAN GEOPHYSICS
G.P.O. Box 320 D,
Hobart, Tasmania 7001

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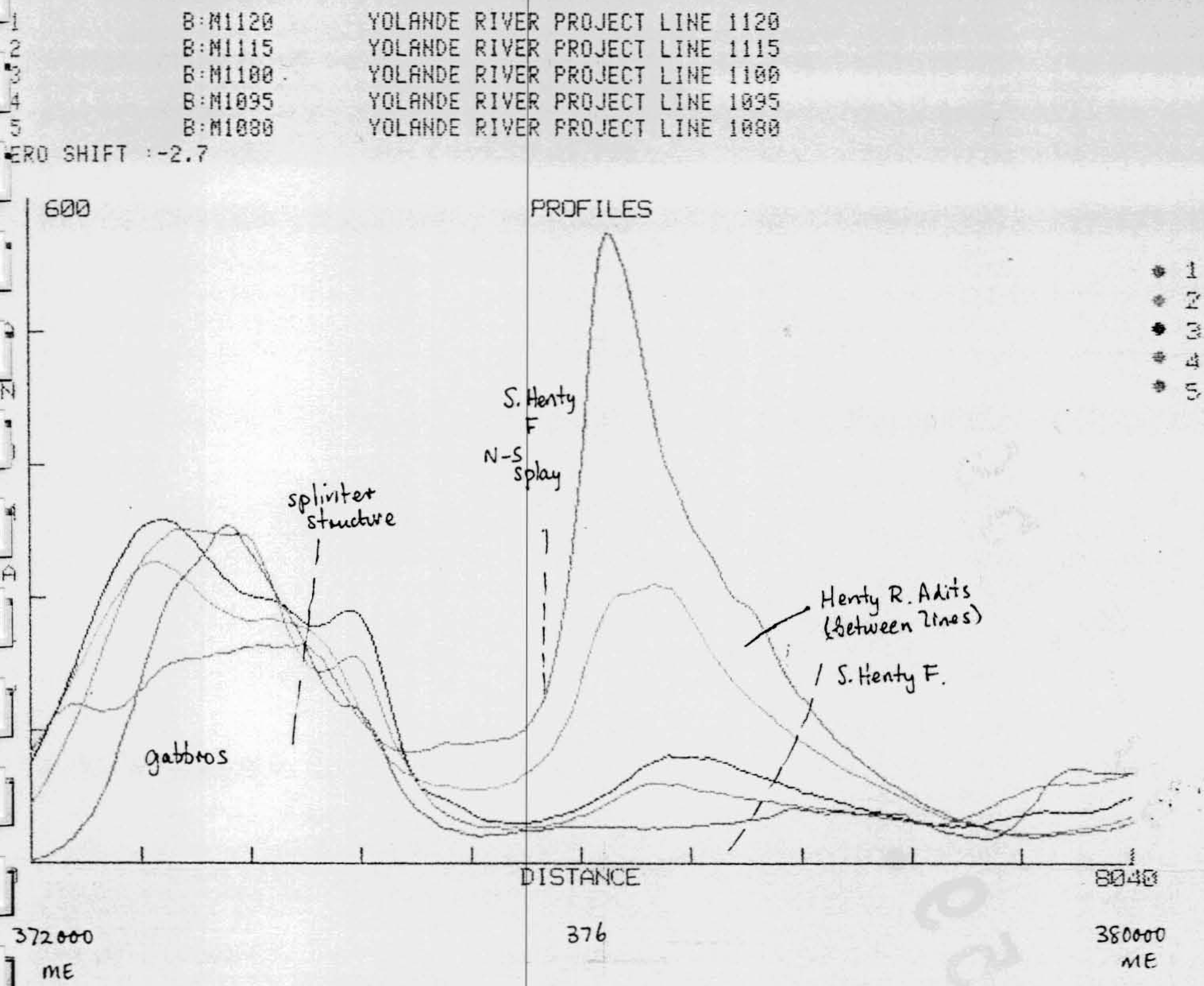

1981 Mines Department aeromagnetic survey
PROFILES FOR LINES 1080 TO 1120 (5353-5355N) FIGURE 4

LEAMAN GEOPHYSICS
G.P.O. Box 320 D,
Hobart, Tasmania 7001

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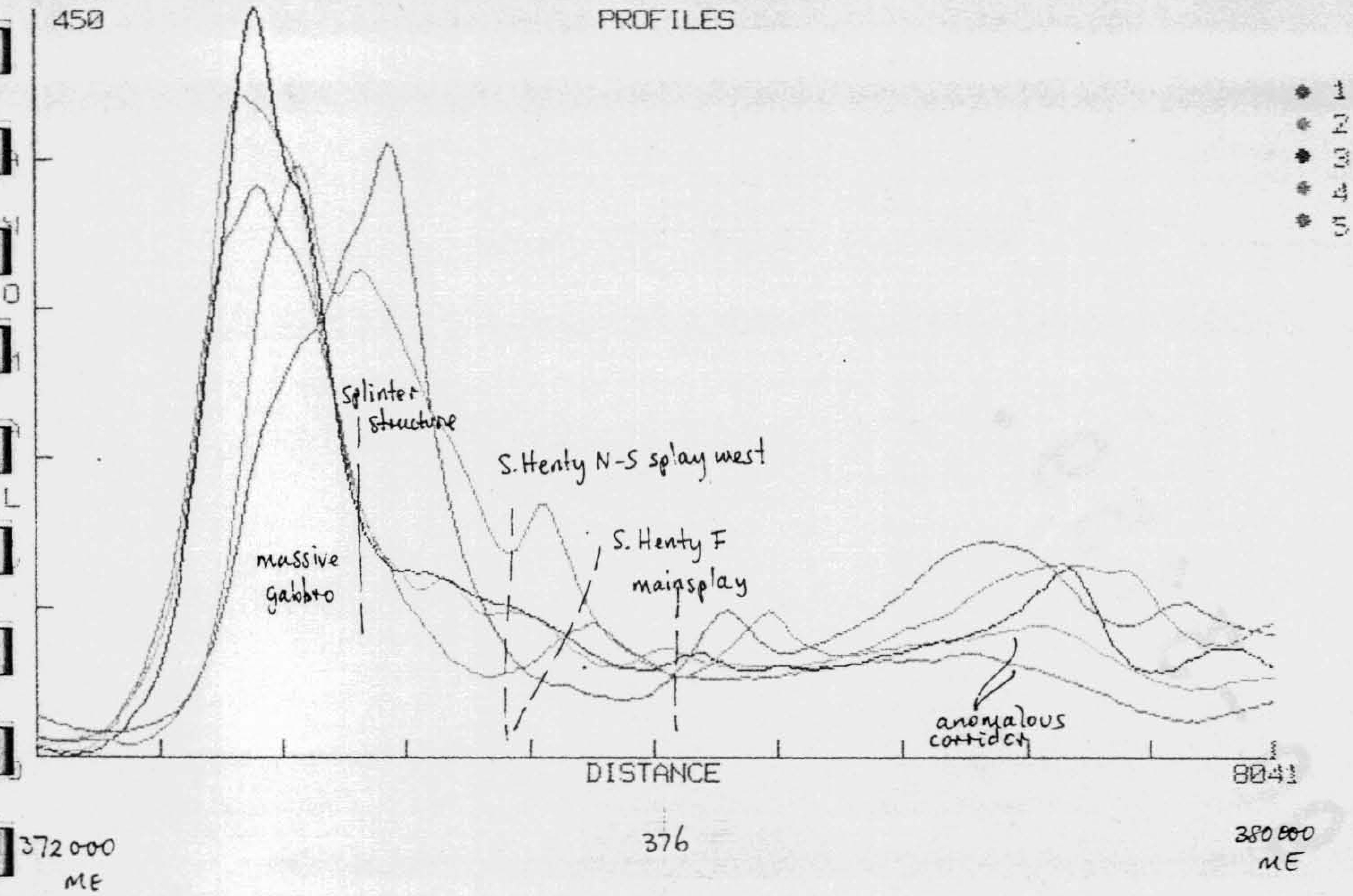
1 B:M1075 YOLANDE RIVER PROJECT LINE 1075
2 B:M1060 YOLANDE RIVER PROJECT LINE 1060
3 B:M1050 YOLANDE RIVER PROJECT LINE 1050
4 B:M1040 YOLANDE RIVER PROJECT LINE 1040
5 B:M1030 YOLANDE RIVER PROJECT LINE 1030
ERO SHIFT : 7.9

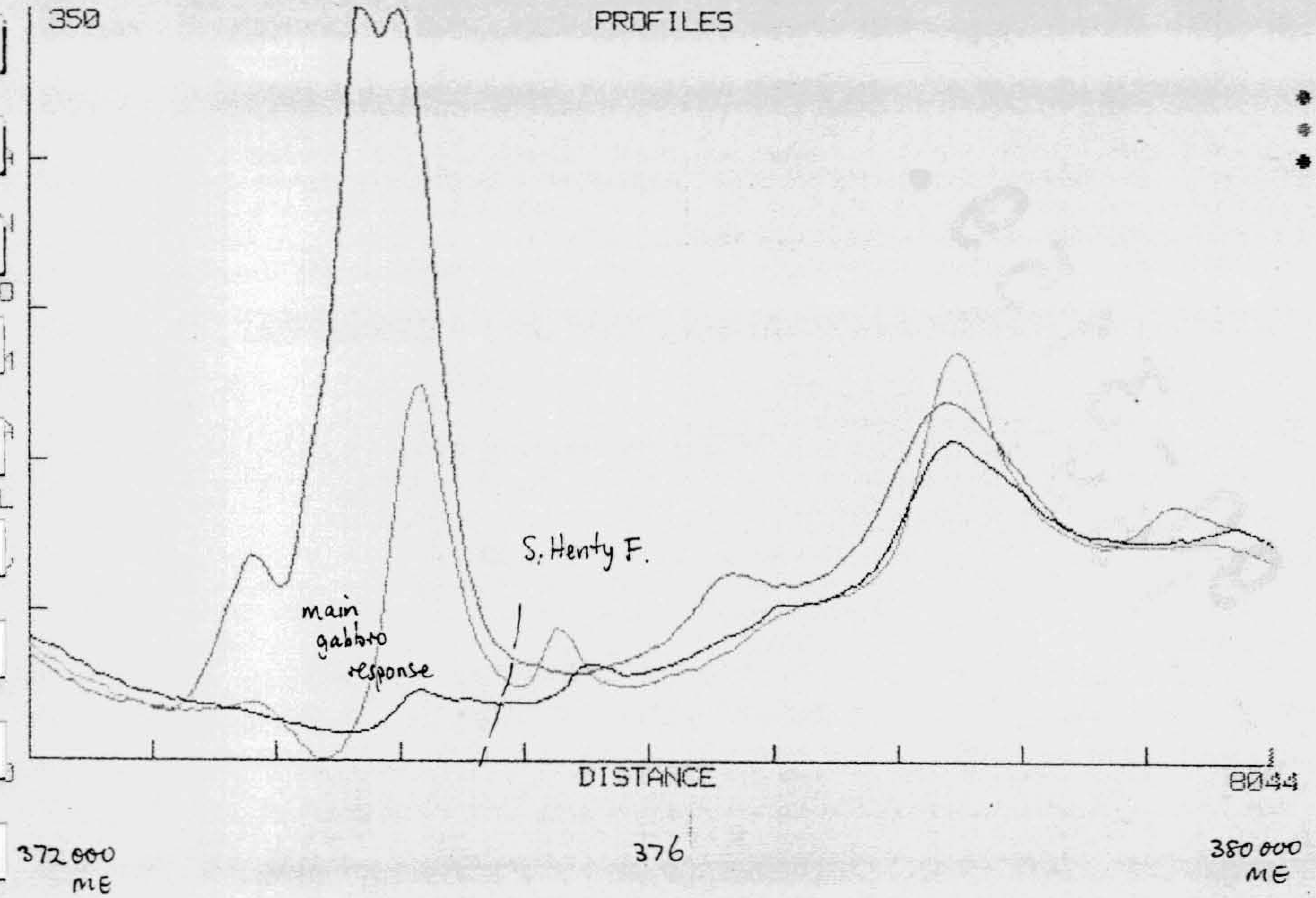


1981 Mines Department aeromagnetic survey
PROFILES FOR LINES 1030 TO 1075 (5350-53525N) FIGURE 5

460218

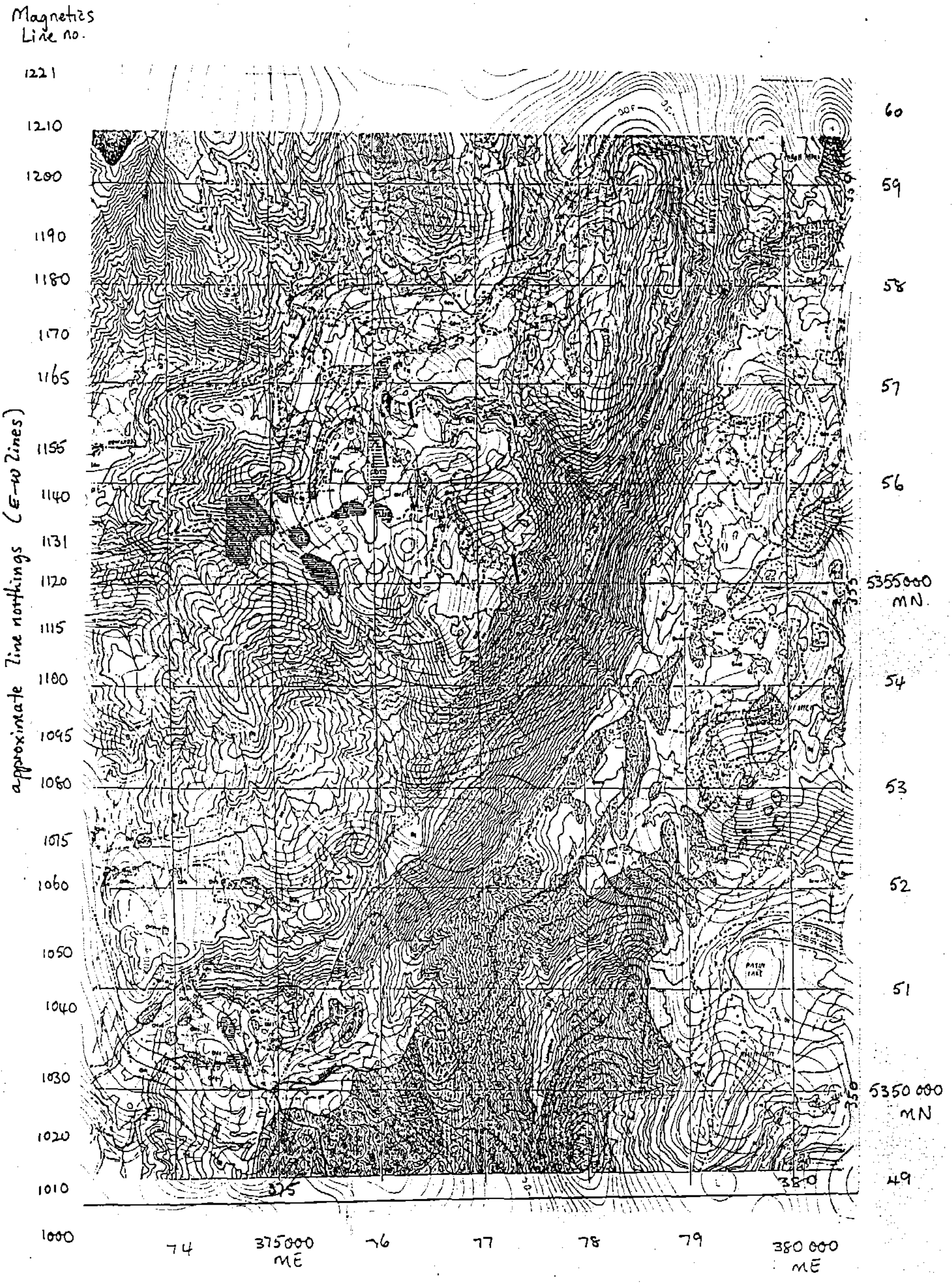
LEAMAN GEOPHYSICS
G.P.O. Box 320 D,
Hobart, Tasmania 7001

1 B:M1020 YOLANDE RIVER PROJECT LINE 1020
2 B:M1010 YOLANDE RIVER PROJECT LINE 1010
3 B:M1000 YOLANDE RIVER PROJECT LINE 1000
ERO SHIFT : 28.8



1981 Mines Department aeromagnetic survey
PROFILES FOR LINES 1000 TO 1020 (53485-53495N) FIGURE 6

218

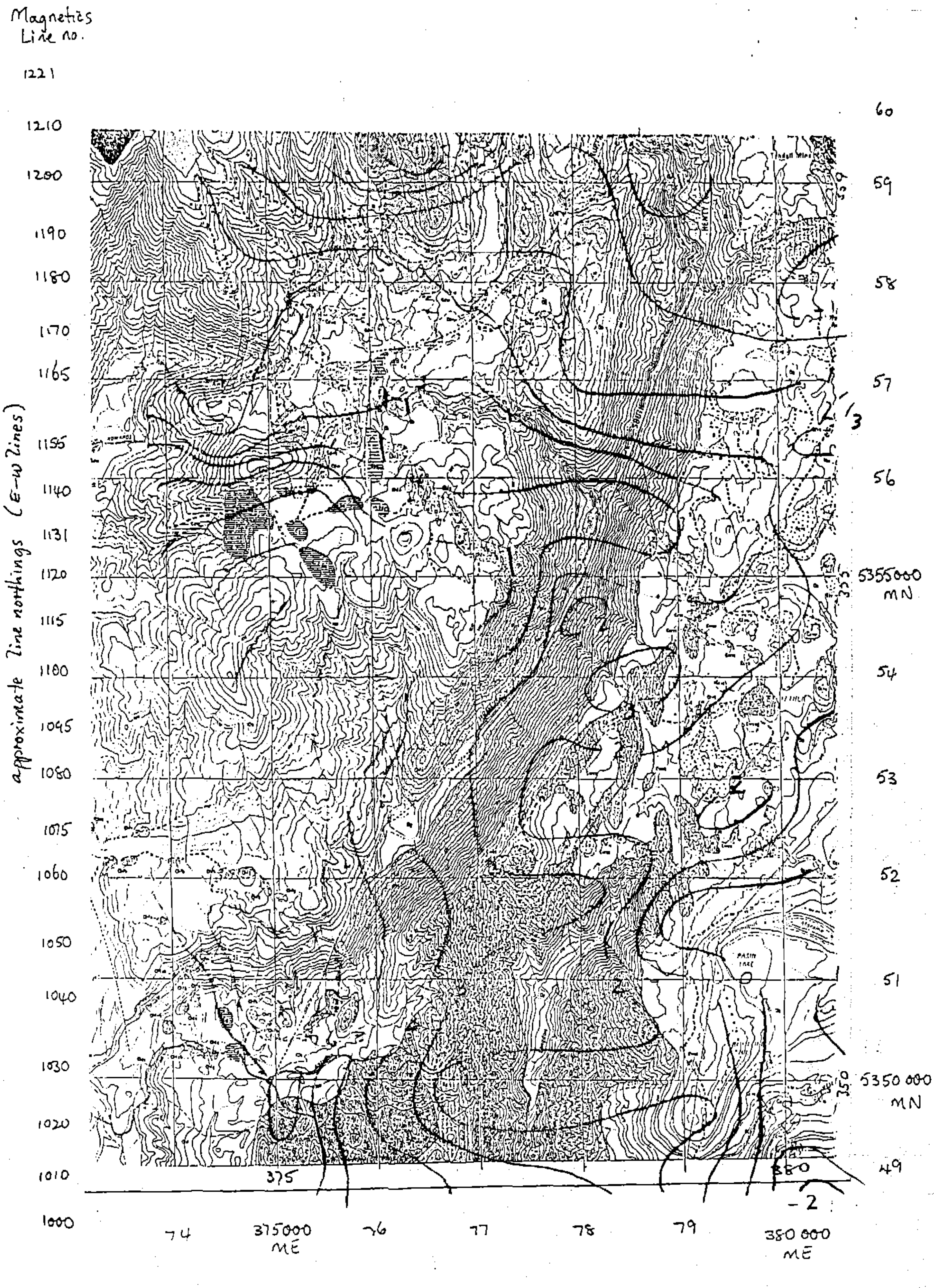


1981 Mines Department aeromagnetic survey
CONTOURS OF MAGNETIC FIELD INTENSITY AS OBSERVED
Base map from Corbett (1986)

FIGURE 7

460220

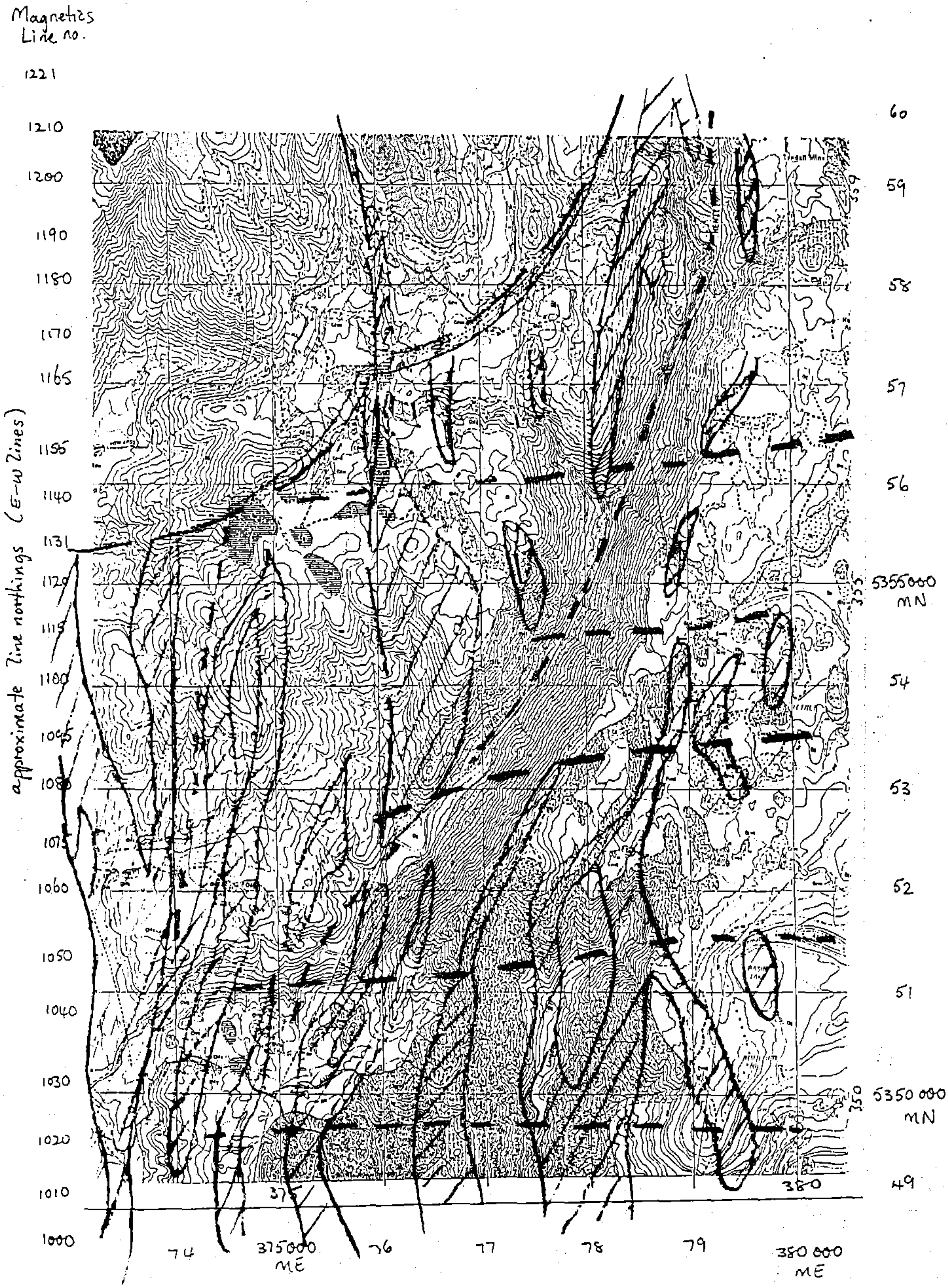
LEAMAN GEOPHYSICS
G.P.O. Box 320 D,
Hobart, Tasmania 7001



Tasgrav and Mt Read Mines Department gravity data bases
CONTOURS OF RESIDUAL BOUGUER ANOMALY
Regional function as defined by Leaman (1988a)   FIGURE 8

460221

LEAMAN GEOPHYSICS
G.P.O. Box 320 D,
Hobart, Tasmania 7001



INTERPRETATION OF MAGNETIC TEXTURE HENTY RIVER AREA EL 11/85
Hatched areas represent positive contrasts. Note that widths of units are estimated and not based on quantitative analysis.

FIGURE 9

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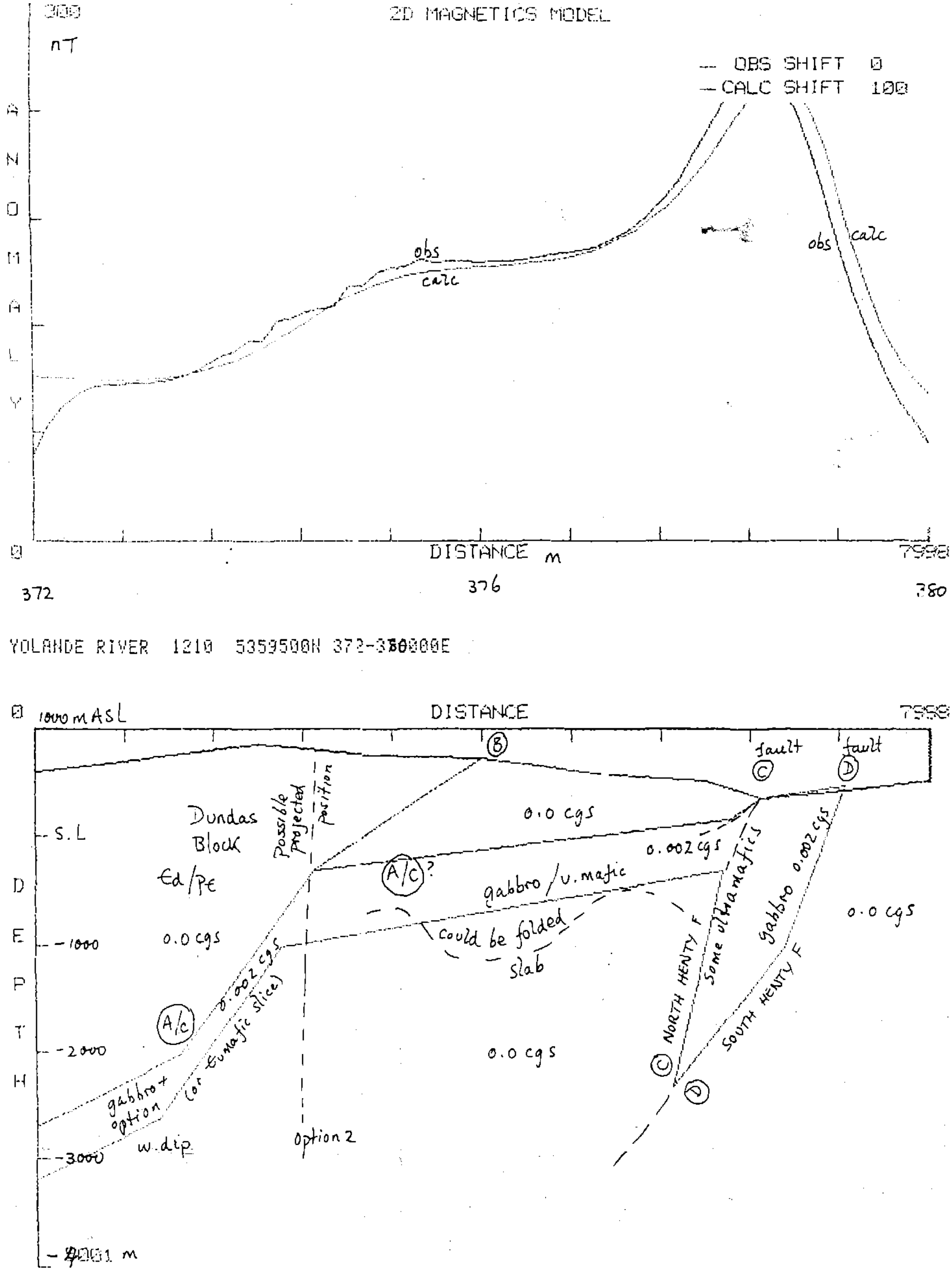
Hobart, Tasmania 7001

460222



2D MAGNETIC INTERPRETATION LINE 1210 HENTY RIVER AREA
EL 11/85 FIGURE 10

YOLANDE RIVER 1140 5356000N 372-380000E

460223

LEAMAN GEOPHYSICS
G.P.O. Box 320 D.
Hobart, Tasmania 7001

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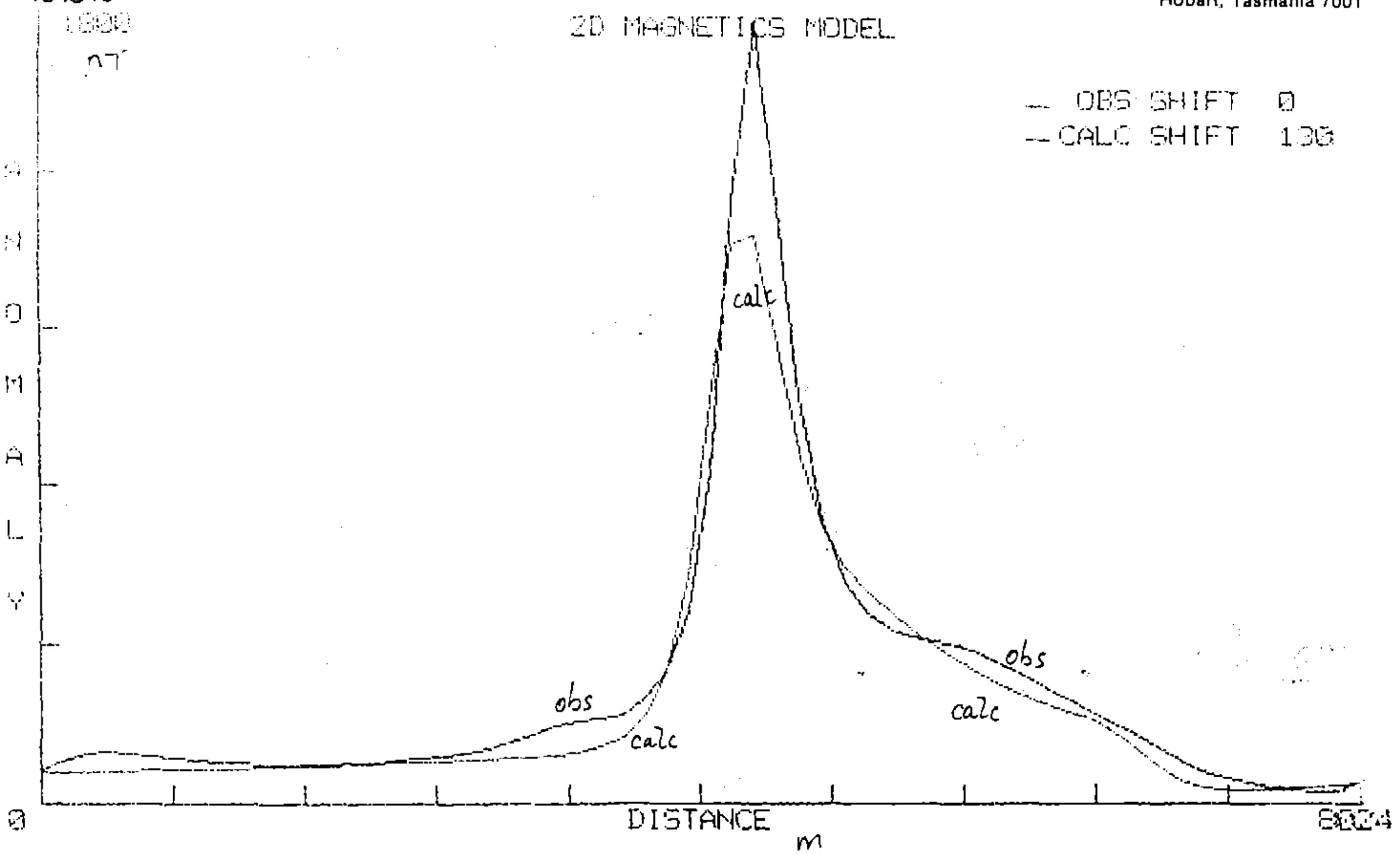
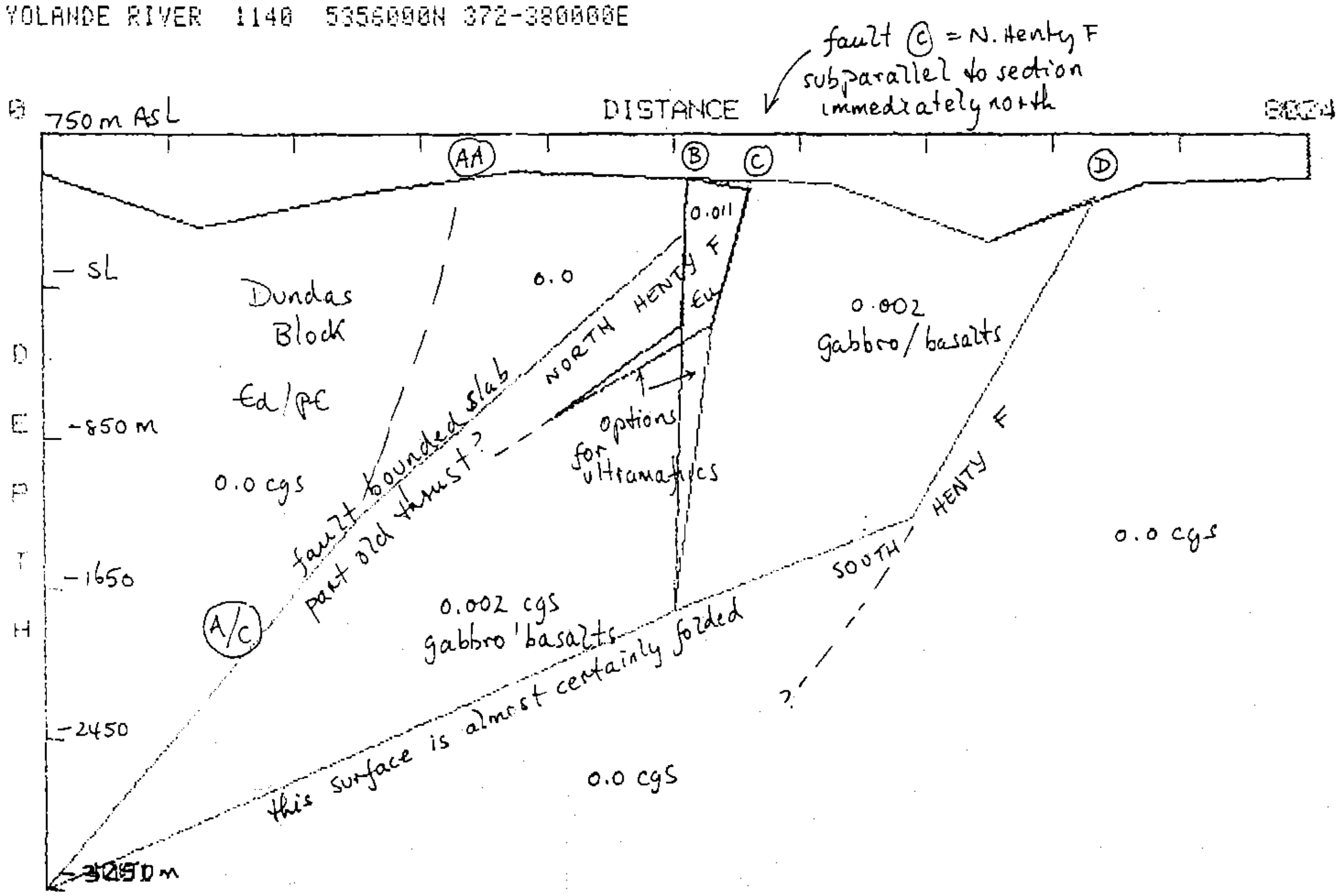


YOLANDE RIVER 1140 5356000N 372-380000E



2D MAGNETIC INTERPRETATION LINE 1140 HENTY RIVER AREA
EL 11/85

FIGURE 11

460224

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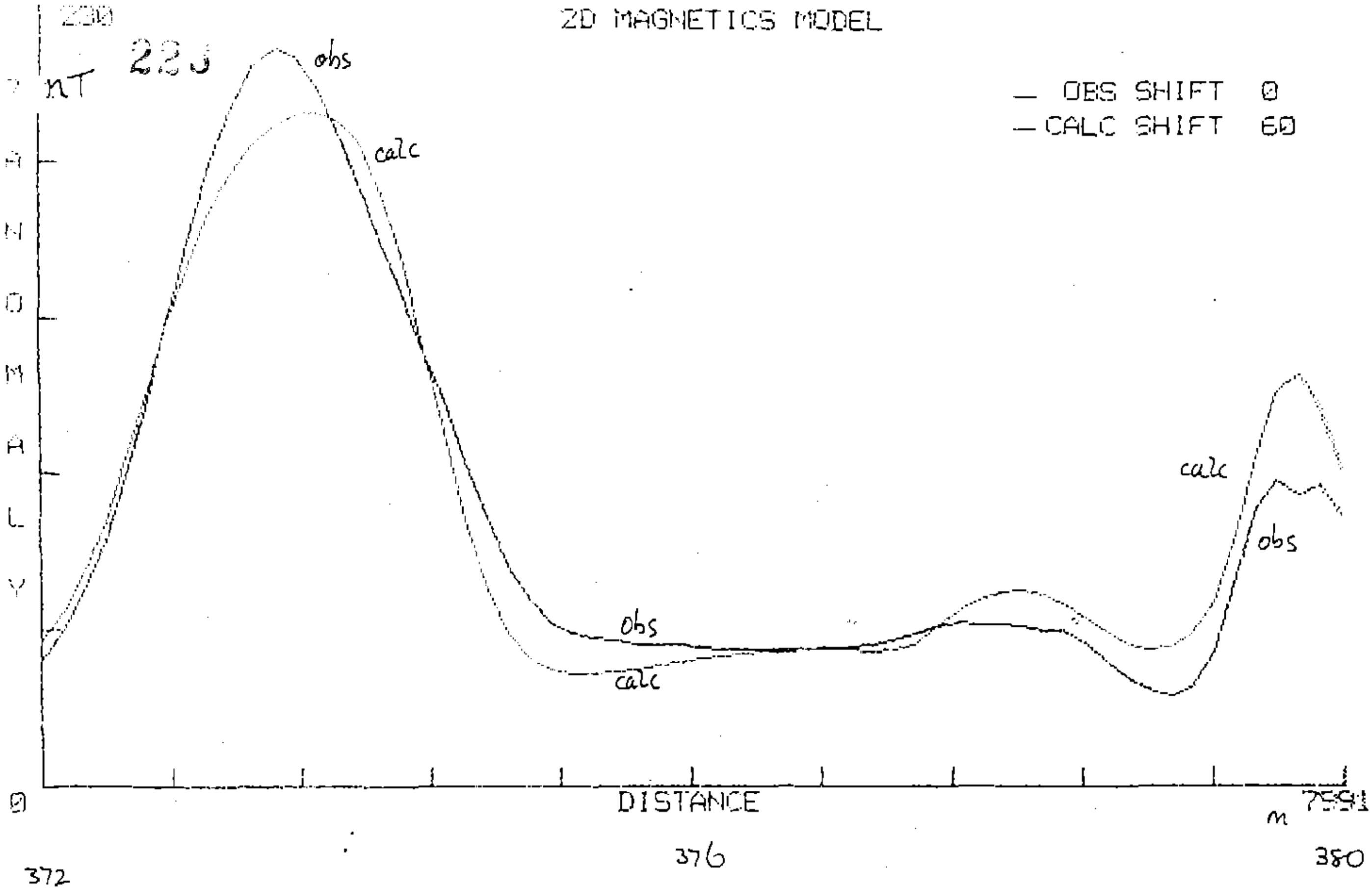
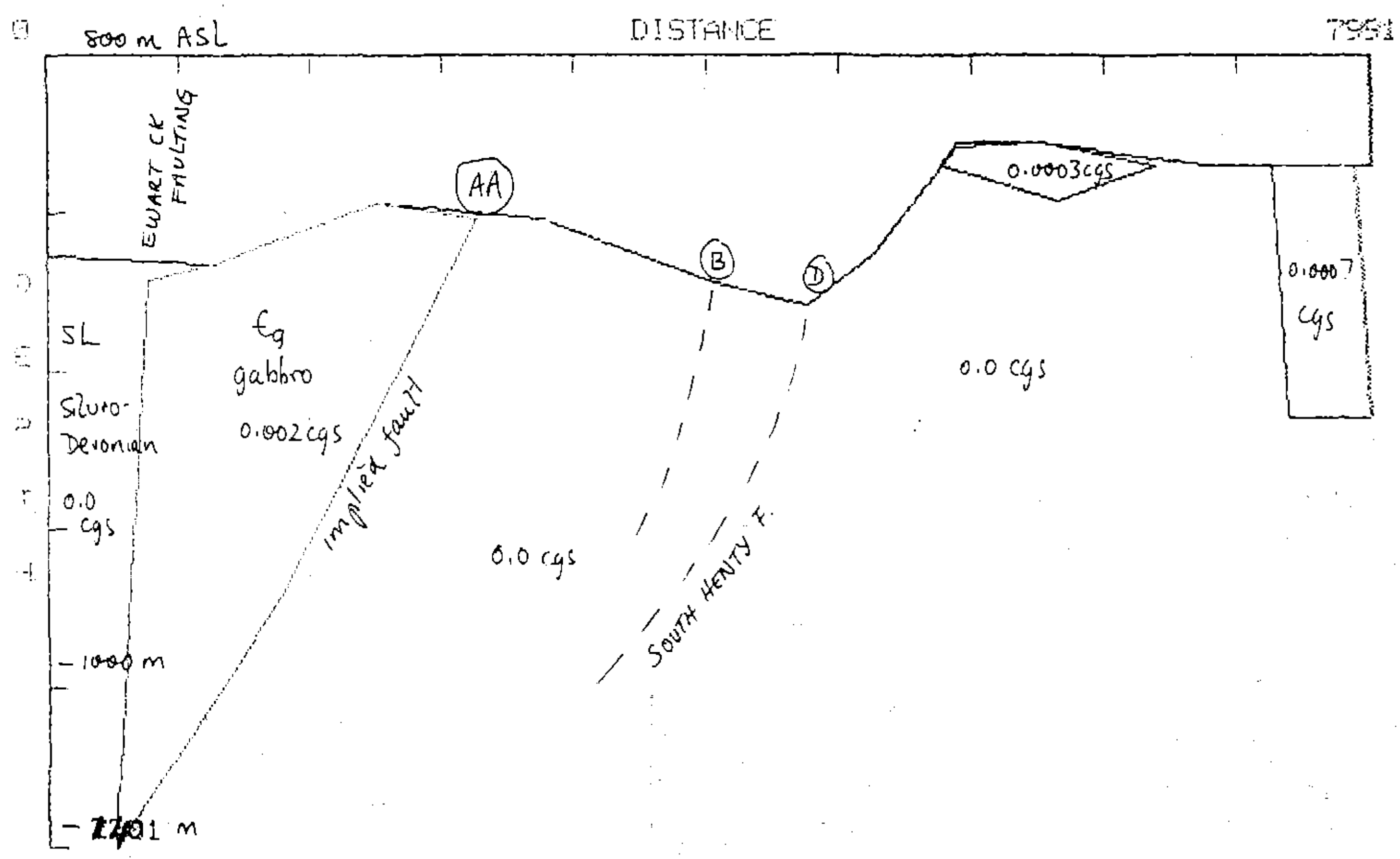
Hobart, Tasmania 7001

LINE PARAMETERS - ORIGIN,LIMIT,INCR : 0 7991 131



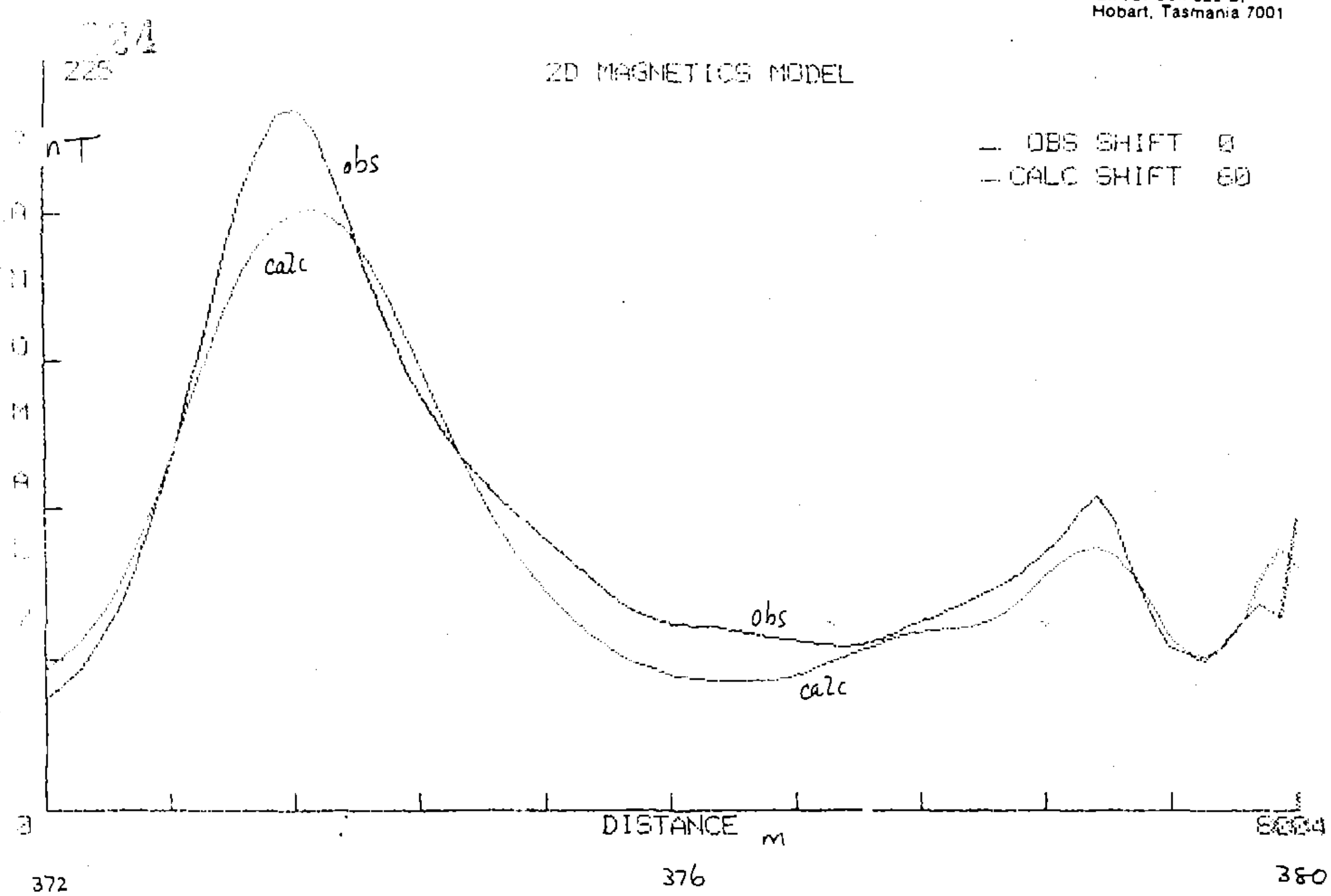
YOLANDE RIVER 1080 5353000N 372-380000E
Z/1=600/620



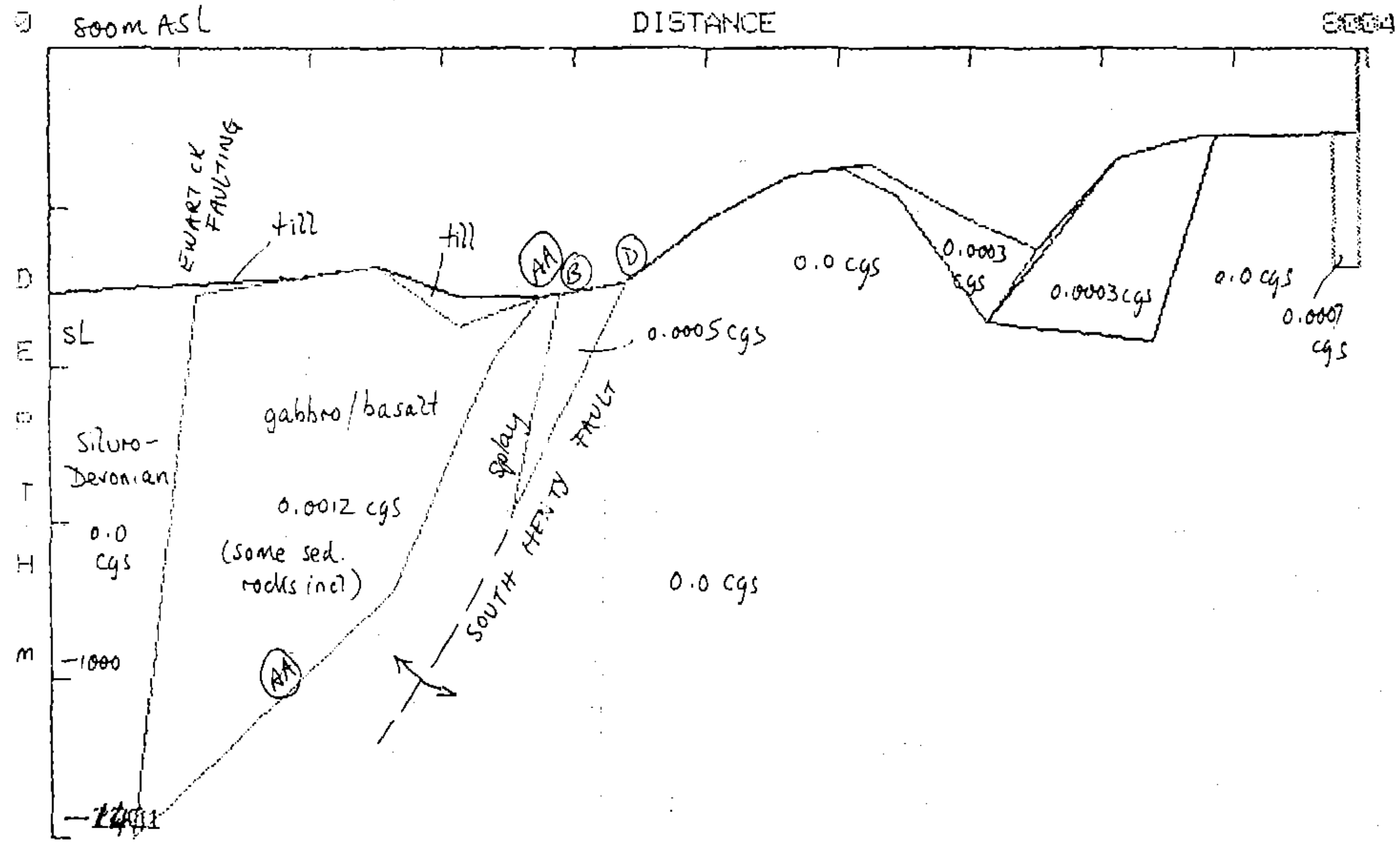
2D MAGNETIC INTERPRETATION LINE 1080 HENTY RIVER AREA
EL 11/85 FIGURE 12

LINE PARAMETERS - ORIGIN,LIMIT,INCR : 0 8004 116

LEAMAN GEOPHYSICS
G.P.O. Box 320 D.
Hobart, Tasmania 7001



YOLANDE RIVER 1050 5351500N 372-380000E



2D MAGNETIC INTERPRETATION LINE 1050 HENTY RIVER AREA
EL 11/85
FIGURE 13

5600 2400

LINE PARAMETERS - ORIGIN,LIMIT,INCR : 0 20000 500

460226
LEAMAN GEOPHYSICS
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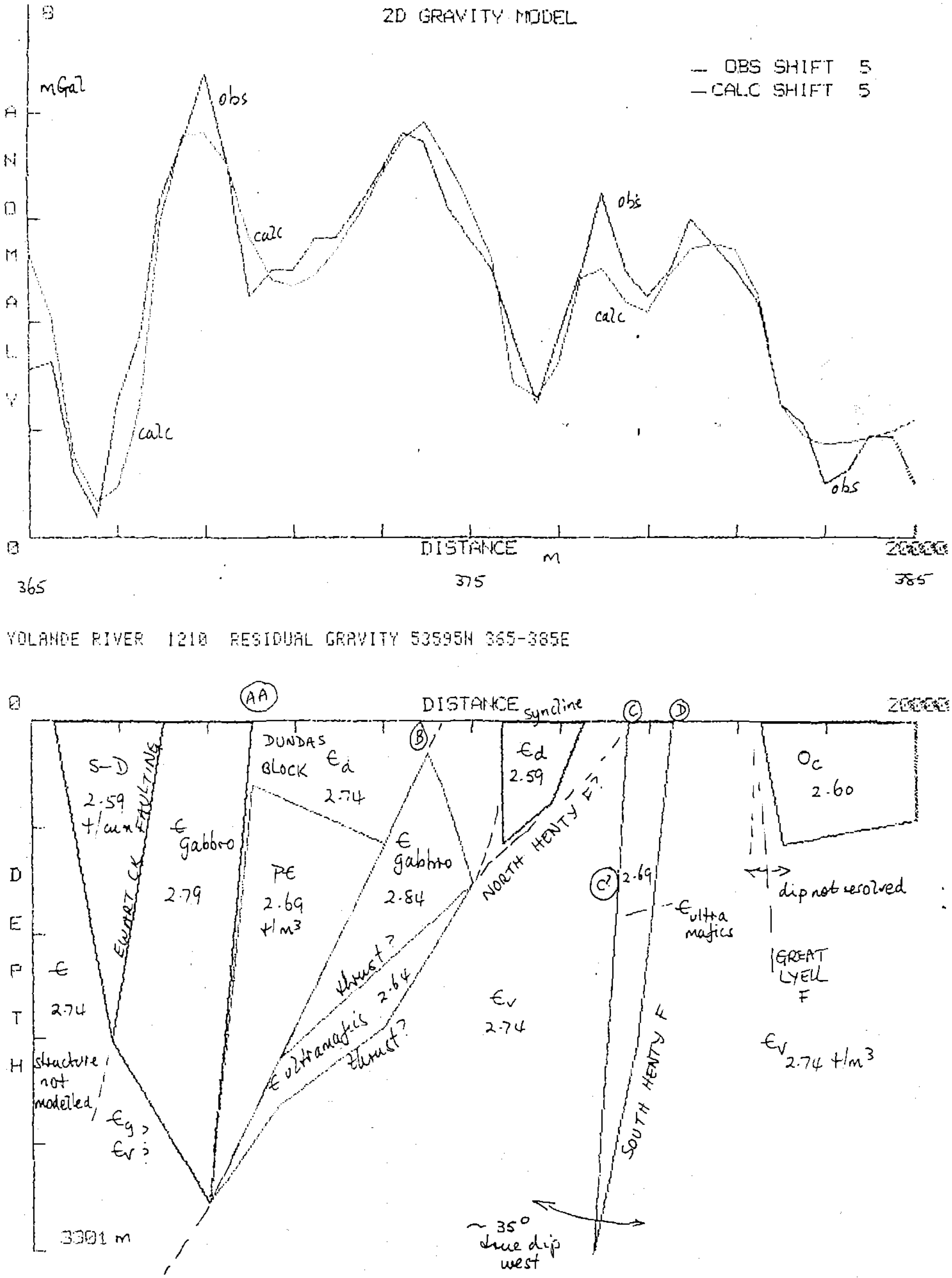

2D GRAVITY INTERPRETATION LINE 1210 HENTY RIVER AREA
EL 11/85 FIGURE 14

LINE PARAMETERS - ORIGIN,LIMIT,INCR : 0 20000 500

460227

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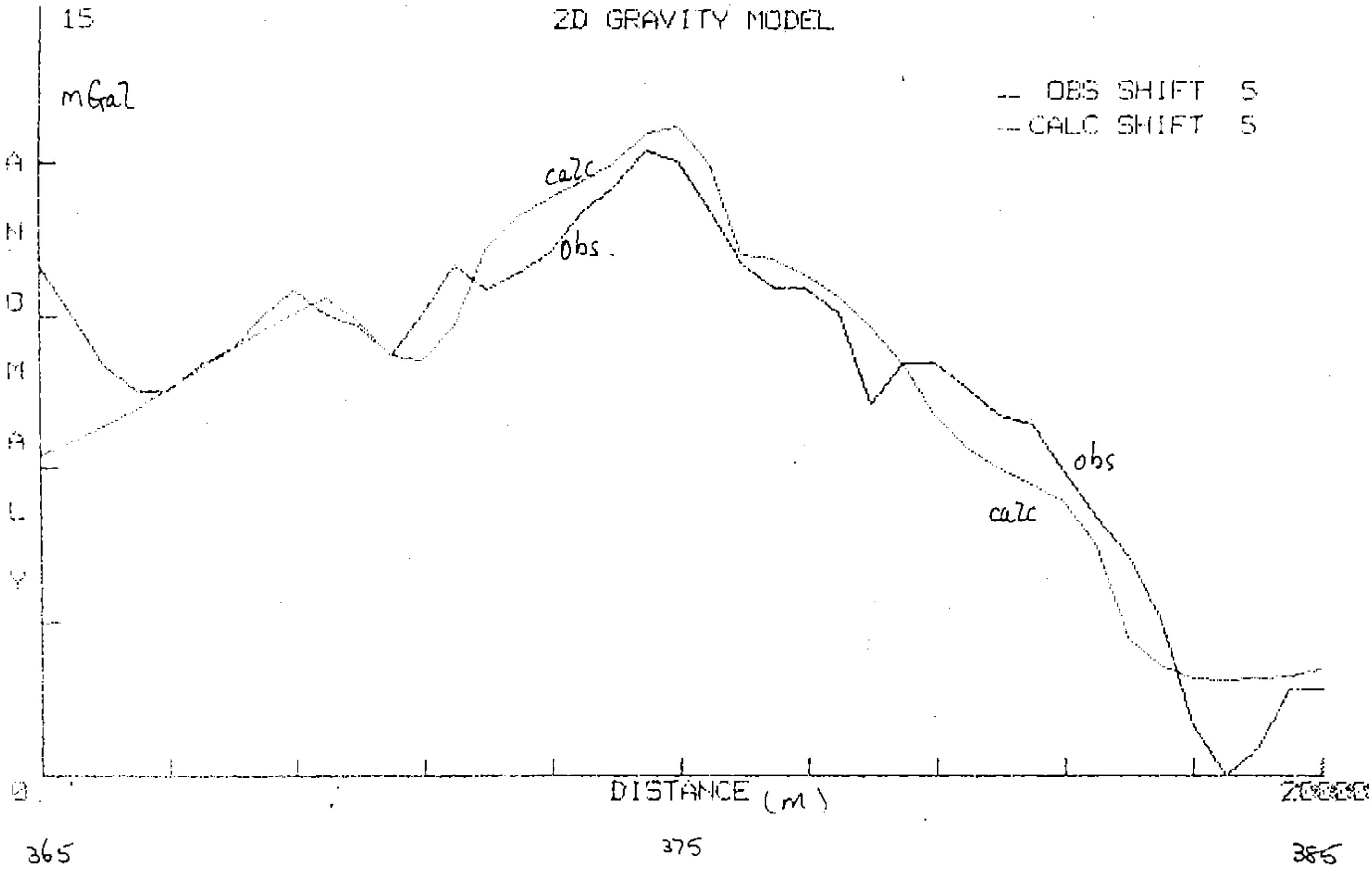
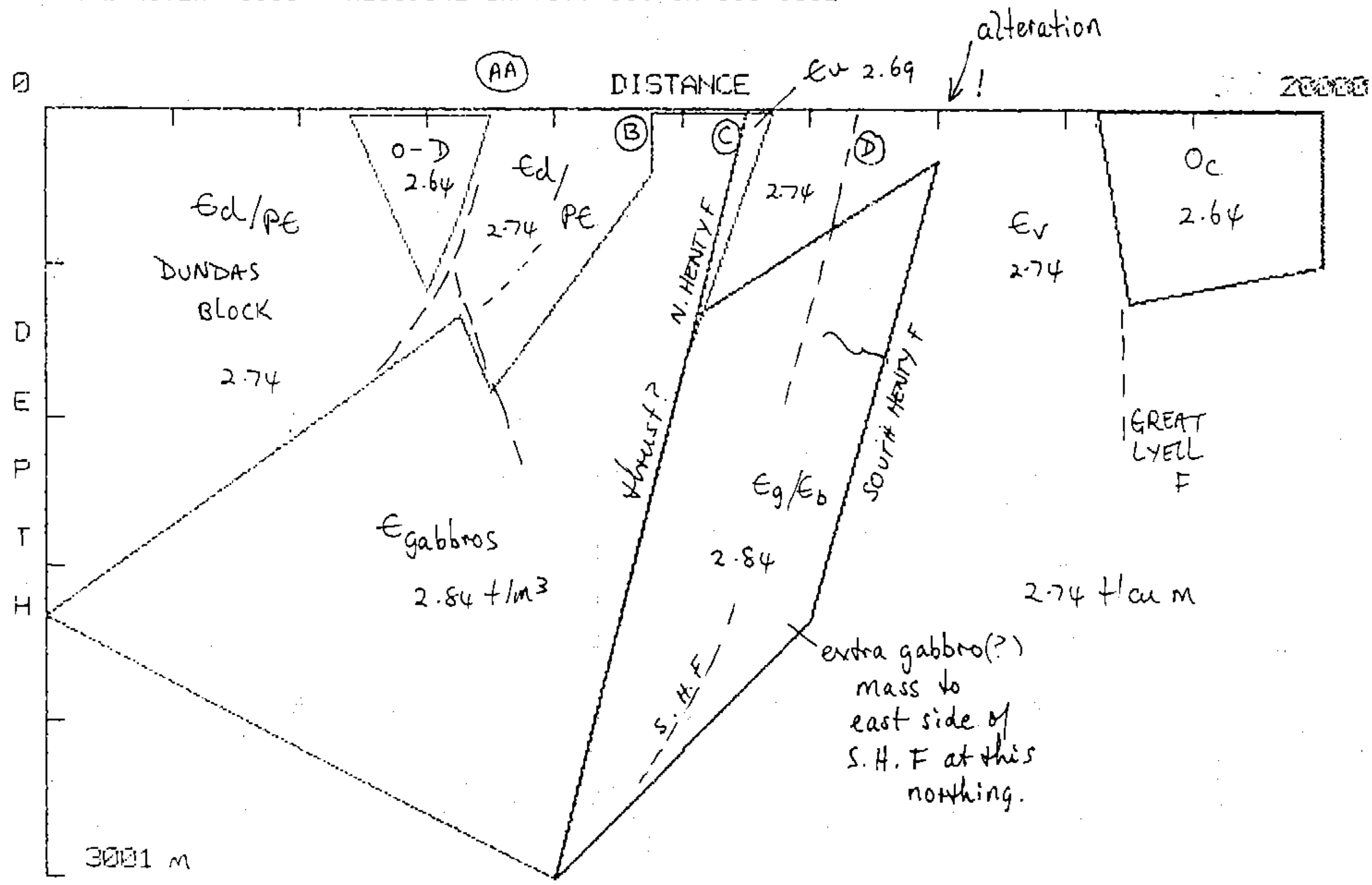
YOLANDE RIVER 1115 RESIDUAL GRAVITY 53545N 365-385E

226



YOLANDE RIVER 1115 RESIDUAL GRAVITY 53545N 365-385E



2D GRAVITY INTERPRETATION LINE 1115 HENTY RIVER AREA
EL 11/85
FIGURE 15

460228

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Hobart, Tasmania 7001

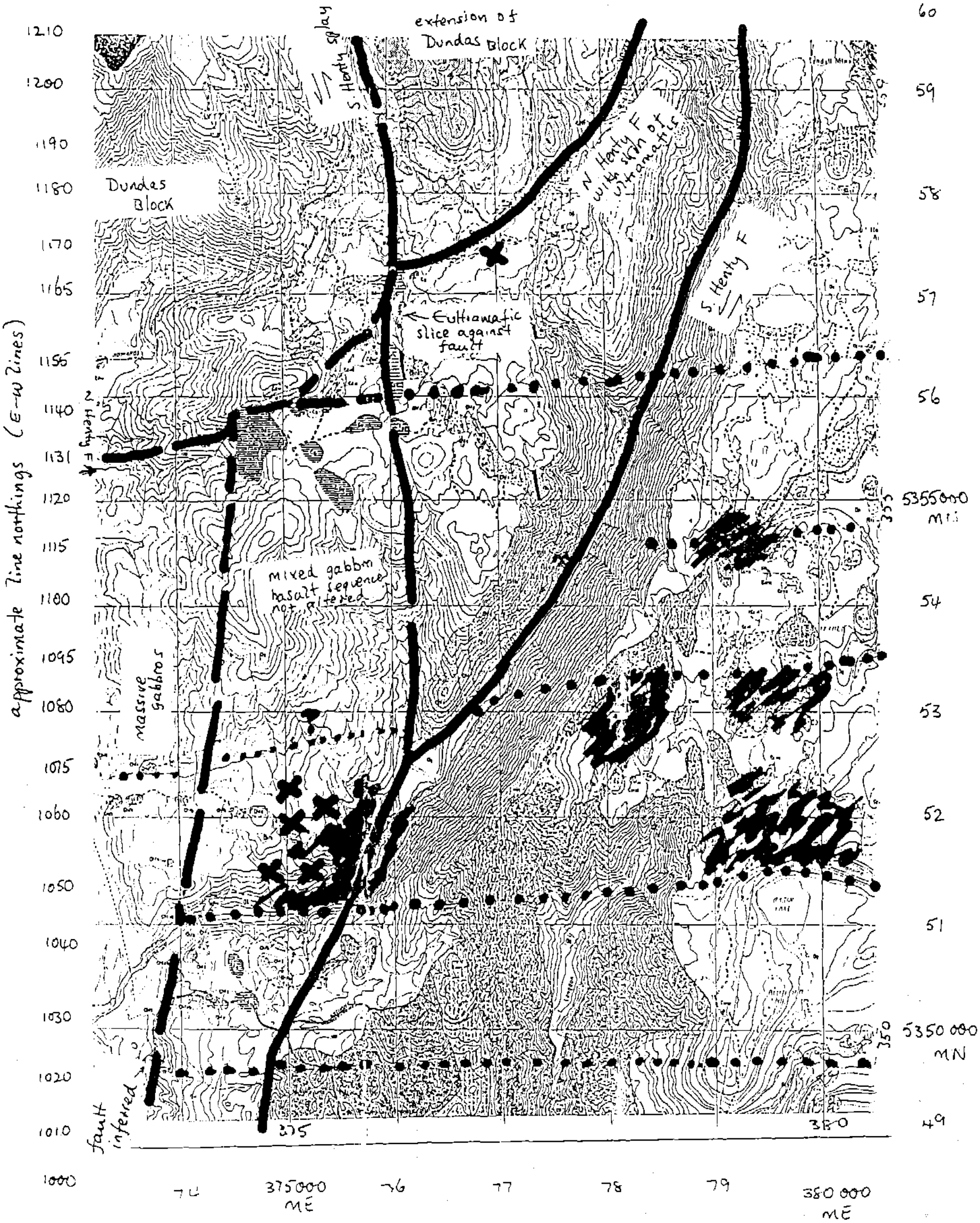
Magnetics Line no.

•••••• magnetic disruptive trends or corridor limits

inferred alteration

× anomalous response

See text for assumptions and data limitations



INTERPRETATION SUMMARY HENTY RIVER AREA EL 11/85

FIGURE 16

1981 Mines Department aeromagnetic survey
CONTOURS OF MAGNETIC FIELD INTENSITY

228

460229

FIGURE 1

22.00 -0.1
14000 3500
16200 2200
225

LEAMAN GEOPHYSICS
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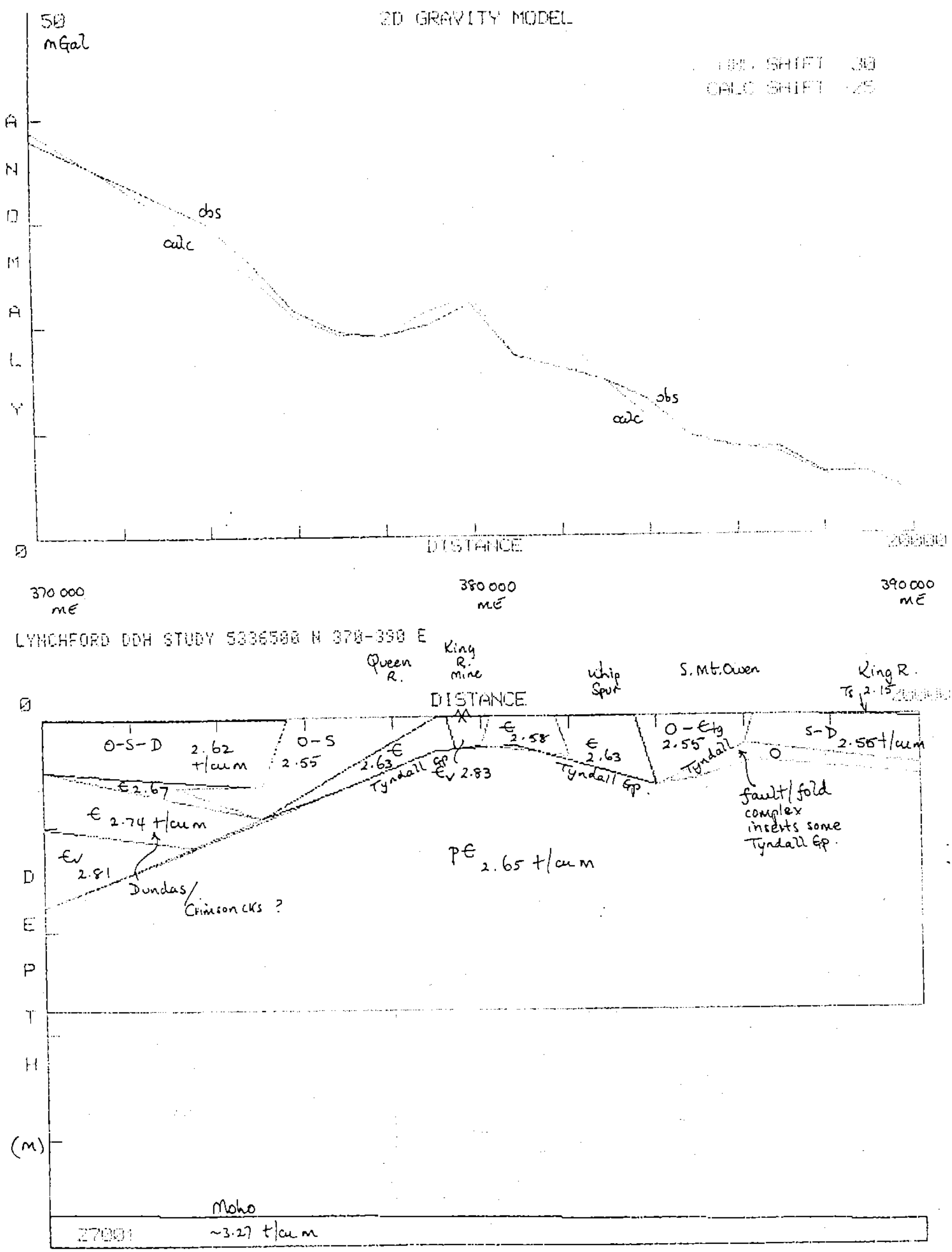
Hobart, Tasmania 7001

0 1500 19990 2500 19990 3000

LINE PARAMETERS - ORIGIN,LIMIT,INCR : 0 20000 1000



GRAVITY SOLUTION CONSTRAINED BY MAGNETIC MODELS

FIGURE 18

5336 500 mN LYNCHFORD

LYNCHFORD DDH PROJECT 5337 500N 370-390 000E

4) 1100 1500 5) 8) 9000, 1170 9) 0.0006 0004

230

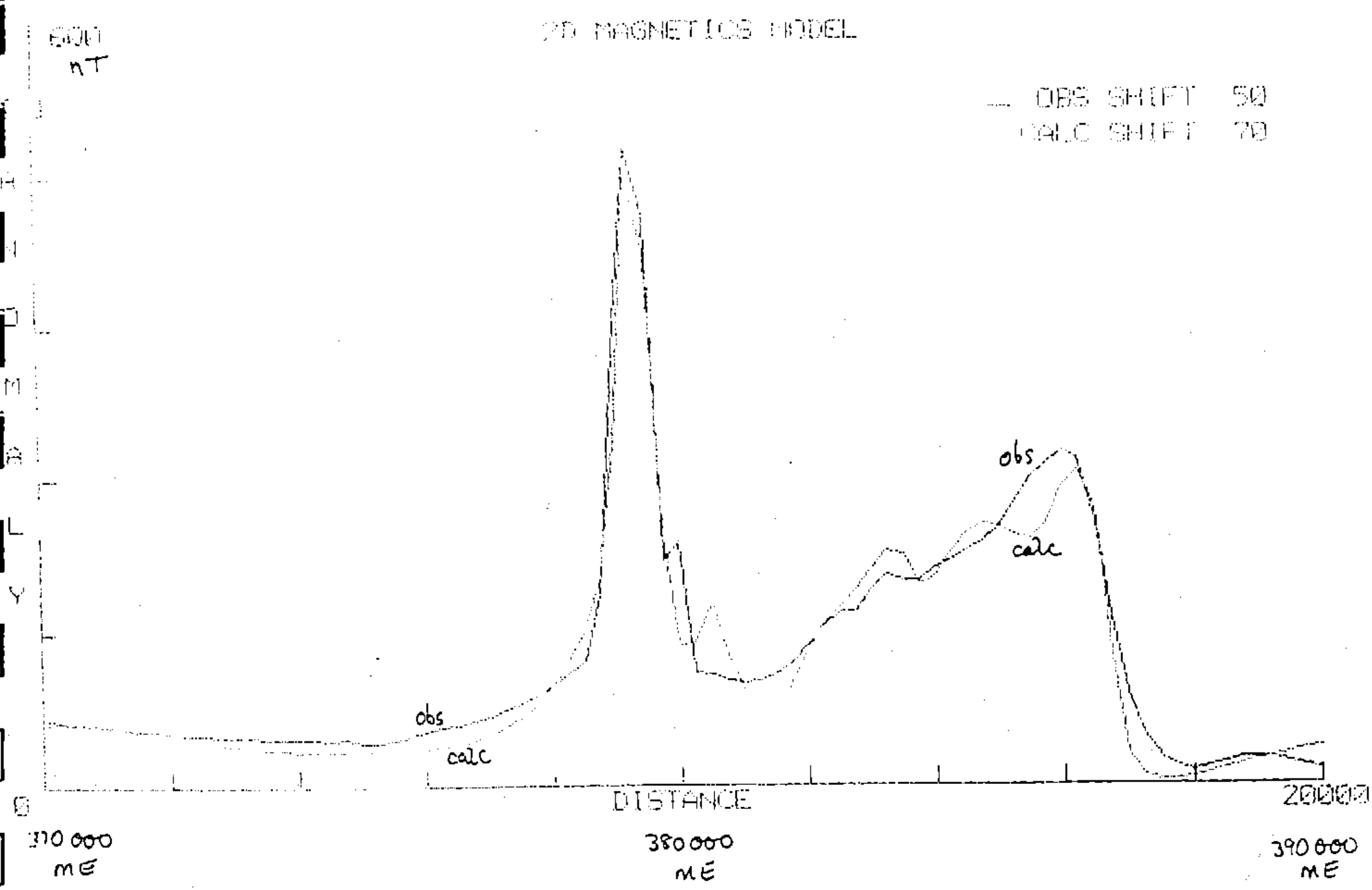
FIELD DATA

INTENSITY	INCLINATION	DECLINATION	OBS LEVEL	LINE DIRECTION
52000.0	-72.0	13.0	140.0	90.0

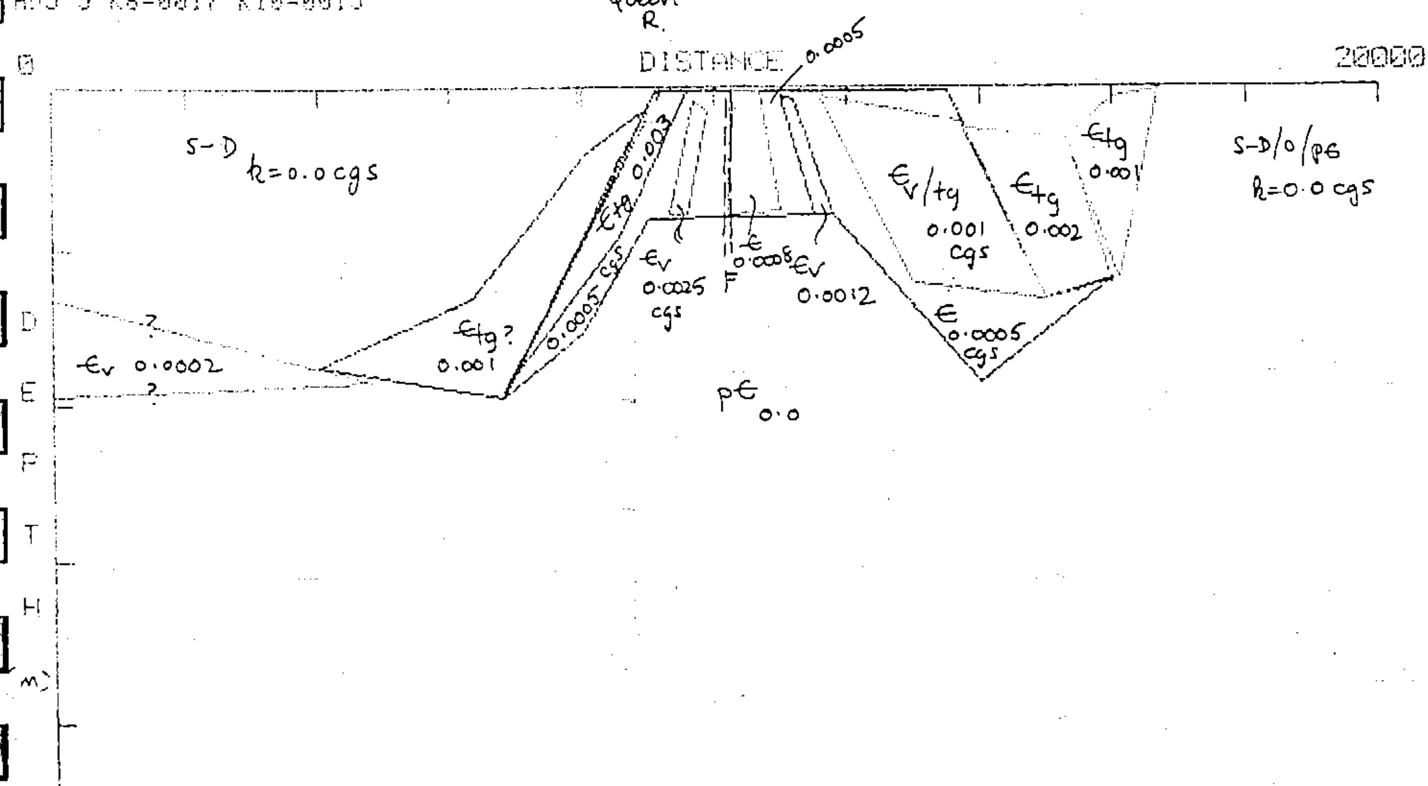
LEAMAN GEOPHYSICS
G.P.O. Box 320 D,
Hobart, Tasmania 7001

LINE PARAMETERS - ORIGIN/LIMIT/INCR : 0 20000 250

460231



LYNCHFORD DDH PROJECT 5337 500N 370-390 000E
ADJ 5 K6=0017 K10=0015



MAGNETIC MODEL 5337 500 MN LYNCHFORD

FIGURE 19

9501

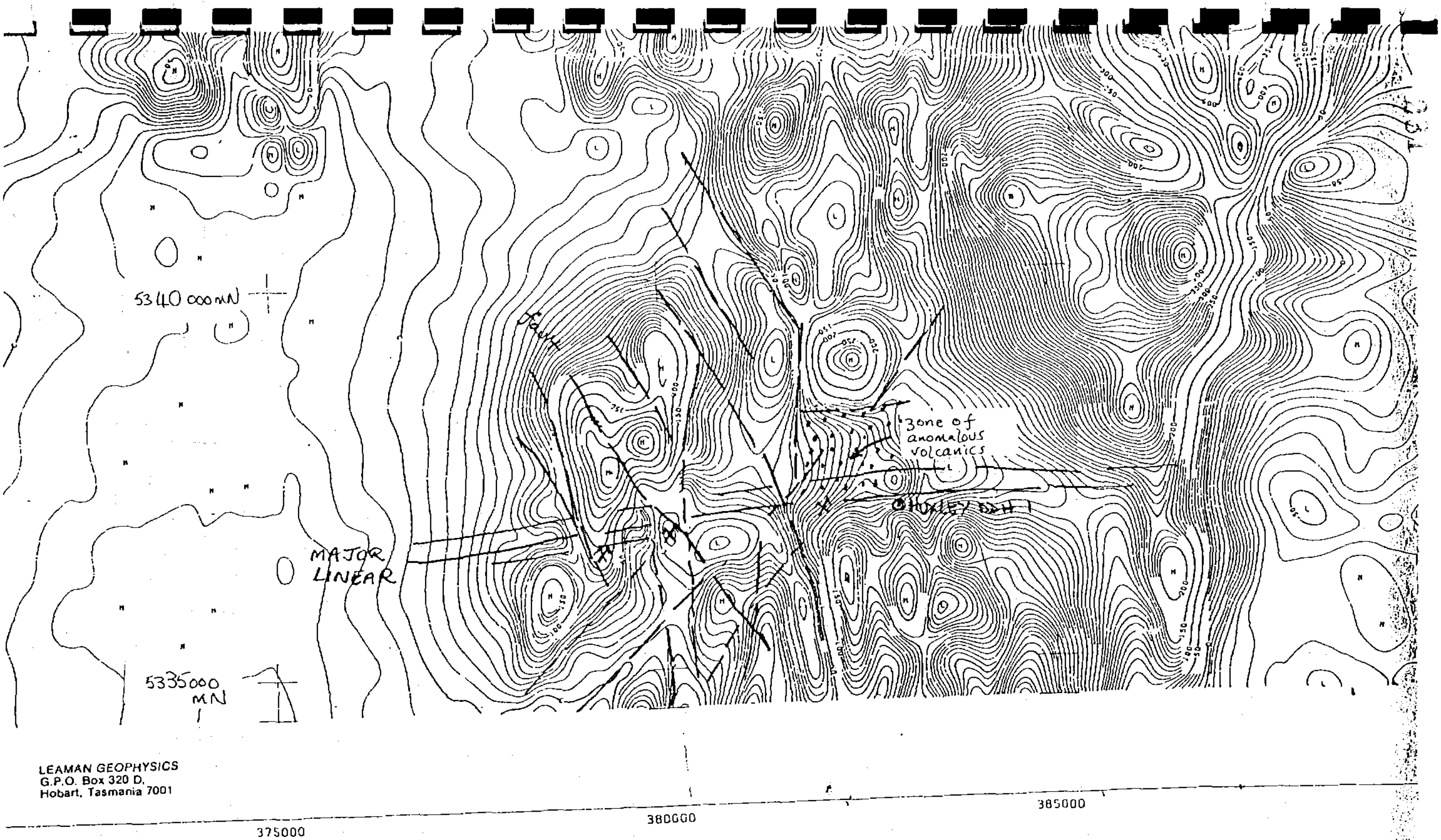


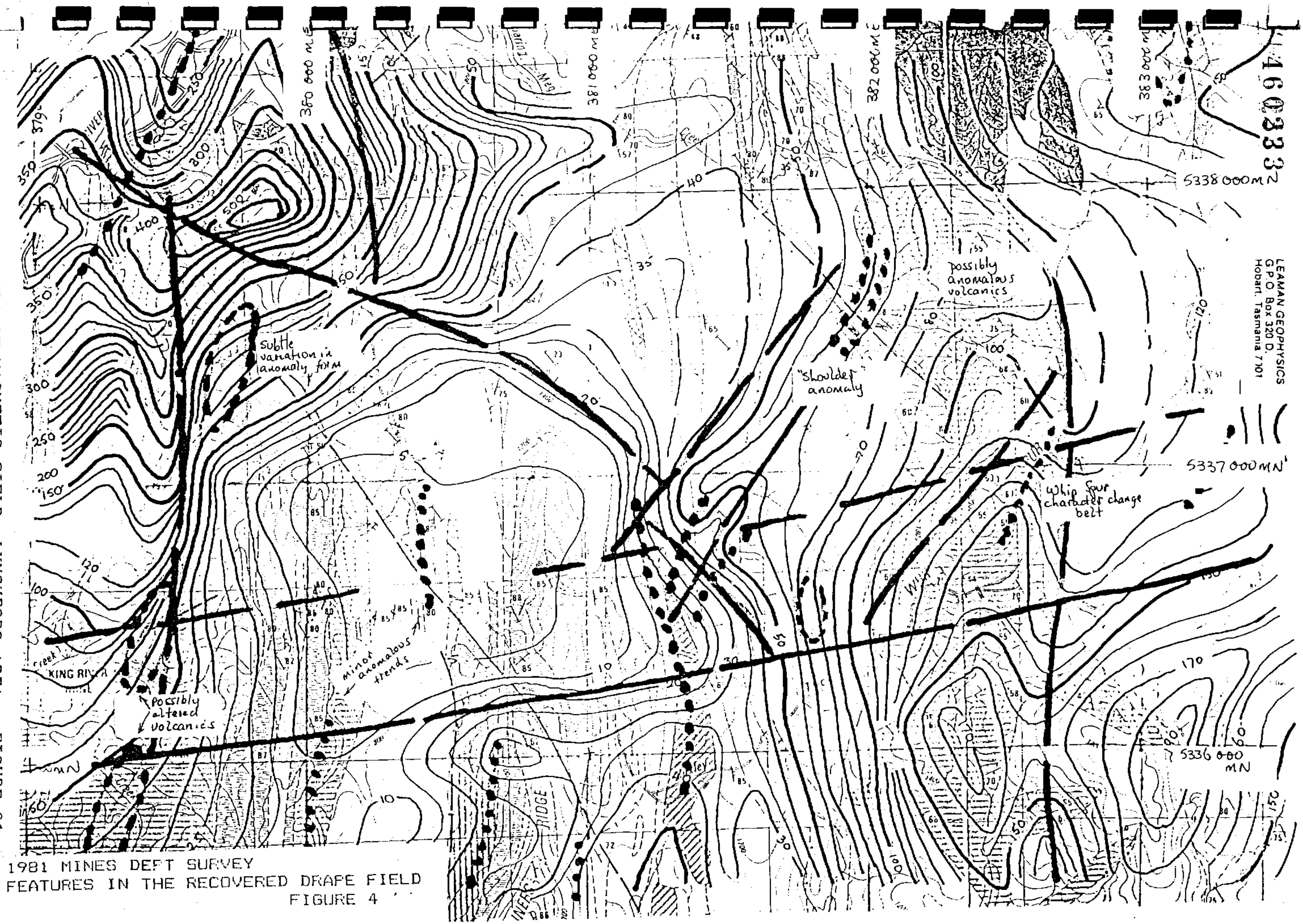
FIGURE 20

y and Compilation by

INTERPRETATION SUMMARY LYNCHFORD AREA EL 11/85

460232

CORRECTED CONTOURS OF MAGNETIC FIELD LYNCHFORD AREA FIGURE 21



1981 MINES DEPT SURVEY
FEATURES IN THE RECOVERED DRAPE FIELD
FIGURE 4

APPENDIX **7** -

HIGH RESOLUTION AEROMAGNETIC SURVEY

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460235

LEAMAN GEOPHYSICS

Survey Review, Specification, Reduction, Interpretation
Gravity, Magnetic and Seismic Methods
Structure and Prospect Evaluation

Registered Office:
21 ZOMAY. AVENUE, DYNNYRNE, TAS. 7005
All Correspondence to:
G.P.O. BOX 320 D, HOBART, TAS. 7001.
TELEPHONE: (002) 24 0319
FACSIMILE: (002) 23 3194

AEROMAGNETIC SURVEY
EL 11/85 YOLANDE RIVER

ACQUISITION REPORT
(INCLUDING UPDATE INTERPRETATION)

for

PASMINCO MINING

by

Dr. D.E. Leaman

July 1990

YOLANDE

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MAGNETIC SURVEY
Specification 2
Survey 3
Processing 3
Presentation 3

COMPARISON WITH PREVIOUS DATA 4

INTERPRETIVE COMMENTS 5
Review of altered or possibly altered sites.. 6
Review of mineralised sites 8
Implications for further exploration ... 9

REFERENCES 10

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1 EL 11/85 location
2 Compilation of Mines Department regional survey
3A Yolande River magnetic survey (north)
3B (south)
4A Yolande River magnetic survey and geology base (north)
4B (south)
5A Colour image of magnetic field
5B Colour image with contours overprinted
6 Gradient of magnetic field
7 Previous interpretation of altered material
8 Outcrop mapping in Newton Creek area
9 Location of principal structures
10 Model of andesite/alteration boundary near Canal

MAPS

1. 1:10000 Line location map and fiducial references
2. Stacked profiles of magnetic field.
3. Contours of residual magnetic field.

Each Map is in two parts, north and south of 5355 500 mN

SUMMARY

A new high resolution helicopter aeromagnetic survey of the Henty River portion of the licence has provided confirmation of gross structures inferred from more regional coverage and shown that many alteration and unit characteristics have not been recorded previously.

This report describes specification and acquisition of the survey. It also includes a review of issues raised using more regional quality data, including sites of possible alteration and structuring. The new survey provides high resolution and detailed coverage and enables many units and boundaries to be located with precision.

The increase in resolution, both in terms of spatial location and definition of magnetic character, has resolved many issues posed by older surveys. Many anomalies, previously thought due to alteration, have now been shown to be due to local exposures of andesitic rocks. Other responses show that andesites are more common than has been mapped and some portions south of Leech Hill and north of Basin Lake are locally altered.
Alteration in the Newton Creek portion of the area is associated with a, presumably faulted, boundary or contact with a thick andesite suite. This contact is disrupted and there are opportunities for unsuspected targets. The magnetic data set defines all offsets.

Other major structures, including the two parts of the Henty Fault, can also be shown to be ragged features affected by very late, but small scale offset faulting. It is also possible that the South Henty Fault does not tend to the SW as mapped and the true position of this structure near the Murchison Highway may be near the road bridge.

The magnetic survey also suggests that the structural accumulations of mafic and ultramafic rocks are blocked out and a large block near the confluence of structures at 376 000, 5352 500 is free of these materials. This structural junction may also contain an increased volume of altered material. The mafic suites and the structural assemblage carrying them does not persist east of the South Henty Fault.

The only definitive mineralisation signatures recognised lie near the Tyndall Mine and Howards Anomaly just east of the EL. Possibly anomalous character can also be identified in tuffs west and south of Henty River Adits.

INTRODUCTION

EL 11/85, Yolande River, is located east of the Murchison Highway and south east of Mount Dundas in western Tasmania (Figure 1). It includes the complex North and South Henty Fault zone but lies west of the Great Lyell Fault.

Gravity and magnetic data in the area were reviewed by Leaman (1989). Results indicated that these data sets could reveal much information about structural setting and control within the area and further surveys were recommended. The regional data available were shown to lack resolution due to line spacing or terrain clearance excesses.

This report describes the detailed aeromagnetic survey flown in order to fulfill part of these recommendations. The principal aims of this survey were to

a) improve definition of lithologic boundaries, including those concealed by till or other surface materials.
b) review implied alteration characteristics,
c) confirm locations of major linking structures inferred in regional data,
d) assess known mineralised sites for signature characteristics,
e) define lineament intersections.

A detailed, high resolution survey was specified.

The report outlines survey specification, presents the results of survey and provides a updated interpretive commentary for the Henty River area. Further work may be justified in some areas after assessment of these comments.

MAGNETIC SURVEY

SPECIFICATION

Specifications for the survey were determined by the previous experience provided by the Mines Department survey (Leaman, 1986) and the need to resolve possible alteration features, subtle trends, and the contribution due to various parts of the Cambrian volcanic pile. Leaman (1986) has established the general viability of magnetic methods for assessment of alteration and mineralised sites in areas free of strong interference effects such as introduced by Tertiary basalt or Cambrian ultramafics.

Many of the features sought are known to be subtle and all previous data has lacked the necessary data resolution - in terms of low clearance, close sampling and line density. Detail, once lost due to variable or excessive clearances, is not recoverable.
Since the reliability of the regional data set was not known, and there is little information available on the variability of contrasts within the volcanics it was important to ensure that a fair and substantial trial of the application was permitted. The best practicable specification was defined.

Line spacing: 100 metres E-W
Tie line spacing: 1000 metres N-S
Nominal terrain clearance: 80m.
Sample interval: < 10 m.
Magnetometer sensitivity: < 0.1 nT.

The line balance and orientation reflects the general form of the terrain and the need to define sub E-W or NW-SE and SW-NE trends as suggested by gravity surveys and the Mines Department survey. Rigorous draping necessitated use of a helicopter. Use of fixed wing aircraft, a higher nominal clearance and general wide variation in that clearance effectively destroyed the resolving power of the Mines Department survey across the important, relatively low relief magnetic field environment associated with Cambrian volcanics and adjacent Dundas Group. Only high relief features were defined by that survey in this area.

Multichannel radiometric data were also specified but no commitment was made toward processing of that data pending inspection of the raw data.
(This data has not yet been fully processed and it is possible that no further analysis will be undertaken).

SURVEY

The survey was flown between February 22 and March 17, 1990 by Geo Instruments Pty Ltd under the supervision of Zoltan Beldi using a G-813 proton precession magnetometer in a towed bird and a GR 3001 spectrometer with 16.8 l capacity.

An equivalent magnetometer was used as base station and the survey was completed over several days.

Survey tracking was visual supported by colour video using topographic basemaps and aerial photographs with a recovery scale of 1: 10000.

Total line coverage was about 700 km. Line recovery and line location details are presented in Map 1 (folder).

PROCESSING

Flight path digitising, processing, gridding and mapping were performed by Pitt Research Pty Ltd of Sydney.
IGRF 1985 was removed from the data and a scalar of 4800 nT added to residual data.
The stability of gridding and acquisition was tested by preparation of pixel image maps which expose line misties. The many cross ties generated by this survey were adjusted by spline interpolations in both directions.

A contour interval of 2 nT was selected for the primary presentation (Map 3 - folder; Figures 3 and 4). Stacked profiles are presented in Map 2.

Radiometric data have not been corrected, levelled or compiled.

DATA PRESENTATION

Maps 1, 2 and 3 (folders) (for northern and southern sections of the survey area) provide detailed presentation of the survey coverage, observed profiles and contours of the magnetic field at 1: ~~25000~~ 10000 scale.

Figure 5 provides colour pixel image versions of the magnetic data. Figure 6 presents an image of horizontal gradients.

All images were prepared by Pitt Research Pty Ltd.

Maps used as bases, or overlays, have been derived from Corbett (1986).

A number of minor herring bone suggestions have persisted throughout the processing. These reflect the high amplitude responses, the very difficult terrain, minor location problems and the high resolution of both acquisition and presentation.

COMPARISON WITH PREVIOUS DATA

The previous regional survey described by Leaman (1986, 1989) has been reproduced as Figure 2 and may be compared with the new survey (Figures 2 to 5). Contour intervals are sufficiently similar to appreciate the improvement in detail and resolution offered by the new survey.

The regional survey can be seen to provide a reasonably reliable view of the magnetic field in terms of the location and identification of all significant responses but there was clearly considerable loss of resolution and definition in many areas. Specific examples relate to the character of many of the more isolated sources, especially east of the South Henty Fault, the shoulder and compound detail on large anomalies and the differentiation of responses generally.

The lower clearance, higher resolution and better constrained flight path with closer line spacings has considerably improved feature recognition and location. The significance of some of this detail is discussed below.

Character correlation of the older data was used to suggest one large sub E-W alteration corridor (approx 5351 500 and 5353 150 mN) and possibly three other features with this orientation. Most erratic responses and interpreted alteration style features were associated with the primary corridor. The largest fault junctions in the region also occurred within this corridor.
The regional data set was also used to suggest rock unit correlations and several linking fault segments were inferred (refer to Figures 9 and 16 of Leaman, 1989).
Each of these suggestions, as well as the capacity to consider detailed responses near known mineralised sites, has been reviewed in this report.

INTERPRETATION UPDATE

The following comments outline possible correlations and implications within, and of, the data set with respect to exposed geology and mineralised sites. Particular emphasis has been applied to those features not apparent in regional data, overlooked in regional analysis or which address issues raised by the regional analysis of Leaman (1989).

The principal object of this discussion has been to assess observed features and possible identification of patterns and relationships which may lead to explanation of known sites and prediction of possible targets for follow-up study.

All styles of presentation (as supplied by the contractor by May 8, 1990) have been reviewed.

FEATURES OF THE MAGNETIC FIELD

FIGURES 3A, B, 4A and B present the residual magnetic field in contoured form (with and without geological basemap).
The relief of the field is evident in Figures 5A and B which include colour images.

These figures stress the anomalous character of the magnetic field north and west of the South Henty Fault and contrast the character of the Dundas facet with the West Coast Range facet. The abnormal character of the block between the two parts of the Henty Fault is also apparent.
Many rock units can be identified unambiguously and matched with some mapped units. The porphyry near 376 300 mE, 5351 000 mN, for example. Other similar features can be recognised near 376 000, 5358 500 and 377 500, 5359 500. The origin of the effect not obvious, or has not been mapped, in most cases. Many of these features show definite character over strike lengths of at least a kilometre and then are abruptly terminated. Many hitherto unsuspected faults can be identified in this way.
The more detailed presentations also enable fracture and trend continuity to be recognised.

The large anomaly located between the two parts of the Henty Fault can be seen to possess considerable grain with primary orientations at about 15, 85, 140 and 170 degrees. Many of these orientations can be identified beyond the core block. The mapping of Corbett & McNeill (1986) displays some of these trends - especially south of the South Henty Fault.
Several units or structures oriented a little west of north can be seen south and east of the South Henty Fault between 376 000, 5350 000 and 380 000, 5361 000. None of these features can be traced across the fault system. Each is, however, associated with a minor change in character or orientation of the anomaly which follows the South Henty Fault and small offsets are implied in these positions.

The structural texture of the various parts of the area is most clearly displayed by the gradient presentation of Figure 6.

REVIEW OF ALTERED OR POSSIBLY ALTERED SITES.

Leaman (1989) nominated some sites in which alteration was inferred or known (Figure 16 reproduced here as Figure 7). Each of these sites has been reviewed using the various presentations available and the raw acquisition profiles.

The zone near 378 000, 5353 000 is now seen to consist of a small group of relatively isolated features upon a subdued ridge in the magnetic field. Examination of profiles, e.g., lines 81 to 83, shows these to be sourced at relatively shallow depth (or at surface in some cases) and to be distinctive but deformed due to the geometric effect of the strongly magnetised andesites to the east. These rocks are incompletely covered by the survey but yield a marked response near their mapped junction with other volcanics.
The small features previously inferred to be altered units are located at 378 300, 5353 000; 377 550, 5352 350; 378 000, 5352 300 approximately and are associated with porphyries mapped by Corbett (1986). There are no grounds for presuming these effects to be abnormal. Similar effects may be observed near 378 300, 5354 500. The effect is, however, lost near 378 200, 5353 500. This porphyry should be inspected!
This anomaly association also suggests that porphyries near 376 000, 5351 500 are incorrectly located; the units are 200 m further east but display a possibly altered character near 376 100, 5351 700.

Responses from the zone near 379 500, 5353 000 are also associated with andesites and the anomaly pattern near 379 000 (N-S) and 5352 600 (E-W) largely reflects the mapped distribution except near 379 800, 5352 300-500 where the effect is distorted and fails to correlate with assumed geology. Either the mapping is in error, these rocks are locally very thin, or they are altered. Figures 5B, 6 show a clear NE-trending structure in this area and this intersects the sub E-W character of the andesitic pile. This site should also be reviewed.

Mapped pyrite in the zone near 379 000, 5354 600 is also associated with andesites but the responses are not well defined due to nearness of the edge of survey. The andesites immediately north of this site display responses consistent with those noted above (normal) and the magnetic field is very different where the alteration has been described. These changes in pattern and field character confirm that the magnetic data, if examined closely, do record alteration changes and can suggest such sites.
The profile for line 64 reveals a subtle shoulder on the regional anomaly in this zone and the loss of contrast can be established for this unit. The principal response is east of 379 000 mE near "Howards anomaly". This zone displays the normal mineralisation signature pattern but may be just outside the EL (Leaman, 1987).

Anomalies in the zone near 379 500, 5351 800 (north of Basin Lake) could be due to concealed pockets of andesite (compare Leech Hill) with a boundary a little west of Basin Lake. The marginal trend is clearly indicated (NNE) in Figure 6. The detail and resolution provided by the new data enables definition of many of these features and allows precise location with exposures.

About one square kilometre centred near 375 500, 5351 700 was inferred to be anomalous and possibly altered by Leaman (1989). Consideration of the present magnetic field mapping and Pasminco outcrop mapping indicates that this is an unusual area but there is a strong correlation between field character and rock type even though information is limited. The field largely reflects disposition of greywackes or basalts/gabbros. Large gaps in outcrop control limited evaluation. The magnetic field pattern defines intersection of NE andf NNW-trending structures near the river at 375 700, 5351 800 (for example).

A zone of particular interest lies north of the river near 375 500, 5353 500. There is no outcrop control but andesites are exposed to the west, gabbros and siltstone to the east, basalts and epiclastics to the south - but all exposures are several hundred metres away.
The nature of the magnetic field, associated with these exposures, but peripheral to the nominated zone reflects the increased magnetisation implied by these lithologies. Either the rocks of the nominated zone are sedimentary, massively altered or comparable with the sequence along Bradshaws Road.

The new survey does imply some other definitely abnormal responses; two are associated with the area described above which is inset into the mafic terrane north of the Henty Fault. Both effects are sub E-W and each has some strike extension but are best observed at 377 000, 5353 700 and 376 500, 5352 900. In each case mapped geology and lithologies have been ignored and the field presents abnormal character. Other anomaly terminations may be noted in association with these features. A similar, but smaller, feature of this type offsets the units west of Henty River Adits.

Alteration mapped in the Newton Creek region by R. Poltock has also been examined.
The magnetic field east of the South Henty Fault is clearly defined and identifies a narrow belt of andesites. The eastern margin of this block carries deposits such as Tyndall Mine and Howards Anomaly. Figure 10 suggests that these deposits lie along a faulted boundary which introduces phyric lavas. The western margin of this block is better defined magnetically and the mineralisation at 379 800, 5360 000 lies along it. Inspection of interfering effects suggests that geometric considerations are not responsible for the forms observed. Some profiles have been modelled across this boundary and although some uncertainty persists due to the limited amount of geology included in each model it seems likely that the boundary is either vertical or dips very steeply to the west (e.g. Figure 10).

Close examination also indicates that the Canal Fault may be incorrectly mapped in terms of orientation. The magnetic field reveals offsets of the andesite margin near 379 600, 5360 500 but the regional alignment remains NNW. I infer that the Canal Fault defines the change in bulk lithology and is altered but trends, with offsets, NNW-SSE. The mapped graphitic shale may well mark the true trend of the fault (Figure 8).
In regional terms the andesites may be seen to be out of place. The overall aspect of the magnetic field reveals some large step features from west to east across the survey area and the andesitic response in this zone is out of character. This rock suite may represent an anomalous event or reflect a concealed major structure.

Alteration along the South Henty Fault is also recognisable but very difficult to quantify in the time allocated to any preliminary assessment. It is clearly observed in profiles for lines 13 to 17 for example where it presents as an abnormal change in anomaly gradient. This detail is not reproduced in any maps.

Other possible alteration or veined zones mapped by R. Poltock cannot be identified with certainty in the magnetic data due to the blinding effects of the concealed mafic-ultramafic mass between the faults (South and North Henty Faults).

REVIEW OF MINERALISED SITES

Mineralised sites in the Newton Creek zone have been commented above. There are clear indicators of alteration east of the South Henty Fault and the key junction and rock type involves an andesite unit. This contact is offset by NE-SW trending features and parts of the magnetic field within the area display similar orientations. One such feature intersects the contact near the primary alteration zone mapped near 379 700, 5360 000 (Figure 8).

The veining near 379 000, 5359 000 is also associated with NW-SE features. These are clearly displayed in Figure 5B, within and beyond the main anomalous area, between the faults. The overall orientation is consistent with the mapping. See also Figure 9 for suggestions of gross trends.

The Canal zone, however, seems the most promising in terms of mineralisation but is probably composed of a series of offset portions. The survey has defined the location of each segment.

Mineralisation near the Henty River Adits (377 600, 5354 400) also lies along a NW-SE trend and its intersection with other disturbances west of the South Henty Fault. The exposed fault is not involved in the association. The principal anomalous responses are about 250 m west of the Henty River Adits and perhaps 500 m south. No signature character is evident in the raw profile data.

IMPLICATIONS FOR FURTHER EXPLORATION

The offset andesite contact, at least partly faulted or sheared, near the Canal within the Newton Creek sub zone, is known to be mineralised. The magnetic survey defines it (in gradients preferably) and offsets of this zone should be inspected. Critical locations are not predictable on the basis of present information. The zones of property loss at 379 700, 5360 650 and 379 800, 5360 000 would seem to offer the best initial prospects for further work. Faulting, offsets, and graphitic shales are likely to complicate any application of electrical methods but the magnetic data could be used to provide refined estimates of dips, junctions and property variations.

There is no evidence to support or deny further work near the Newton Creek veined site at 379 000, 5359 000. The detailed character of the field has been swamped by mafic source effects and it is not certain that these can be removed.

The Henty River Adits zone should be reviewed - but within the felsic tuffs west of the established workings. These materials display erratic properties and lie near the intersection of several major fractures.

The abnormal andesite response near 380 000, 5352 500 must also be reviewed. Is andesite present, and if so is it altered?
Much more andesite is also suspected in the area near 379-380 000, 5356-7 000 than mapped. The irregular anomalies in this small area imply pockets of this lithology may reach to the South Henty Fault.

Data examination also suggests that the South Henty Fault, as mapped, represents only its approximate position and form. The large magnetic anomalies which define it display a number of offsets and it seems unlikely that this structure presents a continuous sweep of slip surfaces. It may also continue to the Murchison Highway near the bridge across the river; the mapped structure extending SW from 376 000, 5352 500 being a more recent transverse structure (the same age as the small offsetting faults?) which has negligible magnetic impact.
The primary transverse structures and fractures, presumably the same age as most of the South Henty Fault movements, lie near 375 000 mE. This feature, and another near 373 300, repeat much of the material and character trapped between the North and South Henty Faults. This pattern is clearly seen in the blocks of colour in Figure 5B. The material between these large blocks of mafic materials, such as near 375 500, 5353 500, and east of the South Henty Fault represents Cambrian section and basement devoid of thrust slices carrying mafics and ultramafics. The present survey confirms the general regional concepts suggested by Leaman (1989) but the precise location of some bounding structures has now been defined (e.g., Figure 9). The predominant NW-SE grain is evident. E-W and NE-SW elements are common but, if more deeply sourced or older as implied elsewhere, may not be well represented in a high resolution, low level magnetic data set.

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Corbett, K.D., 1986. Geology of the Henty River - Mt Read area. Map 3 Mt Read Project Map, Mines Dept. Tasm.

Leaman, D.E., 1987. Mineralisation signature study, geophysics Gravity and Magnetics. Mt Read Volcanics Project Report Mines Dept. Tasm.

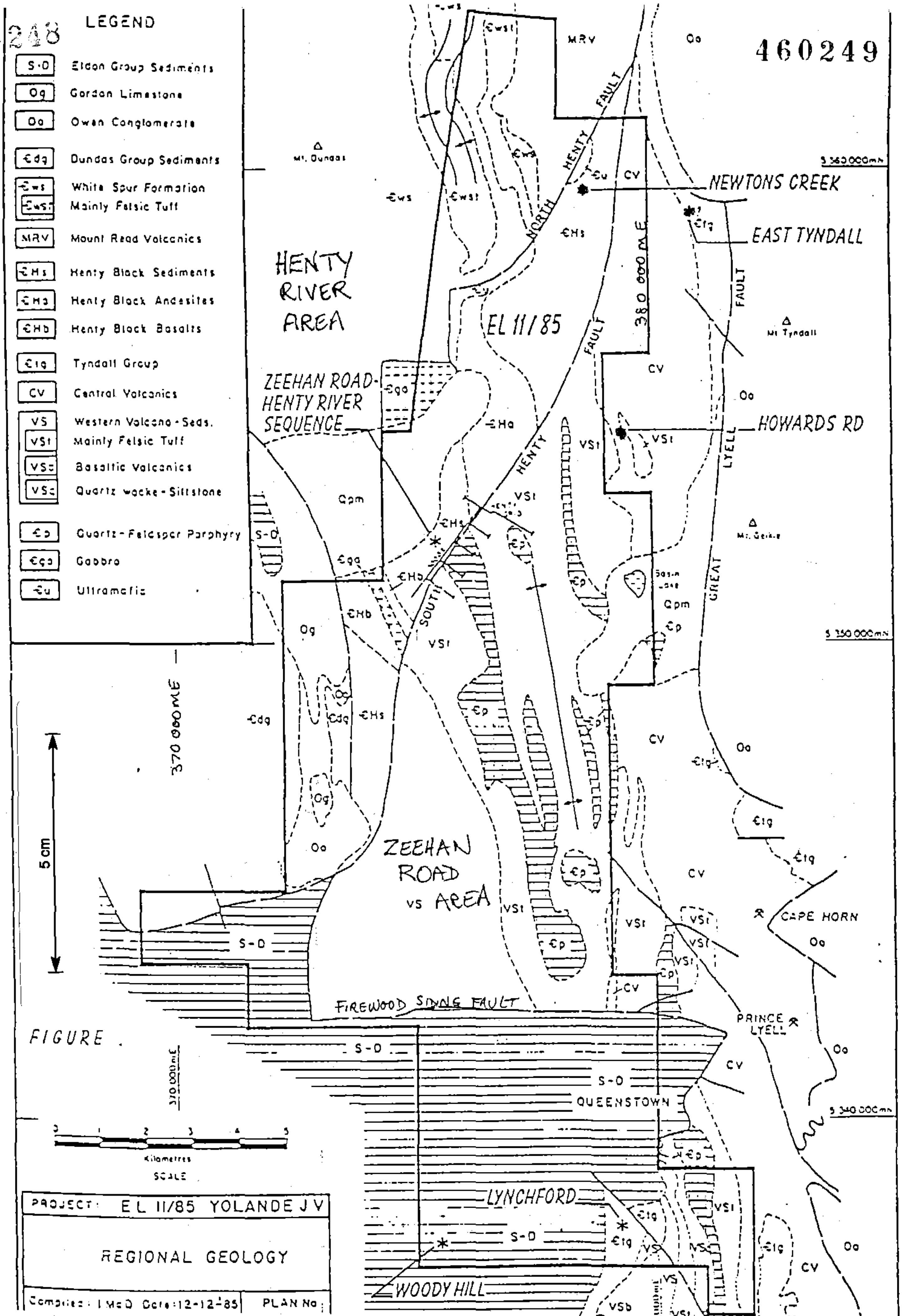
Leaman, D.E., 1989. Gravity and magnetic interpretation of EL 11/85: Yolande River. Report for Pasminco Mining by Leaman Geophsysics (Sept).

Report submitted on behalf of
Leaman Geophysics
by

D. Leaman

Dr. D.E. Leaman, B.Sc., Ph.D
M.Aus.I.M.M., M.M.I.C.A

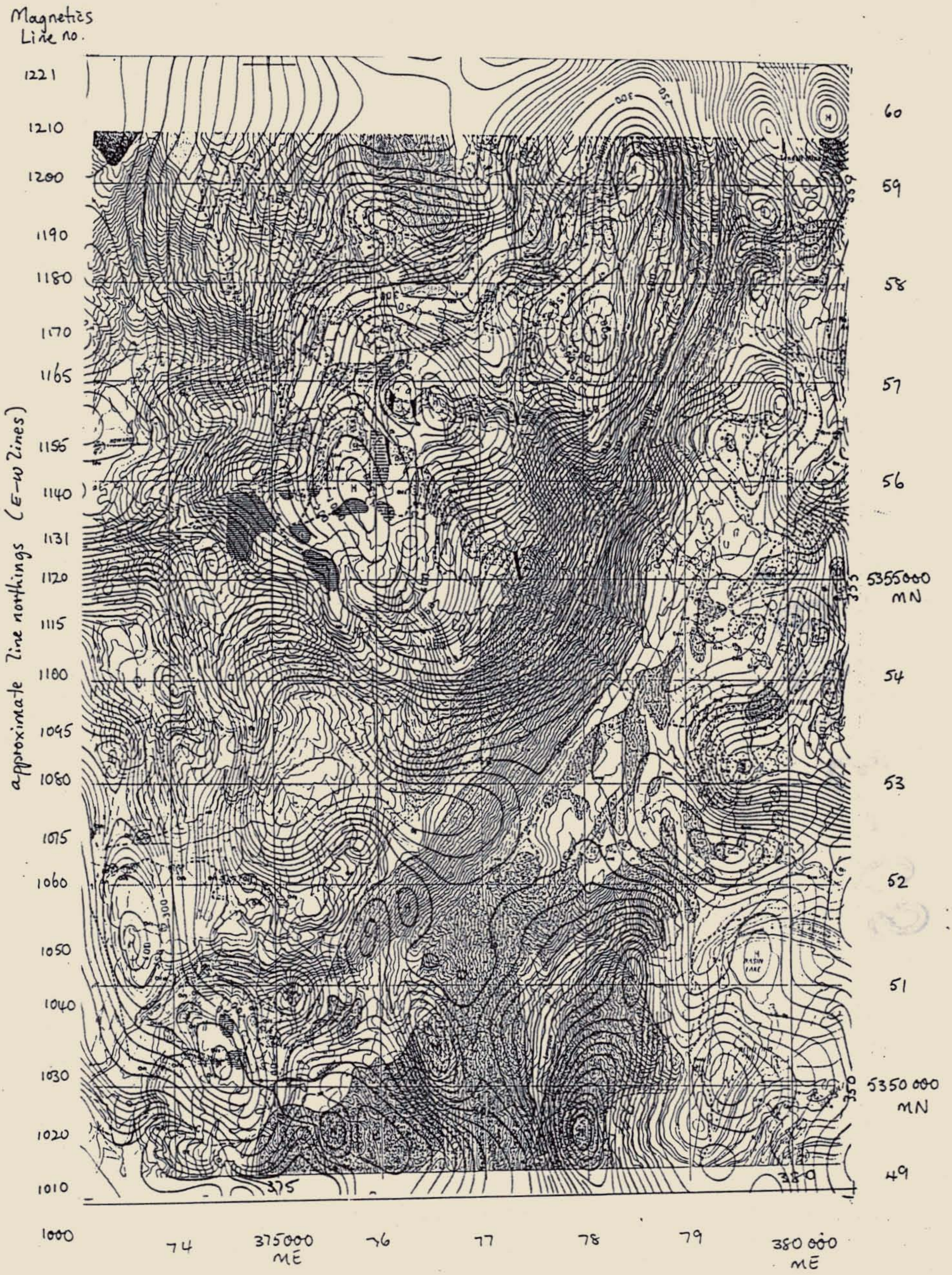
460249



LOCATION AND GEOGRAPHIC REFERENCE : EL 11/85 YOLANDE RIVER

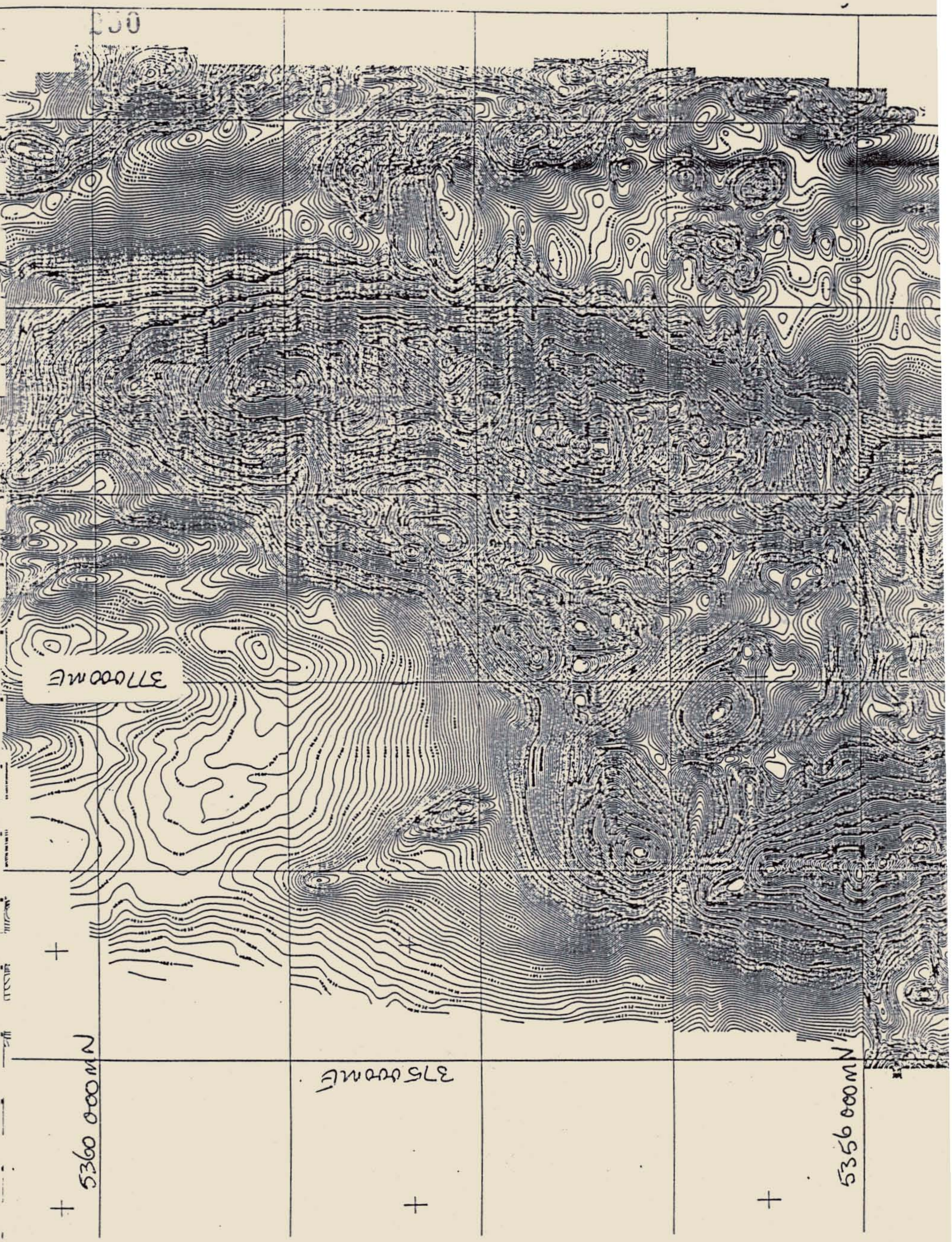
FIGURE 1

460250

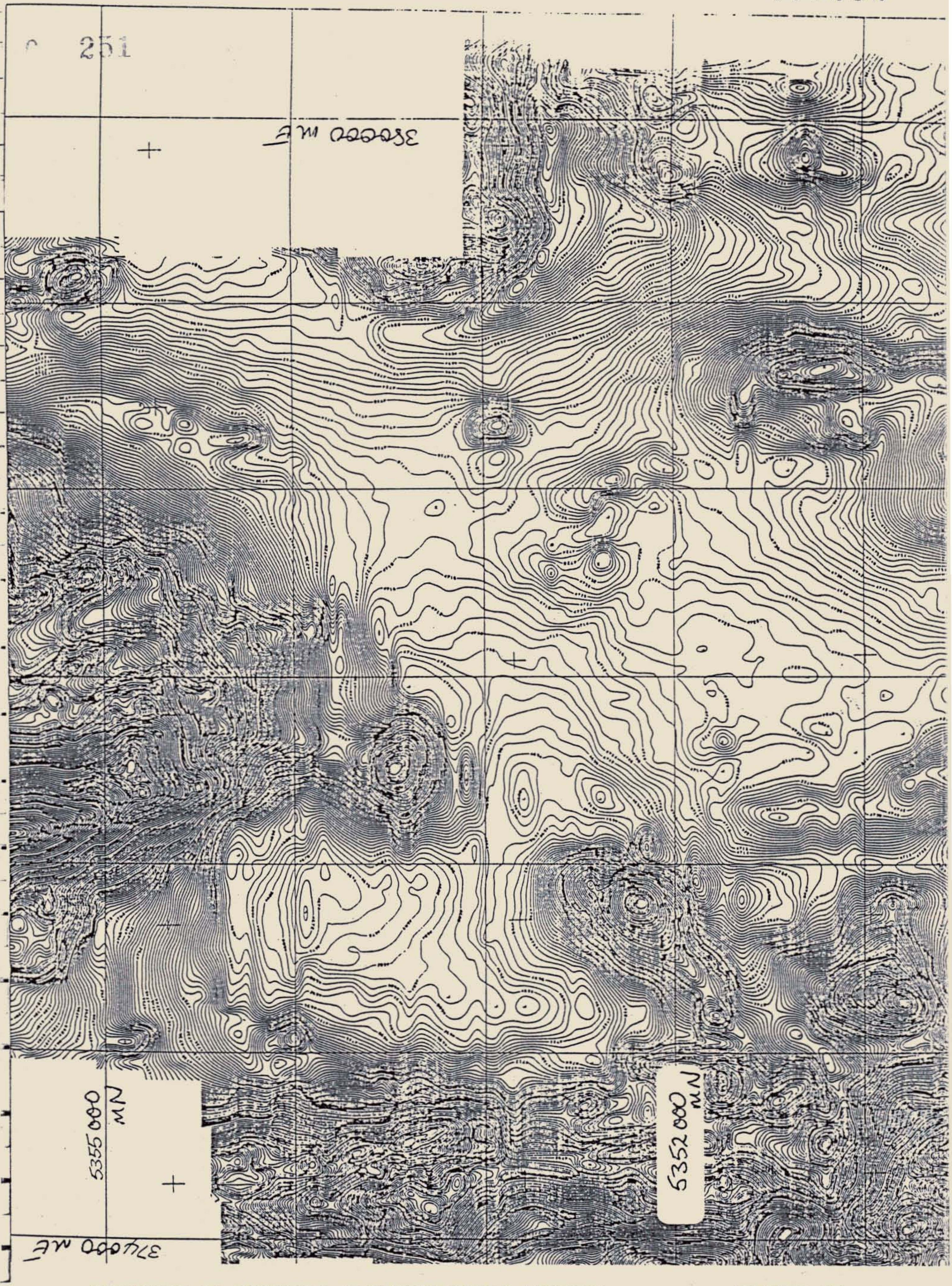


1981 MINES DEPARTMENT SURVEY
FIGURE 2

460251



CONTOURS OF RESIDUAL MAGNETIC FIELD (NORTH) FIGURE 3A
(contour interval 2 nT) See also map 3



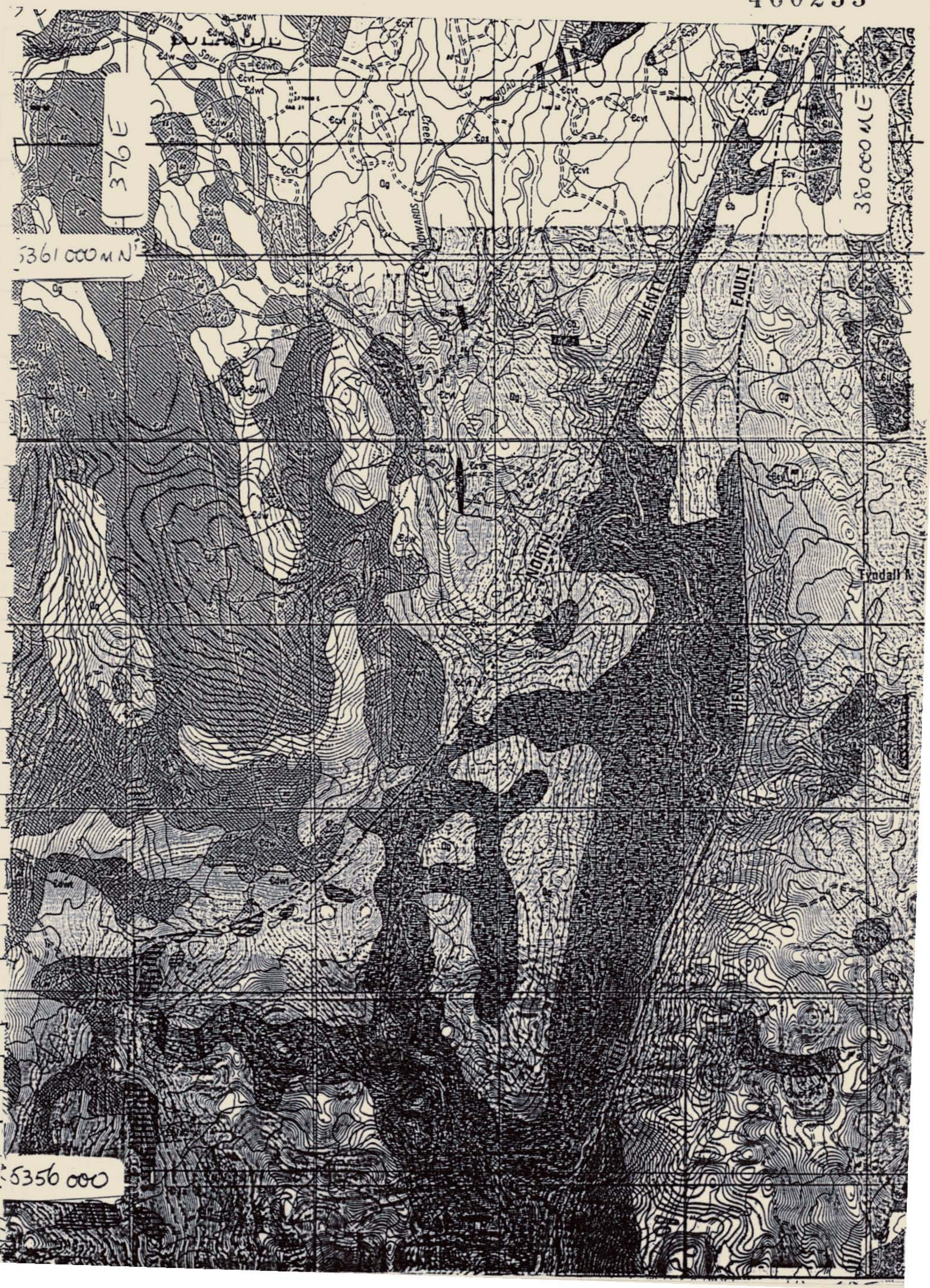
CONTOURS OF RESIDUAL MAGNETIC FIELD (SOUTH) FIGURE 3B
(Contour interval 2 nT) See also map 3

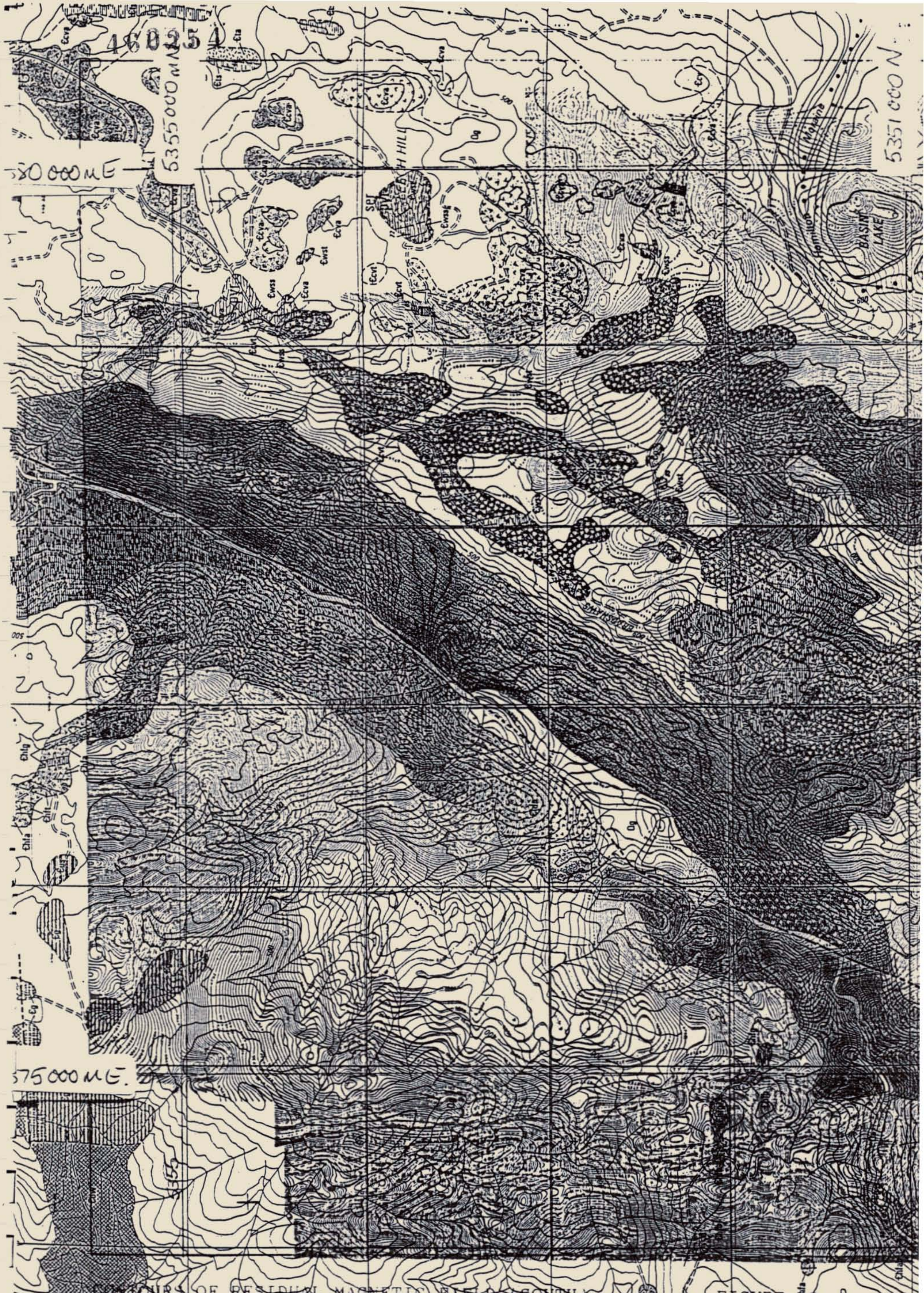
252

CONTOURS OF RESIDUAL MAGNETIC FIELD (NORTH)
(Basemap after Corbett, 1986)

FIGURE 4A

460253

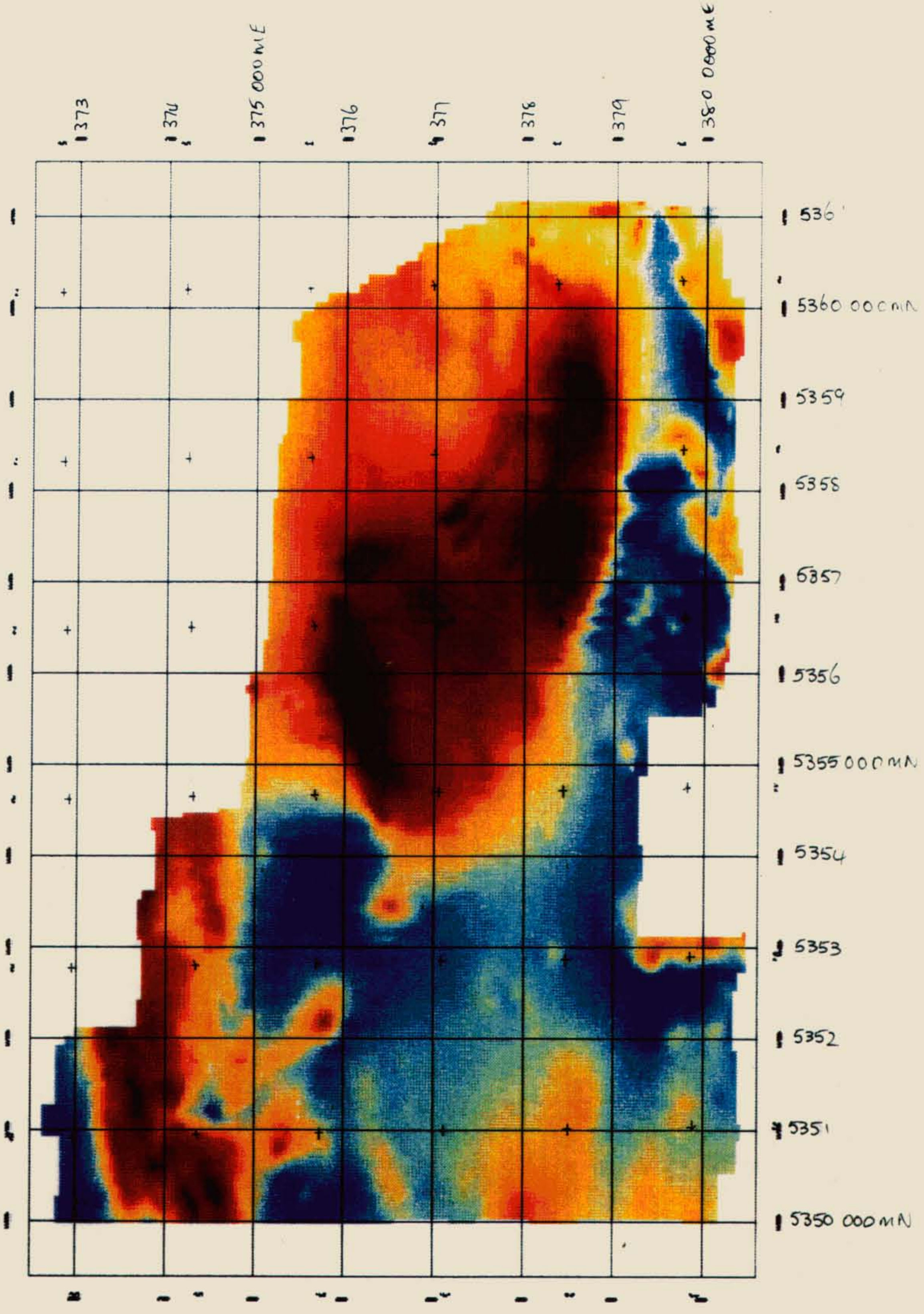




CONTOURS OF RESIDUAL MAGNETIC FIELD (SOUTH)
(Basemap after Corbett, 1986)

FIGURE 4B

460255

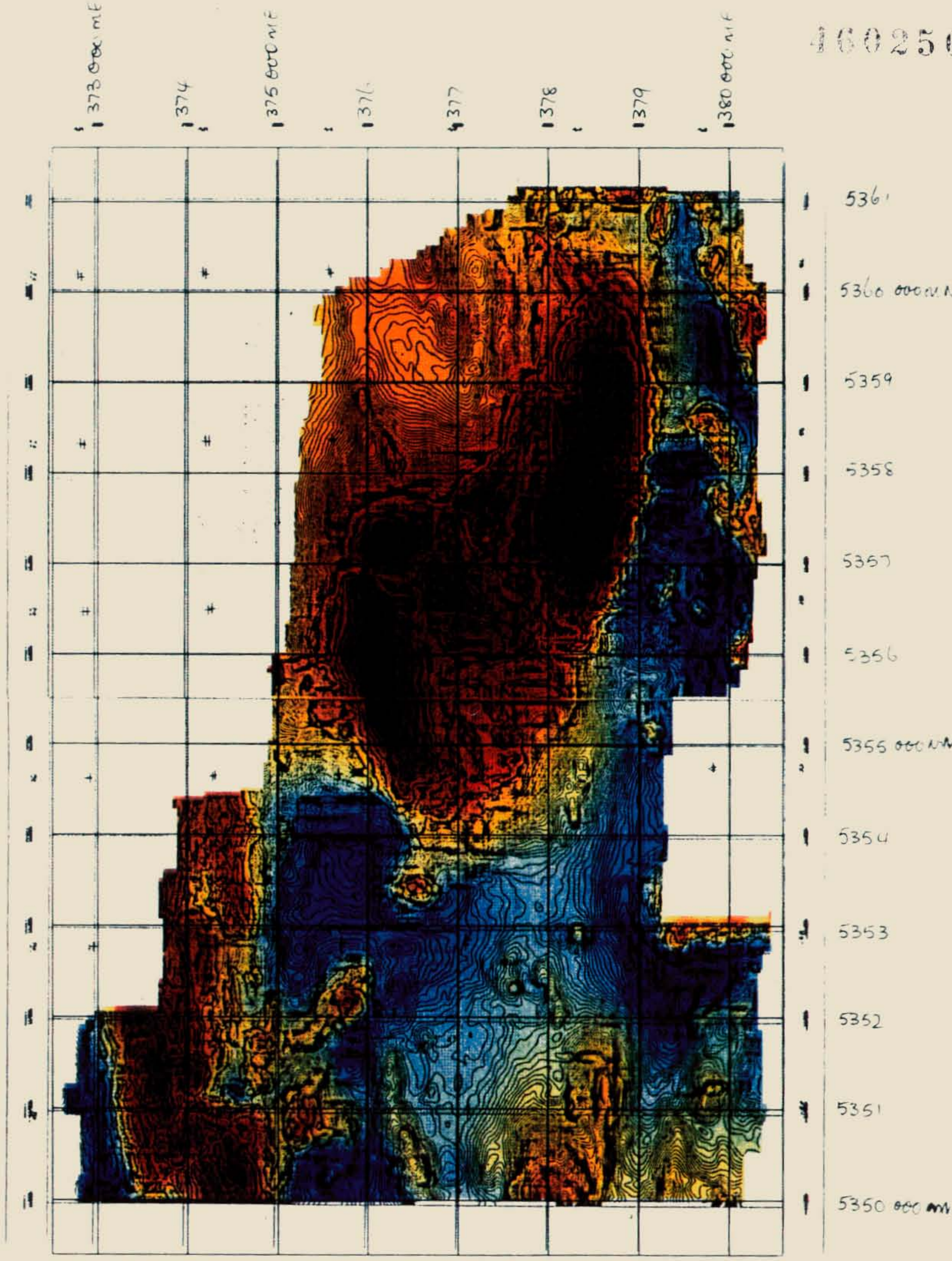


YOLANDE

Processed: Pitt Research

TOTAL MAGNETIC FIELD INTENSITY

FIGURE 5A



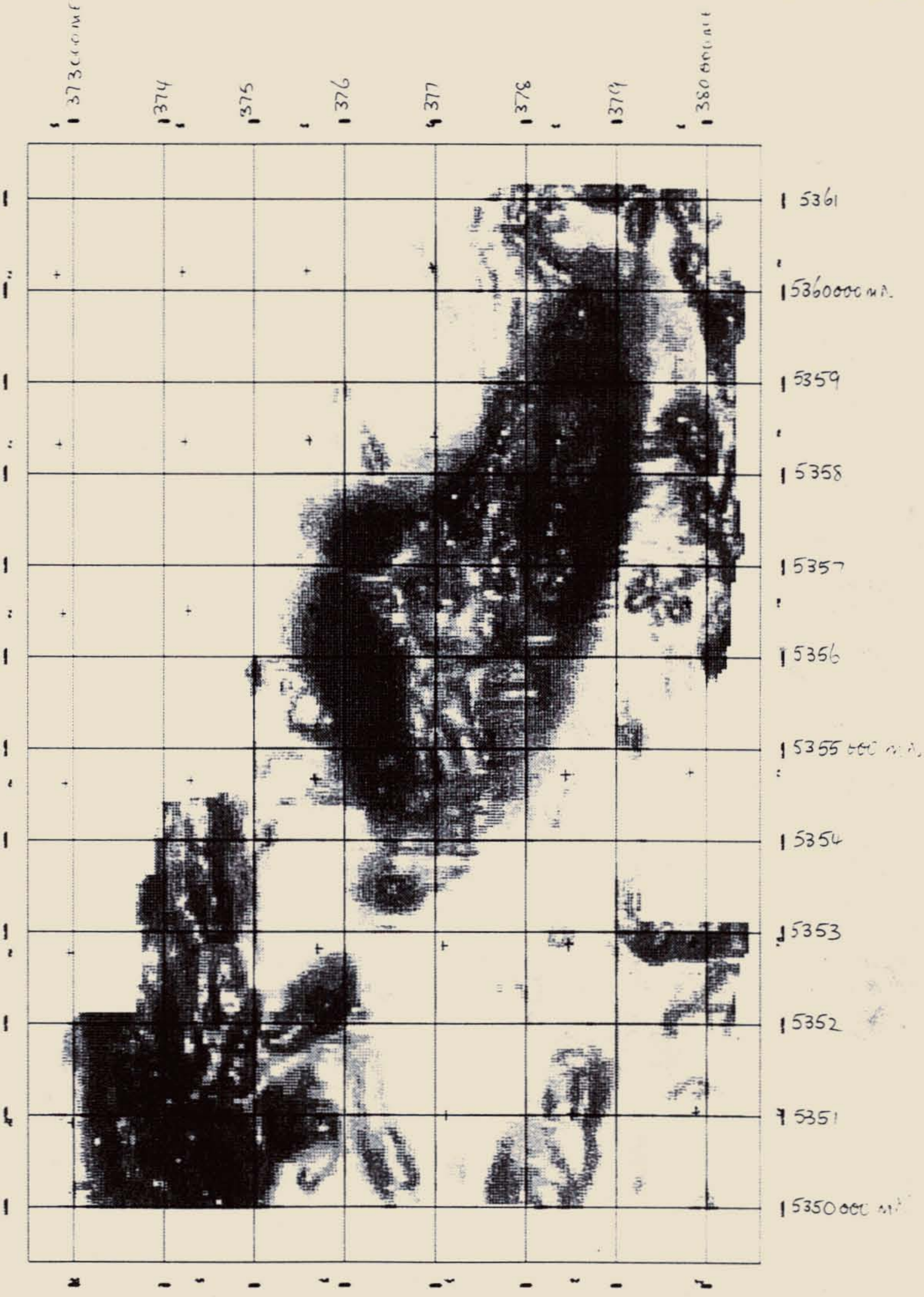
YOLANDE

TOTAL MAGNETIC FIELD INTENSITY

Processed: Pitt Research

FIGURE 5B

460257



Processed: P-H Research

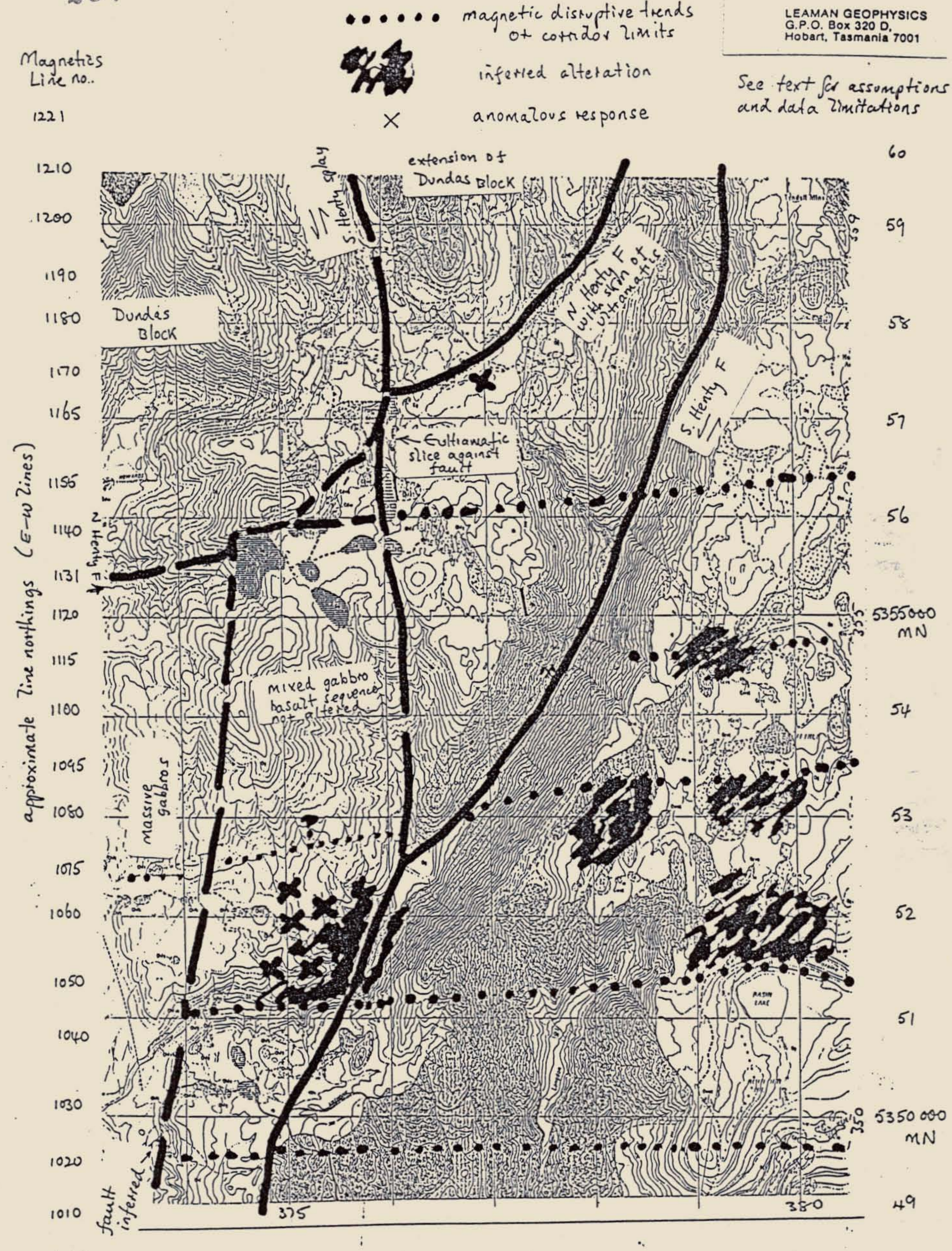
GRADIENT OF MAGNETIC FIELD

FIGURE 6

257

460258

LEAMAN GEOPHYSICS
G.P.O. Box 320 D,
Hobart, Tasmania 7001



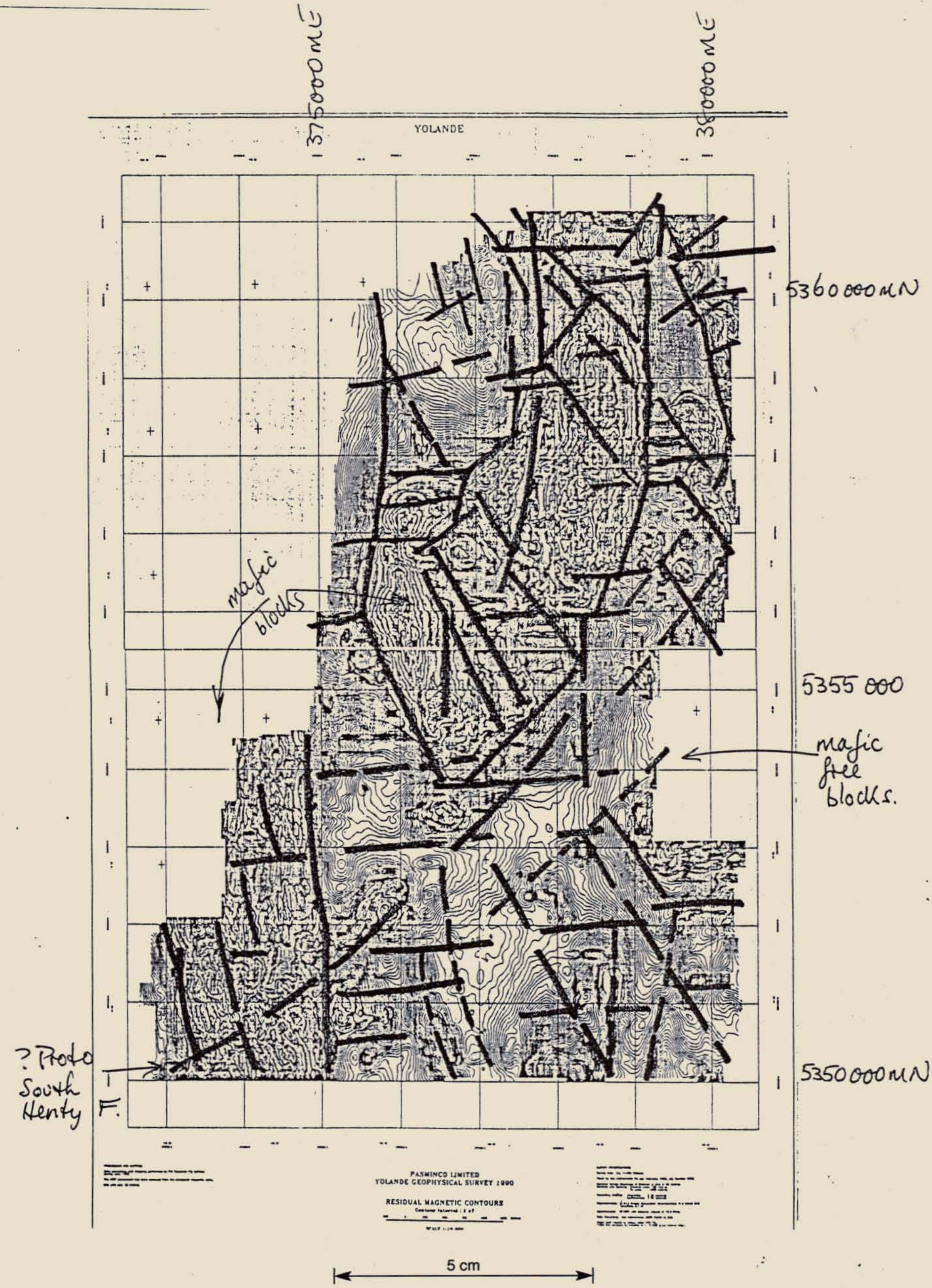
PREVIOUS INTERPRETATION OF ALTERED SITES
YOLANDE RIVER EL 11/85 (FROM LEAMAN, 1989)

FIGURE 7

OUTCROP MAPPING IN THE NEWTON CREEK AREA
MAPPING BY R. POLTOCK

FIGURE 8

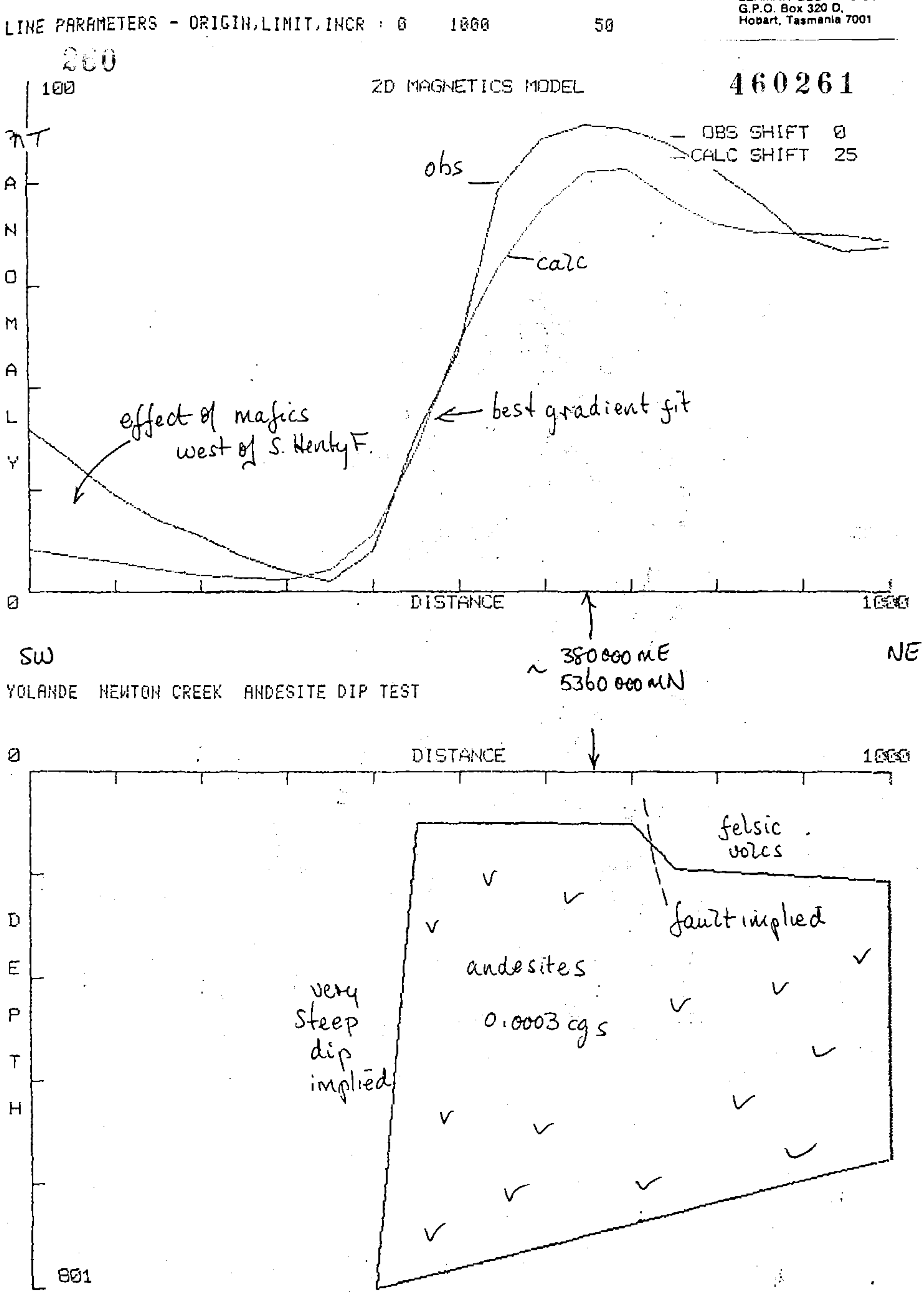
LEAMAN GEOPHYSICS
G.P.O. Box 320 D,
Hobart, Tasmania 7001



LOCATION OF PRINCIPAL STRUCTURES EL 11/85

FIGURE 9

LEAMAN GEOPHYSICS
G.P.O. Box 320 D,
Hobart, Tasmania 7001



MODEL OF ANDESITE/ALTERATION BOUNDARY NEAR CANAL
NEWTON CREEK ZONE EL 11/85

FIGURE 10

File 3 : Rosebery Mine Leases located data
File 4 : Bulgobac located data

These airborne surveys were performed by GeoInstruments Pty Ltd for Pasminco Limited in February 1990.
Data processing and mapping was performed by Pitt Research Pty Limited in May/June 1990.

Data is recorded on this file in 132 byte ASCII records with bytes/record block.
and on located data files in 85 byte ASCII records with 6,800 bytes/record block.

CONSTRUCTION OF LOCATED DATA RECORDS:

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 +--- Number of variable in source file
 |     +--- Format of variable
 |     |        +--- Start character in format string
 |     |        |  +--- Start character in output buffer
 |     |        |  |  +--- Number of characters in output field
 |     |        |  |  |   +--- Variable name
 |     |        |  |  |   |
 1 "(F7.0)" 1  1 6 *  Line
 2 "(F3.0)" 1  7 2 *  Flight
 3 "(F7.0)" 1  9 6 *  YYDDD
 9 "(F8.0)" 1 15 7 *  Fiducial
10 "(F7.0)" 1 22 6 *  Time (samn)
18 "(F3.0)" 1 28 2 *  Recovery pt flag
19 "(F8.0)" 1 30 7 *  AMG Easting (m)
20 "(F9.0)" 1 37 8 *  AMG Northing (m)
16 "(F5.0)" 1 45 4 *  Radar altimeter
17 "(F6.0)" 1 49 5 *  Barometric altimeter
11 "(F9.2)" 1 54 9 *  Total Mag Field (raw)
12 "(F6.0)" 1 63 5 *  Total count (raw)
13 "(F5.0)" 1 68 4 *  Potassium count (raw)
14 "(F4.0)" 1 72 3 *  Uranium count (raw)
15 "(F4.0)" 1 75 3 *  Thorium count (raw)
22 "(F8.2)" 1 78 8 *  IGRF Corr lev mag (nT)
*              85 char/record
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Note: The relevant data field is filled with spaces where an observation is undefined.

STATISTICS INCLUDING VARIABLES OF FILE 2 :

File Title : GEOINSTRUMENTS - PASMINCO - YOLANDE (TAS)

GLOBAL STATISTICS

	Fmt Typ	Name of Variable	No. of Def. Obs.	Minimum	Mean	Maximum	S D

"(F9.2)" 1 54 9 * Total Mag Field (raw)
"(F6.0)" 1 63 5 * Total count (raw)
"(F5.0)" 1 68 4 * Potassium count (raw)
"(F4.0)" 1 72 3 * Uranium count (raw)
"(F4.0)" 1 75 3 * Thorium count (raw)
"(F8.2)" 1 78 8 * IGRF Corr lev mag (nT)
85 char/record

: The relevant data field is filled with spaces where an observation is undefined.

ISTICS INCLUDING VARIABLES OF FILE 2 :

File Title : GEOINSTRUMENTS - PASMINCO - YOLANDE (TAS)

GLOBAL STATISTICS

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[4]	P	4	7	N2	Line type (0=trav,1=tie)	62954	0	0.0819646	1	0.274310
[5]	P	5	8	N4	Bearing from north (deg)	62954	90	90	90	
[6]	P	6	10	N4	Fiducial increment	62954	1	1	1	
[7]	P	7	12	N4	Fid no. of first obs	62954	141	40394.446	99931	38044.10
[8]	P	8	14	N4	Fid no. of last obs	62954	390	40889.826	100280	37956.16
[9]	S	1	1	N4	Fiducial	62954	141	40642.136	100280	38000.37
[10]	S	2	3	N4	Time (samn)	62868	30753	46808.174	60978	9376.949
[11]	S	3	5	N4	Total Mag Field (raw)	62868	58357.066	62177.832	66024.18	228.2759
[12]	S	4	7	N2	Total count (raw)	62868	208	512.29754	1322	113.6751
[13]	S	5	8	N2	Potassium count (raw)	62868	3	24.109372	83	8.674480
[14]	S	6	9	N2	Uranium count (raw)	62868	1	18.244067	78	6.749655
[15]	S	7	10	N2	Thorium count (raw)	62855	1	13.071196	49	5.297543
[16]	S	8	11	N4	Radar altimeter	62868	50	96.475934	232	23.90298
[17]	S	9	13	N4	Barometric altimeter	62868	2	406.39381	998	145.4746
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[21]	S	13	24	N4	IGRF Corr mag (m)	52717	4624.1289	4838.8405	8686.4023	242.158
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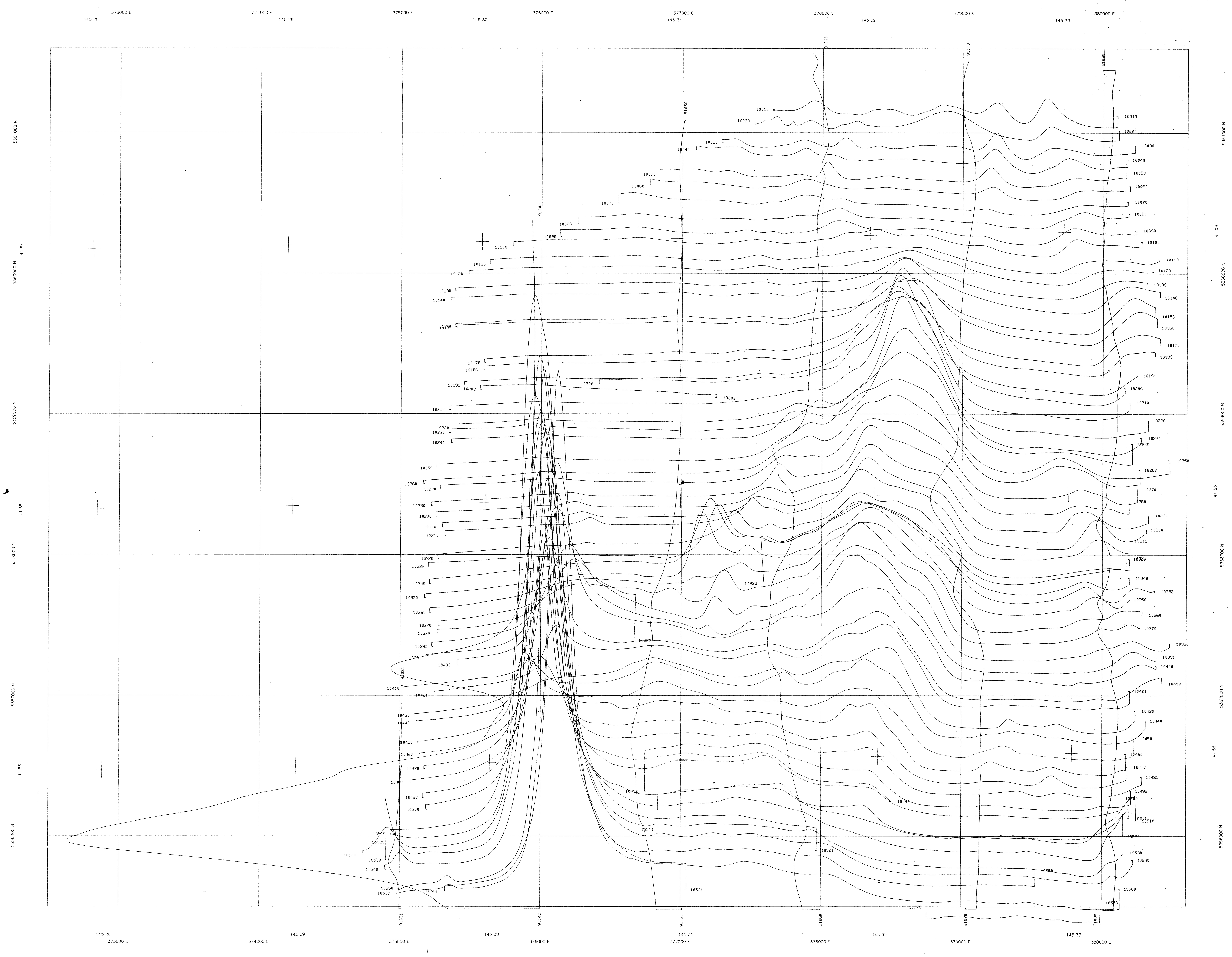
ATISTICS INCLUDING VARIABLES OF FILE 3 :

YOLANDE



PROCESSING AND MAPPING:

Data processing and mapping performed by Pitt Research Pty Limited during June 1990.

The IGRF component has been removed from the measured magnetic data..

460264

PASMINCO LIMITED
YOLANDE GEOPHYSICAL SURVEY 1990

RESIDUAL MAGNETIC PROFILES

Base value 4,800 nT and Vertical Scale 100 nT/cm.

250 0 250 500 750 1000 1250 Metres

SCALE 1:10 000

90-3159.

5 cm

SURVEY SPECIFICATIONS:

Survey Area: E.L. 11/85 Yolande

Flown by Geo Instruments Pty Ltd, February 1990, Job Number 9003.

Nominal Terrain Clearance of Detector in Bird at 80 metres.
Nominal Line Spacing: Traverse Lines 100 metres
Tie Lines 1000 metres.

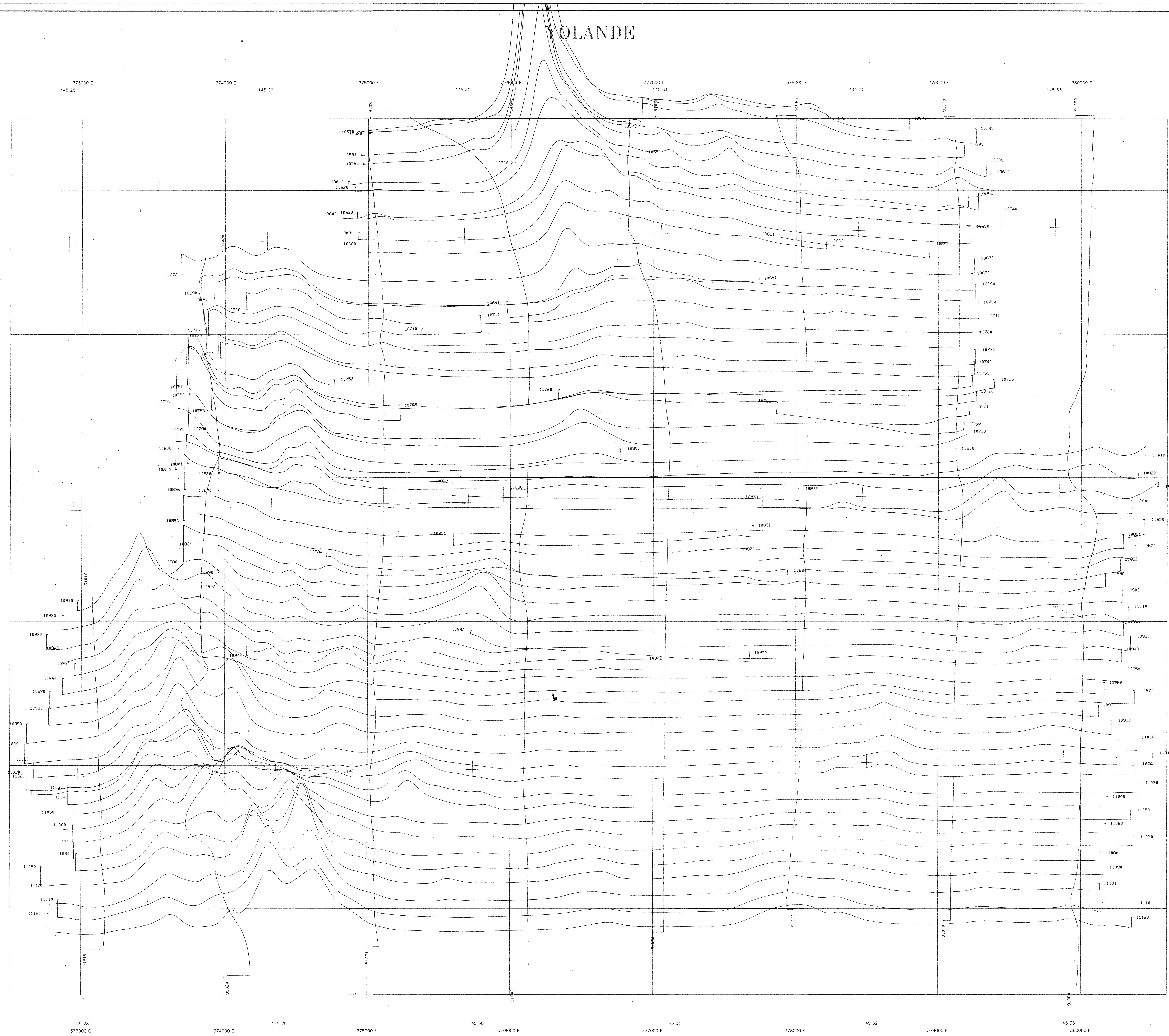
Recording Interval: Magnetics 0.48 seconds
Spectrometer 0.96 seconds

Magnetometer: G-813 Proton Precession Magnetometer in a towed bird. Sensitivity 0.1 nT.

Spectrometer: GR3001 with detector volume of 16.8 litres.

Data Recording: Geo Instruments 2000 Digital to Disk.

Flight path record by colour video VHS PAL.
Flight line recovery by transfer to 1:10 000 scale control maps.



PROCESSING AND MAPPING:

Data processing and mapping performed by Pitt Research Pty Limited during June 1990.

The IGRF component has been removed from the measured magnetic data..

460265

PASMINCO LIMITED
YOLANDE GEOPHYSICAL SURVEY 1990

RESIDUAL MAGNETIC PROFILES

Base value 4,800 nT and Vertical Scale 100 nT/cm.

250 0 250 500 750 1000 1250 Metres

SCALE 1:10 000

5 cm

90-3159.

SURVEY SPECIFICATIONS:

Survey Area: E.L. 11/85 Yolande

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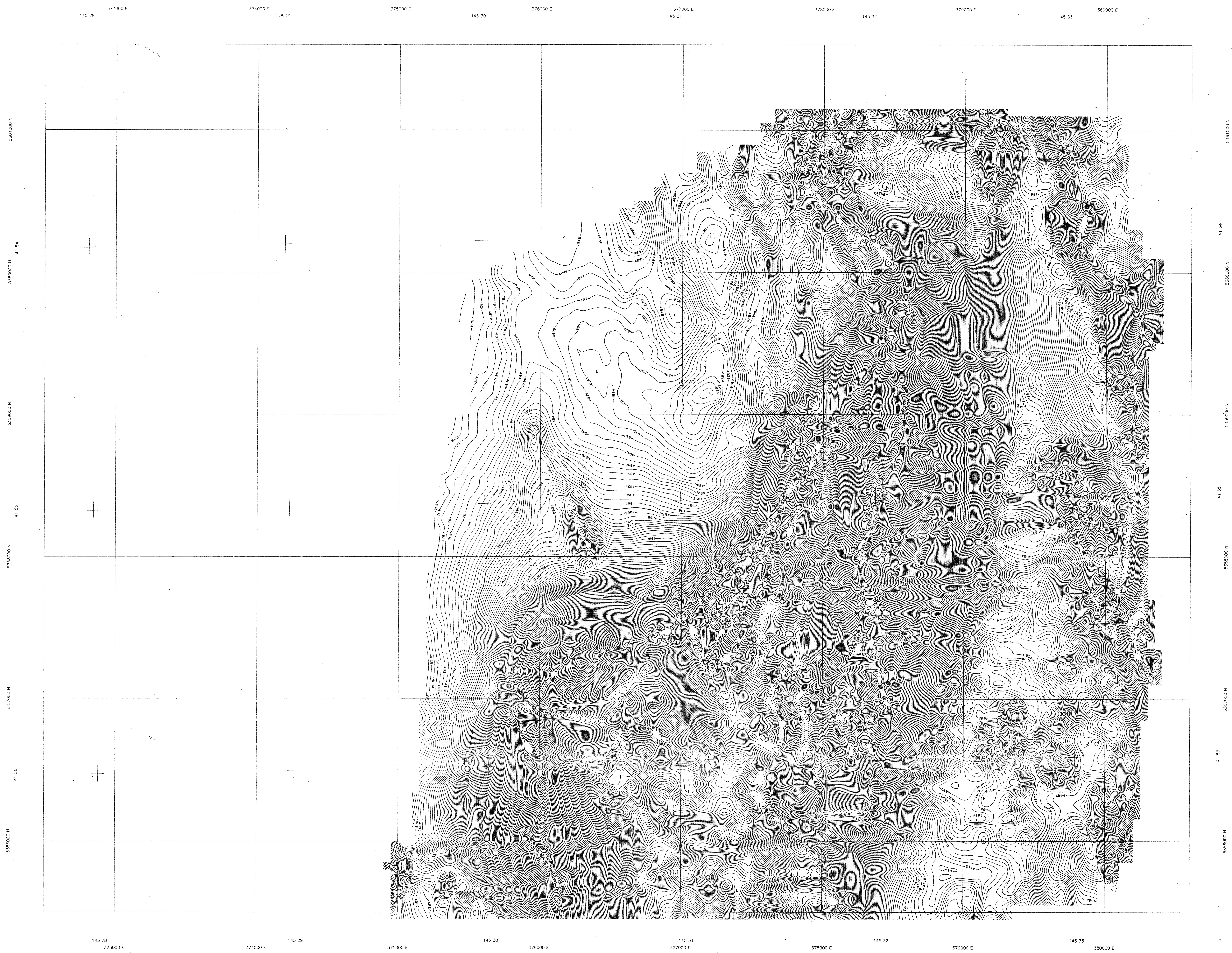
Flight path record by colour video VHS PAL.
Flight line recovery by transfer to 1:10 000 scale control maps.

YOLANDE



PROCESSING AND MAPPING:

Data processing and mapping performed by Pitt Research Pty Limited during June 1990.

The IGRF component has been removed from the measured magnetic data..

Map grid size: 50 metres

460266

PASMINCO LIMITED
YOLANDE GEOPHYSICAL SURVEY 1990

RESIDUAL MAGNETIC CONTOURS

Contour Interval : 2 nT

250 0 250 500 750 1000 1250 Metres

90-3159.

SCALE 1:10 000

5 cm

SURVEY SPECIFICATIONS:

Survey Area: E.L. 11/85 Yolande

Flown by Geo Instruments Pty Ltd, February 1990, Job Number 9003.

Nominal Terrain Clearance of Detector in Bird at 80 metres.
Nominal Line Spacing: Traverse Lines 100 metres
Tie Lines 1000 metres.

Recording Interval: Magnetics 0.48 seconds
Spectrometer 0.96 seconds

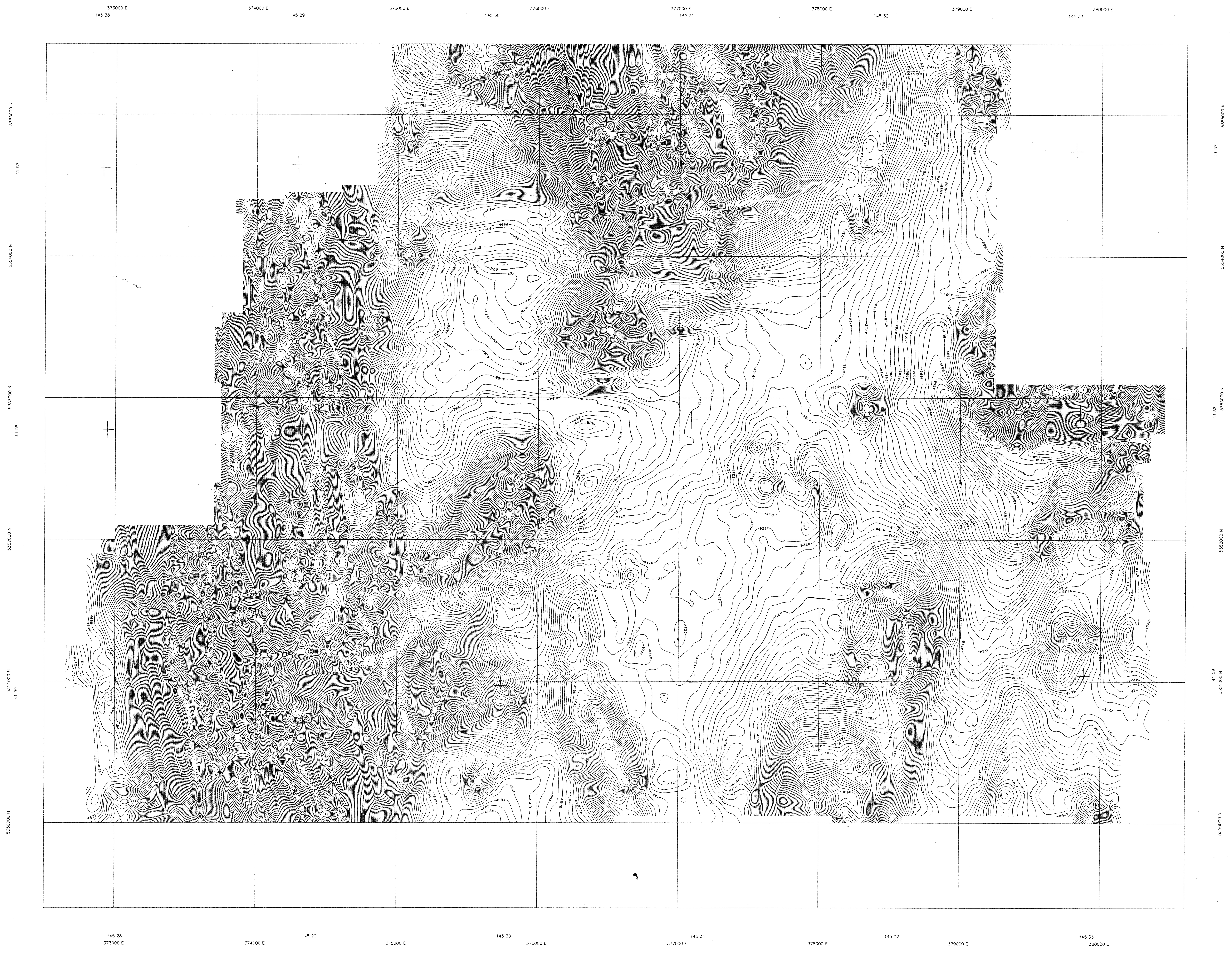
Magnetometer: G-813 Proton Precession Magnetometer in a towed bird.
Sensitivity 0.1 nT.

Spectrometer: GR3001 with detector volume of 16.8 litres.

Data Recording: Geo Instruments 2000 Digital to Disk.

Flight path record by colour video VHS PAL.
Flight line recovery by transfer to 1:10 000 scale control maps.

YOLANDE



PROCESSING AND MAPPING.

Data processing and mapping performed by Pitt Research Pty Limited during June 1990.

The IGRF component has been removed from the measured magnetic data..

Map grid size: 50 metres

460267

PASMINCO LIMITED
YOLANDE GEOPHYSICAL SURVEY 1990

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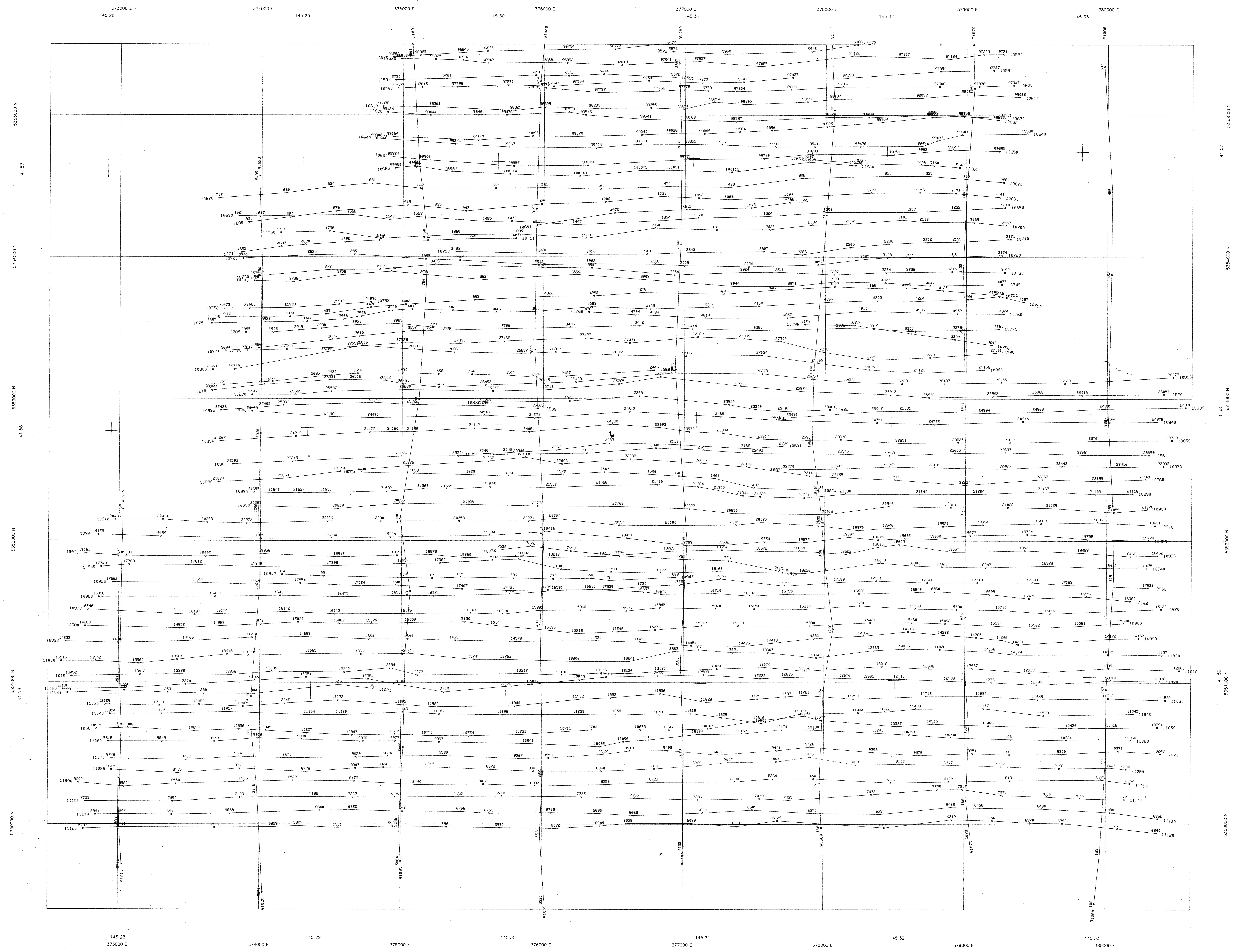

PROCESSING AND MAPPING:

Data processing and mapping performed by Pitt Research Pty Limited during June 1990.

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460268

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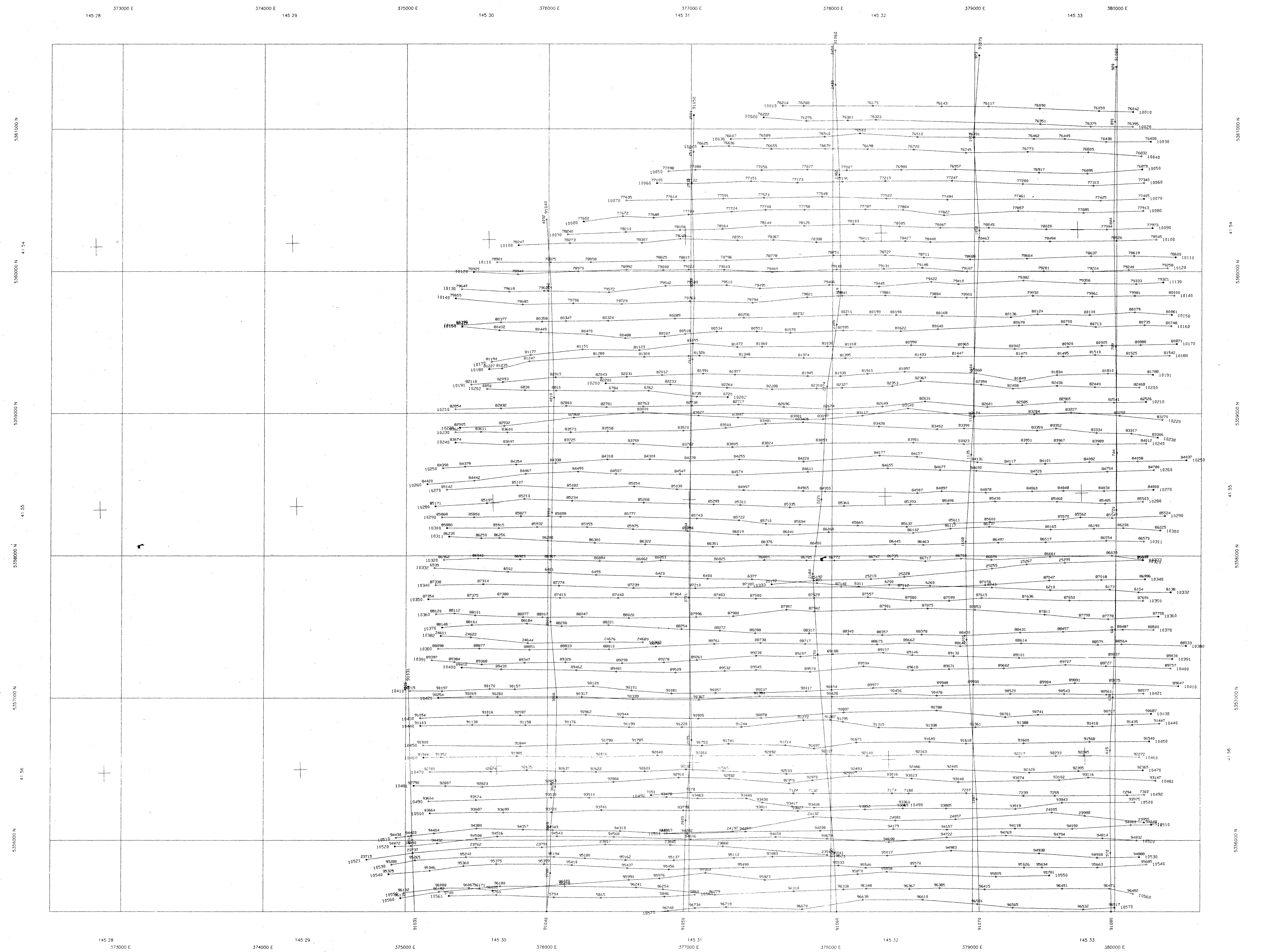
YOLANDE



460269

PASMINCO LIMITED
YOLANDE GEOPHYSICAL SURVEY 1990

FLIGHT PATH

250 0 250 500 750 1000 1250 Metres

SCALE 1:10 000

5 cm

90-3159.

PROCESSING AND MAPPING:

Data processing and mapping performed by Pitt Research Pty Limited during June 1990.

The IGRF component has been removed from the measured magnetic data..

Map grid size: 50 metres

SURVEY SPECIFICATIONS:

Survey Area: E.L. 11/85 Yolande

Flown by Geo Instruments Pty Ltd, February 1990, Job Number 9003.

Nominal Terrain Clearance of Detector in Bird at 80 metres.
Nominal Line Spacing: Traverse Lines 100 metres
Tie Lines 1000 metres.

Recording Interval: Magnetics 0.48 seconds
Spectrometer 0.96 seconds

Magnetometer. G-813 Proton Precession Magnetometer in a towed bird. Sensitivity 0.1 nT.

Spectrometer. GR3001 with detector volume of 16.8 litres.

Data Recording: Geo Instruments 2000 Digital to Disk.

Flight path record by colour video VHS PAL.
Flight line recovery by transfer to 1:10 000 scale control maps.

APPENDIX 8. IMMOBILE AND RARE EARTH ELEMENT INTERPRETATION

THE PETROLOGY, GEOCHEMISTRY AND TECTONIC SIGNIFICANCE OF IGNEOUS ROCKS IN THE HENTY FAULT WEDGE, WEST TASMANIA

A Report for Pasminco Mining, Rosebery, Tasmania

by

Anthony J. Crawford
Geology Department
Univ. of Tasmania

12/11/89

INTRODUCTION

The Mount Read Volcanics (herein MRV) in western Tasmania are probably the most highly mineralized belt of ancient volcanics in eastern Australia. Mapping associated with the Tasmanian Department of Mines' Mount Read Mapping Project has greatly enhanced our understanding of the geology of the MRV. However, a combination of factors including generally difficult access, poor outcrop, thick vegetation, complex internal structure and stratigraphy (rapid facies changes), paucity of fossils and variable alteration, all ensure that a great deal more remains to be learned about the MRV before they are thoroughly understood.

One of the least studied and least understood areas of the MRV belt occurs in the triangular wedge-shaped region between the N and S arms of the Henty Fault system, and the Zeehan highway in the west(see Sheet 3 of MRV Mapping). This region is called the Henty Fault Wedge, and is the focus of this study. The few useful published wholerock chemical analyses for Henty Fault Wedge lavas (Corbett and Solomon 1989) suggest some complexity regarding the affinities of lava suites in this area. The pillow basalts appear to be tholeiitic, whereas the lavas from the Halls Rivulet area are calc-alkaline andesites. A primary aim of this study, therefore, is to determine the affinities and intra-belt correlations of the basaltic and andesitic rocks in the Henty Fault Wedge.

Before presenting and discussing data for the Henty Fault Wedge, an overview of the distribution, petrology, geochemistry and affinities of the MRV is provided to 'set the stage' for a consideration of the Henty Fault Wedge data. The data on which this comparitive study are based constitute the author's MRV DATABASE, that contains over two hundred analyses of well-preserved lavas and intrusives covering the petrographic and geographic range within the MRV belt (including the E-W trending segment east of Hellyer across to Beulah). Besides samples collected by the author, the database contains analyses of rocks provided by some Mines Department geologists (notably Dr. Keith Corbett), and also rocks provided by exploration geologists, especially from Aberfoyle Resources, but also from BHP, Climax Mining, CSR, Placer Exploration, and AMOCO Minerals. Approximately one hundred of these samples have also been analyzed for rare earth element (REE) contents, and these data have been found to be of particular value in local and regional correlation, as well as in determining magmatic affinities of various suites.

Each sample analyzed was selected after careful petrographic filtering that eliminated rocks with strong calcite development, or other intense alteration which had produced monomineralic domains. Most samples so selected have loss on ignition values less than 5wt%. All analyses have been recalculated to the same basis, which is 100wt% volatile-free (ie recalculated anhydrous), thus eliminating alteration/metamorphism-imposed differences due to variable modal amounts of hydrous minerals (mainly chlorite) and calcite.

MOUNT READ VOLCANICS STRATIGRAPHY : AN OVERVIEW

The MRV are a basalt-andesite-dacite-rhyolite suite with abundant interbedded pyroclastics, epiclastics and shale horizons. Radiometric dating has provided little clarification of age relationships within the MRV, due to pervasive alteration. Probably, the most reliable date is a zircon age of 511 m.y. for the Darwin Granite, which intrudes Tyndall Group, whereas K-Ar dates range from 407 to 528 m.y. Late Middle- and Upper Cambrian fossils are recorded from several localities within the MRV (Corbett and Lees 1987), and a presently undated trilobite locality has recently been discovered by the author in the area just west of Paradise. A detailed review of the stratigraphy of the MRV is given in Corbett and Solomon (1989) in the new Geology and Mineral Resources of Tasmania volume.

Recent systematic detailed mapping by the MRV Project geologists from the Tasmanian Department of Mines has clarified important geological relationships within the belt, although several major problems remain. Whereas the Tyndall and Dundas Groups both clearly overlie Central Belt Volcanics, some uncertainty remains regarding the stratigraphic relationships and geological significance of Corbett's (1979) Western Sequence. Corbett (1979) argued that, since the Western Sequence south of Queenstown apparently dips beneath the Central Volcanic Complex, it is likely to be older than the latter. However, my detailed geochemical studies of Western Sequence lavas indicate that they are almost certainly equivalent to the Hellyer basalts, time-correlated with the basal Dundas Group, which are agreed to be post-Central Volcanic Complex (Corbett and Komyshan 1989). This suggests that the Central Volcanic Complex in the area south of Queestown may have been thrust westward over flanking younger Western Sequence rocks. This postulated fault would be a southern analogue of the east-dipping Rosebery Fault, which juxtaposes Dundas Group rocks with overthrust but older Central Volcanic Complex in the Rosebery area; main movement on this fault was Tabberabberan (Corbett & Lees 1987). I prefer to incorporate all lava-dominated sequences along the western side of the MRV in the Western Volcanic Sequence; this includes Corbett's (1979) Western Sequence in the area south of Queenstown, and the basal Dundas Group lavas in the Que-Hellyer area further north.

Several significant findings of geological mapping of the MRV by Corbett and others have been:

1. recognition of the Henty Fault System, which transects the MRV east of Rosebery, bifurcating south of Red Hills; it separates regions of the Central Volcanic Complex which have different dominant lithologies, structure and ore deposits: and,
2. the discovery of tholeiitic lavas and dykes outcropping in the core of an anticline within the Western Volcanic Sequence at Miners Ridge (SW of Queenstown; Corbett 1979), also in the western part of the Henty Fault Wedge, and as a basaltic dyke swarm (the Henty Dyke Swarm) through the Central Volcanic Complex north of the Henty Fault, between Mount Dundas and the Pinnacles. These lavas and dykes are compositionally unlike the high-K calc-alkaline MRV, and their nature and existence must be taken into account in any comprehensive attempt to model the tectonic development of western Tasmania.

CALC-ALKALINE SUITES

Central Volcanic Complex

The Central Volcanic Complex shows significant differences on either side of the Henty Fault System. Southeast of the fault, volumetrically dominant plagioclase-phyric dacitic and rhyolitic lavas are intruded by domes and plugs of hornblende+plagioclase-phyric andesites, well-exposed on Crown Hill and Leach Hill. Subvolcanic granitoids intrude the Central Volcanic Complex both north (Murchison Granite) and south (Darwin Granite) of Queenstown, and are thought to be responsible for the extensive, pink-weathering potassic alteration which affects felsic lavas throughout this area. Ignimbrite-like flows with flattened pumice shards are common, but shale interbeds are sparse. North and west of the Henty

Fault the Central Volcanic Complex contains more andesites than further south, no granites are recorded, and pink, potassic alteration is rare. Andesites and dacites appear to be mainly extrusive, and as for further south, ignimbritic flows are abundant and shale intervals are rare. Basaltic dykes of the Henty Dyke Swarm, unrelated to MRV magmatism, intrude the Central Volcanic Complex north of the Henty Fault. No basaltic lavas are known from either the northern or southern segments of the Central Volcanic Complex.

Western Volcanic Sequence

The Western Volcanic Sequence extends along the western side of the Central Volcanic Complex from Hellyer to south of Queenstown. Unlike the Central Volcanic Complex, it includes abundant basalts, and shows a compositional spectrum from basaltic through to rhyolitic lavas, although basalts are dominant. Extensive, sheet-like bodies of dacitic to rhyolitic porphyries may be of shallow, intrusive origin. Basalt- and andesite-dominated sequences occur in the Que-Hellyer and Lynch Creek areas, and may represent individual volcanic edifices.

Tyndall Group

The Tyndall Group is presently known only on the southeastern side of the Henty Fault System. Andesites and basalts are unknown from the Tyndall Group. In the Queenstown area, and further south, the Tyndall Group apparently overlies both the Western Volcanic Sequence and the Central Volcanic Complex. Correlates of the Tyndall Group occupy several near-meridional grabens extending north from Queenstown, one along the Tyndall Range to near Red Hills and the other along the eastern margin of the MRV in the Lake Dora - Lake Selina area. A significant difference between the rhyolitic lithologies of the Tyndall Group and those in the Central Volcanic Complex is the relative abundance of quartz phenocrysts in the Tyndall rocks, and their general paucity in the latter. Late Middle Cambrian fossils are known from near the base of the Tyndall Group at several localities. Tuffs, laharic breccias and epiclastics dominate the Tyndall Group, although lavas are present in the belt along the eastern side of the MRV. The most distinctive unit within the Tyndall Group is the Comstock Tuff, a banded pink and grey tuff well exposed on the Anthony Road. Corbett (1979) recorded a strikingly similar unit, the Lynchford Tuff, overlying Western Volcanic Sequence rocks south of Queenstown. The dominant lithology in the Tyndall Group is quartz+ feldspar-phyric rhyolitic tuff and subordinate lavas, although dacites are present in the Lake Dora - Lake Selina area. Siliciclastic sediments of the Owen Conglomerate unconformably overlie the Tyndall Group.

The Noddy Creek Volcanics

The Queenstown 1: 250,000 sheet, and also a small less detailed map from the new Geology and Mineral Resources of Tasmania shows a probably fault-bounded block of Mount Read Volcanics-type volcanics, informally named the Noddy Creek Volcanics, extending from Asbestos Point on the southern shore of Macquarie Harbour southward past the Timbertops area to the headwaters of the Hibbs River and beyond. As this area is largely inaccessible, details of the stratigraphy and structure are presently unavailable. Most analyzed samples in my database were collected by AMOCO/Cyprus geologists during traverses across the area in summer 1985-86. The volcanic belt is overlain, probably unconformably, by correlatives of the Owen Conglomerate and Gordon Limestone; these form a syncline which trends northwest, at a high angle to the regional strike of the Cambrian lavas and associated rocks. A second, complex belt of mafic and ultramafic rocks, with slivers of Owen Conglomerate and fossiliferous Late Cambrian Dundas Group rocks, crops out sub-parallel to the Noddy Creek belt only a few kilometers further west. On the Queenstown sheet, this belt appears to be pinched out by faulting before it reaches the southern shore of Macquarie Harbour.

Mount Read Volcanics collected in the Noddy Creek belt include representatives of a basalt-andesite-dacite-rhyolite suite, and a range of hornblende-bearing dioritic to granodioritic shallow intrusives. A small hornblende-bearing granodiorite intrusion at Timbertops, and a newly-discovered larger pluton of diorite-granodiorite in the headwaters of the Hibbs River further south (boundaries presently unknown) are undoubtedly part of the MRV (ie. Cambrian, and not related to the Upper Devonian granites elsewhere in W Tasmania) sequence in this area, and may be related to the Murchison and Darwin granitoids which intrude the MRV north of Macquarie Harbour.

THOLEIITIC SUITES

The Miners Ridge Sequence

Mapping by Corbett (1979) delineated an occurrence of *tholeiitic* basalts and dolerites in the core of an anticline within the Western

Volcanic Sequence in the Miners Ridge area, southwest of Queenstown. They are separated from overlying Western Volcanic Sequence MRV lavas by a sequence of greywacke, shale and tuff, followed upward by a distinctive quartzwacke marker horizon, the Miners Ridge Sandstone, then an overlying sequence of tuff, shale and greywacke which becomes more greywacke-rich up-sequence. Several voluminous basalt-andesite units (Lynch Creek Basalts) within the greywacke sequence, which forms part of the Western Volcanic Sequnce, are interpreted as a major volcanic edifice (Corbett 1979). A white quartz-rich tuff separates the greywacke sequence from the overlying Lynchford Tuff, which bears remarkable similarity in outcrop and thin section to the type formation of the Tyndall Group, the Comstock Tuff.

The Henty Fault Wedge

Between the northern and southern extensions of the Henty Fault System, Corbett & Lees (1987) recorded a complex sequence of lavas and sediments. Probably the best published information concerning the geology of this area can be found in Corbett and Solomon (1989), and this is summarized below.

At its narrow NE end, the Henty Fault Wedge stratigraphy is dominated by a folded sedimentary sequence of volcanogenic lithic wackes, siltstones, mudstones, conglomeratic beds and some rare carbonate-rich units. In the central part of the wedge around Hail Rivulet, andesitic lavas and lava breccias dominate, but felsic tuffs, siltstone, greywackes and occasional dykes of basaltic and doleritic rocks are also noted.

Further west, a poorly exposed siltstone-greywacke sequence containing some felsic and andesitic tuffs, and fossils of reported Middle Cambrian age, interfinger with a basalt-andesite complex along the Henty River and Zeehan Highway. This sequence contains pillowed and massive basalt flows, lava breccias and mafic intrusives, with subordinate felsic tuffs. A Mines Department drillhole in this sequence adjacent to the South Henty Fault intersected pillow basalts and abundant thin basaltic dykes. Ultramafic rocks in poorly exposed fault blocks along the N Henty Fault are dominantly serpentinized and commonly schistose. The western boundary of this mafic sequence is a fault; relationships between the basalts, and sediments and andesites occurring a short distance further east, remain unknown.

The Henty Dyke Swarm

Abundant dykes of basalt and dolerite of the Henty Dyke Swarm intrude the Central Volcanic Complex along, and northwest of the northern branch of the Henty Fault, at least as far north as Tullah. Preliminary chemical studies (McClenaghan & Corbett 1985) showed these dykes to be tholeiitic, and Corbett & Lees (1987) suggested that they may be related to the basalt sequence within the Henty Fault Wedge.

PETROLOGY-GEOCHEMISTRY OF THE HENTY FAULT WEDGE

Since the studied Henty Fault Wedge rocks are basaltic to andesitic in composition, I concentrate discussion of correlations on data for other basalt-andesite sequences in the MRV. These include the Central Volcanic Complex (andesites and more evolved rocks), the Western Volcanic Sequence lavas around Lynchford and in the Que-Hellyer district, the Miners Ridge sequence, the Noddy Creek Volcanics, the Sock Creek basalts, and the Henty Dyke Swarm.

However, all rocks studied have clearly undergone some degree (albeit generally minor) of mineralogical readjustment during burial metamorphism; therefore some comment on the strategy employed in interpreting the 'primary' chemistry of these altered rocks is warranted, prior to drawing petrogenetic or tectonic conclusions from the data presented.

Element Mobility

In studies such as this, focus is concentrated on those elements considered to be essentially immobile during the style of alteration which has affected all rocks selected for this study; these include Ti, Zr, Y, Nb, Sc and particularly, the rare earth elements (REE). Significant emphasis is placed on interpretation of REE patterns. Essential immobility of REE has been suggested by numerous studies of natural examples of alteration of basalts and andesites and by experimental studies of basalt-water interaction at temperatures above 150^{o} . In contrast, other studies have reported limited REE mobilty during relatively intense alteration of volcanic rocks (Hellman and Henderson 1977; Whitford et al. 1988). The meta-andesites studied by Hellman and Henderson (1977) and Whitford et al. (1988) were considerably more altered than samples selected for the present study. Altered lavas studied by Hellman and Henderson (1977) showed extensive patchy, almost monomineralic epidote (Ca-rich) and albite (Na-rich) domains, whereas in the study by Whitford et al. (1988) of hydrothermally altered andesites around the Que Rv. massive sulphide deposit, many lavas were extensively silicified or showed intense sericite-carbonate alteration. Despite this intense alteration of the Que Rv host andesites, REE behaved remarkably coherently; REE patterns show either no change of slope, but only vertical translations due to dilution-residual enrichment processes, or very slight LREE depletion (flattening of patterns).

Whitford et al. (1988) argued that weakly-altered lavas (such as those selected for this study) have retained primary REE patterns, with only Eu showing some evidence for post-magmatic mobility in the form of larger-than-expected negative Eu anomalies in some samples. Similar examples of selective Eu depletion have been documented in altered lavas from around other massive sulphide deposits, and have been attributed to the ability of normally trivalent Eu to change to Eu^{2+} under hydrothermal conditions, and thus be available for leaching with Ca during albitization of calcic plagioclase and alteration of glass.

In summary, however, I am confident that for all the lavas studied for this project, the amount of REE mobility is certainly not enough to lead to an incorrect petrogenetic interpretation of the suites involved, and that for the least-altered MRV selected for this study, the REE patterns are representative of the primary magmatic REE patterns for these rocks, with the proviso that Eu abundances may have been slightly modified. In addition, abundances of Ti, Zr, Y, Nb, Sc, V and probably Ni, Cr, Fe and Mg in these lavas are little removed from their primary abundances in these rocks. While the K-group (K, Rb, Ba) elements and Ca, Na and Sr were undoubtedly more mobile, careful interpretation of their abundances in these least-altered MRV can provide petrogenetically useful information.

Geochemistry of the Central Volcanic Complex Andesites

Perhaps the most important petrological-geochemical feature of the CVC lavas is that basalts are unknown, and the least evolved compositions are andesitic. This is clearly shown in Figure 1, from which it is seen that the minimum SiO_2 content of lavas within the CVC is around 58%. However, a number of important points should be noted from the chemical variations diagrams shown in Figures 1a to d.

1: it is obvious from Figure 1 that two distinct magmatic suites are present within the CVC; these may be referred to as a higher-Ti suite and a lower-Ti suite, and clear compositional groupings can be brought out between these two suites using TiO_2, or oxide/ TiO_2 , as a plotting parameter. The lower TiO_2 suite is also dominantly andesitic relative to the more dacitic to rhyolitic higher- TiO_2 suite, and it is significant that most of the low-Ti suite constitute the hornblende+plagioclase- phyric intrusive andesites, such as those around Crown Hill, N of Queenstown. Presently, I know of no lower-Ti suite rocks from the CVC north of the Henty Fault Zone.

2: Although K_2O is generally considered to be mobile to varying degrees during low-grade burial metamorphism, both the SiO2- K_2O plot (Figure 2) and the K_2O contents of hornblendes in both suites (AJC, unpubl. data) strongly support the argument that both suites in the CVC were high-K calc-alkaline suites.

3: The higher-Ti suite REE patterns (Figure 3) are comparable with high-K calc-alkaline arc magmas from the Andes, whereas the lower-Ti suite are even more enriched in light REE (LREE) than Andean high-K andesites. The significance of these strongly LREE-enriched lavas will be discussed further on.

However, the implications of these data are that both suites of lavas (and intrusives) constituting the CVC, although always andesitic or more evolved compositions, must have been derived from calc-alkaline high-K basaltic parental magmas, probably with more than 1% K_2O, and certainly with pronounced LREE-enrichment.

Que-Hellyer Footwall Andesites

Abundant andesites and dacites in the area N of the Mt. Charter Fault, and occurring footwall to the Hellyer and Que Rv. massive sulphide deposits, are high-K calc-alkaline orogenic andesites (Whitford et al. 1989). They are much less enriched in P_2O_5- and LREE contents than the far more magnesian Hellyer-Lynchford basalts described further on. These footwall andesites, however, bear many compositional similarities to the Central Volcanic Complex Group 1 andesite-dacite- rhyolite lavas, as shown by the element variation diagrams in Figures 4a-c. On most of the major element variation diagrams, the Que-Hellyer Footwall andesites bridge the compositional gap between the Central Volcanic Complex Groups1 and 2 lavas. REE data for the Que-Hellyer Footwall rocks also lies between the CVC Type 1 and Type 2 suites REE patterns (Figure 3b) Note that the great majority of analyzed Central Volcanic Complex Group 1 lavas have more than 65% SiO_2, whereas the Que-Hellyer Footwall lavas range down to 53% SiO_2 and have abundant lavas with less than 65% SiO_2.

Western Volcanic Sequence Lavas

Abundant basalts in the Western Volcanic Sequence both N (Hellyer area) and S (Lynchford area) of the Henty Fault System range compositionally from high-K calc-alkaline basalt compositions to exceptionally P_2O_5- and LREE-enriched shoshonites. These occur in two main accumulations, at Hellyer, and another further south at Lynchford. Both probably represent volcanic edifices. As noted above, no basaltic lavas are known from the Central Volcanic Complex, and the Western Volcanic Sequence andesitic lavas, although apparently subordinate volumetrically to basalts, are compositionally distinct from any possible parent magmas of the Central Volcanic Complex Group 1 andesites.

The less enriched end-members of the spectrum of basalt-andesite compositions in the Western Volcanic Sequence overlap compositionally with Central Volcanic Complex Group 2 andesites, and extend to much higher LREE (Fig. 5) and P_2O_5 contents, and lower Ti/Zr values.

The occurrence of strikingly unusual highly P_2O_5- and LREE-enriched (Figure 5) magnesian basaltic lavas both in the northern part of the Western Volcanic Sequence (Hellyer area) and 50 km further south at Lynchford (west of Queenstown) forms the basis of my claim that Corbett's (1979) Western Sequence in the Queenstown area is likely to be younger than the Central Volcanic Sequence, and a correlate of the Hellyer basalt-andesite sequence.

Noddy Creek Volcanics

The Noddy Creek Volcanics are a high-K calc-alkaline suite extending across the basalt to rhyolite compositional range. Major and trace element contents and ratios, plus REE patterns suggest that both the compositional groups recognized within the Central Volcanic Complex are also present in the Noddy Creek belt. This is further supported by the observation that the group of Noddy Creek rocks with the higher REE levels, close to those of the Central Volcanic Complex Group 2, are hornblende diorites and granodiorites compositionally and mineralogically very close to the CVC Group 2 hornblende-bearing lavas. One difference from the Central Volcanic Complex, however, is that the few extrusive basalts within the Noddy Creek Volcanics have no known counterparts in the Central Volcanic Complex.

The Henty Dyke Swarm

On the basis of available data (see later), it is clear that the Henty Dyke Swarm is basalt-dominated, and that these rocks are tholeiitic. The dyke swarm, at least, attests to an episode of tension and rifting of the Central Volcanic Complex that has no known counterpart in the Western Volcanic Sequence. It will be critical to determine if Henty Dyke Swarm correlates are present in the Hellyer to Beulah area, although available data suggests that they are not present in these well-sampled areas. The detailed geochemistry of the Henty Dyke Swarm basalts is discussed further on.

The Miners Ridge Basalts

Basalts outcropping in the anticlinal core within the Western Volcanic Sequence at Miners Ridge are compositionally unlike the MRV, in that they are strongly tholeiitic (see later). As discussed further on. their compositional features are characteristic of island arc tholeiites erupted in an intra-oceanic arc setting, such as those presently erupting in the Tongan and Mariana arcs. In this respect, they would seem to be unrelated to the MRV. They probably formed, together with the large ophiolites along the western margin of the Dundas Trough, part of the allochthon of forearc crust that was emplaced on Rocky Cape passive margin crust during the Middle Cambrian arc-continent collision which constructed much of the crust of western Tasmania (see later).

THE SOCK CREEK BASALTS

Drilling by BHP in the Sock Ck area intersected in holes SCS 2 and 3 a pile of amygdaloidal augite+olivine+plagioclase-phyric basalts that I described in a report for BHP, now in Pasminco's possession. The unusual lavas studied probably come from one or several related flows. Despite their relative proximity to the Que-Hellyer basaltic andesite sequence that forms part of the Western Volcanic Sequence, and their position on the western side of the Mount Read Volcanic belt, it can be confidently shown that the Sock Ck Holes 2 and 3 lavas are not possibly related to, or correlatable with the Hellyer (or other Western Volcanic Sequence) basalts. I have previously concluded that they are arc basalts transitional between arc tholeiities and arc calc-alkaline basalts. They appear to fill a compositional gap between the Miners Ridge arc tholeiites and the high-K calc-alkaline Western Volcanic Sequence basalts. The significance of this will be discussed further on.

CORRELATION OF THE HENTY FAULT WEDGE ROCKS

LOCATIONS and PETROGRAPHIC SUMMARY of the ANALYZED LAVAS

Samples studied from the Henty Fault Wedge for this report were collected in 1984 to 1987 by several geologists, and sample numbers and locations are given below. One sample (207) collected by Doug Jack (ex-Aberfoyle) has coordinates that place it in glacial scree outside the Henty Fault Wedge by some hundreds of meters. I believe this sample is mis-located, and that it comes from either the Henty River section or the highway nearby. There is no doubt that this sample is from the southern end of the Henty Fault Wedge.

HR126	600m N of Zeehan Hwy (CP748509) Corbett and Solomon pg. 107
1984/11	Zeehan Hwy CP743502 Corbett and Solomon pg. 107
1984/9	Zeehan Hwy CP742503 Corbett and Solomon pg. 107
1984/10	Lower Henty River CP742511 Corbett and Solomon pg. 107
HR23	Hall Rivulet track, CP768557, Corbett and Solomon pg. 107
HR24	Hall Rivulet track, CP 772552, Corbett and Solomon pg. 107
207	CP729 519.5 (outside W boundary fault of HFW!)
206	CP747 503 Zeehan Hwy
216	CP736 053 Track running E from Zeehan Hwy
221	CP736 528 Henty River section
225	CP741 511 Henty River section
BR1/A	Mines Dept Drillhole BR1 at AMGref 374929mE5350434mN (collected by Joe Stolz, AMIRA Rept. August 1988)

PETROGRAPHY

Two samples (HR23, HR24) are plagioclase+augite-phyric andesitic lavas with albitized plagioclase phenocrysts and fresh to partially chloritized small augite phenocrysts in a devitrified vitrophyric groundmass. These are petrographically identical to andesites from the Central Volcanic Complex around Tullah, and also those from the Que-Hellyer Footwall andesite sequence. A third sample (1984/10) is an andesitic tuff.

The remainder of the samples considered useful in interpreting the affinities of the Henty Fault Wedge lavas are basaltic and doleritic. I have examined thoroughly in thin section five of the samples listed above. Salient points include the following:

1. Strongly porphyritic basalts with augite+albitized plagioclase phenocryusts dominant include 207,216 and 221. These are characterized by large plagioclase phenocrysts to 4mm long and less abundant but often quite large augite phenocrysts; Corbett's samples HR26 and 1984/11 almost certainly fall in this group petrographically, although HR126 being more magnesian than the other samples might be expected to carry former olivine phenocrysts .

2. 225 is an exceptionally well-preserved very sparsely plagioclase-phyric basalt, with fresh augite plates in the groundmass.

3. 206 is an ophitic-textured dolerite, clearly intrusive in origin.

4. All rocks show prehnite-pumpellyite facies metamorphic assemblages, and very minor, if any, local hydrothermal overprinting (eg. calcite-sericite alteration).

5. The extensive tholeiitic basalts in the Late Proterozoic -Early Cambrian Crimson Creek Formation and its correlates throughout W Tasmania (eg. in Smithton Trough, southern Dundas Trough, on the south shores of Macquarie Harbour and in the Dial Range Trough, where they are referred to as the 'Motton Spilite'), are either largely aphyric, or very sparsely augite-phyric. Plagioclase phenocrysts are very rare, suggesting that any correlation with the Crimson Creek Formation basalts can be ruled out on petrographic grounds alone.

6. Miners Ridge tholeiitic basalts are less plagioclase-phyric than most of the basalts from the Henty Fault Wedge; they aften contain pseudomorphed olivine phenocrysts, which remain unknown in the Henty Fault Wedge rocks.

7. The textures of the Henty Fault Wedge basalts (and dolerite) are unlike

those making up the bulk of the basalt section in the Western Volcanic Sequence, either at Lynchford, or in the Que-Hellyer area. In the former, the abundance and size of former FeTi oxide grains is an important distinction from the Western Volcanic Sequence basalts.

8. Basalts in the Henty Dyke Swarm are mainly sparsely plagioclase-phyric or aphyric evolved tholeiites; strongly porphyritic samples such as those described in point (1) above are unknown in the Henty Dyke Swarm.

9. Basalts from BHP Drillhole 3 at Sock Creek South are fairly strongly augite+plagioclase+olivine-phyric lavas, also with prehnite-pumpellyite facies burial metamorphic assemblages. They differ petrographically from the basalts in the Henty Dyke Swarm by the presence of (altered) olivine phenocrysts. However, as the Sock Creek basalts are much more primitive (less differentiated) compositions than most of those basalts in the Henty Fault Wedge (except for HR126 which has not been examined petrographically, and dolerite 206), the presence of olivine in the less evolved Sock Creek lavas does not necessarily rule out any correlation with the Henty Fault Wedge basalts.

COMPOSITIONAL FEATURES OF THE HENTY FAULT WEDGE ROCKS

Compositions of the Henty Fault Wedge rocks are given in Table 1. Volatile-free SiO_2 contents vary from 50.3% to 62.3%, and MgO contents show a decrease from 8.6% to 3.8%. The rocks, therefore, vary compositionally from andesites to basalts. However, it is obvious that SiO2 contents are bimodally distributed, with four samples having greater than 58% (to 62%) SiO2 and the remainder having less than 54% SiO2. Two of the andesitic samples are from the Hall Rivulet section in the central part of the Wedge, and the third, the andesitic tuff, remarkably similar compositionally to the Hall Rivulet samples, comes from the Lower Henty Rv section, apparently interbedded with basalts.

The Andesites

It is clear from the analyses in Table 1 and the element variation diagrams in Figures 6a, b and c that the andesitic lavas from the central region of the Henty Fault Wedge, and the andesitic tuff in the basaltic sequence further west, are very similar to andesites in the Central Volcanic Complex, the Noddy Creek andesites, and andesites from the Que-Hellyer Footwall sequence. This is borne out by the REE pattern of

HR23, compared with a CVC-parent high-K calc-alkaline basalt from Noddy Creek in Figure 7 (compare also with CVC andesites in Figure 3).

I have no doubt that the Hall Rivulet andesites from the central part of the Henty Fault Wedge are high-K calc-alkaline lavas directly comparable with other high-K calc-alkaline suites within the Mount Read Volcanics, especially with the Group 1 CVC lavas, those from Noddy Creek belt, and the Que Footwall andesites. The occurrence within the basaltic sequence further W of an andesitic tuff (1984/10) clearly correlated compositionally and petrographically with these andesites, is important. Several interpretations are possible. Either the tuff represents explosive calk-alkaline volcanism occurring contemporaneously adjacent to the region in which the unrelated basalts were being erupted, or else it is an epiclastic derived from the Hall Rivulet-type andesite pile and shed into an area where basalts were being erupted. Without a careful thin section examination of this Mines Dept sample, it is difficult to choose between the alternatives.

The Basalts

The basaltic rocks in the Henty Fault Wedge are all tholeiitic, as shown by the trend of Fe-enrichment with differentiation (Fig. 6a and 6c). They therefore contrast strongly with calk-alkaline basalts of the Western Volcanic Sequence, in which FeO^* contents decrease with increasing fractionation. Further differences between the tholeiitic Henty Fault Wedge basaltic rocks and the calc-alkaline basalts of the Mount Read Volcanics are shown clearly on the Ti/Zr vs SiO2 diagram (Fig. 6b) and by their respective REE patterns (Figures 8a-g). The Henty Fault Wedge basalts and dolerite show relatively mild LREE-enrichment, compared to the strongly LREE- enriched calc-alkaline basalts and shoshonites in the Western Volcanic Sequence. Any correlation of the Henty Fault Wedge basaltic rocks with the calc-alkaline basalts in the Western Volcanic Sequence of the Mount Read Volcanics can therefore be confidently ruled out.

It is quite clear from the range of REE patterns, and range of TiO2 contents at similar MgO levels, that several magma suites are represented within the Henty Fault Wedge. Whereas eveolved tholeiitic andesite compositions such as lava 84/9 may well be differentiation products of parent basalts such as sample 207, it is clear that most magnesian lava HR126, with only slightly less TiO2 than 84/9, cannot be derived from the same magma suite. The important point for this suite is that they are very low-Nb, slightly LREE-enriched tholeiitic basalts with Ti/Zr contents between 70 and 107. This range of compositions is closest to basalts erupted during the early rifting stage of magmatic arcs to form backarc or interarc basins. The low-Nb contents are particularly informative in this respect, and characterize early backarc tholeiites and arc basalts in general. The only definite intrusive rock in the sequence, 206, shows a much flatter REE pattern than the other Henty Fault Wedge lavas (Fig. 8g). It is well established that during backarc opening, a temporal change in magma composition occurs from early LREE-enriched varieties to later more REE-depleted tholeiites, generally accompanied by a serial increase in Nb abundances. Significantly, magnesian dolerite 206 has a Nb anundance (2.6ppm) almost as high as more evolved basalts with around 6-6.2% MgO; this implies the former was a higher Nb magma than the parent basalts of the latter, and supports the inference made above.

As discussed earlier, there are three other tholeiitic basalt suites within the geographic extent of the Mount Read Volcanics. The main task facing correlation of the diverse Henty Fault Wedge basaltic rocks with any (or none) of these other MRV tholeiite suites is to establish characteristic geochemical 'fingerprints' for each of these other suites, and compare these with the rocks being studied from the Henty Fault Wedge.

THE MINERS RIDGE SEQUENCE

The poorly-studied Miners Ridge sequence is dominated by basalts and dolerites that display clear tholeiitic affinities, such as strong Fe-, Ti- and V-enrichment with increasing fractionation. However, it is evident from the data in Table 2 that all the Miners Ridge samples are highly unlikely to be from the same magmatic suite. For example, Ti/Zr values for all the basalts are greater than 88.8, extending up to 164. However, samples D1, D2 and D3 are doleritic ***dykes*** and have Ti/Zr values clustering at at much lower value, around 56-60, and they also have very different Zr/Y values from the extrusive basalts.

Unfortunately no REE data are available for the intrusive dolerites from the Miners Ridge sequence. However the basalts are all strongly and characteristically LREE-depleted (Fig. 9), and with the high to very high Ti/Zr values show all the compositional features of LREE-depleted tholeiitic basalts in primitive oceanic island arcs.

In my opinion, there are two possible interpretations of the tectonic significance of the Miners Ridge basalts. Either they represent part of the lava carapace of an allochthonous ophiolitic sequence that is exposed more fully in large complexes such as those at Serpentine Hill, McIvor Hill and Heazelwood. Alternative they are part of the lower section of an arc lava sequence that formed along the western side of the Mount Read arc (itself represented by the CVC). This basalt pile shows a remarkable temporal(?) change in composition from primitive arc tholeiites represented by the Miners Ridge basalt sequence, through Sock Ck -type transitional tholeiitic to cal-alkaline basalts, to the uppermost high-K to shoshonitic basalts of the Western Volcanic Sequence sensu stricto (as at Hellyer and Lynchford). Much more data and particularly field studies are required before either of these alternative tectonic scenarios can be confidently chosen as correct.

In summary, the Miners Ridge sequence consists of LREE-depleted arc tholeiitic basalts with Ti/Zr values mainly >100, that are intruded by an unrelated suite of tholeiitic doleritic dykes with lower Ti/Zr values, but which nevertheless still show clear arc tholeiitic affinities. The Miners Ridge sequence cannot be correlated with the Henty Fault Wedge basalts.

THE SOCK CREEK SOUTH BASALTS

These amygdaloidal basalts (Table 3) are magnesian low-Ti lavas with low Nb contents, Ti/Zr values around 83-87, and mild LREE-enrichment (Fig. 10). Although their Ti/Zr values fall within the Henty Dyke Swarm Ti/Zr range, significant compositional features listed below rule out any magmatic link between these basalts and the Henty Dyke Swarm.

1. TiO_2 contents, Zr/Sc and Zr/Nb values are all considerably lower for the Sock Ck basalts than for the basalts constituting the Henty Dyke Swarm.
2. Although the Sock Ck basalts are more magnesian than almost all the Henty Dyke Swarm basalts, the latter have lower (below detection limit in many cases) Nb contents, whereas they should have higher Nb contents if they were part of the same fractionation sequence.
3. The more magnesian Sock Ck basalts show stronger LREE-enrichment than any of the three REE-analyzed Henty Dyke Swarm basalts (Figure 10.).

As discussed in detail in my report to BHP, the Sock Ck basalts are compositionally unlike the Miners Ridge tholeiites in many respects (eg. LREE-enriched, versus LREE-depleted Miners Ridge thoeliites). They may, however, form a later stage in a spectrum of arc magma compositions generated in a belt along the western side of the Mount Read arc that terminated with the high-K to shoshonitic basalts of the Western Volcanic Sequence (see earlier discussion).

Comparison of the Sock Ck basalts with those in the Henty Fault Wedge is made somewhat difficult by the range of basalt compositions present in the Henty Fault Wedge. Most of the Henty Fault Wedge basalts are clearly unrelated to the Sock Ck basalts, as shown by their much higher TiO_2 contents at similar or slightly lower MgO levels (ie at similar levels of differentiation), and their genrally slightly flatter REE patterns. However, Fault Wedge basalt 207 shows fairly similar immobile element ratios and REE pattern to the Sock Ck basalt, yet has 4.5% more Al_2O_3. It is little more than black magic to draw a correlation between these suites based on some superficial similarities ***between two samples only*** in these diverse suites. Therefore, on the basis of the available evidence, I feel confident that the Sock Ck basalts are not derived from the same magma suite(s) that produced the diverse rocks in the Henty Fault Wedge.

THE HENTY DYKE SWARM

These largely aphyric, evolved tholeiitic basaltic dykes (Table 4) show a typical trend of generally increasing FeO^* and TiO_2 with increasing differentiation (Fig. 6a), also shown by no decrease of FeO^* with increasing SiO_2 (Fig. 6c). The majority of dykes have Ti/Zr values from 65 to 110, and TiO_2 contents between 0.9% and 1.2% (Table 4); Ti/Zr values decrease with increasing fractionation, reflecting a role for FeTi oxides in the later stages of the fractionation sequence. REE patterns of three samples are shown on Figure 9 (and two repeated on Figure 10), in which they are compared with the Hall Rivulet high-K calc-alkaline andesite HR23 from the Henty Fault Wedge, and a high-K calc-alkaline basalt from the Noddy Creek belt. The dykes show much less pronounced LREE enrichment than the typical CVC calc-alkaline lavas.

The range of compositions shown by the Henty Dyke Swarm basalts shows a strong similarity to those basalts in the Henty Fault Wedge. Key features are the notable low Nb contents of the dykes and Wedge lavas, the similar REE pattern range (Fig. 10), similar Ti/Zr values at similar TiO_2 contents, and the significantly high Al_2O_3 contents of both suites. As mentioned briefly above in the discussion of the Henty Fault Wedge basalt chemistry, the compositional range of both this suite and the Dyke

Swarm is best interpreted as an representative of an incipient backarc basin tholeiitic suite. This magmatism records a tensional episode in the post-CVC phase of magmatism in the Mount Read arc. The low Nb contents are diagnostic of very young backarc basin magmatism; similar basalts from a mature backarc- or major ocean basin would have an order of magnitude higher Nb contents at any stage of differentiation. Similarly, the range in REE patterns (Figs. 9, 10) from almost flat (R8, and 206) to weakly but significantly LREE-enriched (STP234, and 216)) is also typical of young backarc basin magmatism as the mantle sources supplying the basalts change from arc-type with LREE-enrichment, to MORB-type, with flat to LREE-depleted patterns.

TECTONIC AND REGIONAL IMPLICATIONS

The rather tight compositional scatter of the Henty Dyke Swarm basalts, their unambiguous situation cutting CVC high-K calc-alkaline arc-type lavas, and their pronounced compositional similarities to young backarc basin tholeiitic magmas makes them, in my opinion, the best understood of the tholeiitic suites in the Mount Read Volcanics belt and neighbouring areas in W Tasmania. The less well studied suite of basalts and dykes at the western end of the Henty Fault Wedge can be confidently correlated with the Henty Dyke Swarm, and may record incipient rifting and ocean crust formation in the Mount Read foundering and splitting calc-alkaline arc. Given the very strong correlation between the andesites in the central part of the Henty Fault Wedge with the CVC and Que-Hellyer Footwall andesites, this demands that the stratigraphic sequence youngs westwards in the region between the Henty Faults. Alternatively, a major unmapped fault may separate the andesite-dominated central section from the much younger, basalt-dominated western part of the Henty Fault Wedge.

It is worth noting that the tectonic environment envisioned for the development of the Mount Read arc at the stage the Henty Fault Wedge and Henty Dyke Swarm magmas were being produced corresponds very closely to the classic inter-arc basin rifting stage in arcs such as Japan during which the type Kuroko deposits were generated. A thick, dacite-rhyolite dominated lava pile is rifted, intruded and eventually split as hot basalt magma from sub-arc asthenosphere injects benaeath the arc. During this stage of arc demise, immense rises in heatflow and near-surface fluid circulation are produced in deep water, creating an ideal situation for polymetallic base metal sulphide accumulation on the sea-floor.

SUMMARY

A main aim of this study was to determine the compositional affinities and intra-Mount Read Volcanics belt correlations of the rocks in the Henty Fault Wedge. The following conclusions have been reached.

1. The rocks in the central part of the Henty Fault Wedge are high-K calc-alkaline andesites best correlated with the Central Volcanic Complex andesites, the Que-Hellyer Footwall andesites and andesites in the Noddy Creek Volcanics south of Macquarie Harbour.

2. The rocks at the western end of the Henty Fault Wedge are tholeiitic basalts and dolerites that have unusually low-Nb contents, and show a range of REE patterns and immobile element ratios most closely matched by basalts erupted in the very early stages of rifting of island arcs and incipient backarc basin opening.

3. A very strong correlation exists between the compositions of the Henty Fault Wedge basalts and dolerites and the basalts of the Henty Dyke Swarm, that intrudes Central Volcanic COmplex andesites and clearly signifies an episode of crustal tension and rifting late in the history of the Mount Read volcanic arc.

4. No correlation can be made between the Henty Dyke Swarm and Henty Fault Wedge basalts and those tholeiites outcropping beneath the Western Volcanic Sequence at Miners Ridge, nor with the transitional tholeiitic basalts of uncertain geological relationships intersected by drilling at Sock Creek.

5. The Henty Fault Wedge sequence formed in a tectonic scenario very close to that considered to have been in existence during the formation of the type Kuroko volcanogenic massive sulphide deposits.

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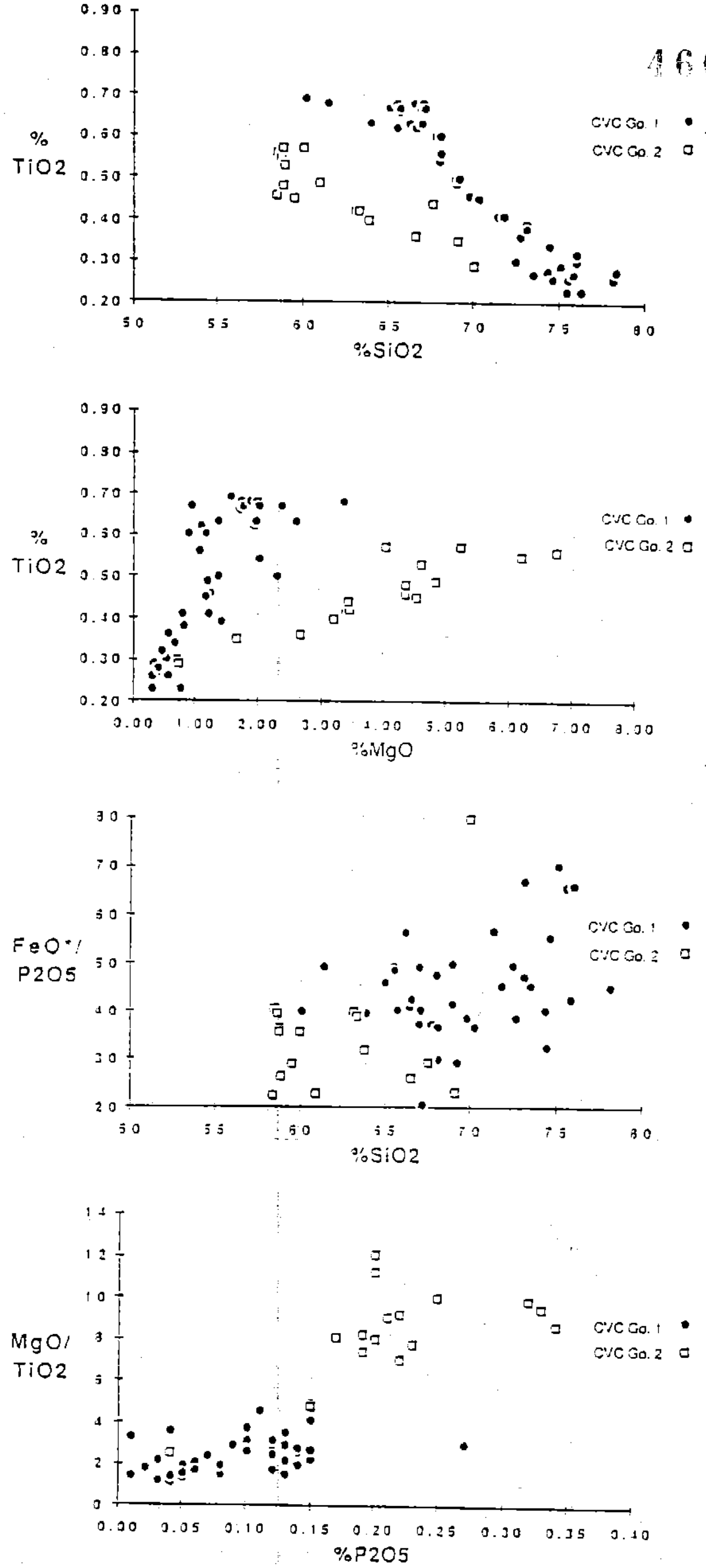


FIGURE 1. Variation diagrams showing distinct compositional fields for Mount Read Volcanics Central Volcanic Complex Group 1 and Group 2 lavas.

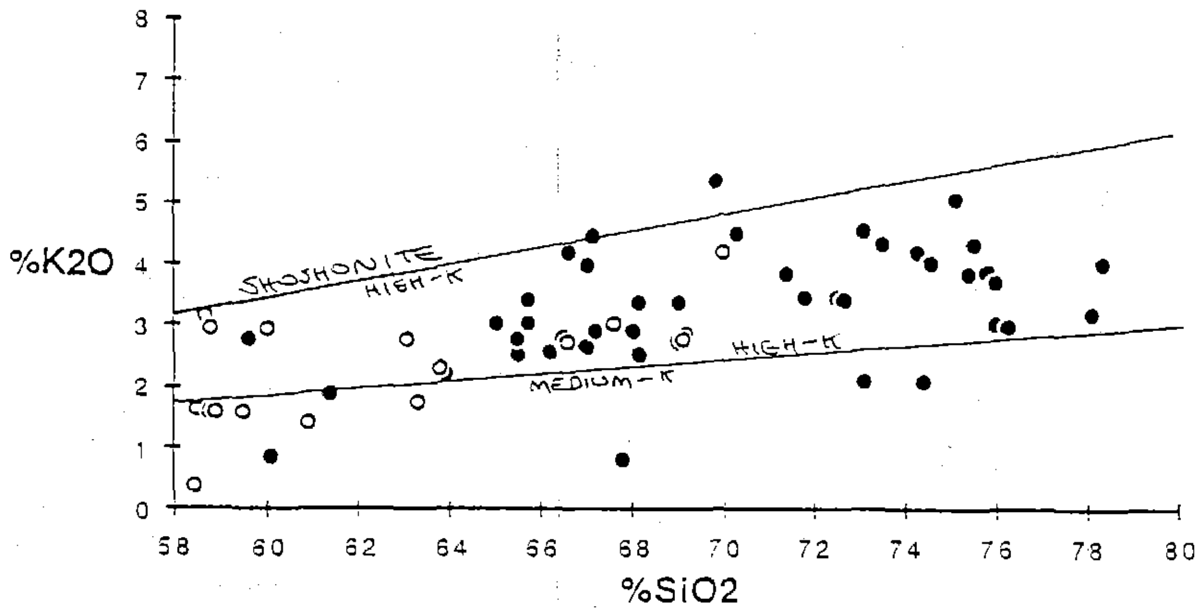


Figure 2: K2O - SiO2 diagram for CVC lavas from the Mount Read Volcanics; filled circles are from N of the Henty Fault, open circles are from S of the Henty Fault.

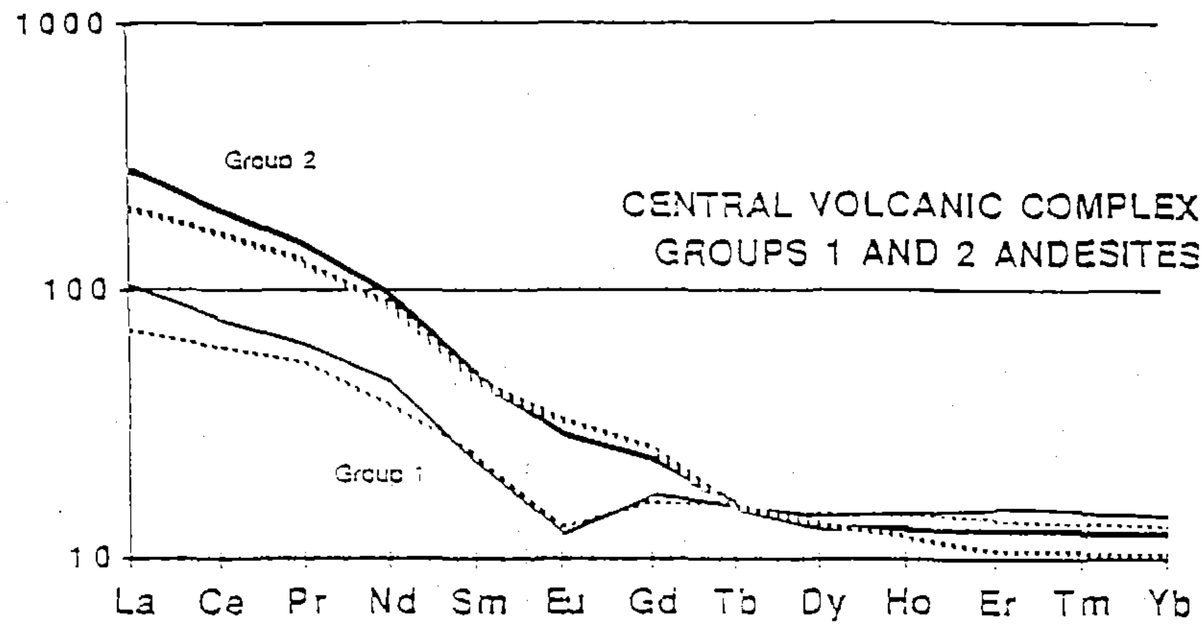


FIGURE 3a: Chondrite-normalized REE patterns for representative andesites from Central Volcanic Complex Groups 1 and 2.

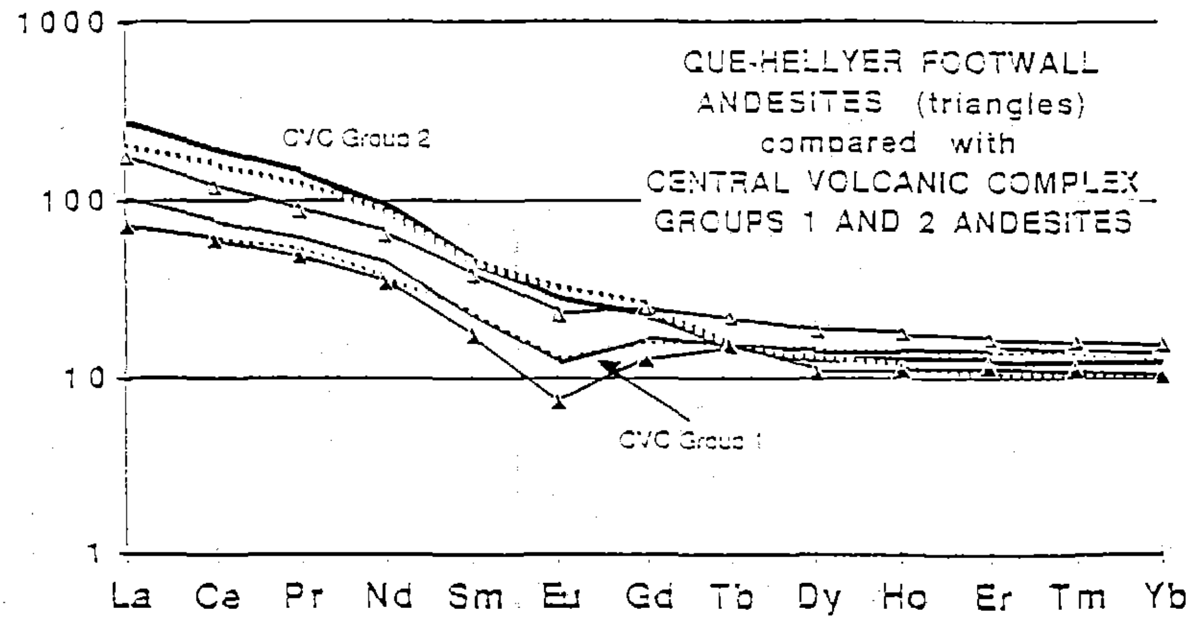
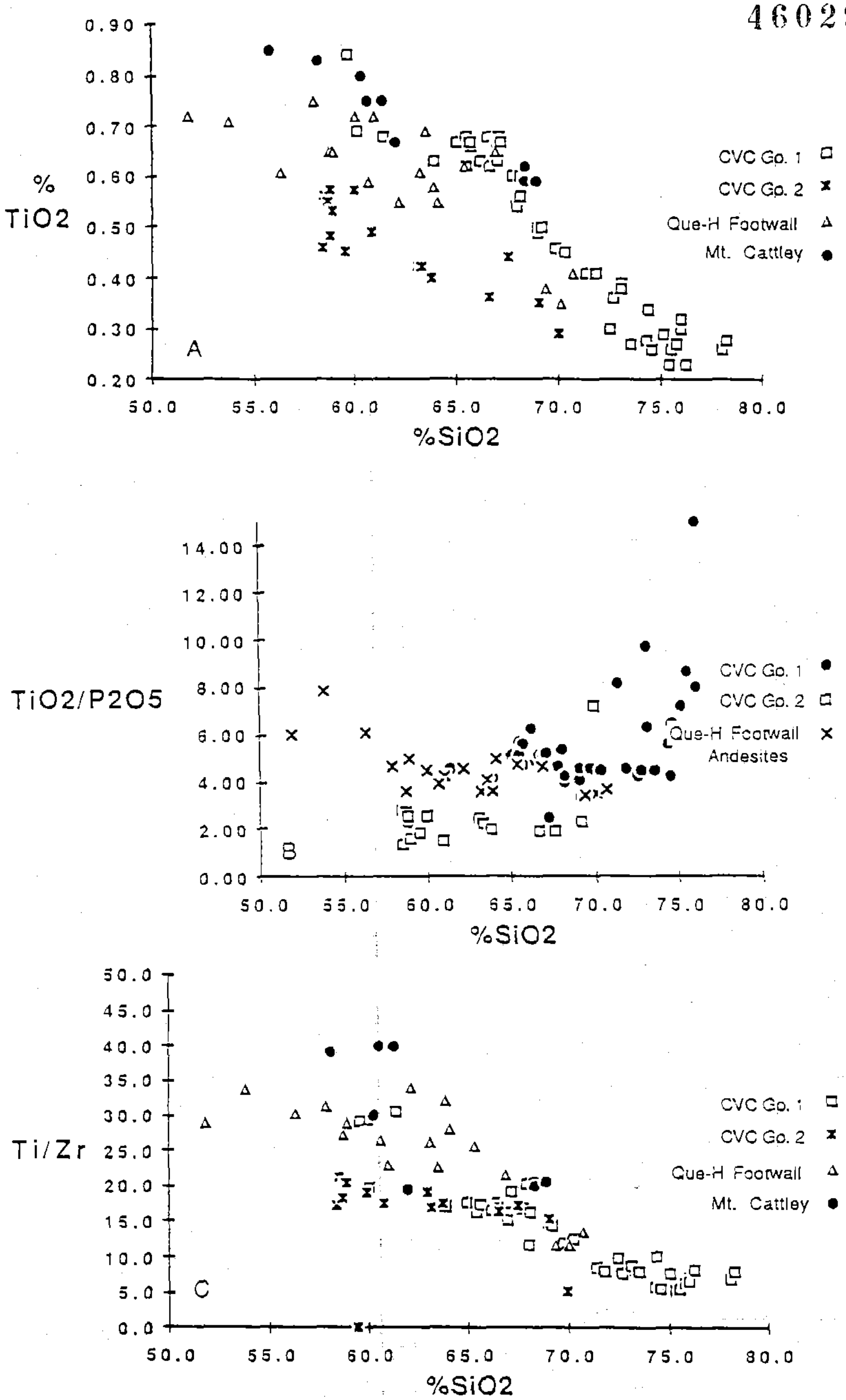


FIGURE 3b: Chondrite-normalized REE patterns for representative andesites from the Que-Hellyer Footwall sequence compared with the Central Volcanic Complex Groups 1 and 2 andesites.



Figures 4a-c: Plots of CVC andesites showing similarity to the Que-Hellyer Footwall andesites.

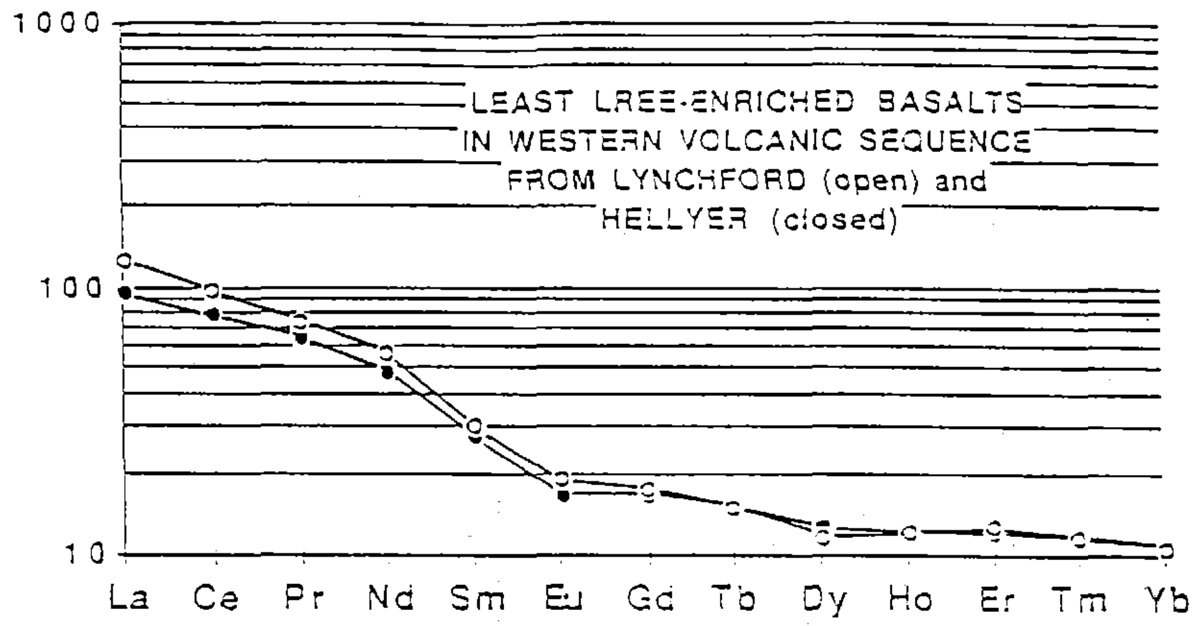


FIGURE 5a: Less LREE- and P-enriched endmembers of the shoshonitic basalt suite in the Western Volcanic Sequence from Hellyer and Lynchford.

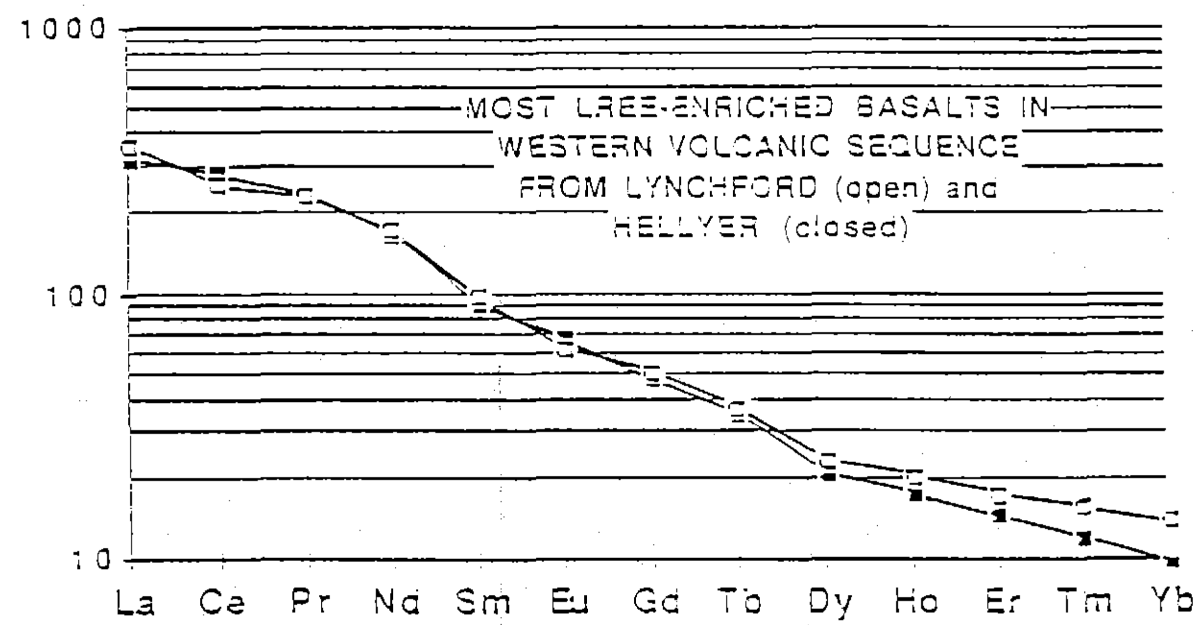


FIGURE 5b: Strongly LREE- and P-enriched endmembers of the shoshonitic basalt suite in the Western Volcanic Sequence from Hellyer and Lynchford.

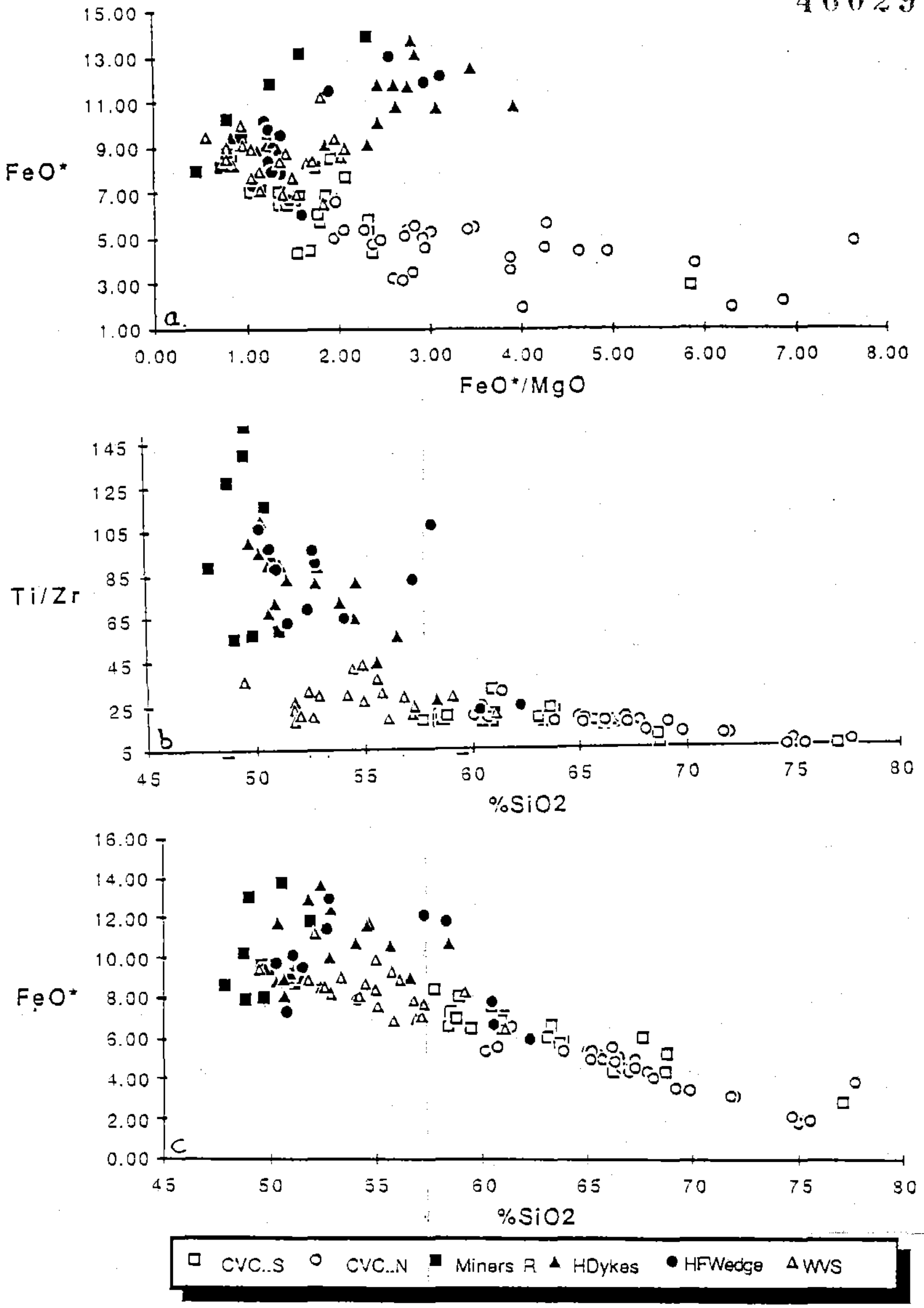


Figure 6a-c: Plots comparing compositional fields of the Central Volcanic Complex lavas from N and S of the Henty Fault with Western Volcanic Sequence lavas from S of the Henty Fault (Lynchford area), and the tholeiitic suites (Miners Ridge lavas, Henty Fault Wedge rocks, and Henty Dyke Swarm basalts).

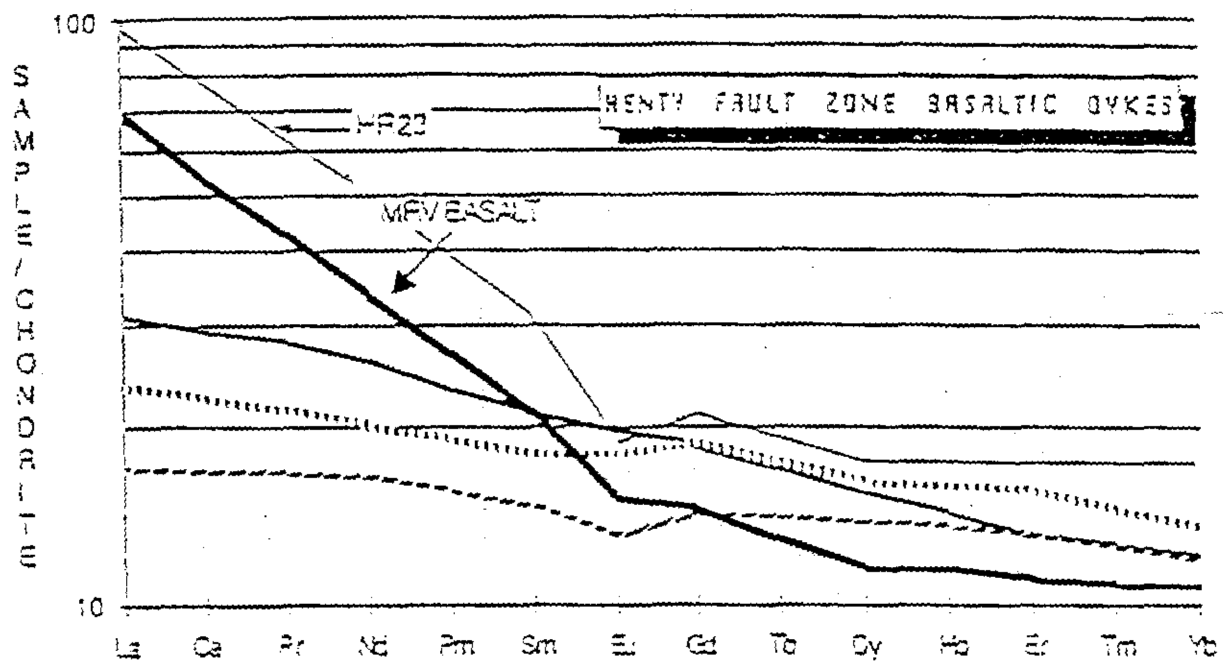
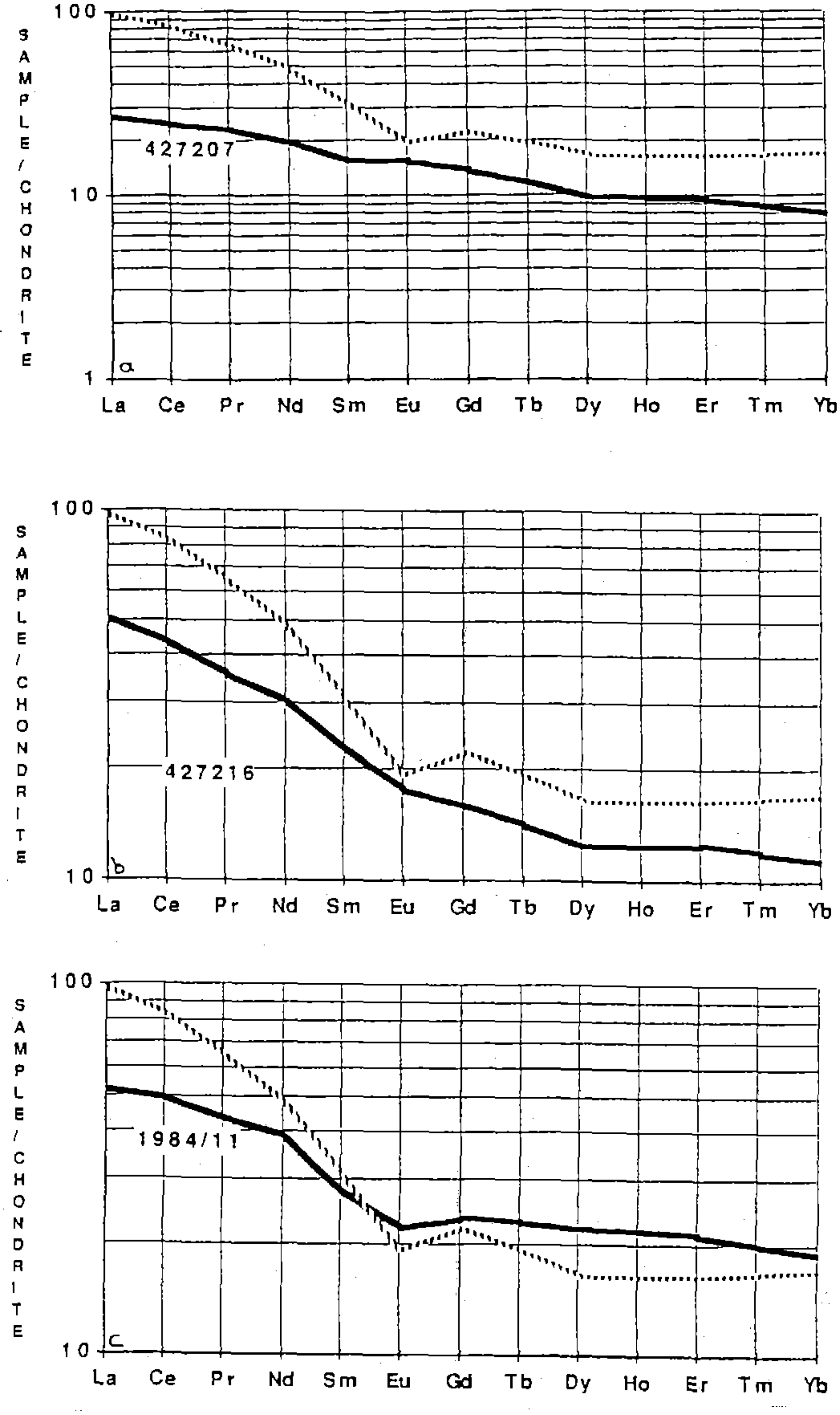


FIGURE 7. Chondrite-normalized REE patterns for three basalts from the Henty Fault Zone dyke swarm, and andesite from the Hails Rivulet sequence of the Henty Fault wedge (HR22), and a typical Mount Reid Volcanics basalt (462A) for comparison.



Figures 8a-g: REE patterns of individual Henty Fault Wedge rocks compared with that for high-K calc-alkaline andesite HR23 from the central region of the Henty Dyke Swarm.

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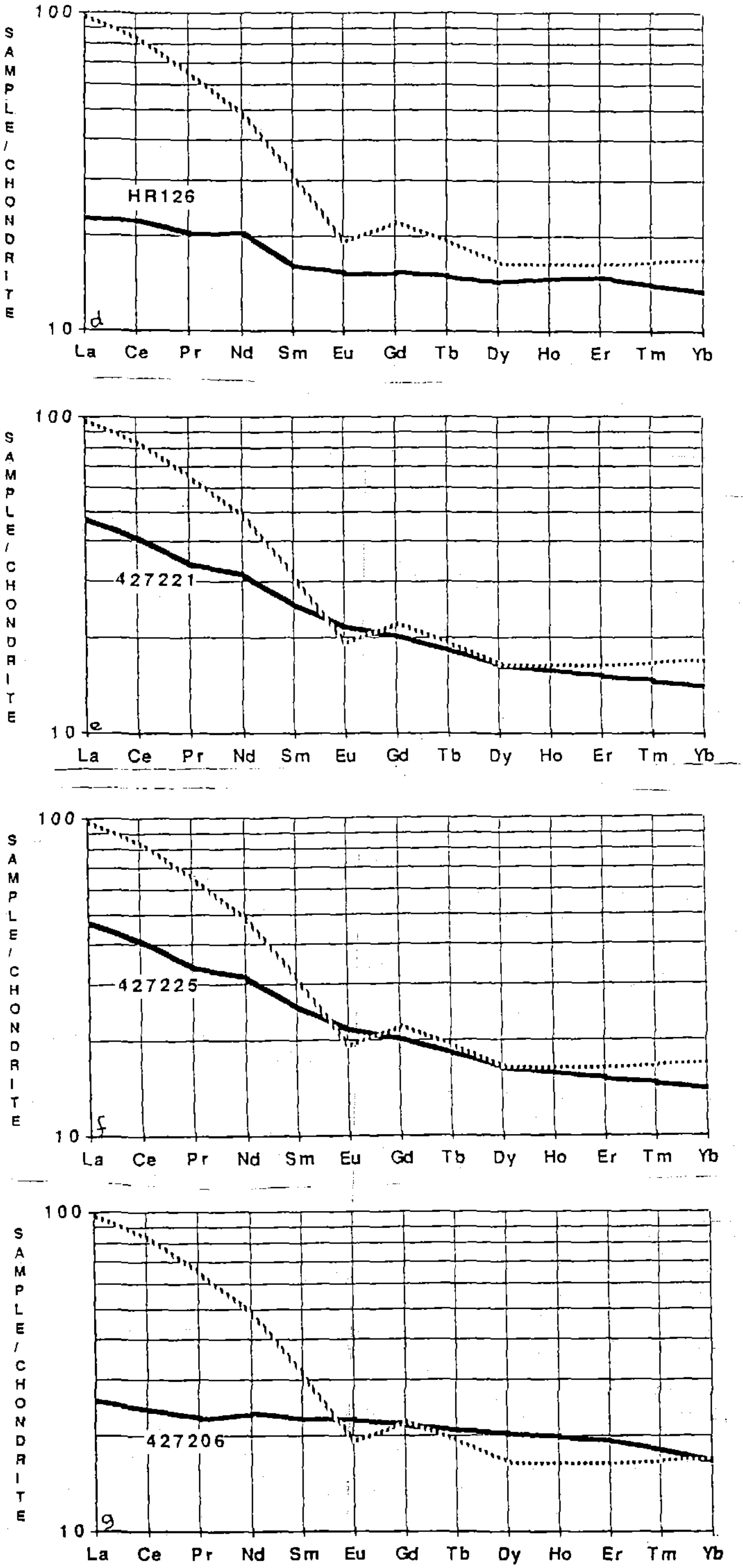
SAMPLE/CHONDRITE
100
10
d
HR126
La Ce Pr Nd Sm Eu Gd Tb Dy Ho Er Tm Yb
SAMPLE/CHONDRITE
100
10
e
427221
La Ce Pr Nd Sm Eu Gd Tb Dy Ho Er Tm Yb
SAMPLE/CHONDRITE
100
10
f
427225
La Ce Pr Nd Sm Eu Gd Tb Dy Ho Er Tm Yb
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La Ce Pr Nd Sm Eu Gd Tb Dy Ho Er Tm Yb

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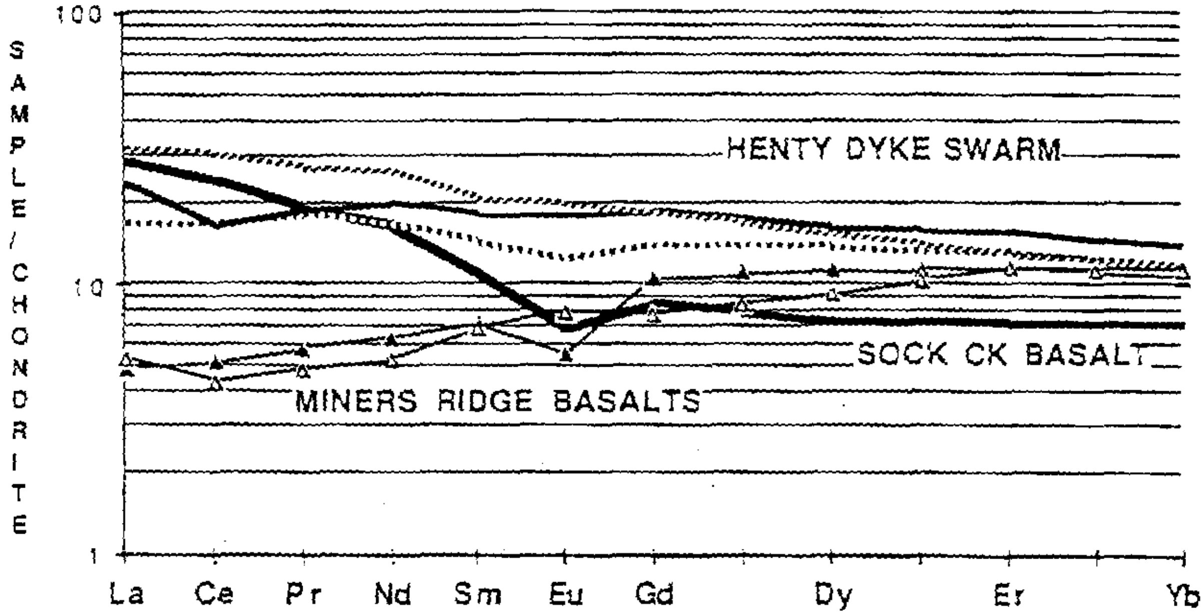

Figure 9: REE patterns of the three analyzed Henty Dyke Swarm basalts, compared with a Sock Ck transitional arc tholeiite basalt, and the LREE-depleted arc tholeiites from Miners Ridge.

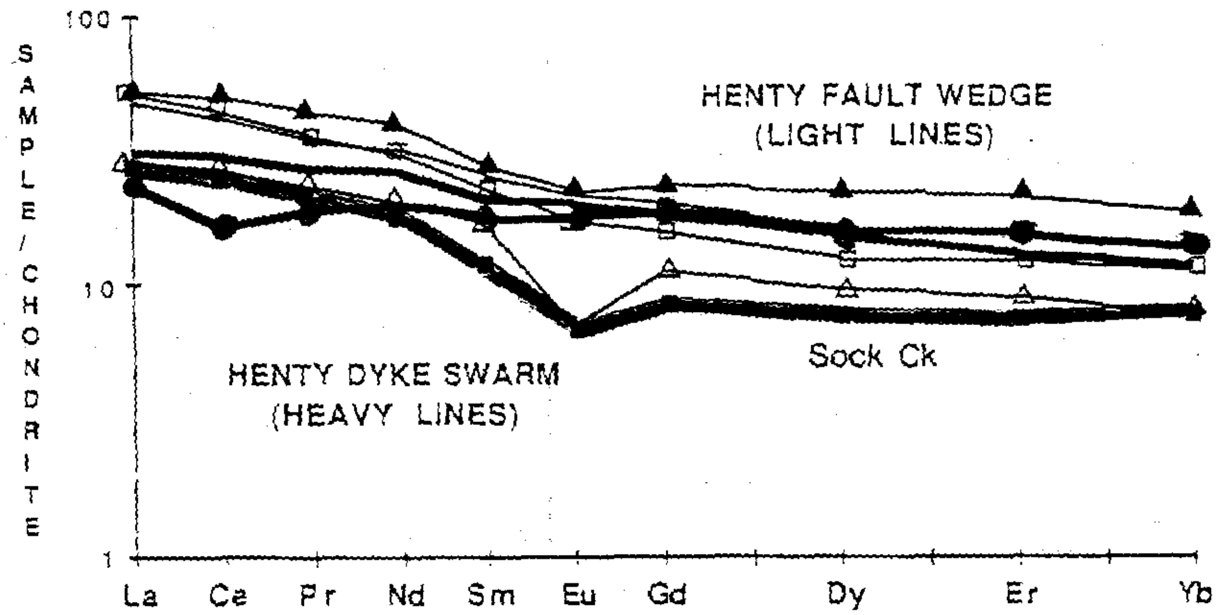

Figure 10: REE patterns of two representative Henty Dyke Swarm basalts (heavy lines), compared with a Sock Ck transitional arc tholeiite basalt (in red), and the range of patterns for the Henty Fault Wedge basalts and dolerite.

TABLE 1 : ROCKS. HENTY FAULT WEDGE

SAMPLE	HR23	HR24	84/10	84/9	84/11	HR126	225	216	221	207	206	BR1/A
SiO_2	60.5	60.4	62.3	58.3	52.8	51.0	52.7	52.4	54.1	50.7	50.3	52.1
TiO_2	0.76	0.75	0.72	1.59	1.59	1.39	1.31	0.72	0.73	0.55	1.4	0.99
Al_2O_3	14.7	14.7	15.6	18.0	14.8	15.1	16	18.6	19.2	19	16.2	18.1
Fe_2O_3	7.42	8.72	6.71	13.2	14.4	11.3	12.8	9.36	8.81	8.14	10.9	11.7
MnO	0.10	0.10	0.14	0.14	0.25	0.18	0.21	0.16	0.17	0.15	0.22	0.23
MgO	4.53	5.72	3.78	4.02	5.04	8.56	6.06	6.75	6.2	6.79	7.91	5.09
CaO	6.68	3.46	4.25	1.21	5.99	7.72	5.53	6.97	3.79	10.3	8.85	7.09
Na_2O	1.95	2.36	3.19	4.13	3.52	3.24	5.29	4.59	5.85	3.51	3.95	4.84
K_2O	3.24	3.67	2.52	0.37	1.30	1.11	1.14	1.28	1.82	1.64	0.15	0.87
P_2O_5	0.12	0.13	0.21	0.18	0.21	0.11	0.15	0.09	0.18	0.08	0.09	0.13
LOI	2.71	3.24	3.49	4.62	3.24	4.01	2.46	3.81	4.56	4.09	3.61	4.97
Ni	45	40		3	11		27	37	46	72	41	
Cr	182	166		5	<5		47	52	75	138	72	
V	184	183	165	200	380	350	312	193	219	228	265	
Sc	27	26	17	28	29	30	31	28	32	31	37	
Zr	183	194	175	89	105	95	82	62	67	34	79	81
Nb	12	11		<3	<3	3	2.7	1.8	2.8	1.5	2.6	3.2
Y	30	38	30	48	35	28	30	21	18	17	36	26
Sr	375	192	390	220	290	220	212	550	298	423	216	377
Rb	100	93	79	17	34	34	33	36	34	46	6	35
Ba	901	1316	770	185	590	410	312	560	661	639	115	
Ti/Zr	25	23	25	107	91	88	96	70	65	97	106	73
Zr/Nb	15.3	17.6				31.7	30.4	34.4	23.9	22.7	30.4	25.3
Zr/Y	6.1	5.1	5.8	1.9	3.0	3.4	2.7	3.0	3.7	2.0	2.2	3.1
Ti/V	25	25	26	48	25	24	25	22	20	14	32	
Zr/Sc	6.8	7.5	10.3	3.2	3.6	3.2	2.6	2.2	2.1	1.1	2.1	
FeO^*/MgO	1.47	1.37	1.60	2.96	2.57	1.19	1.90	1.25	1.28	1.08	1.24	2.06
FeO^*	6.68	7.85	6.04	11.88	12.96	10.17	11.52	8.42	7.93	7.33	9.81	10.53

TABLE 2: MINERS RIDGE ROCKS

SAMPLE	W64*	LE196*	C1*	C2*	C4*	C3*	D1	D2	D3	LE187
SiO2	48.7	47.9	49.7	51.9	49.6	50.5	51.1	49.9	49	48.8
TiO2	0.71	0.40	0.51	0.52	1.24	2.56	0.67	0.72	2.53	0.51
Al2O3	15.3	16.5	15.7	15.1	14.1	14.2	15.2	17.3	16.8	13.4
Fe2O3	11.4	9.59	8.98	13.2	10.7	15.4	9.72	10.5	14.6	8.84
MnO	0.2	0.18	0.19	0.22	0.2	0.26	0.19	0.14	0.32	0.2
MgO	12.7	10.3	11.1	9.36	7.74	5.97	11.1	10.03	8.19	17.4
CaO	6.28	10.91	9.04	4.32	12.5	4.4	6.75	6.96	3.85	7.37
Na2O	3.07	3.26	3.53	4.00	3.3	5.45	2.83	2.84	2.87	2.48
K2O	1.56	0.34	0.88	1.16	0.13	0.34	2.25	1.22	0.96	0.58
P2O5	0.06	0.08	0.03	0.09	0.12	0.26	0.09	0.13	0.37	0.08
LOI	4.3	3.87	4.45	3.16	3.21	3.71	5.84	4.42	7.49	5.25
Ni	177	160	190	64	93	42	127	120	184	250
Cr	365	470	393	26	383	26	319	303	378	3500
V	254	290	264	288	339	814	478	502	540	220
Sc	78	43	35	42		33	39	40	48	37
Zr		27	20	19	53	132	68	75	270	24
Nb						8			4	<5
Y		12	19	19	32	48	18	20	46	13
Sr		150	373	68	299	33	266	670	149	44
Rb		41	38	38		8	75	32	41	35
Ba	730	170	248	444	27	136	966	670	368	320
Ti/Zr		88.81	152.87	164.07	140.26	116.27	59.07	57.55	56.18	127.39
Zr/Nb						17.00			63.00	
Zr/Y		2.25	1.05	1.00	1.66	2.75	3.78	3.75	5.87	1.85
Ti/V	17	8	12	11	22	19	8	9	28	14
Zr/Sc		0.63	0.57	0.45		4.00	1.74	1.88	5.63	0.65
FeO*/MgO	0.81	0.84	0.73	1.27	1.24	2.32	0.79	0.94	1.60	0.46
FeO*	10.26	8.63	8.08	11.88	9.63	13.86	8.75	9.45	13.14	7.96

TABLE 3: Wholerock XRF analyses of Sock Creek South basalts

SAMPLE	Z7247	Z7248	Z7249	Z7250
SiO2	52.20	50.90	50.70	50.90
TiO2	0.44	0.42	0.41	0.41
Al2O3	15.90	15.10	14.70	14.50
FeOT	9.20	8.45	8.37	8.73
MnO	0.25	0.30	0.22	0.24
MgO	8.36	8.14	9.43	9.22
CaO	11.24	12.15	11.51	12.11
Na2O	1.66	3.39	3.73	3.53
K2O	0.34	0.61	0.36	0.29
P2O5	0.06	0.07	0.08	0.07
LOI	3.34	5.52	5.23	5.36
Ni	120	126	127	137
Cr	370	436	433	497
V	271	260	257	263
Sc	43	-	36	39
Zr	30	30	28	28
Nb	3	2	2	3
Y	15	14	13	12
Sr	374	377	324	307
Pb	8	19	10	9
Ba	328	-	341	323
Ti/Zr	87.90	83.90	87.80	87.80
Zr/Y	2.00	2.14	2.15	2.33
Zr/Nb	11.11	15.79	13.33	11.20
Y/Nb	5.56	7.37	6.19	4.30
Ba/Sr	0.88	-	1.05	1.05
Zr/Sc	0.70	-	0.78	0.74
La	9.03			8.15
Ce	19.80			18.50
Pr	2.29			2.22
Nd	9.75			9.25
Sm	2.10			1.80
Eu	0.50			0.36
Gd	2.21			1.91
Dy	2.41			2.16
Er	1.55			1.29
Yb	1.50			1.23

TABLE 4: HENTY DYKE SWARM

SAMPLE	R8	R14	STP234	R195	R227	R19	34519	40154A	40758	30041	31733A	42689	84/25	MR682	84/24	MR572
SiO2	49.8	50.8	50.3	50.6	50.9	50.6	52.8	55.6	54.7	51.5	52.4	52.9	51.2	53.97	54.6	56.6
TiO2	1.02	1.32	1.13	0.99	0.88	0.76	1.03	1.83	1.13	0.88	1.20	1.26	0.88	0.96	1.64	1.04
Al2O3	16.7	15.9	17.1	17.0	17.7	18.3	17.4	18.4	19.8	19.1	17.4	17.1	17.8	17.22	15.81	17.8
Fe2O3	10.5	10.1	9.8	9.1	10.3	9.95	11.2	11.9	13.1	10.1	15.2	13.9	10.7	11.97	12.93	10.09
MnO	0.19	0.19	0.24	0.48	0.17	0.22	0.16	0.14	0.31	0.22	0.14	0.56	0.16	0.23	0.32	0.19
MgO	11.3	7.47	7.73	9.42	7.08	6.61	4.13	3.47	4.83	4.87	4.87	3.61	7.36	4.08	4.21	3.91
CaO	6.84	9.59	8.81	7.04	7.44	7.55	8.07	1.54	0.88	6.67	0.87	3.65	7.78	8.47	5.34	4.22
Na2O	4.09	4.16	3.94	4.76	4.93	3.63	4.60	5.29	3.18	2.74	5.57	6.23	4.42	2.01	4.93	4.28
K2O	0.1	0.33	0.73	0.5	0.43	2.24	0.51	1.71	1.78	3.96	2.2	0.53	0.3	1.6	0.76	2.06
P2O5	0.07	0.13	0.15	0.07	0.12	0.11	0.12	0.39	0.15	0.1	0.18	0.28	0.12	0.25	0.2	0.34
LOI	4.3	2.64	7.98	4.24	3.29	2.87	2.24	3.62	4.21	2.78	3.17	5.11	4.11	3.3	2.29	3.04
Ni	202	40	70	72	47	57	14	5	11	35	17	8	43	6	12	4
Cr	528	118	175	293	39	81	157	3	9	51	6	10	50	59	84	26
V	218	241	223	205	233	270	285	154	334	259	365	394	228	380	165	175
Sc	42	32	30	47	33	34	35	28	39	31	36	37	19	32		26
Zr	61	84	71	66	73	67	76	245	83	63		85	59	80	152	110
Nb					0.9	2	2	6	1.2					4		4
Y	22	32	25	30	33	23	30	53	29	22		29	26	17	46	28
Sr	415	255	184	495	320	394	302	183	232	340		220	264	550	224	540
Rb	2.5	9	30	13	13	59	12	73	39	162		23		65	40	54
Ba	132	188	173	960	185	767	239	463	251	1925	773	242	147	950	150	1120
Ti/Zr	100	94	95	90	72	68	81	45	82	84		89	89	72	65	57
Zr/Nb					81	34	38	41	69					20		28
Zr/Y	2.77	2.63	2.84	2.20	2.21	2.91	2.53	4.62	2.86	2.86		2.93	2.27	4.71	3.30	3.93
Ti/V	28	33	30	29	23	17	22	71	20	20	20	19	23	15	60	36
Zr/Sc	1.45	2.63	2.37	1.40	2.21	1.97	2.17	8.75	2.13	2.03	0.00	2.30	3.11	2.50		4.23
FeO*/MgO	0.84	1.22	1.14	0.87	1.31	1.35	2.44	3.09	2.44	1.87	2.81	3.47	1.31	2.64	2.76	2.32
FeO*	9.45	9.09	8.82	8.19	9.27	8.96	10.08	10.71	11.79	9.09	13.68	12.51	9.63	10.77	11.64	9.08

TABLE 5: REE contents (ppm) and chondrite-normalized values for Henty Fault Wedge rocks, tholeiites Sock Ck, the Henty Dyke Swarm and Miners Ridge

	La	Ce	Pr	Nd	Sm	Eu	Gd	Dy	Er	Yb
HR126	7.12	18.1	2.42	12.2	3.09	1.1	3.96	4.64	3.18	2.79
1984/11	16.5	40.1	5.22	23.3	5.31	1.6	6.1	7.18	4.51	3.9
427206	8.17	19.7	2.72	14.1	4.31	1.61	5.6	6.58	4.12	3.45
427216	15.9	35.2	4.26	18.1	4.32	1.26	4.1	4.02	2.66	2.32
427221	8.97	21.8	2.79	12	3.18	0.51	2.9	3.12	1.92	1.6
427225	14.9	33.5	4.07	18.8	4.87	1.56	5.22	5.31	3.2	2.9
427207	8.45	19.9	2.74	11.6	2.94	1.09	3.51	3.17	2.02	1.65
HR23	30.9	67.5	7.71	29.2	5.98	1.39	5.73	5.34	3.47	3.54
SOCK CK										
Z7247	9.03	19.8	2.29	9.75	2.1	0.5	2.21	2.41	1.55	1.5
HENTY DYKE SWARM										
R8	5.32	13.6	2.19	9.88	2.77	0.91	3.66	4.46	2.79	2.45
R195	7.39	13.4	2.27	11.93	3.43	1.3	4.86	5.2	3.33	2.85
STP234	9.78	24.3	3.23	15.5	3.95	1.43	4.73	4.93	2.74	2.45
MINERS RIDGE BASALTS										
W64	1.54	4.2	0.7	3.83	1.39	0.4	2.76	3.71	2.45	2.21
C2	1.68	3.55	0.59	3.21	1.34	0.58	2.02	3.02	2.47	2.38

CHONDRITE NORMALIZED VALUES

	La	Ce	Pr	Nd	Sm	Eu	Gd	Dy	Er	Yb
427207	26.8	24.5	22.8	19.4	15.3	15.1	13.6	9.8	9.5	7.9
1984/11	52.4	49.3	43.5	39.0	27.7	22.2	23.6	22.1	21.2	18.8
427206	25.9	24.2	22.7	23.6	22.4	22.3	21.6	20.2	19.3	16.6
427216	50.5	43.3	35.5	30.3	22.5	17.5	15.8	12.4	12.5	11.2
427221	28.5	26.8	23.3	20.1	16.6	7.1	11.2	9.6	9.0	7.7
427225	47.3	41.2	33.9	31.5	25.4	21.6	20.2	16.3	15.0	13.9
427207	26.8	24.5	22.8	19.4	15.3	15.1	13.6	9.8	9.5	7.9

SOCK CK	La	Ce	Pr	Nd	Sm	Eu	Gd	Dy	Er	Yb
Z7247	28.7	24.4	19.1	16.3	10.9	6.9	8.5	7.4	7.3	7.2

HENTY DYKE SWARM

	La	Ce	Pr	Nd	Sm	Eu	Gd	Dy	Er	Yb
R8	16.9	16.7	18.3	16.5	14.4	12.6	14.1	13.7	13.1	11.8
R195	23.5	16.5	18.9	20.0	17.9	18.0	18.8	16.0	15.6	13.7
STP234	31.0	29.9	26.9	26.0	20.6	19.8	18.3	15.2	12.9	11.8

MINERS RIDGE

	La	Ce	Pr	Nd	Sm	Eu	Gd	Dy	Er	Yb
W64	4.9	5.2	5.8	6.4	7.2	5.5	10.7	11.4	11.5	10.6
C2	5.3	4.4	4.9	5.4	7.0	8.0	7.8	9.3	11.6	11.4

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APPENDIX 9.

TENEMENT BOUNDARY

LAND DISTRICT OF MONTAGU
VICINITY OF YOLANDE RIVER
MUNICIPALITIES OF ZEEHAN AND QUEENSTOWN
EXPLORATION LICENCE 11/85 151 skm
CYPRUS MINERALS AUSTRALIA CO.

CP02 (3)

Commencing at a north west corner of the area whose grid co-ordinates are 372 000 metres E., 5 352 000 metres N. thence grid east to 374 000 metres E. grid north to 5 353 000 metres N. again grid east to 374 370 metres E. again grid north to 5 354 390 metres N. again grid east to 375 010 metres E. northerly to grid co-ordinates 375 740 metres E. 5 360 000 metres N. grid west to 375 000 metres E. again grid north to 5 362 000 metres N. again grid east to 376 000 metres E. again grid north to 5 364 000 metres N. again grid east to 378 000 metres E. grid south to 5 361 000 metres N. again grid east to 380 000 metres E. again grid south to 5 356 000 metres N. grid west to 379 000 metres E. again grid south to 5 353 000 metres N. again grid east to 380 000 metres E. aforesaid again grid south to 5 349 000 metres N. again grid west to 379 000 metres E. again grid south to 5 343 000 metres N. again grid east to 380 000 metres E. aforesaid again grid south to 5 339 000 metres N. again grid east to 382 000 metres E. again grid south to 5 336 000 metres N. again grid west to 381 000 metres E. again grid north to 5 337 000 metres N. again grid west to 375 000 metres E. again grid north to 5 342 000 metres N. again grid west to 371 000 metres E. again grid north to 5 343 000 metres N. again grid west to 369 000 metres E. again grid north to 5 345 000 metres N. again grid east to 372 000 metres E. aforesaid thence again grid north to the point of commencement.

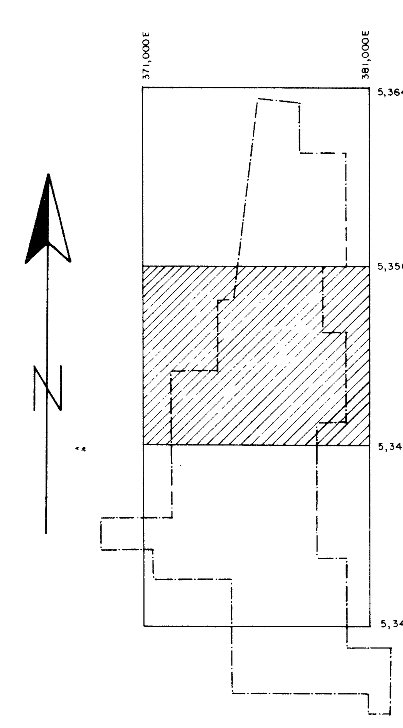
The area excludes:	1 ha Henty Glacial Moraine State Reserve
	4.7 skm Crown Reserves
	4.1 skm H.E.C. (Lake Margaret area)
	0.2 skm Commonwealth of Australia

LAND TENURE

The area comprises:	145.7 skm Crown Land
	1.8 skm Land vested in H.E.C.
	1.6 skm Private Property
	1.0 skm State Forest
The area contains:	0.6 skm South West Conservation Area
	9.2 skm Queenstown Urban Conservation Area (Australian Heritage Act - Registered Entry)

Note: This land tenure table is a guide only

Latest cut grid lines (unsurveyed).



ELECTROLYTIC ZINC CO. of A'ASIA LTD.

PROJECT: YOLANDE J.V. E.L. 11/85 ,TAS.

90-3159

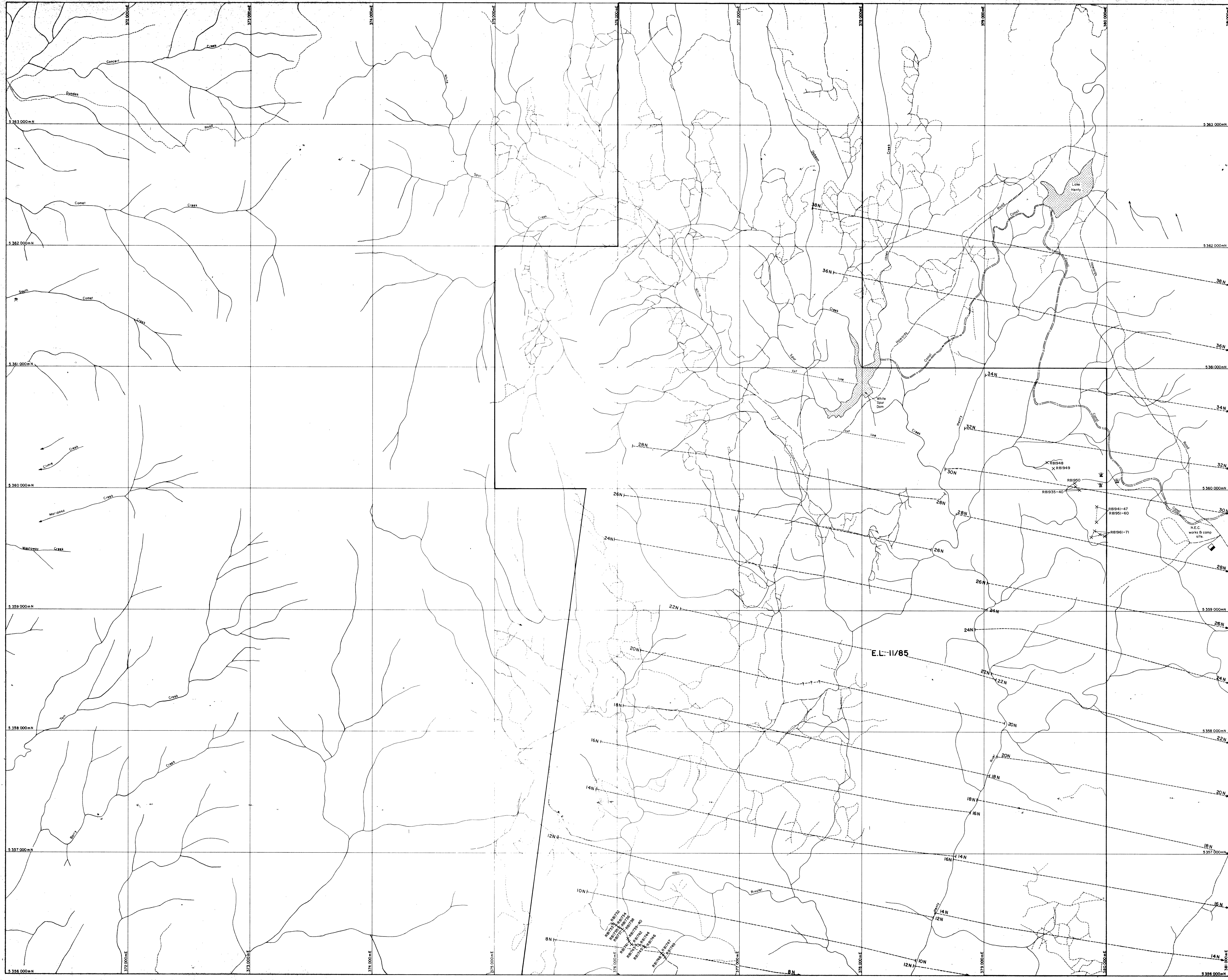
460310

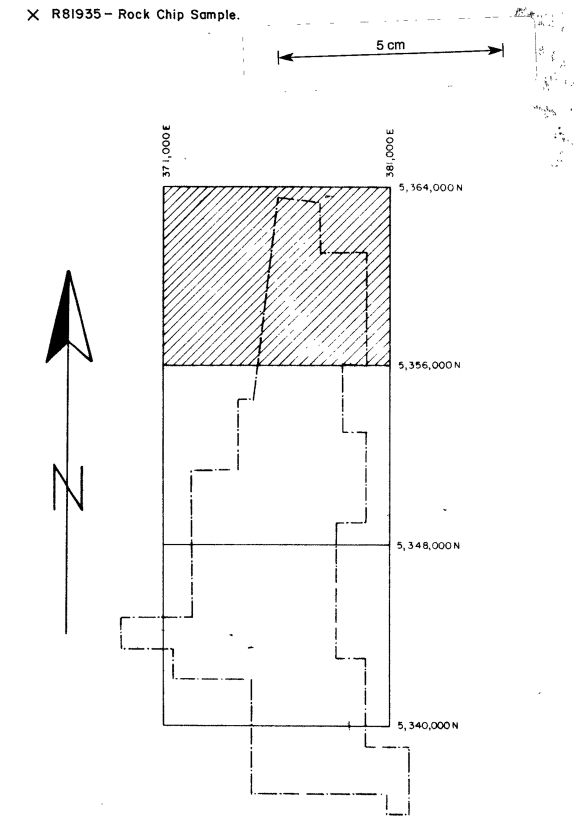
CUT GRID LINES

5 cm

MAP 1

Scale: 1:10,000	Survey: G.J.	Revised:
Reference:	Date: 4-7-'90	Ref. No. A0-519-0032
Drawn: N.W.D.S.	Checked:	





ELECTROLYTIC ZINC CO. of A'ASIA LTD.

PROJECT: YOLANDE J.V. E.L. 11/85 ,TAS.

460311

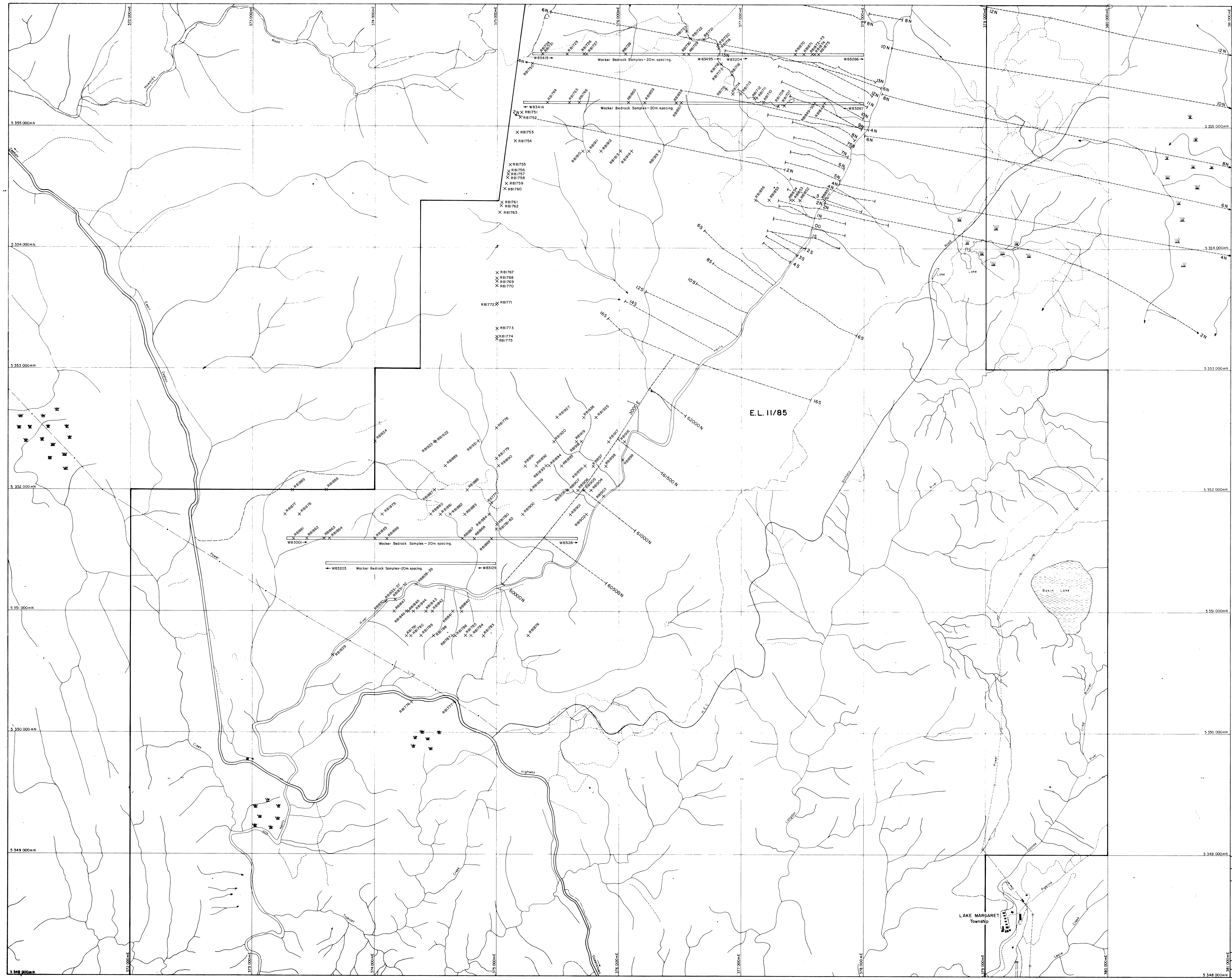
SAMPLE LOCATION, TYPE

and NUMBER

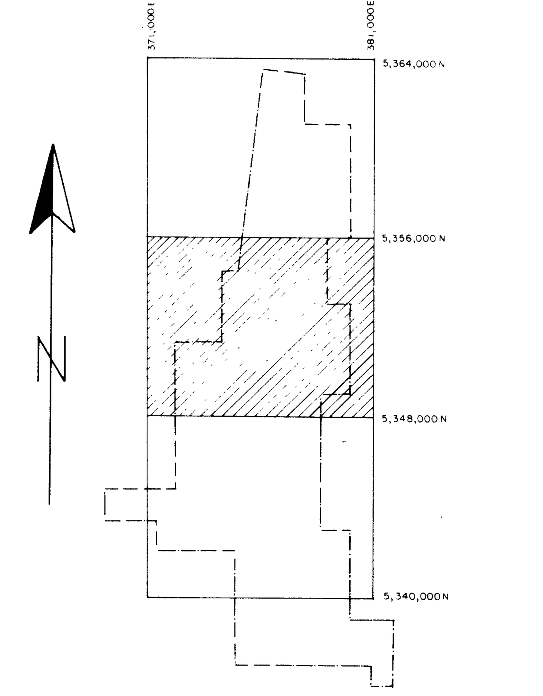
90-3159.

MAP 2

Scale: 1:10,000	Survey: G.J.	Revised:
Reference:	Date: 5-7-'90	Ref. No.
Drawn: N.W.D.S.	Checked:	A0-519-0033



× R81856 = Rock Chip Sample.
▭ W83128 = Wacker Bedrock Sample.



ELECTROLYTIC ZINC CO. of A'ASIA LTD.

PROJECT: YOLANDE J.V. E.L. 11/85 ,TAS.

5 cm

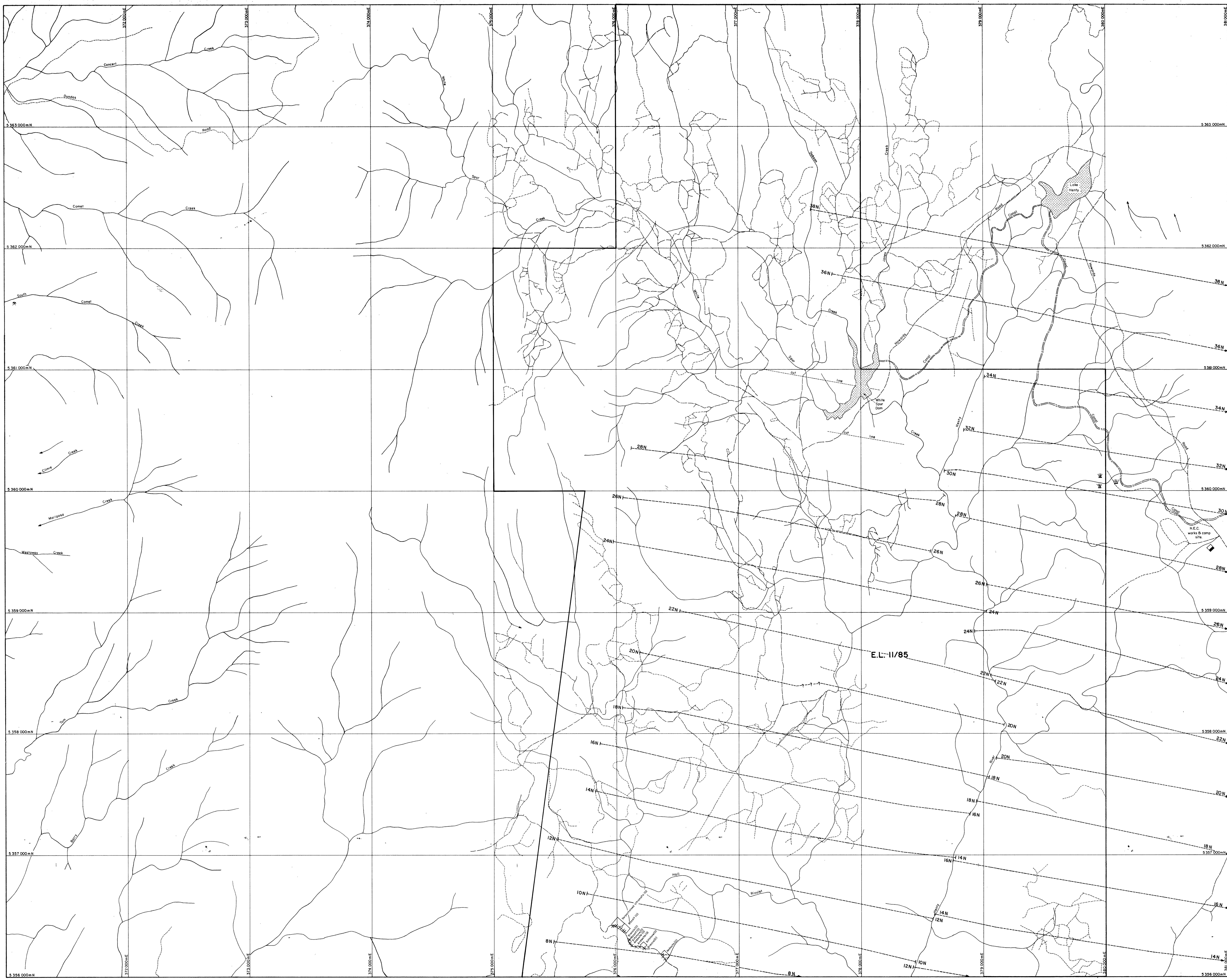
SAMPLE LOCATION, TYPE

and NUMBER 460312

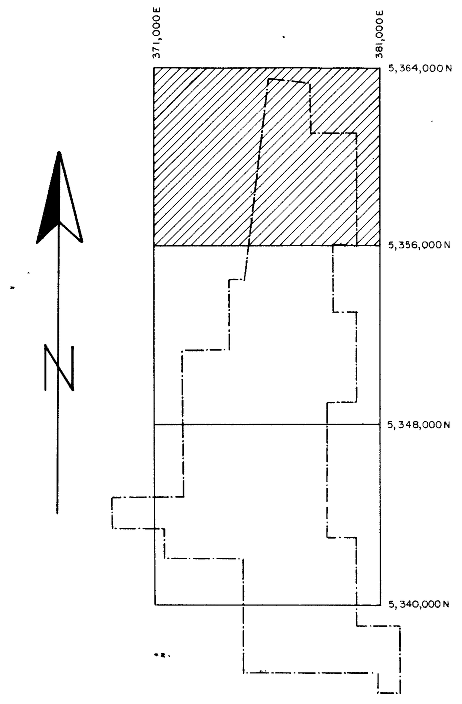
90-3159.

MAP 3

Scale: 1:10,000	Survey: G.J.	Revised:
Reference:	Date: 5-7-'90	Ref. No.
Drawn: N.W.D.S.	Checked:	A0-519-0033



(O) = Outcrop.
(S) = Subcrop.
(F) = Float.



ELECTROLYTIC ZINC CO. of A'ASIA LTD.

PROJECT: YOLANDE J.V. E.L. 11/85 ,TAS.

5 cm

GEOLOGY

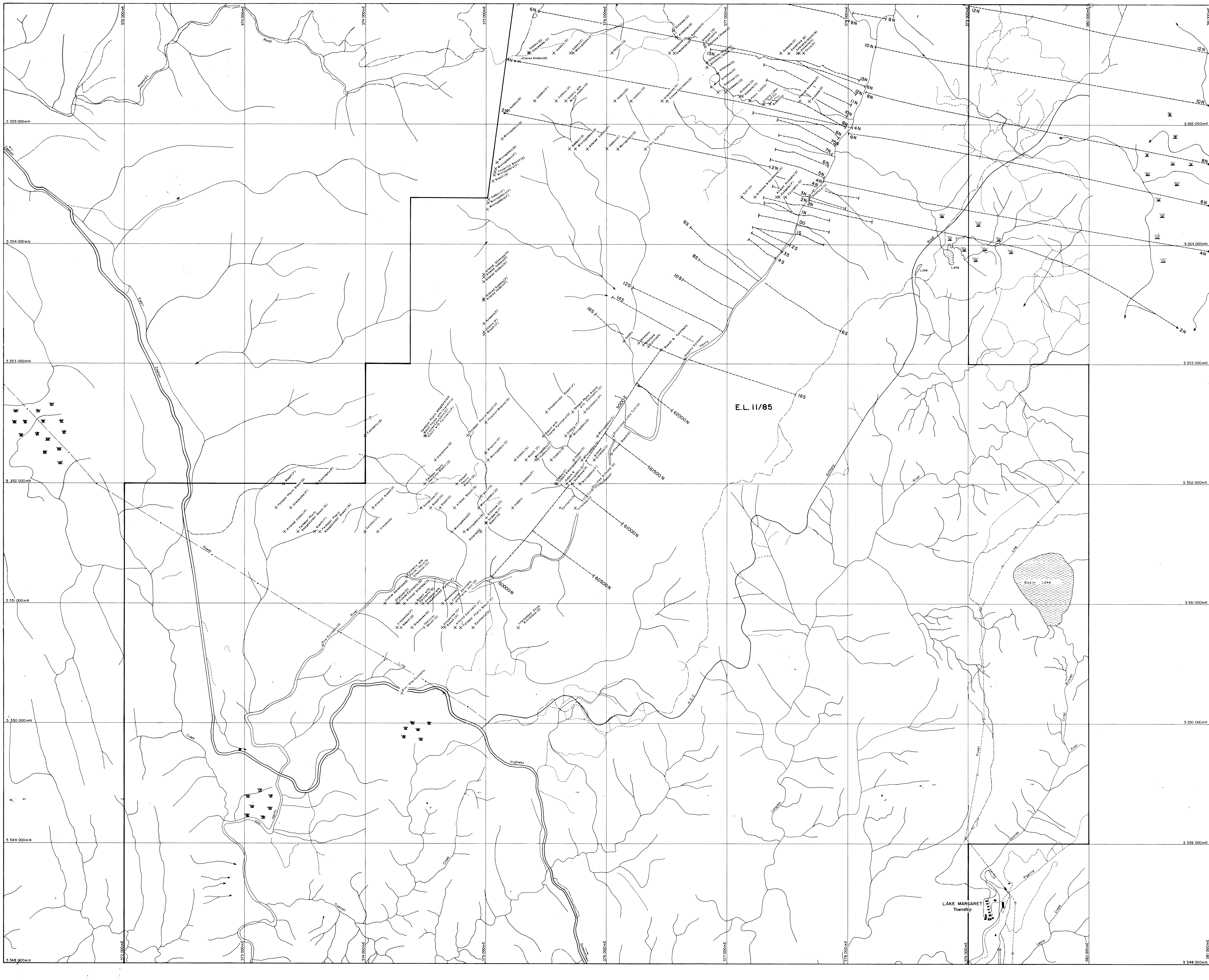
460313

EACT

90-3159.

MAP 4

Scale: 1:10,000	Survey: G.J.	Revised:
Reference:	Date: 6-7-'90	Ref. No. A0-519-0007
Drawn: N.W.D.S.	Checked:	



ELECTROLYTIC ZINC CO. of A'ASIA LTD.

PROJECT: YOLANDE J.V. E.L. 11/85 ,TAS.

5 cm

GEOLOGY

FACT

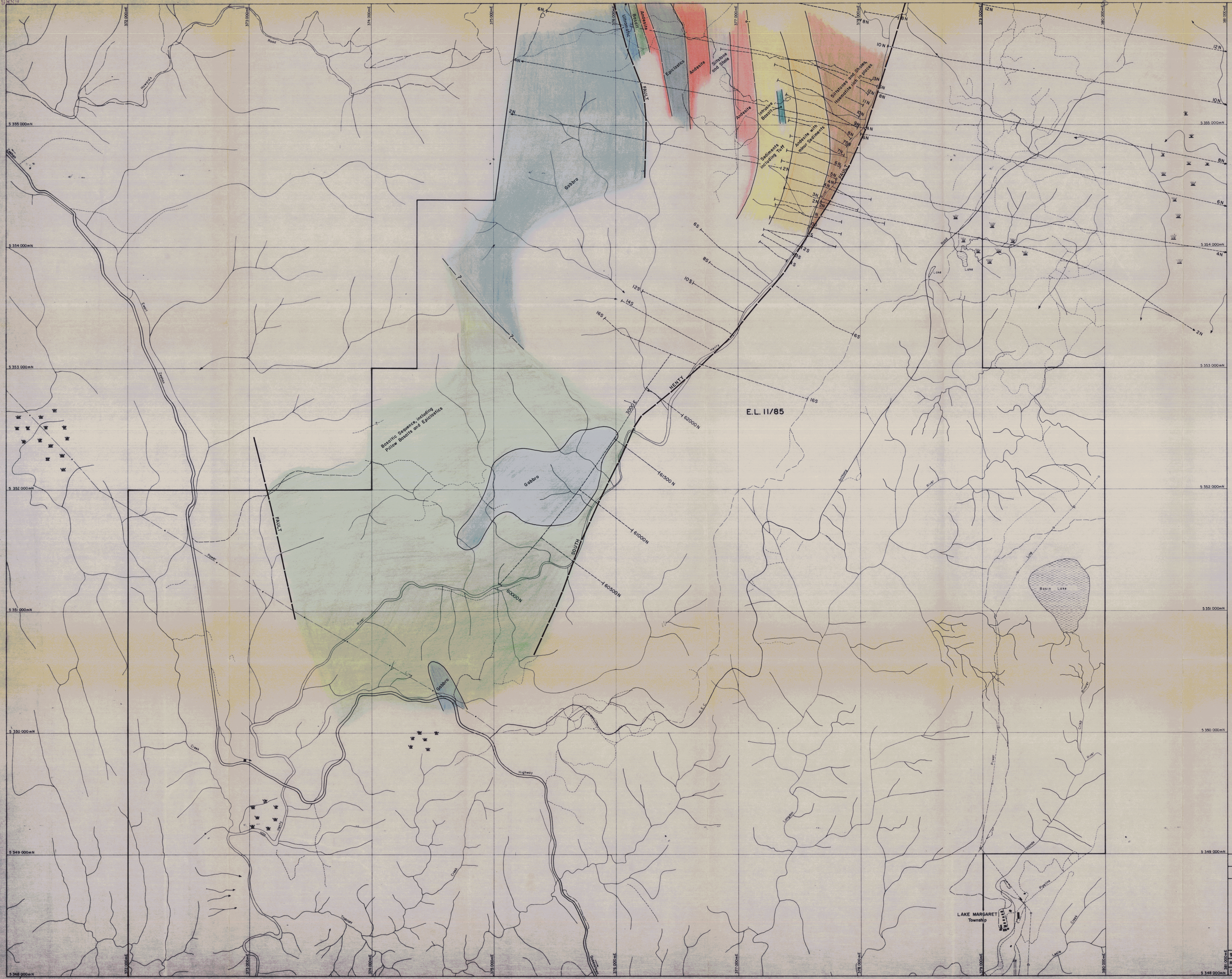
460314

90-3159

MAP 5

Scale: 1:10,000	Survey: G.J.	Revised:
Reference:	Date: 10-7-90	Ref. No.
Drawn: C.K.W.	Checked:	A0-519-0008


E.L. 11/85
Major Fault
Lithological Boundary
FAULT
Ultramafic
Basalt
Andesite
Volcaniclastics
Andesite
Lake Henry
White Spur Dam
H.E.C. works & camp site
ELECTROLYTIC ZINC CO. of A'ASIA LTD.
PROJECT: YOLANDE J.V. E.L. 11/85 ,TAS.
5 cm
GEOLOGY INTERPRETATION
90-3159.
460315
MAP 6
Scale: 1:10,000
Survey: G.J.
Revised:
Reference:
Date: 6-7-'90
Ref. No.
Drawn: N.W.D.S.
Checked:
A0-519-0039



ELECTROLYTIC ZINC CO. of A'ASIA LTD.

PROJECT: YOLANDE J.V. E.L. 11/85 ,TAS.

5 cm

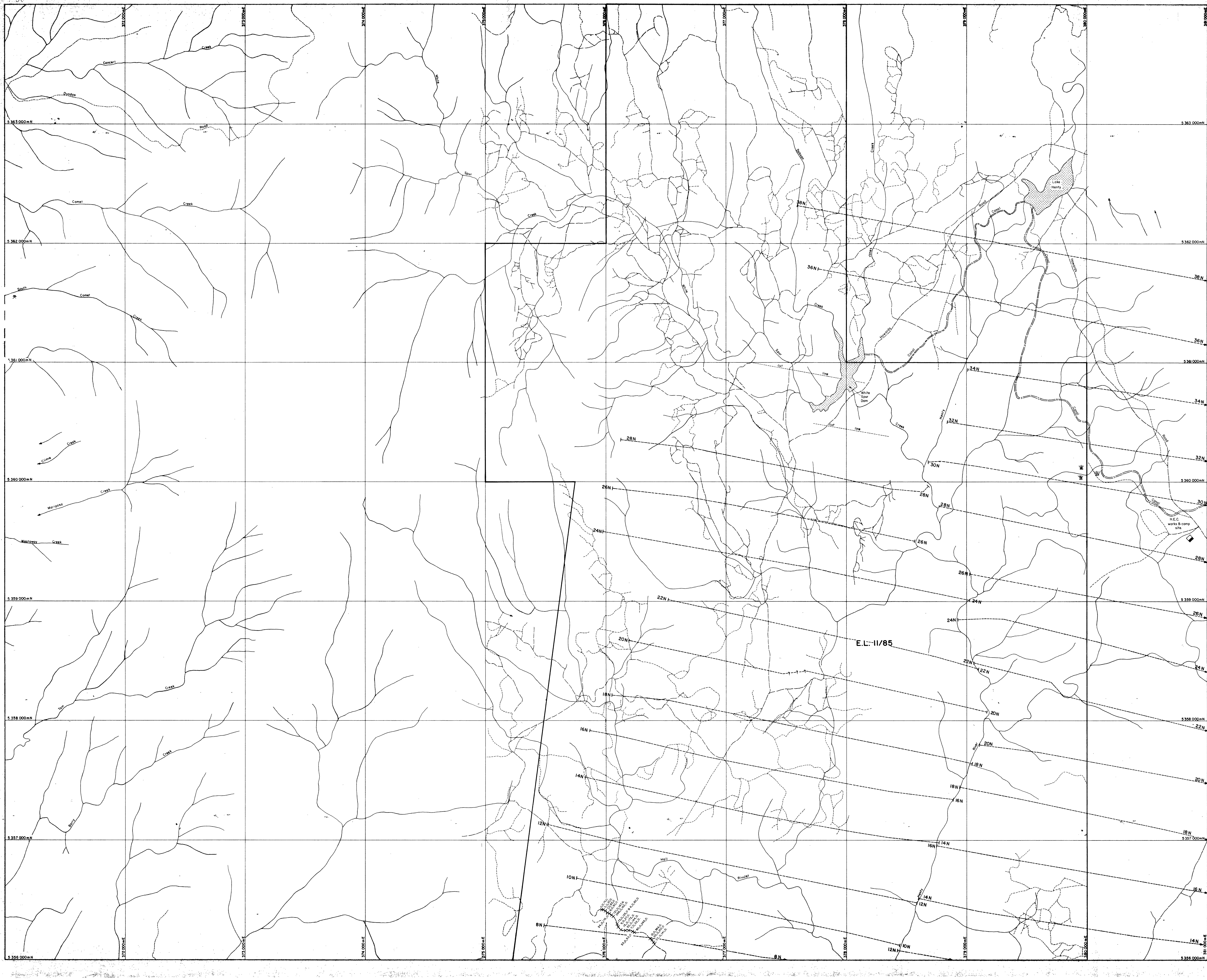
GEOLOGY INTERPRETATION

460316

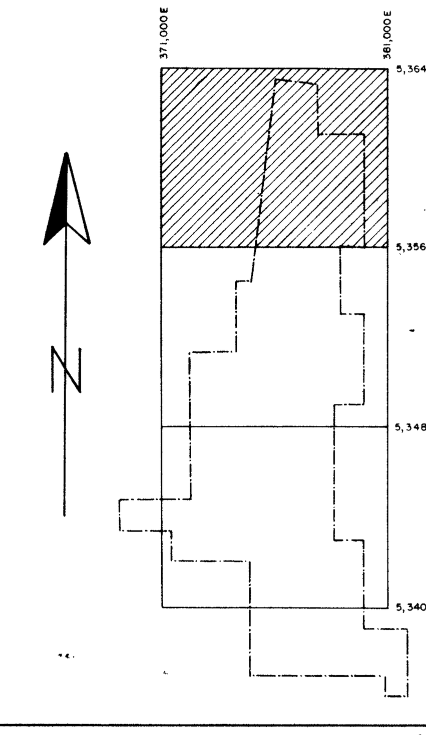
90-3159.

MAP7

Scale: 1:10,000	Survey: G.J.	Revised:
Reference:	Date: 6-7-'90	Ref. No.
Drawn: N.W.D.S.	Checked:	A0-519-0038



N.B.- All results shown as ppm, except Au which is ppb.
Shown on plan in the following order – Cu, Pb, Zn, Au.



ELECTROLYTIC ZINC CO. of A'ASIA LTD.

PROJECT: YOLANDE J.V. E.L. 11/85 ,TAS.

5 cm

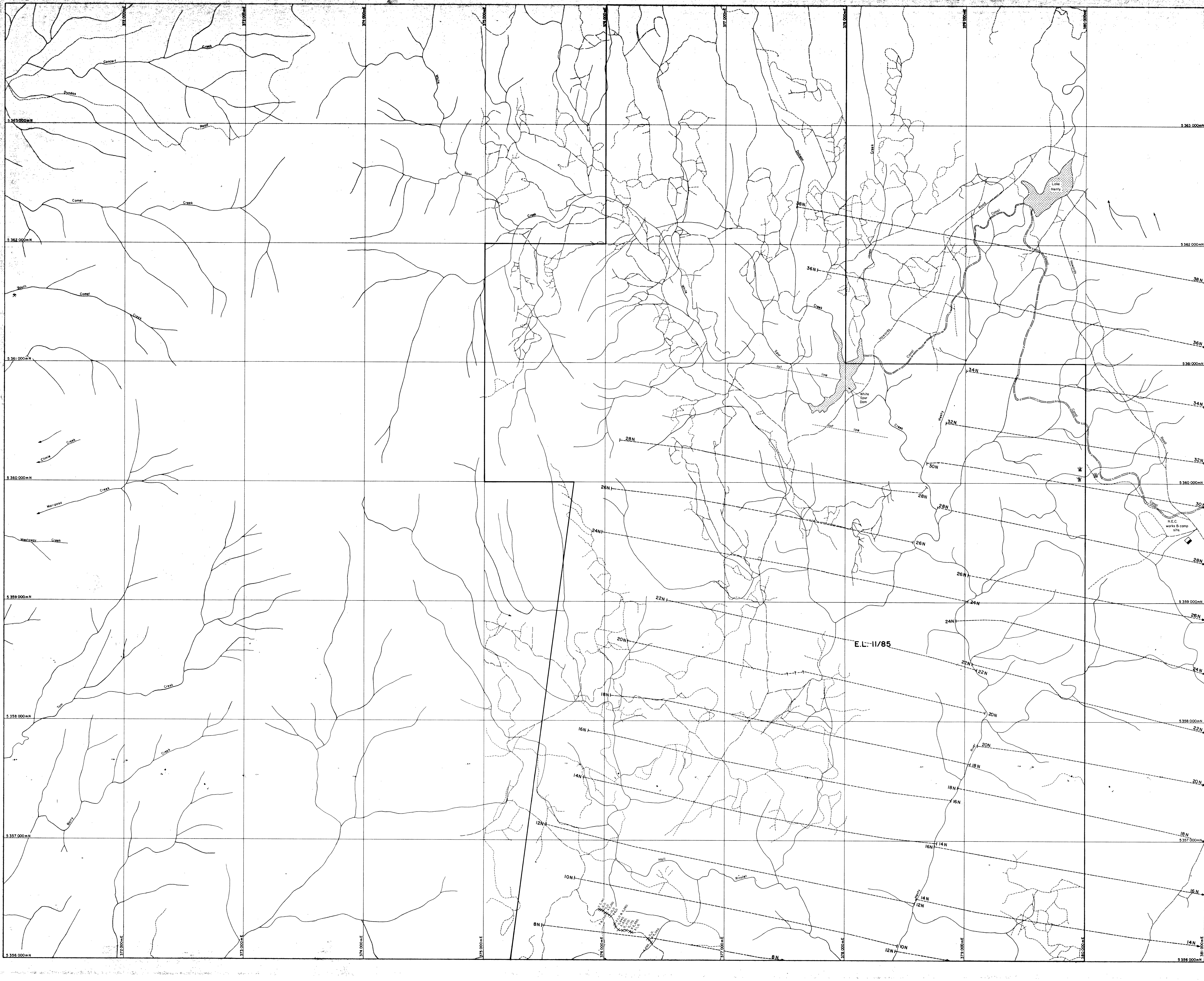
90-3159.

GEOCHEMISTRY

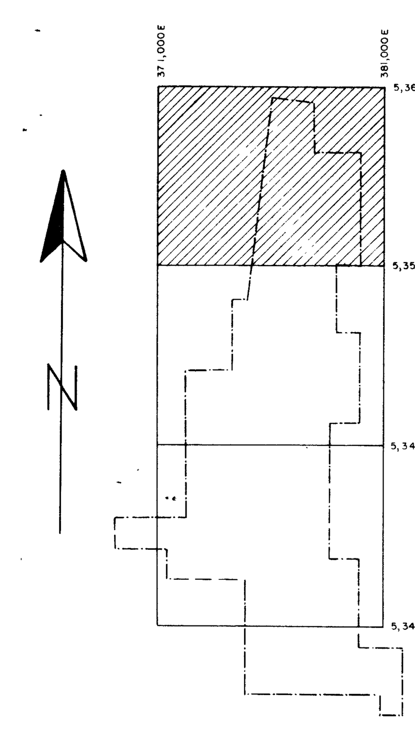
Cu, Pb, Zn, Au. 460317

MAP 8

Scale: 1:10,000	Survey: G.J.	Revised:
Reference:	Date: 5-7-'90	Ref. No.
Drawn: N.W.D.S.	Checked:	A0-519-0034



N.B. – All results shown as ppm.
Shown on plan in the following order As, Ba.



ELECTROLYTIC ZINC CO. of A'ASIA LTD.

PROJECT: YOLANDE J.V. E.L. 11/85 ,TAS.

5 cm

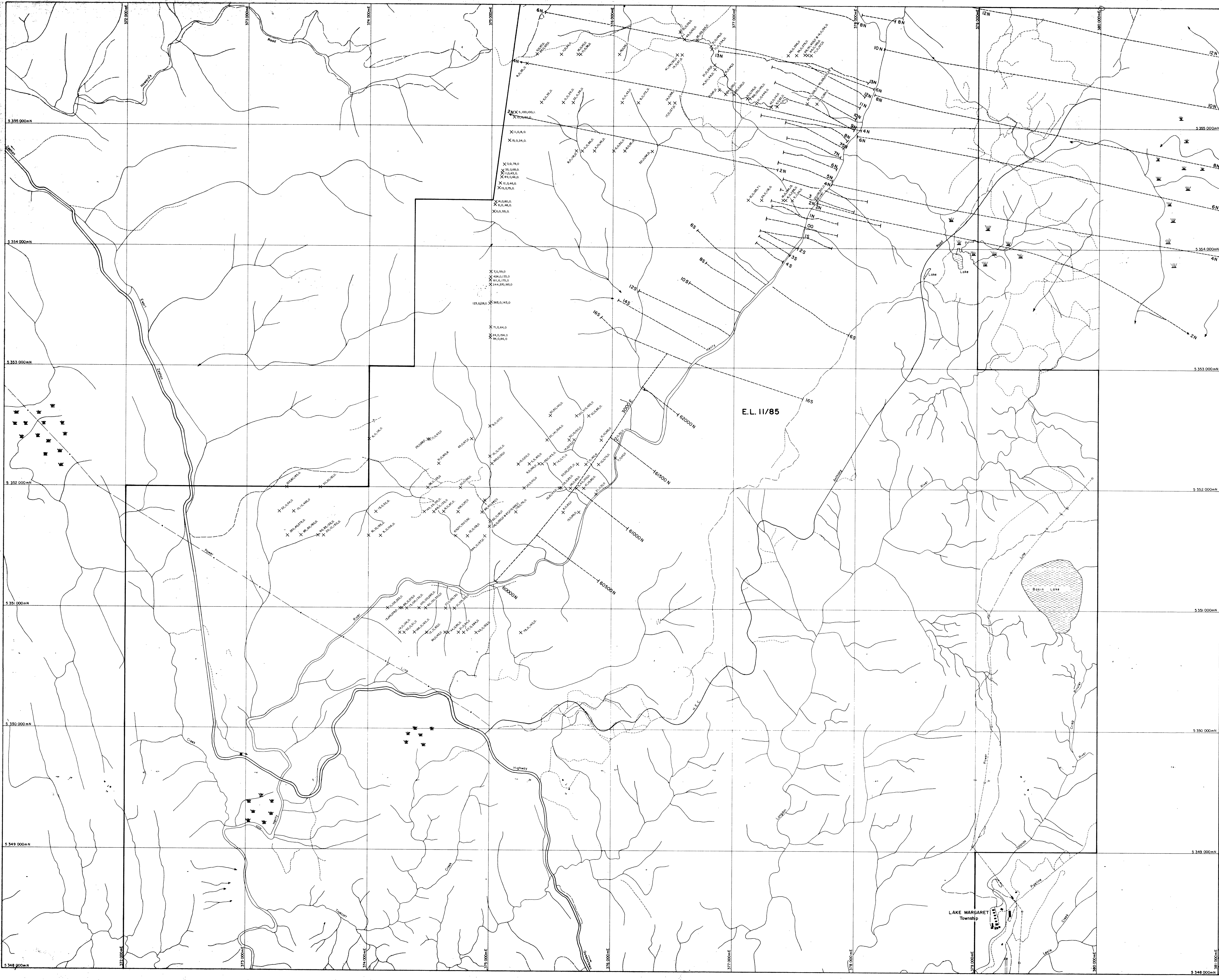
460318

GEOCHEMISTRY

As, Ba. 90-3159.

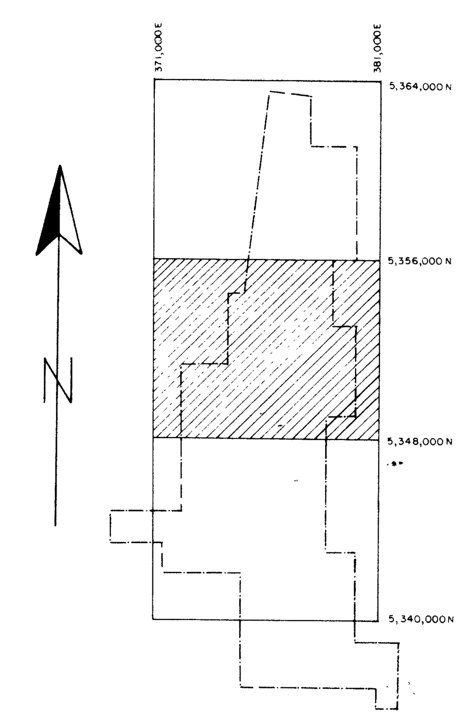
MAP 9

Scale: 1:10,000	Survey: G.J.	Revised:
Reference:	Date: 5-7-'90	Ref. No.
Drawn: N.W.D.S.	Checked:	AO-519-0035



N.B.- All results shown as ppm, except Au which is ppb.

Shown on plan in the following order Cu, Pb, Zn, Au.



ELECTROLYTIC ZINC CO. of A'ASIA LTD.

PROJECT: YOLANDE J.V. E.L. 11/85 ,TAS.

5 cm

460319

GEOCHEMISTRY

Cu, Pb, Zn, Au.

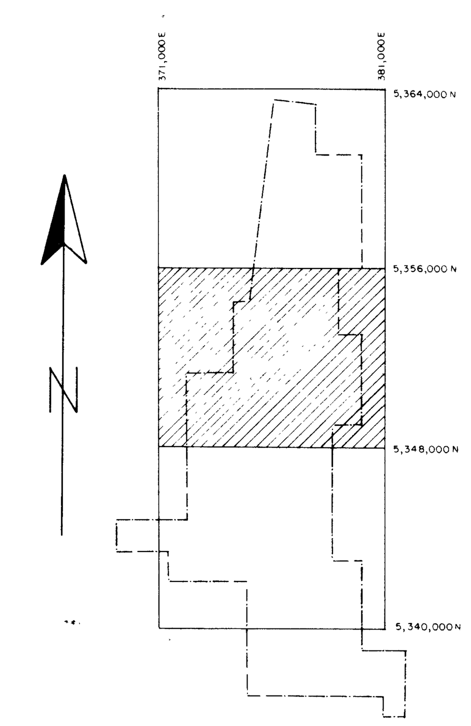
90-3159.

MAP 10

Scale: 1:10,000	Survey: G.J.	Revised:
Reference:	Date: 5-7-'90	Ref. No. A0-519-0036
Drawn: N.W.D.S.	Checked:	

N.B.— All results shown as ppm.

Shown on plan in the following order As, Ba.



ELECTROLYTIC ZINC CO. of A'ASIA LTD.

PROJECT: YOLANDE J.V. E.L. 11/85 ,TAS.

5 cm

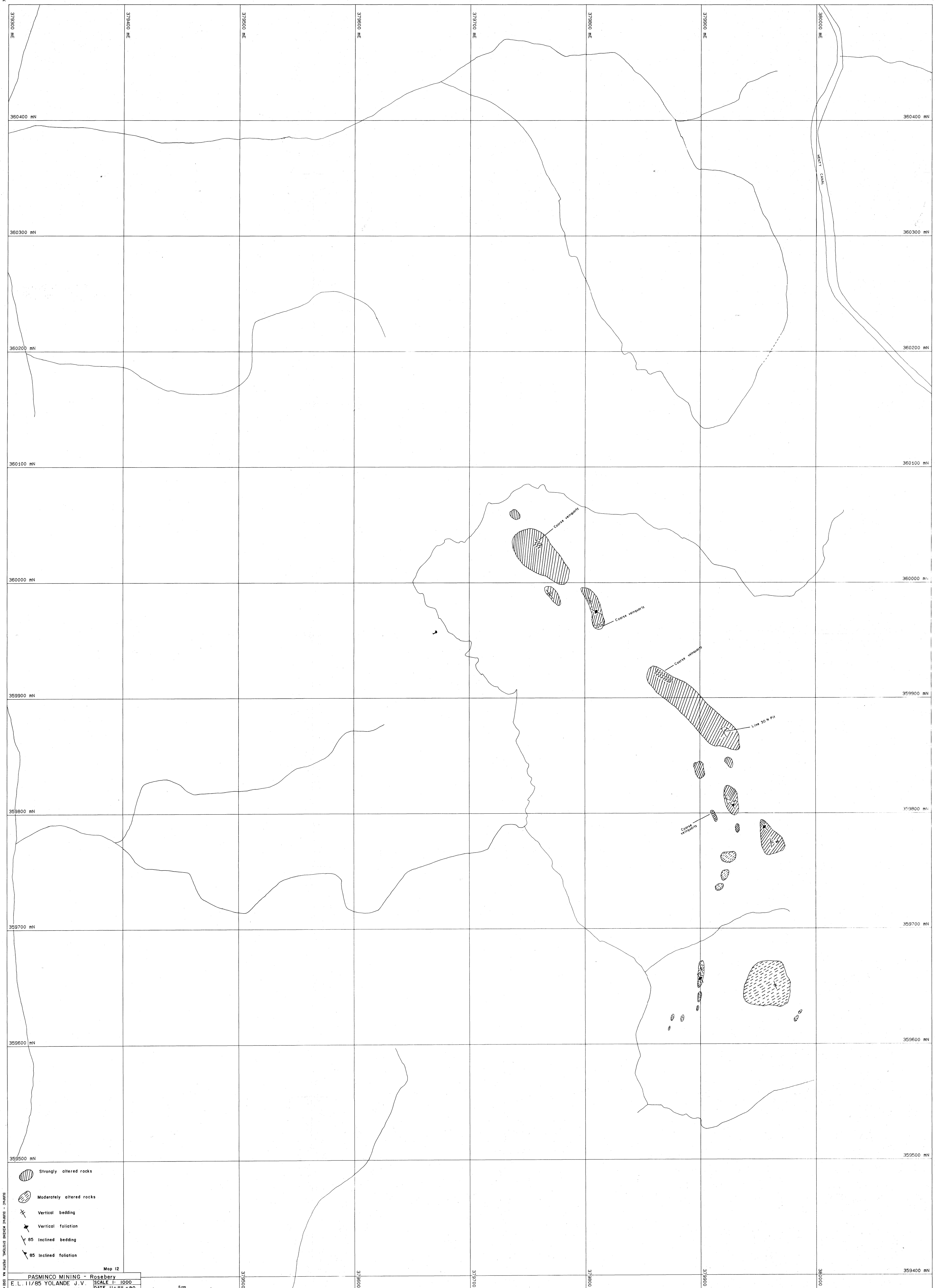
460320

GEOCHEMISTRY

As, Ba. 90-3159.

MAP 11

Scale: 1:10,000	Survey: G.J.	Revised:
Reference:	Date: 5-7-'90	Ref. No. A0-519-0037
Drawn: N.W.D.S.	Checked:	



90-3159. 460321

MAP 13

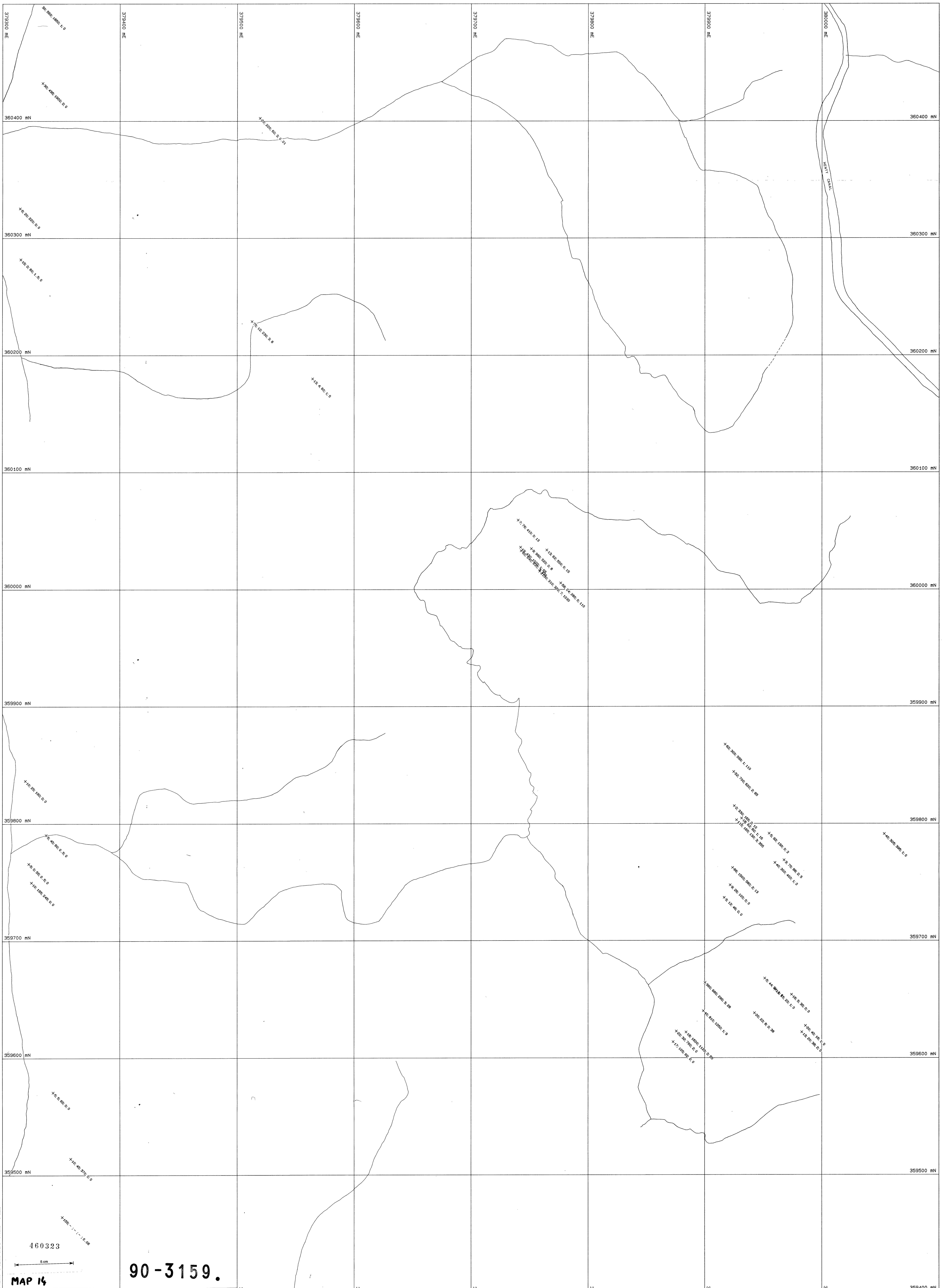
PASMINCO MINING - Rosebery

E.L. 11/85 YOLANDE J.V. NEWTON CK/HENTY CANAL ROCK CHIP SAMPLES	SCALE 1: 1000
	DATE 11-JUL-90
	DESIGN : C.K.W.
	GEOLOGY : G.J.

90-3159.

SURPAC - SURPAC MINING SYSTEMS, PERTH WA (09) 4781411

9896



PASMINCO MINING - Rosebery	
E.L. 11/85 YOLANDE JV NEWTON CREEK Cu; Pb; Zn; Ag; Au	SCALE 1:1000 DATE 12-JUL-90 DESIGN : C K.W GEOLOGY : G.J.

Cu,Pb,Zn,Ag results in ppm
Au results in ppb

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