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PASMINCO EXPLORATION

EL 11/85 YOLANDE JOINT VENTURE

ANNUAL REPORT

FOR 12 MONTHS TO

JULY 1991

volume one of two

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SUMMARY

Exploration Licence 11/85, the Yolande Joint Venture covers a diverse and relatively under explored geological sequence of Cambrian volcanic and sedimentary lithologies. The volcanic sequences range from felsic to mafic compositions and have significant potential to host polymetallic massive sulfide mineralisation, the principal exploration target. In addition an ophiolite suite, which may be prospective for platinum group minerals, and Ordovician carbonates, which have potential to host Irish-style Ag - Pb - Zn deposits, occur within the licence area.

A major exploration program was undertaken during 1990-91. This work, which included extensive geological mapping, geochemistry, aeromagnetic and radiometric surveys, a UTEM survey and photogrammetry, cost a total of **$211 851** for the twelve months to end of June 1991.

Several significant discoveries of mineralisation were made during the year with the identification of the following new major prospect areas:

1. Henty Valley:

A sulfide zone was discovered in the Henty River Valley, including outcrops of massive pyrite lenses up to 1m thick with associated minor galena and sphalerite mineralisation. The zone occurs within a very complex structural wedge bounded by the South Henty Fault and inferred strike extension of the Rosebery Fault and includes: strongly altered basaltic to dacitic volcanics; pyritic; graphitic shales; haematitic breccias and cherts. The highest assay results from limited rock geochemistry are: 1.23% Pb, 0.77% Zn, 12g/t Ag, 0.66% Cu and 2.25g/t Au.

2. Newton Creek:

Clasts of high grade massive sulfide mineralisation were discovered by an Honours Student from the University of Tasmania within a dacitic to andesitic mass debris flow

sequence exposed in the spillway of the Newton Creek dam. A composite assay of these clasts yielded 27.0% Pb, 31.7% Zn, 700g/t Ag and 0.92g/t Au. Preliminary interpretation suggests that this area is structurally very complex with the spillway occurring within a major east-west orientated aeromagnetic structural dislocation. There is strong evidence that this occurrence is proximal to a significant hydrothermal alteration system.

3. White Spur:

Clasts of massive pyrite were also located within felsic mass flow units close to the boundary between the Central Volcanic Complex and the White Spur Formation, south of the Rosebery Mine Lease. Highest assay results from limited rock sampling are: 0.87% Pb, 0.10% Zn and 102g/t Ag. Widespread hydrothermal alteration and minor mineralisation suggests proximity to a potential ore forming system.

4. Lynchford:

Detailed geological mapping has outlined several weakly mineralised units, which could correlate with the equivalent Rosebery-Hercules host rock stratigraphic position. Geochemical similarities with the Que-Hellyer volcanics have also been previously recognised. The UTEM survey identified several bedrock responses, two of which may be associated with sulfide mineralisation. The aeromagnetic survey has highlighted a major east-west orientated structural corridor, reflecting deep seated fracture and potential mineral feeder systems.

The Yolande licence was due to be reduced in area on 20 August 1990, in compliance with Mines Department regulations. A six month deferral of this reduction was sought and granted to enable the new operators of the current Joinnt Venture, Pasminco Exploration, time to assess the mineral potential of the whole tenement area. The licence was reduced in area from 151km^2 to 70km^2 on 20 February 1991.

PLATE 1.

LYNCHFORD: View west from Miners Ridge.

- Huxley Road centre & line 37 400N left of road
- South Queenstown & Queen River Valley far right
- Lynch Creek Basalts cleared area far left
- Ordovician - Devonian sediments Hills in distance

PLATE 2.

HENTY: View north along the Henty River and Henty Fault

centre left-right - White Spur

- Henty Fault Wedge
- Tyndall

distance left-right - Mt Read

- Maxon Saddle
- Goose Neck - Mt Murchison

1. INTRODUCTION

Exploration Licence 11/85, the Yolande Joint Venture, covers the western parts of the Mt Read Volcanic belt and extends from south of Queenstown north to the southern boundary of the Consolidated Rosebery Mine Leases (see Figure 1). This report details exploration undertaken by Pasminco in the 12 months to 20 July 1991. Initially this work was undertaken by Pasminco Mining - Rosebery and since September 1990 by Pasminco Exploration.

In compliance with Mines Department regulations, the licence area was reduced by 50% during the year (see Section 2). The area retained comprises two separate blocks referred to as Henty, covering 62km^2 and Lynchford, covering 8km^2 (see Figure 2). A report on the relinquished area was submitted to the Mines Department in February in 1991 (FitzGerald and Poltock, 1991)

The Lynchford section is readily accessed from South Queenstown by the sealed Lynchford Road and the all weather Huxley 4WD track. The Henty section is serviced by the Zeehan Highway and Anthony Road in the south and east and a network of all weather HEC roads and 4WD logging tracks in the west and north. The least accessible area is in Henty River valley, where steep topography is covered by temperate rain forest. The remainder of the Henty plateau at 500-600m ASL is more open with sparse sub alpine vegetation, especially on the flanks of Mt Read.

Apart from access restrictions in steep and forested areas, other exploration difficulties encountered include:

-glacial moraine covering bedrock throughout extensive parts of the Henty area

-skeletal and transported soils overlying felsic volcanics at White Spur and Tyndall which restrict the use of soil and stream sediment geochemistry

-potential contamination of soil from the old Mt Lyell smelters at Lynchford

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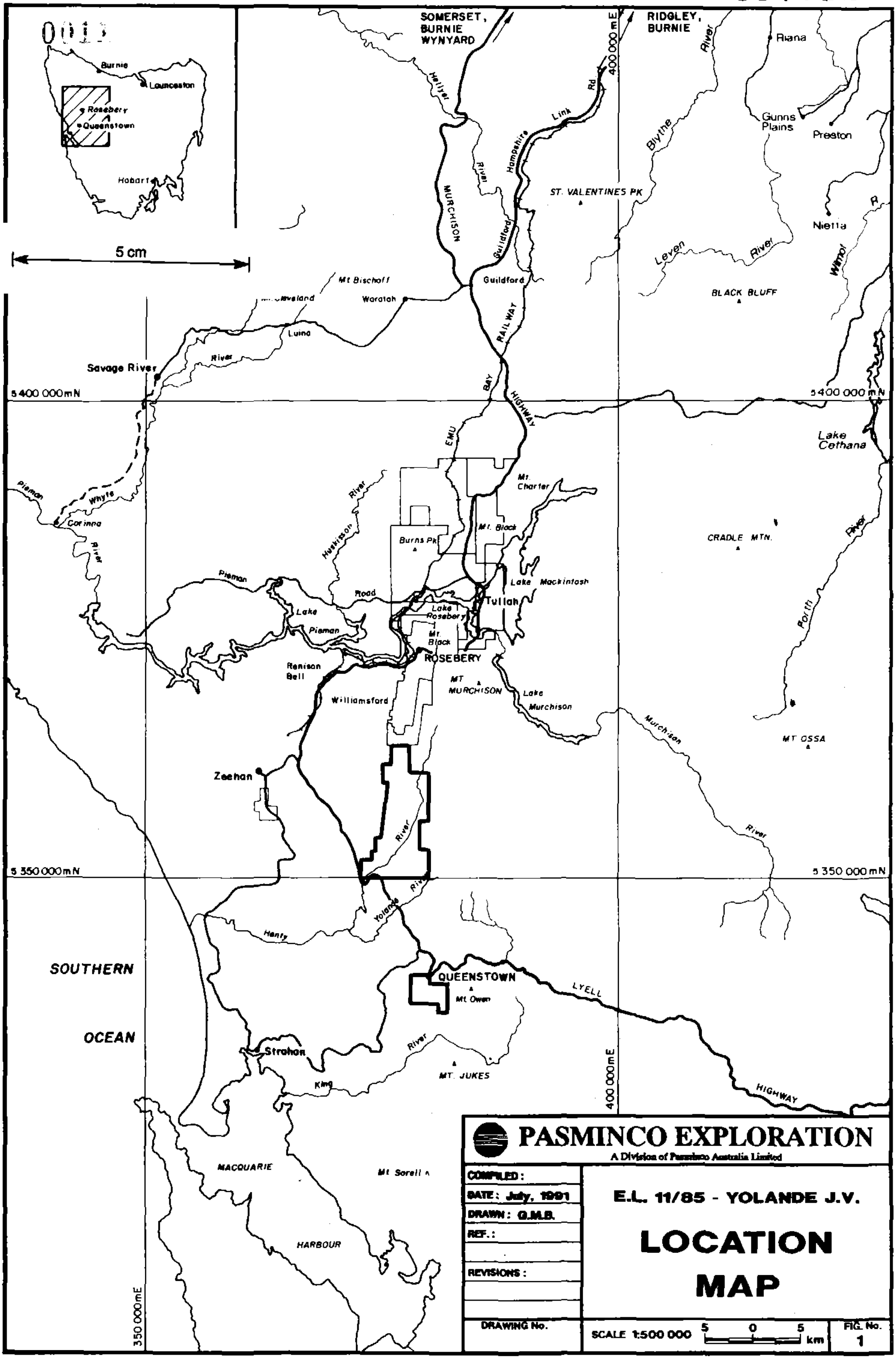

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED:	
DATE: July, 1991	E.L. 11/85 - YOLANDE J.V.
DRAWN: G.M.B.	
REF.:	**LOCATION MAP**
REVISIONS:	
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2 TENURE

Exploration Licence 11/85, Yolande was granted to Amoco Minerals Australia on 21 August 1985 covering an area of 150km^2. Since that time title has been transferred to Cyprus Minerals Australia Company (11 December 1985), then Cyprus Gold Australia Company (March 1988) and finally to Hudspeth and Company Pty Ltd (23 October 1990), the current title holder. The area of the licence was amended to 151km^2 on 22 May 1988.

During the period of tenure the licence has been the subject of two Joint Venture Agreements. The initial Agreement was between Cyprus and the Electrolytic Zinc Company of Australia. The EZ interest was subsequently transferred to Norgold Ltd, part of North Broken Hill-Peko Limited. A new Joint Venture Agreement was concluded on 4 December 1990 between Hudspeth, Norgold and Pasminco Australia Limited. Under the terms of this Agreement Pasminco Exploration, a division of Pasminco Australia, are operators and managers of the Joint Venture.

The Yolande licence was due to be reduced in area on 20 August 1990, in compliance with Mines Department regulations. A six month deferral of this reduction was sought and granted to enable the new operators of the current Joint Venture, Pasminco Exploration, time to assess the mineral potential of the whole tenement area. The licence was reduced in area from 150km^2 to 70km^2 on 20 February 1991.

The area retained comprises two separate blocks, the Henty and Lynchford areas (Figure 2). The land tenure of the current licence comprises mostly Unallocated Crown Land. The areas also include parts of: the South West Conservation Area; the Mt Dundas and Mt Read Recommended Areas for Protection (RAP) as well as the Queenstown Urban Conservation Area; Private Property and land vested in the HEC (see Figure 3). The area includes Crown Reserves and Mining Leases in the Queenstown area.

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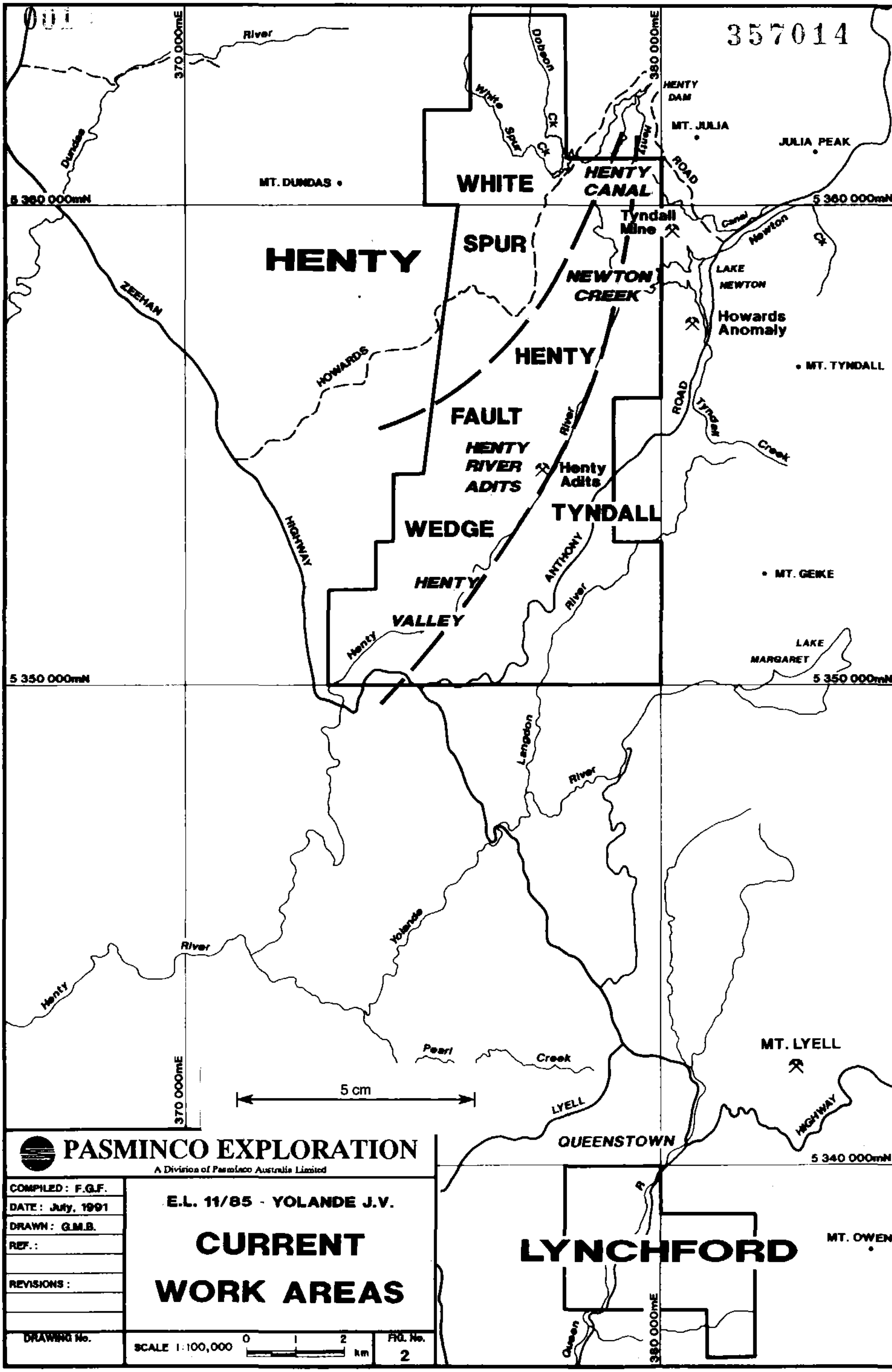

PASMINCO EXPLORATION
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COMPILED: F.G.F.	E.L. 11/85 - YOLANDE J.V.
DATE: July, 1991	
DRAWN: G.M.B.	**CURRENT WORK AREAS**
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REVISIONS:	
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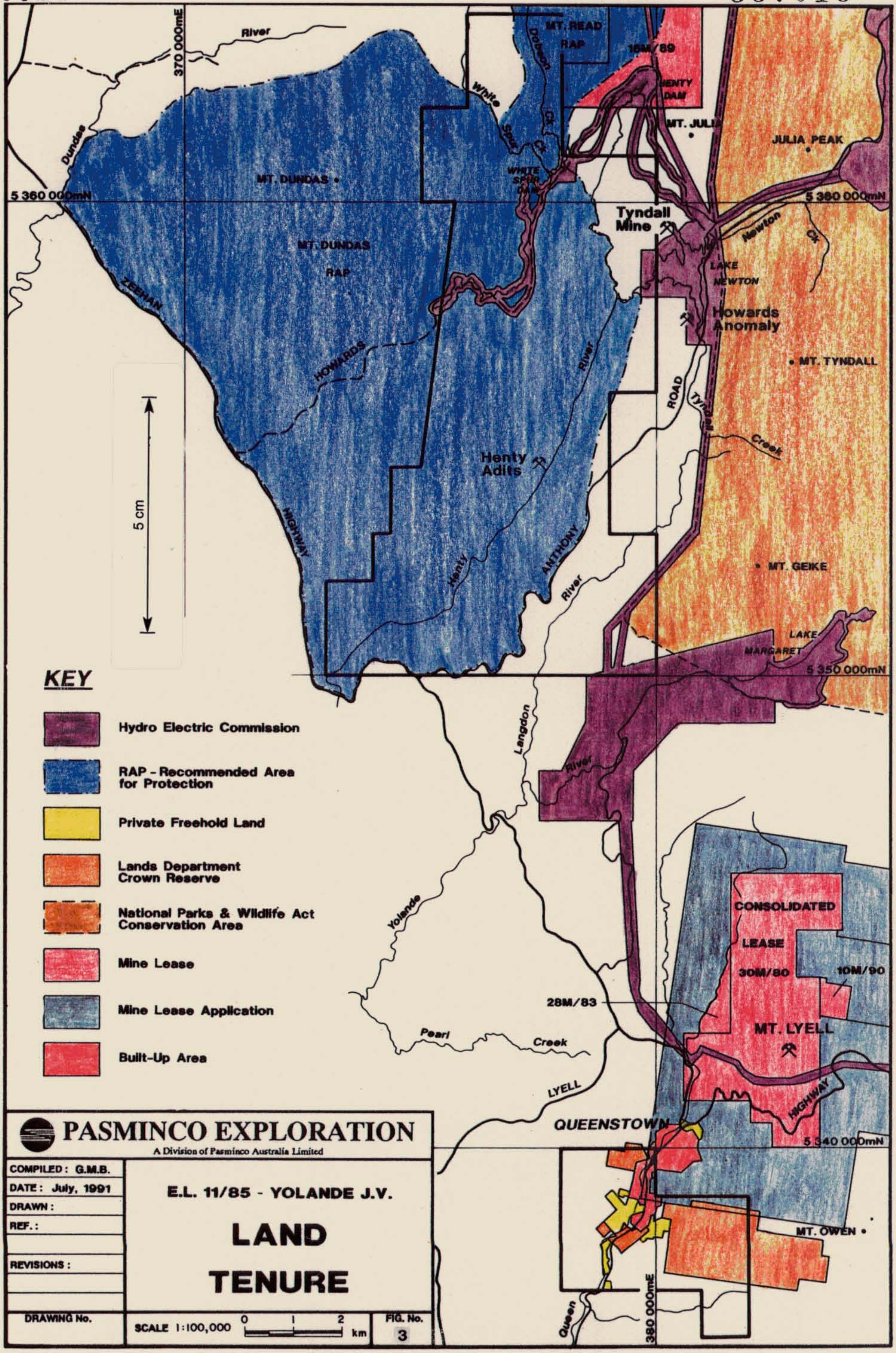
FIG. No. 2	



River
370 000mE
MT. READ RAP
16M/89
HENTY DAM
Dobson Ck
White Spur Ck
WHITE SPUR DAM
MT. JULIA
JULIA PEAK
Dundas
MT. DUNDAS
5 360 000mN
Tyndall Mine
Newton Ck
LAKE NEWTON
MT. DUNDAS RAP
ZEEHAN
HOWARDS
Howards Anomaly
MT. TYNDALL
River
ROAD
Tyndall Creek
5 cm
Henty Adits
HIGHWAY
Henty
ANTHONY
River
MT. GEIKE
LAKE MARGARET
5 350 000mN
KEY
Hydro Electric Commission
RAP - Recommended Area for Protection
Private Freehold Land
Lands Department Crown Reserve
National Parks & Wildlife Act Conservation Area
Mine Lease
Mine Lease Application
Built-Up Area
Langdon
River
Yolande
CONSOLIDATED LEASE 30M/80
10M/90
28M/83
MT. LYELL
Pearl Creek
LYELL
HIGHWAY
QUEENSTOWN
5 340 000mN
MT. OWEN
Queen
380 000mE
PASMINCO EXPLORATION
A Division of Pasminco Australia Limited
COMPILED: G.M.B.
DATE: July, 1991
DRAWN:
REF.:
REVISIONS:
DRAWING No.
E.L. 11/85 - YOLANDE J.V.
LAND TENURE
SCALE 1:100,000
0 1 2 km
FIG. No. 3

The basement in western Tasmania is Precambrian meta pelites and psamites. During the Cambrian a crustal rift developed forming the Dundas Trough, which was a focus for predominantly calcalkaline basaltic to rhyolitic volcanism, the Mount Read Volcanics. The volcanics form a North to North East trending belt 220km long from Elliott Bay in the south to Deloraine in north where they are covered by younger sediments and dolerite sills (Figure 4). The Mt Read volcanics host a number of world class massive sulfide deposits in a variety of volcanic settings (see Table 1).

During the Cambrian slices of ophiolite were thrust into the western sedimentary part of the Dundas Trough. The ultramafics are serpentinized and are associated with placer deposits, which have been mined in the past for osmiridium and chromite. Total osmiridium production was 881kg, (Godfrey, 1984). There is evidence of at least one period of deformation during the Cambrian. Regional structures such as the Henty and Rosebery Faults were active and appear to have influenced volcanism, sedimentation and mineralization.

Volcanism ceased in the late Cambrian but sedimentation continued within the Dundas Trough, initially as thick wedges in localised basins overlying the volcanics and in part derived from them. During the Ordovician sediments became finer grained, better sorted, were derived primarily from the Precambrian metamorphics and were more laterally extensive, culminating in the widespread deposition of a shelf limestone sequence. Carbonate hosted mineralization may have formed during the Ordovician. A number of Pb-Zn-Ag occurrences are known in the Ordivacian limestone but only one major resource has been defined at Oceana (Table 1).

The late Devonian Tabberabberan Orogeny in Western Tasmania resulted in the development of predominantly open NNW trending folds in the Ordovician-Devonian cover sequence. Underlying Cambrian structures were significantly modified by this event. Extensive granite emplacement occurred in the latter stages of the Orogeny and was associated with structurally controlled and carbonate replacement tin tungsten and gold mineralization. The Henty Gold mineralization may also be associated in part with the Devonian granites.

The Devonian was followed by erosion including ice cap glaciation resulting in a flat pre-Permian erosion surface, remnants of which are preserved on the Mounts Read and Dundas plateaux. Younger Palaeozoic sediments were deposited on this surface and were latter intruded by Jurassic dolerites. Extensive uplift and erosion followed until the Tertiary when flood basalts, which blanket significant parts of the prospective sequences north of Hellyer, were extruded.

TABLE 1.

MAJOR BASE AND PRECIOUS METAL DEPOSITS, WESTERN TASMANIA

MINE	PRODUCTION & RESERVES (million tonnes)		GRADE
Rosebery	23.3	P	0.7% Cu, 4.4% Pb, 13.9% Zn, 142g/t Ag, 2.8g/t Au
Hercules	3.6	R	0.3% Cu, 4.4% Pb, 13.2% Zn, 151g/t Ag, 2.5g/t Au
Hellyer	16.6	P	0.3% Cu, 6.8% Pb, 13.0% Zn, 160g/t Ag, 2.3g/t Au
Que River	2.6	P	0.5% Cu,7.4% Pb, 13.4% Zn, 203g/t Ag, 3.7g/t Au
Oceana	4.0	R	8% Pb, 2% Zn, 80g/t Ag
Mt Lyell	123	P	1.3% Cu, 6.4g/t Ag, 0.5g/t Au
Henty	0.16	R	91g/t Au

P includes proven reserves

R includes geological resource

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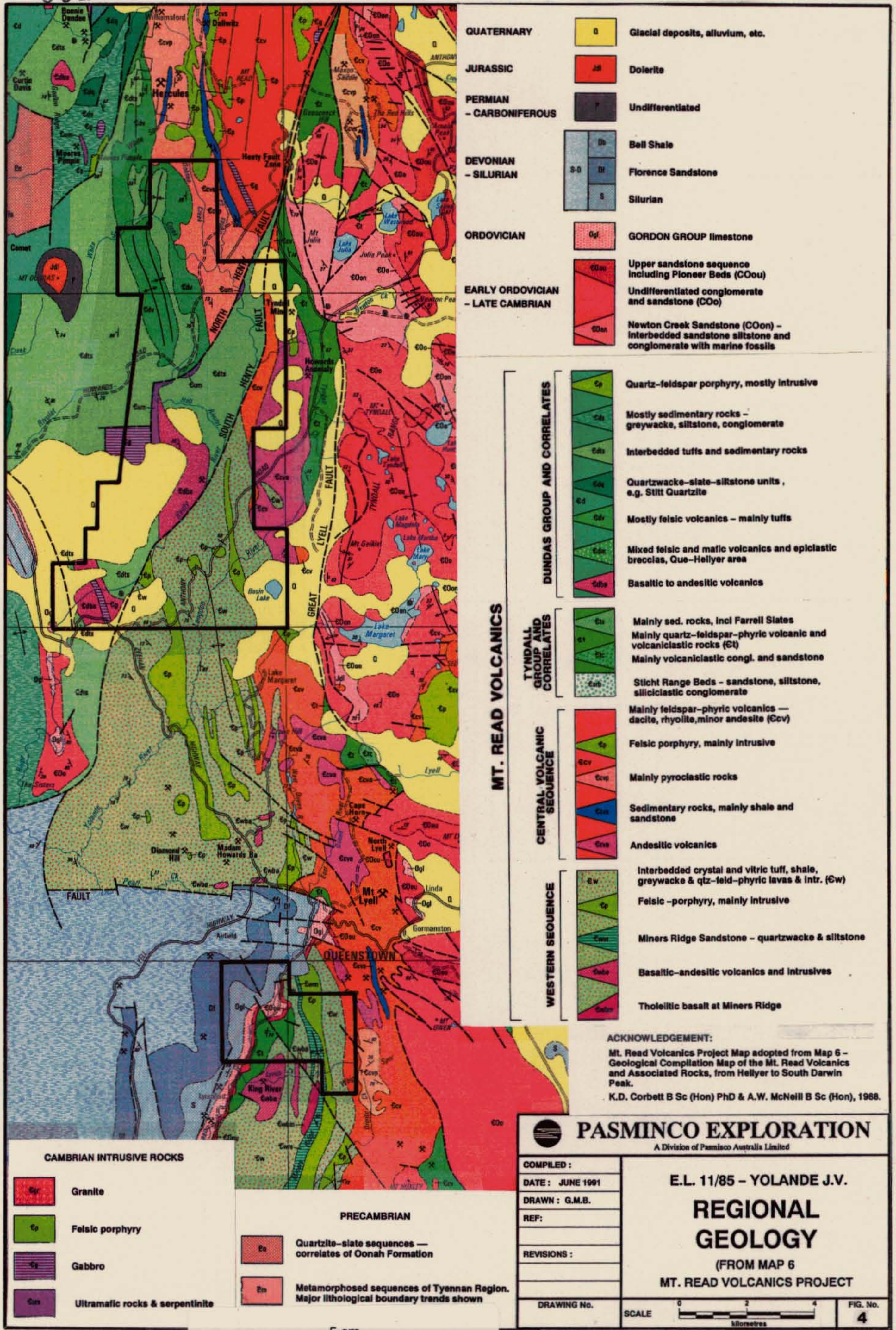

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The Mt Read Volcanics within EL 11/85 comprises a diverse range of magmatic compositions ranging from tholeiitic to calcalkaline basalts, andesites and rhyolites. In addition a possible ophiolite suite including tonalities has been thrust into the volcanics within the Henty block. Ordovician sandstone and limestone occurs in the western and south western sections of Lynchford and Henty respectively. The limestone is almost totally obscured by alluvium and fluvioglacials at both locations (see Figures 5 and 15). Geological fact and interpretative mapping with the Yolande EL is presented in Figures 6–12 and details of lithologies and stratigraphic associations are presented as stratigraphic columns in Figures 16–19.

4.1 Main Sequences

Proposed correlations based on lithogeochemistry and stratigraphic associations both within the licence area and regionally within the Mount Read Volcanics are as follows:

1. **Mudstone and overlying quartz crystal pumiceous debris flows** at Lynchford and White Spur have been tentatively correlated by McPhie (CODES, pers comm) with the Que River Shale and the Hercules–Rosebery hanging wall sequence (Figures 16 and 19).

2. **Calcalkaline basaltic andesite** at Lynch Creek and Halls Rivulet have been correlated on the basis of lithogeochemistry to the Que/Hellyer footwall andesite (Figures 16, 17, 18). A tentative correlation on the basis of petrology has also been made with the Henty Valley basaltic andesite (Crawford, Appendix D2).

3. **Quartz muscovite sandstone** (Precambrian derived) at Henty Valley is interlayered with a massive pyrite lens and mudstone. The sandstone is very similar to the Miners Ridge Sandstone at Lynchford, which Corbett interprets as the base of the Cambrian volcanic sequence in this area (Corbett, 1979).

4. **Quartz muscovite feldspathic wacke** (+–detrital magnetite), derived in part, from Precambrian metasediments. It is closely associated with the sulfide occurrence at the Henty Valley prospect and occurs extensively in the northern part of HFW (Figures 17 and 18).

5. Basic to felsic volcanic derived wacke/conglomerate (+- detrital magnetite) occur at Lynchford and the western part of the "HFW" sequence (Figures 17, 18, 19). These are correlated with the Tyndall Group Comstock Tuff at Queenstown. In EL 11/85 all occurrences apparently underlie the basal Ordovician sandstone and limestone sequence. Banded chlorite albite alteration is common to both areas although this is considered to be coincidental. Similar alteration patterns also occur in felsic lavas at White Spur.

6. Mid-Cambrian age fossiliferous mudstone is interlayered with dacite lavas and overlies conglomerate with chromite grains at Henty Valley (Figure 17). This imposes constraints on the age of mineralization at Henty Valley, the thrusting of ophiolites into the sequence and movement on the South Henty Fault.

The northern part of licence can be subdivided in to three distinct geological blocks, separated by splays off the NNE trending Henty Fault. The blocks from west to east are: White Spur; Henty Fault Wedge (HFW) and Tyndall. The Lynchford block, which is separated by 10km, has some lithological similarities to White Spur and HFW (Figure 4).

4.2 Structure

Lithologies trend north-south at Lynchford compared to a NNW trend at Henty. In most areas a NNW cleavage is well developed, which is consistent with Devonian fold trends. At Lynchford, the dominant fold style is isoclinal, whereas at Henty structures are more open and conform more with Devonian trends. Anomalous east west structural trends exist at the Henty Valley prospect and are interpreted to be associated with Cambrian movement on the Henty Fault.

The dominant structural features at Henty are the north to north east trending splays off the Henty and Rosebery Faults. The Henty Fault splays are interpreted as west dipping thrusts which coalesce 2 Kilometres north of the licence. The Henty Faults are complicated by the intersection with splays off the north-south Rosebery Fault and more subtle east-west structures, which are defined by the aeromagnetics. Displacement associated with these east-west trends is not readily apparent on the ground. Keele (CODES, pers comm) interprets a dominantly dip slip movement on these structures which could be easily overlooked in mapping.

4.3 Alteration and Mineralization

The metamorphic grade in both sections of the licence is prehnite-pumpellyite to lower greenschist facies. Primary lithological features are generally discernible, except in proximity to major faults and alteration.

Several styles of alteration and mineralization have been located, some of which may be associated with massive sulfide mineralization. Assemblages of calcite, sericite, albite, chlorite and epidote may be more regional features associated with deuteric and regional metamorphism. Styles of alteration and mineralization that could be indicative of VMS mineralization include:

i. Sericite, calcite, pyrite +- fuchsite alteration in basaltic to dacitic volcanics associated with massive pyrite at Henty Valley and stringer Pb Zn at Henty Adits;

ii. Sulfide clasts in felsic to andesitic mass flow conglomerates at White Spur and Newton Creek. These horizons are associated with localised silicification and sericitization suggestive proximity to a hydrothermal system;

iii. Barite veins associated with andesitic volcanics and mudstone at Lynchford. They are not anomalous in base or precious metals and not associated with significant alteration;

iv. Silicified mudstone with veinlets of galena, pyrite, sphalerite and calcite outcrop in proximity to a sericitized and pyritic felsic porphyry in Roaring Meg Creek at Lynchford.

Alteration styles not apparently associated with mineralization are as follows:

i. Albite and chlorite in volcaniclastic wackes (Tyndall Group?) at Lynchford and the South West part of HFW and in massive felsic volcanics at White Spur. The alteration is typically banded or pseudoconglomeratic in texture, and frequently associated with disseminated magnetite. Eastoe, Solomon and Walshe (1987) interpret this sodic assemblage as being associated with the down-welling part of a convecting system peripheral to a hydrothermal cell.

ii. Calcite, sericite +- pyrite in close spatial association with the SHF, sampled without significant results (Poltock 1987, 1988).

iii. Silica, carbonate, talc alteration in ultramafics, mainly in the NHF, associated with some gold arsenic anomalism (Poltock 1988).

iv. Chlorite, calcite, epidote +- magnetite, a propylitic assemblage in basaltic to andesitic volcanics and associated epiclastics, considered to be partly deuteric.

4.4 Cover

Evidence of glaciation can be seen throughout the Henty Block as fluvioglacial and moraine deposits. Glacial gouging and hummocky ("roche moutonnee") features are common on the Tyndall and White Spur plateaux and persist down to 150m ASL in the vicinity of the Zeehan Highway. The glacials are primarily derived from the Ordovician silisclastics, except in the Zeehan Highway area where they are sourced from the underlying volcanics. These volcanic derived glacials pose a major problem in differentiating bedrock from float in this area.

The first mineral discovery in the West Coast Range was gold at Lynchford in 1881 by Lynch and Currie (Blainey, 1954). This was followed by a spate of discoveries including the Mount Lyell and Mount Read districts. During this period the current licence area was intensely prospected as evidenced by numerous old prospects developed for copper lead zinc silver and gold. The most extensive workings are located at the Henty Adits. Despite the extent of prospecting there is no recorded mining production from what is now EL 11/85.

Modern exploration techniques were applied to the area commencing in the 1950's and were directed toward locating Rosebery and Mt Lyell style mineralization. This phase of exploration involved the Mount Lyell Mining and Railway Co, Rio Tinto-EZ and Pickands Mather. One hole WSP 103 was drilled at White Spur by Rio Tinto-EZ.

In the period from 1966 to 1983 the Mount Lyell Mining and Railway Co held most of what is now EL 11/85 as part of EL's 9/66 and 41/71. During this period 6 holes were drilled, 5 at the Henty River adits (HR1-5) and one at White Spur (WSP 2) (Figure 5). For a comprehensive review of exploration conducted on these licences see FitzGerald (1987). In addition to Mount Lyells' activity the EZ Co held part of White Spur as EL 1/62 and drilled hole DCP 235 (Figure 5). Cyprus Mines, in a joint venture with Fimiston, held part of the Lynchford section as EL 47/70.

Three stratigraphic holes have also been drilled by the Mines Department and are as follows:

1. Miners Ridge DDH1 380866E 5336197N (134m west of licence boundary) at Lynchford. The hole was planned to drill through the Cambrian sequence to Precambrian basement and intersected Miners Ridge basalt and sediments (Figures 15 & 17).

2. Bradshaws Road DDH 1 AMG 374929.5E 5350434N. The hole intersected basaltic volcanics and the SHF (Figure 5 and Appendix 16).

3. Mount Read DDH 1 377043E 5362227N The hole intersected the White Spur Formation contact with the Central Volcanics Complex (Figure 5 and Appendix 18).

6 PREVIOUS EXPLORATION ON EL 11/85

The licence was granted to Amoco in August 1985, and exploration programs during the first two years were run concurrently with the Joint Venture partner, EZ (now Norgold). Cyprus Minerals (after Amoco) was the sole operator between 1987-89 and since then Pasminco have been operators and managers. Exploration to date has been primarily targeted at volcanogenic base metals and Henty style gold. A secondary target has been platinoids associated with ultramafics.

The major components of this exploration and significant results are summarised below.

1985-86

The Henty River grid was re-established and an EM 37 survey carried out without significant responses (Jones, 1985)

The South Henty Fault in vicinity of the Zeehan Highway was explored. A small grid was established and rock/stream/sediment/pan concentrate geochemistry and petrology undertaken. Disappointing results were received but altered dacites and quartz microgabbros were described from what is now the Henty Valley prospect (Mathison, July 1986).

1986-87

The South Henty Fault grid was extended, geological mapping, soil/rock geochemistry, and some VLF and ground magnetics traverses across the SHF were undertaken. Weakly mineralized dacites associated with Cu Pb Zn soil anomalies were identified (Mathison and Ferguson, July 1987).

Henty Fault splays in the northern part of licence were assessed, mainly for Henty-style gold. Wide spaced grid lines (800-1400m) were cut. Geological mapping defined an extensive alteration zone along the SHF and to a lesser extent the NHF, however soil and rock geochemistry yielded no anomalous results (Poltock 1987).

1987-88

The Henty Fault splays and alteration zones were explored in greater detail with gridding, soil/rock/ Wacker geochemistry. The extent of alteration was confirmed and some base metal anomalies were located.

The South West sector of "HFW" was covered by reconnaissance stream geochemistry and geology. Results include weakly anomalous gold and the location of extensive gabbros and basic volcanics.

Cambrian volcanics at Lynchford were explored by stream and pan concentrate sampling. Anomalous gold in the south was attributed to the King River mine. Anomalous base metals were considered to represent higher background levels in the andesitic Lynchford Tuffs.

All three areas are reported in Poltock (1988).

1988-89

The area south of the Zeehan Highway was assessed for Devonian age, structurally controlled gold mineralization. Work included stream sediment and rock geochemistry at Woody Hill and Sisters Hills. No significant results were obtained and this section has since been relinquished (Poltock, 1989).

1989-90

The Henty River grid was established. Other work included: geological mapping; rock geochemistry and petrology. No significant mineralization was located, however extensive basic volcanics were outlined in the South Western area which warrant further exploration.

At Newton Creek in the vicinity of the 30N pit and Henty Canal, rock geochemistry and 5 line km of dipole IP was carried out across alteration zones associated with the major faults. Significant IP responses were recorded.

Both areas are reported in Jenkins (1990).

7. WORK COMPLETED BY PASMINCO EXPLORATION 1990-91

7.1 Summary

Work completed by Pasminco Exploration during the year ending June 1991 included:

-reconnaissance geology in conjunction with rock geochemistry at Lynchford and Henty River;

-grid geological mapping in both sections of the licence;

-brief inspection of Mines Department diamond drill holes from Miners Ridge and Bradshaws Road;

-382 rock samples collected for reference collection;

-75 rock chip samples assayed for Cu Pb Zn Ag Au Ba (Appendix A, B1);

-7 -80# stream sediments from Henty Fault Wedge (Appendix A,B2);

-30 soil samples for an orientation program at Lynchford (Appendix A,C);

-40 petrological descriptions by A J Crawford (Appendix D);

-aeromagnetic and radiometric surveys at Lynchford and White Spur (Appendix F);

-UTEM survey of the Lynchford grid (Appendix G);

-trial VLF traverses at Henty Valley;

-Dummy probe testing the condition of Henty River Prospect diamond drill holes for possible down hole EM survey;

-magnetic susceptibility measurements on rocks and drill core (HR 1-5 BR 1) (Appendix I);

-specific gravity measurements (Appendix J);

-Wacker bedrock sampling on lines 14, 16, 52 and 56N (Appendix K);

7.2 Henty Fault Wedge

7.2.1 INTRODUCTION

This section of the licence is bounded by the North and South Henty Faults (Figure 2). The geology is characterised by fine to medium grained sediments, basic to intermediate volcanics and an ophiolite suite with abundant basic dykes (Figures 5,17,18). A strong magnetic character is associated with the serpentinites, basic dykes and detrital magnetite in quartzose and volcaniclastic wackes.

Exploration during the year centred on the AMG Henty River grid which was established in 1989/90. The grid covers parts of the former Mt Lyell West Tyndall and Henty River grids and EZ's Henty River grid. The activities included: geological mapping; rock, stream sediment and Wacker geochemistry; reinterpretation of Henty River EM37 survey and probing DDH HR1-5 for the possibility of down hole EM. In addition to the grid work, an assessment of the andesite in the Halls Rivulet area and on the Cyprus grid lines 24-28N was carried out.

The following prospect areas were identified during the course of this program:

7.2.2 HENTY VALLEY

Massive pyrite with anomalous base metals was discovered outcropping in the Henty River. The mineralization is associated with a sequence of altered basaltic to dacitic volcanics, graphitic mudstone, chert and quartz mica wackes (Figures 13, 14,15). The volcanics are quite distinct, petrologically, from other volcanics in the HFW. They have possible affinities with the Lynch Creek Basalts (Crawford, Appendix D2). The prospective sequence is bounded by splays off the South Henty Fault and Rosebery Fault and is a structurally complex zone with an anomalous east west cleavage

Alteration and a regional east-west trending corridor of structural dislocation was interpreted by Leaman (Jenkins 1990, Appendix 7) from aeromagnetic results which is coincident with this new zone of mineralization. This structural corridor should also be investigated further east in the vicinity of Basin Lake. Several trial traverses of VLF were completed over the massive pyrite horizon. A cross over was registered, indicative of a conductor however, these traverses were poorly controlled and the data is not presented.

The volcanics are frequently intensely altered to sericite, chlorite, calcite, pyrite, haematite and fuchsite. Alteration varies from pervasive in highly vesicular basalt to stockworks (fine grained pyrite veins <20mm wide) in the more massive volcanics.

The mineralization located to date includes massive pyrite lamina and 1m thick beds occurring in sandstone and graphitic and siliceous mudstone. The best assays to date are:

Sample No.31646: 1.23%Pb, 0.77%Zn, 12g/tAg in massive pyrite float block with galena veins;

Sample No.31661: 0.66%Cu, 2.25g/tAu in brecciated chlorotic basalt;

Previous exploration in the area has been very limited, however sampling on the EZ Henty River grid, whose baseline traversed part of the area, recorded anomalous values (115ppm Cu, 170ppm Pb and 275ppm Zn) corresponding to altered pyritic basalts and dacites. Similarly, the Wacker traverses along lines 16N and 14N which are located to the north and west of the area returned a single point anomaly of 0.21%Pb and 0.04%Zn on 14N (Appendix K).

7.2.3 HENTY RIVER ADITS

This prospect lies west of the South Henty Fault between lines 54 000N and 55 200N (Figure 5 and 8). Stringer galena and sphalerite mineralisation is associated with andesite lavas and fine to medium grained epiclastics (Figure 18). For details of prospect geology see Meares (1980).

A reassessment of the previous EM37 survey this year recommended that the EM response in the eastern sector of grid between lines 55200-55600N be evaluated (Appendix H). The Mt Lyell Henty River holes were probed to test their condition for a possible downhole EM survey. However the holes were blocked at the following depths: HR1 64m; HR2 42m; HR3 78m and HR4&5 0m, making it impractical to undertake the survey.

The andesitic sequence, which is associated with mineralisation, was geologically mapped to the north west as far as the North Henty Fault. Exposure is generally poor and no significant mineralisation or alteration was located. The andesites located on Cyprus grid lines 24-28N

(Poltock, 1988), have similar lithological and stratigraphic associations as the Henty River Adits andesite. The Cyprus work included soil sampling, which gave maximum values of 405ppm Cu, 250ppm Pb and 820ppm Zn.

The current work involved a single day traversing the stream and river section. The best rock sample assay was 0.14% Zn from mudstone and andesite carrying galena and sphalerite veinlets. The andesite is interlayered with sericitized pyritic sandstone.

7.3 White Spur

7.3.1 INTRODUCTION

This section of the licence is bounded by the North Henty Fault in the south and the Rosebery, Mine Lease in the north (Figure 2). The area has an open cover of subalpine vegetation. Access is via a network of logging tracks and HEC roads and canals, the latter providing new and extensive exposure.

The volcano-sedimentary sequence has similarities to the Hercules area and is composed of predominantly felsic pumiceous mass debris flows, mudstone and greywacke (Figure 14 and 16).

Previous exploration by Rio Tinto, Mt Lyell and EZ culminated in drilling three holes within a pyritic mudstone sequence. The best results are in hole: DCP 235, a 0.7m vein assaying 1.4% Pb and 2.2% Zn and WSP 2, 1.7m pyritic sediment assaying 0.04% Pb and 0.15% Zn. In addition a Mines Dept stratigraphic hole, MR1, intersected the Central Volcanic Complex (CVC) White Spur Formation (WSF) contact. Significant features of this hole include the intersection of pyritic sulfide clasts in conglomerates at the contact and the recognition of a shallow dipping contact between the WSF and CVC.

Current exploration entailed reconnaissance geological mapping, rock geochemistry and a review previous of exploration.

7.3.2 LITHOLOGIES

The geology of the area can be subdivided into the Central Volcanic Complex and overlying White Spur Formation (*Figures 6, 7 & 16*). The CVC *is a massive felsic feldspar* phyric volcanic that could be interpreted either as lavas and/or pyroclastics. Chlorite and albite is the dominant alteration style in the felsic volcanics, occasionally imparting a pseudo bedding texture to this apparently massive unit.

The White Spur Formation represents ambient basin mudstone wacke sedimentation with influxes of felsic mass debris flows. The mudstones are locally pyritic and dolomitic with traces of base metals. Mass debris flows comprise graded units 10 -100m thick with a coarse conglomerate base with clasts of felsic volcanic, quartz porphyry, mudstone and sulfide, which grade to a fine grained vitric mudstone top. Incomplete sections and erosional contacts are common. These mass debris flows are interpreted as distal equivalents of felsic volcanism rather than being derived from a dormant volcanic terrain. The mass debris flows are pervasively sericitized and locally silicified and pyritic.

7.3.3 STRUCTURE

It is difficult to define structures in the massive CVC, however the WSF mudstones are ideal for structural mapping. The mudstones are bedded, frequently graded and develop a strong slaty cleavage. In addition, mass debris flows form distinct horizons based on clast and crystal types. The fold style in the WSF is open NNW trending with plunges mainly to the south. Dips are moderate to flat except in vicinity of the North Henty Fault.

The White Spur area is interpreted to be underlain by the west-dipping NHF and by the east dipping Rosebery thrust fault further west. Berry (1990) interprets the former as a splay off the main Rosebery Fault.

7.3.4 RESULTS

The mass debris flows with sulfide clasts are variably silicified, sericitized and pyritic suggesting proximity to a hydrothermal system. Alternatively the "clasts" could be interpreted as vug fillings or carbonate clast replacements. The sulfide clast locations are as follows:

-77150E 59825N HEC canal, clasts of pyrite, galena and sphalerite occur in a silicified mass debris flow. A quartz sulfide vein with associated silification assayed 0.18% Pb, 0.27% Zn and 2.4g/t Ag.

-76975E 60400N logging track. Clasts of laminated pyrite and silica assayed 0.12% Pb, 0.08% Zn and 102g/t Ag. 150m NW a similar mass debris flow lithology with irregular veinlets of manganese and limonite assayed 0.87% Pb, 0.10% Zn, 44g/t Ag and 1.75% Ba.

Pyritic shears, quartz pyrite veins and silicification, previously reported by McNaught (in Cartwright and Roberts, 1984) were examined. The mineralization is closely associated with the NHF between 57800N and 58300N and occurs within both WSF and HFW sediments. Leaman (in Jenkins, 1990) has suggested that there may be an association with underlying Devonian granites, based on his analysis of gravity data. Assays for base and precious metals were low, the only significant result is from a quartz pyrite vein of 0.12g/t Au. Sample 31540 from a pyrite shear assayed 0.3% Pb and Zn, however this location was resampled with 31575 returning values of < 45ppm Pb and Zn. (Appendix B).

An iron stone exposed in the canal at 77150E 58350N is interpreted as a transported bog iron deposit. The iron stone overlies unaltered and unmineralized sandstone and mudstone. The iron is considered to have been derived locally from pyritic and dolomitic mudstone. However these mudstones are widespread at White Spur and the iron stone is the only one located to date. The iron stone (sample No.31574) assayed only 17ppm Cu, <5ppm Pb and 279ppm Zn.

The open fold style and shallow dips in the WSF significantly enhance the exploration potential of the area. The target host horizons may be buried but at relatively shallow depths distributed over large areas.

7.4. Tyndall

This section is located in the North East part of the licence, east of South Henty Fault and covers the contact between the CVC and Tyndall Group (Figure 2 & 4). A recent discovery of massive sulfide clasts was made in the spillway of the Newton Creek dam which is located on the licence boundary. Other prospects within the area that have been previously described in EL 11/85 reports include: the Henty Canal alteration zone; the line 30N pit and Newton Creek (Poltock 1987, Jenkins 1990).

The volcanics in the area can be broadly subdivided into dacites to the west in the Henty Gorge and andesites to the east. The andesites occur on a plateau and are covered by extensive fluvioglacial deposits.

Field work has been of reconnaissance nature restricted mainly to the south of the Newton Creek discovery. The objective was to trace this mineralized horizon and to interpret the regional geological setting.

The massive sulphide clasts occur within a mass debris flow or volcanic conglomerate sequence. A total of 8 sulfide clasts have been located, measuring up to 40cm in diameter. They appear to have been derived from a high grade polymetallic massive sulfide body. A composite assay of the clasts yielded an assay of 0.09% Cu, 27.0% Pb, 31.7% Zn, 700g/t Ag and 0.92g/t Au. A lead isotope determination gave a Cambrian result which plots between the Rosebery and Hellyer values (D Wallace, pers comm). Other lithologies identified within the complex conglomeratic sequence include weakly altered dacites, silicified dacites and andesites and vesicular basalts with clasts up to 1m in diameter (Crawford, Appendix D3). Several finer grained horizons also occur within this crudely graded sequence. A sample of siliceous sandstone with disseminated sulphides assayed 0.16% Pb 0.51% Zn and 0.11% Ba.

The whole sequence has been strongly deformed with all clasts rotated and flattened into the penetrative cleavage. Several prominent faults, both normal and reverse further disrupt the sequence. The clast bearing horizon has an anomalous east-west structural trend which is broadly coincident with a regional magnetic disruption. This feature strikes east into the CRA-Aberfoyle EL 5/85. A previous drill hole HA 8, intersected 235m at 0.2% Zn and 3g/t Ag (Cartwright and Roberts, 1984) within this structural zone in former EL 9/66. The clast bearing conglomerates lie on the contact between dacitic volcanics to the west and andesitic to the east similar conglomerates with silicified clasts and laminated sandstone and limestone occur 400m south west (Figure 8) (Poltock, 1988). Sericite, calcite, pyrite, alteration within dacites was located 900m south west which may represent a foot wall alteration zone.

The Newton Dam spillway area is being studied in detail by Robert Gibson the discoverer as part of his Geology Honours thesis at CODES, University of Tasmanian.

7.5.1 LYNCHFORD

This area is located immediately south of Queenstown and separated from the Henty block by 10km of Yolande River Sequence sediments, felsic porphyrys and Ordovician - Devonian sediments. (Figures 2 & 4). The licence is bounded by the Mt Lyell Mine Lease to the north and the CRA-Aberfoyle EL 47/83 to the south. The area is readily accessed by the Lynchford Road and Huxley 4WD track. The vegetation cover is dominantly tea tree and blackwood regrowth (see Plate 1).

Previous exploration by BHP, Pickands Mather and Mount Lyell was of a regional nature. Cyprus Mines carried out more detailed work including soil geochemistry in the western section of the current grid. Work completed this year included gridding, geological mapping a UTEM survey and a high resolution aeromagnetic and radiometric survey.

7.5.2 STRATIGRAPHY

The grid based geological mapping has largely confirmed the Mines Department 1:25 000 Queenstown sheet geology. Information outside the grid area is taken directly from this mapping (Figure 15). The sequence comprises calcalkaline andesitic volcanics and felsic volcanics within a mudstone greywacke sequence. These volcanics overly the Precambrian derived Miners Ridge Sandstone and the tholeiitic Miners Ridge Basalt. The latter, which occurs mainly south of the licence area was intersected in the Mines Department DDH MR1 see (Appendix L3). The andesitic and felsic volcanics are overlain by locally derived volcaniclastic sandstone and conglomerate which in turn are unconformably overlain by Ordovician siliciclastics and limestone (Figure 19).

Tentative correlations within the Mount Read Volcanics indicate that equivalents of the Que/Hellyer andesite and the Hercules/Rosebery sequence may exist in the area. If these correlations are correct then a condensed Cambrian sequence with the potential for two mineralized horizons occurs at Lynchford.

7.5.3 STRUCTURE

Dips within the Cambrian sequence are steep to overturned with most measurements taken from the mudstone. A single reading in the younger volcaniclastics suggests that they are conformable with the underlying mudstone. Folds in the Cambrian sequence trend north–south. The dominant structure in the area is the Miners Ridge anticline. Folds within the mudstone may be isoclinal with structural repetitions.

Cleavage and foliation tends to strike north-west with steep dips. This orientation is axial planar to the open north west striking and plunging folds in the Ordovician to Devonian cover sequence to the west (Figure 15). This difference in fold trends between the Cambrian and younger sequencers implies that an angular unconformity occurs at this contact. The only major fault recognised in the area is sub parallel to the Devonian cleavage trend.

Brendan Dowers from CODES, University of Tasmania has mapped a moderate west dipping thrust on the contact between the Miners Ridge Sandstone and felsic porphyries as part of his Honours thesis. This fault has been interpreted by Dowers as a regional structure but it is not recognised in DDHMR1. It may be confined to this lithological contact and dip more steeply than Dowers has interpreted.

7.5.4 SOIL GEOCHEMISTRY

An orientation hand auger soil sampling survey was completed over part of the grid. Six sites were sampled with the following different parameters being studied: lithology soil profile and sample preparation (see Appendices A & C).

Results of the survey show that Cu and to a lesser extent Pb and Zn are enriched in "A" horizon soils with a high clay content. Metals are not consistently enhanced in the -80# or pulverised whole samples. There is some concern that the surface copper enrichment may be due to Mount Lyell smelter contamination. It is apparent that B/C horizon hand angered samples should be adequate to detect underlying mineralization. It is recommended that samples be prepared by pulverising after discarding large rock and quartz fragments.

7.5.5 MINERALIZATION AND ALTERATION

Minor localised alteration and mineralization has been identified both within the grid area and beyond it. Some alteration may be associated with mineralization, however most alteration basic to andesitic rocks is inferred to be largely deuteric.

The main styles of alteration and mineralisation identified include the following:

i. Silicification of mudstone on the North East margin of the grid in Roaring Meg Creek. This is associated with minor veinlets of pyrite, galena and carbonate. Alteration is adjacent to slightly sericitized pyritic porphyries and may be associated with the porphyry intrusion. The maximum assay to date is 415ppm Pb and 550ppm Zn;

ii. Sericite minor pyrite in graphitic mudstone exposed in a Lynchford road cutting. No significant assay results were received;

iii. **Barite veins** exposed in costeans in the CRA-Aberfoyle licence on the southern boundary of EL 11/85 in the vicinity of the old Lynch Creek Gold prospect. The veins occur within both mudstone and Lynch Creek Basalts and are not associated with significant alteration or other mineralization. Sample 31618 assayed 49.4% Ba but negligible values for base metal elements;

iv. **Quartz veins** have been prospected in the past by shallow pits probably for gold. No evidence of mineralization or alteration was noted and no samples were taken for assay;

v. **Chlorite, albite, magnetite, epidote and calcite**, localised within the andesite Lynchford Tuff. This alteration is interpreted as a regional, largely deuteric effect. A similar assemblage, dominated by epidote and haematite has been intersected in Miners Ridge Basalt in the Mines Department hole.

In addition, two styles of mineralization occur close to the licence boundary that are of significance:

i. **Gossan with jasper** located 300m south of the licence boundary on the contact between the Lynch Creek Basalts and mudstone, (Fig 15). This is one of the few features that may be associated with volcanogenic massive sulfide mineralization in the area. The best assay is sample No.30184 240ppm Pb, 135ppm Zn

ii. **Sandstone Hill Galena prospect** located at the intersection of Coalville and Dixon Streets in Queenstown 500m east of EL 11/85 (Figure 15). Taylor (1950) reports that mineralization which was tested with a shaft and two diamond drill holes occurs in Ordovician limestone. Samples from the shaft are reported to have assayed 14.9% Pb and 13oz/t Ag. No indication of zinc values was given. This carbonate hosted mineralization may be similar to the Oceana Deposit at Zeehan. Limestone in the Queen River valley in the western part of the Lynchford block has potential to host this style of mineralization.

7.5.6 GEOPHYSICS

A UTEM survey was undertaken over the entire grid, survey specifications and an interpretation of the results is given by R Smith see (Appendix G). Seven anomalous responses have been recognised, all conformable with the stratigraphy and having a close association with lithological contacts. Two of these responses "D and G" are interpreted as possibly associated with a significant bedrock conductor (Figure 20).

The northern end of Anomaly D is coincident with pyritic and sericitic mudstone and a rock chip assay gave <100ppm Pb and Zn but 2750ppm Ba, which may be significant. North of this point bedrock is obscured by recent alluvium, including pyritic tailings from Mount Lyell in the Queen River. Some 250m north of Anomaly D the prospective sequence is unconformably overlain by Ordovician sediments.

Anomaly G is coincident with the interpreted contact between the mudstone and Miners Ridge Sandstone. This contact is obscured by sandstone scree on the grid lines, however it may be exposed in streams between 38000N and 38200N.

A preliminary interpretation of the high resolution aeromagnetic survey at Lynchford is given by D Leaman, along with the survey specifications in Appendix F. Some significant features have been noted by Leaman. The most prominent feature is a magnetic high which is coincident with the felsic to intermediate, magnetite bearing Lynchford Tuff. It is interesting to note that the Lynch Creek Basalt is not associated with a significant response, and hence magnetics can not be used to define this unit, which trends under cover into EL 11/85.

A prominent regional east-west trending disruption of the magnetics cuts across the grid area. However, no structural feature was located during the geological mapping. The structure is interpreted as a basement feature, possibly a splay off the Linda Disturbance, which in turn may have controlled the location of mineralization at Mount Lyell.

A more detailed evaluation of the magnetics, in conjunction with the latest geological interpretation will be made early next year.

8. EXPENDITURE

Total expenditure on EL 11/85, the Yolande Joint Venture for the twelve month period to 30 June 1991 was **$211 851**. This brings the total expenditure on the licence since it was granted in 1985 to **$66 3562**.

Expenditure during 1990-91 is summarised below:

Personnel: salaries, wages and on costs	36 254
Travel & Accommodation	3 488
Geological contractors	50 505
Geophysical Consultants including image processing	5 456
Petrography	8 609
Aeromagnetic survey	18 261
UTEM survey	12 303
Analytical services	10 872
Track cutting. gridding	16 549
Drafting services	4 900
Vehicles, plant and equipment	2 511
Stores and supplies	2 561
Tenement costs	4 832
Computing	3 009
Office costs	12 482
Administration, management fee	19 259
TOTAL	**211 851**

9.CONCLUSIONS

A major exploration program over EL 11/85, Yolande Joint Venture, during 1991-91 has defined a number of areas that are highly prospective for polymetallic massive sulfide mineralisation. Two of these areas, the Henty River and Newton Creek Prospects are new discoveries made during the year, highlighting the significant mineral potential of this large block of relatively under explored Mt Read Volcanics. In addition, important target areas have been defined within the Lynchford block, in the vicinity of the Henty River Adits and the White Spur area, south of the Rosebery Mine Lease.

These prospect areas occur within a range of geological settings, hosted by rocks ranging from felsic to mafic volcanics, often with highly deformed zones close to major, complex structures such as the Henty and Rosebery Fault Systems. Analogies with both the Rosebery-Hercules and the Que-Hellyer sequences have been inferred by association with volcanic stratigraphy, lithogeochemical characteristics and structural style.

10. RECOMMENDATIONS

Exploration Licence 11/85 Yolande Joint Venture is due for renewal for a seventh year of a maximum ten year tenure on 21 August 1991. Several major prospect areas have now been identified and it is imperative that these are rapidly evaluated, including the first diamond drill testing of the area since the 1970's, during the forthcoming year.

A major program of evaluation is recommended to evaluate the potential for economic massive sulfide mineralisation at the following prospect areas:

1. Henty Valley

Gridding: Infill existing grid and extend further south, approximately 15 line km total

Geology: Detailed mapping and sampling

Geochemistry: Hand auger soil and/or Wacker bedrock sampling

Geophysics: UTEM survey whole grid, possible ground magnetic and detailed gravity surveys

Drilling: Possible diamond drill test of targets generated by above work using helicopter support

2. Newton Creek

Gridding: To cover area between South Henty Fault and EL boundary from Newton Creek to Henty Canal, approximately 30 line km total.

Geology: Detailed mapping and sampling

Geochemistry: Lithogeochemical sampling, possible Wacker bedrock sampling

Geophysics: Comprehensive UTEM survey

Drilling: Possible diamond drill test of targets generated by above work

Note: Some of this area falls within the proposed Henty Mine tailings easement area. Condemnation work including drilling is likely to occur here.

3. Lynchford

Gridding: Extend existing grid to east to cover mineralisation occurrence, approximately 8 line km total

Geochemistry: Soil sampling of grid area, lithogeochemistry

Geophysics: Extend UTEM coverage to east, possible detailed ground magnetic and gravity surveys

Drilling: Possible drill test of targets generated by above investigations

4. White Spur

Geology: Complete detailed mapping north to Mine Lease boundary with emphasis on structural and stratigraphic controls to mineralisation.

Geochemistry: Systematic stream sediment and/or water sampling and lithogeochemistry to outline zones of alteration and favourable mineralisation

Geophysics: Evaluate aeromagnetic survey results, follow up with detailed ground magnetic and gravity surveys

5. Henty River Adits

Gridding: Infill existing grid, estimate 8 line km total

Geology: Detailed mapping and sampling of favourable units

Geochemistry: Detailed soil and/or Wacker bedrock sampling

Geophysics: UTEM survey over mineralization host sequence

6. General

Aeromagnetics: Complete evaluation of 1991 survey, incorporating best geological data and magnetic susceptibility results

IP: Compile and assess results of previous Mt Lyell surveys including image processing

Lithogeochemistry: Complete regional coverage of tenement to aid characterisation of zones of favourable alteration and potential mineralisation

7. Extension of Licence Area

In light of the recent discovery of massive sulfides in the Henty Valley Prospect, close to the southern boundary of the northern section of the licence immediate consideration should be given to re-acquiring the ground adjoining EL 11/85 to the south, to cover possible extensions of this mineralised system.

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KEYWORDS

LEAD, ZINC, VOLCANOGENIC, MASSIVE SULFIDE, MT READ VOLCANICS, THRUST, FAULT ZONE, GEOLOGY, LITHOGEOCHEMISTRY, AEROMAGNETICS, GEOPHYS EM UTEM, PETROGRAPHY, QUEENSTOWN, YOLANDE, HENTY, LYNCHFORD, WHITE SPUR, NEWTON CREEK.

APPENDIX A

ANALYTICAL REPORTS

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

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EL11/85 WHITE SPUR NEWTON CREEK RAF

357050

Phone (004) 316837 | 14 Thirkell St. COOEE TAS 7320 | Fax (004) 318890

ANALYTICAL REPORT No. 111310.60.08047

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

INVOICE TO:
Pasminco Exploration
P.O. Box 886
BURNIE TAS 7320

ORDER No.	PROJECT
0110	3003 11/85

DATE RECEIVED	RESULTS REQUIRED
11/06/91	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
2	08/07/91	1	16

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
315,74/79,83/91,95	RO Prep : GP006,GP009,GP012,GP018	Cu,Pb,Zn,Ag/GA140 Pb,Zn,Ag/GA105
315,74/79,83/91,95	RO Prep :	Au,Au(R)/GG309
315,74/79,83/91,95	RO Prep :	Ba/GX401,Ba/GX403

RESULTS TO
Mr F Fitzgerald
Pasminco Exploration
P.O. Box 886
BURNIE TAS 7320

RESULTS TO
Mr R Poltock
C/- Post Office
WILMOT TAS 7310

RESULTS TO

REMARKS

AUTHORISED OFFICER

357051

ANALABS

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

ANALYTICAL DATA

0059

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	111310.60.08047	08/07/91	0110	1 OF 2

TUBE No.	SAMPLE No.	Cu	Pb	Pb	Zn	Zn	Ag	Ag	Ba	Ba
1	31574	17	<5	—	279	—	<1.0	—	85	—
2	31575	34	45	—	39	—	<1.0	—	1800	—
3	31576	187	570	—	1470	—	<1.0	—	630	—
4	31577	118	989	1199	465	836	>50.0	102.0	270	—
5	31578	170	8649	8700	1015	1022	40.0	44.0	>5000	1.751
6	31579	60	7524	—	452	—	12.9	—	>5000	0.629
7	31583	22	128	—	88	—	<1.0	—	1400	—
8	31584	40	70	—	58	—	<1.0	—	1600	—
9	31585	37	58	—	73	—	<1.0	—	1450	—
10	31586	21	30	—	47	—	<1.0	—	3500	—
11	31587	19	49	—	60	—	<1.0	—	2650	—
12	31588	10	1811	—	2765	—	2.4	—	480	—
13	31589	43	47	—	141	—	<1.0	—	3200	—
14	31590	3	37	—	129	—	<1.0	—	1050	—
15	31591	99	77	—	193	—	<1.0	—	1050	—
16	31595	10	29	—	97	—	<1.0	—	1150	—
17										
18										
19										
20										
21										
22										
23	DETECTION	2	5	25	2	25	1.0	2.5	10	0.005
24	UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
25	METHOD	GA140	GA140	GA105	GA140	GA105	GA140	GA105	GX401	GX403

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

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357052

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	111310.60.08047	08/07/91	0110	2 OF 2

TUBE No.	SAMPLE No.	Au	Au(R)							
1	31574	<0.008	-							
2	31575	0.011	0.011							
3	31576	<0.008	-							
4	31577	0.166	0.139							
5	31578	<0.008	-							
6	31579	<0.008	-							
7	31583	<0.008	-							
8	31584	<0.008	-							
9	31585	<0.008	-							
10	31586	<0.008	-							
11	31587	<0.008	-							
[illegible]	31588	<0.008	<0.008							
13	31589	<0.008	-							
14	31590	<0.008	-							
15	31591	<0.008	-							
16	31595	<0.008	<0.008							
17										
18										
19										
20										
21										
22										
23	DETECTION	0.008	0.008							
24	UNITS	ppm	ppm							
[illegible]	METHOD	GG309	GG309							

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

0054

357053

EL11/85 'NEWTON CK - WHITE SPUR R

ANALABS

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

Analabs - A Division of Inchcape Inspection & Testing Services

RECEIVED 29 MAY 1991

Phone (004) 31 6837 | 14 Thirkell St. Cooee Tas 7320 | Fax (004) 31 8890

ANALYTICAL REPORT No. 111310.60.07980

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

INVOICE TO:
Pasminco Exploration
P.O. Box 886
Burnie
Tasmania 7320

ORDER No.	PROJECT
0109	3003 YOL

DATE RECEIVED	RESULTS REQUIRED
15/05/91	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
2	28/05/91	1	5

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
31525,31527,31540/41,31546	RO Prep: GP005,GP009,GP011,GP018	Cu,Pb,Zn,Ag/GA140
31525,31527,31540/41,31546	RO	Au,Au(R),Au(S)/GG309,Au/RAW,Au/Wt
31525,31527,31540/41,31546	RO	Ba/GX401
31525,31527,31540/41,31546	RO Prep: GP005,GP009,GP011,GP018	Pb,Zn,Ag/GA105

RESULTS TO
Mr Fergus Fitzgerald
Pasminco Exploration
P.O. Box 886
Burnie
Tasmania 7320

RESULTS TO
Mr Roger Poltock
C/- Post Office
Wilmot
Tasmania 7310

RESULTS TO

REMARKS

AUTHORISED OFFICER

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A Division of Inchcape Inspection and Testing Services Australia Pty Ltd

0054

357054

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	111310.60.07980	28/05/91	0109	1 OF 2

TUBE No.	SAMPLE No.	Cu	Pb	Pb	Zn	Zn	Ag	Ag	Au	Au(S)
1	31525	890	27.00	3936	31.70	>10000	700.0	>50	0.920	—
2	31527	300	—	1649	—	5106	—	4	0.090	—
3	31540	60	—	2961	—	2969	—	9	0.025	—
4	31541	35	—	40	—	139	—	1	0.020	—
5	31546	13	—	340	—	409	—	<1	<0.008	<0.008
6										
7										
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12										
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16										
17										
18										
19										
20										
21										
22										
23	DETECTION	2	0.01	5	0.01	2	2.5	1	0.008	0.008
24	UNITS	ppm	%	ppm	%	ppm	ppm	ppm	ppm	ppm
25	METHOD	GA140	GA105	GA140	GA105	GA140	GA105	GA140	GG309	GG309

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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0054 357055

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	111310.60.07980	28/05/91	0109	2 OF 2

TUBE No.	SAMPLE No.	Ba								
1	31525	15								
2	31527	1100								
3	31540	1050								
4	31541	580								
5	31546	1150								
6										
7										
8										
9										
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11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	10								
24	UNITS	ppm								
25	METHOD	GX401								

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.

0053

YOLANDE
HENTY R'CHIP RAD

357056

Analabs - A Division of Inchcape Inspection & Testing Services

Phone (004) 31 6837

14 Thirkell St. Cooee Tas 7320

Fax (004) 31 8890

ANALYTICAL REPORT No. 111310.60.07920

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

INVOICE TO:
Pasminco Exploration
P.O. Box 886
Burnie
Tasmania 7320

ORDER No.	PROJECT
0108	3003-Yolande

DATE RECEIVED	RESULTS REQUIRED
16/04/91	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
1	24/04/91	1	10

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
Various	RD Prep: GP005,GP009,GP011,GP018	Cu,Pb,Zn,Ag/GA140
Various	RD	Au,Au(R),Au(S)/GG309,Au/RAW,Au/Wt
Various	RD	Ba/GX401

RESULTS TO:
Mr Fergus Fitzgerald
Pasminco Exploration
P.O. Box 886
Burnie
Tasmania 7320

RESULTS TO:
Mr Roger Poltock
C/- Post Office
Wilmot
Tasmania 7310

RESULTS TO:

REMARKS

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0056

ANALYTICAL DATA

357057

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	111310.60.07920	24/04/91	0108	1 OF 1

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	Ba	Au	Au(R)	Au(S)	
1	31504	135	30	10	<1	30	0.125	—	—	
2	31674	70	95	45	2	290	<0.008	—	—	
3	31676	50	15	130	<1	<10	<0.008	—	—	
4	31678	10	5	40	<1	150	<0.008	—	—	
5	31681	50	5	105	<1	70	<0.008	—	—	
6	31685	60	255	125	<1	160	0.025	—	—	
7	31686	65	470	2000	<1	370	<0.008	—	—	
8	31687	40	90	245	<1	290	<0.008	<0.008	<0.008	
9	31688	90	155	160	<1	510	0.020	—	—	
10	31700	80	20	120	<1	250	<0.008	—	—	
11										
12										
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16										
17										
18										
19										
20										
21										
22										
23	DETECTION	2	5	2	1	10	0.008	0.008	0.008	
24	UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	
25	METHOD	GA140	GA140	GA140	GA140	GX401	GG309	GG309	GG309	

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

YOLANDE EL 11/85
HENTY R/CHIP

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

0037 Analabs - A Division of Inchcape Inspection & Testing Services 357058

Phone (004) 31 6837 | 14 Thirkell St. Cooee Tas 7320 | Fax (004) 31 8890

ANALYTICAL REPORT No. 111320.60.07879

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

INVOICE TO:
Pasminco Exploration
P.O. Box 886
Burnie
Tasmania 7320

ORDER No.	PROJECT
0107	EL11/85 YOL

DATE RECEIVED	RESULTS REQUIRED
02/04/91	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
2	12/04/91	1	9

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
K316,46,48,50,56,61,62,66/68	RO Prep: GP005,GP009,GP011,GP018	Cu,Pb,Zn,Ag/GA140
K316,46,48,50,56,61,62,66/68	RO	Au,Au(R),Au(S)/GG309,Au/RAW,Au/Wt
K316,46,48,50,56,61,62,66/68	RO	Ba/GX401
6,46,48,50,56,61,62,66/68	RO Prep: GP005,GP009,GP011,GP018	Pb,Zn,Ag/GA105

RESULTS TO
Mr. Fergus Fitzgerald
Pasminco Exploration
P.O. Box 886
Burnie
Tasmania 7320

RESULTS TO
Mr. Roger Pollock
Pasminco Exploration
C/- Post Office
Wilmot
Tasmania 7310

RESULTS TO

REMARKS

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

357059

ANALYTICAL DATA

0930

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	111320.60.07879	12/04/91	0107	1 OF 2

TUBE No.	SAMPLE No.	Cu	Pb	Pb	Zn	Zn	Ag	Ag	Au	Au(R)
1	31646	45	1.23	>10000	7700	7700	12.0	11	<0.008	--
2	31648	40	--	190	--	75	--	5	<0.008	--
3	31650	60	--	35	--	130	--	<1	<0.008	--
4	31656	70	--	5	--	75	--	<1	<0.008	--
5	31661	210	--	30	--	90	--	<1	<0.008	--
6	31662	6600	--	70	--	310	--	3	1.930	2.250
7	31666	75	--	30	--	105	--	1	<0.008	--
8	31667	25	--	400	--	20	--	8	0.020	--
9	31668	35	--	40	--	110	--	<1	<0.008	--
10										
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12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	2	0.01	5	25	2	2.5	1	0.008	0.008
24	UNITS	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
25	METHOD	GA140	GA105	GA140	GA105	GA140	GA105	GA140	GG309	GG309

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.

0039

ANALYTICAL DATA

357060

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	111320.60.07879	12/04/91	0107	2 OF 2

TUBE No.	SAMPLE No.	Ba								
1	31646	25								
2	31648	420								
3	31650	210								
4	31656	280								
5	31661	250								
6	31662	75								
7	31666	60								
8	31667	200								
9	31668	70								
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	10								
24	UNITS	ppm								
25	METHOD	GX401								

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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EL11/85 YOLANDE
LYNCHFORD ROCK SAMPLES

0060

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

Analabs - A Division of Inchcape Inspection & Testing Services

357061

Phone (004) 31 6837 | 14 Thirkell St. Cooee Tas 7320 | Fax (004) 31 8890

ANALYTICAL REPORT No. 111320.60.07823

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

INVOICE TO:
Pasminco Exploration
P.O. Box 886
Burnie
Tasmania 7320

ORDER No.	PROJECT
0106	Lynchford

DATE RECEIVED	RESULTS REQUIRED
12/03/91	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
1	05/04/91	1	14

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
Various	RO Prep: GP009,GP018	Cu,Pb,Zn,Ag/GA140
Various	RO	Au,Au(R),Au(S)/GG309,Au/RAW,Au/Wt
Various	RO	Ba/GX401
Various	RO	Ba/GX404

RESULTS TO
Mr. Fergus Fitzgerald
Pasminco Exploration
P.O. Box 886
Burnie
Tasmania 7320

RESULTS TO
Mr. Roger Poltock
Pasminco Exploration
C/- Post Office
Wilmot
Tasmania 7310

RESULTS TO

REMARKS

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

0061

357062

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	111320.60.07823	05/04/91	0106	1 OF 1

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	Au	Au(R)	Ba	Ba
1	30974	80	100	1350	<1	<0.008	—	380	—
2	30975	165	925	615	<1	<0.008	—	370	—
3	30977	105	5	155	<1	<0.008	—	350	—
4	30981	60	160	1200	<1	<0.008	—	470	—
5	30985	5	5	30	<1	<0.008	—	840	—
6	30986	105	95	280	<1	<0.008	—	330	—
7	31618	15	5	10	<1	<0.008	—	>10000	49.4
8	31627	35	70	100	<1	<0.008	—	2750	—
9	31628	20	5	635	<1	<0.008	—	710	—
10	31632	15	610	30	1	<0.008	—	4450	—
11	31633	25	80	40	1	<0.008	—	1750	—
12	31636	30	415	550	1	<0.008	—	740	—
13	31637	110	305	245	<1	0.295	0.420	75	—
14	31641	70	40	275	<1	<0.008	—	85	—
15									
16									
17									
18									
19									
20									
21									
22									
23	DETECTION	2	5	2	1	0.008	0.008	10	0.1
24	UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
25	METHOD	GA140	GA140	GA140	GA140	GG309	GG309	GX401	GX404

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

YOLANDE : LYNCHFORD
SOIL ORIENTATION
+ STREASEDS HENTY

ANALABS

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

0054

Analabs - A Division of Inchcape Inspection & Testing Services

357063

Phone (004) 31 6837 | 14 Thirkell St. Cooee Tas 7320 | Fax No. (004) 31 8890

ANALYTICAL REPORT No. 111320.60.07769

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

INVOICE TO:
Mr. Fergus Fitzgerald
Pasminco Exploration
P.O. Box 886
Burnie
Tasmania 7320

ORDER No.	PROJECT
0105	11/85 YOL

DATE RECEIVED	RESULTS REQUIRED
18/02/91	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
1	27/02/91	1	22

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
Various	SO Prep: GP006,GP007	Cu,Pb,Zn,Ag/GA140
Various	SO	Au,Au(R),Au(S)/G6309,Au/RAW,Au/Wt
Various	SO	Ba/GX401

RESULTS TO
Mr. Fergus Fitzgerald
Pasminco Exploration
P.O. Box 886
Burnie
Tasmania 7320

RESULTS TO
Mr. Roger Poltock
Pasminco Exploration
C/- Post Office
Wilmot
Tasmania 7310

RESULTS TO

REMARKS

AUTHORISED OFFICER

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

005

357064

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	111320.60.07769	27/02/91	0105	1 OF 1

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	Au	Au(R)	Ba
1	30933	95	50	60	<1	0.020	0.035	150
2	30934	20	<5	30	<1	0.040	0.055	530
3	30935	10	<5	25	<1	0.110	0.125	570
4	30936	110	40	70	<1	<0.008	—	190
5	30937	35	25	65	<1	<0.008	—	180
6	30942	225	65	50	<1	<0.008	—	70
7	30943	25	10	50	<1	<0.008	—	55
8	30944	20	<5	65	<1	<0.008	—	70
9	30948	70	125	35	<1	<0.008	—	660
10	30949	20	115	25	<1	<0.008	—	1850
11	30950	5	<5	25	<1	<0.008	—	110
12	30951	5	5	25	<1	<0.008	—	240
13	30952	15	50	30	<1	<0.008	—	340
14	30958	340	190	70	<1	<0.008	—	170
15	30959	45	10	50	<1	<0.008	—	170
16	30960	40	100	335	<1	<0.008	—	390
17	30961	55	65	230	<1	<0.008	—	390
18	30962	45	65	195	<1	<0.008	—	460
19	30964	40	60	195	<1	<0.008	—	500
20	30966	15	25	100	<1	<0.008	—	240
21	30969	20	20	90	<1	<0.008	—	170
22	30970	30	50	190	<1	<0.008	—	300
23	DETECTION	2	5	2	1	0.008	0.008	10
24	UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm
25	METHOD	GA140	GA140	GA140	GA140	GG309	GG309	GX401

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

357065
0054

ANALABS

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

Analabs - A Division of Inchcape Inspection & Testing Services

RECEIVED 6 MAR 1991

Phone (004) 31 6837

14 Thirkell St. Cooee Tas 7320

Fax No. (004) 31 8890

ANALYTICAL REPORT No. 111320.60.07768

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

LYNCHFORD SOIL ORIENTATION

INVOICE TO:
Mr. Fergus Fitzgerald
Pasminco Exploration
P.O. Box 886
Burnie
Tasmania 7320

ORDER No.	PROJECT
0104	11/85 YOL

DATE RECEIVED	RESULTS REQUIRED
18/02/91	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
1	01/03/91	1	15

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
<309,30/32,38/41,45/47,53/57	SO Prep: GP009,GP018	Cu,Pb,Zn,Ag/GA140
<309,30/32,38/41,45/47,53/57	SO	Au,Au(R),Au(S)/GG309,Au/Wt,Au/RAW
<309,30/32,38/41,45/47,53/57	SO	Ba/GX401

RESULTS TO
Mr. Fergus Fitzgerald
Pasminco Exploration
P.O. Box 886
Burnie
Tasmania 7320

RESULTS TO
Mr. Roger Poltock
Pasminco Exploration
C/- Post Office
Wilmot
Tasmania 7310

RESULTS TO

REMARKS

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

0059

357066

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	111320.60.07768	01/03/91	0104	1 OF 1

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	Au	Au(R)	Au(S)	Ba	
1	30930	60	25	30	<1	0.015	–	–	120	
2	30931	10	10	25	<1	0.010	–	–	220	
3	30932	10	10	25	<1	0.055	–	–	310	
4	30938	65	35	45	<1	<0.008	–	–	140	
5	30939	50	45	55	<1	<0.008	–	–	140	
6	30940	125	60	45	<1	<0.008	–	–	50	
7	30941	35	5	65	<1	<0.008	–	–	55	
8	30945	30	20	20	<1	<0.008	–	<0.008	140	
9	30946	10	155	20	<1	<0.008	–	–	770	
10	30947	10	540	35	<1	<0.008	–	–	1750	
11	30953	10	<5	20	<1	<0.008	–	–	220	
12	30954	15	10	45	<1	0.010	<0.008	–	1700	
13	30955	240	140	60	<1	0.010	–	–	100	
14	30956	35	<5	60	<1	<0.008	–	–	100	
15	30957	25	<5	50	<1	<0.008	–	–	120	
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	2	5	2	1	0.008	0.008	0.008	10	
24	UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	
25	METHOD	GA140	GA140	GA140	GA140	GG309	GG309	GG309	GX401	

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

Analabs - A Division of Inchcape Inspection & Testing Services

Phone (004) 31 6837 | 14 Thirkell St. Cooee Tas 7320 | Fax No. (004) 31 8890

RECEIVED 24 JAN 1991

0055

ANALYTICAL REPORT No. 111320.60.07661

YOLANDE ROCKS RAP

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

INVOICE TO:
Mr. Fergus Fitzgerald
Pasminco Exploration
P.O. Box 886
Burnie
Tasmania 7320

ORDER No.	PROJECT
0103	EL 11/85

DATE RECEIVED	RESULTS REQUIRED
10/01/91	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
3	22/01/91	1	2

357067

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
30183/84	RO Prep: GP005,GP009,GP016	Cu,Pb,Zn,Ag/GA140
30183/84	RO	Au,Au(R),Au(S)/GG309,Au/RAW,Au/Wt
30183/84	RO	Al,Fe,Na,K,Ca,Mg,Rb,Sr,Y,Ti,Zr,Nd,Nb,Ba/GI201

REMARKS

RESULTS TO:
Mr. Roger Pollock
Pasminco Exploration
C/- Post Office
Wilmot
Tasmania 7310

RESULTS TO:
Mr. Fergus Fitzgerald
Pasminco Exploration
P.O. Box 886
Burnie
Tasmania 7320

RESULTS TO:

357067

AUTHORISED OFFICER

ANALABS

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

0U5.

357068

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	111320.60.07661	22/01/91	0103	1 OF 3

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	Au	Al	Ba	Ca	Fe
1	30183	80	85	45	<0.5	<0.008	0.86	58	0.017	12.30
2	30184	90	240	135	<0.5	<0.008	1.54	248	0.041	27.10
3										
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17										
18										
19										
20										
21										
22										
23	DETECTION	5	5	5	0.5	0.008	0.01	5	0.005	0.01
24	UNITS	ppm	ppm	ppm	ppm	ppm	%	ppm	%	%
25	METHOD	GA140	GA140	GA140	GA140	GG309	GI201	GI201	GI201	GI201

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.

0050

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	111320.60.07661	22/01/91	0103	2 OF 3

TUBE No.	SAMPLE No.	K	Mg	Na	Nb	Nd	Sr	Ti	Y	Zr
1	30183	<0.05	<0.002	<0.005	<10	14	7	0.018	1	13
2	30184	0.09	<0.002	0.024	<10	14	42	0.089	4	37
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	0.05	0.002	0.005	10	10	1	0.001	1	5
24	UNITS	%	%	%	ppm	ppm	ppm	%	ppm	ppm
25	METHOD	GI201	GI201	GI201	GI201	GI201	GI201	GI201	GI201	GI201

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

357069

ANALABS

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

0053

357070

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	111320.60.07661	22/01/91	0103	3 OF 3

TUBE No.	SAMPLE No.	Rb
1	30183	6.74
2	30184	11.00
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23	DETECTION	0.05
24	UNITS	ppm
25	METHOD	GI222

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

YOLANDE ROCKS RAI

ANALABS

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

0070

Analabs - A Division of Inchcape Inspection & Testing Services

357071

Phone (004) 31 6837

14 Thirkell St. Cooee Tas 7320

Fax No. (004) 31 8890

ANALYTICAL REPORT No. 111320.60.07659

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

INVOICE TO:
Mr. Fergus Fitzgerald
Pasminco Exploration
P.O. Box 886
Burnie
Tasmania 7320

ORDER No.	PROJECT
0102	EL 11/85

DATE RECEIVED	RESULTS REQUIRED
09/01/91	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
3	19/03/91	1	19

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
Various	RO Prep: 6P005,6P009,6016	Cu,Pb,Zn,Ag/GA140
Various	RO	Au,Au(R),Au(S)/66309,Au/RAW,Au/Wt
Various	RO	Al,Fe,Na,K,Ca,Mg,Rb,Sr,Y,Ti,Zr,Nd,Nb,Ba/GI201
Various	RO	Ti,Zr,Ba/GX401

RESULTS TO
Mr. Roger Poltock
Pasminco Exploration
C/- Post Office
Wilmot
Tasmania 7310

RESULTS TO
Mr. Fergus Fitzgerald
Pasminco Exploration
P.O. Box 886
Burnie
Tasmania 7320

RESULTS TO

REMARKS

AUTHORISED OFFICER

0%

ANALABS

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

357072

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	111320.60.07659	19/03/91	0102	1 OF 3

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	Au	Au(R)	Au(S)	Al	Ba
1	30008	5	15	40	<1.0	0.010	—	—	5.790	75
2	30009	<5	5	40	<1.0	<0.008	—	—	7.770	241
3	30012	60	190	255	<1.0	<0.008	—	—	6.200	222
4	30030	40	240	160	<1.0	<0.008	—	—	6.090	814
5	30038	10	90	240	<1.0	<0.008	—	—	7.150	472
6	30039	70	15	690	1.0	0.535	—	—	0.130	<5
7	30093	100	2050	5500	1.0	0.010	—	—	7.370	363
8	30101	10	25	140	<1.0	<0.008	—	—	7.180	115
9	30108	610	15	300	<1.0	<0.008	—	—	8.850	191
10	30119	10	10	40	<1.0	<0.008	—	—	7.220	166
11	30120	30	10	70	<1.0	0.045	—	—	6.050	306
12	30121	165	280	2050	<1.0	<0.008	<0.008	<0.008	8.410	366
13	30137	5	5	80	<1.0	<0.008	—	—	4.380	245
14	30159	<5	15	110	<1.0	<0.008	—	—	8.510	153
15	30161	15	5	130	<1.0	<0.008	—	—	8.290	392
16	30163	10	5	105	<1.0	<0.008	—	—	7.660	393
17	30167	45	65	190	<1.0	0.010	—	—	6.060	835
18	30175	30	20	55	<1.0	<0.008	—	—	2.840	86
19	30183	70	640	1250	<1.0	<0.008	—	—	7.280	345
20	30									
21										
22										
23	DETECTION	5	5	5	1.0	0.008	0.008	0.008	0.010	5
24	UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm
25	METHOD	GA140	GA140	GA140	GA140	GG309	GG309	GG309	GI201	GI201

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.

00/2 357073

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	111320.60.07659	19/03/91	0102	2 OF 3

TUBE No.	SAMPLE No.	Ca	Fe	K	Mg	Na	Nb ✓	Nd ✓	Sr ✓	Ti
1	30008	0.030	1.050	0.380	0.110	0.020	<10	<10	16	2220
2	30009	0.220	4.320	4.340	0.520	0.100	<10	32	8	12600
3	30012	0.780	10.400	0.580	0.940	0.350	<10	21	78	5610
4	30030	0.940	2.590	1.950	0.650	2.060	<10	20	185	4230
5	30038	0.110	4.440	2.210	0.410	1.120	<10	28	58	7190
6	30039	0.020	49.900	<0.050	<0.002	0.010	<10	<10	<1	46
7	30093	1.430	4.980	1.090	1.310	3.580	12	37	180	7580
8	30101	0.130	4.600	1.130	1.800	2.050	<10	15	44	3140
9	30108	0.310	4.860	1.150	4.770	1.290	<10	24	60	3110
10	30119	0.920	1.990	3.240	0.520	0.550	12	40	11	2420
11	30120	0.040	7.370	1.550	1.960	0.200	10	16	2	2300
12	30121	5.360	7.360	0.580	4.020	2.940	<10	13	311	5860
13	30137	0.120	15.900	1.730	2.210	0.050	11	10	4	8710
14	30159	3.760	4.100	0.550	3.890	0.970	<10	12	169	2350
15	30161	0.140	6.320	2.800	1.280	1.880	<10	34	64	7050
16	30163	0.120	4.420	2.520	1.010	1.540	14	17	28	4330
17	30167	0.140	3.450	3.060	0.690	0.870	12	46	64	4270
18	30175	0.040	20.200	0.340	0.100	0.040	<10	<10	5	1200
19	30183	0.040	20.900	2.370	0.590	0.090	<10	25	4	6410
20										
21										
22										
23	DETECTION	0.005	0.010	0.050	0.002	0.005	10	10	1	10
24	UNITS	%	%	%	%	%	ppm	ppm	ppm	ppm
25	METHOD	GI201	GI201	GI201	GI201	GI201	GI201	GI201	GI201	GI201

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
	111320.60.07659	19/03/91	0102	3 OF 3

TUBE No	SAMPLE No.	Y	Zr	Rb	Ba	Ti	Zr			
1	30008	9	63	15.80	75	1700	65			
2	30009	27	160	207.00	200	10800	180			
3	30012	20	131	30.90	200	5950	120			
4	30030	16	135	72.70	700	3900	140			
5	30038	27	223	130.00	450	6200	230			
6	30039	2	<5	0.50	<10	<50	<5			
7	30093	40	205	29.30	300	6350	190			
8	30101	12	105	53.00	120	2900	110			
9	30108	21	117	61.00	190	2800	110			
10	30119	30	160	174.00	150	1800	230			
11	30120	4	74	74.00	320	2000	120			
12	30121	28	50	24.40	310	4200	35			
13	30137	12	96	94.50	230	8100	170			
14	30159	13	65	19.40	120	2100	60			
15	30161	29	155	136.00	390	4500	160			
16	30163	33	265	147.00	380	4050	280			
17	30167	44	160	142.00	650	3700	170			
18	30175	4	28	26.70	90	1350	20			
19	30183	34	94	120.00	360	6250	80			
20										
21										
22										
23	DETECTION	1	5	0.05	10	50	5			
24	UNITS	ppm	ppm	ppm	ppm	ppm	ppm			
25	METHOD	GI201	GI201	GI222	GX401	GX401	GX401			

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

APPENDIX B

SAMPLE RECORDS & ANALYTICAL DATA SHEETS

B1 Rock Samples

B2 Stream Sediment Samples

ROGER POLTOCK GEOLOGICAL PTY. LTD.

SAMPLE RECORD AND ANALYTICAL DATA SHEET

CLIENT: Pasminco Expl'n
PROJECT: 11/85 Lynchford
PROSPECT:

LABORATORY: Analabs
SAMPLE TYPE: Rock

COLLECTED BY: RP
DATE DISPATCHED: 0103
DATE RECEIVED: 0106

A 28306

SAMPLE NUMBER	LOCATION		DESCRIPTION	ANALYSES								
				Cu	Pb	Zn	Ag	Au	Ba			
30183	AMG 5336 715 N	379 275 E	Gossanous jasper	80	85	45	<0.5	<.008	58			
30184	AMG 5336 675	379 275 E	Gossan	90	240	135	<0.5	<.008	248			
31618	PAS GRID 36950 N	80325 E	Barite vein?	15	5	10	<1	<.008	49.4%			
31627	38 150 N	79200 E	Black siltstone/sericitic sandstone + pyrite	35	70	100	<1	<.008	2750			
31628	37 910 N	79500 E	Gossan in shear zone	20	5	635	<1	<.008	710			
31632	AMG 5338 250 N	381 100 E	Silic' black mudstone + veinlets py gna ccp	15	610	30	1	<.008	4450			
31633	AMG 5338 180 N	381 150 E	Quartz feldsp porph sericitic + py	25	80	40	1	<.008	1750			
31636	PAS GRID 37975 N	81000 E	Silic black mudstone + veinlets py carb gna	30	415	550	1	<.008	740			
31637	PAS 38600 N	80500 E	Limonitic float assoc with porphyry	110	305	245	<1	0.420 0.295	75			

ROGER POLTOCK GEOLOGICAL PTY. LTD.

CLIENT PASMINCO
PROJECT 11/85
PROSPECT HENTY

SAMPLE RECORD AND ANALYTICAL DATA SHEET

LABORATORY ANALABS
SAMPLE TYPE ROCK

COLLECTED BY: RP
DATE DISPATCHED: 0102
DATE RECEIVED:

A 28306

SAMPLE NUMBER	LOCATION		DESCRIPTION	ANALYSES Cu	Pb	Zn	Ag	Au	Ba		
30008	54000 N	75790 E	Brecciated silicified gabbro	5	15	40	<0.5	·010	75		
30009	54000 N	76570 E	Limonitic + manganif' siltstone + carb'	<5	5	40	<0.5	<·008	241		
30012	56040 N	76500 E	Chalcedony + limonite veins in andesite	60	190	255	<0.5	<·008	222		
30030	55250 N	77030 E	Basalt plag porph	40	240	160	<0.5	<·008	814		
30038	54800 N	77580 E	Carbonate altered andesite? + qtz lim veins	10	90	240	<0.5	<·008	472		
30039	54640 N	77790 E	Quartz pyrite vein - float	70	15	690	1.0	0.625	<5		
30093	51900 N	74930 E	Gabbro - albite chl altered + py sph	100	2050	5500	1.0	0.01 ~~0.10~~	363		
			gna on joints								
30101	53200 N	76250 E	Tonalite silic' sericit' + pyrite	10	25	140	<0.5	<·008	115		
30108	53600 N	74920 E	Gabbro - fine basalt + altered + minor copper	610	15	300	<0.5	<·008	191		
			stain								
30119	52800 N	76315 E	Sericitized felsic volcanic + pyritic	10	10	40	<0.5	<·008	166		
30120	52600 N	76070 E	Tonalite - foliated + qtz py veinlets	30	10	70	<0.5	·045	306		
30121	52600 N	75745 E	Fine basic intrusive + minor py	165	280	2050	<0.5	<·008	366		
			gna sph on joints								
30137	55260 N	78090 E	Quartz spec' hematite vein	5	5	80	<0.5	<·008	245		
30159	54800 N	75690 E	Carb' altered - calcite veined gabbro	<5	15	110	<0.5	<·008	153		
30161	50800 N	74750 E	Sandstone - feldxt + Mn + Kfeldsp	15	5	130	<0.5	<·008	392		
30163	50800 N	74490 E	" " " Sericitized + minor py	10	5	105	<0.5	<·008	393		
30167	50800 N	74150 E	Siltst dk grey minor py	45	65	190	<0.5	·01	835		
30175	51200 N	75350 E	Chert + limonitic fractures.	30	20	55	<0.5	<·008	86		
30183/197	51000 N	75060 E	Siltst. limonitic veins	70	640	1250	<0.5	<·008	345		

ROGER POLTOCK GEOLOGICAL PTY. LTD.

SAMPLE RECORD AND ANALYTICAL DATA SHEET

CLIENT: Pasminco Explⁿ
PROJECT: EL 11/85
PROSPECT: HENTY CYPRUS / PASMINCO GRIDS
LABORATORY: ANALABS
SAMPLE TYPE: ROCK
COLLECTED BY: R.P.
DATE DISPATCHED: 0106
DATE RECEIVED: 0107

A 28305

SAMPLE NUMBER	LOCATION		DESCRIPTION	ANALYSES Cu	Pb	Zn	Ag	Au	Ba			
	CYPRUS	GRID										
30974	59900 N	78900 E	Andesite plag' porph' py sph joints	80	100	1350	<1	<.008	380			
30975	59910 N	78900 E	Andesite – siltstone – brecciated + carbonate veins + gna sph	165	925	615	<1	<.008	370			
30977	59975 N	78925 E	Siltstone black laminated + py po'	105	5	155	<1	<.008	350			
30981	59050 N	79100 E	Andesite - carbonate alt' + py sph gna calcite veinlets	60	160	1200	<1	<.008	470			
30985	50500 N	73500 E	Feld xt s/s - albitized	5	5	30	<1	<.008	840			
30986	51075 N	74100 E	S/s fine c̄ py trace gna sph	105	95	280	<1	<.008	330			
31641	51290 N	75300 E	Basaltic scoria sericitized pyritic	70	40	275	<1	<.008	85			
31646	51310 N	75320 E	Float massive pyrite with gna veinlets	45	1.23%	0.77%	12	<.008	25			
31648	51345 N	75360 E	Massive pyrite and black shale	40	190	75	5	<.008	420			
31650	51290 N	75335 E	Black pyritic and siliceous siltstones.	60	35	130	<1	<.008	210			
31656	51470 N	75000 E	Limonitic siltst or very fine basic?	70	5	75	<1	<.008	280			
31661	51565 N	75195 E	Basalt breccia + pyrite stockwork	210	30	90	<1	<.008	250			
31662	51565 N	75200 E	" " or gabbro? + black Cu sulphide float	0.66%	70	310	3	2.25	75			
31666	51530 N	75345 E	Basalt scoria - pyritic	75	30	105	1	<.008	60			
31667	51280 N	75310 E	Graphitic – py siltstone + carbonate	25	400	20	8	0.02	200			
31668	51275 N	75310 E	Laminated carbonate / chert / pyrite.	35	40	110	<1	<.008	70			

357078

ROGER POLTOCK GEOLOGICAL PTY. LTD.

SAMPLE RECORD AND ANALYTICAL DATA SHEET

CLIENT: Pasminco Expl'n
PROJECT: EL 11/85 Yolande
PROSPECT: HENTY.

LABORATORY: ANALABS
SAMPLE TYPE: Rock

COLLECTED BY: R Poltock
DATE DISPATCHED: 0/08
DATE RECEIVED: 0/09

A 28306

SAMPLE NUMBER	LOCATION		DESCRIPTION	Cu	Pb	Zn	Ag	Au	Ba			
31504	57525 N	77100 E	Qtz pyrite vein	135	30	10	<1	0.125	30			
31674	E2 HENTY 60205 N	GRR 3000 E	Carb' alt basalt + pyrite qtz veins	70	95	45	2	<.008	290			
31676	60300 N	3000 E	Basalt py carb' alt'n	50	15	130	<1	<.008	<10			
31678	51598 0N	75710 E	Carbonate altered f-med grit sed/volc?	10	5	40	<1	<.008	150			
31681	50900 N	75120 E	Basalt + qtz hem' stockwork veins	50	5	105	<1	<.008	70			
31685	51040 N	75070 E	Float - gossan + qtz lim fuch' alt' basalt	60	255	125	<1	.025	160			
31686	51010 N	75070 E	Carb alt + lim qtz veins - basalt?	65	470	2000	<1	<.008	370			
31687	50960 N	75060 E	Basalt feld' porph' + carb' fuch' alt'n	40	90	245	<1	<.008	290			
31688	50850 N	75050 E	" " " carb silic fuch alt'n	90	155	160	<1	.020	510			
31700	50600 N	75210 E	Carb/silic alt'n	80	20	120	<1	<.008	250			
31515	58320 N	80040 E	Chips from massive gna sph clasts	890	27.0%	31.70%	700	0.92	15			
31527	58300 N	80020 E	Sandstone c̄ dissem sph and silic mudst	300	0.16%	0.51%	4	0.09	1100			
31540	58275 N	77610 E	Pyritic shear? in felsic volcanics	60	0.29%	0.29%	9	0.025	1050	* RESAMPLED 31575		
31541	58275 N	77620 E	Massive pyrite float - derived from 31540	35	40	139	1	0.02	580			
31546	59850 N	77175 E	Silic felsic mass debris flow/s/s c̄ dissem py gna sph + possible clasts gna sph py	13	340	409	<1	<.008	1150			

007
357073

ROGER POLTOCK GEOLOGICAL PTY. LTD.

SAMPLE RECORD AND ANALYTICAL DATA SHEET

CLIENT: PASMINCO EXPLORATION

PROJECT: EL 11/85 YOLANDE

PROSPECT: White Spur Newton Creek

LABORATORY: ANALABS

SAMPLE TYPE: Rock

COLLECTED BY: R Poltock

DATE DISPATCHED: 0110

DATE RECEIVED:

SAMPLE NUMBER	LOCATION		DESCRIPTION	ANALYSES Cu	Pb	Zn	Ag	Au	Ba
31574	58350N	77150E	Gossan/laterite - transported	17	<5	279	<1	<.008	85
31575	58275N	77600E	Felsic volcanic + seric py. RESAMPLE OF 31540	34	45	39	<1	0.011	1800
31576	60400N	76975E	Limonite + qtz grains (after sulfide clast?)	187	570	1470	<1	<.008	630
31577	60400N	76975E	Clast (mass flow) finely lam py silic	118	1199	836	102	0.139	270
31578	60525N	77075E	Felsic volcanic ± Mn Fe	170	8700	1022	44	<.008	1.75%
31579	60525N	77075E	" " " " "	60	7524	452	12.9	<.008	0.629%
31583	60530N	77250E	0-20m Feld xt s/s + mudst seric altn	22	128	88	<1	<.008	1400
31584			20-40m " " " + py black mudst	40	70	58	<1	<.008	1600
31585			40-60m " " " " " "	37	58	73	<1	<.008	1450
31586			60-80m " " " " " "	21	30	47	<1	<.008	3500
31587	60510N	77350E	80-100m " " " " " "	19	49	60	<1	<.008	2650
31588	59800N	77150E	Qtz galena vein ≤20mm wide	10	1811	2765	2.4	<.008	480
31589	59800N	77150E	Feld xt s/s + black py mudst	43	47	141	<1	<.008	3200
31590	59800N	77150E	Silic <py felsic mass flow + trace gna sph	3	37	129	<1	<.008	1050
31591	58075N	76825E	Laminated black py mudst + dolomitic s/s	99	77	193	<1	<.008	1050
31595	56740N	79025E	Felsic volc seric < carb < py altn	10	29	97	<1	<.008	1150

0080

ROGER POLTOCK GEOLOGICAL PTY. LTD.

SAMPLE RECORD AND ANALYTICAL DATA SHEET

CLIENT: Pasminco Exploration

PROJECT: EL 11/85 Yolande

PROSPECT: Henty

LABORATORY: Analabs

SAMPLE TYPE: -80# Stream sed

COLLECTED BY: R Pollock

DATE DISPATCHED:

DATE RECEIVED:

SAMPLE NUMBER	LOCATION		DESCRIPTION	ANALYSES Cu	Pb	Zn	Ag	Au	Ba			
30960	54620	74120	o/c f-m dolerite/gabbro	40	100	335	<1	<.008	390			
30961	54550	74120	o/c plag porph basic - float ditto	55	65	230	<1	<.008	390			
30962	53400	74200	o/c fine vitric mudst	45	65	195	<1	<.008	460			
30964	53400	74100	o/c basic volc, chert, siltst	40	60	195	<1	<.008	500			
30966	52400N	74480	float glacials + basic volc/intrusive	15	25	100	<1	<.008	240			
30969	52400N	74840E	float basic volc/intrusive + siltst	20	20	90	<1	<.008	170			
30970	52400N	74860E	" " " " " "	30	50	190	<1	<.008	300			

180753

APPENDIX C

SOIL ORIENTATION SURVEY, LYNCHFORD

357083

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Mineral Exploration Contractor

11/3/91

SOIL ORIENTATION SURVEY

E L 11/85 LYNCHFORD

SAMPLING METHOD

6 sites sampled with different lithologies and profile types, at each site two sets of samples collected from holes approximately 1m apart, one sample set sieved to -80# (-80# fraction then pulverized to -120#) the other pulverized as for a rock sample. Samples were collected with hand auger to maximum depth of 0.9m.

RESULTS

"A" horizon soils with a high clay content are enriched in Cu and to a lesser extent Pb and Zn, this horizon in quartz lag soils is not consistently Cu enriched.

"B/C" horizon, Cu in all cases is significantly lower than the "A", Pb and Zn at similar levels or lower. Ba and possibly gold is generally enhanced in this profile.

With the exception of Ba and Au (slight enhancement in -80#) values are not consistently enhanced in the -80# or pulverized treatments.

CONCLUSIONS

Elevated levels of Cu and to a lesser extent Pb Zn in the clay rich "A" horizon may be associated with Mt Lyell smelter contamination.

"B/C" soil or Wacker samples may be more reliable, the samples pulverized after discarding larger rock and particularly quartz fragments.

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SAMPLE RECORD AND ANALYTICAL DATA SHEET

CLIENT PASMINCO EXPLN
PROJECT 11/85
PROSPECT LYNCHFORD

LABORATORY ANALABS
SAMPLE TYPE SOILS – ORIENTATION SURVEY

COLLECTED BY:
DATE DISPATCHED: 0104
DATE RECEIVED: 0105

A 2830

SAMPLE NUMBER	LOCATION		DESCRIPTION	Cu	Pb	Zn	Ag	Au	Ba			
30945	37400N	79795E	0-0.1 A°-A grey-white qtz lag	30	20	20	<1	<.008	140			
30946	"	"	0.1-0.3 B creamgry, clay-qtz lag	10	155	20	<1	<.008	770		PULV	
30947	"	"	0.3-0.5 C cream	10	540	35	<1	<.008	1750			
30948	"	"	0-0.8 A°-A cream/brn qtz lag	70	125	35	<1	<.008	660		-80#	
30949	"	"	0.8-0.9 C weath siltstone	20	115	25	<1	<.008	1850			
30950	37400N	79460E	0-0.4 A gry qtz lag	5	<5	25	<1	<.008	110		-80#	
30951	"	"	0.4-0.5 B cream-orange, clay+qtz lag	5	5	25	<1	<.008	240			
30952	"	"	0.5-0.7 C cream-orange weath "BR"	15	50	30	<1	<.008	340			
30953	"	"	0-0.3 A gry qtz lag	10	<5	20	<1	<.008	220		PULV	
30954	"	"	0.3-0.6 B/C cream-orange	15	10	45	<1	.010	1700			
30955	37800	79520E	0-0.1 A dk brn crumbly	240	140	60	<1	.010	100		PULV	
30956	"	"	0.1-0.3 B orange yel clay	35	<5	60	<1	<.008	100			
30957	"	"	0.3-0.4 C pink-yel weath "BR"	25	<5	50	<1	<.008	120			
30958	"	"	0-0.1 A dk brn	340	190	70	<1	<.008	170		-80#	
30959	"	"	0.1-0.4 B/C brn-orange red -clay weath Rock	45	10	50	<1	<.008	170			

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SAMPLE RECORD AND ANALYTICAL DATA SHEET

CLIENT PASMINCO EXP'N
PROJECT EL 11/85
PROSPECT LYNCH FORD

LABORATORY
SAMPLE TYPE ANALABS - SOILS

COLLECTED BY:
DATE DISPATCHED: 0104
DATE RECEIVED: 0105

A 2830

SAMPLE NUMBER	LOCATION		DESCRIPTION	Cu	Pb	Zn	Ag	Au	Ba		
SOIL	SAMPLING -		ORIENTATION								
30930	37400	80000E	0 – 0.1m A°-A dk cream-grey	60	25	30	<1	.015	120	PULV	
30931	"	"	0.1 – 0.25m B cream grey-orange	10	10	25	<1	.010	220		
30932	"	"	0.25 – 0.35 C cream with BR	10	10	25	<1	.055	310		
30933	37400	80000E	0 – 0.3 A°-A gry brw	95	50	60	<1	.020	150	-80#	
30934	"	"	0.3 – 0.35 B yel-orange	20	<5	30	<1	.040	530		
30935	"	"	0.35 – 0.50 C cream yel	10	<5	25	<1	.110	570		
30936	37400	79960E	0 – 0.2 A°-A khaki brw clay	110	40	70	<1	<.008	190	-80#	
30937	"	"	0.2 – 0.9 B yel brw clay	35	25	65	<1	<.008	180		
30938	"	"	0 – 0.2 A°-A khaki-yel clay	65	35	45	<1	<.008	140	PULV	
30939	"	"	0.2 – 0.6 B/C yel-orange clayey	50	45	55	<1	<.008	140		
30940	37400	79880E	0 – 0.3 A°-A grey-dk brw clayey	125	60	45	<1	<.008	50	PULV	
30941	"	"	0.3 – 0.9 B mottled yel brw orange clayey	35	5	65	<1	<.008	55		
30942	"	"	0 – 0.1 A°-A dk khaki	225	65	50	<1	<.008	70		
30943	"	"	0.1 – 0.7 B yel brw clay	25	10	50	<1	<.008	55	SIEVE -80#	
30944	"	"	0.7 – 0.9 C pink-brw	20	<5	65	<1	<.008	70		

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APPENDIX D

PETROGRAPHIC REPORTS, AJ CRAWFORD

D1 Henty Fault Wedge Area

D2 Henty Valley, Lynchford Prospect Area

D3 Newton Creek Spillway

0085 357087

PETROGRAPHIC REPORT

Rocks from
PASMINCO EL 11/85 YOLANDE (Henty Fault Wedge)
For Roger Poltock Jan.1991

by
Anthony J. Crawford
Geology Department
University of Tasmania

SAMPLE: 30055 Henty Fault Wedge

SUMMARY: This sample is a well-preserved plagioclase-phyric tholeiitic basalt with a holocrystalline groundmass texture suggesting it is a dyke rock. It is best correlated petrographically with similar rocks from the Henty Dyke Swarm and Henty Fault Wedge.

HAND SPECIMEN:

This is a dark green plagioclase-phyric metabasaltic lava with around 10 modal% of small, altered feldspar phenocrysts in a fine-grained matrix.

THIN SECTION DESCRIPTION:

__This sample is a texturally well-preserved porphyritic basaltic lava containing around 10 modal% of altered plagioclase phenocrysts mainly less than 2mm long in what was probably a fine-grained holocrystalline groundmass. The plagioclase phenocrysts occur as mainly well-formed single crystals and clots of crystals that have been albitized, and subsequently variably replaced by murky sericite that is often intergrown with fine-grained aggregates of almost colourless epidote.

The remainder of this rock is composed of a holocrystalline intergrowth of stout albitized plagioclase laths (<0.4mm long), fresh anhedral plates of augite, and quite common interstitial and marginally leucoxenized FeTi oxides. Alteration phases in the groundmass include (other than albite replacing the originally more calcic plagiolcase) yellowish epidote, bright green chlorite and subordinate quartz, suggesting a metamorphic grade within the prehnite pumpellyite facies of regional metamorphism.

This sample was certainly basaltic compositionally, but the almost holocrystalline groundmass, lacking interstitial altered glass, suggests an origin as a dyke rock, or less likely perhaps, from the central portions of a very thick flow. The relative abundance of FeTi oxides and the texture suggest tholeiitic affinities, and are unlike either Mount Read Volcanics basalts (eg Hellyer basalts), or the low-Ti basalts that make up most of the lava carapace of the mafic-ultramafic complexes (ophiolites) in western Tasamania. Tholeiitic Crimson Creek Formation tholeiitic basalts and their correlates throughout western Tasmania are very rarely plagioclase-phyric, tending to rule out a correlation with this sample. Only lavas and dykes from the Henty Fault Wedge and Henty Dyke Swarm petrographically show strong similarities to this sample, and this is probably the best correlation that can be made without chemical data. This well-preserved sample should be included in any analytical study of the Henty Fault Wedge rocks.

SAMPLE: 30124 Henty Fault Wedge

SUMMARY: This is a very strongly carbonate-altered former tholeiitic(?) aphyric basaltic lava or shallow dyke rock, possibly correlated with the Henty Fault Wedge and Dyke Swarm basalts. The alteration assemblage implies intense, localized hydrothermal alteration.

HAND SPECIMEN:

This is a relatively strongly altered, amygdaloidal pale grey-green meta-basic lava with not uncommon carbonate-filled vesicles to 8mm across.

THIN SECTION DESCRIPTION:

This sample is texturally relatively well-preserved, but it is entirely replaced by fine-grained alteration products, dominantly calcite. The sample was probably originally an aphyric basalt, but all traces of original mineralogy have been obliterated by the intense and pervasive carbonate alteration. The rock was composed dominantly of laths of plagioclase mainly 0.2 - 0.5mm long, and <0.2mm wide, and showing a weak flow orientation, intergrown with subordinate platey augite and FeTi oxides; all primary silicate minerals are replaced by very fine-grained calcite, and minor interstitial sericite and pale green chlorite are not uncommon. Former FeTi oxides are small interstitial grains that have been strongly altered to brown Fe hydroxide or oxide minerals rimmed in many places by leucoxene; streaks of 'opaque' material along silicate grain boundaries attest to mobility of Fe during this alteration. Large vesicles, and small areas of groundmass, are filled by globular (botryoidal) calcite-chlorite intergrowths.

The intense alteration suffered by this sample is considerably more intense than normally encountered within basaltic lavas within the Mount Read Volcanics and associated suites (such as the Henty Dyke Swarm and Wedge basalts), and demands localized hydrothermal alteration. The alteration precludes confident correlation with other basaltic suites in western Tasmania, but texture rules out affinities with Hellyer-type Mount Read Volcanics basalts. I suggest that this was a tholeiitic basalt, again associated with the Henty Fault Wedge basalts. Despite the intense alteration, the immobile element signature of this sample, when available, should provide fairly confident correlation.

SAMPLE: 30024A

SUMMARY: This rock is a well-preserved aphyric tholeiitic basaltic rock from a narrow dyke or dyke margin. It is reasonably correlated with other Henty Fault Wedge and Henty Dyke Swarm basalts.

HAND SPECIMEN:

This is a dark grey-green aphric fine-grained metabasalt.

THIN SECTION DESCRIPTION:

This is an aphyric basalt with occasional microphenocrysts of augite and albitized plagioclase set in a holocrystalline but fine-grained, subophitic to intergranular textured groundmass. The few augite microphenocrysts are smaller than 1mm across, but well-formed, and most show some intergrown laths of plagioclase. They are colourless, fresh and unzoned. Even less common are albitized plagioclase phenocrysts partially replaced in turn by minor sericite and pale green chlorite.

The groundmass of this basalt is holocrystalline but fine-grained, composed of intergrown anhedral to subhedral fresh augite and partially sericitized, albitized plagioclase laths, with relatively abundant smaller, leucoxenitized FeTi oxides. Interstitial alteration minerals in the groundmass include pale yellow epidote, green chlorite and clear quartz. The alteration assemblage in this sample is typical of the prehnite-pumpellyite facies of regional metamorphism of basic rocks. The texture of this rock, characterized by the absence of glass or its alteration products, is typical of narrow basaltic dykes.

This is a tholeiitic basalt essentially identical texturally and mineralogically to numerous other Henty Dyke Swarm and Henty Fault Wedge rocks I have examined. However, unlike strongly plagioclase-phyric sample 30055, this sample could equally as well be a Crimson Creek-type tholeiitic basalt, since these are generally aphyric to sparsely augite-pyric tholeiitic basalts.

SAMPLE: 30024B Henty Fault Wedge

SUMMARY: This rock is a strongly plagioclase+augite-phyric basaltic lava with a lowermost greenschist facies metamorphic assemblage, and is similar to some basalts from the SW end of the Henty Fault Wedge which together form a petrographically and compositionally distinctive group, transitional from typical Henty FW and DS tholeiities to Mount Read Volcanics basalts. This sample should be analyzed.

HAND SPECIMEN:

This is a dark grey-green strongly plagioclase+mafics-phyric metabasalt with phenocrysts up to 3mm long.

THIN SECTION DESCRIPTION:

This rock is strongly porphyritic, being composed of subequal proportions (around 10-12 modal% each) of albitized plagioclase and largely fresh augite phenocrysts, up to 3mm long, but mainly 1-2mm long. Both phenocryst phases are euhedral prisms. The albitized plagioclase phenocrysts have been further altered by abundant sericite speckling and patches of fine-grained murky epidote and possibly apple-green pumpellyite. Augite phenocrysts are sometimes partly replaced by pale green chlorite in which fine, fibrous needles of actinolitic amphibole are embedded. No FeTi oxide phenocrysts occur in this rock.

The groundmass of this rock was very fine-grained, probably partly glassy. It is now composed of a fine-grained intergrowth of secondary quartz-albite-chlorite containing small albite laths and chloritized augite prisms, and quite common but fine-grained and leucoxenized FeTi oxide grains. A few very narrow veinlets of fibrous quartz transect the sample. The presence of both actinolite and (probably) pumpellyite in this sample indicates that it was metamorphosed at the lowermost greenschist facies conditions of regional metamorphism (~300^{o}C), probably at slightly higher temperatures than the previous samples described that lack actinolite. The groundmass texture suggests to me that this sample was a lava, although the possibility that it was from the outermost chilled margin of a dyke cannot be ruled out.

This sample is petrographically very similar to some Henty Fault Wedge basalts from the SW end of the fault wedge (427216 and 427221 in my report for Pasminco). They are distinct compositionally and petrographically from the more typical sparsely augite-phyric or aphyric Henty Fault Wedge and Henty Dyke Swarm basalts, and are, in fact, transitional from the latter towards Mount Read-type (ie. calc-alkaline) basalts. The field relationships and composition of this and similar samples needs to be carefully determined.

SAMPLE: 30099

SUMMARY: This is a formerly glassy, sparsely quartz+feldspar-phyric rhyolitic lava with strong calcite-sericite alteration.

HAND SPECIMEN:

This rock is a pinkish very fine-grained felsic lava(?) with greenish sericite streaks and a few quartz phenocrysts.

THIN SECTION DESCRIPTION:

This is a formerly highly glassy, sparsely quartz- and feldspar-phyric felsic lava that has extensively recrystallized and undergone quite strong calcite-sericite alteration during development of a very weak foliation. Quartz phenocrysts, of which only four or five are present in the section, are quite strongly rounded and reacted and reach about 1.5mm diameter; one or two contain small rounded, chloritized melt inclusions. Former plagioclase phenocrysts are only slightly more abundant than quartz and occur now as totally sericitized tabular prisms mainly less than 1mm long. Several sericitized plagioclase phenocrysts are streaked out into the weak foliation. Very small microphenocrysts of apatite and leucoxenitized FeTi oxides are not uncommon, and a number of well-formed small zircons were noted.

The groundmass is a mosaic-textured intergrowth of quartz and albite after glass that has suffered quite strong calcite-sericite alteration, with sericite defining of discontinuous weak foliation. This alteration is somewhat more intense than usually shown in regionally metamorphosed felsic lavas from western Tasmania, and may indicate it has suffered more localized hydrothermal alteration.

There is little doubt that this was a glassy rhyolitic lava, and as such is very similar to those in the Mount Read Volcanics, particularly in the Tyndall Group. The relationship of these felsic lavas in the Henty Fault Wedge to the metabasic rocks needs to be firmly established, as they demand very different petrogentic scenarios.

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SAMPLE: 30126 Henty Fault Wedge

SUMMARY: This is a greenschist facies metadolerite with sparse former augite and plagioclase phenocrysts, differing from other Henty Fault Wedge metaolerites by the higher metamorphic grade.

HAND SPECIMEN:

This rock is a grey-green fine-grained and finely-fractured metadolerite with spots to several mm across (after mafic phenocrysts?) of black chlorite, and altered plagioclase grains to about 2mm across.

THIN SECTION DESCRIPTION:

This sample is a texturally well-preserved holocrystalline fine- to medium-grained metadolerite that has entirely recrystallized under greenschist facies conditions to albite and actinolite, with abundant chlorite and leucoxene after FeTi oxides. Plagioclase phenocrysts to 2mm across, are mainly multi-crystal aggregates and make up only about 2 modal% of the sample. Even less abundant are former augite phenocrysts (also <2mm long) now composed of chlorite and fibrous to acicular actinolite.

The groundmass of this sample was clearly holocrystalline, with a typical doleritic texture, and is composed of intergrown plagioclase (albitized) laths and plates of augite that are mainly replaced by pale green actinolite. Small interstitial FeTi oxide grains are leucoxenitized, and quartz and chlorite are common interstitial alteration phases.

This dolerite is typical of both Henty Dyeke Swarm and Henty Dyke Wedge dolerites, although the rather well developed greenschist facies metamorphic assemblage in this sample implies somewhat higher temperature conditions of metamorphism than for typical Henty Fault Wedge prehnite-pumpellyite facies dolerites. This sample also should be analyzed.

SAMPLE: 30155 Henty Fault Wedge

SUMMARY: This is a contact between a typical greenschist facies Henty Fault Wedge metadolerite and a very fine-grained, chilled, sparsely plagioclase-phyric basaltic dyke of unknown affinities.

HAND SPECIMEN:

This sample is the contact zone between a very fine-grained metabasic lava or dyke and a dolerite or volcanogenic sandstone(?).

THIN SECTION DESCRIPTION:

Thin section examination shows that this sample covers the contact between a metabasaltic dyke and a host metadolerite or microgabbro. The contact is knife-sharp but irregular. The dyke is very sparsely plagioclase-phyric and shows a strong textural variation over less than 1cm distance, from an excellent almost spherulitic quench texture against the dolerite to a texture containing actinolite-altered dendritic to microlitic augite crystallites and crystals in a glassy mesostasis further in; even further away from the dolerite, the texture of the basalt dyke is dominated by sheaves of albitized plagioclase intergrown with tiny well-formed crystals of actinolitized augite. The few plagioclase phenocrysts are notably elongate prisms, and are albitized.

The host dolerite is composed of phenocrysts of augite and plagioclase that have been altered to fibrous pale green actinolite and albite respectively, set in a fairly recrystallized groundmass of actinolite-albite-chlorite-epidote and leucoxene.

Both host and basaltic dyke show well-developed low greenschist facies metamorphic assemblages. The host dolerite is little different from sample 30126 described above, with similar affinities and correlations implied. It is impossible without compositional data to make any judgement regarding the affinities of the totally recrystallized basaltic dyke, although its clear relationship (post-dating) to the dolerite means that some useful conclusions regarding temporal change of magma compositions might be drawn from its composition. The dyke should be analyzed.

SAMPLE: 30117

SUMMARY: This is a tonalite intrusive from a shallow plug or dyke. It contains quite abundant biotite and some K feldspar, and thus is unlike the tonalites in the west Tasmanian ophiolites.

HAND SPECIMEN:

This is a speckled pale brown holocrystalline but relatively fine-grained felsic intrusive rock.

THIN SECTION DESCRIPTION:

This sample is an acidic holocrystalline intrusive rock composed of phenocrysts of feldspar and quartz, and minor biotite, set in a granular groundmass of the same minerals. Quartz phenocrysts are up to 2mm across, often quite fractured, and have ragged edges due to both reaction with melt and re-equilibration with groundmass during metamorphic degradation. They are occasionally intergrown with feldspar phenocrysts. The latter are mainly tabular prisms 1-2mm across, and are apparently albite, although some smaller phenocrysts with more sericite alteration may have originally been K feldspar. A few former mafic phenocrysts to about 1mm across may have been hornblende but are altered to chlorite; more abundant are smaller microphenocrysts of red-brown biotite, some of which are partly chlorite-altered.

The groundmass of this sample is holocrystalline and composed of a fine- to medium-grained granular intergrowth dominated by anhedral quartz and subhedral albite, with abundant interstitial sericite, and not uncommon small plates of brownish biotite. A few small zircons were noted, which may be useful for geochronological studies. The metamorphic assemblage is typical of the prehnite-pumpellyite to lowermost greenschist facies of regional metamorphism of felsic rocks.

This rock is likely to be a tonalitic dyke or shallow intrusive plug. I have not seen tonalites in the Henty Fault Wedge or Dyke Swarm before, but there presence here is not surprising. Tonalitic dykes and small intrusive bodies are frequently associated with the ophiolitic cumulate and dyke sections, but these tonalites lack biotite and are always well into the greenschist facies (abundant actinolite). This sample should also be analyzed.

SAMPLE: 30105 Henty Fault Wedge

SUMMARY: This rock is a strongly plagioclase-phyric tholeiitic dolerite with a lowermost greenschist facies mineral assemblage. It is fairly typical of the Henty Fault Wedge dolerites that I have looked at before.

HAND SPECIMEN:

This rock is a distinctive grey-green strongly plagioclase-phyric basaltic or basaltic andesite with altered plagioclase phenocrysts up to at least 1cm long; many of these show zoning of alteration products.

THIN SECTION DESCRIPTION:

This sample is a well-preserved fine-grained porphyritic dolerite characterized by around 15 modal% of large (to 8mm in section) altered plagioclse phenocrysts, in a typical doleritic-textured groundmass composed of tabular altered albite, with interstitial and finer-grained anhedral to subhedral plates of augite and subordinate FeTi oxides. The latter have been altered to leucoxenic material. Former plagioclase phenocrysts have been albitized, and are riddled by murky epidote that occasionally also occurs as more crystalline blades and aggregates. Sericite is a less abundant but not uncommon alteration mineral in former plagioclase phenocrysts.

The groundmass plagioclase prisms show a similar alteration assemblage to the phenocrysts. Groundmass augite plates, mainly less than 1mm long, are colourless, often simply twinned, and free of alteration. Angular interstices between groundmass plagioclase, augite and FeTi oxides are filled by pale green chlorite and less abundant secondary quartz; tiny actinolite needles are occasionally present in the chlorite where it abuts augite.

This is a tholeiitic dolerite with a metamorphic assemblage typical of the lowermost greenschist facies of regional metamorphism. Its mineralogy and texture are similar to other Henty Fault Wedge dolerites, although the plagioclase phenocrysts are slightly larger and perhaps more abundant than other samples I have seen. It is well preserved and should be analyzed.

SAMPLE: 30106

SUMMARY: This rock is a quenched, strongly plagioclase-phyric basaltic lava or outermost margin of a dyke.

HAND SPECIMEN:

This is a plagioclase-phyric basalt with about 8-10 modal% of clay(?)-altered plagioclase phenocrysts in a very fine-grained groundmass.

THIN SECTION DESCRIPTION:

This rock is a petrographically simple basaltic lava or dyke margin composed of around 10 modal% of euhedral plagioclase phenocrysts that show flow alignment, and perhaps another 2-3 modal% of much smaller plagioclase microphenocryst in a quenched groundmass that was probably largely glassy. The plagioclase phenocrysts are albitized, rather narrow tabular prisms up to 3mm long, mainly well-formed, and with common alteration to sericite. The microphenocrysts are less than

0.2mm long, and similar shaped and altered to the phenocrysts. There are no mafic phenocrysts in this rock.

The groundmass of this sample is structureless and rather murky, and was probably originally a mat of quenched pyroxenes and plagioclases with interstitial glass. It is now composed of a fine-grained intergrowth of chlorite, sericite, quartz and probably albite, in which occasional altered acicular plagioclase quench crystals are visible. The metamorphic assemblage of this rock could be either prehnite-pumpellyite facies or lowermost greenschist facies. Its texture is unambiguously that of a quenched rock, and I would have argued that it is a lava. It is conceivable that it is from the very rim of a decent-sized dyke however. The abundant plagioclase as the sole crystalline phase suggests that it is an evolved basaltic to basaltic andesite composition. Without compositional data it is hard to assign affinities to this sample, but it is not an atypical lithology for either the Henty Dyke Swarm, or the Henty Fault Wedge, in which plagioclase-phyric basalts are quite common.

SAMPLE: 30156 Henty Fault Wedge

SUMMARY: This sample is a greenschist facies formerly plagioclase+ augite-phyric dolerite with less FeTi oxides than many of the other dolerites examined in this set. It may correlate with some of the lower TiO_2 dolerites described from the SW end of the fault wedge (eg 427221, 205 and 216)

HAND SPECIMEN:

This rock is a porphyritic basalt or dolerite with common pinkish altered feldspar phenocrysts and chloritized (?) augite phenocrysts.

THIN SECTION DESCRIPTION:

This sample is a texturally well-preserved originally plagioclase+augite-phyric dolerite or basaltic dyke rock, with a holocrystalline groundmass. It consists of 1-2mm-long phenocrysts of albitized plagioclase and actinolite-chlorite-altered augite, each forming about 5-8 modal% of the sample. The albitized plagioclase phenocrysts are quite pinkish in plane polarized light, being charged with submicroscopic flakes of hematite; they are rarely well-formed, and often appear to have reacted marginally with the groundmass during greenschist facies metamorphism. Augite phenocrysts are euhedral to subhedral and are entirely altered, either to fibrous pale green actinolite, almost colourless chlorite, or both. There are few FeTi oxide microphenocrysts in this rock; those present are altered to leucoxenic aggregates.

The groundmass of this rock was clearly holocrystalline and composed of interlocking subhedral laths of albitized plagioclase and stubby prisms of augite that are totally replaced by actinolite. Small rounded high birefringent grains of sphene replace tiny groundmass FeTi oxides. The texture of the groundmass of this rock is indicative of a basaltic dyke, rather than a lava. The total replacement of augite by actinolite is typical of mid-greenschist facies conditions of regional metamorphism. This sample originally would have been quite similar to 30024B, and the lack of a significant FeTi oxide component suggests compositional affinities with the lower TiO_2 group of dykes analyzed from the southern end of the Henty Fault Wedge (eg. 427221, 216 and 207 in my report to Pasminco).

SAMPLE: 30102 Henty Fault Wedge

SUMMARY: This rock is a very strongly hematite+albite-altered, plagioclase-phyric andesitic dyke.

HAND SPECIMEN:

This rock is a strongly oxidized dark red lava or dyke with small plagioclase phenocrysts.

THIN SECTION DESCRIPTION:

__This rock is a fairly sparsely plagioclase-phyric andesitic dyke rock with around 3-5 modal% of rather ragged small albitized plagioclase phenocrysts (mainly <1mm long) set in an exceptionally feldspar-rich groundmass that is charged with ting hematite grains and grain aggregates that produce the distinctive red colour of this rock. The plagioclase phenocrysts are mainly anhedral clusters of albite microphenocrysts and often have dark rims caused by accumulation at crystal margins of tiny hematite grains. There are no mafic phenocrysts in this sample, not are there any FeTi oxide phenocrysts or microphenocrysts.

The groundmass is a holocrystalline intergrowth of quite elongate plagioclase (albite) laths set in a matrix of anhedral albite and abundant fine-grained hematite. No sign of former mafic grains in the groundmass are discernible. The style of alteration displayed by this sample is characteristic of rocks altered by very oxidizing fluids that strip all the Ca from the rock and replace it with Na; these fluids rarely produce economic Cu-Zn-Pb-rich VMS deposits, but are often active in the footwall alteration zone of massive volcanogenic sulphide deposits that are rich in magnetite and pyrite (eg. Big Cadia in central W NSW). Epidote-rich rocks (epidosites and strongly epidote-veined rocks) are often closely associated with this type of alteration. Only compositional data for immobile elements could determine whether this andesitic rock is an evolved variant of the more typically basaltic Henty Fault Wedge and Dyke Swarm rocks.

SAMPLE: 30002 Henty Fault Wedge

SUMMARY: This rock is a medium-grained volcanogenic greywacke with detrital grains from both typical Mount Read felsic lavas and tuffs, and more mafic andesites and basalts (dolerites). It contains no pelitic metamorphic detritus.

HAND SPECIMEN:

This rock is a massive, structureless medium-grained grey-green volcanogenic sandstone with abundant feldspar and lithic grains.

THIN SECTION DESCRIPTION:

This rock is clearly a volcanogenic greywacke with a non-framework supported fabric. It composed dominantly of only slightly rounded detrital phenocrystal plagioclase, with subordinate phenocryst fragments of augite, quartz, FeTi oxides and rare hornblende, and small, fine-grained lithic volcanic clasts of varying lithology and texture, all set in an indeterminate silty to clayey matrix that may have had a high glassy ash component. The plagioclase grains are <2mm long albite, always speckled by submicroscopic hematite, and are of two main types. Large blocky phenocrysts with sericite spotting are more typical of phenocrysts liberated from felsic lavas and tuffs; however, many albite grains have abundant epidote inclusions and a few are marginally intergrown with augite, almost certainly implying a derivation from more mafic rocks. Augite phenocryst fragments are considerably less abundant than feldspar (perhaps making up around 2-3 modal% of the sample) and would almost certainly be derived from either andeitic or mafic rocks; a few have fringes of actinolite, implying that this sample was metamorphosed under lowest greenschist facies conditions. Detrital quartz grains are clearly of volcanic origin, being monocrystalline, with occasional crystal faces preserved. They would be derived from felsic lavas or tuffs. Leucoxene-altered FeTi oxide grains are relatively large (to around 1mm across) and blocky and look more like they are derived from felsic lavas than andesite-basalt lavas. The few easily identifiable lithic clasts include a beautiful perlitic-cracked formerly highly glassy dacite to rhyolite lavas, several other definite recrystallized formerly glassy felsic lava clasts and a few holocrystalline clsts with doleritic textures. No pelitic metamorphic detritus is present in this sample. The matrix is very fine-grained and riddled with dirty brown epidote, suggesting that it may hav had a significant mafic ash component, although no shard textures are preserved.

SAMPLE: 30061 Henty Fault Wedge

SUMMARY: This rock is a coarse-grained volcanogenic sandstone dominated by felsic volcanic detritus. The matrix has suffered strong but very patchy chloritization.

HAND SPECIMEN:

This rock is a fairly coarse-grained volcanogenic sandstone or grit with abundant detrital feldspar and dark very fine-grained lithic clasts to almost 1cm across.

THIN SECTION DESCRIPTION:

This sample is similar to the previous rock (30002) in many respects, being a volcanogenic greywacke dominated by detrital albite phenocrysts and phenocryst fragments that appear to be mainly from felsic volcanic sources. Major points of difference between this rock and 30002 are :

1: this sample has larger and much more abundant felsic lava fragments; most of these were glassy, but have devitrified to quartz-albite mosaics, often with snowflake textures.

2: Also common in this sample are flow-textured sparsely plagioclase-phyric dacitic to andesitic lava fragments.

3: Augite phenocryst grains and fragments (fresh or altered) are absent entirely, and FeTi oxide grains are much less abundant than in 30002. No unambiguos mafic lithic fragments are present.

4: The silty matrix of this sample was definitley highly glassy, probably with a large component of felsic glass; this has devitrified to granular quartz-albite mosaics that show highly variable extents of overprinting chloritization. Some patches of intensely chloritized matrix are almost 1cm across, and were mistaken in hand specimen for fine-grained lithic fragments.

This is a volcanogenic coarse sandstone derived in large part from a proximal felsic volcanic terrain.

SAMPLE: 30057 Henty Fault Wedge

SUMMARY: This rock is a greenschist facies recrystallized mudstone or shale that contained very fine-grained detrital muscovite, probably from a pelitic metamorphic source, and a component of mafic or intermediate ash that recrystallized as the relatively abundant very fine-grained acicular actinolite in thisrock.

HAND SPECIMEN:

This rock is an exceptionally fine-grained, hard, silicified(?) black shale or mudstone, strongly bleached at the weathering surface,

THIN SECTION DESCRIPTION:

This sample is seen in thin section to be a massive featureless mudstone with the only discernible clastic grains being <<1% of very small detrital muscovite, and one or two tiny angular detrital quartz grains. The rock is riddled with tiny secondary aggregates of dirty brown limonite/goethite that are concentrated in abundance along stylolite-like fractures and more linear cracks and partings. The remainder of the rock is composed of indeterminate material in which tiny acicular actinolite and/or chlorite grains are dispersed in abundance. This is probably a mudstone that contained both a very fine-grained component from a pelitic metamorphic source (muscovite) and probably some very fine-grained comminuted mafic or intermediate ash component. Recrystallization under lower greenschist facies conditions produced this tough, almost hornfelsic rock.

SAMPLE: 30091

SUMMARY: This rock is a massive lizarditic serpentinite after a dunite protolith; it contains useful relic red chromite grains.

HAND SPECIMEN:

This is a massive black serpentinite.

THIN SECTION DESCRIPTION:

This is a massive serpentininite composed almost entirely of structureless lizardite serpentine in which the only relic mineral is about 0.1-0.22 modal% of angular and fractured deep red chromite grains, less than 1mm across. There are no traces of former orthopyroxene or clinopyroxene in this sample, implying that it is derived from hydration of a dunite. Textural obliteration precludes determining whether the dunite protolith was a cumulate rock, or a tectonite dunite. A vein of talc intergrown with colourless chlorite cross-cuts the rock, while pale coloured spots evident in the hand specimen appear to be local concentrations of clay, possibly after talc.

This sample is not mentioned in your notes, but I assume that it comes from the NE end of the fault wedge where ultramafics and gabbros are recorded. Chromite has distinctive compositional features (mainly the ratio Cr/(Cr+Al)) that are very useful for determining the affinities of the ultramafic rock (or serpentinite) in which it is hosted. In the case of this sample, it would be very useful indeed to probe these chromites. If the precursor dunite is associated with the Henty Fault Wedge basalts etc, they should have a Cr/(Cr+Al) value from 0.3-0.7. If on the other hand, they are slices of the typical W Tasmanian ophiolite ultramafic section, they are derived from boninite parent magmas and will have Cr/(Cr+Al) > 0.7.

SAMPLE: 30072

SUMMARY: This rock is a formerly glassy plagioclase+augite +quartz+biotite+FeTi oxide-phyric dacite lava with some calcite alteration overprinting the devitrified glassy groundmass.

HAND SPECIMEN:

This rock is a fresh feldspar+pyroxene (altered)- felsic lava with rather more mafic phenocrysts (chloritized) than in most Mount Read Volcanics dacites and rhyolites.

THIN SECTION DESCRIPTION:

This slightly vesicular sample is composed of around 10-12 modal% of albitized plagioclase feldspar phenocrysts, and 1-2 modal% of augite, quartz, FeTi oxides and biotite, all set in a fairly fine-grained recrystallized, formerly glassy groundmass. The albitized plagioclase phenocrysts are well-formed blocky prisms mainly less than 1.5mm long, that showvariable sericite alteration and minor calcite spotting. Former mafic phenocrysts (augite probably) are small stumpy prisms (<0.4mm long) totally replaced by chlorite; former biotite phenocrysts are also chloritized, bur retain the 'book' cleavage traces well enough to confirm the mica precursor mineral. Quartz phenocrysts are quite large (to almost 2mm), strongly rounded and resorbed, and contain abundant devitrified melt inclusions. Former small FeTi oxide phencrysts have broken down to chlorite-sphene intergrowths. Also notable are common and quite large apatite microphenocrysts.

The groundmass of this sample was almsot certainly originally glassy. It has devitrified to a fine-grained granular mosaic of albite and quartz, with abundant interstitial sericite and minor chlorite. The sample contains a numer of quite large rounded to oval vesicles filled by albite, sometimes partly overprinted by calcite. Fine-grained rather 'dirty' calcite is abundantly disseminated throughout the groundmass. The metamorphic grade of this sample is prehnite-pumpellyite facies, and whereas the calcite indicates some subsequent hydrothermal alteration, this was minor at best. This sample has somewhat more mafic phenocrysts than typically seen in Mount Read Volcanics felsic lavas, but is otherwise little different.

SAMPLE: 30071

SUMMARY: This rock is a formerly glassy quartz+feldspar+biotite-phyric rhyolitic lava.

HAND SPECIMEN:

This rock is a pale brown quartz and feldspar-phyric felsic lava.

THIN SECTION DESCRIPTION:

This rock is a formerly glassy felsic lava containing around 8-10 modal% of slightly rounded and reacted but still "euhedral" phenocrysts of quartz to 2mm across. These show abundant devitrified melt inclusions, and internal strain features and common fracturing. Much less abundant are former plagioclase phenocrysts that are thoroughly sericitized, and subsequently replaced by dirty brown clayey material. Two quite large former bitotite phenocrysts are present, replaced by sericite, chlorite and an Fe or FeTi oxide.

The formerly glassy groundmass has devitrified and crystallized to a fine-grained granular mosaic intergrowth of albite and quartz that is riddled by sericite, which in turn is partially replaced by a brownish clay (during weathering?) that gives this rock is colour. Anastomosing fractures through the sample also concentrate the Fe-stained clay and are darker brown than the matrix. The degree of sericite alteration of this sample is no more than usually observed in burial metamorphose felsic glassy lavas in the Mount Reads (ie. this sample shows no evidence of significant hydrothermal alteration). This is a rhyolitic lava and has obvious correlates in the strongly quartz-phyric rhyolitic lavas of the Tyndall Group and correlates above the Que River Shale in the Hellyer-Sock CK-Mount Cattley region, although quartz-phyric felsic lavas are also known from the Central Vocanic Complex.

PETROGRAPHIC REPORT

Rocks from
PASMINCO EL 11/85 YOLANDE (Henty Fault Wedge)
For Roger Poltock 1/5/91

by
Anthony J. Crawford
Geology Department
University of Tasmania

HENTY FAULT WEDGE - LYNCHFORD SUITE: COMMENTS ON PETROGRAPHY

Those rocks in this collection from the Henty Fault Wedge (herein HFW) are generally remarkably different from the previously lot of HFW rocks that I described previously for Greg Jenkins and Roger Poltock. The major lithology among the rocks I described in the earlier reports were tholeiitic basalts and dolerites. Only one of the present samples matches this group, evolved tholeiitic basalt dyke 31683. Two other samples in the present set (31676 and 31666) are broadly basaltic - andesitic, but alteration or lack of diagnostic textures precludes simple assignment to what I understand as the typical HFW tholeiitic suite. Analytical data on these two samples should enable correlation, and it is strongly recommended that the standard major elements, and Zr, Cr and P2O5 be analysed for. In contrast to the HFW tholeiites, the remaining HFW rocks described in the present report include:

Plagioclase-phyric glassy dacitic lavas (31688 and 30173)

Greywackes derived in large part from Precambrian metasediments and pelitic metamorphics (31678, 31648)

Greywackes derived from felsic volcanic sources, with a minor but significant component derived from the ophiolites (30989)

Greywackes derived from mixed Precambrian metapelite - Mt Read felsic volcanics sources (31700)

It is clearly of great importance to discover the relationships between the felsic lavas 31688 and 30173 in the HFW, and the tholeiitic lavas and dykes. I am still not convinced that the tholeiites in the HFW are not all dykes and sills, but KD Corbett says there are pillow basalts in the Mines Dept drillhole at the southwestern end of the HFW.

I will be very happy to discuss the implications of this report with both of you (ph 002-293831 home, 002-202490 Uni), and try to answer any questions arising.

0119

SAMPLE No: 31614 Lynchford 374100N 79675E

SUMMARY: This is either a rhyolitic quartz+feldspar-phyric ignimbrite, or a quartz+feldspar-phyric vitric crystal tuff.

HAND SPECIMEN:

This is a pale grey altered and silicified(?) quartz and feldspar phyric felsic volcanic rock.

THIN SECTION:

This is a felsic volcanic rock with around 3-5 modal% of each of quartz and albitized plagioclase phenocrysts that vary from 0.5 - 3mm across in a formerly glassy matrix that has devitrified and recrystallized. The quartz phenocrysts are mainly well-formed subhedral to euhedral crystals that show only limited rounding and reaction with the host magma. Likewise, feldspar phenocrysts are euhedral, but almost totally replaced by dirty, fine-grained sericite. A few small FeTi oxide microphenocrysts are replaced by leucoxenitic material.

The groundmass of this rock shows a very unusual and difficult to interpret texture. It shows a weak primary foliation that wraps around bigger phenocrysts, and lends an almost ignimbritic texture to the section. However, there are numerous locations in the slide where ghost relics of glass shards with characteristic curved shapes are observed, suggesting that the matrix was a glassy ash, possibly welded. All the primary glass in this rock has devitrified and recrystallized to a complex and variably-textured quartz-albite intergrowth that has preserved the weak primary foliation. If the rock is pyroclastic in origin, then the largely euhedral and entire phenocrysts are unlike the usually strongly fragmented, broken crystal fragments in the typical felsic 'tuffs' in the Mount Read Volcanics. (eg. Sample 316).

It is difficult to provide a conclusive genetic origin for this rock. It is obviously rhyolitic, but whether it was a true ignimbrite (outcrop evidence might be useful), or a glass-rich rhyolitic mass flow (vitric crystal tuff?) is impossible for me to judge with confidence.

SAMPLE No: 31615 Lynchford

SUMMARY:

This is either a quartz+feldspar-phyric rhyolitic lava or vitric crystal tuff, that has suffered intense sericite-clay alteration.

HAND SPECIMEN:

This is a patchy pale grey felsic lava with rounded quartz phenocrysts and more abundant altered feldspar phenocrysts.

THIN SECTION:

This rather strongly altered sample was clearly a felsic volcanic, although it is less obvious whether it was a rhyolitic lava or a crystal vitric tuff. Quartz phenocrysts from 1-3mm across make up about 3-5 modal% of the sample and are strongly rounded and reacted, and contain numerous rounded crystallized melt inclusions. Former feldspar phenocrysts up to about 2mm long have been totally replaced by sericite and possibly a surficial alteration-related clay mineral. As the groundmass has suffered similar alteration, the feldspar phenocrysts are often difficult to discern, making any estimate of their original modal abundance fairly haphazard. A few microphenocrysts of FeTi oxide have altered to tiny granules of magnetite and sphene.

The groundmass of this sample has been entirely replaced by rather fibrous pale yellow sericite (in places stained bright yellow) intergrown with small patches of rather chalcedonic silica made up of tiny blebs of quartz. The texture of the originally glassy groundmass is largely obliterated by this alteration; however in places there are 'ghost' traces of curved glass shards and textures strongly suggestive of a vitric tuff. In contrast to this evidence, the relatively crystal-poor nature of this sample is perhaps unusual for a Mount Read Volcanics tuff.

It is difficult, if not impossible to determine with certainty whether this rock was a quartz+feldspar-phyric rhyolitic lava, or a vitric crystal tuff. It was however, clearly derived from felsic volcanism, and has suffered intense sericite-clay alteration, much of which might be a surficial weathering feature.

SAMPLE No: 31617 Lynchford

SUMMARY: This is a clean, fine-grained quartz-mica sandstone derived entirely from pelitic metasediments and pelitic metamorphics (quartz-mica schists).

HAND SPECIMEN:

This is a massive quartz-rich well-sorted fine sandstone.

THIN SECTION:

This rock is a clean, well-sorted and matrix-free quartz-rich micaceous sandstone composed entirely of detritus from a pelitic metamorphic source. The average grainsize of the detrital quartz is about 0.1mm, but occasional larger grains are present. Flat, aligned muscovite grains make up around 3-5 modal% of the rock and are up to 1mm long. All the quartz is strained and highly angular, and no evidence of any volcanic component is present in this sample. This sandstone is totally framework supported and adjacent grains show intimately intergrown mutual boundaries indicative of strong pressure solution. Two notable features of this sample are the relative abundance of euhedral, strongly zoned and strongly pleochroic detrital tourmaline, and more rounded to almost euhedral zircons.

This is a clean quartz-mica sandstone derived entirely from the Precambrian pelitic metasediments and metamorphics. It is strongly reminiscent of the Miners Ridge Sandstone.

SAMPLE No: 31620 Lynchford

SUMMARY: This sample is a weakly foliated formerly plagioclase+augite-phyric andesitic lava.

HAND SPECIMEN:

This is a grey-green quite strongly foliated felsic volcanic of pyroclastic rock showing, besides altered feldspar phenocrysts, dark green very fine-grained rock fragments or altered mafic phenocrysts to 0.5cm long.

THIN SECTION:

This sample was undoubtedly an andesitic lava that has suffered fairly strong deformation, with development of a weak foliation defined most clearly by stretching and flattening of the former mafic phenocrysts. The sample is porphyritic, with around 5-8 modal% of small albitized feldspar phenocrysts (<0.5mm long), and about 5 modal% of much larger (originally probably 1-2mm long) mafic phenocrysts that have been thoroughly replaced y pale green chlorite. These were probably augite, although their flattening and replacement means that it cannot be ruled out that they were hornblende.

The groundmass of this sample was probably holocrystalline, although very fine-grained and clearly volcanic. It is composed of small albite laths intergrown with chloritized augite and abundant disseminated amorphous spots of yellow-brown epidote. Several almost parallel bands about 0.5mm wide of dirty brown microcrystalline epidote transect the rock and probably mark diffusion 'fronts'.

The relatively abundant mafic phenocrysts, fairly elongate former plagioclase phenocrysts, and abundant epidote in this sample all indicate that it was originally an andesitic lava. It is not possible without geochemical data to make any further comments on the possible correlations of this sample within the Mount Read Volcanics.

SAMPLE No: 31622 Lynchford

SUMMARY: This is a fine-grained vitric crystal tuff composed of angular crystal fragments of quartz and feldspar in a very fine-grained formerly glassy groundmass in which the glassy ash component has totally recrystallized to quartz and feldspar.

HAND SPECIMEN:

This is a pale grey-cream fine-grained almost sugary-textured felsic tuff or volcanogenic sediment.

THIN SECTION:

This is a very uniform-textured sample, composed of abundant angular fine-grained detritus of quartz and feldspar in a recrystallized glassy ash groundmass. The crystal fragments, dominantly around 0.1-0.5mm across, make up around 25 modal% of this rock and are dominantly angular albitized plagioclase and quartz in subequal proportions. Quartz grains, in particular, show strong corrosion at their margins, and intimate intergrowth with quartz in the recrystallized formerly glassy groundmass. Feldspars are little altered, with occasional fine streaks of sericite. Notable were five or six large euhedral zircons.

The groundmass of this sample is a very uniform fine-grained intergrowth of quartz and albite, peppered with subordinate chlorite. It is almost certainly recrystallized after glass, although there is no textural detail preserved to judge whether this was a welded tuff, a crystal vitric tuff, or a reworked vitric crystal ashy sediment. The lack of sorting of the crystal fragments, and their angularity suggest that this rock has suffered minimal reworking. It was probably a vitric crystal tuff, and was clearly associated with felsic quartz+feldspar-phyric volcanism.

SAMPLE No: 31624 Lynchford

SUMMARY: This is a coarse-grained volcaniclastic sediment composed of crystal and rock fragment detritus from two major sources, a quartz+feldspar-phyric felsic lava pile, and an augite+plagioclase+FeTi oxide-phyric andesite sequence.

HAND SPECIMEN:

This is a quite coarse-grained volcanogenic sediment with clasts of dominantly felsic volcanics up to several cm long.

THIN SECTION:

This sample is a volcanogenic sediment derived principally from two sources. Clasts (and discrete detrital crystals of quartz and feldspar) of originally glassy almost aphyric to relatively strongly quartz+ feldspar-porphyritic rhyolite are dominant make up about 40 modal% of the rock, and vary from several cm long to fine sand-sized. Feldspar occurs as blocky crystals to several mm across, is albitized plagioclase and generally shows only minor sericite speckling. One of the largest clasts in the sample is a formerly glassy almost aphyric rhyolite that has been totally replaced, except at its outermost margins, by fine-grained calcite.

Equally as abundant as the felsic detritus is crystal fragment material and some rock clasts derived from an andesitic to basaltic source. Prominent in this assemblage are beautiful well-formed phenocrysts and phenocryst fragments of fresh augite, that shows marginal replacement by fibrous pale green actinolite. The augite phenocrysts average from 1-2mm long, and have the appearance of typical augite phenocrysts in Mount Read Volcanics andesites and basalts such as the Hellyer and Lynchford basalts. The presence of microphenocrystal inclusions of FeTi oxide in many augite crystals argues for evolved basalt or andesite lava sources for these crystals. In fact, one well-preserved volcanic fragment is clearly andesitic rather than basaltic, with phenocrysts of augite, plagioclase and FeTi oxide. Detrital well-formed FeTi oxide phenocrysts are also common in this rock, and argue for an andesitic source.

The groundmass of this sample is a variable silty to fine-sand-sized material that was probably rich in glassy ash; the glass has devitrified and recrystallized to very fine-grained quartz-feldspar - minor chlorite intergrowths. It contains common acicular actinolite.

This sample is derived from a source dominated by two components, a felsic quartz+feldspar-phyric lava suite and a plagioclase + augite+FeTi-oxide phyric andesite suite. The presence of common actinolite in this rock indicates that it is a low greenschist facies burial metamorphic assemblage, and higher grade than the Henty Fault Wedge rocks described in this set of samples.

ROGER:

Sorry to take so long with these. I only got them off Simon on Thursday eventually, due to a bit of a backlog in the lapidary section.

Major points are:

1: that I saw nothing basaltic and very little andesitic among the clasts in the conglom/ssts. All clasts could have come from typically dacitic -dominated sections of the Mount Read Volcanics. I would discount both the Que andesites and the Hellyer basalts as possible sources.

2: the clast examined (31526) shows intense silicification, and many smaller clasts in the conglom and sandstone show highly variable and quite intense sericitization and some calcite alteration, indicating pre-depositional alteration.

3: however, the base metal sulphides in 31527B are clearly post-depositional and formed in the sediment in situ, perhaps due to remobilization from the base metal sulphide clasts you note in the same host conglomerate..

Please ring me if you have any queries with this. Best wishes

Tony

PS Hard copy plus bill is in mail

SAMPLE No: 31523 Newton Ck Dam Spillway Host Conglom

SUMMARY:

This is a coarse sandstone or fine-grained conglomerate composed entirely of clasts derived from glassy,, weakly feldspar-phyric felsic volcanics. It contains no obvious component from Precambrian pelitic metamorphics, nor does it contain detritus from quartz-phyric felsic volcanics. The most likely source of this sediment would be the thick dacite + rare andesite pile in the Central Volcanic Complex in the Tullah - Mt Black area, or else a section of the Mount Read Volcanics with a similar lava sequence to that area.

HAND SPECIMEN:

This is an altered volcanogenic conglomerate with clasts to at least 10cm long; most are angular feldspar-phyric andesite, although a few finer-grained dark clasts may be basaltic.

THIN SECTION:

This very weakly schistose sample is composed entirely of clasts and finer-grained detritus derived from dominantly felsic, altered glassy volcanics. The majority of clasts were glassy feldspar-phyric dacitic or more evolved volcanics with generally less than 5 modal% of rather broken and rounded albitized plagioclase phenocrysts, ranging in size from <0.5mm to several mm long. More often than not, these albite phenocrysts occur in multi-crystal clots, some of which have small amount of interstitial altered glass between subhedral crystals, and others that show intimately sutured grain boundaries on generally anhedral crystals. The latter are probably small clots of plagioclase-rich cumulates torn from the magma conduit during eruption, whereas the former appear to be crystal clots of phenocrysts agglutinated together during explosive eruption. There are no former mafic phenocrysts in this sample, although leucoxene-altered small FeTi phenocrysts and microphenocrysts are not uncommon, and small apatite microphenocrysts are also present, although not abundant. The matrix of this rock shows considerable diversity in texture, due partially to variable response to devitrification and partially to variable degree of alteration. All clasts but one had a glassy groundmass and the matrix between clasts was glassy, so that the boundaries between clasts are difficult to discern in most cases. Glass has invariably devitrified to very fine-grained intergrowths of quartz and albite pervaded by fine-grained networks of sericite. Several clasts are quite schistose and considerably more sericitized than the others, clearly showing that limited cleavage development and intense sericite alteration had affected at least some of the source rocks of these schistose clasts. One clast is more holocrystalline and choritic, being composed of a fine-grained intergrowth of albitized plagioclase laths with interstitial chlorite.; this was almost certainly from a thick andesitic lava flow. A number of exceptionally fine-grained dark, chloritic clasts with occasional prismatic albite microphenocrysts may represent devitrified chilled glassy margins of the same flow(s).

The dominant alteration assemblage in this sample is sericite-calcite, with sericite pervading the matrix, and calcite forming abundant small pools, especially within albite phenocryst clots. Silica was also clearly mobile during this alteration, although it does not appear to have been introduced into the rocks in any significant amount.

REFLECTED LIGHT:

This sample contains sparse, disseminated and fine-grained pyrite euhedra as the major sulphide phase, and a very minor amount of amorphous, very fine-grained and interstitial sphalerite. A few specks of chalcopyrite are associated with a clast in which chlorite is the dominant silicate. The pyrite is clearly post-depositional in origin.

This sample could easily be derived from the Central Volcanic Complex dacites and rare andesites, such as the sections between Tullah and Mt Black. There is too little andesitic detritus to suggest derivation from the Que Footwall Andesite-type lava pile, and there is no evidence whatsoever for a detrital basaltic component in this sediment.

SAMPLE No: 31526 Newton Ck Dam Spillway

SUMMARY: This rock was a glassy, sparsely plagioclase-phyric dacitic lava that underwent devitrification and sericite-calcite alteration, before intense silicification occurred, probably during more brittle fracturing of the rock.

HAND SPECIMEN:

This is a sample of a very strongly altered, pale grey former felsic lava clast within 31526; it shows altered feldspar phenocrysts and quite strong silicification of the groundmass. It has a darker rim about 1cm wide

THIN SECTION:

This rock is an intensely altered and recrystallized formerly glassy felsic lava. It was composed of a few modal % of blocky subhedral to rather rounded albitized plagioclase phenocrysts up to 2mm across, often partially replaced by pools of clear calcite. The feldspar phenocrysts often occur in multi-crystal clots of three or four intergrown crystals. The only other evidence for former phenocryst phases are quite common leucoxene-altered FeTi oxide, and abundant small euhedral prisms of pale green apatite. There were probably no mafic phenocrysts in this sample.

The groundmass of this rock was originally glassy, but it has devitrified to a very fine-grained quartz-albite intergrowth that is variably but significantly transected by a mesh of sericite, and contains a small amount of fine-grained chlorite. Subsequently, the rock has suffered probably an episode of brittle fracturing during which it was soaked by silica-rich hydrothermal solutions. Groundmass adjacent to en-echelon fractures transecting the rock shows intense either recrystallization dominated by a fine-grained mosaic intergrowth of quartz, and the same material fills veinlets and forms small polycrystalline coarser-grained blebs throughout the groundmass. Elongate calcite rhombs are commonly intergrown with the secondary silica, and almost botryoidal calcite forms borders to many silica patches. The darker rim of the clast is certainly more chloritic than the internal part, but the colour difference is more due to the far less intense silicification of the rim relative to the interior of the clast. It is unusual that the core of this clast should be notably more altered (in this case, silicified) than the rim. This probably implies that the clast was silicified before incorporation into the conglomerate. Alternatively, it may indicate that the dispersed chlorite component in the groundmass of the core of the clast was remobilized and recrystallized (that is, displaced) from the core to the rim of the clast during the intense silicification.

This sample was a glassy sparsely plagioclase-phyric dacite lava that suffered devitrification with calcite-sericite alteration, then an episode of quite intense silicification, during which pre-existing calcite was recrystallized and remobilized.

SAMPLE No: 31527A Newton Ck Dam Spillway

SUMMARY: This sample is a volcanogenic sandstone dominated by clasts derived from glassy felsic volcanics, including feldspar-phyric and feldspar+quartz phyric lavas. It contains disseminated sulphides, dominated by pyrite and sphalerite, but with notable galena, chalcopyrite and pyrrhotite.

HAND SPECIMEN:

This is a grey, coarse volcanogenic sandstone, with clasts averaging around 1-3mm across. It contains notable disseminated pyrite and pits where sulphides have weathered out.

THIN SECTION:

This is a volcanogenic sandstone dominated by 1-3mm-sized grains of fine-grained felsic volcanics and formerly glassy ash-rich fine-grained sediments or vitric tuffs. Clasts and grains range from subrounded to rather elongate-angular, and the sample is now virtually matrix-free, due to pressure solution-compaction which produced narrow dark rims of insoluble material (graphite(?) and altered FeTi oxides and hematite-limonite minerals). By far the majority of grains/clasts were glassy felsic lava, varying from aphyric to sparsely plagioclase-phyric; a few notable clasts contain occasional euhedral to subhedral quartz phenocrysts. Glass has always devitrified to a fine-grained quartz-albite-sericite intergrowth, variable in texture from clast to clast; snowflake devitrification textures are present in some clasts, whereas other clasts show intense sericitization, and in rare cases, strong silicification. Less abundant clasts are fine-grained sediments or tuffs that probably has a large vitric component, that has always devitrified. A few clasts with abundant parallel-orientated narrow albite laths, dark very fine-grained Fe oxide-rich matrix, and not uncommon chlorite were probably more andesitic than rhyolitic/dacitic. Euhedral volcanic quartz up to 2mm across also occurs as occasional detrital grains. Calcite is not common.

REFLECTED LIGHT

Pyrite and sphalerite are the dominant sulphides in this sample, and may make up about 2-3 modal% of the rock. Pyrite occurs as disseminated euhedral grains to about 1mm maximum width, often showing rather ragged grain boundaries. The pyrite crystals grow within clasts, and across clast grain boundaries into adjacent clasts. They are clearly 'in situ', having grown post-deposition of this sediment. Sphalerite is a deep red, probably Fe-rich variety and grows as amorphous interstitial blebs and patches; it is probably modally subordinate to pyrite. The sphalerite is almost always associated with other sulphides, including pyrrhotite, galena and chalcopyrite. Intergrowths of pyrrhotite and sphalerite are most common, and in these the sphalerite is more crystalline. Chalcopyrite commonly occurs as narrow partial rims on sphalerite patches. Galena seems to occur most frequently in small patches of clear secondary quartz, although it does also occur intergrown with amorphous sphalerite.

All the sulphides in this sample have grown in situ; none are detrital. The paragenetic sequence was clearly pyrite first, followed by co-crystallization/growth of sphalerite-chalcopyrite-pyrrhotite and galena. The alteration associated with this base metal mineralization (albeit minor) is not intense or well-developed, and appears to be weak sericite-quartz ± calcite alteration, no different at all from rocks that lack this disseminated sulphide (eg 31523).

SAMPLE No: 30527B Newton Ck Dam Spillway

SUMMARY: This sample is an interbedded volcanogenic fine-sandstone - siltstone composed of lapilli and detrital feldspar fragments derived entirely from felsic glassy volcanics.

HAND SPECIMEN:

This is a well-bedded, grey and white silty volcanogenic (tuffaceous?) sediment with beds ranging from 1mm to 1cm thick

THIN SECTION:

This rock is made up of a sequence of silty to fine-sandy beds composed entirely of detritus from felsic glassy volcanics. The abundance of glassy lapilli (averaging around 0.1-0.4mm across in the coarser-grained beds) that have devitrified to extremely fine-grained quartz-albite, and the certain presence of a similarly-altered finer-grained formerly vitric component, almost obscures the detrital nature of sandstone. Significantly, detrital volcanic quartz is either very rare or absent, and the most abundant detrital mineral fragments are albite. The pronounced colour banding is due essentially to variations in the abundance of both chlorite and leucoxenitic aggregates in adjacent beds. Chlorite occurs as bedding-parallel flakes and concentrations, together with disaggregated trails of dirty brown leucoxenitic minerals. It is likely that the relative abundance of detrital oxides in some layers led to higher Fe contents, thus stabilizing chlorite in that layer during subsequent alteration.

There was no detrital component (eg muscovite-metamorphic quartz) derived from pelitic metamorphics in this sample. Rather, the detrital fraction was derived entirely from glassy dacitic to rhyolitic volcanics. The thick white bands in the hand specimen do not appear in thin section to be silicified compared to the rest of the rock. They are simply 'cleaner', in that they lacked, relative to the darker layers, abundant detrital FeTi oxide granules from which Fe was leached to relocate in chlorite.

This is a volcanogenic fine-grained sandstone-siltstone composed of detritus from glassy felsic, probably feldspar-phyric dacitic lavas. It is probably the least altered of the four samples examined in this set, calcite being virtually absent. Disseminated fine-grained euhedral pyrite is clearly post-depositional.

SAMPLE No: 30173 Henty Fault Wedge

SUMMARY: This sample is a quite strongly plagioclase-phyric formerly glassy dacitic lava.

HAND SPECIMEN:

This is a relatively strongly and coarsely feldspar-phyric felsic lava with strong Fe-staining alteration overprinting the blue-grey 'fresh' core of the hand specimen.

THIN SECTION:

This is a distinctive coarsely feldspar-phyric weakly vesicular dacitic lava composed of around 20-25 modal% of albitized plagioclase phenocrysts up to 4mm long in a formerly vitrophyric groundmass. The altered feldspar phenocrysts are almost totally replaced by sericite, and occasional patches of calcite. Several clusters of small (<0.2mm long) chloritized augite microphenocrysts are present bur make up much less than 1 modal% of this rock.

The groundmass was originally composed of elongate plagioclase microlites embedded in glass. The plagioclase crystals have been altered to albite, and subsequently sericite, whereas the glassy groundmass has devitrified and partially recrystallized as a very fine grained and heterogeneous quartz and feldspar intergrowth riddled with dirty brownish sericite. Vesicles make up about 2 modal% of this sample and are filled by chlorite and calcite. Abundant tiny Fe(Ti) oxide granules are disseminated throughout the groundmass, and may be primary, or alternatively, an alteration feature associated with devitrification-recrystallization of glass. Although the sericite alteration of this sample is fairly severe, I suggest that the alteration style and assemblage are not indicative of any local hydrothermal alteration, but are essentially typical of regional burial metamorphism of glassy felsic lavas. This sample was a markedly plagioclase-phyric dacitic glassy lava.

SAMPLE No: 30989 Henty Fault Wedge

SUMMARY: This is a volcanogenic sandstone derived in part from felsic quartz+feldspar-phyric Mt Read Volcanics, and part from chromite-rich ultramafic-mafic rocks of the W Coast ophiolites.

HAND SPECIMEN:

This is a dark green relatively coarse-grained volcanogenic sediment with clasts of mainly felsic volcanic rocks up to several cm long.

THIN SECTION:

This volcanogenic sediment contains detritus from two distinct and very different sources. Dominant are clasts of formerly glassy sparsely plagioclase ± quartz-phyric rhyolites and dacites, in which the glass has variably devitrified and recrystallized as fine- medium-grained mosaic intergrowths of quartz, feldspar and minor chlorite. Discrete crystal fragments of volcanic quartz and albitized feldspar are abundant as the finer-grained, sandy component of this sediment. Less abundant but nevertheless well-represented and quite important are clasts of serpentinite and chloritized mafic-ultramafic rocks. One of the latter has a texture strongly reminiscent of an orthopyroxenite from the ophiloites such as at Heazlewood. Several others contain large red euhedral chromites in chlorite and serpentine, and are also almost certainly ophiolite-derived. Discrete detrital grains of deep red chromite are quite common, and further support the interpretation that detritus from the ophiolites forms a significant component of this sedimentary rock. There is no trace of any Precambrian pelitic metamorphic-derived detritus in this sample. The orientation of flattish clasts in this sample was probably primary, but the sample shows mild to strong development of sericite, that in places forms a weak foliation. Abutting grains and mutually intrusive grain contracts on clasts indicate extensive pressure dissolution.

This is a volcanogenic coarse sandstone derived in part from a felsic quartz+feldspar-phyric volcanic terrain, clearly Mount Read Volcanics, and partly from a Cr-rich mafic-ultramafic complex, almost certainly that now represented in W Tasmania as the dispersed ophiolite slices such as Serpentine Hill and Heazlewood River Complexes.

SAMPLE No: 31648

SUMMARY: This is a foliated coarse-grained metasediment derived almost entirely from Precambrian metasediments and quartz-mica schists. Some shale clasts are strongly pyritic, and dissolution of this sedimentary pyrite resulted in nucleation and recrystallization of pyrite in the more porous coarse sandstone. This is not hydrothermal pyrite.

HAND SPECIMEN:

This is a dark grey to black bedded, foliated metasediment, with a cm-thick layer of coarse-sandstone adjacent to a fine-grained sandstone containing flat clasts of shale. It shows strong development of pyrite as interstitial grains throughout, and some coarser pyrite development (or clasts?) in the coarse sandstone.

THIN SECTION:

This rock was originally a poorly sorted coarse-grained sandstone with either laminae or rip-up clasts of shale. The coarse bed (mainly 0.4-4mm across) is dominated by single grains of polycrystalline quartz and a remarkable diversity of pelitic metamorphic and metasedimentary lithic clasts, all quartz-rich. The lithic clasts range from shale through siltstone and quartz sandstone to quartz-muscovite schist and quartzite. Some clasts are strongly impregnated by fine-grained pyrite, while others are pyrite-free. Pressure solution has almost eliminated any matrix present, and most clasts show intimately intergrown grain boundaries. The finer bed(s) in this sample are fine quartz sandstone to siltstone, with what appear to be rip-up clasts of pyritic shale. The latter are strongly impregnated by disseminated fine pyrite that defines weak bedding-parallel layers (<<1mm thick). There is no convincing evidence for any volcanic component in this sample.

REFLECTED LIGHT

The abundant sulphide mineral in this sample is exclusively pyrite. It exists in two quite different forms. Volumetrically more abundant is the form composed of subrounded aggregates of extremenly fine-grained pyrite that form grains to several mm across in the coarse-sandstone. These probably formed in situ, rather than being detrital grains, by dissolution - recrystallization of abundant fine-grained disseminated pyrite in the shaley clasts. Outer margins of these grains are recrystallized to coarser, well-formed pyrite euhedra, and similar crystalline pyrite extends into the matrix as narrow veinlets. The paucity (absence) of associated base metal sulphides in this sample, the clear evidence for sedimentary pyrite in the shale clasts, and the textures of the coarser pyrite argue that the pyrite throughout this sample was derived from dissolution and reprecipitation of sedimentary pyrite present in the sample; deformation-associated recrystallization of some of this pyrite in more permeable coarse-grained layers resulted in coarsening of the grainsize of some pyrite, and development of narrow veinlets.

SAMPLE No: 31653 Queenstown Rd near South Henty Fault

SUMMARY: This sample is a feldspar-phyric formerly glassy and possibly weakly flow-banded dacitic lava.

HAND SPECIMEN:

This is a buff-coloured felsic lava or tuff with small altered feldspar phenocrysts.

THIN SECTION:

This is a feldspar-phyric dacitic lava that had originally a glassy groundmass that still shows some vague evidence of flow banding. Feldspar phenocrysts are albitized plagioclase, mainly 0.4-1mm-sized euhedra that are partially replaced by sericite. They make up around 8-10 modal% of this rock. A few small chlorite-altered former mafic microphenocrysts may have been augite, and former FeTi microphenocrysts are altered to leucoxenitic aggregates.

The groundmass of this sample has an unusual texture, with abundant evidence that it is derived from devitrified and recrystallized felsic glass. In places it shows a relic fluidal texture suggestive of former flow banding in the sample, although this is not obvious at all in the hand specimen. There is no trace of former glass shard material, and the groundmass is assumed to have been fairly homogeneous, weakly and finely flow-banded rhyolitic glass. Recrystallization of the altered glass has been very patchy, with some domains being rich is quartz and relatively coarse-grained, whereas other areas are dirty brown and sericite-rich, perhaps reflecting the former presence of secondary Kspar in the recrystallization assemblage. The alteration assemblage (albite, quartz, sericite, leucoxene ± chlorite) is simple and regional metamorphic in nature, rather than due to local hydrothermal alteration.

This sample was a feldspar-phyric glassy dacitic lava.

SAMPLE No: 31664 Henty Fault Wedge

SUMMARY: This is a formerly glassy sparsely plagioclase+augite -phyric felsic lava that has suffered a *quartz-chlorite alteration overprinted by strong carbonate alteration*.

HAND SPECIMEN:

This is a grey felsic lava breccia with sparse angular fragments to almost 1cm long in a fairly altered plagioclase- + mafic-phyric groundmass.

THIN SECTION:

This is clearly a formerly glassy felsic lava in which the one or two fragments obvious in hand specimen have not been cut by the thin section. The rock was an almost aphyric dacitic lava in which the originally glassy groundmass has recrystallized to a relatively coarse-grained quartz-albite intergrowth. A few blocky microphenocrysts of altered plagioclase and one phenocryst of chloritized augite are identifiable, and there are quite a few former microphenocrysts of augite also replaced by very pale green chlorite. A few small FeTi oxide microphenocrysts are altered to dirty leucoxenitic material.

The groundmass of this rock is a recrystallized intergrowth of rather angular quartz and albite, the latter partially replaced by wispy sericite. Very narrow veinlets of quartz are present and merge at their margins into the recrystallized groundmass, suggesting that some degree of silicification has affected this sample. Narrow chlorite veinlets are also present, and there is a relatively large amount (for what is clearly a felsic lava) of disseminated chlorite throughout the groundmass, much of it intergrown with fine-grained quartz. A few idiomorphic pyrite grains <1mm across are probably associated with this quartz-chlorite alteration.

Carbonate alteration (calcite) has pervaded rock post-quartz-chlorite alteration, and overprints perhaps 50 modal% of the section. It occurs as fine-grained patches and pools, as meandering and discontinuous veinlets and as discrete rhombic crystals.

This rock was probably a sparsely porphyritic, glassy dacitic lava, that suffered strong devitrification and recrystallization of glass, possibly contemporaneous with quartz-chlorite ± minor sericite alteration; subsequent calcite alteration overprinted the recrystallized fabric of the rock. The few dark, formerly glassy angular fragments visible in the hand specimen probably represent quenched flowtop material incorporated into the magma during convective overturn accompanying eruption. Although this rock cannot be simply correlated with other felsic volcanics in the Mount Read Volcanics (due to alteration and the fact that most formerly felsic lavas look the same anyway), it is clearly quite unlike the mafic lavas and dolerites previously recorded from within the Henty Fault Wedge. Its field relationships with the latter samples would be useful to know.

SAMPLE No: 31666 Henty Fault Wedge

SUMMARY: This is a very strongly calcite-sericite-hematite ±pyrite-altered andesitic to basaltic strongly vesicular glassy lava breccia. It is probably associated with significant hydrothermal alteration.

HAND SPECIMEN:

This sample is a strongly altered grey green foliated intermediate lava breccia with flattened lava fragments to almost 1cm long.

THIN SECTION:

This rock is a weakly foliated basaltic or andesitic lava breccia that has suffered intense calcite-sericite-hematite alteration. Lava fragments were mostly strongly vesicular glass with variable amounts of phenocrysts of augite and plagioclase. All have been slightly flattened and vesicles are filled by sericite and sometimes pale green chlorite. Former plagioclase phenocrysts up to 2mm long are uncommon and totally replaced by very dense intergrowths of fine-grained sericite. More equigranular phenocrysts also replaced by sericite and occasionally chlorite were probably augite.

Besides the weak foliation development, this sample shows intense alteration. The dominant alteration assemblage is fine-grained sericite and calcite, with abundant finely granular hematite disseminated throughout, but particularly defining the rims of vesicles. Hematite-altered pyrite grains are not common, and slightly coarser-grained than the abundant hematite.

This rock was probably an essentially monomict andesitic to basaltic lava breccia, probably with affinities with the Lynchford-type andesites and basalts rather than the Henty Fault Wedge tholeiitic lavas and intrusives. It is so intensely altered as to suggest proximity to significant hydrothermal alteration.

SAMPLE No: 31676 Henty Fault Wedge

SUMMARY: This is an aphyric meta-andesite or evolved metabasalt of undetermined affinities, but possibly related to Henty Dyke Swarm - Henty Fault Wedge rocks.

HAND SPECIMEN:

This is a dark grey fine-grained aphyric meta-mafic(?) lava with rather patchy alteration marked by paler and darker grey domains and calcite veinlets and patches.

THIN SECTION:

This is a reasonably difficult sample to diagnose, especially with respect to regional correlation. It was clearly an aphyric, quenched lava containing <1 modal% of albitized plagioclase microphenocrysts less than 0.6mm across with only very weak sericite alteration. The remainder of this sample was originally composed of an intersertal-textured groundmass composed of intergrown 0.2 - 0.5mm-long albitized plagioclase laths and less abundant more equigranular augite plates that have entirely altered to an extremely fine-grained intergrowth of quartz and pale green chlorite. There may have been some glassy mesostasis between groundmass grains, but it has been replaced by chlorite, secondary quartz and quite abundant fine-grained Fe(Ti?) oxides; the latter occur as trails and streaks, and concentrations defining the rims of former FeTi oxide microphenocrysts. In an elongate vein-like zone several mm wide in which a number of former vesicles occur, the groundmass grainsize decreases strongly, and the texture changes to a typical quench-textured altered glass with spherulitic former pyroxenes and acicular plagioclase crystallites. This probably represents a cooling crack in the flow into which lava squeezed and quenched.

Two forms of alteration have affected this rock. Randomly orientated microshears several mm wide are quite common and show a pronounced decrease of grainsize and concentration of very fine-grained opaques, attesting to local crushing and dissolution of the rock, and concentration in the microshears of less soluble components such as the FeTi oxides. Secondly, dispersed and abundant calcite overprints the rock, and clearly post-dates even the microshears.

The affinities of this rock are difficult to determine with certainty from thin section diagnosis. I suggest that it was probably an andesitic lava, although the abundance of Fe(Ti?) oxides, and phenocryst-poor nature of the sample might invite comparison with some of the more evolved Henty Dyke Swarm dykes Henty Fault Wedge metabasics. It is texturally unlike the andesitic rocks in the Fault Wedge from the Halls Rivulet area. This rock should be analyzed to check on its affinities; if it becomes evident that it is related to the basaltic Henty Dykes - Henty Fault Wedge suite, its field relationships with the other more felsic rocks in this collection are important.

SAMPLE No: 31678 Henty Fault Wedge

SUMMARY:

This rock is a quartz-rich micaceous greywacke derived entirely from pelitic metamorphics; it shows quite strong calcite alteration, particularly of the silty matrix.

HAND SPECIMEN:

This is a grey, quartz-veined, fine-grained quartz-rich micaceous greywacke.

THIN SECTION:

This rock is a fairly even-textured but poorly sorted sandstone composed of notably angular grains of detrital quartz, well-formed muscovite flakes and pelitic metamorphic rock fragments, with an average grainsize around 0.1 - 0.2mm across. It is not framework-supported, and consists of around 50 modal% of matrix. All the detrital quartz is strained, often polycrystalline metamorphic quartz; there is no convincing volcanic quartz in this sample. Rock fragments are mainly quartz- muscovite schists, and the occurrence of olive green tourmaline and quite coarse (to almost 1mm long) detrital muscovite (about 2 modal%) suggests derivation from a pelitic metamorphic source. The matrix of this sample is silt-sized but has been strongly overprinted and replaced by calcite. Small-scale shears show local recrystallization and crushing, and in zones of abundant sub-parallel shears, Fe-staining picks out a weak foliation marking concentrations of insoluble Fe(Ti) oxides in stylolite-like zones of pressure solution. Small concentrations of tiny oxidized pyrite euhedra are occasionally associated with calcite veins.

This is a greywacke derived from adjacent pelitic metamorphics with apparently zero input from a volcanic source.

SAMPLE No: 31683 Henty Fault Wedge

SUMMARY:

This is a sparsely plagioclase-phyric evolved tholeiitic basaltic dyke probably correlated with the other tholeiitic intrusives in the Henty Fault Wedge and Dyke Swarm.

HAND SPECIMEN:

This is a fine-grained aphyric metabasic lava.

THIN SECTION:

This rock is a well-preserved almost aphyric basaltic dyke rock with sparse small phenocrysts of plagioclase in an ophitic-textured groundmass. The plagioclase phenocrysts are albitized laths mainly from 0.5-2mm long, and make up only 1-2 modal% of the rock. They are thoroughly altered to sericite. The remainder of the rock consists of an intergrowth of albitized and sericitized small plagioclase laths in larger plates of fresh augite that average around 2mm across. Interstitial areas are composed of green chlorite, minor blebby quartz, leucoxene, sericite and quite abundant and well-formed FeTi oxide crystals that sometimes show needle shapes suggestive of ilmenite. Epidote occurs as a well-crystallized pale yellow alteration phase associated with chlorite.

This sample is clearly a basaltic dyke rock, and the abundant oxides and texture are typically tholeiitic, suggesting affinities with the Henty Dyke Swarm and Henty Fault Wedge intrusive tholeiites. It should be analyzed to check this correlation. If its relationship with the felsic rocks in this set is well-defined, this is useful information for interpreting the significance of the Henty tholeiitic suite(s).

SAMPLE No: 31688 Henty Fault Wedge

SUMMARY: This is a formerly glassy plagioclase-phyric dacitic lava that has suffered quite strong calcite-sericite ± pyrite alteration of probable hydrothermal origin.

HAND SPECIMEN:

This is a quite strongly-altered cream-coloured sparsely feldspar-phyric felsic lava with notable thin green streaks of chlorite(?).

THIN SECTION:

Thin section examination shows this sample to be a highly altered formerly glassy feldspar-phyric felsic lava. It is composed of around 3 modal% of quite large and somewhat rounded albitized plagioclase feldspar phenocrysts that show partial sericite alteration, set in an intensely altered groundmass. The feldspar phenocrysts are mainly 1-2mm long. There is no evidence for the former presence in this sample of mafic phenocrysts.

The groundmass of this sample was originally vitrophyric-textured, composed of tiny feldspar microlites randomly orientated in glass. The glass suffered devitrification and recrystallization during burial metamorphic degradation, leading to a fine-grained quartz-feldspar mosaic that was subsequently strongly overprinted by strong sericite- calcite alteration. Localized small patches containing hematite-altered idiomorphic pyrite grains mainly < 0.2mm across are present but make up an insignificant volume of this rock. The intense calcite-sericite ± pyrite alteration is probably of local hydrothermal origin.

This rock was clearly a sparsely plagioclase-phyric felsic lava, probably dacitic.

SAMPLE No: 31700 Henty Fault Wedge

SUMMARY: This is a fine-grained sandstone derived in part from a quartz+feldspar-phyric felsic volcanic source, and in part from a pelitic metamorphic source; the matrix is considered to have had a large component of felsic ash that has altered to a quartz-rich microcrystalline intergrowth.

HAND SPECIMEN:

This is a grey fine-grained volcanogenic sandstone or crystal vitric tuff that looks rather silicified, and is cut by thin quartz veinlets.

THIN SECTION:

This sample is a fine-grained very immature sandstone (greywacke) composed of around 25 modal% of detrital grains of dominantly quartz and feldspar in a recrystallized very fine-grained matrix that probably had a large silty ash component. The grainsize of the detrital fraction averages around 0.1-0.2mm, although a few blocky detrital albite grains are almost 1mm long. All detrital grains are very angular, and derivation from two quite distinct sources is indicated. Most of the detrital quartz and probably all the detrital feldspar grains are clearly of volcanic origin, with occasional crystal faces and round melt inclusions. Feldspar phenocrysts and phenocryst fragments are strongly sericitized, and have blocky habits typical of those in the felsic Mount Read Volcanic lavas and tuffs. However, some detrital quartz is quite polycrystalline, shows gradual extinction and internal strain features suggesting derivation from the Precambrian pelitic metamorphics. This assertion is strongly supported by the common presence of flakes of detrital muscovite, foliated quartz-feldspar-muscovite schist, and occasional tourmaline grains in this rock.

The matrix of this sample is a very fine-grained quartzo- feldspathic intergrowth possibly in large part having crystallized from devitrified felsic glassy ash; however, the extent of the recrystallization and the subsequent overprinting sericitization and carbonate alteration have obliterated any shard structures that might have offered a more positive identification of the felsic ash-dominated matrix Several alteration styles have overprinted this rock. Dominant is fairly pervasive fine-grained calcite alteration that occurs as narrow veinlets, small pools and patches, and as individual small rhombs replacing matrix and detrital grains. It makes up around 20 modal% of the sample. Less abundant quartz veinlets, <1mm wide cut the sample, seem generally to predate the carbonate alteration, but post-date sericitization of the detrital feldspar fraction. A few small patches of brownish-yellow sphalerite are present in the quartz veinlets.

This is a fine-grained volcanogenic sandstone derived in large part from a felsic quartz+feldspar-phyric volcanic source, but with a significant component derived from a pelitic metamorphic terrain.

APPENDIX E

PHOTOGRAPHS OF LITHO-TYPES

E1 White Spur Area

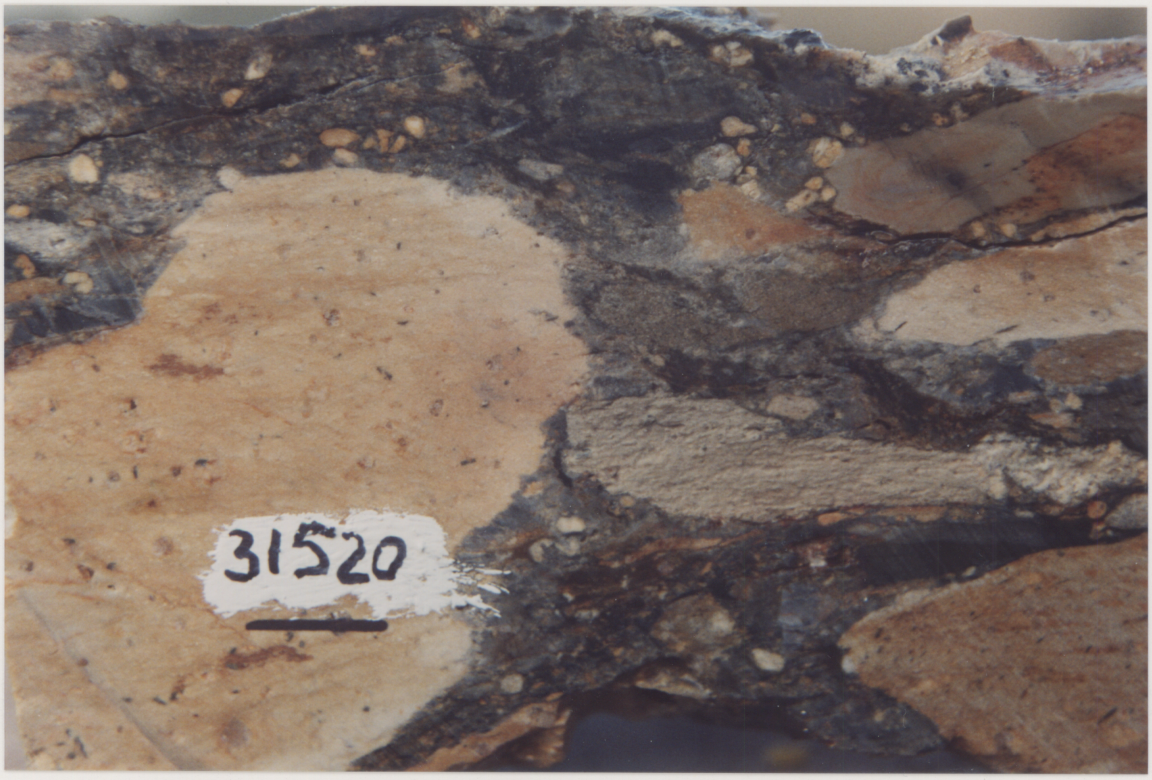
E2 Henty Fault Wedge Area

E3 Newton Creek Area

E4 Lynchford Area

31591

Mudstone with pyritic and dolomitic lamina



31520

Mass debris flow - basal conglomerate, clasts of felsic volcanics and mudstone in mudstone and feldspar quartz crystal

31513

Massive feldspar phyric volcanic with albite chlorite alteration

0136

30982

Felsic derived sandstone with lapilli

30136

Coarse wake, predominantly haematic siltstone clasts note cleavage rotation of clasts to 90° to bedding.

0137

30980

Plagioclase phyric

30024B

Basaltic - andesitic lava plagioclase augite phyric

30169

Volcaniclastic wacke – feldspar crystal dominate

Banded albite chlorite alteration

30173

Dacitic lava, plagioclase in a formerly glassy ground mass

30989

Wacke - conglomerate, derived from felsic volcanics, chert and chromite rich ultra mafics

30179

Wacke - mudstone, quartzose feldspathic micaceous +- detrital magnetic. Derived from volcanics and meta sediments

30175

Chert

31667

Mudstone quartz sandstone associated with massive pyrite bed

30087

Tonalite with biotite +– K feldspar

30987

Basic dyke plagioclase phyric

Henty dyke swarm

31523

Dacitic mass flow Newton Creek

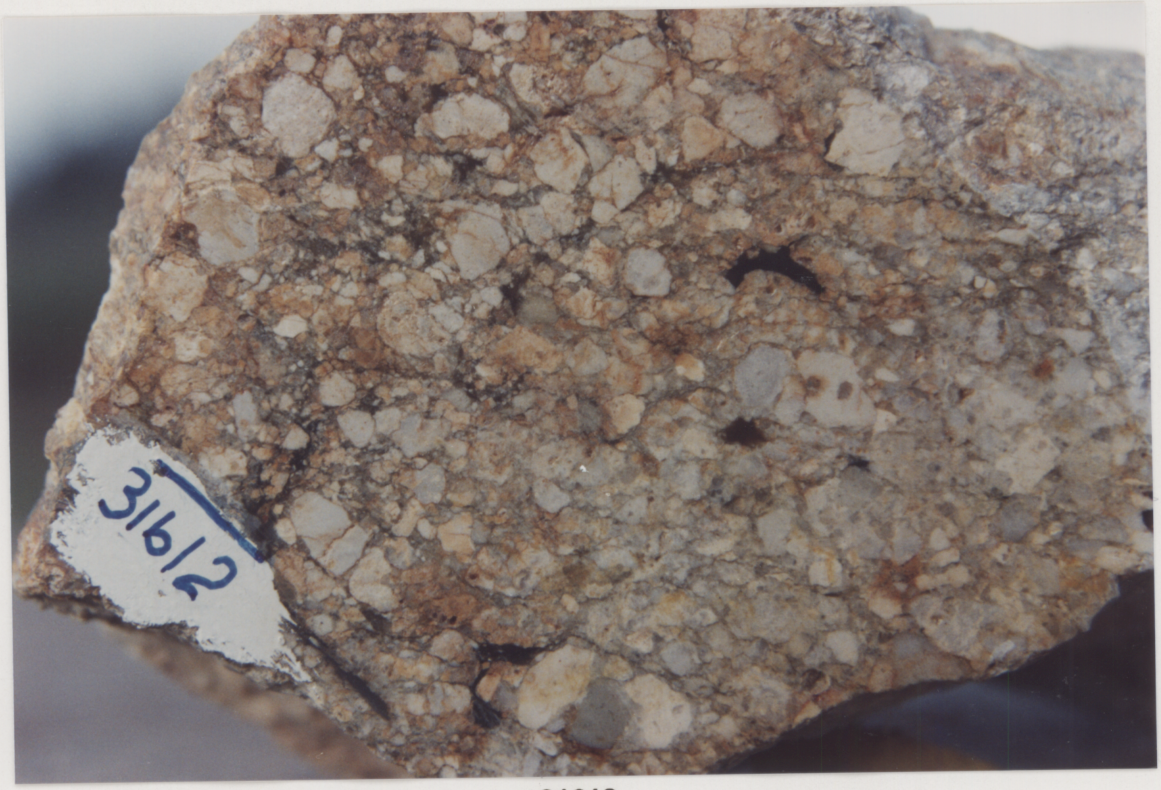
31624

Volcaniclastic conglomerate, derived from felsic and andesite volcanics

31620

Andesitic lava

plagioclase augitic phyric



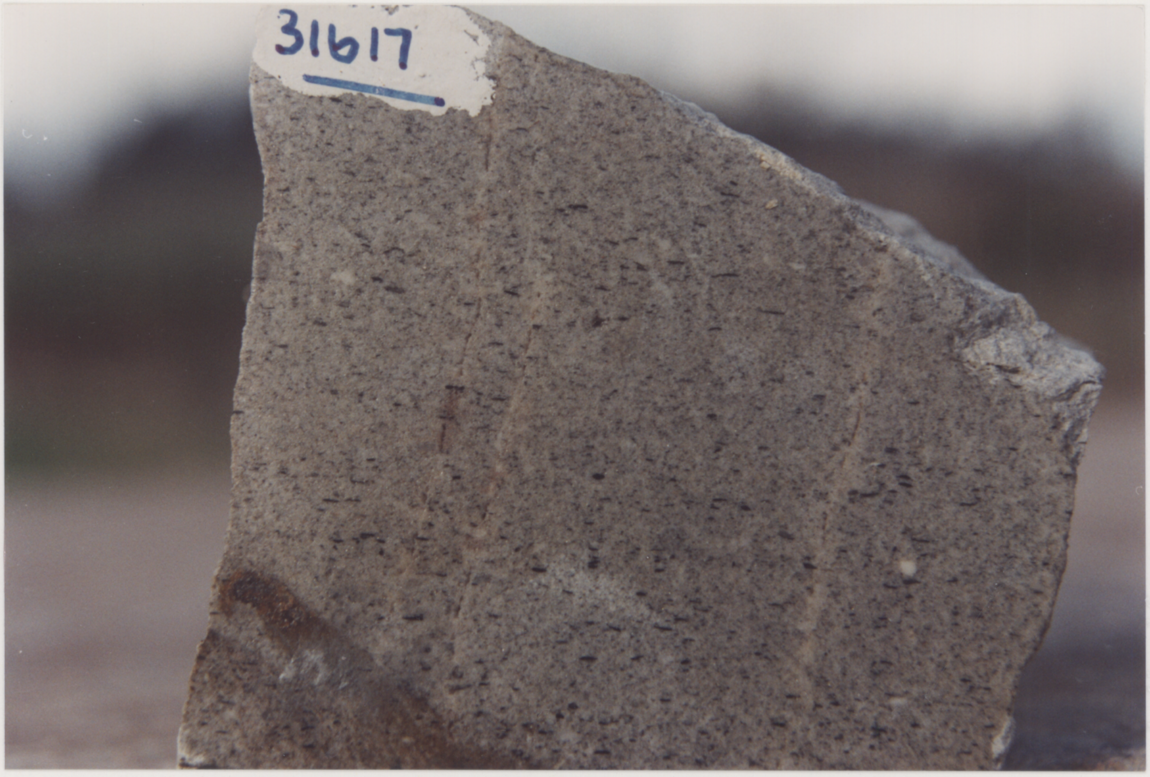
31612

Volcaniclastic/mass debris flow

felsic volcanic derived

30995

Felsic volcanic breccia in mudstone matrix



31617

Quartz mica sandstone derived from metasediments

31634

Quartz feldspar mica porphyry

APPENDIX F

AEROMAGNETIC SURVEY ACQUISITION REPORT, LYNCHFORD & WHITE SPUR AREAS, DE LEAMAN

AMAN SICS
rvey Review, Specificatio nterpretation
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AEROMAGNETIC SURVEYS
EL 11/85 HENTY RIVER - QUEENSTOWN

ACQUISITION REPORT

for
PASMINCO EXPLORATION

by
Dr. D.E. Leaman

July 1991

YOLANDE1

CONTENTS

FIGURES

Maps in folders
1 Flight location including fiducial references
2. Stacked profiles of magnetic field.
3. Contours of residual magnetic field.
Each map is in two parts, White Spur and Queenstown

SUMMARY

New high resolution helicopter aeromagnetic surveys of the northern part of the Henty River (and White Spur) and Lynchford - Queenstown parts of EL 11/85 in central western Tasmania were completed to provide a comprehensive coverage of the area. The bulk of the licence area was surveyed in 1990 and early work demonstrated the value of highly detailed coverage.

This report describes specification and acquisition of the survey. It includes a very brief discussion of possible implications. A detailed interpretation will be available later.

INTRODUCTION

EL 11/85, Henty River-Queenstown, is in two parts. The largest part is located north of the Henty River and east of Mt Dundas while the smaller Queenstown part is located south and west of Queenstown in the Lynchford area in western Tasmania (Figure 1).

Gravity and magnetic data in the area have been reviewed in regional terms previously (Leaman, 1986a, b; 1988, 1989). Results indicated that these data sets could reveal much information about structural setting and control within the area and further analysis was recommended. The regional data available were shown , however, to lack resolution due to line spacing or terrain clearance excesses.

A detailed magnetic survey was then undertaken of the core area around the Henty River (Leaman, 1990). This improvement in data quality demonstrated the value of such data sets and led to review of many elements of the region. The surveys reported here represent an extension of this work and findings.
The particular aims of these surveys have been to upgrade the regional data base and to
a) define alteration within the volcanics,
b) assess structural controls,
c) aid mapping and subdivision of the volcanics and
d) identify any mineralisation signatures present.
e) review anomalous characater within the Dundas Group rocks.

This report outlines survey specification, presents the results of survey and provides a preliminary outline of implications.

MAGNETIC SURVEY

SPECIFICATION

Specifications for the survey were determined by the previous experience provided by the Mines Department survey (Leaman, 1986a), other recent (1990) surveys for Pasminco Exploration (e.g., Leaman, 1990) 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 regional 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 limited 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 a general compromise in order to obtain cost effective coverage, the general form of the terrain and the need to define sub E-W or NW-SE and SW-NE trends as suggested by regional analysis of 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 - as at White Spur. 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 1 and 8, 1991 by Geo Instruments Pty Ltd under the supervision of Zoltan Beldi using a G833 helium vapour magnetometer in a towed bird and a Geometrics GR800 spectrometer. The survey was flown using an Aerospatiale Squirrel helicopter.

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. Data pickup was undertaken by D. Morrison.

Total line coverage was about 150 km in the White Spur portion and 200 km in the Queenstown portion. Line recovery and line location details are presented in Maps 1, 1A (folder).

PROCESSING

Flight path digitising, processing, gridding and mapping were performed by Kevron Geophysics and D. Morrison.
IGRF 1990 updated to 1991.3 was removed from the data and a scalar of 62000 nT added to residual data.
The stability of gridding and acquisition was tested and 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 (Maps 3, 3A - folder). Stacked profiles are presented in Maps 2, 2A.

Radiometric data have not been corrected, levelled or compiled.

DATA PRESENTATION

Maps 1, 2 and 3 (folders) provide detailed presentation of the survey coverage, observed profiles and contours of the magnetic field at 1: 10000 scale.
Maps used as bases have been derived from Corbett & McNeill (1986). See Figure 4A.

The specifications were closely approximated for this survey. The effective terrain clearance was 80-100 m for the entire area and the line coverage, including tie line intersections, was satisfactory. The 0.01 nT precision, 0.2 second sampling, or spacing of about 7m, exceeded these conditions. Note that the map legends indicate a tie line spacing of 2000 m; 1000 m was actually observed (Map 1).

COMPARISON WITH PREVIOUS DATA

The previous regional survey described by Corbett et al (1982) and Leaman (1986a) has been reproduced as Figures 2A, B and may be compared with the new survey (Figures 3A, B). Contour intervals are 2 nT for the new survey and 5 or 10 for the old.

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 western exposures of the volcanics in the White Spur area where the shoulder and compound detail on large anomalies and the differentiation of responses in the anomalies in the west of the area has been lost. Much more character can be seen in the large Lynchford anomalies as well.

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 possible sub E-W alteration corridors (approx 5361 000, 5365 000 and 5337 000 mN) and many NE-SW and NW-SE fractures generally (see Leaman, 1987). The validity of many of these was unknown. Alteration responses had not been recognised previously.

The larger features have been reviewed previously (Leaman, 1989) in terms of regional sources but comprehensive analysis was limited by the detail provided in the older surveys. Subtler elements such as the segmentation of these anomalies and the associated low amplitude variations on them have not been examined previously in any detail.

COMMENTS

The following comments notes some particular elements of the magnetic field which indicates anomalous character or which must be reviewed in light of the most recent surface mapping.

Figure 4A presents an overlay of the magnetic field with the mapping of Corbett & McNeill (1986). Inspection shows that there are few direct and consistent correlations with the base map. This suggests that the units are more diverse than mapped or that many sources are concealed. There is, for example, no consistent pattern response for the field in association with porphyries or many elements of the Dundas Group (such as Edw).
Many anomalies are not continuous and appear truncated by sub E-W features, as near 5362 500 mN.
It is clear, however, that the magnetic survey has been able to provide information about the continuity and disruption of units within those areas blanketed by till and other surface deposits. Appraisal of this data will require careful comparison of unit properties and field responses and can then be expected to reveal structural patterns and anomalous or altered rock volumes.

No adequate geological base is yet available for the Lynchford area but comparative review of maps by Corbett (1979) suggests that the principal anomaly is related to crystal tuffs correlated with the Comstock Tuff. The "Y" shape of the anomaly reflects the distribution of these materials in folds. The broad sweep of anomaly to the NW provides some indication of both extent and dip of these rocks although no calculations have yet been made. This pattern is anomalous and disrupted at about 5337 500 mNf where major re-entries occur in the field. This is not consistent with the apparent geometry of this type of source and ghosts of a sub E-W trend at this northing persist to the east.
Further analysis must await provision of more detailed surface mapping and rock property information.

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Leaman, D.E., 1990. Aeromagnetic survey EL 11/85, Yolande River. Acquisition report including update interpretation. Report for Pasminco Mining, July 1990.

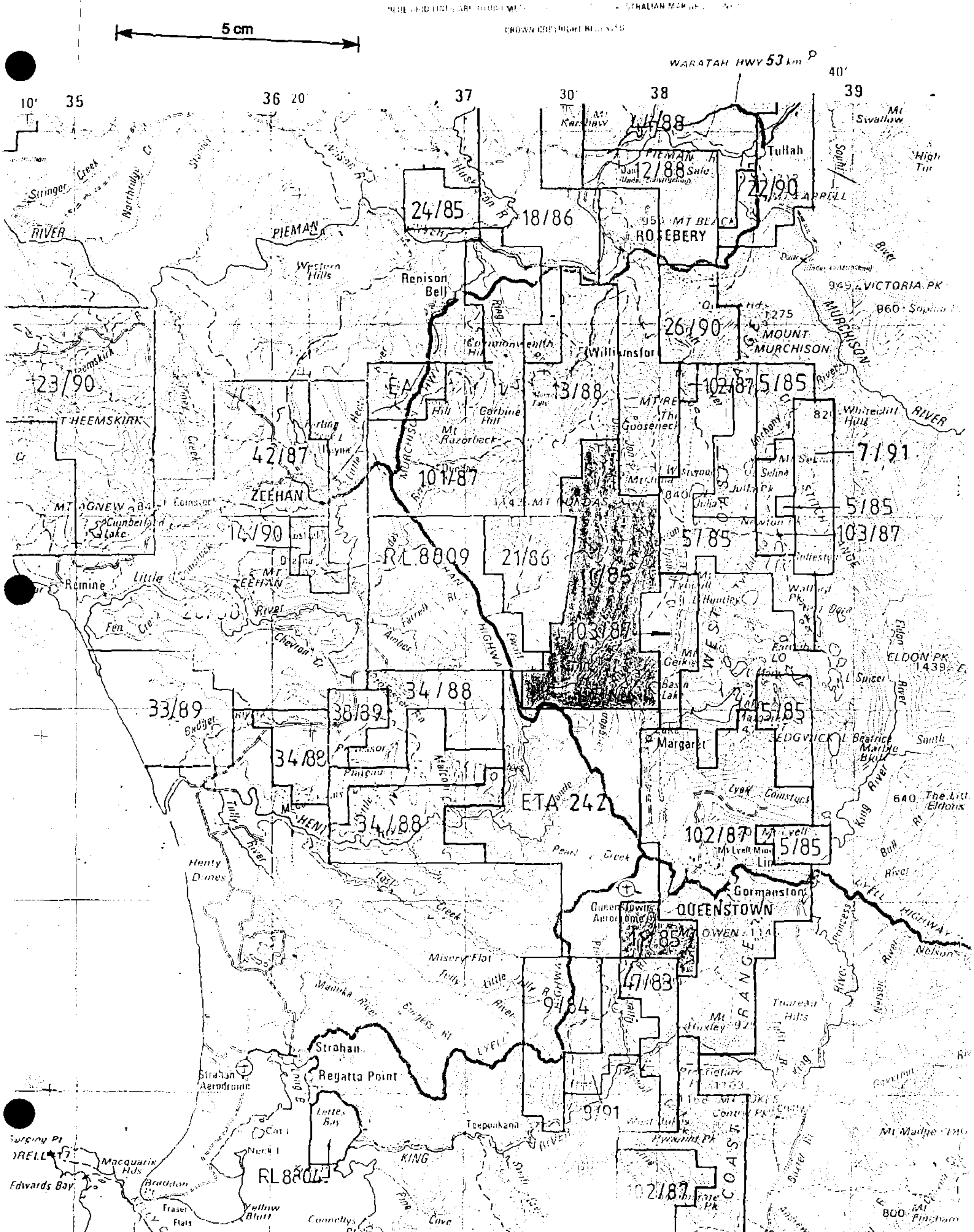
Report submitted on behalf of Leaman Geophysics

by

D Leaman

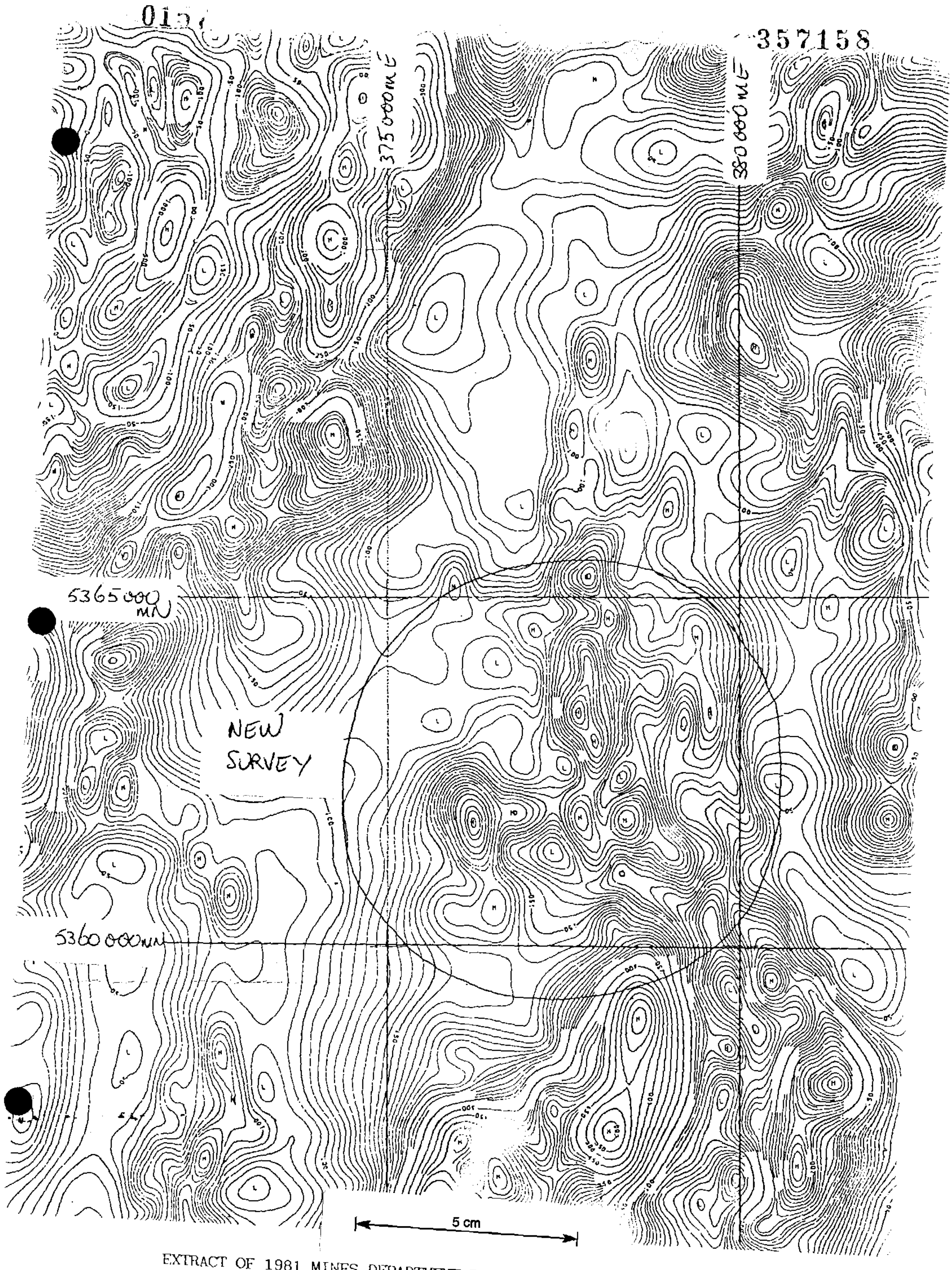
Dr. D. E. Leaman, B.Sc., Ph.D.,
F. Aus. I.M.M., M.M.I.C.A.

Date: 15/7/91



LOCATION OF EL 11/85 HENTY RIVER, QUEENSTOWN

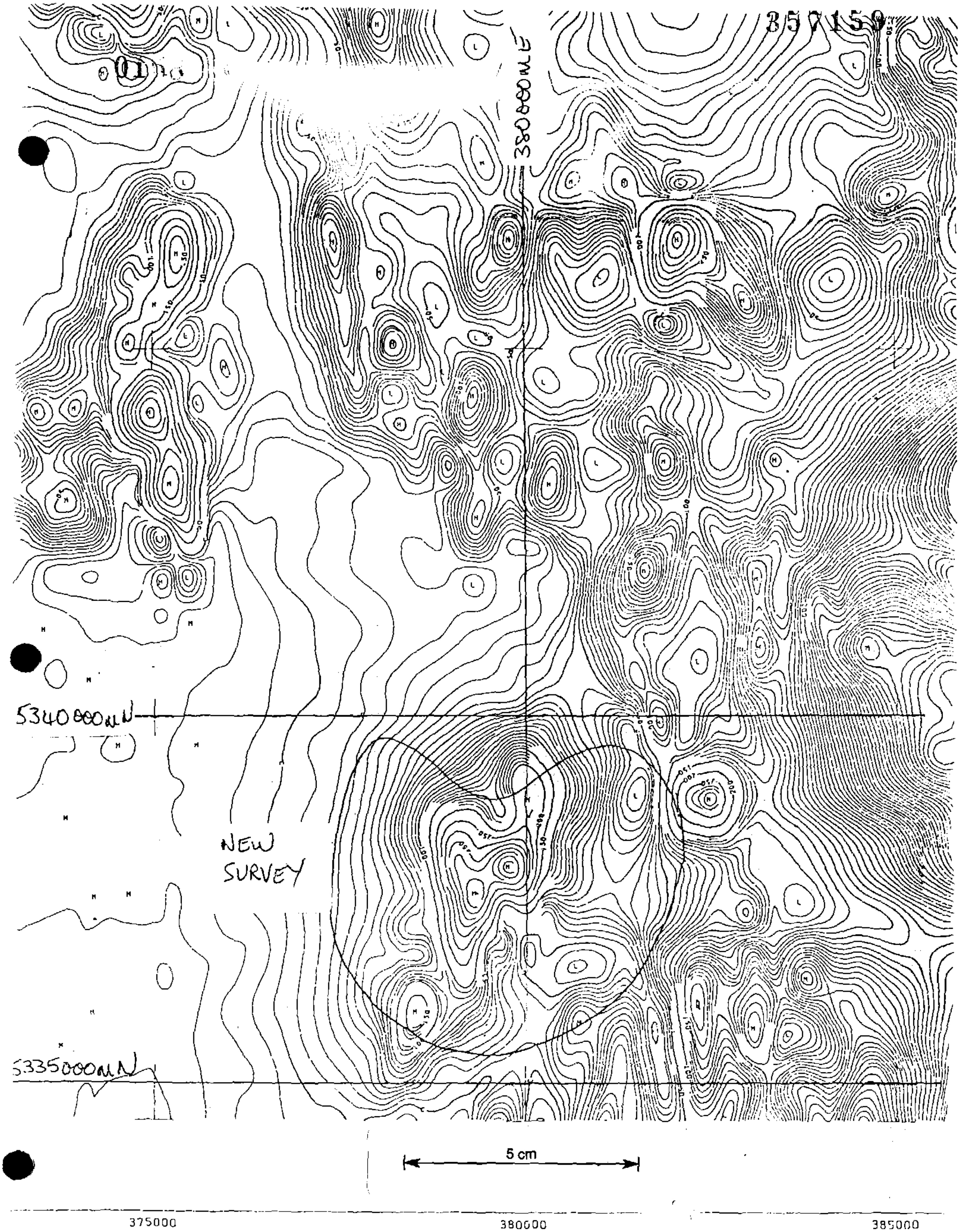
FIGURE 1



EXTRACT OF 1981 MINES DEPARTMENT REGIONAL SURVEY IN WHITE SPUR AREA

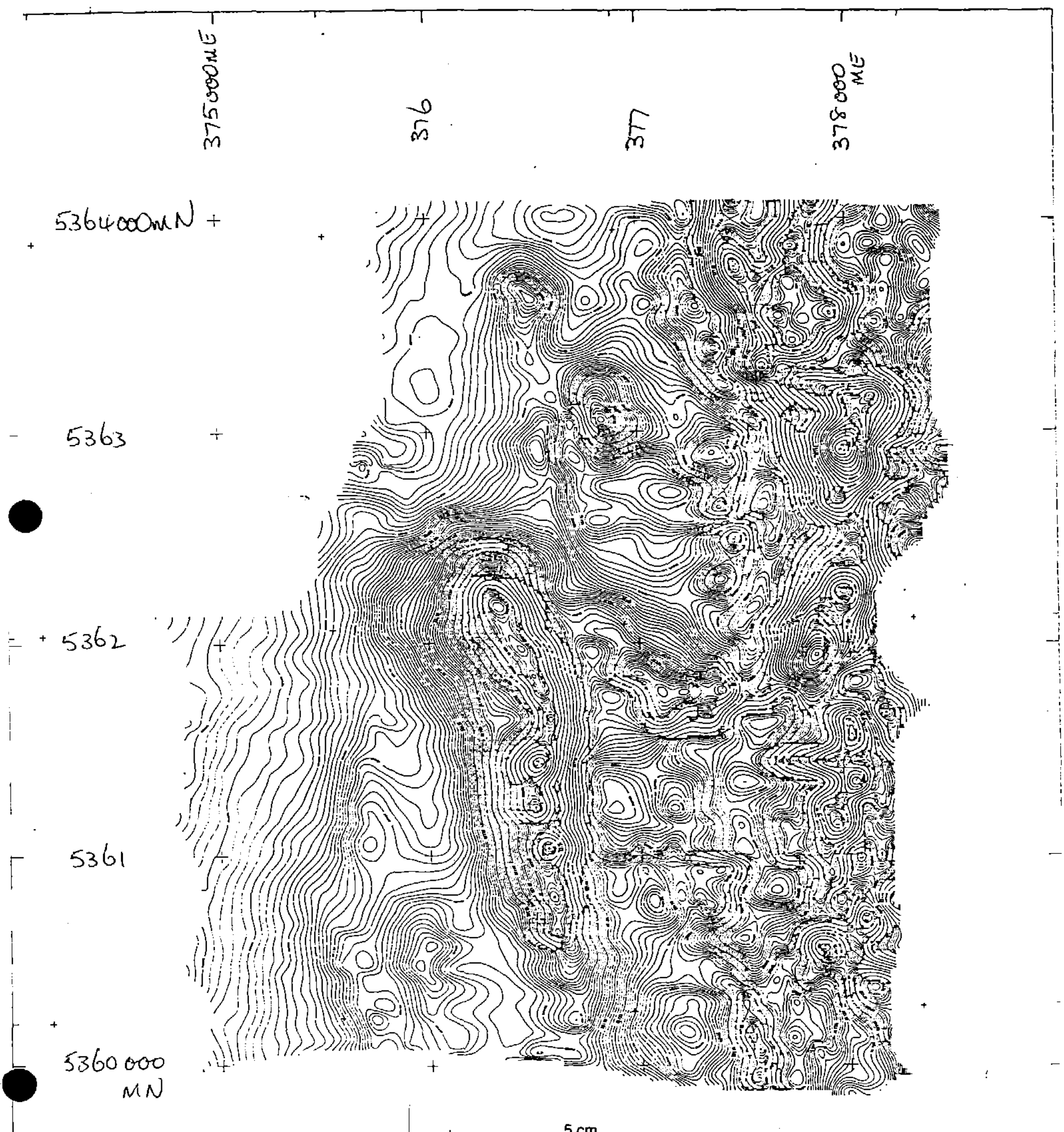
FIGURE 2A

357159



EXTRACT OF 1981 MINES DEPARTMENT REIGONAL SURVEY IN QUEENSTOWN AREA

FIGURE 2B

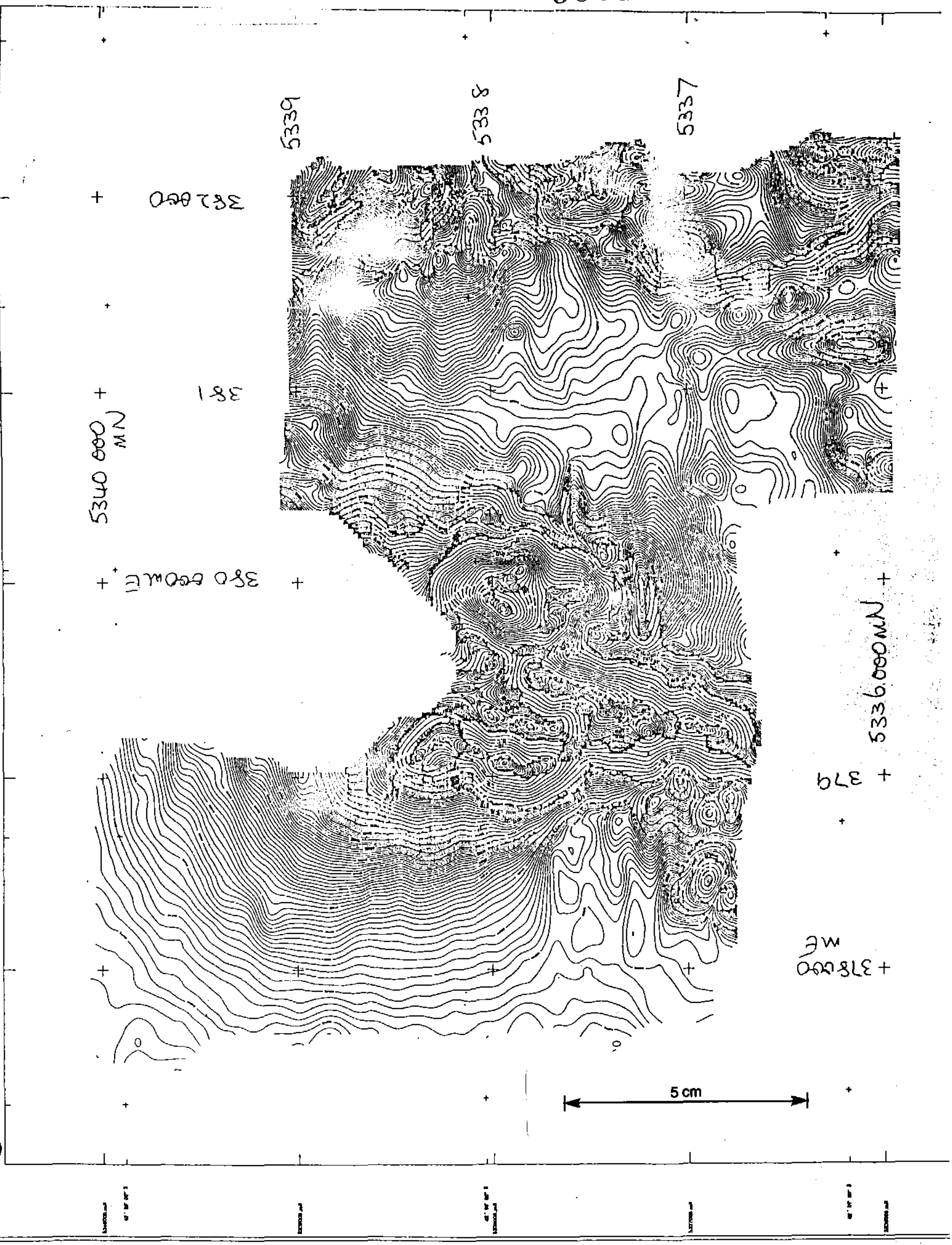


CONTOURS OF RESIDUAL MAGNETIC FIELD (contour interval 2 nT) See also map 3

EL 11/85 White Spur

FIGURE 3A

357161



CONTOURS OF RESIDUAL MAGNETIC FIELD (Contour interval 2nT) See also Map 3

EL 11/85 Queenstown
FIGURE 3B

CONTOURS OF MAGNETIC FIELD EL 11/85 WHITE SPUR
Basemap after Corbett & McNeill (1986)

FIGURE 4A

APPENDIX G

UTEM SURVEY ACQUISITION REPORT,

LYNCHFORD AREA, RS SMITH

PASMINCO EXPLORATION

Acquisition Report: The Collection of UTEM data at Lynchford on EL 11/85, YOLANDE JV.

Author: R.S. Smith

Date: April 1991

Submitted To: F.G. FitzGerald

Attention: R.A. Poltock

Copies: Pasminco Exploration - Burnie
Pasminco Exploration - Hawthorn

Submitted By: Richard Smith

Accepted By: [signature]

Burnie File Number: Y11

Burnie
April 1991
RSS042SR

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1) Summary

A UTEM survey in the Lynchford area identified a number of conductive zones. Most have very short time constants and are of little interest. One zone, in the north-west of the survey area, has generally longer time constants, is about 500m long and occurs in the same formation as a pyrite occurrence. (No readings were taken over the pyrite rich zone). Another zone, to the east, has a shorter time constant but is about a kilometre long and appears to be quite deep in places. Further investigation of these anomalies is recommended.

2. Introduction

Cambrian rocks in the Lynchford area of the Yolande licence were selected for surveying with the UTEM method. A geological map of the area showing the geophysical grid is shown on Figure 1.

I am not aware of any previous geophysical surveys of the area, so these have not been incorporated in the interpretation.

3. Description of the data acquired

The UTEM method utilises a large-loop transmitter, through which a current with a repetitive triangular waveform is passed. (In this survey the repetition rate was 26.23Hz). A small receiver coil (normally vertical) is moved along the survey line measuring the time rate of change of the magnetic flux density. This quantity is proportional to the magnetic field which would be measured if the current in the transmitter is switched from one constant value to another. This type of response, known as the step response, consists of a static primary field (due to the current in the transmitter) and a decaying secondary field (due to current induced in the ground). The secondary field at a particular time is obtained by assuming the late-time asymptote of the step response is the primary field and subtracting this value from the measured response at each time. The response is measured at ten times after the instant that the time derivative of the current changes sign. Channel 10, at 0.028m sec, is the earliest delay time, channel 9 is measured at a delay time equal to twice that of channel 10, and so on, up to channel 1 (the late-time asymptote).

The location of the two transmitter loops used to survey the area are shown with the thick lines on figure 33. There are a number of fences on the western side of the survey area. Those which have significant responses have been marked on the interpretation plan and annotated with the latest channel that the response can be identified as anomalous. Those which do not have a response are marked, but not annotated with a channel number.

The measured response is shown on the profiles presented in Figures 2-32. The secondary field measured in channels 10, 9, 8, 7, 6 and 5 are plotted on the top axis using the symbols ◇, △, X, 7, ∆, Σ . The secondary responses in channels 5, 4, 3 and 2 are smaller, so they are plotted on an axis with an expended vertical scale using the symbols Σ, □, \, / respectively. The curve on the bottom axis, plotted with the | symbol, is the difference between the theoretical primary field and the measured primary field (channel 1). As such, a large channel 1 response indicates some form of noise, an error in the loop position, an error in the receiver location or a very long time constant conductor.

On half the profiles the data at each station have been normalised by the channel 1 response at that station. This is termed continuous normalisation and will increase the magnitude of the anomalies where the primary field is small. When all the data on a profile are normalised by the primary field at one station, the response will be proportioned to the secondary magnetic field. This plotting format is called point normalisation and the station used to normalise the data is marked on the plot with the symbol "***>".

As the vertical component of the magnetic field has been measured in this survey, concentrations of current in discrete conductors are normally indicated by rapid variations in the response: most of the current generally flows below the position of greatest slope. If the conductivity changes laterally from one rock type to another, the current density will vary also, and this will be observed by rapid changes in the slope of the response. This effect is best seen on continuously normalised data.

4. Preliminary Interpretation

The interpretation plan is shown on Figure 33. Loop 1 was used to excite the ground when surveying the western side, and loop 2 the eastern side.

On the western half, there are many anomalies. Most of these are sharp, with short time constants, normally decaying to zero by channels 7, 6 or 5. The largest anomalies are frequently those associated with fences.

There are also a number or early-time anomalies associated with broad conductive zones. These generally occur in the mudstone ∈ms(2) and the basic sandstone (∈sg), but their positions and the mapped geology do not always agree. The felsic sandstone (∈vxl) is relatively resistive to the south, but appears conductive on line 38000N at about 79500E.

Some of the more interesting anomalous zones are labelled with the letters A, B, C and D.

Anomalous zone A occurs near the contact between the basic and felsic sandstone units. The southern most anomaly (on line 37600N) persists to channel 7 and is the sharpest so the source is likely closest to surface here.

Anomaly B, which only persists to channel 8, is larger in magnitude, but is also quite sharp, implying a similar shallow source.

The magnitude of the anomalies in zone C are quite small, but they have a relatively long time constant, persisting to channel 6.

The southern most anomalies in zone D have relatively large amplitudes and are quite broad. They also persist to late delay times (channel 4). The main part of the zone seems to be on the southern edge of the mudstones. If the anomaly were caused by the contrast in conductivity occurring at the contact between the basic sandstone and the mudstone, then a migration of the crossover away from the loop and into the mudstone would be expected. As this is not seen, and because there is no anomaly at the contact on line 38200N, this explanation is less likely than a local increase in conductivity near the anomalous zone. On line 38200N there is a sharp channel 5 anomaly within the mudstone. This may be due to a fence or some pipe near the road; however, it occurs 50m from a pyrite occurrence in the mudstone and may be prospective.

The eastern half of the survey area also shows a number of anomalies. There is a broad conductive zone within the mudstone at about 80200E, and a wider zone in the quartzose sandstone (∈s) east of about 80600E.

At about 80330E on line 37000N, there is a channel 8 anomaly associated with a possible deep conductor. This anomaly has tentatively been associated with two sharper anomalies on line 37200N.

Anomaly F, also on line 37000N, is relatively large and persists to channel 6. The anomaly is quite sharp, suggesting a near-surface source.

The remaining feature is conductive zone G, running more than 1000m in length. On lines 37200N, 37600N and 37800N the anomaly is quite sharp, but on the other lines it is relatively broad, reflecting a deeper structure. The zone generally follows the mapped position of the mudstone/quartzose sandstone contact. On each line, the position of maximum slope or crossover does not migrate into the quartzose sandstone as a function of the delay time. One explanation of this is that the mudstone is more conductive than the quartzose sandstone. If this was the case, the crossover need not always occur on the contact, it may be within the conductive material where the current can flow along a slightly more favourable path. This is consistent with the observed data, except for on line 38000N, where the crossover occurs east of the contact in the sandstone. However, ascribing anomaly G to a contact is not entirely adequate, particularly as there is not a similar anomaly on its western edge at about 79500E when excited by loop 1. The lack of strike extent near 79500E may explain a smaller anomaly on the western edge but not a total absence. Zone G is therefore attributed to some material more conductive than the mudstone.

All of the anomalies so far mentioned in the report have decayed away by channel 3. There are, however, very small negative anomalies in the channel 1 and 2 response. The response is zero at the loop, a maximum negative 40-80 metres from the loop and increases linearly (on point normalised plots) away from the transmitter. This effect is seen on all lines but is strongest to the south. The fact that the crossover always occurs below the transmitter wire would suggest that the cause is non-geological. Jim Macnae of Lamontagne Geophysics has suggested four possible causes:

1) Galvanic leakage. This can effect the late-time response. The resulting distortion of the response will be strongest about the position that leakages occur. It is unlikely to be relatively uniform along the loop edge, as it is in this data. As well, galvanic leakage is not expected to be significant in the dry weather conditions experienced in this survey.

2) Capacitative leakage. This really only effects the early delay times and is therefore an unsuitable explanation.

3) IP effects. These will generally occur at late time. In the UTEM system, the secondary response is calculated with respect to a reference waveform. If the response measured near the loop is distorted by a negative IP effect, then the secondary response away from the loop where IP effects are less should be positive. This is not seen.

4) Problems with the system calibration and waveform deconvolution. There is very poor documentation (none) on the procedure used for deconvolution so I cannot comment on this cause, but it may be that the small negative artefact is introduced at this stage.

I will monitor the occurrence of this relatively minor problem, and if it persists, pressure should be applied to Lamontagne Geophysics to investigate and rectify their calibration procedure.

It should be emphasised that the magnitude of the anomalous response is small. If it were due to geological causes, then the shape information (Macnae, 1985) implies the body is between 240 and 80m depth and the amplitudes information implies it is only a few metres wide. Not necessarily a good target.

It is important to calibrate the waveform when each line comes close to the loop edge to minimise any calibration or deconvolution errors.

5. Conclusions and recommendations

1) Two extensive conductive zones (D and G) have been delineated. Both could be due to conductivity contrasts at formation boundaries, but this is considered less likely than the existence of a conductive source within one of the formation. Two isolated anomalies (E and F) on line 37000N may also be worthy of investigation.

Before these anomalies are followed up, it is recommended that:

a) The UTEM data be modelled, to ascertain conductor position.

b) Other geophysical data be incorporated in the interpretation.

When UTEM is used in future, it is recommended that the following improvements be made to the survey procedure.

i) Calibration be undertaken at each line.

ii) Monitor whether negative responses are seen in channel 2 or 3 and try to rectify this problem.

iii) Sharp anomalies should be detailed to ascertain if the change in slope is sharp or gradual (this distinguishes between a formational conductor or a bedrock conductor).

iv) Request the contractor to plot fences on the profiles (if possible).

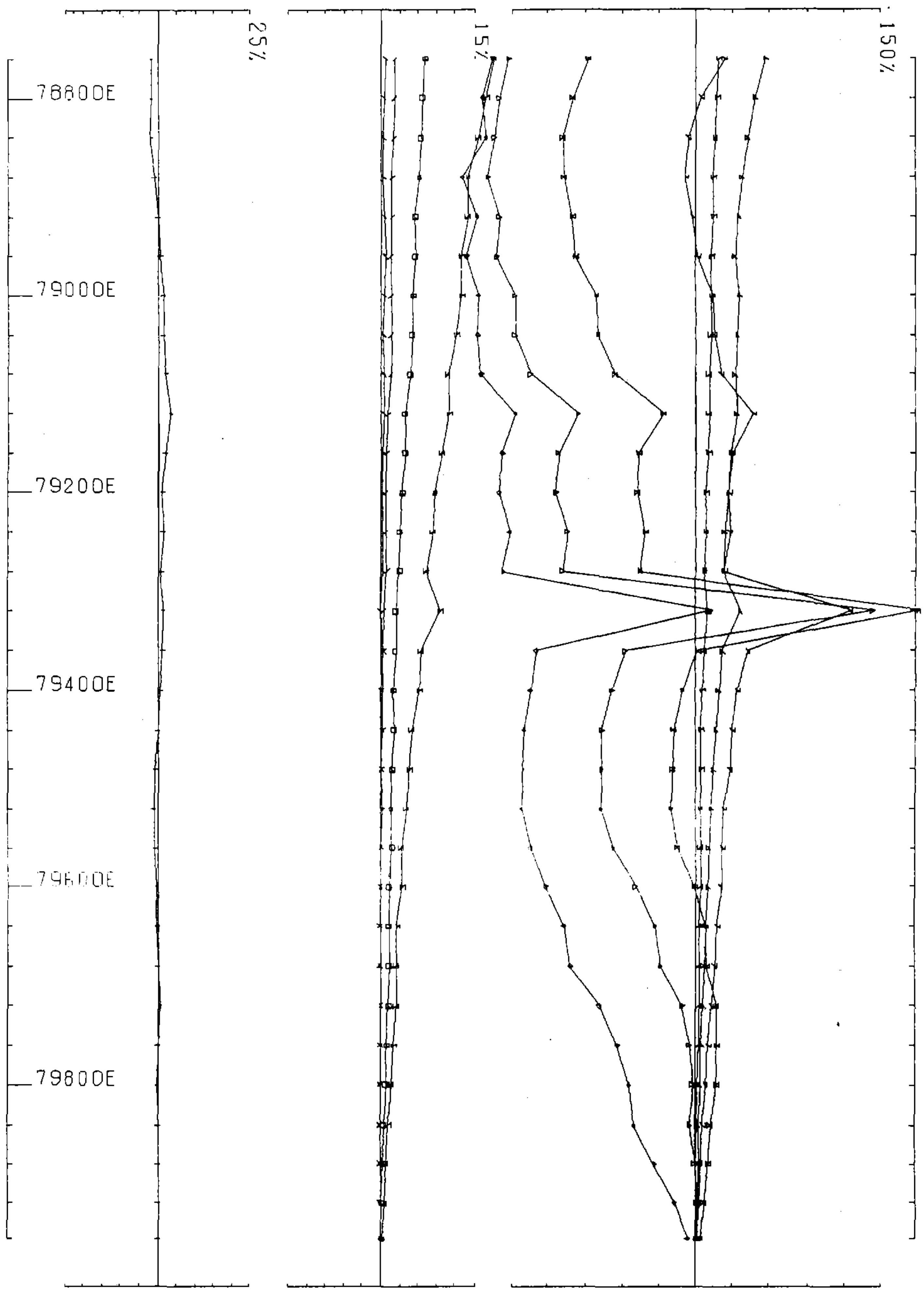
6. References

Macnae, J.C, 1985, Manual of Large Loop Em Interpretations. Lamontagne Geophysics Publication.

7. Keywords and Locality

GEOPHYS EM, UTEM, INTERPRETATION, DECONVOLUTION, QUEENSTOWN, YOLANDE, LYNCHFORD.

8. Figures



UTEM SURVEY AT LYNCHFORD FOR PASMINCO EXPLORATION MARCH 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9103 BASE FREQ (HZ) 26.23
LOOP NO 1 LINE 37000 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

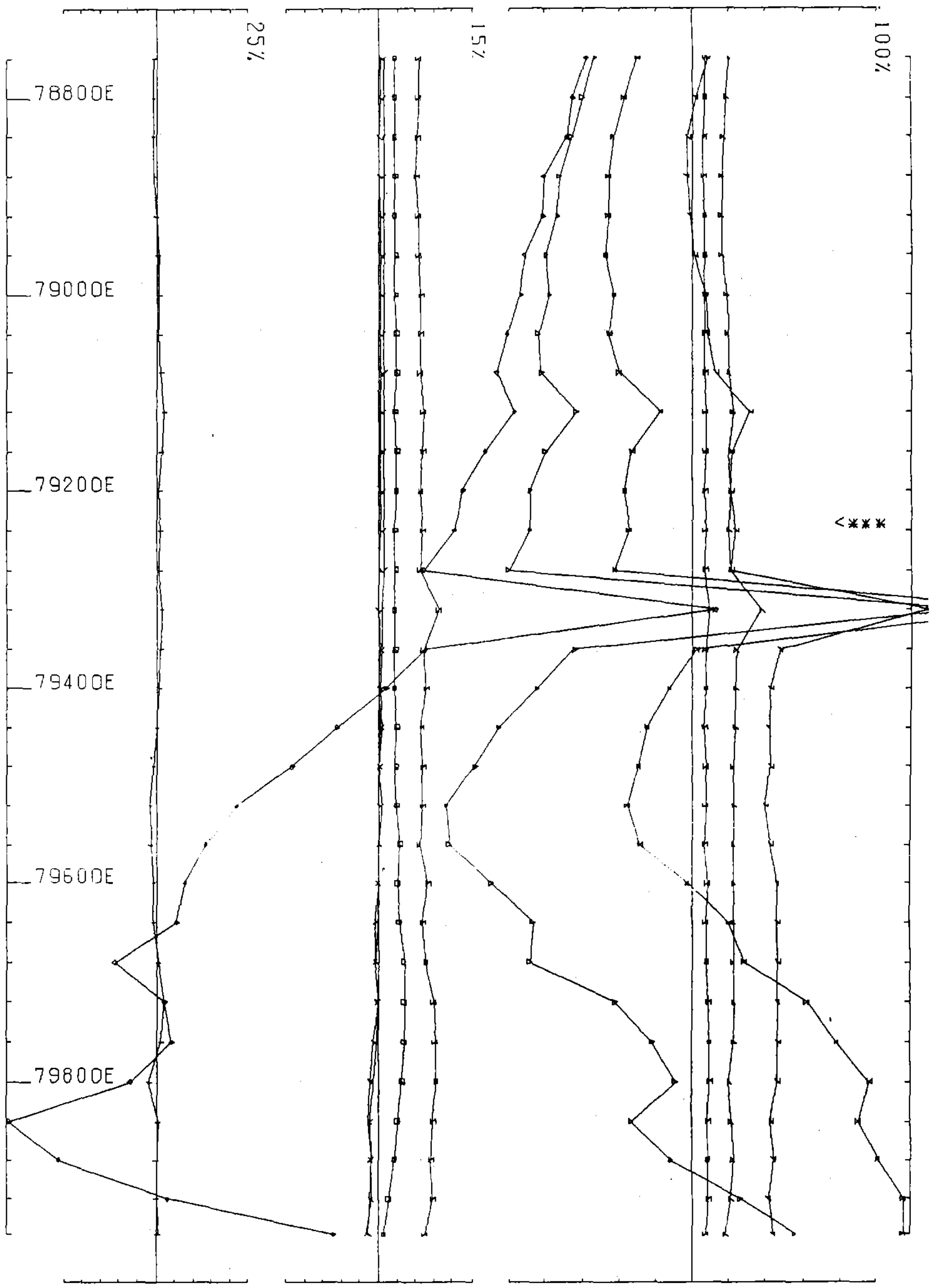
COMPILED : R. Smith
DATE : April 1991
DRAWN :
REF. : Y II
REVISIONS :
DRAWING No.

Yolande JV - EL 11/85
LYNCHFORD UTEM SURVEY
Loop:1 Line:37000N
CONTINUOUS
NORMALISATION
SCALE, 1:5000 0 100m
FIG. No. 2

5 cm

91-3278.

357177



UTEM SURVEY AT LYNCHFORD FOR PASMINCO EXPLORATION
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 0103 BASE FREQ (HZ) 26.23
LOOP NO 1 LINE 37000 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

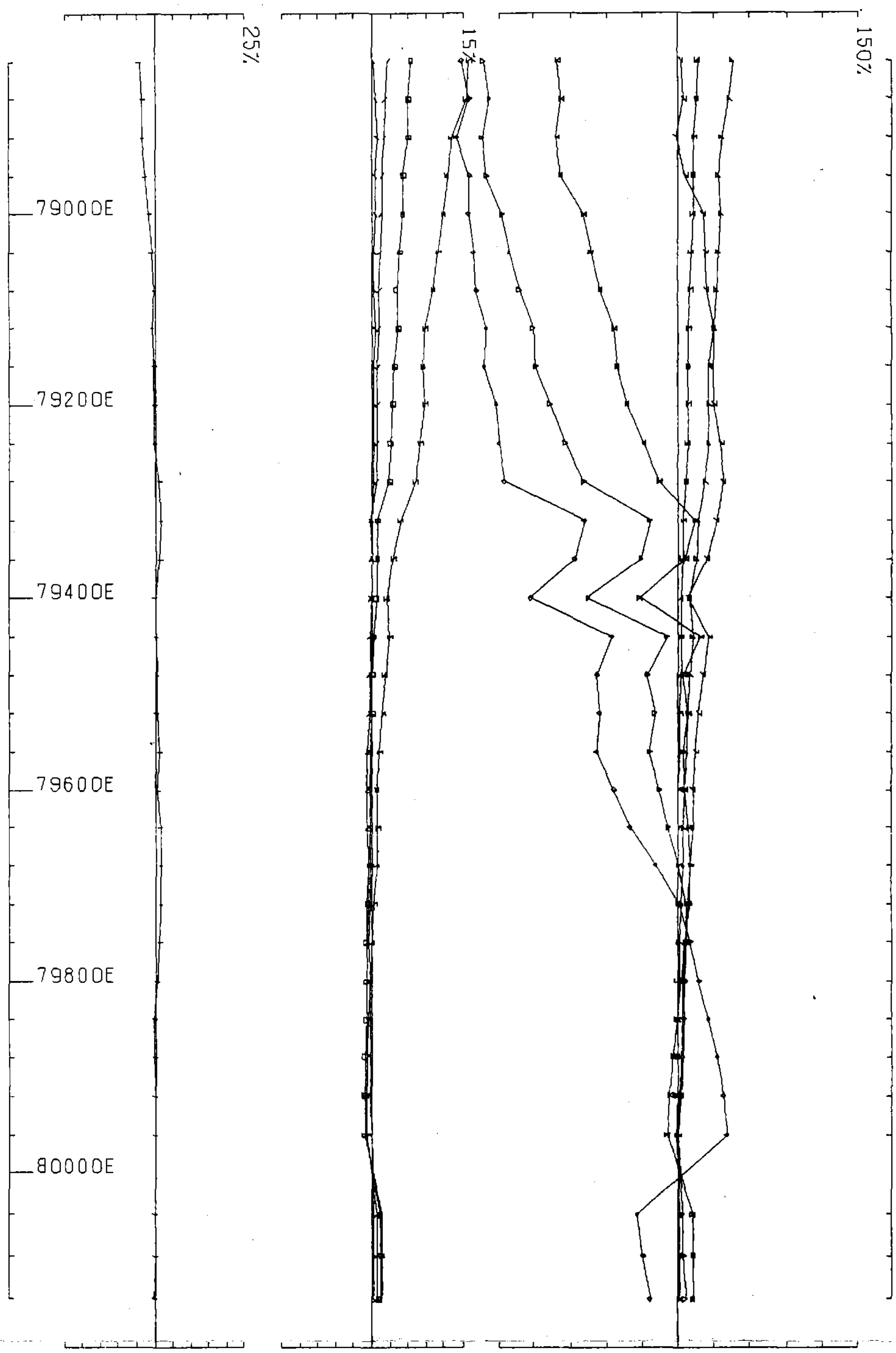
5 cm

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED: R. Smith	Yolande JV - EL 11/85
DATE: April 1991	LYNCHFORD UTEM SURVEY
DRAWN:	*Loop:1* *Line:37000N*
REF.: Y 11	POINT NORMALISATION
REVISIONS:	
DRAWING No.	SCALE 1:5000 0 100m — FIG. No. 3

91-3278.

357178



UTEM SURVEY AT LYNCHFORD FOR PASMINCO EXPLORATION MARCH 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9103 BASE FREQ (HZ) 26.23
LOOP NO 1 LINE 37200 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

5cm

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

Yolanda JV - EL 11/85
LYNCHFORD UTEM SURVEY
Loop:1 Line: 37200N
CONTINUOUS NORMALISATION

COMPILED: R.Smith
DATE: April 1991
DRAWN:
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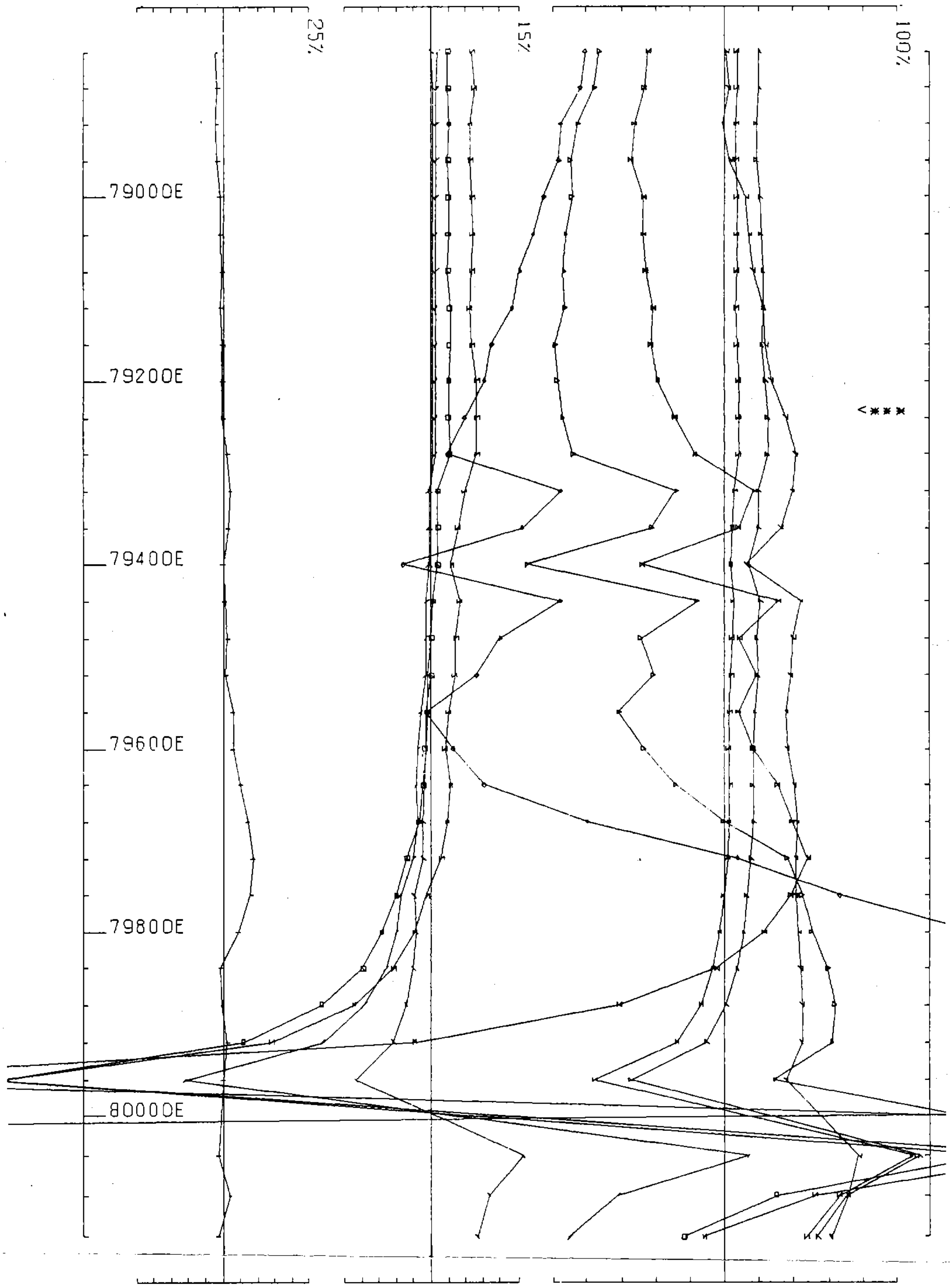
REVISIONS:
DRAWING No.
SCALE 1:5000 0 100m
FIG. No. 4

91-3278.

357179

0173



UTEM SURVEY AT LYNCHFORD FOR PASMINCO EXPLORATION
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9103 BASE FREQ (HZ) 26.23
LOOP NO 1 LINE 37200 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

5 cm

91-3278.

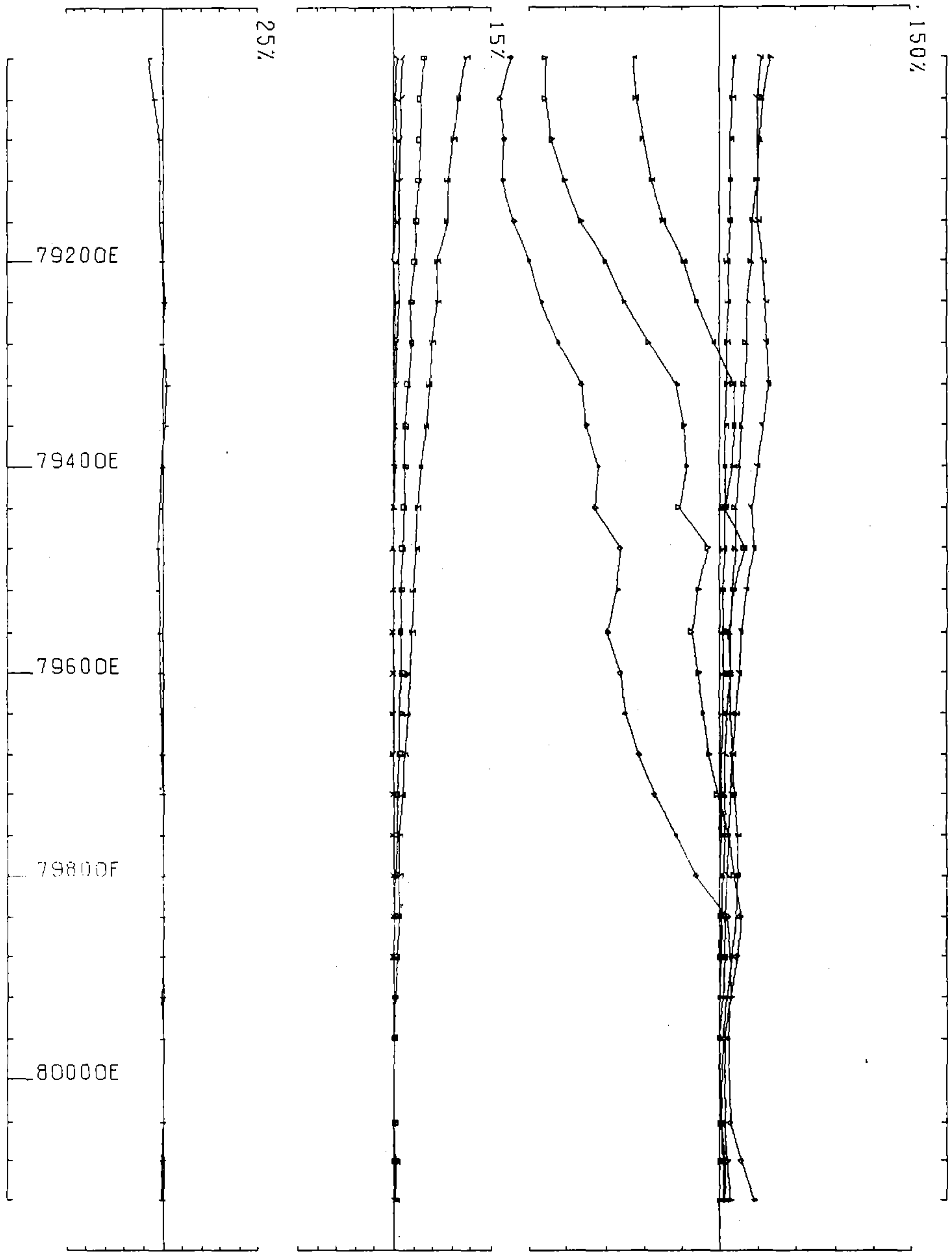
PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED: R. Smith
DATE: April 1991
DRAWN:
REF: Y II
REVISIONS:
DRAWING No.

Yolande JV - EL 11/85
LYNCHFORD UTEM SURVEY
Loop:1 Line: 37200N
POINT NORMALISATION

SCALE 1:5000 0 100m
FIG. No. 5

357180



UTEM SURVEY AT LYNCHFORD FOR PASMINCO EXPLORATION MARCH 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 8103 BASE FREQ (HZ) 26.23
LOOP NO 1 LINE 37400 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED: R. Smith
DATE: April 1991
DRAWN:
REF.: Y II
REVISIONS:
DRAWING No.

Yolande JV - EL 11/85
LYNCHFORD UTEM SURVEY
Loop:1 Line:37400N
CONTINUOUS
NORMALISATION

SCALE 1:5000 0 100m
FIG. No. 6

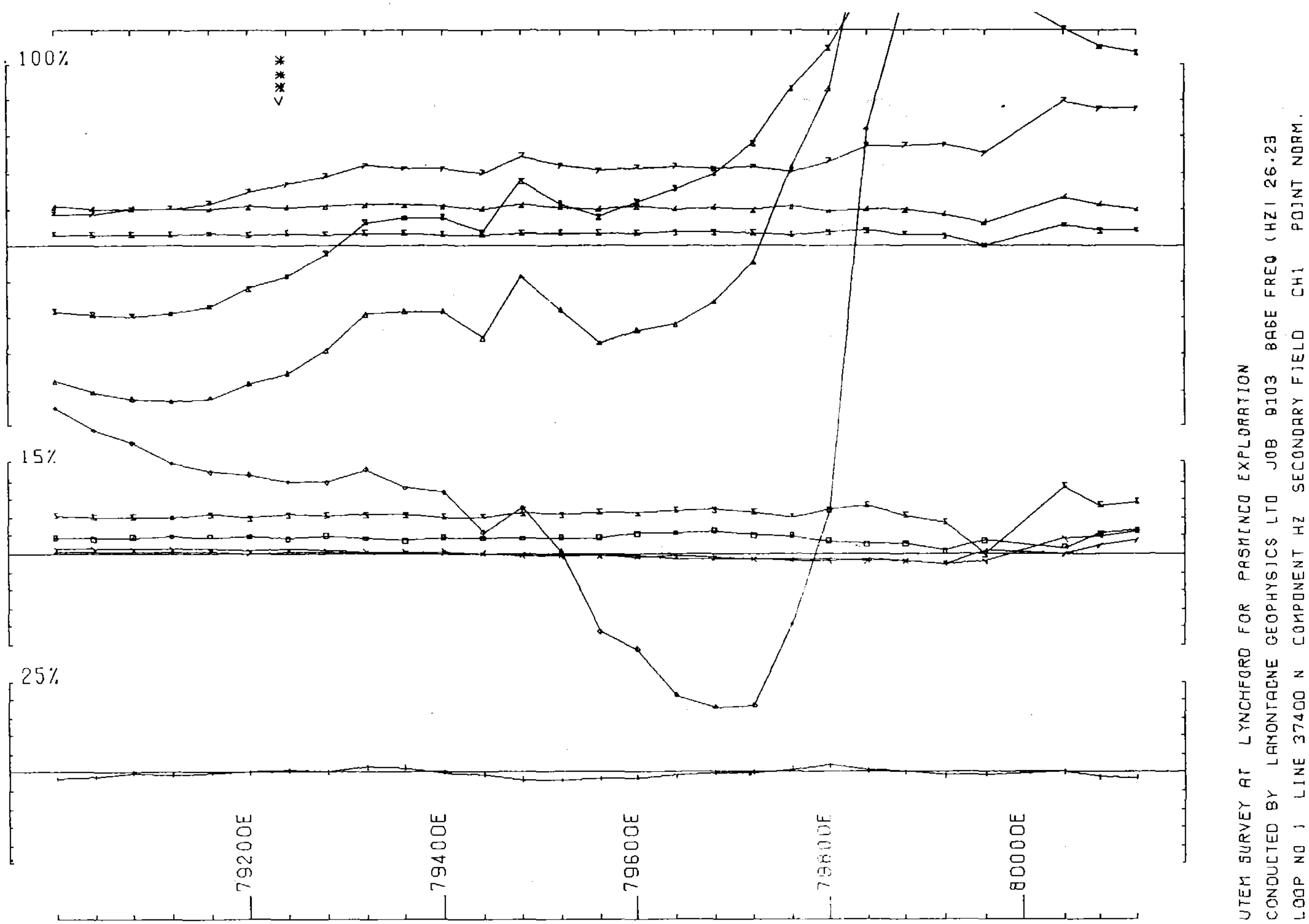
5 cm

91-3278.

357181

018

357182



91-3278.

5 cm

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED : R. Smith	Yolande JV – EL 11/85
DATE : April 1991	LYNCHFORD UTEM SURVEY
DRAWN :	
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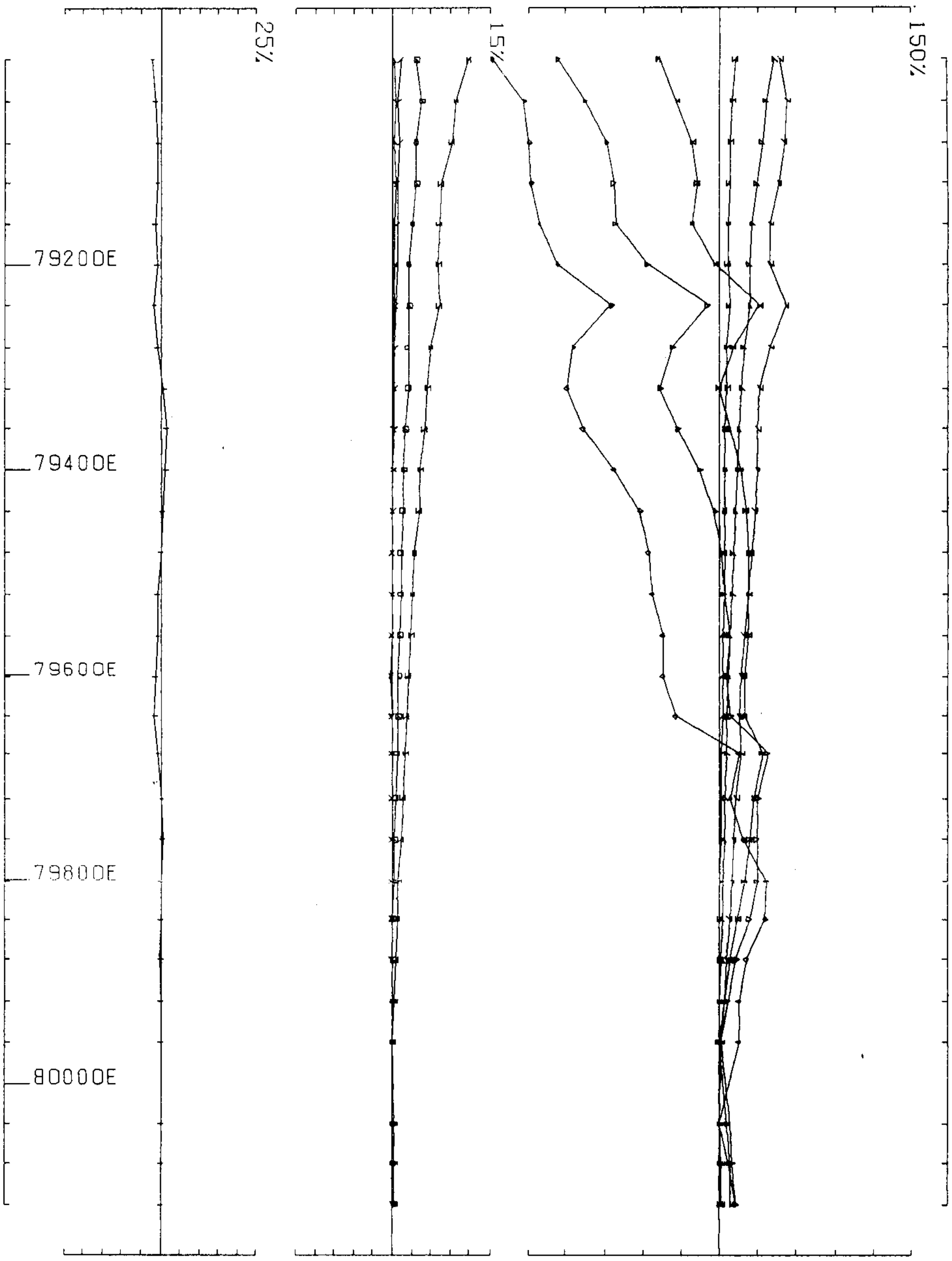
REVISIONS :	POINT NORMALISATION
DRAWING No.	SCALE 1:5000 0 100m
	FIG. No. 7



UTEM SURVEY AT LYNCHFORD FOR PASMINCO EXPLORATION MARCH 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9103 BASE FREQ (HZ) 26.29
LOOP NO 1 LINE 37600 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

5 cm

91-3278.

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED : R. Smith
DATE : April 1991
DRAWN :
REF. : Y II
REVISIONS :

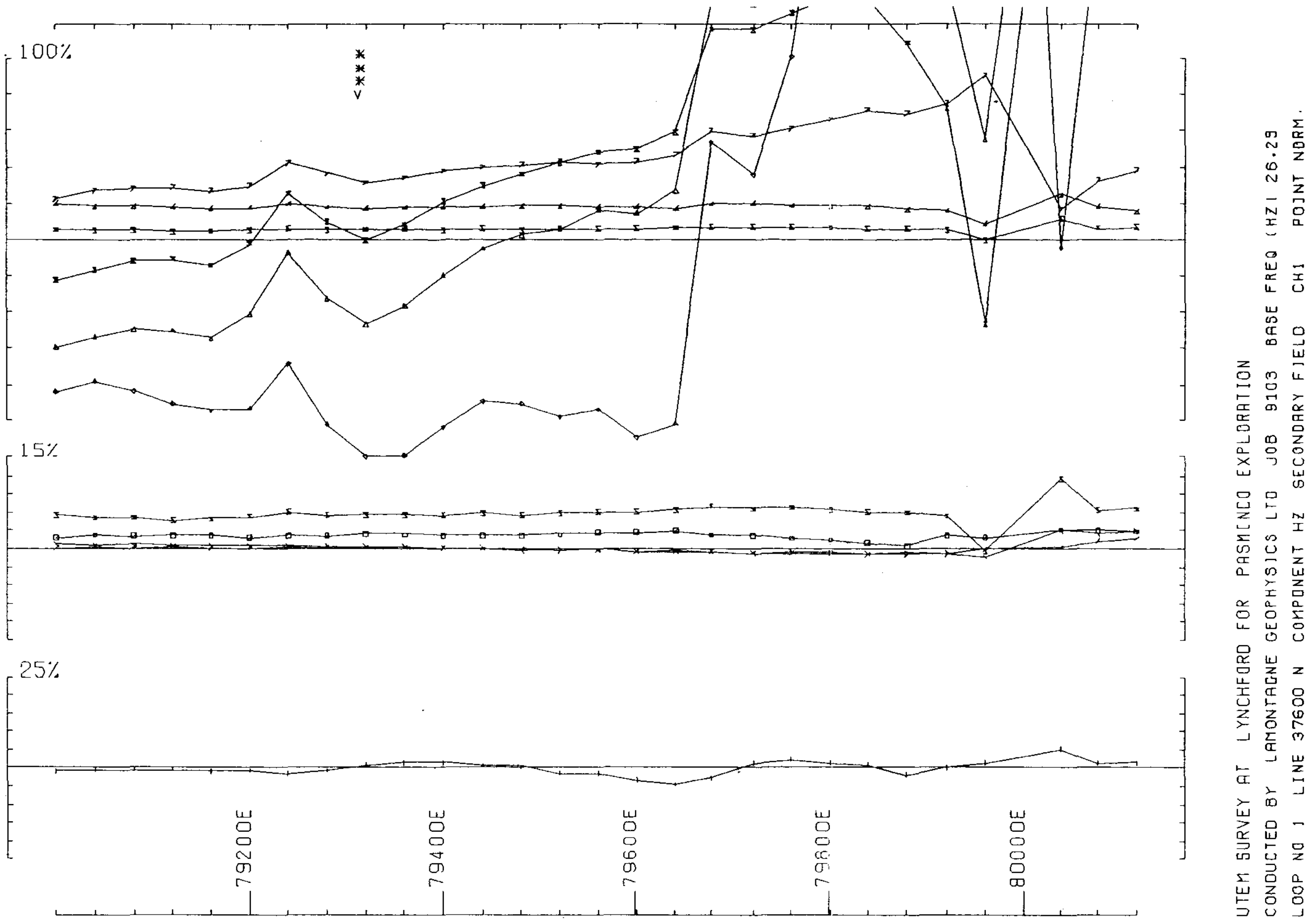
Yolande JV - EL 11/85
LYNCHFORD UTEM SURVEY
Loop: 1 Line: 37600N
CONTINUOUS
NORMALISATION

DRAWING No. | SCALE 1:5000 0 100m | FIG. No. 8

357183

01

357184



91-3278.

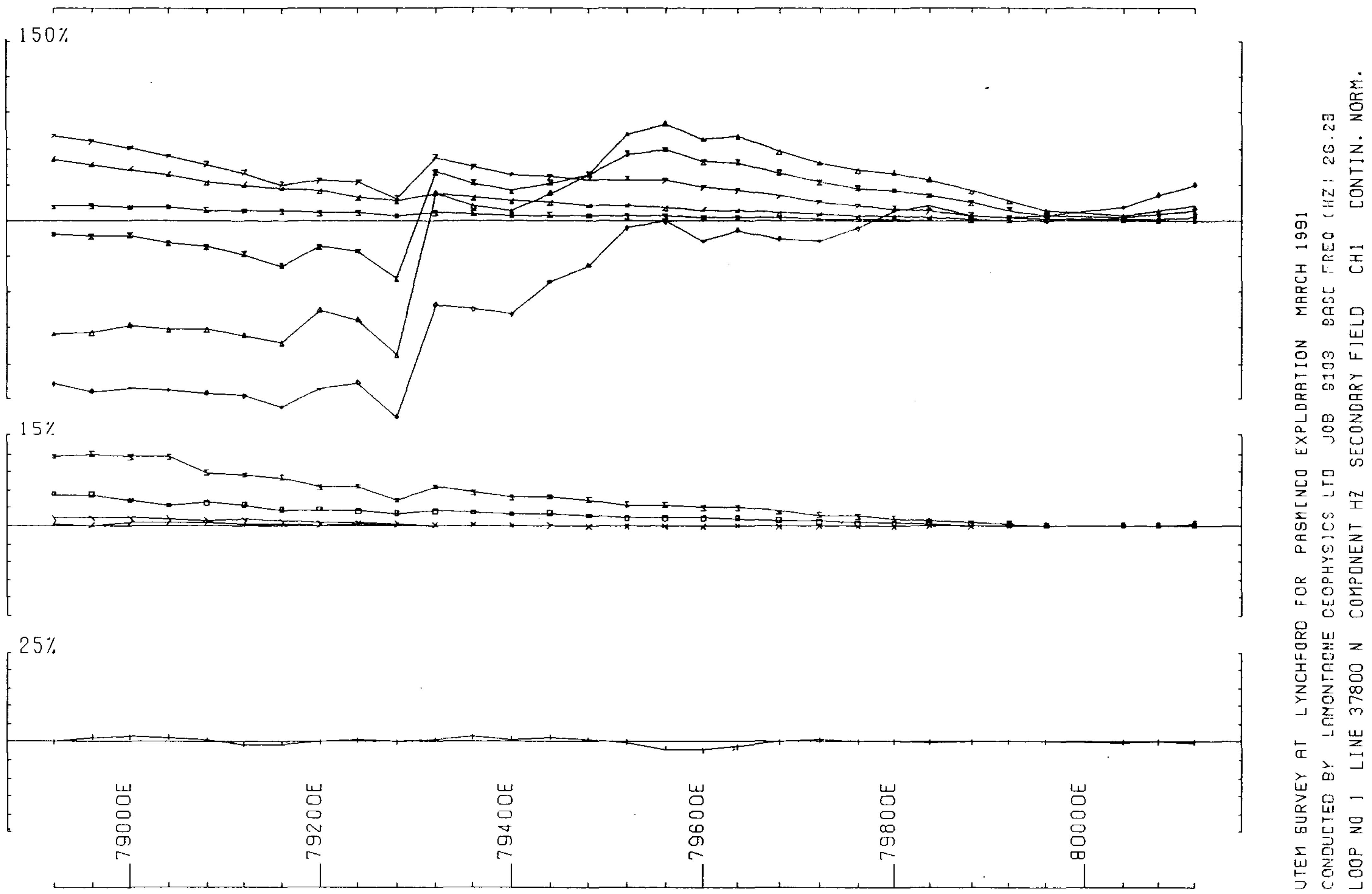
5 cm

PASMINCO EXPLORATION

A Division of Pasminco Australia Limited

COMPILED: R.Smith	Yolande JV – EL 11/85
DATE: April 1991	LYNCHFORD UTEM SURVEY
DRAWN:	
REF.: Y11	*Loop: 1* *Line: 37600N*
REVISIONS:	POINT NORMALISATION
DRAWING No.	SCALE, 1:5000 0 100m FIG. No. 9

357185



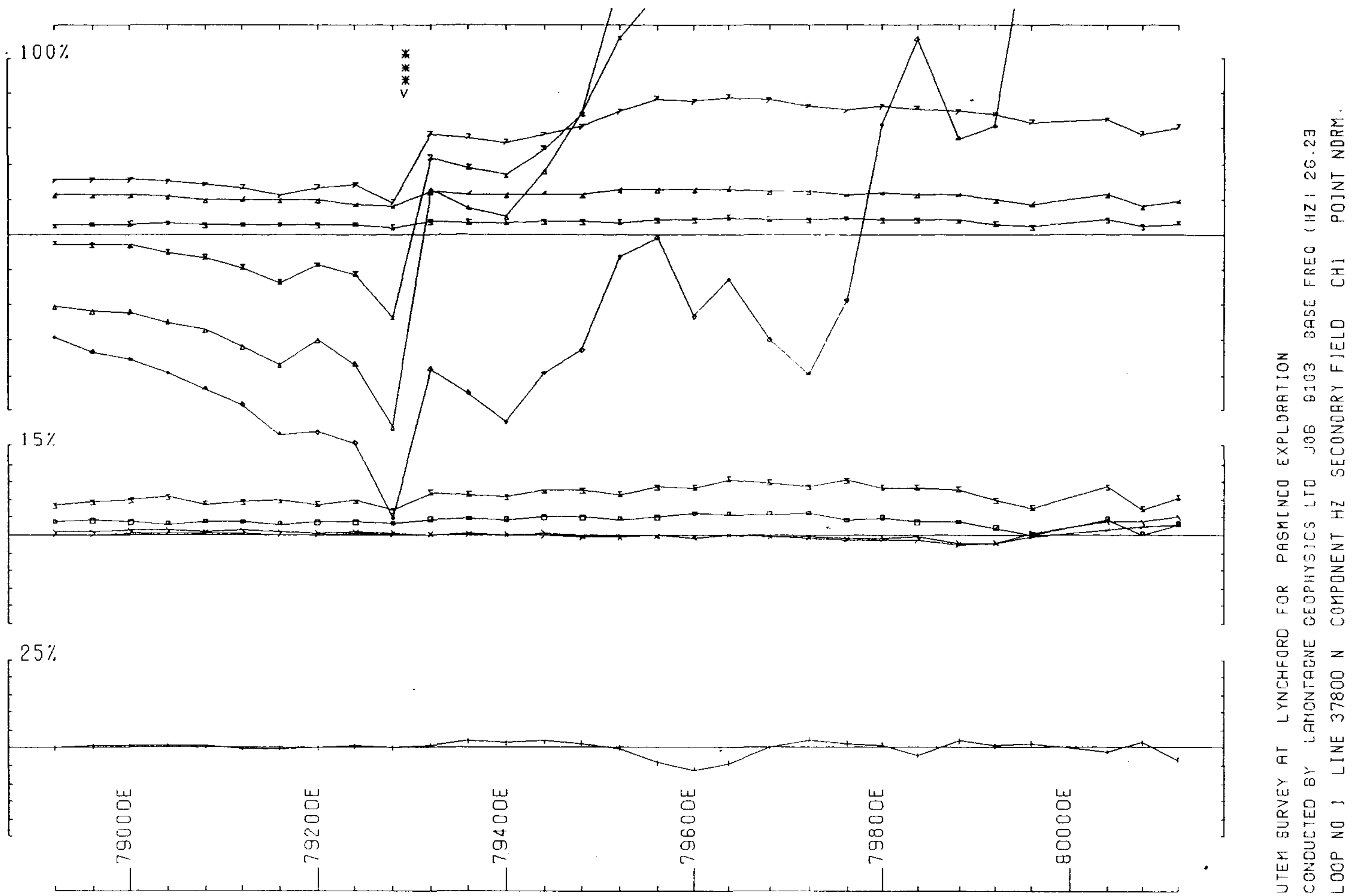
91-3278.

5 cm

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED : R.Smith	Yolande JV – EL 11/85
DATE : April 1991	LYNCHFORD UTEM SURVEY
DRAWN :	
REF.: Y11	***Loop:1*** ***Line: 37800N***
REVISIONS :	CONTINUOUS NORMALISATION
DRAWING No.	SCALE, 1:5000 0 100m — FIG. No. 10

357186

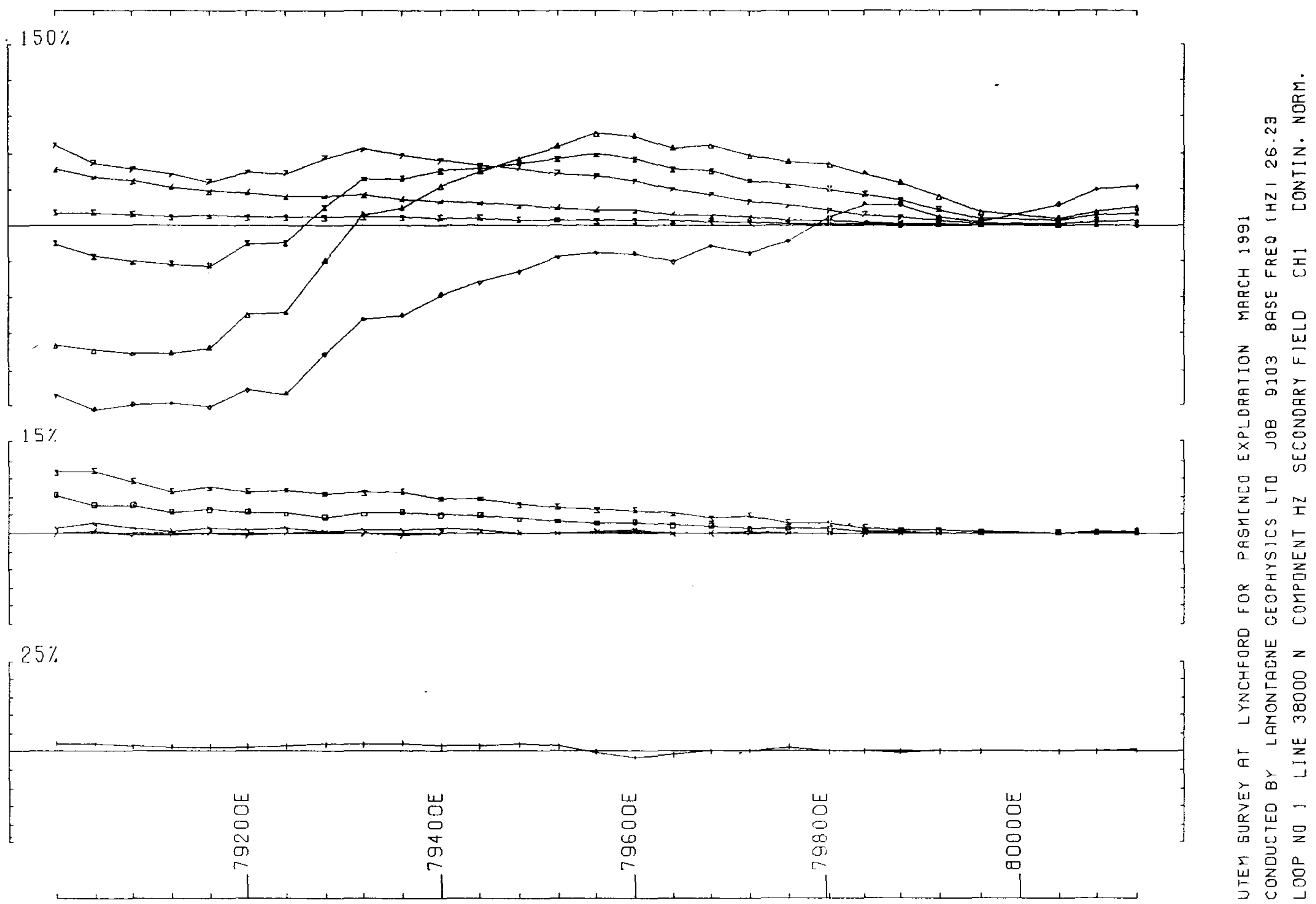


91-3278.

5 cm

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED : R. Smith	Yolande JV - EL 11/85
DATE : April 1991	LYNCHFORD UTEM SURVEY
DRAWN :	
REF. : Y11	***Loop: 1*** ***Line: 37800N***
REVISIONS :	POINT NORMALISATION
DRAWING No.	SCALE, 1:5000 0 100m — FIG. No. 11

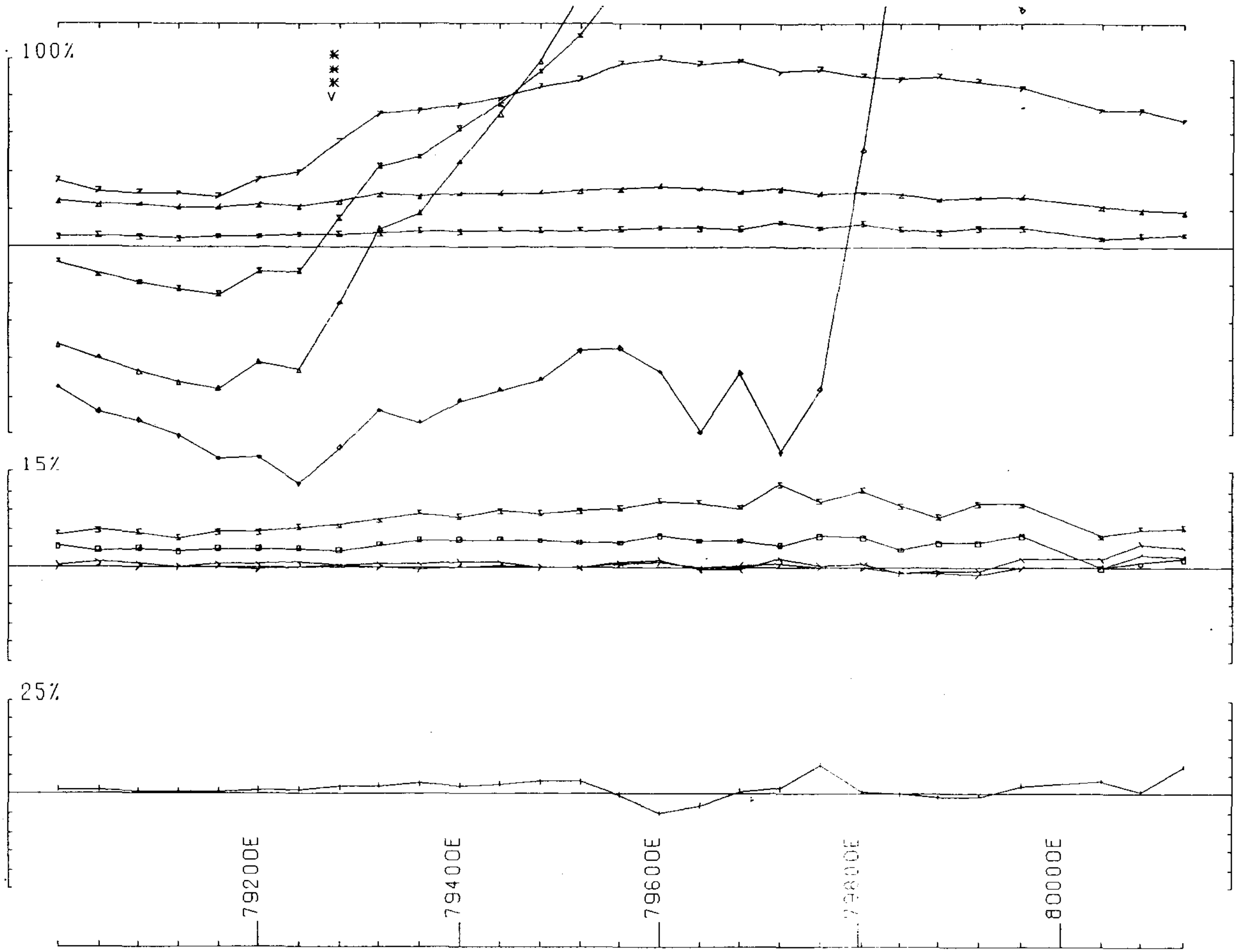


91-3278.

5 cm

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED : R. Smith	Yolande JV – EL 11/85
DATE : April 1991	LYNCHFORD UTEM SURVEY
DRAWN :	
REF. : Y11	*Loop: 1* *Line: 38000N*
REVISIONS :	CONTINUOUS NORMALISATION
DRAWING No.	SCALE, 1:5000 0 100m
	FIG. No. 12



UTEM SURVEY AT LYNCHFORD FOR PASMINCO EXPLORATION
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9103 BASE FREQ (HZ) 26.23
LOOP NO 1 LINE 38000 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

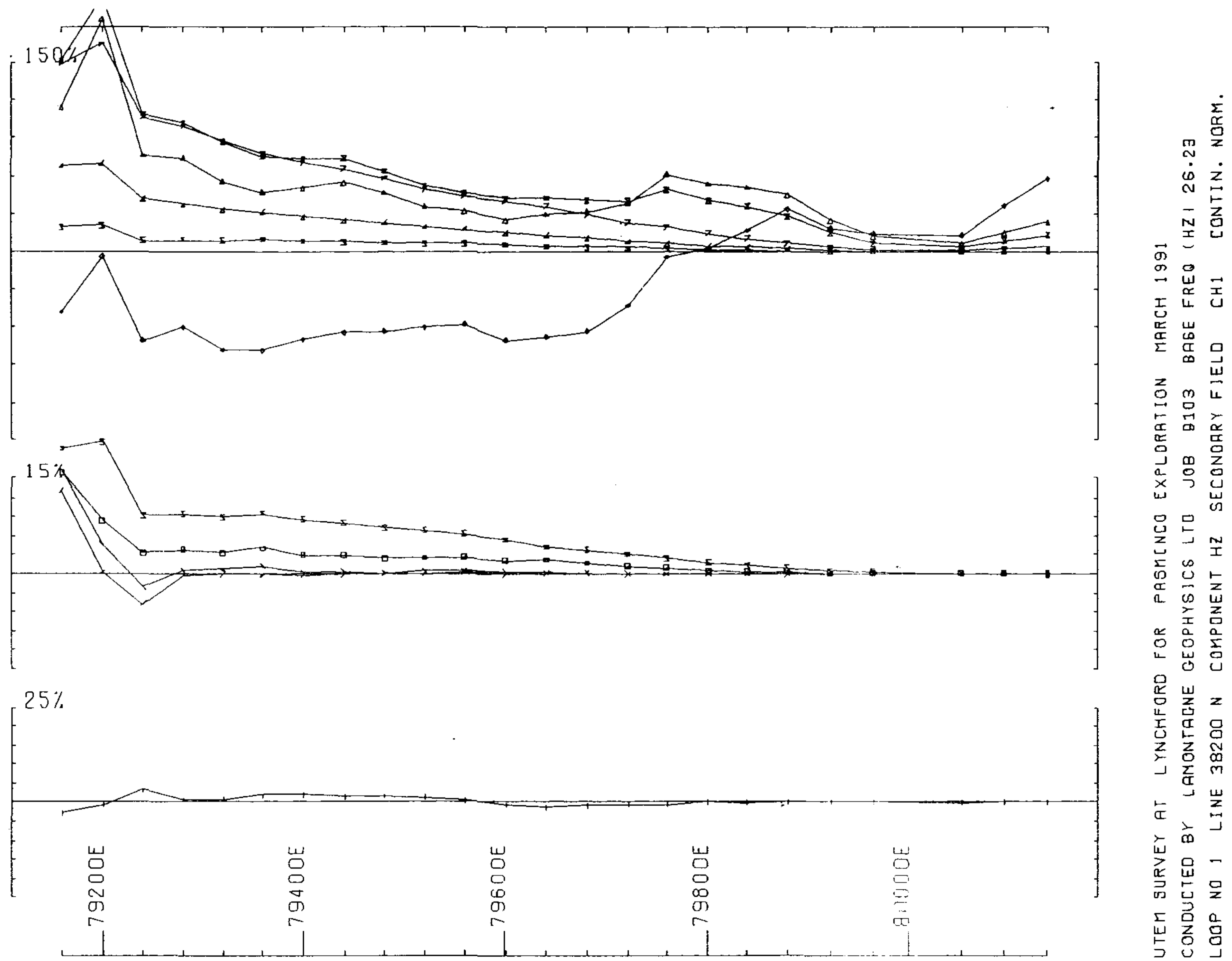
91-3278.

5 cm

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED : R. Smith	Yolande JV – EL 11/85
DATE : April 1991	LYNCHFORD UTEM SURVEY
DRAWN :	
REF. : Y11	*Loop: 1* *Line: 38000N*
REVISIONS :	POINT NORMALISATION
DRAWING No.	SCALE, 1:5000 0 100 m FIG. No. 13

0i

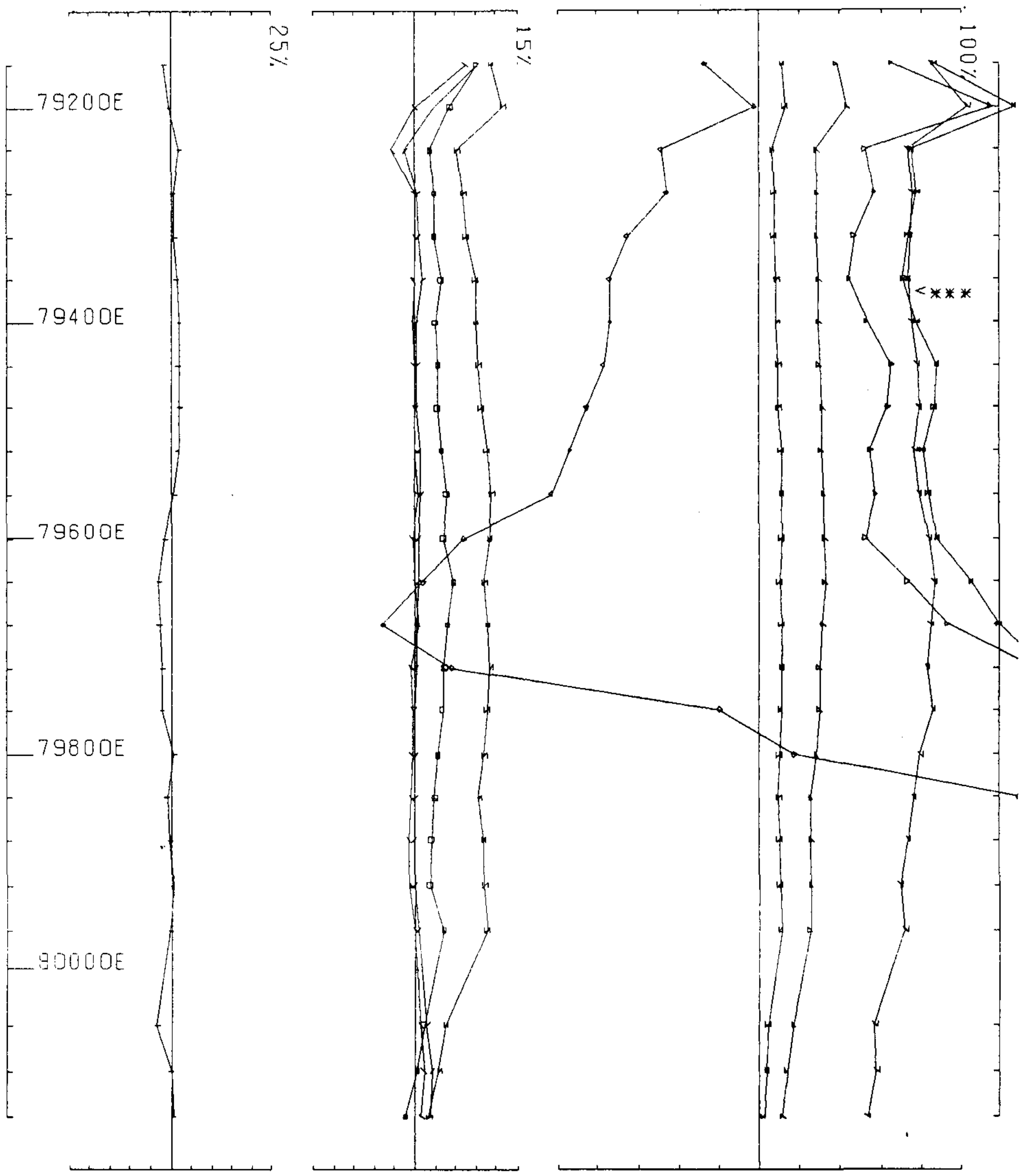


91-378.

5 cm

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED : R. Smith	Yolande JV – EL 11/85
DATE : April 1991	LYNCHFORD UTEM SURVEY
DRAWN :	
REF. : Y11	*Loop: 1* *Line: 38200N*
REVISIONS :	CONTINUOUS NORMALISATION
DRAWING No.	SCALE, 1:5000 0 100m — FIG. No. 14



UTEM SURVEY AT LYNCHFORD FOR PASMINCO EXPLORATION
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9103 BASE FREQ (HZ) 26.23
LOOP NO 1 LINE 38200 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED : R. Smith
DATE : April 1991
DRAWN :
REF : Y II
REVISIONS :
DRAWING No.

Yolande JV - EL 11/85
LYNCHFORD UTEM SURVEY
Loop:1 Line: 38200N
POINT NORMALISATION

SCALE 1:5000 0 100m
FIG. No. 15

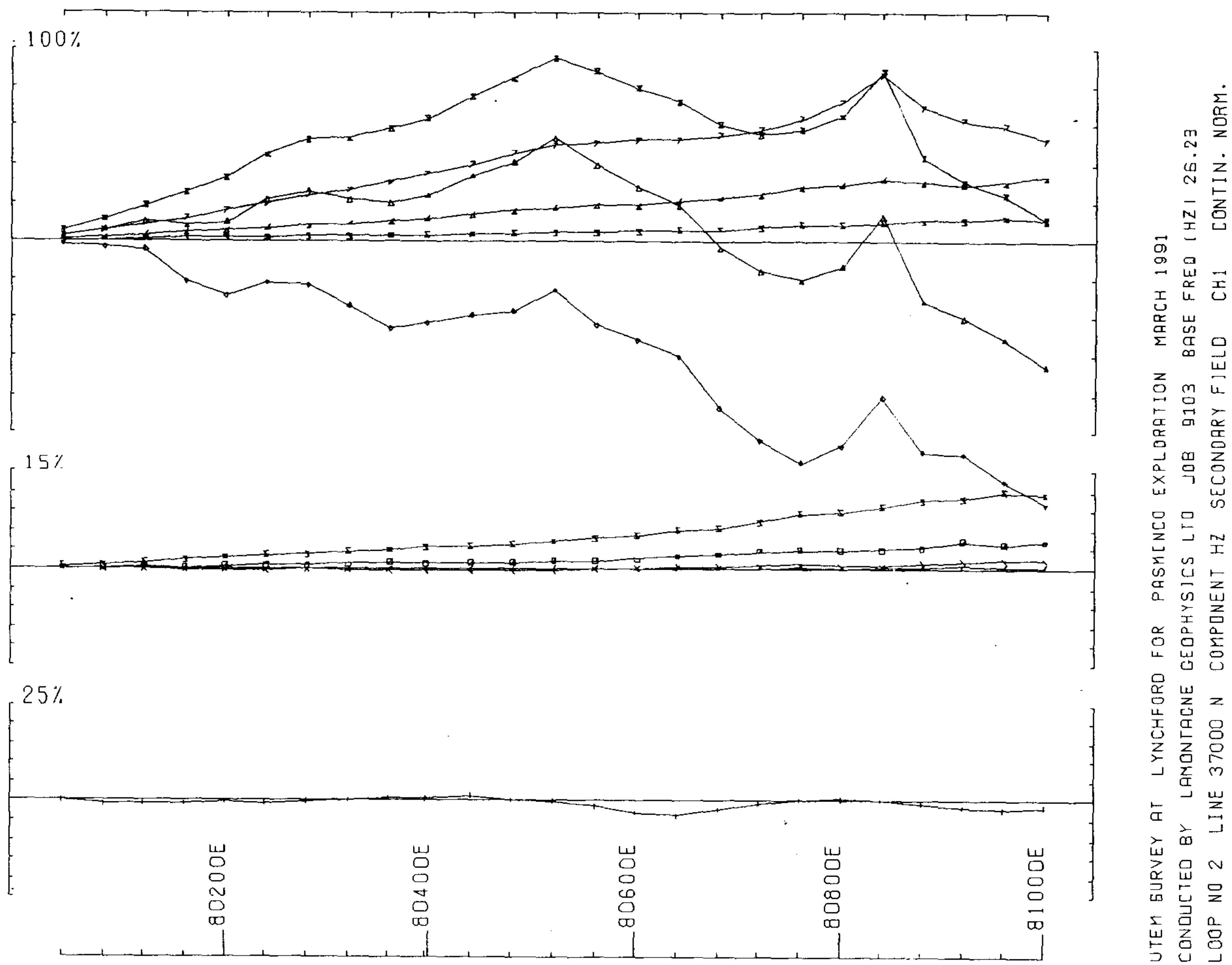
5 cm

91-3278.

357190

019

357191

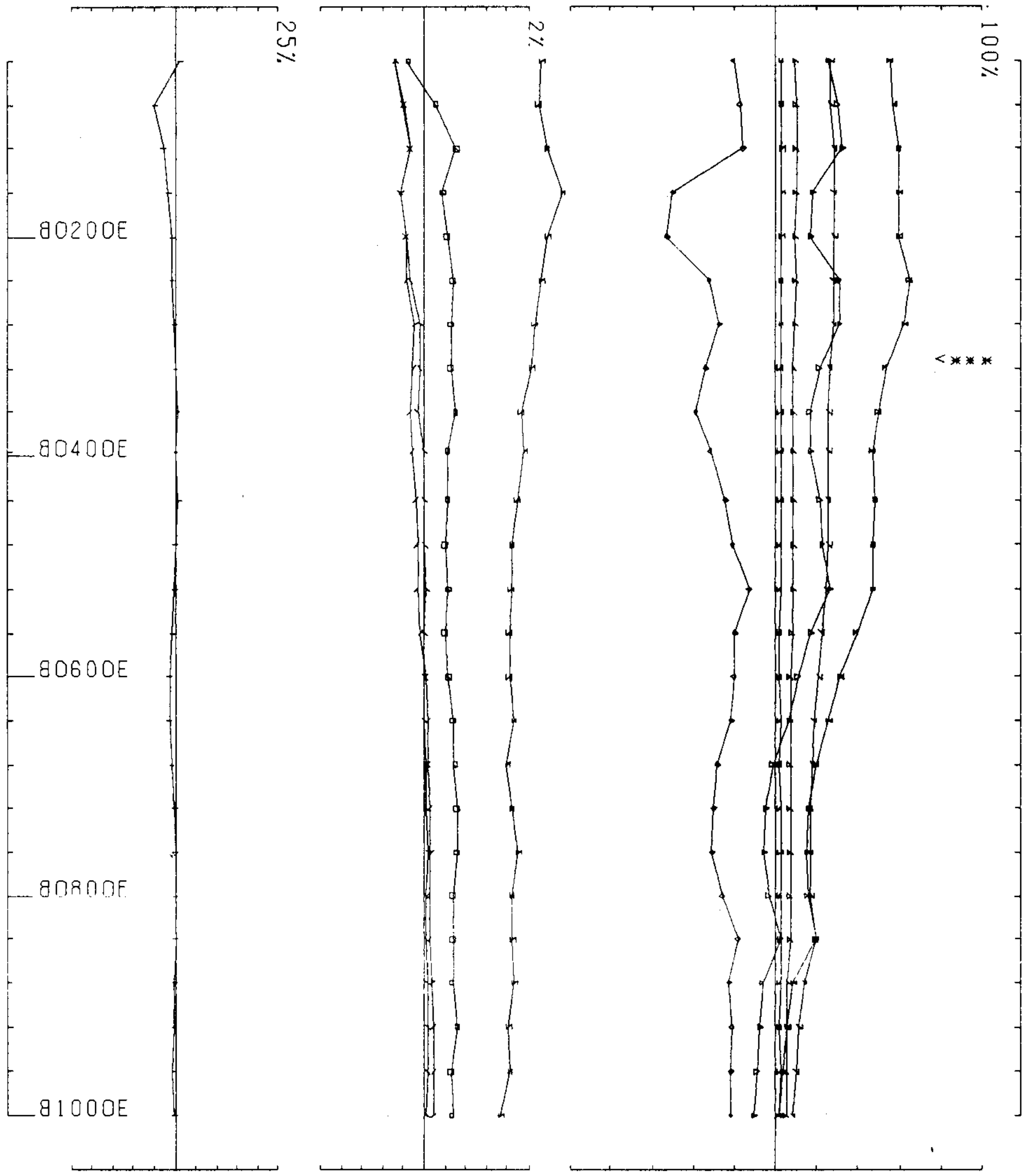


91-328.

5 cm

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED : R. Smith	Yolande JV – EL 11/85
DATE : April 1991	LYNCHFORD UTEM SURVEY
DRAWN :	
REF. : Y11	*Loop: 2* *Line:37000N*
REVISIONS :	CONTINUOUS NORMALISATION
DRAWING No.	SCALE, 1:5000 0 100m
FIG. No. 16	



UTEM SURVEY AT LYNCHFORD FOR PASMINCO EXPLORATION MARCH 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9103 BASE FREQ (HZ) 26.23
LOOP NO 2 LINE 37000 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED : R. Smith
DATE : April 1991
DRAWN :
REF : Y11
REVISIONS :
DRAWING No.

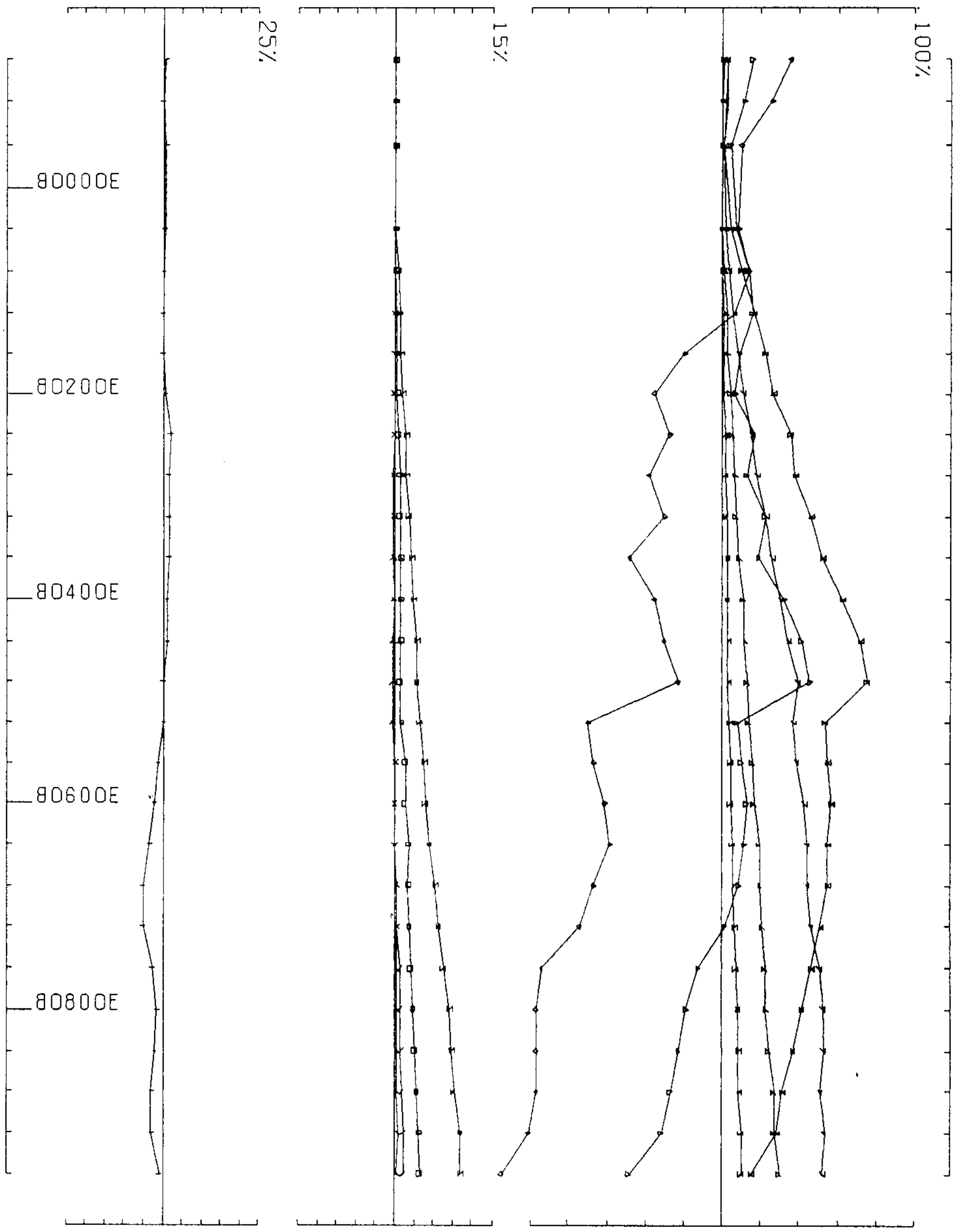
Yolande JV - EL 11/85
LYNCHFORD UTEM SURVEY
Loop: 2 Line: 37000N
POINT NORMALISATION

SCALE 1:5000 0 100m
FIG. No. 17

5 cm

91-3278.

357192



UTEM SURVEY AT LYNCHFORD FOR PASMINCO EXPLORATION MARCH 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9103 BASE FREQ (HZ) 26.23
LOOP NO 2 LINE 37200 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

Yolande JV - EL 11/85
LYNCHFORD UTEM SURVEY
Loop:2 Line:37200N
CONTINUOUS
NORMALISATION

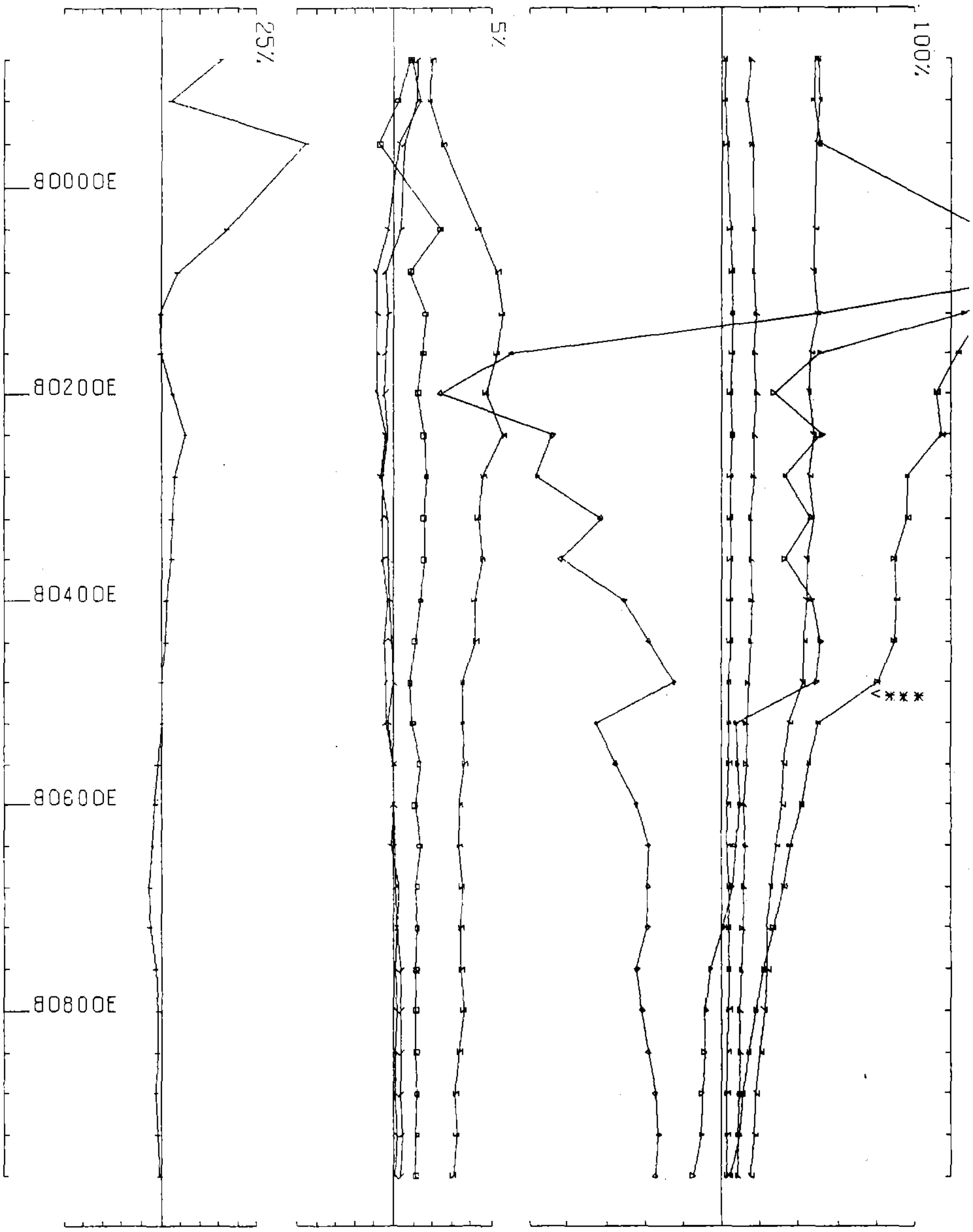
COMPILED: R.Smith
DATE: April 1991
DRAWN:
REF.: Y II
REVISIONS:
DRAWING No.
SCALE 1:5000 0 100m
FIG. No. 18

5 cm

91-3278.

357193

014.



UTEM SURVEY AT LYNCHFORD FOR PASMINCO EXPLORATION MARCH 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9103 BASE FREQ (HZ) 26.23
LOOP NO 2 LINE 37200 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

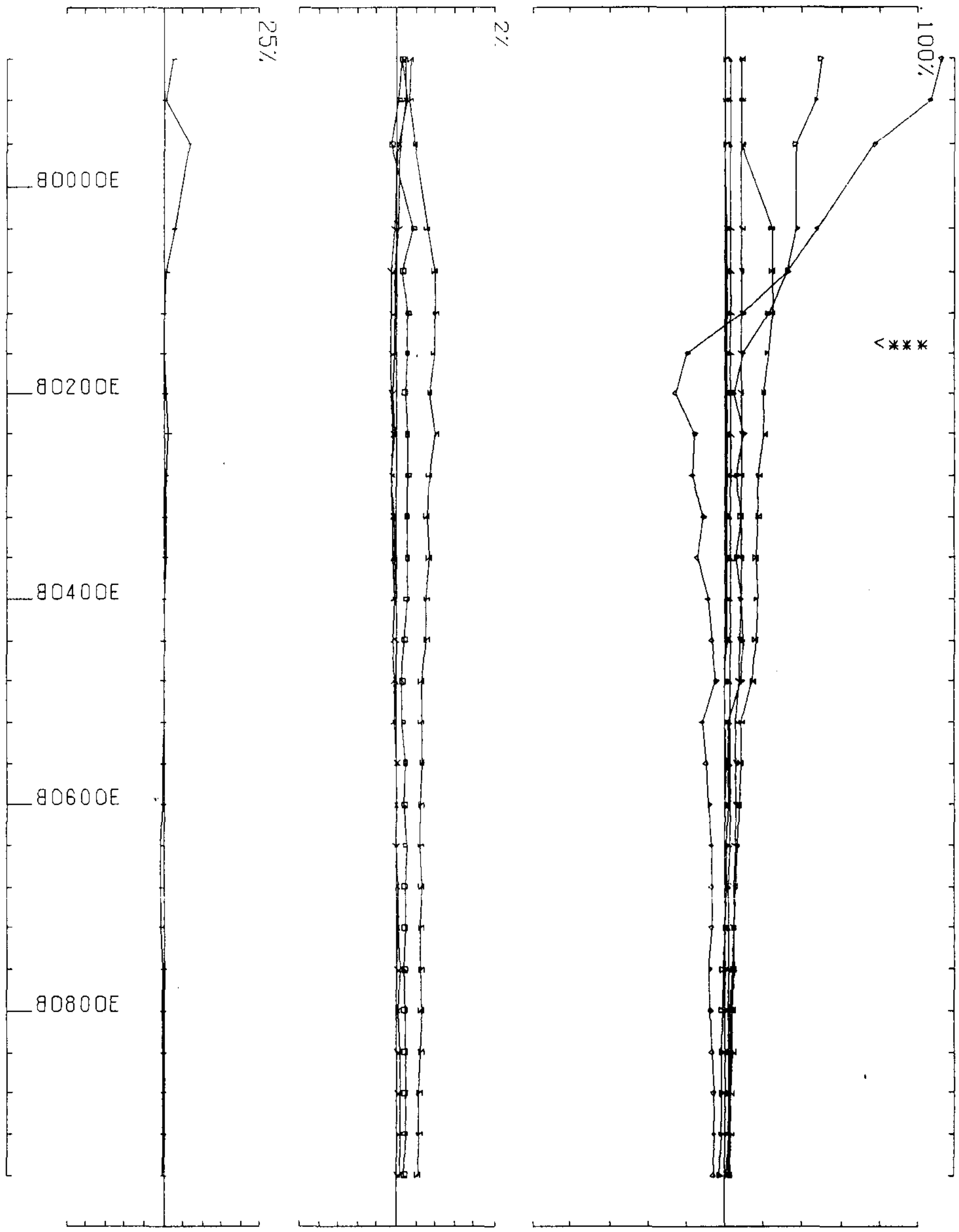
Yolande JV - EL 11/86
LYNCHFORD UTEM SURVEY
Loop: 2 Line: 37200N
POINT NORMALISATION

COMPILED: R. Smith
DATE: April 1991
DRAWN:
REF.: Y11
REVISIONS:
DRAWING No.
SCALE 1:5000 0 100m
FIG. No. 19

5 cm

91-3278.

357194



UTEM SURVEY AT LYNCHFORD FOR PASMINCO EXPLORATION MARCH 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9103 BASE FREQ (HZ) 26.23
LOOP NO 2 LINE 37200 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

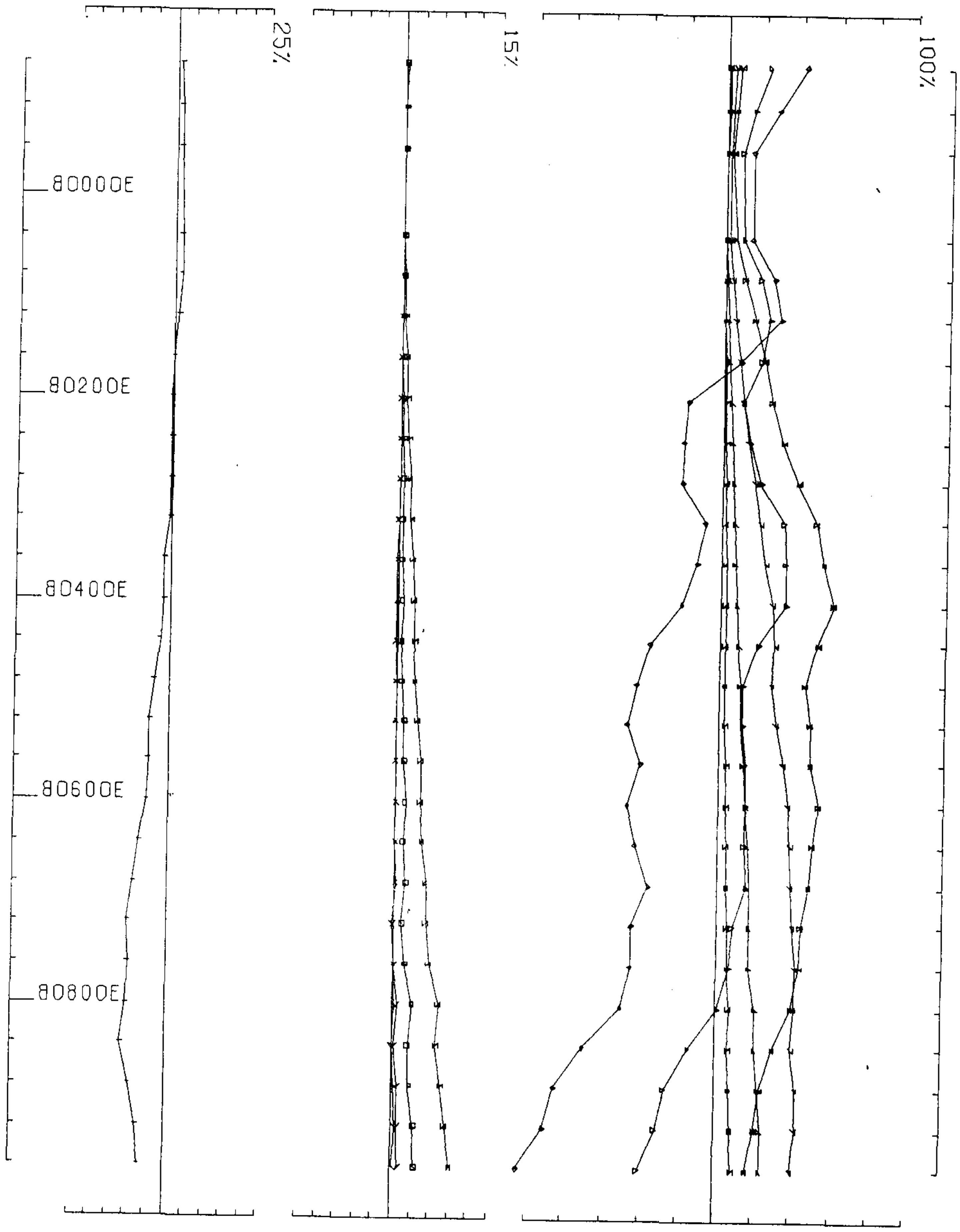
COMPILED : R. Smith
DATE : April 1991
DRAWN :
REF. : Y11
REVISIONS :

Yolande JV - EL 11/85
LYNCHFORD UTEM SURVEY
Loop: 2 Line: 37200N
POINT NORMALISATION

DRAWING No.
SCALE 1:5000 0 100m
FIG. No. 20

5 cm

91-3278.



UTEM SURVEY AT LYNCHFORD FOR PASMINCO EXPLORATION MARCH 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9103 BASE FREQ (HZ) 26.23
LOOP NO 2 LINE 37400 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED : R. Smith
DATE : April 1991
DRAWN :
REF. : Y II
REVISIONS :
DRAWING No.

Yolande JV - EL 11/85
LYNCHFORD UTEM SURVEY
Loop:2 Line: 37400N
CONTINUOUS
NORMALISATION

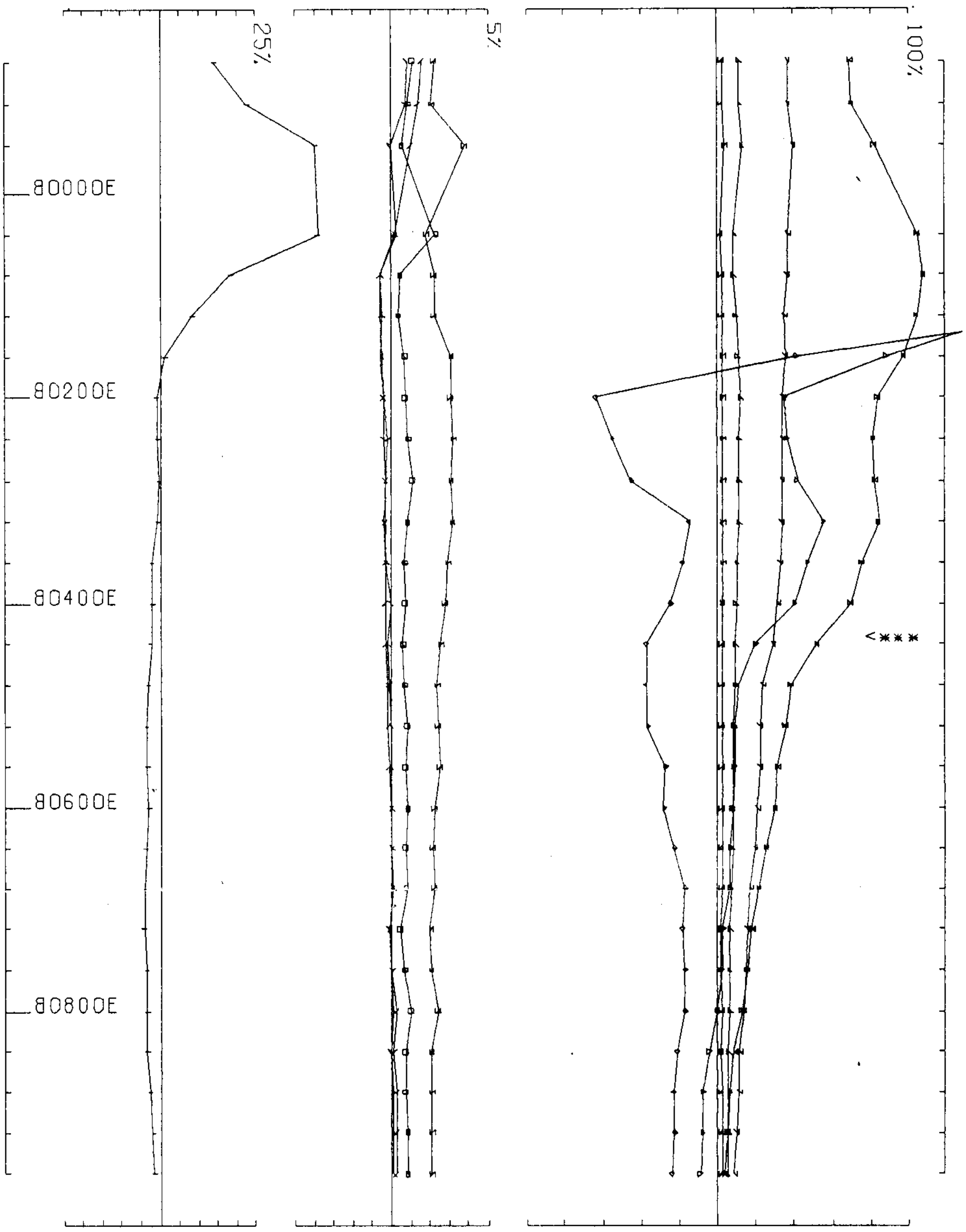
SCALE 1:5000 0 100m

FIG. No. 21

5 cm

91-3278.

357196



UTEM SURVEY AT LYNCHFORD FOR PASMINCO EXPLORATION MARCH 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9103 BASE FREQ (HZ) 26.23
LOOP NO 2 LINE 37400 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

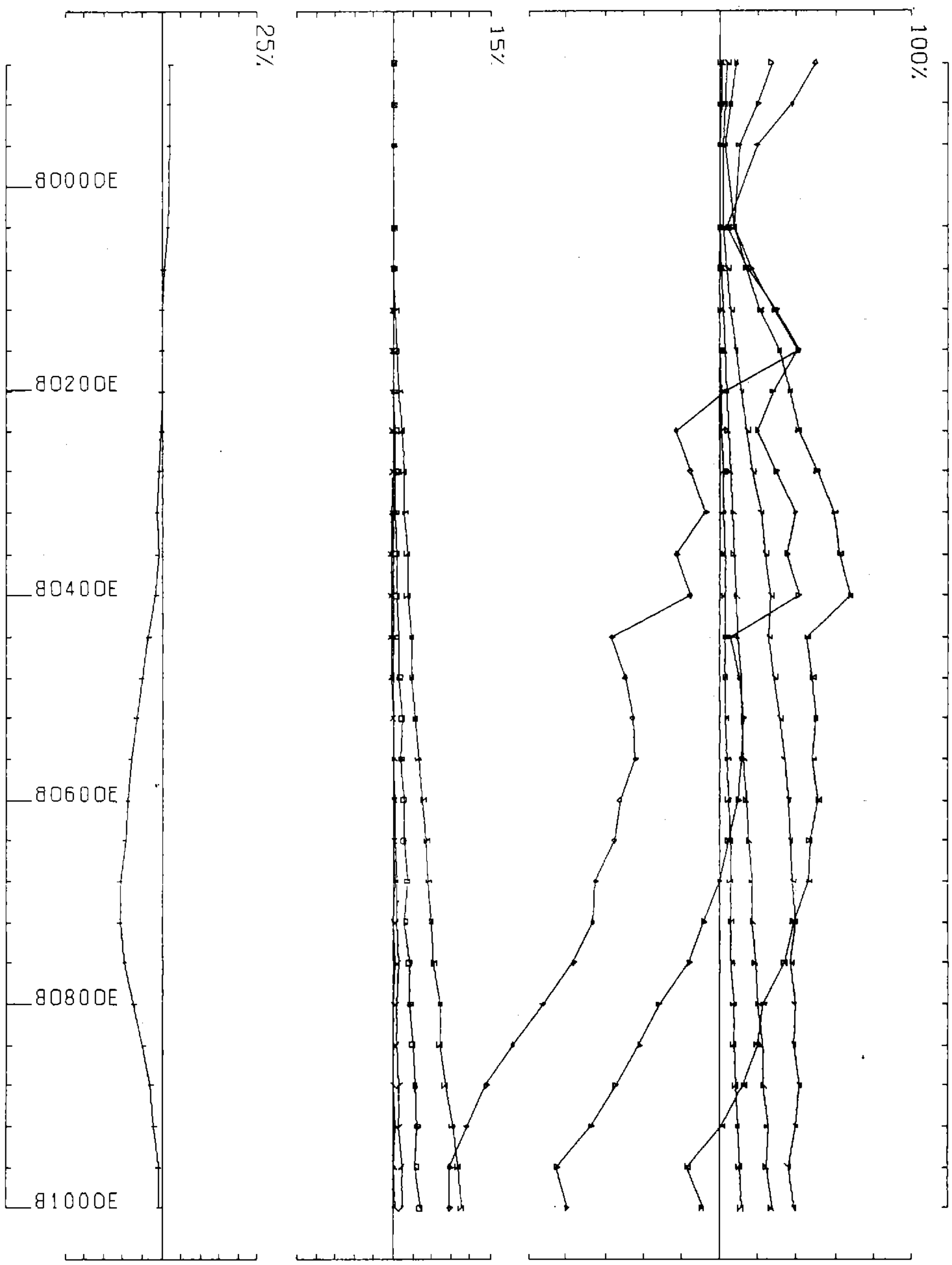
Yolande JV - EL 11/85
LYNCHFORD UTEM SURVEY
Loop:2 Line:37400N
POINT NORMALISATION

COMPILED: R.Smith
DATE: April 1991
DRAWN:
REF.: Y II
REVISIONS:
DRAWING No.
SCALE 1:5000 0 100m
FIG. No. 22

5 cm

91-3278.

0147



UTEM SURVEY AT LYNCHFORD FOR PASMINCO EXPLORATION MARCH 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9103 BASE FREQ (HZ) 26.23
LOOP NO 2 LINE 37600 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

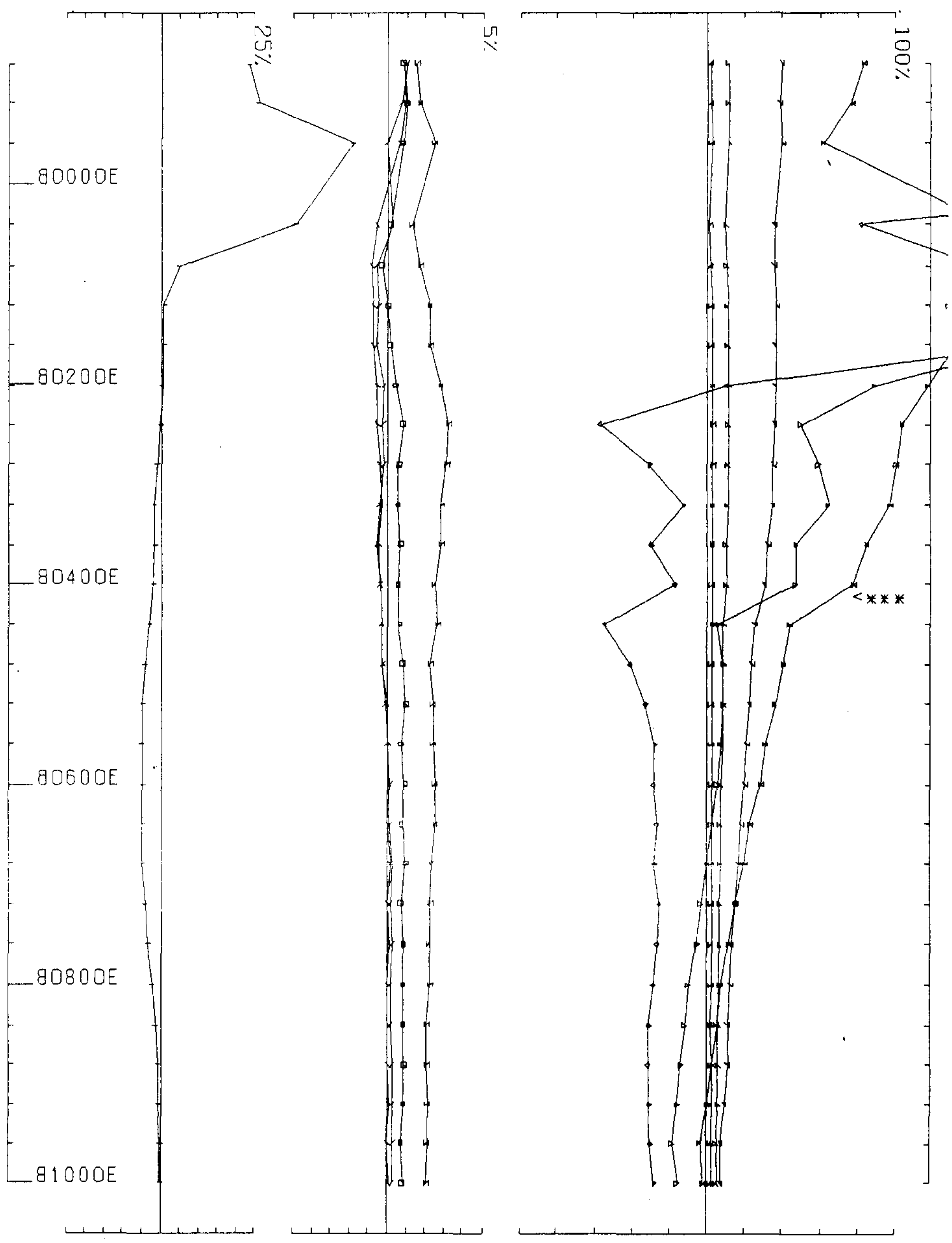
Yolande JV – EL 11/85
LYNCHFORD UTEM SURVEY
Loop:2 Line:37600N
CONTINUOUS
NORMALISATION

COMPILED : R. Smith	
DATE : April 1991	
DRAWN :	
REF : YII	
REVISIONS :	
DRAWING No.	SCALE 1:5000 0 100m
	FIG. No. 23

5 cm

91-3278

357198



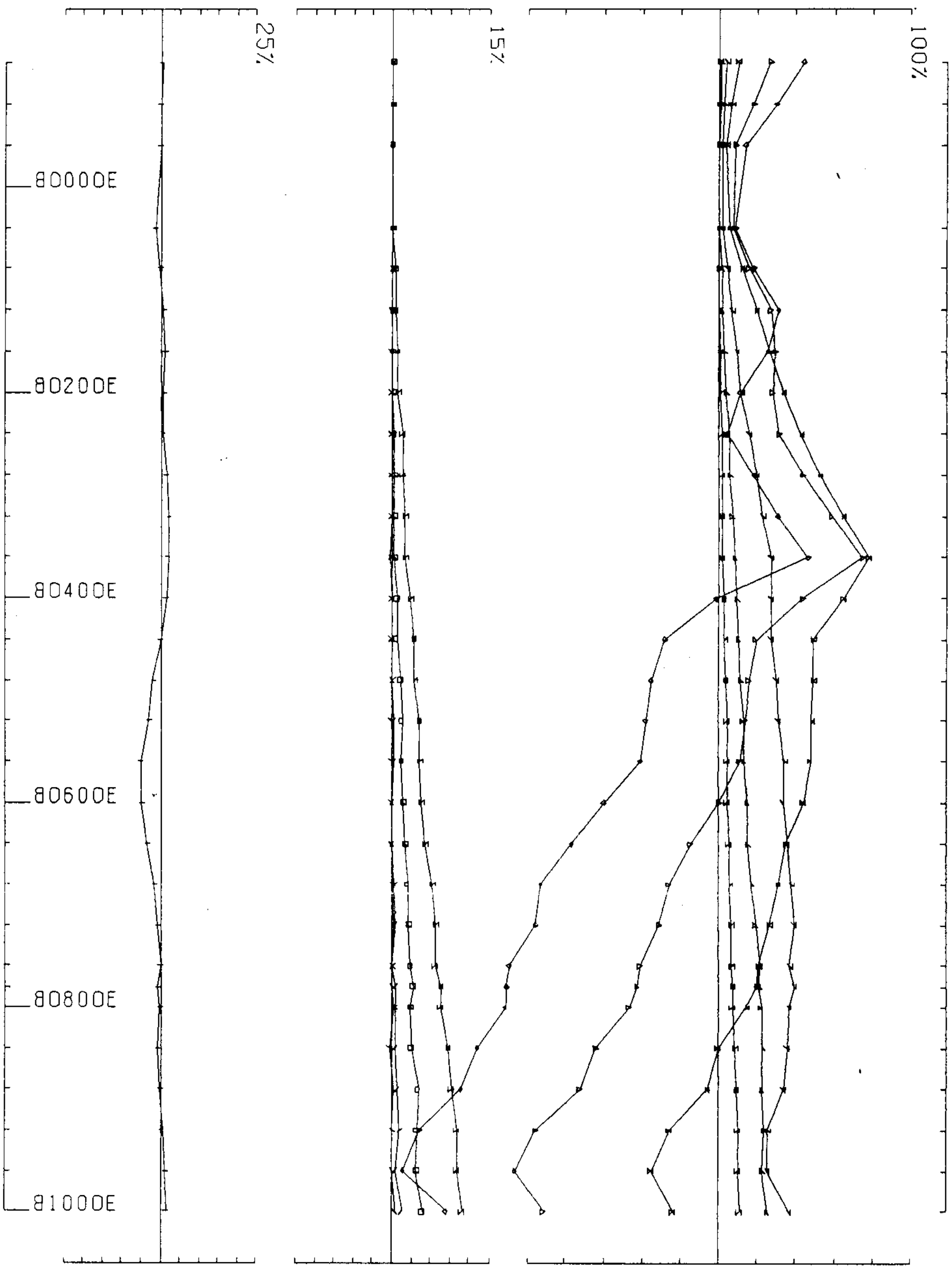
UTEM SURVEY AT LYNCHFORD FOR PASMINCO EXPLORATION MARCH 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9103 BASE FREQ (HZ) 26.23
LOOP NO 2 LINE 37600 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

5 cm

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED : R. Smith	Yolande JV - EL 11/85
DATE : April 1991	LYNCHFORD UTEM SURVEY
DRAWN :	
REF. : Y.II	*Loop:2 Line:37600N*
REVISIONS :	POINT NORMALISATION
DRAWING No.	SCALE 1:5000 0 100m — FIG. No. 24

91-3278.



UTEM SURVEY AT LYNCHFORD FOR PASMINCO EXPLORATION MARCH 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9103 BASE FREQ (HZ) 26.23
LOOP NO 2 LINE 37800 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

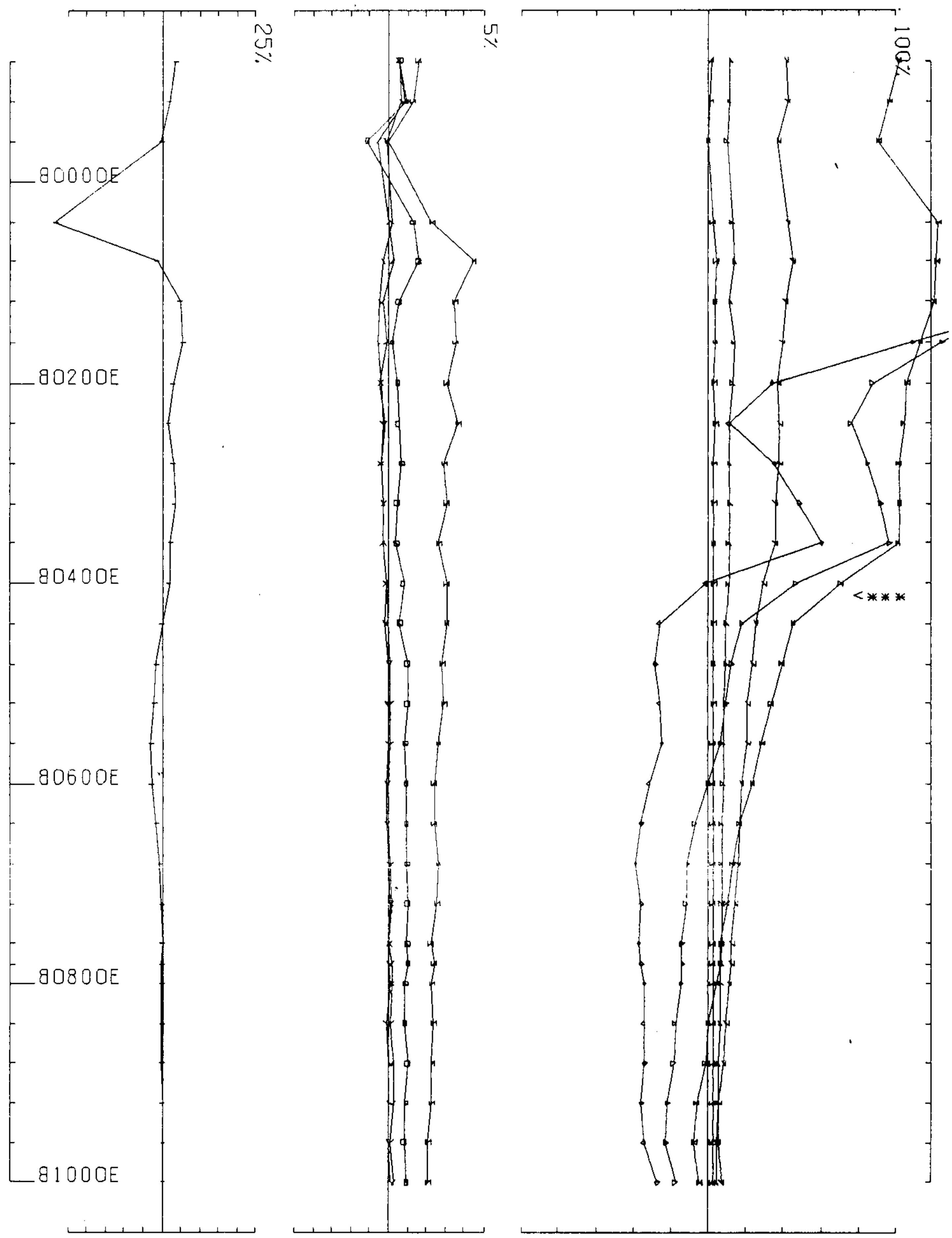
Yolande JV - EL 11/85
LYNCHFORD UTEM SURVEY
Loop: 2 Line: 37800N
CONTINUOUS
NORMALISATION

COMPILED: R. Smith
DATE: April 1991
DRAWN:
REF.: Y 11
REVISIONS:
DRAWING No.
SCALE 1:5000 0 100m
FIG. No. 25

5 cm

91-3278.

357200



UTEM SURVEY AT LYNCHFORD FOR PASMINCO EXPLORATION MARCH 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9103 BASE FREQ (HZ) 26.23
LOOP NO 2 LINE 37800 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

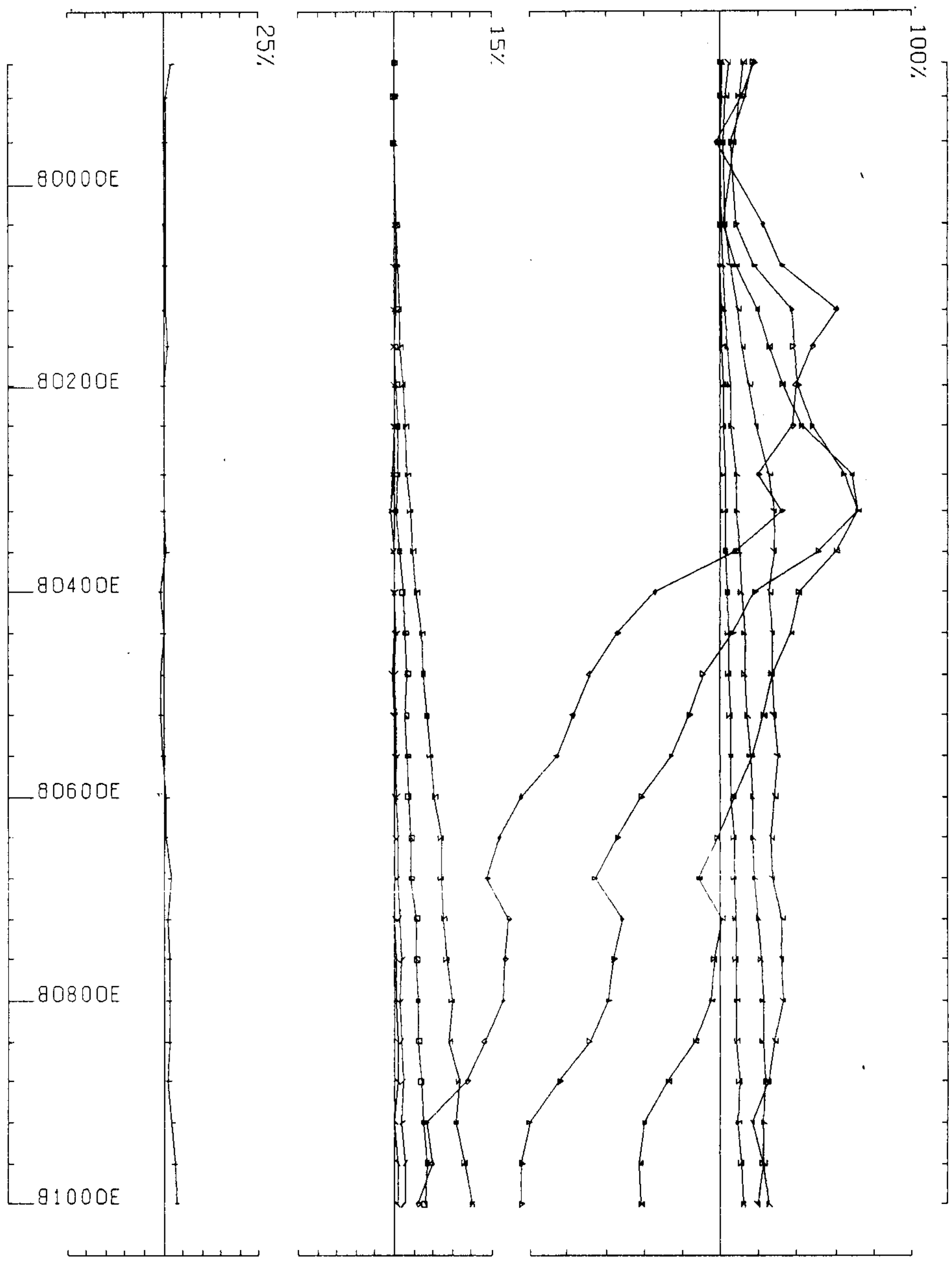
PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED : R. Smith	Yolande JV - EL 11/85
DATE : April 1991	LYNCHFORD UTEM SURVEY
DRAWN :	*Loop: 2 Line: 37800N*
REF.: Y11	POINT NORMALISATION
REVISIONS :	
DRAWING No.	SCALE 1:5000 0 100m
FIG. No. 26	

5 cm

91-3

357201



UTEM SURVEY AT LYNCHFORD FOR PASMINCO EXPLORATION MARCH 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9103 BASE FREQ (HZ) 26.23
LOOP NO 2 LINE 38000 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED: R. Smith
DATE: April 1991
DRAWN:
REF.: Y 11
REVISIONS:

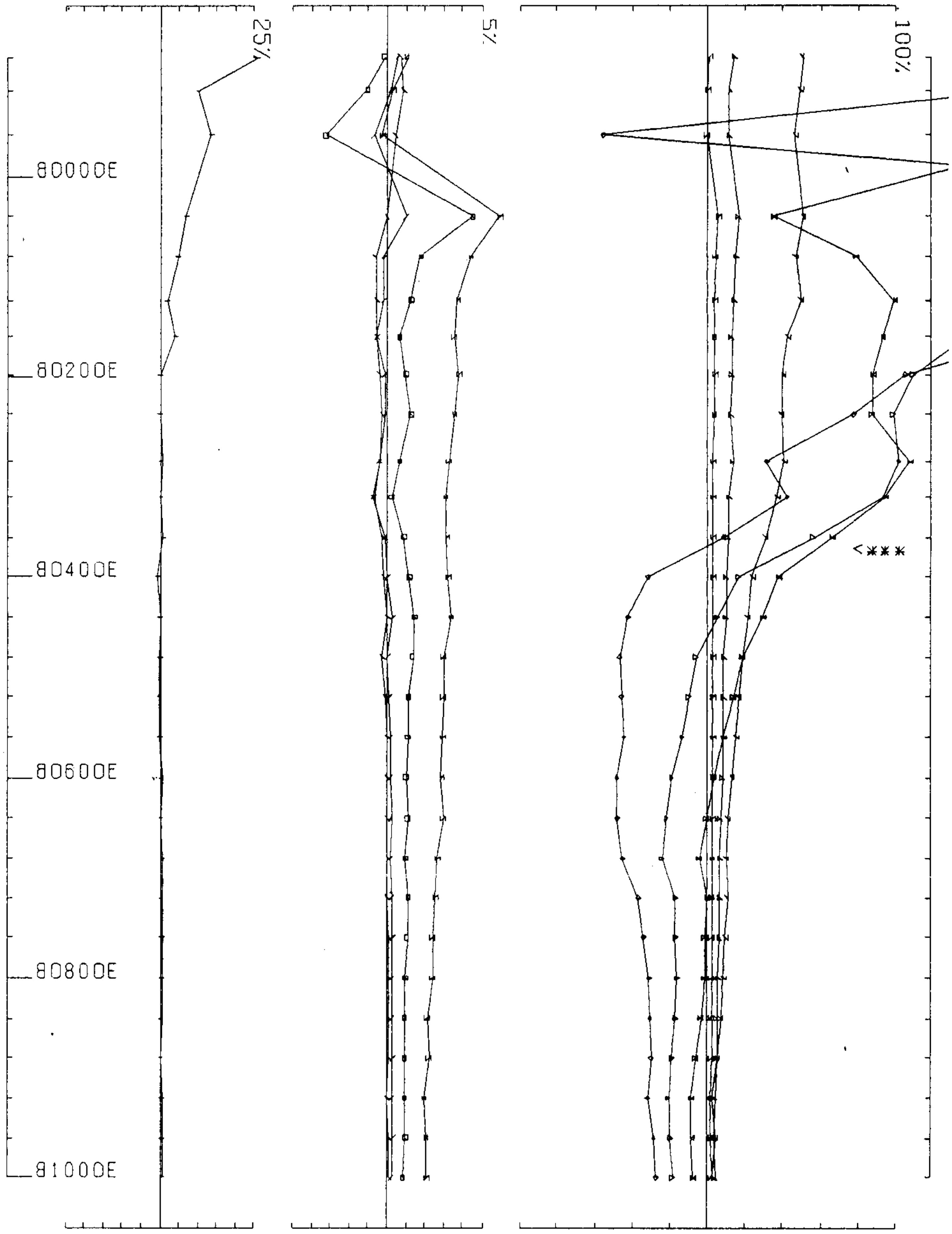
Yolande JV - EL 11/85
LYNCHFORD UTEM SURVEY
Loop:2 Line:38000N
CONTINUOUS
NORMALISATION

DRAWING No.
SCALE 1:5000 0 100m
FIG. No. 27

5 cm

91-3278.

357202



UTEM SURVEY AT LYNCHFORD FOR PASMINCO EXPLORATION MARCH 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9103 BASE FREQ (HZ) 26.23
LOOP NO 2 LINE 38000 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

5 cm

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED: R. Smith
DATE: April 1991
DRAWN:
REF.: Y II
REVISIONS:

Yolande JV - EL 11/85
LYNCHFORD UTEM SURVEY
Loop:2 Line:38000N
POINT NORMALISATION

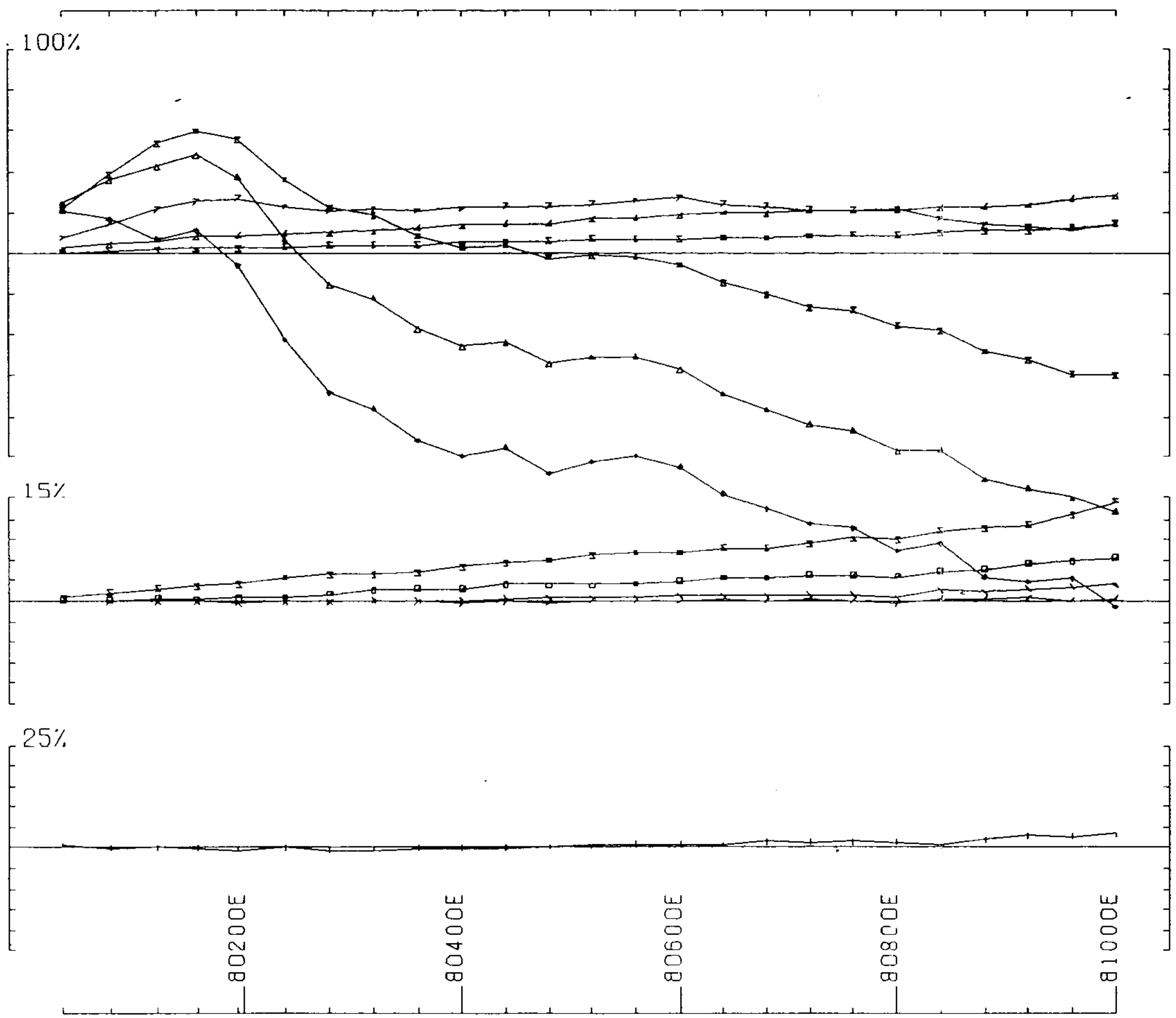
DRAWING No.
SCALE 1:5000 0 100m
FIG. No. 28

91-3278.

357203

02

357204



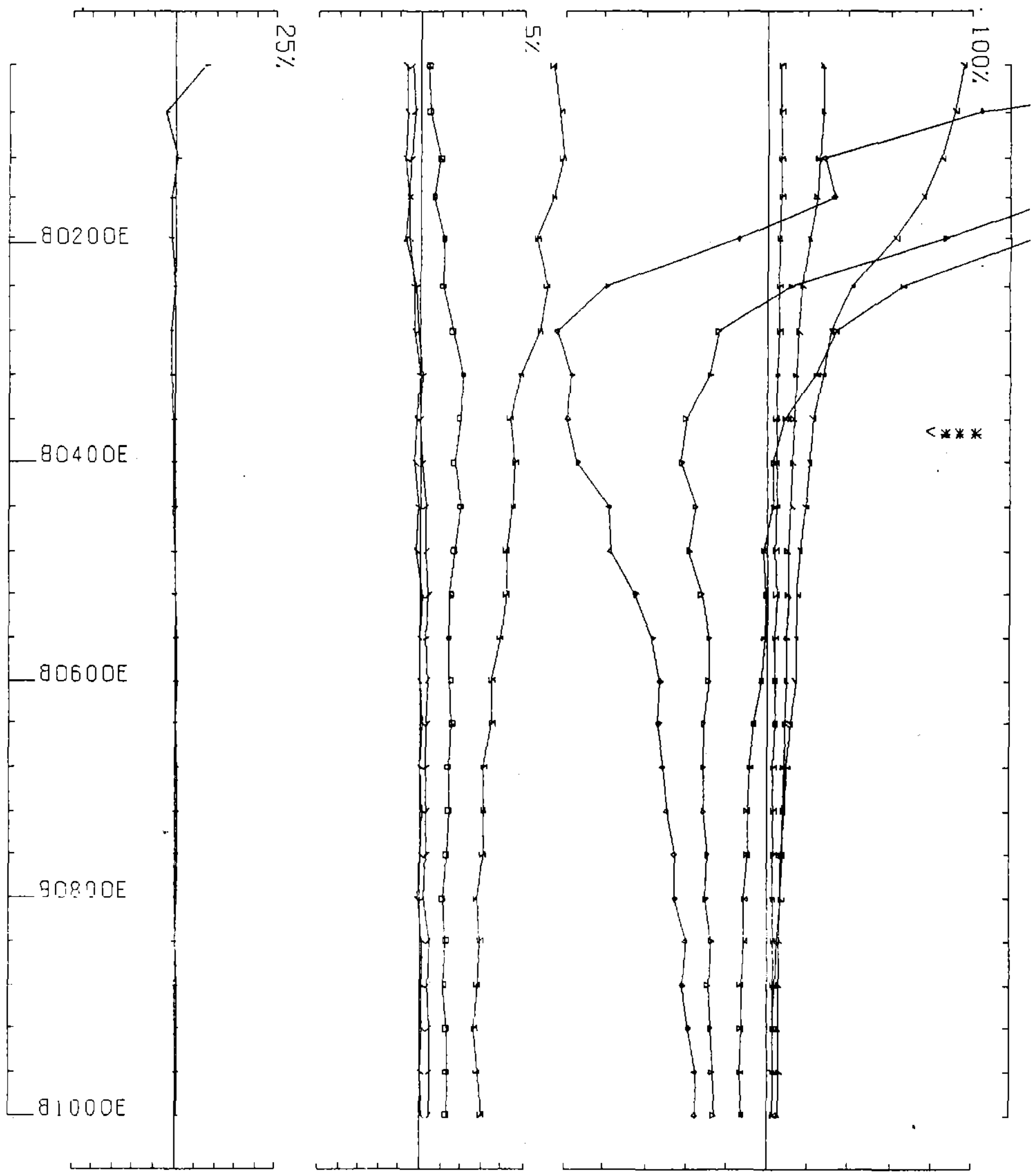
UTEM SURVEY AT LYNCHFORD FOR PASMINCO EXPLORATION MARCH 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9103 BASE FREQ (HZ) 25.23
LOOP NO 2 LINE 38200 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

91-3278.

5 cm

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED : R. Smith	Yolande JV – EL 11/85
DATE : April 1991	LYNCHFORD UTEM SURVEY
DRAWN :	
REF. : Y II	*Loop: 2 Line: 38200N*
REVISIONS :	CONTINUOUS NORMALISATION
DRAWING No.	SCALE, 1:5000 0 100m
FIG. No.	29



UTEM SURVEY AT LYNCHFORD FOR PASMINCO EXPLORATION MARCH 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9103 BASE FREQ (HZ) 25.23
LOOP NO 2 LINE 38200 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED: R. Smith
DATE: April 1991
DRAWN:
REF.: Y11
REVISIONS:
DRAWING No.

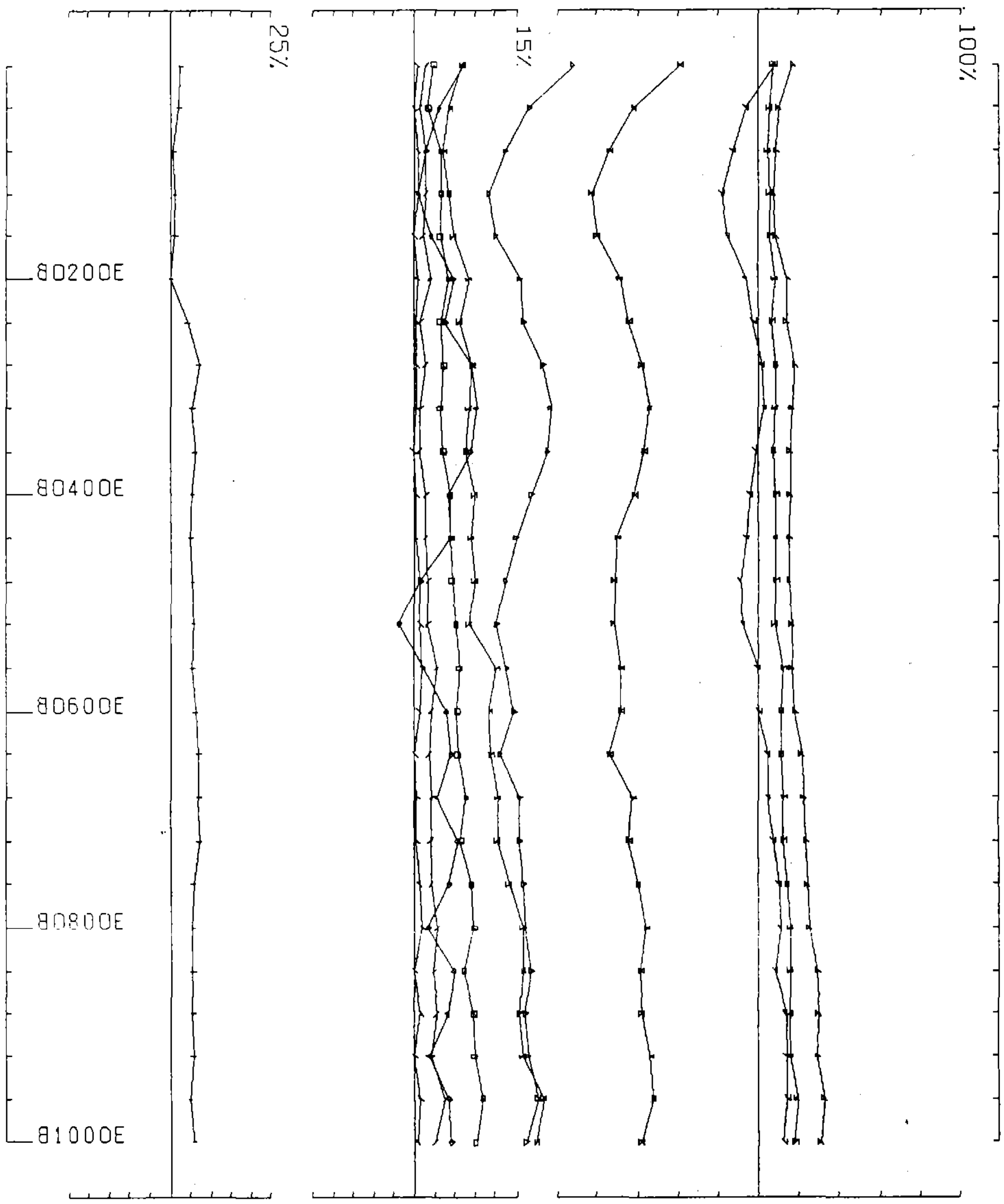
Yolande JV - EL 11/85
LYNCHFORD UTEM SURVEY
Loop:2 Line:38200N
POINT NORMALISATION

SCALE 1:5000 0 100m
FIG. No. 30

5 cm

91-3278.

357205



UTEM SURVEY AT LYNCHFORD FOR PASMINCO EXPLORATION MARCH 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9103 BASE FREQ (HZ) 26.23
LOOP NO 2 LINE 38600 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED: R. Smith
DATE: April 1991
DRAWN:
REF.: Y II
REVISIONS:
DRAWING No.

Yolande JV - EL 11/85
LYNCHFORD UTEM SURVEY
Loop:2 Line:38600N
CONTINUOUS
NORMALISATION

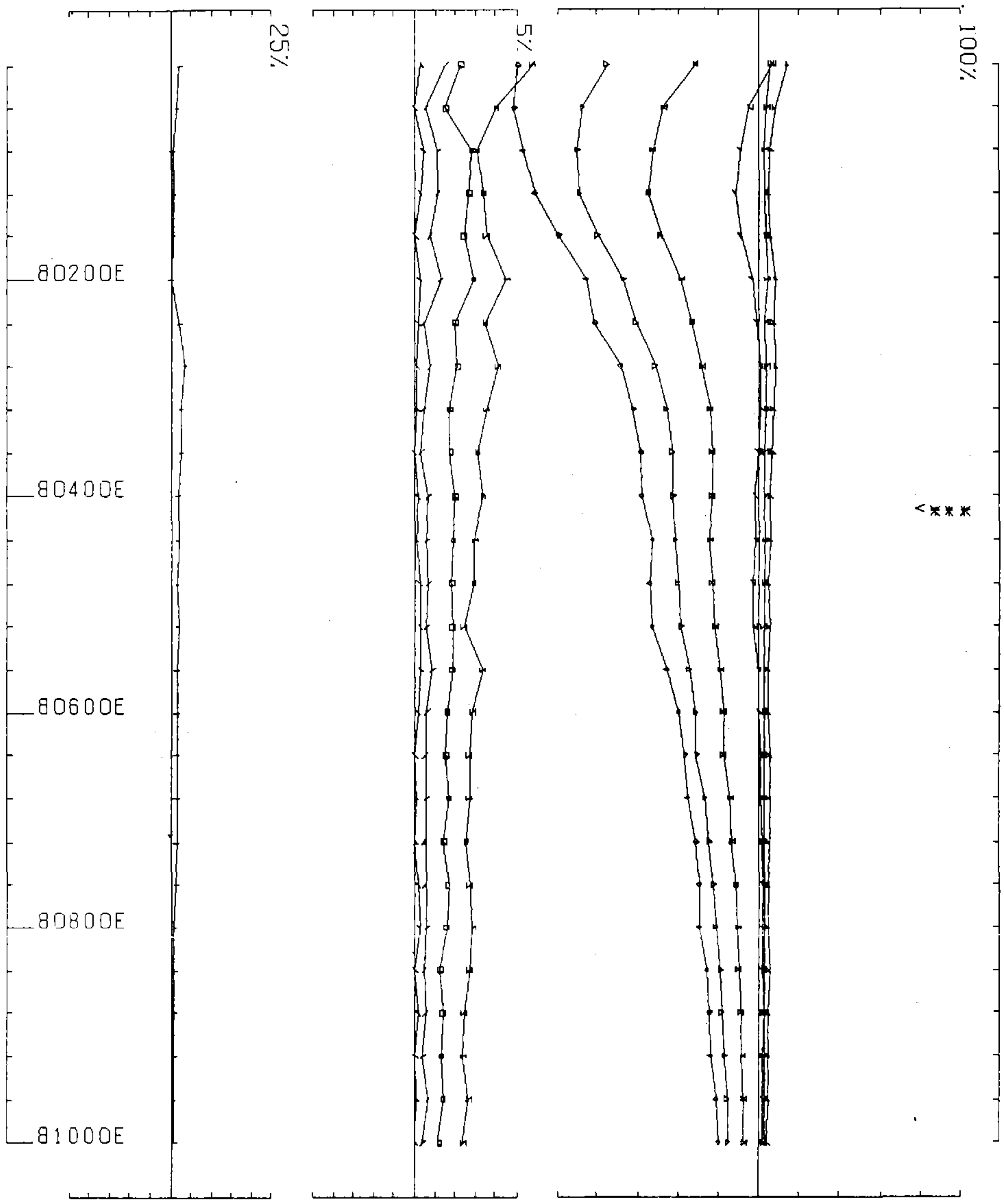
SCALE 1:5000 0 100m
FIG. No. 31

5 cm

91-3278.

357206

0215



UTEM SURVEY AT LYNCHFORD FOR PASMINCO EXPLORATION MARCH 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9103 BASE FREQ (HZ) 26.23
LOOP NO 2 LINE 38600 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED : R. Smith
DATE : April 1991
DRAWN :
REF : Y11
REVISIONS :
DRAWING No.

Yolande JV - EL 11/85
LYNCHFORD UTEM SURVEY
Loop:2 Line:38600N
POINT NORMALISATION

SCALE 1:5000 0 100m

FIG. No. 32

5cm

91-3278.

357207

APPENDIX H

REASSESSMENT OF EM37 SURVEY,

HENTY RIVER PROSPECT, MEMO, RS SMITH

0206

357209

PASMINCO
EXPLORATION

A Division of Pasminco Australia Limited.
(Incorporated in Victoria)

Level 2, The Atrium,
290 Burwood Road,
Hawthorn, Australia, 3122

A.C.N. 004 074 962

MEMORANDUM

MEMO TO: Fergus FitzGerald

MEMO FROM: Richard Smith

DATE: 15 February 1991 Ref: RSS013SR

SUBJECT: **YOLANDE JV HENTY RIVER PROSPECT**

As requested, I have reviewed the EM37 data collected in 1985. In general, I agree with John Bishop's conclusion that there is nothing of great significance in the area surveyed (Bishop, 1985).

An anomaly recorded at early times near the transmitter loop appears to be associated with the transmitter wire, but this cannot be confirmed as no measurements were made inside the loop.

The best anomaly recorded is over the Henty fault zone on lines 1S to 1N near the old adits. However, this anomaly is a little suspicious, as data on either side of the fault (river) was collected on different days.

It is interesting to note that there is no anomaly near 2600'E on line 4N where disseminated sulphide mineralisation outcrops. As well, the tuffaceous and black shales seem to have almost no conductivity contrast with the surrounding rocks. On line 7N, there is a slight increase in response over the shales, but it is difficult to distinguish from noise.

It appears the data was collected quite quickly, only 256 stacks being acquired, however the collection of 2 additional components (N-S, E-W), added to the acquisition time. This is unfortunate, as the N-S and E-W components have largely been ignored, the vertical component being the only one used for interpretation. More stacks would improve the signal level and remove ambiguity as to whether the anomalies (such as those on line 9N at 2650-2700mE) are real or noise.

The anomalies at around 2800mE on lines 11N, 12N and 13N (eastern anomaly) are small, somewhat swamped by noise, but may persist to times later than John Bishop has interpreted. The transmitter is over 500m from the anomaly and the primary field couples poorly to any conductor parallel to the dip at this position, so another transmitter is probably appropriate.

Hole HR3 was sited below a small IP anomaly, but an EM response is not likely here, as the mineralisation is very disseminated and the field also couples poorly to the prospective horizon around 2700m on line 7.5N.

I have been supplied with magnetics, IP, resistivity, and soil geochemistry profiles for lines 2N, 5N, 7N and 10N (the lines with drill sections). On these, the IP seems to have been successful at detecting near-surface disseminated sulphides, although the grades are poor, and drilling sited on these anomalies gave disappointing results.

The TEM has not detected any significant conductive zones (possible massive sulphides), but there is some hint in the eastern anomaly! The IP, magnetics and geochemistry on line 10N do not cover this zone, nor is there any mapped outcrop in the area. The area is only 300m x 100m, but is open to the north. Whether or not further EM is recommended would depend on geological evidence for a prospective zone.

Recommendation for the area.

1. Assess the geological evidence for doing further surveys near the 'eastern anomaly' (in the area east of 2600mE and north of line 10N).

General recommendation for EM-37 when used on future surveys.

1. Measure at least one station inside the loop to ascertain if anomalies can be attributed to the transmitter wire.
2. Measure lines on the same day, or if possible go back and reoccupy at least one station to recalibrate.
3. Unless there is a reason, collect only vertical component data and stack to ensure good signal-to-noise ratios.

Reference:

Bishop, J.R., 1985. Interpretation of the EM37 survey over the Henty River grid Yolande (EL 11/85). Mitre Geophysics Report CM/MG85/13. October 1985.

PASMINCO
EXPLORATION

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FACSIMILE

TO: Fergus

ATTENTION:

FROM: Richard Smith

DATE: 22/2/91

FAX NUMBER:

NO OF PAGES INCL. THIS COVER SHEET: 3

SUBJECT: Henty River geophysics Review

Addendum:

I do think it would be a good idea to try the 'Eastern anomaly' with another loop at some stage. This is because the coupling to this zone wasn't too good.

I will forward original

Richard

Telephone (03) 818 0044 Facsimile (03) 818 0040

APPENDIX I

MAGNETIC SUSCEPTIBILITY DATA

Rock Samples

DDH HR 1, 2, 3 & 5, Henty River Prospect

DDH Bradshaws Road 1

02.. (1)

357213

MAGNETIC SUSCEPTIBILITY READINGS

EL 11/85 YOLANDE

SAMPLE N°	COORD N	E	Reading	sample size	Comment
30001			0.21	50mm	fine gabbro
"			0.13	50	feld xt volc wacke
002			7.75	100mm	" " lithic wacke + mag grain
003			0.1 – 0.45	100mm	gabbro – pyroxenite
004			0.07 – 0.12	50	fine felsic s/s
005			0.30		Basalt breccia
006			0.31 – 0.51	75	Basic & mafic phenos – Basic fine dyke
007			0.11 – 0.23	50	Albitized plag' porph basic
008			0.02	50	Altered plag' porph' basic
009			0.07	50	Siltst < carbonate altered
010			0.34	50	Microgabbro
011			0.18	100	Weathered gabbro
012			0.32	50	Plag mafic porph andesite?
013			0.35	75	" porph andesite
014			0.28	100	" " dyke < seric altered
015			0.30	75	lithic sandstone < sericitized
016			0.19	50	Plag > mafic porph andesite
017					
018					
019			0.03 0.10	50	fine felsic vitric <50 Plag porph andesite
020			2.62	50	Basic fine chl vesicles
021			0.24	50	Laminated vit mudst + xt s/s
022			0.27	<50	Basic fine
023			0.24	50	Coarse xt lith s/s
024			0.34 0.55	<50	Augite porph andesite <50 Basic dyke fine
025			0.20	50	Vitric mudst dissem py
026			0.22	50	Gabbro
027			0.56	75	< Sericitized fine basic?
028			0.29	50	Tonalite?
029			0.22 0.32	50	feld xt s/s 50 fine plag' porph basic
030			0.27	50	fine basic – trachytic
031			1.11	75	Brecciated basic + silic matrix
032			0.40	75	Feld xt lithic s/s coarse
033			6.05	50	Basic fine
034					
035			0.31	50	Volcaniclastic
036			0.08	<50	fine s/s < silic seric altn
037			0.13	<50	Siltstone + carbonate
038			0.21	50	Qtz limonite + carb altn.

MAGNETIC SUSCEPTIBILITY READINGS

EL 11/25 YOLANDE

SAMPLE No	COORD N	E	Reading	Sample size	Comment
30039					
040					
041					
042			1.39	10mm slice	vit mudst + pyrrhotite
043			0.34	50	feld xt + lith sandstone
044			0.4	50	" "
045			0.16	75	siltstone grey
046			0.22	75	Gwk / ss chlorite - hematitic
047			0.48	75	Basalt breccia
048			0.26 0.55	75	Tonalite Basic fine grained
049			46.80	75	Serpentinized u/m
050			0.24 70.90	75	feld + mafic xt s/s 50 v fine basic
051			12.50	100	" " " " med grnd
052			24.90	>100	fine basic
"			4.34	"	plag porph basic + epid veins
053			0.35	>100	s/s crystal lithic
054			0.23	100	" feld xt, banded chl alb altn
055			30.60	100	Basalt plag porph vesic
056			0.30	100	Basalt?
057			0.05	50	V fine grey vit mudst
058			0.04	50	" " dk grey " "
059			0.42 1.01	100	Basic c qtz epid Basic plag porph
060			15.40	100	" plag porph
061			0.24	75	S/s feld xt + chl
062			0.06	100	chert
063			16.00	75	Gabbro + dissem magnetite
064			1.10 – 4.60	50	Flow brecc plag porph lava
065			4.05	>100	Basic fine scattered plag phenos
066			41.40	50	Gabbro + blebs mag cf 30063
067			0.01 - 0.07	100	Chert / silicifn
068			0.48	75	Mudst blue grey
069			0.02	75	Gwk v fine
070			0.06	100	Massive fine grnd felsic
071			0.05	50	Qtz porph rhyolite lava
072			0.21	50	Feld hbl porph - dacite lava
073			0.09	50	Felsic fine
074			0.27	50	Feldsp gwk. - s/s
075			0.20	75	Clastic - felsic
076					

MAGNETIC SUSCEPTIBILITY READINGS

EL 11/85 YOLANDE

SAMPLE Nº	COORD N	E	Reading	SAMPLE SIZE	Comment
30077			0.46	100	Brecc basic
078			0.33 0.49	100	Basic - int volc Cong brecc
079			0.45	100	Basic fine plag porph
080			0.44	70	" "
081			0.15 – 0.20	50	Basalt < hematitic
082			0.18	50	Basic fine
083			0.29	100	Tonalite
084			7.39	>100	Basic fine
085			0.16	75	Tonalite
086			0.25	75	Gabbro fine
087			0.21	>100	Tonalite
088			0.23	75	Carbonate alt fine sed?
089			0.18 – 0.22	100	Talc schist + chromite grains
090			22.00	50	" "
091			13.70	50	Serpentinite
092			0.19	100	Tonalite
093			0.44 – 0.34	<50	f-m grnd dolerite < albitised
094			0.09	100	v fine laminated vit mudst
095			0.38	50	fine basic - dolerite
096			3.81	50	Plag xt or phenos in fine chl gmass
097			0.24	50	Basic plag porph - fine gmass
098			0.17	75	Fine felsic or silic intermed?
099			0.18	100	Seric alt qz porph rhyolite
30100			0.12	50	Carb seric alt rhyolite
101			0.10	50	Silic gabbro / tonalite
102			62.0 0.29	100	v fine basic 100 hematitic congl
103			0.31	100	< chl basic - radiating needle xt
104			24.50	100	Med grnd gabbro/dolerite - magnetite
105			0.34	100	" " plag porph ophitic gmass
106			0.36	<50	Plag porph Basic fine gmass
107			0.19	50	Tonalite qz veined
108			0.18	50	"
109			1.07	100	Plag porph basic fine albit gmass
110			0.25	50	Basic / chl brecc
111			0.26	50	" hyaloclastite?
112			0.16	<50	Basic - interm fine
113			0.18	<50	" "
114			0.26	50	Dolerite fine equigran

MAGNETIC SUSCEPTIBILITY READINGS

EL 11/85 YOLANDE

SAMPLE No	COORD N	E	Reading	Comment
30115			0.19	<50 Basic fine
116			0.22	100 Dolerite / tonalite brecc foliated
117			0.20	<50 Tonalite
118			0.30	75 "
119			0.06	50 Felsic fine vitric
120			0.13	50 Tonalite c pyrite
121			0.38	50 Basic - interm fine
122			0.12	70 Talc schist c chromite grains
123			0.25	50 Basic fine - some hematite
124			11.20	100 Basic fine carb vesic c chl ham
124			0.32	100 Basalt + " "
125			0.17	50 Tonalite fine
126			0.27	100 Basic plag mafic porph fine gmass
127			0.46	100 " fine chl carb vesic
128			0.76	100 " plag mafic porph in fine gmass
129			0.44	100 Gabbro / dolerite f-med
130			0.08	75 Felsic s/s fine or lava?
131			0.26 - 0.34	>100 Basic plag mafic phenos fine gmass
132			0.46	100 Basic v fine
133			0.35 - 0.40	100 Vol'clastic - vit ash
134			0.22	50 Vit mudst - c chl feld xt s/s
135			0.31	100 s/s c hem chl
136			0.16	75 Gwk cong - hem siltst clasts
137			0.13	<50 QTZ spec' hematite vein
138			0.26	50 Mudst - gwk
139			0.33	50 Micro gabbro
140			0.28	100 Intermed derived volc s/s
141			0.12	75 S/s - vitric mudst massive
142			0.16	75 Basic v fine gnd
143			0.26	75 Contact fine basic / gabbro
144			0.16	50 S/s feld xt c chloritic
145			0.18	75 " " " + lithic
146			0.04	50 Vitric mudst? felsic derived
147			0.23	<50 Fine basic c plag pheno cpx
148			0.25	<50 " "
149			16.40	<50 Fine basic (doleritic) c plag phyric
150			0.20	<50 Qtz calcite veins in fine sed
151			0.20	<50 Tonalite? c chloritic
152			0.05	50 " Qtz veined albitised

MAGNETIC SUSCEPTIBILITY READINGS

EL 11/85 YOLANDE

SAMPLE No	COORD N	E	Reading	Comment
30153			0.16	<50 Basic - intermed fine
154			0.38	70 Basic fine
155			0.13 - 0.18	50 " " contact c med plag phyric
156			0.19	50 Andesitic? plag porph fine grained
157			0.10	50 Basic fine < albitized
158			0.25	50 Simil to 30156 + chl xenoliths?
159			0.12	50 Basic f-m
160			0.20	50 Intermed - scattered mafic plag phenos
161			0.19	50 s/s feld xt chl grains
162			23.5 - 26.4	100 Basic f - med grnd
163			0.22	50 s/s f-med felsic derived
164			17.2	100 Andesitic? feld mafic plag phenos epid chlor
164			1.04	75 " xt lithic wacke
165			0.06 - 0.09	75 Mudst? fine vitric
166			0.19	75 Wacke xt lithic cf 30164
167			0.04	<50 s/s fine vitric dark grey
168			0.49	100 Contact fine plag porph / med coarse plag porph
168			11.60	75 Breccia plag mafic porph
169			21.10	>100 s/s feld xt albite magnetite chl [illegible]
170			0.49	75 Basic - intermed plag porph fine grains
171			18.3	100 " plag porph < chl + carb amyg
171			0.54	100 " ~~[illegible]~~ hem py altered
172			0.17 - 0.40	75 Basic f- med grained
173			0.24	75 Dacite plag porph
174			0.12	100 Mudst vit lam black
175			0.04	100 Chert
176			0.05	100 Rhyolitic volc f-m grnd
177			0.06 0.20	50 Sericitic felsic volc 75 Mudst vitric
178			0.03	100 Very fine vitric ash - felsic lava?
179			10.00	100 Lithic wacke f-m grnd
180			0.31	100 Brecc/conglom basaltic hem alt
181			0.10	75 Mudst - limestone
30 182	LYNCHFORD		0.57	100 Silic vitric or brecc chert
183				
184				
30 185	HENTY		0.05	<50 Tonalite
185			0.20	Plag porph intermediate
186			0.15	75 Tonalite very fine grnd

MAGNETIC SUSCEPTIBILITY READINGS

EL 11/85 YOLANDE

SAMPLE Nº	COORD N	E	Reading	Comment
30187	}		8.50	75 Basic fine grnd hem carb vesicles
187			0.20	50 Andesite plag porph
187			0.40	75 Basic fine < chl + calc veins
188			0.13	75 Felsic volc glassy gmass
189			1.47	100 Gabbro? plag porph
190			3.71	75 Wacke feld xt + lithics < chl
191			0.07	50 Vitric mudst?
192			17.30	100 Lava breccia? basic - intermed
193			43.90	75 Basic fine grnd
194			3.92	100 Basic < plag porph dissem py
195	}		0.24	100 S/S feld xt chl alb banding + mag epid
195			3.15	75 Basic lava breccia < hem alter
196	}		0.11	75 Coy flow polymict basic volc + chert
196			0.19	50 Basic - intern plag mafic porph qtz veins
197				
198	Henty River DDH 5			
199	" " " "			
30200	" " " "			
30901			0.24 - 0.45	100 Mudst? alt + gna sph Henty Adits
902			0.16 - 0.27	75 Vitric felsic volc carb alt "
903			0.21	100 Mudst? alt veinlets gna sph "
904	}		0.20	50 Fine basic
904			1.22	100 Volc clastic or hyalo clast intermed?
905				
906			0.31	100 Wacke < hem
907			0.35	75 Basic fine ophitic text
908			0.37	75 Mudst - gritk blue grey
909				
910			0.43	100 Basic fine grnd : vagre
911			0.45	50 Mudst blue grey - brecciated
912			0.40	75 Basic fine < chl + carbonate amyg
913			0.23	50 " " "
914			0.12	50 S/S? felsic derived
915			0.04	75 " " "
916			0.18	100 " felds xt
917			0.26	75 Gwk hem chl
918			0.17	75 Mudst hem carb.
919			0.14	50 Volc clastic < chl

MAGNETIC SUSCEPTIBILITY READINGS

EL 11/85 YOLANDE

SAMPLE N°	COORD N	E	Reading	Comment
30920			0.25	100 Basic xtallen med grnd
921			0.43	100 Mudst v fine grnd
922			0.40	100 Basic v fine < chl
923			0.11	100 S/S? diffuse banding
923			0.41	50 Basic plag porph fine grnd
924			0.38	50 " " "
925			0.41	75 Mudst lam blue grey
926			0.04-0.12	75 And? feld mafic porph carb alteration
927			4.61	75 Intern-basic plag porph fine grnd
928			0.39	75 Felsic fine foliated
928			0.20	50 Chert black
929			0.20	50 Silic gabbro?
30963			·06	75 Mudst fine vit
965			0.33	75 Brecc basic
967			0.00	50 Mudst fine vit
968			0.63	100 Basic fine
971			0.17	50 Siltst - mudst - qwk
972			0.32-0.54	100 Siltst - qwk < carb alt < py
973			0.26-0.34	100 Andesite feld phyric
974			0.27	50 " " "
975			0.28	50 Mudst lam
976			0.10	75 " blue grey
977			0.90	50 " lam dk grey
978			0.34	75 Andesite plag porph
979			0.08	75 s/s felsic < seric py
980			0.43-0.62	100 Andesite feld phyric
981			0.25	75 " " " veined
982			0.06	100 Fine felsic s/s or lava??
983			5.57-20.20	100 Basic - interm plag porph
984			12.00	100 " " "
984			1.09	100 " " < hem py alt
985			0.05	50 Albitized feld qtz xt s/s ?
986B			0.16-0.35	100 Felsic-interm lava? < albitized
987			47.0	75 Basic plag porph
988			0.45	100 Mudst blue grey - fossil frags
989			0.25	100 Grit volc clastic chert qtz clasts + py
990			0.01	100 Felsic vitric fine

MAGNETIC SUSCEPTIBILITY READINGS

EL 11/85 YOLANDE

SAMPLE No	COORD N	E	Reading		Comment
30991	?		0.22	100	Mass debris flow felsic
991			0.12	75	Banded vitric
992			0.03	100	Xt lithic < sericite
993			0.03-0.06	75	Mudst lam - felsic s/s
994			0.04-0.10	100	s/s fine felsic - s/s feld xt + lith
995			0.12	100	Felsic lithic rich pumice flows
996	?		29.80	100	Andesite? quenched lava? + mag
996			0.08	75	Mudst? vit fine
997			19.10	100	cf 996
998			0.02	100	Felsic f-m grd < seric
999			0.05	100	Qtz porph fine glassy gmas
31000			0.07	100	Xt minor lith fine glassy gmas
31501			0.02	<50	Qtz sandstone
502			0.03-0.11	75	Fine vitric + feld xt
503			0.23-0.44	50	Fine < chl sed - fine mudst wacke
504			0.08	50	Qtz py vein
505			0.30	75	Mudst mauve
506			1.32	100	Gwk - s/s fine
507			0.21	75	Cong < hem
508			0.28	50	Mudst - fine gwk
White Spur 509			0.23-0.30	100	Feld qtz xt < albite - qtz gwk grit
510			0.22-1.23	100	" " + lithic < glassy gmas
511	?		0.06-0.03	100	Felsic mass debris - s/s
511			0.28	100	Mudst lam carb bands + py
512			0.1-0.21	100	Felsic lava? fell phyric band chl/alb
513			0.10-0.14	100	Felsic vitric - qtz porph
514			0.09-0.18	100	" " (lava?) feld xt
515			0.09	100	" "
516			0.39-0.64	100	Felsic intrusive?
517			0.08-0.16	100	" feld porph + qtz carb veins
518			0.02	100	" sed? fine
519			0.10	100	V fine vitric felsic lava?
520			0.05	100	Felsic mass debris flow - qtz porph clasts
521			0.10	100	" " - sandstone
522			0.01-0.03	100	Felsic lava - vit ash?
NEXT CREEK 523			0.18-0.21	100	Mass debris flow dacite - andesite
524			0.27-0.31	100	And - dacite?

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MAGNETIC SUSCEPTIBILITY READINGS

EL 11/85 YOLANDE

	SAMPLE Nº	COORD N	E	Reading	Comment
Newt Ck	31525			—	VMS clasts
	526			0.06	100 Silic seric alt dacite clasts
	527			0.92	100 Volc clastic s/s - siltst + po
	528			0.19 – 0.42	100 Chl epid alt volc clastic + pink rh clast
	529			16.5	100 Andesite feld hb porph
	530	?		3.94	75 Trachy andesite c qtz amygs
	530			0.35	75 And feld hb porph altered
	531			0.07	75 Felsic fine pink – orange
	532			0.20	50 " f–med grnd
	533			0.01	50 " qtz seric py schist.
	534			0.17	75 Felsic f–m
	535			8.86	75 Feld hb porph c chl alb alt
	536			0.20	100 Dacite? feld xt c chl
Spur	537			0.05	100 Brecc felsic lava - black mudst matrix
	538			0.01	100 " " " " "
	539			0.22	100 Mass debris flow felsic feld qtz xt
	540			0.08	75 Pyritic alth shear in felsic volc
	541			0.03	100 " seriate
	542			0.06	75 Silic serp?
	543			0.11	100 Mass debris flow feld qtz xt
	544			0.06	100 Mudst laminated feld xt
	545			0.03	100 Silic c py felsic mass debris
	546			0.01	50 " " " " - + grn sp
	547			0.02	100 Mass debris flow feld > qtz xt
	548			0.02	75 " " " " c seric alt
Newt Ck	549			0.24	100 Interm - felsic volc c chl
	550			0.21	100 " " " "
	551			0.10	75 " " brecc volc c seric chl
	552			0.13	100 Brecc dacite? – mass debris
	552			0.80	75 S/s laminated c calc minor po
	553			0.11 – 0.15	75 Dacite? feld porph - brecc
	554			0.13	50 Felsic – interm feld xt fine grns
	555			1.12	75 Andesite c chl
	556			~~0.15~~ 0.07	75 Dacite? chl/seric carb py alt
	557			0.08	75 Very fine vitric
	558			0.28	50 Andesite feld chl mafic porph
	559			0.07	50 Felsic f–med grnd mass debris flow
	560			0.38	75 Andesite? porph feld minor mafic phen

MAGNETIC SUSCEPTIBILITY READINGS

EL 11/85

SAMPLE Nº	COORD N	E	Reading	Comment
31561			0·10	75 Dacite fine glassy gmass c̄ feld xt +py diss
562			0·15	50 AA < chl
563			0·17	75 AA < feld porph < py
564			0·12	50 Intermed? glassy gmass < chl
565			2·30	100 Andesite qtz amygdales < chl
566			0·14	<50 Felsic volc
567			0·17	75 Andesite? < chl lava?
568			13·40	50 " feld mafic phenos < chl gmass
569			0·25	50 "
570			0·16	50 " feld porph
571			0·23	75 " ? feld xt - brecc - < chl
572			0.09–0.15	75 Dacite feld minor qtz glassy gmass
573			0·13–0·17	50 Mudst vitric lam +py
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31600				

MAGNETIC SUSCEPTIBILITY READINGS

EL 11/25 YOLANDE

SAMPLE No	COORD N	E	Reading	Comment
31601			0.07	100 Mudst vit py
602			0.17	100 Cong chert brecc
602			16.40	75 Basic fine grained
603			16.30	100 " " " dissem mag
604			0.06	100 Chert
605			0.14	100 Greywacke : s/s qtz rich
606			24.50	75 Andesite? ē feld phyric dissem mag
607			4.87	100 Sandstone + mag grains
608			0.14	100 Volc s/s silic qtz veined
608			0.13	75 Grit fine hem' ext frags
609			0.21	100 Cong felsic volc clasts?
610			0.20	100 Felsic fine
611			0.04	50 " f-med s/s?
612			0.02	100 " volc grit-cong - qtz porph frags
612			0.01	100 Lam fine vit xt + chl glass
613			0.04	100 Volc clastic felsic
614			0.05	100 Felsic lava qtz phyric
615			0.10	75 Porph qtz feld
616			0.13	100 Felsic med gnd ignimbrite?
617			0.03	100 Mens Ridge? qtz s/s siltst
618			0.14	100 Felsic f-m gd s/s?
619			0.07	75 Vitric speckled ē feld xt
620			0.40	75 Andesitic porph?
621			0.40	100 " feld porph epid
622			0.06	100 Felsic fine s/s or lava?
623			39.30	100 S/s feld xt lithic <chl + mag grains
624			33.80	100 Cong volcclastic basic-felsic derived
625			0.04	100 Volc clastic qtz feld xt felsic
626				
627				
628			0.15	50 Sericic alt + limonite
629			0.14	75 Lava? qtz plag porph - brecciated
630			0.34	50 Basic fine
631			0.01	50 Black mudst + > feld xt
632			0.05	50 Mudst < silic minor py
633			0.06	50 Qtz feld phyric fine glassy grains
634			0.12	100 " " porph
635			0.13	100 " " "

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357224

02

MAGNETIC SUSCEPTIBILITY READINGS

2 11/85 YOLANDE

SAMPLE No	COORD N	E	Reading		Comment
31636			0.06	50	Silic mudst minor py
637					
638					
639			0.14	100	feld - chl mafic phenos in fine grnd
640			0.29	100	feld porph fine gmass
641			0.38	100	basalt - andesite sericite/ch > py
642			0.17	100	Mudst blue grey silic
643			0.14	75	Mudst chem
644			0.39	75	Qtz feld xt s/s - grit
645			0.38	100	Basalt > vesiculated
646			0.21	100	Mudst black silic carb veins
647			0.39	100	Grit feld qtz xt
648			0.03	50	Mudst gwk black py
649			0.61	100	Gwk - mudst - qtz rich
650			0.01	50	Mudst silic py
651			0.55 - 0.62	100	Fine basic minor py - peperite muds
652			0.13	100	Felsic volc? fine vitric gmass flecked fe
653			0.13	100	" " qtz feld xt glassy gmass
654			0.13	100	
655			0.16	100	" "
656					
657			0.07	75	Silic carb alt u/m?
658			6.30	100	Talc schist after u/mafic
659			0.35	100	Brecc fine basic
660			0.19	50	Gabbro - carb alt
661			0.16 - 0.22	75	Basic - int fine chl vesicle
662			0.39	50	" " breccia + copper sulf
663			0.16 - 0.22	50	" ? carb alt + veined
664			0.20	75	" " "
665			0.38	100	Grit f-med qtz feld xt
666			0.38	50	Basalt > vesic. pyrite/chem
667			0.00	50	Mudst black + qtz s/s py
668			0.04 - 0.1	50	Mudst py
669			0.05	100	" or felsic volc? v fine
670			0.04	100	" "
671			0.05	100	Vitric mudst - ash
672			0.29	100	Andesite - lava - perlitic
673			0.26	75	" volc chl basic minor py

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MAGNETIC SUSCEPTIBILITY READINGS

SAMPLE Nº	COORD N	E	Reading		Comment
31674			0.11	50	Basalt v fine fine py
675			0.33	100	ditto 31673
676			0.26	50	Andesite? pyrite
677			0.90	50	Wacke feldspathic + mudst
678			0.07	50	" fine gr/ose
679			0.21	50	Talc schist - v/mafic
680	⎫		5.20	100	chem alt volc or sed?
680	⎭		0.22	75	Grit volc clastic
681			21.00	50	Basic - intermed
682			3.30	100	" brecc chl carb minor py
683			54.7	75	" fine - granular text
684			0.10	75	Chert pale green - [illegible]
685			0.05-0.41	50	Dacite lava [illegible] - carb alt
686			0.08	100	" - > alt
687			0.02-0.05	50	" " alt + mudst
688			0.19	100	" " " " pegg
689			14.60	100	Volc clastic o/s feldxt albite [illegible]
690			0.11	100	Mudst - vitric
691	⎫		0.28	100	F-med felsic volcaclastic
691	⎭		0.16	75	Chert
692			0.43	100	Basic - interm mafic porph
693			0.15-0.23	100	Mudst grey S/S
694			2.39.00	100	S/S - cong volcclastic albite chl mag
695			72.90	100	" "
696			0.30	100	Chert/Jasper
697			0.35-0.53	75	Wacke qtz feldxt - mudst
698	⎫		26.20	50	Mudst py
698	⎭		0.12	75	Wacke qtz feld
699			0.17	50	Mudst grey lam' py
31700			0.21	50	Carb alt S/S derived from felsic volc. pt metamorphic

HK 1 ①

02

357226

MAGNETIC SUSCEPTIBILITY READINGS

DDH No	From	To	Reading	Comment
HB 1	11.5	11.6	.20	NQ split
	17.5	17.6	.30	
	20.5	20.6	.26	
	23.6	23.7	.17	
	26.5	26.7	.22	
	29.5	29.6	.15	
	32.3	32.5	.15	
	35.3	35.5	.21	
	38.5	38.6	.26	
	41.4	41.5	.15	
	44.4	44.5	.29	
	47.5	47.65	.15	
	50.4	50.5	.16	
	53.4	53.5	.14	
	56.1	56.2	.19	
	62.3	62.4	.31	
	68.3	68.4	.26	
	71.5	71.6	.19	
	74.5	74.6	.23	
	77.5	77.6	.15	
	80.5	80.6	.19	
	85.0	85.1	.28	
	89.4	89.5	.26	
	92.5	92.6	.18	
	95.4	95.5	.26	
	98.4	98.5	.25	
	102.0	102.1	.35	
	104.4	104.5	.21	BQ split
	107.5	107.6	.24	
	110.4	110.5	.24	
	116.3	116.6	.26	
	119.4	119.5	~~.18~~ 24	
	122.4	122.5	~~.25~~ 18	BQ whole
	125.4	125.5	.25	BQ split
	128.3	128.4	.21	BQ whole
	131.35	131.5	.21	
	134.4	134.5	.15	
	137.5	137.6	.20	

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HR 1 (2

357227

MAGNETIC SUSCEPTIBILITY READINGS

DDH No	From	To	Reading	Comment
HR 1	140.5	140.6	.21	BQ whole
	143.5	143.6	.15	BQ split
	146.5	146.6	.31	BQ whole
	149.5	149.6	.21	BQ split
	152.5	152.6	.15	BQ whole
	155.4	155.5	.16	
	158.5	158.6	.20	
	161.5	161.6	.20	BQ split
	164.5	164.65	.21	BQ whole
	167.5	167.6	.19	
	170.5	170.6	.24	BQ split
	176.5	176.6	.17	
	179.5	179.6	.16	BQ whole
	182.4	182.5	.16	BQ split
	185.1	185.2	.17	BQ whole
	191.4	191.5	.20	split
	194.4	194.5	.15	whole
	197.5	197.6	.17	
	200.5	200.6	.17	split
	203.35	203.5	.15	
	206.4	206.5	.11	
	209.6	209.75	.30	whole
	212.5	212.6	.26	
	215.4	215.5	.18	split
	218.5	218.6	.20	whole
	221.5	221.6	.20	split
	224.4	224.5	.25	
	227.4	227.5	.16	whole
	230.6	230.7	.14	
	233.5	233.6	.18	split
	236.5	236.6	.25	
	239.5	239.6	.14	whole
	242.5	242.6	.13	split
	245.3	245.5	.13	whole
	248.55	248.7	.11	split
	251.4	251.5	.15	whole
	254.4	254.5	.22	split
	257.5	257.65	.16	whole

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HR 1 (3)

357228

MAGNETIC SUSCEPTIBILITY READINGS

DDH No	From	To	Reading	Comment
HR1	260.4	260.5	.17	BQ split
	263.5	263.65	.12	whole
	266.5	266.6	.12	
	269.5	269.7	.16	split
	272.35	272.5	.15	whole
	275.4	275.5	.14	
	278.5	278.6	.17	
	281.4	281.5	.15	
	284.5	284.65	.18	
	287.5	287.6	.13	
	290.5	290.65	.15	
	293.4	293.5	.16	split
	296.5	296.6	.14	whole
	299.4	299.5	.14	split
	302.5	302.6	.16	
	305.5	305.6	.20	
	308.5	308.65	.11	
	311.4	311.5	.15	whole
	314.5	314.6	.20	split

357229

02[illegible]

MAGNETIC SUSCEPTIBILITY READINGS

22-1-91

DDH No	From	To	Reading	Comment
HR 1	317.5		0.19	Qz Spot
	320.5		0.20	
	323.5		0.19	
	326.5		0.19	
	329.5		0.23	
	332.5		0.35	0.27 Qz carb vein
	335.5		0.28	
	338.5		0.40	
	341.5		0.67	Qz siderite/dolomite vein
	344.5		0.18	
	347.5		0.29	
	350.5		0.52	RANGE 0.20 – 0.50
	353.5		0.24	
	356.5		0.49	
	359.5		0.24	
	362.5		0.23	
	365.5		0.55	

HR2 (1)

357230

0239

MAGNETIC SUSCEPTIBILITY READINGS

DDH No	From	To	Reading	Comment
HR 2	6.15	6.2	1.39	NQ split
	7.5	7.6	0.54	
	9.8	9.9	0.01	
	10.15	10.25	0.36	
	11.4	11.5	0.42	
	12.8	13.0	0.36	
	14.5	14.7	0.47	
	16.0	16.2	0.37	
	17.5	17.65	0.31	
	18.05	18.15	0.42	
	18.8	19.0	0.33	
	20.4	20.5	0.32	
	22.0	22.1	0.48	
	23.5	23.6	0.26	
	24.9	25.0	0.40	
	26.4	26.5	0.52	
	28.0	28.1	0.57	
	29.5	29.6	0.57	
	30.9	31.0	0.51	
	32.5	32.7	0.36	
	35.4	35.5	0.46	
	38.4	38.5	0.49	
	40.0	40.1	0.44	
	43.0	43.1	0.15	
	43.8	43.9	1.23	
	44.5	44.6	0.37	
	45.9	46.0	0.37	
	47.5	47.8	0.25	
	48.9	49.0	0.33	
	50.5	50.6	0.45	
	52.0	52.1	0.50	
	53.5	53.7	0.50	
	53.9	54.0	0.39	
	55.0	55.1	0.11	BQ split
	56.4	58.5	0.16	
	59.4	59.5	0.28	
	62.5	62.6	0.25	[illegible] vein
	63.85	64.0	0.32	
	65.5	65.6	0.35	

357231

0230

MAGNETIC SUSCEPTIBILITY READINGS

DDH No	From	To	Reading	Comment
HR 2	68.5	68.6	0.37	BQ split
	70	70.1	0.32	
	71.4	71.5	0.28	
	74.4	74.5	0.21	
	76.00	76.10	0.35	
	77.5	77.6	0.23	
	79.	79.1	0.27	
	80.5	80.6	0.50	
	81.4	81.5	0.17	
	83.4	83.5	0.19	
	85	85.1	0.18	
	86.5	86.6	0.26	
	88	88.1	0.29	
	89.5	89.6	0.31	
	91	91.1	0.22	
	92.5	92.6	0.19	
	94	94.1	0.21	
	95.5	95.6	0.27	
	97	97.1	0.27	
	98.5	98.6	0.27	
	100	100.1	0.19	
	101.4	101.5	0.26	
	102.9	103	0.24	
	104.5	104.6	0.24	
	106	106.1	0.20	
	107.4	107.5	0.27	
	108.7	108.8	0.25	
	110.5	110.6	0.25	
	113.5	113.6	0.22	
	115.8	116.1	0.29	1/4 core 2×1/4 sections together
	116.5	116.6	0.29	" "
	119.4	119.5	0.35	" " AA
	122.5	122.6	0.21	
	124	124.1	0.35	
	125.4	125.5	0.30	
	126.9	127	0.69	
	128.4	128.5	0.30	
	129.9	130	0.27	

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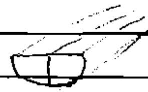
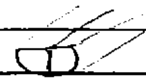
MAGNETIC SUSCEPTIBILITY READINGS

DDH No	From	To	Reading	Comment
HR2	131.4	131.5	0.24	1/2 CORE BQ
	133	133.1	0.22	
	134.5	134.6	0.23	
	136.5	136.6	0.37	
	137.4	137.5	0.48	
	139.0	139.1	0.33	
	140.8	140.9	0.29	
	142	142.1	0.25	
	143.5	143.6	1.22	
	145	145.1	0.47	
	146.5	146.6	0.38	
	148	148.1	0.31	
	149.5	149.6	0.34	
	150.9	151.0	0.65 -	209 1/4 CORE 
	153.5	153.4	0.38	AA
	154.5	154.6	0.62	AA
	155.5	155.6	0.55	"
	156.5	156.6	0.60	" core v broken
	159.5	159.6	0.13	"
	161.4	161.5	0.51	"
	164.5	164.7	0.38	"
	169.0	169.2	0.52	"
	170	170.1	0.29	1/2 CORE
	173.5	173.6	0.26	
	176.5	176.6	0.35	
	177.9	178	0.14	
	182.5	182.7	0.46	1/4 core 
	185.5	185.7	0.31	AA
	188.5	188.7	0.32	AA
	191.4	191.6	0.21	AA
	194.4	194.6	0.18	AA
	197.4	197.6	0.15	AA
	201.9	202	0.17	1/4 CORE
	203.5	203.6	0.12	
	205	205.1	0.39	
	206.4	206.5	0.20	
	208	208.1	0.17	
	209.5	209.6	0.18	

MAGNETIC SUSCEPTIBILITY READINGS

DDH No	From	To	Reading	Comment
HR2	212.4	212.5	0.17	1/2 GRE
	215.4	215.5	0.17	
	218.4	218.5	0.38	
	219.0		0.31	
	221.0	221.1	0.34	
	224.4	224.6	11.8 - 14.3	1/4 Gre 
	227.3	227.5	16-5	1/4 "
	230.4	230.5	2.52-7.86	1/2 GRE
	EOH			

0233 HR3 (

357234

MAGNETIC SUSCEPTIBILITY READINGS

DDH No	From	To	Reading	Comment
HR 3	6.1m	6.3m	.29	HQ split
	7.8m	8.0m	.22	HQ whole
	9.1m	9.2m	.30	
	10.3	10.4m	.33	
	12.1	12.3	.29	
	13.4	13.6	.34	
	14.75	15.0	.36	HQ split
	16.3	16.5	.31	NQ split
	19.35	19.5	.21	NQ whole
	22.5	22.6	.31	NQ split
	25.5	25.65	.26	
	28.5	28.6	.14	NQ whole
	31.5	31.65	.17	
	34.5	34.7	.15	
	37.3	37.4	.19	
	40.4	40.5	.23	NQ split
	43.35	43.5	.29	
	46.5	46.6	.24	
	49.5	49.6	.21	NQ whole
	52.5	52.6	.28	NQ split
	55.5	55.65	.20	NQ whole
	58.5	58.6	.25	NQ split
	61.4	61.5	.19	NQ whole
	64.5	64.6	.26	NQ split
	67.5	67.6	.24	NQ whole
	70.5	70.65	.22	
	73.5	73.6	.21	
	76.5	76.6	.23	NQ split
	79.4	79.5	.29	
	82.4	82.5	.22	NQ whole
	85.3	85.5	.26	
	88.3	88.4	.29	NQ split
	91.5	91.6	.32	
	94.5	94.6	.39	
	97.5	97.7	.26	
	100.4	100.5	.22	NQ whole
	103.35	103.5	.20	
	106.3	106.4	.16	

HR3G

023

357235

MAGNETIC SUSCEPTIBILITY READINGS

DDH No	From	To	Reading	Comment
HR 3	108.9	109	.11	NQ whole
	112.7	112.9	.19	BQ whole
	113.8	113.9	.20	BQ split
	115.5	115.6	.29	
	118.5	118.6	.25	
	121.5	121.7	.23	
	124.5	124.6	.15	BQ whole
	127.4	127.5	.26	BQ split
	130.5	130.6	.21	
	133.1	133.2	.13	BQ whole
	136.3	136.4	.18	
	139.0	139.2	.15	
	142.4	142.5	.18	
	145.4	145.5	.17	BQ split
	148.4	148.5	.15	BQ whole
	151.5	151.6	.11	
	154.4	154.5	.17	
	157.2	157.3	.18	
	159.0	159.1	.04	
	160.5	160.7	.16	
	163.5	163.6	.11	
	166.5	166.6	.06	
	169.4	169.5	.18	
	172.5	172.7	.14	
	175.5	175.6	.15	
	178.4	178.5	.16	
	181.4	181.5	.25	
	184.5	184.7	.23	BQ split
	187.35	187.5	.16	BQ whole
	190.3	190.5	.18	
	193.4	193.5	.10	
	196.5	196.6	.20	BQ split
	199.5	199.7	.22	BQ whole
	202.5	202.6	.20	BQ split
	205.3	205.5	.11	BQ whole
	208.4	208.5	.15	
	211.4	211.5	.16	
	214.4	214.5	.17	BQ split

HR3

(3)

02

357236

MAGNETIC SUSCEPTIBILITY READINGS

DDH No	From	To	Reading	Comment
HR 3	220.6	220.7	.16	BQ whole
	223.5	223.65	.17	BQ split
	226.5	226.6	.08	BQ whole
	229.5	229.6	.14	
	232.5	232.6	.13	
	234	234.1	.11	
	235.6	235.7	.15	
	238.5	238.6	.14	BQ split
	241.6	241.7	.12	BQ whole
	244.1	244.2	.19	
	247.1	247.2	.14	
	250.3	250.4	.11	BQ split
	253.4	253.55	.14	
	256.4	256.5	12	
	259.5	259.6	17	BQ whole
	262.5	262.6	18	BQ split
	265.5	265.7	16	
	268.5	268.75	13	BQ whole
	271.4	271.5	16	BQ split
	274.5	274.6	13	BQ whole
	277.4	277.5	19	
	280.4	280.5	16	
	283.5	283.6	10	
	289.4	289.5	13	
	292.5	292.6	.22	BQ split
	295.5	295.6	.22	
	298.35	298.5	.12	BQ whole
	301.3	301.5	.15	BQ split
	304.5	304.6	.17	
	307.5	307.6	.19	BQ whole
	310.35	310.5	.07	
	313.55	313.7	.20	
	316.4	316.5	.14	
	319.3	319.45	.59	
	322.5	322.65	.17	
	325.5	325.8	.16	
	328.4	328.5	.15	BQ split
	331.4	331.5	.12	

HR3 (4)

357237

0230

MAGNETIC SUSCEPTIBILITY READINGS

DDH No	From	To	Reading	Comment
HR 3	334.3	334.5	.13	BQ whole
	337.4	337.5	.17	BQ split
	340.2	340.3	.14	BQ whole
	343.3	343.4	.14	BQ split
	346.6	346.7	.14	
	349.2	349.4	.12	BQ whole
	352.3	352.4	.14	BQ split
	355.2	355.4	.16	
	358.1	358.3	.13	BQ whole
	361.45	361.6	.13	BQ split
	364.4	364.5	.11	BQ whole
	367.5	367.6	.07	
	370.4	370.5	.14	
	373.35	373.5	.07	BQ split
	376.5	376.6	.14	BQ whole
	379.5	379.7	.19	BQ split
	382.3	382.5	.15	
	385.3	385.5	.19	BQ whole
	388.4	388.5	.13	
	391.6	391.7	.19	BQ split
	394.4	394.5	.16	BQ whole
	397.5	397.6	.19	BQ split
	400.3	400.5	.16	BQ whole
	403.4	403.5	.14	BQ split
	406.4	406.5	.18	BQ whole
	409.3	409.45	.15	
	412.4	412.5	.15	
	415.5	415.6	.13	
	418.5	418.6	.10	
	421.5	421.6	.14	
	424.35	424.5	.20	BQ split
	427.35	427.5	.03	
	430.5	430.65	.16	BQ whole
	433.4	433.5	.14	
	436.5	436.6	.14	
	439.55	439.65	.17	BQ split
	442.5	442.6	.08	BQ whole
	445.35	445.5	.17	BQ split

357238 HR 3
6

023

MAGNETIC SUSCEPTIBILITY READINGS

DDH No	From	To	Reading	Comment
HR 3	448.3	448.5	.13	BQ whole
	451.5	451.6	.07	
	454.3	454.5	.15	BQ split
	457.4	457.5	.16	BQ whole
	460.2	460.45	.15	
	463.35	463.45	.17	BQ split
	466.4	466.5	.18	BQ whole
	469.5	469.6	.10	
	472.5	472.65	.20	BQ split
	475.5	475.6	.25	
	478.5	478.6	.22	
	481.5	481.6	.23	
	484.55	484.65	.26	
	487.5	487.65	.26	
	490.5	490.6	.19	
	493.35	493.5	.23	
	496.5	496.6	.25	
	499.4	499.5	.26	
	502.4	502.5	.35	
	505.5	505.6	.30	
	508.5	508.6	.32	
	511.3	511.5	.35	
	514.5	514.6	.31	
	517.55	517.7	.32	
	604.7	604.8	.39	
	607.7	607.8	.33	
	610.7	610.8	.24	
	613.6	613.7	.25	
	616.55	616.65	.47	
				E.O.H.

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MAGNETIC SUSCEPTIBILITY READINGS

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DDH No	From	To	Reading	Comment
HR3	520	520.5	0.39	1/2 split
	523	523.5	0.43	
	526	526.5	0.29	
	529	529.5	0.27	
	532	532.5	0.26	
	535	535.5	0.16	
	538	538.5	0.20	
	541	541.5	0.25	
	544	544.6	0.19	
	547	547.6	0.32	
	550	550.6	0.32	
	553	553.6	0.32	
	556	556.6	0.23	
	559	559.6	0.49	
	562	562.6	0.54	
	565	565.6	0.79	
	568	568.6	0.25	
	571	571.6	0.18	
	574	574.6	0.41	
	577	577.6	0.39	
	579		0.03	Qz vein
	580	580.6	0.29	
	583	583.7	0.50	
	586	586.7	0.10	
	589	589.6	0.15	
	592	592.7	0.33	
	595	595.7	0.40	
	598	598.7	0.17	
	601	601.7	0.26	

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0239

MAGNETIC SUSCEPTIBILITY READINGS

DDH No	From	To	Reading	Comment
HR 5 1	2.4	2.5	0.10	
2	3.0	3.1	0.10	HQ whole
3	6.0	6.5	0.10	
4	8.9	9.0	0.15	
5	12.0	12.1	0.13	
6	14.7	15.0	0.13	
7	17.8	18.0	0.11	
8	20.9	21.0	0.15	
9	23.9	24.0	0.14	
10	28.4	28.5	0.17	
11	31.1	31.3	0.29	
	34.5	34.6	0.17	
	37.5	37.6	0.13	
	40.5	40.6	0.09	
	43.5	43.6	0.14	
	46.4	46.5	0.09	
	49.4	49.5	0.24	
	52.4	52.5	0.38	
	53.1	53.2	0.44	
	58.5	58.6	0.34	
	61.4	61.5	0.25	
	66.2	66.3	1.19	
	67.5	67.6	3.76	HQ cut
	70.5	70.6	6.99	HQ whole
	76.4	76.5	7.72 - 20.5	(most around 17-19)
	79.4	79.5	15.9	
	82.3	82.4	0.43	
	85.3	85.4	0.47	
	88.4	88.5	0.27	
	91.4	91.5	0.38	
	94.5	94.6	18.95	
	97.5	97.6	9.96	
	102.3	102.5	3.60	
	103.5	103.7	16.2	NQ WHOLE
	106.3	106.4	.34	
	112.5	112.6	.22	
	115.4	115.5	.30	
	118.4	118.5	.30	

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MAGNETIC SUSCEPTIBILITY READINGS

DDH No	From	To	Reading	Comment
HR 5	121.5	121.6	.24	
	127.3	127.45	.17	
	130.4	130.5	.27	
	133.5	133.6	.20	BQ WHOLE
	136.4	136.5	.23	
	139.5	139.6	.22	
	142.4	142.5	.31	
	145.3	145.5	.28	SPLIT CORE
	148.5	148.7	.21	WHOLE
	151.5	151.6	.26	
	157.5	157.7	.22	
	160.5	160.6	.25	
	163.4	163.5	.65	
	166.5	167—	.21	
	169.5	169.6	.25	
	172.4	172.5	.26	SPLIT CORE
	178.35	178.5	.33	WHOLE
	181.5	181.7	.25	
	184.5	184.9	.22	
	187.4	187.5	.34	
	190.4	190.5	.27	
	193.5	193.6	.22	
	196.5	196.65	.22	
	198.5	198.8	.25	SPLIT CORE
	202.4	202.5	.33	WHOLE
	205.5	205.7	.22	
	208.1	208.5	.26	
	211.3	211.45	.36	
	214.5	214.7	.20	
	217.5	217.9	.24	
	220.4	220.5	.24	
	223.5	223.7	.27	
	226.3	226.5	.19	
	229.4	229.5	.46	
	232.5	232.6	.26	
	235.4	235.5	.23	SPLIT CORE
	238.35	238.5	.31	WHOLE
	241.5	241.6	2.00	

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MAGNETIC SUSCEPTIBILITY READINGS

DDH No	From	To	Reading	Comment
HR5	244.5	244.7	.29	
	247.4	247.5	.15	
	250.5	250.6	.18	
	253.4	253.5	.26	
	256.2	256.5	.26	
	259.4	259.5	.28	
	262.5	262.6	.16	
	265.4	265.5	.12	
	268.6	268.7	.17	SPLIT CORE
	271.5	271.6	.32	WHOLE
	274.5	274.6	.24	
	277.35	277.5	.44	
	280.4	280.5	.17	
	283.4	283.5	.15	
	286.5	286.6	.13	
	289.5	289.6	.15	
	292.5	292.6	.11	
	295.5	295.65	.09	
	298.5	298.6	.17	
	301.5	301.6	.34	SPLIT CORE
	355.4	355.5	.08	WHOLE
	358.5	358.6	1.09	
	361.5	361.6	.26	
	364.4	364.5	.39	SPLIT CORE
	367.6	367.8	.34	" "
	370.4	370.5	.21	WHOLE
	373.4	373.5	.29	
	376.4	376.5	.29	SPLIT CORE
	379.6	379.7	.21	WHOLE
	382.4	382.5	.18	
	385.5	385.7	.24	
	388.5	388.7	.17	
	391.4	391.5	.16	
	394.5	394.75	.17	
	397.5	397.65	.23	
	400.5	400.6	.26	
	403.4	403.5	.20	SPLIT CORE
	406.4	406.5	.15	WHOLE

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MAGNETIC SUSCEPTIBILITY READINGS

DDH No	From	To	Reading	Comment
HR5	409.5	409.7	0.16	
	412.4	412.5	0.19	SPLIT CORE
	415.5	415.65	0.17	WHOLE
	418.2	418.5	0.15	
	421.4	421.5	0.18	K-0.14

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MAGNETIC SUSCEPTIBILITY READINGS

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DDH No	From	To	Reading	Comment
HR 5	304.5	304.6	0.22	BQ FULL CORE
	307.5	307.6	0.26	
	310.5	310.6	0.13	
	313.4	313.5	0.11	
	316.4	316.5	0.14	
	319.6	319.7	0.24	few qtz calc veins
	322.4	322.5	0.23	
	325.4	325.5	0.21	
	328.5	328.6	0.24	
	331.4	331.5	0.35	
	334.5	334.6	0.21	
	337.5	337.6	0.25	
	340.5	340.6	0.28	
	343.4	343.5	0.02	Qz vein
	346.5	346.6	0.65	
	349.5	349.6	0.22	
	352.4	352.5	0.32	

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MAGNETIC SUSCEPTIBILITY READINGS

EL 11/85 YOLANDE DDH BR-1

SAMPLE No	COORD N	E	Reading	Comment
NQ 50m			0.46	Full NQ CORE Basalt + calc veins
51 m			0.54	Basalt
52.7			0.24	" ? carb ~~alt~~ silic alt
53.5			0.19	" " " " "
54.5			0.31	" " " epid altn
58.6			0.33	Basalt
61.30			0.11	Mudst
62.00			0.21	"
64.45			0.20	"
67.60			0.19	"
70.50			0.18	"
72.10			0.19	"
76.00			0.48	Basalt - dacite? carb silic alt
77.60			0.29	Brecc pink felsic? clasts chl matrix
79.60			0.24	" " " "
79.86			0.24	" " " "
80.40			0.23	" " "
84.00			0.16	Altered s/s or dacite?
86.00			0.08	Mudst vitric
87.00			0.28	" vitric s/s
88.50			0.12	Qz veined
91.00			0.10	Mudst vitric - chert
110			0.08	"
112.5			0.11	"
118			0.10	"
132.4			0.10	"
139			0.10	"
277.9			0.11	Basalt - sediment
280			0.23	Basalt plag phyric chilled
283.5			0.06	"
286			0.22	"
BQ 301			0.28	Basalt vesic carb/hem, chl cf 12N 750ppt
304.5			0.30	"
307.5			0.12	Mudst vitric
310.6			0.11	Basalt
339.4			0.18	
343.6			0.25	

MAGNETIC SUSCEPTIBILITY READINGS

EL 11/85 YOLANDE DDH BR1

SAMPLE Nº	COORD N	E	Reading	Comment
BQ 346.6			0.19	Full BQ CORE Basalt
425			0.10	Sandstone felsic volc derived?
427.5			0.12	"
430.6			0.11	"
435			0.08	"
435.32			0.15	"
442.6			0.12	"
447			0.10	Sandstone pe derived?

APPENDIX J

SPECIFIC GRAVITY DATA

DDH HR 2 & 3, Henty River Prospect

0247

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S G READINGS

DDH No	DEPTH	DRY weight	WET weight	Dry wt. Volume	S G	Comment
HR 2	7.5 m	225		80	2.81	Basalt - andesite fine
	11.0	293		104	2.82	Fine volc'clastic seric alt
	14.4	288		102	2.82	Sandst fine hematitic
	28.0	199		71	2.80	Basalt. andesite, chloritic
	38.7	274		96	2.85	Siltst grey foliated, qtz veined
	71.5	170		61	2.79	Volc'clastic fine seric alt
	83.9	172		63	2.73	" " coarse " "
	100.0	226		80	2.83	Andesite sericitic
	108.9	140		50	2.80	Siltst - gwk sts grey
	127.4	174		61	2.85	Andesite, plag'porph, carb py alt
	134.3	167		60	2.78	Sandstone coarse carb alt
	142.0	165		59	2.80	Andesite massive fine < carb
	155.5	259		84	3.08	Chl/seric carb'altn + gna sph
	161.4	233		77	3.03	" " " " " "
	170.0	159		57	2.79	Andesite fine carb'/gna veins
	177.0	170		61	2.79	" " carb'alt
	182.5	188		64	2.94	Limest fine, + seric'altn
	189.0	201		71	2.83	" + siltst
	198.0	218		79	2.76	Siltst cream - gry green
	207.6	284		102	2.78	" " " "
	215.4	324		118	2.75	Andesite feld porph carb alt
	230.0	255		90	2.83	Basic fine carb alt
						END OF HOLE
	131.2	171		61	2.80	
HR 3	32.4	718		254	2.83	Siltst hematitic chl calc vein
	57.5	474		167	2.84	" sandst hematitic " " "

APPENDIX K

WACKER BEDROCK SAMPLES HENTY RIVER GRID

Lines 1400N, 1600N, 5200N, 5600N, GW Jenkins

E.L. 11/85, HENTY RIVER GRID
WACKER BEDROCK SAMPLES
LINES 1400N, 1600N, 5200N, 5600N

G.W. Jenkins
Contract Geologist
28th August 1990

Technique

This method of bedrock sampling uses a portable percussion unit (Wacker power head) attached via lengths of solid drill stem to a hardened steel bit of annular cross section, with an exit port at the side of the upper part of the bit. The bit is forced down through soft material by the vibration of the power head while material taken in through the bottom opening of the bit is extruded from the exit port at the top of the bit. When the bit encounters bedrock, the operator allows it to continue to vibrate for long enough to collect a piece of bedrock at the bottom of the bit. At this stage, the hollow bit contains only bedrock and lower C horizon material, the overlying material having been extruded during the downward passage of the drill. The drill stem and bit are then jacked out of the hole and the material contained within the bit is retained as the sample. Each sample consists of about 2kg of material, of which usually up to about 100g consists of relatively fresh bedrock, depending on drill penetration. The depth of sampling is limited only by the upward force able to be applied by the jack.

Lithological determination

Samples obtained during this survey were sorted through to find the bedrock pieces, which were then examined by binocular microscope at up to 40X magnification. Each sample was only regarded as reliable if several of the solid and/or semi-weathered chips had the same lithology. Glacial material was easily recognised, consisting of soft clay with varying content of usually rounded clasts from less than 1mm to about 2cm in size. Most of these clasts consist of quartzite. Of the 471 samples taken, 28 did not contain bedrock. Most of these were from holes deeper than 5m, and may reflect weathered zones associated with faulting, or glacial scours.

Duplicate samples

About every twentieth sample is a duplicate of the number before it, created by splitting the previous sample by hand (in the absence of a riffle). Duplicate sample numbers are: 83023, 83040, 83057, 83080, 83099, 83120, 83140, 83160, 83180, 83197, 83220, 83240, 83260, 83280, 83300, 83320, 83340, 83360, 83380, 83400, 83420, 83440, 83460, 83480.

GEOLOGY

Sample positions and bedrock lithologies are shown on the accompanying maps. Positions are nominal, as the lines have not been surveyed.

1. Lines 1400N, 1600N

These lines cross the basaltic sequence in the southern part of the Henty River Grid. Lithologies are as follows.

Gabbro consists of plagioclase 50-70% and mafics (mainly pyroxene) 30-50%. Grainsize is 1-3mm, and grains are equant.

Microgabbro consists of plagioclase and mafics generally with a ratio of about 70:30. Grainsize is 0.2-1.0mm, and grains are equant. The division between microgabbro and gabbro is one of grainsize only, not composition. Most of the gabbroic material encountered on lines 1400N and 1600N is classified as microgabbro.

Quartz microgabbro is encountered between 5080E and 5220E on line 1600N. It contains plagioclase and mafics in similar proportion to the "normal" microgabbro, but also contains 5-15% quartz. Grainsize is 0.2-1.0mm, and grains are equant. The composition approaches that of dacite in some samples.

Feldspar phyric basalt consists of up to 5% feldspar phenocrysts up to 2mm in size in a basaltic groundmass. Up to 1% magnetite is present in some samples, accounting for some of the strong magnetic gradients in the area. Similar basalt has been observed with sediments in places, including Bradshaws Road DDH BH1, where it is interpreted as extrusive. The small sample size may mean that associated sediments are not always collected and observed. Some of the feldspar phyric basalts are amygdaloidal. Most of the feldspar phyric basalts can thus be regarded, with due caution, as extrusive.

Aphyric basalt has no distinctive features in the Wacker samples, and may be intrusive or extrusive; on the scale of these specimens, there is no evidence either way for intrusion or extrusion.

Some basalts display hyaloclastite textures similar to those observed in Bradshaws Road DDH BH1, and may thus be regarded as intruding wet sediment.

Basalt with sediment of various types is generally regarded (with due caution) as extrusive pillow basalt. In some of these samples, contacts between the basalt and sediment were visible. The basalt with sediment near the eastern end of line 1600N resembles the pillow basalt with interpillow sediment observed in Bradshaws Road DDH BH1.

Epiclastic refers to sediments consisting of clasts up to several millimetres in size, with various degrees of rounding, within and usually supported by very fine grained matrix. The commonest clast type is feldspar crystals; quartz, mafic minerals and lithic fragments may also be present. The matrix is frequently chloritised. These sediments may represent tuffs, although firm evidence for this was not observed. Depending on content of lithic clasts, the epiclastics grade into **greywacke**.

Sandstone, **siltstone** and **shale** are self explanatory. In general, the sandstones are quartz rich with low mafic content. Siltstones frequently contain small amounts of feldspar clasts up to 1mm in size which may be confined to discrete layers. The siltstones are sometimes laminated.

Interpretation

The rapid lithological and facies changes in this type of material, and the fact that these are point samples only, make correlation over the 200m line spacing difficult. Accordingly, some of the connections drawn between lithologies on the accompanying map may be regarded as tentative.

Samples for which the drill did not reach bedrock may be indicative of glacial scours and/or eroded weathered faults.

The position of the southern part of the gabbroic intrusive body shown on Map 7 of the 1989-90 annual report (Jenkins, 1990) is more closely constrained by the new results, and extends further to the southeast than shown on Map 7, following the Cambrian extension of the South Henty Fault. The quartz microgabbro, whose composition approaches that of dacite, corresponds to the 'altered "dacite"', sample 67761, recorded by Mathison (1986).

Mineralisation as such was only observed in two samples, 83075 (pyritic "gossan") and 83096 (traces disseminated sulphides, mainly pyrite), but alteration of various types is much more common. In particular, the samples adjacent to 83075 show varying degrees of alteration. In addition, sample 81867, which was a rock chip sample from a creek outcrop near 83075, contained anomalous metal values (Jenkins, 1990). This creek was not sampled by Mathison (1986). This area of alteration is considered significant in that it occurs on the Cambrian extension of the South Henty Fault. It should be noted that sample 83074 is black shale, which will disrupt electrical geophysical measurements.

Lines 5200N, 5600N

These lines cross the andesitic sequence and the gabbro in the north of the Henty River Grid. Lithologies are as follows.

Gabbro and **microgabbro** range in grainsize from 1-3mm and 0.2-1.0mm respectively. Plagioclase and mafics (principally pyroxene) are the constituents, and the degree of weathering varies markedly. The coarsest gabbro adjacent to the faulted contact with the ultramafic material at about 6100E has been observed elsewhere to be silicified and partly sericitised in thin section, and forms a distinctive marker horizon in outcrop. The only distinctions between the various gabbros in hand specimen are varying grainsize and feldspar/mafic ratios.

Serpentinised ultramafic is self explanatory. It was observed on both sides of the adjacent feldspar phyric basalt on line 5600N; this is attributed to subsidiary faulting.

Feldspar phyric basalt contains less than 1% feldspar phenocrysts up to 1mm in size in a very fine grained groundmass. In appearance, the rock could be a dolerite, but there is no evidence favouring intrusion rather than extrusion or vice versa.

Aphyric basalt occurs in several places, and appears to crosscut the regional strike. As such, it is intrusive, and could more correctly be called dolerite.

Feldspar phyric andesite is the andesite typical of the Halls Rivulet area, and consists of up to 5% feldspar phenocrysts in a very fine grained groundmass. In some samples, pyroxene phenocrysts are also visible, but in the majority of samples, weathering makes positive identification of pyroxene difficult.

Aphyric andesite is self explanatory. It is closely associated with the various units of feldspar phyric andesite, and possibly represents the same units, as the content of phenocrysts in feldspar phyric andesite is quite variable.

Greywacke is also self explanatory, as are **sandstone**, **siltstone** and **shale**. Many of the sandstones and siltstones are felsic, and those about 7250E correspond to the "felsic tuff" unit mapped by Corbett (1986).

Epiclastic is similar to that observed on lines 1400N and 1600N, that is, clasts of varying composition, predominantly feldspar, in a very fine grained matrix.

Haematitic sediments are restricted to the eastern ends of lines 5200N and 5600N.

Interpretation

As for lines 1400N and 1600N, the correlation of units over the 400m line spacing is difficult, with the exception of major features such as the gabbro/ultramafic faulted boundary and the intrusive aphyric basalts (or dolerites). It is apparent that the boundaries drawn on Maps 6 and 7 of the 1989-90 annual report (Jenkins, 1990) are quite generalised, and there is a great deal of finer detail due mainly to rapid facies changes which cannot be mapped with the limited information available.

Mineralisation was only observed in one specimen, 83304, a silicified basalt which contained traces of galena and chalcopyrite associated with quartz veining and also disseminated. Alteration of various types occurs in many specimens. In particular, the alteration on line 5600N at about 7560E in samples 83243 and 83244 corresponds to rock chip samples 81872 and 81873, documented as anomalous by Jenkins (1990). This alteration corresponds to the stratigraphic level of the Henty Adits mineralisation. Alteration on line 5600N also occurs from about 7280E to 7380E. On line 5200N, anomalous rock chip sample 81850 (Jenkins, 1990) is from a broad zone of quartz + chlorite veining between about 7450E and 7720E. The eastern part of the alteration on line 5200N corresponds approximately to the horizon of the Henty Adits mineralisation. It may be significant that the alteration is spatially associated with intrusive basalts (dolerites). It is also noteworthy that the width of the overall zone of alteration appears to increase to the south from line 5600N to 5200N. If the alteration continues to the south for some distance beyond line 5200N, it may be the cause of the magnetically anomalous area to the west and south of the Henty Adits recorded by Leaman (1990).

CONCLUSIONS

The program of Wacker sampling has confirmed the presence of alteration associated with anomalous geochemical responses obtained from rock chip sampling. Assays of the Wacker samples will give further information on the extent and level of mineralisation.

The Cambrian extension of the South Henty Fault is associated with alteration and mineralisation, and should be examined for more of its length. Creek outcrops near 1600N 4700E should be examined and sampled.

The alteration west of the Henty Adits horizon should be investigated further, depending on assay results from the Wacker samples.

As a mapping tool, the method has proved extremely useful in clarifying the position of features known to occur elsewhere in drill core and/or outcrop. Due to the fact that only point samples are taken, the method is most effective when combined with outcrop and/or drill core data; as a stand-alone method, it would be nowhere near as effective.

G. Jenkins
30/8/90

References

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EL 11/85 YOLANDE JV
WACKER BEDROCK SAMPLES
LINE 1400N HENTY GRID

SAMPLE NO	EASTING	DEPTH	COMMENTS
83129.0	5000.0	1.0	
83130.0	4980.0	2.7	
83131.0	4960.0	7.2	
83132.0	4940.0	3.2	
83133.0	4920.0	1.3	
83134.0	4900.0	2.1	
83135.0	4880.0	5.7	
83136.0	4860.0	6.5	
83137.0	4840.0	2.1	
83138.0	4820.0	1.0	flood plain
83139.0	4800.0	1.3	flood plain
83140.0			rpt 83139
83141.0	4780.0	6.1	
83142.0	4760.0	2.4	
83143.0	4740.0	1.0	
83144.0	4720.0	2.5	2 attempts
83145.0	4700.0	1.4	
83146.0	4680.0	1.3	
83147.0	4660.0	1.6	
83148.0	4640.0	1.6	
83149.0	4620.0	7.5	
83150.0	4600.0	6.9	
83151.0	4580.0	6.2	
83152.0	4560.0	2.4	no penetrate
83153.0	4540.0	5.4	
83154.0	4520.0	2.5	
83155.0	4500.0	6.3	
83156.0	4480.0	4.4	
83157.0	4460.0	6.8	flood plain
83158.0	4440.0	2.7	
83159.0	4420.0	1.0	
83160.0			rpt 83159
83161.0	4400.0	3.6	
83162.0	4380.0	0.5	plus r.chip
83163.0	4360.0	1.8	
83164.0	4340.0	3.1	
83165.0	4320.0	2.8	
83166.0	4300.0	1.9	
83167.0	4280.0	2.3	
83168.0	4260.0	3.3	
83169.0	4240.0	1.2	
83170.0	4220.0	1.1	flood plain
83171.0	4200.0	0.9	
83172.0	4180.0	1.1	
83173.0	4160.0	1.9	
83174.0	4140.0	0.9	
83175.0	4120.0	1.4	
83176.0	4100.0	1.2	
83177.0	4080.0	1.9	
83178.0	4060.0	2.1	

SAMPLE NO	EASTING	DEPTH	COMMENTS
83179.0	4040.0	2.9	
83180.0			rpt 83179
83181.0	4020.0	2.4	
83182.0	4000.0	1.3	
83183.0	3980.0	1.5	
83184.0	3960.0	3.8	
83185.0	3940.0	1.4	
83186.0	3920.0	1.0	2 attempts
83187.0	3900.0	2.9	
83188.0	3880.0	2.1	
83189.0	3860.0	0.0	rock chip
83190.0	3840.0	1.0	
83191.0	3820.0	2.9	
83192.0	3800.0	3.1	
83193.0	3780.0	1.6	
83194.0	3760.0	3.4	
83195.0	3740.0	3.5	
83196.0	3720.0	2.5	
83197.0			rpt 83196
83198.0	3700.0	3.5	
83199.0	3680.0	1.6	
83200.0	3660.0	1.5	
83201.0	3640.0	3.5	
83202.0	3620.0	4.5	
83203.0	3600.0	2.6	

EL 11/85 YOLANDE JV
WACKER BEDROCK SAMPLES
LINE 1600N HENTY GRID

SAMPLE NO	EASTING	DEPTH	COMMENTS	SAMPLE NO	EASTING	DEPTH	COMMENTS
83001.0	3280.0	5.5	Clay & float	83049.0	4180.0	2.9	
83002.0	3280.0	7.6	float?	83050.0	5200.0	4.9	
83003.0	3300.0	5.5		83051.0	5220.0	4.6	
83004.0	3320.0	3.5		83052.0	4240.0	3.3	
83005.0	3340.0	0.4	2 attempts	83053.0	4260.0	5.2	
83006.0	3360.0	2.2		83054.0	5280.0	4.3	
83007.0	3380.0	4.0		83055.0	4300.0	2.1	
83008.0	3400.0	1.3		83056.0	4320.0	1.5	
83009.0	3420.0	1.2		83057.0			rpt 83056
83010.0	3440.0	3.1		83058.0	4340.0	2.6	
83011.0	3460.0	1.5		83059.0	4360.0	1.5	
83012.0	3480.0	1.4		83060.0	4380.0	0.9	
83013.0	3500.0	2.6		83061.0	4400.0	1.5	
83014.0	3520.0	1.2		83062.0	4420.0	2.1	
83015.0	3540.0	1.6		83063.0	4440.0	1.0	2 attempts
83016.0	3560.0	2.5		83064.0	4460.0	1.0	
83017.0	3580.0	1.6	2 attempts	83065.0	4480.0	3.9	
83018.0	3600.0	2.5	2 attempts	83066.0	4500.0	1.6	
83019.0	3620.0	1.8		83067.0	4520.0	2.7	
83020.0	3640.0	6.2		83068.0	4540.0	3.1	
83021.0	3660.0	8.2		83069.0	4560.0	3.8	
83022.0	3680.0	0.8		83070.0	4580.0	2.1	
83023.0			rpt 83022	83071.0	4600.0	2.0	
83024.0	3700.0	3.2		83072.0	4620.0	2.6	
83025.0	3720.0	6.4		83073.0	4640.0	1.0	
83026.0	3740.0	5.6		83074.0	4660.0	0.8	in creek
83027.0	3760.0	3.2		83075.0	4680.0	1.0	
83028.0	3780.0	2.7		83076.0	4700.0	2.7	
83029.0	3800.0	1.4		83077.0	4720.0	2.2	
83030.0	3820.0	3.2		83078.0	4740.0	2.5	
83031.0	3840.0	3.1		83079.0	4760.0	3.9	
83032.0	3860.0	2.5		83080.0			rpt 83079
83033.0	3880.0	4.1		83081.0	4780.0	1.5	
83034.0	3900.0	3.7	no penetrate	83082.0	4800.0	1.6	
83035.0	3920.0	5.5	no penetrate	83083.0	4820.0	1.4	
83036.0	3940.0	3.2	swamp	83084.0	4840.0	1.5	
83037.0	3960.0	1.0		83085.0	4860.0	1.0	in creek
83038.0	3980.0	1.0		83086.0	4880.0	2.4	
83039.0	4000.0	1.9		83087.0	4900.0	3.3	
83040.0			rpd 83039	83088.0	4920.0	1.1	2 attempts
83041.0	4020.0	2.5		83089.0	4940.0	3.9	2 attempts
83042.0	4040.0	6.5		83090.0	4960.0	1.3	
83043.0	4060.0	1.7		83091.0	4980.0	1.2	
83044.0	4080.0	0.8		83092.0	5000.0	1.3	
83045.0	4100.0	1.0		83093.0	5020.0	1.3	
83046.0	4120.0	1.1		83094.0	5040.0	1.2	
83047.0	4140.0	0.8		83095.0	5060.0	0.9	
83048.0	4160.0	0.8		83096.0	5080.0	0.0	rock chip

EL 11/85 YOLANDE JV
WACKER BEDROCK SAMPLES
LINE 1600N HENTY GRID

SAMPLE NO	EASTING	DEPTH	COMMENTS	SAMPLE NO	EASTING	DEPTH	COMMENTS
83097.0	5080.0	1.3					
83098.0	5100.0	1.0					
83099.0			rpt 83098				
83100.0	5140.0	1.9					
83101.0	5160.0	2.3					
83102.0	5180.0	1.0					
83103.0	5200.0	5.9					
83104.0	5220.0	2.1					
83105.0	5240.0	1.3					
83106.0	5260.0	1.7					
83107.0	5280.0	2.8					
83108.0	5300.0	1.3					
83109.0	5320.0	1.0					
83110.0	5340.0	1.4					
83111.0	5360.0	1.0	2 attempts				
83112.0	5380.0	1.8					
83113.0	5400.0	0.0	rock chip				
83114.0	5420.0	0.0	rock chip				
83115.0	5440.0	1.6					
83116.0	5460.0	1.3					
83117.0	5480.0	1.0					
83118.0	5400.0	1.0					
83119.0	5420.0	0.9					
83120.0	5440.0		rpt 83119				
83121.0	5460.0	2.7					
83122.0	5480.0	2.5					
83123.0	5500.0	1.9					
83124.0	5500.0	1.5					
83125.0		0.6					
83126.0	5540.0	0.9					
83127.0	5560.0	2.4					
83128.0	5580.0	6.9	no penetrate				

0250

Phone (09) 458 7999

ANALABS

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357259

ANALYTICAL REPORT No. 27.1.08.07332

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

Mr Fergus Fitzgerald
Pasminco Exploration
P.O.Box 886
Burnie
Tas. 7320

ORDER No.	PROJECT
40051	

DATE RECEIVED	RESULTS REQUIRED
27/08/90	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
20	13/09/90	1	494

STATE OF SAMPLES REFER BELOW	SAMPLE NUMBERS	DRY	CRUSH	SPLIT	PULVERISE	SIEVE	OTHER SEE REMARKS	NONE	ANALYSIS REFER TO ANALYSIS SECTION	PREPARATION	METHOD
	<83,001/480,482/495	AC	Prep: 006,010,011,012,013,016						Cu,Pb,Zn,Fe,Mn/101		
	<83,001/480,482/495	AC							Au,AuChk/313		
	<83,001/480,482/495	AC	Prep: 006,010,011,012,013,016						Fe,Mn/105		

REMARKS

RESULTS TO

Mr Fergus Fitzgerald
Pasminco Exploration
P.O.Box 886
Burnie
Tas. 7320

RESULTS TO

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
	27.1.08.07332	13/09/90	40051	1 OF 20

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Fe	Fe	Mn	Mn	Au	AuChk
1	83001	70	25	110	5.51	—	575	—	<0.005	<0.005
2	83002	60	20	100	5.71	—	975	—	<0.005	—
3	83003	65	25	120	5.36	—	550	—	<0.005	—
4	83004	95	25	135	6.05	—	1050	—	<0.005	—
5	83005	275	20	175	>10.00	12.20	1050	—	<0.005	—
6	83006	90	25	145	6.24	—	985	—	<0.005	—
7	83007	225	15	170	>10.00	10.90	1250	—	<0.005	<0.005
8	83008	155	45	145	>10.00	11.80	1100	—	<0.005	—
9	83009	185	20	150	8.51	—	1650	—	<0.005	—
10	83010	210	30	150	7.71	—	865	—	<0.005	—
11	83011	135	5	165	8.02	—	915	—	<0.005	—
12	83012	150	55	165	9.10	—	1250	—	<0.005	—
13	83013	95	35	300	>10.00	13.10	940	—	<0.005	—
14	83014	70	15	130	6.83	—	1600	—	<0.005	—
15	83015	175	70	195	>10.00	10.50	1750	—	<0.005	—
16	83016	160	20	260	9.46	—	1100	—	<0.005	<0.005
17	83017	110	35	95	6.72	—	720	—	<0.005	—
18	83018	150	25	120	7.96	—	600	—	<0.005	—
19	83019	60	20	115	5.34	—	620	—	<0.005	—
20	83020	80	30	130	5.89	—	440	—	<0.005	—
21	83021	40	25	120	4.07	—	310	—	<0.005	—
22	83022	55	30	160	4.25	—	770	—	<0.005	—
23	83023	60	15	150	4.26	—	680	—	<0.005	—
24	83024	35	30	100	7.33	—	505	—	<0.005	—
25	83025	55	35	140	5.64	—	755	—	<0.005	—

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
	27.1.08.07332	13/09/90	40051	2 OF 20

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Fe	Fe	Mn	Mn	Au	AuChk
1	83026	90	35	150	7.24	–	805	–	<0.005	–
2	83027	400	5	110	5.53	–	780	–	<0.005	–
3	83028	160	5	120	6.68	–	990	–	<0.005	–
4	83029	160	5	115	7.71	–	920	–	<0.005	–
5	83030	70	50	135	7.80	–	1800	–	0.005	–
6	83031	55	25	120	5.60	–	530	–	<0.005	–
7	83032	60	35	115	5.06	–	470	–	<0.005	<0.005
8	83033	55	30	130	4.53	–	615	–	<0.005	–
9	83034	45	30	155	4.21	–	475	–	<0.005	–
10	83035	60	35	155	4.63	–	670	–	<0.005	–
11	83036	40	20	95	4.28	–	470	–	<0.005	–
12	83037	45	215	235	3.58	–	215	–	<0.005	–
13	83038	10	30	175	6.42	–	400	–	<0.005	–
14	83039	30	25	125	7.00	–	175	–	<0.005	–
15	83040	30	25	120	7.18	–	175	–	<0.005	–
16	83041	45	45	95	2.64	–	85	–	<0.005	–
17	83042	40	15	60	2.62	–	645	–	<0.005	–
18	83043	35	20	55	5.52	–	150	–	<0.005	–
19	83044	10	5	90	5.01	–	475	–	<0.005	–
20	83045	10	5	105	5.78	–	350	–	<0.005	–
21	83046	145	35	210	6.46	–	680	–	<0.005	–
22	83047	10	<5	50	1.66	–	70	–	<0.005	–
23	83048	165	<5	200	9.05	–	850	–	<0.005	<0.005
24	83049	50	5	1100	8.10	–	775	–	<0.005	–
25	83050	95	5	205	8.64	–	2550	–	<0.005	–

Results in ppm unless otherwise specified
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A Division of Inchcape Inspection and Testing Services Australia Pty Ltd.

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.07332	13/09/90	40051	3 OF 20

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Fe	Fe	Mn	Mn	Au	AuChk
1	83051	140	30	160	9.14	--	555	--	<0.005	--
2	83052	55	75	205	9.25	--	565	--	<0.005	--
3	83053	55	115	195	5.99	--	3700	--	0.007	--
4	83054	120	40	205	9.41	--	1450	--	<0.005	--
5	83055	80	15	180	9.20	--	920	--	0.006	--
6	83056	70	40	140	9.80	--	880	--	<0.005	<0.005
7	83057	60	30	155	10.00	--	1050	--	<0.005	--
8	83058	55	85	180	7.33	--	445	--	<0.005	--
9	83059	10	15	35	2.45	--	65	--	<0.005	--
10	83060	10	15	70	2.00	--	95	--	<0.005	--
11	83061	10	<5	35	0.87	--	60	--	0.006	--
12	83062	25	15	75	3.36	--	185	--	<0.005	--
13	83063	15	10	135	6.60	--	430	--	<0.005	--
14	83064	60	<5	110	9.28	--	700	--	<0.005	--
15	83065	40	10	90	>10.00	10.92	500	--	<0.005	--
16	83066	10	<5	105	7.45	--	800	--	<0.005	<0.005
17	83067	130	<5	125	9.93	--	770	--	<0.005	--
18	83068	50	10	85	5.94	--	535	--	<0.005	--
19	83069	215	10	290	9.76	--	1050	--	<0.005	--
20	83070	175	5	130	8.27	--	1000	--	<0.005	--
21	83071	130	30	245	9.31	--	2450	--	<0.005	--
22	83072	60	50	200	7.05	--	405	--	<0.005	<0.005
23	83073	45	30	115	4.86	--	160	--	<0.005	--
24	83074	65	90	445	5.40	--	270	--	0.012	--
25	83075	170	2150	440	>10.00	11.00	480	--	0.005	--

Results in ppm unless otherwise specified
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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.07332	13/09/90	40051	4 OF 20

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Fe	Fe	Mn	Mn	Au	AuChk
1	83076	30	5	150	7.95	—	1300	—	<0.005	—
2	83077	90	<5	385	8.37	—	1800	—	<0.005	—
3	83078	175	<5	180	6.67	—	1025	—	<0.005	—
4	83079	245	30	345	7.32	—	1100	—	<0.005	—
5	83080	260	30	390	7.92	—	1100	—	<0.005	—
6	83081	510	30	185	7.68	—	730	—	0.009	—
7	83082	280	75	505	9.15	—	200	—	0.007	<0.005
8	83083	50	70	370	>10.00	13.00	1150	—	<0.005	—
9	83084	75	15	365	7.37	—	265	—	<0.005	—
10	83085	40	<5	350	6.56	—	500	—	<0.005	—
11	83086	60	210	425	8.17	—	1050	—	<0.005	—
12	83087	105	55	345	8.60	—	1875	—	<0.005	—
13	83088	220	45	265	6.52	—	735	—	<0.005	—
14	83089	205	60	310	7.52	—	1000	—	<0.005	—
15	83090	210	70	280	6.00	—	785	—	<0.005	—
16	83091	265	<5	215	9.32	—	460	—	0.016	—
17	83092	55	<5	155	8.24	—	870	—	<0.005	—
18	83093	175	25	145	>10.00	10.04	>5000	0.90	<0.005	—
19	83094	55	5	140	6.97	—	1000	—	<0.005	—
20	83095	50	<5	100	5.73	—	945	—	0.005	—
21	83096	50	5	90	5.74	—	1050	—	0.007	—
22	83097	15	15	70	4.19	—	1050	—	<0.005	—
23	83098	45	15	100	6.14	—	1500	—	<0.005	—
24	83099	50	15	95	6.60	—	1650	—	0.005	0.010
25	83100	65	15	90	6.39	—	1500	—	<0.005	<0.005

Results in ppm unless otherwise specified
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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.07332	13/09/90	40051	5 OF 20

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Fe	Fe	Mn	Mn	Au	AuChk
1	83101	115	10	165	7.83	–	740	–	<0.005	–
2	83102	25	15	140	4.69	–	1000	–	0.013	–
3	83103	105	10	520	8.00	–	965	–	<0.005	–
4	83104	70	10	115	8.08	–	1000	–	<0.005	–
5	83105	40	5	80	5.70	–	1075	–	<0.005	0.005
6	83106	160	10	185	7.74	–	1250	–	<0.005	–
7	83107	195	10	115	7.20	–	1000	–	<0.005	–
8	83108	75	10	210	8.02	–	1000	–	<0.005	–
9	83109	65	35	90	4.32	–	1125	–	<0.005	–
10	83110	80	10	40	5.19	–	1000	–	0.005	–
11	83111	50	10	80	8.15	–	200	–	<0.005	–
12	83112	140	10	120	>10.00	12.00	2000	–	<0.005	–
13	83113	85	15	125	>10.00	12.20	2050	–	<0.005	–
14	83114	75	15	100	9.11	–	885	–	0.005	–
15	83115	20	<5	70	7.90	–	580	–	<0.005	–
16	83116	80	<5	115	>10.00	11.20	1900	–	<0.005	–
17	83117	60	<5	125	>10.00	11.80	455	–	<0.005	<0.005
18	83118	75	25	125	9.75	–	330	–	0.005	–
19	83119	85	70	490	8.88	–	2700	–	<0.005	–
20	83120	80	45	460	8.52	–	2350	–	<0.005	–
21	83121	60	5	90	8.89	–	985	–	0.005	–
22	83122	60	5	105	9.08	–	1900	–	<0.005	–
23	83123	50	25	45	8.22	–	395	–	<0.005	–
24	83124	35	10	95	>10.00	12.10	570	–	0.006	–
25	83125	105	<5	120	9.95	–	1275	–	<0.005	–

Results in ppm unless otherwise specified
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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.07332	13/09/90	40051	6 OF 20

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Fe	Fe	Mn	Mn	Au	AuChk
1	83126	10	15	100	9.09	--	155	--	<0.005	--
2	83127	10	<5	25	0.67	--	15	--	<0.005	--
3	83128	10	5	15	0.32	--	10	--	<0.005	--
4	83129	80	20	105	4.41	--	445	--	0.018	--
5	83130	35	5	145	8.06	--	400	--	<0.005	--
6	83131	120	40	345	7.23	--	1100	--	<0.005	--
7	83132	90	20	435	8.80	--	440	--	<0.005	--
8	83133	130	20	585	8.18	--	335	--	<0.005	<0.005
9	83134	40	25	105	4.47	--	1100	--	<0.005	--
10	83135	30	35	125	3.32	--	755	--	<0.005	--
11	83136	85	20	220	6.34	--	1350	--	<0.005	--
12	83137	105	180	550	6.41	--	1850	--	<0.005	--
13	83138	90	60	385	5.88	--	1200	--	<0.005	--
14	83139	75	55	235	7.00	--	1025	--	<0.005	--
15	83140	85	45	270	6.87	--	1000	--	<0.005	0.010
16	83141	175	210	375	6.45	--	1275	--	<0.005	--
17	83142	85	100	270	5.60	--	1225	--	<0.005	<0.005
18	83143	35	10	235	7.20	--	1375	--	<0.005	--
19	83144	110	80	235	7.08	--	3050	--	<0.005	--
20	83145	25	10	185	5.19	--	1200	--	<0.005	--
21	83146	125	5	210	5.47	--	1550	--	<0.005	--
22	83147	80	<5	175	8.61	--	1350	--	<0.005	--
23	83148	65	30	140	5.77	--	1200	--	<0.005	0.005
24	83149	75	180	190	8.26	--	570	--	<0.005	--
25	83150	95	170	375	6.54	--	1000	--	<0.005	--

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.07332	13/09/90	40051	7 OF 20

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Fe	Fe	Mn	Mn	Au	AuChk
1	83151	225	20	340	9.04	--	745	--	<0.005	--
2	83152	55	85	115	4.95	--	625	--	<0.005	--
3	83153	75	25	245	7.69	--	1375	--	<0.005	--
4	83154	60	60	160	>10.00	10.41	1150	--	<0.005	--
5	83155	95	20	195	6.27	--	1125	--	<0.005	--
6	83156	140	5	195	7.11	--	1450	--	<0.005	--
7	83157	65	25	165	9.00	--	1225	--	<0.005	--
8	83158	45	70	150	7.43	--	1000	--	<0.005	--
9	83159	15	80	60	1.90	--	150	--	<0.005	--
10	83160	15	55	55	1.80	--	130	--	<0.005	--
11	83161	85	15	130	5.50	--	860	--	<0.005	--
12	83162	65	25	170	6.30	--	1150	--	0.005	--
13	83163	175	20	205	8.70	--	1650	--	<0.005	--
14	83164	150	15	160	8.17	--	1400	--	<0.005	--
15	83165	135	35	110	6.30	--	820	--	<0.005	--
16	83166	40	10	140	8.34	--	795	--	<0.005	<0.005
17	83167	25	35	100	6.06	--	885	--	<0.005	--
18	83168	15	5	185	6.40	--	1200	--	<0.005	--
19	83169	190	15	105	9.52	--	240	--	<0.005	--
20	83170	65	70	200	7.82	--	740	--	<0.005	--
21	83171	85	<5	200	7.51	--	390	--	<0.005	--
22	83172	40	<5	35	1.70	--	35	--	<0.005	--
23	83173	25	<5	50	1.90	--	35	--	<0.005	--
24	83174	20	5	35	3.40	--	70	--	<0.005	--
25	83175	25	<5	60	2.49	--	35	--	<0.005	--

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.07332	13/09/90	40051	8 OF 20

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Fe	Fe	Mn	Mn	Au	AuChk
1	83176	10	20	30	1.99	--	20	--	<0.005	--
2	83177	195	<5	185	>10.00	11.00	375	--	<0.005	--
3	83178	25	40	50	2.70	--	80	--	<0.005	<0.005
4	83179	200	35	165	7.89	--	195	--	0.005	--
5	83180	190	20	150	8.38	--	175	--	0.006	--
6	83181	30	20	60	3.64	--	75	--	<0.005	--
7	83182	40	25	110	7.80	--	355	--	<0.005	<0.005
8	83183	65	50	115	7.58	--	305	--	<0.005	--
9	83184	130	5	140	7.88	--	900	--	<0.005	--
10	83185	15	20	105	8.95	--	600	--	<0.005	--
11	83186	15	10	75	7.45	--	510	--	<0.005	--
12	83187	55	10	85	6.10	--	510	--	<0.005	--
13	83188	75	5	100	7.02	--	1070	--	<0.005	--
14	83189	190	10	100	8.10	--	810	--	<0.005	--
15	83190	40	20	120	5.03	--	825	--	<0.005	--
16	83191	30	15	90	6.46	--	275	--	<0.005	--
17	83192	35	25	165	6.57	--	775	--	<0.005	--
18	83193	50	30	110	7.20	--	335	--	<0.005	--
19	83194	50	25	145	5.20	--	565	--	<0.005	--
20	83195	50	30	160	5.50	--	890	--	0.005	--
21	83196	60	35	175	6.41	--	490	--	0.007	--
22	83197	65	30	185	6.96	--	520	--	0.005	--
23	83198	60	30	170	6.70	--	940	--	<0.005	<0.005
24	83199	60	30	155	6.15	--	455	--	<0.005	--
25	83200	50	15	170	6.85	--	1200	--	0.007	--

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.07332	13/09/90	40051	9 OF 20

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Fe	Fe	Mn	Mn	Au	AuChk
1	83201	70	25	190	6.54	--	1100	--	<0.005	<0.005
2	83202	105	20	100	7.65	--	855	--	<0.005	--
3	83203	45	20	130	10.00	--	620	--	<0.005	--
4	83204	210	10	305	8.16	--	1000	--	<0.005	--
5	83205	35	15	250	8.82	--	1000	--	<0.005	--
6	83206	25	25	160	5.06	--	700	--	0.005	--
7	83207	20	25	340	7.58	--	920	--	0.005	--
8	83208	60	20	620	8.94	--	1070	--	<0.005	--
9	83209	35	70	750	9.89	--	1100	--	<0.005	--
10	83210	40	40	155	5.02	--	710	--	0.008	--
11	83211	45	40	180	3.41	--	350	--	<0.005	--
12	83212	50	50	235	3.50	--	425	--	<0.005	--
13	83213	50	40	40	0.45	--	20	--	<0.005	--
14	83214	5	<5	20	0.28	--	10	--	<0.005	--
15	83215	5	5	25	0.37	--	10	--	<0.005	--
16	83216	5	<5	35	0.81	--	40	--	<0.005	<0.005
17	83217	5	5	45	0.64	--	20	--	<0.005	<0.005
18	83218	5	<5	35	0.69	--	30	--	<0.005	--
19	83219	5	5	55	0.96	--	50	--	<0.005	--
20	83220	5	5	50	0.95	--	45	--	<0.005	--
21	83221	15	10	55	1.64	--	55	--	<0.005	--
22	83222	10	<5	30	0.42	--	20	--	<0.005	<0.005
23	83223	30	30	170	1.94	--	215	--	<0.005	--
24	83224	10	5	50	0.80	--	45	--	<0.005	--
25	83225	10	5	30	0.70	--	30	--	<0.005	--

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ANALYTICAL DATA

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SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.07332	13/09/90	40051	10 OF 20

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Fe	Fe	Mn	Mn	Au	AuChk
1	83226	10	5	30	0.73	–	40	–	<0.005	–
2	83227	10	5	25	0.63	–	45	–	<0.005	–
3	83228	15	5	30	0.82	–	30	–	<0.005	–
4	83229	20	15	45	1.81	–	170	–	<0.005	–
5	83230	140	35	145	3.20	–	500	–	<0.005	–
6	83231	215	10	350	>10.00	15.00	1450	–	<0.005	–
7	83232	105	15	345	>10.00	12.70	1550	–	<0.005	<0.005
8	83233	30	15	405	>10.00	16.90	2100	–	<0.005	–
9	83234	35	105	195	4.96	–	1350	–	<0.005	–
10	83235	75	40	325	6.00	–	1060	–	<0.005	–
11	83236	35	40	235	6.92	–	850	–	<0.005	–
12	83237	185	15	180	5.42	–	980	–	<0.005	–
13	83238	60	480	225	>10.00	11.50	925	–	<0.005	–
14	83239	25	20	70	2.87	–	250	–	<0.005	–
15	83240	25	25	65	2.62	–	245	–	<0.005	–
16	83241	45	280	170	5.00	–	760	–	<0.005	–
17	83242	70	30	95	5.61	–	495	–	0.010	–
18	83243	40	25	1400	7.85	–	2300	–	<0.005	–
19	83244	40	45	125	4.95	–	680	–	0.010	–
20	83245	160	25	380	9.83	–	2100	–	0.005	–
21	83246	105	35	270	9.15	–	1050	–	<0.005	–
22	83247	85	85	260	6.90	–	2250	–	<0.005	–
23	83248	15	20	145	6.02	–	1100	–	<0.005	<0.005
24	83249	30	30	150	6.84	–	1150	–	<0.005	–
25	83250	10	20	140	7.10	–	1000	–	<0.005	–

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No	PAGE
	27.1.08.07332	13/09/90	40051	11 OF 20

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Fe	Fe	Mn	Mn	Au	AuChk
1	83251	15	15	150	7.32	—	1100	—	<0.005	<0.005
2	83252	15	20	130	6.23	—	860	—	<0.005	—
3	83253	10	20	110	6.68	—	715	—	<0.005	—
4	83254	5	15	155	7.05	—	1200	—	<0.005	—
5	83255	10	15	130	5.73	—	1150	—	0.005	—
6	83256	5	15	125	6.51	—	1050	—	<0.005	<0.005
7	83257	15	15	135	5.22	—	1200	—	0.009	—
8	83258	45	5	125	6.92	—	1000	—	<0.005	—
9	83259	40	25	125	6.48	—	1040	—	<0.005	—
10	83260	20	15	110	7.59	—	970	—	<0.005	—
11	83261	10	10	115	7.90	—	925	—	<0.005	—
12	83262	10	10	105	6.30	—	920	—	<0.005	—
13	83263	50	15	100	6.40	—	460	—	<0.005	—
14	83264	5	10	90	5.55	—	560	—	<0.005	—
15	83265	5	15	65	4.31	—	395	—	<0.005	—
16	83266	5	25	70	6.51	—	45	—	<0.005	<0.005
17	83267	10	15	95	6.75	—	535	—	<0.005	—
18	83268	10	10	105	7.69	—	770	—	<0.005	—
19	83269	15	15	105	7.82	—	740	—	<0.005	—
20	83270	125	15	135	6.81	—	1250	—	<0.005	0.005
21	83271	15	20	130	7.18	—	900	—	0.009	—
22	83272	10	25	135	6.95	—	925	—	<0.005	—
23	83273	20	35	165	7.25	—	830	—	<0.005	—
24	83274	10	45	95	6.54	—	410	—	<0.005	—
25	83275	10	45	155	8.20	—	585	—	<0.005	—

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.07332	13/09/90	40051	12 OF 20

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Fe	Fe	Mn	Mn	Au	AuChk
1	83276	25	40	70	8.42	–	390	–	<0.005	–
2	83277	55	60	340	8.87	–	1250	–	<0.005	–
3	83278	50	165	355	6.28	–	940	–	<0.005	–
4	83279	60	90	220	7.54	–	2200	–	<0.005	–
5	83280	70	80	180	7.62	–	2300	–	<0.005	–
6	83281	55	40	165	6.54	–	700	–	<0.005	–
7	83282	70	45	170	7.29	–	620	–	<0.005	<0.005
8	83283	60	30	90	5.30	–	430	–	<0.005	–
9	83284	75	25	130	6.82	–	795	–	<0.005	–
10	83285	70	75	110	8.50	–	1725	–	0.007	–
11	83286	90	185	185	>10.00	10.40	960	–	0.007	–
12	83287	115	110	290	9.05	–	1500	–	<0.005	–
13	83288	90	140	370	8.90	–	1345	–	<0.005	–
14	83289	85	110	375	9.33	–	1500	–	<0.005	–
15	83290	90	355	630	6.37	–	2025	–	<0.005	–
16	83291	10	10	170	8.33	–	1125	–	<0.005	–
17	83292	40	50	120	8.67	–	610	–	<0.005	–
18	83293	75	50	455	8.03	–	930	–	<0.005	–
19	83294	135	10	200	9.90	–	880	–	<0.005	–
20	83295	15	<5	30	2.70	–	145	–	<0.005	–
21	83296	30	5	85	4.15	–	680	–	<0.005	–
22	83297	130	35	185	7.49	–	960	–	<0.005	<0.005
23	83298	40	115	205	3.34	–	510	–	<0.005	<0.005
24	83299	40	60	145	3.52	–	510	–	<0.005	–
25	83300	45	75	175	4.34	–	650	–	<0.005	–

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.07332	13/09/90	40051	13 OF 20

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Fe	Fe	Mn	Mn	Au	AuChk
1	83301	40	130	440	5.98	–	970	–	<0.005	<0.005
2	83302	25	130	585	9.11	–	1450	–	<0.005	–
3	83303	5	5	30	0.56	–	40	–	<0.005	–
4	83304	165	5	170	6.55	–	1050	–	<0.005	–
5	83305	5	<5	20	0.48	–	40	–	<0.005	–
6	83306	<5	20	20	0.79	–	40	–	<0.005	–
7	83307	75	15	125	7.25	–	915	–	<0.005	–
8	83308	5	<5	30	0.94	–	90	–	<0.005	–
9	83309	5	<5	30	0.98	–	65	–	<0.005	0.005
10	83310	10	15	55	1.14	–	60	–	<0.005	–
11	83311	20	65	385	6.84	–	605	–	<0.005	–
12	83312	50	40	160	4.74	–	425	–	<0.005	–
13	83313	105	10	180	>10.00	10.71	905	–	<0.005	–
14	83314	45	40	160	4.00	–	365	–	<0.005	–
15	83315	20	60	180	2.55	–	410	–	<0.005	–
16	83316	45	30	270	5.01	–	1400	–	<0.005	<0.005
17	83317	15	<5	275	7.53	–	815	–	<0.005	–
18	83318	70	180	130	5.40	–	75	–	<0.005	–
19	83319	10	<5	35	1.02	–	65	–	<0.005	–
20	83320	10	<5	35	1.08	–	75	–	<0.005	–
21	83321	5	<5	30	0.78	–	60	–	<0.005	–
22	83322	10	10	30	0.84	–	60	–	<0.005	–
23	83323	10	5	45	1.06	–	55	–	<0.005	–
24	83324	25	5	35	1.18	–	55	–	<0.005	–
25	83325	15	20	55	1.27	–	510	–	<0.005	–

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.07332	13/09/90	40051	14 OF 20

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Fe	Fe	Mn	Mn	Au	AuChk
1	83326	15	10	30	0.76	—	45	—	<0.005	—
2	83327	10	<5	35	1.05	—	600	—	<0.005	—
3	83328	5	<5	25	0.72	—	20	—	<0.005	—
4	83329	20	<5	45	1.95	—	290	—	<0.005	—
5	83330	<5	5	25	0.62	—	30	—	<0.005	—
6	83331	10	5	45	0.84	—	45	—	<0.005	—
7	83332	5	10	35	0.88	—	50	—	<0.005	<0.005
8	83333	10	10	45	1.06	—	75	—	0.020	—
9	83334	5	5	30	0.72	—	70	—	<0.005	—
10	83335	5	5	25	0.78	—	75	—	<0.005	—
11	83336	10	<5	30	1.02	—	125	—	<0.005	—
[illegible]	83337	15	10	30	0.75	—	65	—	<0.005	<0.005
13	83338	5	15	20	0.52	—	30	—	<0.005	—
14	83339	10	<5	20	0.57	—	45	—	<0.005	—
15	83340	10	5	20	0.67	—	105	—	<0.005	—
16	83341	135	15	100	8.78	—	830	—	<0.005	—
17	83342	100	10	215	>10.00	10.34	885	—	<0.005	—
18	83343	40	80	700	1.09	—	50	—	<0.005	—
19	83344	20	10	80	5.33	—	340	—	<0.005	—
20	83345	25	5	110	8.23	—	420	—	<0.005	—
21	83346	40	5	150	>10.00	12.28	1925	—	<0.005	—
22	83347	25	5	120	8.59	—	585	—	<0.005	—
23	83348	85	145	345	9.26	—	930	—	<0.005	<0.005
24	83349	20	25	115	6.38	—	120	—	<0.005	—
[illegible]	83350	35	40	180	7.60	—	625	—	<0.005	—

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

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SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.07332	13/09/90	40051	15 OF 20

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Fe	Fe	Mn	Mn	Au	AuChk
1	83351	10	10	40	0.95	-	105	-	<0.005	<0.005
2	83352	25	10	95	3.91	-	325	-	<0.005	<0.005
3	83353	25	25	100	2.93	-	315	-	0.026	-
4	83354	15	20	55	4.15	-	135	-	0.013	-
5	83355	100	110	245	8.05	-	1300	-	0.011	-
6	83356	100	15	240	>10.00	10.61	760	-	<0.005	-
7	83357	5	<5	40	3.74	-	105	-	<0.005	-
8	83358	55	10	105	5.46	-	295	-	<0.005	-
9	83359	55	25	115	4.37	-	290	-	0.012	-
10	83360	95	25	110	4.46	-	305	-	<0.005	-
11	83361	5	<5	105	7.28	-	1375	-	<0.005	-
12	83362	5	20	100	7.20	-	970	-	<0.005	-
13	83363	35	20	100	3.92	-	335	-	<0.005	-
14	83364	<5	<5	75	>10.00	13.18	370	-	<0.005	-
15	83365	5	<5	145	>10.00	17.94	855	-	<0.005	-
16	83366	5	<5	105	9.62	-	1500	-	<0.005	-
17	83367	5	<5	40	4.82	-	190	-	<0.005	-
18	83368	<5	<5	40	4.48	-	445	-	<0.005	-
19	83369	20	10	50	2.94	-	415	-	<0.005	-
20	83370	15	<5	45	5.03	-	460	-	0.010	-
21	83371	10	<5	85	7.12	-	605	-	<0.005	-
22	83372	15	<5	60	6.05	-	470	-	<0.005	-
23	83373	10	<5	50	4.31	-	375	-	0.006	-
24	83374	60	27	100	3.73	-	315	-	0.012	-
25	83375	15	10	70	3.89	-	480	-	<0.005	-

Results in ppm unless otherwise specified
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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	27.1.08.07332	13/09/90	40051	16 OF 20

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Fe	Fe	Mn	Mn	Au	AuChk
1	83376	5	<5	65	4.55	–	380	–	<0.005	0.005
2	83377	45	10	105	4.26	–	425	–	<0.005	–
3	83378	20	<5	50	2.45	–	250	–	0.010	–
4	83379	25	5	50	3.25	–	360	–	<0.005	–
5	83380	20	<5	50	3.03	–	375	–	<0.005	–
6	83381	10	5	50	3.69	–	390	–	<0.005	–
7	83382	15	5	40	2.90	–	240	–	<0.005	0.008
8	83383	10	<5	75	5.10	–	1100	–	<0.005	–
9	83384	15	5	90	7.24	–	385	–	<0.005	–
10	83385	15	15	50	3.23	–	290	–	<0.005	–
11	83386	25	25	95	2.78	–	370	–	<0.005	0.010
12	83387	15	10	130	>10.00	14.32	1075	–	<0.005	–
13	83388	10	15	70	3.07	–	310	–	0.006	–
14	83389	5	10	30	2.35	–	240	–	0.009	–
15	83390	15	10	40	3.16	–	375	–	<0.005	–
16	83391	5	5	40	3.81	–	195	–	<0.005	–
17	83392	15	5	55	4.29	–	290	–	<0.005	–
18	83393	5	20	60	3.79	–	430	–	<0.005	–
19	83394	10	5	65	4.91	–	455	–	<0.005	–
20	83395	<5	<5	55	3.34	–	405	–	<0.005	–
21	83396	10	<5	65	5.91	–	535	–	<0.005	–
22	83397	5	10	50	3.58	–	325	–	0.010	–
23	83398	30	5	55	3.00	–	400	–	<0.005	<0.005
24	83399	15	20	85	5.26	–	555	–	<0.005	–
25	83400	15	10	70	5.17	–	565	–	<0.005	–

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
	27.1.08.07332	13/09/90	40051	17 OF 20

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Fe	Fe	Mn	Mn	Au	AuChk
1	83401	5	5	45	3.56	—	330	—	<0.005	—
2	83402	10	<5	65	4.93	—	460	—	<0.005	—
3	83403	15	5	85	4.09	—	390	—	<0.005	—
4	83404	10	<5	90	6.03	—	610	—	<0.005	—
5	83405	15	<5	40	2.99	—	290	—	<0.005	—
6	83406	10	<5	45	4.77	—	385	—	<0.005	—
7	83407	10	<5	45	3.74	—	350	—	<0.005	—
8	83408	10	<5	65	6.58	—	250	—	<0.005	—
9	83409	55	<5	80	9.66	—	5000	—	<0.005	—
10	83410	15	<5	65	>10.00	17.00	180	—	<0.005	—
11	83411	15	<5	50	6.52	—	1650	—	<0.005	0.005
[illegible]	83412	10	<5	45	6.60	—	150	—	<0.005	—
13	83413	10	<5	60	7.93	—	1450	—	<0.005	—
14	83414	10	<5	45	4.09	—	285	—	<0.005	—
15	83415	25	<5	55	6.24	—	340	—	<0.005	—
16	83416	15	10	60	3.55	—	255	—	<0.005	<0.005
17	83417	15	5	50	2.85	—	330	—	<0.005	—
18	83418	55	80	80	3.93	—	215	—	<0.005	—
19	83419	25	15	45	3.04	—	220	—	<0.005	—
20	83420	30	15	45	3.21	—	260	—	<0.005	—
21	83421	20	5	80	7.88	—	225	—	<0.005	—
22	83422	30	<5	60	6.07	—	355	—	<0.005	—
23	83423	35	<5	55	2.50	—	270	—	<0.005	—
24	83424	15	<5	70	1.87	—	165	—	<0.005	—
[illegible]	83425	30	20	85	4.29	—	510	—	<0.005	—

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
	27.1.08.07332	13/09/90	40051	18 OF 20

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Fe	Fe	Mn	Mn	Au	AuChk
1	83426	15	15	65	1.62	–	145	–	<0.005	–
2	83427	15	5	50	5.36	–	1050	–	<0.005	–
3	83428	15	10	70	3.73	–	470	–	<0.005	–
4	83429	5	<5	80	8.79	–	325	–	<0.005	–
5	83430	<5	5	30	1.90	–	210	–	<0.005	–
6	83431	20	10	70	4.66	–	300	–	<0.005	–
7	83432	15	<5	65	3.47	–	485	–	<0.005	<0.005
8	83433	15	10	60	2.63	–	345	–	<0.005	–
9	83434	20	5	55	3.54	–	295	–	<0.005	–
10	83435	10	10	45	1.47	–	165	–	<0.005	–
11	83436	10	5	40	2.78	–	380	–	<0.005	–
[illegible]	83437	40	<5	45	2.55	–	160	–	<0.005	–
13	83438	25	15	85	3.37	–	395	–	<0.005	–
14	83439	10	5	30	2.23	–	175	–	<0.005	–
15	83440	10	<5	25	2.17	–	205	–	<0.005	–
16	83441	25	<5	65	5.92	–	135	–	<0.005	–
17	83442	<5	<5	35	3.10	–	105	–	<0.005	0.005
18	83443	<5	<5	40	3.43	–	125	–	<0.005	–
19	83444	<5	<5	50	4.76	–	150	–	<0.005	–
20	83445	15	<5	95	7.83	–	335	–	<0.005	–
21	83446	15	<5	45	2.72	–	255	–	<0.005	–
22	83447	<5	<5	40	2.52	–	295	–	<0.005	–
23	83448	5	<5	45	3.60	–	465	–	<0.005	<0.005
24	83449	10	5	45	1.92	–	190	–	<0.005	–
25	83450	<5	<5	40	4.12	–	360	–	<0.005	–

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
	27.1.08.07332	13/09/90	40051	19 OF 20

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Fe	Fe	Mn	Mn	Au	AuChk
1	83451	5	<5	55	4.43	--	350	--	<0.005	--
2	83452	5	<5	45	3.23	--	490	--	<0.005	--
3	83453	20	10	75	3.51	--	390	--	<0.005	--
4	83454	10	<5	90	9.00	--	530	--	<0.005	--
5	83455	10	<5	65	7.47	--	985	--	<0.005	--
6	83456	15	<5	40	3.22	--	425	--	<0.005	--
7	83457	5	<5	65	4.09	--	1200	--	<0.005	--
8	83458	5	<5	70	>10.00	10.01	865	--	<0.005	--
9	83459	10	<5	70	5.07	--	515	--	<0.005	--
10	83460	10	<5	75	5.95	--	600	--	<0.005	--
11	83461	40	5	100	5.69	--	1075	--	<0.005	--
12	83462	30	5	95	7.59	--	1025	--	<0.005	--
13	83463	5	<5	60	5.25	--	505	--	<0.005	--
14	83464	30	<5	120	5.80	--	1600	--	<0.005	--
15	83465	130	40	135	3.50	--	210	--	<0.005	--
16	83466	5	10	20	0.51	--	55	--	<0.005	<0.005
17	83467	60	35	155	5.87	--	485	--	0.005	--
18	83468	70	10	145	6.14	--	535	--	0.005	--
19	83469	80	15	150	6.56	--	395	--	0.010	--
20	83470	15	<5	80	3.60	--	155	--	0.005	0.005
21	83471	15	25	120	8.02	--	500	--	0.005	--
22	83472	25	95	495	9.57	--	640	--	0.005	--
23	83473	20	20	60	1.30	--	135	--	<0.005	--
24	83474	40	30	100	2.68	--	370	--	<0.005	--
25	83475	10	10	60	3.37	--	315	--	<0.005	--

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
	27.1.08.07332	13/09/90	40051	20 OF 20

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Fe	Fe	Mn	Mn	Au	AuChk
1	83476	25	20	90	2.55	–	355	–	<0.005	–
2	83477	10	10	195	6.59	–	455	–	0.005	–
3	83478	<5	75	95	6.22	–	510	–	0.005	–
4	83479	20	30	85	4.56	–	465	–	0.005	–
5	83480	25	15	90	4.36	–	470	–	0.005	–
6	83482	40	55	140	9.12	–	825	–	<0.005	–
7	83483	140	50	250	7.74	–	510	–	<0.005	<0.005
8	83484	20	20	45	2.88	–	65	–	0.005	–
9	83485	60	100	280	9.01	–	390	–	<0.005	–
10	83486	40	65	185	8.96	–	430	–	<0.005	–
11	83487	35	150	165	8.94	–	295	–	<0.005	–
[illegible]	83488	25	25	130	3.06	–	360	–	<0.005	–
13	83489	5	25	30	0.92	–	30	–	<0.005	–
14	83490	<5	10	10	0.25	–	<5	–	0.005	–
15	83491	<5	5	25	0.31	–	<5	–	0.005	–
16	83492	<5	<5	10	0.25	–	<5	–	0.005	–
17	83493	<5	5	15	0.24	–	<5	–	0.005	–
18	83494	20	10	105	4.44	–	405	–	<0.005	–
19	83495	50	120	215	2.62	–	375	–	<0.005	–
20										
21										
22										
23	DETECTION	5	5	5	0.05	0.05	5	0.01	0.005	0.005
24	UNITS	ppm	ppm	ppm	%	%	ppm	%	ppm	ppm
[illegible]	METHOD	101	101	101	101	105	101	105	313	313

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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APPENDIX L

MINES DEPARTMENT DRILL HOLE REPORTS

L1 Bradshaws Road Drill hole through South Henty Fault Zone,

Unpublished Report 1985/56, KD Corbett

L2 Mt Read Drill Hole (MR1) through Central Volcanic Sequence -

White Spur Formation Contact near Howards Road

Unpublished Report 1985/55, KD Corbett

L3 Preliminary Log Miner's Ridge Drill Hole, JL Everard

UNPUBLISHED REPORT 1985/56

The Bradshaws Road drill hole through the South Henty Fault Zone, western Tasmania

by K.D. CORBETT

TASMANIA DEPARTMENT OF MINES

1985/56. The Bradshaws Road drill hole through the South Henty Fault Zone, western Tasmania

K.D. Corbett

INTRODUCTION

Geological mapping for the author's Mt Read Volcanics Project over the last few years has shown a major fault system cutting obliquely through the volcanic belt from the Henty River area to Tullah. This Henty Fault System divides into two faults southwards, one of which (the South Henty Fault) follows the gorge of the Henty River before disappearing under glacial deposits near the Bradshaws Road - Zeehan Highway junction (fig. 1). This fault is presumed to connect with a major lineament through Truscott Creek, south-west of the highway, and thence to the Firewood Siding Fault near The Sisters. The fault appears to be a major structure separating an unusual sequence with pillow basalts and gabbros to the north from a volcano-sedimentary sequence flanking the Mt Read Volcanics to the south.

Drilling was aimed at: (a) establishing whether the fault was present under the thick glacial cover; (b) determining its nature and attitude, if possible; (c) examining the sequence on either side of the fault; and (d) determining whether any significant mineralisation was associated with the fault.

GENERAL GEOLOGY

The sequence to the north-west of the South Henty Fault, as exposed along the Zeehan Highway (fig. 1), in the Henty River, and on various logging tracks between the highway and the river, consists of shale, greywacke and felsic tuff (vitric ash, vitric-crystal tuff, including quartz-feldspar and feldspar-phyric varieties) intercalated with units of basaltic to andesitic volcanic rocks and intruded by gabbroic and basaltic dykes. Measured strikes are mostly NNW to NW, with subvertical bedding in which both east and west facings have been seen. Fossils of probable Middle Cambrian age (trilobites, brachiopods) occur in the sequence in a tributary creek of the Henty River.

The basaltic units comprise pillow lavas and massive flows, associated with numerous small dykes in some areas, of pyroxene-plagioclase-phyric and plagioclase-phyric types, the latter being partly of andesitic composition (Corbett, 1984). Breccias and tuffs of intermediate to mafic composition are associated with the basalts, and include prominently banded types in some areas. A large gabbro body exposed on the highway may be continuous with a similar body exposed in the Henty River. Geochemical plots prepared by M. McClenaghan show the basalts to be tholeiitic in nature, as opposed to the calc-alkaline nature of the Mt Read Volcanics.

Extensive Pleistocene moraine, rich in boulders of Owen Conglomerate, blankets much of the area.

The sequence south-west of the South Henty Fault comprises interbedded felsic vitric tuff, vitric-crystal tuff (usually quartz-phyric), black shale and greywacke, with large quartz-feldspar (±pyroxene) porphyry intrusives east of the area shown in Figure 1. The sequence is generally similar to that north-west of the fault, except that it lacks the basaltic-andesitic units.

The shear zone of the South Henty Fault is exposed in the Henty River near the north-east corner of Figure 1, and is probably represented by the linear feature followed by a major tributary creek of Truscott Creek near the southern margin of Figure 1. The approximate position of the fault beneath the moraine cover is shown, as well as the fault intersections projected from the drill hole.

RESULTS

The hole was collared in massive basalt on the south flank of a small hill projecting through the glacial cover. The hole was angled south-east at -50°, and flattened to about -29° at 500 m. After 59 m of basalt, the hole entered an east-facing sequence of shale and tuffaceous sandstone, grading east into sandy vitric ash containing numerous basalt dykes (many with chilled margins) towards the eastern margin. At 284 m a sequence of pillow lavas and basalt flows was entered, containing intercalations of tuff and basaltic breccia, including breccia with pillow fragments (marked by chilling and vesicle development). This continued to where a 3.6 m wide fault zone was intersected at 436 m, marked by highly broken rock and puggy clay. 90% of the core was lost through this zone, which is interpreted as representing the South Henty Fault.

The sequence east of the fault zone consisted of contorted and broken tuffaceous sandstone (quartz-phyric) and siltstone, with some puggy clay patches and zones of core loss. A two metre unit of pale porphyritic basalt was intersected at 445 m, but whether this represents a fault block (of the NW sequence) or an intrusive is uncertain.

A highly broken and weathered zone of sandstone and siltstone, which appears to be a second major fault zone, extended from 490 m to the end of the hole at 502 m.

Although the attitude of the main fault zone is difficult to determine from the drill core, the core-schistosity angles suggest an easterly dip and the projection of the intersection to the surface (fig. 1) lies east of the extrapolated position, suggesting an easterly dip of 60-70°.

Small veins, films and disseminations of pyrite occur scattered through the sequence, but no significant mineralisation was intersected. Carbonate veining is widespread.

REFERENCE

CORBETT, K.D. 1984. Geological maps and summary of the Cambrian stratigraphic units and relationships in the Henty River-Williamsford area. *Unpubl.Rep.Dep.Mines Tasm.* 1984/84.

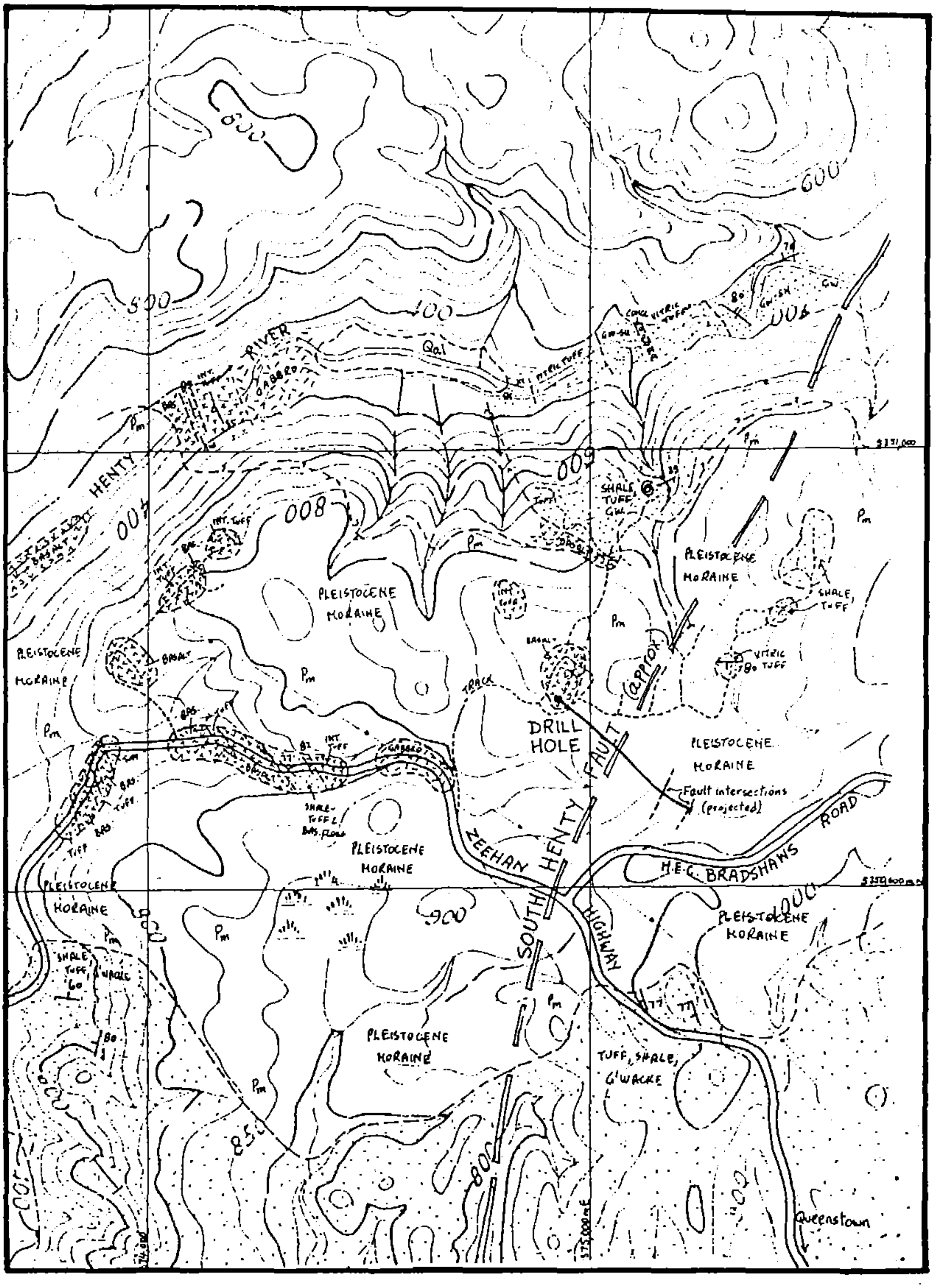


Figure 1. *Geology of the Henty River - Bradshaws Road area.*

5 cm

TASMANIA DEPARTMENT OF MINES
GEOLOGICAL SURVEY BRANCH

DIAMOND DRILL CORE RECORD

HOLE No. BRADSHAWS ROAD 1
REF. No.
SHEET No. 1 of 5

PROJECT: MT READ VOLCANICS AND ASSOCIATED SEQUENCES

OBJECTIVE: To test for presence and nature of South Henty Fault under glacial cover near Zeehan Highway.

PROPOSED BY: K. Corbett
LOGGED BY: K. Corbett August 1985

LOCATION: 400 m NE of Zeehan Highway near Bradshaws Road junction.

MAP SHEET:	ZEEHAN 7914-II	GEOL ATLAS:	ZEEHAN
A.M.G. CO-ORDS:	374929.5 mE	5350434 mN	
COLLAR R.L.:	272.4	TOTAL DEPTH:	502 m
COLLAR DIP:	-50°	AZIMUTH:	127° M
DATE COMMENCED:	22.10.84	DATE COMPLETED:	19.4.85
DRILL RIG:	Longyear 38		
DRILL CREW:	D. Whamond		

HOLE SIZE:

HQ	to	22	m
NQ	to	299	m
BQ	to	502	m
	to		m
	to		m

HOLE CONDITION AFTER COMPLETION: Clear

SURVEY DATA

INSTRUMENT: Eastman Single Shot

DEPTH	INCLINATION		AZIMUTH		COMMENTS
	As read	Dip	As read, °M	°A.M.G.	
15[illegible]		-49°	130		
264		-45°	132		
364		-36°	138		
469		-29°	117		

SUMMARY GEOLOGICAL LOG

From (m)	To (m)	ROCK DESCRIPTION
0	59	Basalt, mainly massive, with minor tuff-breccia
59	284	East-facing sequence of shale and tuffaceous sandstone, with some basaltic breccia, grading to thick unit of sandy vitric ash-tuff. Numerous basalt dykes up to one metre wide towards eastern margin
284	436	Pillow lavas and massive basalt flows with intercalated tuffs and breccias, including pillow breccia.
436	439.6	Fault zone (South Henty Fault?) of highly broken rock and puggy clay, 90% core loss
439.6	490	Broken sandstone and siltstone, with puggy clay patches. One two metre unit of porphyritic basalt at 445 m may be fault-bounded. Bedding highly disturbed.
490	502	Probably fault zone of highly broken and weathered sandstone and silstone, with puggy clay patches.

SUMMARY GEOCHEMICAL DATA (g/t unless specified)

From	To	Length	Rec. (%)							

REPORT REFERENCE: Unpublished Report Tasmania Department of Mines 1985/56

OTHER COMMENTS:

020 X

357285

TASMANIA DEPARTMENT OF MINES
GEOLOGICAL SURVEY BRANCH

DIAMOND DRILL CORE GEOLOGICAL RECORD

HOLE No. BRADSHAWS ROAD 1
REF. No.
SHEET No. 2 of 5

INTERVAL From (m)	INTERVAL To (m)	REC. (%)	Core lift	Core loss	Depth (m)	Graphic log	Min	DESCRIPTION	SPECIMEN Number	SPECIMEN Depth	SPECIMEN Prep'n
0	32							Broken and weathered basalt, plagioclase-phyric; many joints and epidote veins. Strongly bleached in some sections, normal colour dark grey. Pinkish in some sections. Lower 6 m or so is vesicular, with carbonate vesicles mostly weathered out.			
32	32.15							150 mm of bedded volcanic sediment or breccia, fine-grained in part. Probably inter-flow material. Bedding - core angle 25°.			
32.15	51.9							Relatively fresh grey vesicular basalt with carbonate and epidote-carbonate veins. Some bleached altered zones, often with epidote, could be inter-flow contacts. Small plagioclase phenocrysts and glomerocrysts are mostly pink.			
51.9	54.9							3 m of pale fawn "felsic"-looking rock, extremely broken in part, strongly veined (mainly quartz?). Has gradational boundaries with basalt on either side, so could be an inter-flow zone.			
54.9	59.3							Basalt, finely-porphyritic, slightly vesicular in parts, very bleached and pale towards lower contact with sediments. Contact broken.			
59.3	76.6							Grey shale interbedded with fawn to grey tuffaceous sandstone. Bedding-core angle at contact is 25°. Breccia unit with small angular shale clasts (100 mm strat. thickness) at 59.6 m. Scattered shale clasts in some sandy units. Bedding-core angle still 25° at 63.2 m, where sandstone unit contains small green shards. Irregular base of sandstone unit at 64.3 m indicates downhole (E) facing; another at 71.65 m. Bedding-core angle 18° at 73.6 m.			
76.6	84.1							Agglomerate unit, doubly-graded, with sandy sections towards both boundaries. Clasts up to 40 mm in places, many are pink, some dark and fine-grained; most look basaltic. Conformable lower contact with shale.			
84.1	89.6							Shale, with interbedded fawn ash and fine to medium-grained tuffaceous sandstone. Bedding-core angle 40° at 84.2 m. Downhole (E) facing from good erosional base at 84.2 m. Bedding-core angle 20° at 89.6 m.			
89.6	136.6							Black shale, massive, only faint bedding in places. Numerous thin white carbonate veins in places. Cleavage-core angle at 92.6 m is 40° (spaced cleavage). Small breccia zones (to 10 mm across) associated with some veins. Bedding-core angle 20° at 105.6 m. Grades east (downhole) to fine grey ash. Thin carbonate veins common.			
136.6	284							Fine-grained sandy ash with some interbedded sandy layers, some showing irregular mixing and breccia development like slumps. Scattered ovoid "concretions" to 50 mm long, consisting partly of carbonate and with blebs of silica arranged concentrically, are probably devitrification structures. Rock is mostly massive, with some faint bedding. A few breccia zones. Bedding-core angle 15° at 138.8 m. Pyrite on vein at 152.7 m. Bedding-core angle 15° at 150 m, also at 157.6 m. Sandy tuffaceous layer one metre across at 161.2-162.2 m has many clasts of ash-tuff in it. Thin graded sandy layer at 162 m suggests downhole (E) facing. Bedding-core angle 5° at 182 m. Cleavage-core angle 30° at 187.6 m. Pyrite on joints at around 211 m. Carbonate veining with some pyrite at 218.4 m. Mostly sandy fine tuff from 225-235 m, massive. Basalt dyke 300 mm across, at 35° to core axis, at 240 m - has prominent chilled margins. 20 mm wide breccia zone at angle of 20° to core axis at 264 m. 40 mm wide basalt dyke with chilled margins at 265 m - altered fine-grained, with carbonate blebs. 20 mm wide dykelet at 264.4 m. Basalt unit 500 mm wide at 267 m has very irregular margins and lobe-like features on one contact - this could be a thin flow. 300 mm wide basalt dyke at angle of 55° to core axis at 269.8 m. One metre wide dyke from 272-273 m. 270 mm wide dyke at 274 m.			
284	293							Mainly basalt, fine-grained, with patches of unusual breccia and some chilled contacts suggesting multiple flows and/or dykes. Lots of carbonate veins. Basalt contact has angle of 10° with core axis at 293 m. Composite dyke(?) 700 mm wide at 290 m has 45° angle to core axis.			
293	297							Fine ash-tuff, grey to fawn colour.			
297	307.4							Basalt, variably vesicular fine-grained, non-porphyritic. Very lobate lower contact looks like small pillows.			

TASMANIA DEPARTMENT OF MINES
GEOLOGICAL SURVEY BRANCH

DIAMOND DRILL CORE GEOLOGICAL RECORD

HOLE No. BRADSHAWS ROAD 1
REF. No.

INTERVAL From (m)	INTERVAL To (m)	REC. (%)	Core lift	Core loss	Depth (m)	Graphic Log	Min	DESCRIPTION	SPECIMEN Number	SPECIMEN Depth	SPECIMEN Prep'n
307.4	307.7							300 mm of fine-grained green tuff between flows.			
307.7	311.6							Basalt, variably vesicular (carbonate fillings mostly). Small green chlorite flecks in places after small ferromagnesian phenocrysts. 300 mm unit of fine ash-tuff has sub-parallel contact with core at 308.6 m.			
311.6	327.4							Fine tuff, grey-green, with basalt dyke 500 mm wide at 313.6 m.			
327.4	328							600 mm basalt dyke with chilled margins.			
328	332.6							Fine tuff, grey-green (difficult to tell from basalt). Lower 100 mm very chloritic and strongly cleaved - cleavage-core angle 30° at 332 m.			
332.6	335							Basalt, pale to dark green, variably vesicular. Strongly lobate flow contacts are probably pillows at 332.6, 333.6, have abundant vesicles following the edges of the lobes. Small amount of green chloritic tuff(?) wrapping around the pillows.			
335	336							One metre of fine tuff, grey-green, massive.			
336	336.6							Basalt, vesicular.			
336.6	340							Massive basalt, becoming vesicular after two metres. Top contact has angle of 15° with core axis.			
340	341							Tuff, with thin dyke(?) of basalt 50 mm across at 340.5 m.			
341	343							Mainly basalt - very lobate pillow-like contact at 341 m and another at 341.4 m against 100 mm of tuff, then back into basalt. Looks like pillow lavas.			
343	350.5							Massive basalt, slightly vesicular in few places, some carbonate veins.			
350.5	358.6							Basalt breccia, with rounded to irregular clasts of vesicular basalt in fine chloritic matrix (partly tuffaceous?). Some sections of more massive vesicular basalt.			
358.6	363							Mainly tuff, with scattered large rounded clasts of vesicular basalt to 200 mm long. Breccia zone at top of next basalt.			
363	363.8							Basalt			
363.8	364.1							300 mm tuff.			
364.1	369.2							Basalt, vesicular, very lobate contact at 364.1 m, several lobate pillow-like internal contacts with narrow sections of tuff - looks like pillow lava.			
369.2	370.2							One metre of pale tuff.			
370.2	376.3							Mainly massive basalt.			
376.3	379.8							Tuff, sandy, fine-grained, pale grey-green.			
379.8	380.5							Basalt, notably vesicular at margins			
380.5	380.7							Tuff.			
380.7	381							Basalt.			
381	381.2							Tuff.			
381.2	383.7							Basalt, irregular chilled margins.			
383.7	384							Tuff.			
384	384.3							Basalt.			
384.3	386.5							Mainly tuff.			
386.5	389.6							Basalt breccia with irregular clasts of cleaved porphyritic basalt with green phenocrysts (chlorite?) in tuffaceous breccia matrix.			
389.6	402.2							Mainly massive basalt, slightly vesicular in patches, some breccia development.			
402.2	404							Mainly tuff with one or two basalt clasts.			
404	405							Mainly basalt breccia - presence of vesicular clasts with chilled margins suggests this is probably a pillow breccia.			
405	424.5							Mainly massive basalt, vesicular in part (carbonate fillings), some carbonate veins. Lower contact has angle of 40° with core axis. Disseminated pyrite in patches.			
424.5	436.2							Tuff, massive, grey-green, abundant fused dark joints in places.			
436.2	439.6	10%						Fault zone - lightly broken core with lot of core loss. Rock types are white fine tuff and green coarser felsic tuff of next sequence, with few remnants of grey puggy clay. Some patches of pyrite in broken green tuffaceous sandstone towards 439.6 m. 90% of core lost.			
439.6	442.6	73%						Very broken to moderately broken green tuffaceous sandstone. Thin section shows a quartz-feldspar-phyric tuff or tuffaceous sandstone, with abundant quartz and weathered feldspar grains, also some murky and chloritic grains, and rare felsic volcanic clasts, in a fine-grained sericitic matrix, possibly after shards. Cut by carbonate veins, with cleavage slightly oblique to core. 0.8 core loss.	BR1	442 m	TS

TASMANIA DEPARTMENT OF MINES
GEOLOGICAL SURVEY BRANCH

DIAMOND DRILL CORE GEOLOGICAL RECORD

HOLE No. BRADSHAWS ROAD 1
REF. No.

From (m)	To (m)	REC. (%)	Core idn	Core loss	Depth (m)	Graphic Log	Min		DESCRIPTION	Specimen Number	Specimen Depth	Specimen Prep'n
442.6	443.6	100%							*Moderately broken green tuffaceous sandstone, ± full core.*			
443.6	445.7	100%							Pale porphyritic basaltic rock, very broken in patches. Thin section shows a plagioclase-phyric basalt with pilotaxitic groundmass; very carbonate-altered, with scattered small vesicles. Cut by small faults with carbonate on them, which displace earlier carbonate veins. Much paler coloured than basalts in previous sequence.	BR2	445 m	TS
445.7	453.8	2.2 m *core loss*							Sandstone and siltstone, very broken and mashed, black to dark grey. Strongly cleaved and *weathered in part*, with puggy clayey patches possibly representing faults. 2.2 m of core lost between 445.6 m and 448.6 m, probably on a major fault. Schistosity - core angle about 40° at 449 m. Very veined and fractured. Schistosity - core angle 18° at 452.6 m.			
453.8	457								Sandstone, moderately broken in parts. Grey, fairly fine-grained tuffaceous quartzwacke, with rare silty patches. Too broken to see bedding.			
457	460								Siltstone, grey, broken, with very weathered puggy clay sections; some fine sandstone. Schistosity parallel to core at 457.6 m. Pyrite vein 50 mm across at 457 m.			
460	467								Sandstone and siltstone, fairly solid, veined and fractured in parts. Bedding-core angle 60° at 464.6 m, but generally bedding looks very disturbed and fractured. Schistosity - core angle 30° at 466.2 m.			
467	468								Siltstone and sandstone, very broken, with puggy clay patches.			
468	472.6								Sandstone, relatively solid, with broken patches.			
472.6	477								Very broken sandstone-siltstone, with some thin puggy clay patches.			
477	489.6	2 m core loss							Very broken, very weathered siltstone and sandstone with puggy clay patches. One metre core loss between 478.6 m and 481.6 m, also one metre lost between 484.6 m and 487.6 m looks like beginning of large fault zone.			
489.6	502								Mainly brecciated sandstone and siltstone with many puggy clay zones - probably a large fault zone. Includes grey silty breccia with abundant small sandstone clasts and wisps. Wispy bedding in breccia has 40° angle with core axis at 501 m. Schistosity-core angle 25° at 490 m, 40° at 495.5 m, 30° at 501.5 m. Clasts in breccia range from 1 mm to over 100 mm across. Rock is still weathered and soft at end of hole.			
									End of hole.			

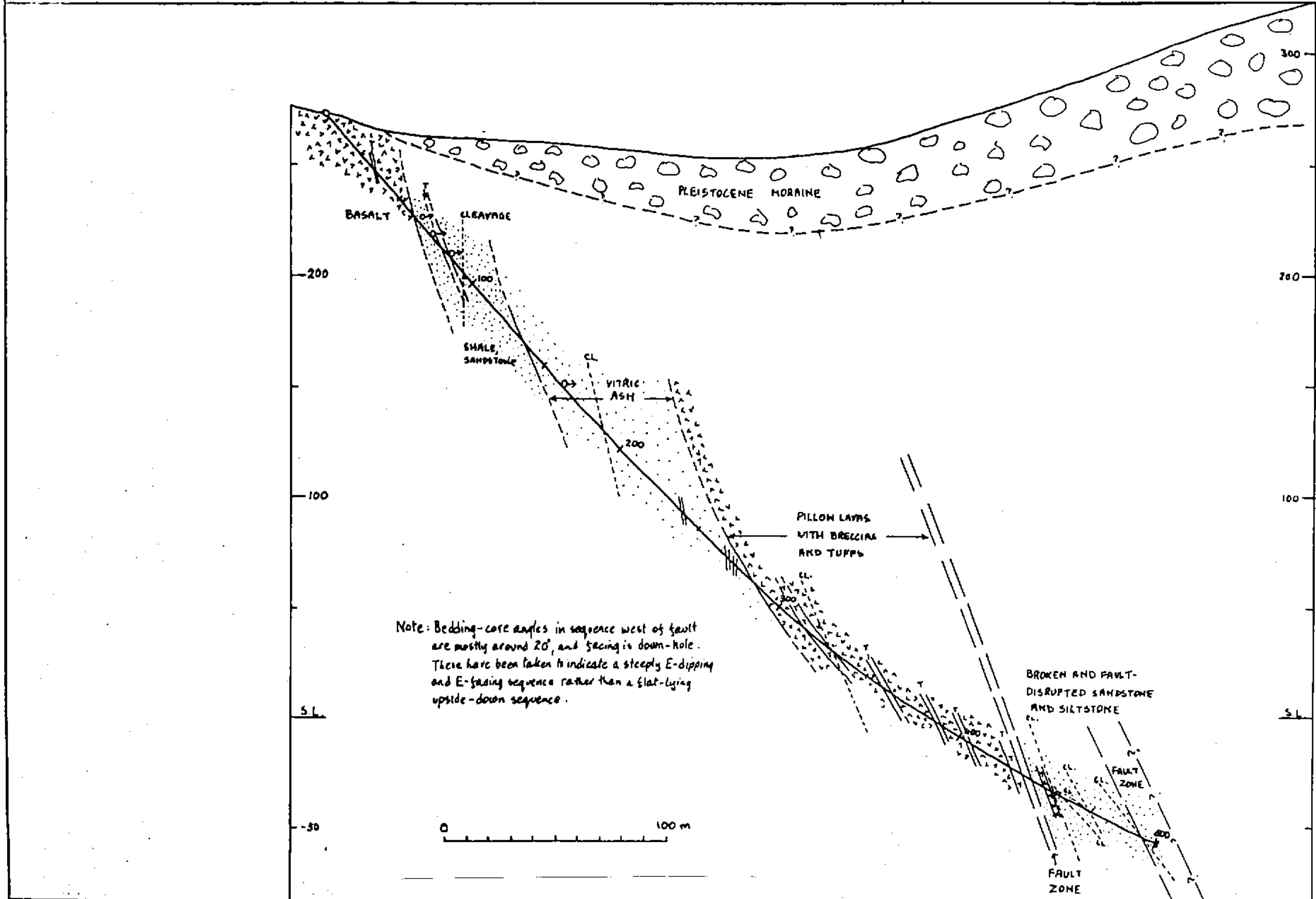
0287

357288

TASMANIA DEPARTMENT OF MINES
GEOLOGICAL SURVEY BRANCH

DIAMOND DRILL HOLE PLOT

HOLE No.	BRADSHAWS ROAD 1		SHEET No.	5 of 5	
REF. No.					
AMG CO-ORDS:	374929.5 mE	COLLAR R.L. 272.4	COLLAR DIP: -50°	SCALE 1:	
	5350434 mN	TOTAL DEPTH: 502	AZIMUTH: 127°M	(Bar scale must be shown)	



5 cm

0270

357289

1985/55. The Mt Read drill hole (MR1) through the central volcanic sequence-White Spur Formation contact near Howards Road, western Tasmania

K.D. Corbett

INTRODUCTION

A proposal for a stratigraphic drill hole through the western margin of the Mt Read Volcanics on the SW flank of Mt Read was first submitted in October 1981. The hole was drilled in February-March 1984, to a total depth of 108 m. During site preparation, a shallow costean was bulldozed across the contact nearby to provide a better exposure and some surface information on the contact's attitude.

GEOLOGY AND REASON FOR DRILL HOLE

A major contact between a volcano-sedimentary sequence of tuff, shale and greywacke to the west (now called the White Spur Formation - Corbett and Lees, in prep.) and a central volcanic sequence of massive feldspar-phyric rhyolitic tuff occurs along the western flanks of Mt Read from Williamsford to the North Henty Fault near Howards Road (fig. 1). The only exposure of this contact was on a four-wheel drive track on a spur north of Howards Road, where the nature of the contact was ambiguous. An early interpretation of the contact (Corbett, 1981) was that it represented a fault scarp in the "western sequence" against which the central volcanic sequence was deposited, *i.e.* the CVS was younger. However, further mapping in the area suggested the contact might be a normal sedimentary one, with the western sequence overlying the central sequence. The relationship is of regional significance in determining the stratigraphic position of the central volcanic sequence, which hosts the Hercules and Rosebery orebodies along strike to the north.

RESULTS

The costean showed a contact dipping west at about 40°, with a basal breccia-agglomerate overlying massive homogeneous feldspar-phyric crystal-vitric tuff. The drill hole, located some 170 m west of the contact and angled at 60° towards it, intersected the contact at 56 m (fig. 2), indicating that the contact had either flattened to be sub-horizontal or had actually risen due to the presence of a topographic high. The hole clearly demonstrated that the western sequence was younger and was resting on a probable erosion surface developed on the central sequence.

Of particular interest was the occurrence, in the coarse lower part of the younger sequence, of clasts of pyrite, pyrite-chert, hematite, galena and pyritised calcic schistose rock. These clasts indicate weathering of an exhalative sulphide deposit. Other clasts include quartz-feldspar porphyry, feldspar porphyry, fine-grained felsic volcanic rocks, vitric tuff, shale and pumice, the latter probably representing juvenile material related to the eruption which may have triggered the mass-flow which deposited the younger unit.

General descriptions of the sequences involved are given in Corbett (1984) and Corbett and Lees (in prep.)

REFERENCES

CORBETT, K.D. 1981. Stratigraphy and mineralization in the Mt Read Volcanics, western Tasmania. *Economic Geology* 76:209-230.

CORBETT, K.D. 1984. Geological maps and summary of Cambrian stratigraphic units and relationships in the Henty River-Williamsford area. *Unpubl. Rep.Dep.Mines Tasm.* 1984/84.

CORBETT, K.D.; LEES, T.C. in prep. Revised stratigraphy and tectonics of the Mt Read Volcanics and associated Cambrian sequences in the Rosebery-Henty River area, western Tasmania. *Aust.J.Earth Sciences* (submitted).

[28 November 1985]

357292

02..

GEOLOGY OF THE HENTY RIVER-WILLIAMSFORD AREA

(PRELIMINARY EDITION) K. D. CORBETT 1984

QUATERNARY

- Qal — *Alluvium*
- Qpm — *Pleistocene moraine*

CARBONIFEROUS-JURASSIC

- P-J — *Permo-Carboniferous beds and Jurassic dolerite*

SILURO-DEVONIAN

- S-D — *Eldon Group undifferentiated*

ORDOVICIAN

- Ogl — *Gordon Limestone (under superficial cover in most areas)*

LATE CAMBRIAN-EARLY ORDOVICIAN

- Oc Oca Onc Ocv — *Owen Conglomerate and correlates including upper sandstone unit, lower Newton Creek Sandstone Member, basal volcaniclastic conglomerate.*

CAMBRIAN SEQUENCES

NORTH OF HENTY FAULT ZONE

DUNDAS GROUP -"ROSEBERY GROUP"

- DRc — *Conglomerate*
- DRq — *Quartzwacke-siltstone-mudstone sequences*
- DRd — *Dolomite-siltstone-sandstone*
- DRv — *Felsic volcanics, including quartz-feldspar porphyry*
- DRu — *Undifferentiated greywacke-mudstone-conglomerate-tuff sequences*
- *Secondary carbonate and/or chert bodies*
- Eg — *Gabbro*

HOWARDS ROAD VOLCANO-SEDIMENTARY SEQUENCE

- HRt — *Felsic tuff and agglomerate, with minor siltstone*
- HRl — *Felsic lava, quartz-feldspar-phyric*
- HRs — *Greywacke, siltstone, minor tuff*
- HRu — *Undifferentiated*

CENTRAL VOLCANIC SEQUENCE

- CVi — *Felsic intrusives with possible lavas*
- CVl — *Felsic lavas, mainly feldspar-phyric*
- CVp — *Felsic pyroclastics, mainly feldspar-phyric*
- CVs — *Bedded shale-sandstone-tuff units*
- CVt — *Bedded tuff-agglomerate units*
- CVq — *Quartz-phyric tuff, agglomerate*
- Eb — *Mafic dykes*
- CVu — *Undifferentiated*

BETWEEN NORTH AND SOUTH HENTY FAULTS

- HFs — *Greywacke, mudstone, with minor conglomerate (c)*
- HFt — *Felsic tuff*
- HFa — *Andesitic volcanics-pyroclastics, lavas*
- HFb — *Basaltic to intermediate volcanics-lavas, pyroclastics*
- Eq — *Quartzwacke-siltstone sequence west of Zeehan Highway*
- Eg — *Gabbro*
- Eum — *Serpentinite and ultramafic rocks*

SOUTH AND EAST OF HENTY FAULT ZONE

TYNDALL GROUP

- Tgl — *Lavas-quartz-feldspar-phyric*
- TGp — *Pyroclastics-quartz-feldspar-phyric*
- TGu — *Undifferentiated-includes volcaniclastic conglomerate*

CENTRAL VOLCANIC SEQUENCE

- CVl — *Felsic lavas, dominantly feldspar-phyric*
- CVp — *Felsic pyroclastics*
- CVs — *Siltstone-sandstone-minor tuff lenses*
- CVa — *Andesitic volcanics-lavas, intrusives, pyroclastics*
- CVqfp — *Quartz-feldspar porphyry*

BRADSHAWS ROAD VOLCANO-SEDIMENTARY SEQUENCE

- BRt — *Vitric tuff, vitric-crystal tuff, siltstone, sandstone*
- BRs — *Dominantly siltstone and greywacke*
- BRi — *Felsic porphyry intrusives*

Geological boundary-approximate, inferred, concealed.

Fault-approximate, inferred.

Bedding-facing unknown, facing known, vertical, overturned.

Layering in igneous rock-dipping, vertical

Cleavage-dipping, vertical.

Foldaxis-syncline, anticline

Road or major 4-wheel drive track

Other track

Prospect

Fossil locality

M 1681

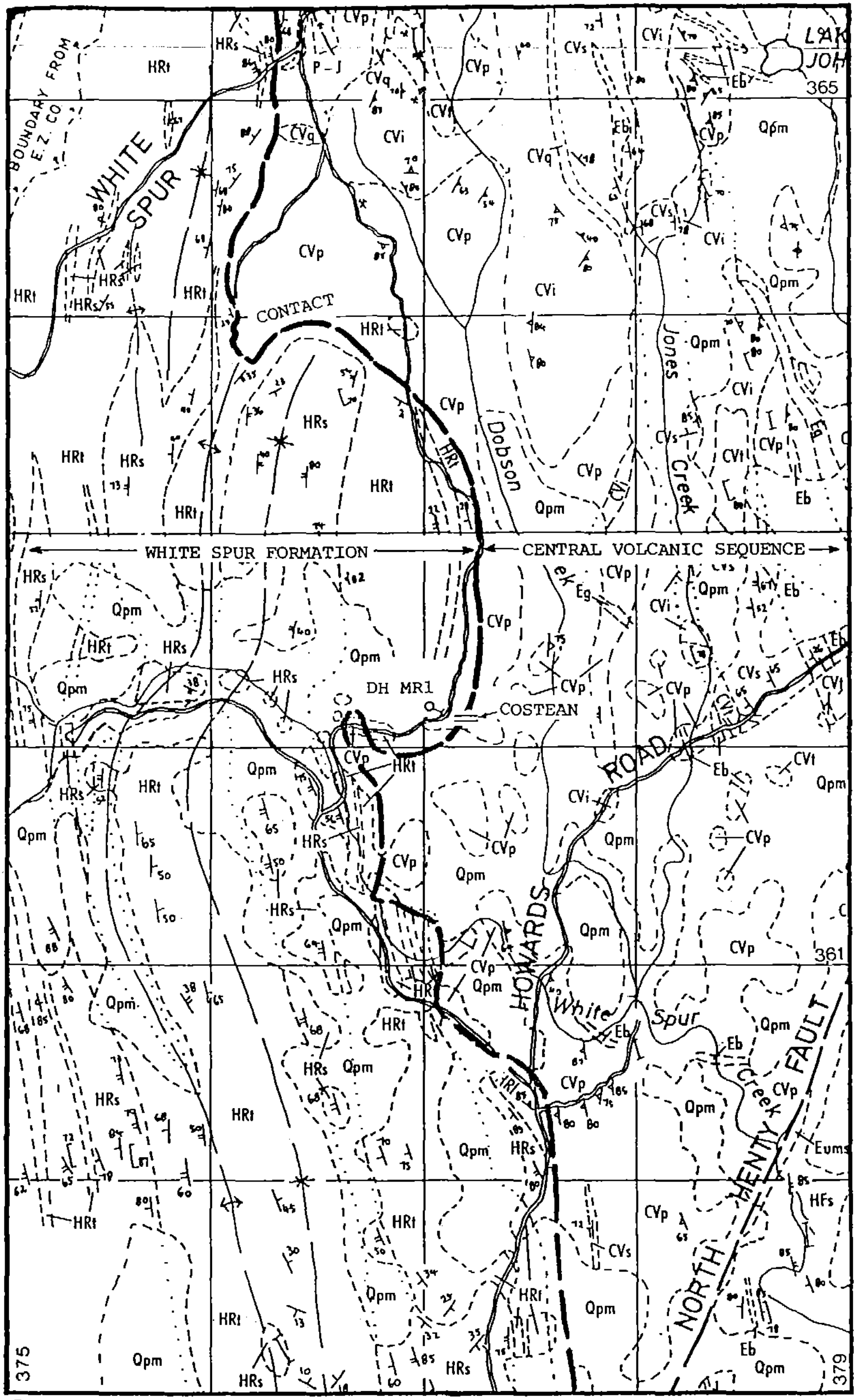


Figure 1. *Geology of the Mt Read Drill Hole area (after Corbett, 1984). Scale = 1:25 000*

5 cm

TASMANIA DEPARTMENT OF MINES
GEOLOGICAL SURVEY BRANCH

DIAMOND DRILL CORE RECORD

HOLE No. MR1
REF. No.
SHEET No. 1 of 3

PROJECT: MT READ VOLCANICS AND ASSOCIATED SEQUENCES

OBJECTIVE: To determine nature and attitude of contact between White Spur Formation and Central Volcanic Sequence

PROPOSED BY: K. Corbett
LOGGED BY: K. Corbett June 1984

LOCATION: SW flank of Mt Read, near Howards Road

MAP SHEET: TYNDALL 8014-III
GEOL. ATLAS: MURCHISON 51
A.M.G. CO-ORDS: 377043 mE 5362227 mN
COLLAR R.L.: 609.8
TOTAL DEPTH: 108.72 m
COLLAR DIP: -60°
AZIMUTH: 110° M / 98.5° AMG
DATE COMMENCED: 13.2.84
DATE COMPLETED: 16.3.84
DRILL RIG: Longyear 38
DRILL CREW: C. Mitchell

HOLE SIZE:

HQ	0	to	51.6	m
NQ	51.6	to	109	m
		to		m
		to		m
		to		m

HOLE CONDITION AFTER COMPLETION: Clean

SURVEY DATA
INSTRUMENT:

DEPTH	INCLINATION		AZIMUTH		COMMENTS
	As read	Dip	As read, °M	°A.M.G.	
					Not surveyed

SUMMARY GEOLOGICAL LOG

From (m)	To (m)	ROCK DESCRIPTION
0	30	Vitric-lithic tuff, coarsening downwards.
30	56	Coarse lithic tuff-breccia, shale clasts at least 800 mm long. Clasts of pyrite to 60 mm, smaller clasts of hematite, galena, schistose rock, as well as various volcanic clasts and pumice.
56	108.72	(EDH). Massive feldspar-phyric crystal-vitric tuff, greenish-grey to splotchy pink and green. Upper contact abrupt, with 20 mm thick quartz vein, but no evidence shearing. No obvious mineralisation.

SUMMARY GEOCHEMICAL DATA (g/t unless specified)

From	To	Length	Rec. (%)							

REPORT REFERENCE: Unpublished Report Tasmania Department of Mines 1985/55.

OTHER COMMENTS:

0241

357294

TASMANIA DEPARTMENT OF MINES
GEOLOGICAL SURVEY BRANCH

DIAMOND DRILL CORE GEOLOGICAL RECORD

HOLE No. MR1
REF. No.
SHEET No. 2 of 3

From (m)	To (m)	REC. (%)	Core dia	Core loss	Depth (m)	Graphic Log	Min		DESCRIPTION	SPECIMEN Number	Depth	Prep'n
0	5.2								Bleached, slightly weathered, whitish hard vitric-lithic tuff.			
5.2	14.5								Hard grey vitric-lithic tuff; scattered to fairly abundant lithic clasts to 40 mm across, mainly of fine-grained felsic volcanics, some of dark shale. Also fairly abundant pumice-like clasts (some sericitic, some chloritic). Some feldspar and quartz crystals in matrix. Suggestion of downwards-coarsening.			
14.5	20								Large clasts of black shale-siltstone begin to appear, up to 200 mm across. Rock becomes more fragmental - now a lithic-vitric-crystal tuff.			
20	31								Rock is now a lithic breccia, with abundant clasts 10-150 mm across. Clasts mostly fine-grained felsic volcanic rocks, some grey fine sandstone and shale, vitric tuff, feldspar-porphyry, quartz-feldspar porphyry. Irregular pumice clasts persist. Clasts vary from angular to rounded. Weathered patch due to several weathered joints at 23.5 m. Small (15 mm) hematite clast at 30.5 m.			
31	55.84								Coarse breccia. Clast of laminated siltstone 800 mm long at beginning, with very irregular edges - obviously a transported raft. Several clasts of massive pyrite to 30 mm long at 36 m. Some weathered patches, particularly near some joints. Some clasts have completely weathered out, leaving holes. Pyrite films on some joint surfaces. Pyrite clast 60 mm across at 38.3 m show deformed primary banding on one side, and contains small lenses of chert. At about 38.9 m there is a 30 mm hematite clast, also 60 mm pyrite-hematite clast and several small (<10 mm) hematite and pyrite clasts. A clast of pale foliated schistose rock (50 x 15 mm) occurs at 40.2 m; has abundant disseminated pyrite in a partly calcareous matrix, with a rim of brown metallic mineral (hematite or sphalerite) all around it. Clast of grey fine-grained pyrite-rich rock, 40 mm across, at 41.1 m; another at 41.3 m. Two small pyrite clasts at 42 m. Large quartz-albite(?) vein 20 mm across at 42.1 m. Scattered hematite-pyrite clasts beyond this. Another hematitic carbonate-rich clast (40 mm) at 43.4 m. Small clast (7 mm) with galena and pyrite at 52.5 m; another of pyrite-chert rock. Small clast (5 mm) with galena at 53.6 m. Small pyritic clasts persist to contact. Breccia becomes somewhat weathered and soft for metre or so above contact; core is broken, yellowish, with clayey zones on joints.			
55.84	108.72 (EOH)								Massive uniform feldspar-phyric crystal-vitric tuff of Central Volcanic Sequence. Contact marked by 20 mm thick quartz vein but no evidence of shearing or faulting. Some pyrite in the slightly weathered underlying tuff for 3-4 mm below quartz vein. Colour of tuff grades from greenish-grey to splotchy pink and green at about 73 m, mainly due to growth of fine secondary albite(?); becomes slightly pinker down to end of hole. Scattered small lithic clasts but no primary bedding features. Few thin chlorite-albite-quartz veins. No obvious mineralisation.			

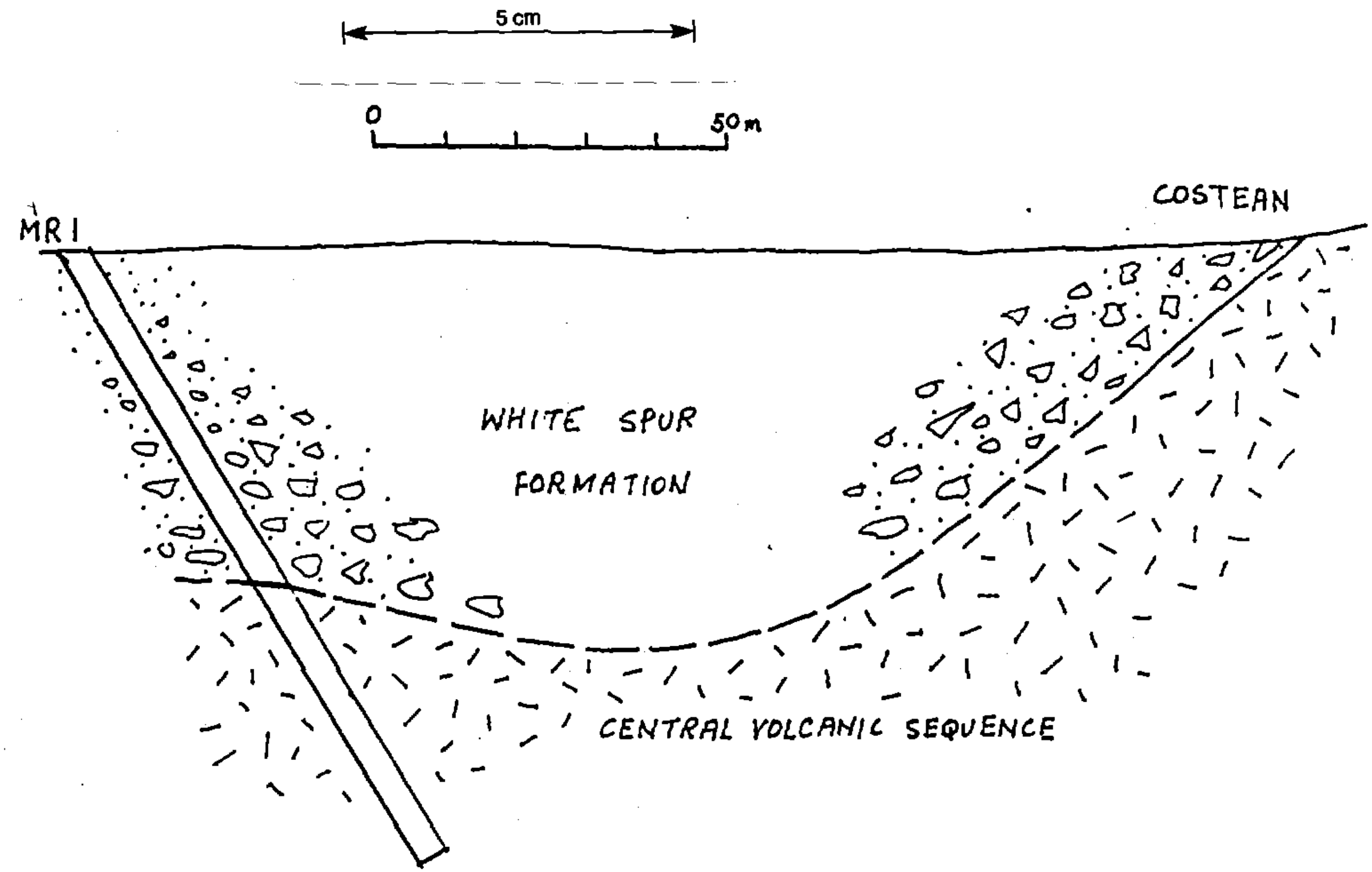
357295

TASMANIA DEPARTMENT OF MINES
GEOLOGICAL SURVEY BRANCH

DIAMOND DRILL HOLE PLOT

HOLE No. MT READ 1
REF. No.
SHEET No. 3 of 3

A.M.G. CO-ORDS:	377043 mE	COLLAR R.L.:	609.8	COLLAR DIP:	-60°	SCALE 1 :
	5362227 mN	TOTAL DEPTH:	108.7 m	AZIMUTH:	110° M	(Bar scale must be shown)



CROSS-SECTION THROUGH MR1 AND COSTEAN

BOREHOLE CO-ORDINATES FILE

MAP SHEET LYELL (N.W)

Memo To ....J. EVERARD........

Memo From ..G. BENN...........

Borehole Name/Number	MINERS RIDGE BH.
Date Commenced	18-8-1989
Date Finished	....
Easting Co-ordinates	380,866 m
Northing Co-ordinates	5,336,197 m
Height	265.5 m
For whom drilled	(REGIONAL) J. EVERARD

Remarks

TIED TO H.E.C. SURVEY (TRANSMISSION LINE SURVEY)

VERTICAL (BH)

CP 80873620

Summary log

0 – 68m Dark grey-green siltstone. Well cleaved, diffusely bedded. Disseminated pyrite locally present. Abundant secondary calcite, disseminated and in veinlets.

68 – c. 365m Basaltic breccia and subordinate amygdaloidal to massive basalt. Blotchy, dark grey-green to maroon colored; clasts typically subrounded to subangular, 10-100mm, but ≤ 400m. Abundant secondary carbonate (calcite) disseminated, in stringers and veinlets. Bright green epidote present in matrix. Local red-brown to copper-colored oxidized zones (?).

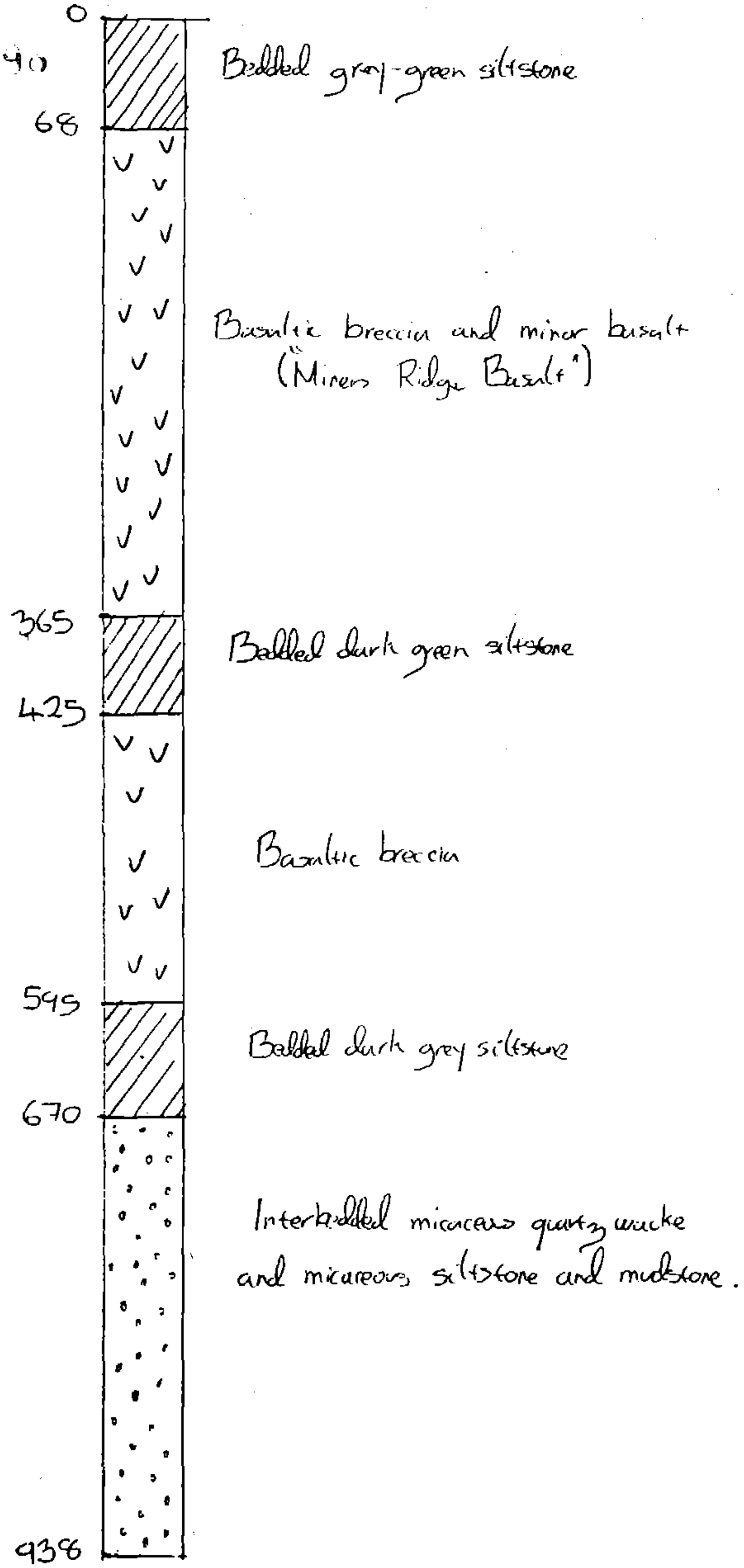
c. 365m – 425m Dark green siltstone, diffusely bedded.

425 – 595m Basaltic breccia and minor basalt, as above

595 – c. 670m. Dark grey siltstone, often finely but diffusely bedded; abundant secondary calcite. Much sericite in thin section. Polycrystalline quartz anhedra and detrital muscovite present below about 640m. Transitional into...

670 – 938m Interbedded medium grey micaceous quartz wacke and dark grey micaceous mudstone and siltstone. Abundant detrital muscovite and polycrystalline quartz anhedra in thin section, also shreds of braided fine-grained black (?) carbonaceous material. ~~Also~~ Traces of detrital tourmaline and zircon present. Mudstones more pelitic with more abundant detrital muscovite; also more carbonaceous. Abundant secondary carbonate throughout.

0240 357299



0
Bedded grey-green siltstone
68
Basaltic breccia and minor basalt
("Miners Ridge Basalt")
365
Bedded dark green siltstone
425
Basaltic breccia
595
Bedded dark grey siltstone
670
Interbedded micaceous quartz wacke
and micaceous siltstone and mudstone.
938

0293

357300

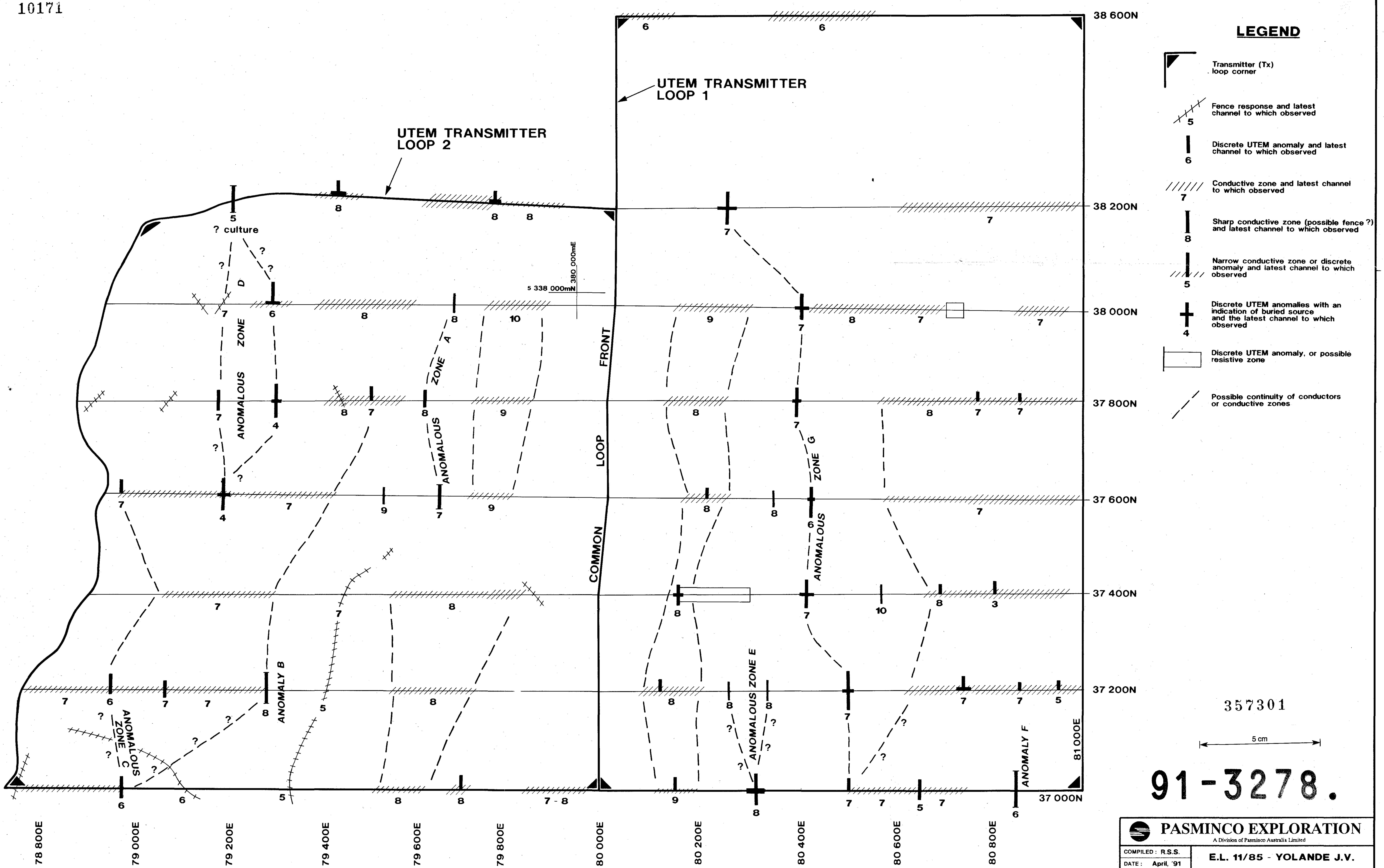
Down-hole survey

Apparent depth	plunge	trend (magnetic)
0	90°	—
510	84	025
674	81°	004
770	63°	001
900	39°	004

A

Apparent depth	true depth	horizontal displacement N	horizontal displacement E	elevation	co-ordinates easting	co-ordinates northing
0	0	0	0	265.5	80866	36197
100	100.0	+0.8	0.6	165.5	80866.6	36197
200	199.9	3.2	2.5	65.6	80868.5	36200
300	299.8	7.3	5.7	-34.3	80871.5	36204
400	399.6	12.9	10.1	-134.1	80876.1	36209
500	499.1	20.2	15.8	-233.6	80881.8	36217
510	509.1	21.0	16.4	-243.6	80882.4	36218
674	671.7	40.1	25.5	-406.2	80891.5	36237
770	762.6	68.6	33.0	-497.4	80899.0	36265
938	886.2	175.2	64.0	-620.7	80930.0	36372

10171



357301

91-3278.

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED : R.S.S.	E.L. 11/85 - YOLANDE J.V.
DATE : April, '91	LYNCHFORD AREA
DRAWN : G.M.B.	UTEM SURVEY LAYOUT GRID AND INTERPRETATION PLAN
REF: Y11	
REVISIONS :	
DRAWING No.	SCALE 1: 5000 (50 0 100 METRES) — FIG. No. 33

10173

PASMINCO EXPLORATION

PROJECT: YOLANDE E.L. 11/85

WACKER BEDROCK SAMPLES
LITHOLOGIES and POSITIONS
LINES 5200N and 5600N
HENTY RIVER GRID

SCALE = 1:5000 | COMPILED = G.W.J. | DRAWN = N.W.D.S. | DATE = 28-8-'90 | FIG. No.

N.B - Qg = glacial float and clay, no bedrock obtained.

5cm

91-3278.

357302

Grid: 5 355 000m.N. – 5 356 000m.N.; 376 000m.E., 377 000m.E., 378 000m.E.

Line 5200N

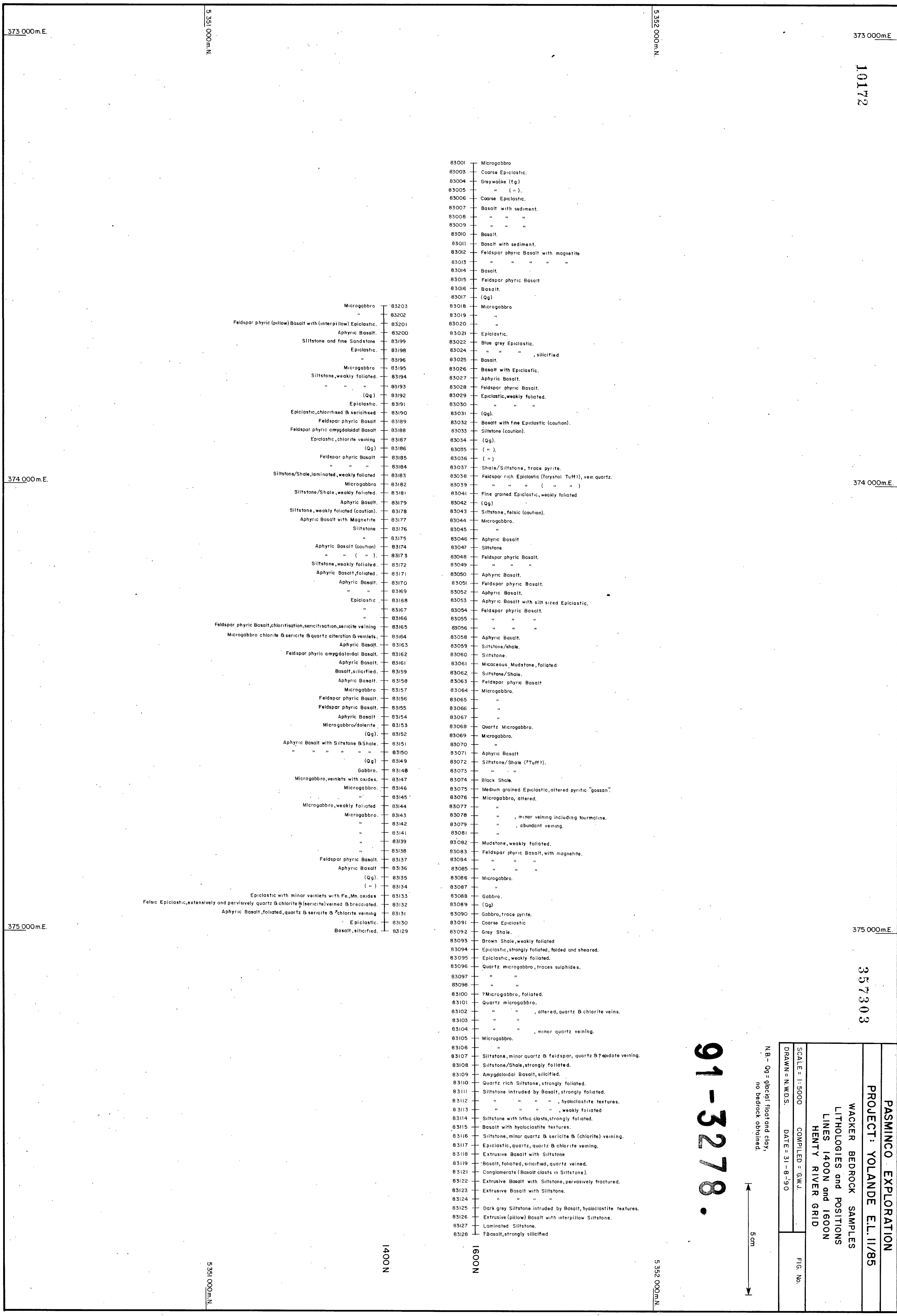
Sample	Lithology
83414	Aphyric Basalt/dolerite
83413	Microgabbro/dolerite
83412	Microgabbro
83411	"
83410	"
83409	Microgabbro,veined,Mn oxides
83408	(Qg).
83407	Microgabbro.
83406	Microgabbro/dolerite
83405	Microgabbro
83404	"
83403	(Qg)
83402	Microgabbro/dolerite.
83401	" "
83399	" "
83398	Microgabbro.
83397	Microgabbro,foliated,quartz veining
83396	Microgabbro.
83395	"
83394	"
83393	"
83392	"
83391	"
83390	Gabbro
83389	"
83388	Microgabbro
83387	Gabbro
83386	"
83385	"
83384	"
83383	Gabbro,sericitised and chloritised
83382	Gabbro
83381	"
83379	"
83378	"
83377	(Qg).
83376	Microgabbro
83375	Gabbro
83374	Feldspar phyric Basalt,sericite veining (caution)
83373	Microgabbro
83372	"
83371	"
83370	"
83369	Gabbro.
83368	Gabbro.
83367	Serpentinised Ultramafic
83366	" "
83365	" "
83364	" "
83363	Feldspar phyric Basalt
83362	" " "
83361	Sandstone/epiclastic,strongly foliated.
83359	Sandstone/epiclastic (float)
83358	Siltstone/fine Sandstone.
83357	" " "
83356	Aphyric Basalt (caution)
83355	Siltstone/fine Sandstone quartz & chlorite alteration & veining.
83354	Siltstone/fine Sandstone
83353	Siltstone intruded by aphyric Basalt,minor chlorite veins
83352	(Qg).
83351	Siltstone/fine Sandstone,felsic.
83350	Epiclastic,matrix chloritised.
83349	" " "
83348	Feldspar phyric Andesite,quartz & chlorite veinlets.
83347	Microgabbro
83346	Siltstone/fine Sandstone,foliated,minor quartz & chlorite veining
83345	Aphyric Andesite,minor chloritisation
83344	Siltstone/fine Sandstone.
83343	Silicified ,?Andesite
83342	Aphyric Andesite,minor chloritisation
83341	" " " "
83339	Siltstone,felsic,weakly foliated,quartz rich.
83338	" " " " " "
83337	" " " " " "
83336	" " " " " "
83335	Siltstone,felsic,weakly foliated
83334	Siltstone,felsic,weakly foliated ,quartz rich.
83333	Siltstone,felsic,weakly foliated.
83332	" " " "
83331	Siltstone,felsic,weakly foliated ,quartz rich,minor quartz veining.
83330	Siltstone,felsic,weakly foliated
83329	" " " "
83328	Siltstone,felsic,weakly foliated,quartz rich
83327	" " " " " "
83326	Siltstone,felsic,weakly foliated.
83325	" " " "
83324	" " " "
83323	Siltstone,felsic
83322	" "
83321	Siltstone
83319	Siltstone/fine Sandstone.
83318	Aphyric Andesite,quartz & chlorite & sericite alteration
83317	" " " " " " " "
83316	Sandstone
83315	Siltstone,felsic,foliated
83314	(Qg)
83313	Feldspar phyric Andesite,foliated,quartz & chlorite veining
83312	Aphyric Basalt,silicified
83311	Greywacke,minor chlorite & sericite veining
83310	Siltstone,felsic,foliated
83309	Sandstone,quartz & chlorite veining
83308	Siltstone,felsic,foliated
83307	Aphyric Andesite, extensively quartz veined
83306	Siltstone,foliated,Fe oxide
83305	Siltstone,foliated.
83304	Silicified Basalt,quartz veining,traces Sulphides
83303	Siltstone ,felsic
83302	Aphyric Andesite ,chloritised mafics,sericite veining.
83301	Siltstone,foliated
83299	Sandstone,felsic.
83298	Aphyric Basalt.
83297	" "
83296	" "
83295	Sandstone,felsic
83294	Feldspar phyric Andesite,quartz & chlorite veining.
83293	" " " " " " "
83292	" " " " " " "
83291	" " " " " " "
83290	" " " " " " "
83289	Feldspar phyric Andesite
83288	Aphyric Basalt.
83287	Feldspar phyric Andesite,minor chlorite veining
83286	" " " " " "
83285	(Qg)
83284	Feldspar phyric Andesite,minor chlorite veining
83283	Andesite,feldspar phyric,quartz & chlorite veined
83282	" " " " " "
83281	Sandstone
83279	Andesite,feldspar phyric,strongly foliated
83278	Andesite,feldspar phyric
83277	Andesite,feldspar phyric
83276	Shale,black,foliated
83275	Siltstone ,Haematitic,foliated
83274	Shale,Haematitic,foliated
83273	Siltstone,Haematitic,weakly foliated
83272	Siltstone,Haematitic,weakly foliated
83271	Shale,Siltstone,Haematitic,weakly foliated
83270	Siltstone,Haematitic,foliated.
83269	Siltstone,Shale,foliated
83268	Shale,Siltstone,Haematitic
83267	Greywacke

5200N

Line 5600N

Sample	Lithology
83415	Microgabbro.
83416	"
83417	"
83418	"
83419	Gabbro.
83421	"
83422	"
83423	"
83424	(Qg).
83425	"
83426	"
83427	"
83428	"
83429	Gabbro,strongly altered,chlorite,Mn oxides
83430	Microgabbro
83431	"
83432	"
83433	(Qg)
83434	Gabbro,foliated
83435	(Qg).
83436	Microgabbro
83437	"
83438	(Qg)
83439	Microgabbro
83441	"
83442	"
83443	"
83444	" , foliated
83445	" "
83446	Gabbro.
83447	Gabbro, altered
83448	" "
83449	(Qg)
83450	Gabbro.
83451	"
83452	"
83453	Gabbro, altered
83454	" "
83455	" "
83456	Gabbro,sericitised and silicified
83457	Microgabbro
83458	Serpentinised Ultramafic
83459	" "
83461	Feldspar phyric Basalt.
83462	" " "
83463	Serpentinised Ultramafic
83464	" " , traces pyrite.
83465	Fine Sandstone,traces pyrite.
83466	(Qg)
83467	Feldspar phyric Andesite
83468	" " " , sericitised.
83469	" " "
83470	Fine Sandstone
83471	Feldspar phyric Andesite
83472	" " "
83473	(Qg)
83474	(Qg)
83475	Siltstone/fine Sandstone, felsic
83476	" " " "
83477	Sandstone, matrix chloritised.
83478	" " "
83479	Feldspar phyric Andesite
83481	N/S
83482	Feldspar phyric Andesite
83483	Greywacke
83484	Fine Sandstone
83485	Greywacke.
83486	" (caution).
83487	Feldspar & pyroxene phyric Andesite.
83488	Siltstone, felsic.
83489	Shale/Siltstone, grey, foliated.
83490	" " " "
83491	Shale, off white, foliated
83492	Siltstone, felsic, foliated.
83493	" " "
83494	Feldspar phyric Andesite, quartz & chlorite veining
83495	(Qg)
83204	Andesite, foliated
83205	" "
83206	Feldspar–pyroxene phyric Andesite
83207	Coarse Epiclastic.
83208	Aphyric Andesite
83209	Feldspar phyric Andesite, strongly foliated
83210	Sandstone, quartz rich
83211	Epiclastic
83212	"
83213	Siltstone/Shale, felsic
83214	Siltstone/Shale, grey, foliated
83215	" " " "
83216	" " " "
83217	Siltstone, off white
83218	" " "
83219	Siltstone/fine Sandstone, felsic, weakly foliated
83221	" " " " " "
83222	Siltstone/Shale, grey foliated
83223	Siltstone, and fine Sandstone, felsic , foliated.
83224	Siltstone/fine Sandstone, felsic
83225	" " " "
83226	" " " "
83227	" " " "
83228	Fine Sandstone, felsic, Fe oxides
83229	Medium Sandstone, Fe oxides
83230	Siltstone/fine Sandstone, quartz veining
83231	Aphyric Basalt, strongly altered, quartz & chlorite & sericite veining
83232	" " " " " " " " " "
83233	Siltstone, sericitised and chloritised
83234	Feldspar phyric Andesite.
83235	" " "
83236	" " "
83237	" " " , strongly foliated
83238	" " "
83239	" " "
83241	" " "
83242	" " " , tight folding of veins.
83243	Siltstone, felsic, quartz veined, with oxides
83244	Shale, dark grey to black, quartz veined, with oxides
83245	Aphyric Andesite.
83246	Siltstone/Shale, weakly foliated
83247	Aphyric Andesite, foliated
83248	Aphyric Basalt
83249	Siltstone, foliated
83250	Shale, dark grey to black, foliated
83251	" " " " " "
83252	" " " " " "
83253	Siltstone/fine Sandstone, dark reddish grey (Haematitic), foliated
83254	Black Shale, slaty cleavage.
83255	" " , cleavage less prominent.
83256	Siltstone/fine Sandstone, weakly foliated.
83257	Shale, Haematitic
83258	Siltstone/fine Sandstone, weakly foliated.
83259	" " " " "
83261	" " " " "
83262	" " " " "
83263	Shale/Siltstone, haematitic.
83264	Shale/Siltstone, black.
83265	Greywacke, coarse.
83266	Sandstone, foliated

5600N



373 000m.E.
5 351 000m.N.
5 352 000m.N.
373 000m.E.
10172
83001 Microgabbro
83003 Coarse Epiclastic.
83004 Greywacke (f.g)
83005 " (").
83006 Coarse Epiclastic.
83007 Basalt with sediment.
83008 " " "
83009 " " "
83010 Basalt.
83011 Basalt with sediment.
83012 Feldspar phyric Basalt with magnetite
83013 " " " " "
83014 Basalt.
83015 Feldspar phyric Basalt
83016 Basalt.
83017 (Qg)
83018 Microgabbro
83019 "
83020 "
83021 Epiclastic.
83022 Blue grey Epiclastic.
83024 " " " , silicified
83025 Basalt.
83026 Basalt with Epiclastic.
83027 Aphyric Basalt.
83028 Feldspar phyric Basalt.
83029 Epiclastic, weakly foliated.
83030 " " "
83031 (Qg).
83032 Basalt with fine Epiclastic (caution).
83033 Siltstone (caution).
83034 (Qg).
83035 (").
83036 (")
83037 Shale/Siltstone, trace pyrite.
83038 Feldspar rich Epiclastic (?crystal Tuff?), vein quartz.
83039 " " " (" ")
83041 Fine grained Epiclastic, weakly foliated
83042 (Qg)
83043 Siltstone, felsic (caution).
83044 Microgabbro.
83045 "
83046 Aphyric Basalt
83047 Siltstone
83048 Feldspar phyric Basalt.
83049 " " "
83050 Aphyric Basalt.
83051 Feldspar phyric Basalt.
83052 Aphyric Basalt.
83053 Aphyric Basalt with silt sized Epiclastic.
83054 Feldspar phyric Basalt.
83055 " " "
83056 " " "
83058 Aphyric Basalt.
83059 Siltstone/shale.
83060 Siltstone.
83061 Micaceous Mudstone, foliated
83062 Siltstone/Shale.
83063 Feldspar phyric Basalt
83064 Microgabbro.
83065 "
83066 "
83067 "
83068 Quartz Microgabbro.
83069 Microgabbro.
83070 "
83071 Aphyric Basalt
83072 Siltstone/Shale (?Tuff?).
83073 " "
83074 Black Shale.
83075 Medium grained Epiclastic, altered pyritic "gossan".
83076 Microgabbro, altered.
83077 "
83078 " , minor veining including tourmaline.
83079 " , abundant veining.
83081 "
83082 Mudstone, weakly foliated.
83083 Feldspar phyric Basalt, with magnetite.
83084 " " "
83085 " " "
83086 Microgabbro.
83087 "
83088 Gabbro.
83089 (Qg)
83090 Gabbro, trace pyrite.
83091 Coarse Epiclastic
83092 Grey Shale.
83093 Brown Shale, weakly foliated
83094 Epiclastic, strongly foliated, folded and sheared.
83095 Epiclastic, weakly foliated.
83096 Quartz microgabbro, traces sulphides.
83097 " "
83098 " "
83100 ?Microgabbro, foliated.
83101 Quartz microgabbro.
83102 " " , altered, quartz & chlorite veins.
83103 " "
83104 " " , minor quartz veining.
83105 Microgabbro.
83106 "
83107 Siltstone, minor quartz & feldspar, quartz & ? epidote veining.
83108 Siltstone/Shale, strongly foliated.
83109 Amygdaloidal Basalt, silicified.
83110 Quartz rich Siltstone, strongly foliated.
83111 Siltstone intruded by Basalt, strongly foliated.
83112 " " " " , hyaloclastite textures.
83113 " " " " , weakly foliated
83114 Siltstone with lithic clasts, strongly foliated.
83115 Basalt with hyaloclastite textures.
83116 Siltstone, minor quartz & sericite & (chlorite) veining.
83117 Epiclastic, quartz, quartz & chlorite veining.
83118 Extrusive Basalt with Siltstone
83119 Basalt, foliated, silicified, quartz veined.
83121 Conglomerate (Basalt clasts in Siltstone).
83122 Extrusive Basalt with Siltstone, pervasively fractured.
83123 Extrusive Basalt with Siltstone.
83124 " " " "
83125 Dark grey Siltstone intruded by Basalt, hyaloclastite textures.
83126 Extrusive (pillow) Basalt with interpillow Siltstone.
83127 Laminated Siltstone.
83128 ?Basalt, strongly silicified
Microgabbro 83203
" 83202
Feldspar phyric (pillow) Basalt with (interpillow) Epiclastic. 83201
Aphyric Basalt. 83200
Siltstone and fine Sandstone 83199
Epiclastic. 83198
" 83196
Microgabbro 83195
Siltstone, weakly foliated. 83194
" " " 83193
(Qg) 83192
Epiclastic. 83191
Epiclastic, chloritised & sericitised 83190
Feldspar phyric Basalt 83189
Feldspar phyric amygdaloidal Basalt 83188
Epiclastic, chlorite veining 83187
(Qg) 83186
Feldspar phyric Basalt 83185
" " " 83184
Siltstone/Shale, laminated, weakly foliated 83183
Microgabbro 83182
Siltstone/Shale, weakly foliated. 83181
Aphyric Basalt. 83179
Siltstone, weakly foliated (caution). 83178
Aphyric Basalt with Magnetite 83177
Siltstone 83176
" 83175
Aphyric Basalt (caution) 83174
" " ("). 83173
Siltstone, weakly foliated. 83172
Aphyric Basalt, foliated. 83171
Aphyric Basalt. 83170
" " 83169
Epiclastic 83168
" 83167
" 83166
Feldspar phyric Basalt, chloritisation, sericitisation, sericite veining 83165
Microgabbro chlorite & sericite & quartz alteration & veinlets. 83164
Aphyric Basalt. 83163
Feldspar phyric amygdaloidal Basalt. 83162
Aphyric Basalt. 83161
Basalt, silicified. 83159
Aphyric Basalt. 83158
Microgabbro 83157
Feldspar phyric Basalt. 83156
Feldspar phyric Basalt. 83155
Aphyric Basalt 83154
Microgabbro/dolerite 83153
(Qg). 83152
Aphyric Basalt with Siltstone & Shale. 83151
" " " " " " 83150
(Qg) 83149
Gabbro. 83148
Microgabbro, veinlets with oxides. 83147
Microgabbro. 83146
" 83145
Microgabbro, weakly foliated 83144
Microgabbro. 83143
" 83142
" 83141
" 83139
" 83138
Feldspar phyric Basalt. 83137
Aphyric Basalt 83136
(Qg). 83135
(") 83134
Epiclastic with minor veinlets with Fe., Mn. oxides 83133
Felsic Epiclastic, extensively and pervisively quartz & chlorite & (sericite) veined & brecciated. 83132
Aphyric Basalt, foliated, quartz & sericite & ?chlorite veining 83131
Epiclastic. 83130
Basalt, silicified. 83129
374 000m.E.
374 000m.E.
375 000m.E.
375 000m.E.
1400N
1600N
5 351 000m.N.
5 352 000m.N.
357303
91-3278.
N.B.- Qg = glacial float and clay, no bedrock obtained.
5cm
PASMINCO EXPLORATION
PROJECT: YOLANDE E.L. 11/85
WACKER BEDROCK SAMPLES
LITHOLOGIES and POSITIONS
LINES 1400N and 1600N
HENTY RIVER GRID
SCALE = 1:5000
COMPILED = G.W.J.
DRAWN = N.W.D.S.
DATE = 31-8-90
FIG. No.

03

357304

PASMINCO EXPLORATION

EL 11/85 YOLANDE JOINT VENTURE

ANNUAL REPORT

FOR 12 MONTHS TO

JULY 1991

volume two of two

AUTHORS: R A Poltock of Roger Poltock Geological Pty Ltd
F G FitzGerald

DATE: July 1991

REPORT No: T91-5

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Burnie
July 1991

LEGEND

QUARTERNARY

- Qa / Bed-rock — Alluvium

SILURIAN-DEVONIAN

- Df — Quartz sandstone/mudstone (Florence Sandstone).
- Sca — Quartz sandstone/mudstone (Crotty and Amber Formations)

ORDOVICIAN

- Ogl — Limestone (Gordon Limestone)
- Oop — Quartz sandstone and grit (Pioneer Beds)

CAMBRIAN

- Єsg — Volcaniclastic sandstone and conglomerate (Tyndall Group - Comstock Tuff/Lynchford Tuff/Whip Spur Agglomerate), polymict (felsic-basaltic), matrix supported, ± patchy albitization, ± magnetite grains
- Єab — Basaltic andesitic intrusives and lavas
- Єv — Felsic feldspar phyric lavas/intrusives, flow banded and columnar jointed.
- Єvx — Quartz porphyry - felsic lava or vitric crystal "tuff" angular quartz crystals <3mm in a fine grained quartz feldspar groundmass (recrystallized glass).
- Єvxl — Rhyolitic pumiceous mass debris flow/ignimbrite, quartz feldspar crystals volcanic and mudstone clasts in a fine grained glassy matrix.
- Єqfmp / Єqfp — Quartz feldspar mica porphyry, massive intrusives and possibly lavas, partly transgressive but generally stratabound.
- Єms(2) — Mudstone grey - graphitic and quartz mica wackes
- Єs — Quartz mica sandstone (Miners Ridge Sandstone), derived from pelitic metamorphics, no volcanic component, detrital tourmaline and zircon
- Єms(1) — Mudstone grey - graphitic and sandstone.
- Cba(lc) — Basaltic - andesitic lavas/breccias/intrusives (Lynch Creek Basalt), plagioclase augite phyric.
- Єb(mr) — Basalt (Miners Ridge Basalt), ophitic textured tholeiitic basalt.

Symbols

- Geological contact - interpreted
- Geological contact/unconformity obscured by Quarternary alluvium
- Unconformity - interpreted
- Contact bedrock exposure and Quarternary alluvium
- Fault
- Plunging syncline
- Plunging anticline
- Foliation
- Cleavage
- Bedding
- Overturned bedding
- Joint
- Quartz vein
- Costean
- Rock sample (31637)
- Soil Sample (30930 - 30935)
- Old Prospect
- Pasminco grid line
- Aberfoyle grid line
- Power pylon

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

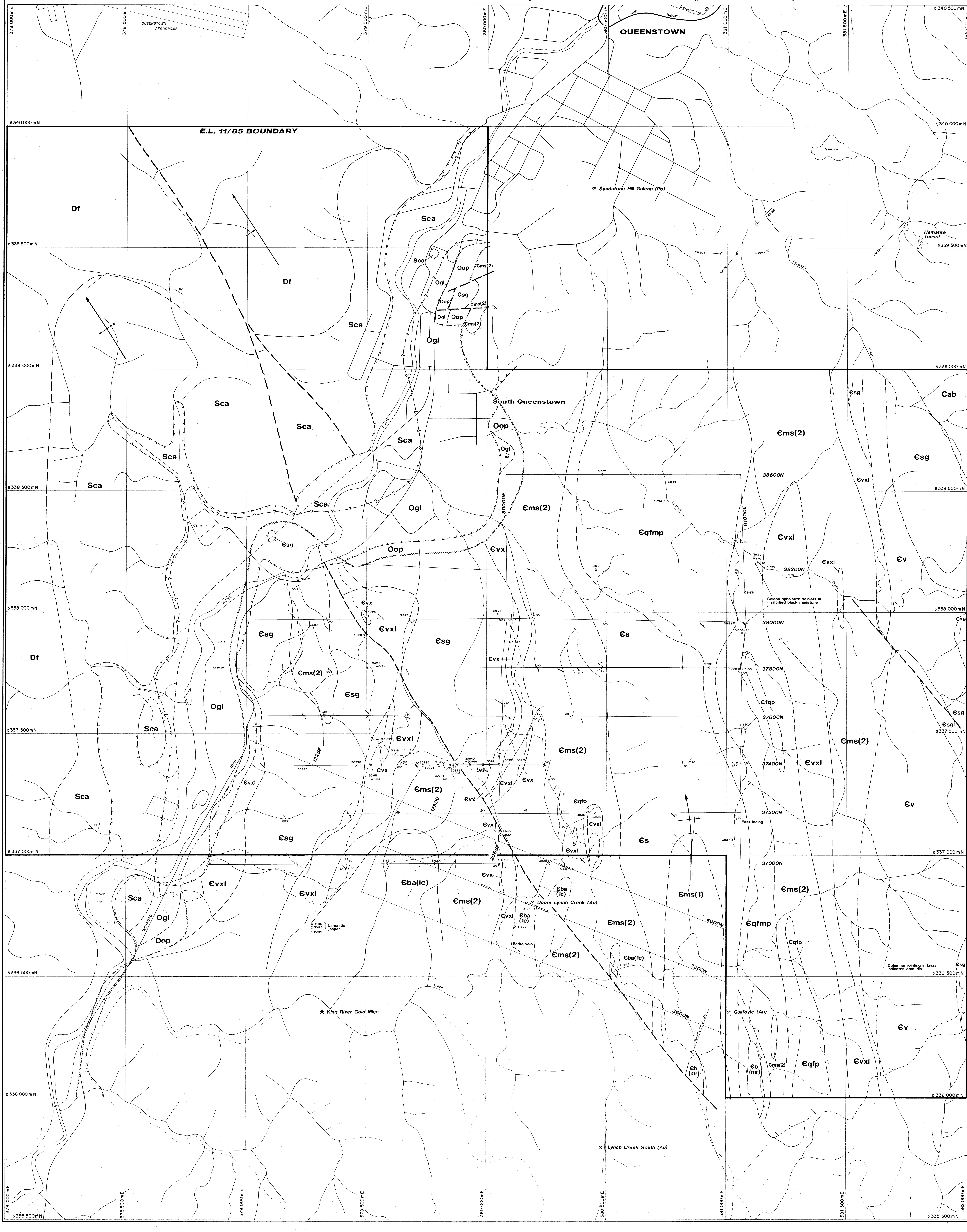
COMPILED : R.A.P.	E.L.11/85 - YOLANDE J.V.
DATE : April, 1991	LYNCHFORD AREA
DRAWN : G.M.B.	GEOLOGICAL INTERPRETATION
REF:	& SAMPLE LOCATIONS
REVISIONS :	
DRAWING No.	SCALE 1: 5000 (100 0 100 m) — FIG. No. 1

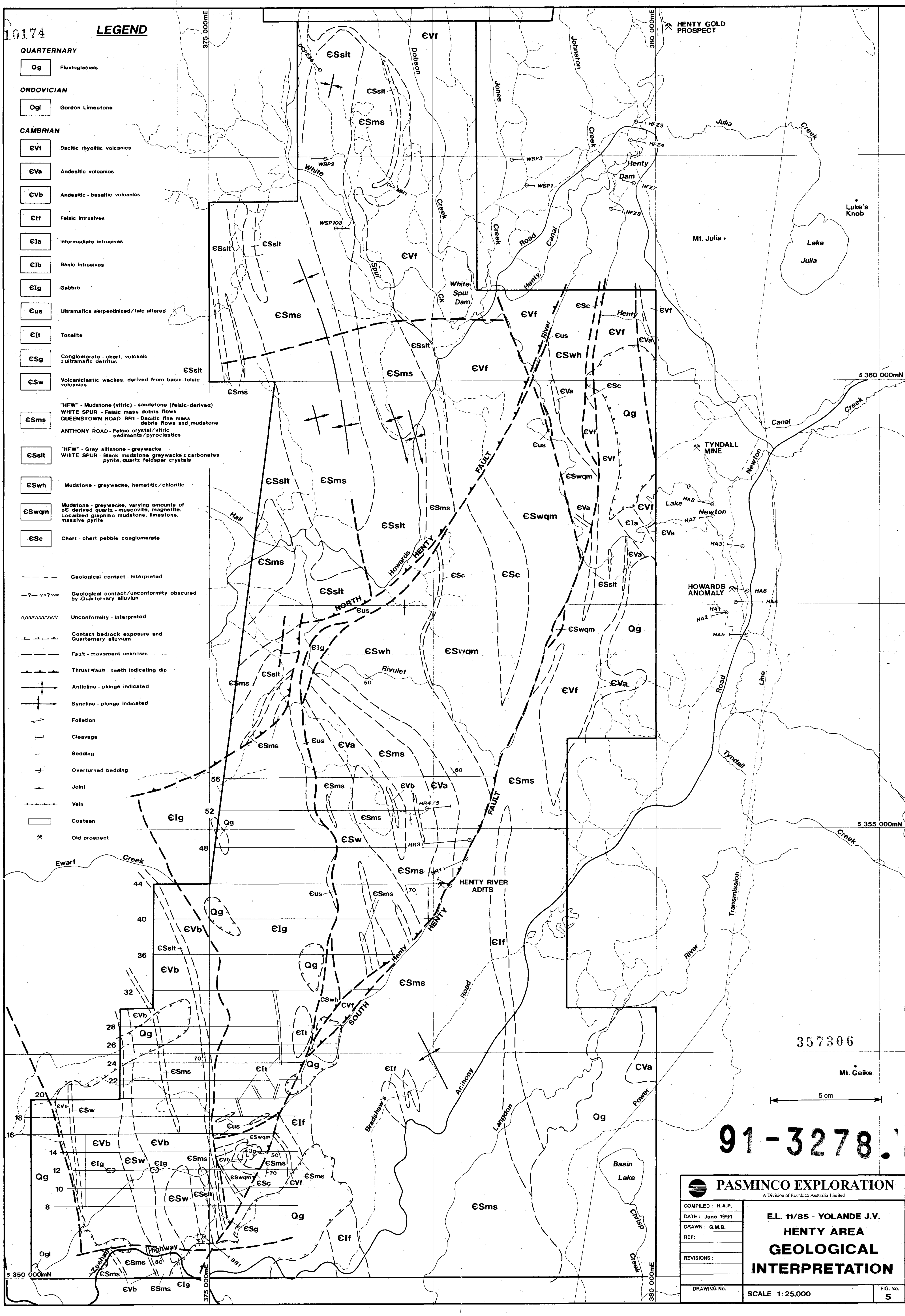
ACKNOWLEDGMENTS :-

1. Geology outside Pasminco Grid area
   Tas. Dept. Mines - Queenstown 1: 25,000
2. Prospect locations
   Tas. Dept. Mines - Metallic Mineral Deposits Queenstown 1:50,000

5 cm

91-3278.





10174
LEGEND
QUARTERNARY
Qg Fluvioglacials
ORDOVICIAN
Ogl Gordon Limestone
CAMBRIAN
ЄVf Dacitic rhyolitic volcanics
ЄVa Andesitic volcanics
ЄVb Andesitic - basaltic volcanics
ЄIf Felsic intrusives
ЄIa Intermediate intrusives
ЄIb Basic intrusives
ЄIg Gabbro
Єus Ultramafics serpentinized/talc altered
ЄIt Tonalite
ЄSg Conglomerate - chert, volcanic ± ultramafic detritus
ЄSw Volcaniclastic wackes, derived from basic-felsic volcanics
ЄSms "HFW" - Mudstone (vitric) - sandstone (felsic-derived) WHITE SPUR - Felsic mass debris flows QUEENSTOWN ROAD BR1 - Dacitic fine mass debris flows and mudstone ANTHONY ROAD - Felsic crystal/vitric sediments/pyroclastics
ЄSslt "HFW" - Grey siltstone - greywacke WHITE SPUR - Black mudstone greywacke ± carbonates pyrite, quartz feldspar crystals
ЄSwh Mudstone - greywacke, hematitic/chloritic
ЄSwqm Mudstone - greywacke, varying amounts of pЄ derived quartz + muscovite, magnetite. Localized graphitic mudstone, limestone, massive pyrite
ЄSc Chert - chert pebble conglomerate
Geological contact - interpreted
Geological contact/unconformity obscured by Quarternary alluvium
Unconformity - interpreted
Contact bedrock exposure and Quarternary alluvium
Fault - movement unknown
Thrust fault - teeth indicating dip
Anticline - plunge indicated
Syncline - plunge indicated
Foliation
Cleavage
Bedding
Overturned bedding
Joint
Vein
Costean
Old prospect
375 000mE
380 000mE
5 360 000mN
5 355 000mN
5 350 000mN
HENTY GOLD PROSPECT
TYNDALL MINE
HOWARDS ANOMALY
HENTY RIVER ADITS
HENTY NORTH FAULT
HENTY SOUTH FAULT
Mt. Julia
Lake Julia
Luke's Knob
Mt. Geike
Henty Dam
White Spur Dam
Lake Newton
Basin Lake
Julia Creek
Canal Creek
Ewart Creek
Dobson Creek
Jones Creek
Johnston Creek
White Spur Creek
Henty River
Hall Rivulet
Howards Road
Henty Road
Canal
Anthony Road
Langdon
Bradshaw's
Power
Crisp Creek
Newton
Tyndall Road
Transmission Line
Zeehan Highway
5 cm
357306
91-3278.
PASMINCO EXPLORATION
A Division of Pasminco Australia Limited
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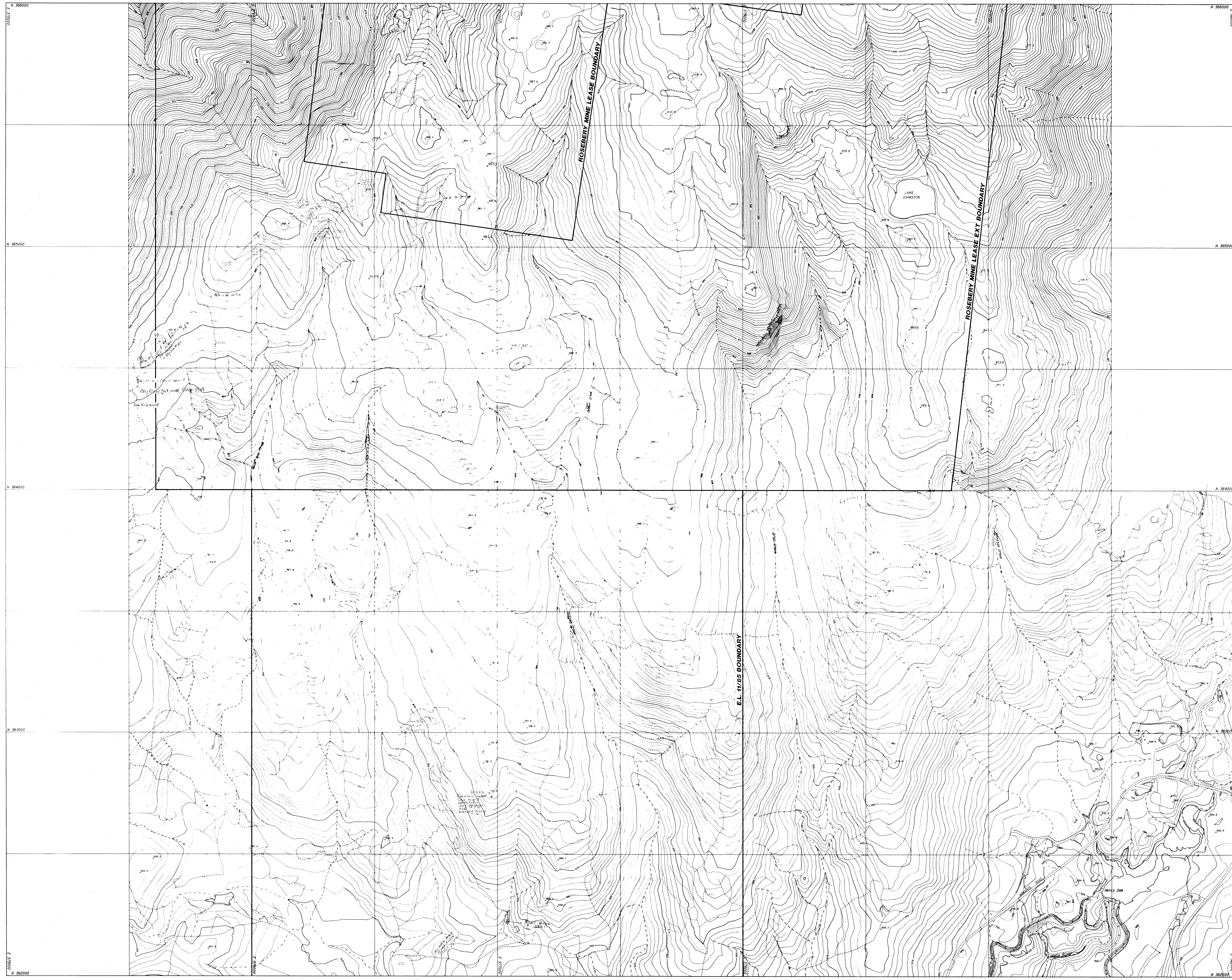
DATE: June 1991
DRAWN: G.M.B.
REF:
REVISIONS:
DRAWING No.
E.L. 11/85 - YOLANDE J.V.
HENTY AREA
GEOLOGICAL INTERPRETATION
SCALE 1:25,000
FIG. No. 5

10175



LEGEND

QUARTERNARY

Qg	Fluvioglacials

ORDOVICIAN

Ogl	Gordon Limestone

CAMBRIAN

ЄVf	Dacitic rhyolitic volcanics
ЄVa	Andesitic volcanics
ЄVb	Andesitic - basaltic volcanics
ЄIf	Felsic intrusives
ЄIa	Intermediate intrusives
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ЄSc	Chert - chert pebble conglomerate

Geological contact - interpreted

Geological contact/unconformity obscured by Quarternary alluviun

Unconformity - interpreted

Contact bedrock exposure and Quarternary alluvium

Fault - movement unknown

Thrust fault - teeth indicating dip

Anticline - plunge indicated

Syncline - plunge indicated

Foliation

Cleavage

Bedding

Overturned bedding

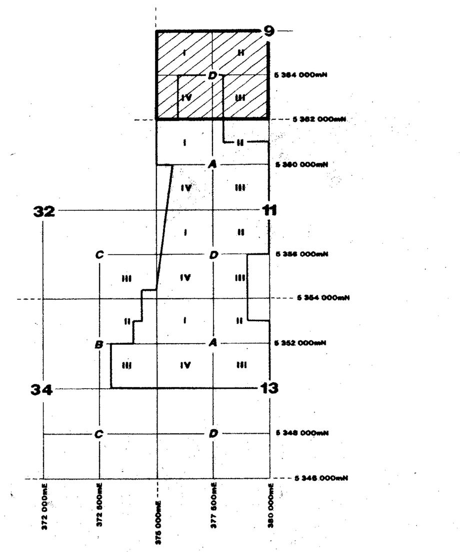
Joint

Vein

Costean

Old prospect

91-3278.



357307

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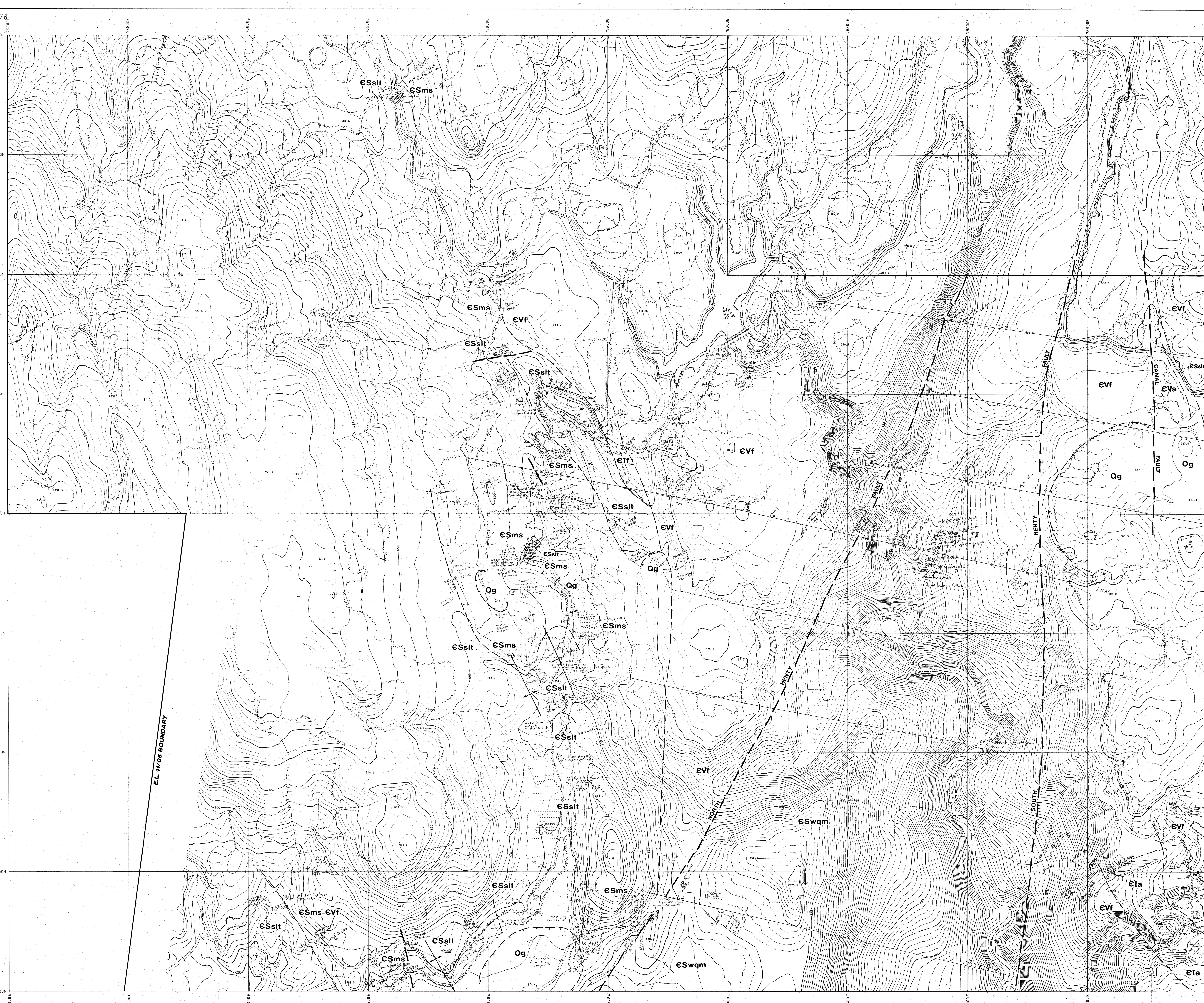
DATE:	HENTY
DRAWN:	FACTUAL GEOLOGY
REF:	AND SAMPLE
REVISIONS:	LOCATIONS

DRAWING No:	SCALE:	FIG No:
9D	1: 5000	6

5 cm

16176



LEGEND

QUARTERNARY

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Ogl	Gordon Limestone

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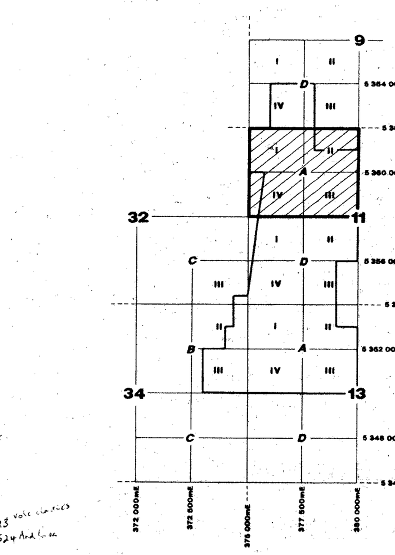
Old prospect

91-3278.



357308

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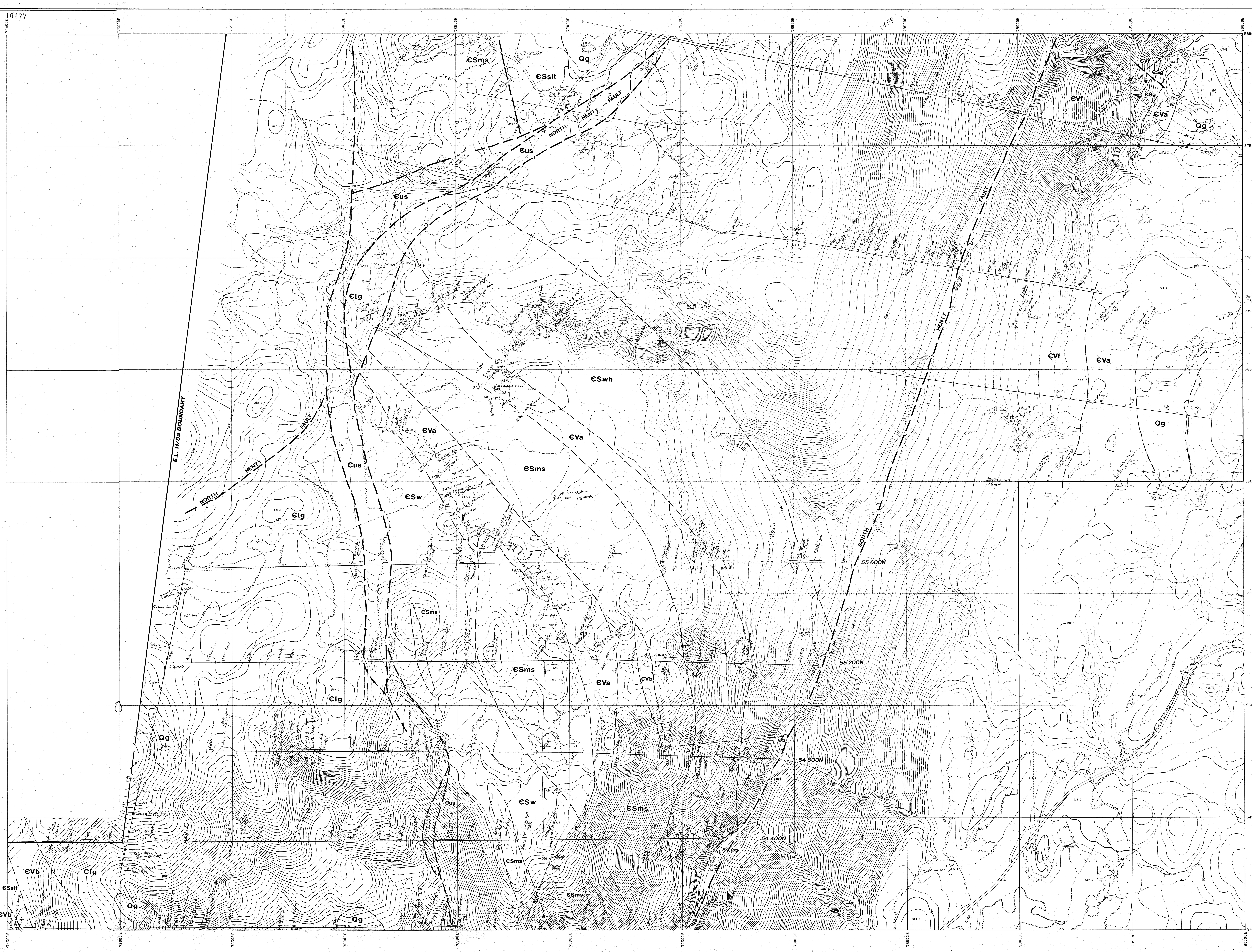
REF:	
REVISIONS:	
DRAWING No.	SCALE 1:5000 100 0 100 m — FIG. No. 7

10177



LEGEND

QUARTERNARY

Symbol	Description
Qg	Fluvioglacials

ORDOVICIAN

Symbol	Description
Ogl	Gordon Limestone

CAMBRIAN

Symbol	Description
€Vf	Dacitic rhyolitic volcanics
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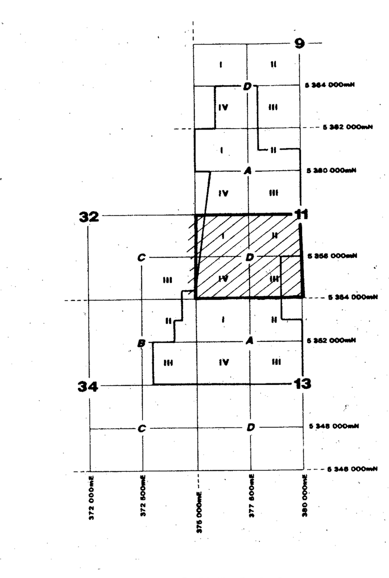
- Foliation
- Cleavage
- Bedding
- Overturned bedding
- Joint
- Vein
- Costean
- Old prospect

91-3278.



357309

5 cm

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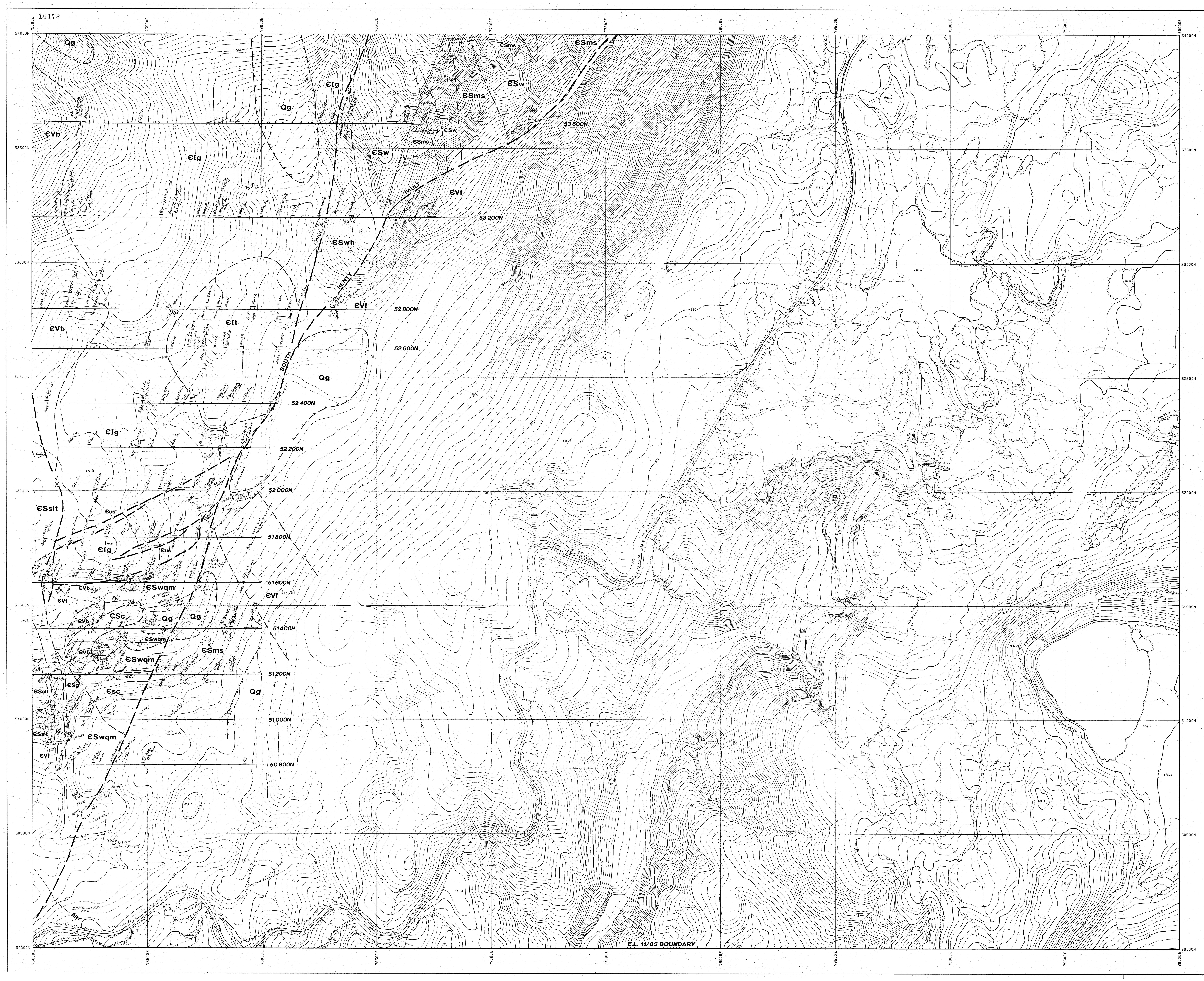
REF:	
REVISIONS :	
DRAWING No.	SCALE 1:5000 (100 0 100 m) — FIG. No. 8

10178



LEGEND

QUARTERNARY

Qg	Fluvioglacials

ORDOVICIAN

Ogl	Gordon Limestone

CAMBRIAN

ЄVf	Dacitic rhyolitic volcanics
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— — — — Geological contact - interpreted

—?— ~~?~~ Geological contact/unconformity obscured by Quarternary alluviun

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Foliation

Cleavage

Bedding

Overturned bedding

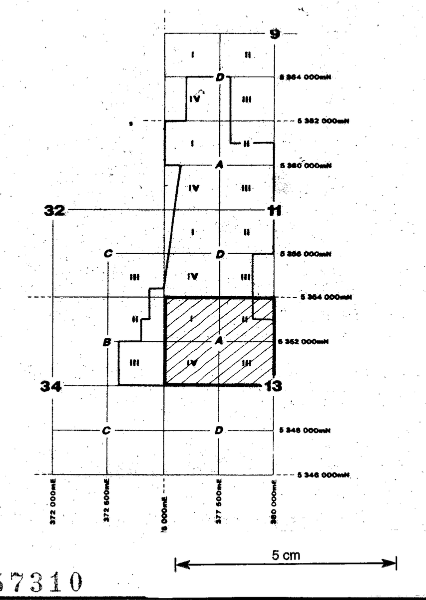
Joint

Vein

Costean

Old prospect

91-3278.



357310

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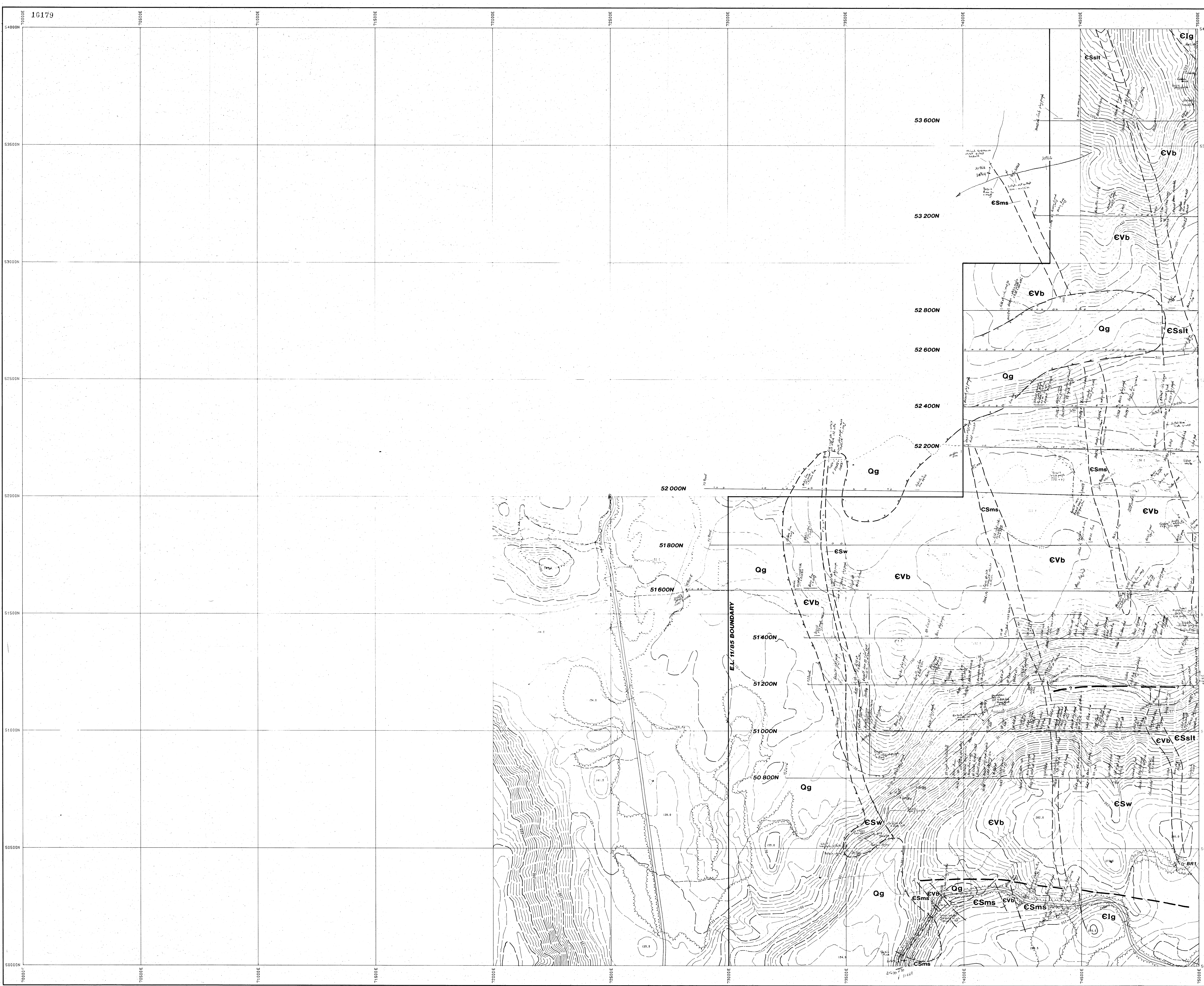
REF:	INTERPRETIVE GEOLOGY
REVISIONS:	AND SAMPLE LOCATIONS
DRAWING No.	SCALE 1:5000 (100 0 100 m) — FIG. No. 9

16179



LEGEND

QUARTERNARY

Qg	Fluvioglacials

ORDOVICIAN

Ogl	Gordon Limestone

CAMBRIAN

€Vf	Dacitic rhyolitic volcanics
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Syncline - plunge indicated

Foliation

Cleavage

Bedding

Overturned bedding

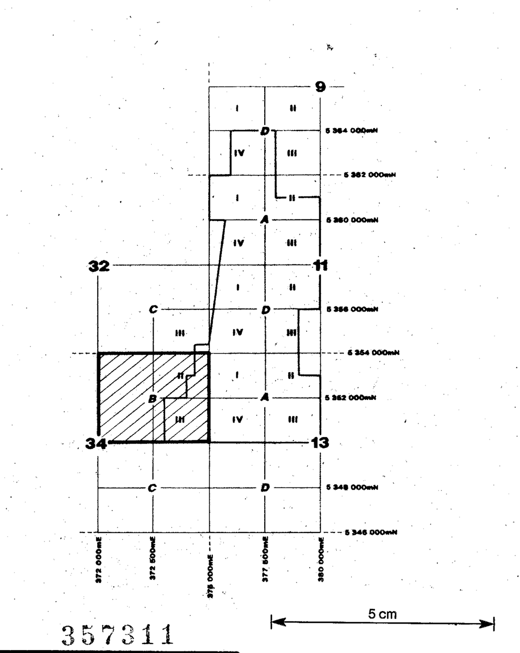
Joint

Vein

Costean

Old prospect

91-3278.



357311

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REVISIONS :
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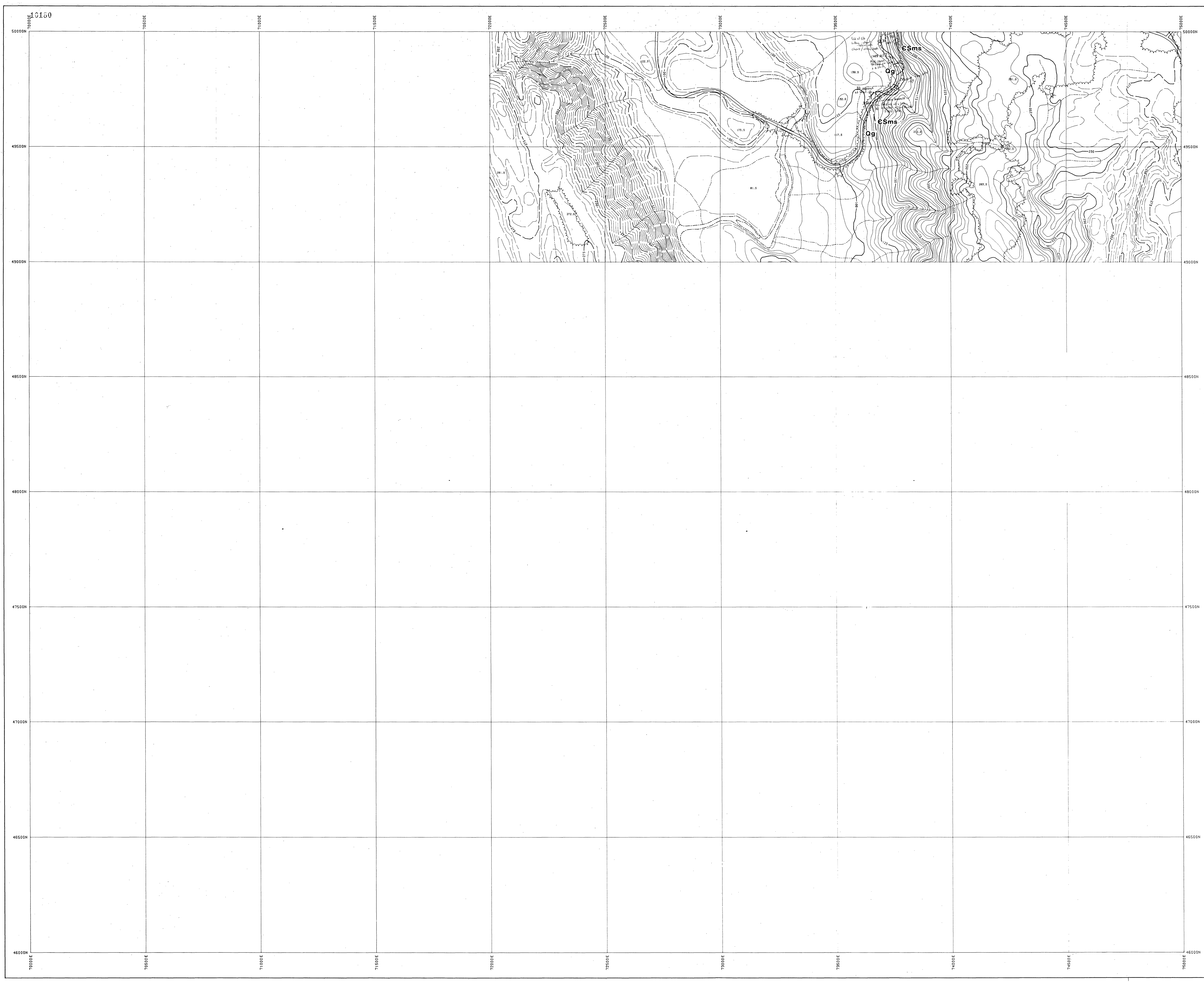
HENTY
FACTUAL AND INTERPRETIVE GEOLOGY AND SAMPLE LOCATIONS

SCALE 1:5000 100 0 100 m

FIG. No. 10

10150



LEGEND

QUARTERNARY

Qg	Fluvioglacials

ORDOVICIAN

Ogl	Gordon Limestone

CAMBRIAN

€Vf	Dacitic rhyolitic volcanics
€Va	Andesitic volcanics
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Syncline - plunge indicated

Foliation

Cleavage

Bedding

Overturned bedding

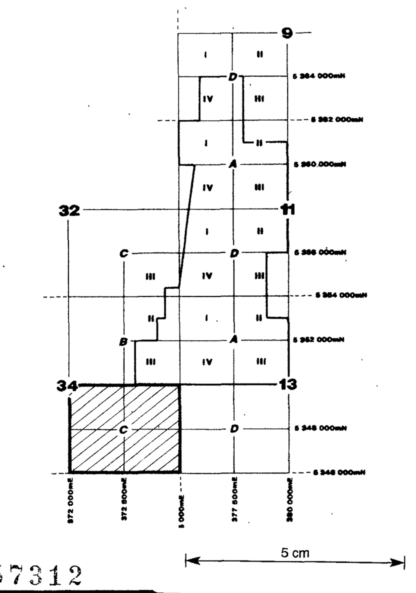
Joint

Vein

Costean

Old prospect

91-3278.



357312

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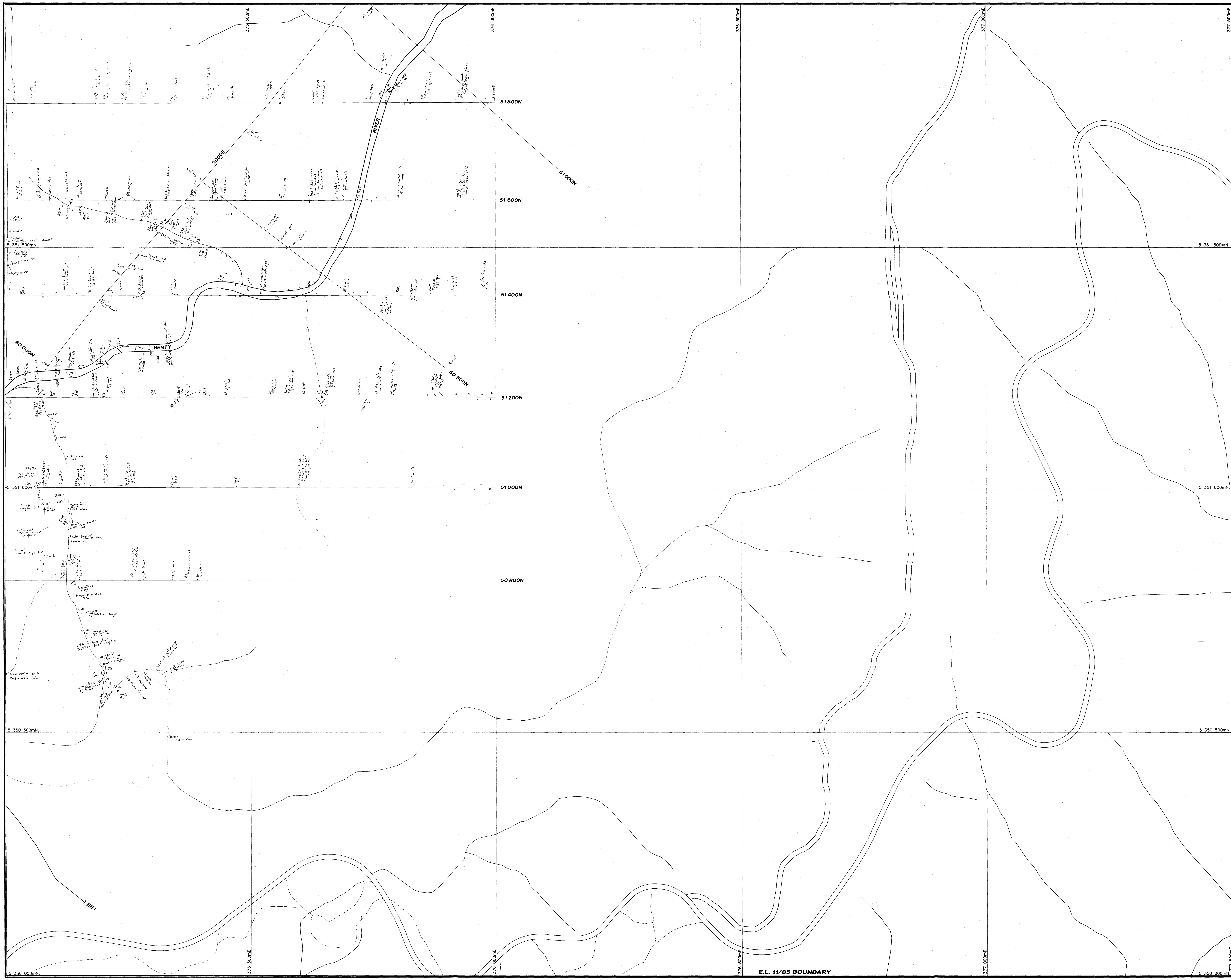
REF:	INTERPRETIVE GEOLOGY
REVISIONS :	AND SAMPLE LOCATIONS
DRAWING No.	SCALE 1:5000 — FIG. No. 11

10181



LEGEND

- Geological contact - interpreted
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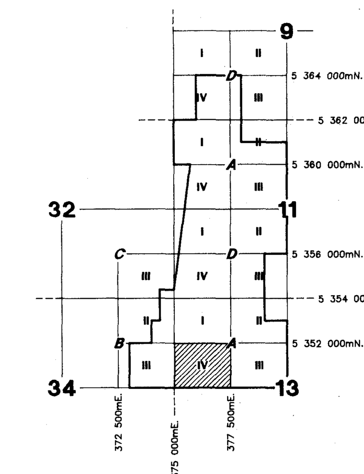

GRID CONVERGENCE 1.0°
GRID/MAGNETIC 12.0°

91-3278

5 cm

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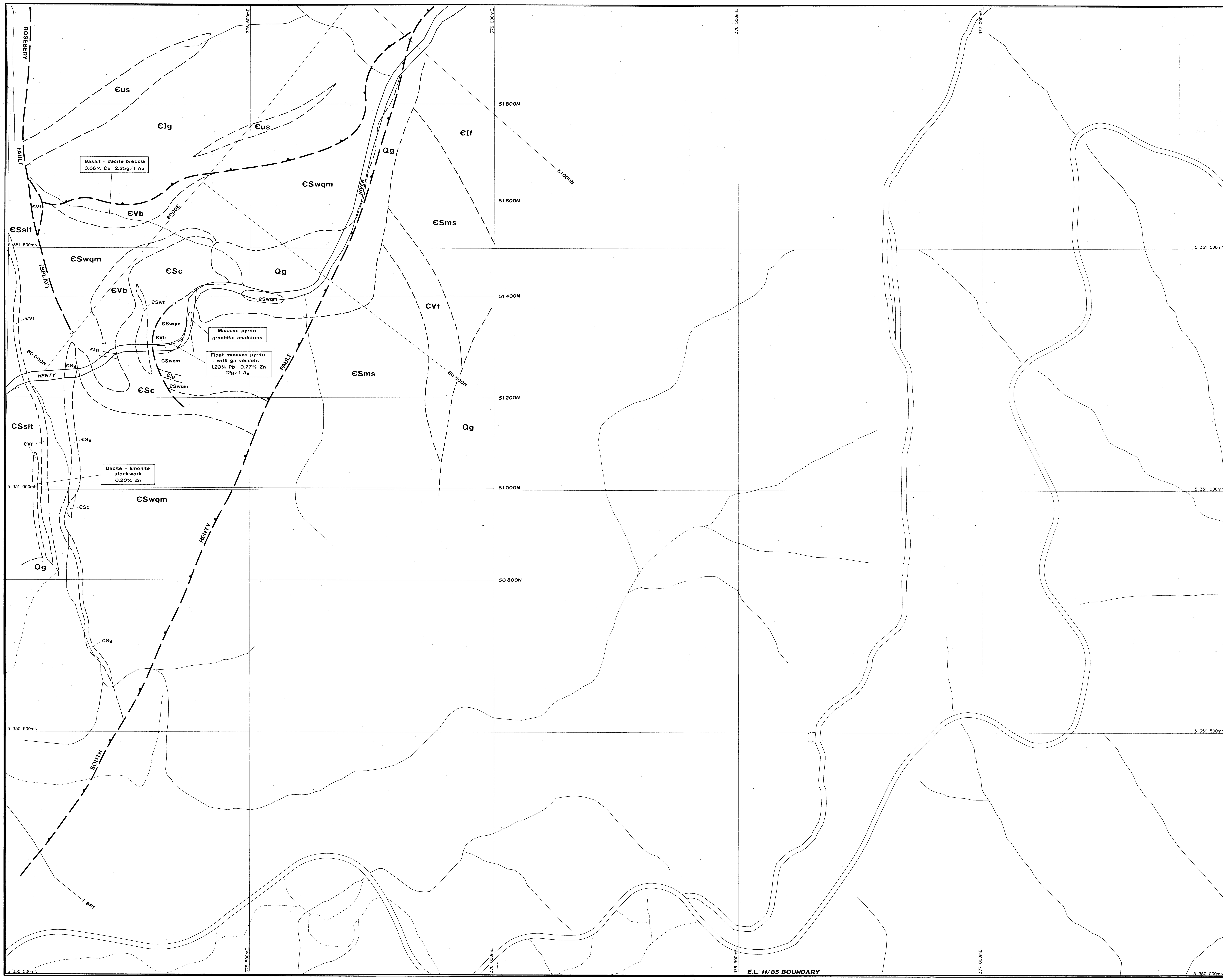
REFERENCE :	357313
REVISIONS :	
DRAWING No.	SCALE 1:2500 (0 50 100 METRES) — FIG. No. 12

10182



LEGEND

QUARTERNARY

Qg	Fluvioglacials

ORDOVICIAN

Ogl	Gordon Limestone

CAMBRIAN

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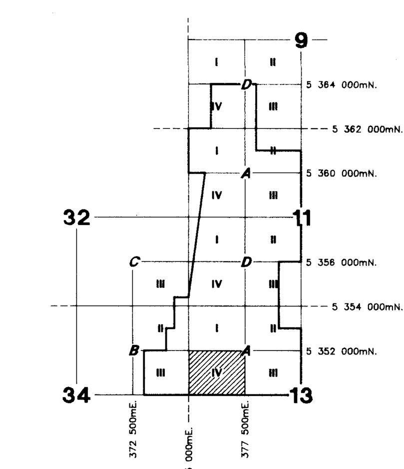
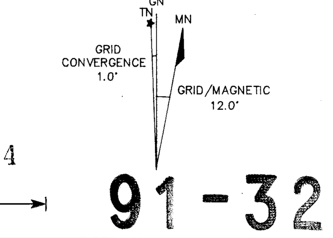
- Cleavage
- Bedding
- Overturned bedding
- Joint
- Vein
- Costean
- Old prospect





357314

5 cm

91-3278.

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DATE : July, 1991	HENTY VALLEY
DRAWN : G.M.B.	GEOLOGICAL
REFERENCE :	INTERPRETATION
REVISIONS :	
DRAWING No.	SCALE 1:2500 (0 50 100 METRES) — FIG. No. 13

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10183

357315 91-3278.

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DATE : July, 1991	HENTY VALLEY
DRAWN : G.M.B.	**SAMPLE**
REFERENCE :	**LOCATIONS**
REVISIONS :	
DRAWING No.	SCALE 1:2500 — 0 50 100 METRES — FIG. No. 14

5 cm

10184

LEGEND

QUARTERNARY

Symbol	Description
Qa / Bed-rock	Alluvium

SILURIAN-DEVONIAN

Symbol	Description
Df	Quartz sandstone/mudstone (Florence Sandstone).
Sca	Quartz sandstone/mudstone (Crotty and Amber Formations)

ORDOVICIAN

Symbol	Description
Ogl	Limestone (Gordon Limestone)
Oop	Quartz sandstone and grit (Pioneer Beds)

CAMBRIAN

Symbol	Description
Єsg	Volcaniclastic sandstone and conglomerate (Tyndall Group - Comstock Tuff/Lynchford Tuff/Whip Spur Agglomerate), polymict (felsic-basaltic), matrix supported, ± patchy albitization, ± magnetite grains
Єab	Basaltic andesitic intrusives and lavas
Єv	Felsic feldspar phyric lavas/intrusives, flow banded and columnar jointed.
Єvx	Quartz porphyry - felsic lava or vitric crystal "tuff" angular quartz crystals <3mm in a fine grained quartz feldspar groundmass (recrystallized glass).
Єvxl	Rhyolitic pumiceous mass debris flow/ignimbrite, quartz feldspar crystals volcanic and mudstone clasts in a fine grained glassy matrix.
Єqfmp / Єqfp	Quartz feldspar mica porphyry, massive intrusives and possibly lavas, partly transgressive but generally stratabound.
Єms(2)	Mudstone grey - graphitic and quartz mica wackes
Єs	Quartz mica sandstone (Miners Ridge Sandstone), derived from pelitic metamorphics, no volcanic component, detrital tourmaline and zircon
Єms(1)	Mudstone grey - graphitic and sandstone.
Cba(lc)	Basaltic - andesitic lavas/breccias/intrusives (Lynch Creek Basalt), plagioclase augite phyric.
Єb(mr)	Basalt (Miners Ridge Basalt), ophitic textured tholeiitic basalt.

- Geological contact - interpreted
- Geological contact/unconformity obscured by Quarternary alluvium
- Unconformity - interpreted
- Contact bedrock exposure and Quarternary alluvium
- Fault
- Plunging syncline
- Plunging anticline
- Foliation
- Cleavage
- Bedding
- Overturned bedding
- Joint
- Quartz vein
- Costean
- 31637 X Rock sample
- 30930 - 30935 Soil Sample
- Old Prospect
- Pasminco grid line
- Aberfoyle grid line
- Power pylon

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED : R.A.P.	E.L.11/85 - YOLANDE J.V.
DATE : April, 1991	LYNCHFORD AREA
DRAWN : G.M.B.	GEOLOGICAL INTERPRETATION & SAMPLE LOCATIONS
REF:	
REVISIONS :	
DRAWING No.	SCALE 1:5000 — FIG. No. 15

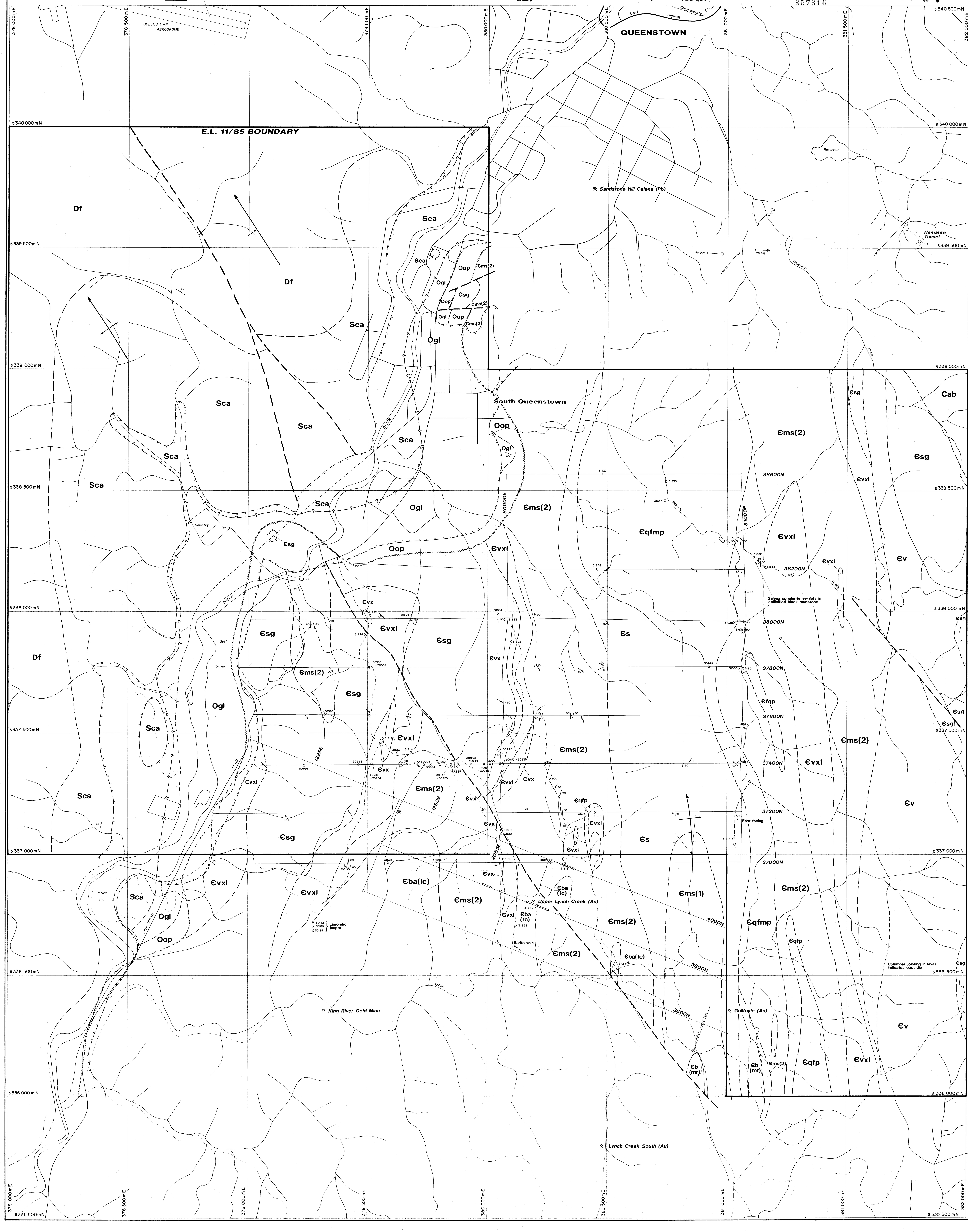
ACKNOWLEDGMENTS :-

1. Geology outside Pasminco Grid area
Tas. Dept. Mines - Queenstown 1:25,000
2. Prospect locations
Tas. Dept. Mines - Metallic Mineral Deposits Queenstown 1:50,000

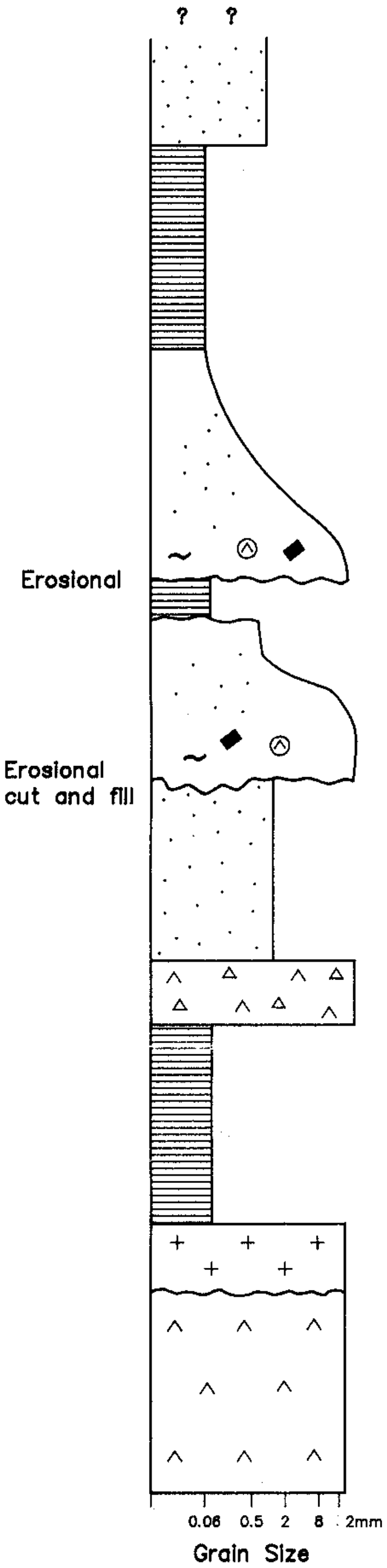
5 cm

91-3278.

357316



10185



LITHOLOGY	CORRELATION	ALTERATION / MINERALIZATION
Lithic sandstone and mudstone, clasts predominantly fine mudstone		
Black mudstone, laminated frequently with pyritic and dolomitic bands. Append. E1/31591		
Mass debris flow associated with felsic volcanism (see below), top vitric mudstone		Sericite, localized silica pyrite dissem. veinlet Gn, Sp.
Black mudstone, feldspar crystal bands		
Mass debris flow conglomerate clasts – felsic volcanics – pumice – qtz feldspar porph. – mudstone – massive pyrite – Galena, Sphalerite Append. E1/31520	Sequence intersected in DDH1 Mount Read * onlap with CVc	
Mass debris flow sandstone felsic volcanic derived, qtz feldspar crystal, thick bedded		Sericite
Black mudstone and felsic lava breccias		
	Rosebery / Hercules horizon?	
Black mudstone – feldspathic wacke, mudstone frequently with feldspar crystal bands		Sericite +– pyrite
Porphyry, quartz feldspar phyric lava/intrusive		
Felsic volcanics, feldspar phyric, fine glassy groundmass, coherent and brecciated lavas Append. 31513	Central Mount Reads Volcanics	Albite chlorite banded

KEY

Volcanics
- ^ Felsic
- >v Intermediate
- v Basic
- △ Breccia

Clast types
- ~ Pumice/glass
- Felsic volcanic
- Intermediate
- Basic
- ■ Mudstone

Intrusives
- + + Felsic porphyry
- // Gabbro

5 cm

357317

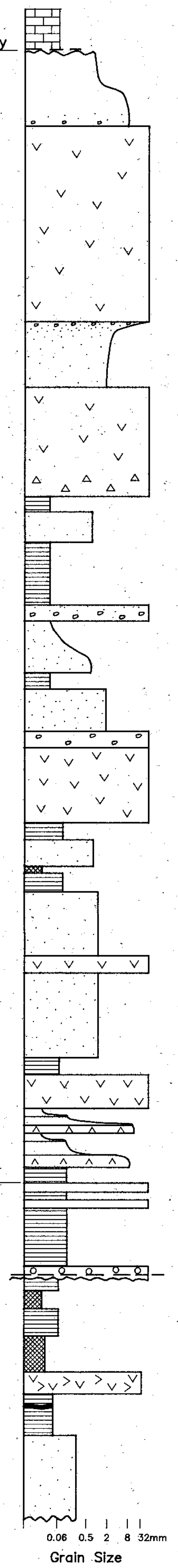
91-3278.

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED : R.Poltock	E.L. 11/85 – YOLANDE J.V.
DATE : July 1991	WHITE SPUR
DRAWN : T.G.D.S.	STRATIGRAPHIC COLUMN
REFERENCE :	
REVISIONS :	
DRAWING No.	SCALE: 1:5000 0 100 METRES — FIG. No. 16

N.W. Coast Computer Aided Drafting Centre. Phone (004 354315)
Fax. (004 354495)

10186



LITHOLOGY	CORRELATION	ALTERATION / MINERALIZATION
	Gordon Limestone	
Volcaniclastic sandstone – conglomerate + – magnetite Append E2/30169	Tyndall Group Comstock Tuff	
Basalt lava, Plagioclase phyric, tholeiitic, +– magnetite TS 30055		Albite/chlorite/epidote +– magnetite, minor pyrite, albitization > intensity in vicinity of Cambro/Ord. contact
Volcaniclastic sandstone – conglomerate Plate 30169		
Basalt lava – flow/quench brecciated base		
Siltstone – mudstone (vitric) TS 30057		
Volcaniclastic sandstone, felsic derived TS 30061		
Mudstone (vitric) siltstone		
Volcaniclastic conglomerate felsic – andesitic derived + – magnetite		
Volcaniclastic sandstone		
Mudstone – siltstone		
Volcaniclastic sandstone		
Volcaniclastic conglomerate, chloritized pumice, + – magnetite		
Basalt lava		
Mudstone		
Chert		
Mudstone		
Volcaniclastic sandstone		
Basalt lava		
Volcaniclastic sandstone		
Mudstone (vitric) (cf TS 30057)	Sequence intersected in DDH BR1?	
Basalt, plagioclase +– augite phyric, vesicular +– calcite hematite amigdales		
Dacite lava – pumiceous mass debris flows, graded units 10–50m thick, fine cherty tops TS 31653		
Mudstone		
Dacite lava / mudstone pepperites TS 30173 Append. E2/30173		Calcite–sericite +– pyrite traces of Gn Sp. TS 31688
Mudstone – middle cambrian fossils		
Conglomerate– sandstone, polymict, derived from felsic volcanics–chert–ultramafics TS 30989 Append. E2/30989	NE section of "HFW" stratigraphically below Henty Adit Andesite	
Chert		
Mudstone		
Chert, massive–banded, white–grey green – hematitic. Append E2/30175		
Basaltic andesitic lava, strongly vesiculated/scoriacious. TS 31666	Lynch Creek Basalts Hellyer Andesite	Calcite, sericite, hematite/pyrite
Graphitic mudstone, limestone, sandstone, massive pyrite. TS 31648 Append. E2/31667	Miners Ridge Sandstone?	Pyritic mudstone–sandstone – massive pyrite
Greywacke – mudstone, volcanic/pre-cambrian metamorphics derived, +– detrital magnetite. Append. E2/30179	NE section of "HFW"	

KEY

Volcanics
- ^ Felsic
- >v Intermediate
- v Basic
- △ Breccia

Clast types
- ~ Pumice/glass
- Felsic volcanic
- Intermediate
- Basic
- ■ Mudstone

Intrusives
- + + Felsic porphyry
- Gabbro

91-3278.

5 cm

357318

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED : R. Poltock	E.L. 11/85 – YOLANDE J.V.
DATE : July 1991	HENTY FAULT WEDGE
DRAWN : T.G.D.S.	51000 N.
REFERENCE :	
REVISIONS :	STRATIGRAPHIC COLUMN
DRAWING No.	SCALE: 1:5000 (0 100 200 METRES) — FIG. No. 17

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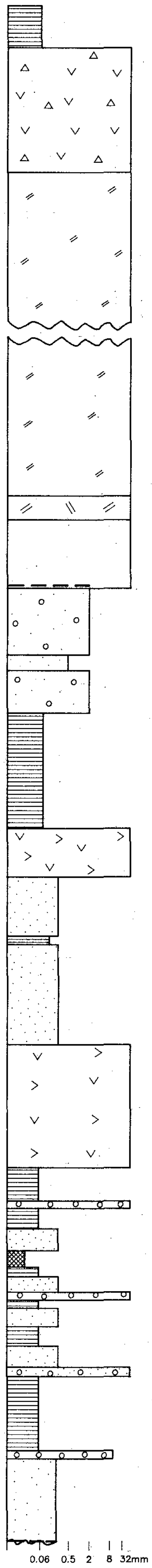

LITHOLOGY	CORRELATION	ALTERATION / MINERALIZATION
Mudstone	Mudstone middle cambrian fossils as on 51000N section, approx. 75000E.	
Basalt – andesite lavas, flow breccias, vesicular. TS 30102		Localized hematite albite
Gabbro fine to medium grained doleritic, abundant basic dykes + 1000m thick		
Gabbro coarse grained		
Ultramafic, serpentinized and locally talc altered. TS 30091		
Volcaniclastic wacke – conglomerate, derived from mafic–felsic volcanics +– detrital magnetite. TS 30002	Tyndall Group Comstock Tuff	Minor chlorite epidote
Mudstone (vitric) – sandstone (+– feldspar quartz crystals)		
Andesite lava, plagioclase – augite phyric, minor flow breccias Append. E2/30024B	CVc andesites Tullah Que River	
Mudstone (vitric) – sandstone (+– feldspar quartz crystals), massive, minor grey mudstone. Alternative interp. felsic volcanic? Append. E2/30982	Some similarities to White Spur and Yolande River Sequence	Chlorite, Epidote, Calcite
Andesite lava – flow breccias – pillow lavas, mudstone interbeds. Append. E2/30980	Cyprus Grid lines 24 and 28N	Sericite/chlorite, calcite Gn, Sp stringer mineralization at Henty Adits
Mixed sequence of mudstone greywacke, limestone, chert and conglomerate. Append. E2/30136 Slightly chloritic – hematitic Conglomerate with clasts of – mudstone – chert – basic/ intermediate volcanics	Similar to" HFW" 75400E,51300N	
Greywacke – mudstone, volcanic / precambrian metamorphics derived, +– detrital magnetite		

91-3278.

357319

5 cm

KEY

Volcanics
- ^ Felsic
- >v Intermediate
- v Basic
- Δ Breccia

Clast types
- Pumice/glass
- Felsic volcanic
- Intermediate
- Basic
- Mudstone

Intrusives
- + + Felsic porphyry
- ⫽ ⫽ Gabbro

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED : R. Poltock	E.L. 11/85 – YOLANDE J.V.
DATE : July 1991	HENTY FAULT WEDGE
DRAWN : T.G.D.S.	55000 N.
REFERENCE :	STRATIGRAPHIC COLUMN
REVISIONS :	
DRAWING No.	SCALE: 1:5000 (0 100 200 METRES) — FIG. No. 18

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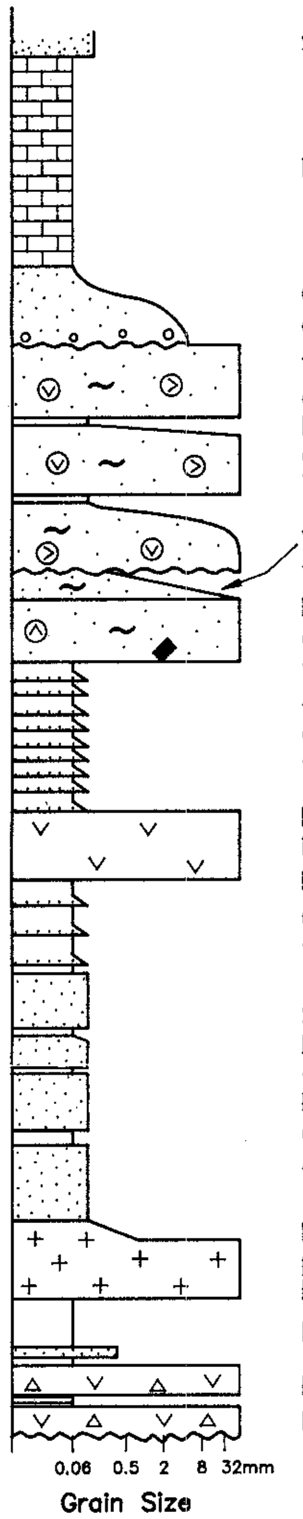
10188



	LITHOLOGY	CORRELATION	ALTERATION / MINERALIZATION
	Sandstone – mudstone	Crotty Quartzite	
	Limestone – mudstone	Gordon Limestone	
ORDOVICIAN	Quartz grit–pebble conglomerate, derital chromite	Pioneer Beds	
Unconformity CAMBRIAN	Volcanoclastic sandstone – conglomerate with mudstone horizons, basaltic– rhyolitic derived +–ditrital magnetite. TS 31624, Append. E4/31624	Tyndall Group Comstock Tuff	Chlorite, calcite, albite, epidote
Erosional Contact	Vitric crystal tuff, quartz feldspar phyric. TS 31622		
Lynch Creek Basalt 'intrusive' contacts with units as indicated	Felsic mass debris flow–ignimbrite, qtz feldspar crystal, clasts pumice/ felsic volcanics/ mudstone. TS 31614 Append.E4/31612, E4/30995	Rosebery/Hercules hangingwall sequence (McPhie)	
	Greywacke – mudstone, micaceous feldspathic graded units 50–100mm	Que River Shale (McPhie)	
	Basaltic – andesitic lava/breccia/ intrusive, plagioclase augite phyric. TS 31620 Append. E4/31620	Lynch Creek Basalt, Hellyer Andesite, Basaltic andesite in "HFW" 75400E, 51300N.	
	Greywacke – mudstone micaceous feldspathic, graded units 50–100mm		Silicified mudstone, veinlets of Gn, Sp, Py and calcite
	Sandstone plus mudstone horizons, quartz muscovite +– tourmaline and zircon. Precambrian metamorphics derived. TS 31617 Append. E4/31617	Miners Ridge Sandstone, 'HFW' mudstone/quartz sandstone 75400E,51300N.	
	Porphyry quartz feldspar mica, partly intrusive within Miners Ridge sandstones. Append. E/31634		Sericite +– pyrite
	Mudstone – quartz sandstone		
	Basalt lava – flow breccia, plus chloritic mudstone	Sequence intersected in MR1, Miners Ridge Basalt	Chlorite, calcite, epidote, hematite

KEY

Volcanics

- ^ Felsic
- >v Intermediate
- v Basic
- △ Breccia

Clast types

- ~ Pumice/glass
- ⊗ Felsic volcanic
- ⊗ Intermediate
- ⊗ Basic
- ■ Mudstone

Intrusives

- + + Felsic porphyry
- ⫽ Gabbro

357320

91-3278.

5 cm

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED : R.Pollock	E.L. 11/85 – YOLANDE J.V.
DATE : July 1991	LYNCHFORD AREA
DRAWN : T.G.D.S.	STRATIGRAPHIC COLUMN
REFERENCE :	
REVISIONS :	
DRAWING No.	SCALE: 1:5000 (0 – 100 METRES) FIG. No. 19

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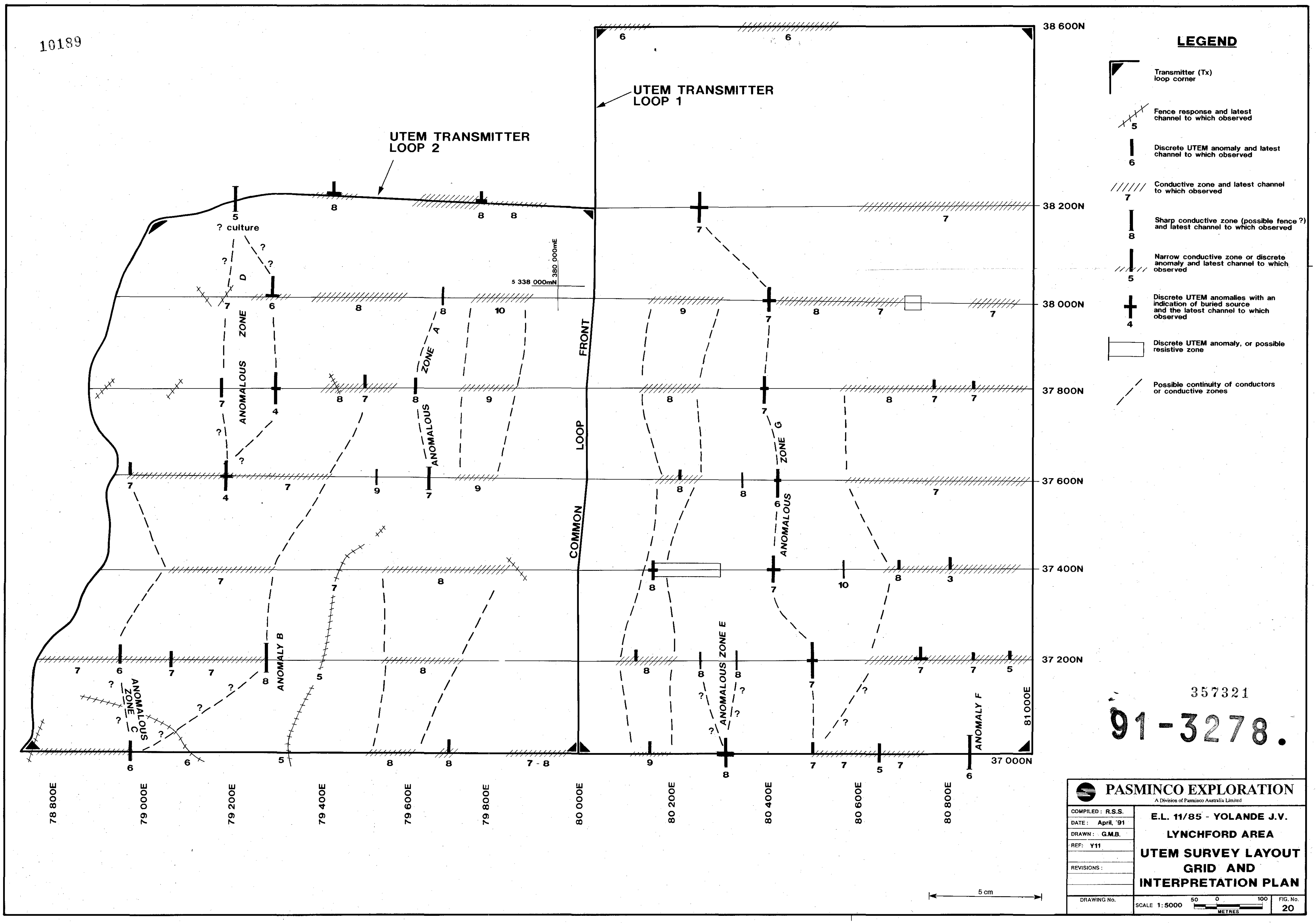
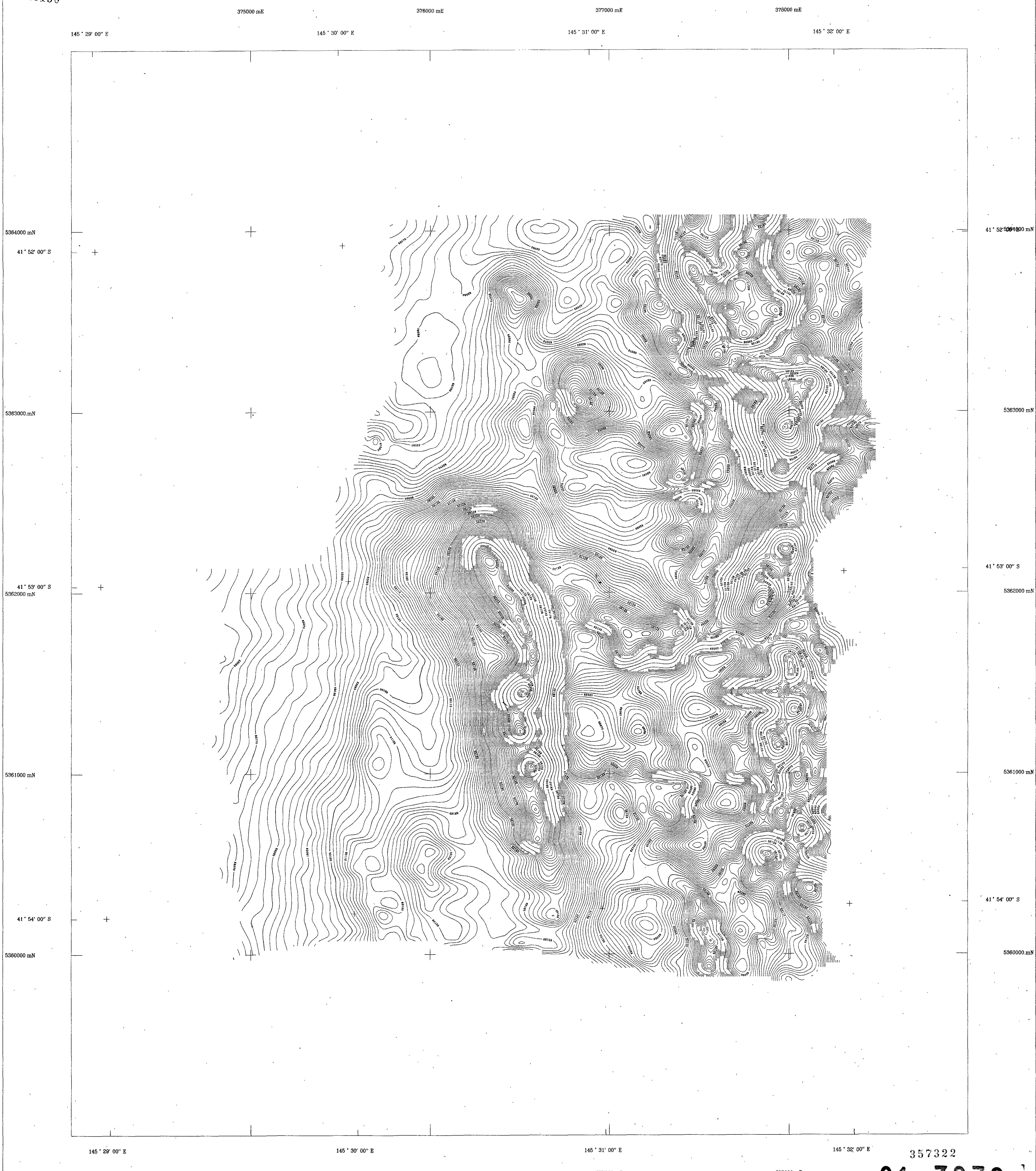
Fax. (004 354495)


10189
LEGEND
Transmitter (Tx) loop corner
Fence response and latest channel to which observed
Discrete UTEM anomaly and latest channel to which observed
Conductive zone and latest channel to which observed
Sharp conductive zone (possible fence ?) and latest channel to which observed
Narrow conductive zone or discrete anomaly and latest channel to which observed
Discrete UTEM anomalies with an indication of buried source and the latest channel to which observed
Discrete UTEM anomaly, or possible resistive zone
Possible continuity of conductors or conductive zones
UTEM TRANSMITTER LOOP 1
UTEM TRANSMITTER LOOP 2
COMMON LOOP FRONT
? culture
ANOMALOUS ZONE D
ANOMALOUS ZONE A
ANOMALOUS ZONE G
ANOMALOUS ZONE E
ANOMALOUS ZONE C
ANOMALY B
ANOMALY F
5 338 000mN
380 000mE
38 600N
38 200N
38 000N
37 800N
37 600N
37 400N
37 200N
37 000N
78 800E
79 000E
79 200E
79 400E
79 600E
79 800E
80 000E
80 200E
80 400E
80 600E
80 800E
81 000E
5 cm
357321
91-3278.
PASMINCO EXPLORATION
A Division of Pasminco Australia Limited
COMPILED: R.S.S.
DATE: April, '91
DRAWN: G.M.B.
REF: Y11
REVISIONS:
DRAWING No.
E.L. 11/85 - YOLANDE J.V.
LYNCHFORD AREA
UTEM SURVEY LAYOUT GRID AND INTERPRETATION PLAN
SCALE 1: 5000
50 0 100
METRES
FIG. No. 20

10190



357322

91-3278.

SCALE 1:10,000

250 0 250 500 750 1000

Metres

AUSTRALIAN MAP GRID ZONE 55

AIRBORNE SURVEY EQUIPMENT

Aircraft	Aerospatiale Ecureuil "Squirrel" VH-HRR
Magnetometer	Geometrics G833 Helium Vapour
Magnetometer Resolution	0.01 nT
Magnetometer Sample Interval	0.2 seconds (approx 7 metres)
Data Acquisition	GeoInstruments Model 2000
Data Recording	1.2Mb floppy disk
Spectrometer	Geometrics GR800
Crystal Size	16.4 Litres in downward array
Spectrometer Sample Interval	1 0 Seconds (approx 35 metres)
Flight Path Record	VHS Colour Video System
Flight Path Recovery	Visually onto aerial photographs

AIRBORNE SURVEY SPECIFICATIONS

Flight Line Direction	090 – 270.00 degrees
Flight Line Separation	100 metres
Tie Line Direction	0 – 180 degrees
Tie Line Separation	2000 metres
Terrain Clearance	80 metres (MTC)

Flown by GEOINSTRUMENTS PTY. LTD.

GeoInstruments job number	9101
Survey flown	February 1991
Processed by	Kevron Geophysics

RESIDUAL MAGNETIC CONTOURS

Diurnal variations removed
IGRF(1985) updated to 1991.3 removed
Average survey base station value and a constant of 62000 nT added to datum

Grid mesh 25 x 25 metres

Contour Interval 2, 10, 50, 250 nT

N

AMG North

PASMINCO EXPLORATION

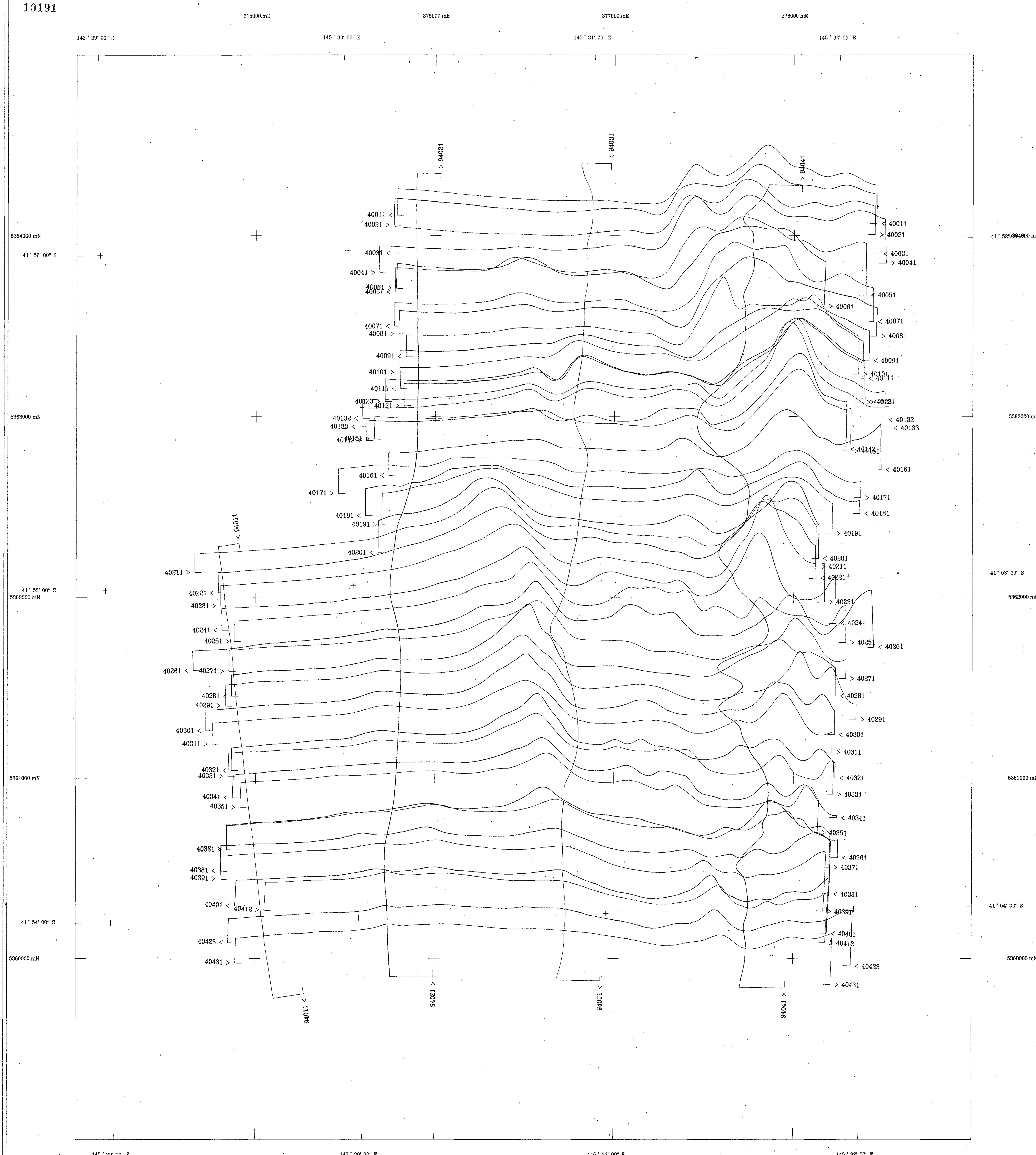
A Division of Pasminco Australia Limited

EL11/85 – Yolande
White Spur Area
Magnetic Intensity Contours

DATE : May 1991	REPORT :
DRAWN : Kevron Geophysics	PLAN NO. 1
SCALE 1: 10000	**Figure 21**

5 cm

10191



357323

91-3278.

SCALE 1:10,000

250 0 250 500 750 1000

Metres

AUSTRALIAN MAP GRID ZONE 55

AIRBORNE SURVEY EQUIPMENT

Aircraft	Aerospatiale Ecureuil "Squirrel" VH-HRR
Magnetometer	Geometrics G833 Helium Vapour
Magnetometer Resolution	0 01 nT
Magnetometer Sample Interval	0.2 seconds (approx 7 metres)
Data Acquisition	GeoInstruments Model 2000
Data Recording	1 2Mb floppy disk
Spectrometer	Geometrics GR800
Crystal Size	16.4 Litres in downward array
Spectrometer Sample Interval	1.0 Seconds (approx 35 metres)
Flight Path Record	VHS Colour Video System
Flight Path Recovery	Visually onto aerial photographs

AIRBORNE SURVEY SPECIFICATIONS

Flight Line Direction	090 – 270.00 degrees
Flight Line Separation	100 metres
Tie Line Direction	0 – 180 degrees
Tie Line Separation	2000 metres
Terrain Clearance	80 metres (MTC)

Flown by GEOINSTRUMENTS PTY LTD.

GeoInstruments job number	9101
Survey flown	February 1991
Processed by	Kevron Geophysics

STACKED MAGNETIC PROFILES

Diurnal variations removed
IGRF(1985) updated to 1991 3 removed
Average survey base station value and a constant of 62000 nT added to datum

Base Value 62000 nT

Vertical Scale 50 nT/cm

N

Grid North

PASMINCO EXPLORATION

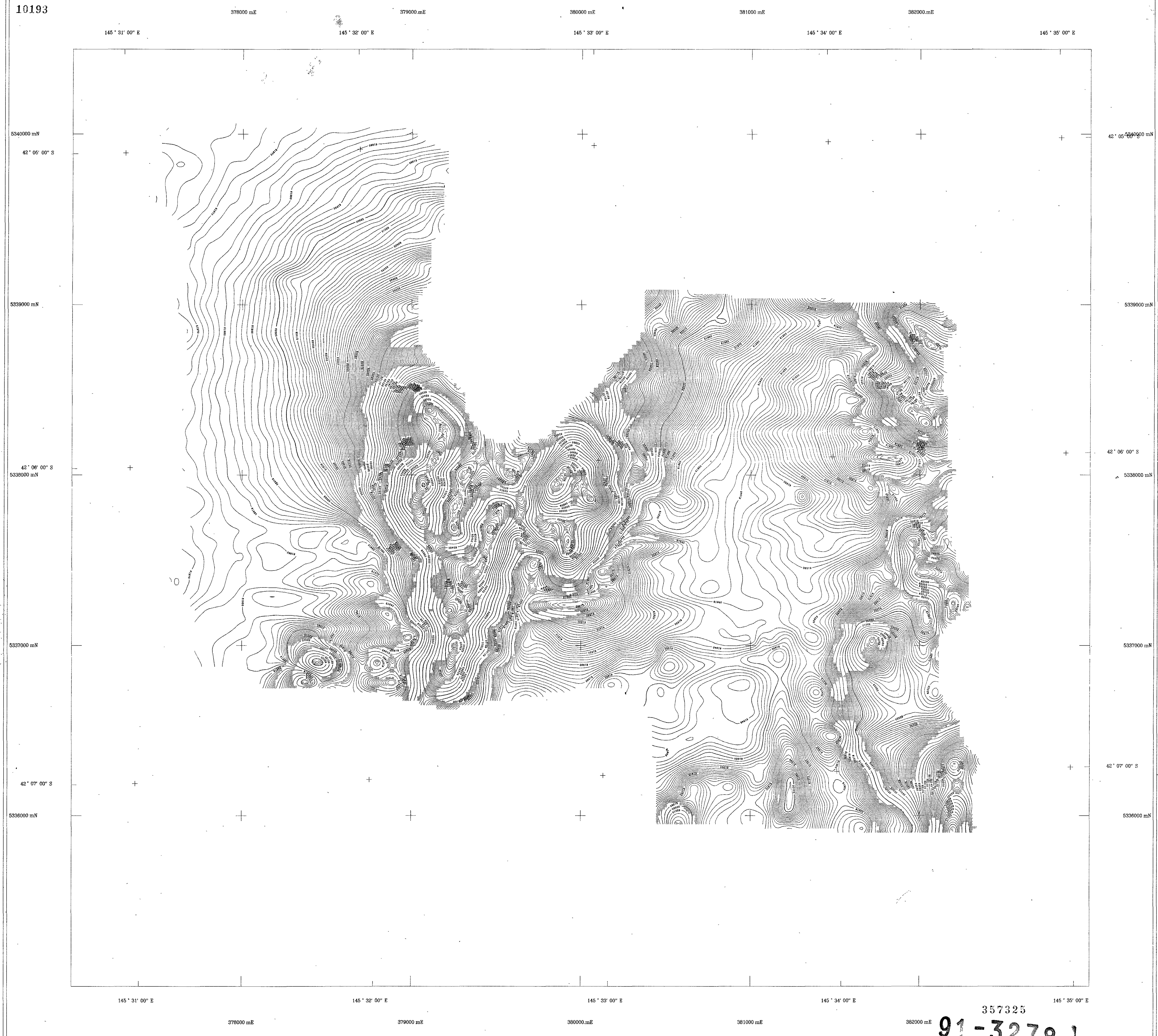
A Division of Pasminco Australia Limited

EL11/85 – Yolande
White Spur Area
Magnetic Intensity Stacked Profiles

DATE : Jun 1991	REPORT :
DRAWN : Kevron Geophysics	PLAN NO. 1
SCALE 1: 10000	**Figure 22**

5 cm

10193



357325

91-3278.1

SCALE 1:10,000

0.25 0 0.25 0.5 0 75 1

Kilometres

AUSTRALIAN MAP GRID ZONE 55

AIRBORNE SURVEY EQUIPMENT

Aircraft	Aerospatiale Ecureuil "Squrrel" VH–HRR
Magnetometer	Geometrics G833 Helium Vapour
Magnetometer Resolution	0 01 nT
Magnetometer Sample Interval	0 2 seconds (approx 7 metres)
Data Acquisition	GeoInstruments Model 2000
Data Recording	1 2Mb floppy disk
Spectrometer	Geometrics GR800
Crystal Size	16 4 Litres in downward array
Spectrometer Sample Interval	1 0 Seconds (approx 35 metres)
Flight Path Record	VHS Colour Video System
Flight Path Recovery	Visually onto aerial photographs

AIRBORNE SURVEY SPECIFICATIONS

Flight Line Direction	090 – 270 00 degrees
Flight Line Separation	100 metres
Tie Line Direction	0 – 180 degrees
Tie Line Separation	2000 metres
Terrain Clearance	80 metres (MTC)

Flown by GEOINSTRUMENTS PTY LTD

GeoInstruments job number	9101
Survey flown	February 1991
Processed by	Kevron Geophysics

RESIDUAL MAGNETIC CONTOURS

Diurnal variations removed
IGRF(1985) updated to 1991.3 removed
Average survey base station value and a constant of 62000 nT added to datum

Grid mesh 25 x 25 metres

Contour Interval 2, 10, 50, 250 nT

N

AMG North

PASMINCO EXPLORATION

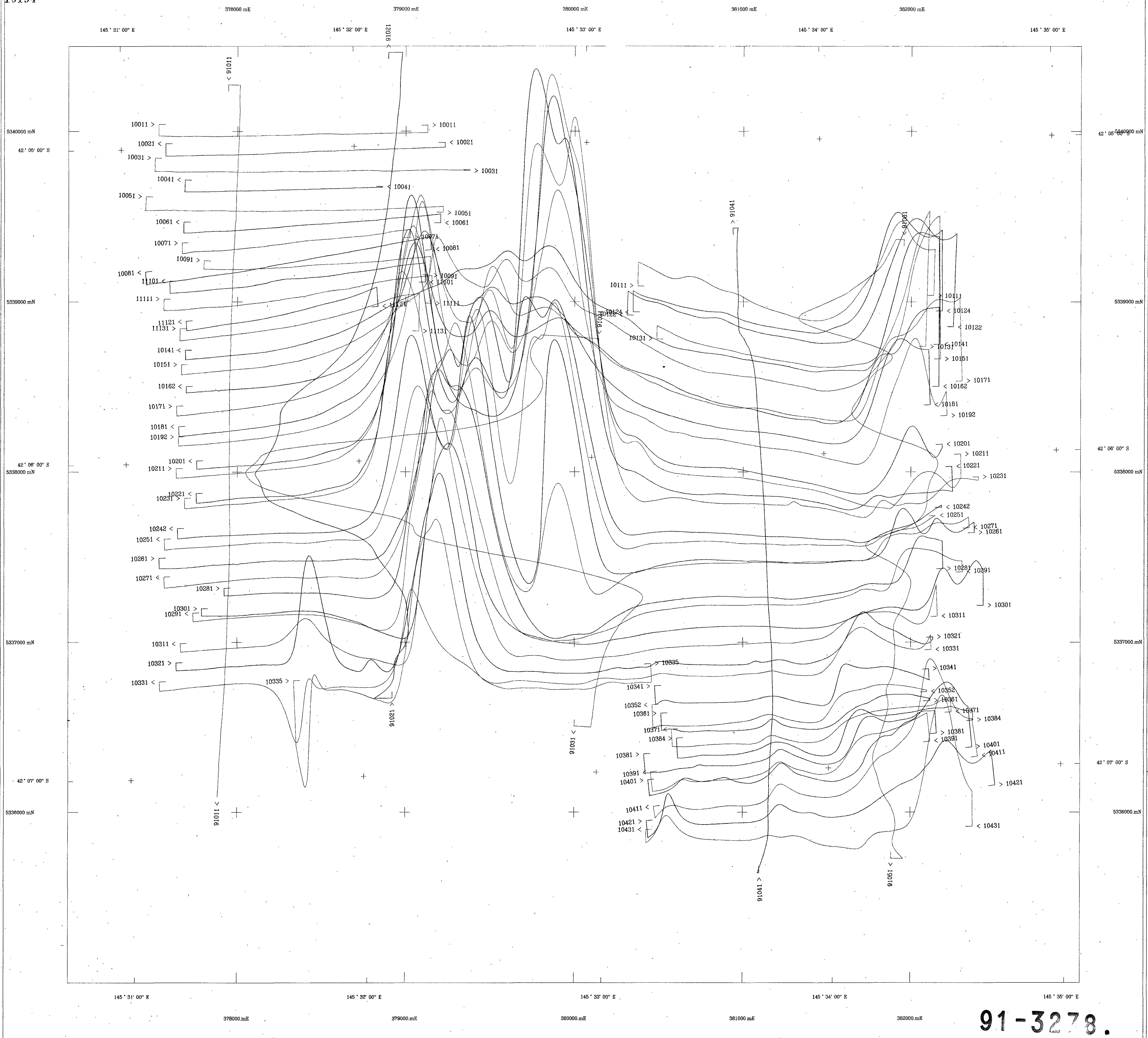
A Division of Pasminco Australia Limited

EL11/85 – Yolande
Lynchford Area
Magnetic Intensity Contours

DATE : May 1991	REPORT :
DRAWN : Kevron Geophysics	PLAN NO. 1
SCALE 1· 10000	Figure 24

5 cm

10194



91-3278.

SCALE 1:10,000

0.25 0 0.25 0.5 0.75 1

Kilometres

AUSTRALIAN MAP GRID ZONE 55

357326

AIRBORNE SURVEY EQUIPMENT

Aircraft	Aerospatiale Ecureuil "Squirrel" VH-HRR
Magnetometer	Geometrics G833 Helium Vapour
Magnetometer Resolution	0 01 nT
Magnetometer Sample Interval	0 2 seconds (approx 7 metres)
Data Acquisition	GeoInstruments Model 2000
Data Recording	1 2Mb floppy disk
Spectrometer	Geometrics GR800
Crystal Size	16 4 Litres in downward array
Spectrometer Sample Interval	1.0 Seconds (approx 35 metres)
Flight Path Record	VHS Colour Video System
Flight Path Recovery	Visually onto aerial photographs

AIRBORNE SURVEY SPECIFICATIONS

Flight Line Direction	090 – 270.00 degrees
Flight Line Separation	100 metres
Tie Line Direction	0 – 180 degrees
Tie Line Separation	2000 metres
Terrain Clearance	80 metres (MTC)

Flown by GEOINSTRUMENTS PTY LTD

GeoInstruments job number	9101
Survey flown	February 1991
Processed by	Kevron Geophysics

STACKED MAGNETIC PROFILES

Diurnal variations removed
IGRF(1985) updated to 1991.3 removed
Average survey base station value and a constant of 62000 nT added to datum

Base Value 62000 nT

Vertical Scale 50 nT/cm

N

Grid North

PASMINCO EXPLORATION

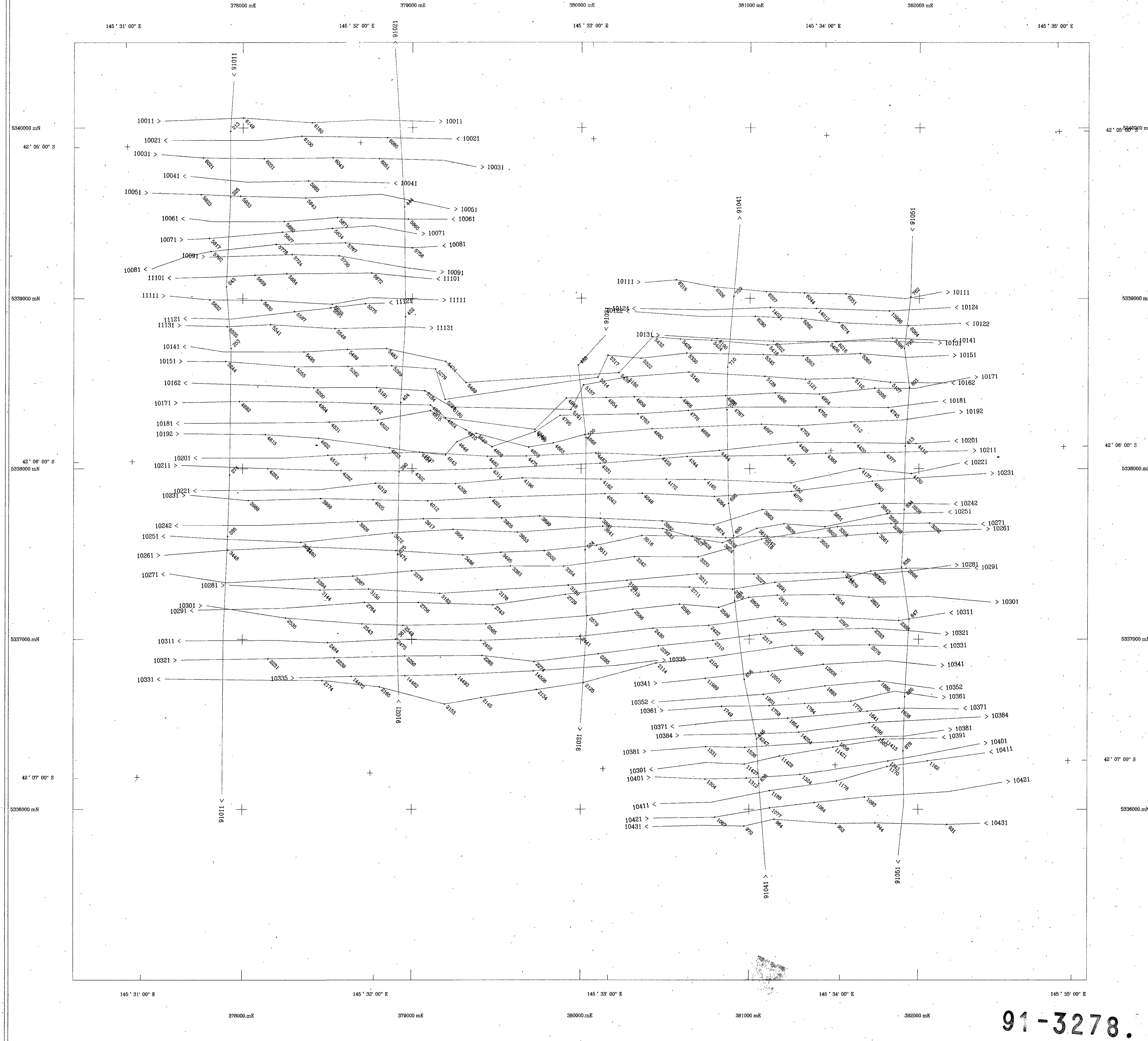
A Division of Pasminco Australia Limited

EL11/85 – Yolande
Lynchford Area
Magnetic Intensity Stacked Profiles

DATE : Jun 1991	REPORT :
DRAWN : Kevron Geophysics	PLAN NO. 1
SCALE 1: 10000	**Figure 25**

5 cm

10195



91-3278.

SCALE 1:10,000

0.25 0 0.25 0.5 0.75 1

Kilometres

AUSTRALIAN MAP GRID ZONE 55

AIRBORNE SURVEY EQUIPMENT

Aircraft	Aerospatiale Ecureuil "Squirrel" VH-HRR
Magnetometer	Geometrics G833 Helium Vapour
Magnetometer Resolution	0.01 nT
Magnetometer Sample Interval	0 2 seconds (approx 7 metres)
Data Acquisition	GeoInstruments Model 2000
Data Recording	1.2Mb floppy disk
Spectrometer	Geometrics GR800
Crystal Size	16.4 Litres in downward array
Spectrometer Sample Interval	1.0 Seconds (approx 35 metres)
Flight Path Record	VHS Colour Video System
Flight Path Recovery	Visually onto aerial photographs

AIRBORNE SURVEY SPECIFICATIONS

Flight Line Direction	090 – 270 00 degrees
Flight Line Separation	100 metres
Tie Line Direction	0 – 180 degrees
Tie Line Separation	2000 metres
Terrain Clearance	80 metres (MTC)

Flown by GEOINSTRUMENTS PTY LTD

GeoInstruments job number	9101
Survey flown	February 1991
Processed by	Kevron Geophysics

FLIGHT PATH PROCESSING

Flight path visually recovered onto aerial photographs and transfered to 1;10000 topographic maps

Grid notation refers to Australian Grid Zone 55

N

Grid North

357327

PASMINCO EXPLORATION

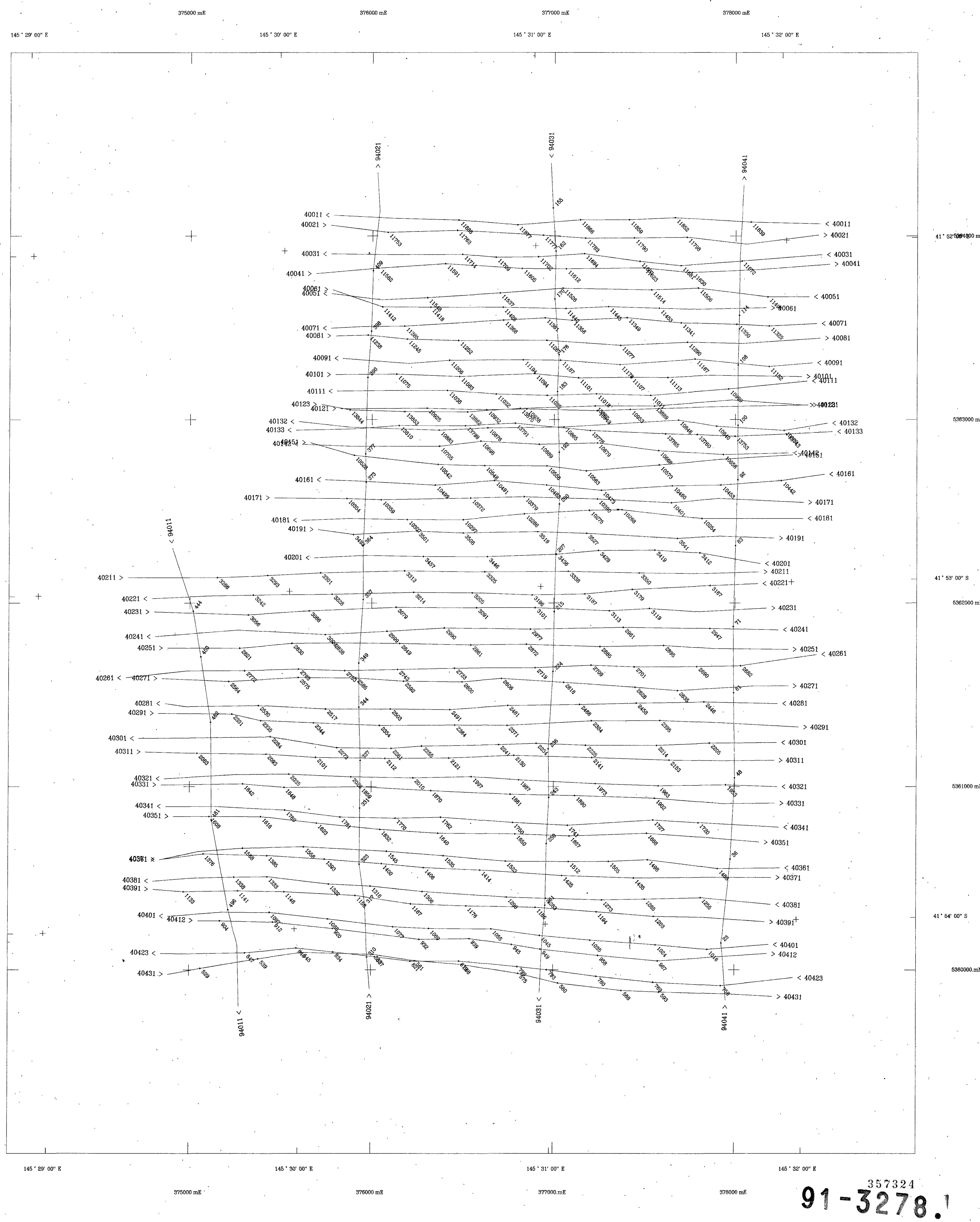
A Division of Pasminco Australia Limited

EL11/85 – Yolande
Lynchford Area
Flight Path

DATE : Jun 1991	REPORT :
DRAWN Kevron Geophysics	PLAN NO. 1
SCALE 1: 10000	**Figure 26**

5 cm

10192



357324

91-3278.

SCALE 1:10,000

250 0 250 500 750 1000

Metres

AUSTRALIAN MAP GRID ZONE 55

AIRBORNE SURVEY EQUIPMENT

Aircraft	Aerospatiale Ecureuil "Squirrel" VH-HRR
Magnetometer	Geometrics G833 Helium Vapour
Magnetometer Resolution	0.01 nT
Magnetometer Sample Interval	0.2 seconds (approx 7 metres)
Data Acquisition	GeoInstruments Model 2000
Data Recording	1.2Mb floppy disk
Spectrometer	Geometrics GR800
Crystal Size	16.4 Litres in downward array
Spectrometer Sample Interval	1.0 Seconds (approx 35 metres)
Flight Path Record	VHS Colour Video System
Flight Path Recovery	Visually onto aerial photographs

AIRBORNE SURVEY SPECIFICATIONS

Flight Line Direction	090 – 270.00 degrees
Flight Line Separation	100 metres
Tie Line Direction	0 – 180 degrees
Tie Line Separation	2000 metres
Terrain Clearance	80 metres (MTC)

Flown by GEOINSTRUMENTS PTY LTD.

GeoInstruments job number	9101
Survey flown	February 1991
Processed by	Kevron Geophysics

FLIGHT PATH PROCESSING

Flight path visually recovered onto aerial photographs and transfered to 1;10000 topographic maps

Grid notation refers to Australian Grid Zone 55

N

Grid North

PASMINCO EXPLORATION

A Division of Pasminco Australia Limited

EL11/85 – Yolande
White Spur Area
Recovered Flight Path

DATE : Jun 1991	REPORT :
DRAWN : Kevron Geophysics	PLAN NO.
SCALE 1: 10000	Figure 23

5 cm