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**PASMINCO EXPLORATION
YOLANDE EL 11/85
&
YOLANDE RIVER EL 25/91
ANNUAL REPORT**

Annual Report
June 1991 - June 1992

volume 1 of 3

MICROFILMED
MF012561-012573

92-3376

Covering letter on
files
EL 11/85 Folios 78-80
EL 25/91 Folios 36-37

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DATE: July 1992

REPORT No.: T92-11

SUBMITTED TO: Regional Exploration Manager - Tasmania

DISTRIBUTION: Mines Department - Hobart
Pasminco Exploration - Burnie
- Hawthorn
- Rosebery

Arimco NL - Sydney
Geopeko - Parkes

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Burnie
June 1992

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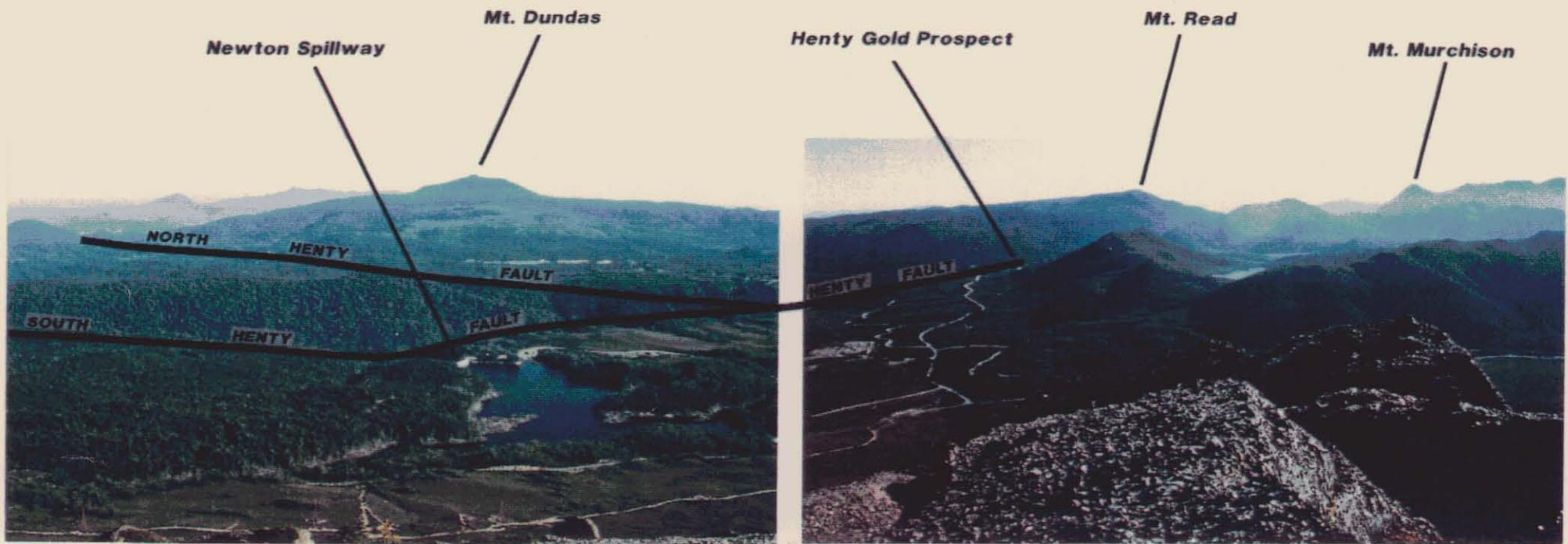
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View west across the Tyndall, Henty Fault Wedge and White Spur areas

E.L. 11/85

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SUMMARY

EL's 11/85 and 25/91, the Yolande Joint Venture tenements, cover a lithologically diverse and relatively under explored sequence of Cambrian volcanics and associated clastics. The volcanics are overlain in the west and south west by an Ordovician to Devonian sedimentary sequence.

The volcanics range from felsic to mafic in composition and have similarities to prospective sequences elsewhere in Western Tasmania and have the potential to host polymetallic massive sulfide mineralization, which is the primary exploration target. Additional targets include Henty Prospect style gold associated with the Henty - South Henty Fault and Irish style carbonate hosted Ag Pb Zn mineralization in the Ordovician Gordon Group limestone.

A major exploration program was undertaken during 1991-92. Activities included gridding, geological mapping, geochemistry, UTEM and gravity surveys. This work has defined several prospective areas within the Yolande licence and exploration is at a drilling stage at Newton Creek and Henty Valley. Total exploration costs for the two licences for the 12 months ending June 1992 were \$322 588.

Prospective areas defined during the year include:

1. Newton Creek:

Within the grid area three potentially mineralized associations have been recognised: Henty Fault Wedge andesite; Newton Spillway massive sulfide clast-bearing conglomerate and siltstones within the CVC rhyodacites with disseminated galena-sphalerite.

2. White Spur:

Regional mapping and rock geochemistry has highlighted an area of intensely sericite feldspar pyrite altered siltstone and locally silicified rhyolitic quartz porphyries in the basal section of the White Spur Formation. Altered rocks are only weakly anomalous geochemically but the same alteration style in the siltstones has been recognised in proximity to massive sulphides at Hercules and Rosebery by Rod Allen.

3. Henty Valley:

Infill gridding, soil geochemistry and UTEM has failed to enhance the prospectivity of this area. Litho-geochemistry indicates that basalts associated with the mineralization have affinities with the basal Cambrian Crimson Creek Formation rather than the Mt Read Volcanics. Despite these results the significant alteration and massive pyrite mineralization should be drilled.

4. Lynchford:

Soil geochemical sampling over UTEM anomalies and siltstone associated with the Lynch Creek Basalt has been completed. Anomalous Pb, Ba and As is broadly coincident with UTEM anomaly "G". The anomaly is interpreted to be associated with a sheared and veined graphitic siltstone. The mineralization is not considered to be part of a volcanogenic massive sulfide system. Siltstones associated with the andesites are anomalous in Pb and require further field evaluation. The siltstones are not coincident with a UTEM response.

5. Ultramafic complex:

Andesite lavas at the top of this complex are calc-alkaline and may have affinities with the Mt Read Volcanics. Very little work has been carried out in the area, which lies within the Pasminco Henty grid. Haematite alteration in the volcanics indicates that they may be mineralized.

6. Yolande River

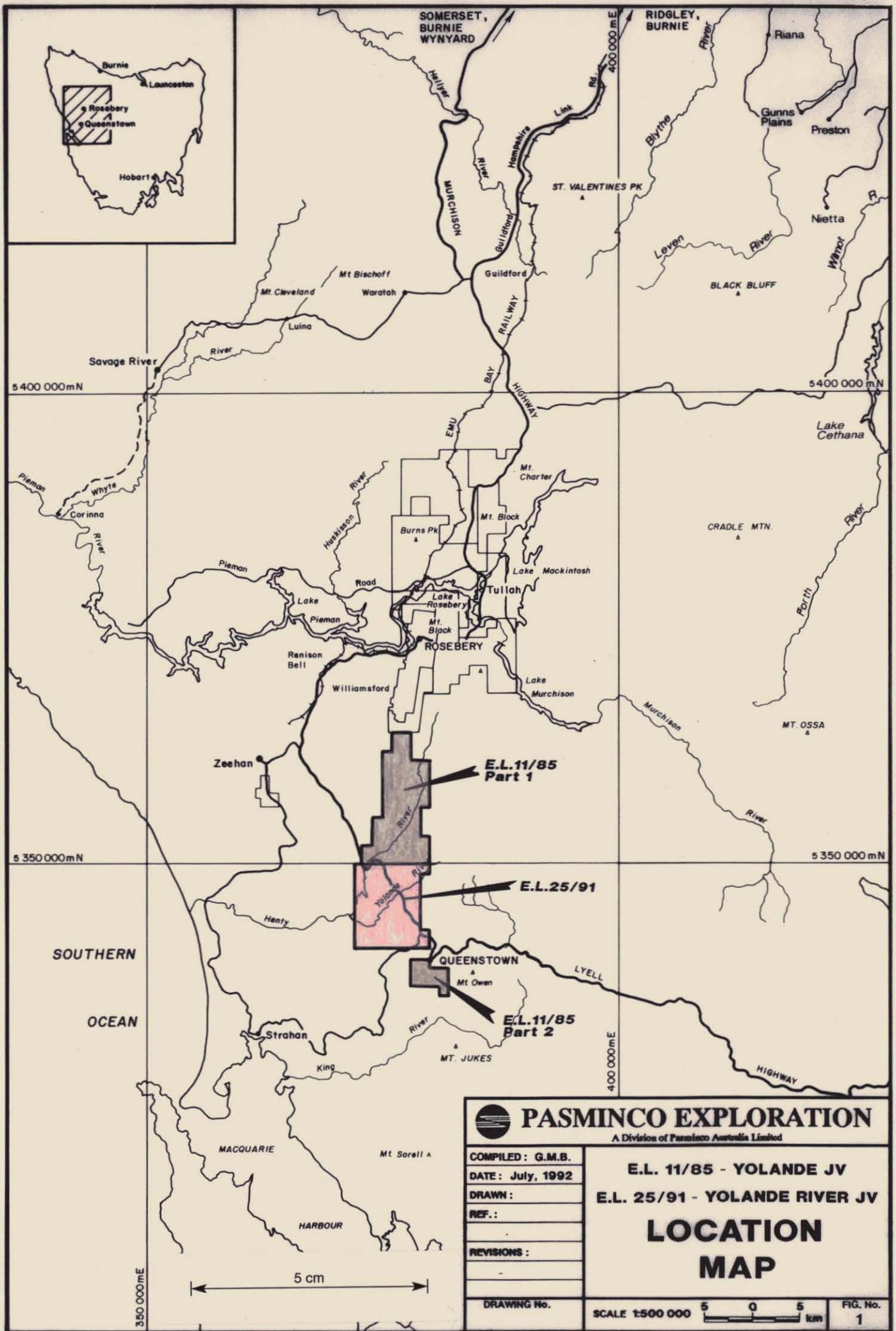
A review of the stratigraphic associations within the licence indicates that the best exploration potential may be on the Central Volcanic Complex - Yolande River Sequence contact.

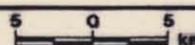
1 .INTRODUCTION

The combined EL's 11/85 and 25/91 cover the western part of the Mt Read Volcanic belt from Lynchford south of Queenstown, north to the southern boundary of the Consolidated Rosebery Mine Leases (see Fig 1). The licences are continuous over this area except for a kilometre wide strip between the Yolande River licence and the Lynchford block of the Henty licence. This report details exploration undertaken by Pasminco Exploration in the 12 months to 20 July 1992.

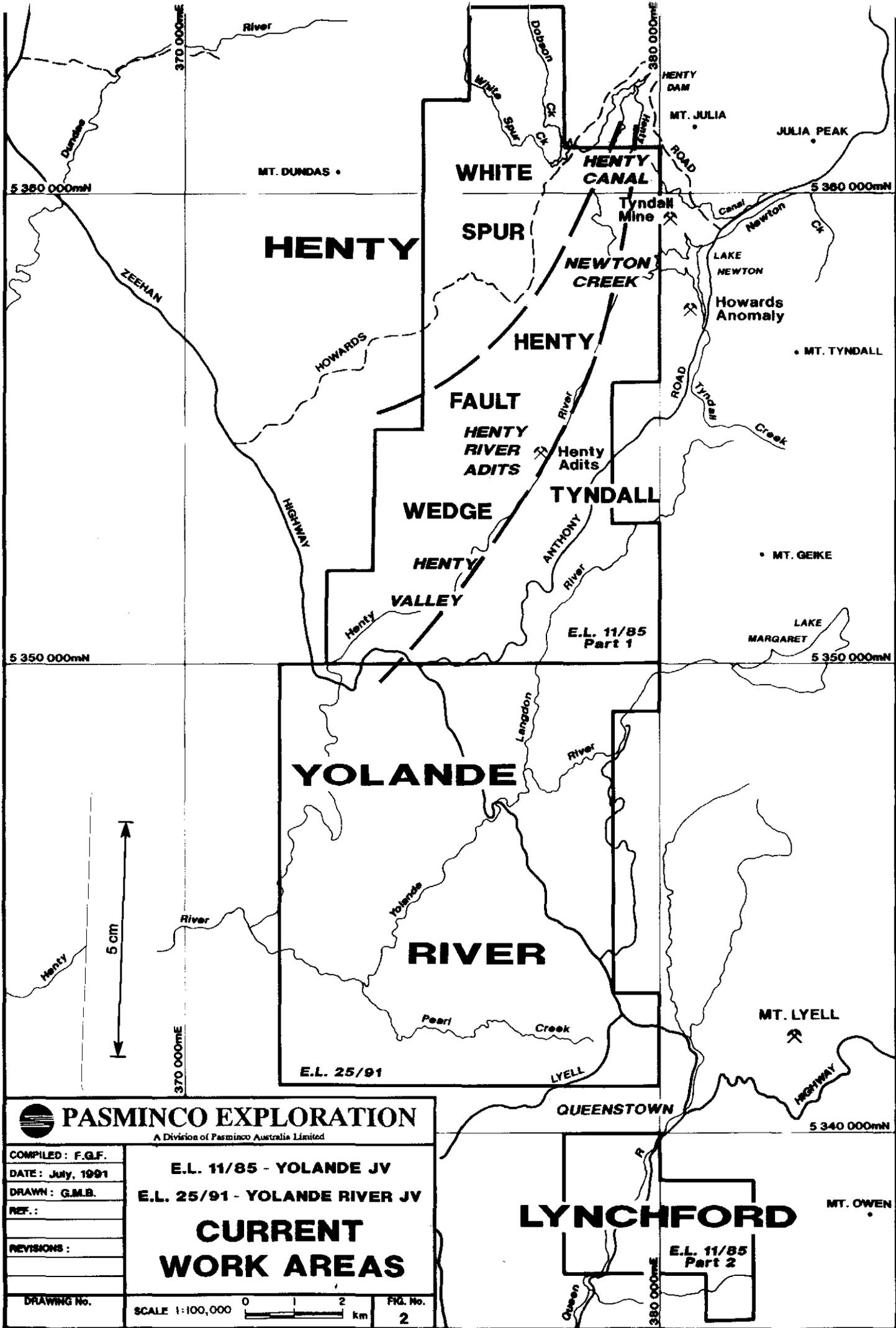
The Lynchford section is readily accessed from South Queenstown by the sealed Lynchford Road and the all weather Huxley 4WD track. The Yolande River and SE section of the Henty block is serviced by the Strahan and Zeehan Highways, and the HEC Anthony Road (see Fig 2). The least accessible areas are in the Henty River valley, where steep topography is covered by temperate rainforest, and the SW parts of the Yolande River licence that are up to 5km from a vehicle access point.

Apart from the access restrictions the main impediment to exploration is the extensive fluvioglacial cover in the Henty area, which limits the use of geological mapping and soil geochemistry.



 PASMINCO EXPLORATION <small>A Division of Pasminco Australia Limited</small>	
COMPILED : G.M.B. DATE : July, 1992 DRAWN : REF.: REVISIONS :	E.L. 11/85 - YOLANDE JV E.L. 25/91 - YOLANDE RIVER JV <h2 style="margin: 0;">LOCATION MAP</h2>
DRAWING No.	SCALE 1:500 000 <div style="display: inline-block; text-align: center; margin: 0 10px;">  </div>
	FIG. No. 1

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PASMINCO EXPLORATION
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COMPILED: F.G.F.
 DATE: July, 1991
 DRAWN: G.M.B.
 REF.:
 REVISIONS:

E.L. 11/85 - YOLANDE JV
E.L. 25/91 - YOLANDE RIVER JV
CURRENT WORK AREAS

DRAWING No.

SCALE 1:100,000 0 2 km FIG. No. 2

2. TENURE

Exploration Licence 11/85, Yolande was granted to Amoco Minerals Australia on 21 August 1985 covering an area of 150km². Since that time title has been transferred to Cyprus Minerals Australia Company (11 December 1985), then Cyprus Gold Australia Company (March 1988), then Hudspeth and Company Pty Limited (23 October 1990), and finally to Arimco Mining Pty Limited, the current title holder.

The area of the licence was amended to 151km² on 22 May 1988. In compliance with Mines Department regulations the licence was reduced in area to 70km² on 20 February 1991. The area of the tenement was amended again by the Department on 15 April 1992 by the addition of 4km² to the western part of the Henty Block. The current area of EL 11/85 is 74km².

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. Pasminco earned a 50% interest in the tenement on 31 December, 1991. All three parties contributed to exploration expenditure for the remainder of 1991-92 in the proportion: Pasminco (50%), Norgold (25%) and Arimco (25%).

Exploration Licence 25/91, Yolande River was granted to Pasminco Australia Limited on 30 November 1991 covering an area of 66km². Under the terms of the Yolande Joint Venture this licence was included in the Agreement. All parties contributed to the exploration expenditure from 1 January - 30 June 1992 on EL 25/91 in the same proportion as for EL 11/85.

Following a meeting with the Mines Department approval was given on 11 May 1992 to amalgamate the Annual Report and Licence Renewal Dates for both EL's 11/85 and 25/91 to reduce the administrative burden. Both licences are now due for renewal on 20 August 1992.

The land tenure of EL's 11/85 and 25/91 comprises the following (see Fig 3).

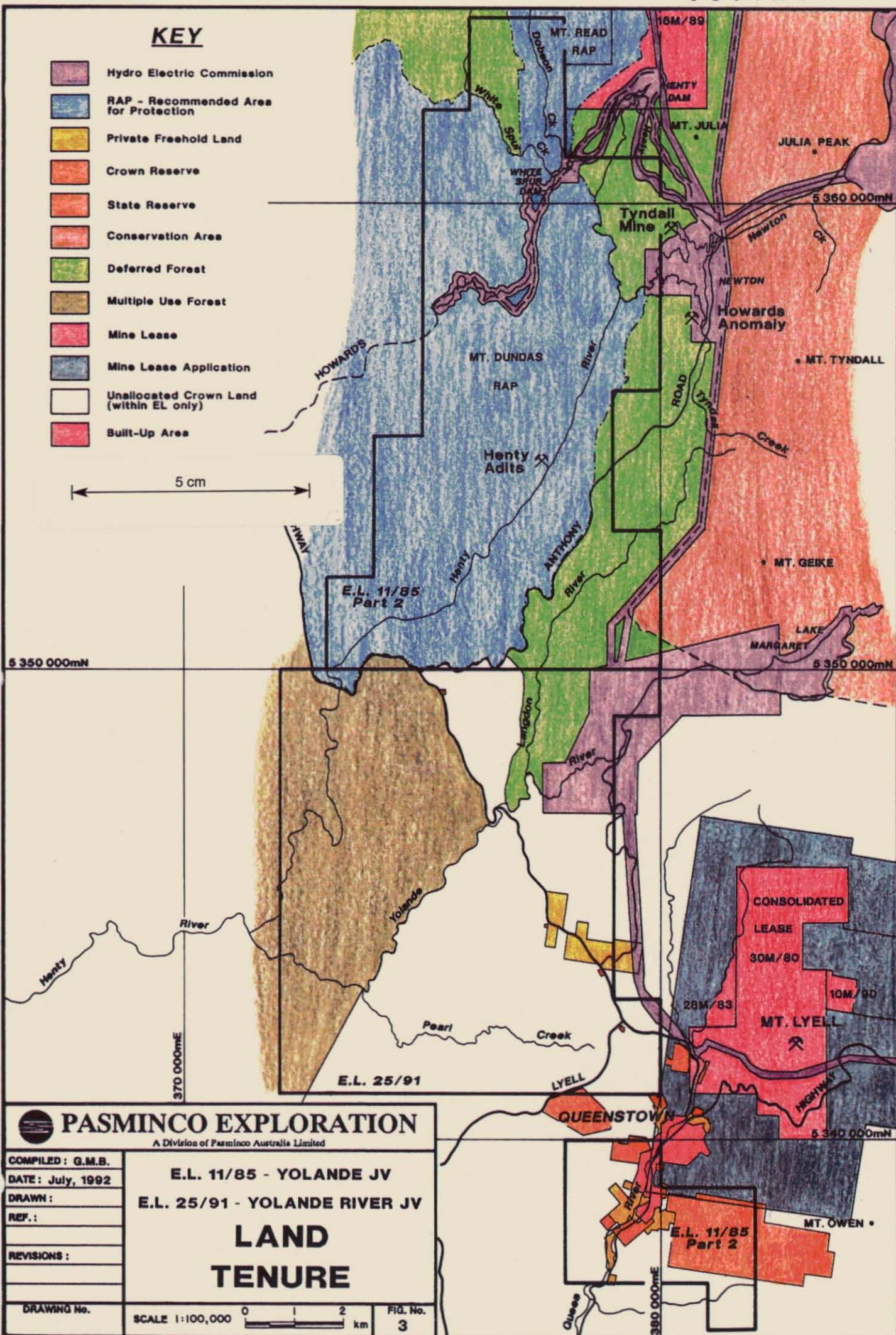
1. Multiple Use Forest Land

2. Deferred Forest Land
3. Recommended Areas for Protection (Mt Dundas & Mt Read)
4. SW Conversation Area
5. HEC Vested Land
6. Uncommitted Crown Land
7. Private Property
8. Queenstown Urban Conversation Area
9. Crown Reserves

KEY

-  Hydro Electric Commission
-  RAP - Recommended Area for Protection
-  Private Freehold Land
-  Crown Reserve
-  State Reserve
-  Conservation Area
-  Deferred Forest
-  Multiple Use Forest
-  Mine Lease
-  Mine Lease Application
-  Unallocated Crown Land (within EL only)
-  Built-Up Area

5 cm



PASMINCO EXPLORATION

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COMPILED: G.M.B.

DATE: July, 1992

DRAWN:

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REVISIONS:

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E.L. 11/85 - YOLANDE JV
E.L. 25/91 - YOLANDE RIVER JV

LAND TENURE

SCALE 1:100,000

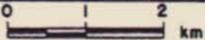


FIG. No. 3

3. REGIONAL GEOLOGY

The basement in Western Tasmania is a sequence of Proterozoic metasediments. The metamorphic facies is dominantly greenschist with localised amphibolite and eclogite facies. The basement is exposed east of the Henty area in the Sticht Range schist and to the west at Dundas.

Cambrian volcanism and sedimentation developed on this continental crust, and can be subdivided into an Eo-Cambrian tholeiitic and mid to late Cambrian, predominantly calc-alkaline events.

The Eo-Cambrian Crimson Creek Formation (CCF) tholeiitic basalts and sediments were deposited in shallow but rapidly subsiding rift basins, which developed on attenuated rifted passive continental margin 550–600ma. Sediments include turbidites, volcanoclastics and cherts. The CCF is exposed in the western part of the Dundas Trough and is the oldest sequence in the Henty Fault Wedge (HFW).

Mafic to ultramafic volcanics and subvolcanic cumulates were thrust onto the CCF in the mid Cambrian. The occurrence of boninitic lavas associated with the ultramafics indicates formation in an oceanic island arc setting. These ultramafics are highly depleted in REE and Zr and are geochemically unlike the ultramafic complex within the HFW, which are relatively REE and Zr enriched.

The Mt Read Volcanics (MRV) are a 200km long by 20km wide north-south belt extending along the eastern side of the Dundas Trough, adjacent to and in some areas onlapping and intruding the Precambrian basement. These mid to upper Cambrian volcanics, which are subdivided on the basis geochemistry into three calc-alkaline and one tholeiitic suite, include intermediate to felsic lavas, subvolcanic porphyries and granites (Crawford, Corbett and Everard, 1992).

The MRV host two types of volcanogenic sulfide deposits: stratiform Pb Zn Cu Ag Au eg Rosebery – Hellyer – Que River, and disseminated Cu Ag Au eg Mt Lyell (see Fig 4). The Henty Gold prospect is also hosted in the volcanics but it is uncertain whether the mineralization is volcanogenic or Devonian granite related. For grade and tonnages of

mineralization see Table 1.

The Henty Fault is a major N to NNE trending structure, cutting obliquely across the MRV (see Fig 4). The structure was active during the Cambrian and early Ordovician. Regional features associated with the fault include;

- differences in MRV volcanics and subvolcanic intrusives north and south of the structure
- mineralization in the MR is Pb Zn Cu Ag Au massive sulfide to NW and predominantly Cu Ag Au disseminated sulphides to the SE
- the fault has been a focus for late Cambrian tholeiitic magmatism
- controlled the deposition of Cambro-Ordovician conglomerates

The MRV calc-alkaline volcanism was followed by tholeiitic Henty Dyke Swarm gabbros and basalts. Both lavas and intrusives are localised in the hanging wall of the South Henty Fault (SHF) and Henty Fault (HF).

Cambrian volcanism and sedimentation was followed by basal Ordovician siliciclastics of the Denison Group, derived mainly from Precambrian metamorphics with some volcanic detritus at the base. The basal conglomerates occur as thick wedges/fans controlled either by extensional rift basins adjacent to the Tyennan Block or accumulations at the western edge of Tyennan metamorphic thrust sheets (Berry, 1991).

The Denison Group is followed by the regionally transgressive Gordon Group marine carbonates and Siluro-Devonian Eldon Group sandstones and shales. Pb Zn Ag mineralization at Oceana on the Zeehan field is hosted by Gordon Limestone and may represent syngenetic mineralization (see Table 1).

The mid Devonian Tabberabberan Orogeny includes at least two phases of regional compression viz, D1 east-west and D2 north-south oriented with folding and cleavage development in the lower Palaeozoic rocks (Keele, 1992). Thrust movement on the Rosebery Fault, North Henty Fault and South Henty Faults is interpreted to be associated with the D1 event.

Deformation was followed by extensive intrusion of Devonian – Carboniferous granitoids, which have characteristics associated with both I and S type granites. These granites are associated with carbonate replacement tin mineralization at Renison Bell and Mt Bischoff, and Pb Zn Ag vein deposits of the Zeehan field.

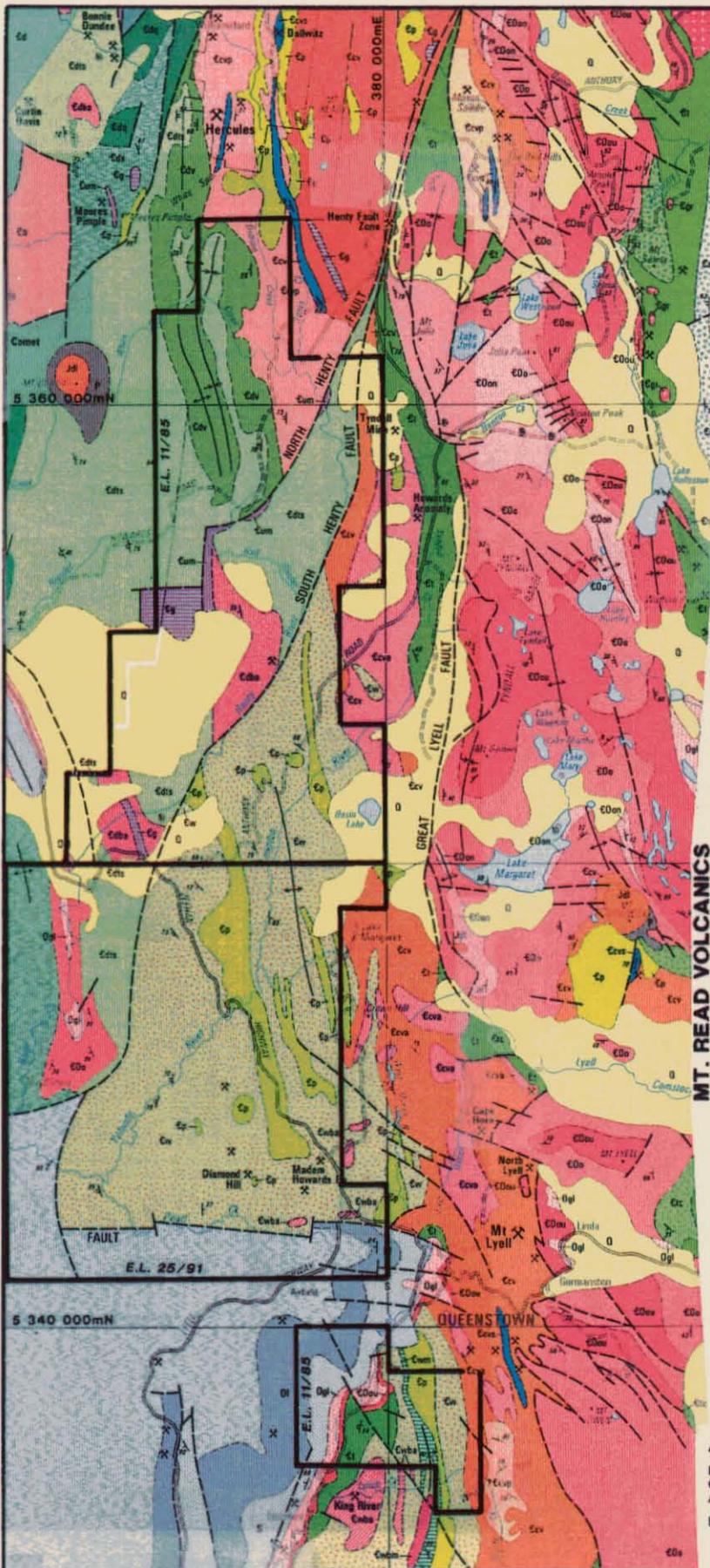
TABLE 1.

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



QUATERNARY	Q	Glacial deposits, alluvium, etc.
JURASSIC	Jd	Dolerite
PERMIAN - CARBONIFEROUS	P	Undifferentiated
DEVONIAN - SILURIAN	Db	Beil Shale
	DI	Florence Sandstone
	S	Silurian
ORDOVICIAN	Ogl	GORDON GROUP limestone
EARLY ORDOVICIAN - LATE CAMBRIAN	EOou	Upper sandstone sequence including Pioneer Beds (COou)
	COo	Undifferentiated conglomerate and sandstone (COo)
	COon	Newton Creek Sandstone (COon) - interbedded sandstone siltstone and conglomerate with marine fossils

DUNDAS GROUP AND CORRELATES	Cp	Quartz-feldspar porphyry, mostly intrusive
	Eds	Mostly sedimentary rocks - greywacke, siltstone, conglomerate
	Edt	Interbedded tuffs and sedimentary rocks
	Edv	Quartzwacke-slate-siltstone units, e.g. Stitt Quartzite
	Edw	Mostly felsic volcanics - mainly tuffs
	Edx	Mixed felsic and mafic volcanics and epiclastic breccias, Que-Hellyer area
TYNDALL GROUP AND CORRELATES	Et	Basaltic to andesitic volcanics
	Ets	Mainly sed. rocks, incl Farrell Slates
	Etv	Mainly quartz-feldspar-phyrlic volcanic and volcanoclastic rocks (Et)
	Etz	Mainly volcanoclastic congl. and sandstone
CENTRAL VOLCANIC SEQUENCE	Ev	Sticht Range Beds - sandstone, siltstone, siliciclastic conglomerate
	Evx	Mainly feldspar-phyrlic volcanics - dacite, rhyolite, minor andesite (Evx)
	Evz	Felsic porphyry, mainly intrusive
	Evw	Mainly pyroclastic rocks
	Evu	Sedimentary rocks, mainly shale and sandstone
	Evv	Andesitic volcanics
WESTERN SEQUENCE	Evw	Interbedded crystal and vitric tuff, shale, greywacke & qtz-feld-phyrlic lavas & intr. (Evw)
	Evz	Felsic - porphyry, mainly intrusive
	Evu	Miners Ridge Sandstone - quartzwacke & siltstone
	Evv	Basaltic-andesitic volcanics and intrusives
	Evw	Tholeiitic basalt at Miners Ridge

MT. READ VOLCANICS

ACKNOWLEDGEMENT:
 Mt. Read Volcanics Project Map adopted from Map 6 - Geological Compilation Map of the Mt. Read Volcanics and Associated Rocks, from Hellyer to South Darwin Peak.
 K. D. Corbett B Sc (HON) PhD and A. W. McNeill B Sc (Hon), 1988

CAMBRIAN INTRUSIVE ROCKS		5 cm	
Cp	Granite		
Cp	Felsic porphyry		
Cp	Gabbro		
Cm	Ultramafic rocks & serpentinite		
PRECAMBRIAN			
Es	Quartzite-slate sequences - correlates of Oonah Formation		
Em	Metamorphosed sequences of Tyennan Region. Major lithological boundary trends shown		

PASMINCO EXPLORATION
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COMPILED:	E.L. 11/85 - YOLANDE JV E.L. 25/91 - YOLANDE R. JV REGIONAL GEOLOGY FROM MAP 6 OF THE MT. READ VOLCANICS PROJECT
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FIG. No. **4**

4. GEOLOGY AND MINERALIZATION OF THE TENEMENTS

4.1 Introduction

The combined EL's are underlain by a diversity of Cambrian associations including the Crimson Creek Formation, Mt Read Volcanics and an ultramafic complex. With the exception of the Newton Creek area, all sequences, including the ultramafics, face west. In the west and south the Cambrian is overlain by Ordovician to Silurian sediments. Interpretive geology for the three licence blocks are shown in Fig 5 Henty, Fig 26 Lynchford and Fig 37 Yolande River. A 1:50 000 scale reduction of the Henty block interpretative geology and enhanced aeromagnetics is shown in Fig 39.

Mineralization and alteration located to date is associated with basaltic to felsic volcanics in proximity to major structures. Mineralization includes massive pyrite at Henty Valley, disseminated galena sphalerite at Henty Adits and Newton Creek and barite veins at Lynchford and Madam Howards Plains.

4.2 Stratigraphic Associations

4.2.1 CVC – YOLANDE RIVER SEQUENCE – TYNDALL GROUP

East of the SHF at Newton Creek rhyodacite volcanics are overlain by dacite to andesite volcanics. The contact between the two sequences is marked by a sulfide clast-bearing conglomerate at Newton Spillway.

In the southern licences there is a common association of CVC, YRS, Tyndall Group and Ordovician – Devonian cover (see Fig 37). In the Yolande River licence the sequence appears continuous, but at Lynchford the relationship between CVC and YRS is ambiguous. YRS includes andesite to dacite lavas/intrusives that geochemically equate with Que-Hellyer

hanging wall volcanics (Crawford et al, 1992).

4.2.2 HENTY FAULT WEDGE

The HFW is bounded by the SHF and NHF and comprises five distinct sequences, which have little in common with sequences to the east and west of the fault wedge. The HFW is divided into two by the Howards Tramway Fault (and associated ultramafics) as an eastern sequence (Fig 33) and western sequence (Fig 34).

From stratigraphic base to top the sequences are:

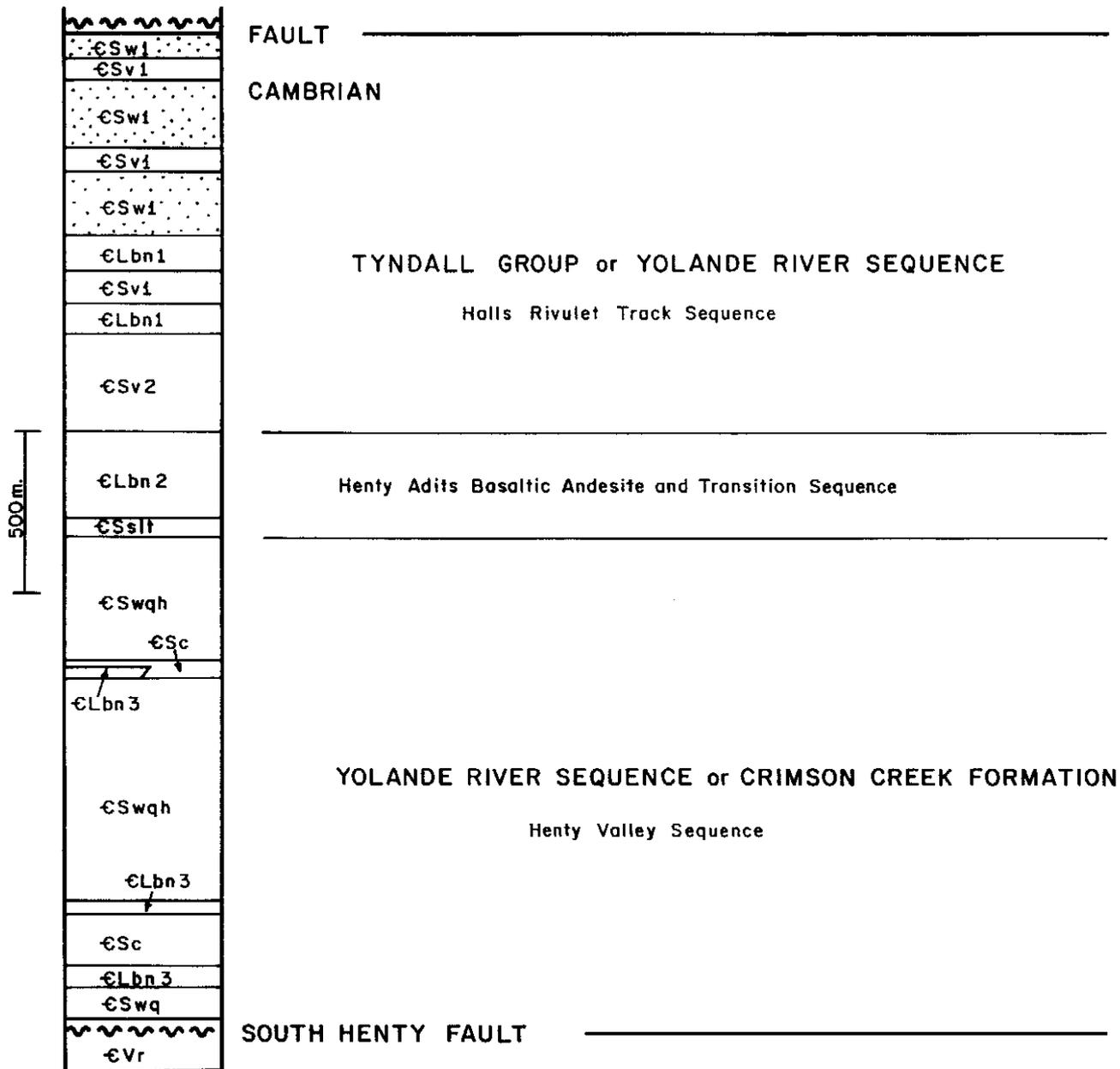
i. Henty Valley Sequence – comprises quartz muscovite sandstone, haematite facies greywackes, chert and basalts. The sandstones contain detrital chromite and have lithological affinities with the Miners Ridge Sandstone at Lynchford. Basalts are tholeiitic and on the basis of trace element geochemistry have affinities with the Eo-Cambrian Crimson Creek Formation (Fig 42). Geochemically the cherts have been compared with recent hydrothermal and biogenic/sedimentary cherts. They have a greater similarity to the latter group of cherts (see Table 2).

Table 2.

COMPARISON OF HENTY VALLEY CHERTS WITH CRETACEOUS HYDROTHERMAL AND BIOGENIC CHERTS FROM THE NORTH PACIFIC

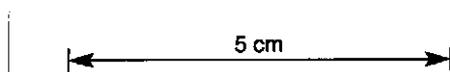
	Leg 32 Hydrothermal Chert	Kamiaso Biogenic Chert	HFW Chert*
Al/(Al+Fe+Mn)	0.01%	0.60%	0.55%
Fe ₂ O ₃	2.53%	0.98%	1.30%
Al ₂ O ₃ /TiO ₂	10.40%	19.90%	19.70%
Fe ₂ O ₃ /TiO ₂	0.60%	9.80%	12.83%
MnO/TiO ₂	8.60%	0.40%	0.79%

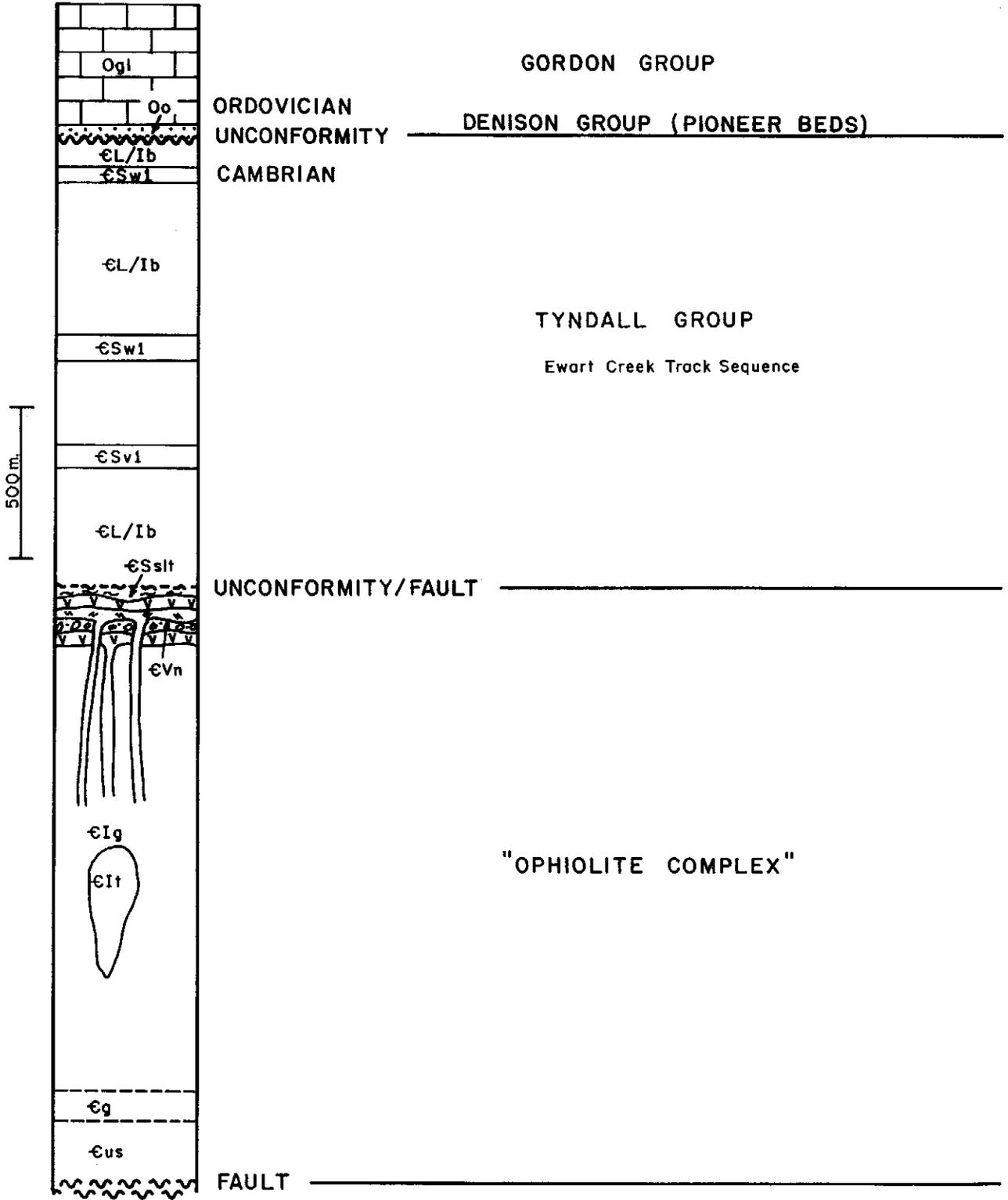
* Average of sample No.s 30175, 32842 from Henty Fault Wedge.



Refer to 1:25000 Legend

 PASMINCO EXPLORATION <small>A Division of Pasminco Australia Limited</small>	
COMPILED: R.A.P. DATE: 27-6-'92 DRAWN: N.W.D.S. REF.: REVISIONS:	STRATIGRAPHIC SECTION EASTERN HENTY FAULT WEDGE
DRAWING No.	SCALE 
FIG. No. 33	





Refer to 1:25000 Legend

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COMPILED: R.A.P. DATE: 27-6-'92 DRAWN: N.W.D.S. REF.: REVISIONS:	STRATIGRAPHIC SECTION WESTERN HENTY FAULT WEDGE
DRAWING No.	SCALE
FIG. No. 34	

066023

380 000mE

E.L. 11/85 HENTY

5 350 000mN

Owen Conglomerate
- Cambrian unconformity
(Corbett, 1985)

TYNDALL
GROUP

YOLANDE RIVER SEQUENCE

E.L. 25/91

CENTRAL
VOLCANIC
SEQUENCE

€Swi

€Swi

€I/Lrd

5 345 000mN

SILURO-
DEVONIAN

€Swi

€I/Lrd

€S2

€S2

Pearl Creek Fault

SILURO - DEVONIAN

375 000mE

PASMINCO EXPLORATION

A Division of Pasminco Australia Limited

COMPILED : R.A.P.

DATE : July, 1992

DRAWN : G.M.B.

REF. :

REVISIONS :

DRAWING No.

E.L. 11/85 - YOLANDE JV
E.L. 25/91 - YOLANDE RIVER JV

**INTERPRETIVE GEOLOGY
STRATIGRAPHIC
RELATIONSHIPS BETWEEN
E.L.11/85 (Henty) AND E.L.25/91**

SCALE 1 : 50,000

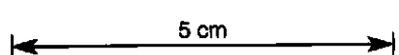


FIG. No.
37

DATA SOURCE

Dept. of Mines - 1:50,000
Strahan and Lyell Sheets

Poltock - EL11/85



ii. Henty Adits Sequence – comprises basaltic andesite and siltstones. The andesites are plagioclase–phyric lavas, that appear to overlap the calc–alkaline and tholeiitic fields, and plot between the main MRV suite fields of Crawford et al (1992) (see Fig 41). The sequence hosts stringer galena sphalerite mineralization at the Henty Adits and disseminated pyrite and pyrrhotite is common in the siltstones.

iii. Halls Rivulet Track Sequence – comprises intermediate to felsic derived volcanoclastic sandstone, vitric siltstone and andesites. The andesites are plagioclase–augite–phyric, calc–alkaline and have geochemical affinities with MRV Suite i (see Fig 41). Crawford et al have included both the Henty Adits and Halls Rivulet Track andesites in Suite i of the MRV, comparing them to the Que–Hellyer footwall volcanics. However, there are significant differences between all three andesites.

iv. Ophiolite suite – the serpentinized ultramafic base is faulted against the Halls Rivulet Track sequence by the Howards Tramway Fault. This suite comprises a cumulate base and a complex of dolerite/tonalite/andesite dykes, which are overlain by andesite lavas and volcanoclastics. The common geochemical trends in Fig 43 indicate that the different lithologies in the complex are co–magmatic. Affinities with the calc–alkaline Mt Read Volcanics can be seen in Ti/Zr – SiO₂ plot Fig 41. REE abundances are unlike those in gabbros and tonalities from McIvor Hill and Macquarie Harbour (Fig 43).

v. Ewart Creek Sequence – comprises basalt, dolerite and gabbros interlayered with basic to felsic derived volcanoclastics. The igneous rocks are tholeiitic, co–magmatic and are equated with the Henty Dyke Swarm (Fig 41). In the Queenstown road section this sequence is dominated by volcanoclastics, which are interpreted to be contiguous with those in the western part of the Yolande River licence (Fig 37). On the basis of volcanoclastic type, nature of tholeiites and proximity to the Ordovician Denison Group, the Ewart Creek Sequence is correlated with the Tyndall Group.

4.2.3 CVC – WHITE SPUR

Outcrop in the NW sector of the Henty block is bound in the south by the NHF and is contiguous with the Hercules area to north. Principle units comprises basal CVC feldspar phyric pumiceous mass debris flows, which are equated with the Hercules/Rosebery footwall sequence. The debris flows are overlain, with apparent conformity – disconformity, by the White Spur Formation. The WSF comprises a number of felsic derived mass debris flows interspersed with siltstone and greywackes. Based on the occurrence of sulfide clasts and

intense sericitic alteration the basal WSF is equated with the Hercules hangingwall or possibly the host sequence.

4.3 STRUCTURE

The structural complexities of the Lower Palaeozoic sequence in the northern areas are outlined by Keele (1991), who shows that a number of distinct domains have been juxtaposed. North-trending open to isoclinal folds occur in all areas in the Cambrian sequence. However, at Lynchford and White Spur these trends are complicated by a Devonian NW trending fold system. Axial plane cleavage is associated with the latter folds and has acted as shear planes at Lynchford and Newton Creek.

Two regional fault sets are recognised: a NS set which includes the SHF and Great Lyell Fault (GLF), and an EW set, which includes the Linda Fault zone and Little Henty Fault. In the Henty area the intersections of these trends appear to be coincident with alteration and known mineral occurrences (Fig 40).

4.4 MINERALIZATION AND ALTERATION

Mineralization and alteration is associated with felsic to basic volcanics and regional structures and is considered to be mainly of Cambrian age. However alteration in the SHF and NW trending faults may be Devonian in age. The gravity data indicates that granites do not underlie the area, except across the northern most part of EL 11/85 (Fig 40).

Known mineralization includes the following occurrences:

- i. barite quartz veins with minor associated gold in the Yolande River Sequence at Lynchford and Howards Plains.
- ii. stringer and semi-massive galena sphalerite in andesitic volcanics at Henty Adits. Drill intercepts reported by Meares (1980) include 10m @ 3.76% Pb, 1.57% Zn, 14g/t Ag.
- iii. massive pyrite lens in siltstones associated with sericite-pyrite altered basalts at Henty Valley
- iv. felsic to intermediate volcanics carrying lens of sulfidic siltstones with disseminated galena sphalerite at 58100N, Newton Creek
- v. high grade massive sulfide clasts within coarse volcanoclastics at the Newton Creek spillway on the eastern licence boundary

vi. weakly anomalous base metals and gold within intense sericite–feldspar–pyrite alteration and localised silicification in basal WSF sediments and quartz porphyries.

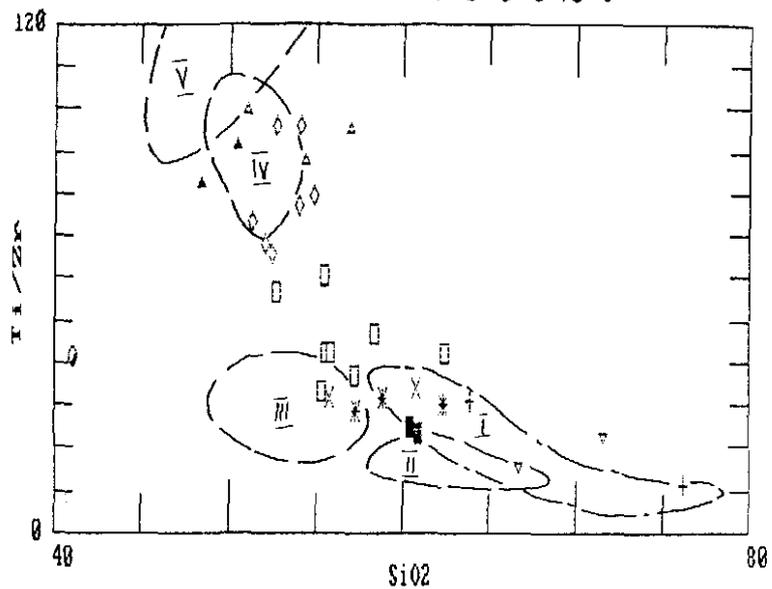
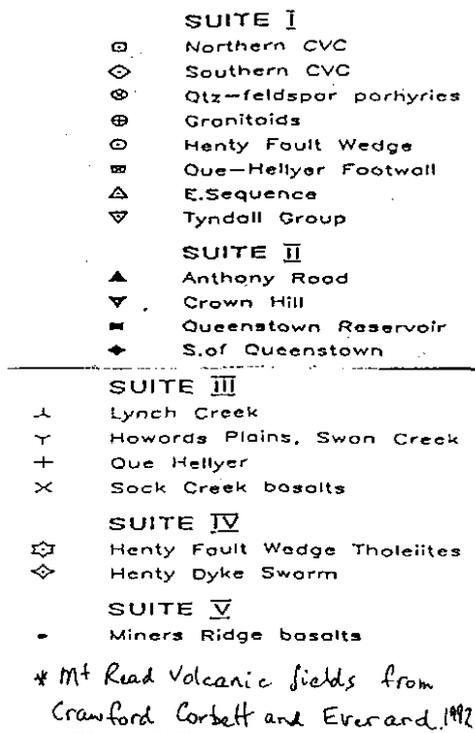


Fig. 41

Ti/Zr - SiO₂ plot for Henty Fault Wedge igneous rocks.

- △ Henty Valley basalts
- Henty Adits basaltic andesite
- Halls Rivulet Track Andesite
- ◇ Ewart Creek basalt - gabbro
- † Ophiolite complex tonalite
- X Ophiolite complex andesite dyke
- * Ophiolite complex andesite lava
- Ophiolite complex gabbro
- ▽ Quartz porphyritic rhyolite from White Spur Creek Fault Zone

5 cm

5362500

+

+

E.L. 11/85
HENTY AREA

5360000

+

+

5357500

+

+

5355000

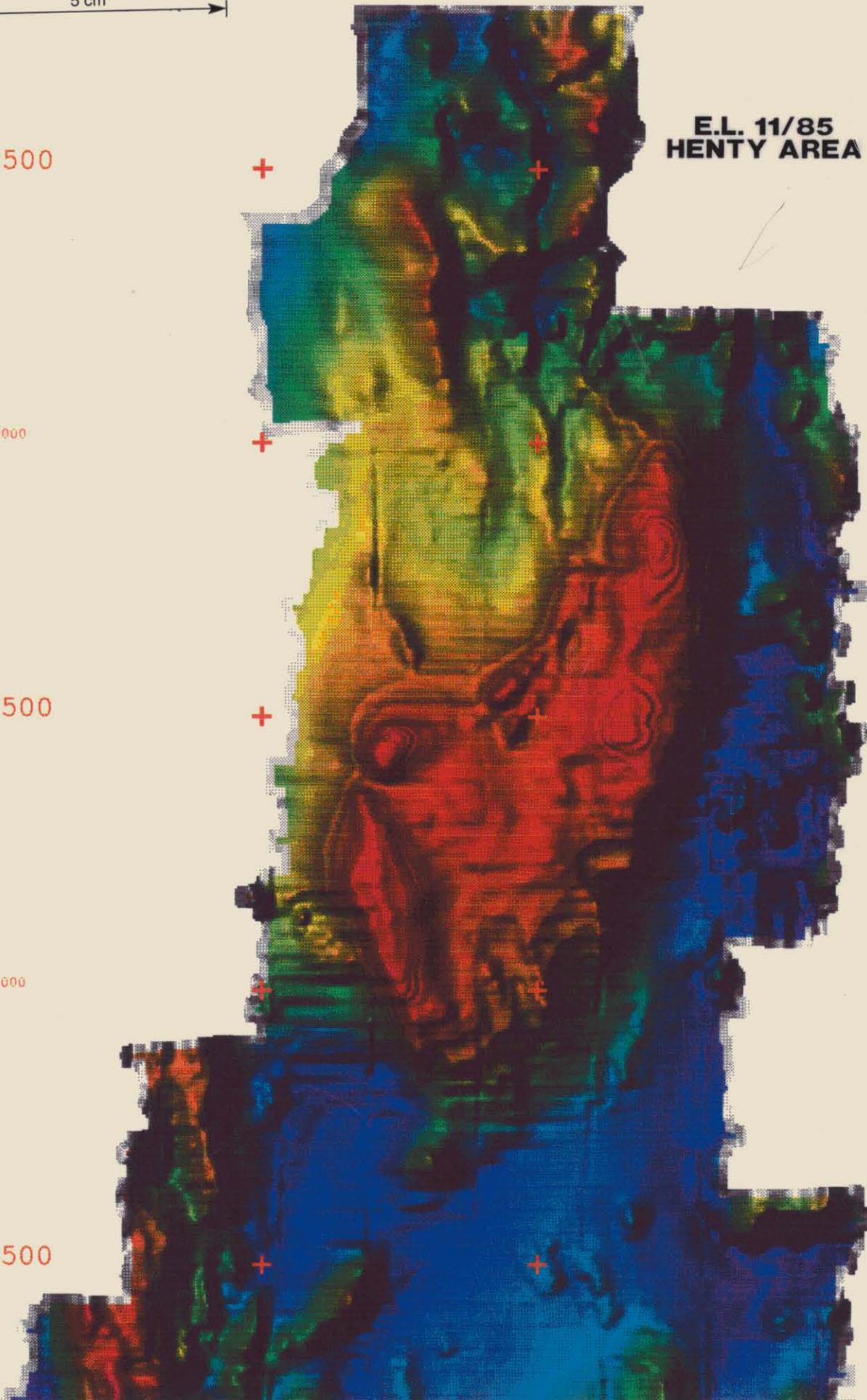
+

+

5352500

+

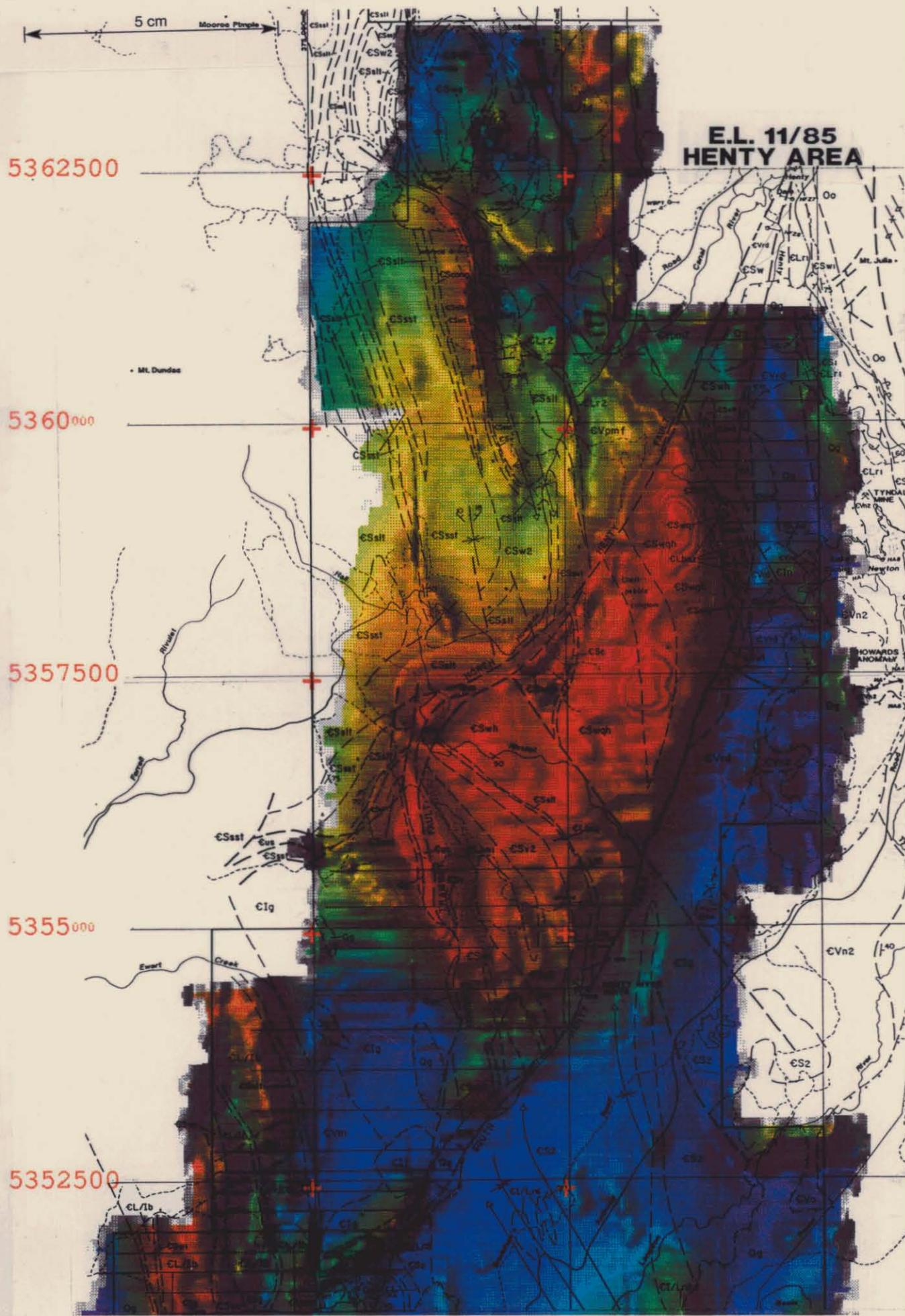
+



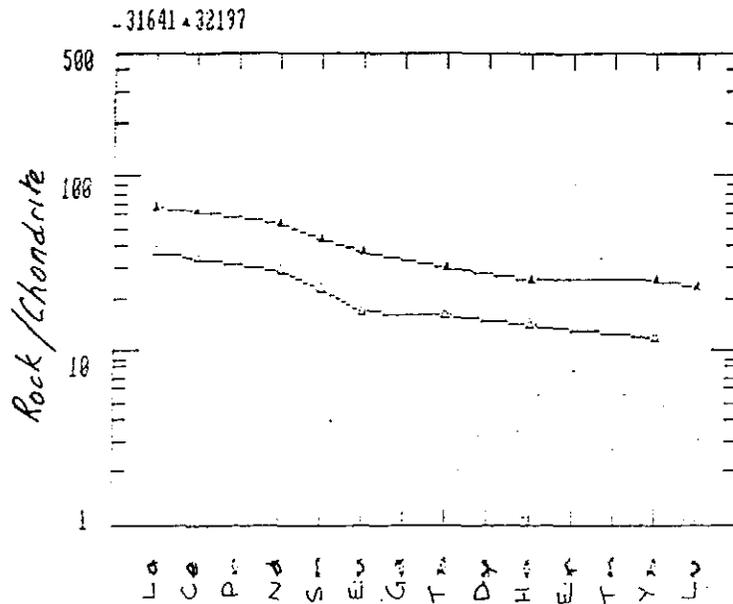
MAGNETICS - COLOUR DRAPE

066028

SUN 305° 70°



INTERPRETIVE GEOLOGY FOR LEGEND SEE 1:25,000 INTERPRETIVE GEOLOGY



(A)

Fig. 42

Comparison of chondrite normalised REE plots for:

(A) Henty Valley tholeiites

(B) Crimson Creek tholeiites

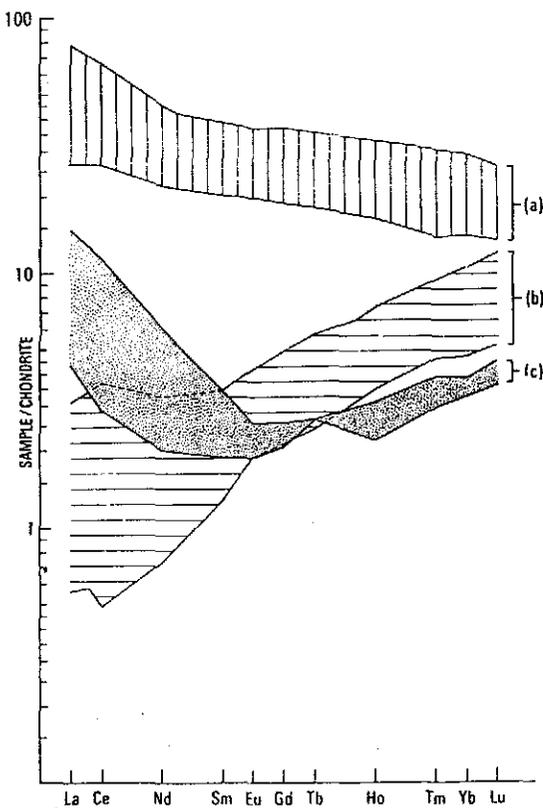


Figure 34. Comparison of chondrite-normalised REE patterns for Dundas Trough samples: (a) Crimson Creek Formation tholeiite; (b) Low-titanium tholeiite; (c) High-magnesian andesite.

(B) from Brown 1986.

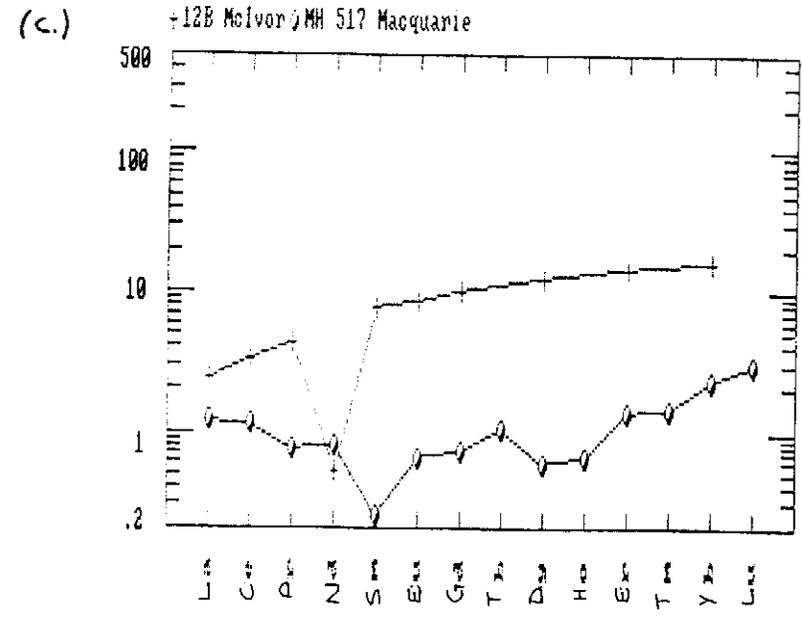
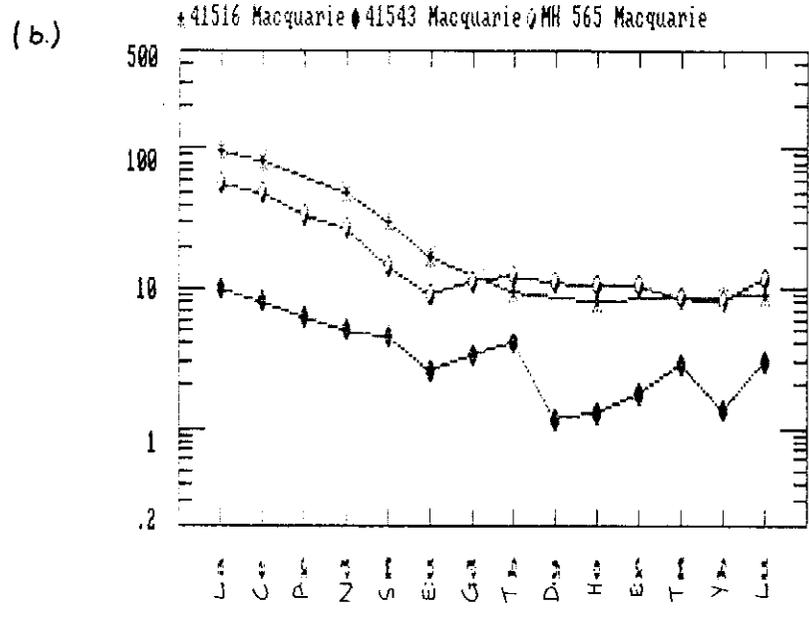
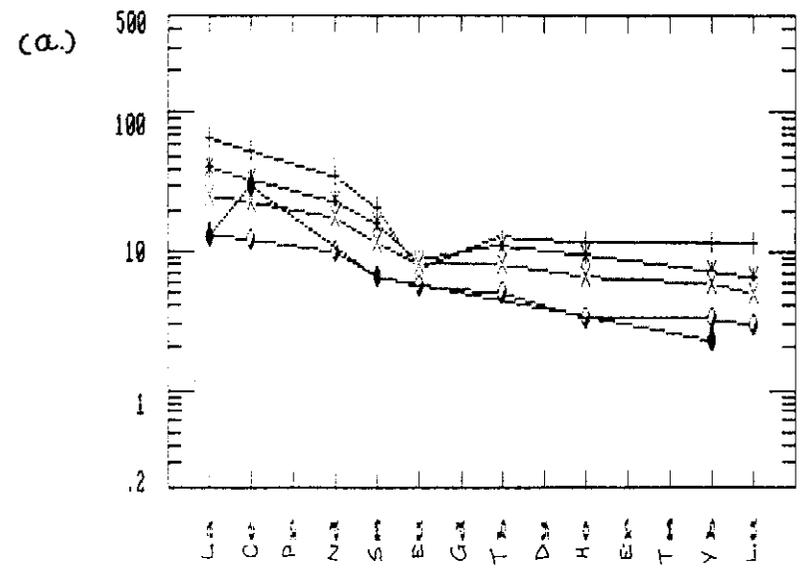


Fig. 43
 Comparison of chondrite normalised REE plots for ultramafic complexes from:
 (a) Henty Fault Wedge
 (b) Macquarie-Timbertops
 (c) McIvor - Macquarie

5. PREVIOUS EXPLORATION ON EL 11/85 AND 25/91

Poltock and FitzGerald (1991) presented a summary of early prospecting and exploration activities, including Mines Department drilling. The Department also undertook a 3 hole drill program at Madam Howards Plains barite prospect in 1963. Work completed during the previous (1990–91) period on the two retained blocks of EL 11/85, Lynchford and Henty, are summarised below.

At Lynchford a grid was established and mapping, UTEM and an orientation soil sampling program were completed. In addition an aeromagnetic survey was flown over the area. The main results of this work are:

- i. UTEM responses that are probably associated with lithologies and structures rather than mineralization.
- ii. location of minor galena sphalerite veinlets in siltstone in Roaring Meg Creek.

In the Henty block the grid established in 1989–90 by Pasminco Mining was mapped, in addition regional scale mapping was commenced at White Spur and Newton Creek. An aeromagnetic survey was flown at White Spur and gravity/magnetics interpretation was continued by Leaman. Important results from this work are:

- i. location of a massive pyrite lens at Henty Valley
- ii. defining mass debris flows in the White Spur Formation with sulfide clasts and sericite silica alteration suggestive of proximity to a mineralizing centre
- iii. location of andesites similar to those hosting the Henty Adits mineralization at Newton Creek

In addition to the work completed by Pasminco an honours student Robert Gibson discovered high grade massive sulfide clasts in a conglomerate at Newton Spillway.

6. WORK COMPLETED BY PASMINGO EXPLORATION 1991-92

6.1 Summary

Work completed by Pasminco Exploration during the year ending June 1992 included:

- Grid and EM loop line cutting at Newton Creek (30km) and Henty Valley (10.3km), both grids are AMG east west and slope corrected at 20m intervals
- Geological mapping at Henty Valley, Newton Creek and White Spur
- UTEM surveys at Newton Creek and Henty Valley
- Gravity survey, infilling Mines Dept regional data in the Henty block
- Aeromagnetic and gravity data interpretation of the Henty and Lynchford areas
- Soil and Wacker B/C horizon geochemistry at Newton Creek (352 samples), Henty Valley (133 samples) and Lynchford (367 samples). All samples were prepared for analysis by pulverising rather than sieving. For sample results and locations see Appendix A and Figs 27 - 32 *CUMULATIVE SAMPLE NO. FROM CYANUS ON. APPENDIX A FROM 91/92 WORK.*
- Rock geochemistry for characterising igneous rock types, alteration indices and ore/pathfinder suites. Some previously analysed samples were re-run for the pathfinder suite. Analyses are listed in Appendix A and sample descriptions listed in Appendix B

Detailed discussion of the results of this exploration are presented for each of the main project areas (see Fig 2).

6.2 Tyndall

6.2.1 INTRODUCTION

The Tyndall area lies east of the Henty River in the NE corner of the licence between 57400N and 61000N. The area includes lithologies of the Henty Fault Wedge, CVC and Tyndall Group, with extensive fluvioglacial cover on the eastern plateau (see Fig 4). The proposed tailings pond easement for the Henty Gold Mine lies within the area, centred at 60200N 79750E.

6.2.2 GRIDDING

The grid was designed to cover the prospective lithologies for a UTEM survey. 24.6km of lines and 4.5km of loop and access lines were cut. The grid has a common base line with the Aberfoyle grid to the east, using the same coordinates and cross lines.

6.2.3 STRATIGRAPHY AND LITHOLOGIES

The **Henty Fault Wedge** includes three lithological associations: viz a haematite facies siltstone and basic lavas, haematite-facies wackes and felsic volcanics, and grey siltstone and andesitic lava.

The haematite facies sediments are massive, cleaved, pink siltstone with frequent quartz chlorite veins and scattered chert and chert pebble conglomerates. Basalts are fine grained, aphyric lavas or sills and are closely associated with the White Spur Creek Fault. Geochemically the basalts are high TiO₂ tholeiites, which are equated with the Henty Valley volcanics, which are in turn correlated with the Eo-Cambrian Crimson Creek Formation.

Haematite-facies greywackes and quartz feldspar crystal volcanics/intrusives are associated with the South Henty Fault and may be exotic fault slices associated with this structure. The equigranular texture, absence of clasts and localised silicification would indicate that some felsics in this package may be intrusives.

The grey siltstones contain disseminated pyrite, pyrrhotite and occasionally veinlets of galena sphalerite. The andesites are plagioclase phyric and have similar geochemistry, petrology and lithological association to basaltic andesites at Henty Adits and Henty Valley.

The **CVC** east of the SHF, is interpreted as east dipping and facing with a normal erosional contact with the Tyndall Group in the east. The sequence is dominated by massive rhyodacite mass debris flows with minor siltstone, vitric siltstone and andesite lavas/intrusives.

The base of the **Tyndall Group** is poorly constrained in the area. A logical break would be the conglomerate horizon between the rhyodacite and andesite dominated sequences exposed at Newton Spillway. Additional evidence from Pb isotopes (Carr, 1992) see Appendix H supports this division. Lead in sulfide clasts at Newton Spillway have greater similarity to Dundas/Tyndall Group lead than CVC lead. In the Newton Creek area the group comprises plagioclase hornblende phyric andesite lavas and co-magmatic porphyries, fine to coarse grained volcanoclastics and quartz feldspar porphyritic rhyolite lavas.

6.2.4 GRAVITY AND MAGNETICS

Interpretation of magnetics in conjunction with the upgraded gravity coverage has been

completed by Leaman (Appendix F). The main features from the interpretation include the following:

- i. A proto–Great Lyell Fault is interpreted as the eastern rift margin to MR and passes through the Newton Dam – Henty Canal area
- ii. The intersection of the GLF and the ENE trending Little Henty Fault is coincident with the Newton Creek / Howards Anomaly area
- iii. *The GLF, SHF and NHF are interpreted as a west dipping family of structures*
- iv. The White Spur Creek Fault is interpreted as a primary structure and is potentially associated with mineralization
- v. Devonian granite does not extend beneath the area (see Fig 40). The southern edge of the subsurface Pine Hill Granite is located at 64000N

Leaman concludes that the best exploration potential lies in proximity to the intersection of structures in the Newton Creek area. This is supported by the known mineralization.

6.2.5 UTEM

The entire grid was surveyed using two loops located on the eastern side of grid. The survey is reported by Smith (Appendix C). There is good correlation between UTEM response and mapped structures and lithological units.

A summary of the main anomalies are as follows:

- i. The SHF is the most prominent conductive feature with the best anomalies at 60200N 79220E and 58400N 79270E. *Both are associated with carbonate–sericite altered–felsic volcanics with minor disseminated and stockwork pyrite.*
- ii. The HFW siltstone and andesite at 60000N 78900E, is anomalous. This anomaly maybe associated with graphite and/or pyrite/pyrrhotite within the shales.
- iii. Weakly conductive surficial responses are associated with pyritic alteration in felsic volcanics in the Henty Canal – 30N pit area and the interpreted strike continuation of the Newton Spillway conglomerate at 57800N 79600E and 58000N 79700E

Sulfidic siltstones at 58100N 79300E are not associated with any response, however this horizon may occur within the SHF north of 58300N and may be associated with responses north of this point.

6.2.6 SOIL AND WACKER GEOCHEMISTRY

Hand auger and Wacker B/C horizon sampling has been completed, to infill the Cyprus data over the most prospective areas. Results are listed in analytical reports (Appendix A) and sample locations plotted on Figs 29–31.

Samples with elevated values have been field checked, however only one area has been sampled more extensively. Anomalies can be subdivided into three groups, those interpreted to be directly associated with mineralization, those associated with Mn scavenging and those associated with elevated backgrounds in distinct lithological units.

Anomalous locations include the following:

i. 58100 – 58200N 79300E

Anomalous Pb (max 225ppm) and Zn (max 182ppm) is associated with disseminated pyrite–galena–sphalerite, which assays up to 0.5% combined Pb+Zn in rock chips. The anomaly has been followed up with 100m spaced infill lines of soil and rock chip sampling. The anomaly is best developed on line 58100N (see Fig 36).

ii. 59600N 79360E

Values of 197ppm Pb, 325ppm Zn and 0.19% Mn in altered felsic volcanics in SHF

iii. 58600N 79300E

Values of 490ppm Pb, 203ppm Zn and 1.34% Mn in manganiferous wad developed in fluvio-glacials. The Mn may be sourced from alteration within the South Henty Fault.

iv. 57800N 79100E

Values of 170ppm Pb, 141ppm Zn and 0.60% Mn, over slightly pyritic siltstones. Rock samples from the area are not anomalous

v. 58400N 79540E

Values of 820ppm Cu, 123ppm Pb and 498ppm Zn are associated with chloritic and limonitic basic volcanics and is interpreted to simply reflect higher background values.

6.2.7 ROCK GEOCHEMISTRY – ORE AND PATHFINDER SUITES

Samples were collected in the course of routine mapping and field checking soil anomalies. In addition, a suite of massive sulfide clasts from Newton Spillway were analysed. Sample descriptions and analyses are listed in Appendix A and B.

The main anomalies located are as follows:

i. 58100 – 58200N 79300E

Disseminated pyrite–galena–sphalerite in a fine grained sandstone, two samples, 32848 and 32850, analysed with the best values 0.29% Pb, 0.25% Zn, and 3g/t, Ag. Cu and Au are not anomalous.

ii. Newton Spillway massive sulfide clasts

Seven samples were analysed with the maximum values 0.15% Cu, 34.40% Pb, 23.99% Zn, 384g/t Ag and 0.72g/t Au. The zinc ratio $[100 \times \text{Zn}/(\text{Pb} + \text{Zn})]$ of these clasts ranges from 41–57 and is unlike massive sulfide mineralization at Rosebery and Hellyer which ranges from 60 – 70. These low values could be explained by secondary leaching and remobilisation alternatively the source sulfide body may be fundamentally different.

iii. 60200N 79140E

Locally silicified and chloritized chert pebble conglomerate is anomalous in Cu at 0.15% but not anomalous in gold or silver. The mineralization is probably associated with the SHF

6.2.8 LITHOGEOCHEMISTRY – LITHOTYPES

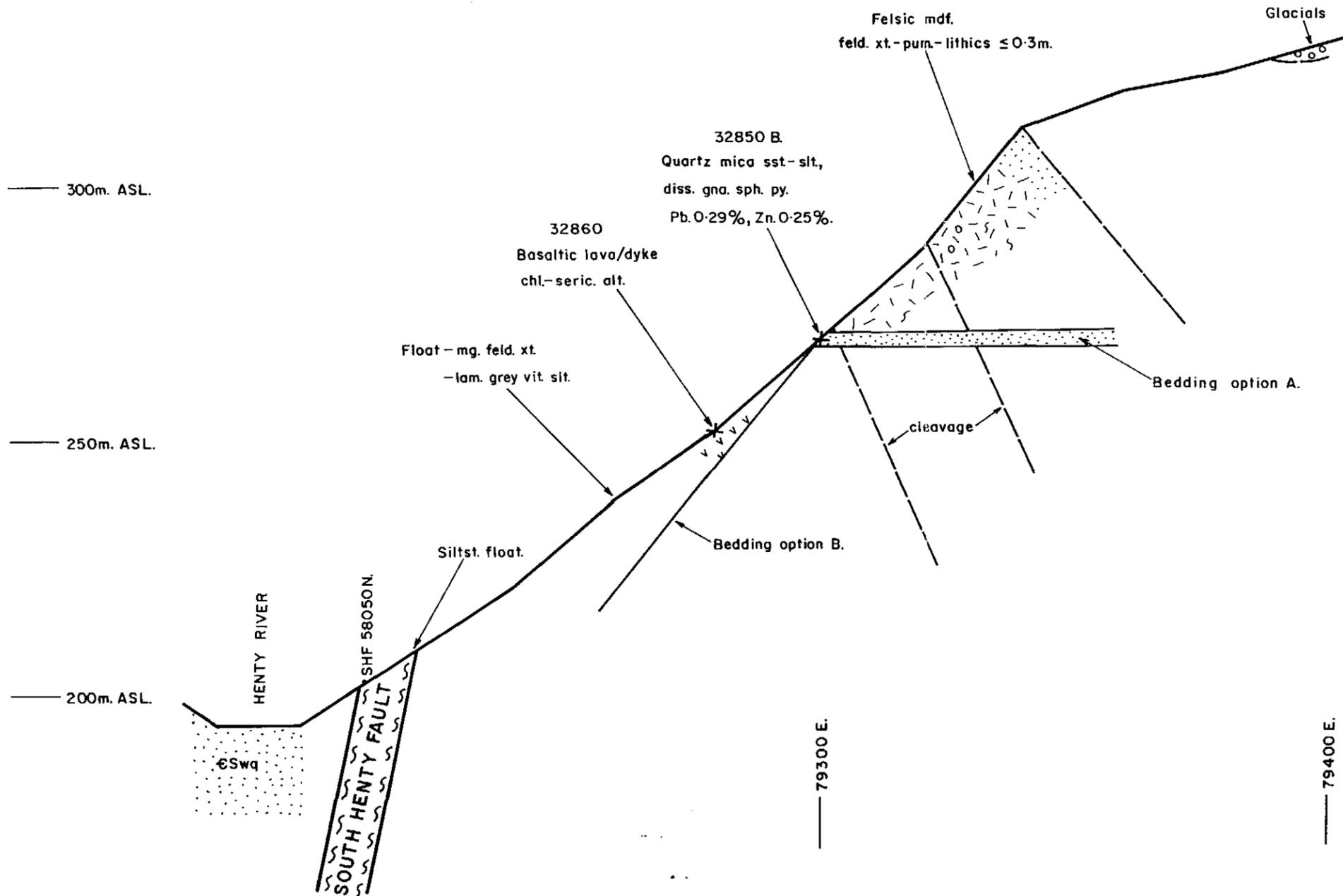
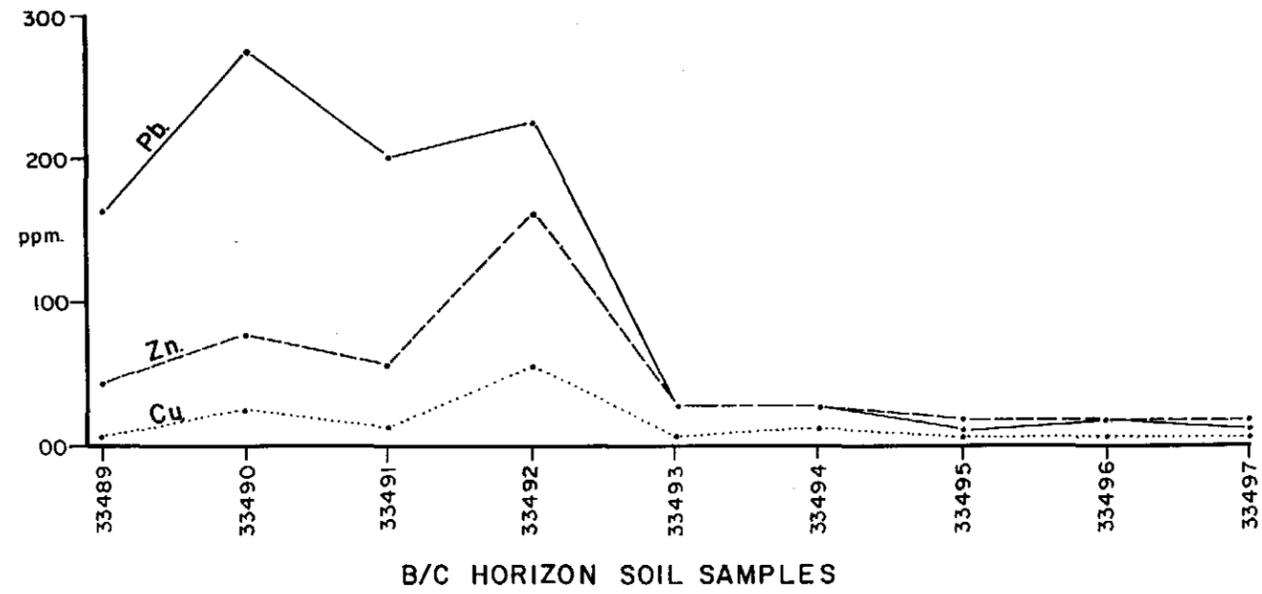
The data base includes lithologies from the CVC, Newton Spillway clasts and Tyndall Group and includes analyses from Pasminco and Gibson (1991). Data is presented on Ti – Zr, Ti/Zr – SiO₂ and normalised geochemical plots including major, trace and REE elements (see Figs 44a–c). Some comments from these plots are presented below:

Ti–Zr Plot (Fig 44a)

- i. separates all mapped units
- ii. clasts have a greater affinity with hanging wall
- iii. hanging wall andesites and andesite intrusives are similar

Ti/Zr – SiO₂ Plot (Fig 44b)

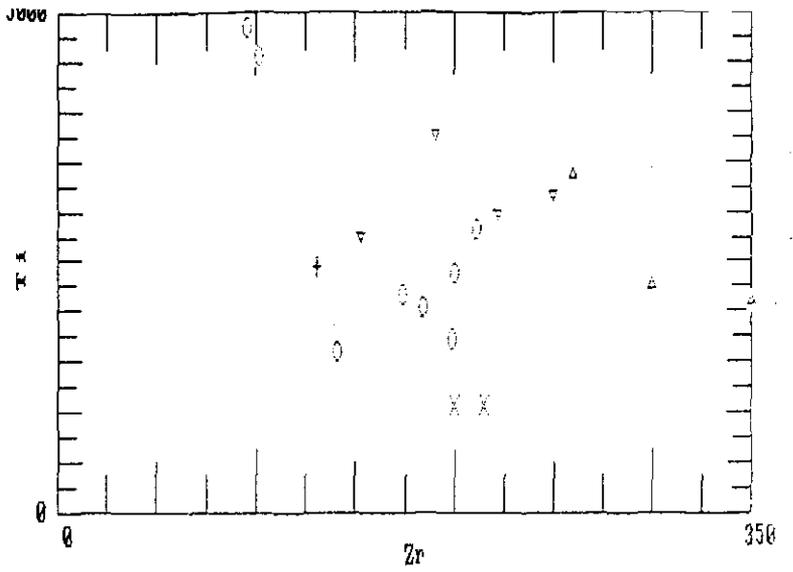
- i. hanging wall, footwall and clasts are coincident with the fields for Suites i and ii from Crawford et al (1992). The only exception, are two samples which are duplicates of a fine grained andesite clast (Gibson, 1991) and may represent a second magma series which is not coincident with any of Crawford's fields.
- ii. footwall volcanics and most clasts are rhyolitic
- iii. hanging wall volcanics and the andesite porphyry intruding the footwall are andesitic to dacitic



NB. - Bedding based on cleavage outcrop and cleavage/bedding in float.

PASMINCO EXPLORATION <small>A Division of Pasminco Australia Limited</small>	
COMPILED: R.A.P.	NEWTON CREEK SOIL/ROCK GEOCHEMISTRY LINE 58100 N
DATE: 6-7-92	
DRAWN: N.W.D.S.	
REF.:	
REVISIONS:	
DRAWING No.	SCALE 1:1000 FIG. No. 36

066039 (a)



- SUITE I**
- Northern CVC
 - ◇ Southern CVC
 - ⊗ Qtz-feldspar porphyries
 - ⊕ Granitoids
 - Henty Fault Wedge
 - Que-Hellyer Footwall
 - △ E.Sequence
 - ▽ Tyndall Group

- SUITE II**
- ▲ Anthony Road
 - ▽ Crown Hill
 - Queenstown Reservoir
 - ◆ S.of Queenstown

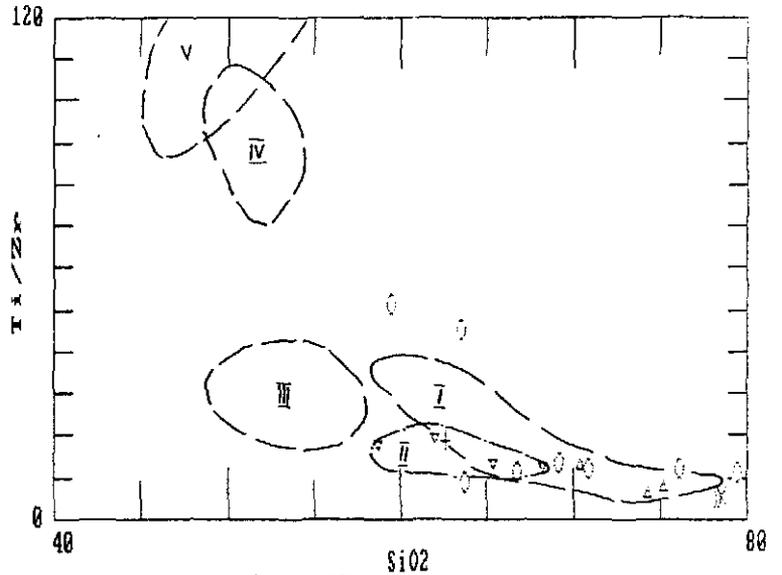
- SUITE III**
- ⋈ Lynch Creek
 - ⋈ Howards Plains, Swan Creek
 - ⋈ Que Hellyer
 - ⋈ Sock Creek basalts

- SUITE IV**
- ⋈ Henty Fault Wedge Tholeiites
 - ⋈ Henty Dyke Swarm

- SUITE V**
- Miners Ridge basalts

* Mt Read Volcanic fields from Crawford Corbett and Everard, 1992

(b)



(c)

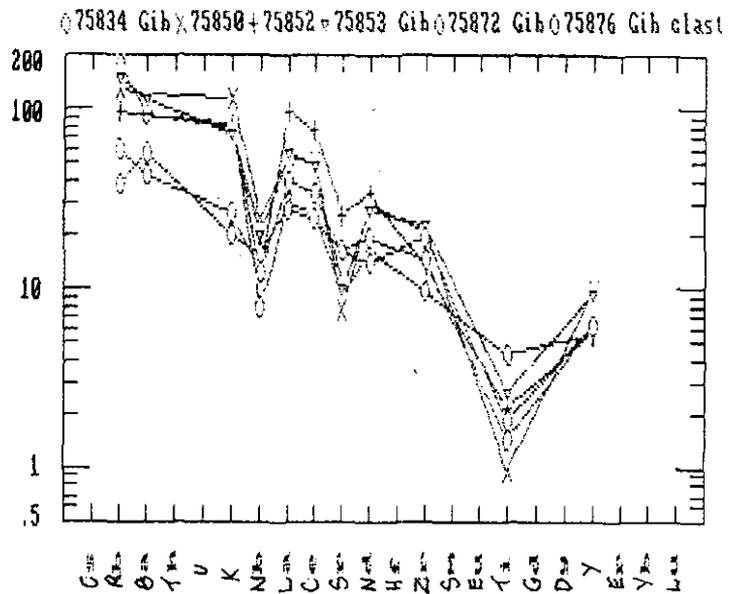


Fig. 44

Newton Spillway Conglomerate - geochemical plots for clasts, hangingwall and footwall lithotypes

(a) Ti - Zr

(b) Ti/Zr - SiO₂

(c) "PRIM" normalised geochemical pattern

⋈ Tyndall Group rhyolite lava

▽ Hangingwall andesite / dacite lava

† Andesite intrusive

△ Footwall rhyolite mass debris flow

Normalised elements (only clast and hanging wall data) (Fig 44c).

- i. A similar profile for all hanging wall samples with common relative depletions in Nb , Sr and Ti
- ii. differences between the hanging wall and clast samples are mainly in the mobile elements (Rb Ba K) and probably reflects a difference due to hydrothermal alteration.

6.2.9. LITHOGEOCHEMISTRY – ALTERATION

Alteration has been studied on a regional comparative basis within Newton Creek grid. Quantification of alteration is by the alteration index ($AI = 100 (K_2O + MgO) / (Na_2O + CaO + K_2O + MgO)$). The following comments summarise the key features of this study:

- i. Henty Fault Wedge andesites in the western sector of grid are not significantly altered, AI = 49–55 in samples 30973 and 30980
- ii. CVrd volcanics are variably sericite–silica–pyrite altered, three areas were sampled;
 - a. Henty Canal – 30N pit area: sericite chlorite silica pyrite alteration with AI=69 in sample 216481 adjacent to SHF, although alteration is strong, albitized plagioclase phenocrysts occur.
 - b. Newton Creek grid 379300–57750N, localised sericite pyrite alteration with AI=83, this may be associated with NW trending structures similar to that exposed on Anthony Road at 54500N and 56900N 380000E.
 - c. Rhyolite volcanoclastics which are footwall to the Newton Spillway conglomerate are not significantly altered, AI = 36–42.
- iii. Clasts from the Newton Spillway conglomerate have been analysed to define the alteration system that may have been associated with the massive sulfide mineralization. Petrologically, alteration has been described as sericite–calcite that has been overprinted by silicification and associated remobilisation and recrystallization of calcite (Crawford, Appendix G). Pyrite is not associated with the alteration. Alteration indices range between 9.8 – 29.7, reflecting K₂O and MgO depletion and addition of CaO. Pink clasts from the western end of the exposure are albite–epidote altered with AI=3.8 (CaO 9.57 Na₂O 5.73). Previously these clasts have been compared to Tyndall Group rhyolites but they are quite distinct on Ti/Zr – SiO₂ plot (Fig 44b).

In summary, volcanics on the Newton Creek grid from all associations have AI's in the range 31 – 55, probably reflecting regional alteration associated with metamorphism. However,

locally intense sericite pyrite silica alteration in the CVC CVrd may be associated with a mineralizing event with AI=83. Volcanic clasts in the Newton Spillway conglomerate have a low AI which is quite distinct from the footwall and hanging wall units and is characterised by carbonate and silica alteration.

6.3 Henty Valley

6.3.1 INTRODUCTION

The prospect is located in the southern part of the Henty block Fig 5 , lying between two splays of the SHF. Previous work in the area by EZ and Pasminco Mining was reported in Poltock and FitzGerald (1991). Work this year included gridding, soil and rock geochemistry, mapping, a UTEM survey and further magnetics/gravity interpretation.

6.3.2 GRIDDING

7.8km of lines were cut east of 74800E, to infill the grid established by Jenkins in 1990. Lines are AMG EW and NS, the latter for access and UTEM. In addition 2.5km of loop lines were cut.

6.3.3 GEOLOGY

Lithologies comprise four separate sequences, three from within the HFW (Henty Valley, Henty Adits and HFW ophiolite) and a fourth from the Yolande River Sequence, east of the SHF. All contacts between associations are faulted.

i. The Henty Valley Sequence from stratigraphic base to top includes:

- a. CSwq Quartz muscovite sandstone, graphitic pyritic siltstone and minor carbonates and massive pyrite lens. Sediments have been derived from Precambrian metasediments and ultramafics, and have lithological similarities to the Miners Ridge Sandstone at Lynchford.
- b. CLbn3: High TiO₂, tholeiitic basaltic andesites, massive to highly vesiculated and pervasively altered. The lavas have geochemical affinities with the Eo-Cambrian Crimson Creek basalts.
- c. CSc: Massive to bedded, grey to red haematitic chert. A comparison with recent cherts (Adachi et al, 1986) indicates that they have a biogenic rather than hydrothermal origin (Table 2). The cherts are closely associated with the CLbn3 andesites.

- d. CSwqm Haematite facies siltstone, greywacke and conglomerate, derived from Precambrian metasediments, felsic volcanics and ultramafics. Detrital magnetite and chromite are common.
- ii. Henty Adits andesite is located west of the above sequence and strikes NS adjacent to the 75000E baseline. The sequence includes grey, pyritic and fossiliferous siltstone and plagioclase pyritic andesites (CLbn2). Geochemically the andesites are calc-alkaline and equate with those at Henty Adits. Unaltered lavas have high background levels of Zn, up to 432ppm Zn.
- iii. The HFW ophiolite forms the northern boundary to the prospect. The contact is a NW dipping thrust (Leaman, 1991). Rock types include talc/serpentinite-altered ultramafics, gabbro and tonalite intrusives.
- iv. East of the SHF, the Yolande River Sequence comprises vitric siltstone, massive felsic derived sandstone and dacitic to rhyolitic porphyritic lavas and intrusives which outcrop on the steep eastern slopes of the Henty River valley.

6.3.4 STRUCTURE

The prospect is a structurally complex area bounded by two splays of the SHF. It is located within a regional ENE trending corridor of anomalous magnetic and gravity character (see Leaman, Appendix D). Due to these complexities and fluvio-glacial cover in areas of interest it is difficult to define the strike trend and extent of the massive pyrite occurrence. 2D magnetic and gravity modelling by Leaman on lines 5351300N and 375400E confirms the attitude of two bounding fault splays, which define a limit to the prospective package.

6.3.5 B/C HORIZON GEOCHEMISTRY

A combined survey using hand auger and Wacker sampling failed to achieve a complete B/C horizon coverage due to coarse grained fluvio-glacial deposits >15m thick. Anomalies are associated with CLbn2 andesites between 50600N – 51200N and to a lesser extent CLbn3 basaltic andesites between 51300 – 51400N/75060 – 75240E. The maximum anomaly is associated with CLbn2, 105ppm Cu and 410ppm Zn. This result simply may reflect high background levels in these andesites.

6.3.6 ROCK – ORE AND PATHFINDER GEOCHEMISTRY

Anomalous lead (0.21%) reported by Jenkins 1990 in a Wacker sample on Line 14N was followed up with rock chip sampling. Carbonated and possibly hornfelsed and siltstones were

located at a gabbro contact; rock samples returned 240ppm Pb and 102ppm Zn.

Follow-up sampling of the anomalous lead (0.21% Pb, reported in Jenkins (1990) by Wacker sampling on line 14N. Gave carbonated and possibly hornfelsed siltstone at a gabbro contact with 240ppm Pb and 102ppm Zn in rock chip sample No 32810. *repeated*

Limonitic float in a stream at 50960N 75600E (sample 32126) assayed 0.29% Ba. Follow-up rock chip sampling located carbonate-sericite altered dacite porphyry (sample 32815) with 0.11% Mn and 0.09% Ba.

6.3.7 ROCK - ALTERATION GEOCHEMISTRY

Alteration is restricted to the two basaltic andesite lavas, enclosing siltstones are pyritic but unaltered. Alteration is pyritic but unaltered siltstones as follows:

- i. CLbn2 are sericite-clay-pyrite-fuchsite altered, with alteration indices ranging from 52 - 96, with the maximum alteration located at 51000N 75070E. Rock chips have been previously reported from this location with a maximum of 0.20% Zn.
- ii. CLbn3 lavas are intensely pyrite-sericite-carbonate altered. Samples 31641 and 31666 have AI = 75 and 31676 has AI = 48. Rock chips have been previously reported from these samples with a maximum of 275ppm Zn in sample 31641.

6.3.8 UTEM

The EW grid was surveyed twice due to the incorrect placement of the eastern loop edge. A number of shallow weak conductive zones were located, the most prominent of these is associated with the SHF. Several potential sources for the conductive zones occur in the area and include: pyritic alteration associated with faults and andesites, pyritic and graphitic siltstones and possibly clay horizons in fluvio-glacial deposits.

6.4 White Spur

6.4.1 INTRODUCTION

The White Spur area is located in the NW sector of the Henty Block, bounded by the NHF in SE and Rosebery Mine Lease to the north. Work for the year includes regional geological mapping, limited lithogeochemistry, gravity survey and gravity/magnetic modelling.

6.4.2 GEOLOGY

Traverses were based on recent HEC canal and road cuttings, logging tracks and exposures in sparsely vegetated areas. Two stratigraphic sequences are recognised, viz a pumiceous debris flow (CVC/CVpmf) and the White Spur Formation (see Figs 5, 11 & 12). Both are dominated by felsic volcanic detritus.

The pumiceous debris flow (CVpmf) is a massive medium grained, feldspar phyric unit of rhyolitic composition with $Ti/Zr = 11.5$. This unit has lithological and stratigraphic similarities to the Hercules/Rosebery footwall sequence. Dacitic lava/intrusives with disseminated magnetite occur in the NE of the area.

The CVpmf is disconformably to unconformably overlain by the White Spur Formation (WSF). This contact relationship is based on similar bedding/layering trends within the two units. Between 59500N – 61500N the basal WSF comprises grey siltstone, felsic wackes, quartz phyric rhyolite lavas/intrusives and associated hyaloclastites. A similar lithological association is exposed on the Halls Rivulet track between the NHF and 75500E.

North of 61500N this basal sequence and the CVpmf are overlapped by mass debris flow conglomerates. This contact was intersected in Mines Department DDH MR1. The conglomerate is composed of clasts of quartz porphyritic rhyolite, mudstone, chert and massive sulphides in a tuffaceous matrix. The conglomerate fines upwards through tuffaceous sandstone, vitric siltstone, dark grey siltstone to micaceous wacke. The sequence has been intersected in previous exploration DDH, DCP 235, WSP 2 and WSP 103. Above the micaceous wacke there are at least six felsic volcanic mass debris flow units separated by siltstone greywackes.

From the regional mapping in this area three marker horizons have been recognised in the White Spur Formation: a basal conglomerate with sulfide clasts in MR1; micaceous wackes at the top of the MR1 mass debris flow and quartz crystal grit/mudstone on the Moores Pimple track at 64500N – 60150N 75700E and Howards Road at 58250N 76100E. Relationships between the two sections of the WSF and underlying CVpmf, and thicknesses of the formation are shown in stratigraphic sections (Fig 35).

6.4.3 ALTERATION

On a regional basis two alteration styles exist viz, chlorite albite in CVpmf and sericite in overlying White Spur Formation. Both of these may be associated with Devonian metamorphism (Eastoe et.al., 1987), however locally intense pyrite sericite and silica-pyrite may be associated with a volcanogenic hydrothermal system.

Chlorite and albite +/- magnetite-epidote alteration is ubiquitous in the CVpmf and to a lesser extent in some felsic mass debris flows within the WSF. This alteration is characterised by mottled banded patterns, often subparallel to bedding within the debris flows. A sample of this alteration (number 32818) near the WSF/CVC contact in the White Spur Canal has AI=28 with 5.86% NaO₂, and associated high magnetite content with magnetic susceptibilities (MS) between 1.0 – 16.0. Elsewhere this alteration style has MS <0.3.

Sericite-feldspar-pyrite alteration of a siltstone is exposed over a 100m section of the canal at 60500N 77300E. Sample 31584 has AI = 96. Ore and pathfinder analyses from the same area are only anomalous in arsenic (max 450ppm As) which is associated with quartz pyrite veins. Allen (1992) compares this with alteration assemblages in siltstone adjacent to massive mineralization at Hercules and Rosebery.

Silicification occurs within WSF sandstone at 59850N 77150E and in rhyolite lavas at 60800N 76900E. Litho geochemistry is only available for the first location where AI = 36. Minor galena sphalerite is associated with this alteration.

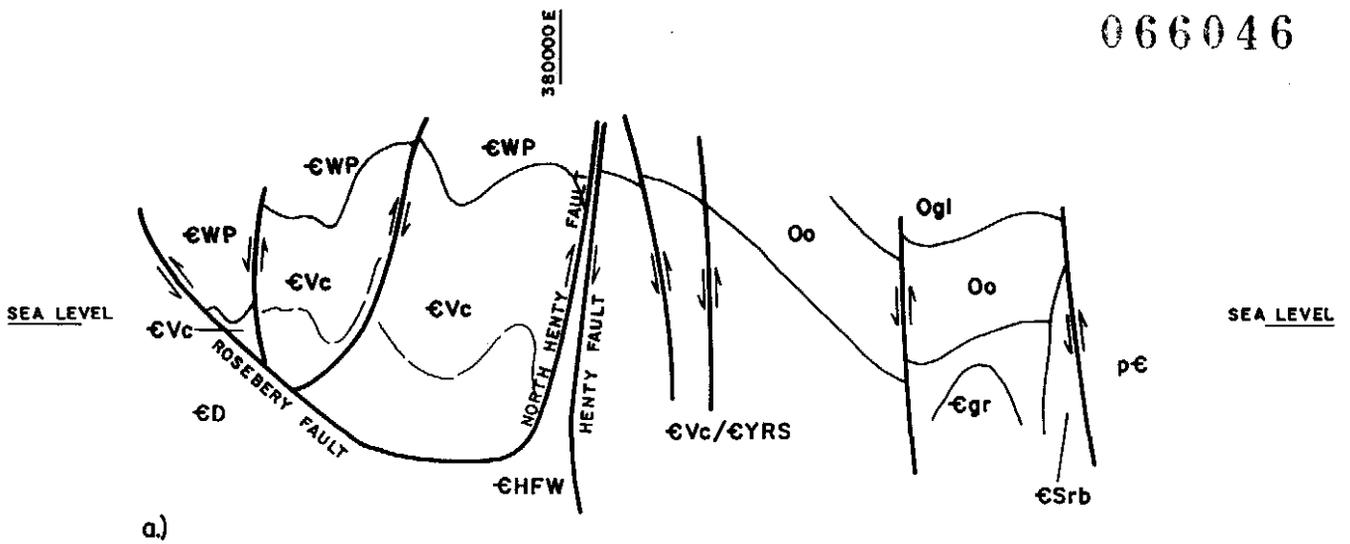
6.4.4 ROCK – ORE AND PATHFINDER GEOCHEMISTRY

Anomalous rock chip sample results were located in three areas:

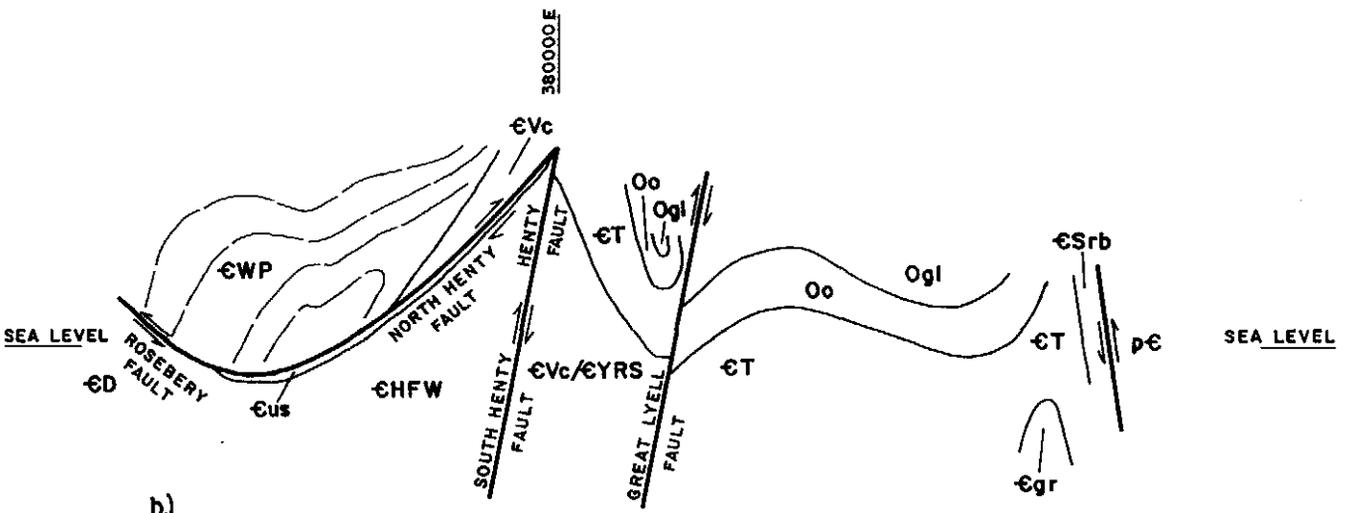
- i. jointed limonitic silicified rhyolite porphyry at 60700N 376750E. Sample 32125 assayed 780ppm Zn and 0.104ppm Au.
- ii. limonite clasts and joints in a mass debris flow at 60500N 377025E. Sample 32121 assayed 0.24% Pb.
- iii. limonite veins <25mm thick in greywackes at 63625N 376600E. Sample 32825 assayed 0.41% Pb, 0.05% Zn, 0.72% Mn and 580ppm As.

6.4.5 STRUCTURE

The White Spur area is bounded in the SE by the NHF. Leaman (Appendix D) models this structure as a shallow to moderate west dipping fault beneath the WSF. The NHF is



a.)



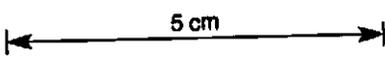
b.)

a.) 66500 N Rosebery Mine Lease. Modified after Fig.5 Keele, 1991.

b.) 58500 N E.L. 11/85 YOLANDE (HENTY).

LEGEND

Ordovician - Ogl	Gordon Limestone	€Vc	Central Volcanics
	Oo	€D	Dundas Group
Cambrian - €T	Tyndall Group	€HFw	Henty Fault Wedge
	€gr	€YRS	Yolande River Sequence
	€Srb	€us	Ultramafics
	€WP	p€	Pre Cambrian



 PASMINCO EXPLORATION <small>A Division of Pasminco Australia Limited</small>	
COMPILED: R.A.P. DATE: 18-7-92 DRAWN: N.W.D.S. REF.: REVISIONS:	INTERPRETIVE GEOLOGICAL SECTIONS, SHOWING RELATIONSHIPS BETWEEN MAJOR FAULTS
DRAWING No.	SCALE 1:100,000  2 km.
	PRG. No. 38

interpreted to be linked with the Rosebery Fault, the two forming a thrust sole to a north plunging "flower – pop-up" structure see Fig 38. The magnetic feature associated with the WSF is interpreted to be sourced from ultramafic within the fault zone.

On the basis of structural styles, the area can be divided into two regions, north and south of 62000N. To the north a series of NS trending synclines and anticlines, which have been modified by NW trending folds to produce an "egg carton effect". South of 62000N the WSF strikes NS and is west dipping and facing, with the exception of a 1km wide corridor adjacent to the NHF where both N and S plunging folds occur (Keele 1991).

These two different fold styles within the same sequence are separated by a NW trending fault, which is a possible extension of WSCF. This structure is located in the White Spur Creek valley and is obscured by fluvio-glacial cover (see Fig 11) but is a prominent feature in the magnetics (Leaman, Sept 1991 and Fig 39). This fault has either acted as a transfer zone allowing the two domains to deform independently of each other or juxtaposed different parts of a single fold. In the latter case the northern area represents the axis of an antiform with a collapsed zone in the anticlinal hinge and the southern area is a west dipping limb of the anticline (Keele, 1991).

6.5 Lynchford

Work in this area consisted of soil geochemistry and was aimed at evaluating UTEM responses and a sequence of siltstones and andesites for massive sulphide mineralization. Magnetics and gravity modelling has been completed on a regional basis.

6.5.1 SOIL GEOCHEMISTRY

Following the results of orientation sampling reported in 1990–91, B/C horizon soil sampling was undertaken over several areas; the entire sample pulverised and a split assayed for Cu Pb Zn Mn Ba As. Sample locations and analyses are plotted on Fig 27 & 28.

Lithological units are defined by Cu and Mn results. A considerable range in background values exists. The extremes are in the Lynch Creek Basalt where Cu is <225ppm, Mn is <620ppm and the Miners Ridge Sandstone where Cu and Mn are both <20ppm.

The highest ranked UTEM response trends E, G and D, were sampled. Significant results

include the following:

- i. **G** Spotty anomalies with maximum values of 0.33% Ba, 174 Pb and 200ppm As. These values and the UTEM axis are interpreted to be associated with a quartz-veined shear zone in graphitic siltstone on the contact of the Miners Ridge Sandstone
- ii. **D** Siltstone horizon in andesitic volcanoclastics with maximum value of 174ppm Zn.

Andesites, with geochemical affinities with the Que-Hellyer hanging wall, and overlying siltstones were sampled. The first phase of sampling located upto 685ppm Pb in siltstone. Re-sampling this site returned 173ppm Pb, which is still anomalous for the siltstone in this area. Spot anomalies of Cu, Pb and As are associated with old prospect pits on quartz veins and NW trending faults with maximum values 420ppm Cu, 220ppm Zn and 200ppm As.

In summary, the soil sampling has failed to enhance the UTEM anomalies. However, anomalous Pb associated with the siltstone /andesite contact requires further follow-up even though this feature is not associated with a UTEM response.

6.5.2 GRAVITY AND MAGNETICS

Results of the gravity/aeromagnetics modelling and interpretation by Leaman (Appendix E) include the following:

- i. The main magnetic anomaly is coincident with andesitic volcanoclastics
- ii. Little correlation exists between magnetics and mapped units suggesting that magnetic features are associated with concealed structures and units. This implies that there are low angle detachments and unconformities within the block.
- iii. Cambrian sequences within the licence are relatively thin. The eastern margin of the Lower Palaeozoic trough is located in the Queen River area
- iv. known mineral occurrences are associated with ENE - WNW trending structures

7. EXPENDITURE

Total expenditure on EL 11/85 during the twelve month period to 30 June 1992, was \$312 107 bringing the total expenditure on the licence since inception on 21 August 1985 to \$975 671. The total expenditure on EL 25/91 since it was granted on 30 November 1991 is \$10 481.

Details of the 1991 - 92 expenditure are as follows:

	EL 11/85	EL 25/91
Personnel: Salaries, Wages & Oncosts	43 217	5 020
Travel & Accommodation	2 516	
Geological Contractors	48 286	
Petrology	2 840	
Geophysical Consultants	10 230	
Gravity Survey, including topographic control	12 537	
UTEM Survey	27 091	
Aeromagnetic Survey - reprocessing data	5 375	
Geochemical Contractors - Wacker sampling	13 833	
Analytical Services	20 952	
Track cutting, Gridding	38 222	
Drilling: Storage existing core	2 410	
Other Contractors: freight etc	421	12
Drafting Services	12 566	
Store & Supplies	6 707	471
Vehicles, Plant & Equipment	6 653	339
Tenement Costs	2 470	1 514
Computing	3 533	77
Office Running Costs	23 870	2 032
Total Direct Costs	283 729	9 525
Administration, Management Fee	28 373	953
TOTAL EXPENDITURE	312 109	10 478

8. CONCLUSIONS

Exploration during 1991–92 on EL 11/85 has focused on the prospective areas for polymetallic massive sulfide mineralization which were defined in the previous year. Two of these areas, Newton Creek and Henty Valley, are now at the drilling stage, whereas at Lynchford and White Spur the target areas are well defined but further work is required prior to committing to drill testing.

Exploration in EL 25/91 is at grass roots stage and it will be necessary to thoroughly evaluate previous exploration to define priority areas for massive sulfide potential.

The prospect areas occur within a range of geological settings, hosted by felsic to mafic volcanics, within structural corridors that can be recognised in both geological and magnetic/gravity data. Volcanic sequences are more diverse than originally interpreted. Analogies with the Rosebery–Hercules, Que–Hellyer sequences have been inferred by association with volcanic stratigraphy, lithogeochemical characteristics and structural style. In addition, some basalts in the Henty Fault Wedge have affinities with the Eo–Cambrian Crimson Creek Formation. The ultramafic body has calc–alkaline characteristics and may be associated with the formation of the Mt Read Volcanics.

9. RECOMMENDATIONS EL 11/85

9.1 EL 11/85 Yolande

Exploration licence 11/85, Yolande is due for renewal for an eighth year of a maximum ten year period of tenure on the 21 August 1991. Several major prospect areas have been identified and it is imperative that these are evaluated early in the new licence year, including the first diamond drill testing of the area since the 1970's.

A major exploration program is recommended to evaluate the potential for economic massive sulfide mineralization at the following prospect areas:

i. Newton Creek

Drilling: 58100N 79300E testing the sulfidic siltstone horizon and targets generated by the above work. Drilling may need to be helicopter – supported to minimise environmental disturbance.

Geology: Detailed mapping and rock geochemistry of soil and UTEM anomalies

Geochemistry: Litho-geochemistry aimed at defining alteration zones and lithotype affinities

ii. Henty Valley

Drilling: 51300N 75400E massive pyrite occurrence, detailed drill profile mapping will be necessary prior to commencement. Drilling would probably need to be helicopter-supported in this area because of difficult access.

iii. White Spur

Gridding: Over an area of alteration and anomalous geochemistry at the base of the White Spur Formation between 59800N – 61000N, approximately 15 line km total.

Geochemistry: B/C horizon soil and Wacker sampling on the above grid

Geophysics: Compilation and enhancement of the Mt Lyell IP data. Possible additional EIP or TEM survey.

iv. Lynchford

Geochemistry: Field evaluation of soil anomalies generated in 1991–92

Drilling: Possible targets generated by soil geochemistry

v. Ophiolite

andesite 5352400– 5354400N / 375000E

Geochemistry: Soil and rock alteration geochemistry on the Pasminco Henty

grid

vi. Basin Lake

Geology: Reconnaissance evaluation of the intersection of CVC/Yolande River Sequence contact with ENE trending structural and alteration corridor.

Geochemistry: Ore and alteration rock geochemistry

Geophysics: Ground evaluation of gravity and magnetics trends

9.2 EL 25/91 Yolande River

Exploration licence 25/91 is due for renewal for a second year of a maximum ten year period of tenure on 29 November 1992. Exploration is at the grass roots stage. Work in the coming year should be directed toward defining priority areas for detailed evaluation. This work will include:

i. Geology:

Semi regional mapping and sampling across the whole tenement, focussing on the strike extent of the Henty Valley structural/alteration zone

ii. Geophysics

Review and interpretation of existing gravity data

Aeromagnetic survey over the licence including possible coverage of the CVC-Yolande River Sequence contact located 1km east of the licence

iii. Geochemistry

Review existing stream and rock geochemistry and field check existing anomalies. Possible additional sampling in areas of interest.

Litho-geochemistry, compilation of existing data, defining magma series and their affinities within the licence and regionally in western Tasmania.

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- CODES: AMIRA Project P 291 – Structure and mineralization of western Tasmania

KEYWORDS

GRAVITY, UTEM, MAGNETICS, SOIL-ROCK-LITHO GEOCHEMISTRY, PETROLOGY.

VOLCANOGENIC, LEAD, ZINC, MASSIVE SULPHIDE, FAULT ZONE.

ULTRAMAFICS, BASALTS, ANDESITE, RHYOLITE, VOLCANICLASTIC, OXIDE FACIES,
THOLEIITE, CALC-ALKALINE.

MT READ VOLCANICS, CRIMSON CREEK FORMATION, DUNDAS GROUP, TYNDALL
GROUP.

YOLANDE, QUEENSTOWN, LYNCHFORD, HENTY VALLEY, HENTY ADITS, NEWTON
CREEK, MADAM HOWARDS BARITE, WHITE SPUR.

APPENDICES

APPENDIX A.
ANALYTICAL REPORTS

File Name C:\NEWPET\HENTY.ROC

Sample	300248	30055	30085	30099	30102	30103	30105	30117	30124	30126
Northing	5355246	5352157	5352190	5353200	5353195	5353198	5353605	5352794	5354013	5354394
Easting	377115	375470	375450	376590	376946	376875	374320	376080	374548	374780
Symbol	6	14	13	9	11	11	14	13	14	11
Syn Colour	1	1	1	1	1	1	1	1	1	1
Rock Type	0	0	0	0	0	0	0	0	0	0
SiO ₂	60.94	52.48	76.16	66.70	62.35	58.90	52.10	63.87	51.34	57.35
TiO ₂	0.72	0.76	0.45	0.70	0.49	0.51	0.82	0.59	0.76	0.46
Al ₂ O ₃	14.58	19.10	12.30	14.00	17.87	17.39	19.58	17.56	16.85	16.27
Fe ₂ O ₃	7.01	8.95	4.89	4.72	6.36	6.95	7.65	7.90	9.10	6.23
FeO	-	-	-	-	-	-	-	-	-	-
MnO	0.16	0.15	0.03	0.11	0.09	0.12	0.12	0.10	0.57	0.14
MgO	4.73	5.86	2.37	1.46	3.92	8.71	5.11	5.58	4.09	8.50
CaO	5.77	5.62	0.10	2.03	0.25	2.28	9.62	0.21	11.67	4.44
Na ₂ O	3.82	4.87	2.58	1.60	8.48	3.63	4.03	2.40	3.56	5.92
K ₂ O	2.12	2.06	1.06	3.03	0.11	1.42	0.84	1.74	1.94	0.63
P ₂ O ₅	0.14	0.15	0.06	0.10	0.08	0.09	0.13	0.04	0.12	0.07
Total	99.99	99.56	100.00	94.95	100.01	100.00	100.00	100.00	100.00	100.02
Mg #	57.20	56.46	48.98	37.99	54.97	71.28	56.95	58.31	47.09	72.99
Cr	156	34	7	-	134	402	123	79	25	351
Mn	38	38	15	-	78	269	66	45	39	186
W	180	241	40	-	43	108	179	141	238	109
Cu	3	196	210	-	4	17	103	8	11	7
Pb	16	8	3	-	10	7	7	4	6	5
Zn	111	92	37	-	58	72	65	98	164	70
Rb	17598	17100	8799	25152	913	11787	6973	14444	16104	5230
Pb	67	57	30	160	2	35	25	53	81	13
Sr	338	596	31	45	56	183	281	31	137	255
Nb	12.5	1.9	13.2	-	8.0	8.9	2.7	9.1	4.4	8.1
Zr	185	69	234	260	97	96	72	113	62	95
Y	4316	4556	2698	4197	2938	3057	4916	3537	4556	2758
Y	29	26	25	30	18	19	24	13	25	23
Th	13.00	8.00	11.00	-	6.00	6.00	5.00	8.00	6.00	7.00
La	28.10	-	21.60	-	-	13.60	-	-	-	-
Ce	60.80	-	46.90	-	-	28.60	-	-	-	-
Pr	-	-	-	-	-	-	-	-	-	-
Nd	28.50	-	22.40	-	-	15.00	-	-	-	-
Sm	5.94	-	4.17	-	-	3.30	-	-	-	-
Eu	1.32	-	0.57	-	-	0.67	-	-	-	-
Gd	-	-	-	-	-	-	-	-	-	-
Tb	0.96	-	0.65	-	-	0.56	-	-	-	-
Dy	-	-	-	-	-	-	-	-	-	-
Ho	1.16	-	0.91	-	-	0.72	-	-	-	-
Er	-	-	-	-	-	-	-	-	-	-
Yb	2.60	-	2.55	-	-	1.59	-	-	-	-
Lu	0.39	-	0.40	-	-	0.22	-	-	-	-
Density	2.50	2.56	2.38	2.40	2.44	2.52	2.58	2.48	2.66	2.52

File Name C:\NEWPET\HENTY.ROC

Sample	30155	30159	30173	30194	30857	30862	30869	30889	30922	30973
Nothing	5354789	5354791	5351197	5351195	HR 5	HR 5	HR 5	HR 5	5356730	5359880
Easting	375861	375720	375069	373588	102m	156m	231m	337m	376310	378890
Symbol	12	12	4	14	4	4	4	4	14	4
Sym Colour	1	1	1	1	1	1	1	1	1	1
Rock Type	0	0	0	0	0	0	0	0	0	0
SiO ₂	60.80	55.80	62.42	54.05	58.45	57.25	55.48	52.74	54.85	55.55
TiO ₂	0.34	0.37	0.85	0.85	1.20	0.94	1.01	1.21	0.70	0.92
Al ₂ O ₃	15.41	16.92	17.52	18.22	16.12	18.25	18.07	18.26	18.34	19.79
Fe ₂ O ₃	4.47	5.43	6.57	8.57	10.22	8.29	8.75	11.62	10.09	8.95
FeO	—	—	—	—	—	—	—	—	—	—
MnO	0.09	0.09	0.23	0.16	0.22	0.22	0.32	0.86	0.24	0.16
MgO	6.10	9.32	2.89	6.14	2.46	3.22	2.92	1.80	6.60	5.37
CaO	5.07	5.90	3.90	5.04	6.36	6.18	7.21	7.93	3.75	2.82
Na ₂ O	7.20	3.72	1.65	6.48	3.37	2.91	4.78	2.22	3.70	4.52
K ₂ O	0.23	1.83	3.84	0.35	1.40	2.59	1.30	3.13	1.58	1.78
P ₂ O ₅	0.09	0.09	0.13	0.15	0.19	0.15	0.15	0.23	0.16	0.14
Total	100.00	99.96	100.00	100.01	99.99	100.00	99.99	100.00	100.01	100.00
	↓		↓		↓		↓			
Mg #	72.12	75.68	46.56	58.66	32.28	43.48	39.79	23.48	56.44	54.30
Cr	124	408	116	44	12	40	23	72	51	159
Ni	54	180	57	32	7	26	25	50	43	79
V	113	106	192	259	308	204	264	265	248	223
Cu	3	2	86	151	42	48	29	77	75	53
Pb	3	4	62	4	26	24	4	7	7	69
Zn	17	20	432	90	327	222	302	855	175	812
K	1909	15191	31876	2905	11621	21500	10791	25982	13116	14776
Rb	6	53	148	5	44	95	57	122	56	74
Sr	167	194	46	114	367	95	144	84	94	184
Nb	5.6	5.6	6.4	2.6	8.7	6.7	4.9	5.7	3.0	7.5
Zr	60	70	120	66	153	152	100	129	53	131
Ti	2038	2218	5096	5096	7194	5635	6055	7254	4197	5515
Y	14	16	19	22	38	30	27	29	18	28
Th	4.00	4.00	5.00	4.00	10.00	9.00	7.00	9.00	5.00	7.00
La	8.64	-	16.60	-	21.40	-	-	18.40	-	-
Ce	20.60	-	35.20	-	48.20	-	-	41.30	-	-
Pr	-	-	-	-	-	-	-	-	-	-
Nd	11.30	-	19.00	-	25.30	-	-	23.90	-	-
Sm	2.43	-	3.74	-	5.56	-	-	4.84	-	-
Eu	0.61	-	0.81	-	1.45	-	-	1.01	-	-
Gd	-	-	-	-	-	-	-	-	-	-
Tb	0.40	-	0.67	-	0.94	-	-	0.82	-	-
Dy	-	-	-	-	-	-	-	-	-	-
Ho	0.50	-	0.74	-	1.26	-	-	1.05	-	-
Er	-	-	-	-	-	-	-	-	-	-
Yb	1.28	-	1.75	-	3.34	-	-	2.70	-	-
Lu	0.17	-	0.25	-	0.52	-	-	0.39	-	-
Density	2.47	2.54	2.47	2.55	2.54	2.53	2.54	2.59	2.56	2.53

066059

File Name	C:\NEWPET\HENTY.ROC										
Sample	30980	30987	31641	31666	31676	31683	32170	32197	32806	32823	
Northing	5359750	5351089	5351285	5351524	5351476	5350962	5358535	5359595	5360032	5356200	
Easting	378838	374094	375328	375358	375256	375126	379039	378779	378770	376020	
Symbol	4	14	7	7	7	8	9	8	14	2	
Sym Colour	1	1	1	1	1	1	1	1	1	1	
Rock Type	0	0	0	0	0	0	0	0	0	0	
SiO ₂	55.84	52.75	56.99	51.03	54.39	48.38	71.52	50.51	54.09	41.09	
TiO ₂	0.96	1.31	2.13	2.57	2.65	3.62	0.37	3.84	1.09	0.18	
Al ₂ O ₃	20.00	15.84	11.34	13.64	14.13	15.61	12.90	15.38	19.84	17.68	
Fe ₂ O ₃	9.56	11.36	16.35	17.65	12.96	15.65	7.27	16.25	11.68	5.34	
FeO	—	—	—	—	—	—	—	—	—	—	
MnO	0.14	0.21	0.19	0.34	0.18	0.29	0.06	0.20	0.11	0.18	
MgO	6.07	5.70	9.07	9.07	7.40	7.09	4.79	6.24	6.71	10.56	
CaO	1.16	6.29	2.76	3.46	4.54	5.46	0.38	3.32	1.48	24.35	
Na ₂ O	4.91	5.19	0.39	0.20	3.41	2.65	0.08	3.40	3.19	0.54	
K ₂ O	1.23	1.17	0.49	1.71	0.02	0.72	2.47	0.31	1.57	0.03	
P ₂ O ₅	0.14	0.18	0.30	0.34	0.32	0.52	0.16	0.55	0.24	0.06	
Total	100.02	100.00	100.02	100.01	100.01	99.99	100.00	100.00	100.01	100.02	
Mg #	55.70	49.84	52.35	50.44	53.07	47.29	56.61	43.20	53.22	79.66	
Cr	176	19	41	49	57	141	638	152	26	699	
Ni	70	23	32	36	40	47	106	42	32	266	
V	242	325	343	402	408	434	170	470	350	131	
Cu	31	238	44	46	48	14	30	69	8	2	
Pb	41	26	24	33	19	13	4	9	9	3	
Zn	213	281	144	92	137	172	72	189	133	35	
K	10210	9712	4067	14195	166	5977	20503	2573	13033	249	
Rb	50	35	13	49	1	23	96	24	65	2	
Sr	121	187	19	27	62	233	11	170	193	2	
Nb	7.4	0.8	18.7	21.8	24.3	21.5	6.2	22.4	3.6	2.6	
Zr	136	82	134	155	182	264	98	252	68	26	
Ti	5755	7853	12769	15407	15867	21702	2218	23021	6535	1079	
Y	22	29	33	37	41	61	9	56	22	9	
Th	7.00	5.00	2.00	1.00	2.00	4.00	14.00	4.00	9.00	1.00	
La	7.82	10.80	12.30	-	-	-	29.70	22.30	-	4.53	
Ce	17.40	25.60	29.00	-	-	-	59.00	54.40	-	10.70	
Pr	-	-	-	-	-	-	-	-	-	-	
Nd	10.30	16.60	18.10	-	-	-	24.50	33.70	-	6.19	
Sm	2.61	4.22	4.63	-	-	-	4.18	8.89	-	1.31	
Eu	0.71	1.15	1.29	-	-	-	1.17	2.81	-	0.44	
Gd	-	-	-	-	-	-	-	-	-	-	
Tb	0.54	0.74	0.79	-	-	-	0.25	1.50	-	0.25	
Dy	-	-	-	-	-	-	-	-	-	-	
Ho	0.79	1.02	1.10	-	-	-	0.25	1.97	-	0.25	
Er	-	-	-	-	-	-	-	-	-	-	
Yb	2.23	2.61	2.62	-	-	-	0.86	5.49	-	0.71	
Lu	0.33	0.37	-	-	-	-	0.12	0.80	-	0.10	
Density	2.53	2.60	2.67	2.72	2.63	2.71	2.44	2.68	2.58	2.76	

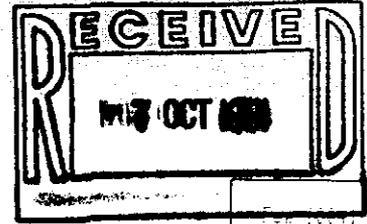
File Name C:\NEWPET\SEDS.ROC

Sample	30175	32838	32839	32841	32842	32844	32845	32846
Northing	5351200	5351300	5351290	5351260	5351250	HR 3	HR 3	HR 3
Easting	375350	375250	375290	375350	375400	301.7m	302m	322.5m
Symbol	1	1	1	1	1	1	1	1
Syn Colour	1	1	1	1	1	1	1	1
Rock Type	chert	hem.silt.	chert	chert	chert	gwk	gwk	gwk
SiO ₂	93.80	65.20	87.50	76.20	96.20	60.10	56.90	56.30
TiO ₂	0.12	0.79	0.33	0.57	0.08	0.72	0.82	0.86
Al ₂ O ₃	2.24	15.89	5.05	10.31	1.66	13.86	15.36	15.51
Fe ₂ O ₃	0.24	1.07	0.44	0.73	0.15	1.39	1.07	1.62
FeO	1.23	5.44	2.26	3.72	0.75	7.09	5.48	8.28
MnO	0.15	0.04	0.11	0.10	0.05	0.15	0.20	0.16
MgO	0.44	2.18	0.79	1.70	0.09	6.64	10.79	7.38
CaO	0.10	0.20	0.47	0.46	0.06	1.04	0.22	0.33
Na ₂ O	0.14	0.77	0.29	0.63	0.02	1.50	1.22	2.53
K ₂ O	0.46	4.57	1.08	2.12	0.54	1.78	1.08	1.74
P ₂ O ₅	0.06	0.12	0.11	0.11	0.03	0.09	0.08	0.12
Total	98.98	96.26	98.44	96.66	99.63	94.36	93.22	94.83
LOI	0.53	3.15	1.43	2.58	0.61	4.72	5.71	4.17
Mg #	35.12	37.78	34.58	40.87	15.39	58.65	74.90	57.46
K	3818	37936	8965	17598	4483	14776	8965	14444
Ti	719	4736	1978	3417	480	4316	4916	5156
Density	2.28	2.43	2.31	2.37	2.26	2.52	2.54	2.55



ANALABS

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



Phone (004) 316897

14 Birkenl. St. DOGEE TAS 7320

Facsimile 318970

ANALYTICAL REPORT No.

11111111111111111111

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

INVOICE TO:

Mr. J. J. Stanger
 14 Birkenl. St.
 DOGEE TAS 7320

ORDER No.

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14

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
0321,07,10,12,17,19/28	ro Prod : 6P029,P1	Cu, Pb, Zn, Ag/GAL40
0321,07,10,12,17,19/28	ro Prod :	Ag, Au, Bi, Al, Sb, Bi, Sn
0321,07,10,12,17,19/28	ro Prod :	Zn, Sb, Sn, Bi, Au

REMARKS

RESULTS

TO

Mr. J. J. Stanger
 14 Birkenl. St.
 DOGEE TAS 7320

RESULTS

TO

Mr. J. J. Stanger
 14 Birkenl. St.
 DOGEE TAS 7320

RESULTS

TO

Mr. J. J. Stanger
 14 Birkenl. St.
 DOGEE TAS 7320

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

ANALYTICAL DATA

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REPORT NUMBER

REPORT DATE

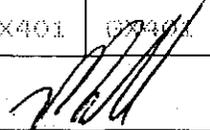
CLIENT ORDER No.

PAGE

		111310.60.08287				03/10/91		0111		1 OF 2	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	Au	Au (R)	Au (S)	Ba	Sb	
1	32107	59	18	102	<0.5	0.009	-	-	1130	<3	
2	32110	38	246	688	1.0	0.022	-	-	831	5	
3	32112	35	<5	128	<0.5	<0.008	-	-	255	4	
4	32117	8	<5	36	<0.5	<0.008	-	-	202	<3	
5	32119	41	<5	<5	<0.5	<0.008	-	-	348	<3	
6	32120	22	<5	54	<0.5	<0.008	-	-	626	<3	
7	32121	59	2380	338	2.3	<0.008	-	-	1860	21	
8	32122	25	745	156	2.5	<0.008	-	-	1500	3	
9	32123	<5	30	66	<0.5	<0.008	-	-	683	<3	
10	32124	7	25	11	<0.5	<0.008	-	-	477	<3	
11	32125	118	780	113	<0.5	0.091	0.104	-	536	140	
12	32126	5	24	96	<0.5	<0.008	<0.008	-	2920	<3	
13	32127	6	7	<5	<0.5	<0.008	-	<0.008	263	<3	
14	32128	15	6	<5	<0.5	<0.008	-	-	383	3	
15											
16											
17											
18											
19											
20											
21											
22											
23	DETECTION	5	5	5	0.5	0.008	0.008	0.008	10	3	
24	UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	
25	METHOD	GA140	GA140	GA140	GA140	GB309	GB309	GB309	GX401	GB401	

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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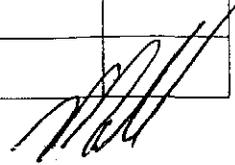
CLIENT ORDER No.

PAGE

		111310.60.08287			03/10/91		0111		2 OF 2	
TUBE No.	SAMPLE No.	Sn								
1	32107	<3								
2	32110	5								
3	32112	<3								
4	32117	<3								
5	32119	5								
6	32120	3								
7	32121	5								
8	32122	6								
9	32123	3								
10	32124	4								
11	32125	8								
12	32126	12								
13	32127	<3								
14	32128	<3								
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	3								
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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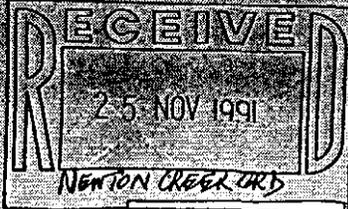


066064



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



Phone (004) 316837

14 Thirkell St. CDBEE TAS 7320

Fax (004) 318890

ANALYTICAL REPORT No.

111310.60.08391

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

0112

3003

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9

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
32801 & others	RO Prep : 6P029,P1	Cu,Pb,Zn,Ag/6A140
32801 & others	RO Prep :	Au,Au(R),Au(S)/6B309
32801 & others	RO Prep :	Ba,Sb,Sn/6X401

REMARKS

RESULTS

TO

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

RESULTS

TO

Mr R Pollock
C/- Post Office
WILMOT TAS 7310

RESULTS

TO

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ANALYTICAL DATA

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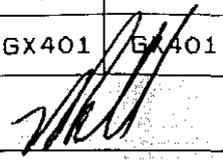
CLIENT ORDER No.

PAGE

		111310.60.08391				21/11/91		0112		1 OF 2	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	Au	Au(R)	Au(S)	Ba	Sb	
1	32144	61	109	144	<0.5	0.009	-	-	1060	9	
2	32166	9	32	17	<0.5	<0.008	-	-	2770	<3	
3	32176	191	15	53	<0.5	0.037	-	-	93	5	
4	32185	38	170	382	1.0	<0.008	-	-	46	<3	
5	32200	178	11	111	<0.5	<0.008	-	-	194	6	
6	32801	34	34	25	<0.5	<0.008	-	<0.008	133	3	
7	32807	1538	<5	59	<0.5	0.009	-	-	67	5	
8	32808	133	23	270	<0.5	<0.008	-	-	319	39	
9	32809	10	9	10	<0.5	<0.008	-	-	29	48	
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23	DETECTION	5	5	5	0.5	0.008	0.008	0.008	10	3	
24	UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	
25	METHOD	GA140	GA140	GA140	GA140	GG309	GG309	GG309	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

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A Division of In-house Inspection and Testing Services Australia Pty Ltd.

ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

111310.60.08391

21/11/91

0112

2 OF 2

TUBE No.	SAMPLE No.	Sn							
1	32144	5							
2	32166	<3							
3	32176	3							
4	32185	<3							
5	32200	8							
6	32801	5							
7	32807	<3							
8	32808	5							
9	32809	<3							
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23	DETECTION	3							
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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ANALABS

Division of Industrial, Agricultural and
Testing Services Australia Pty Ltd

066067

10/10/91
15/11/91
19/11/91

Phone (004) 316837

14 Thirkell St. COOEE TAS 7320

Fax (004) 318890

ANALYTICAL REPORT No.

111310.60.08489

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INVOICE TO:

Pasminco Exploration
P.O. Box 886
BURNIE TAS 7320

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PROJECT

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3003

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169

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
33801/969	SO Prep : 6P029-P2	Cu, Pb, Zn, Bi, Mn/6A140
33801/969	SO Prep : 6P029-P2	Ba, Sb, Sn/6X401
33801/969	SO Prep : 6P029-P2	As/6A114, As/6A101

REMARKS

RESULTS
TO

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

RESULTS
TO

Mr R Pollock
C/- Post Office
WILNOT TAS 7310

RESULTS
TO

[Empty box for results recipient]

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

ANALYTICAL DATA

SAMPLE PREFIX		REPORT NUMBER				REPORT DATE	CLIENT ORDER No			PAGE	
		111310.60.08489				15/01/92	0113			1 OF 14	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Bi	Mn	As	As	Sn	Sb	
1	33801	54	21	72	<10	89	9	-	<3	5	
2	33802	18	11	47	<10	24	3	-	<3	3	
3	33803	31	13	69	<10	70	4	-	7	<3	
4	33804	52	18	78	<10	65	4	-	4	4	
5	33805	59	26	79	<10	79	5	-	5	<3	
6	33806	34	15	40	<10	14	3	-	7	<3	
7	33807	96	16	38	12	11	27	-	6	<3	
8	33808	49	11	90	<10	157	4	-	7	<3	
9	33809	74	23	63	<10	64	6	-	5	<3	
10	33810	99	<5	153	<10	945	1	-	<3	<3	
11	33811	21	16	79	<10	334	4	-	6	4	
12	33812	21	13	164	<10	685	2	-	4	8	
13	33813	36	16	83	<10	363	4	-	5	4	
14	33814	14	22	65	<10	181	5	-	5	<3	
15	33815	14	<5	55	<10	121	3	-	4	<3	
16	33816	19	16	87	<10	92	5	-	<3	<3	
17	33817	9	9	48	<10	47	4	-	4	<3	
18	33818	13	10	89	<10	173	3	-	6	<3	
19	33819	12	6	165	<10	153	4	-	4	4	
20	33820	11	9	179	<10	237	3	-	<3	<3	
21	33821	13	8	112	<10	252	4	-	3	<3	
22	33822	17	14	86	<10	296	15	-	<3	3	
23	33823	87	12	61	<10	134	8	-	<3	<3	
24	33824	72	33	61	<10	55	30	-	<3	6	
25	33825	15	8	66	<10	136	5	-	7	<3	

Results in ppm unless otherwise specified
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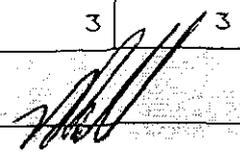
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		111310.60.08489				15/01/92	0113		2 OF 14	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Bi	Mn	As	As	Sn	Sb
1	33826	31	26	93	<10	136	5	-	<3	<3
2	33827	36	16	59	<10	51	9	-	5	<3
3	33828	46	23	56	<10	44	12	-	<3	3
4	33829	11	10	22	<10	15	33	-	5	7
5	33830	10	<5	17	<10	18	2	-	3	<3
6	33831	9	13	19	<10	5	2	-	3	5
7	33832	23	22	22	<10	6	11	-	5	4
8	33833	24	14	57	14	289	7	-	8	<3
9	33834	20	16	52	10	483	6	-	<3	5
10	33835	21	9	72	<10	473	6	-	<3	4
11	33836	20	8	76	<10	216	11	-	<3	<3
12	33837	17	16	35	<10	56	5	-	<3	3
13	33838	23	18	99	<10	442	7	-	<3	3
14	33839	18	11	62	<10	619	2	-	4	<3
15	33840	37	20	57	<10	1560	7	-	6	4
16	33841	21	<5	42	<10	252	5	-	3	3
17	33842	11	10	20	<10	18	3	-	<3	3
18	33843	14	7	38	<10	129	8	-	6	8
19	33844	15	8	42	<10	114	10	-	6	<3
20	33845	24	8	89	<10	312	1	-	3	<3
21	33846	36	7	224	<10	463	3	-	<3	3
22	33847	62	24	28	<10	14	27	-	5	<3
23	33848	9	6	23	<10	11	1	-	<3	<3
24	33849	15	47	24	<10	9	<1	-	3	<3
25	33850	10	12	21	<10	9	<1	-	3	3

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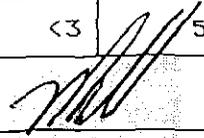
0113

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TUBE No.	SAMPLE No.	Cu	Pb	Zn	Bi	Mn	As	As	Sn	Sb
1	33851	85	44	46	<10	94	66	-	6	4
2	33852	15	42	88	12	192	8	-	<3	<3
3	33853	40	26	75	12	115	12	-	7	<3
4	33854	14	34	51	13	57	7	-	<3	<3
5	33855	27	14	42	<10	43	4	-	7	<3
6	33856	49	24	52	<10	128	18	-	7	6
7	33857	8	11	22	10	14	<1	-	5	6
8	33858	11	11	21	<10	16	<1	-	<3	<3
9	33859	5	10	20	<10	5	2	-	8	<3
10	33860	24	40	26	<10	7	3	-	4	<3
11	33861	5	10	19	<10	8	<1	-	4	<3
12	33862	12	38	28	<10	11	<1	-	8	3
13	33863	16	15	23	<10	12	<1	-	<3	<3
14	33864	<5	7	20	10	7	<1	-	<3	<3
15	33865	7	7	17	<10	11	<1	-	<3	<3
16	33866	<5	14	19	<10	10	<1	-	<3	3
17	33867	15	16	21	<10	13	6	-	<3	3
18	33868	27	22	60	<10	59	5	-	<3	<3
19	33869	47	44	45	<10	27	10	-	6	<3
20	33870	22	34	75	<10	408	10	-	4	4
21	33871	6	10	21	<10	27	3	-	<3	9
22	33872	20	18	31	<10	72	2	-	3	<3
23	33873	43	59	53	<10	110	10	-	<3	<3
24	33874	78	26	96	11	144	19	-	<3	6
25	33875	15	12	41	<10	102	2	-	<3	5

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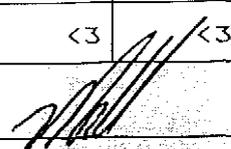
0113

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TUBE No.	SAMPLE No.	Cu	Pb	Zn	Bi	Mn	As	As	Sn	Sb
1	33876	15	28	26	<10	30	2	-	<3	<3
2	33877	16	46	49	<10	104	2	-	<3	<3
3	33878	35	40	24	<10	14	6	-	<3	5
4	33879	13	26	29	<10	16	10	-	6	<3
5	33880	42	63	30	<10	19	11	-	8	3
6	33881	13	59	17	<10	7	2	-	<3	<3
7	33882	13	16	21	<10	12	<1	-	5	<3
8	33883	25	38	22	<10	7	<1	-	6	4
9	33884	36	50	24	<10	7	<1	-	4	<3
10	33885	10	17	14	<10	8	<1	-	<3	<3
11	33886	5	9	14	<10	5	<1	-	<3	<3
12	33887	8	12	18	<10	11	<1	-	<3	<3
13	33888	25	<5	75	<10	153	3	-	8	<3
14	33889	43	33	24	<10	18	5	-	<3	5
15	33890	16	15	11	<10	15	<1	-	5	<3
16	33891	32	57	25	<10	15	7	-	4	9
17	33892	35	174	19	<10	9	10	-	6	3
18	33893	8	11	14	<10	8	10	-	<3	<3
19	33894	7	7	17	<10	8	1	-	<3	7
20	33895	14	8	17	<10	8	<1	-	<3	<3
21	33896	<5	11	16	<10	6	<1	-	5	<3
22	33897	<5	6	16	<10	7	<1	-	<3	<3
23	33898	9	8	21	<10	11	<1	-	<3	<3
24	33899	16	17	24	<10	12	1	-	<3	<3
25	33900	9	7	23	<10	11	1	-	<3	<3

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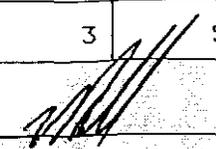
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		111310.60.08489				16/01/92	0113		5 OF 14	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Bi	Mn	As	As	Sn	Sb
1	33901	8	10	23	<10	10	1	-	<3	<3
2	33902	11	14	16	<10	15	1	-	5	<3
3	33903	42	80	33	<10	13	10	-	<3	5
4	33904	33	24	34	<10	69	10	-	<3	<3
5	33905	131	42	115	<10	121	10	-	7	<3
6	33906	19	24	25	<10	15	2	-	3	4
7	33907	7	10	19	<10	10	1	-	<3	<3
8	33908	7	5	22	<10	17	<1	-	<3	<3
9	33909	6	9	21	<10	11	<1	-	3	<3
10	33910	8	9	24	<10	13	<1	-	<3	<3
11	33911	7	7	21	<10	9	<1	-	<3	<3
12	33912	10	18	20	<10	6	<1	-	<3	3
13	33913	6	11	21	<10	11	<1	-	3	3
14	33914	10	13	23	<10	11	<1	-	<3	3
15	33915	7	17	21	<10	6	<1	-	<3	<3
16	33916	18	20	28	<10	19	5	-	<3	<3
17	33917	31	19	30	<10	24	11	-	3	<3
18	33918	12	19	28	<10	6	2	-	<3	4
19	33919	72	74	28	<10	11	12	-	3	5
20	33920	42	24	41	<10	6	20	-	<3	7
21	33921	89	79	67	<10	20	44	-	3	<3
22	33922	12	14	21	<10	24	1	-	<3	4
23	33923	12	21	25	<10	12	1	-	3	<3
24	33924	56	75	43	<10	11	>100	150	<3	11
25	33925	41	39	40	<10	27	25	-	3	5

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TUBE No.	SAMPLE No.	Cu	Pb	Zn	Bi	Mn	As	As	Sn	Sb
1	33926	11	10	21	<10	38	3	-	<3	3
2	33927	8	8	19	<10	13	<1	-	3	<3
3	33928	8	14	24	<10	8	<1	-	<3	<3
4	33929	19	20	28	<10	82	<1	-	4	4
5	33930	14	14	23	<10	38	1	-	4	<3
6	33931	13	11	22	<10	9	<1	-	<3	<3
7	33932	12	8	22	<10	8	1	-	3	<3
8	33933	31	25	33	<10	21	16	-	3	3
9	33934	48	63	31	<10	23	23	-	<3	3
10	33935	15	21	41	<10	65	15	-	<3	3
11	33936	17	22	35	<10	25	15	-	<3	<3
12	33937	79	34	78	<10	141	19	-	4	<3
13	33938	89	58	122	<10	2070	22	-	<3	<3
14	33939	83	57	54	<10	60	22	-	6	<3
15	33940	39	21	71	<10	43	44	-	<3	3
16	33941	17	11	16	<10	7	3	-	<3	4
17	33942	17	11	21	<10	9	6	-	<3	<3
18	33943	6	6	24	<10	5	16	-	7	<3
19	33944	15	5	32	<10	7	5	-	7	<3
20	33945	11	5	23	<10	5	8	-	5	<3
21	33946	14	11	21	<10	7	1	-	<3	<3
22	33947	41	24	51	<10	19	14	-	4	<3
23	33948	143	141	124	<10	208	45	-	6	<3
24	33949	70	76	144	<10	158	30	-	6	<3
25	33950	31	65	76	<10	44	28	-	6	<3

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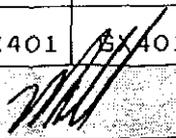
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		111310.60.08489				16/01/92	0113		7 OF 14	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Bi	Mn	As	As	Sn	Sb
1	33951	9	<5	30	<10	10	4	-	<3	4
2	33952	10	5	53	<10	15	9	-	3	<3
3	33953	13	9	33	<10	11	4	-	<3	<3
4	33954	40	12	58	<10	39	6	-	6	<3
5	33955	54	40	26	<10	14	9	-	4	<3
6	33956	29	21	59	<10	120	8	-	5	<3
7	33957	55	101	92	<10	164	24	-	<3	6
8	33958	56	85	74	<10	147	23	-	<3	<3
9	33959	78	86	478	<10	1210	83	-	6	3
10	33960	78	50	131	<10	489	60	-	<3	<3
11	33961	67	47	141	<10	2020	>100	200	6	3
12	33962	21	39	55	<10	74	22	-	4	3
13	33963	28	27	27	<10	9	1	-	<3	4
14	33964	24	153	45	<10	40	31	-	5	<3
15	33965	12	7	24	<10	13	1	-	<3	<3
16	33966	30	32	27	<10	10	6	-	<3	<3
17	33967	26	22	67	<10	71	18	-	8	<3
18	33968	31	26	45	<10	27	13	-	3	<3
19	33969	26	21	27	<10	11	>100	180	<3	<3
20										
21										
22										
23	DETECTION	5	5	5	10	5	1	100	3	3
24	UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
25	METHOD	GA140	GA140	GA140	GA140	GA140	GA114	GA101	GX401	GX401

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TUBE No.	SAMPLE No.	Ba							
1	33801	590							
2	33802	560							
3	33803	540							
4	33804	400							
5	33805	440							
6	33806	520							
7	33807	360							
8	33808	360							
9	33809	960							
10	33810	760							
11	33811	210							
12	33812	500							
13	33813	240							
14	33814	220							
15	33815	240							
16	33816	510							
17	33817	370							
18	33818	390							
19	33819	330							
20	33820	520							
21	33821	350							
22	33822	400							
23	33823	140							
24	33824	790							
25	33825	180							

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TUBE No.	SAMPLE No.	Ba							
1	33826	310							
2	33827	460							
3	33828	620							
4	33829	1100							
5	33830	320							
6	33831	660							
7	33832	530							
8	33833	210							
9	33834	130							
10	33835	370							
11	33836	700							
12	33837	540							
13	33838	640							
14	33839	200							
15	33840	180							
16	33841	260							
17	33842	310							
18	33843	170							
19	33844	190							
20	33845	370							
21	33846	510							
22	33847	1150							
23	33848	3000							
24	33849	3300							
25	33850	340							

Results in ppm unless otherwise specified

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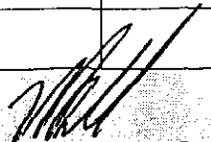
TUBE No.	SAMPLE No.	Ba							
1	33851	1900							
2	33852	350							
3	33853	1100							
4	33854	810							
5	33855	340							
6	33856	840							
7	33857	390							
8	33858	60							
9	33859	800							
10	33860	1350							
11	33861	780							
12	33862	1050							
13	33863	120							
14	33864	180							
15	33865	210							
16	33866	410							
17	33867	25							
18	33868	300							
19	33869	280							
20	33870	1400							
21	33871	1200							
22	33872	610							
23	33873	190							
24	33874	180							
25	33875	710							

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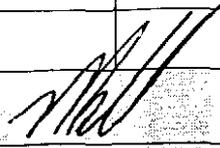
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TUBE No.	SAMPLE No.	Ba							
1	33876	550							
2	33877	690							
3	33878	290							
4	33879	720							
5	33880	820							
6	33881	550							
7	33882	300							
8	33883	560							
9	33884	870							
10	33885	490							
11	33886	360							
12	33887	220							
13	33888	270							
14	33889	300							
15	33890	80							
16	33891	120							
17	33892	1200							
18	33893	180							
19	33894	120							
20	33895	260							
21	33896	220							
22	33897	300							
23	33898	370							
24	33899	400							
25	33900	270							

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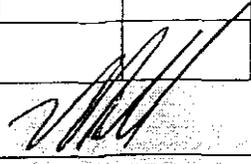
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TUBE No.	SAMPLE No.	Ba							
1	33901	290							
2	33902	240							
3	33903	200							
4	33904	460							
5	33905	410							
6	33906	190							
7	33907	150							
8	33908	14							
9	33909	45							
10	33910	120							
11	33911	85							
12	33912	310							
13	33913	330							
14	33914	390							
15	33915	340							
16	33916	100							
17	33917	150							
18	33918	150							
19	33919	120							
20	33920	280							
21	33921	910							
22	33922	260							
23	33923	400							
24	33924	570							
25	33925	700							

Results in ppm unless otherwise specified
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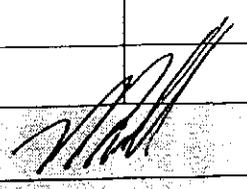
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			111310.60.08489			15/01/92		0113		13 OF 14	
TUBE No.	SAMPLE No.	Ba									
1	33926	640									
2	33927	150									
3	33928	630									
4	33929	780									
5	33930	570									
6	33931	680									
7	33932	730									
8	33933	670									
9	33934	270									
10	33935	370									
11	33936	320									
12	33937	240									
13	33938	310									
14	33939	1050									
15	33940	190									
16	33941	330									
17	33942	280									
18	33943	380									
19	33944	600									
20	33945	590									
21	33946	480									
22	33947	430									
23	33948	320									
24	33949	320									
25	33950	310									

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 Inscope Inspection and Testing Services Australia Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

111310.60.08489

15/01/92

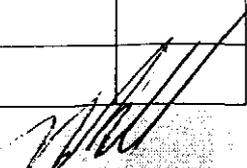
0113

14 OF 14

TUBE No.	SAMPLE No.	Ba							
1	33951	190							
2	33952	260							
3	33953	370							
4	33954	140							
5	33955	60							
6	33956	230							
7	33957	420							
8	33958	550							
9	33959	820							
10	33960	710							
11	33961	960							
12	33962	510							
13	33963	270							
14	33964	560							
15	33965	25							
16	33966	380							
17	33967	370							
18	33968	590							
19	33969	330							
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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Testing Services Australia Pty. Ltd.

*YALMIBE
RAP - ROCKS*

Phone (004) 316837

14 Thirke!! St. COBEE TAS 7320

Fax (004) 318890

ANALYTICAL REPORT No.

111310.60.08529

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

0114

3003

DATE RECEIVED

RESULTS REQUIRED

10/01/92

ASAP

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OF RESULTS**

**DATE
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OF COPIES**

**TOTAL No.
OF SAMPLES**

2

22/01/92

1

6

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
<328,10,13/15,17,25	RD Prep : 6F029,P1	Cu,Pb,Zn,Ag,Bi,Mn,Ni/6A140
<328,10,13/15,17,25	RD Prep :	Au,Au(R),Au(S)/6G309
<328,10,13/15,17,25	RD Prep :	As/6A114,As/6A101
<328,10,13/15,17,25	RD Prep :	Ba,Sb,Sn/6X401

REMARKS

RESULTS

TO

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

RESULTS

TO

Mr R Pollock
C/- Post Office
WILNOT TAS 7310

RESULTS

TO

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ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

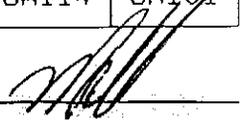
		111310.60.08529				22/01/92		0114		1 OF 2	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	Bi	Mn	Ni	As	As	
1	32810	10	204	102	<0.5	<10	306	43	9	-	
2	32813	159	<5	70	<0.5	<10	1280	53	4	-	
3	32814	56	<5	126	<0.5	<10	168	160	>100	180	
4	32815	<5	<5	20	<0.5	<10	1130	9	2	-	
5	32817	34	28	44	<0.5	<10	121	13	21	-	
6	32825	56	4120	515	2.0	<10	7230	47	>100	580	
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23	DETECTION	5	5	5	0.5	10	5	5	1	100	
24	UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	
25	METHOD	GA140	GA140	GA140	GA140	GA140	GA140	GA140	GA114	GA101	

Results in ppm unless otherwise specified

T = element present, but concentration too low to measure

X = element concentration is below detection limit

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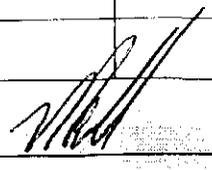
ANALYTICAL DATA

SAMPLE PREFIX REPORT NUMBER REPORT DATE CLIENT ORDER No. PAGE

		111310.60.08529				22/01/92		0114		2 OF 2	
TUBE No.	SAMPLE No.	Ba	Sb	Sn	Au	Au(R)	Au(S)				
1	32810	340	6	<3	<0.008	-	<0.008				
2	32813	55	<3	<3	<0.008	-	-				
3	32814	160	3	<3	0.008	0.008	-				
4	32815	860	6	<3	<0.008	-	-				
5	32817	1950	7	<3	<0.008	-	-				
6	32825	95	45	8	<0.008	-	-				
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23	DETECTION	10	3	3	0.008	0.008	0.008				
24	UNITS	ppm	ppm	ppm	ppm	ppm	ppm				
25	METHOD	GX401	GX401	GX401	GG309	GG309	GG309				

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

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

YOLANDE LITHOGRAPHY RRP

Phone (004) 316837

14 Thirkell St. COOEE TAS 7320

Fax (004) 318890

ANALYTICAL REPORT No. 111310.60.08531

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. 0116	PROJECT 3003
DATE RECEIVED 10/01/92	RESULTS REQUIRED ASAP

No. OF PAGES OF RESULTS 3	DATE REPORTED 23/01/92	No. OF COPIES 1
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TOTAL No. OF SAMPLES
54

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
31504 & others	PU Prep : 6P002	Mn, Bi/6A140
31504 & others	PU Prep : 6P002	As/6A114
31504 & others	PU Prep : 6P002	Sb, Sn/6X401

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

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

RESULTS TO

REMARKS

AUTHORISED OFFICER

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

ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

111310.60.08531

24/01/92

0116

1 OF 3

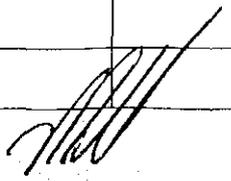
TUBE No.	SAMPLE No.	Mn	Mn	Bi	As	As	Sn	Sb		
1	31504	42	-	10	>100	350	7	<3		
2	31674	498	-	<10	83	-	11	20		
3	31676	1220	-	<10	9	-	10	<3		
4	31678	1340	-	<10	10	-	8	<3		
5	31681	1490	-	<10	2	-	6	5		
6	31685	224	-	<10	>100	500	<3	30		
7	31686	989	-	<10	>100	110	5	13		
8	31687	1000	-	<10	11	-	<3	<3		
9	31688	1460	-	<10	73	-	9	85		
10	31700	858	-	<10	10	-	10	<3		
11	31525	156	-	<10	25	-	<3	330		
12	31527	705	-	<10	48	-	10	<3		
13	31540	176	-	<10	>100	650	6	14		
14	31541	52	-	<10	>100	1150	8	6		
15	31546	52	-	<10	48	-	9	<3		
16	31574	932	-	<10	>100	230	6	<3		
17	31575	164	-	<10	>100	550	5	12		
18	31576	85	-	<10	29	-	6	6		
19	31577	80	-	<10	>100	1200	8	990		
20	31578	>10000	21.00	<10	1	-	11	6		
21	31579	>10000	4.10	<10	>100	310	8	9		
22	31583	647	-	<10	67	-	3	4		
23	31584	316	-	<10	38	-	8	4		
24	31585	209	-	<10	42	-	9	4		
25	31586	163	-	<10	>100	450	6	5		

Results in ppm unless otherwise specified

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SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

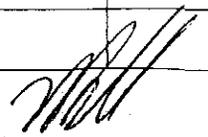
CLIENT ORDER No.

PAGE

		111310.60.08531				23/01/92		0116		2 OF 3	
TUBE No.	SAMPLE No.	Mn	Mn	Bi	As	As	Sn	Sb			
1	31587	172	-	<10	71	-	<3	<3			
2	31588	329	-	<10	1	-	5	<3			
3	31589	681	-	<10	26	-	8	<3			
4	31590	239	-	<10	22	-	6	<3			
5	31591	452	-	<10	23	-	11	<3			
6	31595	1280	-	<10	9	-	8	<3			
7	32107	812	-	<10	32	-	-	-			
8	32110	1150	-	<10	31	-	-	-			
9	32112	1130	-	<10	5	-	-	-			
10	32117	806	-	<10	3	-	-	-			
11	32119	174	-	<10	4	-	-	-			
12	32120	1220	-	<10	3	-	-	-			
13	32121	7030	-	<10	>100	540	-	-			
14	32122	8880	-	<10	92	-	-	-			
15	32123	99	-	<10	4	-	-	-			
16	32124	111	-	<10	2	-	-	-			
17	32125	61	-	<10	>100	1200	-	-			
18	32126	8300	-	<10	>100	330	-	-			
19	32127	74	-	<10	4	-	-	-			
20	32128	329	-	<10	2	-	-	-			
21	32144	832	-	<10	42	-	-	-			
22	32166	126	-	<10	6	-	-	-			
23	32176	250	-	<10	40	-	-	-			
24	32185	3100	-	<10	>100	740	-	-			
25	32200	1090	-	<10	16	-	-	-			

Results in ppm unless otherwise specified
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 - = element not determined

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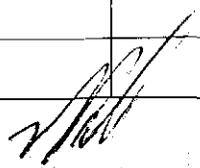
CLIENT ORDER No.

PAGE

		111310.60.08531				23/01/92		0116		3 OF 3	
TUBE No.	SAMPLE No.	Mn	Mn	Bi	As	As	Sn	Sb			
1	32801	88	-	<10	44	-	-	-			
2	32807	320	-	<10	5	-	-	-			
3	32808	159	-	<10	25	-	-	-			
4	32809	65	-	<10	9	-	-	-			
5											
6											
7											
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11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23	DETECTION	5	0.01	10	1	100	3	3			
24	UNITS	ppm	%	ppm	ppm	ppm	ppm	ppm			
25	METHOD	GA140	GA104	GA140	GA114	GA101	GX401	GX401			

Results in ppm unless otherwise specified
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NEWTON CK
HEATH VALLEY
SOLLS

Phone (004) 316837

14 Thirkell St. COOEE TAS 7320

Fax (004) 318890

ANALYTICAL REPORT No. 111310.60.08535

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

0117

3003

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07/02/92

1

337

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
33001/306,33970/34000	SD Prep : 6P029,F2	Cu,Pb,Zn,Bi,Mn/GA140 Mn/104 As/GA114 As/GA101 Ba,Sb,Sn/GX401

REMARKS

RESULTS

TO

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

RESULTS

TO

Mr R Pollock
C/- Post Office
WILMOT TAS 7310

RESULTS

TO

AUTHORISED OFFICER

ANALABSA Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.
A.C.N. 004 581 664**ANALYTICAL DATA**

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REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

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111310.60.08535

07/02/92

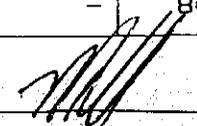
0117

1 OF 28

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Bi	Mn	Mn	As	As	Ba
1	33001	<5	6	22	<10	85	-	1	-	626
2	33002	<5	8	50	<10	31	-	<1	-	198
3	33003	<5	9	35	<10	33	-	<1	-	269
4	33004	<5	8	22	<10	24	-	<1	-	1591
5	33005	<5	6	16	<10	18	-	<1	-	1001
6	33006	<5	<5	14	<10	17	-	<1	-	116
7	33007	<5	<5	39	<10	54	-	2	-	1090
8	33008	<5	18	24	<10	19	-	1	-	616
9	33009	<5	<5	26	<10	98	-	1	-	1332
10	33010	<5	7	27	<10	43	-	4	-	792
11	33011	<5	14	24	<10	69	-	6	-	740
12	33012	<5	11	23	<10	64	-	5	-	588
13	33013	5	20	41	<10	84	-	3	-	482
14	33014	11	14	90	<10	186	-	3	-	778
15	33015	17	13	85	<10	160	-	3	-	832
16	33016	10	23	77	<10	346	-	4	-	1112
17	33017	16	15	95	<10	192	-	4	-	902
18	33018	59	8	202	<10	241	-	6	-	1466
19	33019	6	18	34	<10	55	-	2	-	605
20	33020	23	14	75	<10	126	-	5	-	719
21	33021	<5	36	63	<10	79	-	3	-	891
22	33022	<5	7	95	<10	145	-	1	-	1083
23	33023	<5	46	27	<10	27	-	13	-	1028
24	33024	<5	<5	21	<10	50	-	1	-	753
25	33025	<5	<5	16	<10	25	-	1	-	809

Results in ppm unless otherwise specified
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A.C.N. 004 591 664

ANALYTICAL DATA

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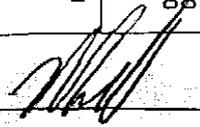
REPORT DATE

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PAGE

		111310.60.08535				07/02/92		0117		2 OF 28	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Bi	Mn	Mn	As	As	Ba	
1	33026	<5	<5	20	<10	31	-	<1	-	631	
2	33027	<5	<5	29	<10	37	-	<1	-	902	
3	33028	<5	<5	39	<10	40	-	<1	-	508	
4	33029	<5	<5	45	<10	51	-	<1	-	438	
5	33030	<5	<5	20	<10	34	-	<1	-	301	
6	33031	<5	<5	30	<10	45	-	<1	-	572	
7	33032	<5	5	30	<10	43	-	<1	-	705	
8	33033	<5	5	27	<10	36	-	<1	-	487	
9	33034	<5	7	25	<10	35	-	<1	-	335	
10	33035	<5	8	21	<10	26	-	<1	-	319	
11	33036	<5	<5	27	<10	25	-	1	-	873	
12	33037	<5	<5	26	<10	18	-	<1	-	817	
13	33038	<5	<5	19	<10	15	-	1	-	944	
14	33039	<5	<5	23	<10	18	-	<1	-	1130	
15	33040	<5	<5	19	<10	14	-	1	-	821	
16	33041	<5	27	18	<10	16	-	1	-	988	
17	33042	<5	<5	18	<10	19	-	1	-	228	
18	33043	<5	38	19	<10	14	-	1	-	556	
19	33044	<5	<5	18	<10	17	-	<1	-	569	
20	33045	<5	118	19	<10	31	-	7	-	727	
21	33046	<5	38	11	<10	22	-	2	-	638	
22	33047	17	43	145	<10	258	-	8	-	1318	
23	33048	65	17	122	<10	699	-	7	-	1101	
24	33049	11	38	59	<10	99	-	5	-	665	
25	33050	23	25	55	<10	160	-	9	-	663	

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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ANALABSA Division of Inchope Inspection and Testing Services Australia Pty. Ltd.
A.C.N. 004 581 664**ANALYTICAL DATA**

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

		111310.60.08535				07/02/92		0117		3 OF 28	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Bi	Mn	Mn	As	As	Ba	
1	33051	<5	<5	13	<10	31	-	3	-	156	
2	33052	<5	<5	14	<10	29	-	4	-	231	
3	33053	<5	15	31	<10	43	-	11	-	346	
4	33054	13	18	100	<10	129	-	8	-	391	
5	33055	<5	<5	32	<10	90	-	6	-	182	
6	33056	<5	14	29	<10	153	-	8	-	236	
7	33057	<5	<5	66	<10	148	-	4	-	792	
8	33058	<5	<5	49	<10	128	-	2	-	853	
9	33059	<5	<5	27	<10	127	-	2	-	832	
10	33060	<5	<5	26	<10	74	-	3	-	870	
11	33061	<5	<5	11	<10	24	-	2	-	527	
12	33062	<5	<5	9	<10	20	-	2	-	264	
13	33063	<5	<5	13	<10	19	-	2	-	1183	
14	33064	<5	<5	14	<10	35	-	2	-	936	
15	33065	<5	10	17	<10	32	-	2	-	516	
16	33066	<5	<5	8	<10	17	-	2	-	189	
17	33067	<5	35	15	<10	23	-	2	-	440	
18	33068	<5	<5	75	<10	111	-	2	-	892	
19	33069	7	5	111	<10	174	-	4	-	950	
20	33070	820	123	498	<10	827	-	34	-	692	
21	33071	38	47	316	<10	823	-	1	-	650	
22	33072	15	60	97	<10	127	-	10	-	653	
23	33073	7	37	34	<10	42	-	7	-	494	
24	33074	13	47	40	<10	50	-	7	-	665	
25	33075	<5	18	30	<10	25	-	5	-	786	

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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ANALABSA Division of Inchope Inspection and Testing Services Australia Pty. Ltd.
A.C.N. 004 591 664**ANALYTICAL DATA**

SAMPLE PREFIX

REPORT NUMBER

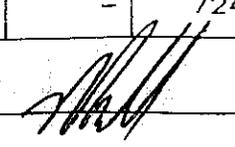
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TUBE No.	SAMPLE No.	Cu	Pb	Zn	Bi	Mn	Mn	As	As	Ba	
1	33076	<5	11	12	<10	21	-	4	-	804	
2	33077	<5	<5	26	<10	37	-	4	-	807	
3	33078	<5	<5	26	<10	30	-	3	-	542	
4	33079	<5	17	15	<10	18	-	4	-	604	
5	33080	24	<5	14	<10	14	-	7	-	817	
6	33081	10	<5	14	<10	15	-	5	-	447	
7	33082	56	39	193	<10	166	-	10	-	741	
8	33083	27	30	135	<10	136	-	5	-	652	
9	33084	18	30	92	<10	160	-	26	-	426	
10	33085	14	<5	55	<10	113	-	23	-	99	
11	33086	198	43	156	<10	693	-	49	-	48	
12	33087	97	25	86	<10	2020	-	>100	140	117	
13	33088	112	73	220	<10	676	-	30	-	42	
14	33089	9	14	117	<10	252	-	13	-	60	
15	33090	50	<5	57	<10	250	-	9	-	219	
16	33091	63	<5	46	<10	142	-	7	-	227	
17	33092	661	<5	55	<10	1190	-	22	-	261	
18	33093	15	<5	18	<10	15	-	2	-	824	
19	33094	9	<5	23	<10	32	-	1	-	411	
20	33095	SNR	-	-	-	-	-	-	-	-	
21	33096	6	13	39	<10	94	-	5	-	685	
22	33097	5	<5	17	<10	18	-	<1	-	766	
23	33098	9	<5	14	<10	14	-	<1	-	473	
24	33099	9	<5	83	<10	138	-	3	-	796	
25	33100	20	27	68	<10	195	-	2	-	724	

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TUBE No.	SAMPLE No.	Cu	Pb	Zn	Bi	Mn	Mn	As	As	Ba
1	33101	11	15	39	<10	54	-	<1	-	819
2	33102	8	7	46	<10	69	-	2	-	487
3	33103	7	10	111	<10	42	-	3	-	979
4	33104	9	25	21	<10	42	-	2	-	446
5	33105	6	12	15	<10	12	-	2	-	273
6	33106	7	10	14	<10	12	-	<1	-	200
7	33107	19	32	44	<10	154	-	3	-	677
8	33108	12	12	102	<10	64	-	13	-	251
9	33109	13	38	46	<10	80	-	4	-	539
10	33110	16	26	97	<10	181	-	5	-	892
11	33111	11	6	115	<10	246	-	2	-	981
12	33112	15	19	57	<10	44	-	3	-	754
13	33113	20	22	107	<10	87	-	9	-	500
14	33114	37	41	107	<10	216	-	12	-	696
15	33115	27	30	72	<10	234	-	11	-	894
16	33116	14	21	45	<10	77	-	7	-	807
17	33117	8	18	13	<10	13	-	3	-	654
18	33118	25	50	93	<10	212	-	10	-	659
19	33119	12	43	23	<10	19	-	10	-	815
20	33120	12	45	23	<10	23	-	12	-	784
21	33121	10	23	19	<10	12	-	4	-	515
22	33122	10	12	10	<10	9	-	2	-	373
23	33123	9	16	12	<10	8	-	2	-	496
24	33124	20	284	163	<10	3120	-	34	-	676
25	33125	20	383	329	<10	>10000	1.13	48	-	1055

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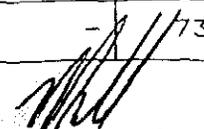
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TUBE No.	SAMPLE No.	Cu	Pb	Zn	Bi	Mn	Mn	As	As	Ba	
1	33126	15	154	87	10	2200	-	14	-	630	
2	33127	23	453	163	<10	1340	-	28	-	585	
3	33128	19	490	203	<10	>10000	1.34	38	-	690	
4	33129	18	243	158	<10	8040	-	54	-	708	
5	33130	17	105	129	<10	2910	-	52	-	541	
6	33131	13	25	39	<10	79	-	7	-	676	
7	33132	15	7	27	<10	92	-	3	-	369	
8	33133	16	<5	16	<10	29	-	3	-	208	
9	33134	17	13	16	<10	48	-	3	-	73	
10	33135	22	9	30	<10	97	-	48	-	21	
11	33136	28	36	40	<10	778	-	31	-	109	
12	33137	29	24	40	<10	93	-	17	-	103	
13	33138	18	18	29	<10	56	-	8	-	72	
14	33139	25	28	68	<10	72	-	12	-	150	
15	33140	36	51	50	<10	274	-	10	-	173	
16	33141	34	42	71	<10	304	-	9	-	144	
17	33142	13	<5	26	<10	26	-	<1	-	382	
18	33143	13	11	9	<10	<5	-	<1	-	542	
19	33144	15	14	11	<10	<5	-	<1	-	422	
20	33145	18	12	26	<10	23	-	<1	-	540	
21	33146	15	40	25	<10	14	-	<1	-	717	
22	33147	15	84	12	<10	<5	-	<1	-	676	
23	33148	17	15	8	<10	<5	-	<1	-	380	
24	33149	20	27	105	<10	112	-	3	-	553	
25	33150	23	61	68	<10	47	-	4	-	738	

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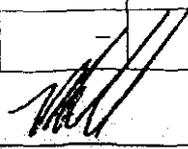
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		111310.60.08535				07/02/92	0117		7 OF 28	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Bi	Mn	Mn	As	As	Ba
1	33151	36	152	151	10	3380	-	1	-	895
2	33152	21	7	15	<10	15	-	1	-	843
3	33153	22	30	29	<10	31	-	3	-	662
4	33154	22	18	27	<10	33	-	7	-	590
5	33155	25	36	38	<10	63	-	8	-	742
6	33156	21	18	9	<10	10	-	<1	-	762
7	33157	17	11	12	<10	15	-	<1	-	486
8	33158	19	8	17	<10	21	-	11	-	333
9	33159	<5	<5	8	<10	14	-	<1	-	105
10	33160	<5	<5	<5	<10	12	-	<1	-	45
11	33161	<5	<5	5	<10	11	-	<1	-	89
12	33162	<5	<5	12	<10	14	-	<1	-	32
13	33163	<5	<5	9	<10	17	-	<1	-	41
14	33164	<5	6	7	<10	14	-	<1	-	58
15	33165	<5	<5	<5	<10	12	-	<1	-	67
16	33166	<5	<5	6	<10	18	-	<1	-	12
17	33167	<5	<5	10	<10	30	-	<1	-	23
18	33168	<5	<5	8	<10	20	-	<1	-	26
19	33169	<5	5	9	<10	22	-	9	-	80
20	33170	<5	9	7	<10	16	-	6	-	20
21	33171	<5	<5	6	<10	20	-	<1	-	37
22	33172	<5	62	102	<10	218	-	38	-	176
23	33173	<5	13	9	<10	26	-	4	-	48
24	33174	<5	14	13	<10	36	-	2	-	80
25	33175	<5	23	33	<10	63	-	12	-	150

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		111310.60.08535				07/02/92		0117		8 OF 28	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Bi	Mn	Mn	As	As	Ba	
1	33176	<5	7	7	<10	20	-	2	-	25	
2	33177	71	9	81	<10	73	-	6	-	148	
3	33178	8	8	41	<10	136	-	3	-	160	
4	33179	21	<5	68	<10	876	-	3	-	349	
5	33180	<5	9	15	<10	66	-	5	-	789	
6	33181	<5	20	28	<10	65	-	6	-	637	
7	33182	<5	197	325	<10	1940	-	67	-	752	
8	33183	<5	48	29	<10	48	-	28	-	727	
9	33184	11	34	29	<10	1120	-	8	-	136	
10	33185	5	8	30	<10	171	-	4	-	87	
11	33186	<5	<5	14	<10	55	-	1	-	61	
12	33187	<5	5	21	<10	68	-	3	-	44	
13	33188	13	17	65	<10	177	-	12	-	99	
14	33189	11	26	15	<10	82	-	9	-	65	
15	33190	6	7	59	<10	80	-	5	-	197	
16	33191	9	22	53	<10	205	-	5	-	161	
17	33192	11	24	40	<10	254	-	3	-	221	
18	33193	6	7	38	<10	170	-	2	-	202	
19	33194	6	11	29	<10	149	-	1	-	166	
20	33195	9	20	46	<10	175	-	3	-	126	
21	33196	6	20	43	<10	220	-	3	-	199	
22	33197	6	18	36	<10	127	-	2	-	171	
23	33198	<5	13	30	<10	120	-	2	-	110	
24	33199	<5	<5	36	<10	124	-	2	-	161	
25	33200	7	31	31	<10	61	-	5	-	185	

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TUBE No.	SAMPLE No.	Cu	Pb	Zn	Bi	Mn	Mn	As	As	Ba
1	33201	<5	16	15	<10	29	-	4	-	122
2	33202	7	26	30	<10	91	-	9	-	157
3	33203	<5	19	34	<10	93	-	6	-	132
4	33204	<5	25	24	<10	60	-	5	-	124
5	33205	5	20	15	<10	37	-	3	-	95
6	33206	<5	18	17	<10	51	-	2	-	146
7	33207	<5	24	58	<10	315	-	2	-	321
8	33208	8	21	68	<10	288	-	5	-	281
9	33209	62	18	128	<10	1044	-	6	-	258
10	33210	16	21	60	<10	580	-	9	-	294
11	33211	56	44	95	<10	1210	-	>100	140	14
12	33212	53	36	80	<10	737	-	65	-	<10
13	33213	74	46	152	<10	1680	-	31	-	36
14	33214	72	55	139	<10	1480	-	31	-	92
15	33215	44	37	97	<10	1250	-	37	-	119
16	33216	9	32	31	<10	419	-	28	-	79
17	33217	<5	8	6	<10	27	-	2	-	77
18	33218	<5	12	8	<10	25	-	1	-	199
19	33219	<5	<5	5	<10	13	-	1	-	109
20	33220	<5	8	5	<10	19	-	1	-	91
21	33221	11	30	36	<10	80	-	9	-	221
22	33222	35	21	40	<10	248	-	9	-	113
23	33223	<5	6	5	<10	23	-	1	-	56
24	33224	<5	12	14	<10	36	-	15	-	188
25	33225	<5	8	<5	<10	9	-	1	-	137

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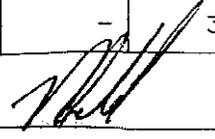
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TUBE No.	SAMPLE No.	Cu	Pb	Zn	Bi	Mn	Mn	As	As	Ba	
1	33226	<5	5	5	<10	24	-	1	-	121	
2	33227	<5	8	21	<10	15	-	1	-	45	
3	33228	<5	11	9	<10	19	-	1	-	28	
4	33229	<5	7	5	<10	8	-	1	-	242	
5	33230	<5	6	<5	<10	16	-	1	-	150	
6	33231	7	53	14	<10	83	-	60	-	217	
7	33232	<5	10	<5	<10	31	-	4	-	72	
8	33233	7	53	6	<10	101	-	15	-	194	
9	33234	<5	12	<5	<10	18	-	3	-	198	
10	33235	<5	6	<5	<10	11	-	<1	-	99	
11	33236	<5	8	7	<10	14	-	<1	-	191	
12	33237	<5	15	6	<10	16	-	1	-	296	
13	33238	<5	13	<5	<10	11	-	3	-	262	
14	33239	<5	17	<5	<10	16	-	10	-	210	
15	33240	<5	9	<5	<10	15	-	1	-	89	
16	33241	<5	9	<5	<10	10	-	<1	-	117	
17	33242	<5	10	<5	<10	8	-	<1	-	258	
18	33243	<5	6	<5	<10	12	-	<1	-	78	
19	33244	<5	11	<5	<10	14	-	<1	-	97	
20	33245	<5	29	10	<10	17	-	1	-	38	
21	33246	<5	13	<5	<10	15	-	1	-	46	
22	33247	<5	23	6	<10	19	-	2	-	63	
23	33248	13	23	14	<10	209	-	8	-	171	
24	33249	<5	14	<5	<10	39	-	4	-	175	
25	33250	<5	9	<5	<10	16	-	<1	-	38	

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TUBE No.	SAMPLE No.	Cu	Pb	Zn	Bi	Mn	Mn	As	As	Ba
1	33251	<5	14	10	<10	23	-	2	-	85
2	33252	23	40	61	<10	102	-	49	-	94
3	33253	9	28	11	<10	35	-	11	-	77
4	33254	<5	13	<5	<10	41	-	1	-	144
5	33255	9	20	10	<10	84	-	11	-	135
6	33256	<5	18	<5	<10	41	-	4	-	113
7	33257	5	22	42	<10	4370	-	20	-	150
8	33258	20	24	29	<10	3820	-	30	-	363
9	33259	27	22	30	<10	2140	-	20	-	254
10	33260	11	14	19	<10	4940	-	48	-	408
11	33261	13	29	28	<10	408	-	24	-	206
12	33262	8	30	18	<10	120	-	5	-	126
13	33263	<5	14	<5	<10	36	-	9	-	89
14	33264	10	50	28	<10	99	-	9	-	218
15	33265	17	44	140	<10	592	-	18	-	330
16	33266	20	27	71	<10	441	-	15	-	251
17	33267	12	49	46	<10	392	-	18	-	231
18	33268	10	24	19	<10	242	-	16	-	168
19	33269	45	44	92	<10	144	-	>100	210	446
20	33270	27	85	126	<10	158	-	13	-	181
21	33271	54	75	171	<10	377	-	22	-	260
22	33272	40	32	68	<10	521	-	13	-	223
23	33273	20	25	20	<10	217	-	6	-	199
24	33274	13	26	12	<10	145	-	4	-	200
25	33275	<5	10	6	<10	133	-	5	-	82

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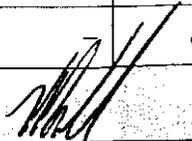
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TUBE No.	SAMPLE No.	Cu	Pb	Zn	Bi	Mn	Mn	As	As	Ba
1	33276	21	10	41	<10	278	-	7	-	157
2	33277	15	12	25	<10	116	-	4	-	65
3	33278	15	8	31	<10	168	-	4	-	142
4	33279	14	11	29	<10	274	-	19	-	162
5	33280	16	18	31	<10	341	-	7	-	90
6	33281	10	14	21	<10	187	-	4	-	59
7	33282	<5	<5	7	<10	41	-	1	-	96
8	33283	5	19	14	<10	55	-	1	-	57
9	33284	7	16	21	<10	74	-	3	-	71
10	33285	5	7	11	<10	30	-	3	-	144
11	33286	<5	5	7	<10	29	-	1	-	290
12	33287	<5	<5	8	<10	27	-	1	-	94
13	33288	5	<5	11	<10	28	-	1	-	78
14	33289	<5	<5	7	<10	19	-	1	-	58
15	33290	<5	<5	7	<10	18	-	2	-	75
16	33291	<5	<5	10	<10	28	-	1	-	68
17	33292	8	20	98	<10	102	-	1	-	191
18	33293	9	<5	68	<10	140	-	15	-	123
19	33294	12	31	112	<10	531	-	26	-	181
20	33295	<5	<5	11	<10	21	-	1	-	114
21	33296	10	7	15	<10	23	-	9	-	140
22	33297	8	<5	17	<10	32	-	3	-	24
23	33298	45	25	78	<10	317	-	7	-	14
24	33299	37	21	84	<10	433	-	6	-	171
25	33300	24	12	40	<10	117	-	8	-	69

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TUBE No.	SAMPLE No.	Cu	Pb	Zn	Bi	Mn	Mn	As	As	Ba
1	33301	18	5	38	<10	138	-	4	-	73
2	33302	16	9	46	<10	196	-	4	-	85
3	33303	24	30	60	<10	369	-	6	-	111
4	33304	28	25	65	<10	410	-	7	-	199
5	33305	61	16	114	<10	409	-	5	-	201
6	33306	18	41	49	<10	111	-	15	-	168
7	33970	<5	6	14	<10	67	-	<1	-	411
8	33971	<5	<5	14	<10	50	-	1	-	299
9	33972	<5	6	10	<10	45	-	<1	-	129
10	33973	<5	<5	12	<10	38	-	1	-	170
11	33974	<5	<5	14	<10	47	-	1	-	304
12	33975	9	16	44	<10	189	-	5	-	470
13	33976	<5	5	17	<10	47	-	1	-	281
14	33977	6	<5	13	<10	32	-	1	-	258
15	33978	12	5	32	<10	147	-	10	-	479
16	33979	5	9	45	<10	62	-	2	-	964
17	33980	7	19	33	<10	157	-	3	-	687
18	33981	8	26	20	<10	38	-	1	-	554
19	33982	5	8	19	<10	62	-	1	-	588
20	33983	5	7	13	<10	30	-	<1	-	628
21	33984	<5	<5	11	<10	14	-	<1	-	475
22	33985	<5	<5	12	<10	44	-	<1	-	1045
23	33986	5	15	75	<10	61	-	<1	-	825
24	33987	<5	7	12	<10	25	-	3	-	774
25	33988	<5	11	7	<10	19	-	3	-	554

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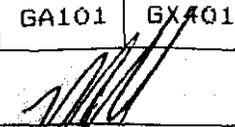
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		111310.60.08535				07/02/92		0117		14 OF 28	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Bi	Mn	Mn	As	As	Ba	
1	33989	7	9	16	<10	59	-	12	-	853	
2	33990	7	6	12	<10	14	-	16	-	869	
3	33991	5	5	7	<10	10	-	7	-	686	
4	33992	8	<5	6	<10	10	-	10	-	551	
5	33993	<5	<5	8	<10	10	-	4	-	435	
6	33994	<5	<5	<5	<10	6	-	5	-	388	
7	33995	<5	<5	11	<10	31	-	14	-	437	
8	33996	14	139	35	<10	123	-	22	-	420	
9	33997	19	95	37	<10	564	-	18	-	403	
10	33998	17	101	60	<10	511	-	23	-	333	
11	33999	35	170	141	<10	6040	-	15	-	419	
12	34000	<5	6	16	<10	91	-	4	-	372	
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23	DETECTION	5	5	5	10	5	0.01	1	100	10	
24	UNITS	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	PPM	
25	METHOD	GA140	GA140	GA140	GA140	GA140	GA104	GA114	GA101	GX101	

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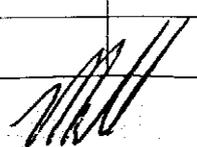
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TUBE No.	SAMPLE No.	Sb	Sn						
1	33001	<3	<3						
2	33002	4	<3						
3	33003	<3	<3						
4	33004	4	6						
5	33005	<3	<3						
6	33006	<3	<3						
7	33007	5	3						
8	33008	6	4						
9	33009	<3	3						
10	33010	4	<3						
11	33011	<3	8						
12	33012	3	9						
13	33013	3	4						
14	33014	<3	<3						
15	33015	<3	4						
16	33016	<3	5						
17	33017	<3	4						
18	33018	3	5						
19	33019	<3	7						
20	33020	6	5						
21	33021	4	4						
22	33022	3	10						
23	33023	5	3						
24	33024	<3	4						
25	33025	<3	5						

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		111310.60.08535		07/02/92		0117		16 OF 28	
TUBE No.	SAMPLE No.	Sb	Sn						
1	33026	3	<3						
2	33027	3	3						
3	33028	4	<3						
4	33029	7	3						
5	33030	4	5						
6	33031	3	<3						
7	33032	5	4						
8	33033	3	<3						
9	33034	3	<3						
10	33035	3	<3						
11	33036	4	4						
12	33037	5	4						
13	33038	<3	<3						
14	33039	4	5						
15	33040	3	<3						
16	33041	<3	6						
17	33042	<3	<3						
18	33043	3	3						
19	33044	<3	5						
20	33045	4	5						
21	33046	4	<3						
22	33047	7	<3						
23	33048	9	8						
24	33049	4	3						
25	33050	3	5						

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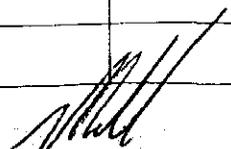
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TUBE No.	SAMPLE No.	Sb	Sn						
1	33051	4	3						
2	33052	3	5						
3	33053	5	9						
4	33054	6	10						
5	33055	6	6						
6	33056	5	7						
7	33057	3	3						
8	33058	5	6						
9	33059	<3	4						
10	33060	<3	<3						
11	33061	5	4						
12	33062	4	4						
13	33063	<3	4						
14	33064	7	7						
15	33065	<3	<3						
16	33066	5	<3						
17	33067	4	7						
18	33068	7	<3						
19	33069	<3	6						
20	33070	8	4						
21	33071	5	5						
22	33072	5	4						
23	33073	7	3						
24	33074	<3	3						
25	33075	8	4						

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		111310.60.08535		07/02/92		0117		18 OF 28	
TUBE No.	SAMPLE No.	Sb	Sn						
1	33076	4	3						
2	33077	<3	<3						
3	33078	6	<3						
4	33079	3	6						
5	33080	4	6						
6	33081	<3	6						
7	33082	<3	3						
8	33083	<3	4						
9	33084	9	6						
10	33085	<3	5						
11	33086	12	<3						
12	33087	32	3						
13	33088	3	6						
14	33089	5	5						
15	33090	4	7						
16	33091	5	7						
17	33092	<3	4						
18	33093	4	9						
19	33094	3	3						
20	33096	4	5						
21	33097	5	5						
22	33098	10	4						
23	33099	4	5						
24	33100	<3	<3						
25	33101	7	4						

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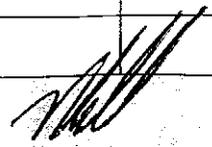
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TUBE No.	SAMPLE No.	Sb	Sn							
1	33102	<3	6							
2	33103	6	<3							
3	33104	4	<3							
4	33105	3	<3							
5	33106	5	<3							
6	33107	<3	8							
7	33108	11	8							
8	33109	7	4							
9	33110	<3	8							
10	33111	3	7							
11	33112	<3	6							
12	33113	3	5							
13	33114	11	<3							
14	33115	<3	8							
15	33116	5	4							
16	33117	<3	4							
17	33118	3	7							
18	33119	<3	5							
19	33120	<3	9							
20	33121	3	<3							
21	33122	<3	5							
22	33123	<3	4							
23	33124	6	7							
24	33125	<3	6							
25	33126	6	5							

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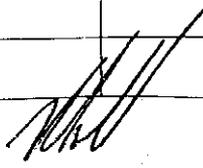
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TUBE No.	SAMPLE No.	Sb	Sn						
1	33127	4	10						
2	33128	4	8						
3	33129	<3	9						
4	33130	3	9						
5	33131	3	8						
6	33132	<3	3						
7	33133	4	9						
8	33134	<3	<3						
9	33135	<3	8						
10	33136	6	<3						
11	33137	4	3						
12	33138	<3	9						
13	33139	<3	5						
14	33140	<3	5						
15	33141	<3	8						
16	33142	6	3						
17	33143	<3	6						
18	33144	6	6						
19	33145	6	7						
20	33146	6	3						
21	33147	3	6						
22	33148	8	5						
23	33149	4	10						
24	33150	10	8						
25	33151	7	<3						

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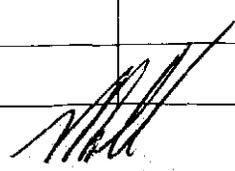
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TUBE No.	SAMPLE No.	Sb	Sn						
1	33152	4	<3						
2	33153	7	9						
3	33154	4	5						
4	33155	7	5						
5	33156	5	4						
6	33157	7	5						
7	33158	4	4						
8	33159	5	5						
9	33160	9	<3						
10	33161	7	4						
11	33162	5	4						
12	33163	3	<3						
13	33164	3	<3						
14	33165	4	3						
15	33166	5	<3						
16	33167	3	4						
17	33168	9	<3						
18	33169	8	6						
19	33170	6	<3						
20	33171	5	<3						
21	33172	6	10						
22	33173	5	<3						
23	33174	8	<3						
24	33175	<3	<3						
25	33176	11	<3						

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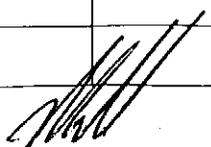
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TUBE No.	SAMPLE No.	Sb	Sn						
1	33177	8	3						
2	33178	6	6						
3	33179	11	8						
4	33180	3	7						
5	33181	7	<3						
6	33182	3	4						
7	33183	6	5						
8	33184	3	<3						
9	33185	8	7						
10	33186	3	7						
11	33187	<3	6						
12	33188	4	4						
13	33189	3	<3						
14	33190	4	7						
15	33191	3	8						
16	33192	3	3						
17	33193	<3	11						
18	33194	<3	4						
19	33195	5	9						
20	33196	6	9						
21	33197	3	<3						
22	33198	7	6						
23	33199	<3	9						
24	33200	6	10						
25	33201	5	5						

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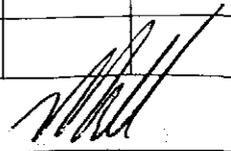
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TUBE No.	SAMPLE No.	Sb	Sn							
1	33202	6	6							
2	33203	5	4							
3	33204	<3	11							
4	33205	<3	<3							
5	33206	3	8							
6	33207	<3	6							
7	33208	<3	8							
8	33209	<3	7							
9	33210	8	7							
10	33211	5	10							
11	33212	4	8							
12	33213	6	6							
13	33214	8	12							
14	33215	6	3							
15	33216	3	6							
16	33217	<3	<3							
17	33218	4	<3							
18	33219	4	<3							
19	33220	6	<3							
20	33221	<3	7							
21	33222	<3	<3							
22	33223	4	<3							
23	33224	4	3							
24	33225	7	<3							
25	33226	7	<3							

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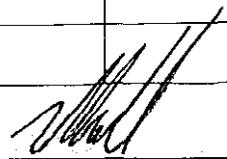
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TUBE No.	SAMPLE No.	Sb	Sn							
1	33227	<3	<3							
2	33228	<3	<3							
3	33229	3	<3							
4	33230	6	<3							
5	33231	6	7							
6	33232	5	<3							
7	33233	8	4							
8	33234	8	<3							
9	33235	<3	<3							
10	33236	<3	<3							
11	33237	7	3							
12	33238	3	<3							
13	33239	4	8							
14	33240	<3	<3							
15	33241	<3	<3							
16	33242	4	4							
17	33243	4	3							
18	33244	6	<3							
19	33245	4	<3							
20	33246	8	<3							
21	33247	5	4							
22	33248	10	<3							
23	33249	6	8							
24	33250	5	<3							
25	33251	7	<3							

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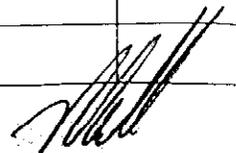
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TUBE No.	SAMPLE No.	Sb	Sn						
1	33252	11	10						
2	33253	6	<3						
3	33254	4	3						
4	33255	4	4						
5	33256	<3	<3						
6	33257	7	3						
7	33258	<3	5						
8	33259	<3	11						
9	33260	<3	9						
10	33261	<3	8						
11	33262	<3	10						
12	33263	<3	5						
13	33264	<3	5						
14	33265	<3	7						
15	33266	<3	10						
16	33267	<3	4						
17	33268	4	10						
18	33269	16	7						
19	33270	<3	8						
20	33271	<3	9						
21	33272	<3	11						
22	33273	6	9						
23	33274	<3	9						
24	33275	<3	7						
25	33276	4	13						

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TUBE No.	SAMPLE No.	Sb	Sn						
1	33277	<3	8						
2	33278	3	6						
3	33279	<3	10						
4	33280	3	9						
5	33281	<3	12						
6	33282	4	5						
7	33283	3	<3						
8	33284	<3	8						
9	33285	<3	8						
10	33286	<3	9						
11	33287	<3	6						
12	33288	<3	7						
13	33289	<3	8						
14	33290	<3	9						
15	33291	4	<3						
16	33292	<3	4						
17	33293	<3	9						
18	33294	<3	8						
19	33295	<3	7						
20	33296	4	9						
21	33297	4	3						
22	33298	<3	7						
23	33299	5	<3						
24	33300	<3	4						
25	33301	<3	<3						

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TUBE No.	SAMPLE No.	Sb	Sn						
1	33302	<3	8						
2	33303	<3	5						
3	33304	3	3						
4	33305	<3	8						
5	33306	4	6						
6	33970	<3	7						
7	33971	4	7						
8	33972	<3	7						
9	33973	<3	9						
10	33974	<3	8						
11	33975	<3	6						
12	33976	5	4						
13	33977	8	<3						
14	33978	4	3						
15	33979	<3	8						
16	33980	<3	4						
17	33981	5	<3						
18	33982	3	9						
19	33983	3	5						
20	33984	3	<3						
21	33985	3	<3						
22	33986	4	7						
23	33987	<3	8						
24	33988	3	7						
25	33989	<3	6						

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ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

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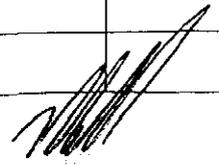
CLIENT ORDER No.

PAGE

		111310.60.08535		07/02/92		0117		28 OF 28	
TUBE No.	SAMPLE No.	Sb	Sn						
1	33990	3	9						
2	33991	8	4						
3	33992	5	5						
4	33993	3	9						
5	33994	8	4						
6	33995	<3	7						
7	33996	3	7						
8	33997	6	<3						
9	33998	<3	7						
10	33999	8	5						
11	34000	<3	6						
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19									
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22									
23	DETECTION	3	3						
24	UNITS	PPM	PPM						
25	METHOD	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



YOLANDE



ANALABS

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

Phone (004) 316837

14 Thirkell St. COOEE TAS 7320

Fax (004) 318890

ANALYTICAL REPORT No. 111310.60.08605

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. 0118 PROJECT 3003

DATE RECEIVED 24/02/92 RESULTS REQUIRED ASAP

No. OF PAGES OF RESULTS 2 DATE REPORTED 13/03/92 No. OF COPIES 1

TOTAL No. OF SAMPLES 15

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
216481,30099,30195,30985	RD Prep : GP029,P1	Rb,Sr,Y,Zr/GX401
31524,31526,31584,31686/88,	RD Prep : GP029,P1	Whole Rock Analysis/OX408
32149/50,32818/19,32821		

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

RESULTS TO
 Roger Poltock Geological Pty Ltd
 Mineral Exploration Contractor
 C/- Post Office
 WILMOT TAS 7310

RESULTS TO

REMARKS

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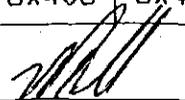
CLIENT ORDER No.

PAGE

		111310.60.08605				13/03/92		0118		1 OF 2	
TUBE No.	SAMPLE No.	Rb	Sr	Y	Zr	Al2O3	SiO2	TiO2	Fe2O3	MnO	
1	216481	160	40	35	260	15.01	70.4	0.56	3.52	0.02	
2	30099	160	45	30	260	14.00	66.7	0.70	4.72	0.11	
3	30195	30	190	25	180	15.38	60.0	0.76	7.26	0.11	
4	30985	120	50	30	260	14.63	72.0	0.30	2.44	0.05	
5	31524	110	170	35	250	14.52	68.2	0.53	6.25	0.06	
6	31526	55	360	30	200	12.26	70.8	0.40	1.46	0.06	
7	31584	130	25	30	300	19.36	63.6	0.71	4.25	0.04	
8	31686	150	9	30	150	16.60	45.3	1.37	22.56	0.14	
9	31687	110	35	18	130	17.45	57.9	0.88	10.87	0.13	
10	31688	140	70	30	140	12.54	65.6	0.73	6.50	0.19	
11	32149	160	55	35	300	13.47	75.2	0.38	2.56	0.01	
12	32150	95	170	30	190	14.63	62.0	0.63	9.23	0.12	
13	32818	45	230	40	270	14.63	70.9	0.52	3.44	0.06	
14	32819	110	250	30	140	13.51	76.8	0.17	1.04	0.01	
15	32821	140	300	55	350	13.67	74.3	0.35	3.25	0.05	
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21											
22											
23	DETECTION	5	5	5	5	0.05	0.1	0.01	0.01	0.01	
24	UNITS	ppm	ppm	ppm	ppm	%	%	%	%	%	
25	METHOD	GX401	GX401	GX401	GX401	OX40B	OX40B	OX40B	OX40B	OX40B	

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.C.N. 004 591 664**ANALYTICAL DATA**

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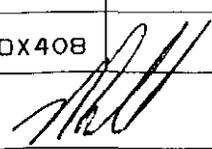
CLIENT ORDER No.

PAGE

		111310.60.08605				13/03/92	0118		2 OF 2	
TUBE No.	SAMPLE No.	CaO	K2O	MgO	P2O5	SO3	Na2O	LOI	TOTAL	
1	216481	0.16	3.77	0.74	0.136	4.93	1.84	3.81	104.90	
2	30099	2.03	3.03	1.46	0.100	0.23	1.60	5.47	100.19	
3	30195	1.99	1.22	4.29	0.119	0.04	5.42	3.36	99.96	
4	30985	0.05	4.91	0.26	0.038	0.02	4.28	1.00	99.98	
5	31524	1.43	2.44	0.86	0.140	0.03	2.89	2.94	100.26	
6	31526	4.49	1.20	0.33	0.108	0.11	4.96	4.15	100.31	
7	31584	0.03	2.53	2.44	0.056	1.21	0.18	6.70	101.10	
8	31686	0.04	3.84	0.65	0.350	0.05	0.16	8.87	99.94	
9	31687	0.10	2.40	2.15	0.110	0.02	1.33	6.51	99.87	
10	31688	2.46	2.89	1.22	0.108	1.25	1.39	5.80	100.65	
11	32149	0.04	3.88	0.77	0.026	2.91	0.94	2.66	102.87	
12	32150	2.32	2.17	2.74	0.087	0.05	1.90	4.45	100.32	
13	32818	0.83	1.65	0.93	0.122	0.01	5.86	1.27	100.22	
14	32819	0.16	2.08	0.43	0.019	0.12	4.31	1.06	99.70	
15	32821	0.39	2.51	0.70	0.045	0.02	3.12	1.89	100.29	
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22										
23	DETECTION	0.01	0.01	0.01	0.005	0.01	0.05	0.01	0.01	
24	UNITS	%	%	%	%	%	%	%	%	
25	METHOD	OX408	OX408	OX408	OX408	OX408	OX408	OX408	OX408	

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

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ANALYTICAL REPORT No.

111310.60.08606

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SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
30175, 32838/39, 32841/42, 32844/45	RD Prep : 6P029.P1	Whole Rock Analysis/OX408

REMARKS

RESULTS

TO

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

RESULTS

TO

Roger Pollock Geological Pty Ltd
Mineral Exploration Contractor
C/- Post Office
MILMOT TAS 7310

RESULTS

TO

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ANALYTICAL DATA

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REPORT NUMBER

REPORT DATE

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PAGE

		111310.60.08606				11/03/92		0119		1 OF 2	
TUBE No.	SAMPLE No.	Al2O3	SiO2	TiO2	Fe2O3	MnO	CaO	K2O	MgO	P2O5	
1	30175	2.24	93.8	0.12	1.61	0.15	0.10	0.46	0.44	0.056	
2	32838	15.89	65.2	0.79	7.11	0.04	0.20	4.57	2.18	0.120	
3	32839	5.05	87.5	0.33	2.96	0.11	0.47	1.08	0.79	0.114	
4	32841	10.31	76.2	0.57	4.87	0.10	0.46	2.12	1.70	0.106	
5	32842	1.66	96.2	0.08	0.98	0.05	0.06	0.54	0.09	0.027	
6	32844	13.86	60.1	0.72	9.27	0.15	1.04	1.78	6.64	0.092	
7	32845	15.36	56.9	0.82	7.16	0.20	0.22	1.08	10.79	0.084	
8	32846	15.51	56.3	0.86	10.82	0.16	0.33	1.74	7.38	0.125	
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23	DETECTION	0.05	0.1	0.01	0.01	0.01	0.01	0.01	0.01	0.005	
24	UNITS	%	%	%	%	%	%	%	%	%	
25	METHOD	OX408	OX408	OX408	OX408	OX408	OX408	OX408	OX408	OX408	

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

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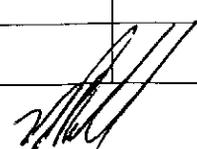
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PAGE

		111310.60.08606				11/03/92	0119		2 OF 2	
TUBE No.	SAMPLE No.	SO3	Na2O	LOI	TOTAL					
1	30175	0.01	0.14	0.53	99.67					
2	32838	<0.01	0.77	3.15	99.98					
3	32839	0.02	0.29	1.43	100.13					
4	32841	0.13	0.63	2.58	99.75					
5	32842	0.07	<0.05	0.61	100.35					
6	32844	<0.01	1.50	4.72	99.92					
7	32845	0.01	1.22	5.71	99.53					
8	32846	<0.01	2.53	4.17	99.92					
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23	DETECTION	0.01	0.05	0.01	0.01					
24	UNITS	%	%	%	%					
25	METHOD	OX408	OX408	OX408	OX408					

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

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ANALYTICAL REPORT No.

111310.60.0860/

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SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
30801.12.33.47.54.76.84	GC Free : GP029,P5	Rb,Sr,Y,Zr/GX401 Whole Rock Analysis/OX408

RESULTS

TO

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

RESULTS

TO

Roger Pollock Geological Pty Ltd
Mineral Exploration Contractor
c/- Post Office
WILMOT TAS 7310

RESULTS

TO

REMARKS


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111310.60.08607

11/03/92

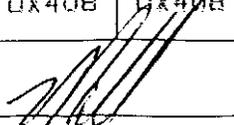
0120

1 OF 2

TUBE No.	SAMPLE No.	Rb	Sr	Y	Zr	Al2O3	SiO2	TiO2	Fe2O3	MnO
1	30801	120	110	17	60	15.40	45.9	0.65	9.62	0.36
2	30812	220	100	10	95	21.91	51.9	1.01	5.75	0.27
3	30833	70	90	20	140	13.49	53.4	0.73	10.52	0.15
4	30847	140	110	20	95	15.39	48.1	0.76	8.73	0.34
5	30854	170	65	25	140	18.25	45.8	1.12	13.87	0.94
6	30876	25	290	25	200	19.12	58.7	1.04	5.85	0.15
7	30884	180	85	25	150	17.62	53.1	1.23	8.90	0.57
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23	DETECTION	S	S	S	S	0.05	0.1	0.01	0.01	0.01
24	UNITS	ppm	ppm	ppm	ppm	%	%	%	%	%
25	METHOD	GX401	GX401	GX401	GX401	OX40B	OX40B	OX40B	OX40B	OX40B

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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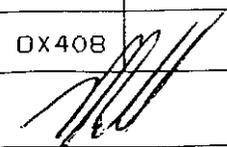
0120

2 OF 2

TUBE No.	SAMPLE No.	CaO	K2O	MgO	P2O5	SO3	Na2O	LOI	TOTAL	
1	30801	8.84	2.04	4.55	0.111	0.19	1.68	10.50	99.87	
2	30812	3.42	4.19	1.96	0.080	0.11	3.63	5.74	100.02	
3	30833	2.85	1.27	5.67	0.111	0.06	1.91	10.06	100.21	
4	30847	6.78	2.62	3.21	0.136	0.14	1.38	12.32	99.87	
5	30854	6.30	3.20	1.63	0.138	0.14	0.27	8.50	100.20	
6	30876	2.35	0.44	1.66	0.159	0.07	8.25	2.49	100.31	
7	30884	4.94	3.58	1.32	0.157	0.46	1.92	5.97	99.82	
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22										
23	DETECTION	0.01	0.01	0.01	0.005	0.01	0.05	0.01	0.01	
24	UNITS	%	%	%	%	%	%	%	%	
25	METHOD	OX408								

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

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ANALYTICAL REPORT No. 111310.60.08621

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13

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
30024B, 30085, 30103, 30155, 30173, 30857, 30889, 30980, 30987, 31641, 32170, 32197, 32823	PU Prep :	La, Ce, Nd, Sm, Eu, Tb, Ho, Yb, Lu/BN805

RESULTS

TO

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

RESULTS

TO

Roger Pollock Geological Pty Ltd
Mineral Exploration Contractor
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RESULTS

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REMARKS


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REPORT NUMBER

REPORT DATE

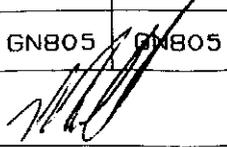
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PAGE

SAMPLE PREFIX		REPORT NUMBER				REPORT DATE		CLIENT ORDER No.		PAGE	
		111310.60.08621				26/03/92		0121		1 OF 1	
TUBE No.	SAMPLE No.	La	Ce	Nd	Sm	Eu	Tb	Ho	Yb	Lu	
1	30024B	28.10	60.8	28.50	5.94	1.32	0.96	1.16	2.60	0.39	
2	30085	21.60	46.9	22.40	4.17	0.57	0.65	0.91	2.55	0.40	
3	30103	13.60	28.6	15.00	3.30	0.67	0.56	0.72	1.59	0.22	
4	30155	8.64	20.6	11.30	2.43	0.61	<0.50	0.50	1.29	0.17	
5	30173	16.60	35.2	19.00	3.74	0.81	0.67	0.74	1.75	0.25	
6	30857	21.40	48.2	25.30	5.56	1.45	0.94	1.26	3.34	0.52	
7	30889	18.40	41.3	23.90	4.84	1.01	0.82	1.05	2.70	0.39	
8	30980	7.82	17.4	10.30	2.61	0.71	0.54	0.79	2.23	0.33	
9	30987	10.80	25.6	16.60	4.22	1.15	0.74	1.02	2.61	0.37	
10	31641	12.30	29.0	18.10	4.63	1.29	0.79	1.10	2.62	0.36	
11	32170	29.70	59.0	24.50	4.18	1.17	<0.50	<0.50	0.86	0.12	
12	32197	22.30	54.4	33.70	8.89	2.81	1.50	1.97	5.49	0.80	
13	32823	4.53	10.7	6.19	1.31	0.44	<0.50	<0.50	0.71	0.10	
14											
15											
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19											
20											
21											
22											
23	DETECTION	0.10	1.0	2.00	0.05	0.10	0.50	0.50	0.10	0.05	
24	UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	
25	METHOD	GN805	GN805	GN805	GN805	GN805	GN805	GN805	GN805	GN805	

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

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YOLANDE STITT QZITE

066129

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ANALYTICAL REPORT No. 111310.60.08640

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SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
32859	RO Prep : 6P029,P5	Cr,Ni/6A140

RESULTS TO

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

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Roger Poltock Geological Pty Ltd
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RESULTS TO

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REMARKS

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SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

111310.60.08640

20/03/92

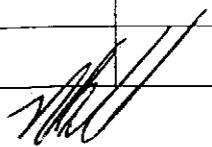
0122

1 OF 1

TUBE No.	SAMPLE No.	Cr	Ni						
1	32859	17	8						
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23	DETECTION	5	5						
24	UNITS	ppm	ppm						
25	METHOD	GA140	GA140						

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



066131



ANALABS

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

YOLANOE
NEWTON CREEK ROCKS

Phone (004) 316837

14 Thirkell St. CDOEE TAS 7320

Fax (004) 318890

ANALYTICAL REPORT No. 111310.60.08641

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.

0123

PROJECT

3003

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03/04/92

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SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
32848, 32850, 32852/32857	Prep : 6P029 Prep :	Cu, Pb, Zn, Bi, Mn/6A140 Cu, Pb, Zn, Ag, Mn, Bi/6A140 Hg/6A122 Au, Au(R)/66309 As/6A114

RESULTS

TO

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

RESULTS

TO

Roger Pollock Geological Pty Ltd
Mineral Exploration Contractor
C/- Post Office
WILMOT TAS 7310

RESULTS

TO

REMARKS

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A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.
A.C.N. 004 591 664

ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

		111310.60.08641				03/04/92		0123		1 OF 2	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	Bi	Mn	As	Au	Au(R)	
1	32848	34	2810	1960	2	<10	220	55	<0.008	<0.008	
2	32850	31	2880	2530	3	<10	430	38	<0.008	-	
3	32852	39	35	86	-	<10	70	4	-	-	
4	32853	9	16	79	-	<10	90	2	-	-	
5	32854	15	12	165	-	<10	785	<1	-	-	
6	32855	13	<3	160	-	<10	610	<1	-	-	
7	32856	9	20	77	-	<10	180	<1	-	-	
8	32857	8	5	61	-	<10	200	6	-	-	
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23	DETECTION	2	3	2	1	10	3	1	0.008	0.008	
24	UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	
25	METHOD	GA140	GA140	GA140	GA140	GA140	GA140	GA114	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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03/04/92

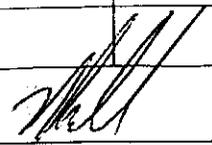
0123

2 OF 2

TUBE No.	SAMPLE No.	Hg	Ba	Sb	Sn				
1	32848	0.520	390	6	6				
2	32850	0.430	360	5	<3				
3	32852	-	460	4	<3				
4	32853	-	570	<3	3				
5	32854	-	1250	6	4				
6	32855	-	1050	<3	3				
7	32856	-	970	<3	<3				
8	32857	-	890	<3	<3				
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23	DETECTION	0.005	10	3	3				
24	UNITS	ppm	ppm	ppm	ppm				
25	METHOD	GA122	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

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

066134

HENTON VALLEY / NEWTON WALKER

Phone (004) 316837

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Fax (004) 318890

ANALYTICAL REPORT No. 111310.60.08705

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

INVOICE TO:

Pasminco Exploration
P.O. Box 884
BURNIE TAS 7320

ORDER No.

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0124

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115

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
33307/33461	Prep : 6P029,P2	Cu,Pb,Zn,Mn/GA140 Ba/GX401 As/GA114

REMARKS

RESULTS TO

Roger Poltock Geological Pty Ltd
Mineral Exploration Contractor
C/- Post Office
WILMOT TAS 7310

RESULTS TO

Mr F Fitzgerald
Pasminco Exploration
P.O. Box 884
BURNIE TAS 7320

RESULTS TO

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A.C.N. 004 591 564

ANALYTICAL DATA

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111310.60.08705

23/04/92

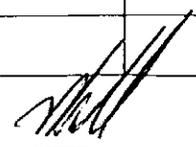
0124

1 OF 5

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Mn	Ba	As			
1	33307	31	11	44	1300	270	3			
2	33308	62	7	140	2150	210	11			
3	33309	105	22	145	2650	220	99			
4	33310	71	12	170	950	130	16			
5	33311	140	31	160	1700	165	17			
6	33317	35	25	82	1200	265	7			
7	33325	54	8	95	160	380	21			
8	33326	33	24	50	4900	225	17			
9	33327	82	5	185	520	570	5			
10	33330	6	<3	105	2950	440	1			
11	33333	37	7	210	820	575	21			
12	33334	7	11	27	1700	215	25			
13	33337	3	8	105	140	454	4			
14	33338	7	3	100	30	1030	4			
15	33339	4	4	24	<10	480	<1			
16	33340	4	3	28	25	585	3			
17	33342	12	<3	67	740	1400	7			
18	33343	17	9	32	25	1550	3			
19	33344	4	<3	39	710	1400	3			
20	33345	9	9	39	10	195	4			
21	33346	23	25	315	50	405	5			
22	33349	125	115	315	1550	155	14			
23	33350	48	21	25	20	340	29			
24	33351	36	10	235	1200	650	4			
25	33352	105	44	410	1550	480	2			

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

SAMPLE PREFIX		REPORT NUMBER				REPORT DATE		CLIENT ORDER No.		PAGE	
		111310.60.08705				27/04/92		0124		2 OF 5	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Mn	Ba	As				
1	33353	16	84	210	1050	350	7				
2	33354	15	6	93	490	615	4				
3	33355	4	3	39	180	780	<1				
4	33356	30	80	195	420	525	2				
5	33357	7	19	45	70	615	1				
6	33358	31	28	210	1100	180	9				
7	33359	16	14	155	600	290	10				
8	33360	33	41	315	920	270	12				
9	33361	73	43	145	360	685	15				
10	33362	125	47	280	470	1000	13				
11	33363	86	46	190	630	455	10				
12	33364	29	9	110	630	290	4				
13	33365	28	<3	85	50	585	2				
14	33366	6	<3	44	30	880	1				
15	33367	10	5	24	10	1400	1				
16	33371	25	23	170	210	360	10				
17	33372	37	6	320	950	835	10				
18	33373	85	20	255	430	1350	7				
19	33376	50	10	68	60	925	2				
20	33377	50	34	66	60	2400	2				
21	33378	49	12	61	100	695	2				
22	33379	90	18	76	180	505	5				
23	33380	110	7	105	890	980	4				
24	33382	8	6	105	90	23	<1				
25	33383	9	8	55	80	1100	<1				

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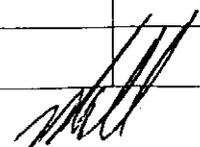


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A.C.N. 004 591 664**ANALYTICAL DATA**

SAMPLE PREFIX		REPORT NUMBER				REPORT DATE	CLIENT ORDER No.		PAGE	
		111310.60.08705				27/04/92	0124		3 OF 5	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Mn	Ba	As			
1	33384	6	<3	3	20	945	<1			
2	33386	4	10	53	50	1250	<1			
3	33387	10	<3	88	80	1450	<1			
4	33388	13	8	120	90	965	1			
5	33389	11	12	84	40	850	2			
6	33390	10	9	46	40	970	1			
7	33391	10	6	99	100	1300	1			
8	33392	2	4	25	40	665	1			
9	33393	3	19	78	120	615	2			
10	33394	2	13	54	130	755	2			
11	33396	15	12	145	780	1000	5			
12	33397	2	9	60	220	760	<1			
13	33398	2	<3	43	190	615	1			
14	33399	2	<3	63	220	660	<1			
15	33400	29	89	350	360	530	20			
16	33404	13	72	46	40	1050	2			
17	33407	48	<3	45	10	465	1			
18	33408	<2	3	9	<10	930	<1			
19	33409	<2	7	19	20	1400	<1			
20	33410	4	4	25	20	800	2			
21	33411	<2	4	17	20	905	<1			
22	33412	2	4	24	40	855	4			
23	33413	5	44	41	80	945	11			
24	33414	87	<3	150	780	700	<1			
25	33417	30	5	90	460	2150	2			

Results in ppm unless otherwise specified
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ANALYTICAL DATA

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REPORT NUMBER

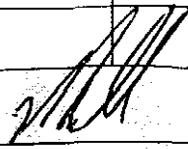
REPORT DATE

CLIENT ORDER No.

PAGE

		111310.60.08705				23/04/92	0124		4 OF 5	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Mn	Ba	As			
1	33418	55	14	135	410	1450	5			
2	33419	17	<3	105	270	1500	1			
3	33422	12	11	69	270	835	<1			
4	33423	20	<3	66	250	230	1			
5	33424	5	6	30	320	640	1			
6	33426	21	25	84	510	1100	5			
7	33427	92	10	135	460	1750	<1			
8	33428	30	13	63	400	875	2			
9	33430	32	3	120	430	1550	5			
10	33431	135	63	265	670	390	1			
11	33432	82	<3	110	460	395	<1			
12	33433	8	6	21	120	2000	<1			
13	33434	4	37	9	40	605	3			
14	33435	3	<3	22	150	1000	<1			
15	33436	3	7	22	140	965	<1			
16	33437	9	9	52	410	1050	<1			
17	33438	3	<3	15	60	1050	<1			
18	33439	2	<3	13	50	1300	1			
19	33440	6	<3	36	170	735	3			
20	33441	41	21	70	210	420	3			
21	33442	4	52	22	80	1750	<1			
22	33443	6	3	30	100	1200	1			
23	33444	5	<3	38	80	650	4			
24	33445	7	3	73	90	735	1			
25	33446	14	<3	230	430	500	4			

Results in ppm unless otherwise specified.
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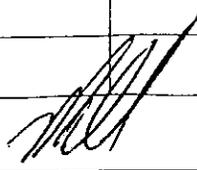
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PAGE

		111310.60.08705				23/04/92		0124		5 OF 5	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Mn	Ba	As				
1	33447	11	5	365	630	250	1				
2	33448	4	31	110	170	695	1				
3	33449	4	22	50	100	825	5				
4	33450	2	5	9	30	865	1				
5	33451	17	98	78	290	970	14				
6	33452	7	8	71	110	900	3				
7	33453	5	6	72	120	870	1				
8	33454	12	15	77	60	870	2				
9	33455	11	7	94	60	1050	1				
10	33456	12	4	49	90	920	<1				
11	33457	20	10	65	40	915	1				
12	33458	8	<3	65	100	775	<1				
13	33459	16	11	81	130	825	1				
14	33460	4	6	115	180	1350	<1				
15	33461	3	<3	32	70	1200	<1				
16											
17											
18											
19											
20											
21											
22											
23	DETECTION	2	3	2	10	10	1				
24	UNITS	ppm	ppm	ppm	ppm	ppm	ppm				
25	METHOD	GA140	GA140	GA140	GA140	GX401	GA114				

Results in ppm unless otherwise specified
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- = element not determined

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066140

JOANNE NEWTON CK SOILS



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

Phone (004) 316837

14 Thirkell St. COOEE TAS 7320

Fax (004) 318890

ANALYTICAL REPORT No. 111310.60.08/40

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INVOICE TO:

Pasminco Exploration
P.O. Box 886
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44

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
33462/500,32861/865	SD Prep : 6P029,92	Cu,Pb,Zn,Mn/GA140 As/GA114,As/GA101 Ba/GX401

RESULTS

TO

Roger Pollock Geological Pty Ltd
Mineral Exploration Contractor
C/- Post Office
WILMOT TAS 7310

RESULTS

TO

Mr J Fitzgerald
Pasminco Exploration
P.O. Box 886
BURNIE TAS 7320

RESULTS

TO

REMARKS

AUTHORISED OFFICER

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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	
		111310.60.08740				19/05/92	0125			1 OF 2	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Mn	As	As	Ba			
1	32861	33	65	43	88	12	-	840			
2	32862	6	102	25	52	7	-	750			
3	32863	7	35	18	55	4	-	680			
4	32864	8	39	23	51	1	-	720			
5	32865	5	6	16	40	4	-	740			
6	33462	29	548	32	39	43	-	1400			
7	33463	63	259	59	1315	12	-	930			
8	33464	78	39	108	1683	8	-	680			
9	33465	50	27	28	94	1	-	1400			
10	33466	84	16	43	62	3	-	6250			
11	33467	160	48	37	195	5	-	2000			
12	33468	122	29	105	664	7	-	700			
13	33469	152	15	98	263	4	-	150			
14	33470	107	10	34	40	11	-	1050			
15	33471	52	35	36	95	46	-	1900			
16	33472	227	64	43	46	>100	250	3150			
17	33473	29	27	21	41	35	-	590			
18	33474	33	6	32	45	7	-	420			
19	33475	8	3	39	80	45	-	300			
20	33476	22	13	22	35	4	-	400			
21	33477	58	15	29	45	12	-	290			
22	33478	66	11	46	62	3	-	250			
23	33479	47	31	20	101	3	-	200			
24	33480	39	3	40	41	<1	-	290			
25	33481	17	5	16	76	1	-	120			

Results in ppm unless otherwise specified
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ANALYTICAL DATA

SAMPLE PREFIX

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CLIENT ORDER No.

PAGE

111310.60.08740

19/05/92

0125

2 OF 2

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Mn	As	As	Ba		
1	33482	9	683	22	43	8	-	1450		
2	33483	19	5	11	97	1	-	150		
3	33484	13	<3	19	55	1	-	690		
4	33485	17	11	33	78	6	-	1550		
5	33486	63	30	21	33	2	-	520		
6	33487	18	51	15	106	1	-	500		
7	33488	14	236	18	59	4	-	1250		
8	33489	15	162	44	225	13	-	760		
9	33490	24	275	79	672	11	-	870		
10	33491	13	200	54	564	31	-	930		
11	33492	54	225	182	368	4	-	930		
12	33493	6	28	27	50	1	-	780		
13	33494	11	24	26	39	2	-	740		
14	33495	3	7	18	32	23	-	1050		
15	33496	5	16	18	29	1	-	670		
16	33497	3	7	15	37	3	-	460		
17	33498	9	45	28	96	14	-	790		
18	33499	5	27	18	50	6	-	750		
19	33500	5	41	20	50	6	-	710		
20										
21										
22										
23	DETECTION	2	3	2	3	1	100	10		
24	UNITS	ppm								
25	METHOD	GA140	GA140	GA140	GA140	GA114	GA101	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 Incharge Inspection and Testing Services Australia Pty. Ltd.

Phone (004) 316837

14 Thirkell St. COOEE TAS 7320

Fax (004) 318890

ANALYTICAL REPORT No.

111310.60.08775

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INVOICE TO:

Pasminco Exploration
P.O. Box 886
BURNIE TAS 7320

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13

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
32866/78	SO Prep : GP029.P2 RO Prep : GP029.P1	Cu,Pb,Zn,Mn/GA140,GA104 Cu,Pb,Zn,Ag,Mn,Bi/GA140 Au/GG309 As/GA114 Ba/GX401

REMARKS

RESULTS

TO

Roger Pollock Geological Pty Ltd
Mineral Exploration Contractor
C/- Post Office
WILPOT TAS 7310

RESULTS

TO

Dr F Fitzgerald
Pasminco Exploration
P.O. Box 886
BURNIE TAS 7320

RESULTS

TO

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.
A.C.N. 004 591 664

ANALYTICAL DATA

SAMPLE PREFIX		REPORT NUMBER				REPORT DATE		CLIENT ORDER No.		PAGE	
		111310.60.08775				02/06/92		0126		1 OF 2	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	Mn	Mn	Bi	Au	As	
1	32866	47	22	190	<1	248	-	<10	<0.008	-	
2	32867	31	33	119	<1	194	-	<10	<0.008	-	
3	32868	23	20	24	-	128	-	-	-	35	
4	32869	25	86	60	-	406	-	-	-	30	
5	32870	78	145	134	-	1170	-	-	-	51	
6	32871	119	101	616	-	>10000	1.90	-	-	26	
7	32872	44	83	53	-	238	-	-	-	14	
8	32873	29	33	74	-	230	-	-	-	8	
9	32874	22	39	38	-	129	-	-	-	6	
10	32875	35	50	63	-	195	-	-	-	7	
11	32876	21	31	46	-	109	-	-	-	4	
12	32877	34	33	76	-	262	-	-	-	3	
13	32878	6	24	37	-	101	-	-	-	3	
14											
15											
16											
17											
18											
19											
20											
21											
22											
23	DETECTION	2	3	2	1	3	0.01	10	0.008	1	
24	UNITS	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	
25	METHOD	GA140	GA140	GA140	GA140	GA140	GA104	GA140	GG309	GA14	

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

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A.C.N. 004 591 664

ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

111310.60.08775

02/06/92

0126

2 OF 2

TUBE No.	SAMPLE No.	Ba							
1	32866	1000							
2	32867	850							
3	32868	280							
4	32869	850							
5	32870	810							
6	32871	1950							
7	32872	970							
8	32873	650							
9	32874	670							
10	32875	770							
11	32876	800							
12	32877	700							
13	32878	520							
14									
15									
16									
17									
18									
19									
20									
21									
22									
23	DETECTION	10							
24	UNITS	ppm							
25	METHOD	GX401							

Results in ppm unless otherwise specified
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Phone (0041) 316837

14 Thirkell St. COOEE TAS 7320

Fax (0041) 318890

ANALYTICAL REPORT No. 111310.60.08848

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
0127	3003
DATE RECEIVED	RESULTS REQUIRED
18/06/92	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES
7	09/07/92	1

TOTAL No. OF SAMPLES
172

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
032879/032900	SO Prep : 6P029.P2	Cu,Pb,Zn,Mn/6A140
033501/033600	SO Prep :	As/6A114,As/6A140
033614/033663	SO Prep :	Ba/6X401

RESULTS TO

Roger Pollock Geological Pty Ltd
Mineral Exploration Contractor
C/- Post Office
WILMOT TAS 7310

RESULTS TO

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

RESULTS TO

REMARKS

AUTHORISED OFFICER

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ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

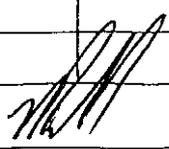
CLIENT ORDER No.

PAGE

		111310.60.08848				09/07/92		0127		1 OF 7	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Mn	As	As	Ba			
1	032879	35	115	17	27	4	-	620			
2	032880	20	14	22	59	1	-	750			
3	032881	9	<3	6	24	1	-	95			
4	032882	8	5	29	25	50	-	450			
5	032883	9	<3	19	24	4	-	220			
6	032884	14	<3	6	24	1	-	55			
7	032885	10	5	12	20	1	-	180			
8	032886	42	38	11	18	10	-	150			
9	032887	39	25	29	83	8	-	340			
10	032888	26	17	27	115	8	-	360			
11	032889	86	40	61	300	7	-	210			
12	032890	18	<3	47	275	3	-	140			
13	032891	7	<3	13	24	<1	-	190			
14	032892	4	<3	14	26	1	-	220			
15	032893	4	<3	15	21	1	-	170			
16	032894	7	5	8	10	1	-	50			
17	032895	10	5	17	26	6	-	240			
18	032896	14	12	13	40	4	-	290			
19	032897	18	6	35	270	2	-	370			
20	032898	32	9	56	465	5	-	190			
21	032899	19	11	33	315	3	-	70			
22	032900	11	9	19	33	1	-	1400			
23	033501	8	3	15	22	3	-	390			
24	033502	11	29	29	61	3	-	1250			
25	033503	18	38	17	34	16	-	590			

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ANALYTICAL DATA

SAMPLE PREFIX REPORT NUMBER REPORT DATE CLIENT ORDER No. PAGE

SAMPLE PREFIX		REPORT NUMBER				REPORT DATE		CLIENT ORDER No.		PAGE	
		111310.60.0884B				09/07/92		0127		2 OF 7	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Mn	As	As	Ba			
1	033504	15	86	18	29	16	-	760			
2	033505	35	53	19	23	10	-	510			
3	033506	29	36	17	32	9	-	460			
4	033507	11	11	15	24	2	-	340			
5	033508	145	72	105	250	8	-	1350			
6	033509	225	75	155	620	26	-	340			
7	033510	82	19	57	115	5	-	310			
8	033511	165	20	80	250	5	-	400			
9	033512	135	42	56	245	10	-	290			
10	033513	87	18	47	130	5	-	340			
11	033514	170	41	69	900	5	-	480			
12	033515	155	29	61	455	6	-	270			
13	033516	120	10	76	350	7	-	980			
14	033517	150	36	99	625	7	-	640			
15	033518	140	63	67	2650	23	-	790			
16	033519	110	36	44	360	19	-	230			
17	033520	130	18	92	440	9	-	310			
18	033521	97	22	54	205	3	-	440			
19	033522	23	18	37	135	6	-	960			
20	033523	46	9	52	150	25	-	900			
21	033524	5	6	20	24	1	-	680			
22	033525	63	48	20	18	16	-	240			
23	033526	14	10	11	26	2	-	150			
24	033527	18	11	23	39	2	-	300			
25	033528	12	3	13	22	6	-	120			

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ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

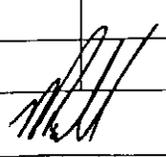
CLIENT ORDER No.

PAGE

		111310.60.08848				09/07/92		0127		3 OF 7	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Mn	As	As	Ba			
1	033529	225	110	29	21	2	-	95			
2	033530	17	19	34	63	4	-	350			
3	033531	54	24	26	34	18	-	320			
4	033532	17	16	20	39	6	-	290			
5	033533	26	26	54	93	16	-	390			
6	033534	9	16	14	29	16	-	1350			
7	033535	335	58	52	115	>100	200	590			
8	033536	119	35	53	99	64	-	360			
9	033537	53	50	41	200	44	-	480			
10	033538	24	35	22	60	39	-	500			
11	033539	107	44	47	120	10	-	470			
12	033540	420	60	220	605	29	-	1900			
13	033541	4	25	11	17	1	-	1400			
14	033542	4	12	13	14	1	-	1950			
15	033543	6	14	14	16	18	-	1200			
16	033544	48	31	40	615	16	-	800			
17	033545	37	5	41	65	2	-	320			
18	033546	55	13	54	59	8	-	240			
19	033547	28	22	21	20	3	-	270			
20	033548	22	13	18	22	1	-	380			
21	033549	32	65	54	765	80	-	480			
22	033550	5	14	20	22	1	-	1450			
23	033551	18	19	22	13	6	-	1050			
24	033552	73	130	36	23	2	-	540			
25	033553	61	58	46	26	6	-	750			

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SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

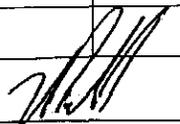
CLIENT ORDER No.

PAGE

		111310.60.08B4B				09/07/92		0127		4 OF 7	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Mn	As	As	Ba			
1	033554	11	76	23	25	7	-	910			
2	033555	110	24	27	32	>100	200	990			
3	033556	8	4	15	39	2	-	1400			
4	033557	3	3	18	28	1	-	1050			
5	033558	12	14	9	28	2	-	250			
6	033559	92	18	50	19	41	-	180			
7	033560	17	13	17	29	7	-	100			
8	033561	41	39	23	31	1	-	230			
9	033562	22	17	15	395	1	-	670			
10	033563	116	93	73	21	23	-	1500			
11	033564	15	12	9	17	<1	-	55			
12	033565	49	205	19	16	16	-	440			
13	033566	6	16	11	24	1	-	80			
14	033567	11	35	15	37	1	-	730			
15	033568	10	29	22	45	1	-	780			
16	033569	10	12	13	30	1	-	260			
17	033570	11	6	14	34	<1	-	560			
18	033571	12	8	13	8	9	-	510			
19	033572	34	29	24	20	14	-	590			
20	033573	9	7	23	18	1	-	460			
21	033574	7	6	16	19	1	-	580			
22	033575	6	3	12	19	4	-	360			
23	033576	12	17	11	11	>100	300	300			
24	033577	13	7	12	18	6	-	260			
25	033578	50	35	35	44	82	-	150			

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SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

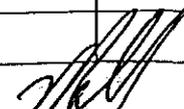
CLIENT ORDER No.

PAGE

		111310.60.0884B				09/07/92		0127		5 OF 7	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Mn	As	As	Ba			
1	033579	24	8	32	120	4	-	130			
2	033580	28	21	26	185	5	-	150			
3	033581	19	7	29	70	22	-	130			
4	033582	17	12	33	47	10	-	85			
5	033583	11	13	28	56	8	-	50			
6	033584	23	19	26	55	21	-	220			
7	033585	8	15	11	7	1	-	320			
8	033586	16	72	8	25	1	-	450			
9	033587	21	173	20	34	7	-	1450			
10	033588	12	235	19	36	1	-	2150			
11	033589	12	11	18	43	1	-	910			
12	033590	7	17	15	20	2	-	610			
13	033591	12	5	14	19	1	-	440			
14	033592	7	29	10	24	36	-	220			
15	033593	13	11	14	13	2	-	350			
16	033594	7	4	13	14	>100	100	560			
17	033595	14	55	15	27	28	-	280			
18	033596	6	6	14	28	8	-	290			
19	033597	13	4	49	290	7	-	150			
20	033598	18	6	83	520	6	-	280			
21	033599	13	<3	59	295	3	-	410			
22	033600	50	5	45	470	5	-	300			
23	033614	25	6	44	380	5	-	230			
24	033615	24	16	44	280	6	-	240			
25	033616	27	15	48	3050	3	-	270			

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SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

		111310.60.08848				09/07/92	0127		6 of 7	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Mn	As	As	Ba		
1	033617	27	15	89	820	3	-	530		
2	033618	29	19	54	260	4	-	240		
3	033619	12	9	41	255	1	-	450		
4	033620	21	20	101	520	4	-	180		
5	033621	14	5	46	115	18	-	160		
6	033622	34	16	55	175	21	-	300		
7	033623	17	9	15	17	1	-	280		
8	033624	33	8	7	44	1	-	85		
9	033625	10	6	13	14	3	-	280		
10	033626	12	8	7	51	1	-	100		
11	033627	90	46	13	58	5	-	310		
12	033628	9	<3	13	38	1	-	530		
13	033629	5	<3	9	12	1	-	420		
14	033630	11	5	8	32	1	-	290		
15	033631	16	7	59	415	3	-	240		
16	033632	12	7	54	395	3	-	260		
17	033633	20	14	48	285	5	-	240		
18	033634	15	15	40	115	5	-	160		
19	033635	67	50	24	54	24	-	220		
20	033636	25	9	38	195	2	-	140		
21	033637	39	22	58	375	3	-	290		
22	033638	42	10	36	150	3	-	130		
23	033639	19	3	49	250	2	-	150		
24	033640	38	11	86	895	2	-	450		
25	033641	98	57	45	545	5	-	480		

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Department of Public Health and Family Services, Albany, N.S.W.

ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

		111310.60.08848				09/07/92		0127		7 OF 7	
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Mn	As	As	Ba			
1	033642	14	4	40	155	3	-	140			
2	033643	18	8	46	86	4	-	140			
3	033644	16	3	32	96	4	-	110			
4	033645	14	<3	51	195	3	-	100			
5	033646	17	3	64	595	2	-	120			
6	033647	24	8	30	135	1	-	270			
7	033648	25	<3	67	200	2	-	280			
8	033649	21	12	6	20	2	-	85			
9	033650	4	<3	7	57	<1	-	85			
10	033651	25	21	7	15	4	-	140			
11	033652	140	110	22	100	52	-	170			
12	033653	51	30	8	33	9	-	140			
13	033654	26	19	29	51	7	-	730			
14	033655	11	6	15	57	1	-	760			
15	033656	42	20	9	61	2	-	420			
16	033657	48	16	20	20	2	-	1200			
17	033658	10	<3	12	34	5	-	360			
18	033659	7	<3	13	17	1	-	240			
19	033660	5	3	11	37	2	-	520			
20	033661	7	<3	8	19	1	-	210			
21	033662	21	3	60	235	7	-	600			
22	033663	19	3	42	540	5	-	150			
23	DETECTION	2	3	2	3	1	50	10			
24	UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm			
25	METHOD	GA140	GA140	GA140	GA140	GA114	GA140	GX401			

Results in ppm unless otherwise specified
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066154

NEWTON CREEK SULPHIDE CLAYS



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

Phone (004) 316837

14 Thirkeil St. CODEE TAS 7320

Fax (004) 318890

ANALYTICAL REPORT No.

111310.60.08124

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

0158

3003

DATE RECEIVED

RESULTS REQUIRED

10/07/91

ASAP

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30/08/91

1

7

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
30361/30367	RC Prep : GP029,P1	Cu,Pb,Zn,Ag,Fe,Mn,Cd,Co/6A104
30361/30367	RC Prep :	Hg/6A122
30361/30367	RC Prep :	Au,As,Ba,W,Sb/6N801
30361/30367	RC Prep : GP029,P1	Ag:1/6A104

REMARKS

RESULTS

TO

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

RESULTS

TO

RESULTS

TO

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

ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

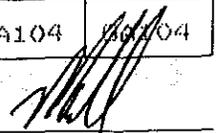
CLIENT ORDER No.

PAGE

		111310.60.08124				30/08/91		0158		1 OF 2	
TUBE No.	SAMPLE No.	Cu	Cu:1	Pb	Zn	Ag	Ag:1	Fe	Mn	Cd	
1	30361	0.61	-	22.8	27.3	270.0	-	4.72	900	3032	
2	30362	0.84	-	22.8	29.5	641.0	-	3.13	120	1854	
3	30363	0.73	-	22.0	20.7	443.0	-	4.04	135	1448	
4	30364	-	100	29.1	27.5	1000.0	6058	1.30	215	1375	
5	30365	0.32	-	17.8	23.4	167.0	-	5.01	358	2253	
6	30366	0.15	-	34.4	24.0	384.0	-	3.05	160	1242	
7	30367	0.16	-	22.0	26.4	252.0	-	3.44	189	1345	
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23	DETECTION	0.01	25	0.1	0.1	2.5	25	0.01	5	5	
24	UNITS	%	ppm	%	%	ppm	ppm	%	ppm	ppm	
25	METHOD	GA104	GA104	GA104	GA104	GA104	GA104	GA104	GA104	GA104	

Results in ppm unless otherwise specified
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ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

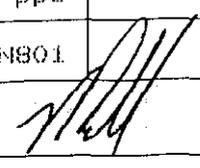
CLIENT ORDER No.

PAGE

		111310.60.08124				30/08/91		0158		2 OF 2	
TUBE No.	SAMPLE No.	Co	Hg	Hg	As	Sb	Ba	W	Au		
1	30361	37	>1.000	35	15	94.9	<380	190	71		
2	30362	<25	>1.000	30	48	510.0	<450	145	533		
3	30363	36	>1.000	25	62	275.0	<420	84	169		
4	30364	<25	>1.000	35	31	962.0	<490	80	1010		
5	30365	51	>1.000	70	20	92.3	<460	37	4290		
6	30366	<25	>1.000	30	59	398.0	<380	18	719		
7	30367	<25	>1.000	30	133	224.0	<380	19	628		
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23	DETECTION	25	0.005	5	2	0.5	100	2	5		
24	UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppb		
25	METHOD	GA104	GA122	GA199	GN801	GN801	GN801	GN801	GN801		

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APPENDIX B.

SAMPLE RECORD & ANALYTICAL DATA SHEETS

B1 Ore & Pathfinder suite

B2 Lithogeochemistry Henty Fault Wedge igneous rocks

B3 Lithogeochemistry alteration, lithotype and sediments

ROGER POLTOCK GEOLOGICAL PTY. LTD.

CLIENT *PASMINCO EXPLORATION*
 PROJECT *11/85 VOLANDE*
 PROSPECT

SAMPLE RECORD AND ANALYTICAL DATA SHEET

LABORATORY *ANALABS 08124.*
 SAMPLE TYPE *Rock*

COLLECTED BY: *F. FitzGerald.*
 DATE DISPATCHED:
 DATE RECEIVED:

A 28306

SAMPLE NUMBER	LOCATION		DESCRIPTION	ANALYSES													
				Cu	Pb	Zn	Ag	Au	Fe	Mn	Co	Mo	Ni	As	Sb	W	Ba
30361	5358650	380000E	Sulfide clast Newton Dam spill way	0.61	22.8	27.3	270		4.72%	3032	37	35	15	94.9	190		
30362	"	"	"	0.24	22.8	29.50	641	0.071	3.13%	120	1854	225	30	510	165		
30363	"	"	"	0.23	22.0	26.67	443	0.169	4.04%	135	1448	36	25	62	275		
30364	"	"	"	0.01	27.10	27.50	605B	1.01	1.30%	215	1375	225	35	31	962		
30365	"	"	"	0.32	17.8	23.40	167	4.29	5.01%	358	2253	57	70	20	92.3		
30366	"	"	"	0.15	34.4	23.99	384	0.719	3.05%	160	1202	225	30	59	398		
30367	"	"	"	0.16	22.0	26.40	252	0.628	3.44%	189	1345	225	30	133	224		

066158

ROGER POLTOCK GEOLOGICAL PTY. LTD.

CLIENT *Palminco Exploration*
 PROJECT *11/25 Toland*
 PROSPECT

SAMPLE RECORD AND ANALYTICAL DATA SHEET
 LABORATORY ANALYSIS *08531*
 SAMPLE TYPE *Rock*

COLLECTED BY: *R Pollock*
 DATE DISPATCHED:
 DATE RECEIVED:

A 28005

SAMPLE NUMBER	LOCATION	DESCRIPTION	ANALYSES								
			Cu	Pb	Zn	Ag	Ag	Ba	Mn	B. As	Sn Sb
31504		LOCATION / ORE SUITE SEE	Approx	B	1980-9	REPORT		42	355	7	23
31674								488	23	11	20
31676								1220	9	10	23
31678								1340	10	8	23
31681								1490	2	6	5
31685								224	500	23	30
31686								989	110	5	13
31687								1000	11	23	23
31688								1460	↑ 73	9	25
31700								258	10	10	23
31525								156	25	23	330
31527								705	48	10	23
31540								176	650	6	14
31541								52	1150	8	6
31546								52	48	9	23
31574								932	230	6	23
31575								104	550	5	12
31576								25	29	6	6
31577								80	1200	8	90
31578								2100%	1	11	6
31579								4.10%	310	8	9

000102

ROGER POLTOCK GEOLOGICAL PTY. LTD.

CLIENT *PASMINCO EXPLORATION*
 PROJECT *11/85 TOLANDE*
 PROSPECT

SAMPLE RECORD AND ANALYTICAL DATA SHEET
 LABORATORY *ANALABS 08531*
 SAMPLE TYPE *ROCK*

COLLECTED BY: *R Poltock*
 DATE DISPATCHED:
 DATE RECEIVED:

A 28006

SAMPLE NUMBER	LOCATION	DESCRIPTION	ANALYSES											
			Cu	Pb	Zn	Ag	Au	Ba	Mn	Bi	As	Sn	Sb	
31583		LOCATION / ORE SUITE SEE APPENDIX B 1890-9									647	67	3	4
31584											316	58	8	4
31585											209	42	9	4
31586											163	450	6	5
31587											172	7	13	13
31588											329	1	5	13
31589											681	26	8	13
31590											239	22	6	13
31591											452	23	11	13
31595											1240	9	8	13
32107											812	32		
32110											1150	5		
32112											1130	5		
32117											806	3		
32119											174	4		
32120											1220	3		
32121											7030	540		
32122											8880	92		
32123											99	4		
32124											111	2		
32125											61	1200		

066163

ROGER POLTOCK GEOLOGICAL PTY. LTD.

CLIENT PAMINCO EXPLORATION
 PROJECT EL 11/RS VOLANDE
 PROSPECT HENTH FAULT WEDGE

SAMPLE RECORD AND ANALYTICAL DATA SHEET
 LABORATORY UNIVERSITY TAS / ANALABS (REE)
 SAMPLE TYPE ROCK.

COLLECTED BY: R. Pollock
 DATE DISPATCHED:
 DATE RECEIVED:

A 28306

SAMPLE NUMBER	LOCATION	DESCRIPTION	ANALYSES				
			SEE	Appendix			
30048	* SEE APPENDIX.	E Lbn 1 andesite plagioclase / augite phyriz					
30055	for coordinates	E L/I b basalt tholeiite					
30085		E I t tonalite					
30099	* See legend	E I / L rd rhyolite lava - qtz fels phyriz					
30102	1:25000 for junction	E Vn 1 andesite lower associated with "ophiolite"					
30103	Code.	" " " " " "					
30105		E L/I b basalt tholeiite					
30117		E I t tonalite					
30124		E L/I b basalt tholeiite					
30126		" " "					
30155		E I g andesite dyke associated with "ophiolite"					
30159		" dolerite " "					
30173		E Lbn 2 plag phyriz andesite					
30194		E L/I b basalt tholeiite					
30857		E Lbn 2 plag phyriz andesite					
30862		" " " "					
30869		" " " "					
30889		" " " "					
30922		E L/I b basalt tholeiite					
30973		E Lbn 2 plag phyriz andesite					
30980		" " " "					

001000

ROGER POLTOCK GEOLOGICAL PTY. LTD.

CLIENT PASMINGO EXPLORATION
 PROJECT EL 11/85 YOLANDE
 PROSPECT

SAMPLE RECORD AND ANALYTICAL DATA SHEET

LABORATORY ANALABS 08605
 SAMPLE TYPE Rock LITHOGEOCHEM

COLLECTED BY: R Poltock
 DATE DISPATCHED:
 DATE RECEIVED:

A 28308

SAMPLE NUMBER	LOCATION		DESCRIPTION	ANALYSES			
				see Appendix			
216481	53 60 780	377414	E Vrd. plag phytic dacitic rvtc, strong silica - sericite - pyrite alteration				
30099	53 53 200	376590	E Lrd. rhyolite lava - qtz feld pyrox - calcite sericite alteration.				
30195	53 51 200	373535	E Swz feld xt rst - albite chl alt				
30985	53 50 500	373500	E Swz " " " - albite jct				
31524	53 50 300	380075	E Vn2 andesite lava < chl.				
31526	53 50 320	380040	E Scng - dacite/andesite chert - sericite/calcite + silic alt				
31524	53 60 525	377275	E Sst siltsone - feld py seric alt.				
31686	53 51 010	375070	E Lbn2 carbonate alteration.				
31687	53 50 960	375060	E Lbn2 Andesite-dacite lava - calc / fuchsite alteration				
31688	53 50 850	375060	E Lbn2 Dacite lava - plag phytic - calcite-sericite pyrite alteration				
32149	53 57 800N	379280E	E Vrd vitc-clastic feld qtz - sericite py alt				
32150	53 57 800N	379200E	E Vn2 Vitc-clastic chlonic				
32218	53 60 275N	377600E	E Vpmf - feldsp phytic - chl alb mag alt				
32219	53 59 850N	377150E	E Sst - silicified "mdf" sandstone.				
32221	53 50 400N	379450E	E Vrd - dacitic mdf - plag phytic				

066169

ROGER POLTOCK GEOLOGICAL PTY. LTD.

CLIENT *PASMINCO EXPLORATION*
 PROJECT *EL 11/25 VOLCANO*
 PROSPECT

SAMPLE RECORD AND ANALYTICAL DATA SHEET
 LABORATORY ANALABS
 SAMPLE TYPE *Rock - Litho geochem*

COLLECTED BY: *R Poltock*
 DATE DISPATCHED:
 DATE RECEIVED:

A 28305

SAMPLE NUMBER	LOCATION		DESCRIPTION	ANALYSES														
				SiF	Ap	Am	Al	Fe	Mg	Ca	Na							
30801	DDH	HR 2	139-140m	Elbn 2	plag phytic andesite -	calcite	veins											
30812	"	"	193-194m	"	"	"	"	sericite	altered									
30833	"	"	95-96m	"	"	"	"											
30847	DDH	HR 3	556-557m	"	"	"	"	sericite	carb	alt								
30854	"	"	583-584m	"	hyaloclastite	- carbonated	- trace	gms	sph									
30876	DDH	HR 5	311-312m	"	plag phytic andesite -	carb	altered											
30884	"	"	332-333m	"	"	"	"	- calc	sph	veins								

066170

APPENDIX C.
FIXED-LOOP ELECTROMAGNETIC SURVEY,
NEWTON CREEK AND HENTY VALLEY
EL 11/85 YOLANDE JV
R S Smith

PASMINCO EXPLORATION

FIXED-LOOP ELECTROMAGNETIC SURVEY,
NEWTON CREEK AND HENTY VALLEY
EL 11/85 YOLANDE JV

Author: R S Smith
Date: June 1992
Submitted To: F G FitzGerald
Attention: R A Poltock

Copies: Pasminco Exploration - Burnie
Pasminco Exploration - Hawthorn

Submitted By:

Accepted By:

Burnie File Nummber: T92-11

Burnie
June 1992

LIST OF FIGURES

NEWTON CREEK

a)	UTEM Survey Grid Layout	1:25 000
b)	1. UTEM Response Loop NC01 Line 61000N Continuous Normalisation	1:10 000
	2. UTEM Response Loop NC01 Line 61000N Point Normalisation	1:10 000
	3. UTEM Response Loop NC01 Line 60800N Continuous Normalisation	1:10 000
	4. UTEM Response Loop NC01 Line 60800N Point Normalisation	1:10 000
	5. UTEM Response Loop NC01 Line 60600N Continuous Normalisation	1:10 000
	6. UTEM Response Loop NC01 Line 60600N Point Normalisation	1:10 000
	7. UTEM Response Loop NC01 Line 60400N Continuous Normalisation	1:10 000
	8. UTEM Response Loop NC01 Line 60400N Point Normalisation	1:10 000
	9. UTEM Response Loop NC01 Line 60200N Continuous Normalisation	1:10 000
	10. UTEM Response Loop NC01 Line 60200N Point Normalisation	1:10 000
	11. UTEM Response Loop NC01 Line 60000N Continuous Normalisation	1:10 000
	12. UTEM Response Loop NC01 Line 60000N Point Normalisation	1:10 000
	13. UTEM Response Loop NC01 Line 59800N Continuous Normalisation	1:10 000
	14. UTEM Response Loop NC01 Line 59800N Point Normalisation	1:10 000
	15. UTEM Response Loop NC01 Line 59600N Continuous Normalisation	1:10 000
	16. UTEM Response Loop NC01 Line 59600N Point Normalisation	1:10 000
	17. UTEM Response Loop NC01 Line 59400N Continuous Normalisation	1:10 000
	18. UTEM Response Loop NC01 Line 59400N Point Normalisation	1:10 000
	19. UTEM Response Loop NC01 Line 59200N Continuous Normalisation	1:10 000
	20. UTEM Response Loop NC01 Line 59200N Point Normalisation	1:10 000
	21. UTEM Response Loop NC02 Line 59000N Continuous Normalisation	1:10 000
	22. UTEM Response Loop NC02 Line 59000N Point Normalisation	1:10 000
	23. UTEM Response Loop NC02 Line 58800N Continuous Normalisation	1:10 000
	24. UTEM Response Loop NC02 Line 58800N Point Normalisation	1:10 000
	25. UTEM Response Loop NC02 Line 58600N Continuous Normalisation	1:10 000
	26. UTEM Response Loop NC02 Line 58600N Point Normalisation	1:10 000
	27. UTEM Response Loop NC02 Line 58400N Continuous Normalisation	1:10 000
	28. UTEM Response Loop NC02 Line 58400N Point Normalisation	1:10 000
	29. UTEM Response Loop NC02 Line 58200N Continuous Normalisation	1:10 000
	30. UTEM Response Loop NC02 Line 58200N Point Normalisation	1:10 000
	31. UTEM Response Loop NC02 Line 58000N Continuous Normalisation	1:10 000
	32. UTEM Response Loop NC02 Line 58000N Point Normalisation	1:10 000
	33. UTEM Response Loop NC02 Line 57800N Continuous Normalisation	1:10 000
	34. UTEM Response Loop NC02 Line 57800N Point Normalisation	1:10 000

35.	UTEM Response Loop NC02 Line 57600N Continuous Normalisation	1:10 000
36.	UTEM Response Loop NC02 Line 57600N Point Normalisation	1:10 000
37.	UTEM Response Loop NC02 Line 57400N Continuous Normalisation	1:10 000
38.	UTEM Response Loop NC02 Line 57400N Point Normalisation	1:10 000
c)	<i>Preliminary UTEM interpretation</i>	1:5 000

HENTY VALLEY

d)	UTEM Survey Grid Layout	1:25 000
e)	1. UTEM Response Loop HV01 Line 51800N Continuous Normalisation	1:10 000
	2. UTEM Response Loop HV01 Line 51800N Point Normalisation	1:10 000
	3. UTEM Response Loop HV01 Line 51600N Continuous Normalisation	1:10 000
	4. UTEM Response Loop HV01 Line 51600N Point Normalisation	1:10 000
	5. UTEM Response Loop HV01 Line 51400N Continuous Normalisation	1:10 000
	6. UTEM Response Loop HV01 Line 51400N Point Normalisation	1:10 000
	7. UTEM Response Loop HV01 Line 51300N Continuous Normalisation	1:10 000
	8. UTEM Response Loop HV01 Line 51300N Point Normalisation	1:10 000
	9. UTEM Response Loop HV01 Line 51200N Continuous Normalisation	1:10 000
	10. UTEM Response Loop HV01 Line 51200N Point Normalisation	1:10 000
	11. UTEM Response Loop HV01 Line 51000N Continuous Normalisation	1:10 000
	12. UTEM Response Loop HV01 Line 51000N Point Normalisation	1:10 000
	13. UTEM Response Loop HV01 Line 50800N Continuous Normalisation	1:10 000
	14. UTEM Response Loop HV01 Line 50800N Point Normalisation	1:10 000
	15. UTEM Response Loop HV01 Line 50600N Continuous Normalisation	1:10 000
	16. UTEM Response Loop HV01 Line 50600N Point Normalisation	1:10 000
	17. UTEM Response Loop HV01 Line 50400N Continuous Normalisation	1:10 000
	18. UTEM Response Loop HV01 Line 50400N Point Normalisation	1:10 000
	19. UTEM Response Loop HV02 Line 51800N Continuous Normalisation	1:10 000
	20. UTEM Response Loop HV02 Line 51800N Point Normalisation	1:10 000
	21. UTEM Response Loop HV02 Line 51600N Continuous Normalisation	1:10 000
	22. UTEM Response Loop HV02 Line 51600N Point Normalisation	1:10 000
	23. UTEM Response Loop HV02 Line 51400N Continuous Normalisation	1:10 000
	24. UTEM Response Loop HV02 Line 51400N Point Normalisation	1:10 000
	25. UTEM Response Loop HV02 Line 51300N Continuous Normalisation	1:10 000
	26. UTEM Response Loop HV02 Line 51300N Point Normalisation	1:10 000
	27. UTEM Response Loop HV02 Line 51200N Continuous Normalisation	1:10 000
	28. UTEM Response Loop HV02 Line 51200N Point Normalisation	1:10 000
	29. UTEM Response Loop HV02 Line 51000N Continuous Normalisation	1:10 000

30.	UTEM Response Loop HV02 Line 51000N Point Normalisation	1:10 000
31.	UTEM Response Loop HV02 Line 50800N Continuous Normalisation	1:10 000
32.	UTEM Response Loop HV02 Line 50800N Point Normalisation	1:10 000
33.	UTEM Response Loop HV02 Line 50600N Continuous Normalisation	1:10 000
34.	UTEM Response Loop HV02 Line 50600N Point Normalisation	1:10 000
35.	UTEM Response Loop HV02 Line 50400N Continuous Normalisation	1:10 000
36.	UTEM Response Loop HV02 Line 50400N Point Normalisation	1:10 000
f)	Preliminary UTEM Interpretation	1:5 000

FIXED-LOOP ELECTROMAGNETIC SURVEY, NEWTON CREEK

A UTEM survey was undertaken on the Newton Creek grid during October, 1991. A waveform repetition rate of 52 Hz was used and there were two transmitter loops NC01 and NC02, the locations of which are shown on figure a. Loop NC01 was used for lines 61 000N to 59200N and loop NC02 was used for lines 59000N to 57400N. The vertical component data measured on each line have been plotted in the normal UTEM format, using both continuous and point normalisation (see figures b1 to b38).

The interpretation plan of the area is shown on figure c. The most distinctive feature is a conductive zone running parallel, but displaced between 40 and 60m to the west of the South Henty fault. South of line 59600N, this feature diverges from the South Henty fault and decreases in magnitude. If this zone were caused by a geochemically blind ore body, the best target would be at 79220E on line 60200N at about 150m depth. Ideally, the drill collar would be at 9300N and inclined at 55° to the west.

The strongest anomaly on the southern part of the grid is within the South Henty fault zone on line 58400N at 9270E. The target appears to be 60m deep. There is also some anomalism on the next two lines to the north, 58600N and 58800N. All three anomalies have a strong component from a shallow source but there are hints of deeper sources, or an indication of current migration down a westerly feature. Because of the existence of these anomalies, there is fairly good evidence for drilling the South Henty fault somewhere between 58800N and 58400N.

The 1–2m wide siltstone/fine-grained sandstone which outcrops at 79330E on line 58000N and is geochemically anomalous has no electromagnetic response.

The conglomerate at about 9600E on lines 57600N – 58000N does have a UTEM response, but the source appears to be surficial on all lines. Optimistically, the anomaly on line 57600N at 79740E appears to be the one most likely to have a source at depth (100m).

The siltstone west of the South Henty fault between 59600N and 60200N is geophysically anomalous. The best target is on line 60000N, 80m below 78900E. The geophysical evidence suggests the zone may extend northwards to 60400N and southwards to 59400N. An alternate target with a stronger electromagnetic anomaly, may be on line 59400N at 78900E, where the source is 60m deep.

East of the South Henty fault, there are at least two conductive zones. The western most of these appears surficial, except on lines 59200N and 59400N at about 79650E where there may be a weakly conductive source at a depth of 50m.

The eastern most zone is geochemically anomalous between 60600N and 61000N and 79700E and 79900E. The electromagnetic anomalies imply the material is conductive, but its depth is probably less than 25m. None of the electromagnetic anomalies are particularly distinctive.

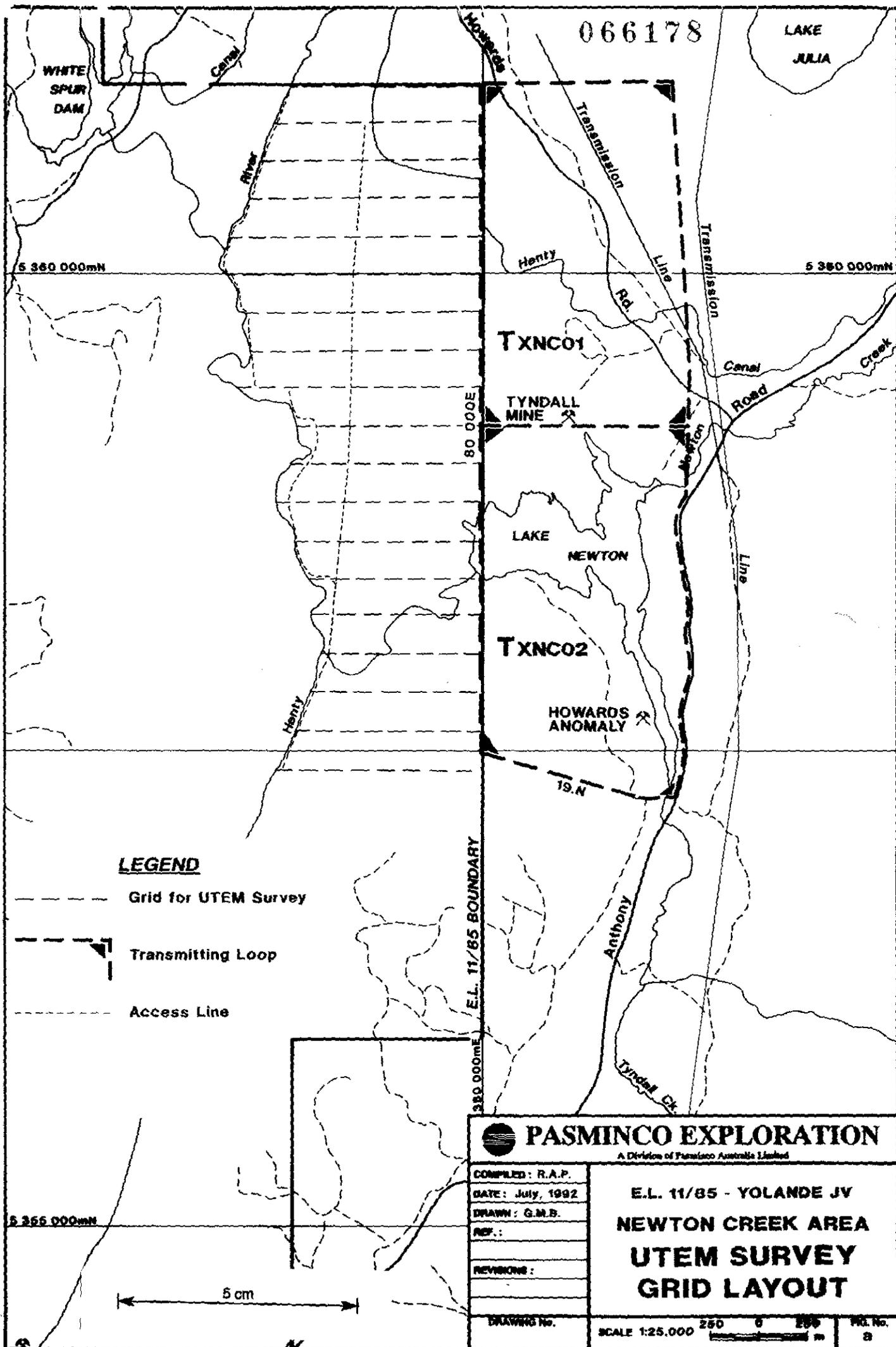
FIXED-LOOP ELECTROMAGNETIC SURVEY, HENTY VALLEY

A UTEM survey was undertaken on the Henty Valley grid during October, 1991. A waveform repetition rate of 52 Hz was used for the survey. Loop HV01 was laid down with its leading edge erroneously placed along line 75000E, so the survey has to be repeated with a second loop HV02, which had a leading edge at 74800E (see figure d). The vertical component measurements, plotted in the normal UTEM format using both continuous and point normalisation, are shown in figures e1 to e36.

An interpretation of the UTEM data is shown on figure f. The most distinctive is the South Henty fault, which is only manifest as a surficial conductive zone. East and west of this fault, there are many other conductive features which appear to be due to surficial sources.

Two zones west of the fault have anomalous geochemistry. One at 75340E on line 51300N has a very sharp UTEM response; the causative body could be 80m deep, but is more likely 20m deep. Unfortunately, there is insufficient data over the anomaly to determine the depth accurately. The response is such that it would be difficult to target or justify a drill-hole on the basis of the electromagnetic data alone.

The second zone of anomalous geochemistry is a steeply dipping unit of altered basaltic andesite to dacite between 75000E and 75200E on lines 50600N to 51400N. UTEM anomalies coincide with this unit on all lines, but each appears to have a shallow source, perhaps due to preferential weathering. The best anomalies are on line 50800N and 51000N at 75080E and 75060E respectively (the former is the stronger). In either case the source would be deeper than 80m and is more likely 40m deep.



066178

WHITE SPUR DAM

LAKE JULIA

5 360 000mN

5 360 000mN

TXNCO1

TYNDALL MINE

LAKE NEWTON

TXNCO2

HOWARDS ANOMALY

LEGEND

- - - - - Grid for UTEM Survey
- - - - - Transmitting Loop
- - - - - Access Line

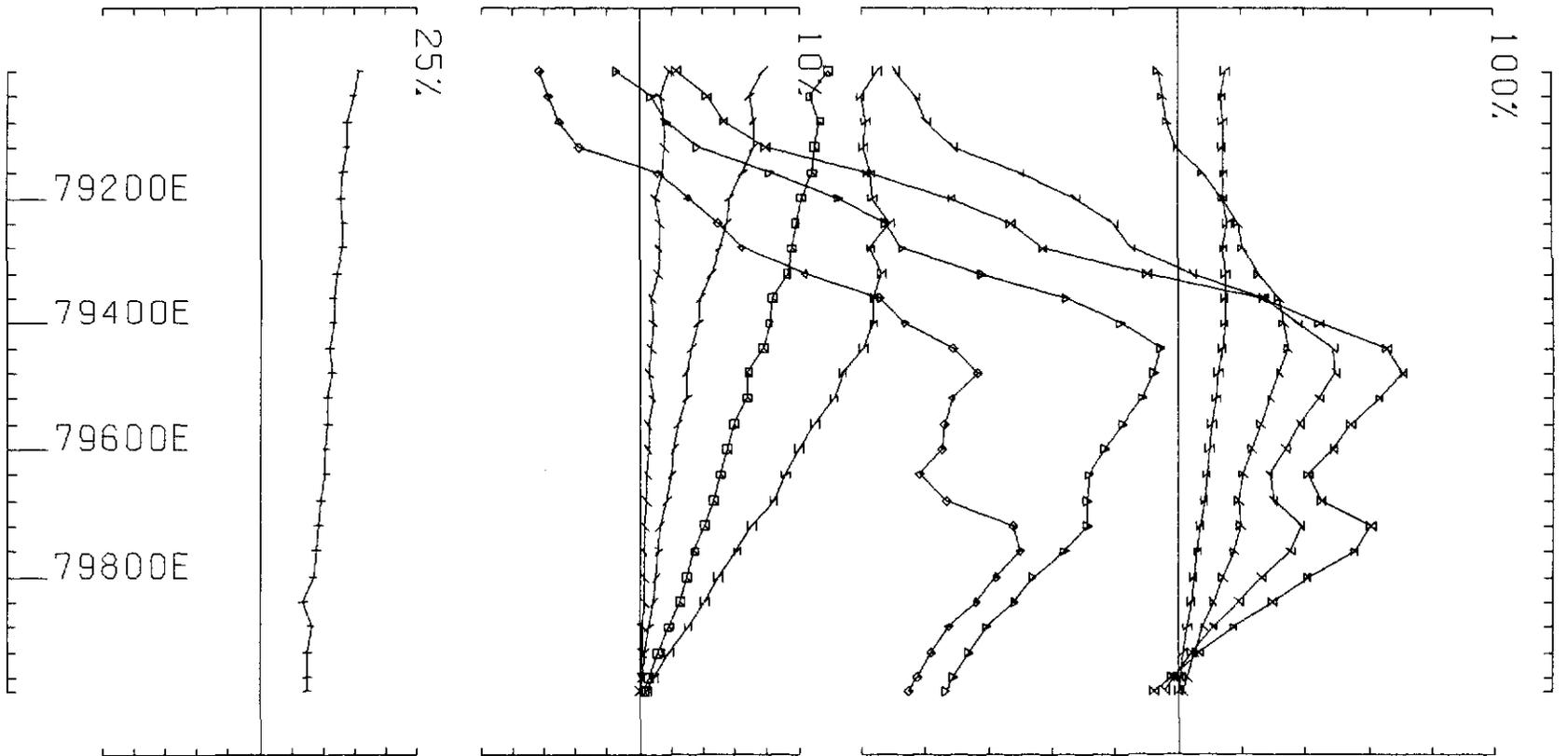
E.L. 11/85 BOUNDARY

380 000mE

5 365 000mN

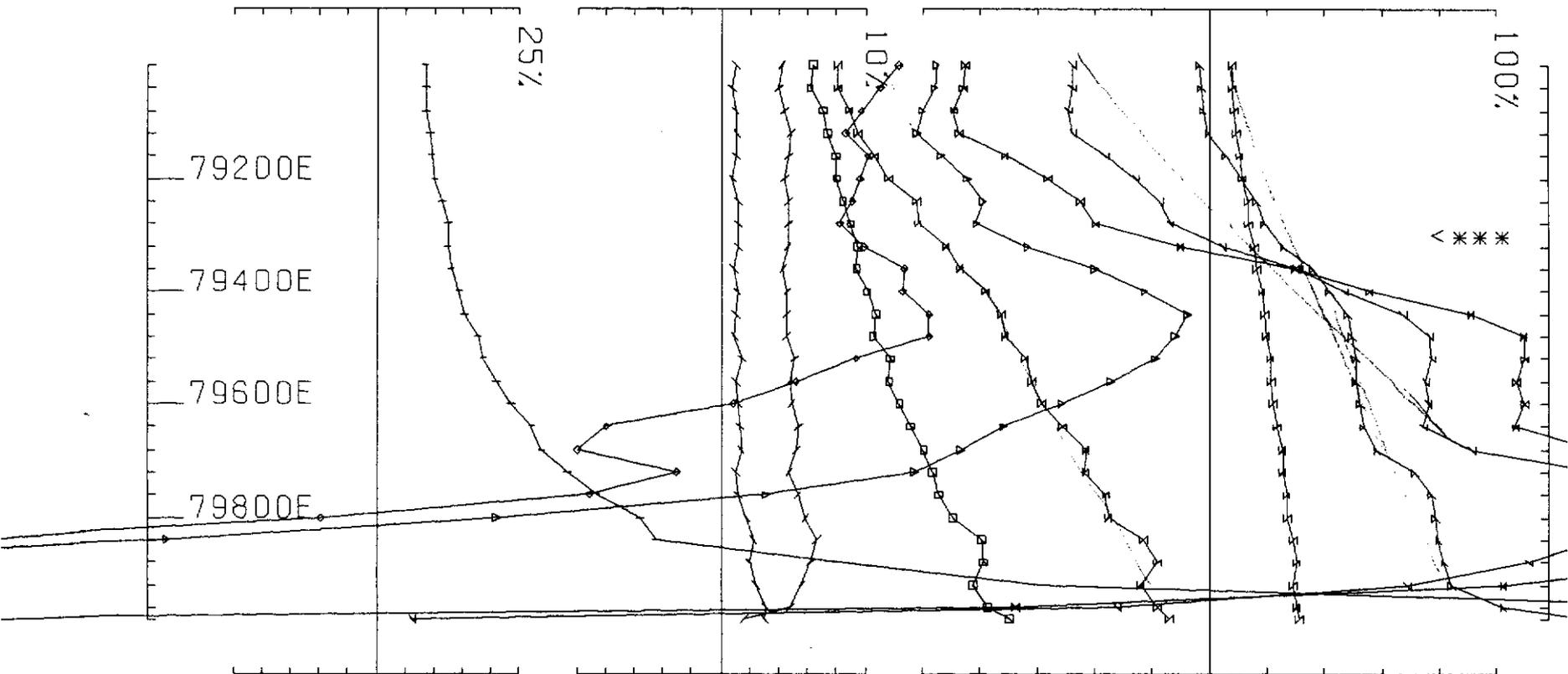
5 cm

 PASMINCO EXPLORATION <small>A Division of Pasminco Australia Limited</small>	
COMPILED: R.A.P. DATE: July, 1992 DRAWN: G.M.B. REF.: REVISIONS:	E.L. 11/85 - YOLANDE JV NEWTON CREEK AREA UTEM SURVEY GRID LAYOUT
DRAWING No.	SCALE 1:25,000
	PRJ. No. 8



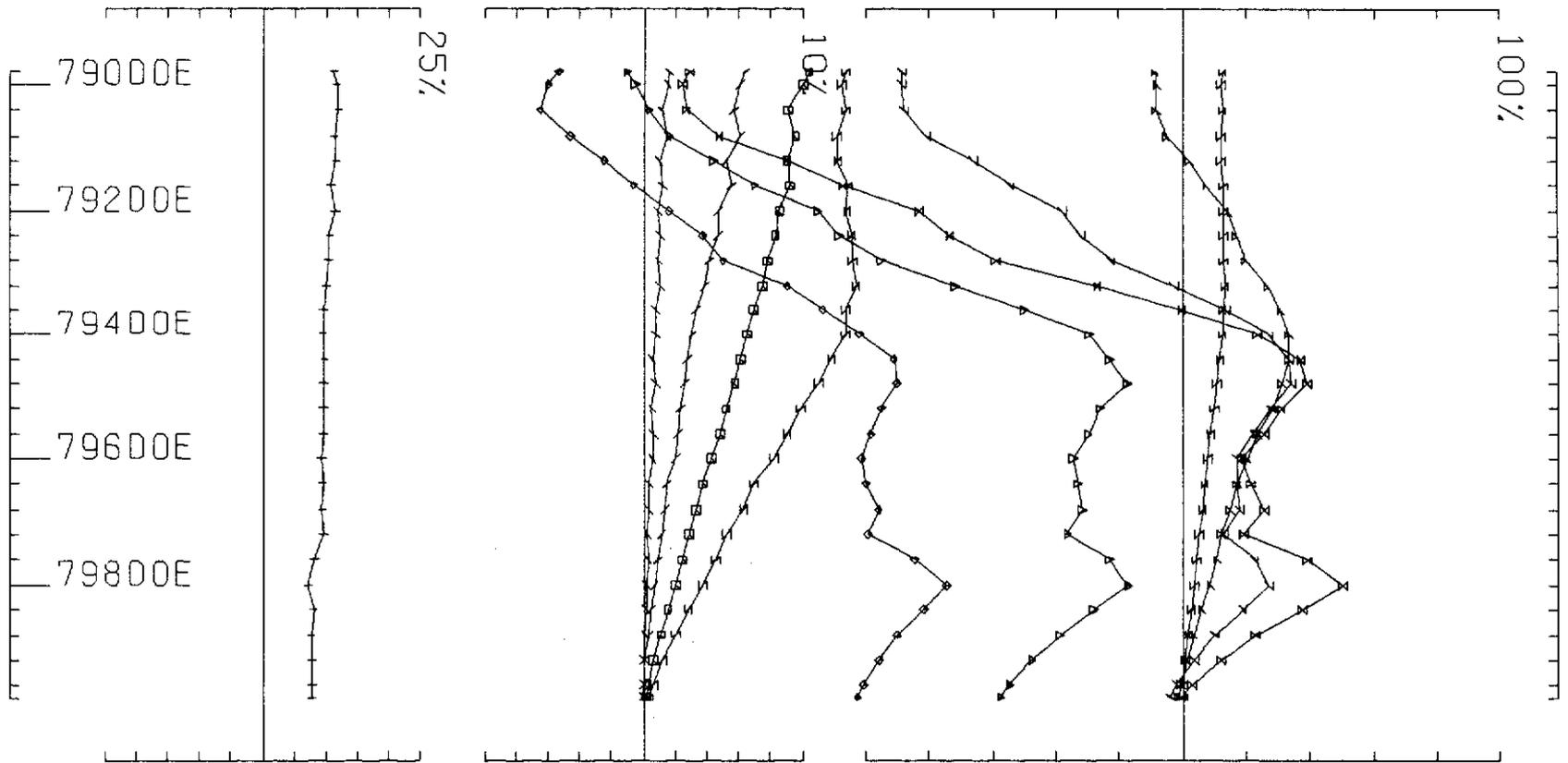
UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION OCT.1991
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
 LOOP NO NC01 LINE 61000 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

066179



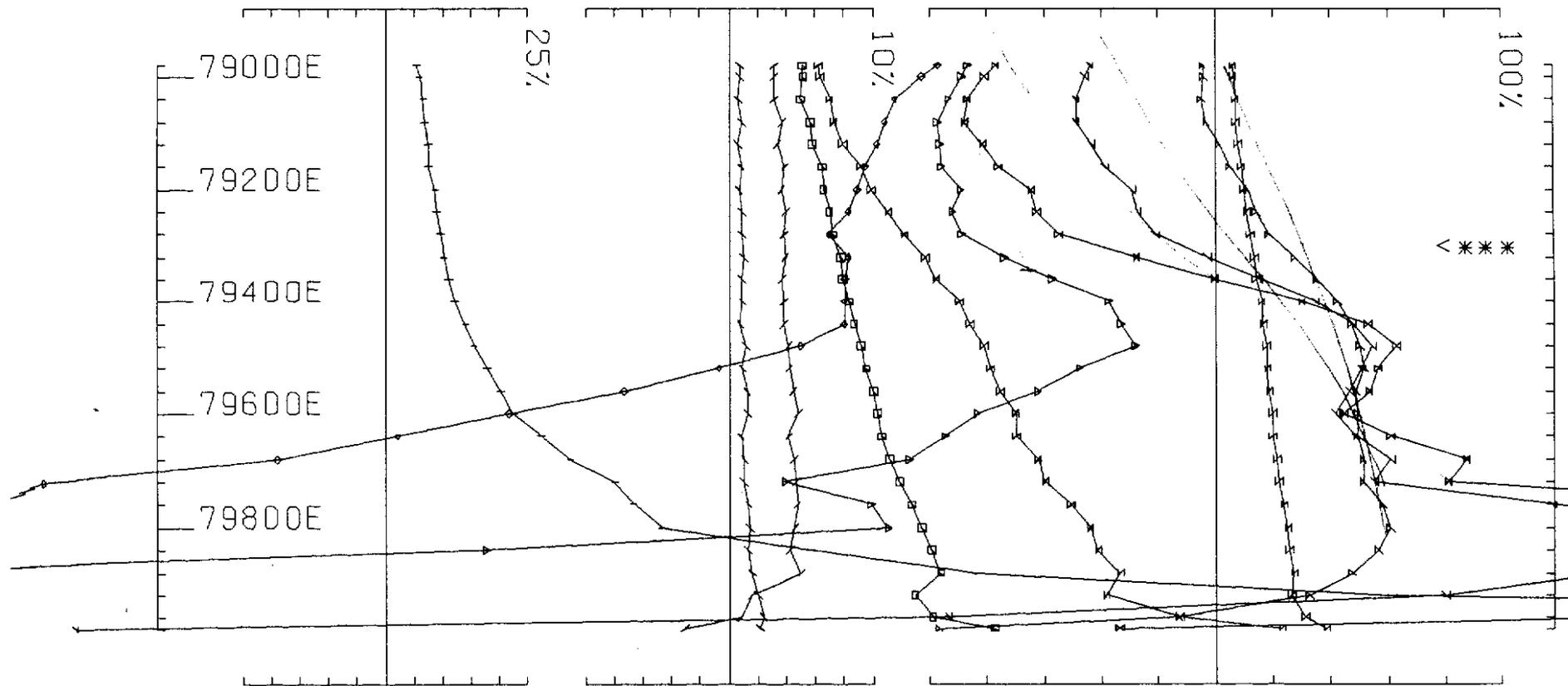
UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION OCT.1991
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
 LOOP NO NC01 LINE 61000 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

066180



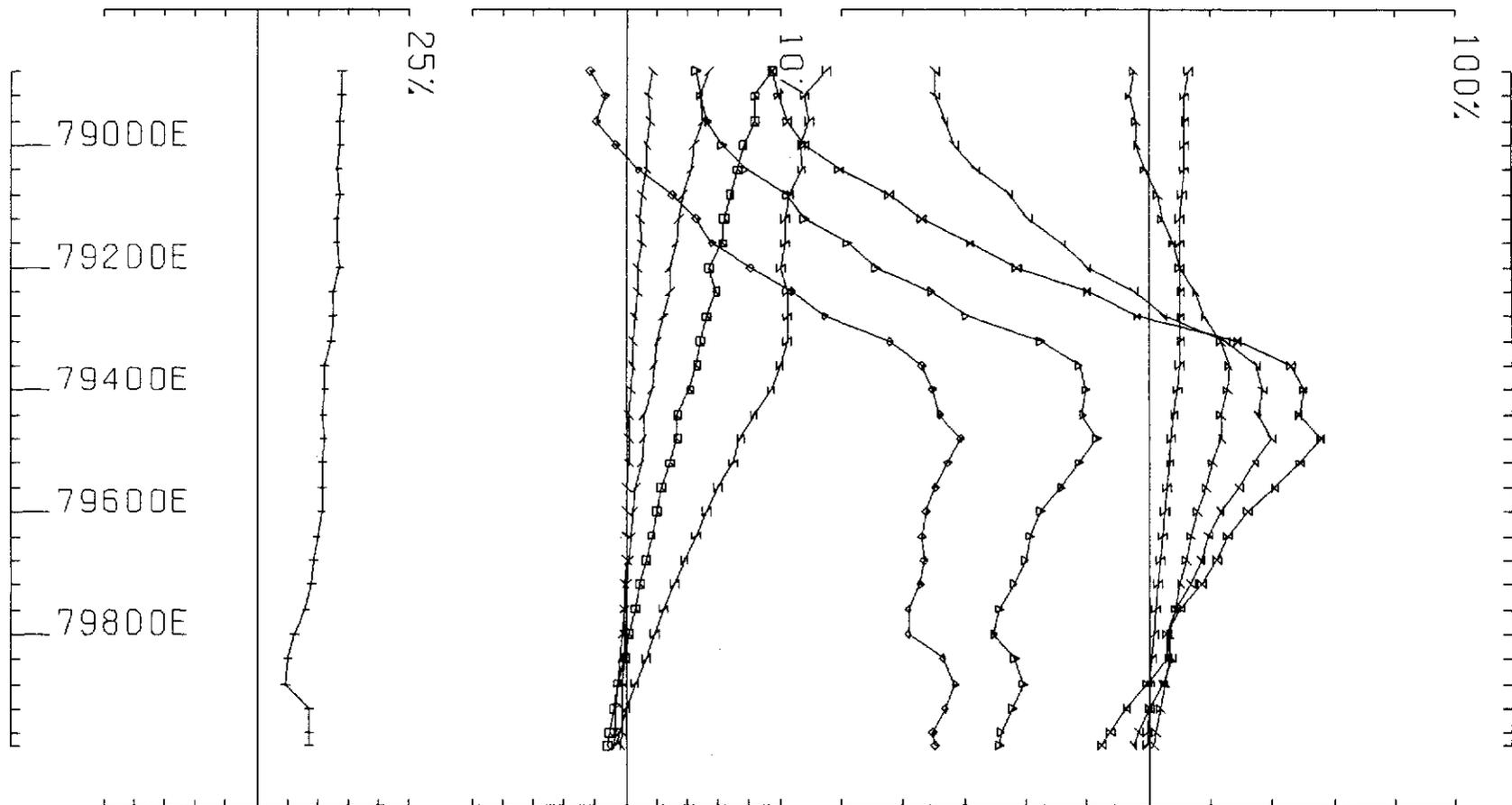
UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION OCT.1991
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
 LOOP NO NC01 LINE 60800 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

066181



UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION OCT.1991
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
 LOOP NO NC01 LINE 60800 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

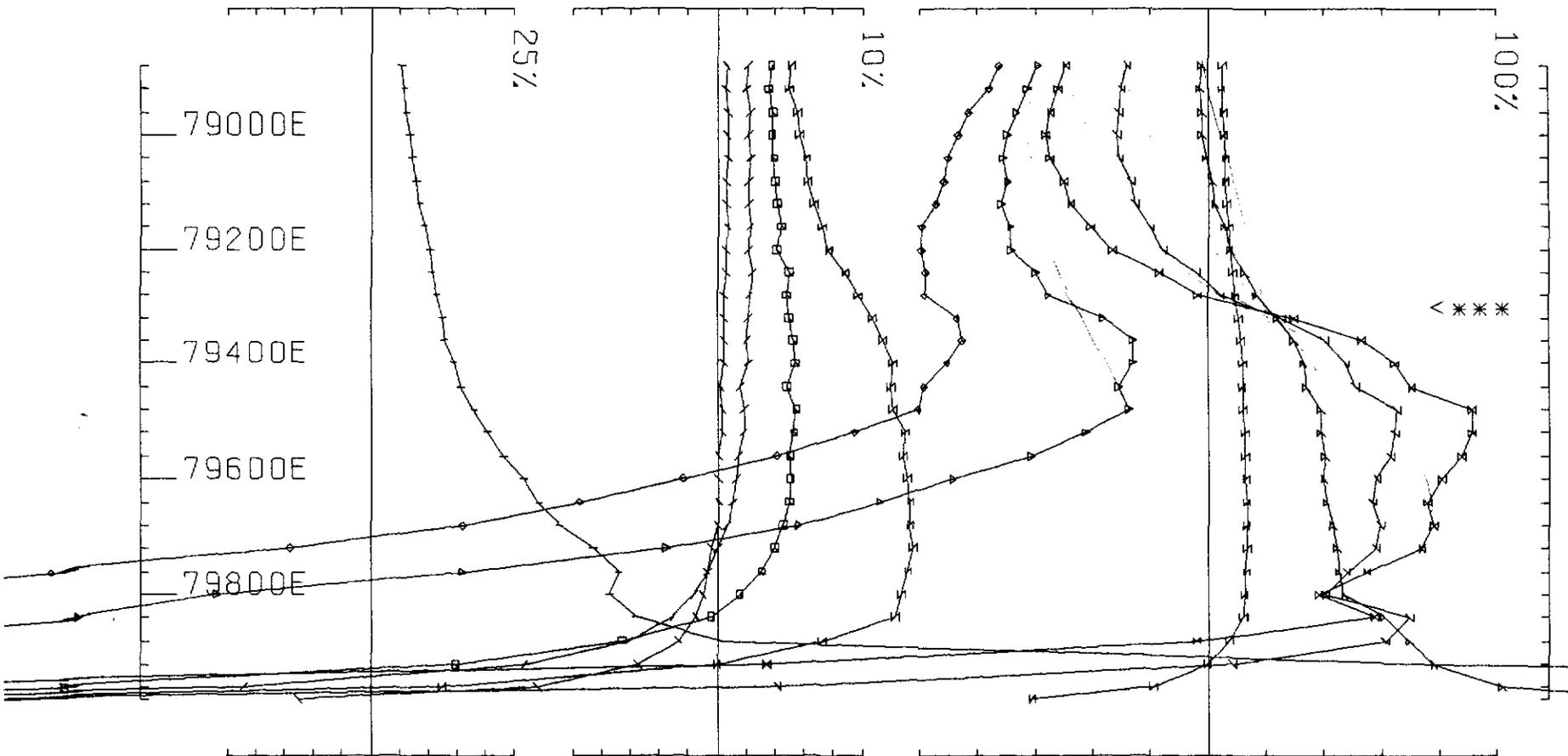
066182



UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION OCT.1991
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
 LOOP NO NC01 LINE 60600 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

066183

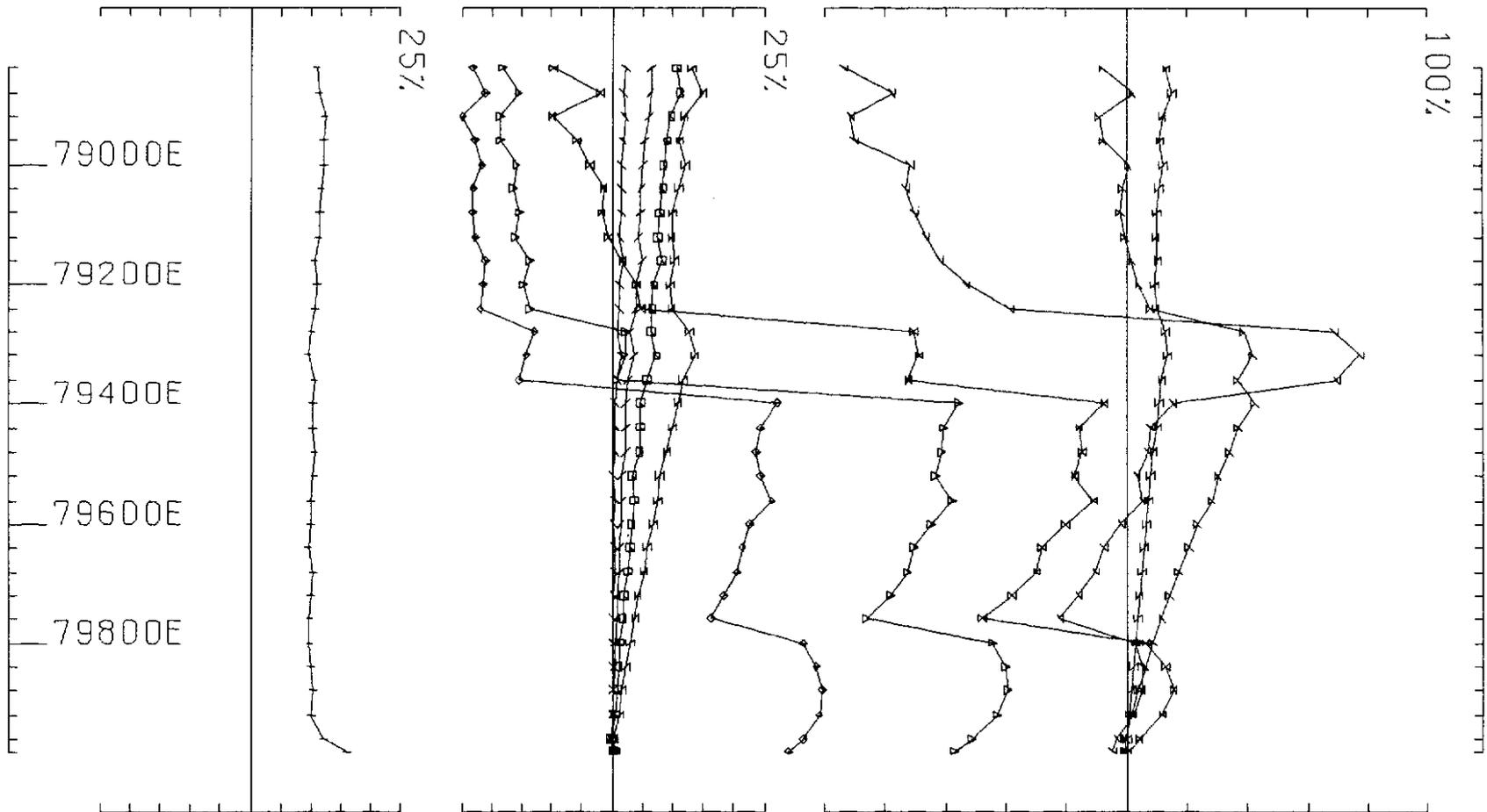
sig.
 b.5



UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION OCT.1991
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
 LOOP NO NC01 LINE 60600 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

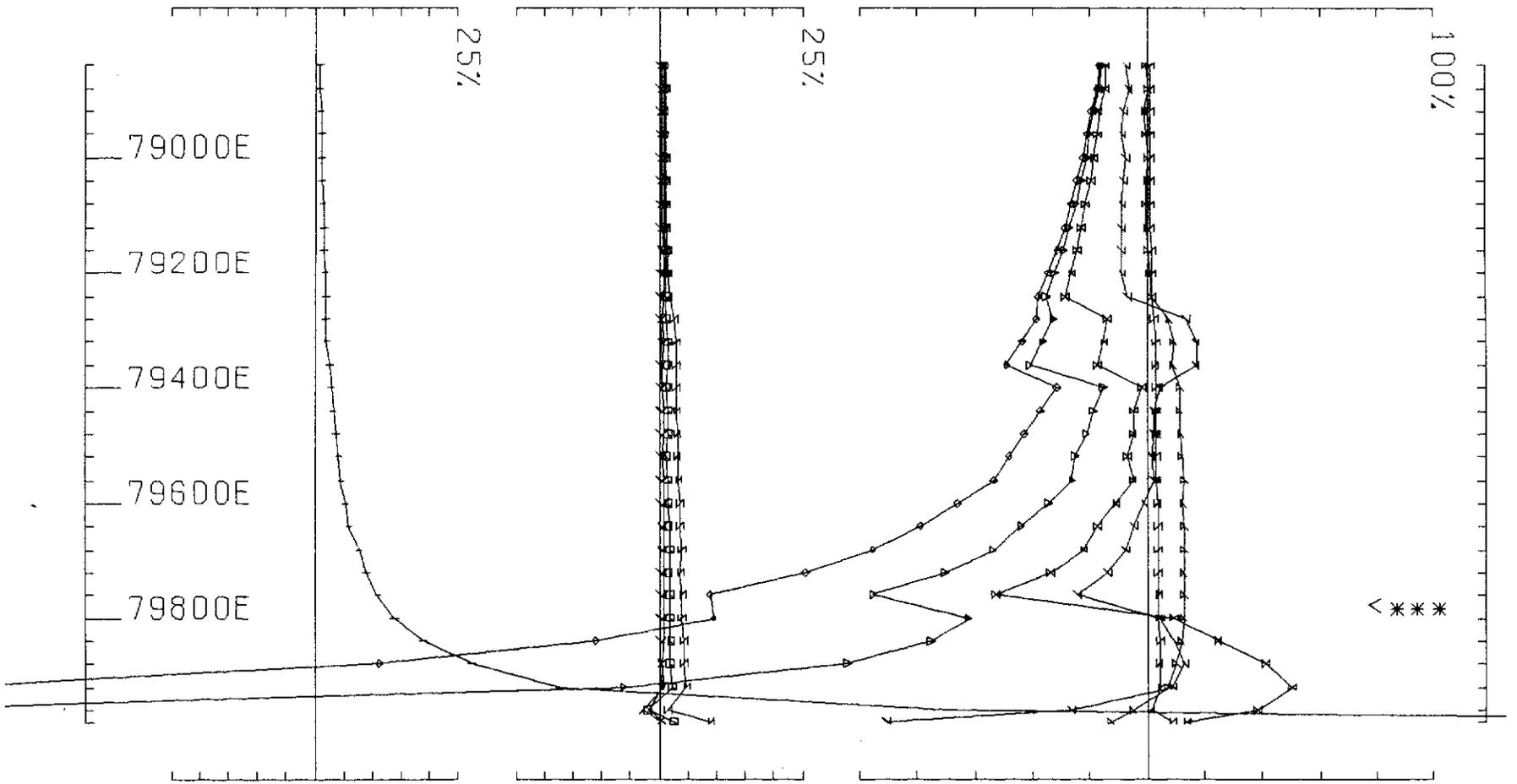
066184

5.9
6.6



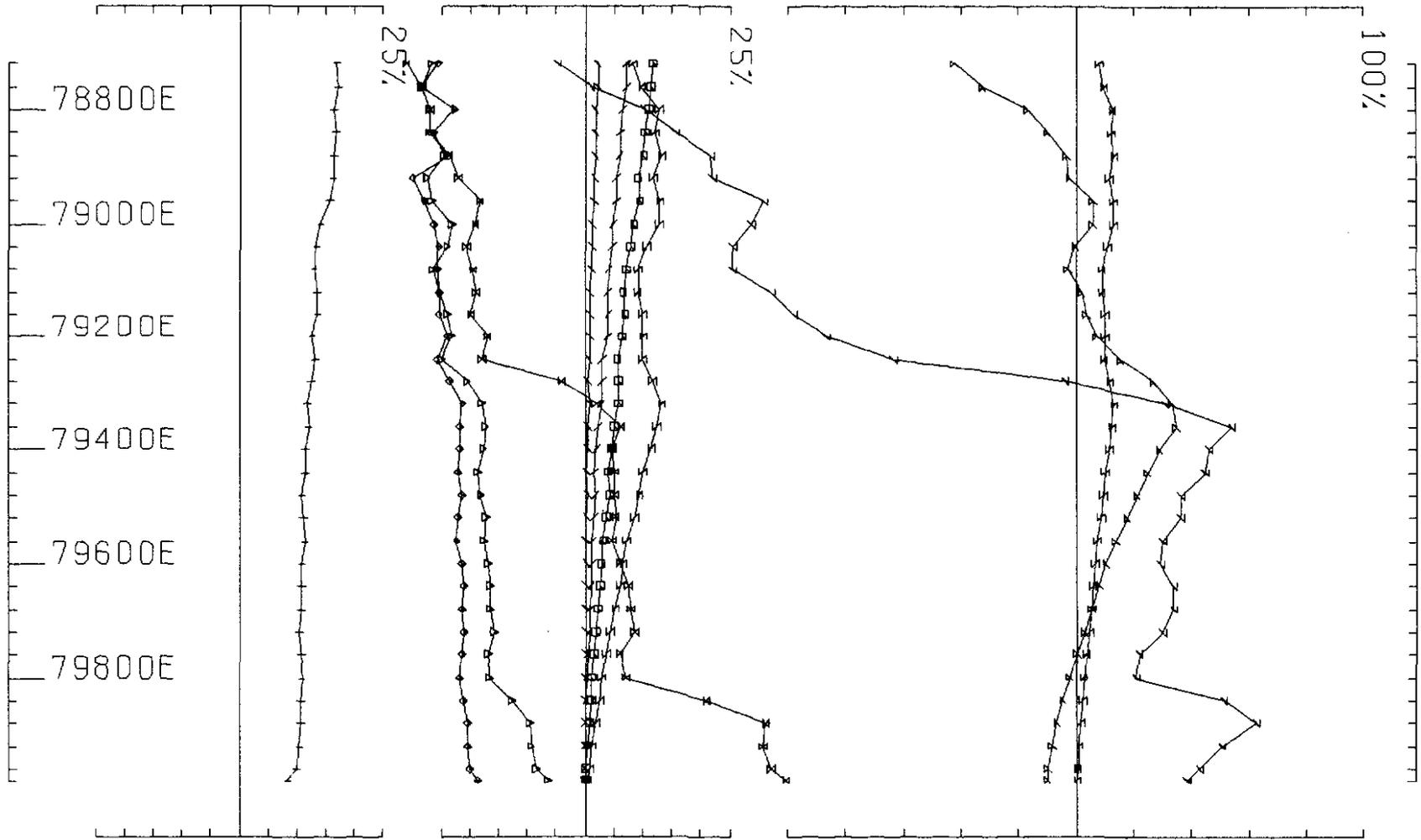
UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
 LOOP NO NC01 LINE 60400 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

066185



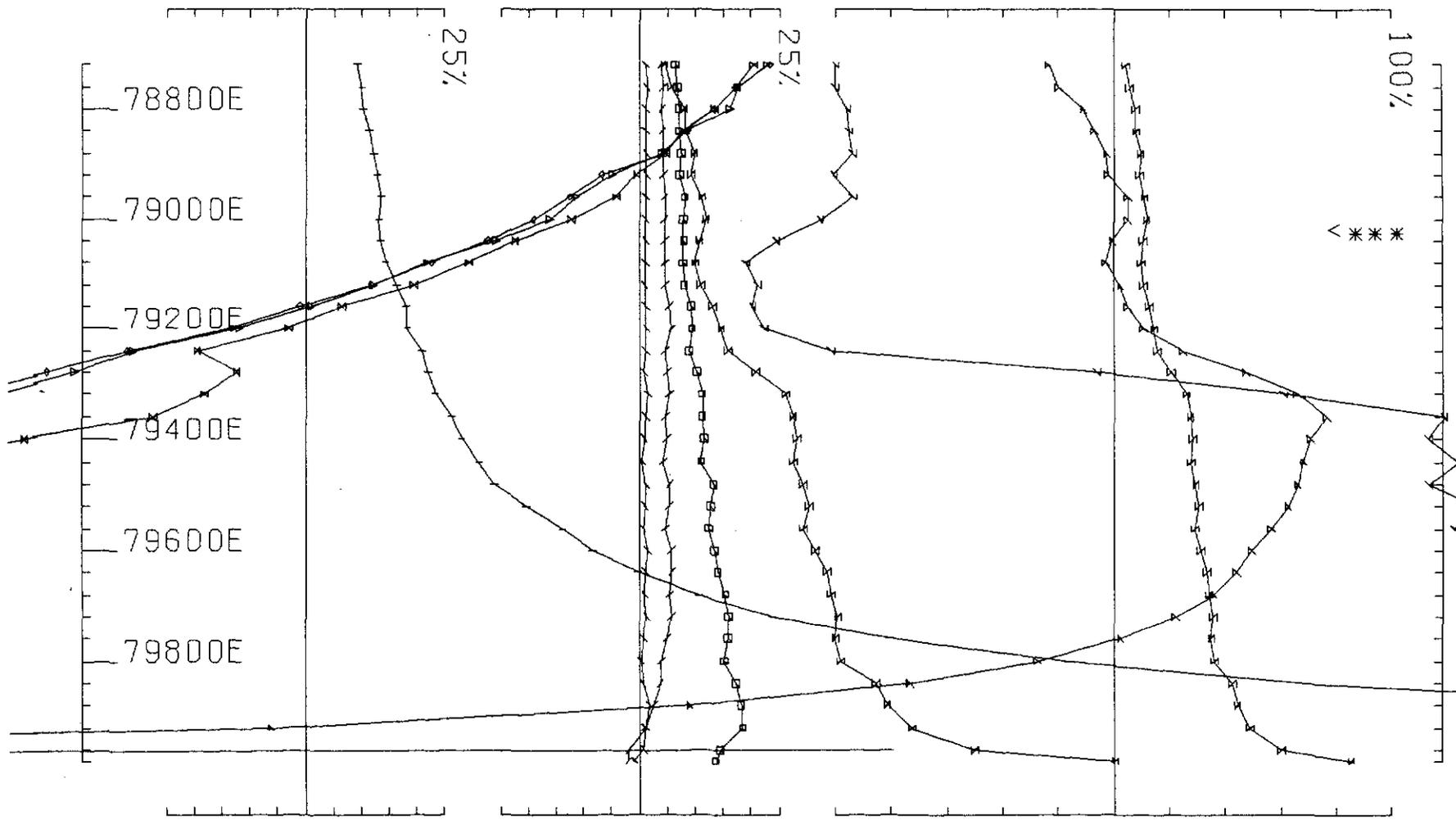
UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
 LOOP NO NC01 LINE 60400 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

066186



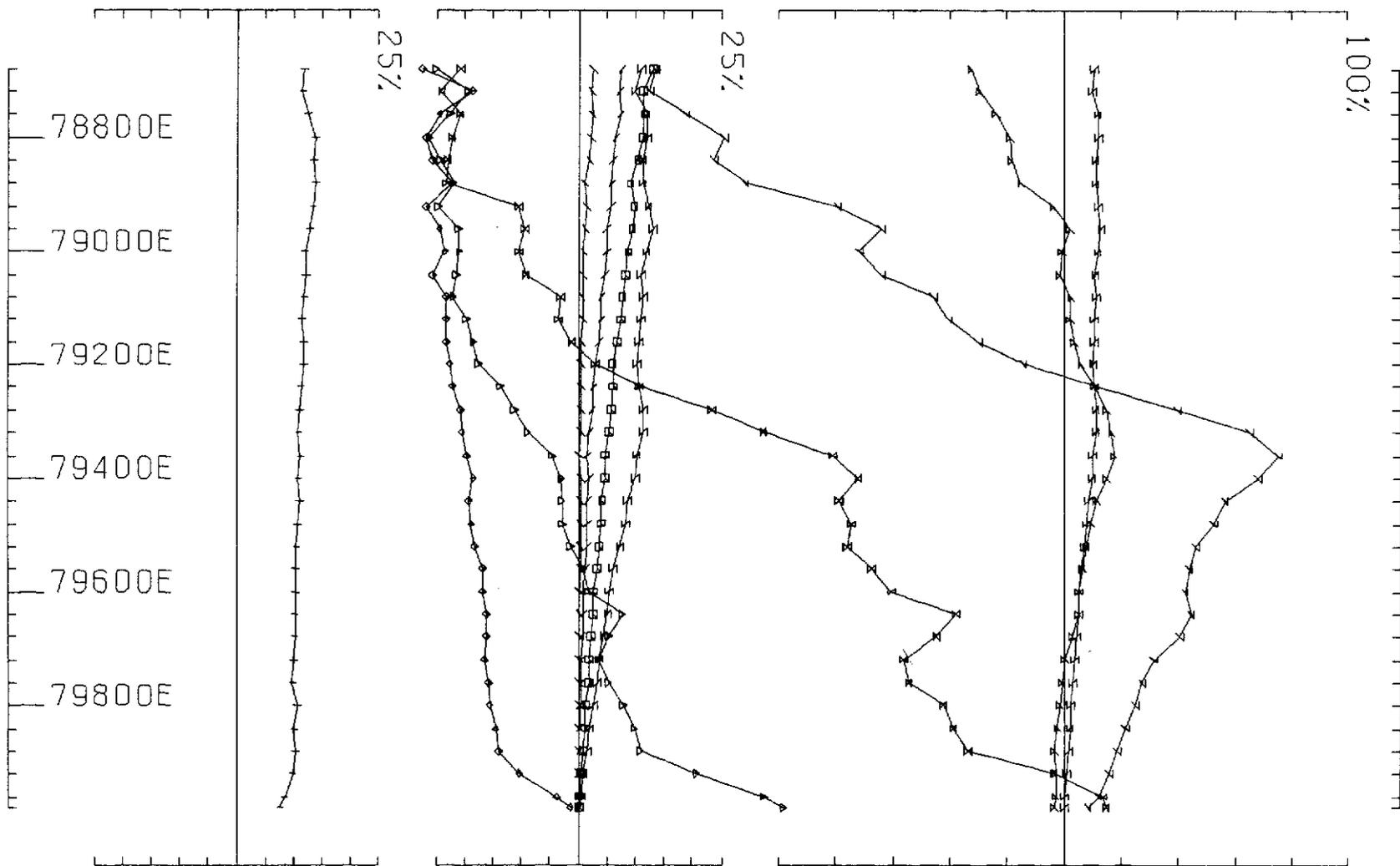
UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
 LOOP NO NC01 LINE 60200 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

066187



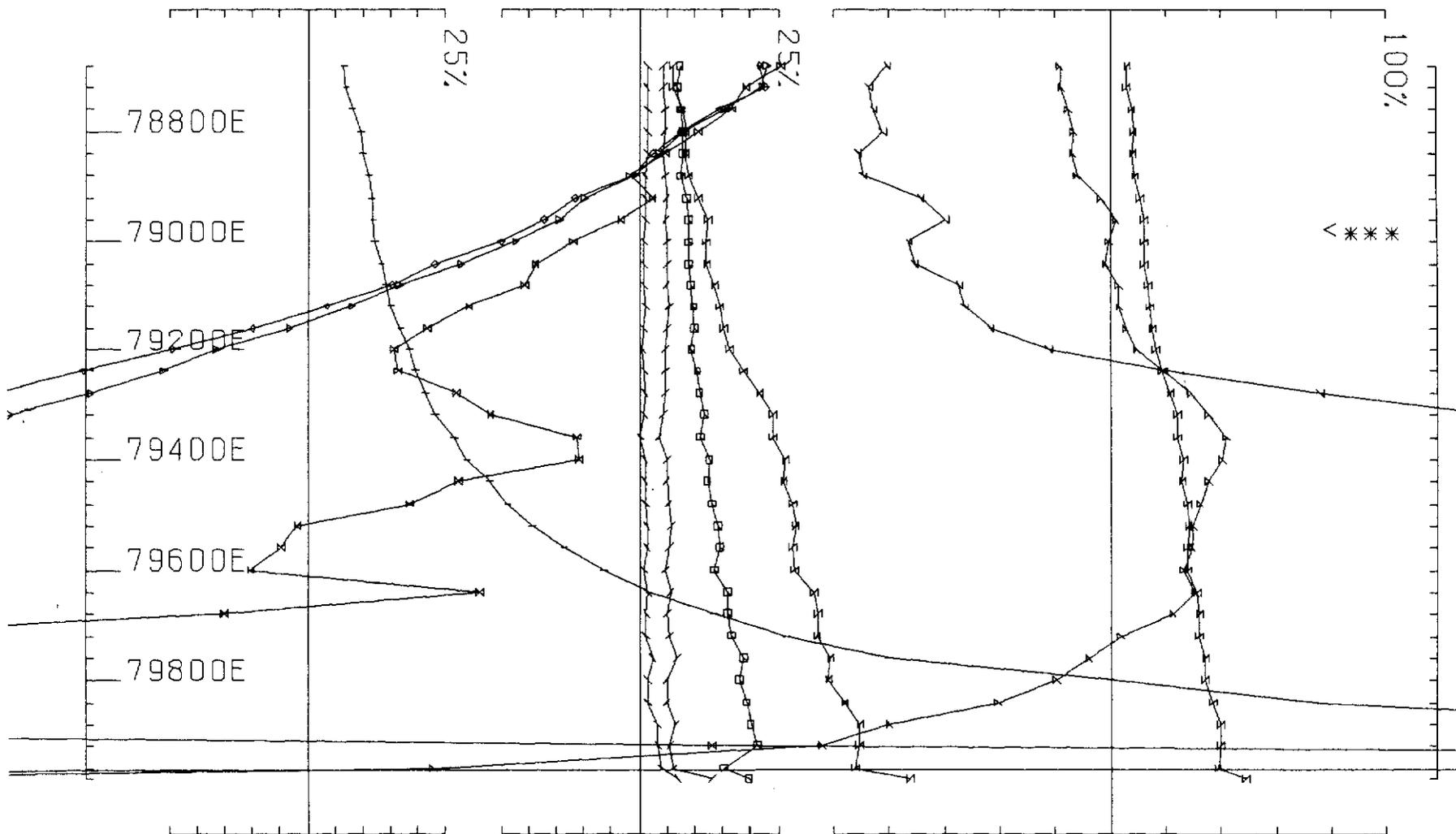
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 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
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066188



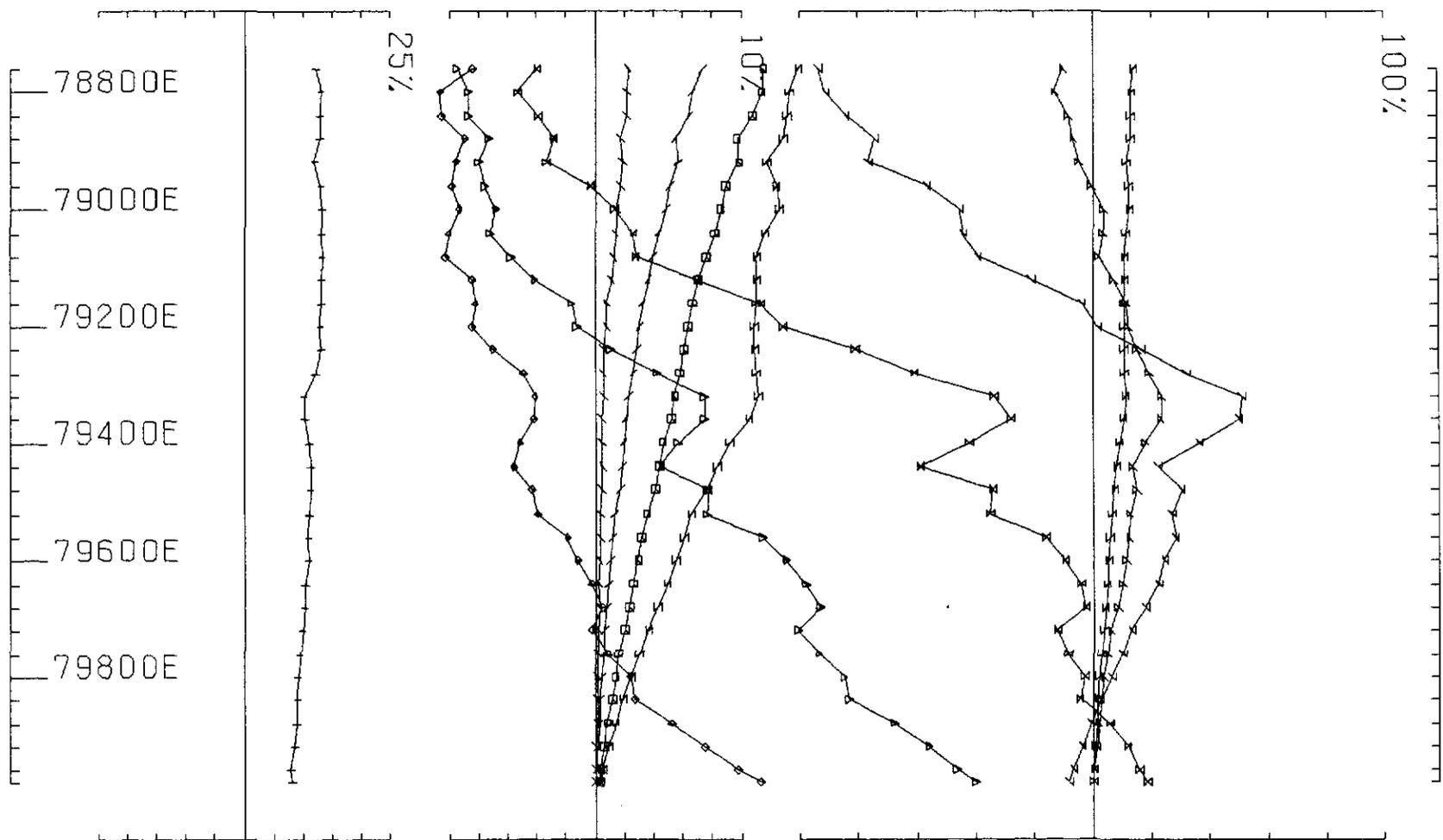
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 LOOP NO NC01 LINE 6000 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

066189



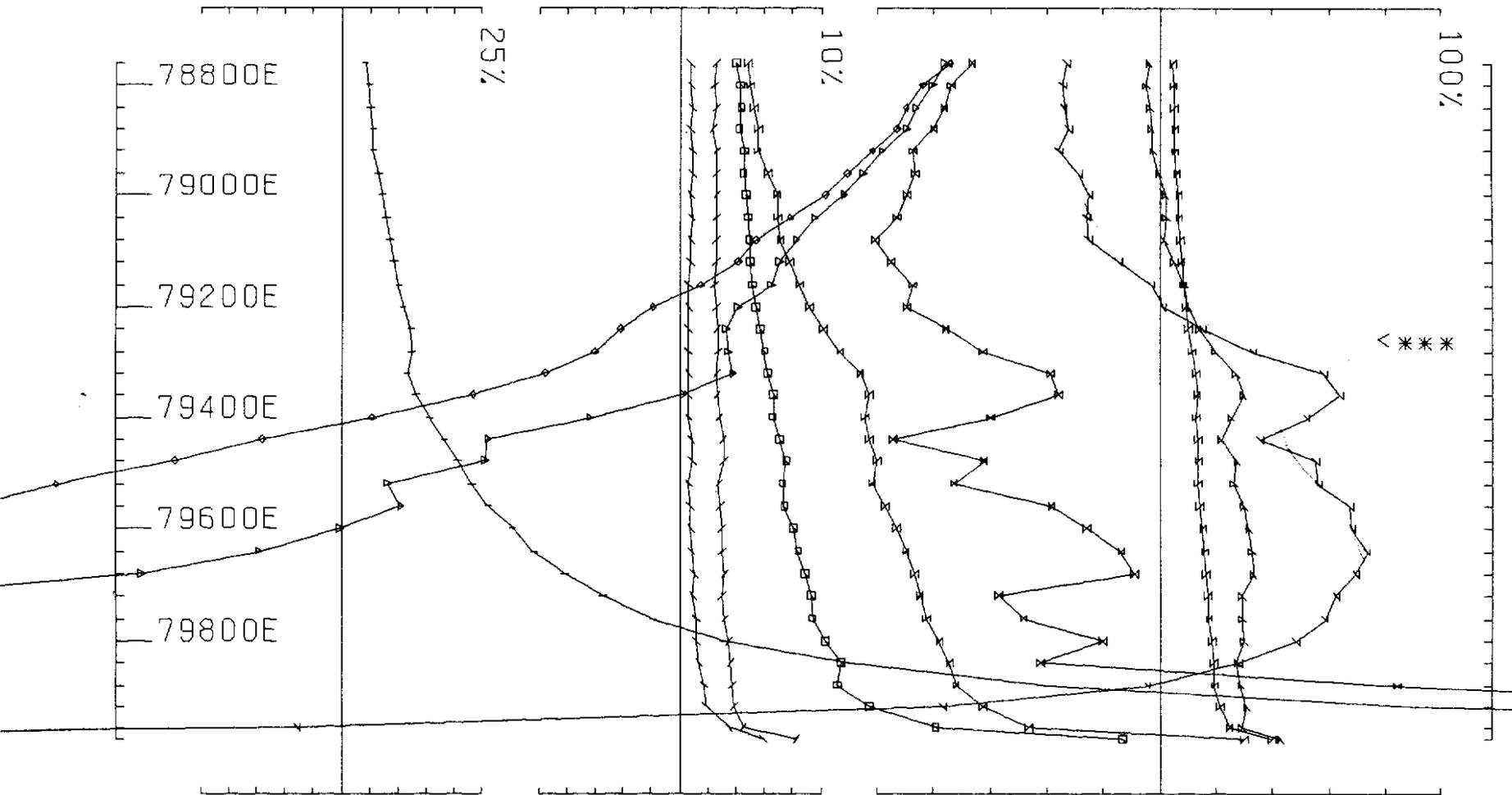
UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION
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 LOOP NO NC01 LINE 60000 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

066190



UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
 LOOP NO NC01 LINE 59800 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

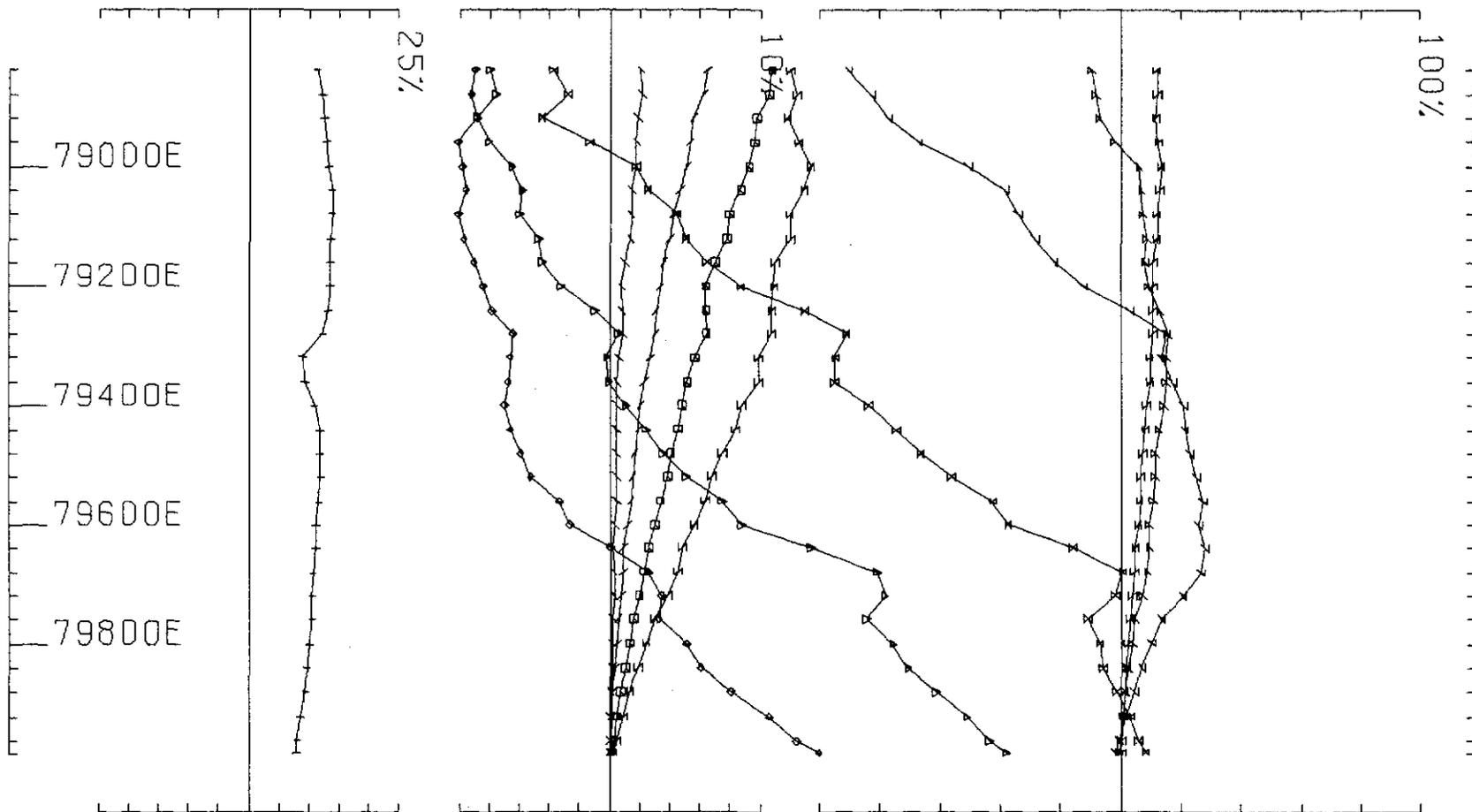
066191



UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
 LOOP NO NC01 LINE 59800 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

066192

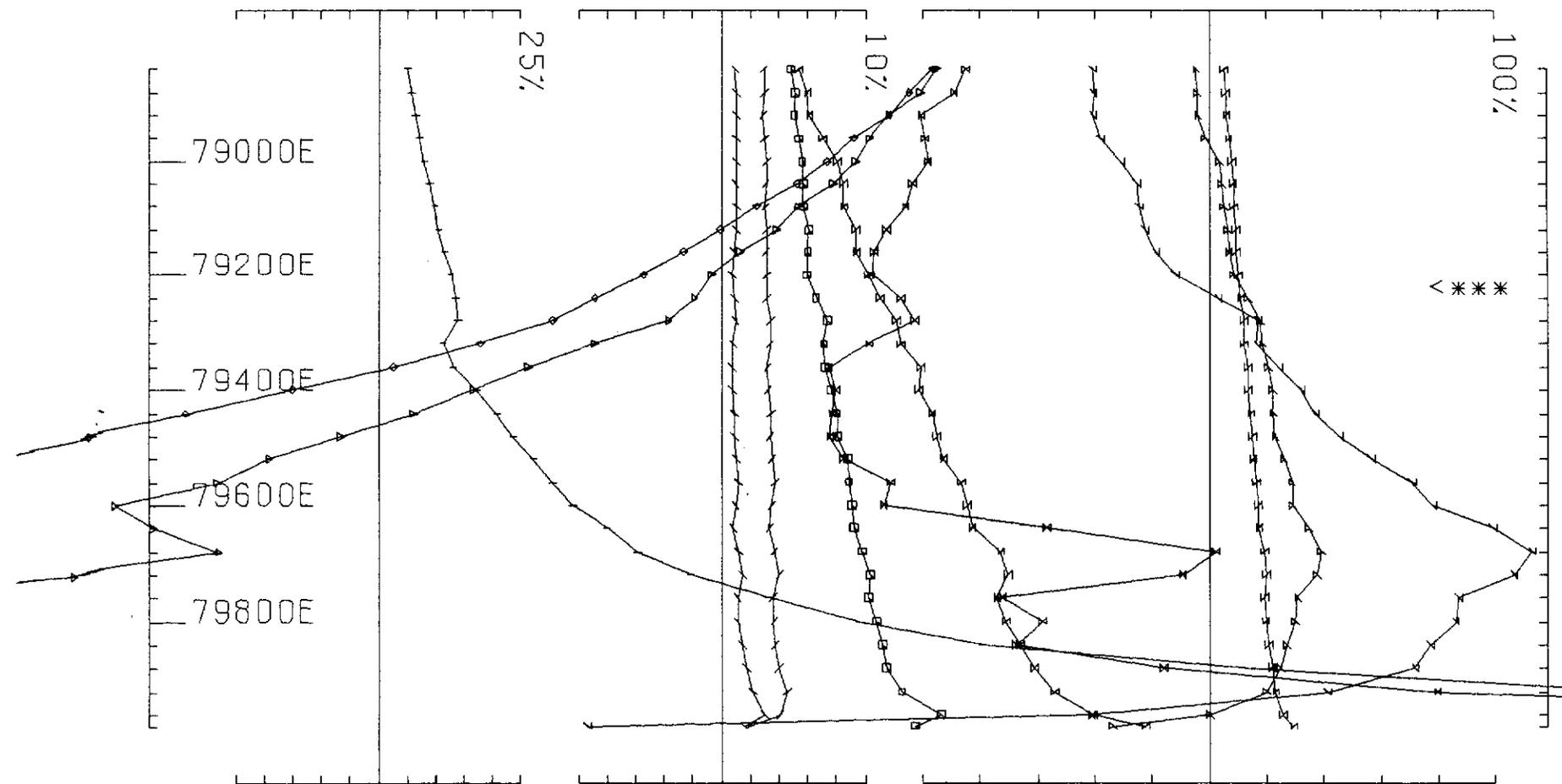
fig.
6.14



UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
 LOOP NO NC01 LINE 59600 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

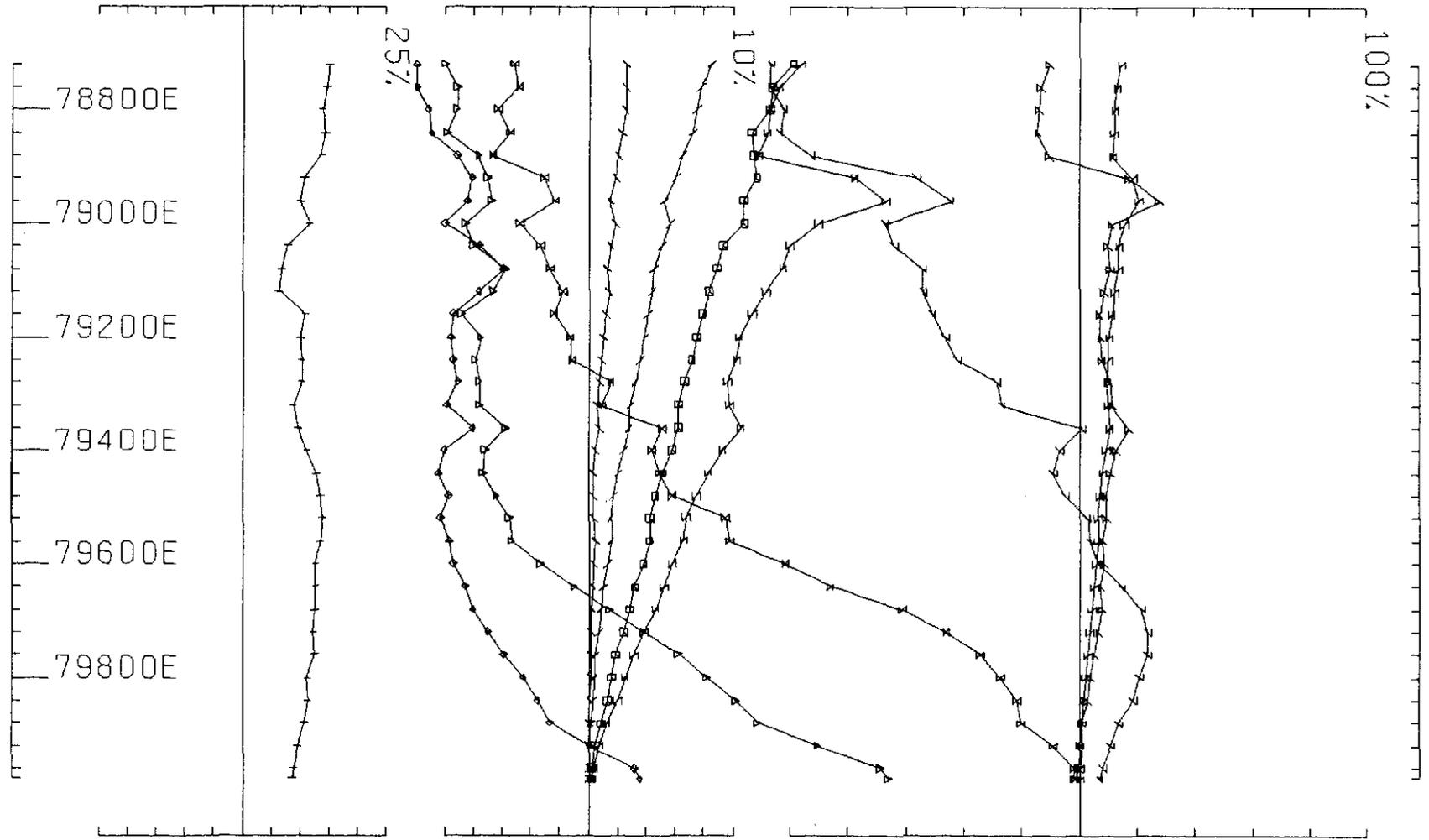
066193

fig.
b.15



UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
 LOOP NO NC01 LINE 59600 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

066194



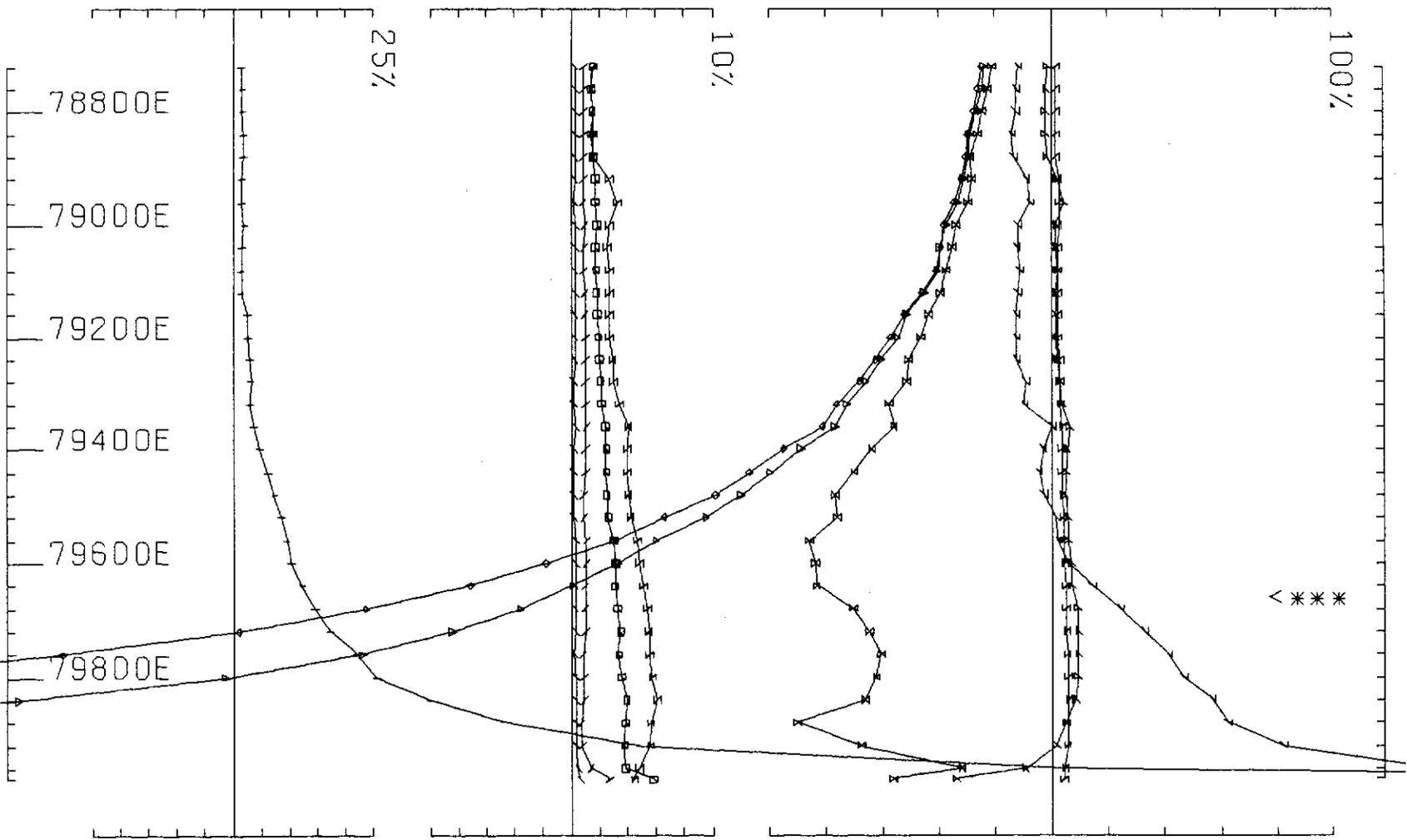
UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
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066195

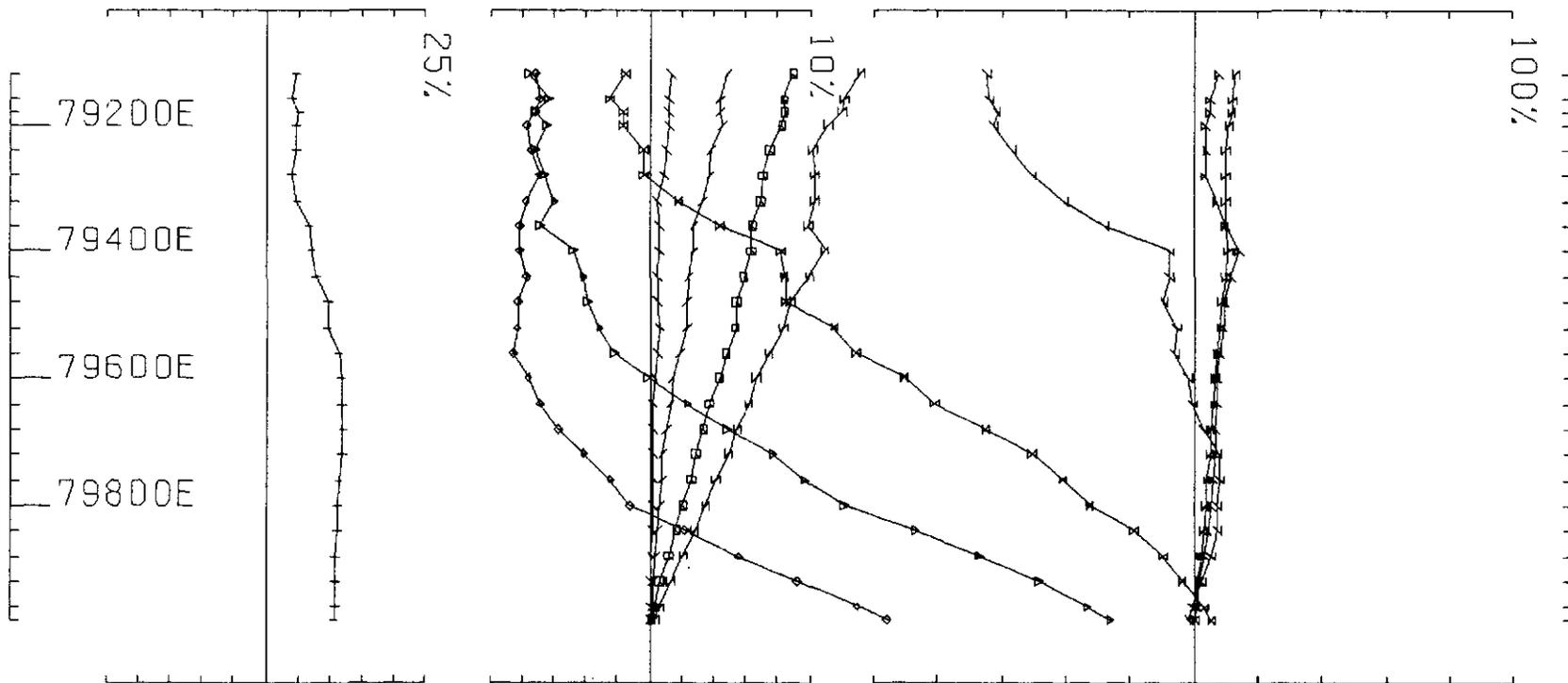
59.
 6.17

066196

fig.
b.18



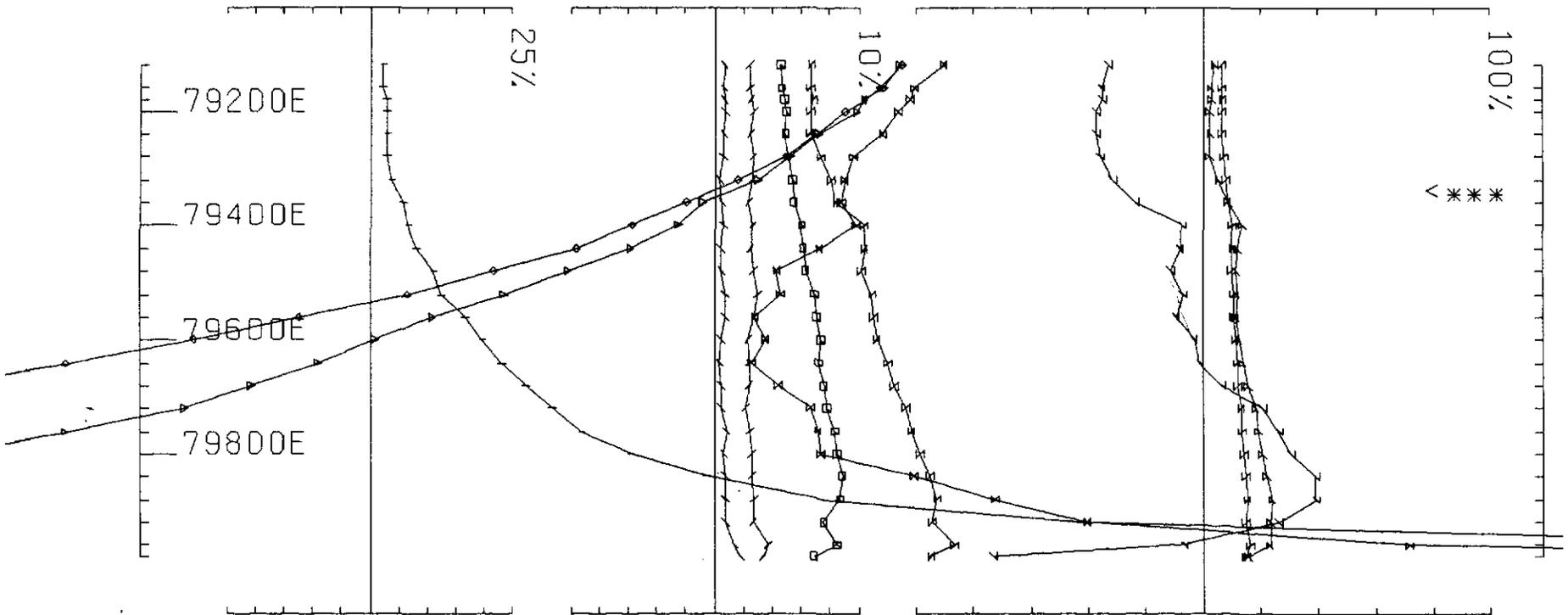
UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION
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LOOP NO NC01 LINE 59400 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.



UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
 LOOP NO NC01 LINE 59200 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

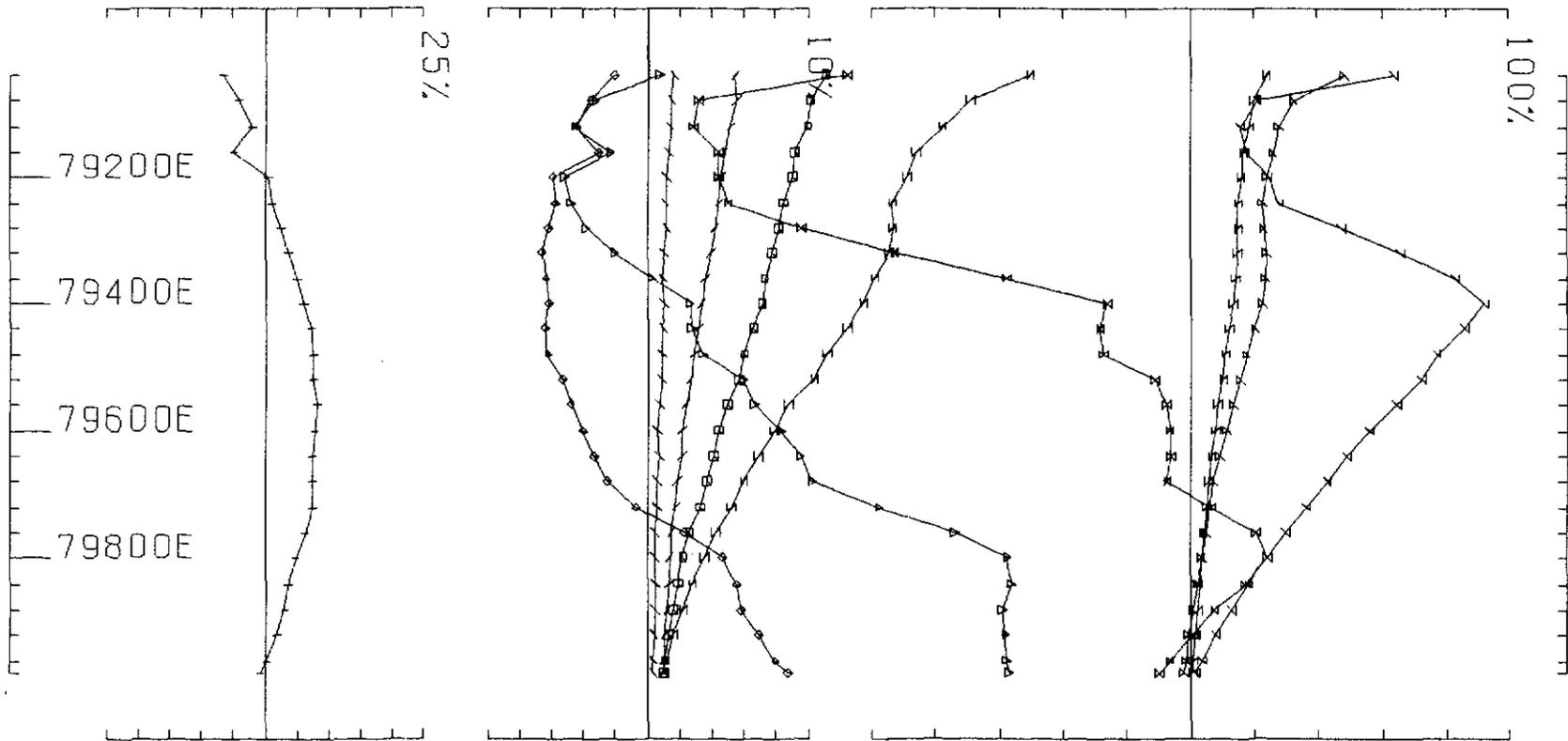
066197

fig.
b.19



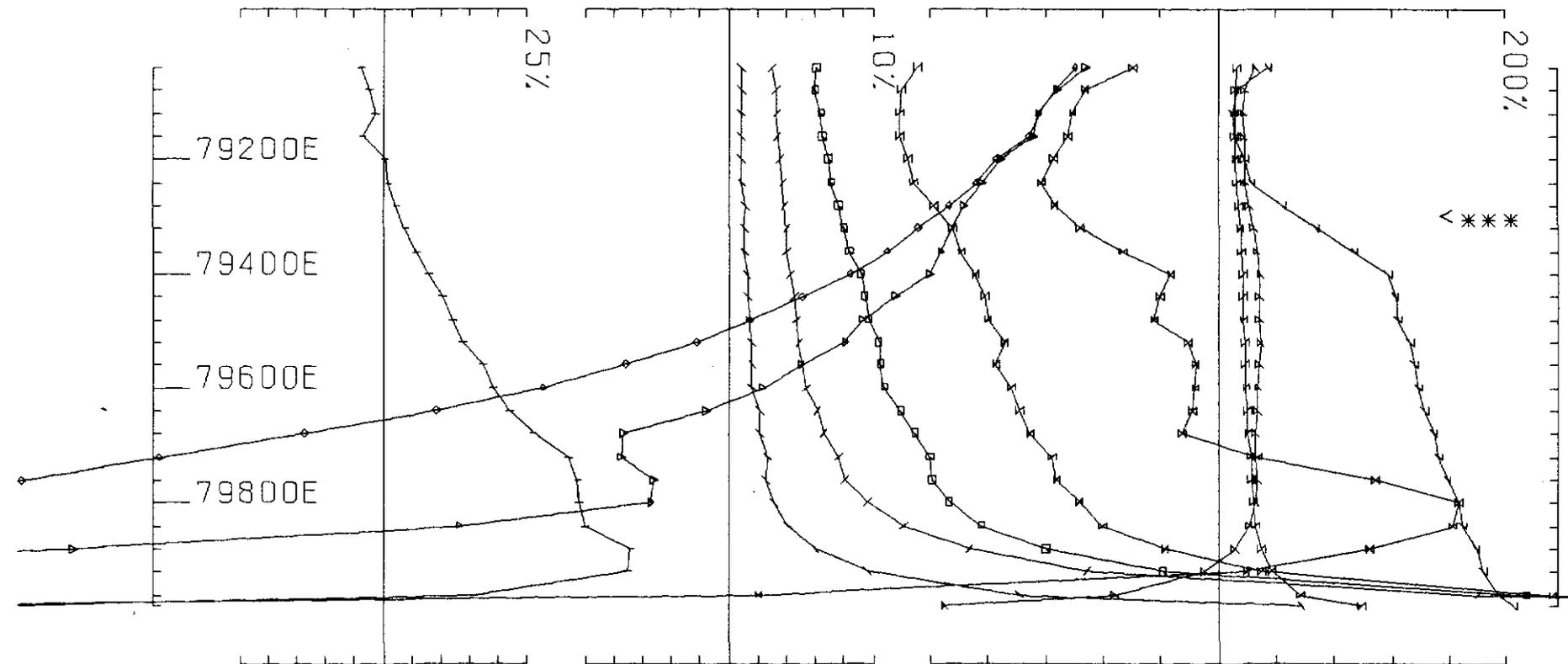
UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION
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066198



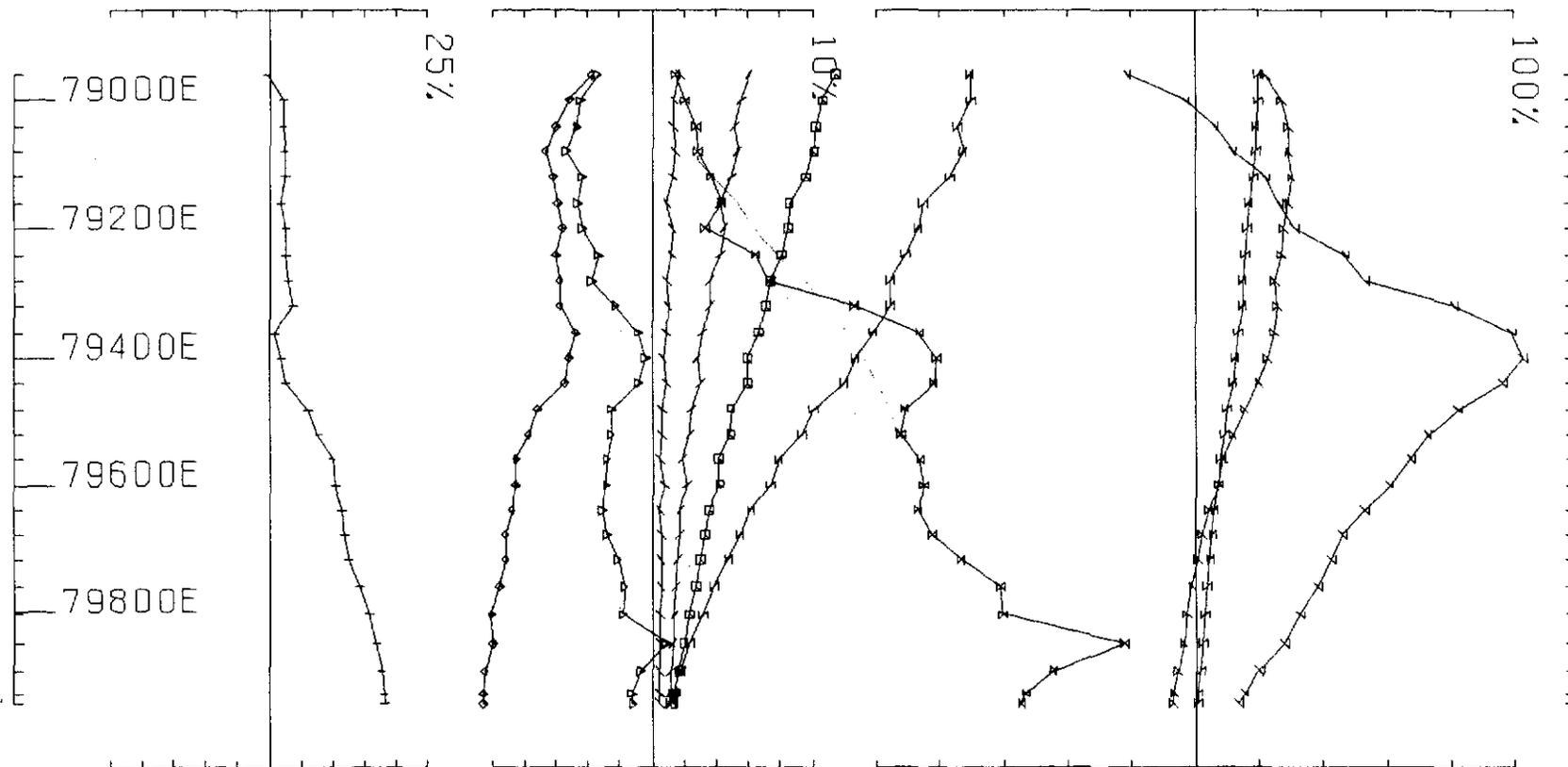
UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION LTD OCT.1991
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
 LOOP NO NCO2 LINE 59000 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

066199



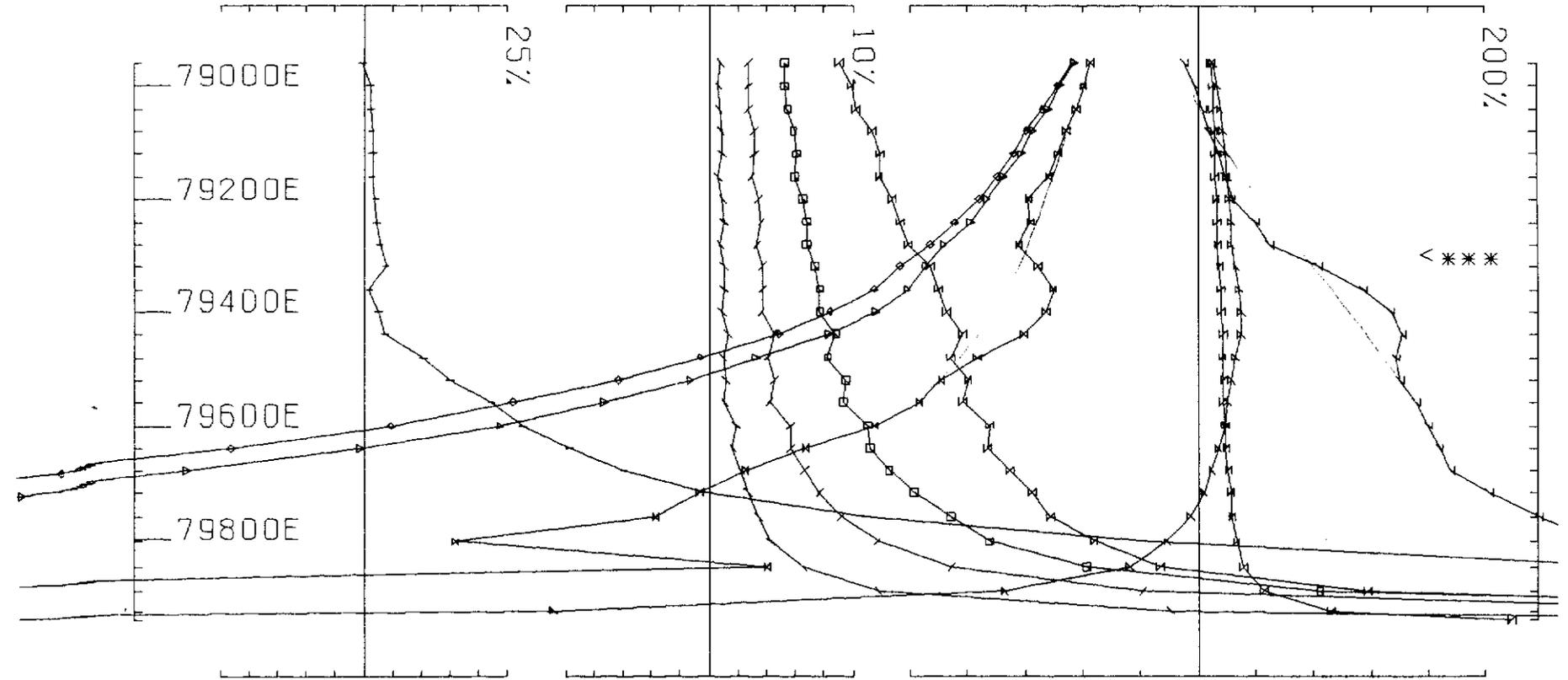
UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION LTD OCT.1991
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
 LOOP NO NCO2 LINE 59000 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

066200



UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION LTD OCT.1991
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
 LOOP NO NC02 LINE 58800 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

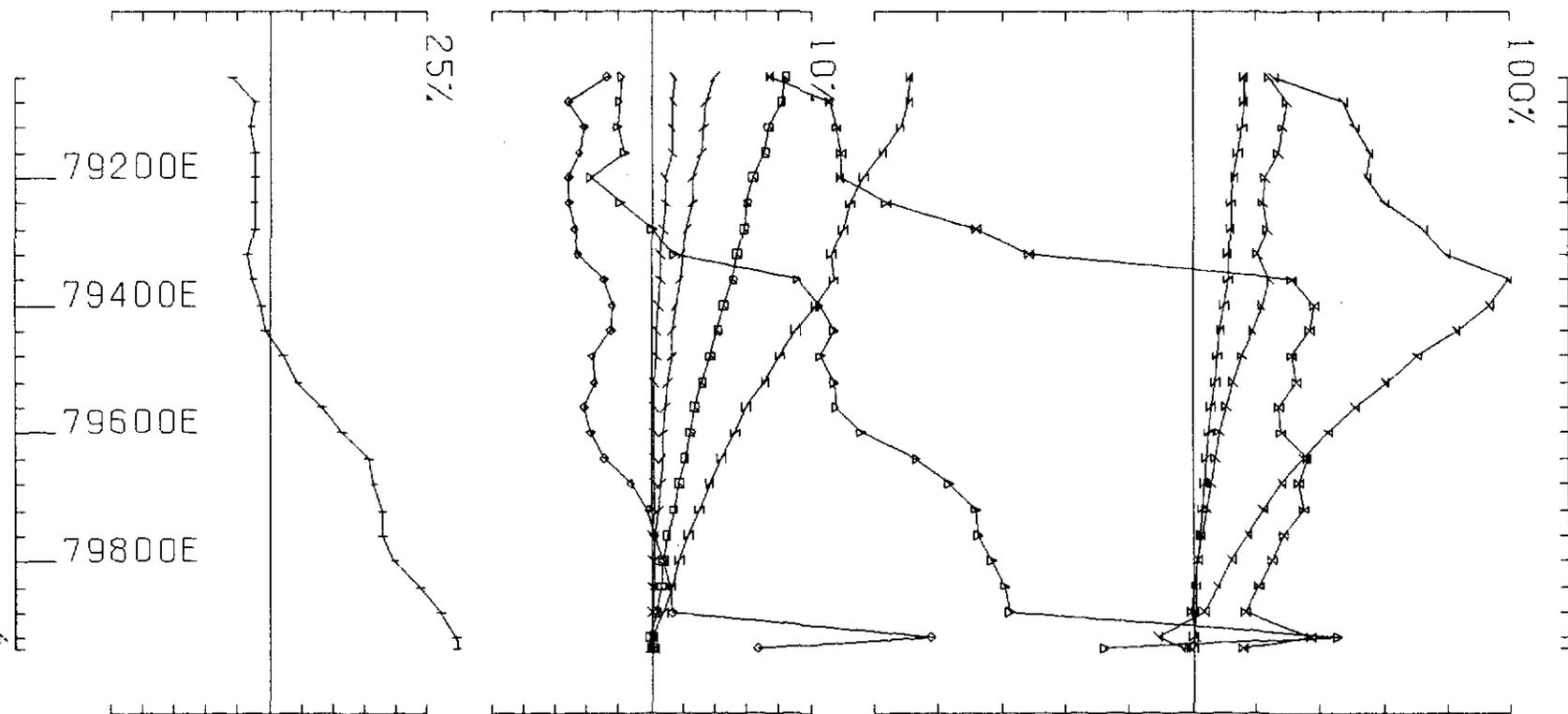
066201



UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION LTD OCT.1991
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
 LOOP NO NC02 LINE 58800 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

066202

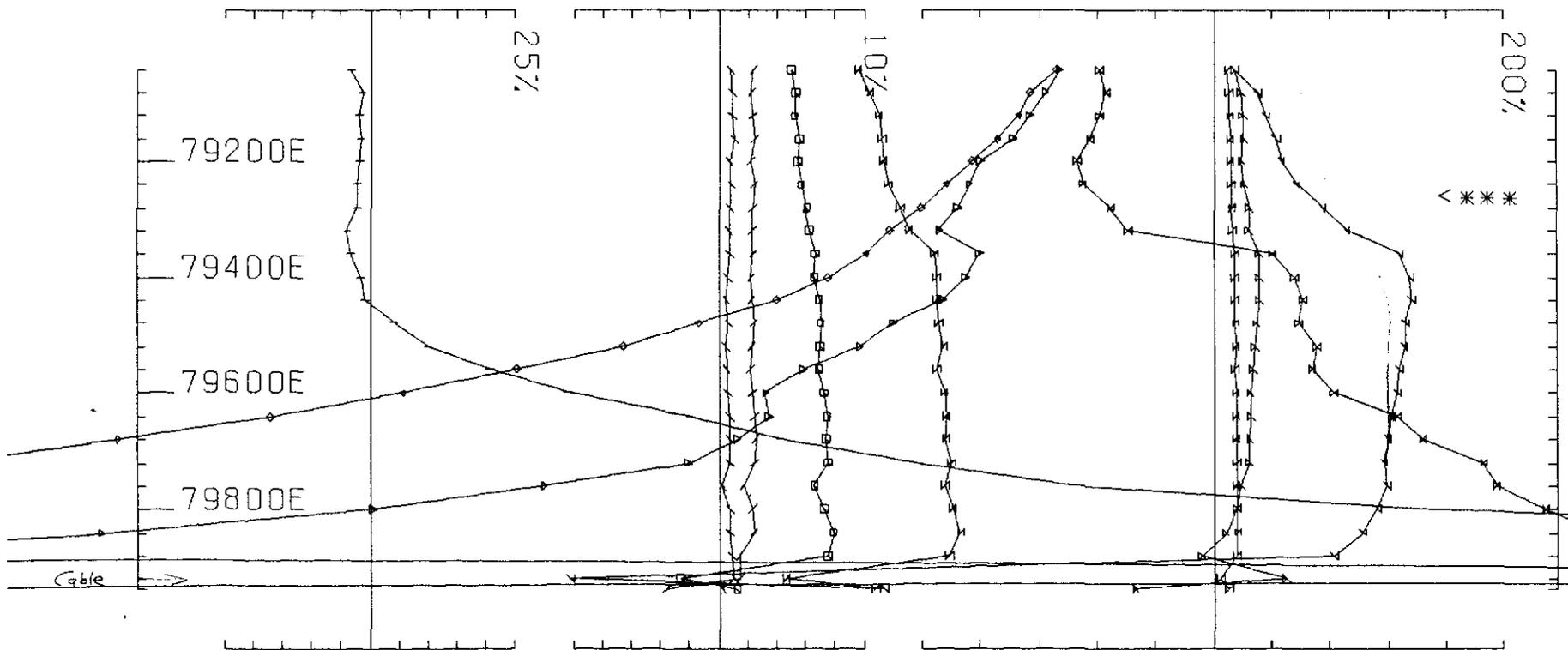
Fig. 6.25



UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION LTD OCT.1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
LOOP NO NC02 LINE 58600 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

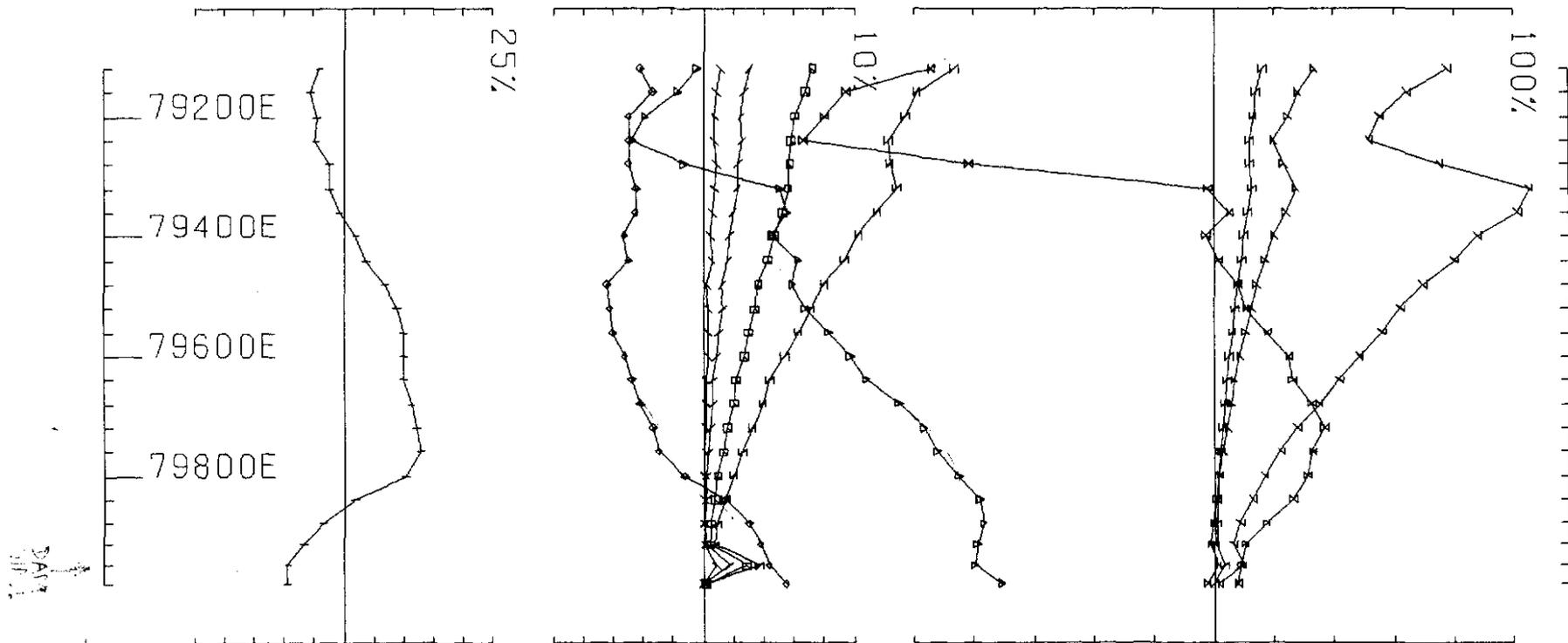
066203

Fig.
6.25



UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION LTD OCT.1991
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
 LOOP NO NC02 LINE 58600 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

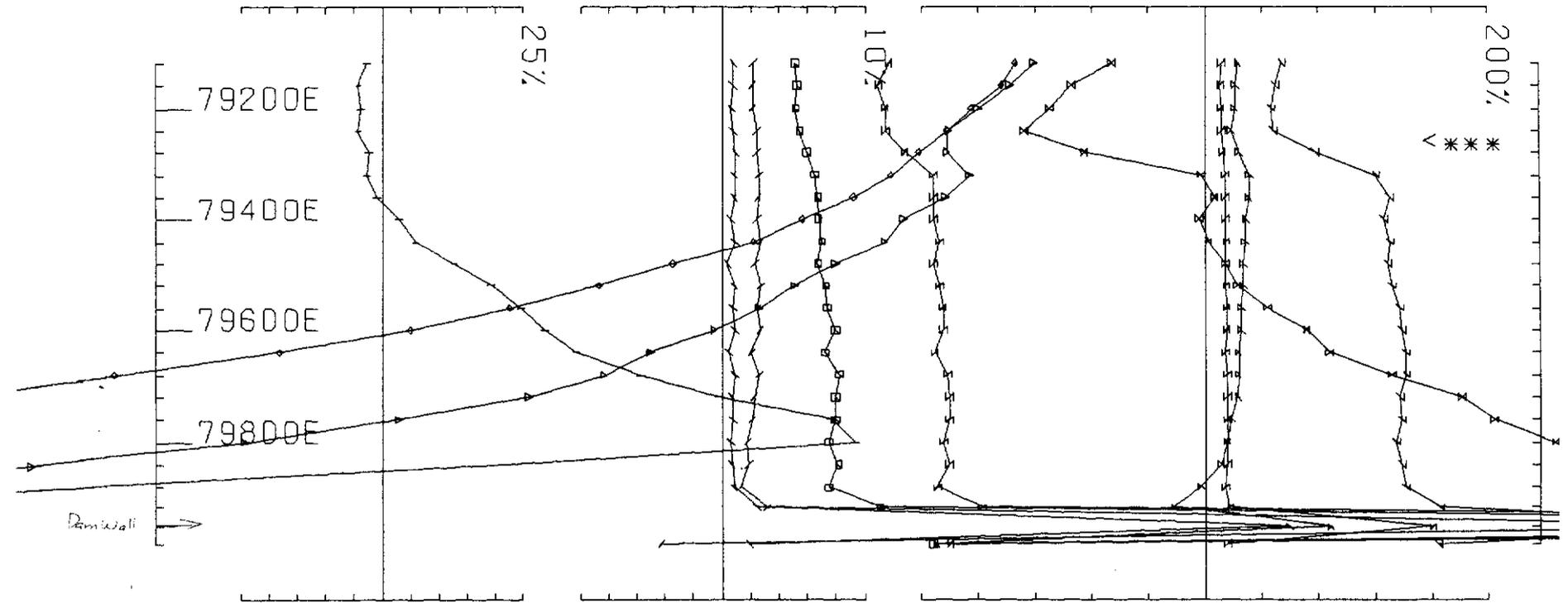
066204



UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION LTD OCT.1991
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
 LOOP NO NCO2 LINE 58400 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

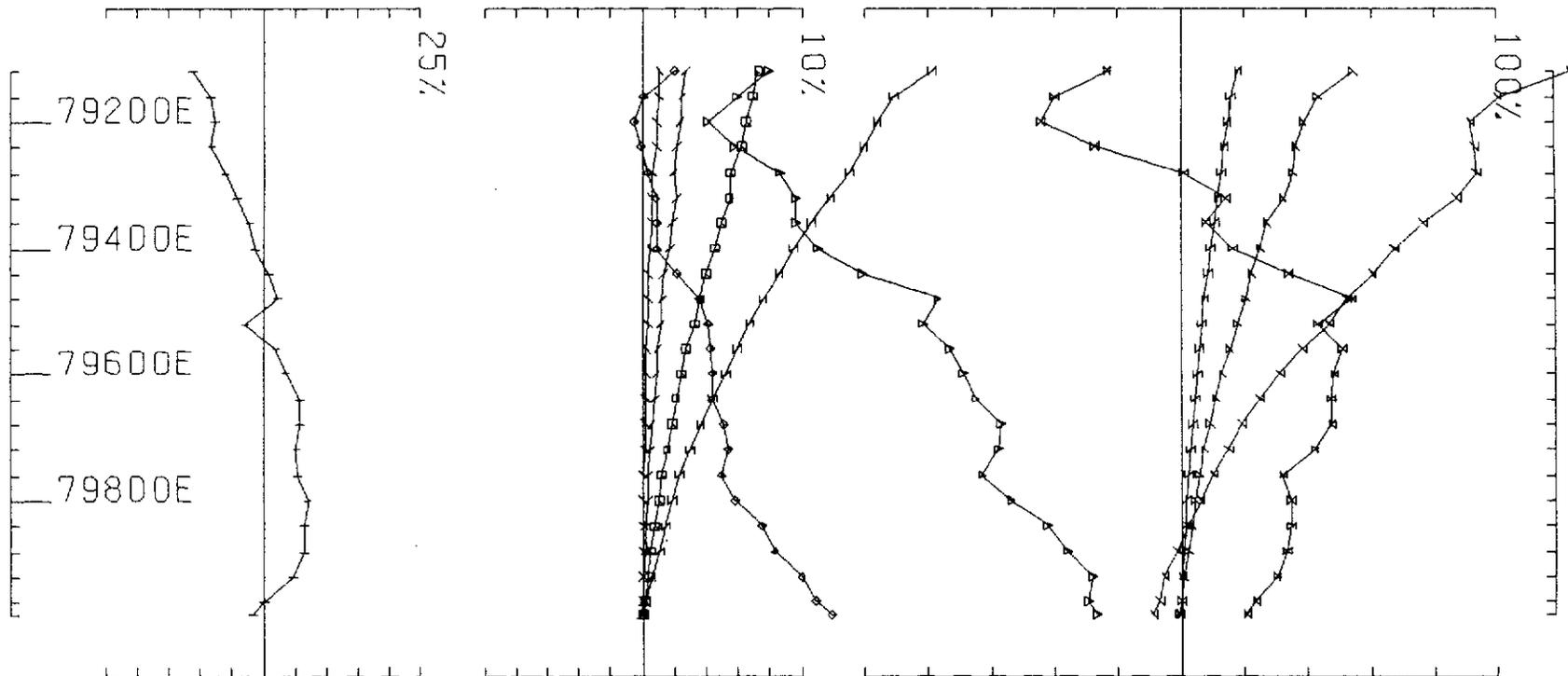
066205

59.
 6.27



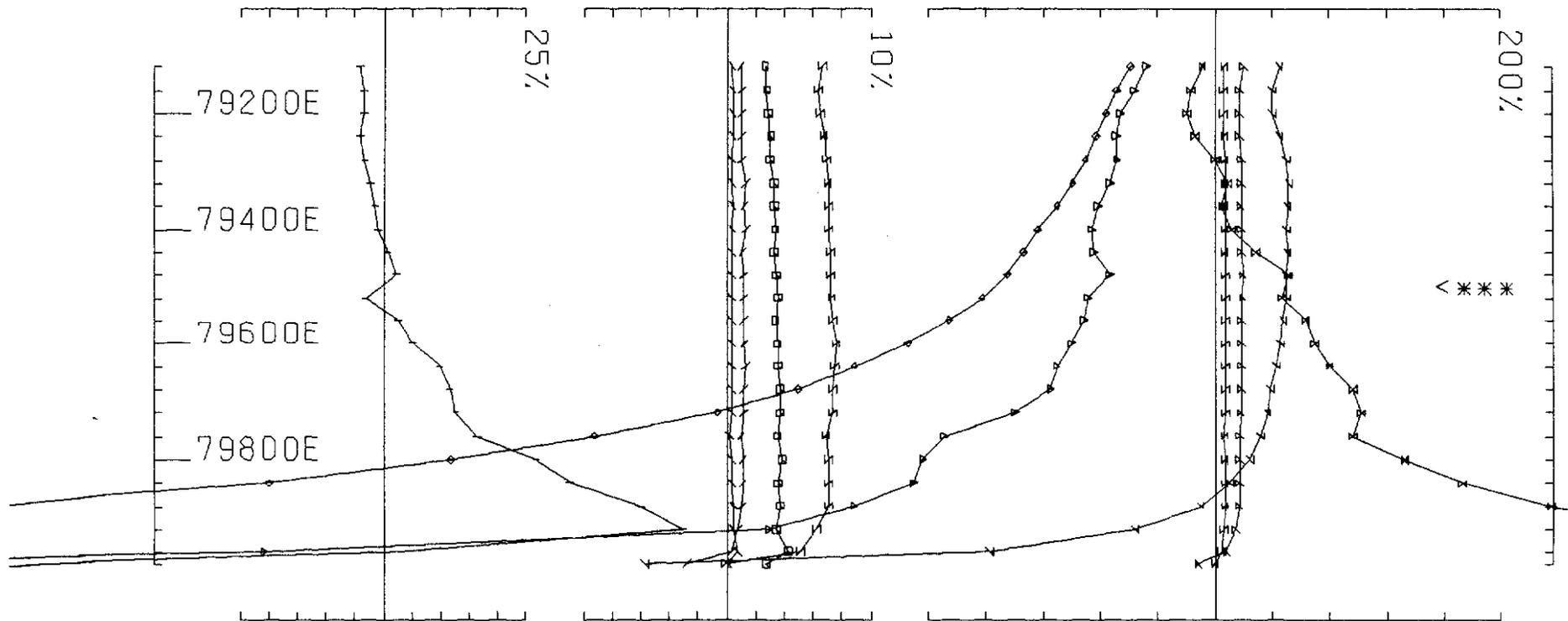
UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION LTD OCT.1991
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
 LOOP NO NCO2 LINE 58400 N COMPONENT HZ SECONDARY FIELD CHI POINT NORM.

066206



UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION LTD OCT.1991
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
 LOOP NO NC02 LINE 58200 N COMPONENT HZ SECONDARY FIELD CHI CONTIN. NORM.

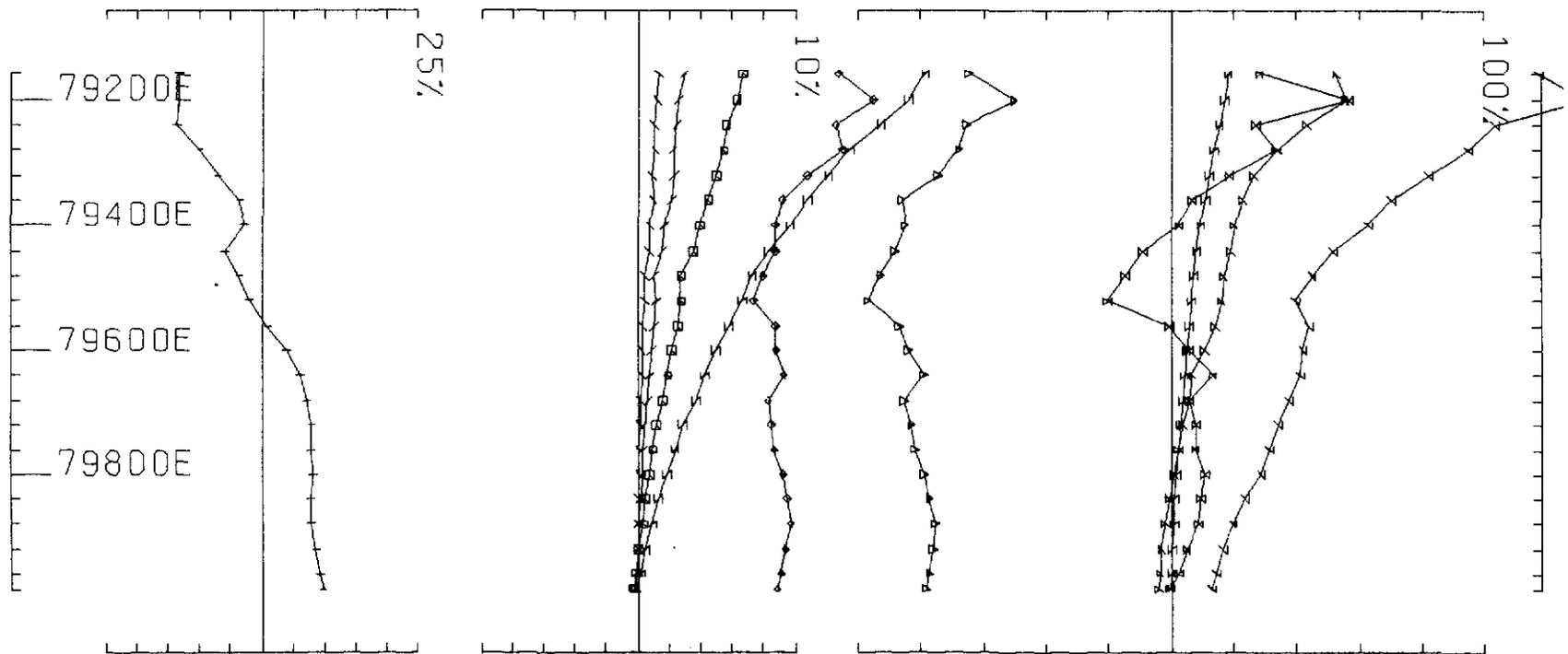
066207



UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION LTD OCT.1991
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 LOOP NO NC02 LINE 58200 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

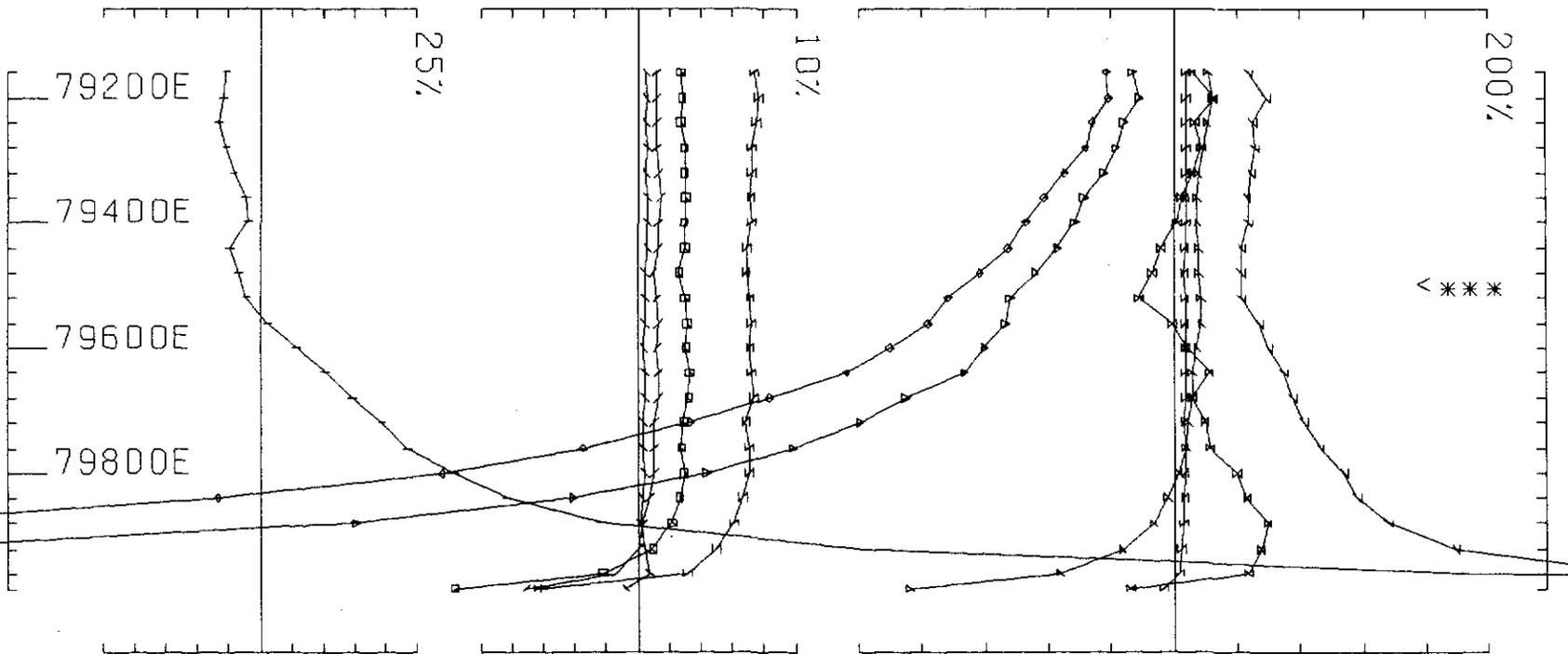
066208

59.
6.30



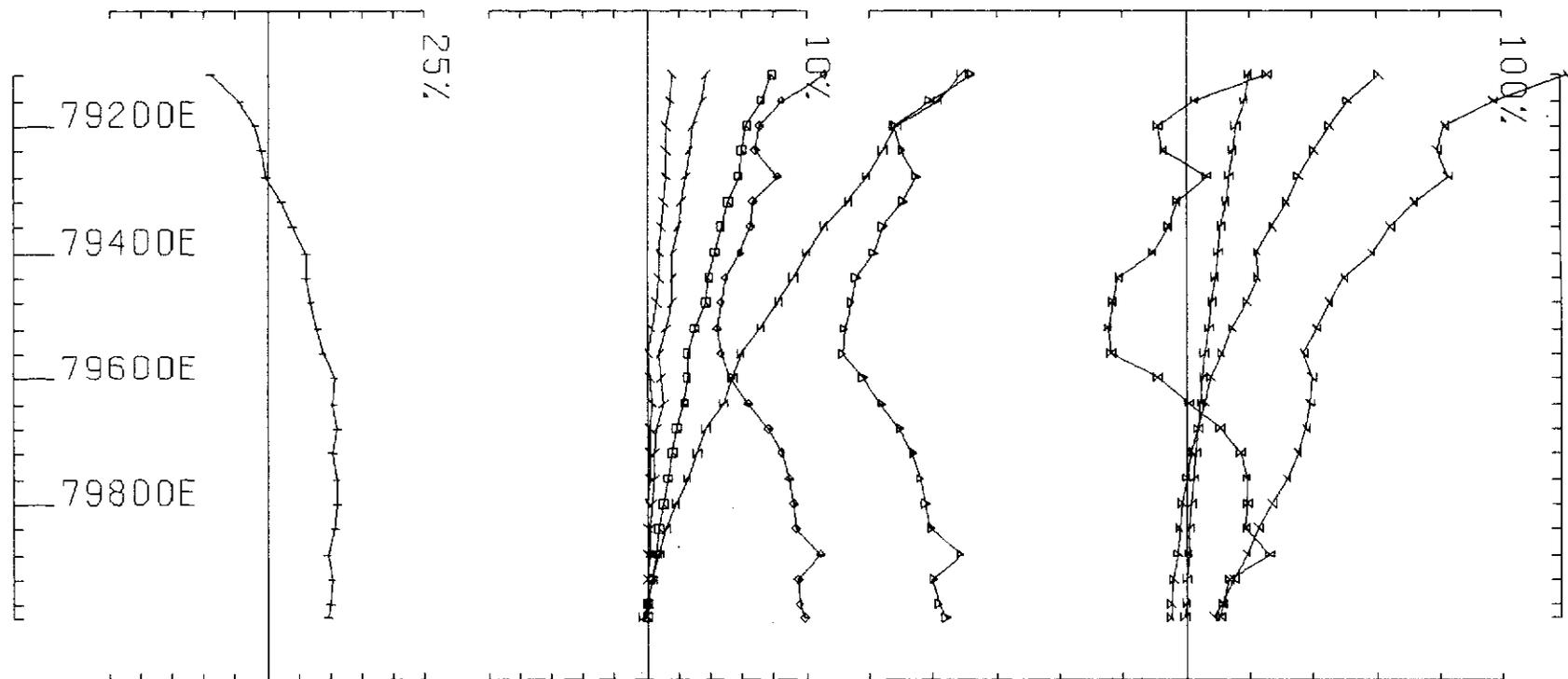
UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION LTD OCT.1991
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
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066209



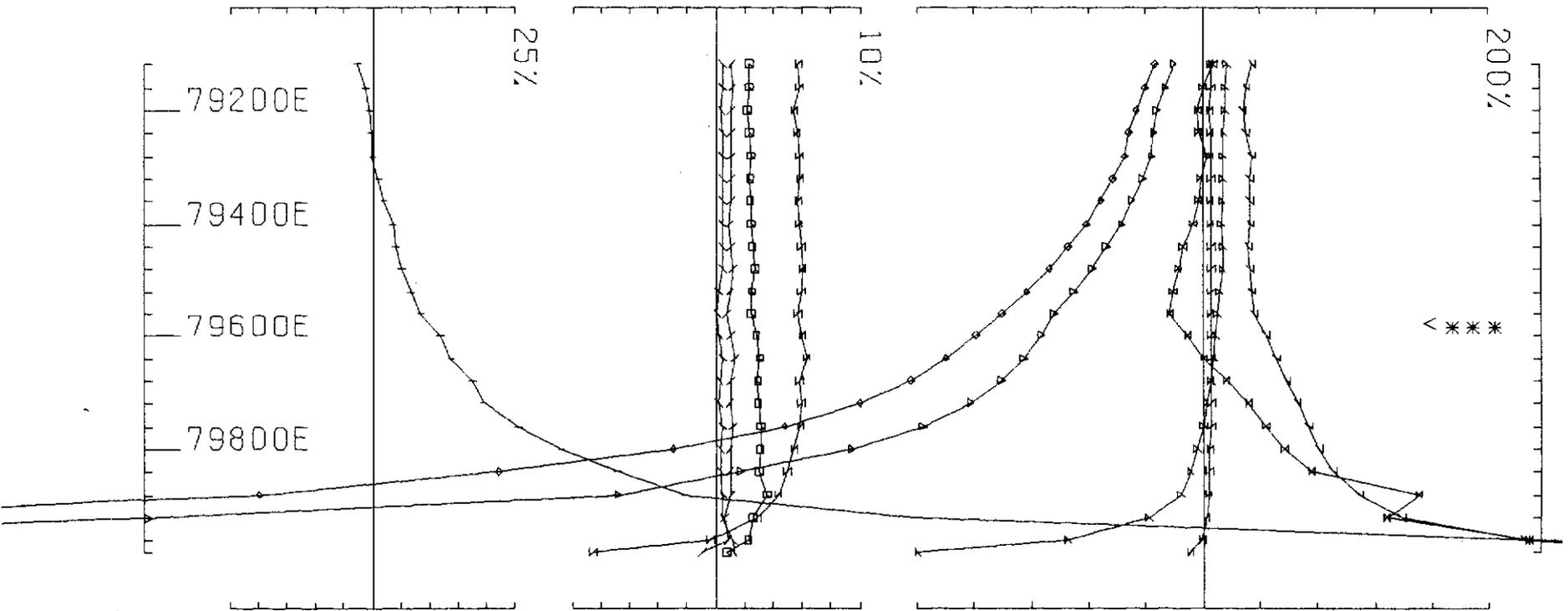
UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION LTD OCT.1991
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
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066210



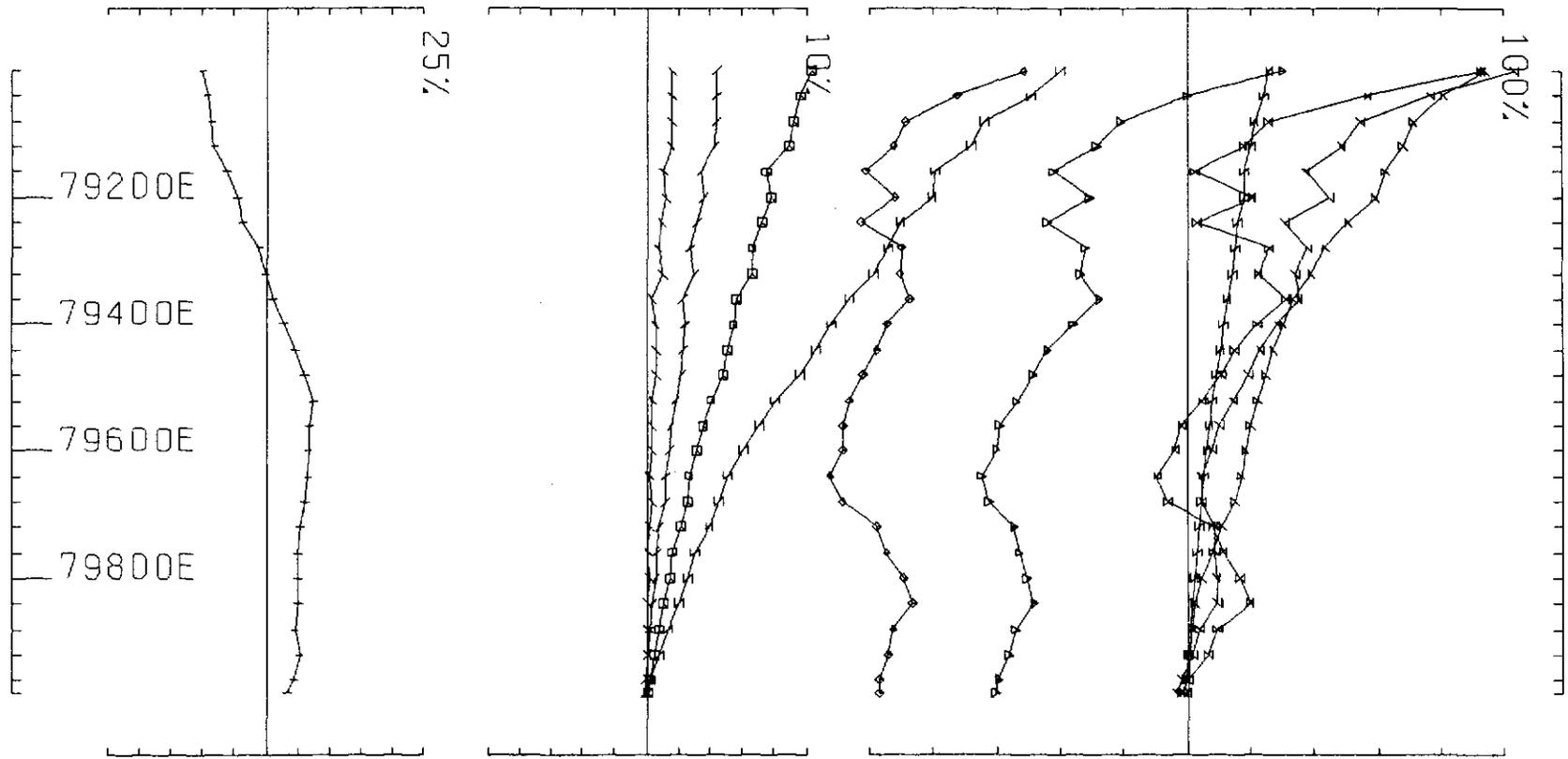
UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION LTD OCT.1991
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
 LOOP NO NC02 LINE 57800 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

066211



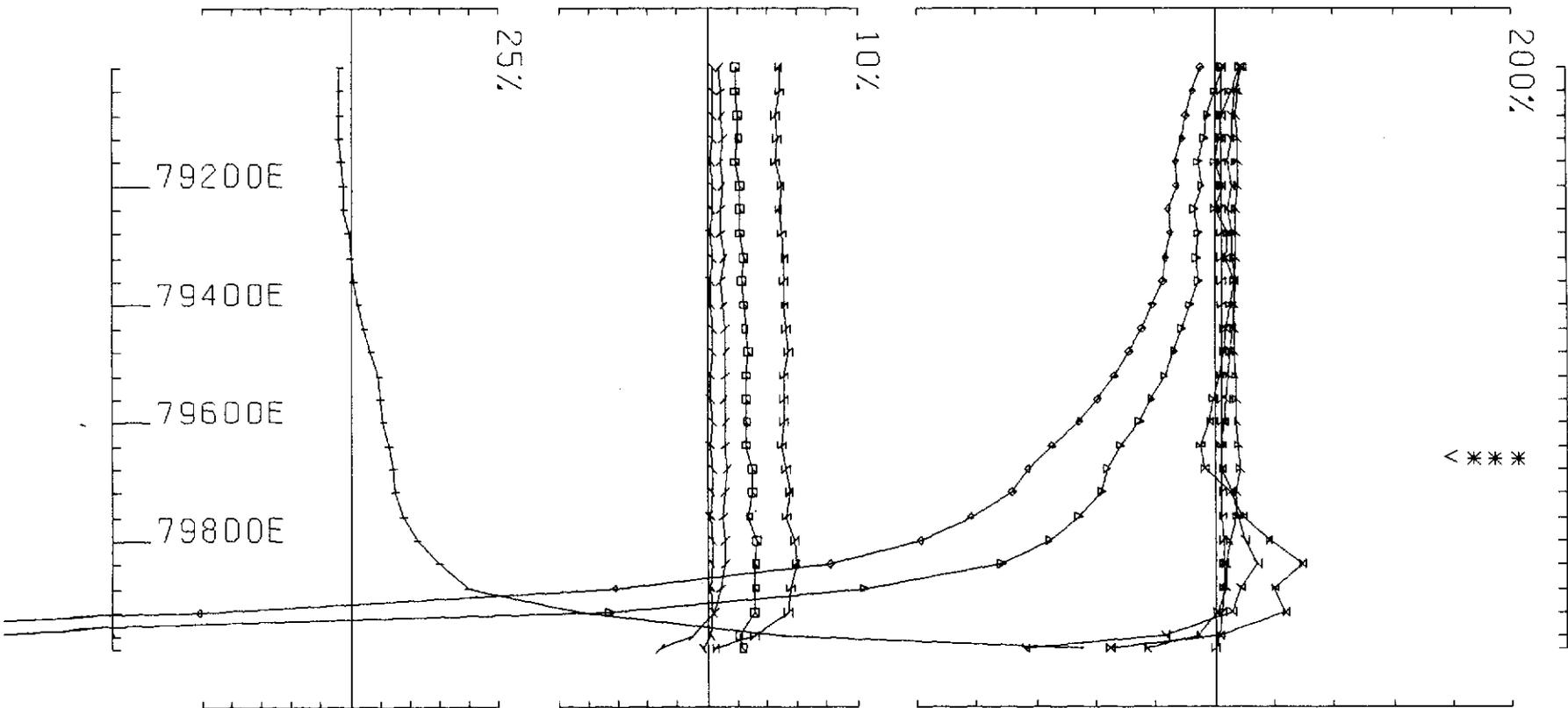
UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION LTD OCT.1991
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
 LOOP NO NC02 LINE 57800 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

066212



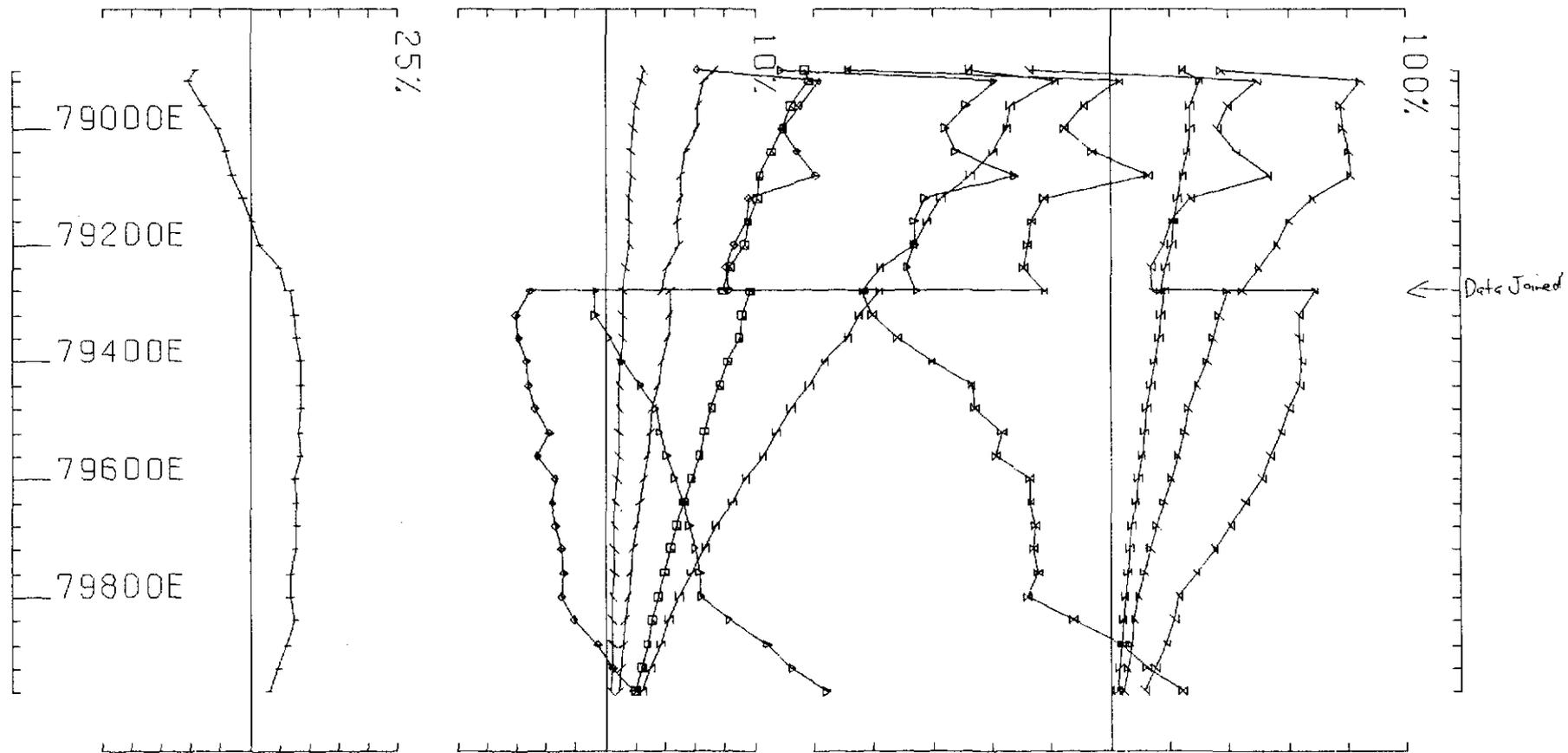
UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION LTD OCT.1991
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
 LOOP NO NC02 LINE 57600 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

UT7900



UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION LTD OCT.1991
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
 LOOP NO NC02 LINE 57600 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

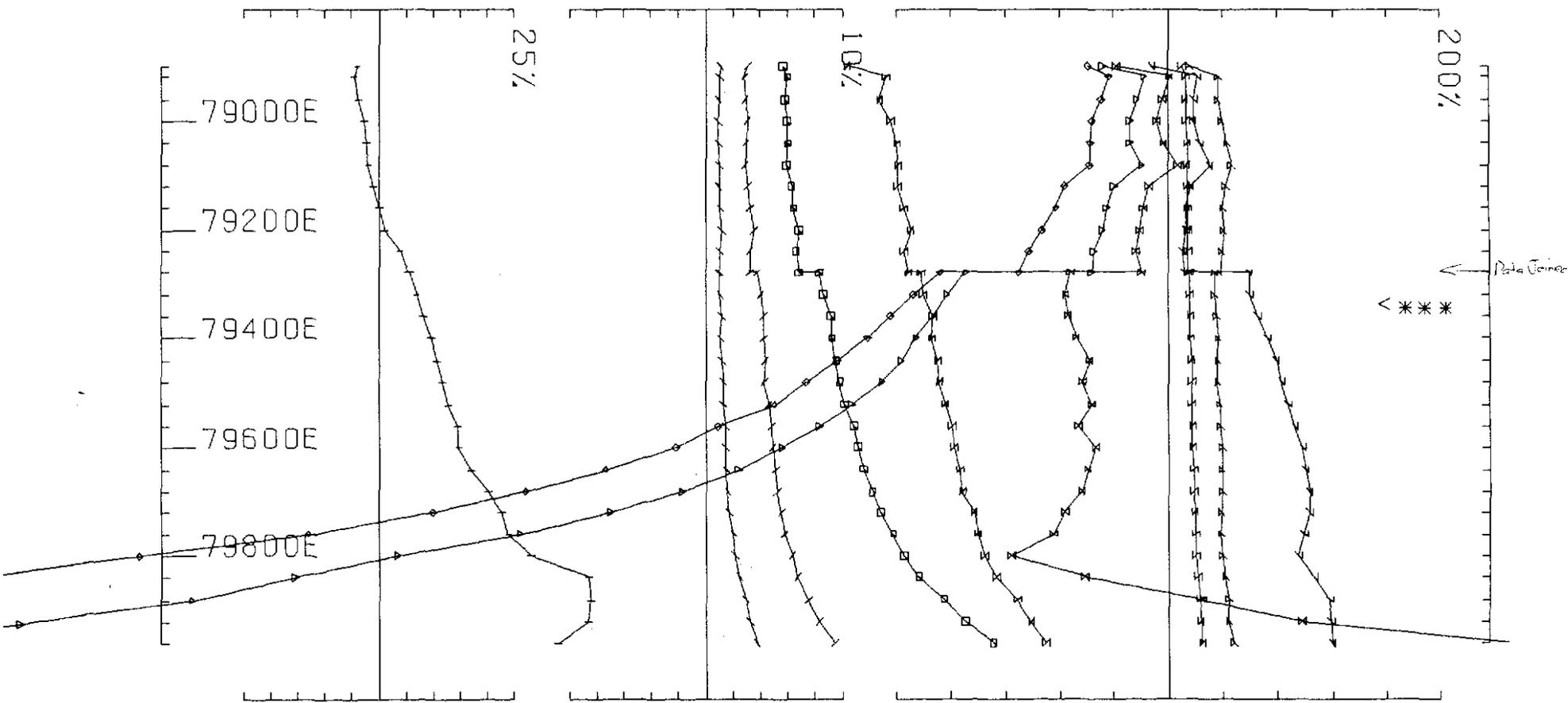
066214



UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION LTD OCT.1991
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 LOOP NO NC02 LINE 57400 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

066215

fig.
6.37



UTEM SURVEY AT NEWTON CREEK AREA FOR PASMINGO EXPLORATION LTD OCT.1991
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
 LOOP NO NC02 LINE 57400 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

066216



PASMINCO EXPLORATION

A Division of Pasminco Australia Limited

COMPILED: R.A.P.

DATE: July 1992

DRAWN: G.M.B.

REF.:

REVISIONS:

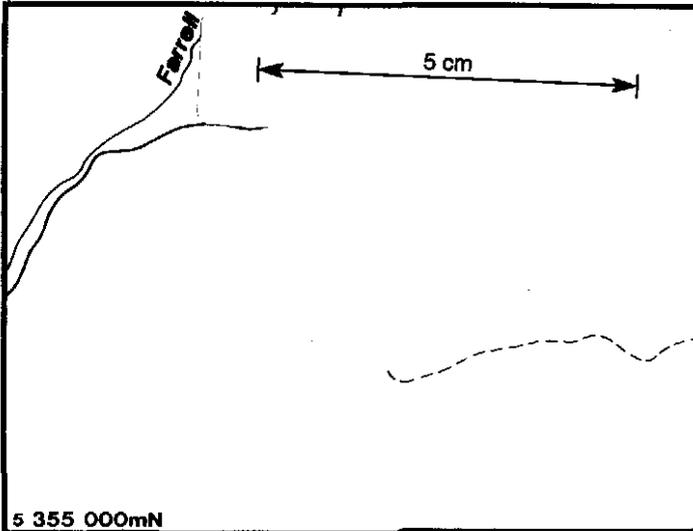
E.L. 11/85 - YOLANDE JV HENTY VALLEY AREA UTEM SURVEY GRID LAYOUT

DRAWING No.

SCALE 1:25,000



FIG. No.

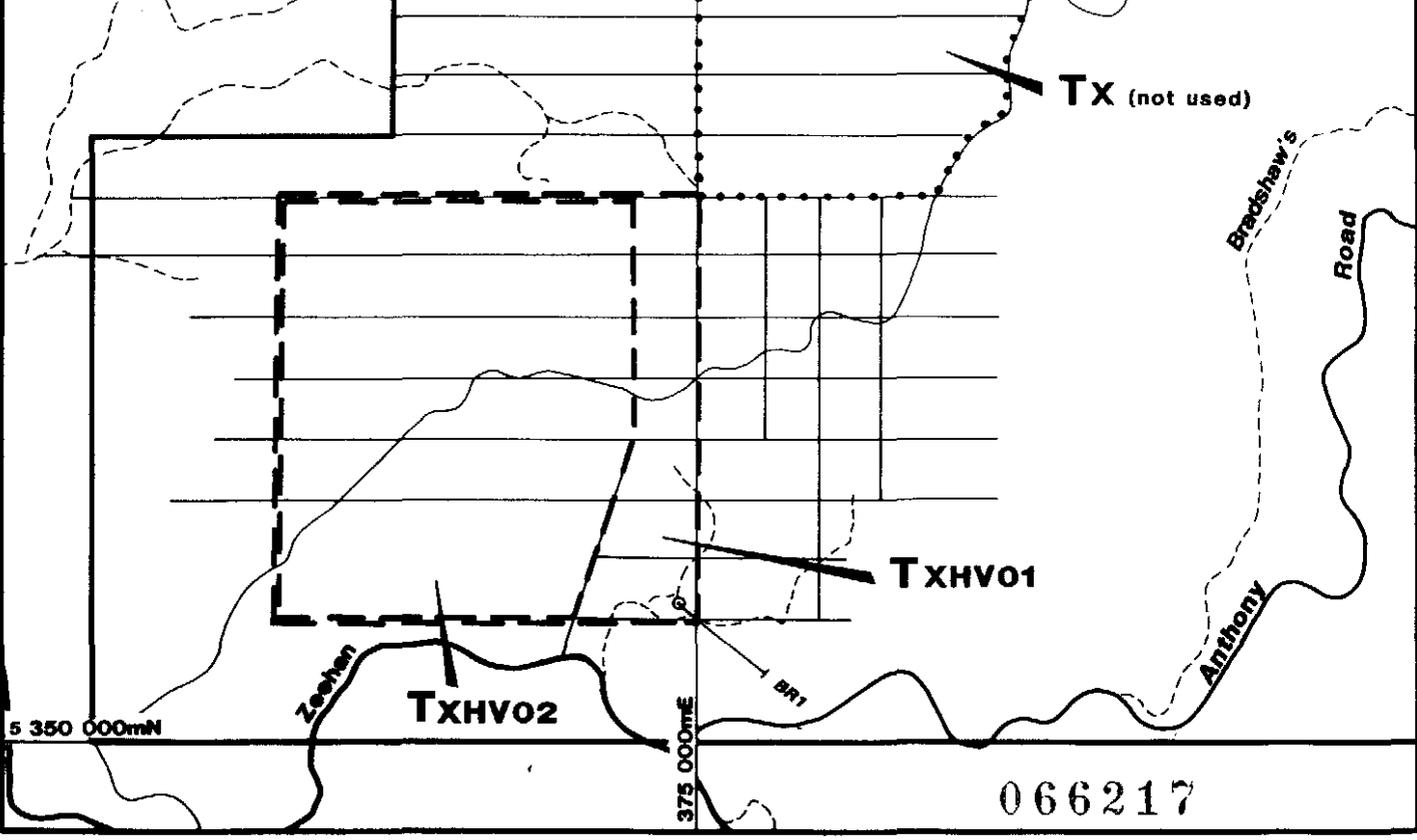


5 355 000mN



E.L. 11/85 BOUNDARY

5 352 500mN



TX (not used)

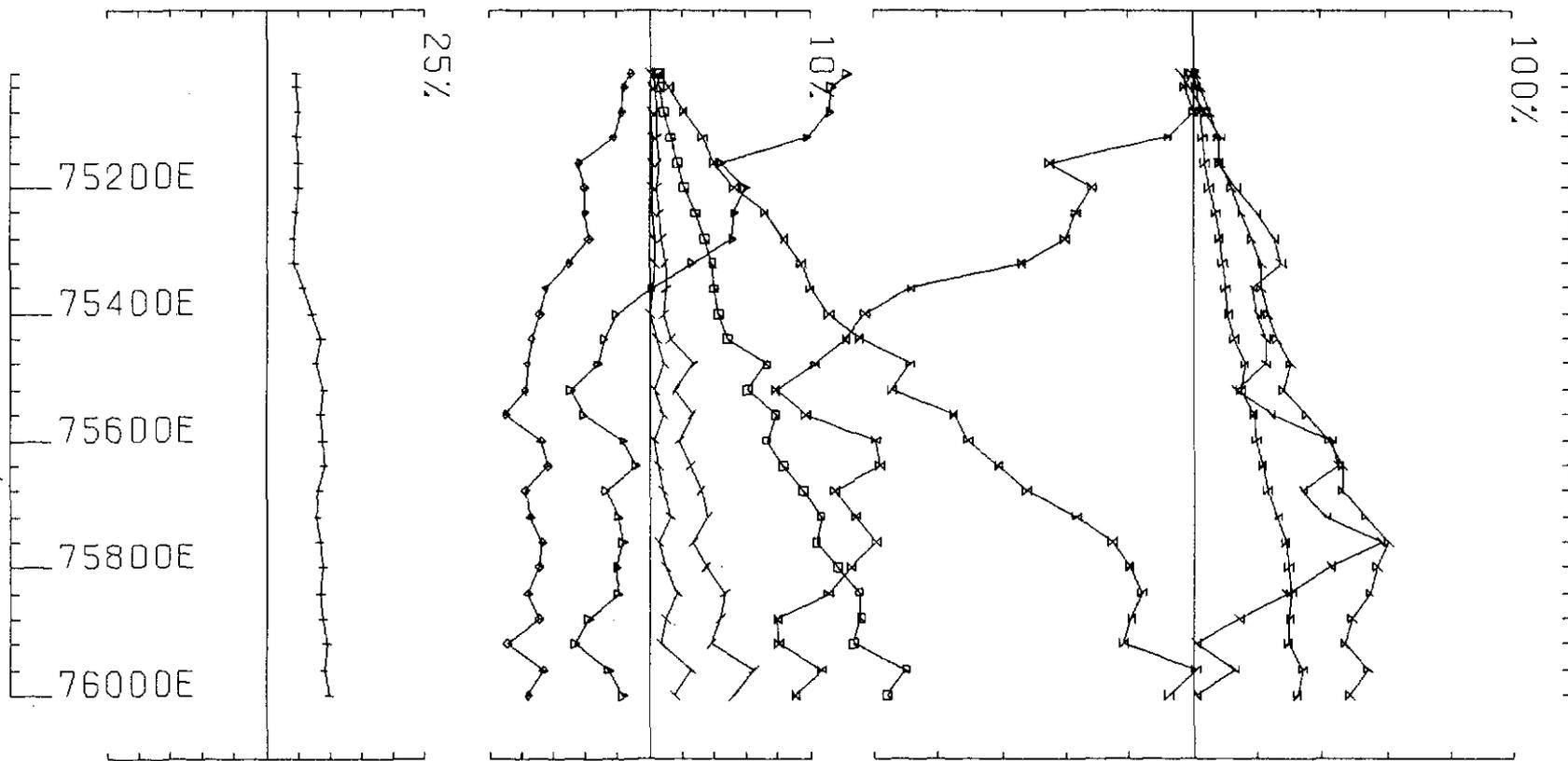
TXHV01

TXHV02

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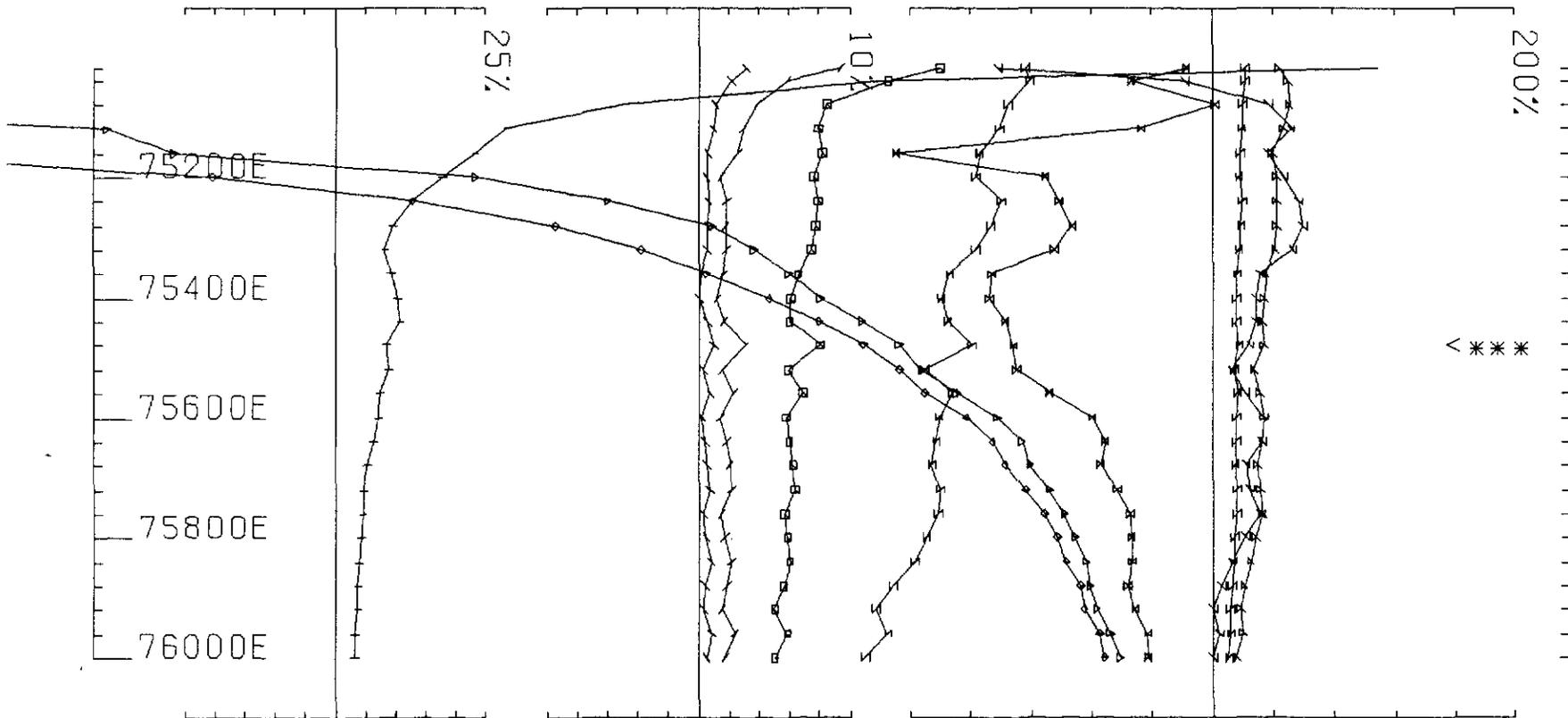
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066217



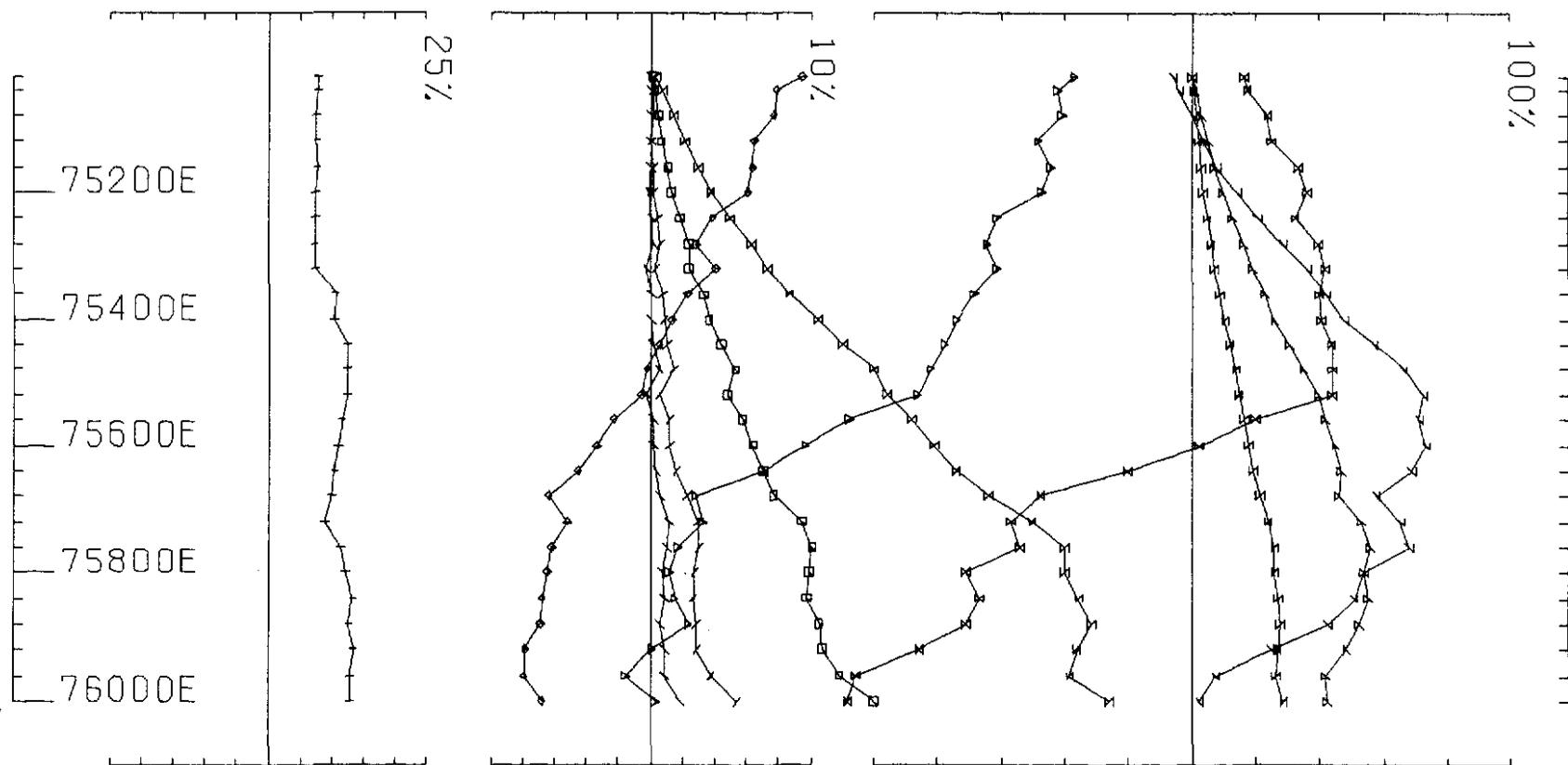
UTEM SURVEY AT HENTY VALLEY GRID FOR PASMINGO EXPLORATION LTD OCTOBER 1991
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
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066218



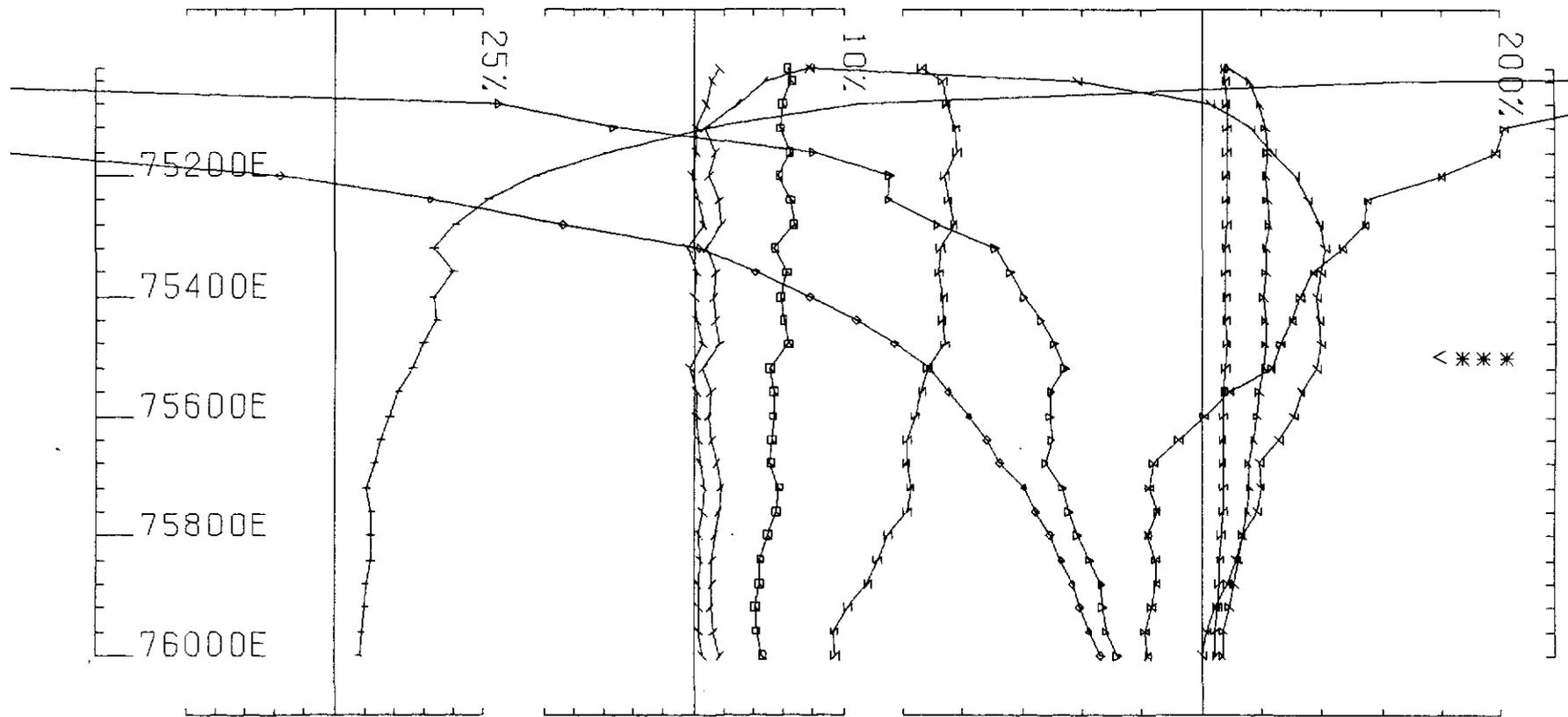
UTEM SURVEY AT HENTY VALLEY GRID FOR PASMINGO EXPLORATION LTD OCTOBER 1991
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
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066219



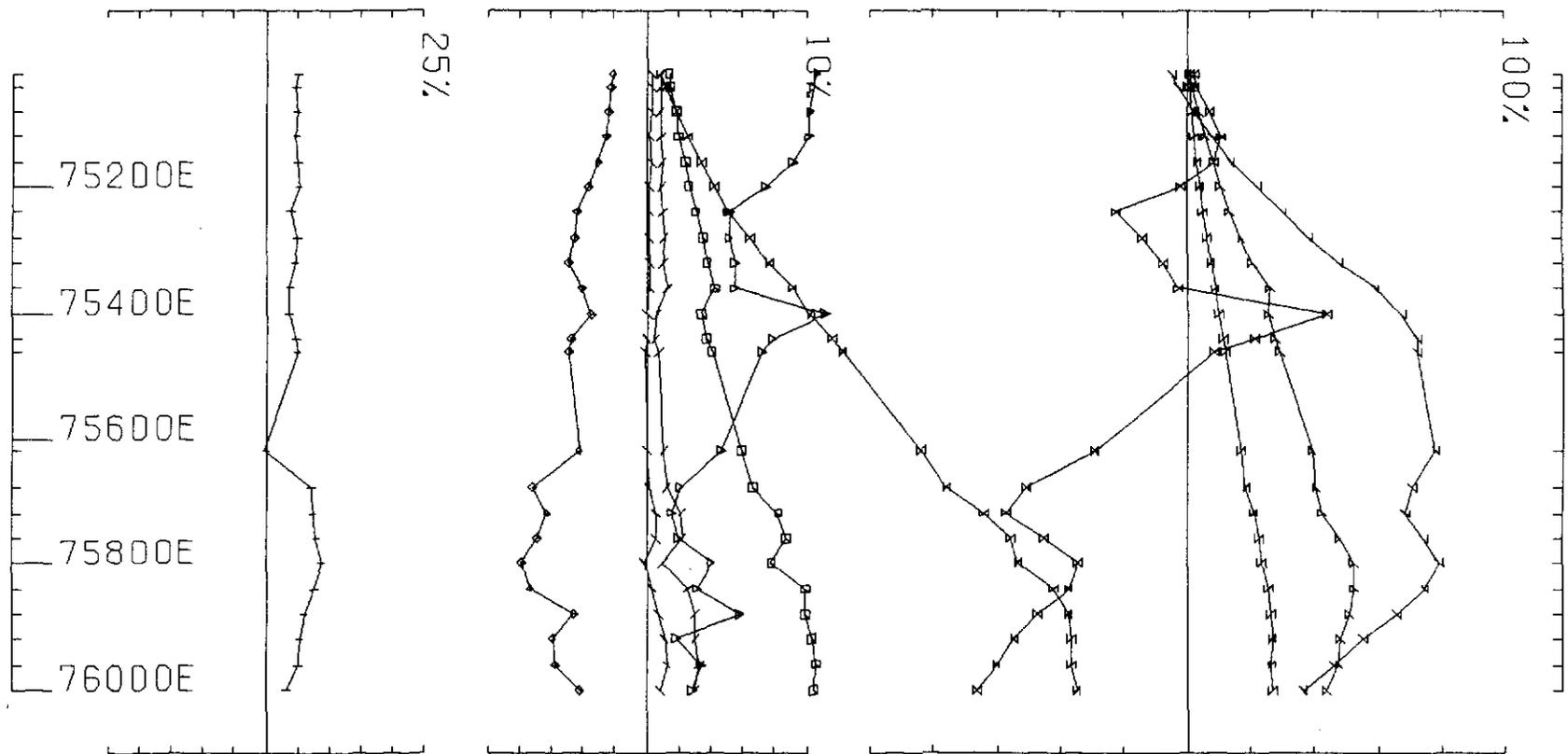
UTEM SURVEY AT HENTY VALLEY GRID FOR PASMINCO EXPLORATION LTD OCTOBER 1991
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
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066220



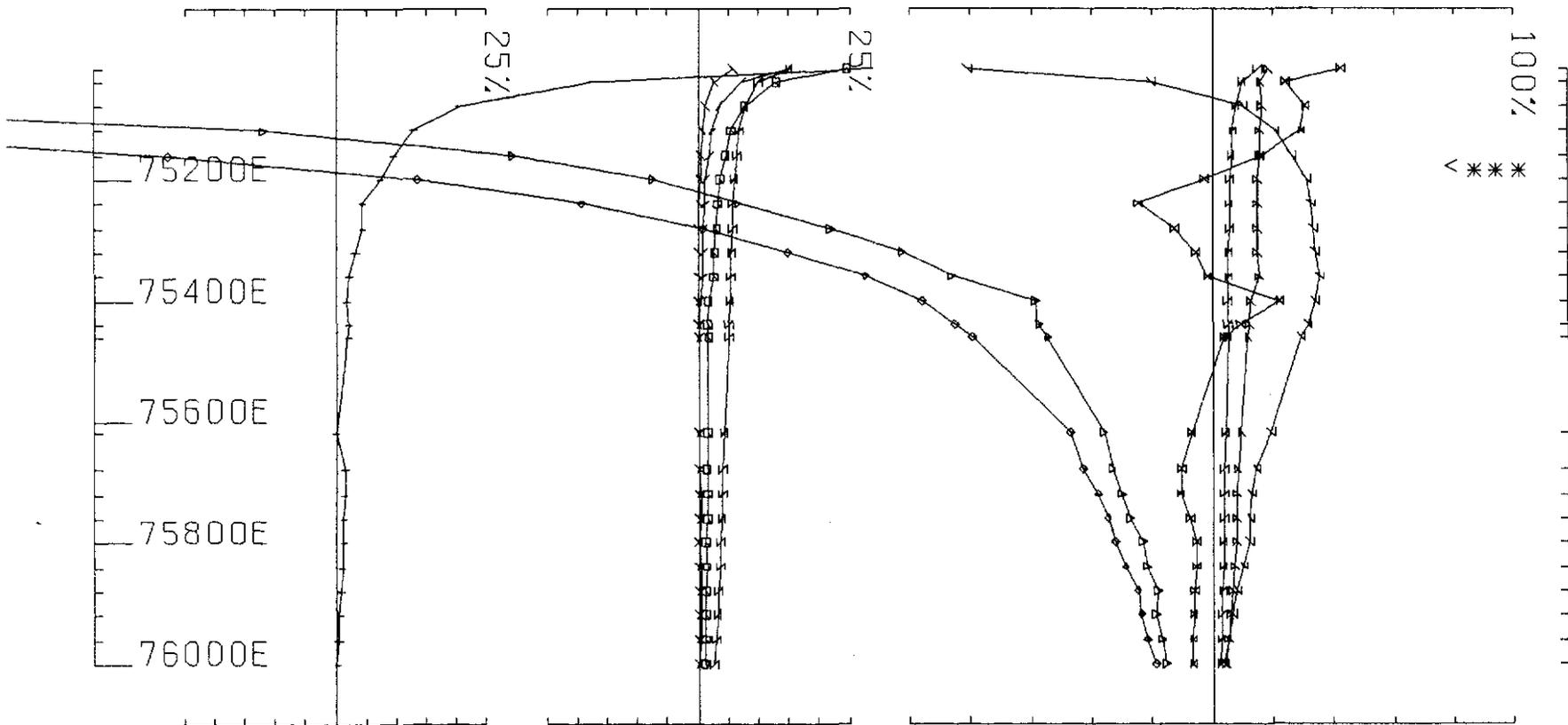
UTEM SURVEY AT HENTY VALLEY GRID FOR PASMINGO EXPLORATION LTD OCTOBER 1991
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
 LOOP NO 01 LINE 51600 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

066221



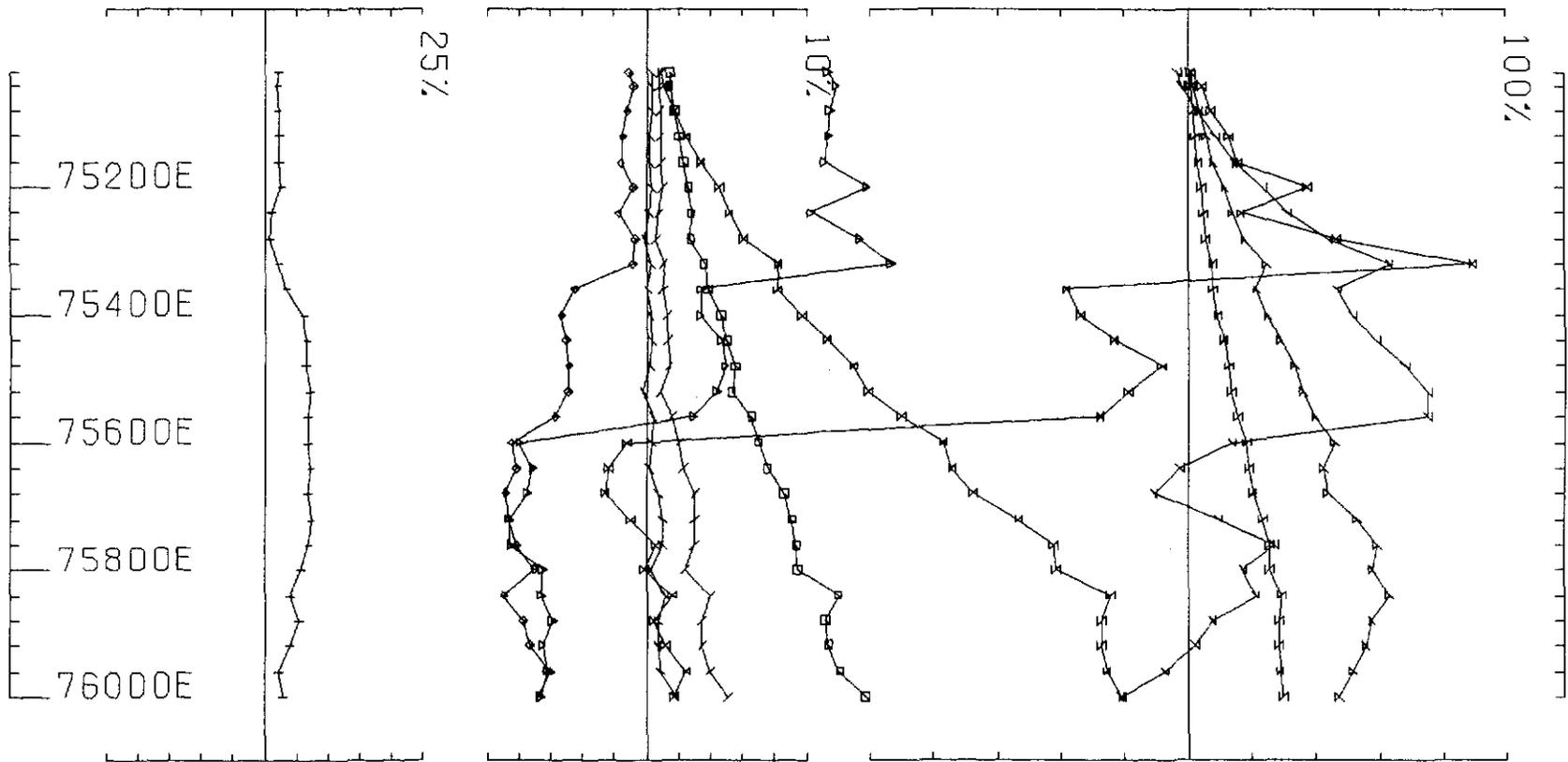
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066222



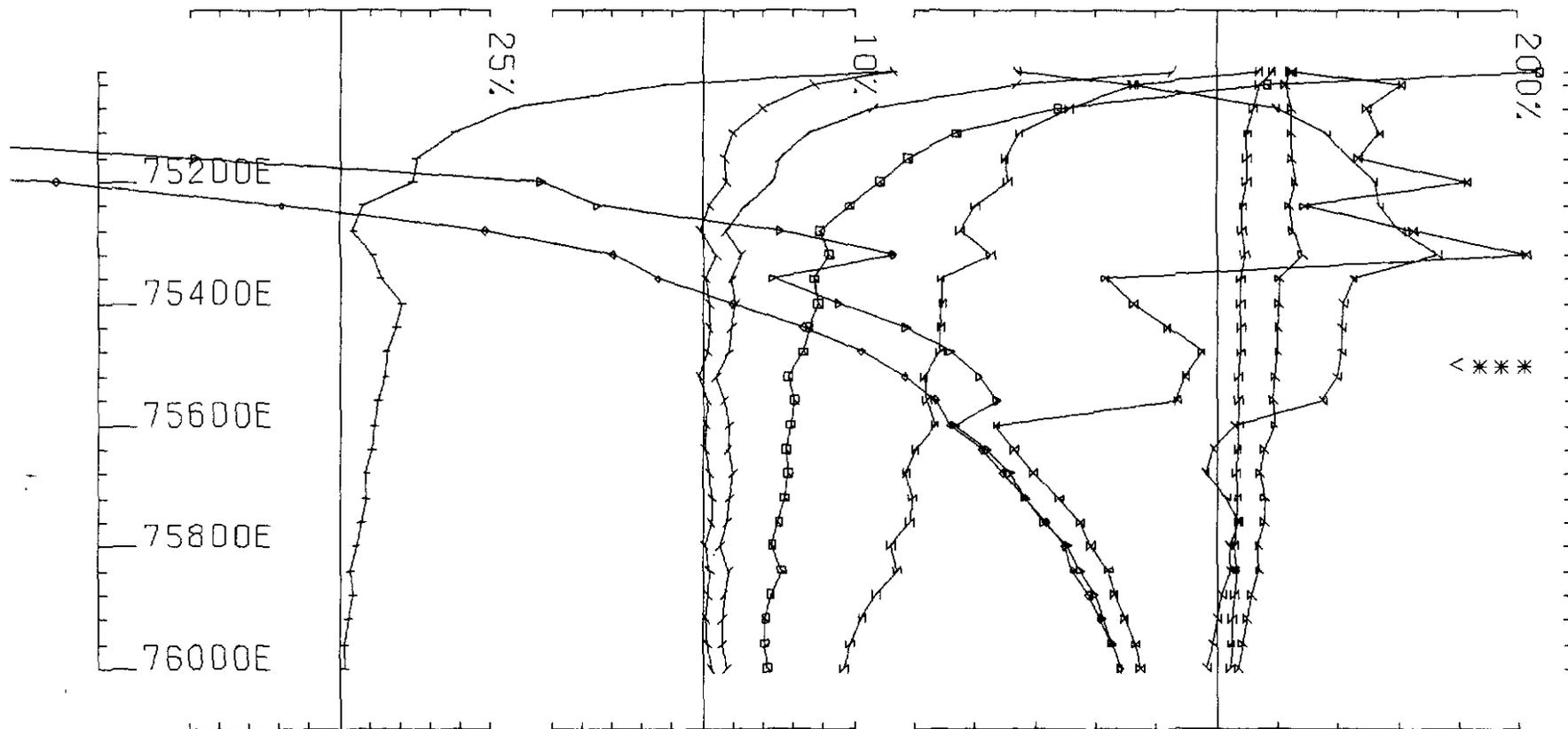
UTEM SURVEY AT HENTY VALLEY GRID FOR PASMINGO EXPLORATION LTD
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
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066223



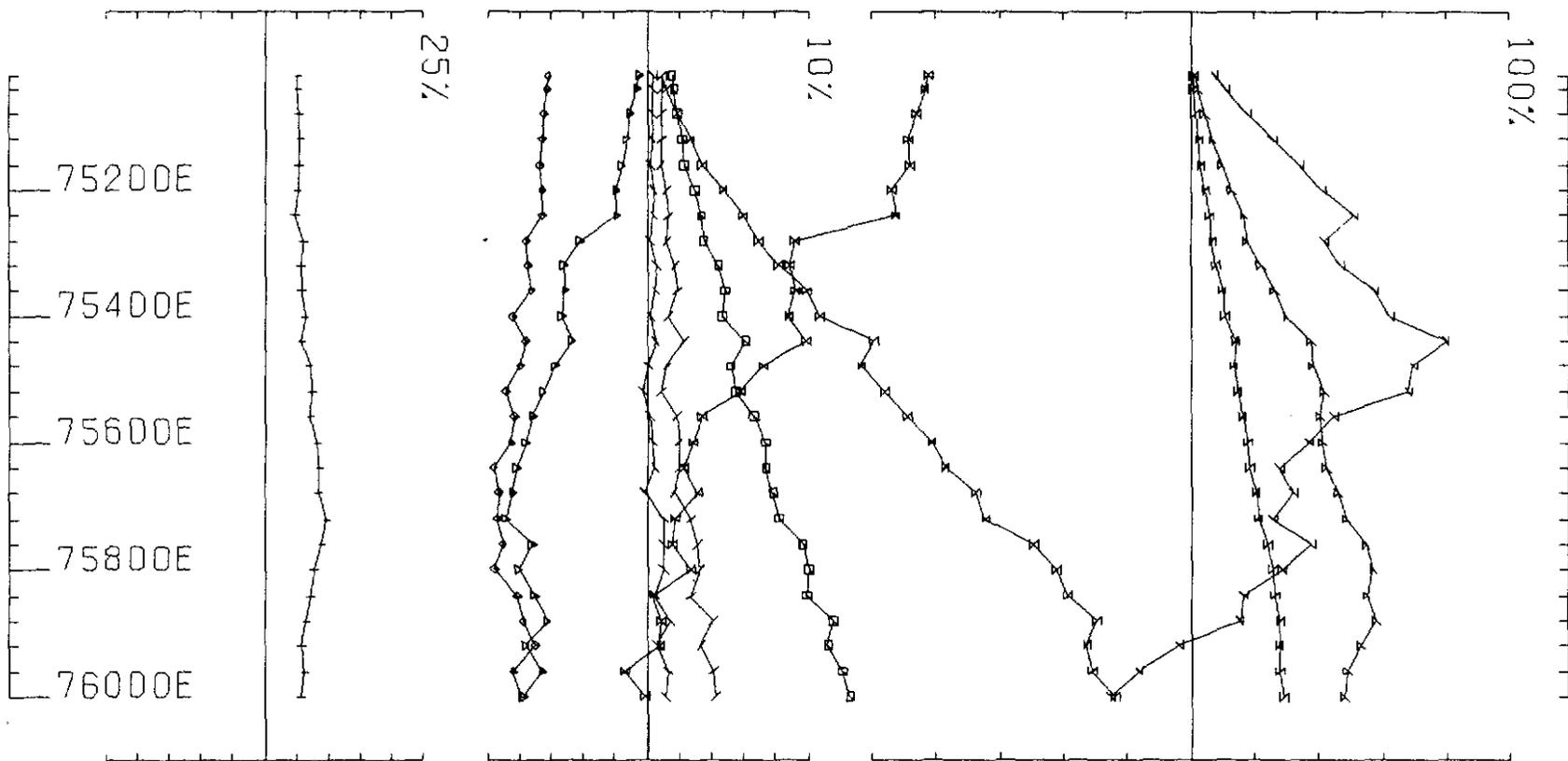
UTEM SURVEY AT HENTY VALLEY GRID FOR PASMINGO EXPLORATION LTD OCTOBER 1991
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
 LOOP NO 01 LINE 51300 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

066224



UTEM SURVEY AT HENTY VALLEY GRID FOR PASMINGO EXPLORATION LTD OCTOBER 1991
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
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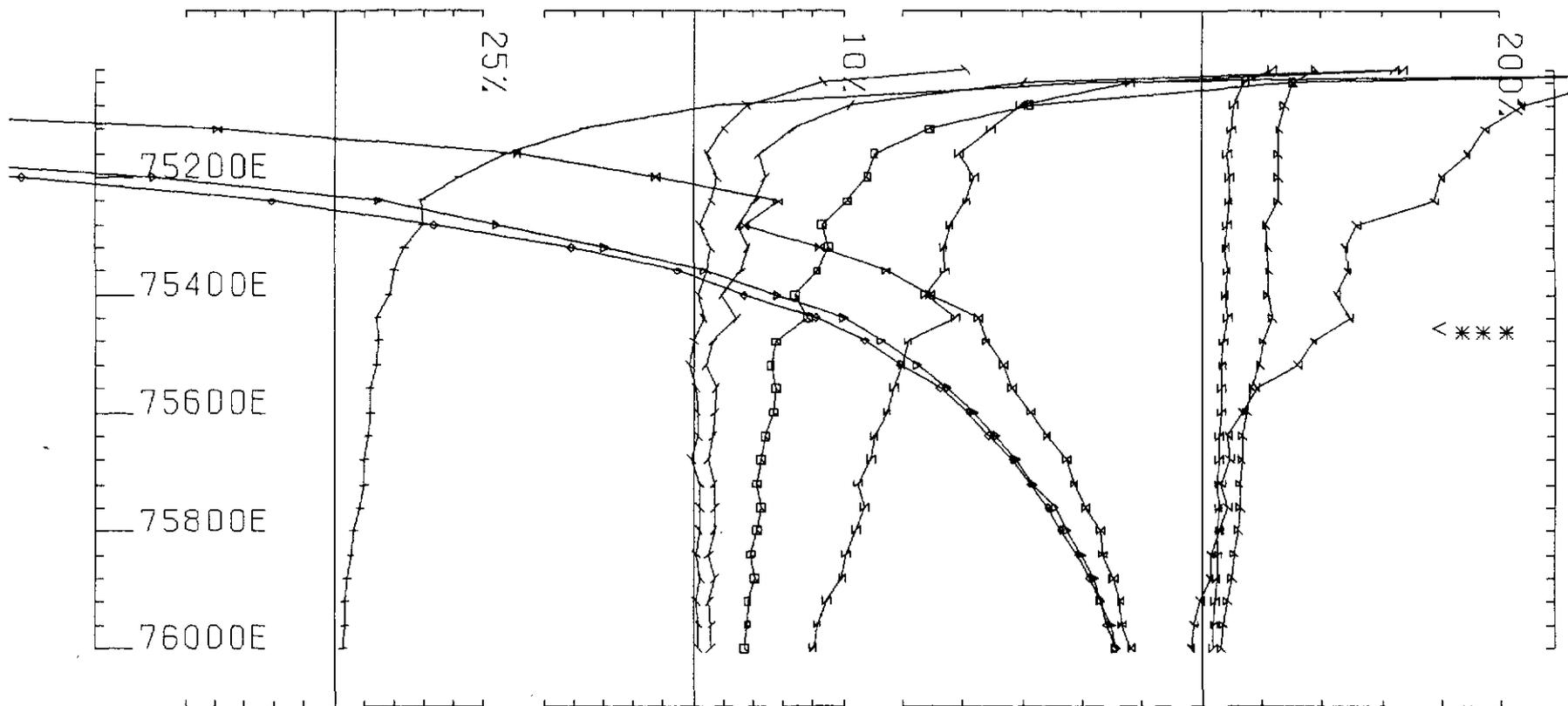
066225



UTEM SURVEY AT HENTY VALLEY GRID FOR PASMINCO EXPLORATION LTD OCTOBER 1991
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 LOOP NO 01 LINE 51200 N COMPONENT HZ SECONDARY FIELO CH1 CONTIN. NORM.

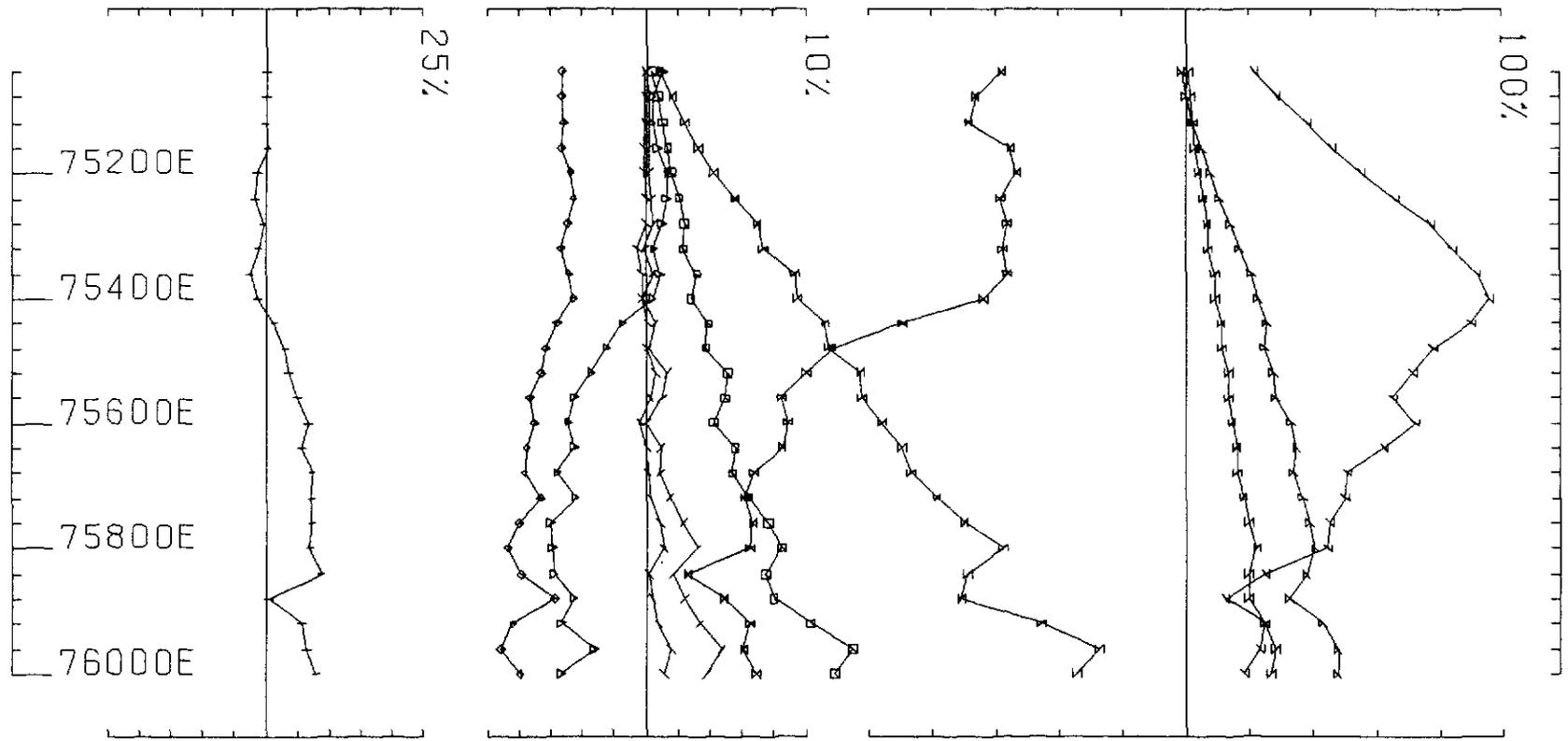
066226

Fig.
e.9



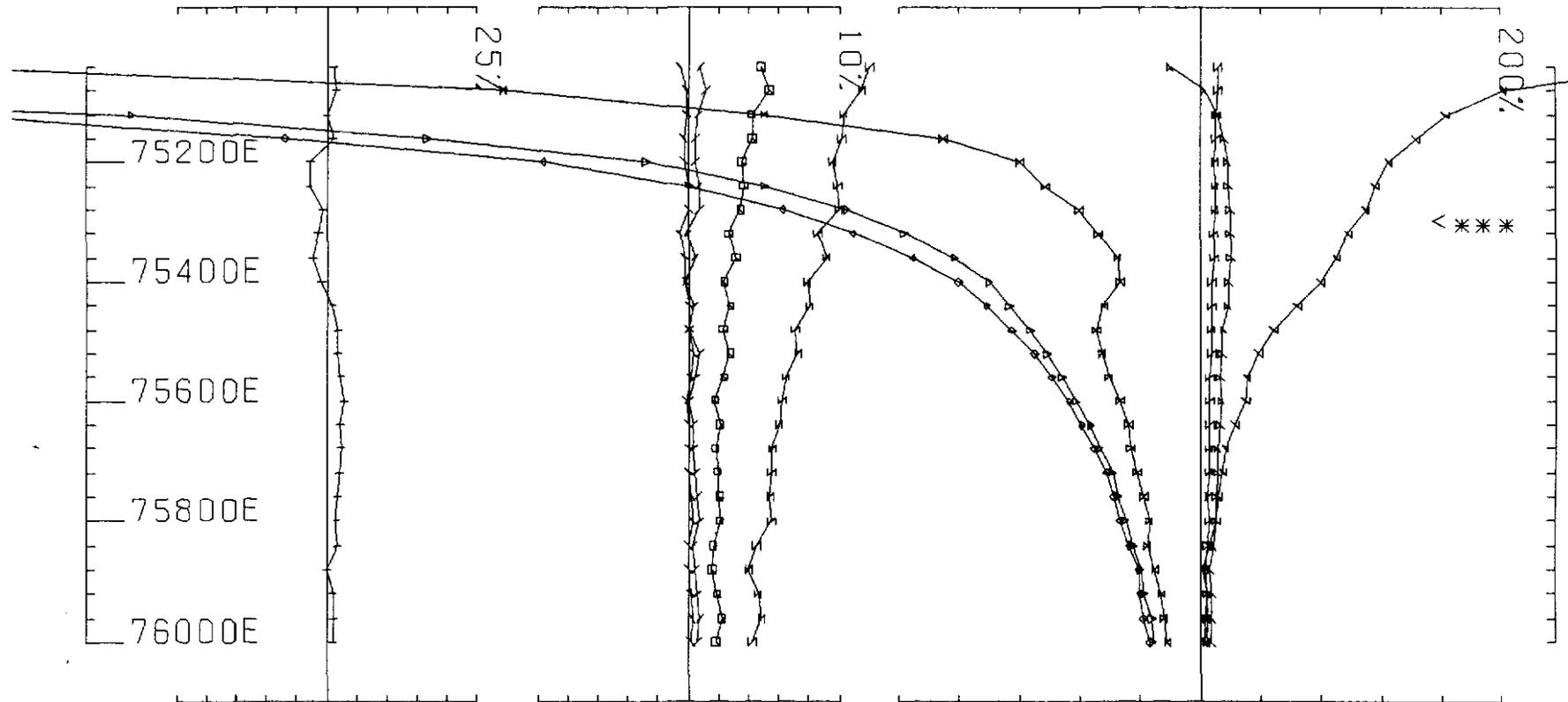
UTEM SURVEY AT HENTY VALLEY GRID FOR PASMINCO EXPLORATION LTD OCTOBER 1991
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066227



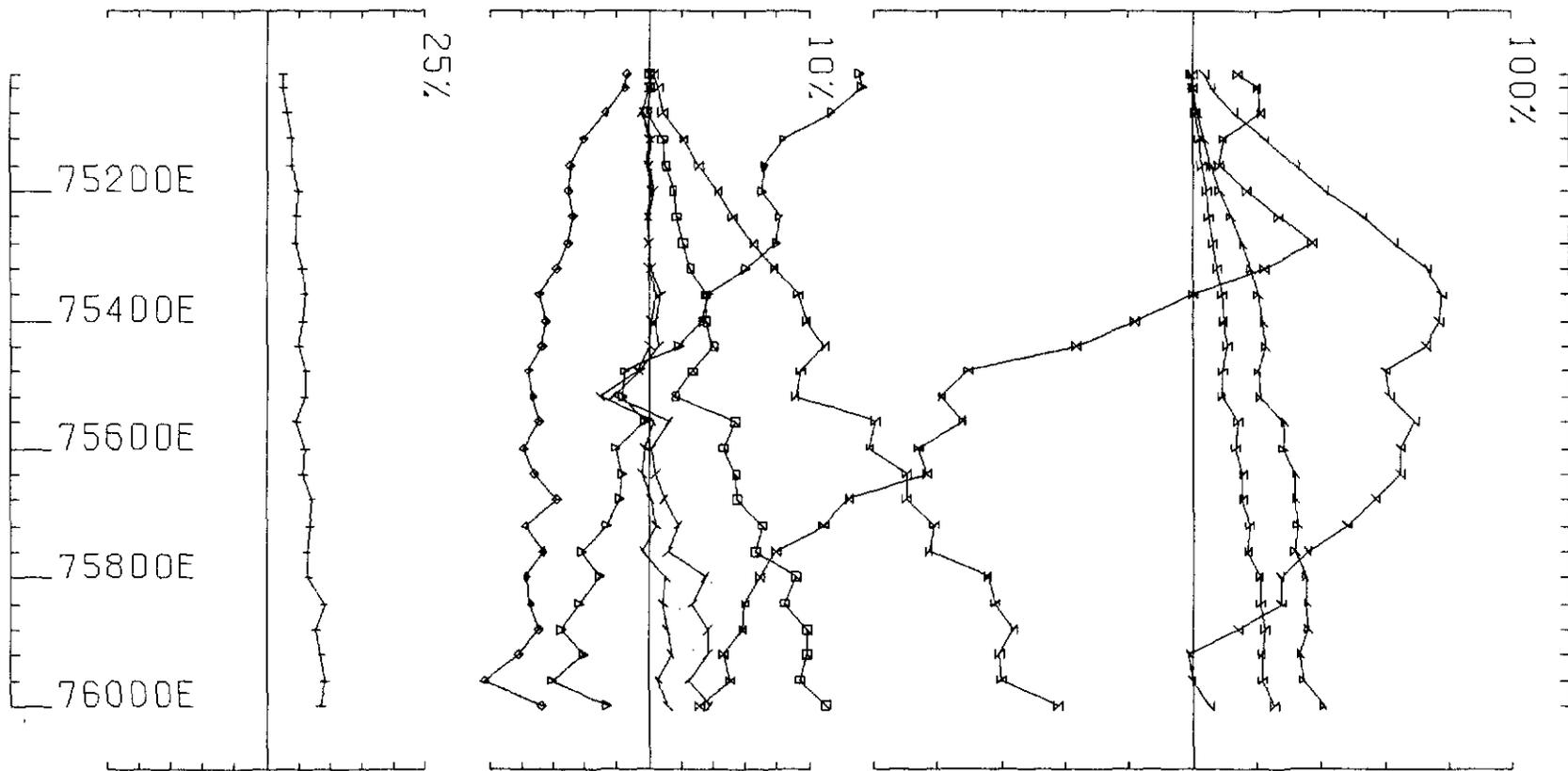
UTEM SURVEY AT HENTY VALLEY GRID FOR PASMINGO EXPLORATION LTD OCTOBER 1991
 CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9110 BASE FREQ (HZ) 52.00
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066228



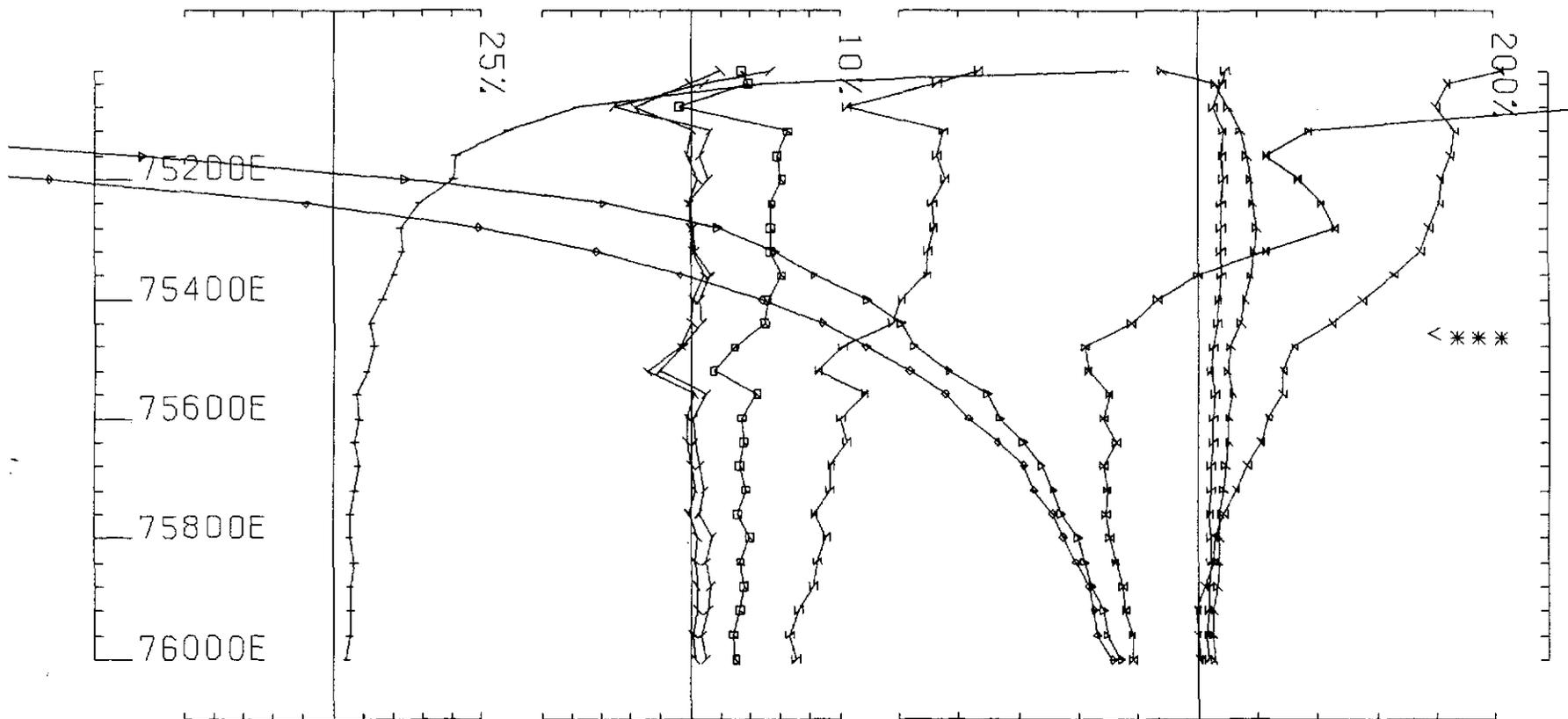
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0662229



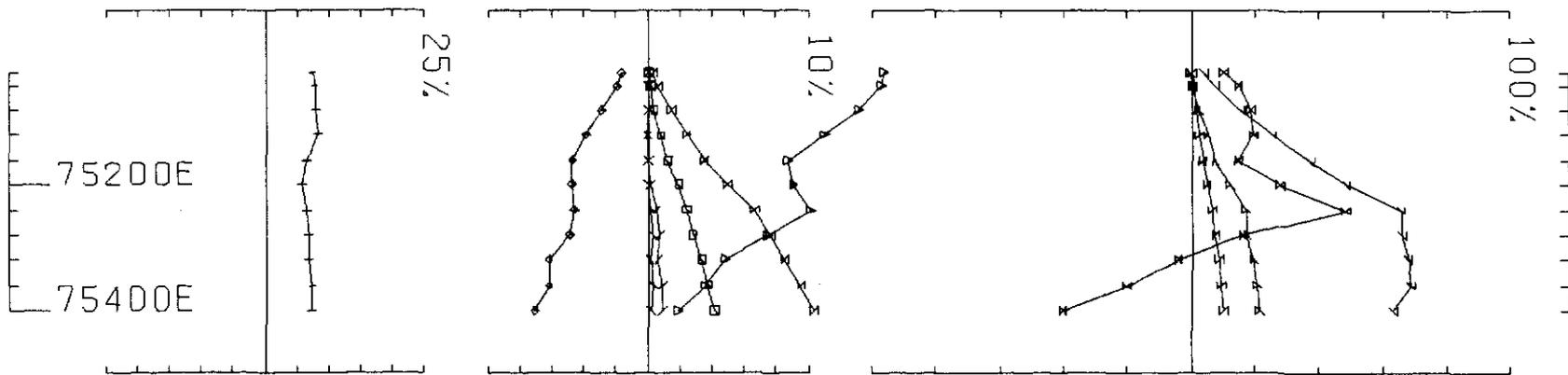
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066230



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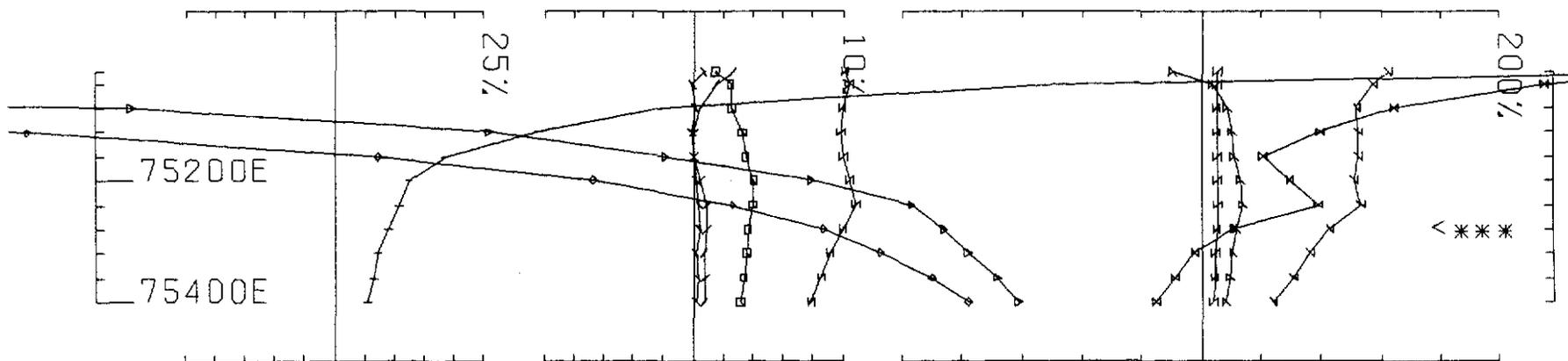
066231



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066232

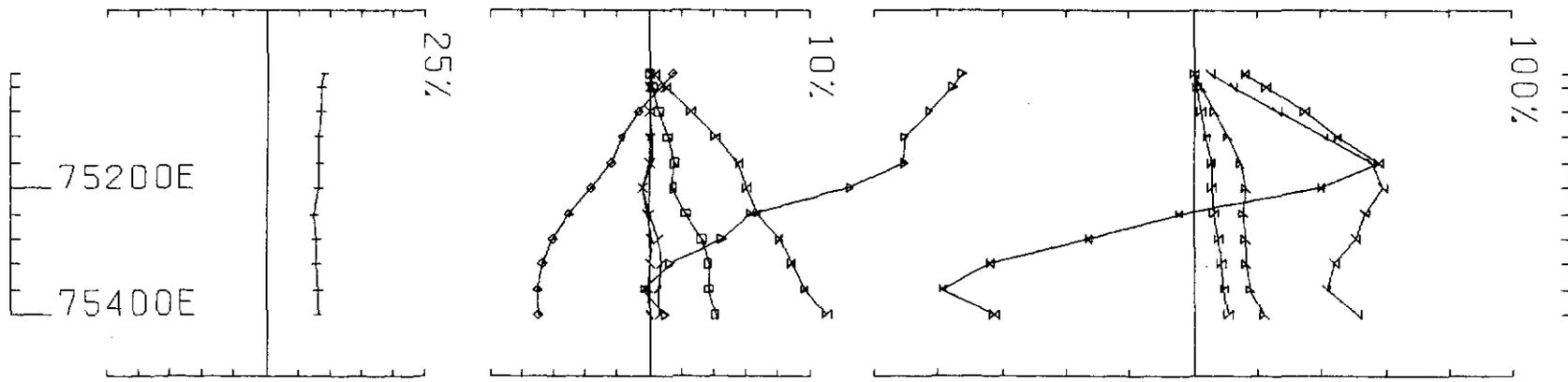
fig.
e.15



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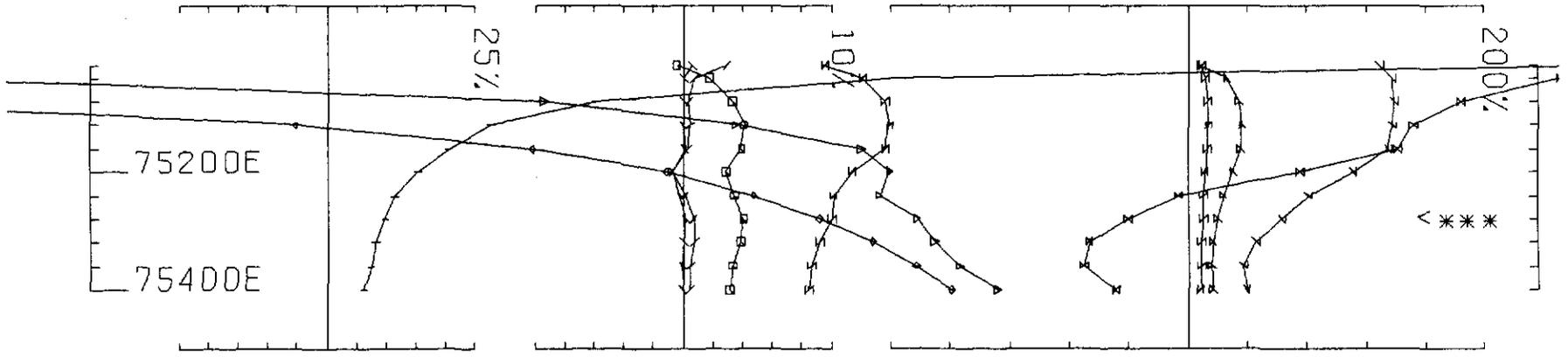
59.
e.16



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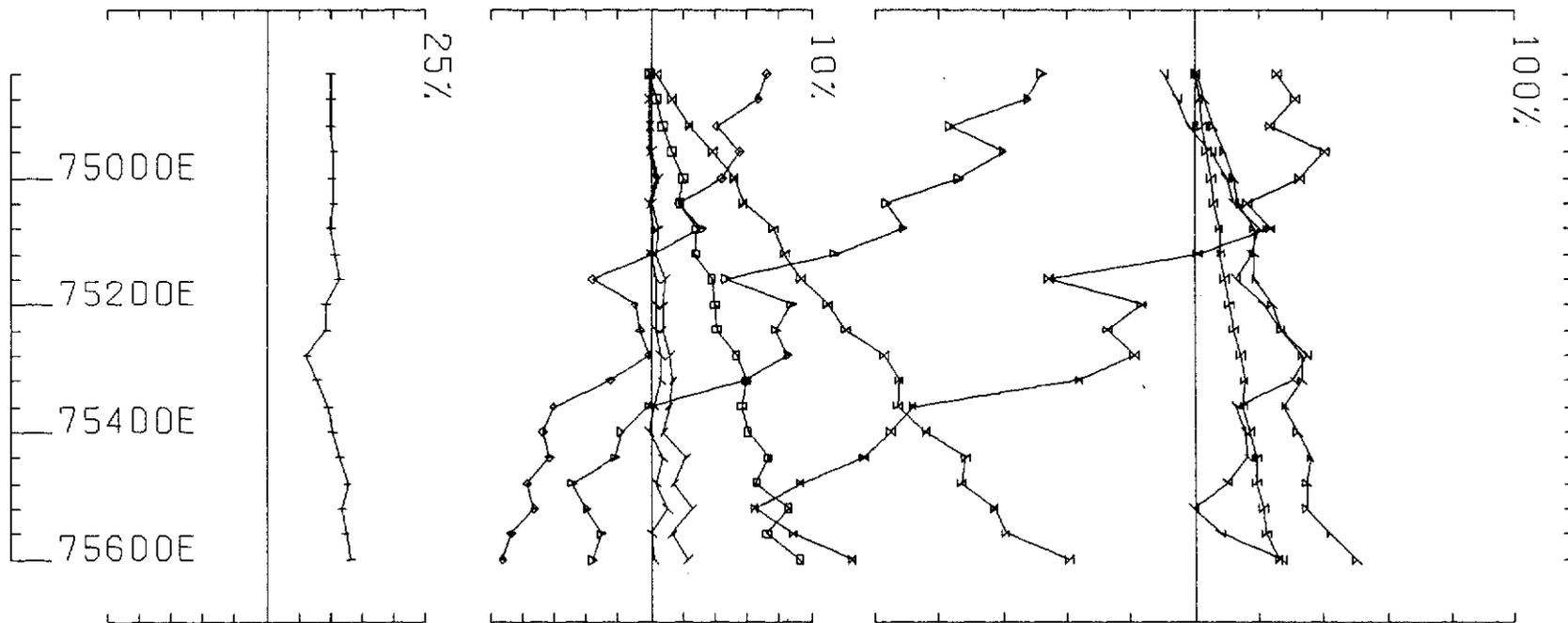
066234

fig.
e.17



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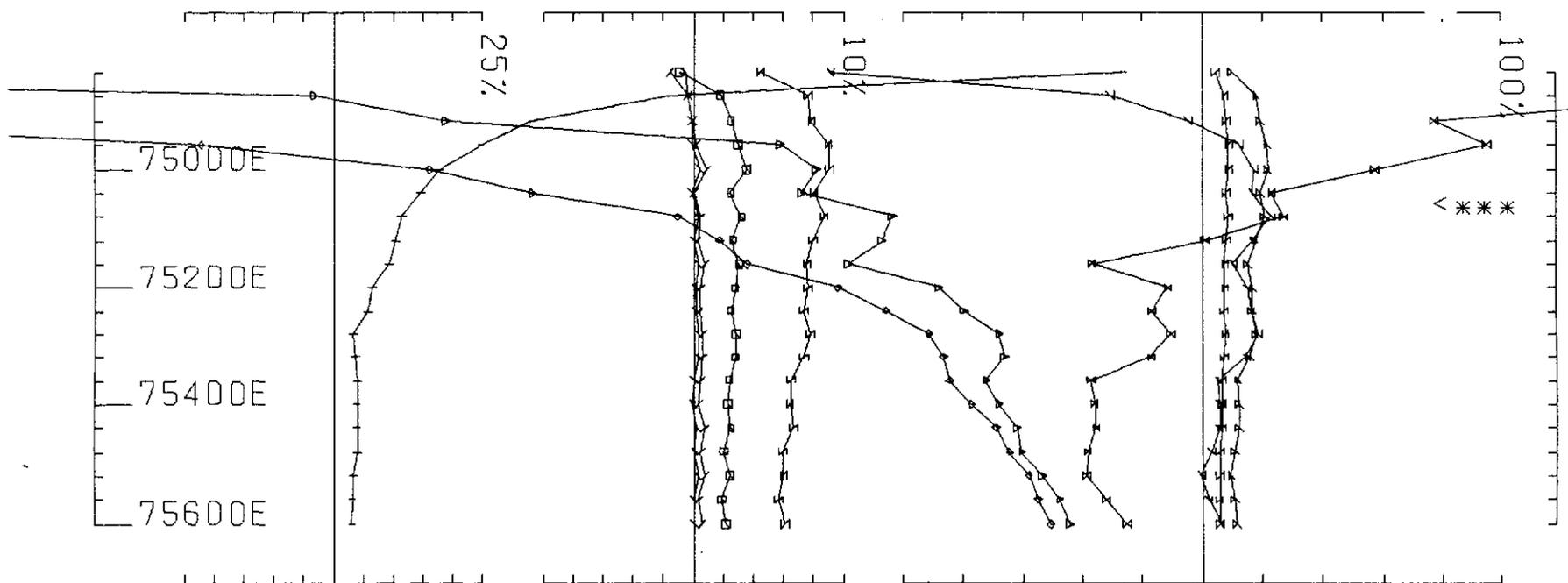
066235



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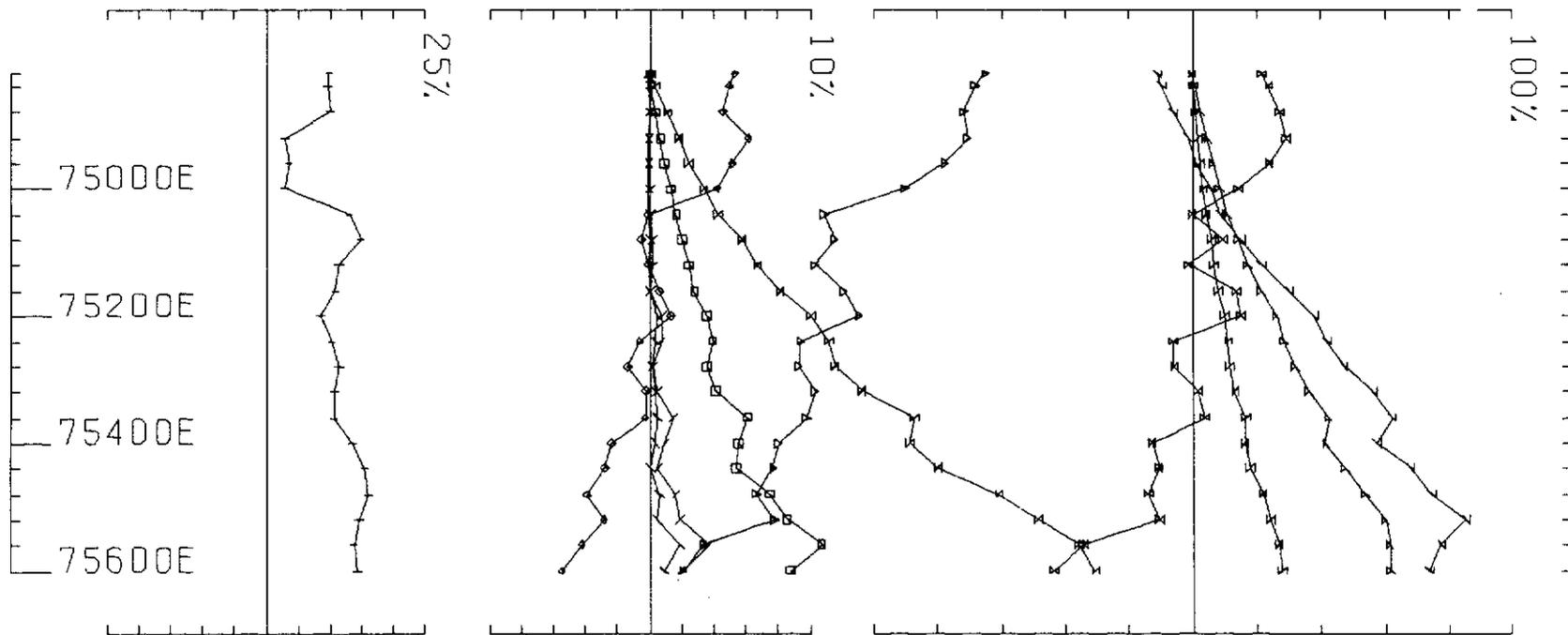
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fig.
e.19



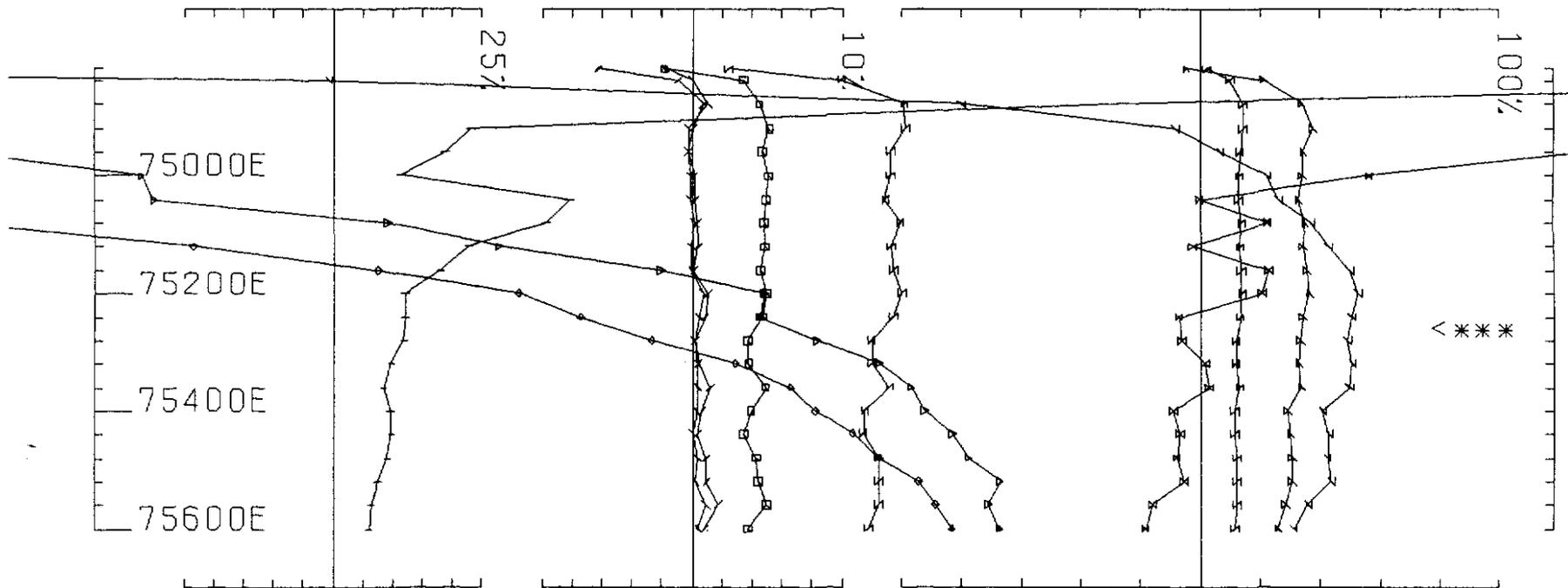
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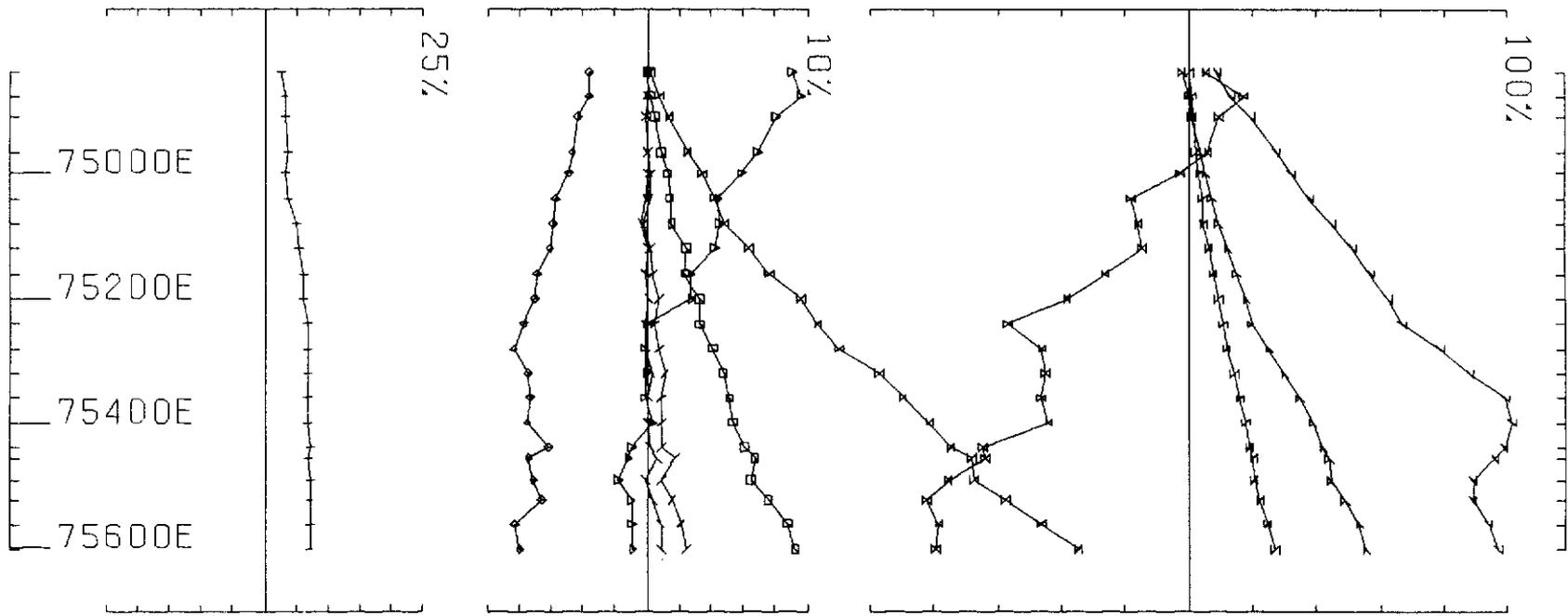
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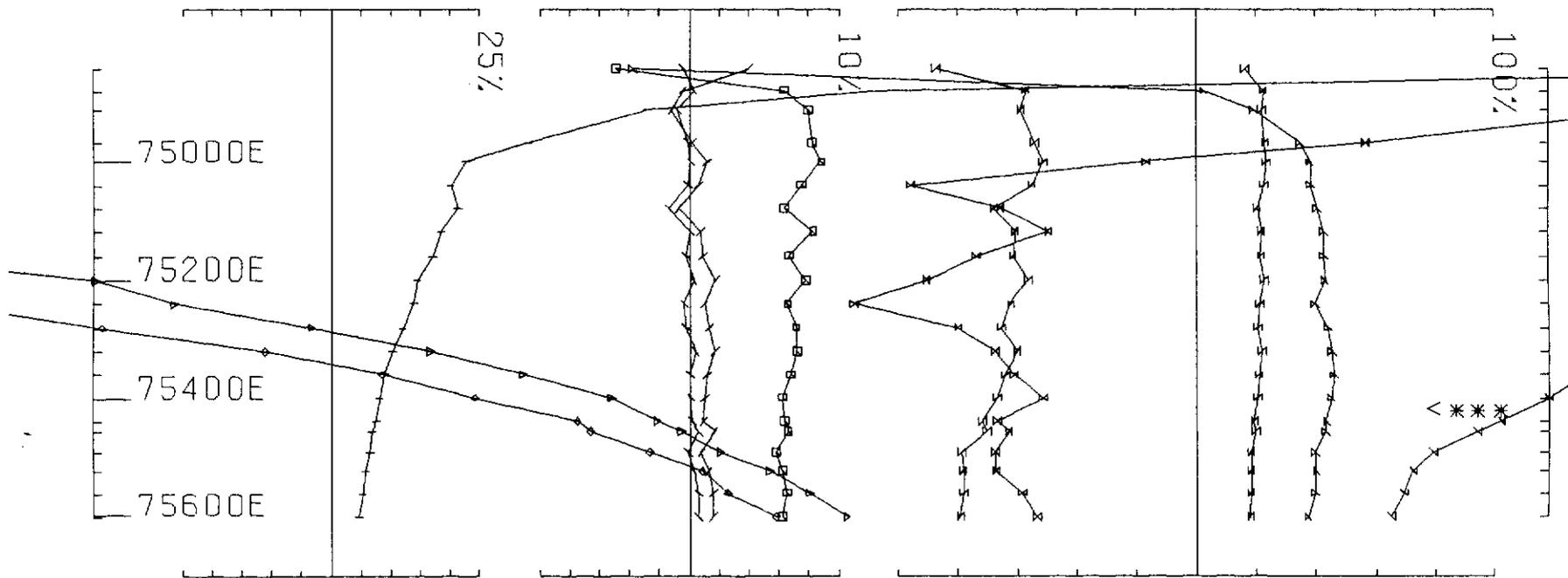
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066239



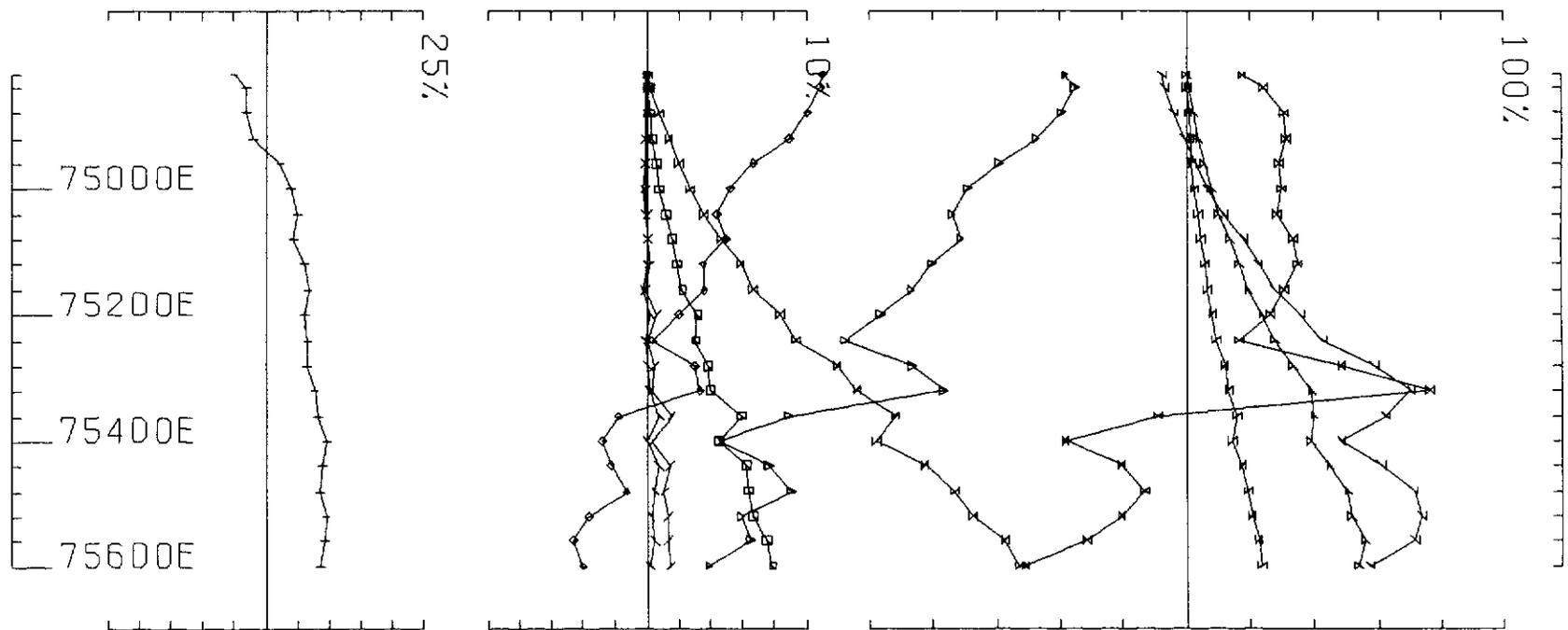
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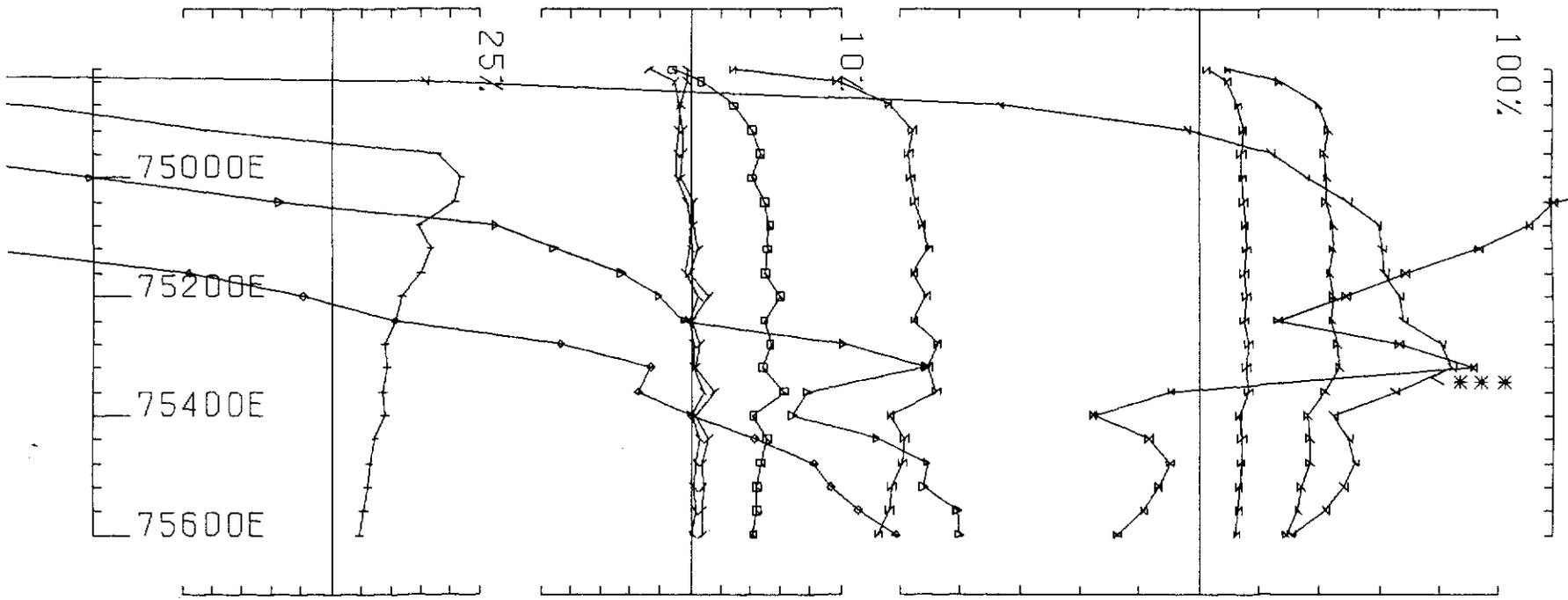
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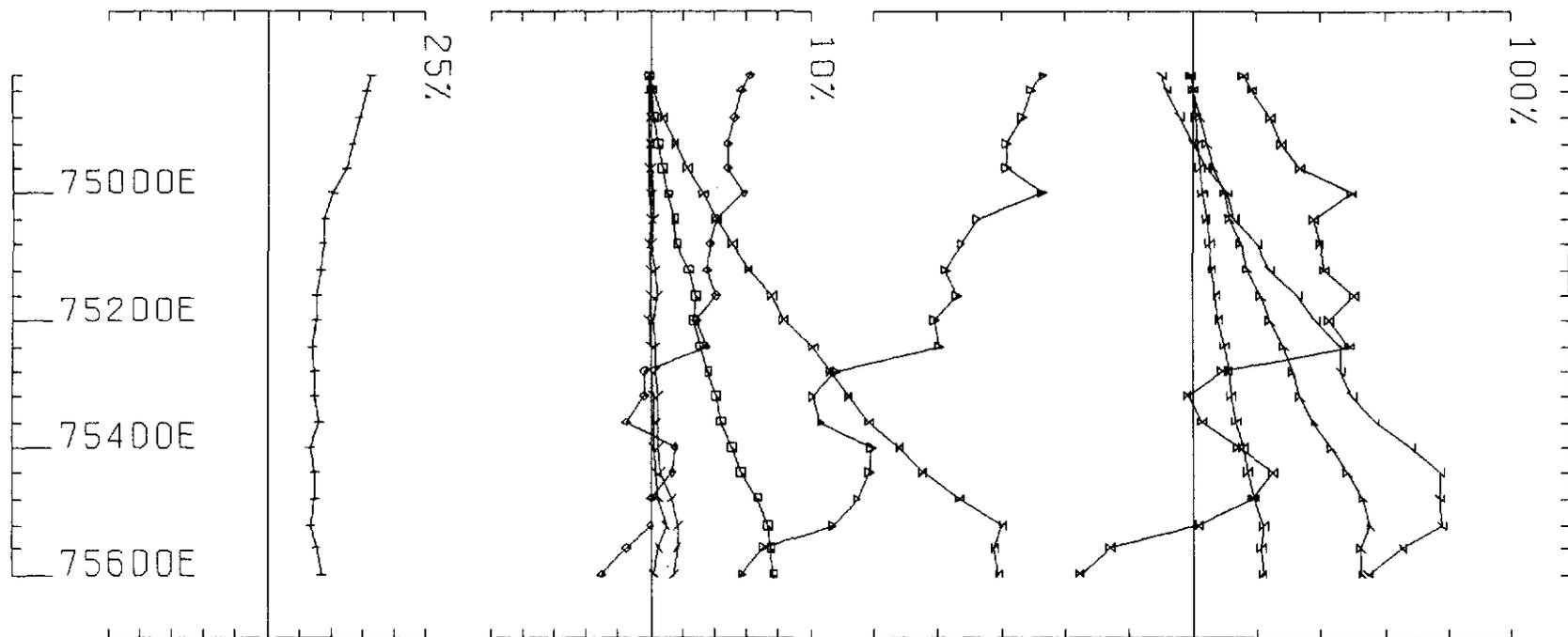
066242

fig.
e.25



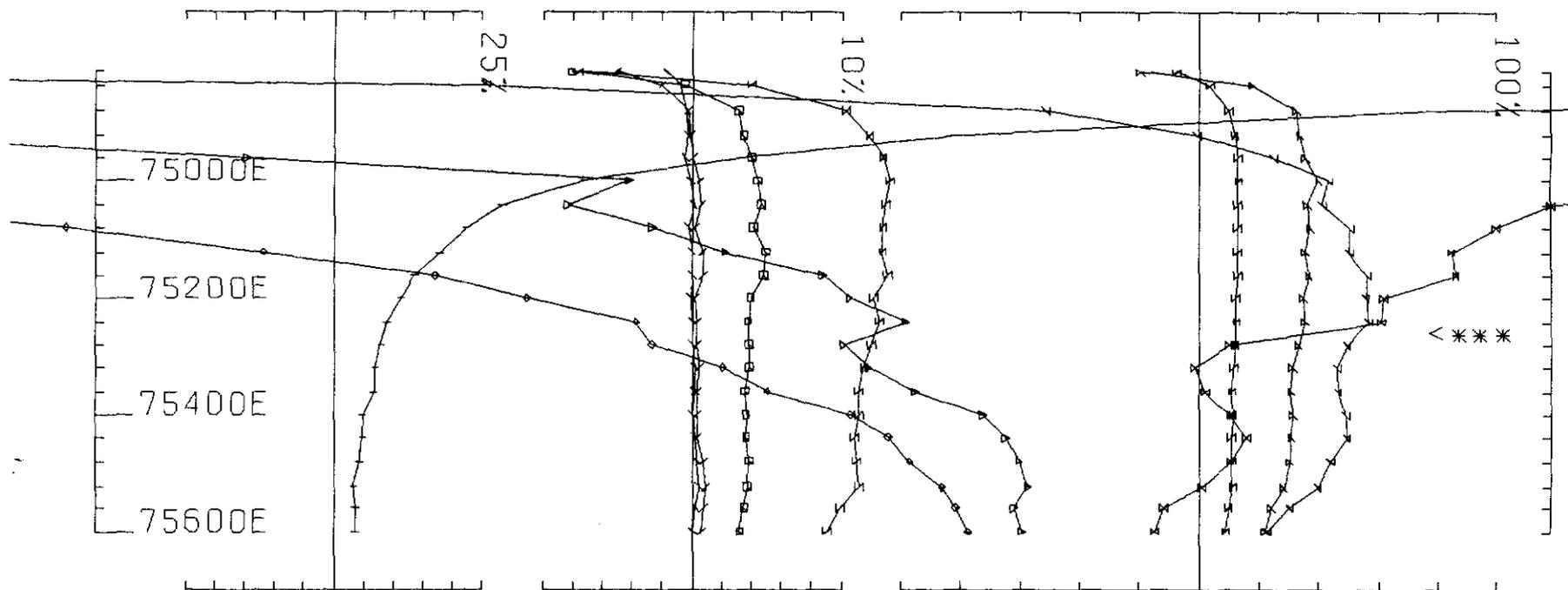
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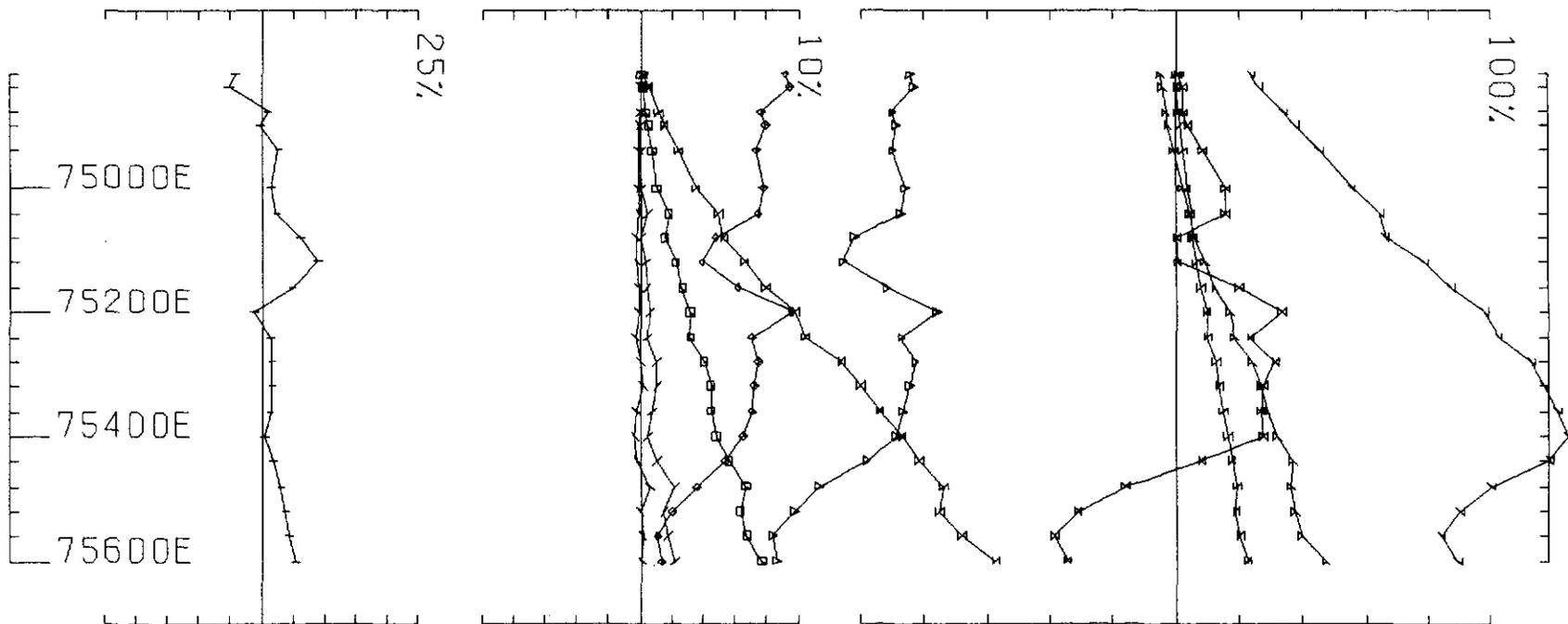
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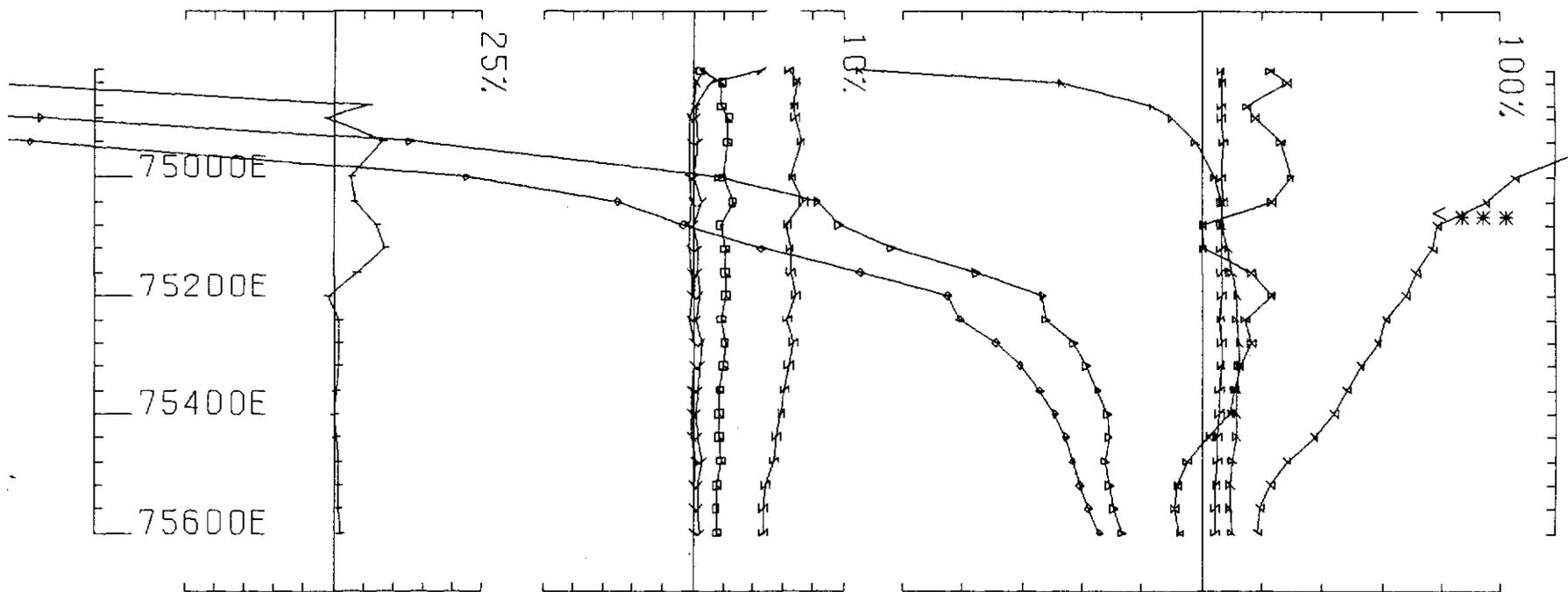
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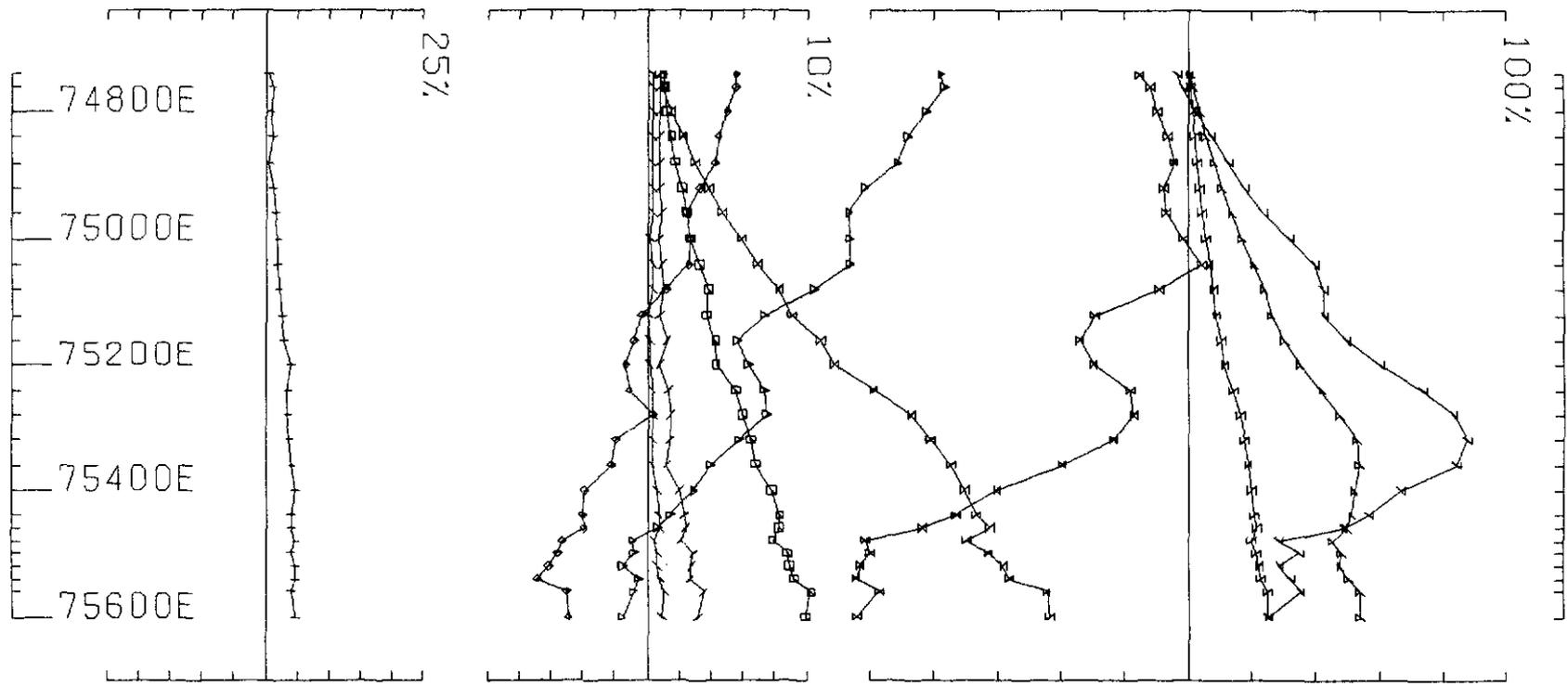
066246

52



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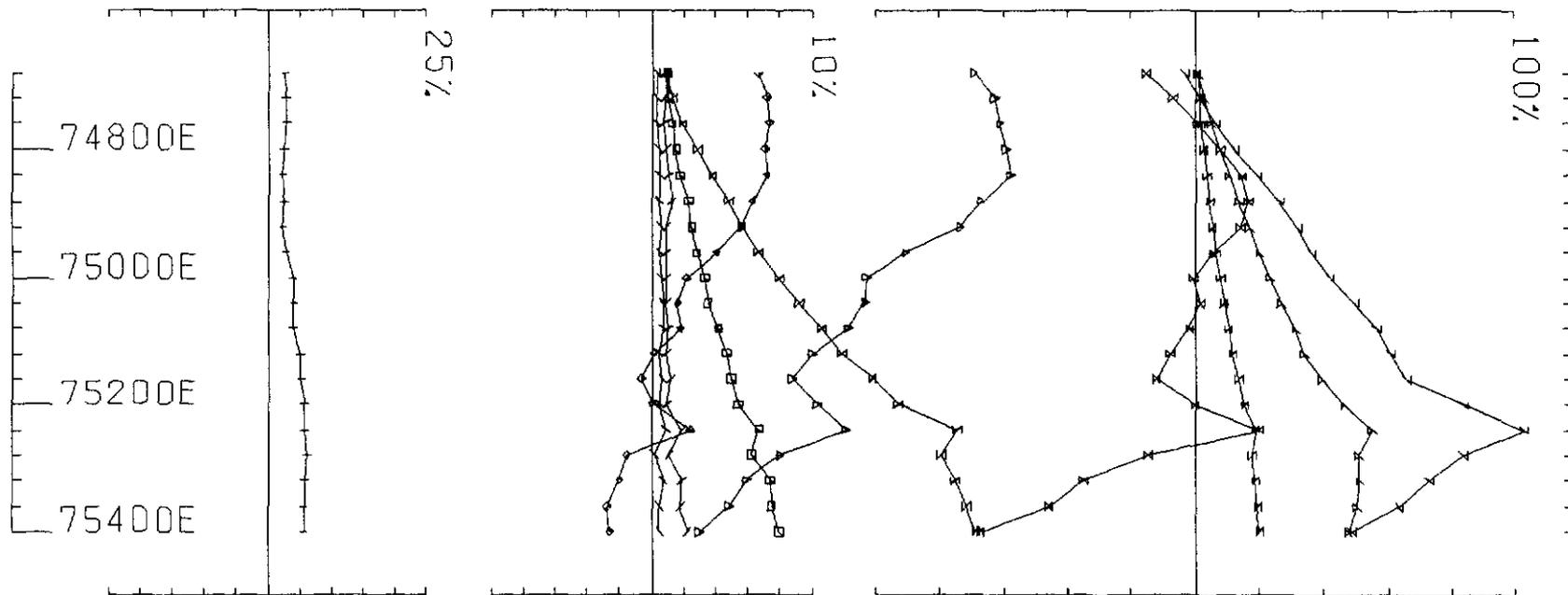
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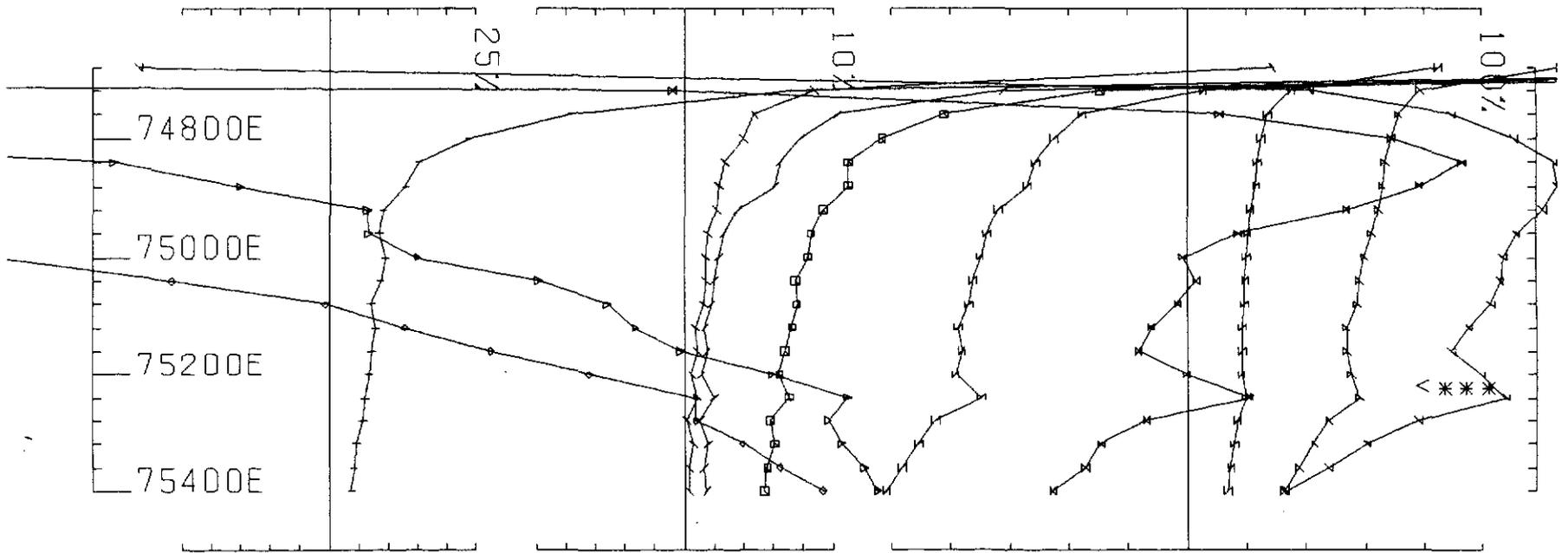
066248

fig.
e.31



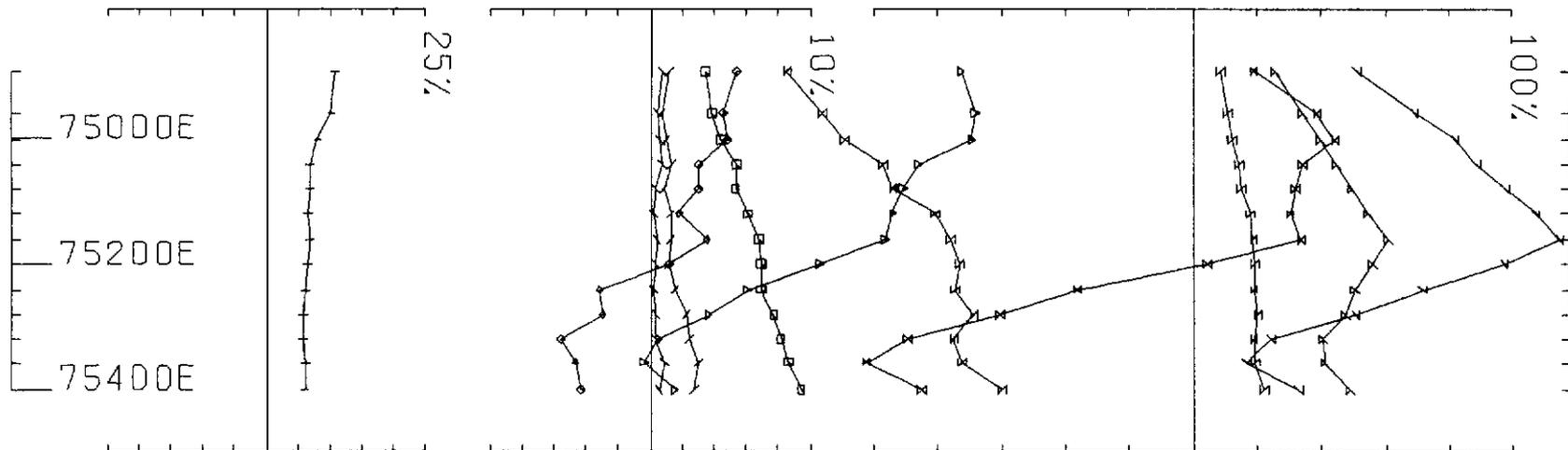
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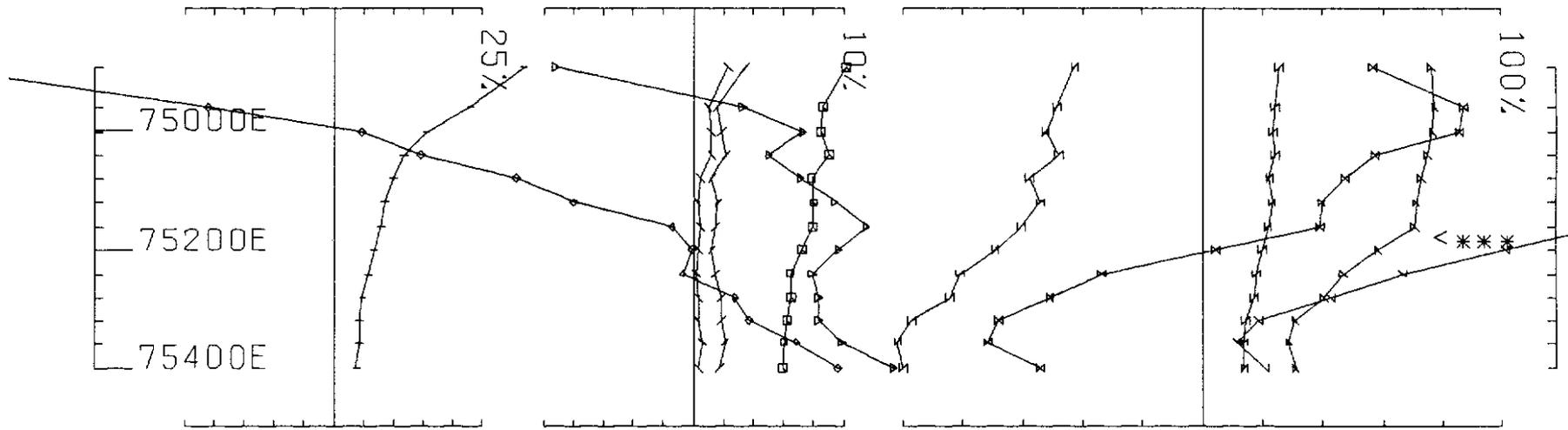
066251



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066252

fig.
e.35



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066253

APPENDIX D.
LEAMAN GEOPHYSICS SEPTEMBER 1991 (AEROMAGNETICS)
EL 11/85 Yolande River (Henty) Interpretation update
for Pasminco Exploration

LEAMAN GEOPHYSICS

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

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Fax: (002) 44 6674

EL 11/85: YOLANDE RIVER (HENTY)
INTERPRETATION UPDATE

for
PASMINCO EXPLORATION
by
Dr. D.E. Leaman

September 1991

HENTY

SUMMARY

Review of structures and relationships in the Henty River area of western Tasmania using the latest magnetic data and upgraded base mapping indicates that known sites of alteration, mineralisation or abnormal geochemistry are related to major sub N-S faults and E-W shears.

Detailed analysis indicates more faulting than previously thought or mapped with many structures sympathetic with the South Henty Fault especially. Many of the fault surfaces incorporate slices of ultramafics and these materials dominate the magnetic field. Few other lithologies generate significant responses. It is not easy in such an environment to resolve local alteration effects.

Resolution of ultramafic slices shows that the fault system is inter-related and tends to sole toward a few basic structures. Most faults now dip west and appear reverse but some were thrusts, normal or strike slip faults before deformation. The thrust set includes ultramafics and has a basic N-S trend. Ultramafic slices may have been ubiquitous prior to early Cambrian rifting and sedimentation and offer a means to conceive re-assemblies of the primary terrane. Two preliminary reconstructions of the Henty - Dundas area can be proposed pending refinement but each embodies classical rift and transfer faults oriented N-S or sub E-W with some lateral conjugates. The intersections of these ancient structures persist as nodes through time and deformation and continue to influence or distort subsequent structures which then offer a means to locate them.

Many movements have been transferred across old boundaries and younger displacements often swap from structure to structure. Since several structures can be tracked across the gorge it seems very unlikely that there has been any significant post Cambrian lateral motion in the area of the South Henty Fault - but considerable and repeated reverse motion and minor offsetting. Note that most of the recent motion on the fault system passes down the Henty Fault to the North Henty and Great Lyell intersections and then is dispersed, partly per the White Spur Creek Fault and then into the South Henty Fault and on to the Zeehan Highway and Ewart Creek Fault. This transfer is a selective rejuvenation and does not reflect primary status.

The concept of rift margins and their location now emphasized by a variety of features explains many of the enigmas relating to the distribution of mafic volcanics, mafic intrusives and the sharp changes to felsic volcanics and thick sedimentation. This work suggests that parts of the sedimentary sequences have been repeated by thrusting.

Mineralisation (known) is related to these active members and their superimposition with the primary rift nodes. On this basis the greatest exploration potential lies near the northing of Newton Creek or along extensions of the White Spur Creek Fault. It is possible to link the Tyndall Mine and Howards Anomaly to these elements and the main northern ENE corridor system. The large bend in the North Henty Fault falls within this corridor. The entire Newton Creek zone lies within the ancient rift axis with conjugate structuring.

The Henty River Adits zone lies on a lesser but comparable corridor and rift axis and its extensions are worthy of further inspection.

Although no complete review of local granitoids has been completed, and gravity data are limited, the northern half of the area has been intruded by granite at moderate to shallow depth.

INTRODUCTION

Recent acquisition of detailed aeromagnetic data and its complete correction and presentation as both precise drupe and fixed reference formats, coupled with detailed geological mapping and sampling - including primary collation of rock properties, has enabled further review of regional, structural and prospect concepts in the region west of the Great Lyell Fault near the valley of the Henty River in western Tasmania.

Previous work using poorer data, and in the absence of rigorous geological mapping and property constraints, had suggested that the area included an extensive fault set which was interlocked and transferred displacements from west to east in a series of north-south elements. It was suggested that mineralisation may be linked to these structures (e.g., Leaman, 1989).

Acquisition of more detailed magnetic data during 1990 suggested that the fault pattern was even more complex than presumed and that many elements of the fracture pattern included ultramafics (Leaman, 1990). Several of the structures inferred, and not previously recognised or mapped, have now been located and confirmed - as have several more occurrences of ultramafics (Pasminco mapping per R. Poltock).

This report considers the much improved data base (geology, magnetics and properties) and offers an evolutionary revision in the application of the data available. The review has tested current implications with the objective of leading to further, more specific, exploration focus in this complex and little understood region.

DATA

The available magnetic data were described by Leaman (1989, 1990). The detailed survey reported by Leaman (1990) has since been compensated for terrain clearance variations and presented as a true drupe at 120m clearance. This processing and correction has exposed some minor deficiencies in the data set in the immediate vicinity of the Henty River gorge and these account for some of the minor erratic character in previously presented contours. The problems are areally restricted and do not impose any critical limitation on the general use of the detailed data set although the correction has led to a number of minor revisions in the presentation.

The data has also been continued to a fixed level of 1300 m (in order to clear the higher acquisition levels across the West Coast Range). Data in this format provides a regional overview and relative scaling of source contrasts and types whereas the drupe presentation is of direct comparative and mapping value.

The geological basemap used for this review is that prepared for

for Pasminco Exploration in June 1991 by R. Poltock.

Residual gravity data as derived and presented by Leaman (1989) have been used. There has been no improvement in coverage within the Henty area since that time and the survey remains gappy and uneven with a relatively coarse station spacing of 1 to 2 km.

Mineralised and altered sites, identified in recent mapping, may be tabulated as follows.

- 375400/5351300: massive pyritic alteration
- 379000/5358500: carbonate alteration and pyrite veins near faults
- 380500/5358500: sericite/pyrite alteration
- 377000/5360500: sulphide clasts
- 378050/5360500: carbonate alteration
- 5360500: North Henty F, carbonate alteration
- 5360500: South Henty F, sericite/pyrite/carbonate alteration (also at Canal F)
- 376500/5353000: pervasive sericite/carbonate alteration at Henty River/S Henty F.
- .375700/5355000: carbonate/silica alteration (fault?)
- 379300/5357500: pyrite veins
- 379800/5360000: gold plus ?
- 379200/5356900: Cu, Pb, Zn soil anomalies (Zn 2%)

PREVIOUS WORK

The Henty River area has been subject to mineral exploration for an extended period. Prospecting and exploration of this structurally complex region has not led to any significant discoveries and most work, and drilling, has been restricted to the gorge of the Henty River - such as near the Henty River Adits, or some distance to the east toward the Great Lyell Fault.

Leaman (1989) was the first to use regional geophysical data in an attempt to outline primary structural elements and relationships and to provide some rational basis for concept development and exploration strategy. Some of the data used had only been acquired in the previous three years.

The brief for this primary work specified a structural interpretation, consideration of alteration responses within felsic and mafic rocks, and guidance for appraisal and improvement of geological base maps. Data used included the 1981 Mines Department magnetic survey and the 1986-7 Mt Read gravity survey.

Many geological maps have been produced over the years; the latest published being that of Corbett (1986) which formed the reference base for the regional work. The regional study suggested a small net of faults, with a complex association of primary thrust, normal and reverse motions, all linked across the area from north to south. Altered sites were also suggested; centred near 375500, 5351600; 379500, 5351800; 378100, 5353000; 379500, 5353100; 379100, 5354700,

with some sub E-W trends near 5349700, 5351300, 5353000 and 5356100 N.

Ultramafics were intimately involved in the family of faults known as the North Henty Fault and its associates and many other slices included uplifted Precambrian rocks in a series of reverse displacements. These lead to exposure of these rocks at Mt Dundas and many of the related faults incorporate ultramafics.

Blocks of mafic rocks were inferred to be present in each main fault block (as shown in Figure 3) east of the Ewart Creek Fault. This early work suggested that only some of the mafic rocks and the ultramafics possessed significant magnetic properties and that most, if not all, major faults dip west.

A regional structural assessment for Pasminco Mining of its lease areas south of Rosebery was undertaken in late 1989, early 1990, and this indicated a more substantial interrelationship between the Henty Faults and the Great Lyell Fault. The view I presented then, and have seen no reason to change since, was that of a much evolved flower structure. Shear motions are evident and common, but not on a large scale or on any single structure due to interlocking and stepped offsets. A multi-block rearrangement pattern and persistent long term activity is indicated.

A limited updating of this interpretation was provided by Leaman (1990) based on acquisition of new data (uncorrected at the time for clearance issues). This data suggested (Figure 4) that many faults were much more segmented and ragged than previously thought and that the blocks adjacent to the Henty River, and between the North and South Henty Faults, were much more disrupted. Alteration near Newton Creek was associated with linears or fault extensions affecting andesites.

Both interpretations exposed an ignorance of the character of the materials and it was thought that some of the exposed sedimentary and volcanic rocks toward the intersection of the major faults near 379000 E may have been quite magnetic due to presence of magnetite. This possibility left considerable ambiguity in the interpretations since it had been assumed that most of the anomalies were related to mafic rocks.

A mapping and sampling programme was undertaken to reduce or resolve these problems and to test if other fault locations could be found. Work completed by R. Poltock for Pasminco Exploration, and used as the basis for the present study, has already confirmed the existence of several of the faults inferred in the zone between the Henty Faults; for example from 377700/5358300 to 378100/5355300, from 378500/5360000 to 379200/5358000, cross fault wedges at 376500/5353000 and 375500/5351500, transfer of the South Henty Fault to the west at 5350300 and to the north from 375200/5350300 to 374200/5355400.

The anomalous area identified near 375500/5351500 was confirmed and found to contain alteration and massive pyrite at least.

INTERPRETATION AND DISCUSSION

General

The following interpretation provides a further stage in an evolving understanding and appraisal of this region. It is particularly focussed on the region west of the South Henty Fault and reviews all available data. The review is dependent upon the upgraded geological and property data provided by recent mapping.

A series of sketch or conceptual sections were also provided on the basis of the mapping and each has been evolved in light of the geophysical data sets. Relatively few dips or structural relationships can be observed and resolution or confirmation of such issues forms a large part of the interpretation. Structurally anomalous volumes, or the sites of previously known or recently discovered alteration or mineralisation, have also been appraised.

Rock Properties

General estimates of rock properties have been derived from the property data base developed by Pasminco Exploration augmented by some local determinations. Most local determinations are based on outcrops and do not necessarily reflect true contrasts. Most have been considered minima unless it is apparent that weathering or alteration has increased (especially) magnetisation.

Most rocks are virtually non magnetic. For example, all determinations of felsic volcanics, andesites, intermediate intrusives, gabbros, tonalites and sediments yielded susceptibilities of 0.0001 cgs or less. Most sediments possessed inductive contrasts of about one fifth or one tenth this value. Some altered sedimentary rocks had slightly higher contrasts. Many basalts also possessed very low susceptibilities (<0.0001 cgs) but these may disguise abnormal remanent magnetisations.

Other basalts possessed susceptibilities as high as 0.003 cgs although these values tend to be restricted to the area west of 375 000 mE. Ultramafic rocks presented variable and locally extreme properties. It is clear from the measurements, although not balanced samples of all units, that only parts of the basaltic sequence and the ultramafics are responsible for most of the character in the magnetic field.

Density determinations have been generally restricted to outcrop specimens and few values are clearly representative of relatively unweathered rock. Occasional samples suggest that the normal bulk density of the felsic volcanics, andesites, basalts, tonalite and sediments is in excess of 2.65, 2.78, 2.85, 2.80 and 2.68-2.79 t/cu m respectively.

The regional data base suggests that values of 2.73-2.77 is normal for felsic volcanics and sedimentary units encompass a similar range.

Granite

Previous studies have not considered the impact or relevance of Devonian granitoids in relation to structure, mineralisation or alteration.

Figure 1 presents the current interpretation of the form of the Granite Tor - Pine Hill Granite in the Henty River area. This model represents a 3D evolution from the basic forms of Leaman & Richardson (1989) and that derived for the Hercules area in the early 1990 mine lease study. Contours are in metres below sea level to the inferred roof of the granite. These suggest that the Henty Gold Prospect (RGC) is within about 1500 m of granite and that the shape of the granite - or the fault zone - is influenced by the other structure. Mineralisation of some sort in the fault zone is hardly surprising.

The current model has not been subject to rigorous development south of White Spur Creek and has also not yet benefited from recent data acquisitions north of 5363 000 mN. It is possible that the southern face of the granite may be up to two or three kilometres further south within the Henty River area or that the spine beneath White Spur twists toward Newton Creek. Raw gravity data suggest that both possibilities are real. Some additional gravity coverage is required before the form of this part of the intrusion can be resolved.

It may be noted, however, that mineralisation near Howards Anomaly, Tyndal Mine, Lake Newton and along the Henty River at 5359 500 mN may well be granite-related. Possible mineralisation further south at Henty Adits or near 375 500/5351 500 is probably unrelated although some migration may have occurred along some of the faults.

The recognition that granite may influence about half of the Henty study area, and might well have introduced gold as well as base metals, demands that all faults be located and classified in terms of likely history and type.

Structure and faulting

1. Regional implications

The magnetic field, as seen at 1300 m ASL, stresses the exceptional nature of the responses between the North and South Henty Faults while showing that these are not unique. A very similar response is evident north and west of Mt Dundas where maximum response is related to large exposures of ultramafic materials. The Dundas anomaly, however, shelves eastward and underlies, with two clear discontinuities, the exposed Precambrian rocks. Unambiguous gradients define the minimum (or shallow) extent of the concealed ultramafics. Both exposed and concealed effects are terminated to the south by a structure, or structures, bearing about 80 degrees - and which would on extrapolation pass close to the Henty Gold Prospect. Truncations on this alignment also occur along Jones Creek.

Although the Dundas features are outside EL 11/85 the clear associations are relevant to the Henty blocks.

Drape data show that the major anomalies near 376000/5356000, for example, are directly associated with ultramafics. Rock property evidence is sufficient to show that no other rocks are particularly magnetic in any event. When the surface or low level magnetic field is removed it becomes clear that the anomalous area is far larger than that limited by the Henty Faults and that it extends northward toward White Spur until truncated - or offset - at about 5362 500 mN by the same structure which limits the Dundas distribution.

When the extended pattern is viewed it is found that there is a general north-south elongation in both anomalous regions - that SW of 374 000 mE and that NE of 376 000 mE. Both zones are evident in Figure 5. When seen in this way it is possible to suggest two things; firstly that the faulting near 375 000 mE extends to both north and south of the area, and secondly that it might represent a major sinistral shear.

The magnitude of the feature and the continuity of the gradients associated with it are beyond question. They can be traced into the Fahl zone on the western side of Colebrook Hill in the north and Lynchford in the south. This broad sweep appears to ignore much surface geology until close inspection of regional trends and structure offsets confirms its impression upon more recent events.

I have argued for it as a shear solely on the association of probable fault blocks including substantial slabs of ultramafics. If the north Dundas ultramafics, and their concealed counterparts beneath the Precambrian block, are taken as one piece and the zone between the two Henty Faults, and their concealed northern extension are taken as a second piece then the third piece lies adjacent to the Ewart Creek Fault. The gape between the Dundas piece and the Henty piece to north and east and the Ewart piece to the south is the precise size needed to restore the Ewart piece and form a single piece (Figure 6).

When this is done then the southern termination of the Ewart piece is seen as a continuation of the southern termination of the Henty piece at about 5354 500 mN. This is a particularly interesting northing since the Henty River Adit mineralisation lies very close to it. As further circumstantial evidence for a major sub E-W old structure at about this northing note that kinks in the faults at both 375 000 and 376 000 nominal mE occur on its projection.

I therefore propose three major primary structures in the western part of the region; one N-S and two sub E-W. The N-S offset is about 6 km and the northern cross feature may have a sinistral offset of about 2 km.

(It is possible to re-assemble these pieces differently using the entire view of the volcanic belt, in which case the reference northing of 5354 500 mN must be applied to the Ewart piece. The restoration still requires 6 km of N-S displacement but BOTH Henty and Ewart pieces must be moved northward. They then adjoin both the Colebrook Hill and Dundas pieces. This mechanism provides an explanation for the magnetic field all the way to Rosebery and account for the elevated field and implied ultramafic slices noted in the regional lease study and the lease initial interpretation following the 1990 magnetic surveys).

Whatever solution is proposed, and there is clearly scope for much

more study, the concept requires major extensions PRIOR to deposition of the volcanic piles and sedimentary units. The displacements must involve all older rocks including the ultramafics and probably the Success Creek and Crimson Creek correlates or equivalents. It might be expected that the volcanic piles would occupy the dilatation elements and be peripheral to the blocks incorporating ultramafics. Even on this preliminary suggestion of this argument this seems supportable, e.g., Mt Black and Mt Block - and the Henty piece. The extensional prisms would be largely N-S but with a significant E-W component.

I also note that the form of the Pine Hill Granite also reflects these primary trends and their location - notably the N-S element.

The Great Lyell Fault system to the east might be expected to reflect these patterns if it is part of the same fault set or the same age at onset. In regional context in terms of magnetic gradients this structure is also predominantly N-S, as between 5352 500 and 5358 500 N, north of 5361 000, and south of 5352 000 mN. It is offset between these elements and can be restored as a single feature with one northern NW dextral offset of 3.5 km and one E-W dextral offset of 1 km. The oblique offset occurs in the vicinity of the Tyndall Mine, the Newton Creek Dam and Howards Anomaly. Another coincidence? Hardly, if the restored position runs close to the eastern side of the andesites carrying the local mineralisation. I believe the Canal Fault to be an incarnation of the Great Lyell Fault on this basis. It is difficult to be sure of age relationships at this stage. The inferred dextral complements for the sinistral structures to the west do indicate a coherent and linked fault system. The persistent N-S grain of these large structures also suggests synergy.

It should also be noted that if the Great Lyell Fault is restored as suggested above then the southern E-W offset is re-located at about 5355 000 mN in terms of the Henty Block!

These preliminary regional concepts clearly need further examination in order to anticipate the current, or true, location of both original rifts and the critical transverse structures since all may have been juggled by subsequent motions or intrusions.

The relevance of this comment may be illustrated by consideration of the gabbro-tonalite intruded block between the Henty Faults and the N-S faults at 375 and 376 000 mE (nominally). I suspect that this zone has been extended and filled by intrusives. Dextral restoration of the scale implied by the regional magnetic data would place the sub E-W faulting and its associated ultramafics (now at about 5351 700 mN) at about 5354 500 mN at very least. My preferred position presuming that the entire motion could be absorbed on these faults would restore it as an extension of the North Henty Fault - a N-S offset of 4 km directly plus an additional 1.5 km for full continuity at 5357 400 mN. This is very close to the magnitude inferred for the Dundas-Ewart piece separation and the restored position can be placed on a sub E-W structure.

The intersection of such a position for the proto North Henty structure and the Great Lyell Fault lies a little south of the Newton Creek Dam about midway between the Tyndall Mine and Howards Anomaly. Such crude estimates of location need refinement but this would be an important node.

The gross structural concept inferred by inspection of regional magnetic data is not easily supported by gravity data due to deficiencies in coverage but it is not contradicted (below).

The implications are far-reaching.

The concept implies a nest of large primary shears active after major tectonism which terminated Lower Cambrian deposition and overthrust both ultramafics and Precambrian basement leading to generation of tensional rifts and further volcanism and sedimentation. The distribution of the disrupted older units and structures controlled new deposition with minor apparent onlap. Thus quite different sequences can abut, as now happens along the Henty gorge, since this represents reverse re-activation of a primary rift edge. Most Devonian motion has been concentrated along this zone with offsetting transfers using older trends, as at 5350 500 mN and 379 000 mE.

A regional view, using gravity data, is given in Figure 7. This was derived to test some of the conceptual issues and indicates the sympathetic and reverse nature of the large faults. It also illustrates the discrete and distinct compositional contents of each block. This sketch interpretation is consistent with those provided by Leaman (1986a, b) but stresses the different character of the blocks regardless of model base levels or basement inclusion. It might also be possible to distribute some mafic section (basalts mainly) into blocks east of the Henty Fault near basement level but these must be thinned eastward if present. Most thinning must occur across the Henty Fault in such a proposition and this concept is then very similar to the ideas discussed from a magnetics viewpoint. Much more work is possible and will be required before any further detail can be provided.

2. Specific Analysis

A number of gravity and magnetic profiles have been examined using 2D methods. While these have some limitations these are rarely serious for initial analysis or relatively shallow feature study - especially if locked into an array or consistent assumptions.

The conceptual basis from which all sections have been reviewed, or have evolved, may be found in the June 1991 compilations of mapping by R. Poltock for Pasminco Exploration who also provided original sketch sections (Figure 8).

No serious limitations are introduced by the magnetic data or coverage but the gravity coverage is gappy and the limited number of stations available may be affected by unrecognised errors or surface materials. This imposes limitations on the present interpretation since no detailed independent testing is feasible for this complex area. In order to minimise this deficiency some lines were reviewed extensively in order to appraise options or alternatives.

Both data sets may carry a regional component but this is ill defined. By using crustally adjusted residual Bouguer data most of these effects have been compensated. Any remainder will be relevant to the particular area and must be evaluated in-situ. Granite below the northern part of the area, and occurring at shallower depths north of it, is clearly significant. Since the granite form in this region has not yet been modelled reliably no gravity models were attempted north of 5358000 mN since these would be biased. Any regional effect in the magnetics has been treated as part of local sources since the largest anomalies in the region are within the EL.

Line 5351 300 mN. (Figures 9, 10, 11)

An extensive treatment of this line is provided in order to demonstrate the range of issues implicit in any interpretation in this area.

The section samples the structures of the southern part of the area including the mafic volcanic sequences between the Ewart Creek Fault and the N-S faulting at 375 000 mE, the felsic sequence east of the South Henty Fault and the triangular wedge of sediments and mafics between the latter faults. Little is known of the dips of the units but the western mafic sequence is thought to be isoclinally folded (vertical) while the units east of the South Henty Fault dip steeply east.

Four fairly distinctive magnetic solutions are offered in the figures. There are two initial problems. What was the zero level of the observed field and what depth range should be modelled?

Figure 9 exemplifies some of these issues.

Figure 9A presents a solution with a modelled depth range of 2000 m (relative to the corrected height employed of 900 m ASL). This yields a solution in accord with the limited geological control in all respects and satisfies the observed field form with a base level shift of about 60 nT. (This value happens to be about right on the basis of now extensive modelling of this data set. The value represents the undeclared but actual base reference used for the survey when compared to the IGRF used to produce the residual field. Since contractors almost never report this it can be inferred from extensive modelling of an array of profiles and as shown below it is vital that it be known) Solution A could be accepted and it could be argued that the depth range used is adequate for exploration purposes.

Unfortunately, with the exception of the westernmost basaltic sequence, and perhaps parts of the gabbros near 374 E, the contrasts employed cannot be sustained by observations. This means that either depth range is relevant, the curve fit base shift is in error, there are regional effects not included or there are some other concealed and comparable magnetic sources present.

Figure 9B considers an alternate solution using the same structural forms but restricted to a literal reading of property determinations. This yields a believable geological form which could be viewed as onlapping or reversed structuring. Note that the fine details of the

sequences or structures are not relevant due to the very low magnetisations of the units present and cannot be resolved. Only primary structures can be defined in this area with this data set. This section establishes this factor.

Unfortunately section 9B yields a base level shift of only 30 nT. This is neither consistent with 9A (not surprising in view of the changes in assumptions) nor with other lines in the survey set which have been anchored on Precambrian basement and its magnetic signature reference. This means either that the observed properties are not representative and too low, that the depth range - though much increased - is incorrect, or that some other influences are at work. It could also mean that all other sections and models are incorrect. This conclusion is inescapable if this solution is found valid.

These are weight issues and the reliability of an entire interpretation depends upon their resolution. But in the Henty area there is no deep drilling or viable and demonstrable geological concepts to guide the solution path.

Figure 10 offers an alternative solution. This also uses property contrasts within or very close to the measured ranges. It achieves a base shift of about 53 to 55 nT (comfortably close to the inferred level of 50 - 60 nT) by repeating some of the mafic section at depth. This is consistent with the reverse nature of the present fault but could be conceived as part of an evolution when the fault system may well have been normal. It is possible to show that the gravity data are consistent with such a solution but the profile is based on only four stations and the lack of resolution is evident. Gravity data would be able to settle these issues but the coverage is inadequate in this entire EL.

Figure 10, however, does provide a coherent geological alternative which is compatible with regional base level implications and observed rock properties. It could be argued that this is a valid and probably correct solution style.

The solution of Figure 9, and to a large extent that of Figure 10, ignores the presence of ultramafics in the area and the undisputed observation that the largest anomalies are directly associated with such materials. Figure 10 is not a viable solution without the inclusion of a thin slice of such material within the South Henty Fault. Not even the other mafic materials, however they are distributed, can account for the field form overall.

It is clear then that most of the rocks of the area are magnetically irrelevant and that the solutions of Figures 9 and 10 cannot be correct even though they may satisfy the base level requirements.

Figure 11 presents an alternative in which measured property ranges and surface implications are fully honoured but in which ultramafics are treated as the primary source for the magnetic field. The curve fit yields the required base level of about -60 nT but does not appear to be a perfect fit. This reflects the high contrast and subtle 3D effects of such sources which occur as thin crudely tabular forms. Very small differences have large effects. It is clear that

such a solution style can satisfy the magnetic field. But is it correct? This question is reviewed below since a final decision on solution style can only be taken after review of several sections in the same area.

It will be noted, however, that whatever the complete geological solution to the structure posed in the area and analysed magnetically that the upper kilometre or so of the geology is not assessed variably. All solutions concur about the shallow projections of the units and suggest that the surface inferences concerning dip are reasonably valid.

All options also indicate that the fault or faults dip steeply, but perhaps variably, to the west. These conclusions, at least, are not ambiguous.

Line 375 400 mE (Figure 12)

This profile and section reviews the implications of previous line in the region of the trapped fault wedge block at the intersection of the two profiles.

Geological control is very limited. Dips south of the South Henty Fault are to the SE while those to the north of the fault wedge are to the north. The anomalies at this easting are clearly affected by lateral effects.

Modelling does show that the base levels required can be found using observed property ranges only if slices of ultramafics are included in the positions of the established faults. These are certainly known to occur at the margin of, and within, the mafic gabbroic mass to the north of the fault wedge. The model suggests that such a slice also occurs in the South Henty Fault at this easting. Review of the map of total field in the area would support this view.

This cross line indicates that the ultramafic solution is the correct one; no others being viable, and that the fault wedge is of limited extent.

Line 5353 000 mN (Figure 12)

This profile samples the two mafic sequences west of the main ultramafic belt at 376 000 mE, including the junction between the basaltic sequence to 375 E and the gabbro-tonalite complex between the N-S structures, a portion of the sedimentary wedge caught between arms of the South Henty Fault and then the felsic/sedimentary succession to the east.

Figure 12 shows the solution when properties are honoured and ultramafics are inserted in the N-S faulting near the South Henty Fault. Dips are consistent with limited observations on both sides of the fault system and the base level is well judged. This is a valid solution which satisfies all known fact AND is consistent with the preferred solutions for previous lines discussed. The only discrepancy in the model presented occurs near the eastern element of the South Henty Fault and the deficiency in the model can be remedied if an additional slice of ultramafics is inserted in this fault surface - as was done in Figure 11. Note also that a small step in the magnetic field has been observed in connection with the western arm of the fault and this implies either some mafic material in this

structure or that the felsic volcanics are slightly more magnetic than the sedimentary rocks. This could not be predicted from the available property determinations since the bulk of these suggest that the materials are either comparable magnetically or that the sedimentary units are more magnetic by up to a factor of two or three (0.25 vs 0.12 x 0.0001 cgs) for all units except some parts of Esms (as mapped). On this basis I infer that mafic units are present in the structure.

Line 5358 500 mN, Figure 13

This is a critical profile since it provides a complete test of hypotheses in terms of exposed materials.

Some structural and dip control is available at either end of the section.

Felsic or sedimentary sequences are exposed for most of the section and the observed background properties, and lack of correlation between the magnetic field and any mapped unit confirms, that these contribute little or nothing to the resultant field. The thickness of such materials cannot be resolved.

The large anomaly observed can only be explained by mafic materials and ultramafics have been mapped along the North Henty Fault and, following an inference of their presence in previous work, along the fault now known as the White Spur Creek Fault (at about 379E). Two west dipping slices of such material can very largely explain the observed magnetic field but the shoulders on the anomaly near the Henty River show that there are other slices. Introduction of such material into the South Henty Fault zone adequately explains the lateral parts of the anomaly but an additional structure is implied near 378 500 mE within the sedimentary sequence. I suspect that the unit mapped as Eswqm is duplicated by this structure.

If the main anomaly is satisfied at the required base level reference then it is found that the field at the ends of the profile implies more magnetic sources.

Figure 13B suggests how these might be arranged consistent with the mapped dips. The implication of slices of ultramafics west of the North Henty Fault is concordant with inspection of the regional field between this zone and Mt Dundas. See previous part of this report.

Modelling of this line confirms most of the implications of other sections. Ultramafics are the dominant element and all other materials are of little consequence. There are a few minor exceptions such as parts of the basaltic sequences and perhaps occasional andesites. But this section links an integrated anomaly to established pieces of ultramafic and also shows that several such pieces are present. These slices of magnetic material can be used to define the structure and pick out other major breaks in section. All structure dip west but units within individual blocks may have variable dips.

Line 5355 000 mN (Figure 14)

This section examines the heart of the structure and suggests the interrelationships of the many faults and slices of ultramafics.

The principal anomaly is located on the N-S arm of the North Henty Fault and certainly associated with exposed ultramafics even though outcrops are limited and the zone appears narrow.

The gabroic rocks west of the fault near 376E are clearly seen to be relatively non magnetic and also, by comparison with the eastern end of the profile, to be little more magnetic than the felsic and sedimentary units. These distinctions have been confirmed by the property measurements and clearly illustrate the relative significance of the rock types magnetically. The volume of material is immaterial; it is the extreme ultramafic contrast which controls the magnetic field.

The section is particularly interesting because of the shape of the anomaly. It peaks near outcrop along the western fault arm but the effect is sustained eastward for over two kilometres and, of course, is unrelated to the sedimentary rocks and intrusives which occupy the zone between the Henty Faults. This resultant shape, resembling a saw tooth, can only be produced by the subtle interaction of several high contrast sources and these are suggested. One may be placed, with little debate, along the South Henty Fault as implied in several other sections. The others, however, add a crucial dimension to the structure.

Two substantial magnetic sources are required in the region which includes some massive andesites. Massive units, even if they possessed modest contrasts, could not produce the smooth integration observed and further slices of the form demonstrated in Figure 13 are indicated. This would suggest some repetition of sequence near the Henty River Adits and the mineralisation may well be related to these structures.

Other ultramafics have been inferred east of the South Henty Fault and two further structures are implied. The structure projecting to 378 600 mE could be an extension of the fault implied at a similar easting at 5358 500 mN. This would be consistent with the general N-S grain evolving from the pattern of faults and ultramafics. The mafic slice at the eastern end of the section is within the Great Lyell Fault Zone (or perhaps the Canal Fault extended). The modest change in contrast indicated in surface rocks is here associated with andesites south of Howards Anomaly. The intrusion of this suite may also have been controlled by an extension of the White Spur Creek Fault since they occupy its projected position.

Line 5360 500 mN, Figure 14

Modelling at this northing is more uncertain due to gross 3D effects and the increased depth of primary sources. The relative termination, as described regionally, also affects interpretation.

Using the indicated contrasts and base references the body of the profile can still be accounted using simple ultramafic slices. The solution offered does not explain the eastern end differential but this is consistent with more of this material in the nearby Canal and Great Lyell Faults.

The modelling indicates that few materials generate the sizeable anomalies observed. The ultramafics which can be directly associated with most large effects and consistently inferred in company with all

others can be used to pick out a complete fault set. Many of positions chosen for these elements within the models have been selected using the field notes for location of certain types of alteration, notably carbonate, and these sites have proved proper in terms of satisfying the magnetic field.

The fault set, which includes slices of mafic material, is an integrated system which now appears to sole into one or two major structures with a predominantly N-S orientation. Mafic slices have only been observed or inferred on structures which trend approximately N-S or NE-SW and this suggests a ruling compressional event early in the structural development of the area oriented about NNW-SSE.

(I note here that some westerly sense is required to emplace the overthrust Precambrian at Cape Sorell and Zeehan and similarly involve ultramafics all the way to Colebrook Hill or Dundas).

It is clear that magnetic data can yield information on at least one fault set - mainly N-S (e.g. Figure 15). It is clear, however, that other structures are present and that these generally lack mafic content of this type. I take them to be impressed structures, fundamentally more important, and which control elements of all developments.

Thus the various pieces of the Henty Fault system all tend asymptotically to sub E-W orientations (approx 80 degrees). This orientation marks the position of the controlling element. The issue now is to what extent has dilation and shear shifted such elements in higher levels in the crust from their home positions, and is it important. If the mineralisation sought is, say, Cambrian then the nodal relationship applying at that time is relevant, not what we may see now. Anticipation of these sites requires major structural reconstruction.

3. Alteration

The discussion given above suggested that much of the alteration observed is fault-related; faults which commonly involve mafic rocks. Since the magnetic field in this area is largely blinded by the impact of high contrast sources it is not yet possible to use it to reliably define subtle alteration signatures in other, virtually non magnetic materials. This might prove possible with more control or with confirmed definition of some of the fault dips and relationships. It should, however, be assumed that many specific effects will never be resolved.

4. Mineralisation

Mineralised locations were tabulated under "Data". These sites represent geochemical anomalies, sulphide enrichments or alterations, or trace (at least) amounts of base metals or gold.

Some attempt may now be made to relate these occurrences with the structural inferences described above.

In the Newton Creek zone (refer Figure 16).

This may be termed the eastern rift zone near the intersection of primary structures (Figure 6). And it is mineralised.

Unfortunately this area is at the edge of detailed magnetic coverage and at the edge of the EL but there is ample evidence that the local intermediate intrusives are more magnetic than andesitic lavas nearby or other units. The boundaries suggest several offsets and these have been mapped.

The Canal Fault does not appear to extend as suggested in Figure 8 and a revised view is offered which remains consistent with the control information near 5360 000 mN. The offset pattern is consistent with full restoration of the proto-Lyell Fault.

Suggestions of gold mineralisation in this area occur on the western gradient of the structure and may be associated with sympathetic splays of the Henty Fault. Note that granite is beneath this area although the actual depth has not been subject to detailed interpretation as yet.

Most other mineralisation seems to be linked to the White Spur Creek Fault. Figure 6 suggests that this feature is not a random fracture but a full primary conjugate. The offsetting of the Great Lyell Fault nearby is sub parallel. The pyritic site near the big bend may be related to a transverse fracture and the course of the river suggests this (ENE). The magnetic data is unclear due to the ultramafics and terrain nearby.

Other sites involving base metals occur near intersections. It may be noted that the Tyndall and Howards locations appear to be comparable and all of these sites are important in terms of first order structure (see Figure 6). It is hoped that identification of this association and some refinement of its position will aid or concentrate exploration in the Newton Creek area.

The importance of the corridor near 5358 500 mN is stressed by the effects on all major structures (as bends or disruptions if not mineralisation as east of the White Spur Creek Fault). I consider the greatest potential to lie in this corridor, especially near the South Henty Fault - as a rift precursor, and the offset intrusives indicate continuing activity through the volcanic period. Leaman (1990) also showed that the gravity data, limited though they are, suggests a major change at about 5357 500 + mN. This is sub E-W(!) and ignores the ruling grain totally.

Granite is involved in this region and its southern limit may be influenced by such structures; certainly all the chemically anomalous sites are in its roof.

In the South Henty Zone (Figure 17).

Three major truncations have been identified (near 5356000, 5353600 and 5350500 mN) which are reflected as distortions in many structures. The first of these affects the extension of the North Henty Fault while the second may be associated with mineralisation near Henty River Adits.

South of the South Henty Fault a number of sympathetic faults have been identified and these are subparallel and may well account for the disturbance, alteration and shattering leading to gorge development. None carry ultramafics east of the main fault - which is presumably the main rift margin (Figure 6). However the ancient

blocks of this area are assembled the central zone is important since it represents part of the transfer fault system rifts.

Many trends are extended about the small block at 375400/5351300 and ultramafics are present at either end and to the north. If my reconstruction is valid, in either form, then the mafic block to the north represents an extensional fill of intrusives or deep seated phases and therefore unlikely to be prospective. The interesting rocks have been removed and a part of them may be exposed in the block west of 374 000 mE. Although the gabbroic fill may be barren in terms of base metals the lateral volcanics about the edge of this zone may not be. Intersections with the three main corridors would represent the best options for exploration. The presence of pyritic alteration in this wedge block may indicate that the southward extension post dates most sedimentation and mineralisation and that the material was located either at 376000/5353500 or 376000/5356000 prior to expansion and thus lay near one of the two northern corridors.

A further anomalous observation may be noted. The felsic suite south of the river at about 376 300 mE has a changed magnetic character in the gorge. While this may be an artifact of the survey and terrain it does occur in a zone with sympathetic faulting and is within the primary rift but near its margin. No granitoids can be associated with the southern parts of the area.

RECOMMENDATIONS

This update interpretation may have suggested the means by which western Tasmanian early Cambrian geology may be reconstructed and some further work is suggested to confirm whether there is a comprehensive system of blocks and faults which can be associated with Late Precambrian or Eo-Cambrian units. This work may well identify the important primary structures and offer a means of discriminating active margins and active faults.

More detailed study of the Newton Creek and White Spur Creek Fault zones is advised. Some additional line work or ground based mapping and sampling is required. The White Spur Creek Fault zone should be closely inspected, as should the displaced margins of intermediate intrusives east of the South Henty Fault.

Gold potential should also be reconsidered in the larger of the fault elements where the area is underlain by granite.

This zone is almost certainly in the axis of a major N-S rift.

Any improvement in gravity coverage, as odd stations, or one or two detailed E-W regional lines and perhaps one N-S line would make a considerable difference to the combined resolving power of the methods employed.

Upgraded gravity data should also be used to refine the interpretation of the form of the granite underlying the White Spur area and the northern half of the Henty Area. It is likely that spines and ribs of granite, relevant to exploration, are present.

The felsic volcanics adjacent to the South Henty Fault in the southern part of the area should be closely inspected since these appear altered. The nearby triangular fault wedge about 375 400/5351 300 is not large and enclosed by major faults which include chunks of ultramafics. Since this area may have been dislocated from a major structural corridor it should be reviewed in detail; in particular the junction at 375000/5350400.

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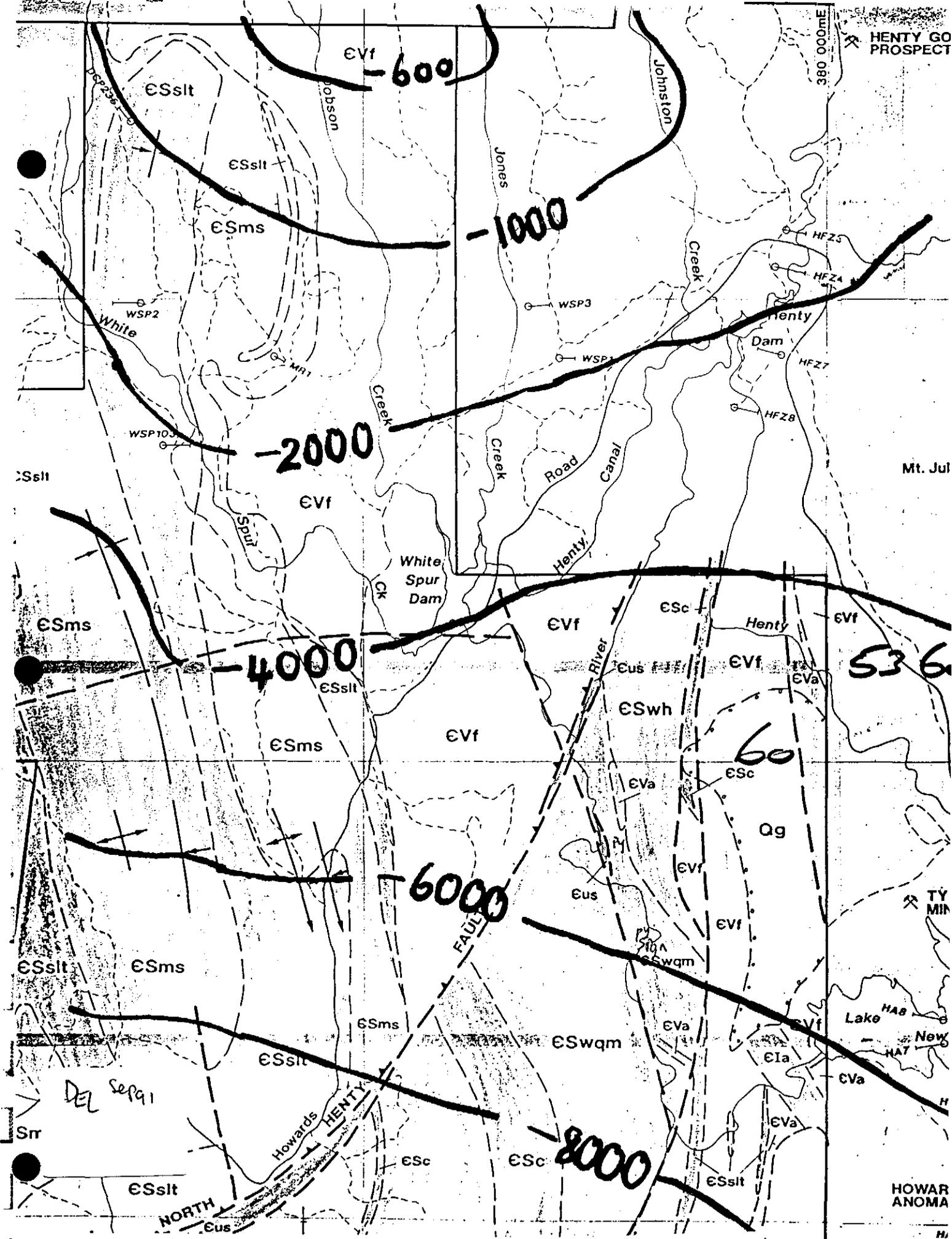
Report submitted on behalf of Leaman Geophysics

by

A handwritten signature in cursive script, appearing to read "D. E. Leaman". The signature is written in dark ink on a white background.

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

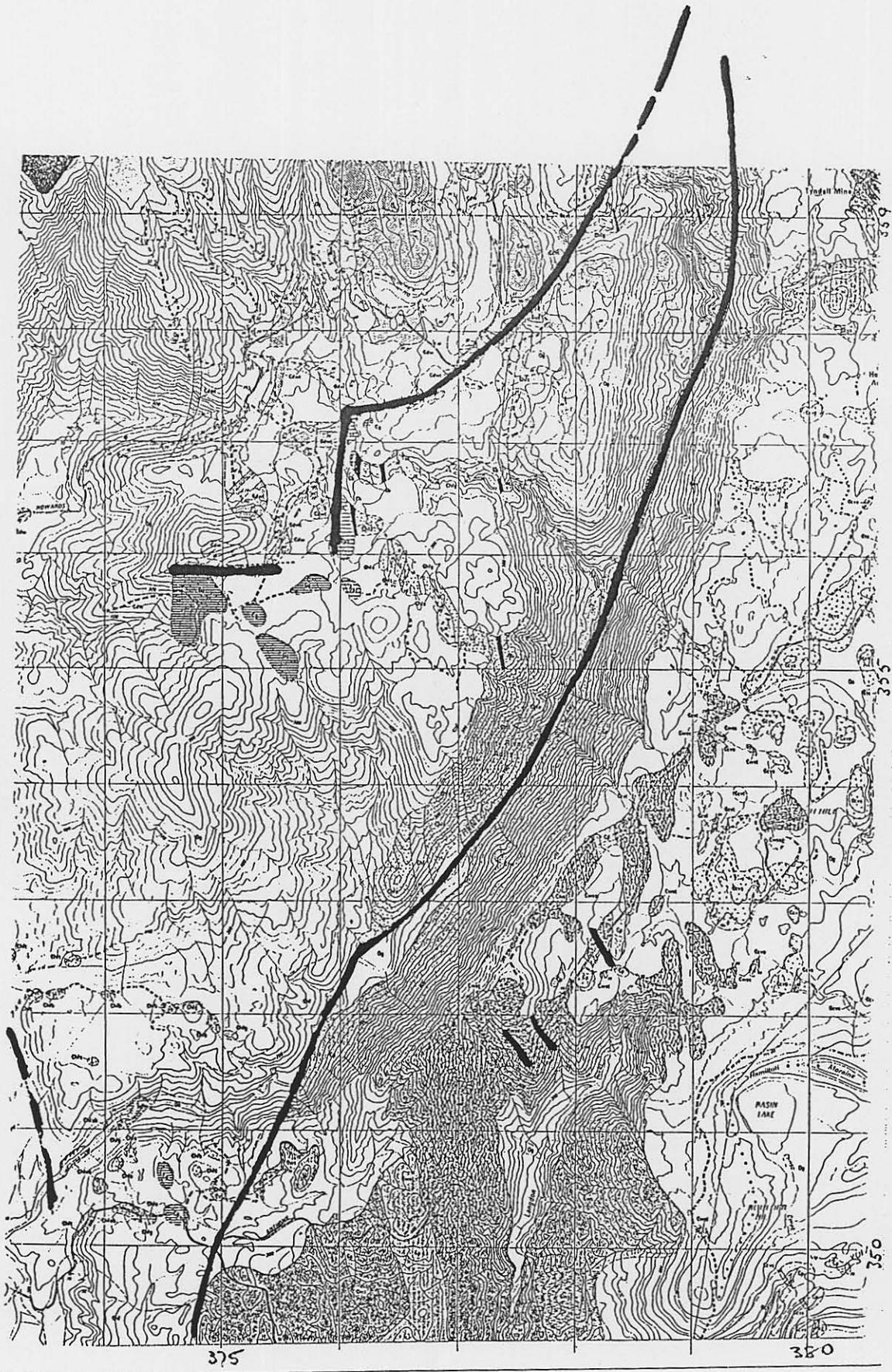
Date: 29/9/91



GENERAL LOCATION AND DEPTH TO GRANITE
 Henty River area. Not complete or detailed review (needs
 further gravity data and analysis)

FIGURE 1

rel. s.l. g
 066277



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FAULTING AS MAPPED BY CORBETT (1986)

FIGURE 2

See text for assumptions
and data limitations

..... magnetic disruptive trends
or corridor limits
 inferred alteration
X anomalous response

Magnetics
Line no.

1221

1210

1200

1190

1180

1170

1165

1155

1140

1131

1120

1115

1100

1095

1080

1075

1060

1050

1040

1030

1020

1010

1000

60

59

58

57

56

5355000
MN

54

53

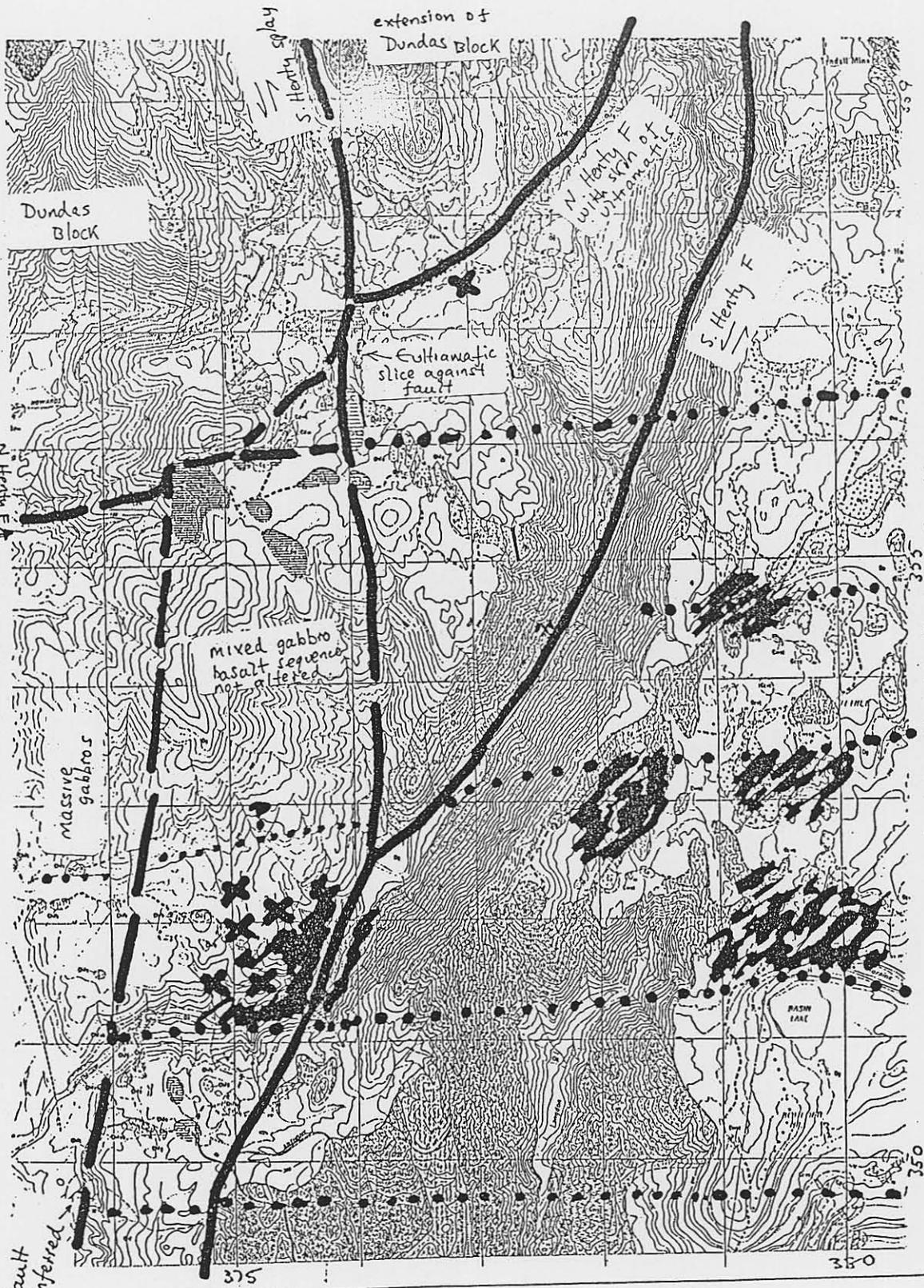
52

51

5350000
MN

49

approximate line northings (E-W lines)



INTERPRETATION SUMMARY HENTY RIVER AREA EL 11/85

FAULTING AS INFERRED BY LEAMAN (1989)

FIGURE 3

5360N

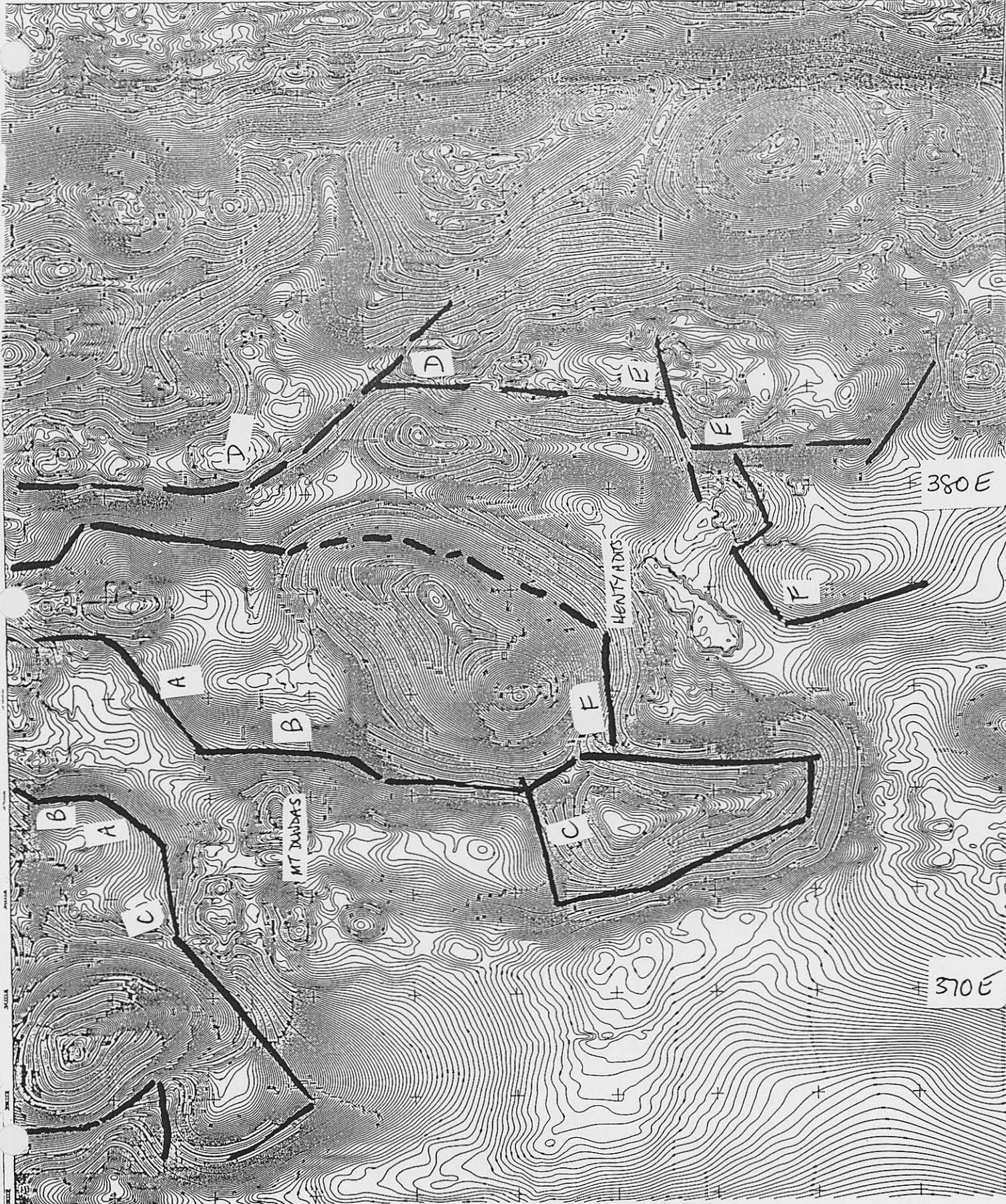


5350N

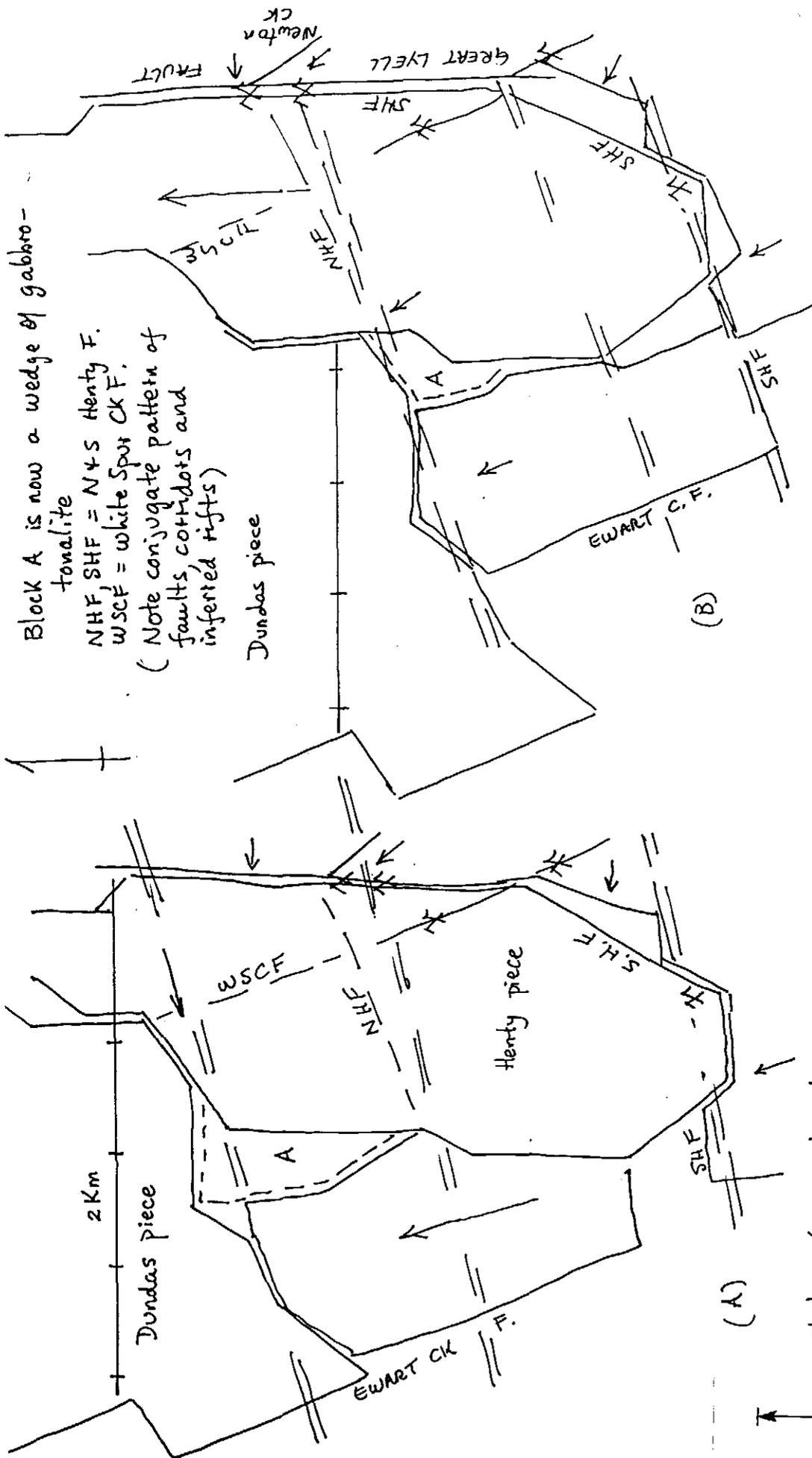
TOTAL
MAGNETIC
FIELD

PROJECT EVALUATION
NEXT TAG TECHNIQUES
FIELD PROFILES
Geological Profile 1 of 1
Drone's Altitude - 1200m
SHEET
1300m ASL

1300m ASL



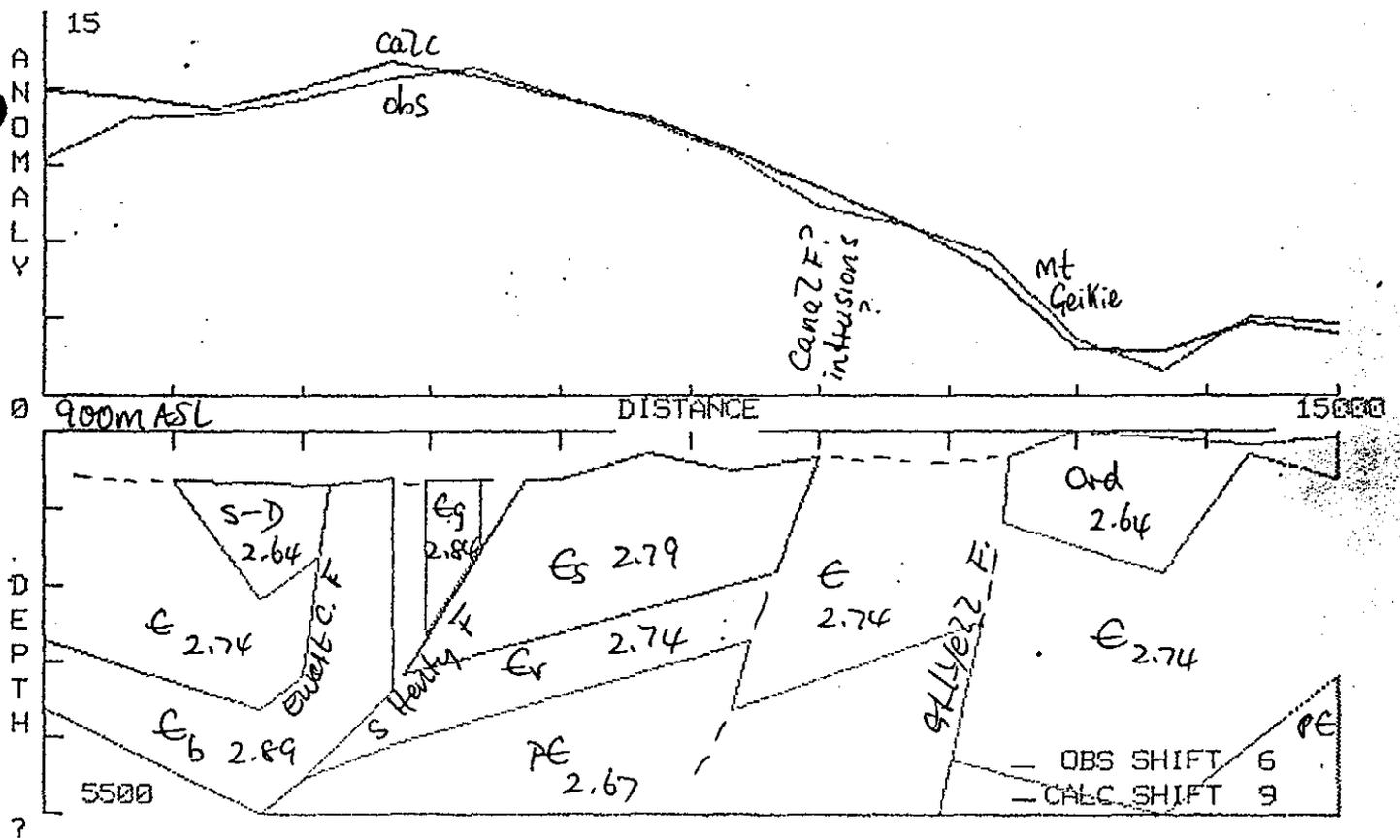
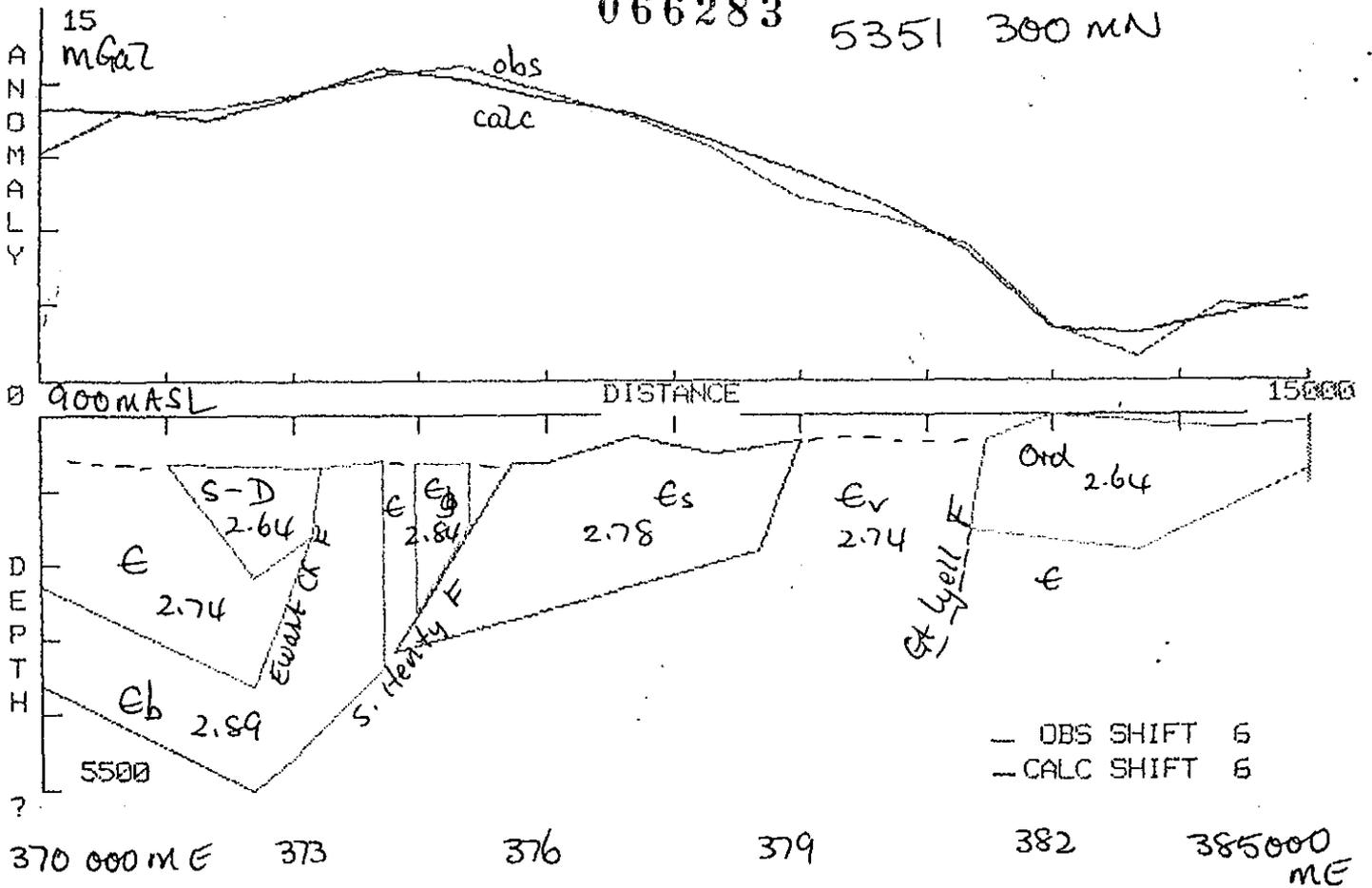
MAGNETIC FIELD AS CONTINUED TO 1300 M ASL
 Possible block boundaries marked based on extent of included ultra-
 mafics.



Styles of reconstruction.
 Arrows indicate sense TO RESTORE including magnitude of movement
 Closures, gaps, block shapes approximate since limiting shapes yet to be accurately defined.
 X = Known mineral locality or abnormal chemistry
 == = ENE corridor based on discontinuities of rift deformations at edges
 Dundas piece considered fixed in each case.

DEL Sep 91

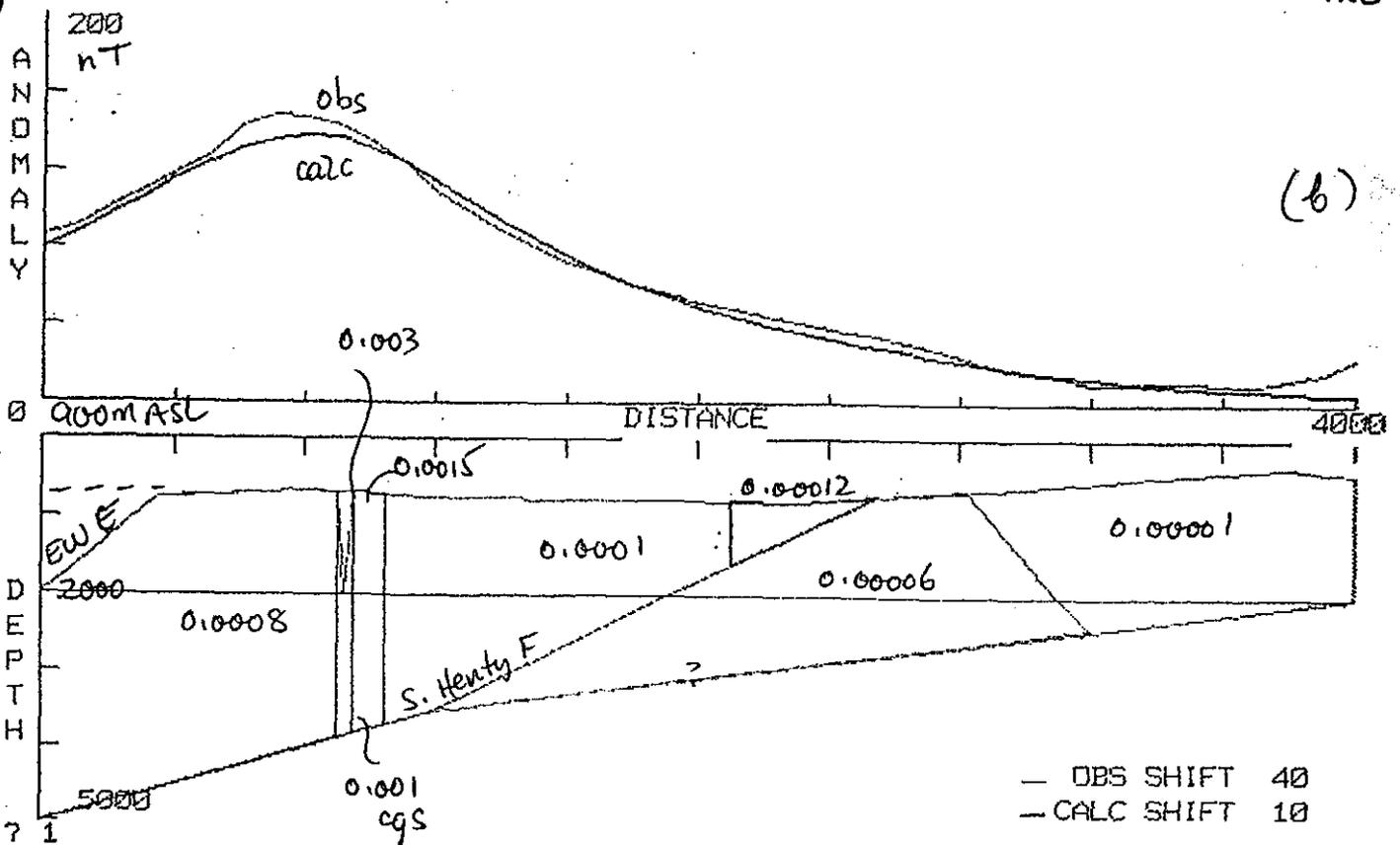
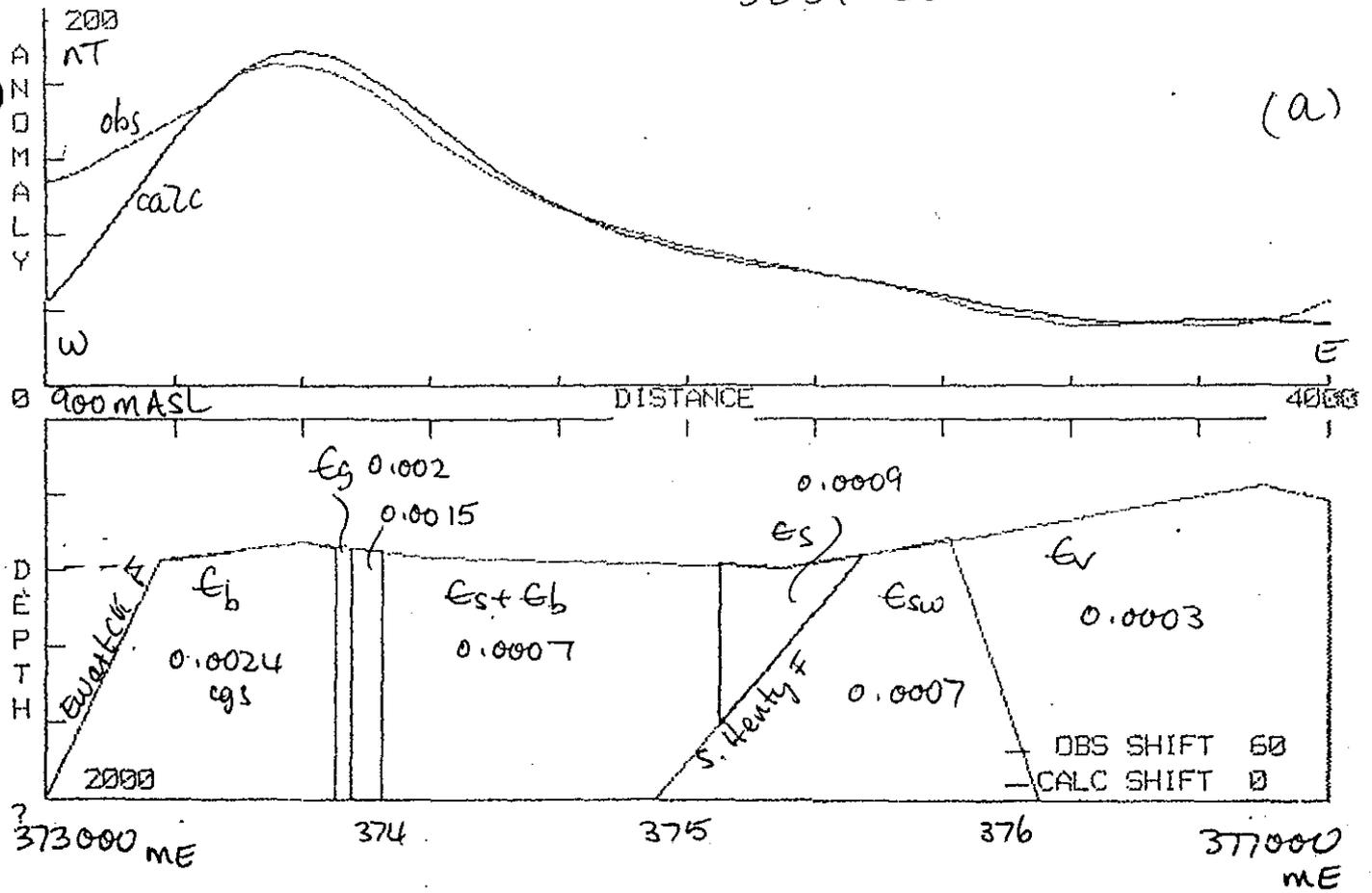
POSSIBLE RESTORATIONS OF ULTRAMAFIC AFFECTED EARLY CAMBRIAN BLOCKS SHOWING LIKELY RIFT AND TRANSFORM FAULT POSITIONS FIGURE 6



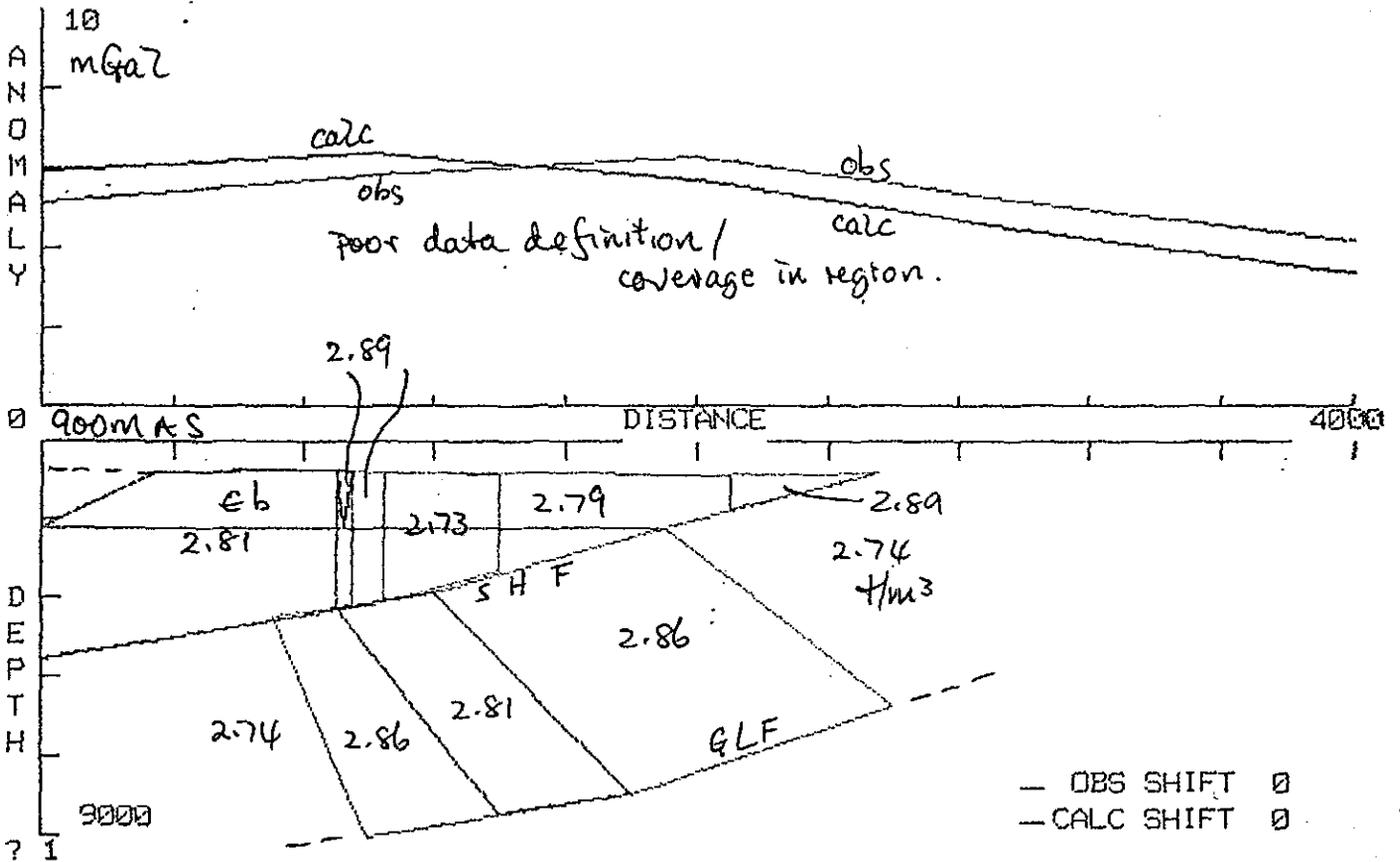
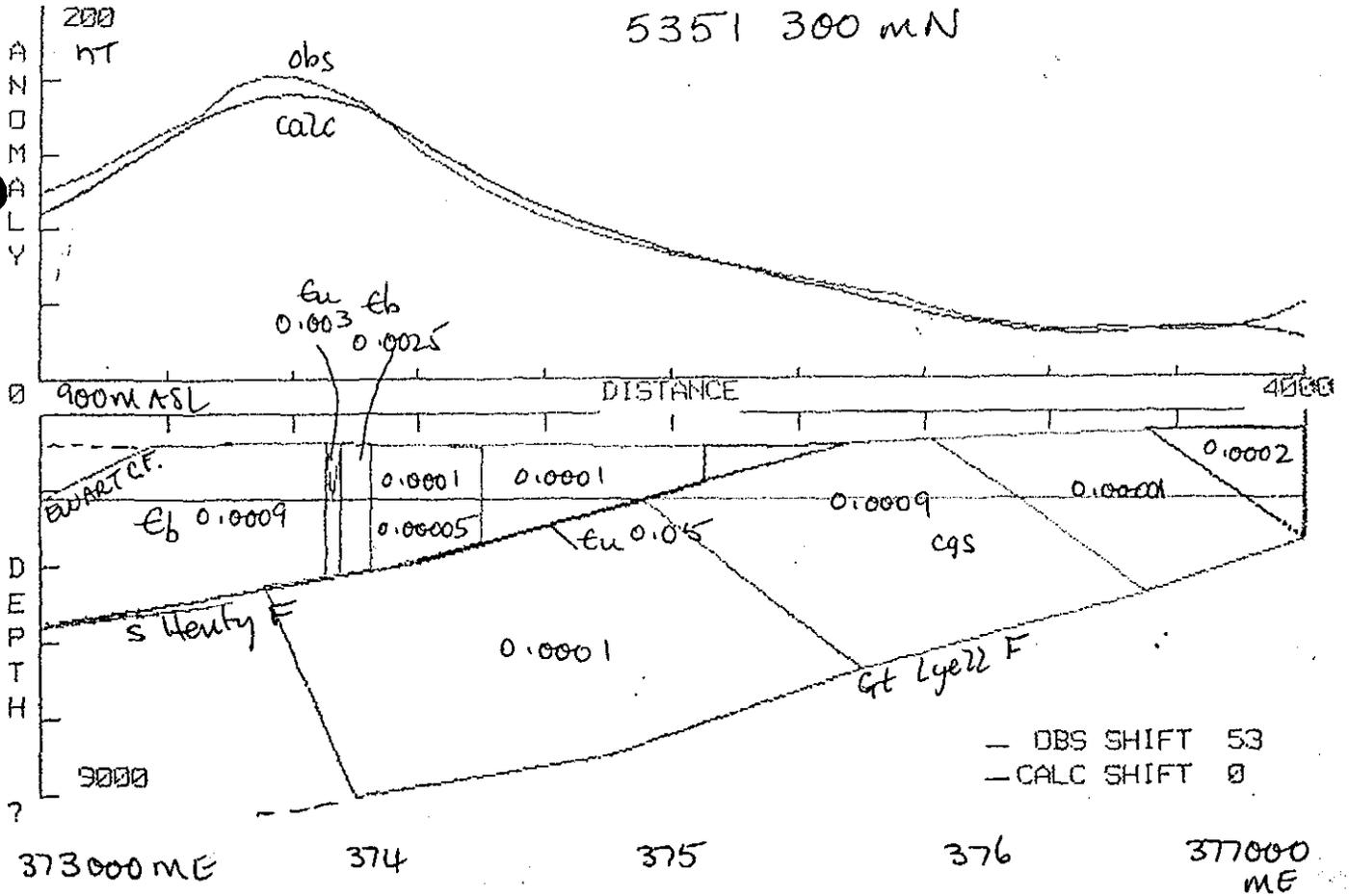
GRAVITY MODELS OF REGIONAL DATA : 5351 300 MN
Residual values separated as in Leaman (1989)

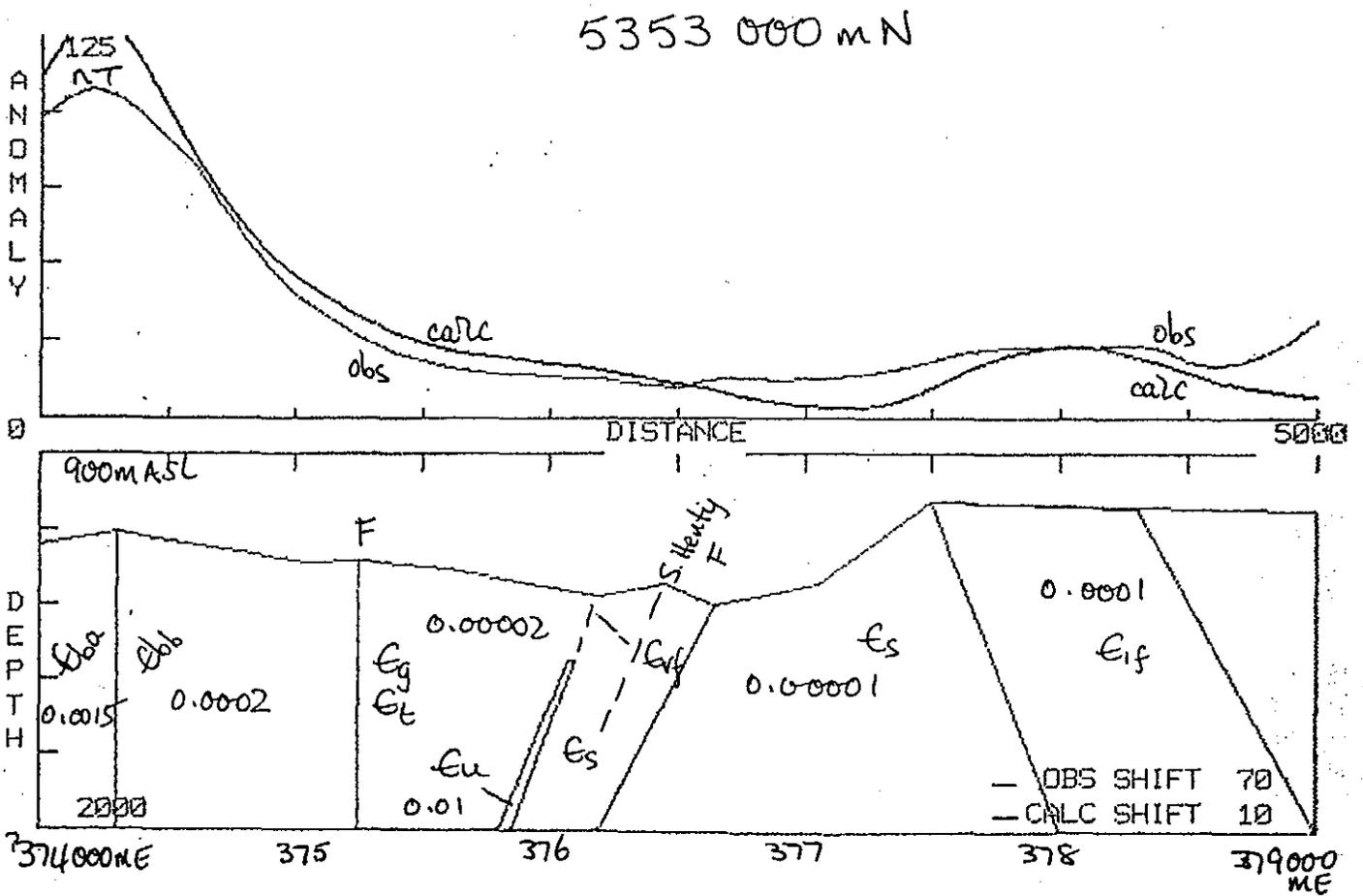
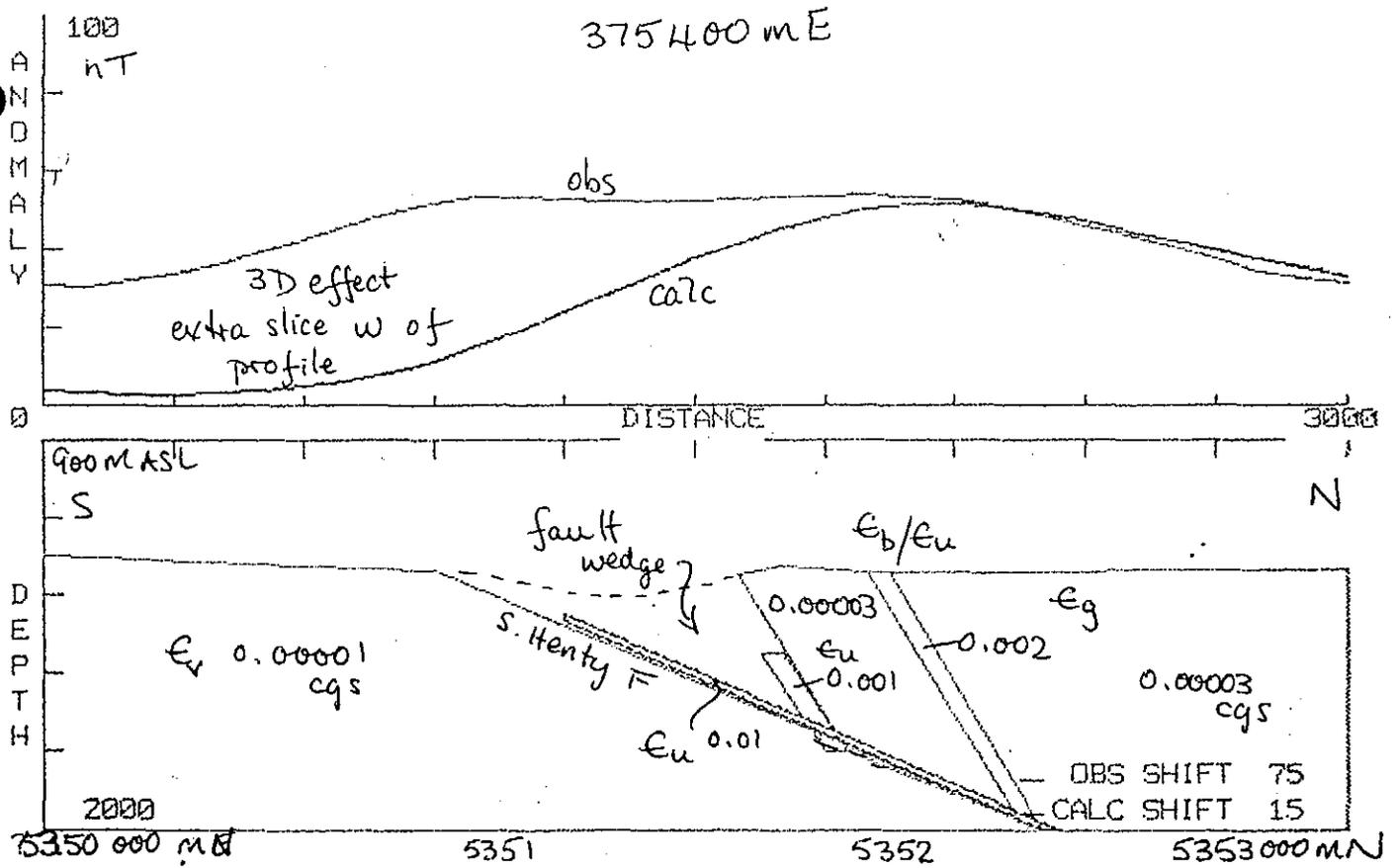
FIGURE 7

5351 300 mN

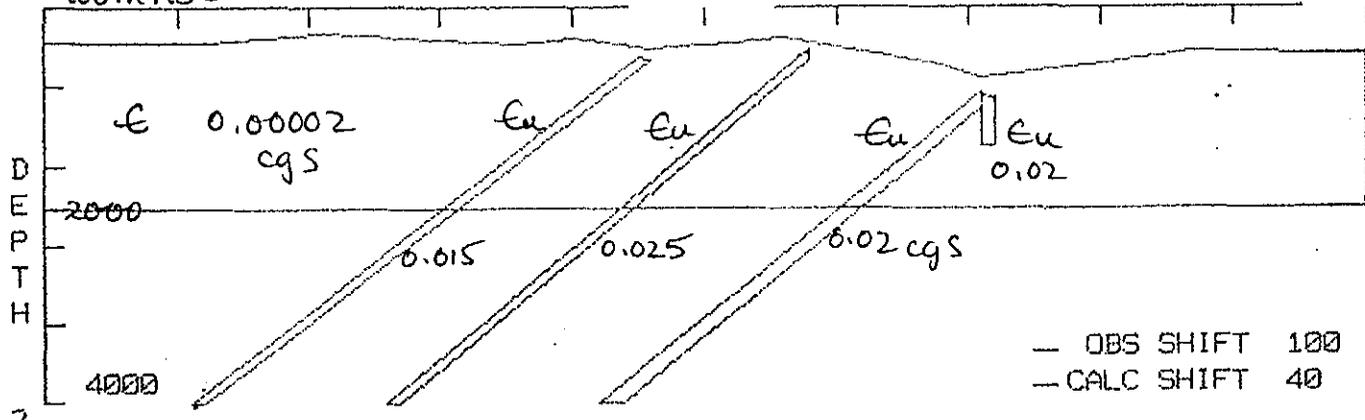
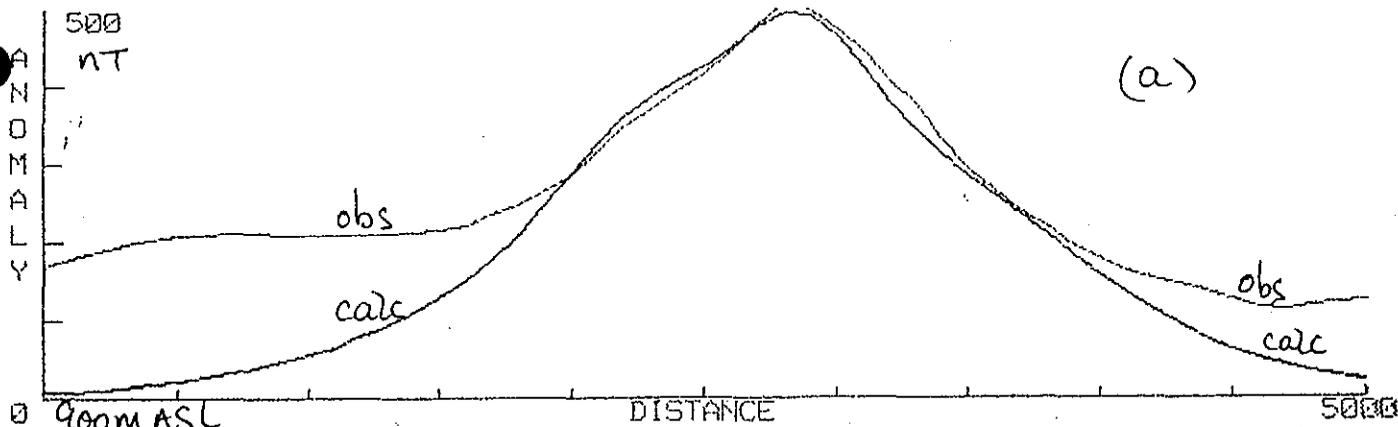


5351 300 mN

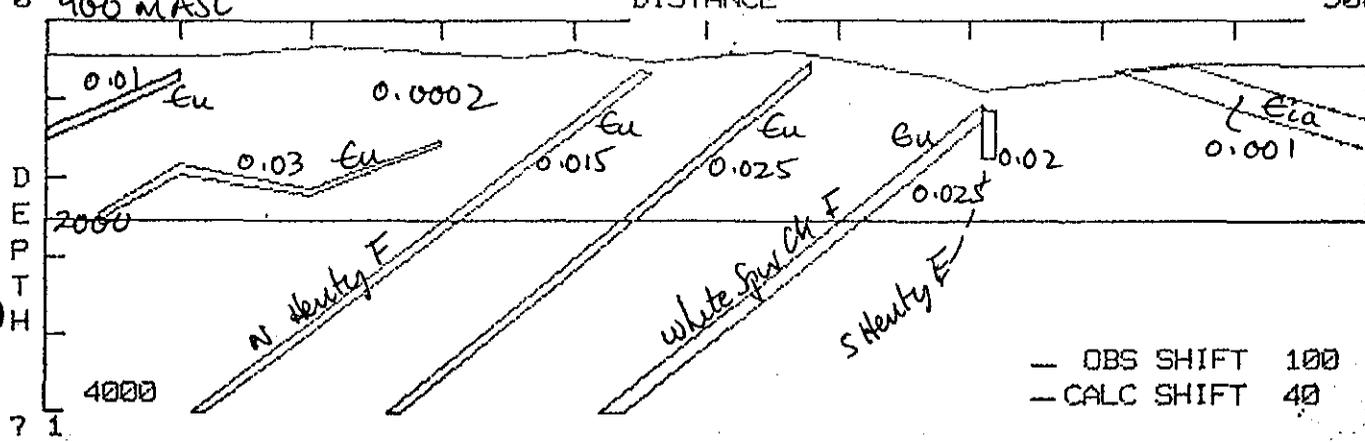
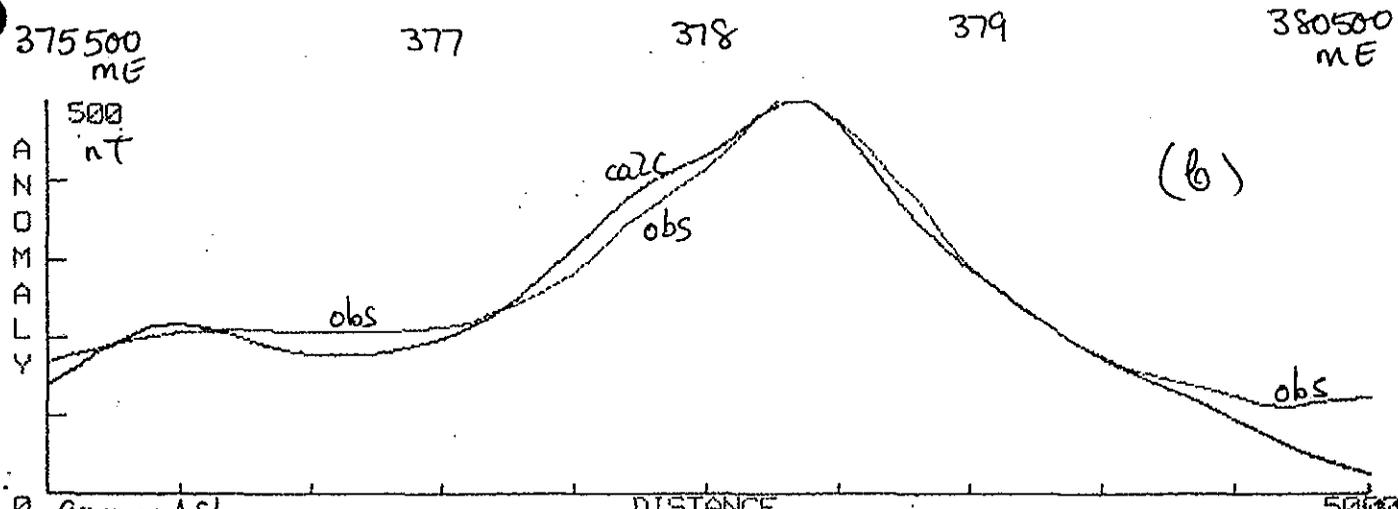




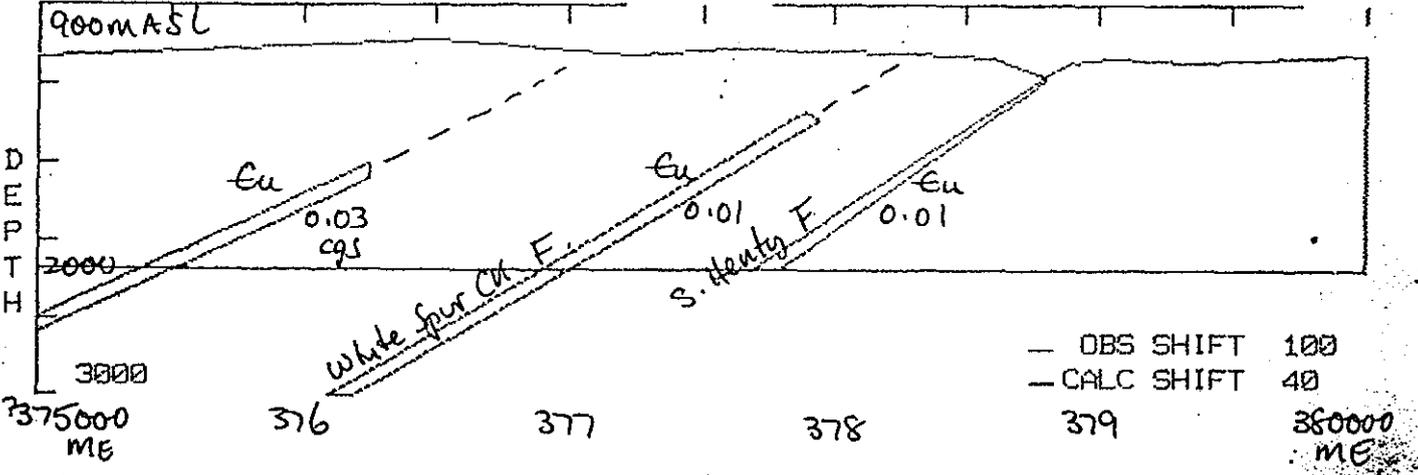
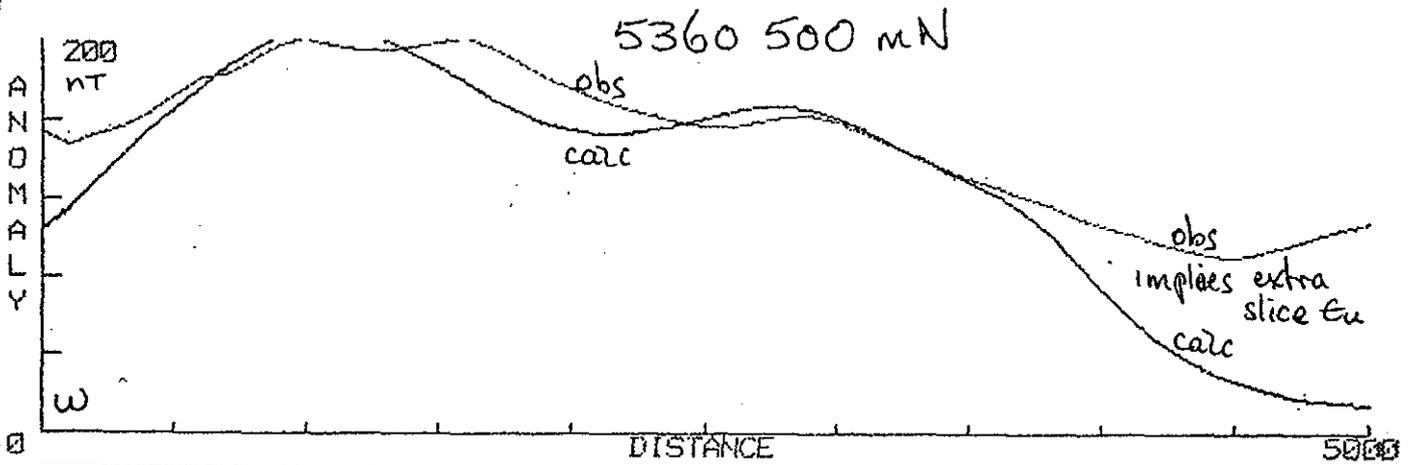
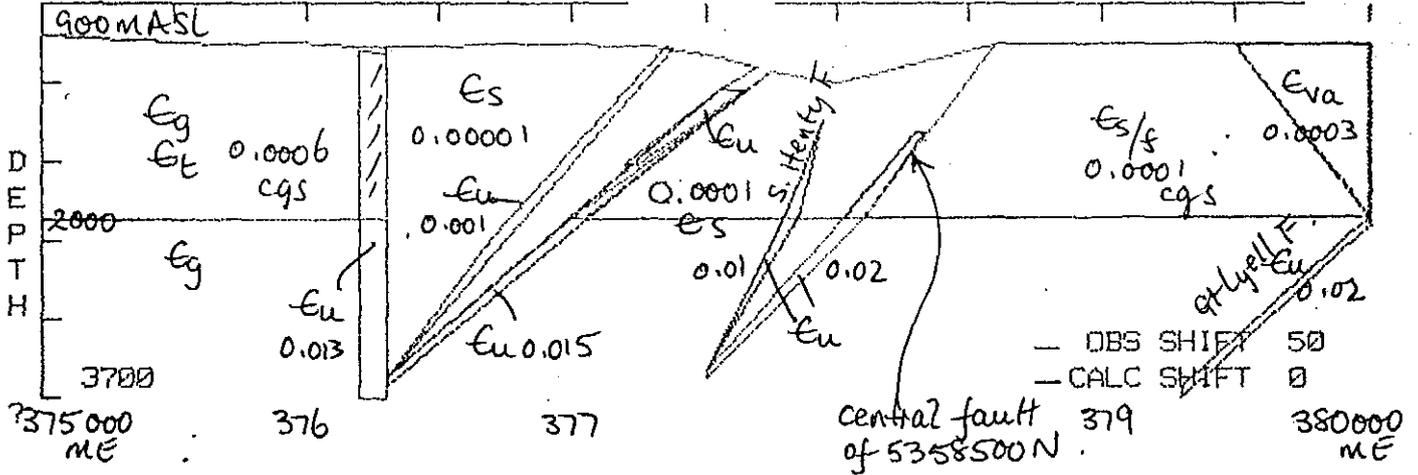
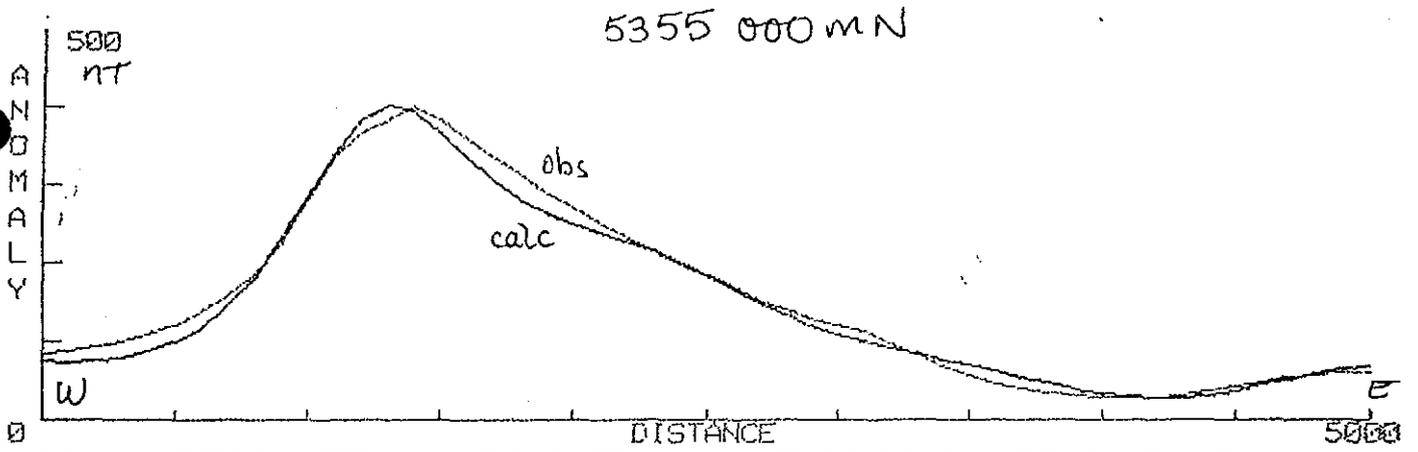
5358 500 mN

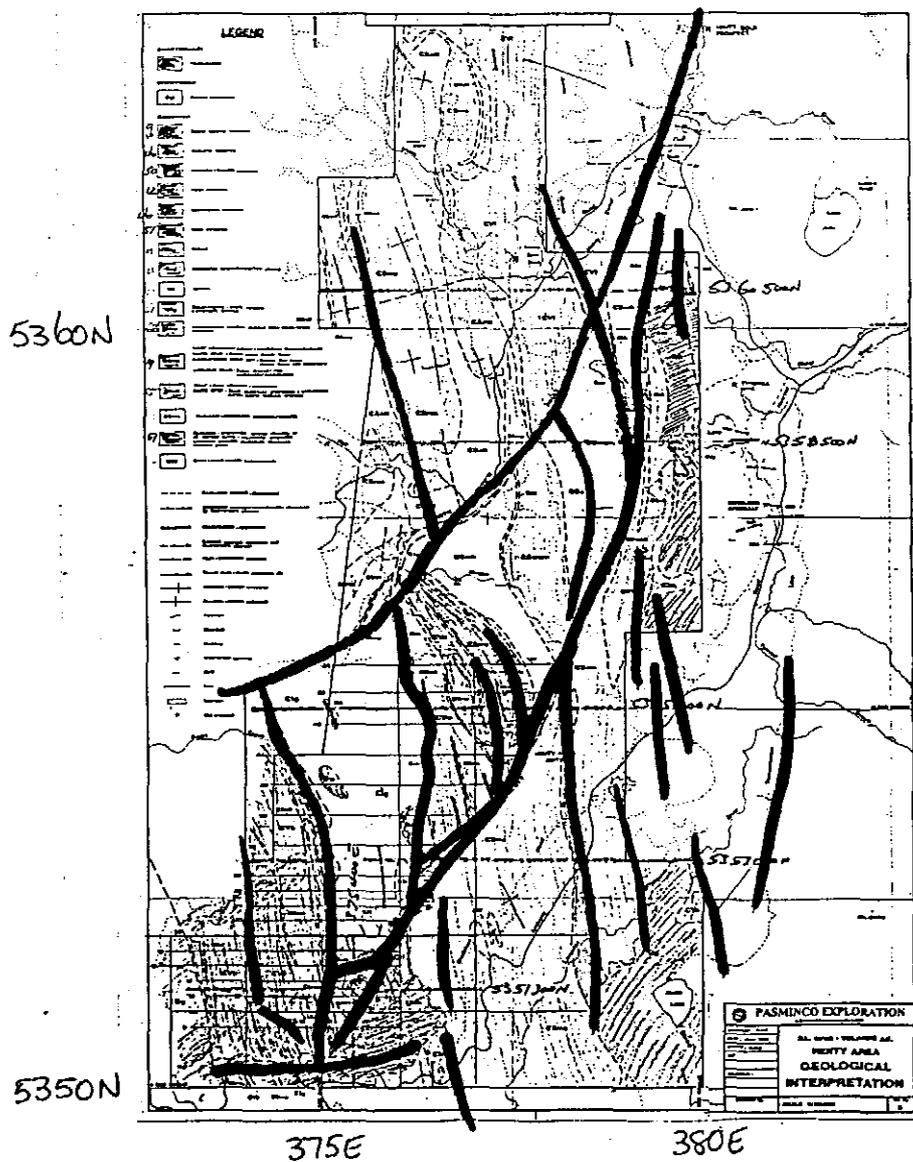


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— CALC SHIFT 40



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— CALC SHIFT 40





INTERPRETATION OF FAULT PATTERN

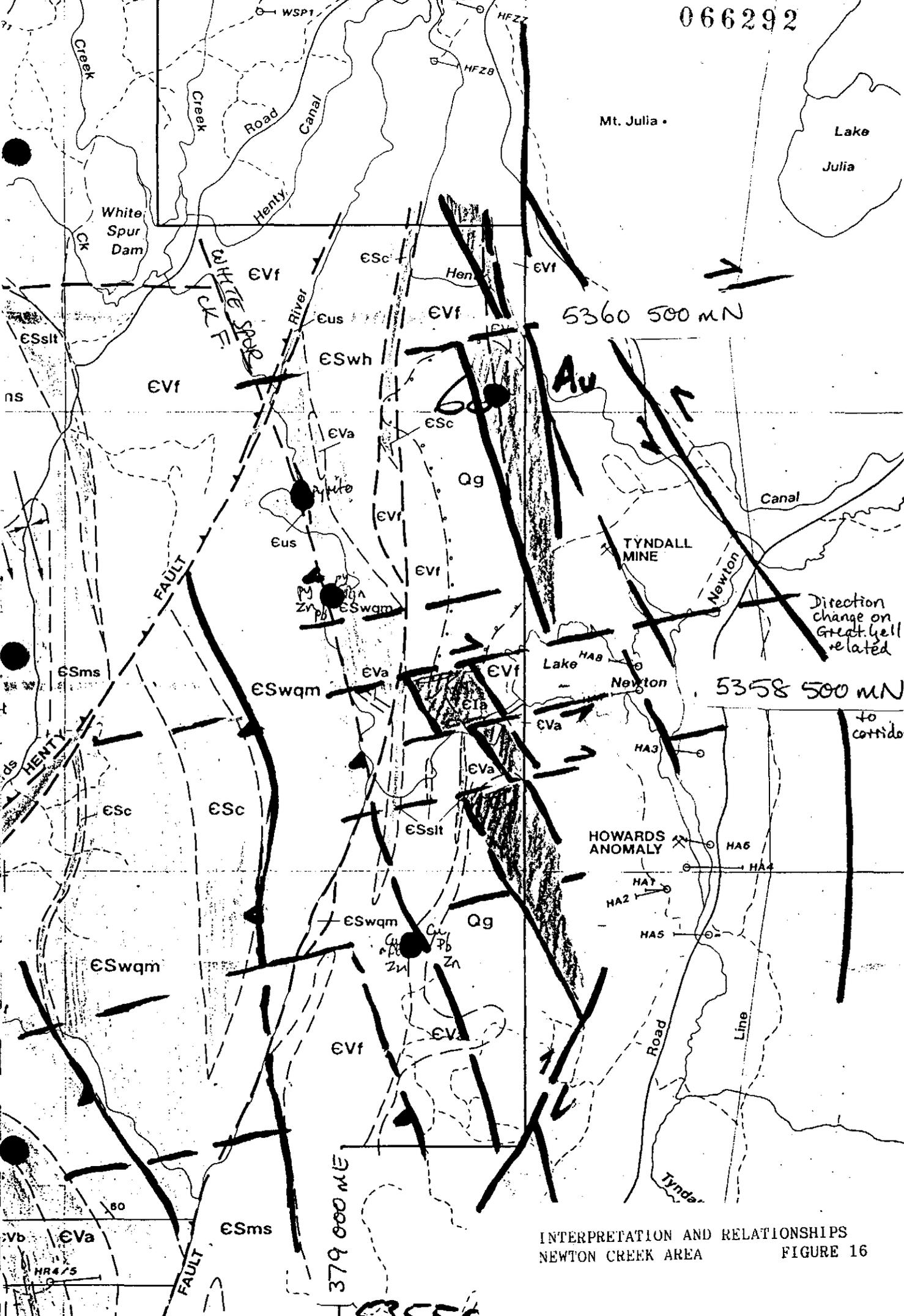
FIGURE 15

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Mt. Julia •

Lake Julia

White Spur Dam



Direction change on Great Hell related

5358 500 mN

to cottidot

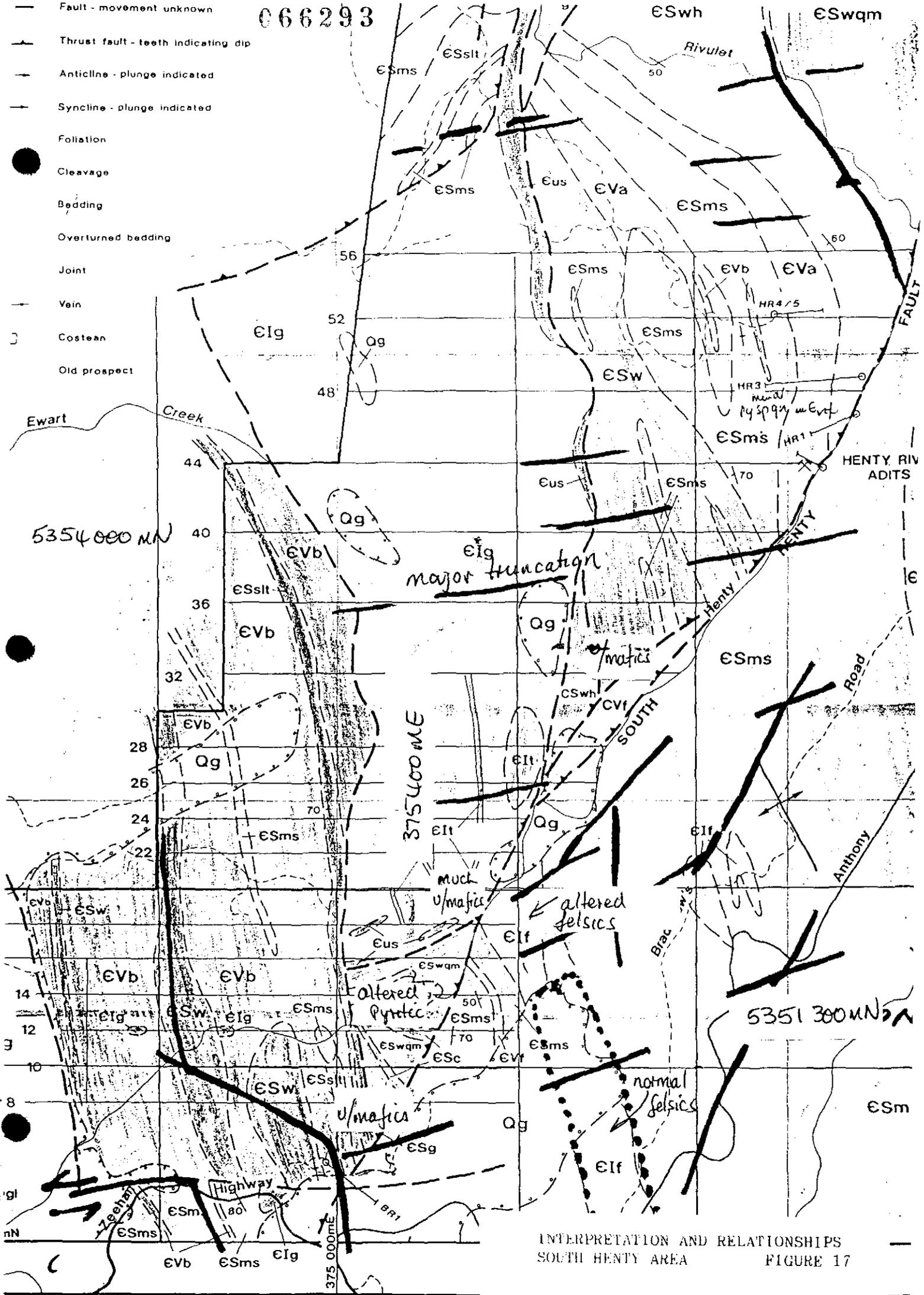
379 000 mE

53550

INTERPRETATION AND RELATIONSHIPS
NEWTON CREEK AREA
FIGURE 16

- Fault - movement unknown
- ▲ Thrust fault - teeth indicating dip
- - - Anticline - plunge indicated
- - - Syncline - plunge indicated
- Foliation
- Cleavage
- Bedding
- - - Overturned bedding
- Joint
- Vain
- Costean
- Old prospect

066293



INTERPRETATION AND RELATIONSHIPS
SOUTH HENTY AREA FIGURE 17

APPENDIX E.

LEAMAN GEOPHYSICS NOVEMBER 1991 (AEROMAGNETICS)

Interpretation update EL 11/85, Queenstown for Pasminco Exploration

LEAMAN GEOPHYSICS

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

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INTERPRETATION UPDATE
EL 11/85 QUEENSTOWN

for
PASMINCO EXPLORATION
by
Dr. D.E. Leaman

November 1991

YOLANDE2

SUMMARY

Recently acquired aeromagnetic data covering the region between South Queenstown and Lynchford have, when coupled with more detailed geological mapping, drawn attention to several structural anomalies in this complex zone.

The principal magnetic anomaly has been generated by magnetite-bearing tuffs considered correlates of the Tyndall Group. These are exposed in the region adjacent to the Queen River and have been preserved in tightly folded synclinal axes.

Other magnetic character generally bears little correlation with mapped units and clearly relates to concealed structures or units - none of which are strongly magnetic. Several discontinuities are evident. There is little to suggest that sources extend to depths much in excess of 1500 m and several detachments are implied.

Consideration of mapped relationships also suggests angular unconformities within the sequence - or low angle detachments. These involve the Miners Ridge Sandstone and volcanics to the east and the Lynchford Basalts and Tyndall Group to the west. A major break in character is indicated between these families and the fold patterns could be consistent with thrust-drag folding. The spotty distribution of Gordon Limestone along the Queen River indicates either major faulting or further detachment since these remnants are not consistent with the style of deposition required. All detachments may be west facing and extend from the thick basin deposit west of the Queen River.

Gravity data enliven these inferences even though coverage is limited and show that a break in sequence must occur near 380 500 mE. Analysis also suggests maximum thickness of about 2000 m for the Cambrian rocks and a sub-horizontal surface between these rocks and underlying basement.

The overall structural pattern implies a series of shallow westward dipping detachments adjacent to a major Lower Palaeozoic trough whose eastern margin along the Queen River is marked by a series of structural rejuvenations.

Such mineralisation as is known is restricted either to particular blocks, lithologies or contacts. Gold is associated with the basalts and an impressed ENE-trending axis about 300 m wide which may be recognised by abnormal magnetic character. Dextral movements within the detached blocks do not appear to disturb this.

Other sulphides may be linked to a N-S trending detachment surface. This combination of observations indicates the existence of some interesting mineralisation somewhere in the area but the overlay of detachments, folds and unconformities - and an uncertain place in the overall stratigraphy - makes for very difficult exploration and anticipation.

It is possible that the basalts are correlates of the Crimson Creek Formation upthrust from the trough nearby.

Further stratigraphic and structural appraisal is needed in this complex area and it is suggested that susceptibility mapping, based on all available exposures, might clarify many issues.

INTRODUCTION

The location of the Queenstown portion of EL 11/85 (Yolande River original name) is shown in Figure 1.

This area has been examined previously (see below) using older data but detailed evaluation has been delayed pending completion of licence area geological mapping. Compilation of mapping by R. Poltock in April 1991, and some assessment of rock properties has enabled this review.

This report outlines current thinking and analysis but, due to the complexity of the relationships in the area, also suggests further needs and foci.

The material presented is an interpretation update, utilising existing foundations, new data and new observations, and is far from a final word.

PREVIOUS WORK

Three previous reports dealing with geophysical-structural data in this area are relevant to the present work. The contents of each has been briefly summarised below.

Leaman (1988) examined possible structures in the Miners Ridge area for the Mount Read Project prior to drilling of a hole on Miners Ridge by the Department of Mines. The work indicated a complex antiform in which basement occurred at shallow depth and that the entire family of Cambrian rocks may have been of abnormally low density and detached.

Due to poor location and orientation the subsequent drillhole did little to clarify the situation.

Leaman (1989) was based on the earlier work but stressed the importance of isoclinal folding on a basement high and the implied rejuvenations along the Queen River Fault. Mineralisation was associated with a corridor extending from 379000 mE, 5336000 mN to 383000, 5337000 approximately but the need for more information and definition of those factors which were critical was recognised. The region near 382 500, 5337 500 was considered anomalous.

The large magnetic anomaly north of Lynchford was associated with a positive gravity anomaly nearby.

Leaman (1991) described the new magnetic data acquired by Pasminco Exploration. This data defined a "Y" shaped anomaly which appeared to correlate directly with exposure of crystal tuffs.

DATA

Gravity data used for control and checking are as reported by Leaman (1988, 1989). The general coverage was acquired as part of the Mt Read Project and has a station spacing of about 1000 m. Some density determinations have been made for formations exposed in the area. Few results are considered reliable and represent minimum values for bulk rock density. These are tabulated below.

Magnetic data used for the primary analysis were collected in 1991 (Leaman, 1991). The survey, using helicopter and terrain clearances of about 90 m, is presented as an overlay to the geological map in Figures 2 and 3. All geological references in this report relate to mapping for Pasminco Exploration.

Susceptibility determinations have been made for a number of units and these are tabulated (as ranges) below.

Unit symbol and lithology	Susc x 10 ⁻⁴ cgs	Density
Esw basalt/andesite	30-40	>2.72
Evx q porph/felsics	0.2-0.6	>2.40
Evxl rhyolitic volcs	0.6	
Eqfp porphyry	0.5-1.4	>2.72
Ems2 mudstones	0.1-0.7	>2.51
Es qz mica sandstone	0.3	>2.47
Eba Lynch Creek basalts	0.4	>2.57

INTERPRETATION

DISCUSSION

The correlation between magnetic field and mapped units is indicated in Figures 2 and 3.

In the west of the area, south of South Queenstown (Figure 2), there is a strong correlation between magnetic anomaly and crystal tuffs considered part of the Tyndall Group. The peak effects and gradients relate directly to exposure. The spread of anomaly to north west and east reflects partly the magnitude of the contrast and a moderate depth range for the source which clearly extends beneath South Queenstown. The precise extent of the material can only be appraised by calculation.

Much more modest responses may be observed in the east of the surveyed area. Mapping indicates some repetition of the same units but the response is not as direct or of the same amplitude. Note the area around 381 750 mE, 5338 500 mN. In this zone the largest anomaly is east of the exposed rocks and the effect is no more than one quarter the size. This means either that a different unit is involved or that it dips eastward with no depth range near the exposure. Much shallower dips would be implied than have been mapped.

The presence of similar responses along the eastern margin of the area and absence of such lithologies would suggest different sources

or some concealment. It should be noted that Mines Department mapping in this area labels these tuffs differently.

The relative negative effects near 378 750 mE, 5337 000 mN and 380 000, 5337 250 may be accepted as geometric responses to termination of the source lithology although the orientation of each is unusual and may indicate some remanent magnetisation or other complications.

The relatively quiet area magnetically centred near 381 000 mE, 5337 250 mN is what would be expected from the rocks present given the susceptibility information. The bulk of the rocks present are magnetically subtle and the extent of the quiet field might have been greater but for the interference of the anomalies to east and west. It should be noted that both basaltic sequences (presuming they are really different) are also non magnetic for all practical purposes. Exceptions may be noted, but are not proven, in the region of the southern basalts (near 381 000 mE, 5336 000 mN).

Within these constraints the magnetic field is quite anomalous a little south of 5337 000 mN within the surveyed area. Several point anomalies can be recognised within individual units, either positive or negative and these tend to be aligned ENE (e.g., 380 800, 5336 700). Trends of this orientation delimit increasing field intensities near the Lynch Creek gold prospect or south of Guilfoyle. Barytes occurs in this axis at 380 100 mE. 5336 600 mN and the King River Mine falls along it further west.

Mapped faults within the area have no definitive expression although offsets can be recognised where the magnetic tuffs are dislocated.

This array of contradictory relationships and trends has been overlain on the geological mapping and presented in Figures 4 and 5. The general lack of correlation between mapped formations and their extension is marked.

The lack of correlation across the entire eastern half of the surveyed area implies the presence of moderate contrast source rocks at relatively shallow depths and formation limits which bear no relationship with surface boundaries. The concealed boundaries are relatively linear and it is clear that the exposed rocks are not part of this deeper association or structural control. Detachments are implied.

The available data have been modelled in order to identify the scale and location of any such features. More regional data has already been used to suggest that such structures are present (Leaman, 1988, 1989). All previous modelling has been assumptive of rock properties and unfortunately little improvement is yet possible gravimetrically. New magnetic observations have been incorporated in revised models.

MODELLING

New models are presented in Figures 6, 7 and 8.

Figure 6 provides a regional overview based on available gravity data. The perspective offered by this section and data is relatively unbiased by details in the South Queenstown area. The profile models residual data using the Tasmanian data base compensated for Mantle model MANTLE91. The model does not include details of the topography since its was designed to provide check estimates of section thickness and locate major breaks.

This it has done.

The Queen River zone, and the deep structure west of it, has not been modelled in detail. The layered nature of the model in this region reflects the general mass distribution but is not correct in detail, especially near the Queen River, since local dips may be substantial. The anomaly at the western end of the profile does, however, require a substantial thickness of material with densities in excess of 2.75 gm/cc. The values used for the Ordovician-Devonian units must be considered approximate but these units do not account for the effect. The effect of such formations can be observed along the King River axis to the east of the range. The likely thickness of these units is of the order of 5 or 6 km and some substantial post Silurian faulting is implied by this section. It should be noted that the thickness may be artificial due to structural repetition.

The Queen River zone is distinct and may not include rocks older than Ordovician. Any Cambrian rocks present must be part of a thinned sequence but that thinning may be structural and not necessarily depositional in origin.

Two imperfections are apparent in this regional model; west of the Queen River and across the West Coast Range. In the first case the deficiency is due partly to data coverage and partly to model detail. In the range case it suggests that either too low a density has been used for the conglomerates or not enough volcanics has been included. Some combination of the two is likely. However this part of the model is re-arranged it is clear that there can be little more than 1 to 2.5 km of post Precambrian section anywhere. It is very difficult to justify reductions in the contrast of the Cambrian rocks when all available data imply densities in excess of 2.72 (for this area) and perhaps 2.74 in western Tasmania generally. Any increase effectively thins the implied sequence.

The model fit differential is credible for the data set and properties used.

Figure 7 examines the detail adjacent to the Queen River at 5338 000 mN.

The distinctive character of the magnetic field is apparent and clearly related to the magnetic tuffs. Note that contrasts compatible with properties observed have been used. For the western fragments of folded tuff the thicknesses implied may well be maxima but the eastern volume may be a minimum. There are significant constraints upon the arrangement of these volumes and much of the response is due

to the depth range of the fold cores. The effects cannot be obtained with more dispersed volumes. It is clear that these fold cores do not extend more than about 2000 m.

The model fit parameters are consistent with requirements within the data set across western Tasmania (estimated to be about 55 nT). The essentially non magnetic character of the eastern part of the area is stressed in this presentation.

The model demonstrates the difference between the eastern and western anomalies by using the same contrast since these responses are presumed to be due to the same unit. This is clearly not so and the eastern rocks possess contrasts little more than 10% that of the tuffs further west.

The primary magnetic change occurs near 380 000 mE.

The gravity model confirms this change although the variation in the field is subtle. The general character of the field may be recognised in the regional model and profile.

The rock properties are generally unsupported but consistent with other parts of western Tasmania. The densities are probably minima. The general positive bulge may reflect the effect of basalts exposed south of the section. Until more data are available and such correlations can be made with certainty no further discussion is warranted.

A much clearer view is provided in Figure 8, for 5337 000 mN.

The gravity field is locally anomalous and the effect can be associated with basalts which are clearly very localised with little extension to either west or east of principal exposures.

Given reasonable contrasts for these rocks a maximum folded thickness of about 2500 m is indicated. The magnetic profile cannot offer much support for this implication due to the domination of the field by the folded tuffs. The basalts are not magnetised. Some overturning is indicated in the structure and this may be related either to the local pod of mafic volcanics and unconformities or compression of the fold.

A linkage is also made between the basalts of the area.

The materials east of 380 500 mE are essentially non magnetic and lower density than those to the west. Basalts are clearly generally absent. This broad pattern was observed in Figure 7 for the section 1 km to the north.

The model solution as drawn implies the existence of a detachment surface near 380 800 mE at this northing and similar structures could be present at 5338 000 mN. If the minimum in the gravity profile is a true indicator then this structure must be near 381 000 mE at the latter northing.

The local complexities along the Queen River structure are also suggested, as is the very different facing in the east of the area. The model indicates that the source of the magnetic responses near the eastern boundary of the licence area may be generated near surface. If this is the case then some review of the mapping is

required. The source is clearly relatively shallow, perhaps no more than 100 or 200 m if not exposed. This means that the structural limits implied in this part of the area (see Figure 5) are quite anomalous and may be very relevant for further exploration given the presence of trace amounts of galena and sphalerite nearby - and on the extension of one such boundary.

CONCLUSIONS

The present update and review has not resolved any of the major issues with any certainty. This is a complex area and there are many apparent contradictions in the structural view outlined. Especially in terms of relationships with mineralisation and directions for further exploration.

Are reverse motions the only way to account for the three discrete blocks of material defined by exposures and properties in the area? Refer to Figure 8. Part of this judgment depends on the inference of thin isoclinally folded sequences on basement or rocks with basement like properties. In any normal stratigraphic relationship basement should lie to the west (probably).

Figure 9 suggests two ways in which the primary elements of the Lynchford area could be emplaced.

The first is compression against a major, old structure which has been part of a basin margin in gross terms - the Queen River structure. This margin has been rejuvenated and slices of section have been forced along it. Thus it is possible to explain the deformed isolated pieces of Ordovician sequence near the river, but east of the main exposures of Siluro-Devonian formations. The Lynch Creek slice, including possible Tyndall Group has been displaced from a deeper part of the basin and the block now furthest east from deep in the basin with direct affinities with basement rocks. This block includes the Miners Ridge Sandstone. There are some limited possible re-arrangements of this scheme but all will account for the folding and general disturbance of the sequence. One of the key problems with this scheme is the origin and shape of the basaltic mass. Why is it isolated and limited if once part of the very substantial deep mafic sequences such as those exposed to north and south in correlates of the Crimson Creek and Mainwaring formations? And why do the ENE linears appear with such clarity when Devonian offsets must have dislocated the entire block pattern?

An alternative structure depends on deformation of an early tensional basin and its western margin. The structures and control along the Queen River axis are comparable to the option described above. In this scenario the basalts are located near either the margin of the subsidiary rift or its axis - after rotation. Basement remains below the blocks although tightly folded and sheared. Differences in deposition and lithology then reflect different primary environments during the Cambrian; one is a basin, the other an intermediate horst. This relationship could well account for the stratigraphic discontinuities observed.

These alternative concepts are important since the first implies considerable distortion and dislocation and a virtual inability to ever properly assemble the history. Tracing mineralisation in such a pattern would be extremely difficult and would depend completely upon preservation of deposits during deformation or within slices. This is not impossible, but exploration is inevitably confused.

In the second scheme most of the deformation is local and most elements have been little moved, if savagely compressed and rotated. Since the compression is essentially east-west, sub E-W controls will be generally preserved but slightly diffused. This appears to be what is observed. It also means that the general location of mineralising centres has also been preserved. It will lie in a zone beneath and directly east of the basaltic pile. This also appears to be observed. Both stories can be read from existing geophysical-structural interpretations.

Some attempt must be made to test these alternative concepts since one leads to potentially attractive targetting and exploration and the other must be frustrating and difficult with targets almost certainly at impossible depths.

There seem to be few ways in which this could be done. Gravity data clearly offer much assistance for structural analysis and infill of two control lines, say those modelled, would be justified. Precise levelling would not be required. Such an improvement in data could be recoupled with further review of the high quality magnetic data. Further application of either data set requires some improvement in property knowledge. Massive outcrops, extant drill core and perhaps some shallow coring should be sampled for densities. It is crucial that some knowledge of realistic background levels be obtained. Is there a real difference in the sequences or is the entire effect due to basalt?

The entire licence area should be assessed for magnetic properties. A few days should be devoted to obtaining hundreds of determinations of susceptibility - for every easily reached exposure and all rock types. There must be at least 25 determinations per rock type. These measurements should serve two functions; assist interpretation and allow some appraisal of map and unit correlations. It should be expected that some variations in the basemap will result.

These relatively low cost measures should be supported by a structural review based on existing facing and dip information but this should not be undertaken until the magnetic properties and unit continuity and correlation issues have been assessed.

In the meantime exploration should perhaps be restricted to the ENE and NNW lineaments defined in Figures 4 and 5. These features are unambiguously defined and each has some association with mineralisation. The region about their intersection may prove of particular interest.

If the second structural model proves to be valid then the distinction between gold and base metal sulphide associations might well be explained in terms of these fundamental controls.

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- Leaman, D.E., 1991. Aeromagnetic surveys EL 11/85, Henty River - Queenstown. Acquisition report. Report for Pasminco Exploration by Leaman Geophysics.

Report submitted on behalf of Leaman Geophysics

by



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

Date:

29/11/91

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MAGNETIC FIELD AND BASE GEOLOGY
EL 11/85 QUEENSTOWN (WEST PART)

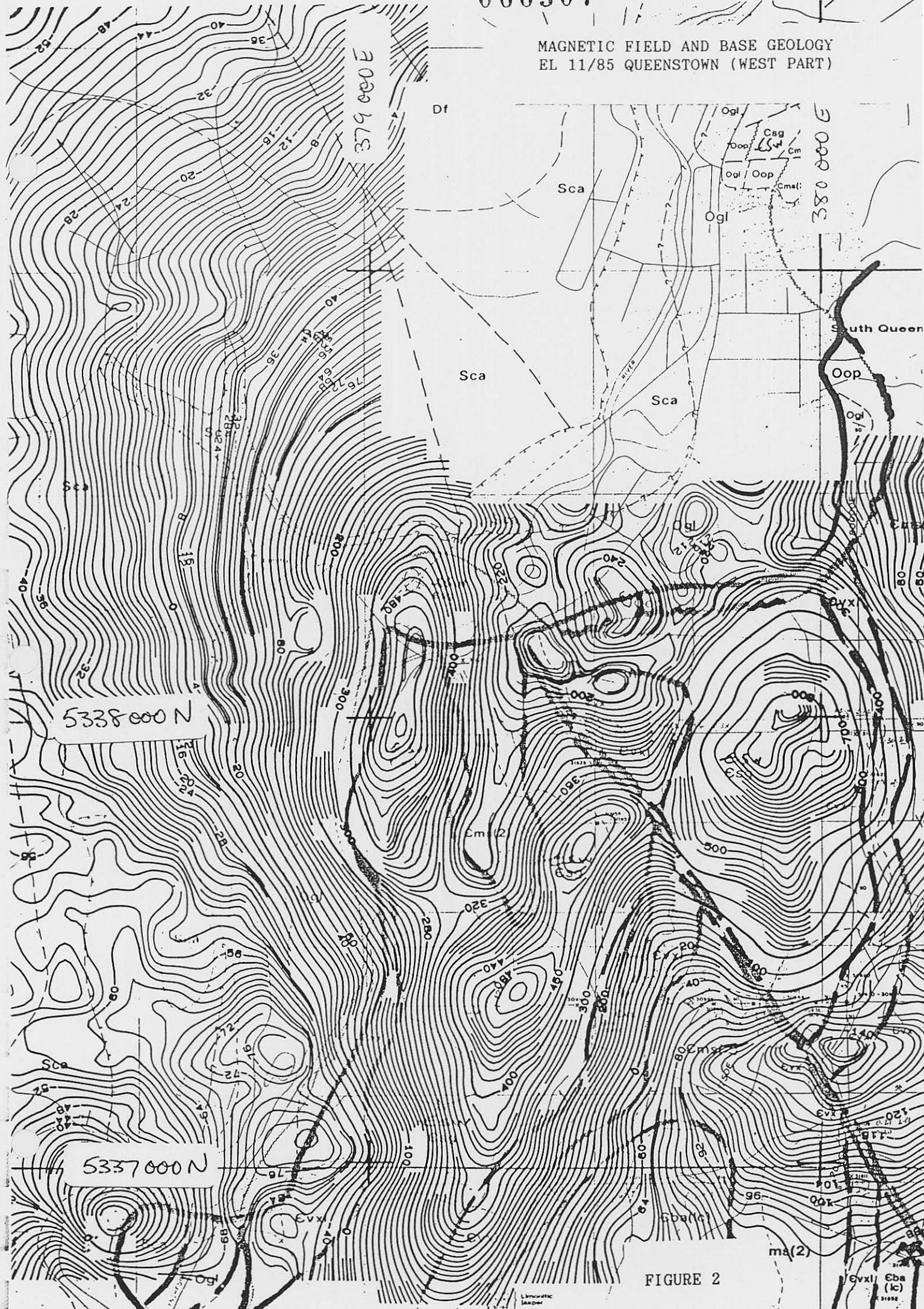


FIGURE 2

MAGNETIC FIELD AND BASE GEOLOGY
EL 11/85 QUEENSTOWN (EAST PART)

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uth Queenstown

OPR

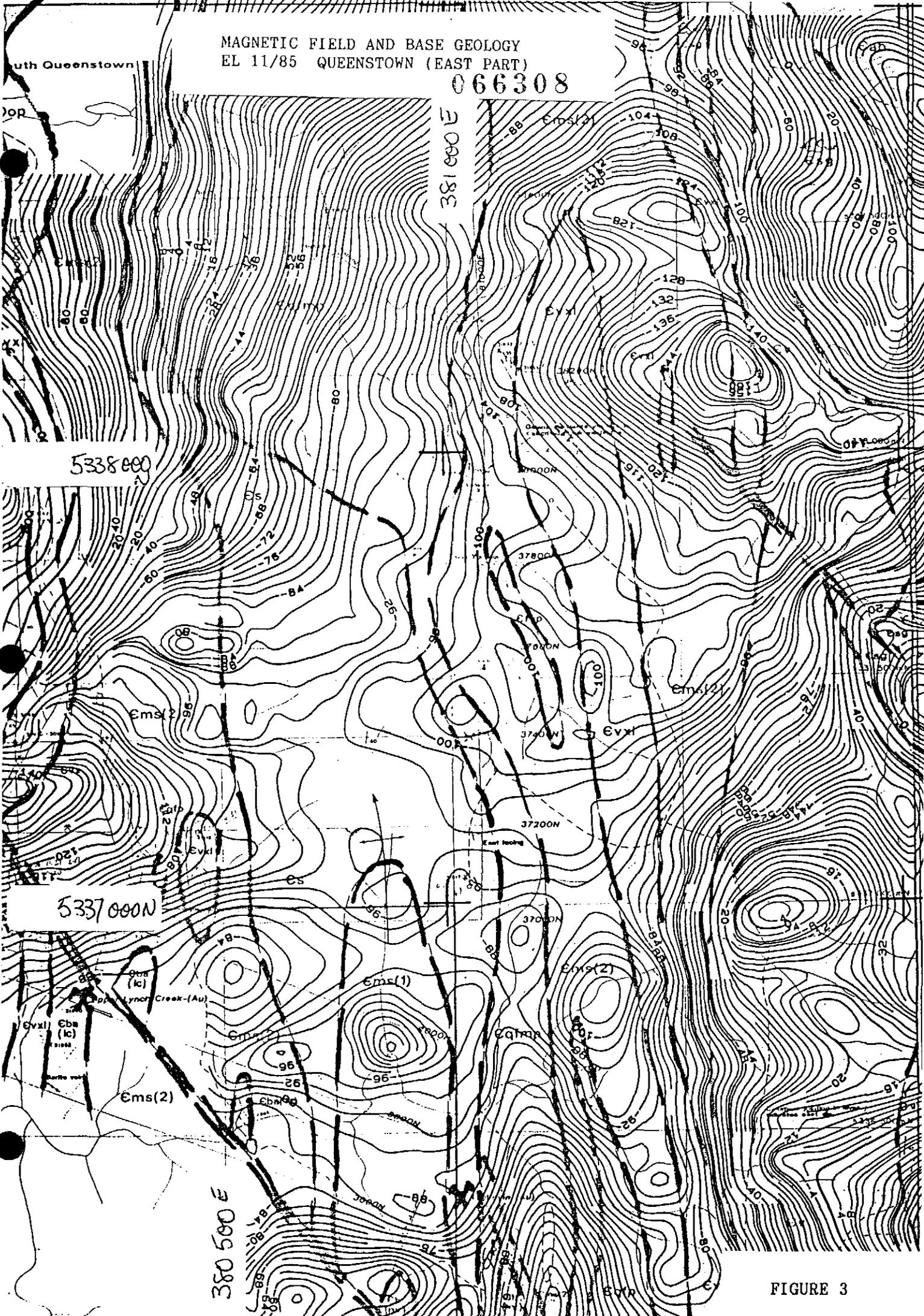
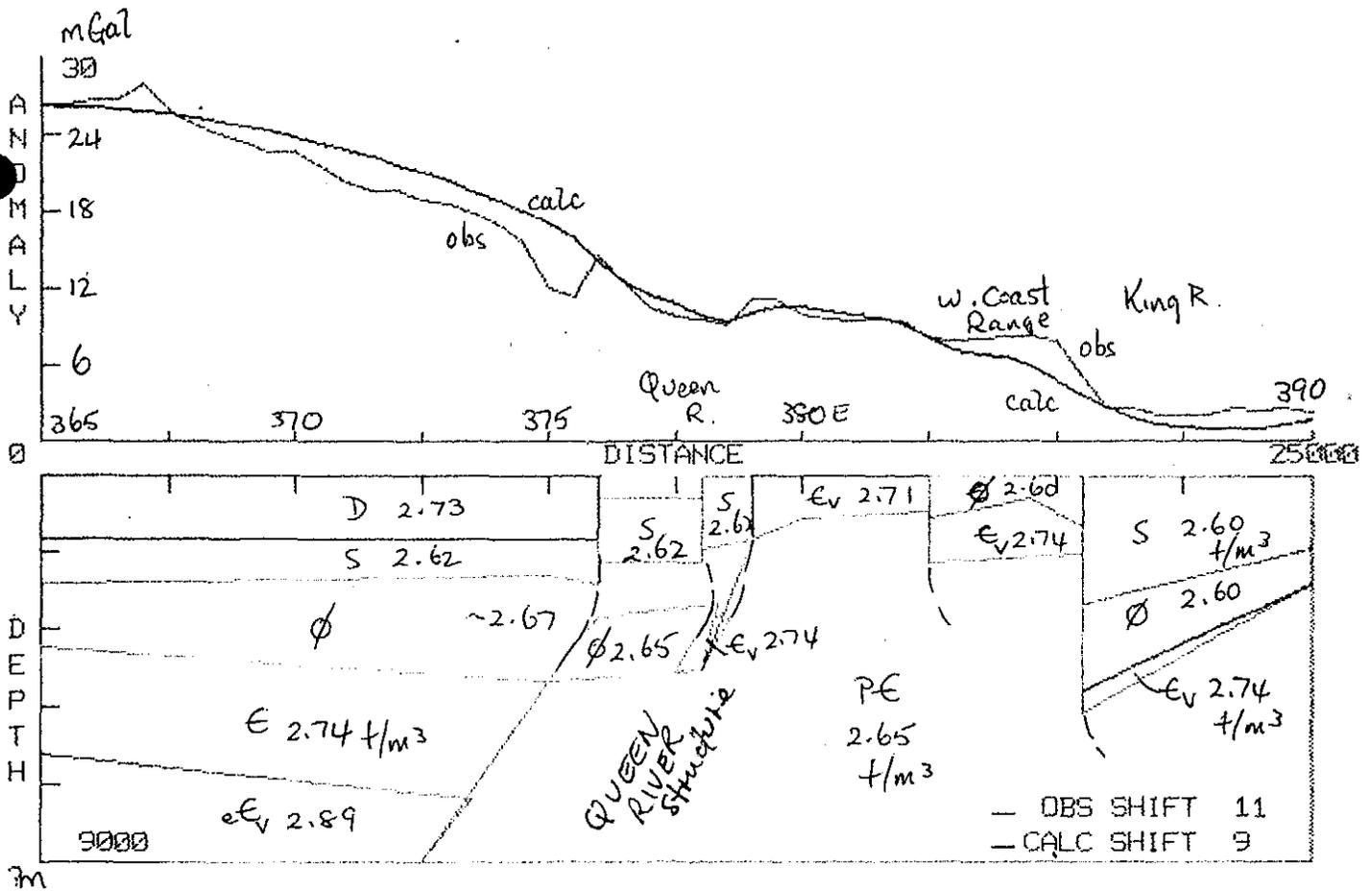


FIGURE 3

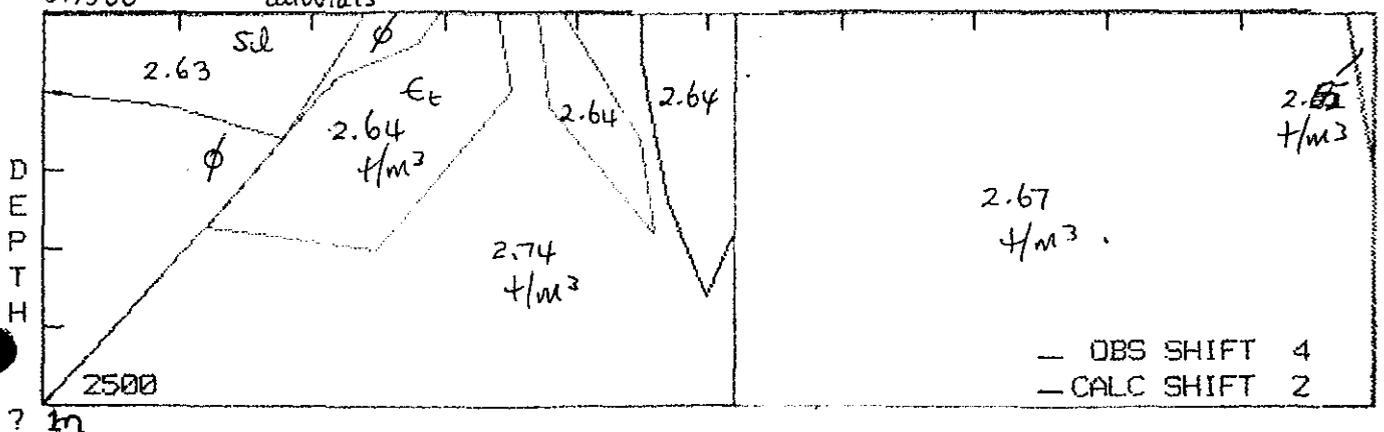
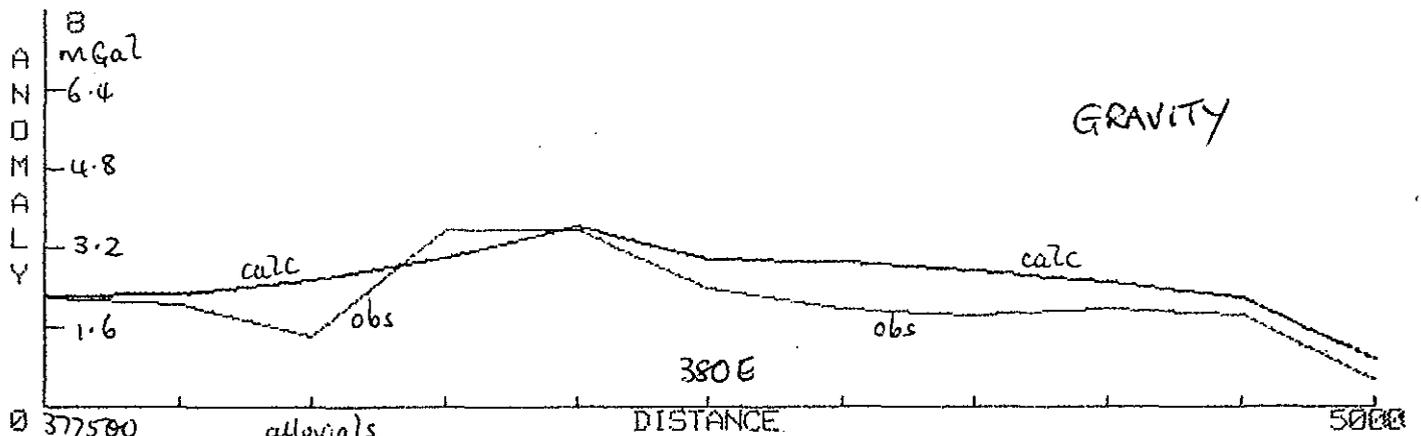
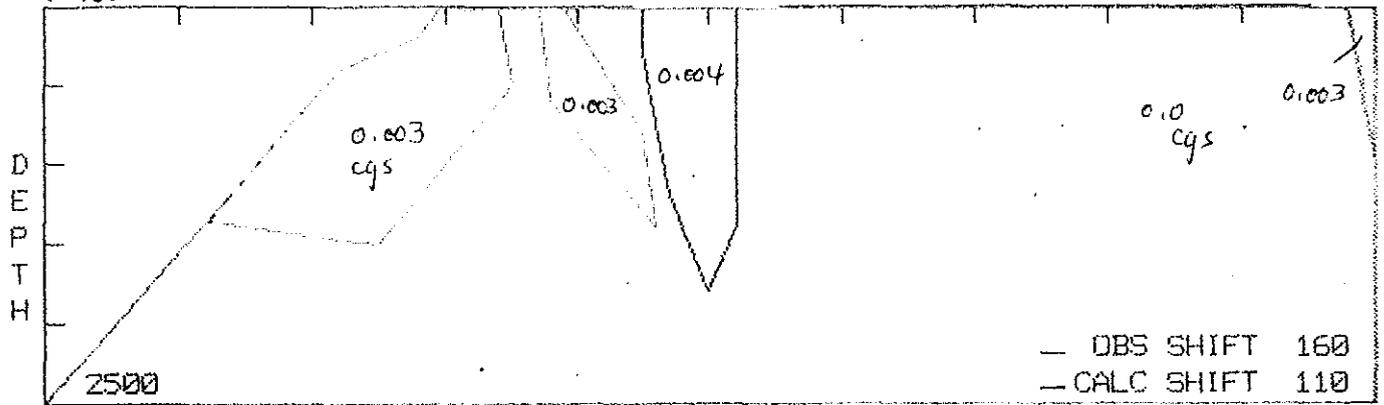
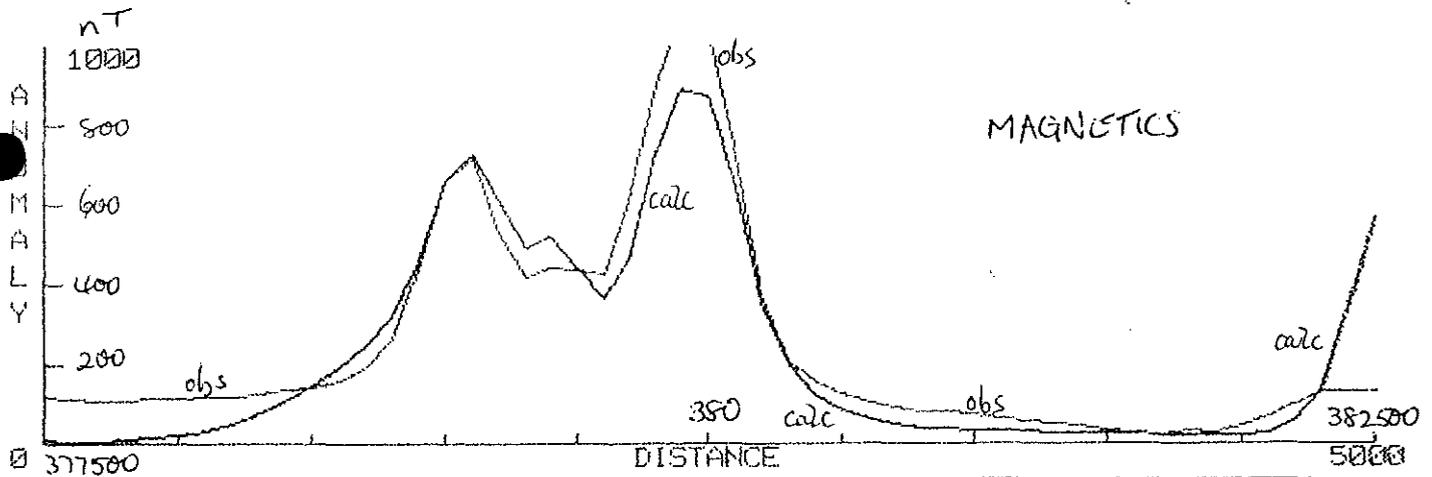
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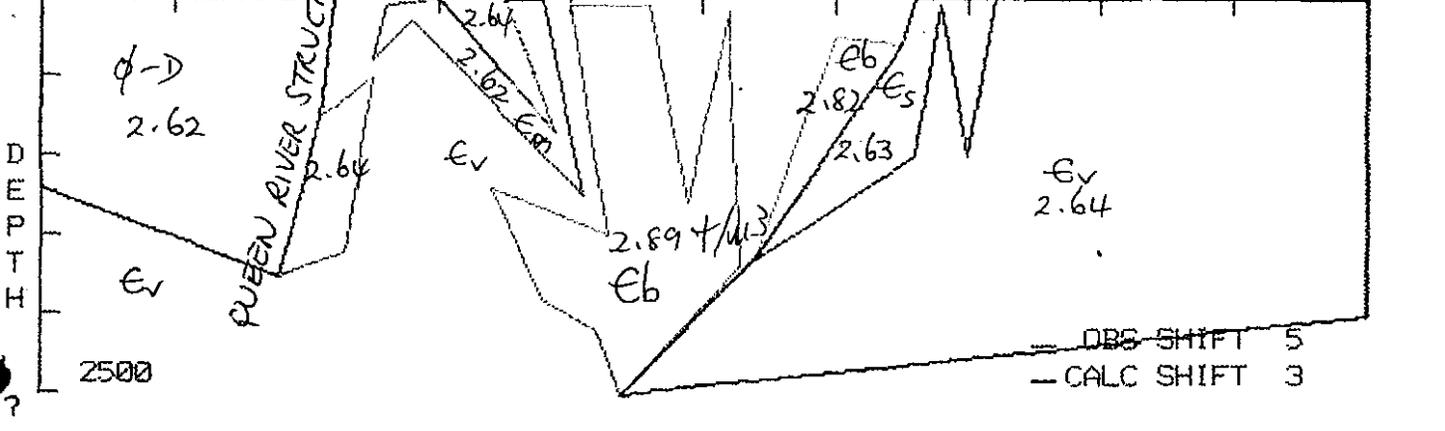
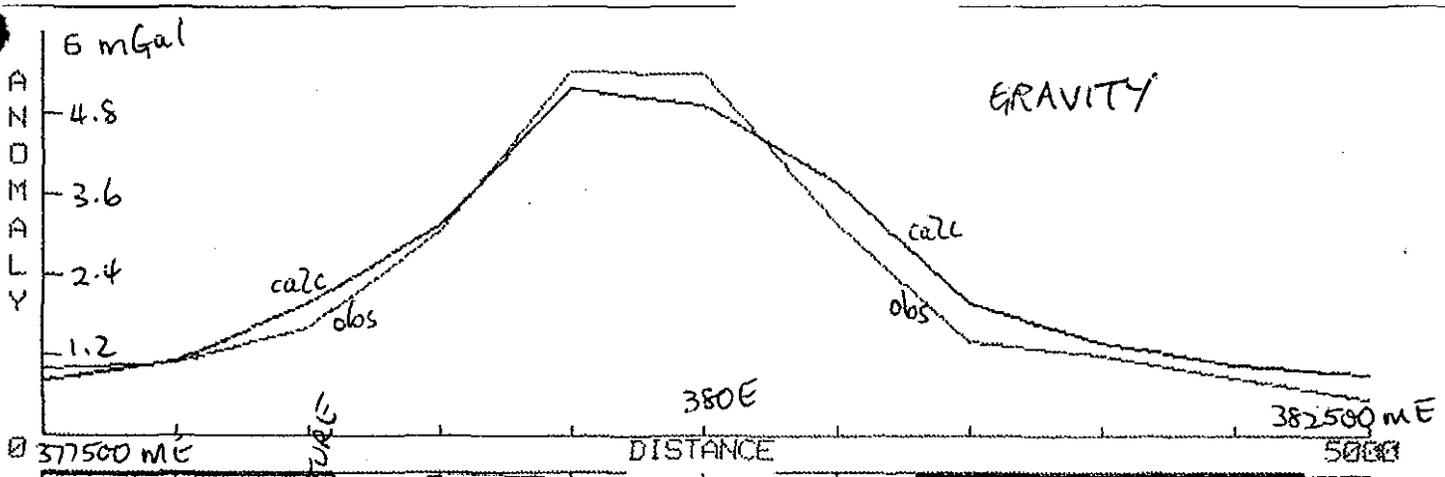
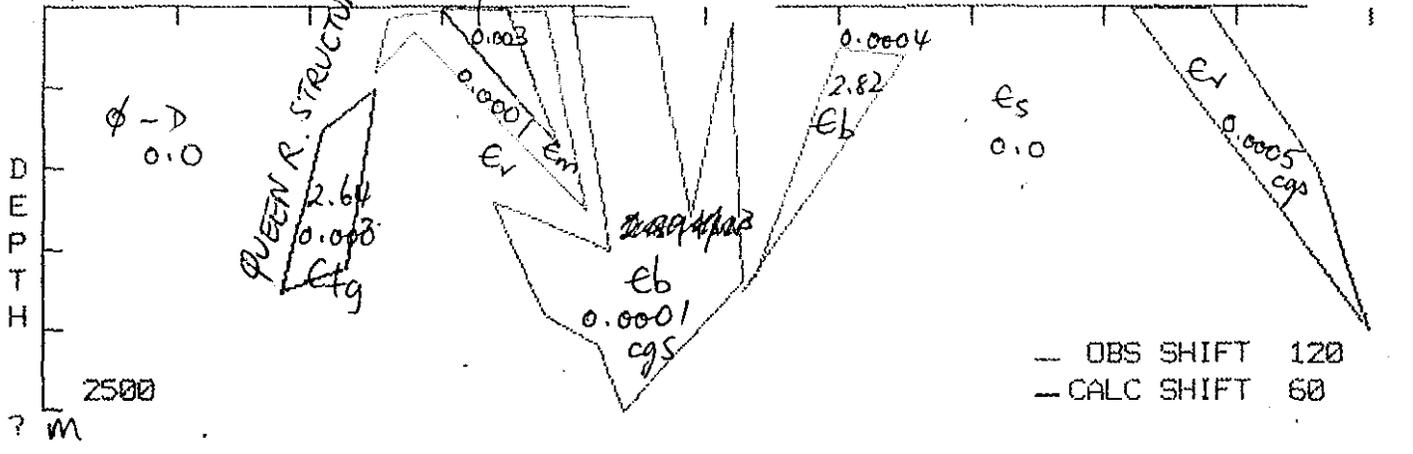
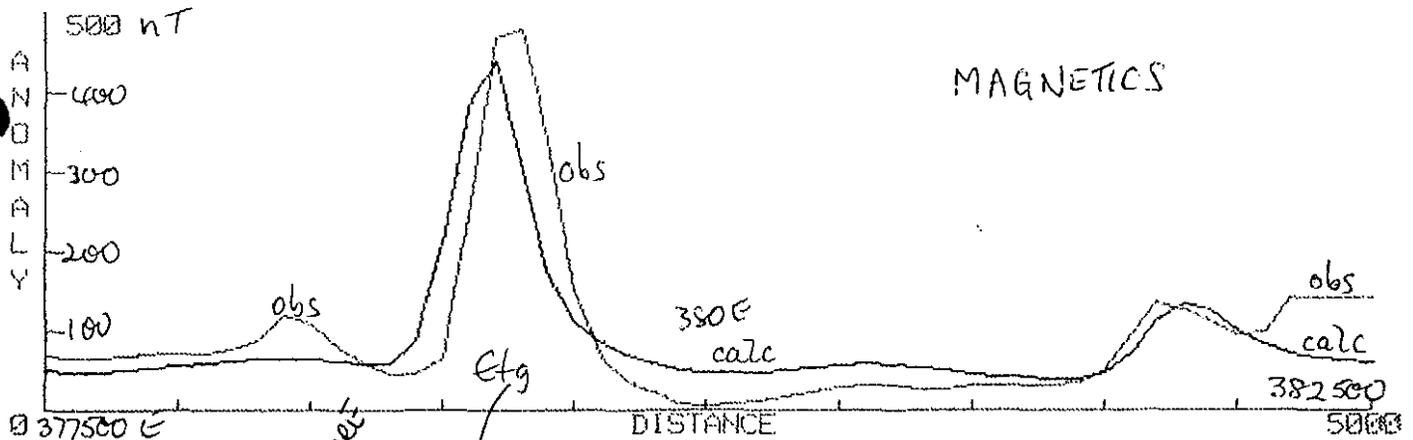
DEL
NW
91

REGIONAL RESIDUAL GRAVITY INTERPRETATION
WEST COAST RANGE 5338 000 MN

FIGURE 6



Del
NW41

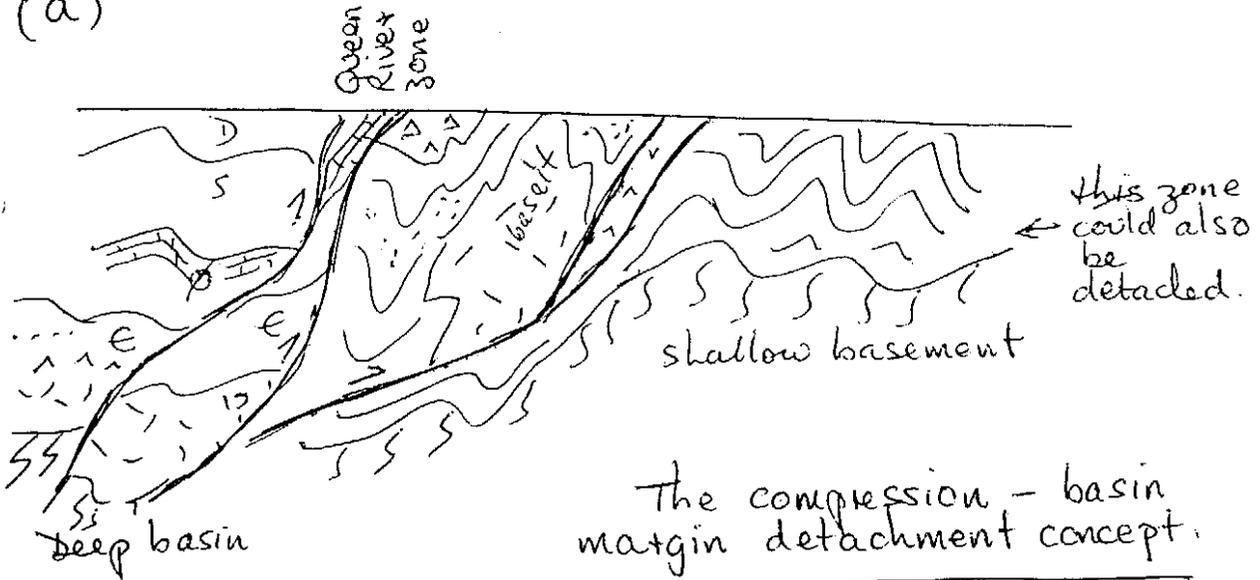


NW91

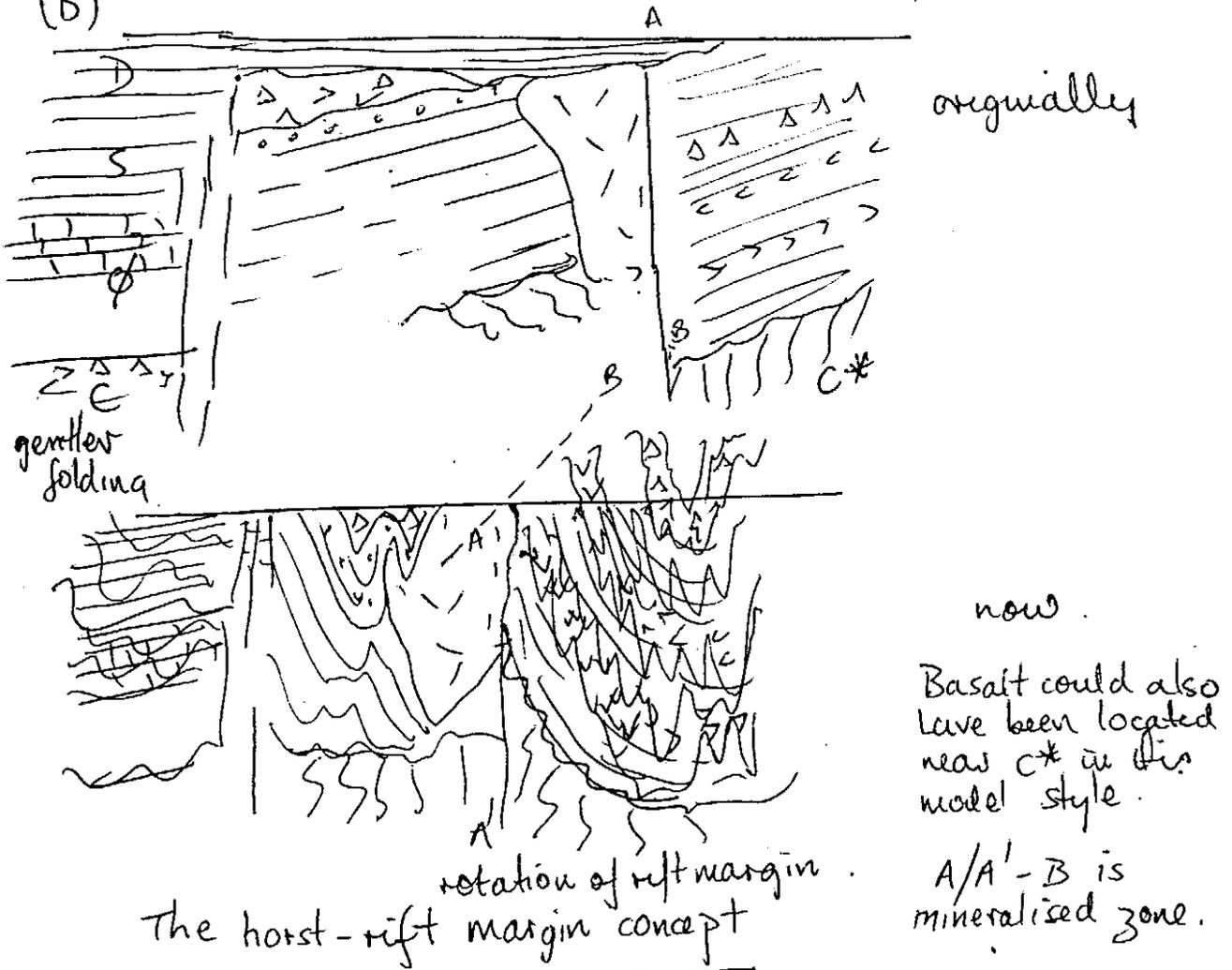
RESIDUAL GRAVITY AND MAGNETIC INTERPRETATION
EL 11/85 QUEENSTOWN 5337 000 MN

FIGURE 8

(a)



(b)



DEL
NW91

APPENDIX F.

LEAMAN GEOPHYSICS APRIL 1992 (GRAVITY)

Memorandum: Yolande River EL 11/85 Western Tasmania

Comments on implications of new gravity data

LEAMAN GEOPHYSICS

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

Registered office:

3 MALUKA STREET, BELLERIVE, TAS. 7018

All correspondence to:

GPO BOX 320 D, HOBART, TAS. 7001

Telephone: (002) 44 1233

Fax: (002) 44 6674

MEMORANDUM:

YOLANDE RIVER EL 11/85 WESTERN TASMANIA

ATTENTION: F. Fitzgerald
R. Poltock

DATE: April 8, 1992

COMMENTS ON IMPLICATIONS OF NEW GRAVITY DATA (Interim notes)

These notes have been provided as a basis of discussion for the forthcoming joint venture meeting. Review of the data is incomplete at the time of writing and some comments are likely to be varied when calculation and assessment has been completed.

Improved gravity coverage of the licence area was recommended by Leaman (1989, 1991) due to the very regional and gappy nature of the extant data base and the demonstrable large structures present. Lack of adequate gravity cover had restricted integration or testing of geological and magnetic interpretations. It was felt that any infills would serve to improve this situation in this relatively inaccessible area.

Figure 1 presents a compilation of gravity data across and around the licence area. It has been processed to a residual form as described in Leaman (1989) and the relevant portions of the diagram may be compared with Figure 8 in that reference. The use of an updated residual separation procedure does not introduce any significant changes in itself in this area; the modest improvement in coverage certainly does. Even so, the general features previously recognised have been confirmed with some modification in terms of precise location and marginal or bounding gradients.

The diagram also shows where the new data was acquired; near Henty Adits, near 5352 000 mN and Howard's Anomaly and across spurs south of White Spur. Large gaps in coverage persist and the data base remains generally inadequate for definition of many features still indicated as critical in magnetic interpretations.

The upgraded survey, however, has established

- a) the continuity of a NW-SE gradient through Mt Dundas,
- b) the distinct difference between the region north and south of Dundas,
- c) the limited scale of the Ewart Creek fault Block zone,
- d) the southward extension of negative anomaly from White Spur and the Hercules region,
- e) a generally north south pattern in the Henty Valley region which does not correlate with the mapped faults

positive than the Hercules-White Spur-Dundas region of the NW quadrant. Close examination of the diagram will show that there is also a change from strongly negative but high contrast field in the SE to less negative and lower contrast field in the NE of the region covered by the compilation in Figure 1. These four zones are defined in Figure 2.

It will be noted that these intersect near Newton Creek (Tyndall Mine and Howard's Anomaly). The alteration and mineralisation known in this area cannot be mere coincidence.....

If we consider the detail provided by the compilation and the new traverses which constrain some elements of the field it will be noted that the E-W zonation trends a little north of east and the orientation is repeated across the map in gross terms. When such trends are inferred and included as a sub grain of the gross regional element then both the Tyndall Mine and Howard's Anomaly can be shown to be associated with the intersection of such a trend and the Great Lyell Fault.

An extension of this approach also shows that the Henty Fault Zone gold mineralisation is related to a similar coupling of features above the southern margin of the underlying granitoid (below).

Although the specifics of these features of the gravity field are not well defined in local terms the gross trends and approximate positions are relatively unambiguous and the consequent associations must be presumed to be more than accident.

The Henty Fault system is not clearly reproduced or reflected in the gravity field. It is ghosted north of 5361 000 mN but there is not clear representation to the south - for either arm of the fault zone.

The pronounced E-W gravity boundary at about 5356 500 mN can be traced westward. It represents an eastward extension of the Little Henty Fault and implies major changes in geology to north and south. These are easily inferred in this area and are only terminated by the Great Lyell Fault in the southern zones. The situation is far more complex to the north of the Little Henty Fault system.

The structural grain to the north of 5356 500 mN contains many NE and NW trending elements. Some are profound, such as that north of Dundas. This feature is also terminated by either the Little Henty or Great Lyell Faults near Newton Creek.

South of the inferred continuation of the Little Henty Fault the grain is almost N-S. Improved coverage may show

and coherent explanation of the Henty Fault System can also be suggested.

The North Henty Fault curls asymptotically into the alignment of the Little Henty Fault which was clearly the older and more fundamental feature. It may even have been an original Cambrian thrust ramp with the E-W element being the structural margin. Developments in the zone south of the Little Henty Fault were N-S and both the Great Lyell and the structure controlling mafic and basin development near 376 000 mE were opened along it. Later reactivations (both Cambrian and Devonian) have thus used both segments and orientations. This accounts for the offsets along both the North Henty and Great Lyell Faults. The lack of major character changes in either sequences or structures near the South Henty Fault demonstrates that this part of the structure is relatively minor. Most Devonian movements from the north were translated to west and south by the older structures comprising the Little Henty Fault system and the basin structure west of Henty Adits.

The gross relationship between these features, displacements and the location of the major granitoid would indicate that it might have been the driving force in all these secondary motions.

The large negative values of the residual field east of the Great Lyell and unified Henty Fault zones are at least partly related to the Ordovician rocks of the range. The anomalies do indicate substantial thicknesses and thus imply east side down faulting prior or during deposition which opposes the indicated west side down faulting of the primary basin developments during the earlier Cambrian. Such reversals of sense clearly make for an attractive long-lived structure in exploration terms. Especially where these intersect structures of comparable magnitude and age. The great bend in the Great Lyell Fault is just such a site. The only issue relevant to Pasminco Exploration is just how much eastward displacement has there been? Given subsequent shearing and detachment (Leaman, 1991) any in situ target must lie west of the Great Lyell Fault along the axis of the Little Henty Fault. (Or at comparable sites and relative locations on other elements of the structures described above) Is such a site still within EL 11/85?

HENTY ADITS

As noted above, this site lies near the intersection of a primary N-S structure related to original Cambrian basin formation and a secondary magnitude ENE offset. While the former structure is well defined in terms of the existing data base the latter is not. Its location can be inferred approximately from sympathetic features to west and east.

intersections and trend changes. These are indicated in Figure 2.

WHITE SPUR ZONE

This region is more complex and less readily assessed in general terms.

New traverses define a spur of modest negative effects south and east of White Spur Creek (Figure 1).

The western side of the feature is not well defined at about 375 000 mE and available data and contouring suggest that

i) parts of the effect follow NNW-SSE fold trends and axes, as near 5361 000 mN and 5362 500 mN with a possible offset to ENE at about 5362 000 mN. This does not appear to be an artifact of current coverage.

ii) the overall gradient; i.e., its limits, is more N-S at about 374 500 mE. This correlates with extension of several major structures passing across White Spur east of Moore's Pimple. These structures are compound, some involve ultramafics and all lie in the zone less than 2 km east of what must be the major late Precambrian internal structural axis - Tyennan to Oonah - which can be traced from Birch Inlet to Waratah (at least). The gradient described here is parallel and can be related to splinters from this feature. If any of these inferences are valid then a major structure has been locally defined. Its signature becomes more diffuse across the granite axis crest near 5367 000 mN but it is still evident and can be traced 1 km west of Williamsford.

Dislocations along and near this zone, which includes ultramafics, face west. (A contrary aspect is described below)

iii) the zone is truncated by a NW-SE feature at 5359 000 mN. This structure limits the granite near Dundas and is intimately associated with mafic complexes in the Dundas and Serpentine Hill regions. It forms a structural boundary.

Available gravity and magnetic data could be pattern read to imply up to 4 km dextral or 5 km sinistral motion. This cannot be determined by simple inspection but any sense of shear will have fundamental ramifications for assessment of this area - either in terms of deformation through its history, or by concealment of much section in the blocks about it but north of the projected old Little Henty Fault zone.

field. Simple interpretation methods must be suspect but results can be contrasted with those for 5351 300 mN (Figure 10, Leaman, 1991). The results are very different.

Precambrian basement must be relatively shallow and it is the change in Precambrian extent and depth range which generates much of the zonal changes marked in Figure 2. The original Little Henty Fault is now shown to be far from little.

The basement forms shown are required. Note that use of magnetic implications and east facing ramps. This type of structural pattern, with two sets of detachments given the dips and folding of exposed units, is similar to that which has been deduced south of Macquarie Harbour and near Zeehan.

The model allows nothing for the gravity effect of the granite mass to the immediate north. Consequently any calculated curve shift must be greater than 2 mGal. Any increase beyond neutrality (3 mGal) implies a greater depth to basement or some adjustment to the overlying Cambrian section.

The model probably displays the minimum depth. Estimates of the effect of the granite suggests that some trade offs are possible and that the basement could lie up to 1500 m deeper. The exact change depends on inclusion of higher densities for the Cambrian section since the densities displayed are perhaps 0.02 to 0.03 gm/cc lower than measured or usually used. These balances could adjust the granite effect; some of which may (has) already have been done by use of the current properties.

The key finding, however, is that the Tyennan basement type extends west to about 375 000 mE beneath the northern part of the area at relatively shallow depths and that it has been multiply sliced. This situation is not reproduced south of the inferred continuation of the ancient position of the Little Henty Fault.

If the impact of granite is relevant to this profile, and capable of generating much uncertainty, then the problem is compounded further north - until profiles are wholly above shallow roof.

In order to assess how such profiles should be shift matched the actual effect of the granite was estimated. This was done by using the best current 3D concept for the Pine Hill - Granite Tor Granite. Much of the preliminary work for this model was outlined by Leaman (1990). The new data, improved separations and better magnetics coverage have all combined to show, as noted earlier in these notes, that the SE face of this granite trends ENE and not ESE as previously inferred.

It was assumed that the gravity effect due to granite was consistent along the profile (approximately so). Due to doubt as to the precise shifts resulting from this assumption the model presented is simply intended to convey projections about shallow relationships.

The gravity and magnetic data used for these models are as observed and have not been compensated to provide a defined reference level. Thus the gravity data apply from surface and the magnetic data from a clearance of 120 m. Consistent terrain levels mean that no major corrections are required.

The gravity data, in isolation, are inadequate to resolve many features but the magnetic data are varied across the same formations. This indicates continuity of suites like the Jones Creek Package - and a steep westerly dip overall. The magnetic response near 376 500 mE is characteristic and unambiguous. Yet the source can only be barely exposed - if at all. If this is part of the central volcanic sequence and there is no detachment involved then most of the source lies beneath the White Spur Formation (given dips mapped and supplied by R. Poltock).

Those dips and this interpretation are contrary to all discussion and implications given in AMIRA P291. Only east of 377 500 mE can east facings be included - and the Jones Creek Package (?) continues beneath.

Gravity data are not conclusive but will support this view. If the worst fit option is taken, such that the profile is matched at its ends, then the whole central zone must be altered or there are substantial uncompensated granite effects. This is unlikely, since some of the gradients are too abrupt, but the issue can only be resolved by careful mapping.

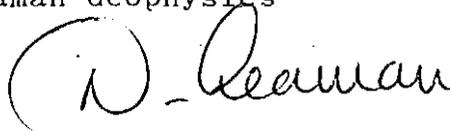
All the material available to me at this date (Mines Dept - MRV mapping, project P291 and R. Poltock notes) is highly contradictory and most is suspect if one uses the implications of the geophysical data (magnetic data especially) as a test.

I recommend further work and await consistent and detailed formation mapping.

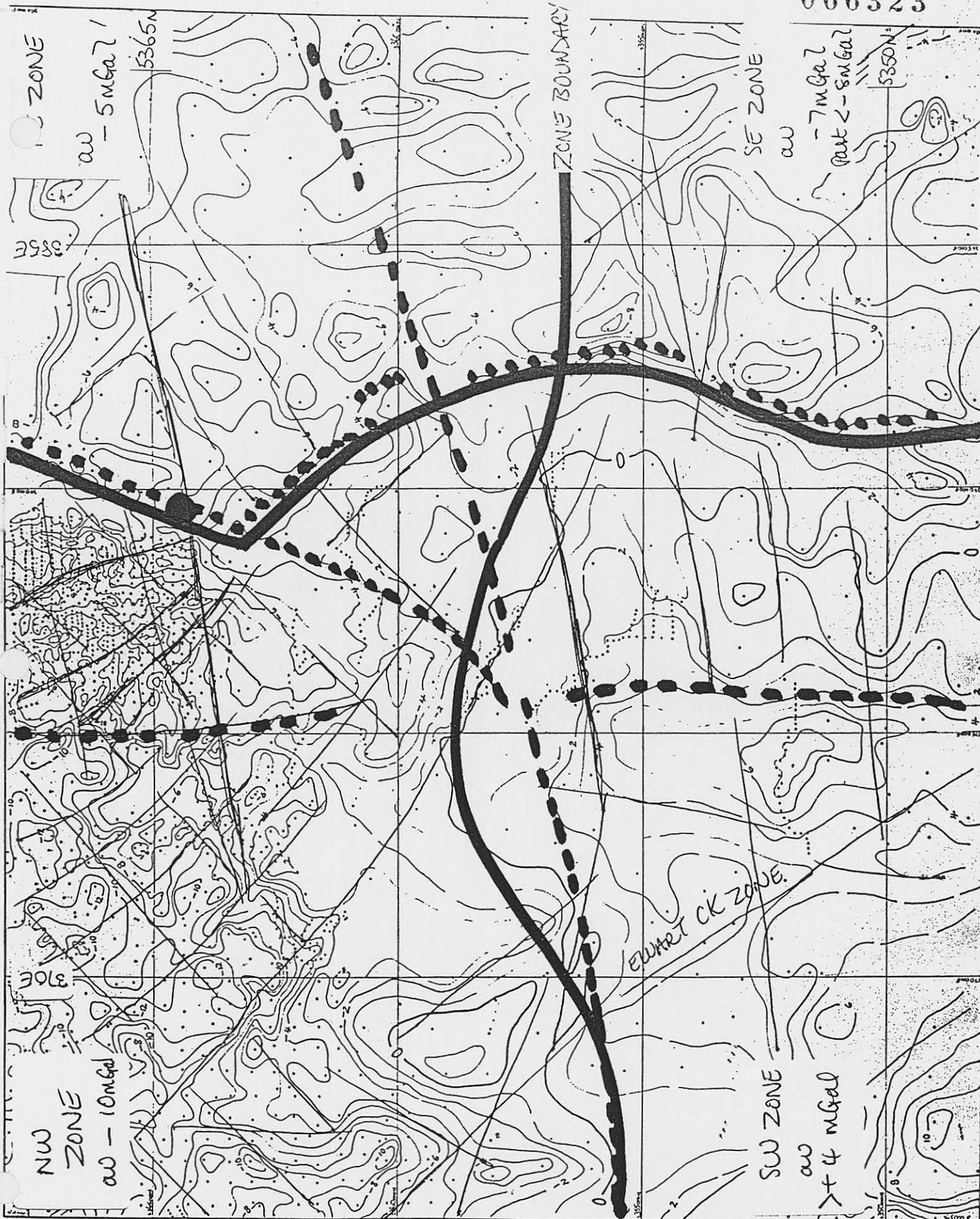
It should be remarked that there are also clear inconsistencies in the Mines Dept maps of these units and their geophysical responses. Either the units are variable (and of exploration interest) or they are not as mapped. All members of the White Spur Formation generate "anomalies" of this type as any comparison of the current mapping and the magnetic field will show.

Leaman, D.E., 1991. EL 11/85, Yolande River (Henty).
Interpretation update. Report for Pasminco
Exploration by Leaman Geophysics, September.

Notes provided by D. E. Leaman, on behalf of
Leaman Geophysics

A handwritten signature in cursive script that reads "D. E. Leaman". The signature is written in black ink and is positioned below the typed name.

April 8, 1992



RESIDUAL BOUGUER ANOMALY HENTY REGION

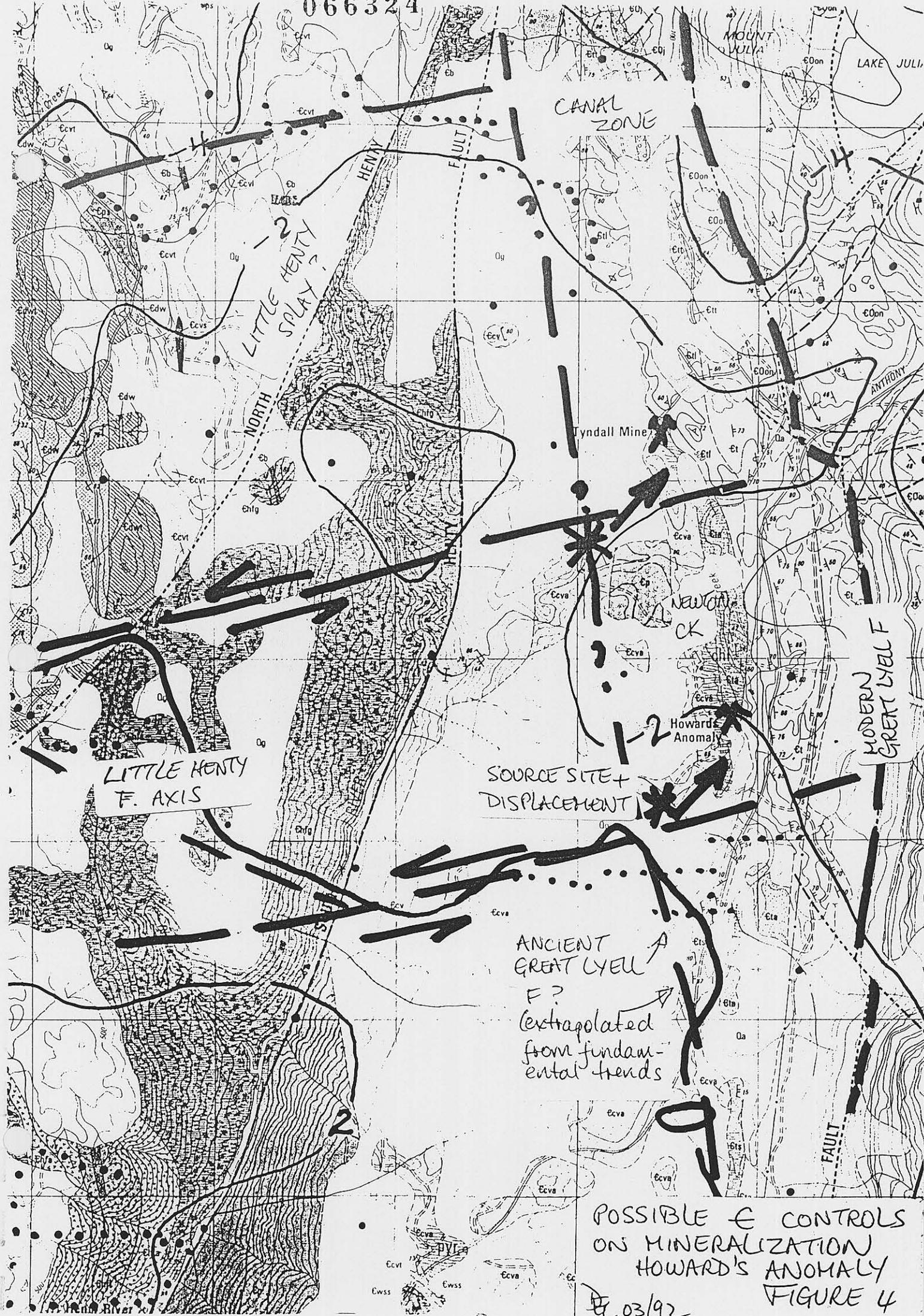
(from MANTLE91 separation)

INFERRED TREND PATTERNS and ANOMALY ZONATION

FIGURE 2

03/92

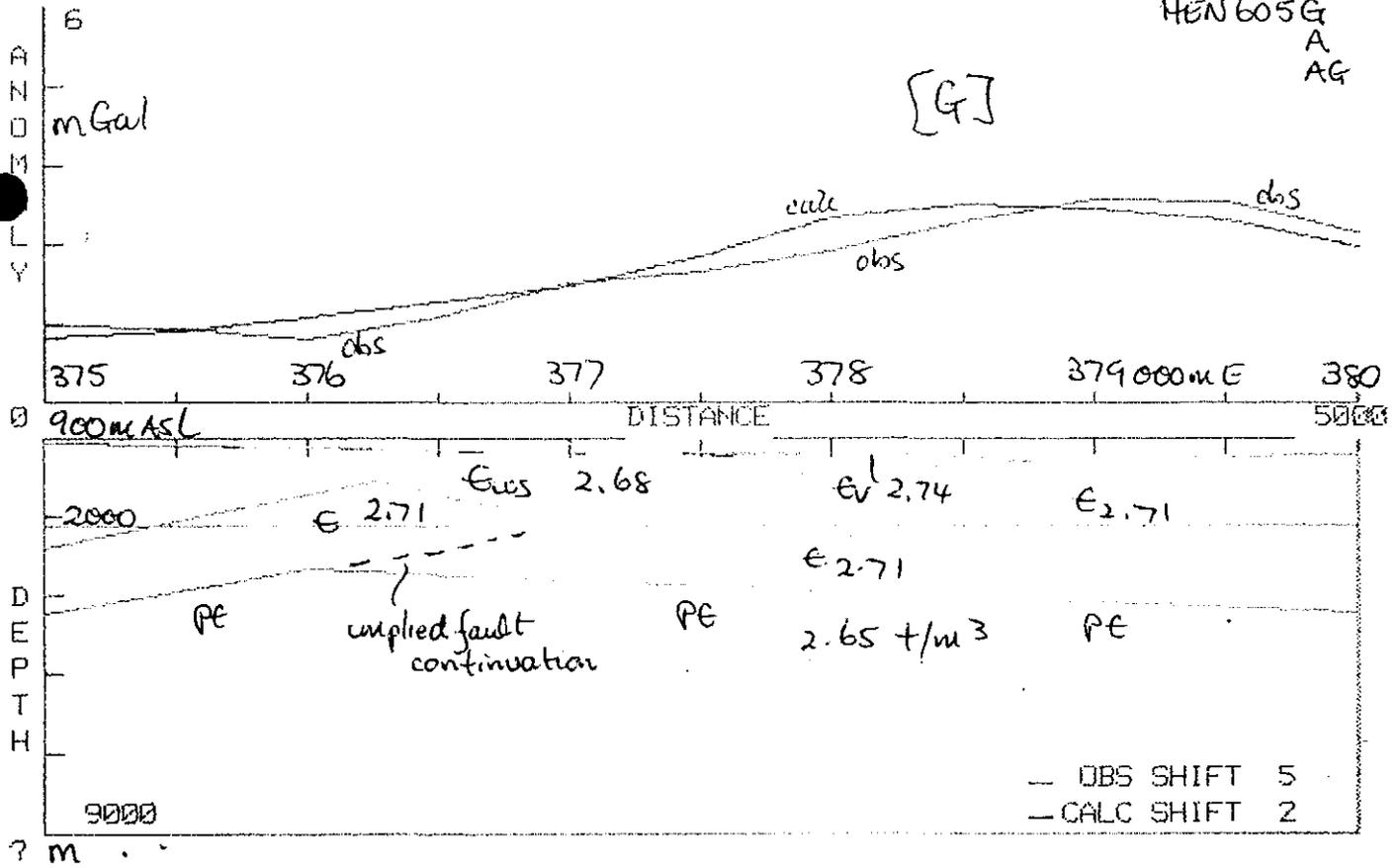
066324



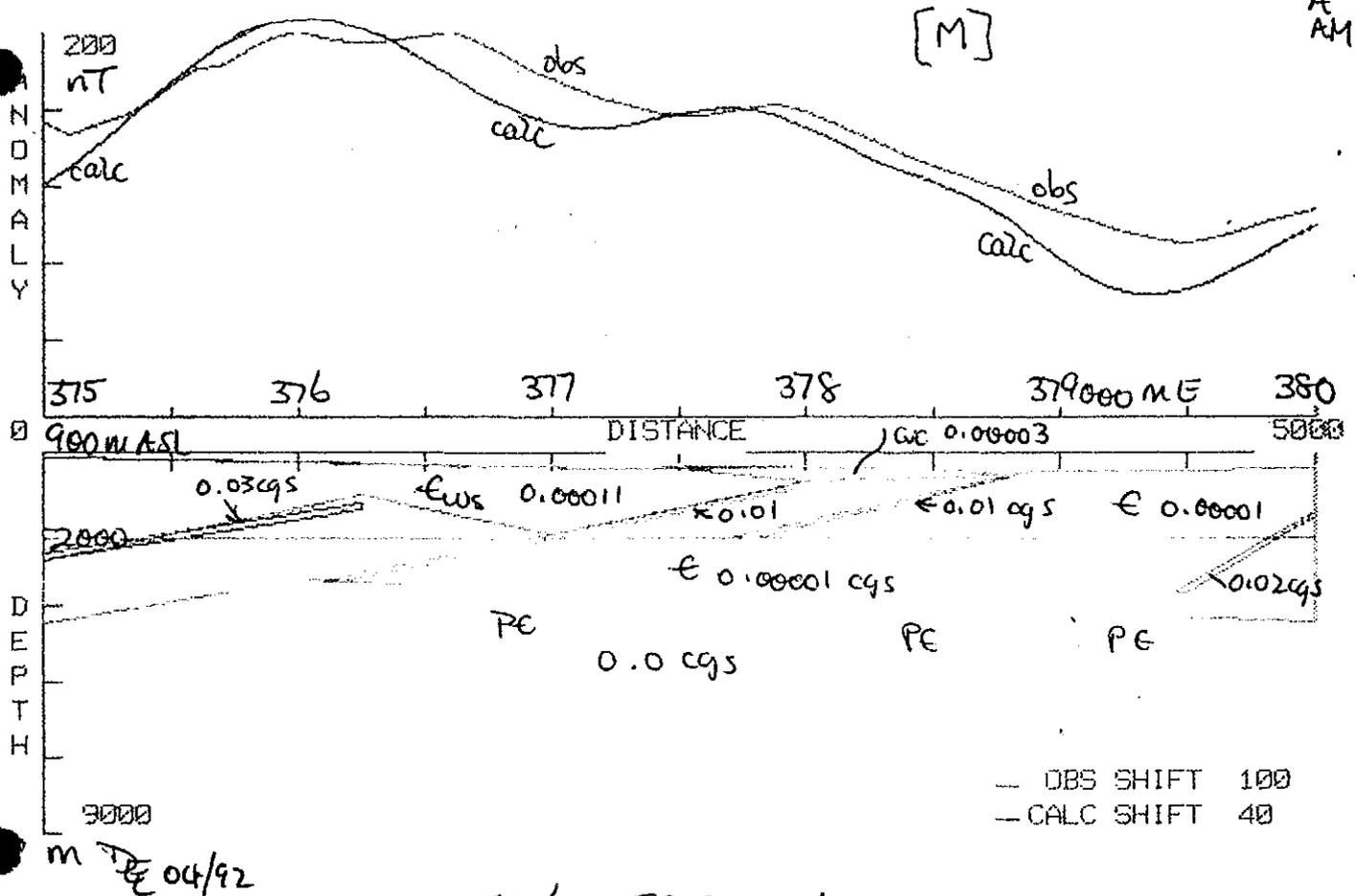
POSSIBLE ϵ CONTROLS
ON MINERALIZATION
HOWARD'S ANOMALY
FIGURE 4
03/92

066325

HEN 605G
A
AG



HEN 605M
A
AM



5360500 m N

FIGURE 6

066326

RR#3363 N
HEN 363 B
CG

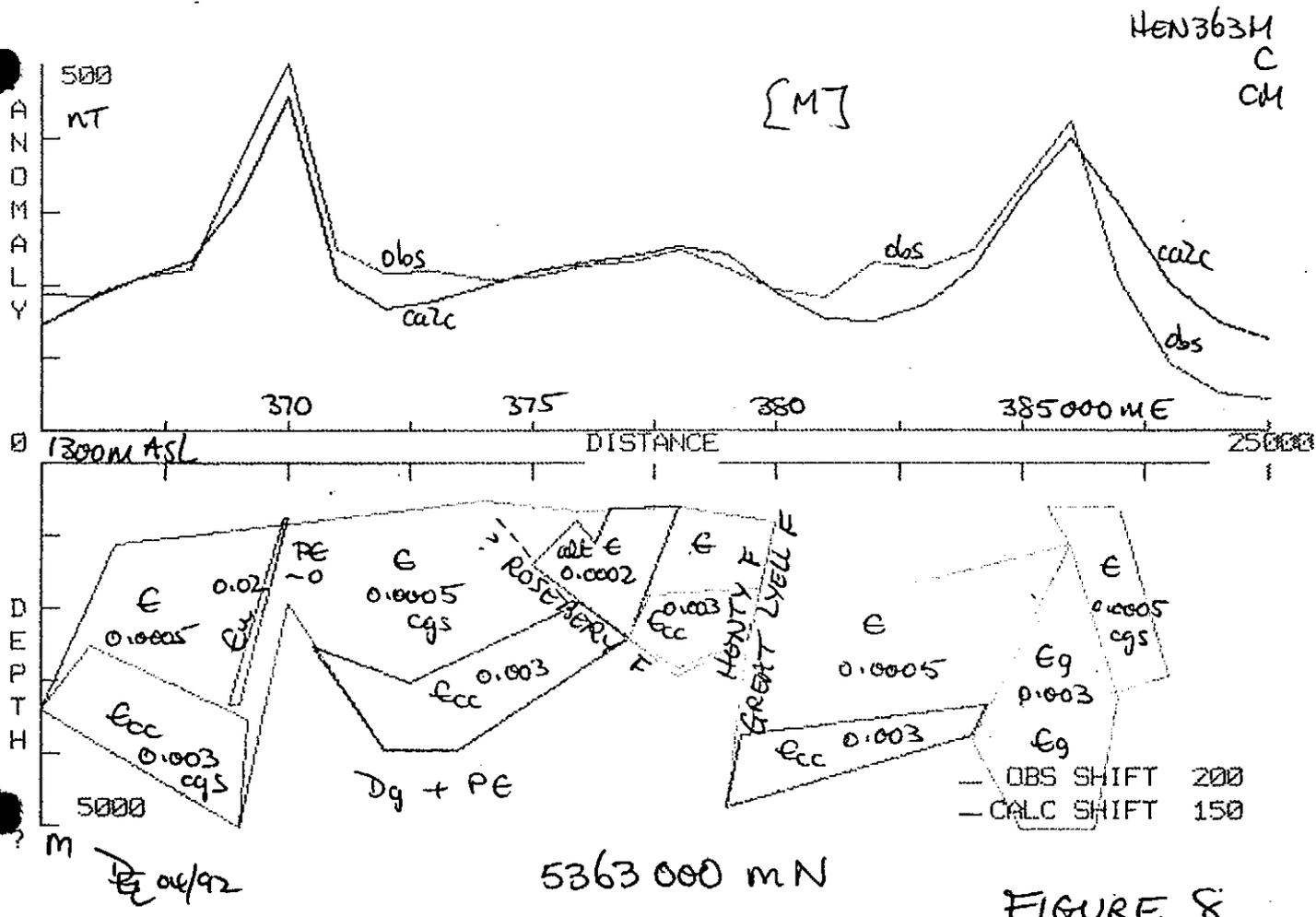
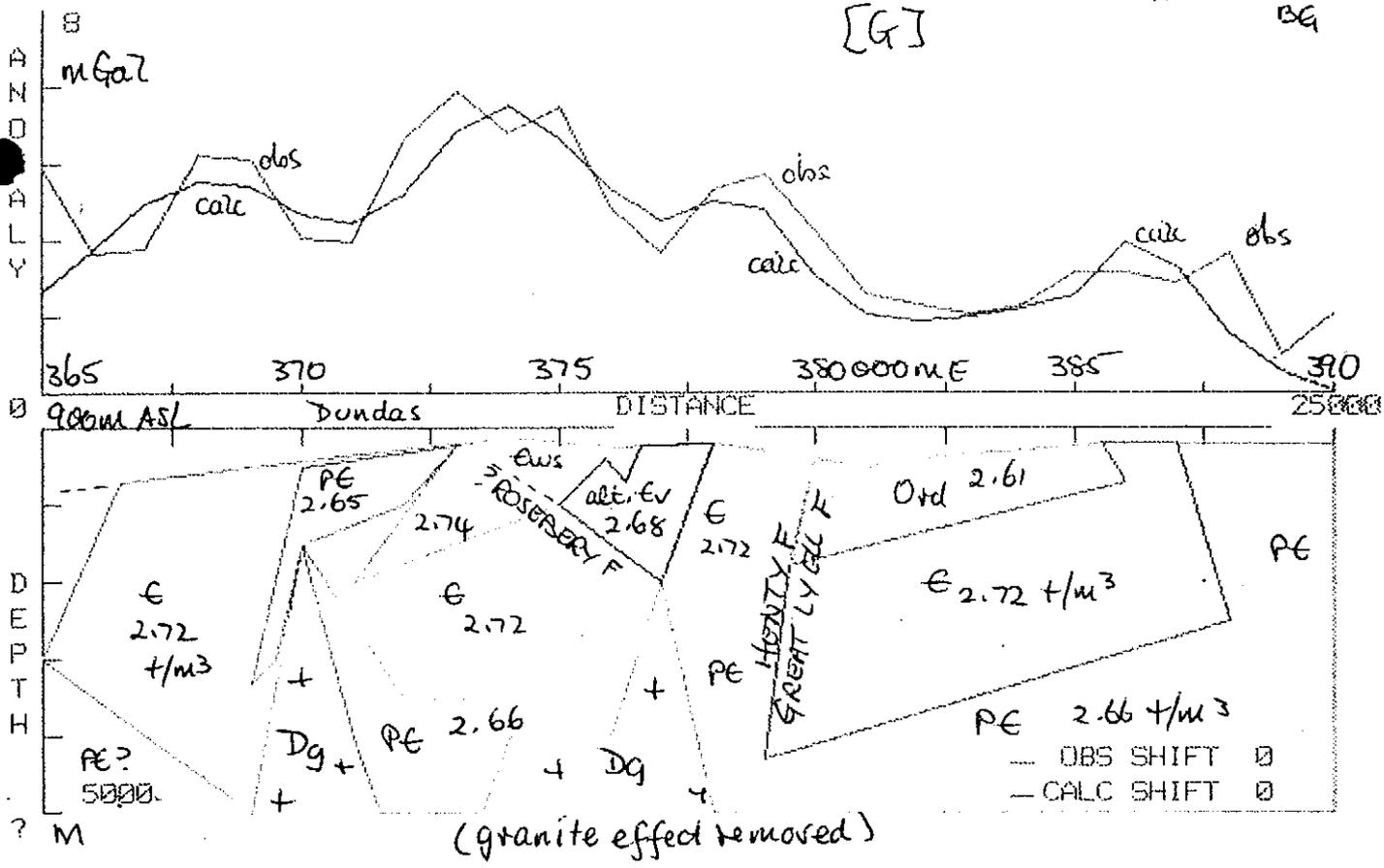


FIGURE 8

APPENDIX G.
CRAWFORD PETROGRAPHIC REPORTS

066328

PETROGRAPHIC REPORT
ROCKS FROM NEWTON CREEK AREA FOR PASMINGO

Attn Roger Poltock and Fergus Fitzgerald

Tony Crawford
Dept of Geology
U Tasmania, 26/6/92

- 32850A Volcanogenic sandstone derived from altered glassy felsic lavas, including prominent chloritized glassy clasts.
- 32850B Quartz-rich greywacke derived entirely from pelitic metamorphics; correlate of Miners Ridge Sandstone
- 32860 Weakly foliated, recrystallized basaltic(?) lava or fine-grained dyke
- 32866 Sericitized plagioclase+quartz-phyric vitric tuff
- 32867 Holocrystalline dioritic intrusive rock.

ROGER:

Pertinent to your questions, it is clear from the descriptions that it is totally out of the question that samples 60, 66 and 67 are the same lithotype (see above). Sample 67 is definitely intrusive, 66 is definitely a vitric crystal tuff, and basaltic or andesitic sample 60 seems unlikely to be related to either of those. The latter probably comes from a fault zone and has recrystallized, masking its original identity. Geochemical data would give us a bit of a hand here, but I don't believe that it could be related to 66 or 67.

The dark clasts in 50A are definitely totally chloritized formerly glassy felsic lava; given the extent of fabric destruction during such intense chlorite alteration, I am not sure that you could rule out whether the precursor felsic volcanic was a lava or a vitric tuff (such as 66), but I think a lava is more likely. So I don't think the dark clasts in 50A are similar to any of 60, 66 or 67.

The sample 50B is clearly a perfect analogue of the Miners Ridge Sandstone. I have no idea of the stratigraphic implications (or complications) that such an assignment demands, but I am absolutely sure of the petrographic assignment, right down to the detrital chromite. Both the sphalerite and the pyrite disseminated through the rock are post-depositional, and not detrital.

SUMMARY:

This rock is a devitrified volcanogenic sandstone derived entirely from felsic plagioclase+quartz-phyric lavas and vitric ashes and tuffs, with prominent totally chloritized lithic clasts.

HAND SPECIMEN:

This is a felsic volcanoclastic with 1cm-sized dark shale or chloritic(?) metavolcanic clasts in a matrix that contains detrital altered feldspar phenocrysts.

THIN SECTION:

This is a volcanoclastic sediment derived entirely from vitric felsic lavas. The most distinctive feature of the hand specimen, the cm-sized dark clasts, are seen to be almost totally chloritized plagioclase-phyric once-glassy lavas. They contain albitized plagioclase phenocrysts to about 1mm long, and rare resorbed quartz phenocrysts set in a very uniform-textured and exceedingly fine-grained chloritic matrix that undoubtedly replaces glass. These chloritized lithic clasts were clearly originally glassy felsic lavas, and are transected by tiny wavy veinlets of silica. Other lithic clasts present in the rock are also devitrified plagioclase-phyric felsic lavas, but these lack the prominent chloritic alteration that characterizes the largest, darkest-coloured clasts. Rather, the glass has devitrified and recrystallized to a quartzo-feldspathic mosaic. Much of this rock is composed of a matrix of broken plagioclase and quartz phenocrysts set in devitrified and variably altered ash. Similar alteration of the ashy matrix and groundmass of the lithic clasts has resulted in *very poor definition of the margins of the clasts*. Weak sericite alteration affects many plagioclase crystal fragments, and streaky sericitic alteration of the formerly vitric ashy groundmass forms a very irregular and weakly developed foliation. The strong chlorite alteration of the dominant clasts in this sandstone clearly preceded erosion and deposition of the sediment.

SAMPLE NUMBER: 32850B

SUMMARY:

This rock is a quartz-rich greywacke, identical to typical Miners Ridge Sandstones, dominated by detrital quartz and muscovite from pelitic metamorphic rocks. It contains common disseminated sphalerite and pyrite.

HAND SPECIMEN:

This is a fairly fine-grained, massive dark grey sandstone with disseminated fine-grained sulphides.

THIN SECTION:

This is a massive quartz-rich greywacke with weak and rather irregular bedding defined under the microscope by the ratio of framework grains to matrix. Most of the sample is almost framework-supported greywacke dominated by angular grains of quartz, mainly less than 0.1mm across, that make up about 60-70 modal% of the sample. A remarkable feature of this rock is the complete range of roundness shown by the quartz grains. Most single quartz grains are quite angular, and these dominate the detrital grain population. However, not at all uncommon are perfectly spherical to ovoid grains, from $\ll 0.1$ mm to about 0.3mm diameter, composed of intimately sutured chalcedonic silica. These almost look like 'liberated' silica-filled vesicles, except that I'm sure they're not, since there is no other sign of any volcanic input in this sediment. I have no concrete explanation as to what these ovoid silica blebs are. At first glance they appear to be detrital, but careful examination indicates that they may well have grown from the silica-rich matrix of the rock, in the manner of 'micro-concretions'. Evidence for this is that many have narrow rims of chlorite or insoluble opaques that would have accreted onto the outside rim of the growing accretions, as well as minor indentations where angular detrital quartz abuts them.

Another important feature of this greywacke is the abundant detrital muscovite, as flakes up to 0.4mm long, and making up perhaps 2-3 modal% of the rock. These are randomly orientated, often partially chloritized, and occasionally occur embedded in a quartzose aggregate; they are clearly derived from pelitic metamorphic rocks. Other detrital grains of interest are a few small schistose lithic fragments, not uncommon greenish tourmaline, and at least two red chromite grains. These are easily distinguished from the common sphalerite (see below) and pyrite by their sharp grain boundaries and deep red colour.

The matrix of this sample is very fine-grained irresolvable silt containing abundant trains of very fine-grained opaques that define stylolites of insoluble material formed during compaction-dissolution of the matrix. Disseminated sulphides are not uncommon in this rock. Deep

honey coloured sphalerite and pyrite are about equally abundant (each < 1 modal%); sphalerite occurs as highly irregular-shaped blebs and small patches, often rimmed by quite crystalline green chlorite.

REFLECTED LIGHT

In reflected light, this section shows several interesting features. Of particular note are abundant small (<0.1mm across) pyrite framboids that have grown from the rock during diagenesis or early stages of hydrothermal alteration. About equally as abundant as the framboidal pyrite, and often almost side by side with the framboids, are well-formed small idiomorphic crystals of pyrite, which often cluster together in small aggregates. Sometimes intergrown with this crystalline pyrite are subordinate amounts of chalcopyrite and galena. The galena is unusual, being slightly anisotropic and lacking the characteristic triangular pits; if I wasn't so conservative I might suggest that this is a bismuth sulphosalt, but I have no idea what that would be doing in this rock. The sphalerite noted in transmitted light forms disseminated amorphous small patches, and is not intergrown with pyrite at all.

The abundance of sulphides in this quartz sandstone is certainly unusual. The presence of framboidal pyrite might suggest that the rock was quite reduced, with an abundance of small bugs or whatever produces the pyrite from interstitial Fe and seawater or pore water. One hypothesis might be that hydrothermal alteration has dissolved a certain amount of the framboidal pyrite, which has then recrystallized more slowly as well-formed pyrite aggregates. I am not sure how the common sphalerite fits in, but the abundance of both sphalerite and pyrite in this rock implies some hydrothermal alteration of the original rock.

SAMPLE NUMBER: 32860

LOCATION: Newton Ck area

SUMMARY:

This is a weakly foliated, recrystallized aphyric basaltic rock. Although recrystallized, it was probably a basaltic lava or fine-grained dyke.

HAND SPECIMEN:

This is a dark green-grey weakly foliated metavolcanic with dark oxidation on major fractures.

THIN SECTION:

This sample is completely recrystallized, and now composed of a weakly foliated and quite fine-grained intergrowth of chlorite, sericite and subordinate quartz. Tiny lensoidal chloritic patches are pervaded by an anastomosing fine-grained sericite mesh, and quartz is present only as occasional small angular secondary patches and veinlet filling. Trains of very small Fe- or FeTi oxide grains have grown parallel to the weak foliation. No sign of former phenocryst minerals is preserved. Strong oxidation along fractures in the sample has oxidized chlorite, and altered sericite to clayey material that is itself Fe-stained.

I would expect that in a rock such as this, sheared and stretched phenocrysts might still be evident if originally present, so I conclude that this rock was probably aphyric. The abundance of chlorite and sericite, and paucity of quartz suggest that this rock was basaltic, and to make further assessment of its affinities, a chemical analysis would be necessary. Recrystallization during deformation precludes a positive diagnosis of this sample, but I think that it was almost certainly fine-grained, and therefore either a basaltic lava or a fine-grained basaltic dyke rock.

SAMPLE NUMBER: 32866

SUMMARY:

This rock is a quite strongly sericitized sparsely plagioclase+quartz-phyric felsic vitric tuff.

HAND SPECIMEN:

This is a pale creamy-coloured strongly sericite-altered plagioclase-phyric felsic volcanic or volcanoclastic rock.

THIN SECTION:

This rock is a strongly altered vitric tuff. It contains about 5-8 modal% of broken phenocrysts of albite and subordinate quartz, all less than about 1.5mm long, set in a devitrified glassy matrix that has recrystallized as a fine-grained, fairly uniform-textured quartzo-feldspathic mosaic now pervaded by sericite. A few lithic clasts are obvious, all being also formerly glassy felsic volcanics, but with quite variable degrees of sericitization, distinct from the enclosing matrix. The most important feature of this rock is the texture evident in the recrystallized groundmass/matrix under uncrossed polars. Despite the total recrystallization of the matrix to quartzo-feldspathic mosaics, and subsequent strong sericitic alteration, abundant clear shardy shapes are still evident. In fact, it is remarkable how a matrix composed of fine-grained felsic ash could recrystallize so evenly. The shard shapes are not visible at all under crossed polars, and the groundmass appears exactly like any other devitrified and recrystallized felsic glassy lava. Sericite alteration occurs as streaky patches and meshworks throughout the sample.

This sample is a sparsely plagioclase+quartz-phyric vitric tuff.

SAMPLE NUMBER: 32867

LOCATION:

Newton Creek area

SUMMARY:

This is a holocrystalline dioritic intrusive rock, with quite strong sericite±magnetite(?) alteration.

HAND SPECIMEN:

This is a strongly altered, pale grey holocrystalline rock with a weak foliation, and very fine-grained disseminated opaques (magnetite?).

THIN SECTION:

This sample is a strongly altered probably tonalitic or granodioritic intrusive rock. Former phenocrysts included plagioclase, which is albitized, and overprinted by strong very fine-grained sericite alteration, and a mafic phase that has altered to green chlorite in which blebby quartz and quite crystalline plates of sericite or muscovite are embedded. Plagioclase phenocrysts were certainly more abundant than the mafic phase, but even a guess at the original modal abundances of both phases is precluded by the strong alteration and recrystallization. Some of the mafic phenocrysts were up to 2mm long, and although it is not possible to be sure, they appear to have been hornblende rather than augite.

The 'groundmass' of this sample was, and still is, rather coarsely holocrystalline, and is composed of a patchy and poorly defined intergrowth of albitized plagioclase and subordinate quartz that is riddled with streaky sericite and more patchy concentrations of chlorite. Relatively large angular grains and grain aggregates of secondary quartz are not uncommon, and secondary opaque minerals, mainly more fine-grained than 0.2mm, pervade the groundmass, making up perhaps 1-2 modal% of the rock. These opaques are often associated with chlorite.

This sample was almost certainly a dioritic or syenitic intrusive rock, perhaps grading towards a granodiorite composition given the common quartz in the rock. It is not possible with the extensive sericitization of feldspar to choose with confidence between plagioclase and Kspar, and thus between diorite and syenite. The presence of abundant albite (albeit mainly sericitized) favours diorite in my opinion. The alteration is mainly sericite-magnetite(?).

PETROGRAPHIC REPORT

ROCKS FROM PASMINGO YOLANDE EL 11/85

ATTN ROGER POLTOCK, FERGUS FITZGERALD

**TONY CRAWFORD
DEPT OF GEOLOGY
UNIVERSITY OF TASMANIA**

SAMPLE NUMBER: 32188

LOCATION: PASMINGO YOLANDE EL 11/85

SUMMARY:

This is a plagioclase-phyric andesitic shallow intrusive rock with quite strong chlorite-epidote-sericite alteration.

HAND SPECIMEN

A grey altered plagioclase-phyric andesitic lava.

THIN SECTION:

This section is a quite altered plagioclase-phyric andesite, with strong sericite alteration of common plagioclase phenocrysts and quite abundant very low birefringent chlorite in the groundmass, making it very murky and rather difficult to interpret. Plagioclase phenocrysts up to 2mm across make up around 20 modal% of the rock; they were albitized before being strongly replaced by fine-grained sericite and very fine-grained epidote that makes the crystals very dirty brown and almost isotropic. Distinctive clear rims of albite on many phenocrysts are less albitized. Former augite phenocrysts all less than 0.5mm long probably made up about 2-3 modal% of this rock, but have been totally replaced by chlorite.

It is difficult to determine the original nature of the groundmass of this sample, due to strong chlorite alteration. Best preserved areas of groundmass show laths of albitized plagioclase up to about 0.3mm long with interstitial chlorite and secondary quartz. The texture is more typical of a shallow intrusive andesite than of a glassy andesitic lava. Small FeTi oxides are common through the groundmass and are always altered to leucoxene. Chlorite is abundant in the groundmass, usually associated with small globular secondary quartz; fine-grained dirty epidote, and less abundant coarser-grained crystalline epidote are present, and mainly associated with flaky sericite.

The abundance of chlorite and epidote in the alteration assemblage suggests that this is not a felsic rock, but rather an andesite. I suggest that it was an andesitic shallow intrusive dyke or sill. The alteration assemblage is probably lowest greenschist facies, but is not intense enough (nor is textural alteration strong enough) to be ascribed to local hydrothermal alteration. A chemical analysis of this sample would be meaningful, and test the comparison with CVC andesites such as those from Tullah and the Sterling River.

SAMPLE NUMBER: 216481

LOCATION: PASMINGO YOLANDE EL 11/85 CVC

SUMMARY:

This is a quite strongly silica-sericite-pyrite(?) altered felsic lithic tuff composed of plagioclase-phyric dacitic to rhyolitic lava or crystal tuff fragments in a formerly largely glassy ash matrix.

HAND SPECIMEN

Not available.

THIN SECTION:

This is a difficult sample to diagnose with confidence. It shows a great variation in texture across the sample, partly due to a primary textural heterogeneity and partly due to quite strong hydrothermal alteration. The rock is definitely derived from felsic volcanics, and originally would have been dacitic to rhyolitic. Lithic fragments probably up to at least 1cm across, with diffuse margins that grade into the more altered matrix, are plagioclase-phyric rhyolitic lava or crystal tuff. Plagioclase phenocrysts are albitized and rarely more than 1mm long; they commonly occur in multi-crystal clots and include rather angular, as well as more euhedral crystals. No mafic phenocrysts were present in this rock.

The matrix of this sample originally had a large glassy component. However strong and localized alteration has led to extensive and variable devitrification - recrystallization. Blebs and aggregates of secondary silica have grown in devitrified glass, and sericitic overprinting is abundant in the altered matrix but more strongly developed in some fragments than others. Veinlets of secondary quartz are common. Very fine-grained trains and trails of pyrite or hematite meander through the sample, being especially concentrated along some fragment boundaries.

I think the hand specimen would help in the interpretation of this rock. I suggest that it was a glassy felsic lithic tuff composed of variably sized fragments of plagioclase-phyric dacite or dacitic crystal tuff. Matrix glassy ash, and groundmass glass in most fragments has been strongly altered.

SAMPLE NUMBER: 216542

LOCATION: PASMINGO YOLANDE EL 11/85 CVC

SUMMARY:

This is a vesicular plagioclase-phyric evolved andesite or dacite lava with notably strong chlorite alteration.

HAND SPECIMEN

Not available

THIN SECTION:

This is a vesicular plagioclase-phyric dacitic or silica-rich andesitic lava. Plagioclase phenocrysts to several mm long make up around 10-15% of the rock and are albitized and strongly sericitized, with veinlets of green chlorite commonly developed along cleavages and fractures. Chlorite pseudomorphs after former small augite phenocrysts make up much less than 1 modal% of the rock, suggesting that it is more likely to have been dacitic than andesitic. A few quite large former FeTi oxide microphenocrysts are altered to leucoxene, and several long prismatic apatite phenocrysts are more typical of andesitic than dacitic lavas in the Mount Read Volcanics.

The groundmass of this sample is quite strongly chloritized, but textural evidence, including the absence of plagioclase microlites, suggest that it was quite glassy. It has devitrified and been recrystallized to a texturally variable chlorite-albite-quartz intergrowth, usually quite fine-grained. Chlorite lines vesicles that are filled by polycrystalline, and often strained quartz, and minor calcite. As noted above, the amount of chlorite in the groundmass of this sample seems exceptional, and may imply more intense hydrothermal alteration than normally developed by regional 'burial metamorphism'.

This sample is probably an evolved andesite to dacite compositionally; the amount of chlorite in the matrix and the presence of some quite large apatite microphenocrysts are more andesitic features, whereas the paucity of mafic phenocrysts and the absence of epidote in the alteration assemblage are more typical of dacites.

SAMPLE NUMBER: 216540 and 32140

LOCATION: PASMINCO YOLANDE EL 11/85 CVC

SUMMARY:

These are both very well-preserved plagioclase-phyric vitric crystal tuffs of rhyolitic to dacitic composition; glass shard shapes are commonly preserved. Sample 216540 has unusual hematite (\pm silica) alteration.

HAND SPECIMEN

Not available for 216540; 32140 is a feldspar crystal-rich volcanoclastic or tuff with a few obvious small lithic fragments

THIN SECTION:

These samples are plagioclase-phyric vitric crystal tuffs in which former glass shard shapes are well preserved in parts of both rocks. Plagioclase phenocrysts to about 2mm long make up around 10-12 modal% of 540 and somewhat less in 140, and are albitized, with minor sericite speckling and brownish mottling probably due to ultra-fine grained hematite. Many plagioclase phenocrysts are quite angular broken crystals, and many have one or more rather rounded abraded margins. An unusual and distinctive alteration feature of 540 is the concentration of granular hematite around the margins of plagioclase phenocrysts and phenocryst fragments. Sample 140 contains a few very distinctive lithic fragments of laminated formerly glassy rock that strongly resemble fiammae.

The groundmass of both samples is very fine-grained and essentially a quartz-feldspar intergrowth with minor streaks of sericite and yellowish chlorite. Under crossed polars, numerous beautifully preserved glass shards shapes are still evident, despite the devitrification-recrystallization process that has affected all such rocks in the Mount Read Volcanics. Sample 140 has minor epidote in the matrix.

Both these samples was clearly a vitric crystal tuffs, and was probably compositionally rhyolitic to dacitic.

SAMPLE NUMBER: 216541

LOCATION: PASMINGO YOLANDE EL 11/85

SUMMARY:

This is a plagioclase-phyric crystal vitric tuff, very similar to 216540 and 32140; it contains disseminated pyrite rather than hematite as in 216540.

HAND SPECIMEN

Not available.

THIN SECTION:

This sample is, in many respects, very similar to 216540 and 32140. It is a plagioclase crystal-rich vitric crystal tuff, with the following differences from 540.

1: Plagioclase crystals in this sample are more abundant and larger (up to 5mm long), and many polycrystalline aggregates of phenocrysts were present. However, these have all partially to completely subgrain-recrystallized, to a mosaic of angular interlocking secondary albite crystals; former phenocrysts shapes are generally preserved.

2: The unusual hematite development around plagioclase phenocrysts in 540 is absent in this sample.

3. The groundmass of this sample is more heterogeneous and variably recrystallized than in 540. However, some better preserved areas of groundmass clearly show altered shard shapes preserved in the quartz-feldspar aggregates replacing devitrified glass.

4: Sericitic meshes and veinlets are more common in this rock than 540.

5: Disseminated idiomorphic fine-grained pyrite is common in this rock, although the distribution of the pyrite crystals shows no relationship to the style or intensity of the alteration.

This is a plagioclase-phyric vitric crystal tuff very similar to 216540, and possibly from the same unit.

SAMPLE NUMBER: 32806

LOCATION: PASMINGO YOLANDE EL 11/85 Henty Fault Wedge

SUMMARY:

This is an aphyric fine-grained doleritic rock probably best correlated with the tholeiites of the Henty Dyke Swarm and SW Henty Fault Wedge.

HAND SPECIMEN

This is a grey-green aphyric andesite lava or shallow intrusive rock.

THIN SECTION:

This rock is a quite strongly altered aphyric intermediate rock with a holocrystalline texture suggestive of a shallow intrusive rather than a lava. The major mineral component is albitized plagioclase; this occurs as an interlocking mesh of quite blocky prismatic crystals that show strong alteration to very fine-grained, almost isotropic chlorite-epidote \pm sericite assemblages. Green chlorite is abundant and many patches probably replace interstitial anhedral augite. Quite large altered FeTi oxide grains are not uncommon, and show ragged and disrupted outlines and typical leucoxene alteration. Abundant alteration minerals besides chlorite are secondary quartz and epidote; the latter occurs intergrown with both quartz and chlorite.

The amount of both chlorite and epidote in the alteration assemblage present in this sample suggest that the rock was andesitic; epidote is rarely developed in dacitic or more evolved compositions. The presence of the quite large FeTi oxides is more reminiscent of tholeiitic dolerites than calc-alkaline Mount Read Volcanics intrusive andesites; however, the tholeiitic Henty Dyke Swarm dolerites are rarely as evolved as andesitic compositions. This sample should be analyzed; I suggest that it is probably correlated with the Henty Dyke Swarm dolerites and the Henty Fault Wedge basalts and dolerites.

SAMPLE NUMBER: 32176

LOCATION: PASMINGO YOLANDE EL 11/85 Henty Fault Wedge

SUMMARY:

This is a quite strongly chloritized quartz+feldspar-phyric crystal vitric tuff.

HAND SPECIMEN

This is an extremely nasty intensely altered clastic volcanogenic rock, either a crystal-rich sediment or pyroclastic.

THIN SECTION:

This sample in thin section is clearly seen to be a volcanoclastic sediment composed of abundant notably angular quartz and feldspar crystal fragments derived from felsic (rhyolitic) volcanic rocks. The grain size of both quartz and feldspar varies from several mm long down to much less than 0.1mm. Quartz grains are obviously volcanic, with common subhedral crystal shapes and melt inclusions. Both quartz and feldspar grains are strongly strained and show local subgrain recrystallization. Albite grains are slightly more abundant than quartz, and show limited to intense sericite speckling. The fabric of the rock is such that the angular quartz and feldspar grains are rarely in contact, so that the rock is not framework supported; rather, they are embedded in matrix. The total lack of lithic fragments in this sample is a significant feature.

The matrix of this sample was definitely glassy; however, devitrification and strong chlorite-sericite alteration have eliminated any primary texture. The matrix is a very fine-grained quartzo-feldspathic intergrowth after devitrified glass, but large areas are either entirely chloritized, or (less commonly and less intensely) sericitized.

The highly angular crystal shapes, lack of sorting, and absence of lithic clasts suggest that this rock was a crystal vitric tuff. It has suffered strong chlorite alteration.

SAMPLE NUMBER: 32197

LOCATION: PASMINGO YOLANDE EL 11/85 Henty Fault Wedge

SUMMARY:

This is a fine-grained tholeiitic dolerite dyke rock, probably correlated with the Henty Dyke Swarm.

HAND SPECIMEN

This is a dark green-grey aphyric metamafic volcanic or shallow intrusive rock.

THIN SECTION:

This is an altered aphyric shallow intrusive rock not dissimilar from 32806. It is composed of blocky fairly small albitized plagioclase crystals riddled with chlorite and possibly extremely fine-grained epidote, making them quite murky. Interstitial areas are dominated by chlorite, and although crystal shapes are not evident in these areas, chlorite probably replaces anhedral augite and mesostasis. A feature of this sample is the abundant quite coarse-grained FeTi oxide grains, most of which average around 0.1-0.2mm across and leucoxenized.

The alteration assemblage in this sample is dominantly chlorite-albite quartz, although very fine-grained epidote may be present, and fine-grained carbonate is quite common. One interesting alteration mineral present in this sample (albeit rare) but rarely seen in Mount Read Volcanics is reddish-brown biotite. It suggests metamorphic conditions approaching low greenschist facies.

The abundance of the FeTi oxides in this sample strongly imply a tholeiitic affinity for this fine-grained dolerite, and by association, a correlation with the Henty Dyke Swarm is most likely. This sample also could be analyzed.

SAMPLE NUMBER: 32173

LOCATION: PASMINGO YOLANDE EL 11/85 CVC

SUMMARY:

This is a distinctive aphyric evolved andesite lava with abundant chlorite in the alteration assemblage.

HAND SPECIMEN

This is a dark grey aphyric andesitic to basaltic lava.

THIN SECTION:

This is an aphyric andesitic rock composed of randomly orientated albitized plagioclase microlites in a matrix of coarser-grained but anhedral albite, chlorite and secondary quartz that have very likely grown from interstitial glass. A few small euhedral plagioclase microphenocrysts are present. Secondary quartz is usually present as clear anhedral grains composed of several interlocking crystals. The matrix also contains quite common tiny altered oxide grains. Chlorite is quite abundant throughout the rock, and much of it may have replaced bladed to anhedral augite intergrown with plagioclase.

This rock is an unusual aphyric andesitic (possibly evolved andesite) lava, as judged by the abundance of chlorite in the alteration assemblage. An analysis of this sample could be useful.

SAMPLE NUMBER: 32170

LOCATION: PASMINGO YOLANDE EL 11/85 Henty Fault Wedge

SUMMARY:

This is a strongly carbonate-altered, formerly glassy, very sparsely quartz-phyric rhyolitic lava.

HAND SPECIMEN

This is an usual mid-grey rock weakly quartz-phyric rock streaked by flattened black chloritic grains usually less than 2mm long.

THIN SECTION:

This rock is a highly carbonate-altered sparsely quartz-phyric (<1 modal%) felsic volcanic rock with a very unusual texture, at first glance suggesting an ignimbrite. The quartz phenocrysts are mainly around 1mm across and are rather rounded and reacted, with abundant internal strain lamellae. The remainder of this rock consists of a sugary intergrowth of quartz and albite after devitrified glass, with quite abundant subparallel streaks of green chlorite that vaguely resemble fiammae, but are too diffuse and on average, probably too small to qualify as flattened glassy lithic fragments. They are more likely to be chlorite concentrations grown in the devitrified altering matrix of this sample during compaction and burial metamorphic degradation. This texture has been overprinted by strong calcite alteration, with granular sugary to interlocking calcite crystals making up more than 50 modal% of the rock.

This was probably a glassy rhyolitic lava, although the intensity of the alteration probably precludes a positive assessment of whether the rock was a lava or a crystal poor vitric tuff.

SAMPLE NUMBER: 32153

LOCATION: PASMINCO YOLANDE EL 11/85 Henty Fault Wedge

SUMMARY:

This is a greywacke derived very largely from Precambrian pelitic metamorphics and metasediments; it contains detrital chromite probably from the ophiolites and can be confidently correlated with the Miners Ridge Sandstone and the Animal Creek Greywacke.

HAND SPECIMEN

This is a grey sericitic volcanoclastic sandstone or crystal-rich tuff.

THIN SECTION:

This is a poorly-sorted greywacke composed dominantly of about equal amounts of equidimensional ~1mm sized detrital quartz grains and longer and flatter lithic fragments. The quartz grains are clearly derived from pelitic metamorphics, showing strong internal strain, common multi-crystalline grains, and very angular grain shapes. The lithic fragments are usually 1-4mm long, and vary from dominant exceptionally fine-grained quartzofeldspathic material (cherty?) to less common clear quartz-muscovite schists and quartzite fragments. A few lithic clasts composed of a quartz-albite mosaic coarser-grained than the most abundant lithic fragments may be formerly glassy dacite-rhyolite lithic fragments; if this is so, it is the sole evidence for a volcanic component in this rock. The presence of seven or eight quite large detrital red chromite grains is important.

This sample is in my opinion, best correlated with the Miners Ridge Sandstone and Animal Creek Greywacke, in being a very largely Precambrian-derived greywacke containing distinct chromites derived in all probability from the 'ophiolites'. This is an important rock and its relationships should be explored further.

SAMPLE NUMBER: 32150

LOCATION: PASMINGO YOLANDE EL 11/85 CVC

SUMMARY:

This is a volcanogenic sandstone derived from felsic plagioclase-phyric lavas and pyroclastics with minimal reworking. The glassy ash matrix has been strongly chlorite-altered.

HAND SPECIMEN

This sample is a dark grey probably felsic lava breccia with fragments to at least 1cm long.

THIN SECTION:

It is difficult to determine from this section whether this rock was a primary volcanoclastic (ie lithic-crystal tuff) or a volcanogenic sediment. The petrographic diversity of the lithic clasts suggests the latter. The dominant component of the framework grains in this rock are euhedral but commonly broken albitized plagioclase phenocrysts mainly 0.3-2mm long, that show weak to strong sericite alteration. There is no detrital quartz in this sample. Lithic clasts are poorly defined in much of the rock due to the strong alteration of the formerly glassy ash-rich matrix. Most were sparsely plagioclase-phyric dacitic to rhyolitic lavas with strongly sericite-altered groundmasses that were undoubtedly glassy. A second lithic clast type has similar phenocryst abundances and sizes, but the glassy groundmass has altered to a chlorite-rich aggregate spotted by tiny blebs of quartz. The formerly vitric-ash matrix of the rest of the rock is composed of either type of alteration assemblage, although the chloritic style of alteration is more abundant. Patchy quite coarse-grained calcite overprints parts of this sandstone.

SAMPLE NUMBER: 31536

LOCATION: PASMINGO YOLANDE EL 11/85

SUMMARY:

This is a very sparsely plagioclase-phyric formerly highly glassy rhyolitic to dacitic lava or obsidian.

HAND SPECIMEN

This is a pale grey aphyric felsic lava.

THIN SECTION:

This sample is a strongly recrystallized, formerly glassy essentially aphyric felsic lava with quite a uniform texture despite the alteration. The section contains four or five small subhedral albitized plagioclase microphenocrysts less than 0.5mm long spotted by pale green-yellow chlorite and minor sericite. The remainder of this rock is composed of a typical polygonal sugary-textured mosaic of quartz and subordinate albite grown from devitrified felsic glass. This is pervaded by quite strong but very fine-grained sericite meshwork. This was probably close to an obsidian prior to alteration-recrystallization.

SAMPLE NUMBER: 32165

LOCATION: PASMINGO YOLANDE EL 11/85 CVC

SUMMARY:

This is a quite strongly chlorite-altered plagioclase-rich volcanoclastic rock probably having originally a matrix of glassy ash. It is derived from plagioclase-phyric felsic eruption(s).

HAND SPECIMEN

This is a pale grey plagioclase-phyric felsic lava or plagioclase-rich volcanogenic sediment.

THIN SECTION:

This sample consists of around 50 modal% of plagioclase crystals in a strongly chloritized matrix. The plagioclase crystals are albitized phenocrysts that vary from <0.1mm to several mm long, and vary from angular and broken crystals to euhedral phenocrysts. Common are clots of plagioclase crystals up to 3mm across composed of blocky prisms of albite with very slight sericite speckling. A few felsic volcanic lithic fragments are also present, and consist of albitized plagioclase phenocrysts in devitrified glassy groundmass. There are no detrital quartz or mafic crystals in this sample.

The matrix of this rock is very strongly chloritized, to the extent that any trace of the original texture is almost obliterated. However least altered matrix areas are clearly formerly glassy material, probably glassy ash, that have devitrified to an exceptionally fine-grained quartz-albite-chlorite intergrowth, itself overprinted by chlorite alteration. Irregular patches of secondary quartz are not uncommon in the chlorite. Disseminated spots of hematite, possibly after pyrite are scattered through the rock, but are not common.

This rock was probably a primary or reworked volcanoclastic derived from plagioclase-phyric felsic magma typical of the CVC.

SAMPLE NUMBER: 32196

LOCATION: PASMINCO YOLANDE EL 11/85 Henty Fault Wedge

SUMMARY:

This is a sheared and granulated sparsely plagioclase-phyric basalt with strong chlorite alteration and weak foliation development; it probably comes from the Henty Dyke Swarm.

HAND SPECIMEN

This is a dark grey foliated and altered meta-andesitic(?) lava or shallow intrusive.

THIN SECTION:

This sample is strongly deformed and partially recrystallized. It consists of abundant granulated and rather fine-grained albite occasionally preserving lath shapes, not uncommon leucoxenitized FeTi oxide grains to 0.4mm across and a few broken but optically continuous larger plagioclase phenocryst in a very heterogeneous matrix traversed by intense chloritic veining and streaking, interspersed with areas composed of irresolvable, almost isotropic material that is probably microcrystalline epidote. The chlorite forms a weak foliation. Calcite veinlets have been offset by the foliation.

The abundance of FeTi oxides and chlorite (and probable epidote) in this sample suggest to me that it was a sparsely plagioclase-phyric basalt, probably associated with the Henty Dyke Swarm. The strong foliation and intense chlorite alteration suggest that it is from a high-strain zone.

APPENDIX H.
REPORT ON READ ISOTOPE STUDY
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**REPORT ON A Pb ISOTOPE STUDY OF
SULFIDE AND ALTERED WALLROCK CLASTS
FROM A VOLCANIC BRECCIA
IN THE CENTRAL VOLCANIC COMPLEX, WESTERN TASMANIA**

SIROTOPE REPORT SR 165**GRAHAM R. CARR****25/05/92**

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1. INTRODUCTION

The aim of this study has been to compare the Pb isotope ratios of galena samples and altered wallrock clasts from andesitic breccias of the Central Volcanic Complex with the target signatures for Cambrian massive sulfide mineralization of the Mt Read Volcanics.

2. SAMPLES

Seven galena rich samples from separate sulfide clasts were provided by Robert Gibson of CODES (MS clasts 1 - 7). A single clast, provided by Dave Wallace (562358), also originates from clast 6. In addition, two altered wallrock fragments were provided for analysis (marked Fault Block 1 and 2). The samples were collected from recent exposures of andesitic breccias in an HEC spillway at approx GR 80000mE, 58500mN.

Analytical methods are described in Appendix 1.

3. TARGET Pb ISOTOPIC SIGNATURES

The target signatures for mineralization at Hellyer and Que River, established by Gulson and Porritt (1987), have been revised in this report based on recent analyses of Hellyer by Bruce Gemmell and the authors and on a reappraisal of available data from Que River. A comparison of the old and new signatures is presented in Figures 1 and 2.

The recent analyses of Hellyer ores will be reported fully elsewhere by Gemmell et al. The new data combined with the old data, indicate a much more homogeneous population than previously defined. This has been brought about by excluding two points in the original dataset (MG18 284.7m, MG18 287.4m) and a single point from the new dataset (JBG 006-1 2ASEZ) which have lower $^{206}\text{Pb}/^{204}\text{Pb}$ ratios and can be shown to be part of a different population to the majority of the data.

The revised Que River target signature is based on analyses, carried out in 1986 by G. Carr, of Que River ores from D. Whitford's collection as well as two bulk ore pulps. It is also more homogeneous, and has lower $^{207}\text{Pb}/^{204}\text{Pb}$ and $^{208}\text{Pb}/^{204}\text{Pb}$ ratios than the original signature which was also based on the Whitford collection samples (reported in Gulson and Porritt, 1987). The difference between the two signatures results both from more controlled fractionation (see Appendix 2) in the newer analyses and from the recognition of some data outliers which, like at Hellyer, represent a different, subordinate population.

It is significant that the Hellyer outliers plot within the Que River signature and the Que River outliers within the Hellyer signature. This indicates the probability that slight changes in the isotopic composition of the ore fluids occurred over the period of deposition of the ores in each deposit and that the bulk of the Pb at Hellyer and Que River were deposited at slightly different stages of development of these ore fluids.

4. RESULTS

The Pb isotopic ratios of the galena-rich clasts plot as two separate populations (Table 1, Figs 3 and 4). Clasts 1 and 5 plot within the revised Hellyer signature and clasts 2, 3, 4, 6 (including 562358) and clast 7 plots within the redefined Que River ellipse. The duplicate analyses plot well within the analytical precision.

The altered wallrock fragments contain relatively low levels of Pb (26 and 228 ppm) and are significantly more radiogenic than the massive sulfide signatures (pts 12, 13 and 14, Fig. 3)

5. INTERPRETATION

The Pb isotope ratios of galenas from all of the clasts point strongly to a Cambrian origin for the Pb. The two different populations indicate that the Pb isotopic composition of the hydrothermal fluid evolved over the period of deposition of the sulfides, in a similar manner to the evolution at Que River and Hellyer described above.

A preliminary investigation of the distribution of Pb isotopic ratios of Cambrian mineralization in the Hellyer - Mt Lyell region indicates that there is a correlation of data with respect to the stratigraphic position of the host lithologies. Mineralization in the Central Volcanic Complex has isotopic ratios which are generally similar to the Rosebery signature. However, some mineralization may have the Que River or Hellyer signature in addition to the Rosebery signature (e.g. Koonya, Mt Lyell, Red Hills, Pinnacles). In contrast, mineralization in the Dundas and Tyndall Groups has only the Que River and/or the Hellyer signatures.

The results for the clasts are thus unique, in that they are, to our knowledge, the only examples of CVC mineralization that does not contain at least some Pb with the Rosebery signature. On a purely observational level, this data might be used to question the stratigraphic correlation of the host lithologies of the sulfide breccias. However, there is only a limited understanding of the geological basis for the Pb isotope variation throughout the Mt Read Volcanics. Current Research work at CSIRO and CODES is aimed at redressing this situation by determining the association between ore and source rock initial ratios. With such knowledge it is envisaged a confident assessment will be

possible of the relationship between individual examples of mineralization and the complex hydrothermal history of the Mt Read Volcanics.

The altered wallrock fragments contain radiogenic Pb which was probably derived *in situ* since alteration. On both diagrams of Figure 3 they define linear arrays which project through the galena clast data. This is necessary, though not sufficient, evidence for a genetic association between Pb in the clasts and in the altered volcanics.

8. REFERENCES

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- Gulson B.L. and Porritt, P.M., 1987. Base metal exploration of the Mount Read Volcanics, Western Tasmania: Pt. II. Lead isotope signatures and genetic implications. *Econ. Geol.*, 82, pp. 308-327.

APPENDIX 1

Galena was handpicked, dissolved in concentrated HNO_3 and Pb purified by micro-electrodeposition onto Pt electrodes. Analyses of duplicate handpicked galena crystal fragments were undertaken on three of the clasts.

A small amount of each powder from the pulverised wallrock fragments was weighed into a teflon beaker and digested in a hot mixture of 7N HCl and 7N HNO_3 . Lead was extracted by anion exchange methods in dilute HBr acid solutions and purified by micro-electrodeposition onto Pt electrodes.

Lead isotope ratios were determined on a VG ISOMASS 54E thermal ionization mass spectrometer run in fully automated mode. The results have been normalized to the accepted values of international standard NBS 981 by applying a correction factor of +0.08% per atomic mass unit. Precision estimates, shown as error bars in the upper left hand corner of the accompanying Figures, are based on over 1300 analyses of international standards and natural samples. Also shown are the 95% confidence ellipses for these standard data.

Lead concentrations were determined simultaneously with isotope ratios by isotope dilution techniques by adding a known amount of ^{202}Pb spike at the initial dissolution stage, and are precise to within about $\pm 5\%$ for low to moderate Pb samples. However, for high Pb samples (about > 1000 ppm), the measurement of the $^{206}\text{Pb}/^{202}\text{Pb}$ ratio becomes increasingly inaccurate so that the calculated Pb levels are only an approximation.

APPENDIX 2 - LEARNING TO COPE WITH Pb ISOTOPE DIAGRAMS

Variation of the Pb isotope ratios shown on the common XY plots ($^{206}\text{Pb}/^{204}\text{Pb}$, $^{207}\text{Pb}/^{204}\text{Pb}$, $^{208}\text{Pb}/^{204}\text{Pb}$), results principally from geological factors. However, some variation can be ascribed to **analytical errors**. The 95% confidence ellipse of the error associated with any Pb isotopic analysis is shown in the top left hand corner of each diagram. The major axis of this ellipse indicates the strong correlation inherent in the errors which arise from a combination of **fractionation** and ^{204}Pb error. Fractionation occurs at the very high temperatures induced during mass spectrometer analysis and results from preferential emission of the lighter isotopes relative to the heavier isotopes. ^{204}Pb error results from the lower precision in estimating peak heights of this low abundance isotope.

The geological variables are:

- 1) The **age** of the sample, i.e. the time at which the Pb was incorporated into the rock/mineral.
- 2) The relative amounts of Pb, U and Th (expressed generally as $^{238}\text{U}/^{204}\text{Pb}$ (μ) and $^{232}\text{Th}/^{204}\text{Pb}$) in the source rocks from which the Pb was leached prior to incorporation in the rock/mineral.
- 3) The U/Pb and Th/U ratios in the rock/mineral between the time the Pb was incorporated and the present.

The isotopic ratios that are presented in the common XY plots are $^{206}\text{Pb}/^{204}\text{Pb}$, $^{207}\text{Pb}/^{204}\text{Pb}$ and $^{208}\text{Pb}/^{204}\text{Pb}$. Whilst ^{206}Pb , ^{207}Pb and ^{208}Pb derive from the constant radiogenic decay of ^{238}U , ^{235}U and ^{232}Th respectively, ^{204}Pb has no parent isotope and so its abundance does not change through geological time. Thus the three ratios above are continually increasing with time according to well defined decay criteria.

A **growth curve** is a model of this variation and indicates the expected isotopic composition of Pb-rich ores at any particular stage in the Earth's history. There is no unique growth curve for the Earth, and different curves can be generated assuming source rocks with different U/Pb and Th/U ratios. **Model ages** can be determined when data from high-Pb samples plot on or near a growth curve on a $^{207}\text{Pb}/^{204}\text{Pb}$ vs $^{206}\text{Pb}/^{204}\text{Pb}$ diagram. The accuracy of model ages vary considerably and relies on the appropriateness of the chosen model. The commonly used **Cumming and Richards curve** is based on the assumption that the U/Pb and Th/Pb ratios in the Earth's crust have been varying continuously and is correlated with the known ages of a set of massive sulfide deposits which probably gained their Pb from hydrothermal solutions which leached large volumes of rocks through the crust. Massive sulfides and other ores which leached their Pb from mantle rocks or lower crustal rocks will not fall on this growth curve.

The Pb isotope **fingerprinting technique** is based on the fact that in any geological domain, ores forming during a particular mineralizing event from the same or similar source rocks will have the same isotopic composition. In some cases we can broadly predict the likely isotopic composition based on geological criteria such as age/rock type etc., but in general the technique relies on a library of data on known ore deposits in a region.

This isotopic "fingerprint" represents the Pb isotopic composition at the time of formation of the ore/rock - otherwise known as the **initial ratios**. If the ore/rock has relatively low U/Pb, and Th/Pb ratios, such as in galena, then these initial ratios will not change with time because insignificant ^{206}Pb , ^{207}Pb and ^{208}Pb will have been added *in situ* since the time of formation by the radioactive decay of ^{238}U , ^{235}U and ^{232}Th respectively. However with "low-Pb" samples (generally less than about 50-100 ppm for Palaeozoic samples and less than about 500-1000 ppm for Proterozoic samples) measurable ^{206}Pb , ^{207}Pb and ^{208}Pb will have been added by *in situ* radioactive decay and so the $^{206}\text{Pb}/^{204}\text{Pb}$, $^{207}\text{Pb}/^{204}\text{Pb}$ and $^{208}\text{Pb}/^{204}\text{Pb}$ ratios will increase; i.e. will be **more radiogenic**. This effect will be magnified in high-U samples and higher Pb contents than the figures quoted above are needed to guarantee that significant additional radiogenic Pb has not changed the initial ratios.

Where *in situ* radioactive decay has occurred the ratios will plot on a line on any of the diagrams commonly presented. This line will always incorporate the initial ratios. On the $^{208}\text{Pb}/^{204}\text{Pb}$ vs $^{206}\text{Pb}/^{204}\text{Pb}$ diagram the slope of the line is dependant on the Th/U ratio of the sample, whereas on the $^{207}\text{Pb}/^{204}\text{Pb}$ vs $^{206}\text{Pb}/^{204}\text{Pb}$ diagram the slope is dependant only on the time interval over which radioactive decay has taken place. In this latter case, where it can be shown that the isotope ratios of all the points on such a line have developed under a closed system with respect to Pb and U then the line is termed an **Pb-Pb isochron**. An isochron is thus defined by the slope, **m**, of a linear regression through the data. An estimate of how well such a regression fit the data is gained from Mean Square Root of the Deviates or **MSWD**. This function compares the deviation of each point from the regression relative to the estimate of analytical precision. An MSWD of 1 or less indicates that the data deviate minimally from the regression whereas higher values indicate increasing deviation.

Source rock studies involve determining, if possible, the initial Pb isotope ratios of those rocks considered to be possible source of metals for mineralization. Such studies are particularly important in areas where mineralization may result from a syngenetic event, such as a VMS deposit, or from later granite intrusion. The syngenetic signature may be well established, but it is also important to know what is the likely Pb isotopic composition of epigenetic mineralization forming in response to the intrusion. This may be done by measuring mineralization known to be associated with the intrusion, such as skarns, or by determining the Pb isotopic composition of a relatively high-Pb silicate component such as K-feldspar. Although K-feldspars may contain a significant proportion of radiogenic Pb (i.e. Pb derived from *in situ* radiogenic decay since crystallization) techniques are available that enable, in many instances, the discrimination of the initial component from the radiogenic component.

Table 1. Lead isotope ratios of clasts and wallrock fragments.

Sample	$\frac{^{208}\text{Pb}}{^{206}\text{Pb}}$	$\frac{^{207}\text{Pb}}{^{206}\text{Pb}}$	$\frac{^{208}\text{Pb}}{^{204}\text{Pb}}$	$\frac{^{207}\text{Pb}}{^{204}\text{Pb}}$	$\frac{^{208}\text{Pb}}{^{204}\text{Pb}}$	Pb(ppm)
1 M.S. CLAST 1	2.0789	0.8507	18.339	15.601	38.126	
2 M.S. CLAST 1R	2.0779	0.8504	18.334	15.592	38.097	
3 M.S. CLAST 2	2.0809	0.8522	18.318	15.610	38.118	
4 M.S. CLAST 3	2.0798	0.8515	18.319	15.599	38.100	
5 M.S. CLAST 4	2.0809	0.8520	18.312	15.601	38.104	
6 M.S. CLAST 5	2.0772	0.8500	18.347	15.595	38.110	
7 M.S. CLAST 5R	2.0782	0.8504	18.346	15.601	38.127	
8 M.S. CLAST 6	2.0800	0.8521	18.300	15.594	38.064	
9 582358	2.0802	0.8521	18.298	15.591	38.063	
10 M.S. CLAST 7	2.0802	0.8521	18.291	15.585	38.049	
11 M.S. CLAST 7R	2.0803	0.8521	18.297	15.590	38.063	
12 FAULT BLOCK 1	2.0667	0.8435	18.518	15.621	38.273	228
13 FAULT BLOCK 2	2.0132	0.8031	19.535	15.689	39.327	26
14 FAULT BLOCK 2 R	2.0121	0.8032	19.516	15.675	39.269	26

Sample number prefixes refer to points plotted in the figures.
R refers to repeat analysis.

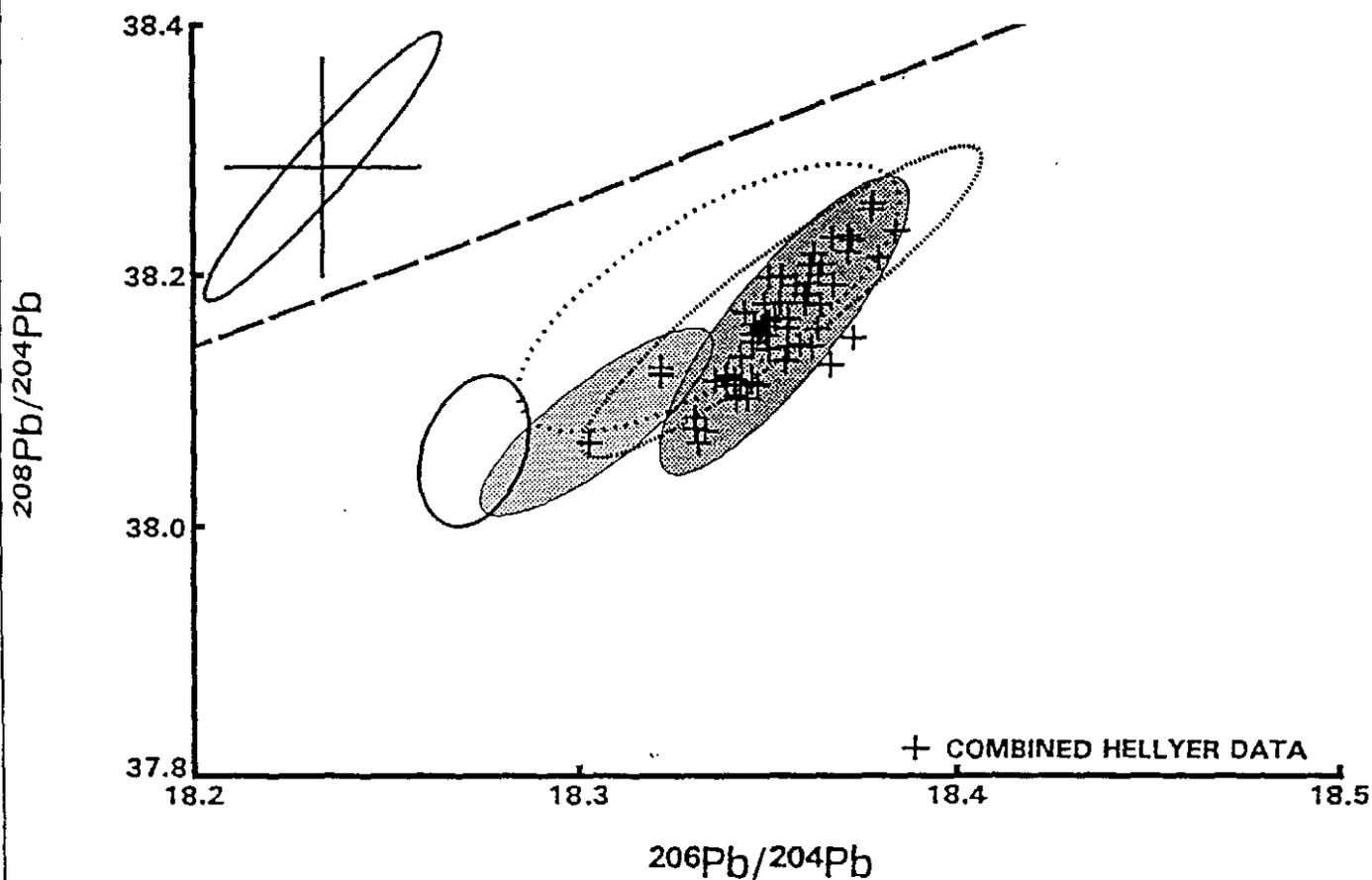
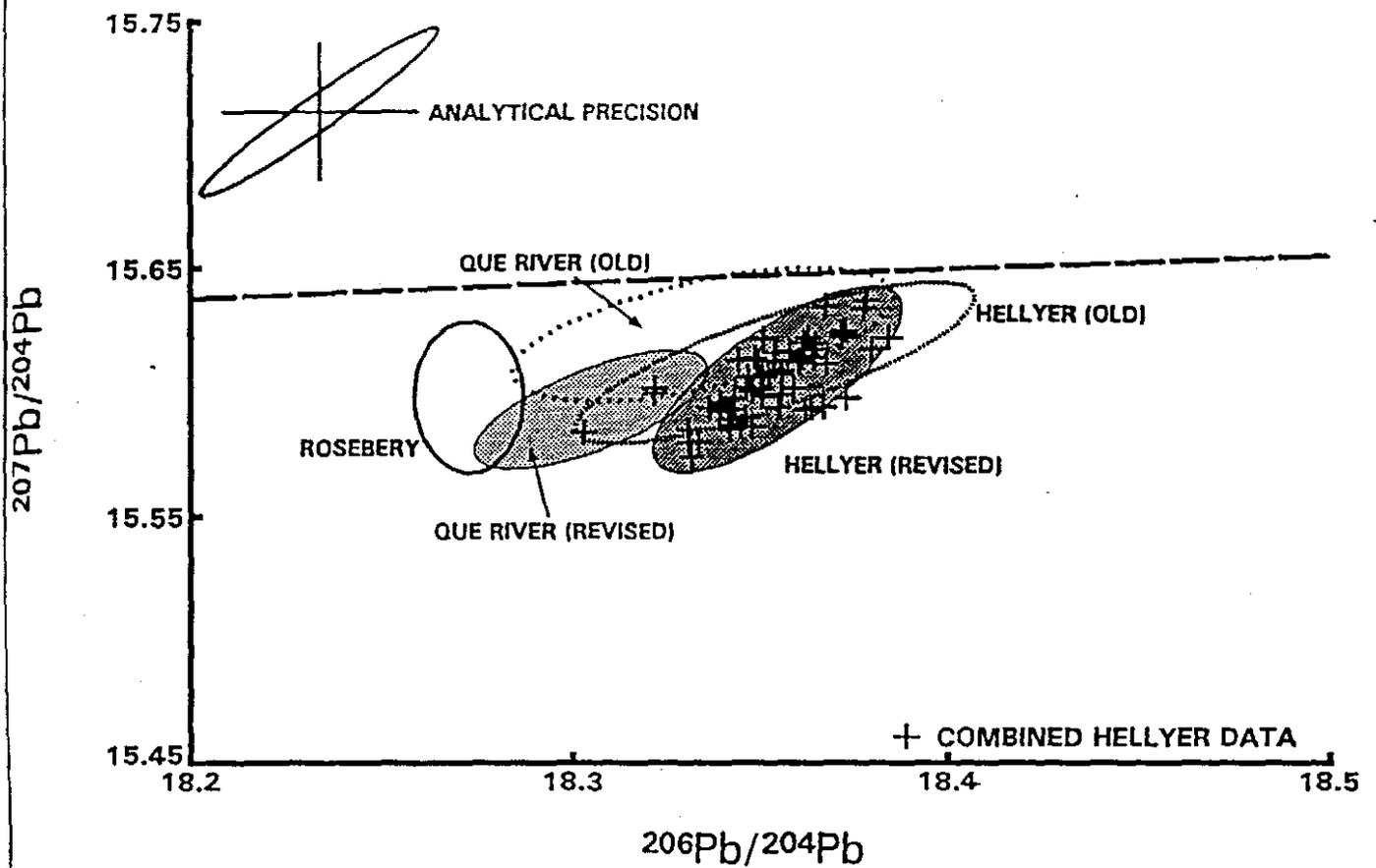


Figure 1. Lead isotope ratio diagrams comparing the 95% confidence ellipses for Hellyer (old and revised), Que River (old and revised) and Rosebery. Also shown is the complete Hellyer ore data with the three data outliers not included in the ellipse calculation. The Pb evolution curve (growth curve) of Cumming and Richards (1975) is shown for reference.

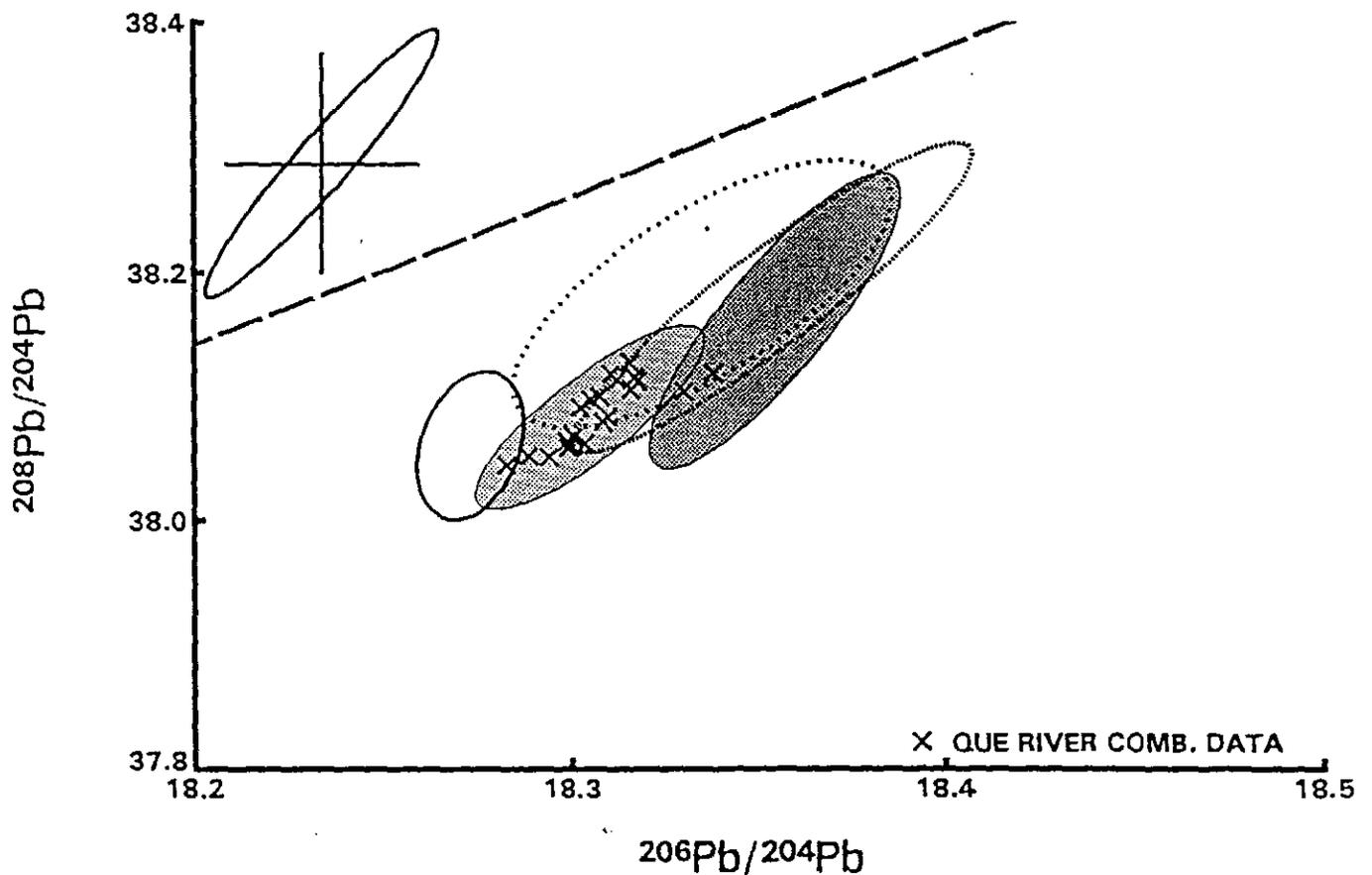
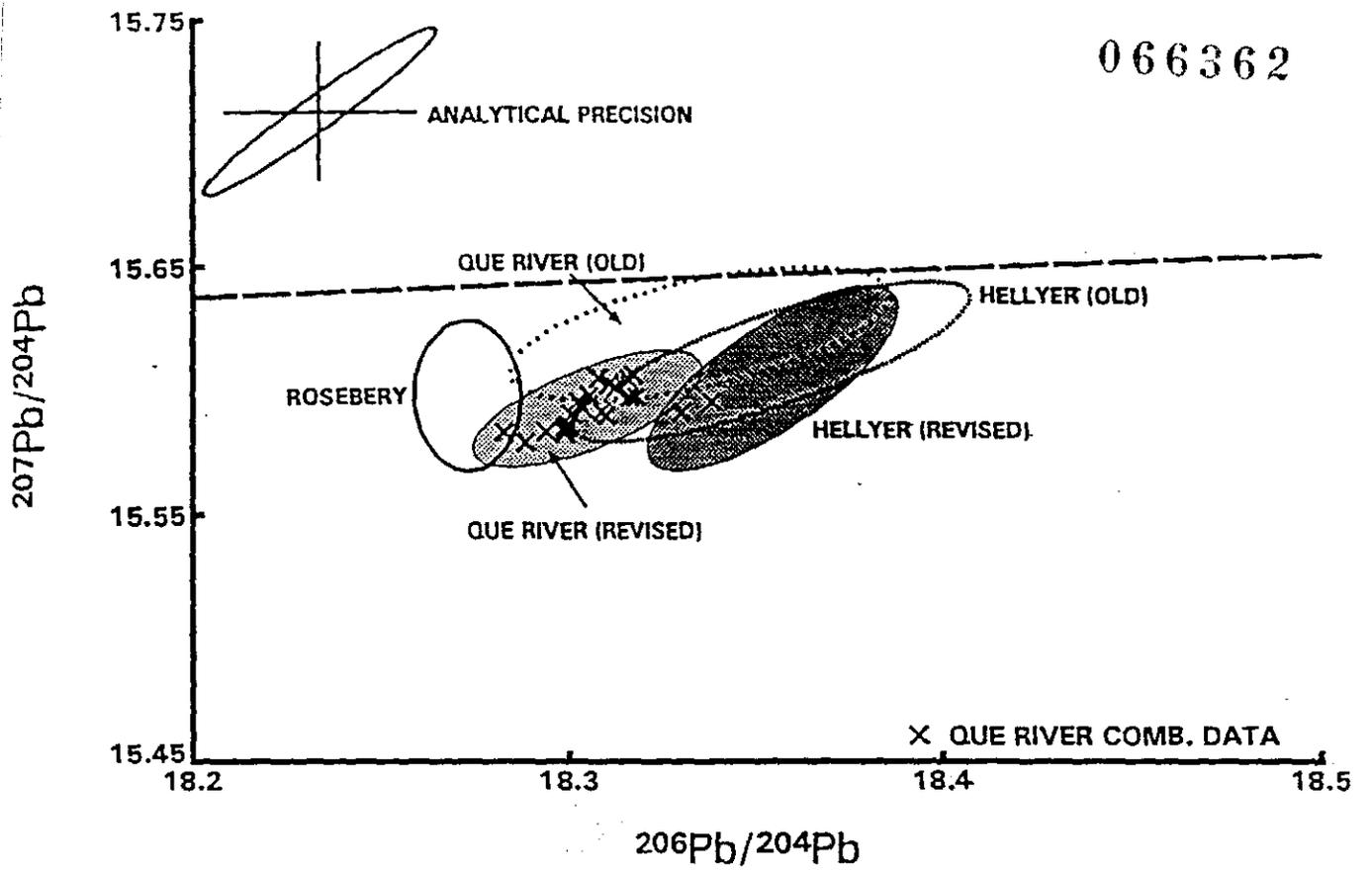


Figure 2. Lead isotope ratio diagrams comparing the 95% confidence ellipses for Hellyer (old and revised), Que River (old and revised) and Rosebery. Also shown is the complete Que River ore data with the two data outliers not included in the ellipse calculation. The Pb evolution curve (growth curve) of Cumming and Richards (1975) is shown for reference.

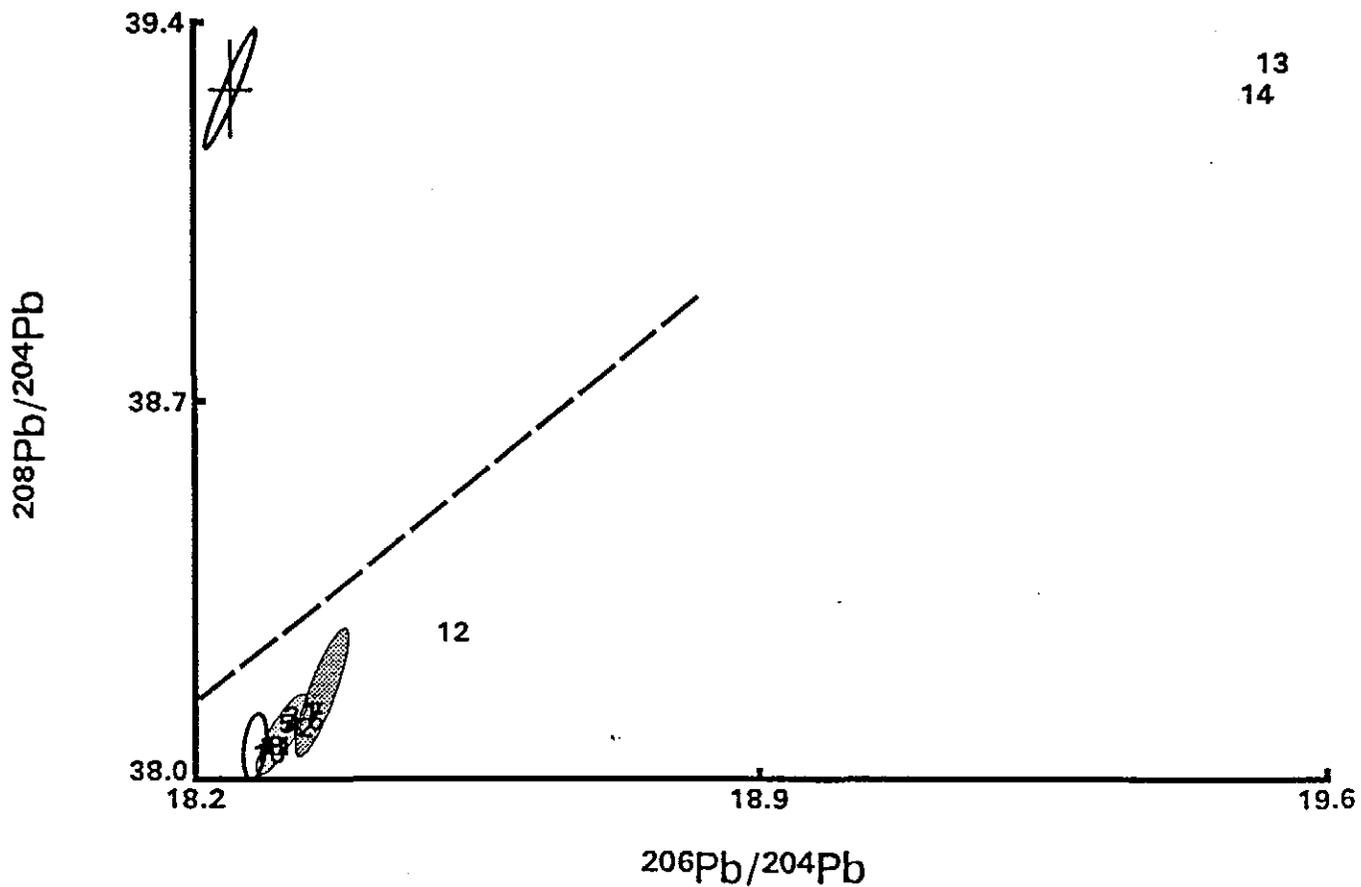
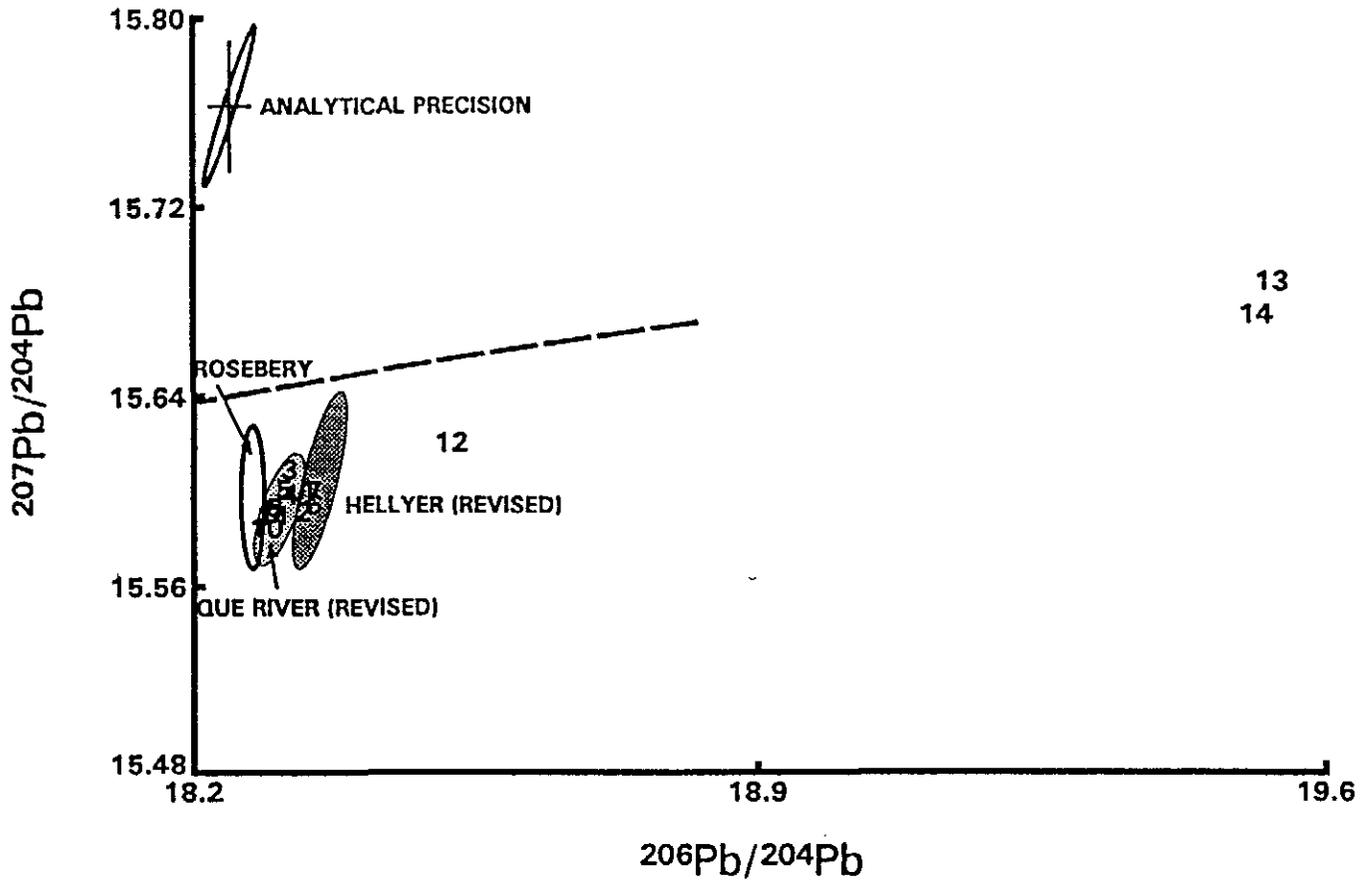


Figure 3. Lead isotope ratio diagrams of the results from this study plotted in comparison to the 95% confidence ellipses for Rosebery, Que River (revised) and Hellyer (revised). The numbered points refer to data in Table 1. The Pb evolution curve (growth curve) of Cumming and Richards (1975) is shown for reference.

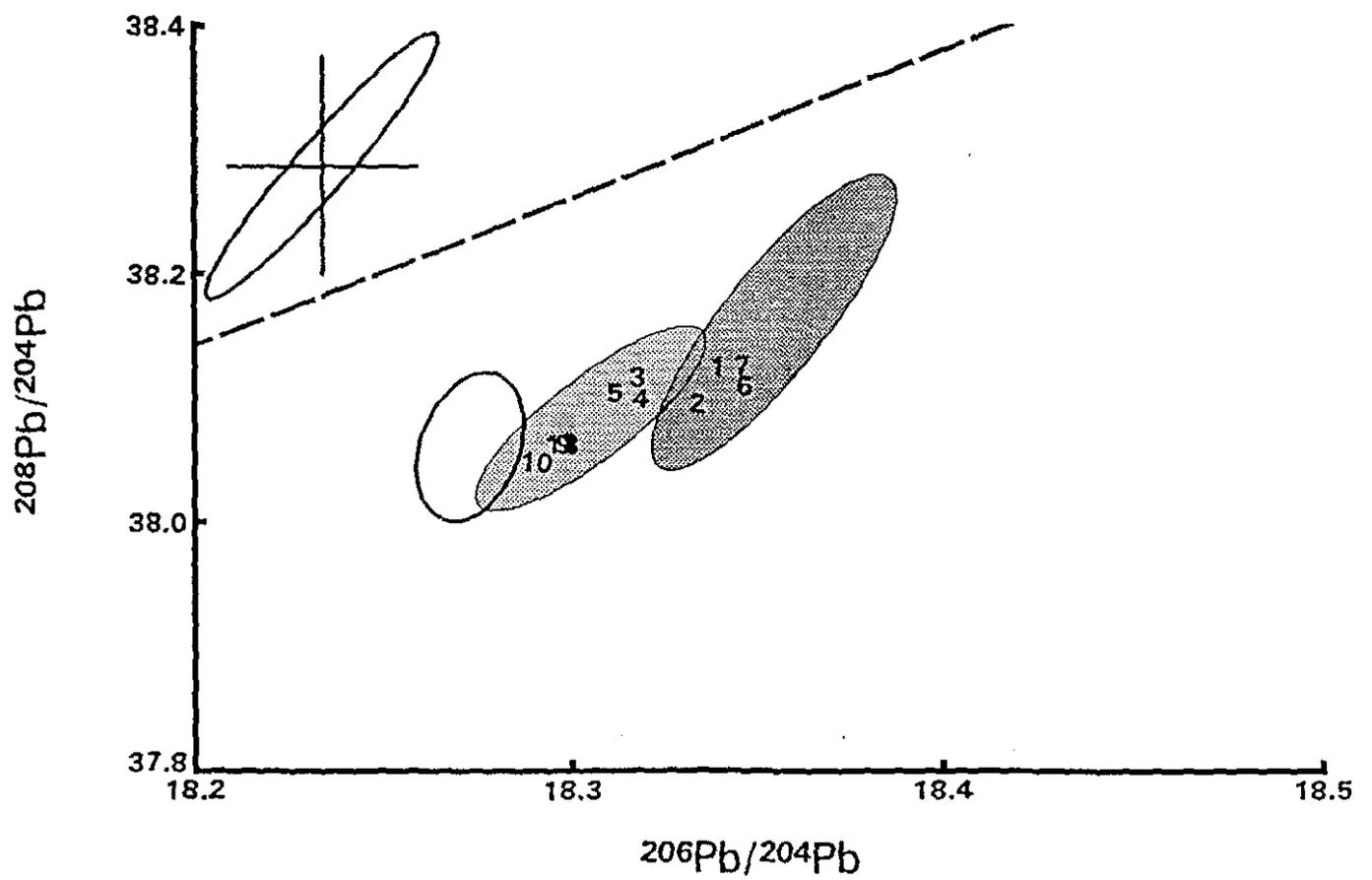
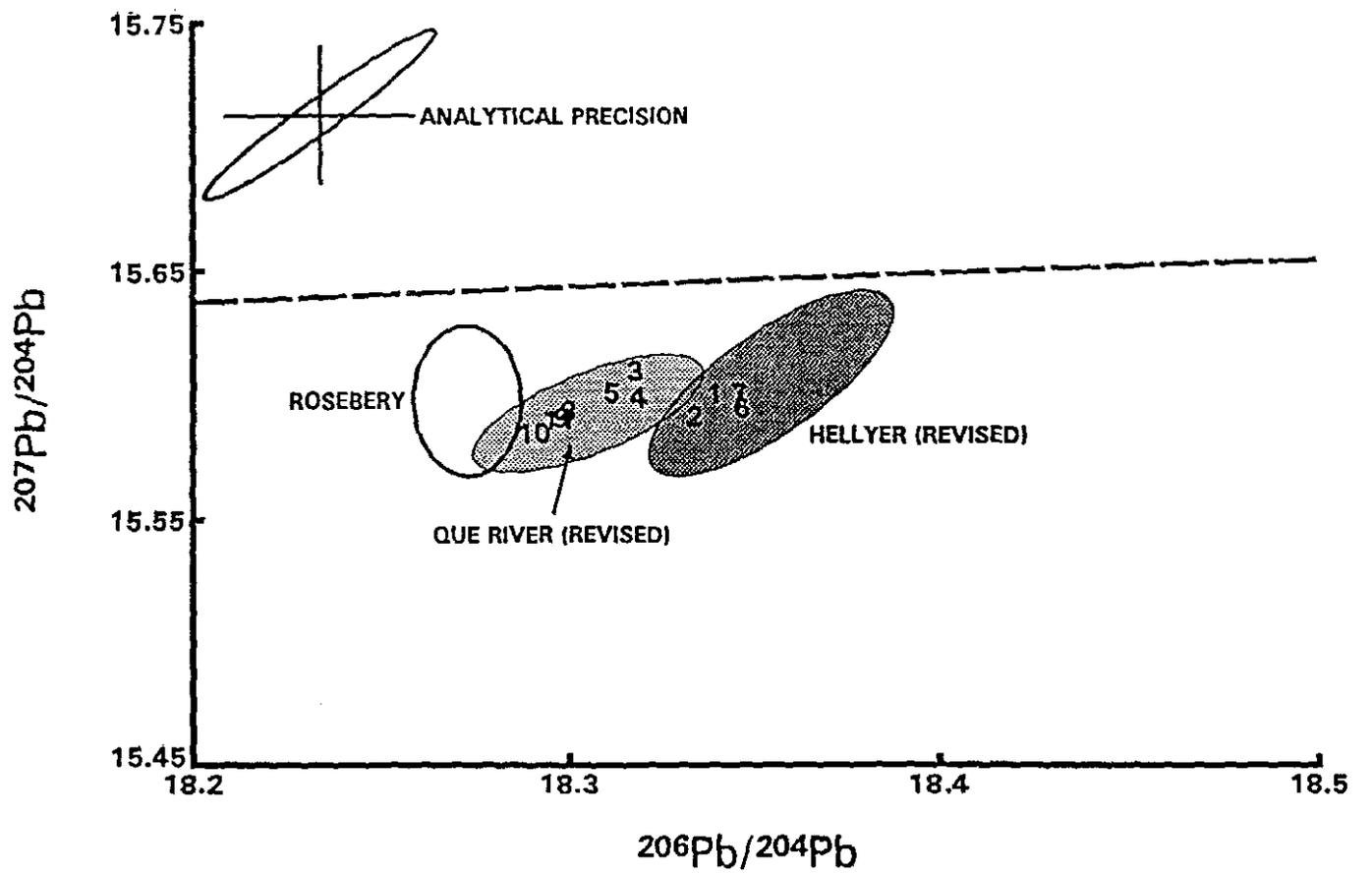
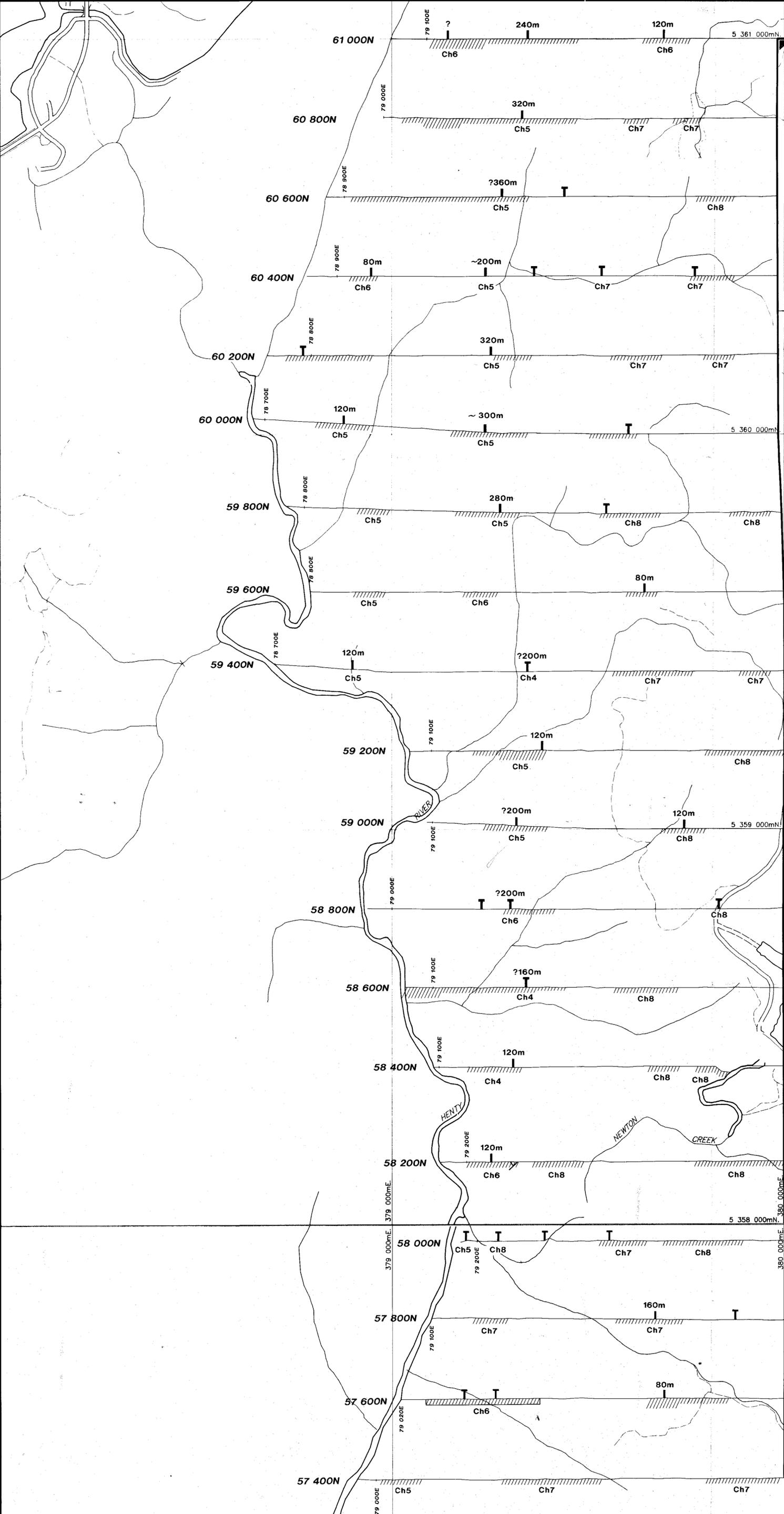


Figure 4. An expanded scale plot of Figure 3.



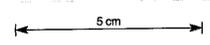
LEGEND

- Zone of more conductive material at surface
- Sharp change (s) in surficial conductivity
- Possible bedrock conductor with anomaly width
- Possible flat-lying inductor
- Indication of dip and direction
- The latest UTEM channel to which an anomalous feature is observed (the smaller the better)
- Transmitter Loop

LOOP TXNC01

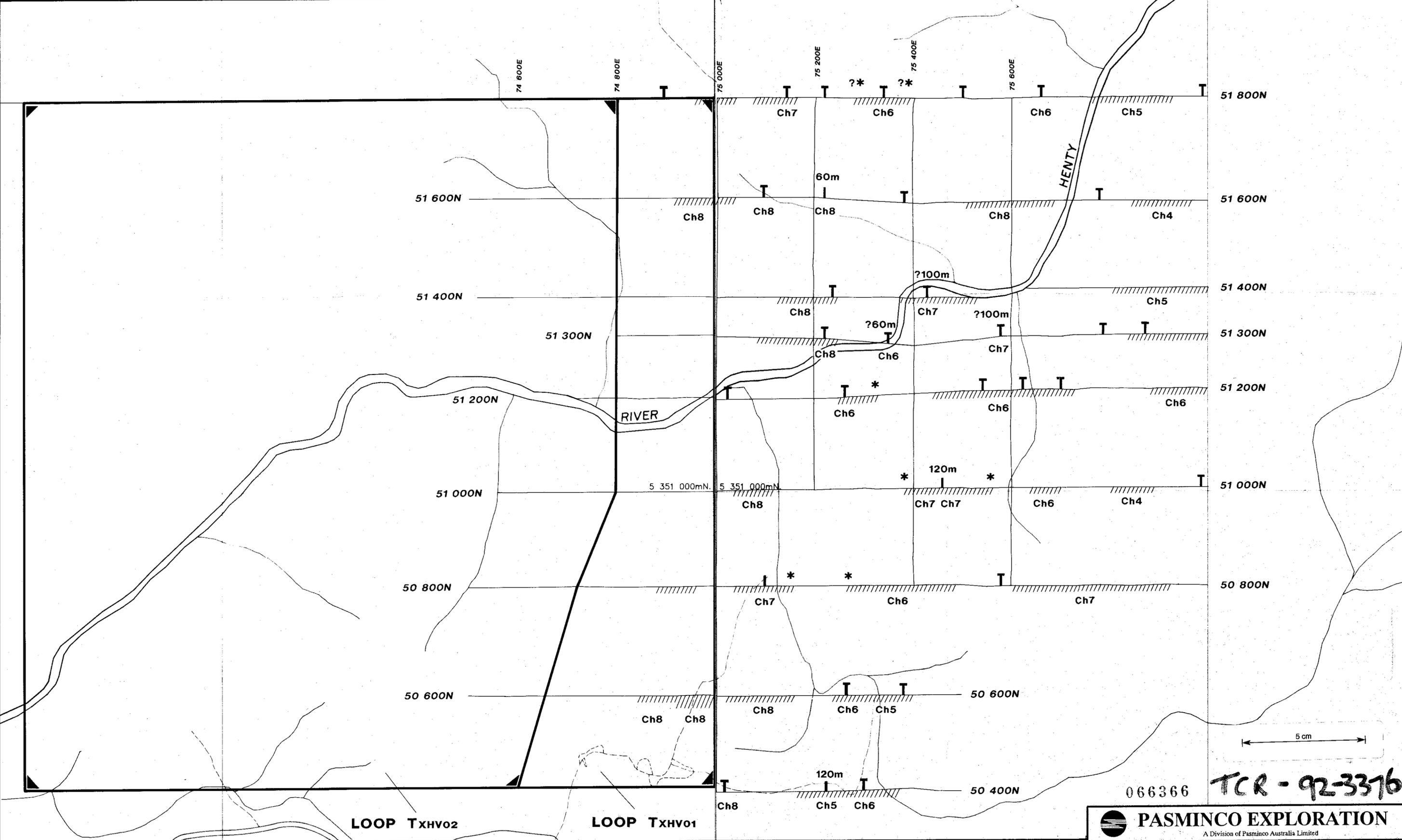
LOOP TXNC02

066365



TCR 92-3376

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DATE : Mar., 1992	
DRAWN : G. M. B.	
REF :	
REVISIONS :	
DRAWING No.	SCALE 1:5000 FIG. No. C



066366 **TCR-92-3376**

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E.L. 11/85 - YOLANDE JV
HENTY VALLEY
UTEM
INTERPRETATION

SCALE 1:5000 FIG. No. f

- Zone of more conductive material at surface
- Possible flat-lying inductor
- Transmitter Loop
- Sharp change (s) in surficial conductivity
- Indication of dip and direction
- Possible bedrock conductor with anomaly width
- The latest UTEM channel to which an anomalous feature is observed (the smaller the better)

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PASMINCO EXPLORATION

YOLANDE EL 11/85

&

YOLANDE RIVER EL 25/91

ANNUAL REPORT

Annual Report

June 1991 - June 1992

volume 2 of 3

92-3376

MINES	
File Ref.	
- 4 AUG 1992	
Doc. Ref.	
Author	Initials
Covering letters on files	
EL 11/85 folios 78-80.	
EL 25/91 folios 36-37	
Date	Date

AUTHOR: R A Poltock
Roger Poltock Geological Pty Limited

DATE: July 1992

REPORT No.: T92-11

SUBMITTED TO: Regional Exploration Manager - Tasmania

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SUBMITTED BY: *R Poltock*

ACCEPTED BY: *[Signature]*

Burnie
June 1992

FIGURES

LEGEND

QUATERNARY

Qg Fluvio-glacials

ORDOVICIAN

Og Gordon Group limestone

Oo Denison Group siliciclastic sandstone and conglomerate

CAMBRIAN

EL Lavas

CI Intrusives

CV Volcanics - lavas/intrusives/clastics undifferentiated

CS Sediments

HENTY FAULT WEDGE

EL/Ib Basalt/dolerite/gabbro, tholeiitic, small bodies shown ... x

CSw1 Volcaniclastic sandstone-conglomerate, feldspar quartz pyroxene crystal, ± chlorite albite alteration banding

CSv1 Vitric mudstone

CSv2 Volcaniclastic sandstone, angular quartz grains and minor zircon in ash matrix, gradational contacts with CSv and siltstone

CLbn1 Basaltic andesite lava?, calc-alkaline, plagioclase augite phyric

CLbn2 Basaltic andesite lava, calc-alkaline, plagioclase phyric

CSs1t Siltstone grey ± andesitic volcaniclastic, minor chert/basalt/dolomite, pyrrhotite, hosts semi massive Pb Zn sulfide lens at Henty Adits

CSs1th Siltstone hematitic - chloritic

CSwqh Siltstone-greywacke-conglomerate, minor chert/basalt/dolomite, hematitic-chloritic, provenance quartzose metasediments/felsic volcanics/ultramafics, detrital magnetite and chromite

CSc Chert/siliceous siltstone/hematitic siltstone

CLbn3 Basaltic andesite lavas, tholeiitic, high TiO2, massive to highly vesiculated, aphyric-plagioclase phyric

CSwq Quartzose wackes-black siltstone, minor limestone and massive pyrite lens at Henty Valley, provenance quartzose metasediments and ultramafics, detrital chromite and tourmaline

HENTY FAULT WEDGE OPHIOLITE COMPLEX

CSs1t Siltstone - greywacke

CVn1 Andesite lavas, intrusives and volcaniclastics, localized hematite silica alteration

CI1 Tonalite, ± biotite K feldspar, small bodies shown ... +

CIg Gabbro/dolerite/basaltic - intermediate dykes

CG Gabbro coarse grained, cumulate textures

Cus Pyroxenite/dunites, serpentine-talc-silica-carbonate altered

EAST AND SOUTH OF HENTY FAULT

TYNDALL GROUP

CLr1 Rhyolite lava, quartz feldspar phyric

CS1 Andesite volcaniclastic and shale, includes Howards Anomaly hematite pyrite barite mineralization

CENTRAL VOLCANIC SEQUENCE

CVn2 Andesite volcanics, plagioclase hornblende pyroxene phyric

CI1n Andesite intrusive, plagioclase hornblende phyric

CScong Conglomerate coarse grained, volcaniclastic includes Newton Creek Spillway Pb Zn massive sulfide clast occurrence

ELnd Andesite-dacite lava, plagioclase phyric, occasionally quartz amygdaloidal

CVrd Rhyodacite volcanics, massive, feldspar phyric

CVr Rhyodacite volcanics, massive, quartz feldspar phyric

YOLANDE RIVER SEQUENCE

CL/Lrd Rhyolite-dacite lavas and intrusives, quartz feldspar ± biotite pyroxene porphyritic

CS2 Shale-lithic wacke, quartz feldspar crystal

WEST AND NORTH OF HENTY FAULT

WHITE SPUR FORMATION

CSw2 Siltstone and greywackes, micaceous

CSs1t Siltstone, locally dolomitic and pyritic

CSv Vitric mudstone

CSst Quartz feldspar crystal lithic sandstone

CScong Quartz feldspar crystal, clasts include mudstone/quartz porphyry felsic volcanics/sulfides

CLr2 Quartz phyric rhyolite lava and hyaloclastite

* Sequence from CScong to CSv represents a mass debris flow unit, repeated in part or full several times in the White Spur Formation

* Marker horizons within the White Spur Formation

• • • quartz grit in mudstone

▲ ▲ ▲ basal WSF north of 61400N

* * * stratigraphically lowest mica wacke

CENTRAL VOLCANIC SEQUENCE

EL/Ld Dacite lava-intrusive, feldspar ± mafic phyric, ± disseminated magnetite

CVpmf Pumiceous mass flow, rhyolite composition, feldspar phyric

--- Geological contact - interpreted

--- Contact bedrock exposure and Quaternary alluvium

--- Fault - movement unknown

▲▲▲ Thrust fault - teeth indicating dip

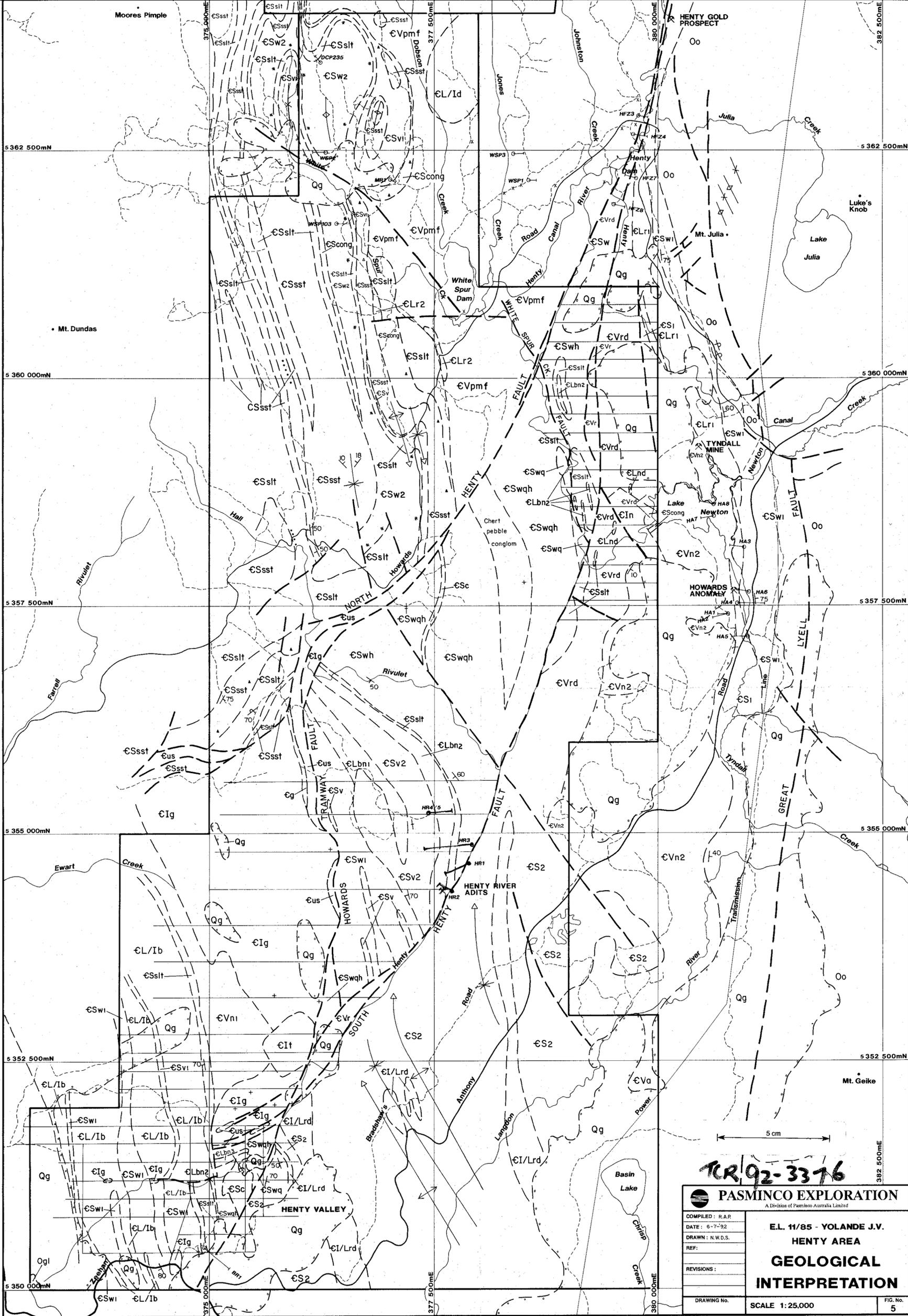
↗ Anticline - plunge indicated

↖ Syncline - plunge indicated

--- Bedding

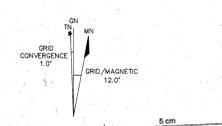
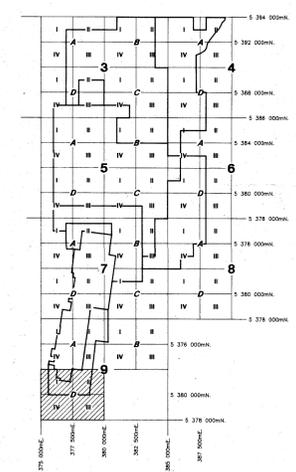
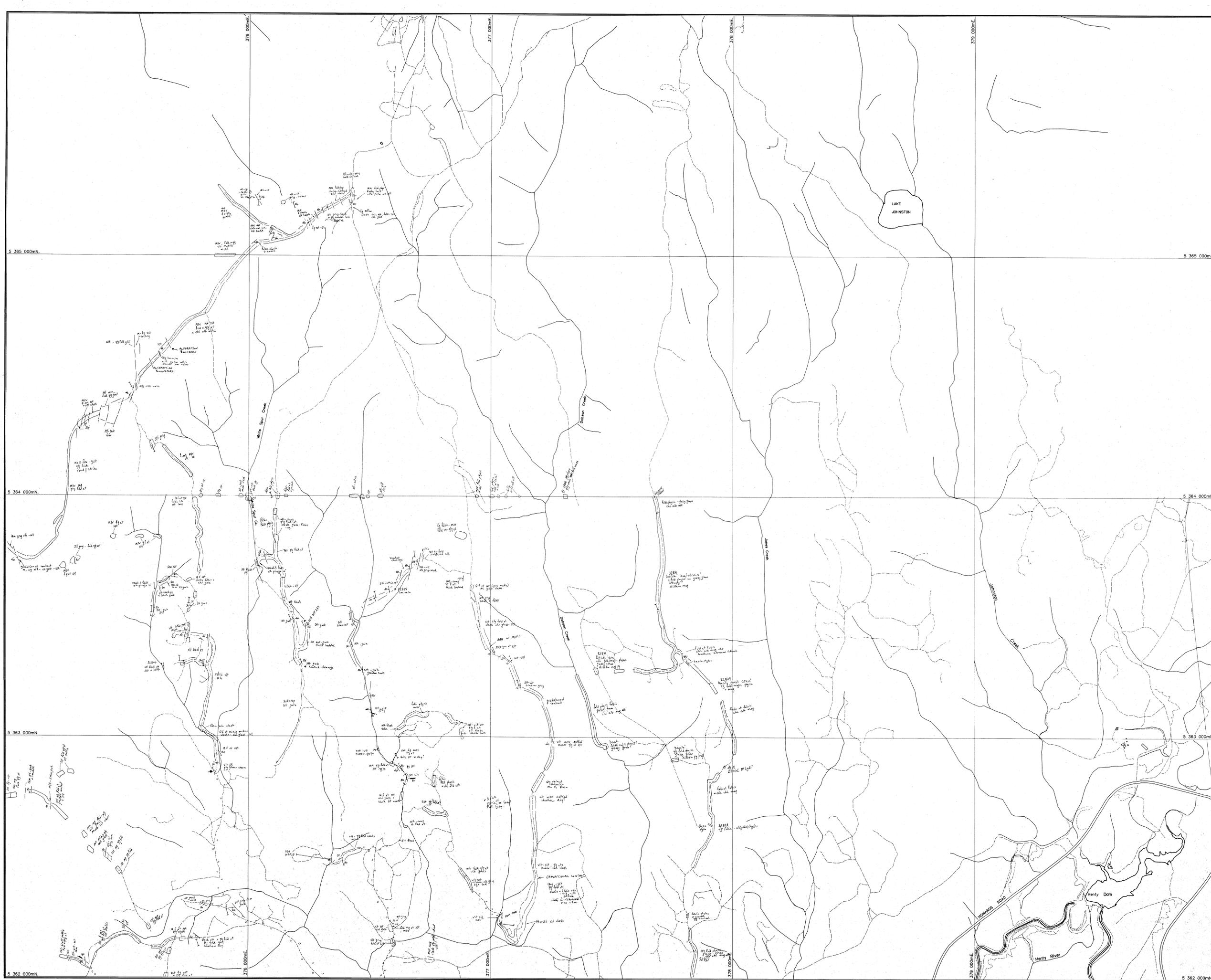
--- Cleavage

--- Joint



TR/92-3376

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<p>REVISIONS:</p>	<p>DRAWING No. SCALE 1:25,000 FIG. No. 5</p>



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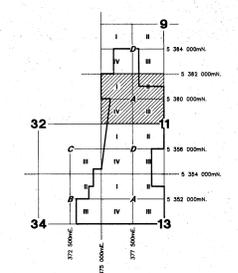
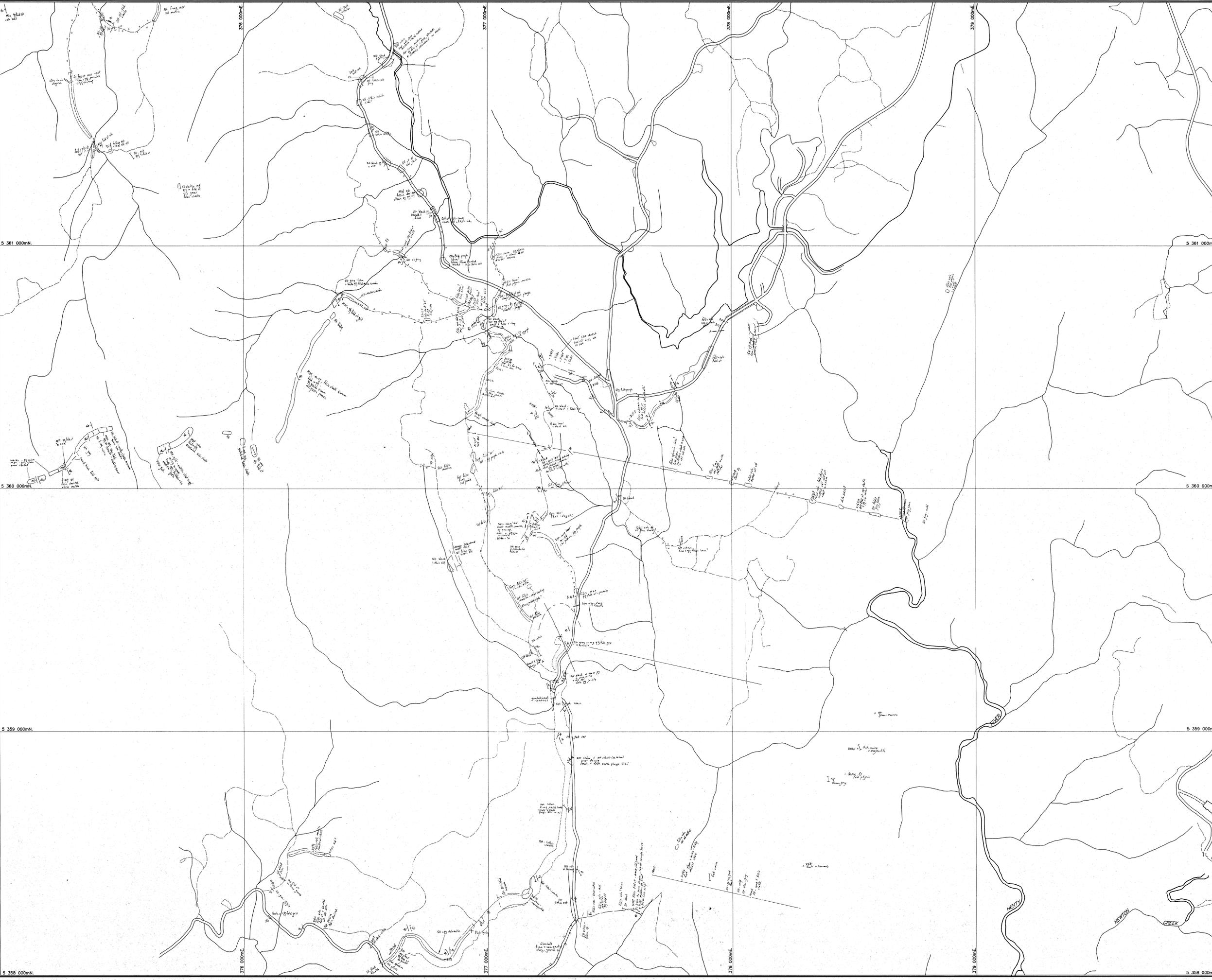
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HENTY AREA
FACTUAL GEOLOGY
AND SAMPLE
LOCATIONS

SCALE 1:5000

0 100 200 METRES

FIG. No 6



066371

8 cm

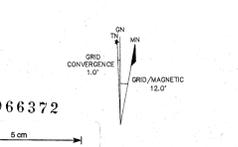
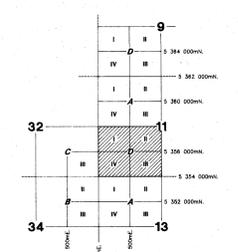
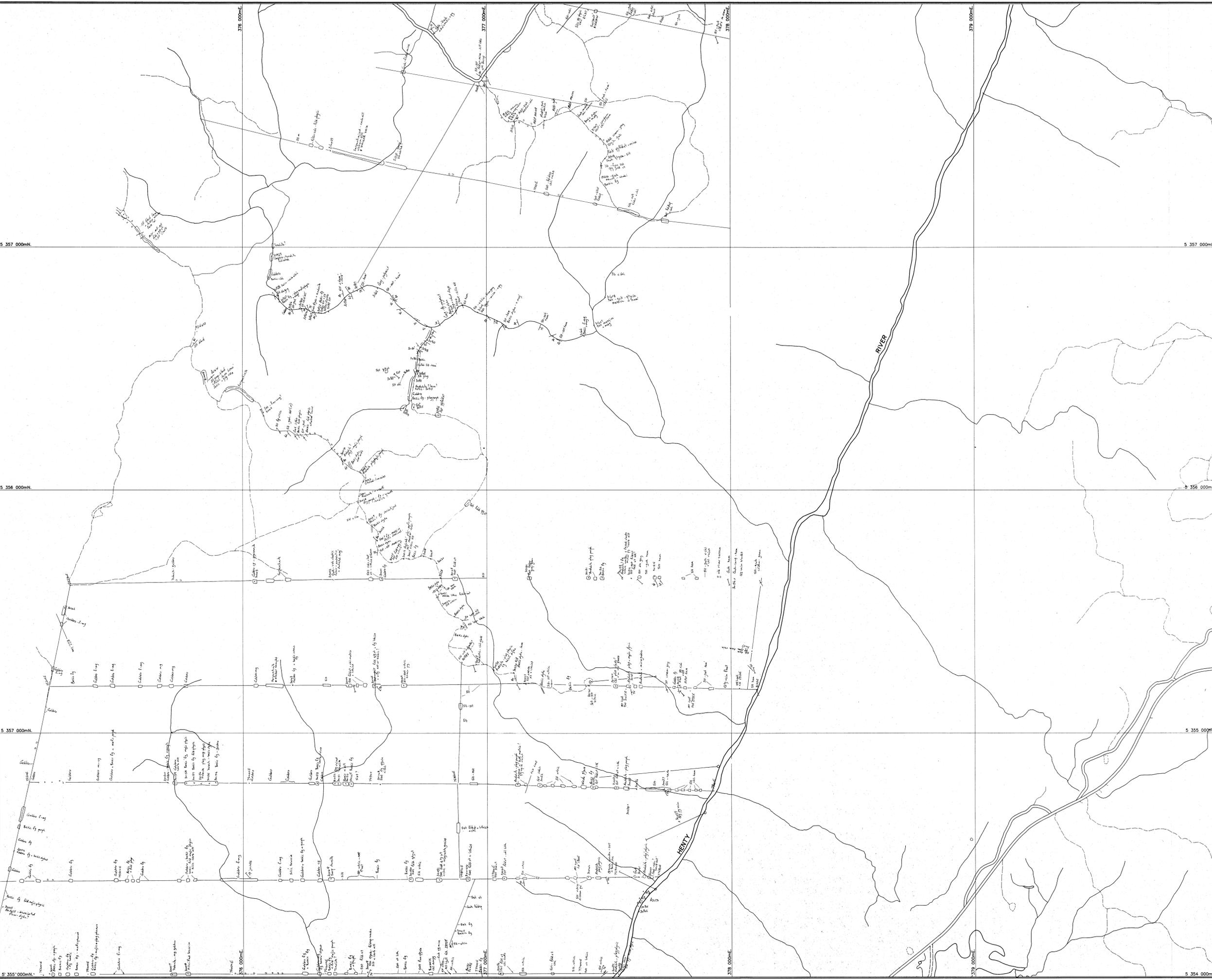
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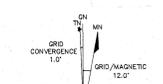
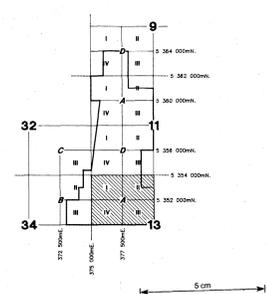
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HENTY AREA
FACTUAL GEOLOGY
AND SAMPLE
LOCATIONS

DRAWING No. SHEET 11A SCALE 1:5000 FIG. No. 7



066372

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<p>SHEET 11D</p>			<p>B</p>



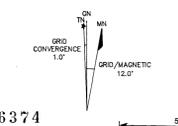
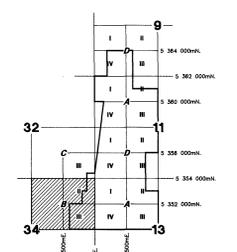
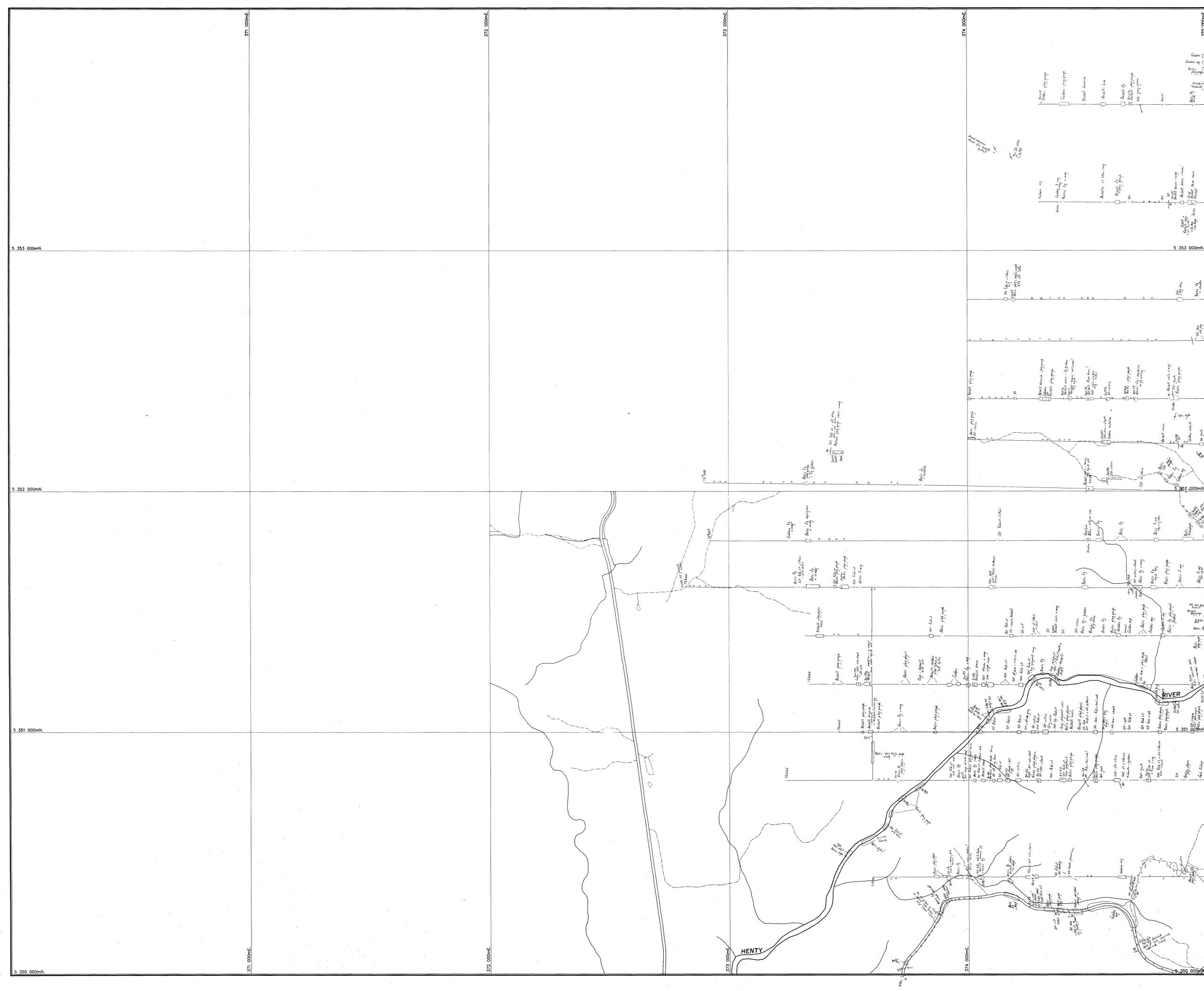
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DRAWING No. SHEET 13A SCALE 1:5000 METRES FIG. No. 9

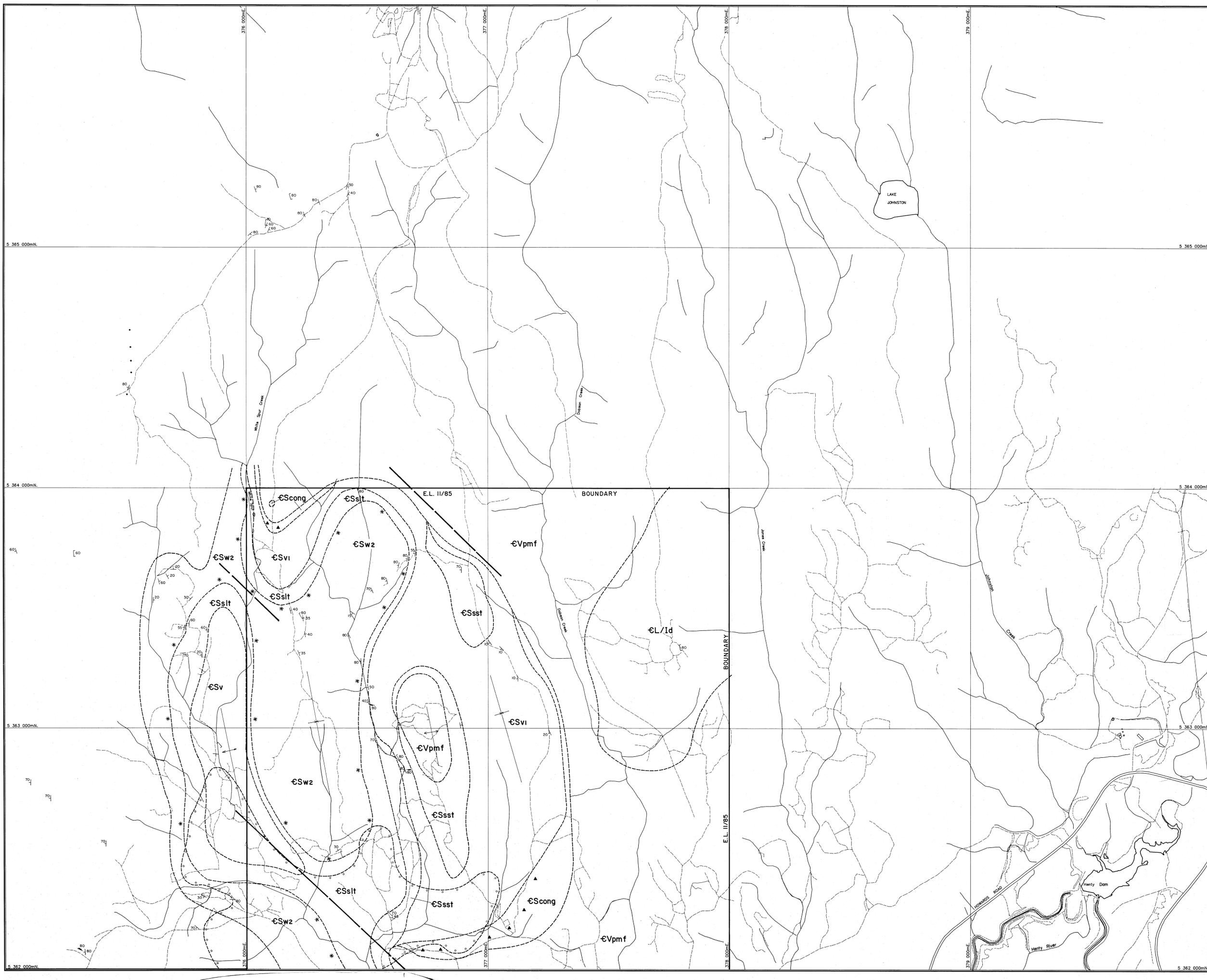


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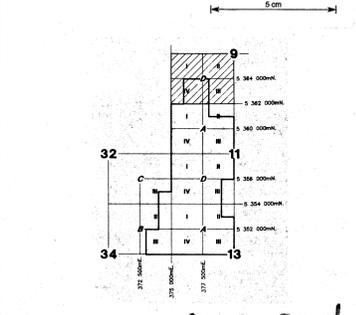
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HENTY AREA
FACTUAL GEOLOGY
AND SAMPLE
LOCATIONS

DRAWING No. SHEET 34B SCALE 1:5000 FIG. No. 10



LEGEND

- QUATERNARY**
- Qa Fluvio-glacials
- ORDOVICIAN**
- O1 Gordon Group limestone
- Oa Denison Group siliciclastic sandstone and conglomerate
- CAMBRIAN**
- Cl Lavas
- Cl Intrusives
- CV Volcanics - lavas/intrusives/taconics undifferentiated
- CS Sediments
- HENTY FAULT WEDGE**
- CL1/b Basalt/dolerite/gabbro, tholeiitic, small bodies shown ... x
- CSw1 Volcaniclastic sandstone-conglomerate, feldspar quartz pyroxene crystal, ± silicite albite alteration banding
- CSv1 Vitric mudstone
- CSv2 Volcaniclastic sandstone, angular quartz grains and minor zircon in ash matrix, gradational contacts with CSv and siltstone
- CL1/b1 Basaltic andesite lavas, calc-alkaline, plagioclase augite phytic
- CL1/b2 Basaltic andesite lava, calc-alkaline, plagioclase phytic
- CSs1t Siltstone grey ± andesitic volcaniclastic, disseminated pyrite/pyrrhotite, hosts semi massive Pb Zn sulfide lens at Henty Adits
- CSs1h Siltstone hematitic - chloritic
- CSw2h Siltstone-greywacke-conglomerate, minor chert/basalt/andesite, hematitic/serpentine, quartzose metasediments/felsic volcanics/ultramafic, detrital magnetite and chromite
- CSs1c Chert/siliceous siltstone/hematitic siltstone
- CL1/b3 Basaltic andesite lavas, tholeiitic, high TiO2, massive to highly vesiculated, aphyric-plagioclase phytic
- CSw2h Quartzose wacke-siltstone, minor limestone and massive pyrite lens at Henty Valley, provenance quartzose metasediments and ultramafic, detrital chromite and tourmaline
- HENTY FAULT WEDGE OPHOLITE COMPLEX**
- CSs1t Siltstone - greywacke
- CSv1 Andesite lavas, intrusives and volcaniclastics, localized hematite siliceous alteration
- CL1 Tonalite, ± biotite K feldspar, small bodies shown ... +
- CG Gabbro/dolerite/basaltic - intermediate dykes
- CS Gabbro coarse grained, cumulate textures
- CSa Pyroxenite/sunites, serpentine-talc-silica-carbonate altered
- EAST AND SOUTH OF HENTY FAULT**
- TINDALL GROUP**
- CL1 Rhyolite lava, quartz feldspar phytic
- CS1 Andesite volcaniclastic and shale, includes Howards Anomaly hematite pyrite barite mineralization
- CENTRAL VOLCANIC SEQUENCE**
- CV2 Andesite volcanics, plagioclase hornblende pyroxene phytic
- CL1 Andesite intrusives, plagioclase hornblende phytic
- CScong Conglomerate coarse grained, volcaniclastic includes Newton Creek Spillway Pb Zn massive sulfide diast occurrence
- CL1d Andesite-dolerite lava, plagioclase phytic, occasionally quartz onygdoloid
- CV2 Rhyodacite volcanics, massive, feldspar phytic
- CV Rhyodacite volcanics, massive, quartz feldspar phytic
- VOLCANIC RIVER SEQUENCE**
- CL1d Rhyolite-dolerite lavas and intrusives, quartz feldspar ± biotite pyroxene porphyritic
- CSa Shale-illitic wacke, quartz feldspar crystal
- HENTY AND NORTH OF HENTY FAULT**
- WHITE SPUR FORMATION**
- CSw Siltstone and greywackes, micaceous
- CSs1t Siltstone, locally dolomitic and pyritic
- CSv Vitric mudstone
- CSs1t Quartz feldspar crystal illitic sandstone
- CScong Quartz feldspar crystal, clasts include mudstone/quartz porphyry felsic volcanics/sulfides
- CL1t Quartz phytic rhyolite lava and hydrothermal
- * Sequence from CScong to CSv represents a mass debris flow unit, repeated in part or full several times in the White Spur Formation
- * Marker horizons within the White Spur Formation
- • • quartz grit in mudstone
- ▲ ▲ ▲ basal WSF north of 61400N
- • • stratigraphically lowest mica wacke
- CENTRAL VOLCANIC SEQUENCE**
- CL1/b1 Dolerite lava-intrusive, feldspar ± mafic phytic, ± disseminated magnetite
- EVpmf Pumiceous mass flow, rhyolite composition, feldspar phytic



066375 **TCR 92-3376**

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REFERENCE:
REVISIONS:

E.L. 11/85 - YOLANDE JV
HENTY AREA
INTERPRETIVE GEOLOGY

DRAWING No. **SHEET 9D** SCALE 1:5000 0 100 200 METRES FIG. No. 11



LEGEND

QUATERNARY

Qg Fluvio-glacial

ORDOVICIAN

G Gordon Group limestone

Gs Denison Group siliciclastic sandstone and conglomerate

CAMBRIAN

CL Lavas

CI Intrusives

CV Volcanics - lavas/intrusives/diatics undifferentiated

CS Sediments

HENTY FAULT WEDGE

CL/ln Basalt/dolerite/gabbro, tholeiitic, small bodies shown ...

CSwi Volcaniclastic sandstone-conglomerate, feldspar quartz pyroxene crystal, ± chlorite albite alteration banding

CSvi Vitric mudstone

CSvq Volcaniclastic sandstone, angular quartz grains and minor zircon in ash matrix, gradational contacts with CSv and siltstone

CSbn Basic andesite lava, calc-alkaline, plagioclase augite phytic

CLbn2 Basic andesite lava, calc-alkaline, plagioclase phytic

CSst Siltstone grey ± andesitic volcaniclastic, disseminated pyrite/particulate, hosts semi-massive Pb-Zn sulfide lens at Henty Adits

CSwh Siltstone hematitic - chloritic

CSwh Siltstone-greywacke-conglomerate, minor chert/basalt/psammite, hematitic-chloritic, porphyroblast quartzite meta-sediments/mafic volcanics/ultramafics, detrital magnetite and chromite

CSc Chert/siliceous siltstone/hematitic siltstone

CLbn3 Basic andesite lava, tholeiitic, high TiO₂, massive to highly vesiculated, aphyric-plagioclase phytic

CSwq Quartzite wacke-black siltstone, minor limestone and massive pyrite lens at Henty Adits, porphyroblast quartzite meta-sediments and ultramafics, detrital chromite and tourmaline

HENTY FAULT WEDGE OPHOLITE COMPLEX

CSst Siltstone - greywacke

CVn Andesite tuffs, intrusives and volcanoclastics, localized hematite siliceous alteration

CLt Tonalite, ± biotite K feldspar, small bodies shown ...

CLg Gabbro/salerite/basaltic - intermediate dykes

CG Gabbro coarse grained, cumulate textures

Cus Pyroxene/sunite, serpentine-talc-silica-carbonate altered

EAST AND SOUTH OF HENTY FAULT

TIBDALL GROUP

CLr Rhyolite lava, quartz feldspar phytic

CSi Andesite volcanoclastic and shale, includes Howards Anomaly hematite pyrite barite mineralization

CENTRAL VOLCANIC SEQUENCE

CLn2 Andesite volcanics, plagioclase hornblende pyroxene phytic

CLn Andesite intrusives, plagioclase hornblende phytic

CScong Conglomerate coarse grained, volcanoclastic includes Newton Creek Spillway Pb-Zn massive sulfide lens occurrence

CLnd Andesite-dalite lava, plagioclase phytic, occasionally quartz ophiolitic

CVs Rhyodacite volcanics, massive, feldspar phytic

CVr Rhyodacite volcanics, massive, quartz feldspar phytic

YOLANDE RIVER SEQUENCE

CL/Lrd Rhyolite-dalite lavas and intrusives, quartz feldspar ± biotite pyroxene porphyritic

CSi Shale-iltitic wacke, quartz feldspar crystal

NORTH AND NORTH OF HENTY FAULT

WHITE SPUR FORMATION

CSw Siltstone and greywackes, micaceous

CSst Siltstone, locally dolomitic and pyritic

CSv Vitric mudstone

CSst Quartz feldspar crystal lithic sandstone

CScong Quartz feldspar crystal, clasts include mudstone/quartz porphyry mafic volcanics/sulfides

CLr Quartz phytic rhyolite lava and hyaloclastite

• Sequence from CScong to CSv represents a mass debris flow unit, repeated in part or full several times in the White Spur Formation

• Marker horizons within the White Spur Formation

• • • quartz grit in mudstone

• • • basal WSF north of E1400N

• • • stratigraphically lowest mica wacke

CENTRAL VOLCANIC SEQUENCE

CL/Lrd Dalite lava-intrusive, feldspar ± mafic phytic, ± disseminated magnetite

CLvpm Punicaceous mass flow, rhyolite composition, feldspar phytic

--- Geological contact - interpreted

--- Contact bedrock exposure and Quaternary alluvium

--- Fault - movement unknown

--- Thrust fault - teeth indicating dip

--- Anticline - plunge indicated

--- Syncline - plunge indicated

--- Bedding

--- Cleavage

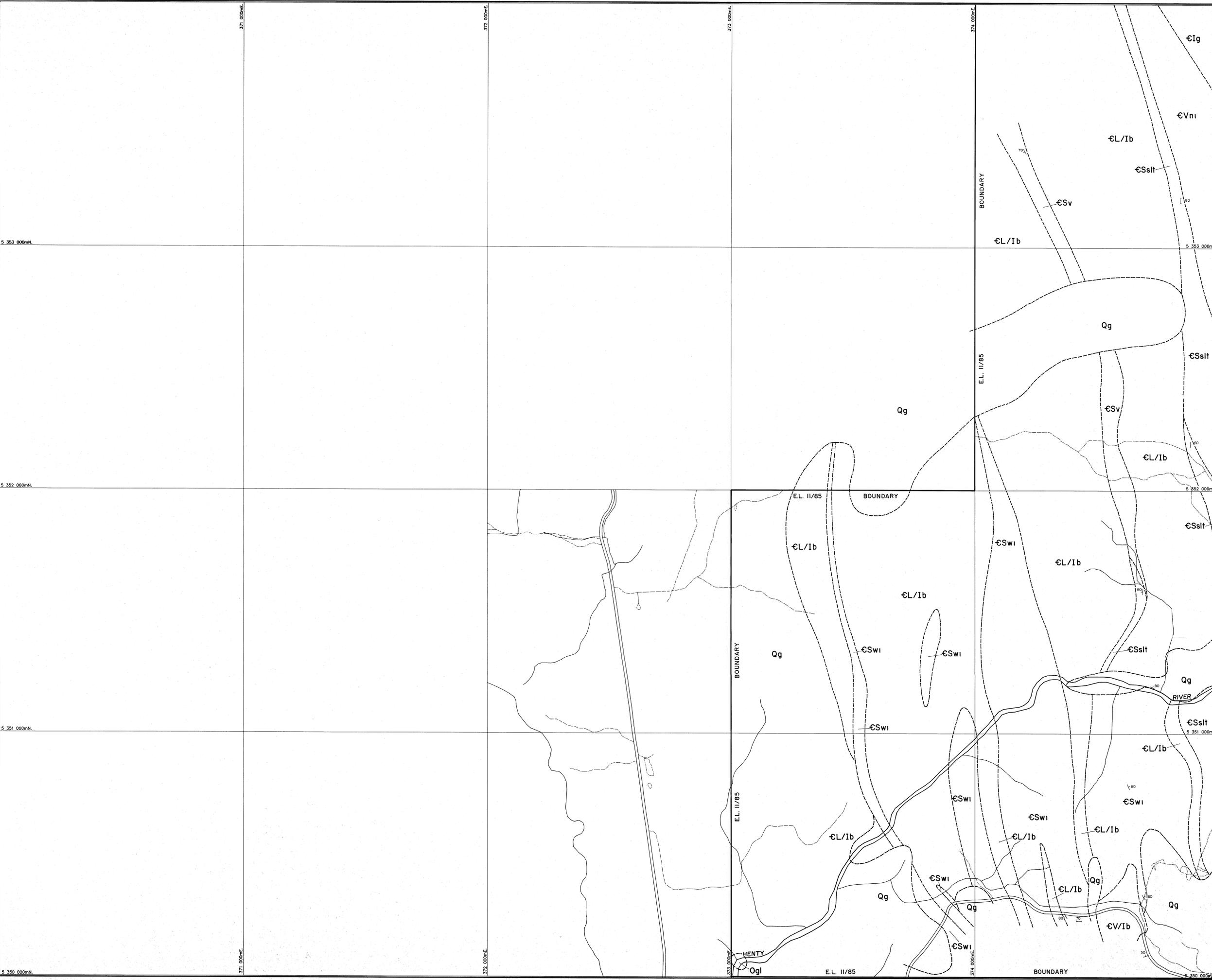
--- Joint

5 cm

066378

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SCALE 1:5000
E.L. 11/85 - YOLANDE JV
HENTY AREA
INTERPRETIVE GEOLOGY
FIG. No. 14



LEGEND

QUATERNARY

- Qg Fluvio-glacials

ORDOVICIAN

- Og Gordon Group limestone
- Oe Denison Group siliciclastic sandstone and conglomerate

CAMBRIAN

- EL Laves
- EL Intrusives
- CV Volcanics - lava/intrusives/diastics undifferentiated
- CS Sediments

HENTY FAULT WEDGE

- EL/Ib Basalt/andesite/gabbro, tholeiitic, small bodies shown ... x
- CSwt Volcaniclastic sandstone-conglomerate, feldspar quartz pyroxene gravel, ± chlorite albite alteration banding
- CSvt Vitric mudstone
- CSsv Volcaniclastic sandstone, angular quartz grains and minor zircon in ash matrix, gradational contacts with CSv and siltstone
- ELbn Basaltic andesite lava, calc-alkaline, plagioclase aegirite phytic
- ELbn Basaltic andesite lava, calc-alkaline, plagioclase phytic
- CSst Siltstone gray ± andesitic volcaniclastic, disseminated pyrite, pyrrhotite, hematite semi massive Pb Zn sulfide lens at Henty Adla
- CSst Siltstone hematitic - quartzitic
- CSwt Siltstone-greywacke-conglomerate, minor chert/basalt/diorite, hematitic-chertitic, prominence quartzose metasediments/felsic volcanics/ultramafic, detrital magnetite and chromite
- CSwt Siltstone-greywacke-conglomerate, minor chert/basalt/diorite, hematitic-chertitic, prominence quartzose metasediments/felsic volcanics/ultramafic, detrital magnetite and chromite
- CS Chert/siltaceous siltstone/hematitic siltstone
- ELbn Basaltic andesite lavas, tholeiitic, high TiO₂, massive to highly vesicular, aphyric-plagioclase phytic
- CSwt Quartzose wacke-block siltstone, minor limestone and impure pyrite lens at Henty Valley, prominence quartzose metasediments and ultramafics, detrital chromite and tourmaline

HENTY FAULT WEDGE OPPOSITE COMPLEX

- CSst Siltstone - greywacke
- CVn Andesite lavas, intrusives and volcanoclastics, localized hematite albite alteration
- EL Tonalite, ± biotite K feldspar, small bodies shown ... +
- EL Gabbro/andesite/basaltic - intermediate dykes
- CG Gabbro coarse grained, cumulate textures
- Cus Pyroxenite/aunites, serpentine-talc-illite-carbonate altered

EAST AND SOUTH OF HENTY FAULT

TRINIDAD GROUP

- ELr Rhyolite lava, quartz feldspar phytic
- CSr Andesite volcaniclastic and shale, includes Howards Anomaly hematite pyrite barite mineralization

CENTRAL VOLCANIC SEQUENCE

- CVn Andesite volcanics, plagioclase hornblende pyroxene phytic
- ELn Andesite intrusive, plagioclase hornblende phytic
- CSong Conglomerate coarse grained, volcaniclastic, includes Newton Creek Spillway Pb Zn massive sulfide clast occurrence
- ELnd Andesite-dacite lava, plagioclase phytic, occasionally quartz amygdaloid
- CVrd Rhyodacite volcanics, massive, feldspar phytic
- CVr Rhyodacite volcanics, massive, quartz feldspar phytic

YOLANDE RIVER SEQUENCE

- EL/Lr Rhyolite-dacite lavas and intrusives, quartz feldspar ± biotite pyroxene porphyritic
- CSs Shale-lithic wacke, quartz feldspar crystal

WEST AND NORTH OF HENTY FAULT

WHITE SPUR FORMATION

- CSwt Siltstone and greywackes, micaceous
- CSst Siltstone, locally dolomitic and pyritic
- CSvt Vitric mudstone
- CSst Quartz feldspar crystal lithic sandstone
- CSong Quartz feldspar crystal, clasts include mudstone/quartz porphyry felsic volcanics/sulfides
- ELr Quartz phytic rhyolite lava and hyaloclastite

• Sequence from CSong to CSv represents a mass debris flow unit, repeated in part or full several times in the White Spur Formation

• • • quartz grit in mudstone

• • • basal WSF north of 61400N

• • • stratigraphically lowest mica wacke

CENTRAL VOLCANIC SEQUENCE

- EL/Ib Dacite lava-intrusive, feldspar ± mafic phytic, ± disseminated magnetite
- CVpm Pumiceous mass flow, rhyolite composition, feldspar phytic

Geological symbols:

- Geological contact - interpreted
- Contact bedrock exposure and Quaternary alluvium
- Fault - movement unknown
- Thrust fault - teeth indicating dip
- Anticline - plunge indicated
- Syncline - plunge indicated
- Bedding
- Cleavage
- Joint

8 cm

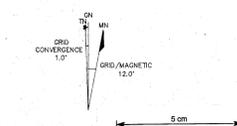
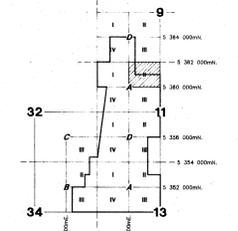
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**E.L. 11/85 - YOLANDE JV
HENTY AREA
INTERPRETIVE
GEOLOGY**

DRAWING No. SHEET 34B SCALE 1:5000 FIG. No. 15



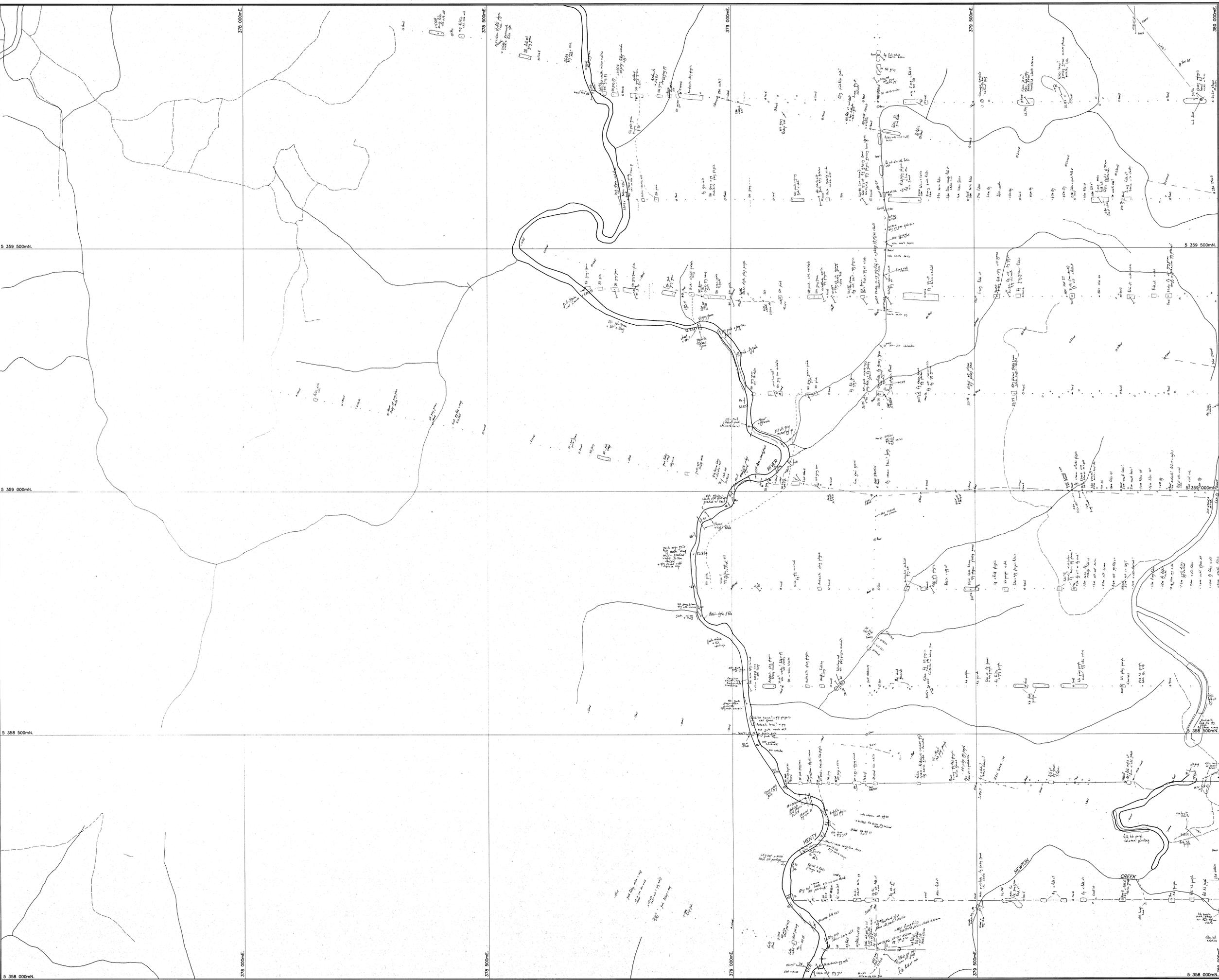
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HENTY AREA
FACTUAL GEOLOGY
AND SAMPLE
LOCATIONS

DRAWING No. SHEET 11A2 SCALE 1:2500 FIG. No. 16



5 359 500mN.

5 359 000mN.

5 358 500mN.

5 358 000mN.

379 000mE.

379 500mE.

379 000mE.

379 500mE.

380 000mE.

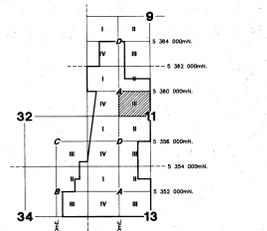
379 000mE.

379 500mE.

379 000mE.

379 500mE.

380 000mE.



5 cm

GRID CONFORMANCE 1.0'
GRID/MAGNETIC 12.0'

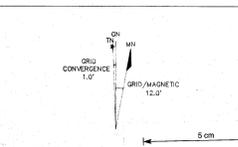
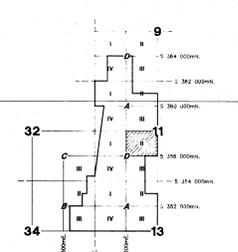
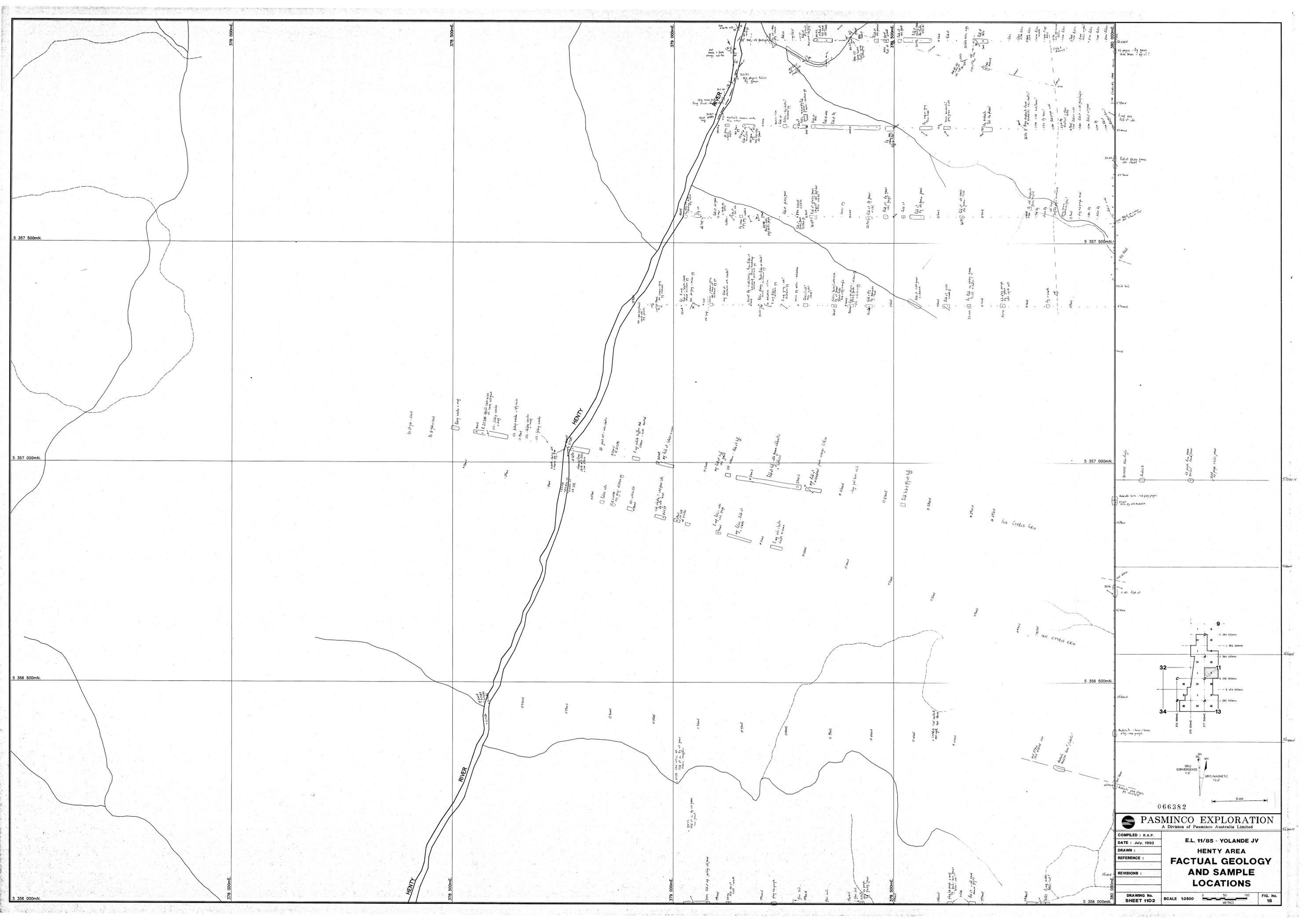
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FACTUAL GEOLOGY
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LOCATIONS

DRAWING No. SHEET 11A3 SCALE 1:2500 0 50 100 METRES FIG. No. 17



066382

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DRAWING No. SHEET 11D2 SCALE 1:2500 0 50 100 METRES FIG. No. 18

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**PASMINCO EXPLORATION
YOLANDE EL 11/85
&
YOLANDE RIVER EL 25/91
ANNUAL REPORT**

Annual Report
June 1991 - June 1992
volume 3 of 3

92-3376

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Roger Pollock Geological Pty Limited

DATE: July 1992

REPORT No.: T92-11

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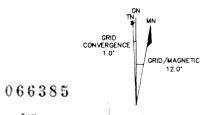
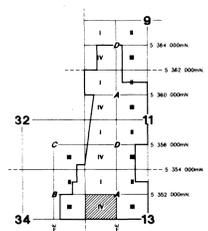
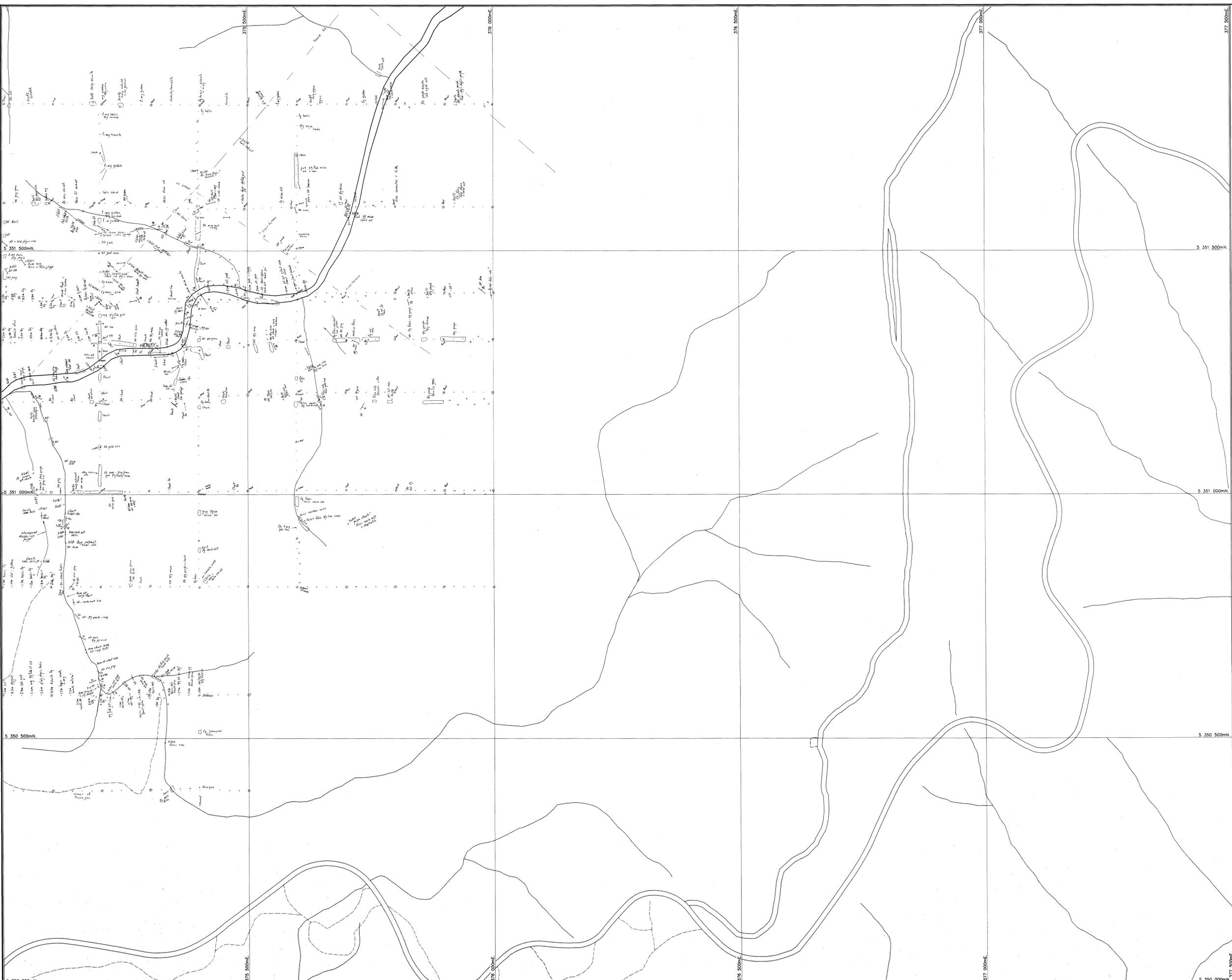
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Burnie
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FIGURES



066385

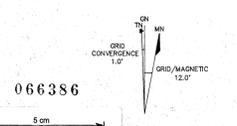
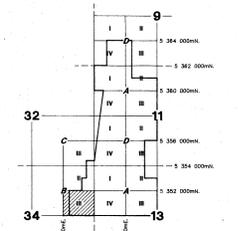
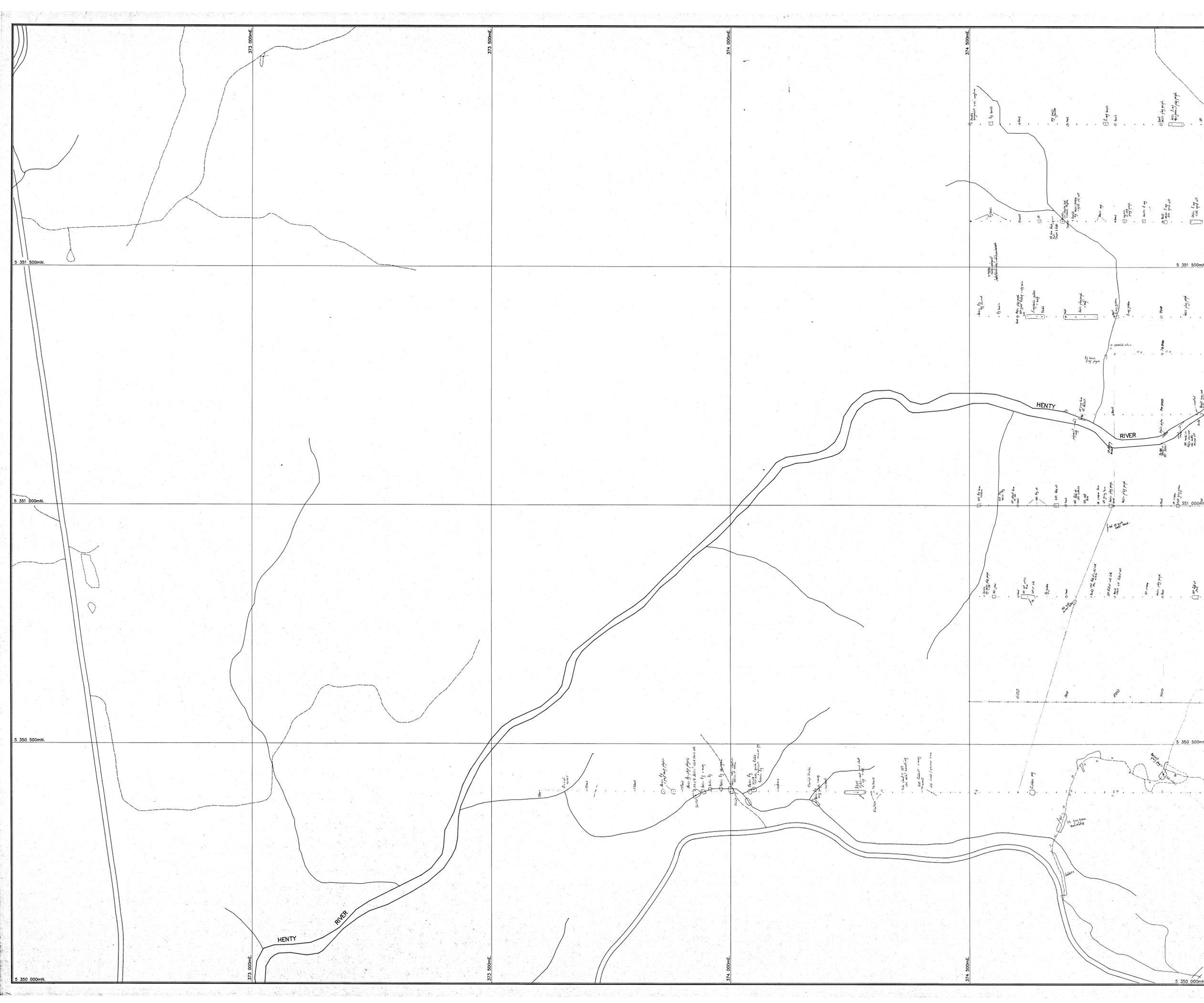
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DATE : July, 1992	
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DRAWING No.	SCALE 1:2500	FIG. No.
SHEET 13A4	0 50 100 METRES	19

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HENTY AREA
FACTUAL GEOLOGY
AND SAMPLE
LOCATIONS

DRAWING No. **SHEET 34B3** SCALE 1:2500 FIG. No. **20**



LEGEND

QUATERNARY
 Qg Fluvio-glacial

ORDOVICIAN
 Og Gordon Group limestone
 Oo Denison Group siliceous sandstone and conglomerate

CAMBRIAN
 CL Laves
 CI Intrusives
 CV Volcanics - laves/intrusives/diases undifferentiated
 CS Sediments

HENTY FAULT WEDGE
 CL7b Basalt/dolerite/gabbro, tholeiitic, small bodies shown ...
 CSw Volcaniclastic sandstone-conglomerate, feldspar quartz pyroxene crystal, ± chlorite albite alteration banding
 CSv Vitric mudstone
 CSva Volcaniclastic sandstone, angular quartz grains and minor zircon in ash matrix, gradational contacts with CSv and siltstone
 CLbn Basaltic andesite lavas, calc-alkaline, plagioclase augite phytic
 CLbn2 Basaltic andesite lava, calc-alkaline, plagioclase phytic
 CSst Siltstone grey ± andesitic volcaniclastic, disseminated pyrite/pyrrhotite, host semi-massive Pb Zn sulfide lens at Henty Adits
 CSstH Siltstone hematitic - chloritic
 CSswp Siltstone-greywacke-conglomerate, minor chert/basalt/dolerite, hematitic-chloritic, prominent quartzose matrix/mudstone/tealite volcanic/ultramafic, detrital magnetite and chromite
 CSs Chert/siliceous siltstone/hematitic siltstone
 CLbn Basaltic andesite lava, tholeiitic, high TiO₂, massive to highly vesicular, ophytic-plagioclase phytic
 CSw Quartzose wacke-block siltstone, minor limestone and massive ophytic lens at Henty Valley, prominent quartzose matrix/mudstone and ultramafic, detrital chromite and tourmaline

HENTY FAULT WEDGE OPPOSITE COMPLEX
 CSst Siltstone - greywacke
 CVn Andesite lavas, intrusives and volcaniclastics, localized hematite albite alteration
 CI Tonalite, ± biotite K feldspar, small bodies shown ...
 CLg Gabbro/dolerite/basaltic - intermediate dykes
 G Gabbro coarse grained, cumulative textures
 Cus Pyroxenite/dunites, serpentine-talc-silica-carbonate altered

EAST AND SOUTH OF HENTY FAULT
TYNDALL GROUP
 CLr1 Rhyolite lava, quartz feldspar phytic
 CSr Andesite volcaniclastic and ash, includes Howards Anomaly hematite pyrite barite mineralization
CENTRAL VOLCANIC SEQUENCE
 CVn Andesite volcanics, plagioclase hornblende pyroxene phytic
 CLn Andesite intrusives, plagioclase hornblende phytic
 CSong Conglomerate coarse grained, volcaniclastic, includes Newton Creek Spillway Pb Zn massive sulfide lens occurrence
 CLnd Andesite-dalite lava, plagioclase phytic, occasionally quartzogabbro
 CVr Rhyodacite volcanics, massive, feldspar phytic
 CVr Rhyodacite volcanics, massive, quartz feldspar phytic

YOLANDE RIVER SEQUENCE
 CL/Lrd Rhyolite-dalite lavas and intrusives, quartz feldspar ± biotite pyroxene porphyritic
 CSs Shale-illitic wacke, quartz feldspar crystal

NORTH AND NORTH OF HENTY FAULT
WHITE SPUR FORMATION
 CSw Siltstone and greywackes, micaceous
 CSst Siltstone, locally dolomitic and pyritic
 CSv Vitric mudstone
 CSst Quartz feldspar crystal illitic sandstone
 CSong Quartz feldspar crystal, clasts include mudstone/quartz porphyry felsic volcanic/sulfides
 CLz Quartz phytic rhyolite lava and hydrothermal
 * Sequence from CSong to CSv represents a mass debris flow unit, repeated in part or full several times in the White Spur Formation
 * Marker horizons within the White Spur Formation
 * * * quartz grit in mudstone
 * * * basal WSP north of 61400N
 * * * stratigraphically lowest mica wacke

CENTRAL VOLCANIC SEQUENCE
 CL/Lrd Dalite lava-intrusive, feldspar ± mafic phytic, ± disseminated magnetite
 EVpmf Pumiceous mass flow, rhyolite composition, feldspar phytic

Geological symbols:
 - - - Geological contact - interpreted
 - - - Contact bedrock exposure and Quaternary alluvium
 - - - Fault - movement unknown
 - - - Thrust fault - teeth indicating dip
 - - - Anticline - plunge indicated
 - - - Syncline - plunge indicated
 - - - Bedding
 - - - Cleavage
 - - - Joint

5 cm

066587 **TCR 92-3376**

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E.L. 11/85 - YOLANDE JV
HENTY AREA
INTERPRETIVE
GEOLOGY

DRAWING No. SHEET 11A2 SCALE 1:2500 FIG. No. 21



LEGEND

QUATERNARY

- Qg Fluvio-glacials

ORDOVICIAN

- Qg Gordon Group limestone
- Qe Denison Group alloclastic sandstone and conglomerate

CAMBRIAN

- CL Lavas
- CL Intrusives
- CV Volcanics - lavas/intrusives/diatics undifferentiated
- CS Sediments

HENTY FAULT BELT

- CL/16 Basalt/dolerite/gabbro, tholeiitic, small bodies shown ... x
- CSv1 Volcaniclastic sandstone-conglomerate, feldspar quartz porphyre crystal, ± chlorite plate alteration banding
- CSv2 Vitric mudstone
- CSv3 Volcaniclastic sandstone, angular quartz grains and minor zircon in ash matrix, gradational contacts with CSv and siltstone
- CLbn1 Basaltic andesite lavas, calc-alkaline, plagioclase augite phytic
- CLbn2 Basaltic andesite lava, calc-alkaline, plagioclase phytic
- CSs1 Siltstone gray ± andesitic volcaniclastic, disseminated pyrite/serpentine, matrix semi-massive Pb Zn sulfide lens of thirty Adu
- CSs2 Siltstone hematitic - chloritic
- CSs3 Siltstone-graywacke-conglomerate, minor chert/basalt/dolerite, hematitic, chloritic, porphyro quartzose interbedded/felsic volcanic/ultramafic, detrital magnetite and chromite
- CSc Chert/siliceous siltstone/hematitic siltstone
- CLbn3 Basaltic andesite lavas, tholeiitic, high TiO₂, massive to highly vesiculated, aphyric-plagioclase phytic
- CSv4 Quartzose wackes-block siltstone, minor limestone and impure and ultramafic, detrital chromite and tourmaline

HENTY FAULT BELT GRANULITE COMPLEX

- CSs1 Siltstone - graywacke
- CSv1 Andesite lavas, intrusives and volcanoclastic, localized hematite silica alteration
- CL11 Tonalite, ± biotite K feldspar, small bodies shown ... +
- CL12 Gabbro/dolerite/basaltic - intermediate dykes
- CL13 Gabbro coarse grained, cumulative textures
- Cus Pyroxenite/aunites, serpentine-talc-silica-carbonate altered

EAST AND SOUTH OF HENTY FAULT

TRIDELL GROUP

- CSr1 Rhyolite lava, quartz feldspar phytic
- CSr2 Andesite volcaniclastic and shale, includes Howards Anomaly hematite pyrite barite mineralization

CENTRAL VOLCANIC SEQUENCE

- CSv2 Andesite volcanics, plagioclase hornblende pyroxene phytic
- CLn Andesite intrusives, plagioclase hornblende phytic
- CScong Conglomerate coarse grained, volcanoclastic, includes Newton Creek Spillway Pb Zn massive sulfide deposit occurrence
- CLnd Andesite-dolerite lava, plagioclase phytic, occasionally quartz amygdaloid
- CSv3 Rhyolite volcanics, massive, feldspar phytic
- CSv4 Rhyolite volcanics, massive, quartz feldspar phytic

YOLANDE RIVER SEQUENCE

- CL/17 Rhyolite-dolerite lavas and intrusives, quartz feldspar ± biotite pyroxene porphyritic
- CSs1 Shale-lithic wacke, quartz feldspar crystal

WEST AND NORTH OF HENTY FAULT

WHITE SPUR FORMATION

- CSwq Siltstone and graywackes, micaceous
- CSs1 Siltstone, locally dolomitic and pyritic
- CSv Vitric mudstone
- CSs1 Quartz feldspar crystal lithic sandstone
- CScong Quartz feldspar crystal, clasts include mudstone/quartz porphyry felsic volcanics/sulfides
- CLr2 Quartz phytic rhyolite lava and hydrochlorite

• Sequence from CScong to CSv represents a mass debris flow unit, repeated in part or full several times in the White Spur Formation

• Marker horizons within the White Spur Formation

- • • quartz grit in mudstone
- • • basal WSF north of 61400N
- • • stratigraphically lowest mica wacke

CENTRAL VOLCANIC SEQUENCE

- CL/19 Dolerite lava-intrusive, feldspar ± mafic phytic, ± disseminated magnetite
- EVpmf Pumiceous mass flow, rhyolite composition, feldspar phytic

Geological symbols:

- Geological contact - interpreted
- Contact bedrock exposure and Quaternary alluvium
- Fault - movement unknown
- Thrust fault - teeth indicating dip
- Anticline - plunge indicated
- Syncline - plunge indicated
- Bedding
- Cleavage
- Joint

Scale: 5 cm

Grid: 32, 34, 13, 11, 9, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34

066388

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E.L. 11/85 - YOLANDE JV
HENTY AREA
INTERPRETIVE GEOLOGY

DRAWING No. SHEET 11A3 **SCALE 1:2500** **FIG. No. 22**



LEGEND

QUATERNARY
 Qg Fluvioglacial

ORDOVICIAN
 Dg Gordon Group limestone
 Ds Denison Group siliceous sandstone and conglomerate

CAMBRIAN
 CL Lavas
 CLi Intrusives
 EV Volcanics - lavas/intrusives/clastics undifferentiated
 CS Sediments

HENTY FAULT WEDGE
 CSwt Basalt/gabbro/gabbro, tholeiitic, small bodies shown ... x
 CSwt Volcaniclastic sandstone-conglomerate, feldspar quartz pyroxene crystal, ± chlorite albite alteration banding
 CSvt Vitric mudstone
 CSv Volcaniclastic sandstone, angular quartz grains and minor zircon in ash matrix, gradational contacts with CSv and siltstone
 CSv Basaltic andesite lava, calc-alkaline, plagioclase augite phytic
 CSwt Basaltic andesite lava, calc-alkaline, plagioclase phytic
 CSwt Siltstone grey ± andesitic volcaniclastic, disseminated pyrite, pyrrhotite, hosts semi-massive Pb-Zn sulfide lens at Henty Adits
 CSwt Siltstone hematitic - chloritic
 CSwt Siltstone-greywacke-conglomerate, minor chert/basalt/dolomite, hematitic-chloritic, pyroxene quartzose metasediments/felsic dykes/ultramafics, detrital magnetite and chromite
 CSwt Chert/siliceous siltstone/hematitic siltstone
 CSwt Basaltic andesite lava, tholeiitic, high TiO₂, massive to highly vesiculated, aphyric-plagioclase phytic
 CSwt Quartzose wacke-block siltstone, minor limestone and massive pyrite lens at Henty Adits, pyroxene quartzose metasediments and ultramafics, detrital chromite and tourmaline

HENTY FAULT WEDGE OPHOLITE COMPLEX
 CSwt Siltstone - greywacke
 CVn Andesite lava, intrusives and volcaniclastics, localized hematite albite alteration
 CLt Tonalite, ± biotite K feldspar, small bodies shown ... +
 CLg Gabbro/dolerite/basaltic - Intermediate dykes
 Gg Gabbro coarse grained, cumulate textures
 Gss Pyroxenite/dunites, serpentine-talc-actinolite-carbonate altered

EAST AND SOUTH OF HENTY FAULT

TINDALL GROUP
 CLr Rhyolite lava, quartz feldspar phytic
 CSi Andesite volcaniclastic and shale, includes Howards Anomaly hematite pyrite barite mineralization

CENTRAL VOLCANIC SEQUENCE
 CLn Andesite volcanics, plagioclase hornblende pyroxene phytic
 CLn Andesite intrusive, plagioclase hornblende phytic
 CScong Conglomerate coarse grained, volcaniclastic, includes Newton Creek Sulfure Pb-Zn massive sulfide district occurrence
 CLnd Andesite-dacite lava, plagioclase phytic, occasionally quartz amygdaloid
 CVa Rhyodacite volcanics, massive, feldspar phytic
 CVr Rhyodacite volcanics, massive, quartz feldspar phytic

YOLANDE RIVER SEQUENCE
 CLr/Lrd Rhyolite-dacite lava and intrusives, quartz feldspar ± biotite pyroxene porphyritic
 CSi Shale-litic wacke, quartz feldspar crystal

WEST AND NORTH OF HENTY FAULT

WHITE SPUR FORMATION
 CSw Siltstone and greywackes, micaceous
 CSwt Siltstone, locally dolomitic and pyritic
 CSv Vitric mudstone
 CSwt Quartz feldspar crystal lithic sandstone
 CScong Quartz feldspar crystal, clasts include mudstone/quartz porphyry felsic volcanics/sulfides
 CLr Quartz phytic rhyolite lava and hyaloclastite

* Sequence from CScong to CSv represents a mass debris flow unit, repeated in part or full several times in the White Spur Formation
 • Marker horizons within the White Spur Formation
 • • • quartz grit in mudstone
 • • • basal WSP north of 61400N
 • • • stratigraphically lowest mica wacke

CENTRAL VOLCANIC SEQUENCE
 CLr/Lrd Dacite lava-intrusive, feldspar ± mafic phytic, ± disseminated magnetite
 CVpm Pumiceous mass flow, rhyolite composition, feldspar phytic

BOUNDARY

Geological contact - interpreted
 Contact bedrock exposure and Quaternary alluvium
 Fault - movement unknown
 Thrust fault - teeth indicating dip
 Anticline - plunge indicated
 Syncline - plunge indicated
 Bedding
 Cleavage
 Joint

5 cm

066389 **TCR 92-3316**

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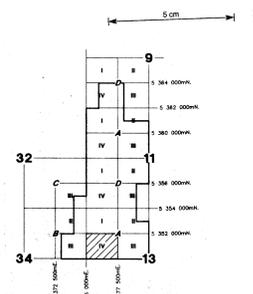
E.L. 11/85 - YOLANDE JV
HENTY AREA
INTERPRETIVE
GEOLOGY

DRAWING No. SHEET 11D2 SCALE 1:2600 FIG. No. 23

LEGEND

- QUATERNARY**
 Qa Fluvio-glacial
- OROGENIC**
 Oq Gordon Group limestone
 Oo Denison Group siliciclastic sandstone and conglomerate
- CAMBRIAN**
 Cl Laves
 Ci Intrusives
 Cv Volcanics - lavas/intrusives/clastics undifferentiated
 Cs Sediments
- HENTY FAULT WEDGE**
 Cl/Lb Basalt/dolerite/gabbro, tholeiitic, small bodies shown ... x
 CSwq Volcaniclastic sandstone-conglomerate, feldspar quartz pyroxene crystal, ± chlorite albite alteration banding
 CSv Vitric mudstone
 CSqg Volcaniclastic sandstone, angular quartz grains and minor zircon in ash matrix, gradational contacts with CSv and altstone
 CLbn1 Basaltic andesite lavas, calc-alkaline, plagioclase aegirine phytic
 CLbn2 Basaltic andesite lavas, calc-alkaline, plagioclase aegirine phytic
 CSstl Siltstone grey ± andesitic volcaniclastic, disseminated pyrite/pyrrhotite, hosts semi massive Pb Zn sulfide lens at Henty Adite
 CSstn Siltstone hematitic - chloritic
 CSwqh Siltstone grey-green-conglomerate, minor chert basalt/dolerite, hematitic-chloritic, pyroxene quartzite metasediments/felsic volcanics/ultramafic, detrital magnetite and chromite
 CSwq Chert/siliceous siltstone/hematitic siltstone
 CLbn3 Basaltic andesite lavas, tholeiitic, high TiO₂, massive to highly vesiculated, aphyric-plagioclase phytic
 CSwqg Quartzite wacke-block siltstone, minor limestone and massive pyrite lens at Henty Valley, provenance quartzite metasediments and ultramafic, detrital chromite and tourmaline
- HENTY FAULT WEDGE OPPOSITE COMPLEX**
 CSstl Siltstone - greywacke
 Cvm Andesite lavas, intrusives and volcanics, localized hematite silica alteration
 Clt Tonalite, ± biotite K feldspar, small bodies shown ... +
 Clg Gabbro/dolerite/basaltic - intermediate dykes
 Cg Gabbro coarse grained, cumulate textures
 Cua Pyroxene/sunite, serpentine-talc-silica-carbonate altered
- EAST AND SOUTH OF HENTY FAULT**
TYPICAL GROUP
 CLr1 Rhyolite lava, quartz feldspar phytic
 CSr Andesite volcaniclastic and shale, includes Howards Anomaly hematite pyrite barite mineralization
- CENTRAL VOLCANIC SEQUENCE**
 Cvn2 Andesite volcanics, plagioclase hornblende pyroxene phytic
 Cln Andesite intrusive, plagioclase hornblende phytic
 CSong Conglomerate coarse grained, volcaniclastic, includes Nelson Creek Spillway Pb Zn massive sulfide lens occurrence
 CLnd Andesite-dacite lava, plagioclase phytic, occasionally quartz amygdaloid
 Cvd Rhyodacite volcanics, massive, feldspar phytic
 Cvr Rhyodacite volcanics, massive, quartz feldspar phytic
- YOLANDE RIVER SEQUENCE**
 Cl/Lrd Rhyolite-dacite lavas and intrusives, quartz feldspar ± biotite pyroxene porphyritic
 CS+ Shale-litic wacke, quartz feldspar crystal
- WEST AND NORTH OF HENTY FAULT**
WHITE SPUR FORMATION
 CSw Siltstone and greywacke, micaceous
 CSstl Siltstone, locally dolomite and pyritic
 CSv Vitric mudstone
 CSst Quartz feldspar crystal lithic sandstone
 CSong Quartz feldspar crystal, clasts include mudstone/quartz porphyry felsic volcanics/sulfides
 CLr2 Quartz phytic rhyolite lava and hyaloclastite
- Sequence from CSong to CSv represents a mass debris flow unit, repeated in part or full several times in the White Spur Formation
 • Marker horizons within the White Spur Formation
 • • • quartz grit in mudstone
 • • • basal WSF north of 61400N
 • • • stratigraphically lowest mica wacke
- CENTRAL VOLCANIC SEQUENCE**
 CL/Ld Dacite lava-intrusive, feldspar ± mafic phytic, ± disseminated magnetite
 Cvm1 Pumiceous mass flow, rhyolite composition, feldspar phytic

- Geological contact - interpreted
 --- Contact bedrock exposure and Quaternary alluvium
 --- Fault - movement unknown
 --- Thrust fault - teeth indicating dip
 --- Anticline - plunge indicated
 --- Syncline - plunge indicated
 --- Bedding
 --- Cleavage
 --- Joint



066290

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 DRAWING No. SHEET 13A4
 SCALE 1:2500
 FIG. No. 24

E.L. 11/85 - YOLANDE JV
HENTY AREA
INTERPRETIVE
GEOLOGY





LEGEND

QUATERNARY
 Qg Fluvioglacial

ORDOVICIAN
 Oq Gordon Group limestone
 Oo Denison Group siliciclastic sandstone and conglomerate

CAMBRIAN
 CL Laves
 CI Intrusives
 CV Volcanics - laves/intrusives/diabase undifferentiated
 CS Sediments

HENTY FAULT WEDGE
 CL/1a Basalt/dolerite/gabbro, tholeiitic, small bodies shown ... x
 CSw Volcaniclastic sandstone-conglomerate, feldspar quartz porphyre, and/or chlorite albite alteration banding
 CSv Vitric mudstone
 CSva Volcaniclastic sandstone, angular quartz grains and minor zircon in ash matrix, gradational contacts with CSv and siltstone
 CLbn Basaltic andesite lavas, calc-alkaline, plagioclase augite phytic
 CLbnr Basaltic andesite lava, calc-alkaline, plagioclase phytic
 CSst Siltstone grey ± andesitic volcaniclastic, disseminated pyrite/pyrrothite, host semi-massive Pb-Zn sulfide lens at Henty Adit
 CSsm Siltstone hemalitic - chloritic
 CSsmr Siltstone-greywacke-conglomerate, minor chert/basalt/dolerite, hemalitic-chloritic, pyroxene quartzose metasediments/felsic volcanics/ultramafic, detrital magnetite and chromite
 CSs Siltstone-greywacke-conglomerate, minor chert/basalt/dolerite, hemalitic-chloritic, pyroxene quartzose metasediments/felsic volcanics/ultramafic, detrital magnetite and chromite
 CSs Siltstone-greywacke-conglomerate, minor chert/basalt/dolerite, hemalitic-chloritic, pyroxene quartzose metasediments/felsic volcanics/ultramafic, detrital magnetite and chromite
 CLbn Basaltic andesite lavas, tholeiitic, high TiO₂, massive to highly vesiculated, and/or phytic-plagioclase phytic
 CSwa Quartzose wacke-black siltstone, minor limestone and massive pyrite lens at Henty Adit, pyroxene quartzose metasediments and ultramafic, detrital chromite and tourmaline

HENTY FAULT WEDGE OPPOSITE COMPLEX
 CSst Siltstone - greywacke
 CVm Andesite lavas, intrusives and volcanoclastics, localized hematite silica alteration
 CLl Tonalite, ± biotite K-feldspar, small bodies shown ... +
 CLg Gabbro/dolerite/basaltic - intermediate dykes
 Cg Gabbro coarse grained, cumulate textures
 Cua Pyroxenite/dunite, serpentine-talc-silica-carbonate altered

EAST AND SOUTH OF HENTY FAULT
TRICAL GROUP
 CLr Rhyolite lava, quartz feldspar phytic
 KSi Andesite volcanoclastic and shale, includes Howards Anomaly hematite pyrite barite mineralization

CENTRAL VOLCANIC SEQUENCE
 CVw Andesite volcanics, plagioclase hornblende pyroxene phytic
 CLn Andesite intrusives, plagioclase hornblende phytic
 CSoc Conglomerate coarse grained, volcanoclastic, includes Newton Creek Spillway Pb-Zn massive sulfide coast occurrence
 CLnd Andesite-dacite lava, plagioclase phytic, occasionally quartz amygdaloidal
 CVrd Rhyodacite volcanics, massive, feldspar phytic
 CVr Rhyodacite volcanics, massive, quartz feldspar phytic

YOLANDE RIVER SEQUENCE
 CL/Lr Rhyolite-dacite lavas and intrusives, quartz feldspar ± biotite pyroxene porphyritic
 CSa Shale-lithic wacke, quartz feldspar crystal

WEST AND NORTH OF HENTY FAULT
WHITE SPUR FORMATION
 CSw Siltstone and greywackes, micaceous
 CSv Vitric mudstone
 CSst Siltstone, locally dolomitic and pyritic
 CSd Quartz feldspar crystal lithic sandstone
 CSoc Quartz feldspar crystal, clasts include mudstone/quartz porphyry felsic volcanics/sulfides
 CLr Quartz phytic rhyolite lava and hydrothermalite

• Sequence from CSoc to CSv represents a mass debris flow unit, repeated in part or full several times in the White Spur Formation
 • • • quartz grit in mudstone
 • ▲ basal WSF north of 61400N
 • • • stratigraphically lowest mica wacke

CENTRAL VOLCANIC SEQUENCE
 CL/1a Dolerite lava-intrusive, feldspar ± mafic phytic, ± disseminated magnetite
 CVm Pumiceous mass flow, rhyolite composition, feldspar phytic

--- Geological contact - interpreted
 - - - Contact bedrock exposure and Quaternary alluvium
 - - - Fault - movement unknown
 - - - Thrust fault - teeth indicating dip
 - - - Anticline - plunge indicated
 - - - Syncline - plunge indicated
 - - - Bedding
 - - - Cleavage
 - - - Joint

5 cm

066391 **TCR 92-3376**

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E.L. 11/85 - YOLANDE JV
HENTY AREA
INTERPRETIVE
GEOLOGY

DRAWING No. SHEET 34B3 SCALE 1:2500 0 50 100 METRES **FIG. No. 25**

LEGEND

QUATERNARY

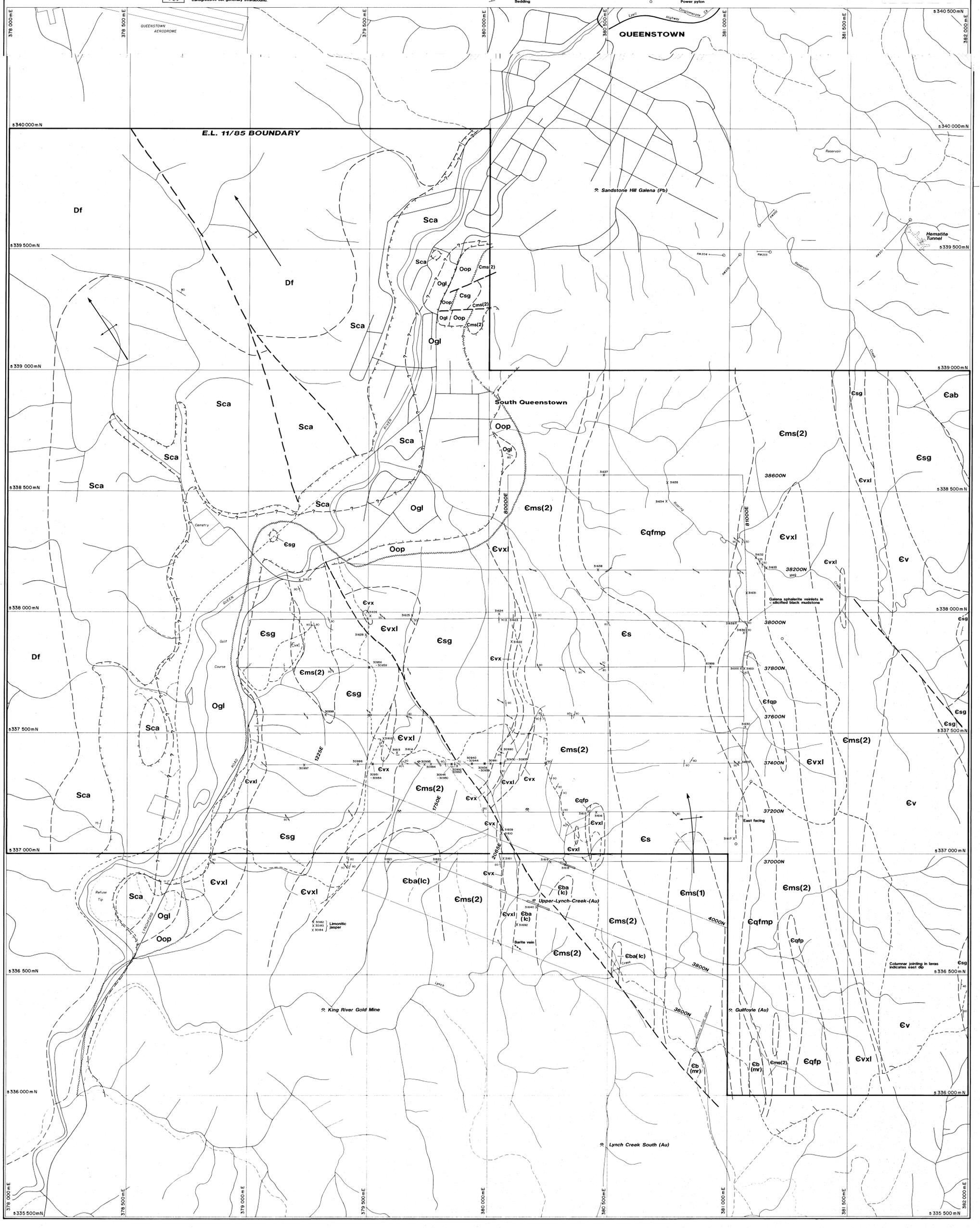
- Qa** / **Qas** Alluvium
- Df** Quartz sandstone/mudstone (Florence Sandstone)
- Sca** Quartz sandstone/mudstone (Crotty and Amber Formations)
- Og1** Limestone (Gordon Limestone)
- Oop** Quartz sandstone and grit (Pioneer Beds)

CAMBRIAN

- Csg** Volcaniclastic sandstone and conglomerate (Tuffal Group - Comstock Tuff/Lynchford Tuff/Wing Spur Agglomerate), polymict (felsic-basaltic) matrix supported; patchy abradation, ± magnetite grains.
- Cab** Basaltic andesitic intrusives and lavas
- Cv** Felsic feldspar phytic lavas/intrusives, flow banded and columnar jointed.
- Evx** Quartz porphyry - felsic lavas or vitric crystal tuff - angular quartz crystals < 3mm in a fine grained quartz feldspar groundmass (recrystallized glass).
- Evxl** Rhyolitic pumiceous mass debris flow/ignimbrite, quartz feldspar crystals volcanic and mudstone clasts in a fine grained glassy matrix.
- Eqfmp** / **Eqfp** Quartz feldspar mica porphyry, massive intrusives and possibly lens, partly transgressive but generally stratobound.

- Ems(2)** Mudstone grey - graphitic and quartz mica wackes
- Es** Quartz mica sandstone (Miers Ridge Sandstone), derived from pelitic metamorphic, no volcanic component, detrital tourmaline and zircon
- Ems(1)** Mudstone grey - graphitic and sandstone.
- Eba(lc)** Basaltic - andesitic lavas/breccias/intrusives (Lynch Creek Basalt), plagioclase augite phytic.
- Eb(mr)** Basalt (Miers Ridge Basalt), ophitic textured tholeiitic basalt.

- Geological contact - interpreted
- Geological contact/unconformity obscured by Quaternary alluvium
- Unconformity - interpreted
- Contact bedrock exposure and Quaternary alluvium
- Fault
- Plunging syncline
- Plunging anticline
- Foliation
- Cleavage
- Bedding
- Overturned bedding
- Joint
- Quartz vein
- Costean
- Rock sample
- Soil Sample
- Old Prospect
- Pasminco grid line
- Aberfoyle grid line
- Power pylon



COMPILED: R.A.P.

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REFERENCE:

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LYNCHFORD AREA

SOIL GEOCHEMISTRY

SAMPLE LOCATIONS

FIG. No. 27

SCALE 1:5000

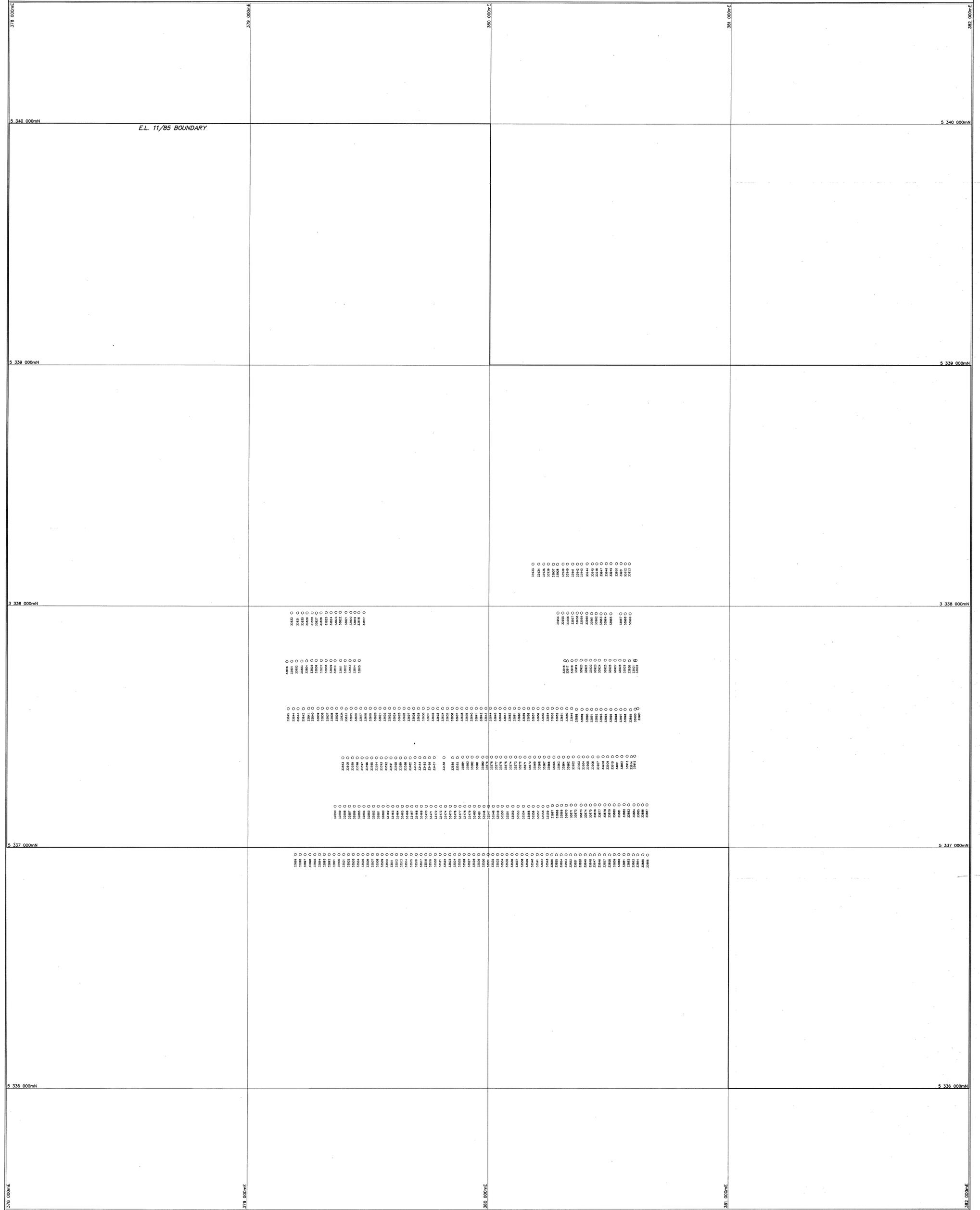
0 100 200 m

066393 TCR 92-3376

Key to Sample Types

○ Soil

5 cm



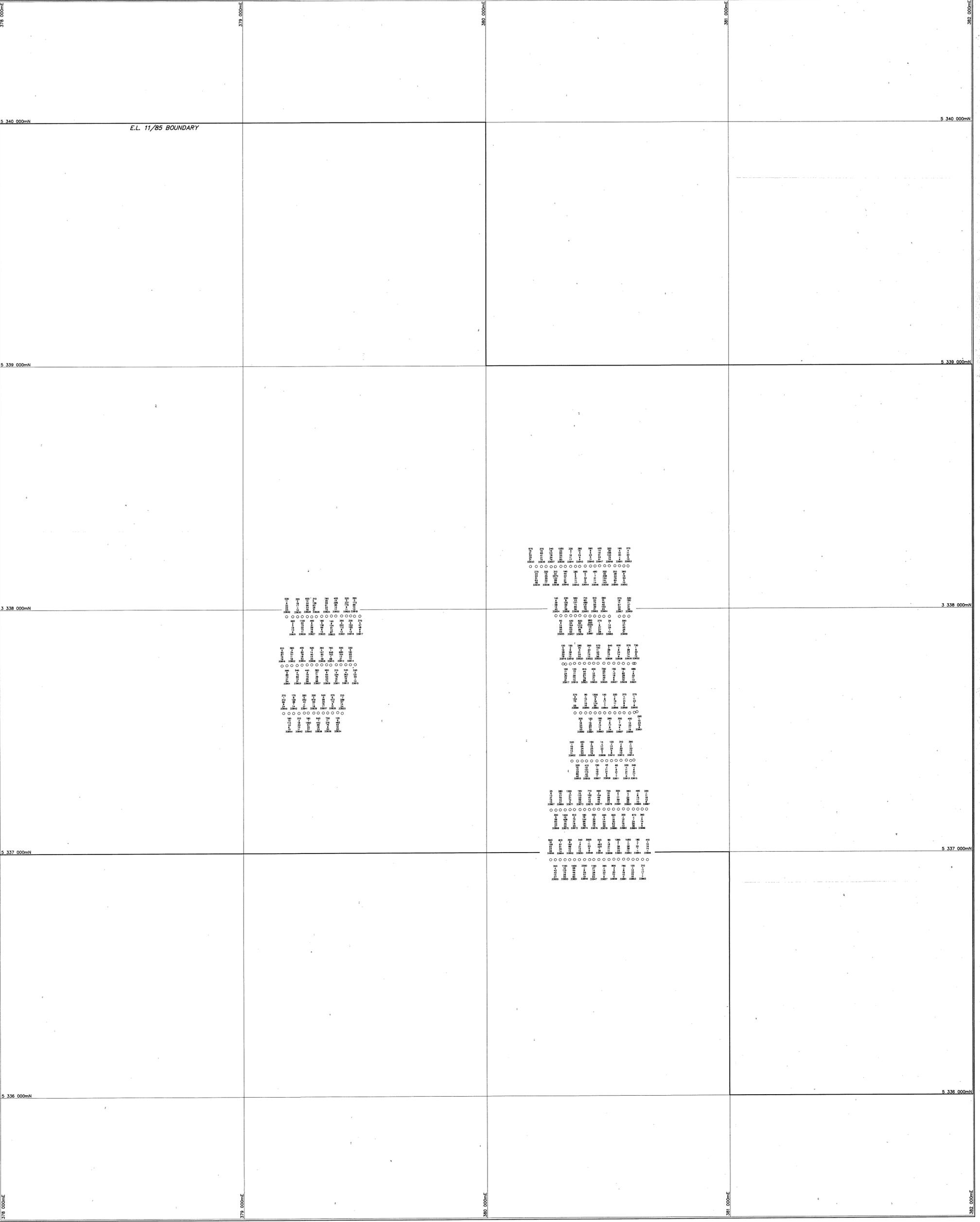
066394

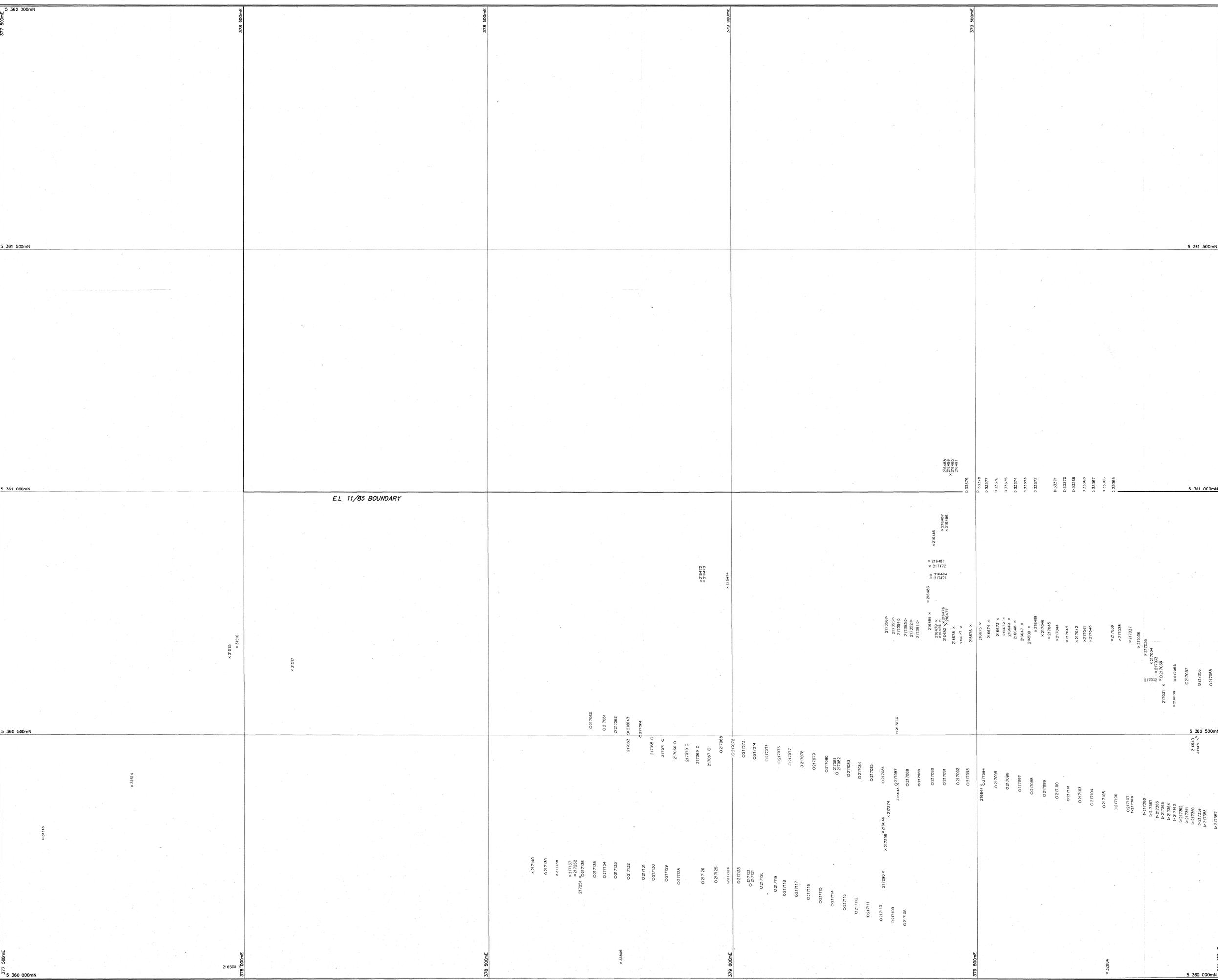
COMPILED: N.A.P.	E.L. 11/85 - YOLANDE JV
DATE: July, 1992	LYNCHFORD AREA
DRAWN:	SOIL GEOCHEMISTRY
REFERENCE:	Cu Pb Zn As Ba Bn
REVISIONS:	
DRAWING No.	SCALE 1:5000 0 100 200 m FIG. No. 28

5 cm

KEY

- 370 Ba
- 4 As
- 11 Mn
- 33 Zn
- 9 Pb
- 13 Cu
- 33953 Sample Number
- o Sample Location

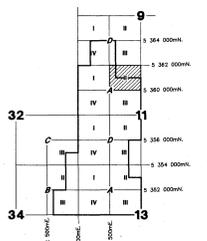




E.L. 11/85 BOUNDARY

Key to Sample Types

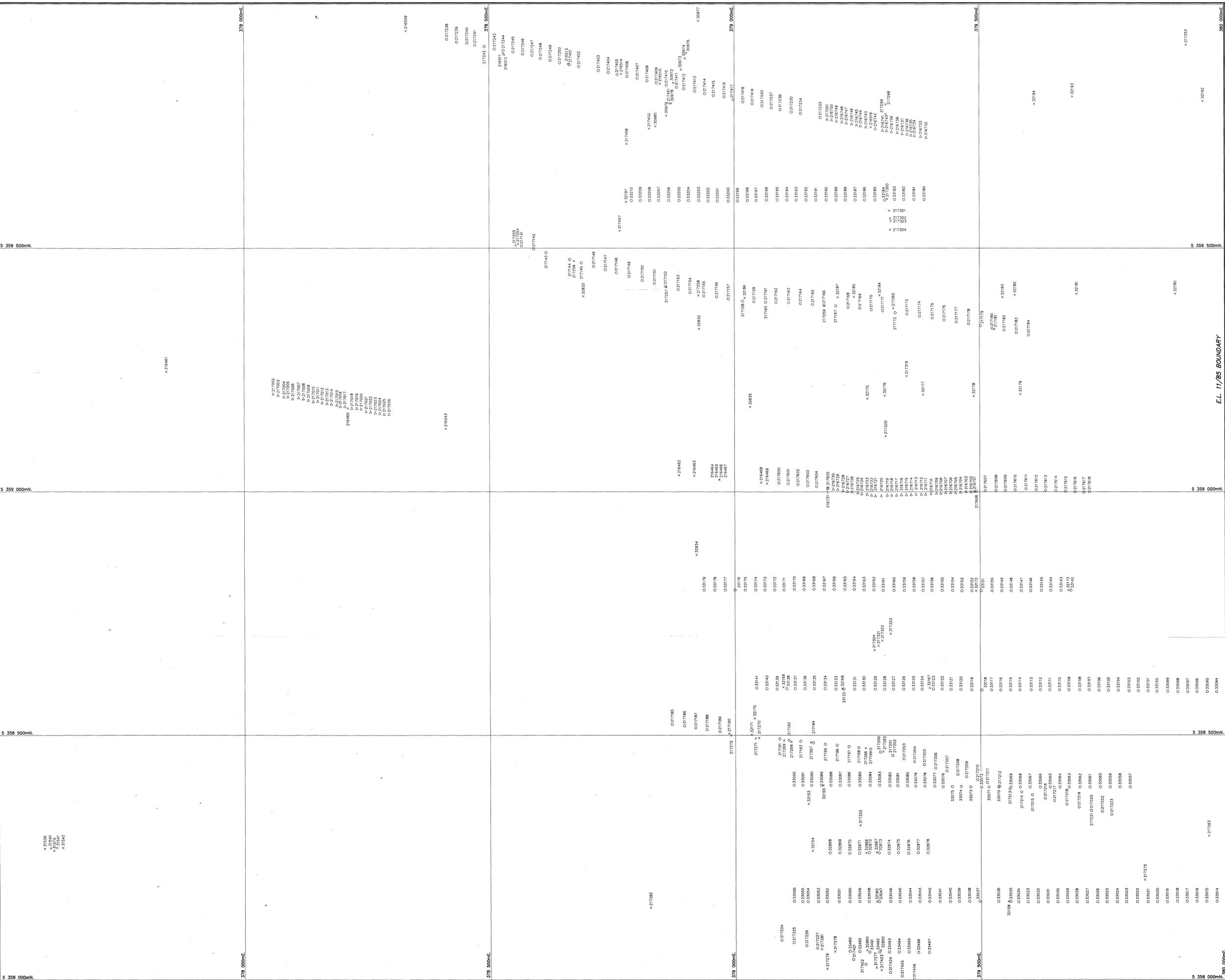
- o Soil
- x Rock
- Δ Wacker



066395
TCR 92-3376

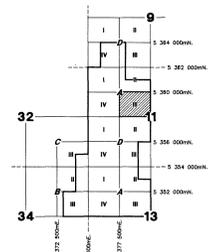
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DATE: July, 1992
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REFERENCE:
REVISIONS:
DRAWING No. SHEET 11A2
SCALE 1:2500
E.L. 11/85 - YOLANDE JV
HENITY AREA
SOIL/WACKER/ROCK
GEOCHEMISTRY
SAMPLE LOCATIONS
FIG. No. 29



Key to Sample Types

- Soil
- × Rock
- △ Wacker



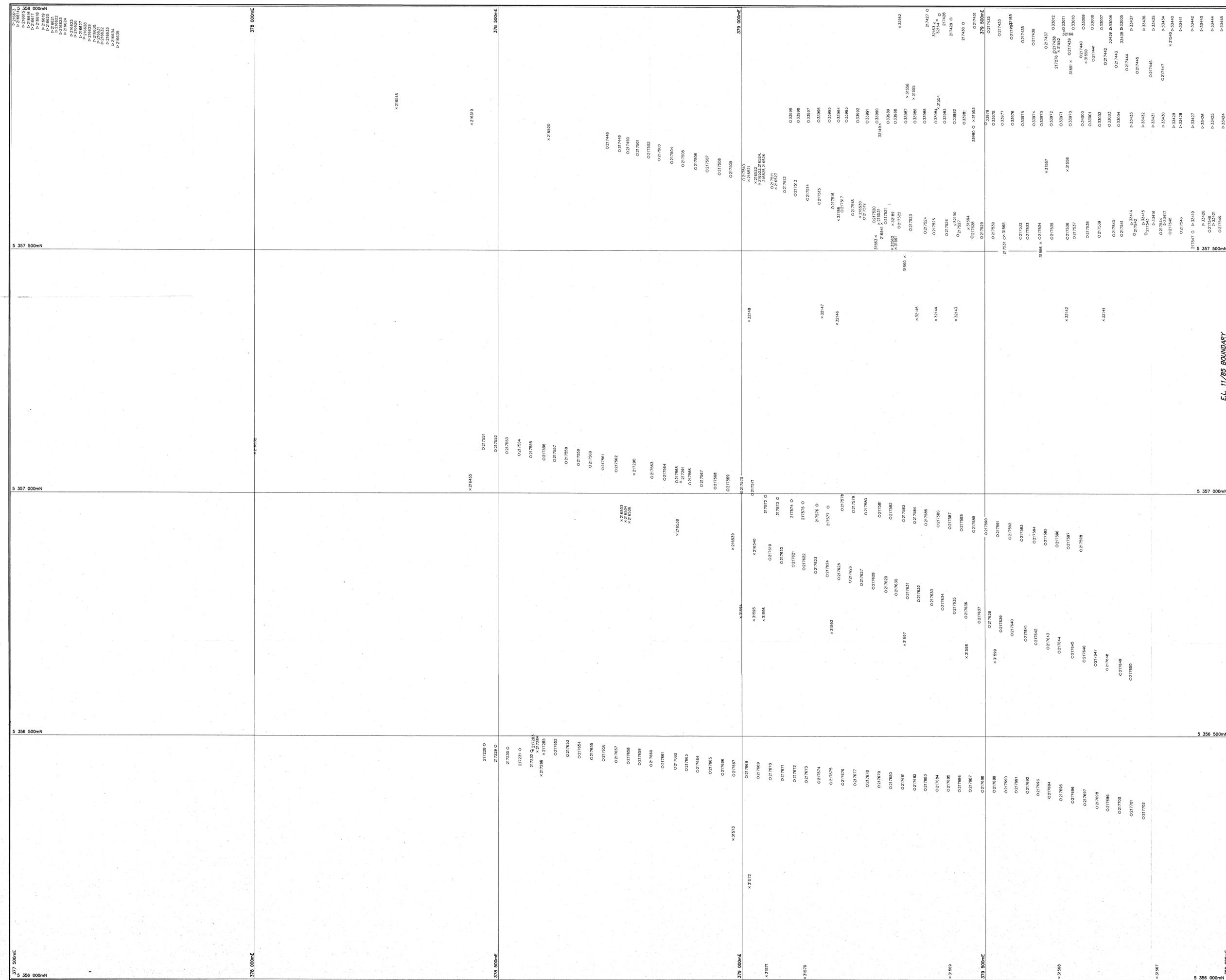
066396

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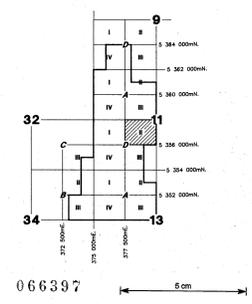
E.L. 11/85 - VOLANDE JV
HENTY AREA
**SOIL/WACKER/ROCK
GEOCHEMISTRY
SAMPLE LOCATIONS**

DRAWING No. SHEET 11A3 SCALE 1:2500 FIG. No. 30



E.L. 11/85 BOUNDARY

Key to Sample Types
 ○ Soil
 × Rock
 △ Wacker



066397

TCR 92-3376

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 DATE: July, 1982

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 CHECKED BY: [Blank]

REFERENCE: [Blank]

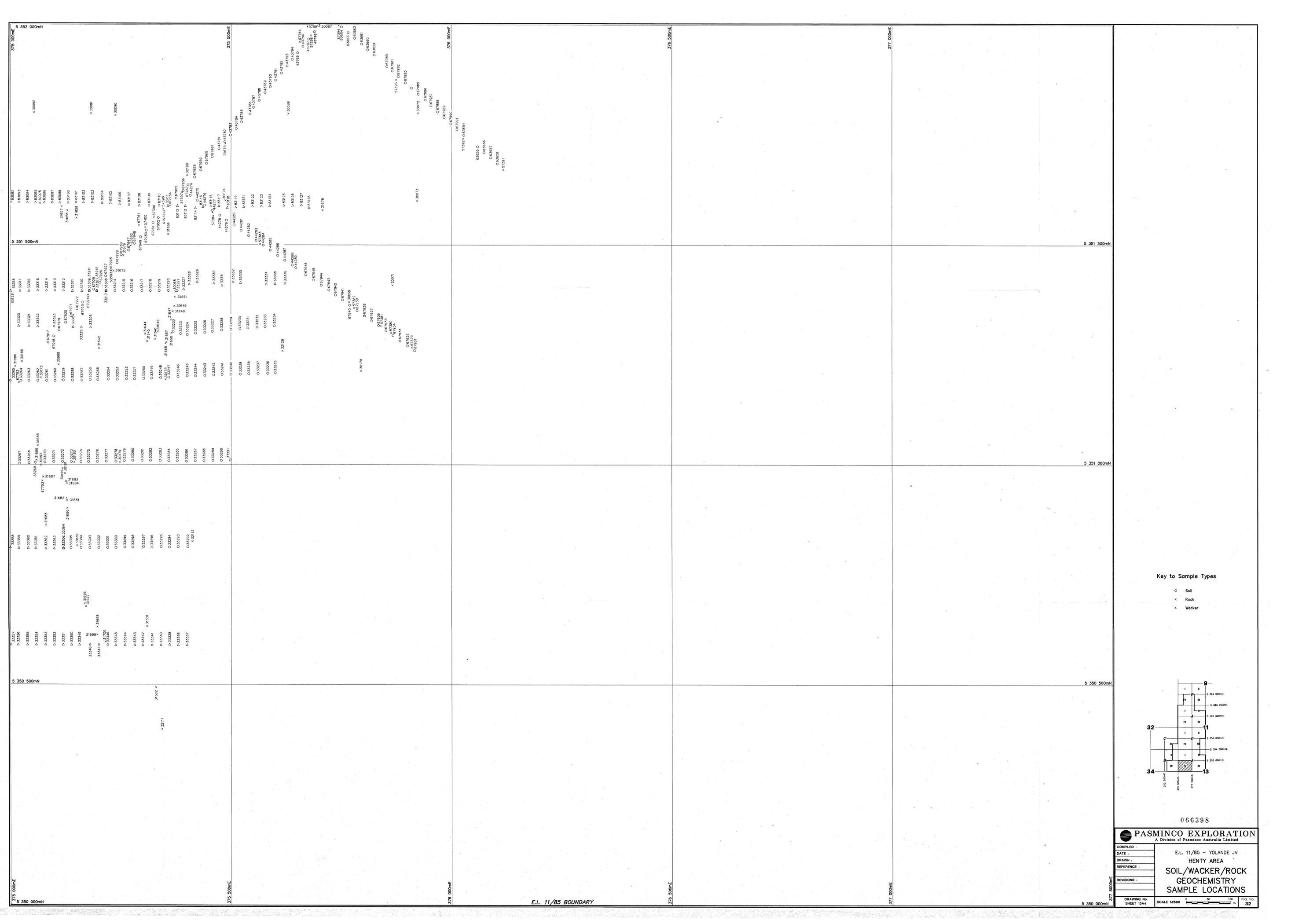
REVISIONS: [Blank]

DRAWING No. [Blank]
 SHEET 102

E.L. 11/85 - YOLANDE JV
 HENTY AREA
 SOIL/WACKER/ROCK
 GEOCHEMISTRY
 SAMPLE LOCATIONS

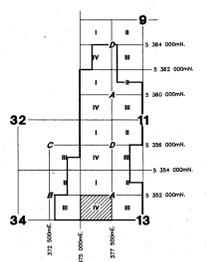
SCALE 1:2500

FIG. No. 31



Key to Sample Types

- Soil
- × Rock
- △ Wacker



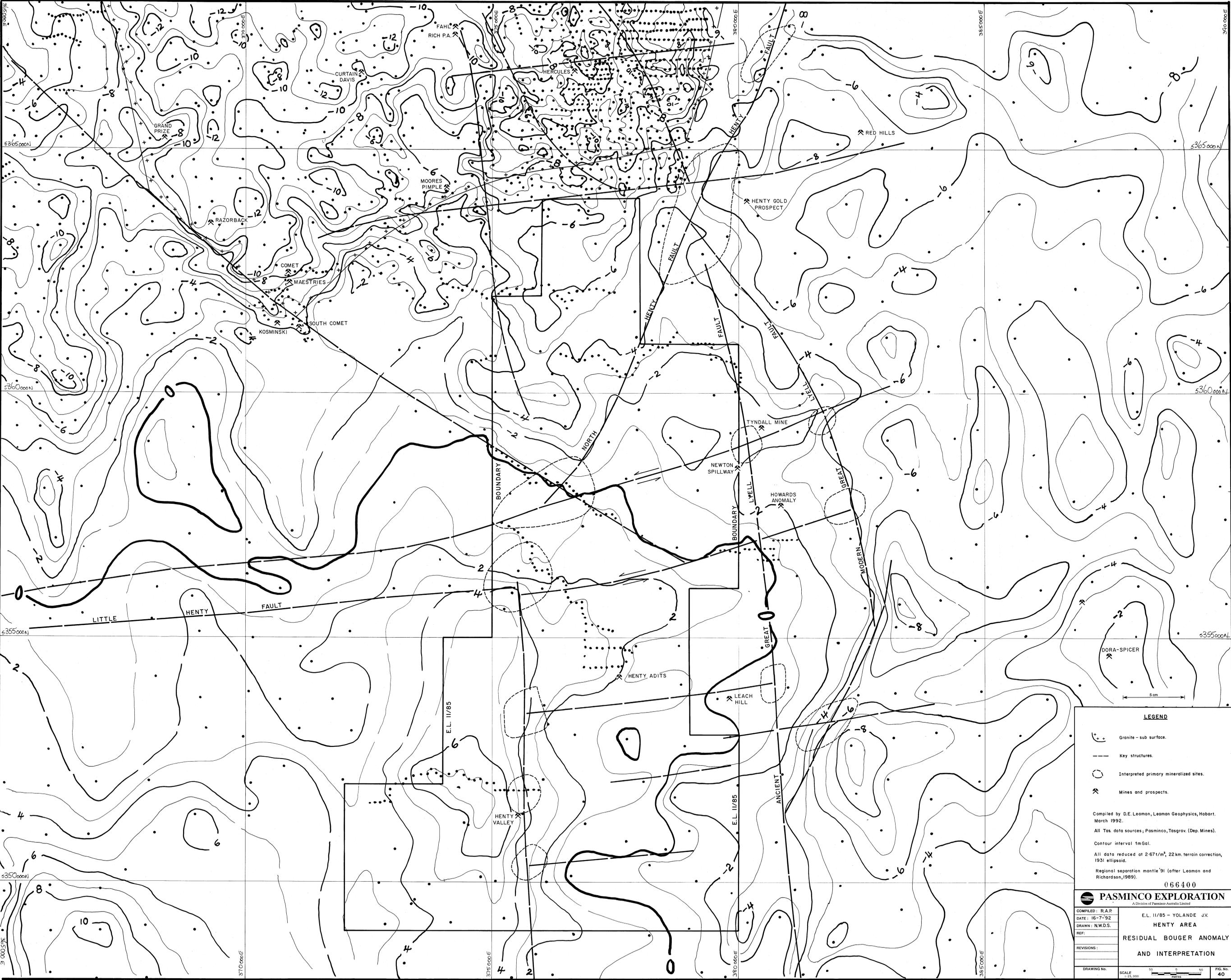
066398

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HENTY AREA
SOIL/WACKER/ROCK
GEOCHEMISTRY
SAMPLE LOCATIONS

DRAWING No. SHEET 18A4 SCALE 1:2500 FIG. No. 32

E.L. 11/85 BOUNDARY



LEGEND

- Granite - sub surface.
- Key structures.
- Interpreted primary mineralized sites.
- Mines and prospects.

Compiled by D.E. Leaman, Leaman Geophysics, Hobart, March 1992.
 All Tas. data sources; Pasmenco, Tasgrav. (Dep. Mines).
 Contour interval 1mGal.
 All data reduced at 2.671/m³, 22km. terrain correction, 1931 ellipsoid.
 Regional separation mantle '91 (after Leaman and Richardson, 1989).

066400

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HENTY AREA
RESIDUAL BOUGER ANOMALY
AND INTERPRETATION

DRAWING No. 10 10 10 10
 SCALE 1:25,000 metres
 FIG. No. 40