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**PASMINCO EXPLORATION**  
**TULLAH EL 22/90 &**  
**STERLING RIVER EL 24/91**  
**ANNUAL REPORT**  
**FOR THE PERIOD ENDING SEPTEMBER 1996**

**Author:** N.K. McGunnigle  
**Date:** October 1996  
**Report No.:** TA-28  
**Submitted to:** Regional Exploration Manager - Tasmania  
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Safety and Mines Division - Hobart  
Pasminco Exploration - Burnie  
- Rosebery  
- Melbourne

EL 22/90  
See folio 53  
EL 24/91  
See folio 51

**Submitted by:** *NKM'Gunnigle*

**Accepted by:** *AMR'Iska*

**OPEN FILE**

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6. DHEM - TF1 - P W Basford

**SUMMARY**

Twelve diamond holes, drilled within the Tullah EL22/90 and adjoining Sterling River EL24/91, totalling 1171.8m were completed during the year. DDH SV4, drilled to test the Murchison Volcanics-Farrell Slates contact, south of the Sterling Valley Mine, intersected mineralized Pb-Zn-Au-As veins in the Farrell Slates. Best results include:

1m @ 2.2% Pb, 0.44% Zn (361.6 - 362.6m)

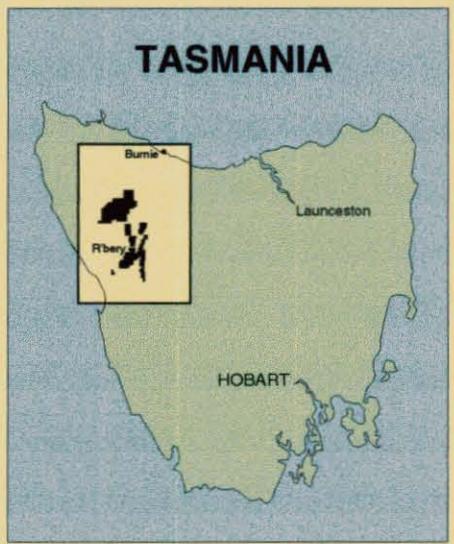
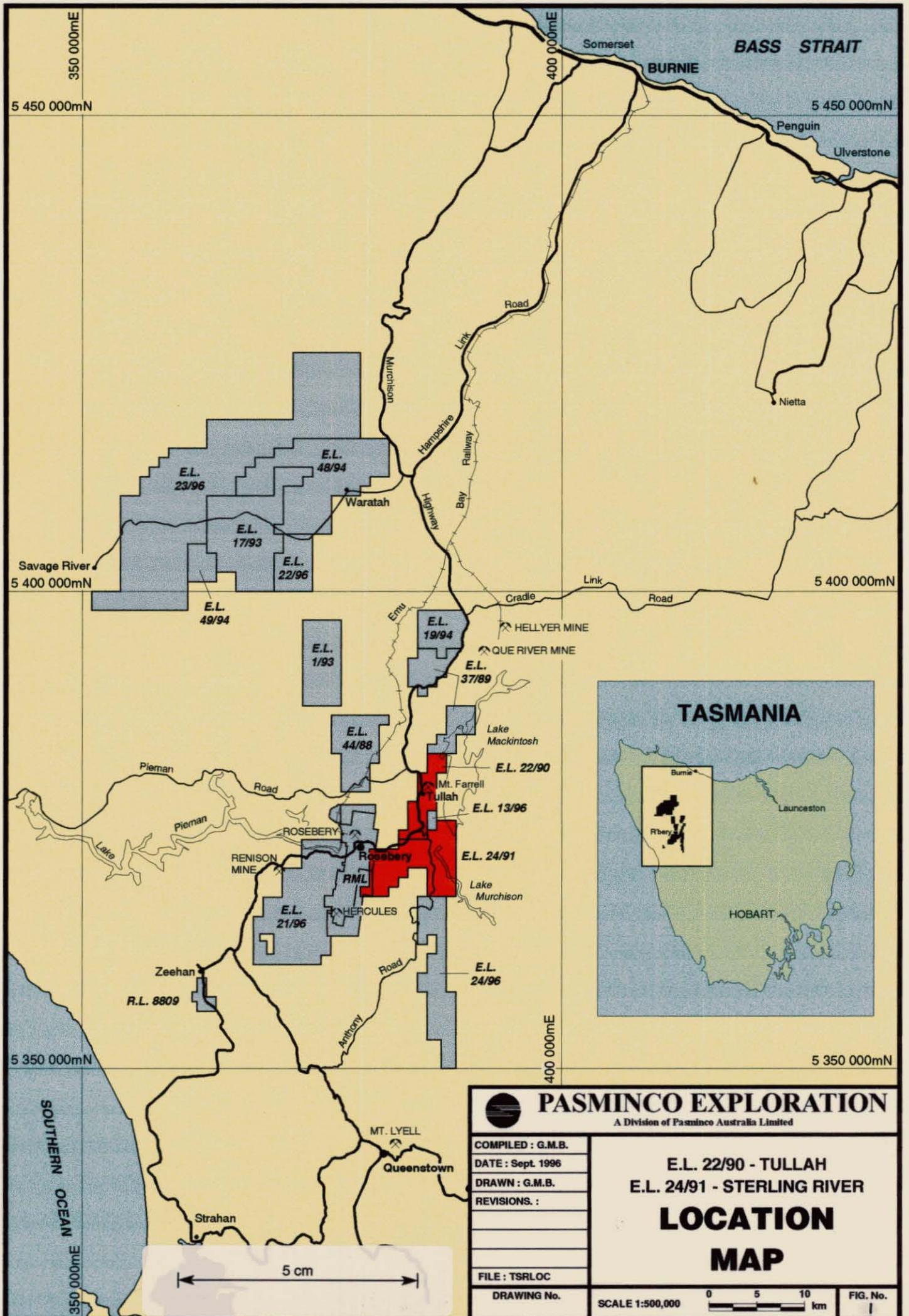
0.8m @ 9.48% As, 1.77 g/t Au (388.0 - 388.8m)

The intense zone of silica-sericite-pyrite alteration located in SR2 and SR3 (reported in 1994-95) is shown to extend to SV4 and to surface. There also appears to be relatively uniform Na depletion throughout the alteration zone.

An exploration program undertaken to investigate the Farrell area for potential open cut resources identified continuations of the Farrell Lodes close to surface, with the potential for a resource of approximately 100 000t @ 6.3% Pb, 1.6% Zn and 201g/t Ag. There is also potential for additional lodes to be found to the east of the known ore bodies.

Rock chip sampling was undertaken along the Murchison Gorge Alteration Zone. Assays show weak elevations of Cu in places, and anomalous values of Pb and Zn can be shown to be related to small veins within the zone.

Previous exploration of the Lakeside and Lorigans Luck Prospects have been briefly reviewed and a database comprising all drill logs and assay results added to Pasminco's GIS. A review of geophysics in the Lakeside area was also completed.



 <b>PAMINCO EXPLORATION</b> <small>A Division of Paminco Australia Limited</small>	
COMPILED : G.M.B. DATE : Sept. 1996 DRAWN : G.M.B. REVISIONS :  FILE : TSRLOC DRAWING No.	<b>E.L. 22/90 - TULLAH</b> <b>E.L. 24/91 - STERLING RIVER</b> <b>LOCATION</b> <b>MAP</b>
SCALE 1:500,000	
	FIG. No. 1

## 1 INTRODUCTION

This report details exploration undertaken on Tullah EL 22/90 and adjoining Sterling River EL 24/91, between September 1995 and September 1996. The EL's are located east of Rosebery, western Tasmania (Figure 1).

As per statutory requirements, the Tullah EL was reduced from 24km<sup>2</sup> to 18km<sup>2</sup> on 20th October 1995. All work conducted by Pasmenco on the relinquished ground is included in the Tullah EL22/90 Relinquishment Report, submitted to the Department of Mines.

The Tullah and Sterling River EL's cover units of the Cambrian Mt Read Volcanics centred on a 16km long section of the Henty Fault in Western Tasmania. The ground is well mineralized, with numerous showings and sub-economic deposits of base metals and precious metals (Figures 3 & 4).

The area has a long history of previous mining (mainly small-scale Pb-Ag) and is one of the more-heavily explored parts of the Mt Read Volcanics, with over 100 surface diamond drill holes and a further 78 holes drilled underground in the old Farrell Mines. Much of the drilling, as well as geophysical and geochemical surveys, has been concentrated along the Henty Fault. Less accessible zones, such as the southern and eastern parts of the Sterling River licence and east of the Farrell Mines, have received minimal attention.

In the September 1994-95 year, work completed by Pasmenco included:

- Twelve diamond drill holes totalling 1171.8m: SV4 (551m) in the Sterling Valley and TF2 - TF12 (620.8m) which were drilled east of the Farrell Mines.
- Evaluation of the Farrell Mines and surrounding area.
- Geological mapping and rock sampling in Sterling Valley.
- Rock chip sampling along the Murchison Gorge, Anthony Road.
- Inspection and additional sampling of Lakeside and Lorrigans Luck diamond drill core, and completion of summary logs.
- Collation of Lakeside and Lorrigans Luck DDH summary logs and assay data into Pasmenco's GIS.

**2 TENURE**

Tullah EL 22/90 covers 18km<sup>2</sup>, of which 2.6km<sup>2</sup> is vested in the HEC and Mine Lease 63M/80 (.16km<sup>2</sup>) is excluded from the EL (Figure 2). On 20th October 1995, the EL was reduced from 24km<sup>2</sup> as required by statutory regulations. The relinquished area comprised part of the Farrell Range and a small section of the Murchison Gorge.

The Tullah EL was applied for in August 1990 by Peko Exploration Limited, a subsidiary of North Broken Hill Limited. In September 1990 the EL application was transferred to Pasminco Australia Limited (of which NBH then owned 45%). The EL was granted on 20th October 1990.

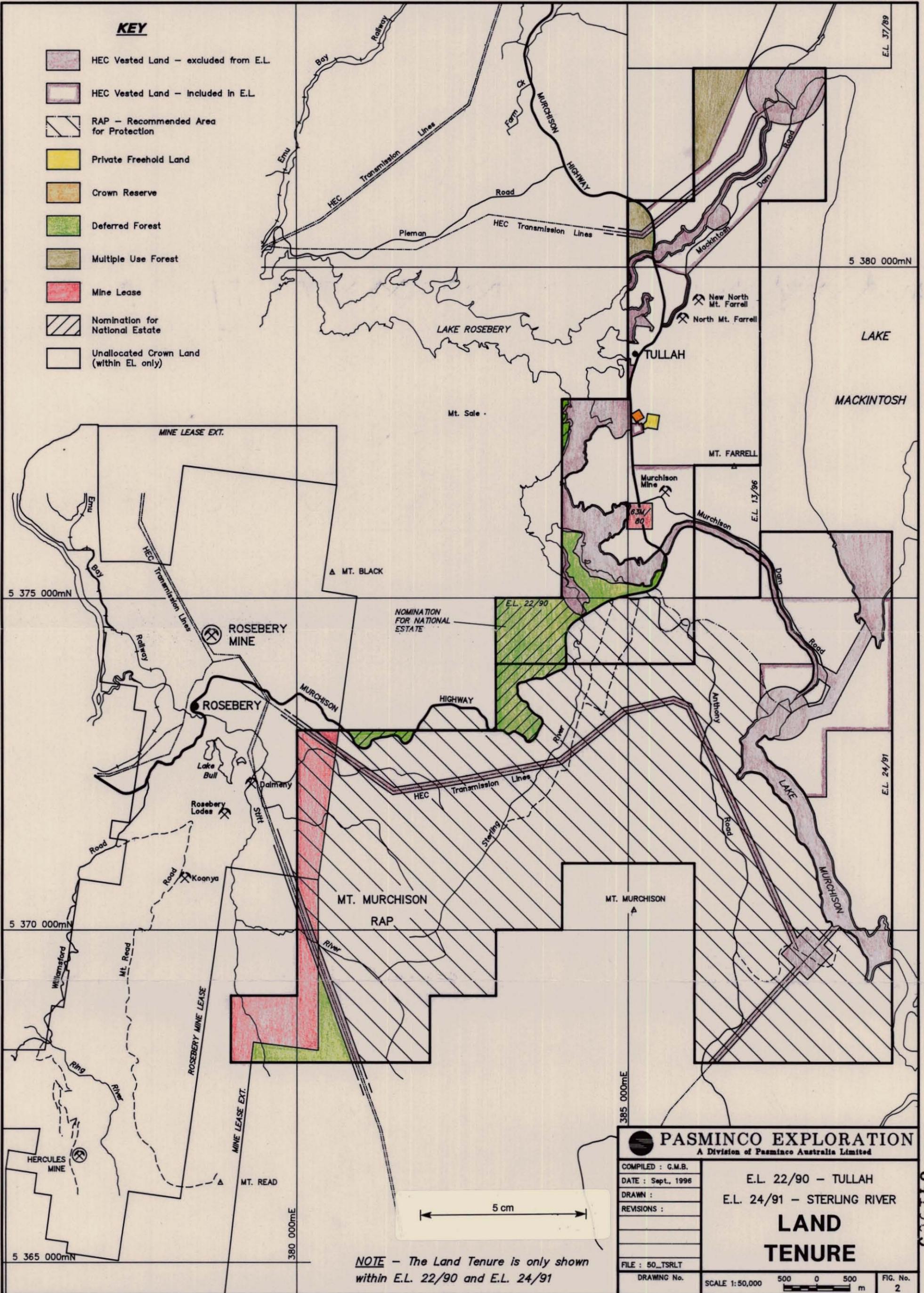
Sterling River EL 24/91 covers 48km<sup>2</sup> around Mt Murchison south of the Tullah EL. The granted area is 42km<sup>2</sup>, with 2.7km<sup>2</sup> of Pasminco's Rosebery Mine Lease and 2.4km<sup>2</sup> vested in the HEC, being excluded from the EL.

Sterling River was originally applied for by Pasminco Exploration as 42km<sup>2</sup> in August 1991, but 6km<sup>2</sup> to the SE of Mt Murchison was added to the application in October 1991. The EL was granted on 10th January 1992. In 1992 the renewal and reporting date for Sterling River was made the same as that for Tullah EL 22/90.

The land categories for Tullah and Sterling River are shown in Figure 2. About 75% of EL 24/91 is covered by the Mt Murchison RAP (Crown Land).

**KEY**

-  HEC Vested Land - excluded from E.L.
-  HEC Vested Land - included in E.L.
-  RAP - Recommended Area for Protection
-  Private Freehold Land
-  Crown Reserve
-  Deferred Forest
-  Multiple Use Forest
-  Mine Lease
-  Nomination for National Estate
-  Unallocated Crown Land (within EL only)



<b>PASMINCO EXPLORATION</b> A Division of Pasminco Australia Limited	
COMPILED : G.M.B. DATE : Sept, 1996 DRAWN : REVISIONS : FILE : 50_TSRLT DRAWING No.	E.L. 22/90 - TULLAH E.L. 24/91 - STERLING RIVER <h2 style="margin: 0;">LAND TENURE</h2> SCALE 1:50,000 500 0 500 m FIG. No. 2

341009

*NOTE - The Land Tenure is only shown within E.L. 22/90 and E.L. 24/91*

### 3 GEOLOGY

The Tullah and Sterling River licences cover units of the Cambrian Mt Read Volcanics extending either side of a 16km length of the Henty Fault. The latter is a major NNE-trending and steeply west-dipping structure located towards the eastern margin of the volcanic belt (Figures 3 & 4).

Within the EL's the volcanics range from rhyolitic to basaltic in composition but are predominantly rhyolitic to dacitic. They include lavas, intrusives, pyroclastics, volcanomict epiclastics and sediments.

West of the Henty Fault the dacitic to andesitic volcanics of the Mt Black Volcanics are dominated by lavas and unworked volcanoclastics. On the western side of the Sterling Valley there is a large wedge of andesitic and basaltic lavas, sills and clastics - the Sterling Valley Volcanics (Allen, 1995).

Lying along the eastern side of the Henty Fault there is an extensive unit of west-dipping and facing fine interbedded sediments including black shales - the Farrell Slates. East of and stratigraphically below the Farrell Slates are the rhyolitic to dacitic Murchison Volcanics, which comprise lavas, intrusives and volcanoclastics. These are intruded by the chemically-similar Murchison Granite (Cambrian), and unconformably overlain by Ordovician Owen Conglomerate.

Most of the volcanics are hydrothermally altered to some degree. In particular, the Murchison Volcanics contain intensely-altered zones, most significantly and extensively along their upper contact with the overlying Farrell Slates.

Pb, Zn, Cu, Ag, Au, Sn and As mineralization is widespread, most particularly in the Farrell Slates and Murchison Volcanics east of the Henty Fault. The only known mineralization west of the fault is the Au-As-Cu-Sn at Lorigans Luck, formerly known as the 'Arsenic Resource', part of which occurs within the mafic Sterling Valley Volcanics.

Most of the known mineralization is of a structurally-controlled lode and vein style. Many lodes are conformable with the primary layering in the enclosing rocks, with lodes and bedding closest to the Henty Fault tending to parallel the steep west dip of this structure. Small, massive basemetal sulphide boudins occur in the Farrell Slates near Mackintosh Dam.

COMPILED : P.G.R.
DATE : July 1996
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REVISIONS
FILE :
DRAWING No.

E.L. 22/90 - TULLAH  
**REGIONAL GEOLOGY**  
FROM MAP 6 OF THE  
MT. READ VOLCANICS PROJECT

SCALE 0 2 4 km	FIG. No. 3
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**ACKNOWLEDGMENT**  
Mt. Read Volcanics Project adopted from Map 6 - Geological Compilation Map of the Mt. Read Volcanics & Associated Rocks, from Hellyer to South Darwin Peak.  
K.D. Corbett B Sc (HON) PhD and A.W. McNeill B Sc (HON) 1988.

<b>QUATERNARY</b>	Q	Glacial deposits, alluvium, etc.
<b>TERTIARY</b>	Tb	Basalt
	Ts	Sediments - gravel, sand, clays
<b>JURASSIC</b>	Jd	Dolerite
<b>PERMIAN - CARBONIFEROUS</b>	P	Undifferentiated
<b>DEVONIAN</b>	Dd	Dolerite
	Dg	Granite
<b>DEVONIAN - SILURIAN</b>	Bs	Bell Shale
	FS	Florence Sandstone
	S	Silurian
<b>ORDOVICIAN</b>	Og	GORDON GROUP limestone
<b>EARLY ORDOVICIAN - LATE CAMBRIAN</b>	COu	Upper sandstone sequence including Pioneer Beds (COu)
	COo	Undifferentiated conglomerate and sandstone (COo)
	COon	Newton Creek Sandstone (COon) - interbedded sandstone siltstone and conglomerate with marine fossils

**MT. READ VOLCANICS**  
**NORTH AND WEST OF HENTY FAULT**  
**DUNDAS GROUP AND CORRELATES**

Qp	Quartz-feldspar porphyry, mostly intrusive
Qs	Mostly sedimentary rocks - greywackes, siltstone, conglomerate
Qst	Interbedded tuffs and sedimentary rocks
Qd	Quartzwacke-slate-siltstone units, e.g. Silt Quartzite
Qv	Mostly felsic volcanics - mainly tuffs
Qm	Mixed felsic and mafic volcanics and epiclastic breccias, Que-Hellyer area
Qba	Basaltic to andesitic volcanics

**CENTRAL VOLCANIC COMPLEX**

COv	Mainly felsic porphyry volcanics - dacite, rhyolite, minor andesite (COv)
Qp	Felsic porphyry, mainly intrusive
COc	Mainly pyroclastic rocks
COs	Sedimentary rocks, mainly shale and sandstone
COa	Andesitic volcanics

**SOUTH AND EAST OF HENTY FAULT**  
**TYNDALL GROUP AND CORRELATES**

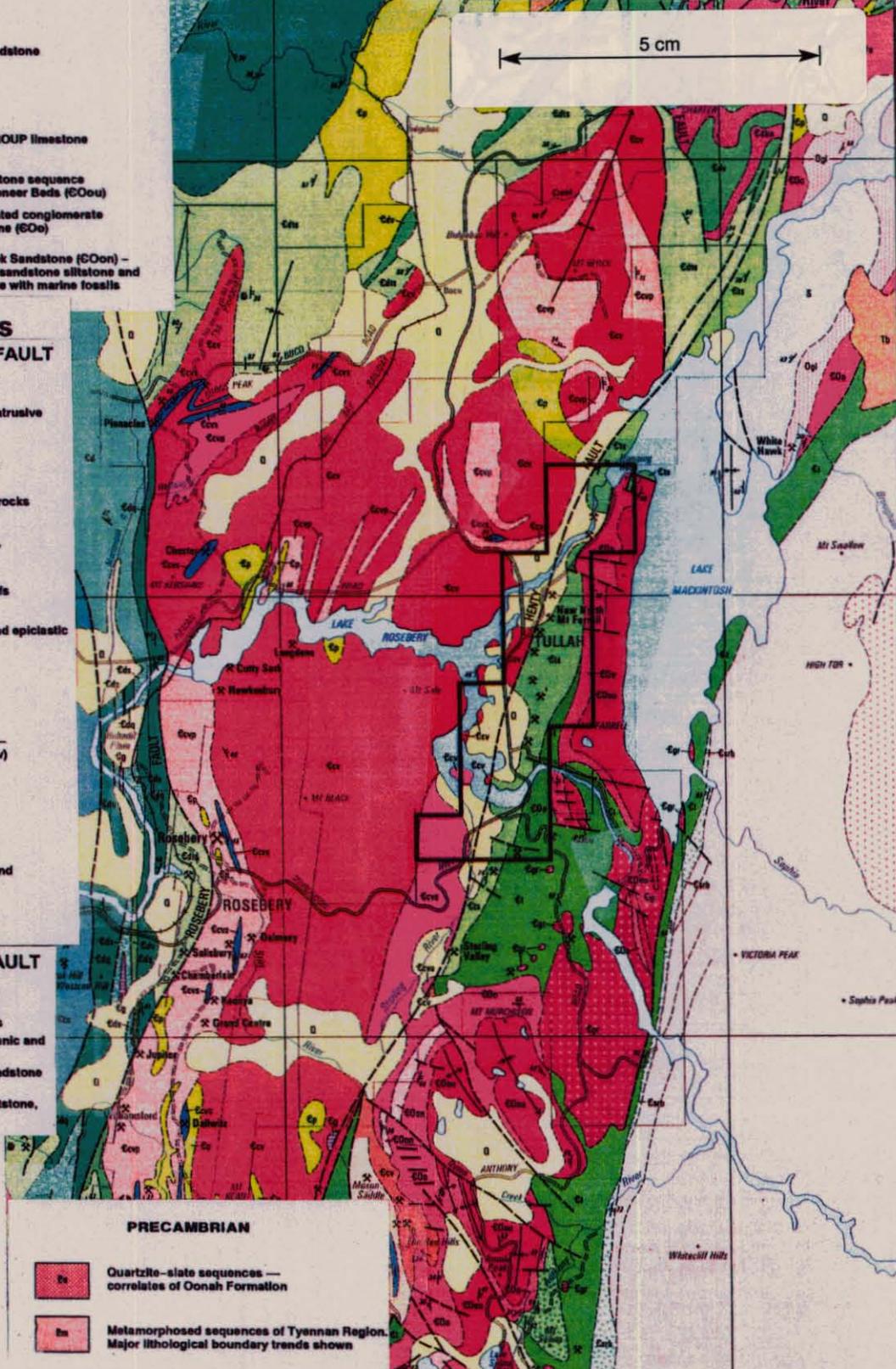
COs	Mainly sed. rocks, incl Farrell Slates
COv	Mainly quartz-feldspar-pyric volcanic and volcanoclastic rocks (COv)
COc	Mainly volcanoclastic congl. and sandstone
COsb	Slicht Range Beds - sandstone, siltstone, siliciclastic conglomerate

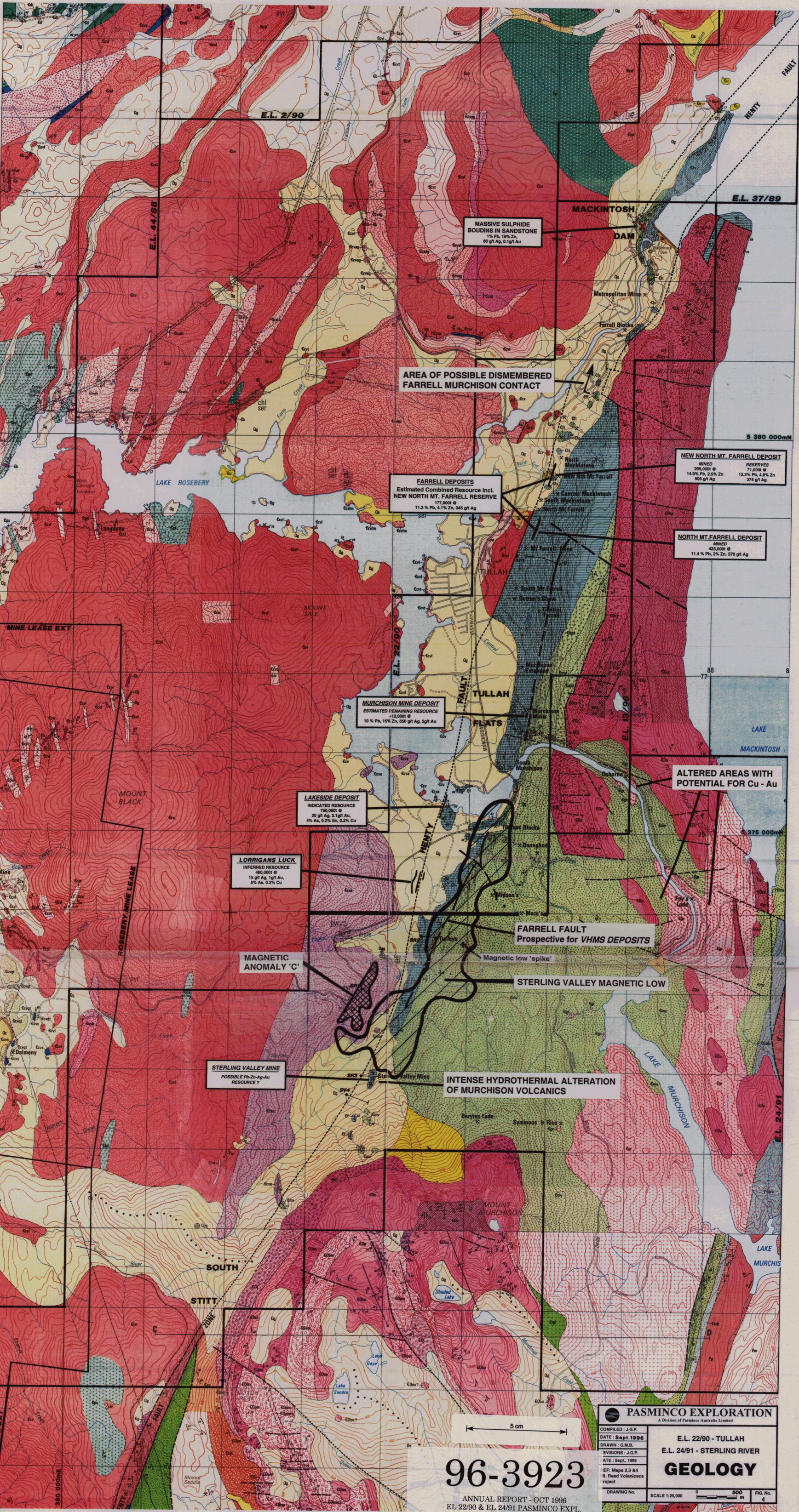
**CAMBRIAN INTRUSIVE ROCKS**

Gr	Granite
Qp	Felsic porphyry
G	Gabbro
U	Ultramafic rocks & serpentinite

**PRECAMBRIAN**

Qs	Quartzite-slate sequences - correlates of Oonah Formation
Em	Metamorphosed sequences of Tyennan Region. Major lithological boundary trends shown





E.L. 2/90

E.L. 44/88

E.L. 37/89

**MASSIVE SULPHIDE BOUDINS IN SANDSTONE**  
1% Pb, 16% Zn,  
80 g/t Ag, 0.1 g/t Au

**AREA OF POSSIBLE DISMEMBERED FARRELL MURCHISON CONTACT**

**NEW NORTH MT. FARRELL DEPOSIT**  
MINED 299,000t @  
14.9% Pb, 2.5% Zn  
556 g/t Ag  
RESERVES 71,000t @  
12.3% Pb, 4.8% Zn  
378 g/t Ag

**FARRELL DEPOSITS**  
Estimated Combined Resource Incl.  
NEW NORTH MT. FARRELL RESERVE  
177,000t @  
11.3% Pb, 4.1% Zn, 345 g/t Ag

**NORTH MT. FARRELL DEPOSIT**  
MINED 423,000t @  
11.4% Pb, 2% Zn, 370 g/t Ag

**MURCHISON MINE DEPOSIT**  
ESTIMATED REMAINING RESOURCE  
12,000t @  
10% Pb, 15% Zn, 355 g/t Ag, 2g/t Au

**LAKESIDE DEPOSIT**  
INDICATED RESOURCE  
750,000t @  
20 g/t Ag, 2.1g/t Au,  
4% As, 0.2% Sn, 0.2% Cu

**LORRIGANS LUCK**  
INFERRED RESOURCE  
480,000t @  
15 g/t Ag, 1g/t Au,  
5% As, 0.3% Cu

**ALTERED AREAS WITH POTENTIAL FOR Cu - Au**

**FARRELL FAULT**  
Prospective for VHMS DEPOSITS

**MAGNETIC ANOMALY 'C'**

**STERLING VALLEY MAGNETIC LOW**

**STERLING VALLEY MINE**  
POSSIBLE Pb-Zn-Ag-Au  
RESOURCE ?

**INTENSE HYDROTHERMAL ALTERATION OF MURCHISON VOLCANICS**

**PASMINCO EXPLORATION**  
A Division of Pasminco Australia Limited

COMPILED: J.G.P.  
DATE: Sept. 1996  
DRAWN: G.M.B.  
REVISIONS: J.G.P.  
ATE: Sept. 1995  
EF: Maps 2.3 & 4  
R. Reed Volcanics project

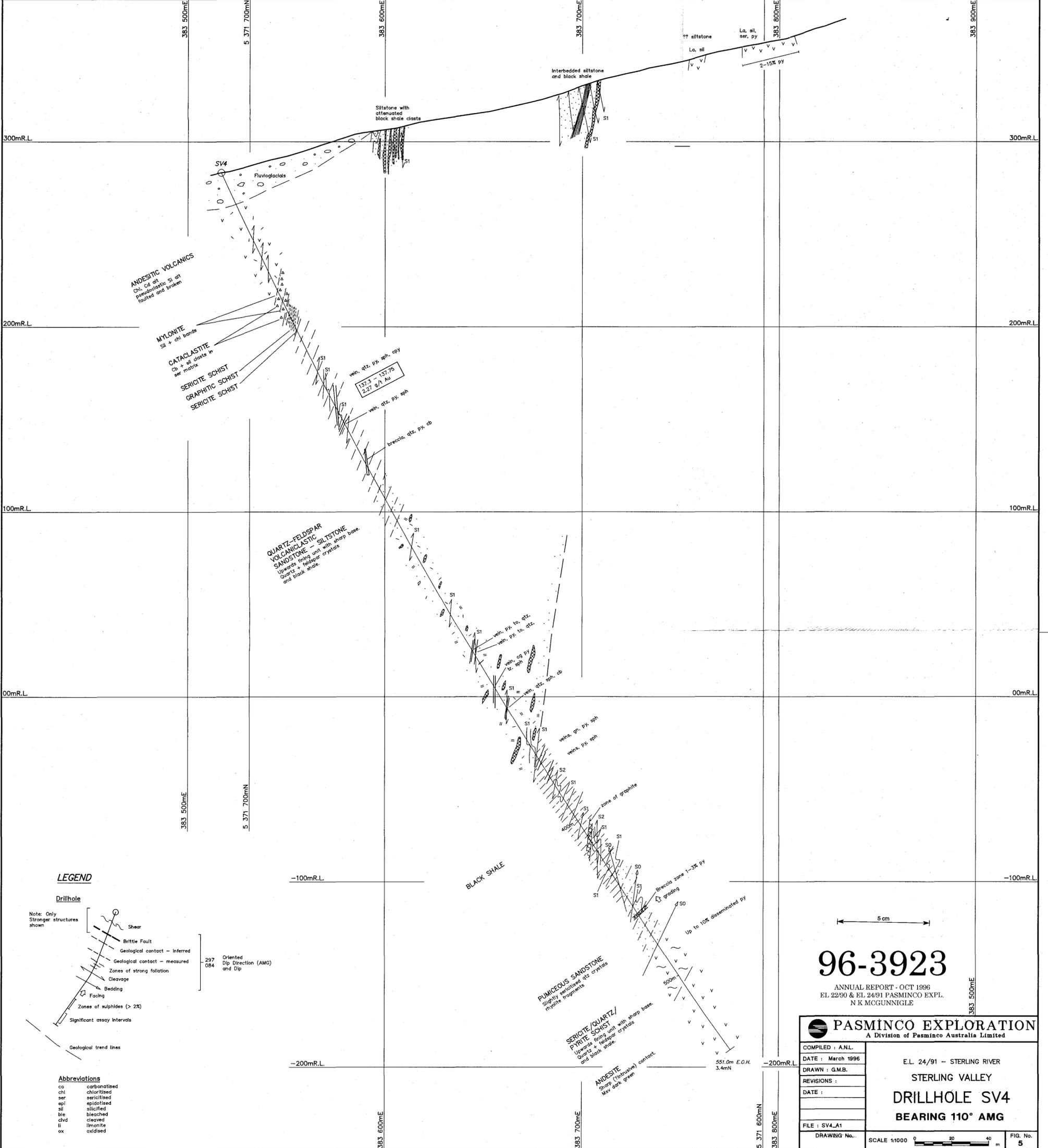
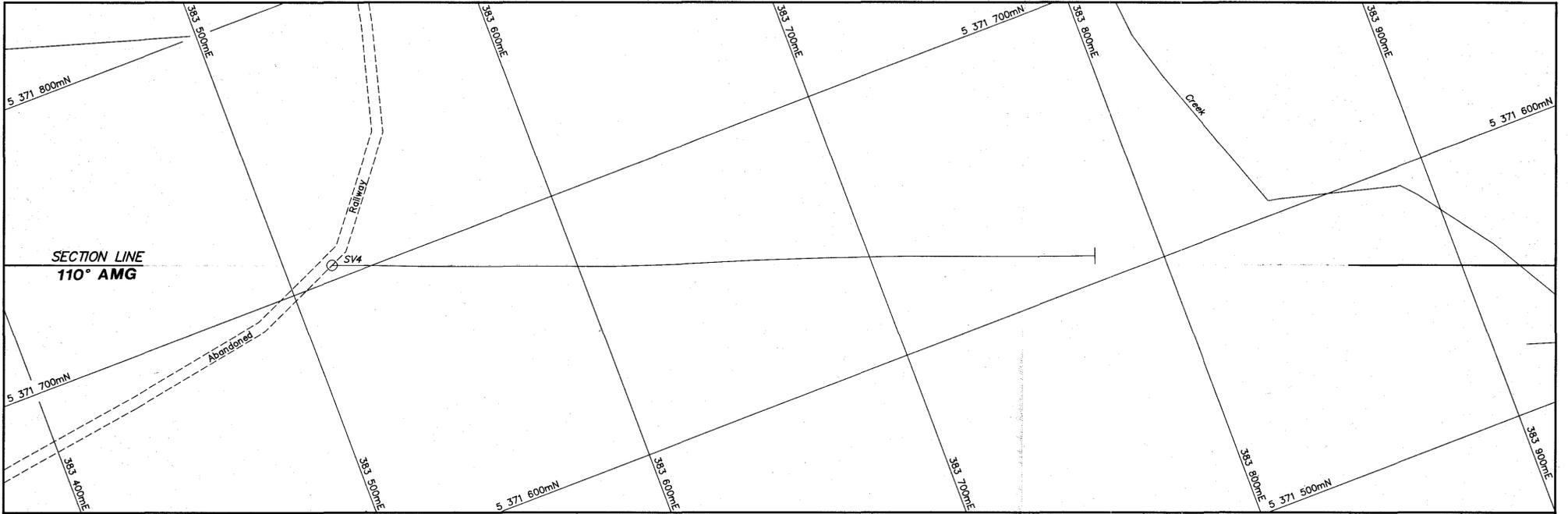
E.L. 22/90 - TULLAH  
E.L. 24/91 - STERLING RIVER

**GEOLOGY**

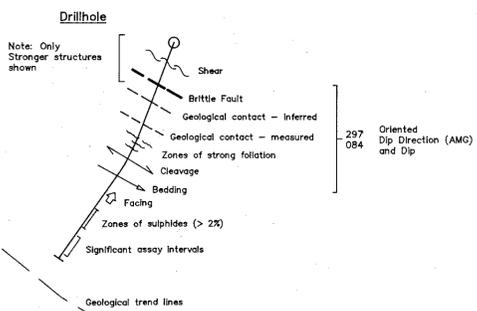
DRAWING No. SCALE 1:25,000 0 500 1 m FIG. No. 4

**96-3923**

ANNUAL REPORT - OCT 1996  
EL 22/90 & EL 24/91 PASMINCO EXPL.  
N K MCGUNNIGLE



**LEGEND**



**Abbreviations**

- ca carbonatised
- chl chloritised
- ser sericitised
- epi epidiotised
- sil silicified
- ble bleached
- clvd cleaved
- li limonite
- ox oxidised

**96-3923**

ANNUAL REPORT - OCT 1986  
EL 2290 & EL 2491 PASMINGO EXPL.  
N K MCGUNNIGLE

<b>PASMINCO EXPLORATION</b> A Division of Pasminco Australia Limited	
COMPILED : A.N.L.	E.L. 24/91 - STERLING RIVER
DATE : March 1986	STERLING VALLEY
DRAWN : G.M.B.	<b>DRILLHOLE SV4</b>
REVISIONS :	<b>BEARING 110° AMG</b>
DATE :	
FILE : SV4_A1	
DRAWING No. _____	SCALE 1:1000
	FIG. No. <b>5</b>

The presence of Au-Sn mineralization, as well as evidence from lead and sulphur isotopes, suggests that much of the mineralization in the Tullah-Sterling River area is a Cambrian-Devonian hybrid (Purvis, 1992). The gold, as well as some of the base metals and silver, are apparently of Cambrian volcanogenic origin and were remobilised in the Devonian largely due to the influence of the granite intrusion, with inputs at that time of Sn, As, further base metals and silver. Gold is a notable absentee from the Pb-Zn-Ag Farrell orebodies at Tullah - the largest (now 80% mined out) of the known resources on the EL's.

The main known mineral showings are shown on Figure 4. Two of the larger mineralized bodies (the Lakeside gold deposit with 750,000t @ 2.1g/t Au, and Lorigans Luck with 480,000t @ 5% As & 1g/t Au), are not exposed at surface and were found by drilling in the 1980's.

#### 4.1 DDH SV4

DDH SV4 (551m) was drilled in early 1996 to test the Murchison Volcanics-Farrell Slates contact for base metal mineralization south of Sterling Valley Mine. Drilling intersected Murchison Volcanics altered to sericite-silica-pyrite schist adjacent to the contact, but no base metal mineralization was present in the volcanics. Veins of Pb-Zn-Au-As mineralization were intersected in the Farrell Slates, with the best base metal mineralisation from 360.0 - 365.2m. The best results include: 1m @ 2.2% Pb, 0.44% Zn (361.6 - 362.6m) and 0.8m @ 9.48% As, 1.77 g/t Au (388.0 - 388.8m).

The log and assay results for SV4 are included in Appendix 1, and a cross section of the hole is illustrated in Figure 5.

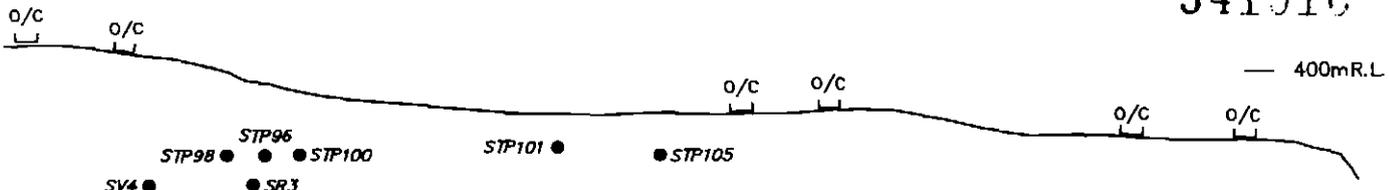
The intense zone of silica-sericite-pyrite alteration intersected by SV4 can be extended to similar lithologies in SR2 and SR3 (Purvis, 1995) and rocks at surface. A series of long sections along the alteration zone, which strikes parallel to the Farrell-Murchison contact are shown in Figure 6. The first of the sections shows the lowest Na<sub>2</sub>O values obtained within the alteration zone for each drill hole and the surface traverse that intersect it. The others show the highest Zn and Cu values.

Na depletion appears to be relatively uniform throughout the zone and no clear trend towards a more intensely altered area emerges. Zn values in SR2 and STP105 are slightly elevated as are Cu values in SV4 and STP96. Using the Rosebery deposit as a model, higher Zn and Cu values would be expected if this alteration zone lies in the footwall to a base metal orebody.

#### 4.2 STERLING VALLEY MAPPING

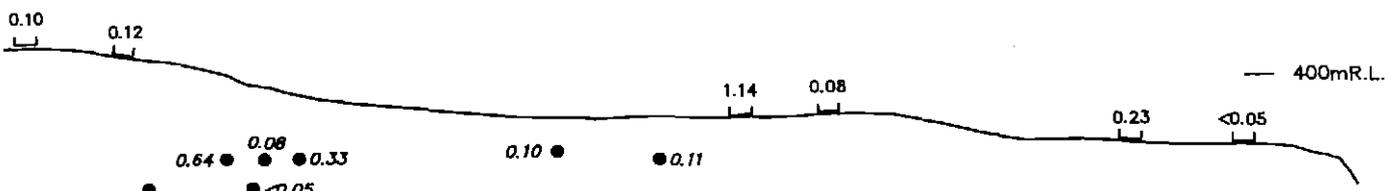
Mapping undertaken in the Sterling Valley by Angela Lorrigan is included in Figure 7. The contact between Murchison Volcanics and Farrell Slates was identified, however rock chips sampling over the silica/sericite/pyrite zone returned no significant metal values. A rock chip sample from the Sterling Valley tramway assayed 1.01g/t Au, in weathered, limonitic and manganiferous mafic volcanic from the western side of the Henty Fault (75501; Appendix 2).

341016



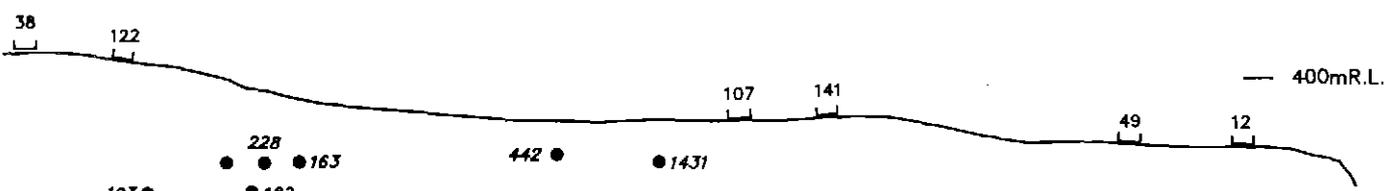
STP96 ● ● ● STP100 ● ● ● STP101 ● ● ● STP105 ● ● ● SR2 ● ● ● SV4 ● ● ● SR3 ● ● ●

**Hole Locations**



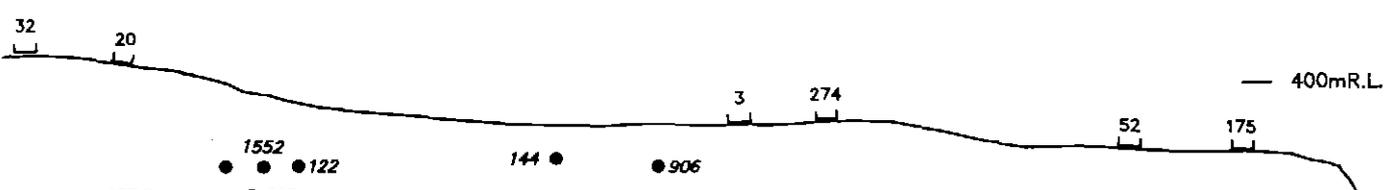
0.10 ● 0.12 ● 0.64 ● 0.08 ● 0.33 ● <0.05 ● 0.10 ● 0.11 ● 1.14 ● 0.08 ● 0.07 ● 0.23 ● <0.05 ●

**Na<sub>2</sub>O**  
(lowest values in alteration zone)



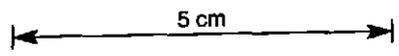
38 ● 122 ● 193 ● 228 ● 163 ● 182 ● 442 ● 1431 ● 107 ● 141 ● 1315 ● 49 ● 12 ●

**Zn**  
(highest values in alteration zone)



32 ● 20 ● 1287 ● 1552 ● 122 ● 323 ● 144 ● 906 ● 3 ● 274 ● 199 ● 52 ● 175 ●

**Cu**  
(highest values in alteration zone)



 <b>PASMINCO EXPLORATION</b> <small>A Division of Pasminco Australia Limited</small>	
COMPILED : A.N.L. DATE : April 1996 DRAWN : G.M.B. REVISIONS : FILE : LS_FSMVC	E.L. 24/91 -- STERLING RIVER LONG SECTION <b>FARRELL SLATES/MURCHISON</b> <b>VOLCANICS CONTACT</b> SOUTHERN ZONE
DRAWING No.	SCALE 1:25,000
	
	FIG. No. <b>6</b>

### 4.3 FARRELL DRILLING PROGRAMME

An exploration program was undertaken by Angela Lorrigan to investigate the Farrell area for resources that could be accessed by open cut mining. Eleven short diamond drill holes totalling 620.8m were drilled in the vicinity of North Farrell and New North Farrell mines, targeting shallow extensions of the known ore bodies (Figure 8). Preliminary sampling of mine dumps and geological mapping was also conducted.

The program, reported in Appendix 3, identified continuations of the Farrell Lodes close to surface and the potential for a resource of approximately 100 000t @ 6.3% Pb, 1.6% Zn and 201g/t Ag. There is potential for additional lodes to be found to the east of the known ore bodies, which are identified as narrow veins. Recommendations for follow up drilling are included in the report which has been forwarded to Pasminco Mining in Rosebery. Further action will be undertaken by the Mine should they think it necessary.

### 4.4 MURCHISON GORGE ROCK CHIP SAMPLING

Intense silica-chlorite alteration of the Murchison Volcanics occurs on the contact with altered Murchison Granite in the Murchison Gorge. Pyritization is widespread and several small copper showings are known. Magnetite-pyrite rich zones are also present. In the 1970's Asarco tested limonite draining from HEC drill holes in these rocks (the holes were put in to test the route of the Sophia Tunnel), and found them to contain anomalous levels of Pb & Zn. The alteration in the gorge area is well described by Polya (1981).

Rock chip sampling was undertaken along the Murchison Gorge Alteration Zone in 3m sample intervals in early 1996 (Figures 9 and 10). Brief descriptions of lithology and alteration were noted during the sampling program (Appendix 4). Assay results, included in Appendix 4, show weak elevation of Cu in places (up to 1163ppm Cu over 3m). Anomalous values of Pb and Zn can be shown to be related to small veins within the zone.

**NEW NORTH  
MT. FARRELL**

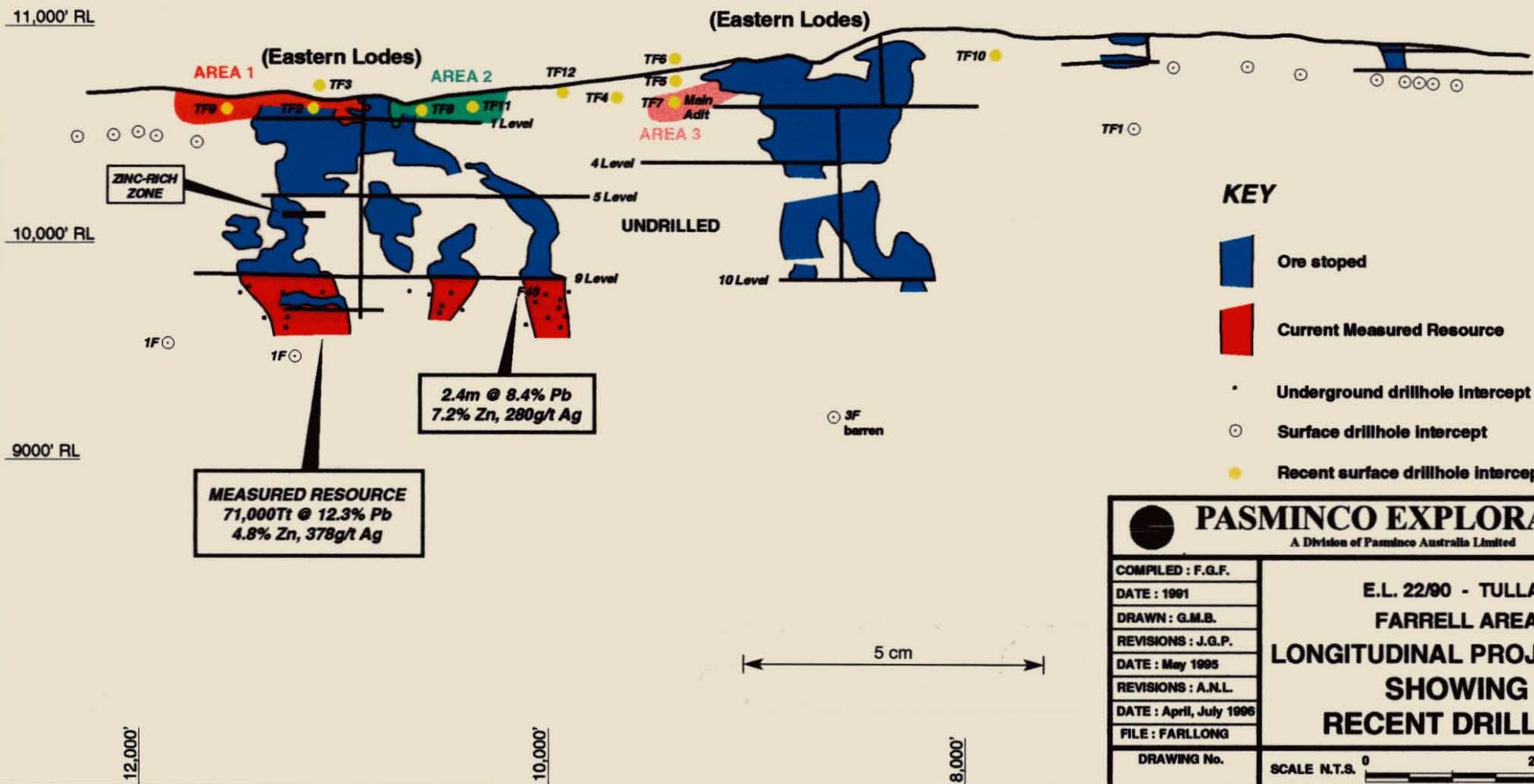
**NORTH  
MT. FARRELL**

**MT. FARRELL**

**MT. FARRELL  
SOUTH**

1934-1973 Produced :  
299,000t @ 14.9% Pb  
2% Zn, 506g/t Ag

1899-1933 Produced :  
432,000t @ 11.4% Pb  
2% Zn, 370g/t Ag



**KEY**

- Ore stoped
- Current Measured Resource
- Underground drillhole intercept
- Surface drillhole intercept
- Recent surface drillhole intercept

341018

**MEASURED RESOURCE**  
71,000t @ 12.3% Pb  
4.8% Zn, 378g/t Ag

2.4m @ 8.4% Pb  
7.2% Zn, 280g/t Ag

<b>PASMINCO EXPLORATION</b> <small>A Division of Pasminco Australia Limited</small>	
COMPILED : F.G.F. DATE : 1991 DRAWN : G.M.B. REVISIONS : J.G.P. DATE : May 1995 REVISIONS : A.N.L. DATE : April, July 1996 FILE : FARLLONG	<b>E.L. 22/90 - TULLAH FARRELL AREA LONGITUDINAL PROJECTION SHOWING RECENT DRILLING</b>
DRAWING No.	SCALE N.T.S. <span style="display: inline-block; width: 100px; border-bottom: 1px solid black; position: relative; top: -5px;"> <span style="position: absolute; left: 0; top: -5px;">0</span> <span style="position: absolute; right: 0; top: -5px;">250</span> <span style="position: absolute; right: 0; top: 5px;">m</span> </span>
	FIG. No. <b>8</b>

Further sampling of the Murchison Alteration Zone will be conducted in conjunction with mapping of lithologies and alteration. Compilation of this data may help identify metal-bearing structures and areas within the zone.

#### **4.5 LAKESIDE AND LORRIGANS LUCK DATA COLLECTION**

Previous exploration of the Lakeside and Lorrigans Luck Prospects have been briefly reviewed and a comprehensive database including all drill logs and assay results added to Pasminco's GIS. The core has been examined, and summary logs compiled for all drill holes in datcol and techbase. Previous assay results have been added to techbase. Additional split core samples have also been taken for analyses, but results have not been received at the time of reporting. Thin and polished sections which exist for the RED holes will be re-examined and added to Pasminco's thin section catalogue.

A review of geophysics in the Lakeside area was completed by Paul Basford (1996; Appendix 5) and includes recommendations for drilling.

Compilation of data will be reviewed in full to direct a follow up work program in the area.

Expenditure for the current period ending 31 August 1996 was \$187,669 on EL24/91 & \$223,994 on EL22/90.

	EL22/90	EL24/91
	\$	\$
Personnel	56,468	50,639
Travel & Accommodation	3,829	3,950
Geological Consultants	14,000	9,847
Geochemical Consultants & Assays	3,491	21,196
Geological Surveys & Consultants	943	(830)
Other Consultants	6,608	4,629
Track Cutting & Gridding	2,550	4,678
Drilling	85,199	52,665
Stores & Supplies	3,132	2,433
Vehicles Plant & Equipment	4,576	2,870
Land	900	999
Computing	3,839	3,339
Office	18,096	13,994
Administration Fee	20,363	17,061
Total	223,994	187,669

It is recommended that future work conducted in the Tullah EL 22/90 and Sterling River EL 24/91 should change focus from large-scale Pb-Zn targets to potential Au/Au-Cu mineralization. The Henty Fault is a prime target for shear zone hosted Au mineralization. The 1996-1997 year work program should include:

- Mapping, rock chip and geochemical sampling over the Henty Fault and subsidiary shear zones.
- Gridding and refurbishment over the Lakeside-Lorrigans Luck, south Sterling Valley and South Stitt areas for geochemical (soil/MMI) sampling and geophysics.
- Ground magnetics and IP surveys over new and refurbished grids.
- Follow up drilling in the Lakeside and Lorrigans Luck areas targeting the mineralized Henty Fault zone.

Allen, R.W. 1995. Geological Transect Across the Sterling Valley and Murchison Volcanics, Tasmania. Unpub Report to Pasminco Exploration, January 1995.

Basford, P.W., 1996. Review of Lakeside Geophysical Surveys - Tullah EL22/90. Pasminco Exploration Memorandum.

Polya, D.A. 1981. The Geology of the Murchison Gorge. BSc Honours Thesis, Uni of Tas, November 1981.

Purvis, J.G. 1992. Tullah EL 22/90 & Sterling River EL 24/91, Western Tasmania. Annual Report October 1991 - September 1992. Unpub Pasminco Expln Report No. T92-13.

Purvis, J.G., 1995. Tullah EL 22/90 & Sterling River EL 24/91, Annual Report. September 1994 - September 1995. Unpub Pasminco Exploration Report No. T95-13.

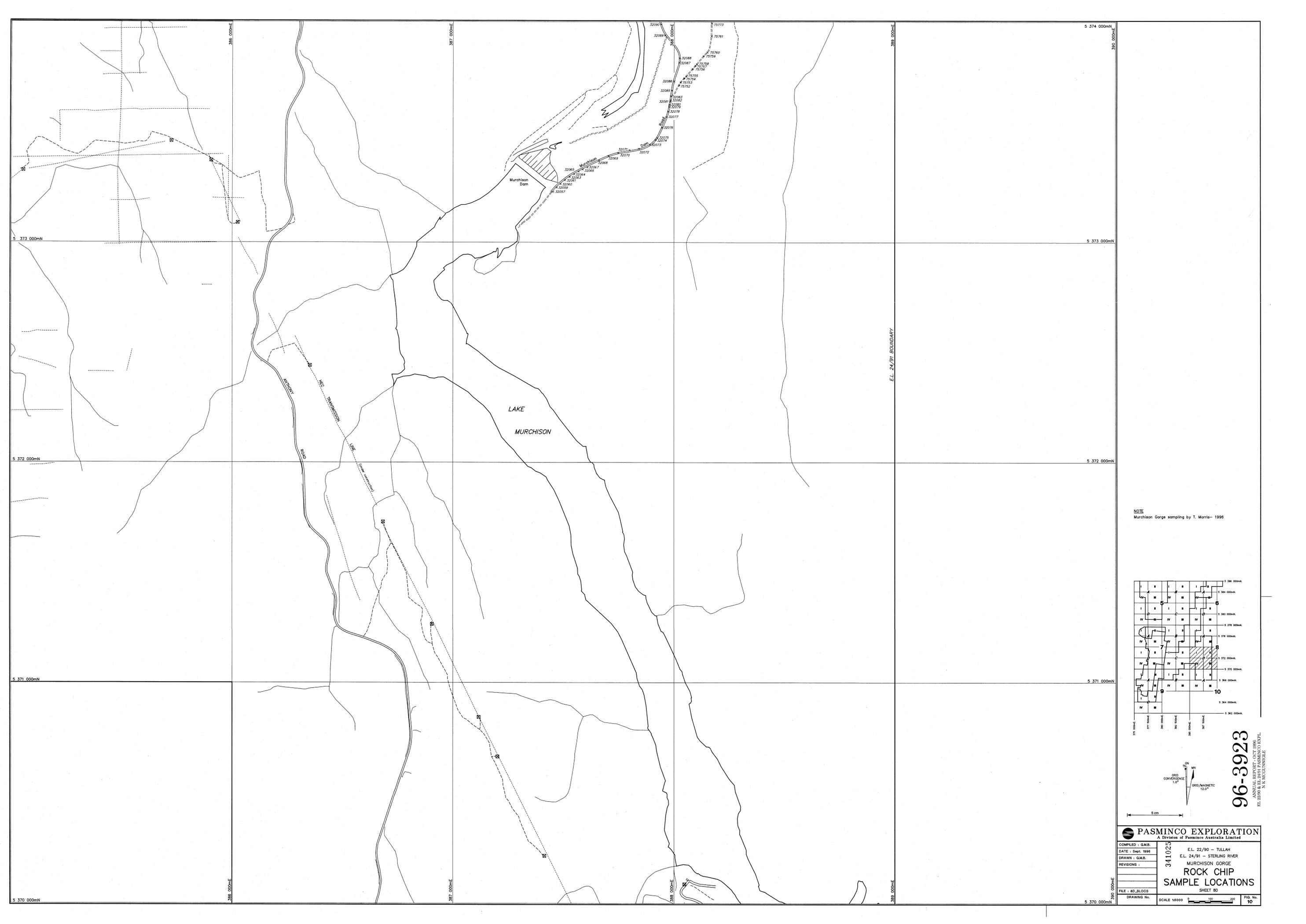
KEYWORDS

ZINC, LEAD, GOLD, SILVER, ARSENIC, TIN, VOLCANOGENIC,  
ALTERATION, STRUCTURE, DRILLING, GEOCHEMISTRY, GRANITE

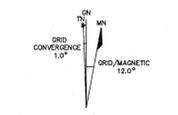
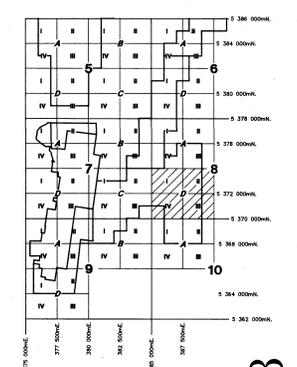
LOCATION

BURNIE SK55-3 & QUEENSTOWN SK55-5:  
TULLAH, STERLING RIVER, MT MURCHISON





**NOTE**  
Murchison Gorge sampling by T. Morris - 1996



**96-3923**  
ANNUAL REPORT - OCT 1996  
EL. 24/91 & EL. 24/91 PASMINGO EXPL.  
N. LANGDONVILLE

<b>PASMINCO EXPLORATION</b> A Division of Pasminco Australia Limited	
COMPILED: G.M.B.	12
DATE: Sept. 1996	EL. 22/90 - TULLAH
DRAWN: G.M.B.	EL. 24/91 - STERLING RIVER
REVISIONS:	34102
	MURCHISON GORGE
	<b>ROCK CHIP</b>
	<b>SAMPLE LOCATIONS</b>
FILE: 80_BLOC8	SHEET 80
DRAWING No.	SCALE 1:5000
	Fig. No. 10

**APPENDIX 1**

**DDH SV4 - Drill Log and Assay Results**



# PAMINCO EXPLORATION DIAMOND DRILL CORE RECORD

HOLE No. SV 4

341027

Page      of     

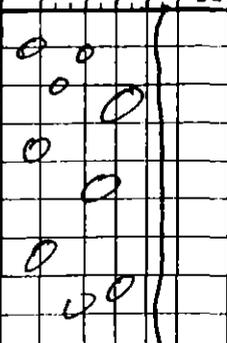
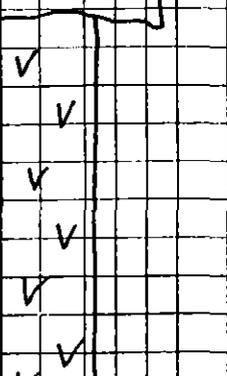
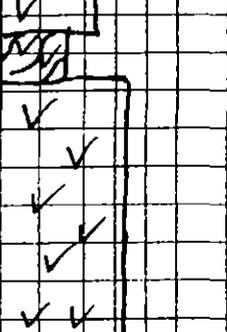
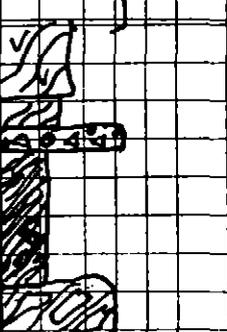
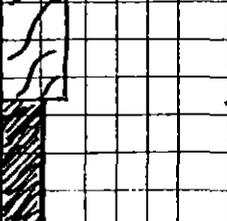
LOCATION		OBJECTIVE	LOCATION/SURVEY DATA (AMG)					
PROJECT	PROSPECT		Grid	AMG	RL Collar m	Bearing Collar	Dip Collar	Length Hole m
Sterling River E.C.	Sterling Valley	To test the Murchison Volcanics / Farrell Slate contact for Base Metal mineralisation	Northing m	5371705.2	283.40	111.0	-65	550
DESIGNED BY	A.N.L.		Easting m	383516.7				
LOGGED BY	A.N.L.		DH Survey Type	Aurmine Camera				
RELOGGED								
		RESULT	Depth m	Bearing	Dip	Depth m	Bearing	Dip
COMMENCED	19/1/96	The Murchison Volcanics are altered to seriate/silica/pyrite schist adjacent to the contact. No base metal min. is present. Veins of Pb/Zn/Au/As min. were intersected in the Farrell Slates.	0.0	111.0	-65			
COMPLETED	20/2/96		50.0	112.0	-64.00			
DRILLED BY	Diamond Drilling Tasmania		100.0	111.0	-63.50			
DRILL RIG	LY 38		151.0	111.0	-62.00			
SIGNIFICANT INTERSECTIONS								
From m	To m	Interval m	Comments					
						251.0	109.0	-60.00
						301.0	108.0	-58.50
						352.0	109.0	-58.00
						403.0	110.0	-57.25
						451.0	111.0	-56.75
						501.0	111.0	-56.00
						550.0	110.0	-54.00
SIGNIFICANT CORE LOSS			POOR GROUND CONDITION ZONES					
From m	To m	% Lost	From m	To m	Condition			
HOLE SIZE		HOLE CONDITIONS AFTER COMPLETION						
Size	Depth m	Collar						
H.Q.	101.4	Steel Casing						
N.Q.	551.0	PVC Casing						
		Ground Water						
		Wedge						
		Drill Pad						

Project: Sterling River  
 Logged by: A.N.L.  
 Date: March 1996

# PASMINCO EXPLORATION DIAMOND DRILL LOG

341028  
 HOLE No. SV4

Page of

m	VEINING and ALTERATION (1 = weak, 4 = Intense)	STRUCTURE b = bedding c = cleavage f = fault Angles to LCA	GRAPHIC LOG S G N R M B	LITHOLOGY	MINERALISATION
				<u>Boulders, glacially deposited overburden.</u>	
18-20				18.0	
	Carverous veins after Carbonate.	18-84m Very broken ground >100 breaks/m		DK. green, magnetic, fd-phyric, Cb-altered, chloritic <u>mafic-intermediate volcanic.</u>	
38.4-40		Chlorite-rich mylonite bands 30°		38.4 As above with strong mylonitic fabric.	
	carbonate veins, parallel to foliation (280)	28° S1		41.7 Siliceous, mostly pink "clasts" in a dark gy-grn chloritic/carbonate matrix. Some clast have diffuse boundaries, appears to be alteration of <u>Mafic Volcanic.</u>	Tr. hm @ 46.7
55.6		25° S1		55.6 DK. gy-grn, strongly fol. <u>Mafic volcanic. Intense chlor. alt.</u>	Tr hm
59.6-60-61.5-62.2	Cb-qtz vng. M. fol'n. q/cb vng. X-cut pat'n.	35° 90° S1 S2 q vn.		59.6 <u>Henty Fault Zone</u> q/cb/ser. Fault by sid. clasts in ser. Cb schist. matrix. Fault pg. with bands q/cb/ser. Some of these are folded. Fault bx. distorted sil. bands in ser/chlor/graph. matrix. Fault pg. ser/graph. mud.	
69.8-72.2-73.6		60° 45° 90° F1 F2		73.6 Pale green. <u>silica/sericite schist.</u>	Tr py.
80-83.5		20° 45° M'flls		80 Very strong foliation, folded to "chevron" folds. 83.5 Black <u>graphitic schist.</u> with puggy zones & patches of silica & qtz vng.	Tr. py.
91.5-94.5		30°		91.5 Buff <u>sericite schist.</u> with some sil. series. 94.5	Tr py

# PASMINCO EXPLORATION DIAMOND DRILL LOG

m	VEINING and ALTERATION (1 = weak, 4 = intense)	STRUCTURE b = bedding c = cleavage f = fault Angles to LCA	GRAPHIC LOG dia rad 3 2 1 max mm	LITHOLOGY	MINERALISATION
	cb + qtz stringers cross-cutting F <sub>1</sub> 5-10m.			101.4 - HQ → NQ. Upward fining <u>Conglomerate</u> - <u>Siltstone.</u>	Tr. py. diss.
120		S <sub>1</sub> 30° S <sub>1</sub> 20° S <sub>1</sub> 30°		Contains black shale and rare siltstone and rhyolite clasts at base. These are contained in a quartz and feldspar crystal matrix. Shale clasts are stretched out parallel to cleavage. No bedding observed.	
140	137.3 py, cpy, sil bx in vein. 150.3 q. vng. 150.6 c bxn. of seds.	F <sub>1</sub> Vein S <sub>1</sub> 25° S <sub>1</sub> 22° S <sub>1</sub> 20° S <sub>1</sub> 20° S <sub>1</sub> 10° S <sub>1</sub> vein. S <sub>1</sub> 70° S <sub>1</sub> 20°		Clasts diminish in number + size up-hole, so do quartz crystals.	137.3 py, cpy, sil bx in vein. 137.5 stringers 137.9 sp ign. 150.3 py + sph 150.6 assoc. c bx. un.
160		S <sub>1</sub> 30° S <sub>1</sub> 38° S <sub>1</sub> 20°		Fines up to a weakly sericitic siltstone probably derived from volcanic material.	176.3 py in bx 176.7 + veins.
180	176.3 qb, py, cb 176.7 vng. bxn. of seds.	S <sub>1</sub> 35° S <sub>1</sub> 25° S <sub>1</sub>		193.0 sericitic patches 197.0 c qb ? phenocrysts ? after vitric volc. fragments.	
200	193.0 197.0				

Project: Sterling River

Logged by: A.N.L.

Date: March 196

# PASMINCO EXPLORATION DIAMOND DRILL LOG

341030  
HOLE No. SV4

Page of

m	VEINING and ALTERATION (1 = weak, 4 = intense)	STRUCTURE b = bedding c = cleavage f = fault Angles to LCA	GRAPHIC LOG b c f N E W max min	LITHOLOGY	MINERALISATION
		$S_1$ 34°			
		$S_1$ 32°			
239.8	Zone of 95 stringers	$S_1$ 32° $S_1$ 42° $S_1$ 38° $S_1$ 10° $S_1$ 20°			
252.7					
282.0	95 vn. E haem.	$S_1$ 35°			
289.3	4cm.	$S_1$ 45° $S_1$ 40°			
291.6	2cm (O/A) clb veins				
294.6	4cm				
300					

Project: Sterling River

Logged by: A.N.L.

Date: March 196

# PASMINCO EXPLORATION DIAMOND DRILL LOG

341031  
HOLE No. SV 4

Page of

m	VEINING and ALTERATION (1 = weak, 4 = intense)	STRUCTURE b = bedding c = cleavage f = fault Angles to LCA	GRAPHIC LOG 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100	LITHOLOGY	MINERALISATION
320	313.5 discont. 314.5 stringers min.	25° S1 min.			313.5 c.g. py 314.5 min. c tr. sp.
340	328.5 qz/sp/lb 330.7 vein. Strongly developed cleavage, strongly sericitic. Sericite on cleavage planes.	43° 35° 330.7 S1 Broken ground 100 lbs/m.			328.5 sp in vein.
358.9	348.1	348.1 S1			
360	360.3 Bx. zone, 362.3 stockwk. vng. stylonics 364.7 graphitic pug.	38° 70° 40° Corrected S0 18° S1 vein		Strongly graphitic, Carbonate-bearing, Black Slate.	360.3 gn+py+asp 362.3 sp in vns.
370.3	370.3 qz/lb 371.8 vein stockwk.	S1 45°		Bedding not observed except at contact.	370.3 py+as 371.8 sp in vns.
380	386.2 qz/lb vng 388.5 py+as	38° S1		386.2 Breccia/stockwork zone Top is cb/qz/chlor 388.5 veins & minor pug. Bottom is ang. slate frags. in qz/py/as matrix.	386.2 py+as in vns. 388.5
400					

Project: Sterling River

Logged by: A. N. L.

Date: March 196

041036

# PASMINCO EXPLORATION DIAMOND DRILL LOG

HOLE No. SV4

Page of

m	VEINING and ALTERATION (1 = weak, 4 = Intense)	STRUCTURE b = bedding c = cleavage f = fault Angles to LCA	GRAPHIC LOG CLG P S N = S P CLG	LITHOLOGY	MINERALISATION
401-2	401 qz/cb vng.	Most vng parallel to clv.			
407-7	407-7 Msr				
409-7	409-7 white vng.				
410-7	410-7 Graphite			410-7 Dk. brown/black	
412-2	412-2 Graphite			412-2 graphite zone.	
436-2	436-2 Zone of vng + pug.				
437-1	437-1	433 Broken Ground 80bks/m			
439-7				439-7 Interbedded Black Shale + Sandstone.	
442				Sandstone predom. volcaniclastic with some qz grains	
448-7	448-7 White				
451-5	451-5 q. vng.				
453-6				453-6 Black Shale.	
458-5		458-5 bx zone			
458-6		458-6 microf. + stylolites			1-3% py in bx zone.
464-5	464-5 Sericite alt'n of sandstone frags.			464-5 Interbedded Black Shale and quartz-volcaniclastic Sandstone	
476-3		476-3 contact		476-3 lode cast facing	
479-7		479-7 Strong Cleavage + bedding of Sst. beds on contact.		479-7 Pale green. Sericite/Silica/pyrite Schist.	
480				Prdb. after fcl-phyril volcanics. Feldspars preserved in sericitic zones	10% py, m.g. cubic, post cleavage and f.g. in clots, strung out along cleav. Tr. cpy.



PASMINCO EXPLORATION  
DIAMOND DRILL CORE ASSAY DATA

341034

No. SV4

Page of

PROJECT :

SAMPLE						ASSAYS (ppm unless specified)												COMMENTS		
Number	Type	From m	To m	Interval m	Recovered m	Cu	Pb	Zn	Ag	As	Mn	Au	Ba							
75920		149.0	151.5			17	433	662	1	256	1.11%	0.017	576							
21		176.3	176.7			46	111	236	5	707	3.94%	0.085	347							
22		239.7	240.7			13	73	117	<1	50	3886	<0.008	733							
23			241.7			15	94	857	<1	<50	2153	"	771							
24			242.7			8	93	274	<1	<50	2457	"	741							
25			243.7			3	30	84	<1	<50	1361	"	705							
26			244.7			<2	26	63	<1	<50	725	"	813							
27			245.7			7	93	955	<1	<50	2153	"	930							
28			246.7			8	226	534	<1	<50	2760	"	891							
29			247.7			7	172	327	<1	<50	293	"	755							
30			248.7			32	354	2265	<1	<50	0.88	"	1040							
31			249.7			41	705	3840	1	50	1798	"	1085							
32			250.7			4	160	311	<1	<50	1790	"	805							
33			251.7			51	176	690	<1	600	0.77%	0.021	761							
34			252.7			14	54	143	<1	<50	0.75%	<0.008	820							
35		289.3	289.6			3	5	30	<1	<50	4123	0.015	617							
36		291.5	291.8			33	144	102	33	2737	1.77%	0.054	707							
37		294.4	294.7			23	222	23	5	50	1.63%	<0.008	498							
38		312.2	313.2			40	17	37	<1	127	3529	"	666							
39		328.4	328.7			10	318	518	<1	<50	4251	"	872							
40		360.0	360.8			285	1383	956	8	164	1.26%	0.013	191							
41			361.6			46	132	78	1	162	2.23%	0.022	43							
42			362.6			547	2.29%	4446	20	270	0.97%	0.027	164							
43			363.6			346	498	3875	2	135	0.68%	0.021	302							
44			364.7			146	1403	2757	3	89	0.73%	0.017	328							
45			365.2			86	1491	1660	2	65	3795	0.018	225							
Laboratory						Analytical-Method														
Job-No.						Detection-Limit														
Date																				

PASMINCO EXPLORATION  
DIAMOND DRILL CORE ASSAY DATA

341035

HOE No. SV 4

PROJECT :

Page of

SAMPLE						ASSAYS (ppm unless specified)											COMMENTS					
Number	Type	From m	To m	Interval m	Recovered m	Cu	Pb	Zn	Ag	As	Mn	Au	Ba									
75946		365.2	366.3			134	103 <del>149</del>	89	273	373	2538	0.03	253									
47		367.1	367.7			168	149	133	44	114	0.63%	5.008	268									
48		369.9	370.2			76	90	80	<1	0.58%	3802	0.032	186									
49			370.8			62	56	130	<1	280	4333	0.019	301									
50			371.8			101	82	1219	<1	399	3416	0.050	198									
51		374.0	375.7			89	895	1423	4	678	3752	0.008	330									
52			376.25			278	185	97	3	849	0.58%	0.017	285									
53		377.0	378.0			76	325	689	2	53	2222	0.008	290									
54			379.0			151	1767	103	3	50	1401	"	301									
55			380.0			58	113	249	1	50	0.82%	"	243									
56			381.0			46	48	173	<1	63	1294	"	299									
57			382.0			67	190	525	1	96	2963	"	308									
58			383.0			25	35	158	<1	79	2697	"	333									
59			384.0			114	1069	914	3	71	3161	"	342									
60		386.2	386.8			35	247	151	2	271	1.36%	0.067	283									
61			387.5			53	192	115	1	50	0.82%	0.008	192									
62			388.0			221	109	297	4	948%	3646	1.77	75									
63			388.8			144	43	142	1	3.52%	1233	0.576	115									
64		404.1	405.0			68	62	140	<1	169	0.74%	0.010	220									
65		406.5	407.5			60	37	184	<1	50	1.81%	0.008	183									
66			408.5			37	31	88	<1	52	0.65%	"	205									
67			409.6			17	10	62	<1	50	1934	"	249									
68		410.7	412.3			408	284	125	5	1152	0.80%	"	12									
77201		436.2	437.2																			
202		448.7	449.2																			
203		479.0	481.0																			
Laboratory				Analytical Method																		
Job-No.		Date		Detection Limit																		



**PASMINCO EXPLORATION  
DIAMOND DRILL CORE ASSAY DATA**

**HOLE NO. SV4**

<i>sample</i>	<i>from</i>	<i>to</i>	<i>Au</i>	<i>Cu</i>	<i>Pb</i>	<i>Zn</i>	<i>Ag</i>	<i>As</i>	<i>Al2O3</i>	<i>SiO2</i>	<i>TiO2</i>	<i>Fe2O3</i>	<i>MnO</i>	<i>CaO</i>	<i>K2O</i>	<i>MgO</i>	<i>P2O5</i>	<i>SO3</i>	<i>Na2O</i>
77201	436.2	437.2	0.042	96	205	193	3	100	11.6	57.1	0.64	10.85	0.41	3.72	2.78	2.3	0.138	1.65	0.05
77202	448.7	449.2	<0.008	15	14	75	2	83	7.76	61.3	0.32	5.67	0.24	6.68	1.44	5.31	0.103	0.84	<0.05
77203	479	481	0.009	165	17	96	1	57	13.7	66.2	0.38	5.13	0.13	2.46	4.02	1.66	0.055	0.98	0.2
77204	481	483	0.017	657	19	60	1	<50	13.8	69.2	0.28	4.7	0.09	0.96	4.47	0.84	0.035	1.74	<0.05
77205	483	485	0.015	290	14	54	<1	<50	13.4	72.1	0.28	3.25	0.1	1	4.31	0.87	0.05	2.2	<0.05
77206	485	487	0.117	485	43	69	<1	100	12.5	69.3	0.19	7.03	0.05	0.47	4.03	0.77	0.026	2.69	0.12
77207	487	489	0.096	153	23	41	<1	69	13.5	69.3	0.21	5.2	0.05	0.73	4.42	0.93	0.024	2.09	<0.05
77208	489	491	0.013	85	12	28	<1	50	12.4	72.3	0.17	3.95	0.09	1.39	4.03	0.92	0.022	1.54	<0.05
77209	491	493	<0.008	38	6	35	<1	<50	11.1	74.6	0.16	2.97	0.1	1.96	3.64	0.73	0.019	2.21	<0.05
77210	493	495	0.011	464	17	44	<1	<50	11.3	74.8	0.17	3.13	0.11	1.26	3.77	0.87	0.018	1.64	<0.05
77211	495.5	497	0.014	795	6	34	<1	<50	11.1	72.7	0.16	5.1	0.08	0.9	3.58	0.88	0.016	1.58	<0.05
77212	497	499	0.012	469	11	33	<1	<50	10.5	76.2	0.15	5	0.04	0.36	3.39	0.64	0.015	0.89	<0.05
77213	499	500.9	0.02	1287	14	34	<1	<50	10.6	73.6	0.15	6.4	0.03	0.26	3.47	0.65	0.014	1.91	<0.05
77214	500.9	502	0.023	260	31	35	<1	<50	12.6	72	0.18	5.66	<0.01	0.09	4.15	0.57	0.016	0.68	<0.05
77215	502	504	<0.008	109	11	19	<1	<50	11.3	75.2	0.16	4.63	0.03	0.3	3.66	0.63	0.018	1.58	<0.05
77216	504	505.7	0.011	95	7	23	<1	<50	11.8	76.4	0.15	3.09	0.04	0.69	3.83	0.81	0.016	1.06	0.09

341037

**APPENDIX 2**

**Rock Chip Sample Assays - Sterling Valley**



### 341039

Phone (004) 315837

14 Thirkell St. COOEE TAS 7320

Fax (004) 318896

### ANALYTICAL REPORT No.

111510.00.11465

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

42/5

DATE RECEIVED

RESULTS REQUIRED

11/12/95

ASAP

No. OF PAGES OF RESULTS

DATE REPORTED

No. OF COPIES

TOTAL No. OF SAMPLES

3

04/01/96

1

11

SAMPLE NUMBERS

SAMPLE DESCRIPTION

ELEMENT/METHOD

75501-75511

RD Prep : GP029 P4

Cu, Pb, Zn, Ag, Hg/GA140, As/HA140  
As/GA140  
Au, Au(R), Au(B)/GB307  
WHOLE ROCK/OX406  
Ba, Sn, W/BA1401

RESULTS TO

Dr. B Tomkinson  
Pasminco Exploration  
P.O. Box 886  
BURNIE TAS 7320

RESULTS TO

Mrs A Lorrigan  
Pasminco Exploration  
P O Box 886  
BURNIE TAS 7320

RESULTS TO

[Empty box for results recipient]

REMARKS

*Startling Valley Samples  
(Rock Chip)*

*PP M.A. Lead*  
AUTHORISED OFFICER

## ANALYTICAL DATA

SAMPLE PREFIX

REPORT No.

REPORT DATE

CLIENT ORDER No.

PAGE

SAMPLE PREFIX		REPORT No.				REPORT DATE		CLIENT ORDER No.		PAGE	
		111310.60.11465				04/01/96		2275		1 OF 3	
METHOD	SAMPLE No.	Cu	Pb	Zn	Ag	Mn	Mn	Au	Au(S)	As	
		GA140	GA140	GA140	GA140	GA140	GA104	GG309	GG309	HA140	
1	Manganiferous rock - g.v. tram 75501	316	333	179	2	>5000	14.0	1.060	-	>50.0	
2	py. volcs. 75502	20	220	122	1	1282	-	0.032	-	>50.0	
3	py. volcs. 75503	11	59	37	<1	349	-	0.012	-	>50.0	
4	Wall rock - g.v. 75504	6	7	33	<1	283	-	<0.008	-	14.0	
5	fil. volcs 75505	9	32	34	<1	213	-	0.074	-	>50.0	
6	qtz veins 75506	9	10	34	<1	328	-	<0.008	<0.008	>50.0	
7	qtz veins 75507	6	<3	53	<1	127	-	<0.008	-	4.1	
8	Bl. Slates 75508	8	13	20	<1	80	-	<0.008	-	39.0	
9	Bl. Slates 75509	6	5	42	<1	2803	-	<0.008	-	36.0	
10	py volcs. 75510	32	27	24	<1	126	-	<0.008	-	>50.0	
11	py volcs. 75511	30	132	38	<1	211	-	0.025	-	46.0	
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24	DETECTION	2	3	2	1	3	0.1	0.008	0.008	0.5	
25	UNITS	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	

Results in ppm unless otherwise specified  
- element not determined

19 - insufficient sample  
SNR - sample not received

AUTHORISED OFFICER

pp *[Signature]*



## 341041

### ANALYTICAL DATA

SAMPLE PREFIX

REPORT No.

REPORT DATE

CLIENT ORDER No

PAGE

SAMPLE PREFIX		111310.60.11465				04/01/96		2275		2 OF 3	
METHOD	SAMPLE No.	As	Ba	Sn	W	Al2O3	SiO2	TiO2	Fe2O3	MnO	
		GA140	BX401	GX401	GX401	DX408	DX408	DX408	DX408	DX408	
1	75501	78	514	<3	<5	-	-	-	-	-	
2	75502	84	2258	8	9	-	-	-	-	-	
3	75503	50	2061	6	10	-	-	-	-	-	
4	75504	-	2262	3	<5	14.70	71.10	0.21	2.90	0.04	
5	75505	50	1120	9	9	15.00	70.40	0.21	3.41	0.03	
6	75506	54	48	3	<5	-	-	-	-	-	
7	75507	-	424	6	5	-	-	-	-	-	
8	75508	-	271	6	<5	-	-	-	-	-	
9	75509	-	189	6	<5	-	-	-	-	-	
10	75510	50	1165	7	8	12.60	75.70	0.18	2.41	0.02	
11	75511	-	1385	9	<5	15.50	68.50	0.40	4.12	0.03	
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
25	DETECTION	50	10	3	5	0.05	0.05	0.01	0.01	0.01	
	UNITS	ppm	ppm	ppm	ppm	%	%	%	%	%	

Results in ppm unless otherwise specified  
-- = element not determinedIS = insufficient sample  
SNR = sample not received

AUTHORISED OFFICER

pp M U [Signature]

### ANALYTICAL DATA

SAMPLE PREFIX

REPORT No

REPORT DATE

CLIENT ORDER No.

PAGE

		111310.60.11465				04/01/96		2275		3 OF 3	
	SAMPLE No.	CaO	K2O	MgO	P2O5	SO3	Na2O	LOI	Total		
METHOD		OX408	OX408	OX408	OX408	OX408	OX408	OX408	OX408		
1	75504	0.03	7.03	0.90	0.040	<0.01	0.12	2.14	99.20		
2	75505	0.01	5.92	0.93	0.020	0.01	0.50	2.78	99.30		
3	75510	<0.01	5.10	0.85	0.040	0.02	0.12	2.15	99.20		
4	75511	0.02	6.26	1.25	0.060	0.07	0.10	3.03	99.30		
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
	DETECTION	0.01	0.01	0.01	0.005	0.01	0.05	0.01	0.01		
25	UNITS	%	%	%	%	%	%	%	%		

Results in ppm unless otherwise specified  
 - = element not determined

IS = insufficient sample  
 SNR = sample not received

AUTHORISED OFFICER



**APPENDIX 3**

**Farrell Lodes Exploration - A.N. Lorrigan**

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10	REFERENCES	13

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8.	Farrell Mine Showing DDH TF8 on Section 3200mN	1:1000
9.	Farrell Mine Showing DDH TF9 on Section 3600mN	1:1000
10.	Farrell Mine Showing DDH TF10 on Section 2400mN	1:1000
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Table 3	Potential Resource - Results

**LIST OF APPENDICES**

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2.	Rock chip Sample Results
3.	Drill Logs TF 2-12

The two major mines in the Farrell area were North Farrell and New North Farrell. The former operated from 1899 to 1932, producing 432,000t at 11.4% Pb, 2% Zn, 370g/t Ag, and the latter from 1933 to 1973, yielding 299,000t at 14.9% Pb, 2% Zn, 506g/t Ag. Smaller producers on the field were the Mt Farrell, Mt Farrell South and North, South and Central Mackintosh. The lead-zinc-silver ore occurs in veins which trend north-south and are found within zones of structural disruption. The lodes vary in width from 0.2m to 9m, average mining width was 1.6m and average tonnes of ore per vertical metre 1245 (EZ, 1985).

The Farrell mines exploited 14 different lodes, some of these, namely 1 and 3 lode, persist for hundreds of metres along strike and down dip, though not in a perfectly straight line. The others are branches from the main lodes or less persistent veins running parallel or sub-parallel to the main structures. Some ore occurs in narrow stringers adjacent to the lodes, which was usually not exploited by the miners and tends to be richer in zinc than the lodes..

The purpose of the exploration program reported here was to investigate the Farrell area for resources that could be accessed by open cut mining. Eleven short diamond holes were drilled in the vicinity of the two Farrell mines, targeting shallow extensions of the known ore bodies. Preliminary sampling of mine dumps and geological mapping were also undertaken.

## 2 TENURE

The Farrell area is covered by the Tullah EL 22/90, held by Pasminco Australia Limited (Fig 1). The EL was granted in October 1990 and is due for relinquishment in October 2000. The old mining leases over the Farrell Mines once held by Pasminco Mining were relinquished in the year 1994-95. A new mining lease would need to be sought if an exploitable resource were found at Farrell.

### 3 PREVIOUS WORK

Documentation of mining and drilling in the Farrell mines is incomplete, particularly for the North Farrell Mine. Incomplete sets of level plans for both mines are held by Pasmenco Exploration. Useful information is also to be found in the reports by Henderson (1945) and Jenson (1959), copies of which are also held by Pasmenco Exploration, along with various memoranda and files on the Farrell area.

The Farrell Lodes occur within the Cambrian Mt Read Volcanics in the Farrell Slates Formation. These rocks lie along the eastern side of the Henty Fault, a structure which dominates the geology of the Tullah area, separating a pile of felsic volcanics known as the Central Volcanic Sequence from the Farrell Slates (Fig 1). The structure dips steeply to the west, and the slates and volcanics adjacent to the fault have a strong cleavage which is predominantly parallel to the dip and strike of the fault. In the slates bedding is at a very low angle (2-10 degrees) to cleavage.

The Lodes are found in zones of structural disruption, marked by kink folding adjacent to planar faults filled with graphitic pug and quartz-carbonate (predominantly siderite) veining. The ore is found within the fault zones and in quartz-carbonate stringers next to them. From observations of the mineralisation in the core and old mine workings it appears that the kink folding post dates ore deposition. Purvis (1995) suggests that the lodes occur within the faulted axis of an anticline.

**PASMINCO EXPLORATION**  
A Division of Pasminco Australia Limited

COMPILED : P.G.R.  
DATE : July 1996  
DRAWN :  
REVISIONS  
FILE :

E.L. 22/90 - TULLAH  
**REGIONAL GEOLOGY**  
FROM MAP 6 OF THE  
MT. READ VOLCANICS PROJECT

DRAWING No. SCALE 0 2 4 km FIG. No. 1

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

- QUATERNARY**  
Q Glacial deposits, alluvium, etc.
- TERTIARY**  
Tb Basalt  
Ts Sediments - gravel, sand, clays
- JURASSIC**  
Jd Dolerite
- PERMIAN - CARBONIFEROUS**  
Undifferentiated
- DEVONIAN**  
Dd Dolerite  
Dg Granite
- DEVONIAN - SILURIAN**  
Dsb Bell Shale  
Dsb Florence Sandstone  
S Silurian
- ORDOVICIAN**  
Gp GORDON GROUP limestone
- EARLY ORDOVICIAN - LATE CAMBRIAN**  
Eou Upper sandstone sequence including Pioneer Beds (Eou)  
Eoc Undifferentiated conglomerate and sandstone (Eoc)  
Eon Newton Creek Sandstone (Eon) - interbedded sandstone siltstone and conglomerate with marine fossils

**MT. READ VOLCANICS**  
NORTH AND WEST OF HENTY FAULT  
DUNDAS GROUP AND CORRELATES

- Qp Quartz-feldspar porphyry, mostly intrusive
- Eds Mostly sedimentary rocks - graywacke, siltstone, conglomerate
- Edi Interbedded tuffs and sedimentary rocks
- Edq Quartzwacke-slate-siltstone units, e.g. Stilt Quartzite
- Edv Mostly felsic volcanics - mainly tuffs
- Edm Mixed felsic and mafic volcanics and epiclastic breccias, Que-Hellyer area
- Eda Basaltic to andesitic volcanics

- CENTRAL VOLCANIC COMPLEX**
- Cov Mainly feldspar-phyric volcanics - dacite, rhyolite, minor andesite (Cov)
  - Cp Felsic porphyry, mainly intrusive
  - Cpc Mainly pyroclastic rocks
  - Cvs Sedimentary rocks, mainly shale and sandstone
  - Cva Andesitic volcanics

**SOUTH AND EAST OF HENTY FAULT**  
TYNDALL GROUP AND CORRELATES

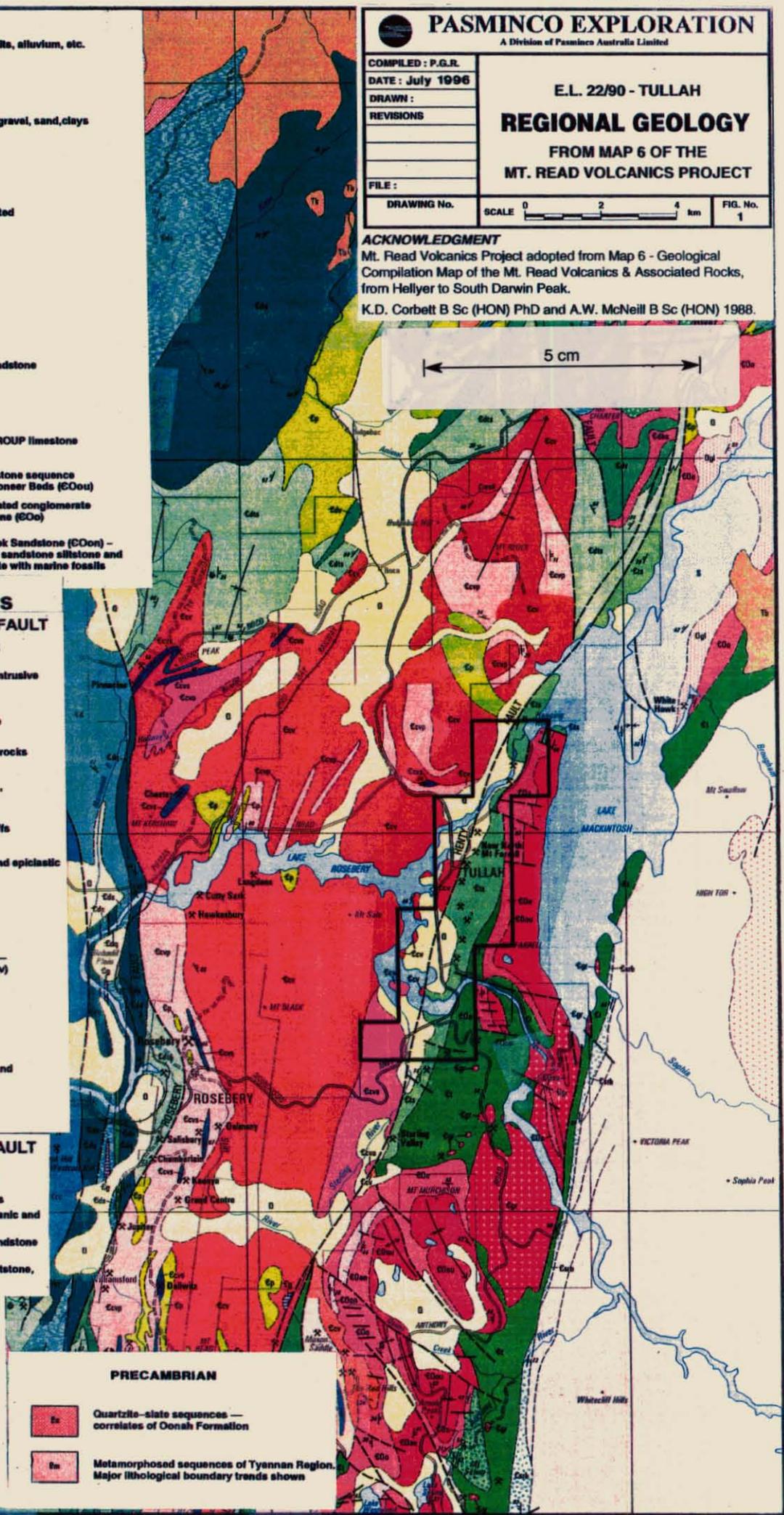
- Et Mainly sed. rocks, incl Farrell Slates
- Ev Mainly quartz-feldspar-phyric volcanic and volcanoclastic rocks (Ev)
- Ec Mainly volcanoclastic congl. and sandstone
- Est Sticht Range Beds - sandstone, siltstone, siliciclastic conglomerate

**CAMBRIAN INTRUSIVE ROCKS**

- Gr Granite
- Gp Felsic porphyry
- Gg Gabbro
- Gm Ultramafic rocks & serpentinite

**PRECAMBRIAN**

- Ex Quartzite-slate sequences - correlates of Donah Formation
- Em Metamorphosed sequences of Tyannan Region. Major lithological boundary trends shown



A measured resource of 71,000t at 12.3%Pb, 4.8% Zn, 0.24%Cu and 378 g/t Ag exists beneath the New North Farrell mine, 250m below the surface (fig.2). The holes which form the basis of this reserve are shown in the report by EZ (EZ 1985) and in appendix 3. These intersections illustrate the variability of the Farrell ore. There is no reason to believe that these are anything but typical of the Farrell area. It is possible however that low grade material may not have been assayed in these holes. The deposit is open at depth, has not been drilled between the two mines (apart from the drilling reported here) or at depth along strike.

**NEW NORTH  
MT. FARRELL**

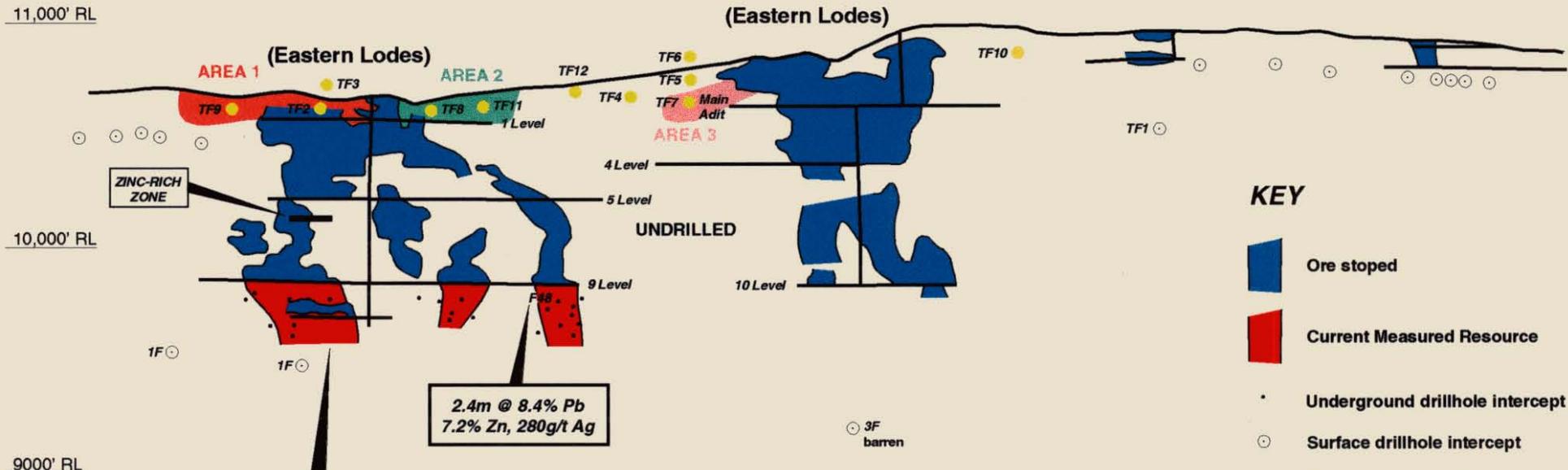
**NORTH  
MT. FARRELL**

**MT. FARRELL**

**MT. FARRELL  
SOUTH**

1934-1973 Produced :  
299,000t @ 14.9% Pb  
2% Zn, 506g/t Ag

1899-1933 Produced :  
432,000t @ 11.4% Pb  
2% Zn, 370g/t Ag



ZINC-RICH ZONE

**MEASURED RESOURCE**  
71,000t @ 12.3% Pb  
4.8% Zn, 378g/t Ag

2.4m @ 8.4% Pb  
7.2% Zn, 280g/t Ag

**KEY**

- Ore stoped
- Current Measured Resource
- Underground drillhole intercept
- Surface drillhole intercept
- Recent surface drillhole intercept

341052

**PASMINCO EXPLORATION**  
A Division of Pasminco Australia Limited

COMPILED : F.G.F.  
DATE : 1991  
DRAWN : G.M.B.  
REVISIONS : J.G.P.  
DATE : May 1995  
REVISIONS : A.N.L.  
DATE : April, July 1996  
FILE : FARLLONG

**E.L. 22/90 - TULLAH  
FARRELL AREA  
LONGITUDINAL PROJECTION  
SHOWING  
RECENT DRILLING**

DRAWING No. SCALE N.T.S. 0 250 m FIG. No. 2

5 cm

11,000' RL  
10,000' RL  
9,000' RL

12,000'

10,000'

8,000'

### 6.1 Mapping

A limited amount of outcrop and adit mapping was undertaken, the results of this are shown in figures 3 and 4. The Henty Fault was located in a number of places and in the North Farrell 4 level adit it was found to be mineralised (No.2 lode).

### 6.2 Mine Dump and Adit Sampling

Preliminary sampling of the many mine dumps revealed that much of the material discarded by early miners was of moderate to high grade. Samples of the jig tailings at the South Mackintosh workings contained up to 7% Pb (Appendix I). Subsequent metallurgical testing of these however found them to be too oxidised to enable reasonable recoveries (C.Hale, Rosebery Mine Geologist, pers.comm.). The size of the fragments at other mine dumps is much larger and it is unlikely that they would have suffered the same degree of oxidation. Results of sampling and Metallurgical testing conducted by Pasminco Mining is also enclosed in Appendix I.

Rock chip sample 77345 is from the remnants of the tailings dam. There appears to be a considerable volume of this material, but its treatability is unknown. The area has also been rehabilitated. No effort has been made to measure the quantity of dump material on site, however a rough estimate would put it in excess of 25,000 tonnes.

The location of the rock chip samples is shown in figs. 3 and 4. Assay results are in appendix 2.

### 6.3 Diamond Drilling

Eleven diamond holes (620.8m) were drilled with the portable Gopher rig belonging

to A.T.E. drilling. This rig is highly suitable for this type of work, requiring very little site preparation.

The holes were targeted on shallow extensions to the Farrell Lodes. An average hole spacing of 150m on the long section (fig.2) was achieved. The best intersections were in holes TF2, TF3, TF7 and TF8. The mineralisation in TF7 and 8 is highly encouraging because these are in the gap between the two mines. At the time of writing, assay results had not been received for the holes TF11 and TF12. The latter hole was unmineralised but TF11 intersected 0.2m of lode and visual estimates for this hole are given below. The location of the holes is shown in figures 3 and 4. The assay results are tabulated below and the drill logs are appended (Appendix 3). Sections of TF2 to TF12 are shown from figures 5 to 12, with figures 13 and 14 completing the sections between holes TF10 and TF7. These results show potential for a shallow resource between the two mines and to the north of the New North Farrell Mine.

**Table 1 Assay Results TF2-TF10, Visual Estimates TF11 & 12**

Hole	From	To	True Width	Pb	Zn	Ag
TF2	21.9	24.3	2.2	5.35	2.99	156
TF2	24.9	28.5	3.3	6.63	1.05	182
TF3	1.7	5.7	3.8 (55%rec)	5.13	0.70	375
TF3	14.0	15.0	0.9	1.54	0.07	98
TF3	27.2	27.6	0.4	10.80	3.23	408
TF3	27.2	28.8	1.5 (bulked)	2.90	1.06	109
TF3	31.7	32.4	0.6	1.49	0.19	68
TF4	44.8	45.7	0.8	7.13	0.09	166
TF4	44.8	46.4	1.5 (bulked)	4.00	0.09	88
TF4	79.2	79.5	0.3	8.37	0.04	241
TF4	79.2	80.5	1.5 (bulked)	1.77	0.02	48
TF6	7.0	8.0	0.9	1.94	0.9	123
TF7	37.6	39.5	1.7	11.87	0.24	320
TF8	10.4	10.9	0.5	1.35	0.03	24
TF8	17.8	18.8	0.9	2.31	0.51	73
TF8	19.8	20.8	0.9	2.00	0.51	46
TF8	21.9	23.5	0.4	17.10	1.22	433
TF8	23.0	23.5	1.5 (bulked)	5.73	0.60	144
TF8	42.4	45.4	2.8	0.58	3.23	18
TF8	48.7	49.4	0.6	0.71	4.61	-
TF9	44.9	46.9	1.8	1.94	5.74	46

TF9	46.9	48.1	1.1	1.84	0.79	52
TF10	18.3	19.4	1.0	2.89	1.9	75
TF11	41.7	42.0	0.3	5.31	4.98	158
TF11	41.7	43.0	1.3	2.90	2.99	86.5 (visual estimate)

Some difficulty was experienced in correlating geology between outcrop and drill holes and between drill holes. Rock types were particularly difficult to match, this reflects the highly faulted and deformed nature of the geology. In most cases the main lodes could be matched up but subsidiary mineralised structures appear to be very discontinuous.

363 068mE (FMG)  
(10 066')

(10 600'E)

2.15/5.0,0.6,174

HENTY FAULT  
Projected Surface  
Position

Mackintoah Dam  
Road

200mR.L.

1 LEVEL

2 LEVEL

3 LEVEL

4 LEVEL

5 LEVEL

6 LEVEL

7 LEVEL

8 LEVEL

9 LEVEL

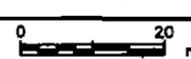
10 LEVEL

KEY

-  "Lode"
-  Black Slate
-  Volcaniclastic Sandstone
-  Volcanics
-  Breccia
-  Fault
-  Shear Zone
-  Cleavage and Cleavage Trends

Significant Interactions -

0.8/3.7,09,90  
m/Pb,Zn,Ag

<b>PASMINCO EXPLORATION</b> A Division of Pasminco Australia Limited	
COMPILED : A.N.L.	E.L. 22/90 - TULLAH FARRELL MINE SHOWING TF2 AND TF3 ON <b>SECTION 3400mN</b> (11,154' FARRELL MINE GRID)
DATE : April 1996	
DRAWN : G.M.B.	
REVISIONS :	
FILE : TF_3400N	
DRAWING No.	SCALE 1:1000
	
FIG. No. 5	

5 cm

341056

3 068mE (FMG)  
(10 086')

Track

TF4

0.8/7.1..09,166

0.8/3.7..-90

shearing

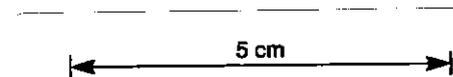
200mR.L.

**KEY**

-  "Lode"
-  Black Slate
-  Volcaniclastic Sandstone
-  Volcanics
-  Breccia
-  Fault
-  Shear Zone
-  Cleavage Trends

Significant Intersections -

0.8/3.7..09,90  
m/Pb,Zn,Ag

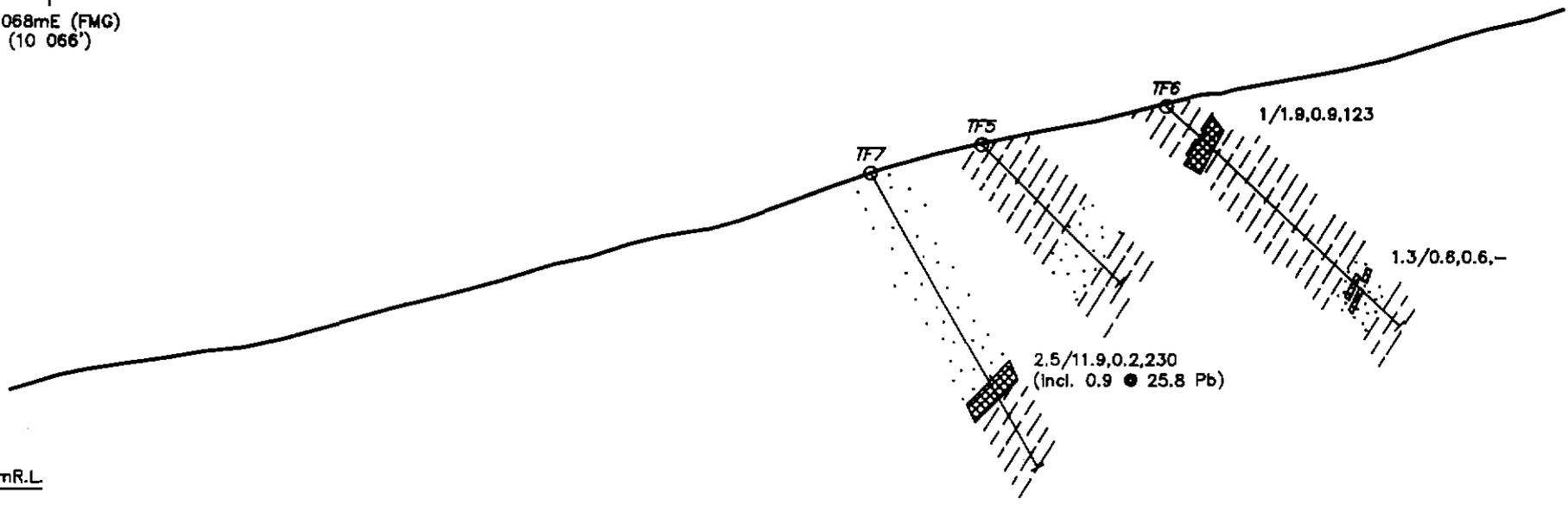


341057

 <b>PASMINGO EXPLORATION</b> <small>A Division of Pasmenco Australia Limited</small>	
COMPILED : A.N.L.	<p>E.L. 22/90 - TULLAH  <b>FARRELL MINE</b>  <b>SHOWING DDH TF4 ON</b>  <b>SECTION 3000mN</b>  (9 860' FARRELL MINE GRID)</p>
DATE : April 1996	
DRAWN : G.M.B.	
REVISIONS :	
FILE : TF_3000N	
DRAWING No.	
SCALE 1:1000	FIG. No. 6

3 068mE (FMG)  
(10 066')

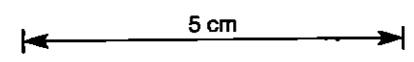
200mR.L



**KEY**

- "Lode"
- Black Slate
- Volcaniclastic Sandstone
- Volcanics
- Breccia
- Fault
- Shear Zone
- Cleavage Trends

Significant Intersections -  
0.8/3.7,09,90  
|  
m/Pb,Zn,Ag



341058

<p><b>PASMINGO EXPLORATION</b> A Division of Pasminco Australia Limited</p>	
<p>COMPILED : A.N.L. DATE : April 1996 DRAWN : G.M.B. REVISIONS :</p>	<p>E.L. 22/90 - TULLAH FARRELL MINE SHOWING TF5, TF6 &amp; 7 ON <b>SECTION 2900mN</b> (9 514' FARRELL MINE GRID)</p>
<p>FILE : TF_2400N</p>	<p>SCALE 1:1000</p>
<p>DRAWING No.</p>	<p>FIG. No. <b>7</b></p>

363 088mE (FMG)  
(10 066')

(10 800')

200mR.L.

Track

Fault in  
Creek

TF8

0.5/1.31, -24

1/2.3, 0.5, 73

1/2.0, 0.5, 46

40mS  
1.7/17.1, 1.2, 433

6.7/6.07, 4.6

1 LEVEL

2 LEVEL

3 LEVEL

4 LEVEL

5 LEVEL

6 LEVEL

7 LEVEL

8 LEVEL

9 LEVEL

No.10  
Lode

No.1  
Lode

No.11  
Lode

No.9  
Lode

BH5

BH6

20mN

**KEY**



"Lode"



Black Slate



Volcaniclastic Sandstone



Volcanics



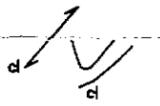
Breccia



Fault



Shear Zone



Cleavage and  
Cleavage Trends

Significant Intersections -

0.8/3.7, .09, 90

m/Pb, Zn, Ag

5 cm

<p><b>PASMINCO EXPLORATION</b> A Division of Pasminco Australia Limited</p>	
<p>COMPILED : A.N.L. DATE : April 1996 DRAWN : G.M.B. REVISIONS :</p>	<p>E.L. 22/90 - TULLAH FARRELL MINE SHOWING DDH TF8 ON <b>SECTION 3200mN</b> (10 498' FARRELL MINE GRID)</p>
<p>FILE : TF_3200N</p>	<p>SCALE 1:1000</p>
<p>DRAWING No.</p>	<p>FIG. No. 8</p>

341059

3 068mE (FMG)  
(10 066')

3 100mE

200mR.L.

TF9

Nth. Mackintosh Adit

qtz vng.

2.0/1.9,5.7,46

**KEY**



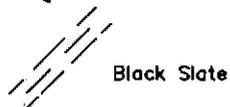
"Lode"



Fault

Significant Intersections -

0,8/3,7,.09,90  
m/Pb,Zn,Ag



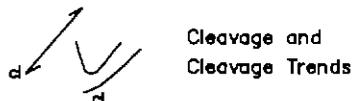
Black Slate



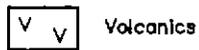
Shear Zone



Volcaniclastic Sandstone



Cleavage and Cleavage Trends



Volcanics



Breccia

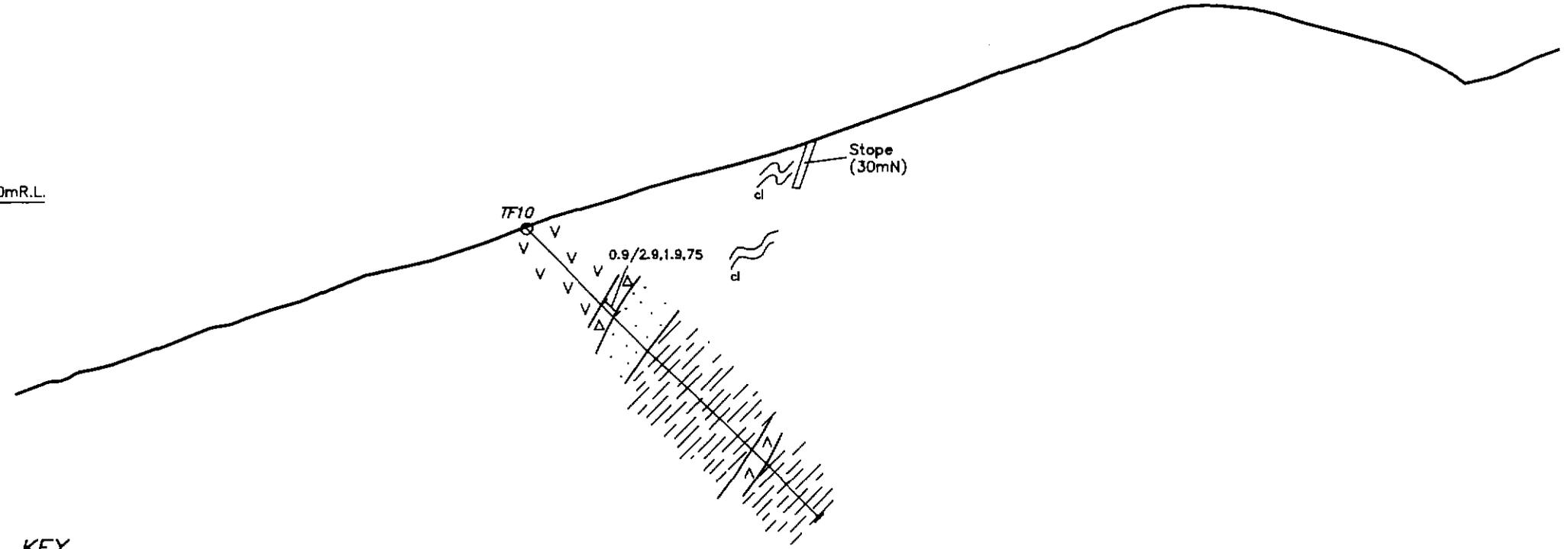
5 cm

341060

<b>PASMINCO EXPLORATION</b> A Division of Pasminco Australia Limited	
COMPILED : A.N.L.	<b>E.L. 22/90 - TULLAH FARRELL MINE SHOWING DDH TF9 ON SECTION 3600mN (11,810' FARRELL MINE GRID)</b>
DATE : April 1996	
DRAWN : G.M.B.	
REVISIONS :	
FILE : TF_3600N	
DRAWING No.	SCALE 1:1000  FIG. No. <b>9</b>

3 068mE (FMG)  
(10 066')

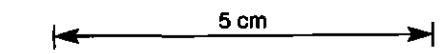
300mR.L.



**KEY**

- "Lode"
- Black Slate
- Volcaniclastic Sandstone
- Volcanica
- Breccia
- Basic dyke
- Fault
- Shear Zone
- Cleavage Trends

Significant Intersections -  
0.8/3.7, .09, 90  
m/Pb, Zn, Ag



341061

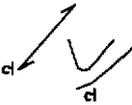
<p><b>PASMINCO EXPLORATION</b> A Division of Pasminco Australia Limited</p>			
COMPILED : A.N.L.	<p>E.L. 22/90 - TULLAH FARRELL MINE SHOWING DDH TF10 ON <b>SECTION 2400mN</b> (7 876' FARRELL MINE GRID)</p>		
DATE : April 1996			
DRAWN : G.M.B.			
REVISIONS :			
FILE : TF_2400N			
DRAWING No.	SCALE 1:1000		FIG. No. <b>10</b>

3 048mE (FMG)  
(10 000')

200mR.L.

TF11

**KEY**

-  "Lode"
-  Black Slate
-  Volcaniclastic Sandstone
-  Volcanics
-  Breccia
-  Fault
-  Shear Zone
-  Cleavage and Cleavage Trends

Significant intersections -

0.8/3.7..09,90  
m/Pb,Zn,Ag

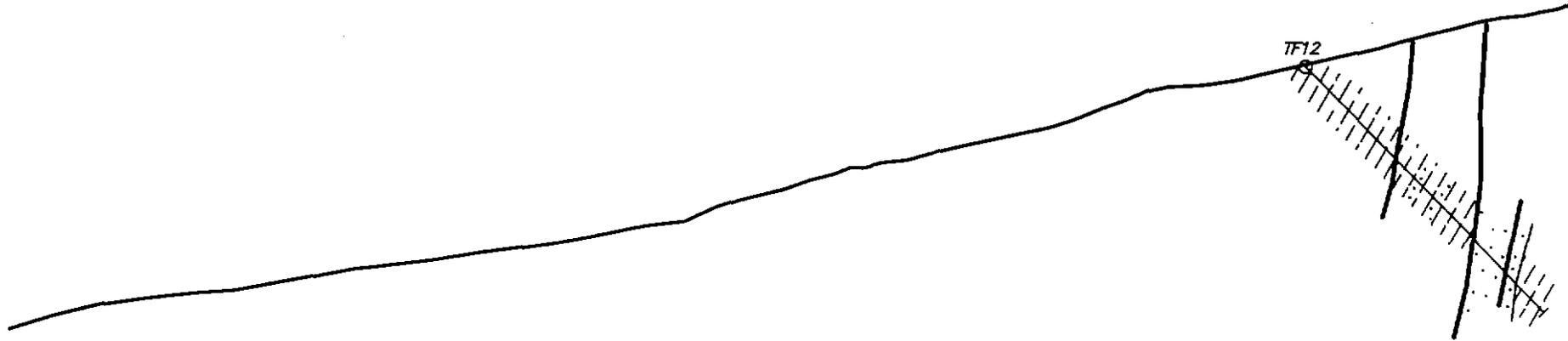
5 cm

341062

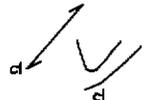
 <b>PASMINCO EXPLORATION</b> A Division of Pasma Australia Limited	
COMPILED : A.N.L.	E.L. 22/90 - TULLAH FARRELL MINE SHOWING DDH TF11 ON <b>SECTION 3185mN</b> (FARRELL MINE GRID)
DATE : July 1996	
DRAWN : G.M.B.	
REVISIONS :	
FILE : TF_3185N	
DRAWING No.	SCALE 1:1000  m
	FIG. No. 11

3 048mE (FMG)  
(10 000')

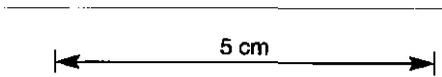
200mR.L.



**KEY**

-  "Lode"
-  Black Slate
-  Volcaniclastic Sandstone
-  Volcanics
-  Breccia
-  Fault
-  Shear Zone
-  Cleavage and Cleavage Trends

Significant intersections -  
0.8/3.7..09.90  
m/Pb,Zn,Ag



341063

 <b>PASMINCO EXPLORATION</b> <small>A Division of Pasma Australia Limited</small>			
COMPILED : A.N.L.	<b>E.L. 22/90 - TULLAH          FARRELL MINE          SHOWING DDH TF12 ON          SECTION 3105mN          (FARRELL MINE GRID)</b>		
DATE : July 1996			
DRAWN : G.M.B.			
REVISIONS :			
FILE : TF_3105N			
DRAWING No.	SCALE 1:1000		FIG. No. 12

3 048mE (FMG)  
(10 000')

"Mistaken Adit"

1 LEVEL

2 LEVEL

3 LEVEL

4 LEVEL MAIN ADIT

5 LEVEL

6 LEVEL

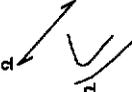
200mR.L.

No. 2 Lode

No. 1 Lode

No. 3 Lode

**KEY**

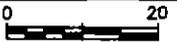
-  "Lode"
-  Black Slate
-  Volcaniclastic Sandstone
-  Volcanics
-  Breccia
-  Fault
-  Shear Zone
-  Cleavage and Cleavage Trends

Significant Intersections -

0,8/3,7,.09,90  
m/Pb,Zn,Ag

341064

5 cm

 <b>PASMINCO EXPLORATION</b> <small>A Division of Pasma Australia Limited</small>	
COMPILED : A.N.L. DATE : July 1996 DRAWN : G.M.B. REVISIONS :  FILE : TF_2600N	E.L. 22/90 - TULLAH FARRELL MINE <b>SECTION 2600mN</b> (FARRELL MINE GRID)
DRAWING No.	SCALE 1:1000
	
	FIG. No. <b>13</b>

3 080mE (FMG)

North Farrell  
Open Cut

1 LEVEL

2 LEVEL

3 LEVEL

4 LEVEL

5 LEVEL

6 LEVEL

Projected 15mS

No. 3 Lode

200mR.L.

**KEY**

-  "Lode"
-  Black Slate
-  Volcaniclastic Sandstone
-  Volcanics
-  Breccia
-  Fault
-  Shear Zone
-  Cleavage Trends

Significant Intersections -  
0.8/3.7..09,90  
m/Pb,Zn,Ag

341065

5 cm

<b>PASMINCO EXPLORATION</b> A Division of Pasminco Australia Limited			
COMPILED : A.N.L.	E.L. 22/90 - TULLAH NORTH FARRELL MINE <b>SECTION 2725mN</b> (FARRELL MINE GRID)		
DATE : July 1998			
DRAWN : G.M.B.			
REVISIONS :			
FILE : TF_2725N			
DRAWING No.	SCALE 1:1000		FIG. No. <b>14</b>

## 7 DISCUSSION

The Farrell ore occurs in veins and faults within zones of structural disruption. It is often associated with siderite and quartz in the veins. Galena is coarse grained and appears to cross-cut and post date sphalerite-quartz-carbonate mineralisation. There appear to be two types of mineralisation, one type which is in well defined lodes and the second type being in narrower stringers which seem on inspection to have a random orientation. Plotting of the stringer zones on sections however shows that they have an orientation which is parallel or sub-parallel to nearby lode channels.

Mineralisation is restricted to veins, which often have angular fragments of country rock within them, no wall rock alteration or evidence of replacement was observed. This confinement to veins limits the tonnage potential of the mines. The variable nature of the ore makes it difficult to estimate the grade and tonnes possible within a given volume. To get some idea of the potential resource within 50m of the surface at Farrell from the drilling data available, the following procedure was used:

1. All assay intervals of less than 1.5m were bulked out to this width (table 2).
2. Holes with less than 1.5m @ 5% Pb+Zn were discarded.
3. A potential tonnage for the three mineralised areas was obtained by using a 1.5m lode width (average historical), projecting the mineralisation 50m beyond the last drill hole and to 50m below surface (table 3).
4. An S.G. of 3.5 has been used.
5. A grade for each area was obtained by calculating a simple average of the intersections within that area.

TABLE 2

Boreholes within the ore reserve, North Mt. Farrell

341067

Collar Location	Drill Hole Number	Intersection					
		From (m)	To (m)	Pb%	Zn%	Ag g/t	True Thickness (m)
Surface	1 F (surface)	471.30	474.3	4.3	1.3	136	3.1
9L F/W Drive Nth	F 27	30.8	33.1	9.8	1.8	202	1.2
9L F/W Drive Nth	F 28	31.4	33.1	26.5	2.1	923	0.9
		34.5	35.7	22.7	6.1	629	0.5
9L F/W Drive Nth	F 29	30.0	30.6	12.4	2.0	446	0.3
9L 14N X/C East	F 30	35.8	36.3	1.4	4.2	60	0.3
9L 13N X/C West	F 38	63.1	65.4	16.2	5.7	426	1.7
		78.3	80.2	33.5	5.6	896	1.5
	F 53	66.7	67.1	1.9	0.42	115	0.3
	F 59	54.5	56.1	7.2	4.6	183	1.5
9L North Dr. Sth	F 39	51.8	54.3	1.9	2.4	74	2.4
		63.3	64.0	16.6	1.9	338	0.8
9L 6N Dr. South	F 40	Nil					
9L 6N Dr. North	F 41	Poor Recovery					
9L Centre H/W X/C	F 57	Nil					
9L " " "	F 58	38.1	41.8	5.6	4.4	150	3.4
9L South End	F 44	Nil					
9L South End	F 45	43.9	47.4	23.0	14.0	818	3.2
9L South End	F 46	44.5	45.4	3.1	1.75	79	0.8
9L South End	F 47	Nil					
9L South End	F 48	42.1	44.5	11.5	6.6	364	2.1
9L South End	F 49	28.0	28.7	59.4	2.0	2155	0.5
9L Sth End X/C W	F 50	76.4	77.7	10.5	5.7	226	1.4
9L Sth End X/C W	F 52	44.9	46.4	5.5	5.5	133	1.2
		50.3	51.2	2.1	20.0	76	0.8
9L Sth End X/C W	F 53	Nil					

Table 3 Potential Resource - Results

The results are as follows (area location shown on figure 2):

Area	Hole	Tonnes	Pb	Zn	Ag
Area 1	TF9 TF2 TF3	52 500	4.7	2.6	189
Area 2	TF8 TF11	26 250	5.0	0.8	1.32
Area 3	TF7	21 000	11.9	0.2	320
<b>Total</b>		<b>99 750</b>	<b>6.3</b>	<b>1.6</b>	<b>201</b>

It must be emphasised that this is NOT a resource estimate, the drill hole spacing is too great for this. The figure is meant to be used as an indication of what ore may be present and therefore can be taken into account when determining whether further drilling is warranted.

Planning of drill holes in the area is made difficult by the branching and discontinuous nature of the veins. A distance of at least 120 metres across dip from the Henty Fault needs to be drilled to ensure that a particular intersection on the long section is complete, this has not been achieved by this latest, limited, drilling program, particularly in the area between the two mines.

The eastern limits of the lodes are not certain, as drilling to date has been confined to the lodes identified by early mining and prospecting. If the anticlinal axis proposed by Purvis is the control on mineralisation, the zone would be expected to be limited, however if the lodes are simply along a series of faults parallel to the Henty Fault, there is potential to find additional lodes to the east of the mine area. No evidence of the anticline was found in the core from the latest drilling program, possibly because the holes were too short to reveal such information.

## 8 CONCLUSIONS

1. The drilling program has identified continuations of the Farrell Lodes close to surface and the potential for a resource of approximately 100,000t @ 6.3% Pb, 1.6% Zn and 201g/t Ag.
2. The Farrell Orebodies are narrow veins that have limited tonnage potential.
3. There is potential for additional lodes to be found to the east of the known ore bodies.
4. A considerable volume of mineralised dump material has been left in the Farrell area.

## 9 RECOMMENDATIONS

1. Infill and extend drilling to the north of the New North Farrell Mine and between the mines. Ten x 80m holes would achieve an approximate spacing of 50m. The estimated cost of such a program is \$60 000.
2. In addition to the above, two lines of shallow drill holes be drilled to test the ground east of the known Farrell ore bodies.
3. Further sampling of the Farrell dumps be undertaken along with a detailed estimate of tonnes.

## 10 REFERENCES

EZ 1985 The Potential of The Farrell Mine, Tullah. Memorandum to Manager, West Coast Mines from Senior Mines Geologist, EZ, May 1985.

Henderson, Q.T. 1945. The Farrell Mining Company Ltd. Mines-Tullah. Unpubl. Report, October 1945.

Jenson, H.E. 1959. Examination of Farrell Mining Company's Properties At Tullah, Tasmania. Unpubl. Report for Rio Tinto Southern Pty. Ltd., November 1959.

Purvis, J.G. 1995. EL 22/90 Tullah & EL 24/91 Sterling River, Annual Report September 1994-September 1995. Unpubl. Pasminco Exploration Report No.T95-13.

**APPENDIX 1**

**TULLAH PROJECT - CORRESPONDENCE (R POTTS)**

12 June, 1996

341073



P A S M I N C O  
E X P L O R A T I O N

ref: anl\96174

Mr R Potts  
General Manager - Rosebery  
Pasminco Mining  
PO Box 21  
ROSEBERY TAS 7470

cc: Dr MJ Tomkinson - Pasminco Exploration  
Mr M. Berry - Pasminco Mining

Dear Dick,

### RE: TULLAH PROJECT

Further to our conversation at Rosebery last week (in the Geology office) I am forwarding to you the results of the sampling we did of the jig tailings at the old South Macintosh workings at Tullah. The two samples taken by Gerald Purvis for PasEx assayed as follows:

Sample	Cu%	Pb%	Zn%	Aug/t	Agppm	As%
39948	.05	5.3	0.2	0.068	226	.01
39949	.03	7.02	0.2	0.085	210	.01

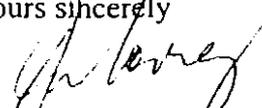
The piles are located on the eastern side of the track which connects the North Farrell mine with the New North Farrell mine. Butch Johnson took us to the site and knows it well. From crude measurements made with a tape I estimate the tonnage to be 3000t.

I am also sending the assay results from the shallow drilling that ATE completed, these holes intersected the Farrell Lode. Their locations are shown on the accompanying long section. We plan to drill two more shallow holes between TF4 and TF8. When these are complete all our work at Farrell will be documented and passed over to Mark Berry.

#### Farrell Drill Hole Assays

TF2 21.9-28.5m @5.6% Pb, 1.0% Zn, 160ppm Ag  
TF3 1.7-5.7m @ 5.0% Pb, 0.6% Zn, 174ppm Ag (2.15m rec.)  
TF6 7-8m @ 1.9% Pb, 0.9% Zn, 123ppm Ag  
TF7 37.0-39.5 @ 11.9% Pb, 0.2% Zn, 230ppm Ag (includes 0.9m @ 25.8% Pb)  
TF8 23-23.5m @ 17.1% Pb, 1.22% Zn, 433ppm Ag  
TF4 44.8-45.7m @7.1% Pb, 0.09% Zn, 166ppm Ag

Yours sincerely

  
Angela N Lorrigan  
Senior Geologist

**NEW NORTH  
MT. FARRELL**

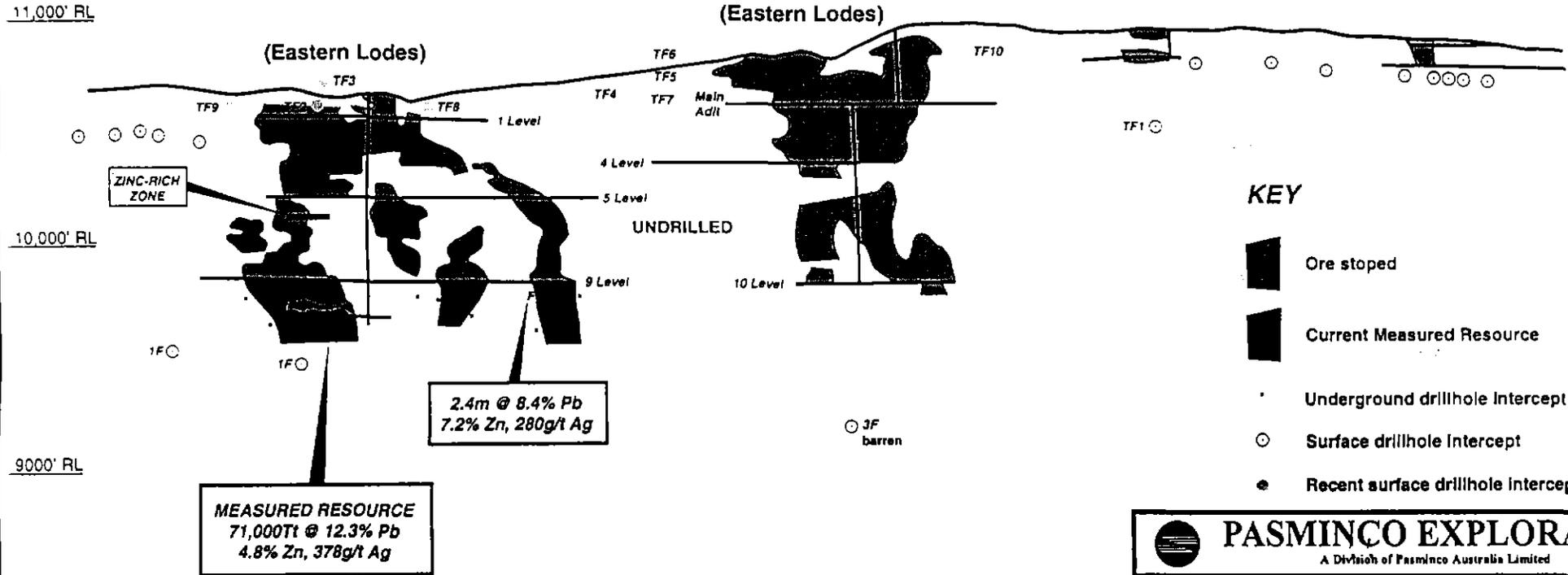
**NORTH  
MT. FARRELL**

**MT. FARRELL**

**MT. FARRELL  
SOUTH**

1934-1973 Produced :  
299,000t @ 14.9% Pb  
2% Zn, 506g/t Ag

1899-1933 Produced :  
432,000t @ 11.4% Pb  
2% Zn, 370g/t Ag



**KEY**

-  Ore stoped
-  Current Measured Resource
-  Underground drillhole Intercept
-  Surface drillhole Intercept
-  Recent surface drillhole intercept

 <b>PASMINCO EXPLORATION</b> <small>A Division of Pasminco Australia Limited</small>	
COMPILED : F.G.F. DATE : 1991 DRAWN : G.M.B. REVISIONS : J.G.P. DATE : May 1995 REVISIONS : A.N.L. DATE : April 1996 FILE : FARLLONG	E.L. 22/90 - TULLAH FARRELL AREA <b>LONGITUDINAL PROJECTION                  SHOWING                  RECENT DRILLING</b>
DRAWING No.	SCALE N.T.S. 
FIG. No.	

341074

**APPENDIX 2**

**ROCK CHIP SAMPLE RESULTS**



# PASMINGO EXPLORATION GEOCHEMICAL ANALYSES RECORD

PROSPECT FARRELL  
PROJECT TULLAH.

Sample Type Dump/Reek Chip

Sample No.	Sample Type	Location	METAL CONTENT (ppm unless specified)											COMMENTS
			Cu	Pb	Zn	Ag	Fe	Cr	Mn	Ni	As	Au		
77343		N <sup>th</sup> Farrell Adit Dump	169	1.61	1750	65	4.45	26	1.02%	23	155	0.014		
344		"	87	2.89	1870	125	3.66	21	9840	33	110	0.024		
345		Tailings Dam	796	3.83	1.94	145	6.73	34	268	31	1450	0.041		
346		N <sup>th</sup> Farrell Adit Dump	458	6.34	1870	360	5.23	57	2.15%	45	85	0.023		
347		Mistaken Adit	527	6.74	3180	197	5.75	31	2.07%	29	507	0.016		
348		N <sup>th</sup> Mackintosh Dump (top)	105	3880	2.53	33	4.18	18	8750	26	61	0.024		
349		" (air)	172	266	1.73	79	2.99	11	7910	12	151	0.032		
350		Central Mackintosh	202	1.54	5580	56	4.56	23	9530	43	129	0.031		
351		Central Mackintosh	1960	24.20	2.61	970	6.33	18	2.32%	23	1360	0.072		
352		Roadway Whop	383	1.75	3870	74	2.80	18	4510	27	157	0.014		
353		Roadway Whop	157	1.34	7440	44	4.23	23	9070	30	313	0.021		
354		Dump of Opulent	56	5310	3020	26	2.19	12	8540	21	499	0.009		
355		" W of Opulent	145	6870	3860	25	4.36	19	1.24%	14	238	0.007		
<del>356</del>			<del>187</del>	<del>149</del>	<del>122</del>	<del>41</del>	<del>9.58</del>	<del>59</del>	<del>2140</del>	<del>82</del>	<del>10</del>	<del>0.003</del>		
<del>357</del>			<del>106</del>	<del>127</del>	<del>73</del>	<del>41</del>	<del>8.77</del>	<del>89</del>	<del>820</del>	<del>49</del>	<del>1</del>	<del>0.003</del>		
<del>358</del>			<del>50</del>	<del>61</del>	<del>103</del>	<del>41</del>	<del>7.48</del>	<del>116</del>	<del>953</del>	<del>71</del>	<del>3</del>	<del>0.002</del>		
359		Face Sample	158	6850	6.14%	36	4.28	25	5350	26	791	0.048		N <sup>th</sup> Mackintosh Mine
360		N <sup>th</sup> Farrell Adit	24	473	2140	4	8.00	63	342%	63	48	0.026		
361		N <sup>th</sup> Farrell Adit Face	21	1450	328	21	1.75	41	1570	11	33	0.012		
77362		Face Sample	98	2160	1840	28	9.73	35	9120	64	123	0.029		N <sup>th</sup> Mackintosh Mine

341076

**APPENDIX 3**

**DRILL LOGS TF 2-12**



# PAMINCO EXPLORATION DIAMOND DRILL CORE RECORD

341078

HOLE No. *TF2*

Page *1* of *1*

LOCATION	OBJECTIVE					LOCATION/SURVEY DATA (AMG)					
PROJECT	<i>To test for shallow extensions to Farrell Ledas.</i>					Grid	AMG	<i>Farrell</i>	RL Collar m <i>224.97/224.16</i>		
PROSPECT						Northing m	<i>53 796061</i>	<i>3389.61</i>	Bearing Collar <i>111.5</i>		
DESIGNED BY						Easting m	<i>386008.323228.92</i>		Dip Collar <i>45</i>		
LOGGED BY						DH Survey Type	-			Length Hole m <i>30</i>	
RELOGGED	RESULT					Depth m	Bearing	Dip	Depth m	Bearing	Dip
COMMENCED	<i>Mineralised lode intersected between 21.9 + 24.3m and 24.9 + 28.5m.</i>										
COMPLETED											
DRILLED BY											
DRILL RIG											
SIGNIFICANT INTERSECTIONS											
From m	To m	Interval m	Pb	Zn	Ag.			Comments			
<i>21.9</i>	<i>24.3</i>	<i>2.4</i>	<i>5.35</i>	<i>2.99</i>	<i>156</i>			<i>True width = 2.2m</i>			
<i>24.9</i>	<i>28.5</i>	<i>3.6</i>	<i>6.63</i>	<i>1.05</i>	<i>182.</i>			<i>" " 3.3m</i>			
SIGNIFICANT CORE LOSS			POOR GROUND CONDITION ZONES								
From m	To m	% Lost	From m	To m	Condition						
<i>0</i>	<i>2</i>	<i>70</i>	<i>0</i>	<i>25.1</i>	<i>Hard qtz veins in graphitic pug.</i>						
<i>21</i>	<i>25.1</i>	<i>50</i>									
HOLE SIZE		HOLE CONDITIONS AFTER COMPLETION									
Size	Depth m	Collar	<i>Marked by wooden peg.</i>								
<i>52.2m</i>	<i>0-30m</i>	Steel Casing									
		PVC Casing									
		Ground Water									
		Wedge									
		Drill Pad	<i>Access only on foot or small bulldozer.</i>								

From m/ft	To m/ft	L-Cod	Lithology	Graphic .06 .5 2 8 32	Structure Angles to LCA	Alteration (wk) mod stg!	Min
0	1.6		Rubble, oxidised mine mullock				
1.6	1.8	A	Broken quartz vein				
1.8	9.3	Sbsh	Strongly foliated black shale		45 S <sub>0</sub>	co3	
9.3	9.6	A	White quartz vein				
9.6	12.3	Sbsh	Strongly foliated black shale			co3	
12.3	12.4	A	White quartz vein				
12.4	14.9	Sbsh	Strongly foliated black shale			co3	
14.9	16.2	A	White quartz vein				
16.2	18.95	Sbsh	Strongly foliated black shale with quartz veins.		30 S <sub>0</sub>	co3	1%cg py in vein
18.95	21.3	A	Quartz veining with frags of black shale, Co3-filled vughs.		10	3% co3	tr-1%py
21.3	21.5	Sbsh	Strongly foliated black shale			co3	
21.5	24.1	Vslt	Grey qtz-fd crystal sandstone quartz, sph and gn filled veins. Veins are vughy with minerals having grown into open space. Brecciation of seds (?hydraulic) fracturing, qtz and sph form bx matrix.		20 S <sub>1</sub> (S <sub>0</sub> reactivated)	co3	21.5 ore zone, veins q/sph/gn/co3
24.1	24.8	bsh	Contains 10cm co3/qtz/py vein.		45		25.1
24.8	30	Vsst	Grey-green sandstone with ser frags, probably de-vit volcanic fragments. Contains qtz and feldspar crystals. EOH		20	ser, co3 fd alt to Co3	28.3 5mm gn vein
					30		

## TF2 ASSAYS

<i>sample</i>	<i>from</i>	<i>to</i>	<i>Au</i>	<i>Cu</i>	<i>Pb</i>	<i>Zn</i>	<i>Ag</i>	<i>As</i>
77217	14.8	16.3	0.013	46	40	56	2	50
77218	16.3	17	0.042	134	115	85	10	162
77219	17	17.7	<0.008	107	20	141	2	54
77220	17.7	18.5	0.025	93	74	104	5	50
77221	18.5	19.8	0.03	103	190	389	5	114
77222	19.8	21	0.008	63	218	478	7	161
77223	21	21.9	0.01	38	1596	7000	9	88
77224	21.9	24.3	0.033	179	53500	29900	156	712
77225	24.3	24.9	0.086	48	779	2122	10	1644
77226	24.9	26.9	0.03	177	83200	16000	224	50
77227	26.9	28	<0.008	950	6300	2208	32	121
77228	28	28.5	0.012	2850	131000	7300	452	21



Project: Farrell		PASMINGO EXPLORATION		Hole No. TF 3			
Logged by: ANL		DIAMOND DRILL LOG		Page of			
Date: March 1996							
From	To	L-Cod	Lithology	Graphic(mm)	Structure	Alteration	Min
m/ft	m/ft			06 .5 2 8 32	Angles to LCA	(wk) mod stg!	
1.7	3.2		Vein quartz rubble				
3.2	6.5	Sbsh	Black shale, broken. Silicified by high density of quartz veining. Minor siderite veining.		2 gal vng S1 60 40	sil!	c.g. spal and gal. in veins
6.5	6.7	Sslt	Grey siltstone		10 25 95 m gal	sil cb	
6.7	6.9	Sbsh	Black shale.			cb	
6.9	24.3	Sslt	Grey siltstone, mineralised in places, min. assoc. with quartz veining		20 100 S1 gal 95 m.	sil cb	11.7-12.9 sph/qtz vng and gal vng. 14.0 c.g. gal vein. 16.2-16.4 c.g. gal/sph vng 19.9 gal vein
24.3	24.9	Sslt	Dark grey siltstone		30 40° 35	cb	
24.9	26.6	Sslt	Siltstone grades up to black shale.		40 gn.	cb	
26.6	27.7	Sslt	Siltstone grades up to dark grey shale. Mineralised quartz veins, x-cut foliation. Sulphides fill spaces in centre of veins.		50 Broken.	sil cb	qtz veins with c.g. sph and gal also qtz bx with f.g. sph.
27.7	41.8	Sbsh	Black shales, strong foliation parallel to bedding. Fine qtz/cb stringers throughout, often parallel to foliation.		75 S1/S0 (parallel)	(cb)	f.g. spots py and pyrr on cleavage planes. trace sph and gal.
41.8	52.8	Mfz	Probable fault zone. Deformed broken and puggy shales.		60 S1	(dtx)	
52.8	58.3	Sbsh	Black shales, broken with quartz veining.		70 75 S1 95 m.	(cb)	54.6-55.0 ?bornite on fracture breaks.
58.3	58.4	Ssst	Graded quartz sandstone bed.				
58.4	70.7	Sbsh	Black shales.		10 30 S1		
70.7	71.3	Ssst	Grey, quartz sandstone.		60 80		
71.3	73.3	Sbsh	Black shale.				
73.3	79.7	Ssst EOH	Grey sandstone. Contains frags. of fd-phyric volcanics, quartz and black shales. Qtz and cb vng, cb replaces shale on vein margins.			cb	Tr. sph and gal in veins.

## TF3 ASSAYS

<i>sample</i>	<i>from</i>	<i>to</i>	<i>Au</i>	<i>Cu</i>	<i>Pb</i>	<i>Zn</i>	<i>Ag</i>	<i>As</i>
77229	1.7	5.45	0.01	68	18300	1202	46	32
77230	5.45	5.7	0.047	2078	291000	51500	1500	468
77231	5.7	6.1	0.023	33	1777	7600	9	90
77232	6.1	6.9	0.044	41	834	2476	9	126
77233	6.9	7.3	0.008	18	281	882	3	50
77234	7.3	9.3	<0.008	8	343	1522	2	50
77235	9.3	11.3	<0.008	4	318	611	1	36
77236	11.3	12.9	<0.008	11	3605	3586	10	294
77237	12.9	14	<0.008	5	1977	1108	5	110
77238	14	15	<0.008	99	15400	733	98	16
77239	15	177	<0.008	20	9500	1488	25	50
77240	17	19	<0.008	6	1118	707	2	16
77241	19	21	<0.008	4	514	826	2	10
77242	21	24.3	<0.008	6	256	519	2	11
77243	24.3	26.3	<0.008	31	278	612	4	44
77244	26.3	27.2	0.019	6	218	1505	2	38
77245	27.2	27.6	0.101	749	108000	32300	408	816
77246	27.6	29	0.055	87	1442	2793	7	153
77247	29	30	0.074	98	490	1043	11	60
77248	30	31.7	0.037	54	423	692	9	82
77249	31.7	32.4	0.053	144	14900	1875	68	92
77250	32.4	34.4	0.05	74	1431	2447	12	101
77251	34.4	35.5	0.039	75	657	2848	8	62



Project: Farrell		PASMINGO EXPLORATION				Hole No. TF4	
Logged by: ANL		DIAMOND DRILL LOG				Page of	
Date: March 1996							
From m/ft	To m/ft	L-Cod	Lithology	Graphic(mm) .06 .5 2 8 32	Structure Angles to LCA	Alteration (wk) mod stg!	Min
0	3.3		Glacial overburden.				
3.3	48.2	Vsht	Grey, graphitic/sericitic fine grained siltstone. Broken with qtz and cb veining from 6.5-10.0 and 43.6-45.7m.		10	ser	45.3-45.7 c.g. gal vns
48.2	56.8	Sbsh	Black shale. Breccia zone with qtz/cb stringers from 54.9-56.7m		20	cb	
56.8	60	Vsht	Black graphitic bands alternate with pale grey silty bands.			cb	
60	61.3	Mfz	Black graphitic breccia with white vein quartz.		30	dtx!	
61.3	81.9	Vsst	Grey, deformed, sericitic and wkly chloritic sandstone. Grainy texture but clasts not recognised. Sericite suggests clasts are volcanic. White qtz veining throughout.		40	ser (chl)	79.2-79.5 veins c.g. galena
81.9	82.4	Mfz	Dark grey pug with siliceous fragments.		50	dtx! sil	
82.4	93.9	Msht	Quartz/sericite schist. Very strong fabric (S1). Abundant white quartz veining throughout. Qtz vein from 87.1-90m			ser! sil!	
93.9	94.6	Ma/z	White quartz veining.		60	sill!	
94.6	100.5	Sst/sh	Well bedded, upward fining f.g. sandstone to siltstone to black shale. Facing uphole.		70		
					80		
					90		
					100		



## TF4 ASSAYS

<i>sample</i>	<i>from</i>	<i>to</i>	<i>Au</i>	<i>Cu</i>	<i>Pb</i>	<i>Zn</i>	<i>Ag</i>	<i>As</i>
77252	6.6	9	0.01	43	1594	2788	8	44
77253	9	10.3	0.02	24	627	702	4	50
77254	43.5	44.8	0.014	16	4524	834	13	37
77255	44.8	45.7	0.013	458	71300	976	166	20
77256	54.1	55.5	0.096	56	1535	386	12	205
77257	55.5	56.9	0.048	33	1075	189	11	74
77258	58.9	59.5	0.008	5	175	169	1	23
77259	78.7	79.2	<0.008	15	9500	3057	13	29
77260	79.2	79.5	0.022	389	83700	398	241	10
77261	79.5	80.5	<0.008	43	1254	244	5	24
77262	80.5	82.5	<0.008	44	3479	713	8	47



# PAMINCO EXPLORATION DIAMOND DRILL CORE RECORD

341087

HOLE No. *TFS*

Page of

LOCATION	FARRELL	OBJECTIVE					LOCATION/SURVEY DATA (AMG)						
PROJECT	TULLAH	<p style="font-size: 18pt; font-style: italic;">To test for shallow extensions to Farrell holes.</p>					Grid	AMG	Farrell	RL Collar m <i>260.11/259.25</i>			
PROSPECT							Northing m	<i>5379072.96</i>	<i>2848.14</i>	Bearing Collar <i>111°(AMG)</i>			
DESIGNED BY	ANL						Easting m	<i>385914.10</i>	<i>3220.36</i>	Dip Collar <i>-45</i>			
LOGGED BY	ANL						DH Survey Type				Length Hole m <i>29.9</i>		
RELOGGED													
		RESULT					Depth m	Bearing	Dip	Depth m	Bearing	Dip	
COMMENCED	March 1996	<p style="font-size: 18pt; font-style: italic;">Only hole intersection was narrow and low grade. No significant intersections.</p>											
COMPLETED	March 1996												
DRILLED BY	A.T.E. (L. Stobbing)												
DRILL RIG	Gopher.												
SIGNIFICANT INTERSECTIONS													
From m	To m	Interval m									Comments		
SIGNIFICANT CORE LOSS			POOR GROUND CONDITION ZONES										
From m	To m	% Lost	From m	To m	Condition								
			<i>0</i>	<i>29.9</i>	<i>Quartz veining in granitic peg.</i>								
HOLE SIZE		HOLE CONDITIONS AFTER COMPLETION											
Size	Depth m	Collar	<p style="font-size: 18pt; font-style: italic;">Marked by wooden peg.</p>										
		Steel Casing											
		PVC Casing											
		Ground Water											
		Wedge											
		Drill Pad	<p style="font-size: 18pt; font-style: italic;">Open only to foot/motor bike/small dozer.</p>										

From m/ft	To m/ft	L-Cod	Lithology	Graphic(mm) .06 .5 2 8 32	Structure Angles to LCA	Alteration (wk) mod stg!	Min
0	1.5		Rubble and overburden				
1.5	18.7	Sbsh	Black shale, strongly graphitic, foliated. Quartz veining and qtz-graphite breccia from 6.0-10.9m.		70 S <sub>1</sub>	cb sil	f-m.g. py along cleav planes
18.7	19.1	Vsst	Quartz/feldspar crystal sandstone.		S <sub>1</sub> S <sub>1</sub> 33	(ser)	
19.1	20.95	Sbsh	Black, foliated shale.		S <sub>0</sub> S <sub>1</sub>	(cb)	
20.95	25.8	Vsst	Quartz/feldspar crystal sandstone with sericitic volcanic fragments.		10 m'alt <sub>3</sub> S <sub>1</sub>	ser	23.9 c.g. py in qtz veins
25.8	27.1	Sslt	Light grey siltstone		S <sub>1</sub>	(cb)	
27.1	29.9	Sbsh	Black, foliated shale. EOH 29.9m		S <sub>1</sub>	(cb)	
					20 S <sub>1</sub> S <sub>2</sub> 62 58		
					S <sub>1</sub> 60		
					30		

## TF5 ASSAYS

<i>sample</i>	<i>from</i>	<i>to</i>	<i>Au</i>	<i>Cu</i>	<i>Pb</i>	<i>Zn</i>	<i>Ag</i>	<i>As</i>
77263	6	7	<0.008	83	366	401	3	70
77264	7	8.8	<0.008	90	168	248	3	74
77265	8.8	10.9	<0.008	123	957	1304	4	75
77266	24.2	26	<0.008	13	7	33	2	22



# PAMINCO EXPLORATION DIAMOND DRILL CORE RECORD

341030

HOLE No. TFG

Page of

LOCATION	FARRELL	<b>OBJECTIVE</b> <i>To test for shallow extensions to Farrell Lodes.</i>					<b>LOCATION/SURVEY DATA (AMG)</b>								
PROJECT	TULLAH						Grid	AMG	FARRELL	RL Collar m	263.43/				
PROSPECT							Northing m	53 79071.90	2850.17	Bearing Collar	111°				
DESIGNED BY	ANL						Easting m	385933.51	3239.69	Dip Collar	-45				
LOGGED BY	ANL	DH Survey Type				Length Hole m		49.6							
RELOGGED		<b>RESULT</b>					Depth m	Bearing	Dip	Depth m	Bearing	Dip			
COMMENCED	March 1996	<i>Low grade lode intersected</i>													
COMPLETED	March 1996														
DRILLED BY	A.T.E. (L. Stebbings)														
DRILL RIG	Gopher.														
<b>SIGNIFICANT INTERSECTIONS</b>															
From m	To m	Interval m	Pb	Zn	Ag.			Comments							
7	8	1	1.94	0.9	123			<i>True width = 0.9.</i>							
<b>SIGNIFICANT CORE LOSS</b>			<b>POOR GROUND CONDITION ZONES</b>												
From m	To m	% Lost	From m	To m	Condition										
			0	49.6	<i>Quartz veining + graphitic pug.</i>										
<b>HOLE SIZE</b>			<b>HOLE CONDITIONS AFTER COMPLETION</b>												
Size	Depth m	Collar	<i>Marked by wooden stake</i>												
		Steel Casing													
		PVC Casing													
		Ground Water													
		Wedge													
		Drill Pad	<i>On track.</i>												

From m/ft	To m/ft	L-Cod	Lithology	Graphic(mm) .06 .5 2 8 32	Structure Angles to LCA	Alteration (wk) mod stg!	Min
0	25.15	Sbsh	Black, deformed and foliated shale.		S <sub>1</sub> 18° S <sub>1</sub> 40° S <sub>1</sub> min stringers S <sub>1</sub>	cb	7.5-9.9 py, gal and sph stringers.
25.15	25.45	Md/z	Black, graphitic pug zone.		7.5, 8	dtx!	
25.45	38.7	Sbsh	Black shale.		S <sub>1</sub> SS	(cb)	
38.7	45.4	Sbsh	Quartz/feldspar crystal sandstone. Sericitic fragments after volcanic material. Quartz veining from 38.7-42.6m.		S <sub>1</sub> 76	(ser)	38.7-42.6 stringers of gal assoc. with qtz vng.
45.4	49.6	Sbsh	Grey-black shale. EOH 49.6m		S <sub>1</sub> SS	cb	

## TF6 ASSAYS

<i>sample</i>	<i>from</i>	<i>to</i>	<i>Au</i>	<i>Cu</i>	<i>Pb</i>	<i>Zn</i>	<i>Ag</i>	<i>As</i>
77267	6	7	0.014	98	2774	2774	9	71
77268	7	8	0.095	273	19400	9800	123	183
77269	8	9	0.044	30	355	340	8	133
77270	9	10	0.058	69	742	679	11	122
77271	10	12	0.075	48	545	518	10	132
77272	12	14	0.019	44	1679	7900	8	62
77273	38.7	42.1	<0.008	22	9	126	1	33
77274	42.1	43.4	<0.008	234	5900	6300	4	13
77275	43.4	45.1	<0.008	8	110	125	2	10



# PAMINCO EXPLORATION DIAMOND DRILL CORE RECORD

341093

E No. *TF7*

Page of

LOCATION	<i>Farrell</i>		<b>OBJECTIVE</b>  <i>To test for shallow extensions to Farrell Lodes.</i>				<b>LOCATION/SURVEY DATA (AMG)</b>								
PROJECT	<i>Tullah</i>						Grid	AMG	<i>FARRELL</i>	RL Collar m <i>250.32/249.50</i>					
PROSPECT							Northing m	<i>5379070.17</i>	<i>2840.49</i>	Bearing Collar <i>111° AMG</i>					
DESIGNED BY	<i>ANL</i>						Easting m	<i>385883.30</i>	<i>3190.38</i>	Dip Collar <i>-60</i>					
LOGGED BY	<i>ANL</i>		DH Survey Type			Length Hole m <i>51.2</i>									
RELOGGED			<b>RESULT</b>  <i>Narrow lode intersection between 37.6 + 39.5m.</i>				Depth m	Bearing	Dip	Depth m	Bearing	Dip			
COMMENCED	<i>March 1996</i>														
COMPLETED	<i>March 1996</i>														
DRILLED BY	<i>A/E (L. Stebbins)</i>														
DRILL RIG	<i>Gopher</i>														
<b>SIGNIFICANT INTERSECTIONS</b>															
From m	To m	Interval m	Pb	Zn	Ag.	Comments									
<i>37.6</i>	<i>39.5</i>	<i>1.9</i>	<i>11.87</i>	<i>0.24</i>	<i>320</i>	<i>True width = 1.7m.</i>									
<b>SIGNIFICANT CORE LOSS</b>			<b>POOR GROUND CONDITION ZONES</b>												
From m	To m	% Lost	From m	To m	Condition										
<b>HOLE SIZE</b>			<b>HOLE CONDITIONS AFTER COMPLETION</b>												
Size	Depth m	Collar	<i>Marked by a wooden stake</i>												
<i>52.2mm</i>	<i>0-51.2m</i>	Steel Casing													
		PVC Casing													
		Ground Water													
		Wedge													
		Drill Pad	<i>On track.</i>												



Project:		PASMINGO EXPLORATION				Hole N o.: TF7	
Logged by:		DIAMOND DRILL LOG				Page of	
Date:							
From	To	L-Cod	Lithology	Graphic(mm)	Structure	Alteration	Min
m/ft	m/ft			.06 .5 2 8 32	Angles to LCA	(wk) mod stg!	
41	51.2	Sbsh	Black shale, very deformed, zone of severe structural disruption from 41.0-51.2m. EOH 51.2m		m	cb (sil)	traces gal and sph in stringers.
					50		
					60		
					70		
					80		

*Zone of chaotic structural disruption.*

*S<sub>1</sub> ← 65*

## TF7 ASSAYS

341096

<i>sample</i>	<i>from</i>	<i>to</i>	<i>Au</i>	<i>Cu</i>	<i>Pb</i>	<i>Zn</i>	<i>Ag</i>	<i>Fe%</i>	<i>As</i>
77276	36.2	37	<0.008	7	581	815	<1	2.26	16
77277	37	37.6	<0.008	264	28900	3617	93	3.03	180
77278	37.6	38.5	0.04	1054	258000	2128	500	1.31	1996
77279	38.5	39.5	0.028	40	47300	2007	71	2.92	762
77280	39.5	40.4	<0.008	12	4770	993	7	2.1	13
77281	40.4	42.2	0.035	47	4986	2013	13	2.68	87
77282	42.2	44.2	0.011	78	4638	1159	17	4.06	62
77283	44.2	46.2	0.036	117	4978	982	14	3.98	115



# PAMINCO EXPLORATION DIAMOND DRILL CORE RECORD

341097

HOLE No. *TF8*

Page  of

LOCATION	FARRELL	OBJECTIVE	LOCATION/SURVEY DATA (AMG)			
PROJECT	TULLAH.	To test for shallow extensions to the Farrell lodes.	Grid	AMG	FARRELL	RL Collar m 223.36/22254
PROSPECT			Northing m	5379361.71	3141.55	Bearing Collar 111° AMG
DESIGNED BY	ANL		Easting m	385966.09	3225.95	Dip Collar -45
LOGGED BY	ANL		DH Survey Type	—		Length Hole m 49.4
RELOGGED		RESULT	Depth m	Bearing	Dip	Depth m
COMMENCED	March 1996	Narrow intervals of Lode intersected.				Bearing
COMPLETED	March 1996					Dip
DRILLED BY	A.T.E. (L. Stebbing)					
DRILL RIG	Gopher.					
SIGNIFICANT INTERSECTIONS						
From m	To m	Interval m	Pb	Zn	Pg	Comments
17.8	18.8	1	2.31	0.51	73.	
19.8	20.8	1	2.0	0.51	46.	
23.0	23.5	0.4	17.1	1.22	433	
SIGNIFICANT CORE LOSS			POOR GROUND CONDITION ZONES			
From m	To m	% Lost	From m	To m	Condition	
			32	42	Broken, graphitic pg.	
HOLE SIZE		HOLE CONDITIONS AFTER COMPLETION				
Size	Depth m	Collar	Marked by a wooden pg.			
52.2mm	0-49.4	Steel Casing				
		PVC Casing				
		Ground Water				
		Wedge				
		Drill Pad				



Project: Farrell		PASMINGO EXPLORATION				Hole No. TF8	
Logged by: ANL		DIAMOND DRILL LOG				Page of	
Date: March 1996							
From	To	L-Cod	Lithology	Graphic(mm)	Structure	Alteration	Min
m/ft	m/ft			.06 .5 2 8 32	Angles to LCA	(wk) mod stg!	
			Network of quartz/cb veining forms breccia from 41.8-49.9m				41.8-EOH bx network of cb/qtz vng with c.g.sphal-> py>gal
			43.2-43.3m zone of graphitic pug.		<i>S<sub>1</sub></i> →		
			EOH 49.4m				
					50		
					60		
					70		
					80		

## TF8 ASSAYS

<i>sample</i>	<i>from</i>	<i>to</i>	<i>Au</i>	<i>Cu</i>	<i>Pb</i>	<i>Zn</i>	<i>Ag</i>	<i>Fe%</i>	<i>As</i>
77284	6.9	7.4	0.013	99	127	99	1	6.59	48
77285	7.4	8.6	0.027	105	671	915	4	7.49	73
77286	8.6	9.1	<0.008	6	1345	166	5	2.09	23
77287	9.1	9.6	<0.008	13	65	95	<1	3.48	12
77288	9.6	10.4	<0.008	6	153	135	<1	3.6	18
77289	10.4	10.9	<0.008	157	13500	349	24	3.55	32
77290	10.9	11.4	<0.008	9	813	64	<1	1.81	22
77291	11.4	12.8	<0.008	43	355	134	1	1.44	22
77292	12.8	13.2	0.023	75	2100	119	23	12.2	49
77293	13.2	14.1	<0.008	9	116	132	<1	1.5	40
77294	14.1	14.6	<0.008	7	278	624	1	1.99	22
77295	17.8	18.8	<0.008	323	23100	5100	73	1.83	42
77296	18.8	19.8	<0.008	55	4554	2664	15	2.37	50
77297	19.8	20.8	<0.008	170	20000	5100	46	3.34	50
77298	20.8	21.3	<0.008	11	1040	1355	1	1.77	40
77299	23	23.5	0.024	1872	171000	12200	433	0.83	1254
77300	23.5	24.5	<0.008	13	2082	2816	6	2.73	53
77550	24.5	25.5	<0.008	10	7000	714	12	2.52	51
77551	40.4	41.4	<0.008	7	1924	461	4	2.45	146
77552	41.4	42.4	0.032	129	3227	2761	26	3.39	230
77553	42.4	43.4	0.09	260	8200	21700	23	3.13	5500
77554	43.4	44.4	0.021	26	311	6000	2	5.67	269
77555	44.4	45.4	0.072	307	8800	13700	54	7.21	4351
77556	45.4	46.5	0.032	33	489	1495	4	4.07	147
77557	46.5	48	0.026	84	434	3080	4	3.95	627
77558	48	48.7	0.025	41	306	502	4	4.97	51
77559	48.7	49.4	0.04	123	711	46100	6	11.6	305



# PAMINCO EXPLORATION DIAMOND DRILL CORE RECORD

341101

HOLE No. *TF 9*

Page of

LOCATION	<i>TOLLAM</i>		<b>OBJECTIVE</b>  <i>To test for shallow extensions,</i>				<b>LOCATION/SURVEY DATA (AMG)</b>											
PROJECT							Grid		AMG	<i>FARRELL</i>	RL Collar m <i>221.71/220.9</i>							
PROSPECT	<i>FARRELL</i>						Northing m		<i>53 79 702.36</i>	<i>3486.76</i>	Bearing Collar <i>111° AMG</i>							
DESIGNED BY	<i>ANL</i>						Easting m		<i>386021.43</i>	<i>3226.62</i>	Dip Collar <i>- 45</i>							
LOGGED BY	<i>ANL.</i>						DH Survey Type		—		Length Hole m <i>64.4m</i>							
RELOGGED							<b>RESULT</b>  <i>Low grade Lode material intersected.</i>						Depth m		Bearing	Dip	Depth m	Bearing
COMMENCED	<i>Mar 1996</i>																	
COMPLETED	<i>n n</i>																	
DRILLED BY	<i>ATE (L. Stebbins)</i>																	
DRILL RIG	<i>Gopher.</i>																	
<b>SIGNIFICANT INTERSECTIONS</b>																		
From m	To m	Interval m	Pb	Zn	Ag.			Comments										
<i>44.9</i>	<i>46.9</i>	<i>2.0</i>	<i>1.9</i>	<i>5.74</i>	<i>46</i>			<i>True Width = 1.9</i>										
<i>46.9</i>	<i>48.1</i>	<i>1.2</i>	<i>1.8</i>	<i>0.79</i>	<i>52</i>			<i>v v = 1.1</i>										
<b>SIGNIFICANT CORE LOSS</b>			<b>POOR GROUND CONDITION ZONES</b>															
From m	To m	% Lost	From m	To m	Condition													
<b>HOLE SIZE</b>			<b>HOLE CONDITIONS AFTER COMPLETION</b>															
Size	Depth m	Collar	<i>Marked by wooden peg.</i>															
<i>52.2mm</i>	<i>0-64.4</i>	Steel Casing																
		PVC Casing																
		Ground Water																
		Wedge																
		Drill Pad																

From m/ft	To m/ft	L-Cod	Lithology	Graphic(mm) 06 5 2 8 32	Structure Angles to LCA	Alteration (wk) mod stg!	Min
0	0.5		Glacial overburden	✓	m		
0.5	8.3	La	Fine grained, sercitic volcanics with fine veinlets of carbonate and chlorite.	✓ ✓ ✓ ✓	So? 40 S <sub>1</sub> 45	ser	
8.3	13.4	Md/z	grades to Green, chlorite/sercitic banded rock. Bands parallel to cleavage. Sercitic bands are also carbonate rich. Lower contact marked by 10cm breccia zone. Henty Fault	✓ ✓	10 S <sub>1</sub> 45 S <sub>1</sub> 75	ser! chl cb	
13.4	20.1	Sbsh	Black shale, foliated with large (up to 2cm) rounded carbonate patches.	hatched	contact 40 S <sub>1</sub> 48 S <sub>1</sub>	cb!	
20.1	20.3	Ma/z	White quartz vein.	hatched	20	sill!	
20.3	48.1	Sbsh	Black shale, foliated, folded and brecciated. Zone of qtz veining from 43.9-44.8m. Qtz/gal/sph/cb stringers below 44.8m	hatched	S <sub>1</sub> 50 S <sub>1</sub> 75 Broken + brecciated	cb	
					30		
					40		



## TF9 ASSAYS

<i>sample</i>	<i>from</i>	<i>to</i>	<i>Au</i>	<i>Cu</i>	<i>Pb</i>	<i>Zn</i>	<i>Ag</i>	<i>Fe%</i>	<i>As</i>
77560	44.4	44.9	0.023	14	18	220	<1	3	35
77561	44.9	46.9	0.081	147	19400	57400	46	0.73	1580
77562	46.9	48.1	0.042	43	18400	7900	52	2.49	980
77563	48.1	49	0.019	13	8300	1604	20	4.03	74
77564	49	50	0.013	15	3975	2813	11	2.45	50
77565	50	51.1	<0.008	5	393	269	1	2.62	18
77566	51.1	52.2	0.036	614	8800	5900	55	3.44	54
77567	52.2	52.8	0.029	51	179	203	3	9.95	71



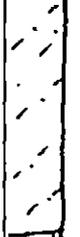
# PAMINCO EXPLORATION DIAMOND DRILL CORE RECORD

341105

Hole No. *TF10.*

Page of

LOCATION	OBJECTIVE						LOCATION/SURVEY DATA (AMG)										
PROJECT	<p style="font-size: 18pt;">To test for shallow extensions to Farrell holes.</p>						Grid	AMG	Farrell 1.	RL Collar m 285.82 / 285.01							
PROSPECT							Farrell	Northing m	5378735.79	2490.64	Bearing Collar 142.0 (AMG)						
DESIGNED BY							ANL	Easting m	28578952	3121.13	Dip Collar - 45.						
LOGGED BY							ANL	DH Survey Type			Length Hole m 70.7						
RELOGGED								Depth m	Bearing	Dip	Depth m	Bearing	Dip				
COMPLETED	<p style="font-size: 18pt;">Low grade hole channel intersected.</p>																
DRILLED BY							ATE (A. Stebbings)										
DRILL RIG							Copper.										
<b>SIGNIFICANT INTERSECTIONS</b>																	
From m							To m	Interval m	Pb	Zn	Ag						Comments
18.3	19.4	1.1	2.89	1.9	75.												
<b>SIGNIFICANT CORE LOSS</b>			<b>POOR GROUND CONDITION ZONES</b>														
From m	To m	% Lost	From m	To m	Condition												
<b>HOLE SIZE</b>			<b>HOLE CONDITIONS AFTER COMPLETION</b>														
Size	Depth m	Collar															
52.2mm		Steel Casing															
		PVC Casing															
		Ground Water															
		Wedge															
		Drill Pad															

Project: Farrell		P A S M I N C O E X P L O R A T I O N				Hole No. TF 10		
Logged by: ANL		D I A M O N D D R I L L L O G				Page of		
Date: March 1996								
From	To	L-Cod	Lithology	Graphic(mm)	Structure	Alteration	Min	
m/ft	m/ft			06 5 2 8 32	Angles to LCA	(wk) mod stg!		
0	18.2	La	Cream, totally bleached(wthd) volcanic. Clots of chlorite throughout. Also stringers and spots of weathered out carbonate, spots probably after feldspar phenocrysts. Traces of apple green mica.	V V V V V	m		chl! cb!	
18.2	21.1	Mfz	Fault breccia on contact, broken sediments in a vein quartz and sulphide matrix.		20	58 — contact		sph and gal in bx matrix
21.1	26.9	Sslt	Light grey siltstone, high carbonate content.			25 — S <sub>1</sub>	cb	
26.9	56.5		Grey-black interbedded black shales and carbonate-rich siltstone. Clots and veinlets of carbonate throughout.		30 40	85 — S <sub>1</sub> 65 — S <sub>1</sub> 40 — S <sub>1</sub>	cb	





Project: Farrell  
 Logged by: ANL  
 Date: June 1996

PASMINCO EXPLORATION  
 DIAMOND DRILL LOG

Hole No. TF 11  
 Page of

From m/ft	To m/ft	L-Cod	Lithology	Graphic(mm) .06 .5 2 8 32	Structure Angles to LCA	Alteration (wk) mod stg!	Min
0	1.6	Sgl	Glacial Conglomerate Boulder				
1.6	20.5	Sbs	Black graphitic shales, brecciated and broken. 10mm sandstone bed at 5.0m. 10.2-11.8m, breccia zone consists of graphitic pug with qtz vein and shale fragments. Galena veins cross cut breccia In this interval order of veining appears to have been qtz vng/ brecciation/cb+sph vng/gn vng/ kink folding.			graph! chl  11.0 gn vein 13.2 f.g. cb and sph vng 14.8 Tr. sph on cleavage planes.	
20.5	38.2	Ssilt	Grey, graphitic, cb-rich siltstone. Clasts of black shale near top contact which is conformable.			cb!  24.5 gn/cb/q vein assoc. with kink bands. 32.9-34.9 gn/sph veins	
38.2	38.7	Bx	Brecciated grey siltstone. Angular, rotated fragments of siltstone in cb/chl matrix.			cb!	
38.7	61.6	Sbs	Black Shale, strongly graphitic high in carbonate. Lode from 41.8-42.0, brecciated vein quartz with later f.g. sph. later c.g. sph and gn veins X-cut c.g. gn on lode margins. 41.8-58.5 Broken with qtz/cb vng some veins carry sph/gn. 59.3 1 cm qtz/tour veins. Below 58.5m, pyritic black shale pyrite cubes strung out along bedding. Large pyrite nodules preserved with shale compacted on either side.			cb! graph  41.8-42.0 high grade sph/gn in lode. Trace-3% gn/sph in veins below lode.	

## TF11 ASSAYS

<i>sample</i>	<i>from</i>	<i>to</i>	<i>Au</i>	<i>Cu</i>	<i>Pb</i>	<i>Zn</i>	<i>Ag</i>	<i>Fe</i>	<i>Mn</i>
76711	1.6	5.2	0.014	121	380	87	4	2.72	229
76712	5.2	6.1	0.044	57	574	101	8	6.45	21000
76713	6.1	7.6	0.026	40	451	225	6	7.56	23000
76714	7.6	9.5	0.021	62	136	106	7	7.52	24600
76715	9.5	10.4	0.024	114	768	729	7	7.13	25500
76716	10.4	11.8	0.025	54	22000	281	49	5.25	18100
76717	11.8	12.8	0.02	47	733	1870	3	4.97	19800
76718	12.8	13.8	0.021	53	2100	5990	8	5.72	22800
76719	13.8	14.7	0.005	77	870	1290	7	8.02	32800
76720	14.7	15.7	0.036	21	398	2740	3	6.27	18500
76721	15.7	17.8	0.045	8	71	661	1	5.68	21000
76722	17.8	18.8	0.006	3	56	177	<1	2.83	9400
76723	23.8	24.8	0.005	7	2950	325	12	3.07	10500
76724	24.8	26.4	0.009	8	1580	130	5	3.91	15000
76725	32.9	34.9	0.008	96	18800	612	56	1.8	4870
76726	34.9	35.9	0.016	283	3030	1030	9	2.5	4780
76727	35.9	37.7	0.003	4	2300	738	3	1.87	6440
76728	37.7	38.8	0.026	6	583	55	2	9.99	41300
76729	38.8	41.7	0.014	8	721	315	2	6.91	28200
76730	41.7	42	0.022	407	53100	49800	158	4.35	14900
76731	42	43	0.005	53	5160	10000	15	7.63	30700
76732	43	44	0.011	53	3020	3320	12	5.84	13400
76733	44	45.9	0.011	17	309	545	1	4.09	6640
76734	45.9	47.9	0.008	47	291	733	2	6.55	15600
76735	47.9	49.9	0.009	43	2300	805	5	5.96	15200
76736	49.9	51.9	0.007	35	381	330	3	7.63	25200
76737	51.9	53.9	0.005	34	261	414	1	5.27	11500
76738	53.9	54.6	0.004	25	573	429	1	6.32	16300
76748	54.6	56.2	0.003	15	187	132	<1	5.18	7900
76739	56.2	57.3	0.003	12	670	281	1	5.96	14200
76740	57.3	58.5	0.01	11	78	92	<1	7.17	3160



# PAMINCO EXPLORATION DIAMOND DRILL CORE RECORD

HOLE No. TF 12.

341111

Page      of     

LOCATION	Tullah	OBJECTIVE	LOCATION/SURVEY DATA (AMG)					
PROJECT		To test the ground between TF8 and TF4.	Grid	AMG	Farrell.	RL Collar m	251.0/250.2	
PROSPECT	Farrell		Northing m	5379247.6	3026.2	Bearing Collar	115°AMG.	
DESIGNED BY	ANL		Easting m	385960.9	3237.0	Dip Collar	-45	
LOGGED BY	ANL.		DH Survey Type				Length Hole m	54.3
RELOGGED								
		RESULT	Depth m	Bearing	Dip	Depth m	Bearing	Dip
COMMENCED	March '96.	No mineralised horizons intersected						
COMPLETED	March '96.							
DRILLED BY	ATE (L. Selbinger)							
DRILL RIG	Gopher.							
SIGNIFICANT INTERSECTIONS								
From m	To m	Interval m					Comments	
SIGNIFICANT CORE LOSS			POOR GROUND CONDITION ZONES					
From m	To m	% Lost	From m	To m	Condition			
HOLE SIZE		HOLE CONDITIONS AFTER COMPLETION						
Size	Depth m	Collar						
52.2mm.	54.3.	Steel Casing						
		PVC Casing						
		Ground Water						
		Wedge						
		Drill Pad						

Project: Farrell  
 Logged by: ANL  
 Date: July 1996

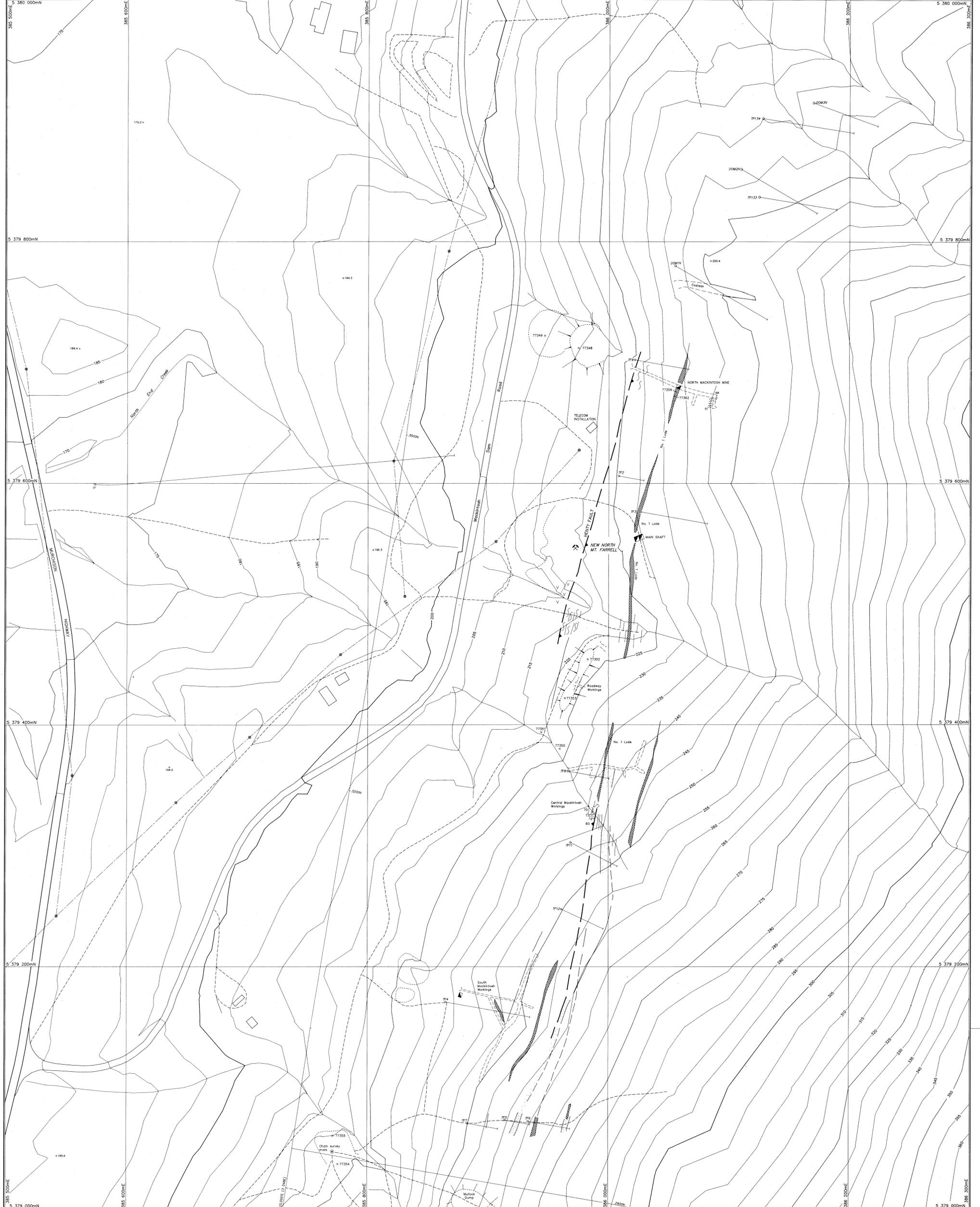
PASMINCO EXPLORATION  
 DIAMOND DRILL LOG

Hole No. TF 12  
 Page of

From m/ft	To m/ft	L-Cod	Lithology	Graphic(mm) .06 .5 2 8 32	Structure Angles to LCA	Alteration (wk) mod stg!	Min
0	3.2	Sgl	Glacial Overburden				
3.2	17.2	Sbsh	Black, broken, graphitic Black Slate.			cb	
17.2	21.9	Sbs/lt	Black Slate interbedded with carbonate-rich grey siltstone. Quartz-carbonate veining assoc. with folding Intense qtz veining and fault zone from 18.9-19.0m.			cb!	
21.9	36.5	Sslt	Grey, cb-rich siltstone with large (up to 5mm long) clasts of Black Slate, oriented along the cleavage. These are near the top contact.			cb!	
36.5	36.7	?M	Interval of black graphitic pug, possible fault zone.			graph!	
36.7	40.7	Sslt	Grey, cb-rich siltstone, becomes folded and broken with qtz veining from 37.6m.			cb!	
40.7	54.3	Sbsh	Graphitic Black Slate qtz and ?qtz/fd veining from 48-49.3m. qtz veining from at 42.9m and from 53.9-54.3m py/chl vein at 53.5m EOH				
				60			
				80			

## TF12 ASSAYS

<i>sample</i>	<i>from</i>	<i>to</i>	<i>Au</i>	<i>Cu</i>	<i>Pb</i>	<i>Zn</i>	<i>Ag</i>	<i>Fe</i>	<i>Mn</i>
76743	15	17	0.011	116	30	61	<1	4.59	3160
76744	17	19	0.014	45	30	62	<1	4.48	4080
76745	19	22	0.022	68	19	52	<1	4.53	3200
76746	22	22.7	0.003	5	148	124	<1	5.71	20200
76749	37	39	0.011	3	29	26	<1	3.56	10500
76747	39	42	0.003	13	117	227	1	5.97	21200



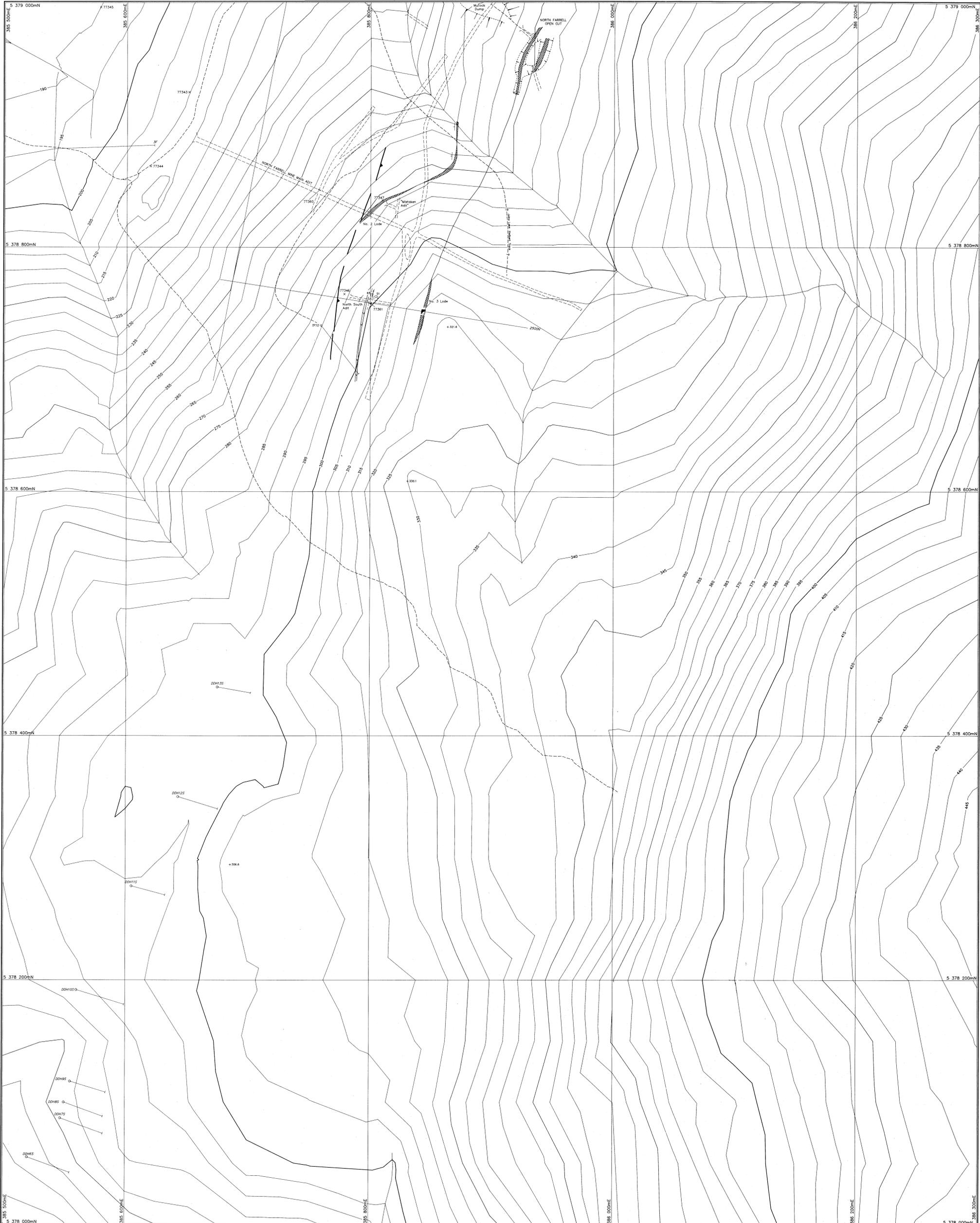
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8 cm

# 96-3923

ANNUAL REPORT - OCT 1996  
EL 2290 & EL 2491 PASMINGO EXPL.  
N K MCGUNNIGLE

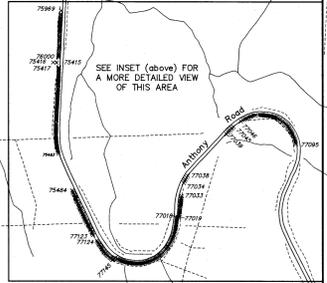
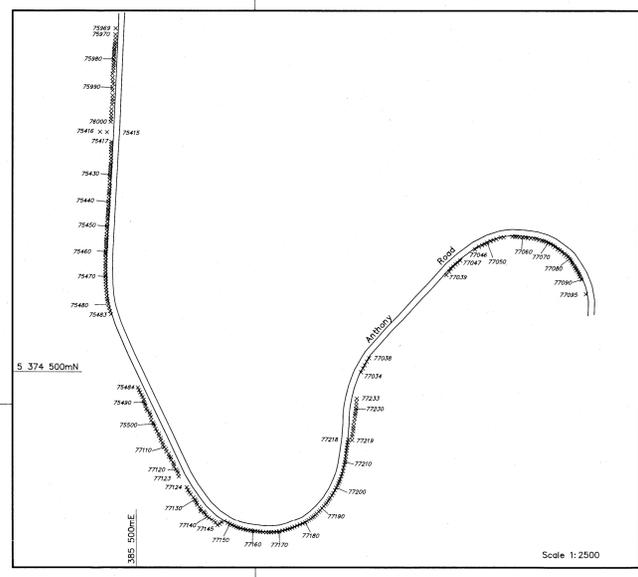
<b>PASMINGO EXPLORATION</b> A Division of Pasmingo Australia Limited	
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FILE: FM/NGEOL DRAWING No. 311114	SCALE 1:1000  FIG. No. 3



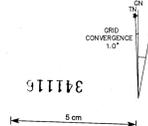
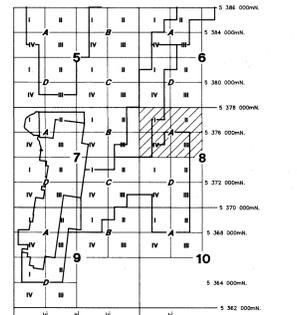
<p>  "Lode"   Black slate   Volcaniclastic sandstone   Volcanics   Schist         </p>	<p>  Thrust fault   Fault   Geology boundary position accurate   Geology boundary position inferred         </p>	<p>  Cleavage   Strike and dip of strata   Workings         </p>	<p>  x 77354 Rock chip sample   v 77359 Channel sample   Workings         </p>
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**96-3923**  
 ANNUAL REPORT - OCT 1996  
 EL 2290 & EL 2491 PASMINGO EXPL.  
 N K MCGUNNIGLE

<b>PASMINCO EXPLORATION</b>	
A Division of Pasminco Australia Limited	
COMPLETED: A.N.L. DATE: July 1996 DRAWN: G.M.B. REVISIONS:	E.L. 22/90 - TULLAH <b>FARRELL AREA</b> <b>34115 GEOLOGY</b> SOUTH SHEET
FILE: FM_SGEOC. DRAWING No.	SCALE 1:1000 FIG. No. 4



NOTE:  
 Anthony Road (part) by D. Kuntz - 1986  
 Murchison Gorge (part) by J. Morris - 1986



**PASMINCO EXPLORATION**  
 A Division of Pasminco Australia Limited

COMPILED: G.M.B.  
 DATE: Sept. 1986  
 DRAWN: G.M.B.  
 REVISIONS:

FILE: BA\_3L00CS  
 DRAWING No. \_\_\_\_\_

E.L. 22/90 - TULLAH  
 E.L. 24/91 - STERLING RIVER  
 ANTHONY ROAD - MURCHISON GORGE  
**ROCK CHIP  
 SAMPLE LOCATIONS**  
 SHEET 8A

SCALE 1:5000

FIG. No. 9

**96-3923**  
 ANNUAL REPORT - OCT 1986  
 RI 2290 & RI 2091 PASMINCO EXPL.  
 N.K. MCCUNNIGLE

**APPENDIX 4**

**Lithological Descriptions and Assay Results, Murchison Alteration Zone**

sample #	Interval length & type	Lithology / alteration	Other comments
75969	3m channel	unaltered felsophyric volcanoclastic	1st sample in first outcrop, RHS of road. Horizontal channel
75970	3m channel	as above, with minor thin qtz veins parallel to cleavage	
75971	2m channel	weakly chloritic felsospar phytic volcanoclastic with minor disseminated epidote & calcite. Occasional thin qtz-phy = an. sp. (staurolite).	
75972	3m channel	felsophyric volcanoclastic	
75973	2m channel	sample perpendicular to shear zone with a cleavage of chlorite-galena-py	shear zone dipping ~ 30° NW
75974	3m channel	Felsophyric volcanoclastic	
75975	3m channel	as above with thin qtz veins	
75976	3m channel	Felsophyric volcanoclastic	
75977	3m channel	weakly sericitic felsospar phytic volc.	
75978	3m channel	Felsophyric volc. with disse pyrite and rare veins & disseminated epidote.	
75979	3m channel	weakly sericitic felsophyric volcanoclastic	
75980	3m channel	Felsophyric volcanoclastic with minor disseminated pyrite and rare disseminated epidote.	
75981	3m channel	Felsophyric volcanoclastic with minor disseminated epidote in places	
75982	3m channel	Felsospar-qtz phytic volcanoclastic	
75983	Gravel	sample taken from suspected waxy qtz rich shear zone within T5982 interval.	
75984	3m rockchip	Felsospar-qtz phytic volcanoclastic.	20 cm rockchip spacing.
75985	3m rockchip	as above	
75986	3m rockchip	Felsophyric volcanoclastic	

sample #	Interval length & type	Lithology / Alteration	Other Comments
5987	3m rock chip	highly cleaned feldspar phytic volcanoclastic	
15988	3m rock chip	as above	
15989	3m rock chip	Feldspar phytic volcanoclastic with minor disseminated pyrite	
75990	3m rock chip	weakly sericitic, feldspar-quartz phytic volcanoclastic	
75991	3m rock chip	as above	
75992	3m rock chip	as for 75990 with thin qtz-chlorite veins	
75993	3m rock chip	weakly sericitic, feldspar-qtz phytic volcanoclastic with thin qtz-chlorite veins.	
75994	3m rock chip	moderately weathered, weakly sericitic, feldspar-qtz phytic volcanoclastic.	
75995	3m rock chip	as above	
75996	3m rock chip	fresh unweathered feldspar-quartz phytic volcanoclastic.	
75997	3m rock chip	weakly chloritic (matrix), feldspar phytic volcanoclastic	
75998	3m rock chip	moderately weathered, moderately chlorite-sericite altered feldspar phytic volcanoclastic.	
75999	3m rock chip	as above only chlorite alt more intense	
76000	3m rock chip	moderately siliceous, strongly chloritic, red sericitic feldspar phytic volcanoclastic.	End of 1st outcrop.
75415	10m rock chip	chip samples from 10m of poorly exposed & weathered feldspar phytic volcanoclastics with 1 wuggy quartz vein 20-30cm wide	from outcrop btw 1st and 2nd major outcrops.
75416	Grab sample	from wuggy quartz vein mentioned above.	
75417	3m rock chip	moderately sericitic feldspar phytic volcanoclastic	start of sampling on 2nd outcrop
75418	3m rock chip	as above	
75419	3m rock chip	coarsely feldspar phytic volcanoclastic.	

341119

Sample #	Internal length & type	Lithology / Alteration	Other Comments
5420	3m rock chip	moderately siliceous to moderately weathered seldspar-quartz phytic volcanoclastic	
75421	3m rock chip	as above	
75422	3m rock chip	moderately weathered, soft seldspar-phytic volcanoclastic.	
75423	3m rock chip	as above	
75423	3m rock chip	as per 75422	
75424	3m rock chip	as per 75422	
75425	3m rock chip	as per 75422	
75426	3m rock chip	as per 75422	
75427	3m rock chip	irregularly sericitic (matrix), fine-grained seldspar-quartz phytic volcanoclastic	
75428	3m rock chip	moderately siliceous-sericitic, seldspar-quartz phytic volcanoclastic	
75429	3m rock chip	highly siliceous, weakly sericite-chlorite altered seldspar-quartz phytic volcanoclastic	
75430	3m rock chip	siliceous seldspar-quartz phytic volcanoclastic, with pyrite-sph-grn rich shear zone 1m from start.	shear zone striking 165° d 55 SW, mineralisation concentrated on hanging wall of shear, and footwall dominantly chlorite plus minor pyrite.
75431	Grab samples	Samples from footwall and hanging wall of shear zone mentioned above.	
75432	3m rock chip	pass from siliceous seldspar-qtz phytic v.c. into 40cm thick bed of fine-grained volcanoclastic overlain by coarse quartz-phytic volcanoclastic	Bedding striking 160°, dipping 55° W, shear zone continues with mineralisation, localised on bedding contact.
75433	3m rock chip	very fine-grained seldspar-phytic volcanoclastic	Sampling along lithology contact mentioned above.
75434	3m rock chip	siliceous medium grained seldspar-phytic volcanoclastic.	Sampling in unit below fine-grained volcanoclastic mentioned above. Shear zone seems to die out.
75435	3m rock chip	highly siliceous quartz-seldspar phytic volcanoclastic	
75436	3m rock chip	siliceous, weakly chloritic, quartz-seldspar phytic volcanoclastic	
75437	3m rock chip	as above	
75438	3m rock chip	siliceous chloritic quartz-phytic volcanoclastic	

341120

Sample #	Int. length	Lithology / Alteration	Other Comments
75439	3m rock chip	siliceous chloritic quartz phytic volcanlastic with occasional 3-4cm wide qtz veins	veins striking 160°, d 84° W
75440	3m rock chip	siliceous seldspar-quartz phytic volcanlastic	
75441	3m rock chip	siliceous sericite altered quartz-phytic volcanlastic	
75442	Grab samples	from qtz-chlorite vein, chlorite-mica.	Taken from 40 cm wide quartz vein above 75441 interval striking ~ north-south, chip from vein & selvedge
75443	3m rock chip	moderately sericitic, moderately quartz phytic volcanlastic with occasional thin quartz veins	
75444	3m rock chip	moderately sericitic, mod qtz-seldspar phytic volcanlastic with patchy disseminated & microveined pyrite & galena	
75445	3m rock chip	sericitic, moderately seldspar-quartz phytic volcanlastic	
75446	3m rock chip	weakly sericitic seldspar-qtz phytic volcanlastic	
75447	3m rock chip	moderately seldspar-quartz phytic volcanlastic	
75448	3m rock chip	as above	
75449	3m rock chip	siliceous qtz-seldspar phytic volcanlastic	
75450	3m rock chip	siliceous, patchy chlorite altered, qtz-seldspar phytic volcanlastic	
75451	3m rock chip	siliceous quartz-seldspar phytic volcanlastic	
75452	3m rock chip	siliceous qtz-seldspar phytic volcanlastic and well bedded fine-grained seldspar phytic volcanlastic	Bedding striking 182° d 65° W
75453	3m rock chip	siliceous qtz-seldspar phytic volcanlastic with pyrite crystals on joint surfaces	
75454	Grab	chip samples from fault zone at start of 75453 interval	Fault striking 030°, d 75° NW
75455	3m rock chip	siliceous, moderate quartz-seldspar phytic volcanlastic	
75456	3m rock chip	siliceous qtz-seldspar phytic volcanlastic with thin veins of crystalline qtz.	

341121

Sample #	Interval length type	Lithology / Alteration	Other Comments
75457	3m rock chip	siliceous Qtz - Spheral phytic volcaniclastic with 10cm Qtz - barite - volubene (?) - iron oxide vein	
75458	3m rock chip	chips from Qtz vein & selage from above interval	vein striking 166°, passes through 75457 & 59 intervals
75459	3m rock chip	siliceous chloritic Qtz - Spheral phytic volcaniclastic with 30-40cm veins of Qtz - chalcopyrite	
75460	3m rock chip	siliceous, probably chloritic altered, Qtz - Spheral phytic volcaniclastic with veins of Qtz - chalcopyrite	one Qtz - chalcopyrite vein vugs out, next sample
75461	Grab	chip sample from Qtz - chalcopyrite vein & selage from 75460 interval	
75462	3m rock chip	weakly chloritic, moderately Qtz phytic volcaniclastic	
75463	3m rock chip	weakly sericite - chlorite, moderately quartz phytic volcaniclastic with occasional thin Qtz veins	
75464	3m rock chip	moderately sericitic, poorly Qtz phytic volcaniclastic with sulfide stained shear zone 1/2 way along interval	
75465	70cm channel	across small iron stained shear zone in 75464 interval	
75466	3m rock chip	siliceous, moderately Qtz - Spheral phytic volcaniclastic	
75467	3m rock chip	minor chlorite altered, siliceous, moderately quartz - Spheral phytic volcaniclastic with occasional thin Qtz veins	
75468	3m rock chip	quartz - phytic volcaniclastic	
75469	3m rock chip	moderately sericitic, quartz - Spheral phytic volcaniclastic	
75470	65cm channel	across iron oxide stained shear zone in 75471 interval	
75471	3m rock chip	moderately sericitic, Qtz phytic volcaniclastic	
75472	3m rock chip	siliceous quartz phytic volcaniclastic with minor Fe - oxide staining	
75473	3m rock chip	siliceous Qtz phytic volcaniclastic	
75474	3m rock chip	as above	

sample #	interval type	lithology / alteration	other comments
15475	3m rock chip	siliceous, moderate qtz phytic volcanoclastic with occasional thin qtz veins.	
15476	3m rock chip	as above	
15477	3m rock chip	siliceous moderately quartz phytic volcanoclastic	
15478	3m rock chip	as above	
15479	3m rock chip	siliceous poor feldspar moderately qtz phytic volcanoclastic	
15480	3m rock chip	siliceous moderately quartz phytic volcanoclastic	
15481	3m rock chip	unaltered, highly feldspar phytic medium grained volcanoclastic	
15482	3m rock chip	Feldspar phytic unit (15481) above, quartz phytic unit (15480) below	
15483	3m rock chip	fresh, highly feldspar phytic, medium grained volcanoclastic	last sample on 2 <sup>nd</sup> major outcrop.
15484	3m rock chip	strongly siliceous, pervasively phenocryst selective potassic altered, phytic (feldspar?) volcanoclastic	1 <sup>st</sup> sample on 3 <sup>rd</sup> major outcrop
15485	3m rock chip	siliceous pervasive potassic alteration ± minor chlorite with common qtz-K-feldspar-chlorite veins	weakly magnetic in places
15486	3m rock chip	massive siliceous K-feldspar & chlorite with minor Mn oxides	some 'bleaching' of outcrop
15487	3m rock chip	Moderately pervasively siliceous-K-feldspar altered feldspar phytic volcanoclastic with minor patchy chlorite and veins of quartz-K-feldspar	Weakly magnetic in places
15488	3m rock chip	as above	as above
15489	3m rock chip	Moderately pervasively siliceous-K-feldspar-chlorite-pyrite altered feldspar phytic volcanoclastic	several thin chlorite-pyrite rich shear zones (magnetic) through interval
15490	3m rock chip	sample across chlorite-pyrite rich shear zones with quartz-chlorite veins	shear zones weakly magnetic
15491	3m rock chip	siliceous fine grained chloritic rock with minor pyrite 5cm veins of qtz-chlorite and 1-2 cm wide veins of K-feldspar	Sampling across section of shear zone, occasionally weakly magnetic
15492	Grab sample	chips from quartz-chlorite veins from 15491 interval	
15493	3m rock chip	highly siliceous hematite dusted rock with minor chlorite & pyrite with several 5cm thick quartz-chlorite	
15494	3m rock chip	massive siliceous chlorite-magnetic-pyrite	moderately magnetic include strongly altered zones.
15495	3m rock chip	massive siliceous K-feldspar-chlorite-pyrite-magnetite, veins of qtz-K-feldspar	
15496	3m rock chip	as above except for several small chlorite-pyrite	weakly magnetic in shear zones

341123

Other comments

sample #	interval type	lithology / alteration	Other comments
75497	3m rock chip	massive siliceous K-feldspar - chlorite with several thin chlorite-pyrite rich shear zones.	
75498	3m rock chip	bleached fine-grained volcanoclastic with a zone of disseminated pyrite alteration	
75499	1m channel	across pyritic fault zone in 75498 interval.	
75500	3m rock chip	sample initially across 1m pyritic fault zone then across moderately chloritic fine-grained volcanoclastic	
77101	1.2m channel	across pyritic fault zone with massive K-feldspar schlage in interval 75500	
77102	3m rock chip	patchy to pervasively chlorite altered fine-grained volcanoclastic with local pyrite and K-feldspar	
77103	3m rock chip	weakly pervasively chlorite altered fine-grained volcanoclastic with Qtz-chlorite veins	
77104	3m rock chip	moderately chlorite - K-feldspar altered volcanoclastic with occasional disseminated pyrite.	
77105	3m rock chip	moderately pervasive chlorite altered fine-grained volcanoclastic with patchy K-feldspar and disseminated pyrite alteration	Weakly magnetic in chloritic shear zone near end of interval
77106	3m rock chip	as above	
77107	3m rock chip	as above	
77108	3m rock chip	as for 77105	
77109	3m rock chip	as for 77105, weakly magnetic in dark massive rock near end of interval	
77110	3m rock chip	as for 77105, with large (20cm thick) quartz-chlorite vein in centre of interval.	
77111	Grab sample	Taken from quartz-chlorite vein in 77110 interval.	
77112	3m rock chip	As for 77105	
77113	3m rock chip	moderately siliceous, chlorite - K-feldspar altered fine-grained volcanoclastic with minor disseminated pyrite.	
77114	3m rock chip	as above, with moderately magnetic shear zone at end of interval	
77115	3m rock chip	siliceous sericite - K-feldspar altered fine-grained rock with thin fault zone and pyritic zone	
77116	70cm rock chip	across fault zone in interval 77115, with well developed unaltered calcic breccia	5cm chip spacing
77117	Grab sample	from pyrite enriched zone in interval 77115, possible shear zone?	

341124

Sample #	Interval type	Lithology / Alteration	Other comments
71178	3m rock chip	Initially across siliceous patchy K-seldspar altered Qtz-phytic volcanoclastic, then seldspar phytic volcanoclastic with disseminated pyrite	One pyritic shear zone in interval sampled here
71119	50 cm channel	across pyritic shear zone with chlorite schage in interval 71118	
71120	3m rock chip	patchy K-seldspar-chlorite altered, highly quartz-seldspar phytic volcanoclastic	
71121	3m rock chip	patchy K-seldspar-sericite altered, highly quartz-seldspar phytic volcanoclastic	
71122	3m rock chip	as above	
71123	3m rock chip	as Ser 71121 except more weathered	last sample on 3rd outcrop face.
71124	3m rock chip	veined & patchy chlorite altered fine-grained seldspar phytic volcanoclastic	start of 4th outcrop face
71125	3m rock chip	as above with occasional patchy disseminated pyrite	
71126	3m rock chip	siliceous veined & patchy chlorite-Kseldspar altered seldspar phytic volcanoclastic with occasional patchy disseminated pyrite	
71127	3m rock chip	siliceous K-seldspar-chlorite-pyrite altered fine-grained seldspar phytic volcanoclastic	
71128	3m rock chip	as above, with quartz-chlorite-Kspar veins	
71129	3m rock chip	as Ser 71128	
71130	Grob samples	chips from Qtz-chlorite-Kseldspar-pyrite veins in intervals 71129 & 71128 intervals	
71131	3m rock chip	poorly siliceous Kseldspar-chlorite-pyrite altered fine-grained seldspar phytic unit into massive chlorite-Kseldspar-pyrite altered rock	
71132	3m rock chip	massive siliceous Kseldspar-chlorite alteration with up to 10% v/v pyrite.	
71133	3m rock chip	as above	
71134	5m rock chip	initially as Ser 71132, then into highly K-seldspar (phenocryst selective)-chlorite (perthite) altered quartz-seldspar (?) phytic volcanoclastic with 1-2% v/v pyrite	5m interval because 3m along probable bedding contact
71135	3m rock chip	Across fault zone with well developed cataclastic zone in highly Kseldspar-chlorite altered quartz-seldspar phytic unit described above	
71136	3m rock chip	sampled within wide Qtz-Kseldspar-pyrite-chlorite veined, pyrite rich cataclastic zone, see Fig 1.	

Sample #	Sample	Lithology / Alteration	Other Comments
77137	Grab sample	rock from hanging wall of fault, near cataclastic zone with sphalerite (?) on joint surface	In interval 77135, see Fig 1
77138	3m rock chip	interval across fault, from pyritic cataclastic zone into K-sphalerite-chlorite-pyrite altered phytic volcanics	See Fig 1 (on back of page)
77139	3m rock chip	highly siliceous K-sphalerite-chlorite-pyrite altered quartz phytic volcanics	
77140	3m rock chip	initially as above, then cross thin fault with sericite cataclastic and pyrite selvage, into chlorite-K-sphalerite altered volcanics	
77141	3m rock chip	highly siliceous chlorite-K-sphalerite-pyrite	
77142	3m rock chip	as above	
77143	3m rock chip	as for 77141, with several thin vertical faults	
77144	3m rock chip	as above, with chlorite-sericite-pyrite altered bleached fault zones and drusy calcite on joint surfaces & veins	
77145	Grab sample	samples of highly material with fine calcite druse from cataclastic zone in interval 77144, maybe surface weathering feature	
77146	3m rock chip	Moving out of fault zone, K-sphalerite-chlorite-pyrite alteration becoming dominant again	
77147	3m rock chip	siliceous K-sphalerite-chlorite-pyrite altered rock with white bleached zones	
77148	3m rock chip	siliceous K-sphalerite with minor chlorite & pyrite and bleed-through in some areas	
77149	3m rock chip	siliceous chlorite-K-sphalerite-epidote(?) - pyrite alteration	
77150	3m rock chip	Massive siliceous K-sphalerite with minor chlorite & pyrite. Several thin chlt-pyrite veins & one well zoned (see across)	
77151	30cm channel, chip & grab	sample across large vein described above	
77152	Grab sample	From chlorite-pyrite veins in 77150 interval	
77153	3m rock chip	'cherty' red massive K-sphalerite-pyrite (disseminated & thin stringer veins) - chlorite rock with thin vertical fault in interval	
77154	3m rock chip	siliceous K-sphalerite-chlorite-epidote(?) - pyrite altered rock	

341126

Sample #	Sample description	Mineralogy & HILTON
77155	3m rock chip	Cherty K-seldspar with minor chlorite & pyrite, common thin qtz-K-seldspar veins
77156	3m rock chip	as above
77157	3m rock chip	as ser 77155
77158	3m rock chip	as ser 77155
77159	3m rock chip	as ser 77155
77160	3m rock chip	as ser 77155, except rare disseminated galena
77161	3m rock chip	as ser 77155
77162	3m rock chip	as ser 77155
77163	3m rock chip	as ser 77155, except cross fault zone near end of interval, with 60cm cataclastic zone and 3m chlorite zone on fault plane
77164	3m rock chip	as ser 77155
77165	3m rock chip	as ser 77155, except cross small chloritic fault near end of interval.
77166	3m rock chip	Massive cherty K-seldspar with patchy & thinny veined chlorite.
77167	3m rock chip	as above, occasional qtz-chlorite veins
77168	3m rock chip	as above, pyritic fault zone in middle of interval
77169	1m continuous chip	sampled across pyritic fault zone with 15cm brecciated cataclastic zone, in interval 77168
77170	3m rock chip	as ser 77167
77171	3m rock chip	K-seldspar-chlorite altered, sintered moderately seldspar phytic volcanoclastic
77172	3m rock chip	sample across moderately chlorite-K-seldspar-pyrite altered, shandy sheared & brecciated fault zone.
77173	3m rock chip	Massive chlorite-K-seldspar altered seldspar (?) phytic volcanoclastic
77174	3m rock chip	Massive cherty K-seldspar with minor chlorite and pyrite. Numerous en-echelon qtz-K-seldspar-chlorite veins
77175	3m rock chip	As ser 77174
77176	3m rock chip	As ser 77174, some qtz-K-seldspar veins

341127

Sample #	Type	Lithology	Other Comments
71177	5m rockchip	varying massive K-seldspar-chlorite-py and chlorite-K-seldspar-pyrite alteration	5m interval because crosses waterfall, samples weakly weathered
71178	3m rockchip	light colored, siliceous K-seldspar/chlorite-pyrite altered rock with vertical sawt zone in interval	
71179	3m rockchip	Massive siliceous variable K-seldspar/chlorite-pyrite alteration	
71180	70cm continuous chip	sample across vertical pyritic sawt zone with qtz veins through cataclastic material, in interval	71178
71181	3m rockchip	Massive chunky K-seldspar with minor chlorite & silica-pyrite zones	
71182	3m rockchip	Massive K-seldspar with patchy & thinly veined chlorite	In places chlorite appears to be replacing thin fine-grained beds
71183	3m rockchip	Massive siliceous K-seldspar with up to 10% v/v pyrite & thin numerous veins of chlorite	
71184	3m rockchip	as above	
71185	3m rockchip	Moderately K-seldspar-chlorite altered seldspar pyritic volcanoclastic	Possible lithology change?
71186	3m rockchip	as above	
71187	3m rockchip	as ser 71185, except K-seldspar alteration more intense	
71188	3m rockchip	strongly K-seldspar (massive)-chlorite (veined) altered seldspar (?) pyritic volcanoclastic	
71189	3m rockchip	texturally destructive K-seldspar-chlorite alteration	
71190	3m rockchip	as above	
71191	3m rockchip	as ser 71189	
71192	3m rockchip	Massive K-seldspar-chlorite alteration ± minor pyrite	
71193	3m rockchip	as above except vertical pyritic sawt near end of interval	
71194	70cm continuous chip	Taken from sawt zone in 71193, pyritic selvage & 5cm cataclastic zone	
71195	3m rockchip	as ser 71192	
71196	3m rock chip	as ser 71192, more pyritic	possibly sampling along joint or sawt plane
71197	3m rockchip	as ser 71192	
71198	3m rockchip	as ser 71192	
71199	3m rockchip	as ser 71192, more pyritic	
71200	3m rockchip	as ser 71192, except one moderately pyritic zone	

341128

77001	3m rock chip	siliceous massive fine-grained chlorite - Kfeldspar continuation from T7200
77002	3m rock chip	as above
77003	3m rock chip	as for 77001, except pyrite on joint surfaces
77004	3m rock chip	as for 77001, except sampling along reverse fault plane in places with siliceous growths of chlorite + epidote(?) - Qtz
77005	Grab sample	taken from Qtz - chlorite - epidote on fault plane from T7004
77006	3m rock chip	siliceous Kfeldspar - chlorite, with several thin veins of Qtz - Kfeldspar with K-feldspar serotage
77007	3m rock chip	as above, with Qtz - chl veins and minor pyrite
77008	Grab samples	from Qtz veins in interval 77007
77009	3m rock chip	sampling along chlorite (perovsive) - Kfeldspar (phosphoryl selective patchy) - pyrite (diss) sawt plane
77010	"	as above
77011	"	as for 77009
77012	"	massive siliceous Kfeldspar (perovsive) - chlorite (patchy) alteration
77013	"	as above, Qtz - chlorite - Kfeldspar veins
77014	"	as above, chlorite more dominant
77015	"	perovsive chlorite with patchy to blocky crystalline Kfeldspar, Qtz - chl - Kfeldspar veins
77016	"	as above, except one Qtz vein vugs out (50cm wide, 70cm long)
77017	Grab sample	from thick Qtz vein mentioned above
77018	3m rock chip	As for 77016, chlorite more dominant
77019	"	Massive fine-grained chlorite with minor patchy Kfeldspar
77020	"	as above, also minor white clays (kaolinite?)
77021	"	as above
77022	"	as for 77020
77023	"	as for 77019, occasional 5m Qtz - Kfeldspar chlorite vein
77024	"	moderately chlorite - Kfeldspar altered fine-grained pinkish green coloured volcanodastic
77025	"	weak to moderately chlorite - Kfeldspar altered fine-grained volcanodastic with Qtz - Kfeldspar + chlorite veins
77026	"	As for 77025
77027	5m rock chip	as for 77025, except more weathered 5m interval because 5m outcrop covered by slump
77028	3m rock chip	deeply weathered (clays), weakly chloritic (perovsive) fine-grained volcanodastic

341129

sample #	type	mineralogy / alteration	Other comments	
77029	3m rock chip	moderately pervasive K-feldspar patchy chlorite altered fine-grained volcanoclastic		
77030	"	"	as above	
77031	"	"	moderately pervasive K-feldspar-chlorite altered strongly shear feldspar phytic volcanoclastic	
77032	"	"	moderately pervasive chlorite, weakly K-feldspar (phenocryst selective), fine-grained volcanoclastic	
77033	3.5m rock chip	as above	last sample from 4th outcrop	
77034	3m rock chip	siliceous pervasively chlorite altered fine-grained volcanoclastic	1st sample from 5th outcrop (small cc)	
77035	"	"	siliceous pervasively chlorite-K-feldspar fine-grained volcanoclastic with minor disseminated pyrite	
77036	"	"	highly siliceous moderately pervasive chlorite-K-feldspar altered dark rock	
77037	"	"	highly siliceous, strongly pervasively chlorite altered rock with minor disseminated pyrite	
77038	"	"	As above, only moderately siliceous	last sample from 5th outcrop
77039	"	"	highly siliceous moderately K-feldspar-chlorite-magnetite altered rock	Start of 6th outcrop (small)
77040	"	"	as above	
77041	"	"	Massive siliceous K-feldspar with Qtz-K-feldspar veins	
77042	"	"	As above, 1m chlorite-pyrite fault plane exposed & chlorite more abundant bleached vertical fault zone in middle of interval	
77043	70cm continuous chip	Across bleached fault zone in interval 77042		
77044	3m rock chip	as ser 77041		
77045	4m rock chip	as ser 77041	End of 6th outcrop	
77046	3m rock chip	massive siliceous K-feldspar with patchy thinny veined chlorite, minor disseminated veined pyrite	Start of 7th outcrop	
77047	"	"	as above except more phytic	
77048	"	"	as ser 77047	
77049	"	"	as ser 77047 except abundant thin vuggy Qtz-chlorite-K-feldspar veins	
77050	"	"	as ser 77049	
77051	"	"	as ser 77049	
77052	"	"	as ser 77049	

341130

Sample #	Core	lithology	Other Comments
77053	3m rock chip	Massive siliceous K-seldspar-chlorite with minor disseminated pyrite	
77054	"	1st 2 metres as above, then matrix chlorite altered seldspar phytic volcanoclastic	
77055	"	strongly chlorite (matrix), weakly K-seldspar (phenocryst selective) altered seldspar phytic volcanoclastic	
77056	"	as above, except some highly pyritic zones	
77057	Grab sample	taken from highly pyritic zone in 77056 interval	
77058	3m rock chip	as for 77056, in places cherty	
77059	"	thinly bedded cherty volcanoclastics with fault zone in middle of interval FW moderately pervasive chlorite, weakly K-seldspar (phenocryst), pyritic altered; H <sub>2</sub> O relatively unaltered	
77060	"	chlorite-pyrite altered fine grained seldspar phytic volcanoclastic	
77061	"	1st metre as above, then K-seldspar alteration becomes dominant & pervasive with minor chlorite - pyrite	
77062	"	moderately to strongly K-seldspar (few zircon phenocryst selective) chlorite fine grained seldspar phytic volcanoclastic	
77063	"	as above, except chlorite dominant in places	
77064	"	as for 77063	
77065	"	moderately chlorite (pervasive) altered fine-grained seldspar phytic volcanoclastic	
77066	"	as above	
77067	"	siliceous chlorite (pervasive) alteration	
77068	"	as above	
77069	"	as for 77067	
77070	"	as for 77067 except minor pyrite & K-seldspar, in fault zone near start of interval	
77071	1m rock chip	chip sampling across pyritic fault zone in T100	5 cm dip spacing
77072	3m rock chip	as for 77067	
77073	"	as for 77067 except minor K-seldspar & less siliceous pyritic fault zone near end of interval	

341131

#	type	lithology / alteration	Other comments
77074	70m rock chip	Across fault zone with well developed catadoclastic zone in interval 77073	Some chip spacing
77075	3m rock chip	Moderately chlorite (perovskite) altered fine-grained felsic volcaniclastic with minor pyrite	
77076	"	as above	
77077	"	as for 77075	
77078	"	Massive chlorite - K feldspar	
77079	"	Massive siliceous chlorite / K feldspar quartzitic volcaniclastic	
77080	"	Massive K feldspar with minor chlorite and qtz - K feldspar veins	
77081	"	Massive K feldspar with minor chlorite and horizontal brecciated zone through interval	
77082	80m rock chip	From brecciated 'spherulitic' zone in interval in 77081 (possible lithology? or fossil horizon?)	
77083	3m rock chip	Massive K feldspar-chlorite	
77084	"	as above, in places weathered, other fresh & siliceous	
77085	"	as for 77083	
77086	"	as for 77083	
77087	"	as for 77083 except in places sampling along pyritic fault plane	
77088	"	Massive chlorite - K feldspar with vuggy & fibrous quartz - chlorite in one area	
77089	Grid samples	From quartz-chlorite - K feldspar (?) vuggy zones in 77088	
77090	3m rock chip	Massive chlorite - K feldspar with occasional qtz-chlorite veins	
77091	"	Massive K feldspar-chlorite alteration, upper lithology chlorite dominant, lower K feldspar dominant	
77092	"	Moderately weathered, massive K feldspar-chlorite alteration	
77093	"	as for 77092	
77094	"	moderately weathered massive chlorite K feldspar alteration	
77095	"	as above, weakly quartzitic	End of 7th outcrop
77096	"	moderately siliceous, pervasively matrix chloritized feldspar quartzitic volcaniclastic	Start of 8th outcrop, W/S of Road
77097	"	pervasively matrix chlorite - K feldspar altered feldspar quartzitic volcaniclastic	

341132

#	Interval / Sample Type	Description	Other Comments
77098	3m rockchip	moderately siliceous, pervasively chlorite-K feldspar altered rock	
77099	"	moderately siliceous chloritic - K feldspar - Fe oxides altered feldspar phytic volcanoclastic, K feldspar alteration now weak and phenocryst selective	
77100	"	siliceous massive chlorite with occasional quartz-chlorite subeuvic veins	
77301	Grab samples	From subeuvic quartz-chlorite growth on fault plane and from en-echelon veins in interval 77100	
77302	3m rockchip	banding along fault plane or in H/L of strongly chloritic massive rock	
77303	"	as above	
77304	"	hard highly siliceous, dark strongly chloritic rock	
77305	"	as ser. above	
77306	"	as ser 77304 with occasional zones of chlorite - K feldspar alteration	
77307	"	as above	
77308	"	as ser 77304, with occasional qtz-chlorite veins	
77309	"	Interval covers moderately sheared zone of pervasive fine-grained chlorite with minor disseminated pyrite	
77310	"	Massive siliceous chlorite-pyrite-magnetite	
77311	"	as above but less magnetite	
77312	"	massive, moderately siliceous, fine-grained chlorite	
77313	"	as above	
77314	"	initially as ser 77312, then changes to highly siliceous chlorite-magnetite-pyrite alteration	
77315	"	As above, pyrite more abundant, patchy & veined in small fault zones	
77316	Chip	Chip samples from pyritic fault zones in interval 77315	
77317	3m rockchip	initially siliceous fine-grained chlorite with minor pyrite then abruptly into siliceous pervasively chlorite altered moderately quartz phytic volcanoclastic, occasional thin en-echelon qtz-K feldspar-chlorite veins	
77318	"	Massive siliceous chlorite-pyrite-magnetite with abundant qtz-K feldspar and qtz-chlorite veins	occasional thin en-echelon qtz-K feldspar-chlorite veins crosscut
77319	"	Massive siliceous chlorite-magnetite-pyrite with occ thin qtz-K feldspar and qtz-chlorite veins	Quartz-K feldspar veins
77320	"	As above, thin pyritic shear zone near end of interval	
77321	Grab samples	taken from thin pyritic shear zone near end of interval	

Sample #	Interval height & type	mineralogy / lithology	Other comments
77322	3m rock chip	Massive siliceous chlorite-K feldspar (becoming more pervasive through interval), with numerous quartz-chlorite and qtz-K feldspar veins	
77323	Grab sample	From strongly qtz-chlorite veined area in interval 77322	
77324	3m rock chip	Massive siliceous chlorite-pyrite alteration with zones of K feldspar alteration associated with quartz-chlorite-epidote (?) veins	
77325	"	as above except chipping along gwall plane for some of the interval	
77326	Grab samples	From qtz-chlorite-epidote (?) veins & K feldspar selvage in interval 77325	
77327	3m rock chip	Massive siliceous chlorite with minor pyrite and thin veins of quartz-chlorite and quartz-K feldspar	
77328	"	As above except some zones of K feldspar-chlorite alteration	
77329	"	Variable massive siliceous chlorite to chlorite-K feldspar alteration with quartz-chlorite-epidote veins	
77330	"	As above, also patchy disseminated pyrite	
77331	"	Initially as for 77330, then becomes dominantly massive chlorite-with minor magnetite	
77332	"	Massive siliceous chlorite with some patches of chlorite-K feldspar alteration	
77333	"	As above	
77334	"	As for 77332	
77335	"	Massive highly siliceous chlorite with thin pyrite and K feldspar veins	Sampling along joint surface
77336	"	Massive siliceous chlorite with occasional 2cm wide qtz-chlorite veins	
77337	"	As above	
77338	"	Initially as for 77336, then into fine-grained chloritic volcanoclastics, very thinly bedded.	
77339	Grab	From waxy crystalline qtz and pyrite on joint planes and veins in interval 77338	
77340	3m rock chip	Initially thinly bedded, fine-grained chloritic volcanoclastics, then pass through pyritic shear zone, then into chloritic medium-grained feldspar pyrite volcanoclastics	
77341	1m rock chip	Across shear zone into 77340, thinly bedded volcanoclastics on gwall, feldspar pyrite volcanoclastic in gwall	
77342	3m rock chip	Massive siliceous chloritic, moderate to weakly feldspar pyrite volcanoclastic with minor patchy disseminated barite	5cm chip spacing. End of sampling on 8th outcrop face. 120m total along 8th " "

## Murchison Gorge Alteration Zone Assay Results

341135

lgc_samp	lgc_n	lgc_e	Cu	Pb	Zn	Mn	Ag	As	Au	Ba
75415	5374739	385470.9	4	10	34	161	<1	4.4	<0.008	578
75416	5374739	385463.9	5	<3	15	40	<1	3.1	<0.008	39
75417	5374729	385475.5	5	13	53	125	<1	5.8	<0.008	1025
75418	5374727	385475.4	4	15	49	128	<1	7	<0.008	954
75419	5374725	385475.2	4	16	53	115	<1	14	<0.008	750
75420	5374722	385475.1	4	18	51	117	<1	5.4	<0.008	796
75421	5374719	385474.9	3	13	47	155	<1	6.6	<0.008	848
75422	5374716	385474.9	3	11	49	99	<1	5.1	<0.008	721
75423	5374713	385475	4	23	54	104	<1	5.2	<0.008	744
75424	5374710	385475.1	4	27	55	100	<1	5.1	<0.008	782
75425	5374707	385474.7	3	15	42	84	<1	4.5	<0.008	794
75426	5374706	385474.8	3	15	39	91	<1	8.3	<0.008	779
75427	5374704	385474.4	3	16	39	80	<1	4.7	<0.008	785
75428	5374701	385474.3	3	27	42	95	1	3.9	<0.008	935
75429	5374699	385474	5	164	60	92	1	4.6	<0.008	966
75430	5374696	385474.1	11	565	754	1731	1	20	<0.008	917
75431	5374694	385473.9	19	1137	2457	10100	2	611	0.027	562
75432	5374692	385473.6	39	1820	2067	2410	3	106	0.008	849
75433	5374688	385473.7	32	76	271	3181	<1	37	<0.008	1160
75434	5374686	385473.8	6	72	108	518	<1	9.7	<0.008	851
75435	5374683	385473.5	7	71	83	533	<1	6.5	<0.008	729
75436	5374680	385473.4	4	87	109	527	<1	6.6	<0.008	644
75437	5374678	385472.7	4	92	68	225	<1	10	<0.008	718
75438	5374675	385472.7	7	225	121	300	<1	3.9	<0.008	806
75439	5374672	385472.8	4	353	98	285	1	6.9	<0.008	883
75440	5374670	385472.6	5	122	57	175	<1	2.1	<0.008	792
75441	5374667	385472.8	8	200	309	1026	1	3	<0.008	876
75442	5374665	385472.4	5	115	170	242	<1	7.8	<0.008	303
75443	5374662	385472.1	8	143	138	836	<1	50	<0.008	513
75444	5374660	385472.2	5	88	166	633	<1	7.9	<0.008	625
75445	5374658	385472.1	6	157	250	616	<1	6.8	<0.008	589
75446	5374656	385471.7	9	191	157	677	<1	4.3	<0.008	707
75447	5374653	385471.9	4	55	207	677	<1	13	<0.008	663
75448	5374652	385471.4	4	128	150	1550	<1	10	<0.008	720
75449	5374648	385471.3	16	94	103	1007	<1	13	<0.008	891
75450	5374646	385471	6	63	116	533	<1	3.2	<0.008	1105
75451	5374643	385471	7	97	131	526	<1	5.6	<0.008	1295
75452	5374640	385471	38	79	142	484	<1	2.3	<0.008	1290
75453	5374637	385470.6	5	131	125	994	<1	4.7	<0.008	943
75454	5374634	385470.7	5	166	123	231	<1	10	<0.008	1105
75455	5374632	385470.3	4	116	66	281	<1	4.9	<0.008	1100
75456	5374630	385470.2	3	82	90	630	<1	3.7	<0.008	1150
75457	5374628	385470.1	3	152	113	2126	<1	16	<0.008	948
75458	5374625	385470.3	3	123	95	1597	<1	15	<0.008	781
75459	5374623	385470.2	90	237	165	1169	1	12	<0.008	1040
75460	5374620	385469.8	73	140	441	853	<1	5.4	<0.008	920
75461	5374619	385469.6	27300	41300	22900	2919	370	4.3	0.072	323
75462	5374617	385469.6	12	116	157	1185	<1	25	0.014	1000
75463	5374614	385469.6	4	167	126	933	<1	8.5	<0.008	944
75464	5374611	385469.7	2	110	135	641	<1	8.2	<0.008	1180
75465	5374608	385469.4	4	125	63	207	<1	-	<0.008	1140
75466	5374605	385469.5	4	161	181	1774	<1	15	<0.008	1175
75467	5374603	385469.5	3	67	103	640	<1	10	<0.008	1470

<i>Igc_samp</i>	<i>Igc_n</i>	<i>Igc_e</i>	<i>Cu</i>	<i>Pb</i>	<i>Zn</i>	<i>Mn</i>	<i>Ag</i>	<i>As</i>	<i>Au</i>	<i>Ba</i>
75468	5374600	385469.4	3	159	84	625	<1	7.7	<0.008	1395
75469	5374597	385469.4	2	167	96	827	<1	8	<0.008	1155
75470	5374595	385469.5	2	353	143	844	<1	29	<0.008	1165
75471	5374593	385469.7	2	156	120	727	<1	10	<0.008	1120
75472	5374590	385469.7	24	224	132	863	<1	7.8	<0.008	1020
75473	5374588	385469.8	51	50	90	895	<1	6.7	<0.008	1325
75474	5374585	385469.9	2	87	103	643	<1	6.2	<0.008	1300
75475	5374581	385470.3	3	79	144	542	<1	7.3	<0.008	1175
75476	5374579	385470.5	3	195	93	712	<1	5.6	<0.008	1320
75477	5374575	385470.8	6	177	119	641	<1	6.2	<0.008	1130
75478	5374573	385471	6	122	91	745	<1	4.6	<0.008	1025
75479	5374570	385471.6	3	144	99	812	<1	13	<0.008	1080
75480	5374567	385472.3	3	182	101	428	<1	26	<0.008	1025
75481	5374564	385472.9	<2	42	51	243	<1	4.8	<0.008	1100
75482	5374561	385473.9	5	28	45	240	<1	9.1	<0.008	930
75483	5374558	385474.8	2	16	37	242	<1	3	<0.008	858
75484	5374484	385501.8	10	<3	66	529	<1	2.3	<0.008	3435
75485	5374482	385502.9	4	3	57	397	<1	2.4	<0.008	3330
75486	5374479	385504	18	8	87	518	<1	4.5	<0.008	3105
75487	5374477	385505.4	50	8	104	596	<1	2.2	<0.008	3070
75488	5374475	385506.5	52	14	117	464	<1	3.7	<0.008	3265
75489	5374472	385507.7	54	16	108	430	<1	6.9	<0.008	3055
75490	5374470	385508	37	56	143	1029	<1	9.4	<0.008	2915
75491	5374468	385509	7	39	128	879	<1	9.2	<0.008	2600
75492	5374466	385509.2	4	15	318	2041	<1	8.7	<0.008	527
75493	5374463	385510.3	17	27	176	687	<1	4	<0.008	2065
75494	5374461	385511.1	207	20	193	707	<1	10	<0.008	2235
75495	5374459	385513.6	23	25	154	705	<1	5.2	<0.008	2295
75496	5374457	385513.9	23	33	104	510	<1	6.5	<0.008	2240
75497	5374455	385514.9	3	27	96	515	<1	2.2	<0.008	2250
75498	5374451	385515	2	30	107	526	<1	2.9	<0.008	1530
75499	5374449	385516.8	2	33	84	339	<1	2.9	<0.008	1340
75500	5374448	385517.5	2	17	122	620	<1	2.9	<0.008	1260
75745	5374565	387545.7	12	20	160	1153	<1	638	0.029	1000
75746	5374577	387538	58	57	387	5500	<1	402	0.008	588
75747	5374587	387534.1	93	43	299	3293	1	87	<0.008	1080
75748	5374625	387513.5	35	32	266	2462	<1	21	<0.008	1440
75749	5374651	387500.7	16	8	203	2060	<1	7	<0.008	1225
75750	5374673	387489.1	3	3	200	1211	<1	9.9	0.015	1595
75751	5374697	387478.3	26	8	221	1513	<1	1.8	<0.008	1875
75752	5373713	388023.5	23	11	135	1440	<1	22	0.01	1170
75753	5373725	388029.6	10	<3	95	1378	<1	11	<0.008	1435
75754	5373744	388046	30	17	171	1851	<1	44	0.013	1030
75755	5373752	388055.4	274	81	257	3040	<1	70	0.008	1410
75756	5373786	388084.3	23	9	182	3057	<1	16	0.01	1575
75757	5373801	388097.1	32	14	1761	4725	<1	45	<0.008	1425
75758	5373807	388103.1	90	628	0.61	1.22	4	452	0.008	398
75759	5373845	388133.6	16	74	148	851	<1	13	<0.008	1635
75760	5373862	388150.5	23	104	196	1529	<1	11	<0.008	1355
75761	5373934	388169.9	15	39	199	1017	<1	22	<0.008	1380
75773	5373991	388171.1	149	736	1567	4569	20	104	<0.008	3230
75969	5374843	385479.6	17	124	251	85	1	10	<0.008	517
75970	5374836	385479.4	5	25	53	84	1	14	<0.008	445
75971	5374833	385479.6	28	364	4899	1478	3	36	<0.008	470
75972	5374829	385479.1	10	152	127	218	<1	16	<0.008	1160
75973	5374827	385478.9	23	418	2004	168	2	44	<0.008	1005

<i>lgc_samp</i>	<i>lgc_n</i>	<i>lgc_e</i>	<i>Cu</i>	<i>Pb</i>	<i>Zn</i>	<i>Mn</i>	<i>Ag</i>	<i>As</i>	<i>Au</i>	<i>Ba</i>
75974	5374825	385478.7	44	296	463	126	2	42	<0.008	1325
75975	5374822	385478.5	11	172	207	115	2	24	<0.008	1185
75976	5374821	385478.1	6	63	57	91	<1	8.2	0.008	1235
75977	5374819	385478.1	7	60	73	99	<1	6.5	<0.008	1115
75978	5374817	385478.2	90	1311	14400	327	8	152	0.266	772
75979	5374815	385477.9	24	390	1441	231	2	93	<0.008	663
75980	5374812	385477.5	44	893	877	288	4	40	<0.008	920
75981	5374811	385477.9	7	31	59	590	<1	11	<0.008	1095
75982	5374808	385477.9	14	128	2460	467	1	27	<0.008	988
75983	5374806	385477.6	14	154	1192	539	1	26	<0.008	853
75984	5374803	385477.5	5	127	102	127	<1	9.7	<0.008	1130
75985	5374800	385477.2	14	120	978	108	1	39	<0.008	927
75986	5374797	385476.4	14	20	57	79	<1	8.3	<0.008	892
75987	5374793	385476.5	6	15	39	116	<1	6.2	<0.008	848
75988	5374790	385476.7	6	17	43	131	<1	6.7	<0.008	1190
75989	5374787	385477.1	5	27	40	101	<1	17	<0.008	1130
75990	5374784	385476.3	5	10	41	74	<1	5.5	<0.008	1175
75991	5374781	385476.5	4	9	42	103	<1	4.8	<0.008	1115
75992	5374776	385476.6	4	7	38	80	<1	4	<0.008	1015
75993	5374772	385476.4	4	14	38	109	<1	3.9	<0.008	955
75994	5374770	385476.4	9	24	42	138	<1	2.3	<0.008	1140
75995	5374767	385476	4	15	38	108	<1	12	<0.008	932
75996	5374762	385475.6	4	18	42	113	<1	4	<0.008	958
75997	5374758	385475.2	3	13	36	96	<1	4.2	<0.008	1075
75998	5374755	385475.2	4	3	29	139	<1	3	<0.008	665
75999	5374752	385475	10	5	34	116	<1	4.5	<0.008	865
76000	5374749	385474.7	5	4	26	84	<1	3.6	<0.008	909
77001	5374386	385700	9	11	113	467	<1	6.1	0.13	1590
77002	5374389	385701	5	6	105	528	<1	6.6	0.094	1520
77003	5374391	385701.9	3	11	112	508	<1	3.7	0.016	1295
77004	5374393	385702.6	16	87	242	852	<1	3.3	0.02	1315
77005	5374396	385703.7	43	6	108	569	<1	2	0.019	52
77006	5374398	385704.5	6	17	113	589	<1	5.4	0.014	1155
77007	5374401	385705.4	5	31	137	1006	<1	10	0.012	1655
77008	5374404	385706.1	3	14	77	547	<1	7.9	0.014	947
77009	5374407	385706.8	4	27	217	1164	<1	9.3	0.024	1535
77010	5374410	385707.5	7	23	135	570	<1	2.7	<0.008	780
77011	5374412	385707.9	10	18	164	615	<1	4.3	0.008	1205
77012	5374415	385708.6	5	9	124	506	<1	1.7	0.009	1665
77013	5374419	385708.7	2	10	107	410	<1	1.6	0.01	2040
77014	5374421	385709.1	12	14	93	395	<1	10	0.009	2020
77015	5374424	385709.4	68	12	186	639	<1	4.5	0.008	1465
77016	5374427	385709.8	16	5	127	482	<1	2.3	0.013	1150
77017	5374430	385710.2	14	3	66	387	<1	1.6	<0.008	441
77018	5374432	385710.9	12	12	222	700	<1	2.2	0.008	1730
77019	5374432	385714.7	5	7	240	715	<1	2.1	<0.008	1530
77020	5374435	385714.7	4	10	242	651	<1	2.3	<0.008	1335
77021	5374438	385714.9	5	12	194	545	<1	2.5	0.009	1195
77022	5374441	385715.7	4	23	184	621	<1	2.5	<0.008	1460
77023	5374444	385715.9	3	40	179	505	<1	2.6	<0.008	1585
77024	5374446	385716.1	2	42	115	502	<1	11	<0.008	1155
77025	5374450	385716.6	10	42	128	641	2	5.1	0.008	1440
77026	5374453	385717.3	10	44	120	505	<1	4.3	<0.008	1350
77027	5374457	385717.7	7	16	163	550	<1	2.8	0.008	1490
77028	5374458	385717.8	8	81	163	1086	1	5.1	0.01	1135
77029	5374461	385718.3	13	76	155	657	1	21	<0.008	829

<i>Igc_samp</i>	<i>Igc_n</i>	<i>Igc_e</i>	<i>Cu</i>	<i>Pb</i>	<i>Zn</i>	<i>Mn</i>	<i>Ag</i>	<i>As</i>	<i>Au</i>	<i>Ba</i>
77030	5374463	385718.4	42	24	163	479	<1	9.4	<0.008	1155
77031	5374466	385718.8	21	15	221	626	<1	3.6	0.01	1105
77032	5374470	385719	11	19	138	400	<1	2.2	0.011	1760
77033	5374473	385719.4	41	15	97	366	1	2.1	0.014	1365
77034	5374500	385723.6	25	16	125	349	<1	3.6	0.012	1020
77035	5374504	385725.6	72	13	124	366	<1	2.3	0.011	1645
77036	5374507	385727.2	19	17	142	483	<1	6.4	0.01	1395
77037	5374510	385729.3	17	24	182	525	<1	15	0.012	1425
77038	5374514	385731.8	4	9	144	604	<1	2.1	<0.008	1360
77039	5374597	385808.8	7	17	192	674	<1	21	0.02	3215
77040	5374600	385811.6	2	34	266	872	<1	21	<0.008	3210
77041	5374603	385813.3	2	18	94	305	<1	6	0.015	2500
77042	5374605	385815.8	19	105	137	363	<1	12	<0.008	2550
77043	5374607	385818.1	25	358	217	206	1	49	<0.008	2380
77044	5374609	385820	24	62	147	784	<1	11	<0.008	1955
77045	5374611	385822.6	13	30	166	982	<1	7.1	0.01	1850
77046	5374622	385837.3	14	92	129	474	<1	17.2	<0.008	2730
77047	5374625	385841.1	23	235	198	396	<1	26	<0.008	7995
77048	5374627	385844.3	8	243	176	480	<1	22	0.08	2115
77049	5374628	385846.9	15	527	392	496	<1	14	<0.008	1810
77050	5374629	385849.5	5	117	204	628	<1	8.3	<0.008	1895
77051	5374631	385852.7	8	121	92	400	<1	5.7	<0.008	1690
77052	5374632	385855.6	43	213	1035	433	1	28	0.016	1925
77053	5374633	385858.5	3	52	69	248	<1	<0.5	<0.008	1965
77054	5374634	385862.7	13	212	143	669	<1	35	<0.008	1665
77055	5374635	385865.7	38	457	521	794	1	18	<0.008	1515
77056	5374635	385874.5	12	1776	255	941	1	47	<0.008	2225
77057	5374635	385877.1	5	204	221	846	<1	50	0.017	4075
77058	5374635	385879.1	11	263	128	505	<1	21	<0.008	1470
77059	5374635	385881.7	26	494	472	850	1	50	<0.008	1725
77060	5374635	385884.6	133	1447	1194	867	3	27	<0.008	879
77061	5374635	385887.3	105	55	122	440	<1	4.6	<0.008	494
77062	5374634	385889.6	135	62	108	448	1	3.5	<0.008	1375
77063	5374633	385892.8	75	76	113	516	1	3.7	<0.008	997
77064	5374633	385896	16	186	143	541	1	9.6	<0.008	1030
77065	5374633	385898.2	15	222	144	769	3	14	0.018	792
77066	5374632	385901	57	261	203	561	1	16	0.012	1270
77067	5374631	385903.7	19	17	180	708	<1	14	<0.008	1215
77068	5374631	385905.5	9	9	147	549	<1	5.4	<0.008	1885
77069	5374630	385907.9	22	10	127	496	<1	12	<0.008	2775
77070	5374629	385909.9	36	26	118	441	<1	10	<0.008	2615
77071	5374628	385912.3	17	26	92	359	<1	17	<0.008	2720
77072	5374626	385914.7	10	24	199	721	<1	11	<0.008	1480
77073	5374625	385916.6	13	12	126	510	<1	9	<0.008	965
77074	5374623	385919.4	22	20	114	534	<1	19	<0.008	1145
77075	5374622	385921.3	6	6	105	530	<1	9.9	<0.008	809
77076	5374620	385923.2	11	22	123	627	<1	6.7	<0.008	966
77077	5374618	385925.7	14	15	149	701	<1	5.4	<0.008	963
77078	5374616	385927.7	3	6	120	702	<1	3.2	<0.008	1075
77079	5374615	385929.4	<2	4	149	603	<1	3	<0.008	829
77080	5374613	385931.2	2	13	108	506	<1	4.6	<0.008	1320
77081	5374612	385932.2	<2	12	141	581	<1	2.1	<0.008	1460
77082	5374609	385933.6	2	16	122	484	<1	3.2	<0.008	1620
77083	5374607	385934.3	<2	9	131	501	<1	2.7	<0.008	1485
77084	5374605	385935.9	2	10	136	549	<1	2.5	<0.008	1395
77085	5374604	385937	6	10	138	599	<1	9.2	<0.008	1005

<i>Igc_samp</i>	<i>Igc_n</i>	<i>Igc_e</i>	<i>Cu</i>	<i>Pb</i>	<i>Zn</i>	<i>Mn</i>	<i>Ag</i>	<i>As</i>	<i>Au</i>	<i>Ba</i>
77086	5374602	385938	13	7	153	715	<1	6.3	<0.008	1515
77087	5374600	385939.5	20	28	146	608	<1	18	<0.008	1525
77088	5374598	385940.5	11	11	160	605	<1	7.2	<0.008	689
77089	5374595	385941.3	12	18	188	884	<1	2.5	<0.008	452
77090	5374592	385943.1	18	19	147	604	<1	4.7	<0.008	842
77091	5374589	385944.4	15	28	142	534	<1	7.4	<0.008	1145
77092	5374587	385944.9	14	24	150	498	<1	6.5	<0.008	897
77093	5374584	385946.4	27	23	131	764	<1	4.9	<0.008	983
77094	5374581	385946.6	2	<3	148	623	<1	3.3	<0.008	643
77095	5374578	385947.4	8	8	109	496	<1	††	<0.008	576
77101	5374446	385518.5	2	16	95	448	<1	5.3	<0.008	1050
77102	5374443	385519.5	3	48	173	908	<1	10	<0.008	1335
77103	5374441	385520.8	<2	18	125	978	<1	5.1	<0.008	1300
77104	5374438	385522.6	<2	24	102	682	<1	4.1	<0.008	1825
77105	5374436	385522.8	6	758	868	1344	<1	9.2	<0.008	1470
77106	5374434	385524.5	<2	34	119	1095	<1	2.5	<0.008	1255
77107	5374431	385524.6	4	33	208	950	<1	3.8	0.01	1480
77108	5374429	385526.3	74	185	264	1215	<1	9.8	<0.008	1465
77109	5374427	385526.6	2	18	169	1286	<1	4.5	<0.008	1330
77110	5374425	385528.1	2	21	161	932	<1	3.7	<0.008	1120
77111	5374423	385529.7	2	14	101	514	<1	1.8	<0.008	350
77112	5374420	385530.2	4	45	189	945	<1	8.9	0.008	1880
77113	5374418	385532.5	3	36	172	990	<1	2	<0.008	1570
77114	5374415	385532.7	2	<3	120	783	<1	2.5	<0.008	1070
77115	5374415	385534.6	2	8	62	512	<1	1.7	<0.008	808
77116	5374412	385534.7	2	10	44	294	<1	1.4	<0.008	758
77117	5374409	385536.7	8	112	170	637	<1	23	<0.008	942
77118	5374408	385537.7	13	55	82	1197	<1	17	<0.008	783
77119	5374405	385537.7	14	29	95	347	<1	16	<0.008	565
77120	5374402	385539.8	4	13	68	201	<1	3.1	<0.008	918
77121	5374401	385541	2	11	57	283	<1	3.2	<0.008	1060
77122	5374399	385541.6	4	14	68	418	<1	3.1	<0.008	1455
77123	5374395	385542.5	3	<3	46	204	<1	2.1	<0.008	589
77124	5374385	385550.3	6	30	82	412	<1	0.7	<0.008	1105
77125	5374382	385551.5	6	17	92	522	<1	2	<0.008	928
77126	5374379	385552.8	11	35	127	446	<1	0.6	<0.008	1085
77127	5374377	385554.2	79	46	120	598	<1	3.4	0.009	1360
77128	5374376	385555.4	18	35	71	403	<1	11	<0.008	1535
77129	5374374	385556.8	26	25	230	480	<1	11	<0.008	834
77130	5374372	385558.4	55	37	214	532	<1	16	<0.008	759
77131	5374371	385559.1	17	22	100	483	<1	<0.5	<0.008	1820
77132	5374369	385560.3	11	34	45	346	<1	-	0.009	1410
77133	5374367	385560.7	21	30	57	278	<1	13	<0.008	1635
77134	5374365	385562.8	8	61	76	496	<1	7.8	<0.008	1830
77135	5374363	385564.1	14	44	90	380	<1	12	0.012	2845
77136	5374361	385564.3	11	58	69	321	<1	50	0.01	3030
77137	5374360	385567.2	10	48	134	536	<1	5.7	<0.008	3935
77138	5374359	385568	7	37	92	490	<1	21	<0.008	1690
77139	5374357	385569.3	3	7	85	317	<1	2.6	<0.008	1995
77140	5374355	385570.5	2	23	185	548	<1	2.4	0.01	2145
77141	5374354	385572.5	2	17	149	422	<1	2	0.009	3035
77142	5374352	385575.5	3	14	124	508	<1	2.3	0.009	3045
77143	5374351	385577.2	8	103	196	473	<1	4.2	<0.008	2920
77144	5374349	385578.7	16	170	194	769	<1	16	0.009	222
77145	5374346	385580.7	25	487	451	827	<1	35	<0.008	289
77146	5374347	385583.2	4	106	183	821	<1	9.4	0.008	1575

<i>Igc_samp</i>	<i>Igc_n</i>	<i>Igc_e</i>	<i>Cu</i>	<i>Pb</i>	<i>Zn</i>	<i>Mn</i>	<i>Ag</i>	<i>As</i>	<i>Au</i>	<i>Ba</i>
77147	5374350	385584.6	2	13	112	319	<1	1.9	<0.008	2010
77148	5374351	385587.6	2	14	76	354	<1	3.3	<0.008	2045
77149	5374349	385591	4	86	420	774	<1	1.3	<0.008	1945
77150	5374347	385593.2	30	31	199	679	<1	10	<0.008	1640
77151	5374346	385595.2	561	908	1389	279	7	21	0.011	883
77152	5374345	385597.3	47	100	189	721	3	50	0.008	2525
77153	5374345	385599.4	89	12	101	382	<1	10	<0.008	2205
77154	5374344	385601.4	25	9	96	396	<1	3.6	0.009	1595
77155	5374343	385603.6	12	11	91	237	<1	6.6	<0.008	1780
77156	5374342	385606.4	16	22	88	263	1	1.1	<0.008	1875
77157	5374342	385608.7	5	15	116	289	<1	1.1	0.008	1315
77158	5374341	385610.9	15	18	140	325	<1	5	<0.008	1735
77159	5374341	385613.7	7	48	119	341	<1	1.5	0.01	1505
77160	5374340	385615.7	5	11	114	430	<1	1.8	<0.008	1735
77161	5374340	385617.9	2	12	90	214	<1	1.2	<0.008	1195
77162	5374340	385620.8	2	13	94	212	<1	1.5	0.01	1640
77163	5374340	385623	7	22	88	253	<1	0.9	0.008	1810
77164	5374339	385625.9	6	9	96	215	<1	1.2	<0.008	2345
77165	5374339	385629.1	11	17	111	267	<1	7.4	<0.008	2445
77167	5374339	385633.9	21	36	107	263	<1	3.7	<0.008	2130
77168	5374339	385636.7	11	73	119	287	<1	2.6	0.009	1930
77169	5374340	385639.3	4	224	163	366	<1	21	<0.008	1680
77170	5374340	385642	5	18	104	218	<1	2.2	<0.008	1740
77171	5374341	385645.2	4	20	103	219	<1	1.8	<0.008	1310
77172	5374341	385647.6	3	20	134	411	<1	3.3	0.008	1270
77173	5374342	385650.4	3	8	134	667	<1	1.6	<0.008	978
77174	5374343	385652.5	<2	10	129	450	<1	4.7	0.011	981
77175	5374344	385654.9	3	17	109	358	<1	0.7	<0.008	1275
77176	5374345	385657.1	2	29	90	298	<1	10	0.026	1510
77177	5374346	385659.7	2	28	150	430	<1	6.9	0.01	1820
77178	5374347	385662.3	17	744	191	462	5	50	0.01	397
77179	5374348	385665.2	22	401	437	<3	<1	22	0.009	1765
77180	5374349	385667.6	107	407	93	442	590000	50	0.022	306
77181	5374350	385669.4	6	72	78	303	1	22	<0.008	1770
77182	5374352	385671.2	3	59	125	560	1	20	0.013	1765
77183	5374353	385673.3	55	333	754	863	3	20	0.016	942
77184	5374354	385674.9	25	244	434	823	1	16	0.042	1025
77185	5374355	385676.4	3	47	132	778	<1	4.4	0.012	1310
77186	5374357	385677.9	2	22	78	521	<1	1.5	0.018	1630
77187	5374358	385679.3	2	16	110	629	<1	21	0.013	1470
77188	5374360	385681.1	9	32	94	528	<1	10	0.016	1090
77189	5374361	385682.7	2	18	96	755	<1	4.2	0.018	1185
77190	5374364	385684.5	24	86	1272	1502	<1	19	0.01	1645
77191	5374366	385686.3	2	23	112	779	<1	2.7	0.012	1435
77192	5374367	385688	3	38	121	621	<1	8.8	0.011	1155
77193	5374369	385689.2	4	17	124	1418	<1	3.7	0.016	1105
77194	5374371	385690.6	16	36	112	3756	<1	21	0.012	655
77195	5374373	385691.6	2	26	109	899	<1	3.9	0.008	1080
77196	5374374	385692.6	63	66	153	845	<1	16	0.01	822
77197	5374377	385694.5	14	431	756	830	1	34	0.016	1310
77198	5374379	385695.8	2	36	176	892	<1	5.1	0.013	1355
77199	5374382	385697.5	5	92	173	959	<1	23	0.01	1445
77200	5374384	385698.6	4	36	176	738	<1	3.6	0.008	1300

**APPENDIX 5**

**Review of Lakeside Geophysical Surveys, Tullah EL 22/90**

**P.W. Basford**



# MEMORANDUM

**TO:** NK McGunnigle  
**FROM:** PW Basford  
**DATE:** 9 August 1996  
**REF:** pwb\96248  
**SUBJECT:** REVIEW OF LAKESIDE GEOPHYSICAL SURVEYS-TULLAH EL22/90

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## SUMMARY

The Lakeside prospect was initially discovered by testing an Induced Polarization (IP) anomaly with drill hole MRP212. Subsequent geophysical tests indicate it is detectable by a variety of techniques, responses being associated with either disseminated or massive sulphide mineralisation. Lorrigans Luck (formerly the Arsenic Resource) was also discovered after drill testing a coincident IP, magnetic and DIGHEM anomaly (STP217).

## CONCLUSION

Geophysics is a useful tool in the exploration for Lakeside and Lorrigans Luck style mineralisation. IP is also useful in the detection and location of the Henty Fault. Several IP anomalies between Lakeside and Lorrigans Luck appear untested and may be associated with mineralisation. The area between the two prospects has not been fully tested, geophysically and geologically.

IP data infers the presence of transfer faults displacing the Henty fault, one of which is interpreted to exist parallel to line 5100N. The presence of such a feature may indicate why there is no apparent southern extension to the Lakeside prospect.

## RECOMMENDATION

1. The high chargeability response in the gradient array data on the Henty fault, line 4700N, 4640E should be investigated. This is located behind the collar of STP232.
2. The IP anomaly on line 5100N, 4700E should be investigated. This feature appears to be associated with a transfer fault.
3. Reinvestigate the DHEM on hole RED88-2, and results for hole RED88-4 which was drilled to test the EM anomaly but did not intersect its original target as a result of the hole lifting. Note that there was mineralisation in hole RED88-4.
4. Follow up on down-dip extension from hole RED87-2. Uncertain if this has been done.

## INTRODUCTION

This memorandum outlines the geophysical work carried out over the Lakeside prospect and surrounding areas to the Lorrigans Luck prospect, and reviews previous interpretations. Initial work was carried out by EZ, with the later work by Billiton.

## GEOPHYSICAL DATA

In 1988 Nigel Hungerford authored the 'Report on Lakeside Geophysical Surveys Late 1987', which outlined the geophysical work carried out over the Lakeside prospect and related the responses to some drill hole intersections. A limited number of techniques and systems have been used over the prospect, limited also by the Rosebery Lake stopping surveying at the north end of the prospect.

Ground surveys conducted over Lakeside and reported by Hungerford (1988) include gradient array and spectral induced polarisation, MALM, a single line of gravity, UTEM, DHEM and DHIP. Several generations of aeromagnetic data exist over the area as well as a DIGHEM data set. The report indicates that all techniques observe the Lakeside prospect (sulphides) to some degree with the exception of gravity. Data collected both prior to and after 1987 is

also reviewed.

Mineralisation is associated with semi-massive pyrite and arsenopyrite with various amounts of chalcopyrite and pyrrhotite, hosted within the Farrell Slates close to the Henty Fault. A 20m alteration halo is supposed to exist around the mineralisation.

The initial hole MRP212 was targeted on an IP anomaly in search for Sn. The interpretation indicated that the strike length of the anomaly is 300m. The Gradient array IP survey was conducted by Scintrex in 1979 (Howland-Rose 1979). Chargeability anomalies can be observed on lines 5100N, 5200N, 5300N, 5400N, 5500N and 5600N, indicating a possible strike length of 500m. The prospect of deeper extensions both north and south (data was collected further north but no clear anomalism was observed) still needs to be investigated. A dipole-dipole survey was carried out on line 5300N, with a large chargeability anomaly indicated in the data, centred at 384700E. Ground magnetic data was also collected over the grid and a weak magnetic anomaly was inferred to be coincident with the IP response.

DIGHEM data collected prior to 1987 indicates a response over the Lakeside prospect, however, it is not a distinct anomaly. It apparently links up with the response observed over the Lorrigans Luck prospect.

Two lines of spectral IP were carried out over lines 5100N and 5300N in 1987, both of which have been compared to the 1979 gradient array data. The spectral IP data indicates an anomalous response coincident with drill hole intersections. Chargeability data also indicates the location of the Henty fault. Hungerford inferred that both the mineralisation and Henty fault are also detectable in the gradient array data.

An alternative interpretation for the IP data on line 5100N is proposed. Chargeability data (and gradient array data) infers that the line may run parallel to a transfer fault, with the Henty fault located at both 4560E and 4700E. A chargeability high also occurs at 4700E which is coincident with a strange time constant anomaly. It is not clear if this feature has been drilled, however, if a transfer fault occurs here then this could indicate an offset extension to Lakeside.

The Hungerford report (1988) mentions the use of down hole IP, however, no data was presented.

The MALM data presented by Hungerford (1988) is somewhat confusing with chargeability data indicating a different response to the potential data. Data was not recorded as far east as necessary for a full interpretation. The chargeability high at 4460E, 5150N was not explained.

A single line of gravity along line 5300N (best mineralisation intersection) is not conclusive as to its potential to detect the mineralisation, or use as an exploration tool. A positive result from the survey is that the fault appears to have been detected, indicating close spaced gravity along lines may be useful in further exploration to locate the Henty fault.

Three lines of UTEM data were collected (5300N, 5200N and 5100N) in 1987. Data indicates the mineralisation to exist under the glacial cover at around 40-50m, coincident with the up-dip extension of intersected mineralisation. Other conductors were located and some drill tested (MR1, MR2 and RED86-1) intersecting a graphitic unit. A weak conductor may exist around 4820E on line 5100N. All UTEM responses indicate limited depth potential.

Down-hole EM data indicates a good response to the massive mineralisation. Data for holes RED87-2 and RED87-6 are presented in Hungerford, 1988. Most of the responses can be attributed to mineralisation intersected in the hole (in-hole response), however, the interpretation for hole RED87-2 inferred the response to be indicative of an in-hole with a significant down-dip component to the conductor. This partly contradicts the UTEM interpretation, however, the EM response from the surface may be masked by the glacials.

South of Lakeside several surveys were carried out to determine if the mineralisation extended to the Lorrigans Luck prospect, located on line 4500N. A fixed loop SIROTEM survey was conducted in 1988 on the North Sterling Valley grid (Hall et al, 1988b), as was gradient array IP and a ground magnetic survey (Hall et al., 1988a). SIROTEM data was collected on lines 4500N to 5000N (100m line spacing), whilst ground magnetic and IP data were collected on lines 4600N to 5100N. A single line of Max-Min data was also collected on line 5300N.

The SIROTEM data does not contain any obvious anomalies, nor did the data indicate the presence of the fault. The loop was located to the east of the Henty fault which would have reduced coupling strength to east dipping conductors. The proposition that there are no conductors present and that the area has been tested between Lakeside and Lorrigans Luck is tenuous. Due to poor coupling, masking effects of the Farrell slates and the possibility of deeper conductors, the area still remains open.

The location of the Henty fault can be interpreted from the gradient array IP data, however, the interpretation made by Billiton does not appear to fit the entire data set. There are also two small chargeability highs that may not have been investigated. One is directly on the fault on line 4700N, at 4440E, behind the collar of STP232, the other smaller anomaly is on line 4600N at 4520E. A transfer fault has been interpreted between line 4700N and 4600N and the chargeability anomaly on line 4600N may be associated with that fault.

Ground magnetic data is dominated by the magnetic high associated with Lorrigans Luck, as well as the large negative anomaly which is associated with alteration. A small high along strike from the larger magnetic responses is located over the southern limit of the Lakeside prospect (5100N, 5000E). Data also displays a small single point low on lines 5100N, 5000N, 4900N and 4800N. If this feature is real, then an oblique cross structure exists in the area running NNW to SSE along these lines, west of the Lakeside prospect.

A review of the data directly over the Lorrigans Luck has not been carried out to date. This will be done shortly.

## REFERENCES

Howland-Rose A.W., 1979. A report on a gradient array reconnaissance EIP survey over the Murchison Grid near Tullah, Tasmania on behalf of Electrolytic Zinc Company of Australasia Limited. Scintrex Report TAS-065. Pasminco Burnie Library TSV30

Hungerford N., 1988. Rosebery East Joint Venture N.W. Tasmania. Report on Lakeside Geophysical Surveys Late 1987. Billiton Report No. 08.3962. Pasminco Burnie Library TSV55A

Hall et al., 1988a. E.L. 4/73 - Sterling Valley Final Report and Report on Exploration to 6th March, 1988. Billiton Report No. 08.3912. Pasminco Burnie Library TSV55

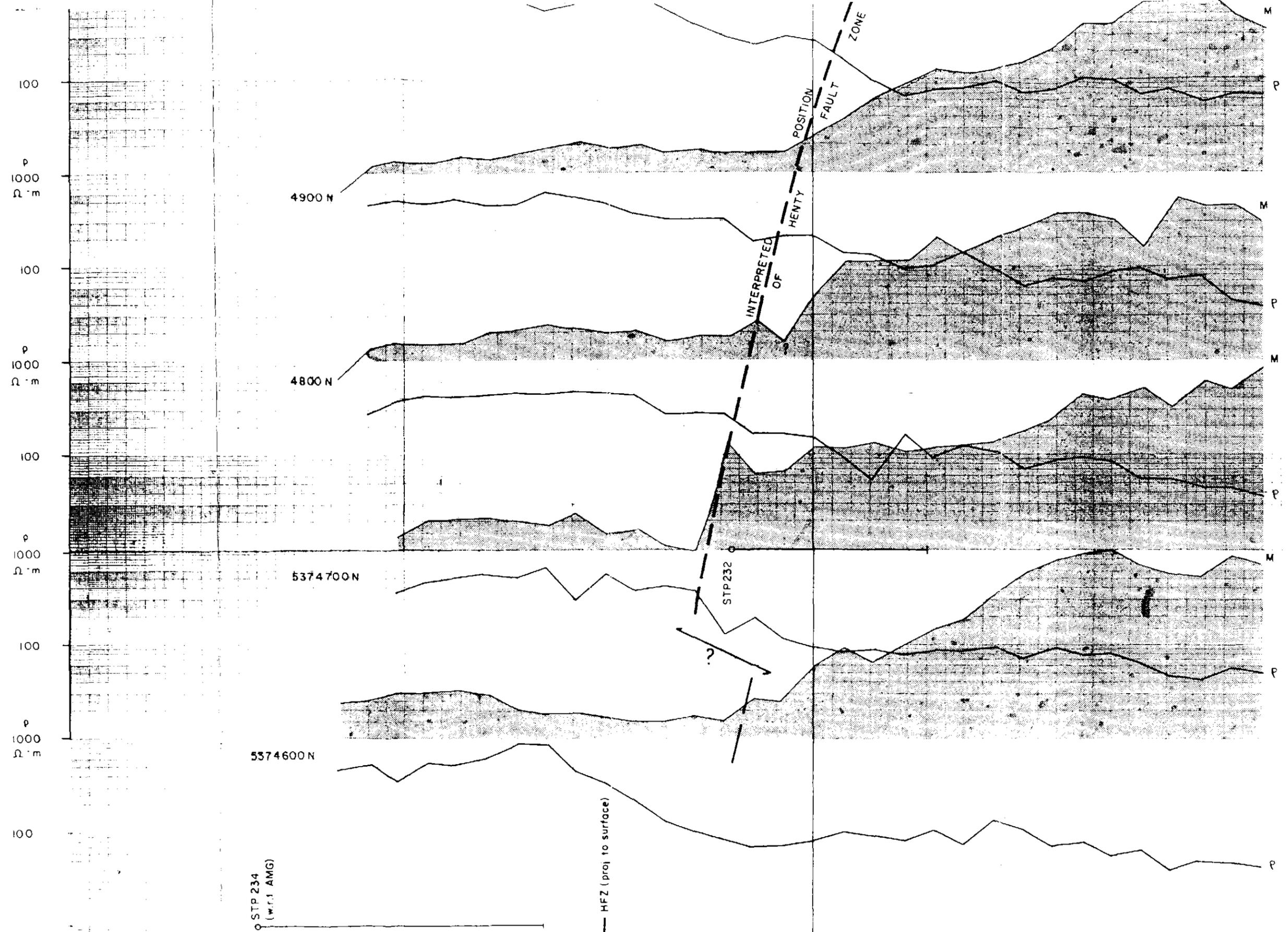
Hall et al., 1988b. E.L. 1/62 - Annual Report to 22/01/89. Billiton Report No. 08.4242. Pasminco Burnie Library TSV57

5 374 900 N  
900 N  
700 E

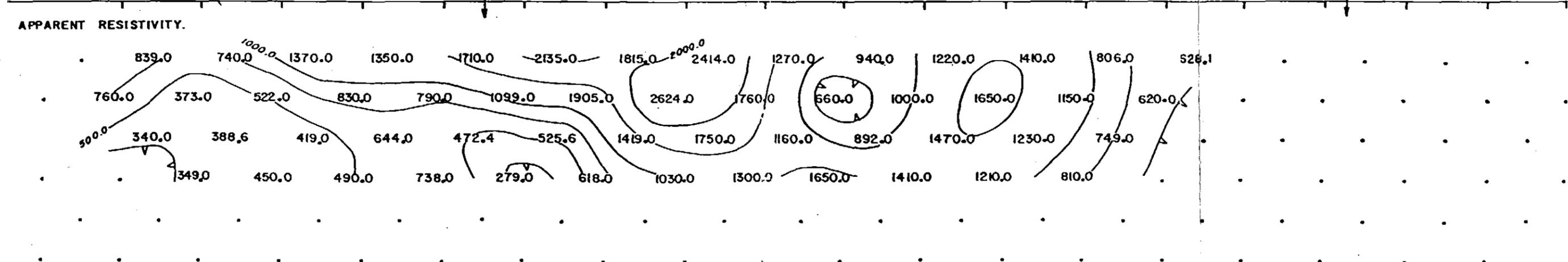
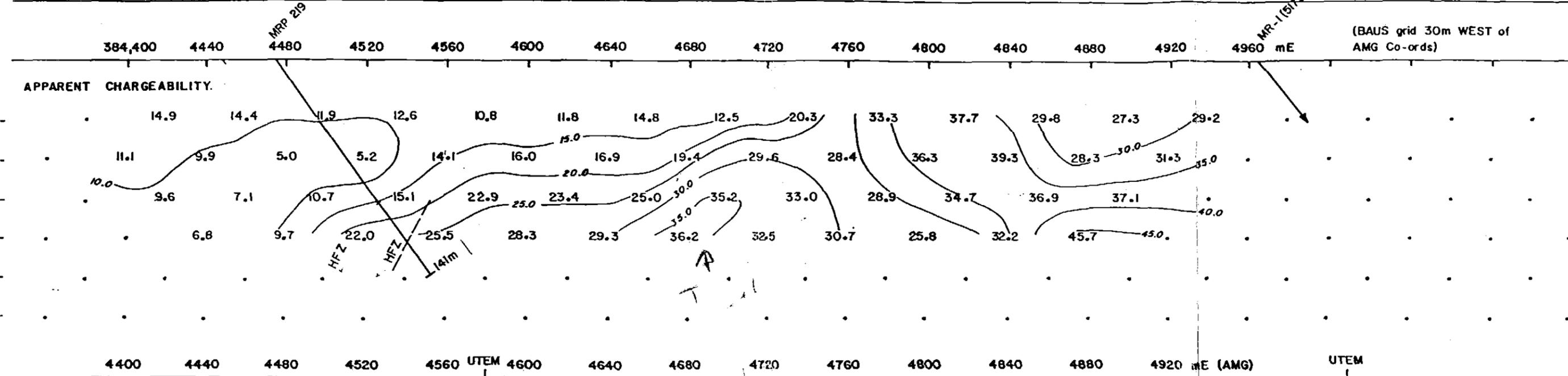
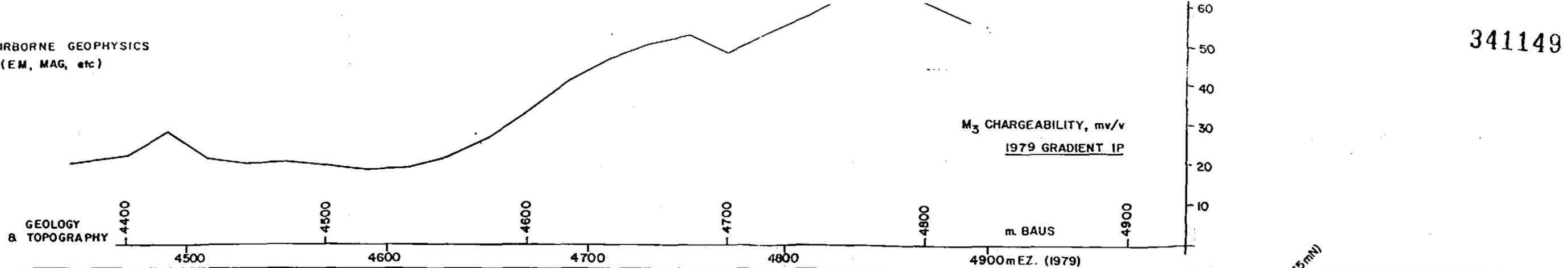
5 374 800 N

5 374 700 N

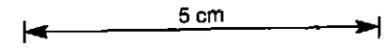
5 374 600 N



341148

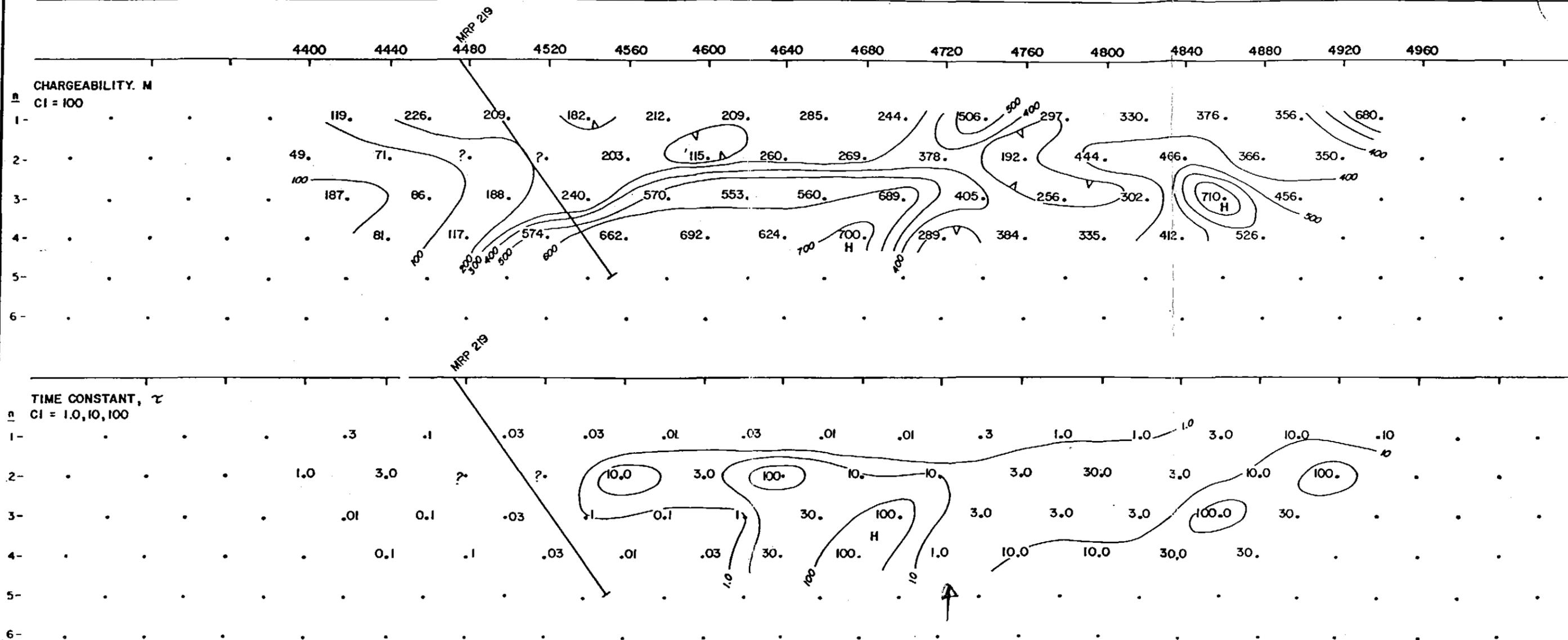


Contractor : SCINTREX  
 Date : 11/87  
 Timing : 2 sec.  
 Transmitter : 10KW  
 Receiver : IPR-II  
 Integration time : Mo-Mg(30-1770ms)  
 Array : DIPOLE-DIPOLE  
 Dipole length : 40m



<b>Billiton Australia</b>		
Project: ROSEBERRY EAST J.V. LAKESIDE PROSPECT		
Title: I.P./RESISTIVITY SURVEY LINE 5,375,100N		
Author: N.H.	Date:	Scale: 1:2,000
Drawn: 12/87	Office: AHK	Revised: Date:
Drawing No.: LJ50/1104	Fig. No. 5	

GEOLOGY  
& TOPOGRAPHY



Contractor : SCINTREX  
 Date : 11/87  
 Timing : 2 sec.  
 Transmitter : 10 KW  
 Receiver : IPR-II  
 Integration time : Mo-M<sub>9</sub> (30-1770 ms)  
 Array : DIPOLE - DIPOLE  
 Dipole length : 40m

5 cm

SPECTRAL PARAMETERS

C generally  $\leq$  0.2

<b>Billiton Australia</b>			
Project: ROSEBERY EAST J.V. LAKESIDE PROSPECT			
Title: I.P./RESISTIVITY SURVEY LINE 5,375,100N			
Author: M.H.	Date:	Scale: 1:2,000	
Drawn: 12/87	Office: A.H.O.	Revised:	Date:
Drawing No.: LJ50/103			Fig No: 6

TRANSIENT EN PROFILE

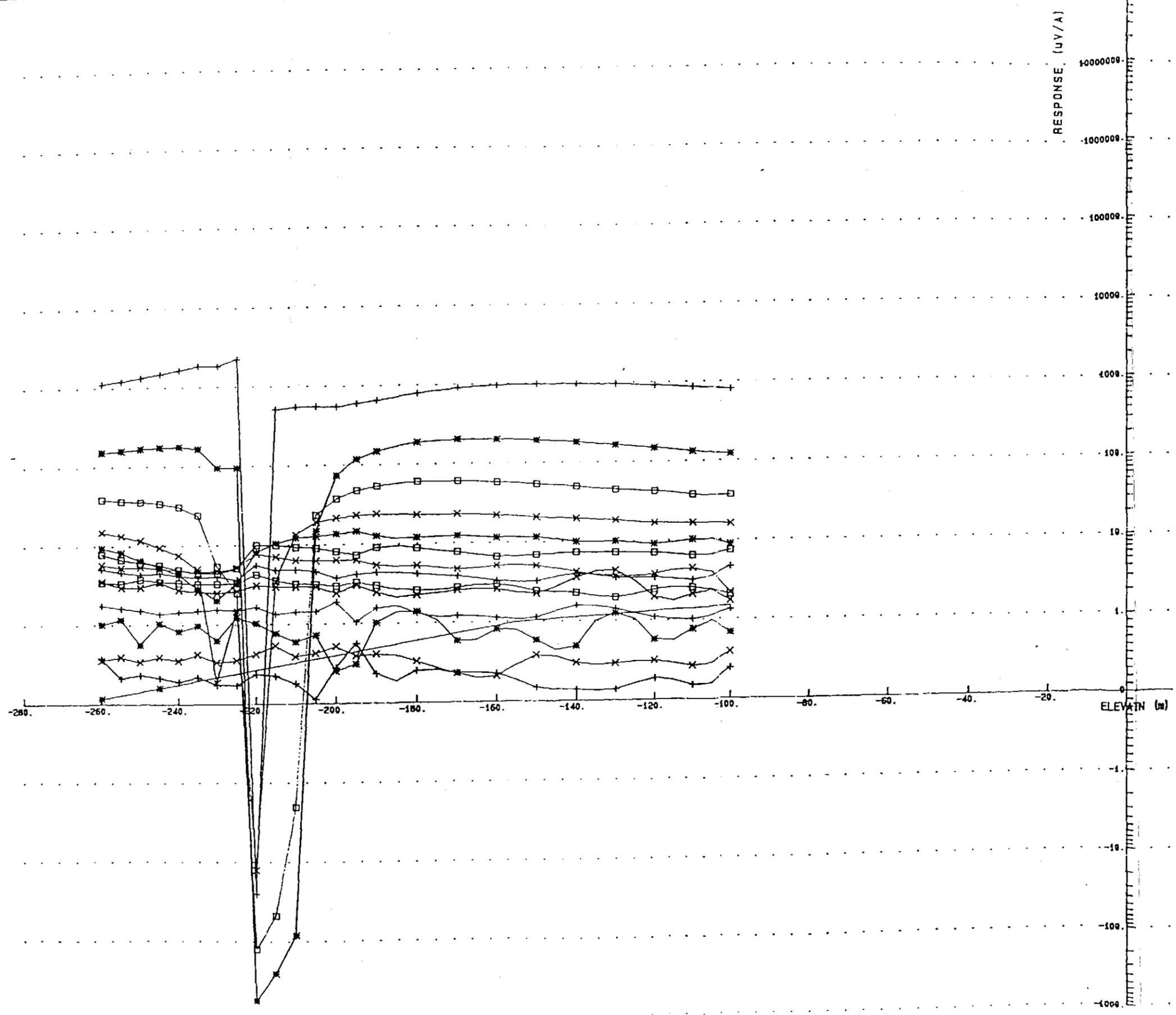
Line: D0H9863

PEBLE TEM file details

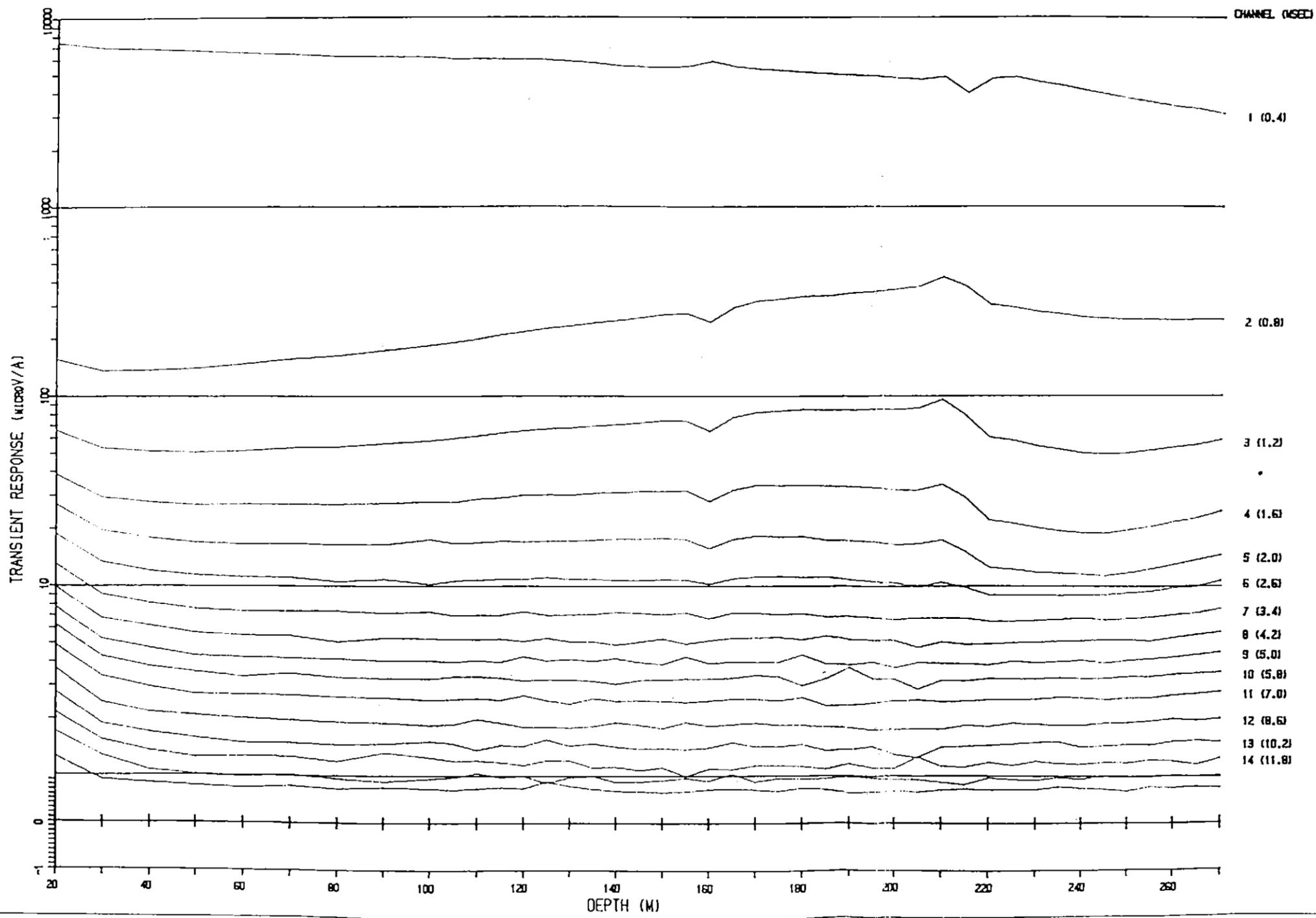
Loop config. - DOWNHOLE  
 Device type - SIROTEM  
 Rx Component - R  
 Resp turn-off - 0.14 ms  
 Tx size - 150. m x 150. m  
 Tx loop rotn. - 0 deg  
 Tx loop orig. - 4360. 5200.  
 Eff. Rx area - 10000. sq. m

Legend

- Channel 1: 0.4870ms
- \* Channel 2: 0.8790ms
- Channel 3: 1.2710ms
- x Channel 4: 1.6630ms
- \* Channel 5: 2.0550ms
- Channel 6: 2.4470ms
- x Channel 7: 2.8390ms
- + Channel 8: 3.2310ms
- Channel 9: 3.6230ms
- x Channel 10: 4.0150ms
- + Channel 12: 5.7790ms
- \* Channel 14: 7.5430ms
- x Channel 16: 9.3070ms
- + Channel 18: 11.0710ms
- \* Channel 20: 12.8350ms



BILLITON AUSTRALIA	
ROSEBERY EAST JV	
LAKESIDE SIROTEM ST	
DDH RED87-2	
FIG. NO: 21	REPT. NO:
ENCL. NO:	DRS. NO:
DATE: 12/87	AUTHOR: YH
DRAWN:	OFFICE:

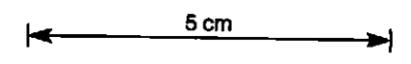


SURVEY SPECIFICATIONS

DATA ACQUISITION : WESKIMMING GEOPHYSICS P/L  
 SURVEY DATE : JUNE 1988  
 CONFIGURATION : 200M SQUARE TRANSMITTER LOOP,  
 DRILL HOLE SURVEY  
 READING INT. : 10 METRES  
 NO. OF STACKS : 612  
 TRANSMITTER : MEDIUM POWER  
 RECEIVER : SIROTEM II S/N 1236  
 CURRENT : 9.7 AMPS  
 OPERATOR : P WESKIMMING

PLOT SPECIFICATIONS

HORIZONTAL SCALE - 1:1000  
 VERTICAL SCALE - LOGARITHMIC  
 4CM. PER DECADE  
 LINEAR BETWEEN -1 AND +1

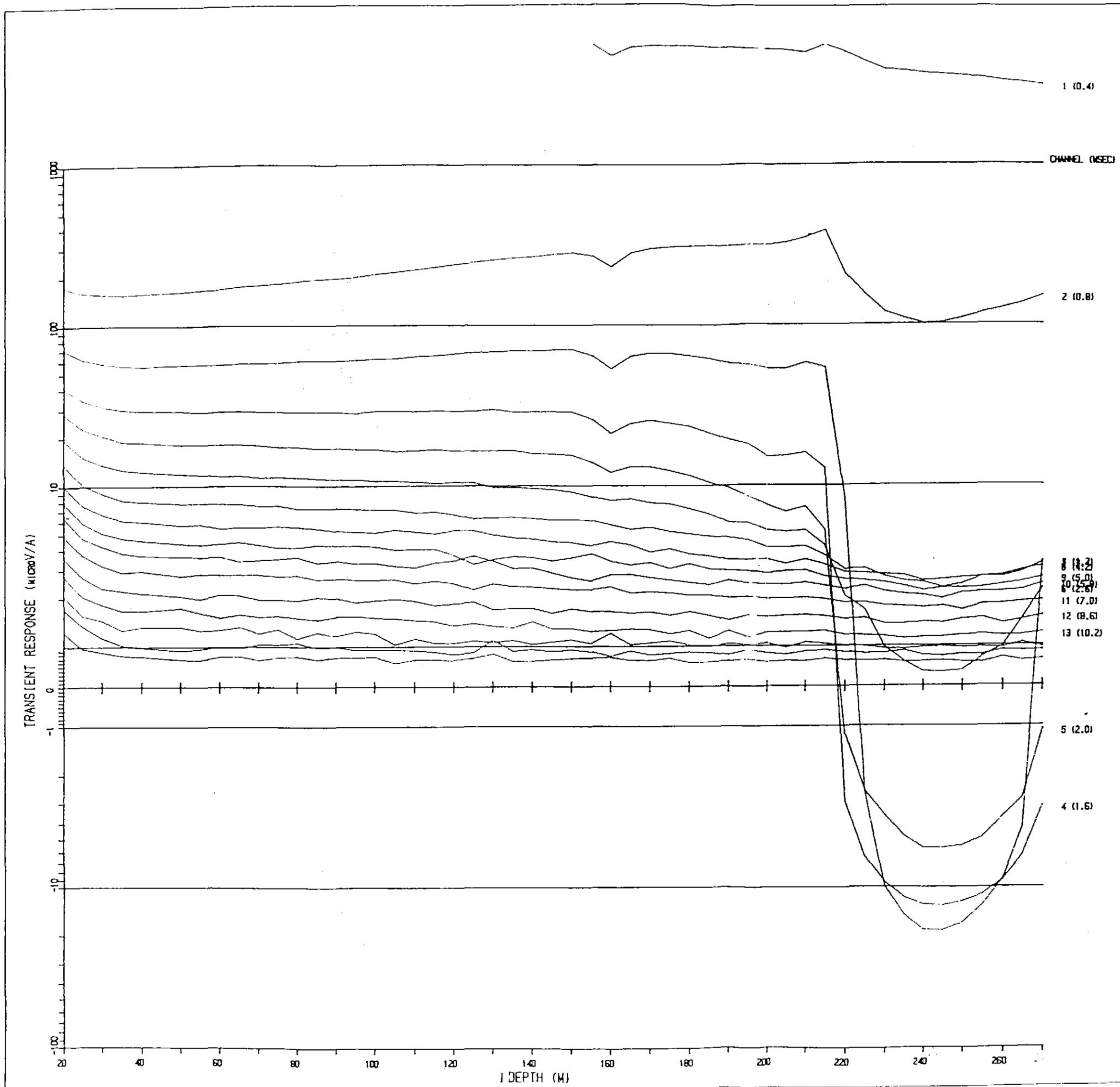


BILLITON AUST

TASMANIA  
 LAKESIDE  
 SIROTEM PROFILE  
 LINE RED 88-2 LOOP 2

SCALE - 1:1000

Fig. 23



SURVEY SPECIFICATIONS

DATA ACQUISITION : MCKIMMING GEOPHYSICS P/L

SURVEY DATE : JUNE 1988

CONFIGURATION : 200M SQUARE TRANSMITTER LOOP,  
DRILL HOLE SURVEY

READING INT. : 10 METRES

NO. OF STACKS : 512

TRANSMITTER : MEDIUM POWER

RECEIVER : SIROTEM II S/N 1236

CURRENT : 9.6 AMPS

OPERATOR : P MCKIMMING

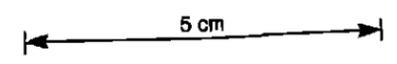
PLOT SPECIFICATIONS

HORIZONTAL SCALE - 1:1000

VERTICAL SCALE - LOGARITHMIC

10% PER DECADE

LINEAR BETWEEN -1 AND #1



BILLITON AUST

TASMANIA  
LAKESIDE  
SIROTEM PROFILE  
LINE RED 88-2 LOOP 1

SCALE - 1:1000

Fig. 24

384 000 E

4100

4200

4300

4400

384 500E

4600

4700

4800

5 375 100 N

5 375 000 N

5 374 900 N

5 374 800 N

5 374 700 N

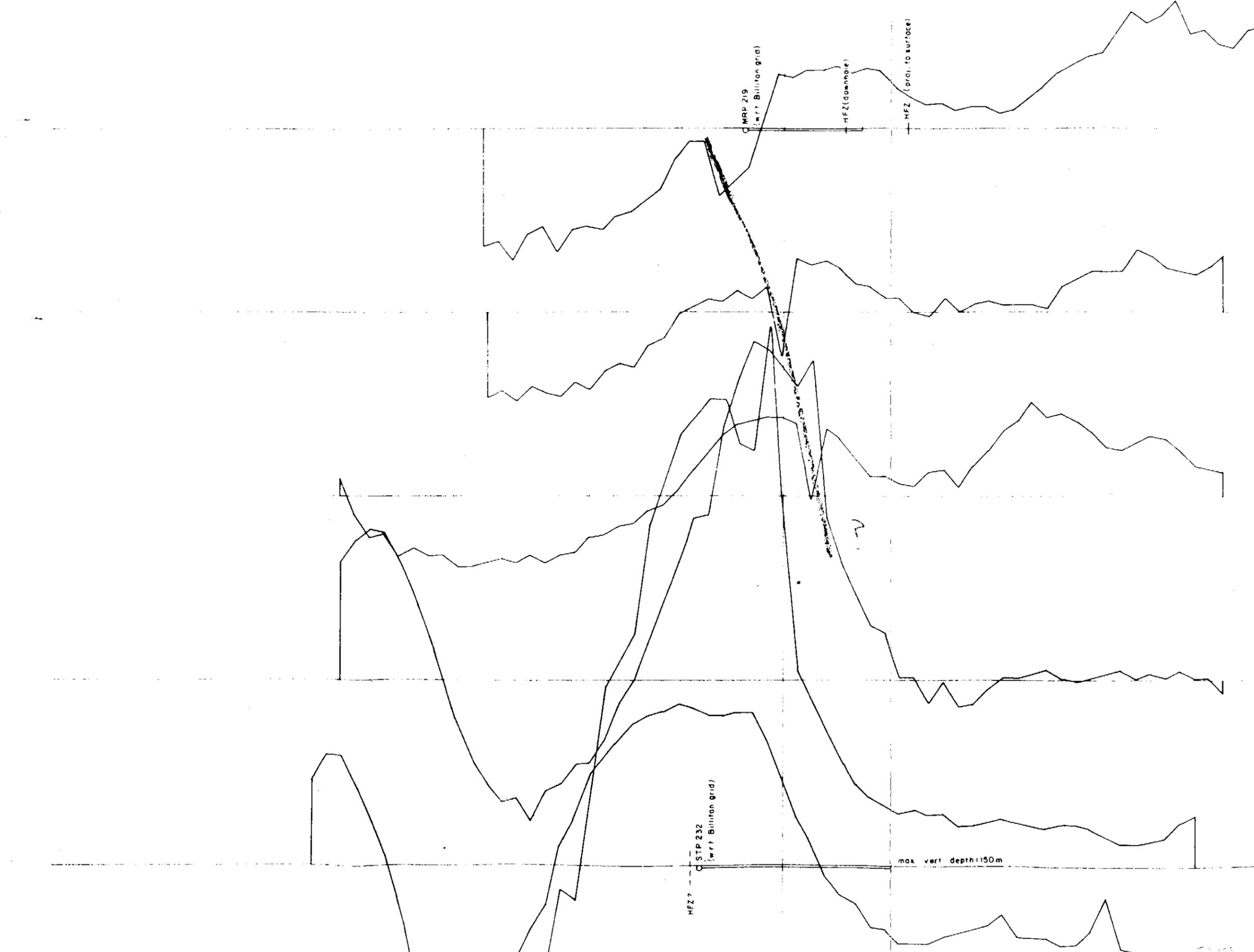
MRP 219  
(wrt Bullion grid)

HFZ (downhole)

HFZ (proj. to surface)

HFZ ?  
STP 232  
(wrt Bullion grid)

max vert depth=150m

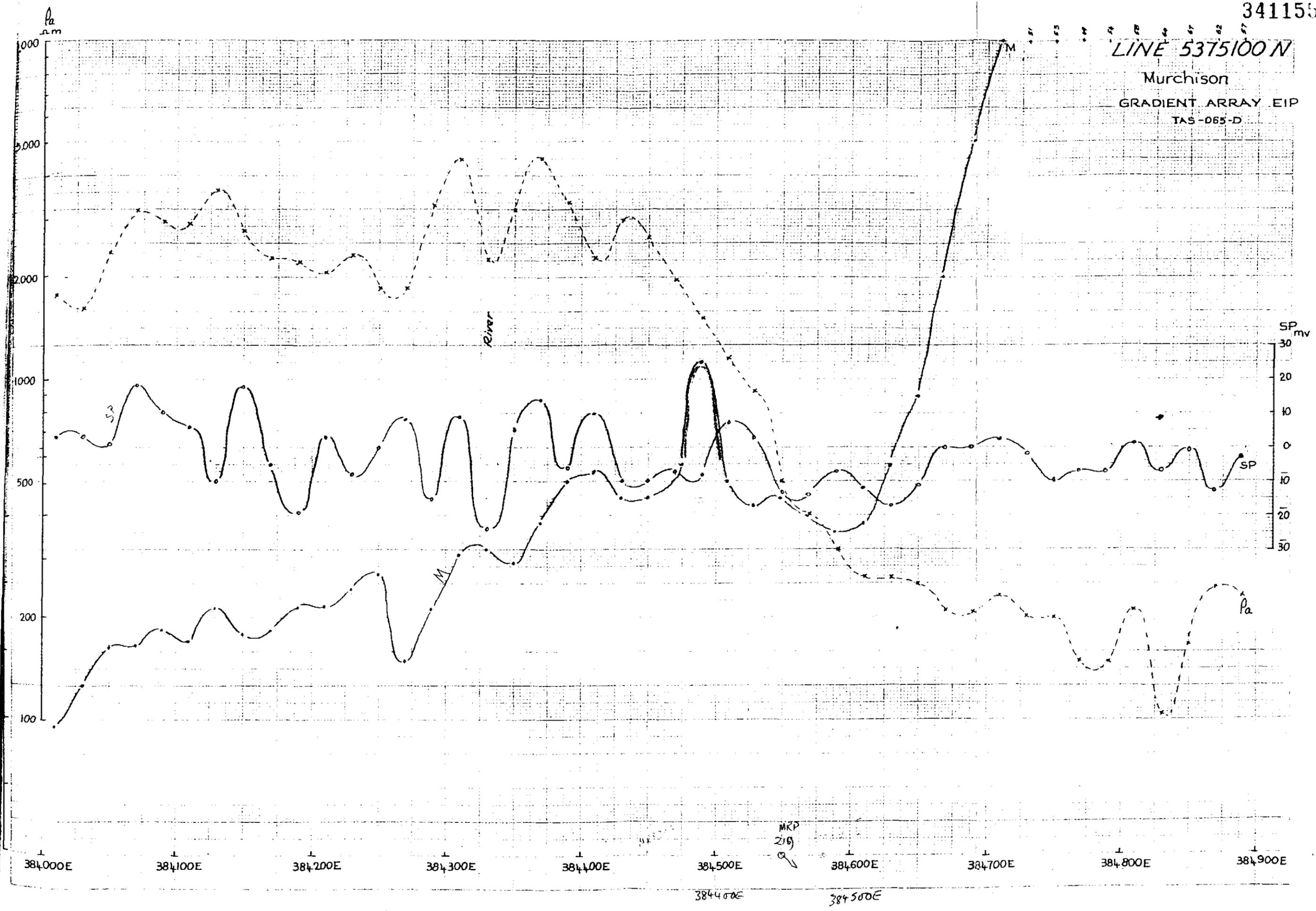


LINE 5375100 N

Murchison

GRADIENT ARRAY EIP

TAS-065-D



384000E

384100E

384200E

384300E

384400E

384500E

384600E

384700E

384800E

384900E

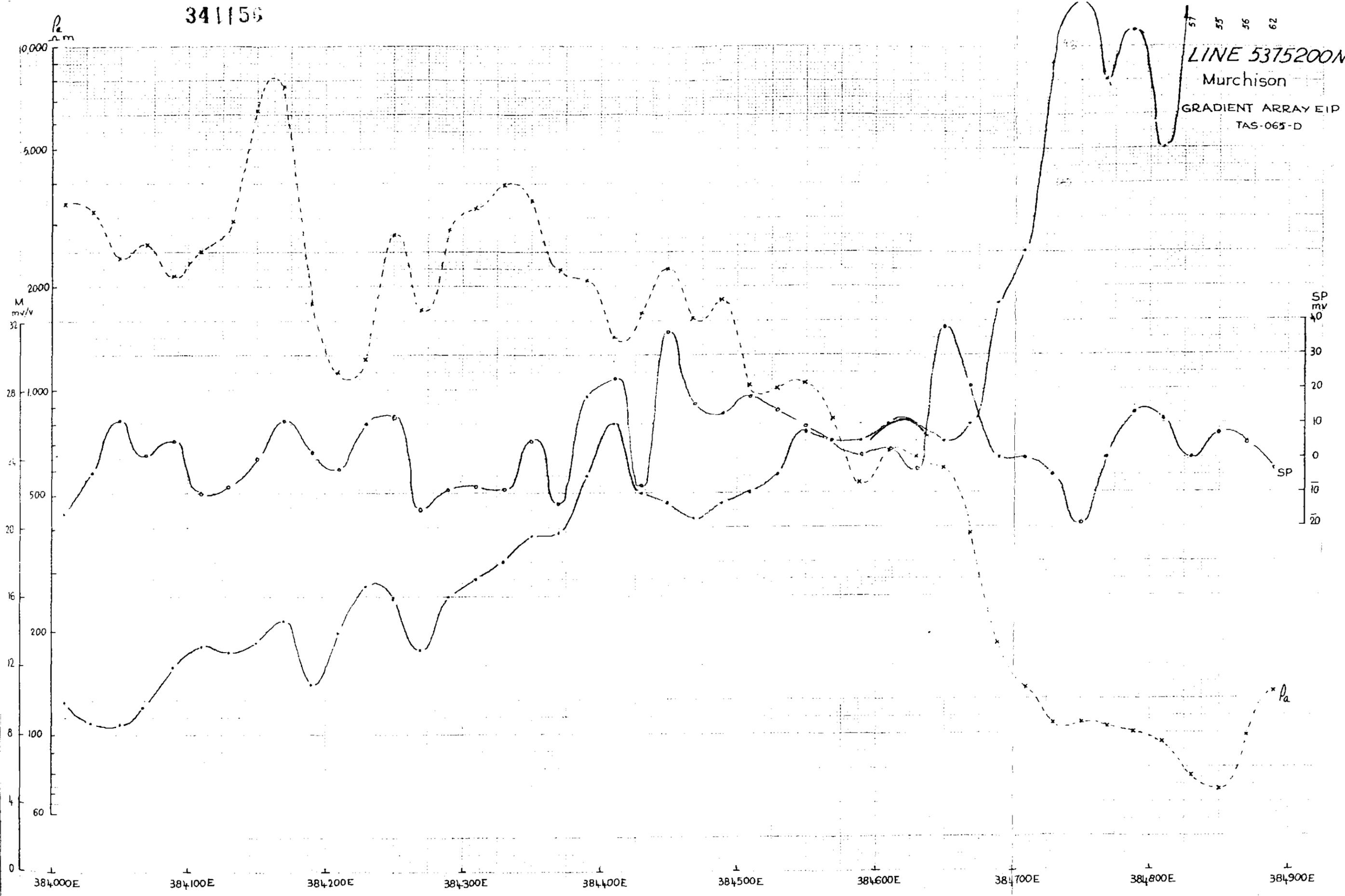
384400E

384500E

MRP  
219

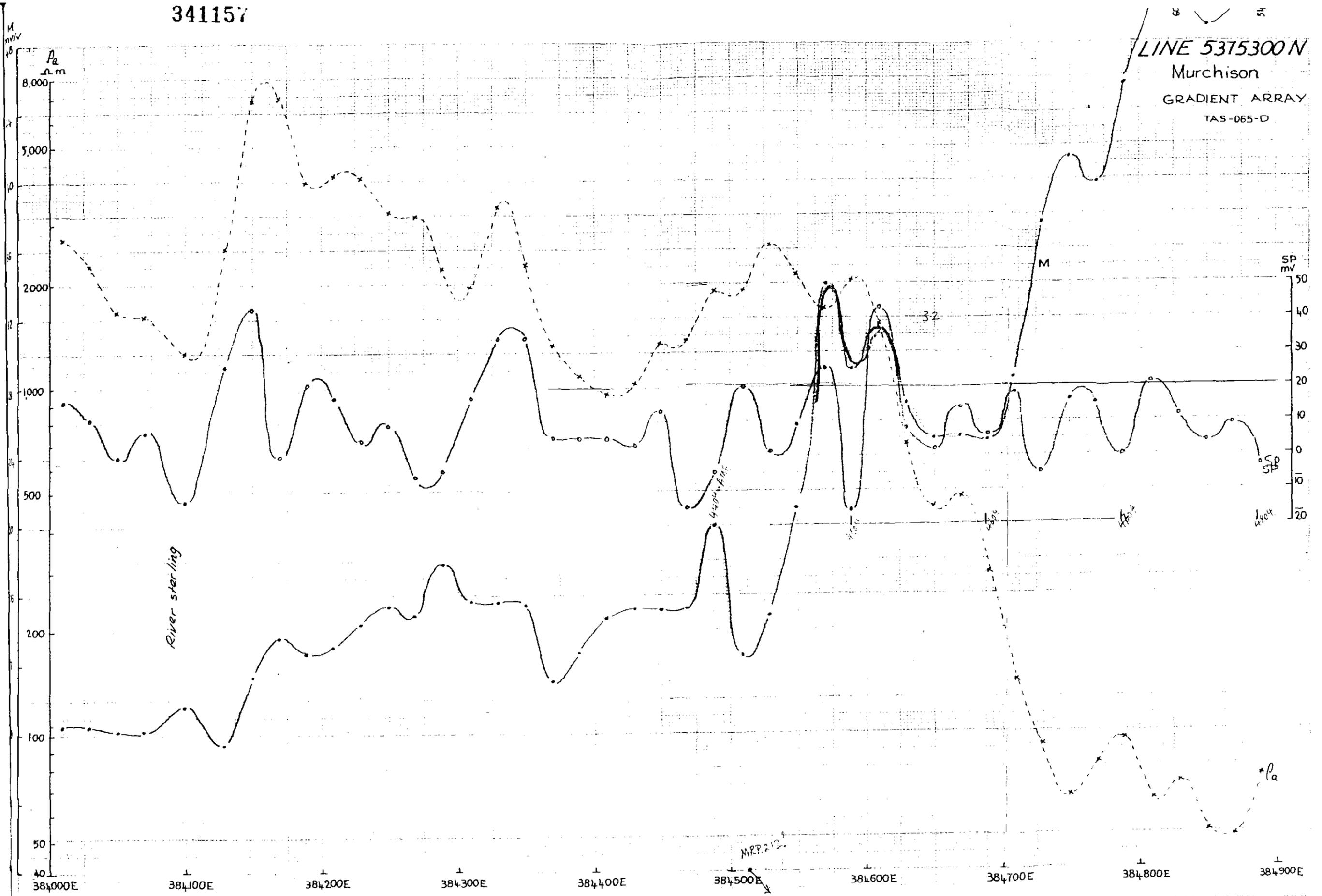
341156

51 55 56 62  
LINE 5375200N  
Murchison  
GRADIENT ARRAY EIP  
TAS-065-D



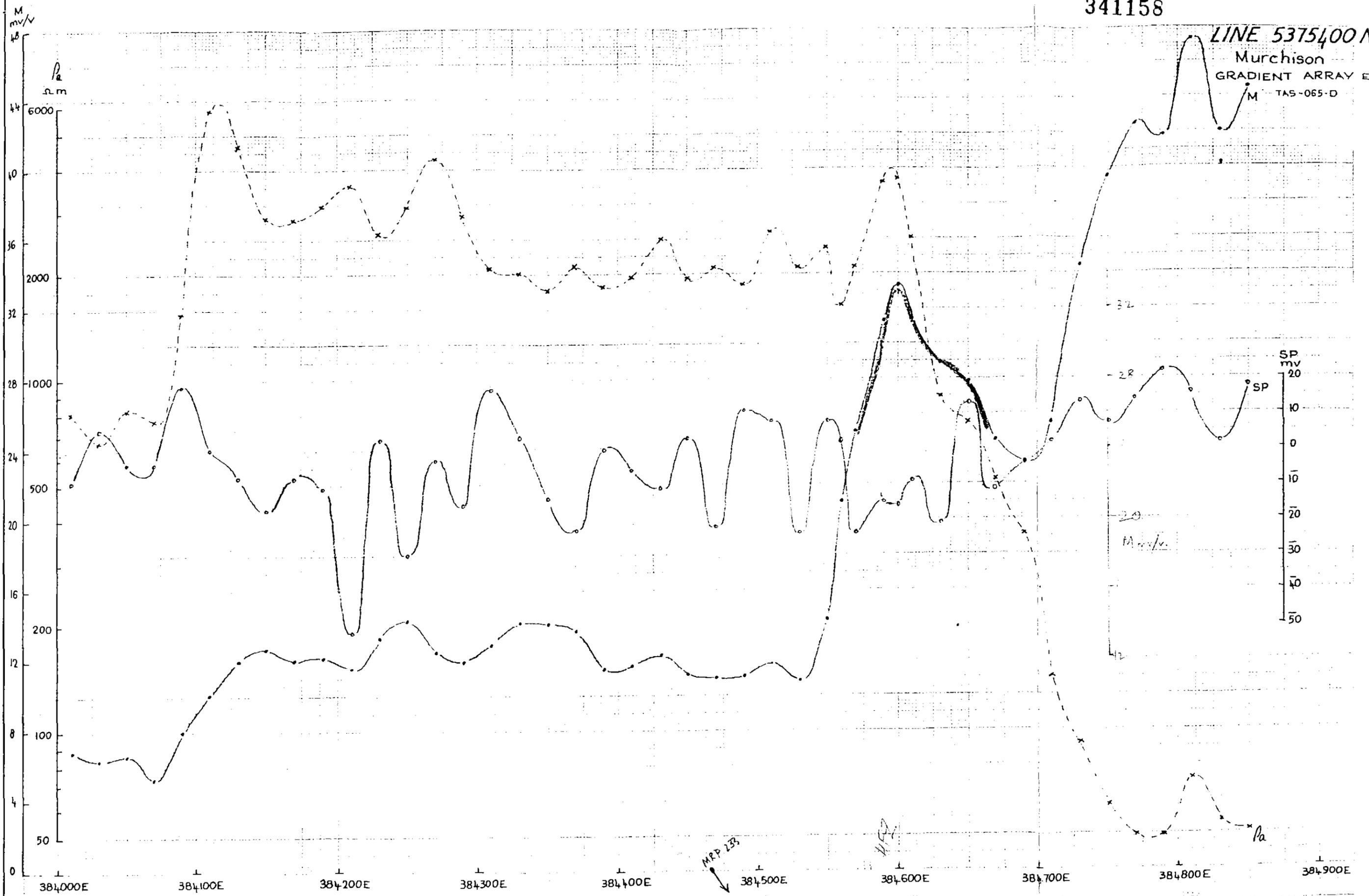
341157

LINE 5375300 N  
Murchison  
GRADIENT ARRAY  
TAS-065-D



341158

LINE 5375400 N  
Murchison  
GRADIENT ARRAY EIP  
M TAS-065-D



MRP 233  
↓

4/82

Pa

32

28

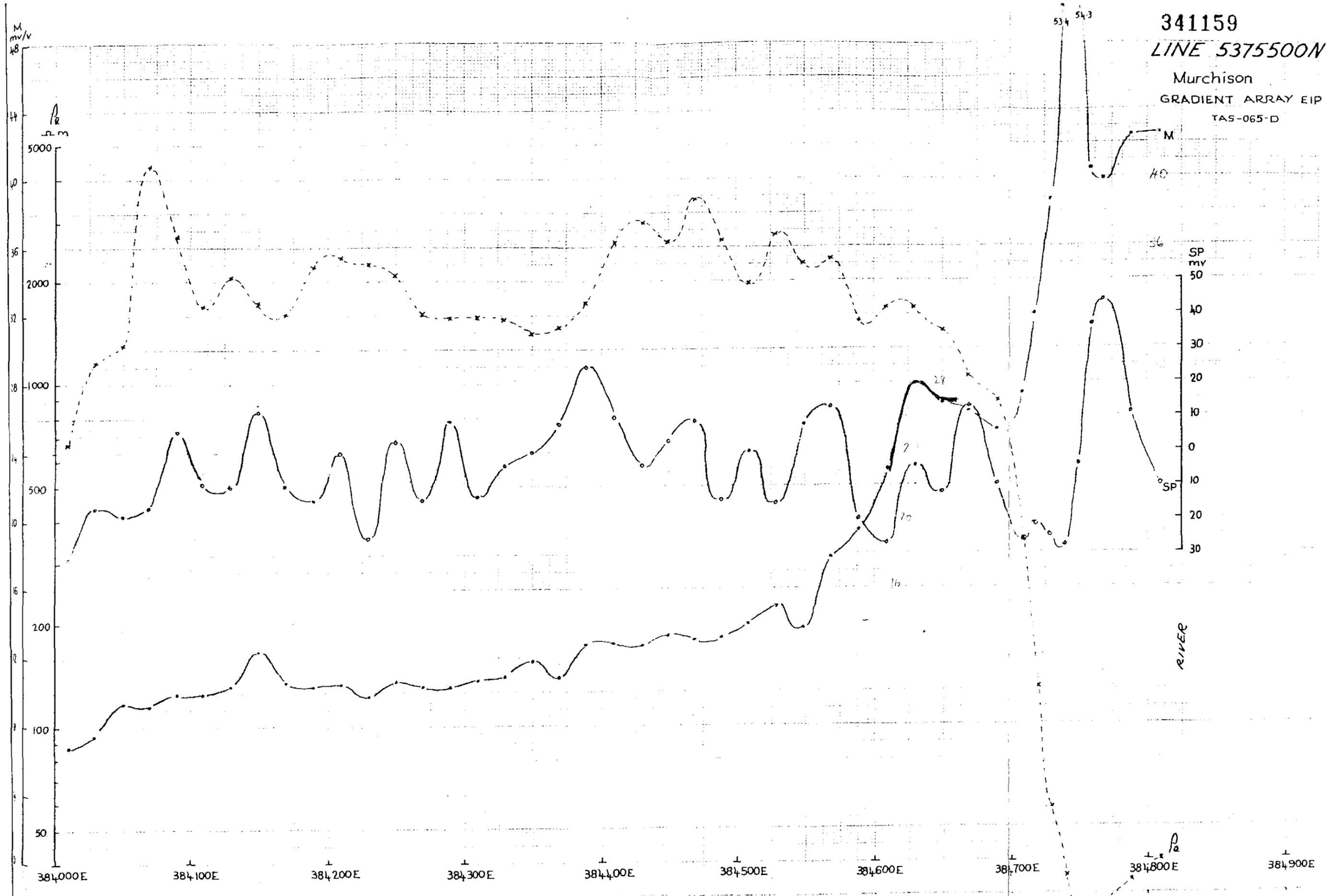
20

12

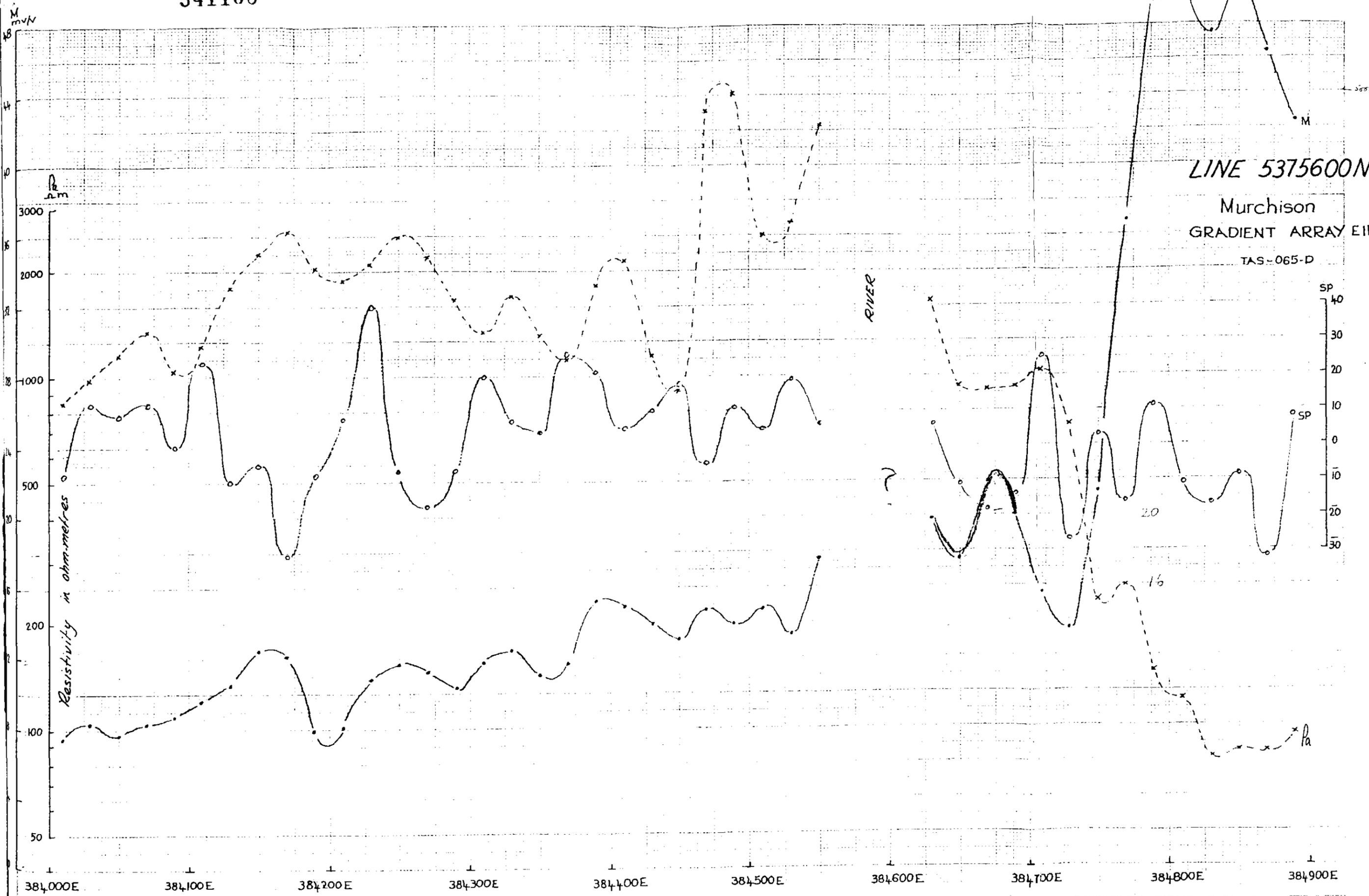
SP  
mv  
20  
10  
0  
-10  
-20  
-30  
-40  
-50

384000E 384100E 384200E 384300E 384400E 384500E 384600E 384700E 384800E 384900E

341159  
LINE 5375500N  
Murchison  
GRADIENT ARRAY EIP  
TAS-065-D



341160



LINE 5375600N

Murchison  
GRADIENT ARRAY EIP

TAS-065-D

RIVER

Resistivity in ohm-metres

SP  
40  
30  
20  
10  
0  
-10  
-20  
-30

384,000E 384,100E 384,200E 384,300E 384,400E 384,500E 384,600E 384,700E 384,800E 384,900E

20

16

Pa

M

57.8

58.5

**APPENDIX 6**

**DHEM - TF1**  
**P.W. Basford**



# MEMORANDUM

**TO:** NK McGunnigle

**FROM:** PW Basford

**DATE:** 2 October 1996

**REF:** pwb/96276

**SUBJECT:** DHEM: Tullah EL 22/90

---

## Summary

Diamond drill hole TF1 was surveyed with DHEM in the month of May, 1996. Small in-hole conductors were detected, however, these are located within the Farrell Slates sequence and do not relate to a massive sulphide at the contact of the Farrell Sequence and Murchison Volcanics.

## Conclusions and Recommendations

There are no conductive bodies evident proximal to the drill hole at the location of the contact between the Farrell Slates and Murchison Volcanics.

## Surveying

Two loops were used for the survey, one placed over the collar (loop 1-96), the other north of the collar overlying the hole at depth (loop 2-96). The survey was recorded using a 10 msec time base and 0.5 msec ramp on the receiver. The transmitter had a very fast shut off (unknown speed) which causes ringing in the primary pulse as it decays. A 15 ohm resistor was placed in the loop to decrease the amplitude of the ringing. Twenty channels of data were recorded from 0.05 to 6.2 msec. A peak current of 4 Amps was circulated through loop 96-1, with 3.5 Amps through loop 96-2. The hole was surveyed to 785m.

Due to the presence of the anomalism at 230m, the X-Y components were also surveyed. It was

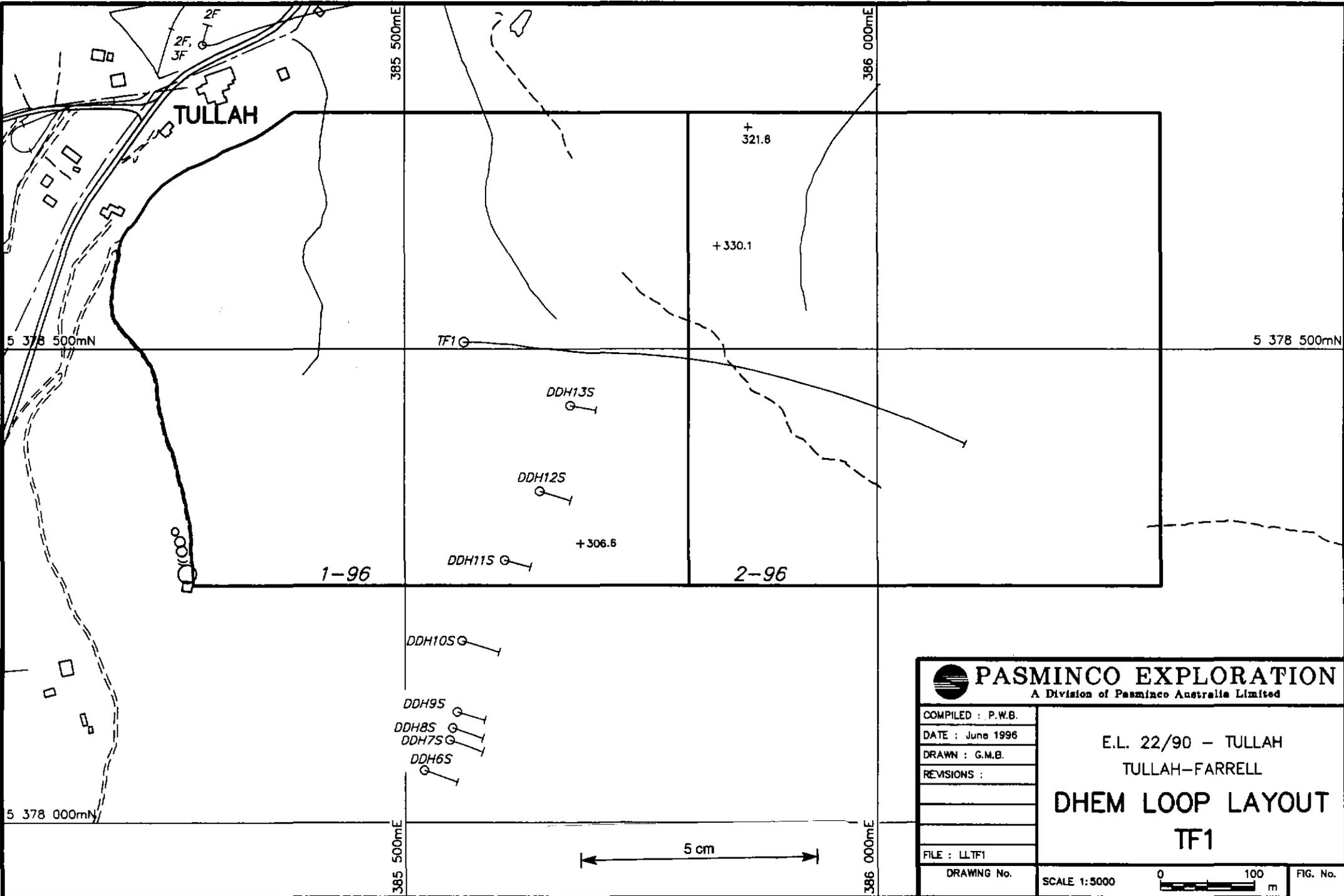
discovered after the completion of the survey that the X-Y probe was not operating. No cross component data is therefore available.

**Loop 1-96**

The data shows a sharp in-hole response at 230m down the hole, followed by a long wavelength low amplitude off-hole. This is assumed to be related to the often conductive Farrell slates.

**Loop 2-96**

Data from this loop also shows the presence of an in-hole conductor at 230m, as well as a weak response at 280m. Both are attributed to Farrell Slates. No evidence for a large conductive off-hole conductor exists at the bottom of the hole.



 <b>PASMINCO EXPLORATION</b> A Division of Pasminco Australia Limited	
COMPILED : P.W.B.	E.L. 22/90 - TULLAH TULLAH-FARRELL <b>DHEM LOOP LAYOUT</b> <b>TF1</b>
DATE : June 1996	
DRAWN : G.M.B.	
REVISIONS :	
FILE : LLTF1	SCALE 1:5000 
DRAWING No.	

1:0114C

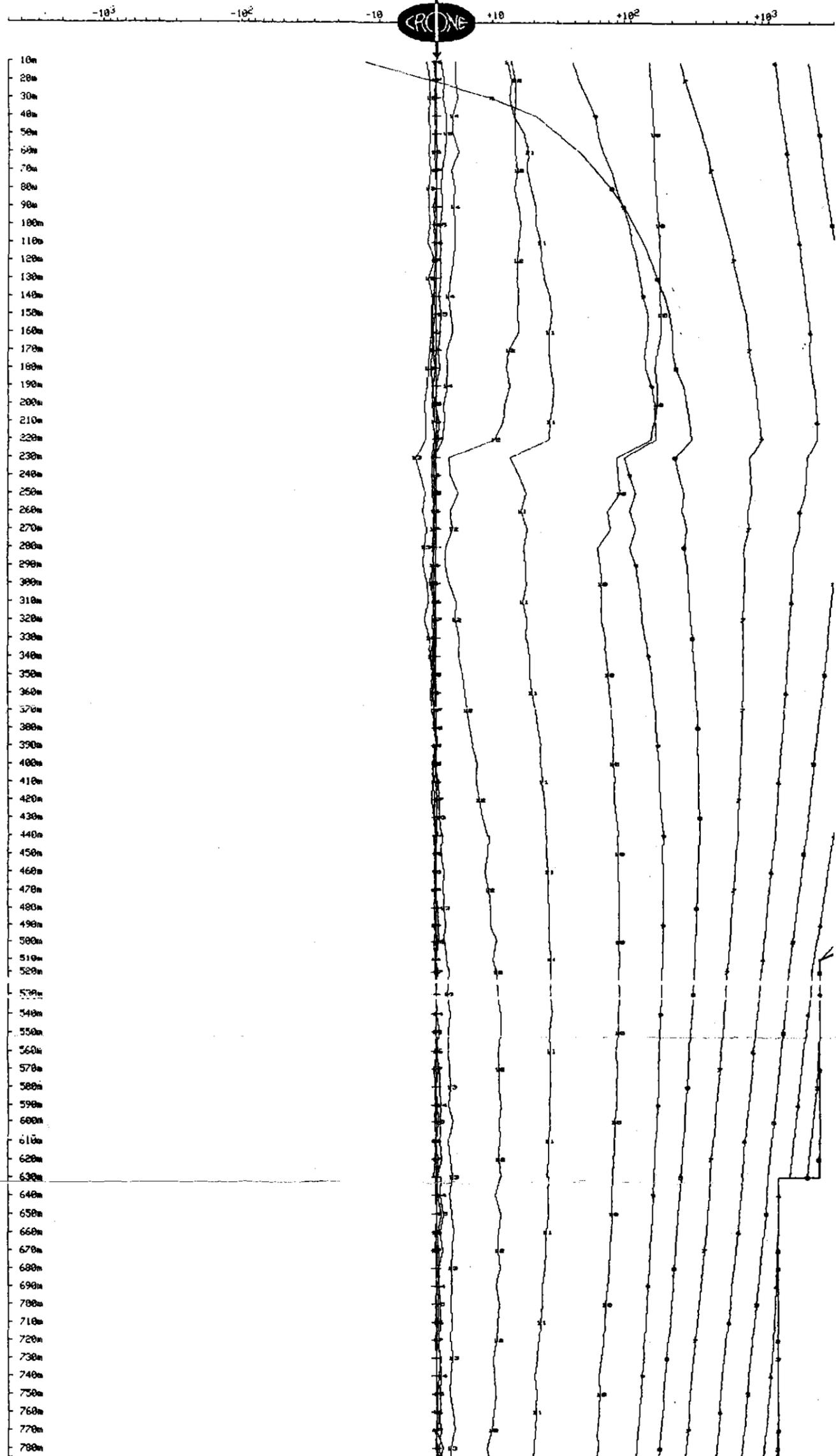
Pasminco Exploration  
BOREHOLE PEM

Client : BURNIE, Tasmania  
Grid : Farrell  
Date : May 9, 1995

Hole : TF1  
Loop : 96-1  
File name : NTF1.PEM

Z COMPONENT dBz/dt nanoTesla/sec - 17 channels

Scale: 1:2500



Pasminco Exploration  
BOREHOLE PEM

Client : BURNIE, Tasmania  
Grid : Farrell  
Date : May 10, 1996

Hole : TF1  
Tx Loop : 96-2  
File name : TF1L2.PEM

Z COMPONENT dBz/dt nanoTesla/sec - 17 channels

Scale: 1:2500

