97-3989
Vol 1 of 2

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PLUTONIC OPERATIONS LIMITED

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EXPLORATION LICENCES 4/92 AND 7/92

SORELL PENINSULA

Annual Report on Exploration Activity

to September 1996

VOL 1 OF 2 (TEXT)

MINERAL RESOURCES
19 MAR 1997
EL 4/92 See folio 46
EL 7/92 See folio 26

97-3989

ANNUAL REPORT - ELS 4/92 & 7/92
PLUTONIC OPERATIONS LTD.
R.REID & R CLOSE - **VOL 1 OF 2**

R Reid and R J Close
February 1997

REF:RJC:JM:RPT009

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AMG REFERENCE POINTS ADDED

N

41°

BURNIE

DEVONPORT

GOWRIE PARK
EL 10/88

CETHANA

LAUNCESTON

DELORAINE

WARATAH

BURNS PEAK
EL 44/88

HELLYER

QUE R.

PINNACLES

LAKE ROSEBERY
EL 12/96

ROSEBERY

MT READ
VOLCANICS

HERCULES

RED HILLS
EL 29/94

ZEEHAN

HENTY

42°

MT LYELL

QUEENSTOWN

STRAHAN

AMG
361000 E
5317000 N

MT DARWIN

MUDDY
COVE
EL 4/92

THOMAS CK

SORELL
PENINSULA

AMG
375500 E
5302000 N

HIGH ROCKY
POINT
EL 7/92

STRATHGORDON

NEW NORFOLK

WART HILL

43°

145°

146°

147°

LOCALITY MAP

FLINDERS ISLAND

KING ISLAND

LAUNCESTON

TASMANIA

HOBART

WART HILL

LEGEND

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Technical Report No.	PROJECT: 706 - 710	
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FIGURE 1

1.0 SUMMARY

This report details exploration conducted by Plutonic Operations Limited on EL's 4/92 and 7/92 within the Sorell Peninsula during the annual period to the 11th September 1996.

Field work was delayed by the late arrival of the Geoterrex Pty Ltd GeoTem Deep airborne system which eventually completed 90% of the proposed survey, a total of 1520 line kilometres over five days in late March 1996. Detailed interpretation of this sophisticated TEM survey provided a series of secondary anomalous targets for followup but did not define any high priority targets considered to be related to VHMS mineralisation. Therefore no immediate field checking of anomalies was undertaken.

Subsequent fieldwork in mid May to late June was focussed on the Thomas Creek intrusive hosted porphyry Cu - (Au) prospect which was drill tested by eight BQTK diamond holes totalling 806.6 metres. Results were somewhat disappointing in that only low grade (0.1-0.2% Cu) disseminated pyrite-chalcopyrite mineralisation with only minor vein mineralisation was intersected in diorites intruded by micro-monzodioritic dykes. However, considerable potential remains at depth and perhaps elsewhere in this largely undefined sub-volcanic intrusive system. An ongoing study of the petrography, geochemistry and mineralogical controls of the Thomas Creek mineralisation should help to clarify its economic potential.

Limited reconnaissance in drainages mainly to the east of the existing grid, located weakly mineralised intermediate intrusives and sulphidic quartz veining suggesting a more extensive mineralised system may be present.

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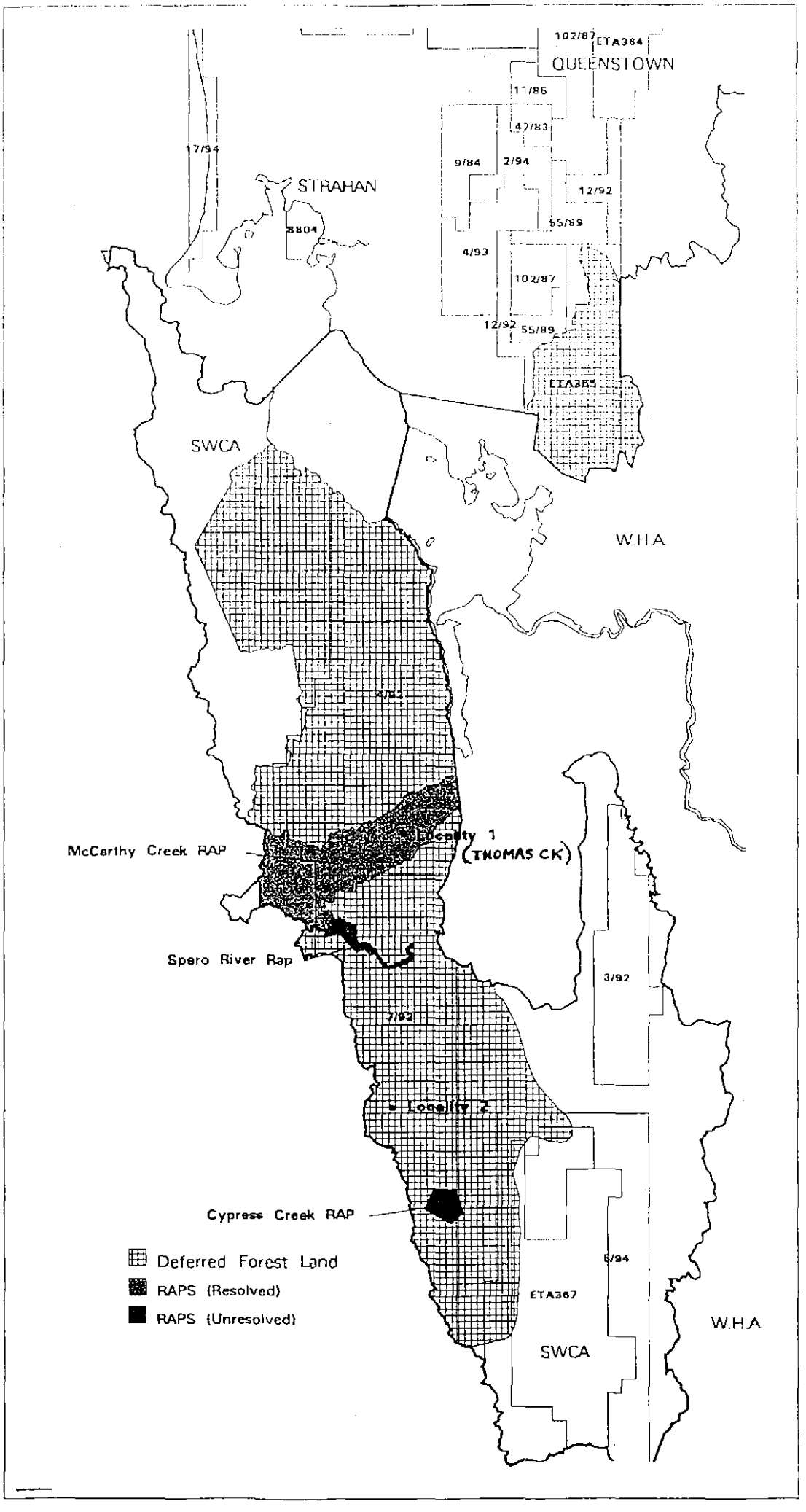


FIGURE 2

2.0 INTRODUCTION

2.1 Tenure

EL's 4/92 "Muddy Cove Creek" (243 km^2) and 7/92 "High Rocky Point" (183 km^2) were granted to Plutonic Operations Limited on 11 September 1992. The EL's are located in south-west Tasmania within the Sorell Peninsula as shown in Figures 1, 2 and 4.

Following Plutonic's initial assessment of the Sorell Peninsula tenements in 1993 it was evident that substantial exploration over a number of years would be required to bring any prospect to the development stage. Given that the Wilderness Society has proposed the Sorell Peninsula be added to the Tasmanian Wilderness World Heritage Area (TWWHA), it was therefore decided to quantify the sovereign risk perceived to be posed by conservation interests in inhibiting mining development within the South-West Conservation Area.

Assessment of this risk was achieved by presenting a hypothetical mining proposal for the Sorell Peninsula to the Tasmanian Department of Resources and Energy for its evaluation of environmental and conservation issues and the likelihood of approval for development. The Department responded in July 1994 with a document entitled "Issues for Consideration" which outlined the approval process and the requirement of any development to be declared a project of State Significance. In consideration of the fact the area has been declared a Strategic Prospectivity Zone and the strong support the Tasmanian Government has declared for any significant development in the area, Plutonic subsequently decided to proceed with the exploration of these tenements.

Expenditure commitments were waived for the second year of the project in 1994 and subsequently expenditure by Plutonic has more than met the minimum requirements.

2.2 Access and Land Usage

Access and movement within these tenements is problematic with no roads or passable tracks for vehicles except for trail bikes in a few peripheral areas in the north. The prospective rocks are invariably under thick bush or forest with few natural helipads. Passage through this terrain is generally slow and physically demanding especially along creeks which are usually overgrown and difficult to travel along.

The Sorell Peninsula along the south-west coast, receives the full brunt of the roaring forties so that exploration in the winter months is not advisable and the field season is generally November to April.

All of the area is included in the South-West Conservation Area. This means that although exploration is allowed, there are more stringent guidelines than in Crown Land elsewhere. This applies in particular to three Recommended Areas for Protection (RAPS) covering flora habitats within the tenement areas. Refer Figure 2. Given due care to minimise environmental disturbance and adherence to approved and safe exploration practice, work programmes in these areas such as at Thomas Creek Prospect, can be conducted satisfactorily.

3.0 REGIONAL GEOLOGY

3.1 Introduction

Due to the difficulty of access, lack of outcrop and minimal exploration to date, the geology of Sorell Peninsula (Figure 3) is relatively poorly understood.

The main belt of Cambrian Mt Read Volcanics extends for 170 km south from Hellyer, through Queenstown, along the West Coast Range to South Darwin Peak where it disappears under a Tertiary graben, to re-appear along the D'Aguillar Range and further south to the coast at Elliott Bay.

To the west of the D'Aguillar Range in the Sorell Peninsula, the Noddy Creek Volcanics have been correlated with the Mt Reads on the basis of their petrology and calc-alkaline geochemical characteristics by a number of workers. However, it is difficult to structurally relate these volcanics with the main belt and it is possible that they represent a slice of a separate, possibly earlier island arc province which has been dismembered and thrust into the present position.

From regional scale magnetics and gravity it is clear that there is a major structure running north-south through Birch's Inlet on the east side of the Sorell Peninsula and a second north-westerly trending structure along the north side of Macquarie Harbour. The whole Sorell Peninsula may thus have been displaced south from a position west of Zeehan and is now in faulted contact with the Mt Read Volcanics along the Copper Creek Fault Zone.

3.2 Stratigraphy

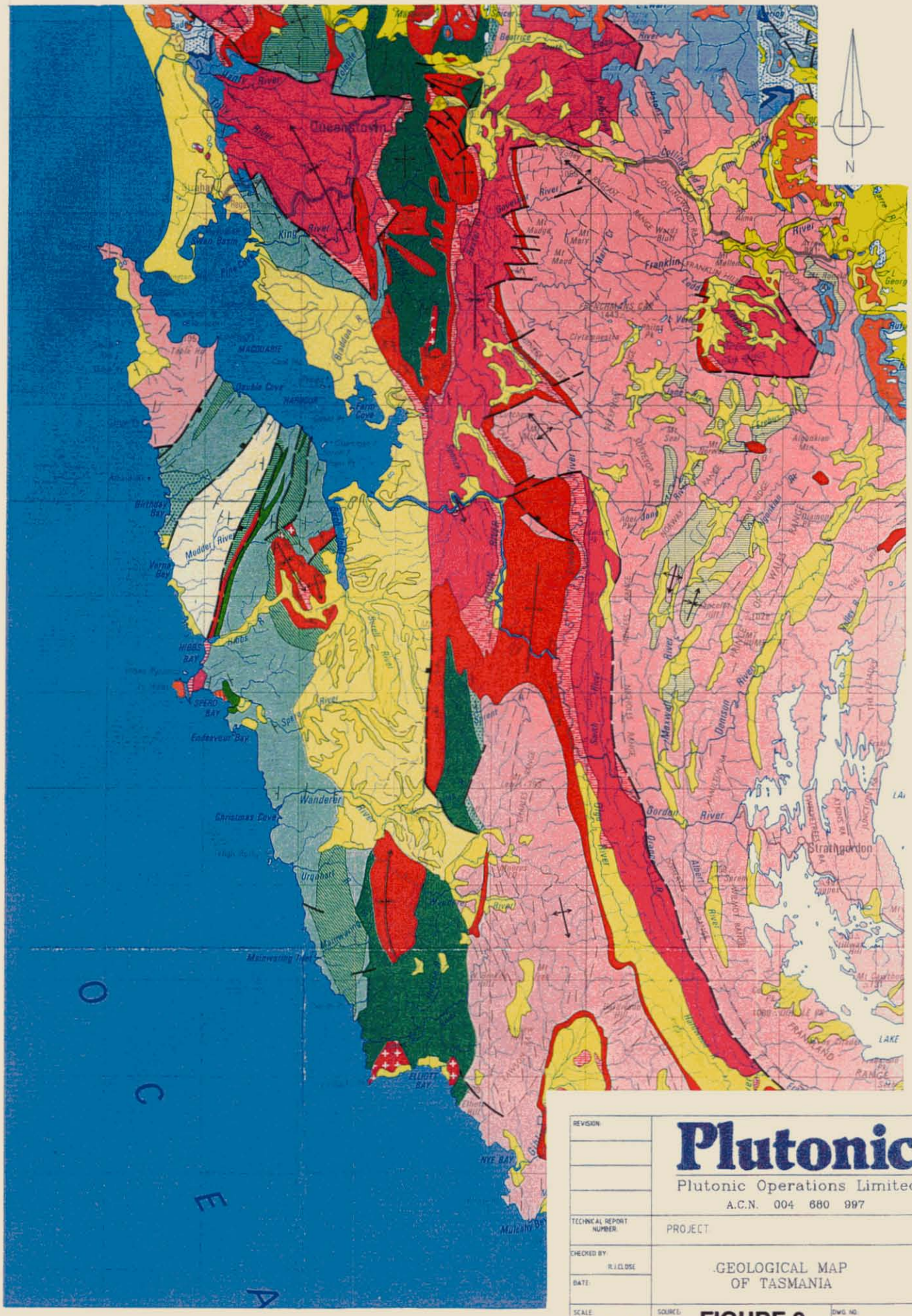
The geology of the Sorell Peninsula and the volcanics in particular has been described in company reports for BHP and Amoco/Cyprus, in White's PhD thesis and in recent Mines Department mapping by A Brown, D Seymour, M McClenaghan and D Findlay.

The first regional mapping of the area was completed by BHP in the late 1960s, however, it was based upon coastal and a few inland traverses and relied to a large degree on photo interpretation with the Cambrian and Precambrian left largely undifferentiated. Nevertheless Amoco/Cyprus (Ferris, 1984) relied heavily upon this mapping in their exploration and produced no map of their own other than the rough maps of their areas of interest.

In order to rectify this situation the Tasmanian Mines Department instituted a 1:50,000 regional geological survey in the late 1980s, however due to funding restrictions this programme remains uncompleted. The area north of Varna Bay is covered by the Macquarie Harbour (1989) sheet and the area south of High Rocky Point covered by the Montgomery (1988) sheet. Unfortunately the central Point Hibbs sheet area covering the major area of interpreted Noddy Creek Volcanics and related intrusives has not been mapped apart from a few reconnaissance traverses.

311010

5 cm


N
Queenstown
Franklin
Strathgordon
Gordon River
King River
Mt Mary
Mt Maud
Mt Madge
Mt Jukes
Mt Sedgwick
Mt Owen
Mt Lyell
Mt Darwin
Mt Huxley
Mt Tyndall
Mt Humphrey
Mt Sorell
Mt Ward
Mt Ball
Mt Ball
Mt Ball

The significant differences between the Mines Department mapping and the earlier BHP/Amoco/Cyprus mapping is the extension of the prospective Noddy Creek Volcanics south to the coast at High Rocky Point and the associated sediments down to Veridian Point. Noddy Creek Volcanics in the Point Hibbs quadrangle were interpreted by Close and Reid (1995) mainly from aeromagnetics as well as limited reconnaissance mapping.

The structure of the Sorell Peninsula is discussed in Brown *et al.* (1991), Carey and Berry (1988) McClenaghan and Corbett (1989) and McClenaghan and Findlay (1993). Two thrust fault bounded belts of Cambrian rocks separated by Precambrian sedimentary sequences occur on the northern part of the Sorell Peninsula. The western-most belt contains the tholeiitic mafic to intermediate Lucas Creek Volcanics and associated carbonate and greywacke-mudstone sequences. The eastern belt, however contains a complex sequence of volcanic suites and associated volcanic derived sediments, cut by fault bounded blocks containing mafic-ultramafic bodies and intruded by felsic to intermediate plutons. Refer Figure 3 and Plate 1.

The Cambrian-Ordovician sequences are confined by major north-north-east trending and easterly dipping thrust faults of probable Devonian age, along which late transcurrent movement is indicated by McClenaghan and Findlay (1993). This faulting together with limited mapping, poor exposure and the presence of isoclinal folding in sediment-dominant sequences, has combined to reduce the overall understanding of the relationships between major stratigraphic packages in this region.

However, Brown *et al* (1991) and McClenaghan and Findlay (1993) recognise the following Cambrian associations in the tenement areas:-

1. Calc-alkaline Noddy Creek Volcanics;
2. Boninitic Timbertops Volcanics;
3. Tholeiitic basalt Mainwaring-Birch's Inlet Volcanics;
4. Point Hibbs Melange Belt - mafic-ultramafic intrusives.

3.2.1 Noddy Creek Volcanics

The Noddy Creek Volcanics differ from the other volcanics on the Sorell Peninsula by the fact that they are a calc-alkaline island arc suite of rocks as opposed to the more exotic alkaline, tholeiitic and picritic basalts and boninitic andesites and ultramafics elsewhere on the peninsula.

It appears almost certain that the Noddy Creek Volcanics are a correlate of the VHMS mineralised Mt Read Volcanics in the Queenstown to Hellyer region. Based upon correlations with the other volcanic suites on the Peninsula, Brown (pers.comm.) feels that they may have been faulted south from around Zeehan. An alternative explanation suggested by McClenaghan and Corbett (1989) is that they are a separate sub-arc.

The Noddy Creek Volcanics and associated sediments were originally mapped by BHP in the 1960's, however they concentrated on the Timbertops area and the Point Hibbs ultramafic intrusives which are faulted against the western side of the Cambrian volcanics and sediments. (Close 1972.) Amoco/Cyprus gave a few localities some attention but not to the degree warranted by the prospectivity of the rocks.

Rocks considered by Brown (1988), McClenaghan and Findlay (1989), Brown *et al.* (1991), Brown (pers. comm.) and Seymour (pers. comm.) to be part of the Noddy Creek volcano-sedimentary association have been previously described in Hall *et al* (1969), White (1975), McClenaghan and Corbett (1989). BHP and Amoco/Cyprus considered most of the sediments associated with these volcanics, from Macquarie Harbour to south of High Rocky Point, to be part of the Dundas Group.

Brown (1988), McClenaghan and Findlay (1993), Brown *et al* (1991) and Seymour (pers. comm.) mapped the Noddy Creek volcano-sedimentary association as predominantly intermediate-acidic, calc-alkaline Cambrian volcanics comprising lavas with associated volcaniclastics and epiclastics derived from these volcanics. Where the association is dominated by the sedimentary component the volcanic units occur as pillowed and sheet lavas, breccia flows and porphyritic flows with volcanic xenoliths, interbedded with vitric tuff or volcaniclastic siltstone and volcanicwacke beds.

Within the sediment dominated part of the section south of the Wanderer River, the sedimentary rocks form a flyschoid sequence with includes channellised sandstone and pebble-cobble conglomerate, suggesting a proximal submarine fan origin. The main clastic component is derived from a quartz-rich acid volcanic terrain with a minor component of metamorphic rock, exotic volcanic clasts and quartz fragments showing graphic intergrowths with feldspar.

In the Timbertops area and to the north two distinct groups of volcanics have been recognised. The first group consists of pyroxene/plagioclase phyric andesite lavas, while the second group consists of quartz/feldspar phyric rhyolitic lavas.

In the south, around High Rocky Point, three groups of pyroxene/plagioclase basaltic-andesite to andesitic rocks, and a later group of hornblende-bearing andesite-dacite dykes have been recognised by Brown *et al* (1991). These define a chemically evolving suite of volcanic rocks consistent with the generally east facing nature of the sequence.

Geochemically the basaltic andesite and andesitic rocks have similarities with the Que-Hellyer Volcanics whilst the andesitic-dacite dykes from the southern part and the rhyolitic rocks from the northern part have geochemical similarities with the bulk of the acid to intermediate rocks of the Mt Read Volcanics. (Brown et al 1991.)

The northern exposures of Noddy Creek Volcanics from Muddy Cove Creek to Timbertops the Noddy Creek Volcanics were petrologically described by White (1975), Ferris (1984), Kary (1985) and McClenaghan and Findlay (1993).

White (1975) described weakly deformed and altered quartz-albite phyric acid lavas, welded quartz-rich lithic tuffs, non-porphyritic, and augite-albite phyric andesites, breccias and crystal lithic-vitric tuffs from sequences north of Timbertops. Whereas Ferris (1984) studying volcanics in the Timbertops area included augite $\pm$ orthopyroxene-phyric basalts, basaltic andesitic tuffs and lavas, rhyodacites and siliceous andesites to trachyandesites as well as quartz microdiorites in the sequence. Rocks from the northern-most part of the Muddy Cove Creek area are described in Kay (1985) as acid tuffs, dacites, andesites as well as basalts, dolerite, gabbro, gabbro/norite and sediments including cherts (Brown et al 1991).

The Timbertops area to Muddy Cove Creek, McClenaghan and Findlay (1993) have broadly differentiated sequences of rhyolitic and andesitic composition, which in the Timbertops area are intruded by probable co-magmatic felsic and intermediate-gabbro bodies. These may represent sub-volcanic intrusives into a former volcanic centre. They also recognise a separate group of boninitic lavas, referred to as the Timbertops Volcanics, which extend to the west and south of Timbertops.

South of Timbertops in the vicinity of Hibbs River and Thomas Creek, basaltic-andesitic tuffs, andesite, dacites and trachyandesites have been correlated with the Noddy Creek Volcanics. In the eastern part of this area adjacent to and probably underlying Ordovician sediments in the Timbertops Syncline, the volcanics are associated with a major intermediate intrusive centre referred to informally as the Thomas Creek diorite complex. The limits of this intrusive system are unknown but on the basis of aeromagnetic interpretation could cover 10 km^2. Mapped intrusives vary from medium to coarse grained augite-plagioclase phyritic diorite to microdiorite with locally strong chlorite-pyrite-magnetite-tourmaline alteration as at the Thomas Creek Prospect (528,6000N, 370,000E).

3.2.2 Timbertops Volcanics

In the Timbertops region outcrops of boninitic (high-Mg andesitic) lavas, breccias and crystal lithic tuffs, with interbedded mudstones and siltstones (McCleghan and Findlay 1993), are juxtaposed against the calc-alkaline Noddy Creek volcanics with the unexposed contact possibly a low angle thrust. These rocks are invariably altered with relatively pristine rocks consisting of talc and chlorite pseudomorphs of pyroxene in a matrix of talc, chlorite and spinel.

Microprobe analysis of spinels correlates these rocks with boninitic lavas around Zeehan. Boninitic volcanics were reported along the western side of the Timbertops Syncline as well as along the eastern flank of the ultramafics at the southern end of the Macquarie Harbour sheet.

BHP (McGregor and Bumstead, 1969) described the volcanics in the area mapped as Timbertops Volcanics by Brown *et al,* as being andesitic lavas with very minor basalt and gabbro bodies. They also noted the presence of talc and chlorite alteration of the andesites near contacts with intrusive diorite bodies.

White (1975) refers to these rocks as altered ultramafics, probably pyroxenites, and considered they may be interbedded with the Noddy Creek Volcanics.

Amoco (Ferris, 1984) noted a strong correlation between nickel in soils and chrome in sediments and volcanics west and south of the Timbertops region, as corresponding to the boninitic rocks of McClenaghan and Findlay (1993). This correlation suggests that soil geochemistry for Ni and stream geochemistry for Cr may be a useful mapping tool in delineating the boundary of the calc-alkaline Noddy Creek Volcanics from the Timbertops Volcanics.

3.2.3 Birch's Inlet-Mainwaring River Volcanics

Brown *et al.* (1991) consider that the mafic volcanics and associated sediments south of Urquhart River and those outcropping immediately to the west of Birch's Inlet but east of the Noddy Creek Volcanics, are from the same north-south trending belt with the central part hidden by Tertiary cover. Previous workers have considered the two mafic groups separately with the Mainwaring River Volcanics receiving by far the most attention because of their copper anomalous signature.

The two volcanic areas are correlated as a single belt on the basis of geochemical affinities, similar stratigraphy and the presence of a broad aeromagnetic high joining the two areas of outcrops separated by Tertiary sediments.

Brown *et al* (1991) refer to this belt as being a picritic basalt-basalt association with intra-plate and island-arc affinities. The sequence is described as consisting of vesicular, pillow and sheet flows of pyroxene phyric and/or plagioclase phyric basaltic rocks interlayered with hyaloclastite and basalt breccia.

The proportion of sedimentary rocks in the sequence increases to the south. These consist of interbedded mudstones and chert, volcaniclastics siltstone, lithicwacke, carbonates, siliceous pebbly conglomerates and lithicwackes. Brown (1988) noted the northern sequence was east facing whilst in the south isoclinally folded sediments predominate.

Two groups of lavas have been identified in both volcanic areas, with the lower group generally picritic and the upper group tholeiitic. The lower group resembles lavas from the Miners Ridge basalt further north at Queenstown which are considered to represent the base of the Mt Read Volcanic sequences.

This is in contrast to Ferris (1984) who, tentatively correlated the volcanics with the calc-alkaline basic-intermediate Que-Hellyer Volcanics from the uppermost part of the Mt Read Volcanics.

In the Birch's Inlet area, McGregory and Bumstead (1969) on behalf of BHP described a sequence of spilitic basalts and laminated siltstone, whereas White (1975) refers to the Birch's Inlet Volcanics as spilite with thin bands of basaltic tuff, volcanic greywacke and serpentinite. The lack of significant drainage anomalism over these volcanics and their tholeiitic mafic composition has not encouraged any detailed exploration of their economic potential.

In contrast, the volcanics in the Mainwaring River area to the south have received considerable attention, and they were perhaps the main focus of early BHP and late Amoco/Cyprus exploration because of their copper anomalous character.

Amoco/Cyprus (Ferris 1984) considered the Mainwaring Volcanics occurred within a discrete vent area due to the abnormal amount of explosive mafic volcanic rocks "agglomerates and breccias" interbedded with tuffaceous sediments. Only a minor acid volcanic component was recognised.

BHP (Hall and Corbett 1969) describe the lower (western) part of the Mainwaring Group as consisting of argillites, phyllites and greywackes cross-cut by diorite and gabbro bodies and intruded by andesitic sills. The upper part described as consisting predominantly of thick basaltic to andesitic tuffs with minor conglomerate also cut by small sill-like gabbro and diorite intrusives, corresponds to the Mainwaring River Volcanics of Brown *et al.*(1991). They consider the western sediment-dominated package is definitely not related to these mafic volcanics and is probably a distal correlate of the Noddy Creek Volcanics, faulted against the Mainwaring River Volcanics.

3.2.4 Point Hibbs Melange Belt

A major thrust bound sequence across the Sorell Peninsula consists variously of massive to highly sheared, talcose and/or serpentinised peridotite with minor layered pyroxenite, intruded by gabbro-norite bodies and late lamprophyric dykes. West of the Timbertops area, the ultramafics are apparently associated with sheared, talc-rich boninitic andesite lavas (McClenaghan and Findlay, 1993). A similar association in the Dundas Trough near Zeehan may indicate an original spatial relationship between these two areas.

3.2.5 Post Cambrian Stratigraphy

Ordovician sequences in the Sorell Peninsula are restricted to isolated fault slivers on the western side of the Point Hibbs Melange Belt and the major north-west trending Timbertops Syncline. The Ordovician sequence at Timbertops unconformably overlies Cambrian strata, and consists of basal quartz sandstone with conglomerate interbeds and fossiliferous micaceous siltstone-sandstone correlated with the Denison Group. In the core of the syncline recessive outcrops of Gordon Limestone have been recognised (McClenaghan and Findlay, 1993).

Mid to Upper Palaeozoic sedimentary sequences and Jurassic dolerite are restricted to faulted zones between Hibbs Bay and Point Hibbs. Apart from thick unconsolidated quartzose Tertiary sediment cover in the Birch's Inlet to Wanderer River area, no other significant Palaeozoic or younger sequences exists on the Sorell Peninsula.

4.0 EXPLORATION PHILOSOPHY

The Sorell Peninsula tenements were acquired by Plutonic Resources to explore primarily for VHMS deposits related to the Noddy Creek Volcanics which were initially correlated with mineralised felsic to intermediate volcanic sequences of the Mt Read Volcanics.

A secondary target is porphyry-style Cu-Au deposits associated with sub-volcanic intrusive equivalents to the Noddy Creek Volcanics. The Thomas Creek prospect may be an important example of this style of deposit.

5.0 EXPLORATION HISTORY

A detailed account of exploration by previous companies was presented by MacDonald in the August 1993 report on these tenements and therefore is not repeated here.

Plutonic's preferred exploration strategy in the rugged Sorell Peninsula has been to search for a major VHMS or intrusive related deposit using the most environmentally as well as technically sensitive airborne and ground exploration methods. This necessitated considerable delays in regional exploration assessment before a suitable time domain electromagnetic system could be mobilized to fly the terrain in 1996. During this period data from 1984 aeromagnetic-radiometric survey over this region conducted by Amoco Minerals was reprocessed and interpreted to provide the basis for an updated regional geological map of the tenement areas. (Plate 1.)

In 1993, Plutonic conducted detailed geochemical and ground EM surveys in the Briggs Creek area over DIGHEM anomalies recommended by Bishop (1986) within the Noddy Creek Volcanics. These surveys failed to locate any significant EM or geochemical response and the airborne survey data or interpretation was considered questionable.

A gold drainage and reconnaissance mapping survey in the Wanderer River following up Huminex anomalies was also unsuccessful.

At the Thomas Creek prospect however, mapping, sampling and petrology confirmed Amoco's results and indicated a significant zone of alteration with the characteristics of a porphyry Cu-Au system.

In 1994-95 exploration concentrated on the Thomas Creek prospect where detailed mapping, bedrock geochemistry and IP surveys defined disseminated and vein hosted copper-(gold) mineralisation within an altered multiphase intermediate to mafic intrusive suite. This style of mineralisation may be unique in Tasmania and little is known about the age, tectonic setting or relationship between the host Thomas Creek Intrusive Complex and the surrounding volcano-sedimentary sequences. The latter are interpreted to belong to the Noddy Creek Volcanics of probable Early Cambrian age and based on limited petrology and inadequate geochemistry these volcanics could be co-magmatic with the Thomas Creek intrusive.

6.0 WORK CONDUCTED

6.1 Introduction

Proposed field work for the 1995-96 season was to conduct an airborne TEM survey and then field check resultant priority conductors to define mineralised targets worthy of detailed evaluation. These targets were to be diamond drilled along with the Thomas Creek prospect during autumn and winter 1996.

In December 1995 Geoterrex Pty Ltd was unable to mobilise its GeoTem II survey equipment and given the chance to use the new improved GeoTem Deep equipment, the survey was postponed to March 1996 when the system was properly calibrated. As a result no fieldwork was conducted during the summer season until after the survey was flown.

Unfortunately the delayed survey did not provide any unequivocal late time conductive anomalies interpreted to be related to sulphide mineralisation. Therefore no followup field surveys of geophysical targets were carried out during the rest of 1996 field season.

In the absence of any other significant prospects, Plutonic decided to diamond drill test the porphyry style mineralisation at Thomas Creek during May-June 1996. An eight hole programme totalling 806.6 metres was successfully conducted using a lightweight "Gopher Rig" operated by All Terrain Exploration.

The drilling which was targetted at peak zones of copper geochemistry and IP chargeability, confirmed the porphyry-style of mineralisation but grades were less than expected with better intersections assaying 0.1 to 0.2 % Cu and <0.1 g/t Au. Petrological, geochemical and alteration studies are underway to evaluate the Thomas Creek system and indicate vectors towards higher grade mineralisation.

6.2 GeoTem Survey

6.2.1 Introduction

A GeoTem Deep survey was eventually conducted between the 23rd and 28th March when bad weather curtailed flying over the remaining 10% of the proposed survey area south of High Rocky Point (Figure 4). A total of 1520 line kilometres along 200 metre spaced east-west lines and tie lines were completed. Specifications, logistics and interpretation of the survey results are presented in a report by Geoterrex as Appendix I.

Survey plans, anomaly interpretation plans and plans of contoured Channel 2, AD1 as well as aeromagnetic data are shown in Plates 2 - 14.

311019

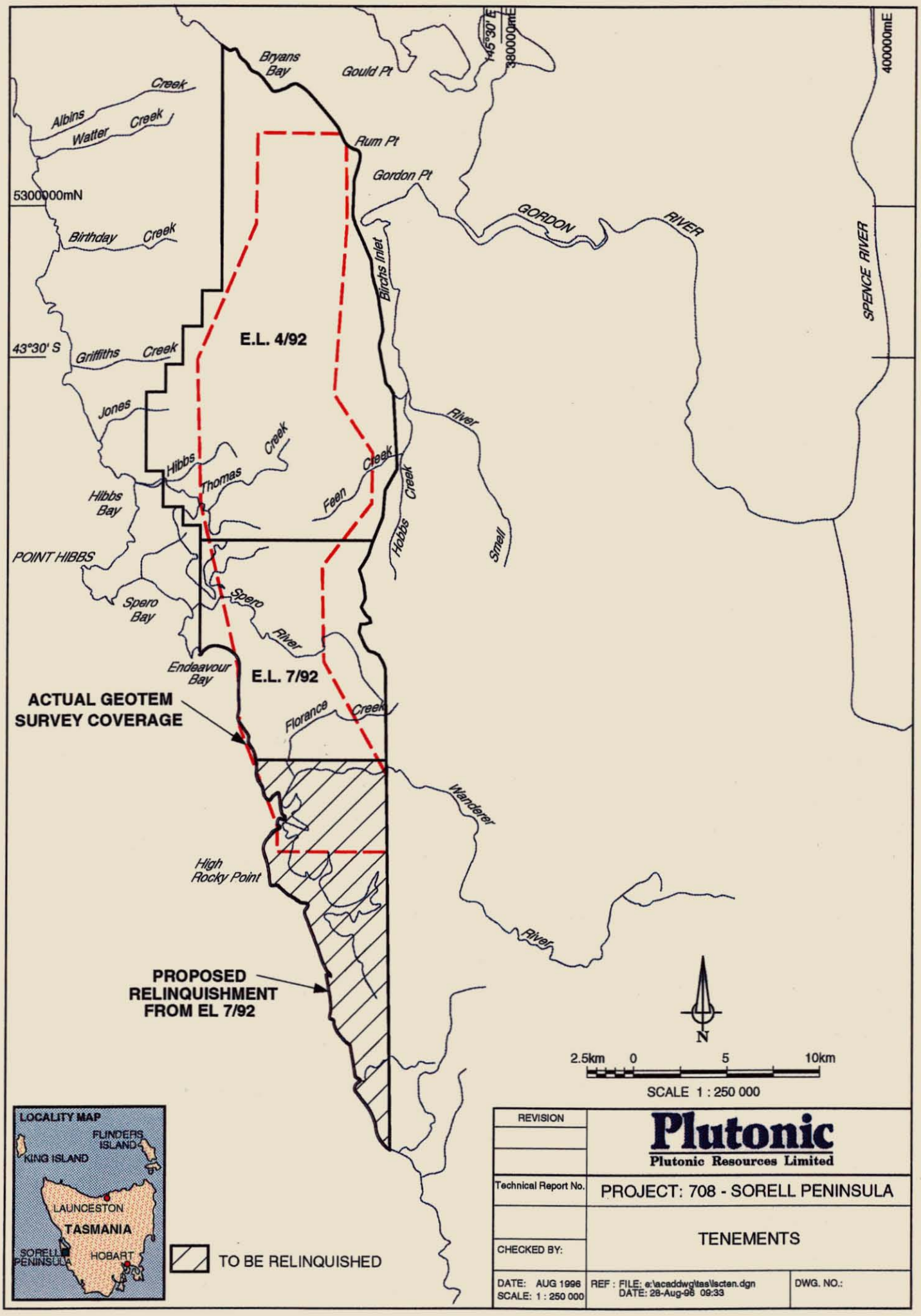


FIGURE 1

The following discussion is taken from a report by Plutonic's geophysicist, Llew Wynn who was on site during the survey.

6.2.2 Interpretation

General

Slow decays of AEM responses are indicative of conductive bodies; the slower the decay the stronger the conductor. Time constants (TC) are used to quantify the rate of decay of AEM responses; the slower the decay, the larger the Time constant.

Amplitude Decay Index (ADI) measures the rate of decay and weights it relative to the amplitude of the response.

The AEM anomalies identified in this report (Plates 5 and 6) are classified into three groups:

x - high amplitude responses which are apparent to 2.22 milliseconds (channel 7) - obtained from profiles:

□ - low amplitude responses with slow decays (obtained from profiles); and

○ - ADI anomalies (ie relatively high amplitudes with slow decays of the secondary field) - calculated by Geoterrex.

The strongest AEM responses were detected in the north-west corner of the survey, high ADI values coincide with ultramafic units (pyroxenite serpentinites) of the Point Hibbs Melange Belt. The most conductive responses and coincident magnetic highs appear to parallel major faults between the ultramafics and Cambrian sediments.

A total of thirteen AEM anomalies detected over the prospective Noddy Creek Volcanics are listed below in order of priority. Table 1. These anomalies were also recorded by Geoterrex and are detailed in Appendix 1. Anomalies 11, 12 and 13 are weak and are considered of low priority.

TABLE 1 - AEM ANOMALIES IN THE NODDY CREEK VOLCANICS (NCV)

Anomaly No/ Anomaly Type		Flight Line	Fiducial	Comments
1	x ○	268	61017	Centrally located in the Noddy Creek Volcanics, between inferred faults trending north-east. The anomaly occurs approximately 1km south of an intrusive diorite.
2	x □ ○ x ○	208 204	56805 57836	Located in a narrow zone of Noddy Creek Volcanics (NCV) - surrounded by greywackes and conglomerates. The line 208 anomaly is the more significant response.
3	x ○	290	45438	Occurs within the NCV package adjacent to the Caroline Creek Sandstone contact. An inferred north-west trending fault coincides with the AEM anomaly.
4	x ○ x ○ x ○ x □ x ○ x ○ x ○	214 212 211 210 209 207 206	44638 55816 56100 56295 56602 56075 57321	All detected within a widnow of NCV in the south-west (north-east of Endeavour Bay). Anomalies on lines 212, 211, 210 and 206 are located near the boundary of the Noddy Creek Volcanics and are considered less prospective than anomalies on lines 214, 209 and 207 which occur well within the NCV package.
5	x □	232	40234	Detected well within the NCV package. Anomaly has low initial amplitude, but a slow decay. Situated approximately 1.2km from the southern limit of Thomas Creek and coincides with an inferred fault/geological contact.
6	x ○	242	37523	Occurs on an inferred fault between the NCV and Birch's Inlet Volcanics.
7	x ○	141	47832	Detected near the eastern edge of a package of NCV north of High Rocky Point.
8	x ○	240	37965	Situated within a narrow zone of NCV surrounded by greywackes and conglomerates of the Dundas Group.
9				Magnetic anomaly - see magnetic interpretation, Section 4.3
10	x □	153	44797	Detected in south-west corner of survey (north of Anomaly 7). This anomaly is characterised by a slow decay.
11	○	253	34297	Situated in a wedge of NCV between the Caroline Creek Sandstone and the Thomas Creek Microdiorite.
12	○	265	61732	Occurs in a similar geological setting to anomaly on line 253, ie, between the Caroline Creek Sandstone and the northern limit of the Thomas Creek Microdiorite.
13	○	297	43850	Detected on the margin of a quartz-biotite granite. The AEM anomaly is located on the flanks of a bulls-eye type magnetic high caused by an intrusive diorite to the south-west.

Five other AEM anomalies described in Table 2 below are adjacent to the NCV boundaries. As these boundaries are inferred, some may be located within the prospective NCV.

TABLE 2 - AEM ANOMALIES ADJACENT TO NCV

Flight Line/ Anomaly Type	Fiducial	Comments
283 x □	57289	Occurs within the Birch's Inlet Volcanics between the Timbertops area and Birch's Inlet. An anomaly with slow decay near an inferred fault trending north-east.
220 x ○	43242	Detected near the greywacke/conglomerate boundary.
230 x ○	40723	Situated immediately east of an inferred fault trending NNE and truncating the NCV. This fault is evident in the AEM channel 2 contours.
214	44696	Located within the mapped Dundas Group conglomerate, however this boundary is inferred and the slow decaying anomaly may be situated within the NCV.
198	59186	Detected over gravel/alluvium cover south of a narrow zone of NCV.

During the 1993 field season four Dighem (Helicopter-borne frequency domain EM) anomalies were ground checked with soil sampling, ground magnetics and frequency domain EM (Scintrex Genie System). The Dighem anomalies and corresponding grid lies are shown in Interpretation Plates 5 and 6. No Geotem anomalies were detected in the vicinity of the Dighem anomalies.

A large, complex circular magnetic high detected over the Thomas Creek Prospect dominates the magnetic contours in Plate 6. The source of the high magnetic response is interpreted to be Hornblende diorite (Di) and Microdiorite (MDi) A gradual decrease in magnetic intensity to the north-east suggests the intrusive complex extends below the surrounding Noddy Creek Volcanics and the sediments in the Timbertops Syncline to the north-east.

A bulls-eye type response is evident over Hornblende diorite occurrences immediately north of the Timbertops Caroline Creek Sandstone (Oc) unit whereas the adjacent Timbertop Microgranite (MGT) is weakly magnetic, refer Plate 1.

High amplitude, linear magnetic trends are coincident with the NNE trending ultra mafic units in the north-west corner of the survey.

The prospective Noddy Creek Volcanics are relatively more magnetic than the surrounding Dundas Group siltstones, greywackes and conglomerates. The Ordovician clastic sequences in the Timbertops Syncline show little magnetic relief.

A linear magnetic high (No 9) occurs within the Noddy Creek Volcanics in the vicinity of the Dighem anomalies within Briggs area, Plate 6. Although no anomalous AEM responses were detected over the magnetic high, this anomaly may warrant ground checking.

6.2.3 Conclusions

The most prominent AEM anomalies correlate with faults/shears within the ultramafic units in the north-west.

The remaining anomalies are moderate-weak responses from faults, Tertiary cover, clay zones and areas of deeper weathering. Significant anomalies detected over the prospectrive Noddy Creek Volcanics are ranked 1 to 14. These anomalies correlate with the anomalies identified by Geoterrex, and need to be reviewed in detail with known geology to determine which anomalies require ground checking as ground follow-up in this remote environment is difficult and expensive.

6.3 THOMAS CREEK PROSPECT

6.3.1 Introduction

This report details work undertaken during the diamond drilling of the Thomas Creek Prospect during May and June 1996.

This program entailed drilling of eight BQTK diamond drill holes totalling 806.6 metres to test peak anomalous soil geochemistry and induced polarisation geophysical anomalies, Figure 6. A lightweight "Gopher Rig" operated by All Terrain Exploration (ATE) was utilised to allow rig shifts between drill sites without the need for helicopter support.

Whilst only sub-economic copper-gold ore was intersected in drill core, results from all facets of the program indicate that significant porphyry style copper mineralisation is likely to exist in the Thomas Creek area.

Limited regional geological reconnaissance involving geological mapping and collection of stream sediment and soil samples resulted in the discovery of moderately pyritic mineralisation in creek systems to the northeast and east of the Thomas Creek grid. This is considered encouraging for locating significant zones of mineralisation in future. Ground magnetics coverage over the entire grid system was also completed.

The geological and geochemical data presented herein should be considered preliminary in nature as considerable refinement is expected resulting from a Masters of Economic Geology study by Rob Reid.

6.3.2 Geology

The geology of the Thomas Creek prospect has been previously discussed with respect to surface geology in the 1994-95 annual report. Mainly on the basis of soil/bedrock auger samples, this work indicated mostly intermediate volcanic-sub-volcanic rocks within the area with a central zone of medium grained dioritic intrusives approximately aligned along the 5800N line. Drilling of this prospect has obviously greatly elucidated our knowledge of the geological environment.

It now appears that dioritic rocks are more widespread, although K-feldspar-silica (ks-sil) alteration tends to mask rock identity, particularly in the northern end of line 369600E. Lithologies here maybe finer grained and tending to andesitic, although intermittent porphyritic texture is evident.

Two principal rock types are now recognised within the area drilled. (Refer Plate 15.) The most volumetrically common is a cream and green feldspar-augite porphyritic Diorite whereas light brown weak to moderately porphyritic mineralised "Micro-monzodiorite"/Andesitic intrusives form thin dykes up to several metres in width within the Porphyritic Diorite. Spatial distribution of the Monzo-microdiorites is illustrated by drill sections 370000E, 369800E and 369600E. (Plates 20 to 24.) From these sections it is apparent that distribution of these late intrusives is largely confined to the central portion of 369600E lines the central northern portion of 369800E and within drill hole TCD1 (370200E). Dyke intrusion density apparently decreases to the south along section 369800E.

Paragenetic relationships between intrusive rock types at Thomas Creek are relatively clear cut despite broken core obscuring the contacts in many cases. The porphyritic diorites are early with respect to all other intrusive types, and brecciation may have accompanied introduction of these rocks. Porphyritic andesites and micro-monzodiorites are definitely younger but temporal differentiation between the two is unclear as these rocks are not seen in close proximity.

Variation in intrusive mechanism is apparent. Micro-monzodiorite contacts are often obscured by drill core fragmentation and loss, particularly where a close spatial association with breccia textures is evident. Breccia textures at some micro-monzodiorite margins may be partly intrusive related. A carapace of pervasive ks-silica alteration is evident in several examples from drill core on line 369600mE (TCD7, 93.80-96.37m).

Strong alignment of feldspar phenocrysts at the upper contact of a peculiar k-feldspar altered monzonite in TCD5 (50.52m) provide a clearer indication of forceful intrusion of this dyke. Elsewhere, knife edge contacts are frequently observed with no evidence of forceful intrusion. Chilled margins are common, and one instance of peperitic tongues intruding the host porphyritic diorite exists at the irregular margins of a porphyritic Andesite is recorded. This intrusive is dissimilar to the mineralised micro-monzodiorites.

6.3.2.1 Intrusives

Preliminary field logging utilised a small number of principal rock type names to enable quick pigeon-holing of the units observed. The most common unit names used were feldspar-augite phenocryst crowded andesite/diorite, and microdiorite. The latter mostly applied to poorly to moderately porphyritic volcanic intrusives of andesitic composition with fine grained to aphanitic matrix. Aphanitic varieties are referred to as porphyritic andesites, whilst fine grained and medium grained varieties are termed microdiorite and diorite or where applicable monzodiorite. Rock unit names have been modified since, but are still tentative and await final classification by thinsection and XRF analysis. Principal rock types are discussed below.

Porphyritic Diorite

This is the most volumetrically common intrusive rock type observed in drill core. The porphyritic diorites typically display a pale to light green coloured groundmass, sometimes with a distinctive spotted texture imparted by scattered dark green augite phenocrysts. They are typically feldspar-augite phenocryst crowded, but alteration overprints commonly mask this texture.

Where less altered, a typical porphyritic diorite displays a medium grained feldspar-augite phenocryst crowded texture. Phenocrysts reside in a very fine grained to aphanitic groundmass which constitutes less than 5% by volume. Cream to pale green feldspar crystals are very near close packed as subhedral to euhedral crystals (1-3mm dia, 60-70%) within this groundmass. Feldspars are often sericitised and less commonly concentrically zoned. Dark green subhedral to euhedral and locally weakly glomerophyric augite phenocrysts (3-5mm dia) are variable in abundance from 10 to 30%. Augite phenocrysts are commonly chloritised and less frequently magnetite psuedomorphed.

Variations in diorite textures resulting from both primary and secondary alteration effects can make these rocks difficult to differentiate. Many intervals detailed in the drill logs could be abbreviated as the units probably represent altered variants of the same porphyritic diorite.

A medium/coarse grained equigranular groundmass is rarely evident within drill core, but is characteristic of diorite outcropping to the north. The porphyritic diorites discussed above may represent late or more rapidly crystallised variants of these equigranular diorites.

"Microdiorite" which is volumetrically insignificant is mineralogically identical to the porphyritic diorites. The microdiorite's are fine/medium grained and equigranular, but can be poorly augite-phyric and less frequently also feldspar-phyric. The groundmass is often sandy textured, exhibiting abundant fine grained primary magnetite specks. These units are dissimilar to the monzo-microdiorites, principally due to lack of k-feldspar and are probably co-magmatic with the porphyritic diorites.

A pale green/cream feldspar-phenocryst crowded (locally weakly augite-phyric) "Acid" diorite is observed as a minor phase (eg. TCD3 23.7-29.05m). It is not clear whether mineral destructive alteration or melt fractionation is responsible for the paucity of augite in these rocks.

All the diorite variants exhibit a fuzzy groundmass with increasing (silicification)/alteration to produce a somewhat ambiguous nondescript pale green/grey rock. Examples of this texture are most common peripheral to mineralised/micro-monzodiorite intrusive zones within drillholes TCD6 and 8.

Breccias

Breccia textures are common within the porphyritic diorites particularly adjacent or proximal to micro-monzodiorite intrusive margins. These breccias are most common in drill holes on sections 370000E and 369800mE. The breccias are typically open framework, comprised of dark grey augite-phyric clasts and less commonly pink k-feldspar-silica clasts/domainal zones.

The formational mechanism for these breccias is presently undefined, however they are likely to be alteration induced and/or intrusion related pseudobreccias as they are typically monomict with no accidental/accessory lithics present. Support for this interpretation comes from macroscopic observations of drill core. These are examples of partially developed breccia-like textures where pervasive magnetite alteration/dark grey augite-phyric "clasts" form sharp alteration boundaries, often with tongues extending into the enclosing lithology. An alternative interpretation for this texture is peperitic intrusion of porphyritic andesites.

Some breccias display sub-rounded clasts which may indicate some mechanical action involved in formation. One such breccia (TCD1, 19.00-19.70m) is enclosed by micro-monzodiorite intrusions. In this case the relationship between intrusions and breccia is not clear.

Some breccias certainly predate monzo-microdiorite intrusion and/or pervasive k-feldspar-silica alteration. Support comes from an example in TCD2 @ 28.1m, where weak k-feldspar-silica alteration at the lower sharp margin of a monzo-microdiorite intrusive overprints breccia texture within the host porphyritic Diorite.

Breccia zones are evidently an important feature for localisation of mineralisation. Sulphide infill of the breccia matrix is a common feature, particularly within TCD2, 40.80-70.55m. Tourmaline veins, late smectite veins and pervasive k-feldpar-silica alteration infill or overprint breccias in many cases. These textures are elaborated upon within the section on alteration and mineralisation below.

Porphyritic Andesites

This lithology applies to a number of subtly different intrusive types which are dark grey to brown in colour, with aphanitic groundmass enclosing feldspar and lesser augite phenocrysts. The andesites are typically moderately porphyritic, containing less than 50% phenocrysts relative to approximately 80%+ total for phenocrysts in the porphyritic diorites. Feldspar phenocryst morphology is typically euhedral and tabular/lath like whereas sub-hedral feldspars are more common within the porphyritic diorites. These intrusives are uncommonly silicified and some irregular margins possibly represent peperite.

Andesitic intrusives of this type are typically strongly magnetic possibly caused by pervasive magnetite alteration.

Some varieties may correlate with the mineralised micro-monzodiorites described below, but have been differentiated upon the basis of minimal included mineralisation. Whole rock geochemical data and thin sections have been submitted to clarify any association, but are currently unavailable.

"Micro-monzodiorite"

The term "Micro-monzodiorite" has been used to tentatively describe disseminated chalcopyrite-pyrite mineralised intrusive dykes evident in drill core. These dykes are typically light brown in colour and are weak to moderately feldspar and augite porphyritic. Groundmass is commonly fine grained, but ranges from near aphanitic to medium grained. A colour variation to dark grey is often evident at chilled intrusive margins.

The "Micro-monzodiorite" classification is made on the basis of crystal size and observed mineralogy, particularly lack of quartz and abundance of plagioclase feldspars. Pink colouration of feldspars hints at a more monzonitic composition, but gradations to milky feldspars within some units suggest selective k-feldspar alteration. Therefore the original composition of these intrusives may be andesitic to dioritic.

The form of these mineralised bodies is inferred to be dyke-like, with individual intrusives typically being 0.2 to 2.0m in width with knife edged chilled margins/contacts. These units are generally little altered and are preserved as relatively large coherent, fracture free core sticks, which suggests late emplacement. The strongly broken/fractured nature of the enclosing host may be partly related to forceful intrusion of these micro-monzodiorites, but most likely represents a pre-existing feature providing pathways for dyke intrusion.

Micro-monzodiorite intrusives are evident in all drill holes, excluding TCD8. Their distribution is not constrained within any particular alteration zone, but greatest density of intrusives is perhaps reached within or immediately adjacent to pervasive magnetite alteration.

Monzonite

A single occurrence of monzonite was intersected in TCD5 (50.52-58.50m). This unit is evident as a pale reddish-brown feldspar-augite-(quartz?)-moderately porphyritic Monzonite intrusive. The phenocryst composition of this rock is feldspar(30%), quartz(< 1%) and augite(5%). The latter is commonly epidote replaced and feldspar varies in colour from pale pink to pale red, presumably dependant upon the degree of k-feldpsar replacement. The groundmass of this distinctive rock is fine grained, pink and aphanitic in patches and at the margins. Contacts are sharp with the upper margin marked by 8cm of moderate foliation?/ crystal alignment. Feldspar phenocrysts are clearly stretched parallel to the foliated contact at (~45^0 LCA) and small (2 by 1cm) apophyses occur in the host. These features suggest a forceful intrusion or late deformation (?). The unit contains trace pyrite, but unlike the micro-monzodiorites apparently lacks chalcopyrite.

6.3.2.2 Alteration and Mineralisation

Many aspects of the alteration and mineralisation evident at the Thomas Creek Prospect are similar to those present within porphyry copper-gold deposits of Australia and the SW Pacific. The principal alteration types and vein style overprints evident in drill core are:-

Principal Alteration Zones:-

Magnetite-chlorite-actinolite-K-feldspar-py-cpy
K-feldspar-silicification (+/-py)

Vein Overprints:-

tourmaline-pyrite-quartz+/-cpy veins
late smectite (+/-py) veins
late epidote (+/-py) veins

Magnetite-rich Alteration

Zones of pervasive dark grey strongly magnetic alteration are extensively developed in TCD1 (26.55 to 50.90m) and TCD2 (40-70m), but have a minor occurrence in TCD8 (55.8-~65m), and in TCD3 and 7. The distribution of this alteration is not unexpectedly co-incident with magnetic highs disclosed by ground magnetics.

This alteration type hosts the most extensive copper anomalism at the Thomas Creek Prospect. TCD2 for example, yielded 58m @ 840ppm Cu from 40m with the best interval being 9m @ 0.13% Cu from 50 metres.

Texturally, magnetite alteration is fine grained and matrix pervasive, apparently leaving the form of primary phenocrysts little altered. Relatively sharp gradations from strong to weak alteration are evident. This alteration is accompanied by weakly developed matrix pervasive silicification, augite selective chlorite alteration and uncommon grey quartz +/- pyrite-chalcopyrite veins(eg. TCD1 @19.70m). Most of the pyrite and chalcopyrite is disseminated with only minor development of irregular sulphide dominated veinlets.

Associated veins dominated by very coarse grained fibrous actinolite, mixed with lesser pink to brick red potassium feldspar are commonly accompanied by strong pervasive magnetite alteration. Actinolite veins are not a feature of magnetite alteration in TCD8 (55-85m), which may reflect a setting relatively distal to the hotter central mineralised focus to the east.

Some textures indicate magnetite is early in the alteration paragenesis. Evidence for this occurs in dark grey clast bearing magnetite breccia in TCD2 (74.5-85.60m) which is overprinted by pervasive ks-silica alteration and smectite veining.

The alteration and mineralisation described above fits the description of Cooke (et al, 1996) for K-silicate (ie potassic) alteration in Australian and SW Pacific porphyry Cu-Au deposits. Biotite has not been recognised, but is a likely component of this fine grained strongly magnetic alteration.

K-feldspar(?)-Silica Alteration

This most widespread style of alteration in the prospect is evident as a pervasive pinkish coloured silicification which imparts a homogenous aphyric appearance presumably comprising a fine grained intergrowth of silica and k-feldpsar or albite. Haematite may also be partly responsible for the distinctive pink colouration. This alteration should not be confused with classically potassic alteration in porphyry copper systems and it is commonly developed marginally to micro-monzodiorite hosted magnetite ("potassic") alteration zones. The best example encloses micro-monzodiorite within TCD7(93.8-96.7m).

A possible origin for this alteration style may be contact metasomatism with weaker alteration distal to these intrusives reflecting metamorphism/ metasomatism related to heat flow from mineralising "hot spots". Similar alteration is evident in the Mount Read Volcanics at Red Hills and in the Mount Darwin region associated with Cambrian intrusives.

K-feldspar-Silica alteration varies considerably in its development. It is generally texture destructive, but primary textures are often evident within irregularly distributed, isolated "islands" of less altered rock. In it's mildest form a relatively homogeneous grey aphyric texture is apparent and this "weakly silicified" texture in drill logs may simply reflect partial recrystalisation of the host's groundmass. Pink colouration intensifies with increasing degree of alteration, thus a reddish colouration is inferred to represent strong k-feldspar and perhaps haematite, associated with strong silicification.

K-feldspar-silica altered zones are generally only weakly magnetic and usually sulphide poor or barren with minor chalcopyrite, however exceptions occur where later alteration overprints ks rich zones. Leached/pitted pale coloured zones of strong silicification with disseminated pyrite up to 15% are rare. These zones are typically narrow (<30cm) and relatively distal to significant mineralisation as in TCD8 (16.80-16.95m) and TCD6 (83.20-83.45m) in Plates 20 and 21.

Chlorite

Strong chlorite alteration is not a prominent feature of mineralisation in drillcore at the Thomas Creek Prospect. It is however readily apparent in rock chip and soil samples, particularly where pyrite is abundant(eg 5800mN, 369830mE). Chlorite alteration commonly occurs as psuedomorphs of augite crystals within magnetite/potassic alteration zones and less commonly as late diffuse-edged irregular veins overprinting ks-silica alteration (eg. TCD3, 81-88m).

Sericite Alteration

Obvious sericite alteration has limited distribution in drill core at Thomas Creek. Sericite is observed as alteration of feldspar crystals within some medium grained dioritic units for example at 70 metres in TCD7. Sericite may also be a major component of the late smectite overprint.

Tourmaline -pyrite+/-quartz+/-chalcopyrite veins

Tourmaline commonly occurs within thin pyrite-chalcopyrite bearing veinlets and narrow zones of hydro-brecciation/breccia matrix flooded zones. The mineral proportions of this vein style are variable. Pyrite dominant veins are locally evident and may contain a little tourmaline. Similarly tourmaline veins display quartz selvages in some instances and quartz-sulphide +/- tourmaline veins are infrequently observed. These subtly differing vein mineralogies probably represent the same generation of mineralisation. Disseminated aggregates of tourmaline crystals appear less commonly, for example in TCD7 at 69.9m within sericitised medium grained diorite.

Distribution of these veins is intermittent, but they are noted proximal to mineralised intrusives in some instances. For example, at a monzo-microdiorite margin in TCD2 at 104.85m, intense sil-tour-py veining and replacement grades out to thin tourmaline-py veins slightly more distal from the intrusive margin. Pyritic veinlets locally infill fracture planes of crosscutting micro-monzodiorite dykes (eg. TCD1, 19.70-22.20m). The observations above suggest the micro-monzodiorites are pre to contemporaneous with pyrite/tourmaline vein development and this mineralisation appears to pre-date at least one deformation (faulting) event as well as the late k-feldspar -smectite and epidote veining.

A strong correlation between anomalous copper analysis and tourmaline bearing veins is evident. Examples are at 95-96, 76-77m, in TCD6 and at 37.5-39.0m (0-2% Cu) in TCD5.

Tourmaline mineralisation is linked to Cambrian magmatic activity in the MRV and is very commonly related to Devonian granite -related tin mineralisation throughout Tasmania. Tourmaline mineralisation of a strikingly similar nature to that at Thomas Creek is found at Jukes Pty, on the slopes of Mt Jukes south of Queenstown. A magmatic source of fluids is interpreted for this mineralisation (M. Doyle, 1990 Hons Thesis, CODES).

Late smectite- k-feldspar alteration

Clay is evident as a late stage overprinting vein form alteration. These veins overprint all mineralisation styles with the apparent exception of the mineralised micro-monzodiorite dykes. Vein form is often irregular with infill of breccia matrix being a common feature. Vein components are smectite (-siderite?) and k-feldspar (pers. comm. Goeff Green) with subordinate pyrite

This vein mineralogy was identified following a visit to the Thomas Creek Prospect by Industry, Safety and Mines geologists. A select few mineral samples from these veins (TCD2, ~54.7-57.4m) were analysed by XRD at the ISM labs at Rosny Park, Hobart. Analysis revealed smectite and siderite were present in pale green to tan coloured vein material. A red mineral from the same vein comprised k-feldspar(microcline) and crystalline brown haematite is also evident in a vein from this interval.

Epidote (late stage)

Epidote is commonly developed on fracture planes as thin veinlets. These are clearly later and cross-cut all other alteration and mineralisation as well as the micro-monzodiorite (eg. TCD2, 104.95-106.40m). Minor pyrite is evident within some veins.

This epidote veining may represent propylitic alteration produced as the hydrothermal system wanes.

6.3.2.3 Discussion

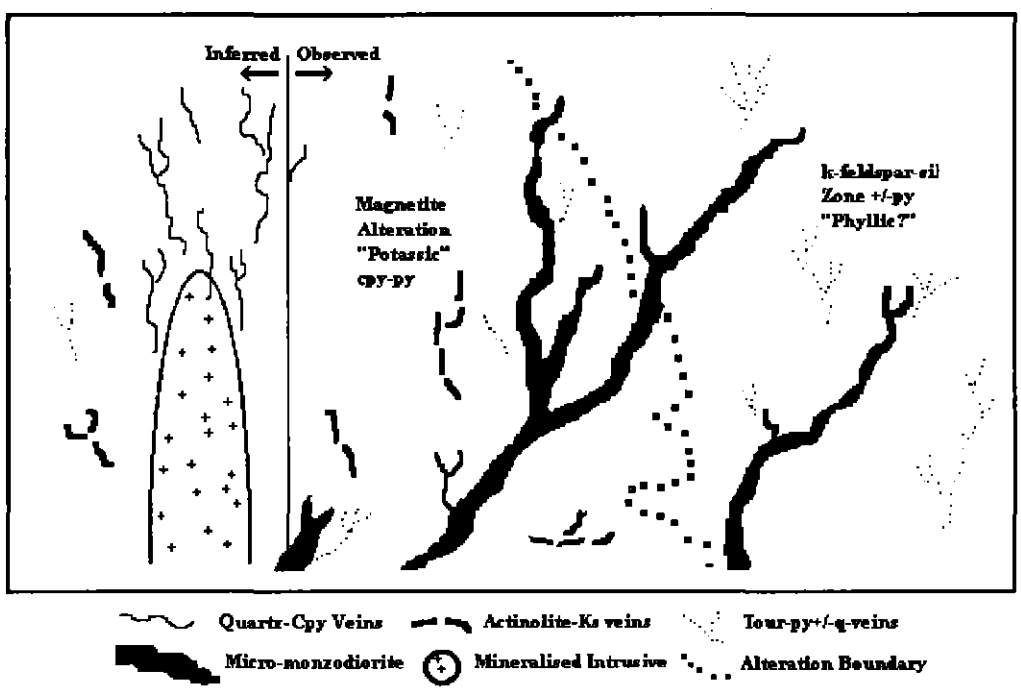
It is not yet known whether a single intrusive is responsible for the known mineralisation at Thomas Creek. Mineralised intrusives in many of the SW Pacific porphyry copper-gold deposits are of diorite or quartz-diorite composition whereas in Central NSW mineralising plutons are commonly monzodioritic to monzonitic. Diorites at Thomas Creek host mineralisation but may not be mineralising intrusives themselves. Whereas, late mineralised micro-monzodiorites are more likely to be genetically related to the mineralisation event, and they extend beyond the main potassic zone, similar to the situation at the Dinki Di deposit in the Phillipines. (Wolfe, R pers comm).

Analogy to the Goonumbla porphyry copper-gold deposits may also be possible in terms of the quartz-monzonite porphyry mineralising intrusives recognised by Hooper, et al., 1996. At Thomas Creek in TCD5 there is no obvious link between mineralisation and an adjacent quartz-monzonite pluton. However, narrow intervals with significant copper grades exist proximal to this intrusive (8m @ 0.17% Cu from 31m) and the forceful intrusive nature of this body is favorable for development of associated mineralisation.

Most porphyry systems in the SE Pacific display quartz-copper bearing veining closely associated with potassic/magnetite zones. This association however is only weakly developed in drill holes at Thomas Creek. For example in TCD1 at 1-4m and possibly in the top of TCD2.

A schematic model outlining the relationships between the various intrusive, mineralisation and alteration features exhibited at the Thomas Creek Prospect is presented below. All features are represented in their true context with the exception of the mineralising intrusive with it's proximal quartz-chalcopyrite veins.

THOMAS CREEK MINERALISATION MODEL



6.3.3 Reconnaissance Geochemistry

A limited programme of geological mapping and stream sediment sampling was undertaken around Thomas Creek. Fieldwork in 1995 concentrated on the grid area and vein mineralisation reported by Amoco in a creek northeast of the prospect. In 1996 reconnaissance was localised in the vicinity of the exit track and nearby creek systems to the south east of the gridded area at Thomas Creek. Assessment of this track suggests that excursions on foot into the area are viable assuming helicopter support for supplies is available for extended period stays. The creeks traversed were overgrown with thick horizontal bush/forest resulting in slow progress. They are relatively sediment choked with little outcrop evident over much of their length but rock chip samples were collected from all outcrops observed.

The reconnaissance involved collection for geochemical orientation purposes of a variety of stream sediment samples in the form of panned concentrates (12), -80# samples of active sediment (seived later) (15), Bleg ((bulk leach extractable gold) samples (4), as well as rock chips (17) and soil samples (8). Bleg samples were not collected in the 1996 survey, partly as a result of their prohibitive carry weight under the bush conditions encountered. Sieving of -80# samples at each site could be advantageous in future exploration programs to enable collection of the maximum quantity of data /samples available. The 1995 samples were analysed by Analabs at Burnie using method GG340 for Cu and Au in Blegs, GA101 for Cu, Pb, An and Co as well as GG309 for Au in -80# samples.

The 1996 samples were analysed by ALS in Brisbane using ICPOS582 for Cu, Pb, Zn, Ag, As, Fe% Mn, Co, Mo and Bi for soils, -80# stream samples and rocks. The pan-concentrates were analysed for gold by method PM219. All sample locations, analyses and geology are shown on the appended Plates 16 and 17.

Bleg sampling involved collection of approximately 2.5kg of active stream sediment which was analysed for gold and copper by Analabs, Brisbane (technique GG340). The technique is biased toward detection of gold in particulate form and is best suited to arid areas as sample leaching during bottle roll only digests the outer weathered rind of rock in the sample. In this case the technique was varied to include a sample crush and grind to approximately 150 microns prior to solvent extraction and analysis to attempt an averaged indication of metal abundance within rock types of the drainage area sampled. When compared with nearby soil and rock chip sample analysis the Blegs were found to be a good discriminant for Au. However, little range was evident in the Cu analysis which perhaps reflected the broad extent of mineralisation in this area. Further samples are required to assess the applicability of Cu in Bleg analysis in this district.

Drainage sampling utilising the -80# fraction of active sediment was also undertaken at the same sites as the Bleg samples. Sieving of -80# samples at each site could be advantageous in future exploration programmes to enable collection of the maximum quantity of data/samples available. In general, low level results were returned for Cu, Pb and Zn with maximum values of 165 ppm Cu, 50 ppm Pb, and 113 ppm Zn draining known mineralisation. Thus the method seems capable of discriminating target areas for detailed evaluation.

Panned concentrate samples were collected from suitable stream trap sites. Trace fine grained visible gold was observed in some samples but overall heavy mineral contents were low. Approximately 5 to 6 kg (one pan load) of sediment was panned in each case. Heavy mineral content and therefore anomaly contrast could perhaps be improved by increasing the initial stream gravel sample size in subsequent sampling. Highly anomalous values of 3.1 and 1.02 ppm Au were obtained from creeks draining known mineralisation in the NE and E of the Thomas Creek plateau, respectively. Values for base metals analyses from panned concentrates are comparable to those from -80# at the same site but are distinctly anomalous in copper, to maximum 243 ppm Cu and to a lesser extent zinc, max 108 ppm Zn in the gold anomalous samples. Therefore this technique appears quite useful, particularly in locating gold anomalous areas.

Geologically the most promising mineralisation in outcrop came from a creek draining the Thomas Creek Prospect and flowing across the exit track at 370800mE, 5500mN. At this site, outcrop yielded a green pyritic (1%) and trace chalcopyrite bearing chloritic rock of intermediate intrusive composition with slightly anomalous values of 153 ppm Pb and Zn in sample 18447.

Six C-horizon soil samples collected at 25m intervals along a track traverse centered upon this pyritic outcrop gave low results with peak values of 88ppm Cu, 66ppm Pb and 91ppm Zn, and Fe values to 11.28%. Outcrops over a 10m section of creek, located approximately 200m downstream displayed variable pyrite to >4% and ks-sil alteration but results from rockchips are also low. Rock sample 18448 within andesite to the southeast of these other samples gave an anomalous result of 378 ppm Pb and 289 ppm Zn.

6.3.4 Geophysics

6.3.4.1 Ground Magnetics

A ground magnetic survey of the Thomas Creek grid system was completed during the drilling program of May/June 1996. Limited ground magnetic data over the eastern part of the grid to 369800E had previously been collected during the 1995 summer field season, but unfortunately the survey was not completed at this stage due to equipment failure. There is a considerable range in the 1995 data whereas the 1996 data from the western portion of this grid is of a somewhat more bland nature. This observation may have important implications for future drilling and may help explain the mediocre results of the 1996 drilling program. These aspects are discussed later.

Data was collected using a pair of Geometrics 85% proton magnetometers with measurements at 10m intervals along all existing grid lines. A base station magnetometer ran concurrently with field data collection in order to assess and correct for diurnal variations. Graphed profiles of diurnal fluctuations for any given day generally displayed a low gradient rise in the magnetic field strength over the duration of field measurements. All diurnal fluctuations, with one exception, remained within a narrow, less than 20nT range. The exception was a 90nT range measured during one day of the 1995 field work. Corresponding range in the field data collected for that day was 5000nT and typical ranges for other days were between 2500 to 4000nT with most data varying over at least 1000 to 1500nT. Given the highly variable character of the area's magnetic field, correction for diurnal variation was not made prior to contouring of data.

A contoured 1:2500 scale ground magnetics plot presented as Plate 18 was produced by Robert Richardson, at Tasmania Development and Resources.

Magnetic susceptibility data for selected drill core samples has been measured but is not presented here.

6.3.5 Drilling

6.3.5.1 Access and Infrastructure

The Thomas Creek Prospect lies approximately 48km south east of Strahan on Tasmania's West Coast. This area at the foot of the Sorell Peninsula has no existing road infrastructure. Although a network of now overgrown vehicle tracks constructed by BHP in the late 1960's extends to within 5km to the north of this prospect. Similarly a limited number of cut but overgrown walking tracks pass through the area and one of these tracks pass through the Thomas Creek campsite.

A new "exit" walking track was cut during 1996 from the camp to the button grass plains to the east terminating outside the World Heritage Area and within several kilometres of the southern end of Birch's Inlet. Huts for emergency shelter exists at both the BHP landing and near the Birch's River at the southern end of Birch's Inlet.

Considering the difficulty of access, any exploration in this area becomes a costly exercise demanding careful planning. Access to the Thomas Creek Prospect for the 1996 drilling program required a full day of mobilisation and another for demobilisation. During mobilisation, equipment and personnel boarded a barge owned by Petuna Seafoods at Strahan before day break at approximately 5.30am. Barge loading time was minimal. ATE's truck with drill rig and a Plutonic vehicle with trailer loaded with camp supplies were driven directly onto this large self-powered barge. Travel time to the helicopter rendezvous at the BHP landing in Birch's Inlet was 3 to 4 hours from Hobart. All loads were slung directly from the barge using a Helicopter Resources "Squirrel" having lift capacity of approximately 600kg.

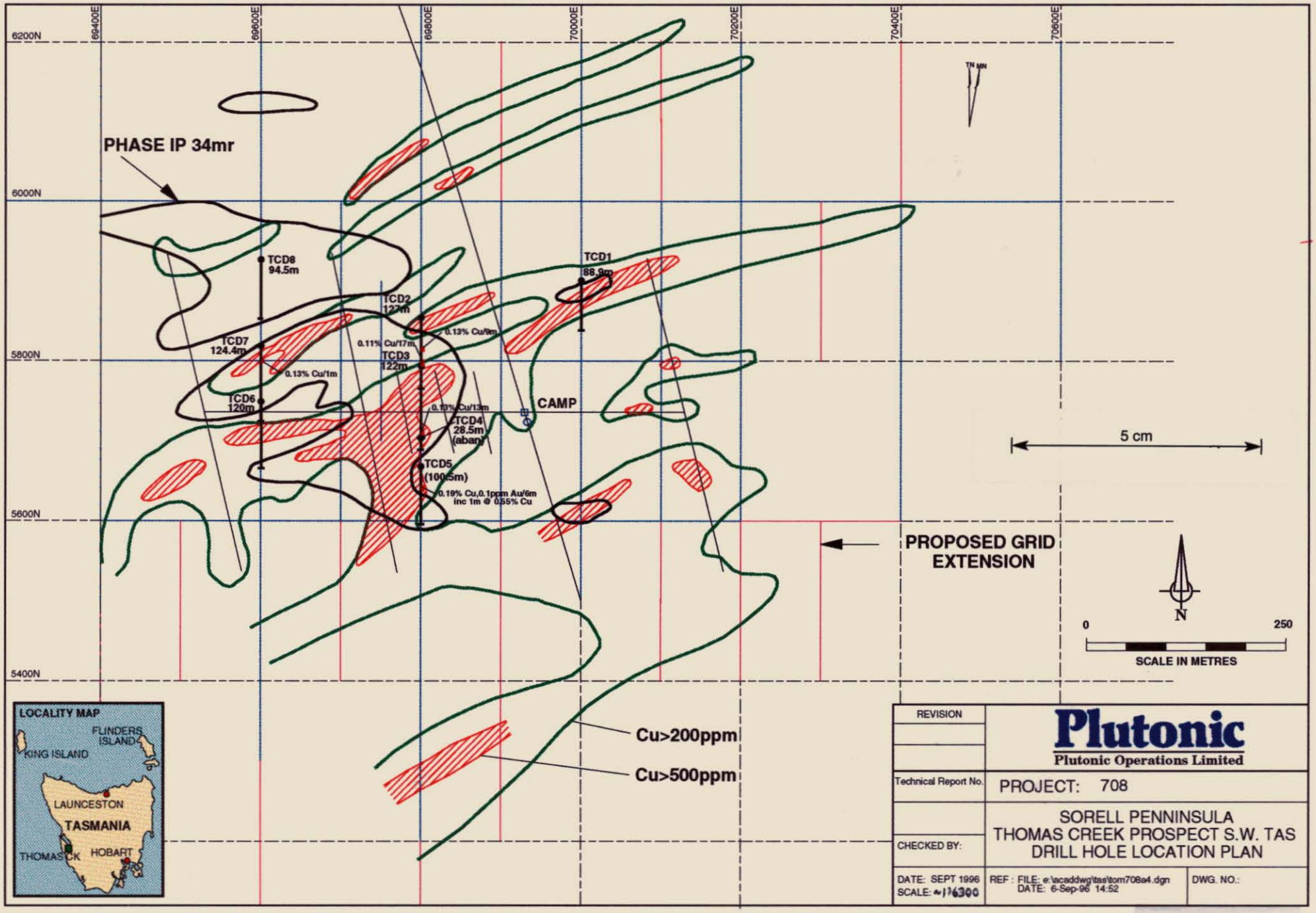


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FIGURE 6

Demobilisation followed the reverse procedure. Drill core was strapped to wooden palettes fitted with a stabilising fin prior to slinging directly onto the barge deck. Similarly, ATE's drill rig was landed directly onto the tray of their truck.

At Thomas Creek camp, Plutonic employees and drillers were accommodated in tents erected beneath a large 10 x 8 metre PVC hoop-supported tarpaulin. This structure also partly covered a 6 x 3 metre tin garden shed which served as a store, kitchen, dining room and office. Both tents and shed were erected on an "L" shaped raised wooden deck. Water was supplied via pumping to a 200 litre tree-mounted header tank from a creek 300 metres distant. Hot water for the kitchen and shower was provided by an on-demand gas driven water heater. Petrol driven generator power was used for lighting and battery charging for a satellite phone which provided immediate communication for support and reporting purposes.

6.3.5.2 Drilling Statistics And Logistics

The careful planning for the drilling campaign at Thomas Creek resulted in the completion of the programme on schedule and within budget. A lightweight, manouverable self winching "Gopher" rig capable of drilling 150 metre holes with BQTK core was selected because of its easy mobilisation and movement between drill sites in the swampy terrain.

TABLE 3

DRILL HOLE STATISTICS

Hole	Co-ordinates mE	mN	Azimuth Deg	Dip Deg	EOH m	Date Commenced	Date Completed
TCD1	370000	5900	180	-45	88.9	20/05/96	24/05/96
TCD2	369800	5858	180	-45	127.8	26/05/96	30/05/96
TCD3	369800	5790	180	-45	122	31/05/96	3/06/96
TCD4	369800	5710	180	-45	28.5	3/06/96	4/06/96
TCD5	369800	5667	180	-45	100.5	4/06/96	7/06/96
TCD6	369600	5750	180	-45	120	18/06/96	20/06/96
TCD7	369600	5815	180	-45	124.4	20/06/96	25/06/96
TCD8	369600	5925	180	-45	94.5	25/06/96	29/06/96
				Total	806.6		

TABLE 4

Thomas Creek Prospect Mineralised Intervals					
Drill hole	interval (m)	from (m)	to (m)	% Cu	Au(ppm)
TCD1	15	35	50	0.046	
TCD2	58	40	98	0.084	
inc.	9	50	59	0.130	
inc.	27	71	98	0.100	
TCD3	12	8	20	0.055	
TCD3	76	45	121	0.047	
inc.	8	49	57	0.065	
inc.	20	60	80	0.060	
inc.	5	74	79	0.097	
inc.	3	94	97	0.089	
inc.	9	108	117	0.090	
TCD5	8	31	39	0.170	
inc.	5	32	37	0.208	0.124
	7	73	80	0.052	
TCD6	3	74	77	0.076	
	7	94	101	0.038	
TCD7	8	69	77	0.042	
	6	116	122	0.039	
TCD8	6	78	84	0.038	
(based on >300ppm Cu and <2m internal dilution)					

Drilling of the Thomas Creek Prospect commenced on Monday 20 May 1996. By Tasmanian standards this was late for an operation of this type in the South West but fortunately fine weather allowed completion of the vast majority of the helicopter lifting on the first day. Five holes were drilled (TCD1 to 5) totalling 467.7m during the first stint of three weeks duration. The subsequent three drill holes (TCD6 to 8) totalling 338.9m were completed during a second stint of two weeks commencing Friday 7 June.

Drillers worked around the clock on two shifts of approximately eleven hours each during both periods of drilling. Drilling statistics are presented in Table 3, significant results in Table 4 and drill hole locations are shown in Figure 6 and Plate 19.

All drillcore was logged and photographed on site prior to packing and transportation to Zeehan base for sample selection, core cutting and sample despatch to ALS laboratories in Brisbane. Samples at one metre intervals or less were assayed by the ICPOS technique for Cu, Pb, Zn and for gold by 50gm fire assay, the results are presented in Appendix II. Drill logs and downhole surveys are presented as Appendix III, and drill sections in Plates 20 to 24.

6.3.5.3 Results

Drilling of the Thomas Creek Prospect yielded mediocre results in terms of significant intervals of copper and gold mineralisation. However the knowledge gained allows refinement of mineralisation models, particularly in light of the ground magnetics data, and provides encouragement for discovery of significant mineralisation in future. Table 4 provides a list of the better intersections for each drill hole, with the best value of 27 metres of 0.1% Cu in drill hole TCD2..

Drill sections at 1:250 scale for holes TCD1 to 8 display down hole geology with annotation pertaining to alteration styles and distribution along the drill hole trace. Surface geological data from the vicinity of the drill hole surface traces as well as C-horizon soil geochemistry, ground magnetics, chargeability and resistivity measurements are also displayed.

Best copper mineralised intervals are marked on drill sections as a bar covering the interval width and displaying grade notion (eg 2m @ 0.045%Cu). These intervals have been calculated on the basis of >0.03% Cu (300ppm) with a maximum of 2m of internal dilution. While not representing economically signfiicant intervals, they have proven useful for interpretation of mineralisation.

Defining major intervals within drill core was initially somewhat problematical, with logs describing near meter by metre variations. However sub-sequently the drill logs have been rewritten with many intervals incorporated into one major interval. This problem mostly applied to description of the porphyritic diorites which exhibit textural variants from fine grained microdiorite to moderately and strongly porphyritic diorite and further variants result from the extent of alteration present. Many major intervals reflect zones of similar alteration type and do not necessarily reflect the true distribution of the rock unit described. Obviously, rock type definitions will be refined as thin section data is obtained.

Drill core recovered was commonly highly broken, with significant core loss evident, particularly in some clay rich zones. The effect of this loss upon the grades from some intervals has not been fully assessed, but could be significant if appreciable chalcopyrite was introduced with the clay rich vein phase. Drill core recoveries are appended.

The depth extent of weathering in bedrock was unexpected as soil sampling the weathered bedrock was intersected in most holes between 0.2 and 1.2m. Samples obtained from shallower depths were commonly found to be hard or indurated particularly in areas of silicification and k-feldspar alteration (eg vicinity of TCD3). Reasons for the deep weathering may be related to the highly broken nature of many drill intersections and the fracture network which provided an abundance of water access from the water logged swampy nature of the drainage over Thomas Creek Prospect.

7.0 CONCLUSIONS

The long delayed GeoTem airborne survey of the tenement areas which was completed in March 1996 did not provide any high priority targets for VHMS mineralisation. Given that reconnaissance ground surveys were unlikely to provide any drill targets in the remainder of the fold season it was decided to assess the mineralisation potential of the Thomas Creek porphyry Cu - (Au) system with a series of shallow drill holes.

Eight BQTK diamond drillholes totalling 806.6 metres angled at 50° south on three lines 200 metres apart tested peak soil geochemistry and IP chargeability anomalism in the central portion of this prospect. Low grade disseminated and vein hosted chalcopyrite-pyrite mineralisation with best values of 27 metres at 0.1% Cu in TCD2 is generally associated with magnetite-rich silica-chlorite-octivolite-K-spar ± tourmaline alteration surrounding micro-monzodiorite dykes.

The paucity of vein or fracture controlled mineralisation together with the poor development of typical porphyry-type potassic alteration, suggests this project could be a weakly developed porphyry Cu-Au system or the surficial zone drilled to date is peripheral to a more focussed stockwork system at depth.

Ongoing petrological and mineralogical studies may lead to a clearer definition of mineralisation styles and vectors to higher grade mineralisation at Thomas Creek.

The proposed next stage of fieldwork will focus on exploring the area surrounding the Thomas Creek Intrusive Complex in an endeavour to locate other more prospective intrusive related mineralisation or VHMS style mineralisation in the adjacent Noddy Creek Volcanics.

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PHOTO 1

TASMA BARGE AT BHP LANDING, BIRCH'S INLET WITH DRILL AND SUPPLIES AT START OF PROGRAMME

PHOTO 2

DRILL RIG BEING MOBILISED BY SLING TO THOMAS CREEK BY HELICOPTER RESOURCES' SQUIRREL MACHINE

REF:RJC:JM:RPT009

PHOTO 3

RIG BEING MANOEUVRED ONTO DRILL SITE AT THOMAS CREEK BY DRILLERS LANCE AND MARK STEBBINGS

PHOTO 4

SETTING UP DRILL RIG FOR A NIGHT SHIFT
CAMP FOREMAN: PAUL VANNINI - DRILLER: ANDY HORBACH

REF:RJC:JM:RPT009

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PHOTO 5
THOMAS CREEK CAMP IN LATE MAY

PHOTO 6
INTERIOR OF CAMP SHED, MESS AREA AND OFFICE
PERSONNEL FROM LEFT: MARK STEBBINGS, ROB REID, GRAHAM JAGO, LANCE STEBBINGS, PAUL VANNINI

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PHOTO 7

DRILL SITE TCD002. 5800N:369800E

PHOTO 8

LOGGING AND PHOTOGRAPHING CORE ON SITE TCD002

REF:RJC:JM:RPT009

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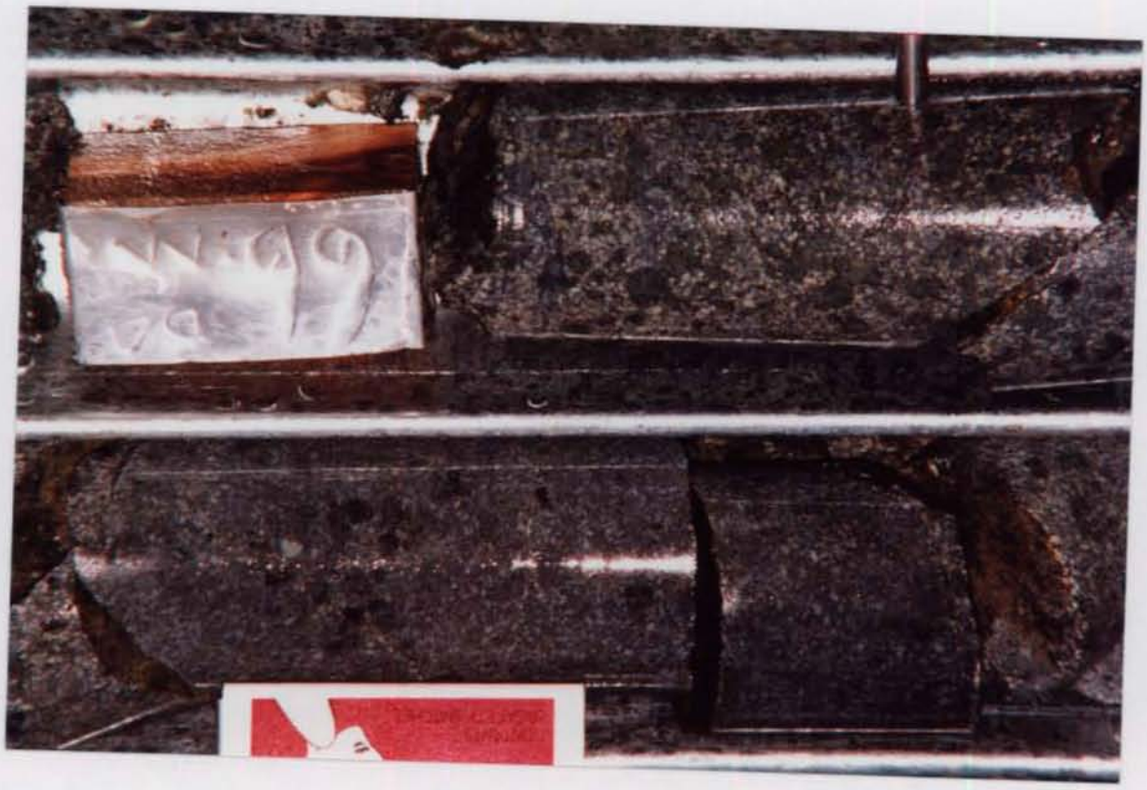

PHOTO 9
TCD001 - 66M DIORITE - FELDSPAR, AUGITE PHYRIC

PHOTO 10
TCD002 - 1045M MICRODIORITE SHOWING PYRITE-TOURMALINE VEINS (TOP) AND PYRITE-CHALCOPYRITE-EPIDOTE VEINS WITH DISSEMINATIONS (BOTTOM)

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PHOTO 11

TCD002 - 54.9M. HAEMATITE-ACTINOLITE-K-FELDSPAR VEIN WITH CHALCOPYRITE

PHOTO 12

TCD003 - 29.05M. INTRUSIVE CONTACT BETWEEN ALTERED MICRODIORITE AND FELDSPAR PORPHYRITIC ANDESITE

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APPENDIX I

GEOTERREX REPORT

ON THE GEOTEM DEEP SURVEY

OVER THE SORELL PENINSULA

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LOGISTICS AND INTERPRETATION OF A GEOTEM$_{DEEP}$ AIRBORNE ELECTROMAGNETIC AND MAGNETIC SURVEY OVER THE SORELL PENINSULA, TASMANIA EL4/92 AND EL7/92 FOR PLUTONIC OPERATIONS LTD.

JOB NO. 8-735
May, 96

Compiled by:
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ABSTRACT

A **GEOTEM**$_{DEEP}$ time-domain airborne electromagnetic and magnetic survey was flown by Geoterrex Pty Ltd for Plutonic Operations Ltd over the Sorell Peninsula, Tasmania, during March 1996.

Data was collected using the **GEOTEM**$_{DEEP}$ airborne electromagnetic and magnetic system, with a base operating frequency of 25 Hz, employing a two component electromagnetic receiver (X and Z). GPS and Doppler velocity data were used for navigation. The survey aircraft was a CASA C212-200 Turbo Prop.

GEOTEM$_{DEEP}$ field data was processed to remove atmospheric and system noise. Algorithms were applied to create Amplitude Decay Index (ADI) and altitude corrected data sets for both X and Z components.

The final processed data was recorded as located data and grids on Exabyte tapes. Hard copies of the processed data were produced as multi-parameter profile plots at 1 : 25 000 scale. Other products provided were 1 : 25 000 magnetic contour maps, ADI images and Channel 2 response images.

Interpretation of the data reveals a number of conductive lithologies throughout the survey area which may be considered prospective for further investigation. Local geological and geophysical studies should be consulted if available to assess the prospectivity of these areas. The most obvious electromagnetic conductor is a unit mapped as a serpentinite dunite. Other lithologies which respond to the primary electromagnetic field include the Noddy Creek Volcanics and the Birch's Inlet Volcanics. Various faults and lithological boundaries appear as conductors. The electromagnetic properties of these areas may be related to alteration.

Some of these inferred bedrock conductors may warrant further investigation using appropriate surface exploration techniques. Areas of interest may be assigned priorities on the basis of supporting geophysical, geochemical and geological information.

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INTRODUCTION

From the 23rd of March to the 28th of March 1996, Geoterrex Pty Ltd conducted a **GEOTEM**$_{DEEP}$ airborne electromagnetic survey over the Sorell Peninsula, Tasmania, for Plutonic Operations Ltd. The base of operations was Strahan. This report summarises the logistics, survey parameters, calibration procedures and processing details of the survey. Interpretation maps of the results and explanatory notes are included.

In total, 1520 line kilometres of **GEOTEM**$_{DEEP}$ electromagnetic data was collected in 6 flights over the survey area at a base operating frequency of 25 Hz. Traverse lines were east-west with a 200 metre line spacing. Tie lines were flown along the eastern and western boundaries with a spacing of approximately 5 kilometres.

Surveying was stopped before the completion of the originally planned area due to difficult flying conditions.

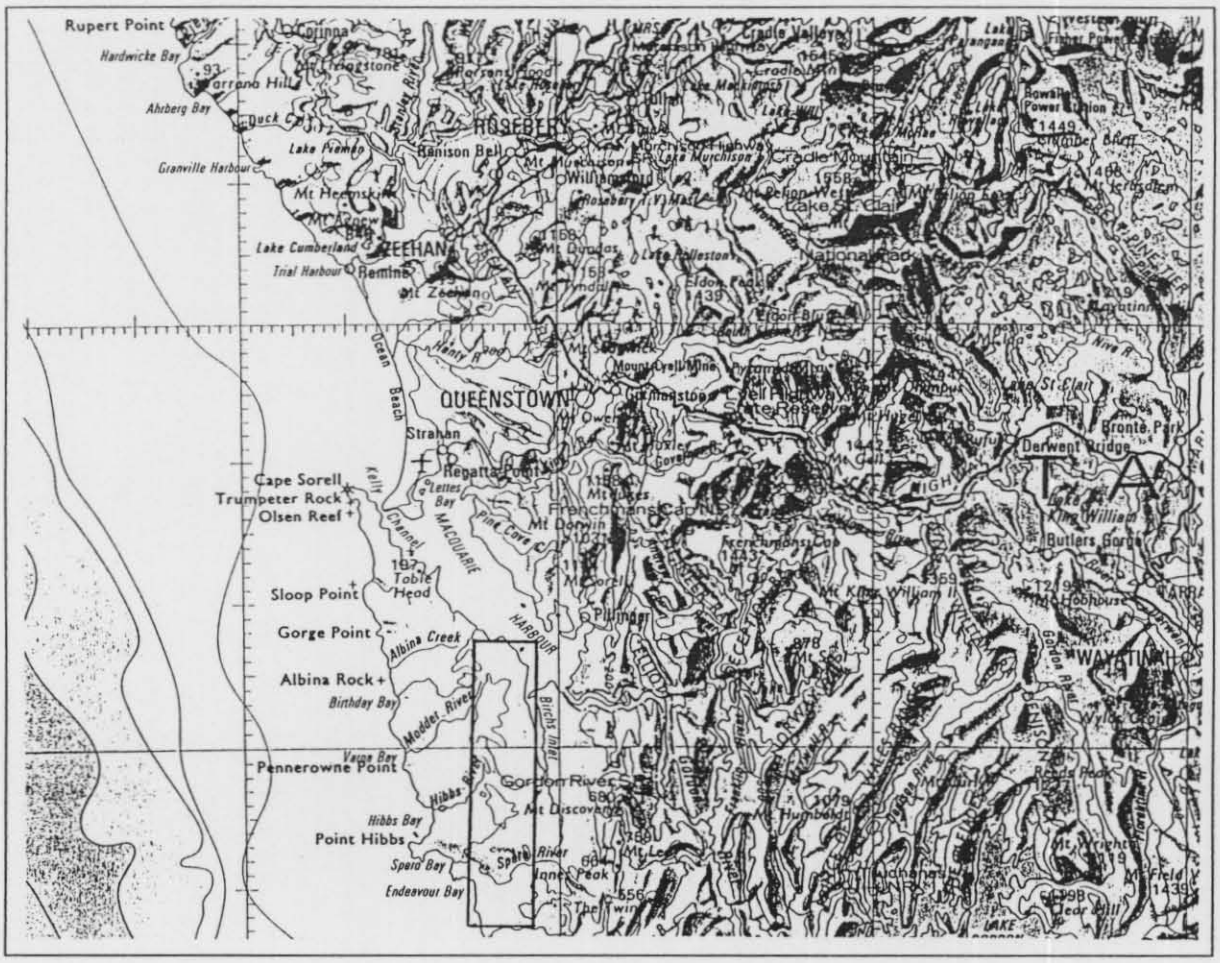


Figure 1 LOCATION MAP: Sorell Peninsula, Tasmania
Scale: 1 : 1 000 000

5 cm

1. SURVEY OPERATIONS SUMMARY

Table 1: SURVEY OPERATION SPECIFICATIONS

Aircraft		CASA C212-200 Turbo Prop, VH-TEM
Type of survey		Electromagnetic
Base of Operations		Strahan
Nominal Aircraft Terrain Clearance (m)		105
Nominal Aircraft Speed (m/sec)		65
Navigation		GPS / Doppler
Field Personnel	Pilots Electronics Technician Geophysicist/Processor Crew Manager	T Haldane, H Thompson T Green M Schneider, M Cooper A Cole

Table 2: FLIGHT PLAN SPECIFICATIONS

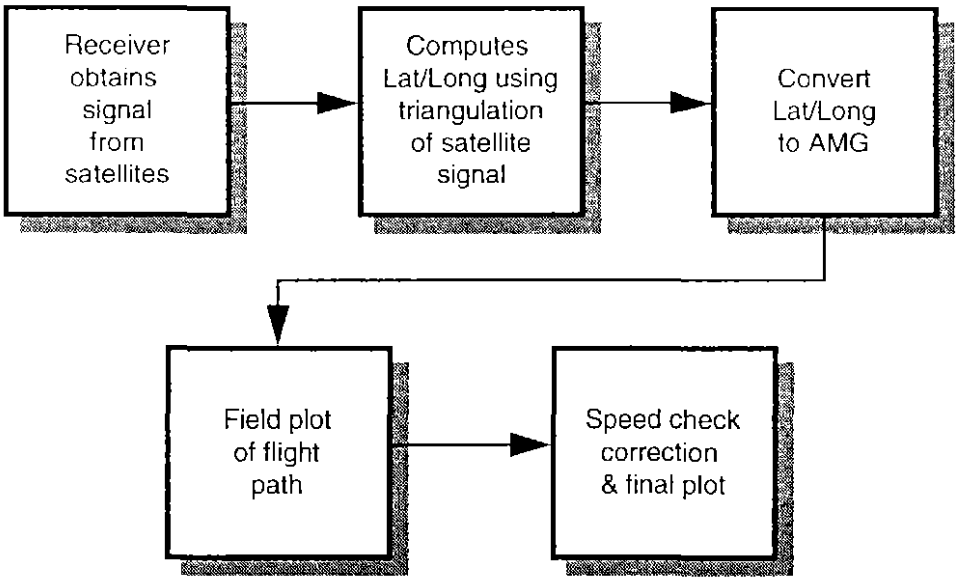
Specification	Sorell Peninsula
Survey Size (line km)	1660 - planned, 1520 - flown
Traverse line direction	East/West
Traverse line spacing (m)	200
Tie line direction	North/South
Tie line spacing (km)	5

Table 3: SURVEY PROGRESS

Date	Progress
18 March	Flights 1,2 & 3 : tests and calibration
19 - 22 March	poor weather
23 March	Flight 4 : tie lines and traverses
24 March	Flight 5 & 6 : traverses
25 March	Flight 7 & 8 : traverses
26 - 27 March	poor weather
28 March	Flight 9 : traverses

2. FLIGHT PATH RECOVERY

GPS NAVIGATIONAL SYSTEM PROCEDURES



A GPS receiver is mounted in the aircraft. This determines satellites in operation and uses 3D triangulation of satellite signals to calculate the position of the aircraft in real time and provides the pilots with steering information. The GPS data are read into the field computer and plotted on a daily basis to ensure data quality control and determine any necessary reflights. The positioning data is stored digitally as Latitudes and Longitudes (Lat / Longs) and later converted to Australian Map Grid (AMG) co-ordinates.

The Doppler system is a radar velocity sensor that determines the three components of aircraft velocity from measurements of the Doppler frequency shift in radar energy transmitted toward, and received back from the ground. These velocity data considered with the heading data from the aircraft's compass are used to determine the aircraft position.

To obtain the optimum level of positioning accuracy the Doppler velocity information is combined with the GPS coordinates using least squares techniques. The integrated solution has greater accuracy and repeatability than either of the individual components. The integrated aircraft track was plotted on a daily basis at 1 : 25 000 scale to ensure data quality and to determine any necessary reflights.

3. GEOTEM$_{DEEP}$ ELECTROMAGNETIC SYSTEM

3.1 EQUIPMENT SPECIFICATIONS

Table 4: EQUIPMENT SPECIFICATIONS

System Specifications		GEOTEM$_{DEEP}$
Geometry	Transmitter Height (m) (above ground level (agl))	105
	Receiver Bird Height (agl, m)	60
	Tx-Rx horizontal separation (m)	120
Transmitter	Coil Axis	Vertical
	Signal	Half sine wave current pulse
	Base frequency (Hz)	25
	Repetition rate (pulses per second)	40
	Pulse width (microseconds)	4 108
	Loop area (square metres)	231
	Number of turns	6
	Peak Current (amps)	480
	Tx loop dipole moment (Am^2)	6.65×10^5
Receiver	Coil Axes	X and Z
	Sample Interval (seconds)	0.25
	Channel times	see Table 5

Figure 2: GEOTEM$_{DEEP}$ SYSTEM GEOMETRY AND WAVEFORM

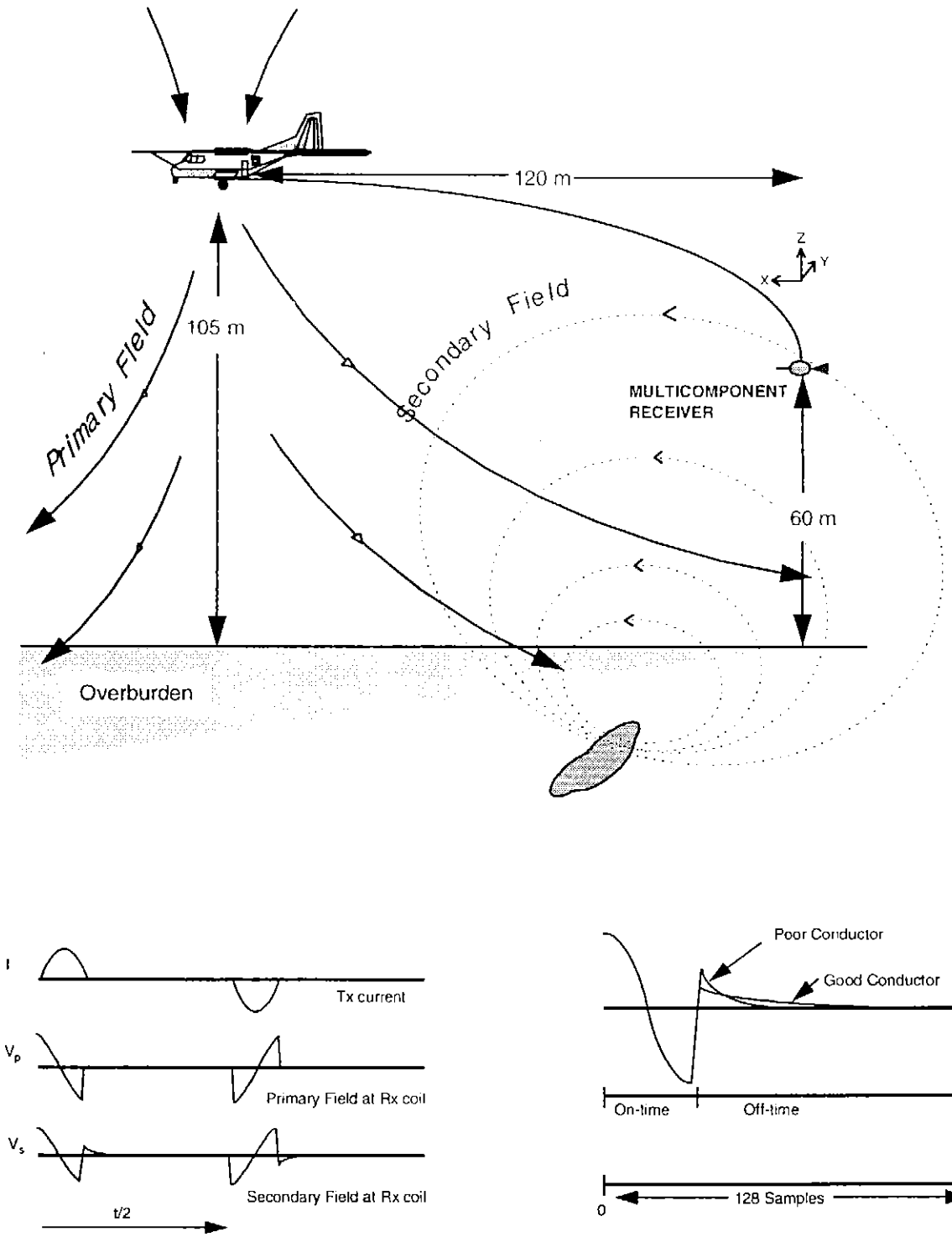
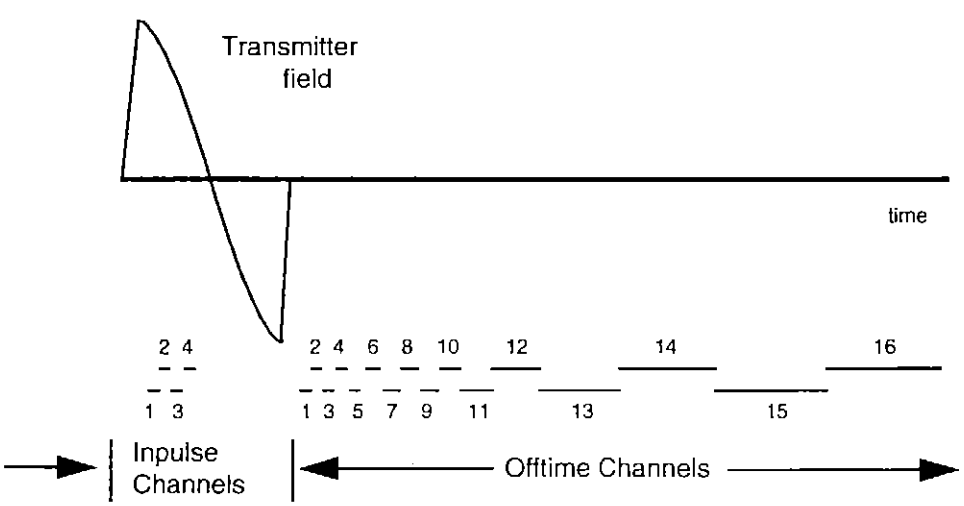


Table 5: X and Z COMPONENT CHANNEL POSITIONS

Channel	Channel Centre µsec after Tx	Channel Width µsec
Inpulse 1	-3 788	313
Inpulse 2	-3 476	313
Inpulse 3	-3 163	313
Inpulse 4	-2 851	313
Offtime 1	352	156
Offtime 2	509	156
Offtime 3	665	156
Offtime 4	899	313
Offtime 5	1 212	313
Offtime 6	1 602	469
Offtime 7	2 071	469
Offtime 8	2 618	625
Offtime 9	3 321	781
Offtime 10	4 181	938
Offtime 11	5 196	1 094
Offtime 12	6 368	1 250
Offtime 13	7 774	1 563
Offtime 14	9 493	1 875
Offtime 15	11 681	2 500
Offtime 16	14 337	2 813

Figure 3: X AND Z COMPONENT CHANNEL POSITIONS



3.2 SYSTEM DESCRIPTION

GEOTEM$_{DEEP}$ is a time domain towed bird electromagnetic system incorporating a high speed EM receiver. The primary electromagnetic pulses are created by a series of discontinuous half-sine current pulses fed into a multi turn transmitting loop surrounding the aircraft and fixed to the nose, tail and wing tips. The pulse repetition rate is 25 Hz (40 bipolar pulses per second).

The EM sensor is a pair of orthogonal air cored coils mounted in a "bird", towed behind the aircraft on a long cable. The cable is demagnetised to reduce noise levels. The geometry of the system is displayed in Figure 2. Two coil orientations are available, the X component having an axis which is horizontal and in the direction of flight, and the Z component having a vertical axis.

For each primary pulse a secondary magnetic field is produced by decaying eddy currents in the ground (The transmitted and received waveforms are depicted in Figure 2). These in turn induce a voltage in the receiver coil which is in proportion to the electromagnetic field. This voltage is sampled over 20 time channels (for both X and Z components) whose centres and widths are software selectable and which may be placed anywhere within or outside the transmitter pulse.

The time varying EM signals received at the sensor pass through anti-aliasing filters and are then digitised with an A/D converter. The digital data stream from the A/D converter passes into an array processor where all the numerically intensive processing tasks are carried out. The array processor is under control of a multi-tasking minicomputer. The on-board processing sequence is as follows:

Transient Analysis: Transient analysis enables the separation of noise from signal in real time;

Digital Stacking: The stacking of transients to produce 1 recorded reading, of which 4 are recorded every second;

Windowing of Data: The transient is initially sampled over 128 time windows which are then binned to form 20 channels.

3.3 SYSTEM CALIBRATION

All checks and adjustments are performed at high altitude at the start of each flight to allow for automatic compensation and calibration at survey altitude. The calibrations and compensations are as follows:

Compensation: During the flight, the transmitter creates eddy currents within the structure of the aircraft that have measurable effects at the receiver coil. Compensation for this signal is effected numerically within the receiver by a statistical analysis of the signal at the bird in the absence of ground response (by flying at an altitude in excess of 600 m above ground level). The observed signal is used to define a compensation signal that is removed from the observed signal to produce a null and thus effectively buck out any response due to changing geometry between receiver and transmitter (ie between the bird and the aircraft);

Normalisation: All EM response channels are automatically calibrated and reduced to parts per million of the primary field in the receiver.

3.4 DATA PROCESSING

Data collected was loaded onto a UNIX workstation and processed using GMAPS software.

Levelling

Since the **GEOTEM**$_{DEEP}$ receiver constantly normalises and calibrates during data acquisition there is no levelling of data at the post-survey processing stage.

Synchronisation Lag

All **GEOTEM**$_{DEEP}$ and auxiliary geophysical data has been synchronised with the navigation data so that there is no "peak position" offset between the responses obtained from lines flown in opposite directions over a narrow vertical conductor.

Noise Reduction

Noise reduction in the digital data is accomplished by identification of the noise type (atmospheric, system or cultural), analysis of the spectral content of the entire signal (geological + noise) and selective filtering.

Atmospheric Noise — The first stage of processing is atmospheric (sferic) noise removal which is achieved by using a method based loosely on cross correlation and non linear filtering, since most sferic events are single reading (impulse response) features which cannot be properly removed by linear filtering.

Cultural noise — Cultural noise (which includes sources such as 50 Hz powerlines, electric fences, cathodic protected metal structures) is measured by the 50 Hz monitor. Normally cultural noise is not removed during processing

System noise — System noise is removed by filtering using strict amplitude and wavelength thresholds to correctly isolate noise from geological signal. The filter shape and amplitude thresholds are determined on a flight by flight basis from raw data plots of at least 2 flight lines flown in opposite directions at the beginning and end of the flight. This allows customisation of filtering for directional, diurnal and flight noise, ensuring that the minimal amount of filtering is performed so that real signal is not degraded by using a "lowest common denominator" philosophy of applying one filter (usually the maximum) for all noise conditions.

4. MAGNETOMETER SYSTEM

4.1 EQUIPMENT SPECIFICATIONS

Model:	Cesium vapour optical absorption magnetometer
Mounting:	Tail stinger
Sample period:	50 milliseconds
Sample interval:	1.0 seconds *
Sensitivity:	0.01 nanoteslas (nT)

* To operate both the **GEOTEM$_{DEEP}$** system and the magnetometer system simultaneously, the transmitter is switched off for a period of 200 milliseconds every second to allow for a noise free magnetometer reading.

Base Station

Model:	G856 Proton Procession
Sample interval:	5 seconds
Sensitivity:	0.1 nT

4.2 DATA PROCESSING

Corrections

Diurnal Levelling

The base station data is edited so that all significant spikes, level shifts and null data are eliminated. It is resampled and synchronised to the airborne fiducial system prior to subtraction from the airborne magnetic readings.

Synchronisation Lag

A lag of 2 seconds (130 metres) was applied to synchronise the magnetic data with the navigation data.

5. AUXILIARY EQUIPMENT

5.1 DATA ACQUISITION SYSTEM

Model: Geoterrex Pty Ltd GEODAS

The GEODAS is a computer-based software system using a 486DX/25 field PC. It runs multiple DOS programs in a multi-tasking environment. The modular design of the GEODAS allows for reconfiguring the system to record different types of surveys by adding, removing or changing task modules.

The GEODAS is currently installed in a rugged, totally enclosed, moisture and dust proof system, originally designed for military use. Currently, it uses a 486DX CPU on a plug-in module card which can be upgraded. Data is recorded on 220 Mb hard disks. A Q10150 cartridge tape system is used for data transfer to the field processing centre.

The following are recorded digitally using the GEODAS:

Each second	Flight number Navigation data including GPS height of the aircraft Total magnetic field Fiducial number (Time in seconds) Barometric pressure Altitude (Radar and Barometer) Temperature outside the cabin in degrees Celsius
Each 0.25 secs:	20 X & Z Component GEOTEM$_{DEEP}$ Channels X & Z Component Transmitter primary field Power Line Noise Monitor (X & Z Component) Earth Field Monitor (X & Z Component) Earth Field Correction

5.2 TRACKING CAMERA

Model: Sony DXC101P Video Camera

The tracking camera is equipped with a 4 mm wide-angle lens. The video tape is synchronised with the geophysical record by a digital fiducial display that increments every tenth of a second. These fiducials are recorded on the video tape and displayed on the bottom left of the video screen. Times are recorded from the digital information provided by the GEODAS system.

5.3 ALTIMETER

Barometric Altimeter

Model:	Geoterrex Barometric Altimeter (SENSYM 142SC15A)
Sample Interval:	1.0 seconds
Sensitivity:	0.24 mV/foot (6.5 mV/mb)

Radar Altimeter

Model:	Sperry Stars AA200 radio altimeter system
Sample interval:	1.0 second
Accuracy:	+/- 3% of indicated altitude.

The Sperry radio altimeter is a high quality instrument whose output is factory calibrated. It is fitted with a test function which checks the calibration of a terrain clearance of 100 feet and altitudes which are multiples of 100 feet.

5.4 ELECTRONIC NAVIGATION

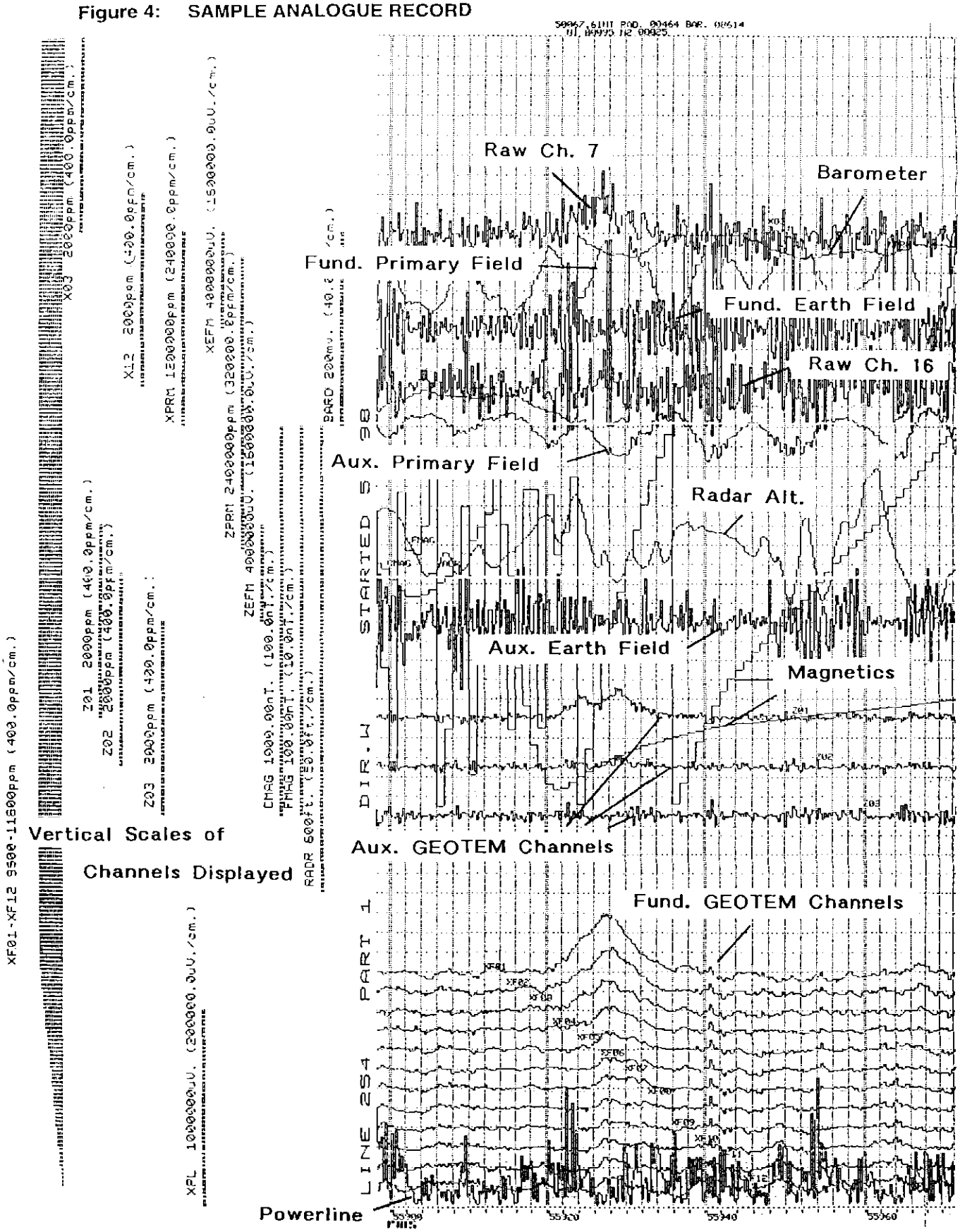
GPS Equipment:	Sercel NR103 GPS receiver and antennae mounted in aircraft and equipped with steering indicators.
Doppler Equipment:	Singer Kearfott AN/ASN 128, Sperry VG-14 Vertical Gyroscope, Sperry C-12 Compass.

5.5 ANALOGUE RECORDER

A sample analogue record is shown in Figure 4.

Model:	RMS GR33 Thermal Dot Matrix Printer
Chart speed:	11 cm/minute; time increases from left to right
Chart width:	30.5 cm
Event marks:	20 second marks are recorded on the bottom of the chart with the associated fiducial numbers being printed at the base of the chart.
GEOTEM$_{DEEP}$ Traces:	The scales for the **GEOTEM$_{DEEP}$** traces are displayed on the analogue charts. The zero line for each channel is separated by 0.5 cm with the latest channel always being plotted closest to the bottom of the page.
Synchronisation:	A lag of approximately 5.0 seconds occurs between the **GEOTEM$_{DEEP}$** channels and the magnetometer and altimeter traces.
Channels Displayed:	Channel 7 noise monitor X Component Primary Field Monitor Z Component Primary Field Monitor X and Z Component Earth Field Monitors Channel 16 noise monitor Total Magnetic Field - Fine Scale Total Magnetic Field - Coarse Scale Terrain Clearance - Radar Barometer **GEOTEM$_{DEEP}$** X channels 5-16 Powerline Monitor

Figure 4: SAMPLE ANALOGUE RECORD



6. SURVEY PRODUCTS

6.1 MULTI-PARAMETER PROFILE PLOTS

The final **GEOTEM$_{DEEP}$** data (and the altitude corrected **GEOTEM$_{DEEP}$** data) is presented as multi-parameter profiles plotted at suitable scales from top to bottom, as listed below. The x-axes of alternate sections of each plot are annotated with fiducial numbers or AMGs. The scales for the **GEOTEM$_{DEEP}$** traces vary according to the channel, to allow resolution in late channels, whilst keeping early channels on scale. The base level for each channel is separated by 0.5 cm with the latest channel always being plotted closest to the bottom of the page. Each plot has a title containing line number, job number, area name, frequency, pulse width and average northing or easting.

Table 6 MULTI-PARAMETER PROFILE PLOT SCALES (1 : 25 000 horizontal scale)

AXIS	Channel	Trace Colour	Scale
1 (top)	Residual Magnetics Coarse Scale	Red	100nT/cm
	Residual Magnetics Fine Scale	Green	10nT/cm
	Barometric Altimeter	Black	50m/cm
	Radar Altimeter	Blue	20m/cm
2	Z Inpulse Channel 1 Z Inpulse Channel 2 Z Inpulse Channel 3 Z Inpulse Channel 4	Black Blue Green Red	10000 ppm/cm
3	ADI (9-16) Z Component	Red	8000 units/cm
	Z Offtime Channels 1-4 Z Offtime Channels 5-8 Z Offtime Channels 9-11 Z Offtime Channels 12-16 50 Hz Monitor - Z Component	Black Blue Green Red Blue	1000 ppm/cm 800 ppm/cm 600 ppm/cm 400 ppm/cm 0.1 volts/cm
4	X Inpulse Channel 1 X Inpulse Channel 2 X Inpulse Channel 3 X Inpulse Channel 4	Black Blue Green Red	10000 ppm/cm
5 (bottom)	ADI (9-16) X Component	Red	8000 units/cm
	X Offtime Channels 1- 4 X Offtime Channels 5- 8 X Offtime Channels 9-11 X Offtime Channels 12-16 50 Hz Monitor - X Component	Black Blue Green Red Blue	1000 ppm/cm 800 ppm/cm 600 ppm/cm 400 ppm/cm 0.1 volts/cm

6.2 FLIGHT PATH MAPS

Flight path maps were produced on film at 1 : 25 000 scale. These were annotated with line numbers, flight direction and fiducial position.

6.3 MAGNETIC CONTOURS

Magnetic data was gridded and used to create 1 : 25 000 contour maps that were printed on film.

6.4 IMAGES

Channel 2 response images and ADI images were produced on laminated paper at 1 : 25 000 scale. Images were made for both X and Z components. The channel 2 response and calculated ADI values were used to produce a 50 x 50 metre grid. A 5 point, triangular, no threshold filter was applied to the grid and the result displayed with a colour scale and contours.

6.5 DATA TAPES AND FORMAT

A set of located data files were produced and copied to 8mm Exabyte tape in 8505 uncompressed format. The structure of the data files is described in Tables 7 and 8.

The gridded data used to create magnetic contours, ADI and channel 2 images were provided in ER Mapper format on Exabyte tape.

6.6 ITEMS DELIVERED

A set of the following was delivered for each survey area.

Analogue Charts
Videotape records of the aircraft track
Flight logs
Mileage list
Final flight line list
Multi-parameter profile plots at 1 : 25 000 scale
Flight path maps at 1 : 25 000 scale on film
Magnetic contours at 1 : 25 000 scale on film
ADI images at 1 : 25 000 scale, laminated
Channel 2 response at 1 : 25 000 scale, laminated
Located data tapes and associated documentation
Gridded data tapes
Logistics and Interpretation report
Exabyte tapes of multi-parameter profile plots

Table 7 LOCATED DATA TAPE FORMAT - Processed Data

Columns	Field Description
1 - 4	1 Flight number
5 - 10	2 Line identifier
11 - 18	3 Fiducial
19 - 26	4 AMG Zone 54 Easting - metres
27 - 34	5 AMG Zone 54 Northing - metres
35 - 42	6 X Inpulse Channel 1 - ppm
43 - 50	7 X Inpulse Channel 2 - ppm
51 - 58	8 X Inpulse Channel 3 - ppm
59 - 66	9 X Inpulse Channel 4 - ppm
67 - 74	10 X GEOTEM Channel 1 - ppm
75 - 82	11 X GEOTEM Channel 2 - ppm
83 - 90	12 X GEOTEM Channel 3 - ppm
91 - 98	13 X GEOTEM Channel 4 - ppm
99 - 106	14 X GEOTEM Channel 5 - ppm
107 - 114	15 X GEOTEM Channel 6 - ppm
115 - 122	16 X GEOTEM Channel 7 - ppm
123 - 130	17 X GEOTEM Channel 8 - ppm
131 - 138	18 X GEOTEM Channel 9 - ppm
139 - 146	19 X GEOTEM Channel 10 - ppm
147 - 154	20 X GEOTEM Channel 11 - ppm
155 - 162	21 X GEOTEM Channel 12 - ppm
163 - 170	22 X GEOTEM Channel 13 - ppm
171 - 178	23 X GEOTEM Channel 14 - ppm
179 - 186	24 X GEOTEM Channel 15 - ppm
187 - 194	25 X GEOTEM Channel 16 - ppm
195 - 202	26 X GEOTEM ADI Chs 9-16 - units
203 - 210	27 Z Inpulse Channel 1 - ppm
211 - 218	28 Z Inpulse Channel 2 - ppm
219 - 226	29 Z Inpulse Channel 3 - ppm
227 - 234	30 Z Inpulse Channel 4 - ppm
235 - 242	31 Z GEOTEM Channel 1 - ppm
243 - 250	32 Z GEOTEM Channel 2 - ppm
251 - 258	33 Z GEOTEM Channel 3 - ppm
259 - 266	34 Z GEOTEM Channel 4 - ppm
267 - 274	35 Z GEOTEM Channel 5 - ppm
275 - 282	36 Z GEOTEM Channel 6 - ppm
283 - 290	37 Z GEOTEM Channel 7 - ppm
291 - 298	38 Z GEOTEM Channel 8 - ppm
299 - 306	39 Z GEOTEM Channel 9 - ppm
307 - 314	40 Z GEOTEM Channel 10 - ppm
315 - 322	41 Z GEOTEM Channel 11 - ppm
323 - 330	42 Z GEOTEM Channel 12 - ppm
331 - 338	43 Z GEOTEM Channel 13 - ppm
339 - 346	44 Z GEOTEM Channel 14 - ppm
347 - 354	45 Z GEOTEM Channel 15 - ppm
355 - 362	46 Z GEOTEM Channel 16 - ppm
363 - 370	47 Z GEOTEM ADI Chs 9-16 - units
371 - 378	48 GEOTEM 50Hz Monitor
379 - 386	49 Radar Altimeter - metres
387 - 394	50 Barometric Altimeter - metres
395 - 404	51 Diurnally Levelled Magnetics - nT
405 - 405	**<newline>**

Table 8 LOCATED DATA TAPE FORMAT - Altitude Corrected Data

Columns	Field Description
1 - 4	1 Flight number
5 - 10	2 Line identifier
11 - 18	3 Fiducial
19 - 26	4 AMG Zone 54 Easting - metres
27 - 34	5 AMG Zone 54 Northing - metres
35 - 42	6 X GEOTEM Altitude Corrected Channel 1 - ppm
43 - 50	7 X GEOTEM Altitude Corrected Channel 2 - ppm
51 - 58	8 X GEOTEM Altitude Corrected Channel 3 - ppm
59 - 66	9 X GEOTEM Altitude Corrected Channel 4 - ppm
67 - 74	10 X GEOTEM Altitude Corrected Channel 5 - ppm
75 - 82	11 X GEOTEM Altitude Corrected Channel 6 - ppm
83 - 90	12 X GEOTEM Altitude Corrected Channel 7 - ppm
91 - 98	13 X GEOTEM Altitude Corrected Channel 8 - ppm
99 - 106	14 X GEOTEM Altitude Corrected Channel 9 - ppm
107 - 114	15 X GEOTEM Altitude Corrected Channel 10 - ppm
115 - 122	16 X GEOTEM Altitude Corrected Channel 11 - ppm
123 - 130	17 X GEOTEM Altitude Corrected Channel 12 - ppm
131 - 138	18 X GEOTEM Altitude Corrected Channel 13 - ppm
139 - 146	19 X GEOTEM Altitude Corrected Channel 14 - ppm
147 - 154	20 X GEOTEM Altitude Corrected Channel 15 - ppm
155 - 162	21 X GEOTEM Altitude Corrected Channel 16 - ppm
163 - 170	22 Z GEOTEM Altitude Corrected Channel 1 - ppm
171 - 178	23 Z GEOTEM Altitude Corrected Channel 2 - ppm
179 - 186	24 Z GEOTEM Altitude Corrected Channel 3 - ppm
187 - 194	25 Z GEOTEM Altitude Corrected Channel 4 - ppm
195 - 202	26 Z GEOTEM Altitude Corrected Channel 5 - ppm
203 - 210	27 Z GEOTEM Altitude Corrected Channel 6 - ppm
211 - 218	28 Z GEOTEM Altitude Corrected Channel 7 - ppm
219 - 226	29 Z GEOTEM Altitude Corrected Channel 8 - ppm
227 - 234	30 Z GEOTEM Altitude Corrected Channel 9 - ppm
235 - 242	31 Z GEOTEM Altitude Corrected Channel 10 - ppm
243 - 250	32 Z GEOTEM Altitude Corrected Channel 11 - ppm
251 - 258	33 Z GEOTEM Altitude Corrected Channel 12 - ppm
259 - 266	34 Z GEOTEM Altitude Corrected Channel 13 - ppm
267 - 274	35 Z GEOTEM Altitude Corrected Channel 14 - ppm
275 - 282	36 Z GEOTEM Altitude Corrected Channel 15 - ppm
283 - 290	37 Z GEOTEM Altitude Corrected Channel 16 - ppm
291 - 298	38 GEOTEM 50Hz Monitor
299 - 306	39 Radar Altimeter - metres
307 - 314	40 Barometric Altimeter - metres
315 - 324	41 Final Magnetics - nT
325 - 325	<newline>

7. SURVEY RESULTS

7.1 General

The operation of a towed-bird time domain electromagnetic system involves the measurement of decaying secondary electromagnetic fields induced in the ground by a series of short current pulses generated from an aircraft mounted transmitter. Variations in the decay of the secondary field (sampled and displayed as channels) are analysed and interpreted to provide information about the sub-surface geology. The response of such a system, utilising a vertical axis transmitter dipole and a horizontal axis receiver coil, has been documented by various authors, including *Palacky and West (1973, Geophysics, v. 38, p. 1145-1158)*.

GEOTEM$_{DEEP}$ data may be presented through a number of parameters depending on the application and target sought. These include multiparameter profiles, Channel amplitude maps, ADI maps, CDTs and apparent conductance maps. Channel amplitude maps are valuable as a raw guide to the electromagnetic response of the halfspace beneath the aircraft. Early channel amplitudes will reflect shallow material, overburden and weak conductors. X component data emphasises vertical conductors, Z component data reflects large conductors which may be flat-lying and obscured by large amounts of flat-lying conductive overburden.

Free air model studies using plate and layered earth modelling programs demonstrate that the depth of investigation of the system depends upon the geometry of the target and the conductivity regime. Time domain systems respond to a wide range of conductors and the method is capable of high resolution of conductor geometry, thus discrimination of bedrock from surficial conductors.

7.2 Conductor Type

Differentiation between types of bedrock conductors and between bedrock and surficial conductors can be made through analysis of various **GEOTEM$_{DEEP}$** output parameters. Bedrock conductors respond to the primary field with long decay times and elevated amplitudes in late-time channels. This feature of the secondary field response can be accentuated through appropriate application of the amplitude-weighted decay index, by selecting a number of mid to late-time channels which should typify the kind of conductive response sought. For instance, in an area where relatively shallow, weak conductors are the target, early to mid time channels may be selected. However in an environment typified by conductive overburden and suspected deep conductors, late-time channels utilising a low frequency **GEOTEM$_{DEEP}$** system configuration would be more appropriate.

Bedrock conductors may be caused by a number of geological circumstances. Carbonaceous sediments resulting in graphitic horizons are characterised by long, narrow, generally linear conductive zones. Graphitic layers may also be concentrated along faults and shear zones. These units are generally very conductive and strike-bound, displaying multiple peaks on the multiparameter profiles. The signature of graphitic horizons is usually quite recognisable.

Massive syngenetic sulphide bodies often correspond to long multiple conductors and their conductivities vary considerably. Pyrrhotite associated with mineralisation can cause coincident magnetic anomalies. Massive sulphide bodies of long strike length are rare, however a strong discrete conductor may suggest the presence of massive sulphide mineralisation.

Magnetite in bedrock lithology may appear primarily as a magnetic units with some weak associated conductance. Serpentinised ultrabasic rocks may be both conductive and magnetic and may host mineralisation. Manganese oxide in bedrock may result in a weak secondary field responses. Long strike-bound structures associated with strong magnetic character may be indicative of banded iron

formations. 20 to 400 gamma magnetic anomalies associated with EM responses may infer the presence of pyrrhotite.

Surficial conductors include clayey alluvium, residual soils, swamps, brackish ground-water and lateritic formations. Many surficial features are broad horizontal sheets of low to moderate conductivity. Such features produce an asymmetric response with the **GEOTEM$_{DEEP}$** system. If anomaly location is strongly dependent on line direction, a surficial source is probable.

Many surficial materials are low to moderate conductors and are not easily mistaken for conductive bedrock features. Surficial conductors are generally broad and result in anomaly characteristics typical of horizontal sheets. When surficial conductivity is high it is possible to distinguish between a conductive horizontal layer and a conductive vertical body, as a horizontal conductor will display the asymmetric characteristics delineated in the previous paragraph.

An ambiguous situation may occur if surface conductivity is related to bedrock lithology. For example, surficial alteration of a bedrock unit. It may also be difficult to distinguish between a weak conductor within bedrock and a surficial source, depending on the dip and strike of the bedrock.

Interpretation of surficial conductors may be a survey goal. The electromagnetic characteristics of soils, weathered or altered surficial materials can be a useful aid to geologic mapping. Shear zones and faults may also be identified by weak, narrow anomalies. Surficial conductivity characteristics can be used in exploration for lignite deposits and kimberlites, and for definition of palaeodrainage features and groundwater. In coastal or arid areas, surficial responses may serve to define spatial limits of fresh, brackish or salty water.

7.3 Channel Amplitude Maps

Channel amplitude maps provide a simplified representation of the electromagnetic features of an area. The channel selected for plotting as a colour image is targeted to a specific type of conductor. Data presented in this form is useful as a guide to the overall surficial conductivity within an area rather than as a method for distinguishing individual targets. Channel amplitude maps permit the degree of isolation of conductors to be determined and the mapping of structural features. Early-time channel amplitude maps reflect shallow sources, weak conductors and overburden effects, late-time channel amplitude maps reflect deeper conductors and so on.

A feature that may appear on X component channel amplitude maps is a "herringbone" pattern which may be seen along the margins of some conductive regions. This pattern is due to the asymmetric responses generated by the **GEOTEM$_{DEEP}$** system when flying over thin horizontal conductors. The leading edge of a conductor has a different electromagnetic response size, decay rate and position than the trailing edge. Stronger coupling between the conductor and primary field occurs at the leading edge of a horizontal sheet and a weaker response occurs at the trailing edge. This is due to the position of the receiver a considerable distance behind the transmitter. As alternate survey lines are generally flown from opposite directions, a staggered peak amplitude occurs. The degree of stagger is reduced as the conductor dip becomes greater or as the horizontal plate becomes thicker.

7.4 Amplitude-weighted Decay Index (ADI)

To aid interpretation of GEOTEM$_{DEEP}$ data, time constants can be calculated to quantify the rate of decay of the electromagnetic response. The Amplitude Decay Index (ADI) measures the rate of decay and weights it relative to the amplitude of the response. In this respect the Amplitude Decay Index is also a measurement of the area under the decay curve rather than just an estimate of the

rate of decay. The ADI is derived from the best fitting exponential to the decay curve using data from selected **GEOTEM**$_{DEEP}$ channels (a minimum of four) as indicated on the multi-parameter profile plots and this index is included on the final located data tape.

Channels 5 to 10 were used in the calculation of ADI over the Sorell Peninsula.

7.4 Altitude Correction

In addition to the final processed channels of data, multi-parameter profile plots may also display altitude corrected **GEOTEM**$_{DEEP}$ data. This data may be presented as hashed lines along the same axes, using the same base lines and scaling applicable for the solid lines which represent the other processed channels of **GEOTEM**$_{DEEP}$ data. This presentation highlights those areas where the electromagnetic response has been affected by variation in aircraft terrain clearance. This aids data interpretation by correcting the data to the mean survey altitude. Unexpectedly large variations in altitude are not corrected, so avoid drastic distortion of the **GEOTEM**$_{DEEP}$ data does not occur. This is achieved by the use of tapering functions.

7.4 Interpretation

The objective of the survey was to detect conductors which may represent massive metallic sulphides. Magnetic and electromagnetic plan maps provide an overall view of the geophysical environment and relate directly to structure and lithological boundaries. Conductors have been selected from the maps and profiles by analysing shape, relationship to geology and structure, rate of decay, magnetic responses and other diagnostic characteristics. Geological references have been made with the aid of the Poseidon, Placer Regional Geology 1 : 50 000 Geological Map and the Queenstown 1 : 250 000 Geology Map.

Geological and structural characteristics of the survey area are clearly seen through study of the magnetic maps and the Channel 2 amplitude map. These maps permit a more detailed understanding of the conductive units, which may be responsible for enhanced **GEOTEM**$_{DEEP}$ amplitudes or highly magnetic zones. Prospectivity of the units highlighted by these maps can be better defined utilising the ADI maps.

The survey area has a complex geological structure, the definition of which is improved by the geophysical maps. The area is transected by numerous faults and lineaments which trend north-northwest to south-southeast through to north-northeast to south-southwest. These appear as breaks and discontinuities in the magnetic signatures and may also appear in the processed Channel amplitude maps as changes in conductor shape and direction. The geophysical and geological maps generally correspond well, however, there are areas where divergences occur. These areas may be of interest, particularly if they are notable for distinctive geophysical characteristics such as elevated conductivity or increased magnetic intensity. These areas may represent places where the geology has been incompletely mapped, or they may reflect geological features buried by rock or other overburden. In many areas, geophysical mapping may elucidate geological responses from under weathered surficial material or unconsolidated Quaternary sediments.

The lithologies showing the highest electromagnetic responses are the Noddy Creek Volcanics and the Birch's Inlet Volcanics, as well as undifferentiated sediments of the Dundas Group and various igneous rocks associated with the Dundas Group (including a very conductive pyroxenite serpentinite).

Conductive zones marked on the Interpretation Maps represent both prospective conductors and other structural and lithological features. The selection and classification of conductors is based on the following criteria :

- Structurally favourable context (ie. along contacts, near faults or intrusive units)
- Strike length and degree of isolation of the conductor
- Associated magnetic characteristics
- Localised characteristics of the conductive zone. Particular reference is made to changes in the decay rate, although other features may be relevant
- The position of the conductor with respect to strike of local geological structures

Conductive regions marked on the interpretation maps are labelled "C-1" etc, regions of anomalous ADI responses are labelled "A-2" etc and regions of elevated magnetic intensity are labelled "M-1" etc.

Sheet 1

C-1, A-1 : The most prominent anomalous region on this sheet is a zone of increased conductivity in the northwestern corner of the sheet, marked as C-1. This area is characterised by very high early channel amplitudes and slow decays. There is a correlation between this zone and a mapped unit of pyroxenite serpentinite (Evm), which is flanked on both sides by relatively broad zones of argillite and siltstone. This unit appears to be the most conductive unit within the survey area. However, given its length (over 4.5 km), it may represent merely a conductive serpentinite without accessory mineralisation. The ADI response of this zone is of interest, as it corresponds to the faulted eastern margin of the unit (as marked on the geology map). Although the ADI anomaly terminates at approximately 5 301000 mN, the arcuate trend of the fault is evident in the Channel 2 amplitude map. This trend continues south through conductive regions marked as C-3 and A-3.

C-2, A-2: These zones are responses to the salt water of Macquarie Harbour in the northeastern corner of the survey area.

A-3: This is a small east-west trending zone which appears to correspond to a mapped cross-fault. This zone also crosses a strong electromagnetic trend and may be considered a possible area for further investigation.

Anomaly (3)

A north-south trending electromagnetic lineament in the northeast of the Channel 2 Amplitude Map, just west of the C-2 boundary, corresponds to a faulted boundary between Eda and Eds. Although a low amplitude conductor, this trend may be of interest.

C-3: This conductive area lies on the convergence of a number of mapped faults and lithological boundaries. In the eastern part of this zone is a small ADI anomaly which lies over the conjunction of a number of volcanic (apparently plutonic) bodies, including the Stoney Creek Granite. The small ADI anomaly is located on Line 297/1, FID 43850.

Anomaly (13)

C-4: A relatively linear conductive zone, which lies over the M-3 magnetic zone and may be related to faulting.

C-5: This is a weakly conductive area with no corresponding ADI or magnetic anomalies.

There are some other small regions of anomalous ADI on this sheet which should be compared to local geological or other studies in order to better evaluate the prospectivity of these areas.

M1: This is a zone of linear, strike oriented magnetic units on the western side of the survey area. The perimeters of the northern part of this area correlate to that of A-1. More particularly, the mapped Evm serpentinite unit corresponds directly to a linear magnetic high within this zone.

M-2 and M-3: These are two strongly magnetised zones related to a group of volcanics which includes diorites, gabbros and basalts.

Sheet 2

C-3: This zone continues in a southerly direction from Sheet 1, into the central north of Sheet 2 and corresponds to a long electromagnetic lineament which continues for almost the entire length of the sheet. This appears to be the response of a fault marked on the geological map. A small ADI anomaly can be seen within this zone on Line 268/1 fid 61015. Given the association of this zone with a fault, this anomaly may be of interest.

Anomaly 0

C-6: This zone appears in the southwest corner of Sheet 1 and continues in the northwest corner of Sheet 2. It appears to correlate with a unit mapped as Cambrian Dundas Group greywackes and conglomerates.

M-4: This magnetic region lies adjacent to C-6 and between two electromagnetic lineaments. It is linear and corresponds to the Noddy Creek Volcanics, and is displaced to the west by approximately 200 m in its centre, possibly due to cross faulting.

C-7: This is a broad conductive zone with some magnetic character. A narrow, NNE extending limb of this zone has strong magnetic and electromagnetic trends. These trends correspond to a large mapped fault (as for Sheet 1). At the southern extent of these trends, a small anomalous ADI lineament can be seen and probably represents a weak, shallow conductor, perhaps alteration around a fault.

A-5: This ADI response does not appear to be directly related to a specific lithology. The anomaly lies within Cambrian greywackes and conglomerates (Eds) and may be an incorrectly mapped unit of serpentinite or Birch's Inlet Volcanics.

Anomaly 8

A-6: An electromagnetic response of the Dundas Group greywackes and conglomerates (Eds).

A-7: This ADI anomaly is related to the Noddy Creek Volcanics (Evn). This zone encompasses the serpentinite unit (Evm) near the Spero River.

M-5: This region corresponds to the Birch's Inlet Volcanics and a Hornblende diorite (Evb and Di).

M-6: Birch's Inlet Volcanics (Evb).

C-8: A weakly conductive region which corresponds to a large block of undifferentiated Dundas Group Sediments (Ed(s)).

C-9 / A-8: *The western boundary of C-9 corresponds to the boundary of Tertiary gravels and* alluvium in this region. A-8 corresponds to the position of the Tertiary materials and an area mapped as "Evb?". These high EM responses could be the result of low-lying areas near Birch's Inlet and they may be saturated with salt (sea) water.

Anomalies 6 - 8

C-10: This is a weakly conductive region which corresponds to Cambrian Dundas Group undifferentiated sediments (Ed(s)) and the Noddy Creek Volcanics (Evn).

A-9: This is a region of anomalous ADI which corresponds to a mapped region of Noddy Creek Volcanics (Evn).

See 2.2.3 Line 214 Anomaly

Sheet 3

A-7 / C-7: This trend continues south from Sheet 2 and represents Noddy Creek Volcanics and a broad area of Dundas Group sediments which continue south to Endeavour Bay.

Anomaly 4

C-10: *This conductive region continues in a southerly direction from Sheet 2, along the* eastern margin of the survey area. It is interpreted as an area of undifferentiated sediments and Tertiary gravels and sands.

A-10 / C-12: This conductive region extends along the western margin of the survey area and is an electromagnetic response to the sea water off the west coast of the survey area.

A-11: This is a region of anomalous ADI response, probably an unmapped extension of the magnetic M-6 zone, but in contrast to M-6, it is conductive and has a lower magnetic signature. This conductor also lies along a faulted boundary and may be considered prospective for further investigation.

Anomaly 2

C-11: This area corresponds well to a mapped region of Noddy Creek Volcanics (Evn) and Dundas Group sediments (Ed(s)). The electromagnetic trends within this large zone can be correlated to volcanics (Evn) interbedded with Ed(s) as well as some fault lineaments.

ANOMALY 7

M-7: *A basalt unit (Evnb) which lies almost on the western coast.*

C-13: This is a moderate - low conductivity zone with a small area of high ADI associated with it. Two EM lineaments pass through this region. Both of these lineaments appear to strike NNW to SSE in contrast to mapped geology, which strikes N-S or NNE-SSW. These lineaments may represent faults or volcanics (Evn).

M-8: This magnetic unit is a continuation of the M7 Noddy Creek Volcanics basalt which has been displaced to the east by faulting.

ANOMALY 10 - 7

A-12 / C14: A-12 corresponds closely to a mapped border of Tertiary gravel and alluvium, which is possibly saturated and quite conductive. C-14 lies in the same region but is the response of felsic tuffs of the Noddy Creek Volcanics (Evnt). The electromagnetic trends marked on the interpretation map in this area are interpreted to be caused by volcanic units (Edv).

8. CONCLUSIONS AND RECOMMENDATIONS

This report provides a description of the survey results and describes the equipment, procedures and logistics of the survey.

The survey was successful in defining conductivity contrasts associated with contacts and fault zones. Such anomalous regions were targets of the survey and may warrant additional work. The various maps included with this report display the magnetic and conductive properties of the survey area. It is recommended that the survey results be reviewed in detail, in conjunction with all available geophysical, geological and geochemical information. Particular reference should be made to the computer generated data profiles which clearly define the characteristics of the anomalous zones.

Most anomalies in the area are moderately weak and poorly-defined. Many have been attributed to conductive overburden or deep weathering, although a few appear to be associated with conductive clays possibly overlying basalts.

Interpreted conductors and suspected alteration zones defined by the survey should be subjected to further investigation, using appropriate surface exploration techniques. Anomalies which are currently considered to be of moderately low priority may require upgrading if follow-up results are favourable.

It is also recommended that image processing of existing geophysical data be considered, in order to extract the maximum amount of information from the survey results. Current software and imaging techniques often provide valuable information on structure and lithology, which may not be clearly evident on the contour and colour maps. These techniques can yield images which define subtle, but significant, structural details.

APPENDIX A: RMS THERMAL PAPER STORAGE INSTRUCTIONS

PAPER STORAGE AND HANDLING, RMS 2030 THERMAL PAPER

STORAGE:

Ambient Temperature:	Less than 25°C
Relative Humidity:	Less than 65%
Storage Location:	In darkness before and after exposure.

Under these conditions, the paper should retain its characteristics and the printed images will remain legible for at least 5 years, although in the case of blue image paper, there may be some slight fading.

TO ELIMINATE PREMATURE PAPER DEVELOPMENT:

- Colour development begins at temperatures between 70 to 100°C, and reaches saturation density between 80 and 120°C. Premature development of the paper may occur at lower temperatures, and particularly if the humidity is greater than 65%.
  eg. If the paper is stored for 24 hours at a temperature of 60°C, some development may occur. Or if the paper is stored for 24 hours at a temperature of 45°C when the relative humidity is 90%, development may also occur.

- Avoid use of solvent-type adhesives. Adhesives containing volatile organic solvents such as alcohol, ester, ketone, etc causes colour formation and therefore rubber-type adhesives etc should not be used. Starch, PVA and CMC type adhesives are recommended.

- Frictional heat generated by rubbing a finger nail or sharp object over the surface will cause images to develop.

- Thermal paper will develop colour if brought into contact with freshly processed Diazo copying paper.

TO ELIMINATE PAPER FADING:

- Thermal paper will turn yellow, and blue printed images will fade if exposed to direct sunlight or to fluorescent lighting for long periods. File exposed paper in the dark immediately after exposure. Do not store paper near windows.

- Prolonged contact with PVC film containing plasticisers such as ester phthalate will reduce the image forming ability of the paper and cause printed images to fade. We recommend that files made of polyethylene, polypropylene, polyester, etc be used.

- Self-adhesive cellophane tapes containing an alcohol type plasticiser will cause the image to fade. Double-sided adhesive tape is recommended for use instead of paste.

- Handling thermal paper with dirty or sweaty fingers may cause images to fade.

- Do not store developed paper with the sensitised surfaces touching as images might be transferred from one sheet to another.

APPENDIX II

GEOCHEMICAL ANALYSES

FOR RECONNAISSANCE SURVEYS AND DRILLCORE

PLUTONIC

Plutonic Operations Limited
A.C.N. 004 680 997
Level 37, 100 Miller Street, North Sydney, NSW 2060
Telephone (02) 959 3433, Facsimile (02) 955 9620

311083

SAMPLE RECORD SHEET

PROJECT NAME: Sorell Peninsular CODE: 108 TENEMENT: EL 4/92 (or SHEET No.)

PROSPECT NAME: Thomas Creek

SAMPLER: R Reid / N McKim SAMPLE TYPE: Stream/Soil DATE: 31/7/96

HOLE I.D.: P.O. No.: 2018603

SAMPLE No.	TYPE	INTERVAL/ LOCATION/CO-ORDS	DESCRIPTION
S 18421	-80#	DRAINAGE.	S1 ~~f-aug-phc I py(1%) cpy(tr)~~
2	"	↓	S2
3	"		S5
4	-80#		S9
5	"		A6
6	"		A8
7	"		A10
8	"	5855mN, 369800mE	
9	"	369605mE, 5800mN	fine sand / some silt
S 18430	-80#	369600mE, 5788mN	sand & fine gravel
1	Pan Con		S1
2	"		S2
3	"		S5
4	"		S9
5	"		A6 poor trap
6	"	369605mE, 5800mN	poor trap 1x5kg pan
7	"	369800mE, 5855mN	free root base.
8	"	" "	repeat "
9	C-Horiz soil		SS1
S 18440	Soil Sample		SS2
1	"		SS3
2	"		SS4
3	"		SS5
4	"		SS6
5	"	369600E, 5950mN	
6	"	369600mE, 5912.5mN	
7	Rock chip		S1 gn f-aug-phc I py(1%) cpy(tr) ch(tr?)
8			S3 bn f-phc And/Bac?
9			S4 lht gn/bn mod f-aug-phc I, transient q-und(1%)
S 18450			S5

REMARKS:

WHITE: Assay File
PINK: Project File
YELLOW: Field Copy

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311084

SAMPLE RECORD SHEET

JECT NAME: Sorell Peninsular CODE: 708 TENEMENT: EL 4/94 (or SHEET No.)

SPECT NAME:

ER: R Reid SAMPLE TYPE: Rockchip/-80# DATE: 31/7/96

E I.D.: P.O. No.: 2018860 33

AMPLE No.	TYPE	INTERVAL/ LOCATION/CO-ORDS	DESCRIPTION
18451	Rock chip		S7 lht gn mod-f-aug-phc I, white q-vnd (tr)
2	"		S10
3	"		S12
4	"		S13
5	"		S14a pk/gn I? ks(m) sill(w/m) ch(w/m?) mag(w) py(4% dss)
6	"		S14b pgn I? py(8% dss/sms) sill(w) (f-phc?)
7	"		S14c I ch(w) sill(w) py(5%)
8	"		S15 gn f-phc I
9	"		A1 bn hb-phc I? fg ch/sil vnd(tr) volcaniclastic?
18460	"		A2 bn fg/lng f-phc? I (MDI?) mag(w)
1	"		A3 bn aug-phc I (MDI?)
2	"		A9 crm/gn I/Di f-aug-mag? (mag w/m)
3	"		A8/float, bn f-hb-And porphyry, chalcedony vnd (botryoidal)
4	-80#	370065mE, 5600mN	
5			
6			
7			
8			
9			
18470			
1			
2			
3			
4			
5			
6			
7			
8			
9			
18480			

MARKS:

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Rex X-press Printing Co (07) [illegible]

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Telephone (02) 959 3433, Facsimile (02) 955 9620

SAMPLE RECORD SHEET

PROJECT NAME: Sorell Peninsular CODE: 708 TENEMENT: (or SHEET No.)

PROSPECT NAME: Thomas Creek

SAMPLER: R Reid SAMPLE TYPE: Stream Sediments DATE: 95

HOLE I.D.: P.O. No.: 2017052

SAMPLE No.	TYPE	INTERVAL/ LOCATION/CO-ORDS	DESCRIPTION
S 16981	Bag 5-4kg	369000E, 5286590 N	Ck junction, Crack frags diorite, massive milky qtz, coarse angular frags
2		369400E 5286075 N	Cfrags eg qtz-ch porphyritic intrusive "
3		370470E 5286000 N	Cfrags IV, silicified Diorite? "
4		370280E 5286750 N	Crounded frags (@90m)
5		370360E 5286780 N	(@285) "
6	—80##	369000E 5286590 N	
7		369400E, 5286075 N	
8		370280E 5286750 N	
9		370200E, 5286710 N	
S 16990	PANNED	369000E, 5286590 N	2x5 kg pan loads.
1	Concentrates	369400E 5286075 N	
2		370200E, 5286710 N	
3		370360E, 5286780 N	
4			
5			
6			
7			
8			
9			
S 17000			
1			
2			
3			
4			
5			
6			
7			
8			
9			
S 17010			

REMARKS:

WHITE: Assay File
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Analabs

311086

Analabs Pty. Ltd.
A.C.N. 004 591 664

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

ANALYTICAL REPORT No. 111715.60.11515

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

INVOICE TO:

Plutonic Operations Limited
Level 32
100 Miller Street
NORTH SYDNEY NSW 2060

ORDER No.	PROJECT
2017062	

DATE RECEIVED	RESULTS REQUIRED
28/12/95	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
1	22/01/96	1	13

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
16981-93	SS Prep : GP031,GP007	Au/GG340
		Au/GG309
		Cu,Pb,Zn,Co/GA101
	PC Prep : GP004	Au/GG300

RESULTS TO

Rob Reid
Plutonic Operations Limited
P O Box 282
ZEEHAN TAS 7469

RESULTS TO

RESULTS TO

REMARKS

AUTHORISED OFFICER

Analabs

Analabs Pty. Ltd.
A.C.N. 004 591 664

311087

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.11515	22/01/96	2017062	1 OF 1

	SAMPLE No.	Cu	Pb	Zn	Co	Au	Au	Au	Cu	
METHOD		GA101	GA101	GA101	GA101	GG309	GG300	GG340	GG340	
1	16981	-	-	-	-	-	-	1.12	7.63	BLIG
2	16982	-	-	-	-	-	-	0.52	2.75	"
3	16983	-	-	-	-	-	-	1.69	6.90	"
4	16984	-	-	-	-	-	-	11.50	7.51	"
5	16985	-	-	-	-	-	-	4.52	7.43	"
6	16986	<4	9	54	<5	<0.008	-	-	-	-80# *
7	16987	7	<5	22	<5	<0.008	-	-	-	"
8	16988	44	6	100	<5	<0.008	-	-	-	"
9	16989	151	7	58	22	0.014	-	-	-	"
10	16990	29	9	39	<5	-	<0.2	-	-	PANCON
11	16991	37	7	108	<5	-	<0.2	-	-	"
12	16992	243	10	75	55	-	3.1	-	-	"
13	16993	50	13	59	11	-	0.2	-	-	"
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24	DETECTION	4	5	4	5	0.008	0.2	0.05	0.01	
25	UNITS	ppm	ppm	ppm	ppm	ppm	ug	ppb	ppm	

Results in ppm unless otherwise specified
- = element not determined

IS = Insufficient sample
SNR = sample not received

AUTHORISED OFFICER

AUSTRALIAN LABORATORY SERVICES P/L

311088 A.C.N. 009 936 029

[redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15739
SUB BATCH: 0
No. OF SAMPLES: 11
DATE RECEIVED: 08/08/96
DATE COMPLETED: 29/08/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2018603 SAMPLE TYPE: -80# SIEVED PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Cu ppm IC582 5	Pb ppm IC582 5	Zn ppm IC582 5	Ag ppm IC582 1	As ppm IC582 1	Fe % IC582 0.01
18421		14	<5	12	<1	1	1.43
18422		23	50	113	<1	6	3.52
18423		14	27	64	<1	4	2.48
18424		15	12	37	<1	5	2.49
18425		11	11	89	<1	4	2.81
18426		17	10	95	<1	3	4.51
18427		15	24	72	<1	3	3.78
18428		<5	<5	5	<1	<1	0.24
18429		14	<5	6	<1	<1	0.32
18430		165	<5	24	<1	3	1.79
18464		<5	<5	<5	<1	<1	0.18

COMMENTS:

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Tamworth Laboratory
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Brisbane Laboratory
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Cloncurry Laboratory
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BATCH NUMBER: ST15739
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No. OF SAMPLES: 11
DATE RECEIVED: 08/08/96
DATE COMPLETED: 29/08/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2018603 SAMPLE TYPE: -80# SIEVED PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Mn ppm IC582 5	Co ppm IC582 5	Mo ppm IC582 5	Bi ppm IC582 5		
18421		141	6	<5	<5		
18422		795	28	5	<5		
18423		382	16	<5	<5		
18424		401	14	<5	<5		
18425		427	18	7	<5		
18426		841	22	8	<5		
18427		330	11	8	<5		
18428		61	<5	<5	<5		
18429		67	<5	<5	<5		
18430		238	27	10	<5		
18464		81	<5	<5	<5		

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ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15739
SUB BATCH: 1
No. OF SAMPLES: 8
DATE RECEIVED: 08/08/96
DATE COMPLETED: 29/08/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2018603 SAMPLE TYPE: PANNED CONCENTRATES PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Au ppm PM219 0.001	S. Wt g ALS 0.01				
	18431	1.02	16.20				
	18432	0.002	24.60				
	18433	0.004	13.40				
	18434	<0.001	23.30				
	18435	0.004	8.20				
	18436	0.237	22.70				
	18437	0.017	11.50				
	18438	0.002	21.10				

COMMENTS:

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[illegible]go Laboratory
[illegible]: (054) 48 1390 Fax: (054) 48 1389
[illegible]e Laboratory
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Phone: (077) 79 9155 Fax: (077) 79 9729

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AUSTRALIAN LABORATORY SERVICES P/L

311091 A.C.N. 009 936 029

[redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15739
SUB BATCH: 2
No. OF SAMPLES: 8
DATE RECEIVED: 08/08/96
DATE COMPLETED: 29/08/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2018603 SAMPLE TYPE: SOIL PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Cu ppm IC582 5	Pb ppm IC582 5	Zn ppm IC582 5	Ag ppm IC582 1	As ppm IC582 1	Fe % IC582 0.01
18439		11	<5	29	<1	7	4.93
18440		7	20	54	<1	15	8.36
18441		21	53	91	<1	20	7.38
18442		62	66	90	<1	17	11.28
18443		82	62	51	<1	17	8.74
18444		36	41	56	<1	17	10.10
18445		60	54	79	<1	15	3.53
18446		88	52	60	<1	10	1.58

COMMENTS:

This is the Final Report which supersedes any preliminary reports with this batch number. • Results apply to sample(s) as submitted by client.

[redacted]ringe Laboratory
[redacted](069) 52 6020 Fax: (069) 52 6028
[redacted]ge Laboratory
[redacted]ne: (054) 46 1390 Fax: (054) 46 1389
[redacted]ane Laboratory
[redacted]07) 3243 7222 Fax: (07) 3243 7218
[redacted] Towers Laboratory
[redacted]077) 87 4155 Fax: (077) 87 4220

Clencurry Laboratory
Phone: (077) 42 1323 Fax: (077) 42 1685
Kalgoorlie Laboratory
Phone: (090) 21 1457 Fax: (090) 21 6253
New Zealand Laboratory
Phone: (07) 575 7654 Fax: (07) 575 7641
Orange Laboratory
Phone: (063) 601 1722 Fax: (063) 601 1189

Perth Laboratory
Phone: (09) 249 2988 Fax: (09) 249 2942
Townsville Laboratory
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AUSTRALIAN LABORATORY SERVICES P/L

311092 A.C.N. 009 936 029

[redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15739
SUB BATCH: 2
No. OF SAMPLES: 8
DATE RECEIVED: 08/08/96
DATE COMPLETED: 29/08/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2018603 SAMPLE TYPE: SOIL PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Mn ppm IC582 5	Co ppm IC582 5	Mo ppm IC582 5	Bi ppm IC582 5		
18439		226	10	5	<5		
18440		773	20	6	<5		
18441		1250	33	5	<5		
18442		410	28	8	<5		
18443		212	13	8	<5		
18444		214	16	8	<5		
18445		515	13	8	<5		
18446		138	8	7	<5		

COMMENTS:

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[illegible]rings Laboratory
[illegible](089) 52 6020 Fax: (089) 52 6028
[illegible]ligo Laboratory
[illegible]: (054) 46 1390 Fax: (054) 46 1389
[illegible]ge Laboratory
[illegible](07) 3243 7222 Fax: (07) 3243 7218
[illegible] Towers Laboratory
[illegible](077) 87 4155 Fax: (077) 87 4220
Cloncurry Laboratory
Phone: (077) 42 1323 Fax: (077) 42 1685
Kalgoorlie Laboratory
Phone: (090) 21 1457 Fax: (090) 21 6253
New Zealand Laboratory
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Orange Laboratory
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AUSTRALIAN LABORATORY SERVICES P/L

311093

A.C.N. 009 936 029

[redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15739
SUB BATCH: 3
No. OF SAMPLES: 17
DATE RECEIVED: 08/08/96
DATE COMPLETED: 29/08/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2018603 SAMPLE TYPE: ROCK CHIPS PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Cu ppm IC582 5	Pb ppm IC582 5	Zn ppm IC582 5	Ag ppm IC582 1	As ppm IC582 1	Fe % IC582 0.01
18447		51	153	153	1	16	11.51
18448		8	378	289	1	21	6.25
18449		9	51	150	<1	16	5.73
18450		25	62	168	<1	11	10.86
18451		24	33	93	<1	23	5.14
18452		26	47	90	<1	15	3.88
18453		5	12	50	<1	12	6.26
18454		67	22	67	<1	22	6.93
18455		6	22	34	<1	26	8.57
18456		11	10	29	<1	19	7.92
18457		28	17	44	<1	17	7.64
18458		12	29	109	<1	19	6.65
18459		<5	27	123	<1	10	2.36
18460		92	21	39	<1	12	3.72
18461		7	45	69	<1	8	3.91
18462		17	31	63	<1	16	3.25
18463		13	56	67	<1	10	3.55

COMMENTS:

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• Results apply to sample(s) as submitted by client.

Springs Laboratory
Phone: (089) 52 6020 Fax: (089) 52 6028
Ulverstone Laboratory
Phone: (054) 46 1390 Fax: (054) 46 1389
Brisbane Laboratory
Phone: (07) 3243 7222 Fax: (07) 3243 7218
Townsville Laboratory
Phone: (077) 87 4155 Fax: (077) 87 4220
Cloncurry Laboratory
Phone: (077) 42 1323 Fax: (077) 42 1685
Kalgoorlie Laboratory
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New Zealand Laboratory
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Orange Laboratory
Phone: (063) 601 1722 Fax: (063) 601 1189
Perth Laboratory
Phone: (09) 249 2988 Fax: (09) 249 2942
Townsville Laboratory
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AUSTRALIAN LABORATORY SERVICES P/L

311094 A.C.N. 009 936 029

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15739
SUB BATCH: 3
No. OF SAMPLES: 17
DATE RECEIVED: 08/08/96
DATE COMPLETED: 29/08/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2018603 SAMPLE TYPE: ROCK CHIPS PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Mn ppm IC582 5	Co ppm IC582 5	Mo ppm IC582 5	Bi ppm IC582 5	Au ppm PM219 0.001	Au PM219 ppm CHECKS 0.001
18447		1360	37	5	<5	0.002	
18448		1770	49	5	<5		
18449		1650	35	<5	<5	0.005	
18450		1500	77	6	<5		
18451		1270	44	<5	<5	0.002	
18452		864	31	<5	<5		
18453		775	19	<5	<5		
18454		1020	37	5	<5		
18455		682	34	5	<5	0.010	
18456		450	27	5	<5	0.002	
18457		588	54	6	<5	0.008	0.006
18458		1450	33	6	<5		
18459		656	10	<5	<5		
18460		685	17	<5	<5	0.009	
18461		698	20	<5	<5		
18462		619	18	<5	<5		
18463		495	16	<5	<5	0.007	0.006

COMMENTS:

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Alice Springs Laboratory
Phone: (089) 52 8020 Fax: (089) 52 8026
Bendigo Laboratory
Phone: (054) 46 1390 Fax: (054) 46 1389
Brisbane Laboratory
Phone: (07) 3243 7222 Fax: (07) 3243 7218
Charters Towers Laboratory
Phone: (077) 87 4155 Fax: (077) 87 4220
Cloncurry Laboratory
Phone: (077) 42 1323 Fax: (077) 42 1685
Kalgoorlie Laboratory
Phone: (090) 21 1457 Fax: (090) 21 6253
New Zealand Laboratory
Phone: (07) 575 7854 Fax: (07) 575 7841
Orange Laboratory
Phone: (063) 601 1722 Fax: (063) 601 1189
Perth Laboratory
Phone: (09) 249 2888 Fax: (09) 249 2942
Townsville Laboratory
Phone: (077) 79 9155 Fax: (077) 79 9729

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ANALYTICAL DATA

CLIENT PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.11515	22/01/96	2017062	1 OF 1

SAMPLE	Cu GA101	Pb GA101	Zn GA101	Co GA101	Au GG309	Au GG300	Au GG340	Cu GG340
16981	-	-	-	-	-	-	1.12	7.63
16982	-	-	-	-	-	-	0.52	2.75
16983	-	-	-	-	-	-	1.69	6.90
16984	-	-	-	-	-	-	11.50	7.51
16985	-	-	-	-	-	-	4.52	7.43
16986	<4	9	54	<5	<0.008	-	-	-
16987	7	<5	22	<5	<0.008	-	-	-
16988	44	6	100	<5	<0.008	-	-	-
16989	151	7	58	22	0.014	-	-	-
16990	29	9	39	<5	-	<0.2	-	-
16991	37	7	108	<5	-	<0.2	-	-
16992	243	10	75	55	-	3.1	-	-
16993	50	13	59	11	-	0.2	-	-
DETECTION	4	5	4	5	0.008	0.2	0.05	0.01
UNITS	ppm	ppm	ppm	ppm	ppm	ug	ppb	ppm

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AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

311096 [redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15444
SUB BATCH: 0
No. OF SAMPLES: 113
DATE RECEIVED: 12/07/96
DATE COMPLETED: 18/07/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ER No.: 2017095 SAMPLE TYPE: CORE* PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Au ppm PM209 0.01	Au PM209 ppm CHECKS 0.01	Cu ppm IC581 5	Pb ppm IC581 5	Zn ppm IC581 5	Ag ppm IC581 1
18001		0.02		830	179	331	<1
18002		<0.01		259	13	95	<1
18003		0.01		67	9	62	<1
18004		0.01		47	<5	46	<1
18005		0.03		364	7	54	<1
18006		0.03		350	56	399	<1
18007		0.01		527	<5	45	<1
18008		0.02		505	<5	35	<1
18009		0.02		470	8	37	<1
18010		0.01		255	<5	89	<1
18011		0.04		690	5	97	<1
18012		0.09		1590	<5	55	<1
18013		0.01	0.01	32	12	32	<1
18014		0.01	0.01	140	27	32	<1
18015		0.01		179	13	72	<1
18016		0.02		454	12	24	<1
18017		<0.01		67	5	46	<1
18018		<0.01		70	15	43	<1
18019		<0.01		73	15	63	<1
18020		0.01		172	19	131	<1
18021		<0.01		59	23	69	<1
18022		0.01		224	<5	41	<1
18023		<0.01		51	16	61	<1
18024		<0.01		54	14	42	<1
18025		<0.01		23	<5	56	<1
18026		<0.01		26	<5	53	<1
18027		0.01		27	5	58	<1
18028		<0.01		23	<5	33	<1
18029		<0.01		21	<5	33	<1
18030		0.01		91	<5	48	<1

ENTS:

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Laboratory
6020 Fax: (089) 52 6028
Laboratory
54) 46 1390 Fax: (054) 46 1389
Laboratory
7222 Fax: (07) 3243 7218
Laboratory
4155 Fax: (077) 87 4220
Cloncurry Laboratory
Phone: (077) 42 1323 Fax: (077) 42 1685
Kalgoorlie Laboratory
Phone: (090) 21 1457 Fax: (090) 21 6253
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AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

311097

[redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15444
SUB BATCH: 0
No. OF SAMPLES: 113
DATE RECEIVED: 12/07/96
DATE COMPLETED: 18/07/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2017095 SAMPLE TYPE: CORE PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Au ppm PM209 0.01	Au PM209 ppm CHECKS 0.01	Cu ppm IC581 5	Pb ppm IC581 5	Zn ppm IC581 5	Ag ppm IC581 1
18031		0.01	0.01	16	<5	26	<1
18032		<0.01		22	<5	29	<1
18033		<0.01		88	<5	29	<1
18034		<0.01		15	<5	24	<1
18035		<0.01		23	<5	28	<1
18036		<0.01		158	<5	34	<1
18037		<0.01		81	<5	29	<1
18038		0.03		699	<5	40	<1
18039		0.01		164	<5	30	<1
18040		<0.01		85	<5	29	<1
18041		0.02		414	<5	26	<1
18042		0.03		853	<5	24	<1
18043		0.02		345	<5	26	<1
18044		0.03		327	<5	33	<1
18045		0.01		589	<5	35	<1
18046		0.02	0.02	573	<5	38	<1
18047		0.06	0.06	1440	<5	55	<1
18048		0.02	0.02	617	<5	34	<1
18049		<0.01		44	<5	26	<1
18050		0.01		51	<5	30	<1
18051		0.01		147	<5	36	<1
18052		0.02		625	<5	30	<1
18053		0.08		1440	<5	26	<1
18054		0.02		257	<5	29	<1
18055		0.02		364	<5	38	<1
18056		0.03		557	<5	34	<1
18057		0.01		195	<5	22	<1
18058		0.03		758	<5	28	<1
18059		0.02		468	<5	23	<1
18060		0.02		500	<5	21	<1

COMMENTS:

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• Results apply to sample(s) as submitted by client.

AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

311098

[redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15444
SUB BATCH: 0
No. OF SAMPLES: 113
DATE RECEIVED: 12/07/96
DATE COMPLETED: 18/07/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2017095 SAMPLE TYPE: CORE PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Au ppm PM209 0.01	Au PM209 ppm CHECKS 0.01	Cu ppm IC581 5	Pb ppm IC581 5	Zn ppm IC581 5	Ag ppm IC581 1
18061		0.01		387	<5	21	<1
18062		0.02		304	<5	15	<1
18063		0.01		132	<5	14	<1
18064		0.01		250	<5	19	<1
18065		0.03	0.03	523	<5	32	<1
18066		0.04		872	<5	30	<1
18067		0.04		723	<5	38	<1
18068		0.05		1310	<5	30	<1
18069		0.04		915	<5	37	<1
18070		0.04		1020	<5	36	<1
18071		0.02		327	<5	35	<1
18072		<0.01		111	<5	31	<1
18073		0.01		189	<5	39	<1
18074		0.01		249	<5	41	<1
18075		<0.01		49	<5	24	<1
18076		<0.01		125	<5	18	<1
18077		<0.01		87	<5	29	<1
18078		0.02		415	<5	38	<1
18079		0.02		168	<5	25	<1
18080		0.01	0.01	97	<5	27	<1
18081		0.01	<0.01	221	<5	31	<1
18082		0.02	0.02	405	<5	37	<1
18083		0.01		40	<5	27	<1
18084		0.01		192	<5	38	<1
18085		0.02		268	<5	40	<1
18086		0.03		499	<5	41	<1
18087		0.01		1540	<5	58	<1
18088		0.03		620	<5	43	<1
18089		0.01		114	<5	40	<1
18090		0.01		47	<5	39	<1

COMMENTS:

[illegible] the Final Report which supersedes any preliminary reports with this batch number. • Results apply to sample(s) as submitted by client.

Sp[illegible]s Laboratory
[illegible] 52 6020 Fax: (089) 52 6028
[illegible] Laboratory
[illegible] 054) 46 1390 Fax: (054) 46 1389
[illegible] Laboratory
[illegible] 3243 7222 Fax: (07) 3243 7218
[illegible]wers Laboratory
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AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

311099

[redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15444
SUB BATCH: 0
No. OF SAMPLES: 113
DATE RECEIVED: 12/07/96
DATE COMPLETED: 18/07/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2017095 SAMPLE TYPE: CORE PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Au ppm PM209 0.01	Au PM209 ppm CHECKS 0.01	Cu ppm IC581 5	Pb ppm IC581 5	Zn ppm IC581 5	Ag ppm IC581 1
18091		0.01		58	<5	43	<1
18092		0.04		732	<5	34	<1
18093		0.01		263	7	42	<1
18094		0.01		104	12	49	<1
18095		0.01		138	<5	61	<1
18096		<0.01		26	15	31	<1
18097		0.01		296	10	40	<1
18098		0.01		175	<5	57	<1
18099		0.01	0.01	209	<5	62	<1
18100		0.03		513	<5	78	<1
18101		0.05		1480	<5	91	<1
18102		0.05		1190	<5	70	<1
18103		0.07		1190	<5	68	<1
18104		0.02		771	<5	64	<1
18105		0.02		622	<5	91	<1
18106		0.02		563	<5	64	<1
18107		0.01		212	<5	45	<1
18108		0.08		1570	<5	73	<1
18109		0.01		107	<5	65	<1
18110		0.01		172	<5	69	<1
18111		0.01		254	<5	62	<1
18112		0.04		789	13	42	<1
18113		0.01	0.01	146	<5	37	<1

COMMENTS:

This is the Final Report which supersedes any preliminary reports with this batch number.

• Results apply to sample(s) as submitted by client.

AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

311100 [redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15444
SUB BATCH: 0
No. OF SAMPLES: 113
DATE RECEIVED: 12/07/96
DATE COMPLETED: 18/07/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2017095 SAMPLE TYPE: CORE PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	As ppm IC581 2	Fe % IC581 0.01	Mn ppm IC581 5	Co ppm IC581 5		
18001		9	3.64	243	98		
18002		6	4.13	219	74		
18003		10	6.48	300	149		
18004		8	5.51	257	108		
18005		7	4.99	243	58		
18006		5	4.93	179	58		
18007		5	4.07	185	39		
18008		3	3.87	179	30		
18009		4	4.13	215	39		
18010		4	3.67	140	64		
18011		21	3.41	125	75		
18012		16	4.89	171	147		
18013		9	5.51	195	101		
18014		8	5.27	213	69		
18015		6	5.90	214	67		
18016		5	4.40	126	60		
18017		7	5.68	156	77		
18018		6	3.88	149	43		
18019		6	4.96	221	82		
18020		7	6.65	262	110		
18021		9	6.27	290	122		
18022		6	4.25	249	27		
18023		7	6.35	257	180		
18024		8	6.70	235	105		
18025		8	5.98	224	75		
18026		9	6.45	264	98		
18027		7	5.38	253	103		
18028		7	5.33	240	59		
18029		6	6.02	286	50		
18030		9	7.88	522	67		

COMMENTS:

This is the Final Report which supersedes any preliminary reports with this batch number. • Results apply to sample(s) as submitted by client.

Orange Laboratory
Phone: (089) 52 6020 Fax: (089) 52 6028
Cobar Laboratory
Phone: (054) 46 1390 Fax: (054) 46 1389
[illegible] Laboratory
Phone: (07) 3243 7222 Fax: (07) 3243 7218
Townsville Laboratory
Phone: (077) 87 4155 Fax: (077) 87 4220
Cloncurry Laboratory
Phone: (077) 42 1323 Fax: (077) 42 1685
Kalgoorlie Laboratory
Phone: (090) 21 1457 Fax: (090) 21 6253
New Zealand Laboratory
Phone: (07) 575 7654 Fax: (07) 575 7641
Orange Laboratory
Phone: (063) 601 1722 Fax: (063) 601 1189
Perth Laboratory
Phone: (09) 249 2988 Fax: (09) 249 2942
Townsville Laboratory
Phone: (077) 79 9155 Fax: (077) 79 9729

AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

311101 [redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15444
SUB BATCH: 0
No. OF SAMPLES: 113
DATE RECEIVED: 12/07/96
DATE COMPLETED: 18/07/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2017095 SAMPLE TYPE: CORE PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	As ppm IC581 2	Fe % IC581 0.01	Mn ppm IC581 5	Co ppm IC581 5		
18031		8	6.49	315	78		
18032		7	6.24	253	62		
18033		7	6.73	255	82		
18034		7	6.80	340	49		
18035		7	6.03	331	52		
18036		8	6.77	420	73		
18037		9	7.04	378	84		
18038		8	6.34	545	36		
18039		6	5.41	378	48		
18040		3	3.81	283	40		
18041		10	6.24	382	122		
18042		12	8.80	439	138		
18043		7	6.41	333	93		
18044		9	5.55	327	101		
18045		6	5.43	390	46		
18046		6	5.34	349	56		
18047		16	7.43	369	260		
18048		6	5.93	316	78		
18049		6	5.45	347	47		
18050		3	5.06	300	71		
18051		6	6.10	413	74		
18052		5	6.51	371	60		
18053		7	6.97	339	97		
18054		2	4.25	322	36		
18055		9	5.92	446	107		
18056		5	5.22	394	39		
18057		4	4.43	290	33		
18058		5	5.40	324	41		
18059		5	4.35	325	61		
18060		6	3.91	292	35		

COMMENTS:

This is the Final Report which supersedes any preliminary reports with this batch number. • Results apply to sample(s) as submitted by client.

AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

311102

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15444
SUB BATCH: 0
No. OF SAMPLES: 113
DATE RECEIVED: 12/07/96
DATE COMPLETED: 18/07/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2017095 SAMPLE TYPE: CORE PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	As ppm IC581 2	Fe % IC581 0.01	Mn ppm IC581 5	Co ppm IC581 5		
18061		3	4.50	384	31		
18062		2	3.91	286	44		
18063		3	3.88	278	39		
18064		4	5.16	293	97		
18065		7	5.09	438	58		
18066		9	5.38	456	50		
18067		8	5.29	422	28		
18068		13	8.87	520	48		
18069		9	7.91	624	50		
18070		13	6.03	490	34		
18071		10	6.24	416	72		
18072		8	7.04	455	62		
18073		12	7.37	505	91		
18074		10	4.58	447	94		
18075		5	3.70	433	9		
18076		6	5.50	460	37		
18077		6	4.72	463	22		
18078		7	3.52	473	27		
18079		10	5.97	434	81		
18080		9	4.84	399	55		
18081		6	4.15	377	33		
18082		10	4.85	336	90		
18083		9	5.88	336	131		
18084		7	4.55	417	46		
18085		10	6.56	451	62		
18086		12	8.06	560	85		
18087		14	6.97	446	123		
18088		14	7.95	499	153		
18089		12	6.91	482	139		
18090		9	5.03	448	52		

COMMENTS:

This is the Final Report which supersedes any preliminary reports with this batch number. • Results apply to sample(s) as submitted by client.

Springvale Laboratory
Phone: (089) 52 6020 Fax: (089) 52 6028
Bendigo Laboratory
Phone: (054) 46 1390 Fax: (054) 46 1389
Brisbane Laboratory
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Townsville Laboratory
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Kalgoorlie Laboratory
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New Zealand Laboratory
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Orange Laboratory
Phone: (063) 601 1722 Fax: (063) 601 1189
Perth Laboratory
Phone: (09) 249 2988 Fax: (09) 249 2942
Townsville Laboratory
Phone: (077) 79 9155 Fax: (077) 79 9729

AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

311103

[redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15444
SUB BATCH: 0
No. OF SAMPLES: 113
DATE RECEIVED: 12/07/96
DATE COMPLETED: 18/07/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2017095 SAMPLE TYPE: CORE PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	As ppm IC581 2	Fe % IC581 0.01	Mn ppm IC581 5	Co ppm IC581 5		
18091		11	4.99	447	81		
18092		12	6.71	503	34		
18093		9	5.60	569	39		
18094		11	5.55	611	43		
18095		9	5.00	511	84		
18096		12	5.83	379	84		
18097		10	4.52	515	72		
18098		9	4.75	489	66		
18099		12	5.69	479	155		
18100		9	4.57	448	76		
18101		14	6.67	486	173		
18102		15	7.48	520	174		
18103		7	5.35	421	51		
18104		7	5.19	434	49		
18105		10	6.08	547	62		
18106		6	4.81	451	73		
18107		8	3.69	350	78		
18108		12	4.89	509	115		
18109		12	9.58	1010	231		
18110		10	5.88	671	122		
18111		9	4.66	473	151		
18112		9	5.20	554	118		
18113		6	4.94	581	33		

COMMENTS:

This is the Final Report which supersedes any preliminary reports with this batch number.

• Results apply to sample(s) as submitted by client.

[illegible]ings Laboratory
[illegible]: (089) 52 6020 Fax: (089) 52 6028
[illegible]go Laboratory
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[illegible] Laboratory
[illegible]7) 3243 7222 Fax: (07) 3243 7218
[illegible] Towers Laboratory
[illegible]77) 87 4155 Fax: (077) 87 4220
Cloncurry Laboratory
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Townsville Laboratory
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AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029 311104

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15444
SUB BATCH: 0
No. OF SAMPLES: 113
DATE RECEIVED: 12/07/96
DATE COMPLETED: 18/07/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2017095 SAMPLE TYPE: DUPLICATES PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Cu ppm IC581 5	Pb ppm IC581 5	Zn ppm IC581 5	Ag ppm IC581 1	As ppm IC581 2	Fe % IC581 0.01
*** 18009		466	8	43	<1	3	4.92
Original Result		470	8	37	<1	4	4.13
*** 18019		81	16	65	<1	5	5.54
Original Result		73	15	63	<1	6	4.96
*** 18029		20	<5	35	<1	7	6.46
Original Result		21	<5	33	<1	6	6.02
*** 18053		1460	<5	28	<1	11	7.48
Original Result		1440	<5	26	<1	7	6.97
*** 18063		133	<5	15	<1	6	4.17
Original Result		132	<5	14	<1	3	3.88
*** 18073		199	<5	42	<1	12	7.82
Original Result		189	<5	39	<1	12	7.37
*** 18097		306	12	45	<1	9	4.93
Original Result		296	10	40	<1	10	4.52
*** 18107		215	<5	45	<1	8	4.00
Original Result		212	<5	45	<1	8	3.69
*** 18108		1580	<5	71	<1	8	4.75
Original Result		1570	<5	73	<1	12	4.89

COMMENTS:

Results which appear on this report are routine laboratory duplicates for QUALITY CONTROL purposes.

This is the Final Report which supersedes any preliminary reports with this batch number. • Results apply to sample(s) as submitted by client.

AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

311105 [redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15444
SUB BATCH: 0
No. OF SAMPLES: 113
DATE RECEIVED: 12/07/96
DATE COMPLETED: 18/07/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2017095 SAMPLE TYPE: DUPLICATES PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Mn ppm IC581 5	Co ppm IC581 5				
*** 18009		260	49				
Original Result		215	39				
*** 18019		248	83				
Original Result		221	82				
*** 18029		301	55				
Original Result		286	50				
*** 18053		377	94				
Original Result		339	97				
*** 18063		307	28				
Original Result		278	39				
*** 18073		541	96				
Original Result		505	91				
*** 18097		563	71				
Original Result		515	72				
*** 18107		376	79				
Original Result		350	78				
*** 18108		498	117				
Original Result		509	115				

COMMENTS:

This is the Final Report which supersedes any preliminary reports with this batch number. • Results apply to sample(s) as submitted by client.

Bundaberg Laboratory
Phone: (069) 52 6020 Fax: (069) 52 6028
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Kalgoorlie Laboratory
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Orange Laboratory
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Perth Laboratory
Phone: (09) 249 2988 Fax: (09) 249 2942
Townsville Laboratory
Phone: (077) 79 9155 Fax: (077) 79 9729

AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

311106

31110 [redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15515
SUB BATCH: 0
No. OF SAMPLES: 85
DATE RECEIVED: 19/07/96
DATE COMPLETED: 26/07/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2017096 SAMPLE TYPE: DRILL CORE PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Au ppm PM209 0.01	Au PM209 ppm CHECKS 0.01	Cu ppm IC581 5	Pb ppm IC581 5	Zn ppm IC581 5	Ag ppm IC581 -
18114		0.02		43	<5	61	<1
18115		0.02		553	<5	58	<1
18116		0.01		269	<5	55	<1
18117		0.01		180	<5	47	<1
18118		<0.01		73	<5	57	<1
18119		0.01		178	<5	30	<1
18120		0.02		567	<5	43	<1
18121		0.01		479	<5	26	<1
18122		0.01		365	<5	44	<1
18123		0.01		428	<5	34	<1
18124		0.01		234	<5	57	<1
18125		0.02		424	<5	41	<1
18126		0.11		716	<5	44	<1
18127		0.06		425	<5	56	<1
18128		0.03	0.03	470	<5	37	<1
18129		0.02	0.02	283	<5	26	<1
18130		0.03	0.03	1210	<5	37	<1
18131		0.03		945	<5	39	<1
18132		0.07		1910	<5	43	<1
18133		0.03		747	<5	39	<1
18134		0.02		1010	<5	34	<1
18135		0.02		394	<5	44	<1
18136		0.09		2190	<5	37	<1
18137		0.08		2020	<5	39	<1
18138		0.05		1270	<5	41	<1
18139		0.03		825	<5	22	<1
18140		0.05		631	<5	20	<1
18141		0.01		425	<5	19	<1
18142		0.03		603	<5	13	<1
18143		0.03		515	<5	26	<1

COMMENTS:

This is the Final Report which supersedes any preliminary reports with this batch number. • Results apply to sample(s) as submitted by client.

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Perth Laboratory
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Townsville Laboratory
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Brisbane Laboratory
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Mt Isa Laboratory
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Cloncurry Laboratory
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Kalgoorlie Laboratory
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New Zealand Laboratory
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Orange Laboratory
Phone: (063) 601 1722 Fax: (063) 601 1189

All pages of this report have been checked and approved for release.

AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

311107 [redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15515
SUB BATCH: 0
No. OF SAMPLES: 85
DATE RECEIVED: 19/07/96
DATE COMPLETED: 26/07/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2017096 SAMPLE TYPE: DRILL CORE PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Au ppm PM209 0.01	Au PM209 ppm CHECKS 0.01	Cu ppm IC581 5	Pb ppm IC581 5	Zn ppm IC581 5	Ag ppm IC581 1
18144		0.06		267	<5	33	<1
18145		0.03		71	<5	17	<1
18146		0.03		366	<5	17	<1
18147		0.08	0.06	524	<5	19	<1
18148		0.03		638	<5	25	<1
18149		0.03		372	<5	23	<1
18150		0.02		471	<5	19	<1
18151		0.07		981	<5	22	<1
18152		0.05		849	<5	32	<1
18153		0.02		671	<5	18	<1
18154		0.05		1390	<5	31	<1
18155		0.05		928	<5	31	<1
18156		0.04		974	<5	19	<1
18157		0.05		1040	<5	16	<1
18158		0.02		386	<5	15	<1
18159		0.05		685	<5	19	<1
18160		0.06		1360	<5	26	<1
18161		0.02		544	<5	22	<1
18162		0.06	0.07	1420	<5	24	<1
18163		0.08	0.09	1890	<5	20	<1
18164		0.09	0.07	2210	<5	44	<1
18165		0.01		928	<5	20	<1
18166		<0.01		182	<5	17	<1
18167		0.03		856	<5	21	<1
18168		0.03		871	<5	22	<1
18169		0.02		1150	<5	31	<1
18170		0.16	0.16	3230	<5	21	<1
18171		0.03	0.03	865	<5	23	<1
18172		0.03		949	<5	31	<1
18173		0.02		613	<5	28	<1

COMMENTS:

This is the Final Report which supersedes any preliminary reports with this batch number. • Results apply to sample(s) as submitted by client.

AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

311108

[redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15515
SUB BATCH: 0
No. OF SAMPLES: 85
DATE RECEIVED: 19/07/96
DATE COMPLETED: 26/07/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2017096 SAMPLE TYPE: DRILL CORE PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Au ppm PM209 0.01	Au PM209 ppm CHECKS 0.01	Cu ppm IC581 5	Pb ppm IC581 5	Zn ppm IC581 5	Ag ppm IC581 1
18174		0.01		200	<5	23	<1
18175		<0.01		225	<5	21	<1
18176		0.03		979	<5	24	<1
18177		0.02		592	<5	27	<1
18178		<0.01		105	<5	45	<1
18179		<0.01		65	<5	21	<1
18180		<0.01		146	<5	32	<1
18181		0.01	<0.01	128	<5	21	<1
18182		0.01		369	<5	25	<1
18183		<0.01		174	<5	33	<1
18184		0.02		293	<5	35	<1
18185		0.02		754	<5	37	<1
18186		0.01		455	<5	42	<1
18187		0.03		1300	<5	35	<1
18188		0.01		249	<5	32	<1
18189		0.01		169	<5	42	<1
18190		0.01		186	<5	43	<1
18191		0.02		471	<5	40	<1
18192		0.01		206	<5	39	<1
18193		<0.01		138	<5	52	<1
18194		0.01		92	<5	68	<1
18195		0.02		736	<5	56	<1
18196		<0.01	0.01	165	<5	121	<1
18197		0.01	0.01	451	<5	64	<1
18198		<0.01	<0.01	18	<5	47	<1

COMMENTS:

This is the Final Report which supersedes any preliminary reports with this batch number. • Results apply to sample(s) as submitted by client.

Southern Laboratory
Phone: (089) 52 8020 Fax: (089) 52 6028
Launceston Laboratory
Phone: (054) 46 1390 Fax: (054) 46 1389
Brisbane Laboratory
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AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

311109 [redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15515
SUB BATCH: 0
No. OF SAMPLES: 85
DATE RECEIVED: 19/07/96
DATE COMPLETED: 26/07/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2017096 SAMPLE TYPE: DRILL CORE PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	As ppm IC581 2	Co ppm IC581 5	Fe % IC581 0.01	Mn ppm IC581 5		
18114		10	127	2.77	333		
18115		9	26	3.11	614		
18116		9	21	3.48	628		
18117		7	42	4.49	455		
18118		15	284	3.47	318		
18119		10	33	3.92	339		
18120		14	113	3.63	301		
18121		13	136	3.26	225		
18122		13	91	3.56	261		
18123		10	114	2.17	71		
18124		9	123	2.61	219		
18125		18	139	3.81	324		
18126		17	55	4.34	387		
18127		13	74	5.06	489		
18128		14	145	4.43	340		
18129		22	275	5.30	256		
18130		14	84	4.37	348		
18131		16	166	4.93	348		
18132		16	122	6.07	511		
18133		15	86	9.24	573		
18134		11	41	6.28	390		
18135		11	42	6.05	529		
18136		18	100	7.92	442		
18137		18	142	7.10	480		
18138		26	389	9.21	445		
18139		11	68	5.67	294		
18140		9	59	5.25	310		
18141		8	41	5.06	330		
18142		8	57	5.89	236		
18143		9	59	4.84	281		

COMMENTS:

This is the Final Report which supersedes any preliminary reports with this batch number. • Results apply to sample(s) as submitted by client.

Springs Laboratory
Phone: (089) 52 6020 Fax: (089) 52 6028
Kalgoorlie Laboratory
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New Zealand Laboratory
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Orange Laboratory
Phone: (063) 601 1722 Fax: (063) 601 1189
Cloncurry Laboratory
Phone: (077) 42 1323 Fax: (077) 42 1685
Perth Laboratory
Phone: (09) 249 2988 Fax: (09) 249 2942
Townsville Laboratory
Phone: (077) 79 9155 Fax: (077) 79 9729
Laboratory
Phone: (054) 46 1390 Fax: (054) 46 1389
Laboratory
Phone: (07) 3243 7222 Fax: (07) 3243 7218
Laboratory
Phone: (077) 87 4155 Fax: (077) 87 4220

AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

311110

[redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15515
SUB BATCH: 0
No. OF SAMPLES: 85
DATE RECEIVED: 19/07/96
DATE COMPLETED: 26/07/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

REPORT No.: 2017096 SAMPLE TYPE: DRILL CORE PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	As ppm IC581 2	Co ppm IC581 5	Fe % IC581 0.01	Mn ppm IC581 5		
18144		9	52	4.66	236		
18145		9	155	6.72	253		
18146		9	25	6.35	252		
18147		10	74	7.60	368		
18148		8	61	5.48	249		
18149		12	54	5.68	306		
18150		8	23	6.08	331		
18151		9	119	5.20	201		
18152		14	236	8.48	373		
18153		7	38	4.70	271		
18154		8	57	6.57	236		
18155		11	111	6.39	301		
18156		9	67	6.31	320		
18157		9	47	7.28	332		
18158		9	87	7.35	238		
18159		7	77	5.97	245		
18160		11	56	6.27	371		
18161		7	26	3.60	249		
18162		9	69	7.07	384		
18163		11	94	5.67	267		
18164		15	163	5.28	232		
18165		11	42	4.48	337		
18166		7	35	4.30	333		
18167		10	63	4.26	290		
18168		8	41	3.88	344		
18169		9	46	4.51	414		
18170		12	106	7.94	438		
18171		10	46	5.01	330		
18172		10	78	6.56	315		
18173		9	71	6.18	364		

COMMENTS:

This is the Final Report which supersedes any preliminary reports with this batch number. • Results apply to sample(s) as submitted by client.

Darwin Laboratory
089 52 6020 Fax: (089) 52 6028
Alice Springs Laboratory
(054) 46 1390 Fax: (054) 46 1389
Brisbane Laboratory
07 3243 7222 Fax: (07) 3243 7218
Cairns Laboratory
07 87 4155 Fax: (077) 87 4220
Cloncurry Laboratory
Phone: (077) 42 1323 Fax: (077) 42 1685
Kalgoorlie Laboratory
Phone: (090) 21 1457 Fax: (090) 21 6253
New Zealand Laboratory
Phone: (07) 575 7854 Fax: (07) 575 7841
Orange Laboratory
Phone: (063) 601 1722 Fax: (063) 601 1189
Perth Laboratory
Phone: (09) 249 2888 Fax: (09) 249 2942
Townsville Laboratory
Phone: (077) 79 9155 Fax: (077) 79 9729

AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029 311111

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15515
SUB BATCH: 0
No. OF SAMPLES: 85
DATE RECEIVED: 19/07/96
DATE COMPLETED: 26/07/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2017096 SAMPLE TYPE: DRILL CORE PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	As ppm IC581 2	Co ppm IC581 5	Fe % IC581 0.01	Mn ppm IC581 5		
18174		10	57	6.29	290		
18175		10	30	6.00	354		
18176		11	49	5.88	377		
18177		12	91	5.65	360		
18178		37	55	4.61	333		
18179		9	30	4.79	380		
18180		15	75	5.28	317		
18181		8	37	4.51	355		
18182		9	38	4.54	407		
18183		10	71	5.57	495		
18184		12	134	4.74	380		
18185		13	34	7.49	475		
18186		15	78	6.04	434		
18187		13	61	6.07	384		
18188		11	61	4.93	300		
18189		10	64	5.09	440		
18190		10	46	4.43	443		
18191		8	49	3.74	387		
18192		9	43	3.58	346		
18193		12	75	4.79	524		
18194		9	191	3.38	314		
18195		22	175	4.75	202		
18196		10	65	4.72	310		
18197		14	63	4.81	302		
18198		9	38	6.48	244		

COMMENTS:

This is the Final Report which supersedes any preliminary reports with this batch number. • Results apply to sample(s) as submitted by client.

Springvale Laboratory
Phone: (089) 52 6020 Fax: (089) 52 6026
Leonora Laboratory
Phone: (054) 46 1390 Fax: (054) 46 1389
Wubin Laboratory
Phone: (07) 3243 7222 Fax: (07) 3243 7218
Cloncurry Laboratory
Phone: (077) 42 1323 Fax: (077) 42 1665
Kalgoorlie Laboratory
Phone: (090) 21 1457 Fax: (090) 21 6253
New Zealand Laboratory
Phone: (07) 575 7654 Fax: (07) 575 7641
Orange Laboratory
Phone: (063) 601 1722 Fax: (063) 601 1189
Perth Laboratory
Phone: (09) 249 2988 Fax: (09) 249 2942
Townsville Laboratory
Phone: (077) 79 9155 Fax: (077) 79 9729

AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

311112

[redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15515
SUB BATCH: 0
No. OF SAMPLES: 85
DATE RECEIVED: 19/07/96
DATE COMPLETED: 26/07/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2017096 SAMPLE TYPE: DUPLICATES PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Cu ppm IC581 5	Pb ppm IC581 5	Zn ppm IC581 5	Ag ppm IC581 1	As ppm IC581 2	Co ppm IC581 5
*** 18122		377	<5	48	<1	14	98
Original Result		365	<5	44	<1	13	91
*** 18132		2070	<5	52	<1	17	137
Original Result		1910	<5	43	<1	16	122
*** 18142		675	<5	16	<1	10	53
Original Result		603	<5	13	<1	8	57
*** 18166		182	<5	16	<1	7	37
Original Result		182	<5	17	<1	7	35
*** 18176		1030	<5	24	<1	11	54
Original Result		979	<5	24	<1	11	49
*** 18186		451	<5	41	<1	17	77
Original Result		455	<5	42	<1	15	78

COMMENTS:

Results which appear on this report are routine laboratory duplicates for QUALITY CONTROL purposes.

This is the Final Report which supersedes any preliminary reports with this batch number. • Results apply to sample(s) as submitted by client.

Sales Laboratory
Phone: (089) 52 6020 Fax: (089) 52 6028
Laboratory
Phone: (054) 46 1390 Fax: (054) 46 1389
Laboratory
Phone: (07) 3243 7222 Fax: (07) 3243 7218
Laboratory
Phone: (077) 87 4155 Fax: (077) 87 4220
Cloncurry Laboratory
Phone: (077) 42 1323 Fax: (077) 42 1685
Kalgoorlie Laboratory
Phone: (090) 21 1457 Fax: (090) 21 6253
New Zealand Laboratory
Phone: (07) 575 7654 Fax: (07) 575 7641
Orange Laboratory
Phone: (063) 601 1722 Fax: (063) 601 1189
Perth Laboratory
Phone: (09) 249 2988 Fax: (09) 249 2942
Townsville Laboratory
Phone: (077) 79 9155 Fax: (077) 79 9729

AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

311113

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15515
SUB BATCH: 0
No. OF SAMPLES: 85
DATE RECEIVED: 19/07/96
DATE COMPLETED: 26/07/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2017096 SAMPLE TYPE: DUPLICATES PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Fe % IC581 0.01	Mn ppm IC581 5				
*** 18122		3.72	274				
Original Result		3.56	261				
*** 18132		6.94	589				
Original Result		6.07	511				
*** 18142		6.29	254				
Original Result		5.89	236				
*** 18166		4.32	337				
Original Result		4.30	333				
*** 18176		6.06	391				
Original Result		5.88	377				
*** 18186		5.95	430				
Original Result		6.04	434				

COMMENTS:

This is the Final Report which supersedes any preliminary reports with this batch number. • Results apply to sample(s) as submitted by client.

Wangaratta Laboratory
Phone: (089) 52 6020 Fax: (089) 52 6029
Wodonga Laboratory
Phone: (054) 46 1390 Fax: (054) 46 1389
Brisbane Laboratory
Phone: (07) 3243 7222 Fax: (07) 3243 7218
Townsville Laboratory
Phone: (077) 87 4155 Fax: (077) 87 4220
Cloncurry Laboratory
Phone: (077) 42 1323 Fax: (077) 42 1865
Kalgoorlie Laboratory
Phone: (090) 21 1457 Fax: (090) 21 6253
New Zealand Laboratory
Phone: (07) 575 7854 Fax: (07) 575 7841
Orange Laboratory
Phone: (063) 601 1722 Fax: (063) 601 1189
Perth Laboratory
Phone: (09) 249 2988 Fax: (09) 249 2942
Townsville Laboratory
Phone: (077) 79 9155 Fax: (077) 79 9729

AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

311114

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ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15553
SUB BATCH: 0
No. OF SAMPLES: 100
DATE RECEIVED: 24/07/96
DATE COMPLETED: 06/08/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2017097 SAMPLE TYPE: ROCK PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Au ppm PM209 0.01	Au PM209 ppm CHECKS 0.01	Cu ppm IC581 5	Pb ppm IC581 5	Zn ppm IC581 5	Ag ppm IC581 1
18199		0.02		17	16	58	<1
18200		0.04		606	8	69	<1
18201		0.04		876	<5	33	<1
18202		0.01		299	<5	54	1
18203		<0.01		22	<5	38	<1
18204		0.02		28	<5	37	<1
18205		<0.01		221	<5	37	<1
18206		<0.01		266	<5	61	<1
18207		<0.01		206	<5	38	<1
18208		0.02		88	<5	30	<1
18209		0.02		66	<5	37	<1
18210		0.01		427	<5	37	<1
18211		<0.01		179	<5	69	<1
18212		<0.01		83	<5	55	<1
18213		<0.01		52	<5	53	<1
18214		<0.01		108	<5	58	<1
18215		0.02		196	<5	53	<1
18216		0.02		289	<5	79	<1
18217		0.01		213	<5	61	<1
18218		0.01	<0.01	331	<5	42	<1
18219		0.04		583	<5	74	<1
18220		0.02		491	<5	89	<1
18221		0.02		520	<5	82	<1
18222		0.02		293	<5	38	<1
18223		0.01		19	7	45	<1
18224		0.02		87	34	58	<1
18225		0.02		510	<5	61	<1
18226		0.03		862	<5	48	<1
18227		0.02		483	<5	40	<1
18228		0.02		439	21	86	<1

COMMENTS:

This is the Final Report which supersedes any preliminary reports with this batch number. • Results apply to sample(s) as submitted by client.

Springvale Laboratory
0[illegible]52 6020 Fax: (089) 52 6028
[illegible] Laboratory
054) 46 1390 Fax: (054) 46 1389
[illegible] Laboratory
0[illegible]243 7222 Fax: (07) 3243 7218
[illegible]vers Laboratory
(0[illegible]87 4155 Fax: (077) 87 4220
Cloncurry Laboratory
Phone: (077) 42 1323 Fax: (077) 42 1685
Kalgoorlie Laboratory
Phone: (090) 21 1457 Fax: (090) 21 6253
New Zealand Laboratory
Phone: (07) 575 7654 Fax: (07) 575 7641
Orange Laboratory
Phone: (063) 601 1722 Fax: (063) 601 1189
Perth Laboratory
Phone: (09) 249 2988 Fax: (09) 249 2942
Townsville Laboratory
Phone: (077) 79 9155 Fax: (077) 79 9729

All pages of this report have been checked and approved for release.

AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

311115

[redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15553
SUB BATCH: 0
No. OF SAMPLES: 100
DATE RECEIVED: 24/07/96
DATE COMPLETED: 06/08/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2017097 SAMPLE TYPE: ROCK PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Au ppm PM209 0.01	Au PM209 ppm CHECKS 0.01	Cu ppm IC581 5	Pb ppm IC581 5	Zn ppm IC581 5	Ag ppm IC581 1
18229		0.02		172	<5	78	<1
18230		<0.01		550	8	66	<1
18231		0.03		1190	<5	63	<1
18232		0.02		300	<5	80	<1
18233		<0.01	<0.01	42	<5	81	<1
18234		0.02	0.02	295	<5	63	<1
18235		0.02	0.02	271	<5	56	<1
18236		0.01		131	6	80	<1
18237		0.02		285	<5	81	<1
18238		<0.01		237	<5	48	<1
18239		0.02		259	<5	40	<1
18240		<0.01		241	<5	29	<1
18241		<0.01		135	<5	36	<1
18242		<0.01		169	<5	39	<1
18243		<0.01		55	<5	27	<1
18244		<0.01		134	<5	53	<1
18245		0.04		1250	<5	28	<1
18246		<0.01		216	<5	24	<1
18247		<0.01		418	<5	25	<1
18248		0.02		119	<5	44	<1
18249		<0.01		19	<5	35	<1
18250		<0.01		79	<5	32	<1
18251		<0.01		226	<5	30	<1
18252		0.02	0.02	236	<5	38	<1
18253		<0.01		82	<5	44	<1
18254		0.02		221	<5	30	<1
18255		0.01		226	<5	29	<1
18256		<0.01		82	<5	38	<1
18257		0.01		419	<5	27	<1
18258		<0.01		429	<5	21	<1

COMMENTS:

This is the Final Report which supersedes any preliminary reports with this batch number. • Results apply to sample(s) as submitted by client.

[illegible] Laboratory
089) 52 6020 Fax: (089) 52 6028
[illegible] Laboratory
054) 46 1390 Fax: (054) 46 1389
[illegible] Laboratory
07) 3243 7222 Fax: (07) 3243 7218
[illegible]ers Laboratory
07) 87 4155 Fax: (077) 87 4220
Cloncurry Laboratory
Phone: (077) 42 1323 Fax: (077) 42 1685
Kalgoorlie Laboratory
Phone: (090) 21 1457 Fax: (090) 21 6253
New Zealand Laboratory
Phone: (07) 575 7654 Fax: (07) 575 7641
Orange Laboratory
Phone: (063) 601 1722 Fax: (063) 601 1189
Perth Laboratory
Phone: (09) 249 2988 Fax: (09) 249 2942
Townsville Laboratory
Phone: (077) 79 9155 Fax: (077) 79 9729

AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

311116 [redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15553
SUB BATCH: 0
No. OF SAMPLES: 100
DATE RECEIVED: 24/07/96
DATE COMPLETED: 06/08/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ER No.: 2017097 SAMPLE TYPE: ROCK PROJECT:

MPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Au ppm PM209 0.01	Au PM209 ppm CHECKS 0.01	Cu ppm IC581 5	Pb ppm IC581 5	Zn ppm IC581 5	Ag ppm IC581 1
18259		<0.01		462	<5	25	<1
18260		<0.01		125	<5	23	<1
18261		<0.01		200	<5	24	<1
18262		<0.01		68	<5	29	<1
18263		<0.01		136	<5	34	<1
18264		0.01		163	<5	38	<1
18265		<0.01		129	<5	32	<1
18266		<0.01		136	<5	36	<1
18267		<0.01	<0.01	292	<5	27	<1
18268		<0.01	<0.01	156	<5	27	<1
18269		0.01	0.01	551	<5	36	<1
18270		0.02		364	<5	39	<1
18271		<0.01		170	<5	21	<1
18272		<0.01		558	<5	32	<1
18273		<0.01		116	<5	26	<1
18274		0.01		632	<5	29	<1
18275		0.02		657	<5	27	<1
18276		0.02		309	<5	27	<1
18277		<0.01		286	<5	22	<1
18278		<0.01		99	<5	25	<1
18279		0.02		285	<5	23	<1
18280		<0.01		144	<5	28	<1
18281		<0.01		85	<5	37	<1
18282		0.03		753	<5	30	<1
18283		<0.01		325	<5	34	<1
18284		<0.01		37	<5	36	<1
18285		<0.01		35	<5	34	<1
18286		<0.01	<0.01	202	<5	23	<1
18287		<0.01		110	<5	19	<1
18288		<0.01		127	<5	22	<1

MENTS:

is the Final Report which supersedes any preliminary reports with this batch number. • Results apply to sample(s) as submitted by client.

Sp[illegible]e Laboratory
[illegible] 52 6020 Fax: (089) 52 6028
Laboratory
054) 46 1390 Fax: (054) 46 1389
Laboratory
3243 7222 Fax: (07) 3243 7218
wers Laboratory
87 4155 Fax: (077) 87 4220
Cloncurry Laboratory
Phone: (077) 42 1323 Fax: (077) 42 1665
Kalgoorlie Laboratory
Phone: (090) 21 1457 Fax: (090) 21 6253
New Zealand Laboratory
Phone: (07) 575 7654 Fax: (07) 575 7641
Orange Laboratory
Phone: (063) 601 1722 Fax: (063) 601 1189
Perth Laboratory
Phone: (09) 249 2988 Fax: (09) 249 2942
Townsville Laboratory
Phone: (077) 79 9155 Fax: (077) 79 9729

AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

311117

[redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15553
SUB BATCH: 0
No. OF SAMPLES: 100
DATE RECEIVED: 24/07/96
DATE COMPLETED: 06/08/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2017097 SAMPLE TYPE: ROCK PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Au ppm PM209 0.01	Au PM209 ppm CHECKS 0.01	Cu ppm IC581 5	Pb ppm IC581 5	Zn ppm IC581 5	Ag ppm IC581 1
18289		<0.01		160	<5	24	<1
18290		<0.01		423	<5	22	<1
18291		<0.01		652	<5	15	<1
18292		<0.01		310	<5	19	<1
18293		<0.01		154	<5	22	<1
18294		0.01		60	<5	64	<1
18295		<0.01		191	<5	80	<1
18296		<0.01		150	<5	72	<1
18297		0.01		949	<5	29	<1
18298		<0.01	<0.01	543	<5	41	<1

COMMENTS:

This is the Final Report which supersedes any preliminary reports with this batch number. • Results apply to sample(s) as submitted by client.

Sydney Laboratory
Phone: (089) 52 6020 Fax: (089) 52 6028
Burnie Laboratory
Phone: (054) 46 1390 Fax: (054) 46 1389
Brisbane Laboratory
Phone: (07) 3243 7222 Fax: (07) 3243 7218
Townsville Laboratory
Phone: (077) 87 4155 Fax: (077) 87 4220
Cloncurry Laboratory
Phone: (077) 42 1323 Fax: (077) 42 1885
Kalgoorlie Laboratory
Phone: (090) 21 1457 Fax: (090) 21 6253
New Zealand Laboratory
Phone: (07) 575 7654 Fax: (07) 575 7641
Orange Laboratory
Phone: (063) 601 1722 Fax: (063) 601 1189
Perth Laboratory
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Townsville Laboratory
Phone: (077) 79 9155 Fax: (077) 79 9729

AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

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ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15553
SUB BATCH: 0
No. OF SAMPLES: 100
DATE RECEIVED: 24/07/96
DATE COMPLETED: 06/08/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2017097 SAMPLE TYPE: ROCK PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	As ppm IC581 2	Fe % IC581 0.01	Mn ppm IC581 5	Co ppm IC581 5		
18199		8	8.38	262	55		
18200		5	5.20	429	47		
18201		8	5.27	432	26		
18202		8	8.56	526	111		
18203		8	9.06	386	86		
18204		7	9.20	396	73		
18205		8	5.26	321	35		
18206		8	5.95	398	63		
18207		10	5.54	338	51		
18208		5	7.67	312	44		
18209		7	8.32	368	38		
18210		6	8.87	352	53		
18211		8	9.20	392	51		
18212		7	11.99	375	68		
18213		5	11.08	372	39		
18214		7	10.65	366	44		
18215		8	9.46	371	69		
18216		12	9.97	527	126		
18217		18	11.28	374	71		
18218		7	9.14	310	85		
18219		9	8.57	334	73		
18220		9	8.37	398	78		
18221		8	6.79	417	33		
18222		11	6.46	433	26		
18223		12	6.50	485	33		
18224		8	6.45	494	28		
18225		11	9.16	504	55		
18226		7	8.20	355	43		
18227		10	9.35	338	60		
18228		14	13.11	522	70		

COMMENTS:

This is the Final Report which supersedes any preliminary reports with this batch number. • Results apply to sample(s) as submitted by client.

AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

311119 [redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15553
SUB BATCH: 0
No. OF SAMPLES: 100
DATE RECEIVED: 24/07/96
DATE COMPLETED: 06/08/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2017097 SAMPLE TYPE: ROCK PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	As ppm IC581 2	Fe % IC581 0.01	Mn ppm IC581 5	Co ppm IC581 5		
18229		23	9.46	506	48		
18230		10	8.37	403	73		
18231		13	10.74	397	83		
18232		15	11.60	445	113		
18233		10	11.22	626	48		
18234		11	6.19	562	15		
18235		10	5.92	533	20		
18236		18	6.13	594	25		
18237		9	11.42	518	40		
18238		9	6.64	414	26		
18239		8	2.61	443	29		
18240		10	2.60	465	36		
18241		7	3.09	540	17		
18242		7	4.67	568	34		
18243		9	3.28	423	16		
18244		20	3.31	384	50		
18245		14	2.92	331	82		
18246		14	3.82	393	54		
18247		11	2.74	338	61		
18248		8	4.67	631	15		
18249		8	3.36	429	34		
18250		8	3.64	445	18		
18251		9	3.04	361	21		
18252		8	3.67	521	19		
18253		10	5.42	578	20		
18254		12	3.32	471	74		
18255		7	2.99	413	27		
18256		9	3.10	507	8		
18257		6	2.91	392	11		
18258		9	3.74	458	30		

COMMENTS:

This is the Final Report which supersedes any preliminary reports with this batch number. • Results apply to sample(s) as submitted by client.

Spring Laboratory
(089) 52 6020 Fax: (089) 52 6028
Kalgoorlie Laboratory
(054) 46 1390 Fax: (054) 46 1389
[illegible] Laboratory
([illegible]) 3243 7222 Fax: (07) 3243 7218
[illegible]wers Laboratory
([illegible]) 87 4155 Fax: (077) 87 4220
Cloncurry Laboratory
Phone: (077) 42 1323 Fax: (077) 42 1685
Kalgoorlie Laboratory
Phone: (090) 21 1457 Fax: (090) 21 6253
New Zealand Laboratory
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Orange Laboratory
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Perth Laboratory
Phone: (09) 249 2988 Fax: (09) 249 2942
Townsville Laboratory
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AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

311120

[redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15553
SUB BATCH: 0
No. OF SAMPLES: 100
DATE RECEIVED: 24/07/96
DATE COMPLETED: 06/08/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2017097 SAMPLE TYPE: ROCK PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	As ppm IC581 2	Fe % IC581 0.01	Mn ppm IC581 5	Co ppm IC581 5		
18259		11	2.45	331	22		
18260		7	3.11	416	13		
18261		6	3.06	430	16		
18262		6	3.11	527	19		
18263		7	3.06	552	14		
18264		7	3.20	727	19		
18265		7	2.65	594	19		
18266		6	2.99	648	8		
18267		8	2.87	519	36		
18268		6	3.19	577	8		
18269		7	3.78	616	26		
18270		9	3.22	638	30		
18271		5	2.00	376	9		
18272		10	3.44	598	28		
18273		6	2.76	524	12		
18274		9	3.30	628	21		
18275		11	2.62	467	17		
18276		10	3.09	586	20		
18277		9	4.79	487	30		
18278		12	7.73	425	43		
18279		10	6.92	352	51		
18280		11	7.50	604	89		
18281		11	5.42	544	50		
18282		13	4.01	541	116		
18283		11	3.20	498	44		
18284		13	3.20	569	19		
18285		13	3.01	539	20		
18286		12	2.37	523	17		
18287		9	2.69	390	16		
18288		10	2.16	454	15		

COMMENTS:

This is the Final Report which supersedes any preliminary reports with this batch number. • Results apply to sample(s) as submitted by client.

Springs Laboratory
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Kalgoorlie Laboratory
Phone: (054) 46 1390 Fax: (054) 46 1389
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Orange Laboratory
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Perth Laboratory
Phone: (09) 249 2988 Fax: (09) 249 2942
Townsville Laboratory
Phone: (077) 79 9155 Fax: (077) 79 9729

AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

311121

[redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15553
SUB BATCH: 0
No. OF SAMPLES: 100
DATE RECEIVED: 24/07/96
DATE COMPLETED: 06/08/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

D[illegible] No.: 2017097 SAMPLE TYPE ROCK PROJECT:

A[illegible]PLE NUMBER	ELEMENT UNIT METHOD L.O.R.	As ppm IC581 2	Fe % IC581 0.01	Mn ppm IC581 5	Co ppm IC581 5		
18289		12	2.37	490	14		
18290		11	2.50	493	19		
18291		12	2.17	319	16		
18292		13	2.82	423	9		
18293		13	2.41	364	9		
18294		22	7.56	846	46		
18295		19	8.43	1090	33		
18296		21	7.92	940	38		
18297		18	2.61	508	57		
18298		18	2.69	610	19		

[illegible]NTS:

[illegible] the Final Report which supersedes any preliminary reports with this batch number. • Results apply to sample(s) as submitted by client.

[illegible] Laboratory
[illegible] 52 6020 Fax: (089) 52 6028
[illegible] Laboratory
[illegible] (054) 46 1390 Fax: (054) 46 1389
[illegible] Laboratory
[illegible] 43 7222 Fax: (07) 3243 7218
[illegible] Laboratory
[illegible] 4155 Fax: (077) 87 4220
Cloncurry Laboratory
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Townsville Laboratory
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AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

311122 [redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15553
SUB BATCH: 0
No. OF SAMPLES: 100
DATE RECEIVED: 24/07/96
DATE COMPLETED: 06/08/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2017097 SAMPLE TYPE: DUPLICATES PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Cu ppm IC581 5	Pb ppm IC581 5	Zn ppm IC581 5	Ag ppm IC581 -	As ppm IC581 2	Fe % IC581 0.01
*** 18207		228	<5	40	<1	11	5.77
Original Result		206	<5	38	<1	10	5.54
*** 18217		221	<5	63	<1	19	11.22
Original Result		213	<5	61	<1	18	11.28
*** 18227		455	<5	39	<1	12	8.67
Original Result		483	<5	40	<1	10	9.35
*** 18251		213	<5	33	<1	13	3.49
Original Result		226	<5	30	<1	9	3.04
*** 18261		220	<5	29	<1	10	3.79
Original Result		200	<5	24	<1	6	3.06
*** 18271		200	<5	19	<1	8	1.82
Original Result		170	<5	21	<1	5	2.00
*** 18295		191	<5	82	<1	21	8.82
Original Result		191	<5	80	<1	19	8.43
*** 18296		143	<5	72	<1	23	7.91
Original Result		150	<5	72	<1	21	7.92

COMMENTS:

Results which appear on this report are routine laboratory duplicates for QUALITY CONTROL purposes.

This is the Final Report which supersedes any preliminary reports with this batch number. • Results apply to sample(s) as submitted by client.

AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

311123

[redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15553
SUB BATCH: 0
No. OF SAMPLES: 100
DATE RECEIVED: 24/07/96
DATE COMPLETED: 06/08/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2017097 SAMPLE TYPE DUPLICATES PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Mn ppm IC581 5	Co ppm IC581 5				
*** 18207		352	54				
Original Result		338	51				
*** 18217		377	65				
Original Result		374	71				
*** 18227		317	51				
Original Result		338	60				
*** 18251		441	28				
Original Result		361	21				
*** 18261		490	21				
Original Result		430	16				
*** 18271		354	10				
Original Result		376	9				
*** 18295		1150	33				
Original Result		1090	33				
*** 18296		943	39				
Original Result		940	38				

COMMENTS:

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Springs Laboratory
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Laboratory
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Laboratory
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AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

311124

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15557
SUB BATCH: 0
No. OF SAMPLES: 99
DATE RECEIVED: 24/07/96
DATE COMPLETED: 02/08/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2018602 SAMPLE TYPE: CORE PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Au ppm PM209 0.01	Au PM209 ppm CHECKS 0.01	Cu ppm IC581 5	Pb ppm IC581 5	Zn ppm IC581 5	Ag ppm IC581 1
18299		<0.01		156	<5	38	<1
18300		<0.01		100	<5	40	<1
18301		<0.01		188	<5	44	<1
18302		<0.01		293	<5	39	<1
18303		<0.01		207	<5	34	<1
18304		<0.01		323	<5	32	<1
18305		<0.01		69	<5	29	<1
18306		<0.01		381	5	25	<1
18307		<0.01		74	<5	28	<1
18308		0.02		163	<5	20	<1
18309		0.03		114	<5	24	<1
18310		0.02		410	<5	16	<1
18311		0.04		612	<5	23	<1
18312		<0.01		271	<5	41	<1
18313		<0.01		324	<5	46	<1
18314		<0.01		388	<5	27	<1
18315		0.02		351	<5	20	<1
18316		0.02		65	<5	32	<1
18317		0.02	0.02	400	<5	9	<1
18318		0.01		41	<5	12	<1
18319		<0.01		39	6	9	<1
18320		<0.01		40	<5	14	<1
18321		<0.01		151	<5	16	<1
18322		0.01		147	<5	8	<1
18323		0.01		132	<5	10	<1
18324		0.03		555	<5	17	<1
18325		0.01		240	<5	17	<1
18326		0.01		55	<5	16	<1
18327		0.02		175	<5	17	<1
18328		0.01		334	<5	14	<1

COMMENTS:

This is the Final Report which supersedes any preliminary reports with this batch number.

• Results apply to sample(s) as submitted by client.

[illegible]ings Laboratory
[illegible]89) 52 6020 Fax: (089) 52 6028
[illegible]go Laboratory
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[illegible]ne Laboratory
[illegible]7) 3243 7222 Fax: (07) 3243 7218
[illegible] Towers Laboratory
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Cloncurry Laboratory
Phone: (077) 42 1323 Fax: (077) 42 1685
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Townsville Laboratory
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All pages of this report have been checked and approved for release.

AUSTRALIAN LABORATORY SERVICES P/L 311125

A.C.N. 009 936 029

[redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15557
SUB BATCH: 0
No. OF SAMPLES: 99
DATE RECEIVED: 24/07/96
DATE COMPLETED: 02/08/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2018602 SAMPLE TYPE: CORE PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Au ppm PM209 0.01	Au PM209 ppm CHECKS 0.01	Cu ppm IC581 5	Pb ppm IC581 5	Zn ppm IC581 5	Ag ppm IC581 1
18329		0.02		494	<5	20	<1
18330		0.07		1460	<5	20	<1
18331		0.02		301	<5	24	<1
18332		0.05		685	<5	26	<1
18333		0.03		154	<5	32	<1
18334		0.01		228	<5	28	<1
18335		0.02		580	<5	34	<1
18336		0.05		352	<5	23	<1
18337		0.01		345	5	24	<1
18338		<0.01		273	<5	17	<1
18339		<0.01		189	<5	22	<1
18340		0.01		333	<5	34	<1
18341		0.01		218	<5	29	<1
18342		<0.01		62	14	32	<1
18343		0.02		6	<5	24	<1
18344		0.01		16	<5	26	<1
18345		0.02		7	<5	29	<1
18346		<0.01		5	<5	26	<1
18347		0.01		73	<5	34	<1
18348		0.01	<0.01	138	<5	27	<1
18349		<0.01		41	<5	32	<1
18350		0.03		438	<5	43	<1
18351		0.04		625	5	44	<1
18352		0.01		187	5	35	<1
18353		0.01		120	5	40	<1
18354		<0.01		154	<5	31	<1
18355		<0.01		87	5	52	<1
18356		<0.01		106	<5	32	<1
18357		<0.01		137	5	33	<1
18358		<0.01		31	6	40	<1

COMMENTS:

This is the Final Report which supersedes any preliminary reports with this batch number. • Results apply to sample(s) as submitted by client.

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AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

311126

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15557
SUB BATCH: 0
No. OF SAMPLES: 99
DATE RECEIVED: 24/07/96
DATE COMPLETED: 02/08/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2018602 SAMPLE TYPE: CORE PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Au ppm PM209 0.01	Au PM209 ppm CHECKS 0.01	Cu ppm IC581 5	Pb ppm IC581 5	Zn ppm IC581 5	Ag ppm IC581 1
18359		<0.01		156	5	35	<1
18360		0.01		182	<5	30	<1
18361		0.01		70	<5	39	<1
18362		<0.01		45	<5	28	<1
18363		<0.01		68	<5	20	<1
18364		0.01		180	<5	24	<1
18365		0.01	0.01	203	<5	28	<1
18366		0.01	0.01	161	<5	25	<1
18367		0.01		247	<5	27	<1
18368		0.01		258	<5	27	<1
18369		<0.01		155	5	20	<1
18370		0.01		806	5	21	<1
18371		<0.01		224	5	23	<1
18372		0.01		330	<5	25	<1
18373		<0.01		80	<5	41	<1
18374		0.01		463	<5	22	<1
18375		0.01		386	<5	31	<1
18376		0.01		106	<5	35	<1
18377		<0.01		153	<5	30	<1
18378		0.01		181	15	51	<1
18379		0.03		676	14	54	<1
18380		0.08		1740	6	42	<1
18381		0.16		5460	5	146	<1
18382		0.02	0.04	145	<5	43	<1
18383		0.22		479	<5	36	<1
18384		0.14		2570	<5	57	<1
18385		<0.01		432	<5	31	<1
18386		0.03		2020	<5	39	<1
18387		<0.01		112	<5	34	<1
18388		<0.01		40	<5	30	<1

COMMENTS:

This is the Final Report which supersedes any preliminary reports with this batch number. • Results apply to sample(s) as submitted by client.

Spotts Laboratory
Phone: (089) 52 6020 Fax: (089) 52 6028
Stawell Laboratory
Phone: (054) 46 1390 Fax: (054) 46 1389
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AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

311127 [redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15557
SUB BATCH: 0
No. OF SAMPLES: 99
DATE RECEIVED: 24/07/96
DATE COMPLETED: 02/08/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2018602 SAMPLE TYPE: CORE PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Au ppm PM209 0.01	Au PM209 ppm CHECKS 0.01	Cu ppm IC581 5	Pb ppm IC581 5	Zn ppm IC581 5	Ag ppm IC581 1
18389		<0.01		209	<5	32	<1
18390		0.04		1090	<5	29	<1
18391		0.02		700	<5	32	<1
18392		0.01		453	<5	78	<1
18393		0.01		247	5	36	<1
18394		0.02		400	<5	40	<1
18395		0.02		325	<5	32	<1
18396		0.03	0.03	405	<5	45	<1
18397		<0.01	<0.01	135	<5	41	<1

MMENTS:

[redacted] the Final Report which supersedes any preliminary reports with this batch number. • Results apply to sample(s) as submitted by client.

S[redacted]e Laboratory
[redacted] (089) 52 6020 Fax: (089) 52 6028
[redacted]s Laboratory
[redacted] (054) 46 1390 Fax: (054) 46 1389
[redacted]aboratory
[redacted] 3243 7222 Fax: (07) 3243 7218
[redacted]owers Laboratory
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Cloncurry Laboratory
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Kalgoorlie Laboratory
Phone: (090) 21 1457 Fax: (090) 21 6253
New Zealand Laboratory
Phone: (07) 575 7654 Fax: (07) 575 7641
Orange Laboratory
Phone: (063) 601 1722 Fax: (063) 601 1189
Perth Laboratory
Phone: (09) 249 2988 Fax: (09) 249 2942
Townsville Laboratory
Phone: (077) 79 9155 Fax: (077) 79 9729

AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

311128

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15557
SUB BATCH: 0
No. OF SAMPLES: 99
DATE RECEIVED: 24/07/96
DATE COMPLETED: 02/08/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2018602 SAMPLE TYPE: CORE PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	As ppm IC581 2	Fe % IC581 0.01	Mn ppm IC581 5	Co ppm IC581 5		
18299		3	2.42	458	9		
18300		4	4.04	549	13		
18301		5	2.87	498	14		
18302		3	2.92	530	15		
18303		<2	2.93	511	9		
18304		3	3.36	552	10		
18305		3	2.34	432	8		
18306		6	2.28	431	81		
18307		<2	2.20	424	8		
18308		5	1.91	456	9		
18309		3	4.85	671	14		
18310		4	2.08	392	34		
18311		5	1.97	460	9		
18312		3	5.80	647	28		
18313		3	6.98	548	31		
18314		6	3.17	420	54		
18315		<2	2.09	338	12		
18316		2	3.26	533	11		
18317		3	1.69	156	63		
18318		2	2.07	253	18		
18319		5	1.50	162	37		
18320		2	1.94	217	23		
18321		2	1.78	269	45		
18322		4	2.58	177	69		
18323		3	2.50	217	79		
18324		5	2.85	259	83		
18325		6	4.30	433	41		
18326		2	3.60	372	28		
18327		8	4.11	404	101		
18328		8	2.46	258	72		

COMMENTS:

n s[illegible] the Final Report which supersedes any preliminary reports with this batch number. • Results apply to sample(s) as submitted by client.

[illegible]ngs Laboratory
[illegible] (089) 52 6020 Fax: (089) 52 6028
[illegible]go Laboratory
[illegible]: (054) 46 1390 Fax: (054) 46 1389
[illegible] Laboratory
[illegible] 3243 7222 Fax: (07) 3243 7218
[illegible]owers Laboratory
[illegible]7) 87 4155 Fax: (077) 87 4220
Cloncurry Laboratory
Phone: (077) 42 1323 Fax: (077) 42 1685
Kalgoorlie Laboratory
Phone: (090) 21 1457 Fax: (090) 21 6253
New Zealand Laboratory
Phone: (07) 575 7654 Fax: (07) 575 7641
Orange Laboratory
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Perth Laboratory
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Townsville Laboratory
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A.C.N. 009 936 029

311129

[redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15557
SUB BATCH: 0
No. OF SAMPLES: 99
DATE RECEIVED: 24/07/96
DATE COMPLETED: 02/08/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2018602 SAMPLE TYPE: CORE PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	As ppm IC581 2	Fe % IC581 0.01	Mn ppm IC581 5	Co ppm IC581 5		
18329		7	2.87	309	58		
18330		16	4.78	438	138		
18331		3	3.85	463	27		
18332		11	3.71	437	62		
18333		2	3.77	477	14		
18334		2	2.89	412	22		
18335		3	3.52	516	35		
18336		4	2.67	364	37		
18337		6	3.49	475	32		
18338		4	2.34	413	20		
18339		4	3.06	414	20		
18340		9	4.24	568	70		
18341		2	3.56	488	16		
18342		5	3.86	474	120		
18343		2	2.88	412	22		
18344		3	2.91	401	23		
18345		4	3.27	463	24		
18346		4	3.10	442	47		
18347		11	4.07	449	28		
18348		7	6.05	461	37		
18349		21	4.94	567	31		
18350		17	8.72	832	39		
18351		18	7.19	577	41		
18352		7	8.90	619	38		
18353		5	6.99	448	30		
18354		7	5.84	327	32		
18355		6	7.18	515	29		
18356		9	5.04	358	31		
18357		6	5.29	392	38		
18358		5	5.75	471	29		

COMMENTS:

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Stanhope Laboratory
Phone: (089) 52 6020 Fax: (089) 52 6028
Stafford Laboratory
Phone: (054) 46 1390 Fax: (054) 46 1389
Brisbane Laboratory
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Townsville Laboratory
Phone: (077) 87 4155 Fax: (077) 87 4220
Cloncurry Laboratory
Phone: (077) 42 1323 Fax: (077) 42 1685
Kalgoorlie Laboratory
Phone: (090) 21 1457 Fax: (090) 21 6253
New Zealand Laboratory
Phone: (07) 575 7654 Fax: (07) 575 7641
Orange Laboratory
Phone: (063) 601 1722 Fax: (063) 601 1189
Perth Laboratory
Phone: (09) 249 2988 Fax: (09) 249 2942
Townsville Laboratory
Phone: (077) 79 9155 Fax: (077) 79 9729

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A.C.N. 009 936 029

311130

[redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15557
SUB BATCH: 0
No. OF SAMPLES: 99
DATE RECEIVED: 24/07/96
DATE COMPLETED: 02/08/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2018602 SAMPLE TYPE: CORE PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	As ppm IC581 2	Fe % IC581 0.01	Mn ppm IC581 5	Co ppm IC581 5		
18359		6	4.41	358	42		
18360		4	4.52	337	40		
18361		5	4.79	422	17		
18362		5	2.34	308	8		
18363		4	2.09	249	9		
18364		4	2.34	302	21		
18365		4	3.21	299	45		
18366		4	3.98	330	54		
18367		6	3.34	374	32		
18368		4	3.49	390	44		
18369		4	5.54	320	37		
18370		4	4.34	304	42		
18371		6	5.33	254	51		
18372		7	4.43	272	54		
18373		4	5.09	371	32		
18374		4	4.71	320	52		
18375		4	4.82	414	47		
18376		5	3.89	557	26		
18377		4	2.99	364	12		
18378		3	4.75	504	46		
18379		9	4.83	350	101		
18380		23	5.90	234	203		
18381		7	4.09	192	178		
18382		7	3.43	325	91		
18383		5	4.54	517	34		
18384		8	5.50	694	133		
18385		3	3.61	497	33		
18386		3	3.01	427	54		
18387		10	6.23	374	82		
18388		6	5.02	375	36		

COMMENTS:

This is the Final Report which supersedes any preliminary reports with this batch number. • Results apply to sample(s) as submitted by client.

Sp[illegible]e Laboratory
([illegible]) 52 6020 Fax: (089) 52 6028
[illegible]o Laboratory
(054) 46 1390 Fax: (054) 46 1389
[illegible] Laboratory
([illegible]) 3243 7222 Fax: (07) 3243 7218
[illegible]wers Laboratory
([illegible]) 87 4155 Fax: (077) 87 4220
Cloncurry Laboratory
Phone: (077) 42 1323 Fax: (077) 42 1685
Kalgoorlie Laboratory
Phone: (090) 21 1457 Fax: (090) 21 6253
New Zealand Laboratory
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Orange Laboratory
Phone: (063) 601 1722 Fax: (063) 601 1189
Perth Laboratory
Phone: (09) 249 2988 Fax: (09) 249 2942
Townsville Laboratory
Phone: (077) 79 9155 Fax: (077) 79 9729

AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

311131 [redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15557
SUB BATCH: 0
No. OF SAMPLES: 99
DATE RECEIVED: 24/07/96
DATE COMPLETED: 02/08/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2018602 SAMPLE TYPE: CORE PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	As ppm IC581 2	Fe % IC581 0.01	Mn ppm IC581 5	Co ppm IC581 5		
18389		5	4.76	356	80		
18390		12	9.82	534	117		
18391		6	5.35	381	19		
18392		6	5.50	450	25		
18393		6	8.66	430	53		
18394		8	5.50	349	33		
18395		7	5.09	289	36		
18396		7	5.24	454	66		
18397		5	3.95	451	35		

COMMENTS:

This is the Final Report which supersedes any preliminary reports with this batch number.

• Results apply to sample(s) as submitted by client.

– Sale[illegible]ga Laboratory
[illegible] (089) 52 6020 Fax: (089) 52 6028
[illegible]e Laboratory
[illegible] (054) 46 1390 Fax: (054) 46 1389
[illegible] Laboratory
[illegible] 3243 7222 Fax: (07) 3243 7218
[illegible]owers Laboratory
[illegible]7) 87 4155 Fax: (077) 87 4220
Cloncurry Laboratory
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Kalgoorlie Laboratory
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New Zealand Laboratory
Phone: (07) 575 7654 Fax: (07) 575 7641
Orange Laboratory
Phone: (063) 601 1722 Fax: (063) 601 1189
Perth Laboratory
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311132

[redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15557
SUB BATCH: 0
No. OF SAMPLES: 99
DATE RECEIVED: 24/07/96
DATE COMPLETED: 02/08/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2018602 SAMPLE TYPE: DUPLICATES PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Cu ppm IC581 5	Pb ppm IC581 5	Zn ppm IC581 5	Ag ppm IC581 1	As ppm IC581 2	Fe % IC581 0.01
*** 18307		82	<5	32	<1	<2	2.53
Original Result		74	<5	28	<1	<2	2.20
*** 18317		407	<5	10	<1	2	1.76
Original Result		400	<5	9	<1	3	1.69
*** 18327		181	<5	18	<1	6	4.28
Original Result		175	<5	17	<1	8	4.11
*** 18351		707	5	45	<1	17	7.38
Original Result		625	5	44	<1	18	7.19
*** 18361		77	<5	42	<1	7	5.25
Original Result		70	<5	39	<1	5	4.79
*** 18371		214	5	24	<1	6	5.57
Original Result		224	5	23	<1	6	5.33
*** 18395		328	<5	33	<1	6	5.24
Original Result		325	<5	32	<1	7	5.09
*** 18396		453	<5	50	<1	8	5.76
Original Result		405	<5	45	<1	7	5.24

COMMENTS:

Results which appear on this report are routine laboratory duplicates for QUALITY CONTROL purposes.

This is the Final Report which supersedes any preliminary reports with this batch number. • Results apply to sample(s) as submitted by client.

Springvale Laboratory
Phone: (089) 52 6020 Fax: (089) 52 6028
Wodonga Laboratory
Phone: (054) 46 1390 Fax: (054) 46 1389
Brisbane Laboratory
Phone: (07) 3243 7222 Fax: (07) 3243 7218
Townsville Laboratory
Phone: (077) 79 9155 Fax: (077) 79 9729
Cloncurry Laboratory
Phone: (077) 42 1323 Fax: (077) 42 1685
Kalgoorlie Laboratory
Phone: (090) 21 1457 Fax: (090) 21 6253
New Zealand Laboratory
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Orange Laboratory
Phone: (063) 601 1722 Fax: (063) 601 1189
Perth Laboratory
Phone: (09) 249 2988 Fax: (09) 249 2942

AUSTRALIAN LABORATORY SERVICES P/L 311133

A.C.N. 009 936 029

[redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15557
SUB BATCH: 0
No. OF SAMPLES: 99
DATE RECEIVED: 24/07/96
DATE COMPLETED: 02/08/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2018602 SAMPLE TYPE: DUPLICATES PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Mn ppm IC581 5	Co ppm IC581 5				
*** 18307		492	12				
Original Result		424	8				
*** 18317		169	66				
Original Result		156	63				
*** 18327		421	116				
Original Result		404	101				
*** 18351		594	42				
Original Result		577	41				
*** 18361		466	21				
Original Result		422	17				
*** 18371		267	53				
Original Result		254	51				
*** 18395		299	35				
Original Result		289	36				
*** 18396		492	73				
Original Result		454	66				

COMMENTS:

This is the Final Report which supersedes any preliminary reports with this batch number.

• Results apply to sample(s) as submitted by client.

AUSTRALIAN LABORATORY SERVICES P/L 311134

A.C.N. 009 936 029

[redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15907
SUB BATCH: 0
No. OF SAMPLES: 15
DATE RECEIVED: 23/08/96
DATE COMPLETED: 29/08/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2018607 SAMPLE TYPE: ROCK PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Au ppm PM209 0.01	Au PM209 ppm CHECKS 0.01	Cu ppm IC581 5	Pb ppm IC581 5	Zn ppm IC581 5	Ag ppm IC581 1
18398		<0.01		129	<5	57	<1
18399		0.01		234	<5	63	<1
18400		<0.01		116	<5	62	<1
18401		0.01		175	<5	58	<1
18402		<0.01		79	<5	70	<1
18403		0.01		496	<5	63	<1
18404		0.03		681	7	76	<1
18405		<0.01		143	<5	43	<1
18406		<0.01	<0.01	144	<5	19	<1
18407		<0.01		234	10	46	<1
18408		0.01		92	<5	70	<1
18409		0.01		289	<5	68	<1
18410		0.09		270	<5	72	<1
18411		<0.01		201	<5	73	<1
18412		<0.01	<0.01	56	<5	72	<1

COMMENTS:

This is the Final Report which supersedes any preliminary reports with this batch number.

• Results apply to sample(s) as submitted by client.

Kalgoorlie Laboratory
Phone: (090) 21 1457 Fax: (090) 21 6253
New Zealand Laboratory
Phone: (07) 575 7854 Fax: (07) 575 7641
Orange Laboratory
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Perth Laboratory
Phone: (09) 249 2988 Fax: (09) 249 2942
Townsville Laboratory
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All pages of this report have been checked and approved for release.

AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

311135

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15907
SUB BATCH: 0
No. OF SAMPLES: 15
DATE RECEIVED: 23/08/96
DATE COMPLETED: 29/08/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2018607 SAMPLE TYPE: ROCK PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	As ppm IC581 2	Fe % IC581 0.01	Mn ppm IC581 5	Co ppm IC581 5		
18398		15	7.23	603	41		
18399		19	6.51	550	57		
18400		25	7.42	627	48		
18401		13	7.28	582	43		
18402		21	7.12	760	48		
18403		26	6.45	674	81		
18404		32	7.69	785	144		
18405		21	7.08	668	47		
18406		11	6.71	354	34		
18407		13	5.04	531	28		
18408		23	6.97	833	55		
18409		25	7.05	891	47		
18410		16	6.58	881	24		
18411		16	7.26	893	40		
18412		27	7.57	848	43		

COMMENTS:

This is the Final Report which supersedes any preliminary reports with this batch number.

• Results apply to sample(s) as submitted by client.

Bendigo Laboratory
Phone: (054) 52 6020 Fax: (054) 52 6028
Orange Laboratory
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Brisbane Laboratory
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Cloncurry Laboratory
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Kalgoorlie Laboratory
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A.C.N. 009 936 029 311136

[redacted]

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15907
SUB BATCH: 0
No. OF SAMPLES: 15
DATE RECEIVED: 23/08/96
DATE COMPLETED: 29/08/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2018607 SAMPLE TYPE: DUPLICATES PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Cu ppm IC581 5	Pb ppm IC581 5	Zn ppm IC581 5	Ag ppm IC581 1	As ppm IC581 2	Fe % IC581 0.01
*** 18406		149	<5	20	<1	16	6.88
Original Result		144	<5	19	<1	11	6.71
*** 18407		251	9	49	<1	17	5.32
Original Result		234	10	46	<1	13	5.04

COMMENTS:

Results which appear on this report are routine laboratory duplicates for QUALITY CONTROL purposes.

This is the Final Report which supersedes any preliminary reports with this batch number. • Results apply to sample(s) as submitted by client.

Orange Laboratory
Phone: (063) 52 6020 Fax: (063) 52 6028
Tamworth Laboratory
Phone: (054) 46 1390 Fax: (054) 46 1389
Brisbane Laboratory
Phone: (07) 3243 7222 Fax: (07) 3243 7218
Mt Isa Towers Laboratory
Phone: (077) 87 4155 Fax: (077) 87 4220
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New Zealand Laboratory
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Perth Laboratory
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311137

ANALYTICAL REPORT

LABORATORY: STAFFORD
BATCH NUMBER: ST15907
SUB BATCH: 0
No. OF SAMPLES: 15
DATE RECEIVED: 23/08/96
DATE COMPLETED: 29/08/96

CONTACT: MR R REID
CLIENT: PLUTONIC OPERATIONS LIMITED
ADDRESS:
P O BOX 282
ZEEHAN TAS 7469

ORDER No.: 2018607 SAMPLE TYPE: DUPLICATES PROJECT:

SAMPLE NUMBER	ELEMENT UNIT METHOD L.O.R.	Mn ppm IC581 5	Co ppm IC581 5				
*** 18406		380	37				
Original Result		354	34				
*** 18407		571	29				
Original Result		531	28				

COMMENTS:

This is the Final Report which supersedes any preliminary reports with this batch number. • Results apply to sample(s) as submitted by client.

Orange Laboratory
Phone: (069) 52 6020 Fax: (069) 52 6028
Bathurst Laboratory
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Townsville Laboratory
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Cloncurry Laboratory
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Kalgoorlie Laboratory
Phone: (090) 21 1457 Fax: (090) 21 6253
New Zealand Laboratory
Phone: (07) 575 7664 Fax: (07) 575 7641
Orange Laboratory
Phone: (063) 601 1722 Fax: (063) 601 1189
Perth Laboratory
Phone: (09) 249 2988 Fax: (09) 249 2942
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Phone: (077) 79 9155 Fax: (077) 79 9729

311138

APPENDIX III

DRILL LOGS AND SURVEY DATA

FOR RECONNAISSANCE SURVEYS AND DRILLCORE

311139

Hole No:	TCD1					
Prospect:	Thomas Creek					
Section:	370000mE					
Co-ordinates:	370000	mE	5900	mN	~220	mRL
Azimuth:	180 °G	167	°M	Inclination	-45°	
EOH:	88.90m					
Logged by:	Robert Reid 27/5/96					
Date commenced:	20/05/96		Date completed:		24/05/96	

0.00 to 14.90m

pale green spotted porphyritic Diorite. This unit is feldspar-augite-phenocryst crowded. Feldspar crystals of 1 to 4mm diameter constitute 40 to 50% of rock mass and have variable anhedral to sub-hedral form. Augite crystals occur as dark green spots (10 to 15%) of 2 to 7 mm diameter, having rounded to anhedral form. Phenocrysts reside in a fine grained pale green groundmass. Locally, a very coarse grained appearance is imparted by weak chlorite -pyrite alteration.(eg 8.5 to 9.5m). Mineralisation typically exists as disseminated pyrite throughout (1% overall) in the form of sub to euhedral crystals of fine to coarse grain size. An intrusive/alteration? induced breccia texture is evident over the lower 60cm. Core is highly broken with maximum core stick of 15cm. Core recovery is very poor due to extent of weathering.

Minor intervals

0.00-1.00m pervasive grey siliceous alteration containing 5 to 8% pyrite, and locally 30 to 40% in small highly silicified (vein?) fragments. Silica alteration varies from locally texture destructive (s) to partially matrix pervasive (w). Chalcopyrite reaches 1 to 2% in some strongly silica altered fragments, but is 0.5% overall. Strongly siliceous fragments are often weakly vuggy where the host diorite has weathered out.

1 - 2.5m py (4%), sil (w), locally strong in pyritic and barren fragments.

2.5 - 8.5m py (2%) ch(w)

8.5 - 8.5m py (4%) ch (w/m) ks(w) at interval end.

9.4-11.5m (5cm core recovered)py (3-4%), cpy(tr), sil(w)pink ks(w), mag(w) but pervasive, ep(w), ch(w)

11.5- 11.6m sil(s)py(3%)

11.6-14.3 py(tr-1%),ser (w?)locally, magnetite replacement of augite.

14.90-15.90m

grey crystal crowded augite-feldspar-phyric Andesite containing fine to medium grain size, often irregular shaped, near close packed phenocrysts. Unit is slightly more mafic than above with augite (20%) as dark grey crystals. Epidote(w/m) exists as matrix/ feldspar? replacing flecks, and also commonly as fracture plane fillings. py(1%), ser?(w), Broken core, mag(w/m) as dark grey flecks.

15.90-17.60m
light green feldspar-augite-Porphyritic Diorite (as for 0-14.m), locally displays fragmental appearing texture with "matrix" infilled by semi-pervasive chlorite alteration with associated disseminated pyrite(1%) and cpy(tr). The matrix appears weakly silicified where cpy is present. Ferromagnesian minerals are preferentially chloritised and pyritic, and are infrequently replaced by magnetite. Where less altered ferromagnesian minerals are pale green in colour, euhedral and well cleaved parallel to their long axis. Groundmass is very fine grained, sandy appearing with black specks of magnetite? Sharp lower contact (intrusive?). Un-foliated.

17.60-19.00m
medium grained pinkish feldspar-augite Micro-monzodiorite(MDI). Very sharp upper and lower contacts, coherent core. mg feldspathic matrix, weakly porphyritic in feldspar (10%) and augite(5%). Augite commonly replaced/pseudomorphed by magnetite. Pink colour may be due to k-feldspar alteration, which is evident in feldspars.
Mineralisation: py(1-2%), mag(w/m) as crystal pseudomorphs and fine grains in the groundmass. Magnetite rims pyrite locally. Epidote(w) has a close spatial association with pyrite, evident both as veinlets on fracture planes and disseminations. Disseminated pyrite forms mg to 7mm crystal aggregates. Magnetite is locally evident as silvery grey augite replacements, differing from the dominant dark grey pervasive magnetite alteration style evident elsewhere. un-foliated.

19.00-19.70m
Dark grey/green fragmental/altered strongly feldspar-augite-phyric Diorite. Contains fragments to 8cm, including grey sub-rounded silicified fragments. (diatreme breccia?) Py(1-2%) as disseminations and veinlets. Py veinlets <1% often with silicified margins. Pink ks alteration is evident locally (tr) at py aggregate and vein margins. ep(w), ser?(w) as feldspar replacements and scattered flecks. Matrix:- locally (10-15%) pervaded by dark grey (magnetite) alteration. Feldspar crystals appear little altered by these fluids. cpy(tr), 0.5% over basal 10cm. Lower contact marked by an 8mm py-silica-cpy vein at ~80 degrees to the core axis. Other veins occur at 45 degrees. Un-foliated.

19.70-22.20m
grey fg/mg feldspar-augite Micro-monzodiorite(similar to 17.6 to 19.0m), broken core, variable crystal size, very weakly porphyritic in both feldspar and augite with crystals <2mm. Disseminated py(2%), cpy(tr-0.5%), py veinlets on fracture planes (<0.5%) often evident as 1mm coating on fracture planes. ep(w) as flecks, mag(w,1%) as dark grey alteration patches with replacements of augite being common.
Minor interval
20.95-21.15m py locally 3-4% with cpy 1%

22.2-25.18m
mg/cg porphyritic Diorite (similar to 0-14m). Displays a distinctive spotty augite-phyric texture with chlorite altered crystals up to 6mm diameter. mg feldspar crystals are close packed, but not interlocking. py(1%), cpy(tr), disseminated, ch(w), ser(w) in groundmass, mag(w) as spots. Sharp lower contact.

25.18-26.55m
pinkish grey fg/mg augite-phyric Micro-monzodiorite. py(2%), cpy(tr-0.5%) dss, ep(w) as flecks in groundmass and locally strong as fracture coatings. Pink silicification/k-feldspar is evident on some fracture planes. Magnetite(w) as spots and flecks. Lower contact is faulted with sinistral displacement indicated by poorly developed slickensides and ramps formed on an epidote/chlorite coating.

26.55-38.80m
light green/grey porphyritic Diorite with local weakly developed breccia textures. The diorite is phenocryst/crystal crowded containing feldspar(50%) and augite(25%) within a dark grey magnetite altered aphanitic groundmass. Feldspars are of sub to euhedral form and often display concentric reaction rims. Feldspars appear little changed by the moderate intensity magnetite alteration which is dominant throughout in matrix pervasive form. Where variable, magnetite alteration induces a fragmental appearance, eg. @28.2 and 32.0-32.5m, and where weak, magnetite occurs as replacements of chloritic ferromags. Sulphide mineralisation occurs as m/cg and blebby disseminations and also as fracture plane filling veinlets to 5mm in diameter(< 0.5%). Overall this interval contains py(1-2%), cpy(tr) and patchy pink ks alteration of weak intensity. Broken core at end of interval.
Minor Intervals
@25.65m 6mm grey quartz vein with py-cpy(1%).
26.55-28.00m grey quartz zones/irregular veinlets from 0.5 to 1.5cm are patchy (< 1%). sil(w), py(2-3%), cpy(0.5%).
36.65-37.80m matrix pervasive grey silicification (w/m), py(3%), cpy(0.5-1.0%), dss, mag(w). Interval contains a 12cm weakly magnetic fg/mg micro-monzodiorite? dyke hosting py(7%) and cpy(1.0%).

38.80-41.10m
pale green/grey mg poorly augite-phyric Microdiorite with a fuzzy equigranular groundmass. This unit is dissimilar to the micro-monzodiorites, principally upon the basis of lack of k-feldspar. Core occurs as relatively coherent sticks to 30cm, with broken core at the up-hole contact. Epidote (w) forms veinlets on fracture planes, but mostly exists as replacements(?) of augite crystals. mag(w, grains), ch?(m), py(1.0%), cpy(tr).

41.10-50.90m
light green and grey variably altered mg porphyritic Diorite and breccia. The diorite is composed of greenish (sericitised) anhedral to subhedral feldspars having even but crowded distribution(50%, <3mm dia). Weakly chloritised euhedral augite phenocrysts constitute 15 to 20% (< 5mm dia). Phenocrysts reside in a fine grained cream/light green and black (magnetite/ilmenite?) speckled groundmass.
Breccia textures are locally evident as zones of irregularly shaped variable composition(?) clasts. Clasts include medium grained monzodiorite and varieties of dark grey porphyritic andesite, having aphanitic groundmass. The breccia may be intrusion (mg monzodiorite?) and magnetite alteration related. Broken core precludes adequate study.
Alteration and mineralisation is variable. Lowest intensity alteration comprises 30% of interval as sericitisation (w/m) of feldspars and chloritisation (w) of augite phenocrysts.

Veins of very coarse grained fibrous actinolite(70%) with pink/brick red ks(< 25%) +/- py constitute < 5% and range up to 4cm width. They are commonly enclosed by dark grey groundmass pervasive magnetite(s). Magnetite alteration intensity appears to decrease away from vein margins. Py and cpy commonly occur within the most intense magnetite alteration. The form of py and cpy mineralisation is typically as dss and irregular veins up to 1.5cm in diameter. True vein widths are hard to characterise as numerous vein tongues and high intensity dss are evident proximal to vein margins. Epidote(w) often forms fracture plane filling veins and some instances are spatially associated with k-feldspar. Overall py(2%), cpy(tr-locally 1% over 5 to 15cm intervals)

50.90-52.50m
pinkish green mg weakly augite-phyric Micro-monzodiorite. Pink k-feldspar is evident within the equigranular groundmass along with evenly disseminated cpy(tr-0.5%).

52.50-74.70m
mg/cg porphyritic Diorite (feldspar-augite-phenocryst crowded) with minor intercalated feldspar-phyric Dacitic intrusives in the vicinity of 67m. Magnetite(m) as zones of matrix pervasive and augite destructive alteration. py locally 1%, cpy(tr).
Minor Interval
52.50-54.20m light green Acid Andesite/Dacite breccia. Contains clasts of feldspar-rich "dacite". Feldspars within clasts are cream and pale green, sericitised, sub-hedral to tabular euhedral, constituting ~60%. Clast groundmass is pale green, fine grained and displays abundant fg black (magnetite/rutile?) specks. Contact with unit above is marked by broken core with matrix pervasive magnetite alteration and breccia texture decreasing away from the contact. Overall mag(s), py(2%), cpy(0.5%) dss and sulphidic veinlets(tr).

74.70-81.70m
grey fg/mg Microdiorite, Weakly augite-phyric with granular appearing groundmass containing weakly sericitised feldspar. ep(tr) as stringers on fracture planes. magnetite(w), sil(w), evenly disseminated py(3%), cpy(tr).
Minor interval
79.50-80.70m py(7%), cpy(tr)

81.70-83.70m
light green Diorite/porphyritic Diorite(feldspar-augite-phyric). Displays a mg/cg groundmass containing fg magnetite grains. Augite phenocrysts reach 6mm. Both upper and lower margins are distinct, marked by a grain size increase relative to the adjacent units. py(tr), mag(w).

83.70-88.90m
light green fg/mg MDI. equigranular, weakly altered/mineralised, leucoxene 1%. Epidote forms fracture filling veinlets (<1%), sil(w), ch(w) as flecks, py(1%).

EOH @ 88.90m

Hole No:	TCD2					
Prospect:	Thomas Creek					
Section:	369800mE					
Co-ordinates:	369800	mE	5858	mN	~220	mRL
Azimuth:	180 °G	167 °M	Inclination	-45°		
EOH:	127.80m					
Logged by:	Robert Reid					
Date commenced:	26/05/96	Date completed:	30/05/96			

0.00-17.00m
porphyritic Diorite. feldspar-augite-phenocryst crowded. Interval is strongly altered, containing irregular sil(s)-tour(w)-py veins/replacements throughout. py(2-5%) both in these veins and as disseminations, ep(w).
Minor Interval
0.00-4.30m Weathered feldspar-phenocryst crowded porphyritic Diorite? Very poor core recovery. Abundant py in drill fines(~4%).

17.00-18.90m
pinkish/pale brown Micro-monzodiorite. Exhibits a fine/medium grained equigranular texture composed of augite, feldspar and lesser magnetite(w) as primary? grains. cpy(0.5%, dss). ks(w), act?(w)

18.90-30.90m
porphyritic Diorite. augite-feldspar-phyric. Strongly altered with pervasive and veined grey/cream sil-py+/-tour. ep/ser(m). py(2-8%) disseminated and within irregular vein-like zones. Mineralisation weakens considerably after 30.5m. Similarly, breccia textures are locally evident up to 30.90m. Best examples are 24.3-24.6 and ~26.1m.
Minor intervals
20.30-20.60m py (15-20%)
27.10-28.10m green augite-feldspar- moderately porphyritic Andesite displaying a very fine grained light brown groundmass. Weak pervasive ks-sil alteration at the lower margin overprints breccia texture within the host porphyritic Diorite. ep(w), py(0.5%), mag(w), weakly mineralised.
32.1-33.6m augite-feldspar-phyric andesite (as above). py(tr), mag(w).

30.90-40.80m
medium/coarse grained feldspar-augite porphyritic Diorite. Weakly mineralised with < 1% ep-sil-py+/-tour+/-cpy veins. mag(w) and cpy(tr) overall.

40.80-70.55m
Variably coloured, green and pinkish cream feldspar-augite-porphyritic Diorite with fine grained groundmass. Breccia textures are common, with the matrix frequently infilled by later mineralisation. Highly but variably altered in three principal styles:- 1) pervasive and diffuse veined sil-py-tour, 2) disseminated and pervasive mag-py+/-cpy, and 3) green and brown veins of actinolite?(/ch)-ks+/-haematite +/-cpy constituting < 1% overall.

Minor Intervals
40.80-45.00m cream/pink variably altered feldspar-augite-porphyritic Diorite. pervasively altered by ks(m), sil(m/s), tour(w), ep(w), py(4%) as dss and minor diffuse veinlets containing cpy. overall cpy(tr-0.5%).
45.00-54.70m green Andesite/porphyritic Diorite with cpy(0.5%) and variable py (2-7%) overall.
54.70-57.40m Actinolite-ks-hm-cpy veined zone (20% vnd), includes late pale yellowish green siderite-smectite veins and @ 54.8m a 20cm act-hm(20%)-cpy(2%+) vein. Overall cpy(1%+).
57.40-70.55m as for 45.00 -54.70m
70.55-74.50m variable colour green/very light brown/grey highly altered feldspar-augite-porphyritic Diorite with minor feldspar-phyric Acid Andesite intrusives. Alteration includes matrix pervasive magnetite(w) associated? with disseminated py and cpy. Actinolite?-ch-py-cpy veins constitute 15%. Overall py (1-5%) and cpy (0.5%).

74.50-85.60m
pinkish grey variably altered feldspar-augite-porphyritic Diorite /brecciated diorite (similar to above). Breccia texture is abundant with (20%) pinkish k-felspar and silicified cpy bearing zones. Contains numerous (5-8%) late stage smectite veins, which both infill the matrix and crosscut "clasts". Overall py(1-3%), cpy(0.5%).

Mixed Intrusive Zone
85.60-87.00m
light green augite-phyric Andesite intrusive with a very fine grained/aphanitic groundmass. Cpy(0.5%, dss), mag(m)
87.00-89.05m
very light pink ks altered very fine grained Andesite/microdiorite? cpy(0.5%), ks(m), sil(m), ep(w), mag(m).
89.05-89.5m
dark grey feldspar-augite-moderately porphyritic Andesite. aphanitic groundmass, cpy(tr), mag(m/s).
89.50-91.70m
green fine grained augite-phyric Andesite. cpy(0.5-1.0%), py(1%), sulphides are dss and veined(< 1%), act/ch(m), ks(w).
End mixed zone

91.70-94.45m
pink/green feldspar-augite-porphyritic Diorite. ks(m), ch(m), py(1%), cpy(tr-0.5%), dss, ep(w) late, mag(m).

94.45-96.00m
light brown fine/medium grained moderately feldspar-augite-phyric Micro-monzodiorite. This unit is a coherent intrusive and features pink ks-altered feldspar phenocrysts. py(0.5%), cpy(tr), late ep(w,< 1%) veins.

96.00-104.95m
light green/pink feldspar-augite-porphyritic Diorite. Breccia textures are locally noted down to 98.00m. Silicification increases toward the lower intrusive contact, initially noted as pervasive proximal to fracture margins in the diorite (eg. 104.0m) and increasing to pervasive at base of interval.
Minor intervals
96.00-98.00m ks(m), ch(m), py(1%), cpy(tr-0.5%), dss, ep(w) late, mag(m/s).
98.00-99.50m strongly feldspar-phyric, py(0.5%), cpy(tr).
99.50-104.95m pink/light green. Exhibits pervasive silicification(m/s), with veined and dss sulphides. Overall py(0.5%), cpy(tr). Pyritic veinlets increase in intensity up to the basal MDI contact, reaching 10%.

104.95-106.40m
pink/light brown fg/mg feldspar-augite Micro-monzodiorite displays a chilled upper margin and disseminated sulphides. py(0.5%), cpy(0.5%).

106.40-108.15m
pink/green feldspar-augite-porphyritic Diorite. Py 2% in disseminated and vein/replacement form. Sil(s) pervasive, ks(w/m) and increasing in intensity to strong over the basal 10cm.

108.15-108.80m
light brown fg/mg moderately feldspar-augite-porphyritic Micro-monzodiorite intrusive. py(0.5%), cpy(<0.5%). Strong sil-ks alteration occurs in the host at MDI margins.

108.80-127.80m
Light green feldspar-augite-porphyritic Diorite. Locally moderately silicified. py(2%) as dss and veinlets(< 1%). cpy(tr). Ks(m)-sil(w) extends to 115m.

EOH @ 127.80m

Hole No:	TCD3					
Prospect:	Thomas Creek					
Section:	369800mE					
Co-ordinates:	369800	mE	5790	mN	~220	mRL
Azimuth:	180	°G	167	°M	Inclination	-45°
EOH:	122m					
Logged by:	Robert Reid 1/6/96					
Date commenced:	31/05/96		Date completed:		3/06/96	

0.00-29.05m

light green (locally pinkish) feldspar-augite-porphyritic Diorite. This unit is variably sil-ks-mag altered. Cream to pale green feldspar crystals are near close packed as sub to euhedral crystals (1-3mm dia, 60-70%). Feldspars are notably weakly sericitised and often concentrically zoned from 23.70m. Dark green subhedral to euhedral and locally weakly glomerophyric augite phenocrysts (3-5mm dia) are variable in abundance from 10 to 30%. Augite is particularly scarce from 22.80m (constituting <10%) but feldspar remains abundant ("acid" Diorite?). It is not clear whether mineral destructive alteration or melt fractionation is responsible for the paucity of augite here.

Where less altered, a medium grained feldspar-augite phenocryst crowded texture is commonly evident. An equigranular groundmass is infrequently evident in the upper 13m. Elsewhere, a sandy texture with abundant fine grained primary magnetite specks is seen, particularly from 22.80 to 29.05m and 13.53 to 17.40m.

The groundmass becomes fuzzy with increasing silicification. Silicification is weak/moderate throughout and often pinkish when accompanied by ks alteration, which varies from weak to locally moderate. Broken core , un-foliated, and poor core recovery in 0 to 4.5m.

Minor intervals:-

0.00-5.30m weathered, mag(w) as silvery grains in patches and weakly disseminated. Ch(w) replaces augite. Intensity of disseminated py and cpy increases with ks and mag content. py(2-3%), cpy(tr), sil(m), ks(w)

5.30-13.53m pink and green, ch(m) throughout, mag(w/m) locally strong over 5cm intervals. Cpy often concentrated in magnetite rich patches. Locally displays pseudo fragmental? texture with sub-rounded moderately magnetic grey "clast-like" zones enclosed by pervasive sil-ks alteration. Chlorite and magnetite alteration are commonly interstitial between/within ks-sil alteration. Intensity of silicification grades from weak to moderate, being strongest over the basal 50cm. Silicification is matrix pervasive with feldspar crystals within the host feldspar-augite-phyric Andesite being evident. Basal 30cm contains common (10%) fracture plane veins of dark green coarse grained fibrous actinolite. unfoliated, core sticks 2 to 25cm, mostly 10-20cm. py(5%), cpy(<0.5%) dss, sil(m), ks(w)

13.53-17.40m Yellowish pale green mg feldspar-augite-porphyritic Diorite. Feldspar crystals are near close packed as sub to euhedral crystals (60-70%) within a very fg black speck(mag) bearing groundmass. Dark green sub to euhedral and locally weakly glomerophyric augite phenocrysts are variable in abundance from

10 to 30%. Mag(w), ch(w). Note sharp change in alteration intensity at both ends of interval, with rubbly / more broken core at either end.

17.4-18.3m Interval exhibits pink ks replacement of feldspar crystals and commences with diffuse edged qtz-tour-py-cpy veins(5% by volume). Several fragments of up two 2 by 2 by 1cm contain up to 10% Cpy. Poor core recovery over this interval.

18.30-20.75m displays fragmental texture with pseudoclasts of sub-rounded grey feldspar-augite moderately porphyritic andesite enclosed by ks(w) sil(w/m) py(3%) cpy(tr, 0.5% locally). "clasts" appear largely un-sulphide mineralised.

20.75-22.8m cream/pale green feldspar-augite-porphyritic Diorite. Weak alteration. with sericitisation(w) of feldspar crystals. py(0.5%). Contains irregular edged zones/alteration patches of magnetite(m)-py(4%)-cpy(0.5%). These zones are up to 15cm long and constitute 8% overall.

22.8-23.7m very pale brown and spotted green, feldspar-augite moderately porphyritic microdiorite intrusive. fg sandy appearing matrix with abundant fg black specks of magnetite(/rutile?). Feldspar (20%, 1-3mm dia) and augite(10%, 3-5mm dia) phenocrysts are locally weakly glomerophyric, particularly in augite. Both margins appear chilled with groundmass grading to aphanitic and grey in colour. Groundmass contains fg and mg aggregates of disseminated py (1%), mag(m).

23.7-25.00m zone of pervasive mag(m) alt patches, py(2%), cpy(tr), ch(w). Interval terminates with 40cm of ep(w), sil(w/m) mag(w/m), py(6%), cpy(0.5%)

26.6-29.05m As above, mag(w/m) patches, py(2-3%), cpy(tr), ch(w). Final 15cm py(4%), cpy(0.5%+), sil(m), ks(w), ch(w).

29.05-29.95m

light brown fg augite-feldspar-phyric weakly porphyritic Micro-monzodiorite intrusive. cpy(tr-0.5%), unlike 22.8 to 23.7m, phenocrysts smaller(2-3mm max) and more sparse. Irregular upper intrusive contact. Chalcopyrite appears to be more concentrated near margins, locally reaching 1% over 15cm. Pyrite is more prevalent in the main body of unit (<0.5%). Chilled margins (dark grey) 10cm wide. mag(m). Lower contact obscured by broken core.

29.95-37.5m

pale green and patchy grey altered feldspar-phenocryst crowded "Acid" porphyritic Diorite(similar to 23.7-29.5m.). Patches of dark grey magnetite(m) up to 30cm length (<10% overall). They contain py(1%), cpy(tr). Note these zones are frequently moderately feldspar-augite-porphyritic and appear to be small intrusives. Their appearance is superficially very similar to the chilled margins of micro-monzodiorite intrusives. Margins of these alteration zones are commonly sharp and irregular. Psuedobreccia textures occur intermittently throughout.

Minor intervals

29.95-30.70m similar alteration sequence to 26.6 to 29.05m with grey mag(m) py(2%), cpy(tr) within a psuedobrecciated altered light green andesite. sil(m), mag(w/m), ep(w), ser(w?), ks(vw) in patches with py(6%), cpy(tr).

33.25-~35m zone of pink sil(m), ks(w/m) to locally strong over 34.5-34.7m with disseminated py(4%), cpy(tr), ep(w), ch(w).

37.50-38.05m
brown and green fine grained augite-feldspar-Micro-monzodiorite. Augite(~30%) 2-3 mm in size, feldspar (30%) 1-3mm in size. Features sharp, chilled intrusive margins, chloritisation(w) of augite, pink ks-altered feldspar and py(1%, dss), cpy(tr).

38.05-44.85m
light green feldspar-augite- porphyritic Diorite. Feldspar phenocryst crowded (60%), augite (10-15%). Interval contains minor dark grey moderately porphyritic feldspar-augite-phyric andesite intrusives?(10-15%, by volume). "Intrusives" are numerous and of irregular form imparting a dark grey patchy appearance to the core. These andesites are composed of feldspar(20%) and augite(20%) phenocrysts in a fine grained/aphanitic groundmass. Both intrusives and host porphyritic Diorite are moderately magnetic, lending weight to the likely intrusive nature of dark grey patches versus origin as just magnetite alteration patches/ psuedobreccia texture.
Mineralisation:- late stage siderite/smectite veinlets crosscut the core, mostly at acute angles, and overprint both rock types. Chlorite alteration occurs as psuedomorphs of augite crystals and reaches moderate intensity at intrusive margins. Feldspars in the host Diorite are weak to moderately sericitised. Several narrow zones of ser-ks-sil-py(6%)-cpy(<0.5%) exist locally and covering intervals up to 20cm.
Minor interval
41.10-44.85m py(7%), cpy(tr), ks(m)-sil(m), ser(w/m).

44.85-47.20m
brown/dark green Micro-monzodiorite contains disseminated cpy(<0.5%+), ks(m) within a fine grained pink groundmass. This unit features ks-sil-py-cpy-ser mineralised margins within the host. Core is largely coherent/weakly broken.

47.20-69.75m
Altered brownish red and green moderately feldspar-augite porphyritic Diorite/I?. Fine grained to aphanitic matrix where visible. This zone contains ks(m)-sil(m) pervasive alteration with ch(m), py(1%), cpy(0.5%, locally 1% over 0.5m). Barren late stage siderite-smectite veins occupy 1%. Diffuse edged siderite-ch-py-cpy veins occupy less than 2%. Mineralisation weakens beyond 68m.
Minor Interval
66.15-66.85m brown, weak to moderately porphyritic feldspar-augite Micro-monzodiorite, containing cpy(0.5%), py(<1%).

69.75-81.20m
light green feldspar?-augite(15%) porphyritic Diorite. Feldspars not visible through alteration. Silica alteration is pervasive and feldspar destructive.

Minor Intervals
69.75-72.60m sericitised(w) feldspar, sil(m) ch(m) ep(w) py(1%).
72.60-81.20m feldspar-augite-phyric Andesite/Diorite? moderate to strong pervasive ks-sil alteration with py(1%) cpy(<0.5%).

81.20-87.75m
green feldspar-augite-porphyritic Diorite?. This is a chloritic zone with early pervasive ks(w/m), sil(w/m) overprinted by pervasive ch(m) and chlorite veins. These veins have diffuse edges, irregular form and crosscut core at a variety of angles, acute to obtuse. They comprise 15% overall. Early pervasive ks-sil alteration appears to be accompanied by diffuse edged silica(qtz)-rich zones/veins that locally carry magnetite +/- tourmaline?-py-cpy and account for <2% by volume. Veins are mostly <5mm in width. Cpy is approximately trace to 0.5% in these veins but rich spot highs are also evident. For example at 82.13m a 2cm wide mag +/- tourmaline-cpy (20%)- py(2%) occurs. Sulphides in these veins are often sub-hedral (cubic) in form. Both ks-sil and mag-tour-py veins are overprinted and crosscut by late pale to apple green epidote-siderite?-smectite veinlets. Veinlets often form zones of anastomosing vein sets covering 5 to 8cm width and are strongest where chlorite vein intensity is greatest. They account for 3% overall are have irregular orientation where overprinting chlorite veined zones, but typically lie at 55 to 60 degrees to the long core axis and to other similar veins. This 120/60 degree crosscutting relationship could reflect a reidel shear set.
Zone weakens to 87.75m, returning to dominantly ks-sil alteration. Augite-phyric texture (15% crystals) is locally evident within this interval with feldspar crystals destroyed by pervasive silica alteration. Augite crystals are replaced by chlorite and locally by a yellowy-brown coloured siderite? in the less altered areas.
Sulphide mineralisation is patchy with up to 4% py-0.5% cpy over narrow (<40cm) intervals. Overall sulphide content is as follows:- py(1%), cpy(tr-0.5%).

87.75-100.00m
pinkish feldspar-augite-phyric Diorite? Interval/unit is a pervasively altered zone, characterised by ks(m)-sil(m) and zoned ch(w) with disseminated? mag(w). Late stage yellowish siderite-smectite veinlets constitute <0.5%.
Sulphide mineralisation is variable:- py(1-2%), cpy(tr-0.5%) overall, but locally high (see minor intervals)
Minor Intervals
91.2-91.8m py(6%), cpy(<0.5%)
91.90-92.5m grey feldspar-phyric Acid Andesite/dacite with common lath-like euhedral feldspar phenocrysts. These reside in a fine grained groundmass with a sil(w/m) overprint which is particularly prevalent at both ends making the margins location fuzzy. The siliceous overprint suggests the intrusion is pre-silicification (unrelated to micro-monzodiorite). Pyrite at the margins maybe related to this intrusion.
94.2-100.0m green and pink feldspar-augite-phyric Andesite/Diorite. Similar to 81.2 to 87.75m. Contains moderately chloritic zones and a late siderite smectite overprint (<2%). ks(w/m) and sil(w/m) both increase adjacent to the interval end.

100.00-102.30m
Mixed interval of brown feldspar(30%)-augite(5%)-phyric Micro-monzodiorite intrusives with a central (101.3-101.8m+) unit of light green feldspar-augite-phenocryst crowded Diorite comprising 40% of total interval and containing py(1%), cpy(tr). The micro-monzodiorite displays lath-like pink feldspars, a very fine grained groundmass and a chilled knife edge grey/brown upper margin. The lower margin is obscured by broken core. Unfoliated. cpy(0.5%), py(0.5%).

102.3-122m
Variably altered pink to light green feldspar-augite-phenocryst crowded Andesite/Diorite. Alteration fades in and out with varying degrees of 1)ks-sil, reaching moderate intensity but mostly weak (70%), ks very weak locally. 2)mag-tour-qtz-py-cpy veins, intermittently dispersed throughout as 3-4mm max width veinlets on fracture planes and 3)late apple green epidote with yellow siderite-smectite veins. The later are mostly concentrated in chlorite rich zones.
Overall py(<1%), cpy(tr), mag(w).
Minor Intervals
109.95-111.40m mag-tour-qtz-py-cpy veins, 8% with cpy(<0.5%) py(2%) and ch(w/m).
116.9-118.5m zone of chlorite(m)-ks(w)-sil(w)-py(2-3%)-cpy(<0.5%) with 10%+ yellow siderite-smectite veins. Pyrite often occurs in chlorite-rich veins/zones overprinted by yellow siderite-smectite veins.

E.O.H @ 122m
TOFR difficult to position exactly. Occurs at 5.5m but weathered zones occur intermittently beneath this depth.

311151

Hole No:	TCD4					
Prospect:	Thomas Creek					
Section:	369800mE					
Co-ordinates:	369800	mE	5710	mN	~220	mRL
Azimuth:	180	°G	167	°M	Inclination	-45°
EOH	28.5m					
Logged by:	Robert Reid 5/6/96					
Date commenced:	3/06/96		Date completed:		4/06/96	

0-13.5m
No core recovery, drill rods pushed down with no return.
Orange clay

13.5-20.95m
feldspar-augite (phenocryst crowded) porphyritic Diorite.
Minor Intervals
13.50-19.00m light orange feldspar-augite porphyritic Diorite. Highly weathered. Ch(w)?, mag(w).
19.00-20.95m green feldspar-augite porphyritic Diorite. ch(w/m), ep(w), sil(w), ks(w), py(0.5-2.0%), cpy(tr).

20.95-~21.7m
light brown moderately feldspar-augite-phyric Andesite/micr-monzodiorite intrusive. (full core recovery 21.00-21.5m). py(<1.0%, dss, 2% locally over 5cm intervals), cpy(tr+), mag(m)

21.7-28.5m
cream and green grading to pink locally, feldspar-augite (phenocryst crowded) porphyritic Diorite. Sil(w/m), ks(w) in patches, py(<0.5%), mag(w).

EOH at 28.5m
Comments:-
Hole terminated well short of 100m target depth as rods were bogging with driller advising of risk of loosing rod string. Appears to have intersected soil geochem zone at surface (963ppm Cu).

311152

Hole No: TCD5
Prospect: Thomas Creek
Section: 369800mE
Co-ordinates: 369800 mE 5667 mN ~220 mRL
Azimuth: 180 °G 167 °M Inclination -45°
EOH 100.50m
Logged by: Robert Reid
Date commenced: 4/6/96 Date completed: 7/06/96

0.00-26.80m
orange (clay) weathered feldspar-augite porphyritic Diorite(phenocryst crowded). Very poor core recovery through ora weathered clay. Pinkish pseudobreccia texture is evident where less weathered (see below). BOCO at 26.8m.
Minor Intervals
19.75-22.20m patchy grey feldspar-augite porphyritic Diorite. Weak pervasive sil-ks(?), py(6-7%), mag(w). Displays a probable pseudobreccia texture with dark grey patches to 5 by 5cm, which frequently display cream feldspar and green, sometimes magnetite replaced, augite phenocrysts.

26.80-30.45m
cream and grey moderately to strongly feldspar-augite-porphyritic Andesite with a dark grey aphanitic groundmass, intermixed with minor feldspar-phyric Acid Andesite. py(< 1%).

30.45-50.52m
variably altered light green to mostly light pinkish green/grey feldspar-augite porphyritic Diorite(phenocryst crowded). Alteration varieties are ch(w) and sil-ks(w) to sil-ks(s). Silicification-ks alteration obliterates primary textures over much of this unit, but these features are evident within irregularly distributed "islands" of less altered rock. Breccia textures are evident intermittently throughout. Both the upper and lower portions of the interval are moderately magnetic and little sil-ks altered, whereas the majority of the interval is only weakly magnetic. Pyrite is variable from 1 to 6%, cpy(tr).
Minor Intervals(summary):
30.45-31.35m ser(w), ch(w), py(3-4%), mag(m)
31.35-34.75m sil(w/m), ks(w/m), py(2-4%)
34.75-37.50m patchy dark green and brick red, ks(s),sil(m) patches ch(m). Tour-sil-py +/- cpy veins occupy the central portion of the zone, but a quantity is hard to determine due to broken core. py(4-5%), cpy(<0.5%?).
37.50-47.70m similar to 31.35-34.75m, but ks(w)-sil(w) beyond 45m. py(3%)
47.70-50.52m ser(w), ch(w), py(4%), cpy(tr), mag(m), includes moderately sericitised zone of distinct apple/kaki green colour adjacent to monzonite(48.6-50.52m).

50.52-58.50m
pale reddish-brown feldspar-augite-(q?)-moderately porphyritic Monzonite intrusive. The phenocryst composition of this rock is feldspar(30%), quartz(< 1%) and augite(5%). The latter is commonly epidote replaced and feldspar varies in colour from pale pink to pale red, possibly dependant upon the degree of ks replacement? The groundmass of this distinctive rock is fg pink and aphanitic in patches and at margins. Unit margins are sharp. The upper margin is marked by 8cm of moderate foliation?/crystal alignment. Feldspar phenocrysts are clearly stretched parallel to the contact and foliation (~45^0 LCA). Small (2 by 1cm) apophyses occur in the host at the contact. These features suggest a late forceful intrusion or late deformation (?). py(tr-1% locally) This unit is similar to MDI seen elsewhere, but apparently lacks cpy. Lower contact at 45^0 LCA and marked by a tour-hm-py-cpy vein of 7mm width, which post dates the host(s). mag(m).
Minor Interval
54.00-54.15m sil-tour +/- ks-py-cpy zone/vein? (area of broken core). cpy comprises < 0.5%, reaching 6% in one 2 by 2 by 1cm fragment.

58.50-74.15m
pink/light green moderate/strongly feldspar-augite-phyric Andesite/Diorite. Breccia textures are evident intermittently throughout. ks(w), sil(w), py(3%), fracture filling veins py +/- tour (< 1%).
Minor Interval
58.50-64.0m mag(m/s).
71.0-74.15m ks(w/m), sil(w/m) py(2%), cpy(tr).

74.15-79.40m
brown/green feldspar-augite-phyric Micro-monzodiorite and minor feldspar-augite-phenocryst crowded Diorite. mag(m).
Minor Intervals
74.15-75.95m cpy?(0.5%)
75.95-76.50m feldspar-augite-phenocryst crowded Diorite. Similar to 71 to 71.40m, contains late greenish/yellow smectite veining, py(1-2%).
76.50-79.40m Micro-monzodiorite with cpy(tr) at margin within ch-ks(w/m) veins.

79.40-100.50m
dark grey and locally pinkish feldspar-augite porphyritic Diorite/Andesite. Breccia texture is well developed from 91 to 94m and intermittent elsewhere. Feldspar(30%, 1-1.5mm dia), Augite(30%, 3-5mm dia), ks(vw) and sil(vw) in patches.
Minor Intervals
82.80-88.80m ch(w), ks(w), py(2%)
88.80-91.20m ks(m/s), sil(w/m), mag(w), py(3-4%)
91.2-100.50m patchy dark grey as local matrix pervasive magnetite (or chilled MDI?), magnetite (m, locally s), py(2-3%), cpy (tr, 1 grain at 97m).

EOH @ 100.50m

311154

Hole No:	TCD6					
Prospect:	Thomas Creek					
Section:	369600mE					
Co-ordinates:	369600	mE	5750	mN	-220	mRL
Azimuth:	180 °G	167	°M	Inclination	-45°	
EOH:	120.00m					
Logged by:	Robert Reid					
Date commenced:	18/6/96		Date completed:		20/6/96	

0.00-5.80m
greyish brown and light green feldspar-augite-phc Andesite/Micro-monzodiorite?. This distinctive unit is moderately porphyritic with euhedral cream coloured feldspar laths (40%) of 2-4mm by 1mm diameter. Green augite phenocrysts of up to 3mm constitute 10%. Phenocrysts reside in a very fine grained sandy/grainy appearing specked groundmass which varies in colour from greyish brown to sandy cream. Mag(w) in patches ,< 2-3%. Epidote occurs as late veinlets(w), < 1%. Disseminated py (1%) is often seen replacing augite, which is also weakly chloritised.

5.80-11.25m
very pale green fine to medium grained porphyritic Diorite. feldspar-augite phenocryst crowded. Texture varies considerably from fine grained equigranular and very weakly augite-phc to medium grained, near equigranular Diorite to clearly porphyritic Diorite. Outwardly appears little altered but contains py (1%). Chilled margin at 11.25m. This unit may be later than the brown feldspar-augite Micro-monzodiorite?
Minor Intervals
9.00-11.25m cpy(0.5%), py(1%)

11.25-12.70m
light brown moderately feldspar-augite-phc Andesite/Micro-monzodiorite(As for 0.00 to 5.80m). cpy (<0.5%), py(tr-0.5%) dss. Contains grey patches (30%) near upper contact with mag(m) in these patches. Mag(w/m) overall. Late pale green (sericitic) and pinkish-red (ks < 10%) veins, overall 1%.

12.70-36.00m
light green (and light pink or grey locally) porphyritic Diorite. Primary textures appear highly variable and are apparently closely related to the alteration intensity expressed within minor intervals. Textural variants present include:-weak to moderately augite-phc and feldspar-augite-phc Microdiorite/Diorite displaying augite crystals up to 4mm in diameter within a fine grained fuzzy interlocking? feldspathic groundmass(with fine grained primary magnetite crystals locally), strongly porphyritic Diorite and altered nondescript Intermediate rocks. Some of these textural variants here may represent separate intrusions but are lumped together for ease of logging. This and subsequent units/intervals describe the same rock type but variations in alteration intensity are apparent.

Minor Intervals

12.70-17.00m light green, with sil(s) cpy(tr) over upper 15cm adjacent to contact.

17.00-19.40m light pink sil(m), ks(w) pervasive alteration. Similar alteration is repeated on the other side of the next interval; may be zonation about the following intrusive. py (< 1%), cpy(tr, 0.5% locally).

19.40-21.20m light green moderately feldspar-augite porphyritic diorite (intrusive?). mag(m). Displays a fine grained black magnetite speckled groundmass. Augite phenocrysts are often tan coloured due to siderite/smectite replacement. Tan (siderite/smactite)-red(ks, < 1%) veins are sporadic (< 1%). py(tr) cpy(tr).

21.20- 22.94m grey and pink ks-sil altered Intermediate, mag(m), pervasive sil(m/s), ks(w/m). Primary textures wiped out. Disseminated sulphides, py(1%) cpy(tr), are often evident within silica alteration adjacent to chlorite/actinolite? veins, which constitute 10%. Apple green epidote occurs on fracture planes as veins(5%), epidote flecks (<1%).

22.94-24.60m grey(variable intensity) strongly porphyritic Diorite. Mag(m), silicification variable w to m, py(3%), locally 5%, includes 10cm of dark grey moderately porphyritic andesite intrusive displaying feldspar laths.

24.6-28.10m as for 17 to 19.4m, py(1-2%, dss) ,pervasive ks(w)-sil(w/m) . Alteration fades near end of interval.

28.10-36.00m light green feldspar-augite-phc And/Diorite Primary texture is often fuzzy, varying from augite+/-feldspar-phc Andesite to clearly feldspar-augite-phenocryst crowded Diorite. Appears to be very weak silicification of the groundmass. Py(tr) often as isolated veinlets (<0.5%).

36.00- 83.0m

grey/light green and pink feldspar-augite porphyritic Diorite. This represents a zone of variable ks(vw to s) and sil overprint(w to m/s). Ks-sil is matrix pervasive and patchy/domainal matrix pervasive. Pyrite varies from trace to mostly 1-3%, particularly in ks rich zones where py occurs as disseminated and vein(tr) form. Tan coloured siderite-smectite veinlets are evident in trace quantities with widths up to 1.5cm. Groundmass chlorite alteration is trace to very weak overall, but is present with py-ser(w)-ep(w) in diffuse replacement /veined zones.

Minor intervals

42.0-47.0m breccia texture containing pink ks altered clasts and grey magnetite alterd patches.

63.00-71.30m pink ks(m/s) sil(m), py(1-3%), cpy(tr-0.5%), patchy distribution of disseminated sulphides.

73.92-76.55m ks(m), sil(m), cpy(tr-0.5%), py(1-2%), ch(+/-green tourmaline?)-py-sil+/-cpy veins constitute 15 to 20%. The veins are frequently diffuse edged.

83.0-120.00m

grey/light green feldspar-augite porphyritic Diorite. Similar to above but less altered overall. This unit is largely monotonous displaying a nondescript fuzzy groundmass, presumably imparted by pervasive silicification. Locally feldspar-augite phenocryst crowded Diorite and moderately porphyritic andesitic texture is evident. Patchy domainal k-feldspar alteration reaches moderate intensity, but is mostly weak to very weak.

Silicification is weak and pervasive throughout, reaching moderate intensity where ks is strongest. Narrow bleached/leached zones displaying an etched or pitted texture are infrequently evident and are comprised of silicification and disseminated pyrite with minimal k-feldspar. Disseminated pyrite concentration is variable, mostly tr to 1%, but reaches 3% over 20cm intervals locally. Cpy is extremely intermittent, typically within green tourmaline veined zones. (tr-locally 0.5% over 30cm). Two vein types occur:- ch-green tourmaline(/act?)-sil-py+/-cpy are sparsely(1%) scattered., and tan/yellow siderite-smectite veinlets are late overprinting the former (<1%). These veins are typically of <1 to 3cm in width. A diffuse edged vein occurs at 115.30-115.40m and is unlike the typical sharp edged vein form.

Epidote(w) is often evident at chlorite-tourmaline vein margins and on fracture planes.

Minor intervals

83.20-83.45m zone of pervasive silicification(s) evident as a diffuse edged vein like form of leached appearance. py(6%), green tourmaline <1%.

87.47-87.90m As above, with ks(w), cpy(<0.5%), py(1%), tourmaline(5%).

94.75-95.10m cpy(tr), associated with green tourmaline.

96.95-97.60m cpy(<0.5%), py(1%) dss.

98.35-98.50m ch-py(2%)-ks-sil-cpy(<1%) veined zone.

98.80-103.00m pink coloured zone of ks(m), sil(m), cpy(tr), py(tr-0.5%) with patchy epidote(w).

113.30-114.35m ks(m), sil(w/m), mag(m), py(1%), cpy(<0.5%). Tour-py-mag-veining constitutes ~30% with late green smectite veins (3%).

EOH @ 120.0m

Hole No: TCD7
Prospect: Thomas Creek
Section: 369600mE
Co-ordinates: 369600 mE 5815 mN ~220 mRL
Azimuth: 180 °G 167 °M Inclination -45°
EOH: 123.4m
Logged by: Robert Reid
Date commenced: 20/06/96 Date completed: 25/06/96

0.00-17.55m
light green feldspar-augite-porphyritic Diorite. (phenocryst crowded, 1 to 3mm size). Feldspars are locally sericitised with augite being chloritised. Zones of sil(vw)-ks(vw) increase towards the base of the interval. The basal contact is abrupt, however the end of the interval may simply reflect a change in alteration intensity with the following fg/mg appearing microdiorite simply being a reflection of increasing silicification . Py(<1%) overall throughout. Cpy trace overall but greatest concentration reacted in sil-ks altered zones. Late bright light green smectite veining is typically diffuse and matrix pervasive, not phenocryst altering, 3% overall.
Minor Interval
8.60-8.75m cpy(0.5%), dss, py(1%)
13.90-14.70m pervasive ks(w)-sil(m), cpy(tr-0.5%), py(<1%) dss.

17.77-38.90m
light green and pink unit of fg/mg equigranular Microdiorite? (non-porphyritic). Textures largely destroyed by pervasive silicification? Groundmass is fuzzy. Pyrite is variable from trace to 4% over the short intervals. Zones of green tourmaline?-py-cpy occur locally (2%, overall). Generally sil(w?) with ks(w) locally. Epidote veins (4%, overall) are evident on fracture planes, mostly outside areas of tour-py-+/-cpy veining and silicification. Base of interval is a transitional alteration boundary front.
Minor Intervals
26.00-27.10m zone of green (tour/act)-py(5%)-cpy(2%) veining constituting <10%, cpy(<0.5%, overall).
30.00-38.90m ks-sil alteration intermittent(30%) increasing to the end of interval.

38.90-50.20m
pink ks-sil altered feldspar-augite-porphyritic Diorite. Primary textures are largely overprinted by alteration. Minor moderately feldspar-augite-phyric Andesite(/micro-monzo-diorite?), displaying a dark grey groundmass and euhedral lath-like feldspars is evident locally. ks(m), sil(m/s), cpy(<0.5%), py(1%) mostly as disseminated sulphides. Sulphides, especially chalcopyrite, frequently occur in green fibrous(tour/act?) patches/irregular veins. mag(w) to locally moderate. Note ks-sil alteration appears to pre-date cpy-py-tour veining. ks-sil altered zones are not always mineralised.

50.20-61.84m
light green mg/cg Diorite, feldspar-augite crystal bearing. Groundmass texture is near equigranular but still maintains a minor fine grained component(2%). Feldspar crystals(50+%) are 2 to 4mm in size and are commonly sericitised, while augite(30%) forms 3 to 5mm diameter, weakly chloritic and sometimes pyrite replaced crystals. A weak silica overprint at the interval margins is pervasive and feldspar destructive but augite appears little altered by silicification(ch and py altered only). Feldspars in the core of the interval are sericitised. Pyrite (1%) and cpy(tr) occur in disseminated and sulphidic veinlet(<0.5%) form. Interval terminates at an intrusive contact with Andesite/Microdiorite.

61.84-69.57m
light green/grey weakly silicified fg/mg porphyritic Diorite? and minor Andesitic(/micro-monzodiorite?) intrusive. Suspect unit is a feldspar-augite-phyric phenocryst crowded Diorite with a texture destructive silica alteration overprint. Overall sil(w/m) with ks(vw), py(tr-0.5%), cpy(tr), mag(w) Mid part of interval especially contains narrow (<10cm) intense ks-sil(w)-ep(w/m) pervasive domainal alteration zones constituting 3% overall.
Minor intervals
61.84-62.11m dark grey augite-feldspar-phyric Andesitic(/micro-monzodiorite?) intrusive, moderately porphyritic with sharp contacts. Augite is evident as weak to moderately chloritised phenocrysts of 2-6mm, whereas cream feldspars are 1-2mm in size.
62.11-62.81m ks(w), sil(m), py(1%), cpy(0.5%) pervasive ks-sil alteration weakens away from contact.

69.57-70.40m
light green mg Diorite(/microdiorite) intrusive. A near equigranular/close packed diorite texture is evident from 69.65 to 70.40m. Displays probable chilled, weakly augite-phyric margin with groundmass grading to fg over the basal 15cm. However both contacts are difficult to discern. Mag(w/m) in disseminated grains to 2mm with py. Sericitised (w) feldspars. Contains light brown mineral flecks(siderite?). Py(1-2%), cpy(0.5-1% overall) dss.

70.40-77.71m
ks-sil altered porphyritic Diorite?. ks(w)-sil(m) is pervasive texture destructive. cpy(tr-0.5%), py(0.5%), Disseminated sulphides have intermittent distribution. Ks strongest near upper contact.

77.71-81.05m
light green mg Diorite(/Microdiorite) intrusive. weakly augite-phyric. mag(s). Sil(s) with no ks within interval above at sharp basal margin. Chilled to fg over basal 10cm. Down hole margin is ks -sil altered with unit probably continuous up to contact with brown Microdiorite. Overprinting alteration styles are apparent. Silicification appears to be associated with diorite intrusion (+/-cpy?) whereas Microdiorite has associated ks-sil alteration at the margins overprinting the diorite. potassic to weak phyllic overprint.

Minor intervals
77.71-80.25m cpy(tr-0.5%, locally), py(2%), dss
80.25-81.05m ks(w/m), sil(m), py(4%, dss), cpy(tr)

81.05-81.50m
brown feldspar-augite-moderately porphyritic Micro-monzodiorite. This unit is strongly magnetic, featuring a very fine grained groundmass with feldspar(25%) and augite(15%). Feldspar is pinkish in colour(ks altered?), evident as euhedral laths of 2 to 4mm. Augite phenocrysts of 2 to 5mm are often weakly glomerophyric and replaced by pyrite locally. Py(1%) often as sub-rounded disseminated aggregates of fine grained crystals to 3mm diameter. Both margins display broken core with ks-sil+/-ch altered host. mag(s)

81.50-93.80m
light green feldspar-augite-mod/str-phyric Diorite with w/m silicification throughout, reaching strong locally. Ks(vw) but locally strong where silicification is strong. Texture generally destroyed but locally evident, eg @~92.5m. The observed alteration distribution in the lower end of the interval may reflect zonation about the following Micro-monzodiorite intrusive, with ks-sil-mag then sil-ser zoned outward from the intrusives margin.
Minor intervals
81.50-82.52m ks(w), but moderate over upper 40cm where sil(m), cpy(0.5%), py(4%) disseminated.
86.00-86.70m cpy(tr-0.5%), py(0.5-1.0%), ks(w/m), sil(m)
87.25-87.25m dark grey mod-porphyritic feldspar-augite-andesitic intrusive? Gradational/unclear margin may simply represent mag alteration of the host. py(0.5%), mag(s).
90.60-92.30m pink(& light green) ks-sil-ser altered zone with moderately augite-feldspar-phyric andesitic texture visible locally and extending beyond this interval to >93m. Interval begins with ks(vs), overall ks(m). Sil(m/s) and ser(w/m) in mid interval. Py(1%)-cpy(~0.5%) disseminated in scattered zones, particularly at ends of interval. The sericitised mid part of the interval is sulphide poor.
93.56-93.80m ch(w/m)-ks(m)-sil(m/s) increasing to end of interval, py(1%, increasing to 3% at end).

93.80-96.37m
brown/pinkish feldspar-augite-mod-phyric Micro-monzodiorite. feldspar are 1-2mm, smaller than within the typical Micro-monzodiorite intrusive. Both margins are chilled over 15 to 20cm, but the lower margin is intruded by a coarser phenocryst size, feldspar-augite-phyric andesite intrusive with aphanitic groundmass (95.52-96.37m). Both contacts display ks-sil alteration within the host. Cpy appears to be concentrated at either end of the interval, being strongest where chilling becomes first apparent. At both ends cpy reaches 0.5-1% over 15cm. Overall cpy(<0.5%), py(1%), mag(s).

96.37-118.40m
light green feldspar-augite-mod/str porphyritic Diorite. Silicification is weak to moderate throughout with porphyry texture only weakly evident locally. Domainal patches of ks(w/m)-sil(m) are evident, particularly at interval ends where ks(m/s)-sil(s). Yellow smectite veinlets are sparse but two veins of 2cm and 10cm width are evident at 104.52 and 115.5m respectively. Outside minor intervals, cpy(tr), py(0.5%). A pink/crm clay? mineral is abundant as disseminations beyond 115.30m.
Minor intervals
96.76-98.38m ks(w/m) to ks(s) at start of interval. Cpy is intermittent in disseminated and vein form, with concentration <0.5%, but reaching 2% over 10cm near the upper contact. Late irregular green ch? veins constitute <1%. Late apple green ep-smectite? veins 3%, ep(w), overall mag(w).
98.88-106.60m cpy(tr) is intermittent and clearly late, often evident within tour-py veinlets on fracture planes and also as disseminations. Tour-py veins appear to increase lower in the interval.
@110.19m tour-sil vein displays slickensides with possible dextral movement indicated by very weak ramps.
@111.6m similar to above but clearly sinistral movement.
115.00-115.30m psuedobreccia texture with sil-green tourmaline irregular vein fill (40%) between pink ks-sil "clasts". Cpy is hosted by tour-sil alteration. cpy(<0.5%), py(0.5%)
116.80-118.40m cpy(0.5%), py(0.5%).

118.40-120.30m
brown feldspar-augite-phyric Micro-monzodiorite. Brown aphanitic groundmass. late green sil-ep veins constitute approximately 1% and crosscut pervasive/veined ks alteration zones locally. Chalcopyrite has variable disseminated distribution, locally reaching 1% over upper 20cm. Overall cpy 0.5%, py(0.5%). Zonation of sulphides is apparent with cpy:py ratio of 2:1 at margins and locally within, whereas elsewhere ratio is 1:3. Chalcopyrite occurs as disseminations and within light green ep-sil? veins that crosscut diffuse ks veins.

120.30-123.40m
pink and greyish/light green feldspar-augite-porphyritic Diorite. Silicification is w/m throughout with py 0.5% overall.
Minor interval
120.30-121.85m ks(m) grading to ks(w) down hole. sil(m), cpy(tr), py(0.5%).

EOH @ 123.40

Hole No: TCD8
Prospect: Thomas Creek
Section: 369600mE
Co-ordinates: 369600 mE 5925 mN ~220 mRL
Azimuth: 180 °G 167 °M Inclination -45°
EOH: 94.5m
Logged by: Robert Reid
Date commenced: 25/6/96 Date completed: 29/6/96

0.00-27.90m
Light green feldspar-augite-porphyritic Diorite(phenocryst crowded). Sericite veined (2%). Pyrite is variable from 1 to locally 15%, but averages 2%. sil(w), ser(w/m). Alteration may represent phyllic alteration at the margin of a porphyry system.
Minor Intervals
16.80-16.95m sil(m), py(15%)
23.50-27.90m as above with ch(w)
27.90-34.40m as above, tour-sil-ep+/-py veined (2%)

34.40-40.50m
Weakly altered light green feldspar-augite- porphyritic Diorite(phenocryst crowded). Displays weak chlorite alteration of augite phenocrysts and isolated pervasively silicified zones (15%).

40.50-55.80m
Light green feldspar-augite-porphyritic Diorite(phenocryst crowded). Displays weak pervasive silicification and sericitisation with mag(vw) and tour-ks-sil-ep(w)-ser+/-py+/-cpy(tr overall) veining (1%). Weak chlorite is evident in the basal few metres.

55.80-85.50m
Light green and dark grey mixed zone of feldspar-augite-porphyritic Diorite (phenocryst crowded) and pervasive magnetite alteration/augite-phyric andesitic intrusives(?). ep(w) as late veins. Strong pervasive magnetite alteration extends to 65m with patchy magnetite alteration beyond this point. Magnetite also exists as pseudomorphs of augite phenocrysts in the latter zone. Overall py(1-2%), cpy(tr-0.5%). This zone is similar to, but weaker than the best mineralised intervals within TCD 1&2.
Minor Intervals
66.00-67.00m py(4-6%), cpy(0.5-1.0%)
71.00-74.50m ks(w), sil(w/m), mag(m), py(<0.5%)

85.50-94.5m
Pink/light green feldspar-augite-porphyritic Diorite(phenocryst crowded). Potassic alteration zone with ks(w/m), sil(m) and mag(w to locally m). py (variable, 0.5-2%), cpy(tr).

EOH @ 94.5m

311162

Thomas Creek Drill Core Recoveries

TCD1	Recovery Logged By:		G Jago	
From (m)	To (m)	Metres Drilled	Metres Recovered	Recovery (%)
0.00	1.00	1.00	0.10	10.0
1.00	2.50	1.50	0.10	6.7
2.50	4.00	1.50	0.00	0.0
4.00	5.50	1.50	0.20	13.3
5.50	7.00	1.50	0.10	6.7
7.00	8.50	1.50	0.30	20.0
8.50	9.50	1.00	0.40	40.0
9.50	11.50	2.00	0.05	2.5
11.50	13.00	1.50	1.00	66.7
13.00	14.30	1.30	1.30	100.0
14.30	14.90	0.60	0.30	50.0
14.90	15.90	1.00	0.40	40.0
15.90	16.00	0.10	0.10	100.0
16.00	17.50	1.50	1.00	66.7
17.50	18.00	0.50	0.50	100.0
18.00	19.00	1.00	1.00	100.0
19.00	19.90	0.90	0.80	88.9
19.90	20.50	0.60	0.30	50.0
20.50	22.00	1.50	1.50	100.0
22.00	23.50	1.50	1.50	100.0
23.50	25.00	1.50	1.50	100.0
25.00	26.50	1.50	1.50	100.0
26.50	28.00	1.50	1.50	100.0
28.00	29.50	1.50	1.40	93.3
29.50	31.00	1.50	1.50	100.0
31.00	32.50	1.50	1.50	100.0
32.50	34.00	1.50	1.50	100.0
34.00	35.50	1.50	1.50	100.0
35.50	37.00	1.50	1.50	100.0
37.00	38.50	1.50	1.50	100.0
38.50	40.00	1.50	1.40	93.3
40.00	41.50	1.50	1.50	100.0
41.50	43.00	1.50	1.50	100.0
43.00	44.50	1.50	1.50	100.0
44.50	46.00	1.50	1.50	100.0
46.00	46.50	0.50	0.50	100.0
46.50	47.60	1.10	0.90	81.8
47.60	48.10	0.50	0.30	60.0
48.10	48.80	0.70	0.60	85.7

311163

48.80	50.10	1.30	1.20	92.3	TCD1 cont'
50.10	50.80	0.70	0.70	100.0	
50.80	52.40	1.60	1.50	93.7	
52.40	54.00	1.60	0.40	25.0	
54.00	54.70	0.70	0.70	100.0	
54.70	55.40	0.70	0.70	100.0	
55.40	57.00	1.60	1.30	81.2	
57.00	58.50	1.50	1.50	100.0	
58.50	60.00	1.50	1.50	100.0	
60.00	61.50	1.50	1.50	100.0	
61.50	63.00	1.50	1.50	100.0	
63.00	64.50	1.50	1.50	100.0	
64.50	66.00	1.50	1.50	100.0	
66.00	67.50	1.50	1.50	100.0	
67.50	69.00	1.50	1.50	100.0	
69.00	70.30	1.30	1.30	100.0	
70.30	71.80	1.50	1.50	100.0	
71.80	72.40	0.60	0.50	83.3	
72.40	73.20	0.80	0.80	100.0	
73.20	74.70	1.50	1.50	100.0	
74.70	76.20	1.50	1.50	100.0	
76.20	77.30	1.10	1.10	100.0	
77.30	78.00	0.70	0.70	100.0	
78.00	79.50	1.50	1.50	100.0	
79.50	80.00	0.50	1.00	200.0	?
80.00	81.20	1.20	1.20	100.0	
81.20	81.50	0.30	0.40	133.3	
81.50	83.00	1.50	1.50	100.0	
83.00	83.50	0.50	0.50	100.0	
83.50	85.00	1.50	1.50	100.0	
85.00	86.50	1.50	1.50	100.0	
86.50	88.00	1.50	1.50	100.0	
88.00	88.90	0.90	0.90	100.0	
	EOH	Total Recovered =	74.45		

311164

TCD2	Recovery Logged By:		G Jago	
From (m)	To (m)	Metres Drilled	Metres Recovered	Recovery (%)
0.00	1.30	1.30	0.00	0.0
1.30	2.80	1.50	0.15	10.0
2.80	4.30	1.50	0.00	0.0
4.30	5.80	1.50	0.20	13.3
5.80	7.30	1.50	0.70	46.7
7.30	8.80	1.50	0.70	46.7
8.80	10.30	1.50	0.35	23.3
10.30	11.80	1.50	0.90	60.0
11.80	13.30	1.50	0.50	33.3
13.30	15.00	1.70	0.50	29.4
15.00	15.80	0.80	0.30	37.5
15.80	16.40	0.60	0.60	100.0
16.40	16.70	0.30	0.20	66.7
16.70	17.00	0.30	0.30	100.0
17.00	17.70	0.70	0.70	100.0
17.70	18.90	1.20	1.20	100.0
18.90	19.50	0.60	0.90	150.0
19.50	20.30	0.80	0.80	100.0
20.30	21.50	1.20	0.20	16.7
21.50	22.50	1.00	0.00	0.0
22.50	23.10	0.60	0.40	66.7
23.10	23.60	0.50	0.50	100.0
23.60	24.30	0.70	0.60	85.7
24.30	25.10	0.80	0.80	100.0
25.10	25.50	0.40	0.40	100.0
25.50	26.10	0.60	0.30	50.0
26.10	26.60	0.50	0.50	100.0
26.60	27.20	0.60	0.20	33.3
27.20	28.10	0.90	1.00	111.1
28.10	28.60	0.50	0.50	100.0
28.60	29.20	0.60	0.50	83.3
29.20	29.70	0.50	0.60	120.0
29.70	30.30	0.60	0.60	100.0
30.30	31.00	0.70	0.70	100.0
31.00	31.80	0.80	0.40	50.0
31.80	33.30	1.50	1.60	106.7
33.30	34.80	1.50	1.60	106.7
34.80	36.30	1.50	1.50	100.0
36.30	37.80	1.50	0.95	63.3
37.80	39.30	1.50	2.60	173.3
39.30	40.80	1.50	1.30	86.7

40.80	42.30	1.50	1.50	100.0	TCD2 cont'
42.30	43.80	1.50	0.95	63.3	
43.80	45.30	1.50	0.90	60.0	
45.30	46.80	1.50	1.70	113.3	
46.80	48.30	1.50	1.20	80.0	
48.30	49.80	1.50	1.80	120.0	
49.80	51.30	1.50	1.70	113.3	
51.30	52.60	1.30	1.30	100.0	
52.60	53.40	0.80	0.80	100.0	
53.40	54.00	0.60	0.60	100.0	
54.00	54.70	0.70	0.70	100.0	
54.70	55.40	0.70	0.70	100.0	
55.40	56.30	0.90	0.70	77.8	
56.30	57.80	1.50	1.20	80.0	
57.80	58.50	0.70	1.20	171.4	?
58.50	59.20	0.70	0.70	100.0	
59.20	60.30	1.10	1.10	100.0	
60.30	60.50	0.20	0.20	100.0	
60.50	61.10	0.60	0.60	100.0	
61.10	62.60	1.50	1.50	100.0	
62.60	63.40	0.80	0.50	62.5	
63.40	63.70	0.30	0.20	66.7	
63.70	63.80	0.10	0.20	200.0	
63.80	65.30	1.50	1.50	100.0	
65.30	66.80	1.50	1.50	100.0	
66.80	68.30	1.50	1.50	100.0	
68.30	69.80	1.50	1.50	100.0	
69.80	71.30	1.50	1.50	100.0	
71.30	72.80	1.50	1.50	100.0	
72.80	74.30	1.50	1.50	100.0	
74.30	75.80	1.50	1.50	100.0	
75.80	77.30	1.50	1.50	100.0	
77.30	78.80	1.50	1.50	100.0	
78.80	80.30	1.50	1.50	100.0	
80.30	81.00	0.70	0.70	100.0	
81.00	81.50	0.50	0.30	60.0	
81.50	82.50	1.00	1.00	100.0	
82.50	83.30	0.80	0.75	93.8	
83.30	84.10	0.80	0.80	100.0	
84.10	84.50	0.40	0.20	50.0	
84.50	85.10	0.60	0.70	116.7	
85.10	86.00	0.90	0.80	88.9	
86.00	86.10	0.10	0.20	200.0	
86.10	87.00	0.90	0.90	100.0	
87.00	87.40	0.40	0.30	75.0	
87.40	88.10	0.70	0.70	100.0	

TCD2 cont'

88.10	88.30	0.20	0.30	150.0
88.30	89.50	1.20	0.90	75.0
89.50	89.80	0.30	0.20	66.7
89.80	91.30	1.50	1.60	106.7
91.30	92.80	1.50	1.50	100.0
92.80	94.30	1.50	1.50	100.0
94.30	95.30	1.00	1.30	130.0
95.30	95.80	0.50	0.50	100.0
95.80	96.00	0.20	0.30	150.0
96.00	97.30	1.30	1.40	107.7
97.30	98.80	1.50	1.50	100.0
98.80	100.30	1.50	1.60	106.7
100.30	101.50	1.20	1.20	100.0
101.50	102.40	0.90	0.90	100.0
102.40	103.40	1.00	1.00	100.0
103.40	104.10	0.70	0.70	100.0
104.10	105.40	1.30	1.30	100.0
105.40	106.40	1.00	1.00	100.0
106.40	107.00	0.60	0.60	100.0
107.00	107.90	0.90	0.90	100.0
107.90	109.30	1.40	1.40	100.0
109.30	109.60	0.30	0.35	116.7
109.60	110.10	0.50	0.50	100.0
110.10	111.30	1.20	1.20	100.0
111.30	112.70	1.40	1.50	107.1
112.70	113.50	0.80	0.80	100.0
113.50	113.70	0.20	0.15	75.0
113.70	113.80	0.10	0.15	150.0
113.80	114.80	1.00	1.00	100.0
114.80	115.30	0.50	0.50	100.0
115.30	116.80	1.50	1.50	100.0
116.80	118.30	1.50	1.50	100.0
118.30	119.80	1.50	1.50	100.0
119.80	120.50	0.70	0.70	100.0
120.50	121.80	1.30	1.10	84.6
121.80	123.30	1.50	1.70	113.3
123.30	124.00	0.70	0.70	100.0
124.00	124.80	0.80	0.80	100.0
124.80	126.30	1.50	1.50	100.0
126.30	127.10	0.80	0.80	100.0
127.10	127.80	0.70	0.40	57.1
	EOH	Total Recovered =	112.50	

311167

TCD3	Recovery Logged By:		G Jago	
From (m)	To (m)	Metres Drilled	Metres Recovered	Recovery (%)
0.00	1.50	1.50	0.20	13.3
1.50	3.00	1.50	0.30	20.0
3.00	4.50	1.50	0.40	26.7
4.50	6.00	1.50	1.25	83.3
6.00	7.50	1.50	1.50	100.0
7.50	9.00	1.50	1.40	93.3
9.00	10.50	1.50	1.40	93.3
10.50	12.00	1.50	1.30	86.7
12.00	13.50	1.50	1.20	80.0
13.50	15.00	1.50	0.50	33.3
15.00	16.00	1.00	0.50	50.0
16.00	17.30	1.30	0.70	53.8
17.30	18.20	0.90	0.20	22.2
18.20	19.00	0.80	0.45	56.3
19.00	19.30	0.30	0.30	100.0
19.30	19.80	0.50	0.55	110.0
19.80	21.00	1.20	1.20	100.0
21.00	21.60	0.60	0.55	91.7
21.60	22.50	0.90	0.90	100.0
22.50	23.80	1.30	1.30	100.0
23.80	24.00	0.20	0.20	100.0
24.00	24.60	0.60	0.45	75.0
24.60	25.30	0.70	0.70	100.0
25.30	26.00	0.70	0.50	71.4
26.00	26.80	0.80	0.90	112.5
26.80	27.30	0.50	0.40	80.0
27.30	27.50	0.20	0.10	50.0
27.50	27.80	0.30	0.40	133.3
27.80	28.00	0.20	0.20	100.0
28.00	28.50	0.50	0.15	30.0
28.50	29.00	0.50	0.30	60.0
29.00	29.50	0.50	0.40	80.0
29.50	29.90	0.40	0.50	125.0
29.90	30.40	0.50	0.10	20.0
30.40	30.80	0.40	0.40	100.0
30.80	31.50	0.70	0.80	114.3
31.50	32.10	0.60	0.50	83.3
32.10	32.40	0.30	0.30	100.0
32.40	33.00	0.60	0.50	83.3
33.00	33.25	0.25	0.25	100.0
33.25	34.50	1.25	1.20	96.0

TCD3 cont'

34.50	34.90	0.40	0.40	100.0
34.90	35.60	0.70	0.65	92.9
35.60	36.00	0.40	0.40	100.0
36.00	37.50	1.50	1.70	113.3
37.50	38.20	0.70	0.70	100.0
38.20	38.80	0.60	0.60	100.0
38.80	39.00	0.20	0.15	75.0
39.00	39.70	0.70	0.60	85.7
39.70	40.50	0.80	0.80	100.0
40.50	40.80	0.30	0.30	100.0
40.80	41.40	0.60	0.60	100.0
41.40	42.00	0.60	0.60	100.0
42.00	42.40	0.40	0.40	100.0
42.40	43.00	0.60	0.90	150.0
43.00	43.70	0.70	0.80	114.3
43.70	44.50	0.80	0.80	100.0
44.50	46.60	2.10	1.15	54.8
46.60	47.00	0.40	0.50	125.0
47.00	48.50	1.50	1.70	113.3
48.50	49.30	0.80	0.80	100.0
49.30	50.00	0.70	0.70	100.0
50.00	51.50	1.50	1.50	100.0
51.50	53.00	1.50	1.50	100.0
53.00	53.80	0.80	0.20	25.0
53.80	54.50	0.70	0.70	100.0
54.50	56.00	1.50	1.40	93.3
56.00	56.90	0.90	0.80	88.9
56.90	58.10	1.20	1.20	100.0
58.10	59.40	1.30	1.30	100.0
59.40	60.50	1.10	1.10	100.0
60.50	60.90	0.40	0.40	100.0
60.90	62.00	1.10	1.10	100.0
62.00	63.10	1.10	1.00	90.9
63.10	64.60	1.50	1.50	100.0
64.60	65.50	0.90	0.90	100.0
65.50	66.50	1.00	1.00	100.0
66.50	67.00	0.50	0.50	100.0
67.00	67.30	0.30	0.30	100.0
67.30	67.40	0.10	0.10	100.0
67.40	68.10	0.70	0.70	100.0
68.10	69.40	1.30	1.30	100.0
69.40	71.00	1.60	1.60	100.0
71.00	72.50	1.50	1.50	100.0
72.50	74.00	1.50	1.50	100.0
74.00	75.50	1.50	1.50	100.0
75.50	77.00	1.50	1.50	100.0

311169

TCD3 cont'

77.00	78.50	1.50	1.50	100.0
78.50	80.00	1.50	1.50	100.0
80.00	81.50	1.50	1.40	93.3
81.50	83.00	1.50	1.50	100.0
83.00	84.50	1.50	1.50	100.0
84.50	86.00	1.50	1.50	100.0
86.00	87.50	1.50	1.50	100.0
87.50	89.00	1.50	1.50	100.0
89.00	90.50	1.50	1.50	100.0
90.50	91.20	0.70	0.70	100.0
91.20	92.00	0.80	0.80	100.0
92.00	93.30	1.30	1.30	100.0
93.30	94.80	1.50	1.50	100.0
94.80	96.40	1.60	1.60	100.0
96.40	98.00	1.60	1.60	100.0
98.00	99.00	1.00	1.00	100.0
99.00	99.40	0.40	0.40	100.0
99.40	101.00	1.60	1.60	100.0
101.00	101.20	0.20	0.20	100.0
101.20	102.30	1.10	1.10	100.0
102.30	102.80	0.50	0.40	80.0
102.80	103.80	1.00	1.00	100.0
103.80	104.00	0.20	0.30	150.0
104.00	104.60	0.60	0.60	100.0
104.60	105.80	1.20	1.20	100.0
105.80	106.70	0.90	0.90	100.0
106.70	107.20	0.50	0.50	100.0
107.20	107.70	0.50	0.50	100.0
107.70	109.20	1.50	1.50	100.0
109.20	110.00	0.80	0.90	112.5
110.00	111.50	1.50	1.50	100.0
111.50	113.00	1.50	1.50	100.0
113.00	114.50	1.50	1.40	93.3
114.50	116.00	1.50	1.60	106.7
116.00	117.50	1.50	1.50	100.0
117.50	119.00	1.50	1.50	100.0
119.00	120.50	1.50	1.50	100.0
120.50	122.00	1.50	1.50	100.0
	EOH	Total Recovered =	111.70	

311170

TCD4	Recovery Logged By:		R Reid	
From (m)	To (m)	Metres Drilled	Metres Recovered	Recovery (%)
0.00	13.50	13.50	0.00	0.0
13.50	16.50	3.00	0.6	20.0
16.50	18.00	1.50	0.75	50.0
18.00	19.50	1.50	0.65	43.3
19.50	20.00	0.50	0.2	40.0
20.00	21.00	1.00	0.2	20.0
21.00	21.50	0.50	0.55	110.0
21.50	22.50	1.00	0.4	40.0
22.50	24.00	1.50	0.55	36.7
24.00	25.50	1.50	0.2	13.3
25.50	27.00	1.50	0.02	1.3
27.00	28.50	1.50	0.45	30.0
	EOH	Total Recovered =	4.57	

311171

TCD5	Recovery Logged By:		R Reid	
From (m)	To (m)	Metres Drilled	Metres Recovered	Recovery (%)
0.00	7.50	7.50	0	0.0
7.50	9.00	1.50	0	0.0
9.00	10.50	1.50	0	0.0
10.50	12.00	1.50	0.01	0.7
12.00	12.50	0.50	0.1	20.0
12.50	15.00	2.50	0.44	17.6
15.00	16.50	1.50	0.04	2.7
16.50	18.00	1.50	0.1	6.7
18.00	19.50	1.50	1.5	100.0
19.50	21.00	1.50	1.41	94.0
21.00	22.50	1.50	0.6	40.0
22.50	24.00	1.50	0.82	54.7
24.00	25.50	1.50	0.95	63.3
25.50	27.00	1.50	0.55	36.7
27.00	28.50	1.50	0.95	63.3
28.50	29.00	0.50	0.5	100.0
29.00	30.00	1.00	0.15	15.0
30.00	30.80	0.80	0.5	62.5
30.80	31.50	0.70	0.65	92.9
31.50	33.00	1.50	1.15	76.7
33.00	34.50	1.50	1.4	93.3
34.50	36.00	1.50	0.6	40.0
36.00	37.50	1.50	0.8	53.3
37.50	39.00	1.50	0.45	30.0
39.00	39.70	0.70	0.3	42.9
39.70	40.30	0.60	0.5	83.3
40.30	40.50	0.20	0.25	125.0
40.50	41.30	0.80	0.8	100.0
41.30	42.00	0.70	0.65	92.9
42.00	42.60	0.60	0.38	63.3
42.60	43.50	0.90	1	111.1
43.50	44.60	1.10	0.9	81.8
44.60	45.00	0.40	0.4	100.0
45.00	46.30	1.30	1.3	100.0
46.30	47.70	1.40	1.4	100.0
47.70	48.20	0.50	0.5	100.0
48.20	49.50	1.30	1.2	92.3
49.50	51.00	1.50	1.42	94.7
51.00	51.80	0.80	0.94	117.5
51.80	53.40	1.60	1.56	97.5
53.40	54.00	0.60	0.6	100.0

311172

TCD5 cont'

54.00	54.60	0.60	0.6	100.0
54.60	55.80	1.20	1.17	97.5
55.80	56.70	0.90	0.9	100.0
56.70	58.00	1.30	1.28	98.5
58.00	58.20	0.20	0.1	50.0
58.20	58.80	0.60	0.56	93.3
58.80	60.00	1.20	1	83.3
60.00	60.60	0.60	0.59	98.3
60.60	60.90	0.30	0.17	56.7
60.90	61.90	1.00	1	100.0
61.90	62.00	0.10	0.12	120.0
62.00	63.00	1.00	1	100.0
63.00	63.80	0.80	0.8	100.0
63.80	64.50	0.70	0.7	100.0
64.50	65.60	1.10	1.07	97.3
65.60	66.00	0.40	0.33	82.5
66.00	66.70	0.70	0.8	114.3
66.70	67.50	0.80	0.9	112.5
67.50	69.00	1.50	1.35	90.0
69.00	69.40	0.40	0.48	120.0
69.40	70.50	1.10	0.9	81.8
70.50	72.00	1.50	1.5	100.0
72.00	73.50	1.50	0.9	60.0
73.50	75.00	1.50	1.4	93.3
75.00	76.50	1.50	1.3	86.7
76.50	78.00	1.50	0.95	63.3
78.00	79.50	1.50	1.08	72.0
79.50	81.00	1.50	0.6	40.0
81.00	81.70	0.70	0.55	78.6
81.70	81.80	0.10	0.02	20.0
81.80	82.50	0.70	0.7	100.0
82.50	82.70	0.20	0.2	100.0
82.70	83.00	0.30	0.25	83.3
83.00	83.30	0.30	0.3	100.0
83.30	84.00	0.70	0.65	92.9
84.00	84.40	0.40	0.35	87.5
84.40	85.00	0.60	0.6	100.0
85.00	85.50	0.50	0.4	80.0
85.50	85.80	0.30	0.07	23.3
85.80	86.10	0.30	0.3	100.0
86.10	86.50	0.40	0.4	100.0
86.50	86.70	0.20	0.2	100.0
86.70	88.00	1.30	1.25	96.2
88.00	89.60	1.60	1.6	100.0
89.60	91.20	1.60	1.6	100.0
91.20	92.80	1.60	1.55	96.9

92.80	93.00	0.20	0.2	100.0	TCD5 cont'
93.00	94.20	1.20	1.2	100.0	
94.20	95.00	0.80	0.8	100.0	
95.00	95.40	0.40	0.4	100.0	
95.40	96.00	0.60	0.55	91.7	
96.00	97.50	1.50	1.5	100.0	
97.50	99.00	1.50	1.45	96.7	
99.00	100.50	1.50	1.4	93.3	
	EOH	Total Recovered =	69.81		

311174

TCD6	Recovery Logged By:		R Reid		
From (m)	To (m)	Metres Drilled	Metres Recovered	Recovery (%)	
0.00	1.50	1.50	0.00	0.0	
1.50	3.00	1.50	0.01	0.7	
3.00	4.50	1.50	0.46	30.7	
4.50	6.00	1.50	0.15	10.0	
6.00	7.50	1.50	0.85	56.7	
7.50	9.00	1.50	0.40	26.7	
9.00	10.50	1.50	1.35	90.0	
10.50	12.00	1.50	1.42	94.7	
12.00	13.50	1.50	0.90	60.0	
13.50	15.00	1.50	0.40	26.7	
15.00	16.10	1.10	0.55	50.0	
16.10	16.50	0.40	0.40	100.0	
16.50	17.10	0.60	0.15	25.0	
17.10	17.60	0.50	0.45	90.0	
17.60	18.00	0.40	0.25	62.5	
18.00	18.20	0.20	0.20	100.0	
18.20	18.50	0.30	0.20	66.7	
18.50	18.90	0.40	0.40	100.0	
18.90	19.50	0.60	0.27	45.0	
19.50	20.10	0.60	0.50	83.3	
20.10	21.00	0.90	0.45	50.0	
21.00	22.00	1.00	0.75	75.0	
22.00	22.40	0.40	0.40	100.0	
22.40	23.80	1.40	0.80	57.1	
23.80	24.30	0.50	0.45	90.0	
24.30	25.30	1.00	0.70	70.0	
25.30	26.30	1.00	0.90	90.0	
26.30	26.60	0.30	0.30	100.0	
26.60	27.20	0.60	0.40	66.7	
27.20	28.20	1.00	0.45	45.0	
28.20	29.70	1.50	1.50	100.0	
29.70	30.60	0.90	0.85	94.4	
30.60	31.80	1.20	1.15	95.8	
31.80	33.00	1.20	0.20	16.7	NB:1m missing
33.00	34.50	1.50	0.95	63.3	(driller error)
34.50	35.40	0.90	0.85	94.4	
35.40	36.00	0.60	0.52	86.7	
36.00	37.50	1.50	1.45	96.7	
37.50	38.00	0.50	0.43	86.0	
38.00	39.00	1.00	1.00	100.0	
39.00	39.50	0.50	0.50	100.0	

TCD6 cont'

39.50	40.50	1.00	1.00	100.0
40.50	40.90	0.40	0.35	87.5
40.90	42.00	1.10	1.00	90.9
42.00	43.10	1.10	1.10	100.0
43.10	43.50	0.40	0.40	100.0
43.50	43.90	0.40	0.35	87.5
43.90	44.10	0.20	0.20	100.0
44.10	45.00	0.90	0.85	94.4
45.00	45.90	0.90	0.90	100.0
45.90	46.50	0.60	0.30	50.0
46.50	46.70	0.20	0.15	75.0
46.70	47.20	0.50	0.50	100.0
47.20	48.00	0.80	0.80	100.0
48.00	48.40	0.40	0.40	100.0
48.40	49.50	1.10	1.10	100.0
49.50	50.40	0.90	0.85	94.4
50.40	51.00	0.60	0.60	100.0
51.00	51.50	0.50	0.50	100.0
51.50	53.00	1.50	1.50	100.0
53.00	54.50	1.50	1.35	90.0
54.50	56.00	1.50	1.50	100.0
56.00	57.20	1.20	1.20	100.0
57.20	58.50	1.30	1.30	100.0
58.50	59.40	0.90	0.84	93.3
59.40	60.90	1.50	1.50	100.0
60.90	62.40	1.50	1.50	100.0
62.40	63.00	0.60	0.60	100.0
63.00	64.50	1.50	1.50	100.0
64.50	65.90	1.40	1.40	100.0
65.90	67.00	1.10	1.10	100.0
67.00	68.50	1.50	1.50	100.0
68.50	69.10	0.60	0.60	100.0
69.10	69.50	0.40	0.40	100.0
69.50	71.00	1.50	1.10	73.3
71.00	71.50	0.50	0.50	100.0
71.50	73.00	1.50	1.46	97.3
73.00	74.50	1.50	1.50	100.0
74.50	74.90	0.40	0.02	5.0
74.90	75.10	0.20	0.20	100.0
75.10	76.50	1.40	1.30	92.9
76.50	78.00	1.50	1.50	100.0
78.00	79.00	1.00	0.94	94.0
79.00	79.50	0.50	0.50	100.0
79.50	81.00	1.50	1.50	100.0
81.00	82.50	1.50	1.50	100.0
82.50	83.20	0.70	0.64	91.4

83.20	84.00	0.80	0.80	100.0	TCD6 cont'
84.00	85.50	1.50	1.50	100.0	
85.50	87.00	1.50	1.50	100.0	
87.00	88.50	1.50	1.60	106.7	
88.50	90.00	1.50	1.30	86.7	
90.00	90.90	0.90	0.90	100.0	
90.90	91.50	0.60	0.60	100.0	
91.50	92.70	1.20	1.20	100.0	
92.70	93.00	0.30	0.30	100.0	
93.00	94.50	1.50	1.50	100.0	
94.50	96.00	1.50	1.44	96.0	
96.00	97.50	1.50	1.60	106.7	
97.50	99.00	1.50	1.60	106.7	
99.00	100.50	1.50	1.50	100.0	
100.50	102.00	1.50	1.50	100.0	
102.00	103.50	1.50	1.50	100.0	
103.50	105.00	1.50	1.50	100.0	
105.00	106.50	1.50	1.50	100.0	
106.50	108.00	1.50	1.50	100.0	
108.00	108.70	0.70	0.70	100.0	
108.70	109.10	0.40	0.40	100.0	
109.10	110.60	1.50	1.50	100.0	
110.60	111.00	0.40	0.45	112.5	
111.00	111.90	0.90	0.90	100.0	
111.90	113.50	1.60	1.55	96.9	
113.50	115.00	1.50	1.50	100.0	
115.00	116.50	1.50	1.50	100.0	
116.50	117.10	0.60	0.60	100.0	
117.10	118.20	1.10	1.10	100.0	
118.20	119.70	1.50	1.50	100.0	
119.70	120.00	0.30	0.36	120.0	
	EOH	Total Recovered =	103.01		

311177

TCD7	Recovery Logged By:		G Jago	
From (m)	To (m)	Metres Drilled	Metres Recovered	Recovery (%)
0.00	1.40	1.40	0.10	7.1
1.40	2.90	1.50	0.00	0.0
2.90	4.40	1.50	0.10	6.7
4.40	5.90	1.50	0.20	13.3
5.90	7.40	1.50	1.10	73.3
7.40	8.90	1.50	0.80	53.3
8.90	10.40	1.50	0.40	26.7
10.40	10.90	0.50	0.10	20.0
10.90	11.40	0.50	0.10	20.0
11.40	11.90	0.50	0.35	70.0
11.90	12.50	0.60	0.40	66.7
12.50	13.00	0.50	0.20	40.0
13.00	13.40	0.40	0.10	25.0
13.40	14.00	0.60	0.60	100.0
14.00	14.80	0.80	0.70	87.5
14.80	15.30	0.50	0.40	80.0
15.30	15.90	0.60	0.50	83.3
15.90	16.40	0.50	0.50	100.0
16.40	17.20	0.80	0.60	75.0
17.20	17.50	0.30	0.20	66.7
17.50	18.00	0.50	0.50	100.0
18.00	18.10	0.10	0.10	100.0
18.10	18.70	0.60	0.20	33.3
18.70	19.40	0.70	0.20	28.6
19.40	20.10	0.70	0.20	28.6
20.10	20.50	0.40	0.30	75.0
20.50	20.80	0.30	0.30	100.0
20.80	21.20	0.40	0.20	50.0
21.20	21.50	0.30	0.15	50.0
21.50	22.40	0.90	0.60	66.7
22.40	23.30	0.90	0.40	44.4
23.30	23.60	0.30	0.30	100.0
23.60	23.90	0.30	0.20	66.7
23.90	24.10	0.20	0.05	25.0
24.10	24.80	0.70	0.40	57.1
24.80	25.20	0.40	0.40	100.0
25.20	25.70	0.50	0.30	60.0
25.70	26.50	0.80	0.50	62.5
26.50	26.90	0.40	0.50	125.0
26.90	27.90	1.00	1.00	100.0
27.90	28.40	0.50	0.50	100.0

TCD7 cont'

28.40	29.10	0.70	0.60	85.7
29.10	29.50	0.40	0.30	75.0
29.50	29.90	0.40	0.20	50.0
29.90	30.10	0.20	0.10	50.0
30.10	30.40	0.30	0.30	100.0
30.40	31.40	1.00	1.00	100.0
31.40	31.80	0.40	0.40	100.0
31.80	32.90	1.10	1.10	100.0
32.90	33.20	0.30	0.15	50.0
33.20	33.60	0.40	0.40	100.0
33.60	33.80	0.20	0.20	100.0
33.80	34.40	0.60	0.20	33.3
34.40	35.00	0.60	0.60	100.0
35.00	35.90	0.90	0.80	88.9
35.90	37.00	1.10	1.10	100.0
37.00	37.40	0.40	0.40	100.0
37.40	37.90	0.50	0.40	80.0
37.90	38.70	0.80	0.80	100.0
38.70	38.90	0.20	0.20	100.0
38.90	40.40	1.50	1.50	100.0
40.40	41.40	1.00	1.00	100.0
41.40	41.90	0.50	0.50	100.0
41.90	42.20	0.30	0.30	100.0
42.20	43.40	1.20	1.20	100.0
43.40	44.90	1.50	1.50	100.0
44.90	46.40	1.50	1.50	100.0
46.40	47.10	0.70	0.70	100.0
47.10	48.40	1.30	1.30	100.0
48.40	48.80	0.40	0.40	100.0
48.80	49.30	0.50	0.50	100.0
49.30	50.20	0.90	0.90	100.0
50.20	50.50	0.30	0.30	100.0
50.50	51.00	0.50	0.50	100.0
51.00	51.20	0.20	0.10	50.0
51.20	52.70	1.50	1.50	100.0
52.70	53.70	1.00	1.00	100.0
53.70	54.20	0.50	0.50	100.0
54.20	55.00	0.80	0.80	100.0
55.00	55.60	0.60	0.60	100.0
55.60	56.40	0.80	0.90	112.5
56.40	56.80	0.40	0.40	100.0
56.80	57.00	0.20	0.20	100.0
57.00	57.70	0.70	0.60	85.7
57.70	57.90	0.20	0.20	100.0
57.90	59.40	1.50	1.50	100.0
59.40	60.80	1.40	1.40	100.0

TCD7 cont'

60.80	61.40	0.60	0.60	100.0
61.40	62.90	1.50	1.50	100.0
62.90	64.40	1.50	1.50	100.0
64.40	65.90	1.50	1.50	100.0
65.90	67.40	1.50	1.50	100.0
67.40	68.90	1.50	1.50	100.0
68.90	70.40	1.50	1.50	100.0
70.40	71.90	1.50	1.50	100.0
71.90	79.40	7.50	1.50	20.0
79.40	80.90	1.50	1.50	100.0
80.90	81.10	0.20	0.10	50.0
81.10	81.50	0.40	0.50	125.0
81.50	82.00	0.50	0.50	100.0
82.00	83.00	1.00	1.00	100.0
83.00	83.40	0.40	0.35	87.5
83.40	84.20	0.80	0.80	100.0
84.20	84.70	0.50	0.50	100.0
84.70	85.00	0.30	0.30	100.0
85.00	86.30	1.30	1.30	100.0
86.30	87.70	1.40	1.30	92.9
87.70	89.20	1.50	1.50	100.0
89.20	90.70	1.50	1.50	100.0
90.70	91.00	0.30	0.25	83.3
91.00	91.20	0.20	0.25	125.0
91.20	91.40	0.20	0.20	100.0
91.40	92.10	0.70	0.70	100.0
92.10	92.90	0.80	0.80	100.0
92.90	94.40	1.50	1.40	93.3
94.40	96.40	2.00	1.60	80.0
96.40	97.70	1.30	1.60	123.1
97.70	97.90	0.20	0.20	100.0
97.90	99.10	1.20	1.20	100.0
99.10	99.40	0.30	0.30	100.0
99.40	100.10	0.70	1.60	228.6
100.10	103.00	2.90	1.20	41.4
103.00	103.40	0.40	0.40	100.0
103.40	104.90	1.50	1.50	100.0
104.90	105.20	0.30	1.30	433.3
105.20	106.40	1.20	0.20	16.7
106.40	107.70	1.30	1.30	100.0
107.70	107.90	0.20	0.20	100.0
107.90	109.40	1.50	1.50	100.0
109.40	110.90	1.50	1.50	100.0
110.90	112.40	1.50	1.50	100.0
112.40	113.90	1.50	1.50	100.0
113.90	115.40	1.50	1.50	100.0

115.40	116.80	1.40	1.40	100.0	TCD7 cont'
116.80	117.60	0.80	0.80	100.0	
117.60	118.40	0.80	0.70	87.5	
118.40	119.20	0.80	0.80	100.0	
119.20	120.00	0.80	0.80	100.0	
120.00	121.00	1.00	1.00	100.0	
121.00	122.40	1.40	1.40	100.0	
122.40	123.40	1.00	1.00	100.0	
123.40	124.40	1.00	1.00	100.0	
	EOH	Total Recovered =	102.15		

311181

TCD8	Recovery Logged By:		R Reid	
From (m)	To (m)	Metres Drilled	Metres Recovered	Recovery (%)
0.00	1.50	1.50	0.00	0.0
1.50	3.00	1.50	0.50	33.3
3.00	4.50	1.50	0.05	3.3
4.50	6.00	1.50	0.60	40.0
6.00	7.50	1.50	0.05	3.3
7.50	9.00	1.50	0.10	6.7
9.00	10.50	1.50	0.50	33.3
10.50	12.00	1.50	0.60	40.0
12.00	13.50	1.50	0.25	16.7
13.50	13.80	0.30	0.25	83.3
13.80	14.30	0.50	0.40	80.0
14.30	14.90	0.60	0.55	91.7
14.90	15.40	0.50	0.50	100.0
15.40	15.70	0.30	0.30	100.0
15.70	16.20	0.50	0.50	100.0
16.20	17.10	0.90	0.80	88.9
17.10	18.50	1.40	1.45	103.6
18.50	19.60	1.10	1.10	100.0
19.60	20.90	1.30	1.30	100.0
20.90	21.50	0.60	0.60	100.0
21.50	22.80	1.30	1.30	100.0
22.80	23.50	0.70	0.75	107.1
23.50	24.30	0.80	0.25	31.3
24.30	25.40	1.10	1.05	95.5
25.40	26.70	1.30	1.30	100.0
26.70	27.90	1.20	0.85	70.8
27.90	28.60	0.70	0.95	135.7
28.60	29.70	1.10	1.10	100.0
29.70	30.50	0.80	0.90	112.5
30.50	31.40	0.90	0.80	88.9
31.40	31.60	0.20	0.20	100.0
31.60	32.10	0.50	0.45	90.0
32.10	32.30	0.20	0.20	100.0
32.30	32.80	0.50	0.40	80.0
32.80	33.00	0.20	0.05	25.0
33.00	33.60	0.60	0.25	41.7
33.60	34.20	0.60	0.20	33.3
34.20	34.50	0.30	0.30	100.0
34.50	35.10	0.60	0.20	33.3
35.10	36.00	0.90	0.90	100.0
36.00	36.70	0.70	0.20	28.6

36.70	37.00	0.30	0.25	83.3	TCD8 cont'
37.00	37.50	0.50	0.50	100.0	
37.50	38.00	0.50	0.50	100.0	
38.00	38.50	0.50	0.50	100.0	
38.50	39.00	0.50	0.50	100.0	
39.00	39.30	0.30	0.30	100.0	
39.30	39.70	0.40	0.40	100.0	
39.70	40.50	0.80	0.75	93.8	
40.50	41.20	0.70	0.60	85.7	
41.20	41.40	0.20	0.15	75.0	
41.40	42.00	0.60	0.35	58.3	
42.00	42.30	0.30	0.50	166.7	
42.30	43.50	1.20	0.70	58.3	
43.50	44.00	0.50	0.20	40.0	
44.00	44.60	0.60	0.70	116.7	
44.60	45.00	0.40	0.55	137.5	
45.00	45.50	0.50	0.50	100.0	
45.50	46.30	0.80	0.80	100.0	
46.30	46.50	0.20	0.18	90.0	
46.50	47.50	1.00	0.65	65.0	
47.50	48.00	0.50	0.45	90.0	
48.00	49.00	1.00	0.70	70.0	
49.00	49.50	0.50	0.50	100.0	
49.50	49.90	0.40	0.40	100.0	
49.90	50.40	0.50	0.55	110.0	
50.40	51.20	0.80	0.80	100.0	
51.20	51.50	0.30	0.30	100.0	
51.50	51.80	0.30	0.30	100.0	
51.80	52.70	0.90	0.90	100.0	
52.70	53.60	0.90	0.45	50.0	
53.60	53.90	0.30	0.45	150.0	
53.90	54.50	0.60	0.50	83.3	
54.50	55.20	0.70	0.60	85.7	
55.20	55.80	0.60	0.60	100.0	
55.80	56.80	1.00	1.15	115.0	
56.80	57.60	0.80	1.05	131.2	
57.60	59.10	1.50	1.05	70.0	
59.10	60.00	0.90	0.30	33.3	
60.00	60.90	0.90	0.90	100.0	
60.90	61.10	0.20	0.15	75.0	
61.10	61.50	0.40	0.50	125.0	
61.50	61.60	0.10	0.15	150.0	
61.60	62.70	1.10	1.05	95.5	
62.70	62.90	0.20	0.15	75.0	
62.90	63.00	0.10	0.10	100.0	
63.00	64.00	1.00	1.10	110.0	

64.00	64.50	0.50	0.50	100.0	TCD8 cont'
64.50	66.00	1.50	1.50	100.0	
66.00	67.50	1.50	1.42	94.7	
67.50	67.90	0.40	0.40	100.0	
67.90	69.00	1.10	1.10	100.0	
69.00	70.10	1.10	1.05	95.5	
70.10	70.50	0.40	0.40	100.0	
70.50	72.00	1.50	1.30	86.7	
72.00	73.50	1.50	1.50	100.0	
73.50	75.00	1.50	1.50	100.0	
75.00	76.50	1.50	1.50	100.0	
76.50	77.40	0.90	0.90	100.0	
77.40	78.00	0.60	0.45	75.0	
78.00	78.90	0.90	0.90	100.0	
78.90	79.50	0.60	0.60	100.0	
79.50	81.00	1.50	1.50	100.0	
81.00	82.20	1.20	1.05	87.5	
82.20	82.50	0.30	0.30	100.0	
82.50	82.90	0.40	0.40	100.0	
82.90	83.50	0.60	0.60	100.0	
83.50	84.00	0.50	0.50	100.0	
84.00	85.50	1.50	1.50	100.0	
85.50	86.00	0.50	0.50	100.0	
86.00	86.80	0.80	0.80	100.0	
86.80	87.80	1.00	1.00	100.0	
87.80	88.40	0.60	0.53	88.3	
88.40	88.90	0.50	0.50	100.0	
88.90	89.20	0.30	0.40	133.3	
89.20	90.10	0.90	0.85	94.4	
90.10	91.40	1.30	1.20	92.3	
91.40	91.90	0.50	0.35	70.0	?
91.90	93.40	1.50	1.50	100.0	
93.40	94.00	0.60	0.70	116.7	
94.00	94.20	0.20	0.25	125.0	
94.20	94.50	0.30	0.35	116.7	
	EOH	Total Recovered =	77.53		

97-3989
Vol 2 of 2

311184

OPEN FILE

PLUTONIC OPERATIONS LIMITED

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EXPLORATION LICENCES 4/92 AND 7/92

SORELL PENINSULA

Annual Report on Exploration Activity

to September 1996

VOL 2 OF 2 (PLATE)

MINERAL RESOURCES
FILE
19 MAR 1997
EL 4/92 See folio 46
EL 7/92 See folio 26

97-3989

ANNUAL REPORT - ELS 4/92 & 7/92
PLUTONIC OPERATIONS LTD.
R.REID & R CLOSE - **VOL 2OF 2**

R Reid and R J Close
February 1997

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2. AEM anomalies adjacent to NCV
3. Drill hole statistics
4. Thomas Creek Prospect mineralised intervals

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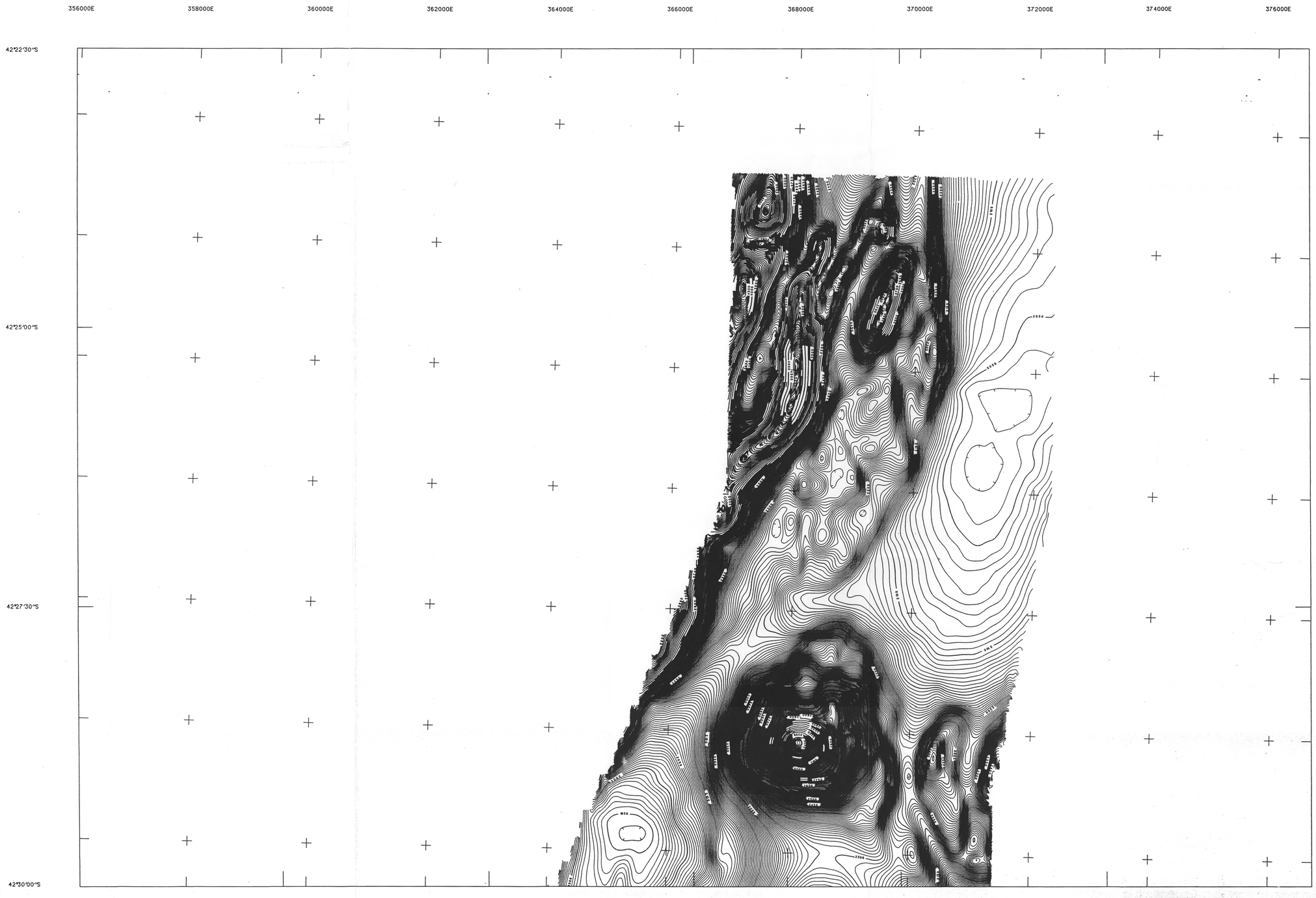
APPENDICES

I Geoterrex Report on the Geotem Deep Survey over the Sorell Peninsula
II Geochemical Data for Reconnaissance Surveys and Drill Core.
III Drill Logs and Survey Data



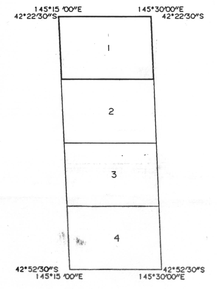
AIRBORNE SURVEY SPECIFICATIONS

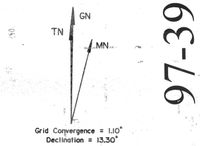
EM SYSTEM :	GEOTEM III 25 Hz Pulse width : 4108 microseconds Components : X and Z Channel centres : 501,658,814,1048,1361 1751,2220,2767,3470,4330,5345,6517,7923 9642,11830,14486 microseconds after transmitter turn off Impulse channel centres : 469,781,1094,1406 microseconds after transmitter turn on
RECORDING INTERVAL :	0.25 sec (approx 16 m sampling) at mean ground speed of 235 km/hour
MAGNETOMETER :	Cesium Vapour optical absorption Sensitivity : 0.01 nT
RECORDING INTERVAL :	1.0 sec (approx 65 m sampling) at mean ground speed of 235 km/hour
DIGITAL RECORDING :	Geoterrex GEODAS acquisition system
NOMINAL TERRAIN CLEARANCE :	Magnetometer sensor in aircraft at 105 m EM transmitter in aircraft at 105 m EM receiver in towed bird at 62 m
NOMINAL LINE SPACING :	Traverse lines 200 m
NOMINAL LINE DIRECTION :	Tie lines peripheral Traverse lines 090/270 degrees Tie lines various.
FLIGHT PATH NAVIGATION :	SERCEL NR103 GPS navigation system and a SINGER KEARFOTT AN/ASN 128 Doppler system with SPERRY C12 compass and YG14 vertical gyro
FLIGHT PATH RECORD :	GPS positioning corrected for selected availability integrated with Doppler track

RESIDUAL MAGNETIC CONTOURS

Grid notation refers to Australian Map Grid Zone 55

Magnetics :	Diurnally levelled
IGRF :	1990 model (updated for secular variation to March 1996) removed. datum 2000 nT added
Total Field :	62562 nT (at 42°35'00S, 145°25'00E)
Inclination :	73 degrees S
Declination :	13.3 degrees E
Grid mesh size :	50 x 50 metres
Grid filter :	None
Contour interval :	5, 50 and 500 nT





SCALE 1:25000

500 0 500 1000 1500 2000 m

5 cm

JOB NO : 2-735
Surveyed by: GEOTERREX PTY LTD : MARCH 1996
Compiled by: GEOTERREX PTY LTD, SYDNEY
Processed by: GEOTERREX PTY LTD, SYDNEY

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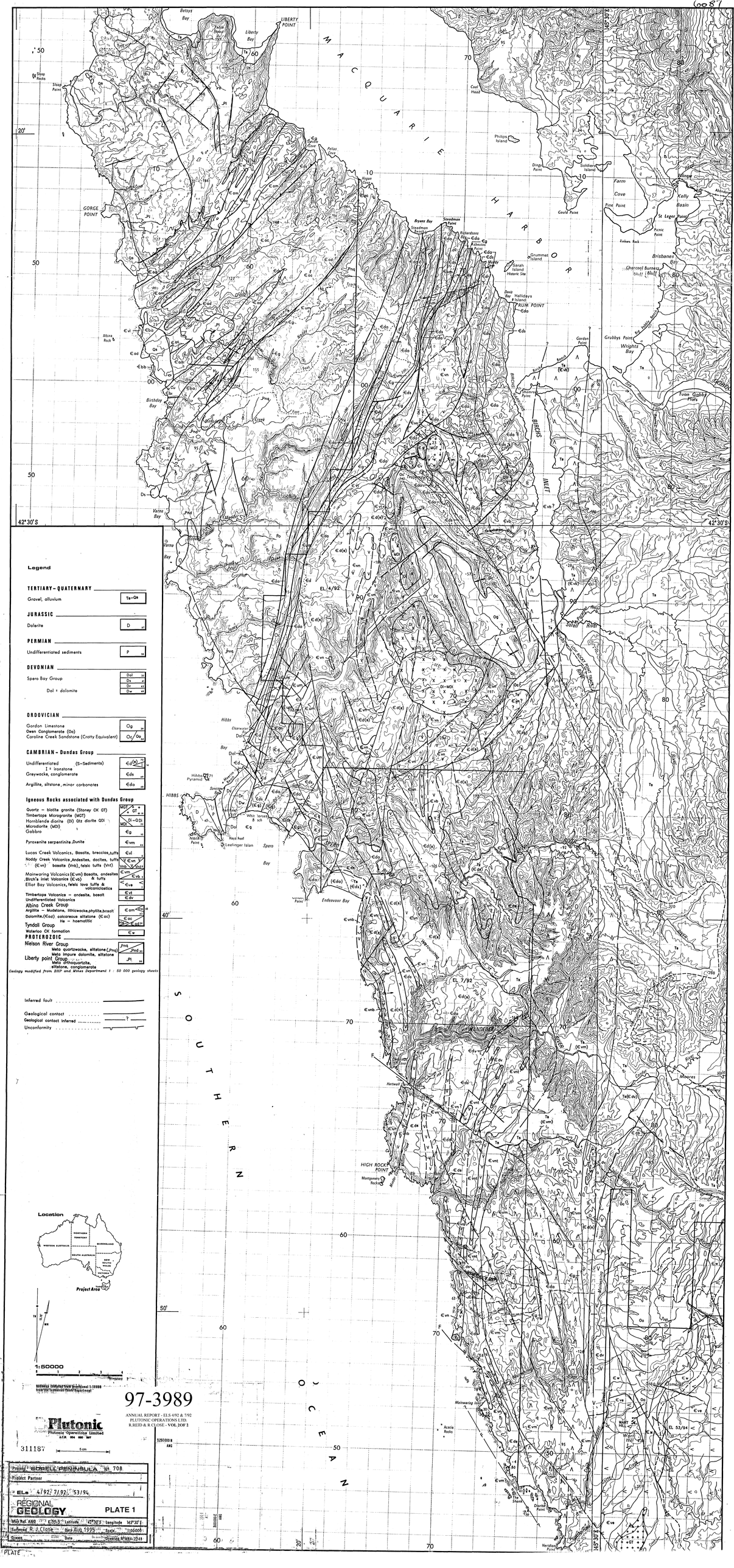
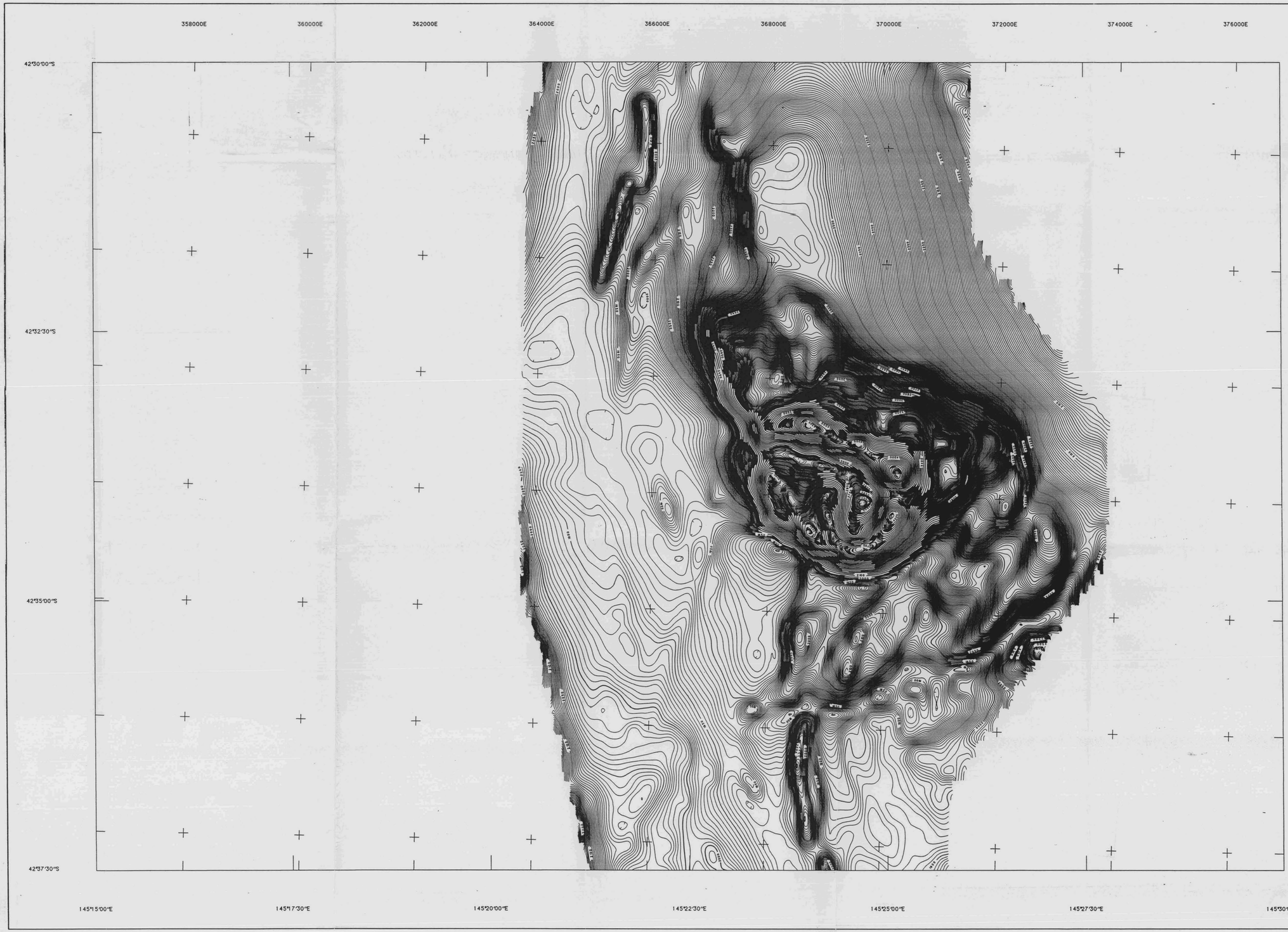
ANNUAL REPORT - ELS 4/92 & 7/92
PLUTONIC OPERATIONS LTD
RAMPS & CURSE - VOL 2 OF 2

PLUTONIC OPERATIONS LIMITED

SORELL PENINSULA EL4/92 EL7/92
RESIDUAL MAGNETIC CONTOURS
25HZ 4MS GEOTEM
311186
SHEET 1 OF 4 PLATE 2

CREATED : MC	DRAWING NO :
CHECKED : WDM	DATE : 10-APR-1996


MACQUARIE HARBOUR
SOUTHERN OCEAN
LIBERTY POINT
GORGE POINT
ALUM POINT
BIRCHS INLET
Farm Cove
Kelly Basin
St Leger Point
Brisbane Bay
Grubbys Point
Wrights Bay
Tuan Gabbro Plate
Birthday Bay
Varna Bay
Spero Bay
Endeavour Bay
HIGH ROCK POINT
42°30'S
145°30'E
Legend
TERTIARY – QUATERNARY
Gravel, alluvium
JURASSIC
Dolerite
PERMIAN
Undifferentiated sediments
DEVONIAN
Spero Bay Group
Dol = dolomite
ORDOVICIAN
Gordon Limestone
Owen Conglomerate
Caroline Creek Sandstone (Crotty Equivalent)
CAMBRIAN – Dundas Group
Undifferentiated (S–Sediments)
I = ironstone
Greywacke, conglomerate
Argillite, siltstone, minor carbonates
Igneous Rocks associated with Dundas Group
Quartz – biotite granite (Stoney CK GT)
Timbertops Microgranite (MGT)
Hornblende diorite (DI) Qtz diorite (QDI)
Microdiorite (MDI)
Gabbro
Pyroxenite serpentinite, Dunite
Lucas Creek Volcanics, Basalts, breccias, tuffs
Noddy Creek Volcanics, Andesites, dacites, tuffs
(Ꞓvn) basalts (Vnb), felsic tuffs (Vnt)
Mainwaring Volcanics (Ꞓvm) Basalts, andesites
Birch's Inlet Volcanics (Ꞓvb) & tuffs
Elliot Bay Volcanics, felsic lava tuffs & volcaniclastics
Timbertops Volcanics – andesite, basalt
Undifferentiated Volcanics
Albina Creek Group
Argillite – Mudstone, lithicwacke, phyllite, basalt
Dolomite, (Ꞓad) calcareous siltstone (Ꞓac)
He – haematitic
Tyndall Group
Waterloo CK formation
PROTEROZOIC
Nelson River Group
Meta quartzwacke, siltstone (Pnq)
Meta impure dolomite, siltstone
Liberty point Group
Meta orthoquartzite, siltstone, conglomerate
Geology modified from BMR and Mines Department 1 : 50 000 geology sheets
Inferred fault
Geological contact
Geological contact inferred
Unconformity
Location
WESTERN AUSTRALIA
NORTHERN TERRITORY
QUEENSLAND
SOUTH AUSTRALIA
NEW SOUTH WALES
VICTORIA
TASMANIA
Project Area
1:50000
Projection: Transverse Mercator
Datum: Australian Geodetic 1966
Grid: Zone 55 Transverse Mercator Projection
97-3989
ANNUAL REPORT - EL'S 4/92 & 7/92
PLUTONIC OPERATIONS LTD.
R.REID & R.CLOSE - VOL 2OF 2
Plutonic
Plutonic Operations Limited
A.C.N. 004 880 397
311187
Project: BORELL PENINSULA No. 708
Project Partner
EL's 4/92, 7/92, 53/94
REGIONAL GEOLOGY
PLATE 1
Map Ref. AMG Zone 55 Latitude 42°30'S Longitude 145°30'E
Surveyed R.J. Close Date Aug 1995 Scale 1:50000
Drawn Date Drawing No. M84-2248
PLATE



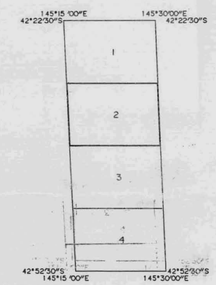
AIRBORNE SURVEY SPECIFICATIONS

EM SYSTEM :	GEOTEM III 25 Hz Pulse width : 4108 microseconds Components : X and Z Channel centres : 501.638.814.1048.1361 1751.2220.2767.3470.4336.5345.6517.7923 9642.11830.14486 microseconds after transmitter turn off Inpulse channel centres : 469.781.1094.1406 microseconds after transmitter turn on
RECORDING INTERVAL :	0.25 sec (approx 16 m sampling) at mean ground speed of 235 km/hour
MAGNETOMETER :	Caesium Vapour optical absorption Sensitivity : 0.01 nT
RECORDING INTERVAL :	1.0 sec (approx 65 m sampling) at mean ground speed of 235 km/hour
DIGITAL RECORDING :	Geoterrex GEODAS acquisition system
NOMINAL TERRAIN CLEARANCE :	Magnetic sensor in aircraft at 105 m EM transmitter in aircraft at 105 m EM receiver in towed bird at 62 m
NOMINAL LINE SPACING :	Traverse lines 200 m Tie lines peripheral
NOMINAL LINE DIRECTION :	Traverse lines 090/270 degrees Tie lines various
FLIGHT PATH NAVIGATION :	SERCEL NR103 GPS navigation system and a SINGER KEARFOTT AN/ASN 128 Doppler system with SPERRY C12 compass and VG14 vertical gyro
FLIGHT PATH RECORD :	GPS positioning corrected for selected availability integrated with Doppler track

RESIDUAL MAGNETIC CONTOURS

Grid notation refers to Australian Map Grid Zone 55

Magnetics :	Diurnally levelled
IGRF :	1990 model updated for secular variation to March 1996) removed. datum 2000 nT added
Total Field :	62562 nT (at 42°35'00S, 145°25'00E)
Inclination :	73 degrees S
Declination :	13.5 degrees E
Grid mesh size :	50 x 50 metres
Grid filter :	None
Contour interval :	5, 50 and 500 nT



97-3989

ANNUAL REPORT - ELS 492 & 792
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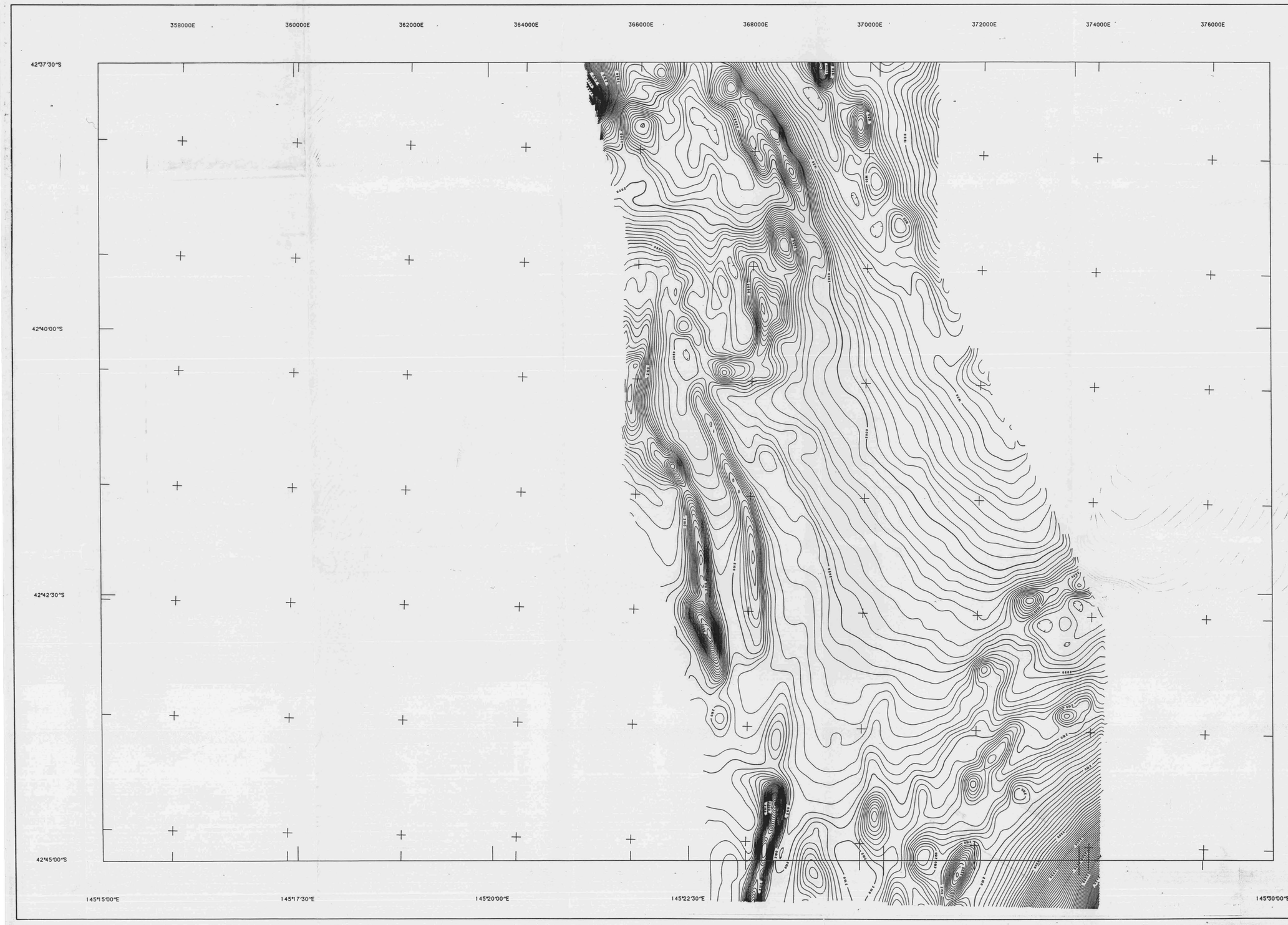
R.REID & R.CLOSE - VOL.2OF 2

JOB NO : 2-735
Surveyed by GEOTERREX PTY LTD : MARCH 1996
Compiled by GEOTERREX PTY LTD, SYDNEY
Processed by GEOTERREX PTY LTD, SYDNEY

PLUTONIC OPERATIONS LIMITED

SORELL PENINSULA EL4/92 EL7/92
RESIDUAL MAGNETIC CONTOURS
311188 25HZ 4MS GEOTEM
SHEET 2 OF 4 PLATE 3

CREATED : MC
CHECKED : WDM
DRAWING NO :
DATE : 10-APR-1996



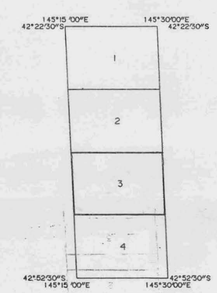
AIRBORNE SURVEY SPECIFICATIONS

EM SYSTEM :	GEOTEM III 25 Hz Pulse width : 4108 microseconds Components : X and Z Channel centres : 501.658.814.1048.1361 1751.2220.2767.3470.4330.5345.6517.7923 9642.11830.14486 microseconds after transmitter turn off Impulse channel centres : 469.781.1094.1406 microseconds after transmitter turn on
RECORDING INTERVAL :	0.25 sec (approx 16 m sampling) at mean ground speed of 235 km/hour
MAGNETOMETER :	Cesium Vapour optical absorption Sensitivity : 0.01 nT
RECORDING INTERVAL :	1.0 sec (approx 65 m sampling) at mean ground speed of 235 km/hour
DIGITAL RECORDING :	Geoterrex GEODAS acquisition system
NOMINAL TERRAIN CLEARANCE :	Magnetometer sensor in aircraft at 105 m EM transmitter in aircraft at 105 m EM receiver in towed bird at 62 m
NOMINAL LINE SPACING :	Traverse lines 200 m Tie lines peripheral
NOMINAL LINE DIRECTION :	Traverse lines 090/270 degrees Tie lines various
FLIGHT PATH NAVIGATION :	SERCEL NR103 GPS navigation system and a SINGER KEARFOTT AN/ASN 128 Doppler system with SPERRY C12 compass and V014 vertical gyro
FLIGHT PATH RECORD :	GPS positioning corrected for selected availability integrated with Doppler track

RESIDUAL MAGNETIC CONTOURS

Grid notation refers to Australian Map Grid Zone 55

Magnetics :	Diurnally levelled
IGRF :	1990 model (updated for secular variation to March 1996) removed. datum 2000 nT added
Total Field :	62562 nT (at 42°35'00S, 145°25'00E)
Inclination :	73 degrees S
Declination :	13.3 degrees E
Grid mesh size :	50 x 50 metres
Grid filter :	None
Contour interval :	5, 50 and 500 nT



SCALE 1:25000

500 0 500 1000 1500 2000 m

5 cm

JOB NO : 2-735
Surveyed by GEOTERREX PTY LTD : MARCH 1996
Compiled by GEOTERREX PTY LTD, SYDNEY
Processed by GEOTERREX PTY LTD, SYDNEY

97-3989

ANNUAL REPORT ELS 4/92 & 7/92
PLUTONIC OPERATIONS LTD
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PLUTONIC OPERATIONS LIMITED

SORELL PENINSULA EL4/92 EL7/92
RESIDUAL MAGNETIC CONTOURS
25HZ 4MS GEOTEM

311189

SHEET 3 OF 4 PLATE 4

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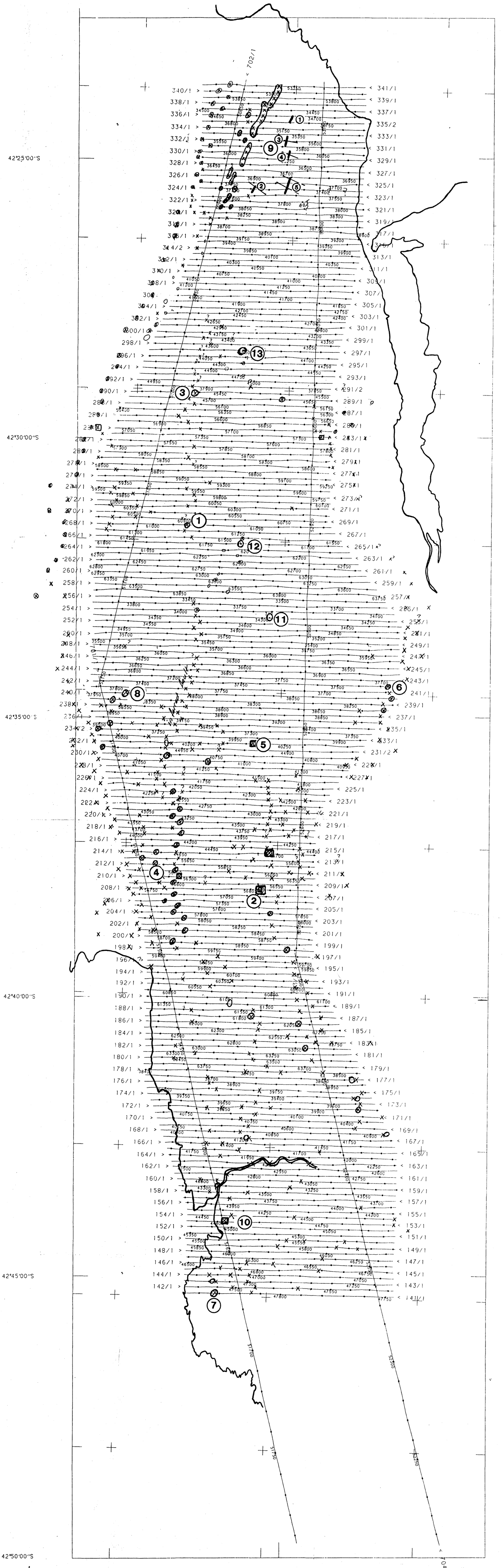
CHECKED : MJPM	DATE : 10-APR-1996



AIRBORNE SURVEY SPECIFICATIONS

EM SYSTEM :	GEOTEM III .25 Hz Pulse width : 4106 microseconds Component : Z Channel centres : 1.521,658,814,1048,1361 1751,2220,2761,3476,4332,5345,6317,7523 9642,11653,14486 microseconds after transmitter turn off Inputs : channel centres : 469,781,1094,1406 microseconds after transmitter turn on
RECORDING INTERVAL :	0.25 sec. (approx. 10 m sample rate)
MAGNETOMETER :	at mean ground speed of 235 km/hour Cesium vapour Varian, sensor Sensitivity : 0.01 nT
RECORDING INTERVAL :	1.0 sec. (approx. 65 m sampling) at mean ground speed of 235 km/hour
DIGITAL RECORDING :	System : GEOLAS acquisition system
NOMINAL TERRAIN CLEARANCE :	Magnetometer sensor in aircraft at 35 m EM transmitter in aircraft at 105 m EM receiver in towed bird at 62 m
NOMINAL LINE SPACING :	Traverse lines 200 m
NOMINAL LINE DIRECTION :	Traverse lines (approximate) Traverse lines 090/270 degrees
FLIGHT PATH NAVIGATION :	Tie lines 180/360 SERCEL NR107 GPS navigation system and a SINGER KEARFOTT AN/ASN-128 Doppler system with SPERRY C12 compass and VG14 vertical gyro
FLIGHT PATH RECORD :	GPS continuously corrected for selected availability, integrated with Doppler track

FLIGHT PATH

Grid notation refers to Australian Map Grid Zone 55
Navigation fix 32768

LEGEND

- X A.E.M. anomaly (apparent to 2.22 millisecs.-channel 7)
- ○ Amplitude Decay Index (A.D.I.) anomaly
- □ Low amplitude response with slow decay
- (1) Anomaly number
- (2) Dighem anomaly and number
- Grid line

Flown by Geoterrex

Date: March 1996

97-3989

ANNUAL REPORT - ELS 4092 & 7592
PLUTONIC OPERATIONS LTD.
R.REID & E.CLOSE - VOL.2.OF 2

Grid Convergence : 1.07°
Declination : 11.60°

SCALE 1:50000

1 0 1 2 3 4 km

5 cm

PLUTONIC OPERATIONS LIMITED

SORELL PENINSULA

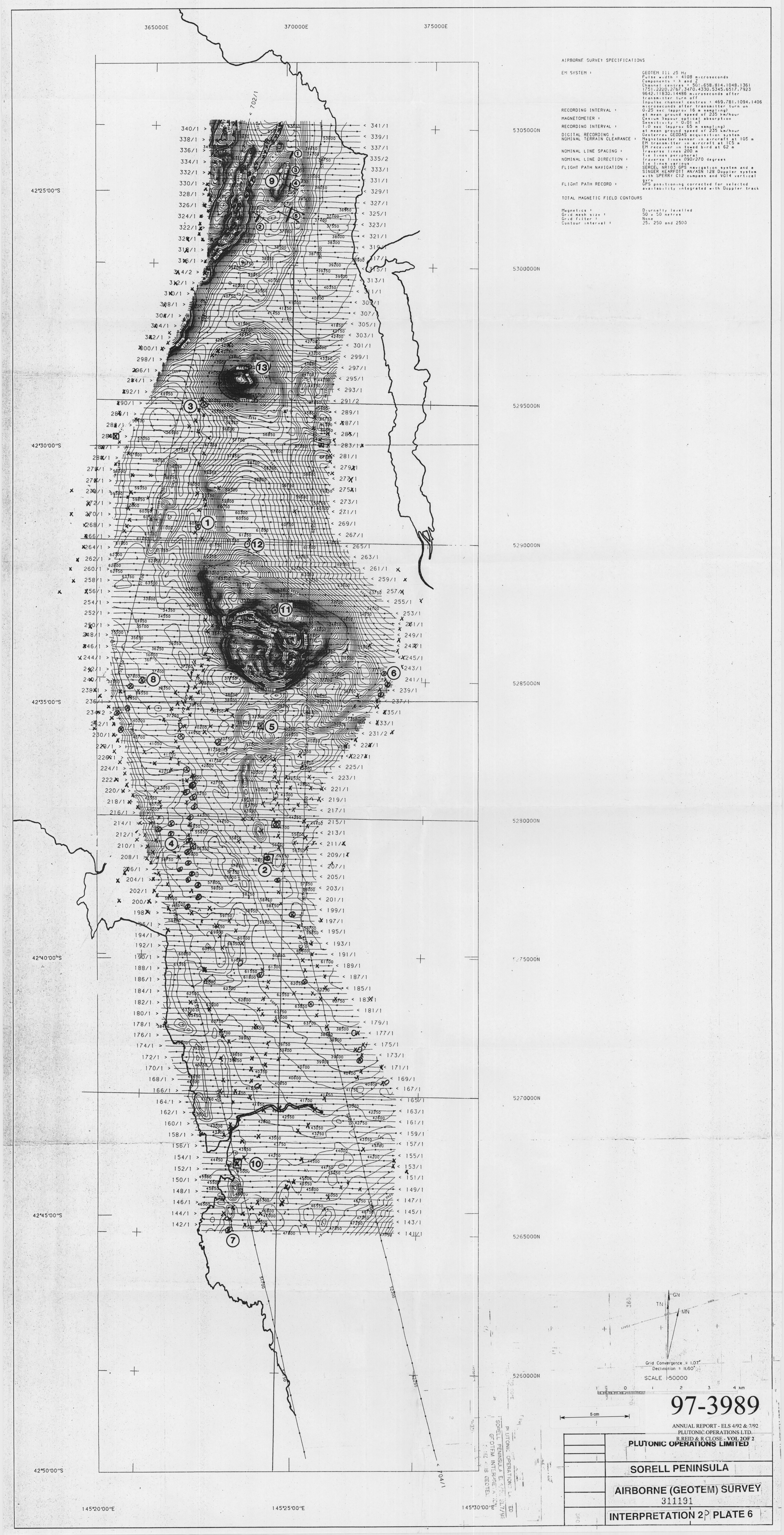
A.E.M.(GEOTEM) SURVEY

INTERPRETATION 1

DRAWN BY L.H.B.
SURVEYED BY J.F.W.

DRAWING NO. PLATE 5

311130



AIRBORNE SURVEY SPECIFICATIONS

EM SYSTEM :	GEOTEM III 25 Hz Pulse width : 4108 microseconds Components : X and Z Channel centres : 501,658,814,1048,1361 1751,2220,2767,3470,4330,5345,6517,7923 9642,11830,14486 microseconds after transmitter turn off Inpulse channel centres : 469,781,1094,1406 microseconds after transmitter turn on
RECORDING INTERVAL :	0.25 sec (approx 16 m sampling) at mean ground speed of 235 km/hour
MAGNETOMETER :	Cesium Vapour optical absorption Sensitivity : 0.01 nT
RECORDING INTERVAL :	1.0 sec (approx 65 m sampling) at mean ground speed of 235 km/hour
DIGITAL RECORDING :	Geoterrex GEODAS acquisition system
NOMINAL TERRAIN CLEARANCE :	Magnetometer sensor in aircraft at 105 m EM transmitter in aircraft at 105 m EM receiver in towed bird at 62 m
NOMINAL LINE SPACING :	Traverse lines 200 m Tie lines peripheral
NOMINAL LINE DIRECTION :	Traverse lines 090/270 degrees Tie lines various
FLIGHT PATH NAVIGATION :	SERCEL NR103 GPS navigation system and a SINGER KEARFOTT AN/ASN 128 Doppler system with SPERRY C12 compass and VG14 vertical gyro
FLIGHT PATH RECORD :	GPS positioning corrected for selected availability integrated with Doppler track

TOTAL MAGNETIC FIELD CONTOURS

Magnetics :	Diurnally levelled
Grid mesh size :	50 x 50 metres
Grid filter :	None
Contour interval :	25, 250 and 2500

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PLUTONIC OPERATIONS LTD.
R.REID & R CLOSE - VOL 2OF 2

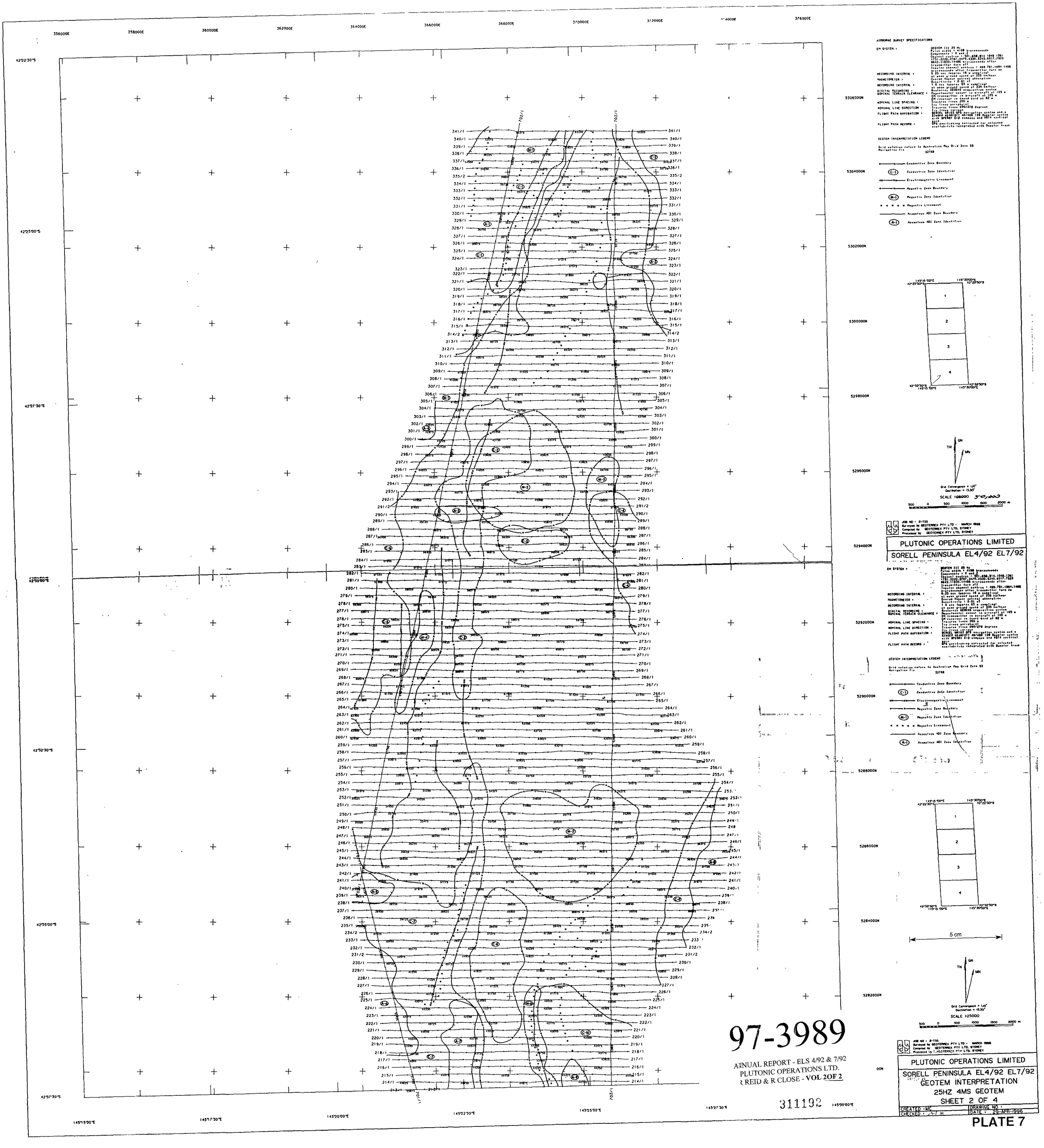
PLUTONIC OPERATIONS LIMITED

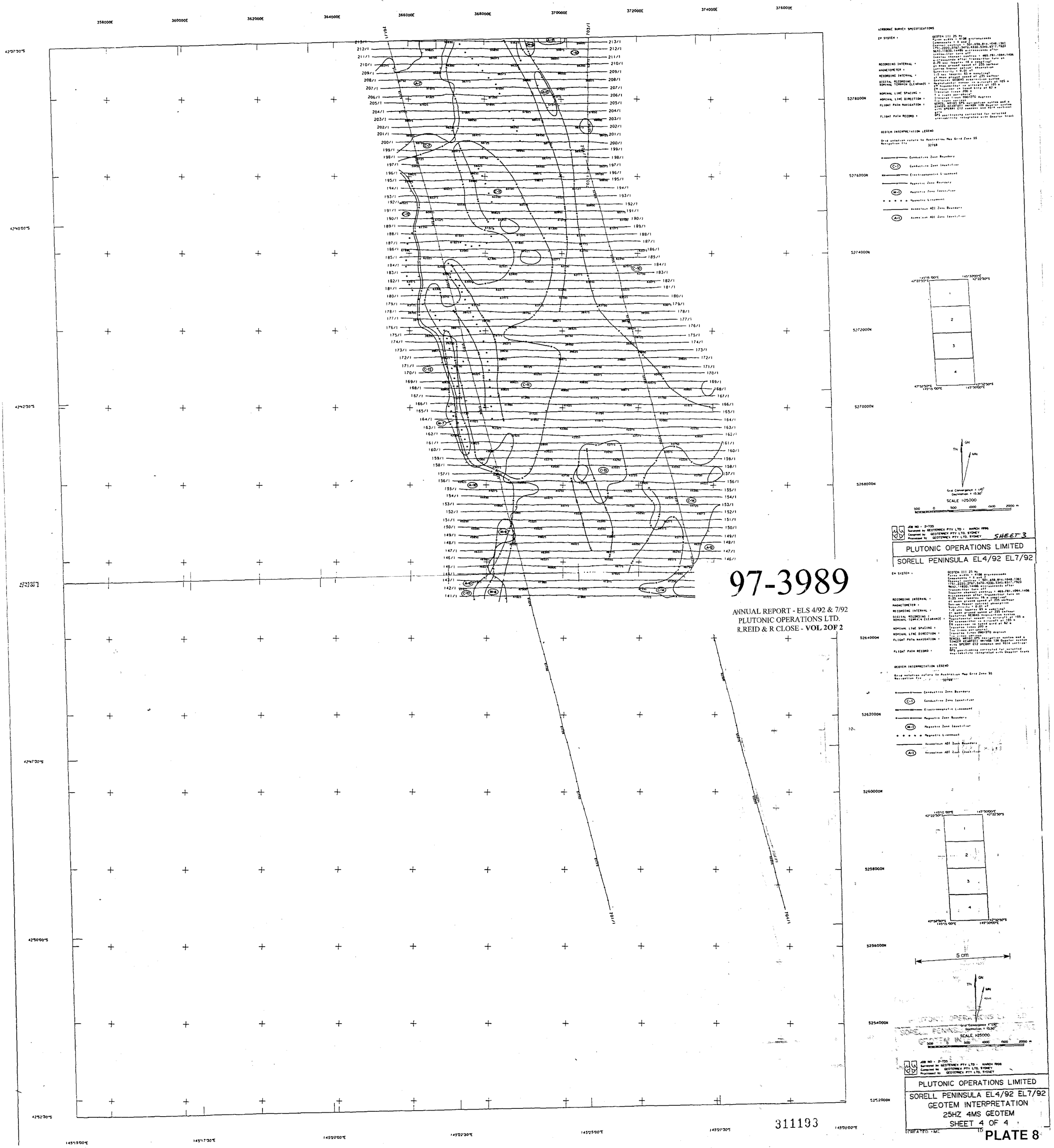
SORELL PENINSULA

AIRBORNE (GEOTEM) SURVEY

311191

INTERPRETATION 2P PLATE 6


AIRBORNE SURVEY SPECIFICATIONS
EM SYSTEM :
RECORDING INTERVAL :
MAGNETOMETER :
RECORDING INTERVAL :
DIGITAL RECORDING :
NOMINAL TERRAIN CLEARANCE :
NOMINAL LINE SPACING :
NOMINAL LINE DIRECTION :
FLIGHT PATH NAVIGATION :
FLIGHT PATH RECORD :
GEOTEM INTERPRETATION LEGEND
Grid solution refers to Australian Map Grid Zone 55
Navigation fix 32768
Conductive Zone Boundary
Conductive Zone Identifier
Electromagnetic Lineament
Magnetic Zone Boundary
Magnetic Zone Identifier
Magnetic Lineament
Anomalous ADI Zone Boundary
Anomalous ADI Zone Identifier
GN
TN
MN
Grid Convergence = 1.0°
Declination = 15.30°
SCALE 1:25000
500 0 500 1000 1500 2000 m
JOB NO : 2-735
Surveyed by GEOTERREX PTY LTD : MARCH 1996
Compiled by GEOTERREX PTY LTD, SYDNEY
Processed by GEOTERREX PTY LTD, SYDNEY
PLUTONIC OPERATIONS LIMITED
SORELL PENINSULA EL4/92 EL7/92
GEOTEM INTERPRETATION
25HZ 4MS GEOTEM
SHEET 2 OF 4
CREATED : MC
CHECKED : H
DRAWING NO :
DATE : 29-APR-1996
97-3989
ANNUAL REPORT - ELS 4/92 & 7/92
PLUTONIC OPERATIONS LTD.
R REID & R CLOSE - VOL 2OF 2
311192
PLATE 7



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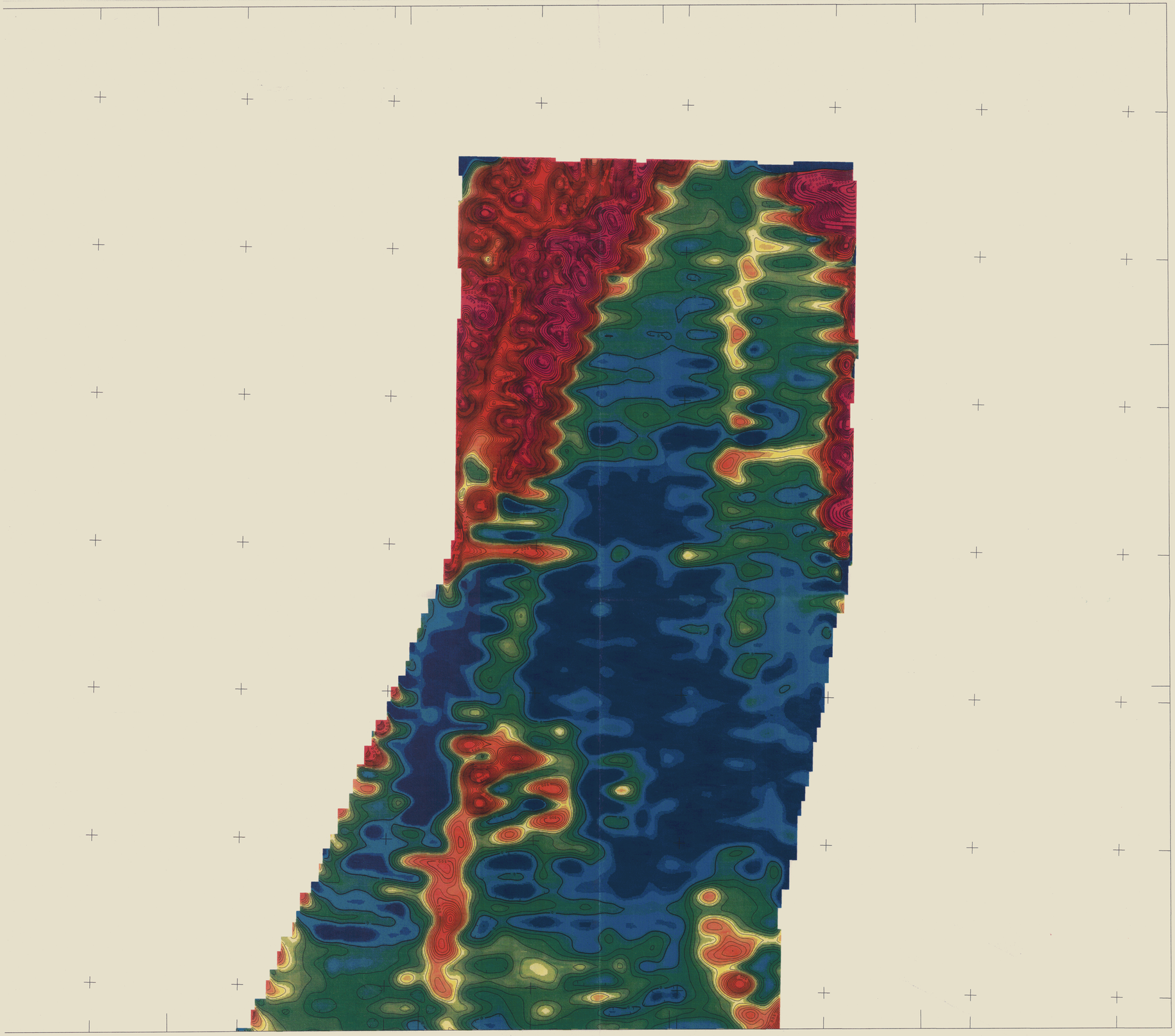
PLUTONIC OPERATIONS LTD.
R.REID & R CLOSE - **VOL 2OF 2**

PLATE 8



AIRBORNE SURVEY SPECIFICATIONS

EM SYSTEM :	GEOTEM III 25 Hz Pulse width : 4108 microseconds Components : X and Z Channel centres : 501.658.814.1048.1361 1751.2220.2767.3470.4330.5345.6517.7923 9642.11830.14486 microseconds after transmitter turn off Inpulse channel centres : 469.781.1094.1406 microseconds after transmitter turn on
RECORDING INTERVAL :	0.25 sec (approx 16 m sampling) at mean ground speed of 235 km/hour
MAGNETOMETER :	Cesium Vapour optical absorption Sensitivity : 0.01 nT
RECORDING INTERVAL :	1.0 sec (approx 65 m sampling) at mean ground speed of 235 km/hour
DIGITAL RECORDING :	Geoterrex GEODAS acquisition system
NOMINAL TERRAIN CLEARANCE :	Magnetometer sensor in aircraft at 105 m EM transmitter in aircraft at 105 m EM receiver in towed bird at 62 m
NOMINAL LINE SPACING :	Traverse lines 200 m Tie lines peripheral
NOMINAL LINE DIRECTION :	Traverse lines 090/270 degrees Tie lines various
FLIGHT PATH NAVIGATION :	SERCEL NR103 GPS navigation system and a SINGER KEARFOTT AN/ASN 128 Doppler system with SPERRY 012 compass and VG14 vertical gyro
FLIGHT PATH RECORD :	GPS positioning corrected for selected availability integrated with Doppler track

X COMPONENT Ch 2 IMAGE

Grid notation refers to Australian Map Grid Zone 55

Grid mesh size :	50 x 50 metres
Grid filter :	Spl (triangular, no threshold
Contour Interval :	50. 500 and 3000 ppm

COLOUR KEY - ppm

-120.0	210.0
-75.0	230.0
-55.0	255.0
-35.0	275.0
-15.0	295.0
5.0	315.0
25.0	335.0
45.0	355.0
65.0	395.0
90.0	460.0
110.0	540.0
130.0	665.0
150.0	850.0
170.0	1245.0
190.0	2070.0
210.0	3780.0

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Grid Con
Declination - 15.30

SCALE 1:25000

500 0 500 1000 1500 2000 m

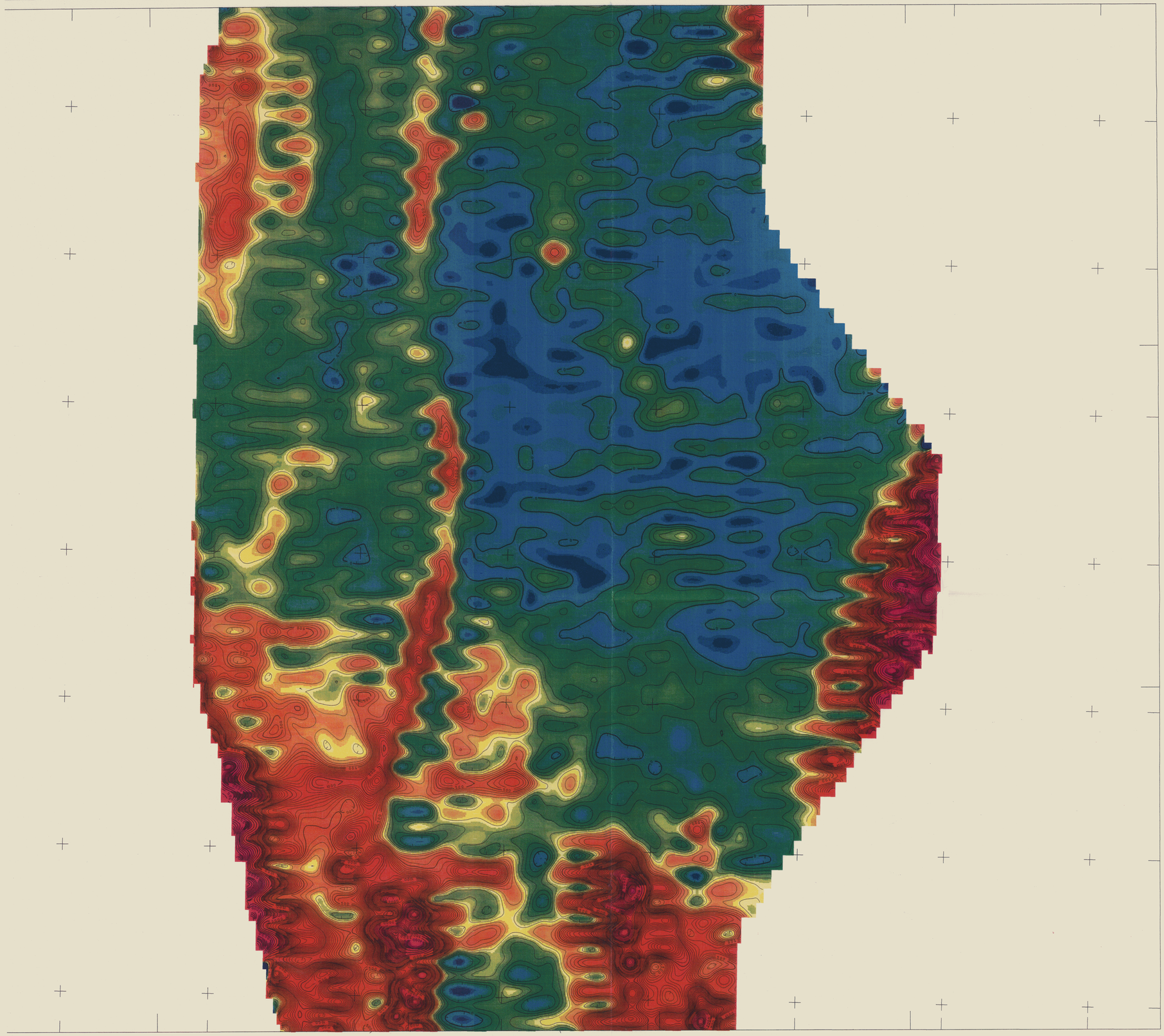
5 cm

JOB NO : 2-735
Surveyed by GEOTERREX PTY LTD : MARCH 1996
Compiled by GEOTERREX PTY LTD, SYDNEY
Processed by GEOTERREX PTY LTD, SYDNEY

PLUTONIC OPERATIONS LIMITED

SORELL PENINSULA EL4/92 EL7/92
X COMPONENT Ch 2 IMAGE
311194 25HZ 4MS GEOTEM
SHEET 1 OF 4 **PLATE 9**

CREATED : MC | DRAWING NO :



AIRBORNE SURVEY SPECIFICATIONS

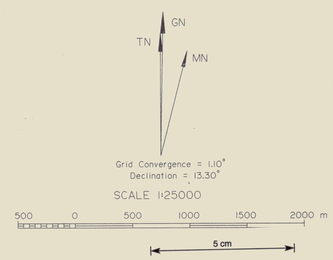
EM SYSTEM :	GEOTEM III 25 Hz Pulse width : 4108 microseconds Components : X and Z Channel centres : 501,658,814,1048,1361 1751,2220,2767,3470,4330,5345,6517,7923 9642,11830,14486 microseconds after transmitter turn off Inpulse channel centres : 469,781,1094,1406 microseconds after transmitter turn on
RECORDING INTERVAL :	0.25 sec (approx 16 m sampling) at mean ground speed of 235 km/hour
MAGNETOMETER :	Cesium Vapour optical absorption Sensitivity : 0.01 nT
RECORDING INTERVAL :	1.0 sec (approx 65 m sampling) at mean ground speed of 235 km/hour
DIGITAL RECORDING :	Geoterrex GEODAS acquisition system
NOMINAL TERRAIN CLEARANCE :	Magnetometer sensor in aircraft at 105 m EM transmitter in aircraft at 105 m EM receiver in towed bird at 62 m
NOMINAL LINE SPACING :	Traverse lines 200 m Tie lines peripheral
NOMINAL LINE DIRECTION :	Traverse lines 090/270 degrees Tie lines various
FLIGHT PATH NAVIGATION :	SERCEL NR103 GPS navigation system and a SINGER KEARFOTT AN/ASN 128 Doppler system with SPERRY C12 compass and V014 vertical gyro
FLIGHT PATH RECORD :	GPS positioning corrected for selected availability integrated with Doppler track

X COMPONENT Ch 2 IMAGE

Grid notation refers to Australian Map Grid Zone 55	
Grid mesh size :	50 x 50 metres
Grid filter :	5pt triangular, no threshold
Contour Interval :	50, 500 and 5000 ppm

COLOUR KEY - ppm

-120.0	210.0
-75.0	230.0
-55.0	255.0
-35.0	275.0
-15.0	295.0
5.0	315.0
25.0	335.0
45.0	355.0
65.0	395.0
90.0	460.0
110.0	540.0
130.0	665.0
150.0	850.0
170.0	1245.0
190.0	2070.0
210.0	3780.0



JOB NO : 2-735
Surveyed by GEOTERREX PTY LTD : MARCH 1996
Compiled by GEOTERREX PTY LTD, SYDNEY
Processed by GEOTERREX PTY LTD, SYDNEY

311195

PLUTONIC OPERATIONS LIMITED

SORELL PENINSULA EL4/92 EL7/92
X COMPONENT Ch 2 IMAGE
25HZ 4MS GEOTEM
SHEET 2 OF 4 **PLATE 10**

CREATED : MC | DRAWING NO :

97-3989

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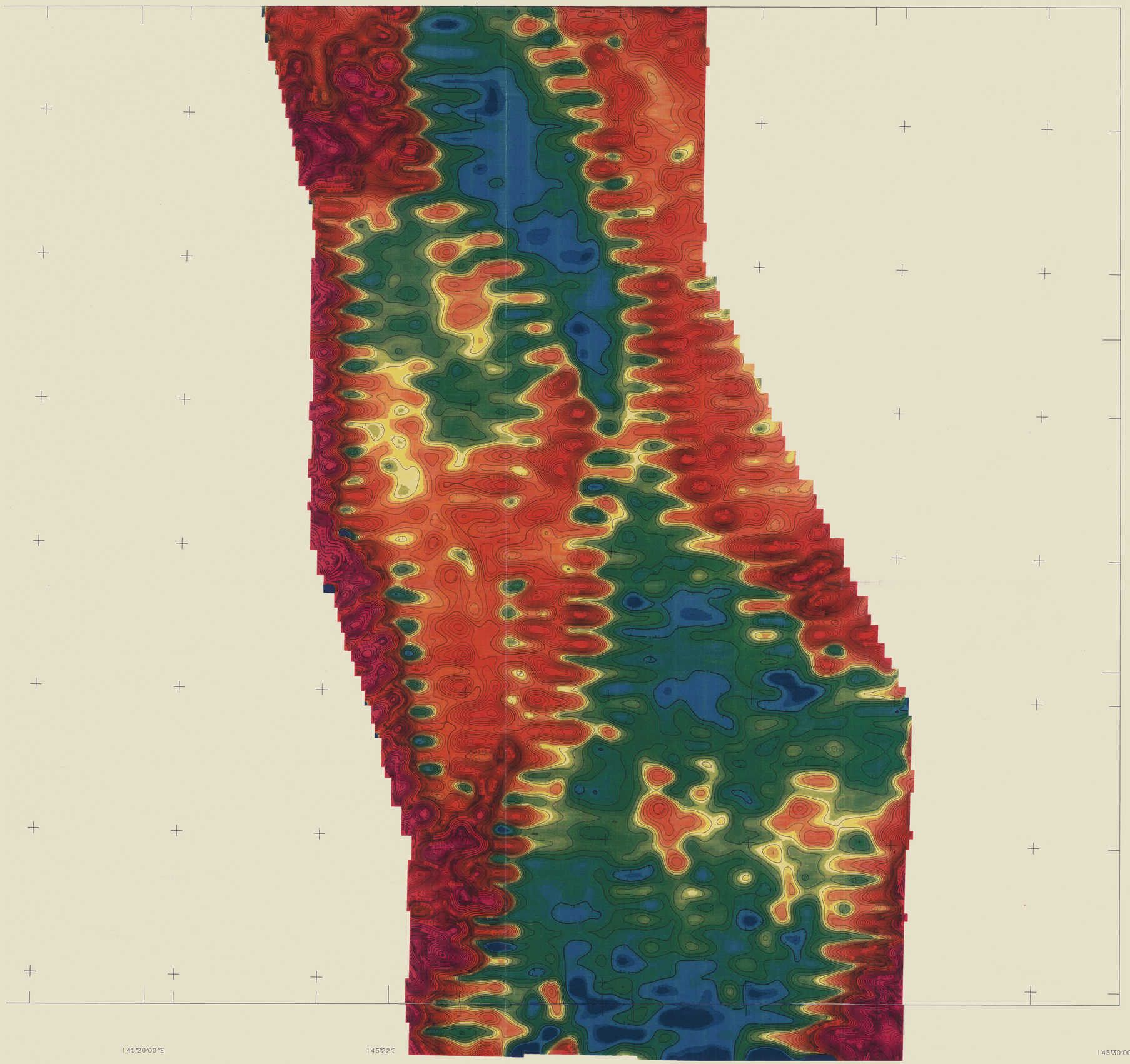
PLUTONIC OPERATIONS LTD.
R.REID & R CLOSE - **VOL 2OF 2**



AIRBORNE SURVEY SPECIFICATIONS

EM SYSTEM :	GEOTEM III 25 Hz Pulse width : 4108 microseconds Components : X and Z Channel centres : 501.658.814.1048.1361 1751.2220.2767.3470.4330.5345.6517.7923 9642.11830.14486 microseconds after transmitter turn off Inpulse channel centres : 469.781.1094.1406 microseconds after transmitter turn on
RECORDING INTERVAL :	0.25 sec (approx 16 m sampling) at mean ground speed of 235 km/hour
MAGNETOMETER :	Cesium Vapour optical absorption Sensitivity : 0.01 nT
RECORDING INTERVAL :	1.0 sec (approx 65 m sampling) at mean ground speed of 235 km/hour
DIGITAL RECORDING :	Geoterrex GEODAS acquisition system
NOMINAL TERRAIN CLEARANCE :	Magnetometer sensor in aircraft at 105 m EM transmitter in aircraft at 105 m EM receiver in towed bird at 62 m
NOMINAL LINE SPACING :	Traverse lines 200 m Tie lines peripheral
NOMINAL LINE DIRECTION :	Traverse lines 090/270 degrees Tie lines various
FLIGHT PATH NAVIGATION :	SERCEL NR103 GPS navigation system and a SINGER KEARFOTT AN/ASN 128 Doppler system with SPERRY C12 compass and V014 vertical gyro
FLIGHT PATH RECORD :	GPS positioning corrected for selected availability integrated with Doppler track

X COMPONENT Ch 2 IMAGE

Grid notation refers to Australian Map Grid Zone 55

Grid mesh size :	50 x 50 metres
Grid filter :	5pt triangular, no threshold
Contour Interval :	50, 500 and 5000 ppm

COLOUR KEY - ppm

-120.0	210.0
-75.0	230.0
-55.0	255.0
-35.0	275.0
-15.0	295.0
5.0	315.0
25.0	335.0
45.0	355.0
65.0	395.0
90.0	460.0
110.0	540.0
130.0	665.0
150.0	850.0
170.0	1245.0
190.0	2070.0
210.0	3780.0

Grid Convergence = 1.10°
Declination = 13.30°

SCALE 1:25000

500 0 500 1000 1500 2000 m

5 cm

JOB NO : 2-735
Surveyed by GEOTERREX PTY LTD : MARCH 1996
Compiled by GEOTERREX PTY LTD, SYDNEY
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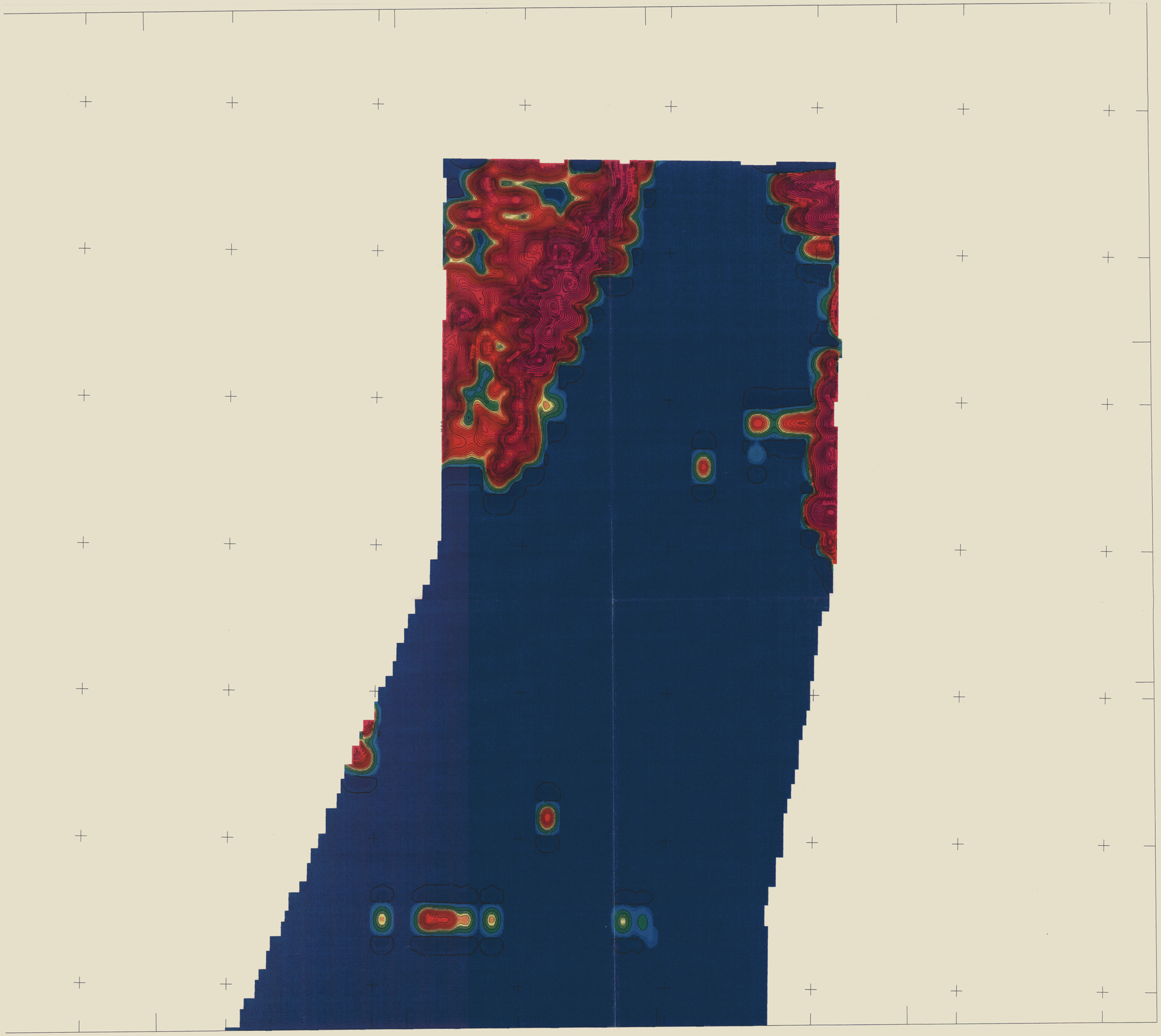
PLUTONIC OPERATIONS LTD.
R.REID & R.CLOSE - VOL 2OF 2

PLUTONIC OPERATIONS LIMITED

SORELL PENINSULA EL4/92 EL7/92
X COMPONENT Ch 2 IMAGE
25HZ 4MS GEOTEM
311196
SHEET 3 OF 4 **PLATE 11**



EM SYSTEM :	GEOTEM III 25 Hz Pulse width : 4108 microseconds Components : X and Z Channel centres : 501.658.814.1048.1361 1751.2220.2767.3470.4330.5345.6517.7923 9642.11830.14486 microseconds after transmitter turn off Impulse channel centres : 469.781.1094.1406 microseconds after transmitter turn on
RECORDING INTERVAL :	0.25 sec (approx 16 m sampling) at mean ground speed of 235 km/hour
MAGNETOMETER :	Cesium Vapour optical absorption Sensitivity : 0.01 nT
RECORDING INTERVAL :	1.0 sec (approx 65 m sampling) at mean ground speed of 235 km/hour
DIGITAL RECORDING :	Geoterrex GEODAS acquisition system
NOMINAL TERRAIN CLEARANCE :	Magnetometer sensor in aircraft at 105 m EM transmitter in aircraft at 105 m EM receiver in towed bird at 62 m
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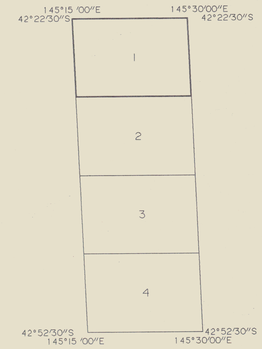
NOMINAL LINE DIRECTION :	Traverse lines 090/270 degrees Tie lines various
FLIGHT PATH NAVIGATION :	SERCEL NR103 GPS navigation system and a SINGER KEARFOTT AN/ASN 128 Doppler system with SPERRY C12 compass and VG14 vertical gyro
FLIGHT PATH RECORD :	GPS positioning corrected for selected availability integrated with Doppler track

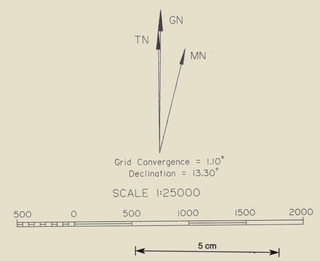
X COMPONENT ADI IMAGE

Grid notation refers to Australian Map Grid Zone 55
ADI calculated from channels 5 to 10
Grid mesh size : 50 x 50 metres
Grid filter : 5pt triangular, no threshold
Contour interval : 50, 500 and 5000 units

COLOUR KEY - adi units

-5.0	165.0
5.0	175.0
15.0	190.0
30.0	200.0
40.0	210.0
50.0	225.0
60.0	235.0
75.0	245.0
85.0	255.0
95.0	270.0
110.0	280.0
120.0	290.0
130.0	305.0
145.0	315.0
155.0	760.0
165.0	1955.0





97-3989

ANNUAL REPORT - ELS 4/92 & 7/92
PLUTONIC OPERATIONS LTD.
R.REID & R CLOSE - VOL 2 OF 2

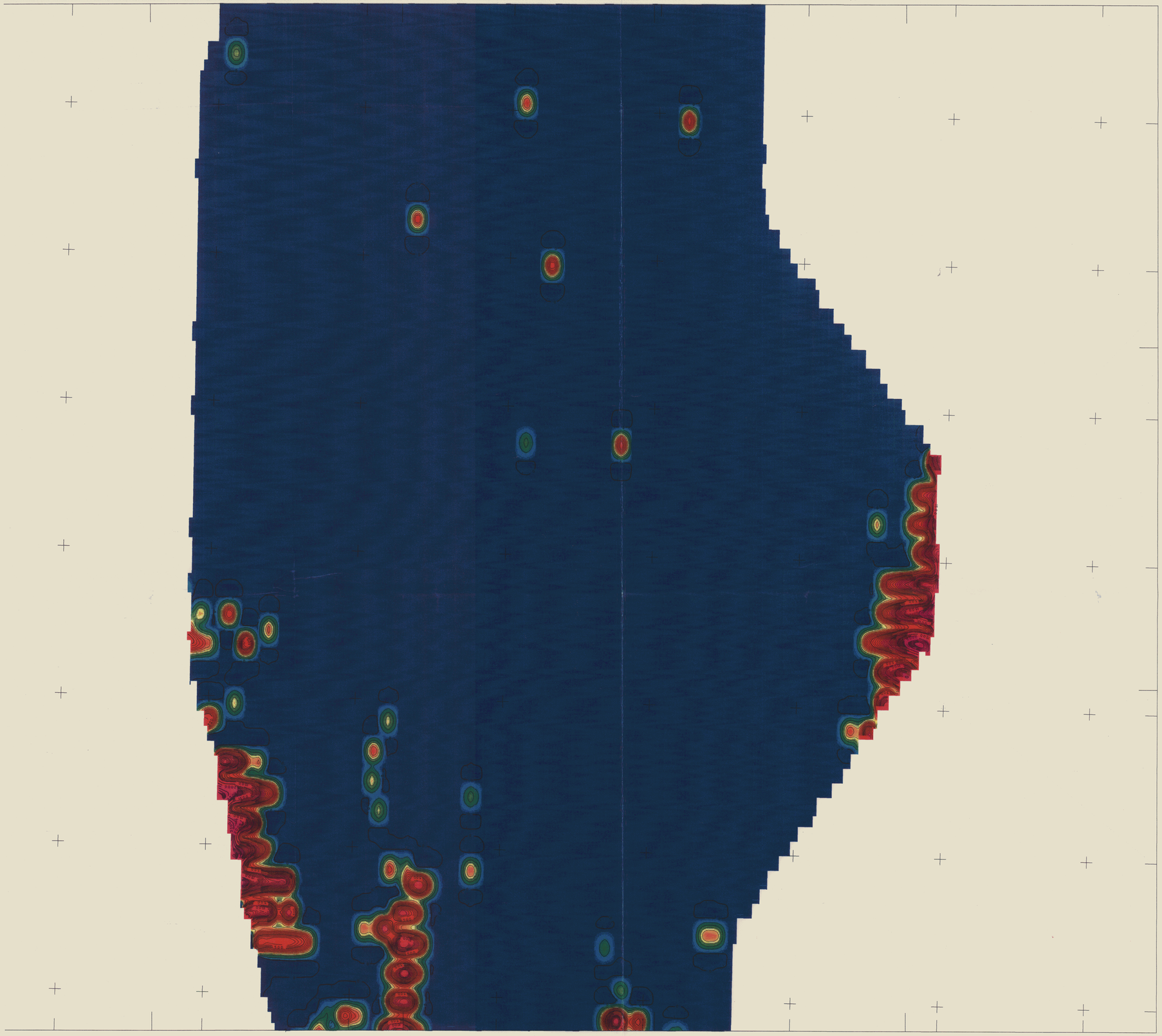
JOB NO : 2-735
Surveyed by GEOTERREX PTY LTD : MARCH 1996
Compiled by GEOTERREX PTY LTD, SYDNEY
Processed by GEOTERREX PTY LTD, SYDNEY

311197

PLUTONIC OPERATIONS LIMITED

SORELL PENINSULA EL4/92 EL7/92
X COMPONENT ADI IMAGE
25HZ 4MS GEOTEM
SHEET 1 OF 4 **PLATE 12**

CREATED : MC	DRAWING NO :
CHECKED : WDM	DATE : 12-APR-1996



AIRBORNE SURVEY SPECIFICATIONS

EM SYSTEM :	GEOTEM III 25 Hz Pulse width : 4108 microseconds Components : X and Z Channel centres : 501.658.814.1048.1361 1751.2220.2767.3470.4330.5345.6517.7923 9642.11830.14486 microseconds after transmitter turn off Inpulse channel centres : 469.781.1094.1406 microseconds after transmitter turn on
RECORDING INTERVAL :	0.25 sec (approx 16 m sampling) at mean ground speed of 235 km/hour
MAGNETOMETER :	Cesium Vapour optical absorption Sensitivity : 0.01 nT
RECORDING INTERVAL :	1.0 sec (approx 65 m sampling) at mean ground speed of 235 km/hour
DIGITAL RECORDING :	Geoterrex GEODAS acquisition system
NOMINAL TERRAIN CLEARANCE :	Magnetometer sensor in aircraft at 105 m EM transmitter in aircraft at 105 m EM receiver in towed bird at 62 m
NOMINAL LINE SPACING :	Traverse lines 200 m Tie lines peripheral
NOMINAL LINE DIRECTION :	Traverse lines 090/270 degrees Tie lines various
FLIGHT PATH NAVIGATION :	SERCEL NR103 GPS navigation system and a SINGER KEARFOTT AN/ASN 128 Doppler system with SPERRY C12 compass and VG14 vertical gyro
FLIGHT PATH RECORD :	GPS positioning corrected for selected availability integrated with Doppler track

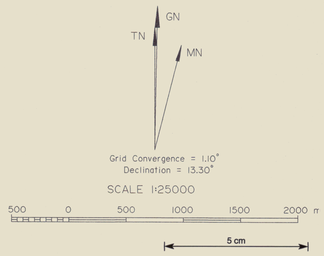
X COMPONENT ADI IMAGE

Grid notation refers to Australian Map Grid Zone 55

ADI calculated from channels	5 to 10
Grid mesh size :	50 x 50 metres
Grid filter :	5pt triangular, no threshold
Contour interval :	50, 500 and 5000 units

COLOUR KEY - adi units

-5.0	165.0
5.0	175.0
15.0	190.0
30.0	200.0
40.0	210.0
50.0	225.0
60.0	235.0
75.0	245.0
85.0	255.0
95.0	270.0
110.0	280.0
120.0	290.0
130.0	305.0
145.0	315.0
155.0	760.0
165.0	1955.0



JOB NO : 2-735
Surveyed by GEOTERREX PTY LTD : MARCH 1996
Compiled by GEOTERREX PTY LTD, SYDNEY
Processed by GEOTERREX PTY LTD, SYDNEY

311198

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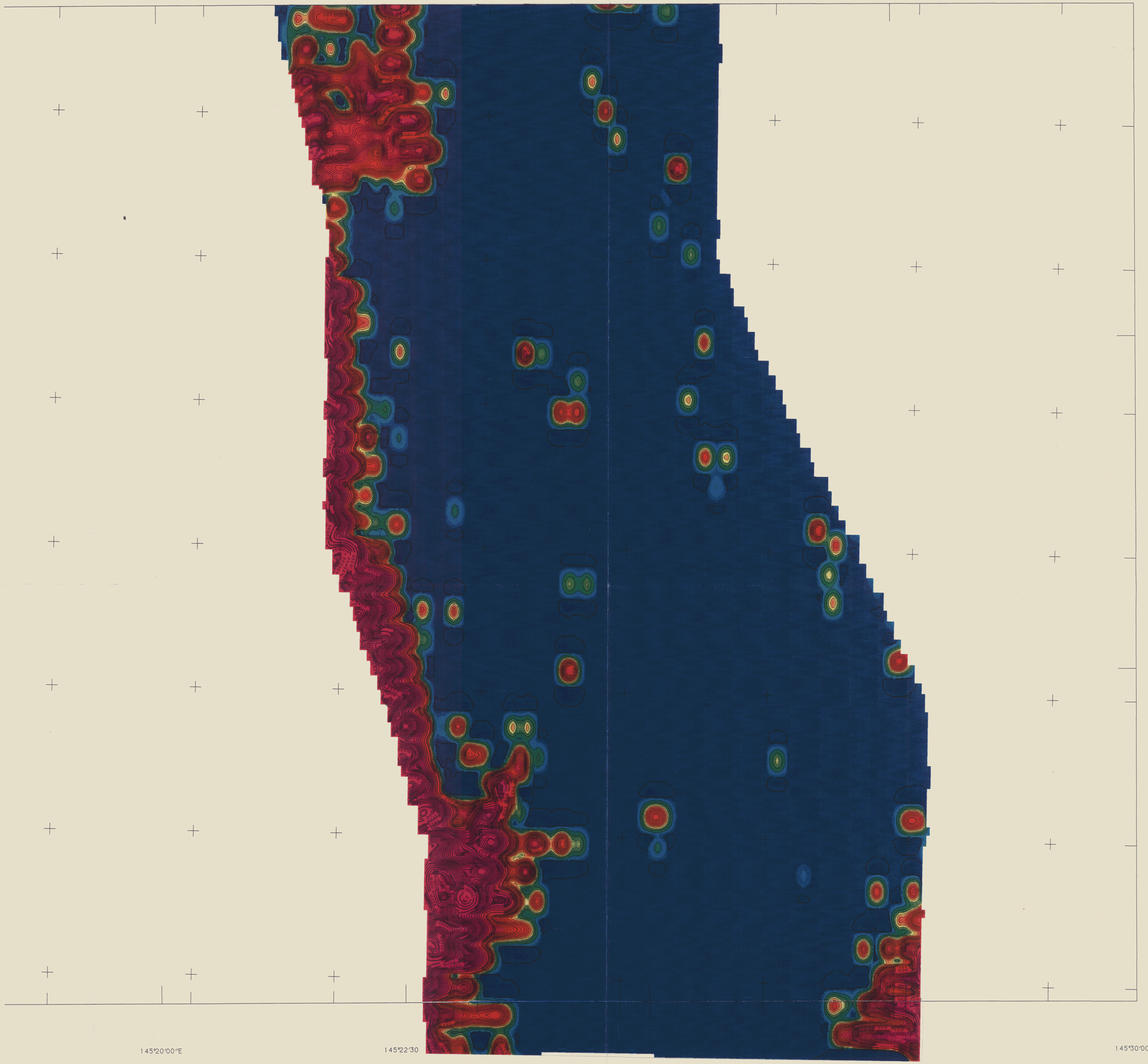
ANNUAL REPORT - ELS 492 & 792
PLUTONIC OPERATIONS LTD.
R.REID & R CLOSE - VOL 2OF 2

PLUTONIC OPERATIONS LIMITED

SORELL PENINSULA EL4/92 EL7/92
X COMPONENT ADI IMAGE
25HZ 4MS GEOTEM
SHEET 2 OF 4 **PLATE 13**

CREATED : MC
DRAWING NO :



AIRBORNE SURVEY SPECIFICATIONS

EM SYSTEM :	GEOTEM III 25 Hz Pulse width : 4108 microseconds Components : X and Z Channel centres : 501.658.814.1048.1361 1751.2220.2767.3470.4330.5345.6517.7923 9642.11830.14486 microseconds after transmitter turn off Inpulse channel centres : 469.781.1094.1406 microseconds after transmitter turn on
RECORDING INTERVAL :	0.25 sec (approx 16 m sampling) at mean ground speed of 235 km/hour
MAGNETOMETER :	Cesium Vapour optical absorption Sensitivity : 0.01 nT
RECORDING INTERVAL :	1.0 sec (approx 65 m sampling) at mean ground speed of 235 km/hour
DIGITAL RECORDING :	Geoterrex GEODAS acquisition system
NOMINAL TERRAIN CLEARANCE :	Magnetometer sensor in aircraft at 105 m EM transmitter in aircraft at 105 m EM receiver in towed bird at 62 m
NOMINAL LINE SPACING :	Traverse lines 200 m Tie lines peripheral
NOMINAL LINE DIRECTION :	Traverse lines 090/270 degrees Tie lines various
FLIGHT PATH NAVIGATION :	SERCEL NR103 GPS navigation system and a SINGER KEARFOTT AN/ASN 128 Doppler system with SPERRY C12 compass and VG14 vertical gyro
FLIGHT PATH RECORD :	GPS positioning corrected for selected availability integrated with Doppler track

X COMPONENT ADI IMAGE

Grid notation refers to Australian Map Grid Zone 55
ADI calculated from channels 5 to 10

Grid mesh size :	50 x 50 metres
Grid filter :	5pt triangular, no threshold
Contour interval :	50, 500 and 5000 units

COLOUR KEY - adi units

-5.0	165.0
5.0	175.0
15.0	190.0
30.0	200.0
40.0	210.0
50.0	225.0
60.0	235.0
75.0	245.0
85.0	255.0
95.0	270.0
110.0	280.0
120.0	290.0
130.0	305.0
145.0	315.0
155.0	760.0
165.0	1955.0

Grid Convergence = 1.10°
Declination = 13.30°

SCALE 1:25000

500 0 500 1000 1500 2000 m

5 cm

JOB NO : 2-735
Surveyed by GEOTERREX PTY LTD : MARCH 1996
Compiled by GEOTERREX PTY LTD, SYDNEY
Processed by GEOTERREX PTY LTD, SYDNEY

PLUTONIC OPERATIONS LIMITED

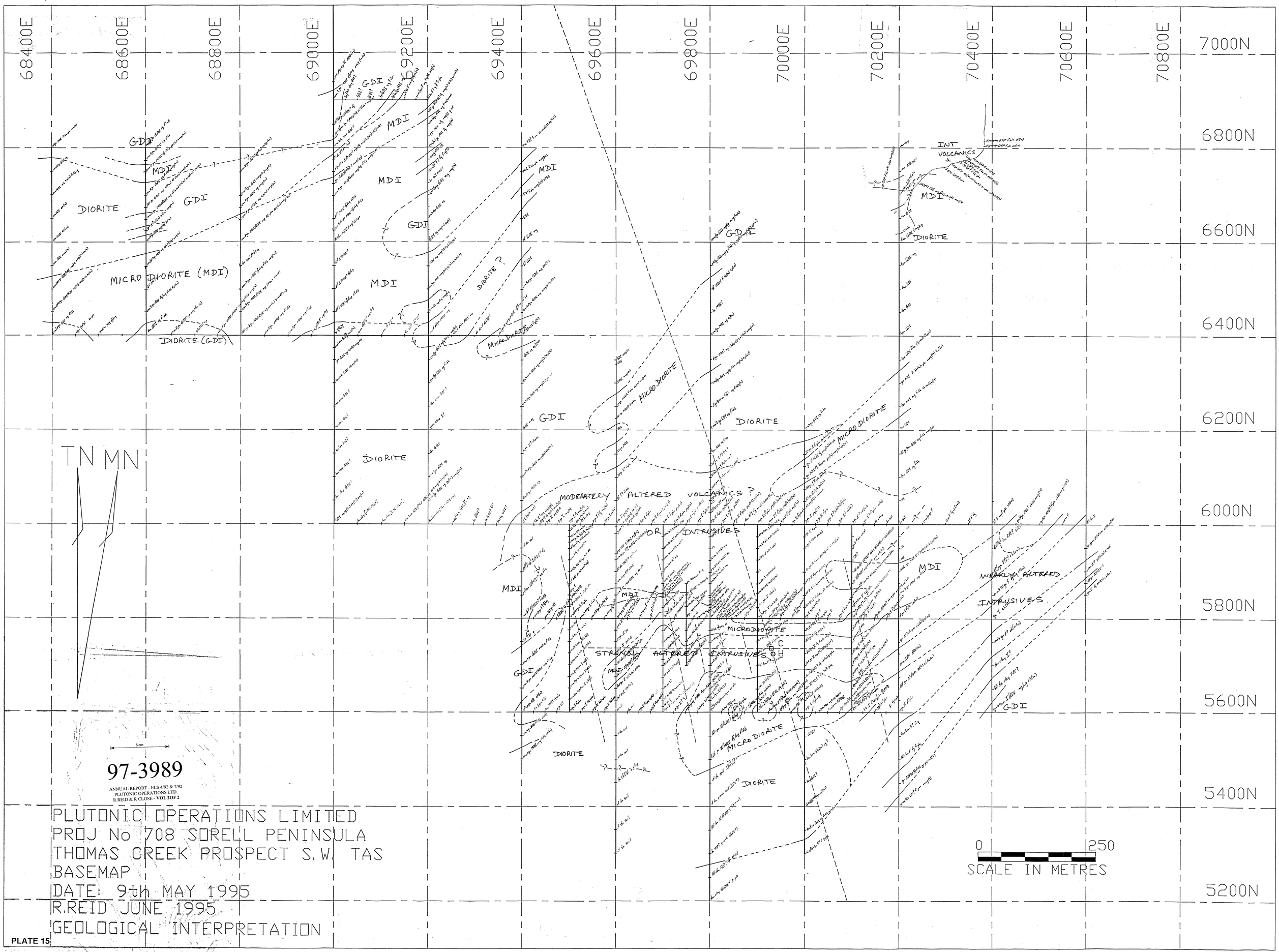
SORELL PENINSULA EL4/92 EL7/92
X COMPONENT ADI IMAGE
25HZ 4MS GEOTEM
SHEET 3 OF 4 **PLATE 14**

311199

CREATED : MC
DRAWING NO :

97-3989

ANNUAL REPORT - ELS 4/92 & 7/92
PLUTONIC OPERATIONS LTD.
R.REID & R CLOSE - **VOL 2 OF 2**



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ANNUAL REPORT - ELS 4/92 & 7/92
PLUTONIC OPERATIONS LTD.
R.REID & R CLOSE - VOL 2OF 2

PLUTONIC OPERATIONS LIMITED
PROJ No 708 SORELL PENINSULA
THOMAS CREEK PROSPECT S.W. TAS
BASEMAP
DATE: 9th MAY 1995
R.REID JUNE 1995
GEOLOGICAL INTERPRETATION

PLATE 15

311200

370 000E
371 000E
372 000E
373 000E
5286 000N
5285 000N
210
GDI/An
An?-Sil
Thomas Creek Camp
I-f
I-Py4%
K-Sil
I-e
An-fa
Qv
51, 153, 153
An-fa
Py1%
CPy Trace
I-f, a, Qv
I-f, a, Ch, Qv
8, 378, 289
An-f
Sv
I-f, m
Sv-Bx
Ch-Py-m
I-f
Sv
Qv
Ie
Tc

Tc — Tertiary cover
GDI - IntermediateIntrusive
f - feldspar porphyritic
a - augite porophyritic
e - equigranular
I - undifferentiated Intrusive
Sv - Volcaniclastic SST
Py - Pyritic
Ch - Chloritic
M - Magnetic
Cpy - Chalcopyrite
Ks-Sil - K-spar-silica alteration
Sil - Siliceous
Bx - Brecciated
Qv - Quartz veins
X Anomalous Rockchip Geochemistry Cu, Pb, Zn
Walking track

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N

0 0.5km
Scale 1:10000

LOCALITY MAP
FLINDERS ISLAND
KING ISLAND
LAUNCESTON
TASMANIA
THOMAS CREEK
HOBART

REVISION	PLUTONIC OPERATIONS LIMITED
Technical Report No.	PROJECT: 708
CHECKED BY:	THOMAS CREEK RECONNAISSANCE GEOLOGY
DATE: FEB 1997 SCALE: 1:	REF : FILE: c:\lachlan\recgeol2.dgn DATE: 13-Mar-97 07:28 — DWG. NO.:

311201

5 cm

PLATE 16

370 000E
371 000E
372 000E
373 000E
5286 000N
5285 000N
5285500N
210
16990
16984, 88
16992
16993
16985
16989
16982, 87
16991
16983
18445
18428
18429
18430
18436
18437
18438
camp
18464
18454
18455-7
18453
18434
18451
18444
18443
18442
18421
18458
18456
18452
18431
18447
18423
18450
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18459
18432
18422
18427
18460
18462
18461
18446
18463
18426
18435
18425
Plutonic Operations Ltd
Plutonic Operations Ltd
Thomas Creek Prospect Ground
Sorell 1:100,000 SW
Contour Interval 100ft
X Drainage - 80# or BLEG (708)
PANCON
Soil - 80#
Rockchip
5 cm
N
0
0.5km
Scale 1:10000

LOCALITY MAP
FLINDERS ISLAND
KING ISLAND
LAUNCESTON
TASMANIA
THOMAS CREEK
HOBART

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Technical Report No.	PROJECT: 708	
CHECKED BY:	THOMAS CREEK RECONNAISSANCE GEOCHEMISTRY	
DATE: FEB 1997 SCALE: 1 :	REF : DATE: 14-Mar-97 09:40 FILE: e:\acaddwg\tas\tomcreek\recgeol1.dgn	DWG. NO.:

PLATE 17

311202

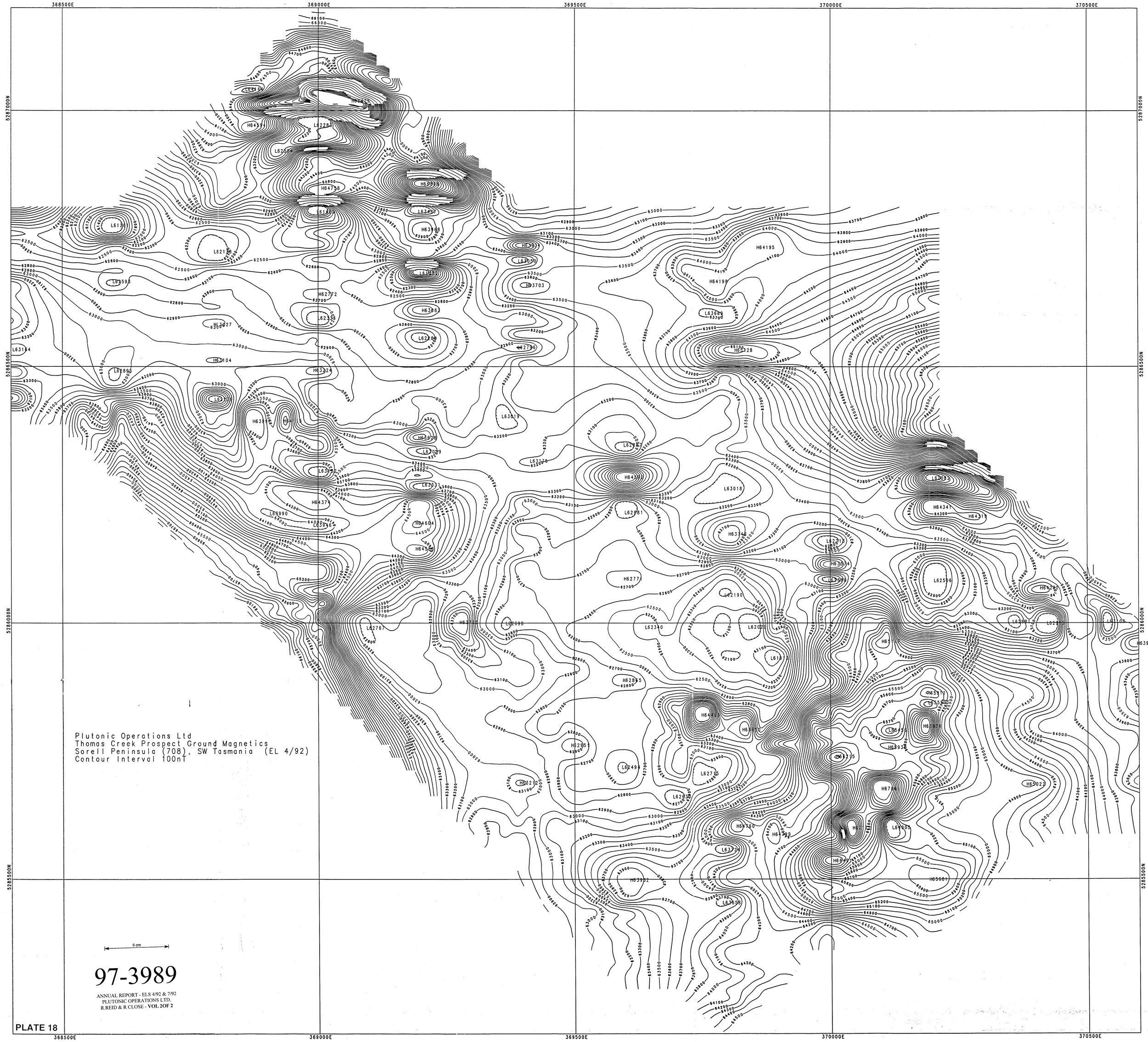

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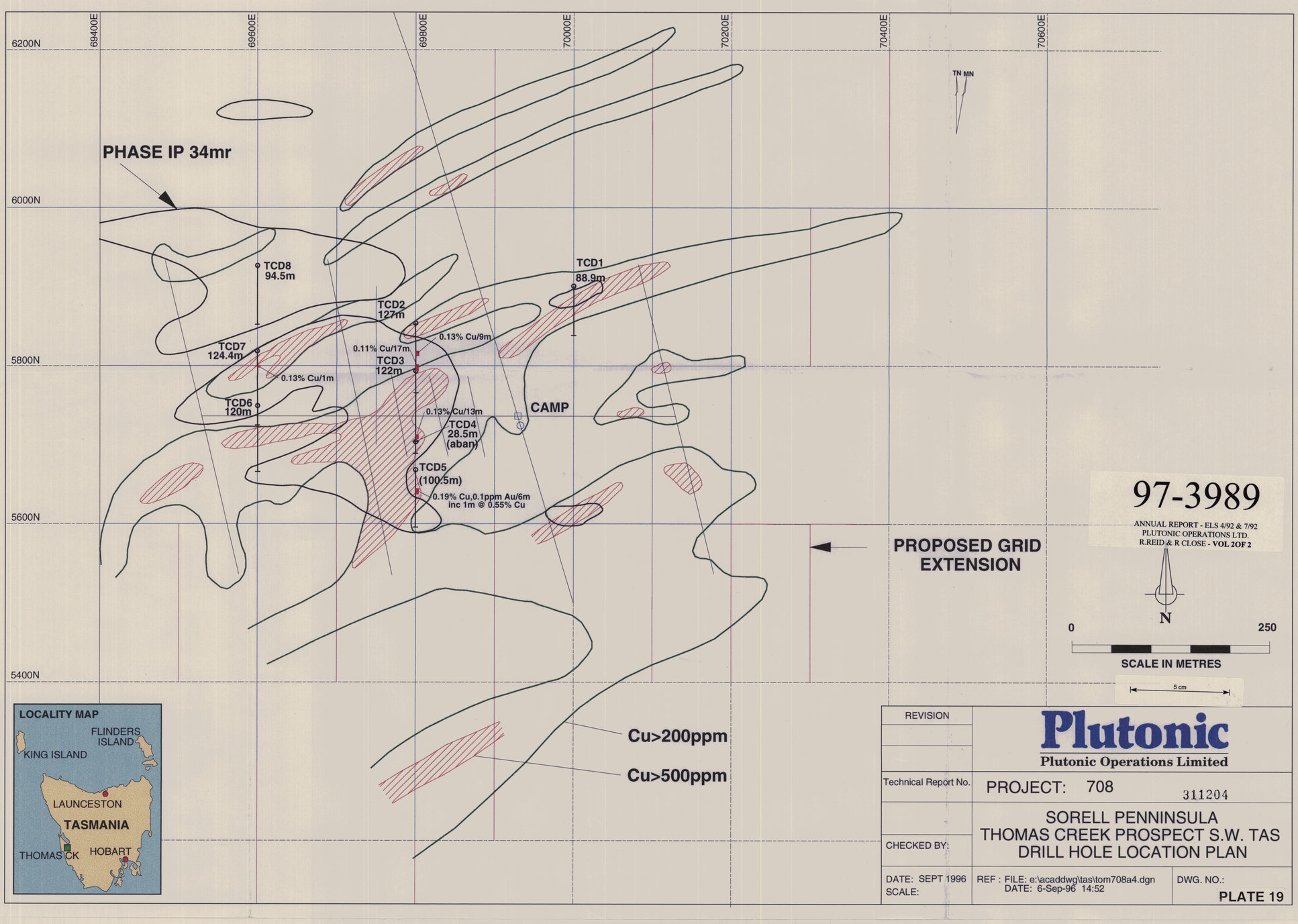
PLATE 18

311203



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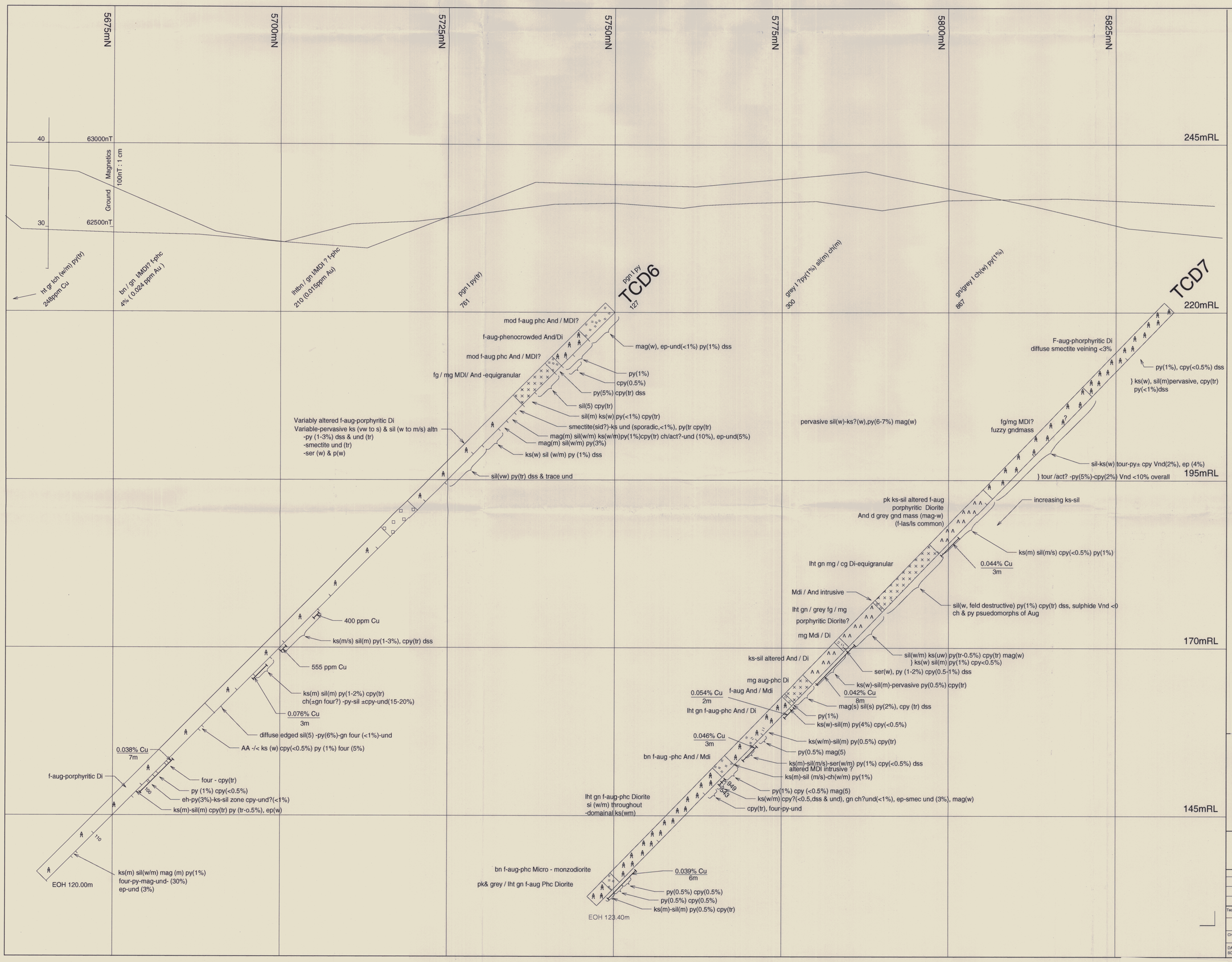
Technical Report No.	PROJECT: 708 311204	
CHECKED BY:	SORELL PENNINSULA THOMAS CREEK PROSPECT S.W. TAS DRILL HOLE LOCATION PLAN	
DATE: SEPT 1996 SCALE:	REF : FILE: e:\acaddwg\tas\tom708a4.dgn DATE: 6-Sep-96 14:52	DWG. NO.: PLATE 19



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LOCALITY MAP

SHEET INDEX

SCALE 1 : 250

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Technical Report No.	PROJECT: 000 - THOMAS CREEK
CHECKED BY:	SECTION 369600(a)mE
DATE: SEP 1996 SCALE: 1 : 250	REF : FILE: e:\acad\dwg\las\tomcreek\369600a.dgn DATE: 23-Dec-96 08:40 — DWG. NO.:

311205

PLATE 20

5800mN 5825mN 5850mN 5875mN 5900mN 5925mN 5950mN

Resistivity Values - underlined eg. 584

63000nT
40
Gradient Array - chargability
62800nT
Ground Magnetics
100nT : 1 cm
30
62600nT
Soil Geology
gn / grey l py (1%) ch(w)
62400nT

716 901 557 647 495 432 392

245mRL

Resistivity
Chargability
Magnetics

Zonation ?
-mag-rich intrusive core (potassic core)
-sulphide-rich shell (phylloc envelope)
corresponds with chargability heights

-compared with
mag high @ TCD2 63800nT
TCD1 63200nT

TCD7

12 cm & gn MDI ? (f-aug And) mg

Cym/Pgn F/l ch(w)
83ppm Cu

f-g-aug-phc MDI?

lht bn TA/F? f-gr-rich
11ppm Cu

TCD8

Cym/Pgn F?l py(1%) mls(1%) ch(w)
122ppm Cu

94ppm Cu Pgn F/l sil(m) py(2%)

220mRL

lht gn f-aug porphyritic Di
ser(w/m) und(2%), py(1-2%)
sil(w)

sil(m) py(15%)

ch(w)

tour sil-ep ±py und(2%)

note:- boundaries represent alt'n rather than lithology in TCD8

195mRL

lht gn f-aug porphyritic Di
- aug selective ch alt(w)
- isolated pervasive sil zones, ~15%

lht gn & gery f-aug-porphyritic Di
& pervasive mag alt / aug-phc I
intrusives(?), -py(1-2%), cpy(tr)
- late ep(w) und

0.053% Cu
2m

mag(s)

} py(4-6%) cpy(<0.5)

170mRL

ks(w), sil(w/m) mag(m) py(<0.5%)

pk / lht gn f-aug-porphryitic Di
- ks(w), sil (m), ag(n)
py(0.5-2%) cpy(tr)

0.038% Cu
6m

EOH 94.50m

- mag indicates north plunging body.
- Dipole -dipole data shows a southerly
plunging trend for chargability & resistivity?

145mRL

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LOCALITY MAP

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2.5m 0 5 10 15m
SCALE 1 : 250

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DATE: SEP 1996 SCALE: 1 : 250	REF : FILE: e:\acaddwg\tas\tomcreek\369600b.dgn DATE: 23-Dec-96 08:39
	DWG. NO.:

311206

5 cm

PLATE 21

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LOCALITY MAP

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2.5m 0 5 10 15m
SCALE 1 : 250

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SECTION 369800(a)mE

DATE: SEP 1996
SCALE: 1 : 250

REF : FILE: e:\acaddwg\tasmcreek\369800a.dgn
DATE: 23-Dec-96 08:38

DWG. NO.:

5 cm

PLATE 22

311207

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LOCALITY MAP

SHEET INDEX

SCALE 1 : 250

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PROJECT: 000 - THOMAS CREEK

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SECTION 369800(b)mE

DATE: SEP 1996
SCALE: 1 : 250

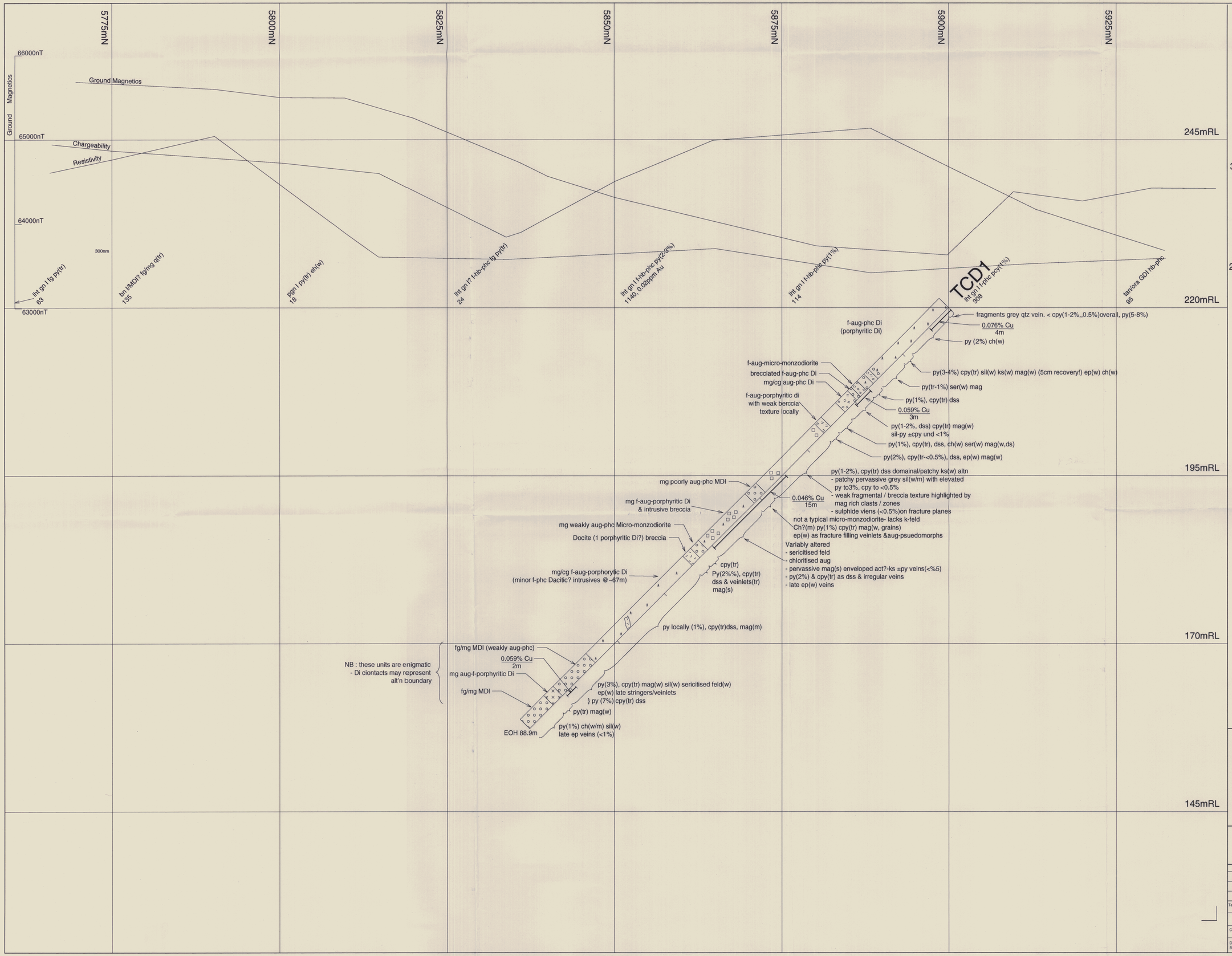
REF : FILE: e:\acaddwg\tas\tomcreek\369800b.dgn
DATE: 23-Dec-98 08:37

DWG. NO.:

311208

5 cm

PLATE 23



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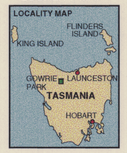
LOCALITY MAP



SHEET INDEX

2.5m 0 5 10 15m
SCALE 1 : 250

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Technical Report No.	PROJECT: 000 - THOMAS CREEK
CHECKED BY:	SECTION 370000(a)mE
DATE: SEP 1996 SCALE: 1 : 250	REF : FILE: e:\acaddwg\tas\tomcreek\370000a.dgn DATE: 23-Dec-96 08:36 — DWG. NO.:

311209

5 cm

PLATE 24