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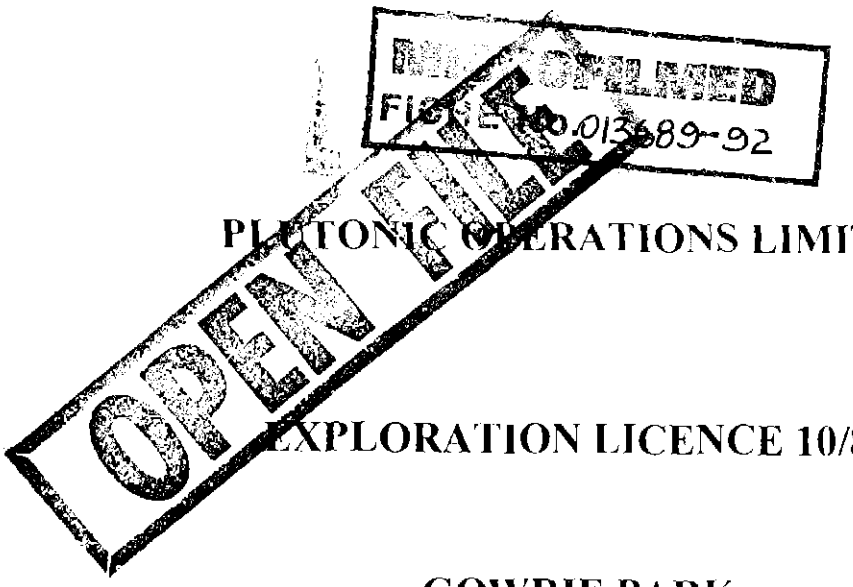
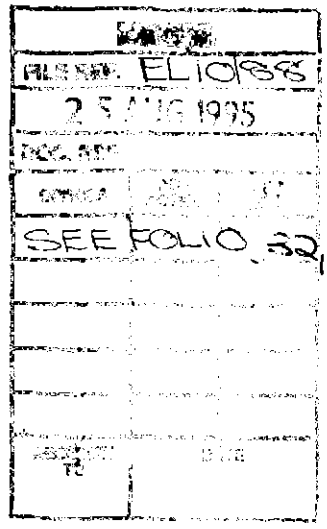


PLUTONIC OPERATIONS LIMITED

EXPLORATION LICENCE 10/88

GOWRIE PARK



Annual Report on Exploration Activity

August 1994 to July 1995

95-3763

ANNUAL REPORT GOWRY PARK 1994-5
EL 10/88 PLUTONIC OPERATIONS
CLOSE, R.J. - MACDONALD, G.

ly: R J Close
G MacDonald

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TABLE OF CONTENTS

FIGURES

PLATES

TABLES

APPENDICES

1.0 SUMMARY AND RECOMMENDATIONS

1.1 Summary

Two new diamond drill holes totalling 395 metres were completed at Cethana East during September to October 1994.

Drill hole CED 1 which was targeted on a dipole-dipole IP chargeability high on line 22,400E, intersected a sub-vertically dipping package of moderately sericite and/or chlorite ± haematite ± pyrite altered, generally medium grained felsic volcanics/volcaniclastics. The IP response was successfully explained by a zone of deformed pyrite stringers and blebs.

Drill hole CED 2 was targeted on both a dipole-dipole IP chargeability high on line 21,800E (deeper target) and the strike extension of a small base metal lens intersected 75m west in DD77CC5. CED2 intersected a similar sequence as in CED 1 with the upper prospective horizon containing slightly elevated base metals in fine volcaniclastics/sediments however the mineralisation appears to be epigenetic in late stage veinlets. The lower IP target corresponds to a weak zone of stratabound disseminated and stringer pyrite as in CED1.

DHEM surveys were conducted on drill holes CED1 and CED2 as well as three of the five existing CRAE holes. No anomalous responses were detected in CED1, CED2, DD77CC6 and DD77CC8. A weak in-hole response noted in DD77CC7 corresponds to a small massive pyrite lens, whilst the survey of DD77CC4 gave an unusual inhole response suggesting that drill casing has been left in the hole.

With regards to Cethana East, the following summary can be made based on the last two decades work:-

- A strong IP chargeability anomaly tested from 21600E to 22400E by drill holes DD77CC7, DD77CC4, CED 2 and CED 1 is due to a stratabound zone of deformed pyrite stingers/blebs with only moderately elevated base metal values. Within this zone, two possibly exhalative pyritic lenses intersected by DD77CC4, and DD77CC7 have been shown by DHEM to have limited strike extent even though the DD77CC4 intersection may not be fully tested.

- The anomalous base metal horizon overlying the western part of the major IP zone was intersected in DD77CC5, DD77CC6 and CED2, but does not extend east along strike to line 22400E and may not continue down-dip below DD77CC5 in DD77CC8. However it remains open to the west.

- The mineralisation tested to date could be considered stringer style and footwall to an undefined exhalative position up sequence towards the top of the altered geochemically anomalous volcaniclastics in this prospect. This new target should be the focus of ongoing exploration at Cethana.

1.2 Recommendations

It is recommended that further work should be carried out on the westerly strike extension of the anomalous base-metal horizon intersected in DD77CC6 and DD77CC5. This could be best carried out by the drilling of a fence of angled percussion holes along a powerline track, corresponding roughly with lines 21400E and 21450E.

The conceptual exhalative target to the north may be related to open ended base metal soil anomalies extending westwards from Olivers Road for at least one kilometre. Bedrock auger sampling should be conducted where applicable, followed up by fences of shallow percussion holes to define geological and geochemical trends beneath glacial cover. Targets may be refined by relevant geophysical surveys prior to diamond drill testing.

2.0 INTRODUCTION

2.1 Tenure

EL 10/88 (Figure 1) was previously a joint venture between Plutonic Operations Ltd and Noranda Pty Ltd, however on 2 June 1992 Plutonic Operations Ltd became the sole licensee and operator.

Previously the ground was part of EL 7/73 granted to Asarco in March 1973. In 1974 Asarco relinquished 297km^2 of the original 743km^2, then CRA Exploration Pty Ltd (CRAE) joint ventured into the EL in July 1976 and also pegged EL 10/76 which covered the southern part of the Lake Barrington portion of the present Gowrie Park EL. CRAE became the license holders in December 1979, reducing the total area of 7/73 to 199km^2 and Asarco sold its share to Carpentaria Exploration Co Ltd in June 1980. In 1983 CRAE became the sole lease holder until relinquishment of the EL in 1988.

Noranda Pty Ltd successfully tendered for the ground in August 1989, and added another 8km^2 as EL 35/88. The Mines department subsequently added another 0.9 km^2 in order to rationalise the boundaries with AMG grid lines. The EL was in two parts, however, all exploration and reporting has been conducted as if one license. Following relinquishment of half of the original area in 1993 the EL was divided into three parts (see Figure 2).

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DATE: 2nd June 95	
SCALE: 1:1250	SOURCE:
	DWG NO.: 1

Plutonic

Plutonic Operations Limited

A.C.N. 004 680 997

2.2 Access and Land Usage

Good access to all parts of the EL is provided by bitumen roads as well as HEC and old forestry tracks. However, access to individual prospects and/or desirable drill sites can be problematic because of steep topography. Lake Barrington itself provides excellent access by boat for the purposes of mapping

Effectively all of the prospective rocks in the EL are within State Forest, the exception being part of the Cethana West Prospect which lies within land vested to the HEC

3.0 REGIONAL GEOLOGY

The prospective rocks within the EL are part of the Cambrian Mt. Read volcanics which host five gold rich polymetallic VMS deposits in Western Tasmania. These include Mt Lyell, Hercules, Rosebery, Que River and Hellyer as well as the Henty gold deposit. In addition, there are numerous occurrences of sub-economic deposits and VMS style alteration throughout the belt.

All of the above deposits occur in the Dundas Trough along the major north-south trending part of the volcanic belt which runs from Elliott Bay to north of Hellyer. The Mt Read volcanics that outcrop in EL 10/88 occupy a subsidiary region, the Fossey Mountain Trough, which trends roughly east-south-easterly from north of Hellyer to beyond Deloraine.

In the vicinity of the Gowrie Park tenement, (refer Figure 2), Tasmanian Mines Department MRBP 1:50,000 mapping stops just within the western most boundary of the EL and is included in the "Geology of the Winterbrook-Moina" area. Other than this, the most recent Mines Department regional mapping is the very outdated "Sheffield" (1959) and Middlesex (1958) one mile to one inch mapping. Proposed revision of the "Sheffield" sheet has been shelved indefinitely

Early Cambrian volcanism in the main Mount Read Belt was rhyolitic to dacitic in composition followed by a period of andesitic-basaltic volcanism before a return to felsic volcanism in the late Cambrian. The VMS orebodies of Rosebery and Hercules are believed to have formed later in the initial felsic volcanic phase, whereas the Que and Hellyer orebodies formed during the subsequent mafic-intermediate phase The disseminated copper orebodies at Mt Lyell are hosted in the lower felsic phase but may be time correlates of the mafic intermediate phase having mainly been deposited sub-surface, possibly due to fluid boiling.

This relative ageing of mineralising events is subject to considerable debate due to the overprinting of alteration and deformation over initially complex inter-fingering relationships of volcanic packages related to separate volcanic centres.

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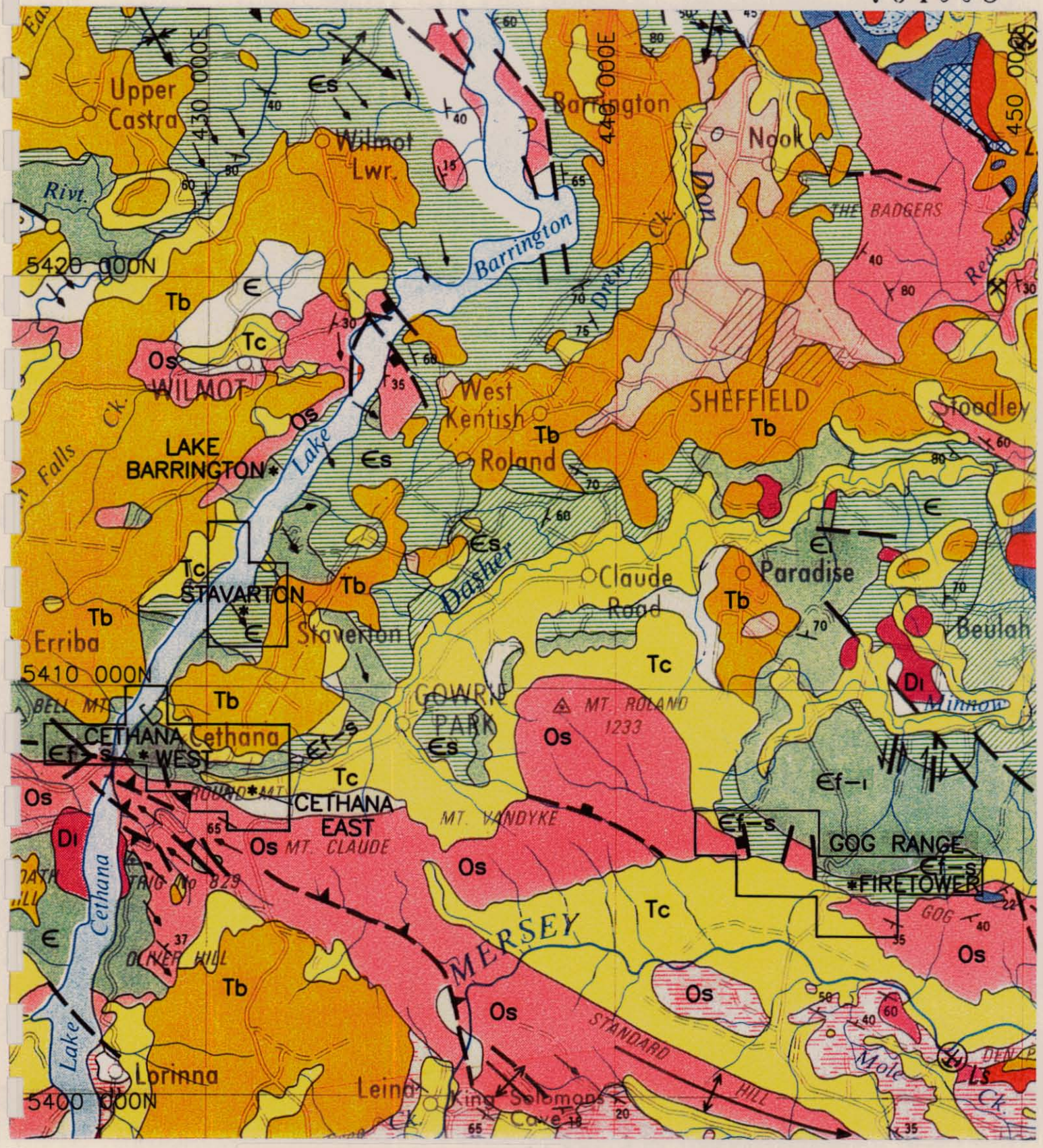


LEGEND

Tc	TERTIARY-RECENT COVER
Tb	TERTIARY BASALT
Di	DEVONIAN INTRUSIVE
Os	ORDOVICIAN SEDIMENTS
Es	CAMBRIAN SEDIMENTS
Ef-i	CAMBRIAN FELSIC-INTERMEDIATE VOLCANICS
*	PROSPECTS

REVISION:	
TECHNICAL REPORT NUMBER:	
CHECKED BY:	RJC
DATE:	18-8-95
SCALE:	1 : 125 000

Plutonic

Plutonic Operations Limited

A.C.N. 004 680 997

PROJECT: 706 – GOWRIE PARK

REGIONAL GEOLOGY AND PROSPECTS

SOURCE:

DWG. NO.: 2

The volcanics and associated sediments of the Fossey Mountain Trough have an uncertain position within this stratigraphy because regional mapping has revealed significant differences between the volcanic sequences in the Dundas Trough and the Fossey Mountain Trough. In particular the mafic-intermediate phase as represented by the Beulah Formation south of the Sheffield, may be more significant in the north of the state than in the central western part of the belt.

In the Fossey Mount Trough the siliciclastic largely Precambrian derived Roland Conglomerate and Moina Sandstone, of Late Cambrian-Ordovician age, unconformably overlie the Cambrian volcanics with small outlies of these younger rocks capping the volcanics in many places. That the unconformity is clearly angular in many places indicates that there was a major phase of deformation, (compressional) in the Late Cambrian, prior to the deposition of the siliciclastics.

The siliciclastics are overlain by the Gordon Limestone. These younger post volcanic rocks were themselves folded, during the mid-Devonian Tabberabberan Orogeny during which time some thrust faulting is believed to have taken place. (Jennings, 1979).

Williams (1979) refers to two phases of mid-Devonian folding, earlier east-west "Loongana/Wilmot trend" folds with a half wavelength of 5 km and later north-westerly to northerly "Deloraine/Railton trend" folds with a half wavelength of 2.5 km. These two folds trends interfere in the Fossey Mountains.

In general, Cambrian deformation is not considered to have produced the S1 cleavage which is considered to be consistent with the earlier of the two mid-Devonian fold trends. However, Woodward et al (193) has highlighted the significance of thrusting during both late-Cambrian and mid-Devonian deformation. Recognition of thrust faulted contacts along portions of the southern margin of the Fossey Mountain Trough, indicate similar thrusts may be present in the Cambrian volcanic sequence, though none have been recognised.

Following the mid-Devonian deformation the north and west of Tasmania was intruded by granitic batholiths. Intrusive bodies in the region of EL10/88 include the Dalcoath Granite to the south of Cethana, and the Beulah Granite to the north of the Gog Range. The former granitoid was responsible for a number of relatively minor and possibly zoned base metal mineral deposits in the Moina area south-west of Cethana.

Tertiary tholeiitic basalt lavas which originally infilled most topographic lows, now occupy topographic highs and cover prospective Cambrian volcanics and associated sediments in many parts of the belt.

Glaciation in the Quaternary has produced both glacial deposits and scree which is locally widespread and covers much of the northern area of the Cethana East prospect.

4.0 EXPLORATION PHILOSOPHY

Exploration has targeted two mineralisation styles in EL 10/88. The initial target of ASARCO/CRAE was a polymetallic volcanic hosted massive sulphide (VHMS) orebody such as those found at Rosebery, Hercules, Que River and Hellyer. The pervasive alteration at Cethana and Staverton is very similar to that seen around these orebodies.

The presence of a number of small occurrences of VHMS style mineralisation within felsic volcaniclastics at Cethana East and West emphasise the relatively high prospectivity of these prospects in relation to the rest of the Fossey Mountain Trough.

In addition, whole rock/REE geochemistry and petrology on samples from Staverton suggest that these rocks are strongly altered correlates of the mafic Que-Hellyer footwall sequence and therefore are also highly prospective.

The second target is a Cambrian volcanic-hosted gold deposit. Models initially explored for by Noranda (Jones 1989) were South Hercules and Henty which are considered to be VHMS related, although the higher grade quartz vein-silicic mineralisation at the Henty Mine is probably syndeformational and Devonian in age.

Another discretely different style of volcanic hosted gold orebody is exemplified by Voyager 12 and 24 at Elliott Bay at the extreme south of the main Mt Read Belt, and other occurrences such as Anio Creek/Ten Mile Creek which lie south-east of Que and Hellyer. These occurrences are not spatially related to VHMS orebodies but appear to be spatially/genetically related to Cambrian quartz-feldspar-biotite porphyries which occur along the eastern and southern margin of the Dundas Trough and Fossey Mountain trough respectively. The Gog Range part of the EL, including the Fire Tower prospect is prospective for this style of deposit.

5.0 LOCAL GEOLOGY

5.1 Introduction

This district suffers the lack of a good regional compilation map of the type produced for the Mount Read Volcanic Project. Within the tenement area Plutonic has mapped at 1:1000 to 1:2500 prospect scales augmented by previous mapping by Aberfoyle and CRAE and reconnaissance traverses compiled by Macdonald 1993.

The oldest recognised Cambrian strata at Cethana occur in the southern part of Cethana West. These sediments are moderately to steeply dipping, face north-north-east and comprise fine chloritic, pyritic siltstones and lesser sandstones with interbedded conglomeratic mass flows which are haematite and magnetite bearing towards the top of the sequence.

The sediments are overlain by a package of felsic lavas, volcaniclastics (reworked tuffs) grading to fine tuffaceous sediments, which are all at least moderately sericite $\pm$ chlorite $\pm$ pyrite $\pm$ haematite altered with increasing intensity up sequence to the north. This pervasively altered package is overlain by steeply dipping, unaltered greywackes and conglomerates of probable intermediate derivation, together with interbedded intermediate lavas.

Along strike at Cethana East the altered felsic sequence is similar though the felsic volcaniclastics are more dominant and associated hydrothermal alteration more widespread than at Cethana West.

An enigmatic body of quartzite low in the package, just north of Olivers Road lookout may either be a thrust slice of Precambrian or Moina Sandstone as mapped by Herrmann (1989).

North of Cethana West the intermediate sediments/lava sequence is followed by relatively unaltered felsic lavas, felsic volcaniclastics and minor sediments until another zone of strong alteration and north-north-west striking schistosity is encountered at "Campground". North of these altered felsic volcaniclastics, alteration intensity decreases and the rocks become more clearly sedimentary up to just before the Staverton prospect where outcrop includes intermediate derived mass flows and lava breccias amongst siltstones and sandstones. These sediments in turn are overlain by strongly altered andesitic to dacitic lavas at Staverton.

Further north between Staverton and the Lake Barrington prospect the stratigraphy becomes quite complex with interbedded unaltered mafic lavas, intermediate lavas and lava breccias, felsic volcaniclastics, siltstones and sandstones. However, it would appear that this predominantly mafic-intermediate package at Staverton occupies a major synclinal position. This is borne out by dipping/facing orientations at both the Staverton and Lake Barrington prospects.

At the Lake Barrington prospect intermediate lavas and associated sediments overlie sediments which are in turn underlain by felsic lavas and mass flows. North of the Lake Barrington prospect these felsic lavas are underlain by siltstones and felsic volcaniclastics.

The stratigraphy in the Staverton to Lake Barrington area has strong similarities to the Cethana sequence, the main difference being the major development of mafic to intermediate volcanics around Lake Barrington compared to the relatively restricted intermediate unit at Cethana West.

This could merely be a function of facies changes related to an intermediate volcanic centre to the north or east, with the upper volcanics at Cethana West being a distal expression of this volcanism. In this case the felsic volcanics north of Lake Barrington could correlate with the lower felsic volcanic sequence at Cethana.

Alternatively, it is also possible the Lake Barrington mafic intermediate volcanics extend along strike under Tertiary cover to the south-east into Gowrie Park prospect east of the current tenement. In this case, the intermediate volcanics to the north are probably younger than those at Cethana West and entirely unrelated. Also the altered felsic volcanics in the Campground area south-west of Staverton may have correlates north of Cethana East and east at Gowrie Park.

However, structural complexity could also account for disparities between volcanic sequences in these areas and the above correlations are speculative.

In the eastern portion of the tenement, the Gog Range has a somewhat different geology (Macdonald and Tomlinson, 1992 and Jones, 1989). The sequence consists of a quartz-feldspar biotite porphyry/lava overlain by intermixed felsic volcaniclastics and vitric tuffaceous siltstones. Along the western end of the range the latter siltstones are overlain by chloritic lapilli tuffs and then by siltstones and more quartz porphyry units. To the north this package is overlain by mafic-intermediate volcanics at Lower Beulah, with the contact zone the focus of strong alteration.

Jennings et al (1959) maps the sequence as "Gog Range Greywacke" overlain by "Minnow Keratophyre" overlain by "Beulah Formation". The former two units appear to have little validity and should not longer be used whilst the "Beulah Formation" should probably be retained with the cautionary note that not all mafic-intermediate volcanics in the area necessarily belong to this unit.

The Gog Range stratigraphy may be older than sequences at Cethana. The Fire Tower prospect sequence could correspond to a sequence underlying the siltstones exposed on the Lorinna Road and extend beneath the Ordovician cover, to equate with similar lithologies in the Bull Creek Formation to the west as mapped by Pemberton and Vicary (1989).

5.2 Staverton Prospect

Only relatively minor prospect scale mapping was conducted by Noranda prior to drilling a mostly geophysical-geochemical target at Staverton. The most relevant geological data was obtained from the STD1 drill core, which intersected a sequence of altered, pyritic holocrystalline andesitic to dacitic lavas with occasional felsic volcaniclastics and lava breccias. Chlorite and pyrite alteration is predominant in the mafic/intermediate rocks with sericite $\pm$ pyrite alteration common in the interbedded felsic volcaniclastics. These latter zones are often strongly schistose with fine grained pyrite in the cleavage.

In part, early alteration is overprinted by later calcite-chlorite-pyrite-tourmaline alteration which is probably Devonian granite related.

The altered volcanics exhibited maximum values of 33 ppm Cu, 3000 ppm Pb and 3600 ppm Zn in zones with elevated sulphides. This sequence is considered to dip steeply and going to the north east based on grading in siltstones outcropping on the western shore of Lake Barrington. A major northerly structure is interpreted to mark the western boundary of the prospective volcanic sequence.

5.3 Cethana West Prospect

The steeply north-north-east dipping Cambrian volcanic/sedimentary sequence at Cethana West youngs to the north, based on rare grading and scour and fill structures in drill core and outcrop. The sequence is divided into two discrete structural blocks by a north-north-east trending fault along which there has been 400 to 600m of sinistral movement. This fault passes just to the west of DD86CC12 on line 700E.

The basal rocks of the western structural block appear to be mainly plagioclase rich with lesser quartz phyric tuffs overlain by a siliceous sandstone/siltstone which was interpreted by Herrmann (1989) to be a fault bounded sliver of Moina sandstone. Contacts are weathered and it is unclear what the true relationships here are.

Adjacent to the unconformity with the Roland Conglomerate on the Lorinna Road, the Cambrian sediments at the southern ends of lines 900E to 1300E are chloritic with disseminated pyrite. DDH's 77CC2, CC3 and 86CC13 extend into the uppermost of these rocks.

The first two of these holes intersected anomalous base metals of a similar tenor to the soil anomalies tested, however these metals are in post-cleavage carbonate veins probably associated with a Devonian granite which outcrops to the south of EL 10/88. The most significant stratabound mineralisation encountered in these sediments occurs in DD86CC13 from 206.40m to 210.00m where 3.6 metres of 0.38% Cu, 0.65% Zn and 0.46% Pb is associated with very fine grained sulphide disseminations in a chloritic mudstone. This latter mineralisation is probably Cambrian in age.

Magnetic, haematitic, chloritic and sericitic conglomerates with matrix supported rounded cherty clasts are interbedded with the upper half of these sediments. These rocks outcrop on the Lorinna Road and grid lines 900E, 1000E, 1200E, 1300E, 1400E as well as being intersected in DD77CC2, DD77CC3 and possibly DD86CC13.

Overlying these sediments is an important sequence of silica-sericite ± chlorite altered felsic volcaniclastics. These rocks are characterised by rounded quartz eyes with variable amounts of pumice, feldspars and lithics, the latter being generally rounded and of mixed provenance but are predominantly fine grained siliceous (quenched felsic lava) clasts. Patches of diffuse haematite alteration, are seen in DD77CC2 and DD77CC3. In DD86CC13 a rock with pink feldspars which was previously described as a granodiorite (Hicks, 1990) is more probably an albite altered volcaniclastic.

Highly anomalous barium up to 9350 ppm in drill core as well as in occasional rock chips indicates that barite alteration is widespread. However, the presence of barite veins in the basal sediments as well as similar barite occurrences from the Promised Land prospect (old CRAE prospect) in the north of the EL indicates the barite may have little exploration significance for VHMS mineralisation.

Overlying the felsic volcaniclastics in the western block and in the eastern part of the eastern block are massive quartz ± feldspar phyric lavas. In the central part of the prospect from lines 800E to 1100E are very strongly silica sericite altered schistose rocks with quartz eyes which may be altered lavas or alternatively are altered felsic volcaniclastics which were deposited into a topographic depression lying between the felsic lavas to the east and west.

This altered sequence was evaluated by DD77CC1 which intersected a late stage post cleavage vein assaying 0.4 metres @ 8.3% Zn and 0.2% Pb from 78.6 metres, then 2.0 metres @ 190 ppm Cu, 1.03% Pb, 1.09% Zn from 98 metres in a black tuffaceous siltstone. Although mineralisation is now in late stage fractures, it is unlikely to have travelled far and hence is probably Cambrian.

To the north of felsic lavas are more sericite-chlorite altered felsic volcaniclastics grading to fine grained tuffaceous siltstones. The massive pyrite reported to in PD84CC9 on line 600E would appear to be hosted in these altered sediments.

Up sequence are barren, relatively unaltered green siltstone and greywacke sandstones of probable intermediate provenance. Cherty clast conglomerates and plagioclase > quartz phyric lavas/intrusives in turn interfinger and overlie these unaltered sediments.

The contact between the altered and unaltered sediments in the northern portion of the prospect appears to have the best prospects for a classic exhalative style VMS deposit. This zone is characterised by weak UTEM anomalies along it from 100E to 700E and moderate IP anomaly in the footwall to the contact. Unfortunately the contact on line 300E is halfway down a steep slope and rocks are very leached, nevertheless it still has weakly anomalous soil geochemistry (up to 120 ppm Cu, 260 ppm Pb, 64 ppm Zn) and strongly anomalous rock chips (up to 160 ppm Cu, 1340 ppm Pb, 3700 ppm Zn).

To the east the altered volcaniclastics appear to onlap a massive felsic unit which could be a dome separating possibly equivalent volcaniclastic strata at Cethana East.

5.4 Cethana East Prospect

Geological interpretation at Cethana East, (refer Figure 4) is based largely upon G J Purvis' (1979) mapping with some check mapping re-logging of DD77CC4 - CC8 and mapping of road cuttings. The two new DDHs' CED1 and CED2, support the previous lithological interpretation but suggest the hydrothermal system is weakening to the east.

The Cethana East prospect lies along strike from Cethana West with the intervening ground covered by Quaternary glacials and periglacial Roland conglomerate scree which extends eastwards over the northern part of Cethana East. This cover obscures potentially prospective rocks which remain untested for VHMS mineralisation.

As recognised at Cethana West, the southern contact between the Cambrian volcanics/sediments and the younger Late Cambrian - Ordovician siliclastics is an angular unconformity. Towards the southern end of lines 21600E, 21700E and 21750E an unaltered siliceous sandstone outcrops. This may be fault bounded sliver of the Moina Sandstone (Herrmann 1979) but as Purvis (1979) indicates, it looks quite like a Precambrian quartzite. The contact between this sandstone/quartzite and the Cambrian volcanics to the north does not outcrop but appears as a very weak anomaly on the CRONE EM survey (MacDonald 1993) and it is probably a fault.

No facing indications were found at Cethana but it is very likely that the sub-vertical sequence youngs to the north based on the younging orientation of similar rocks to the west, along strike at Cethana West.

The Cambrian rocks at Cethana East essentially consist of a package of felsic volcaniclastics and cherty tuffaceous siltstones, the former characterised by fine grained to coarse grained quartz eyes with variable pumice, feldspars and lithics including rounded cherty (quenched felsic lava?) clasts and tuffaceous siltstones. Felsic lavas/porphyries are less common at Cethana East than along strike both east and west.

Overall the package appears to fine up sequence to the north in the area of Olivers Road where drilling has taken place, though the rocks further north are obscured by Quaternary cover.

A felsic lava with a hyaloclastic margin outcrops in the western part of the prospect on lines 21400E and 21450E and extends at depth in DD77CC6, (refer Figure 4). Similar lava was intersected in CED1 and CED2 to the east but lava has not been mapped in this area.

Alteration is restricted and less intense in the lavas compared to the surrounding felsic volcaniclastics, which exhibit ubiquitous but variable quartz $\pm$ sericite $\pm$ and chlorite development together with common post cleavage carbonate veining.

Low-grade sulphidic mineralised zones detailed in Table 1 and shown in Figures 6 and 7, were intersected in all CRAE drillholes. Of most significance are the semi-massive pyrite-sphalerite-galena-chalcopyrite lens form 37.8m - 38.8m in DD77CC3 and the thin massive pyrite lenses at 62.7m - 62.0m in DD77CC7 and from 61.5m - 61.75m in DD77CC4. Most sulphidic zones consist of pyrite stringer veins and blebs partially aligned in the S_2 cleavage, which suggests an early, possibly syngenetic origin.

The most important galena-sphalerite bearing stringer zone was intersected over twleve metres from 31.0m to 43.0m in DD77CC6. This is correlated with the semi-massive zone in DD77CC5 along strike to the east. Petrology suggests this zone could be syngentic in origin and may represent a weak early phase of exhalative mineralisation above a dominantly pyritic footwall alteration zone to the south. The lack of a significant sulphide intersection in DD77CC8 directly below the promising intercept in DD77CC5, is considered indicative of a poorly developed lenticular mineralised zone which is unlikely to have significant lateral or vertical extent. This may be a result of rapid ongoing sedimentation swamping and diluting the sulphide mineralisation, or erratic sub-seafloor syndiagenetic mineralisation which was controlled by relative permeability in the volcaniclastic package.

Potential remains for this mineralisation to be better developed in a more quiescent sedimentary environment, which may have existed along strike to the west of DD77CC6 but more likely was up sequence where finer lithologies are reported north of the hairpin bend on Olivers Road.

TABLE 1

PREVIOUS SIGNIFICANT DRILL RESULTS AT CETHANA EAST

Hole No	Interval (m)	Significant Intercept
DD77CC5	37.8 - 38.8	1.0 m@ 1.18% Cu, 0.80% Pb, 3.88% Zn, 1.85 g/t Ag and 0.7 g/t Au
	57.0 - 59.3	2.3 m@ 45 ppm Cu, 9500 ppm Pb, 3950 ppm Zn
	80.0 - 85.0	5 m@ 770 ppm Cu, 1100 ppm Pb, 3500 ppm Zn
DD77CC6	31.0 - 43.0	12 m@ 142 ppm Cu, 3442 ppm Pb, 6308 ppm Zn
incl	36.5 - 41.0	4.5 m@ 227 ppm Cu, 3833 ppm Pb, 1.19% Zn
	50.2 - 62.4	12.2 m@ 137 ppm Cu, 5439 ppm Pb, 2412 ppm Zn
incl	52.2 - 54.2	2 m@ 110 ppm Cu, 9200 ppm Pb, 2800 ppm Zn
incl	60.0 - 62.4	2.4 m@ 310 ppm Cu, 9800 ppm Pb, 6500 ppm Zn
	189.0 - 200.5	11.5 m@ 273 ppm Cu, 743 ppm Pb, 2467 ppm Zn
DD77CC7	62.2 - 62.8	0.6 m@ 90 ppm Cu, 1400 ppm Pb, 4550 ppm Zn
	68.5 - 86.0	17.5 m@ 72 ppm Cu, 693 ppm Pb, 2453 ppm Zn
	109.3 - 112.5	3.2 m@149 ppm Cu, 1694 ppm Pb, 2009 ppm Zn
DD77CC8	32.0 - 32.75	0.75 m@ 130 ppm Cu, 1500 ppm Pb, 5000 ppm Zn
	54.0 - 57.0	3 m@140 ppm Cu, 1150 ppm Pb, 3150 ppm Zn
	95.0 - 103.0	8 m@180 ppm Cu, 1220 ppm Pb, 4120 ppm Zn

5.5 Fire Tower Prospect

The geology of the Fire Tower prospect has been previously described in the annual report for 1991 to 1992 (MacDonald and Tomlinson, 1992) with the results of DDH's FTD1 to FTD4 presented in MacDonald (1993).

Relevant additions to the prospect geology are that black tuffaceous siltstones are more common at depth, and the chloritic sandstones and mass flows which are "effectively" the hanging wall to the felsic host rocks at Fire Tower, are not faulted into position but are conformable.

The Pb isotopes from galena associated with gold mineralisation from the early drillholes exactly match that of the V24 stratabound mineralisation from Elliott Bay, where gold in quartz carbonate veins within silica-sericite-carbonate altered felsic volcaniclastics is considered by Large (1985) to be genetically related to a nearby rhyodacitic intrusive.

The Fire Tower gold prospect could therefore be also related to a Cambrian intrusive, probably the quartz-feldspar-biotite porphyry mapped to the south of the mineralised zone.

6.0 EXPLORATION HISTORY

6.1 Previous Company Exploration

Asarco's initial program was regional stream sediment sampling at 2/km^2 and reconnaissance mapping. Essentially all current prospects were discovered as a result of this drainage geochemistry.

CRAE entered into a joint venture with Asarco in 1976 and initiated ground surveys to assess the targets generated through Asarco's stream sampling program. These surveys included gridding, geological mapping, soil and rock chip sampling and geophysical surveying (gradient array IP, dipole-dipole IP, magnetics, self potential and VLF-EM) on the Lake Barrington, Promised Land, Staverton, Cethana (East and West), Gog Range and Cethana Picnic Ground prospects.

Encouraging results led to detailed work to be conducted on the Lake Barrington, Cethana (East and West), Staverton and Gog Range grids. These surveys included detailed dipole-dipole IP, Genie EM, PEM, UTEM and helicopter borne EM (Dighem) results of which led to the drilling of 14 diamond and three percussion drillholes. Twelve of the holes were drilled on the Cethana Prospect with six holes each at Cethana West and Cethana East. The majority of holes intersected low-grade lead-zinc mineralisation (1%-2%) within pyritic altered volcanics and tuffaceous sediments. Best results are as shown in Table 1 and discussed in Sections 5.3 and 5.4.

All four diamond holes drilled on the Lake Barrington prospect encountered encouraging stringer-vein type pyritic copper mineralisation with some gold and silver credits within felsic volcanics and volcaniclastics. Best results are as follows:-

TABLE 2
SIGNIFICANT DRILLING RESULTS AT LAKE BARRINGTON

Drillhole	Interval (m)	Significant Intercept
DD80LB1	179.4 - 179.5	0.10m @ 14% Cu, 0.75% Pb, 0.59% Zn, 1.35 g/t Au
DD82LB3	140.8 - 140.98	0.18m @ 9.1% Cu, 52 g/t Ag
	156.5 - 172.45	15.85m @ 1.2% Cu, 12 g/t Ag
	207.85 - 209.00	1.15m @ 1.6% Cu, 18 g/t Ag
DD83LB4	48.0 - 49.0	1.00m @ 1.9% Cu, 5 g/t Ag
	225.8 - 226.3	0.50m @ 4.8% Cu, 36 g/t Ag, 3.2 g/t Au

A mise-a-la-masse anomaly with almost coincident IP and strong Cu soil anomalous were not adequately tested by any of these holes at the Lake Barrington prospect.

At Staverton, percussion hole PD83SP1, designed to test coincident geochemical/geophysical responses, intersected highly altered pyritic quartz sericite schists with significant base metal mineralisation. Results included 24 metres @ 0.9% Pb, 0.5% Zn, 10 g/t Ag from 20 metres depth including 6 metres from 28 metres at 1.3% Pb, 1.0% Zn and 14 g/t Ag.

Throughout the tenement it should be noted that few gold assays were undertaken by CRAE until extremely late in the period of tenure when an attempt was made to broadly assess the licence for fine grained volcanogenic gold deposits. Bulk Cyanide Leach sampling techniques in conjunction with standard stream sediment sampling surveys were implemented sparsely across the tenement. Significant results were returned, however, no detailed investigations were instigated to confirm and quantify the occurrences. In particular, no detailed follow-up was undertaken of the high grade Gog Range gold/tungsten panned concentrate sample which eventually led to the discovery of the Fire Tower Prospect.

Minor re-assaying of drillcore for gold returned values to 1 g/t Au over 1 metre, however, in general, only samples which contained visible lead-zinc mineralisation were assayed and not zones with abundant pyrite and/or silica. However, all four Lake Barrington drillholes were assayed for gold by Noranda.

6.2 Plutonic Exploration

In March 1992 when Plutonic became operator of the joint venture, a thorough review of all previous geological, geophysical and geochemical data was undertaken, which resulted in the recognition of potential drill targets for Cethana East and West, Staverton, Lake Barrington and Fire Tower prospects.

Reconnaissance mapping was conducted at Cethana (East and West), however, the major field work involved mapping of the Fire Tower prospect at 1:500 scale and re-logging of the 17 short DDH's drilled by Noranda at Fire Tower. Lead isotope and petrological analysis indicated that the gold mineralisation was Cambrian in age and was deposited along with pyrite-chalcopyrite-galena into brecciated felsic volcaniclastics and vitric tuffaceous siltstones derived from felsic lavas and tuffs.

In August 1992 to July 1993 exploration was carried out on the Fire Tower, Staverton, Cethana West and Cethana East prospects as well as on the now relinquished Lake Barrington prospect.

6.2.1 Fire Tower Prospect

Four DDH's, totalling 542.10 metres were drilled to test the down-dip extension of anomalous gold mineralisation indicated by surface sampling and the early shallow drillholes. Significant results are shown in Table 3.

TABLE 3

FIRE TOWER DIAMOND DRILLING - SIGNIFICANT GOLD INTERSECTIONS

HOLE NO	INCLINATION	AZIMUTH (TN)	FINAL DEPTH	SIGNIFICANT INTERSECTIONS
FTD 1	-45°	174°	145.00m	8m @ 2.27 g/t from 48.0m to 56.0m 3m @ 1.30 g/t from 58.0m to 61.0m
FTD 2	-45°	354°	122.60m	3m @ 1.30 g/t from 58.0m to 61.0m 5m @ 2.22 g/t from 76.0m to 81.0m 1m @ 3.23 g/t from 57.0m to 58.0m
FTD 3	-45°	354°	121.50m	2m @ 7.69 g/t from 74.0m to 76.0m 5m @ 1.43 g/t from 89.0m to 94.0m 3m @ 1.80 g/t from 104.0m to 107.0m
FTD 4	-45°	354°	153.00m	2m @ 1.66 g/t from 44.0m to 46.0m 3m @ 1.36 g/t from 48.0m to 51.0m 1m @ 3.53 g/t from 53.0m to 54.0m 2m @ 1.76 g/t from 69.0m to 71.0m 5m @ 1.90 g/t from 140.0m to 145.0m

6.2.2 Staverton Prospect

Following limited prospect scale mapping a single DDH of 267.20 metres was targeted on coincident dipole-dipole IP and anomalous Cu, Pb and Zn in rocks and soils. The hole intersected intermediate to mafic lavas with similar trace/whole rock geochemistry to the rocks in the footwall to the Que River and Hellyer deposits. Minor associated lithologies included felsic volcaniclastics and lavas, and a major fault was interpreted near the end of the hole. Base metals and gold assays of drill core gave patchy, moderate anomalism, however, DHEM and extensive ground EM (CRONE) surveys over the whole of the prospect provided no responses considered to relate to conductive sulphides.

6.2.3 Cethana West Prospect

Detailed mapping, including the re-logging of previously drilled (CRAE) DDHs, was carried out along with some reconnaissance soil and rock geochemical sampling. This work led to the recognition of the existence of a contact between underlying, weakly anomalies (maximum 833 ppm Zn) altered felsic volcanics/volcaniclastics to the south, and relatively unaltered greywackes and intermediate volcanics to the north.

DHEM surveys were conducted on drillholes 77CC1 and 86CC13, and percussion holes PD84CC9, however no responses due to conductive sulphides were recorded. Ground EM on two grid lines was also unsuccessful due to interference from overhead power lines.

6.2.4 Cethana East Prospect

Core re-logging and mapping at Cethana East was conducted prior to carrying out an extensive ground EM (CRONE) survey over the majority of the prospect, including a portion of the previously untested northern sequence above the area previously drilled by CRAE. No positive responses due to conductive sulphides were recorded, however the presence of high tension power lines may have affected the results. Reconnaissance and check rock/soil geochemical sampling was conducted with the single most significant result being the 3149 ppm zinc soil sample corresponding to a dark shaley siltstone taken from north of Claude Road.

6.2.5 Regional

Mapping led to the discovery that the intermediate/mafic rocks of the Beulah Formation are much more extensive than previously understood and occupy a major synclinal position in the Staverton area. To the south-west the "Campground" alteration zone in felsic volcanics may correlate with sequences at Gowrie Park east of the Cethana prospects.

7.0 WORK CONDUCTED 12 MONTHS TO JULY 1995

7.1 Introduction

Work in the 12 months from August 1994 to July 1995 focused solely on the Cethana East prospect. Two new DDH's, CED1 and CED2 were drilled for a total of 395 metres during September and October 1994. In addition, three of the five existing old CRAE DDH's were cleaned out and a fourth lined with PVC without the need of the drill rig. All of these drillholes were subsequently surveyed using CRONE DHEM equipment in October 1994.

7.2 Drilling

Two diamond drillholes CED1 and CED2, located 425 metres apart tested the eastern extension of the Cethana East pyrite zone. Drillhole statistics are presented in Table 4.

TABLE 4
SUMMARY OF 1994 DRILLING AT CETHANA EAST

Hole No	Co-Ordinates S	E	Az	Dip	Total Depth (m)	Significant Mineralisation Interval	Intercept
CED 1	700	22400	192.5°	- 64 °	200.0	No significant results	
CED2	3480	21825	192.5°	- 45 °	295.0	79.2 - 85.2, 6m @ 0.01% Cu, 0.20% Pb, 0.64% Zn,	
					incl	81.2 - 83.2, 2m @ 1.02% Zn, 112.0 - 115.0, 3m @ 0.34% Pb, 0.14% Zn, 231.0 - 232.0, 1m @ 0.05% Pb, 0.46% Zn	

CED 1

Drillhole CED 1 (Figures 3 and 4) was sited on line 22400E to test a strong chargeability high (>3 times background) recorded in a 1990-1991 dipole-dipole IP (50m spread) survey conducted by Noranda. The 200 metre hole was angled at 64° towards magnetic south (see Plate 1) to intersect the target around 150 metre depth.

The hole passed through a sequence of fine to medium grained felsic (quartz ± feldspar) volcaniclastics, moderately cleaved and moderately chlorite altered throughout with disseminated and diffuse haematite alteration and minor disseminated pyrite down to 135.15 metres. At this depth a 1.05m wide zone of pyrite stringers (15% Py) aligned into the cleavage was intersected within sericitic fine to medium grained felsic volcaniclastics. From 136.20 metres to 148.60 metres the hole intersected further chloritic, haematitic felsic volcaniclastics and a porphyritic felsic lava (?) before intersecting a major 3.23 metre thick pyritic stringer zone, from 164.15 metres to 167.40 metres. Stringer silica-pyrite-carbonate veins and pyrite blebs range from 2% to 20% in narrow intervals in this zone. Below this zone pyrite stringers continue at a lesser frequency to the end of the hole, within mottled chloritic, haematitic, pumiceous felsic volcaniclastics. No significant base metals accompany the pyrite.

All values are less than 500 ppm Cu, Pb and Zn and maximum gold values are 0.02 g/t Au. These results match the poor surface geochemical expression of the target sequence. The pyrite stringer zones explain the IP response but the lack of associated base metals indicates this horizon is unlikely to be directly associated with an exhalative horizon of significance.

CED 2

Drillhole CED2 was positioned on section 21825E (Figures 3 and 5) to test two targets:

1. Strong chargeability high recorded in the same 1990-1991 survey as the anomaly targeted by CED1.

2. Geochemically anomalous fine chloritic sediments which host the base metal intersection in DD77CC5 on section 21750E, 75 metres to the west.

The hole was sited on the edge of Olivers Road (refer Plate 2) and drilled at 45° towards magnetic/grid south for 295.00 metres. The hole initially passed through a package of fine tuffaceous siltstones and fine to medium grained sericitic felsic volcaniclastics with minor disseminated and veinlet haematite and pyrite. From 79.0 to 88.5 metres the hole intersected base metal anomalous pyrite-silica-carbonate veinlet mineralisation within moderately chloritic siltstones and sandstones which are probably equivalent to the host sequence to the CC5 sulphide intersection . The six metre zone from 79.2 to 85.2 metres assayed 0.01% Cu, 0.20% Pb, 0.64% Zn including two metres of 1.02% Zn from 81.2 metres.

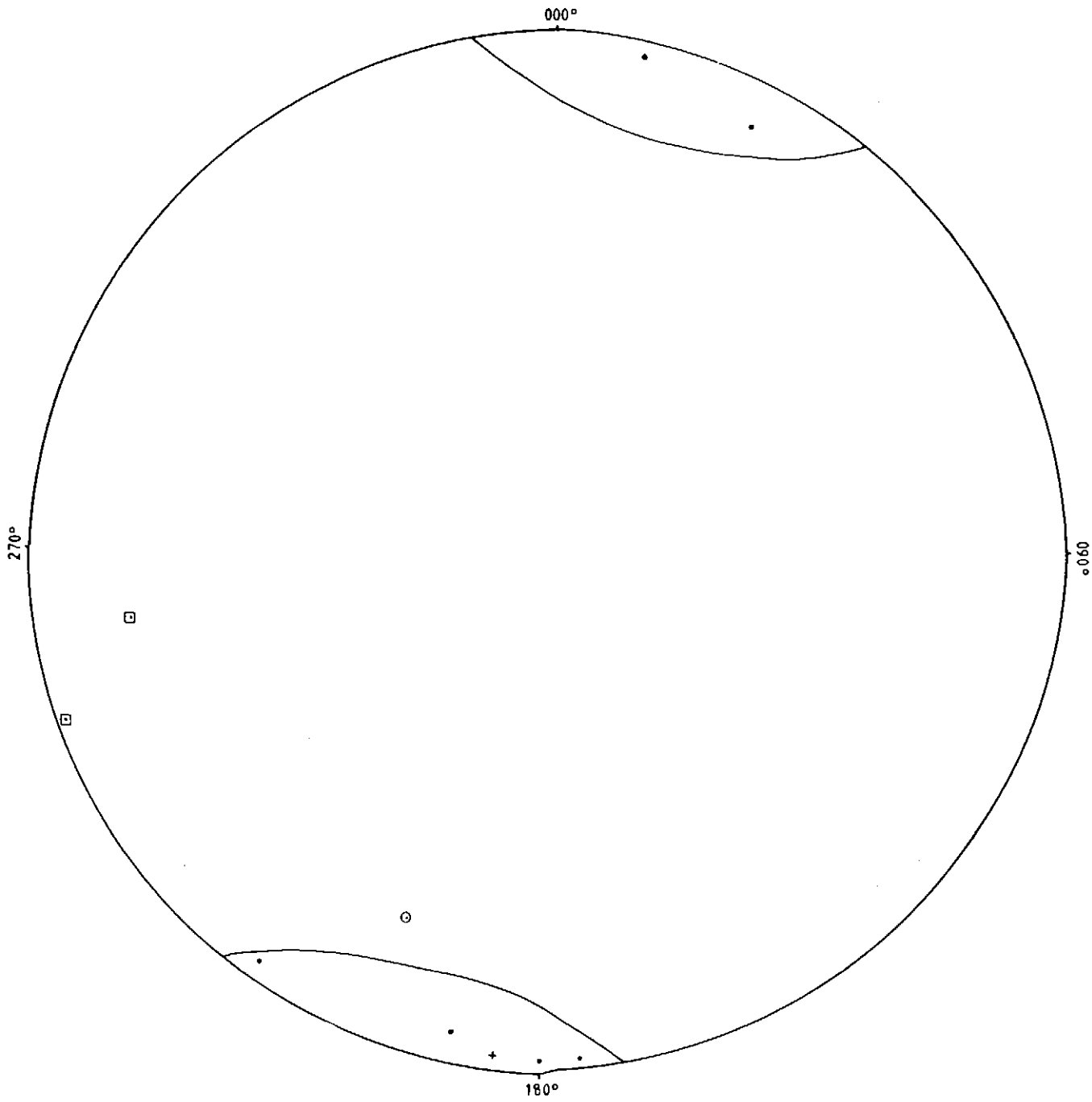
Below 109.20 metres to around 180.00 metres minor (1-5% Py) deformed pyrite stringer veinlets in the cleavage were intersected within a package of more medium grained felsic volcaniclastics exhibiting moderate sericitic and diffuse/disseminated haematite alteration. The maximum pyrite development (5-10% Py) with associated silica and carbonates occures in a zone from 166.70 metres to 168.10 metres.

Overall base metal sulphide levels are low, though much higher than in CED1, reflecting the increasing surface geochemistry to the west towards DD77CC5. Gold assays are uniformly low with a maximum value of 0.059 g/t Au.

The equivalent horizon to the CC5 intersection exhibits elevated lead and zinc values associated with moderate development of post-cleavage carbonate-sulphide veins. Other elevated base metal anomalous zones further down hole also appear to be related to similar silica or carbonate rich veins within sericite altered volcaniclastics. However, at least some base metals are associated with pyritic blebs or stringer veins as at 231-232 metres where a 20 cm pyrite stringer assayed 0.05% Pb and 0.46% Zn.

Ten oriented structural readings taken from CED2 are displayed in Figure 8. These include pyrite stringers (six readings) and foliation (one reading) which are sub-vertical towards 015° - 195 ° (TN), whilst two haematitic veinlets are steep.towards 065 " TN. This result indicates the pyrite and haematite may belong to separate generation.even though they commonly occur together.

ORIENTED STRUCTURES - CED 2



POLES TO:

- pyrite veinlets
- foliation
- ⊙ flow banding(?) pyrite veinlet
- ⊡ haematite veinlets

Fig. No. 8

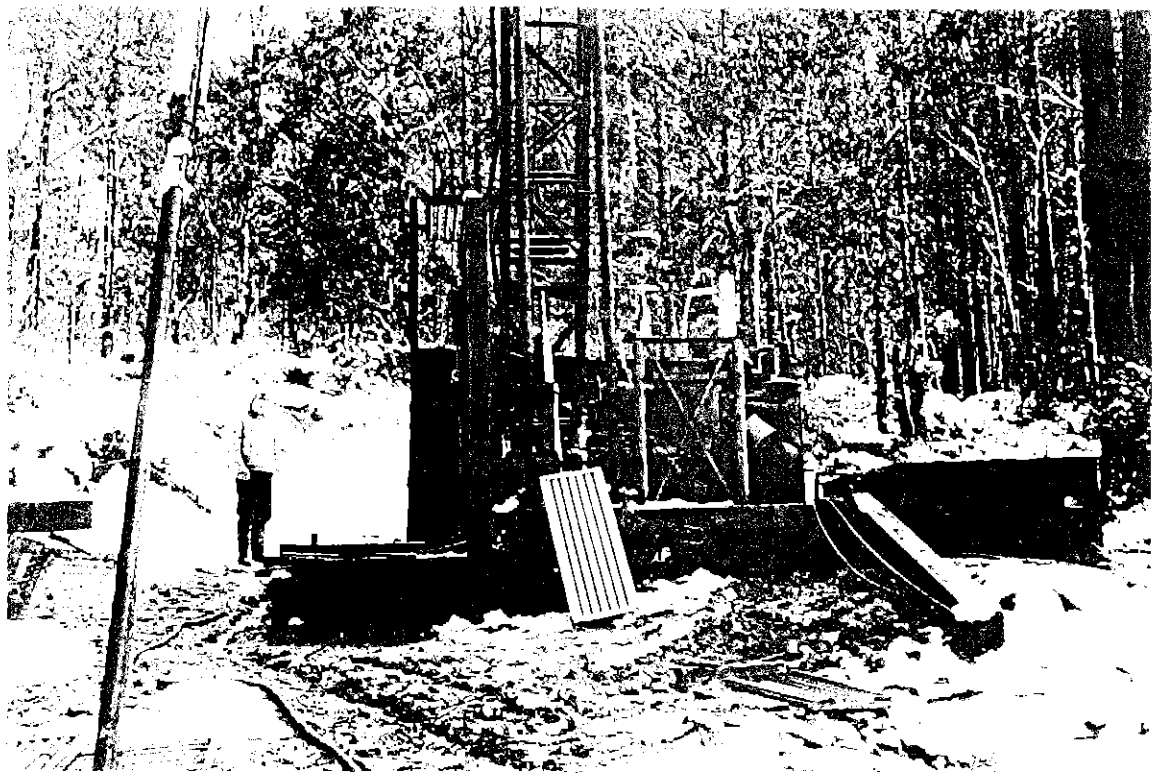


PLATE 1 DRILL SITE CED 1 LATE SEPTEMBER 1994

PLATE 2 DRILL SITE CED 2 EARLY OCTOBER 1994

7.3 DHEM Surveys

In October 1994, Outer Rim Exploration from Townsville conducted DHEM surveys using CRONE equipment on both new drillholes and all CRAE DDH's at Cethana East, except for D77CC5 which was effectively tested by surveying DD77CC8. It was necessary to clean the old CRAE DDHs out prior to lining with PVC for the DHEM surveys. Due to time constraints DD77CC4 was not able to be cleaned out, however the top 106 metres of the 149.7 metre drillhole was lined with PVC which was sufficient to adequately test the pyrite zone. Both CED2 and DD77CC6 were also not able to be fully surveyed because the probe became jammed at depth. A total of five overlapping 200 metre loops as shown in Figure 9 were utilised during the surveys.

In general the downhole surveys presented in Table 5 gave poor results, particularly for CED1 and CED2 in which the lack of a response with the Z probe meant that the oriented probes were not required for these holes.

DD77CC7 gave a weak in-hole response at 60 metres. This position coincides with a 40cm thick (true width around 25cm) massive pyrite lens. As noted in Table 2 the response indicated that the lens has no significant continuity along strike.

DD77CC4 gave a puzzling in-hole response in the absence of a sulphide intersection which is considered to be possibly due to drill casing left in the hole even though none is noted in CRAE's original logs. It is a possibility as the PVC was able to be inserted into the hole without jamming or catching on the casing "shoulder" where the hole diameter changes from NQ to BQ at 64.4 metres.

TABLE 5

CETHANA EAST DHEM SURVEY RESULTS

Hole No	Drilled Depth (m)	Cleaned-Out Depth (m)	Survey Depth (m)	Probes	Results
CED 1	200.0	-	195.0	Z only	"No anomalous responses detected"
CED 2	295.0	-	234.0	Z only	"No anomalous responses detected"
OLD CRAE DDHs					
77CC4	149.7	106.0	100.0	X, Y & Z	Strong anomalous response at 36-66m appears to be from steel casing left in drillhole. * No anomalies were detected outside of this interval.
77CC6	200.5	200.0	165.0	X, Y, & Z	"No anomalous responses detected"
77CC7	137.0	137.0	130.0	X, Y, & Z	A weak in-hole response at 60 metres coincided with the intersection of a narrow conductor. This is a single point anomaly which indicates the intersected horizon is not extensive.
77CC8	157.6	157.6	157.0	X, Y, & Z	"No anomalous responses detected"

* It is quite possible that casing was left in DD77CC4 in this interval as the hole changes from NQ to BQ at 64.6 metres however, no such casing is noted in CRAE's original logs.

7.4 Conclusions

Seven diamond drill holes have been drilled at Cethana East over the past two decades. Four of those holes (CC4, CC7, CED1, CED2) were targeted on IP anomalies and two (CC5 and CC6) targeted on soil geochemical anomalies. DDHCC8 failed to intersect a significant down-dip extension of the promising semi-massive sulphide intersection in DDHCC5, however in general, surface geochemical targets have been shown to have a base metal expression at depth.

The drilling has provided sufficient geological information for it to be stated that the chargeability anomalies targeted and intersected by CC4, CC7, CED1 and CED2 are due to the one broad zone of irregular cleavage oriented pyrite ± silica-carbonate stringers which strikes from 21600E to 222600E. This pyrite zone is considered to be typical of a deformed "footwall stringer" zone beneath a potential exhalative target horizon.

CED2 has shown that the base metal horizon intersected in CC5 on 21750E is only weakly developed on 21825E however it remains open along strike to the west of DDHCC6 where surface geochemistry remains strong.

Although many of the base metal intersections in this zone are related to narrow quartz-sulphide veins, these veins are considered to be related to a Cambrian VMS hydrothermal system which has been deformed during the Devonian.

DHEM surveys have indicated that there are no significant conductive sulphide lenses nearby any of the drillholes at Cethana East. The narrow pyrite intersection DDHCC7 has no strike extent and must be a minor lens low within the footwall sulphide zone.

Exploration focus should now shift to locating and testing an exhalative target zone within the overlying altered, geochemically anomalous sequence of fine grade felsic volcaniclastics north to the Claude Road.

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APPENDIX 1

DRILL LOGS FOR CED 1 AND CED 2

CED 1 DIAMOND DRILL RECORD

764033

Hole No: CEDI
Section: 22400E
Northing: 700 South
Easting: 22400 East
Grid: CETHANA EAST
Direction: GRID SOUTH
Inclination: -64°
Elevation: 425m.a.s.l.
Azimuth: 192.5°
Mag.Azimuth: 180.0°, 180.0°, 181.0°, 165.5°, 0°Mag = 12.5°, True or 0° Grid (nominally)
Length(m): 200.00m
Precollar(m): 4.9m
Boco:
TOFR:
Water Table:

Drill Type: MINDRILL
Core Size: HQ 56.6 NQ
Contractor: Fred Ortner

Dip Tests

Depth	Az	Dip
0.0m	192.5°	-64°
100.0m	192.5°	-61.25°
150.0m	193.5°	-59°
199.0m	178.0°	-57°

Property: CETHANA EAST
State: Tasmania
GMR: CETHANA
EL No: 10/88
Project Ne: 706
Date Started: 13/9/94
Date Completed: 23/9/94
Logged By: Grant MacDonald
Date Logged:
Interpreted: Grant MacDonald
Initialled:

CED 1 SUMMARY LOG

4.90	32.80	Fine to Medium Grained Felsic Volcaniclastic
32.80	37.70	Fault
37.70	53.40	Felsic Crystal Tuff
53.40	56.60	Medium Grained Felsic Volcaniclastic
56.60	68.60	Fine and Medium Grained Felsic Volcaniclastic, Soft Sediment Deformed
68.60	71.70	Fine and Medium Grained Felsic Volcaniclastic, Soft Sediment Deformed
71.70	74.20	Fault
74.20	103.60	Fine to Medium Grained Felsic Volcaniclastic, Soft Sediment Deformed
103.60	114.70	Mottled Medium Grained Felsic Volcaniclastic
114.70	119.00	Fault (minor)
119.00	125.40	Mottled Medium Grained Felsic Volcaniclastic
125.40	135.15	Fine Grained Felsic Volcaniclastic
135.15	136.20	Semi-massive Pyrite Zone
136.20	148.60	Mottled Fine to Medium Grained Felsic Valcaniclastic
148.60	164.15	Felsic Lava
164.15	167.40	Semi-massive Pyrite Zone
167.40	194.30	Mottled Medium Grained Felsic Volcaniclastic
194.30	200.00	Felsic Lava Breccia
200.00		E.O.H.

4	0.00	4.90	Precollar, no core.
4	4.90	32.80	**Fine to Medium Grained Felsic Volcaniclastic** Tan brown (where weathered) or pink to pale green massive rock with fine to medium grained quartz and feldspars and occasional lithics (to 10mm), being fine grained tuffaceus siltstones or quenched felsic lava, in a sericitic matrix. No sulphides are present but around 2% disseminated haematite. Below 23.00m the rock contains chlorite along fractures and no longer contains obvious lithics. At 27.70 is a minor fault at 10° to the core axis.
4	32.80	37.70	**Fault** Similar to unit from 4.90m to 32.80m but in broken core with puggy zones at 30° to the core axis.
4	37.70	53.40	**Felsic Crystal Tuff** Beige (above 43.50m) to grey green (below 43.50m), medium grained quartz (to 3mm) and feldspar (to 4mm in sericitic matrix with pumice like patches/clasts (to 15mm). The rock is foliated at 30° to the core axis, 0.5% disseminated haematite. Evenly distributed, phenocryst rich rock, unwelded.
4	53.40	56.60	**Medium Grained Felsic Volcaniclastic** Beige green medium grained quartz and feldspars in sericitic matrix. Probably reworked version of underlying unit (ie 37.70m to 53.40m).
4	56.60	68.60	**Fine Grained and Medium Grained Felsic Volcaniclastic, Soft Sediment Deformed** Moderately to dark green, predominantly fine grained clasts/fragments within medium grained quartz and feldspars making up the matrix to these clasts/fragments. Some clasts may be preferentially haematite altered. Possible bedding at 40° to the core axis at 65.50m, foliation at 40° to the core axis 0.5% disseminated haematite and minor pyrite. A puggy zone from 69.0m to 69.1m is at 45° to the core axis.
4	68.60	71.20	**Fine Grained and Medium Grained Felsic Volcaniclastic, Soft Sediment Deformed** Similar to 56.6m to 68.6m but now more sericite altered and with lesser fine grained component.
4	71.20	74.20	**Fault**

			Sericitic carbonate altered fault zone at 30° to the core axis with much of the core broken.
4	74.20	103.60	**Fine to Medium Grained Felsic Volcaniclastic, Soft Sediment Deformed** Creamy grey green, moderately chloritic, moderately schistose, fine grained felsic tuffaceous siltstone which contains rounded clasts of quenched lava? (or siliceous siltstone) and medium grained quartz and feldspars in a soft sediment deformed package. Fine chloritic veinlets define the foliation at 40° to the core axis. Diffuse blood red haematite alteration preferentially alters clasts and zones. Minor pyrite and 0.5% disseminated haematite. Some late stage brittle carbonate veining. Fine grained component diminishes below 103.6m, defining the base of the unit.
5	74.20	76.30	As above with clasts to 20mm and strong carbonate brecciation/veining an d0.5% pyrite.
5	76.30	77.00	As above but with two minor pug zones at upper and lower contacts.
5	77.00	83.90	More chloritic.
5	83.90	83.93	Minor pug zone.
5	83.93	100.80	Fine grained component dominates.
5	100.80	101.40	2% pyrite-chlorite veinlets associated with haematite at 20° to the core axis.
5	101.40	103.60	As above.
4	103.60	114.70	**Mottled Medium Grained Felsic Volcaniclastic** Mottled, moderately chloritic, medium grained quartz and feldspar volcaniclastic with diffuse haematite alteration in patches giving a pseudo-clastic appearance. Contains some fine grained zones but is more similar to similar mottled volcaniclastics downhole. The rock contains 0.5% pyrite and 0.5% haematite as dissemination's throughout and is foliated at 40° to the core axis.
5	106.40	106.50	Pyrite and silica selvedge to a quartz-carbonate chlorite-vn with 10% pyrite.
5	108.70	109.80	Broken core, possibly minor structure.
5	110.0	110.50	Silica pyrite selvedge to quartz-chlorite-carbonate vein at 35° to the core axis with 5% pyrite.

5	112.00	112.30	Strongly chloritic zone foliated at 40° to the core axis with pug at 112.30m.
4	114.70	119.00	**Fault (minor)** Very chloritic zone in broken core with hematite patches and some puggy zones at 35° to the core axis.
4	119.00	125.40	**Mottled Medium Grained Felsic Volcaniclastic** Similar to unit from 103.60m to 114.70m but with more fine grained component. Minor diffuse haematite alteration.
4	125.40	135.15	**Fine Grained Felsic Volcaniclastic** Pale purple grey to pale grey green, fine grained, soft sediment deformed sediment with a deformed black siltstone/shale clast from 126.20m to 126.70m. Contains only minor disseminated haematite but 0.5% pyrite throughout with 1% from 125.90m to 129.70m in fine irregular stringers. The black siltstone/shale contains only breccia fill fine grained pyrite. The rock becomes more fine to medium grained below 133.00m. The contact with the pyritic zone is sharp and at 40° to the core axis.
4	135.15	136.20	**Semi-Massive Pyrite Zone** 15% pyrite in a sericite silica carbonate altered zone of fine to medium grained felsic volcaniclastic. Pyrite occurs as deformed stringer blebs and as "rosette" clusters in carbonate alteration zones. One lithic (at 5mm). The rock is foliated at 35° to 40° to the core axis. The units immediately above and below this intersection are not noticeably pyritic.
4	136.20	148.60	**Mottled to Fine to Medium Grained Felsic Volcaniclastic** Mottled green fine to medium grained quartz and feldspar (generally < 1mm) and rare lithics, including fine grained siliceous siltstones? or quenched felsic lava with a 100mm porphyritic felsic lava clast at 137.10m. Some patches look pumiceous. The rock is moderately chloritic with 1% disseminated haematite, and some diffuse haematitic zones. Minor pyrite occurs as deformed stringer blebs.
4	148.60	164.45	**Felsic Lava** Grey green to purple grey, medium grained quartz (to 4mm) sericitised feldspar (to 5mm) phyric felsic lava. The upper contact is sharp. The lower contact is arbitrary, at 160.80 the phenocrysts disappear,

			however, the true lower contact may lie just within or adjacent to the mineralised zone. Cleavage planes in the lava are defined by sericitic bands at 40° to the core axis. Occasional brecciated zones are infilled with siderite. The rock contains fine (< 2mm) pyrite veinlets dissemination's and blebs, generally near the upper and lower contacts, associated with silicification and chlorite (chlorite near upper contact), at variable angles to the core axis but often at low angles. The rock contains 0.25% disseminated haematite to 163.0m from 163.0m to 163.65m the core is purple due to diffuse but strong haematite alteration and as dissemination's to 2mm. At 163.65m there is no obvious change in lithology but haematite alteration/dissemination's give way sharply to pyrite with the contact at 30° to the core axis.
5	163.65	164.15	Still porphritic lava but with 2% pyrite as dissemination's and blebs and as 5mm thick veins at 30° to the core axis.
4	164.15	167.40	**Semi-Massive Pyrite Zone** More pseudoclastic (due to haematitic pink domains and pale white carbonate-silica altered zones). No phenocrysts are visible.
5	164.15	164.45	20% pyrite in deformed stringer blebs at 35° to 40° to the core axis. Probably a more permeable volcaniclastic zone.
5	164.45	165.80	2% to 5% pyrite in deformed veins and blebs at 30° to 40° to the core axis.
5	165.80	166.30	Diffuse alteration picks out possible clasts of quenched felsic lava though this may be pseudo-clastic. The pyrite content increases downhole from 2% to 5%.
5	166.30	167.40	Definite volcaniclastic host rock with sub rounded clasts of quartz feldspar phyric felsic lava to 8mm. The rock is moderately foliated at 35° to the core axis. Pyrite occurs in deformed stringers parallel to the foliation. From 166.80m to 167.10 are three pyrite stringers, 20mm to 30mm thick, making up 30% of this zone. The pyrite is associated with carbonate alteration. Above and below this zone the core contains 2% pyrite.
4	167.40	194.30	**Mottled Medium Grained Felsic Volcaniclastic** Mottled green, white and red, medium grained quartz and feldspar volcaniclastic with mottling due to chlorite alteration, feldspars and disseminated haematite respectively. The rock appears to contain

			flattened chloritic pumicous clasts to 15mm thick though more massive zones contain irregularly cross-cutting chlorite veins. Occasional zones are more sericitic as described below. Carbonate ± quartz veins predate the last stage of deformation. Pyrite is variable, variable being minor to 1% unless noted below.
5	167.90	167.93	Pink zone of feldspar or haematite altered rock deformed parallel to foliation at 45° to the core axis.
5	168.30	168.40	5% pyrite as fine dissemination's and as fine stringers at 55° to the core axis.
5	169.30	169.31	10mm thick grey white band of silicification with 10% pyrite at 10° to the foliation ie 65° to the core axis.
5	169.90	170.50	Grey silicification and pyrite content increases downhole from 2% with 20% pyrite from 170.25m to 170.30m at 40° to the core axis. There is a sharp contact at 45° to the core axis between this pyritic zone and the adjacent haematitic zone.
5	170.50	171.40	5% disseminated haematite clustered on the upper contact. Pyrite increases to 2% downhole.
5	172.10	172.55	Moderately silicified zone possibly as a selvedge to a breccia carbonate quartz vein from 172.40m to 172.55m, 5% pyrite occurs as dissemination's through the silicified zone.
5	173.70	173.90	5% pyrite as deformed stringers and blebs with one bleb 25mm 15mm.
5	174.50	174.51	10% pyrite in 10mm thick deformed stringer.
5	174.51	175.60	Occasional fine 1mm to 4mm thick deformed pyrite veinlets.
5	175.60	175.63	Pink feldspar or haematic altered zone.
5	177.90	178.40	Massive moderately silicified zone with 2% pyrite.
5	181.90	182.60	Pale creamy pink alteration.
5	182.60		Below this the rock becomes slightly coarser grained.
5	184.60	185.40	10% to 15% pyrite throughout as fine veinlets and dissemination's.
5	186.10	186.15	Pink zone or clast?
5	186.50	187.10	Weakly silicified with 2% py.
5	188.50	188.65	Pink zone or clast?

5	189.70	189.80	Pink zone or clast?
5	190.50	190.65	Pink zone or clast?
5	192.60	193.00	Pale pink zone.
5	194.20		Small micro fault indicating west over east dip slip movement based upon carbonate-chlorite-haematite fibres.
4	194.30	200.00	**Felsic Lava Breccia?** Pale grey cream rock with quartz feldspar phyric patches which appear as porphyritic lava clasts in a finer grained matrix the lava fragments being probably brecciated hyaloclastically 1% pyrite occurs as fine dissemination's throughout. The rock is weakly foliated at 40° to the core axis at 195.00m and 30° to the core axis at 199.00m. From 197.30m to 197.40m is a fine grained zone which has taken up the deformation with a fault at 197.45m to 197.48m at 70° to 80° to the core axis.
5	200.00		EOH

CED 2 DIAMOND DRILL RECORD

764040

Hole No: CED2
Section: 21800E
Northing: 3480 South
Easting: 21825 E
Grid: CETHANA EAST
Direction: GRID SOUTH
Inclination: -45°
Elevation: 400m a.s.l.
Azimuth: 192.5°
Mag Azimuth: 180.0°, 179.0°, 182.0°, 184.0°, 186.0°;
0° Mag = 12.5° True or 0° Grid (nominally)
Length (m): 295.00m
Precollar(m): 6.00m
Boco: <6.00m
Tofr: 9.80m
Water Table: ~60.00m

Drill Type: Mindrill
Core Size: HQ 42.40 NQ
Contractor: Fred Ortner

Dip Tests

Depth	Az	Dip
0.0m	192.5°	-45°
50.0m	191.5°	-44.75°
154.0m	194.5°	-42°
217.0m	196.5°	-37.75°
277.0m	198.5°	-33°

Property: CETHANA EAST
State: Tasmania
GMR: CETHANA
EL No: 10/88
Project No: 706
Date Started: 3/10/94
Date Completed: 14/10/94
Logged By: Grant MacDonald
Date Logged:
Interpreted: Grant MacDonald
Initialled:

CED 2 SUMMARY LOG

6.00m	18.90m	Fine to Medium Grained Felsic Volcaniclastic
18.90m	20.20m	Fault
20.20m	20.50m	Medium Grained Felsic Volcaniclastic
20.50m	40.00m	Felsic Tuffaceous Siltstone
40.00m	40.50m	Fault
40.50m	57.00	Felsic Tuffaceous Siltstone
57.00	70.40	Interbedded Felsic Tuffaceous Siltstone and Medium Grained Felsic Volcaniclastic
70.40	79.00	Fine and Medium Grained Felsic Volcaniclastic
79.00	86.30	Felsic Tuffaceous Siltstone
86.30	88.50	Medium Grained Felsic Volcaniclastic
88.50	109.20	Volcaniclastic Siltstones and Sandstone
109.20	124.60	Medium to Coarse Grained Felsic Volcaniclastic
124.60	126.90	Andesitic Intrusive
126.90	132.00	Interbedded Black and Felsic Tuffaceous Siltstones
132.00	148.10	Medium Grained Felsic Volcaniclastic
148.10	158.80	Coarse Grained "Stripey" Felsic Volcaniclastic
158.80	162.00	Haematitic Felsic Volcaniclastic
162.00	166.70	Fine to Medium Grained Felsic Volcaniclastic
166.70	168.10	Semi-massive Pyrite Zone
168.10	186.20	Medium Grained Felsic Volcaniclastic
186.20	195.70	Haematitic Medium Grained Felsic Volcaniclastic
195.70	204.40	Coarse Grained "Stripey" Felsic Volcaniclastic
204.40	207.20	Fault
207.20	207.70	Andesitic Intrusive
207.70	264.00	Fine to Medium Grained Felsic Volcanic
264.00	265.50	Fault
265.50	295.00	Felsic Volcanic
295.00		EOH

CED 2

4	0.00	6.00	Precollar, no core.
4	6.00	9.80	**Fine to Medium Grained Sericitic Felsic Volcaniclastic** Orange brown, moderately oxidised, fine to medium grained quartz and sericitised feldspars in a strongly schistose (cleavage at 35 degrees to core axis), sericitised matrix with minor disseminated euhedral haematite. Considerable core loss.
4	9.80	18.90	**Fine to Medium Grained Sericitic Felsic Volcaniclastic** As for 6.00 to 9.80 but unoxidised pale grey green, becoming beige green downhole, fine to medium grained quartz and sericitised feldspars in a strongly schistose (cleavage 35 degrees to core axis), sericitised matrix. Some finer grained zones as well as zones with medium grained angular quartz. Minor disseminated haematite throughout. Considerable core loss.
4	18.90	20.20	**Fault** Puggy fault.
4	20.20	20.50	**Medium Grained Sericitic Felsic Volcaniclastic** As for 9.80 to 18.90 but with angular medium grained quartz.
4	20.50	40.00	**Felsic Tuffaceous Siltstone, Sericitic** Pale cream to beige, fine grained tuffaceous siltstone, weakly siliceous, more brittle/ductile style of deformation than above with more irregularly orientated cleavage at 30 to 40 degrees to the core axis. Some very occasional pale green sericitic shears or zones are probably primary bands at 45 degrees to the core axis. A minor shear has sericitic fibres indicating dip-slip movement. Pre S^2 carbonate veins become more common downhole, associated with haematite. Minor haematite also occurs as dissemination's and in veinlets in the S^2 cleavage. Becomes fine to medium grained below 39.50. Below 37.00 core is very broken.
4	40.00	40.50	**Fault**

			Focus of deformation. Rocks as for above and below intersection.
4	40.50	57.00	**Felsic Tuffaceous Siltstone, Sericitic** Similar to 20.50 to 40.00. Much broken core to 42.40. Pale cream to beige fine grained felsic tuffaceous siltstone. Sericitic shears become more common downhole at 40 degrees to the core axis. 0.5% disseminated euhedral haematite throughout with very minor fine grained disseminated pyrite. Some zones with carbonate alteration as pre-latest stage deformation brecciation infilling, especially from 52.00 to 53.50. The clastic zone from 54.00 to 55.30 is a soft sediment deformation effect with minor fine to medium grained quartz in the matrix.
4	57.00	70.40	**Interbedded Felsic Tuffaceous Siltstone and Medium Grained Felsic Volcaniclastics** Interbedded zones of pale grey green finer grained felsic tuffaceous siltstones and medium grained felsic volcaniclastics. The coarser zones contain quartz and sercitised feldspars and have a stripy appearance due to sericitic shears. Some soft sediment deformation in finer zones. Minor pyrite and minor to 2% haematite as noted below.
5	57.00	58.30	Medium grained with 2% disseminated haematite and occasional carbonate-chlorite-pyrite rings.
5	58.30	58.60	Medium grained brecciated zone with irregular pyrite chlorite vein.
5	58.60	59.00	Finer grained zone.
5	59.00	59.60	Finer grained soft sediment deformed zone.
5	59.60	59.90	Finer grained zone.
5	59.90	61.60	Medium grained stripy zone.
5	61.60	66.50	Fine to medium grained zone with 1% pyrite generally associated with carbonate-chlorite-haematite in deformed blebby stringers which are pre-S^2 but not obviously syngenetic.
5	66.50	70.40	Medium grained stripy zone becoming less stripey below 67.50. 1% pyrite associated with carbonate and chlorite.
4	70.40	79.00	**Fine and Medium Grained Felsic Volcaniclastic** Blotchy grey green and pale pink rock with medium grained quartz and feldspars. Has clastic appearance

			due to colouration, however, colour appears to be due to diffuse haematite and chlorite alteration. Probably reworked crystal tuff. 0.5% pyrite in fine dissemination's. Fines up gradually below 77.80. Sericitic shears at 65 degrees to core axis are concentrated in finer grained zones. Puggy minor fault at 74.20.
4	79.00	86.30	**Fine Grained Volcaniclastic (Tuffaceous Siltstone)** Pale grey green, fine grained, with some occasional pale green shears/bands. Moderate chlorite alteration throughout. Cleavage/schistocity is at 45 degrees to the ore axis. Fine pyrite veinlets are concordant to the foliation (S^2) and are associated with carbonate and chlorite.
5	79.00	80.20	As above.
5	80.20	80.23	Carbonate vein with 5% pyrite, 2% galena and 1% chalcopyrite. Vein is concordant to the foliation (S^2).
5	80.23	82.50	2% pyrite in fine veinlets parallel to foliation.
5	82.50	82.70	Carbonate quartz vein with finely laminated pyrite.
5	82.70	83.00	As above.
5	83.00	83.40	Carbonate quartz vein.
5	83.40	86.30	As above with occasional minor quartz haematite veinlets.
4	86.30	88.50	**Medium Grained Felsic Volcaniclastic** Pale orange brown, medium grained quartz volcaniclastic with silica-clay(?) veinlets anastomosing around saccharine siliceous zones with 1% fine grained disseminated pyrite and fine pyrite veinlets as well as 1% disseminated haematite. At 88.00 two 2 mm pyrite chlorite veins are concordant to foliation at 60 degrees to the core axis. At 87.30 is a minor pug zone. The lower contact is gradational.
4	88.50	109.20	**Fine to Medium Grained Felsic Volcaniclastics (Siltstones and Sandstone)** Dark green, moderately foliated, moderately chlorite altered fine to medium grained sediment. The rock contains medium grained chloritic clots especially around 93.00. Becomes more pyritic downhole with up to 2% pyrite in fine dissemination's and veinlets, occasionally associated with haematite. Lower contact is gradational.

4	109.20	124.60	**Medium to Coarse Grained Felsic Volcaniclastic**

Similar to 86.30 to 88.50. Medium to coarse grained quartz (to 8mm) eyes in a fine grained matrix with anatomising sericitic veinlets. 5% pyrite in deformed stringer blebs concordant to the foliation at 40 degrees to the core axis. Below 123.00 the rock becomes increasingly puggy to 124.30 which is a puggy fault. At 124.40 is a black siltstone clast. The lower contact is sharp but unsheared in broken core.

4	124.60	126.90	**Andesitic Intrusive**

Moderately sericitised, foliated (65 degrees to core axis) fine to medium grained white feldspars and pale green mafics in a moderate green matrix. Disseminated haematite clots may be vesicle fillings. The lower contact is sharp but in broken core. This rock is an andesitic intrusive as intersected in other DDH's.

4	126.90	132.00	**Interbedded Black and Sericitic Siltstones**

Interbedded black and sericitic bands, sub-parallel to cleavage, with gritty quartz eyes to 3mm in the sericitic bands. The moderately defined foliation, at 50° to the core axis, dips approximately 80° to 40° (true). From 126.90 to 127.70m the rock is 100% black siltstone with 1% to 2% disseminated pyrite. Below 127.70m the rock becomes interbedded. The black siltstone is probably a chloritic tuffaceous shale. Somewhat gradational lower contact.

4	132.00	136.00	**Medium Grained Sercitic Felsic Volcaniclastic**

Medium grained quartz (to 4mm), sericitised feldspar and rare lithics (quenched lava or felsic siltstone) in a sericitised, weakly silicified matrix. From 133.60m to 134.10m the rock contains 5% pyrite in deformed stringer blebs parallel to the cleavage. Elsewhere is 1% to 2% pyrite as fine dissemination's and deformed blebs associated with haematite. Below 135.40m 2mm thick deformed haematite-carbonate-minor pyrite and occasional chlorite veins are either concordant to the foliation or deformed in the cleavage.

4	136.00	148.10	**Medium Grained Felsic Volcaniclastic**

Quartz (to 2mm) and feldspar in a sericitised matrix giving a mottled appearance. 1% to 2% pyrite in disseminated blebs in the cleavage and 2% disseminated and veinlet haematite are present throughout. From 140.90m to 141.10m 5% to 10%

			pyrite occurs in veins parallel to the cleavage at 45° to the core axis. From 141.10m to 142.10m 5% pyrite occurs as veins and zones to 20mm thick at 15° to the core axis. Haematite levels increase below 141.10m. From 143.80m to 144.20m 5% pyrite occurs as irregular veinlets. From 145.20m to 146.10m 5% haematite occurs as veinlets with a gradational lower contact. Pyrite-sericite-silica-carbonate bands/veins are at 45° to 50° to the core axis, dipping approximately 80° to 205° (true). From 147.00m to 147.40m the rock contains 5% pyrite.
4	148.10	158.80	**Coarse Grained "Stripey" Felsic Volcaniclastic** Quartz feldspar rich volcaniclastic with a stripey appearance due to banded sericite alteration at 50 degrees to the core axis. Sericitic zones are fine grained and lie between gritty quartz and feldspar rich zones. From 152.50m to 152.70m 5% pyrite occurs as veinlets associated with haematite whilst elsewhere the rock contains 2% pyrite as very fine grained dissemination's and deformed blebs, and also fine grained disseminated haematite and veinlets of haematite in the cleavage. The lower contact is sharp with the purple haematitic rock.
4	158.80	162.00	**Haematitic Felsic Volcaniclastic** Purple rock with occasional fine to medium grained quartz eyes. Purple colouration is due to diffuse haematite alteration.
5	158.80	159.90	As above with 5% pyrite in veinlets at 35 degrees to the core axis in a pale pink purple zone.
5	159.90	161.95	As above with 3% to 5% pyrite throughout in deformed stringer blebs with 10% pyrite from 161.00m to 161.20m associated with silicification.
5	161.95	162.00	Gritty puggy fault zone.
4	162.00	166.70	**Fine to Medium Grained Felsic Volcaniclastic** Mottled red-brown and white-green, fine to medium grained quartz and feldspar volcaniclastic, variably diffusely haematite and sericite altered zones. 2% pyrite throughout in continuous fine veinlets at 50 degrees to the core axis and 2% fine grained

			disseminated haematite. The lower contact is sharp and defined by increase in pyrite content.
4	166.70	168.10	**Semi-Massive Pyrite Zone** 5% to 10% pyrite in veinlets, associated with silicification and carbonate at 45 degrees to the core axis throughout the pale pink fine to medium grained sericitic and silicified quartz feldspar volcaniclastic. The rock contains negligible disseminated haematite and has a gradational lower contact. At 166.70 a pyrite veinlet dips 87° to 190° (true).
4	168.10	186.20	**Medium Grained Felsic Volcaniclastic** Gritty, pale purple green to pale pink, variably diffusely haematite and sericite altered, massive medium grained quartz volcaniclastic with rare sub-angular lithics to 10mm. Lithics are beige felsic siltstones or quenched lava fragments. Above 177.50m the rock is pale purple green due to haematite alteration, below 172.50m it is pale pink. 2% pyrite throughout in deformed blebs with better zones as follows: 170.20m to 170.30m 3% pyrite in irregular veinlets; 172.40m to 174.30m 3% pyrite in diffuse and irregular veinlets; 177.30m to 177.60m 5% pyrite in veinlets at 45 degrees to the core axis. At 169.20 the foliation dips at 88° to 0.05° (true).
4	186.20	195.70	**Haematite to Medium Grained Felsic Volcaniclastic** Medium grained quartz pyrite volcanic (porphyritic lava?) with purple colouration due to diffuse haematite alteration as well as 2% disseminated haematite and deformed veinlets. The rock is foliated at 45 degrees to the core axis with 1% to 2% pyrite in deformed stringer blebs. Pyrite veinlets associated with silicification around 187.40m dip 84° to 010° (true), 86° to 034° (true), 88° to 355° (true) and 88° to 000° (true). Brecciated haematite veinlets at 186.70m dip 88° to 070° and at 187.40m dip 70° to 080° (true).
4	195.70	204.40	**Coarse Grained "Stripey" Felsic Volcaniclastic** Similar rock to 148.10m to 158.80m with quartz to 4mm. The cleavage is at 50° to the core axis and contains 1% to 2% pyrite throughout and only very minor disseminated haematite decreasing downhole.
4	204.40	207.20	**Fault** As above rock in a fault zone.

4	207.20	207.70	**Andesitic Dyke** Pale lime green andesitic dyke, foliated at 80° to the core axis, with flattened feldspar and mafics. Vesicles are filled with chlorite and carbonate.
4	207.70	264.00	**Fine to Medium Grained Felsic Volcanic** Pale pink green, fine to medium grained quartz feldspar phyric volcanic with quartz to 3mm and 1% disseminated pyrite unless noted below. Possibly a felsic lava.
5	209.70	211.00	3% to 5% pyrite as deformed blebs in pink massive zones.
5	212.00	212.30	3% pyrite associated with silicification.
5	214.20	214.80	3% pyrite associated with silicification.
5	220.00	231.60	3% to 5% pyrite in veinlets and deformed stringer blebs
5	231.60	231.80	10% pyrite in deformed stringer.
5	240.00	240.02	Pug zone.
5	241.80	243.50	3% pyrite.
5	260.30	260.50	3% pyrite associated with silicification in fine veinlets at 30° to the core axis.
5	270.50	277.50	5% pyrite.
4	264.00	265.50	**Fault** Puggy fault zone.
4	265.50	279.70	**Felsic Volcanic** Pale pink to pale grey green, medium grained quartz phyric volcanic, possibly a felsic lava. Similar to 207.70m to 264.40m and to underlying unit to the EOH. From 270.40m to 277.00m the rock contains 3% pyrite in deformed veinlets sub parallel to the cleavage at 35° to the core axis. From 279.50m to 279.70m is a distinctly porphyritic felsic volcanic fragment.
4	279.70	295.00	**Felsic Volcanic** Creamy pale green fine to medium grained quartz feldspar phyric? Volcanic with fine chlorite pyrite veinlets to 1mm consistently cross-cutting at 75° to

		the core axis, possibly picking out flow-banding. This veining dips 75° to 020° (true) at 286.00m. The rock is possibly a felsic lava. 1% to 2% pyrite throughout occurs as deformed blebs as well as the chlorite pyrite veinlets. From 281.40m to 281.70m is a puggy fault zone.
4	295.00	EOH

APPENDIX 2

ASSAY RESULTS CED 1 AND CED 2

Analabs

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

764050

Phone (004) 316337 | 14 Thirkell St. DOOEE TAS 7320 | Fax (004) 318890

ANALYTICAL REPORT No. 111713.60.10525

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

INVOICE TO:
Mr Grant MacDonald
Plutonic Operations Limited
112 West Street
DEVONPORT TAS 7310

ORDER No.	PROJECT
G MacDonald	

DATE RECEIVED	RESULTS REQUIRED
10/11/94	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
5	24/11/94	1	84

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
VARIOUS	RD Prep : BP033	Au,Au(R),Au(S)/66309 Cu,Pb,Zn/GA140 Pb,Zn/GA104

REMARKS

RESULTS TO
Mr Grant MacDonald
Plutonic Operations Limited
112 West Street
DEVONPORT TAS 7310

RESULTS TO

RESULTS TO

AUTHORISED SIGNATORY

Analabs

Analabs Pty. Ltd.
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ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111/15.60.10525	24/11/94	G MacDonald	1 OF 5

	SAMPLE No.	Cu	Pb	Pb	Zn	Zn	Au	Au(R)
METHOD		GA140	GA140	GA104	GA140	GA104	GG309	GG309
1	CED1 22 100.8-101.4	25	67	-	480	-	<0.008	-
2	CED1 27 125.9-126.8	92	42	-	206	-	0.010	-
3	CED1 30 148.6-147.6	9	5	-	145	-	<0.008	-
4	CED1 31 149.6-150.6	5	13	-	114	-	<0.008	-
5	CED1 32 161.0-162.0	14	29	-	115	-	0.010	-
6	CED1 33 162.0-163.0	7	9	-	224	-	<0.008	-
7	CED1 33 163.0-163.65	6	<3	-	87	-	<0.008	-
8	CED1 33 163.65-164.4	109	8	-	106	-	0.023	-
9	CED1 33 164.45-165.4	26	14	-	93	-	0.018	-
10	CED1 33 164.45-166.3	12	10	-	57	-	0.019	-
11	CED1 33 166.3-167.8	127	11	-	178	-	0.019	-
12	CED1 33 167.4-168.4	58	4	-	477	-	<0.008	<0.008
13	CED1 34 168.4-169.5	11	8	-	417	-	<0.008	-
14	CED1 34 169.5-170.5	26	20	-	374	-	0.012	-
15	CED1 34 170.5-171.4	8	9	-	353	-	<0.008	-
16	CED1 34 171.4-172.5	42	22	-	314	-	0.014	-
17	CED1 34 172.5-173.5	18	15	-	316	-	<0.008	-
18	CED1 34 173.4-174.6	41	13	-	382	-	0.021	-
19	CED1 35 174.6-175.6	9	3	-	294	-	0.009	-
20	CED1 36 184.6-185.4	77	17	-	212	-	0.012	-
21	CE2 5 35.0-36.0	6	924	-	86	-	<0.008	-
22	CED2 9 60.0-61.0	7	56	-	185	-	<0.008	<0.008
23	CED2 10 62.2-63.2	31	101	-	1028	-	<0.008	-
24	CED2 13 79.2-80.2	59	1388	-	1852	-	0.012	-
25	CED2 13 80.2-81.2	117	1102	-	2432	-	0.026	-

Results in ppm unless otherwise specified
- = element not determined

IS = insufficient sample
SNR = sample not received

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.10525	24/11/94	G MacDonald	2 OF 5

	SAMPLE No.	Cu	Pb	Pb	Zn	Zn	Au	Au(R)
METHOD		GA140	GA140	GA104	GA140	GA104	GG309	GG309
1	CED2 13 81.2-82.2	122	2562	-	-	1.33	0.030	-
2	CED2 13 82.2-83.2	49	1495	-	-	0.70	0.010	-
3	CED2 13 83.2-84.2	166	1170	-	4916	-	0.012	-
4	CED2 13 84.2-85.2	140	-	0.43	-	0.88	0.056	-
5	CED2 14 87.7-88.7	67	1271	-	4202	-	0.015	-
6	CED2 18 109.0-110.0	20	146	-	724	-	0.037	-
7	CED2 18 110.0-111.0	10	164	-	598	-	<0.008	-
8	CED2 18 111.0-112.0	12	321	-	525	-	0.011	-
9	CED2 18 112.0-113.0	14	1762	-	1599	-	0.025	-
10	CED2 18 113.0-114.0	16	-	0.69	1886	-	0.018	-
11	CED2 19 114.0-115.0	13	1553	-	700	-	<0.008	-
12	CED2 19 115.0-116.0	18	1067	-	334	-	0.011	<0.008
13	CED2 19 116.0-117.0	17	235	-	387	-	0.008	-
14	CED2 19 117.0-118.0	24	281	-	340	-	0.008	-
15	CED2 20 118.0-119.0	24	243	-	317	-	<0.008	-
16	CED2 20 119.0-120.0	25	154	-	464	-	0.012	-
17	CED2 20 120.0-121.0	14	107	-	216	-	<0.008	-
18	CED2 20 121.0-122.0	45	115	-	329	-	0.009	-
19	CED2 20 122.0-123.0	35	199	-	216	-	0.010	-
20	CED2 21 126.9-128.0	29	161	-	802	-	0.015	-
21	CED2 21 128.0-129.0	3	19	-	186	-	<0.008	-
22	CED2 22 132.0-133.0	10	87	-	204	-	<0.008	<0.008
23	CED2 22 133.0-134.0	23	83	-	317	-	<0.008	-
24	CED2 23 134.0-135.0	14	41	-	238	-	<0.008	-
25	CED2 24 143.2-144.2	28	38	-	351	-	0.008	-

Results in ppm unless otherwise specified
- = element not determined

IS = insufficient sample
SNR = sample not received

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

764053

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.10525	24/11/94	G MacDonald	3 OF 5

	SAMPLE No.	Cu	Pb	Pb	Zn	Zn	Au	Au(R)
METHOD		GA140	GA140	GA104	GA140	GA104	GG309	GG309
1	CED2 26 153.0-154.0	6	18	-	166	-	<0.008	-
2	CED2 26 154.0-155.0	5	23	-	329	-	<0.008	-
3	CED2 26 155.0-156.0	6	19	-	376	-	0.009	-
4	CED2 27 159.9-160.9	11	42	-	329	-	<0.008	-
5	CED2 27 160.9-161.9	14	58	-	212	-	<0.008	-
6	CED2 28 166.7-167.7	37	531	-	283	-	0.059	-
7	CED2 28 167.7-168.7	17	152	-	187	-	0.008	-
8	CED2 29 171.5-172.5	7	72	-	300	-	<0.008	-
9	CED2 29 172.5-173.5	23	576	-	605	-	0.011	-
10	CED2 28 173.5-174.5	20	247	-	229	-	<0.008	-
11	CED2 31 185.8-186.8	37	221	-	161	-	0.030	-
12	CED2 35 209.7-210.7	9	123	-	808	-	<0.008	<0.008
13	CED2 36 210.7-211.7	9	87	-	260	-	<0.008	-
14	CED2 36 214.0-215.0	12	63	-	278	-	<0.008	-
15	CED2 38 227.0-228.0	4	31	-	109	-	<0.008	-
16	CED2 39 228.0-229.0	4	33	-	115	-	<0.008	-
17	CED2 39 229.0-230.0	9	161	-	452	-	<0.008	-
18	CED2 39 230.0-231.0	15	302	-	845	-	<0.008	-
19	CED2 39 231.0-232.0	30	528	-	4625	-	0.008	-
20	CED2 39 232.0-233.0	7	47	-	407	-	<0.008	-
21	CED2 39 233.0-234.0	3	12	-	222	-	<0.008	-
22	CED2 39 234.0-235.0	6	20	-	175	-	<0.008	<0.008
23	CED2 40 235.0-236.0	5	8	-	213	-	<0.008	-
24	CED2 44 259.0-260.0	15	15	-	123	-	<0.008	-
25	CED2 44 260.0-261.0	5	18	-	146	-	<0.008	-

Results in ppm unless otherwise specified
– = element not determined
IS = insufficient sample
SNR = sample not received

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764054

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.10525	24/11/94	G MacDonald	4 OF 5

	SAMPLE No.			Cu	Pb	Pb	Zn	Zn	Au	Au(R)
METHOD				GA140	GA140	GA104	GA140	GA104	GG309	GG309
1	CED2 44 261.0-262.0			5	11	-	156	-	<0.008	-
2	CED2 44 262.0-263.0			7	14	-	100	-	<0.008	-
3	CED2 46 270.5-271.5			20	40	-	188	-	0.008	-
4	CED2 46 271.5-272.5			12	113	-	157	-	0.008	-
5	CED2 46 272.5-273.5			9	124	-	166	-	<0.008	-
6	CED2 46 273.5-274.5			9	35	-	38	-	<0.008	-
7	CED2 46 274.5-275.5			28	48	-	28	-	0.010	-
8	CED2 47 275.5-276.5			58	70	-	35	-	0.010	-
9	CED2 47 276.5-277.5			186	111	-	40	-	0.008	-
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24	DETECTION			2	3	0.01	2	0.01	0.008	0.008
25	UNITS			ppm	ppm	%	ppm	%	ppm	ppm

Results in ppm unless otherwise specified
- = element not determined

IS = insufficient sample
SNR = sample not received

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764055

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.10525	24/11/94	G MacDonald	5 OF 5

	SAMPLE No.			Au(S)						
METHOD				GG309						
1	CED1 27 125.9-126.8			<0.008						
2	CED2 13 82.2-83.2			0.009						
3	CED2 21 128.0-129.0			<0.008						
4	CED2 39 230.0-231.0			<0.008						
5	CED2 46 274.5-275.5			0.009						
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24	DETECTION			0.008						
25	UNITS			ppm						

Results in ppm unless otherwise specified
– = element not determined

IS = insufficient sample
SNR = sample not received

AUTHORISED OFFICER

APPENDIX 3

DRILL LOGS

FOR PREVIOUS CETHANA EAST DDHs

764057

HOLE NO. : DD77CC4
SECTION : 21750.00 EAST

PLUTONIC OPERATIONS LIMITED
GOWRIE PARK

Page: 1

Northing : -8.00
Easting : 21750.00
Grid : CETHANA EAST
Direction : GridS
Inclination : 192.5
Elevation : 478.00
Azimuth : -58.0
Mag Azimuth : 180; 0G=0M or 12.5T
Length (m) : 149.70
Precol. (m) : 3.00m
BOCO : <3.00m
TFR : 3.00m
Water Table : N/A

DIAMOND DRILL RECORD

Drill Type :Mindrill F30
Core Size :HQ 3.00 NQ 64.60 BQ
Contractor :Associated

Dip Tests Method: ?
Depth Az Dip

Property : CETHANA EAST
State : Tasmania
GMR : Cethana 4240
E.L. No. : GOWRIE PARK
Project No. : 706
Date Started : ?/?/77
Date Completed: ?/?/77
Logged by : G. MacDONALD
Relogged by :
Date Logged :
Interpreted : G. MacDONALD

Initialled :

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm)
.00	2.50	PRECOLLAR Triconed-no core.							
2.50	16.70	VOLCANICLASTIC / SILICA SERICITE ALTERATION / CHLORITE SILICA ALTERATION ALTERED REWORKED FELSIC VOLCANICLASTIC. Pale green grey, moderately silicified, sericitized and chlorite altered schist with medium grained rounded quartz eyes to 2mm and possibly sericitized feldspars and sericitized pumiceous clasts in a fine grained tuffaceous matrix. The rock is probably reworked from felsic crystal vitric tuffs. The rock contains 1-2% pyrite throughout, locally richer in veins, to 10mm thick, concordant the cleavage at 35 degrees to the core axis. The lower contact is gradational with the underlying rock which has coarser quartz eyes.	D00001	3.00	4.50	1.50	45	280	190
			D00002	4.50	6.00	1.50	15	130	310
			D00003	6.00	10.00	4.00	15	150	590
			D00004	10.00	12.50	2.50	15	250	390
			D00005	12.50	13.50	1.00	20	500	780
			D00006	13.50	14.00	.50	25	940	710
			D00007	14.00	17.00	3.00	15	100	280
16.70	64.60	VOLCANICLASTIC / SILICA SERICITE ALTERATION ALTERED FELSIC VOLCANICLASTIC. Pale green, moderately sericitized silicified rock with distinct rounded quartz eyes to 8mm, sericitized feldspars (?) and flattened pumiceous clasts. Pyrite veins, up to 10mm thick and concordant to the cleavage, continue into this unit and contain occasional minor associated galena and sphalerite. The cleavage is at 30 degrees to the core axis initially but is around 45 degrees to the core axis downhole. From 61.50m to 61.75m a cross-cutting zone of massive pyrite with siliceous pyritic selvedges may be a syn-sedimentary lens. This lens is silicified and massively pyritic towards the upper contact and more sericitized towards the lower contact. Other than this the rock contains only trace galena and sphalerite.	D00008	17.00	17.40	.40	85	250	150
			D00009	17.40	20.00	2.60	15	120	230
			D00010	20.00	25.00	5.00	10	30	190
			D00011	25.00	30.00	5.00	15	40	180
			D00012	30.00	32.00	2.00	20	40	320
			D00013	32.00	36.50	4.50	15	50	220
			D00014	36.50	37.00	.50	45	360	250
			D00015	37.00	39.00	2.00	25	110	200
			D00016	39.00	43.00	4.00	15	50	190
			D00017	43.00	46.40	3.40	10	30	270
			D00018	46.40	46.90	.50	45	450	510
			D00019	46.90	51.00	4.10	10	30	160
			D00020	51.00	55.50	4.50	15	30	170
			D00021	55.50	60.00	4.50	30	50	250
			D00022	60.00	62.00	2.00	30	340	130
			D00023	62.00	64.50	2.50	30	60	160
			D00024	64.50	69.00	4.50	10	100	180
64.60	64.65	SHEAR ZONE Puggy shear zone with the shearing at 45 degrees to the core axis.							

HOLE NO. : DD77CC4 PLUTONIC OPERATIONS LIMITED Page: 2

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm
64.65	98.50	VOLCANICLASTIC / SILICA SERICITE ALTERATION							
		ALTERED FELSIC VOLCANICLASTIC.	D00025	69.00	73.50	4.50	20	130	290
		Pinky orange to pale grey sericitized and silicified rock	D00026	73.50	75.00	1.50	10	70	230
		consisting of fine grained, occasionally medium grained,	D00027	75.00	77.50	2.50	30	2150	560
		quartz eyes, feldspars and pumice clasts. The rock	D00028	77.50	79.50	2.00	30	210	800
		contains 1% pyrite generally in patches of silicification	D00029	79.50	82.00	2.50	25	190	240
		concordant to the foliation at 30 degrees to the core axis	D00030	82.00	83.00	1.00	15	50	670
		though the rock is generally massive. The rock contains 2%	D00031	83.00	85.50	2.50	35	140	550
		pyrite in bands / beds (?) from 74.60m to 74.90m at 35	D00032	85.50	87.50	2.00	20	160	600
		degrees to the core axis, from 82.90m to 87.50m and from	D00033	87.50	91.00	3.50	15	100	290
		94.00m to 94.50m, with generally only minor associated	D00034	91.00	94.00	3.00	10	30	400
		sphalerite.	D00035	94.00	94.60	.60	120	530	210
			D00036	94.60	98.00	3.40	10	50	280
			D00037	98.00	102.00	4.00	15	60	450
98.50	121.50	VOLCANICLASTIC / CHLORITE SILICA ALTERATION							
		The same rock as intersected from 64.65m to 98.50m except	D00038	102.00	102.50	.50	490	3520	550
		that it is now more chlorite altered than sericite. The	D00039	102.50	107.00	4.50	10	50	390
		rock is foliated at 40 degrees to the core axis. The rock	D00040	107.00	108.00	1.00	15	70	400
		contains 2% to 4% pyrite in bands / beds (?) from 102.10m	D00041	108.00	112.00	4.00	12	60	350
		to 102.70m associated with 0.5% galena. Probable bedding	D00042	112.00	116.00	4.00	30	90	350
		is generally at 50 to 55 degrees to the core axis.	D00043	116.00	120.50	4.50	10	40	380
			D00487	120.50	122.00	1.50	35	70	250
121.50	149.70	VOLCANICLASTIC							
		SILICIFIED FELSIC VOLCANICLASTICS.	D00488	122.00	124.00	2.00	25	230	250
		Pinky orange to grey, silicified, weakly sericitized,	D00489	124.00	126.00	2.00	15	290	160
		variably fine grained and more gritty with quartz eyes to	D00490	126.00	127.80	1.80	25	190	270
		4mm with pumiceous fragments. The rock is very similar to	D00491	127.80	128.30	.50	90	980	0
		the overlying rocks and is still pyritic with pyrite	D00492	128.30	129.60	1.30	40	440	510
		associated with silicification. The most pyritic zones are	D00493	129.60	131.00	1.40	20	280	170
		from 127.80m to 127.95m and from 136.00m to 138.00m with	D00494	131.00	133.00	2.00	15	370	510
		pyrite in massive bands. There is a significant puggy	D00495	133.00	135.00	2.00	30	250	630
		fault from 138.00m to 138.50m below which the rock becomes	D00496	135.00	136.00	1.00	10	250	300
		less sulphidic. A lesser structure may cross-cut the core	D00497	136.00	138.00	2.00	40	880	0
		at 131.20m at 60 degrees to the core axis.	D00498	138.00	139.00	1.00	55	500	0
		149.70 E.O.H.	D00499	139.00	143.20	4.20	15	60	200
			D00500	143.20	148.00	4.80	15	90	200
			D00501	148.00	149.70	1.70	25	310	280

764059

HOLE NO. : DD77CC5
SECTION : 21750.00 EAST

PLUTONIC OPERATIONS LIMITED
GOWRIE PARK

Page: 1

Northing : -8.00
Easting : 21750.00
Grid : CETHANA EAST
Direction : Grid S
Inclination : 192.5
Elevation : 452.00
Azimuth : -55.0
Mag Azimuth : 180; OG=OM or 12.5T
Length (m) : 164.20
Precol. (m) : 1.20m
BOCO : <1.20m
TFR : 8.50m
Water Table :

DIAMOND DRILL RECORD

Drill Type :
Core Size :HQ 1.20 NQ 35.90 BQ
Contractor :

Dip Tests Method:
Depth Az Dip

Property : CETHANA EAST
State : Tasmania
GMR : Cethana 4240
E.L. No. : GOWRIE PARK
Project No. : 706
Date Started :
Date Completed:
Logged by : G. MacDONALD
Relogged by :
Date Logged :
Interpreted : G. MacDONALD

Initialled :

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm)
.00	1.20	PRECOLLAR							
1.20	9.20	SILICA SERICITE ALTERATION Strongly sericitized and moderately siliceous quartz sericite schist, oxidised throughout with the cleavage at 25 to 30 degrees to the core axis. The rock was probably a reworked quartz phyric tuff prior to alteration. There is a dark grey tuffaceous shale interbed running down the centre of the core from 8.60m to 8.70m. The rock contains no visible sulphides, these being oxidised and now limonitic.	E00001	1.20	7.50	6.30	30	1210	50
			E00002	7.50	9.30	1.80	115	310	170
9.20	15.00	VOLCANICLASTIC / CHLORITE SILICA ALTERATION ALTERED FELSIC VOLCANICLASTIC. Moderately chlorite, sericite and silica altered quartz feldspar phyric volcaniclastic with sericitized pumiceous clasts sheared out parallel to the cleavage at 25 degrees to the core axis. There are some open space cavities after ferruginous carbonate veins. The rock contains very minor disseminated clots of pyrite, galena and sphalerite.	E00003	9.30	12.60	3.30	10	440	550
			E00004	12.60	15.60	3.00	15	490	850
15.00	17.60	VOLCANICLASTIC FELSIC VOLCANICLASTIC. Tan brown, quartz feldspar phyric pumiceous volcaniclastic, strongly foliated but not schistose. Pumice clasts are chlorite altered, up to 10mm long and foliated at 30 degrees to the core axis. The rock contains no sulphides.	E00005	15.60	19.70	4.10	135	640	2750
17.60	19.70	PELITE / CHLORITE SILICA ALTERATION ALTERED FELSIC TUFFACEOUS SILTSTONE. Fine grained green, moderately chlorite altered, sericitic, moderately schistose volcaniclastic, cleaved at 30 degrees to the core axis. The rock contains some weakly pyritic dark bands, up to 2mm thick, which appear to be the same as the tuffaceous shale intersected from 8.60m to 8.70m. These shale interbeds are at approximately 20 degrees to the cleavage.							

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm
19.70	24.00	SHEAR ZONE Shear zone / fault with complete core loss. The few fragments left in the core boxes appear to be a haematitic breccia.	E00006	19.70	25.20	5.50	1000	550	1250
24.00	31.20	VOLCANICLASTIC / CHLORITE SILICA ALTERATION ALTERED FELSIC VOLCANICLASTIC. Strongly schistose, moderately sericitic fine grained, reworked quartz feldspar phyric tuff with strong overprinting by fine sericite veins. The rock contains a clast (?) of massive sphalerite at 29.00m and is probably a reworked crystal tuff. Elsewhere the rock contains minor disseminated sulphides.	E00007	25.20	28.20	3.00	55	250	1420
			E00008	28.20	30.00	1.80	45	470	1550
			E00009	30.00	32.00	2.00	35	500	1180
31.20	37.80	VOLCANICLASTIC / CHLORITE SILICA ALTERATION ALTERED FELSIC VOLCANICLASTIC. Logged previously as a slump breccia, this rock contains medium grained gritty quartz phenocrysts, chloritic pumiceous patches and occasional cross-cutting creamy silicic sericite bands with fine grained chloritic tuffaceous siltstone rafts (?) or interbeds. From 37.50m to 37.80m the rock is moderately sericitized and schistose at 30 degrees to the core axis. The rock contains minor disseminated pyrite, chalcopyrite and sphalerite. The lower contact with the mineralized zone is sharp, sheared and sericitic.	E00010	32.00	34.00	2.00	10	40	670
			E00011	34.00	36.00	2.00	15	310	870
			E00012	36.00	36.90	.90	20	120	780
			E00013	36.90	37.80	.90	1200	330	2450
37.80	38.80	SEMI-MASSIVE SULPHIDES Semi-massive sulphides in compositionally distinct bands with distinct sphalerite, chalcopyrite and pyrite bands / beds which were probably deposited syngenetically to sedimentation. The sulphides are now in sheared out bands in a quartz chlorite carbonate gangue, the banding of mineralization at 40 degrees to the core axis. The host rock is a fine grained chloritic tuffaceous shale. The rock is described in D. Cooke's report included as an appendix to this report.	E00014	37.80	38.80	1.00	11800	8000	38800
38.80	50.90	VOLCANICLASTIC / CHLORITE SILICA ALTERATION ALTERED FELSIC VOLCANICLASTIC. Moderately chloritic, weakly sericitized, gritty quartz rich reworked (?) tuff with chloritic pumiceous clasts and occasional sub - rounded fine grained siliceous cherty clasts. The upper contact with the mineralized zone is gradational. The rock contains minor disseminated sulphides, predominantly pyrite and lesser sphalerite, decreasing downhole.	E00015	38.80	41.00	2.20	75	1050	2350
			E00016	41.00	43.00	2.00	110	590	1300
			E00017	43.00	45.00	2.00	215	390	1130
			E00018	45.00	46.50	1.50	120	210	1300
			E00019	46.50	47.50	1.00	80	1150	1320
			E00020	47.50	49.00	1.50	80	990	570
			E00021	49.00	50.90	1.90	70	170	660
50.90	51.80	BRECCIA FAULT BRECCIA. Carbonate healed, brittle style, fault breccia, post chlorite alteration with the rock containing clasts of chlorite altered tuffaceous siltstones throughout. The rock contains minor pyrite and sphalerite / galena in clots	E00022	50.90	51.80	.90	110	1100	3170
51.80	70.80	FELSIC MASS FLOW / FELSIC TUFF / CHLORITE SILICA ALTERATION							

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm
		ALTERED SOFT SEDIMENT DEFORMED PACKAGE OF REWORKED FELSIC TUFFS. Chloritic soft sediment breccia of fine grained vitric tuffaceous siltstones, tuffaceous shale and reworked pumiceous quartz rich crystal tuffs. Some clasts / rafts have frayed edges with some bedding (?) at low angles to the core axis. At 58.90m is a cross-cutting galena sphalerite vein parallel to the foliation. The mafic dyke cross-cutting the core from 68.50m to 68.51m is identical to that intersected from 70.80m to 72.60m.	E00023	51.80	53.00	1.20	75	790	1250
			E00024	53.00	55.00	2.00	55	540	890
			E00025	55.00	57.00	2.00	100	3150	4160
			E00026	57.00	59.30	2.30	45	9500	3950
			E00027	59.30	63.20	3.90	30	690	930
			E00028	63.20	64.50	1.30	40	920	1270
			E00029	64.50	66.00	1.50	45	450	1130
			E00030	66.00	68.00	2.00	60	980	1660
			E00031	68.00	70.00	2.00	40	450	660
			E00032	70.00	70.80	.80	40	220	580
70.80	72.60	INTERMEDIATE INTRUSIVE Tan brown clayey plagioclase phyric, strongly foliated at 15 degrees to the core axis, mafic intrusive. The upper and lower contacts are in broken core. The rock contains very minor disseminated pyrite.	E00033	70.80	72.60	1.80	20	70	430
72.60	100.50	VOLCANICLASTIC / CHLORITE SILICA ALTERATION ALTERED FELSIC VOLCANICLASTIC. Similar rock to those volcaniclastics intersected uphole with medium grained quartz clasts, altered pumiceous clasts and rounded siliceous clasts up to 40mm in a weakly sericitized, moderately chlorite altered matrix with minor pyrite, galena and sphalerite associated with cross-cutting quartz carbonate +/- chlorite veins which post-date the cleavage but have probably remobilised pre-existing sulphides. The foliation is at 40 degrees to the core axis.	E00034	72.60	75.00	2.40	75	940	2750
			E00035	75.00	77.00	2.00	85	480	2170
			E00036	77.00	79.00	2.00	145	440	810
			E00037	79.00	80.00	1.00	165	70	500
			E00038	80.00	82.50	2.50	540	1000	3330
			E00039	82.50	83.20	.70	260	620	4420
			E00040	83.20	85.00	1.80	1020	1570	3420
			E00041	85.00	87.00	2.00	35	300	1250
			E00042	87.00	89.00	2.00	460	650	770
			E00043	89.00	91.00	2.00	150	350	850
			E00487	91.00	92.00	1.00	285	270	710
			E00488	92.00	94.00	2.00	75	290	390
			E00489	94.00	96.00	2.00	25	500	575
			E00490	96.00	98.00	2.00	25	690	660
			E00491	98.00	100.00	2.00	20	470	410
			E00492	100.00	101.00	1.00	20	110	250
100.50	121.30	VOLCANICLASTIC / CHLORITE SILICA ALTERATION GRITTY ALTERED FELSIC VOLCANICLASTIC. Similarly altered to the previous unit but now with quartz clasts / eyes up to 3mm. The rock contains only minor disseminated pyrite.	E00493	101.00	103.00	2.00	20	120	250
			E00494	103.00	105.00	2.00	20	200	2080
			E00495	105.00	107.00	2.00	15	190	310
			E00496	107.00	109.00	2.00	40	270	580
			E00497	109.00	111.00	2.00	45	270	580
			E00498	111.00	113.00	2.00	30	260	1070
			E00499	113.00	115.00	2.00	55	470	1660
			E00500	115.00	117.00	2.00	20	340	770
			E00501	117.00	118.80	1.80	15	270	410
			E00502	118.80	121.00	2.20	35	110	560
			E00503	121.00	123.00	2.00	20	40	560
138.30	138.40	SHEAR ZONE Small shear zone at 45 degrees to the core axis.	E00504	123.00	126.00	3.00	45	260	1230
			E00505	126.00	128.00	2.00	60	360	1330
			E00506	128.00	130.00	2.00	55	410	210
			E00507	130.00	132.00	2.00	15	170	90
			E00508	132.00	134.00	2.00	10	30	110
			E00509	134.00	136.00	2.00	10	60	100
			E00510	136.00	138.40	2.40	15	30	160

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm)
138.40	139.30	VOLCANICLASTIC / SILICA SERICITE ALTERATION ALTERED FELSIC VOLCANICLASTIC. Continuation of the unit intersected from 121.30m to 138.30m.	E00511	138.40	140.00	1.60	15	80	310
139.30	140.10	VOLCANICLASTIC / CHLORITE SILICA ALTERATION ALTERED FELSIC VOLCANICLASTIC. Moderately sericite and chlorite altered pumice and coarse grained quartz (up to 8mm) rich volcaniclastic foliated at 70 degrees to the core axis with 0.5% disseminated pyrite associated with the chlorite alteration.	E00512	140.00	142.00	2.00	65	850	360
140.10	140.20	SHEAR ZONE Puggy shear zone.							
140.20	145.50	VOLCANICLASTIC / CHLORITE SILICA ALTERATION ALTERED FELSIC VOLCANICLASTIC. Chloritic altered rock consisting of pumice clasts and recrystallised quartz eyes to 8mm, foliated at 45 degrees to the core axis with 0.5% pyrite associated with the chlorite alteration.	E00513	142.00	144.00	2.00	55	920	300
			E00514	144.00	146.00	2.00	30	270	230
145.50	154.80	VOLCANICLASTIC / FELSIC TUFF / CHLORITE SILICA ALTERATION ALTERED FELSIC VOLCANICLASTIC. Intermixed package of fine grained chloritic tuffaceous siltstones and the coarse grained quartz eye (to 4mm) and pumice rich volcaniclastic. The rock contains 0.5% pyrite and occasional clots of chalcopyrite, both generally associated with chlorite alteration.	E00515	146.00	148.00	2.00	65	120	150
			E00516	148.00	149.50	1.50	10	130	200
			E00517	149.50	150.50	1.00	15	40	120
			E00518	150.50	152.00	1.50	30	40	240
			E00519	152.00	153.00	1.00	115	60	110
			E00520	153.00	154.10	1.10	100	107	190
			E00521	154.10	154.80	.70	45	780	600
154.80	157.60	PELITE / FELSIC TUFF ALTERED TUFFACEOUS SILTSTONE. Intermixed siliceous black shale and quartz rich reworked tuffs. Approximately 30% of the rock is the black shale. Bedding is generally at 60 degrees to the core axis with the lowermost 15cm consisting of remobilised bands of pyrite, chalcopyrite and lesser sphalerite and galena with approximately 5% total sulphides in this zone.	E00522	154.80	156.00	1.20	210	1140	2250
			E00523	156.00	157.60	1.60	1450	1700	2170
157.60	164.20	VOLCANICLASTIC / SILICA SERICITE ALTERATION ALTERED FELSIC VOLCANICLASTIC. Moderately siliceous, sericitized, weakly chloritic medium grained to coarse grained quartz eye (to 8mm) felsic volcaniclastic with pumice clasts foliated at 70 degrees to the core axis. The rock contains minor disseminated pyrite. 164.20 E.O.H.	E00524	157.60	159.00	1.40	15	290	220
			E00525	159.00	163.70	4.70	10	30	150
			E00526	163.70	164.20	.50	75	40	150

HOLE NO. : DD77CC6
SECTION : 21600.00 EAST

PLUTONIC OPERATIONS LIMITED
GOWRIE PARK

Page: 1

Northing : -3505.00
Easting : 21600.00
Grid : CETHANA EAST
Direction : Grid S
Inclination : 192.5
Elevation : 452.00
Azimuth : -55.0
Mag Azimuth : 180; OG=OM or 12.5T
Length (m) : 200.50
Precol. (m) : 0.00m
BOCO : 1.00m
TFR : 3.80m
Water Table :

DIAMOND DRILL RECORD

Drill Type :
Core Size :HQ 5.70 NQ 54.0 BQ
Contractor :

Dip Tests Method: ?
Depth Az Dip

Property : CETHANA EAST
State : Tasmania
GMR : Cethana 4240
E.L. No. : GOWRIE PARK
Project No. : 706
Date Started :
Date Completed:
Logged by : G. MacDONALD
Relogged by :
Date Logged :
Interpreted : G. MacDONALD

Initialled :

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm
.00	2.00	PRECOLLAR							
2.00	15.90	VOLCANICLASTIC / SILICA SERICITE ALTERATION							
		ALTERED FELSIC VOLCANICLASTIC.	F00001	2.50	7.00	4.50	15	310	105
		Orange brown, schistose, sericite altered rock with medium	F00002	7.00	10.00	3.00	45	1000	65
		grained quartz eyes and pumiceous clasts. The cleavage is	F00003	10.00	13.00	3.00	40	1450	75
		at 35 degrees to the core axis. The rock is limonitic	F00004	13.00	16.00	3.00	80	1100	80
		after pyrite.							
15.90	35.80	VOLCANICLASTIC / SILICA SERICITE ALTERATION							
		ALTERED FELSIC VOLCANICLASTIC, SULPHIDIC.	F00005	16.00	19.50	3.50	85	740	220
		Pale grey green, schistose, quartz sericite and weakly	F00006	19.50	22.90	3.40	90	680	160
		chlorite altered rock with medium grained quartz eyes. The	F00007	22.90	25.00	2.10	210	1600	680
		rock becomes finer grained downhole with graphitic patches	F00008	25.00	27.00	2.00	50	1100	480
		from 30.90m. The cleavage is at 35 degrees to the core	F00009	27.00	31.00	4.00	70	940	470
		axis. The rock contains only very minor sulphides above	F00010	31.00	33.00	2.00	55	3300	2500
		31.00m. Below 31.00m the sulphide content increases with	F00011	33.00	35.00	2.00	80	2000	4400
		sulphides in very fine veins / bands concordant to the	F00012	35.00	36.50	1.50	140	1500	3600
		cleavage. The lower contact is gradational.							
35.80	62.50	PELITE / FELSIC VITRIC TUFF							
		REWORKED GRAPHITIC AND CHERTY VITRIC TUFFACEOUS SILTSTONE,	F00013	36.50	38.00	1.50	160	4800	17000
		SULPHIDIC.	F00014	38.00	39.50	1.50	270	5000	11000
		Very fine grained sulphidic black graphitic shale with	F00015	39.50	41.00	1.50	250	1700	7800
		interbedded very fine grained, creamy, cherty tuffaceous	F00016	41.00	43.00	2.00	100	5600	1400
		siltstones. Sulphides are associated with the graphitic	F00017	43.00	45.00	2.00	55	820	1250
		bands which are generally 10mm thick and at 40 to 45	F00018	45.00	46.80	1.80	40	450	280
		degrees to the core axis. Sulphides consist of 0.5%	F00019	46.80	48.50	1.70	60	1800	900
		sphalerite and 0.5% galena with 2% pyrite. This	F00020	48.50	50.20	1.70	25	1800	980
		stratigraphic control suggests a primary syn-sedimentary	F00021	50.20	52.20	2.00	60	3500	1200
		origin for mineralization. This interpretation is	F00022	52.20	54.20	2.00	110	9200	2800
		supported by petrology by D. Cooke (see appendix included	F00023	54.20	56.20	2.00	100	6000	1300
		in this report). The cleavage is at 35 degrees to the core	F00024	56.20	57.20	1.00	260	5800	150
		axis and is defined by very fine grained sericite	F00025	57.20	60.00	2.80	45	2050	1100
		veinlets. Some sulphides are associated with later stage	F00026	60.00	62.40	2.40	310	9800	6500
		cross-cutting carbonate veins.	F00027	62.40	65.00	2.60	75	880	1350
		35.80 39.30 Equally intermixed black and creamy tuffaceous siltstones.							
		39.30 42.40 Approximately 5% black shale interbeds with							

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm
		the rest the creamy cherty siltstone.							
	42.40	47.00 100% creamy cherty siltstones with lesser sulphides than the zones with the black graphitic beds. The cleavage is at 35 degrees to the core axis.							
	47.00	57.20 Similar amount of black shale interbeds to the rock from 39.30m to 42.40m.							
	57.20	59.90 100% creamy cherty siltstones.							
	59.90	62.50 As above but with minor black shale interbeds at 45 degrees to the core axis.							
62.50	68.40	VOLCANICLASTIC / SILICA SERICITE ALTERATION							
		ALTERED FELSIC VOLCANICLASTIC.	F00028	65.00	68.00	3.00	48	540	580
		Creamy cherty rock with medium grained quartz eyes to 3mm in a moderately schistose, sericite altered fine grained matrix. The cleavage is at 40 degrees to the core axis. The rock contains only minor disseminated pyrite.	F00029	68.00	71.00	3.00	35	330	190
68.40	87.00	VOLCANICLASTIC / FELSIC TUFF							
		Grey green, medium grained, siliceous fine grained massive rock with medium grained quartz eyes / phenocrysts (?) throughout. The rock is only weakly schistose at 30 degrees to the core axis and contains pumice like clasts concordant to this foliation. The rock is only weakly chlorite altered and contains minor disseminated sulphides except for 73.50m to 75.50m and 80.00m to 82.50m where sulphides are associated with later stage carbonate veining / alteration.	F00030	71.00	74.00	3.00	38	160	270
			F00031	74.00	77.00	3.00	22	330	210
			F00032	77.00	79.00	2.00	55	70	180
			F00033	79.00	80.00	1.00	115	3300	240
			F00034	80.00	83.00	3.00	48	1400	190
			F00035	83.00	86.00	3.00	70	640	310
			F00036	86.00	89.00	3.00	22	95	640
87.00	90.50	FELSIC LAVA BRECCIA							
		Hyaloclastic like lava breccia with angular fragments of quartz +/- feldspar phyric felsic lava, looking almost jigsaw fit in places. The rock is cream to grey green in colour but is only weakly sericite altered with patchy chlorite and late stage carbonate alteration. The rock is moderately schistose at 45 to 60 degrees to the core axis. Generally the rock contains negligible sulphides with very minor disseminated pyrite in patches.	F00037	89.00	92.00	3.00	35	65	280
90.50	170.50	FELSIC LAVA							
		Variably sericite and chlorite altered quartz +/- feldspar phyric, moderately schistose at 45 degrees to the core axis, felsic lava. There is a minor fault from 161.00m to 161.70m. Quartz phenocrysts are generally 3-4mm with feldspars 1-2mm. The rock contains only very minor disseminated sulphides, predominantly pyrite. The lower contact is very hard to pick.	F00038	92.00	95.00	3.00	42	90	220
			F00039	95.00	98.00	3.00	22	220	200
			F00040	98.00	101.00	3.00	22	130	230
			F00041	101.00	104.00	3.00	20	65	110
			F00042	104.00	107.00	3.00	20	120	280
			F00043	107.00	110.00	3.00	55	160	840
			F00487	110.00	113.00	3.00	42	110	230
			F00488	113.00	116.00	3.00	28	250	220
			F00489	116.00	119.00	3.00	48	15	700
			F00490	119.00	122.00	3.00	42	20	320
			F00491	122.00	125.00	3.00	25	28	500
			F00492	125.00	128.00	3.00	25	30	300
			F00493	128.00	131.00	3.00	40	250	820
			F00494	131.00	134.00	3.00	22	190	260
			F00495	134.00	137.00	3.00	25	95	200
			F00496	137.00	140.00	3.00	25	110	170
			F00497	140.00	143.00	3.00	20	250	500

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm
			F00498	143.00	146.00	3.00	20	170	240
			F00499	146.00	149.00	3.00	18	110	560
			F00500	149.00	152.00	3.00	25	160	450
			F00501	152.00	155.00	3.00	32	150	0
			F00502	155.00	158.00	3.00	25	240	600
			F00503	159.00	161.00	2.00	38	32	300
			F00504	161.00	164.00	3.00	22	65	360
			F00505	164.00	167.00	3.00	18	20	180
			F00506	167.00	170.00	3.00	70	430	1200
			F00507	170.00	173.00	3.00	220	740	1350
170.50	187.30	VOLCANICLASTIC							
		ALTERED FELSIC VOLCANICLASTIC.	F00508	173.00	176.00	3.00	110	60	700
		Grey green, moderately siliceous with medium grained quartz eyes / clasts and occasional rounded clasts of fine grained cherty tuff, vitric tuff and feldspars in a fine grained matrix. The rock is moderately sericite and chlorite altered. Possible bedding is at 70 degrees to the core axis though this may be banding of alteration. The lower contact is sharp and is at 70 degrees to the core axis.	F00509	176.00	179.00	3.00	140	540	860
			F00510	179.00	182.00	3.00	180	110	620
			F00511	182.00	185.00	3.00	75	200	1100
			F00512	185.00	187.20	2.20	50	430	1100
			F00513	187.20	189.00	1.80	120	440	660
187.30	194.00	PELITE							
		SULPHIDIC SILTSTONE.	F00514	189.00	191.00	2.00	165	880	1800
		Black, very pyritic, cherty shale with diffusely intermixed very fine grained beige and lesser medium grained quartz eye reworked tuff. Sulphides are in irregular stringers with some pyrite in massive bands parallel to bedding at 70 degrees to the core axis, though bedding is disturbed. The lower contact is gradational.	F00515	191.00	193.00	2.00	90	1100	3500
			F00516	193.00	195.00	2.00	105	1200	3300
194.00	200.50	VOLCANICLASTIC							
		ALTERED FELSIC VOLCANICLASTIC.	F00517	195.00	197.00	2.00	90	740	2000
		Grey green, weakly bedded reworked tuffs consisting of quartz eyes, feldspars, clasts of black shale and fine grained siltstones. Bedding ranges from 35 to 70 degrees to the core axis. Sulphides generally in occasional disseminated clots. The rock is moderately sericite and chlorite altered with later stage carbonate alteration. The rock is moderately schistose.	F00518	197.00	200.50	3.50	640	200	2050
		200.50 E.O.H.							

HOLE NO. : DD77CC7
SECTION : 21600.00 EAST

PLUTONIC OPERATIONS LIMITED
GOWRIE PARK

 764066

Northing : -3718.00
Easting : 21600.00
Grid : CETHANA EAST
Direction : Grid S
Inclination : 192.5
Elevation : 507.00
Azimuth : -50.0
Mag Azimuth : 180; 0G=0M or 12.5T
Length (m) : 137.40
Precol. (m) : 3.80m
BOCO : <3.80m
TFR : 5.20m
Water Table :

DIAMOND DRILL RECORD

Drill Type :
Core Size :HQ 5.70 NQ 54.00 BQ
Contractor :

Dip Tests Method:
Depth Az Dip

Property : CETHANA EAST
State : Tasmania
GMR : Cethana 4240
E.L. No. : GOWRIE PARK
Project No. : 706
Date Started :
Date Completed:
Logged by : G. MacDONALD
Relogged by :
Date Logged :
Interpreted : G. MacDONALD

Initialled :

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm
.00	3.80	PRECOLLAR							
			G00001	1.10	3.00	1.90	25	350	660
			G00002	3.00	4.50	1.50	20	270	820
3.80	14.50	VOLCANICLASTIC / CHLORITE SILICA ALTERATION							
		ALTERED FELSIC VOLCANICLASTIC.	G00003	4.50	6.00	1.50	20	200	900
		Green, chlorite altered volcaniclastic rock with medium	G00004	6.00	7.50	1.50	10	90	860
		grained quartz eyes in patches, looking sandy to silty in	G00005	7.50	9.00	1.50	20	105	820
		others, the rock being reworked tuffs. The rock contains	G00006	9.00	10.50	1.50	15	130	1200
		approximately 1% pyrite throughout in blebs. The lower	G00007	10.50	12.00	1.50	20	320	1300
		contact is sharp.	G00008	12.00	13.50	1.50	25	200	1100
			G00009	13.50	14.50	1.00	15	50	680
14.50	20.40	VOLCANICLASTIC / FELSIC TUFF							
		Relatively unaltered, pale grey green volcaniclastic with	G00010	14.50	18.00	3.50	290	60	860
		coarse grained quartz eyes to 8mm with smaller feldspars	G00011	18.00	21.00	3.00	130	75	500
		and pumice. The rock is sheared from 14.60m to 16.10m. The							
		rock contains only minor disseminated pyrite.							
20.40	46.30	VOLCANICLASTIC / SILICA SERICITE ALTERATION							
		ALTERED FELSIC VOLCANICLASTIC.	G00012	21.00	24.00	3.00	130	120	580
		Pale grey green, weakly siliceous, moderately sericitized	G00013	24.00	27.00	3.00	65	300	360
		rock with fine grained to medium grained quartz eyes in a	G00014	27.00	30.00	3.00	40	90	450
		fine grained moderately altered, schistose, matrix with	G00015	30.00	32.50	2.50	25	150	620
		fine to medium grained feldspars and possibly pumiceous	G00016	32.50	35.00	2.50	30	85	560
		fragments. The rock contains only minor disseminated	G00017	35.00	37.50	2.50	25	55	440
		pyrite and lesser galena.	G00018	37.50	40.00	2.50	40	95	390
			G00019	40.00	42.50	2.50	25	40	520
			G00020	42.50	45.50	3.00	45	135	640
			G00021	45.50	46.50	1.00	15	270	1300
46.30	59.20	PELITE / FELSIC VITRIC TUFF / SILICA SERICITE ALTERATION							
		ALTERED TUFFACEOUS SILTSTONE, SULPHIDIC.	G00022	46.50	48.00	1.50	40	330	1200
		Grey, siliceous cherty tuffaceous siltstones with numerous	G00023	48.00	49.00	1.00	40	340	1200
		concordant pyrite bands / remobilised bedding at 70	G00024	49.00	50.00	1.00	30	280	2200
		degrees to the core axis. These sulphidic band are up to	G00025	50.00	51.00	1.00	20	165	860
		30mm but are generally around 2mm to 4mm and are	G00026	51.00	52.00	1.00	30	280	1800
		dominantly pyrite though sphalerite is present in some	G00027	52.00	53.00	1.00	35	120	540
		bands. These sulphides appear to have been deposited	G00028	53.00	54.00	1.00	30	490	2300

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm
		syngenetically with sedimentation and later remobilised into the cleavage which is at a low angle to bedding where discernible. The rock is moderately sericite altered throughout. Sulphides are generally associated with patches of silicification.	G00029	54.00	55.50	1.50	28	420	2000
			G00030	55.50	56.50	1.00	60	320	1000
			G00031	56.50	58.00	1.50	38	650	2150
			G00032	58.00	59.00	1.00	60	550	1200
			G00033	59.00	60.50	1.50	50	140	760
59.20	62.60	VOLCANICLASTIC / FELSIC TUFF / SILICA SERICITE ALTERATION							
		ALTERED FELSIC VOLCANICLASTIC, SULPHIDIC.	G00034	60.50	62.20	1.70	42	3550	1000
		Similar to the previous unit except that the host rock consists of fine to medium grained quartz eyes, feldspars and possibly pumiceous fragments. The rock still has sulphides in bands, now in the cleavage though probably originally stratiform. The rock becomes more silicified adjacent to the underlying massive pyrite lens.	G00035	62.20	62.80	.60	90	1400	4550
62.60	63.00	SEMI-MASSIVE SULPHIDES							
		MASSIVE PYRITE LENS - SYN-SEDIMENTARY.	G00036	62.80	65.00	2.20	45	110	760
		Massive lens of pyrite with 0.5% sphalerite. The rock is more massively pyritic in the up-hole part becoming more sericitic and schistose downhole. The rock is almost syn-sedimentary.							
63.00	123.40	VOLCANICLASTIC / FELSIC TUFF / SILICA SERICITE ALTERATION							
		ALTERED FELSIC VOLCANICLASTIC.	G00037	65.00	67.00	2.00	45	140	800
		Generally medium grained quartz eye rich reworked tuff with feldspars. The rock is moderately schistose and sericitized throughout. The rock contains minor sulphides in fine bands in the cleavage associated with patches of silicification, especially from 63.00m to 86.00m and 109.00m to 115.00m.	G00038	67.00	68.50	1.50	80	580	580
			G00039	68.50	70.50	2.00	40	1000	3750
			G00040	70.50	73.00	2.50	35	470	960
			G00041	73.00	75.50	2.50	65	650	2750
			G00042	75.50	78.00	2.50	160	580	2700
			G00043	78.00	80.50	2.50	95	1100	2150
			G00487	80.50	83.00	2.50	70	1050	3650
			G00488	83.00	86.00	3.00	40	170	2050
			G00489	86.00	89.00	3.00	50	440	640
			G00490	89.00	92.00	3.00	55	480	720
			G00491	92.00	95.00	3.00	50	410	1200
			G00492	95.00	98.00	3.00	60	760	720
			G00493	98.00	101.00	3.00	40	240	420
			G00494	101.00	104.00	3.00	50	250	1100
			G00495	104.00	107.00	3.00	55	680	1100
			G00496	107.00	109.30	2.30	40	600	640
			G00497	109.30	110.50	1.20	48	2100	1500
			G00498	110.50	111.50	1.00	180	1300	2830
			G00499	111.50	112.50	1.00	240	1600	1800
			G00500	112.50	115.50	3.00	30	360	820
			G00501	115.50	118.50	3.00	60	960	2000
			G00502	118.50	121.50	3.00	50	1200	620
			G00503	121.50	124.50	3.00	50	1300	1500
123.40	137.40	VOLCANICLASTIC / FELSIC TUFF							
		ALTERED FELSIC VOLCANICLASTIC.	G00504	124.50	127.50	3.00	40	360	840
		Petrologically this rock has been described as a quartz and feldspar rich crystal vitric tuff though from the core it is apparent that there has been some reworking by water. The rock is moderately sericitized and schistose at 70 degrees to the core axis. The rock contains minor sulphides in disseminations.	G00505	127.50	130.50	3.00	65	350	780
			G00506	130.50	133.50	3.00	145	600	1000
			G00507	133.50	136.00	2.50	80	440	1100
			G00508	136.00	137.40	1.40	50	660	1100
		137.40 E.O.H.							

HOLE NO. : DD77CC8
SECTION : 21750.00 EAST

PLUTONIC OPERATIONS LIMITED
GOWRIE PARK

Northing : 44.00
Easting : 21750.00
Grid : CETHANA EAST
Direction : Grid S
Inclination : 192.5
Elevation : 439.00
Azimuth : -55.0
Mag Azimuth : 180; OG=OM or 12.5T
Length (m) : 157.60
Precol. (m) : 0.00m
BOCO : 0.00m
TFR : 11.30m
Water Table :

DIAMOND DRILL RECORD

Drill Type :
Core Size :HQ 2.95 NQ 84.50 BQ
Contractor :

Dip Tests Method: ?
Depth Az Dip

Property : CETHANA EAST
State : Tasmania
GMR : Cethana 4240
E.L. No. : GOWRIE PARK
Project No. : 706
Date Started :
Date Completed:
Logged by : G. MacDONALD
Relogged by :
Date Logged :
Interpreted : G. MacDONALD

Initialled :

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm)
.00	8.40	PELITE / FELSIC VITRIC TUFF / SILICA SERICITE ALTERATION ALTERED FELSIC TUFFACEOUS SILTSTONE. Strongly schistose, sericite altered fine grained cherty tuffaceous siltstone i.e. A reworked felsic vitric tuff. The rock is in broken core and contains occasional minor limonitic stains and is cleaved at 30 degrees to the core axis.	H00001	.00	2.00	2.00	55	200	340
			H00002	2.00	4.00	2.00	55	240	140
			H00003	4.00	6.00	2.00	80	420	150
			H00004	6.00	8.00	2.00	80	2550	85
			H00005	8.00	10.00	2.00	110	1850	1650
8.40	14.40	VOLCANICLASTIC / SILICA SERICITE ALTERATION ALTERED FELSIC VOLCANICLASTIC. Creamy quartz sericite altered schistose rock with medium grained quartz eyes with minor disseminated pyrite below 11.30m, cleaved at 30 degrees to the core axis. Probably a reworked felsic tuff prior to alteration.	H00006	10.00	12.00	2.00	120	830	1100
			H00007	12.00	14.00	2.00	780	2150	1050
			H00008	14.00	16.00	2.00	28	400	860
14.40	18.50	PELITE / SILICA SERICITE ALTERATION ALTERED FELSIC TUFFACEOUS SILTSTONE. Fine grained, creamy, cherty sericitic tuffaceous siltstone as intersected from 0.00m to 8.40m. The rock contains minor disseminated pyrite and sphalerite.	H00009	16.00	18.00	2.00	120	230	2200
			H00010	18.00	20.00	2.00	32	100	1350
18.50	23.40	PELITE / SILICA SERICITE ALTERATION / BRECCIA ALTERED FELSIC TUFFACEOUS SILTSTONE, BRECCIATED. Strongly quartz sericite altered rock which is brecciated with sub - angular fragments of fine grained cherty sericitic tuffaceous siltstone in a fracture fill purple carbonate matrix. The rock is also schistose with the cleavage at 30 degrees to the core axis. The rock contains minor disseminated pyrite and sphalerite.	H00011	20.00	22.00	2.00	75	210	330
			H00012	22.00	24.00	2.00	60	140	2150
23.50	40.25	PELITE / SILICA SERICITE ALTERATION ALTERED FELSIC TUFFACEOUS SILTSTONE. Essentially the same as the preceding altered reworked fine grained tuffs but not brecciated like the preceding unit. The rock contains only minor disseminated pyrite and sphalerite.	H00013	24.00	26.00	2.00	30	170	520
			H00014	26.00	28.00	2.00	45	140	1450
			H00015	28.00	30.00	2.00	110	100	860
			H00016	30.00	32.00	2.00	120	160	1650
			H00017	32.00	32.75	.75	130	1500	5000
			H00018	32.75	33.50	.75	12	460	1700
			H00019	33.50	35.50	2.00	35	140	960
			H00020	35.50	37.50	2.00	95	270	1050

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm)
			H00021	37.50	40.00	2.50	120	150	700
			H00022	40.00	42.00	2.00	55	180	580
0.25	60.80	VOLCANICLASTIC / SILICA SERICITE ALTERATION ALTERED FELSIC VOLCANICLASTIC. Quartz sericite altered, moderately schistose rock consisting of fine to medium grained quartz eyes and pumice clasts to 5mm in a fine grained matrix. The rock contains fine veinlets of carbonate or chlorite giving a somewhat brecciated appearance. The rock contains only minor disseminated pyrite.	H00023	42.00	44.00	2.00	45	45	540
			H00024	44.00	46.00	2.00	110	540	740
			H00025	46.00	48.00	2.00	42	40	490
			H00026	48.00	51.00	3.00	35	580	230
			H00027	51.00	57.00	6.00	140	1150	3150
			H00028	57.00	60.00	3.00	38	340	800
			H00029	60.00	63.00	3.00	18	240	980
60.80	71.00	VOLCANICLASTIC / SILICA SERICITE ALTERATION ALTERED FELSIC VOLCANICLASTIC. Silicified and moderately sericitized rock with quartz eyes to 6mm and rounded lithics to 8mm including fine grained cherty tuffaceous siltstones. The cleavage is generally around 30 degrees to the core axis. The rock contains minor disseminated pyrite and lesser galena.	H00030	63.00	66.00	3.00	30	430	470
			H00031	66.00	69.00	3.00	35	330	540
			H00032	69.00	72.00	3.00	50	1150	490
71.00	71.50	SHEAR ZONE Strongly sheared fault zone in broken core with the structure probably around 30 degrees to the core axis.							
71.50	72.50	VOLCANICLASTIC / CHLORITE SILICA ALTERATION ALTERED FELSIC VOLCANICLASTIC. Moderately chlorite altered, moderately schistose rock with quartz eyes to 4mm, pumiceous clasts and feldspars in a fine grained matrix. The rock contains only very minor disseminated sulphides.	H00033	72.00	75.00	3.00	22	45	330
72.50	76.90	VOLCANICLASTIC Moderately silicified rock with medium grained quartz eyes and pumiceous clasts in a fine grained matrix which is only moderately schistose but is foliated at 35 degrees to the core axis. The rock is brecciated with carbonate filling fractures to 74.00m being weakly chlorite altered below this.	H00034	75.00	78.00	3.00	28	200	580
76.90	95.15	VOLCANICLASTIC / CHLORITE SILICA ALTERATION ALTERED GRITTY / CONGLOMERATIC VOLCANICLASTIC. Green, sericite and chlorite altered rock with quartz eyes to 5mm, rounded tuffaceous siltstones and fine grained cherty rock and pumiceous clasts in a fine grained sandy matrix. Lithics are generally to 5mm though some are up to 40mm. The rock contains occasional bands of green cherty layers at 45 (?) degrees to the core axis below 85.30m. The rock contains only occasional disseminated clots of pyrite but contains numerous fine cross-cutting carbonate veinlets. The lower contact is sharp and at 60 degrees to the core axis.	H00035	78.00	81.00	3.00	55	800	3150
			H00036	81.00	84.00	3.00	60	400	1880
			H00037	84.00	87.00	3.00	200	480	1250
			H00038	87.00	90.00	3.00	110	660	1300
			H00039	90.00	92.50	2.50	70	880	2400
			H00040	92.50	95.00	2.50	30	380	800
			H00041	95.00	97.00	2.00	240	1150	6600
95.15	100.00	PELITE / CHLORITE SILICA ALTERATION ALTERED FELSIC TUFFACEOUS SILTSTONE. Fine grained, green cherty tuffaceous siltstone, moderately siliceous chlorite and sericite altered. The rock is probably a reworked vitric tuff. Sulphides are	H00042	97.00	99.00	2.00	110	1050	3250
			H00043	99.00	101.00	2.00	140	650	2500

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm
		generally in later stage cross-cutting carbonate veins and are predominantly pyrite with lesser sphalerite and galena.							
100.00	115.50	PELITE							
		ALTERED FELSIC TUFFACEOUS SILTSTONE.	H00487	101.00	103.00	2.00	200	1450	3650
		Creamy grey, siliceous cherty (?) fine grained siltstone with carbonate infilling of brecciation with negligible chlorite or sericite alteration. Sulphides are generally in cross-cutting carbonate veining / infilling of brecciation.	H00488	103.00	105.00	2.00	210	1800	4600
			H00489	105.00	107.00	2.00	70	320	1200
			H00490	107.00	109.00	2.00	130	540	1200
			H00491	109.00	111.00	2.00	120	1500	1950
			H00492	111.00	113.00	2.00	120	2000	4650
			H00493	113.00	115.00	2.00	85	300	550
			H00494	115.00	117.00	2.00	110	340	1800
115.50	115.70	FAULT ZONE							
		Quartz vein and cavity with water flowing.							
115.70	125.30	VOLCANICLASTIC / CHLORITE SILICA ALTERATION							
		ALTERED FELSIC VOLCANICLASTIC.	H00495	117.00	119.00	2.00	230	780	2050
		Grey green, chlorite and sericite altered schistose rock with fine to medium grained quartz eyes, pumiceous clasts and possibly other lithics, generally to 4mm, though up to 50mm, in a fine grained matrix. Sulphides are generally in cross-cutting carbonate veins.	H00496	119.00	121.00	2.00	220	760	2200
			H00497	121.00	123.00	2.00	42	1050	640
			H00498	123.00	125.00	2.00	48	190	420
			H00499	125.00	127.00	2.00	30	370	960
125.30	146.00	PELITE / CHLORITE SILICA ALTERATION							
		ALTERED FELSIC TUFFACEOUS SILTSTONE.	H00500	127.00	129.00	2.00	42	960	1200
		Dark green, moderately chloritic fine grained silty sediment with discernible bedding, generally at approximately 60 degrees to the core axis. The rock contains only very minor sulphides.	H00501	129.00	131.00	2.00	35	390	560
			H00502	131.00	133.00	2.00	38	110	300
			H00503	133.00	135.00	2.00	55	28	250
			H00504	135.00	137.00	2.00	60	180	350
			H00505	137.00	139.00	2.00	65	48	240
			H00506	139.00	141.00	2.00	90	15	310
			H00507	141.00	143.00	2.00	60	330	900
			H00508	143.00	145.00	2.00	100	230	500
			H00509	145.00	147.00	2.00	140	740	2400
146.00	157.60	VOLCANICLASTIC / CHLORITE SILICA ALTERATION							
		ALTERED FELSIC VOLCANICLASTIC.	H00510	147.00	149.00	2.00	30	300	460
		Generally green, moderately chlorite and sericite altered rock with quartz eyes to 4mm and occasional lithics to 50mm including pumiceous clasts and tuffaceous siltstone in a fine grained chloritic matrix. Occasional cross-cutting bands of fine grained black siliceous siltstone may be rafts or beds at 60 to 70 degrees to the core axis. The rock contains approximately 1 to 2% pyrite in disseminations. The cleavage is at 50 degrees to the core axis.	H00511	149.00	151.00	2.00	45	120	640
			H00512	151.00	153.00	2.00	28	230	400
			H00513	153.00	155.00	2.00	30	240	660
			H00514	155.00	157.60	2.60	30	140	370
		157.60 E.O.H.							

APPENDIX 4

CRONE DHEM SURVEYS

FOR CETHANA EAST DDHs

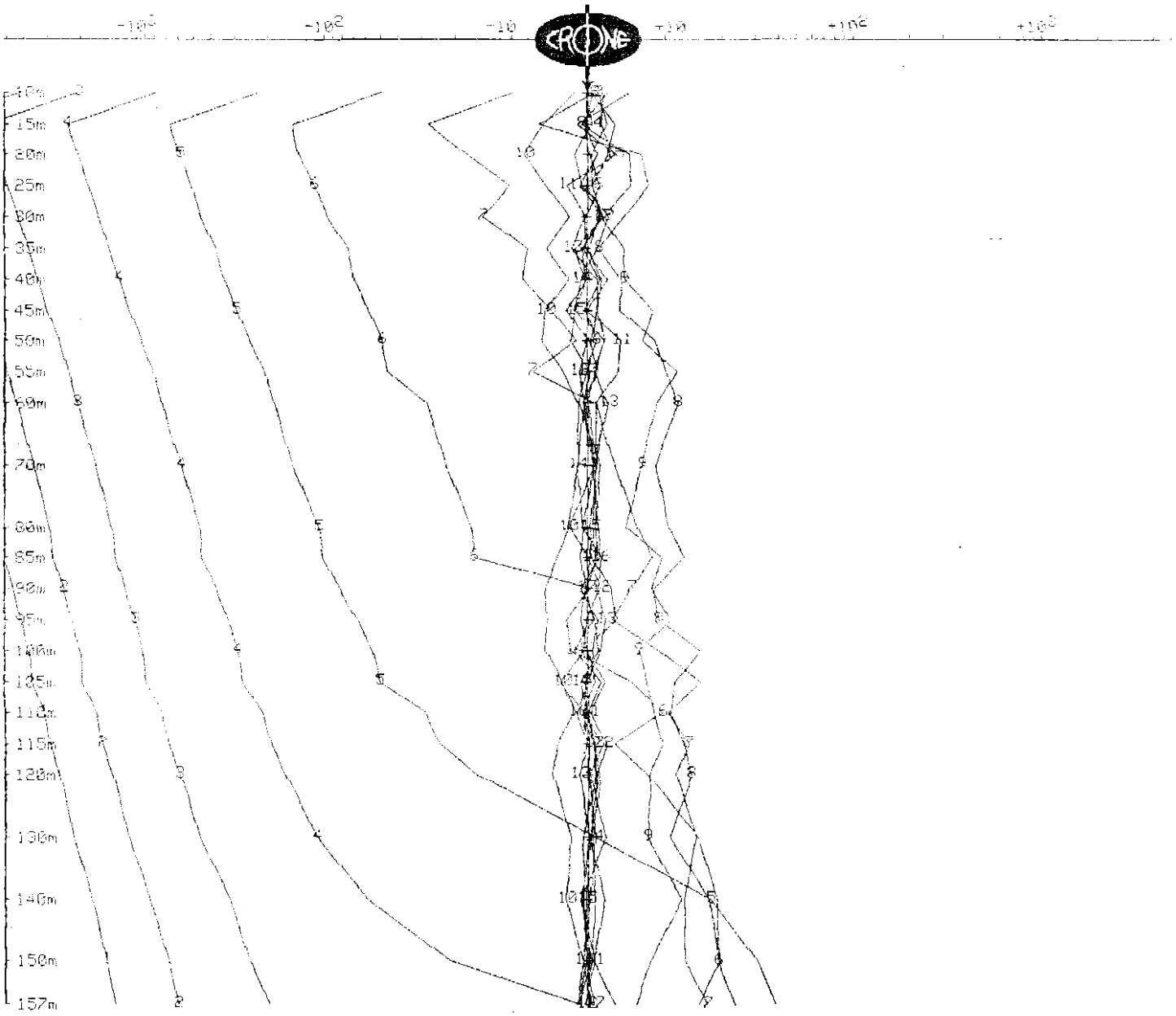
764072

OUTER-RIM EXPLORATION SERVICES
Operating Crone PEM System
BOREHOLE PEM

Client	: PLUTONIC	Hole	: Hole-DD78CC8
Grid	: CETHANA	Tx Loop	: Loop #1
Date	: Oct 19, 1994	File name	: CE8XY.PEM

Data Corrected for Probe Rotation using Orientation Tool #2
X COMPONENT dBx/dt nanoTesla/sec - 17 channels and PP

Scale: 1:1000



5 cm

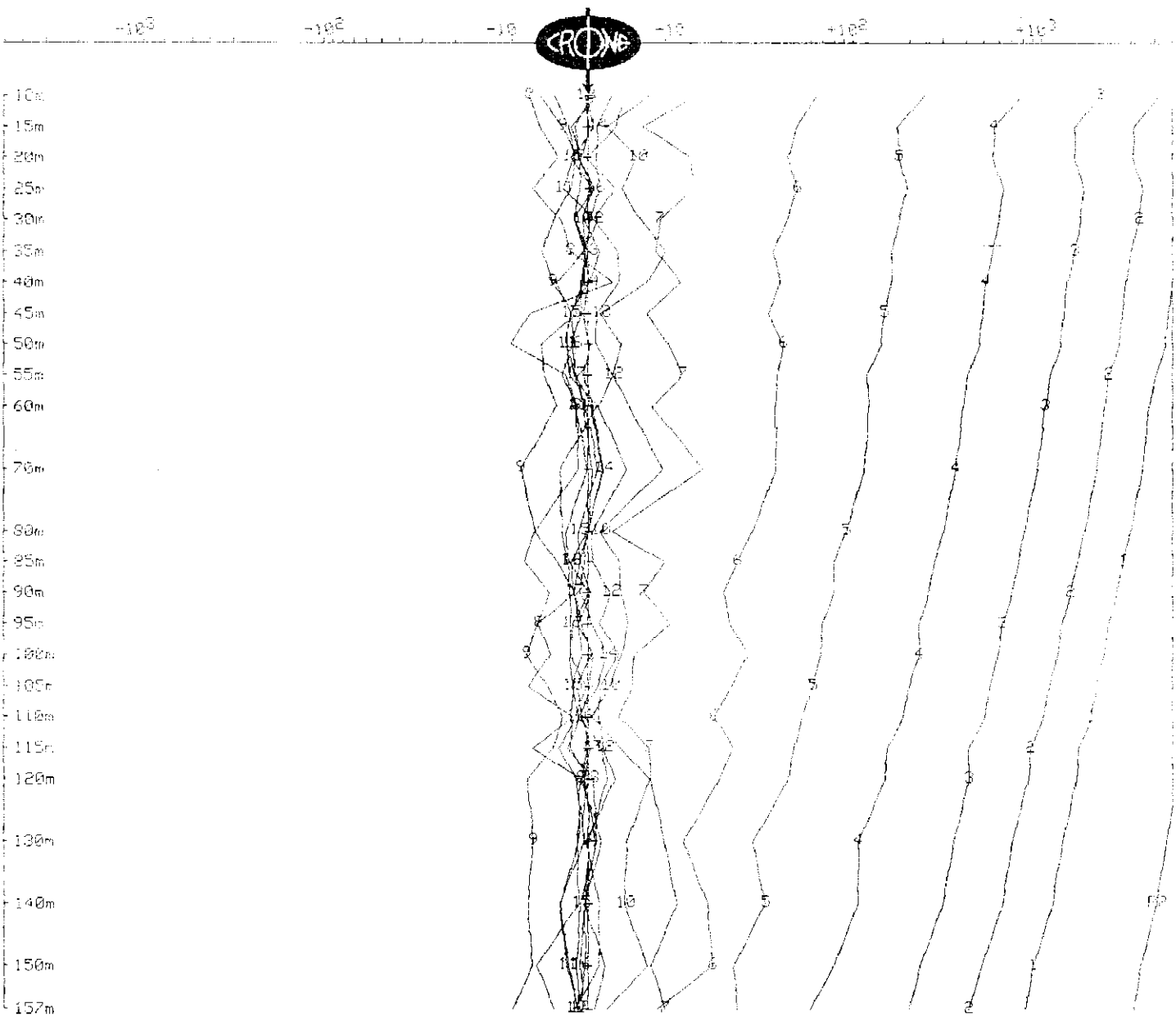
764073

OUTER-RIM EXPLORATION SERVICES
Operating Crone PEM System
BOREHOLE PEM

Client	: PLUTONIC	Hole	: Hole-DD78CC8
Grid	: CETHANA	Tx Loop	: Loop #1
Date	: Oct 19, 1994	File name	: CE8XY.PEM

Data Corrected for Probe Rotation using Orientation Tool #2
Y COMPONENT dBy/dt nanoTesla/sec - 17 channels and PP

Scale: 1:1000



5 cm

764074

OUTER-RIM EXPLORATION SERVICES
Operating Crone PEM System
BOREHOLE PEM

Client	: PLUTONIC	Hole	: Hole CED-1
Grid	: CETHANA	Tx Loop	: Loop #5
Date	: Oct 20, 1994	File name	: CE1Z.PEM

Z COMPONENT dBz/dt nanoTesla/sec - 17 channels and PP

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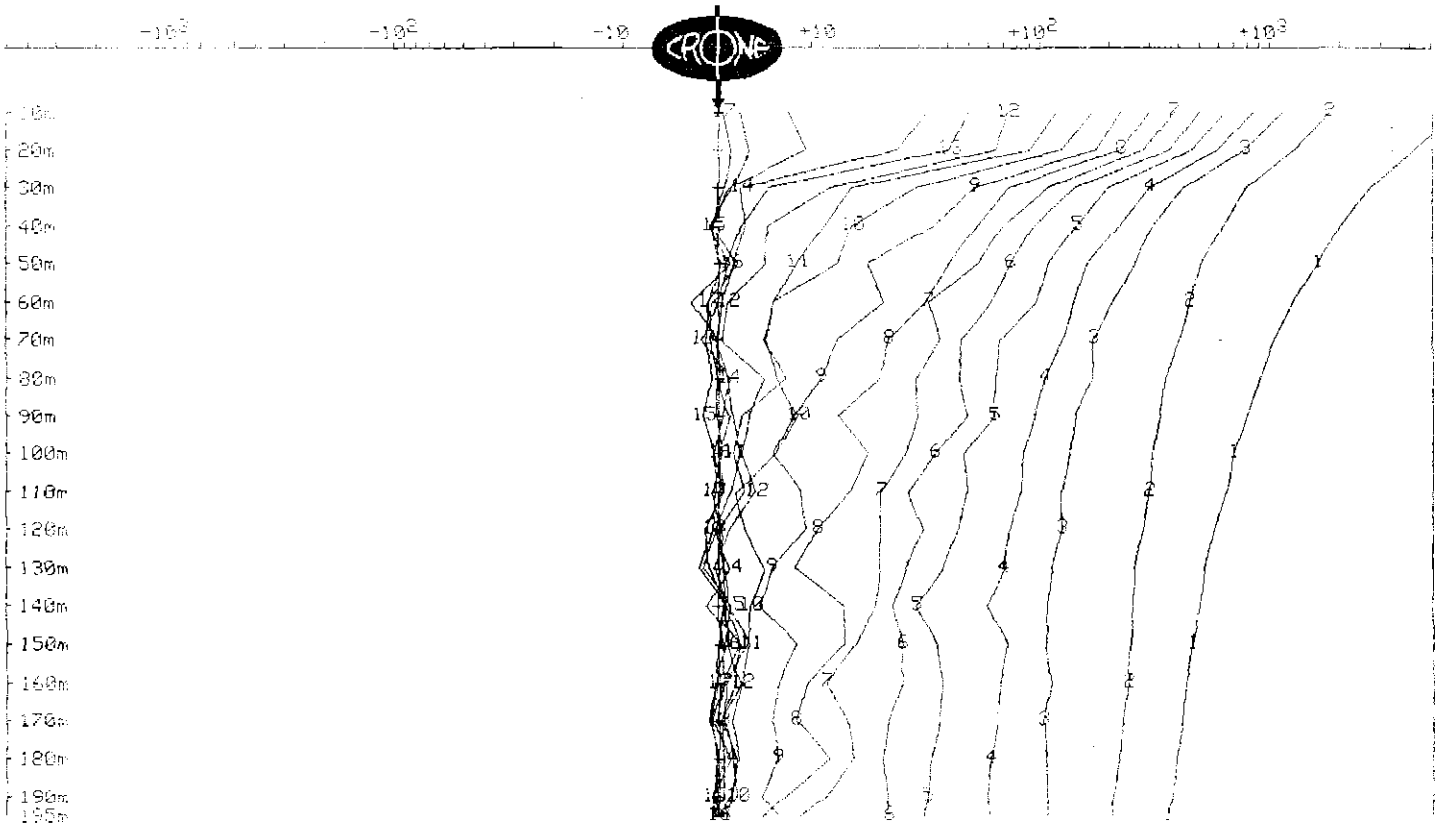


5 cm

764075

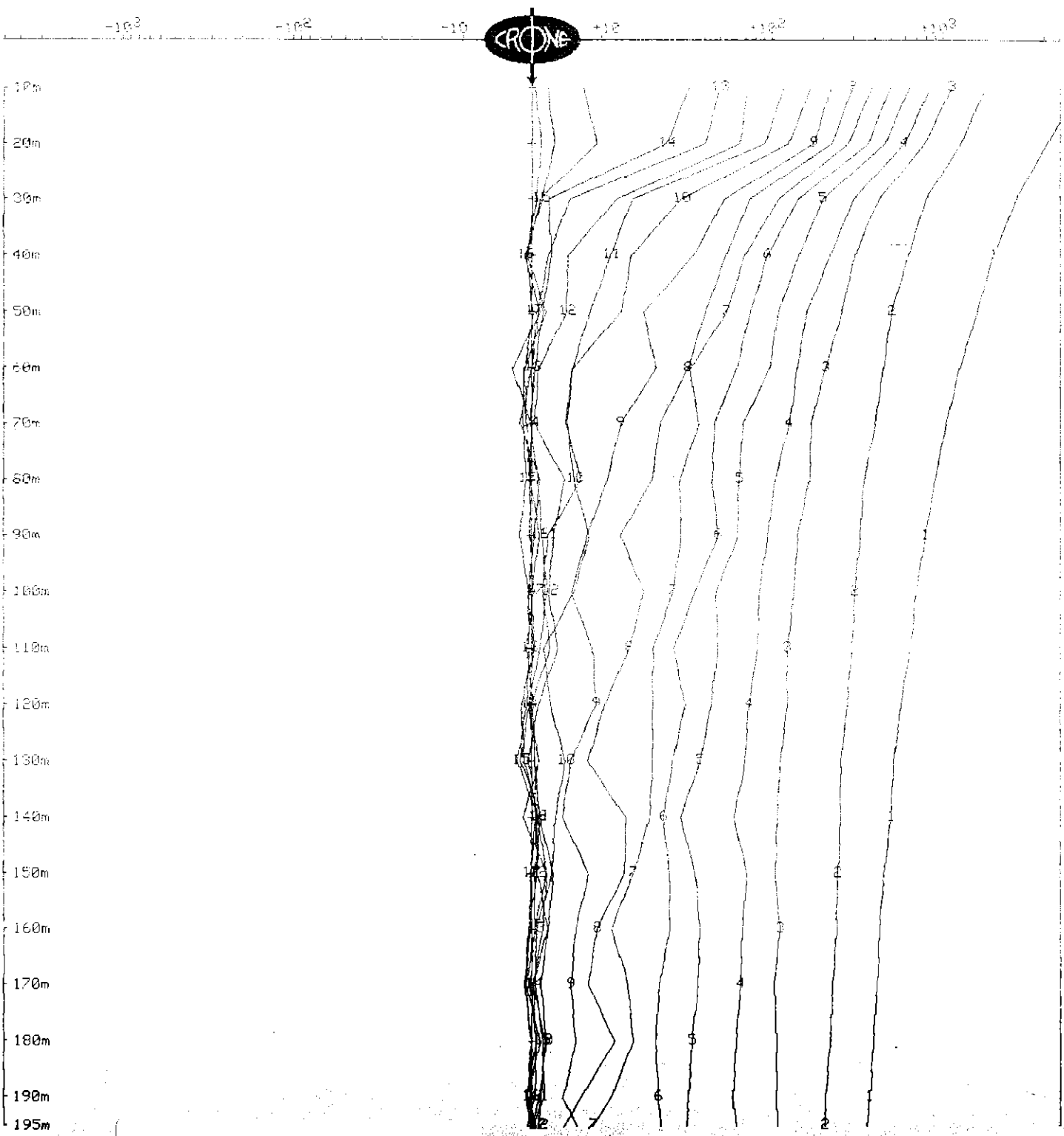
OUTER-RIM EXPLORATION SERVICES
Operating Crone PEM System
BOREHOLE PEM

Client : PLUTONIC
Grid : CETHANA
Date : Oct 20, 1994

Hole : Hole CED-1
Tx Loop : Loop #5
File name : CE1Z.PEM

Z COMPONENT dBz/dt nanoTesla/sec - 17 channels and PP

Scale: 1:1000



764076

5 cm

OUTER-RIM EXPLORATION SERVICES
Operating Crone PEM System
BOREHOLE PEM

Client	: PLUTONIC	Hole	: Hole CED-2
Grid	: CETHANA	Tx Loop	: Loop #1
Date	: Oct 19, 1994	File name	: CE2Z.PEM

Z COMPONENT dBz/dt nanoTesla/sec - 17 channels and PP

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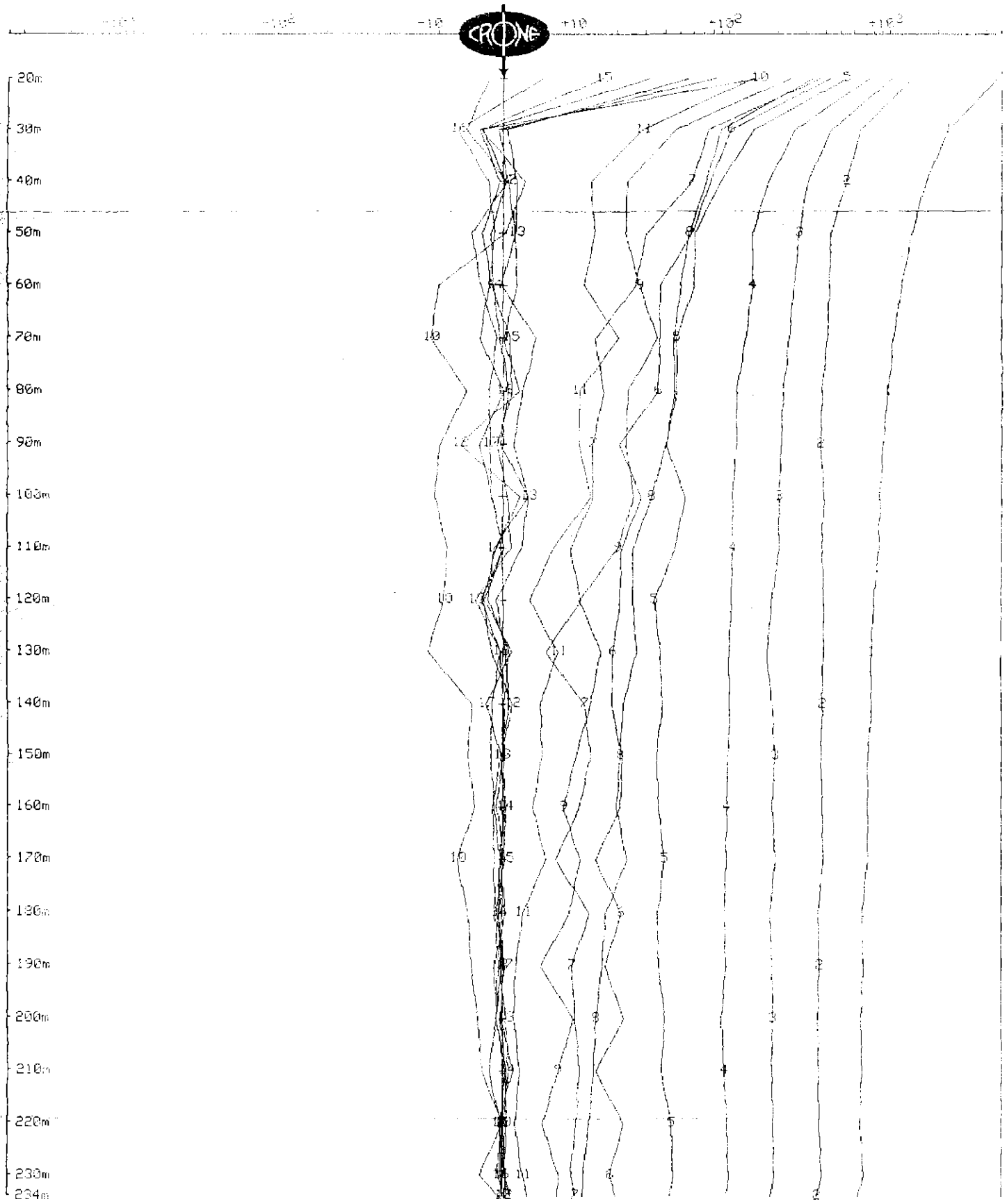

764077

OUTER-RIM EXPLORATION SERVICES
Operating Crone PEM System
BOREHOLE PEM

Client	: PLUTONIC	Hole	: Hole CED-2
Grid	: CETHANA	Tx Loop	: Loop #1
Date	: Oct 19, 1994	File name	: CE2Z.PEM

Z COMPONENT dBz/dt nanoTesla/sec - 17 channels and PP

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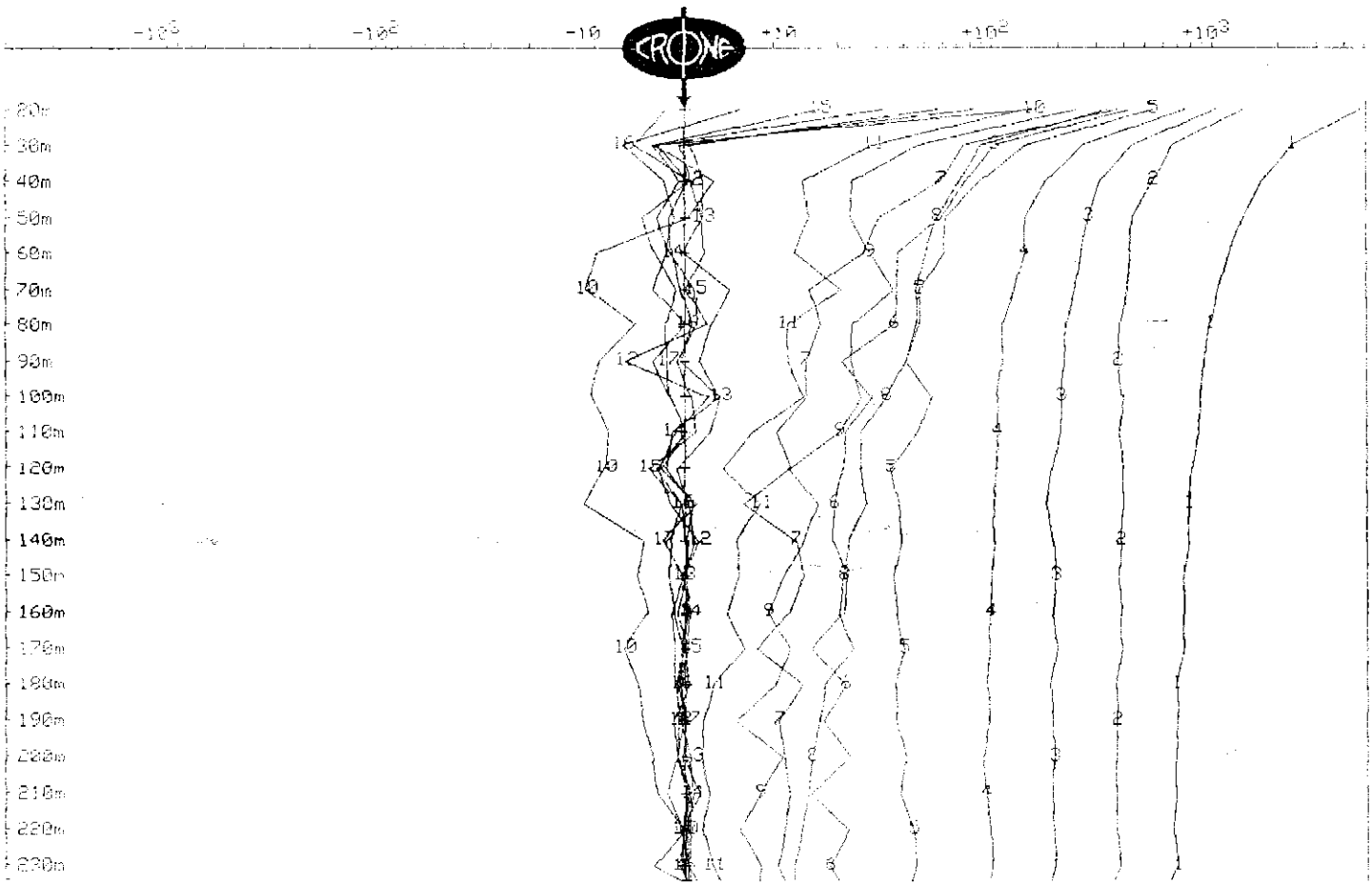


5 cm

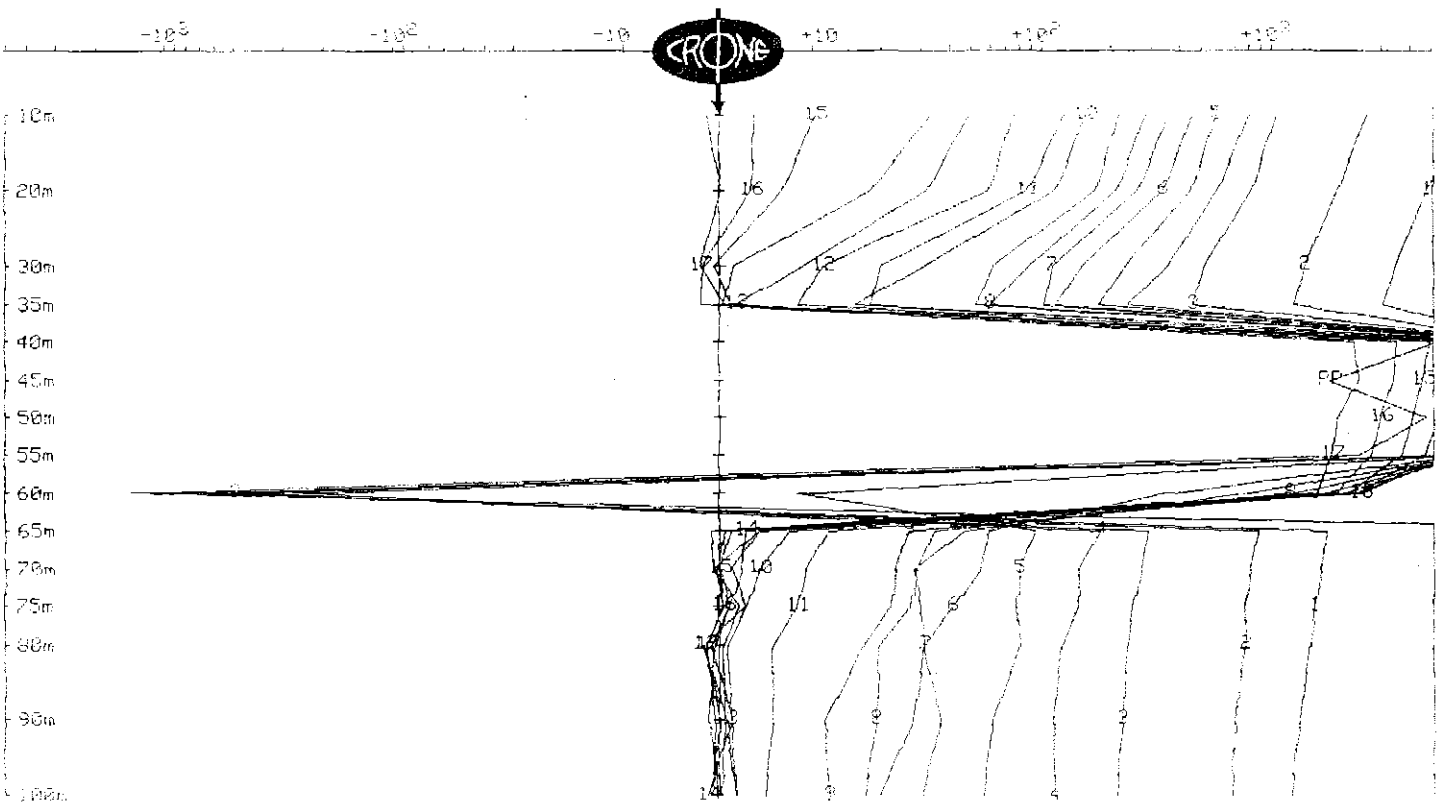
764078

OUTER-RIM EXPLORATION SERVICES
Operating Crone PEM System
BOREHOLE PEM

Client	: Plutonic Resources	Hole	: Hole-DD77CC4
Grid	: CETHANA	Tx Loop	: Loop #4
Date	: Oct 28, 1994	File name	: CE4Z.PEM

Z COMPONENT dBz/dt nanoTesla/sec - 17 channels and PP

Scale: 1:1000



5 cm

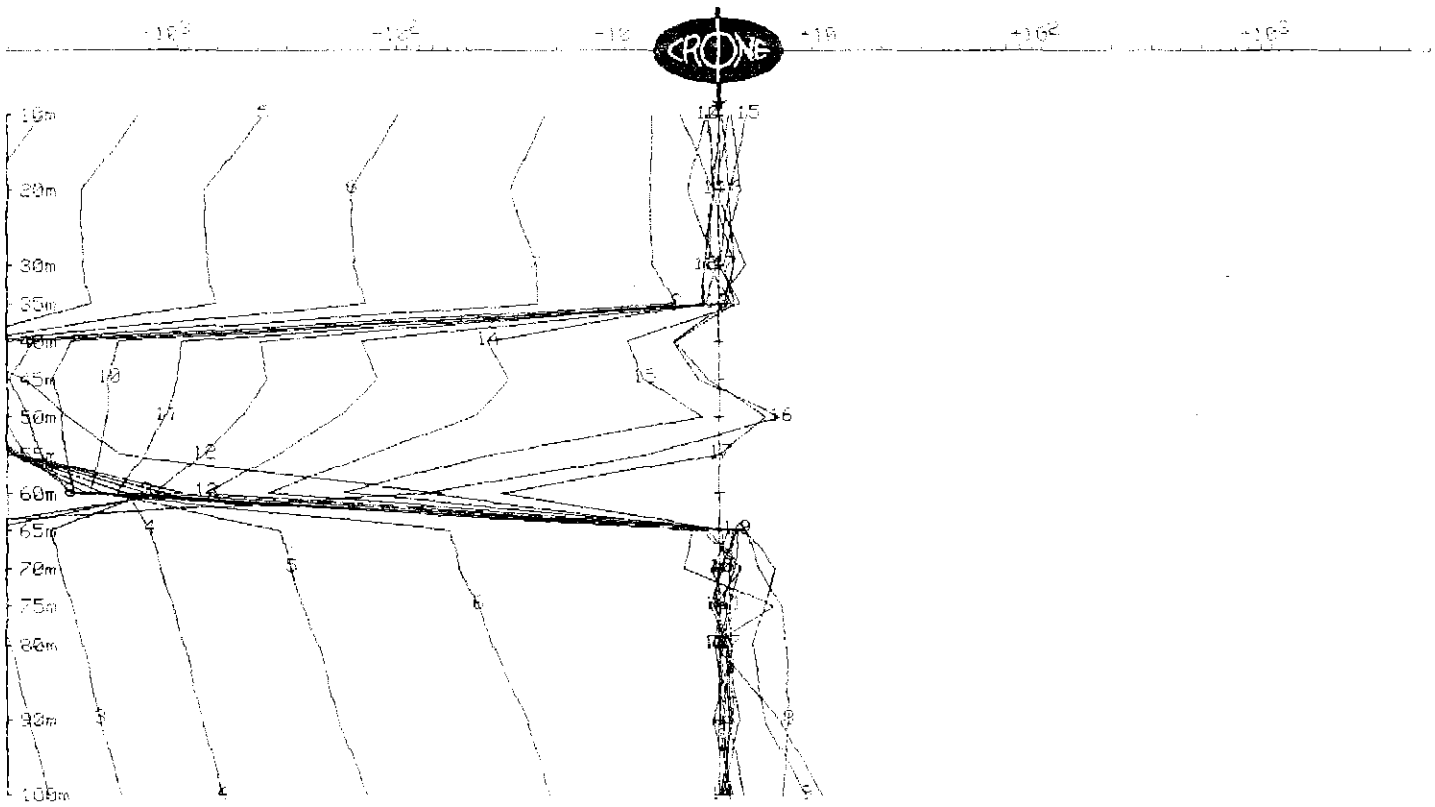
764079

OUTER-RIM EXPLORATION SERVICES
Operating Crone PEM System
BOREHOLE PEM

Client	: Plutonic Resources	Hole	: Hole-DD77CC4
Grid	: CETHANA	Tx Loop	: Loop #4
Date	: Oct 28, 1994	File name	: CE4XY.PEM

Data Corrected for Probe Rotation using Orientation Tool #2
X COMPONENT dBx/dt nanoTesla/sec - 17 channels and PP

Scale: 1:1000



5 cm

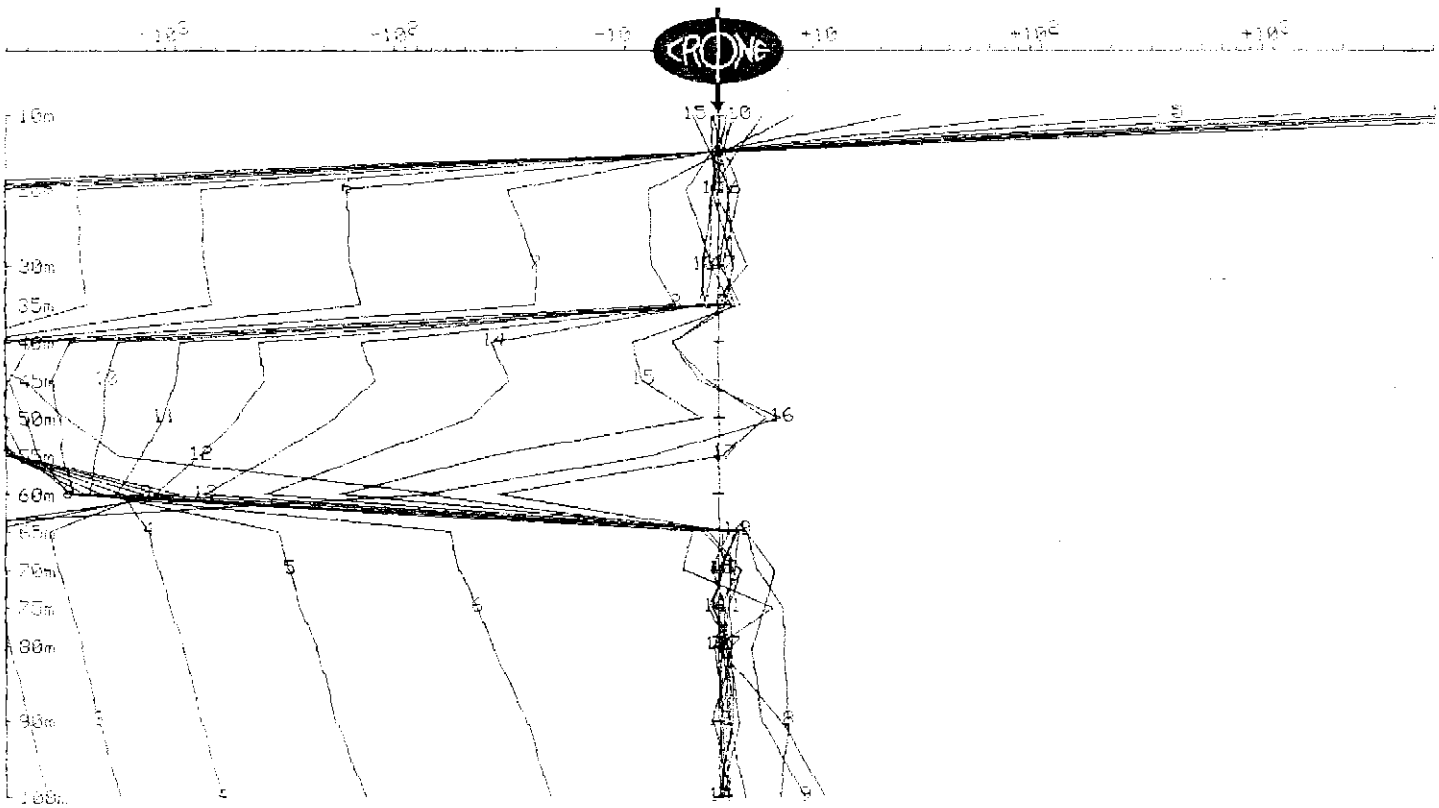
764080

OUTER-RIM EXPLORATION SERVICES
Operating Crone PEM System
BOREHOLE PEM

Client	: Plutonic Resources	Hole	: Hole-DD77CC4
Grid	: CETHANA	Tx Loop	: Loop #4
Date	: Oct 28, 1994	File name	: CE4PP.PEM

Data Corrected for Probe Rotation using Cleaned PP
X COMPONENT dBx/dt nanoTesla/sec - 17 channels and PP

Scale: 1:1000



5 cm

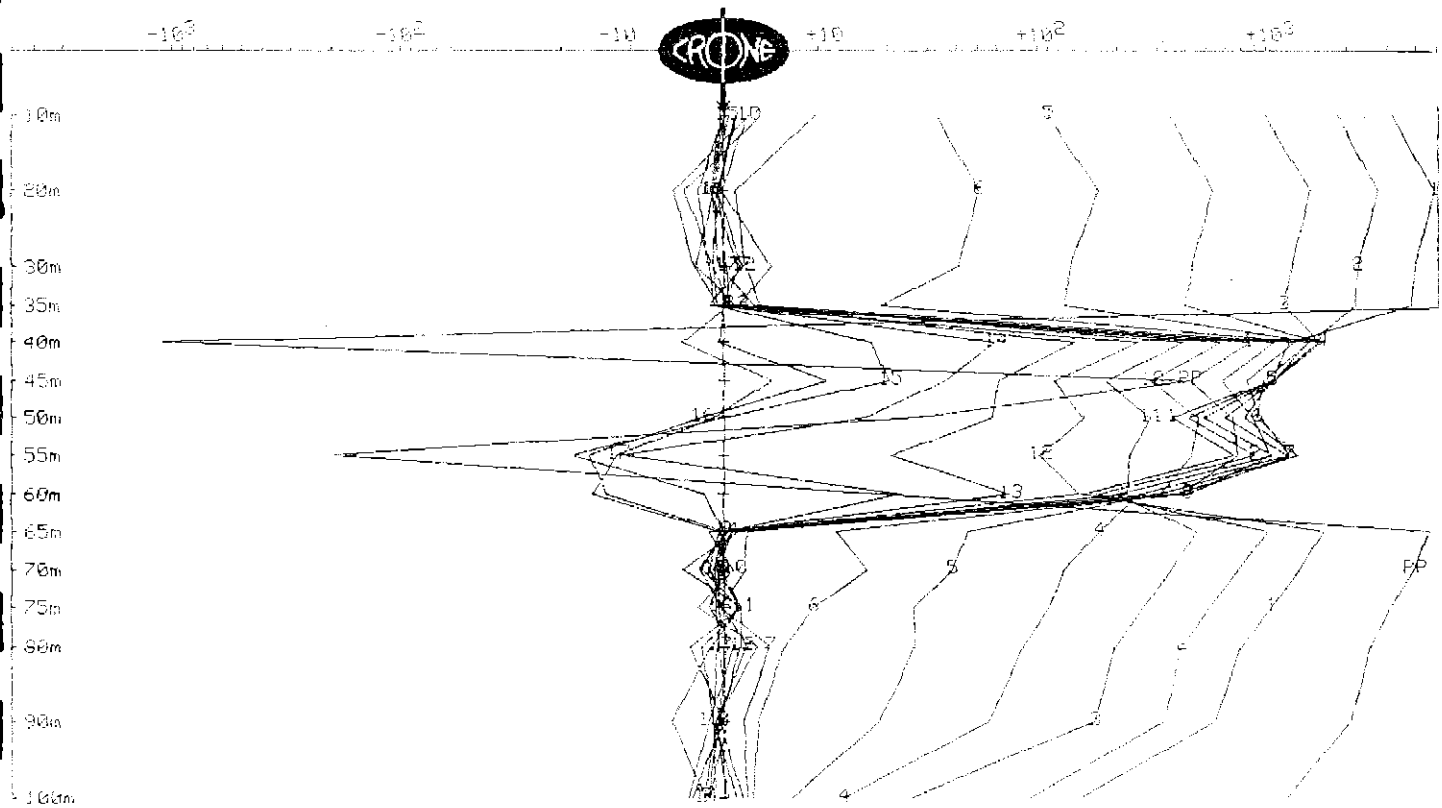
764081

OUTER-RIM EXPLORATION SERVICES
Operating Crone PEM System
BOREHOLE PEM

Client	: Plutonic Resources	Hole	: Hole-DD77CC4
Grid	: CETHANA	Tx Loop	: Loop #4
Date	: Oct 28, 1994	File name	: CE4XY.PEM

Data Corrected for Probe Rotation using Orientation Tool #2
Y COMPONENT dBy/dt nanoTesla/sec - 17 channels and PP

Scale: 1:1000



5 cm

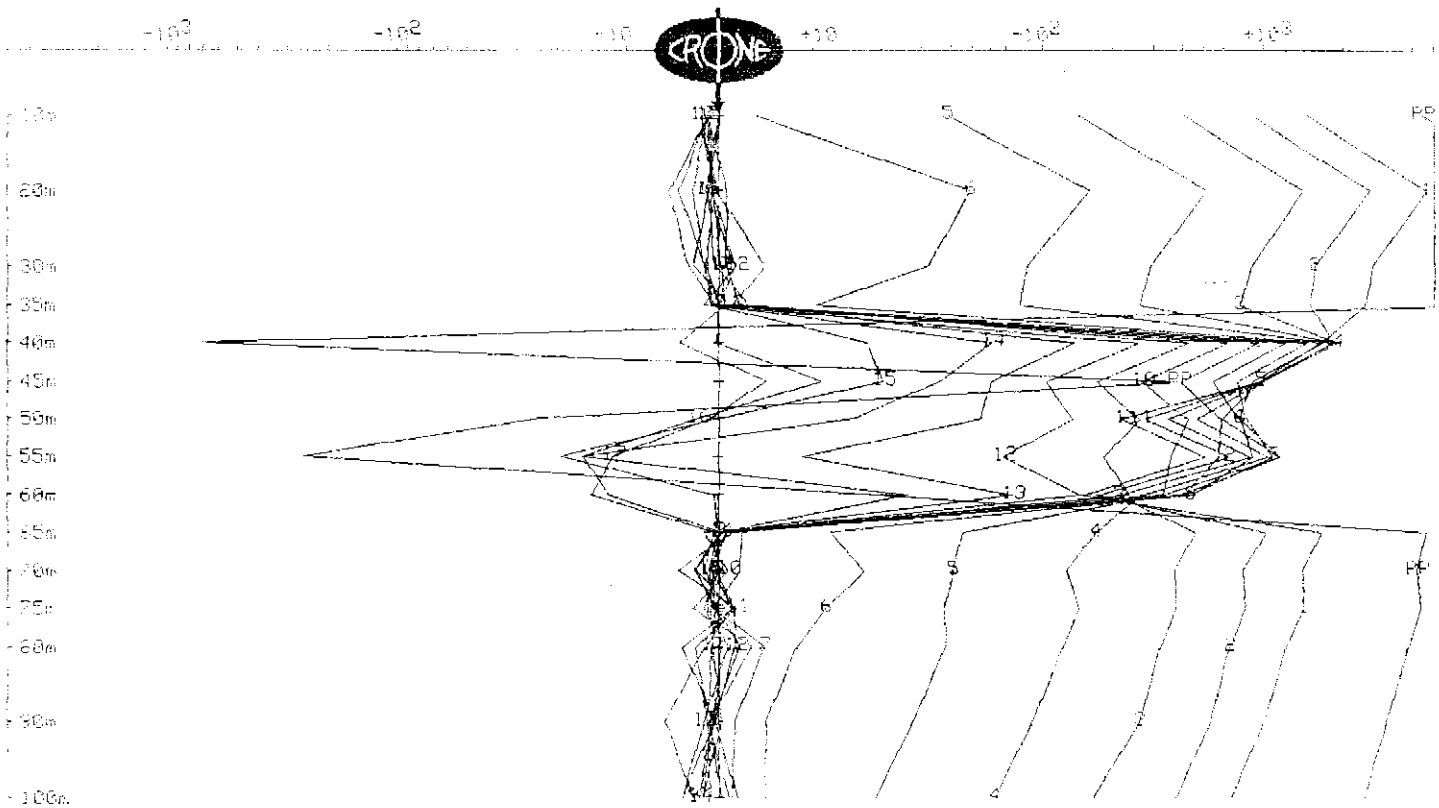
764082

OUTER-RIM EXPLORATION SERVICES
Operating Crone PEM System
BOREHOLE PEM

Client	: Plutonic Resources	Hole	: Hole-DD77CC4
Grid	: CETBANA	Tx Loop	: Loop #4
Date	: Oct 28, 1994	File name	: CE4PP.PEM

Data Corrected for Probe Rotation using Cleaned PP
Y COMPONENT dBy/dt nanoTesla/sec - 17 channels and PP

Scale: 1:1000



5 cm

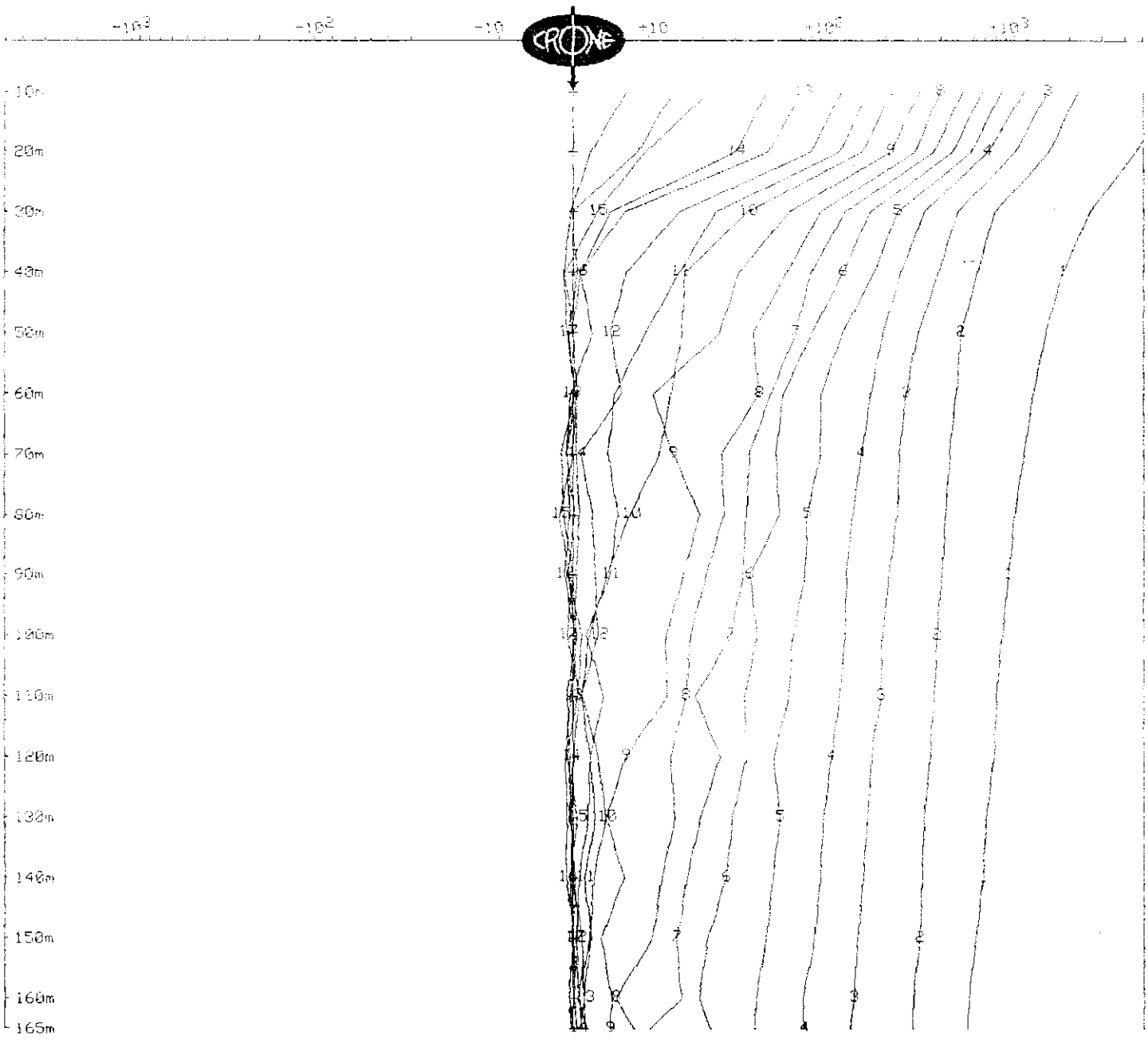
764083

OUTER-RIM EXPLORATION SERVICES
Operating Crone PEM System
BOREHOLE PEM

Client	: Plutonic Resources	Hole	: Hole-DD77CC6
Grid	: CETHANA	Tx Loop	: Loop #3
Date	: Oct 27, 1994	File name	: CE6Z.PEM

Z COMPONENT dBz/dt nanoTesla/sec - 17 channels and PP

Scale: 1:1000



5 cm

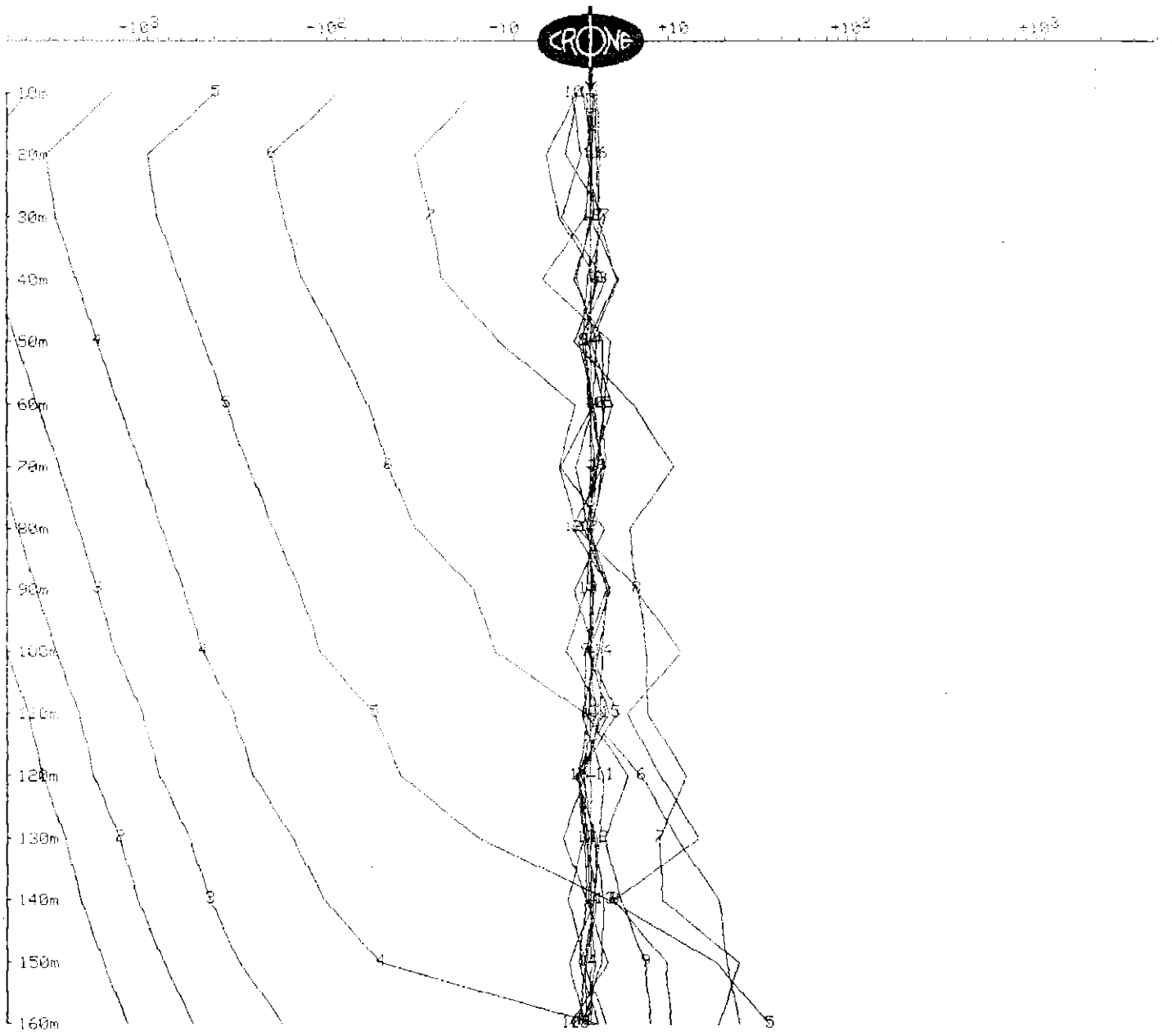
764084

OUTER-RIM EXPLORATION SERVICES
Operating Crone PEM System
BOREHOLE PEM

Client	: Plutonic Resources	Hole	: Hole-DD77CC6
Grid	: CETHANA	Tx Loop	: Loop #3
Date	: Oct 27, 1994	File name	: CE6XY.PEM

Data Corrected for Probe Rotation using Orientation Tool #2
X COMPONENT dBx/dt nanoTesla/sec - 17 channels and PP

Scale: 1:1000



5 cm

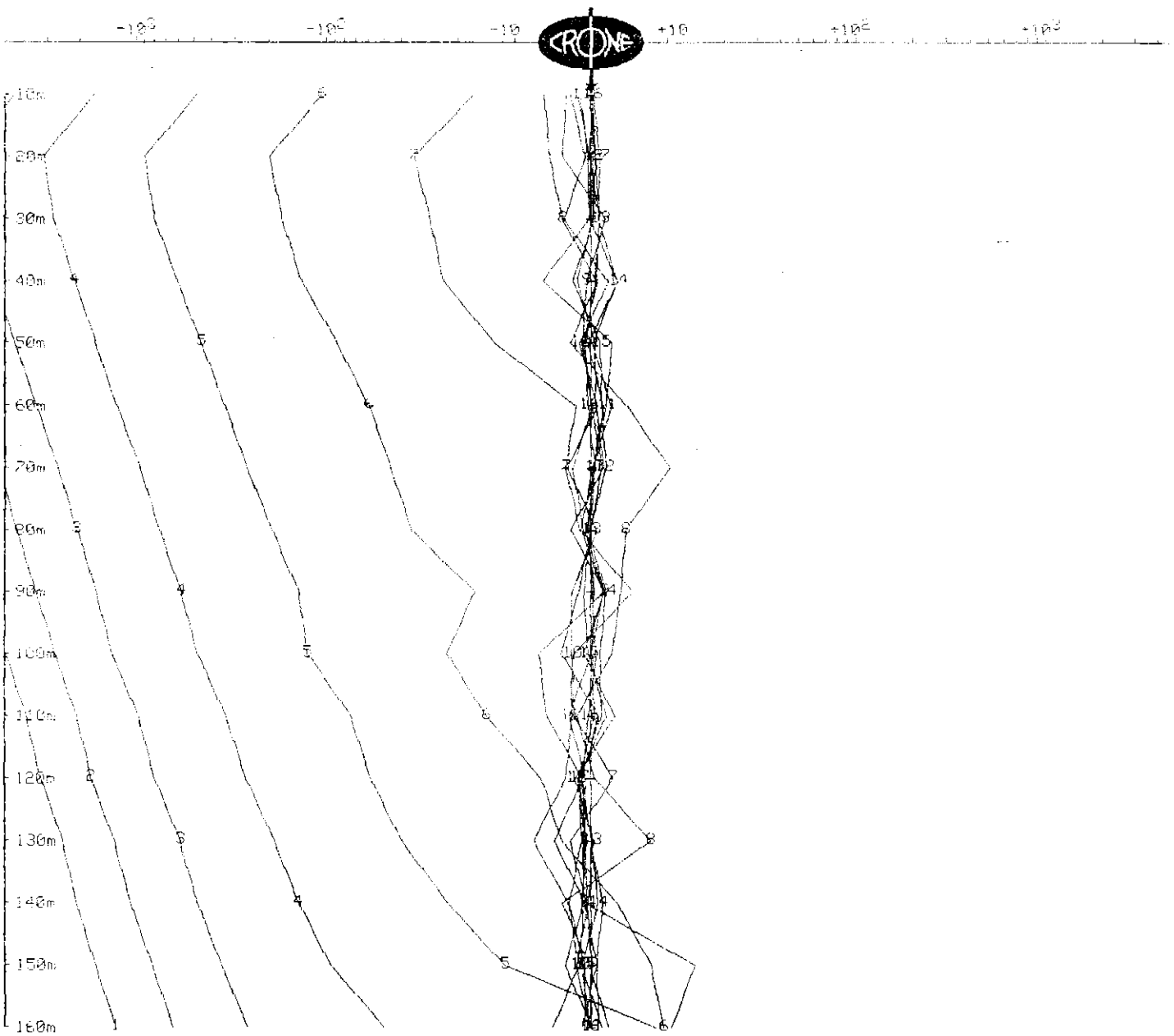
764085

OUTER-RIM EXPLORATION SERVICES
Operating Crone PEM System
BOREHOLE PEM

Client	: Plutonic Resources	Hole	: Bole-DD77CC6
Grid	: CETHANA	Tx Loop	: Loop #3
Date	: Oct 27, 1994	File name	: CE6PP.PEM

Data Corrected for Probe Rotation using Cleaned PP
X COMPONENT dBx/dt nanoTesla/sec - 17 channels and PP

Scale: 1:1000



5 cm

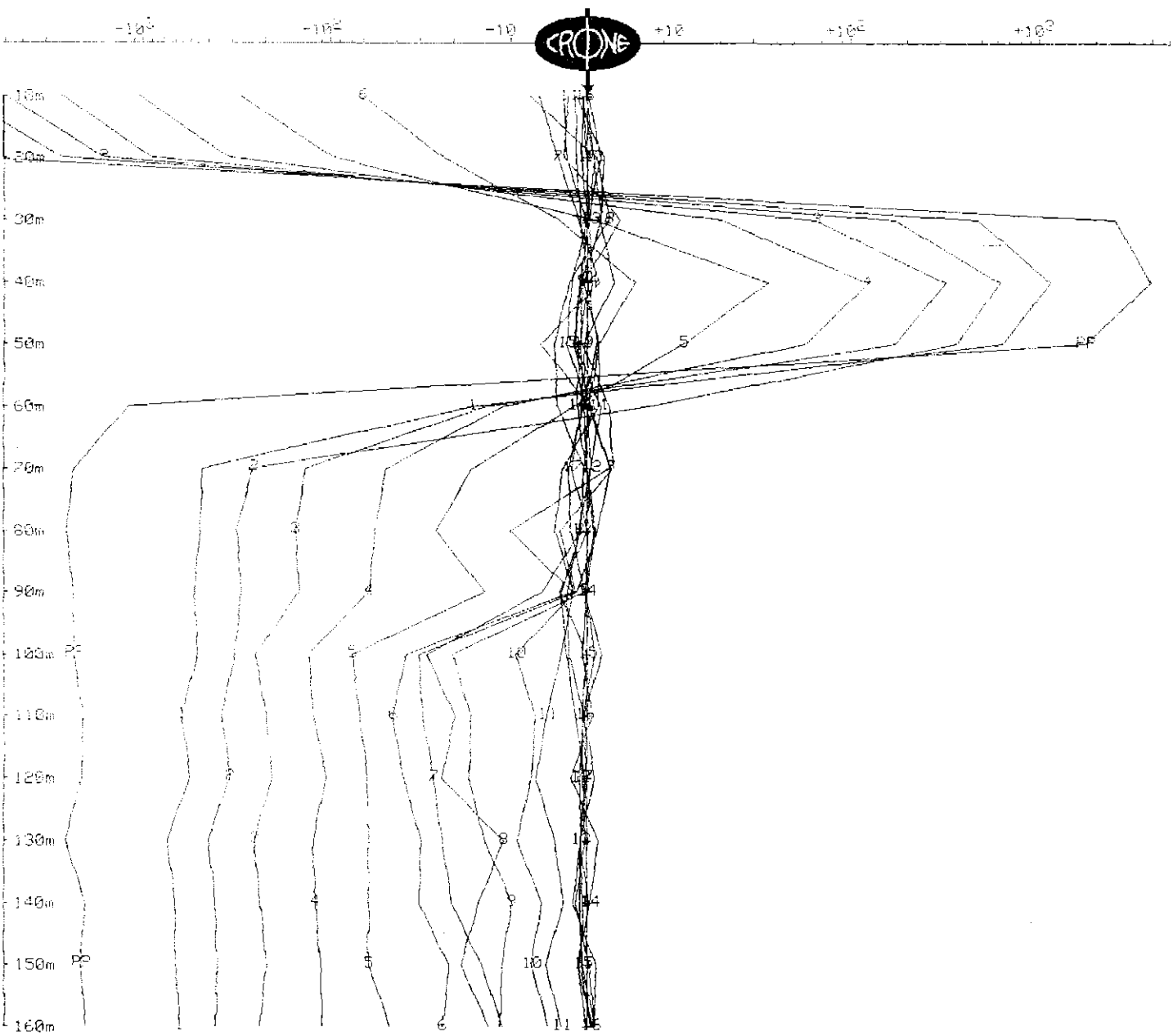
764086

OUTER-RIM EXPLORATION SERVICES
Operating Crone PEM System
BOREHOLE PEM

Client	: Plutonic Resources	Hole	: Hole-DD77CC6
Grid	: CETHANA	Tx Loop	: Loop #3
Date	: Oct 27, 1994	File name	: CE6XY.PEM

Data Corrected for Probe Rotation using Orientation Tool #2
Y COMPONENT dBy/dt nanoTesla/sec - 17 channels and PP

Scale: 1:1000



5 cm

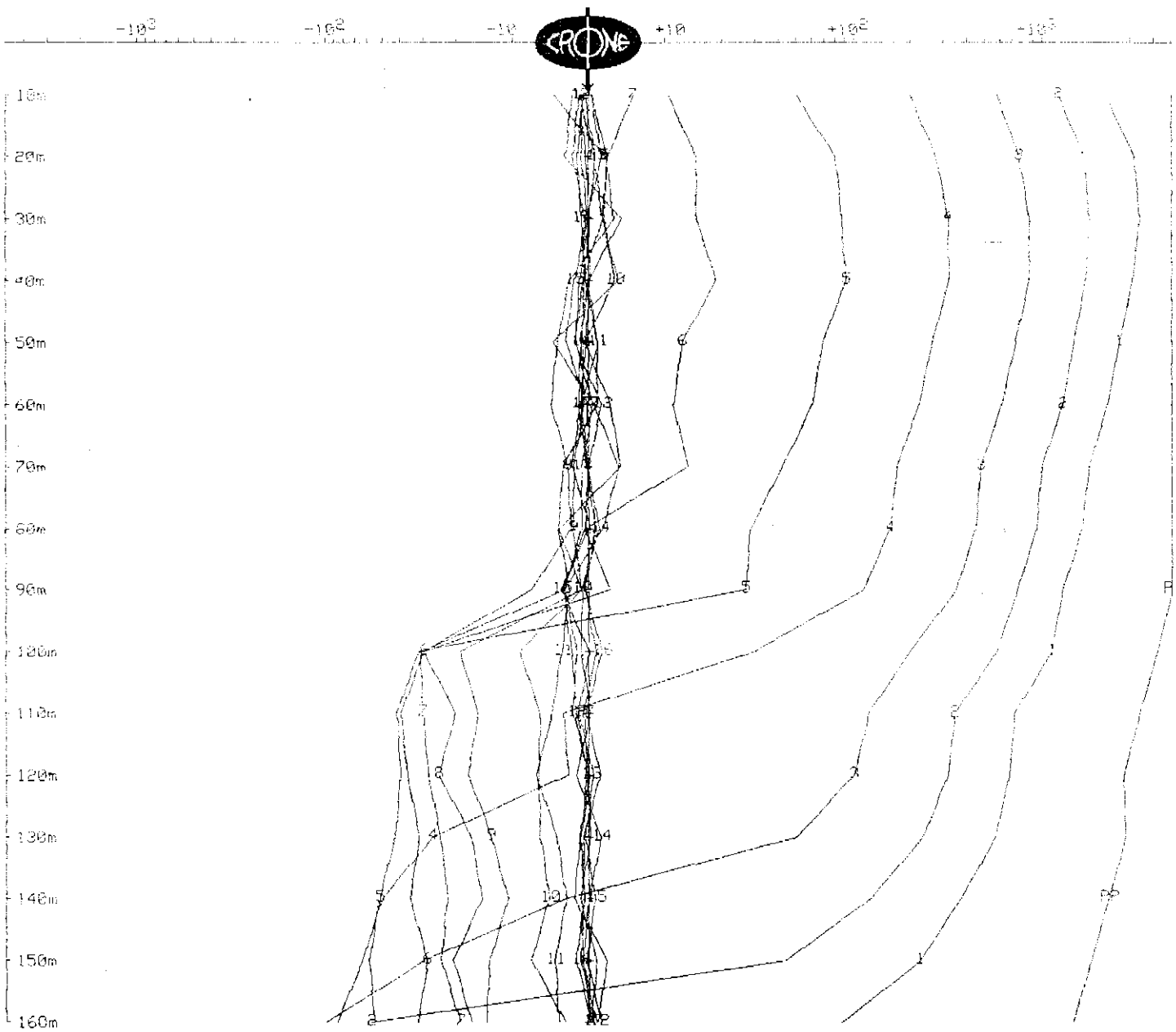
764087

OUTER-RIM EXPLORATION SERVICES
Operating Crone PEM System
BOREHOLE PEM

Client	: Plutonic Resources	Hole	: Hole-DD77CC6
Grid	: CETHANA	Tx Loop	: Loop #3
Date	: Oct 27, 1994	File name	: CE6PP.PEM

Data Corrected for Probe Rotation using Cleaned PP
Y COMPONENT dBy/dt nanoTesla/sec - 17 channels and PP

Scale: 1:1000



5 cm

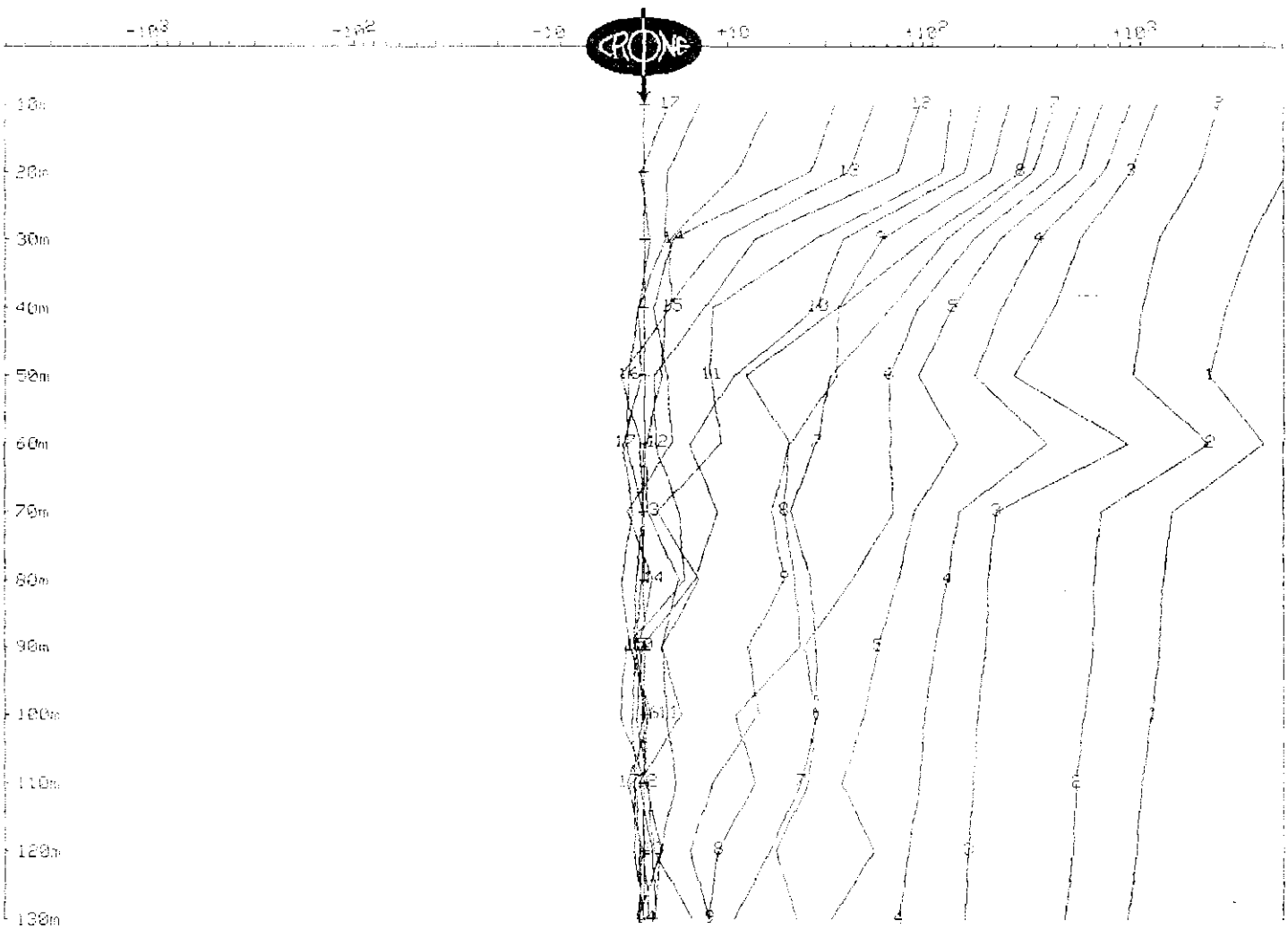
764088

OUTER-RIM EXPLORATION SERVICES
Operating Crone PEM System
BOREHOLE PEM

Client	: Plutonic Resources	Hole	: Hole-DD77CC7
Grid	: CETHANA	Tx Loop	: Loop #3
Date	: Oct 27, 1994	File name	: CE7Z.PEM

Z COMPONENT dBz/dt nanoTesla/sec - 17 channels and PP

Scale: 1:1000



5 cm

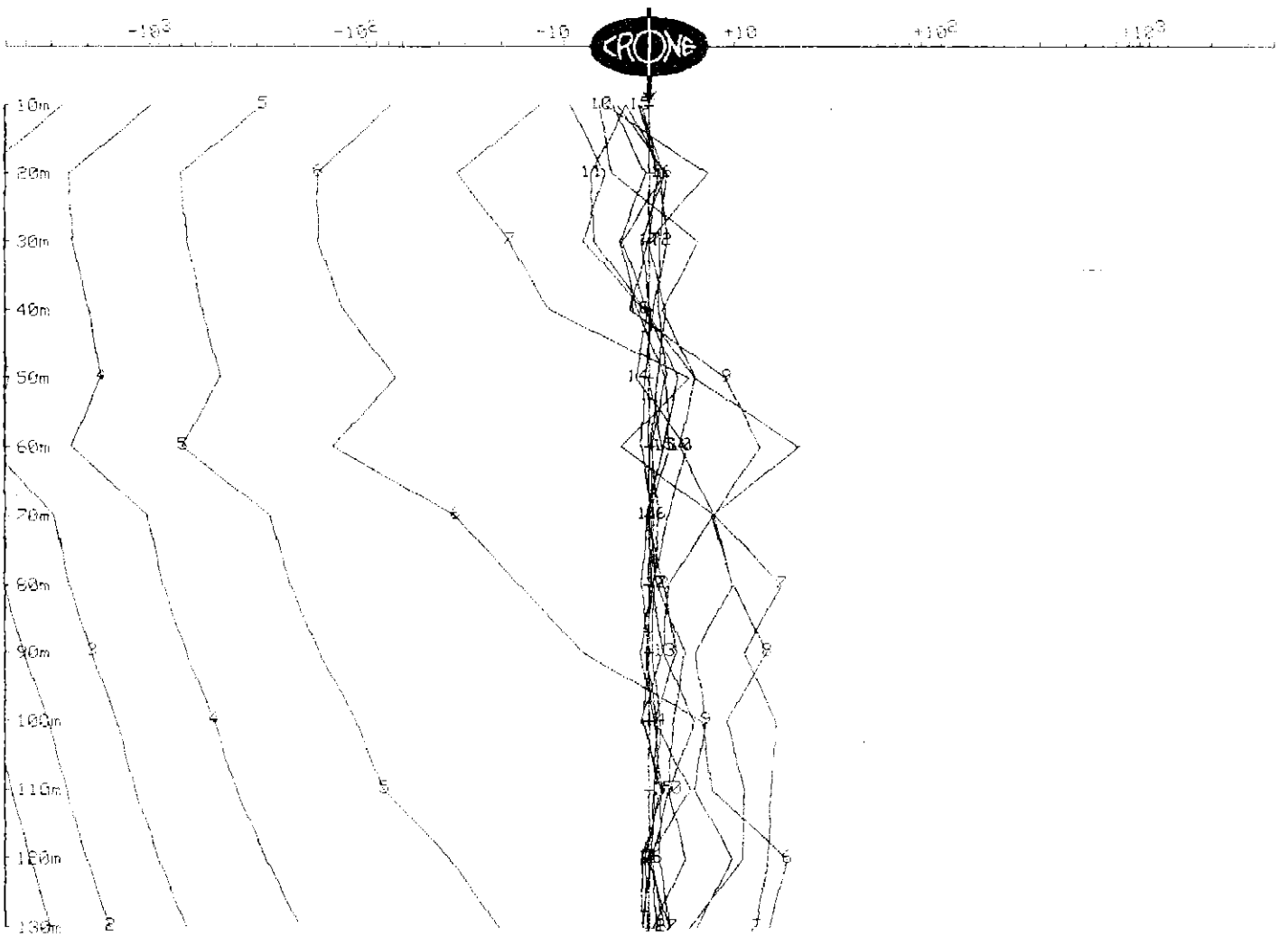
764089

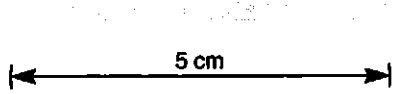
OUTER-RIM EXPLORATION SERVICES
Operating Crone PEM System
BOREHOLE PEM

Client	: Plutonic Resources	Hole	: Hole-DD77CC7
Grid	: CETHANA	Tx Loop	: Loop #3
Date	: Oct 27, 1994	File name	: CE7XY.PEM

Data Corrected for Probe Rotation using Orientation Tool #2
X COMPONENT dBx/dt nanoTesla/sec - 17 channels and PP

Scale: 1:1000





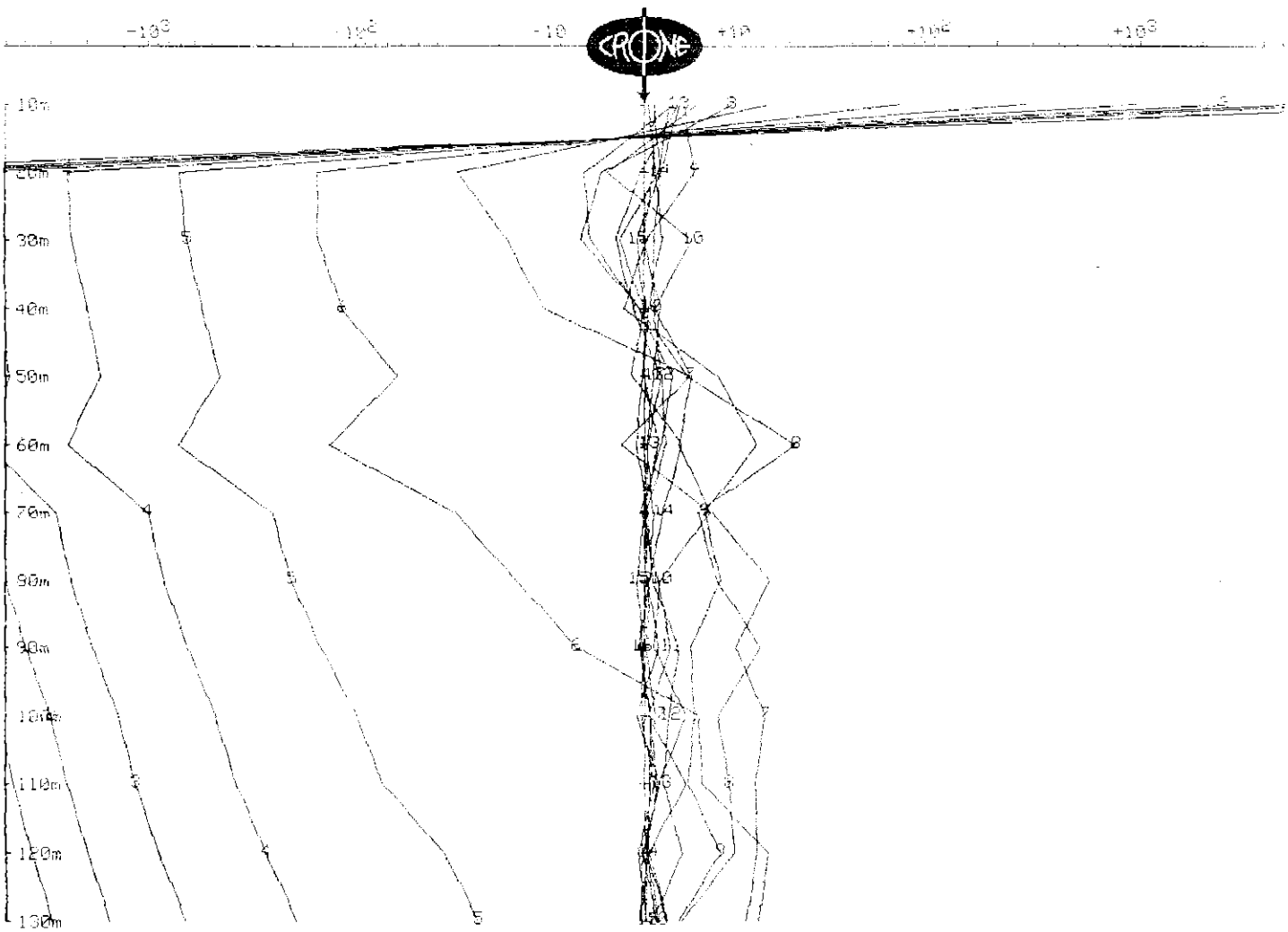
764090

OUTER-RIM EXPLORATION SERVICES
Operating Crone PEM System
BOREHOLE PEM

Client	: Plutonic Resources	Hole	: Hole-DD77CC7
Grid	: CETHANA	Tx Loop	: Loop #3
Date	: Oct 27, 1994	File name	: CE7PP.PEM

Data Corrected for Probe Rotation using Cleaned PP
X COMPONENT dBx/dt nanoTesla/sec - 17 channels and PP

Scale: 1:1000



5 cm

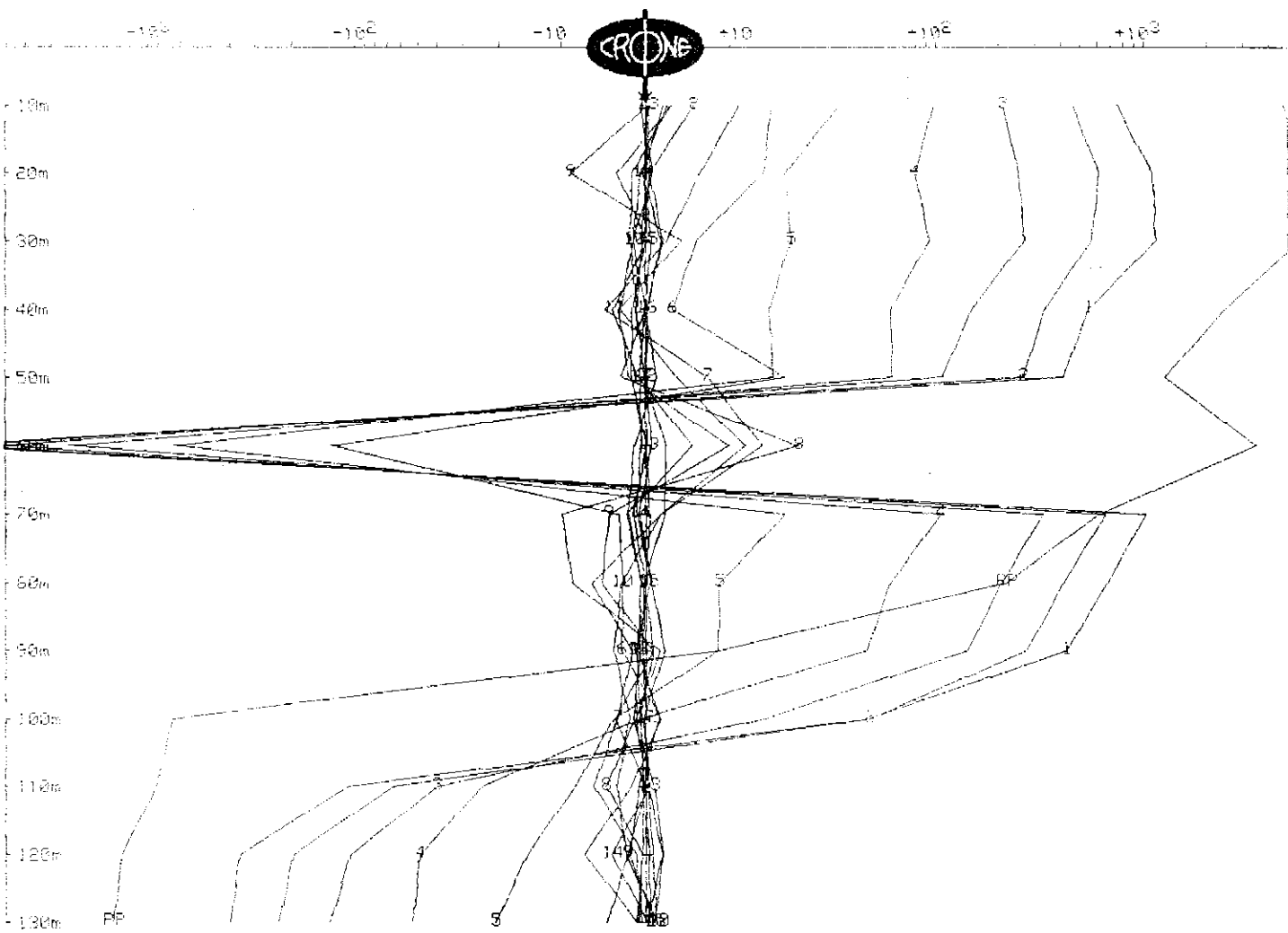
764091

OUTER-RIM EXPLORATION SERVICES
Operating Crone PEM System
BOREHOLE PEM

Client	: Plutonic Resources	Hole	: Hole-DD77CC7
Grid	: CETHANA	Tx Loop	: Loop #3
Date	: Oct 27, 1994	File name	: CE7XY.PEM

Data Corrected for Probe Rotation using Orientation Tool #2
Y COMPONENT dBy/dt nanoTesla/sec - 17 channels and PP

Scale: 1:1000



5 cm

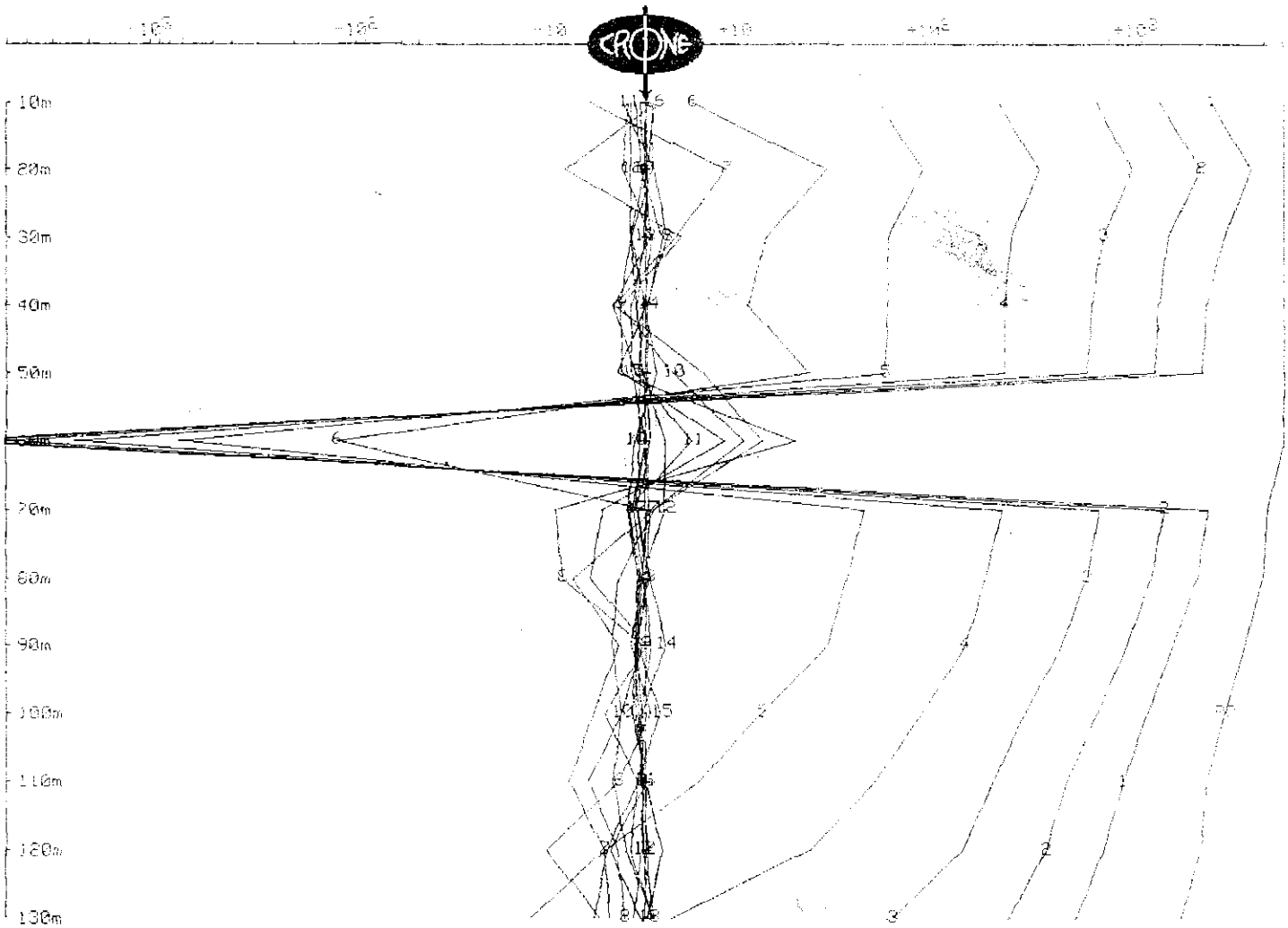
764092

OUTER-RIM EXPLORATION SERVICES
Operating Crone PEM System
BOREHOLE PEM

Client	: Plutonic Resources	Hole	: Hole-DD77CC7
Grid	: CETHANA	Tx Loop	: Loop #3
Date	: Oct 27, 1994	File name	: CE7PP.PEM

Data Corrected for Probe Rotation using Cleaned PP
Y COMPONENT dBy/dt nanoTesla/sec - 17 channels and PP

Scale: 1:1000



5 cm

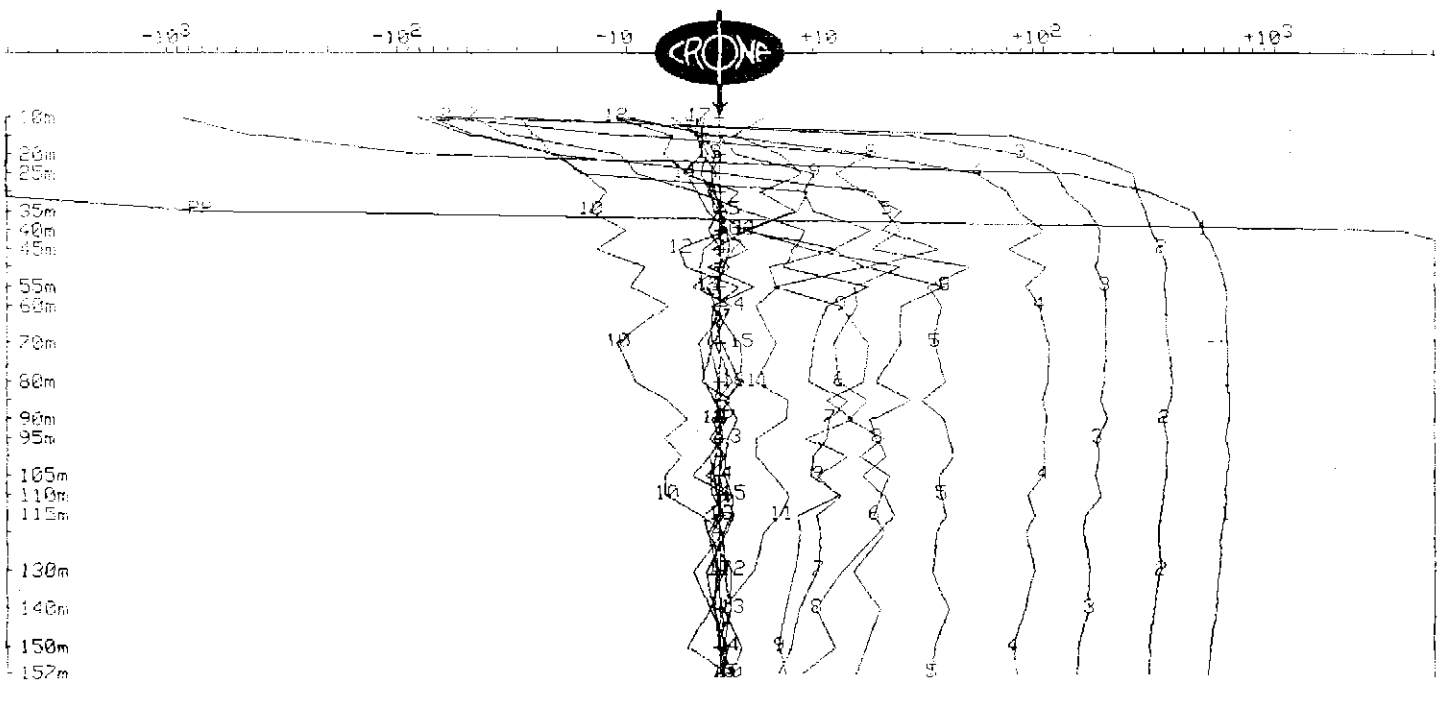
764093

OUTER-RIM EXPLORATION SERVICES
Operating Crone PEM System
BOREHOLE PEM

Client	: PLUTONIC	Hole	: Hole-DD78CC8
Grid	: CETHANA	Tx Loop	: Loop #1
Date	: Oct 19, 1994	File name	: CE8Z.PEM

Z COMPONENT dBz/dt nanoTesla/sec - 17 channels and PP

Scale: 1:2000



5 cm

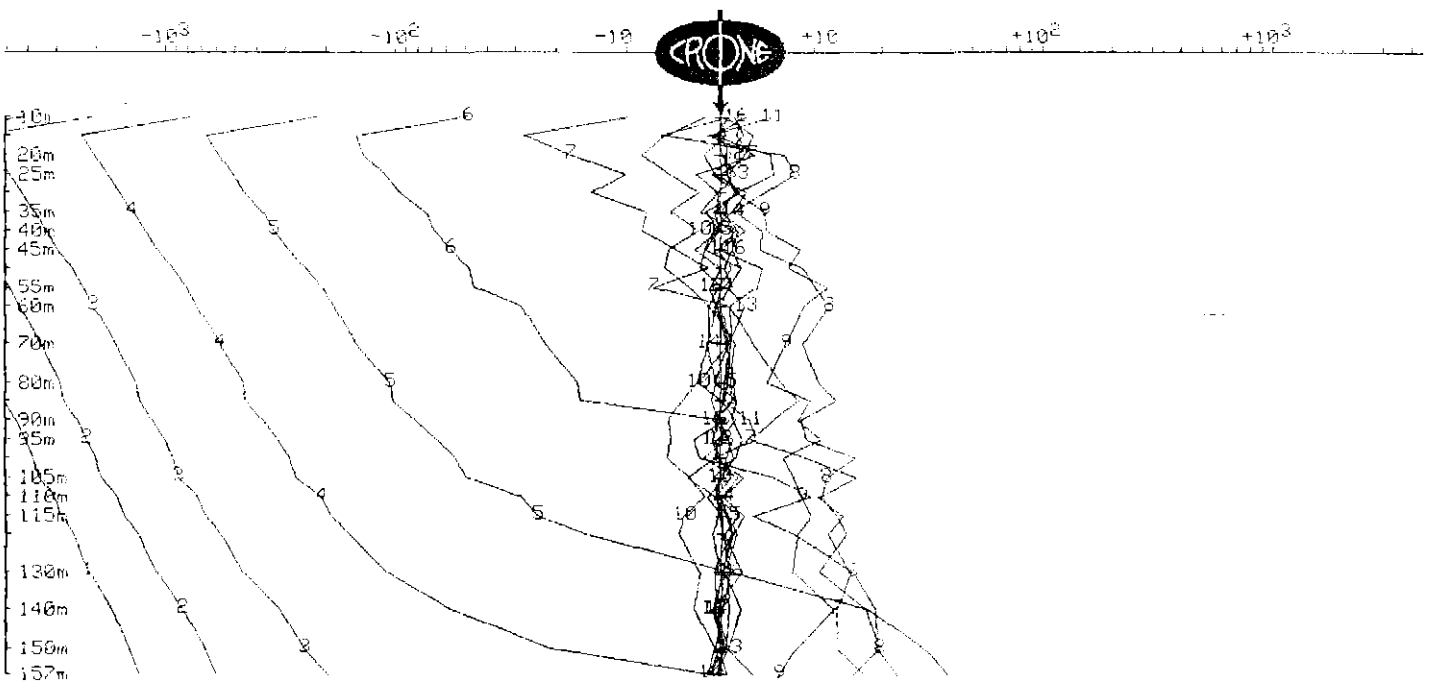
764094

OUTER-RIM EXPLORATION SERVICES
Operating Crone PEM System
BOREHOLE PEM

Client	: PLUTONIC	Hole	: Hole-DD78CC8
Grid	: CETHANA	Tx Loop	: Loop #1
Date	: Oct 19, 1994	File name	: CE8XY.PEM

Data Corrected for Probe Rotation using Orientation Tool #2
X COMPONENT dBx/dt nanoTesla/sec - 17 channels and PP

Scale: 1:2000



5 cm

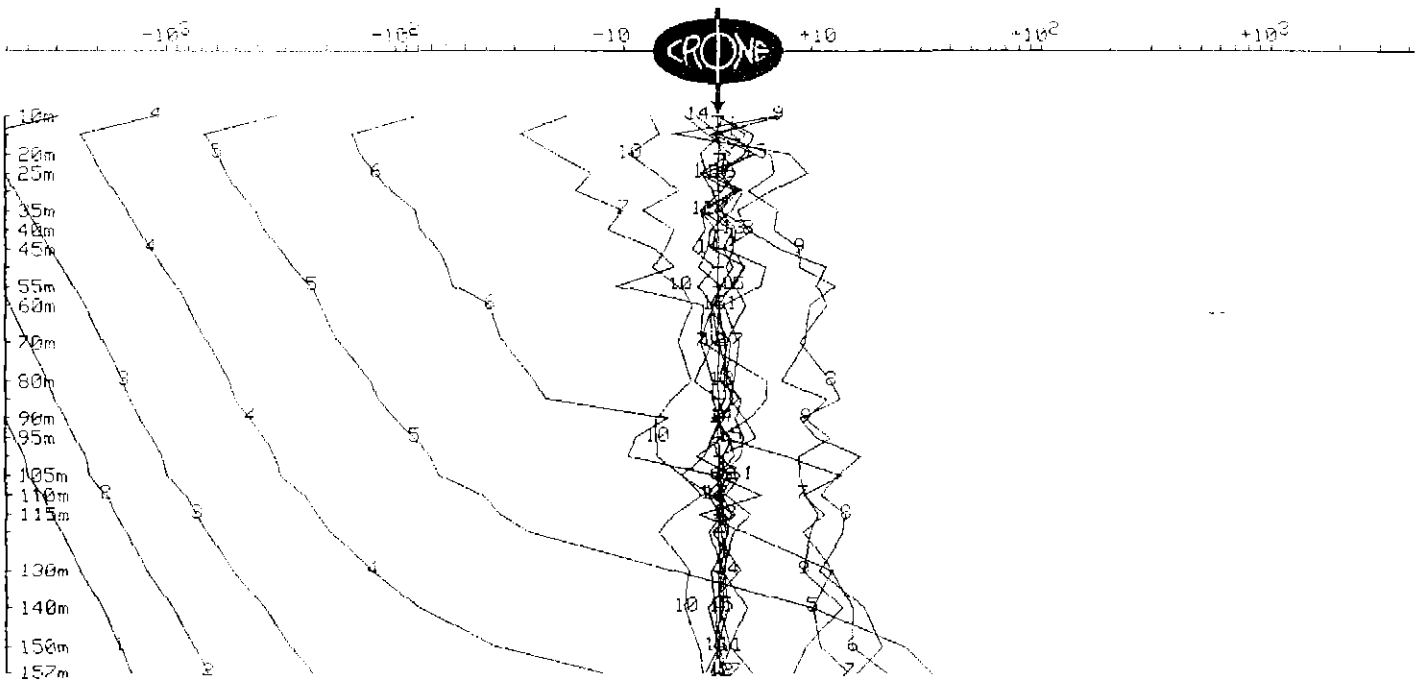
764095

OUTER-RIM EXPLORATION SERVICES
Operating Crone PEM System
BOREHOLE PEM

Client	: PLUTONIC	Hole	: Hole-DD78CC8
Grid	: CETHANA	Tx Loop	: Loop #1
Date	: Oct 19, 1994	File name	: PP8.PEM

Data Corrected for Probe Rotation using Cleaned PP
X COMPONENT dBx/dt nanoTesla/sec - 17 channels and PP

Scale: 1:2000



5 cm

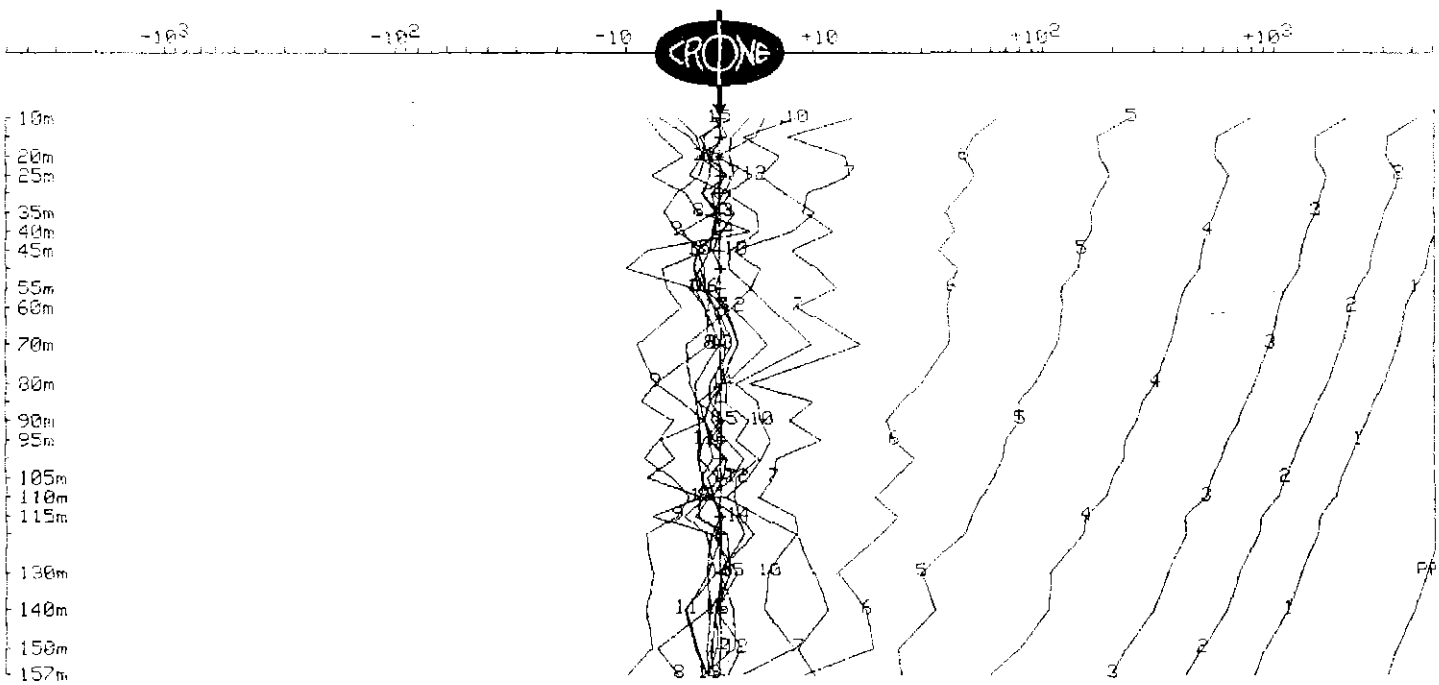
764096

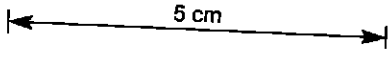
OUTER-RIM EXPLORATION SERVICES
Operating Crone PEM System
BOREHOLE PEM

Client	: PLUTONIC	Hole	: Hole-DD78CC8
Grid	: CETHANA	Tx Loop	: Loop #1
Date	: Oct 19, 1994	File name	: CE8XY.PEM

Data Corrected for Probe Rotation using Orientation Tool #2
Y COMPONENT dBy/dt nanoTesla/sec - 17 channels and PP

Scale: 1:2000





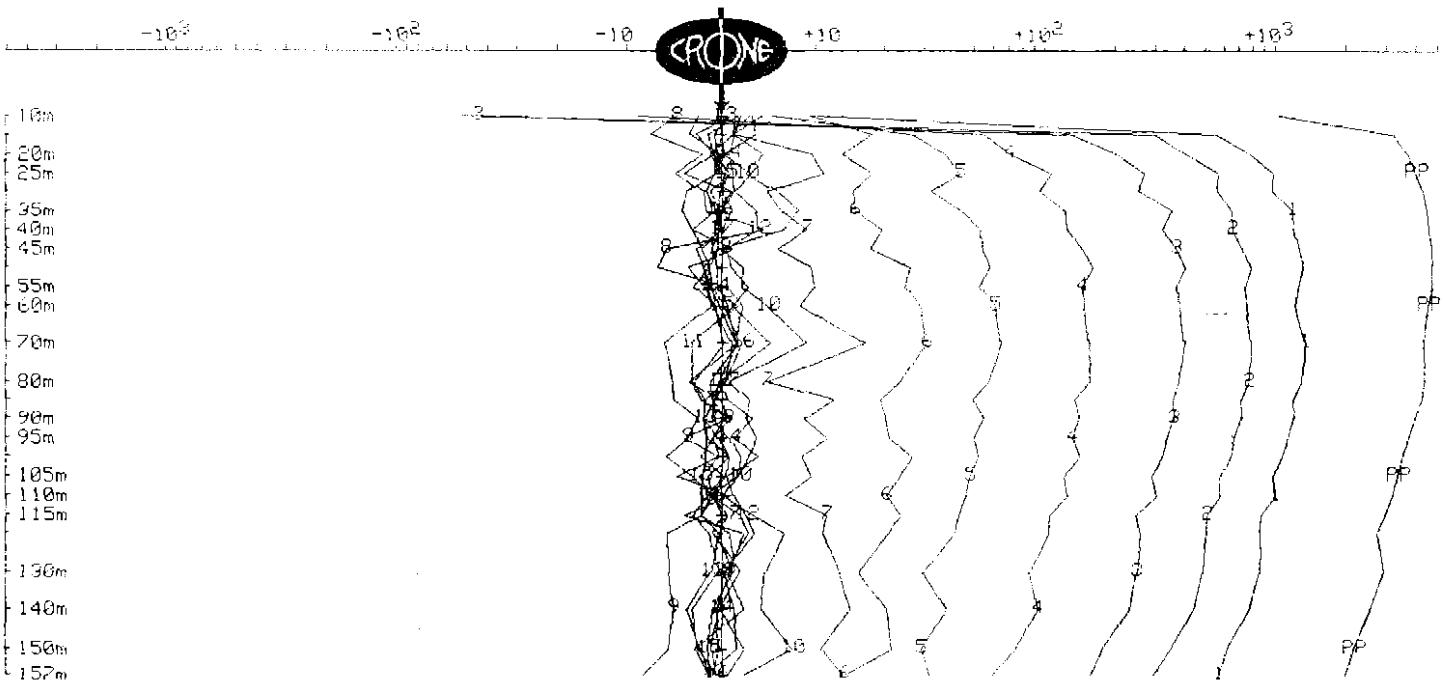
764097

OUTER-RIM EXPLORATION SERVICES
Operating Crone PEM System
BOREHOLE PEM

Client	: PLUTONIC	Hole	: Hole-DD78CC8
Grid	: CETHANA	Tx Loop	: Loop #1
Date	: Oct 19, 1994	File name	: PP8.PEM

Data Corrected for Probe Rotation using Cleaned PP
Y COMPONENT dBy/dt nanoTesla/sec - 17 channels and PP

Scale: 1:2000



5 cm

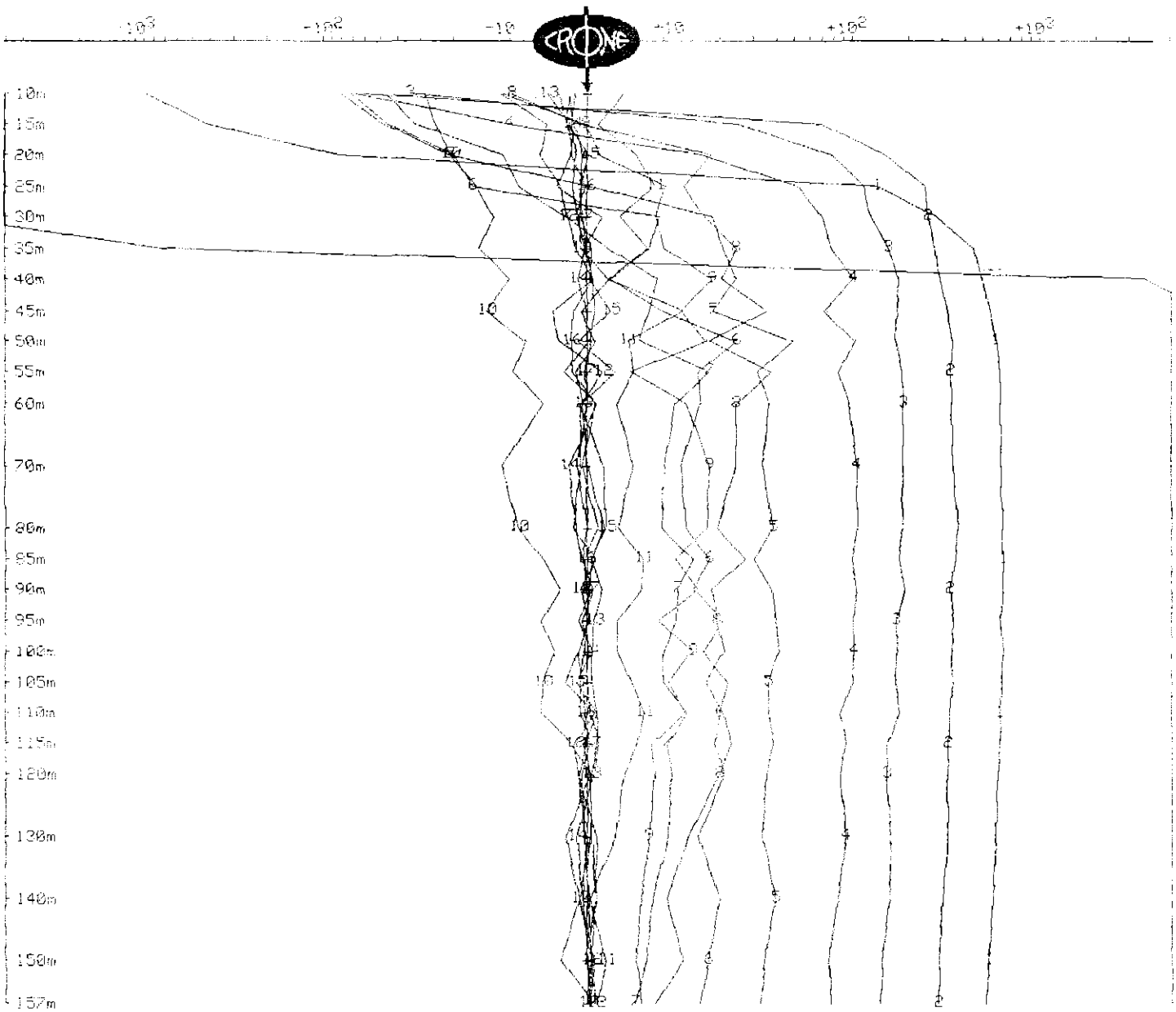
764098

OUTER-RIM EXPLORATION SERVICES
Operating Crone PEM System
BOREHOLE PEM

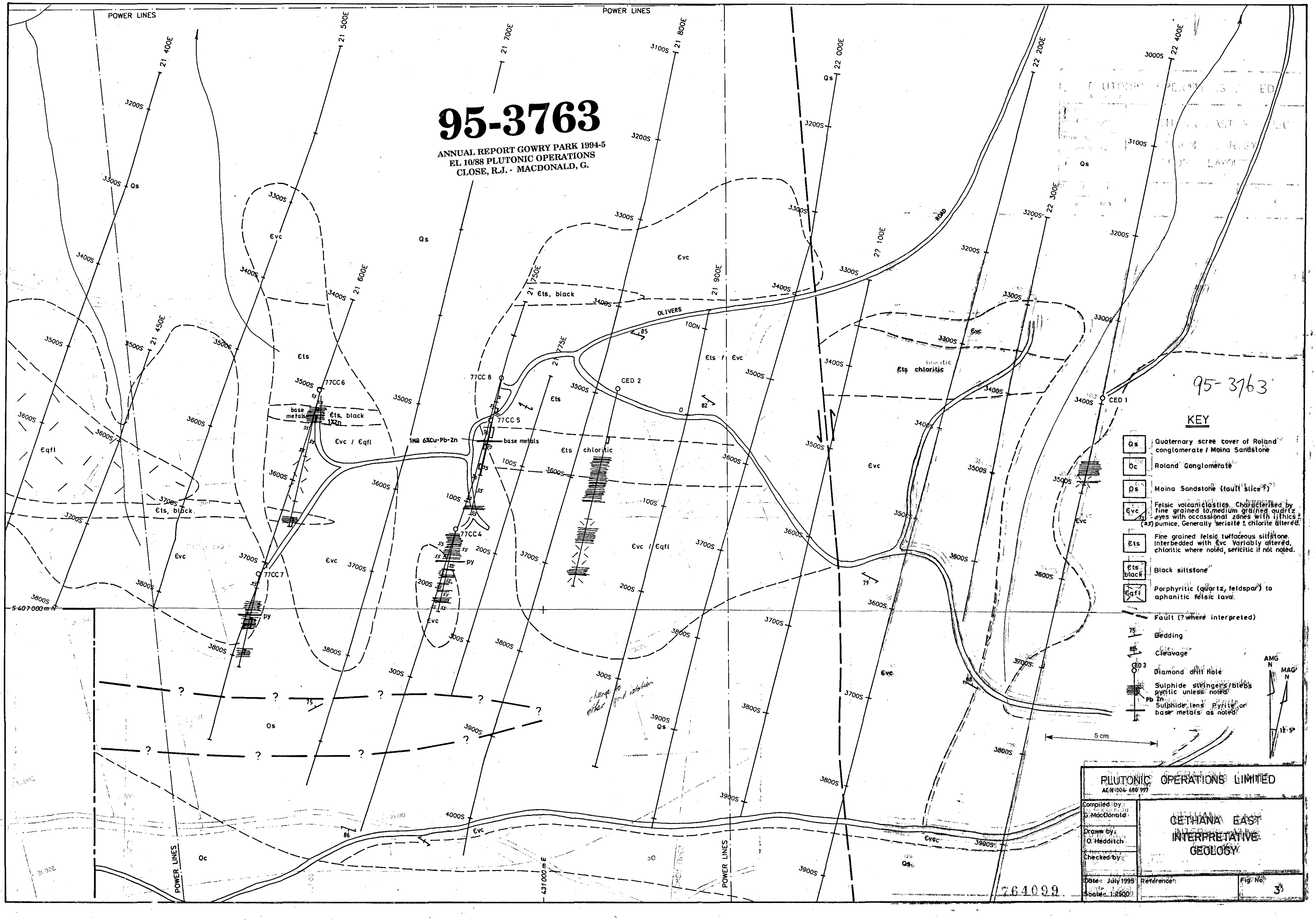
Client	: PLUTONIC	Hole	: Hole-DD78CC8
Grid	: CETHANA	Tx Loop	: Loop #1
Date	: Oct 19, 1994	File name	: CE8Z.PEM

Z COMPONENT dBz/dt nanoTesla/sec - 17 channels and PP

Scale: 1:1000



5 cm


95-3763
ANNUAL REPORT GOWRY PARK 1994-5
EL 10/88 PLUTONIC OPERATIONS
CLOSE, R.J. - MACDONALD, G.
POWER LINES
POWER LINES
21 400E
21 450E
21 500E
21 600E
21 700E
21 750E
21 775E
21 800E
21 900E
22 000E
22 100E
22 200E
22 300E
22 400E
5 407 000 m N
431 000 m E
OLIVERS
ROAD
77CC 4
77CC 5
77CC 6
77CC 7
77CC 8
CED 1
CED 2
1M@ 6%Cu-Pb-Zn
base metals
Ets, black
Ets chloritic
Evc / Eqfl
Ets / Evc
Qs
Oc
py
change to other grid rotation
95-3763
KEY
Qs Quaternary scree cover of Roland conglomerate / Moina Sandstone
Oc Roland Conglomerate
Qs Moina Sandstone (fault slice?)
Evc Felsic volcaniclastics. Characterised by fine grained to medium grained quartz eyes with occassional zones with lithics ± (ss) pumice. Generally sericite ± chlorite altered.
Ets Fine grained felsic tuffaceous siltstone. Interbedded with Evc. Variably altered, chloritic where noted, sericitic if not noted.
Ets black Black siltstone
Eqfl Porphyritic (quartz, feldspar) to aphanitic felsic lava.
Fault (? where interpreted)
Bedding
Cleavage
Diamond drill hole
Sulphide stringers/blebs pyritic unless noted
Sulphide lens Pyrite or base metals as noted
AMG N
MAG N
5 cm
PLUTONIC OPERATIONS LIMITED
ACN 004 680 997
Compiled by: G. MacDonald
Drawn by: O. Heddrich
Checked by:
Date: July 1995
Scale: 1:2500
Reference:
CETHANA EAST INTERPRETATIVE GEOLOGY
Fig. No: 3
764099

900S

800S

CED 1
-64° to 192·5° (true)

700S

600S

400m a.s.l.

300m a.s.l.

50m

100m

150m

15%Py

2-20%Py

EOH
200.0m

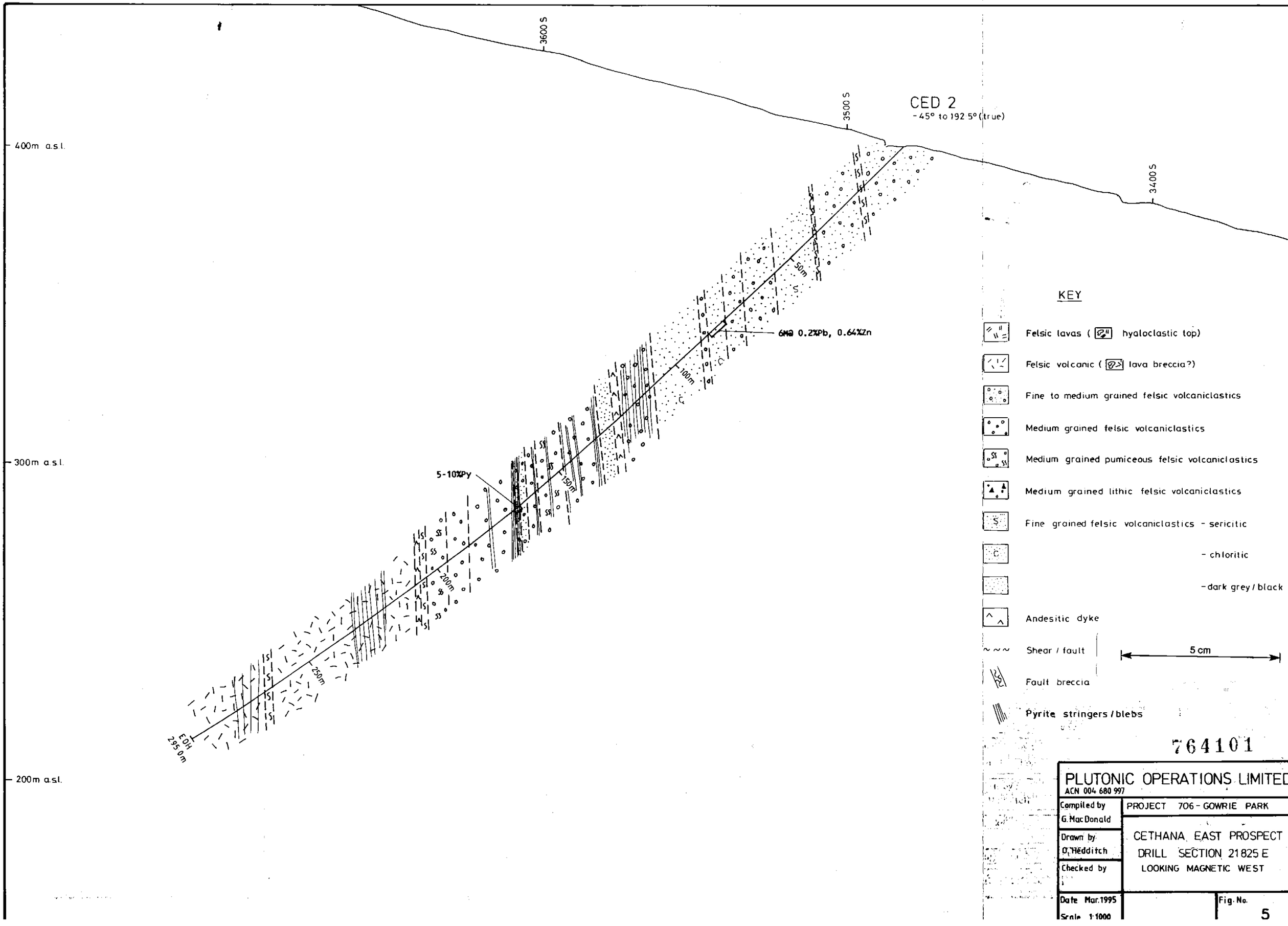
KEY

- Felsic lavas (hyaloclastic top)
- Felsic volcanic (lava breccia?)
- Fine to medium grained felsic volcaniclastics
- Medium grained felsic volcaniclastics
- Medium grained pumiceous felsic volcaniclastics
- Medium grained lithic felsic volcaniclastics
- Fine grained felsic volcaniclastics – sericitic
  - chloritic
  - dark grey/black
- Andesitic dyke
- Shear/fault
- Fault breccia
- Pyrite stringers/blebs

764100

PLUTONIC OPERATIONS LIMITED
ACN 004 680 997

Compiled by G. Mac Donald	PROJECT 706 – GOWRIE PARK
Drawn by O. Hedditch	CETHANA EAST PROSPECT
Checked by	DRILL SECTION 22400E
	LOOKING MAGNETIC WEST
Date Mar 1995	Fig No. 4
Scale 1:1000	



764101

PLUTONIC OPERATIONS LIMITED
ACN 004 680 997

Compiled by G. MacDonald	PROJECT 706 - GOWRIE PARK
Drawn by O. Hedditch	CETHANA EAST PROSPECT DRILL SECTION 21825 E LOOKING MAGNETIC WEST
Checked by	
Date Mar. 1995 Scale 1:1000	Fig. No. 5

764102

DD77CC4
-58° to 192·5° (true)

DD77CC5
-55° to 192·5° (true)

DD77CC8
-55° to 192·5° (true)

200S
100S
0N
100N

400m a.s.l.
300m a.s.l.

Py
50m
100m
150m
EOH 149·70m
EOH 164·20m
EOH 157·60m

1.0M@ 1.18%Cu, 0.80%Pb, 3.88%Zn
1.85g/tAg, 0.7g/tAu
2.3M@ 0.95%Pb, 0.4%Zn
5M@ 0.08%Cu, 0.11%Pb
0.35%Zn
8M@ 0.12%Pb, 0.41%Zn
0.75M@ 0.15%Pb, 0.50%Zn
3M@ 0.12%Pb
0.32%Zn

KEY

- Felsic lavas (hyaloclastic top)
- Felsic volcanic (lava breccia?)
- Fine to medium grained felsic volcaniclastics
- Medium grained felsic volcaniclastics
- Medium grained pumiceous felsic volcaniclastics
- Medium grained lithic felsic volcaniclastics
- Fine grained felsic volcaniclastics — sericitic
- chloritic
- dark grey / black
- Andesitic dyke
- Shear / fault
- Fault breccia
- 5 cm
- Massive sulphide lenses (base metals in DD77CC5, pyrite in DD77CC4); Pyrite stringers / blebs

PLUTONIC OPERATIONS LIMITED ACN 004 680 997	
Compiled by G. MacDonald	PROJECT 706 - GOWRIE PARK
Drawn by D. Hedditch	CETHANA EAST PROSPECT
Checked by	DRILL SECTION 21750E
	LOOKING MAGNETIC WEST
Date Mar. 1995	Fig. No. 6
Scale 1:1000	

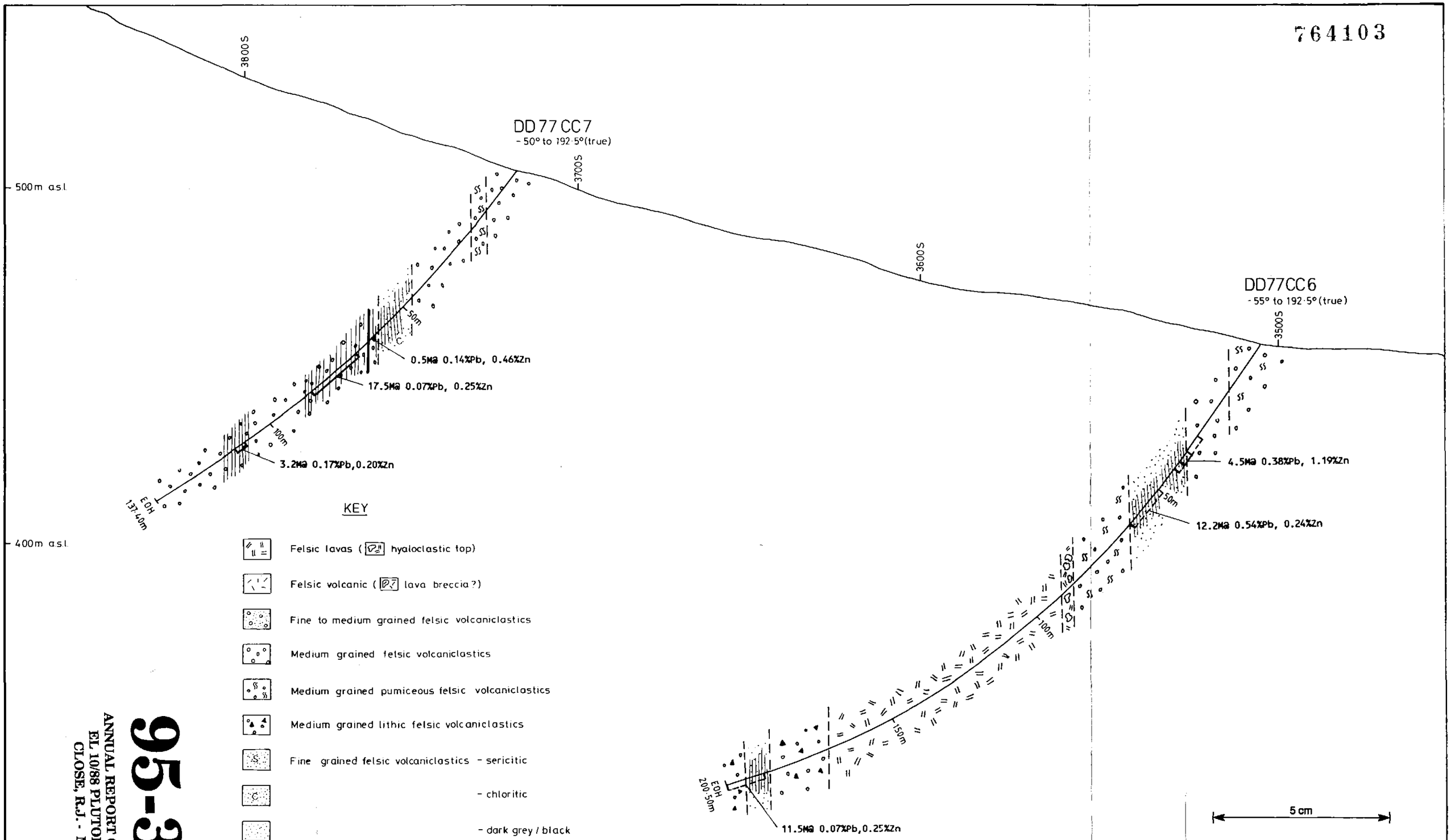
95-3763

ANNUAL REPORT GOWRY PARK 1994-5
EL 10/88 PLUTONIC OPERATIONS
CLOSE, R.J. - MACDONALD, G.

764103

95-3763

ANNUAL REPORT GOWRY PARK 1994-5
EL 10/88 PLUTONIC OPERATIONS
CLOSE, R.J. - MACDONALD, G.

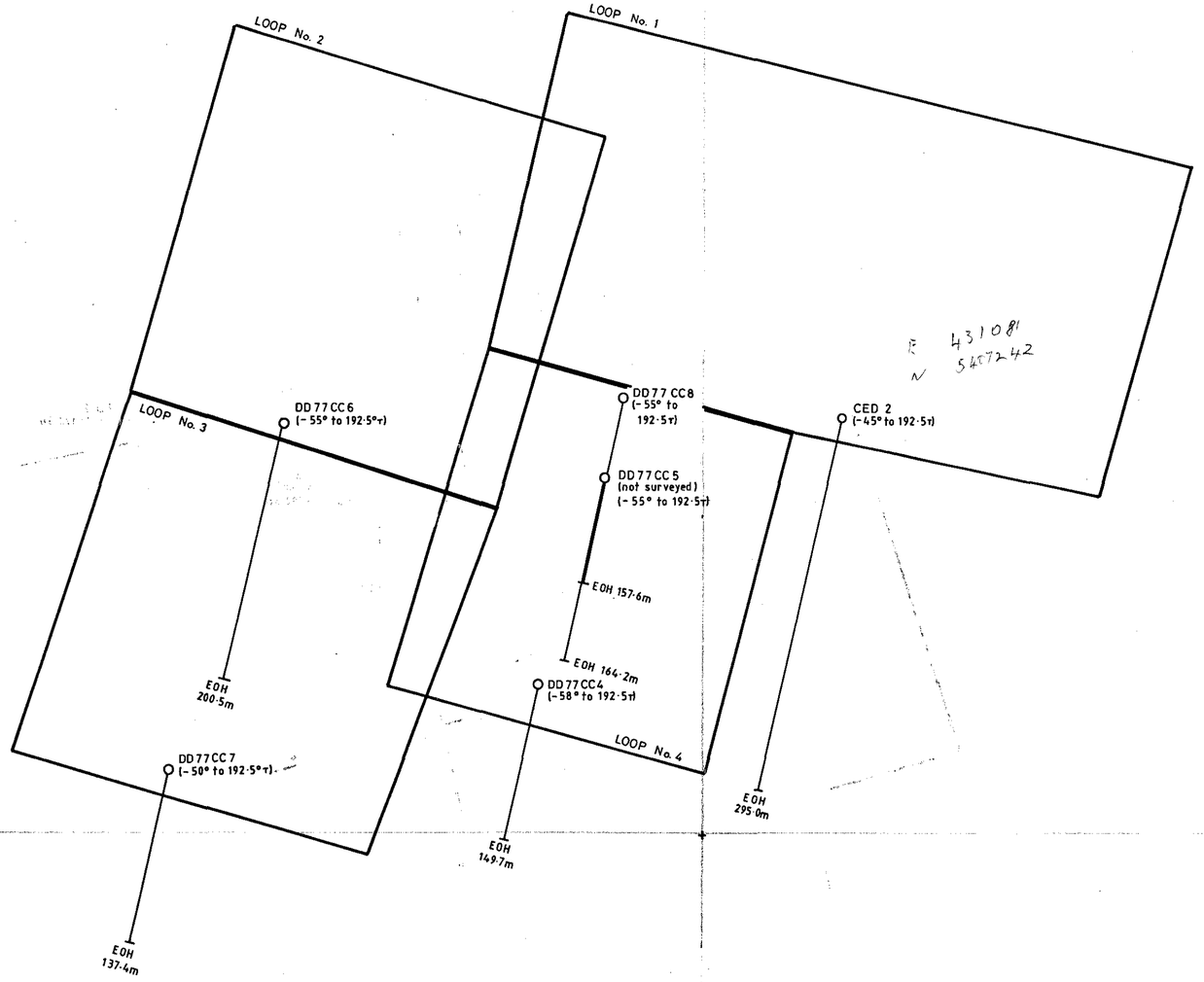


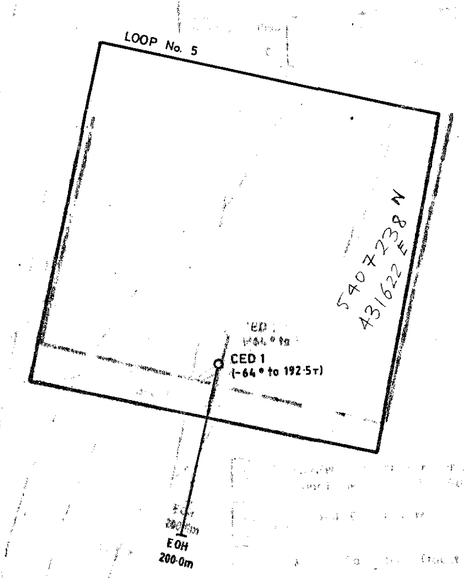
KEY

- Felsic lavas (PZ hyaloclastic top)
- Felsic volcanic (PZ lava breccia?)
- Fine to medium grained felsic volcaniclastics
- Medium grained felsic volcaniclastics
- Medium grained pumiceous felsic volcaniclastics
- Medium grained lithic felsic volcaniclastics
- Fine grained felsic volcaniclastics - sericitic
- chloritic
- dark grey / black
- Andesitic dyke
- Shear / fault
- Fault breccia
- Massive sulphide lens (pyrite in DD77CC7); **Sulphide stringers / blebs** (pyrite except for upper part DD77CC6)

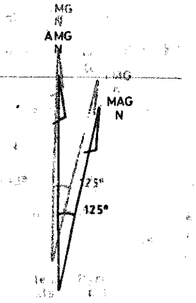
PLUTONIC OPERATIONS LIMITED
ACN 004 680 997

Compiled by: G. MacDonald	PROJECT : 706-GOWRIE PARK
Drawn by: O. Hedditch	CETHANA EAST PROSPECT DRILL SECTION 21600 E LOOKING MAGNETIC WEST
Checked by:	
Date: Mar. 1995 Scale: 1:1000	Fig. No. 7





DD 77 CC4	surveyed	LOOP No. 4
DD 77 CC6	surveyed	LOOP No. 2
DD 77 CC7	surveyed	LOOP No. 3
DD 77 CC8	surveyed	LOOP No 1
CED 2	surveyed	LOOP No 1
CED 1	surveyed	LOOP No 5



5 cm

95-3763

ANNUAL REPORT GOWRY PARK 1994-5
EL 10/88 PLUTONIC OPERATIONS
CLOSE, R.J. - MACDONALD, G.

PLUTONIC OPERATIONS LIMITED
ACN 004 680 997

Compiled by: Grant MacDonald	CETHANA EAST PROSPECT
Drawn by: O. Hedditch	DHEM SURVEY
Checked by:	LOOP LAYOUTS
Date: March 1995	Reference:
Scale: 1:2500	Fig. No. 9

764104