974001

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PLUTONIC OPERATIONS LIMITED

EXPLORATION LICENCE 10/88

GOWRIE PARK

MICROFILMED
FICHE No. 012951-71

Annual Report on Exploration Activity

August 1992 to July 1993

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Grant MacDonald
July 1993

TABLE OF CONTENTS

974002

		Page No.
1.0	**SUMMARY AND RECOMMENDATIONS**	**1**
1.1	Summary	1
1.2	Recommendations	1
2.0	**INTRODUCTION**	**4**
2.1	Tenure	4
2.2	Access and Land Usage	4
3.0	**REGIONAL GEOLOGY**	**5**
4.0	**EXPLORATION PHILOSOPHY**	**7**
5.0	**LOCAL GEOLOGY**	**8**
5.1	Introduction	8
5.2	Lake Barrington Prospect Geology	9
5.3	Staverton Prospect Geology	9
5.4	Cethana West Prospect Geology	10
5.5	Cethana East Prospect Geology	11
5.6	Fire Tower Prospect/Gog Range Geology	14
6.0	**EXPLORATION HISTORY**	**15**
7.0	**WORK CONDUCTED 12 MONTHS TO JULY 1993**	**17**
7.1	Introduction	17
7.2	Lake Barrington Prospect	17
7.3	Staverton Prospect	18
7.4	Cethana West Prospect	19
7.5	Cethana East Prospect	20
7.6	Fire Tower Prospect	21
7.7	Regional	23
8.0	**BIBLIOGRAPHY**	**24**

FIGURES

974003

1.	Project Location (in text)	1:2000000
2.	Plan of Areas for Retention/Relinquishment (in text)	1:100000
3.	Cross Section Cethana (in text)	1:10000
4.	Stereonet Plot of S_o Readings (in text) Lake Barrington Part	
5.	Stereonet Plot of S_1 and S_2 Readings (in text) Lake Barrington Part	
6.	Geology of Lake Barrington Part (with regional stream sediment results and regional rock chip sample locations.)	1:10000
7.	Geology of Fire Tower Prospect	1:500
8.	Section 2360E	1:500
9.	Section 2420E	1:500
10.	Section 2460E	1:500
11.	Section 2500E	1:500
12.	Section 2520E	1:500
13.	Section 2540E	1:500
14.	Section 2560E	1:500
15.	Section 2580E	1:500
16.	Drillhole Location Plan, Fire Tower Prospect	1:500
17.	Geology Staverton Prospect	1:1000
18.	Section 600E Staverton Prospect	1:1000
19.	Section 900E Staverton Prospect	1:1000
20.	Geology Lake Barrington Prospect	1:1000
21.	Section 4700E Lake Barrington Prospect	1:1000
22.	Geology Cethana West Prospect	1:2500

FIGURES (Cont'd)

974004

23.	Soil Survey Cethana West, Copper Contours	1:2500
24.	Soil Survey Cethana West, Lead Contours	1:2500
25.	Soil Survey Cethana West, Zinc Contours	1:2500
26.	Rock Chip Survey Cethana West	1:2500
27.	Geophysical Compilation Cethana West	1:2500
28.	Geology Cethana East Prospect	1:2500
29.	Soil Survey Cethana East, Copper Contours	1:2500
30.	Soil Survey Cethana East, Lead Contours	1:2500
31.	Soil Survey Cethana East, Zinc Contours	1:2500
32.	Geophysical Compilation Cethana East	1:2500
33.	Ground Magnetics Survey, Staverton	1:2000

TABLES

974005

1. Zinc Ratios for STD 1 (in text)

APPENDICES

A. Drill Logs for Fire Tower Prospect (GP-90-1 to 17 and FTD 1 to 4).

B. Lead Isotope Survey for Fire Tower Prospect.

C. Drill Log for STD 1 for Staverton Prospect.

D. Whole Rock and REE Geochemistry, Analysis and Petrology of Core from STD 1, Staverton Prospect.

E. Whole Rock and REE Geochemistry results for STD 1, Staverton Prospect.

F. Polished Section Petrology for four samples from STD 1, Staverton Prospect.

G. Drill Log for DD80LB1 Extended, Lake Barrington Prospect.

H. Re-logs for Cethana West Prospect DDH's.

I. Re-logs for Cethana East Prospect DDH's.

J. Polished Section Petrology, Cethana East Prospect.

K. Assay Results for all Gowrie Park EL 10/88 Work, 1992 to 1993.

L. Crone EM Geophysical Survey Results for Cethana East/West Prospects, Lake Barrington Prospect and Staverton Prospect.

1.0 SUMMARY AND RECOMMENDATIONS

1.1 Summary

EL 10/88, although explored for two decades, still has a large potential for VHMS and epigenetic gold mineralisation to be found.

The source of the IP/mise-a-la-masse anomaly at Lake Barrington has been shown to be chalcopyrite rich vein(s) downgrading this prospect considerably.

The source of the IP and the geochemical anomalies on the 900E line at Staverton has been satisfactorily explained by STD 1, however, the rocks are highly altered correlates of the Que-Hellyer footwall rocks, and, given the considerably higher grades intersected by a previous percussion hole on the 600E line, there is still much potential for a VHMS, possibly shear hosted a-la-Pinnacles, Hercules and Rosebery (?).

The intense alteration and numerous occurrences of small semi-massive sulphide lenses in the Cethana (East and West) alteration zone has not been adequately tested. Previous work has not eliminated the prospectivity of those prospects with the contact between the altered and relatively unaltered rocks at Cethana West tested by only one dipole-dipole IP line (300E) over 1200m of strike length and with no drilling anywhere near it. The small massive sulphide lens intersected in DD77CC5 is particularly interesting and although faulted out at depth, is still open to the east and possibly to the west under scree. The lack of EM responses due to conductive sulphides should not be used to downgrade these prospects as mineralisation is zinc rich and sheared and hence is not expected to be conductive. The orebodies of Rosebery, Hercules and Que River are not conductive.

The drilling at Fire Tower concentrated on the best soil/rock geochemistry. The genesis of this mineralisation is unclear but is probably related to the quartz-feldspar-biotite phyric intrusive to the south of the prospect. Drilling has not eliminated the potential at depth though this is unlikely to be economic. Of more interest are the two spot gold soil anomalies to the east in geologically similar environments and the 0.14 ppm -80# stream sediment sample from a creek draining similar rocks to those of the Fire Tower Prospect but two kilometres to the west.

1.2 Recommendations

From the review carried out in 1991-1992 and the mapping, geochemistry, geophysics and drilling conducted in 1992-1993 the following work is recommended.

(i) Fire Tower Prospect (Gog Range)

East of the Fire Tower Prospect soil sampling has only been carried out for Au every 800m or so. It is recommended that the prospective "horizon" be mapped in better detail, ie. off the grid lines, and all grid lines over this horizon be sampled for Au.

North-west of the Fire Tower the 0.14 g/t Au stream anomaly should be followed up with closer spaced stream sediment sampling and reconnaissance soil and rock geochemical sampling and mapping in order to determine the best locations for future gridding if warranted.

(ii) Cethana West Prospect

The 26 x J DIGHEM anomaly warrants two 600m soil sampling lines given the moderately anomalous rock chip geochemistry. The combined 600m along strike UTEM anomaly and the IP response on line 300E needs further attention. This may involve either further IP on adjacent lines or the drilling of the horizon. Given the topography Nick Poltock's hand held rig is recommended, with two or three 30m holes, staggered, possibly necessary to locate and test the contact.

A dipole-dipole IP line should be surveyed north of the 800E line for 400-500m to test the anomalous rock chips in the adjacent creek.

(iii) Cethana East Prospect

Two phases of work are recommended for Cethana East:

a) Dipole-dipole IP (50m spread) should be extended from 3325S to 2900S on 21800E and 3800S to 3000S on 22000E to test the northern anomalous soil zone (see figures 29 to 31).

Further dipole-dipole IP (50m spread) compatible with the 1990 SURTEC survey is required on the following lines:

Line No.	From-To from Figure 32	From Actual Pegs	Reason
21300E	No on Plan	5000N-4350N	} To test for } along strike } extensions of } mineralisation } in DD77CC5 }and 6.
21500E	3000S-38000S	5000N-4200N	
21800E	2900S-3325S	3000N-3425N	} To test } anomalous } rock chip 30m } at 1.2% Pb } and 0.15% Zn } on 21800E } line and } anomalous } soils.
22000E	3000S-3800S	100S-900S	

b) Subsequently or alternatively the following holes are recommended:

Co-ordinates	**Inclination/Azimuth**	**Depth**
A. 22000E, 650S	-50° to grid south	200m
B. 21800E, 3350N	-50° to grid south	150m

(iv) Staverton Prospect

Further mapping and soil geochemical surveying is recommended, particularly north-east of the prospect on extensions of grid lines.

2.0 INTRODUCTION

2.1 Tenure

EL 10/88 was previously a joint venture between Plutonic Operations Ltd and Noranda Pty Ltd. 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 297 km² of the original 743 km². CRA Exploration Pty Ltd 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 licence holders in December 1979, reducing the total area of 7/73 to 199 km². Asarco sold their share to Carpentaria Exploration Co Ltd in June 1980. In 1983 CRAE became the sole leaseholder relinquishing the EL in 1988. Noranda Pty Ltd successfully tendered for the ground in August 1989. Noranda added another 8 km² as EL 35/88 and the Mines Department added another 0.9 km² in order to rationalise the boundaries with AMG grid lines.

The EL has been in two parts (see Figure 1 and 2), however, all exploration and reporting has been conducted as if one licence. Following relinquishment of half of the original area the EL will be in four parts (see Figure 2).

Part 1, known as Lake Barrington, with a total land area of 37 km² runs down both sides of Lake Barrington from Wilmot/Promised Land in the north to Cethana in the south. 15 km² will be retained with one part of 10 km² centred on Cethana with the remaining 5 km² centred on the Staverton prospect.

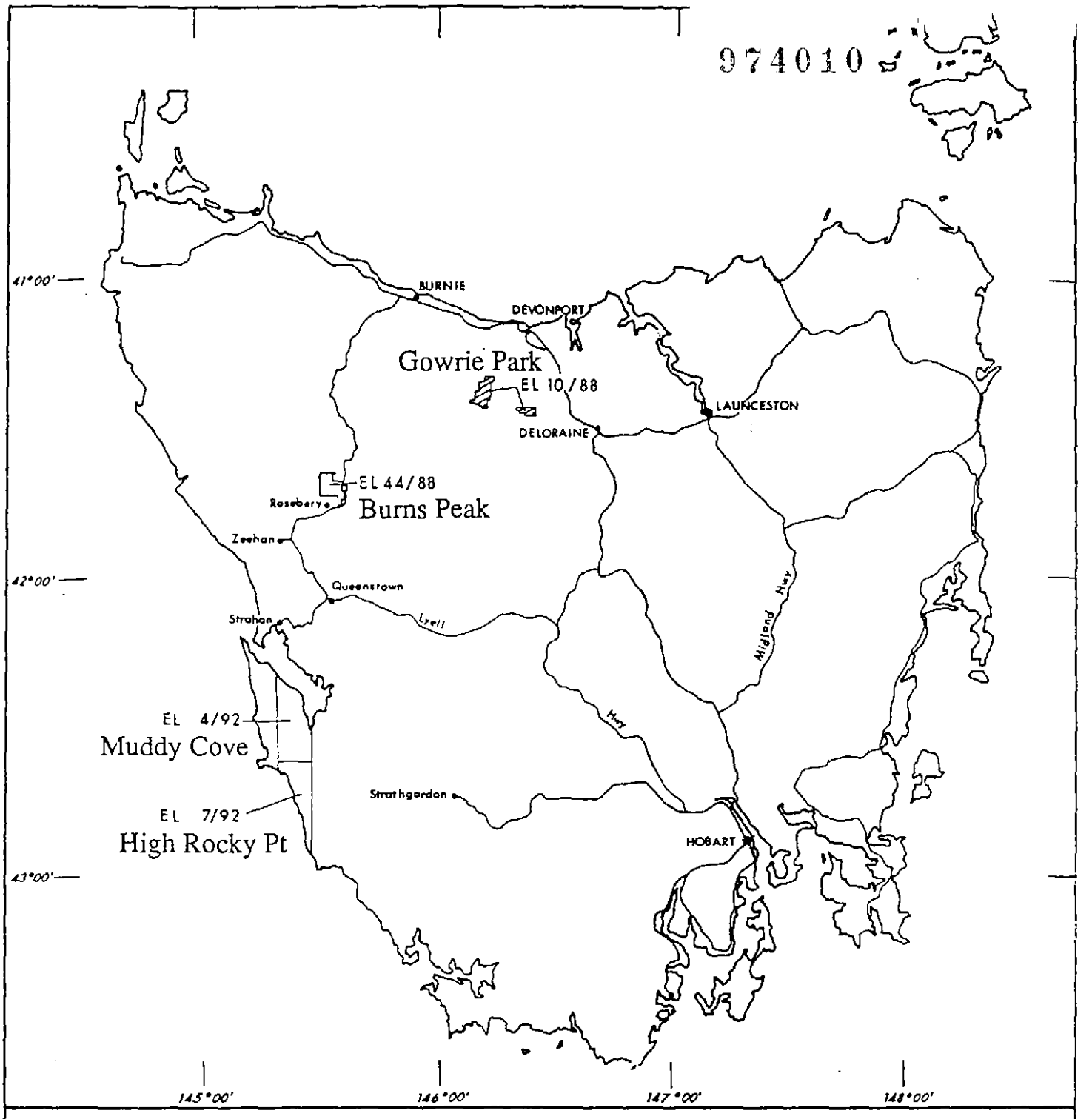
Part 2, known as Gog Range, with a total land area of 17 km² lies around 6 km NNW of Mole Creek. A stone and gravel Mining Lease, 93 M/84, occupies 12 hectares towards the western end of the Gog Range. 9 km² will be retained in two parts meeting at a common corner.

2.2 Access and Land Usage

Access to both parts of the EL is very good with major roads running through them. HEC and old forestry roads allow access to much of the lease, however, access to individual prospects and/or desirable drill sites is problematic, most being in areas of steep topography. Two of the prospects have required access across private farmland. Lake Barrington itself provides excellent access by boat for the purposes of mapping.

Effectively all of the prospective rocks in the EL are state forest, the exception being part of the Cethana West Prospect which lies within land vested to the HEC and part of the Lake Barrington prospect which overlaps onto two privately held bush blocks.

974010



SCALE 1:2000000

10 0 10 20 30 40 50 60 70 80 90 100 km

T.N.

5 cm

REVISION	PLUTONIC OPERATIONS LIMITED A.C.N. 004 680 997
Technical Report No:	PROJECT: TASMANIA GENERAL
ORIG. OFFICE	PROJECT LOCATIONS
CHECKED BY:	
DATE: APR. 1992 DRAWN BY: K.G.F. / L.H.B. SCALE: 1:2000000 GEOLOGIST: K.M.T.	DWG. No. PROJECT No 701

FIGURE 1

974011

430000 m E

450000 m E

5420000 m N

5410000 m N

5400000 m N

Barrington

BARRINGTON LAKE

SHEFFIELD ROAD

SHEFFIELD

CRADLE MOUNTAIN ROAD

CLAUDE ROAD

Paradise

LOWER BEULAH ROAD

Lower Beulah

Gowrie Park

▲ MT. ROLAND

5 cm

AREA TO BE RETAINED

AREA FOR RELINQUISHMENT

REVISION	PLUTONIC OPERATIONS LIMITED A.C.N. 004 680 997 (INC. IN N.S.W.)
TECH. REPORT No.	PROJECT
COMPILED BY G Mac Donald	EL.10/88 GOWRIE PARK RELINQUISED / RETAINED AREAS
DRAWN BY O. Hedditch	
CHECKED BY	
DATE July 1993 SCALE 1:100 000	REFERENCE DWG No 2

974612

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. These include Mt Lyell, Hercules, Rosebery, Que River and Hellyer and the Cambrian Henty gold deposit. In addition, there are instances of sub-economic deposits and VMS style alteration throughout the belt.

All of the above deposits lie within the major north-south trending part of the belt which runs from Elliott Bay to north of Hellyer, occupying the Dundas Trough. The Mt Read volcanics that outcrop in EL 10/88 occupy a smaller trough, the Fossey Mountain Trough, which trends roughly east-south-easterly from north of Hellyer to beyond Deloraine. The Fossey Mountain Trough is considered to be a branch of the Dundas Trough.

Mines Department MRVP 1:50,000 mapping stops just within the western most boundary of the EL with 1 km² included in the "Geology of the Winterbrook-Moina" area. Other than this the most recent Mines Department regional mapping is the Sheffield (1959) and Middlesex (1958) 1 mile to 1 inch mapping. Recent regional updating of the "Sheffield" sheet has been shelved indefinitely.

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

Even within the main belt this relative aging of mineralising events is subject to considerable debate due to the overprinting of alteration and deformation over initially complex inter-fingering relationships. Placing the volcanics and associated sediments of the Fossey Mountain Trough within this stratigraphy is even less certain, however, the andesites of the Beulah Formation were very probably deposited during the mafic-intermediate phase. However, 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 may be more significant in the north of the state than in the central part of the belt.

The siliciclastic Precambrian derived Roland Conglomerate and Moina Sandstone, of Lake Cambrian-Ordovician age unconformably overlie the Cambrian volcanics with small outliers of these younger rocks capping the volcanics in many places. That the unconformity is clearly angular in many places strongly suggests that there was a major phase of deformation, (compressional) in the Lake Cambrian, prior to the deposition of the siliciclastics.

Some contacts to the south of the trough are faulted and have been mapped as thrusts. It is quite possible that similar thrusts occur in the Cambrian volcanic sequence though none yet have been recognised.

The siliciclastics of the Roland Conglomerate/Moina Sandstone are overlain by the Gordon Limestone. These younger post volcanic rocks were themselves folded, probably twice, during the mid-Devonian Tabberabberan Orogeny during which time the thrust faulting is believed to have taken place.

The structural complexity of the region is an impediment to exploration and is not easily resolved.

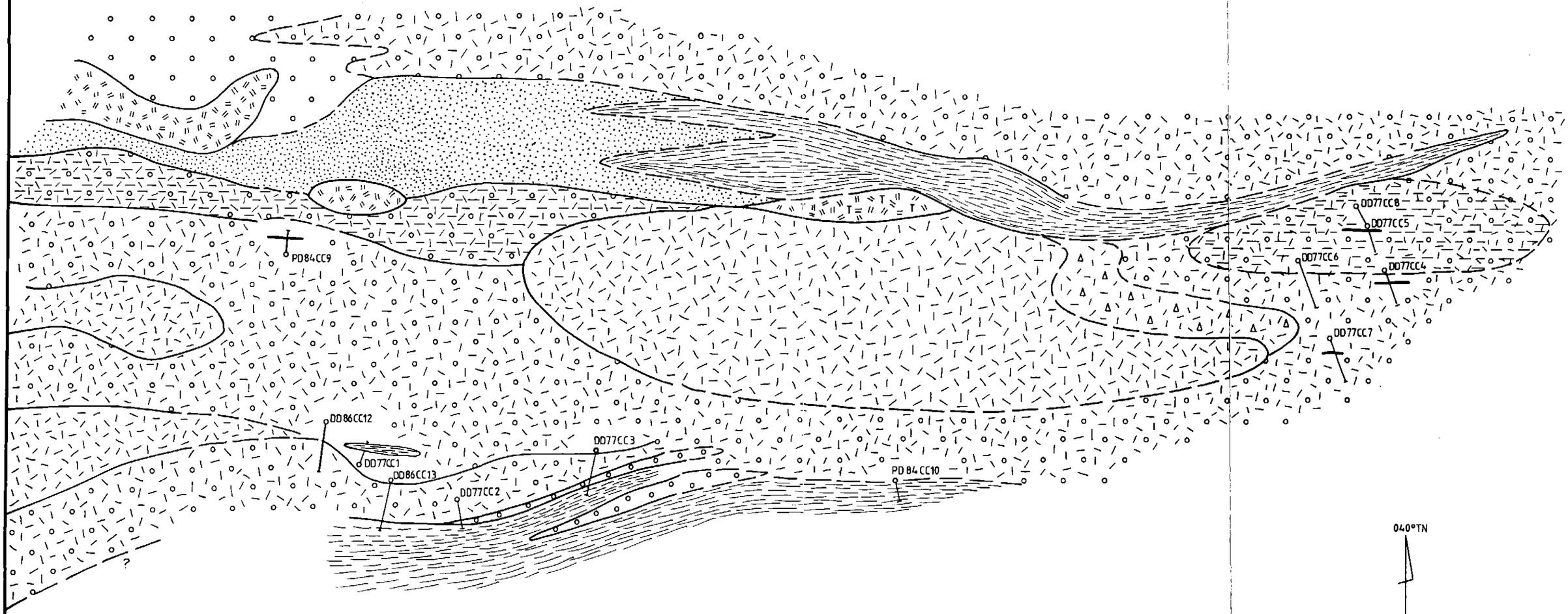
Williams (1979) refers to two phases of mid-Devonian folding, namely the earlier east-west trending "Loongana/Wilmot trend" folds with a half wavelength of 5 km and the later north-westerly to northerly "Deloraine/Railton trend" folds with a half wavelength of 2.5 km, with the two folds interfering in the Fossey Mountains. 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 folds. The structural complexity of the rocks in EL 10/88 are discussed in further detail later.

Following the mid-Devonian deformation, the north and west of Tasmania was intruded by granitic batholiths with two such bodies outcropping in the region of 10/88, one to the south of Cethana, the Dalcoath Granite, and the other to the north of the Gog Range, the Beulah Granite. The former granitoid was responsible for a number of smaller mineral deposits in the Moina area south-west of Cethana.

In the Tertiary tholeiitic basalt lavas infilled most topographic lows, these flows now occupying topographic highs, overlying prospective Cambrian volcanics and associated sediments in many parts of the belt.

Glaciation in the Quaternary has produced both the glacial deposits and scree which cover much of the Cethana East prospect.

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Felsic volcaniclastic quartz eyes common. Fine grained where (⁻·⁻·⁻)

Plagioclase phyric lavas or tuffs (T)

Cherty clast conglomerates

Greywacke, siltstones, sandstones, relatively maltered

Felsic lavas, hyaloclastic where (⟩Δ⟨)

Fine grained, generally black siltstones/shales

Mapped geological contacts

Interpreted geological contacts/areas of uncertainty

Massive sulphide lenses

Drillholes

5 cm

040°TN

REVISION	PLUTONIC OPERATIONS LIMITED A.C.N. 004 680 997 (INC. IN N.S.W.)
TECH.REPORT No.	PROJECT 706 - GOWRIE PARK
COMPILED BY: G. MacDonald	SCHEMATIC SECTION CETHANA ALTERATION ZONE (Oriented such that up is 040TN) PRE-DEFORMATION
DRAWN BY: O. Hedditch	
CHECKED BY:	
DATE: July 1993 SCALE: 1:1000	REFERENCE: DWG No: 3

4.0 EXPLORATION PHILOSOPHY

Two styles of orebody are the targets of exploration 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 alteration at Cethana and Staverton is very similar to that seen around these orebodies.

A number of occurrences of small VHMS style mineralisation at Cethana East and West point to the prospectivity of these areas for VHMS's, these being described under the Prospect Geology for each.

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

The second target is a Cambrian volcanic hosted gold deposit. Jones (1989) for Noranda cites South Hercules and Henty as the two type examples in Tasmania and these are valid models, being orebodies formed near to VHMS style orebodies (sub-economic in Henty's case), however, a discretely different style of volcanic hosted gold orebody is exemplified by Voyager 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 run 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.

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5.0 LOCAL GEOLOGY

5.1 Introduction

EL 10/88 lies mostly within the Tasmanian Mines Department's "Sheffield" quadrangle with part of the Gog Range part lying at the north of the "Middlesex" quadrangle the former mapped by Jennings et al (1959) the latter by Jennings and Burns (1958). Re-mapping of the "Sheffield" quadrangle which began this year, has been shelved due to lack of funding.

Perhaps the best other regional mapping is that of Clementson (1983) for CRAE at 1:25000.

Individual prospects have been mapped this year at scales of 1:1000 to 1:2500 and this coupled with the mapping of the shoreline of Lake Barrington and some other traverses is compiled at 1:10000 as Figure 6.

The southern most Cambrian rocks at Cethana West dip moderately steeply and face to the north-north-east. They are fine chloritic siltstones and lesser sandstones with disseminated pyrite and have interbedded conglomeratic mass flows, haematitic and magnetic, towards their top. Altered felsic volanics which overlie these sediments are overlain towards the north by felsic lavas. These lavas are in turn overlain by altered intermixed felsic volcaniclastics and siltstones, volcanic derived, which are overlain by greywackes and conglomerates of probably intermediate derivation, and possibly intermediate lavas. Along strike at Cethana East, felsic lavas are overlain by felsic volcaniclatics and siltstones.

North of Cethana West the intermediate sediments/lavas are followed by relatively unaltered felsic lavas, felsic volcaniclastics and minor sediments until another zone of strong alteration/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/lava breccias amongst siltstones and sandstones. These sediments are overlain by strongly altered andesitic to dacitic lavas at Staverton.

Between Staverton and the Lake Barrington prospect the sequence becomes quite confused 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 occupies a 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 are underlain by sediments which are in turn underlain by felsic lavas and mass flows. North of the Lake Barrington prospect are siltstones and felsic volcaniclastics.

Structurally two cleavages are commonly seen in outcrop giving a sygmoidal appearance. Cleavage orientations are displayed undifferentiated in Figure 5, however, it is generally the case that the dip direction of S_2 cleavages is 20° to 30° clockwise from S_1 cleavages and generally dip more shallowly to the north-east than the S_1 cleavage or more steeply to the south-west than the S_1 cleavage when the latter dips to the south-west. No attempt has been made to place these readings into domains yet. So readings are shown in Figure 4 and indicate that steep to the north-west, steep to the east and moderately to the north and south are common orientations of bedding.

The Gog Range has a somewhat different geology with quartz-feldspar-biotite porphyry/lava overlain by intermixed felsic volcaniclastics and vitric tuffaceous siltstones the latter overlain by chloritic lapilli tuffs on the western end of the range, all overlain by siltstones with occasional quartz porphyries. The geology of the Gog Range is discussed in more detail in the previous annual report.

5.2 Lake Barrington Prospect Geology

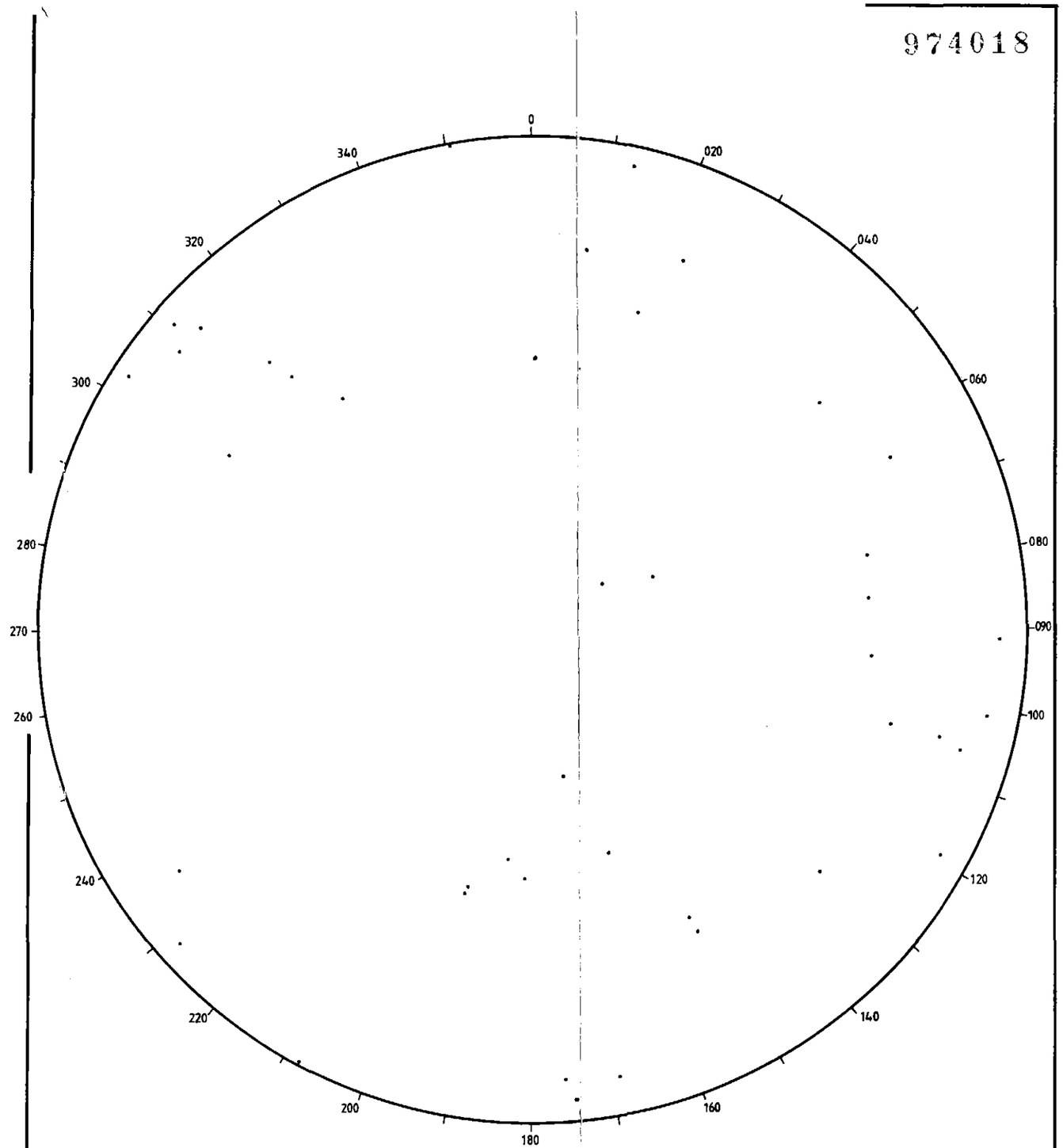
Re-logging of four previously drilled DDH's, DD80LB1, DD80LB2, DD82LB3 and DD83LB4 and surface mapping at 1:1000 indicate the geology to be that shown in Figure 20. Felsic lavas and felsic mass flows are overlain by felsic tuffs, tuffaceous siltstones, further felsic lavas and black siltstones which in turn are overlain by intermediate lavas and associated sediments. Intermediate dykes intersected in the DDH's are probably feeders to these outcropping intermediate lavas. The rocks are relatively unaltered. The mise-a-la-masse anomaly was formed by coupling to the 0.10m from 179.4m to 179.5m in DD80LB1 which assayed 14% Cu, 0.75% Pb, 0.59% Zn and 1.35 g/t Au and which is described as massive sulphide but is probably a vein. The extension to DD80LB1 to target this mise-a-la-masse and IP anomaly intersected three pyrite chalcopyrite galena sphalerite carbonate veins of approximately 10 cm true thickness and a number of smaller veins in carbonate altered felsic volcaniclastics, tuffs and siltstones.

The veinsappear to trend north-north-west, roughly parallel to bedding, dipping steeply to the south-west. Mineralisation probably occurred concurrently with a brittle style faulting event in the Devonian(?).

5.3 Staverton Prospect

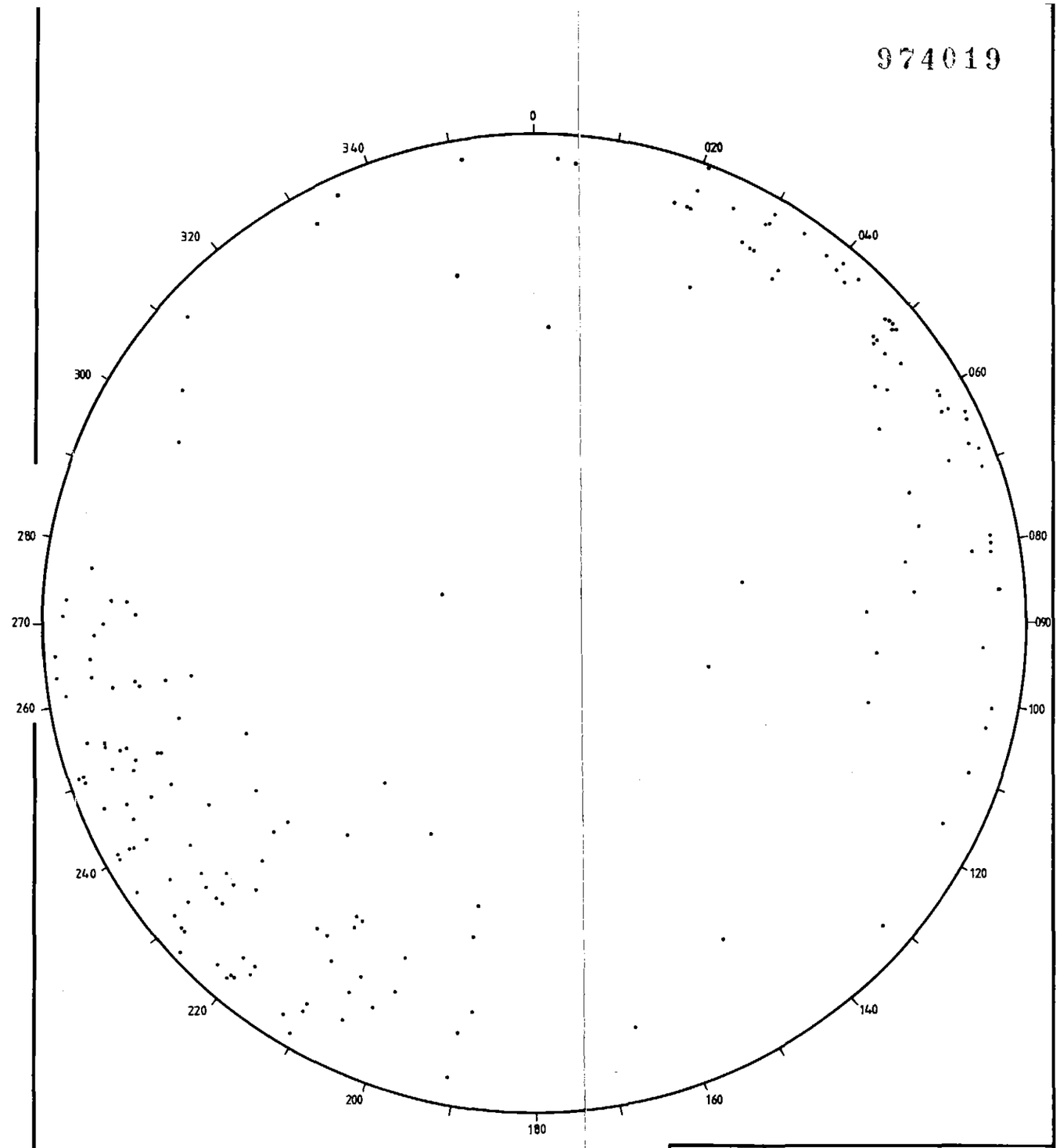
STD 1 drilled at the Staverton prospect revealed the rocks to consist primarily of altered pyritic holocrystalline andesitic to dacitic lavas with occasional felsic volcaniclastics and dacitic lava breccias. A major structure, as shown on the map, brings siltstones up against these volcanics. The rocks are chlorite-pyrite and sericite and carbonate altered throughout with raised sulphide levels (best 33 ppm Cu, 3000 ppm Pb, 3600 ppm Zn). Two previous maps incorrectly show the rocks to be quartz eye schists. The rocks are considered to dip steeply and young to the north-east based on grading in outcropping siltstones across the lake. The geology of the prospect is further discussed in section 7.3.

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REVISION	PLUTONIC OPERATIONS LIMITED A.C.N. 004 680 997 (INC. IN N.S.W.)
TECH. REPORT No	PROJECT : 706 - GOWRIE PARK
COMPILED: G. Mac Donald	So READINGS (total = 47) REGIONAL MAPPING LAKE BARRINGTON PART
DRAWN BY: O. Hedditch	
CHECKED BY:	
DATE: July 1993	
SCALE:	REFERENCE: DWG No: 4

974019



REVISION	PLUTONIC OPERATIONS LIMITED A.C.N. 004 680 997 (INC. IN N.S.W.)
TECH. REPORT No.	PROJECT 706 - GOWRIE PARK
COMPILED BY: G. MacDonald	S_1 & S_2 READINGS REGIONAL MAPPING LAKE BARRINGTON PART
DRAWN BY: O. Hedditch	
CHECKED BY:	
DATE: July 1993	
SCALE:	REFERENCE: DWG No.: 5

5.4 Cethana West Prospect Geology

The geology of the Cethana West prospect is shown (at 1:2500) in Figure 22 and a schematic section of Cethana East and West in Figure 3. The steeply north-north-east dipping Cambrian volcanic/sedimentary sequence youngs to the north, based on rare grading and scour and fill structures in drill core, and is divided into two discrete structural blocks by a north-north-east trending fault which passes just to the west of DD86CC12 (on line 700E) along which there has been 400 to 600m of sinistral movement.

The contact in the south with the younger Late Cambrian - Ordovician siliciclastic Roland Conglomerate/Moina Sandstone, although mapped previously as a thrust, is probably an angular unconformity along which some later movement has taken place. This is not to say that no thrust faulting has taken place in the area as some quite significant low angle faults occur just to the south of this contact with small fault bounded slivers of Cambrian volcanics mapped amongst the younger rocks.

The oldest Cambrian volcanics/sediments are the siltstones and sandstones adjacent to the unconformity with the Roland Conglomerate on the Lorinna Road. At the southern ends of lines 900E to 1300E these rocks are chloritic with disseminated pyrite. DDH's 77CC2, CC3 and 86CC13 extend into the uppermost of these rocks. The first two of these holes were proposed to test geochemical anomalies and the DDH's do contain anomalous base metals of a similar tenor to the soil anomalies tested, however, this metals are in post-cleavage carbonate veins, associated with the Devonian granite which outcrops to the south of EL 10/88 and whose northern margin is interpreted to plunge away steeply below the southern boundary of EL 10/88. The most significant mineralisation encountered in these sediments is in DD86CC13 from 206.40m to 210.00m where 0.38% Cu, 0.65% Zn and 0.46% Pb is in very fine grained disseminations.

Interbedded with the upper half of these sediments are magnetic haematitic chloritic and sericitic conglomerates with rounded cherty clasts, matrix supported. 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 are rocks mapped as altered felsic volcaniclastics. These rocks are characterised by rounded quartz eyes with variable amounts of pumice, feldspars and lithics, the latter generally rounded and of mixed provenance but predominantly fine grained siliceous clasts. These rocks are invariably altered by silica sericite $\pm$ chlorite. Patches of diffuse haematite alteration, are seen in DD77CC2 and DD77CC3. In DD86CC13 a rock with pink feldspars has been described as a granodiorite (Hicks, 1990) though it is more probably an albite altered volcaniclastic. Anomalous Ba, (only assayed for in DD86CC12 and DD86CC13) up to 9350 ppm in drill core as well as in occasional rock chips indicates that baryte alteration is present, however, the presence of baryte veins in the basal sediments appears to downgrade the significance of this. Similar baryte occurrences are reported from the Promised Land prospect (old CRAE prospect) in the north of the EL.

The basal rocks of the western structural block appear to be plagioclase lesser quartz phyric tuffs overlain by a siliceous sandstone/siltstone. It is this latter unit which is that 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.

To the north of this sediment the rocks are the felsic volcaniclastics described above.

Overlying the felsic volcaniclastics in the western block and in the eastern part of the eastern block are massive felsic lavas, quartz ± feldspar phyric. In the central part of the prospect from lines 800E to 1100E the altered volcaniclastics are overlain by 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 to the west. The black tuffaceous siltstone intersected in DD77CC1 from 95.80m to 100.50m with 2m @ 190 ppm Cu 1.03% Pb and 1.09% Zn from 98.0m to 100.0m is hosted in these quartz sericite schists and although mineralisation is in late stage fractures, the mineralisation is unlikely to have travelled far.

Overlying these lavas are more altered felsic volcaniclastics followed by fine grained tuffaceous siltstones, all altered to sericite ± chlorite. The massive pyrite reported to in PD84CC9 on line 600E would appear to be hosted in these altered sediments.

Overlying these altered sediments are 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.

It is this contact between the altered and unaltered sediments which appears to have the best prospects for a classic exhalative style VMS. It is this contact which has weak UTEM anomalies along it from 100E to 700E and which has a moderate IP anomaly in the footwall to the contact. Unfortunately the contact is halfway down a steep slope and rocks are very leached, nevertheless it still has moderately anomalous soil geochemistry (up to 120 ppm Cu, 260 ppm Pb, 64 ppm Zn) and rock chips (up to 160 ppm Cu, 1340 ppm Pb, 3700 ppm Zn).

It is this horizon which may correlate approximately with the mineralised zone at Cethana East.

5.5 Cethana East Prospect - Geology

The geology of Cethana East is shown in Figure 28 (1:2500 scale). This mapping is based largely upon G J Purvis's (1979) mapping with some check mapping, re-logging of DD77CC4 through to 8 and mapping of road cuttings.

The Cethana East prospect lies along strike from Cethana West with the ground between covered by Quaternary glacials and periglacial Roland conglomerate scree. This cover obscures potentially prospective rocks making exploration difficult.

As with Cethana West the southern contact between the Cambrian volcanics/sediments and the younger Lake Cambrian - Ordovician siliciclastics is a angular unconformity. Towards the southern end of lines 21600E, 21700E and 21750E an unaltered siliceous sandstone outcrops. This may be Ordovician Sandstone but as Purvis (1979) indicates, it looks quite like a Precambrian quartzite. The contact between this quartzite and the Cambrian volcanics to the north does not outcrop but appears as a very weak anomaly on the CRONE EM survey conducted this year. It is probably a faulted contact.

No facing indications were found at Cethana but it is very likely that the steeply north-north-east dipping 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 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 clasts and tuffaceous siltstones.

Overall the sequence appears to fine up somewhat to the north in the area where drilling has taken place though the rocks to the north of this area are obscured by Quaternary cover.

The felsic lava which outcrops on 21400E and 21450E extends at depth and is intersected by DD77CC6. It appears to have a hyaloclastic top.

Other than the lavas, the rocks are almost invariably quartz sericite $\pm$ chlorite altered with post cleavage carbonate veins common.

Drill core contains a number of sulphidic zones. Other than the semi-massive pyrite-sphalerite-galena-chalcopyrite from 37.8m to 38.8m in DD77CC5 the drill core contains small massive pyrite lenses from 62.7m to 63.0m in DD77CC7 and from 61.50 to 61.75 in DD77CC4. The best sulphidic zones are as follows:

Hole No.	From	To	Width	Assay
DD77CC5	37.8m	38.8m	1.0m @	1.18% Cu, 0.80% Pb, 3.88% Zn, 1.85 g/t Ag and 0.7 g/t Au
	57.0m	59.3m	2.3m @	45 ppm Cu, 9500 ppm Pb, 3950 ppm Zn
	80.0m	85.0m	5m	770 ppm Cu, 1100 ppm Pb, 3500 ppm Zn
DD77CC6	31.0m	43.0m	12m @	142 ppm Cu, 3442 ppm Pb, 6308 ppm Zn
incl.	365m	41.0m	4.5m @	227 ppm Cu, 3833 ppm Pb, 1.19% Zn
	50.2m	62.4m	12.2m @	137 ppm Cu, 5439 ppm Pb, 2412 ppm Zn
incl.	52.2m	54.2m	2m @	110 ppm Cu, 9200 ppm Pb, 2800 ppm Zn
incl.	60.0m	62.4m	2.4m @	310 ppm Cu, 9800 ppm Pb, 6500 ppm Zn
	189.0m	200.5m	11.5m @	273 ppm Cu, 743 ppm Pb, 2467 ppm Zn
DD77CC7	62.2m	62.8m	0.6m @	90 ppm Cu, 1400 ppm Pb, 4550 ppm Zn
	68.5m	86.0m	17.5m @	72 ppm Cu, 693 ppm Pb, 2453 ppm Zn
	109.3m	112.5m	3.2m @	149 ppm Cu, 1694 ppm Pb, 2009 ppm Zn
DD77CC8	32.0m	32.75m	0.75m @	130 ppm Cu, 1500 ppm Pb, 5000 ppm Zn
	54.0m	57.0m	3m @	140 ppm Cu, 1150 ppm Pb, 3150 ppm Zn
	95.0m	103.0m	8m @	130 ppm Cu, 1220 ppm Pb, 4120 ppm Zn

The best zone, from 37.8m to 38.8m to DD77CC5 is clearly faulted off by a structure intersected from 115.50 to 115.70 in DD77CC8. To the east this horizon may be that interested in DD77CC6 from 36.5m to 41.0m whilst to the east this horizon may be that rock which outcrops approximately where the road crosses the 21800E line at 3500S where a 30m channel sample assayed 1.2% Pb, 0.15% Zn corresponding to a deep weak IP anomaly (see Purvis, 1979).

5.6 Fire Tower Prospect/Gog Range Geology

The geology of the Fire Tower prospect was described in the annual report for 1991 to 1992 (MacDonald and Tomlinson, 1992) and the 1:500 map is enclosed here as Figure 7, however, the drilling of four relatively deep DDH's require some modifications to the geology, and some reconnaissance further along the range in both directions was undertaken.

The major additions to the previous description of the geology of the prospect is that black tuffaceous siltstones are more common at depth and the chloritic sandstones and mass flows which are "effectively" the hanging wall to the "host" rocks at Fire Tower are not faulted into position, with a conformable relationship apparent from drilling.

The Pb isotopes from galena associated with gold mineralisation from the short holes exactly matches that of the V24 mineralisation from Elliott Bay where gold in quartz carbonate veins in silica sericite carbonate altered felsic volcaniclastics is considered to be genetically related to a nearby rhyodacitic intrusive.

Large (1985) considers the gold to be stratabound

This prospect has significant geological similarities to own Fire Tower Prospect particularly since the gold at Fire Tower appears to be genetically related to a Cambrian intrusive - probably the quartz-feldspar-biotite porphyry mapped to the south of the mineralised zone.

Although in different hosts, gold mineralisation at Ten Mile Creek/Anio Creek appears to be genetically related to quartz-feldspar-biotite porphyries.

The significance in the Fire Tower area is that quartz-feldspar-biotite phyric rocks continue east along the range with occasional gold soil spot highs. Almost identical rocks occur, in a fault offset block, to the north-west of Fire Tower with a 0.14 g/t - 80# stream sediment anomaly from a creek draining these.

6.0 EXPLORATION HISTORY

Asarco's initial program was one of regional stream sediment sampling (two samples per km²) and reconnaissance mapping. Essentially all current prospects were discovered from this stream sampling.

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. Genic EM, PEM, UTEM and helicopter borne EM (Dighem), results of which led to the drilling of 17 holes; 14 diamond and three percussion. Twelve of the holes were drilled on the Cethana Prospect with six situated at Cethana West and the remainder at 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 follows:

Cethana West Hole DD86CC13	206.4-210.0 = 3.6m @ 0.38% Cu, 0.65% Pb, 0.46% Zn in a fine grained chloritic mudstone.
Cethana West Hole DD77CC1	78.6-79.0 = 0.4m @ 8.3% Zn + 0.2% Pb in a late stage post cleavage vein.
Cethana West Hole DD77CC1	98.0-100.0 = 2m @ 190 ppm Cu, 1.03% Pb, 1.09% Zn in a black siltstone.
Cethana East Hole DD77CC5	37.8 - 38.8 = 1.0m @ 3.9% Zn, 0.8% Pb, 1.2% Cu, 185 ppm Ag, 0.7 g/t Au in a probable syn sedimentary lens.

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

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 and nearly coincident IP and strong Cu soil anomaly were not tested by any of these holes.

A percussion hole designed to test coincident geochemical/geophysical responses on the Staverton grid intersected highly altered pyritic quartz sericite schists with minor but significant base metal mineralisation. Results for this hole are as follows:

PD83SPI	20 - 44	=	24m @ 0.9% Pb, 0.5% Zn, 10 g/t Ag
incl.	28 - 34	=	6m @ 1.3% Pb, 1.0% Zn, 14 g/t Ag

It should be noted that little gold assaying was undertaken 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 of the Gog Range gold/tungsten panned concentrate sample - now the Fire Tower Prospect - was undertaken.

Some minor core re-assaying for gold was conducted very late in the period, returning 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. All four Lake Barrington drillholes were assayed for gold.

Following Plutonic becoming operator in March 1992 a thorough review of all previous geological, geophysical and geochemical data was undertaken and potential drill targets for Cethana East and West, Staverton, Lake Barrington and Fire Tower were defined. Some reconnaissance mapping was conducted at Cethana (East and West), however, the major field work involved the mapping of the Fire Tower prospect at 1;500 and the re-logging of the 17 short (average 30m) DDH's drilled by Noranda at Fire Tower. Lead isotope and petrological analysis indicated that gold was deposited along with pyrite chalcopyrite galena in the Cambrian into brecciated felsic volcaniclastics, and vitric tuffaceous siltstones derived from felsic lavas and crystal lithic tuffs.

7.0 WORK CONDUCTED 12 MONTHS TO JULY 1993

7.1 Introduction

All of the work recommended in last years annual report other than the ground magnetics survey has been completed. In addition a CRONE EM survey was carried out on a number of prospects.

7.2 Lake Barrington Prospect

Following the re-establishment of the old CRAE grid the Lake Barrington prospect was mapped at 1:1000 scale (see Figure 20) with the geology described in Section 5.2. This mapping also involved the re-logging of the old CRAE DDH's DD80LB1, DD80LB2, DD82LB3 and DD83LB4.

It was decided to test the coincident mise-a-la-masse and IP anomaly by extending the old CRAE hole DD80LB1 by 75m. Due to the presence of sulphides at this depth the hole was extended 100.30m to a final depth of 287.80m. The leg for all of DD80LB1 is included as Appendix G and a drill section as Figure 21.

Best intersections are as follows:

222.0m to 223.30m	1.3m @	1.32% Cu, 0.21% Pb, 1.02% Zn in a pyrite-chalcopyrite-galena-sphalerite vein at 15 degrees to the core axis
239.0m to 240.0m	10.0m @	0.36% Cu, 0.57% Pb, 0.85% Zn in a pyrite-chalcopyrite-galena-sphalerite vein
242.9m to 246.1m	3.2m @	1.17% Cu, 1.04% Pb, 0.70% Zn in a carbonate vein with pyrite-chalcopyrite-galena-sphalerite veins
246.1m to 247.9m	2.8m @	1.41% Cu, 0.12% Pb, 0.61% Zn as sulphide infilling of brittly brecciated black siltstone

It is considered that the sulphide veins are the reason for the IP and mise-a-la-masse anomalies. The sulphide mineralisation is brittle style and is not associated with any significant alteration other than carbonate. The sulphides in the black siltstone are in post lithification brittle fractures. Similar chalcopyrite veins occur to the north of the EL where they have proven to be uneconomic.

Crone pulse DHEM on the extended DDH (see Appendix L) gave no responses due to conductive sulphides other than repeating the response at 100m which was revealed in a previous UTEM survey. This response, by a steeply west dipping body below the hole is only seen on channel one and is not considered to be worthy of follow up.

7.3 Staverton Prospect

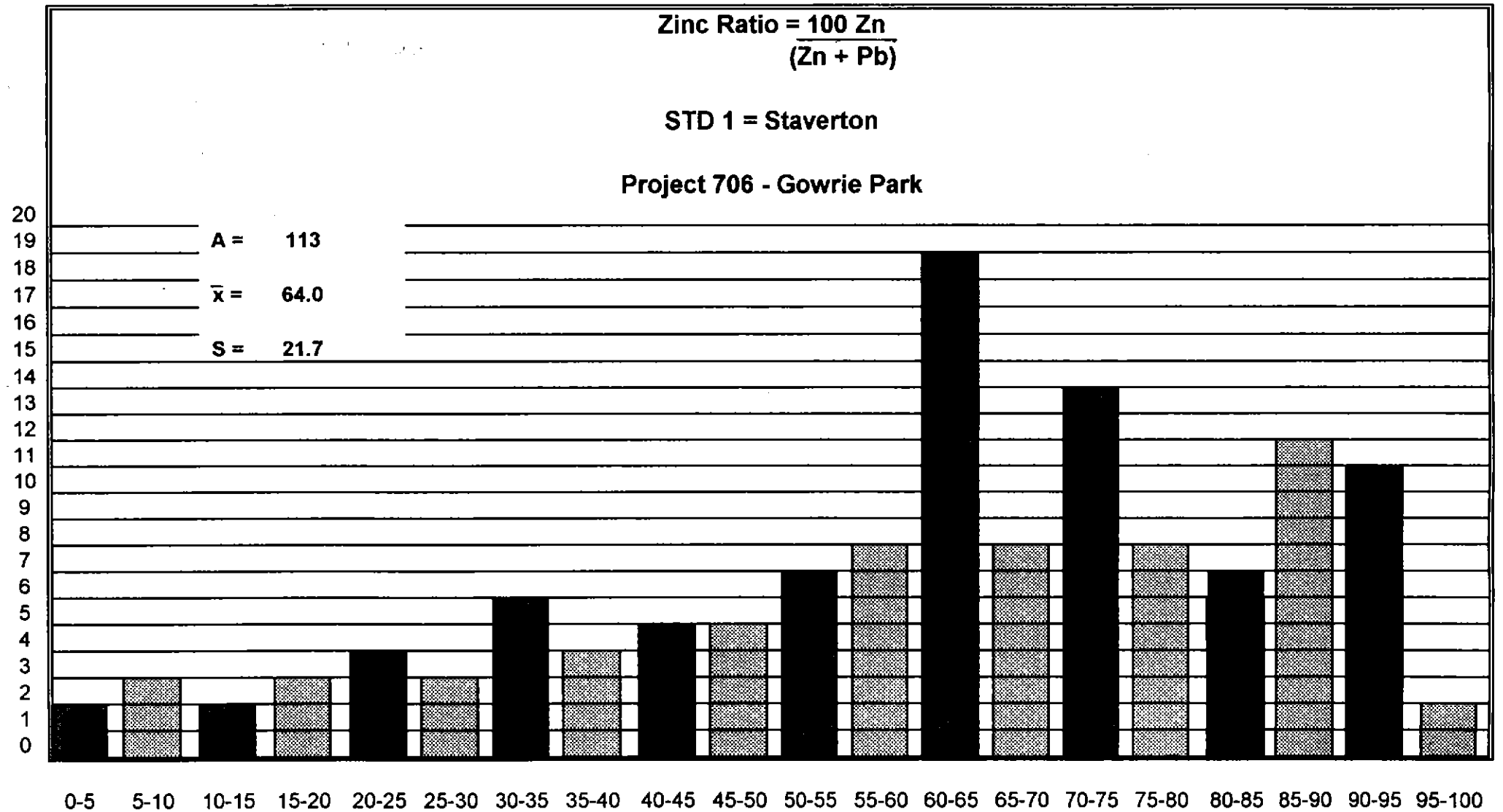
Following re-establishment of the old CRAE grid mapping was undertaken in area overlying the best coincident IP and soil and rock geochemistry (see Figure 17), revealing the rocks to be altered plagioclase phyric tuffs/lavas/lava breccias, altered felsic volcaniclastics and, to the south- west and north-east, fine grained siltstones. Fresh pyrite was noted in some outcrop with gossanous patches in others.

STD 1 was targeted to test the strongest IP anomaly under one of the best geochemical anomalies. Although a 150m hole was proposed, the presence of pyrite to 5% and occasional galena and sphalerite in highly altered volcanic rocks kept the hole going to 267.20m, 12.20m past a major shear zone. The log of the hole and assay results are in Appendix C (assay records in Appendix K) and a section is enclosed as Figure 19. The section of the previously drilled PD83SP1 is enclosed as Figure 18.

Other than the sediments, felsic volcaniclastics and lava breccias towards the bottom of the hole and the relatively unaltered sediments below the shear the hole is characterised by chloritic plagioclase phyric intermediate to felsic lavas with strongly schistose, strongly sericitised shear zones, with concordant veins of very fine grained pyrite, every 40m to 50m.

14 thin sections from core with supporting whole rock/REE analysis for four of the samples have been analysed to Dr A Crawford (see Appendix D). Coupled with core logging his analysis points to the sequence intersected consisting largely of variably silica, sericite, chlorite, pyrite, tourmaline and carbonate altered holocrystalline andesitic to dacitic or andesitic to basaltic lavas with lesser polymict, plagioclase phyric, altered dacitic lava breccias and altered quartz rich felsic volcaniclastics with the rocks below the major structure, moderately altered felsic crystal vitric tuffs or ash-rich volcaniclastic siltstones.

Geochemically all of the rocks are likely to be comagmatic and correlatable with the intermediate-mafic rocks of the Que-Hellyer footwall. With regard to alteration, three assemblages are noted, they being sericite-carbonate, silica-chlorite $\pm$ pyrite and silica-calcite-chlorite-pyrite-tourmaline $\pm$ sphalerite. Tourmaline is generally associated with Devonian granitoids, thus potentially downgrading the prospect, however, Dr Crawford suggests that the rocks were more pervasively altered by Cambrian hydrothermal activity with the tourmaline bearing assemblage more spatially restricted and later stage.


Zinc Ratio = 100 Zn / (Zn + Pb)
STD 1 = Staverton
Project 706 - Gowrie Park
A = 113
x̄ = 64.0
S = 21.7
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
0-5
5-10
10-15
15-20
20-25
25-30
30-35
35-40
40-45
45-50
50-55
55-60
60-65
65-70
70-75
75-80
80-85
85-90
90-95
95-100

974029

Four samples from three of the strongly schistose sericitic zones were studied as polished thin sections by Dr D Huston. He describes them as felsic volcanic and felsic volcanic sandstones which have been extensively sericite-carbonate-pyrite-quartz altered and strongly foliated to strongly sheared. One sample has 0.5 - 1.0% sphalerite with minor galena and chalcopyrite, two others having trace chalcopyrite and galena. Pyrite is strongly brecciated and hence is pre or syn deformational. The sphalerite is also aligned in the cleavage and hence is also pre or syn deformational. This suggests that a Devonian granitoid driven mineralising event is unlikely to be responsible, though the presence of tourmaline in two samples does suggest a role for Devonian granitoids. Dr Huston suggests both Pb isotope and Zn ratio studies to resolve this. The zinc ratio plot for STD 1 is presented as Table 1 and Pb isotope analysis for a single weakly mineralised (2000 ppm Pb) sample from PD83SP1 is presented in Hicks (1990) where he suggests that the Pb at Staverton is less radiogenic than that from Cethana or other VMS's in Tasmania though this is hardly conclusive. The zinc ratio graph is also equivocal but tends towards a Cambrian VHMS pattern.

A CRONE pulse EM survey was conducted over the whole of the Staverton prospect including a DHEM survey on STD 1. Loop layouts and profiles are in Appendix L, however, no EM responses from conductive sulphides were detected, including the UTEM anomaly which was the target of PD83SP1.

A ground magnetics survey was also carried out at Staverton (see Figure 33).

Soil and rock chip sampling and geological mapping traverses were made north-west from the end of 300E and over the lake (see Figure 6). Results were disappointing with the best result a soil sample with 101 ppm Cu, 174 ppm Pb and 190 ppm Zn at 300E, 325N.

Mapping on both shores of the lake near Staverton reveals a predominance of felsic volcaniclastics, siltstones and mass flows containing intermediate lava fragments.

7.4 Cethana West Prospect

Following the re-establishment of the old CRAE grid, work at Cethana West involved the detailed mapping at 1:1000, compiled as 1:2500 (see Figure 22) of the prospect. This mapping involved the re-logging of five previous DDH's, the logs being included in Appendix H.

Three grid lines, ie. 700E south of the road and both 900E and 1100E north of the road, were soil sampled to ascertain why the latter two areas had relatively low assays and to see if there was any anomalous geochemistry on line 700E not revealed in previous surveying. Results were generally higher than for the previous survey but not anomalously so except for the following.

		Cu ppm	Pb ppm	Zn ppm	Au g/t
900E	4450N	23	490	240	0.010
900E	4425N	105	510	200	0.053

which lie along strike from the gossanous veins in the road cutting at around 850E 4425N and which were tested by DD77CC1.

A soil sampling survey was conducted north from grid lines 800E and 1000E for 400m in both instances, ie. from 5000N to 5400N (see Figure 23, 24, 25). At the same time a rock chip sampling survey was conducted in the creek which initially cuts Day's Road but subsequently parallels these grid lines, occupying approximately the position of the 700E line (see Figure 26). Results of the soil survey were disappointing with the best assays 11 ppm Cu, 123 ppm Pb, 93 ppm Zn at 800E, 5400N, however, rock chips returned 7 out of 10 adjacent samples with Zn >400 ppm, corresponding to approximately 700E, 5100N to 700E, 5325N. Best result was 11 ppm Cu, 120 ppm Pb, 833 ppm Zn. This zone corresponds roughly to the "contact" between altered and relatively unaltered rocks.

The dipole-dipole IP survey which CRAE ran over a northern extension to 900E to test this "contact" did not extend far enough to cover the horizon with the anomalous geochemistry.

It was proposed to clean out DDH's 77CC1, 86CC13 and 86CC12 for a down hole EM survey, however, the drillers lost their rods 30m down 86CC12 and hence this hole was lost. The DHEM survey was carried out by CRONE in early January on the former three holes as well as PD84CC9. No EM responses from conductive sulphides were detected in any holes bringing into question both the UTEM anomaly PD84CC9 was targeted on and the massive pyrite reported from it. Nor do the sulphides in the black siltstone in DD77CC1 from 98.00m to 100.00m and in the chloritic mudstone in DD86CC13 from 206.40m to 210.0m become conductive orebodies along strike. Attempts to read lines 800E and 700E were thwarted by high tension powerlines overhead.

DIGHEM anomaly 26 x 5 on the western side of the Lake Barrington but along strike from Cethana West, was followed up with rocks consisting of felsic lavas overlain by altered felsic volcaniclastics and fine grained sediments. Bests results were:

	Cu ppm	Pb ppm	Zn ppm	Au g/t
S01842	75	325	325	NR
S01844	242	329	341	NR
S01846	26	535	53	0.016
S01847	50	157	400	NR

The anomaly does not appear to be due to the edge of a Tertiary basalt flow.

7.5 Cethana East Prospect

Initial work at Cethana East involved the re-establishment of the grid and unravelling of the two or three co-ordinate systems used.

Some mapping was carried out. This involved the re-logging of five old CRAE diamond drillholes, with the logs projected as Appendix I, the mapping of road cuttings, check mapping of G. Purvis's (1979) map and the mapping of parts of 22200E, 22400E and 22600E as part of a soil/rock chip sampling survey.

The core logging reveals the sequence of fine grained to coarse grained felsic volcaniclastics~~sequence~~ at Cethana East to be highly altered and sulphidic with two probable exhalative pyrite lenses, a probable exhalative semi-massive sulphide lens in DD77CC5 from 37.8m to 38.8m @ 3.9% Zn, 0.8% Pb, 1.2% Cu, 185 g/t Ag and 0.7 g/t Au as well as numerous other occurrences of fine pyrite and base metal rich veins/bands which have been deformed by the cleavage. It is one of these zones in DD77CC6 and the semi-massive sulphide described above which were analysed by Dr D Cooke (of CODES, Tasmanian University) (see Appendix J). He concluded that the original sulphide mineralisation is possible syn sedimentary in origin as sphalerite, galena and chalcopyrite inclusions have been noted in pyrite and pyrite inclusions in sphalerite.

A CRONE pulse EM survey was conducted over the whole of the prospect with no EM responses due to conductive sulphides detected. Loop layouts and lines read are shown in Figure 32.

A soil and rock chip sampling program was carried out over the strongly anomalous dipole-dipole IP responses on lines 22200E, 22400E and 22600E. Although the soil assays are only weakly anomalous a considerable number of rock chips are moderately anomalous (see Appendix K) with the best being:

Sample No.	Cu ppm	Pb ppm	Zn ppm	Ag g/t
501901	103	668	455	<2
501913	97	263	640	<2
501919	114	497	762	<2
501945	51	973	21	<2
501958	168	1128	47	<2
501961	121	677	38	6>
501966	149	650	52	<2

The IP profiles are presented in Appendix A in (MacDonald and Tomlinson 1992)

7.6 Fire Tower Prospect

Four diamond drillholes, totalling 542.1m, were drilled at the Fire Tower prospect to test the anomalous gold at surface indicated by soil and rock ship geochemistry and the 17 short diamond drillholes drilled by Noranda . Logs of all old (ie. GP-90-1-17) and new (ie. FTD 1-4) holes are included as Appendix A with sections displaying all drilling enclosed as Figures 8 to 15 with a plan of drillholes as Figure 16.

Results are somewhat disappointing with best result shown in the following summary of drilling.

Hole No.	Incli-nation	Azimuth (TN)	Final Depth	Best Results
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

Mineralisation is patchy with large areas of essentially barren rock lying between relatively narrow mineralised zones which cannot easily be traced from section to section as individual sheets. Black siltstones are more common in the FTD holes than in the GP-90 holes or on surface. These black siltstones are generally brecciated and sulphidic and generally contain anomalous gold. The shear intersected by GP-90-4 was intersected in FTD 2 and the hole terminated just below this in chloritic mass flows. In the case of FTD 3 and 4 the holes were pulled up in chloritic lithic rich volcaniclastics. FTD 1 was terminated when it was felt that sulphide levels were consistently low.

Other than the drilling, some reconnaissance was carried out to the west and east of Fire Tower.

To the west this involved simply the identification of rocks at the headwaters of a creek giving a -80# Au analysis of 0.14 g/t as haematite stockworked felsic volcaniclastics undifferentiable from those at Fire Tower. No samples were sent for assay.

To the east reconnaissance was carried out on the soil/rock chip anomalies identified by CRAE and Noranda to attempt to identify the source. Rock chips from a haematitic vein in relatively unaltered massive quartz porphyry gave best results of 104 ppm Cu, 2764 ppm Pb and 1248 ppm Zn and 468 ppm Cu, 2342 ppm Pb and 5740 ppm Zn.

974034

7.7 Regional

Due to the low level of Lake Barrington to allow annual maintenance it was decided to map the shores of Lake Barrington. This work is presented in Figure 6. Numerous rock samples were taken with the best assayed. Results were generally disappointing with the best results as follows:

Sample No.	Cu ppm	Pb ppm	Zn ppm
SO1227	157	< 5	326
SO1234	16	887	43
SO1514	10	361	242
SO1549	22	317	58
SO1605	342	< 5	100

A zone of strongly quartz sericite altered schistose quartz "eye" felsic volcaniclastics was recognised halfway between Staverton and Cethana West opposite a "campground". Best results are SO1514 above and SO1520 with 16 ppm Cu, 240 ppm Pb and 123 ppm Zn.

974035

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974036

APPENDIX A

Drill logs - Fire Tower Prospect

ie. GP-90-1 through to 17

and FTD 1, FTD 2, FTD 3, FTD 4

HOLE NO. . FTD1 | PLUTONIC OPERATIONS LIMITED | Page: 1

SECTION : 2580.00 EAST | GOWRIE PARK | 974037

DIAMOND DRILL RECORD

Northing : 4964.00
Easting : 2580.00
Grid : FIRE TOWER
Direction : GRID S
Inclination : -45.0
Elevation : 10004.00
Azimuth : 180.0
Mag Azimuth : 161.5 164.5 165.5 166.5; OM=12.5T OR 18.5G
Length (m) : 145.00
Precol. (m) : 2.8
BOCO : 1.0 m
TFR : 6.0 m
Water Table : N/A

Drill Type :LY38
Core Size :HQ 2.8 NQ
Contractor :LONGYEAR

Dip Tests Method: EASTMAN

Depth	Az	Dip
49.0	183.0	-44.7
100.0	184.0	-44.4
145.0	185.0	-44.1

Property : FIRE TOWER
State : Tasmania
GMR : GOG 4440
E.L. No. : GOWRIE PARK
Project No. : 706
Date Started : 13/11/1992
Date Completed: 15/11/1992
Logged by : G. MacDONALD
Relogged by :
Date Logged : 16/11/1992
Interpreted : G. MacDONALD

Initialled

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
.00	2.80	PRECOLLAR					
2.80	12.15	PELITE Pale grey to grey, finely bedded siltstones with beds from 1 to 20mm thick. Bedding is at 50 to 60 degrees to the core axis throughout. Individual beds show grading indicating an uphole, ie northerly facing. The beds contains occasional minor soft sediment micro fractures sub-parallel to the core axis. The lower contact with the underlying rock is gradational. The rock contains numerous fine brittle style fractures. These are generally sub-parallel to sub-perpendicular to banding. Fractures are moderately manganese stained and generally with narrow Fe oxide selvedges. Fractures are consistently spread throughout the core with the more strongly fractured and veined patches from 2.80 to 3.00, 5.35 to 5.45, 6.00 to 6.15 and 8.40 to 8.50 m. Generally the fractures are oxidised but from 6.00 to 6.15 m the rock contains a fine vein, 1 to 2 mm wide and attenuated with occasional fresh pyrite in patches, oxidising. The vein is at 40 degrees to the core axis.	S00001 S00002 S00003 S00004 S00005 S00006 S00007 S00008 S00009 S00010	2.80 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00	4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00	1.20 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	<.01 <.01 <.01 <.01 <.01 <.01 <.01 <.01 <.01 <.01
12.15	16.50	PSAMMITE FINE GRAINED, QUARTZ FELDSPAR RICH SANDSTONE / SILTSTONE. Tan massive to weakly bedded fine grained sandstone to siltstone. Bedding, where visible, is at 50 degrees to the core axis at 13.00 and 60 degrees to the core axis at 15.90 From 12.80 to 13.00 there are occasional irregular clasts of grey siltstone. The lower contact with the underlying coarser quartz feldspar rich rock is sharp, unsheared and irregular. The rock contains slightly less oxidised brittle style fractures than the overlying siltstone. These fractures are spread evenly throughout the core and are irregularly oriented though sub - parallel to the core axis and 40 to 50 degrees to the core axis are common orientations. Manganese staining of fractures is not common though more diffuse manganese staining of the rock is. From 14.85 to 16.20 there is only 70% recovery, apparently coinciding with the rock immediately preceding	S00011 S00012 S00013 S00014	13.00 14.00 14.85 16.20	14.00 14.85 16.20 17.00	1.00 .85 1.35 .80	<.01 <.01 <.01 <.01

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
		16.20m where the rock is brecciated adjacent to a gossanous quartz vein at 45 degrees to the core axis. The most strongly veined patch is from approximately 15.80 to 16.50.					
16.50	17.10	PSAMMITE COARSE GRAINED, IMMATURE, QUARTZ FELDPSAR RICH SANDSTONE. This rock has some gross similarities to an intrusive based on the apparently euhedral nature of the fsp, albeit strongly weathered, however the rocks immediately adjacent to the contact show no quenching or associated silicification and the irregular nature of the upper contact can be explained by scouring. A similar unit is intersected in GP-90-2 and probably GP-90-5 where it lies near the top of the upper volcaniclastic, near to the contact with the hanging wall sediments. The rock is a mottled pale grey and orange due to the 1mm quartz and weathered feldspar respectively. The rock is massive and is cross-cut by two quartz carbonate haematite veins at 70 degrees to the core axis and also by some more diffuse manganese stained, discontinuous, irregularly oriented veins, possibly after pyrite. The lower contact is in broken core but is apparently parallel to the bedding in the underlying siltstones at 35 degrees to the core axis. The lower contact is almost certainly conformable.	S00015	17.00	19.40	2.40	<.01
17.10	23.70	PELITE GREY INTERBEDDED SILTSTONES. Grey siltstone, similar to but not a repetition of the siltstone from 2.80 to 12.15. The rock consists of fine beds of pale grey and dark grey siltstones 1 to 5mm thick and at 40 degrees to the core axis to 21.20. Below 21.20 the rock is dark grey throughout but with moderate bedding at 40 degrees to the core axis. From 22.05 to 22.15 there is a ductile shear zone at 50 degrees to the core axis with elongated fragments of siltstone in a slightly paler siltstone matrix. From 17.10 to 21.20 soft sediment micro-fractures are visible sub-perpendicular to the bedding. From 17.70 to 17.90 the rock is strongly oxidised. The rock contains fine irregularly oriented haematitic fractures and broader gossanous quartz carbonate haematite (after pyrite) veins /patches. The latter are from 19.00 to 19.40, 20.80 to 21.00 and 23.20 to 23.25. Fresh pyrite is visible in a number of places; as very minor attenuated veinlets in broken core from 19.00 to 19.40 ; as very minor disseminations and fine attenuated veinlets from 19.40 to 20.80 ; approximately 0.5% in clots and attenuated veinlets associated with quartz carbonate haematite veining from 20.80 to 21.00 ; approximately 0.5% from 21.00 to 21.60 as fine grained disseminations and irregularly oriented attenuated veinlets ; 1% from 21.60 to 21.80 as fine veinlets and veins to 2mm thick generally parallel to bedding at 45 degrees to the core axis ; 0.5% from 21.80 to 22.80 as disseminations and fine attenuated veins ; 1% from 22.80 to 23.00 in oxidised veins parallel to moderate foliation at 35 degrees to the core axis and 0.5% from 23.00 to	S00016 S00017 S00018 S00019	19.40 21.00 22.00 23.00	21.00 22.00 23.00 24.00	1.60 1.00 1.00 1.00	<.01 <.01 <.01 .04

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
		23.60 in disseminations and fine attenuated veinlets. From 23.60 to 23.70 are occasional oxidised veins after pyrite. The lower contact with the underlying volcaniclastic unit is marked by 10cm of moderate quartz sericite ferruginous carbonate pyrite alteration with strong manganese staining.					
23.70	49.20	VOLCANICLASTIC					
		Beige green, massive to moderately foliated, weak to moderately quartz, sericite and carbonate altered rock consisting of quartz and sericitized feldspar phenocrysts and apple green flattened pumiceous clasts and other occasional lithics, predominantly dark grey siltstones in a fine grained matrix. It it is this rock which hosts the bulk of the mineralization in the short holes GP-90-1 to 17. From 23.70 to 26.10 the rock contains only minor oxidised patches, from 26.10 to 33.25 the rock is moderately oxidised throughout and from 33.25 to 39.90 the rock contains negligible oxidised patches. The rock is foliated at 35 degrees to the core axis. The rock contains a 20mm thick quartz haematite vein (tensional) at 40 degrees to the core axis at 24.30, a 5 to 15mm thick pyrite vein weakly oxidised at 25 degrees to the core axis at 24.40, 1mm thick pyrite vein at 30 degrees to the core axis at 24.80, 0.5% pyrite in fine veins and associated clots at low angles to the core axis from 25.40 to 25.60, 0.5% pyrite and minor chalcopyrite in fine irregularly oriented veins and cross-cutting quartz haematite (after pyrite) veins at 50 degrees to the core axis from 25.60 to 25.80 and negligible sulphides from 25.80 to 26.10.	S00020	24.00	25.00	1.00	.02
			S00021	25.00	26.00	1.00	.04
			S00022	26.00	27.00	1.00	.60
			S00023	27.00	28.00	1.00	<.01
			S00024	28.00	29.00	1.00	.05
			S00025	29.00	30.00	1.00	.10
			S00026	30.00	31.00	1.00	.04
			S00027	31.00	32.00	1.00	.11
			S00028	32.00	33.00	1.00	.11
			S00029	33.00	34.00	1.00	.03
			S00030	34.00	35.00	1.00	.01
			S00031	35.00	36.00	1.00	.01
			S00032	36.00	37.30	1.30	.01
			S00033	37.30	39.00	1.70	.02
			S00034	39.00	39.90	.90	<.01
			S00035	39.90	41.00	1.10	.01
			S00036	41.00	42.00	1.00	.13
			S00037	42.00	43.00	1.00	.13
			S00038	43.00	44.00	1.00	.12
			S00039	44.00	45.00	1.00	<.01
			S00040	45.00	46.00	1.00	.01
			S00041	46.00	47.00	1.00	.01
			S00042	47.00	48.00	1.00	.05
			S00043	48.00	49.20	1.20	2.08
	26.10	33.25 As above. The rock is moderately oxidised and haematitic throughout but still with discernible pumice and siltstone fragments and quartz sericitized feldspar phenocrysts. The rock contains only very minor pyrite. Oxidised patches are associated with fine haematite veins at low angles to the core axis.					
	33.25	39.90 As above. The rock is foliated at 50 to 55 degrees to the core axis with the foliation defined by flattened pumiceous clasts. The rock is moderately carbonate veined from 35.00 to 35.10 with 0.5% associated pyrite. Elsewhere the rock contains negligible sulphides. The carbonate veining/alteration is weak throughout this volcaniclastic unit. The rock contains very occasional oxidised patches predominantly from 39.50 to 39.70. The rock also contains occasional very dark grey irregular siltstone clasts to 20mm as above.					
	39.90	49.20 As above. The rock is foliated at 50 to 55 degrees to the core axis and contains irregular angular lithic fragments of beige green tuffaceous siltstone as well as quartz and sericitized feldspar phenocrysts. The rock is weak to moderately carbonate altered throughout, weakly silicified throughout and weak to moderately sericitized throughout except from 44.00 to 45.50 where the rock is					

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
		weakly chloritic. The rock contains 0.5% pyrite throughout as disseminations and associated with very occasional carbonate veins predominantly at 30 to 40 degrees to the core axis.					
49.20	85.80	VOLCANICLASTIC					
		VOLCANICLASTIC, SERICITISED.	S00487	49.20	50.00	.80	1.17
		Beige green quartz rich volcaniclastic silica sericite and carbonate altered. The rock contains sericitized feldspar and lithics predominantly in the top part of the hole.	S00488	50.00	51.00	1.00	3.30
			S00489	51.00	52.00	1.00	1.62
			S00490	52.00	53.00	1.00	.23
		49.20 52.00 As above with oxidised pyrite veins parallel to the core axis from 50.00 to 52.00 with approximately 2% pyrite.	S00491	53.00	54.00	1.00	4.14
			S00492	54.00	55.00	1.00	2.86
			S00493	55.00	56.00	1.00	2.73
		52.00 52.90 Black massive siltstone with 5% pyrite in veins cross-cutting generally at 45 degrees to the core axis and in fine grained disseminations. Possibly some arsenopyrite.	S00494	56.00	57.00	1.00	.63
			S00495	57.00	58.00	1.00	.40
			S00496	58.00	59.00	1.00	.99
			S00497	59.00	60.00	1.00	1.40
		52.90 55.10 Volcaniclastic as above but sulphidic with 60% pyrite in a large clot associated with silicification from 54.90 to 55.00. Also 5% pyrite from 53.30 to 55.10 in irregular broad veins associated with carbonate and silica alteration.	S00498	60.00	61.00	1.00	1.53
			S00499	61.00	62.00	1.00	.34
			S00500	62.00	63.00	1.00	.03
			S00501	63.00	64.00	1.00	.10
			S00502	64.00	65.00	1.00	.07
			S00503	65.00	66.00	1.00	.03
		55.10 61.90 Volcaniclastic as above with increasing amount of large black siltstone clasts/rafts downhole. The rock contains approximately 1% pyrite throughout, generally in occasional veins and clots and often associated with the siltstones.	S00504	66.00	67.00	1.00	.01
			S00505	67.00	68.00	1.00	.01
			S00506	68.00	69.00	1.00	.03
			S00507	69.00	70.00	1.00	<.01
			S00508	70.00	71.00	1.00	.02
			S00509	71.00	72.00	1.00	.01
		61.90 81.00 Volcaniclastic as above with approximately 0.5% pyrite generally in irregular cross-cutting veins and fractures predominantly from 69.80 to 69.90, 73.90 to 74.00 and 75.60 to 77.30.	S00510	72.00	73.00	1.00	.03
			S00511	73.00	74.00	1.00	.01
			S00512	74.00	75.00	1.00	.03
			S00513	75.00	76.00	1.00	.01
			S00514	76.00	77.00	1.00	.03
		81.00 85.80 Volcaniclastic as above but with approximately 2% pyrite throughout increasing to 4% throughout downhole. Pyrite is in veins generally cross-cutting at 45 degrees to the core axis and associated with carbonate and silica alteration. The lower contact is gradational with the underlying beige green siltstone.	S00515	77.00	78.00	1.00	.06
			S00516	78.00	79.00	1.00	.05
			S00517	79.00	80.00	1.00	.04
			S00518	80.00	81.00	1.00	.03
			S00519	81.00	82.00	1.00	.04
			S00520	82.00	83.00	1.00	.03
			S00521	83.00	84.00	1.00	.02
			S00522	84.00	85.00	1.00	.03
			S00523	85.00	86.00	1.00	.31
85.80	88.00	PELITE					
		FINE GRAINED SILTSTONE, SERICITIC.	S00524	86.00	87.00	1.00	.12
		Fine grained, siliceous, beige green, massive, sericitized siltstone. As above the rock is very sulphidic with 5% pyrite and minor chalcopyrite throughout including 15% pyrite from 87.60 to 88.00. Sulphides occur as fine fracture fill veinlets irregularly oriented. From 87.90 to 88.00 the rock is a black siltstone.	S00525	87.00	88.00	1.00	.05
88.00	96.20	VOLCANICLASTIC					
		VOLCANICLASTIC, SERICITISED.	S00526	88.00	89.00	1.00	.04
		Beige green / brown, quartz volcaniclastic with	S00527	89.00	90.00	1.00	.01

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
		sericitized feldspars and sericitic patches. The rock contains 2% pyrite throughout in fractures associated with carbonate and silica alteration. The lower contact gradational.	S00528	90.00	91.00	1.00	.01
			S00529	91.00	92.00	1.00	.03
			S00530	92.00	93.00	1.00	.01
			S00531	93.00	94.00	1.00	.02
			S00532	94.00	95.00	1.00	.01
			S00533	95.00	96.00	1.00	.01
			S00534	96.00	97.00	1.00	.03
96.20	98.30	PELITE					
		FINE GRAINED SILTSTONE, SERICITIC.	S00535	97.00	98.00	1.00	<.01
		Fine grained siliceous beige green, massive, sericitic siltstone as for 85.80 to 88.00. Rock contains 1% pyrite throughout in irregular fractures generally associated with silicification. The lower contact is gradational.	S00536	98.00	99.00	1.00	.01
98.30	102.00	VOLCANICLASTIC					
		VOLCANICLASTIC, SERICITISED.	S00537	99.00	100.00	1.00	.03
		Beige green quartz lithic volcaniclastic. Rock is silica sericite and carbonate altered and sulphidic with 2% to 4% pyrite throughout in irregular fractures associated with silica and carbonate alteration. The lower contact is sharp	S00538	100.00	101.00	1.00	.01
			S00539	101.00	102.00	1.00	.02
102.00	106.60	PELITE					
		BLACK SILTSTONE.	S00540	102.00	103.00	1.00	.01
		Black sulphidic siltstone. Fine grained rock with irregularly cross-cutting carbonate sulphide veins and more diffuse patches of carbonate and sulphides. Sulphides are predominantly pyrite and a very fine grained brown sulphide, probably sphalerite, in clots and very minor chalcopyrite. The rock is most sulphidic from 105.00 to 105.15, 105.70 to 106.10 and 106.20 to 106.60. The rock is banded / bedded with variable angles to the core axis. The lower contact is sharp and and sheared at 35 degrees to the core axis. The rock contains 2% sulphides throughout.	S00541	103.00	104.00	1.00	<.01
			S00542	104.00	105.00	1.00	.02
			S00543	105.00	106.00	1.00	<.01
			S00544	106.00	107.00	1.00	.01
106.60	109.60	VOLCANICLASTIC					
		Beige to olive green, sericitic moderately silicified and carbonate altered, massive, volcaniclastic consisting of occasional lithics in a fine grained matrix. Lithics include fine grained siliceous clasts and clasts of black siltstone. The rock contains 0.2 to 0.4% sulphides throughout, predominantly pyrite but possibly some arsenopyrite in fine grained irregularly oriented attenuated veinlets and associated with carbonate alteration. Occasional sericitic shears are at 35 degrees to the core axis.	S00545	107.00	108.00	1.00	.01
			S00546	108.00	109.00	1.00	.01
			S00547	109.00	110.00	1.00	.01
109.60	110.10	PELITE					
		BLACK SILTSTONE.	S00548	110.00	111.00	1.00	<.01
		Strongly carbonate altered (in veins and snow-flake textured) black siltstone with 0.2% pyrite associated with the carbonate alteration. Upper contact gradational and interbedded, lower contact at 35 degrees to the core axis in broken core.					
110.10	111.25	VOLCANICLASTIC / PELITE					
		Very fine grained siliceous, massive beige green rock	S00549	111.00	112.00	1.00	.01

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
		somewhat like the felsic lava. The lower contact is possibly moderately sheared. From 110.20 to 110.30 is an interbedded patch of black siltstone. From 110.30 to 111.00 the rock contains 1% pyrite in disseminated clots to 3mm and in occasional cross-cutting pyrite carbonate veins at 50 degrees to the core axis. From 111.00 to 111.25 the rock contains 2% pyrite in attenuated veinlets sub - parallel to and sub - perpendicular to the core axis. The rock is probably a siltstone derved from vitric tuffs.					
111.25	116.40	PELITE BLACK SILTSTONE. The rock is weak to moderately carbonate altered throughout as diffuse alteration and in cross-cutting fine veins. The rock is bedded at 15 to 60 degrees to the core axis. With no obvious trends, ie at 111.50 bedding is at 15 degrees to the core axis at 42.50 at 20 degrees to the core axis, at 115.40 at 60 degrees to the core axis and 116.40 at 40 degrees to the core axis. The rock contains approximately 0.2% pyrite throughout as fine grained disseminations and in clots associated with carbonate altered. The lower contact is sharp and at 45 degrees to the core axis.	S00550 S00551 S00552 S00553 S00554	112.00 113.00 114.00 115.00 116.00	113.00 114.00 115.00 116.00 117.00	1.00 1.00 1.00 1.00 1.00	.02 <.01 .01 <.01 .01
116.40	118.20	PELITE Fine grained, massive, beige to lemon green with diffuse orange patches. Moderately to strongly (increasingly downhole) silicified and sericitized, moderately carbonate altered vitric tuff. The rock has a coarsely mottled appearance due to variable alteration. The rock also contains occasional patches of black siltstone. The rock contains 0.5% pyrite throughout generally associated with silicification. Best zones are from 118.40 to 119.40 and 121.50 to 123.73. Sulphides are also associated with cross-cutting carbonate veins at 35 degrees to the core axis and sericite veins at 35 degrees to the core axis.	S00555 S00556	117.00 118.00	118.00 119.00	1.00 1.00	<.01 .02
118.20	130.30	VOLCANICLASTIC VOLCANICLASTIC, SERICITISED. Beige green volcaniclastic with quartz, sericitized feldspars and occasional lithics. The rock contains sulphides throughout but decreasing somewhat downhole. The rock is silica sericite and carbonate altered throughout. 118.20 122.00 Volcaniclastic as above but beige brown with 1% pyrite throughout associated with silicification, rock contains 4% pyrite from 119.00 to 119.30. 122.00 126.50 Volcaniclastic with large clasts of black siltstone. Rock contains 2% throughout associated with silicification in both the siltstones and volcaniclastic. 126.50 130.30 Volcaniclastic as above with 2% pyrite throughout in irregular veins and fractures generally associated with silicification.	S00557 S00558 S00559 S00560 S00561 S00562 S00563 S00564 S00565 S00566 S00567 S00568	119.00 120.00 121.00 122.00 123.00 124.00 125.00 126.00 127.00 128.00 129.00 130.00	120.00 121.00 122.00 123.00 124.00 125.00 126.00 127.00 128.00 129.00 130.00 131.00	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	<.01 <.01 <.01 <.01 <.01 <.01 <.01 <.01 <.01 <.01 <.01 <.01
130.30	134.20	PELITE					

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
		SILTSTONE, BRECCIATED.	S00569	131.00	132.00	1.00	<.01
		Mottled beige green and dark grey siltstone. Rock looks to be strongly soft sediment deformed but it may be an alteration effect. Rock contains approximately 1% pyrite throughout associated with silicification. Silicified sericitized and carbonate altered throughout. The lower contact is gradational with the underlying more massive volcaniclastic sediment.	S00570	132.00	133.00	1.00	<.01
			S00571	133.00	134.00	1.00	<.01
			S00572	134.00	135.00	1.00	<.01
134.20	145.00	PSAMMITE / VOLCANICLASTIC					
		VOLCANICLASTIC SANDSTONE, SERICITIC.	S00573	135.00	136.00	1.00	<.01
		Fine grained beige green sandstone, massive, silica sericite and carbonate altered with 1% to 2% pyrite throughout decreasing to 0.5% downhole below 139.00. Pyrite is associated with silicification. The rock contains fine grained sericite patches after feldspars. Rock is essentially the same as the 'host rocks' intersected in FTD's 1,2,3 and 4 as well as the GP-90 short holes but is somewhat finer grained and sandier though moderately silicified as is normal for host rocks. Frequency and amount of pyrite decreases downhole.	S00574	136.00	137.00	1.00	.02
			S00575	137.00	138.00	1.00	<.01
			S00576	138.00	139.00	1.00	<.01
			S00577	139.00	140.00	1.00	<.01
			S00578	140.00	141.00	1.00	<.01
			S00579	141.00	142.00	1.00	<.01
			S00580	142.00	143.00	1.00	<.01
			S00581	143.00	144.00	1.00	<.01
			S00582	144.00	145.00	1.00	.03
		145.00 End Of Hole.					

HOLE NO. : FTD2
SECTION : 2532.00 EAST

PLUTONIC OPERATIONS LIMITED
GOWRIE PARK

Page: 1

DIAMOND DRILL RECORD

Northing : 4895.00
Easting : 2532.00
Grid : FIRE TOWER
Direction : GRID N
Inclination : -45.0
Elevation : 9967.00
Azimuth : 360.0
Mag Azimuth : 341.5 347.0 349.0; OM=12.5T OR 18.5G
Length (m) : 122.60
Precol. (m) : 2.50
BOCO : < 2.50 m
TFR : 6.30 m
Water Table : N/A

Drill Type :LY38
Core Size :HQ 2.5 NQ
Contractor :LONGYEAR

Dip Tests Method: EASTMAN

Depth	Az	Dip
60.0	5.5	-43.3
120.0	7.5	-42.0

Property : FIRE TOWER
State : Tasmania
GMR : GOG 4440
E.L. No. : GOWRIE PARK
Project No. : 706
Date Started : 16/11/1992
Date Completed: 22/11/1992
Logged by : G. MacDONALD
Relogged by :
Date Logged : 23/11/1992
Interpreted : G. MacDONALD
Initialled :

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
.00	2.50	PRECOLLAR					
2.50	30.80	VOLCANICLASTIC Beige green, massive, medium grained, volcaniclastic consisting of quartz and sericitized feldspar phenocrysts, occasional pumice like clasts and rounded to sub - angular beige green vitric tuffs, black siltstones and cherty clasts in a moderately silicified sericitized and carbonate altered matrix.	S00044	2.50	3.00	.50	.02
			S00045	3.00	4.00	1.00	.01
			S00046	4.00	5.00	1.00	<.01
			S00047	5.00	6.00	1.00	.01
			S00048	6.00	7.00	1.00	.01
			S00049	7.00	8.00	1.00	<.01
			S00050	8.00	9.00	1.00	.02
			S00051	9.00	10.00	1.00	<.01
			S00052	10.00	11.00	1.00	<.01
			S00053	11.00	12.00	1.00	.01
			S00054	12.00	13.00	1.00	<.01
			S00055	13.00	14.00	1.00	.01
			S00056	14.00	15.00	1.00	<.01
			S00057	15.00	16.00	1.00	.02
			S00058	16.20	17.00	.80	<.01
			S00059	17.00	18.00	1.00	<.01
			S00060	18.00	19.00	1.00	.01
			S00061	19.00	20.00	1.00	<.01
			S00062	20.00	21.00	1.00	.01
			S00063	21.00	22.00	1.00	.05
			S00064	22.00	23.00	1.00	.02
			S00065	23.00	24.00	1.00	.34
			S00066	24.00	25.00	1.00	.19
			S00067	25.00	26.00	1.00	.06
			S00068	26.00	27.00	1.00	.02
			S00069	27.00	28.00	1.00	<.01
			S00070	28.00	29.00	1.00	.03
			S00071	29.00	30.00	1.00	.01
			S00072	30.00	31.00	1.00	.13
30.80	37.60	VOLCANICLASTIC Beige green and grey interbedded rock. Approximately 80% of the rock is beige green and 20% grey. The rock is moderately silicified, sericitized and carbonate altered throughout. Bedding is strongly soft sediment micro fractured and micro-faulted. Bedding is generally at 35	S00073	31.00	32.00	1.00	.07
			S00074	32.00	33.00	1.00	.04
			S00075	33.00	34.00	1.00	.07
			S00076	34.00	35.00	1.00	.20
			S00077	35.00	36.00	1.00	.05

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
		degrees to the core axis but some significant rotation of bedding has occurred. Pyrite averages up to 0.5% throughout and is generally associated with the carbonate alteration. Trace galena is visible and there are quartz chlorite veins parallel to the core axis from 32.30 to 33.00. Fine quartz, minor chalcopyrite and galena veins cross-cut at 20 degrees to the core axis from 33.20 to 33.50. Below 33.50 bedding is generally indistinct with predominantly beige green and interbedded dark grey beds from 33.50 to 35.90 and predominantly dark grey siltstone below 35.90. The rock is weak to moderately chlorite altered from 33.40 with the chlorite as veins and diffuse alteration, generally associated with silicification. The unit averages 1% pyrite with the best zones from 34.70 to 34.85 with 5% pyrite and arsenopyrite, 36.30 to 36.40 with 5% pyrite and from 37.50 to 37.60 with 5% sulphides consisting of pyrite and arsenopyrite and minor chalcopyrite. Sulphides are predominantly pyrite and arsenopyrite (possibly fine grained galena) with very minor chalcopyrite. Sulphides are in fine irregularly oriented fracture fill veins and in more continuous veins generally at 20 to 35 degrees to the core axis. To a lesser degree sulphides are associated with chlorite alteration.	S00078 S00079	36.00 37.00	37.00 38.00	1.00 1.00	.13 .17
37.60	39.65	PELITE Beige green, fine grained, massive siltstone derived from vitric tuffs. The rock is the same as the beige green beds in the overlying interbedded siltstones. The rock is moderately silicified, sericitized and carbonate altered throughout with pyrite associated with silicification. The rock contains 5% pyrite from 39.10 to 39.35 associated with diffuse silicification. Elsewhere the rock averages 1% pyrite throughout.	S00080 S00081	38.00 39.00	39.00 40.00	1.00 1.00	.22 .03
39.65	45.90	PELITE BLACK SILTSTONE. Same rock as the black to dark grey beds in the interbedded siltstones from 30.80 to 37.60. The rock is moderately carbonate altered throughout. The rock contains visible banding of alteration at 15 to 50 degrees to the core axis. The rock appears to be weakly to moderately chlorite altered in patches. This rock is particularly sulphidic with the sulphides 2% to 4% throughout. Sulphides consists of predominantly pyrite but with some arsenopyrite also and minor chalcopyrite. Mineralization is in attenuated irregularly oriented fracture fill veins. Fine carbonate veins dip 25 degrees to 340 degrees (TN) these veins contain pyrite and arsenopyrite though numerous other orientations are common also. A carbonate vein brecciating the rock is at 70 degrees to 360 degrees (TN). The lower contact with the underlying volcaniclastic is sharp and at 70 degrees to the core axis.	S00082 S00083 S00084 S00085 S00086 S00087	40.00 41.00 42.00 43.00 44.00 45.00	41.00 42.00 43.00 44.00 45.00 46.00	1.00 1.00 1.00 1.00 1.00 1.00	.65 .05 .09 .07 .06 .04
45.90	94.25	VOLCANICLASTIC Beige green, massive to bedded, fine grained to medium grained volcaniclastic generally with quartz phenocrysts	S00088 S00089	46.00 47.00	47.00 48.00	1.00 1.00	.03 .14

From (m)	To (m)	Description
		and occasional sericitized feldspars. The rock contains occasional clasts or deformed beds of dark grey to black siltstones. The rock is moderately banded in patches with the banding probably due to sericite alteration. The rock is moderately silicified, sericitized and carbonate altered throughout. From 61.00 to 72.00 the carbonate alteration is snowflake textured.
45.90	59.00	The rock contains 0.1 to 0.2% disseminated sulphides, being predominantly pyrite but with significant arsenopyrite, minor chalcopyrite and possibly galena. The rock contains very occasional chlorite veins with minor associated chalcopyrite. More sulphidic patches are from 51.95 to 52.00. The rock contains black siltstone infilling fractures.
59.00	72.00	The rock contains more minor disseminated sulphides with a more sulphidic rich zone from 59.90 to 60.05. The rock contains banding of alteration (sericite). Below 68.00 banding is at 15 to 20 degrees to the core axis dipping sub-vertical to 245 degrees at 71.80.
72.00	75.65	The rock is moderately altered with galena now more common. Black siltstone patches from 75.10 to 75.15 and 75.45 to 75.65 have contacts at 45 to 50 degrees to the core axis and bedding parallel to this. The upper siltstone contains 4% galena in fine veins at 20 degrees to the core axis.
75.65	85.00	Below 75.65 the volcaniclastic changes character with sericitized pumiceous patches and other lithics more common. The rock is strongly carbonate altered throughout with approximately 1% sulphides (predominantly pyrite) throughout. Sulphides (pyrite >> galena and chalcopyrite) are as disseminated clots generally associated with siliceous patches in the middle of carbonate alteration. From 76.30 to 77.10 the volcaniclastic shows banding of sericite alteration at 45 to 50 degrees to the core axis. At 79.00 is a 30 mm thick pyrite vein at 80 degrees to the core axis. Below 77.10 the rock contains more lithic fragments of beige green siltstones and black siltstones generally sub - angular to sub - rounded. There is a puggy zone at 82.00. At 84.60 the foliation is at 35 degrees to the core axis. At 83.40 a strongly carbonate healed breccia cross-cuts the core at 35 degrees to the core axis with pyrite, galena and chalcopyrite clots. There is a puggy zone at 84.60.
85.00	93.30	Below 85.00 the sulphide content drops to 0.2% throughout and is predominantly galena. At 85.80 the foliation is at 35 degrees to the core axis, at 89.80 the foliation is at 45 degrees to the core axis.
93.30	94.25	The rock contains 2% sulphides throughout as

Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
S00090	48.00	49.00	1.00	.05
S00151	49.00	50.00	1.00	.08
S00152	50.00	51.00	1.00	.26
S00153	51.00	52.00	1.00	.11
S00154	52.00	53.00	1.00	.08
S00155	53.00	54.00	1.00	.12
S00156	54.00	55.00	1.00	.19
S00157	55.00	56.00	1.00	.11
S00158	56.00	57.00	1.00	.15
S00159	57.00	58.00	1.00	2.18
S00160	58.00	59.00	1.00	.12
S00161	59.00	60.00	1.00	1.32
S00162	60.00	61.00	1.00	.17
S00163	61.00	62.00	1.00	.03
S00164	62.00	63.00	1.00	.02
S00165	63.00	64.00	1.00	.01
S00166	64.00	65.00	1.00	.01
S00167	65.00	66.00	1.00	.05
S00168	66.00	67.00	1.00	.03
S00169	67.00	68.00	1.00	<.01
S00170	68.00	69.00	1.00	.02
S00171	69.00	70.00	1.00	.05
S00172	70.00	71.00	1.00	.04
S00173	71.00	72.00	1.00	.13
S00174	72.00	73.00	1.00	.26
S00175	73.00	74.00	1.00	.08
S00176	74.00	75.00	1.00	.10
S00177	75.00	76.00	1.00	.44
S00178	76.00	77.00	1.00	1.08
S00179	77.00	78.00	1.00	.50
S00180	78.00	79.00	1.00	5.24
S00181	79.00	80.00	1.00	1.93
S00182	80.00	81.00	1.00	2.33
S00183	81.00	82.00	1.00	.02
S00184	82.00	83.00	1.00	<.01
S00185	83.00	84.00	1.00	.61
S00186	84.00	85.00	1.00	.14
S00187	85.00	86.00	1.00	<.01
S00188	86.00	87.00	1.00	.01
S00189	87.00	88.00	1.00	.01
S00190	88.00	89.00	1.00	.01
S00191	89.00	90.00	1.00	.02
S00192	90.00	91.00	1.00	.04
S00193	91.00	92.00	1.00	<.01
S00194	92.00	93.00	1.00	.01
S00195	93.00	94.00	1.00	<.01
S00196	94.00	95.00	1.00	.18

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
		fine veins and as disseminations in a fragment of siltstone from 94.00 to 94.25. The rock is increasingly foliated at 45 degrees to the core axis with the carbonate alteration concordant to this foliation. The fine sulphide veins associated with silicification are generally concordant to this foliation. The lower contact of this unit is marked by the siltstone though the underlying unit is of similar composition to this one only finer grained.					
94.25	101.90	PELITE Beige green to pale grey green, massive occasionally bedded siltstone derived from felsic vitric tuff. From 94.25 to 94.40 the rock is medium grained, below this it is fine grained to very fine grained. The rock is moderately silicified, sericitized and carbonate altered throughout with the carbonate as snowflake textures. The rock contains a fragment of black siltstone from 94.90 to 95.00. The rock is bedded from 97.00 to 97.20 at 35 degrees to the core axis and also from 97.90 to 98.10. The rock contains very minor sulphides except from 96.50 to 96.80 with 1% pyrite in diffuse irregular veins. There is a puggy shear zone at 50 degrees to the core axis at 98.15. From 100.50 to 100.70 the rock contains 2% sulphides consisting of pyrite and chalcopyrite in a carbonate breccia at 50 degrees to the core axis. The lower contact with the underlying grey green bedded siltstone is gradational.	S00197	95.00	96.00	1.00	.02
			S00198	96.00	97.00	1.00	<.01
			S00199	97.00	98.00	1.00	<.01
			S00200	98.00	99.00	1.00	<.01
			S00201	99.00	100.00	1.00	<.01
			S00202	100.00	101.00	1.00	.02
			S00203	101.00	102.00	1.00	<.01
101.90	108.85	PELITE Grey green, well bedded fine grained to medium grained siltstone. Bedding is at 35 to 40 degrees to the core axis and fines up down hole. The rock contains quartz, feldspar and probably mafic fragments. From 106.80 to 107.00 the rock is silicified, sericitized and carbonate altered elsewhere it is grey green and chloritic. The rock contains negligible veining except for undeformed cross-cutting veins of carbonate, occasional pyrite and a distinctive red mineral, possibly haematite. The more porous medium grained beds, generally broader, contain approximately 0.2% pyrite as fine grained disseminated clots. The contact with the underlying mass flows is in broken core and is not discrete with some siltstone included in the mass flows near the contact.	S00204	102.00	103.00	1.00	<.01
			S00205	103.00	104.00	1.00	<.01
			S00206	104.00	105.00	1.00	<.01
			S00207	105.00	106.00	1.00	<.01
			S00208	106.00	107.00	1.00	<.01
			S00209	107.00	108.00	1.00	<.01
			S00210	108.00	109.00	1.00	<.01
108.85	122.60	FELSIC MASS FLOW Grey green mass flows consisting of sub - rounded to sub - angular fragments of beige green and dark green siltstones as described above, pumice like fragments, milky white cherty fragments, fine grained volcanic fragments and quartz, feldspar and biotite (?) porphyritic volcanics in a quartz feldspar mafic rich matrix. The rock is foliated at approximately 50 degrees to the core axis. The rock contains only very minor disseminated sulphides throughout. 108.85 111.80 A discrete mass flow fining up down-hole.	S00211	109.00	110.00	1.00	<.01
			S00212	110.00	111.00	1.00	<.01
			S00213	111.00	112.00	1.00	<.01
			S00214	112.00	113.00	1.00	<.01
			S00215	113.00	114.00	1.00	<.01
			S00216	114.00	115.00	1.00	<.01
			S00217	115.00	116.20	1.20	.05
			S00218	116.20	117.60	1.40	<.01
			S00219	117.60	119.80	2.20	<.01

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
	111.80	114.60 Another discrete mass flow fining up down-hole with the lower contact disappearing into broken core.	S00220	119.80	121.00	1.20	<.01
			S00221	121.00	122.20	1.20	<.01
			S00222	122.20	122.60	.40	<.01
	114.60	119.80 Moderate broken core and core loss.					
	119.80	122.00 Much broken core, strongly sheared core and much core loss. Shearing is at 55 to 60 degrees to the core axis. This is the shear zone intersected in GP-90-4.					
	122.00	122.60 As above but only moderately sheared and broken core.					
	122.60	E.O.H.					

974049

HOLE NO. : FTD3 | PLUTONIC OPERATIONS LIMITED | Page: 1
SECTION : 2500.00 EAST | GOWRIE PARK

DIAMOND DRILL RECORD

Northing : 4895.00
Easting : 2500.00
Grid : FIRE TOWER
Direction : GRID N
Inclination : -45.0
Elevation : 9957.00
Azimuth : 360.0
Mag Azimuth : 341.5 345.4 345.5; OM=12.5T OR 18.5G
Length (m) : 121.50
Precol. (m) : 3.00
BOCO : <3.00 m
TFR : 6.30 m
Water Table : N/A

Drill Type :LY38
Core Size :HQ 3.00 NQ
Contractor :LONGYEAR

Dip Tests Method: EASTMAN

Depth	Az	Dip
60.0	4.0	-41.2
120.0	4.1	-41.0

Property : FIRE TOWER
State : Tasmania
GMR : GOG 4440
E.L. No. : GOWRIE PARK
Project No. : 706
Date Started : 23/11/1992
Date Completed: 29/11/1992
Logged by : G. MacDONALD
Relogged by :
Date Logged : 30/11/1992
Interpreted : G. MacDONALD
Initialled :

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
.00	3.00	PRECOLLAR					
3.00	19.00	VOLCANICLASTIC Beige green volcaniclastic. The massive rock consists of quartz phenocrysts, possibly sericitized feldspar phenocrysts and occasional sub - angular to sub - rounded fragments of siltstones. The rock is moderately silicified, sericitized and carbonate altered throughout. From approximately 17.00 to 18.50 the rock is more like a quartz feldspar rich sandstone. The rock contains only minor pyrite throughout occurring as discrete irregular clots to 15 mm generally associated with carbonate alteration. A particularly rich zone is from 15.90 to 15.93 with 10% pyrite associated with a carbonate quartz vein at 45 degrees to the core axis. Below this there are occasional quartz chlorite (occasional minor chalcopyrite) cross-cutting veins. From 24.20 to 25.00 a 3 mm thick carbonate pyrite runs parallel to the core axis.	S00223	3.00	5.00	2.00	.01
			S00224	5.00	6.00	1.00	.03
			S00225	6.00	7.00	1.00	<.01
			S00226	7.00	8.00	1.00	<.01
			S00227	8.00	9.00	1.00	.01
			S00228	9.00	10.00	1.00	<.01
			S00229	10.00	11.00	1.00	<.01
			S00230	11.00	12.00	1.00	<.01
			S00231	12.00	13.00	1.00	.01
			S00232	13.00	14.00	1.00	.16
			S00233	14.00	15.00	1.00	.02
			S00234	15.00	16.00	1.00	.27
			S00235	16.20	17.00	.80	.19
			S00236	17.00	18.00	1.00	.03
			S00237	18.00	19.00	1.00	.13
19.00	25.00	VOLCANICLASTIC / PELITE Beige green volcaniclastic as before but with interbedded black siltstone to 200 mm and interbedded beige green and grey fine grained siltstones below 21.15. Bedding of the black siltstones is generally approximately 45 degrees to the core axis whilst the beige green siltstones have deformed bedding. The black siltstones have ghosted quartz fragments and are moderately chlorite altered in patches. The rock contains occasional fine pyrite veins however the black siltstone from 20.65 to 20.85 and 19.70 to 19.75 contains approximately 5% sulphides consisting of pyrite and arsenopyrite equally.	S00238	19.00	20.00	1.00	.30
			S00239	20.00	21.00	1.00	.59
			S00240	21.00	22.00	1.00	.18
			S00241	22.00	23.00	1.00	.07
			S00242	23.00	24.00	1.00	.19
			S00243	24.00	25.00	1.00	.46
25.00	57.90	VOLCANICLASTIC Beige green, massive volcaniclastic consisting of quartz, possibly sericitized feldspar phenocrysts and occasional lithic fragments. The rock contains minor sulphides other than occasional quartz pyrite veins to 5 mm thick at approximately 30 degrees to the core axis with approximately one vein / m except from 33.00 to 33.50 with	S00244	25.00	26.00	1.00	.40
			S00245	26.00	27.00	1.00	.05
			S00246	27.00	28.00	1.00	.03
			S00247	28.00	29.00	1.00	.02
			S00248	29.00	30.00	1.00	.04
			S00249	30.00	31.00	1.00	.05

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
		5 such veins. There are also quartz chlorite (occasional minor chalcopyrite) veins occasionally associated with the pyrite veins. Below 35.50 the sulphide content is approximately 0.2%. Below, 43.00 the rock contains more lithic fragments but not pumiceous clasts. There is some moderate diffuse chlorite alteration below 41.00. From 41.00 to 52.00 the rock contains discrete sulphide (predominantly pyrite) rich patches, generally associated with quartz carbonate (chlorite). Particularly rich patches are from 43.50 to 43.60, from 44.20 to 45.00 in a vein parallel to the core axis and from 48.50 to 48.60. There are two black siltstones bands, weakly chlorite altered from 51.00 to 51.20 with no associated sulphides. Other than these sulphidic patches the rock contains only minor to very minor disseminated pyrite. Below 55.00 the rock fines up down hole to the underlying siltstone. The rock adjacent to the contact, from 57.00 to 57.90 contains 0.5% *fine grained disseminated pyrite and arsenopyrite.*	S00250	31.00	32.00	1.00	.16
			S00251	32.00	33.00	1.00	.24
			S00252	33.00	34.00	1.00	.07
			S00253	34.00	35.00	1.00	.08
			S00254	35.00	36.00	1.00	.06
			S00255	36.00	37.00	1.00	.28
			S00256	37.00	38.00	1.00	.16
			S00257	38.00	39.00	1.00	.02
			S00258	39.00	40.00	1.00	.02
			S00259	40.00	41.00	1.00	.05
			S00260	41.00	42.00	1.00	.05
			S00261	42.00	43.00	1.00	.28
			S00262	43.00	44.00	1.00	.07
			S00263	44.00	45.00	1.00	.13
			S00264	45.00	46.00	1.00	.16
			S00265	46.00	47.00	1.00	.24
			S00266	47.00	48.00	1.00	.39
			S00267	48.00	49.00	1.00	.22
			S00268	49.00	50.00	1.00	.37
			S00269	50.00	51.00	1.00	.43
			S00270	51.00	52.00	1.00	.45
			S00271	52.00	53.00	1.00	.01
			S00272	53.00	54.90	1.90	.19
			S00273	54.90	56.00	1.10	.59
			S00274	56.00	57.00	1.00	.28
			S00275	57.00	58.00	1.00	3.23
57.90	59.70	PELITE					
		Grey green to black siltstone becoming darker down hole. The rock is generally well bedded at approximately 30 degrees to the core axis. The rock contains brittle style fracture fill pyrite quartz carbonate veins occasionally parallel to bedding but generally perpendicular to bedding at 45 degrees to the core axis. The contact is marked by a pyrite rich quartz vein from 59.70 to 59.75 in the underlying volcaniclastic.	S00276	58.00	59.00	1.00	.29
			S00277	59.00	60.00	1.00	.05
59.70	72.70	VOLCANICLASTIC					
		Beige green volcaniclastic. Finer grained than previous volcaniclastics with visible bedding. The rock is moderately silicified, sericitized and carbonate altered throughout. Bedding is more obvious above 63.40 at 30 degrees to the core axis. There are occasional black siltstone patches from 66.00 to 66.10 and 64.50 to 64.60. The rock contains approximately 2% pyrite from 67.30 to 68.90 associated with diffuse carbonate and quartz veining of the rock. Similar sulphidic patches are from 59.70 to 59.80, 63.40 to 63.60 and 65.75 to 66.00. Other than this the rock contains only minor disseminated sulphides. The rock is brecciated with carbonate filling the brecciation. The rock from 71.90 to the contact also contains 2% sulphides (pyrite >> chalcopyrite).	S00278	60.00	61.00	1.00	.03
			S00279	61.00	62.00	1.00	.02
			S00280	62.00	63.00	1.00	.01
			S00281	63.00	64.00	1.00	.02
			S00282	64.00	65.00	1.00	.12
			S00283	65.00	66.00	1.00	.48
			S00284	66.00	67.00	1.00	.27
			S00285	67.00	68.00	1.00	.61
			S00286	68.00	69.00	1.00	1.22
			S00287	69.00	70.00	1.00	.05
			S00288	70.00	71.00	1.00	1.25
			S00289	71.00	72.00	1.00	.26
			S00290	72.00	73.00	1.00	.50
72.70	75.60	PELITE					
		Black siltstone, occasionally beige green, generally brecciated with occasional bedding at 40 degrees to the core axis. The rock is very sulphidic throughout with	S00291	73.00	74.00	1.00	.99
			S00292	74.00	75.00	1.00	13.20
			S00293	75.00	76.00	1.00	2.18

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
		approximately 1% sulphides throughout. Sulphides are predominantly pyrite with minor chalcopyrite and with arsenopyrite generally as fine grained disseminations. Sulphides are associated with cross-cutting quartz and / or carbonate veins at generally high angles to the core axis. From 74.20 to 74.80 the rock contains approximately 10% pyrite with much pyrite as disseminations in the siltstone.					
75.60	77.60	VOLCANICLASTIC Beige green, generally fine grained to medium grained, moderately bedded volcaniclastic, almost a sandstone. The upper contact is gradational with sulphidic carbonate brecciation of the core adjacent to the contact. The rock is also sulphidic from 76.70 to 77.30 with approximately 1 % sulphides in veins associated with carbonate alteration. Elsewhere the rock contains minor disseminated sulphides. The lower contact with the underlying black siltstone is sharp.	S00294	76.00	77.00	1.00	.14
			S00295	77.00	78.00	1.00	.03
77.60	86.20	PELITE Black siltstone with discernible 2mm thick grey green bedding at 35 to 45 degrees to the core axis. The rock contains 1 to 2% sulphides throughout generally in cross-cutting pyrite carbonate veins with lesser pyrite carbonate veins concordant to bedding. Sulphides also occur as very fine grained disseminations. From 82.00 to 82.10 and 85.70 to 85.80 the rock is carbonate brecciated with 5% galena associated with the carbonate. The lower contact of the siltstone is somewhat gradational with intermixing of the siltstone and the underlying volcaniclastic. This contact zone contains 1% galena associated with carbonate alteration.	S00296	78.00	79.00	1.00	.05
			S00297	79.00	80.00	1.00	.02
			S00298	80.00	81.00	1.00	.01
			S00299	81.00	82.00	1.00	.01
			S00300	82.00	83.00	1.00	<.01
			S00301	83.00	84.00	1.00	.07
			S00302	84.00	85.00	1.00	.19
			S00303	85.00	86.00	1.00	.33
			S00304	86.00	87.00	1.00	.03
86.20	107.00	VOLCANICLASTIC Beige coarse grained volcaniclastic with numerous lithic fragments and two interbedded siltstones, one from 89.50 to 90.10 the other from 102.60 to 103.10. The rock is moderately silicified, sericitized and carbonate altered throughout.	S00305	87.00	88.00	1.00	.18
			S00306	88.00	89.00	1.00	.07
			S00307	89.00	90.00	1.00	1.48
			S00308	90.00	91.00	1.00	1.74
			S00309	91.00	92.00	1.00	1.39
		86.20 89.50 Volcaniclastic with a 15 mm thick pyrite carbonate vein at 87.80 at 80 degrees to the core axis and a 5 mm thick pyrite carbonate vein at 80 degrees to the core axis at 89.45. Occasional irregular carbonate veins contain minor clots of galena. Other than this the rock contains only 0.1% pyrite.	S00310	92.00	93.00	1.00	1.05
			S00311	93.00	94.00	1.00	1.47
			S00312	94.00	95.00	1.00	.58
			S00313	95.00	96.00	1.00	.43
			S00314	96.00	97.00	1.00	.13
			S00315	97.00	98.00	1.00	.03
			S00316	98.00	99.00	1.00	.03
		89.50 90.10 Interbedded grey green bedded siltstone at 30 degrees to the core axis with approximately 1% pyrite and 0.5% arsenopyrite associated with carbonate brecciation of the rock. Bedding is generally approximately 30 degrees to the core axis though the siltstone may be a raft.	S00317	99.00	100.00	1.00	.01
			S00318	100.00	101.00	1.00	.03
			S00319	101.00	102.00	1.00	.12
			S00320	102.00	103.00	1.00	.12
			S00321	103.00	104.00	1.00	.16
			S00322	104.00	105.00	1.00	2.03
		90.10 102.60 Volcaniclastic. From 90.10 to 99.00 the volcaniclastic is as above. From 99.00 to 102.60 pumiceous like clasts are more common. The rock contains 10% pyrite in a white	S00323	105.00	106.00	1.00	1.02
			S00324	106.00	107.00	1.00	2.34

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
		carbonate vein from 93.30 to 93.33. Elsewhere the rock contains occasional fine pyrite veins cross-cutting and disseminated clots of chalcopyrite, pyrite and possibly arsenopyrite, particularly to 96.90. From 100.30 to 100.90 the rock contains approximately 2% pyrite and minor sphalerite (?). The rock below 99.00 is foliated at 30 to 40 degrees to the core axis.					
	102.60 103.10	Bedded black siltstone, possibly a raft. The rock contains 3% pyrite in cross-cutting pyrite carbonate veins and as fine grained disseminated patches.					
	103.10 107.00	Volcaniclastic. Beige green moderately silicified and sericitized, moderately to strongly carbonate altered rock consisting of quartz and sericitized feldspar phenocrysts. The rock contains 1% sulphides consisting of pyrite in carbonate veins and pyrite and minor arsenopyrite and chalcopyrite in fine grained disseminations and disseminated clots. The contact with the underlying siltstone is sharp. Some veins are oxidised. From 106.00 to 106.10 there is a particularly sulphidic zone with 2% pyrite and arsenopyrite associated with silicification and carbonate alteration.					
107.00	116.20	PELITE					
		Beige green to grey green fine grained siltstones generally well bedded.	S00325	107.00	108.00	1.00	.09
		107.00 109.70 Beige green with interbedded dark grey green beds. Bedding is at 35 to 40 degrees to the core axis. The rock contains very occasional cross-cutting fine carbonate vein with minor pyrite and chalcopyrite.	S00326	108.00	109.00	1.00	<.01
			S00327	109.00	110.00	1.00	<.01
			S00328	110.00	111.00	1.00	<.01
			S00329	111.00	112.00	1.00	<.01
			S00330	112.00	113.00	1.00	.30
			S00331	113.00	114.00	1.00	.35
		109.70 112.60 Dark grey green siltstones. Bedding is at 40 to 45 degrees to the core axis. The rock contains only minor pyrite and chalcopyrite in occasional cross-cutting carbonate veins.	S00332	114.00	115.00	1.00	.15
			S00333	115.00	116.00	1.00	.01
			S00334	116.00	117.00	1.00	.01
		112.60 116.20 Beige green to grey green fine grained to medium grained siltstones similar to the volcaniclastic sandstones. The rock contains a sulphidic brecciated zone from 112.80 to 112.85 with 2% pyrite and chalcopyrite associated with quartz and carbonate veining. Elsewhere the rock contains minor sulphides in carbonate veins.					
116.20	121.50	PSAMMITE					
		Grey green quartz feldspar mafic sandstone generally massive but with some interbedded siltstone at 117.50 to 118.00. The rock contains very minor sulphides in cross-cutting carbonate and / or quartz veins with a more sulphidic patch from 116.70 to 117.30 with 0.5% pyrite and chalcopyrite in carbonate veins. No obvious shearing but broken core and core loss. These rock are from the hanging	S00335	117.00	118.00	1.00	.01
			S00336	118.00	119.00	1.00	.03
			S00337	119.00	120.00	1.00	.01
			S00338	120.00	121.50	1.50	.08

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
		wall sediments.					
	121.50	E.O.H.					

974054

HOLE NO. : FTD4 | PLUTONIC OPERATIONS LIMITED | Page: 1
SECTION : 2460.00 EAST | GOWRIE PARK

DIAMOND DRILL RECORD

Northing : 4890.00
Easting : 2460.00
Grid : FIRE TOWER
Direction : GRID N
Inclination : -45.0
Elevation : 9931.00
Azimuth : 360.0
Mag Azimuth : 341.5 344.0 344.0; OM=12.5T OR 18.5G
Length (m) : 153.00
Precol. (m) : 3.50 m
BOCO : <3.50 m
TFR : 9.50 m
Water Table : N/A

Drill Type :LY38
Core Size :HQ NQ
Contractor :LONGYEAR

Dip Tests Method: EASTMAN

Depth	Az	Dip
75.0	2.5	-41.2
150.0	2.5	-41.1

Property : FIRE TOWER
State : Tasmania
GMR : GOG 4440
E.L. No. : GOWRIE PARK
Project No. : 706
Date Started : 30/11/1992
Date Completed: 9/12/1992
Logged by : G. MacDONALD
Relogged by :
Date Logged : 10/12/92
Interpreted : G. MacDONALD
Initialled :

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
.00	3.50	PRECOLLAR					
3.50	24.65	VOLCANICLASTIC					
		VOLCANICLASTIC, SERICITISED.	S00339	3.50	6.00	2.50	.34
		3.50 9.50 Moderately oxidised quartz lithic volcaniclastic. The rock contains quartz haematite veins, oxidised and leached, at 30 degrees to the core axis. Veins contain much manganese staining. Rock contains minor pyrite veins.	S00340	6.00	7.00	1.00	.09
			S00341	7.00	8.00	1.00	.03
			S00342	8.00	9.00	1.00	.05
			S00343	9.00	10.00	1.00	.09
			S00344	10.00	11.00	1.00	.06
			S00345	11.00	12.00	1.00	.01
		9.50 24.65 Silica sericite carbonate altered, beige green, occasionally grey green and weakly chloritic altered volcaniclastic consisting of quartz and lithics in a tuffaceous matrix. Rock contains minor pyrite throughout with pyrite rich zones associated with silicification from 10.00 to 10.30 and from 11.80 to 11.90 both at 30 degrees to the core axis and consisting of approximately 1.0% pyrite. Rock contains occasional cross-cutting carbonate veins at low angles to the core axis. The rock is quartz and lithic rich throughout. From 9.50 to 15.70 the rock is beige green, from 15.70 to 20.50 it is grey green and from 20.50 to 24.65 the rock is beige green. Rock also contains two cross-cutting carbonate pyrite veins at 50 to 70 degrees to the core axis from 23.30 to 23.50. The lower contact with the underlying siltstone is sharp.	S00346	12.00	13.00	1.00	.02
			S00347	13.00	14.00	1.00	.01
			S00348	14.00	15.00	1.00	.03
			S00349	15.00	16.00	1.00	.13
			S00350	16.20	17.00	.80	.47
			S00351	17.00	18.00	1.00	.02
			S00352	18.00	19.00	1.00	.01
			S00353	19.00	20.00	1.00	.04
			S00354	20.00	21.00	1.00	.11
			S00355	21.00	22.00	1.00	.08
			S00356	22.00	23.00	1.00	.04
			S00357	23.00	24.00	1.00	.59
			S00358	24.00	25.00	1.00	.53
24.65	35.50	PELITE					
		SILTSTONES, BEDDED AND DARK GREY.	S00359	25.00	26.00	1.00	.16
		24.65 28.15 Interbedded beige green and lesser dark grey siltstones. Bedding is disturbed. Rock is silica sericite and carbonate altered. Bedding where more coherent is at 45 to 70 degrees to the core axis. Rock contains occasional minor disseminated pyrite and pyrite carbonate veins.	S00360	26.00	27.00	1.00	.22
			S00361	27.00	28.00	1.00	.10
			S00362	28.00	29.00	1.00	.11
			S00363	29.00	30.00	1.00	.10
			S00364	30.00	31.00	1.00	.04
			S00365	31.00	32.00	1.00	.19
		28.15 31.90 Beige green more massive siltstone with very	S00366	32.00	33.00	1.00	.12

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
		occasional very disturbed bedding. Rock is silica sericite carbonate altered throughout. The upper contact is silicified with 20% pyrite over 30 mm in a silicified zone at 30 degrees to the core axis. The rock contains minor disseminated pyrite except for fine irregular pyrite veins associated with carbonate at 28.60 and 30.20. The rock has a gradational lower contact with the underlying dark grey siltstone with the rock becoming more dark grey downhole.	S00367	33.00	34.00	1.00	.05
			S00368	34.00	35.00	1.00	.30
			S00369	35.00	36.00	1.00	.07
	31.90 35.50	Dark grey siltstone with bedding from 32.00 to 32.30 at 25 degrees to the core axis, otherwise massive but disturbed. The rock contains a 10 mm carbonate vein parallel to the core axis from 32.20 to 33.20 with 2% pyrite in clots. Elsewhere the rock contains minor disseminated pyrite. From 33.40 to 34.80 the rock is weakly bedded parallel to the core axis. The lower contact is gradational.					
35.50	63.70	VOLCANICLASTIC					
		VOLCANICLASTIC, SERICITISED.	S00370	36.00	37.00	1.00	.13
		Generally a beige green silica sericite carbonate altered quartz lithic volcaniclastic with some interbedded patches of dark grey siltstone.	S00371	37.00	38.00	1.00	.08
			S00372	38.00	39.00	1.00	.16
			S00373	39.00	40.00	1.00	.05
	35.50 37.00	Beige green volcaniclastic with approximately 2% pyrite from 35.50 to 35.80 in a quartz carbonate vein parallel to the core axis. Else the rock contains very minor disseminated pyrite.	S00374	40.00	41.00	1.00	.02
			S00375	41.00	42.00	1.00	.09
			S00376	42.00	43.00	1.00	.05
			S00377	43.00	44.00	1.00	.06
			S00378	44.00	45.00	1.00	2.00
	37.00 38.40	Dark grey siltstone with intermixed fragments of volcaniclastic. Rock contains approximately 2% pyrite as disseminated clots and also probably 0.5% arsenopyrite.	S00379	45.00	46.00	1.00	1.31
			S00380	46.00	47.00	1.00	.30
			S00381	47.00	48.00	1.00	.16
			S00382	48.00	49.00	1.00	1.64
	38.40 63.70	Beige green quartz lithic volcaniclastic silica sericite and carbonate altered. The rock contains numerous black siltstone filled fractures and contains minor disseminated pyrite. At 45.90 a 10 mm pyrite carbonate vein is cross-cutting at 15 degrees to the core axis. Below 44.30 the volcaniclastic becomes finer grained. The rock contains very occasional fine pyrite veins irregularly oriented and generally associated with carbonate alteration. From 44.00 to 54.00 the rock is not sulphidic as suggested by assays, however it is somewhat more carbonate altered. The rock is massive throughout with only carbonate veining and very minor pyrite as noted. The lower contact with the underlying black siltstone is sharp, unsheared and at 70 degrees to the core axis.	S00383	49.00	50.00	1.00	1.17
			S00384	50.00	51.00	1.00	1.26
			S00385	51.00	52.00	1.00	.31
			S00386	52.00	53.00	1.00	.84
			S00387	53.00	54.00	1.00	3.53
			S00388	54.00	55.00	1.00	.08
			S00389	55.00	56.00	1.00	.17
			S00390	56.00	57.00	1.00	.34
			S00391	57.00	58.00	1.00	.17
			S00392	58.00	59.00	1.00	.38
			S00393	59.00	60.00	1.00	.27
			S00394	60.00	61.00	1.00	.03
			S00395	61.00	62.00	1.00	<.01
			S00396	62.00	63.00	1.00	.02
			S00397	63.00	64.00	1.00	.02
63.70	66.20	PELITE					
		SILTSTONE, DARK GREY AND BEIGE, DISTURBED BEDDING.	S00398	64.00	65.00	1.00	.01
		Bedded but disturbed interbedded dark grey, predominantly,	S00399	65.00	66.00	1.00	<.01

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
		and beige green siltstone. Bedding is generally parallel to the core axis though the lower contact is at 60 degrees to the core axis. The rock contains fine to 2 mm thick pyrite chalcopyrite veins cross-cutting at 80 to 90 degrees to the core axis every 20 to 40 mm. At 64.90 is a sharp contact at 70 degrees to the core axis below which the rock is predominantly beige green.	S00400	66.00	67.00	1.00	.01
66.20	77.30	PELITE / *VOLCANICLASTIC*					
		SILTSTONE/FINE GRAINED VOLCANICLASTIC SERICITISED.	S00401	67.00	68.00	1.00	.03
		Silica sericite, strongly carbonate altered fine grained volcaniclastic or siltstone. The rock is massive with numerous irregularly cross-cutting carbonate veins constituting 20% of the rock. Below 74.10 the rock is more massive and featureless with a sharp contact with a more bedded rock at 80 degrees to the core axis at 75.30 below which the rock is bedded parallel to the core axis. From 66.20 to 74.10 the rock is strongly carbonate altered as noted. From 69.00 to 70.80 the rock contains approximately 4% sulphide throughout associated with diffuse carbonate alteration. The sulphides are equally pyrite and chalcopyrite. From 72.60 to 72.90 the rock is in broken core and may be a minor shear zone. The contact between this rock and the underlying siltstone is sharp but irregular due to soft sediment deformation.	S00402	68.00	69.00	1.00	.03
			S00403	69.00	70.00	1.00	1.93
			S00404	70.00	71.00	1.00	1.58
			S00405	71.00	72.00	1.00	.07
			S00406	72.00	73.00	1.00	.06
			S00407	73.00	74.00	1.00	.02
			S00408	74.00	75.00	1.00	.06
			S00409	75.00	76.00	1.00	.02
			S00410	76.00	77.00	1.00	<.01
			S00411	77.00	78.00	1.00	.02
77.30	81.20	PELITE					
		BLACK SILTSTONE.	S00412	78.00	79.00	1.00	.01
		Fine grained black siltstone. Rock is soft sediment deformed throughout with patches of medium grained to coarse grained quartz lithic volcaniclastic intermixed irregularly. The rock contains 2% pyrite throughout as irregular cross-cutting veins associated with carbonate and in disseminations.	S00413	79.00	80.00	1.00	<.01
			S00414	80.00	81.00	1.00	<.01
			S00415	81.00	82.00	1.00	<.01
81.20	83.10	VOLCANICLASTIC					
		QUARTZ LITHIC VOLCANICLASTIC, SERICITISED.	S00416	82.00	83.00	1.00	.01
		Beige green, silica sericite and carbonate altered medium grained quartz and lithic volcaniclastic with 1% disseminated pyrite throughout. Lower contact is sharp and at 60 degrees to the core axis.	S00417	83.00	84.00	1.00	.76
83.10	87.60	PELITE					
		SILTSTONE, SERICITISED AND DARK GREY.	S00418	84.00	85.00	1.00	<.01
		Siltstone. The rock is silica, sericite and carbonate altered to 85.30 becoming darker grey below 85.30. Bedding is generally at low angles to the core axis and is soft sediment deformed. Rock contains 2% pyrite throughout associated with preferential sericite and carbonate alteration of some beds. From 86.90 to 87.00 the rock contains 5% pyrite and 2% galena associated with cross-cutting carbonate veining.	S00419	85.00	86.00	1.00	<.01
			S00420	86.00	87.00	1.00	.04
			S00421	87.00	88.00	1.00	.11
87.60	100.05	VOLCANICLASTIC					
		QUARTZ LITHIC VOLCANICLASTIC, SERICITISED.	S00422	88.00	89.00	1.00	<.01
		Beige green, silica sericite and carbonate altered volcaniclastic consisting of medium grained quartz and	S00423	89.00	90.00	1.00	.21
			S00424	90.00	91.00	1.00	.04

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
		lithics, predominantly black siltstone fragments and occasional rafts of siltstone to 100mm thick. The rock contains minor disseminated pyrite except for irregular cross-cutting veins at 89.60, 94.05 and 99.30. From 94.40 to 95.60 the rock contains a black siltstone on one side of the core with carbonate brecciation and minor galenaon the other.	S00425	91.00	92.00	1.00	<.01
			S00426	92.00	93.00	1.00	<.01
			S00427	93.00	94.00	1.00	<.01
			S00428	94.00	95.00	1.00	.79
			S00429	95.00	96.00	1.00	.58
			S00430	96.00	97.00	1.00	.04
			S00431	97.00	98.00	1.00	.02
			S00432	98.00	99.00	1.00	.09
			S00433	99.00	100.00	1.00	.31
			S00434	100.00	101.00	1.00	.01
100.05	104.75	VOLCANICLASTIC / PELITE INTERMIXED VOLCANICLASTIC AND BLACK SILSTONE. Irregularly interbedded volcaniclastic and black siltstone due to soft sediment deformation. Siltstone component increases downhole. Rock contains 1% pyrite in the volcaniclastic with 2% to 4% in the siltstone as cross-cutting veins and disseminations associated with carbonate.	S00435	101.00	102.00	1.00	.06
			S00436	102.00	103.00	1.00	.09
			S00437	103.00	104.00	1.00	.17
			S00438	104.00	105.00	1.00	.09
104.75	107.75	VOLCANICLASTIC QUARTZ LITHIC VOLCANICLASTIC, SERICITISED. Beige green quartz lithic volcaniclastic with lithics predominantly black siltstone. Rock is silica sericite and carbonate altered with 1% pyrite throughout in veins and disseminations. The lower contact is sharp.	S00439	105.00	106.00	1.00	.04
			S00440	106.00	107.00	1.00	.04
			S00441	107.00	108.00	1.00	.02
107.75	110.70	PELITE BLACK SILTSTONE. Black siltstone. Rock is fine grained and massive with approximately 4% pyrite throughout in irregularly cross-cutting carbonate veins associated with carbonate and in disseminations.	S00442	108.00	109.00	1.00	.01
			S00443	109.00	110.00	1.00	.02
			S00444	110.00	111.00	1.00	.01
110.70	131.70	VOLCANICLASTIC QUARTZ LITHIC VOLCANICLASTIC, SERICITISED. Beige green, quartz, sericitized feldspar, lithic volcaniclastic. Lithics consist of fine grained beige green and black siltstones and occasional fiamme. The rock contains minor pyrite throughout as disseminations and occasional coarse grained clots except for 123.60 to 123.70 with 2% pyrite in irregular fractures. Lithics are common throughout with fiamme more common downhole. The rock is moderately foliated at 50 to 60 degrees to the core axis, becoming lesser downhole.	S00445	111.00	112.00	1.00	.08
			S00446	112.00	113.00	1.00	.01
			S00447	113.00	114.00	1.00	.01
			S00448	114.00	115.00	1.00	.03
			S00449	115.00	116.00	1.00	.01
			S00450	116.00	117.00	1.00	<.01
			S00451	117.00	118.00	1.00	<.01
			S00452	118.00	119.00	1.00	.01
			S00453	119.00	120.00	1.00	.09
			S00454	120.00	121.00	1.00	.01
			S00455	121.00	122.00	1.00	<.01
			S00456	122.00	123.00	1.00	.01
			S00457	123.00	124.00	1.00	<.01
			S00458	124.00	125.00	1.00	.01
			S00459	125.00	126.00	1.00	.07
			S00460	126.00	127.00	1.00	.06
			S00461	127.00	128.00	1.00	.17
			S00462	128.00	129.00	1.00	<.01
			S00463	129.00	130.00	1.00	<.01
			S00464	130.00	131.00	1.00	<.01
			S00465	131.00	132.00	1.00	<.01

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
131.70	138.10	VOLCANICLASTIC					
		QUARTZ LITHIC VOLCANICLASTIC, PALE GREY.	S00466	132.00	133.00	1.00	<.01
		Rock as for 110.70 to 131.70 except that it is generally	S00467	133.00	134.00	1.00	<.01
		pale grey and unaltered. Rock is moderately sericitized	S00468	134.00	135.00	1.00	<.01
		initially becoming less so downhole. The rock is strongly	S00469	135.00	136.00	1.00	<.01
		foliated at 45 degrees to the core axis and contains	S00470	136.00	137.00	1.00	<.01
		fiamme like fragments. Rock contains medium grained quartz	S00471	137.00	138.00	1.00	<.01
		and sericitized feldspars throughout. The rock contains	S00472	138.00	139.00	1.00	<.01
		negligible sulphides.					
138.10	142.15	VOLCANICLASTIC					
		QUARTZ LITHIC VOLCANICLASTIC, SERICITISED.	S00473	139.00	140.00	1.00	<.01
		Rock as for above but now is moderately silica sericite	S00474	140.00	141.00	1.00	1.83
		and carbonate altered throughout. The rock contains 1%	S00475	141.00	142.00	1.00	5.15
		pyrite associated with pink silicification from 138.70 to	S00476	142.00	143.00	1.00	1.12
		138.80 and 10% chalcopyrite and pyrite from 140.90 to					
		141.00 and 141.30 to 141.60. Elsewhere the rock contains					
		minor pyrite.					
142.15	147.90	PELITE					
		INTERBEDDED SILTSTONE, SERICITISED.	S00477	143.00	144.00	1.00	<.01
		Predominantly beige green siltstone with lesser dark grey	S00478	144.00	145.00	1.00	1.40
		interbedded siltstone. The rock is bedded at 30 to 45	S00479	145.00	146.00	1.00	.02
		degrees to the core axis to 146.50 below which the rock is	S00480	146.00	147.00	1.00	<.01
		more massive. The rock contains minor pyrite except for	S00481	147.00	148.00	1.00	<.01
		two, concordant to bedding, 10mm thick, pyrite, minor					
		chalcopyrite veins from 144.20 to 144.40. Most of the rock					
		is in broken core.					
147.90	151.00	PSAMMITE					
		SANDSTONE, CHLORITIC, HANGINGWALL.	S00482	148.00	149.00	1.00	<.01
		Grey green, massive, weak to moderately chloritic	S00483	149.00	150.00	1.00	<.01
		sandstone in broken core. Rock contains very minor	S00484	150.00	151.00	1.00	<.01
		disseminated pyrite.					
151.00	153.00	VOLCANICLASTIC / PSAMMITE					
		VOLCANICLASTIC SANDSTONE, HANGINGWALL.	S00485	151.00	152.00	1.00	<.01
		Grey, weakly foliated at 45 degrees to the core axis,	S00486	152.00	153.00	1.00	<.01
		quartz feldspar lithic sandstone / volcaniclastic, weakly					
		chloritic. The rock contains very minor disseminated					
		pyrite. Rock is lithic rich with lithics consisting of					
		siltstones and occasional fiamme, quartz and sericitized					
		feldspars.					
		153.00 E.O.H.					

974059

HOLE NO. : GP-90-1 | PLUTONIC OPERATIONS LIMITED | Page: 1
SECTION : 2520.00 EAST | GOWRIE PARK

DIAMOND DRILL RECORD

Northing	: 4967.00	Property	: FIRE TOWER
Easting	: 2520.00	State	: Tasmania
Grid	: FIRE TOWER	GMR	: GOG 4440
Direction	: Vertical	E.L. No.	: GOWRIE PARK
Inclination	: -90.0	Project No.	: 706
Elevation	: 9992.00	Date Started	:
Azimuth	: 180.0	Date Completed	:
Mag Azimuth	:	Logged by	: G. MacDonald
Length (m)	: 24.70	Relogged by	:
Precol. (m)	: 2.8m	Date Logged	: May '92
BOCO	: 0.30m	Interpreted	: G. MacDONALD
TFR	: 1.90m		
Water Table	:	Initialled	:

Drill Type :LY38
Core Size :
Contractor :N Poltock

Dip Tests Method:

Depth	Az	Dip
24.7	180.0	-90.0

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
.00	.30	PRECOLLAR					
.30	24.70	VOLCANICLASTIC					
.70	3.80	QUARTZ RICH VOLCANICLASTIC. Orange brown to beige brown, medium grained to coarse grained (generally 1-2mm) sub - angular to sub - rounded, massive, quartz rich volcaniclastic. Rock is strongly silicified and sericitized throughout, weakly carbonate altered. Quartz and sericite alteration is diffuse, carbonate alteration is in spots and blebs. The lower contact is gradational. The rock contains 2% pyrite in fine disseminations and coarse grained blebs and veins up to 1 cm cross-cutting at 45 degrees to the core axis. Pyrite is generally associated with silicification. Rock contains minor, locally 1% galena in fine disseminations and in late stage fine veins at 70 to 80 degrees to the core axis with quartz and/or carbonate. Minor chalcopyrite is associated with pyrite and occasionally with quartz carbonate galena veins. The rock contains quartz carbonate haematite veins at 50 to 60 degrees to the core axis. Quartz fibres in veins show growth sub-perpendicular to the vein orientation. Moderate manganese staining of veins / fractures.	SA000X	.30	1.00	.70	1.94
			SA000Y	1.00	2.00	1.00	2.41
			SA0000	2.00	3.00	1.00	2.32
			SA0001	3.00	4.00	1.00	3.59
			SA0002	4.00	5.00	1.00	2.45
			SA0003	5.00	6.00	1.00	1.17
			SA0004	6.00	7.00	1.00	4.51
			SA0005	7.00	8.00	1.00	3.11
			SA0006	8.00	9.00	1.00	.57
			SA0007	9.00	10.00	1.00	.74
			SA0008	10.00	11.00	1.00	.76
			SA0009	11.00	12.00	1.00	3.26
			SA0010	12.00	13.00	1.00	1.12
			SA0011	13.00	14.00	1.00	1.32
			SA0012	14.00	15.00	1.00	.77
			SA0013	15.00	16.00	1.00	1.43
			SA0014	16.00	17.00	1.00	5.61
			SA0015	17.00	18.00	1.00	1.75
			SA0016	18.00	19.00	1.00	.72
			SA0017	19.00	20.00	1.00	1.55
.30	1.90	As above but orange brown strongly oxidised silicified and sericitized rock with manganese staining of fractures. Rock contains approximately 2% pyrite in blebs and fine veins at low angles to the core axis, approximately 1% galena in fine disseminations and veinlets and approximately 0.5% chalcopyrite in fine disseminations and blebs. From 1.45 to 1.80 the rock contains numerous fine carbonate veinlets with minor galena cross-cutting at 70 to 80 degrees to the core axis. Possibly ghosted fiamme in this rock.	SA0018	20.00	21.00	1.00	.74
			SA0019	21.00	22.00	1.00	3.84
			SA0020	22.00	23.00	1.00	.73
			SA0021	23.00	24.00	1.00	1.72
1.90	3.05	As above but generally beige green, weak to moderately oxidised, silicified, sericitized and carbonate altered rock. From 2.40 to 2.65 the rock contains approximately 5% pyrite in 1 cm	SA0022	24.00	24.70	.70	.40

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)

wide veins with oxidised selvedges at 45 degrees to the core axis. From 1.90 to 2.40 the rock contains minor fine grained galena in fine fractures at high angles to the core axis, very minor disseminated chalcopyrite and minor pyrite in coarse grained clots. From 2.65 to 3.05 the rock contains fine fractures at 80 degrees to the core axis filled with quartz carbonate galena and/or very minor chalcopyrite.

3.05 3.80 As above but beige brown, strongly silicified. The rock contains minor fine quartz galena filled fractures cross-cutting at high angles to the core axis and pyrite filled fractures and blebs associated with silicification, at lower angles to the core axis and probably earlier than the quartz galena veins.

3.80 4.30 QUARTZ FIAMME VOLCANICLASTIC.

Orange brown to beige green massive, moderately oxidised silicified, sericitized and carbonate altered rock with medium grained sub - rounded to sub - angular quartz and coarse grained ghosted fiamme. The rock contains numerous quartz carbonate veins at 35 to 50 degrees to the core axis with manganese staining. The rock contains approximately 2% pyrite in blebs and disseminations.

4.30 6.30 QUARTZ VOLCANICLASTIC.

Beige green, occasionally orange brown where oxidised, massive, silicified, sericitized and carbonate altered rock with sub - rounded to sub - angular medium grained quartz. Rock contains numerous quartz carbonate haematite veins at 60 to 85 degrees to the core axis above 5.55 and from 30 to 60 degrees to the core axis below 5.55. Rock contains trace fine grained disseminated galena and minor chalcopyrite and minor pyrite generally associated with quartz carbonate veining. Rock becomes more sparsely clastic below 5.15. There is moderate autobrecciation by haematite from 5.95 to 6.30. At 4.90 there is a very dark grey / black, siliceous, fine grained interbed (?) or clast (?) of black siltstone at 25 degrees to the core axis. This bed/clast has veins of the same material in the adjacent rock due to soft sediment deformation. Rock has a gradational contact with the underlying fine grained rock.

6.30 7.90 FINE GRAINED VOLCANICLASTIC.

Beige green, strongly silicified, massive fine grained, sericitized and carbonate altered volcaniclastic. Rock contains numerous fine quartz carbonate haematite veins at 45 to 50 degrees to the core axis. Rock contains occasional moderately oxidised patches and variable sulphides. Carbonate alteration is spotty to irregularly finely veined.

6.30 6.45 As above with minor pyrite clots throughout.

6.45 6.70 As above with no obvious sulphides.

6.70 6.95 As above but moderately oxidised zone with haematite veining autobrecciating the rock.

6.95 7.50 As above with occasional dark grey ghosted possible but not convincing, clasts. Rock contains very minor galena in fine quartz veins and occasional clots of pyrite with oxidised

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)

rims. Carbonate alteration is spotty.

7.50 7.90 As above with numerous fine quartz, minor galena, very minor chalcopyrite filled fractures at 45 to 50 degrees to the core axis. These veins are cross-cut by a 3 mm wide pyrite vein.

7.90 8.15 QUARTZ LITHIC VOLCANICLASTIC.

Beige green, fine grained to coarse grained, massive, silicified sericitized and carbonate altered, sub - rounded quartz and sub - angular lithics volcaniclastic. Quartz is fine grained to medium grained whilst lithics are dark grey to dark grey green, fine grained, siliceous somewhat ghosted medium grained to coarse grained siltstones. The rock contains very minor galena in occasional fractures. Carbonate veining is moderate and is generally sub - perpendicular to the core axis.

8.15 10.80 QUARTZ VOLCANICLASTIC.

Beige green, fine grained to coarse grained (to 4 mm), massive, silicified, sericitized and carbonate, occasionally chlorite, altered quartz volcaniclastic. The rock generally contains fine grained to medium grained quartz though in patches quartz is rare. Quartz is sub - rounded to sub - angular. Rock contains generally minor to very minor pyrite and galena respectively. Rock generally contains quartz carbonate haematite veins at 60 to 70 degrees to the core axis. In places there are late stage quartz veins sub - perpendicular to the quartz carbonate haematite veins.

8.15 8.25 As above with very minor pyrite associated with fine quartz veins and minor manganese staining.

8.25 8.70 As above with possible ghosted clasts dark green and unconvincing. Rock contains minor pyrite clots.

8.70 8.90 As above but rock strongly autobrecciated by cross-cutting haematite veins. Rock contains minor galena in fine quartz veins.

8.90 9.20 As above but more fine grained with diffuse dark green patches. Rock contains carbonate very minor pyrite and galena and occasional irregularly cross-cutting haematite veins.

9.20 10.80 As above but rock contains pyrite, 2%, in coarse grained clots and minor galena in fine cross-cutting quartz veins. Rock contains carbonate veining associated with dark green chlorite patchys. Rock contains ovoid siliceous pods parallel to the core axis.

10.80 10.95 BLACK SILTSTONE.

Very dark grey siltstone bed or clast. The upper contact is diffuse and marked by a zone of quartz. The lower contact is sharp and at 20 degrees to the core axis. The siltstone is cross-cut by irregularly oriented quartz veins

10.95 14.95 QUARTZ LITHIC VOLCANICLASTIC.

Beige green, medium grained to coarse grained, massive, silicified, sericitized and carbonate altered, quartz, variably lithic volcaniclastic. The quartz is medium grained to coarse grained (up to 4 mm), sub - rounded to sub - angular. Lithics include black siltstone, beige green fine grained siliceous siltstone and dark green,

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)

fine grained, siltstone. Lithics are sub - angular to sub - rounded. Rock contains occasional cross-cutting quartz carbonate haematite veins at 45 degrees to the core axis. Rock contains very minor galena and chalcopyrite and minor pyrite throughout.

10.95 11.95 As above with very minor galena, chalcopyrite and minor pyrite in fine veinlets.

11.95 12.35 As above but moderately oxidised due to cross-cutting haematite veinlets. Rock contains minor clots of pyrite.

12.35 13.35 As above but rock contains minor pyrite in clots and veins and very minor galena associated with late stage fine quartz veins.

13.35 14.15 As above but moderately oxidised with minor chalcopyrite in open space fractures after quartz carbonate haematite veins.

14.15 14.95 As above but with 1 to 2% pyrite and 1% chalcopyrite in irregular blebs and associated with cross-cutting quartz veins.

14.95 17.15 QUARTZ VOLCANICLASTIC.

Beige green, medium grained, massive, silicified, sericitized and altered quartz volcaniclastic. The quartz is medium grained and sub - rounded to sub - angular. Rock contains minor to 2% pyrite and very minor chalcopyrite and galena in veins and blebs. The rock contains minor quartz carbonate haematite veining variably oriented. Rock is generally strongly carbonate / clay veined.

14.95 16.15 As above with minor pyrite and very minor chalcopyrite, weakly veined.

16.15 17.00 As above with 2% pyrite and very minor chalcopyrite. Rock more strongly veined.

17.00 17.15 As above but moderately oxidised and negligible sulphides.

17.15 24.70 QUARTZ LITHIC FIAMME VOLCANICLASTIC.

Beige green medium grained to coarse grained, massive, quartz, lithic and fiamme volcaniclastic, silicified, sericitized and carbonate altered. Quartz is medium grained to coarse grained (up to 4mm) and sub - rounded. Lithics are medium grained to coarse grained (up to 50 mm) and include rafts of black siltstone, dark green, fine grained, sediments, pale green, fine grained, siliceous tuffaceous clasts. Fiamme are chloritic (to 100 mm). The rock is weak to moderately quartz carbonate veined, generally at 70 degrees to the core axis. The rock contains approximately 1 to 2% pyrite throughout as clots and disseminations and occasionally trace to very minor galena and chalcopyrite associated with the quartz carbonate veins. Carbonate alteration is in fine irregularly oriented veinlets generally altered to clay.

24.70 E.O.H.

974063

HOLE NO. : GP-90-2
SECTION : 2502.50 EAST

PLUTONIC OPERATIONS LIMITED
GOWRIE PARK

Page: 1

DIAMOND DRILL RECORD

Northing : 4967.00
Easting : 2502.50
Grid : FIRE TOWER
Direction : Vertical
Inclination : -90.0
Elevation : 9983.00
Azimuth : 180.0
Mag Azimuth :
Length (m) : 25.80
Precol. (m) : 0.30 m
BOCO : <0.30 m
TFR : 0.30 m
Water Table :

Drill Type :
Core Size :
Contractor :N Poltock

Dip Tests Method:

Depth	Az	Dip
25.8	180.0	-90.0

Property : FIRE TOWER
State : Tasmania
GMR : GOG 4440
E.L. No. : GOWRIE PARK
Project No. : 706
Date Started :
Date Completed:
Logged by : G. MacDONALD
Relogged by :
Date Logged : May '92
Interpreted : G. MacDONALD
Initialled :

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
.00	.30	PRECOLLAR					
.30	1.60	VOLCANICLASTIC Quartz volcaniclastic, moderately oxidised but silica sericite and carbonate altered with fine haematite veins throughout, generally with manganese staining. The rock contains 0.2% pyrite in occasional coarse grained clots.	SB000X SB000Y	.30 1.00	1.00 2.00	.70 1.00	.07 .25
1.60	2.40	PELITE / VOLCANICLASTIC INTERMIXED SILTSTONES AND SERICITISED VOLCANICLASTICS. Intermixed grey to dark grey siltstone clasts/rafts to 8cm thick and quartz rich volcaniclastic, silica sericite and carbonate altered. The rock has been soft sediment deformed with flame structures visible. The siltstone contains very fine grained disseminated arsenopyrite and fine quartz galena pyrite veinlets. Bedding is generally deformed though occasionally at 40 degrees to the core axis. Pyrite minor galena veins cross-cut irregularly and are associated with silicification. The volcaniclastic contains occasional black siltstone fragments. The lower contact with the underlying quartz feldspar rich volcaniclastic is gradational.	SB0000	2.00	3.00	1.00	.28
2.40	5.30	VOLCANICLASTIC QUARTZ FELDSPAR VOLCANICLASTIC. Pale pinky green to pale pink, coarse grained, massive volcaniclastic consisting of sub - rounded quartz and pink feldspars. From 2.40 to 3.30 the rock contains more quartz than feldspar with equal amounts of quartz and feldspar below 3.30. From 2.40 to 3.30 the rock contains 5% very coarse grained clots of pyrite with minor galena. Here the rock also contains occasional black siltstone fragments. From 3.30 to 5.00 the rock contains pyrite veins to 5mm thick every 20cm and occasional black siltstone fragments. Above 5.00 the feldspars are pink whilst below 5.00 they are white. Below 5.00 the rock contains 0.5% galena in fine veins cross-cutting irregularly and minor pyrite in clots. The rock becomes more quartz rich downhole to the lower contact which is somewhat gradational.	SB0001 SB0002 SB0003	3.00 4.00 5.00	4.00 5.00 6.00	1.00 1.00 1.00	.78 .52 .36

974064

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
5.30	25.80	VOLCANICLASTIC					
		QUARTZ LITHIC FIAMME VOLCANICLASTIC, SERICITISED. Pale to dark to beige green, medium grained to coarse grained quartz lithic volcaniclastic, generally silica sericite and carbonate altered, chloritic where noted below. Lithics include beige green and black siltstones. The rock contains numerous cross-cutting pyrite veins with minor galena and possibly sphalerite.	SB0004	6.00	7.00	1.00	.79
			SB0005	7.00	8.00	1.00	.18
			SB0006	8.00	9.00	1.00	.43
			SB0007	9.00	10.00	1.00	.78
			SB0008	10.00	11.00	1.00	4.53
			SB0009	11.00	12.00	1.00	.66
			SB0010	12.00	13.00	1.00	.14
			SB0011	13.00	14.00	1.00	.50
			SB0012	14.00	15.00	1.00	.04
			SB0013	15.00	16.00	1.00	.06
			SB0014	16.00	17.00	1.00	.57
			SB0015	17.00	18.00	1.00	.59
			SB0016	18.00	19.00	1.00	.25
			SB0017	19.00	20.00	1.00	1.38
			SB0018	20.00	21.00	1.00	1.52
			SB0019	21.00	22.00	1.00	.19
			SB0020	22.00	23.00	1.00	.27
			SB0021	23.00	24.00	1.00	.13
			SB0022	24.00	25.00	1.00	1.07
			SB0023	25.00	25.80	.80	.25
	5.30	7.00 Quartz volcaniclastic as above but oxidised after cross-cutting pyrite veins. The rock contains 2% pyrite in cross-cutting veins generally at 50 to 60 degrees to the core axis.					
		7.00 9.30 Quartz lithic volcaniclastic as above with occasional cross-cutting pyrite veins.					
		9.30 9.70 Quartz lithic volcaniclastic as above with oxidised veins at 40 degrees to the core axis after pyrite.					
		9.70 10.40 Quartz lithic volcaniclastic as above with 1% pyrite associated with silicification.					
		10.40 12.80 Quartz lithic rich volcaniclastic as above with minor disseminated pyrite. The rock contains a black siltstone clast with weak bedding and apparently conformable 4% disseminated galena. The rock contains occasional cross-cutting oxidised veins with manganese staining. Lithics are foliated at 10 degrees to the core axis. The major shear zone previously logged for 12.60 is in broken core but is not obvious. From 12.60 to 12.80 the rock is strongly silicified with coarse grained disseminated clots of galena sphalerite pyrite and minor chalcopyrite.					
		12.80 14.00 Quartz lithic volcaniclastic as above with numerous cross-cutting quartz carbonate haematite veins at 70 to 80 degrees to the core axis and 2% pyrite in 5mm thick veins and 1% galena in fine attenuated veins at 70 to 80 degrees to the core axis.					
		14.00 15.90 Quartz volcaniclastic but now moderately to strongly chlorite altered. The rock contains 2% pyrite in coarse grained clots. The rock contains very occasional attenuated veinlets of galena sphalerite chalcopyrite.					
		15.90 25.80 Quartz lithic fiamme volcaniclastic as above, now silica sericite and carbonate altered again. The rock contains 1% pyrite associated with quartz veining and silicification and 0.5% galena in fine grained clots. The rock contains haematitic zones from 16.50 to 16.80 and 17.40 to 17.70 after oxidised pyrite. Similar haematitic zones are associated with moderate shearing at 40 degrees to the core axis from 18.40 to 18.60, 19.40 to 19.60 and 21.50 to 21.60. The rock contains occasional irregular clasts of black siltstone and possibly a chloritic, mafic(?) volcanic					

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
		fragment from 24.50 to 24.80. The rock contains cross-cutting pink carbonate and quartz veins with occasional pyrite, irregularly oriented. The rock contains occasional pyrite clots with minor associated galena and sphalerite. Below 23.00 the rock contains occasional fiamme foliated sub - parallel to the core axis.					
	25.80	E.O.H.					

974066

HOLE NO. : GP-90-3
SECTION : 2455.00 EAST

PLUTONIC OPERATIONS LIMITED
GOWRIE PARK

Page: 1

Northing : 4941.50
Easting : 2455.00
Grid : FIRE TOWER
Direction : Grid East
Inclination : -65.0
Elevation : 9947.00
Azimuth : 90.0
Mag Azimuth :
Length (m) : 24.60
Precol. (m) : 0.50 m
BOCO : <0.50 m
TFR : 0.50 m
Water Table :

DIAMOND DRILL RECORD

Drill Type :
Core Size :
Contractor :N Poltock

Dip Tests Method:

Depth	Az	Dip
24.6	90.0	-65.0

Property : FIRE TOWER
State : Tasmania
GMR : GOG 4440
E.L. No. : GOWRIE PARK
Project No. : 706
Date Started :
Date Completed:
Logged by : G. MacDONALD
Relogged by :
Date Logged : May '92
Interpreted : G. MacDONALD
Initialled :

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
.00	.50	PRECOLLAR					
.50	24.60	VOLCANICLASTIC					
		QUARTZ LITHIC FIAMME VOLCANICLASTIC,SERICITISED. Silica sericite carbonate altered quartz, ghosted feldspar, lithic fiamme volcaniclastic, beige green, massive to moderately foliated.	SC000X	.50	1.00	.50	.10
			SC000Y	1.00	2.00	1.00	.38
			SC0000	2.00	3.00	1.00	.56
			SC0001	3.00	4.00	1.00	1.56
			SC0002	4.00	5.00	1.00	.46
			SC0003	5.00	6.00	1.00	8.53
			SC0004	6.00	7.00	1.00	2.24
			SC0005	7.00	8.00	1.00	1.35
			SC0006	8.00	9.00	1.00	.17
			SC0007	9.00	10.00	1.00	.52
			SC0008	10.00	11.00	1.00	.33
			SC0009	11.00	12.00	1.00	.28
			SC0010	12.00	13.00	1.00	8.15
			SC0011	13.00	14.00	1.00	4.29
			SC0012	14.00	15.00	1.00	2.44
			SC0013	15.00	16.00	1.00	2.97
			SC0014	16.00	17.00	1.00	1.92
			SC0015	17.00	18.00	1.00	1.56
			SC0016	18.00	19.00	1.00	.28
			SC0017	19.00	20.00	1.00	4.65
			SC0018	20.00	21.00	1.00	1.42
			SC0019	21.00	22.00	1.00	.53
			SC0020	22.00	23.00	1.00	.03
			SC0021	23.00	24.00	1.00	.86
			SC0022	24.00	24.60	.60	.65
.50	4.00	Medium grained quartz rich volcaniclastic with occasional black siltstone clasts which. Are sub - rounded to sub - angular. Rock contains occasional sericite altered fiamme. Rock is strongly veined with leached quartz carbonate haematite veins with fresh pyrite adjacent to some veins. Some veins have manganese staining. The rock is weakly foliated at 30 degrees to the core axis. From 3.00 to 3.30 the rock is more silicified with 1% fine grained disseminated pyrite and galena. Rock is moderately oxidised throughout.					
4.00	5.00	Less oxidised now. Rock contains occasional cross-cutting quartz carbonate haematite veins but more lithics. Rock is moderately silicified with 2% pyrite in blebs. From 4.30 to 4.40 the rock contains 5% galena. Lithics include fiamme black siltstone and beige green siltstone. The rock is foliated at 30 degrees to the core axis.					
5.00	6.10	More strongly silicified now. From 5.65 to 5.75 the rock is a pale pink, possibly k-spar alteration. Rock contains occasional quartz carbonate haematite veins and minor disseminated pyrite in attenuated veins and very minor disseminated galena from 5.20 to 5.45.					
6.10	6.65	More quartz rich volcaniclastic. Rock is moderately sheared / brecciated from 6.30 to 6.65 at 35 degrees to the core axis.					
6.65	24.60	Essentially the same rock throughout. The rock is a medium grained quartz, coarse grained lithic, occasional fiamme volcaniclastic, silica sericite and carbonate altered. Lithics					

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
		are sub - rounded and include black shale and beige green siltstones. Rock contains quartz carbonate veins at 70 to 80 degrees to the core axis throughout. Rock contains occasional pyrite veins. Above 16.00 the rock is moderately foliated at 30 degrees to the core axis. Below 16.00 this foliation is much weaker. From 12.80 to 12.90 is a large clast or bed of black siltstone with very fine concordant layers of galena at 20 degrees to the core axis, parallel to the foliation in the surrounding rock. From 19.00 to 19.05 is a band of pyrite and black siltstone. The rock is rich in fiamme from 20.45 to 20.55 foliated at 55 degrees to the core axis. At 23.65 is a 2cm thick chert / fine grained galena vein at 45 degrees to the core axis. At 23.65 is a clast of fine grained volcanic with medium grained ghosted quartz phenocrysts. The rock contains only minor pyrite throughout generally as fine disseminations and attenuated veinlets. 24.60 E.O.H.					

974068

HOLE NO. : GP-90-4 | PLUTONIC OPERATIONS LIMITED | Page: 1
SECTION : 2520.00 EAST | GOWRIE PARK

DIAMOND DRILL RECORD

Northing : 5000.00
Easting : 2520.00
Grid : FIRE TOWER
Direction : Grid South
Inclination : -55.0
Elevation : 9974.00
Azimuth : 180.0
Mag Azimuth :
Length (m) : 27.20
Precol. (m) : 3.00 m
BOCO : <3.00 m
TFR : 3.00 m
Water Table :

Drill Type :
Core Size :
Contractor :N Poltock

Dip Tests Method:

Depth	Az	Dip
27.2	180.0	-55.0

Property : FIRE TOWER
State : Tasmania
GMR : GOG 4440
E.L. No. : GOWRIE PARK
Project No. : 706
Date Started :
Date Completed:
Logged by : G. MacDONALD
Relogged by :
Date Logged : May '92
Interpreted : G. MacDONALD
Initialled :

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
.00	3.00	PRECOLLAR					
3.00	4.00	PSAMMITE SANDSTONE, GREY GREEN. Moderately oxidised sandy to silty bedded sediment with manganese staining of cross-cutting haematite quartz veins. Rock is moderately chlorite altered throughout.	SD0001	3.00	4.00	1.00	<.01
4.00	9.90	PELITE / PSAMMITE INTERBEDDED SANDSTONES AND SILTSTONES, GREY GREEN. Grey green, bedded at 30 degrees to the core axis, interbedded sandstones and siltstones, predominantly the latter. The rock is moderately chlorite altered with some elongate chloritic patches. The rock contains occasional haematite veins occasionally with manganese staining.	SD0002	4.00	5.00	1.00	.01
			SD0003	5.00	6.00	1.00	.01
			SD0004	6.00	7.00	1.00	.01
			SD0005	7.00	8.00	1.00	.01
			SD0006	8.00	9.00	1.00	.01
			SD0007	9.00	10.00	1.00	.02
9.90	10.40	PSAMMITE SANDSTONE/VOLCANICLASTIC. Grey green sandy rock with medium grained rounded quartz clasts. The difference between this and the host rocks is that this rock is chloritic and not sericite altered. The rock is massive with some quartz haematite veining and very occasional clots of pyrite.	SD0008	10.00	11.00	1.00	.02
10.40	20.00	SHEAR ZONE / PSAMMITE Rock is in broken core and is strongly sheared throughout. Shear foliation is possibly at 25 degrees to the core axis. The rock is a silty to sandy chloritic sediment as above and is grey in colour with some occasional fractured quartz haematite veins.	SD0009	11.00	12.00	1.00	.02
			SD0010	12.00	13.00	1.00	.01
			SD0011	13.00	14.00	1.00	.01
			SD0012	14.00	16.00	2.00	.01
			SD0014	16.00	18.00	2.00	.01
			SD0016	18.00	20.00	2.00	.02
20.00	27.20	PSAMMITE Generally pale brown, occasionally grey green sandy to silty sediment in broken core. Rock is moderately sericite altered in patches. 27.20 E.O.H.	SD0017	20.00	22.00	2.00	.01
			SD0018	22.00	24.00	2.00	.01
			SD0019	24.00	26.00	2.00	.01
			SD0020	26.00	27.20	1.20	.01

974069

HOLE NO. : GP-90-5 | PLUTONIC OPERATIONS LIMITED | Page: 1
SECTION : 2520.00 EAST | GOWRIE PARK

DIAMOND DRILL RECORD

Northing	: 4984.50	Property	: FIRE TOWER
Easting	: 2520.00	State	: Tasmania
Grid	: FIRE TOWER	GMR	: GOG 4440
Direction	: Grid South	E.L. No.	: GOWRIE PARK
Inclination	: -50.0	Project No.	: 706
Elevation	: 9977.00	Date Started	:
Azimuth	: 180.0	Date Completed	:
Mag Azimuth	:	Logged by	: G. MacDONALD
Length (m)	: 30.20	Relogged by	:
Precol. (m)	: 1.50 m	Date Logged	: May '92
BOCO	: <1.50 m	Interpreted	: G. MacDONALD
TFR	: 1.50 m		
Water Table	:	Initialled	:

Drill Type :
Core Size :
Contractor :N Poltock

Dip Tests Method:

Depth	Az	Dip
30.2	180.0	-50.0

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
.00	1.50	PRECOLLAR					
1.50	17.85	PELITE / PSAMMITE					
	1.50 3.30	Pale grey green green, silty to sandy beds with occasional interbedded dark grey beds to 3 mm thick at 50 degrees to the core axis. Sediments are generally quartz feldspar rich. The rock contains leached weathered veins at 70 to 80 degrees to the core axis.	SE000X	1.50	2.00	.50	.03
			SE0000	2.00	3.00	1.00	.01
			SE0001	3.00	4.00	1.00	.09
			SE0002	4.00	5.00	1.00	.02
			SE0003	5.00	6.00	1.00	.05
			SE0004	6.00	7.00	1.00	.02
	3.30 14.20	Rhythmically interbedded pale cream beds and dark grey siltstones with bedding at 50 to 55 degrees to the core axis. Rock contains very occasional micro fractures and faults. Rock contains very occasional haematite quartz carbonate veins at low angles to the core axis.	SE0005	7.00	8.00	1.00	.03
			SE0006	8.00	9.00	1.00	.09
			SE0007	9.00	10.00	1.00	.02
			SE0008	10.00	11.00	1.00	.06
			SE0009	11.00	12.00	1.00	.01
			SE0010	12.00	13.00	1.00	.04
	14.20 17.85	As logged for 3.30 to 14.20 except in a soft sediment mass flow breccia. Downhole the rock contains quartz lithic sandy beds.	SE0011	13.00	14.00	1.00	<.01
			SE0012	14.00	15.00	1.00	.01
			SE0013	15.00	16.00	1.00	.05
			SE0014	16.00	17.00	1.00	.03
			SE0015	17.00	18.00	1.00	.01
17.85	19.30	PSAMMITE SANDSTONE, HANGING WALL. Beige quartz and feldspar rich sandstone with fragments to 1 mm of dark grey and pale green siltstone. The rock is massive.	SE0016	18.00	19.00	1.00	.12
			SE0017	19.00	20.00	1.00	.12
19.30	19.85	SHEAR ZONE Oxidised shear zone with red brown and pale fragments in a clay rich matrix. The rock is a shear zone. Shearing is at approximately 50 degrees to the core axis.					
19.85	20.05	PSAMMITE As logged for 17.85 to 19.30.	SE0018	20.00	21.00	1.00	3.80
20.05	20.40	BRECCIA BRECCIATED CONTACT. Strongly brecciated contact between black siltstone and underlying beige volcaniclastic. Fractures contain 2%					

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
		pyrite and 2% arsenopyrite.					
20.40	22.65	VOLCANICLASTIC VOLCANICLASTIC, SERICITISED. Silica sericite carbonate altered quartz, sericitized feldspar, fiamme, minor lithic volcaniclastic with bedding at 50 to 60 degrees to the core axis. Rock contains minor disseminated galena or arsenopyrite throughout. Rock contains pyrite and galena or arsenopyrite in veins from. 20.50 to 20.60, 21.20 to 21.40 and from 22.10 to 22.25.	SE0019 SE0020	21.00 22.00	22.00 23.00	1.00 1.00	.04 1.22
22.65	22.90	VOLCANICLASTIC FINE GRAINED VOLCANICLASTIC. Dark brown fine grained snowflake carbonate textured rock. The contact with the underlying volcaniclastic is erosional and sulphidic with 10% arsenopyrite over 50 mm and 1% pyrite and chalcopyrite. Rock is massive.					
22.90	24.30	VOLCANICLASTIC QUARTZ FELDSPAR VOLCANICLASTIC. Pale orange brown quartz feldspar rich volcaniclastic. The rock is very similar to that logged in GP-90-2. The rock is moderately sericite altered throughout and is weakly foliated at 40 to 50 degrees to the core axis, contains cross-cutting carbonate pyrite minor chalcopyrite and galena veins at 15 degrees to the core axis from 23.80 to 24.00.	SE0021 SE0022	23.00 24.00	24.00 25.00	1.00 1.00	.13 .97
24.30	24.80	SHEAR ZONE / VOLCANICLASTIC Rock as for 22.90 to 24.30 but now is strongly oxidised and probably a shear zone. The rock contains 2% to 4% pyrite throughout in clots.					
24.80	30.20	VOLCANICLASTIC VOLCANICLASTIC, SERICITISED. Beige green silica sericite carbonate altered medium grained to coarse grained quartz, fiamme (to 30 mm), volcaniclastic. Rock is foliated at 45 degrees to the core axis. Strong carbonate brecciation of rock. Cross-cutting quartz carbonate veins at 70 to 90 degrees to the core axis also contain minor pyrite and very minor galena and chalcopyrite. The rock contains an oxidised pyrite vein at 25 degrees to the core axis from 24.80 to 24.95. 30.20 E.O.H.	SE0023 SE0024 SE0025 SE0026 SE0027 SE0028	25.00 26.00 27.00 28.00 29.00 30.00	26.00 27.00 28.00 29.00 30.00 30.20	1.00 1.00 1.00 1.00 1.00 .20	1.04 .12 .26 .96 .53 .56

974071

HOLE NO. : GP-90-6
SECTION : 2520.00 EAST

PLUTONIC OPERATIONS LIMITED
GOWRIE PARK

Page: 1

DIAMOND DRILL RECORD

Northing	: 4951.50	Drill Type	:
Easting	: 2520.00	Core Size	:
Grid	: FIRE TOWER	Contractor	:N Poltock
Direction	: Grid South		
Inclination	: -52.0		
Elevation	: 9990.00		
Azimuth	: 180.0		
Mag Azimuth	:		
Length (m)	: 30.15	Dip Tests	Method:
Precol. (m)	: 0.70 m	Depth Az Dip	
BOCO	: <0.70 m	30.1 180.0 -52.0	
TFR	: 0.70 m		
Water Table	:		

Property	:	FIRE TOWER
State	:	Tasmania
GMR	:	GOG 4440
E.L. No.	:	GOWRIE PARK
Project No.	:	706
Date Started	:	
Date Completed	:	
Logged by	:	G. MacDONALD
Relogged by	:	
Date Logged	:	May '92
Interpreted	:	G. MacDONALD
Initialled	:	

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
.00	.70	PRECOLLAR					
.70	6.95	PELITE					
		.70 6.95 INTERBEDDED SILTSTONES, SERICITIC. Interbedded beige green and lesser black siltstones up to 10 mm thick. Rock is fine grained and weak to moderately silica sericite and carbonate altered. The rock is moderately oxidised to 2.35 and contains leached quartz haematite carbonate veins at low angles to the core axis. The rock is more massive from 1.25 to 2.35. The bedded rock is micro fractured and faulted. The rock contains 2% pyrite in veins sub - parallel to the core axis and as disseminations and possibly some disseminated arsenopyrite and contains a major oxidised vein from 4.30 to 4.70 at a low angle to the core axis with 5% pyrite.	SF000Y	.70	1.00	.30	.41
			SF000X	1.00	2.00	1.00	.03
			SF0000	2.00	3.00	1.00	.08
			SF0001	3.00	4.00	1.00	.07
			SF0002	4.00	5.00	1.00	.15
			SF0003	5.00	6.00	1.00	.05
			SF0004	6.00	7.00	1.00	.20
6.95	9.35	PELITE / VOLCANICLASTIC					
		INTERBEDDED SEQUENCE OF SILTSTONES, SERICITIC AND BLACK, AND VOLCANICLASTICS.	SF0005	7.00	8.00	1.00	.31
			SF0006	8.00	9.00	1.00	.23
			SF0007	9.00	10.00	1.00	.19
		6.95 7.05 Medium grained quartz volcaniclastic in a bed sub - parallel to the core axis. Rock is silica sericite and carbonate altered.					
		7.05 7.22 Black siltstone. Fine grained siliceous rock with clay filled fractures and a 2 mm pyrite veins at 20 degrees to the core axis.					
		7.22 7.50 Fine grained sericite altered siltstone with a bed of fine grained quartz rich volcaniclastic at 35 degrees to the core axis. This bed has undergone soft sediment deformation. The rock contains minor oxidised pyrite veins.					
		7.50 7.62 Black siltstone. Fine grained siliceous rock with occasional dark green beds at 35 degrees to the core axis.					
		7.62 7.73 Fine grained volcaniclastic. Rock is fine grained, occasionally medium grained quartz occasional lithic volcaniclastic and is pale brown and sericitized. The lower contact is sharp and at 20 degrees to the core axis. Weak grading suggests an uphole i.e. Northerly facing.					

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
		7.73 8.00 Black siltstone as above.					
		8.00 8.65 Fine grained volcaniclastic or siltstone. Rock is fine grained with 2% disseminated pyrite.					
		8.65 9.00 Black siltstone with weak bedding at 30 degrees to the core axis. Rock contains 1% pyrite as disseminations and a pink hard mineral in patches / veins from 8.70 to 8.80.					
		9.00 9.35 Fine grained volcaniclastic or siltstone. Pale grey and siliceous in broken core.					
9.35	10.60	VOLCANICLASTIC					
		VOLCANICLASTIC, SERICITIC. Medium grained quartz volcaniclastic, silica sericite and carbonate altered and containing numerous leached haematite quartz veins sub - parallel to the core axis with some manganese staining.	SF0008	10.00	11.00	1.00	.34
10.60	11.10	PELITE					
		BLACK SILTSTONE. Black siltstone in very broken core. Rock contains approximately 5% pyrite in veins and as disseminations.	SF0009	11.00	12.00	1.00	.14
11.10	11.60	VOLCANICLASTIC					
		VOLCANICLASTIC, SERICITIC. As for 9.35 to 10.60.					
11.60	17.20	PELITE					
		INTERBEDDED SILTSTONES, SERICITIC. Predominantly beige green fine grained silica sericite and carbonate altered siltstone with lesser interbedded black siltstones in beds to 10 mm thick. Bedding is generally micro fractured and faulted. Where coherent bedding is at 20 to 30 degrees to the core axis. Rock contains 2% pyrite throughout in clots and cross-cutting quartz carbonate haematite veins at 70 to 80 degrees to the core axis. The lower contact is irregular and sharp.	SF0010	12.00	13.00	1.00	.16
			SF0011	13.00	14.00	1.00	.45
			SF0012	14.00	15.00	1.00	.55
			SF0013	15.00	16.00	1.00	.09
			SF0014	16.00	17.00	1.00	.41
			SF0015	17.00	18.00	1.00	.16
17.20	17.80	VOLCANICLASTIC					
		VOLCANICLASTIC, SERICITIC. Medium grained quartz volcaniclastic foliated at 25 degrees to the core axis with 1% pyrite in blebs and fine veins.					
17.80	20.80	PELITE					
		BLACK SILTSTONE. Very dark grey siltstone with occasional interbedded paler beds micro fractured and faulted. Where more coherent ie at 17.85 and 18.10 bedding is at 70 degrees to the core axis and 45 degrees to the core axis respectively. Rock is very sulphidic with 5% pyrite throughout, locally 20%.	SF0016	18.00	19.00	1.00	.22
			SF0017	19.00	20.00	1.00	.19
			SF0018	20.00	21.00	1.00	.10
20.80	23.55	PELITE					
		INTERBEDDED SILTSTONES, SERICITIC. Beige green with lesser black siltstones. Rock is silica sericite and carbonate altered with 1% to 2% pyrite throughout. Lower contact is somewhat gradational.	SF0019	21.00	22.00	1.00	.46
			SF0020	22.00	23.00	1.00	.81
			SF0021	23.00	24.00	1.00	1.19

974073

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
23.55	24.30	VOLCANICLASTIC QUARTZ LITHIC VOLCANICLASTIC, SERICITIC. Fine grained to medium grained quartz lithic volcaniclastic, silica sericite and carbonate altered. Rock is very sulphidic in patches with 5% pyrite from 23.60 to 23.65 and approximately 1% to 2% throughout. Rock has a gradational lower contact.	SF0022	24.00	25.00	1.00	.37
24.30	25.90	PELITE INTERBEDDED SILTSTONES, SERICITIC. Interbedded beige green and lesser black siltstone. Rock is silica sericite and carbonate altered with 2% pyrite throughout. The lower contact is somewhat gradational.	SF0023	25.00	26.00	1.00	1.24
25.90	27.00	VOLCANICLASTIC VOLCANICLASTIC, SERICITIC. Fine grained to medium grained quartz lithic volcaniclastic. Rock is more fine grained downhole. From 26.75 to 26.85 are three black siltstones beds at 25 degrees to the core axis. Rock contains 2% pyrite throughout.	SF0024	26.00	27.00	1.00	.49
27.00	30.15	PELITE INTERBEDDED SILTSTONES, SERICITIC. As described before, bedding from 50 to 75 degrees to the core axis and 1% pyrite throughout. 30.15 E.O.H.	SF0025 SF0026 SF0027 SF0028	27.00 28.00 29.00 30.00	28.00 29.00 30.00 30.15	1.00 1.00 1.00 .15	2.41 .31 .15 .05

974074

HOLE NO. : GP-90-7
SECTION : 2520.00 EAST

PLUTONIC OPERATIONS LIMITED
GOWRIE PARK

Page: 1

Northing : 4937.50
Easting : 2520.00
Grid : FIRE TOWER
Direction : Grid South
Inclination : -51.0
Elevation : 9982.00
Azimuth : 180.0
Mag Azimuth :
Length (m) : 30.95
Precol. (m) : 0.80 m
BOCO : <0.80 m
TFR : 0.80 m
Water Table :

DIAMOND DRILL RECORD

Drill Type :
Core Size :
Contractor :N Poltock

Dip Tests Method:

Depth	Az	Dip
31.0	180.0	-51.0

Property : FIRE TOWER
State : Tasmania
GMR : GOG 4440
E.L. No. : GOWRIE PARK
Project No. : 706
Date Started :
Date Completed:
Logged by : G. MacDONALD
Relogged by :
Date Logged : May '92
Interpreted : G. MacDONALD
Initialled :

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
.00	.80	PRECOLLAR					
.80	19.75	PELITE					
		Fine grained, pale creamy green to grey green siltstone, silica sericite and carbonate altered throughout. The rock contains occasional black siltstone beds which are disturbed and micro-fractured and faulted. Generally the rock is massive. The rock contains numerous cross-cutting quartz carbonate haematite veins. The rock averages 2% pyrite throughout.	SG000X	.80	2.00	1.20	.18
			SG0000	2.00	3.00	1.00	3.25
			SG0001	3.00	4.00	1.00	2.01
			SG0002	4.00	5.00	1.00	3.32
			SG0003	5.00	6.00	1.00	3.60
			SG0004	6.00	7.00	1.00	2.17
			SG0005	7.00	8.00	1.00	2.65
		.80 1.70 As above but strongly oxidised with 2% pyrite in irregular veins. Bedding at 50 degrees to the core axis.	SG0006	8.00	9.00	1.00	.47
			SG0007	9.00	10.00	1.00	.57
			SG0008	10.00	11.00	1.00	1.16
		1.70 3.95 As above but moderately oxidised with bedding at 25 degrees to the core axis and 0.5% pyrite.	SG0009	11.00	12.00	1.00	.57
			SG0010	12.00	13.00	1.00	.06
		3.95 8.70 As above but oxidised with 5% pyrite to 5.00, 1% below 5.00.	SG0011	13.00	14.00	1.00	.19
			SG0012	14.00	15.00	1.00	.04
		8.70 11.10 As above but weakly oxidised with 2% pyrite.	SG0013	15.00	16.00	1.00	.04
		11.10 12.40 As above but with oxidised veins down centre of the core. Rock contains minor black siltstone beds.	SG0014	16.00	17.00	1.00	.07
			SG0015	17.00	18.00	1.00	.26
			SG0016	18.00	19.00	1.00	.14
		12.40 16.45 As above with some black siltstone beds at 65 degrees to the core axis and only minor pyrite. Rock contains a quartz haematite vein from 15.90 to 16.45.	SG0017	19.00	20.00	1.00	.42
		16.45 19.75 As above but leached and oxidised, chloritic from 17.60 to 17.65. Black siltstone beds at 17.65 are at 45 degrees to the core axis. The rock contains 2% pyrite filling fractures. From 18.16 to 18.18 the rock is moderately sheared and chlorite and sericite altered probably a discrete silty bed. The rock contains minor veinlets from 17.45 to 18.25 becoming moderately chlorite veined from 18.25 to 19.75.					
19.75	30.95	VOLCANICLASTIC					
		Medium grained quartz rich volcaniclastic with some lithics. The rock is generally silica sericite and	SG0018	20.00	21.00	1.00	.08
			SG0019	21.00	22.00	1.00	.26

 974075

From (m)	To (m)	Description
		carbonate altered or chlorite altered as noted below. The rock contains generally only minor pyrite. Occasional siltstones may be large clasts or rafts. Lithics include beige green and black siltstones and occasional quartz feldspar phyric clasts.
19.75	20.10	Medium grained quartz volcaniclastic with some lithics as above but very chloritic with chlorite veins at 70 degrees to the core axis.
20.10	22.50	Quartz lithic volcaniclastic as above, silica sericite and carbonate altered with chlorite veins at 70 degrees to the core axis. The rock contains minor pyrite galena and chalcopyrite from 21.10 to 21.50.
22.50	22.56	Black siltstone at 45 degrees to the core axis with medium grained quartz clasts included. Cross-cutting chlorite veins are at 60 to 70 degrees to the core axis.
22.56	25.15	Quartz lithic volcaniclastic as above, silica sericite and carbonate altered with cross-cutting quartz chlorite veins at 70 to 90 degrees to the core axis.
25.15	25.28	Quartz rich volcaniclastic, strongly chlorite altered.
25.28	25.60	Quartz lithic volcaniclastic, silica sericite and carbonate altered with chlorite veins as above.
25.60	25.65	Black siltstone with 5% arsenopyrite, 1% pyrite and 1% chalcopyrite associated with carbonate veining / alteration.
25.65	26.50	Quartz lithic volcaniclastic with some fiamme at 27.50 and a black siltstone bed at 28.30 at 30 degrees to the core axis. Rock is silica sericite and carbonate altered.
26.50	26.90	Quartz lithic volcaniclastic strongly chlorite altered.
26.90	27.70	Silica sericite and carbonate altered quartz volcaniclastic with 0.5% arsenopyrite chalcopyrite from 27.20 to 27.30.
27.70	27.90	As above with three black siltstone beds at 45 degrees to the core axis.
27.90	30.95	Quartz lithic volcaniclastic, silica sericite and carbonate altered. Rock contains minor pyrite in disseminations and blebs. Rock contains haematite veins from 27.95 to 28.40 and 29.65 to 29.90.
30.95		E.O.H.

Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
SG0020	22.00	23.00	1.00	.40
SG0021	23.00	24.00	1.00	.83
SG0022	24.00	25.00	1.00	.31
SG0023	25.00	26.00	1.00	.65
SG0024	26.00	27.00	1.00	.81
SG0025	27.00	28.00	1.00	.64
SG0026	28.00	29.00	1.00	.09
SG0027	29.00	30.00	1.00	.04
SG0028	30.00	30.95	.95	.08

974076

HOLE NO. : GP-90-8 | PLUTONIC OPERATIONS LIMITED | Page: 1
SECTION : 2520.00 EAST | GOWRIE PARK

DIAMOND DRILL RECORD

Northing : 4922.00
Easting : 2520.00
Grid : FIRE TOWER
Direction : Grid South
Inclination : -55.0
Elevation : 9975.00
Azimuth : 180.0
Mag Azimuth : 0.70 m
Length (m) : 30.15
Precol. (m) : 0.70 m
BOCO : 0.70 m
TFR : <0.70 m
Water Table :

Drill Type :
Core Size :
Contractor :N Poltock

Dip Tests Method:

Depth	Az	Dip
30.1	180.0	-55.0

Property : FIRE TOWER
State : Tasmania
GMR : GOG 4440
E.L. No. : GOWRIE PARK
Project No. : 706
Date Started :
Date Completed:
Logged by : G. MacDONALD
Relogged by :
Date Logged : May '92
Interpreted : G. MacDONALD
Initialled

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
.00	.70	PRECOLLAR					
.70	3.70	VOLCANICLASTIC FINE GRAINED VOLCANICLASTIC. Cream silica sericite altered fine grained volcaniclastic, weathered and leached with overprinting brown colour after haematite. Occasional haematite veins are generally at high angles to the core axis. Some fresh pyrite veins have oxidised haematite selvedges with approximately 2% pyrite throughout. Fine fractures have manganese staining. The rock contains fine quartz chlorite veins generally at high angles to the core axis, predominantly from 2.40 to 3.50 with a 20 mm thick vein with brecciated selvedges at 60 degrees to the core axis at 3.45. The rock is generally fine grained but contains very occasional medium grained quartz fragments at 2.30. Haematite veins postdate the quartz chlorite veins. From 3.50 to 3.70 the rock is very chloritic throughout with medium grained to coarse grained sub - rounded quartz clasts.	SH000X SH0000 SH0001	.70 2.00 3.00	2.00 3.00 4.00	1.30 1.00 1.00	1.34 1.18 .86
3.70	4.90	VOLCANICLASTIC QUARTZ LITHIC VOLCANICLASTIC, SERICITISED. Pale cream silica sericite altered medium grained to coarse grained quartz and other lithics. The rock contains occasional pyrite clots with 1% pyrite throughout. The rock is occasionally weakly chloritic but with irregularly oriented quartz chlorite veins throughout.	SH0002	4.00	5.00	1.00	.72
4.90	7.95	VOLCANICLASTIC QUARTZ LITHIC VOLCANICLASTIC, CHLORITIC. Similar to overlying rock except moderately chlorite and carbonate altered. Rock has chlorite veins at 70 to 80 degrees to the core axis. Quartz carbonate veins at 70 to 80 degrees to the core axis cross-cut the quartz chlorite veins but the quartz chlorite veins cross-cut diffuse carbonate alteration. Quartz carbonate veins are often sub - parallel to the quartz chlorite veins. The rock is finely carbonate altered throughout. The rock contains occasional lithics and approximately 1% pyrite throughout	SH0003 SH0004 SH0005	5.00 6.00 7.00	6.00 7.00 8.00	1.00 1.00 1.00	.29 .17 .99

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
		in clots.					
7.95	9.50	VOLCANICLASTIC FINE GRAINED VOLCANICLASTIC, SERICITISED. Fine grained, beige green silica sericite carbonate altered volcaniclastic with medium grained to coarse grained fiamme to 2 mm. Veining more common downhole with veins consisting of chlorite, haematite, carbonate and pyrite with approximately 2% pyrite throughout. The rock has a moderately brecciated, chlorite sericite altered lower contact with the underlying quartz rich volcaniclastic.	SH0006 SH0007	8.00 9.00	9.00 10.00	1.00 1.00	.05 .01
9.50	11.10	VOLCANICLASTIC FINE AND MEDIUM GRAINED VOLCANICLASTIC, SERICITISED. Interbedded fine grained beige green volcaniclastic with some medium grained fiamme and medium grained to coarse grained quartz, occasional lithics, volcaniclastic. The rock is silica sericite and carbonate altered throughout. The rock contains three weathered and leached haematite veins at 20 degrees to the core axis. The lower contact is irregular and at 25 degrees to the core axis.	SH0008 SH0009	10.00 11.00	11.00 12.00	1.00 1.00	<.01 <.01
11.10	16.25	VOLCANICLASTIC QUARTZ LITHIC FIAMME VOLCANICLASTIC. 11.10 14.20 The rock is silica sericite and carbonate altered throughout. The rock is foliated at 60 degrees to the core axis. Lithics include siltstone and fine grained tuff fragments to 30 mm. 14.20 15.50 Rock is silica sericite and carbonate altered and is strongly oxidised with approximately 4% pyrite in veins often oxidised. Rock contains some fine chlorite veins with weak chlorite alteration downhole. 15.50 16.25 Rock now moderately to strongly chlorite and sericite altered. Oxidised haematite veins after pyrite are at 80 and 40 degrees to the core axis. All sulphides oxidised. Lower contact has manganese staining and is at 35 degrees to the core axis.	SH0010 SH0011 SH0012 SH0013 SH0014	12.00 13.00 14.00 15.00 16.00	13.00 14.00 15.00 16.00 17.00	1.00 1.00 1.00 1.00 1.00	<.01 <.01 <.01 <.01 <.01
16.25	17.20	PELITE SILTSTONE, GREY GREEN. Fine grained, grey green, siliceous chloritic siltstone with ovoid quartz to 5 mm and bedding at 15 degrees to the core axis at 17.15. The rock contains carbonate filled fractures throughout and weathered and leached haematite veins. Lower contact is sharp and marked by a quartz carbonate haematite vein at 20 degrees to the core axis.	SH0015	17.00	18.00	1.00	.04
17.20	19.75	VOLCANICLASTIC QUARTZ VOLCANICLASTIC, CHLORITE AND SERICITE ALTERED. 17.20 19.25 Medium grained quartz rich volcaniclastic with numerous quartz haematite carbonate veins generally at 80 degrees to the core axis and 30 degrees to the core axis. Some manganese	SH0016 SH0017	18.00 19.00	19.00 20.00	1.00 1.00	<.01 <.01

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
		staining of fractures from 17.20 to 17.50. Rock is more silicified downhole. Rock contains negligible sulphides.					
	19.25 19.75	Very fine grained, siliceous, green to beige green rock with ovoid pods of quartz, occasionally with chlorite rims, elongate to 25 degrees to the core axis. Rock is cross-cut by numerous leached haematite veins at 65 to 90 degrees to the core axis and fine quartz chlorite veins. Rock contains negligible sulphides.					
19.75	30.15	VOLCANICLASTIC					
		QUARTZ LITHIC VOLCANICLASTIC, CHLORITE AND SERICITE ALTERED	SH0018	20.00	21.00	1.00	<.01
	19.75 27.15	Medium grained to coarse grained sub - rounded quartz and lithic rich volcaniclastic. Lithics are generally fine grained pale green to dark green siltstones. To 21.40 the rock is silica carbonate and moderately chlorite altered. Below 21.40 it is variably chlorite and sericite altered with silica and carbonate alteration throughout. The rock contains a fine grained siltstone from 20.95 to 21.05 with upper contact and lower contact marked by leached haematite veins. The rock is predominantly lithic rich below 22.00 with lithics 25% of the rock. The rock contains chalcopyrite in a quartz haematite vein at 25.85. The rock contains quartz chlorite veins at 70 to 90 degrees to the core axis below 26.20. The rock contains quartz carbonate haematite veins at 45 to 70 degrees to the core axis throughout.	SH0019	21.00	22.00	1.00	<.01
			SH0020	22.00	23.00	1.00	.01
			SH0021	23.00	24.00	1.00	<.01
			SH0022	24.00	25.00	1.00	n/a
			SH0023	25.00	26.00	1.00	<.01
			SH0024	26.00	27.00	1.00	<.01
			SH0025	27.00	28.00	1.00	<.01
			SH0026	28.00	29.00	1.00	.02
			SH0027	29.00	30.00	1.00	.01
	27.15 27.25	As above but strongly chlorite altered with some haematite veins after pyrite.					
	27.25 28.35	As above but silica sericite altered rock in broken core.					
	28.35 30.15	As above with some fine grained dark grey lithics to 15 mm. Rock is silica sericite and carbonate altered becoming more silicified downhole.					
	30.15	E.O.H.					

974079

HOLE NO. : GP-90-9 | PLUTONIC OPERATIONS LIMITED | Page: 1
SECTION : 2560.00 EAST | GOWRIE PARK

DIAMOND DRILL RECORD

Northing	: 4965.50	Drill Type	:
Easting	: 2560.00	Core Size	:
Grid	: FIRE TOWER	Contractor	:N Poltock
Direction	: Grid South		
Inclination	: -49.0		
Elevation	: 9993.00		
Azimuth	: 180.0		
Mag Azimuth	:		
Length (m)	: 30.45	Dip Tests	Method:
Precol. (m)	: 0.30 m	Depth Az Dip	
BOCO	: <0.30 m	30.5 180.0 -49.0	
TFR	: 0.30 m		
Water Table	:		

Property	:	FIRE TOWER
State	:	Tasmania
GMR	:	GOG 4440
E.L. No.	:	GOWRIE PARK
Project No.	:	706
Date Started	:	
Date Completed	:	
Logged by	:	G. MacDONALD
Relogged by	:	
Date Logged	:	May '92
Interpreted	:	G. MacDONALD
Initialled	:	

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
.00	.30	PRECOLLAR					
.30	2.70	PSAMMITE / PELITE INTERBEDDED SEDIMENTS. Finely bedded at 35 to 50 degrees to the core axis. Rock consists of interbedded sandy to silty grey green to pale brown rock with white feldspars mafic and quartz with occasional cross-cutting haematite quartz veins.	SI000Y SI000X SI0000	.30 1.00 2.00	1.00 2.00 3.00	.70 1.00 1.00	<.01 <.01 <.01
2.70	3.40	PSAMMITE Pale pink massive feldspar rich sandstone.	SI0001	3.00	4.00	1.00	<.01
3.40	6.40	PSAMMITE / PELITE INTERBEDDED SEDIMENTS. Approximately 50% pale pink massive sandstone as above and 50% grey green bedded, at 45 degrees to the core axis siltstones to 10 mm.	SI0002 SI0003 SI0004	4.00 5.00 6.00	5.00 6.00 7.00	1.00 1.00 1.00	<.01 <.01 <.01
6.40	10.05	PELITE INTERBEDDED SILTSTONES. Pale grey siliceous siltstone with leached veins. Rock massive but with some visible bedding at 60 degrees to the core axis. Rock contains negligible sulphides.	SI0005 SI0006 SI0007 SI0008	7.00 8.00 9.00 10.00	8.00 9.00 10.00 11.00	1.00 1.00 1.00 1.00	<.01 <.01 .01 .19
10.05	10.70	PSAMMITE ARKOSIC SANDSTONE. Coarse grained and medium grained interbedded sandstone arkosic with elongate rock fragments to 2 mm of siltstone. Rock contains 1% pyrite in coarse grained clots throughout. Rock contains white feldspars and quartz.					
10.70	11.40	PELITE PALE GREY AND BLACK SILTSTONE. 10.70 11.00 Pale grey cherty siltstone in broken core. Rock contains 0.5% pyrite in disseminations. 11.00 11.40 Black siltstone with creamy interbeds. Bedding is strongly soft sediment deformed. Rock contains negligible sulphides.	SI0009	11.00	12.00	1.00	.02

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
11.40	15.20	VOLCANICLASTIC					
		QUARTZ LITHIC FIAMME VOLCANICLASTIC, SERICITISED. Beige green, sericite altered rock with medium grained quartz feldspars, occasional lithics (predominantly black siltstones) and fiamme foliated at 65 degrees to the core axis at 12.20. Rock is silica sericite and carbonate altered with minor pyrite in disseminations and associated with leached veins. Fiamme are up to 30 mm and at 65 degrees to the core axis. From 14.40 to 15.20 the rock is strongly oxidised with quartz carbonate haematite veins sub - parallel to and at 70 degrees to the core axis.	SI0010	12.00	13.00	1.00	<.01
			SI0011	13.00	14.00	1.00	<.01
			SI0012	14.00	15.00	1.00	<.01
			SI0013	15.00	16.00	1.00	.18
15.20	16.00	PELITE					
		SILTSTONE, INTERBEDDED DARK GREY. Interbedded dark grey siltstone with creamy green cherty siltstones interbeds. The rock contains some haematite veins at low angles to the core axis.					
16.00	16.70	VOLCANICLASTIC					
		VOLCANICLASTIC, SERICITISED. Silica sericite and carbonate altered medium grained quartz volcaniclastic. No sulphides.	SI0014	16.00	17.00	1.00	<.01
16.70	19.45	PSAMMITE / PELITE					
		INTERBEDDED SILTSTONE AND SANDSTONES. Interbedded siltstones and sandstones creamy and possibly hangingwall but the distinction in this hole is unclear as there are volcaniclastics up hole from these sediments, albeit relatively barren volcaniclastics.	SI0015	17.00	18.00	1.00	<.01
			SI0016	18.00	19.00	1.00	<.01
			SI0017	19.00	20.00	1.00	<.01
		16.70 17.15 Creamy grey to black laminated cherty siltstone. Bedding is at 30 degrees to the core axis. Rock is quartz rich.					
		17.15 18.00 Oxidised cream clayey medium grained quartz rich sandstone with feldspars and occasional darker fragments. Rock contains liezer gange rings. Lower contact is sharp and at 30 degrees to the core axis.					
		18.00 18.18 Black siltstone as for 16.70 to 17.15.					
		18.18 18.70 Sandstone as for 17.15 to 18.00.					
		18.70 18.85 Black siltstone as for 16.70 to 17.15.					
		18.85 18.92 Sandstone as for 17.15 to 18.00.					
		18.92 19.45 Black siltstone as for 16.70 to 17.15. 2 cm thick siltstone bed at base.					
19.45	28.50	PELITE					
		INTERBEDDED SILTSTONE. Rhythmically interbedded dark grey siltstone and cream to beige green beds. Bedding is micro fractured and micro faulted throughout with bedding from 0 to 45 degrees to the core axis. Leached veining is generally sub - parallel to or sub - perpendicular to bedding. Rock contains no sulphides. Some relatively broad folding is suggested by bedg orientation.	SI0018	20.00	21.00	1.00	<.01
			SI0019	21.00	22.00	1.00	<.01
			SI0020	22.00	23.00	1.00	<.01
			SI0021	23.00	24.00	1.00	<.01
			SI0022	24.00	25.00	1.00	<.01
			SI0023	25.00	26.00	1.00	.01
			SI0024	26.00	27.00	1.00	<.01
			SI0025	27.00	28.00	1.00	<.01
			SI0026	28.00	29.00	1.00	<.01
28.50	30.45	VOLCANICLASTIC					
		QUARTZ LITHIC FIAMME VOLCANICLASTIC.	SI0027	29.00	30.00	1.00	<.01

974081

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
		Silica sericite and carbonate altered medium grained to coarse grained quartz lithic fiamme volcaniclastic. Lithics include beige green siltstones and quartz feldspar phyric volcanics. Rock contains pyrite and very minor chalcopyrite to 29.95. Below 29.95 the rock contains 5% pyrite and 0.5% arsenopyrite and trace chalcopyrite. Pyrite veins generally at low angles to the core axis with pyrite chalcopyrite veins at 60 to 70 degrees to the core axis. The rock is foliated below 29.95 at 30 degrees to the core axis and is quartz rich.	SI0028	30.00	30.45	.45	1.07
	30.45	E.O.H.					

974082

HOLE NO. : GP-90-10 | PLUTONIC OPERATIONS LIMITED | Page: 1
SECTION : 2540.00 EAST | GOWRIE PARK

DIAMOND DRILL RECORD

Northing	: 4960.50	Drill Type :	Property : FIRE TOWER
Easting	: 2540.00	Core Size :	State : Tasmania
Grid	: FIRE TOWER	Contractor :N Poltock	GMR : GOG 4440
Direction	: Grid South		E.L. No. : GOWRIE PARK
Inclination	: -45.0		Project No. : 706
Elevation	: 9992.00		Date Started :
Azimuth	: 180.0		Date Completed:
Mag Azimuth	:		Logged by : G. MacDONALD
Length (m)	: 30.25	Dip Tests Method:	Relogged by :
Precol. (m)	: 0.40 m	Depth Az Dip	Date Logged : May '92
BOCO	: <0.40 m	30.3 180.0 -45.0	Interpreted : G. MacDONALD
TFR	: 0.40 m		
Water Table	:		Initialled :

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
.00	.40	PRECOLLAR					
.40	2.10	PELITE SILTSTONE, INTERBEDDED. Dark grey to grey siltstones, finely laminated to 1.00, more and massive dark grey to 2.10. Soft sediment micro fractures and faults to 1.00. Brecciation and veining below 1.60. Rock contains numerous irregularly oriented fine oxidised veins after pyrite. Some minor chalcopyrite in quartz carbonate haematite veins at 70 degrees to the core axis. Minor fine grained pyrite in fine veinlets. The brecciated rock has a carbonate matrix. Bedding is at 10 to 20 degrees to the core axis in the laminated part.	SJ000Y SJ000X SJ0000	.40 1.00 2.00	1.00 2.00 3.00	.60 1.00 1.00	.19 .39 .01
2.10	4.35	PELITE / VOLCANICLASTIC SILTSTONE, BEIGE GREEN. Beige green to pale brown, fine grained, siliceous siltstone. From 2.10 to 3.00 the rock contains carbonate haematite veining at 40 degrees to the core axis and parallel to the core axis. From 3.00 to 3.70 the rock contains quartz carbonate haematite veins at 70 degrees to the core axis. From 2.10 to 2.90 the rock contains only minor pyrite with 4% pyrite in veins from 2.90 to 3.70. The rock contains lithics at 3.30.	SJ0001 SJ0002	3.00 4.00	4.00 5.00	1.00 1.00	.04 <.01
4.35	13.00	VOLCANICLASTIC QUARTZ LITHIC FIAMME VOLCANICLASTIC, SERICITISED. 4.35 7.45 Silica sericite and carbonate altered, quartz lithic fiamme volcaniclastic. Rock is moderately oxidised. Rock contains manganese staining on fractures. Rock contains minor pyrite except for 10% pyrite from 7.00 to 7.45 in a vein sub - parallel to core axis. Rock contains leached veins at 30 degrees to the core axis. 7.45 8.05 Moderately oxidised volcaniclastic as above but very sulphidic with 10% pyrite in irregular veins and irregular patches with oxidised selvedges. 8.05 8.80 Beige green volcaniclastic as above but now	SJ0003 SJ0004 SJ0005 SJ0006 SJ0007 SJ0008 SJ0009 SJ0010	5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00	6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	<.01 .01 3.27 .51 .58 30.00 21.00 13.15

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
		fiamme rich. Rock is strongly foliated at 40 degrees to the core axis. Rock contains 3% galena in veins, diffuse patches and disseminations generally associated with pyrite at 2% and occasionally minor sphalerite. Quartz carbonate haematite veins at 70 degrees to the core axis from 8.70 to 8.80.					
	8.80 11.30	Moderately oxidised volcaniclastic as above. Rock contains 5% pyrite in veins and patches with oxidised selvedges with minor chalcopyrite predominantly from 10.65 to 10.90 associated with a quartz carbonate haematite vein at 30 degrees to the core axis. The rock contains some coarse grained lithics predominantly black siltstones and fiamme.					
	11.30 13.00	Still medium grained quartz rich volcaniclastic with some fiamme and black siltstone clasts. The rock is silica sericite and carbonate altered throughout and contains minor chalcopyrite associated with quartz carbonate haematite veins at 70 to 80 degrees to the core axis. The rock contains 10% pyrite throughout in oxidised clots. This is a high grade intersection and is very pyritic.					
13.00	13.50	BRECCIA Angular breccia, not soft sediment, with fractures healed by carbonate contituting 30% of the rock. 2% galena is coeval with the carbonate. The brecciated rock is a fine grained siliceous olive green tuffaceous siltstone as for 13.50 to 15.50. Some clasts are elongate up to 20 mm. The upper contact is at 20 degrees to the core axis and marked by a quartz vein. The rock is moderately foliated at 40 degrees to the core axis in the upper part and parallel to the core axis in the lower and is probably brecciated in-situ.	SJ0011	13.00	14.00	1.00	.64
13.50	15.50	PELITE / VOLCANICLASTIC SILTSTONE OR FINE GRAINED VOLCANICLASTIC. Green to dark green, fine grained volcaniclastic. Bedding is generally < 10 mm thick but is very micro fractured and faulted. The rock contains numerous quartz carbonate haematite veins at 70 to 80 degrees to the core axis with 0.5% galena throughout in quartz carbonate veins and minor pyrite and trace chalcopyrite. The rock is moderately brecciated from 13.75 to 14.00 with carbonate filling the breccia.	SJ0012 SJ0013	14.00 15.00	15.00 16.00	1.00 1.00	1.28 1.41
15.50	16.35	PELITE BLACK SILTSTONE. Diffuse gradational upper contact. The rock is a black siltstone with carbonate filled irregular fractures. Bedding is disturbed. The lower contact is gradational with intermixing of beds.	SJ0014	16.00	17.00	1.00	2.67
16.35	18.00	PELITE SILTSTONE.	SJ0015	17.00	18.00	1.00	1.41

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
		Green to dark green interbedded siltstones. Bedding is disturbed with micro fractures and faults. Some bedding is perpedicular to other bedding in places. Cross-cutting quartz carbonate haematite veins contain minor galena and very minor chalcopyrite and are cross-cutting at 70 to 80 degrees to the core axis. The rock is moderately brecciated with 2% pyrite in carbonate filling of brecciation.					
		17.15 17.85 As above but strongly brecciated with carbonate filling of brecciation and occasional pyrite in veins.					
		17.85 18.00 Now dark grey siltstone strongly carbonate veined.					
18.00	18.50	VOLCANICLASTIC					
		VOLCANICLASTIC, SERICITISED. Silica sericite and carbonate altered medium grained quartz rich volcaniclastic with minor interbedded green to dark grey siltstone as above. Upper contact is sharp at 50 degrees to the core axis. Rock contains cross-cutting quartz carbonate haematite veins at 70 to 80 degrees to the core axis.	SJ0016	18.00	19.00	1.00	.84
18.50	30.25	PELITE					
		SILTSTONE, INTERBEDDED.	SJ0017	19.00	20.00	1.00	4.59
		18.50 18.85 Interbedded dark green to dark grey fine grained siliceous siltstone with micro fractured and faulted bedding.	SJ0018	20.00	21.00	1.00	7.29
			SJ0019	21.00	22.00	1.00	.54
			SJ0020	22.00	23.00	1.00	.25
		18.85 19.50 Strongly brecciated zone with haematite and manganese staining. Rock is a green siltstone.	SJ0021	23.00	24.00	1.00	1.74
			SJ0022	24.00	25.00	1.00	.34
		19.50 26.35 Green fine grained siliceous siltstone with interbedded black siltstone beds making up 10% of the rock. Bedding is micro fractured and faulted. Rock is generally carbonate altered. Rock contains cross-cutting quartz carbonate haematite veins and only very minor occasional pyrite.	SJ0023	25.00	26.00	1.00	.03
			SJ0024	26.00	27.00	1.00	.79
			SJ0025	27.00	28.00	1.00	.54
			SJ0026	28.00	29.00	1.00	.36
			SJ0027	29.00	30.00	1.00	.14
		26.35 26.55 Volcaniclastic interbed. Rock is medium grained quartz rich silica sericite and carbonate altered volcaniclastic with possible olive green lithics.					
		26.55 28.30 As for 19.50 to 26.35. Bedding is at 25 degrees to the core axis at 27.50 and 40 degrees to the core axis at 27.25.					
		28.30 28.65 Interbedded green and black siltstones as above but with approximately 25% interbedded medium grained quartz rich volcaniclastic. Rock contains 4% pyrite in irregular clots throughout.					
		28.65 30.25 Interbedded green and black siltstones with the black siltstone component decreasing downhole. Rock contains 4% pyrite from 28.65 to 29.30 in irregular clots and veins. Bedding is moderately micro fractured and faulted, at 30 degrees to the core axis at 29.40. The rock contains cross-cutting quartz carbonate haematite veins throughout.					

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
	30.25	E.O.H.					

974086

HOLE NO. : GP-90-11
SECTION : 2360.00 EAST

PLUTONIC OPERATIONS LIMITED
GOWRIE PARK

Page: 1

Northing : 4969.00
Easting : 2360.00
Grid : FIRE TOWER
Direction : Grid South
Inclination : -44.0
Elevation : 9913.00
Azimuth : 360.0
Mag Azimuth :
Length (m) : 30.10
Precol. (m) : 0.65 m
BOCO : <0.65 m
TFR : 0.65 m
Water Table :

DIAMOND DRILL RECORD

Drill Type :
Core Size :
Contractor :N Poltock

Dip Tests Method:

Depth	Az	Dip
30.1	360.0	-44.0

Property : FIRE TOWER
State : Tasmania
GMR : GOG 4440
E.L. No. : GOWRIE PARK
Project No. : 706
Date Started :
Date Completed:
Logged by : G. MacDONALD
Relogged by :
Date Logged : May '92
Interpreted : G. MacDONALD

Initialled :

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
.00	.65	PRECOLLAR					
.65	30.10	PSAMMITE / PELITE					
		SEDIMENTS.	SK000Y	.65	1.00	.35	<.01
		The whole hole intersects sand to silt grade sediments	SK000X	1.00	2.00	1.00	<.01
		with occasional lithics to 10 mm.	SK0000	2.00	3.00	1.00	<.01
		.65 1.30 As above but rock moderately oxidised with	SK0001	3.00	4.00	1.00	<.01
		weathered and leached quartz haematite veins.	SK0002	4.00	5.00	1.00	<.01
		1.30 8.20 SEDIMENTS, TAN.	SK0003	5.00	6.00	1.00	<.01
		1.30 6.25 Predominantly tan brown sediments with orange	SK0004	6.00	7.00	1.00	<.01
		clays after feldspars some chloritic clasts and	SK0005	7.00	8.00	1.00	<.01
		quartz. Rock is generally massive, bedded at 40	SK0006	8.00	9.00	1.00	<.01
		degrees to the core axis at 2.50.	SK0007	9.00	10.00	1.00	<.01
		6.25 6.50 As above but with occasional pale grey clasts to	SK0008	10.00	11.00	1.00	<.01
		10 mm.	SK0009	11.00	12.00	1.00	<.01
		6.50 8.20 As logged for 1.30 to 6.25.	SK0010	12.00	13.00	1.00	<.01
		8.20 13.00 SEDIMENTS, GREEN.	SK0011	13.00	14.00	1.00	<.01
		8.20 10.50 Grey green sediments with feldspars and	SK0012	14.00	15.00	1.00	<.01
		elongate chloritic phenocrysts (?).	SK0013	15.00	16.00	1.00	<.01
		10.50 13.00 Rock in broken core with weakly oxidised	SK0014	16.00	17.00	1.00	1.22
		fractures but else as for 8.20 to 10.50.	SK0015	17.00	18.00	1.00	.97
		13.00 19.00 SEDIMENTS, TAN.	SK0016	18.00	19.00	1.00	1.34
		Rock in broken core but tan arkosic sediments, massive to	SK0017	19.00	20.00	1.00	.01
		16.50, more silty and bedded at low angles to the core	SK0018	20.00	21.00	1.00	<.01
		axis below 16.50. Lower contact at 40 degrees to the core	SK0019	21.00	22.00	1.00	<.01
		axis. The rock contains occasional irregularly oriented	SK0020	22.00	23.00	1.00	<.01
		fine clay filled fractures.	SK0021	23.00	24.00	1.00	<.01
		19.00 28.00 SEDIMENTS, GREEN.	SK0022	24.00	25.00	1.00	<.01
		Interbedded massive sand grade and bedded silt grade	SK0023	25.00	26.00	1.00	<.01
		greywackes. Rock contains occasional clay filled fractures	SK0024	26.00	27.00	1.00	<.01
		at 45 degrees to the core axis.	SK0025	27.00	28.00	1.00	<.01
		28.00 30.10 SEDIMENTS, TAN.	SK0026	28.00	29.00	1.00	<.01
		Weakly oxidised arkosic, massive occasionally bedded at 45	SK0027	29.00	30.10	1.10	<.01
		degrees to the core axis, tan brown sediments.					
		30.10 E.O.H.					

HOLE NO. : GP-90-12
SECTION : 2360.00 EAST

PLUTONIC OPERATIONS LIMITED
GOWRIE PARK

DIAMOND DRILL RECORD

Page:

Northing : 4969.00
Easting : 2360.00
Grid : FIRE TOWER
Direction : Grid South
Inclination : -60.0
Elevation : 9913.00
Azimuth : 180.0
Mag Azimuth :
Length (m) : 30.10
Precol. (m) : 0.60 m
BOCO : <0.60 m
TFR : 0.60 m
Water Table :

Drill Type :
Core Size :
Contractor :N Poltock

Dip Tests Method:

Depth	Az	Dip
30.1	180.0	-60.0

Property : FIRE TOWER
State : Tasmania
GMR : GOG 4440
E.L. No. : GOWRIE PARK
Project No. : 706
Date Started :
Date Completed:
Logged by : G. MacDONALD
Relogged by :
Date Logged : May '92
Interpreted : G. MacDONALD

Initialled

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
.00	.60	PRECOLLAR					
.60	11.20	PSAMMITE					
		SANDSTONE, MINOR PELITE.	SL000Y	.60	1.00	.40	<.01
		.60 5.00 Weakly oxidised, generally sand grade, massive grey green sandstone / greywacke. The rock contains very minor fractures / veins and no sulphides.	SL000X	1.00	2.00	1.00	<.01
			SL0000	2.00	3.00	1.00	<.01
			SL0001	3.00	4.00	1.00	<.01
			SL0002	4.00	5.00	1.00	<.01
		5.00 5.75 Silt grade grey green siltstone with bedding at 40 degrees to the core axis.	SL0003	5.00	6.00	1.00	<.01
			SL0004	6.00	7.00	1.00	<.01
		5.75 11.20 Predominantly tan brown to green brown sand grade, massive sandstone. Bedding is at 40 degrees to the core axis. Rock becomes more silty below 9.35.	SL0005	7.00	8.00	1.00	<.01
			SL0006	8.00	9.00	1.00	<.01
			SL0007	9.00	10.00	1.00	<.01
			SL0008	10.00	11.00	1.00	<.01
			SL0009	11.00	12.00	1.00	<.01
11.20	13.50	PELITE					
		SILTSTONE, BEDDED.	SL0010	12.00	13.00	1.00	<.01
		Finely bedded predominantly silty rock with some sandy and shaley beds. The rock is generally grey green, else brown with the shale beds dark grey. Bedding is at 50 degrees to the core axis with micro faults and fractures sub - perpedicular to bedding.	SL0011	13.00	14.00	1.00	<.01
13.50	13.80	SHEAR ZONE					
		Mylonitised shear zone with ovoid clasts of grey green siltstone in a sericite clay matrix with fine orange brown clay tails on rotated clasts. Shearing is oriented at 35 degrees to the core axis.					
13.80	16.20	PELITE					
		SILTSTONE, BEDDED.	SL0012	14.00	15.00	1.00	<.01
		Rhythmically bedded as for 11.20 to 13.50 but bedding now dark grey green at 50 degrees to the core axis.	SL0013	15.00	16.00	1.00	<.01
			SL0014	16.00	17.00	1.00	<.01
16.20	17.10	PSAMMITE					
		QUARTZ FELDSPAR VOLCANICLASTIC.	SL0015	17.00	18.00	1.00	<.01
		Quartz feldspar rich volcaniclastic with chlorite interstices weathered to clay. Upper contact is irregular					

974088

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
		but sharp with overlying siltstone. Rock contains some very coarse grained (to 8 mm) siltstone clasts and chloritic fiamme with discernible bedding at 45 degrees to the core axis.					
17.10	18.05	PELITE SILTSTONE, BEDDED. Dark grey green to olive green siltstone with black interbeds. Rock is rhythmically interbedded with bedding disturbed with micro fractures and faults. Bedding generally at 50 to 80 degrees to the core axis.	SL0016	18.00	19.00	1.00	<.01
18.05	19.00	PELITE BLACK SILTSTONE. Very pyritic fine grained black siltstone with 5% pyrite in veins and patches of fine grained disseminations.					
19.00	20.30	PELITE SILTSTONE, BEDDED. Rock as for 17.10 to 18.05 with bedding at 80 degrees to the core axis.	SL0017 SL0018	19.00 20.00	20.00 21.00	1.00 1.00	<.01 1.09
20.30	30.10	VOLCANICLASTIC QUARTZ LITHIC VOLCANICLASTIC, SERICITIC. Medium grained to coarse grained quartz rich volcaniclastic with occasional lithics consisting of black siltstone and pale green siliceous siltstone to 10 mm. Clasts are sub - rounded. The matrix is silica and sericite altered. The rock is oxidised throughout with leached carbonate haematite veins generally at 70 to 80 degrees to the core axis. From 21.00 to 24.00 there are occasional moderately chloritic patches. Bedding at 21.35 is at 45 degrees to the core axis. 30.10 E.O.H.	SL0019 SL0020 SL0021 SL0022 SL0023 SL0024 SL0025 SL0026 SL0027	21.00 22.00 23.00 24.00 25.00 26.00 27.00 28.00 29.00	22.00 23.00 24.00 25.00 26.00 27.00 28.00 29.00 30.10	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.10	.03 <.01 <.01 <.01 <.01 .03 .04 .03 .05

 974089

HOLE NO. : GP-90-13
SECTION : 2354.00 EAST

PLUTONIC OPERATIONS LIMITED
GOWRIE PARK

DIAMOND DRILL RECORD

Northing : 4938.00
Easting : 2354.00
Grid : FIRE TOWER
Direction : Grid South
Inclination : -45.0
Elevation : 9885.00
Azimuth : 360.0
Mag Azimuth :
Length (m) : 30.60
Precol. (m) : 0.20 m
BOCO : <0.20 m
TFR : 0.20 m
Water Table :

Drill Type :
Core Size :
Contractor :N Poltock

Dip Tests Method:

Depth	Az	Dip
30.6	360.0	-45.0

Property : FIRE TOWER
State : Tasmania
GMR : GOG 4440
E.L. No. : GOWRIE PARK
Project No. : 706
Date Started :
Date Completed:
Logged by : G. MacDONALD
Relogged by :
Date Logged : May '92
Interpreted : G. MacDONALD

Initialled :

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
.00	.20	PRECOLLAR					
.20	13.50	VOLCANICLASTIC					
		QUARTZ LITHIC RICH VOLCANICLASTIC. Beige green to grey green, medium grained to coarse grained (up to 30 mm), massive rock consisting of predominantly of milky white quartz and lesser lithics in a silica sericite carbonate altered matrix. The quartz is generally medium grained and sub - rounded to sub - angular and has a somewhat 'ghosted' appearance due to the alteration. To 7.40 m the lithics are generally rarer and medium grained. Below 7.40 m they are coarse grained and more prominent. The rock is oxidised to 12.20. The rock is cross-cut throughout by quartz carbonate haematite veins generally at 45 to 90 degrees to the core axis. Occasional pyrite veins have oxidised selvedges. There is some manganese staining of fractures to 2.85. Generally only minor pyrite in veins.	SM000Y	.20	1.00	.80	.27
			SM000X	1.00	2.00	1.00	.07
			SM0000	2.00	3.00	1.00	.88
			SM0001	3.00	4.00	1.00	.20
			SM0002	4.00	5.00	1.00	.37
			SM0003	5.00	6.00	1.00	.33
			SM0004	6.00	7.00	1.00	.50
			SM0005	7.00	8.00	1.00	.21
			SM0006	8.00	9.00	1.00	.03
			SM0007	9.00	10.00	1.00	<.01
			SM0008	10.00	11.00	1.00	<.01
			SM0009	11.00	12.00	1.00	.04
			SM0010	12.00	13.00	1.00	.25
			SM0011	13.00	14.00	1.00	.02
.20	2.15	As above but strongly oxidised with occasional manganese staining of fractures and beige green and orange brown fine micro-fractures. The rock is silica, sericite and carbonate altered throughout.					
2.15	7.40	As above but beige green moderately oxidised minor manganese staining of fractures. Lithics include pale green and grey fine grained siliceous sediments.					
7.40	9.10	As above but weakly oxidised, mottled grey green due to somewhat spotty carbonate and chloritic alteration. The rock contains chlorite and / or quartz carbonate veining throughout, generally at 60 to 80 degrees to the core axis and oxidised quartz carbonate haematite veins sub - parallel to the chlorite veins. Lithics include fine grained grey to grey green siliceous sediments. Occasional carbonate filled fractures are generally at 50 degrees to the core axis.					
9.10	10.40	As above but silicified, sericitized and carbonate altered, occasionally chloritic,					

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
		beige green, moderately oxidised quartz rich volcaniclastic with manganese staining of fractures. Lithics somewhat masked by alteration					
	10.40	11.90 As above but grey green mottled, chloritic rock. Mottling due to strong carbonate and chlorite alteration of matrix. Occasional quartz carbonate veins at 70 to 80 degrees to the core axis. Minor haematite.					
	11.90	12.40 As above but beige brown brown strongly silicified sericitized and with strong carbonate alteration of matrix. Very coarse grained sub - angular lithics to 15 mm are fine grained grey and siliceous. Rock contains occasional pinky orange carbonate veins to 3 mm variably oriented. Rock becomes increasingly oxidised down hole.					
	12.40	13.50 As above but very strongly oxidised in very broken core. Rock is silicified, sericitized and carbonate altered and contains medium grained quartz. Possibly a sheared contact with the underlying rock.					
13.50	18.45	FELSIC MASS FLOW					
		BRECCIA-MASS FLOW (?) / CHLORITIC.	SM0012	14.00	15.00	1.00	.63
		Medium grained to coarse grained, dark green, massive to very weakly foliated quartz lithic rich volcaniclastic with very occasional possible fiamme (?). Rock is silicified and chloritic throughout with variable carbonate in fine veins. Rock contains minor pyrite throughout locally to 1% in veins. Rock contains very minor quartz chlorite veins at variable orientations and very occasional quartz carbonate haematite veins. Lithics are sub - angular to sub - rounded consisting of fine grained grey siliceous and very dark green fine grained chloritic rock. Quartz is milky white and medium grained to coarse grained sub - rounded.	SM0013	15.00	16.00	1.00	.04
			SM0014	16.00	17.00	1.00	.08
			SM0015	17.00	18.00	1.00	.03
			SM0016	18.00	19.00	1.00	.02
	13.50	15.00 As above. Incudes a fine grained dark grey siliceous siltstone (?) clast 25 mm, and another dark grey siliceous clast with creamy quartz rimmed quartz clasts (?) and possible fiamme from 14.20 to 14.30. Rock contains quartz carbonate veins at 45 degrees to the core axis.					
	15.00	15.70 As above but moderately oxidised, weak to moderately brecciated rock in broken core. Probably not a shear zone. Rock contains minor pyrite veins and chlorite veins at 70 to 80 degrees to the core axis.					
	15.70	18.10 As above but with occasional very coarse grained lithics (to 15mm), very dark green irregular clasts/alteration effects (?), other clasts and quartz and feldspars, now medium grained to coarse grained.					
	18.10	18.45 As above but dark green to orange brown, moderately oxidised, massive, medium grained to coarse grained quartz, lithic rich rock essentially as logged for 13.50 to 18.10 but					

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
		in very broken core. Lithics include sub - angular dark grey fine grained sediments.					
18.45	23.50	FELSIC MASS FLOW					
		BRECCIA WITH FIAMME / MASS FLOW (?).	SM0017	19.00	20.00	1.00	<.01
		Possibly a second discrete mass flow. The last 1.3 m could possibly be included in the following unit. Rock is dark green to very dark green, massive, medium grained to very coarse grained and consists of medium grained to coarse grained sub - rounded milky white quartz and coarse grained to very coarse grained lithics often 'ghosted' including fine grained sediments and fiamme to 20 mm in a chloritic variably carbonate altered matrix. Rock contains minor pyrite throughout in veins and locally very minor chalcopyrite and possibly arsenopyrite.	SM0018	20.00	21.00	1.00	.05
			SM0019	21.00	22.00	1.00	.05
			SM0020	22.00	23.00	1.00	.05
			SM0021	23.00	24.00	1.00	.07
		18.45 20.45 As above but grey green to dark green medium grained to very coarse grained (up 50 mm) milky white quartz and lithic rich volcaniclastic again. Rock is silicified and chloritic with a variably carbonate altered matrix. Lithics include dark green, fine grained, siliceous, sediments and pale green siliceous siltstone as well as possible chloritic fiamme. Quartz is medium grained to coarse grained. The rock contains minor pyrite veining and associated very minor chalcopyrite and possibly arsenopyrite.					
		20.45 22.20 As above but very dark green massive more matrix rich rock with occasional medium grained to coarse grained sub - angular ghosted clasts. Rock is very chloritic and contains only very occasional cross-cutting quartz carbonate chlorite veins at 45 degrees to the core axis. Rock contains minor pyrite and chalcopyrite in fine irregularly oriented veins.					
		22.20 23.50 As above but very green, massive, medium grained to coarse grained milky water table quartz and lithic rich volcaniclastic in moderately broken core but not a shear zone. Rock is chloritic and moderately carbonate altered throughout and is moderately oxidised throughout. The rock contains oxidised haematite veins at low angles to the core axis. The rock contains fine, irregularly oriented pyrite chlorite quartz veins. Lithics are generally very dark green and ghosted to 5 mm.					
23.50	26.95	VOLCANICLASTIC					
		QUARTZ LITHIC FIAMME VOLCANICLASTIC.	SM0022	24.00	25.00	1.00	<.01
		Dark green, medium grained to coarse grained, weakly foliated at 20 degrees to the core axis, rock consisting of somewhat sparse sub - rounded medium grained to coarse grained (up to 3 mm) milky white quartz and very dark green sub - angular, chloritic, lithics to 5 mm, occasionally up to 25 mm sub - parallel to to the core	SM0023	25.00	26.00	1.00	<.01
			SM0024	26.00	27.00	1.00	<.01

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
		axis at 26.70 as well as fiamme to 20 mm. The rock contains fine chlorite quartz veins at 80 to 40 degrees to the core axis and occasional quartz carbonate chlorite veins up to 5 mm thick variably oriented. The rock contains minor pyrite and occasionally very minor chalcopyrite associated with chlorite veining. Rock has somewhat gradational contact with the underlying silicified, sericitized carbonate altered rock.					
26.95	29.75	VOLCANICLASTIC					
		QUARTZ LITHIC VOLCANICLASTIC.	SM0025	27.00	28.00	1.00	.41
		26.95 29.75 Beige green to grey green, medium grained to coarse grained milky white quartz, occasional lithic rich, volcaniclastic. Rock is very strongly silicified and carbonate altered and is sericitized. The rock is variably chlorite altered, the chlorite associated with quartz, carbonate and sulphides in irregular veins. Lithics are pale green to dark green, fine grained siltstones and are generally sub - angular to 10 mm. Two intersections of very fine grained, black siltstone may be clasts or beds. These are both around 150 mm thick. The rock is strongly veined throughout with the dominant orientation around 45 to 70 degrees to the core axis.	SM0026	28.00	29.00	1.00	.97
			SM0027	29.00	30.00	1.00	.07
		26.95 27.20 As above but beige green to grey green strongly silicified and sericitized with carbonate altered spotty alteration and minor chlorite veining. Rock contains minor pyrite and trace arsenopyrite and possibly chalcopyrite. Medium grained quartz but no obvious lithics.					
		27.20 27.80 Cross-cutting grey green bands / bed of strongly sericitized, moderately silicified rock with medium grained sub - rounded quartz. Possibly a discrete bed or clast. Banding cross-cuts at 45 degrees to the core axis. And is in turn cross cut by quartz carbonate veins.					
		27.40 27.80 As above but beige green to grey green strongly veined with around 0.5% arsenopyrite and chalcopyrite associated with quartz carbonate chlorite veining / alteration at *around 20 degrees to the core axis*, predominantly from 27.65 to 27.80. Occasional medium grained quartz visible.					
		27.80 28.00 Black siltstone clast/bed. Upper contact slightly off set at 45 degrees to the core axis, lower contact at 35 degrees to the core axis. Rock is strongly quartz carbonate veined, up to 5 mm thick and oriented at 70 degrees to the core axis. Rock contains minor fine grained disseminated arsenopyrite and lesser chalcopyrite.					
		28.00 28.85 As above but beige green silicified, sericitized and carbonate altered. Rock contains numerous quartz-carbonate veins at 45					

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
		to 50 degrees to the core axis and contains 0.5% fine grained disseminated arsenopyrite pyrite and very minor chalcopyrite throughout. Rock contains medium grained quartz and medium grained to coarse grained lithics, predominantly black fine grained siltstone.					
28.85	29.00	Black siltstone clast or bed. Rock contains discrete patch of quartz and/or carbonate alteration and 1% fine grained disseminated arsenopyrite, 0.5% pyrite and minor chalcopyrite throughout. Upper contact around 60 degrees to the core axis, lower contact at 60 to 70 with both contacts sharp.					
29.00	29.75	As above but beige green and more diffusely silicified, sericitized and carbonate altered rock with medium grained to coarse grained quartz and minor dark grey medium grained lithics. Rock contains a 1cm wide interbed (?) of black siltstone and concordant pyrite and sphalerite (?). Veining at 70 degrees to the core axis at 29.17 is moderately autobrecciated now but the bed may be a primary feature. Rock becomes weakly chloritic below 29.60 and has a gradational contact with the underlying chloritic altered quartz lithic volcaniclastic.					
29.75	30.60	QUARTZ FIAMME LITHIC VOLCANICLASTIC. Green to dark green massive medium grained to coarse grained sub - rounded milky white quartz and sub - rounded to sub - angular dark green lithic rich volcaniclastic. Rock is silicified and chloritic altered throughout with moderate sericitisation and variable diffuse carbonate alteration throughout. Lithics are up to 15 mm and include fine grained, dark green siliceous sediments / tuff, beige green tuff and sericitized fiamme to 30 mm. The rock contains minor veining at 70 degrees to the core axis and quartz carbonate chlorite veining at low angles to the core axis. Rock contains very minor pyrite and possibly some arsenopyrite.					
30.60		E.O.H.					

HOLE NO. : GP-90-14
SECTION : 2354.00 EAST

PLUTONIC OPERATIONS LIMITED
GOWRIE PARK

DIAMOND DRILL RECORD

Northing	: 4938.00	Drill Type	:
Easting	: 2354.00	Core Size	:
Grid	: FIRE TOWER	Contractor	:N Poltock
Direction	: Grid South		
Inclination	: -60.0	Dip Tests	Method:
Elevation	: 9885.00	Depth Az Dip	
Azimuth	: 180.0	32.3 180.0 -60.0	
Mag Azimuth	:		
Length (m)	: 32.30		
Precol. (m)	: 3.50 m		
BOCO	: <3.50 m		
TFR	: 3.50 m		
Water Table	:		

Property	: FIRE TOWER
State	: Tasmania
GMR	: GOG 4440
E.L. No.	: GOWRIE PARK
Project No.	: 706
Date Started	:
Date Completed	:
Logged by	: G. MacDONALD
Relogged by	:
Date Logged	: May '92
Interpreted	: G. MacDONALD
Initialled	:

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
.00	3.50	PRECOLLAR					
3.50	16.15	VOLCANICLASTIC QUARTZ LITHIC VOLCANICLASTIC, SERICITIC. Generally beige green, occasionally darker green, and occasionally orange brown where strongly oxidised, medium grained to coarse grained (up to 8mm), massive, predominantly sub - angular to sub - rounded quartz rich, occasionally with lithics, volcaniclastic. The rock is predominantly silica sericite and carbonate altered with very occasional minor moderately chloritic patches. The rock is variably oxidised throughout being weak to moderately oxidised to 13.65 and strongly oxidised to 16.15. The rock is moderately quartz carbonate haematite veined throughout with veining generally at 50 to 80 degrees to the core axis, occasional manganese staining of fractures and some brick red alteration. The rock contains negligible sulphides.	SN0001	3.50	4.00	.50	.09
			SN0002	4.00	5.00	1.00	.26
			SN0003	5.00	6.00	1.00	.60
			SN0004	6.00	7.00	1.00	.30
			SN0005	7.00	8.00	1.00	.28
			SN0006	8.00	9.00	1.00	.17
			SN0007	9.00	10.00	1.00	1.19
			SN0008	10.00	11.00	1.00	.26
			SN0009	11.00	12.00	1.00	.06
			SN0010	12.00	13.00	1.00	.20
			SN0011	13.00	14.00	1.00	1.32
			SN0012	14.00	15.00	1.00	.47
			SN0013	15.00	16.00	1.00	.41
			SN0014	16.00	17.00	1.00	<.01
3.50	7.10	As above but orange brown to beige green and carbonate altered, generally medium grained occasionally coarse grained (to 3 mm), moderately sub - angular quartz rich volcaniclastic with very occasional dark grey fine grained lithics weak to moderately quartz carbonate haematite veined, moderately oxidised. The rock contains minor chlorite veins at 70 degrees to the core axis from 6.80 to 7.10.					
7.10	7.70	As above with occasional patches of diffuse brick red alteration and carbonate alteration in very fine veins throughout. Rock is silica sericite and carbonate altered throughout with medium grained to coarse grained (up to 8 mm) sub - rounded to sub - angular quartz. The rock contains minor chlorite veining.					
7.70	7.80	As above but strongly chlorite altered.					
7.80	10.45	As above but generally beige green, occasionally orange brown medium grained to coarse grained (up to 5 mm) sub - rounded to moderately sub - angular quartz rich					

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
		volcaniclastic. With very occasional dark grey fine grained lithics. Rock is silica sericite and carbonate altered throughout with moderate manganese staining throughout. Occasional quartz carbonate haematite veins are generally at 70 to 80 degrees to the core axis.					
	10.45	10.55 Interbedded beige green, very fine grained volcaniclastic the upper contact is at 40 degrees to the core axis the lower contact in broken core. The rock contains no sulphides and is cross-cut by a quartz carbonate haematite vein.					
	10.55	11.20 As above but beige green silica sericite and carbonate altered, medium grained to coarse grained (to 8 mm) quartz rich, very occasional lithics volcaniclastic. The rock contains no sulphides but has strong manganese staining.					
	11.20	11.30 As above but moderately chlorite, carbonate altered, medium grained to coarse grained (to 5 mm) quartz volcaniclastic.					
	11.30	13.45 As above but beige green, medium grained to coarse grained (to 4 mm) sub - rounded quartz rich volcaniclastic with occasional fine grained dark grey lithics (sediments). Rock is silica sericite and carbonate altered throughout. Rock contains numerous quartz carbonate haematite veins at 70 to 80 degrees to the core axis. The rock contains no sulphides.					
	13.45	14.00 As above but dark green, moderately chlorite altered, carbonate altered weakly sericitized, medium grained to coarse grained to 7 mm quartz, occasional lithic volcaniclastic. The rock contains no sulphides but minor fine chlorite veins at 70 degrees to the core axis and occasional quartz carbonate haematite veins generally at 20 to 40 degrees to the core axis.					
	14.00	16.15 As above but orange brown to cream strongly oxidised rock in very broken core. Possibly a fault but probably just a very strongly veined zone.					
16.15	19.65	FELSIC LAVA QUARTZ FELDSPAR PHYRIC LAVA. Pale pinky orange very fine grained, siliceous, possibly fine grained albite altered carbonate altered matrix with coarse grained (up to 10 mm) sub - angular clots / phenocrysts of quartz and sub - angular coarse grained clots of apple green to dark green sericite altered feldspar. Rock contains dendritic manganese staining. Some suggestion of coarse grained albite crystals sub - rounded but these are possibly an alteration effect. The rock contains no sulphides but contains very weak fine irregularly oriented haematite veinlets.	SN0015 SN0016 SN0017	17.00 18.00 19.00	18.00 19.00 20.00	1.00 1.00 1.00	<.01 <.01 <.01
19.65	21.50	SHEAR ZONE					

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
		Strongly sheared zone with shear foliation at 30 degrees to the core axis. Rock includes zones of the pinky orange felsic lava with coarse grained sub - angular quartz and green sericitized and carbonate altered, weakly chlorite altered fine grained rock with medium grained quartz clasts. Rock contains fine haematite veining streaming throughout and moderate manganese staining throughout.	SN0018	20.00	21.00	1.00	<.01
			SN0019	21.00	22.00	1.00	<.01
21.50	32.30	FELSIC LAVA					
		QUARTZ FELDSPAR PHYRIC LAVA.	SN0020	22.00	23.00	1.00	<.01
		Essentially appears to be the same unit as logged for 16.15 to 19.65 on the other side of the shear zone. Rock is a pale pinky orange to pale beige green, fine grained massive siliceous rock with coarse grained sub - angular clots / phenocrysts of quartz (to 10 mm) and somewhat diffuse bounded apple green clots of sericite altered feldspars (to 10 mm) occasionally with more sharp edges. Rock appears to be fine grained albite altered throughout. Very occasional quartz veins are indistinguishable from the phenocrysts (?). Rock contains very fine carbonate filled irregularly oriented fractures throughout. The rock contains approximately 2% pyrite, occasionally trace chalcopyrite throughout. The rock is weakly autobrecciated in the lower part of the intersection with a sericite matrix.	SN0021	23.00	24.00	1.00	<.01
			SN0022	24.00	25.00	1.00	<.01
			SN0023	25.00	26.00	1.00	.03
			SN0024	26.00	27.00	1.00	<.01
			SN0025	27.00	28.00	1.00	<.01
			SN0026	28.00	29.00	1.00	<.01
			SN0027	29.00	30.00	1.00	<.01
			SN0028	30.00	31.00	1.00	<.01
			SN0029	31.00	32.30	1.30	<.01
		21.50 22.40 As above but weakly oxidised in broken core. Rock contains occasional quartz carbonate haematite veins variably oriented.					
		22.40 22.70 As above but with approximately 5% pyrite in quartz pyrite infilling.					
		22.70 25.50 As above but with occasional wispy attenuated pyrite veins with minor pyrite throughout.					
		25.50 28.35 As above but with approximately 2% pyrite and trace chalcopyrite in attenuated veins and clots. Veins are oriented sub - parallel to the core axis. Rock is weakly autobrecciated from 26.90 to 28.35 with a sericite matrix. The rock contains occasional carbonate and minor quartz veins up to 1 cm wide.					
		28.35 28.80 As above but with 5% pyrite often with oxidised selvedges in veins and clots with trace chalcopyrite.					
		28.80 32.30 As above but with approximately 1% pyrite and trace chalcopyrite in veins and clots. Veining is sub - parallel to the core axis. Rock contains occasional quartz carbonate veins cross-cutting at 50 to 80 degrees to the core axis.					
		32.30 E.O.H.					

974097

HOLE NO. : GP-90-15 | PLUTONIC OPERATIONS LIMITED | Page: 1
SECTION : 2419.00 EAST | GOWRIE PARK

DIAMOND DRILL RECORD

Northing : 4967.50
Easting : 2419.00
Grid : FIRE TOWER
Direction : Grid South
Inclination : -55.0
Elevation : 9913.00
Azimuth : 180.0
Mag Azimuth :
Length (m) : 30.85
Precol. (m) : 3.50 m
BOCO : <3.50 m
TFR : 3.50 m
Water Table :

Drill Type :
Core Size :
Contractor :N Poltock

Dip Tests Method:
Depth Az Dip
30.9 180.0 -55.0

Property : FIRE TOWER
State : Tasmania
GMR : GOG 4440
E.L. No. : GOWRIE PARK
Project No. : 706
Date Started :
Date Completed:
Logged by : G. MacDONALD
Relogged by :
Date Logged : May '92
Interpreted : G. MacDONALD
Initialled :

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
.00	3.50	PRECOLLAR					
3.50	4.80	VOLCANICLASTIC QUARTZ FELDSPAR LITHIC FIAMME VOLCANICLASTIC. Moderately oxidised medium grained to coarse grained quartz feldspar lithic fiamme volcaniclastic. Rock is massive, beige green silica sericite and carbonate altered. The rock contains minor pyrite in veins parallel to the core axis and some minor staining. Lower contact with interbedded siltstone is in broken core.	S00001 S00002	3.50 4.00	4.00 5.00	.50 1.00	<.01 <.01
4.80	6.00	PELITE SILTSTONES, BEDDED. Rhythmically interbedded at 40 degrees to the core axis grey to dark grey siltstones. Rock contains micro fractures and faults. Rock contains irregular pyrite veins meandering sub - parallel to the core axis. The rock contains a patch of volcaniclastic from 5.60 to 5.70. The lower contact is at 30 degrees to the core axis.	S00003	5.00	6.00	1.00	.01
6.00	12.10	VOLCANICLASTIC VOLCANICLASTIC,VARIABLY WITH QUARTZ, FELDSPAR AND LITHICS AND FIAMME. 6.00 6.30 Medium grained quartz feldspar, possibly minor fiamme, volcaniclastic with fine siltstone bands and very minor disseminated pyrite. 6.30 6.50 Medium grained quartz, coarse grained lithic, fiamme rich volcaniclastic foliated at 40 degrees to the core axis, silica sericite and carbonate altered. 6.50 7.60 Medium grained to coarse grained sub - angular quartz rich, cream, sericite carbonate altered. Upper contact is gradational. Rock contains some occasional black siltstone fragments and very occasional quartz carbonate veins at 70 to 80 degrees to the core axis. 7.60 7.70 Large clast of black siltstone on one side of core with volcaniclastic on other side. 7.70 8.55 Green, coarse grained fiamme rich, medium	S00004 S00005 S00006 S00007 S00008 S00009 S00010	6.00 7.00 8.00 9.00 10.00 11.00 12.00	7.00 8.00 9.00 10.00 11.00 12.00 13.00	1.00 1.00 1.00 1.00 1.00 1.00 1.00	<.01 <.01 <.01 <.01 <.01 <.01 <.01

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
		grained quartz and feldspar rich sericite carbonate altered volcaniclastic.					
		8.55 9.40 Beige to pale brown, pale pink in patches. Rock contains quartz, feldspar, fiamme and occasional lithics.					
		9.40 11.00 Grey green quartz rich volcaniclastic. Rock is bedded from 10.20 to 11.00 at 45 to 50 degrees to the core axis.					
		11.00 11.45 Interbedded patches of dark green siltstone with bedding at 45 degrees to the core axis.					
		11.45 12.10 Quartz feldspar lithic volcaniclastic silica sericite altered. Lithics include finely bedded siltstone. The rock becomes more fine grained downhole and more sericitic. The lower contact is sharp and conformable with the interbedded siltstones at 40 degrees to the core axis.					
12.10	16.15	PELITE					
		SILTSTONES, BEDDED.	S00011	13.00	14.00	1.00	<.01
		12.10 13.95 Interbedded dark grey green and grey green siltstones with beds up to 10mm thick at at 30 degrees to the core axis at 12.50 and 40 degrees to the core axis at 13.90.	S00012	14.00	15.00	1.00	<.01
			S00013	15.00	16.00	1.00	.01
			S00014	16.00	17.00	1.00	.01
		13.95 16.15 Interbedded dark grey siltstone with minor pale grey siltstone. Much soft sediment deformation of bedding. Rock contains irregular carbonate filled fractures and 2% pyrite in disseminations.					
16.15	16.25	SHEAR ZONE					
		Sheared contact at 25 degrees to the core axis consisting of angular siltstone fragments in a carbonate matrix.					
16.25	17.75	PELITE					
		SILTSTONES, BEDDED.	S00015	17.00	18.00	1.00	<.01
		As logged for 13.95 to 16.15 but bedding more coherent. Bedding is at 65 degrees to the core axis below 17.10. Rock contains 2% pyrite in irregular veins and disseminations. Rock contains elongate chloritic clasts to 2 mm.					
17.75	19.30	VOLCANICLASTIC / PSAMMITE					
		VOLCANICLASTIC SANDSTONE.	S00016	18.00	19.00	1.00	<.01
		Beige fine grained rock becoming more coarse grained downhole below 19.00. Rock contains quartz feldspar and lithics including siltstones and fiamme. Rock contains bedding in patches at 60 degrees to the core axis. The rock is silica sericite altered throughout but with no veining or sulphides.	S00017	19.00	20.00	1.00	<.01
19.30	19.95	PELITE					
		SILTSTONES, BLACK AND SERICITIC.					
		From 19.30 to 19.50 the rock is a black siltstone with numerous irregular fractures filled with pyrite and carbonate. From 19.50 to 19.95 the rock is grey green and contains no pyrite.					

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
19.95	30.85	VOLCANICLASTIC					
		VOLCANICLASTIC, SERICITIC.	S00018	20.00	21.00	1.00	<.01
		Beige green, occasionally grey green, coarse grained	S00019	21.00	22.00	1.00	<.01
		quartz lithic and fiamme volcaniclastic. The rock contains	S00020	22.00	23.00	1.00	<.01
		a foliation at 65 degrees to the core axis throughout. The	S00021	23.00	24.00	1.00	<.01
		rock contains pink feldspars to 21.30. The rock is	S00022	24.00	25.00	1.00	.01
		chlorite altered from 20.65 to 23.40. The rock contains	S00023	25.00	26.00	1.00	<.01
		quartz carbonate veins at 70 to 80 degrees to the core	S00024	26.00	27.00	1.00	<.01
		axis but no sulphides.	S00025	27.00	28.00	1.00	<.01
		30.85 E.O.H.	S00026	28.00	29.00	1.00	<.01
			S00027	29.00	30.00	1.00	<.01
			S00028	30.00	30.85	.85	<.01

974100

HOLE NO. : GP-90-16
SECTION : 2421.00 EAST

PLUTONIC OPERATIONS LIMITED
GOWRIE PARK

Page: 1

DIAMOND DRILL RECORD

Northing : 4952.50
Easting : 2421.00
Grid : FIRE TOWER
Direction : Grid South
Inclination : -55.0
Elevation : 9913.00
Azimuth : 180.0
Mag Azimuth :
Length (m) : 30.75
Precol. (m) : 2.00 m
BOCO : <2.00 m
TFR : 2.00 m
Water Table :

Drill Type :
Core Size :
Contractor :N Poltock

Dip Tests Method:

Depth	Az	Dip
30.8	180.0	-55.0

Property : FIRE TOWER
State : Tasmania
GMR : GOG 4440
E.L. No. : GOWRIE PARK
Project No. : 706
Date Started :
Date Completed:
Logged by : G. MacDONALD
Relogged by :
Date Logged : May '92
Interpreted : G. MacDONALD

Initialled

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
.00	2.00	PRECOLLAR					
2.00	9.15	VOLCANICLASTIC QUARTZ LITHIC FIAMME VOLCANICLASTIC. Pale grey green to beige green, weakly foliated, medium grained to very coarse grained volcaniclastic consisting of medium grained to coarse grained (to 4mm) sub - rounded quartz, very coarse grained unflattened quartz feldspar phyric sericite, carbonate altered fiamme oriented at approximately 70 degrees to the core axis up to 30mm and very occasional medium grained to coarse grained (to 5mm) sub - rounded clasts of dark grey, fine grained siliceous siltstones and beige fine grained siliceous tuff. The rock is only occasionally weakly oxidised. Rock is silica, sericite and carbonate altered throughout with clay spots. To 3.25 m the rock contains occasional quartz carbonate haematite pyrite veins at 70 to 80 degrees to the core axis. From 3.25 to 9.15 the rock contains only very minor quartz carbonate veining and only very minor pyrite throughout.	SP000X	2.00	3.00	1.00	.32
			SP0001	3.00	4.00	1.00	.09
			SP0002	4.00	5.00	1.00	.06
			SP0003	5.00	6.00	1.00	.04
			SP0004	6.00	7.00	1.00	.09
			SP0005	7.00	8.00	1.00	.42
			SP0006	8.00	9.00	1.00	.96
			SP0007	9.00	10.00	1.00	.16
9.15	9.80	BRECCIA BRECCIA-FAULT ZONE. Orange brown, strongly clay altered fault zone. Rock is that logged for both underlying and overlying units but brecciated and sheared.					
9.80	28.05	VOLCANICLASTIC QUARTZ LITHIC FIAMME VOLCANICLASTIC. Generally beige green to beige brown medium grained to very coarse grained moderately foliated quartz, lithic volcaniclastic with variable fiamme. Quartz is sub - angular to sub - rounded. Lithics include black siltstone, beige green tuff and very fine grained cherty sediment / tuff. Clasts other than the siltstones are generally sub - rounded to sub - angular and are up to 20mm. Below 26.25 the rock contains very irregular fragments / beds of black siltstone. The rock contains fine irregular veins throughout of carbonate / clay alteration. Where foliated	SP0008	10.00	11.00	1.00	.09
			SP0009	11.00	12.00	1.00	.13
			SP0010	12.00	13.00	1.00	.02
			SP0011	13.00	14.00	1.00	.24
			SP0012	14.00	15.00	1.00	.24
			SP0013	15.00	16.00	1.00	.12
			SP0014	16.00	17.00	1.00	.07
			SP0015	17.00	18.00	1.00	.03
			SP0016	18.00	19.00	1.00	.78
			SP0017	19.00	20.00	1.00	.26
			SP0018	20.00	21.00	1.00	.52

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
		the foliation is at 60 to 75 degrees to the core axis. The rock contains only very occasional fiamme. The rock contains minor pyrite, locally up to 2% in veins and fracture infillings and occasionally very minor chalcopyrite associated with quartz carbonate veining. The rock is generally weak to moderately quartz carbonate veined with veining at 70 to 90 degrees to the core axis. The contact with the underlying siltstone is sharp and unsheared at 30 degrees to the core axis.	SP0019	21.00	22.00	1.00	1.37
			SP0020	22.00	23.00	1.00	.03
			SP0021	23.00	24.00	1.00	.31
			SP0022	24.00	25.00	1.00	.09
			SP0023	25.00	26.00	1.00	1.19
			SP0024	26.00	27.00	1.00	.50
			SP0025	27.00	28.00	1.00	.26
			SP0026	28.00	29.00	1.00	1.29
		9.80 11.40 As above with very minor pyrite and lithics rare					
		11.40 13.25 As above but with minor pyrite and arsenopyrite associated with patches of silicification and occasional lithics.					
		13.25 13.75 As above but with quartz chlorite vein at 70 degrees to the core axis and minor pyrite. The rock is weakly chlorite altered also.					
		13.75 15.70 As above but with very minor pyrite and trace arsenopyrite again associated with patches of silicification.					
		15.70 18.30 As above with very minor pyrite. Rock more clastic.					
		18.30 18.65 As above with approximately 1% pyrite.					
		18.65 19.45 As above with very minor pyrite.					
		19.45 21.30 As above with 0.5% pyrite in blebs and minor associated arsenopyrite.					
		21.30 26.25 As above with approximately 0.5% pyrite in irregular clots and very occasional very minor chalcopyrite.					
		26.25 28.05 As above with large irregular black siltstone clasts. Rock contains approximately 0.5% chalcopyrite and arsenopyrite. The chalcopyrite is generally in cross-cutting quartz veins and fine grained disseminations. The arsenopyrite is in patches associated with silicification. Carbonate / clay veins continue through the siltstone clasts.					
28.05	30.75	PELITE / VOLCANICLASTIC BLACK SILTSTONE WITH QUARTZ FRAGMENTS.	SP0027	29.00	30.00	1.00	.11
		28.05 30.75 Black fine grained massive siliceous siltstone with interbedded patches of sulphidic quartz, sericite, carbonate altered rock. The siltstone contains cross-cutting quartz carbonate veins occasionally irregularly oriented but generally at high angles to the core axis. Approximately 0.5% chalcopyrite and arsenopyrite is associated with these veins and more diffuse patches of carbonate alteration. The quartz volcaniclastic / strongly altered rock (?) contains locally 2% arsenopyrite and chalcopyrite. It is probably a quartz volcaniclastic as the quartz looks like the quartz in the previous unit and the quartz carbonate veins post-date this quartz. The quartz volcaniclastic interbeds are moderately clay altered after carbonate. The contacts between the siltstone and the	SP0028	30.00	30.75	.75	1.24

974102

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
		volcaniclastic are at low angles to the core axis.					
28.05	28.50	As above but 100% siltstone.					
28.50	28.80	As above but 50% siltstone, 50% interbed.					
28.80	30.25	As above but 100% siltstone.					
30.25	30.40	As above but interbed.					
30.40	30.65	As above but 100% siltstone.					
30.65	30.70	As above but interbed.					
30.70	30.75	As above but 100% siltstone.					
30.75		E.O.H.					

974103

HOLE NO. : GP-90-17 | PLUTONIC OPERATIONS LIMITED | Page: 1
SECTION : 2423.00 EAST | GOWRIE PARK

DIAMOND DRILL RECORD

Northing	: 4922.50			Property	: FIRE TOWER
Easting	: 2423.00			State	: Tasmania
Grid	: FIRE TOWER			GMR	: GOG 4440
Direction	: Grid South			E.L. No.	: GOWRIE PARK
Inclination	: -55.0	Drill Type	:	Project No.	: 706
Elevation	: 9916.00	Core Size	:	Date Started	:
Azimuth	: 180.0	Contractor	:N Poltock	Date Completed	:
Mag Azimuth	:			Logged by	: G. MacDONALD
Length (m)	: 30.35	Dip Tests	Method:	Relogged by	:
Precol. (m)	: 1.65 m	Depth Az Dip		Date Logged	: May '92
BOCO	: <1.65 m	30.4 180.0 -55.0		Interpreted	: G. MacDONALD
TFR	: 1.65 m				
Water Table	:			Initialled	:

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
.00	1.65	PRECOLLAR					
1.65	3.55	PELITE					
		1.65 2.40 SILTSTONE, INTERBEDDED AND SERICITIC. Interbedded dark grey to pale grey tuffaceous siltstone with bedding at 40 to 55 degrees to the core axis. Rock contains 2% to 4% pyrite in fine veins with oxidised selvedges. The rock also contains trace fine grained disseminated arsenopyrite.	SP000Y	1.65	2.00	.35	.26
			SP000X	2.00	3.00	1.00	.32
			SP0001	3.00	4.00	1.00	.09
		2.40 2.80 SILTSTONE / BRECCIA. Carbonate healed breccia of dark grey and pale grey tuffaceous siltstone. Quartz carbonate veins cross-cutting the brecciated rock are in turn cross-cut by pyrite veins. The rock contains 1% pyrite, 0.5% fine grained arsenopyrite and very minor chalcopyrite associated with the carbonate.					
		2.80 3.55 SILTSTONE, SERICITIC. *Initially weakly brecciated siltstone becoming finely* bedded bedded downhole at 40 to 45 degrees to the core axis. Rock contains 0.5% pyrite and arsenopyrite throughout. From 3.35 to 3.55 the rock contains a brecciated contact sub - parallel to the core axis.					
3.55	4.60	VOLCANICLASTIC					
		FINE GRAINED VOLCANICLASTIC, SERICITIC. Pale cm green fine grained siliceous volcaniclastic / siltstone. The rock contains trace arsenopyrite and minor pyrite.	SP0002	4.00	5.00	1.00	.06
4.60	30.15	VOLCANICLASTIC					
		Generally beige green, occasionally dark grey green, medium grained volcaniclastic with medium grained quartz clasts throughout and occasional lithics. The rock is generally silica sericite and carbonate altered occasionally moderately chloritic. The rock contains only minor sulphides.	SP0003	5.00	6.00	1.00	.04
			SP0004	6.00	7.00	1.00	.09
			SP0005	7.00	8.00	1.00	.42
			SP0006	8.00	9.00	1.00	.96
			SP0007	9.00	10.00	1.00	.16
			SP0008	10.00	11.00	1.00	.09
		4.60 6.55 As above but fine grained volcaniclastic consisting of fine grained quartz clasts, sub - rounded to sub - angular in a silica sericite	SP0009	11.00	12.00	1.00	.13
			SP0010	12.00	13.00	1.00	.02
			SP0011	13.00	14.00	1.00	.24

From (m)	To (m)	Description
		carbonate altered matrix. Rock contains trace to 0.2% arsenopyrite.
6.55	7.00	As above but medium grained quartz rich volcaniclastic with approximately 1% pyrite and fine chlorite veins generally at 70 degrees to the core axis. Silica sericite carbonate altered.
7.00	8.30	As above but medium grained volcaniclastic with quartz and lithics in a silica sericite carbonate altered matrix. The rock contains only minor pyrite. Cross-cutting quartz carbonate veins are cross-cut by chlorite and quartz chlorite veins at high angles to the core axis.
8.30	9.25	As above but moderately chlorite altered medium grained volcaniclastic. Chlorite veins generally at 70 degrees to the core axis. The rock contains 0.5% pyrite and very minor chalcopyrite.
9.25	10.10	As above but silica sericite carbonate altered medium grained volcaniclastic with cross-cutting quartz chlorite veins at 70 degrees to the core axis.
10.10	13.40	As above but silica sericite carbonate altered medium grained volcaniclastic with medium grained lithics. Quartz fragments are generally sub - angular. Quartz carbonate veins are cross-cutting sub - perpendicular to the core axis. Occasional minor pyrite veins.
13.40	13.41	Black fine grained fragment or bed at 20 degrees to the core axis with medium grained quartz clasts.
13.41	15.30	As above but medium grained volcaniclastic with coarse grained lithics including black siltstone and pale green tuffaceous siltstone. The rock contains minor pyrite and arsenopyrite throughout and cross-cutting quartz carbonate veins at 70 to 80 degrees to the core axis.
15.30	18.80	As above but quartz lithic volcaniclastic and dark grey green due to moderate chlorite alteration. The rock contains fine chlorite veins. A cross-cutting quartz minor arsenopyrite minor chalcopyrite vein at 45 degrees to the core axis at 15.45 appears to cross-cut the fine chlorite veins. The rock contains trace arsenopyrite, chalcopyrite and pyrite throughout.
18.80	28.60	As above but silica sericite carbonate altered, medium grained to coarse grained quartz and lithic rich volcaniclastic. Lithics include very fine grained cream cherty fragments and black siltstones. The matrix is beige, green and contains trace arsenopyrite, minor pyrite and occasionally minor chalcopyrite throughout. The arsenopyrite is associated with pyrite veins, the chalcopyrite with quartz carbonate alteration. The rock contains 2% pyrite and 0.5% arsenopyrite from 23.75 to 23.95 ; 2% pyrite and 0.5%

Sample No.	From (m)	To (m)	Width (m)	Au (ppm)
SP0012	14.00	15.00	1.00	.24
SP0013	15.00	16.00	1.00	.12
SP0014	16.00	17.00	1.00	.07
SP0015	17.00	18.00	1.00	.03
SP0016	18.00	19.00	1.00	.78
SP0017	19.00	20.00	1.00	.26
SP0018	20.00	21.00	1.00	.52
SP0019	21.00	22.00	1.00	1.37
SP0020	22.00	23.00	1.00	.03
SP0021	23.00	24.00	1.00	.31
SP0022	24.00	25.00	1.00	.09
SP0023	25.00	26.00	1.00	1.19
SP0024	26.00	27.00	1.00	.50
SP0025	27.00	28.00	1.00	.26
SP0026	28.00	29.00	1.00	1.29
SP0027	29.00	30.35	1.35	.11

974105

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)
		arsenopyrite to 24.80 and 2% pyrite and 0.5% arsenopyrite from 24.80 to 25.10.					
	28.60	30.15 As above but medium grained quartz and lithic volcaniclastic dark grey green due to chlorite alteration. The rock contains 0.5% arsenopyrite and 1% pyrite from 28.90 to 29.10.					
30.15	30.35	PELITE SILTSTONE, CHLORITIC. Very fine grained very dark green chloritic siltstone with irregular carbonate filled fractures. The upper contact is at 45 degrees to the core axis. The rock contains negligible sulphides.					
	30.35	E.O.H.					

974106

APPENDIX B

Lead Isotope Survey - Fire Tower Prospect

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Sirotope

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REPORT TO PLUTONIC OPERATIONS

ON A Pb ISOTOPE STUDY OF SAMPLES FROM

THE CETHANA AREA, NORTH WESTERN TASMANIA

SIROTOPE REPORT SR 238

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6/11/92

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1. INTRODUCTION

The aim of this study has been to determine the Pb isotopic compositions of galena in quartz-carbonate veins in the Cethana area and to assess the metallogenic association of the mineralization based on comparisons of the data with target signatures for Cambrian VHMS and Devonian mineralization in north western Tasmania.

The prospect is located in the Gog Range ≈ 10 kms south of Beulah. Mineralization represents an unusual style for the Mount Read Volcanic Belt of galena/gold association (G. McDonald, oral comm.) which may be similar to that at Voyager 24 in the Elliott Bay region of south western Tasmania. Volcanics are quartz phyric and there are minor andesites in the area. Five shallow galena-bearing drill core samples from three holes, GP-90-1, -5 and -10, were submitted by Grant McDonald. Methods of Pb isotope analysis are given in Appendix 1. **GP-90-1** @ ≈ 6.5m was analysed in duplicate.

2. TARGET SIGNATURES

The target Pb isotope signatures for VHMS mineralization of Cambrian age in the Mount Read Volcanics are depicted in Figure 1 as 95% confidence ellipses. These have recently been slightly revised from those presented in Gulson and Porritt (1987), based both on new analyses of Hellyer (**SIROTOPE** unpubl. data) and on a reappraisal of available data from Que River. Rosebery/Hercules has a slightly less radiogenic isotopic composition (lower $^{206}Pb/^{204}Pb$ ratios; Fig. 1).

Lead isotope data available from the **SIROTOPE** Database for over thirty deposits and prospects hosted by the Mount Read Volcanics suggests that mineralization associated with the Central Volcanic Complex (CVC) has the Rosebery signature but mineralization associated with the Mt Charter, Dundas and Tyndall Groups may have either the Que River/Hellyer or the Rosebery signature.

Mineralization associated with Devonian plutonism, and other vein deposits, commonly have $^{206}Pb/^{204}Pb$ ratios > about 18.4 (e.g. Queen Hill, Farrell, Tullah; Fig. 1). There are however occurrences which have isotopic compositions less radiogenic than the Cambrian targets, for example WOW/CAB (an old Comstaff prospect in the Oonah Formation) and the Marionoak mineralization on the Pieman Dam Road (Fig. 1). Whilst the origin of such mineralization remains enigmatic, the low $^{206}Pb/^{204}Pb$ ratios may result from leaching of Pb from nearby Precambrian source rocks. In addition, at both WOW/CAB and Marionoak more radiogenic isotopic populations exist which are similar to the Devonian signature, indicating derivation of Pb from a complex source region. Mineralization displaying such variation in isotopic composition is likely to be derived from only localised, small-scale hydrothermal systems.

3. RESULTS

Lead isotope ratios for the Cethana prospect are given in the Table and plotted in Figure 1 with reference to the average crustal Pb evolution curve, or growth curve, of Cumming and Richards (1975), the revised Cambrian VHMS target signatures, and Devonian granite-related and vein mineralization discussed above.

Galena data from the Cethana area lie along a fractionation trend (see Appendix 2 for a brief discussion of Pb isotope systematics and terminology) and are thus considered the same within experimental error. The original analysis of *Gp-90-1 @ 6.5m* (point 1) is poor quality data and displays the most fractionation. The data form a homogeneous group which is similar to but has slightly lower $^{206}Pb/^{204}Pb$ ratios (i.e. is less radiogenic) than the target fields for VHMS mineralization hosted by either the Dundas and Tyndall Groups (Que River/Hellyer) or the CVC (Rosebery). The Cethana Pb isotope data are distinquishable from Devonian granite-related mineralization being significantly less radiogenic, and are considerably more radiogenic than the WOW/CAB and Marionoak populations which probably exhibit a Precambrian Pb component.

4. DISCUSSION

Although the Pb isotope data for Cambrian VHMS deposits of western Tasmania are relatively homogeneous, there is certainly a continuum in isotopic composition spanning the signatures from Rosebery to Que River to Hellyer. These data exhibit a range in $^{206}Pb/^{204}Pb$ ratios of $\approx 0.6\%$. A similar range is also shown by galena data from the Kuroko deposits of Japan (0.8% in $^{206}Pb/^{204}Pb$ ratio; Fehn et al., 1983). In contrast, Lower Palaeozoic VHMS deposits of the Lachlan and Thomson Fold Belt systems of Eastern Australia are remarkably homogeneous (Dean and Carr, 1990), probably due to the fact that the source rocks for much of the Pb are extensive, homogeneous Ordovician turbidite sequences. Whilst there is no known major Cambrian VHMS deposit in the Sheffield area of Tasmania, it is feasible to expect that such a deposit would have an isotopic composition which is homogeneous but which may be slightly different from the major signatures.

Lead isotope results from mineralization in the Sheffield - Middlesex - Dial Range area are shown in Figure 2 (Carr, 1988; Carr and Dean, 1989; unpubl. **SIROTOPE** data). Including the Cethana data from this study, there is a concentration of analyses with slightly lower $^{206}Pb/^{204}Pb$ ratios than Rosebery. There is a paucity of information on the volcanics in this region which are mainly quartz-feldspar-phyric rocks. Based on fossil evidence they are thought to be Mid to Late Cambrian in age, suggesting they are correlates of the Dundas and Tyndall Groups (Corbett and Solomon, 1989). In addition, andesites such as the Beulah Formation occur in the volcanic pile, along with small intrusives bodies of quartz-feldspar-porphyry (Corbett, 1989). Andesitic volcanics elsewhere in the Mt Read Belt are generally associated with the top of the CVC (Corbett, 1992). Mineralization which has

derived Pb from andesitic volcanics commonly has more primitive Pb isotopic compositions (lower $^{206}Pb/^{204}Pb$ and $^{207}Pb/^{204}Pb$ ratios). However, lower $^{206}Pb/^{204}Pb$ ratios may also be associated with closer proximity to Precambrian basement.

Altered Beulah Basalt has initial Pb isotope ratios which are indistinquishable from the Cethana data whilst the initial ratios of the Beulah Baryte are significantly less radiogenic (Fig. 2; Carr, 1988). Exact locations of mineralization analysed for Noranda (Carr and Dean, 1989) are not known. These span a range of isotopic compositions with most data plotting close to Cethana, and the Rosebery 95% confidence ellipse. Radiogenic values ($^{206}Pb/^{204}Pb$ ratios > 18.4) are considered to represent Devonian mineralization.

In Figure 3, Cethana is compared to Pb isotope data from mineralization in the Elliott Bay region of south western Tasmania (Gulson et al., 1987), in particular Voyager 24. Voyager 24 is considered to be a stratabound Au deposit associated with the intrusion of quartz porphyry (Large et al., 1987). The Pb isotope data (Gulson et al., 1987) support a genetic relationship between the mineralization and the quartz porphyry. Massive sulfide mineralization such as Voyager 19 at Elliott Bay is less radiogenic than Voyager 24, with sulfides from Pb-Zn-As veins at Voyager 31 plotting near the Devonian field. Whilst the similarity of the Cethana and Voyager 24 galena data may be fortuitous, it may indicate a genetic link between Cethana and the intrusion of similar quartz porphyry bodies in the Cethana region.

5. ASSESSMENT

Galenas from the Cethana area form a homogeneous group with the following isotopic composition:

$^{206}Pb/^{204}Pb$ 18.241 ± 0.023 (2σ)
$^{207}Pb/^{204}Pb$ 15.592 ± 0.026 (2σ)
$^{208}Pb/^{204}Pb$ 38.051 ± 0.076 (2σ)

The $^{206}Pb/^{204}Pb$ ratio for Cethana is slightly lower than the Rosebery value and within experimental error of other data from the region, such as the Beulah Basalt and Noranda prospects. This probably indicates a regional isotopic composition which, due to its homogeneity, its association with Cambrian volcanism and its similarity to other VHMS mineralization hosted by the Mt Read Volcanics, is considered a target signature for Cambrain mineralization rather than mineralization associated with Devonian intrusion. However, it may not be possible to discriminate between a Cambrian VHMS deposit and mineralization related to emplacement of quartz porphyries. In the Elliott Bay region, these appear to have different Pb isotope systematics and thus can be distinquished. If the volcanics in the Sheffield - Gog Range region are correlates of those in the Elliott Bay area, the comparisions of the Cethana and Voyager data may be applicable. Analyses of potassium feldspar from potential

source rocks (granites, volcanics, intrusives) may assist in resolving the complex nature of data from this region where the volcanics are not as well studied as elsewhere in the Mt Read Belt.

5. REFERENCES

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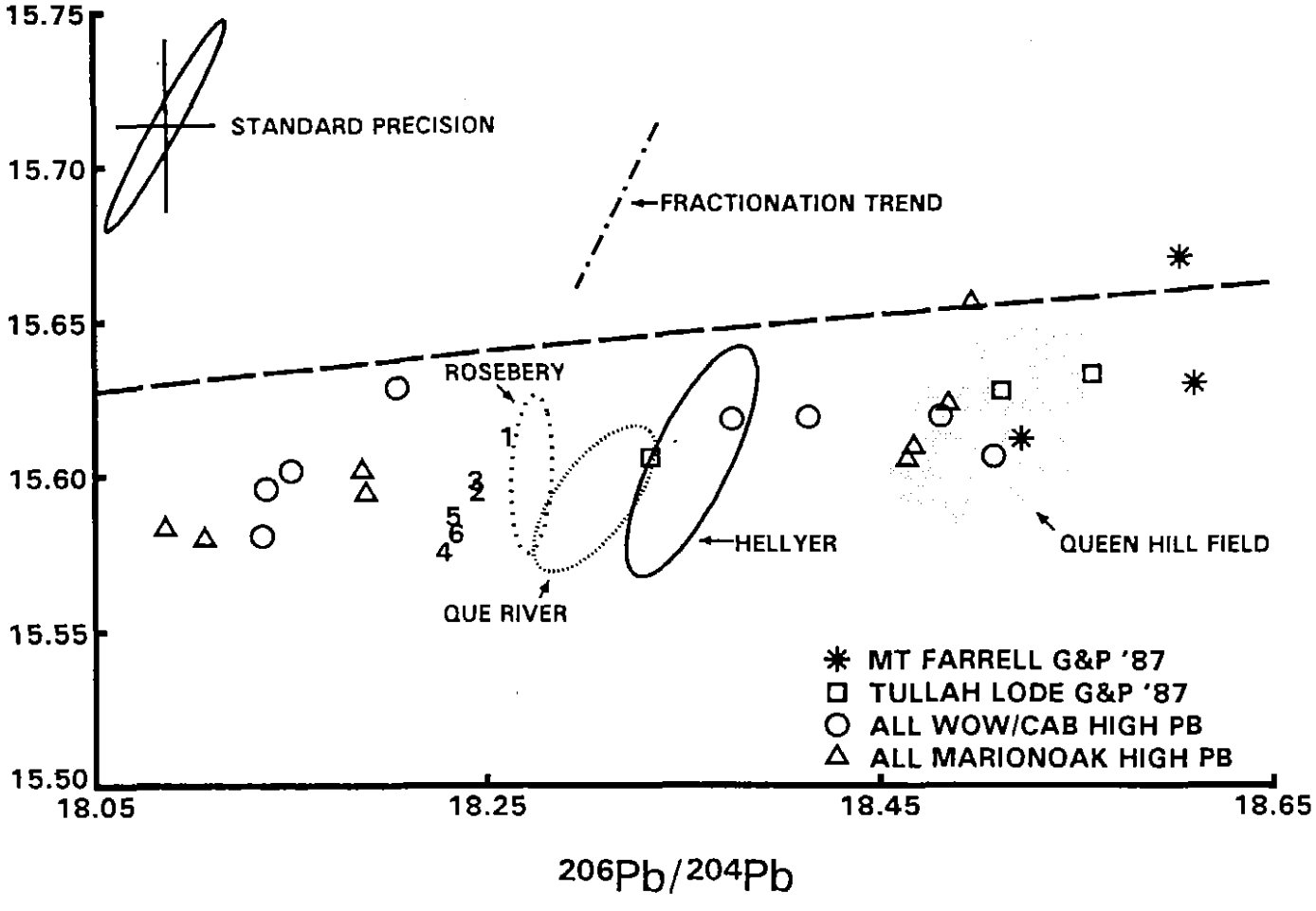
Large, R.R., Herrmann, W, and Corbett, K.D. (1987). Base metal exploration of the Mount Read Volcanics, Western Tasmania: Pt. I. Geology and exploration, Elliott Bay. *Econ. Geol., 82,* pp. 267-290.

TABLE 1. LEAD ISOTOPE DATA FOR THE CETHANA AREA

Sample	$\frac{^{208}Pb}{^{206}Pb}$	$\frac{^{207}Pb}{^{206}Pb}$	$\frac{^{206}Pb}{^{204}Pb}$	$\frac{^{207}Pb}{^{204}Pb}$	$\frac{^{208}Pb}{^{204}Pb}$
1 PB1 GP-90-1	2.0872	0.8550	18.260	15.613	38.113
2 PB1 GP-90-1 R	2.0859	0.8548	18.245	15.595	38.057
3 PB2 GP-90-1	2.0867	0.8550	18.244	15.599	38.070
4 PB3 GP-90-10	2.0849	0.8545	18.228	15.576	38.004
5 PB4 GP-90-10	2.0862	0.8549	18.233	15.587	38.037
6 PB5 GP-90-5	2.0854	0.8545	18.235	15.582	38.027

R denotes repeat analysis
All samples are galenas
SAMPLE NUMBER PREFIXES REFER TO PLOTTED POINTS IN FIGURES

CETHANA AREA THIS STUDY



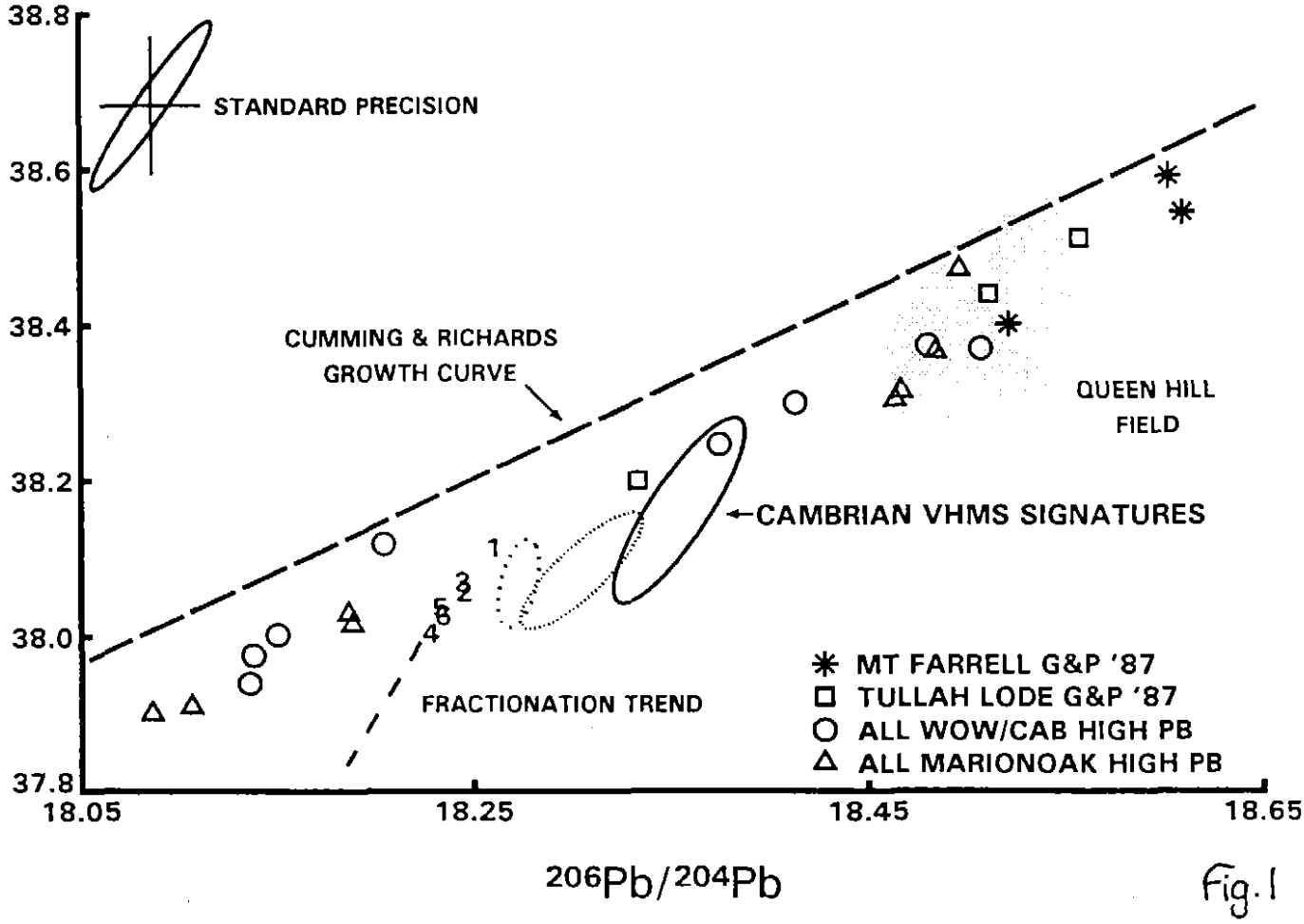
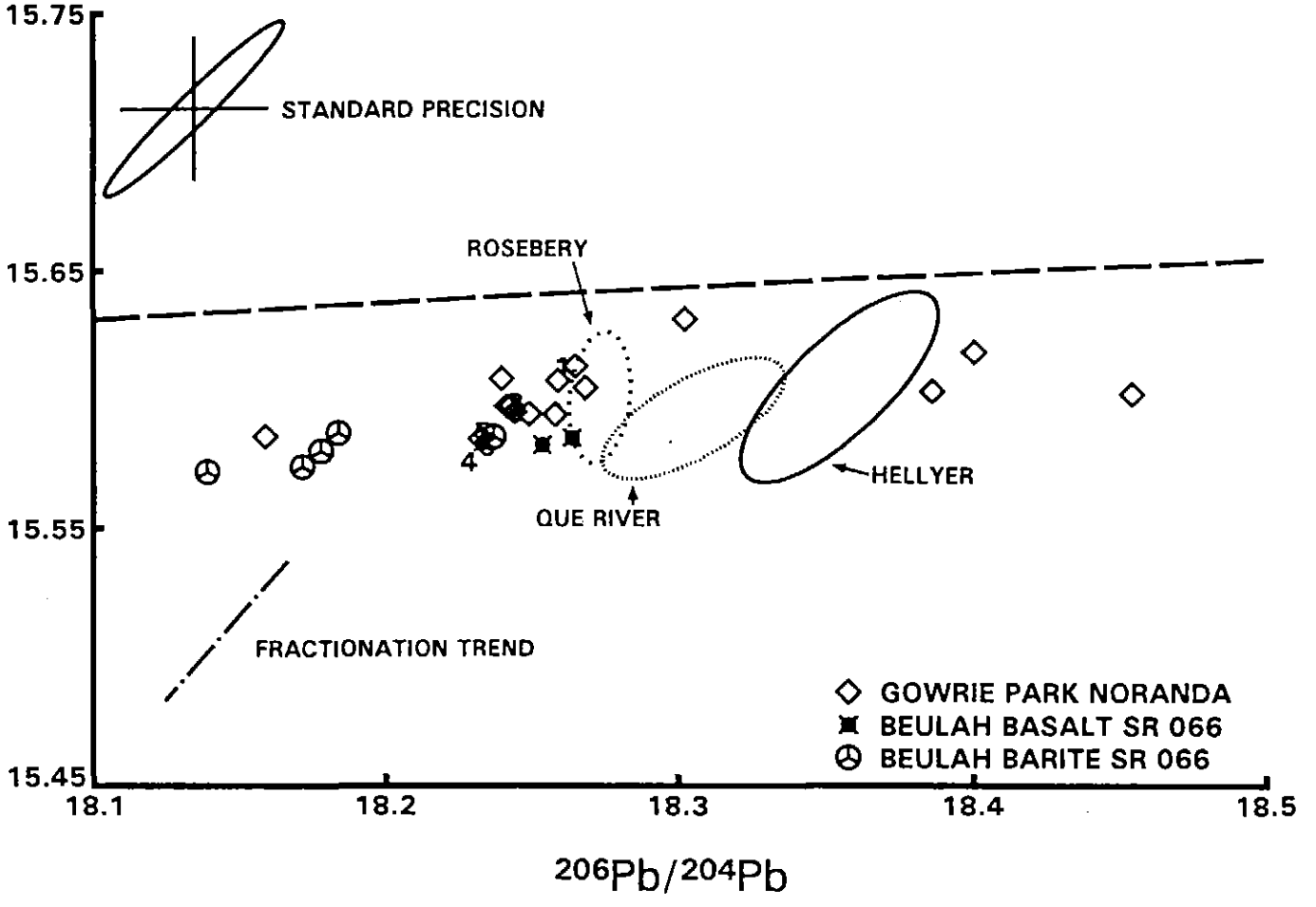


Fig. 1

CETHANA - BEULAH AREA



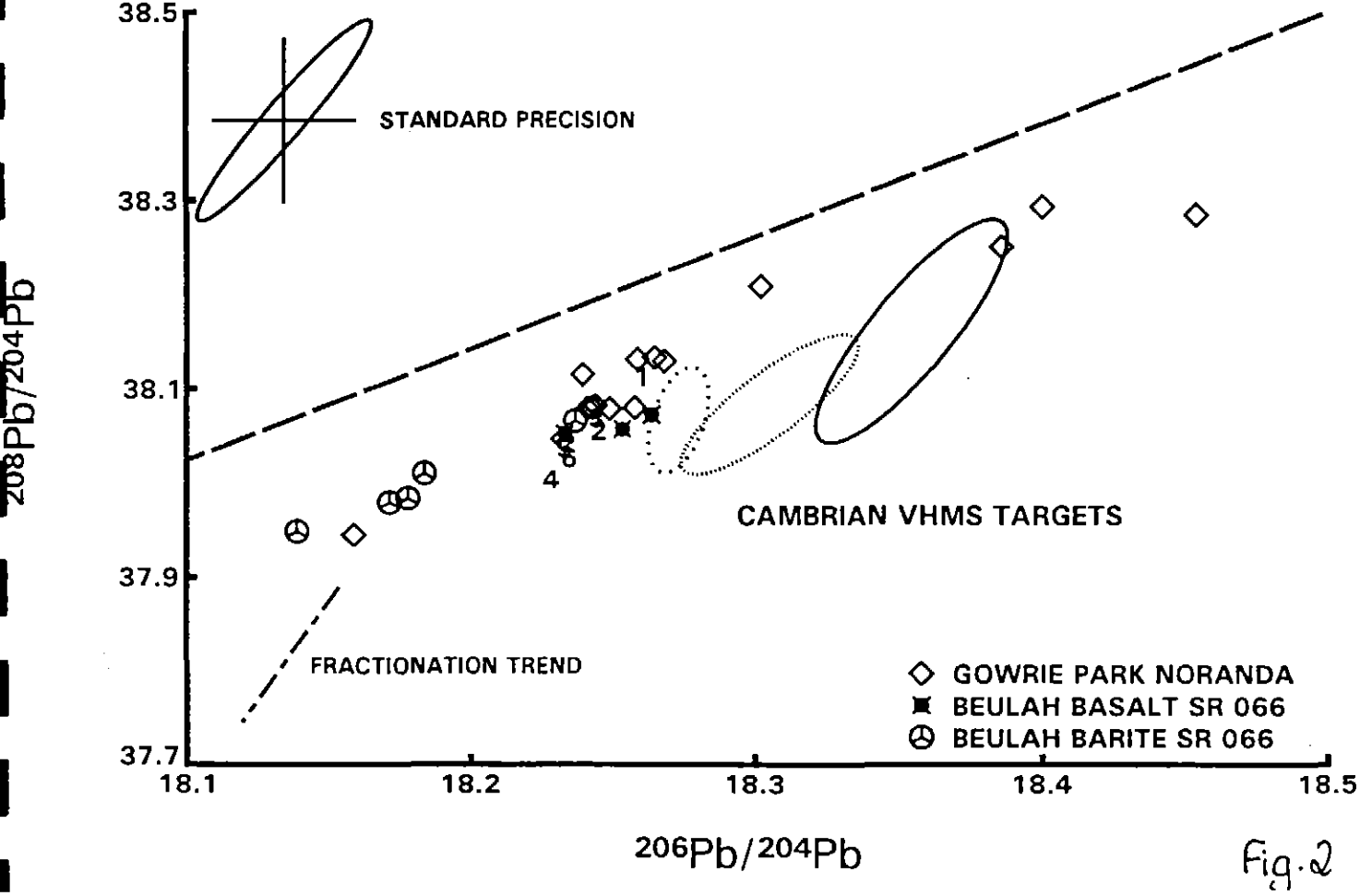
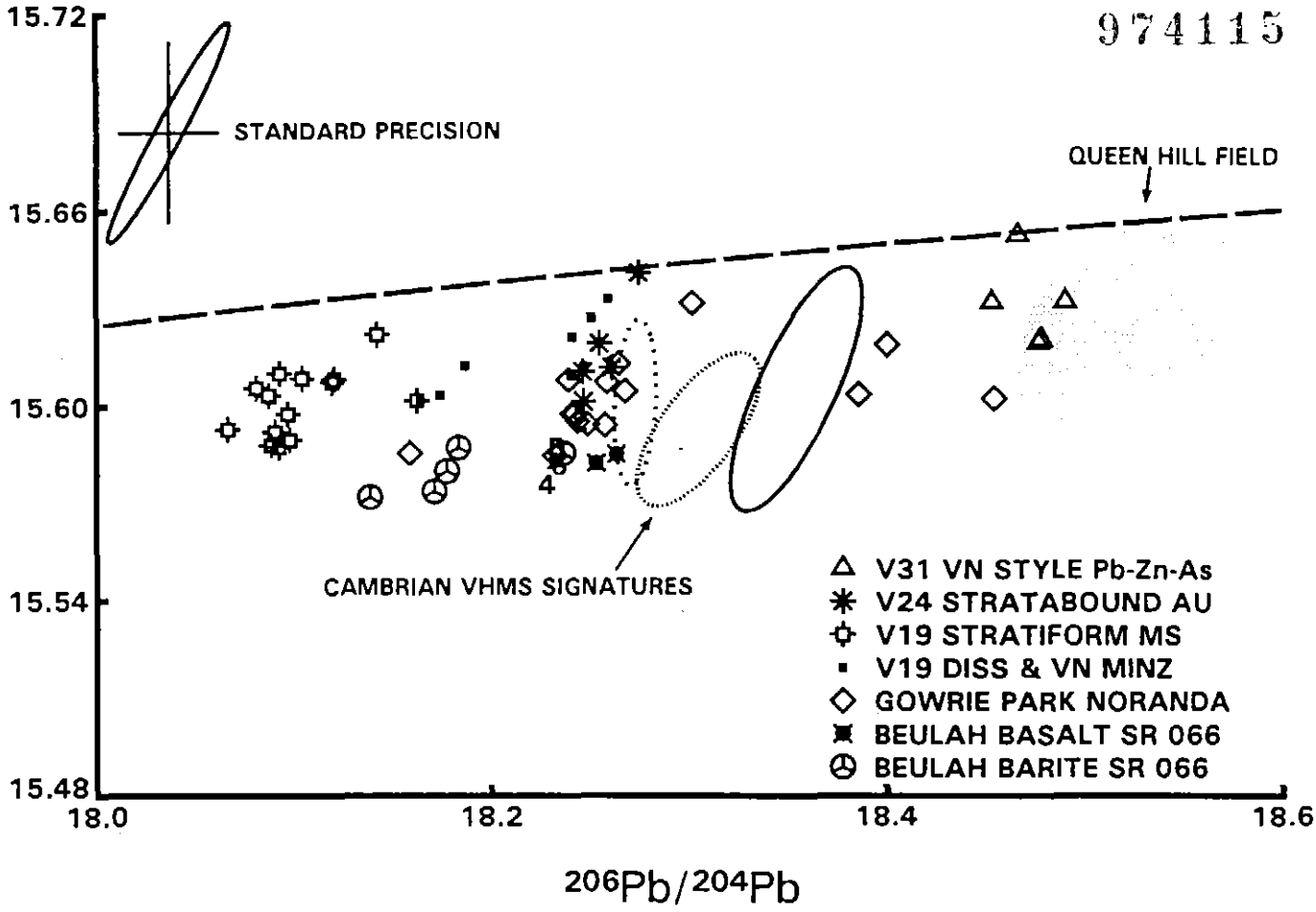


Fig. 2

COMPARISON CETHANA & ELLIOTT B

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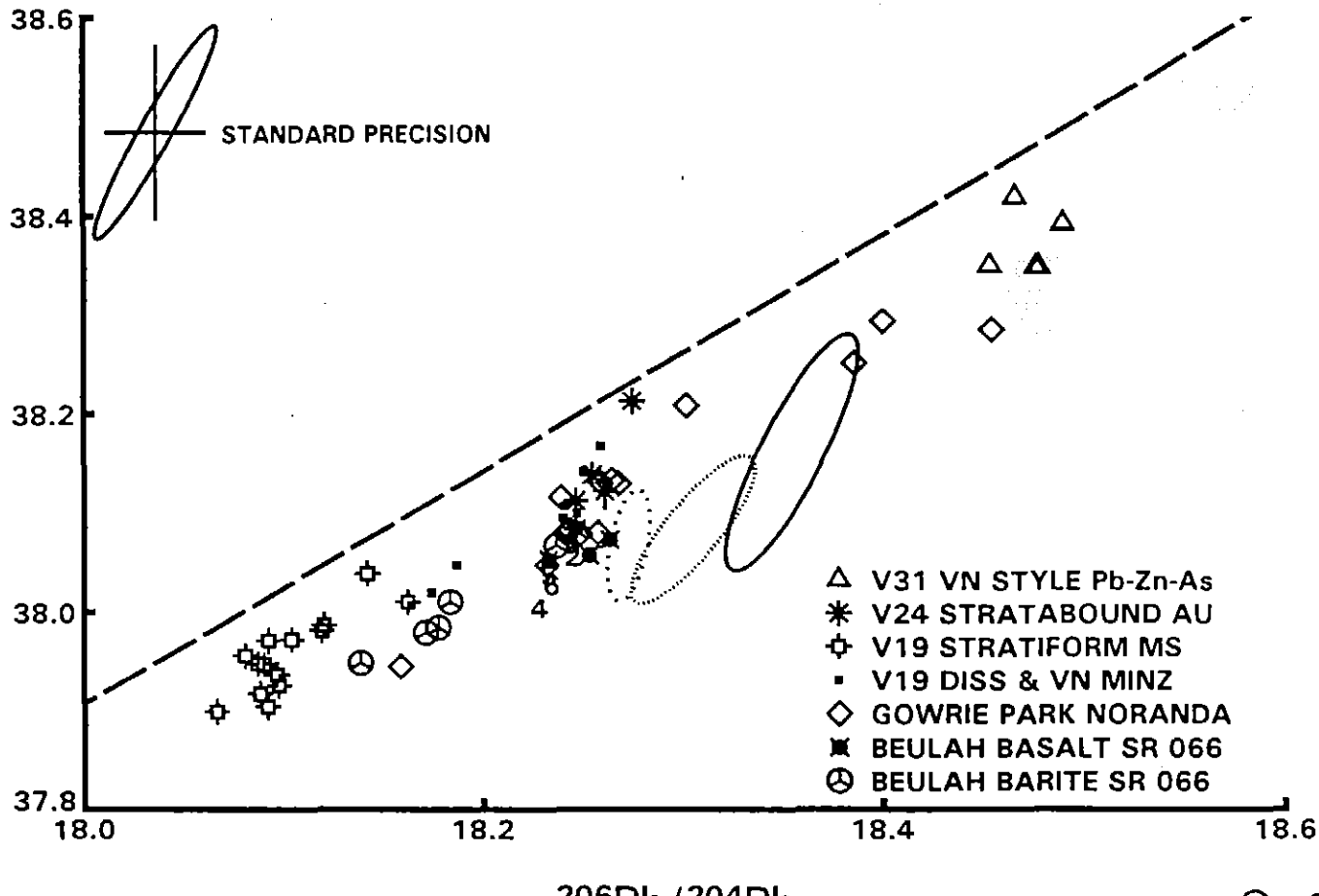


Fig. 3

APPENDIX 1 - LEAD ISOTOPE METHODS

Galenas were handpicked, dissolved in concentrated HNO_3 acid and Pb purified by micro-electrodeposition techniques onto Pt electrodes.

Lead isotope ratios were determined on a VG ISOMASS 54E thermal ionization mass spectrometer run in fully automated mode. The results have been normalized to the accepted values of international standard NBS SRM 981 by applying a correction factor of +0.08% per atomic mass unit. Precision estimates, shown as error bars in the upper left hand corner of the accompanying Figures, are based on over 1300 analyses of international standards and natural samples. Also shown are the 95% confidence ellipses for the standard data.

APPENDIX 2 - BRIEF DISCUSSION OF Pb ISOTOPE SYSTEMATICS AND TERMINOLOGY

Lead isotope data are conventionally represented as the ratio of one isotope of Pb to another, most often in terms of $^{206}Pb/^{204}Pb$, $^{207}Pb/^{204}Pb$ and $^{208}Pb/^{204}Pb$. Whilst ^{206}Pb, ^{207}Pb and ^{208}Pb derive from the constant radiogenic decay of ^{238}U, ^{235}U and ^{232}Th respectively, ^{204}Pb has no parent isotope and so its abundance does not change through geological time. Thus the three ratios above are continually increasing with time according to well defined decay criteria. Lead isotope ratios are presented graphically on conventional XY ratio plots; $^{208}Pb/^{204}Pb$ vs $^{206}Pb/^{204}Pb$ diagram details the Th-U/Pb system, and the $^{207}Pb/^{204}Pb$ vs $^{206}Pb/^{204}Pb$ diagram the U/Pb system.

Variation of Pb isotope data results principally from geological factors. However, some variation can be ascribed to **analytical errors**. The 95% confidence ellipse of the error associated with any Pb isotopic analysis is shown in the top left hand corner of each diagram. The major axis of this ellipse indicates the strong correlation inherent in the errors which arise from **fractionation** and to a lesser extent ^{204}Pb error. Fractionation occurs at the very high temperatures induced during mass spectrometer analysis and results from preferential emission of the light isotopes (e.g. ^{204}Pb) relative to the heavier isotopes (e.g. ^{208}Pb, ^{207}Pb). ^{204}Pb error results from the lower precision in estimating peak heights of this low abundance isotope.

Geological variables resulting in isotopic variation are:

1) The **age** of the sample, i.e. the time at which the Pb was incorporated into the rock/mineral.

2) The relative amounts of Pb, U and Th (expressed generally as $^{238}U/^{204}Pb$ (μ) and $^{232}Th/^{204}Pb$) in the source rocks from which the Pb was leached prior to incorporation in the rock/mineral.

3) The U/Pb and Th/U ratios in the rock/mineral between the time the Pb was incorporated and the present.

A **growth curve** is a model of this variation and indicates the expected isotopic composition of Pb-rich ores at any particular stage in the Earth's history. There is no unique growth curve for the Earth, and different curves can be generated assuming source rocks with different U/Pb and Th/U ratios. **Model ages** can be determined when data from high-Pb samples plot on or near a growth curve on a $^{207}Pb/^{204}Pb$ vs $^{206}Pb/^{204}Pb$ diagram. The accuracy of model ages vary considerably and relies on the appropriateness of the chosen model. The commonly used Cumming and Richards curve is based on the assumption that the U/Pb and Th/Pb ratios in the Earth's crust have been varying continuously and is correlated with the known ages of a set of massive sulfide deposits which probably gained their

Pb from hydrothermal solutions which leached large volumes of rocks through the crust. Massive sulfides and other ores which leached their Pb from mantle rocks or lower crustal rocks will not fall on this growth curve.

The Pb isotope **fingerprinting technique** is based on the fact that in any geological domain, ores forming during a particular mineralizing event from the same or similar source rocks will have the same isotopic composition. In some cases we can broadly predict the likely isotopic composition based on geological criteria such as age/rock type etc., but in general the technique relies on a library of data on known ore deposits in a region.

This isotopic "fingerprint" represents the Pb isotopic composition at the time of formation of the ore/rock - otherwise known as the **initial ratios**. If the ore/rock has relatively low U/Pb, and Th/Pb ratios, such as in galena, then these initial ratios will not change with time because insignificant ^{206}Pb, ^{207}Pb and ^{208}Pb will have been added *in situ* since the time of formation by the radioactive decay of ^{238}U, ^{235}U and and ^{232}Th respectively. However with "low-Pb" samples (generally less the about 50-100 ppm for Palaeozoic samples and less than about 500-1000 ppm for Proterozoic samples) measurable ^{206}Pb, ^{207}Pb and ^{208}Pb will have been added by *in situ* radioactive decay and so the $^{206}Pb/^{204}Pb$, $^{207}Pb/^{204}Pb$ and $^{208}Pb/^{204}Pb$ ratios will increase; i.e. will be **more radiogenic**. This effect will be magnified in high-U samples and higher Pb contents than the figures quoted above are needed to guarantee that significant additional radiogenic Pb has not changed the initial ratios.

Where *in situ* radioactive decay has occurred the ratios will plot on a line on any of the diagrams commonly presented. This line will always incorporate the initial ratios. On the $^{208}Pb/^{204}$ vs $^{206}Pb/^{204}Pb$ diagram the slope of the line is dependant on the Th/U ratio of the sample, whereas on the $^{207}Pb/^{204}Pb$ vs $^{206}Pb/^{204}Pb$ diagram the slope is dependant only on the time interval over which radioactive decay has taken place. In this latter case, where it can be shown that the isotope ratios of all the points on such a line have developed under a closed system with respect to Pb and U then the line is termed an Pb-Pb **isochron**. An isochron is thus defined by the slope, **m**, of a linear regression through the data. An estimate of how well such a regression fit the data is gained from Mean Square Root of the Deviates or **MSWD**. This function compares the deviation of each point from the regression relative to the estimeat of analytical precision. An MSWD of 1 or less indicates that the data deviate minimally from the regression whereas higher values indicate increasing deviation.

Source rock studies involve determining, if possible, the initial Pb isotope ratios of those rocks considered to be possible source of metals for mineralization. Such studies are particularly important in areas where mineralization may result from a syngenetic event, such as a VMS deposit, or from later granite intrusion. The syngenetic signature may be well established, but it is also important to know what is the likely Pb isotopic composition of epigenetic mineralization forming in response to the intrusion. This may be done by measuring mineralization known to be associated with the intrusion, such as skarns, or by determining the Pb isotopic composition of a relatively high-Pb silicate

component such as K-feldspar. Although K-feldspars may contain a significant proportion of radiogenic Pb (i.e. Pb derived from *in situ* radiogenic decay since crystallization) techniques are available that enable, in many instances, the discrimination of the initial component from the radiogenic component.

APPENDIX C

Drill logs for STD1 -

Staverton Prospect

974121

HOLE NO. : STD1 | PLUTONIC OPERATIONS LIMITED | Page: 1
SECTION : 900.00 EAST | GOWRIE PARK

DIAMOND DRILL RECORD

Northing : 25.00
Easting : 900.00
Grid : STAVERTON
Direction : GRID S
Inclination : -45.0
Elevation : 390.00
Azimuth : 180.0
Mag Azimuth : mag 180.0, 179.0, 179.0, 180.0, 180.5, 179.0; OM=12.5T OR -45.0G
Length (m) : 267.20
Precol. (m) : 3.00m
BOCO : <3.0m
TFR : 35.80m
Water Table : N/A

Drill Type :LY38
Core Size :HQ 3.00 NQ
Contractor :LONGYEAR

Dip Tests Method: EASTMAN

Depth	Az	Dip
50.0	179.0	-44.8
100.0	179.0	-44.6
150.0	180.0	-40.7
200.0	180.5	-37.0
267.2	179.0	-34.0

Property : STAVERTON
State : Tasmania
GMR : WILMOT 4241
E.L. No. : GOWRIE PARK
Project No. : 706
Date Started : 13/12/92
Date Completed: 20/12/92
Logged by : G. MacDONALD
Relogged by :
Date Logged : 6/1/93
Interpreted : G. MacDONALD
Initialled :

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm)
							Au, Ag assays in appendix K		
.00	3.00	PRECOLLAR							
3.00	17.90	INTERMEDIATE LAVA / INTERMEDIATE TUFFS Medium grained feldspar mafic phyric moderately foliated strongly weathered intermediate volcanic rock being either a crystal tuff or a lava. The rock is red to tan due to weathering of the chloritic matrix. In patches the rock is pale due to leaching. Feldspars are generally tabular and sericitized a pale colour. Mafics are chloritic and are tabular or acicular but sheared and they were probably plagioclase feldspars. The rock contains occasional gossanous patches with manganese staining and occasional very fine chlorite veins and the rock is moderately foliated at 40 to 50 degrees to the core axis. Gossanous veins are irregularly oriented. The amount of veining increases somewhat downhole, the best zones being from 17.05 to 17.30.	S00601	3.00	5.00	2.00	100	2150	2150
			S00602	5.00	7.20	2.20	170	500	210
			S00603	7.20	8.80	1.60	66	290	70
			S00604	8.80	10.20	1.40	94	320	145
			S00605	10.20	11.20	1.00	120	1150	690
			S00606	11.20	12.00	.80	110	565	210
			S00607	12.00	13.00	1.00	145	675	515
			S00608	13.00	14.00	1.00	175	515	180
			S00609	14.00	15.00	1.00	165	465	200
			S00610	15.00	16.00	1.00	175	560	245
			S00611	16.00	17.00	1.00	135	565	245
			S00612	17.00	18.00	1.00	135	965	385
17.90	22.20	FELSIC TUFF Medium grained feldspar quartz phyric, massive, generally weathered and leached with a pale matrix. In patches the rock may contain mafic phenocrysts and quartz and feldspar phenocrysts are not ubiquitous. The rock appears to be a tuff as phenocrysts are somewhat fragmented. The feldspars are probably obliterated by moderate sericite alteration. Occasional manganese stained fine cross-cutting veins, fine sericite or leached chlorite veins are present at low angles to the core axis. The most gossanous patches are from 18.20 to 18.75, 19.20 to 19.30, 20.20 to 20.50, 20.80 to 21.00 and 22.10 to 22.20.	S00613	18.00	19.00	1.00	110	940	275
			S00614	19.00	20.00	1.00	91	940	935
			S00615	20.00	21.00	1.00	195	885	655
			S00616	21.00	22.00	1.00	245	1150	675
			S00617	22.00	25.00	3.00	145	1800	1250
22.20	29.30	INTERMEDIATE TUFFS Medium grained feldspar and mafic phyric, massive, possibly weakly foliated at 50 to 60 degrees to the core axis, weathered rock. Feldspars are generally anhedral and sericitized, mafics sparser than from 3.00 to 17.90, are chloritic. Fine chlorite veins and gossanous manganese stained veins are both generally at 15 to 50 degrees to the core axis. The rock is strongly manganese stained from	S00618	25.00	26.00	1.00	150	1050	1250
			S00619	26.00	27.00	1.00	135	530	705
			S00620	27.00	28.00	1.00	110	530	530
			S00621	28.00	29.40	1.40	115	750	610

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm
		28.90 to 29.30. The lower contact is in broken core.							
29.30	31.20	FELSIC TUFF Very similar to the intersection from 17.90 to 22.20. The rock is pale to tan in colour being weathered and leached and contains medium grained feldspar and quartz phenocrysts the former generally sericitized as is the matrix. The rock contains approximately 0.5% disseminated clots of pyrite with oxidised rims and fully oxidised clots. Fine grained chloritic clots appear more like alteration than mafic phenocrysts. A 10 mm thick quartz minor pyrite vein cross-cuts at 45 degrees to the core axis at 29.40.	S00622	29.40	31.20	1.80	100	175	355
31.20	35.80	INTERMEDIATE TUFFS Similar rock to that intersected from 22.20 to 29.30. The rock is generally oxidised with some fresh patches showing the rock to be a medium grained feldspar phyric rock moderately chlorite and silica altered with sericitisation of the feldspar. Fine chlorite veins are generally at moderate angles to the core axis. The rock contains 1% pyrite throughout as fine grained disseminations.	S00623	31.20	33.00	1.80	65	130	380
			S00624	33.00	34.20	1.20	98	81	380
			S00625	34.20	35.80	1.60	140	175	335
35.80	39.65	INTERMEDIATE TUFFS / CHLORITE SILICA PYRITE ALTERATION Essentially the same rock as for 31.20 to 35.80 except unweathered. The rock contains occasional medium grained sericitized feldspars but is generally a mottled green white with fine grained to medium grained clots of chlorite in a pale silica-sericite matrix. 2% to 4% pyrite throughout occurs as fine grained to very fine grained disseminations generally associated with chlorite alteration. Some medium grained chlorite clots look subhedral suggesting they were originally mafics. Much of the core is broken with substantial core loss.	S00626	35.80	38.40	2.60	375	130	205
			S00627	38.40	40.00	1.60	315	72	1050
39.65	40.60	SILICA SERICITE PYRITE ALTERATION Very pale moderately silicified and sericitized rock with 5% pyrite in coarse grained clots and finer disseminations generally associated with patches of silicification. A pale pink colour in patches is probably manganese carbonate. Diffuse dark green patches invariably associated with pyrite in the silicification are chlorite. The sericite is in very fine veinlets and as diffuse alteration. The upper contact and lower contact are gradational. No obvious phenocrysts are evident.	S00628	40.00	41.00	1.00	390	56	450
40.60	49.60	INTERMEDIATE LAVA / CHLORITE SILICA PYRITE ALTERATION Location of the lower contact is uncertain due to 1.70m core from 48.10 to 49.20. The rock is moderately chlorite and silicic altered throughout and is generally massive but contains somewhat tabular medium grained clots of chlorite probably after mafics or feldspars which are moderately foliated at 45 degrees to the core axis. Below 46.65 the medium grained clots of chlorite and lesser sericite are distinctive. There are also subhedral clots of sericite. Pyrite, approximately 2% to 4% throughout, is in irregular veins and associated with chlorite	S00629	41.00	42.00	1.00	270	22	305
			S00630	42.00	43.00	1.00	225	42	420
			S00631	43.00	44.00	1.00	49	41	345
			S00632	44.00	46.00	2.00	285	11	655
			S00633	46.00	47.00	1.00	27	115	755
			S00634	47.00	48.10	1.10	95	4450	1050
			S00635	48.10	49.00	.90	24	38	365
			S00636	49.00	50.00	1.00	17	35	100

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm)
		alteration. The rock is also diffusely ferruginous carbonate altered in spots and broader veins.							
49.60	50.80	SHEAR ZONE / SILICA SERICITE PYRITE ALTERATION Strongly sericitized, moderate to strongly silicified, and schistose sulphidic rock. Rock contains foliated apple green fuchsitic patches after feldspars. From 49.85 to 50.20 the rock is strongly sheared ie a shear zone at 60 degrees to the core axis. 5% pyrite throughout is in coarse grained clots and in concordant pyrite carbonate veins. At 50.30 is a concordant pyrite vein. The selvedges to the inner sericitic shear zone are first silicified then chloritic further out with gradational lower and upper contacts. The rock also contains strong carbonate veining apparently syngenetic to the sulphides silica and chlorite.	S00637	50.00	51.00	1.00	23	9	115
50.80	76.50	INTERMEDIATE LAVA / CHLORITE SILICA PYRITE ALTERATION FELDSPAR PHYRIC, CHLORITIC ROCK. Dark green rock with medium grained plagioclase feldspar throughout. Rock is moderately to strongly chloritic throughout with 2% to 4% pyrite as disseminations and fine irregular veinlets. Texturally the rock is massive becoming more foliated downhole. The rock contains occasional carbonate and carbonate quartz veins. Pale green sericite rims on mafic phenocrysts are a common feature with a chloritic core. There are at least two generations of these carbonate veins. In patches the rock is finer grained and more massive. There are also more minor silica sericite altered zones as noted below.	S00638	51.00	52.00	1.00	59	8	155
			S00639	52.00	53.00	1.00	82	22	380
			S00640	53.00	54.00	1.00	87	430	500
			S00641	54.00	55.00	1.00	17	31	405
			S00642	55.00	56.00	1.00	51	<5	180
			S00643	56.00	57.00	1.00	12	<5	160
			S00644	57.00	58.00	1.00	10	<5	140
			S00645	58.00	59.00	1.00	5	<5	97
			S00646	59.00	60.00	1.00	22	<5	82
			S00647	60.00	61.00	1.00	17	260	72
			S00648	61.00	62.00	1.00	42	145	100
			S00649	62.00	63.00	1.00	35	18	110
			S00650	63.00	64.00	1.00	77	7	190
			S00651	64.00	65.00	1.00	22	33	130
			S00652	65.00	66.00	1.00	6	12	135
			S00653	66.00	67.00	1.00	20	<5	140
			S00654	67.00	68.00	1.00	19	795	115
			S00655	68.00	69.00	1.00	9	30	83
			S00656	69.00	70.00	1.00	6	41	75
			S00657	70.00	71.00	1.00	7	13	140
			S00658	71.00	72.00	1.00	7	<5	255
			S00659	72.00	73.00	1.00	8	22	225
			S00660	73.00	74.00	1.00	53	23	420
			S00661	74.00	75.00	1.00	33	3000	3600
			S00662	75.00	76.00	1.00	86	55	290
			S00663	76.00	77.00	1.00	49	695	375
		50.80 60.90 As above with altered plagioclase phenocrysts throughout and 2% to 4% pyrite as fine disseminations. Rock is moderately silicified.							
		58.65 PETROLOGICAL SAMPLE 27/; moderately altered holocrystalline andesitic to dacitic intrusive.							
		60.90 61.20 Strongly sulphidic zone with 10% pyrite as disseminated spots. More strongly silicified but with chlorite alteration and altered feldspar phenocrysts visible. The rock contains a vein cross-cutting at 30 degrees to the core axis with quartz and a very dark mineral very probably chlorite.							
		61.20 62.80 As above with altered feldspar phenocrysts and 4% pyrite throughout.							
		62.80 64.20 Fine grained dark green chloritic rock with silica fine grained altered plagioclase feldspar phenocrysts visible with 1% pyrite.							
		64.20 65.80 As above with altered plagioclase feldspar phenocrysts and 2% pyrite, although the rock is paler green and more moderately silicified.							
		65.80 65.90 Strongly silicified, pale pink with medium grained chloritic altered plagioclase feldspar phenocrysts and 2% pyrite in clots.							
		65.90 66.55 As above with altered plagioclase feldspar phenocrysts and 4% pyrite. At 66.15 a fine vein at 30 degrees to the core axis contains a red brown mineral with some associated medium							

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm
		grained clots of the same in the rock adjacent to the vein.							
	66.55	66.70 Mottled pale brown rock with 1% pyrite. Pale brown mineral is a medium grained moderately hard mineral which may be silicified biotite.							
	66.70	66.90 As above with medium grained altered plagioclase feldspar phenocrysts and 1% pyrite.							
	66.90	67.10 Pale brown moderately silicified sericite altered rock. Rock is moderately schistose at 40 degrees to the core axis, dipping 38 to 122 (TN). Rock contains 4% pyrite associated with carbonate alteration.							
	67.10	76.50 As above with medium grained altered plagioclase feldspar phenocrysts in a chloritic matrix. The rock contains approximately 2% to 4% pyrite and rock has a gradational lower contact. From 67.10 to 67.40 the rock is also moderately sericite altered with 4% of pyrite in a shear like vein from 67.25 to 67.30 at 45 degrees to the core axis dipping 35 to 132 (TN). A quartz carbonate vein with minor galena at 67.90 at 30 degrees to the core axis is concordant to the foliation dipping 29 to 142 (TN). Moderate schistosity and concordant quartz carbonate veining at 68.30 dips 40 to 326 (TN). At 69.10 a concordant quartz carbonate vein dipping 25 to 140 (TN) contains the red mineral with a 10 mm clot of galena. Another pyrite vein concordant to foliation at 69.90 at 35 degrees to the core axis dips 33 to 132 (TN). The rest of the rock is the medium grained altered plagioclase phyric, chloritic rock with 2% to 4% pyrite throughout. From 74.60 to 74.75 the rock contains 5% to 10% galena, minor chalcopyrite and possibly some fine grained grey sphalerite associated with deformed white silicification. The lower contact is sharp, weakly schistose and at 45 degrees to the core axis.							
76.50	82.40	VOLCANICLASTIC / SILICA SERICITE PYRITE ALTERATION							
		ALTERED FELSIC VOLCANICLASTIC.	S00664	77.00	78.00	1.00	29	790	535
		Mottled pinky orange and pale brown rock rich in medium grained rounded quartz clasts and probably albitised feldspars. The rock is moderately sericite altered throughout with a weak foliation at 45 degrees to the core axis and contains 5% pyrite throughout in fine disseminations and cross-cutting veinlets. From 76.90 to 77.50 the rock contains 1% galena associated with quartz chlorite pyrite veins / alteration. The rock contains occasional fine concordant veinlets of pyrite and contains sub - angular pale pinky orange clasts to 15 mm. The lower contact is sharp and brecciated over 20 mm and irregular.	S00665	78.00	79.00	1.00	51	41	49
			S00666	79.00	80.00	1.00	60	29	25
			S00667	80.00	81.00	1.00	95	35	27
			S00668	81.00	82.00	1.00	7	21	37
			S00669	82.00	83.00	1.00	13	100	295
	81.15	PETROLOGICAL SAMPLE 20/; strongly altered quartz phyric crystal vitric tuff or ash rich volcaniclastic sandstone.							

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm
82.40	87.50	INTERMEDIATE LAVA / CHLORITE SILICA PYRITE ALTERATION							
		Chloritic altered, medium grained altered plagioclase phyric rock with feldspars. Rock is moderately chlorite altered and moderately silicified. Below 85.00 the rock is more strongly silicified. The rock is strongly foliated at 45 degrees to the core axis and contains approximately 2% to 4% pyrite throughout increasing downhole. Cross-cutting pyrite vein at 85.70. Occasional pyrite quartz veins are concordant to the foliation. The rock also contains cross-cutting 10 to 30 mm thick quartz carbonate veins.	S00670	83.00	84.00	1.00	35	140	420
			S00671	84.00	85.00	1.00	10	45	175
			S00672	85.00	86.00	1.00	8	13	145
			S00673	86.00	87.50	1.50	9	45	86
		85.10 PETROLOGICAL SAMPLE 28/; strongly altered holocrystalline andesitic to dacitic intrusive.							
87.50	88.40	INTERMEDIATE LAVA / CHLORITE SILICA PYRITE ALTERATION							
		Moderately to strongly silicified and chloritic and weak to moderately sericite altered rock with 10% pyrite in disseminated clots and concordant veinlets at 45 degrees to the core axis and 1% galena throughout associated with irregular quartz carbonate veining. Phenocrysts are not obvious. The upper contact is marked by a 2 mm thick concordant vein of pyrite.	S00674	87.50	88.40	.90	36	<5	72
88.40	135.75	INTERMEDIATE LAVA / CHLORITE SILICA PYRITE ALTERATION							
		Predominantly moderately silica and chlorite altered plagioclase feldspar phyric foliated rock with 2% to 4% pyrite throughout. The rock contains occasional moderately sericite altered zones as noted below.	S00675	88.40	89.00	.60	8	455	81
			S00676	89.00	90.00	1.00	11	105	90
			S00677	90.00	91.00	1.00	14	105	105
			S00678	91.00	92.00	1.00	13	205	90
		88.40 90.45 Moderately sericite and chlorite altered zone with 5% pyrite throughout. The rock contains apple green sericite patches. Phenocrysts are chloritic and are plagioclase feldspars. The rock becomes more strongly silicified from 90.05 to 90.45 and is foliated at 45 degrees to the core axis. The lower contact is schistose at 60 degrees to the core axis.	S00679	92.00	93.00	1.00	9	76	195
			S00680	93.00	94.00	1.00	13	21	225
			S00681	94.00	95.00	1.00	23	39	200
			S00682	95.00	96.00	1.00	20	120	130
			S00683	96.00	97.00	1.00	19	135	79
			S00684	97.00	98.00	1.00	80	110	145
			S00685	98.00	99.00	1.00	100	21	140
			S00686	99.00	100.00	1.00	31	14	94
		90.45 93.20 Weakly sericite, moderately chlorite and silica altered zone that is foliated at 45 degrees to the core axis and contains 4% pyrite. Chlorite altered medium grained phenocrysts were feldspars.	S00687	100.00	101.00	1.00	32	11	115
			S00688	101.00	102.00	1.00	10	27	61
			S00689	102.00	103.00	1.00	68	12	145
			S00690	103.00	104.00	1.00	41	15	125
			S00691	104.00	105.00	1.00	73	26	110
		93.20 93.30 Moderately chloritic and sericite altered with feldspars and possibly quartz phenocrysts though the latter probably are alteration effects.	S00692	105.00	106.00	1.00	44	53	130
			S00693	106.00	107.00	1.00	38	96	95
			S00694	107.00	108.00	1.00	62	11	62
			S00695	108.00	109.00	1.00	22	27	47
		93.30 96.30 As above moderately chloritic and silicified in a mottled patchy style. Rock contains 2% pyrite throughout.	S00696	109.00	110.00	1.00	34	16	80
			S00697	110.00	111.00	1.00	25	59	71
			S00698	111.00	112.00	1.00	35	37	130
		96.30 97.00 Pale pinky orange more like a quartz carbonate rich volcaniclastic but may be alteration. Rock is weakly sericite altered and contains 2% pyrite in veinlets.	S00699	112.00	113.00	1.00	25	46	200
			S00700	113.00	114.00	1.00	46	10	165
			S00701	114.00	115.00	1.00	39	<5	100
			S00702	115.00	116.00	1.00	17	<5	92
		97.00 98.20 Moderately chloritic rock with feldspar phenocrysts with a 20 mm fine grained pyrite vein at 25 degrees to the core axis at 97.40 to 97.50.	S00703	116.00	117.00	1.00	9	<5	115
			S00704	117.00	118.00	1.00	17	27	165
			S00705	118.00	119.00	1.00	12	91	220
			S00706	119.00	120.00	1.00	28	69	185
		98.20 99.50 Moderately chlorite and sericite altered rock,	S00707	120.00	121.00	1.00	14	150	240

From (m)	To (m)	Description
		foliated / schistose at 50 degrees to the core axis. Rock contains medium grained rounded clasts (?), which may be an alteration effect, at 98.80 to 98.90. Elsewhere the rock contains medium grained plagioclase feldspars. The rock is fine grained from 98.20 to 98.70. The rock contains large patches of diffuse silicification and contains 2% pyrite throughout with 4% pyrite in the more sericite altered patches.
99.50	101.20	As above. Chloritic rock with 2% pyrite throughout. A moderately developed schistosity is at 45 degrees to the core axis. Phenocrysts somewhat ghosted.
101.20	102.00	Patch of brecciated silicification and carbonate alteration in a sheared moderately chloritic and sericite altered matrix with 4% pyrite in disseminated clots.
102.00	106.85	As above. Chloritic, moderately foliated rock with approximately 2% pyrite throughout with medium grained ghosted phenocrysts, probably feldspars. The rock is moderately schistose at 45 to 50 degrees to the core axis, dipping 10 to 240 (TN) at 102.50 and 8 to 024 (TN) at 104.10. A sheared breccia zone of silicification from 103.70 to 104.00 dips shallowly to 220 (TN).
106.85	107.40	Fine grained chloritic rock with sharp upper contact and lower contact at approximately 50 and 70 degrees to the core axis respectively.
107.40	126.90	Moderately chloritic, weak to moderately schistose rock, generally with medium grained chloritic phenocrysts. Phenocrysts generally tabular or blocky suggestive of feldspars. The rock contains 1% to 2% fine grained disseminated pyrite throughout and irregularly cross-cutting carbonate veins. The rock contains very occasional carbonate veins with the red mineral predominantly from 119.40 to 120.50. The rock is foliated / schistose at 45 to 50 degrees to the core axis throughout, dipping 12 to 036 (TN) at 120.50. A carbonate and red mineral vein dips 35 to 328 (TN) and another, also with pyrite, dips 63 to 322 (TN).
111.15		PETROLOGICAL SAMPLE 33/; strongly altered plagioclase phyric felsic lava.
126.90	132.10	Chloritic rock still but more sandy in appearance with a weakly mottled quartz chlorite alteration style throughout. The rock is weakly schistose throughout at approximately 45 degrees to the core axis. The rock contains approximately 1% pyrite as disseminations and contains cross-cutting fracture fill carbonate veins.
132.10	135.75	Chloritic rock with medium grained altered

Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm
S00708	121.00	122.00	1.00	21	74	250
S00709	122.00	123.00	1.00	96	56	210
S00710	123.00	124.00	1.00	50	6	125
S00711	124.00	125.00	1.00	33	7	155
S00712	125.00	126.00	1.00	15	<5	190
S00713	126.00	127.00	1.00	20	24	235
S00714	127.00	128.00	1.00	20	85	130
S00715	128.00	129.00	1.00	5	<5	58
S00716	129.00	130.00	1.00	11	<5	62
S00717	130.00	131.00	1.00	10	<5	73
S00718	131.00	132.00	1.00	12	<5	95
S00719	132.00	133.00	1.00	46	190	260
S00720	133.00	134.00	1.00	33	14	81
S00721	134.00	135.00	1.00	46	390	125
S00722	135.00	136.00	1.00	24	180	140

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm
		feldspar phenocrysts. From 134.90 to 135.75 feldspar phenocrysts are pale green and sericite altered. The rock contains 1% to 2% pyrite throughout with 4% from 132.50 to 132.70 and 134.30 to 134.60. A brecciated and sheared chloritic zone of silicification and carbonate alteration from 132.70 to 132.80 is sheared at 35 degrees to the core axis.							
135.75	137.10	SHEAR ZONE / SILICA SERICITE PYRITE ALTERATION / CHLORITE SILICA PYRITE ALTERATION							
		Strongly sheared, schistose, chlorite and sericite altered zone with sheared and deformed quartz and carbonate veins. Some patches are very sulphidic. Sericite is apple green in patches. Medium grained phenocrysts, foliated at 45 degrees to the core axis are probably feldspars.	S00723	136.00	137.00	1.00	61	1750	840
			S00724	137.00	138.00	1.00	65	47	115
		135.75 136.50 Initially more sericite altered, becoming more chloritic downhole with approximately 2% pyrite throughout and carbonate veining sub - parallel to the core axis. The rock is schistose at 50 degrees to the core axis dipping 68 to 008 (TN) at 136.30.							
		136.50 136.70 More chloritic with 2% galena and trace chalcopyrite associated with concordant carbonate veining with the red mineral. The concordant veins are at 136.50 and 136.70 with some minor fine grained pyrite at 136.70. Both veins are at 40 degrees to the core axis, dipping 85 to 015 (TN) at 136.50. The red mineral is approximately 2% of the rock. The veins have the red mineral in the centre with galena selvedges. The vein at 136.70 dips 82 to 022 (TN).							
		136.70 137.10 More chloritic with deformed quartz carbonate veining and 2% pyrite.							
137.10	143.20	INTERMEDIATE LAVA / CHLORITE SILICA PYRITE ALTERATION							
		Similar to previous chloritic rocks but with medium grained more blocky chloritic phenocrysts throughout ghosted by chlorite alteration. The rock is weak to moderately foliated at 45 degrees to the core axis and rock contains 1% to 2% pyrite throughout as disseminations and irregular veinlets. The rock contains cross-cutting carbonate veins with a pale red mineral at 45 degrees to the core axis at 139.30 and 139.70. The rock contains 1% to 2% pyrite throughout and contains medium grained plagioclase phenocrysts now pale green and sericite altered. Cross-cutting carbonate pyrite veins are generally at 40 to 70 degrees to the core axis and are not parallel to the foliation. From 138.15 to 138.70 the rock is a zone of strong sericite alteration and silicification. Sericite alteration of feldspar phenocrysts here is apple green. The zone contains 5% pyrite. The lower contact is gradational.	S00725	138.00	139.00	1.00	32	20	92
			S00726	139.00	140.00	1.00	48	29	145
			S00727	140.00	141.00	1.00	20	10	125
			S00728	141.00	142.00	1.00	14	100	120
			S00729	142.00	143.00	1.00	10	32	88
			S00730	143.00	144.00	1.00	11	60	69
143.20	146.05	INTERMEDIATE LAVA / SHEAR ZONE / SILICA SERICITE PYRITE							

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm
		ALTERATION							
		Pale tan to pale pinky brown massive to moderately schistose sulphidic rock. Weakly ghosted medium grained phenocrysts appear to be feldspars. The rock contains 10% pyrite throughout with 1% galena below 145.00. The pyrite veining is at low angles to the core axis in the more massive parts predominantly from 143.20 to 144.00 and 144.60 to 145.00. These pyrite veins are generally at 10 to 20 degrees to the core axis. Elsewhere the rock is schistose and more strongly sericite altered with 5% to 10% pyrite in veins concordant to carbonate veining and the schistosity at 40 degrees to the core axis. The rock contains 2% to 4% of fine grained pyrite from 144.00 to 144.60 and from 145.10 to 145.20. From 145.00 to 146.05 the rock contains approximately 1% galena in veining associated with carbonate generally at low angles to the core axis though pre-deformation. The lower contact is gradational over 100 mm.	S00731	144.00	145.00	1.00	9	1450	315
			S00732	145.00	146.00	1.00	20	2700	1700
			S00733	146.00	147.00	1.00	21	320	160
		143.35 PETROLOGICAL SAMPLE 32/; strongly altered formerly plagioclase phyric lava.							
		144.10 PETROLOGICAL SAMPLE 31P/; strongly sheared, sericite-carbonate-quartz-pyrite felsic rock with 2% to 3% pyrite, trace rutile and trace galena.							
		144.25 PETROLOGICAL SAMPLE 30/; strongly altered formerly plagioclase phyric lava.							
146.05	166.50	INTERMEDIATE LAVA / CHLORITE SILICA PYRITE ALTERATION							
		Dark green chloritic rock as logged previously. The rock is moderately foliated / schistose throughout at 50 degrees to the core axis and contains 1% to 2% pyrite throughout with occasional patches to 5%. The rock contains medium grained, now chloritic, phenocrysts which are altered feldspars, some phenocrysts being sericite altered. At 153.20 the schistosity dips 70 to 024 (TN). The rock is more pyritic from 147.90 to 148.10, 149.70 to 150.70 and 160.00 to 160.30. From 161.40 to 161.90 the rock is strongly sericite altered with apple green sericite alteration of medium grained phenocrysts with deformed patches of silicification. The zone contains 4% pyrite. From 163.00 to 163.20 the rock is strongly silicified with 5% pyrite in clots. There is a strongly silicified zone from 163.10 to 163.20 with carbonate veins containing the red mineral. The lower contact is gradational.	S00734	147.00	148.00	1.00	34	31	84
			S00735	148.00	149.00	1.00	45	42	105
			S00736	149.00	150.00	1.00	43	99	175
			S00737	150.00	151.00	1.00	40	140	255
			S00738	151.00	152.00	1.00	25	<5	67
			S00739	152.00	153.00	1.00	47	<5	98
			S00740	153.00	154.00	1.00	<4	<5	110
			S00741	154.00	155.00	1.00	32	<5	105
			S00742	155.00	156.00	1.00	18	<5	88
			S00743	156.00	157.00	1.00	59	<5	57
			S00744	157.00	158.00	1.00	13	<5	58
			S00745	158.00	159.00	1.00	18	21	59
			S00746	159.00	160.00	1.00	46	105	130
			S00747	160.00	161.00	1.00	34	50	105
			S00748	161.00	162.00	1.00	20	340	160
			S00749	162.00	163.00	1.00	72	375	560
			S00750	163.00	164.00	1.00	61	73	140
			S00751	164.00	165.00	1.00	15	25	110
			S00752	165.00	166.00	1.00	46	<5	62
			S00753	166.00	167.00	1.00	8	9	155
166.50	173.70	INTERMEDIATE LAVA / CHLORITE SILICA PYRITE ALTERATION							
		Dark green moderately chloritic but strongly silicified rock with approximately 4% pyrite throughout. The rock contains cross-cutting quartz carbonate veins from 171.80 to 172.20 at high angles to the core axis. The rock is moderately schistose / foliated at 50 degrees to the core axis with occasional patches of now chloritic phenocrysts concordant to the foliation. The rock is gradational	S00754	167.00	168.00	1.00	75	7	47
			S00755	168.00	169.00	1.00	<4	24	44
			S00756	169.00	170.00	1.00	11	36	80
			S00757	170.00	171.00	1.00	59	37	62
			S00758	171.00	172.00	1.00	27	46	115
			S00759	172.00	173.00	1.00	36	21	170
			S00760	173.00	174.00	1.00	115	86	235

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm
		between the overlying chloritic pyritic rock and the underlying breccia.							
173.70	176.70	VOLCANICLASTIC / BRECCIA Mottled quartz chlorite silicified lithic rich volcaniclastic. This unit has a mottled appearance due to medium grained chloritic clots forming the matrix to medium grained to coarse grained sub - rounded quartz clots and pinky orange siliceous lithics with feldspars and lesser quartz phenocrysts. The chloritic clots may be after phenocrysts but it really looks more like alteration. The edges of quartz clasts are somewhat diffuse and the lower contact is somewhat sharp but the underlying rock is still probebly a volcaniclastic. There is a pebbly zone of broken core at 175.10. The rock contains approximately 0.3% galena and 0.1% chalcopyrite with 1% pyrite as fine grained aggregates. A vein 3 mm thick of fine grained pyrite at 173.90 dips 72 to 288 (TN). A weak foliation at 175.00 dips 40 to 135 (TN).	S00761 S00762 S00763	174.00 175.00 176.00	175.00 176.00 177.00	1.00 1.00 1.00	135 150 125	1000 545 185	3800 1250 96
176.70	180.20	SHEAR ZONE / VOLCANICLASTIC / SILICA SERICITE PYRITE ALTERATION Foliated / schistose rock consisting of fine grained pyrite in veins / sheets at 35 to 45 degrees to the core axis. This zone is sheared with moderate sericite and chlorite alteration, the carbonate and quartz veins are deformed. The rock contains 5% of fine grained pyrite from 178.05 to 178.30 and 179.90 to 180.20 with 2% from 178.30 to 179.90 where the rock more closely resembles the volcaniclastic from 173.70 to 176.70. The rock contains 4% pyrite throughout and is generally more sericite altered and only weak to moderately chlorite altered with moderate silicification. The lower contact is sharp and at 70 degrees to the core axis. 178.25 PETROLOGICAL SAMPLE 16P/; strongly schistose, sericite-carbonate pyrite-tourmaline altered felsic volcanic with 7% to 10% pyrite, 2% to 3% tourmaline and trace rutile and chalcopyrite. 180.10 PETROLOGICAL SAMPLE 17P/; strongly sheared, sericite-carbonate-quartz-pyrite felsic volcanic with 3% to 5% pyrite.	S00764 S00765 S00766	177.00 178.00 178.90	178.00 178.90 180.20	1.00 .90 1.30	43 45 18	24 36 15	43 30 25
180.20	184.40	INTERMEDIATE LAVA / CHLORITE SILICA PYRITE ALTERATION More silicified than chloritic, alteration with medium grained chloritic feldspar phenocrysts with moderate silicification predominantly from 182.80 to 184.40. The rock is generally moderately schistose at 50 degrees to the core axis and is transitional between the overlying and underlying rocks. The lower contact is somewhat gradational.	S00767 S00768 S00769 S00770 S00771	180.20 181.00 182.00 183.00 184.00	181.00 182.00 183.00 184.00 185.00	.80 1.00 1.00 1.00 1.00	6 13 11 5 4	<5 10 8 16 9	69 51 50 22 110
184.40	203.20	INTERMEDIATE LAVA / CHLORITE SILICA PYRITE ALTERATION Similar to the previous chloritic rock with a mottled appearance. The rock contains medium grained chloritic phenocrysts throughout with a moderate foliation that is at 45 to 50 degrees to the core axis and dipping 55 to 114	S00772 S00773 S00774 S00775	185.00 186.00 187.00 188.00	186.00 187.00 188.00 189.00	1.00 1.00 1.00 1.00	34 <4 6 17	8 <5 <5 <5	120 60 55 73

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm
		(TN) at 185.80. The rock contains 2% pyrite throughout, occasional generally concordant cross-cutting carbonate and quartz carbonate veins. The rock contains very occasional red mineral with carbonate in veins from 194.10 to 195.30. The lower contact is sharp at 40 degrees to the core axis. There is a deformed bed of pale green siltstone at 45 degrees to the core axis.	S00776	189.00	190.00	1.00	28	13	63
			S00777	190.00	191.00	1.00	33	7	51
			S00778	191.00	192.00	1.00	54	10	61
			S00779	192.00	193.00	1.00	13	5	66
			S00780	193.00	194.00	1.00	52	11	88
			S00781	194.00	195.00	1.00	5	<5	105
			S00782	195.00	196.00	1.00	36	17	100
		187.30 PETROLOGICAL SAMPLE 23/; moderately altered holocrystalline andesitic to dacitic intrusive.	S00783	196.00	197.00	1.00	62	30	95
			S00784	197.00	198.00	1.00	50	56	89
			S00785	198.00	199.00	1.00	54	17	61
			S00786	199.00	200.00	1.00	35	7	81
			S00787	200.00	201.00	1.00	13	5	72
			S00788	201.00	202.00	1.00	28	32	67
			S00789	202.00	203.00	1.00	22	8	61
			S00790	203.00	204.00	1.00	47	29	72
203.20	206.80	INTERMEDIATE LAVA / CHLORITE SILICA PYRITE ALTERATION							
		Dark green chloritic rock but more fine grained than overlying rock with medium grained sericitised plagioclase phenocrysts. The difference with the overlying rock is that the overlying rock is more mottled and possibly more sandier. The rock contains approximately 1% disseminated pyrite throughout. The lower contact is sharp, marked by a quartz carbonate vein at 40 degrees to the core axis.	S00791	204.00	205.00	1.00	67	14	100
			S00792	205.00	206.00	1.00	72	5	75
			S00793	206.00	207.00	1.00	14	8	61
206.80	213.00	VOLCANICLASTIC							
		FELSIC VOLCANICLASTIC. Pinky orange medium grained quartz rich, massive with cross-cutting fine carbonate veins and 2% pyrite in fine grained disseminated clots. Rock contains occasional lithics. At 211.60 there is a contact at 30 degrees to the core axis with a fine grained siliceous version of the overlying rock. The fine grained rock has a sharp contact at 50 degrees to the core axis at 212.30 with a medium grained quartz rich volcaniclastic. The fine grained rock shows a weak banding at 30 degrees to the core axis. From 212.30 to 213.00 the rock contains disseminated medium grained clots of chlorite looking somewhat like the volcaniclastic from 173.70 176.70. The lower contact is moderately sheared at 15 degrees to the core axis.	S00794	207.00	208.00	1.00	<4	9	14
			S00795	208.00	209.00	1.00	<4	7	13
			S00796	209.00	210.00	1.00	<4	6	10
			S00797	210.00	211.00	1.00	<4	5	20
			S00798	211.00	212.00	1.00	94	5	56
			S00799	212.00	213.00	1.00	160	13	46
213.00	214.45	PSAMMITE							
		Pale green to green brown fine grained to medium grained ghosted feldspar and fine grained to medium grained quartz rich sediment. There is a weak bedding at 50 degrees to the core axis at 213.30. The rock contains approximately 0.5% pyrite throughout in disseminations. The lower contact is at 45 degrees to the core axis and is sharp but unsheared.	S00800	213.00	214.00	1.00	44	5	75
			S00801	214.00	215.00	1.00	97	43	145
214.45	216.10	VOLCANICLASTIC							
		FELSIC VOLCANICLASTIC. Quartz rich volcaniclastic as for 206.80 to 213.00 except rock fines up downhole in broken core. The rock contains approximately 1% disseminated pyrite. The lower contact is not obvious but feldspars become more common and quartz less so below 216.10. The rock contains 1% disseminated	S00802	215.00	216.00	1.00	50	865	185
			S00803	216.00	217.00	1.00	100	300	225

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm)
		pyrite.							
216.10	217.35	PSAMMITE Somewhat mixed package of fine grained to medium grained rock generally with feldspars now ghosted. 216.10 216.35 Moderately foliated at 55 degrees to the core axis. Rock contains occasional medium grained sericite patches and occasional medium grained quartz. At 216.35 is a quartz carbonate vein at 40 degrees to the core axis 216.35 216.45 Pale brown fine grained siltstone with irregular bedding at 40 degrees to the core axis. The upper and lower contacts are both sharp. 216.45 217.15 Sediment, strongly foliated at 35 to 40 degrees to the core axis and containing occasional medium grained rounded quartz and elongate feldspars. The rock is a sediment. The rock contains concordant deformed carbonate veins with minor associated galena and 2% pyrite in disseminated clots. The lower contact is very sharp, conformable and at 70 degrees to the core axis. 217.15 217.30 Pale brown to pale green fine grained siltstone with rounded clots of quartz as alteration. Rock contains 0.5% pyrite. The lower contact is sharp at 70 degrees to the core axis. 217.30 217.35 Very chloritic zone. Probably a coarser sediment with strong chlorite alteration. Rock contains 4% pyrite and 4% of the red mineral, darker now. The lower contact is sharp and at approximately 80 degrees to the core axis.	S00804	217.00	218.00	1.00	30	74	325
217.35	219.30	INTERMEDIATE LAVA INTERMEDIATE LAVA OR INTRUSIVE. Deformed carbonate altered rock, silicified. The rock was originally logged as a sandy sediment though the thin section shows this to be an andesitic to dacitic intrusive. From 217.35 to 218.55 the rock contains 1% pyrite. From 218.55 to 219.30 the rock contains 2% galena in clots associated with carbonate alteration. 217.40 PETROLOGICAL SAMPLE 24/; strongly altered holocrystalline andesitic to dacitic intrusive.	S00805 S00806	218.00 219.00	219.00 220.00	1.00 1.00	24 48	3100 1100	420 320
219.30	220.00	VOLCANICLASTIC A continuation of the mixed sedimentary unit from 216.10 to 217.35 though now the rock is best described as a felsic volcaniclastic. 219.30 219.40 Small shear at 25 degrees to the core axis adjacent to a quartz vein. 219.40 220.00 Beige green silicified sparsely volcaniclastic rock with quartz and occasional lithics. The rock contains approximately 0.3% pyrite. The lower contact							

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm)
		is sharp at 70 degrees to the core axis.							
220.00	228.20	INTERMEDIATE LAVA / CHLORITE SILICA PYRITE ALTERATION Similar to previous chloritic rocks. Rock contains 2% pyrite throughout and very minor galena and chalcopyrite associated with clots of carbonate alteration. The rock is weakly foliated with a concordant quartz carbonate vein at 50 degrees to the core axis dipping 70 to 004 (TN) at 222.05. The lower contact is moderately schistose at 50 degrees to the core axis.	S00807	220.00	221.00	1.00	74	11	210
			S00808	221.00	222.00	1.00	54	56	125
			S00809	222.00	223.00	1.00	130	22	125
			S00810	223.00	224.00	1.00	105	2300	225
			S00811	224.00	225.00	1.00	35	110	180
			S00812	225.00	226.00	1.00	20	235	115
			S00813	226.00	227.00	1.00	52	530	405
			S00814	227.00	228.00	1.00	125	1750	950
			S00815	228.00	229.00	1.00	13	110	155
228.20	233.40	INTERMEDIATE LAVA / VOLCANICLASTIC POLYMICT LAVA BRECCIA, INTERMEDIATE. Brecciated irregular fragments of porphyritic lava with ghosted chloritic rims, containing phenocrysts of medium grained sericitized feldspars in a pale green matrix. Fragments lie in a grey green matrix, moderately chloritic. The rock contains pinky orange clots of carbonate, probably a manganese carbonate. There is a discernible foliation of clasts at 50 degrees to the core axis. The rock contains 1% pyrite increasing to 2% downhole. The upper contact is sheared with the first 30cm more of a silicified sediment, pale brown. The rock is not obviously graded as this fine grained 30cm is not a graded top. The lower contact is sharp and at 35 degrees to the core axis. The matrix contains very minor disseminated chalcopyrite. 232.10 PETROLOGICAL SAMPLE 9/; strongly altered polymict felsic lava breccia dominated by dacitic lava fragments. 232.20 PETROLOGICAL SAMPLE 10/; strongly altered polymict felsic lava breccia as for 9/.	S00816	229.00	230.00	1.00	490	63	110
			S00817	230.00	231.00	1.00	51	94	180
			S00818	231.00	232.00	1.00	135	1000	1100
			S00819	232.00	233.00	1.00	115	1350	1350
			S00820	233.00	234.00	1.00	85	315	800
233.40	236.10	PSAMMITE / CHLORITE SILICA PYRITE ALTERATION Fine grained grey green sediment, chloritic altered with sericitized feldspar and pale beige green siliceous clasts from 235.40 to 236.10. From 233.40 to 234.60 the rock contains medium grained chlorite altered phenocrysts being more fine grained from 234.60 to 235.40. The rock contains approximately 1% pyrite throughout and minor fine grained clots of the red mineral. The lower contact is sharp and at 50 degrees to the core axis. The rock appears to be a mixed package of sediments, probably reworked tuffs.	S00821	234.00	235.00	1.00	16	165	245
			S00822	235.00	236.00	1.00	74	125	455
			S00823	236.00	237.00	1.00	69	315	565
236.10	239.45	INTERMEDIATE LAVA / VOLCANICLASTIC POLYMICT LAVA BRECCIA, INTERMEDIATE. Coarsely clastic rock consisting of brecciated fragments of pale pinky orange to pale grey siliceous fragments with very ghosted possible phenocrysts. Most clasts have very diffuse edges and the rock is only apparently a lava breccia due to the occasional distinct clasts otherwise it would be mottled silica and chlorite alteration. The rock contains 1% pyrite throughout. The lower contact is sharp and at 40 degrees to the core axis.	S00824	237.00	238.00	1.00	34	265	405
			S00825	238.00	239.00	1.00	47	265	485
			S00826	239.00	240.00	1.00	155	200	240

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm)
239.45	241.10	VOLCANICLASTIC / CHLORITE SILICA PYRITE ALTERATION ALTERED FELSIC VOLCANICLASTIC. Silica chlorite altered, somewhat mottled rock with medium grained patches of chlorite in a siliceous matrix. The rock contains 0.5% disseminated pyrite and contains medium grained sericitized feldspars, not porphyritic. The lower contact is gradational with the underlying rocks more sericite altered.	S00827 S00828	240.00 241.00	241.00 242.00	1.00 1.00	85 130	120 1950	120 99
241.10	246.90	PSAMMITE / SILICA SERICITE PYRITE ALTERATION / CHLORITE SILICA PYRITE ALTERATION Variably altered sediments. 241.10 241.60 Pale pink rock with medium grained feldspars sericitized with 1% pyrite in clots. From 241.55 to 241.60 the rock contains 4% galena and 2% of fine grained pyrite in more strongly sericite altered rock. 241.60 241.80 Milky white carbonate vein. 241.80 243.50 Pale grey green moderately schistose rock with 1% pyrite in concordant veins at 70 degrees to the core axis, minor galena associated with carbonate at 243.10. The rock contains medium grained ghosted fragments. The lower contact is sharp. 243.50 243.55 Cross-cutting carbonate vein as for 241.60 to 241.80. 243.55 244.40 Pinky orange medium grained feldspar and quartz clastic volcaniclastic with 1% pyrite throughout. 244.40 246.90 Pale grey green, moderately schistose at 70 degrees to the core axis, rock as for 241.80 to 243.50 with 2% pyrite in concordant veins and pods. Rock has a gradational lower contact. The rock contains minor galena associated with carbonate below 246.00. The lower contact is sharp but the underlying rock is essentially the same as this though more sulphidic.	S00829 S00830 S00831 S00832 S00833	242.00 243.00 244.00 245.00 246.00	243.00 244.00 245.00 246.00 246.90	1.00 1.00 1.00 1.00 .90	58 49 46 105 190	130 1850 505 705 570	160 150 150 580 975
246.90	249.05	SHEAR ZONE / SILICA SERICITE PYRITE ALTERATION Strongly sulphidic rock with 5% to 10% pyrite in concordant bands at 70 degrees to the core axis and disseminated throughout with some associated fine grained sphalerite and minor galena. The rock is sericite and moderately chlorite altered throughout with associated carbonate alteration with some bands of fine grained pyrite. The rock appears to contain porphyritic volcanic fragments with chloritic phenocrysts. The lower contact is gradational with the underlying rocks less sulphidic. 248.60 PETROLOGICAL SAMPLE 7P/; strongly schistose, sericite-pyrite-carbonate altered, tourmalinised volcanic sandstone? with 7% to 10% pyrite, 0.5% to 1% sphalerite, trace to 0.25% tourmaline and trace galena, chalcopyrite and rutile.	S00834 S00835 S00836	246.90 248.00 249.00	248.00 249.00 250.00	1.10 1.00 1.00	8 52 55	51 400 1100	135 1150 1600
249.05	251.80	VOLCANICLASTIC / CHLORITE SILICA PYRITE ALTERATION							

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm)
		ALTERED FELSIC VOLCANICLASTIC.	S00837	250.00	251.00	1.00	4	63	90
		Grey green chlorite and sericite altered rock. Somewhat mottled, the rock contains medium grained quartz clasts and possibly feldspar clasts with 1% disseminated pyrite. The rock is moderately schistose at 50 degrees to the core axis.	S00838	251.00	251.80	.80	10	42	105
251.80	253.20	INTERMEDIATE LAVA / SILICA SERICITE PYRITE ALTERATION							
		This rock was originally logged as a sediment / felsic volcaniclastic, however the petrology indicates that it is an altered intermediate lava / intrusive. Pale green, sericite, weakly chlorite altered rock, possibly moderately chlorite altered diffusely, with fine grained quartz and feldspars and medium grained foliated chloritic clasts ? at 60 degrees to the core axis. The rock contains 1% pyrite disseminated throughout and becomes more strongly sericite altered and schistose downhole.	S00839	251.80	253.20	1.40	61	220	225
		251.90 PETROLOGICAL SAMPLE 13/; strongly altered holocrystalline andesitic to basaltic intrusive.							
253.20	255.00	SHEAR ZONE							
		MAJOR SHEAR ZONE.	S00840	253.20	255.00	1.80	8	11	36
		Very strongly schistose and strongly sericite altered rock, schistose at 45 degrees to the core axis with some quartz carbonate veining. The rock appears to have been a quartz feldspar volcaniclastic.							
255.00	263.10	VOLCANICLASTIC / SILICA SERICITE ALTERATION							
		ALTERED FELSIC VOLCANICLASTIC.	S00841	255.00	256.00	1.00	7	14	41
		Strongly sericite altered volcaniclastic unit rich in medium grained quartz with possible lithics, feldspar and sericitic fiamme? volcaniclastic. The schistosity is at 50 degrees to the core axis. Some sericite patches have quartz, most do not. The rock contains negligible sulphides. From 261.20 to 261.40 the rock contains a cross-cutting quartz carbonate vein. Below 261.00 the rock contains interbedded sediments with medium grained foliated sericitized feldspars. Below 262.10 the rock contains interbedded siltstones with a gross fining up in this unit downhole.	S00842	256.00	257.00	1.00	4	6	13
			S00843	257.00	258.00	1.00	<4	9	11
			S00844	258.00	259.00	1.00	<4	<5	13
			S00845	259.00	260.00	1.00	5	<5	15
			S00846	260.00	261.00	1.00	<4	<5	11
			S00847	261.00	262.00	1.00	7	<5	42
			S00848	262.00	263.00	1.00	<4	<5	19
			S00849	263.00	264.00	1.00	9	11	19
		256.95 PETROLOGICAL SAMPLE 14/; weak to moderately altered quartz phyric crystal vitric tuff.							
263.10	267.20	PELITE							
		Interbedded pale grey and dark grey siltstones, weakly sericitized in patches. Bedding is at 60 to 70 degrees to the core axis and is deformed with imbrication of dark grey and pale grey rock. The rock contains very occasional disseminated pyrite in cubic clots and contains concordant carbonate veining throughout.	S00850	264.00	265.00	1.00	29	36	26
			S00851	265.00	266.00	1.00	10	29	19
			S00852	266.00	267.20	1.20	<4	<5	17
		265.95 PETROLOGICAL SAMPLE 11/; altered felsic crystal vitric tuff or ash rich volcaniclastic fine sandstone to siltstone.							
		267.20 E.O.H.							

APPENDIX D

Whole Rock and REE Geochemistry -

Analysis Petrology of Core from STD 1 -

Staverton Prospect

Sample locations STD 1 (Sample numbers from analytical results in parentheses - see Appendix E)

9.	232.10m	
10.	232.20m	
11.	225.95m	(SO1104)
13.	251.90m	(SO1105)
14.	265.95m	
20.	81.15m	
23.	187.30m	(SO1107)
24.	217.35m	(SO1110)
27.	58.65m	(SO1108)
28.	85.10m	(SO1109)
29.	174.60m	
30.	144.25m	
32.	143.35m	
33.	111.15m	(SO1106)

INTERPRETATION OF GEOCHEMICAL DATA
ROCKS FROM STAVERTON E/L

Thin section descriptions of the 12 samples selected for petrographic work are appended. A summary is provided below:

9 and 10: Polymict felsic lava breccias dominated by glassy, sparsely plagioclase-phyric dacitic lava fragments. The rocks have suffered early sericite alteration, overprinted by strong calcite-chlorite-pyrite-tourmaline± sphalerite alteration.

11: A felsic crystal vitric tuff or ash-rich volcaniclastic fine sandstone to siltstone, that was carbonate-altered, then weakly cleaved at several different orientations.

13: A shallow intrusive, almost holocrystalline, near-aphyric andesitic to basaltic dyke rock that has suffered intense sericite-calcite hydrothermal alteration.

14: A crystal vitric tuff derived from dominantly quartz-phyric explosive felsic volcanism. It has suffered weak to moderate sericite-calcite alteration.

20: A strongly sericite-pyrite-altered foliated quartz-phyric crystal vitric tuff or ash-rich volcaniclastic sandstone.

23: An andesitic to dacitic holocrystalline dyke rock, with moderate hydrothermal alteration (silica-chlorite±pyrite).

24: A virtually holocrystalline strongly carbonate-altered andesitic to dacitic dyke rock.

27: A holocrystalline moderately hydrothermally altered andesitic (dioritic) to dacitic dyke rock, very similar to sample 23.

28: A holocrystalline intrusive andesitic to dacitic rock similar to 23 and 27, but it suffered stronger silica-pyrite alteration, and subsequent remobilization of the same alteration assemblage during an episode of brittle fracturing.

29: Probably a holocrystalline andesitic to dacitic (dioritic) intrusive similat to 23, 27 and 28, but it has suffered intense silica-tourmaline±sphalerite±pyrite hydrothermal alteration.

30 and 32: Both sparsely plagioclase-phyric, formerly glassy dacitic lavas. They have suffered strong hydrothermal alteration, with development of calcite-pyrite, and ribbon quartz-pyrite-calcite veins.

33: A weakly foliated, formerly glassy plagioclase-phyric felsic lava(?) that shows a strong hydrothermal alteration assemblage dominated by chlorite-calcite-sericite±pyrite.

The rocks described are dominantly felsic lavas and associated crystal vitric tuffs that have been intruded by a suite of andesitic to dacitic (dioritic) dykes or plugs. The latter have holocrystalline but fairly fine-grained textures, and it might be evident from core logging that they are intrusive into the host lava-tuff sequence. Wholerock major and trace element data (including REE) were provided for four samples, three of which are intrusive dioritic rocks (23, 27 and 28), and the fourth a definite lava (33)

The combined petrographic and geochemical data are assessed with respect to answering the following questions.

1: Are the diorites and the host lavas and tuffs likely to be essentially comagmatic?

2: What are the affinities and regional correlations of both suites?

3: What is the style and significance of the alteration shown by these samples?

The geochemical data provided are presented in Table 1 recalculated volatile-free, to facilitate comparison of compositions with varying degrees of hydration and carbonate alteration from this area, and with much less-altered rocks from elsewhere within the Mount Read Volcanics (herein MRV). The chondrite-normalized REE patterns of the four analyzed Staverton rocks are given in Figure 1A, and patterns for a comparative suite of andesites and dacites (my unpublished data) from the northern, E-W trending section of the MRV (Beulah-Winterbrook-Paradise) are given in Figure 1B. Several geochemical discriminant diagrams

for the MRV, from our recent Economic Geology paper, are given in Figures 2A-D. Two compositional plots of these Beulah rocks (TiO2-SiO2 and FeO*-SiO2) are given in Figures 3A and 3B, showing data for the analyzed Staverton rocks.

1: Are the diorites and the host lavas and tuffs likely to be essentially comagmatic?

The petrographic/geochemical data provided show that the samples are highly altered (probably mainly carbonated) andesites and shallow intrusive diorites averaging around 10% loss on ignition. Comparison from Table 1 of the clearly extrusive acid andesite sample 33 with the intrusive diorites 23 and 27 with similar SiO2 contents shows strong, clear similarities, extending to Ti/Zr values (34, versus 34 and 35) and shapes of REE patterns (for 27 and 28 at least). I have no doubt that the intrusive dioritic rocks in this set are broadly comagmatic with the acid andesites (and presumably the crystal vitric tuffs). that they intrude.

2: What are the affinities and regional correlations of both suites?

The MRV are a post-collisional calc-alkaline medium- to high-K and shoshonitic basalt-andesite-dacite-rhyolite suite (see Crawford et al. 1992; appended). We have defined several magmatic suites within the MRV based on both stratigraphic and geochemical considerations, with weight given to the latter. Figure 2 shows four of the geochemical discriminant diagrams with which we subdivided the MRV. Most volumetrically abundant of these is Suite 1, exemplified by the Que Footwall Andesites, the andesites at Tullah, and most of the non-hornblende-phyric andesites of the Central Volcanic Complex. Suite 2 includes the mainly intrsusive hornblende andesites such as at Crown Hill and on the Anthony Road, that have FeO* and TiO2 contents not dissimilar to Suite 1 rocks, but are characterized by notably higher P2O5 and REE levels among other things; they are easily petrographically and compositionally distinguished from Suite 1. Suite 3 includes the distinctive Hellyer basalts and their correlates at Lynchford in the south of the MRV. These range to high P2O5 shoshonitic

compositions with remarkably enriched REE patterns, and most are quite mafic basalts.

From Figures 2B, C and D, it is clear that three of the four samples from Staverton plot essentially as Suite 1, whereas the fourth, more low-SiO2 sample (28) plots within or close to Suite 3. However, Figure 2A, perhaps the most critical and useful for distinguishing Suite 3, shows that sample 28 from Staverton has a very low P2O5/TiO2 value, more characteristic of Suite 1 than Suite 3. The same applies to the REE pattern for 28, which is much less LREE-enriched than for Suite 3 andesites.

Why, then, does 28 plot with Suite 3 and not Suite 1 in the diagrams? The answer lies in Figures 3A and B. I have plenty of unpublished geochemical data for rocks from the Beulah Formation and correlated units along the northern, E-W trending section of the MRV, from Hellyer to Sheffield. Some of these data are plotted in Figures 3A and B, and what is clear, when coupled with other data such as the REE patterns (Figure 1), is that these rocks are essentially Suite 1, but with rather more abundant mafic samples (SiO2 from 52-60%) than are presently recorded from the N-S trending section of the MRV. They may be considered compositional analogues to Suite 1 in every way, and the large number of Suite 1 rocks analyzed from the N-S part of the MRV would definitely have had to include more mafic parental magmas similar to those in the Beulah Formation data set. Therefore, on the basis of the Staverton samples plotting in the Beulah Formation fields on Figures 3A and B, and having essentially identical REE patterns for three of the rocks analyzed, I am confident that the Staverton rocks analyzed include andesites and diorites compositionally (and probably stratigraphically correlated with Suite 1 of the MRV, especially the Que Footwall andesites and Tullah andesites).

There is one further point to note from the REE patterns (Fig, 1). Obviously, the REE pattern for diorite 23 is rather different from those of the other two diorites and the essentially comagmatic andesite lava 33. What is the significance of this difference? The REE pattern of 23 is rather weird, strongly LREE-enriched, and is much closer to those of Suite 2 hornblende andesites (see our accompanying paper). However, in terms of diagnostic immobile element ratios such as P2O5/TiO2, there is no

difference at all between 23 and the other analyzed Staverton rocks, nor is there any similarity other than the weird REE pattern of 23 to Suite 2 rocks. This is highly unlikely to be an alteration feature, as all analyzed Staverton diorites have similar alteration styles and intensities. The significance of the weird REE pattern of 23 is not at all obvious to me, and this serves to emphasize the value of analyzing a suite of samples rather than just one or two of the same unit.

As a final point of interest, I simply do not believe the Cr data provided for these samples. Cr ppm seem excessively high, and I have no explanation of why this should be so, but I would argue that there is some analytical problem. Maybe I'm wrong!

3: What is the style and significance of the alteration shown by these samples?

An encouraging feature of these rocks for exploration is the relatively pervasive and intense hydrothermal alteration. Three broad alteration assemblages are noted. First, the pervasive sericite-carbonate alteration, sometimes with disseminated pyrite. Second, silica-chlorite±pyrite alteration is present in a few samples. The latter seems to be irregularly distributed and may have been overprinted and obliterated by the more pervasive sericite-carbonate alteration. The third assemblage, and one of some interest, is the silica-calcite-chlorite-pyrite-tourmaline± sphalerite assemblage in samples 9, 10, and 29. As this occurs in both felsic to andesitic lava breccias (9 and 10) and a dioritic intrusive (29), it cannot be assigned to alteration accompnying the diorite emplacement. All tourmaline alteration in the MRV that I am aware of is a Devonian, granite-related overprint, and as there is good petrographic evidence of late stage brittle fracturing and cleavage development in some of the samples from Staverton I looked at, I think that the tourmaline-bearing alteration may have a similar origin (Dalcoath Granite-related?). This does not mean that the pervasive alteration of all the samples examined is related to the Devonian alteration event. I suggest that these rocks were seriously altered by Cambrian hydrothermal alteration, and that the Devonian alteration is more spatially restricted, and overprints the Cambrian alteration in places probably related to shears and faults..

Tony Crawford
29/4/93

SAMPLE NUMBER: PLUTONIC 9 and 10

SUMMARY: These samples were polymict felsic lava breccias dominated by glassy, sparsely plagioclase-phyric dacitic lava fragments. The rocks have suffered early sericite alteration, overprinted by strong calcite-chlorite-pyrite-tourmaline± sphalerite alteration.

HAND SPECIMEN:

These two samples from the same interval appear to be either felsic lava breccias, or autobrecciated (false brecciated?) lavas that have been very strongly hydrothermally altered (calcite-sericite-pyrite).

THIN SECTION DESCRIPTION:

These rocks are clearly derived from the same protolith, but sample 10 preserves the original texture and is rather less intensely calcite-overprinted than sample 9. It is clear that both are felsic lava breccias, although at least three textural varieties of clasts are present in both rocks. The dominant clast in 10 is a single clast at least 1.5cm across composed of a moderately plagioclase-phyric foliated dacite in which the small tabular plagioclase laths are all totally replaced by sericite. The formerly devitrified glass groundmass has altered to a very fine-grained quartzo-feldspathic intergrowth (Kspar?) totally riddled with tiny sericite flecks that show preferred orientation, and occasionally coalesce into streaky, discontinuous cleavage traces. Tiny patches of chlorite, and larger overprinting patches of calcite are common.

Most of the other lava fragments in this rock were sparsely plagioclase-phyric felsic glassy lavas, with clean albite phenocrysts mainly 0.5-2mm long. The groundmasses have recrystallized to rather coarse-grained patchy quartzo-feldspathic mosaics. These, in turn, have suffered strong alteration-recrystallization and coarsening to polycrystalline quartz and chlorite intergrowths The chlorite often occurs as rosettes with fan extinction. Narrow irregular seams of sericite transect the coarser domains, and calcite overprints patches here and there, and to a considerably greater degree in section 9. A key feature of the

alteration assemblage of this rock is the presence in the most altered areas of the section (10) of most unusual calcite-tourmaline-sulphide intergrowths. Calcite forms the matrix of these patches (the largest is 1cm across) and is riddled with radiating rosettes of strongly pleochroic tourmaline and rather anhedral amorphous aggregates of pyrite(?). In sample 9, calcite is abundant but tourmaline is absent; however, more obvious pyrite occurs in aggregates in the calcite together with subordinate amounts of pale coloured sphalerite.

These are polymict glassy felsic lava breccias that have suffered intense hydrothermal alteration. Fairly strong sericite alteration that defines a weak cleavage was followed by more intense alteration-recrystallization producing calcite-chlorite-pyrite-tourmaline±sphalerite assemblages.

SAMPLE NUMBER: PLUTONIC 11

SUMMARY: **This sample was a felsic crystal vitric tuff or ash-rich volcaniclastic fine sandstone to siltstone, that was carbonate-altered, then weakly cleaved at several different orientations.**

HAND SPECIMEN:

This appears to be an altered, cream coloured, fine-grained sandstone (tuffaceous?), with several dark, highly cleaved darker shaley layers 2-6mm thick.

THIN SECTION DESCRIPTION:

This rock is a strongly carbonate-altered fine-grained volcaniclastic sediment of vitric crystal tuff. The strong carbonate±sericite alteration has all but obliterated the primary texture, but plenty of small angular detrital quartz and albite grains are present, in what was almost certainly a fine-grained (silty) matrix composed of vitric ash. The latter has recrystallized to an exceptionally fine-grained quartzo-feldspathic intergrowth. Two generations of cleavage are defined by moderately well-developed meshes of sericite, which intersect at about 40o. Interestingly, both of these are at a slight angle to the main dark coloured bands, which in thin section are seen to be strongly cleaved, almost phyllitic layers. These phyllitic layers are clearly due to volume loss during intense shearing, and contain abundant fine-grained, insoluble opaques, but quartz and albite detrital grains are stretched out, or more commonly, dissolved. Calcite has been eliminated by pressure solution from these strongly cleaved bands. Scattered small crystals of calcite overprint about 40 modal% of the rock, and show no preferred orientation, or any obvious association with the cleavage. Importantly, the calcite also occurs as a number of boudinaged veinlets that are terminated and offset by the main cleavage.

This rock may have been a vitric crystal tuff or volcaniclastic sandstone derived from ash-rich felsic volcanism. It probably suffered strong, pervasive carbonate alteration before

being deformed and cleaved several times, at different angles, in a changing stress field. Certainly, the main cleavage post-dates both earlier cleavages and the calcite overprint, and may be Devonian in age.

SAMPLE NUMBER: PLUTONIC 13

SUMMARY: This sample was a shallow intrusive, almost holocrystalline, near-aphyric andesitic to basaltic dyke rock that has suffered intense sericite-calcite hydrothermal alteration.

HAND SPECIMEN:

This is a pale grey-green, cleaved, fine-grained felsic(?) volcanic with common small dark chloritic spots.and convoluted calcite veinlets.

THIN SECTION DESCRIPTION:

This was clearly a plagioclase-rich, almost aphyric dacitic to andesitic rock that has suffered near-terminal alteration. A few former small (<1mm long) plagioclase phenocrysts are present, but have been intensely sericite-altered, to the point wherein their original crystal shapes are rarely preserved. There was also a small number of probably mafic phenocrysts present, but their former sites are filled by calcite and chlorite, and crystal shapes are totally wiped out; it can't, therefore, be determined whether they were olivine, augite or hornblende. A few rounded vesicles are filled with chlorite and also overprinted by calcite.

The groundmass of this rock has a distinctive texture. It was composed of plagioclase laths, altered mafic crystals and tiny altered opaque oxide grains, without much obvious interstitial mesostasis. The interlocking plagioclase laths are mainly 0.2-0.5mm long, and all are totally replaced by sericite;less abundant are bladed former mafic crystals that are now replaced by messy brownish chlorite-calcite intergrowths.

This sample is extremely difficult to diagnose due to the intense sericite-calcite overprint. Almost certainly it was a near-aphyric dyke rock, of andesitic to basaltic composition. This should be easily picked from the compositional data. The alteration is quite intense, and clearly of hydrothermal origin. The rather cleaved appearance in hand specimen is deceptive, as no clear cleavage is apparent in the thin section. A few meandering calcite veinlets transect this rock.

SAMPLE NUMBER: PLUTONIC 14

SUMMARY: **This sample was a crystal vitric tuff derived from dominantly quartz-phyric explosive felsic volcanism. It has suffered weak to moderate sericite-calcite alteration.**

HAND SPECIMEN:

This is a greenish strongly cleaved volcaniclastic sandstone or crystal tuff with abundant quartz and feldspar crystal detritus and possibly some stretched and flattened pumiceous clasts.

THIN SECTION DESCRIPTION:

This rock is seen to be a crystal vitric tuff dominated by quite angular, broken phenocryst fragments of quartz. These are up to several mm across, and rarely retain any crystal faces, although rounded recrystallized melt inclusions and generally sharp extinction indicate that these were quartz phenocrysts broken during explosive eruption and incorporation into this tuff. Although altered feldspar phenocrysts are almost certainly present judging from the hand specimen, none are present in this thin section. A few former pumice clasts are present, but these have entirely recrystallized and are now totally replaced by foliated yellowish sericite.

The matrix of this rock was almost certainly composed of silt-sized vitric ash and comminuted quartz and albite crystal debris. The glass has devitrified, then recrystallized to a very fine-grained quartzo-feldspathic intergrowth. This is cut by an irregular and discontinuous fracture cleavage defined by sericite. In places, the sericite defining this cleavage coalesces into quite thick lenses that resemble sericitized pumice clasts. Calcite is common as a late-stage overprinting phase occurring as individual crystals and aggregates of small crystals making up about 10-15 modal% of the rock.

This was a felsic crystal vitric tuff derived from explosive rhyolitic eruptions. It has suffered weak sericitic alteration during devitrification and cleavage development, and subsequent calcite overprinting.

SAMPLE NUMBER: PLUTONIC 20

SUMMARY: This sample is a strongly sericite-pyrite-altered foliated quartz-phyric crystal vitric tuff or ash-rich volcaniclastic sandstone.

HAND SPECIMEN:

This is a greenish, quite strongly foliated volcaniclastic sandstone or crystal vitric tuff with disseminated fine-grained pyrite.

THIN SECTION DESCRIPTION:

This rock is strongly foliated and dominated by deformed and commonly granulated and partially recrystallized quartz phenocryst fragments, mainly in the 1-3 mm size range. These make up around 30 modal% of the rock, the remainder being composed of sericitized and cleaved, recrystallized vitric ash. The quartz phenocryst fragments occasionally retain small chloritized melt inclusions, and are generally strongly fractured and subgrain recrystallized, with pronounced strain lamellae in many of the larger grains. There is no convincing evidence that any former plagioclase phenocrysts or phenocryst fragments were present in this rock. A number of small, lensoid 'clasts(?)' composed of recrystallized felsic glass, and now consisting of a fine-grained quartzo-feldspathic mosaic intergrowths overprinted by fine-grained calcite, may have been former lithic clasts of glassy lava, although it is hard to rule out the possibility that they are simply better preserved areas of the recrystallized vitric ash matrix of this sample.

The matrix is heavily overprinted by a dense, fluidal-textured, oriented mesh of sericite that forms a strong fracture cleavage. The sericite overprints a very heterogeneous-textured quartzo-feldspathic intergrowth containing abundant spots and streaks of secondary coarser-grained silica. The sericite defining cleavage/foliation throughout the rock is occasionally heavily impregnated with small poorly-formed pyrite grains that tend to occur in streaked-out clusters and aggregates, as if in places formerly larger pyrite grains have been fragmented and stretched out in the foliation. Although the extent of alteration-recrystallization in this rock almost precludes confident diagnosis, I think that this rock was either a volcaniclastic sandstone dominated by broken phenocrysts of quartz in a vitric ash matrix, or a crystal vitric tuff derived from quartz-phyric rhyolitic explosive volcanics. It has suffered strong sericite-pyrite ±calcite hydrothermal alteration, and has been foliated apparently syn- or post-alteration.

SAMPLE NUMBER: PLUTONIC 23

SUMMARY: This sample was an andesitic to dacitic holocrystalline dyke rock, with moderate hydrothermal alteration (silica-chlorite±pyrite).

HAND SPECIMEN:

This is a holocrystalline(?) andesitic to dacitic dyke rock (silicified?) with quartz/calcite veinlets and disseminated pyrite.

THIN SECTION DESCRIPTION:

This rock is rather difficult to confidently diagnose due to the abundant anhedral secondary quartz and fairly intense sericite alteration that pervades the rock. In least altered areas, it appears to be a holocrystalline intergrowth of tabular albitized plagioclase crystals, occasional totally chloritized augite phenocrysts mainly around 1mm long, and quite abundant interstitial anhedral quartz and fine-grained chlorite. It is not possible to distinguish groundmass from clear phenocryst-sized crystals. In some parts of the section, quartz occurs as patchy intergrowths of abundant anhedral, rather strained crystals associated with subordinate chlorite and minor pyrite. Not uncommon small former FeTi oxide phenocrysts or grains in the indistinct groundmass of this rock are totally altered to leucoxene.A fairly strong mesh of sericite pervades the sample, in places becoming intensely developed enough to define an irregular fracture foliation. Pyrite occurs disseminated throughout the rock as small subidiomorphic grains and grain aggregates up to about 1mm across, usually associated with chlorite. Veins of calcite are clearly the last alteration feature of this rock, transecting both the chlorite-silica alteration patches and the sericitic foliation.

This was probably an acid andesitic to dacitic dyke rock that has suffered moderate hydrothermal alteration, initially producing a chlorite-silica±pyrite assemblage, followed by a sericite-defined very weak and discontinuous foliation, and finally calcite veining and moderate overprinting of earlier assemblages.

SAMPLE NUMBER: PLUTONIC 24

SUMMARY: This sample is a virtually holocrystalline strongly carbonate-altered andesitic to dacitic dyke rock.

HAND SPECIMEN:

This is a pale grey, fairly massive, very sparsely vesicular fine-grained andesitic lava, apparently aphyric, with occasional calcite veins and streaky sericite alteration that almost resembles flow-banding.

THIN SECTION DESCRIPTION:

This rock is a very sparsely plagioclase-phyric andesitic lava or shallow dyke rock. It contains less than 1 modal% of small (<1mm long) tabular albitized plagioclase phenocrysts, set in a very altered groundmass that appears to be a near-holocrystalline intergrowth dominated by rather long, narrow albite laths, with subordinate totally altered FeTi oxides, and calcite overprinting whatever else was originally present. Occasional small spots and streaks of browny-yellow chlorite are present, but the calcite probably makes up about 30-40 modal% of this rock. Sericite lightly speckles the plagioclase, but also occurs as narrow, discontinuous wavy seams and streaks that are not intensely developed enough to form a fracture foliation. The few round vesicles present in this section are filled by calcite, and calcite also occurs as rare veinlets cutting the rock.

The apparent near-holocrystalline texture of this sample suggests that it is a sample from a narrow dyke, probably of andesitic to dacitic composition. It has suffered strong carbonate alteration.

SAMPLE NUMBER: PLUTONIC 27

SUMMARY: This sample is a holocrystalline moderately hydrothermally altered andesitic (dioritic) to dacitic dyke rock, very similar to sample 23.

HAND SPECIMEN:

This is very similar to sample 23 in hand specimen, being a grey-green strongly altered andesitic to dacitic holocrystalline (?) rock.

THIN SECTION DESCRIPTION:

As noted for the hand specimen, this rock is very similar petrographically to sample 23. It appears to have been a virtually holocrystalline intergrowth of tabular to blocky albitized plagioclase crystals mainly 0.5-1mm long, lightly speckled by sericite, in a matrix of fairly coarse-grained anhedral quartz, Kspar, leucoxenitized FeTi oxides, chlorite and common calcite. The overall grainsize of this sample is slightly coarser than for sample 23, and chloritized former augite grains are probably slightly less abundant but larger than in 23, but are invariably overprinted by calcite. Irregularly developed, discontinuous cleavage planes are defined mainly by sericite, and several distinct microshears are defined by intense chlorite development.

This is another intrusive andesitic to dacitic dyke rock, almost coarse-grained enough to be classified as a dioritic intrusive. Moderate hydrothermal alteration has produced a weak chlorite-calcite-disseminated (rare) pyrite assemblage, overprinted by abundant calcite. This rock is strikingly similar to sample 23.

SAMPLE NUMBER: PLUTONIC 28

SUMMARY: This sample was another holocrystalline intrusive andesitic to dacitic rock similar to 23 and 27, but it suffered stronger silica-pyrite alteration, and subsequent remobilization of the same alteration assemblage during an episode of brittle fracturing.

HAND SPECIMEN:

This is another sample that looks quite similar to sample 23, being a grey-green apparently holocrystalline andesite to dacite intrusive with strong hydrothermal alteration.

THIN SECTION DESCRIPTION:

This rock is considerably more altered than samples 23 and 27, to which it was originally probably very similar. Very little of the primary mineralogy is left, and abundant, intensely sericite-altered blocky to tabular plagioclase crystals 0.5-1.5mm long are the only clue that this was probably a holocrystalline dyke sample like 23 and 27. These sericitized plagioclase crystals are commonly almost totally overprinted by very fine-grained, dirty calcite. Small areas between the blocky altered plagioclases are composed of anhedral quartz, sericitized feldspars, minor chlorite and calcite. Large spots of chlorite to about 2mm long may represent chloritized former mafic (augite) phenocrysts, although many of these streaks are scattered and streaked along the foliation, and it is difficult to judge whether they were originally phenocrysts, chlorite-filled vesicles, or simply chlorite concentrations developed along the stronger foliation planes. Areas of intense silica-pyrite alteration occur through the rock, sometimes as blotchy patches, and sometimes as narrow cross-cutting veinlets of ribbon quartz filled by abundant subidiomorphic to well-formed but strongly fractured and disaggregated pyrite grains. Pyrite occurs far less commonly embedded in chlorite spots.

This was a holocrystalline intrusive andesitic to dacitic rock similar to 23 and 27, but it has suffered far more intense hydrothermal alteration, leading to quartz-pyrite segregations. Late -stage quartz-pyrite veinlets clearly developed from in-situ quartz-pyrite by remobilization and brittle fracturing in a stress field, as the quartzes are strongly ribboned and strained and the pyrite is broken and disaggregated.

SAMPLE NUMBER: PLUTONIC 29

SUMMARY: This sample was probably a holocrystalline andesitic to dacitic (dioritic) intrusive similar to 23, 27 and 28, but it has suffered intense silica-tourmaline±sphalerite±pyrite hydrothermal alteration.

HAND SPECIMEN:

This is a rather coarse-grained, holocrystalline and intensely altered rock (diorite?) with quartz-tourmaline alteration and calcite veinlets.

THIN SECTION DESCRIPTION:

This rock is so totally recrystallized and altered that few traces of the original texture remain, and even those least-altered patches are not convincing. However, I suggest that this was another dioritic intrusive rock, similar to 23, 27 and 28, composed of a plagioclase-dominated holocrystalline intergrowth with subordinate interstitial quartz and probably minor augite or hornblende. Intense and pervasive recrystallization-alteration of the rock has occurred, leading to a very patchy texture of coarse, strongly-strained anhedral secondary quartz, minor strained albite that is also rather coarse, and abundant fine-grained areas composed of sugary quartz intergrowths, or quartz-tourmaline intergrowths. Tourmaline also occurs as radiating rosettes up to 4 or 5 mm across. Intense calcite overprinting seems to have occurred late in the crystallization history of the tourmaline and quartz, and calcite often contains scattered trains and aggregates of small idiomorphic pyrite crystals. Interestingly, colourless sphalerite occurs as late stage spots and very narrow veinlets cutting tourmaline and calcite.

This is another dioritic intrusive that has suffered intense silica-tourmaline hydrothermal alteration, probably with remobilization of pre-existing pyrite and calcite, and possibly introduction of minor sphalerite late in the quartz-tourmaline alteration.

SAMPLE NUMBER: PLUTONIC 30 and 32

SUMMARY: These samples were both sparsely plagioclase-phyric, formerly glassy dacitic lavas. They have suffered strong hydrothermal alteration, with development of calcite-pyrite, and ribbon quartz-pyrite-calcite veins.

HAND SPECIMEN:

These samples from close together in the core apparently, are rather different in hand specimen. 30 is a grey-pink meta-felsic volcanic with abundant dark chloritic (?) spots and folded veinlets with a zoned pyritic core and bleached margins. 32 is a pinkish mottled rock (felsic metavolcanic?), also with banded (but not folded) pyrite-cored veinlets, crosscut by quartz veinlets.

THIN SECTION DESCRIPTION:

Sample 30 is exceptionally strongly altered and recrystallized, and only in one area of the thin section can it be seen that the protolith of this rock was a sparsely plagioclase-phyric glassy dacitic lava. Small former plagioclase phenocrysts are altered to sericite, and the groundmass has devitrified and altered to a very fine-grained quartzo-feldspathic intergrowth with abundant (~5-10 modal%) fine-grained disseminated pyrite. The remainder of the rock is an intensely altered and recrystallized, much coarser-grained quartzo-feldspathic intergrowth that is strongly overprinted by calcite as small crystals and meandering veinlets. A weak and discontinuous fracture cleavage cuts the sample, with the foliation being defined by sericite. Folded veinlets to several mm thick composed of calcite and diaggregated and fractured small pyrite grains cut the sample, and are in turn cut by calcite veinlets that lack pyrite altogether.

Sample 32 is a much better preserved, though still quite altered formerly plagioclase-phyric felsic lava. Sericite-altered plagioclase phenocrysts to about 1mm long make up about 5 modal% of the rock, but former mafic phenocrysts are apparently absent.

The groundmass is a quartzo-feldspathic intergrowth after devitrified glass, but it has been heavily overprinted by fairly fine-grained very dirty brown calcite or siderite. Small clots of fractured pyrite grains occur associated with the calcite in places. The vein obvious in hand specimen is composed of abundant small (<1mm across) rather poorly-formed pyrite grains in a matrix of ribbon quartz, partly overprinted by calcite. Dirty brown calcite occurs as subparallel micro-veins either side of the quartz-pyrite vein.

These rocks were sparsely plagioclase-phyric glassy dacitic lavas that have suffered strong hydrothermal alteration, with calcite-pyrite dominant in 30 and ribbon quartz-pyrite-calcite predominant in 32.

SAMPLE NUMBER: PLUTONIC 33

SUMMARY: This sample is a weakly foliated, formerly glassy plagioclase-phyric felsic lava(?) that shows a strong hydrothermal alteration assemblage dominated by chlorite-calcite-sericite±pyrite.

HAND SPECIMEN:

This is a dark grey-green, intensely altered and recrystallized felsic volcanic or intrusive rock with strong chlorite alteration, and calcite veinlets, and an almost phyllitic cleavage exposed on fracture surfaces.

THIN SECTION DESCRIPTION:

This rock is so intensely altered and recrystallized that the originally mineralogy and texture have been thoroughly obliterated. My feeling is that it was probably a plagioclase-phyric glassy dacite, as for 30 and 32. However, it is now composed of an intergrowth of rather anhedral patchy quartz, sericite-altered feldspars, and disseminated chlorite, all intensely cut by sericite-defined foliation with an equally strong calcite overprint. Chlorite is quite common, as large patches that are sometimes stretched into the foliation, and sometimes chlorite defines narrow, strong, straight foliation planes and microshears. In contrast, sericite-defined foliation planes are more wavy and discontinuous. The chloritic microshears mainly seem to post-date the sericitic foliation. Swirling veinlets of deformed, platy calcite also cut the rock, and at least one of these is cut by veinlets of ribbon quartz and idiomorphic pyrite. Most of the remaining pyrite in this rock occurs as stretched and disaggregated crystals or crystal clots, often associated with chloritic concentrations.

This was probably a plagioclase-phyric glassy dacitic lava. It has suffered strong chlorite-sericite-calcite±pyrite hydrothermal alteration and weak foliation development.

TABLE 1: Staverton wholerock analyses recalculated volatile-free				
	33	23	27	28
SiO2	59.44	58.06	58.47	54.27
TiO2	0.69	0.67	0.81	0.77
Al2O3	15.69	18.38	17.49	15.86
Fe2O3	9.43	10.15	7.39	10.89
MnO	0.21	0.14	0.2	0.16
MgO	5.28	3.83	5.09	5.57
CaO	4.91	3.27	4.52	8.07
Na2O	2.54	3.13	4.19	2.59
K2O	1.63	2.13	1.68	1.68
P2O5	0.13	0.15	0.17	0.14
LOI+SO3	10.13	9.28	8.46	11.47
Cr	158	57	188	257
Zr	122	114	142	102
La	27.3	43.3	23.5	14.3
Ce	50.8	119.4	54.2	31.7
Nd	23.9	63.1	26.3	17.8
Sm	4.95	12.43	5.31	4.24
Eu	1.56	3.3	1.42	1.13
Tb	0.89	1.54	0.77	0.68
Ho	1.22	1.76	1.09	0.91
Yb	2.89	2.86	2.84	2.38
Lu	0.344	0.363	0.4	0.36
Ti/Zr	33.91	35.23	34.20	45.26
P2O5/TiO2	0.19	0.22	0.21	0.18
FeO*	8.487	9.135	6.651	9.801
CHONDRITE-NORMALIZED VALUES				
La	86.67	137.46	74.60	45.40
Ce	62.48	146.86	66.67	38.99
Nd	40.03	105.70	44.05	29.82
Sm	25.78	64.74	27.66	22.08
Eu	21.61	45.71	19.67	15.65
Tb	18.16	31.43	15.71	13.88
Ho	16.71	24.11	14.93	12.47
Yb	13.89	13.75	13.65	11.44
Lu	10.65	11.24	12.38	11.15

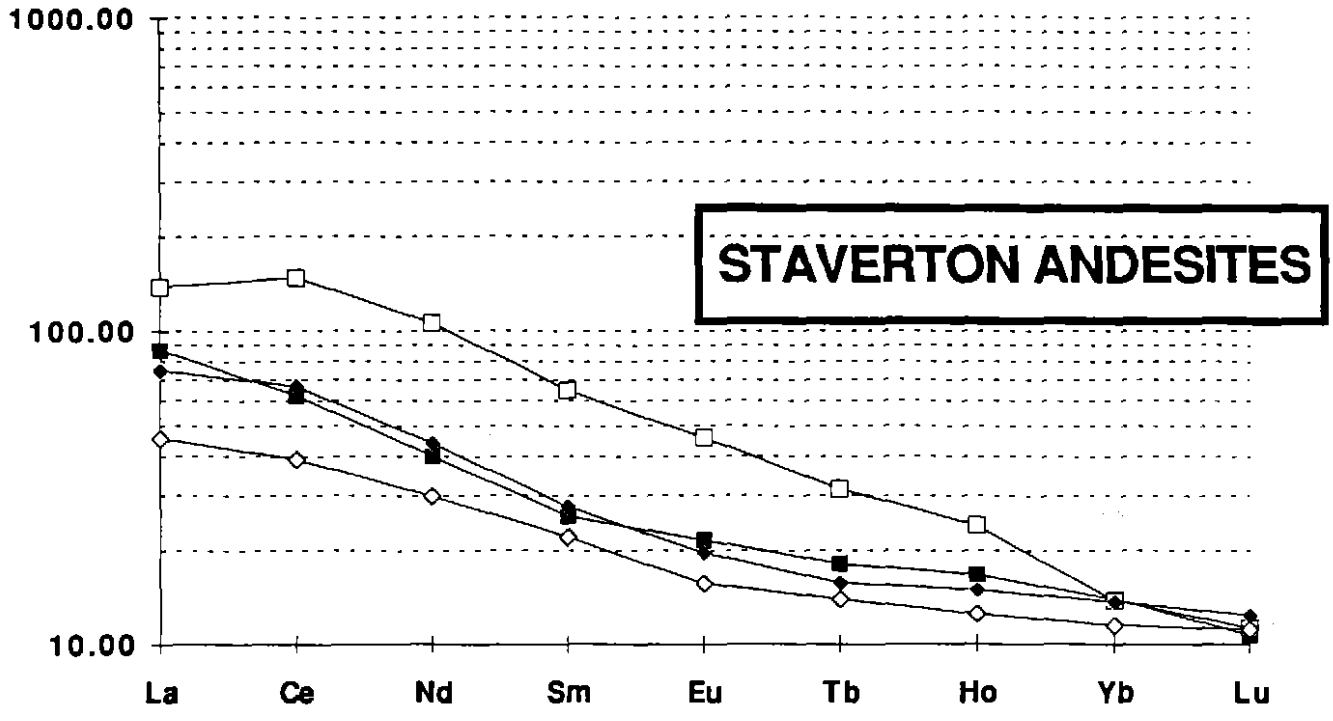


FIGURE 1A

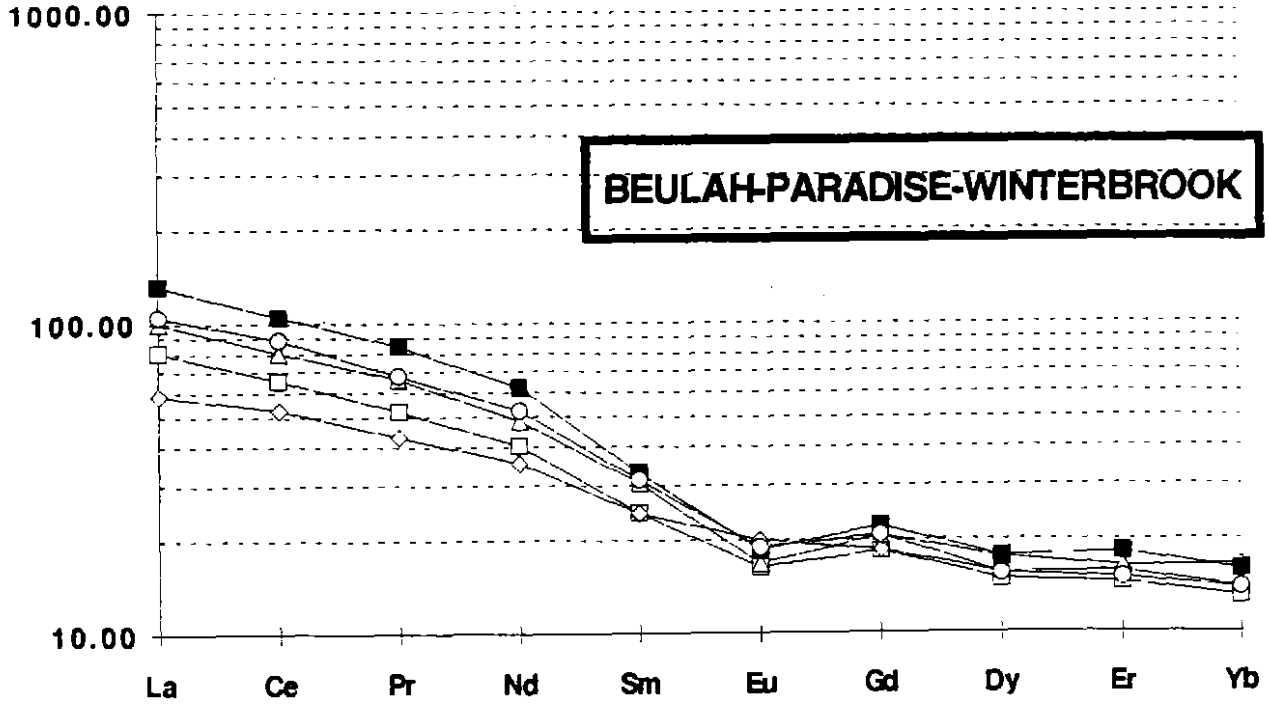


FIGURE 1B

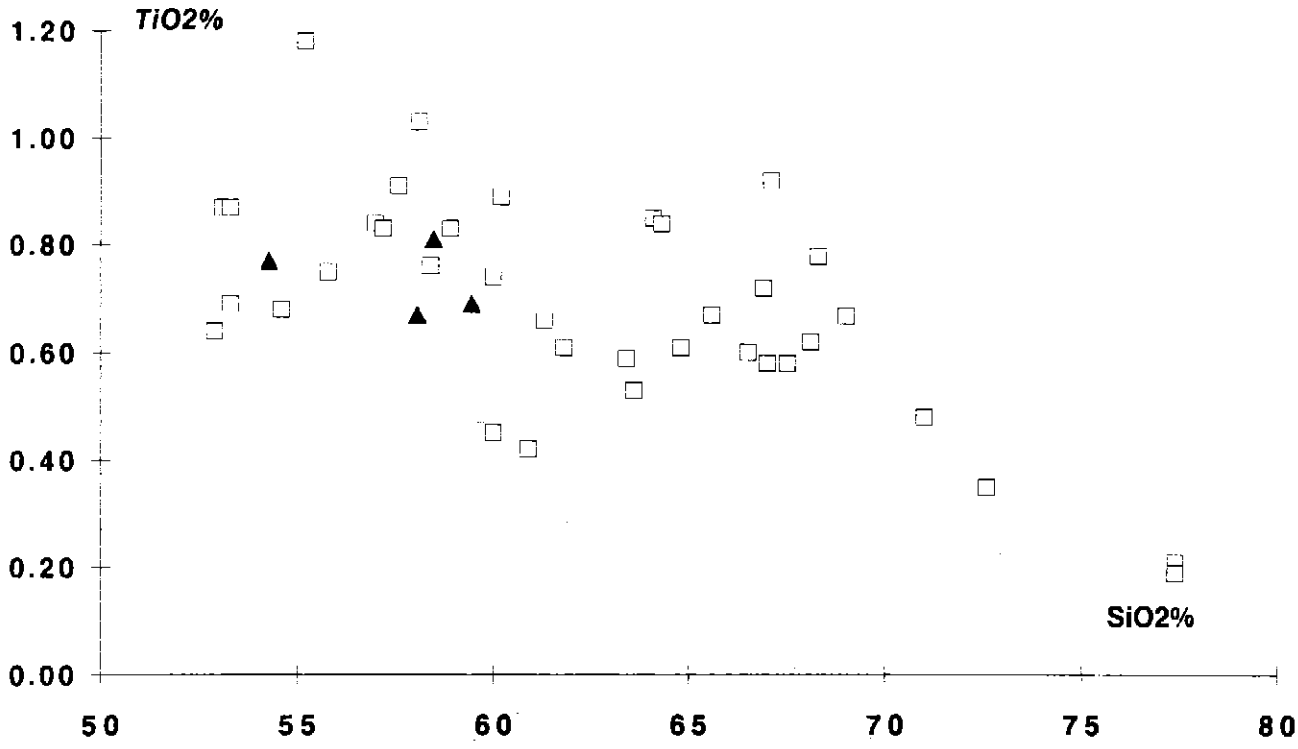


Figure 2A

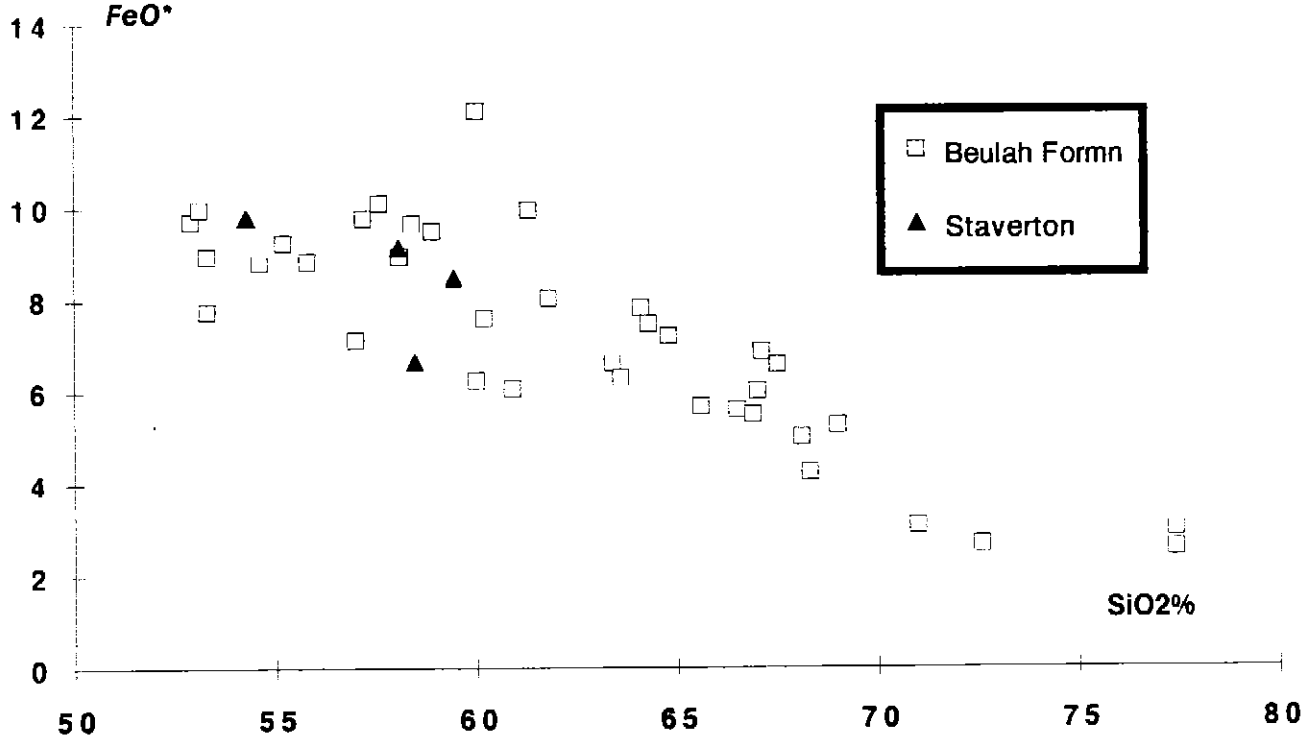


Figure 2B

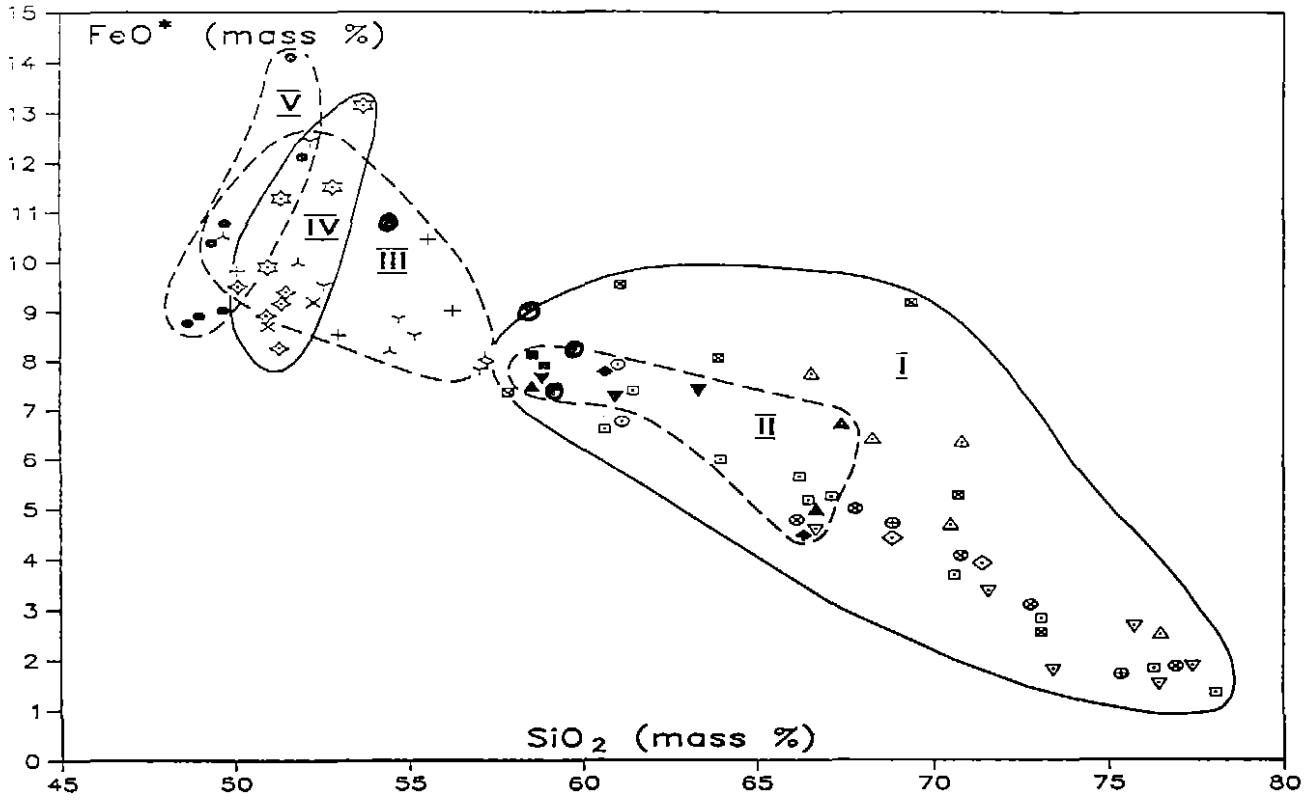

FeO* (mass %)
V
IV
III
II
I
SiO2 (mass %)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
45
50
55
60
65
70
75
80

FIG 3A

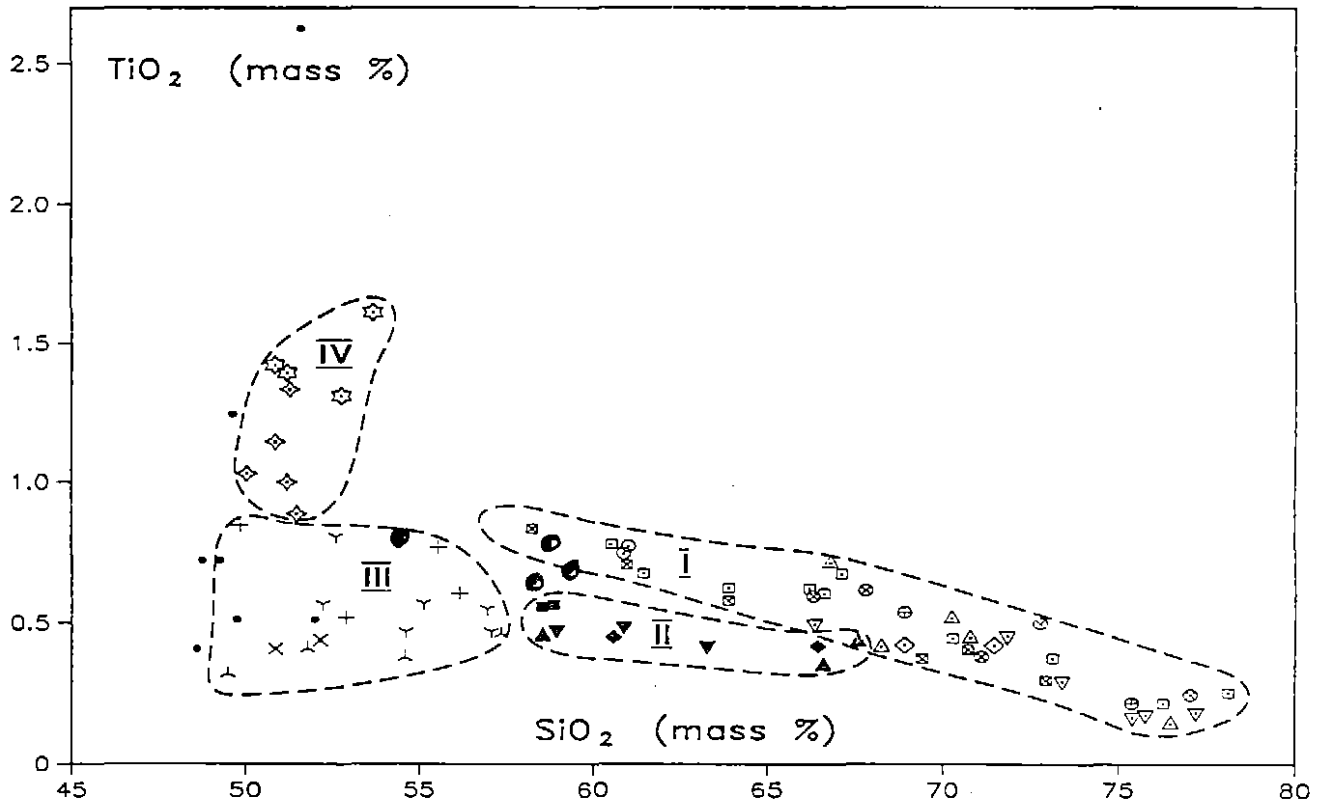

TiO2 (mass %)
IV
III
II
I
SiO2 (mass %)
0
0.5
1.0
1.5
2.0
2.5
45
50
55
60
65
70
75
80

FIG 3B

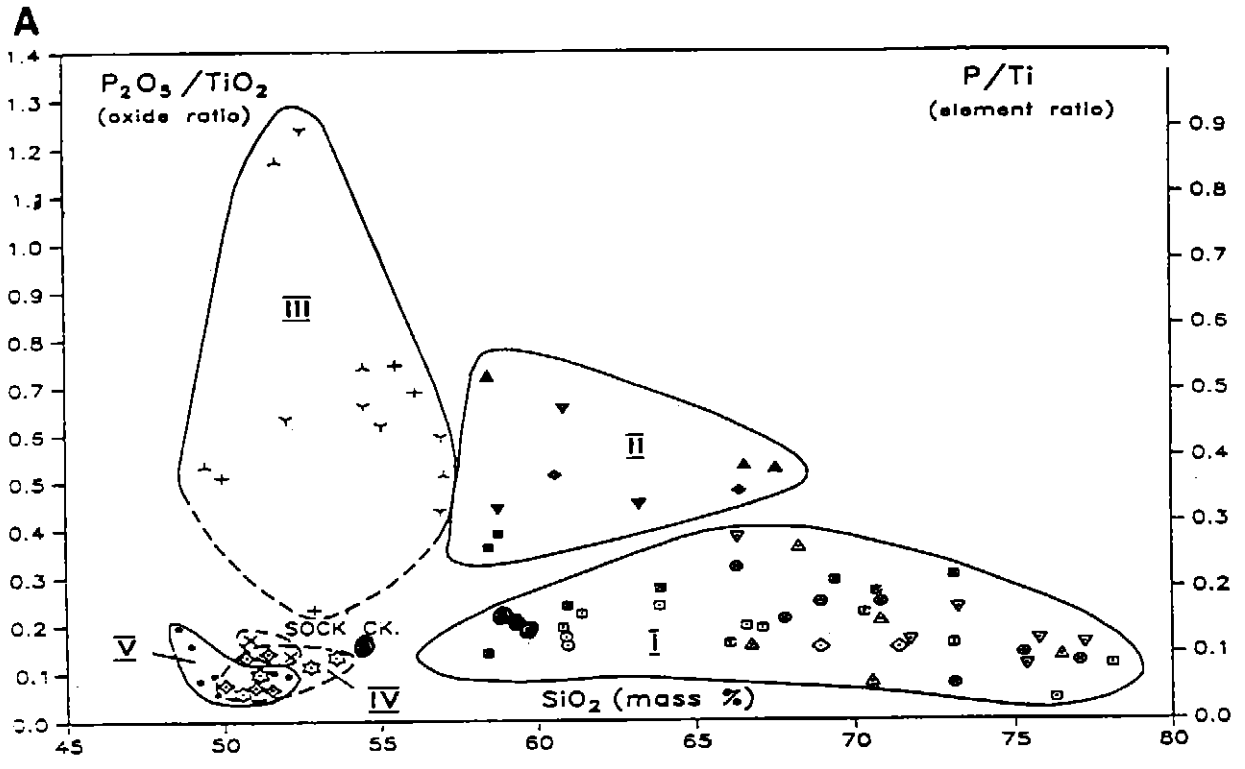

A
P_2O_5/TiO_2
(oxide ratio)
P/Ti
(element ratio)
III
II
I
V
IV
SOCK CK.
SiO_2 (mass %)
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
45
50
55
60
65
70
75
80

FIG 3C

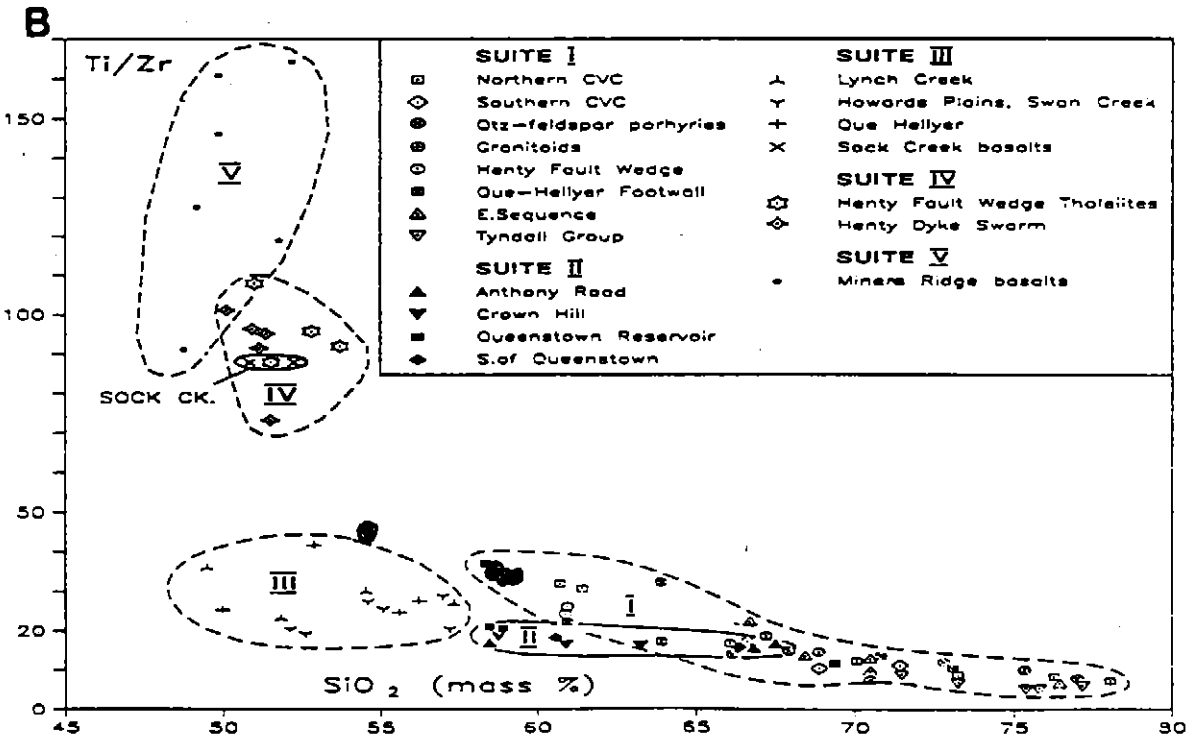

B
Ti/Zr
SUITE I
Northern CVC
Southern CVC
Otz–feldspar porhyries
Granitoids
Henty Fault Wedge
Que–Hellyer Footwall
E.Sequence
Tyndall Group
SUITE II
Anthony Road
Crown Hill
Queenstown Reservoir
S.of Queenstown
SUITE III
Lynch Creek
Howards Plains, Swan Creek
Que Hellyer
Sock Creek basalts
SUITE IV
Henty Fault Wedge Tholeiites
Henty Dyke Sworm
SUITE V
Miners Ridge basalts
V
IV
III
II
I
SOCK CK.
SiO_2 (mass %)
150
100
50
20
0
45
50
55
60
65
70
75
80

FIG 3D

APPENDIX E

Whole Rock and REE Geochemistry

for STD 1 - Staverton Prospect

974162

ANALABS

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

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

ANALYTICAL REPORT No. 11171S.60.09365

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

INVOICE TO: Mr Grant MacDonald
Plutonic Operations Limited
41 Bass Highway
DELORAINE TAS 7304

ORDER No.	PROJECT

DATE RECEIVED	RESULTS REQUIRED
15/03/93	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
3	19/04/93	1	7

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
301104/10	DC Prep : GP009,GP018	Cr,Zr/GX401
STD 1 ext Whole rock / REE		Whole Rock Analysis/QX408
		La,Ce,Nd,Sm,Eu,Tb,Ho,Yb,Lu/SN605

REMARKS

RESULTS TO: Mr Grant MacDonald
Plutonic Operations Limited
41 Bass Highway
DELORAINE TAS 7304

RESULTS TO:

RESULTS TO:

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974163

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09365	19/04/93		1 OF 3

TUBE No.	SAMPLE No.	No From	Cr	Zr	Al2O3	SiO2	TiO2	Fe2O3	MnO	CaO	K2O
1	S01104	11/ 225.95m	20	-	-	-	-	-	-	-	-
2	S01105	13/ 251.90m	181	-	-	-	-	-	-	-	-
3	S01106	33/ 111.15m	142	110	14.12	53.50	0.62	8.49	0.19	4.42	1.47
4	S01107	23/ 187.30m	52	103	16.65	52.60	0.61	9.20	0.12	2.96	1.93
5	S01108	27/ 58.65m	172	130	16.01	53.50	0.74	6.76	0.18	4.14	1.54
6	S01109	28/ 85.1m	227	90	13.99	47.90	0.68	9.61	0.14	7.12	1.48
7	S01110	24/ 217.35m	117	-	-	-	-	-	-	-	-
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23	DETECTION		5	5	0.05	0.05	0.01	0.01	0.01	0.01	0.01
24	UNITS		ppm	ppm	%	%	%	%	%	%	%
25	METHOD		GX401	GX401	OX408	OX408	OX408	OX408	OX408	OX408	OX408

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

AUTHORISED OFFICER

974164

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A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09365	19/04/93		2 OF 3

UBE No.	SAMPLE No.	MgO	P2O5	SO3	Na2O	LOI	TOTAL	La	Ce	Nd
1	S01106	4.75	0.120	1.70	2.29	8.43	100.09	24.6	45.7	21.5
2	S01107	3.55	0.140	3.36	2.84	5.92	99.88	39.2	108.4	57.4
3	S01108	4.66	0.160	0.69	3.83	7.77	99.95	21.5	49.6	24.1
4	S01109	4.92	0.120	3.12	2.29	8.35	99.74	12.6	28.0	15.7
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	0.01	0.005	0.01	0.05	0.01	0.01	0.1	1.0	2.0
24	UNITS	%	%	%	%	%	%	ppm	ppm	ppm
25	METHOD	OX408	OX408	OX408	OX408	OX408	OX408	GN805	GN805	GN805

Results in ppm unless otherwise specified
T = element present, but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

AUTHORISED OFFICER

974165

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

ANALYTICAL DATA

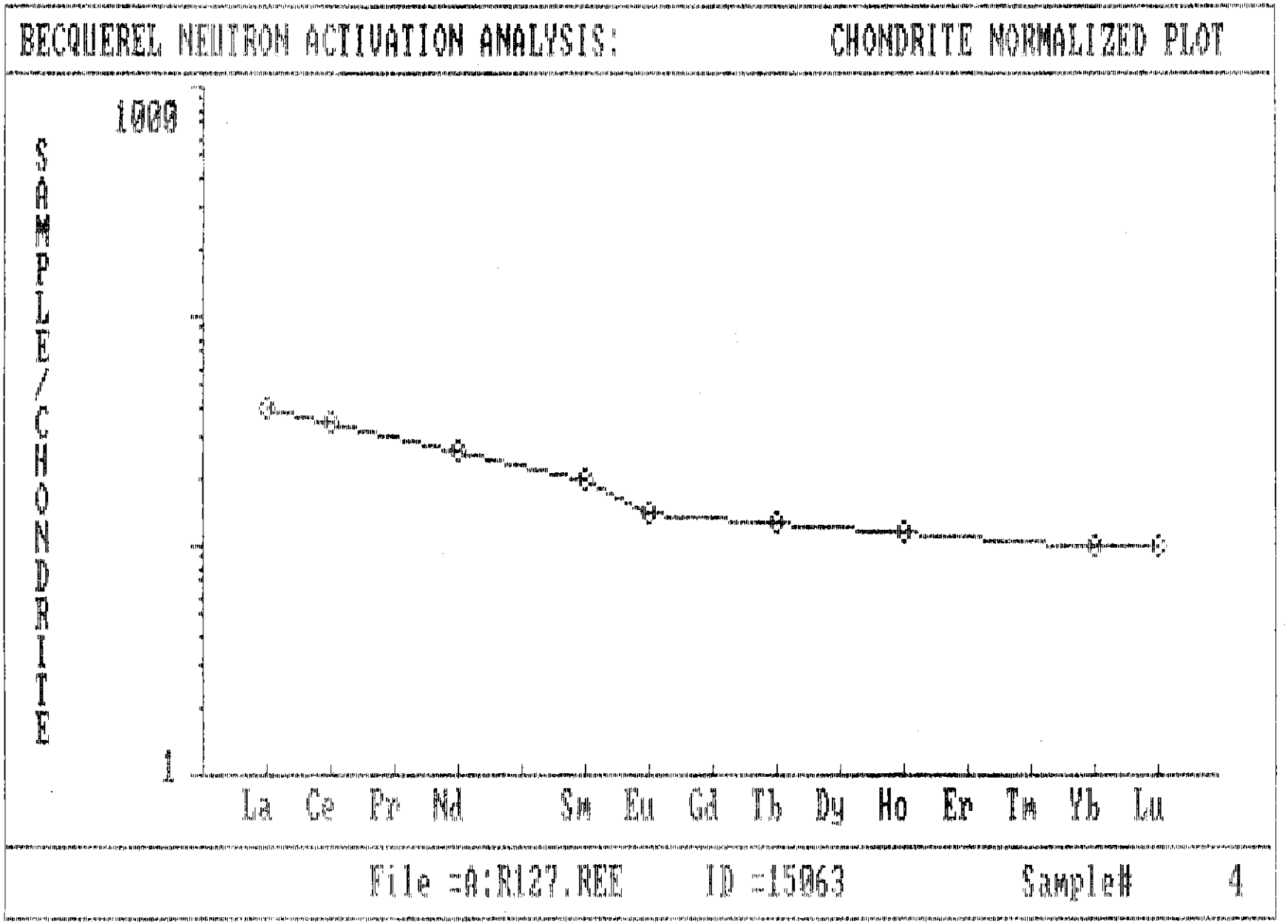
SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09365	19/04/93		3 OF 3

TUBE No.	SAMPLE No.	Sm	Eu	Tb	Ho	Yb	Lu			
1	S01106	4.46	1.4	0.8	1.1	2.6	0.31			
2	S01107	11.30	3.0	1.4	1.6	2.6	0.33			
3	S01108	4.86	1.3	0.7	1.0	2.6	0.37			
4	S01109	3.74	1.0	0.6	0.8	2.1	0.32			
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	0.05	0.1	0.5	0.5	0.1	0.05			
24	UNITS	ppm	ppm	ppm	ppm	ppm	ppm			
25	METHOD	GN805	GN805	GN805	GN805	GN805	GN805			

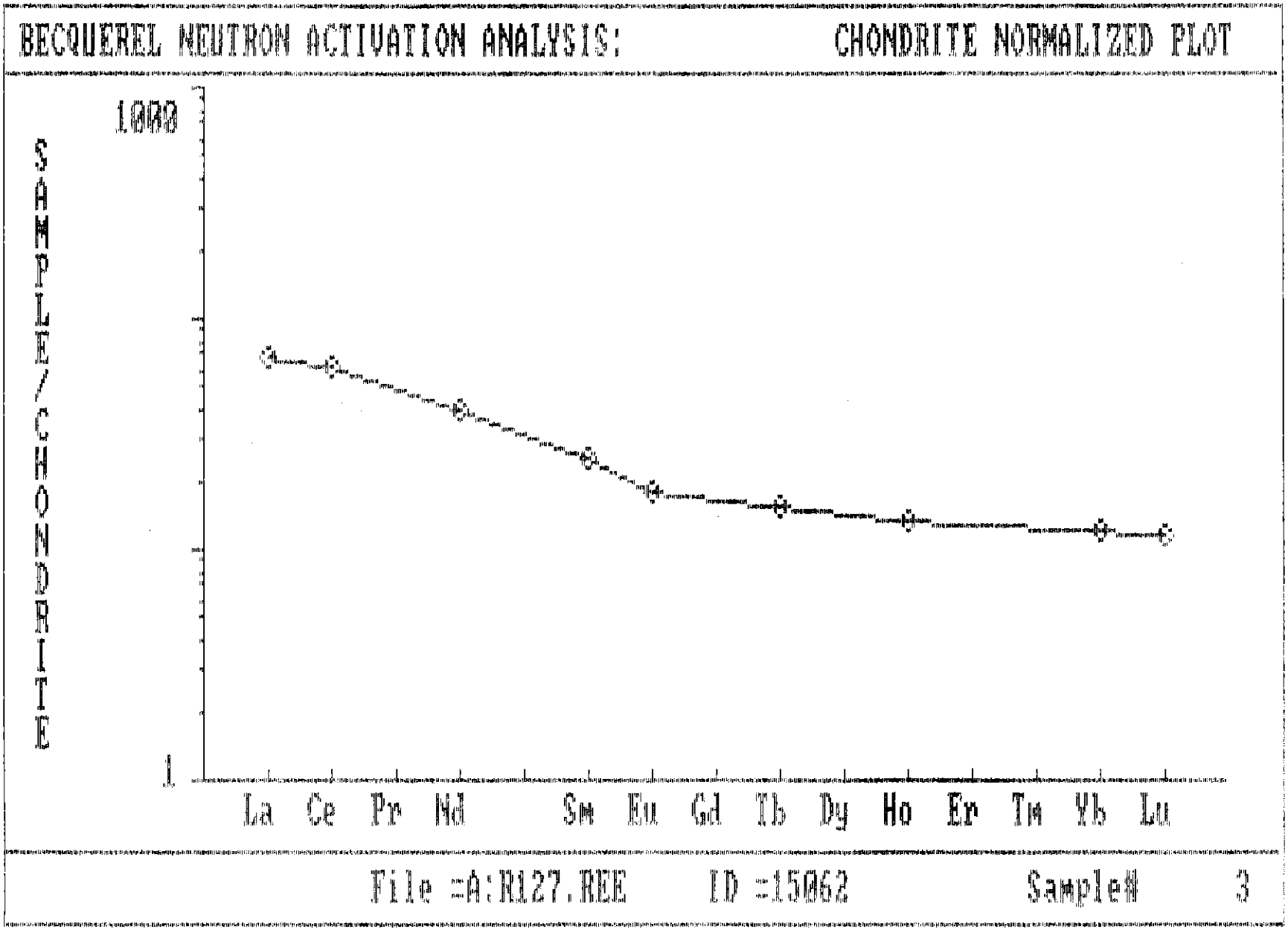
Results in ppm unless otherwise specified
T = element present, but concentration too low to measure
X = element concentration is below detection limit
- = element not determined

AUTHORISED OFFICER

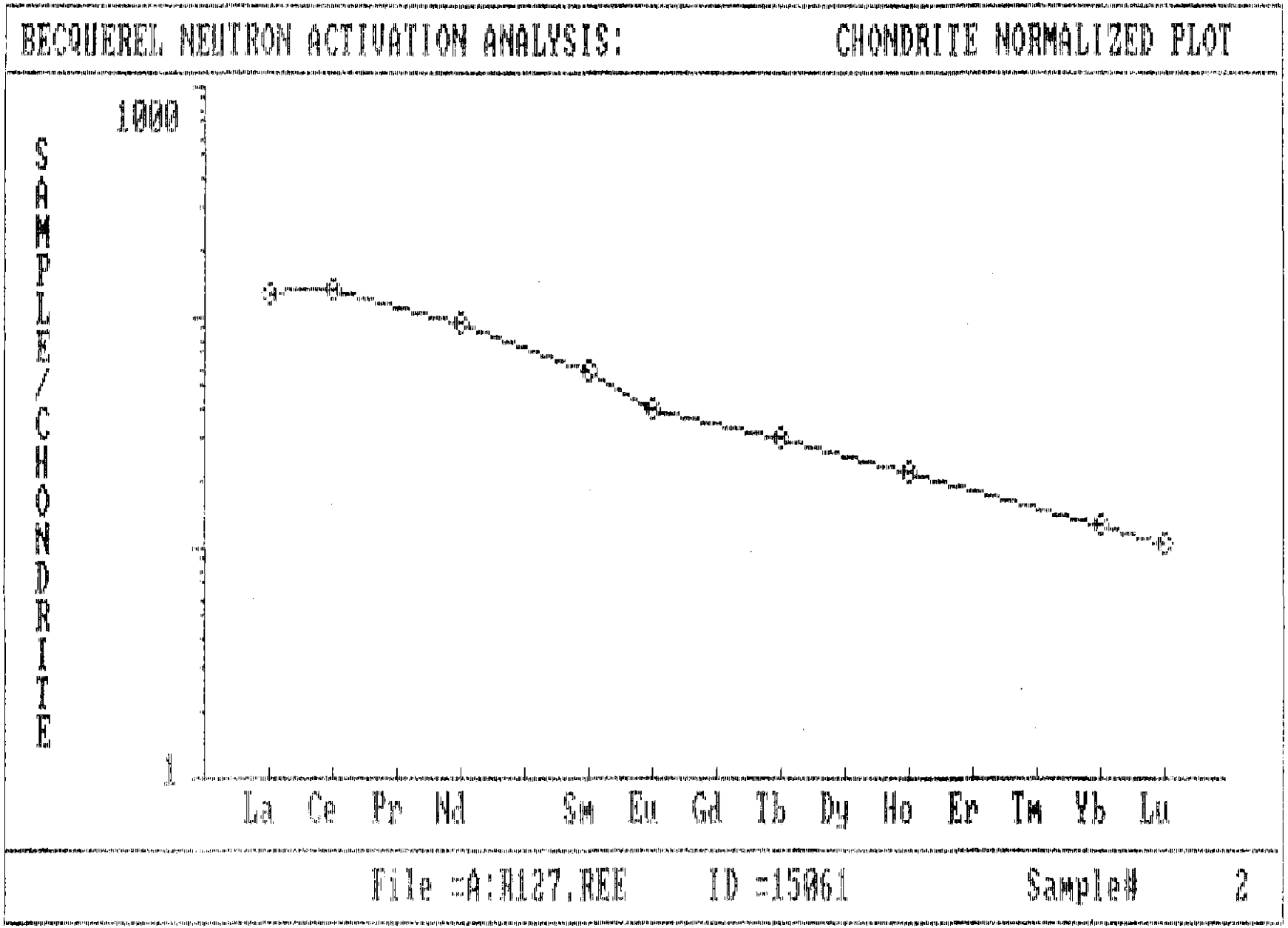
97-166


BECQUEREL NEUTRON ACTIVATION ANALYSIS:
CHONDRITE NORMALIZED PLOT
1000
SAMPLE/CHONDRITE
1.0
La Ce Pr Nd Sm Eu Gd Tb Dy Ho Er Tm Yb Lu
File =A:R127.REE
ID =15063
Sample#
4

97A167

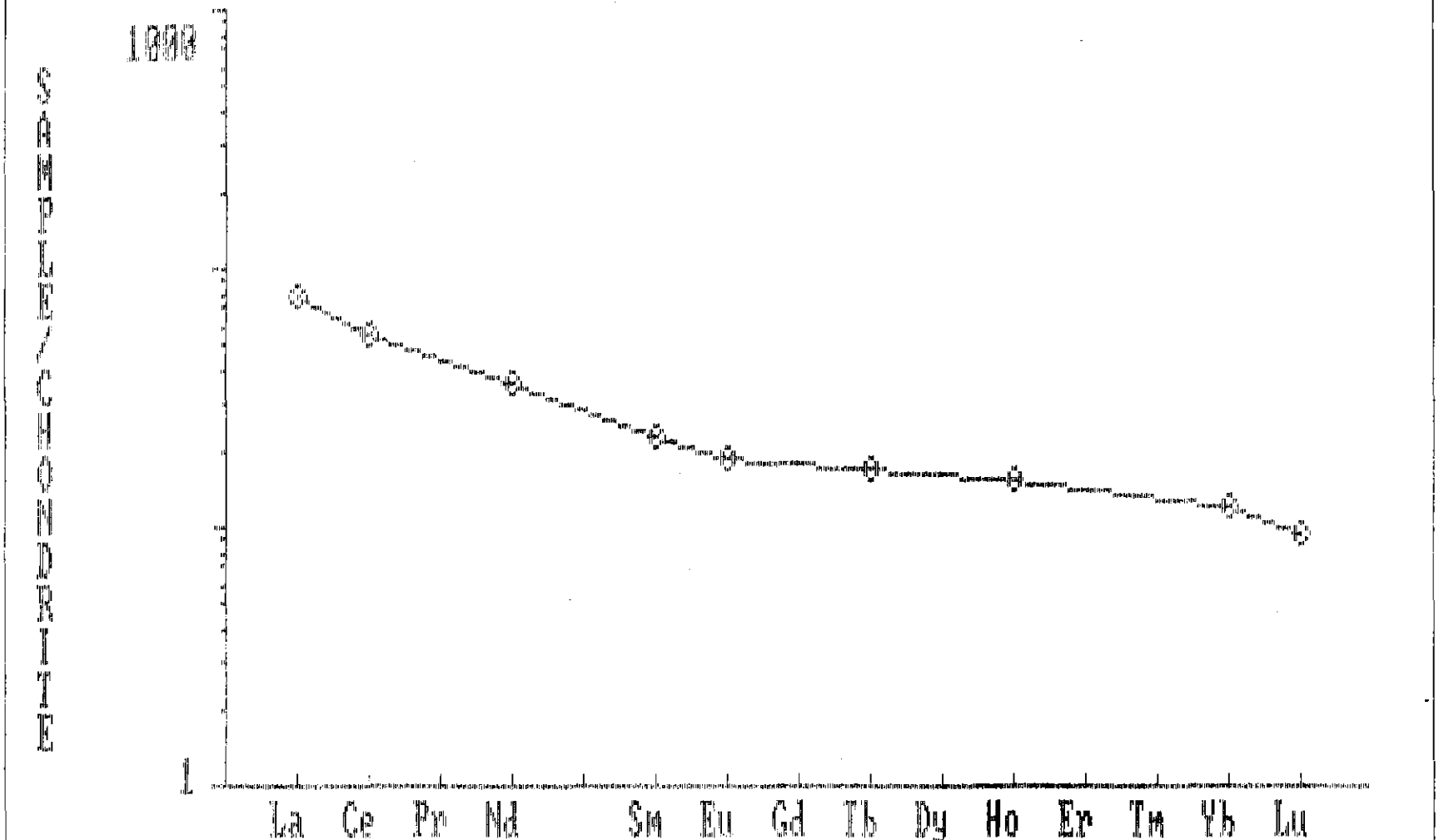

BECQUEREL NEUTRON ACTIVATION ANALYSIS: CHONDRITE NORMALIZED PLOT
1000
SAMPLE/CHONDRITE
1
La Ce Pr Nd Sm Eu Gd Tb Dy Ho Er Tm Yb Lu
File =A:R127.REE ID =15062 Sample# 3

974168


BECQUEREL NEUTRON ACTIVATION ANALYSIS:
CHONDRITE NORMALIZED PLOT
1000
SAMPLE/CHONDRITE
1
La
Ce
Pr
Nd
Sm
Eu
Gd
Tb
Dy
Ho
Er
Tm
Yb
Lu
File =A:R127.REE
ID =15061
Sample#
2

97169

BECQUEREL NEUTRON ACTIVATION ANALYSIS: CHONDRITE NORMALIZED PLOT



File =A:R127.REE ID =15860 Sample# 1

974170

APPENDIX F

Polished Section Petrology for 4 samples from

STD1 - Staverton Prospect

Dr D Huston

Sample locations in STD 1

7P	**248.60m**
16P	**178.25m**
17P	**180.15m**
31P	**144.10m**

974171

Report on four polished thin sections submitted by Plutonic Resources

David L. Huston

18/22 Runnymede St
Battery Point, Tasmania 7004

11 May 1993

Submitted to:

Grant McDonald
Plutonic Resources

974172

Report on four polished thin section submitted by Plutonic Resources

David L. Huston, 18/22 Runnymede St, Battery Point, TAS 7004

11 May 1993

Polished thin section of four samples of felsic volcanic rocks from western Tasmania were prepared and examined petrographically. All of the samples were strongly foliated, with samples 17P and 31P being extensively sheared. Samples 7P and 16P had a well-developed fragmental appearing texture, with carbonate knots and ghosty, light colored "fragments" in a strongly foliated matrix. This texture is interpreted as an alteration texture (c.f. Allen, 1988, *Econ. Geol.*, v. 83, p. 1424-1446) accentuated by deformation.

All samples were strongly sericite-carbonate-quartz-pyrite altered. Sample 7P contained significant quantities of sphalerite, chalcopyrite and galena, and samples 16P and 31P contained trace quantities of chalcopyrite and galena, respectively. The pyrite occurred largely within the sheared matrix of the rocks, whereas the other sulfides had a strong association with carbonate. The pyrite was commonly strongly brecciated, indicating that it was present at the time of shearing. Sphalerite was also aligned into the cleavage in sample 7P. These relationships indicate that the sulfide minerals were introduced prior to or during the shearing.

The presence of tourmaline in two of the samples is suggestive of a Devonian granitoid-related overprint to the mineralization, or of a direct association of mineralization to Devonian granitoid intrusion. As no unequivocal evidence of an earlier timing is present, A devonian timing is proposed for sulfide mineralization and alteration in these four samples. However, the mineralization could have been originally deposited in the Cambrian, but later remobilized in the Devonian. Independant evidence such as a Zn ratio study (e.g. Huston and Large, 1987, *Econ. Geol.*, v. 82, p. 1521-1539) or Pb isotope study (e.g. Gulson *et al.*, 1987, *Econ Geol.*, v. 82, p. 308-327) is recommended to test such a hypothesis.

Petrographic description

Sample: 7P **Date:** 8 May 1993

Rock name: Sericitie-pyrite-carbonate altered and tourmalinitized, strongly schistose, volcanic rock (possibly a volcanic sandstone).

Description: In hand specimen, this sample has a weak fragmental appearance, with lensoidal "fragments" of quartz and carbonate in a light green to gray, schistose matrix.

In thin section, 0.05-0.5 mm quartzose fragments sit within a schistose sericite-quartz-chlorite matrix. A weak crenulation of the sericite is locally present. The sample has been strongly altered and moderately mineralized. The matrix has been sericitized and contains disseminated pyrite. The sample has also been carboante altered; carbonate occurs both as veins and as carbonate-rich lenses that give the sample a knotted or fragmental look in hand specimen. Chlorite, which has Berlin-blue birefringence, occurs with carbonate or as wisps or nodules within the groundmass. Carbonate-chlorite-pyrite boudins or lenses to 5 mm long occur parallel to the schistosity. Within these zones the pyrite commonly has quartz pressure shadows. Tourmaline occurs as individual 0.01-0.05 mm grains or as mats of very fine grains. It appears to replace the matrix. In one case a carbonate vein cuts a tourmaline mat, but in several other locations the tourmaline appears to be later that the carbonate. The section contains significant quantities of clear, light colored sphalerite, and minor chalcopyrite and galena. The FeS content of the sphalerite is 1-2 mole % indicating moderately oxidizing conditions of deposition. The sulfides have a strong association with carbonate and chlorite; sphalerite has a particular associate with chlorite. The sulfide quatities present indicate the sample contains 2000-5000 ppm Zn, and several hundred ppm Cu and Pb. The Zn ratio (100Zn/(Zn+Pb) is probably >90. The estimated quantities of minerals is as follows:

Mineral	Volume percent	Grain size (mm)
Quartz	50-60	0.001-0.5
Sericite	20-30	0.001-0.005
Carbonate	7-10	0.01-0.3
Pyrite	7-10	0.01-0.5
Chlorite	2-3	0.001-0.1
Sphalerite	0.5-1	0.01-0.1
Tourmaline	tr-0.25	0.001-0.05
Chalcopyrite	tr	0.001-0.01
Galena	tr	0.001-0.01
Rutile	tr	0.001-0.005

Discussion: This presence of tourmaline and the strong association of sulfide minerals with foliation and/or carbonate indicates a Devonian timing for mineralization. Pyrite formed either prior to or during deformation as indicated by the orientation of pyrite parallel to foliation and the presence of quartz pressure shadows about the pyrite. Most sphalerite is also aligned parallel to cleavage, although some sphalerite cuts the foliation. No close association between tourmaline and sulfides was

noted. The textural relationships noted indicate a probable close relationship between deformation and mineralization; the presence of tourmaline indicates a relationship to Devonian granitoid intrusion. However, the above relationships are not absolute as Cambrian mineralization is commonly remobilized during the Devonian in Tasmania. However, more evidence would be required to justify such an interpretation for this sample.

Petrographic description

Sample: 16P **Date:** 9 May 1993

Rock name: Sericitie-carbonate-pyrite-tourmaline altered, strongly schistose, volcanic rock (possibly an altered felsic lava).

Description: In hand specimen, this sample has a fragmental appearance, with light colored, 1-7 mm "fragments" in a dark, very fine-grained quartz-sericite-pyrite matrix. The "fragments" are elongate parallel to a well developed schistosity in the matrix. In several cases the "fragments" have diffuse boundaries and quartz eyes transgress the boundaries between the fragment and the matrix.

In this section the textures observed in hand specimen are not apparent. The rock consists of 7-10% 0.1-1 mm anhedral quartz eyes withn a schistose quartz-sericite-carbonate-tourmaline matrix. Although some of the quartz eyes are angular, most are rounded, and several eyes contain overgrowths over a core with a well formed quartz crystal shape. The section also contains 1-3 mm domains of aggregates of intergrown 0.005-0.05 mm quartz anhedra that may also contain a quartz eye. This texture is a silicified, primary igneous texture. The boundaries of these domains are not sharp, as they would be for true fragments.

The matrix consists dominantly of quartz and foliated sricite, with lesser quantities of carbonate, pyrite and tourmaline. Although carbonate occurs in veins that cut foliation, its dominant occurrence is as aggregates of 0.05-0.2 mm grains that occurs within the matrix. Pyrite forms trains of angular fragments parallel to foliation, which indicates that it was brecciated during shearing. Some of the larger pyrite grains have quartz pressure shadows. Tourmaline is also a common mineral in the matrix. It is most strongly associated with carbonate, although it has a weak asociation with pyrite. It occurs within the schistosity, as unoriented sprays with carbonate, and as veinlets that cut the schistosity. Trace rutile occurs in the matrix, and trace chalcopyrite occurs as inclutions in pyrite. The estimated quantities of minerals is as follows:

Mineral	Volume percent	Grain size (mm)
Quartz	50-60	0.005-1
Sericite	20-30	0.001-0.01
Carbonate	7-10	0.05-0.2
Pyrite	7-10	0.005-0.2
Tourmaline	2-3	0.005-0.1
Rutile	tr	0.005-0.01
Chalcopyrite	tr	0.005-0.01

Discussion: This sample is interpreted to be a strongly sheared and sericite-carbonate-pyrite-tourmaline altered volcanic rock, possibly from a coherent felsic body. The fragmental appearance in had specimen is likely the result of shearing and alteration (i.e. a pseudobreccia; Allen, 1988). Based on the observed relations in the sample, only one alteration event is likely. This alteration event accompanied shearing and is probably related to Devonian granitoid activity.

Petrographic description

Sample: 17P **Date:** 10 May 1993

Rock name: Strongly sheared sericitie-carbonate-quartz-pyrite felsic volcanic rock (possibly an altered felsic lava).

Description: In hand specimen, this sample contains minor quantities of 1-3 mm quartz eyes and 1-5 mm carbonate knots in a strongly foliated, very fine-grained quartz-sericite-carbonate matrix.

In thin section the rocks consists of 2-3% 0.05-2 mm anhedral quartz grains and eyes along with minor 0.1-1 mm sheared feldspar grains in a very-fine grained sericite-carbonate-quartz matrix. The coarser quartz and feldspar grains are commoly fractured, and the feldspar grains are commonly extended along the foliation. These grains are also veined or replaced by carbonate and/or minor sericite. The section also contains numerous lensoidal aggregates of 0.05-0.2 mm carbonate grains. The carbonate aggregates are elongate parallel to, and wrapped by foliation, with maximum lengths of 2-3 mm. In one instance, a coarser grained (0.2-0.5 mm) carbonate vein cut one of the carbonate lenses, but was itself cut off by the foliation.

The matrix consists dominantly of sericite, with lesser carbonate, quartz and pyrite. A well defined cleavage is developed by the sericite. This cleavage wraps around the feldspar and quartz grains as well as the carbonate lenses. Quartz in the groundmass occurs as 0.01-0.05 mm anhedral grains that are disseminated through the matrix and commonly form trains parallel to the foliation. Elongate and very intricate quartz pressure shadows are present around the coarser pyrite grains. Pyrite does not have a strong association to other minerals as in other sections. The estimated mineral abundance is as follows:

Mineral	Volume percent	Grain size (mm)
Sericite	30-40	0.001-0.01
Carbonate	20-30	0.02-0.5
Quartz	20-30	0.01-0.5
Pyrite	3-5	0.002-0.2
Feldspar	1-2	0.1-1

Discussion: This sample is a very strongly sheared, and sericite-carbonate-quartz-pyrite altered felsic volcanic rock. Although primary textures were largely destroyed by the strong shearing the rock was possibly a coherent rock. The carbonate knots may be altered feldspar. In hand specimen the carboante occurs as lenses parallel to foliation and in minor cross-cutting veinlets to foliation. This suggests that carbonate alteration, and probably sericite and pyrite alteration occurred during or slightly after the shearing event. Unlike the other samples, no tourmaline was observed, but a Devonian timing is likely for the alteration.

974177

Petrographic description

Sample: 31P **Date:** 10 May 1993

Rock name: Strongly sheared, sericitie-carbonate-quartz-pyrite felsic volcanic rock (extensively but by syn- to post-kinematic carbonate veins.

Description: In hand specimen, this sample consists of rare 1-3 mm quartz eyes in a highly sheared sericite-quartz-carbonate matrix. The sample has been extensively veined, with early, discontinuous, 1-3 mm wide carbonate veins developed parallel to the foliation, but also cut by the foliation. These veins and the foliation are cut agin by later, thicker carbonate veins.

In thin section the rocks contains of 1-2% 1-3 mm, fractured quartz eyes and the odd carbonated feldspar phenocryst (to 1 mm) in a very-fine grained, sheared sericite-carbonate-quartz matrix. In addition to the matrix carbonate, which is relatively minor, two generations of carbonate veins are present. The earliest set contains very dirty looking carbonate and is oriented parallel or sub-parallel to the foliation. Early carbonate also forms lenses wrapped by foliation and infills creacks between highly fractured and dismembered pyrite grains. The later vein set consists of straight veins that cut earlier veins and the foliation, and contains clear, well crystallized carbonate grains 0.05-0.5 mm in size. Sericite, quartz and carbonate occur with the matrix; sericite is strongly foliated. Pyrite also occurs in the matrix, generally in trains parallel to cleavage. The pyrite, which occurs as 0.005-0.2 mm anhedra, is commonly fractured and/or dismembered. Trace 0.01-0.1 mm galena anhedra are associated with carboante, particularly the late, clear carbonate veins. Trace 0.01-0.02 mm rutile anhedra occur in the matirix. The estimated mineral abundance is as follows:

Mineral	Volume percent	Grain size (mm)
Matrix carbonate	2-3	0.02-0.1
Early vein carbonate	30-40	0.02-1
Late vein carbonate	7-10	0.05-0.5
Sericite	20-30	0.001-0.01
Quartz	20-30	0.02-0.5
Pyrite	2-3	0.005-0.2
Galena	tr	0.01-0.1
Rutile	tr	0.01-0.02

Discussion: This sample is very strongly sheared and carbonate altered. The carbonate alteration and veining appears to have accompanied the shearing, although some late carbonate veining is present. Galena accompanies mainly the later carboante veining. Minerals with high strength, such as quartz and pyrite, have been extensively fractured and dismembered during the shearing. Relations in this sample suggest that the sulfides accompanied or post-dated shearing, hence they are most likely Devonian in age.

APPENDIX G

Drill Logs for DD80LB1 Extended -

Lake Barrington Prospect

974179

HOLE NO. : DD80LB1 | PLUTONIC OPERATIONS LIMITED | Page: 1
SECTION : 4700.00 EAST | GOWRIE PARK

DIAMOND DRILL RECORD

Northing : 4920.00
Easting : 4700.00
Grid : LAKE BARRINGTON
Direction : GRID S
Inclination : -60.0
Elevation : 296.00
Azimuth : 180.0
Mag Azimuth : 210,209,208,208,208,208,208,208; OM=12.5T OR 330G
Length (m) : 287.80
Precol. (m) : 2.30M
BOCO :
TFR :
Water Table : na

Drill Type :LY38
Core Size :HQ 2.30 NQ 27.0 BQ
Contractor :Longyear
Dip Tests Method:

Depth	Az	Dip
30.0	180.0	-60.0
60.0	179.0	-59.3
90.0	178.0	-59.3
120.0	178.0	-58.5
150.0	178.0	-56.7
180.0	178.0	-56.3
230.0	178.0	-56.0
285.0	178.0	-55.7

Property : LAKE BARRINGT
State : Tasmania
GMR : WILMOT
E.L. No. : GOWRIE PARK
Project No. : 706
Date Started : 22/12/92
Date Completed: 11/1/93
Logged by : G. MacDONALD
Relogged by :
Date Logged : 28/1/93
Interpreted : G. MacDONALD
Initialled : [signature]

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm)

Au assays in appendix K.

.00 2.30 PRECOLLAR

2.30 17.40 FELSIC MASS FLOW

Very coarse grained conglomerate consisting of sub - rounded clasts to 80 mm of predominantly pale pink orange quartz feldspar phyric lava and fragments of quartz and feldspar phenocrysts in a matrix of the same composition. In patches the rock is matrix supported, other places it is more clast supported. The rock is very poorly sorted. The rock also contains clasts of fine grained siliceous felsic rock which are probably quenched lava fragments, occasional dark grey quartz feldspar phyric unaltered porphyritic rock and moderately sericitized quartz feldspar porphyritic rock with strongly sericitized feldspars in a moderately sericitized matrix. The rock is unaltered in the upper part becoming weakly silicified downhole. The rock has no obvious bedding. The rock contains limonitic quartz veins with approximately 2 veins per metre predominantly at 50 to 60 degrees to the core axis and 70 to 80 degrees to the core axis. The rock contains no obvious sulphides. The rock grades up somewhat downhole.

Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm)
816101	8.40	8.70	.30	1770	18	28
795551	8.70	11.00	2.30	790	15	56
795552	11.00	13.60	2.60	440	13	50
816102	13.60	14.20	.60	320	6	13
795553	14.20	16.00	1.80	270	13	120
795554	16.00	18.00	2.00	350	14	56

17.40 17.90 PSAMMITE / VOLCANICLASTIC

QUARTZ FELDSPAR LITHIC SANDSTONE / VOLCANICLASTIC.
The rock has the same composition as the overlying and underlying rocks. The rock contains limonitic quartz veins at approximately 10 per metre at 40 to 90 degrees to the core axis, variably oriented. The rock is massive with no bedding. The rock is gradational with both the underlying and overlying mass flows suggesting that the underlying and overlying rocks are from the same unit. Occasional lithics are up to 10 mm and are sub - rounded. The rock is still poorly sorted.

17.90 47.60 FELSIC MASS FLOW

Same rock as logged for 2.30 to 17.40. From the upper

Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm)
816103	18.00	18.30	.30	18800	120	690

From (m)	To (m)	Description
		contact with the overlying sandstone the rock coarsens up somewhat downhole. Veins cross-cutting the rock are relatively fresh and pyritic with variable chalcopyrite and bornite as noted below. Clast composition is the same as for 2.30 to 17.40 though there also some more intermediate clasts and the clasts are generally only up to 40 mm. The rock is weakly silicified in patches with some weakly haematite altered parts. The rock contains a fine grained beige brown clast / raft of siliceous tuffaceous siltstone or quenched lava from 38.40 to 38.60. Contacts with thic clast are indistinct though the upper contact may be at 70 degrees to the core axis. At 18.40 a clast / bed of siltstone at 55 degrees to the core axis. The contact with the underlying siltstone is probably at 40 degrees to the core axis with the mas flow adjacent to the contact still containing clasts to 15 mm. The rock is generally massive with some weak possible bedding at 60 degrees to the core axis at 41.30. Rocks towards the base of this unit are still of mixed provenance as above.
18.50	18.55	20% pyrite in veins at 35 degrees to the core axis and as matrix to autobrecciated fragments.
21.70	22.00	5% limonitic pyrite and minor bornite.
22.30	22.31	25% pyrite and 5% bornite and minor chalcopyrite in a cross-cutting, moderately limonitic vein at 70 degrees to the core axis.
28.02	28.12	Three limonitic quartz veins at 80 degrees to the core axis, 2, 5 and 10 mm thick.
28.80	29.00	Two limonitic pyrite quartz veins, 10 to 20 mm thick, at 35 degrees to the core axis.
32.00	32.50	Two limonitic pyrite quartz and minor chalcopyrite veins, 10 mm thick, at 70 degrees to the core axis.
32.50	32.51	Limonitic pyrite and minor chalcopyrite vein at 20 degrees to the core axis.
35.30	35.65	Three limonitic pyrite bornite and quartz veins ; 30 mm thick at 45 degrees to the core axis with 10% bornite, 20 mm thick at 40 degrees to the core axis with 20% bornite and 5 mm thick at 30 degrees to the core axis with 5% bornite.
37.90	37.93	Two limonitic pyrite veins, 5 mm thick at 30 degrees to the core axis.
38.55	38.56	Cuprite crystals in fine limonitic veins at 30 degrees to the core axis.
39.50	39.60	Limonitic pyrite vein, 30% pyrite, 20 mm thick at 20 degrees to the core axis.
41.20	41.40	Manganese staining in bands at 60 degrees to the core axis.
42.30	42.40	Spotty manganese staining and minor malachite.
44.00	46.00	As above but weakly limonitic throughout and weakly brecciated in patches.
46.00	46.03	Limonitic pyrite vein at 30 degrees to the core axis.
46.03	46.75	Disseminated clots of bornite, 1%, and manganese staining and trace malachite.
47.60	48.80	PELITE

Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm)
795555	18.30	21.70	3.40	490	18	46
816104	21.70	22.30	.60	7700	21	17
795556	22.30	25.00	2.70	730	11	64
795557	25.00	27.90	2.90	870	9	91
816105	27.90	28.20	.30	1160	10	17
795558	28.20	28.40	.20	1670	6	14
816106	28.40	28.60	.20	600	10	19
816107	28.60	28.80	.20	380	4	9
816108	28.80	29.10	.30	1930	12	24
795559	29.10	31.50	2.40	320	10	110
795560	31.50	33.80	2.30	2500	16	67
816109	33.80	34.00	.20	15200	52	22
795561	34.00	35.20	1.20	517	8	7
816110	35.20	35.60	.40	27000	48	42
795562	35.60	36.80	1.20	1904	8	15
816111	36.80	37.10	.30	7200	16	30
795563	37.10	39.50	2.40	2900	15	56
816112	39.50	39.80	.30	2500	22	13
795564	39.80	42.00	2.20	1560	12	73
816113	42.00	42.40	.40	3800	12	10
795565	42.40	45.40	3.00	2800	11	59
816114	45.40	46.00	.60	4300	74	42
816115	46.00	46.30	.30	13900	18	13
816116	46.30	46.70	.40	11900	14	13
816117	46.70	47.50	.80	540	8	15
816118	47.50	48.40	.90	1000	21	13

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm)
		BEIGE TUFFACEOUS SILTSTONES. Beige brown / green siliceous fine grained tuffaceous siltstone. The upper contact is at 40 degrees to the core axis. The rock is moderately limonitic and brecciated from 47.60 to 48.20. Bedding is at 35 to 40 degrees to the core axis. The rock has relatively sharp upper and lower contacts and is not a graded top to the underlying and overlying mass flows.	816119	48.40	49.00	.60	1600	10	30
48.80	56.00	FELSIC MASS FLOW The rock is essentially the same as for the previous intersections except that the rock is generally fine grained. The contact with the underlying felsic lava is indistinct with the last metre from 55.00 to 56.00 very similar to the lava in gross appearance though fragments in the rock overlying the last metre are still of mixed provenance. The rock from 55.00 to 56.00 is probably a hyaloclastite with quenching and brecciation of the lava. The rock is pinky orange brown throughout. 49.50 49.60 Pyrite > chalcopyrite and minor bornite vein, 20 mm thick and at 20 degrees to the core axis. 53.00 53.10 Diffuse vein consisting of 10% pyrite and 10% chalcopyrite associated with sericite alteration.	816126	49.00	51.00	2.00	870	20	57
			816127	51.00	52.50	1.50	280	17	28
			816128	52.50	53.80	1.30	2800	9	19
			816129	53.80	55.00	1.20	580	11	25
			816130	55.00	56.90	1.90	270	14	32
56.00	84.60	FELSIC LAVA Pinky orange brown, quartz feldspar phyric, massive fine grained lava. The rock contains clastic textures to 62.00 m, probably hyaloclastites due to quenching of the lava or as a result of a shallow intrusion into the mass flows. The rock is grey in patches due to weak silicification but is not strongly altered with no obvious sericitisation but moderate carbonate (siderite) veinlets. The rock contains patchy pyrite and lesser chalcopyrite in attenuated veins generally at 40 to 60 degrees to the core axis. The rock contains occasional quartz carbonate veins at 70 to 80 degrees to the core axis. The rock contains fine irregularly oriented clay (after carbonate?) veinlets. The rock is variably fine grained and medium grained throughout below 74.50 with a sharp contact with a coarse grained clastic rock at 75.40 to 75.50 followed by more fine grained and medium grained rock to about 76.50 where the rock becomes more clastic until 77.40 where it becomes porphyritic again. It is probable that the hole has re-entered the hyaloclastic top of the flow from 74.50 to 77.40 with the juxtaposed fine grained and medium grained patches representing fragments of a coarse grained hyaloclastic breccia. The rock becomes moderately pyritic from 84.40 to 84.60 adjacent to the contact with the underlying porphyritic intermediate dyke with approximately 10% pyrite in spaces between brecciated fragments of quenched dyke rock and the lava.	816131	56.90	58.50	1.60	2400	14	41
			816132	58.50	59.60	1.10	1040	12	30
			816133	59.60	61.90	2.30	210	16	39
			816134	61.90	63.00	1.10	800	18	34
			816135	63.00	64.50	1.50	1170	16	27
			816136	64.50	66.50	2.00	940	18	40
			816137	66.50	67.50	1.00	1290	13	25
			816138	67.50	68.50	1.00	160	12	21
			816139	68.50	70.00	1.50	800	10	22
			816140	70.00	72.60	2.60	380	9	20
			816141	72.60	73.90	1.30	850	8	21
			816142	73.90	75.60	1.70	240	13	27
			816143	75.60	77.40	1.80	330	37	31
			816144	77.40	79.50	2.10	26	16	20
			816145	79.50	80.70	1.20	41	13	21
			816146	80.70	82.50	1.80	350	15	22
			816147	82.50	83.70	1.20	55	15	24
			816148	83.70	85.50	1.80	98	33	45
84.60	87.50	INTERMEDIATE INTRUSIVE INTERMEDIATE INTRUSIVE. Tan brown, clayey, sericitized feldspar phyric rock with rounded quartz carbonate filled amygdules up to 3 mm and	816149	85.50	87.50	2.00	45	13	58

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm)
		chilled margins. The rock has a sharp lower contact at 20 degrees to the core axis and a moderately brecciated upper contact, probably at 30 degrees to the core axis. Feldspars, up to 1 mm long are foliated at 30 degrees to the core axis. The rock is an intermediate intrusive. The rock contains very minor pyrite with some limonitic amygdules probably after pyrite.							
87.50	103.00	FELSIC LAVA							
		Same unit as logged for 56.00 to 84.60 but without clastic textures. The rock is massive, porphyritic, quartz and feldspar phyric throughout with occasional pyrite, minor chalcopyrite veins, occasionally parallel to the core axis with very minor associated chlorite below 95.50. The rock is still only weakly altered with weak carbonate alteration and weak silicification. The lower contact with the intrusive is sharp with no associated alteration. The lower contact is in broken core but is probably parallel to the foliation in the intrusive at 30 degrees to the core axis.	816150	87.50	89.00	1.50	31	12	38
			816151	89.00	91.30	2.30	27	7	19
			816152	91.30	93.00	1.70	120	10	22
			816153	93.00	95.00	2.00	63	12	15
			816154	95.00	97.00	2.00	85	16	18
			816155	97.00	99.00	2.00	28	27	17
			816156	99.00	101.30	2.30	42	15	23
			816157	101.30	103.00	1.70	10	5	17
103.00	104.60	INTERMEDIATE INTRUSIVE							
		INTERMEDIATE INTRUSIVE.	816158	103.00	104.70	1.70	21	8	57
		Similar rock to that logged for 84.60 to 87.50 except all amygdules are limonitic and feldspars are sericitized and more tabular and up to 3 mm. The rock is soft and clayey but is brittly fractured below 103.30. The rock is foliated at 30 degrees to the core axis. The rock contains very minor disseminated pyrite near the upper contact.							
104.60	108.40	FELSIC LAVA							
		As logged for 56.00 to 84.60 and 87.50 to 103.00. The rock contains fine limonitic fractures adjacent to the upper contact and contains occasional irregular pyrite veins generally at low angles to the core axis. The rock is more coherent, occasionally weakly fractured, weakly silicified and carbonate altered. The lower contact is sharp with the underlying fine grained siliceous siltstone with the contact marked by a 1 cm wide pyrite vein at 65 degrees to the core axis.	816159	104.70	106.00	1.30	130	16	44
			816160	106.00	108.30	2.30	190	20	32
			816161	108.30	109.70	1.40	126	15	113
108.40	109.45	PELITE							
		TUFFACEOUS SILTSTONE.							
		Fine grained, beige green, siliceous siltstone with distinct dark banding / bedding at 30 degrees to the core axis at 108.80, 60 degrees to the core axis at 109.20 and 35 degrees to the core axis at 109.45. The beds / bands are micro-fractured and micro-faulted sub-perpendicular to the banding. The rock has a sharp upper contact and a sharp but moderately brecciated lower contact at 35 degrees to the core axis. The rock is weak to moderately brecciated throughout with the fine fractures filled with later quartz carbonate or pyrite and trace chalcopyrite. The rock is weakly sericitized. The pyrite veins don't appear to be disrupted by the microfaulting.							
109.45	176.25	FELSIC LAVA							

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm)
		Very similar to that logged for 56.00 to 84.60, 87.50 to 103.00 and 104.60 to 108.40 except that the rock has a weak green tinge to its pinky orange brown colour. From 109.45 to 122.00 the rock is variably clastic with textures suggesting that the rock is hyaloclastic. Below 122.00 the rock is much more coherent and massive. The rock adjacent to the lower contact is relatively coherent also. Occasional cross-cutting quartz carbonate (haematite) veins are at 60 to 80 degrees to the core axis. Feldspars are generally sericitized and the matrix is weakly sericitized, silicified and siderite altered in patches but is relatively fresh and unaltered throughout. The rock contains only minor sulphides except for approximately 1 to 2% pyrite in attenuated veins with associated minor chalcopyrite and bornite from 109.50 to 113.00 and 1 to 2% pyrite from 163.00 to 166.00. Below 166.00 the rock contains variable but generally minor to very minor disseminated pyrite, chalcopyrite, sphalerite (?) and galena. The rock is brecciated in patches with haematite infilled autobrecciation from 118.00 to 118.50 and variable but generally minor carbonate brecciation from 127.00 to 133.00 and 162.50 to 164.00. Fine chlorite stringers noted in previous logging of this core are negligible where present. The lower contact is in broken core but may be at 70 degrees to the core axis. The rock adjacent to the lower contact is somewhat finer grained but is coherent.	816162	109.70	112.60	2.90	539	22	128
			816163	112.60	113.80	1.20	535	20	132
			816164	113.80	114.80	1.00	110	10	35
			816165	114.80	117.50	2.70	178	10	53
			816166	117.50	120.00	2.50	302	12	87
			816167	120.00	122.50	2.50	1141	15	111
			816168	122.50	124.90	2.40	257	8	81
			816179	124.90	128.50	3.60	153	12	81
			816180	128.50	136.20	7.70	257	13	152
			816181	136.20	138.60	2.40	154	12	115
			816182	138.60	141.40	2.80	161	15	78
			816169	173.75	175.30	1.55	70	100	210
			816170	175.30	177.60	2.30	390	100	200
176.25	187.50	PELITE INTERMIXED SEQUENCE OF TUFFACEOUS SILTSTONES. Mixed sequence of sandy and silty tuffaceous siltstones with no obvious bedding and more gradational contacts except for 60 degrees to the core axis at 177.00. The sandy and silty tuffs contain sericitized feldspars and are weakly sericitized and carbonate altered and beige green in colour. Finer grained tuffaceous siltstones are beige green and siliceous and occasionally contain angular fragments of black tuffaceous siltstones, quartz and sericitized feldspars and are weak to moderately siderite altered and variably weakly to moderately silicified and weakly sericitized throughout. The rock contains minor disseminations and fine attenuated veinlets of pyrite, chalcopyrite, sphalerite and galena and / or bornite throughout with the major veins being the chalcopyrite pyrite sphalerite veins / banded massive sulphides with quartz gangue from 179.40 to 179.50 and a 10 mm thick chalcopyrite bornite sphalerite vein with quartz carbonate gangue at 181.50. Other than these the rock contains numerous carbonate veins cross-cutting at 40 to 80 degrees to the core axis but generally at 60 to 70 degrees to the core axis, approximately 10 to 20 per metre in patches. There has been considerable core loss and there is much broken core but roughly speaking the rock consists of predominantly very fine grained siltstones from 176.50 to 177.00, sandy and silty siltstones to 184.50 and very fine grained siltstones to 187.50. Of note is a coarse grained rock from 182.30 to 182.50 which consists of sub - rounded	816171	177.60	179.40	1.80	1200	100	310
			816172	179.40	179.50	.10	14000	7500	5900
			816173	179.50	180.40	.90	4700	600	1100
			816174	180.40	181.80	1.40	2100	200	2800
			816175	181.80	184.00	2.20	350	100	1300
			816176	184.00	185.05	1.05	260	100	230
			816177	185.05	186.20	1.15	300	100	230
			816178	186.20	187.50	1.30	450	100	310

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm)
		to sub - angular grey cherty clasts and altered feldspars in a chloritic matrix.							
187.50	192.20	PELITE / VOLCANICLASTIC BEIGE GREEN SILTSTONES AND VOLCANICLASTICS. Interbedded fine grained beige green siltstones and medium grained quartz and feldspar rich volcaniclastics. Bedding is parallel to the core axis in places, at low angles to the core axis in others. The rock is weak to moderately carbonate altered throughout with 0.5% disseminated pyrite. Feldspars and quartz in the volcaniclastics are tabular but in confused bedding.							
192.20	205.00	PELITE / PSAMMITE CHLORITIC SILTSTONES AND SANDSTONES. Very broadly interbedded fine grained chloritic siltstones and chloritic volcaniclastics with feldspars and lesser quartz as above. The rock does not show bedding but contacts between sandstones and siltstones are at low angles to the core axis. The rock contains up to 0.5% disseminated pyrite and very occasional cross-cutting pyrite carbonate galena veins below 204.50.							
205.00	212.80	PELITE BEIGE GREEN / GREY SILTSTONES, BRECCIATED. Pale beige green brecciated siltstone and medium grained volcaniclastic as above with strong carbonate alteration in fracture fillings and snowflake textures. The rock contains 0.2% chalcopyrite as fracture fillings. Occasional bedding is at 20 degrees to the core axis. The rock becomes more chloritic downhole below 211.5.	S00871	206.40	207.40	1.00	825	510	470
212.80	214.30	SHEAR ZONE / BRECCIA Moderately sheared, strongly brecciated, chloritic zone. The rock was previously a siltstone, chlorite altered. The rock contains minor pyrite and very minor chalcopyrite. The shearing is at 20 degrees to the core axis and the zone is clearly a significant structure.	S00872	214.00	215.00	1.00	2200	245	690
214.30	218.70	PELITE PINKY ORANGE SILTSTONES, SIDERITIC. Pinky orange siltstones and volcaniclastics with feldspars. The rock is moderately to strongly carbonate altered as above. The rock is strongly sulphidic with 5% to 10% pyrite in irregularly cross-cutting blebs associated with carbonate and silicification. The rock is a reworked tuff. The rock contains minor chalcopyrite and occasional minor galena.	S00873	215.00	216.00	1.00	705	105	195
			S00874	216.00	216.40	.40	4300	70	145
			S00875	216.40	217.00	.60	3250	34	105
			S00876	217.00	218.15	1.15	2100	22	80
			S00877	218.15	219.00	.85	1650	25	100
218.70	222.50	VOLCANICLASTIC / FELSIC MASS FLOW Lithic rich volcaniclastic / mass flow, very sulphidic. From 218.70 to 219.30 the rock contains coarse grained feldspar phyric volcanics. From 219.30 to 222.70 the rock is a medium grained volcaniclastic with 3% pyrite associated with carbonate alteration and minor chalcopyrite and galena. The rock is moderately sericite and strongly carbonate altered throughout with 2% pyrite	S00878	219.00	220.00	1.00	1400	25	110
			S00879	220.00	222.00	2.00	4150	1600	9050
			S00880	222.00	223.30	1.30	13200	2100	10200

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm)
		overall. Lithics are up to 20mm in diameter.							
222.50	223.30	SEMI-MASSIVE SULPHIDES Approximately 40% massive pyrite, 2% chalcopyrite, 1% galena and 1% sphalerite associated with carbonate and silica alteration. The upper contact is gradational whilst the lower contact is sharp. Mineralization is in discrete bands at 15 degrees to the core axis but is quite clearly a vein. The matrix consists of quartz carbonate and sericite. The lower contact is at 30 degrees to the core axis.							
223.30	232.20	VOLCANICLASTIC / FELSIC MASS FLOW Strongly carbonate, moderately sericite altered, mass flow / volcaniclastic with minor pyrite disseminated and in fracture fill veins. From 233.30 to 233.33 and 233.50 to 233.53 the rock contains two 30mm thick massive chalcopyrite veins at 45 degrees to the core axis. Lithics include beige to grey siltstones and porphyritic volcanics. Lithics are up to 20mm in diameter.							
232.20	234.60	SEMI-MASSIVE SULPHIDES SELVEDGE TO VEIN. Irregular veining of very fine grained pyrite and minor chalcopyrite associated with strong carbonate alteration / matrix running sub - parallel to the core axis. The veins are hairlike with a carbonate matrix. The rock contains 0.5% chalcopyrite throughout associated with the pyrite. The rock appears as a number of veins running through carbonate with disseminated pyrite clots. It is very similar to the selvedges to the more massive vein from 239.00 to 240.00 and may indeed be one of the selvedges to this vein.	S00881 S00882	233.30 234.00	234.00 235.00	.70 1.00	17900 3100	445 1200	1400 8750
234.60	239.00	PELITE Moderately carbonate altered, pinky orange massive siltstone with snowflake carbonate alteration. The rock contains 0.5% pyrite and 0.5% chalcopyrite in fine fractures at irregular angles to the core axis. The rock becomes strongly carbonate altered / brecciated below 238.00 as it approaches the underlying massive vein.	S00883 S00884 S00885 S00886	235.00 236.00 237.00 238.00	236.00 237.00 238.00 239.00	1.00 1.00 1.00 1.00	795 3650 5900 2500	1200 2950 1900 2100	665 2850 9600 7750
239.00	240.00	SEMI-MASSIVE SULPHIDES Semi-massive pyrite > chalcopyrite vein with a carbonate matrix with approximately 50% pyrite, 1% chalcopyrite, 1% galena and 1% sphalerite. The vein is at 5 degrees to the core axis and appears to be 50mm thick. The upper contact and lower contact are very similar with both strongly carbonate altered. The vein is sub - parallel to the core axis and hence any assays overstate its true sulphide content.	S00887	239.00	240.00	1.00	3620	5700	8500
240.00	242.90	VOLCANICLASTIC / FELSIC MASS FLOW Lithic rich volcaniclastic / massflow in a strongly carbonate altered matrix. The contact with the overlying massive sulphide vein is gradational with the very strong carbonate alteration decreasing downhole. From 240.00 to	S00888	240.00	241.00	1.00	6500	1200	2300

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm)
		241.00 the rock contains 2% pyrite with minor chalcopyrite whilst from 241.00 to 242.90 the rock contains 1% pyrite and minor chalcopyrite in a lithic rich rock as logged previously.							
242.90	245.70	SEMI-MASSIVE SULPHIDES							
		SELVEDGE TO VEIN.	S00889	242.90	244.00	1.10	15700	11800	7050
		Carbonate selvedge very sulphidic with 4% galena, 2% chalcopyrite and sphalerite and 5% pyrite in a very strongly carbonate altered / breccia matrix. Discrete veins are at 5 to 10 degrees to the core axis. The lower contact is brecciated with the underlying black siltstone. The rock is very probably a selvedge to the vein from 239.00 to 240.00.	S00890	244.00	245.00	1.00	9500	14900	10400
			S00891	245.00	246.10	1.10	10000	4350	3600
245.70	247.93	PELITE							
		BRECCIATED SULPHIDIC BLACK SILTSTONE.	S00892	246.10	247.00	.90	17400	2400	5650
		Fine grained black siltstone, strongly brecciated post lithification with fractures filled with carbonate and 2% chalcopyrite and 2% pyrite. Bedding is unreliable. The lower contact with the underlying pinky orange siltstone is marked by a 30mm thick pyrite vein cross-cutting at 80 degrees to the core axis with a carbonate sericite and silica matrix. Fractures are irregularly oriented.	S00893	247.00	247.90	.90	10700	78	440
247.93	254.50	PELITE							
		Pinky orange siltstone with snowflake textured carbonate alteration throughout. The rock is massive throughout with irregularly cross-cutting pyrite and minor chalcopyrite fracture fill veins increasing below 252.50. The rock contains minor chalcopyrite.	S00894	249.00	250.00	1.00	9000	39	90
			S00895	250.00	251.00	1.00	14700	195	500
			S00896	252.50	253.50	1.00	3500	68	48
			S00897	253.50	254.50	1.00	5450	163	125
254.50	263.80	VOLCANICLASTIC / FELSIC MASS FLOW							
		Lithic rich volcaniclastic / mass flow as logged further uphole. Lithics consist of fine grained cherty sediment and porphyritic volcanics in a moderately carbonate altered, moderately sericite, occasionally moderately chlorite altered matrix with 0.5% to 1% pyrite in disseminated clots.							
263.80	272.50	PELITE							
		Pinky orange siltstone as logged for 247.93 to 254.50 with ghosted siliceous clasts in patches. The rock becomes chloritic below 267.90. The rock is massive throughout.							
272.50	272.60	SHEAR ZONE							
		Chloritic shear zone at 25 degrees to the core axis.							
272.60	287.80	VOLCANICLASTIC							
		Lithic rich volcaniclastic with clasts up to 15mm in a moderately carbonate, weak to moderately sericite altered matrix. Fragments include porphyritic volcanics, feldspars, quartz and cherty siltstones. The rock contains 0.5% pyrite and occasional minor chalcopyrite in cross-cutting veins. From 283.20 to 283.60 the rock contains 4% chalcopyrite in cross-cutting chalcopyrite pyrite veins associated with carbonate alteration and	S00898	283.20	283.60	.40	18300	5900	4200

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm)	(
		minor galena. Below 286.30 the rock is less altered.								
		287.80 E.O.H.								

APPENDIX H

Re-logs of Cethana West Prospect DDH's

ie. DD77CC1
DD77CC2
DD77CC3
DD86CC12
DD86CC13

97448

HOLE NO. : DD77CC1 | PLUTONIC OPERATIONS LIMITED | Page: 1
SECTION : 825.00 EAST | GOWRIE PARK

DIAMOND DRILL RECORD

Northing : -35.00
Easting : 825.00
Grid : CETHANA WEST
Direction : +007 GridN
Inclination : -45.0
Elevation : 340.00
Azimuth : 7.0
Mag Azimuth : 045 045; OM=12.5T or -038.0G
Length (m) : 106.40
Precol. (m) : 3.00m
BOCO : <3.00m
TFR : 3.00m
Water Table : N/A

Drill Type :Mark 12
Core Size :HQ 3.00 NQ 51.50 BQ
Contractor :Longyear

Dip Tests Method: Not surveyed?

Depth	Az	Dip
106.4	7.0	-45.0

Property : CETHANA WEST
State : Tasmania
GMR : Cethana 4240
E.L. No. : GOWRIE PARK
Project No. : 706
Date Started : 28/1/77
Date Completed: 2/2/77
Logged by : G. MacDONALD
Relogged by :
Date Logged : 18/8/92
Interpreted : G. MacDONALD
Initialled : [signature]

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm)
.00	3.00	PRECOLLAR Triconed-no core.							
3.00	5.00	SILICA SERICITE ALTERATION Yellow gritty clay after quartz sericite schist.							
5.00	7.00	SILICA SERICITE ALTERATION Pale grey, occasionally aqua i.e. Fuchsitic, schistose, sericitic, moderately silicified quartz sericite schist with ferruginous puggy shears at approximately 25 degrees to the core axis.	A00001	5.00	7.00	2.00	35	42	32
7.00	8.00	CORE LOSS							
8.00	9.40	SILICA SERICITE ALTERATION Broken core but essentially as for 5.00m to 7.00m, the quartz sericite schist containing fine grained recrystallised pyrite, to 1%, predominantly in puggy shears at 20 to 30 degrees to the core axis.	A00002	8.00	12.60	4.60	180	90	190
9.40	14.00	CORE LOSS	A00003	12.60	14.00	1.40	65	80	80
14.00	15.60	SILICA SERICITE ALTERATION As for 8.00m to 9.40m.	A00004	14.00	15.00	1.00	80	270	550
			A00005	15.00	15.60	.60	12	710	740
15.60	17.00	CORE LOSS	A00006	15.60	17.00	1.40	50	270	780
17.00	34.70	SILICA SERICITE ALTERATION Dark brown, ferruginous, schistose quartz sericite schist. Medium grained rounded quartz phenocrysts are generally sparse though they may form the cores to diffuse augen shaped patches of silicification. In more silicified patches the core is moderately brecciated. Fine to medium grained recrystallised pyrite, to 1%, and very minor galena and sphalerite, predominantly from 20.60m to 22.00m, are predominantly in shears, and in fractures	A00007	17.00	19.20	2.20	48	260	540
			A00008	19.20	20.60	1.40	70	250	730
			A00009	20.60	22.60	2.00	150	3310	2880
			A00010	22.60	23.30	.70	20	130	200
			A00011	23.30	24.30	1.00	48	980	720
			A00012	24.30	25.20	.90	22	800	180
			A00013	25.20	28.20	3.00	22	240	190
			A00014	28.90	30.50	1.60	38	680	1040

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm)
		where the core is more massive and silicified.	A00015	30.50	31.60	1.10	120	950	770
			A00016	31.60	33.20	1.60	42	400	610
			A00017	33.20	36.20	3.00	25	140	230
34.70	95.80	SILICA SERICITE ALTERATION							
		Pale grey to beige brown, moderately to strongly schistose, quartz sericite altered, augen schist. The rock contains medium grained rounded quartz phenocrysts and was probably originally a felsic tuff, probably reworked in a submarine environment. Fine to medium grained pyrite, to 1%, is predominantly in puggy shears and lesser fractures. Very minor galena and sphalerite is occasionally visible. Weak carbonate alteration in patches is in fine veins hosted in shears. The schistosity is generally at 30 to 35 degrees to the core axis, locally to 15 degrees to the core axis.	A00018	36.20	37.60	1.40	20	70	180
			A00019	37.60	38.90	1.30	10	90	130
			A00020	38.90	41.00	2.10	20	190	390
			A00021	41.00	43.00	2.00	38	200	430
			A00022	43.00	45.00	2.00	28	190	270
			A00023	45.00	47.00	2.00	48	85	170
			A00024	47.00	48.20	1.20	65	25	270
			A00025	48.20	49.80	1.60	28	35	270
			A00026	49.80	51.30	1.50	28	60	210
			A00027	51.30	51.60	.30	48	80	160
			A00028	51.60	53.00	1.40	45	150	220
		34.70 37.20 As above but somewhat gritty quartz rich with up to 0.5% pyrite.	A00029	53.00	55.00	2.00	45	35	220
			A00030	55.00	57.30	2.30	55	70	190
		37.20 37.40 Grey schistose rock with quartz sericite patches and 1% disseminated pyrite. The rock probably originally had a more vitric tuffaceous component than the adjacent rock.	A00031	57.30	58.90	1.60	40	150	180
			A00032	58.90	61.00	2.10	330	80	200
			A00033	61.00	62.70	1.70	150	320	180
			A00034	62.70	64.50	1.80	260	95	940
		37.40 47.10 As above but pale grey, moderately schistose quartz sericite schist with up to 0.5% pyrite. Oxidised fine carbonate veins are hosted in shears, cross-cutting veinlets and filling fractures in more silicified patches and hence are probably post shearing. The cleavage is at 30 degrees to the core axis.	A00035	64.50	67.80	3.30	100	110	140
			A00036	67.80	70.70	2.90	50	60	270
			A00037	70.70	72.00	1.30	10	38	160
			A00038	72.00	72.30	.30	38	140	380
			A00039	72.30	74.40	2.10	15	38	180
			A00040	74.40	76.00	1.60	22	140	340
			A00041	76.00	78.60	2.60	65	410	1530
		47.10 51.00 As above but weak to moderately schistose, moderately silicified, moderately brecciated rock with oxidised carbonate infilling of breccias. The rock contains sub - rounded quartz phenocrysts to 3 mm and elongate pumice like sericite patches.	A00042	78.60	79.00	.40	340	1970	82000
			A00043	79.00	79.40	.40	110	160	3170
			A00487	79.40	81.20	1.80	18	80	740
			A00488	81.20	83.00	1.80	80	500	850
			A00489	83.00	85.30	2.30	48	220	410
			A00490	85.30	87.00	1.70	18	200	660
		51.00 95.80 As above but strongly schistose quartz sericite schist with 0.5% pyrite. A 5 mm thick pyrite sphalerite galena vein from 78.60m to 79.00m runs parallel to the core axis, cross-cutting, and hence post-dating the cleavage. Quartz siderite veins also cross-cut the cleavage from 59.40m to 59.60m, 64.40m to 64.50m, 67.80m to 68.20m and 87.80m to 87.90m with minor associated pyrite. The cleavage is generally at 30 to 35 degrees to the core axis, locally 15 degrees to the core axis. Fine to medium grained quartz phenocrysts are common and the rock was probably originally a reworked felsic tuff. The lower contact with the dark grey tuffaceous siltstone is gradational with an increasing siltstone component from 95.00m.	A00491	87.00	88.60	1.60	18	60	110
			A00492	88.60	89.80	1.20	110	570	990
			A00493	90.00	92.00	2.00	45	390	910
			A00494	92.00	94.10	2.10	65	330	1220
			A00495	94.10	95.80	1.70	180	2380	9900
95.80	100.50	PELITE							
		Dark grey, fine grained, siltstone, massive and brecciated from 99.00m to 100.00m, schistose adjacent to the upper and lower contacts. Shears in more schistose patches are	A00496	95.80	98.00	2.20	110	150	2000
			A00497	98.00	100.00	2.00	190	10300	10900
			A00498	100.00	100.60	.60	120	8300	3600

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm
		sericitic. 1% pyrite, galena and sphalerite from 98.00m to 100.00m are concentrated in fractures which clearly postdate fine bedding which can be seen in some brecciated fragments at 98.80m. Ferruginous carbonate also fills fractures. The rock has a gradational lower contact with the sericite component increasing downhole from 99.00m.							
100.50	106.40	SILICA SERICITE ALTERATION							
		Pale yellow brown, strongly schistose, strongly sericitized rock with fine to medium grained quartz phenocrysts forming the core to augen shaped patches of silicification. Occasional carbonate veins are sub - parallel to the cleavage but clearly postdate deformation. The rock contains only minor disseminated pyrite.	A00499	100.60	101.50	.90	28	150	150
			A00500	101.50	104.00	2.50	18	30	130
			A00501	104.00	106.40	2.40	18	75	190
		106.40 E.O.H.							

974192

HOLE NO. : DD77CC2 | PLUTONIC OPERATIONS LIMITED | Page: 1
SECTION : 1075.00 EAST | GOWRIE PARK

DIAMOND DRILL RECORD

Northing : -154.50
Easting : 1075.00
Grid : CETHANA WEST
Direction : +172 GridN
Inclination : -61.0
Elevation : 405.00
Azimuth : 172.0
Mag Azimuth : 210 210; OM=12.5T or -038.0G
Length (m) : 164.10
Precol. (m) : 3.50m
BOCO : <3.50m
TFR : 3.50m
Water Table : N/A

Drill Type :Mark 12
Core Size :HQ 3.50 NQ 17.80 BQ
Contractor :Longyear

Dip Tests Method: Not surveyed?

Depth	Az	Dip
164.1	172.0	-61.0

Property : CETHANA WEST
State : Tasmania
GMR : Cethana 4240
E.L. No. : GOWRIE PARK
Project No. : 706
Date Started : 4/2/77
Date Completed: 9/2/77
Logged by : G. MacDONALD
Relogged by :
Date Logged : 18/8/92
Interpreted : G. MacDONALD
Initialled :

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm
.00	3.50	PRECOLLAR Triconed-no core.							
3.50	19.40	CHLORITE SILICA ALTERATION / FELSIC TUFF Mottled green, cream and pale green, chlorite sericite quartz altered quartz porphyritic schist with lensoidal patches of chlorite and sericite foliated at 45 to 50 degrees to the core axis. Cream patches are probably sericitised feldspars. Chloritic patches may be after mafics i.e. Biotite?. The core is weakly magnetic and contains minor magnetite, pyrite and galena as disseminations. Below 18.00m the core is pink due to potassic alteration. The rock is probably a reworked or primary felsic crystal tuff though it may be an altered deformed quartz feldspar biotite porphyry (W. Herrmann, 1989). The lower contact is sharp.	B00001	6.00	6.50	.50	30	130	600
			B00002	6.50	8.50	2.00	28	210	660
			B00003	8.50	10.60	2.10	22	210	650
			B00004	10.60	12.50	1.90	25	150	590
			B00005	12.50	13.50	1.00	38	1650	900
			B00006	13.50	14.00	.50	8	310	640
			B00007	14.00	16.00	2.00	18	670	1640
			B00008	16.00	18.00	2.00	20	490	1080
			B00009	18.00	19.30	1.30	22	330	520
			B00010	19.30	21.30	2.00	30	950	1900
19.40	52.60	PELITE / FELSIC VITRIC TUFF Fine grained, green, siliceous chloritic, massive siltstone, probably a reworked, altered vitric tuff. The rock becomes more brecciated downhole with carbonate infilling of fractures. Occasional cross-cutting quartz carbonate +/- chlorite veins and veinlets contain minor pyrite and lesser galena and sphalerite and clearly postdate the cleavage (e.g. From 38.00m to 40.00m). The cleavage is generally at 45 to 55 degrees to the core axis. The lower contact is in broken core.	B00011	21.30	23.00	1.70	48	560	970
			B00012	23.00	24.40	1.40	60	75	160
			B00013	24.40	25.40	1.00	65	40	110
			B00014	25.40	26.60	1.20	28	15	80
			B00015	26.60	27.70	1.10	20	20	90
			B00016	27.00	29.90	2.90	65	28	190
			B00017	29.90	32.00	2.10	110	70	180
			B00018	32.00	34.00	2.00	40	10	50
			B00019	34.00	36.00	2.00	48	80	100
			B00020	36.00	38.00	2.00	55	450	420
			B00021	38.00	39.00	1.00	38	640	1680
			B00022	39.00	40.00	1.00	45	240	2220
			B00023	41.00	43.00	2.00	110	160	190
			B00024	43.00	45.00	2.00	110	32	490
			B00025	45.00	46.00	1.00	120	830	2260
			B00026	46.00	47.00	1.00	80	1190	4320
			B00027	47.00	48.00	1.00	180	250	640
			B00028	48.00	50.00	2.00	200	160	680
			B00029	50.00	52.00	2.00	170	200	560
			B00030	52.00	53.40	1.40	25	65	160

974193

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm)
52.60	59.40	VOLCANICLASTIC / FELSIC MASS FLOW Mottled green and white volcaniclastic consisting of quartz, sericitized feldspar and lithics, the latter consisting of small fine grained vitric tuffaceous siltstone and larger, to 20mm, rounded siliceous pebbles of uncertain origin. The matrix is siliceous, chloritic and weakly sericitized. Irregularly interbedded beds or rafts of the green vitric tuffaceous siltstone which overlying and underlying this unit indicate a probable mass flow origin for this rock. Only trace pyrite is present.	B00031	53.40	58.00	4.60	25	170	200
			B00032	58.00	61.50	3.50	30	60	130
59.40	70.70	PELITE / FELSIC VITRIC TUFF Essentially the same rock as intersected from 19.40m to 52.60m but less sulphidic and more massive. Fractures between brecciated fragments are filled with chlorite. There is a cross-cutting quartz carbonate chlorite vein from 69.20m to 69.40m. The rock contains only minor pyrite and the lower contact is sharp and unsheared and at 70 degrees to the core axis.	B00033	61.50	63.50	2.00	35	48	200
			B00034	63.50	65.80	2.30	42	45	160
			B00035	65.80	68.70	2.90	45	90	180
			B00036	68.70	70.70	2.00	28	22	170
70.70	79.80	VOLCANICLASTIC / FELSIC MASS FLOW Essentially the same rock as that intersected from 52.60m to 59.40m, i.e. Another mass flow. The purple green colour of the matrix is due to diffuse haematite alteration and chlorite. Rounded siliceous clasts to 30mm and vitric tuffaceous clasts lie within a matrix of quartz and sericitized feldspars. The rock contains only very minor disseminated pyrite except for some more sericitic, schistose zones where there are fine cross-cutting haematite pyrite veins (e.g. 73.0m to 75.5m and 76.4m to 77.8m). The lower contact is sharp and unsheared and at 55 degrees to the core axis.	B00037	71.00	73.40	2.40	28	5	42
			B00038	73.40	75.50	2.10	22	5	38
			B00039	75.50	77.60	2.10	25	<5	40
			B00040	77.60	82.00	4.40	45	20	50
79.80	81.90	PELITE / FELSIC VITRIC TUFF Similar rock to the two previous intersections of pelite/vitric tuff except that the rock becomes more gritty from 78.70m to 79.80m with quartz and lithics (rounded siliceous and vitric tuffaceous clasts to 10mm) in a dark green vitric tuffaceous matrix. Above and below this the rock is a dark green fine grained vitric tuffaceous siltstone. The lower contact is weakly brecciated, carbonate altered and contains approximately 5% pyrite, elsewhere the rock contains <0.5% pyrite.							
81.90	99.90	FELSIC LAVA Pinky orange to grey green, massive, relatively unaltered medium grained quartz, sericitized feldspar and lesser fine to medium grained chlorite altered biotite. The rock contains negligible sulphides except for the lower contact which is masked by a cross-cutting quartz carbonate pyrite vein.	B00041	82.00	84.00	2.00	10	10	28
			B00042	84.00	89.50	5.50	15	20	30
			B00043	89.50	95.00	5.50	15	20	60
			B00487	95.00	99.60	4.60	20	<5	30
			B00488	99.60	100.10	.50	170	42	35
99.90	102.00	PELITE / FELSIC VITRIC TUFF Dark green, fine grained, vitric tuffaceous siltstone essentially the same as that intersected from 19.40m to 52.60m and 59.40m to 70.70m. The rock contains only very	B00489	100.10	104.60	4.50	45	20	70

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm
		minor disseminated pyrite. The lower contact is sharp and weakly sheared and is at 60 degrees to the core axis.							
102.00	105.70	VOLCANICLASTIC / FELSIC MASS FLOW Grey green, pebbly volcaniclastic conglomerate similar to other volcaniclastic/ mass flows intersected uphole. Clasts are sub - rounded, occasionally sub - angular, and consist of felsic vitric tuffaceous siltstone, dark grey siltstone, fine grained quenched? volcanics, quartz and possible pumice fragments in a clast supported framework with a chloritic fine grained matrix. Wispy sericite defines the schistosity at 40 degrees to the core axis. The rock contains occasional cross-cutting quartz carbonate veins but negligible sulphides. The lower contact is in broken core.	B00490	104.60	107.50	2.90	28	90	110
105.70	113.40	PELITE / FELSIC VITRIC TUFF Essentially as logged as pelite/vitric tuff uphole. The grey green rock contains minor disseminated pyrite and is moderately schistose with the cleavage at 45 to 65 degrees to the core axis. From 111.90m to 112.20m is a cross-cutting bed of rounded siliceous clasts to 25mm similar to the volcaniclastic/mass flow units intersected uphole. In the last 100mm to the lower contact the rock shows compositional banding with 3mm thick quartz rich gritty beds and fine grained vitric tuffaceous siltstone with bedding at 70 degrees to the core axis. The lower contact is in broken core but appears to be gradational. The rock contains minor disseminated pyrite.	B00491 B00492 B00493 B00494	107.50 109.00 111.00 113.30	109.00 111.00 113.30 115.00	1.50 2.00 2.30 1.70	42 30 70 75	90 190 410 38	120 240 860 85
113.40	118.70	VOLCANICLASTIC / FELSIC MASS FLOW As intersected from 102.00m to 105.70m but with a purple green colour due to diffuse haematite chlorite alteration. The rock is strongly magnetic due to disseminated magnetite and contains approximately 1% pyrite throughout in medium grained clots. Clasts are sub - rounded up to 20mm and include quartz feldspar porphyritic volcanics, cherty hematite and quartz, all in a moderately chloritic siliceous matrix. Late stage carbonate fills occasional fractures. The lower contact is somewhat gradational and is at 30 degrees to the core axis.	B00495	115.00	119.00	4.00	15	20	50
118.70	121.00	PELITE / FELSIC VITRIC TUFF Dark olive green, fine grained, siliceous chloritic, vitric tuffaceous siltstone similar to previous intersections uphole but now more massive and brecciated with carbonate infilling fractures between fragments. There are occasional interbeds of more gritty, sandy rock with bedding, at 85 degrees to the core axis, probably disturbed. The rock contains minor disseminated pyrite and very minor disseminated haematite. The lower contact is strongly sheared.	B00496	119.00	123.00	4.00	200	140	70
121.00	121.10	SHEAR ZONE Puggy shear zone with the schistosity at 40 to 55 degrees to the core axis.							

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm)
121.10	140.00	VOLCANICLASTIC / FELSIC MASS FLOW							
		Similar rock to previous intersections of volcaniclastic/mass flow with clasts, up to 40mm, of haematite stained chert, fine grained beige vitric tuffaceous siltstone, quartz feldspar porphyritic felsic volcanics, quartz phenocrysts and pale grey cherty clasts in a relatively unaltered green chloritic matrix. Occasional interbeds of fine grained green vitric tuffaceous siltstone are essentially similar to the green vitric tuffaceous siltstones intersected elsewhere in this DDH. Adjacent to the lower contact is a 300mm clast of quartz feldspar porphyritic felsic lava. The lower contact is marked by a quartz carbonate minor pyrite vein at 70 degrees to the core axis.	B00497	123.00	125.00	2.00	8	8	42
			B00498	125.00	127.00	2.00	15	<5	48
			B00499	127.00	132.00	5.00	45	20	70
			B00500	132.00	137.10	5.10	75	20	70
			B00501	137.10	139.10	2.00	85	75	420
			B00502	139.10	140.40	1.30	65	70	120
140.00	164.10	PELITE / FELSIC VITRIC TUFF							
		Grey green, massive vitric tuffaceous siltstone similar to that intersected uphole. The rock is moderately siliceous and chloritic and is weak to moderately brecciated with carbonate infilling of fractures. The rock contains 0.5% cubic pyrite generally associated with cross-cutting quartz veins and on fracture surfaces. A puggy chloritic zone from 160.95m to 161.05m is schistose at 65 degrees to the core axis.	B00503	140.40	141.10	.70	30	70	810
			B00504	141.10	143.10	2.00	25	40	880
			B00505	143.10	145.10	2.00	30	90	150
			B00506	145.10	147.70	2.60	25	150	180
			B00507	151.00	152.00	1.00	30	70	400
			B00508	152.00	152.60	.60	25	65	230
			B00509	152.60	156.00	3.40	18	210	380
			B00510	156.00	158.50	2.50	30	190	470
			B00511	158.50	160.50	2.00	30	50	200
			B00512	160.50	164.10	3.60	22	80	220
		164.10 E.O.H.							

974196

HOLE NO. : DD77CC3
SECTION : 1400.00 EAST

PLUTONIC OPERATIONS LIMITED
GOWRIE PARK

Page: 1

DIAMOND DRILL RECORD

Northing : 20.00
Easting : 1400.00
Grid : CETHANA WEST
Direction : 170 GridN
Inclination : -60.0
Elevation : 440.00
Azimuth : 170.0
Mag Azimuth : 208 208; OM=12.5T and -038.0G
Length (m) : 190.00
Precol. (m) : 2.20m
BOCO : <2.20m
TFR : 24.70m
Water Table : N/A

Drill Type :Mark 12
Core Size :HQ 2.20 NQ 39.20 BQ
Contractor :Longyear

Dip Tests Method: Not surveyed?

Depth	Az	Dip
190.0	170.0	-60.0

Property : CETHANA WEST
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 : 19/8/92
Interpreted : G. MacDONALD

Initialled :

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm)
.00	2.20	PRECOLLAR Triconed-no core.							
2.20	17.20	SILICA SERICITE ALTERATION Brown to pale purple, strongly to moderately oxidised, schistose, limonitic quartz sericite schist with cubic oxidised pits after pyrite. The cleavage is at 45 degrees to the core axis and the rock contains occasional limonitic veins parallel to to this cleavage, probably after ferruginous carbonate. Occasional fine to medium grained quartz phenocrysts suggest that this rock was originally a crystal tuff, possibly reworked.	C00001	2.20	4.00	1.80	28	430	60
			C00002	4.00	6.00	2.00	38	1030	190
			C00003	6.00	8.00	2.00	32	560	70
			C00004	8.00	10.00	2.00	28	430	42
			C00005	10.00	12.00	2.00	8	540	20
			C00006	12.00	14.00	2.00	18	650	28
			C00007	14.00	17.00	3.00	5	790	50
			C00008	17.00	19.00	2.00	20	330	430
17.20	17.70	CHLORITE SILICA ALTERATION Green, fine grained chlorite quartz sericite altered schist, moderately oxidised with occasional manganese staining limonitic veins parallel to the cleavage.							
17.70	18.20	SILICA SERICITE ALTERATION As intersected from 2.20m to 17.20m, moderately oxidised with limonitic veinlets parallel to the cleavage and fine grained quartz in a sericitic siliceous matrix.							
18.20	35.00	CHLORITE SILICA ALTERATION Fine grained green, chlorite quartz altered rock, moderately schistose at 45 degrees to the core axis. The rock is probably an altered fine grained reworked vitric tuffaceous siltstone. Some manganese staining limonitic veins cross-cut the cleavage with others are parallel to the cleavage at 45 degrees to the core axis, the limonite due to oxidation of ferruginous carbonate in some instances, pyrite in others.	C00009	19.00	21.30	2.30	12	160	430
			C00010	21.30	22.20	.90	10	230	75
			C00011	22.20	24.50	2.30	18	650	280
			C00012	24.50	26.50	2.00	12	220	590
			C00013	26.50	28.40	1.90	15	120	630
			C00014	28.40	30.40	2.00	20	220	660
			C00015	30.40	32.20	1.80	18	180	670
			C00016	32.20	34.40	2.20	35	290	1050
			C00017	34.40	36.40	2.00	18	260	460
35.00	102.00	VOLCANICLASTIC Green, schistose, chlorite quartz sericite altered volcaniclastic consisting of quartz, sericitized feldspar and pale green sericitized flattened pumice up to 10mm long. Previous logging describes 'white to straw coloured	C00018	36.40	38.40	2.00	15	570	1610
			C00019	38.40	39.20	.80	60	730	6700
			C00020	39.20	42.70	3.50	20	170	850
			C00021	42.70	45.30	2.60	25	350	1130

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm)
		carbonate in the matrix'. A similar rock intersected in DD86CC13 and DD86CC12 contains high levels of barium, as do rocks sampled from outcrop in the vicinity of this DDH, hence this mineral is probably barite. The rock contains very minor pyrite and some minor galena and sphalerite in patches associated with late stage cross-cutting carbonate veins. The cleavage is at 45 degrees to the core axis at 40.0m, 60 degrees to the core axis at 70.0m and 50 degrees to the core axis at 100.0m.	C00022	45.30	45.70	.40	5	490	820
			C00023	45.70	50.50	4.80	20	490	1000
			C00024	50.50	52.10	1.60	5	200	770
			C00025	52.10	57.30	5.20	10	220	420
			C00026	57.30	58.30	1.00	10	40	620
			C00027	58.30	64.60	6.30	10	70	620
			C00028	64.60	67.90	3.30	10	220	630
			C00029	67.90	69.20	1.30	5	500	670
			C00030	69.20	73.60	4.40	10	520	790
35.00	39.80	As above but fine to medium grained with chlorite veins parallel to and cross-cutting cleavage. Carbonate veining is also late stage.	C00031	73.60	75.00	1.40	5	310	810
			C00032	75.00	75.90	.90	22	100	860
			C00033	75.90	79.70	3.80	10	340	560
39.80	56.90	As above with occasional cross-cutting quartz chlorite veins post dating the cleavage increasing downhole. The rock contains very occasional cubic disseminated pyrite.	C00034	79.70	80.50	.80	5	1290	890
			C00035	80.50	81.70	1.20	10	290	290
			C00036	81.70	83.60	1.90	55	480	2500
			C00037	83.60	85.40	1.80	22	510	1540
56.90	57.20	Cross-cutting quartz carbonate chlorite vein.	C00038	85.40	87.40	2.00	10	530	1640
57.20	68.20	As above but with lesser sericite alteration than chlorite.	C00039	87.40	90.00	2.60	5	200	870
			C00040	90.00	92.00	2.00	15	630	1850
68.20	82.80	As above but more sericitized with occasional fine grained patches. Becomes more pumice rich downhole with diffuse ferruginous carbonate alteration.	C00041	92.00	96.50	4.50	10	330	1100
			C00042	96.50	102.50	6.00	55	670	1730
82.80	84.00	As above but more chloritic.							
84.00	87.40	As above but more sericitic.							
87.40	99.20	As above but more chloritic.							
99.20	102.00	As above but more sericitic.							
102.00	109.50	FELSIC TUFF							
		Green, fine grained, chlorite quartz lesser sericite and carbonate altered quartz and sericitized feldspars tuff or reworked tuff with the major distinctions between this and the preceding unit being the lack of pumice and a somewhat more massive appearance.	C00043	102.50	104.50	2.00	25	670	1470
			C00487	104.50	107.50	3.00	15	400	810
			C00488	107.50	109.40	1.90	18	720	1760
			C00489	109.40	112.90	3.50	125	550	1280
109.50	161.30	VOLCANICLASTIC							
		Similar rock to that intersected from 35.00m to 102.00m except that the rock is less sericitized and carbonate alteration is more diffuse in this unit. Purple patches are after haematite alteration, predominantly from 129.90m to 131.50m and 136.50m to 137.50m. D. Hicks (1990) logs this rock as a granodioritic intrusive, W. Herrmann (1989) as a felsic ignimbrite. The upper contact is marked by a quartz carbonate chlorite vein. The only sulphides are in cross-cutting quartz carbonate +/- chlorite veins which clearly postdate cleavage development. The lower contact is in broken core but is probably sharp and unsheared and at 75 degrees to the core axis though G. Purvis (1978) describes the contact as and unconformity truncating bedding. Weak bedding in patches is generally at 45 to 55 degrees to the core axis.	C00490	112.90	113.20	.30	8	40	870
			C00491	113.20	118.80	5.60	10	50	840
			C00492	118.80	122.80	4.00	10	50	860
			C00493	122.80	124.20	1.40	28	2220	2070
			C00494	124.20	126.60	2.40	10	70	600
			C00495	126.60	127.20	.60	5	500	810
			C00496	127.20	132.00	4.80	10	150	700
			C00497	132.00	137.00	5.00	20	430	1000
			C00498	137.00	140.10	3.10	10	260	740
			C00499	140.10	140.90	.80	30	1010	1580
			C00500	140.90	144.90	4.00	10	300	570
			C00501	144.90	145.70	.80	100	3600	3510
			C00502	145.70	146.80	1.10	85	2140	1430
			C00503	146.80	147.80	1.00	45	330	790
			C00504	147.80	148.20	.40	30	1720	1130
			C00505	148.20	152.50	4.30	85	1210	1200
			C00506	152.50	156.50	4.00	30	410	610
			C00507	156.50	158.50	2.00	90	870	1100
			C00508	158.50	162.00	3.50	15	50	300
161.30	173.50	PELITE / FELSIC VITRIC TUFF							

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm
		Pale grey green, chloritic siliceous, fine grained, moderately brecciated vitric tuffaceous siltstone with a weak cleavage at 70 degrees to the core axis and carbonate infilling of fractures surrounding breccia fragments. Probably the same unit intersected in DD77CC2. The rock becomes more silicified and dirty brown from 171.50m to 173.40m. The rock contains very minor disseminated pyrite. The lower contact is in broken core but is probably somewhat gradational.	C00509	162.00	163.00	1.00	42	250	1020
			C00510	163.00	168.00	5.00	20	100	250
			C00511	168.00	168.80	.80	20	32	75
			C00512	168.80	173.10	4.30	25	50	110
			C00513	173.10	175.00	1.90	15	50	75
173.50	180.50	VOLCANICLASTIC / FELSIC MASS FLOW							
		Grey green, massive volcaniclastic/mass flow consisting of sub - angular clasts, to 8mm, of vitric tuffaceous siltstone, quartz, pumice and grey quartz in a vitric tuffaceous matrix. The rock contains very minor disseminated galena and sphalerite associated with diffuse, but probably late stage carbonate alteration. Vitric tuffaceous siltstone at 175.0m is probably a raft. The lower contact is gradational.	C00514	175.00	175.70	.70	25	330	340
			C00515	175.70	177.40	1.70	15	8	42
			C00516	177.40	179.20	1.80	22	<5	25
			C00517	179.20	180.50	1.30	220	25	5
180.50	184.50	PELITE / FELSIC VITRIC TUFF							
		Fine grained, massive, pinky orange to cream, siliceous tuffaceous silstone with minor pyrite associated with very minor pyrite associated with late stage fracture fill quartz veins. The lower contact is gradational.	C00518	180.50	182.20	1.70	5	5	15
			C00519	182.50	187.50	5.00	15	0	30
184.50	185.50	VOLCANICLASTIC / FELSIC MASS FLOW							
		Essentially the same as that intersected from 173.50m to 180.50m.							
185.50	188.70	PELITE / FELSIC VITRIC TUFF							
		Very similar to that intersected from 180.50m to 184.50m.	C00520	187.50	188.00	.50	15	30	65
			C00521	188.00	190.00	2.00	15	20	50
188.70	189.70	VOLCANICLASTIC / FELSIC MASS FLOW							
		As for 173.50m to 180.50m and 184.50m to 185.50m.							
189.70	190.00	PELITE / FELSIC VITRIC TUFF							
		Pale grey green, siliceous, vitric tuffaceous siltstone with attenuated lensoidal patches at 80 degrees to the core axis.							
		190.00 E.O.H.							

974199

HOLE NO. : DD86CC12 | PLUTONIC OPERATIONS LIMITED | Page: 1
SECTION : 700.00 EAST | GOWRIE PARK

DIAMOND DRILL RECORD

Northing : -20.00
Easting : 700.00
Grid : CETHANA WEST
Direction : 180 GridN
Inclination : -55.0
Elevation : 380.00
Azimuth : 182.0
Mag Azimuth : 182.0 182.0; 0M=12.5T or -038.0G
Length (m) : 190.00
Precol. (m) : 45.0m
BOCO : <45.0m
TFR : <45.0m
Water Table : N/A

Drill Type :Boyles
Core Size :HQ 45.0 NQ
Contractor :Parry

Dip Tests Method: Not surveyed?

Depth	Az	Dip
190.0	182.0	-55.0

Property : CETHANA WEST
State : Tasmania
GMR : Cethana 4240
E.L. No. : GOWRIE PARK
Project No. : 706
Date Started : 1/5/86
Date Completed: 9/5/86
Logged by : G. MacDONALD
Relogged by :
Date Logged : 20/8/92
Interpreted : G. MacDONALD
Initialled :

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm
.00	45.00	PRECOLLAR Triconed-no core.							
45.00	66.50	SILICA SERICITE ALTERATION / VOLCANICLASTIC Pale brown, schistose, quartz sericite lesser chlorite and carbonate altered schist with quartz phenocrysts, rounded siliceous clasts to 5mm and approximately 2% pyrite in concordant siliceous pale grey pyrite veins which are pre-deformation. The rock was probably reworked from felsic tuffs. Fine red brown haematite veins concordant to the cleavage are probably after ferruginous carbonate. The cleavage is generally at 50 degrees to the core axis though in patches it is folded and is parallel to the core axis. The lower contact is gradational and is defined by a change in alteration mineralogy.	K00001	45.50	48.00	2.50	10	360	430
			K00002	48.00	51.00	3.00	20	145	470
			K00003	51.00	54.00	3.00	20	400	550
			K00004	54.00	57.00	3.00	40	430	390
			K00005	57.00	60.00	3.00	25	200	660
			K00006	60.00	63.00	3.00	20	250	350
			K00007	63.00	66.40	3.40	85	350	1850
			K00008	66.40	69.00	2.60	640	620	4200
66.50	73.50	CHLORITE SILICA ALTERATION / VOLCANICLASTIC Similar to the overlying rock but chlorite altered. The rock is a chlorite quartz lesser sericite and carbonate altered schist with fine to medium grained quartz phenocrysts and rounded siliceous clasts to 40mm and minor disseminated pyrite.	K00009	69.00	71.00	2.00	145	220	1250
			K00010	71.00	73.30	2.30	20	340	1550
			K00011	73.30	77.00	3.70	30	340	970
73.50	106.60	SILICA SERICITE ALTERATION / VOLCANICLASTIC Pale yellow brown, schistose, sericite quartz lesser chlorite and carbonate altered rock with fine to medium grained quartz phenocrysts and rounded siliceous clasts to 30mm and approximately 2% pyrite associated with silicified patches / veining which appears to be pre-deformation. The cleavage is at 40 to 50 degrees to the core axis. The rock was originally the same as the preceding unit but has a different alteration mineralogy.	K00012	77.00	80.00	3.00	30	220	500
			K00013	80.00	83.00	3.00	120	55	300
			K00014	83.00	86.00	3.00	40	100	430
			K00015	86.00	89.00	3.00	50	1000	1200
			K00016	89.00	92.00	3.00	60	90	670
			K00017	92.00	95.00	3.00	90	1650	2550
			K00018	95.00	98.00	3.00	25	420	500
			K00019	98.00	101.00	3.00	20	730	1400
			K00020	101.00	105.10	4.10	45	620	900
			K00021	105.10	107.00	1.90	125	410	110
106.60	122.50	CHLORITE SILICA ALTERATION / VOLCANICLASTIC As for the preceding unit but now green brown due to and increased amount of chlorite alteration. The rock contains approximately 4% pyrite. The cleavage is at 45 degrees to	K00022	107.00	110.00	3.00	30	210	640
			K00023	110.00	113.00	3.00	15	120	460
			K00024	113.00	115.00	2.00	20	280	400

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm
		the core axis.	K00025	115.00	117.40	2.40	20	175	520
			K00026	117.40	119.00	1.60	10	55	310
			K00027	119.00	122.00	3.00	20	95	340
			K00028	122.00	125.00	3.00	45	240	440
122.50	162.00	SILICA SERICITE ALTERATION / VOLCANICLASTIC							
		Quartz phenocryst and rounded siliceous clasts to 30mm in a quartz sericite lesser carbonate and chlorite altered rock with minor to 4% pyrite generally in disseminations and veins associated with patches of silicification, probably pre-deformational.	K00029	125.00	128.00	3.00	120	320	360
			K00030	128.00	131.00	3.00	20	470	420
			K00031	131.00	134.00	3.00	35	710	620
			K00032	134.00	137.00	3.00	60	500	1900
			K00033	137.00	139.50	2.50	15	185	300
			K00034	139.50	143.00	3.50	25	140	670
			K00035	143.00	146.00	3.00	10	75	470
			K00036	146.00	149.00	3.00	20	45	660
			K00037	149.00	152.00	3.00	20	125	840
			K00038	152.00	156.00	4.00	10	110	380
			K00039	156.00	159.30	3.30	10	320	370
			K00040	159.30	161.00	1.70	25	150	520
			K00041	161.00	164.00	3.00	15	250	430
162.00	190.00	CHLORITE SILICA ALTERATION / VOLCANICLASTIC							
		Grey to grey green, silicified and variably chlorite lesser sericite and carbonate altered rock with quartz phenocrysts and rounded siliceous clasts to 30mm. The rock contains minor pyrite, locally to 5%, in concordant grey siliceous veins which are pre-deformational. The rock is moderately schistose at 60 to 70 degrees to the core axis and contains flattened pumice like sericite patches and deformed massive specular haematite in veins to 20mm thick.	K00042	164.00	167.00	3.00	10	100	360
			K00043	167.00	170.00	3.00	20	440	660
			K00487	170.00	173.00	3.00	55	240	1050
			K00488	173.00	175.50	2.50	20	155	790
			K00489	175.50	179.00	3.50	20	175	980
			K00490	179.00	182.00	3.00	5	85	370
			K00491	182.00	185.00	3.00	35	350	1450
			K00492	185.00	188.00	3.00	10	195	390
	190.00	E.O.H.	K00493	188.00	190.00	2.00	0	0	0

HOLE NO. : DD86CC13 | PLUTONIC OPERATIONS LIMITED | Page: 1974201
SECTION : 900.00 EAST | GOWRIE PARK

DIAMOND DRILL RECORD

Northing : .00
Easting : 900.00
Grid : CETHANA WEST
Direction : +182 GridN
Inclination : -60.0
Elevation : 410.00
Azimuth : 182.0
Mag Azimuth : 220 220; OM=12.5T or -038.0G
Length (m) : 229.50
Precol. (m) : 9.0m
BOCO : <9.0m
TFR : 16.0m
Water Table : N/A

Drill Type :Boyles
Core Size :HQ 9.0 BQ
Contractor :Longyear

Dip Tests Method: Not surveyed?

Depth	Az	Dip
229.5	182.0	-60.0

Property : CETHANA WEST
State : Tasmania
GMR : Cethana 4240
E.L. No. : GOWRIE PARK
Project No. : 706
Date Started : 13/5/86
Date Completed: 23/5/86
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	9.00	PRECOLLAR							
9.00	32.00	CHLORITE SILICA ALTERATION / FELSIC TUFF Mottled green to grey green, weathered, moderately chlorite quartz sericite altered, schistose chlorite quartz sericite schist with limonitic pits to approximately 20.30m with visible cubes of fine to medium grained pyrite, to 1%, and minor disseminated galena and sphalerite below this and occasional boudinaged pyrite veins to 20mm concordant to the cleavage. The fine grained nature of the rock suggests that it was originally a fine grained tuff or tuffaceous siltstone. The cleavage is at 45 degrees to the core axis and the lower contact is sharp and parallel to this schistosity.	L00001	9.00	16.30	7.30	30	250	105
			L00002	16.30	20.00	3.70	20	220	690
			L00003	20.00	23.00	3.00	10	330	830
			L00004	23.00	26.00	3.00	15	115	760
			L00005	26.00	29.00	3.00	20	90	680
			L00006	29.00	32.00	3.00	15	195	750
32.00	36.00	CHLORITE SILICA ALTERATION / VOLCANICLASTIC Mottled chlorite quartz sericite altered rock similar to the overlying rock but with rounded siliceous clasts to 10mm and up to 0.5% disseminated pyrite. Upper and lower contacts are gradational.	L00007	32.00	35.00	3.00	10	300	1000
			L00008	35.00	38.00	3.00	10	400	920
36.00	71.00	CHLORITE SILICA ALTERATION / VOLCANICLASTIC Mottled green and cream, chlorite quartz lesser sericite altered schistose rock with altered feldspars, quartz and rounded siliceous lithics and possible altered pumiceous clasts to 10mm in a fine grained green matrix. The rock contains very minor disseminated pyrite and occasional cross-cutting quartz carbonate +/- chlorite veins post deformation.	L00009	38.00	41.00	3.00	35	370	1250
			L00010	41.00	44.00	3.00	15	180	1050
			L00011	44.00	47.00	3.00	45	1150	1950
			L00012	47.00	50.00	3.00	40	1050	4700
			L00013	50.00	53.00	3.00	10	570	950
			L00014	53.00	56.00	3.00	5	30	620
			L00015	56.00	59.00	3.00	10	90	550
			L00016	59.00	62.00	3.00	5	15	570
			L00017	62.00	65.00	3.00	15	160	550
			L00018	65.00	68.00	3.00	5	85	590
			L00019	68.00	71.00	3.00	30	1800	660
71.00	76.00	FELSIC LAVA / INTERMEDIATE LAVA Mottled pink and green coloured rock due to albitisation of feldspars. The rock is chlorite quartz albite altered throughout and is massive with only minor disseminated pyrite. The rock is more massive than underlying and	L00020	71.00	74.00	3.00	15	105	490
			L00021	74.00	77.00	3.00	10	680	920

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm
		overlying rocks and is either a porphyritic flow or intrusive or was a more competent siliceous rock during deformation. D. Hicks (1990) describes a thin section from 173.00m as a 'granitic rock' but does not display it as such in his DDH section. Upper and lower contacts are somewhat sharp. From 51.00m to the lower contact the rock is pink/red, probably due to potassic alteration. Ba up to 7700 ppm, averaging 1200 ppm, suggests that there is diffuse barite alteration.							
76.00	108.10	CHLORITE SILICA ALTERATION / VOLCANICLASTIC							
		Essentially as intersected from 36.00m to 71.00m. The rock is mottled green and cream due to chlorite alteration of the matrix and probable mafics, biotite?, sericitized feldspars rounded siliceous clasts to 30mm and pumiceous clasts. The rock contains trace disseminated pyrite increasing downhole to 1%. The rock is schistose at 45 degrees to the core axis but is more massive and silicified in patches, predominantly from 107.00m to 108.10m. The lower contact is probably a change in alteration style. Pink/red patches of alteration are probably due to potassic alteration.	L00022	77.00	80.00	3.00	15	520	640
			L00023	80.00	83.00	3.00	20	350	720
			L00024	83.00	86.00	3.00	15	300	900
			L00025	86.00	89.00	3.00	20	2350	900
			L00026	89.00	92.00	3.00	10	270	750
			L00027	92.00	95.00	3.00	30	360	1550
			L00028	95.00	98.00	3.00	20	190	760
			L00029	98.00	101.00	3.00	20	440	1250
			L00030	101.00	104.00	3.00	20	175	810
			L00031	104.00	108.00	4.00	25	110	690
			L00032	108.00	110.00	2.00	10	790	610
108.10	116.00	FELSIC LAVA / FELSIC TUFF							
		Pale pinky orange, massive to weakly schistose fine grained rock which becomes more pinky grey downhole. The rock contains 2% pyrite in fine veins parallel to the weak cleavage and is associated with quartz or sericite. The rock becomes more brecciated downhole but is not obviously hyaloclastic.	L00033	110.00	113.00	3.00	10	90	760
			L00034	113.00	116.00	3.00	10	370	640
116.00	121.80	CHLORITE SILICA ALTERATION / FELSIC TUFF							
		Pale grey green, weak to moderately schistose rock, chlorite and quartz altered with blebby quartz carbonate barite? alteration. Elongate sericite patches are possibly pumiceous patches and the rock also contains fine to medium grained quartz and sericitized feldspars. The lower contact is gradational.	L00035	116.00	119.00	3.00	25	600	1650
			L00036	119.00	122.00	3.00	35	480	1150
121.80	139.70	CHLORITE SILICA ALTERATION / VOLCANICLASTIC							
		Pale orange brown to green, massive, brecciated, silicified rock becoming more chloritic downhole. The rock contains rounded siliceous lithics to 50mm, predominantly below 127.20m, quartz phenocrysts to 3mm and feldspars in a fine grained matrix and is probably reworked from a felsic tuff, possibly crystal lithic. Pyrite to 1% and very minor galena and sphalerite ? are in fine grained disseminations.	L00037	122.00	125.00	3.00	35	1400	1850
			L00038	125.00	129.00	4.00	30	330	830
			L00039	129.00	131.00	2.00	10	185	680
			L00040	131.00	134.00	3.00	25	660	1300
			L00041	134.00	137.00	3.00	20	3500	4350
			L00042	137.00	140.00	3.00	10	650	1350
139.70	145.40	PELITE / FELSIC VITRIC TUFF							
		Dark grey, fine grained, siliceous siltstone or reworked vitric tuff. The rock is moderately brecciated / sheared at 35 degrees to the core axis. The rock is moderately chlorite and quartz altered and contains 0.5% disseminated pyrite. The lower contact is sharp and at 70 degrees to the core axis.	L00043	140.00	142.90	2.90	15	620	1400
			L00487	142.90	145.50	2.60	n/a	n/a	n/a

From (m)	To (m)	Description	Sample No.	From (m)	To (m)	Width (m)	Cu (ppm)	Pb (ppm)	Zn (ppm)
145.40	174.80	CHLORITE SILICA ALTERATION / VOLCANICLASTIC Siliceous, moderately sericitized, occasionally weakly chloritic, rock with sericitized pumice?, occasional quartz phenocrysts and sericitized feldspars and trace disseminated pyrite. The rock is schistose at 60 degrees to the core axis.	L00488	145.50	149.00	3.50	15	330	450
			L00489	149.00	152.00	3.00	35	260	400
			L00490	152.00	155.00	3.00	20	55	440
			L00491	155.00	158.00	3.00	15	65	380
			L00492	158.00	162.00	4.00	35	250	480
			L00493	162.00	165.00	3.00	30	370	290
			L00494	165.00	168.00	3.00	10	30	340
			L00495	168.00	171.00	3.00	20	90	340
			L00496	171.00	174.00	3.00	5	<5	270
			L00497	174.00	177.00	3.00	5	30	320
174.80	201.00	CHLORITE SILICA ALTERATION / VOLCANICLASTIC Mottled dark green and pale cream, chlorite quartz lesser sericite and minor barite? altered rock with rounded quartz phenocrysts, altered feldspars and rounded siliceous lithics to 50mm and possibly altered pumiceous fragments. The rock contains disseminated pyrite to 2% and occasional patches with very minor disseminated galena. Very similar to the unit intersected from 29.40m to 102.00m but with purple haematite alteration from 173.00m to 174.00m with weak, occasionally moderate, potassic alteration below 174.00m. From 167.60m to 167.75m is a cross-cutting fine grained chlorite bed at 45 degrees to the core axis.	L00498	177.00	180.00	3.00	5	<5	230
			L00499	180.00	183.00	3.00	2	15	330
			L00500	183.00	186.00	3.00	10	35	300
			L00501	186.00	187.40	1.40	5	<5	320
			L00502	187.40	188.70	1.30	5	420	65
			L00503	188.70	192.00	3.30	10	40	250
			L00504	192.00	195.00	3.00	2	<5	280
			L00505	195.00	198.00	3.00	2	<5	230
			L00506	198.00	201.00	3.00	15	<5	175
201.00	203.60	PELITE / FELSIC VITRIC TUFF Dark green, fine grained, vitric tuffaceous siltstone with fine sericite shears at 40 degrees to the core axis. Fine dark grey beds are occasionally visible at 40 degrees to the core axis. The rock contains minor disseminated pyrite associated with patches of quartz chlorite alteration. Very similar rock to the pelite/vitric tuff intersected in DD77CC2 and DD77CC3.	L00507	201.00	204.00	3.00	65	2050	880
203.60	207.20	CHLORITE SILICA ALTERATION / VOLCANICLASTIC Similar rock to the coarser volcaniclastics intersected uphole. The rock is chlorite quartz altered and consists of rounded quartz phenocrysts, altered feldspars and rounded siliceous clasts to 20mm in a fine grained dark green matrix.	L00508	204.00	206.40	2.40	20	55	250
			L00509	206.40	210.00	3.60	3800	6500	4600
207.20	229.50	PELITE / FELSIC VITRIC TUFF Very similar to the rock intersected from 201.00m to 203.60m being a dark green, fine grained siltstone with fine, grey, wispy quartz veins cross-cut by carbonate veins. The rock contains fine grained disseminated pyrite throughout with very fine grained disseminated galena, sphalerite and chalcopyrite in the core adjacent to the upper contact. 229.50 E.O.H.	L00510	210.00	213.00	3.00	25	300	590
			L00511	213.00	216.00	3.00	40	500	1300
			L00512	216.00	219.00	3.00	15	55	190
			L00513	219.00	222.00	3.00	25	75	240
			L00514	222.00	225.00	3.00	15	50	115
			L00515	225.00	229.50	4.50	25	55	75

APPENDIX I

Re-logs of Cethana East Prospect DDH's

ie. DD77CC4
DD77CC5
DD77CC6
DD17CC7
DD77CC8

974205

HOLE NO. : DD77CC4
SECTION : 21750.00 EAST

PLUTONIC OPERATIONS LIMITED
GOWRIE PARK

Page: 1

DIAMOND DRILL RECORD

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

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.							

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

974207

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

974211

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; 0G=0M 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. Orange brown, schistose, sericite altered rock with medium grained quartz eyes and pumiceous clasts. The cleavage is at 35 degrees to the core axis. The rock is limonitic after pyrite.	F00001 F00002 F00003 F00004	2.50 7.00 10.00 13.00	7.00 10.00 13.00 16.00	4.50 3.00 3.00 3.00	15 45 40 80	310 1000 1450 1100	105 65 75 80
15.90	35.80	VOLCANICLASTIC / SILICA SERICITE ALTERATION ALTERED FELSIC VOLCANICLASTIC, SULPHIDIC. Pale grey green, schistose, quartz sericite and weakly chlorite altered rock with medium grained quartz eyes. The rock becomes finer grained downhole with graphitic patches from 30.90m. The cleavage is at 35 degrees to the core axis. The rock contains only very minor sulphides above 31.00m. Below 31.00m the sulphide content increases with sulphides in very fine veins / bands concordant to the cleavage. The lower contact is gradational.	F00005 F00006 F00007 F00008 F00009 F00010 F00011 F00012	16.00 19.50 22.90 25.00 27.00 31.00 33.00 35.00	19.50 22.90 25.00 27.00 31.00 33.00 35.00 36.50	3.50 3.40 2.10 2.00 4.00 2.00 2.00 1.50	85 90 210 50 70 55 80 140	740 680 1600 1100 940 3300 2000 1500	220 160 680 480 470 2500 4400 3600
35.80	62.50	PELITE / FELSIC VITRIC TUFF REWORKED GRAPHITIC AND CHERTY VITRIC TUFFACEOUS SILTSTONE, SULPHIDIC. Very fine grained sulphidic black graphitic shale with interbedded very fine grained, creamy, cherty tuffaceous siltstones. Sulphides are associated with the graphitic bands which are generally 10mm thick and at 40 to 45 degrees to the core axis. Sulphides consist of 0.5% sphalerite and 0.5% galena with 2% pyrite. This stratigraphic control suggests a primary syn-sedimentary origin for mineralization. This interpretation is supported by petrology by D. Cooke (see appendix included in this report). The cleavage is at 35 degrees to the core axis and is defined by very fine grained sericite veinlets. Some sulphides are associated with later stage cross-cutting carbonate veins. 35.80 39.30 Equally intermixed black and creamy tuffaceous siltstones. 39.30 42.40 Approximately 5% black shale interbeds with	F00013 F00014 F00015 F00016 F00017 F00018 F00019 F00020 F00021 F00022 F00023 F00024 F00025 F00026 F00027	36.50 38.00 39.50 41.00 43.00 45.00 46.80 48.50 50.20 52.20 54.20 56.20 57.20 60.00 62.40	38.00 39.50 41.00 43.00 45.00 46.80 48.50 50.20 52.20 54.20 56.20 57.20 60.00 62.40 65.00	1.50 1.50 1.50 2.00 2.00 1.80 1.70 1.70 2.00 2.00 2.00 1.00 2.80 2.40 2.60	160 270 250 100 55 40 60 25 60 110 100 260 45 310 75	4800 5000 1700 5600 820 450 1800 1800 3500 9200 6000 5800 2050 9800 880	17000 11000 7800 1400 1250 280 900 980 1200 2800 1300 150 1100 6500 1350

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.							

974214

HOLE NO. : DD77CC7
SECTION : 21600.00 EAST

PLUTONIC OPERATIONS LIMITED
GOWRIE PARK

Page: 1

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. Green, chlorite altered volcaniclastic rock with medium grained quartz eyes in patches, looking sandy to silty in others, the rock being reworked tuffs. The rock contains approximately 1% pyrite throughout in blebs. The lower contact is sharp.	G00003	4.50	6.00	1.50	20	200	900
			G00004	6.00	7.50	1.50	10	90	860
			G00005	7.50	9.00	1.50	20	105	820
			G00006	9.00	10.50	1.50	15	130	1200
			G00007	10.50	12.00	1.50	20	320	1300
			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 coarse grained quartz eyes to 8mm with smaller feldspars and pumice. The rock is sheared from 14.60m to 16.10m. The rock contains only minor disseminated pyrite.	G00010	14.50	18.00	3.50	290	60	860
			G00011	18.00	21.00	3.00	130	75	500
20.40	46.30	VOLCANICLASTIC / SILICA SERICITE ALTERATION ALTERED FELSIC VOLCANICLASTIC. Pale grey green, weakly siliceous, moderately sericitized rock with fine grained to medium grained quartz eyes in a fine grained moderately altered, schistose, matrix with fine to medium grained feldspars and possibly pumiceous fragments. The rock contains only minor disseminated pyrite and lesser galena.	G00012	21.00	24.00	3.00	130	120	580
			G00013	24.00	27.00	3.00	65	300	360
			G00014	27.00	30.00	3.00	40	90	450
			G00015	30.00	32.50	2.50	25	150	620
			G00016	32.50	35.00	2.50	30	85	560
			G00017	35.00	37.50	2.50	25	55	440
			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. Grey, siliceous cherty tuffaceous siltstones with numerous concordant pyrite bands / remobilised bedding at 70 degrees to the core axis. These sulphidic band are up to 30mm but are generally around 2mm to 4mm and are dominantly pyrite though sphalerite is present in some bands. These sulphides appear to have been deposited	G00022	46.50	48.00	1.50	40	330	1200
			G00023	48.00	49.00	1.00	40	340	1200
			G00024	49.00	50.00	1.00	30	280	2200
			G00025	50.00	51.00	1.00	20	165	860
			G00026	51.00	52.00	1.00	30	280	1800
			G00027	52.00	53.00	1.00	35	120	540
			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. 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.	G00034	60.50	62.20	1.70	42	3550	1000
			G00035	62.20	62.80	.60	90	1400	4550
62.60	63.00	SEMI-MASSIVE SULPHIDES MASSIVE PYRITE LENS - SYN-SEDIMENTARY. 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.	G00036	62.80	65.00	2.20	45	110	760
63.00	123.40	VOLCANICLASTIC / FELSIC TUFF / SILICA SERICITE ALTERATION ALTERED FELSIC VOLCANICLASTIC. 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.	G00037	65.00	67.00	2.00	45	140	800
			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. 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.	G00504	124.50	127.50	3.00	40	360	840
			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.							

974216

HOLE NO. : DD77CC8
SECTION : 21750.00 EAST

PLUTONIC OPERATIONS LIMITED
GOWRIE PARK

Page: 1

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
40.25	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.							

974219

APPENDIX J

Polished Section Petrology -

Cethana East Prospect

Dr David R Cooke

Sample Locations

5/1	**DD77CC5**	**38.15m**
5/2	**DD77CC5**	**38.05m**
6/6	**DD77CC6**	**37.70m**

974220

Petrographic descriptions of sulfide-bearing samples from the Cethana East Prospect, North-Western Tasmania

Dr. David R. Cooke

C/O Centre For Ore Deposit and Exploration Studies,
Geology Department, University of Tasmania,
GPO Box 252C, Hobart, 7001



Figure 1: Coarse sphalerite band parallel to S_2 shear zone. Sphalerite and pyrite are intimately intergrown with chlorite above and below this band respectively. Pyrite crystals in the pyrite-rich band in the lowermost portion of the photos are surrounded by fibrous quartz-chlorite pressure shadows. (Sample CC5/2; photograph taken under reflected light; field of view = 5 mm).

974221

Petrographic descriptions of sulfide-bearing samples from the Cethana East Prospect, Tasmania

David R. Cooke

Centre For Ore Deposit and Exploration Studies, Geology Dept., University of Tasmania

SYNOPSIS: Examination of three sulfide-bearing schists from the Cethana East prospect revealed the following sulfide minerals (in order of decreasing abundance): pyrite, sphalerite, chalcopyrite, galena. No free gold or barite has been observed. Sulfide mineralisation is hosted by foliated muscovite-quartz-chlorite-carbonate schists (after fine grained quartz-phyric volcanics?). Coarse sulfide aggregates occur predominantly in quartz-, chlorite- and carbonate-rich domains. Late stage euhedral carbonate veins cut pyrite-rich bands in samples CC5/1 and CC5/2. One of the carbonate veins contains moderate quantities of sphalerite and minor amounts of chalcopyrite, pyrite and galena (CC5/2). Recent surface oxidation is characterised by the development of secondary hematite and/or goethite along cleavages and on the edge of carbonate veins (CC5/1).

Original sulfide mineralisation is interpreted to predate deformation and is possibly syngenetic in origin. Coarse irregular pyrite grains have fibrous quartz-chlorite-carbonate pressure shadows, indicating that pyrite was present in these rocks prior to deformation. Minor brecciation of pyrite has also been noted, supporting a pre-deformation origin. Sphalerite, galena and chalcopyrite have all been observed within pressure shadows around pyrite grains, indicating that these minerals have been remobilised and recrystallised during deformation. However, in less strained zones, sphalerite, galena and chalcopyrite inclusions have been noted in pyrite grains, and pyrite inclusions have been noted in sphalerite grains, indicating simultaneous deposition of these phases prior to deformation and remobilisation. Possible sphalerite-bearing chlorite-quartz stringer veins are preserved in sample C5/2; these irregular veins appear to pre-date deformation.

CC5/1 Fine grained sericite-chlorite-quartz schist (originally a fine grained quartz-phyric volcanic rock?) with two prominent foliations. Muscovite and minor chlorite define both foliations, which occur at an angle of ≈ 30° to each other. Pyrite-rich bands are parallel to the earlier foliation (S_1). The pyrite bands probably represent primary lithological layering (S_0). Chlorite is most abundant within and around the sulfide-rich bands, where minor carbonate is also present. In contrast, there is very little sulfide mineralisation associated with the second foliation (S_2). A late euhedral carbonate vein with very minor pyrite and sphalerite parallel to S_2 cuts the pyrite bands and the S_1 foliation (Figure 2).

Pyrite clearly occupies an early position in the paragenesis, as the pyrite-rich bands contain elongate, irregular, fractured pyrite grains surrounded by fibrous quartz-chlorite-(carbonate) pressure shadows (Figure 3). Chalcopyrite, galena and sphalerite occupy the tensile fractures in these elongate pyrite grains (Figure 4). Pyrite also occurs as framboidal aggregates, and as coarser anhedral to euhedral unstrained crystals that contain variable quantities of inclusions (predominantly quartz, with minor chalcopyrite, galena and sphalerite; see Figure 5). Chalcopyrite and galena occur as anhedral fracture fillings within and as partial rims around pyrite grains. Because chalcopyrite and galena also occur as rare inclusions in undeformed pyrite grains, it is likely that they have been remobilised into fractures during deformation. Chalcopyrite, galena and sphalerite are also recognisable within pressure shadows around large pyrite grains, indicating that these phases must have been recrystallised during deformation. Irregular pyrite grains that occur in the pressure shadows may be fragments from the larger grains, or they may represent minor remobilisation and recrystallisation of pyrite during deformation.

Late hematite and goethite alteration occurs predominantly along the major tectonic fabric and also along the margins of the barren carbonate vein (Figure 2). These minerals have probably formed during recent near-surface oxidation.

The sulfide and oxide paragenesis for this sample is as follows:

Early (syngenetic?):	pyrite, (sphalerite, galena, chalcopyrite?)
Syn-deformation	chalcopyrite, galena, sphalerite, (pyrite?)
Late (weathering?):	goethite, hematite

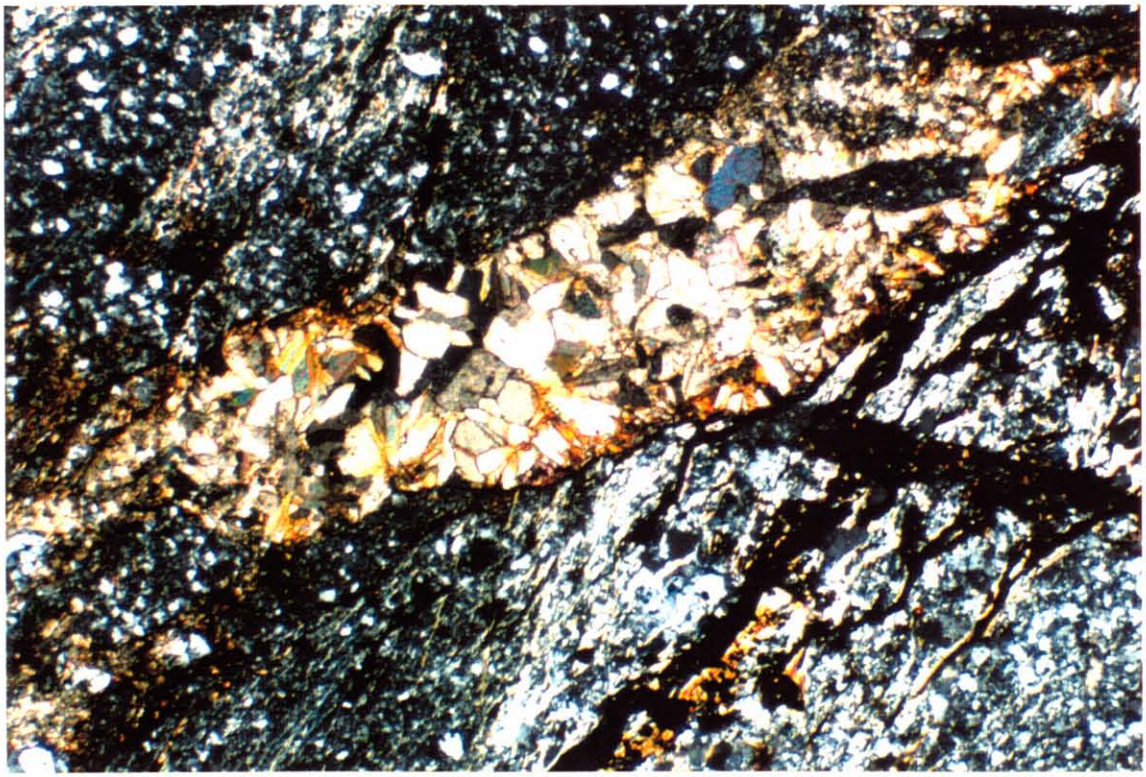


Figure 2: Euhedral barren calcite vein parallel to S_2 with supergene hematite and goethite along vein margins. Note ≈30° angle between the vein and the principle foliation (S_1). (Sample CC5/1; photograph taken under transmitted light, crossed polars; field of view = 2.5 mm).

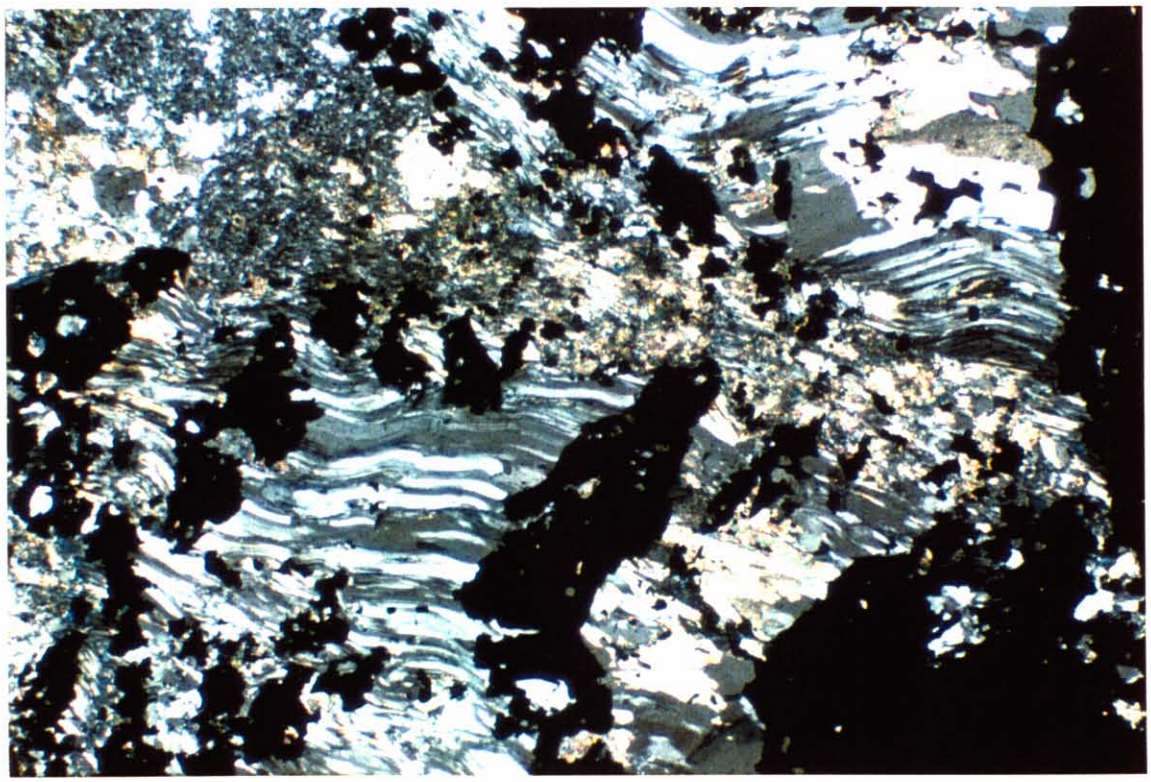


Figure 3: Elongate inclusion-rich pyrite from a pyrite-rich sulfide band (S0). Pyrite grains are surrounded by fibrous quartz-chlorite pressure shadows. Sphalerite, chalcopyrite and pyrite also occur within the pressure shadows intergrown with calcite. (Sample CC5/1; photograph taken under transmitted light, crossed polars; field of view = 2.5 mm).

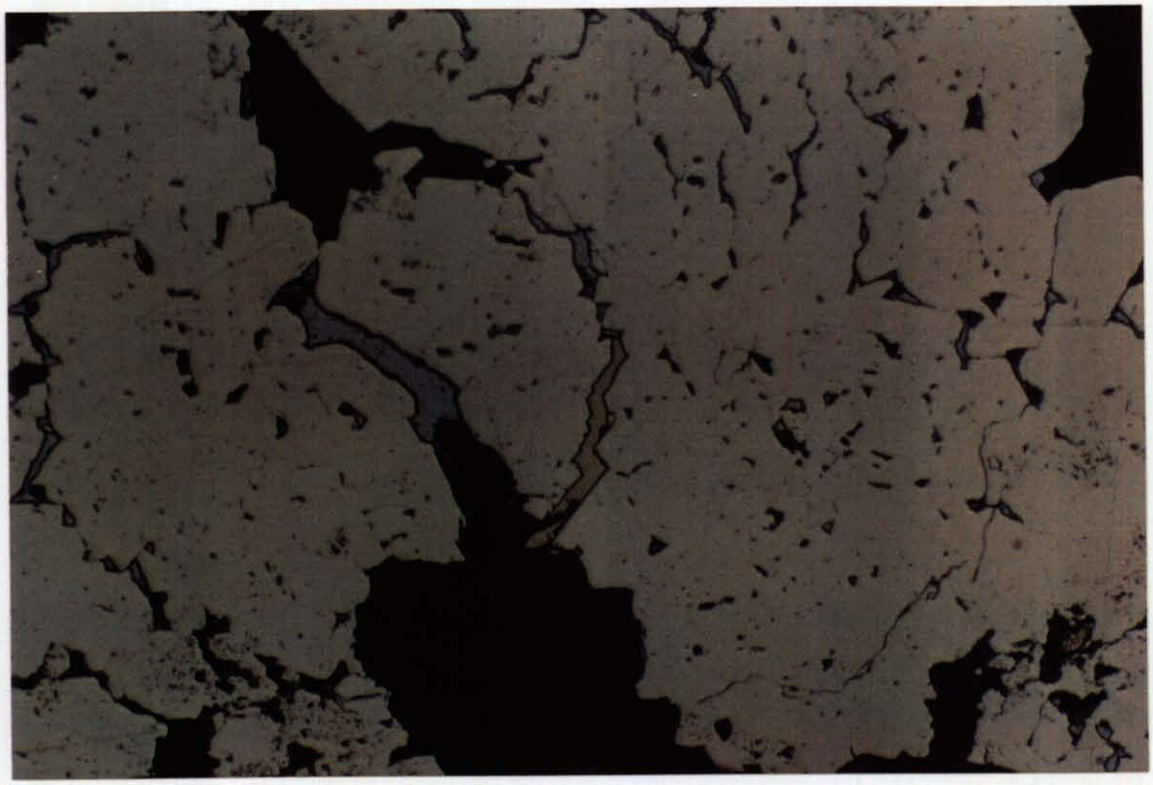


Figure 4: Galena and chalcopyrite along tensile fractures in pyrite, indicating remobilisation of chalcopyrite and galena during deformation. Quartz is the major gangue mineral. (Sample CC5/1; photograph taken under reflected light; field of view = 0.3 mm).



Figure 5: Unstrained pyrite with rounded galena inclusions, indicating co-precipitation. Also note the pyrite, chalcopyrite and galena inclusions in sphalerite. (Sample CC5/2; photograph taken under transmitted light, crossed polars; field of view = 0.3 mm).

C5/2 Fine grained sericite-chlorite-quartz schist (originally a fine grained quartz-phyric volcanic rock?) similar to sample C5/1. Sulfide-rich bands (S_0) once again contain subrounded to elongate inclusion-rich fractured pyrite grains surrounded by fibrous quartz-chlorite pressure shadows. Although tensile fractures in the elongate pyrite grains are filled by sphalerite, galena and pyrite, the base metal sulfides also occur as small inclusions in less deformed pyrite crystals (Figure 5). It is therefore likely that the base metal sulfides were precipitated together with pyrite prior to deformation, but were remobilised into fractures during the major deformational event

S_1 is defined primarily by muscovite and occurs sub-parallel to S_0. A steeply dipping S_2 shear zone is present on one side of the thin section - S_0 and S_1 have been rotated into this zone (Figure 1). S_2 is defined primarily by chlorite with minor intergrowths of muscovite, quartz, sphalerite (Figure 1) and a thin band of epidote. A euhedral vuggy carbonate vein occurs on the margin of the S_2 shear zone - this vein contains abundant clear to violet coloured low-Fe sphalerite and minor chlorite (intergrown with sphalerite), quartz, pyrite, chalcopyrite and galena (Figure 6). Late (weathering-related?) minor goethite and hematite occur on the margins of this vein.

Irregular chlorite-rich domains occur in relatively undeformed rock away from the S_2 shear zone. These domains have no preferred orientation; in places they are aligned along S_2, but they clearly transgress out of the S_2 foliation (Figure 7). Several of the chlorite domains are oblique to S_0, S_1 and S_2. Both S_1 and S_2 are refracted through these oblique chlorite domains, suggesting that they predate both phases of deformation. Clear low-Fe sphalerite and minor chalcopyrite occur on the margins of these domains (Figure 7); sphalerite also occurs with quartz in the central portions of the domains. They possibly represent sphalerite-bearing chloritic stringer veins associated with initial deposition of sulfide mineralisation.

The sulfide and oxide paragenesis for this sample is as follows:

Early (syngenetic?):	pyrite, sphalerite, chalcopyrite, galena
Syn-deformation	sphalerite, pyrite, chalcopyrite, galena
Late (weathering?):	goethite, hematite

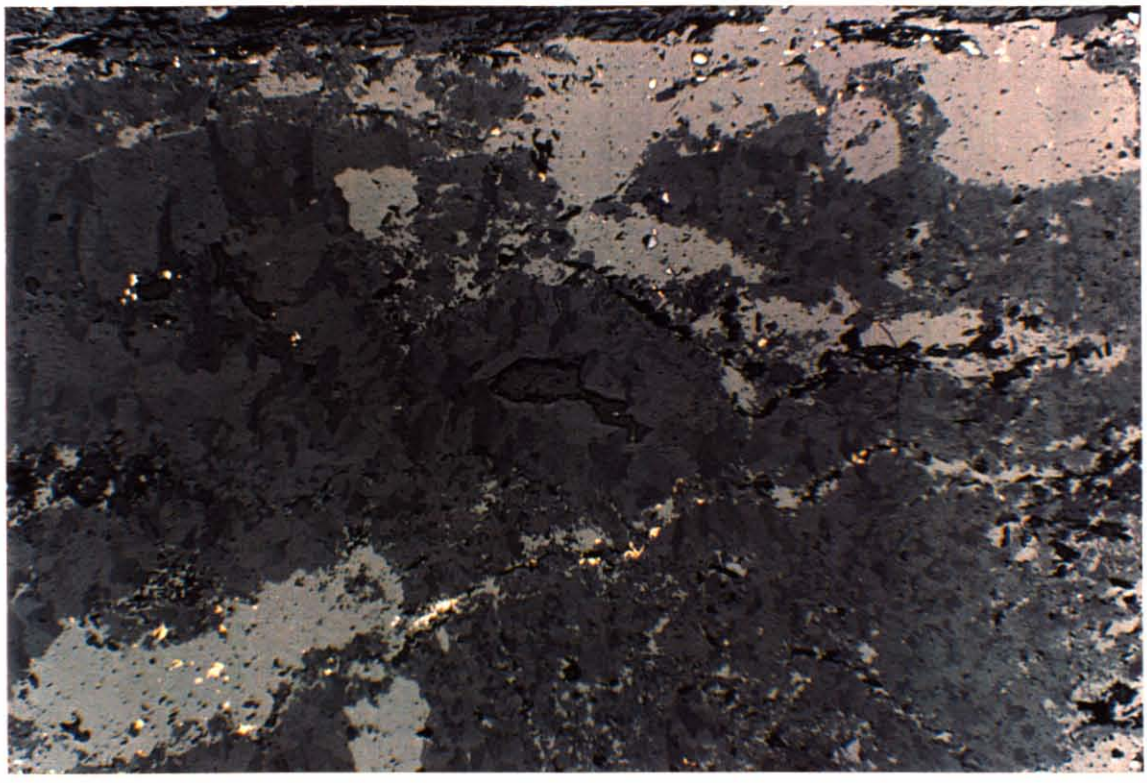


Figure 6: Sphalerite and minor pyrite and chalcopyrite in coarse euhedral vuggy carbonate vein parallel to S_2. (Sample CC5/2; photograph taken under reflected light; field of view = 5 mm).

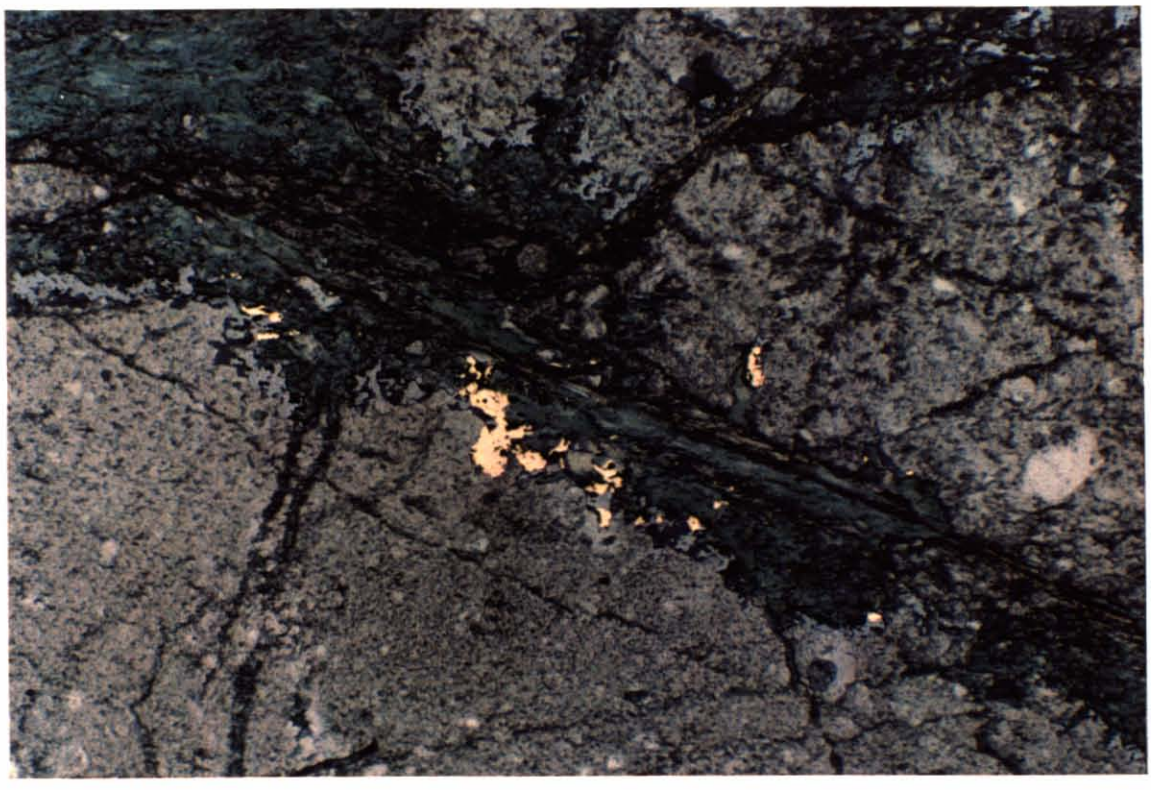


Figure 7: Chalcopyrite and sphalerite lining the edge of a chlorite-rich domain parallel to S_2. In the top left corner of the photograph, the chlorite domain migrates away from the S_2 fabric, where it becomes broader and more irregular in shape. This may represent an original chloritic stringer vein reactivated by S_2 shearing. (Sample CC5/2; photograph taken under transmitted light and reflected light; field of view = 2.5 mm).

C6/6 Fine grained muscovite-quartz-carbonate schist (originally a fine grained quartz-phyric volcanic rock?) that contains more muscovite and calcite and significantly less chlorite than C5/1 or C5/2. Minor 2 - 5 mm thick sulfide-rich bands (S_0) contain subrounded to elongate pyrite grains surrounded by fibrous calcite-quartz-(sphalerite-pyrite-chalcopyrite-galena) pressure shadows (Figures 8 and 9). Significantly more carbonate occurs within sulfide bands in this sample compared to C5/1 and C5/2. Galena is the principal mineral filling tensile fractures in pyrite; sphalerite and chalcopyrite occur as inclusions and as minor fracture-fillings. Sporadic disseminations of sphalerite, pyrite and galena occur in the groundmass of the schists; their origin is uncertain.

The main tectonic fabric (S_1) is oriented sub-parallel to S_0 (Figure 8). S_1 is defined primarily by muscovite with minor calcite and chlorite. S_2 is defined by muscovite and is oriented oblique ($\approx 30°$) to S_1 and S_0. Minor pyrite and base metal sulfides occur along the S_2 fabric.

The sulfide and oxide paragenesis for this sample is as follows:

Early (syngenetic?):	pyrite, sphalerite, chalcopyrite, (galena?)
Syn-deformation	pyrite, galena, sphalerite, chalcopyrite
Late (weathering?):	goethite

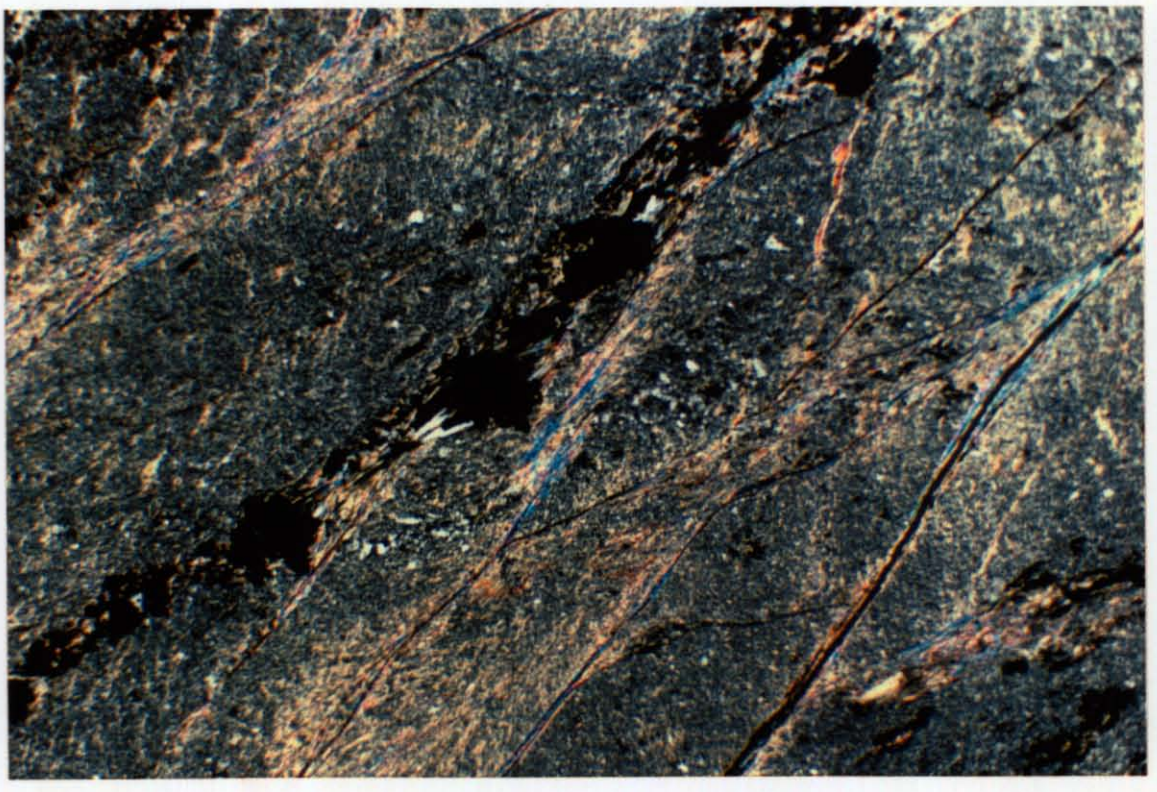


Figure 8: Pyrite-rich sulfide band (S_0) with quartz-chlorite-carbonate-muscovite pressure shadows subparallel to muscovite-defined S_1 foliation. A second, weaker fabric (S_2) occurs at an angle of approximately 30° to S_0/S_1. (Sample CC6/6; photograph taken under transmitted light, crossed polars; field of view = 5 mm).

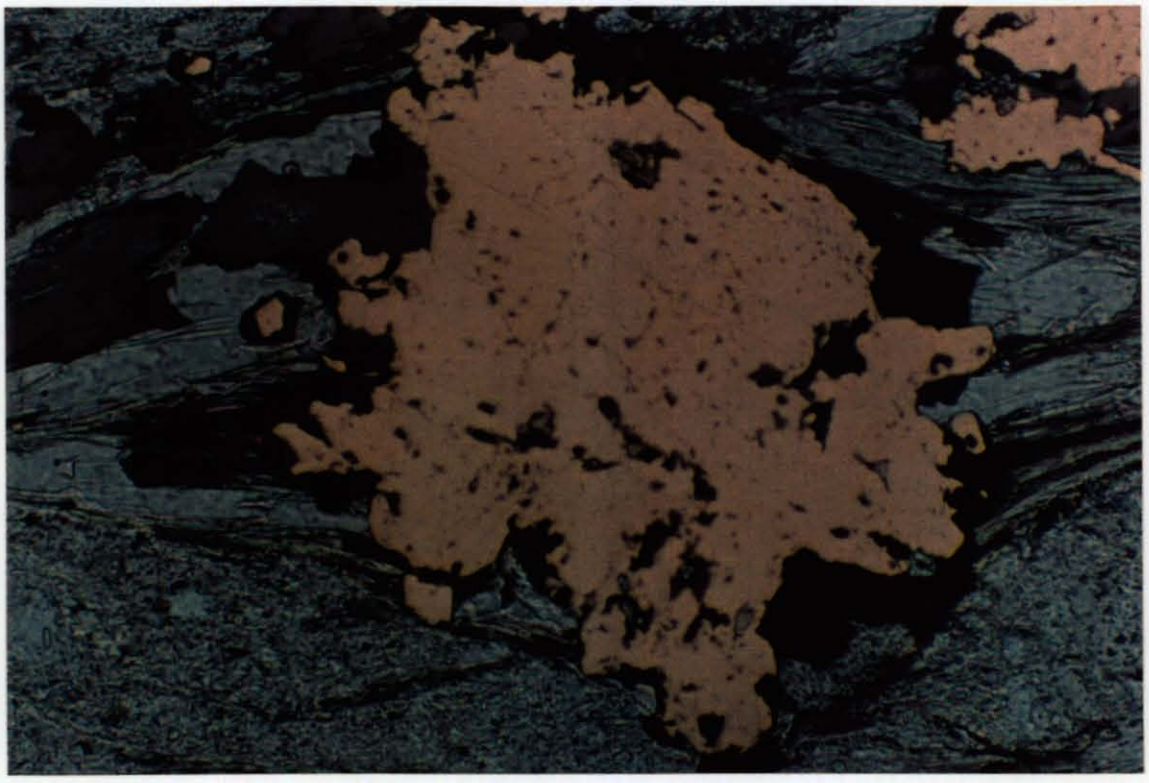


Figure 9: Close up of part of the sulfide band shown in Figure 8 with fibrous quartz-chlorite-sphalerite pressure shadows enclosing an irregular pyrite grain. (Sample CC6/6; photograph taken under transmitted light and reflected light; field of view = 0.6 mm).

974229

APPENDIX K

Assay Results for all Gowrie Park

EL 10/88 Work, 1992-1993

ANALABS

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

974230

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

ANALYTICAL REPORT No. 111715.60.09114

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

INVOICE TO:

Plutonic Operations Limited
41 Bass Highway
DELORAINE TAS 7304

ORDER No.	PROJECT
2005447	

DATE RECEIVED	RESULTS REQUIRED
19/11/92	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
2	24/11/92	1	43

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
3001/043 FTD1 2.8m → 49.2m	DC Prep : SP006,SP009,SP012	Au,Au(R),Au(S)/SG309

REMARKS

RESULTS TO

Mr Grant MacDonald
Plutonic Operations Limited
41 Bass Highway
DELORAINE TAS 7304

RESULTS TO

RESULTS TO

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974231

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09114	24/11/92	2005467	1 OF 2

TUBE No	SAMPLE No.	Au	Au(R)	Au(S)	From	To.
1	S00001	<0.008	-	-	2·8	4
2	S00002	<0.008	-	-	4.	5
3	S00003	<0.008	-	-	5	6
4	S00004	<0.008	-	-	6	7
5	S00005	<0.008	-	-	7	8
6	S00006	<0.008	-	-	8	9
7	S00007	<0.008	-	-	9	10
8	S00008	<0.008	-	-	10	11
9	S00009	<0.008	-	-	11	12
10	S00010	<0.008	-	-	12	13
11	S00011	<0.008	-	-	13	14
12	S00012	<0.008	<0.008	-	14	14·85
13	S00013	<0.008	-	-	14·85	16·2
14	S00014	<0.008	-	-	16·2	17
15	S00015	<0.008	-	<0.008	17	19·4
16	S00016	<0.008	-	-	19·4	21
17	S00017	<0.008	-	-	21	22
18	S00018	<0.008	-	-	22	23
19	S00019	0.040	-	-	23	24
20	S00020	0.016	-	-	24	25
21	S00021	0.042	-	-	25	26
22	S00022	0.620	0.588	-	26	27
23	S00023	<0.008	-	-	27	28
24	S00024	0.049	-	-	28	29
25	S00025	0.096	-	-	29	30

Results in ppm unless otherwise specified
T = element present: but concentration too low to measure
X = element concentration is below detection limit
- = element not determined

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974232

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09114	24/11/92	2005467	2 OF 2

TUBE No.	SAMPLE No.	Au	Au(R)	Au(S)		From	To			
1	S00026	0.043	-	-		30	31			
2	S00027	0.107	-	-		31	32			
3	S00028	0.113	-	-		32	33			
4	S00029	0.031	-	-		33	34			
5	S00030	0.008	-	-		34	35			
6	S00031	0.012	-	-		35	36			
7	S00032	0.013	-	-		36	37.3			
8	S00033	0.022	-	-		37.3	39			
9	S00034	<0.008	-	-		39	39.9			
10	S00035	0.010	-	-		39.9	41			
11	S00036	0.132	-	-		41	42			
12	S00037	0.130	0.128	-		42	43			
13	S00038	0.124	-	0.118		43	44			
14	S00039	<0.008	-	-		44	45			
15	S00040	0.010	-	-		45	46			
16	S00041	0.014	-	-		46	47			
17	S00042	0.053	-	0.055		47	48			
18	S00043	2.080	-	-		49	49.2			
19										
20										
21										
22										
23	DETECTION	0.008	0.008	0.008						
24	UNITS	ppm	ppm	ppm						
25	METHOD	GG309	GG309	GG309						

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

AUTHORISED OFFICER

ANALABS

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

974233

Phone (03) 6165 7607 | 14 Thinkell St, 2008E TAS 7320 | Fax (03) 6165 7611

ANALYTICAL REPORT No.

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

INVOICE TO:

ORDER No. | PROJECT

DATE RECEIVED | RESULTS REQUIRED

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
TD 1 49.2m → 145.0 (E.O.H.)	1E Prep : BP006,BP009,BP012-LM5	Au.Au(R).Au(S)/GG309

REMARKS

RESULTS TO

Mr Grant MacDonald
Tasmin Operations Limited
Esk Main Highway
[illegible] TAS 7304

RESULTS TO

RESULTS TO

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 684

974234

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09175	21/12/92		1 OF 4

TUBE No	SAMPLE No.	Au	Au(R)	Au(S)		From	To			
1	S 00487	1.170	-	-		49.2	50			
2	S00488	3.300	-	-		50	51			
3	S00487	1.620	-	-		51	52			
4	S00490	0.229	-	-		52	53			
5	S00491	4.140	-	-		53	54			
6	S00492	2.860	-	-		54	55			
7	S00493	2.730	-	-		55	56			
8	S00494	0.626	-	-		56	57			
9	S00495	0.403	-	-		57	58			
10	S00496	0.993	-	-		58	59			
11	S00497	1.400	-	-		59	60			
12	S00498	1.530	1.500	1.520		60	61			
13	S00499	0.344	-	-		61	62			
14	S00500	0.028	-	-		62	63			
15	S00501	0.102	-	-		63	64			
16	S00502	0.070	-	-		64	65			
17	S00503	0.033	-	-		65	66			
18	S00504	0.014	-	-		66	67			
19	S00505	0.010	-	-		67	68			
20	S00506	0.030	-	-		68	69			
21	S00507	<0.008	-	-		69	70			
22	S00508	0.015	0.018	-		70	71			
23	S00509	0.014	-	-		71	72			
24	S00510	0.027	-	-		72	73			
25	S00511	0.008	-	-		73	74			

Results in ppm unless otherwise specified
T = element present: but concentration too low to measure
X = element concentration is below detection limit
- = element not determined

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 864

974235

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09175	21/12/92		2 OF 4

TUBE No.	SAMPLE No.	Au	Au(R)	Au(S)		From	To			
1	S00512	0.028	-	-		74	75			
2	S00513	0.011	-	-		75	76			
3	S00514	0.031	-	-		76	77			
4	S00515	0.056	-	-		77	78			
5	S00516	0.048	-	-		78	79			
6	S00517	0.037	-	-		79	80			
7	S00518	0.028	-	-		80	81			
8	S00519	0.042	-	-		81	82			
9	S00520	0.031	-	-		82	83			
10	S00521	0.019	-	-		83	84			
11	S00522	0.031	-	-		84	85			
12	S00523	0.310	0.309	-		85	86			
13	S00524	0.119	-	-		86	87			
14	S00525	0.045	-	-		87	88			
15	S00526	0.040	-	0.043		88	89			
16	S00527	0.008	-	-		89	90			
17	S00528	0.011	-	0.012		90	91			
18	S00529	0.032	-	-		91	92			
19	S00530	0.010	-	-		92	93			
20	S00531	0.016	-	-		93	94			
21	S00532	0.013	-	-		94	95			
22	S00533	0.012	0.010	-		95	96			
23	S00534	0.031	-	-		96	97			
24	S00535	<0.008	-	-		97	98			
25	S00536	0.015	-	-		98	99			

Results in ppm unless otherwise specified
T = element present: but concentration too low to measure
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A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974236

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09175	21/12/92		3 OF 4

TUBE No.	SAMPLE No.	Au	Au(R)	Au(S)		From	To			
1	S00537	0.031	-	-		99	100			
2	S00538	0.011	-	-		100	101			
3	S00539	0.017	-	-		101	102			
4	S00540	0.014	-	-		102	103			
5	S00541	<0.008	-	-		103	104			
6	S00542	0.020	-	-		104	105			
7	S00543	<0.008	-	-		105	106			
8	S00544	0.012	-	-		106	109			
9	S00545	0.011	-	-		107	108			
10	S00546	0.014	-	-		108	109			
11	S00547	0.009	-	-		109	110			
12	S00548	<0.008	<0.008	-		110	111			
13	S00549	0.008	-	-		111	112			
14	S00550	0.016	-	-		112	113			
15	S00551	<0.008	-	-		113	114			
16	S00552	0.014	-	-		114	115			
17	S00553	<0.008	-	-		115	116			
18	S00554	0.012	-	-		116	117			
19	S00555	<0.008	-	-		117	118			
20	S00556	0.019	-	-		118	119			
21	S00557	<0.008	-	-		119	120			
22	S00558	<0.008	<0.008	-		120	121			
23	S00559	<0.008	-	-		121	122			
24	S00560	<0.008	-	-		122	123			
25	S00561	<0.008	-	-		123	124			

Results in ppm unless otherwise specified
T = element present: but concentration too low to measure
X = element concentration is below detection limit
- = element not determined

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A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09175	21/12/92		4 OF 4

TUBE No.	SAMPLE No.	Au	Au(R)	Au(S)		From	To			
	S00562	<0.008	-	-		124	125			
2	S00563	<0.008	-	-		125	126			
3	S00564	<0.008	-	-		126	127			
	S00565	<0.008	-	<0.008		127	128			
5	S00566	<0.008	-	-		128	129			
	S00567	<0.008	-	-		129	130			
7	S00568	<0.008	-	-		130	131			
8	S00569	<0.008	-	-		131	132			
	S00570	<0.008	-	-		132	133			
10	S00571	<0.008	-	-		133	134			
	S00572	<0.008	-	-		134	135			
12	S00573	<0.008	<0.008	<0.008		135	136			
13	S00574	0.016	-	-		136	137			
	S00575	<0.008	-	-		137	138			
15	S00576	<0.008	-	-		138	139			
	S00577	<0.008	-	-		139	140			
17	S00578	<0.008	-	-		140	141			
18	S00579	<0.008	-	-		141	142			
	S00580	<0.008	-	-		142	143.			
20	S00581	<0.008	-	-		143	144			
21	S00582	0.025	-	-		144	145			
22										
23	DETECTION	0.008	0.008	0.008						
24	UNITS	ppm	ppm	ppm						
25	METHOD	GG309	GG309	GG309						

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

AUTHORISED OFFICER

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

974238

Phone (004) 316837 | 14 Thirkell St. DOOEE TAS 7320 | Fax (004) 718890

ANALYTICAL REPORT No. 11715.60.09122

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

INVOICE TO:
Mr Grant MacDonald
Plutonic Operations Limited
41 Bass Highway
DELORAINE TAS 7304

ORDER No.	PROJECT
2005469	

DATE RECEIVED	RESULTS REQUIRED
23/11/92	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
3	25/11/92	1	70

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
044/090	QC Prep : GP006,GP009,GP018-LM5	Au,Au(R),Au[illegible]/SG309
GM151/177		
FTD2		
1.5m → 72.0m		

REMARKS

RESULTS TO
Mr Grant MacDonald
Plutonic Operations Limited
41 Bass Highway
DELORAINE TAS 7304

RESULTS TO

RESULTS TO

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974239

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09122	26/11/92	2005469	1 OF 3

TUBE No.	SAMPLE No.	Au	Au(R)	Au(S)		From	To			
1	S00044	0.018	-	-		2.5	3			
2	S00045	0.012	-	-		3	4			
3	S00046	<0.008	-	-		4	5			
4	S00047	0.008	-	-		5	6			
5	S00048	0.009	-	-		6	7			
6	S00049	<0.008	-	-		7	8			
7	S00050	0.016	-	-		8	9			
8	S00051	<0.008	-	-		9	10			
9	S00052	<0.008	-	-		10	11			
10	S00053	0.008	-	-		11	12			
11	S00054	<0.008	-	-		12	13			
12	S00055	<0.008	0.008	-		13	14			
13	S00056	<0.008	-	<0.008		14	15			
14	S00057	0.020	-	-		15	16			
15	S00058	<0.008	-	-		16	17			
16	S00059	<0.008	-	-		17	18			
17	S00060	0.011	-	-		18	19			
18	S00061	<0.008	-	-		19	20			
19	S00062	0.009	-	-		20	21			
20	S00063	0.053	-	-		21	22			
21	S00064	0.024	-	-		22	23			
22	S00065	0.328	0.343	-		23	24			
23	S00066	0.195	-	-		24	25			
24	S00067	0.061	-	-		25	26			
25	S00068	0.018	-	-		26	27			

Results in ppm unless otherwise specified
T = element present: but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974240

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09122	26/11/92	2005469	2 OF 3

TUBE No.	SAMPLE No.	Au	Au(R)	Au(S)		From	To			
1	S00069	<0.008	-	-		27	28			
2	S00070	0.028	-	-		28	29			
3	S00071	0.013	-	-		29	30			
4	S00072	0.126	-	-		30	31			
5	S00073	0.066	-	-		31	32			
6	S00074	0.035	-	-		32	33			
7	S00075	0.074	-	-		33	34			
8	S00076	0.199	-	-		34	35			
9	S00077	0.054	-	-		35	36			
10	S00078	0.128	-	0.137		36	37			
11	S00079	0.171	-	-		37	38			
12	S00080	0.204	0.247	-		38	39			
13	S00081	0.034	-	-		39	40			
14	S00082	0.647	-	-		40	41			
15	S00083	0.045	-	-		41	42			
16	S00084	0.093	-	-		42	43			
17	S00085	0.067	-	-		43	44			
18	S00086	0.060	-	-		44	45			
19	S00087	0.040	-	-		45	46			
20	S00088	0.029	-	-		46	47			
21	S00089	0.142	-	-		47	48			
22	S00090	0.043	0.057	-		48	49			
23	S00151	0.084	-	-		49	50			
24	S00152	0.258	-	-		50	51			
25	S00153	0.108	-	-		51	52			

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

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974241

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09122	26/11/92	2005469	3 OF 3

TUBE No.	SAMPLE No.	Au	Au(R)	Au(S)		From	To			
1	S00154	0.084	-	-		52	53			
2	S00155	0.124	-	0.121		53	54			
3	S00156	0.186	-	-		54	55			
4	S00157	0.111	-	-		55	56			
5	S00158	0.146	-	-		56	57			
6	S00159	2.180	-	-		57	58			
7	S00160	0.115	-	-		58	59			
8	S00161	1.320	-	-		59	60			
9	S00162	0.172	-	-		60	61			
10	S00163	0.030	-	-		61	62			
11	S00164	0.019	-	-		62	63			
12	S00165	0.011	0.011	-		63	64			
13	S00166	0.013	-	-		64	65			
14	S00167	0.047	-	-		65	66			
15	S00168	0.026	-	-		66	67			
16	S00169	<0.008	-	-		67	68			
17	S00170	0.020	-	-		68	69			
18	S00171	0.042	-	0.051		69	70			
19	S00172	0.039	-	-		70	71			
20	S00173	0.134	-	-		71	72			
21										
22										
23	DETECTION	0.008	0.008	0.008						
24	UNITS	ppm	ppm	ppm						
25	METHOD	GG309	GG309	GG309						

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

AUTHORISED OFFICER

ANALABS

974242

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

ANALYTICAL REPORT No. 111715.60.09134

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

INVOICE TO: Mr Grant MacDonald
Plutonic Operations Limited
41 Bass Highway
DELORAINE TAS 7304

ORDER No.	PROJECT
200547/1	

DATE RECEIVED	RESULTS REQUIRED
26/11/92	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
3	02/12/92	1	49

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
174/222 TD 2 12.0m → 122.6 (E.O.H.)	DC Prep : GP033	Au,Au(R),Au(S)/66309

RESULTS TO: Mr Grant MacDonald
Plutonic Operations Limited
41 Bass Highway
DELORAINE TAS 7304

RESULTS TO:

RESULTS TO:

REMARKS

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974243

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09134	02/12/92		1 OF 3

TUBE No.	SAMPLE No.	Au	Au(R)	Au(S)		From	To			
1	S00174	0.257	-	-		72	73			
2	S00175	0.083	-	-		73	74			
3	S00176	0.104	-	-		74	75			
4	S00177	0.436	-	-		75	76			
5	S00178	1.080	-	-		76	77			
6	S00179	0.496	-	-		77	78			
7	S00180	5.240	-	-		78	79			
8	S00181	1.930	-	-		79	80			
9	S00182	2.330	-	-		80	81			
10	S00183	0.016	-	-		81	82			
11	S00184	<0.008	-	-		82	83			
12	S00185	0.612	0.602	-		83	84			
13	S00186	0.140	-	-		84	85			
14	S00187	<0.008	-	-		85	86			
15	S00188	0.014	-	-		86	87			
16	S00189	0.014	-	-		87	88			
17	S00190	0.009	-	-		88	89			
18	S00191	0.021	-	-		89	90			
19	S00192	0.037	-	-		90	91			
20	S00193	<0.008	-	<0.008		91	92			
21	S00194	<0.008	-	0.009		92	93			
22	S00195	<0.008	<0.008	-		93	94			
23	S00196	0.183	-	-		94	95			
24	S00197	0.017	-	-		95	96			
25	S00198	<0.008	-	-		96	97			

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

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974244

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09134	02/12/92		2 OF 3

TUBE No.	SAMPLE No.	Au	Au(R)	Au(S)		From	To			
1	S00199	<0.008	-	-		97	98			
2	S00200	<0.008	-	-		98	99			
3	S00201	<0.008	-	-		99	100			
4	S00202	0.022	-	-		100	101			
5	S00203	<0.008	-	-		101	102			
6	S00204	<0.008	-	-		102	103			
7	S00205	<0.008	-	-		103	104			
8	S00206	<0.008	-	-		104	105			
9	S00207	<0.008	-	-		105	106			
10	S00208	<0.008	-	-		106	107			
11	S00209	<0.008	-	-		107	108			
12	S00210	<0.008	<0.008	-		108	109			
13	S00211	<0.008	-	-		109	110			
14	S00212	<0.008	-	-		110	111			
15	S00213	<0.008	-	-		111	112			
16	S00214	<0.008	-	-		112	113			
17	S00215	<0.008	-	-		113	114			
18	S00216	<0.008	-	-		114	115			
19	S00217	0.050	-	-		115	116.2			
20	S00218	<0.008	-	<0.008		116.2	117.6			
21	S00219	<0.008	-	-		117.6	119.8			
22	S00220	<0.008	<0.008	-		119.8	121			
23	S00221	<0.008	-	-		121	122.2			
24	S00222	<0.008	-	-		122.2	122.6			
25										

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

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974245

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09134	02/12/92		3 OF 3

TUBE No.	SAMPLE No.	Au	Au(R)	Au(S)						
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	0.008	0.008	0.008						
24	UNITS	ppm	ppm	ppm						
25	METHOD	GG309	GG309	GG309						

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

AUTHORISED OFFICER

ANALABS

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

974246

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

ANALYTICAL REPORT No. 11715.30.09140

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

INVOICE TO: Mr Grant MacDonald
Mt Lyonic Operations Limited
41 Bass Highway
DELORAINE TAS 7304

ORDER No.	PROJECT
2003471	

DATE RECEIVED	RESULTS REQUIRED
30/11/92	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
1	04.12.92	1	50

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
223/272 FTD 3 3.0m → 54.9m	DC Prep : GP006.GP009.GP012-LM5	Au.Au(R).Au(S)/GG309

REMARKS

RESULTS TO: Mr Grant MacDonald
Mt Lyonic Operations Limited
41 Bass Highway
DELORAINE TAS 7304

RESULTS TO:

RESULTS TO:

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty Ltd.
A.C.N. 004 591 664

974247

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09140	04/12/92	2005471	1 OF 3

TUBE No.	SAMPLE No.	Au	Au(R)	Au(S)		From	To			
1	S00223	0.008	-	-		3	5			
2	S00224	0.026	-	-		5	6			
3	S00225	<0.008	-	-		6	7			
4	S00226	<0.008	-	-		7	8			
5	S00227	0.010	-	-		8	9			
6	S00228	<0.008	-	-		9	10			
7	S00229	<0.008	-	-		10	11			
8	S00230	<0.008	-	-		11	12			
9	S00231	0.015	-	-		12	13			
10	S00232	0.164	-	-		13	14			
11	S00233	0.018	-	-		14	15			
12	S00234	0.289	0.252	-		15	16			
13	S00235	0.189	-	0.180		16	17			
14	S00236	0.031	-	-		17	18			
15	S00237	0.132	-	-		18	19			
16	S00238	0.296	-	-		19	20			
17	S00239	0.587	-	-		20	21			
18	S00240	0.177	-	-		21	22			
19	S00241	0.067	-	-		22	23			
20	S00242	0.187	-	-		23	24			
21	S00243	0.455	-	-		24	25			
22	S00244	0.423	0.369	-		25	26			
23	S00245	0.049	-	-		26	27			
24	S00246	0.034	-	-		27	28			
25	S00247	0.018	-	-		28	29			

Results in ppm unless otherwise specified
T = element present: but concentration too low to measure
X = element concentration is below detection limit
- = element not determined

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 684

974248

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09140	04/12/92	2005471	2 OF 3

TUBE No.	SAMPLE No.	Au	Au(R)	Au(S)		From	To			
1	S00248	0.040	-	-		29	30			
2	S00249	0.046	-	-		30	31			
3	S00250	0.160	-	-		31	32			
4	S00251	0.243	-	-		32	33			
5	S00252	0.070	-	-		33	34			
6	S00253	0.077	-	-		34	35			
7	S00254	0.060	-	-		35	36			
8	S00255	0.275	-	-		36	37			
9	S00256	0.161	-	0.158		37	38			
10	S00257	0.019	-	-		38	39			
11	S00258	0.023	-	-		39	40			
12	S00259	0.043	0.054	-		40	41			
13	S00260	0.051	-	-		41	42			
14	S00261	0.281	-	-		42	43			
15	S00262	0.068	-	-		43	44			
16	S00263	0.130	-	-		44	45			
17	S00264	0.156	-	-		45	46			
18	S00265	0.242	-	-		46	47			
19	S00266	0.391	-	-		47	48			
20	S00267	0.223	-	-		48	49			
21	S00268	0.373	-	0.362		49	50			
22	S00269	0.430	0.432	-		50	51			
23	S00270	0.446	-	-		51	52			
24	S00271	0.010	-	-		52	53			
25	S00272	0.195	-	-		53	54.9			

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

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974249

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09140	04/12/92	2005471	3 OF 3

TUBE No.	SAMPLE No.	Au	Au(R)	Au(S)						
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	0.008	0.008	0.008						
24	UNITS	ppm	ppm	ppm						
25	METHOD	GG309	GG309	GG309						

Results in ppm unless otherwise specified
T = element present: but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

AUTHORISED OFFICER

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

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

974250

ANALYTICAL REPORT No. 111715.60.09144

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

INVOICE TO: Mr Grant MacDonald
Plutonic Operations Limited
41 Bass Highway
DELORAINE TAS 7304

ORDER No.	PROJECT

DATE RECEIVED	RESULTS REQUIRED
02/12/92	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
2	04/12/92	1	66

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
273338	DC Prep : GP006,GP009,GP018-LM5	Au,Au(R),Au(S)/GG309
FTD 3		
54.9m → 121.5m (E.o.H)		

REMARKS

RESULTS TO: Mr Grant MacDonald
Plutonic Operations Limited
41 Bass Highway
DELORAINE TAS 7304

RESULTS TO:

RESULTS TO:

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974251

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09144	04/12/92		1 OF 3

TUBE No.	SAMPLE No.	Au	Au(R)	Au(S)		From	To			
1	S00273	0.593	-	-		54.9	56			
2	S00274	0.288	-	0.274		56	57			
3	S00275	3.230	-	-		57	58			
4	S00276	0.288	-	-		58	59			
5	S00277	0.049	-	-		59	60			
6	S00278	0.027	-	-		60	61			
7	S00279	0.022	-	-		61	62			
8	S00280	0.015	-	-		62	63			
9	S00281	0.021	-	-		63	64			
10	S00282	0.115	-	-		64	65			
11	S00283	0.484	-	-		65	66			
12	S00284	0.273	0.258	-		66	67			
13	S00285	0.605	-	-		67	68			
14	S00286	1.220	-	-		68	69			
15	S00287	0.047	-	-		69	70			
16	S00288	1.250	-	-		70	71			
17	S00289	0.257	-	-		71	72			
18	S00290	0.505	-	-		72	73			
19	S00291	0.992	-	-		73	74			
20	S00292	13.200	-	-		74	75			
21	S00293	2.180	-	-		75	76			
22	S00294	0.144	0.139	-		76	77			
23	S00295	0.025	-	0.030		77	78			
24	S00296	0.055	-	-		78	79			
25	S00297	0.019	-	-		79	80			

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

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974252

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09144	04/12/92		2 OF 3

TUBE No.	SAMPLE No.	Au	Au(R)	Au(S)		From	To			
1	S00298	0.009	-	-		80	81			
2	S00299	0.010	-	-		81	82			
3	S00300	<0.008	-	-		82	83			
4	S00301	0.073	-	-		83	84			
5	S00302	0.194	-	-		84	85			
6	S00303	0.331	-	-		85	86			
7	S00304	0.025	-	-		86	87			
8	S00305	0.178	-	-		87	88			
9	S00306	0.072	-	-		88	89			
10	S00307	1.480	-	-		89	90			
11	S00308	1.740	-	-		90	91			
12	S00309	1.520	1.260	-		91	92			
13	S00310	1.050	-	-		92	93			
14	S00311	1.470	-	-		93	94			
15	S00312	0.577	-	-		94	95			
16	S00313	0.432	-	-		95	96			
17	S00314	0.132	-	-		96	97			
18	S00315	0.027	-	-		97	98			
19	S00316	0.028	-	-		98	99			
20	S00317	0.014	-	-		99	100			
21	S00318	0.026	-	-		100	101			
22	S00319	0.102	0.138	-		101	102			
23	S00320	0.117	-	-		102	103			
24	S00321	0.157	-	-		103	104			
25	S00322	2.030	-	-		104	105			

Results in ppm unless otherwise specified
T = element present: but concentration too low to measure
X = element concentration is below detection limit
- = element not determined

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974253

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09144	04/12/92		3 OF 3

TUBE No.	SAMPLE No.	Au	Au(R)	Au(S)		From	To			
1	900321	1.020	-	-		105	106			
2	900324	2.370	-	2.310		106	107			
3	900325	0.094	-	-		107	108			
4	900326	<0.008	-	-		108	109			
5	900327	<0.008	-	-		109	110			
6	900328	<0.008	-	-		110	111			
7	900329	<0.008	-	-		111	112			
8	900330	0.302	-	-		112	113			
9	900331	0.346	-	-		113	114			
10	900332	0.146	-	-		114	115			
11	900333	<0.008	-	0.012		115	116			
12	900334	0.009	0.011	-		116	117			
13	900335	0.012	-	-		117	118			
14	900336	0.030	-	-		118	119			
15	900337	0.011	-	-		119	120			
16	900338	0.094	-	-		120	1215			
17										
18										
19										
20										
21										
22										
23	DETECTION	0.008	0.008	0.008						
24	UNITS	ppm	ppm	ppm						
25	METHOD	BR309	GG309	GS309						

Results in ppm unless otherwise specified
T = element present: but concentration too low to measure
X = element concentration is below detection limit
- = element not determined

AUTHORISED OFFICER

ANALABS

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

974254

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

ANALYTICAL REPORT No. 111713.60.09149

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

INVOICE TO: Mr Grant MacDonald
Plutonic Operations Limited
41 Bass Highway
DELORAINE TAS 7304

ORDER No.	PROJECT
Pls advise	

DATE RECEIVED	RESULTS REQUIRED
07/12/92	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
4	09/12/92	1	30

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
00339/418 FTD 4 3.5m → 85.0m	DC Prep : GP006,GP009,GP012-LM5	Au,Au(R),Au(S)/GG309

REMARKS

RESULTS TO: Mr Grant MacDonald
Plutonic Operations Limited
41 Bass Highway
DELORAINE TAS 7304

RESULTS TO:

RESULTS TO:

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974255

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09149	09/12/92		1 OF 4

TUBE No.	SAMPLE No.	Au	Au(R)	Au(S)		From	To			
1	S00339	0.335	-	-		3.5	6			
2	S00340	0.092	-	-		6	7			
3	S00341	0.034	-	-		7	8			
4	S00342	0.053	-	-		8	9			
5	S00343	0.094	-	-		9	10			
6	S00344	0.062	-	-		10	11			
7	S00345	0.015	-	-		11	12			
8	S00346	0.018	-	-		12	13			
9	S00347	0.012	-	-		13	14			
10	S00348	0.034	-	-		14	15			
11	S00349	0.132	-	-		15	16			
12	S00350	0.459	0.484	-		16	17			
13	S00351	0.027	-	0.020		17	18			
14	S00352	0.012	-	-		18	19			
15	S00353	0.038	-	-		19	20			
16	S00354	0.109	-	-		20	21			
17	S00355	0.079	-	-		21	22			
18	S00356	0.041	-	-		22	23			
19	S00357	0.586	-	-		23	24			
20	S00358	0.529	-	-		24	25			
21	S00359	0.159	-	-		25	26			
22	S00360	0.233	0.217	-		26	27			
23	S00361	0.097	-	-		27	28			
24	S00362	0.116	-	0.108		28	29			
25	S00363	0.096	-	-		29	30			

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

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974256

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09149	09/12/92		2 OF 4

TUBE No.	SAMPLE No.	Au	Au(R)	Au(S)		From	To			
1	S00364	0.042	-	-		30	31			
2	S00365	0.185	-	-		31	32			
3	S00366	0.115	-	-		32	33			
4	S00367	0.055	-	-		33	34			
5	S00368	0.299	-	-		34	35			
6	S00369	0.069	-	-		35	36			
7	S00370	0.125	-	-		36	37			
8	S00371	0.079	-	-		37	38			
9	S00372	0.159	-	-		38	39			
10	S00373	0.050	-	-		39	40			
11	S00374	0.023	-	-		40	41			
12	S00375	0.090	0.088	-		41	42			
13	S00376	0.051	-	-		42	43			
14	S00377	0.063	-	-		43	44			
15	S00378	2.000	-	-		44	45			
16	S00379	1.310	-	-		45	46			
17	S00380	0.325	-	0.279		46	47			
18	S00381	0.155	-	-		47	48			
19	S00382	1.640	-	-		48	49			
20	S00383	1.170	-	-		49	50			
21	S00384	1.260	-	-		50	51			
22	S00385	0.343	0.269	-		51	52			
23	S00386	0.836	-	-		52	53			
24	S00387	3.530	-	-		53	54			
25	S00388	0.076	-	-		54	55			

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

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974257

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09149	09/12/92		3 OF 4

TUBE No.	SAMPLE No.	Au	Au(R)	Au(S)		From	To			
1	S00389	0.175	-	-		55	56			
2	S00390	0.340	-	-		56	57			
3	S00391	0.172	-	-		57	58			
4	S00392	0.383	-	-		58	59			
5	S00393	0.267	-	-		59	60			
6	S00394	0.026	-	-		60	61			
7	S00395	<0.008	-	-		61	62			
8	S00396	0.019	-	-		62	63			
9	S00397	0.016	-	-		63	64			
10	S00398	0.012	-	-		64	65			
11	S00399	<0.008	-	-		65	66			
12	S00400	<0.008	0.013	-		66	67			
13	S00401	0.026	-	-		67	68			
14	S00402	0.034	-	-		68	69			
15	S00403	1.930	-	-		69	70			
16	S00404	1.580	-	-		70	71			
17	S00405	0.070	-	-		71	72			
18	S00406	0.063	-	0.056		72	73			
19	S00407	0.021	-	-		73	74			
20	S00408	0.059	-	-		74	75			
21	S00409	0.017	-	-		75	76			
22	S00410	<0.008	<0.008	-		76	77			
23	S00411	0.017	-	-		77	78			
24	S00412	0.010	-	-		78	79			
25	S00413	<0.008	-	-		79	80			

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

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974258

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09149	09/12/92		4 OF 4

TUBE No.	SAMPLE No.	Au	Au(R)	Au(S)		From	To			
1	S00414	<0.008	-	-		80	81			
2	S00415	<0.008	-	-		81	82			
3	S00416	0.009	-	-		82	83			
4	S00417	0.756	-	-		83	84			
5	S00418	<0.008	-	-		84	85			
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	0.008	0.008	0.008						
24	UNITS	ppm	ppm	ppm						
25	METHOD	GG309	GG309	GG309						

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

AUTHORISED OFFICER

ANALABS

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

974259

Phone (004) 316877 | 14 Thirkell St, DODEE TAS 7320 | Fax (004) 316879

ANALYTICAL REPORT No. 974259.0.091193

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

INVOICE TO: Mr Grant MacDonald
Futuris Operations Limited
91 Bass Highway
DELORAINE TAS 7304

ORDER No.: As advise

PROJECT:

DATE RECEIVED: 11/12/92

RESULTS REQUIRED: ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
3	17/12/92	1	60

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
004179486	DC Prep : GP006,GP009,GP012-Lx5	Au,Au(R),Au,B1/GB30?
FTD4 85.0m → 153.0m (E.O.H.)		

REMARKS

RESULTS TO: Mr Grant MacDonald
Futuris Operations Limited
91 Bass Highway
DELORAINE TAS 7304

RESULTS TO:

RESULTS TO:

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974260

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09168	17/12/92		1 OF 3

TUBE No.	SAMPLE No.	Au	Au(R)	Au(S)		From	To.			
1	S00419	<0.008	-	-		85	86			
2	S00420	0.038	-	-		86	87			
3	S00421	0.114	-	-		87	88			
4	S00422	<0.008	-	-		88	89			
5	S00423	0.206	-	-		89	90			
6	S00424	0.035	-	-		90	91			
7	S00425	<0.008	-	-		91	92			
8	S00426	<0.008	-	-		92	93			
9	S00427	<0.008	-	-		93	94			
10	S00428	0.790	-	-		94	95			
11	S00429	0.584	-	-		95	96			
12	S00430	0.038	0.035	-		96	97			
13	S00431	0.020	-	-		97	98			
14	S00432	0.089	-	-		98	99			
15	S00433	0.313	-	-		99	100			
16	S00434	0.012	-	0.010		100	101			
17	S00435	0.059	-	-		101	102			
18	S00436	0.088	-	-		102	103			
19	S00437	0.165	-	-		103	104			
20	S00438	0.088	-	-		104	105			
21	S00439	0.037	-	-		105	106			
22	S00440	0.044	0.034	-		106	107			
23	S00441	0.024	-	-		107	108			
24	S00442	0.014	-	-		108	109			
25	S00443	0.023	-	-		109	110			

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

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974261

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09168	17/12/92		2 OF 3

TUBE No.	SAMPLE No.	Au	Au(R)	Au(S)		From	To			
1	S00444	0.008	-	-		110	111			
2	S00445	0.081	-	-		111	112			
3	S00446	0.011	-	-		112	113			
4	S00447	0.014	-	-		113	114			
5	S00448	0.031	-	-		114	115			
6	S00449	0.009	-	-		115	116			
7	S00450	<0.008	-	-		116	117			
8	S00451	<0.008	-	-		117	118			
9	S00452	0.010	-	<0.008		118	119			
10	S00453	0.091	-	-		119	120			
11	S00454	0.015	-	-		120	121			
12	S00455	<0.008	<0.008	-		121	122			
13	S00456	0.009	-	-		122	123			
14	S00457	<0.008	-	-		123	124			
15	S00458	0.008	-	-		124	125			
16	S00459	0.068	-	-		125	126			
17	S00460	0.059	-	-		126	127			
18	S00461	0.165	-	-		127	128			
19	S00462	<0.008	-	-		128	129			
20	S00463	<0.008	-	-		129	130			
21	S00464	0.008	-	-		130	131			
22	S00465	<0.008	<0.008	-		131	132			
23	S00466	<0.008	-	-		132	133			
24	S00467	<0.008	-	-		133	134			
25	S00468	<0.008	-	-		134	135			

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

AUTHORISED OFFICER

974262

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09168	17/12/92		3 OF 3

TUBE No.	SAMPLE No.	Au	Au(R)	Au(S)		From	To			
1	S00469	<0.008	-	-		135	136			
2	S00470	<0.008	-	<0.008		136	137			
3	S00471	<0.008	-	-		137	138			
4	S00472	<0.008	-	-		138	139			
5	S00473	<0.008	-	-		139	140			
6	S00474	1.830	-	-		140	141			
7	S00475	5.150	-	-		141	142			
8	S00476	1.120	-	-		142	143			
9	S00477	<0.008	-	-		143	144			
10	S00478	1.400	-	-		144	145			
11	S00479	0.016	-	-		145	146			
12	S00480	<0.008	<0.008	-		146	147			
13	S00481	<0.008	-	-		147	148			
14	S00482	<0.008	-	-		148	149			
15	S00483	<0.008	-	<0.008		149	150			
16	S00484	<0.008	-	-		150	151			
17	S00485	<0.008	-	-		151	152			
18	S00486	<0.008	-	-		152	153			
19										
20										
21										
22										
23	DETECTION	0.008	0.008	0.008						
24	UNITS	ppm	ppm	ppm						
25	METHOD	GG309	GG309	GG309						

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

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.
A.C.N. 004 591 684

974263

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

ANALYTICAL REPORT No. 11715.60.09211

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

INVOICE TO:
Mr Grant MacDonald
Plutonic Operations Limited
41 Bass Highway
DELORAINE TAS 7304

ORDER No.	PROJECT
TBA	

DATE RECEIVED	RESULTS REQUIRED
06/01/93	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES
11	16/02/93	1

TOTAL No. OF SAMPLES: 252

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
G00601/720	DC Prep : GP006,GP009,GP012	Cu,Pb,Zn,Ag/GA101
G00721/852		
STD1.		
3m → 267.2m (E.O.H.)		

RESULTS TO
Mr Grant MacDonald
Plutonic Operations Limited
41 Bass Highway
DELORAINE TAS 7304

RESULTS TO

RESULTS TO

REMARKS

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974264

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09211	16/02/93		1 OF 11

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag				From	To.
1	S00601	100	2150	2150	2				3	5
2	S00602	170	500	210	<2				5	7.2
3	S00603	66	290	70	<2				7.2	8.8
4	S00604	94	320	145	<2				8.8	10.2
5	S00605	120	1150	690	<2				10.2	11.2
6	S00606	110	565	210	<2				11.2	12
7	S00607	145	675	515	<2				12.	13
8	S00608	175	515	180	<2				13	14
9	S00609	165	465	200	<2				14	15
10	S00610	175	560	245	<2				15	16
11	S00611	135	565	245	<2				16	17
12	S00612	135	965	385	<2				17	18
13	S00613	110	940	275	<2				18	19
14	S00614	91	940	935	2				19	20
15	S00615	195	885	655	<2				20	21
16	S00616	245	1150	675	4				21	22
17	S00617	145	1800	1250	3				22	25
18	S00618	150	1050	1250	<2				25	26
19	S00619	135	530	705	<2				26	27
20	S00620	110	530	530	<2				27	28
21	S00621	115	750	610	<2				28	29.4
22	S00622	100	175	355	<2				29.4	31.2
23	S00623	65	130	380	<2				31.2	33.0
24	S00624	98	81	380	<2				33.0	34.2
25	S00625	140	175	335	<2				34.2	35.8

Results in ppm unless otherwise specified
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AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974265

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
[redacted]	111715.60.09211	16/02/93		2 OF 11

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag				From	To
[redacted]1	S00626	375	130	205	<2				35.8	38.4
[redacted]2	S00627	315	72	1050	<2				38.4	40
3	S00628	390	56	450	<2				40	41
[redacted]4	S00629	270	22	305	<2				41	42
[redacted]5	S00630	225	42	420	<2				42	43
[redacted]6	S00631	49	41	345	<2				43	44
[redacted]7	S00632	285	11	655	<2				44	46
8	S00633	27	115	755	<2				46	47
[redacted]9	S00634	95	4450	1050	2				47	48.1
10	S00635	24	38	365	<2				48.1	49
[redacted]11	S00636	17	35	100	<2				49	50
[redacted]12	S00637	23	9	115	<2				50	5Φ
13	S00638	59	8	155	<2				5Φ	52
[redacted]14	S00639	82	22	380	<2				52	53
15	S00640	87	430	500	3				53	54
[redacted]16	S00641	17	31	405	<2				54	55
[redacted]17	S00642	51	<5	180	<2				55	56
18	S00643	12	<5	160	<2				56	57
[redacted]19	S00644	10	<5	140	<2				57	58
20	S00645	5	<5	97	<2				58	59
[redacted]21	S00646	22	<5	82	<2				59	60
[redacted]22	S00647	17	260	72	<2				60	61
23	S00648	42	145	100	<2				61	62
[redacted]24	S00649	35	18	110	<2				62	63
25	S00650	77	7	190	<2				63	64

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

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974266

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09211	16/02/93		3 OF 11

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag				From	To
1	S00651	22	33	130	<2				64	65
2	S00652	6	12	135	<2				65	66
3	S00653	20	<5	140	<2				66	67
4	S00654	19	795	115	<2				67	68
5	S00655	9	30	83	<2				68	69
6	S00656	6	41	75	<2				69	70
7	S00657	7	13	140	<2				70	71
8	S00658	7	<5	255	<2				71	72
9	S00659	8	22	225	<2				72	73
10	S00660	53	23	420	<2				73	74
11	S00661	33	3000	3600	2				74	75
12	S00662	86	55	290	<2				75	76
13	S00663	49	695	375	<2				76	77
14	S00664	29	790	535	<2				77	78
15	S00665	51	41	49	<2				78	79
16	S00666	60	29	25	<2				79	80
17	S00667	95	35	27	<2				80	81
18	S00668	7	21	37	<2				81	82
19	S00669	13	100	295	<2				82	83
20	S00670	35	140	420	<2				83	84
21	S00671	10	45	175	<2				84	85
22	S00672	8	13	145	<2				85	86
23	S00673	9	45	86	<2				86	87.5
24	S00674	36	>5000	72	4				87.5	88.4
25	S00675	8	455	81	<2				88.4	89

Results in ppm unless otherwise specified
T = element present: but concentration too low to measure.
X = element concentration is below detection limit
– = element not determined

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 [illegible] 664

974267

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09211	16/02/93		4 OF 11

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag				From	To
1	S00676	11	105	90	<2				89	90
2	S00677	14	105	105	<2				90	91
3	S00678	13	205	90	<2				91	92
4	S00679	9	76	195	<2				92	93
5	S00680	13	21	225	<2				93	94
6	S00681	23	39	200	<2				94	95
7	S00682	20	120	130	<2				95	96
8	S00683	19	135	79	<2				96	97
9	S00684	80	110	145	<2				97	98
10	S00685	100	21	140	<2				98	99
11	S00686	31	14	94	<2				99	100
12	S00687	32	11	115	<2				100	101
13	S00688	10	27	61	<2				101	102
14	S00689	68	12	145	<2				102	103
15	S00690	41	15	125	<2				103	104
16	S00691	73	26	110	<2				104	105
17	S00692	44	53	130	<2				105	106
18	S00693	38	96	95	<2				106	107
19	S00694	62	11	62	<2				107	108
20	S00695	22	27	47	<2				108	109
21	S00696	34	16	80	<2				109	110
22	S00697	25	59	71	<2				110	111
23	S00698	35	37	130	<2				111	112
24	S00699	25	46	200	<2				112	113
25	S00700	46	10	165	<2				113	114

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

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974268

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09211	16/02/93		5 OF 11

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag				From	To
1	S00701	39	<5	100	<2				114	115
2	S00702	17	<5	92	<2				115	116
3	S00703	9	<5	115	<2				116	117
4	S00704	17	27	165	<2				117	118
5	S00705	12	91	220	<2				118	119
6	S00706	28	69	185	<2				119	120
7	S00707	14	150	240	<2				120	121
8	S00708	21	74	250	<2				121	122
9	S00709	96	56	210	<2				122	123
10	S00710	50	6	125	<2				123	124
11	S00711	33	7	155	<2				124	125
12	S00712	15	<5	190	<2				125	126
13	S00713	20	24	235	<2				126	127
14	S00714	20	85	130	<2				127	128
15	S00715	5	<5	58	<2				128	129
16	S00716	11	<5	62	<2				129	130
17	S00717	10	<5	73	<2				130	131
18	S00718	12	<5	95	<2				131	132
19	S00719	46	190	260	<2				132	133
20	S00720	33	14	81	<2				133	134
21	S00721	46	390	125	<2				134	135
22	S00722	24	180	140	<2				135	136
23	S00723	61	1750	840	3				136	137
24	S00724	65	47	115	<2				137	138
25	S00725	32	20	92	<2				138	139

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

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974269

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09211	16/02/93		6 OF 11

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag				From	To
1	S00726	48	29	145	<2				139	140
2	S00727	20	10	125	<2				140	141
3	S00728	14	100	120	<2				141	142
4	S00729	10	32	88	<2				142	143
5	S00730	11	60	69	<2				143	144
6	S00731	9	1450	315	2				144	145
7	S00732	20	2700	1700	3				145	146
8	S00733	21	320	160	2				146	147
9	S00734	34	31	84	2				147	148
10	S00735	45	42	105	2				148	149
11	S00736	43	99	175	<2				149	150
12	S00737	40	140	255	<2				150	151
13	S00738	25	<5	67	<2				151	152
14	S00739	47	<5	98	<2				152	153
15	S00740	<4	<5	110	<2				153	154
16	S00741	32	<5	105	<2				154	155
17	S00742	18	<5	88	<2				155	156
18	S00743	59	<5	57	<2				156	157
19	S00744	13	<5	58	<2				157	158
20	S00745	18	21	59	<2				158	159
21	S00746	46	105	130	<2				159	160
22	S00747	34	50	105	<2				160	161
23	S00748	20	340	160	<2				161	162
24	S00749	72	375	560	<2				162	163
25	S00750	61	73	140	<2				163	164

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

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974270

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09211	16/02/93		7 OF 11

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag				From	To
1	S00751	15	25	110	<2				164	165
2	S00752	46	<5	62	<2				165	166
3	S00753	8	9	155	<2				166	167
4	S00754	75	7	47	<2				167	168
5	S00755	<4	24	44	<2				168	169
6	S00756	11	36	80	<2				169	170
7	S00757	59	37	62	<2				170	171
8	S00758	27	46	115	<2				171	172
9	S00759	36	21	170	<2				172	173
10	S00760	115	86	235	<2				173	174
11	S00761	135	1000	3800	<2				174	175
12	S00762	150	545	1250	<2				175	176
13	S00763	125	185	96	<2				176	177
14	S00764	43	24	43	<2				177	178
15	S00765	45	36	30	<2				178	178.9
16	S00766	18	15	25	<2				178.9	180.2
17	S00767	6	<5	69	<2				180.2	181
18	S00768	13	10	51	<2				181	182
19	S00769	11	8	50	<2				182	183
20	S00770	5	16	22	<2				183	184
21	S00771	4	9	110	<2				184	185
22	S00772	34	8	120	<2				185	186
23	S00773	<4	<5	60	<2				186	187
24	S00774	6	<5	55	<2				187	188
25	S00775	17	<5	73	<2				188	189

Results in ppm unless otherwise specified
T = element present: but concentration too low to measure
X = element concentration is below detection limit
- = element not determined

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974271

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09211	16/02/93		8 OF 11

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag				From	To
1	S00776	28	13	63	<2				189	190
2	S00777	33	7	51	<2				190	191
3	S00778	54	10	61	<2				191	192
4	S00779	13	5	66	<2				192	193
5	S00780	52	11	88	<2				193	194
6	S00781	5	<5	105	<2				194	195
7	S00782	36	17	100	<2				195	196
8	S00783	62	30	95	<2				196	197
9	S00784	50	56	89	<2				197	198
10	S00785	54	17	61	<2				198	199
11	S00786	35	7	81	<2				199	200
12	S00787	13	5	72	<2				200	201
13	S00788	28	32	67	<2				201	202
14	S00789	22	8	61	<2				202	203
15	S00790	47	29	72	<2				203	204
16	S00791	67	14	100	<2				204	205
17	S00792	72	5	75	<2				205	206
18	S00793	14	8	61	<2				206	207
19	S00794	<4	9	14	<2				207	208
20	S00795	<4	7	13	<2				208	209
21	S00796	<4	6	10	<2				209	210
22	S00797	<4	5	20	<2				210	211
23	S00798	94	5	56	<2				211	212
24	S00799	160	13	46	<2				212	213
25	S00800	44	5	75	<2				213	214

Results in ppm unless otherwise specified
T = element present, but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974272

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09211	16/02/93		9 OF 11

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag				From	To
1	S00801	97	43	145	<2				214	215
2	S00802	50	865	185	<2				215	216
3	S00803	100	300	225	<2				216	217
4	S00804	30	74	325	<2				217	218
5	S00805	24	3100	420	2				218	219
6	S00806	48	1100	320	<2				219	220
7	S00807	74	11	210	<2				220	221
8	S00808	54	56	125	<2				221	222
9	S00809	130	22	125	<2				222	223
10	S00810	105	2300	225	2				223	224
11	S00811	35	110	180	<2				224	225
12	S00812	20	235	115	<2				225	226
13	S00813	52	530	405	<2				226	227
14	S00814	125	1750	950	2				227	228
15	S00815	13	110	155	<2				228	229
16	S00816	490	63	110	<2				229	230
17	S00817	51	94	180	<2				230	231
18	S00818	135	1000	1100	2				231	232
19	S00819	115	1350	1350	7				232	233
20	S00820	85	315	800	3				233	234
21	S00821	16	165	245	<2				234	235
22	S00822	74	125	455	<2				235	236
23	S00823	69	315	565	2				236	237
24	S00824	34	265	405	<2				237	238
25	S00825	47	265	485	<2				238	239

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
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AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974273

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09211	16/02/93		10 OF 11

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag			From	To
1	S00826	155	200	240	<2			239	240
2	S00827	85	120	120	<2			240	241
3	S00828	130	1950	99	2			241	242
4	S00829	58	130	160	<2			242	243
5	S00830	49	1850	150	<2			243	244
6	S00831	46	505	150	<2			244	245
7	S00832	105	705	580	<2			245	246
8	S00833	190	570	975	<2			246	246.9
9	S00834	8	51	135	<2			246.9	248
10	S00835	52	400	1150	<2			248	249
11	S00836	55	1100	1600	2			249	250
12	S00837	4	63	90	<2			250	251
13	S00838	10	42	105	<2			251	251.8
14	S00839	61	220	225	<2			251.8	253.2
15	S00840	8	11	36	<2			253.2	255
16	S00841	7	14	41	<2			255	256
17	S00842	4	6	13	<2			256	257
18	S00843	<4	9	11	<2			257	258
19	S00844	<4	<5	13	<2			258	259
20	S00845	5	<5	15	<2			259	260
21	S00846	<4	<5	11	<2			260	261
22	S00847	7	<5	42	<2			261	262
23	S00848	<4	<5	19	<2			262	263
24	S00849	9	11	19	<2			263	264
25	S00850	29	36	26	<2			264	265

Results in ppm unless otherwise specified
T = element present but concentration too low to measure
X = element concentration is below detection limit
-- = element not determined

AUTHORISED OFFICER

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A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974274

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09211	16/02/93		11 OF 11

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag				From	To
1	S00851	10	29	19	<2				265	266
2	S00852	<4	<5	17	<2				266	267.2
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	4	5	4	2					
24	UNITS	ppm	ppm	ppm	ppm					
25	METHOD	GA101	GA101	GA101	GA101					

Results in ppm unless otherwise specified
T = element present: but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

AUTHORISED OFFICER

ANALABS

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

974275

Phone (004) 316837 | 14 Thirkell St. CODEE TAS 7320 | Fax (004) 313890

ANALYTICAL REPORT No. 11715.60.09266

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

INVOICE TO:
Mr Grant MacDonald
Plutonic Operations Limited
41 Bass Highway
DELORAINE TAS 7304

ORDER No.	PROJECT
TBA	

DATE RECEIVED	RESULTS REQUIRED
02/02/93	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
2	16/02/93	1	39

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
S00871/93	DC Prep : GP033,GP034	Cu,Pb,Zn/GA101, Cu,Pb,Zn/GA104
S00901/09,S00911,S00912	SO Prep : GP001,GP006	Au/GA340
LBD1 extended (also some EL 7/92 results).		

RESULTS TO
Mr Grant MacDonald
Plutonic Operations Limited
41 Bass Highway
DELORAINE TAS 7304

RESULTS TO

RESULTS TO

REMARKS

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974276

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09266	16/02/93	2.2.93	1 OF 2

TUBE No.	SAMPLE No.	Cu	Cu	Pb	Pb	Zn	Zn	Au ppm.	From	To.
1	S00871	825	-	510	-	470	-	-	206.4	207.4
2	S00872	2200	-	245	-	690	-	-	214	215
3	S00873	705	-	105	-	195	-	-	215	216
4	S00874	4300	-	70	-	145	-	-	216	216.4
5	S00875	3250	-	34	-	105	-	-	216.4	217
6	S00876	2100	-	22	-	80	-	-	217	218.15
7	S00877	1650	-	25	-	100	-	-	218.15	219
8	S00878	1400	-	25	-	110	-	0.012	219	220
9	S00879	4150	-	1600	-	9050	-	0.026	220	222
10	S00880	>10000	1.32	2100	0.20	>10000	1.02	0.118	222	223.3
11	S00881	>10000	1.79	445	0.05	1400	-	0.084	223.3	224
12	S00882	3100	-	1200	-	8750	-	-	234	235
13	S00883	795	-	1200	-	665	-	-	235	236
14	S00884	3650	-	2950	-	2850	-	-	236	237
15	S00885	5900	-	1900	-	9600	-	-	237	238
16	S00886	2500	-	2100	-	7750	-	0.829	238	239
17	S00887	>10000	3.62	4200	0.57	8500	-	0.312	239	240
18	S00888	6500	-	1200	-	2300	-	-	240	242.9
19	S00889	>10000	1.57	>5000	1.18	7050	-	-	242.9	244
20	S00890	8300	0.95	>5000	1.49	>10000	1.04	0.044	244	245
21	S00891	10000	-	4350	-	3600	-	0.057	245	246.1
22	S00892	>10000	1.74	2400	0.24	5650	-	0.058	246.1	247
23	S00893	>10000	1.07	78	-	440	-	0.032	247	249
24	S00894	9000	-	39	-	90	-	-	249	250
25	S00895	>10000	1.47	195	-	500	-	-	250	251

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

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974277

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09266	16/02/93	2.2.93	2 OF 2

TUBE No.	SAMPLE No.	Cu	Cu	Pb	Pb	Zn	Zn	Au ppm	From	To
1	S00896	3500	-	68	-	48	-	-	252.5	253.5
2	S00897	5450	-	163	-	125	-	0.026	253.5	254.5
3	S00898	>10000	1.83	>5000	0.59	4200	-	0.039	283.2	283.6
4	S00901	-	-	-	-	-	-	0.57	⇑	
5	S00902	-	-	-	-	-	-	0.07		
6	S00903	-	-	-	-	-	-	0.07		
7	S00904	-	-	-	-	-	-	0.84		
8	S00905	-	-	-	-	-	-	0.12		
9	S00906	-	-	-	-	-	-	<0.05		
10	S00907	-	-	-	-	-	-	<0.05		
11	S00908	-	-	-	-	-	-	0.05		
12	S00909	-	-	-	-	-	-	0.24		
13	S00911	-	-	-	-	-	-	0.26		
14	S00912	-	-	-	-	-	-	0.34	⇓	
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	4	0.01	5	0.01	4	0.01	0.05		
24	UNITS	ppm	%	ppm	%	ppm	%	ppb		
25	METHOD	GA101	GA104	GA101	GA104	GA101	GA104	GG340		

Au ppb

results 7/92 EL

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

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.
A.C.N. 004 591 884

974278

Phone (004) 316837 | 14 Thirkell St. COOEE TAS 7320 | Fax (004) 313890

ANALYTICAL REPORT No. 111715.60.09281

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

INVOICE TO:
Mr Grant MacDonald
Plutonic Operations Limited
41 Bass Highway
DELORAINE TAS 7304

ORDER No.	PROJECT
TBA	

DATE RECEIVED	RESULTS REQUIRED
05/02/93	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES
2	18/02/93	1

TOTAL No. OF SAMPLES: 24

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
00878/881,886/887,890/893, 897/898, LBD1 ext 900634,661,674,723,732,761,805, 810,816,818,830,836 STD1	PU Prep :	Au,Au(R)/66309

RESULTS TO
Mr Grant MacDonald
Plutonic Operations Limited
41 Bass Highway
DELORAINE TAS 7304

RESULTS TO

RESULTS TO

REMARKS

AUTHORISED OFFICER

ANALABS

974279

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09281	18/02/93	5.2.93 PHONE	1 OF 2

TUBE No.	SAMPLE No.	Au	Au(R)			From	To			
1	S00878	0.012	-	↑		219	220			
2	S00879	0.026	-			220	222			
3	S00880	0.118	-			222	223.3			
4	S00881	0.084	-			223.3	224			
5	S00886	0.029	-	Ext.		238	239			
6	S00887	0.312	-			239	240			
7	S00890	0.044	-	LBD1		244	245			
8	S00891	0.057	-			245	246.1			
9	S00892	0.058	-			246.1	247			
10	S00893	0.032	0.032			247	249			
11	S00897	0.026	-			253.5	254.5			
12	S00898	0.039	0.040	↓↑		283.2	283.6			
13	S00634	<0.008	-	↓↑		47	48.1			
14	S00661	<0.008	-			74	75			
15	S00674	<0.008	-			87.5	88.4			
16	S00723	<0.008	-			136	137			
17	S00732	0.013	-	STD1		145	146			
18	S00761	<0.008	-			174	175			
19	S00805	<0.008	-			218	219			
20	S00810	<0.008	-			223	224			
21	S00816	0.023	-			229	230			
22	S00818	<0.008	<0.008			231	232			
23	S00830	<0.008	-			243	244			
24	S00836	<0.008	-	↓		249	250			
25										

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

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974280

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09281	18/02/93	5.2.93 PHONE	2 OF 2

TUBE No.	SAMPLE No.	Au	Au(R)							
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	0.008	0.008							
24	UNITS	ppm	ppm							
25	METHOD	GG309	GG309							

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

AUTHORISED OFFICER

ANALABS

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

974281

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

ANALYTICAL REPORT No. 11715.60.09510

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

INVOICE TO:
Mr Grant MacDonald
Plutonic Operations Limited
41 Bass Highway
DELORAINE TAS 7304

ORDER No.	PROJECT
2005688	

DATE RECEIVED	RESULTS REQUIRED
18/05/93	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
4	20/05/93	1	80

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
0109 /501607 NOT CONTINUOUS Regional rock chip. for sample locations see plan No 2.	RG Prep : GP006,GP009,GP018	Cu,Pb,Zn/GA101

REMARKS

RESULTS TO
Mr Grant MacDonald
Plutonic Operations Limited
41 Bass Highway
DELORAINE TAS 7304

RESULTS TO

RESULTS TO

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974282

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09510	28/05/93	2005688	1 OF 4

TUBE No.	SAMPLE No.	Cu	Pb	Zn	
1	S00108	12	12	86	felsic volcaniclastic / quartz sericite altered Schistose
2	S00109	11	11	21	"
3	S01203	11	7	45	mod. sericite altered fine grained siltstone.
4	S01204	7	6	35	strongly limonitic dark green/purple siltstone
5	S01207	46	19	103	haematitic quartz sericite schist
6	S01221	9	<5	48	"
7	S01222	9	<5	114	quartz vein
8	S01225	93	9	194	limonitic pods in qtz feldspar rich sed.
9	S01226	16	10	47	limonitic quartz vein.
10	S01227	157	<5	326	limonitic pods in green intermediate ^ derived siltstone
11	S01228	14	<5	73	see 4 for key q fsp r sts fc volc w lmc spots
12	S01233	9	22	107	int mass flows w q and fsp's
13	S01234	16	887	43	fsp > q r sed's
14	S01244	12	9	48	fg fsp > q r sed's
15	S01250	63	<5	57	
16	S01256	11	<5	132	
17	S01265	10	<5	21	fc volc
18	S01267	11	16	36	fc lava breccia
19	S01279	7	<5	45	cherty clasts in lmc sts ser altd MR
20	S01283	13	<5	87	
21	S01284	16	<5	46	lmt q r sed
22	S01285	28	<5	54	lmt q vn
23	S01286	10	6	77	
24	S01287	16	9	62	
25	S01288	16	9	173	

Results in ppm unless otherwise specified
T = element present, but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

AUTHORISED OFFICER Keith Hand

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974283

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09510	28/05/93	2005688	2 OF 4

TUBE No.	SAMPLE No.	Cu	Pb	Zn	
1	S01322	8	102	26	fsp > q crystal tuff w hmt vn's
2	S01328	6	<5	13	red weathering lmc stg fc volc
3	S01329	6	20	37	q fsp volc w hmt pods.
4	S01352	50	<5	28	q fsp serd fc volc
5	S01353	34	<5	46	"
6	S01354	85	14	56	"
7	S01356	13	<5	48	dacitic lava breccia
8	S01357	18	13	52	hmt vein
9	S01408A	25	7	76	hmt fg fsp rich sed's
10	S01408B	33	<5	62	"
11	S01420	11	<5	16	felsic lava breccia
12	S01422	12	<5	8	(Ordovician?) cherty hmt siliceous sediment
13	S01433	33	43	12	
14	S01434A	9	<5	98	
15	S01434B	11	<5	117	
16	S01438	210	<5	60	hmt sed's.
17	S01439	263	14	57	silicified fractured hmt volc
18	S01443	15	<5	7	Roland conglomerate ?
19	S01456	12	<5	50	hb(?) fsp ph mafic lava
20	S01464	8	6	28	q fsp serd fc volc
21	S01467	20	14	97	lmc q vn
22	S01468	6	103	42	q fsp serd fc volc
23	S01470	10	9	17	q vn w lmc clots
24	S01471	<4	<5	14	q fsp serd fc lmc
25	S01473	5	<5	32	purple hmt q ad lithic rich sediment

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A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974284

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09510	28/05/93	2005688	3 OF 4

TUBE No.	SAMPLE No.	Cu	Pb	Zn		
1	S01474A	6	<5	227		q fsp serd fe volc
2	S01474B	5	<5	15		andesitic lava
3	S01480	4	<5	30		q fsp ph rhyolitic lava?
4	S01483	4	<5	19		q fsp fe volc serd
5	S01491	6	8	35		q r sts serd fe volc w hmt vn's
6	S01492	5	146	121		q r sts serd fe volc
7	S01498	9	<5	14		q fsp rich sed
8	S01501	104	2769	1248		↑ hmt vn
9	S01503	468	2342	5740		hmt vn.
10	S01505	137	114	471	q porphyry	Cog Range reconnaissance samples —
11	S01507	40	445	1348	hmt vn	see text for approximate locations
12	S01508	31	57	170	q porphyry	↓
13	S01509	7	5	23		↑
14	S01510	6	<5	23		
15	S01511	137	26	30		
16	S01512	7	<5	20		
17	S01513	5	8	24		all leached but haematitic
18	S01514	10	361	242		fine to medium grained
19	S01515	9	<5	21		schistose felsic volcaniclastics
20	S01516	5	<5	23		from 'campground'
21	S01517	8	11	74		
22	S01518	15	<5	39		
23	S01520	16	240	123		↓
24	S01601	7	5	28		q r fe volc lmc.
25	S01602	19	130	50		q r fe volc sy serd w hmt vn's

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AUTHORISED OFFICER Keith Hand

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A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974285

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09510	28/05/93	2005688	4 OF 4

TUBE No.	SAMPLE No.	Cu	Pb	Zn	
1	S01603	13	21	51	q r fc volc sy serd w hmt vn's
2	S01604	7	17	50	q r fc serd volc stg.
3	S01605	342	<5	100	very ~~brown~~ hmt cherty conglomerate?
4	S01606	339	<5	118	"
5	S01607	314	<5	123	"
6					
7	altd	altered			
8	~~fc~~ fc	felsic			
9	~~fg~~ fg	fine grained			
10	fsp	feldspar			
11	hb	hornblende			
12	~~hmt~~	haematite/haematitic			
13	int	intermediate			
14	lmc	limonitic			
15	~~mx~~ mx	matrix			
16	ph	phyric			
17	q	quartz			
18	r	rich			
19	ser	sericite			
20	stg	schistose			
21	sy	strongly			
22	vn	vein			
23	volc	volcaniclastic with			
24	DETECTION	4	5	4	
25	UNITS	ppm	ppm	ppm	
	METHOD	GA101	GA101	GA101	

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

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

974286

Phone (049) 31[illegible]37 | 14 Thirkell St. DEVEE TAS 7320 | Fax (049) 3[illegible]90

ANALYTICAL REPORT No. [illegible]

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

INVOICE TO: [illegible]

ORDER No.	PROJECT

DATE RECEIVED	RESULTS REQUIRED
[illegible]	[illegible]

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES
[illegible]	[illegible]	[illegible]

TOTAL No. OF SAMPLES: [illegible]

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
[illegible]	SG Area : SP006,SP009,SP018	Cu,Pb,Zn,Ag/E8101 Au/S8309

Rock chips from Cethana West & Lake Barrington prospect,

REMARKS

RESULTS TO: [illegible]

RESULTS TO:

RESULTS TO:

AUTHORISED OFFICER

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

974287

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
[redacted]	111715.60.09047	26/10/92		1 OF 1

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	Au			
1	S00110	36	47	395	<2	-	Cethana West		fine grained vitric tuff/arenite siltstone
2	S00111	19	33	15	<2	-	"	"	black shale
3	S00112	110	185	16	<2	-	"	"	manganese stained felsic volc
4	S00113	50	745	615	<2	0.009	"	"	haematite chloritic volcaniclastic.
5	S00114	37	26	105	<2	-	"	"	haematite chlorite schist
6	S00115	130	70	425	<2	-	"	"	"
7	S00116	68	88	395	<2	-	"	"	fine grained chlorite haematite schist
8	S00117	12	<5	120	<2	-	Late Barrington prospect		
9	S00118	125	<5	25	<2	-	"	"	haematitic breccia
10	S00119	385	<5	325	<2	-	"	"	"
11	S00120	135	<5	110	<2	-	"	"	haematitic clasts breccia
12	S00121	330	<5	100	<2	-	"	"	" with shale clasts.
13	S00122	125	430	46	<2	-	Cethana West		haematite chlorite schist.
14									
15									
16									
17									
18									
19									
20									
21									
22									
23	DETECTION	4	5	4	2	0.008			
24	UNITS	ppm	ppm	ppm	ppm	ppm			
25	METHOD	GA101	GA101	GA101	GA101	GG309			

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

AUTHORISED OFFICER

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

Phone (004) 316837 | 14 Thirkell St. CROSE TAS 7320 | Fax (004) 316890

ANALYTICAL REPORT No. 111715.60.09016

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

INVOICE TO:
Mr Grant MacDonald
Plutonic Operations Limited
41 Bass Highway
DELORAINE TAS 7304

ORDER No.	PROJECT
2002784	

DATE RECEIVED	RESULTS REQUIRED
23/09/92	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
3	20/10/92	1	66

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
SR10042/10107 SR10,059,061,091,097,105 Cethana West C-horizon soils. 700E 900E (& 1000E) 1100E	SR Prep : GP006,GP018	Cu,Pb,Zn,Mn/GA140 Au/GE309,Ba/GX401

RESULTS TO
Mr Grant MacDonald
Plutonic Operations Limited
41 Bass Highway
DELORAINE TAS 7304

RESULTS TO

RESULTS TO

REMARKS

AUTHORISED OFFICER

974289

ANALABS

A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.
A.C.N. 004 591 684

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09016	20/10/92	2002784	1 OF 3

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Mn	Au	Ba			
1	SR10042	50	140	61	96	-	-		Cethana West 1100E	4575N
2	SR10043	12	40	35	24	-	-		"	4562.5N
3	SR10044	4	71	44	17	-	-		"	4550N
4	SR10045	3	12	34	40	-	-		"	4537.5N
5	SR10046	3	14	31	12	-	-		"	4525N
6	SR10047	5	86	21	13	-	-		"	4512.5N
7	SR10048	7	17	19	9	-	-		"	4500N
8	SR10049	6	11	22	28	-	-		"	4487.5N
9	SR10050	4	5	44	27	-	-		"	4475N
10	SR10051	3	13	39	77	-	-		"	4450N
11	SR10052	4	21	50	47	-	-		"	4425N
12	SR10053	4	26	29	14	-	-		"	4400N
13	SR10054	6	11	18	11	-	-		"	4375N
14	SR10055	4	15	25	11	-	-		"	4350N
15	SR10056	3	8	13	10	-	-		"	4325N
16	SR10057	24	7	62	30	-	-		"	4300N
17	SR10058	5	18	19	14	-	-		"	4275N
18	SR10059	23	490	240	63	0.010	2550		Cethana West 900E	4450N
19	SR10060	48	145	68	33	-	-		"	4437.5N
20	SR10061	105	510	200	18	0.053	1850		"	4425N
21	SR10062	3	330	16	13	-	-		"	4412.5N
22	SR10063	4	7	6	26	-	-		"	4400N
23	SR10064	4	14	13	26	-	-		"	4387.5N
24	SR10065	5	9	5	18	-	-		"	4375N
25	SR10066	4	8	4	21	-	-		"	4362.5N

Results in ppm unless otherwise specified
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A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.
A.C.N. 004 591 664

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09016	20/10/92	2002784	2 OF 3

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Mn	Au	Ba			
1	SR10067	4	7	2	20	-	-		Cethana West 900E	4350N
2	SR10068	3	15	8	12	-	-		"	4325N
3	SR10069	3	13	9	16	-	-		"	4300N
4	SR10070	3	8	6	17	-	-		"	4275N
5	SR10071	3	26	46	13	-	-		"	4250N
6	SR10072	3	8	3	19	-	-		"	4225N
7	SR10073	17	9	91	105	-	-		"	4200N
8	SR10074	3	10	20	15	-	-		"	4175N
9	SR10075	3	4	14	9	-	-		"	4150N
10	SR10076	3	27	15	7	-	-		"	4125N
11	SR10077	4	22	27	13	-	-		Cethana West 1000E	4925N
12	SR10078	2	7	14	7	-	-		"	4950N
13	SR10079	4	9	11	12	-	-		"	4975N
14	SR10080	3	7	17	8	-	-		"	5000N
15	SR10081	3	6	11	7	-	-		"	5025N
16	SR10082	11	19	50	21	-	-		Cethana West 700E	4750N
17	SR10083	6	35	23	39	-	-		"	4737.5N
18	SR10084	8	54	28	60	-	-		"	4725N
19	SR10085	28	55	81	325	-	-		"	4712.5N
20	SR10086	19	120	36	48	-	-		"	4700N
21	SR10087	57	98	110	485	-	-		"	4687.5N
22	SR10088	26	73	67	325	-	-		"	4675N
23	SR10089	28	59	71	160	-	-		"	4662.5N
24	SR10090	17	57	100	190	-	-		"	4650N
25	SR10091	23	170	125	130	<0.008	990		"	4625N

Results in ppm unless otherwise specified
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A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.
A.C.N. 004 691 954

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09016	20/10/92	2002784	3 OF 3

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Mn	Au	Ba			
1	SR10092	12	170	23	49	-	-		Cathar West 700E	4600 N
2	SR10093	22	120	58	130	-	-		"	4575 N
3	SR10094	20	145	51	43	-	-		"	4550 N
4	SR10095	10	105	34	62	-	-		"	4525 N
5	SR10096	7	74	25	45	-	-		"	4500 N
6	SR10097	20	230	120	46	<0.008	1700		"	4475 N
7	SR10098	15	72	85	135	-	-		"	4450 N
8	SR10099	21	46	67	62	-	-		"	4425 N
9	SR10100	14	220	50	60	-	-		"	4400 N
10	SR10101	20	75	65	105	-	-		"	4375 N
11	SR10102	9	23	40	70	-	-		"	4350 N
12	SR10103	88	60	73	705	-	-		"	4325 N
13	SR10104	24	20	40	62	-	-		"	4300 N
14	SR10105	91	160	245	315	<0.008	1750		"	4275 N
15	SR10106	54	280	71	605	-	-		"	4250 N
16	SR10107	69	210	91	1100	-	-		"	4225 N
17										
18										
19										
20										
21										
22										
23	DETECTION	2	3	2	3	0.008	10			
24	UNITS	ppm	ppm	ppm	ppm	ppm	ppm			
25	METHOD	GA140	GA140	GA140	GA140	GG309	GX401			

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A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.
A.C.N. 004 581 564

974292

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

ANALYTICAL REPORT No. 111715.60.09634

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

INVOICE TO:

Mr Grant MacDonald
Pluton1c Operations Limited
112 Best Street
DEVONPORT TAS 7310

ORDER No.	PROJECT
TBA	

DATE RECEIVED	RESULTS REQUIRED
19/07/93	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
1	30/07/93	1	71

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
G01859,872,866,857,846	Prep : GP006,GP009,GP012	Au/GG309
G01765/873 Not Continuous Cethana West rock chip with some Cethana East rock chips and 300W Staverton.		Cu,Pb,In/GA101 Pb,In/GA104

REMARKS

RESULTS TO

Mr Grant MacDonald
Pluton1c Operations Limited
112 Best Street
DEVONPORT TAS 7310

RESULTS TO

RESULTS TO

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974293

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09634	30/07/93	TBA	1 OF 3

TUBE No.	SAMPLE No.	Cu	Pb	Pb	Zn	Zn	Au		
1	S01753	13	23	-	111	-	-	Staverton 300W	soil 0N
2	S01754	14	24	-	106	-	-	"	25N
3	S01755	10	5	-	37	-	-	"	50N
4	S01756	9	5	-	67	-	-	"	75N
5	S01757	10	22	-	22	-	-	"	100N
6	S01758	13	8	-	108	-	-	"	125N
7	S01759	14	20	-	76	-	-	"	150N
8	S01760	12	6	-	80	-	-	"	175N
9	S01761	7	<5	-	27	-	-	"	200N
10	S01762	7	5	-	42	-	-	"	250N
11	S01763	6	<5	-	25	-	-	"	300N
12	S01764	7	<5	-	23	-	-	"	350N
13	S01765	14	5	-	31	-	-	"	400N
14	S01766	7	10	-	27	-	-	"	450N
15	S01767	14	<5	-	25	-	-	"	500N
16	S01768	11	<5	-	20	-	-	"	550N
17	S01803	6	<5	-	24	-	rocks ↓ -	Staverton 17m ck 500W	Creek from lake to 500W 550N, 0m at lak
18	S01804	6	<5	-	62	-	-	46m ck	
19	S01805	5	<5	-	66	-	-	103m ck	
20	S01806	5	9	-	110	-	-	250m ck	ie 500W 550N.
21	S01807	6	<5	-	71	-	-	Staverton 500W	566N
22	S01808	5	<5	-	12	-	-	"	604N
23	S01809	7	<5	-	23	-	-	"	613N
24	S01810	4	<5	-	36	-	-	"	634N
25	S01811	8	8	-	29	-	-	"	645N

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A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974294

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09634	30/07/93	TBA	2 OF 3

TUBE No.	SAMPLE No.	Cu	Pb	Pb	Zn	Zn	Au			
1	S01812	11	15	-	98	-	-	Rocks 500W Steverton	684N	
2	S01813	5	<5	-	50	-	-	"	770N	
3	S01814	7	<5	-	39	-	-	"	825N	
4	S01815	8	<5	-	32	-	-	"	870N	
5	S01816	9	9	-	44	-	-	"	873N	
6	S01831	51	<5	-	148	-	-	Cethana West	DIGHEM 26xJ rock chips, follow up	
7	S01832	6	<5	-	25	-	-			
8	S01833	10	29	-	39	-	-			
9	S01834	14	11	-	31	-	-			
10	S01835A	20	85	-	89	-	-			
11	S01835B	8	21	-	33	-	-			
12	S01836	21	21	-	34	-	-			
13	S01837	11	19	-	32	-	-			
14	S01838	6	8	-	25	-	-			
15	S01839	26	122	-	56	-	-			
16	S01840	9	20	-	44	-	-			
17	S01841	35	63	-	180	-	-			
18	S01842	75	325	-	325	-	-			
19	S01843	70	186	-	194	-	-			
20	S01844	242	329	-	341	-	-			
21	S01846	26	535	-	53	-	0.016			
22	S01847	50	157	-	400	-	-			
23	S01848	8	7	-	52	-	-			
24	S01851	32	125	-	3149	-	-	Cethana 20900E	East soils ON	
25	S01852	63	163	-	116	-	-	"	25N	

Cethana West rock chips
Locations shown on 1:2500

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

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974295

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09634	30/07/93	TBA	3 OF 3

TUBE No.	SAMPLE No.	Cu	Pb	Pb	Zn	Zn	Au			
1	S01853	10	55	–	31	–	–	CE soil 20900E	50N	
2	S01854	33	79	–	149	–	–	"	75N	
3	S01855	14	147	–	498	–	–	Check sample	DDH 86CC13	
4	S01856	87	331	–	800	–	<0.008	209.0m	DD86CC13	
5	S01857	10	105	–	307	–	<0.008	180.20m	DD86CC12	
6	S01858	31	2205	–	186	–	–	207.80m	DD86CC13	
7	S01859	402	>5000	1.10	>10000	2.37	0.009	39.0m	DD77CC6	
8	S01860	12	86	–	260	–	–	186.50m	DD86CC12	
9	S01861	39	448	–	201	–	–	haematitic sericitic	fine grained	Lorinna Road shale
10	S01862	26	1738	–	145	–	–	Cethana East rocks. creamy cherty sediment		
11	S01863	18	732	–	110	–	–	dark grey graphitic	shale	
12	S01864	20	270	–	30	–	–	creamy cherty	sediment	
13	S01865	21	551	–	160	–	–	"	"	with haematite veins
14	S01866	36	436	–	147	–	–	"	"	"
15	S01867	44	2905	–	965	–	–	"	"	"
16	S01868	20	591	–	74	–	–	"	"	"
17	S01869	30	4839	–	623	–	–	fine grained	siltstone	with magnetite
18	S01870	114	2103	–	1260	–	–		"	
19	S01871	25	2415	–	63	–	–		"	
20	S01872	20	506	–	1315	–	<0.008	strongly silicified manganese	brecciated haematitic	siltstone.
21	S01873	224	1895	–	367	–	↓	creamy cherty siltstone with haematitic pods.		
22										
23	DETECTION	4	5	0.01	4	0.01	0.008			
24	UNITS	ppm	ppm	%	ppm	%	ppm			
25	METHOD	GA101	GA101	GA104	GA101	GA104	GG309			

Locations on Cethana East 1:2500 geology

Results in ppm unless otherwise specified
T = element present, but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

AUTHORISED OFFICER

ANALABS

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

974296

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

ANALYTICAL REPORT No. 111715.60.09605

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

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

ORDER No.	PROJECT
TBA	

DATE RECEIVED	RESULTS REQUIRED
30/06/93	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
8	09/07/93	1	185

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
501527/551,560/583,585/592, 594/603,605/618,620/642,645/649, 651/654,656/659,719/752,759/802	Prep : GP006,GP009,GP012,GP018	Cu,Pb,Zn/GA101 Au,Au(R),Au(S)/GG309

Rock chips and C-horizon soils Cethana West, Regional and Cethana East. (and Bell Mount assays)

REMARKS

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

RESULTS TO

RESULTS TO

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

ANALYTICAL DATA

974297

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09605	09/07/93	TBA	1 OF 8

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Au	Au(R)	Au(S)	
1	S01527	<4	35	20	-	-	-	
2	S01528	6	42	138	-	-	-	
3	S01529	5	35	35	-	-	-	
4	S01530	9	42	24	-	-	-	
5	S01531	<4	33	15	-	-	-	
6	S01532	5	39	36	-	-	-	
7	S01533	15	44	39	-	-	-	
8	S01534	7	38	64	-	-	-	
9	S01535	39	70	51	-	-	-	
10	S01536	34	83	42	-	-	-	
11	S01537	8	28	52	-	-	-	
12	S01538	6	42	145	-	-	-	
13	S01539	4	32	16	-	-	-	
14	S01540	<4	48	14	-	-	-	
15	S01541	6	53	40	-	-	-	
16	S01542	4	24	4	-	-	-	
17	S01543	18	46	118	-	-	-	
18	S01544	5	47	290	-	-	-	
19	S01545	7	38	28	-	-	-	
20	S01546	<4	31	34	-	-	-	
21	S01547	<4	36	24	-	-	-	
22	S01548	4	35	25	-	-	-	
23	S01549	27	317	58	-	-	-	
24	S01550	12	109	87	-	-	-	
25	S01551	4	42	35	-	-	-	

Lake Barrington Creek. Kellys 1:10,000 geological map.
From shoreline to Davies Creek
rock chip samples from
Staverton 300E 350N

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

AUTHORISED OFFICER Gary Lindberg

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974298

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09605	09/07/93	TBA	2 OF 8

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Au	Au(R)	Au(S)	
1	S01560	8	33	36	-	-	-	↑
2	S01561	7	64	75	-	-	-	
3	S01562	5	22	18	-	-	-	
4	S01563	<4	28	24	-	-	-	
5	S01564	<4	38	55	-	-	-	
6	S01565	<4	22	23	-	-	-	
7	S01566	6	46	32	-	-	-	
8	S01567	6	53	223	-	-	-	
9	S01568	20	36	76	-	-	-	
10	S01569	25	36	55	-	-	-	
11	S01570	SNR	-	-	-	-	-	
12	S01571	11	44	105	-	-	-	
13	S01572	4	28	13	-	-	-	
14	S01573	15	35	44	-	-	-	
15	S01574	<4	36	61	-	-	-	
16	S01575	8	27	18	-	-	-	↓
17	S01576	11	33	39	-	-	-	↑
18	S01577	6	48	19	-	-	-	
19	S01578	5	41	156	-	-	-	
20	S01579	64	36	156	-	-	-	
21	S01580	4	28	37	-	-	-	
22	S01581	4	27	23	-	-	-	
23	S01582	4	27	20	-	-	-	
24	S01583	11	26	27	-	-	-	
25	S01585	6	25	12	-	-	-	

↑ rock chips from end of 700E line Cathona west creek near Cathona west. 1:2500 see map only

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

AUTHORISED OFFICER Gary Lindberg

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974299

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09605	09/07/93	TBA	3 OF 8

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Au	Au(R)	Au(S)			
1	S01586	6	14	11	-	-	-			
2	S01587	6	21	6	-	-	-			
3	S01588	33	66	87	-	-	-			
4	S01589	6	30	26	-	-	-			
5	S01590	6	27	7	-	-	-			
6	S01591	6	42	148	-	-	-			
7	S01592	17	51	446	-	-	-			
8	S01594	7	35	124	-	-	-			
9	S01595	6	47	531	-	-	-			
10	S01596	8	42	156	-	-	-			
11	S01597	7	219	460	-	-	-			
12	S01598	13	265	298	-	-	-			
13	S01599	4	54	476	-	-	-			
14	S01600	4	169	443	-	-	-			
15	S01601	81	87	489	-	-	-			
16	S01602	11	120	833	-	-	-			
17	S01603	7	115	237	-	-	-			
18	S01605	18	86	57	-	-	-			
19	S01606	64	209	92	-	-	-			
20	S01607	27	626	108	-	-	-			
21	S01608	4	39	42	-	-	-			
22	S01609	11	38	27	-	-	-			
23	S01610	30	355	37	-	-	-			
24	S01611	62	54	163	-	-	-			
25	S01612	56	55	245	-	-	-			

Creek near end of 7000E Grid W → Dwyers Rd sec. 1:2500 rock chip map. Calhoun Welt.

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

AUTHORISED OFFICER Gary Lindber

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A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974300

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09605	09/07/93	TBA	4 OF 8

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Au	Au(R)	Au(S)			
1	S01613	9	41	189	-	-	-	Starlton Road - Cathcart Area	See Cathcart East 1:2500 Geology.	
2	S01614	22	51	125	-	-	-			
3	S01615	10	38	83	-	-	-			
4	S01616	19	76	43	-	-	-			
5	S01617	34	93	133	-	-	-	↓		
6	S01618	11	84	51	-	-	-	⇉		
7	S01620	-	-	-	<0.008	-	-			
8	S01621	-	-	-	<0.008	-	-			
9	S01622	-	-	-	<0.008	-	-			
10	S01623	-	-	-	<0.008	-	-			
11	S01624	-	-	-	<0.008	-	-			
12	S01625	-	-	-	<0.008	-	-			
13	S01626	-	-	-	<0.008	-	-			
14	S01627	-	-	-	<0.008	-	-			
15	S01628	-	-	-	<0.008	-	-	recon.		
16	S01629	-	-	-	<0.008	-	-			
17	S01630	-	-	-	<0.008	-	-	Mount		
18	S01631	-	-	-	<0.008	<0.008	-			
19	S01632	-	-	-	<0.008	-	-			
20	S01633	-	-	-	<0.008	-	-	Bell		
21	S01634	-	-	-	<0.008	-	-			
22	S01635	-	-	-	<0.008	-	-			
23	S01636	-	-	-	<0.008	-	-			
24	S01637	-	-	-	<0.008	-	-			
25	S01638	-	-	-	<0.008	-	<0.008			

Results in ppm unless otherwise specified
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AUTHORISED OFFICER Gary Lindberg

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A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 684

974301

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
[redacted]	111715.60.09605	09/07/93	TBA	5 OF 8

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Au	Au(R)	Au(S)	
[redacted]1	S01639	-	-	-	<0.008	-	-	
[redacted]2	S01640	-	-	-	<0.008	-	-	
3	S01641	-	-	-	<0.008	<0.008	-	
[redacted]4	S01642	-	-	-	<0.008	-	-	
[redacted]5	S01645	-	-	-	<0.008	-	-	
[redacted]6	S01646	-	-	-	0.008	-	-	
[redacted]7	S01647	-	-	-	<0.008	-	-	
8	S01648	-	-	-	<0.008	-	-	
[redacted]9	S01649	-	-	-	<0.008	-	-	
10	S01651	-	-	-	<0.008	-	-	
[redacted]1	S01652	-	-	-	<0.008	-	-	
[redacted]2	S01653	-	-	-	<0.008	-	-	
13	S01654	-	-	-	<0.008	-	-	
[redacted]4	S01656	-	-	-	0.015	-	-	
15	S01657	-	-	-	<0.008	-	-	
[redacted]6	S01658	-	-	-	<0.008	-	<0.008	
[redacted]7	S01659	-	-	-	<0.008	-	-	
18	S01719	26	34	137	-	-	-	
[redacted]9	S01720	33	49	151	-	-	-	
20	S01721	39	35	128	-	-	-	
[redacted]1	S01722	11	44	184	-	-	-	
[redacted]2	S01723	34	52	218	-	-	-	
23	S01724	30	51	216	-	-	-	
[redacted]4	S01725	10	80	83	-	-	-	
25	S01726	8	64	79	-	-	-	

Bell Mount recon.

500W ↑ Staverton Streams see 1:10000 map. ↓

↑ Cethana West stream sediments. see 1:10000 map. ↓

↑ Staverton soils 300E 200N

" 225N

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AUTHORISED OFFICER Gary Lindberg

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974302

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09605	09/07/93	TBA	6 OF 8

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Au	Au(R)	Au(S)			
1	S01727	6	49	72	-	-	-	Staverton Soils	300E	250N
2	S01728	24	137	91	-	-	-		"	275N
3	S01729	41	78	97	-	-	-		"	300N
4	S01730	101	174	190	-	-	-		"	325N
5	S01731	30	68	80	-	-	-		"	350N
6	S01732	6	47	106	-	-	-		"	380N
7	S01733	11	66	141	-	-	-		"	400N
8	S01734	5	36	39	-	-	-		"	440N
9	S01735	<4	46	47	-	-	-		"	470N
10	S01736	8	42	34	-	-	-		"	500N
11	S01737	23	79	138	-	-	-		"	530N
12	S01738	6	36	64	-	-	-		"	560N
13	S01739	12	47	79	-	-	-		"	590N
14	S01740	14	76	70	-	-	-		"	620N
15	S01741	13	52	96	-	-	-		"	650N
16	S01742	7	37	115	-	-	-		"	680N
17	S01743	15	89	84	-	-	-		"	710N
18	S01744	12	65	74	-	-	-		"	740N
19	S01745	8	53	77	-	-	-		"	770N
20	S01746	6	41	133	-	-	-		"	800N
21	S01747	20	53	140	-	-	-		"	830N
22	S01748	9	47	148	-	-	-		"	860N
23	S01749	19	41	134	-	-	-		"	890N
24	S01750	68	45	124	-	-	-		"	920N
25	S01751	11	36	49	-	-	-		"	950N

Results in ppm unless otherwise specified
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AUTHORISED OFFICER Gary Lindberg

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974303

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
[redacted]	111715.60.09605	09/07/93	TBA	7 OF 8

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Au	Au(R)	Au(S)			
[redacted]	S01752	15	39	70	-	-	-	300E	980N	
[redacted]	S01769	6	19	39	-	-	-	800E Cellar W	5000N	
3	S01770	5	20	27	-	-	-	"	5025N	
[redacted]	S01771	<4	27	10	-	-	-	"	5050N	
5	S01772	<4	28	18	-	-	-	"	5075N	
[redacted]	S01773	4	39	26	-	-	-	"	5100N	
[redacted]	S01774	6	26	36	-	-	-	"	5125N	
8	S01775	7	36	35	-	-	-	"	5150N	
[redacted]	S01776	7	34	65	-	-	-	"	5175N	
10	S01777	4	51	75	-	-	-	"	5200N	
[redacted]	S01778	4	41	66	-	-	-	"	5225N	
[redacted]	S01779	4	38	47	-	-	-	"	5250N	
13	S01780	4	56	167	-	-	-	"	5275N	
[redacted]	S01781	5	79	48	-	-	-	"	5300N	
15	S01782	5	53	39	-	-	-	"	5325N	
[redacted]	S01783	6	57	28	-	-	-	"	5350N	
[redacted]	S01784	6	116	73	-	-	-	"	5375N	
18	S01785	11	123	93	-	-	-	"	5400N	
[redacted]	S01786	9	38	44	-	-	-	Cellar W 1000E	5000N	
20	S01787	<4	28	11	-	-	-	"	5025N	
[redacted]	S01788	9	50	51	-	-	-	"	5050N	
[redacted]	S01789	5	42	46	-	-	-	"	5075N	
23	S01790	6	35	27	-	-	-	"	5100N	
[redacted]	S01791	5	28	20	-	-	-	"	5125N	
25	S01792	5	31	59	-	-	-	"	5150N	

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

AUTHORISED OFFICER Gary Lindberg

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 891 664

974304

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09605	09/07/93	TBA	8 OF 8

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Au	Au(R)	Au(S)			
1	S01793	6	40	79	-	-	-	1000 E	Soils 5175 N	
2	S01794	8	48	76	-	-	-	"	5200 N	
3	S01795	4	27	16	-	-	-	"	5225 N	
4	S01796	4	18	29	-	-	-	"	5250 N	
5	S01797	4	28	25	-	-	-	"	5275N	
6	S01798	4	34	26	-	-	-	"	5300 N	
7	S01799	5	27	25	-	-	-	"	5325N	
8	S01800	5	44	140	-	-	-	"	5350N	
9	S01801	18	52	83	-	-	-	"	5375N	
10	S01802	8	47	65	-	-	-	"	5400N	
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22	SNR = SAMPLE NOT RECEIVED									
23	DETECTION	4	5	4	0.008	0.008	0.008			
24	UNITS	ppm	ppm	ppm	ppm	ppm	ppm			
25	METHOD	GA101	GA101	GA101	GG309	GG309	GG309			

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

AUTHORISED OFFICER Gary Lindberg

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

974305

Phone (004) 316837 | 14 Thirkell St. DODES TAS 7320 | Fax (004) 318690

ANALYTICAL REPORT No. 11171S.60.09661

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

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

ORDER No.	PROJECT
TBA	

DATE RECEIVED	RESULTS REQUIRED
05/08/93	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
4	10/08/93	1	84

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
1900/83	80 Prep : BP033	Cu,Pb,Zn,Ag/BA101, Ag/BA104

REMARKS

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

RESULTS TO

RESULTS TO

AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974306

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09661	18/08/93	TBA	1 OF 4

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	Ag			
[redacted]	S01900	424	34	35	<2	-		gossanous veinlets and manganese stained pods in fg fmg fe volc	
2	S01901	103	668	455	<2	-		fg clc sand w goss platelets	
3	S01902	349	28	25	<2	-		as for	S01900
[redacted]	S01903	21	25	162	<2	-		mg q "eyes" in hmt mx	
5	S01904	15	73	165	<2	-			"
[redacted]	S01905	46	19	23	<2	-		5:1 mx	w goss vnt' fmg fe
7	S01906	25	49	32	10	-			"
[redacted]	S01907	62	39	15	<2	-			"
[redacted]	S01908	6	21	11	<2	-	22200E ↓ 5755	soils w rk' - fmg q fe volc	mg ^ sere alt'd
10	S01909	19	44	28	<2	-	6005	soils	
[redacted]	S01910	24	75	47	<2	-	6255	soils	
[redacted]	S01911	33	47	39	<2	-	6255	rk' in ^ anger hole	- goss vnt' in lcd fe
13	S01912	41	242	221	<2	-	ft 6355	mg q r	clc? fe
[redacted]	S01913	97	263	640	<2	-	fe 6405	fg clc	sand
15	S01914	28	132	83	<2	-	6505	soils	
[redacted]	S01915	25	107	190	<2	-	6505	rk' in auger	hole - fg goss clc? sand.
[redacted]	S01916	64	220	413	<2	-	ft 6605	fg clc	sed, goss
[redacted]	S01917	79	30	33	<2	-	ft 6655	mg q in	w hmt vnt' mg serc alt'd mx
[redacted]	S01918	37	108	35	<2	-	ft 6655	fmg q r	in hmt mx
20	S01919	114	499	762	<2	-	ft 6705	fg clc	sed.
[redacted]	S01920	15	17	22	<2	-	6755	soils	
[redacted]	S01921	29	15	15	<2	-	ft 6905	fmg fe	w hmt frac'
23	S01922	15	22	30	<2	-	7005	soils	
[redacted]	S01923	15	38	35	<2	-	7005	soils w rk' -	q vn and fg fe
25	S01924	15	32	15	<2	-	ft 7255	mg q in	wg sh mx w hmt vnt'

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

AUTHORISED OFFICER _____

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974307

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09661	18/08/93	TBA	2 OF 4

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	Au				
1	S01925	24	21	25	<2	-	725 s	soils w rk' - fmg q fe w mnst		
2	S01926	74	28	34	<2	-	ft 730S	gy fe w hmt' vnt' and mnst		
3	S01927	9	11	36	<2	-	750s	soils w rk' - gy sil fg fe		
4	S01928	22	35	8	<2	-	"Purvis chert sinter"	sil rk probably near q vn.		
5	S01929	49	110	61	<2	-	22400E ↓ 762S	soils.		
6	S01930	22	50	23	<2	-	762s	rk'	mg q in red mx	
7	S01931	16	95	17	<2	-	ft 775S	mg q, goss patches, red mx.		
8	S01932	18	174	87	<2	-	775s	soils		
9	S01933	14	67	77	<2	-	775s	rk'	fmg q r vole	
10	S01934	19	322	6	<2	-	ft 780S	v goss	fmg q fe	
11	S01935	31	343	9	<2	-	ft 780S		"	
12	S01936	20	511	8	<2	-	ft 780S		"	
13	S01937	23	89	16	<2	-	ft 790S	red ad goss mx in fmg fe		
14	S01938	7	204	61	<2	-	800S	soils		
15	S01939	15	135	62	<2	-	800s	rk' - fmg fe w ded specular haematite		
16	S01940	27	494	37	4	-	d/c 815S	mg q pno' (?) w hmt vnt'		
17	S01941	194	148	50	<2	-	ft 815 s	goss vnt' in fmg q fe		
18	S01942	19	503	74	2	-	825 s	soils		
19	S01943	17	335	101	<2	-	850S	soils w rk' - fmg fe w hmt vnt'		
20	S01944	10	175	74	<2	-	870 S	soils		
21	S01945	51	973	21	<2	-	870s	rk' - red wen mx w mnst		
22	S01946	6	62	43	<2	-	895s	soils w rk' - gy clay w (cong) clasts	Over wash	
23	S01947	85	215	337	<2	-	22600E ↓ 850S	soils		
24	S01948	48	219	282	<2	-	850s	rk' - mg q in red mx	clr?	
25	S01949	42	179	29	<2	-	ft 855 s	mg q in sericitised mx w hmt vnt'	my sts	

Results in ppm unless otherwise specified
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AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974308

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09661	18/08/93	TBA	3 OF 4

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	Ag			
1	S01950	146	360	26	<2	-	ft 870s	as for S01949.	
2	S01951	59	400	107	<2	-	ft 875s	3mm thk hmt vn' in frag fe.	
3	S01952	71	248	136	<2	-	875s	soils.	
4	S01953	18	171	58	<2	-	875s	rk' - mg g in fe mx w hmt particles	
5	S01954	35	372	29	<2	-	ft 895s		
6	S01955	54	124	129	<2	-	900s	soils	
7	S01956	25	75	155	<2	-	900s	rk'	
8	S01957	47	221	169	<2	-	ft 920s	pale green mx w goss patch	
9	S01958	168	1128	47	<2	-	ft 925s	hmt vn' in frag fe	
10	S01959	41	111	83	<2	-	925s	soils	
11	S01960	14	76	66	<2	-	925s	rk' - mg g in hmt mx	
12	S01961	121	677	38	>50	62	ft 930s	goss patches / vn' in frag fe	
13	S01962	95	205	66	<2	-	ft 935s	"	
14	S01963	156	343	45	<2	-	ft 940s	"	
15	S01964	62	172	65	<2	-	ft 950s	"	
16	S01965	28	101	51	<2	-	950s	soils	
17	S01966	149	650	52	<2	-	950s	rk' hmt pods in red wea frag fe	
18	S01967	17	93	54	<2	-	975s	soils	
19	S01968	9	70	49	<2	-	975s	rk' mg g "eyes" in red wea mx	
20	S01969	107	122	393	<2	-	ft 990s	hmt pods in frag fe	
21	S01970	13	78	51	<2	-	1000s	soils	
22	S01971	17	75	54	<2	-	1000s	rk' mg g fe w hmt pods	
23	S01972	39	41	22	<2	-	ft 1010s	g vn w hmt and clc	
24	S01973	16	32	39	<2	-	ft 1010s	~~soils~~ hmt fe	
25	S01974	43	95	71	<2	-	ft 1025s ~~1030s~~	soils ~~frag fe w hmt vn'~~	

Results in ppm unless otherwise specified
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AUTHORISED OFFICER

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

974309

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09661	18/08/93	TBA	4 OF 4

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	Ag				
1	S01975	41	428	13	<2	-	~~ofc~~ ft 1028s	fmg fc w hmt vnt'		
2	S01976	8	115	15	<2	-	o/c 1030S	fmg hmt fc.		
3	S01977	26	225	80	<2	-	1050S	soils		
4	S01978	12	28	48	<2	-	1050S	rk'	hmt	fg fc
5	S01979	27	72	63	<2	-	1075S	rk'	"	
6	S01980	5	<5	19	<2	-	Cethana W 300E, 4950N	haematitic gossanous rock outcrop. with rounded siliceous clasts.		
7	S01981	627	507	2485	<2	-	Cethana W 200E, 4850N float	creamy fine grained felsic siltstone? strongly manganese stained		
8	S01982	130	1844	453	<2	-	Cethana W 200E, 4825N float	~~silicified~~ felsic fine grained with haematitic patches.		
9	S01983	25	64	57	<2	-	Cethana W 200E, 4775N float	"		
10										
11	clc - chloritic or chlorite.					rk'	- rocks			
12	dsd - disseminated.					sts	- schistose			
13	fc - felsic volcanic					ser	- sericite			
14	fmg - fine to medium grained.					sed	- sediment			
15	fg - fine grained					sand	- sandstone			
16	gy - grey goss - gossanous					v w	- very - with			
17	hmt - haematitic or haematite									
18	mg - medium grained					o/c	- outcrop			
19	mx - matrix					ft	- float			
20	mnst - manganese stained					soils	w rk' -	rocks taken from		
21	pho' - phenocrysts q - quartz							auger hole.		
22	r - rich									
23	DETECTION	4	5	4	2	10				
24	UNITS	ppm	ppm	ppm	ppm	ppm				
25	METHOD	GA101	GA101	GA101	GA101	GA104				

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

AUTHORISED OFFICER

APPENDIX L

Crone EM Geophysical Survey Results -

Cethana East/West, Lake Barrington and

Staverton Prospects

PROFILES IN PART TWO

Jim McNeil, CRONE
Llew Wynn, Plutonic

Crone EM Survey (January 1993)

974311

An interpretation of results - Llew Wynn, Plutonic Operations Limited

No. EM responses from conductive sulphides were detected.

Prospect	T x Loop No.	Hole/Line No.	Comments
Cethana West	1	DD77CC1	Conductive cover - no anomalies.
		PD84CC9	No anomalies.
		DD86CC13	Conductive cover - no anomalies.
		700E (4625N-4350N)	Response from powerlines.
		800E (4625N-4325N)	Response from powerlines.
Cethana East	2	22600E (1400S-600S)	No anomalies - low amplitude response - resistive rocks.
		22400E (1125S-475S)	No anomalies.
		22300E (4425N-4925N)	No anomalies.
	3	22200E (1175S-525S)	No anomalies.
		22100E (4175N-4800N)	No anomalies.
		22000E (500S-225S)	No anomalies.
		21900E (450S-125N)	No anomalies.
		21800E (3075N-3925N)	No anomalies.
		21700E (3225N-4000N)	No anomalies.
		21600E (3400N-4000N)	No anomalies.
	4	21500E (4325N-5125N)	Powerline response - no anomalies.
		21300E (4350N-5000N)	Powerline response - no anomalies.
		21100E (4375N-4975N)	Powerline response - no anomalies.
Staverton	1	700E (175S-250N)	No anomalies.
		800E (300S-200N)	Very weak anomalies at 60mS and 300mS.
		900E (350S-300N)	No anomalies.
		1000E (325S-350N)	No anomalies.
		1100E (175S-300N)	No anomalies.
		1200E (175S-325N)	No anomalies.
	2	100E (75S-150N)	No anomalies.
		200E (75S-225N)	No anomalies.
		300E (75S-350N)	No anomalies.
		400E (ON-350N)	No anomalies.
		500E (75S-350N)	Very weak anomaly at 125mN.
		600E (200S-300N)	No anomalies.

TR.GMD

974312

APPENDIX L

Crone EM Geophysical Survey Results -

Cethana East/West, Lake Barrington and

Staverton Prospects

MICROFILMED
FICHE No.012951 -71

Jim McNeil, CRONE
Llew Wynn, Plutonic

MINES
FILE REF. EL 10/88
16 SEP 1993
DOC. REF.
OFFICER | FOR ACTION | FOR INFO.
SEE FOLIO 75
FOR COVERING
LETTER
DATE

93-3500.

Crone EM Survey (January 1993)

974:13

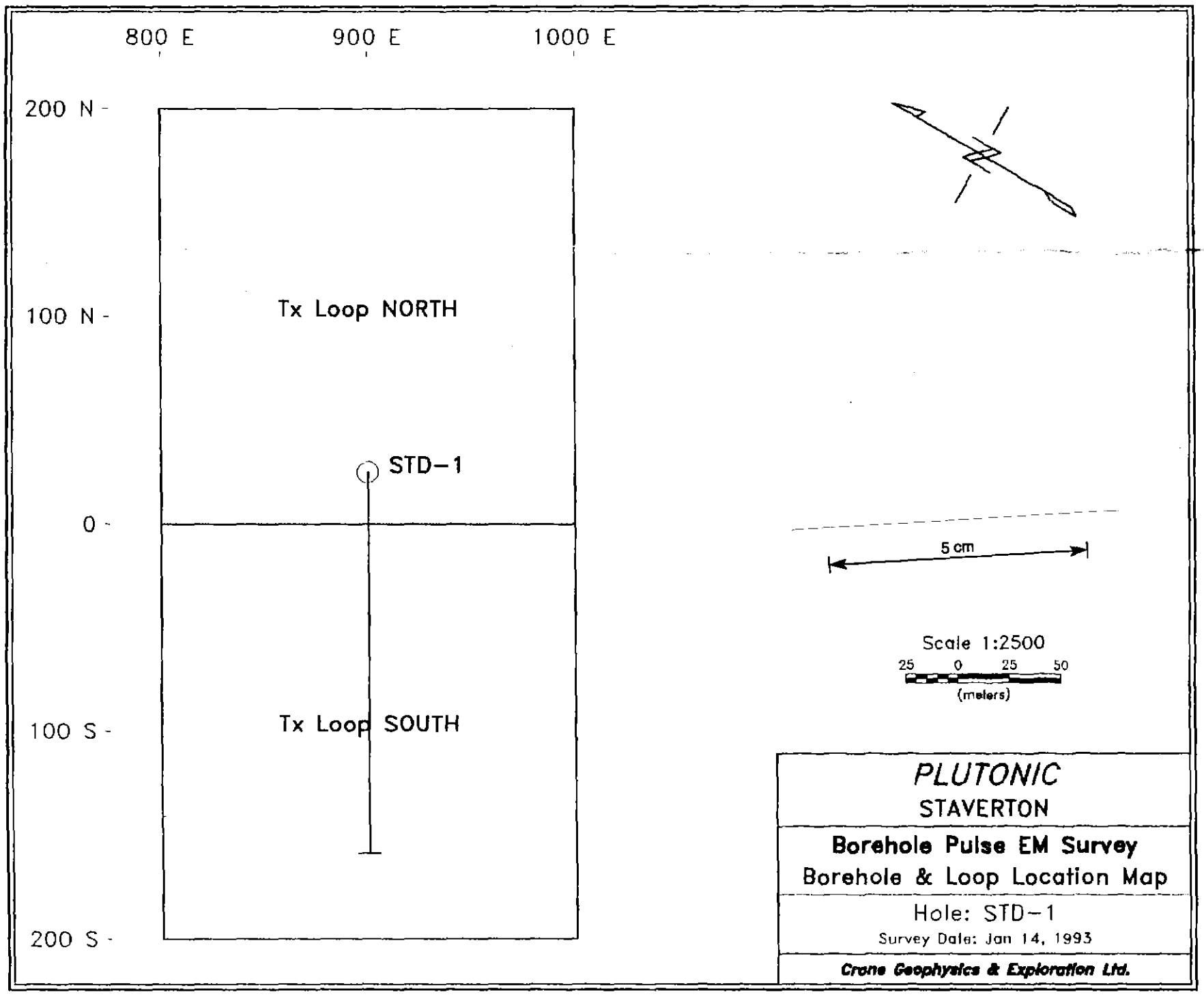
An interpretation of results - Llew Wynn, Plutonic Operations Limited

No. EM responses from conductive sulphides were detected.

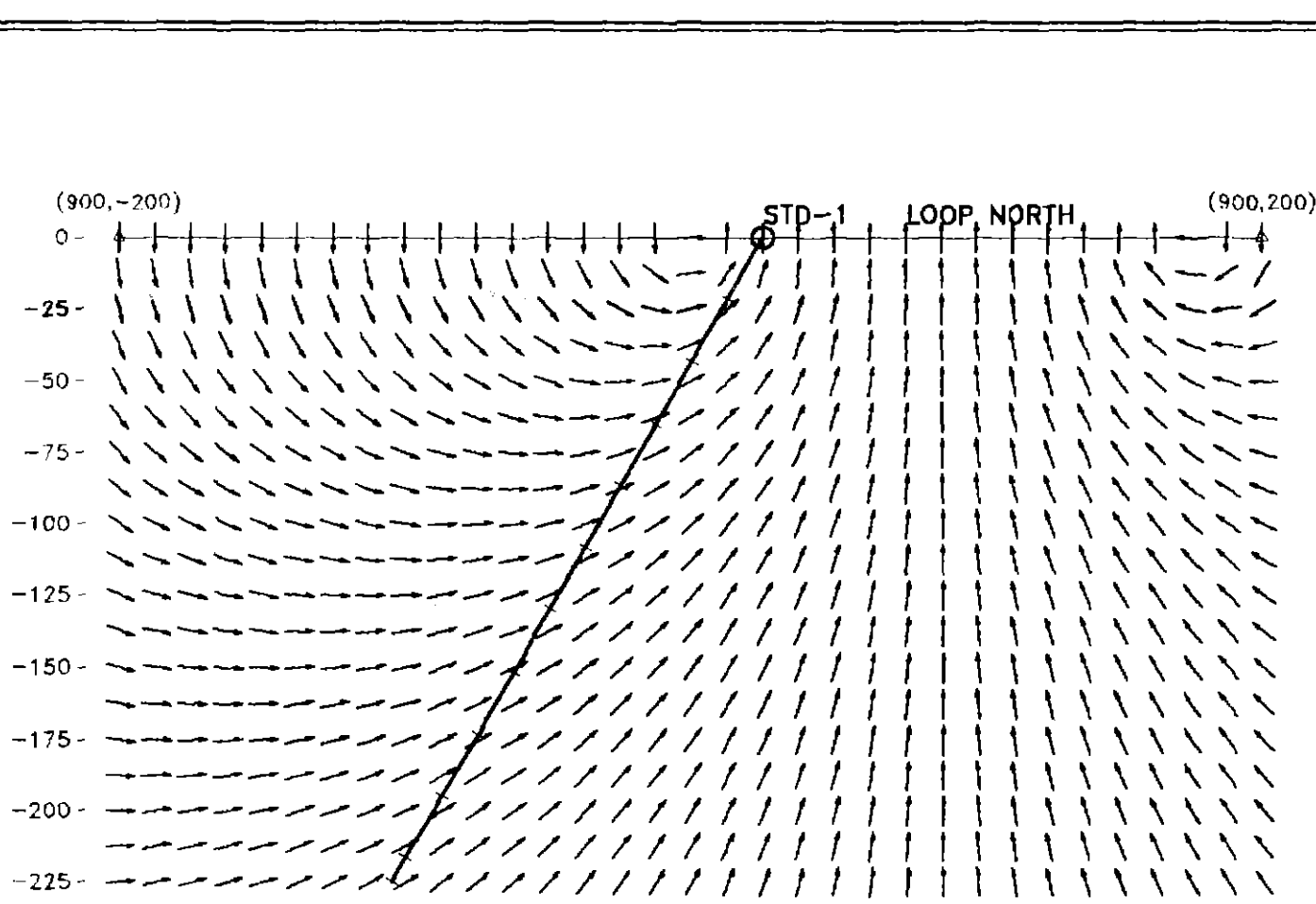
Prospect	T x Loop No.	Hole/Line No.	Comments
Cethana West	1	DD77CC1	Conductive cover - no anomalies.
		PD84CC9	No anomalies.
		DD86CC13	Conductive cover - no anomalies.
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		800E (4625N-4325N)	Response from powerlines.
Cethana East	2	22600E (1400S-600S)	No anomalies - low amplitude response - resistive rocks.
		22400E (1125S-475S)	No anomalies.
		22300E (4425N-4925N)	No anomalies.
	3	22200E (1175S-525S)	No anomalies.
		22100E (4175N-4800N)	No anomalies.
		22000E (500S-225S)	No anomalies.
		21900E (450S-125N)	No anomalies.
		21800E (3075N-3925N)	No anomalies.
		21700E (3225N-4000N)	No anomalies.
		21600E (3400N-4000N)	No anomalies.
	4	21500E (4325N-5125N)	Powerline response - no anomalies.
		21300E (4350N-5000N)	Powerline response - no anomalies.
		21100E (4375N-4975N)	Powerline response - no anomalies.
Staverton	1	700E (175S-250N)	No anomalies.
		800E (300S-200N)	Very weak anomalies at 60mS and 300mS.
		900E (350S-300N)	No anomalies.
		1000E (325S-350N)	No anomalies.
		1100E (175S-300N)	No anomalies.
		1200E (175S-325N)	No anomalies.
	2	100E (75S-150N)	No anomalies.
		200E (75S-225N)	No anomalies.
		300E (75S-350N)	No anomalies.
		400E (ON-350N)	No anomalies.
		500E (75S-350N)	Very weak anomaly at 125mN.
		600E (200S-300N)	No anomalies.

93-3500.

TR.GMD


800 E
900 E
1000 E
200 N
100 N
0
100 S
200 S
Tx Loop NORTH
STD-1
Tx Loop SOUTH
5 cm
Scale 1:2500
25 0 25 50
(meters)
PLUTONIC
STAVERTON
Borehole Pulse EM Survey
Borehole & Loop Location Map
Hole: STD-1
Survey Date: Jan 14, 1993
Crone Geophysics & Exploration Ltd.

974314



5 cm

Scale 1:2500

25 0 25 50

(meters)

PLUTONIC

STAVERTON

3-D Borehole Pulse EM Survey

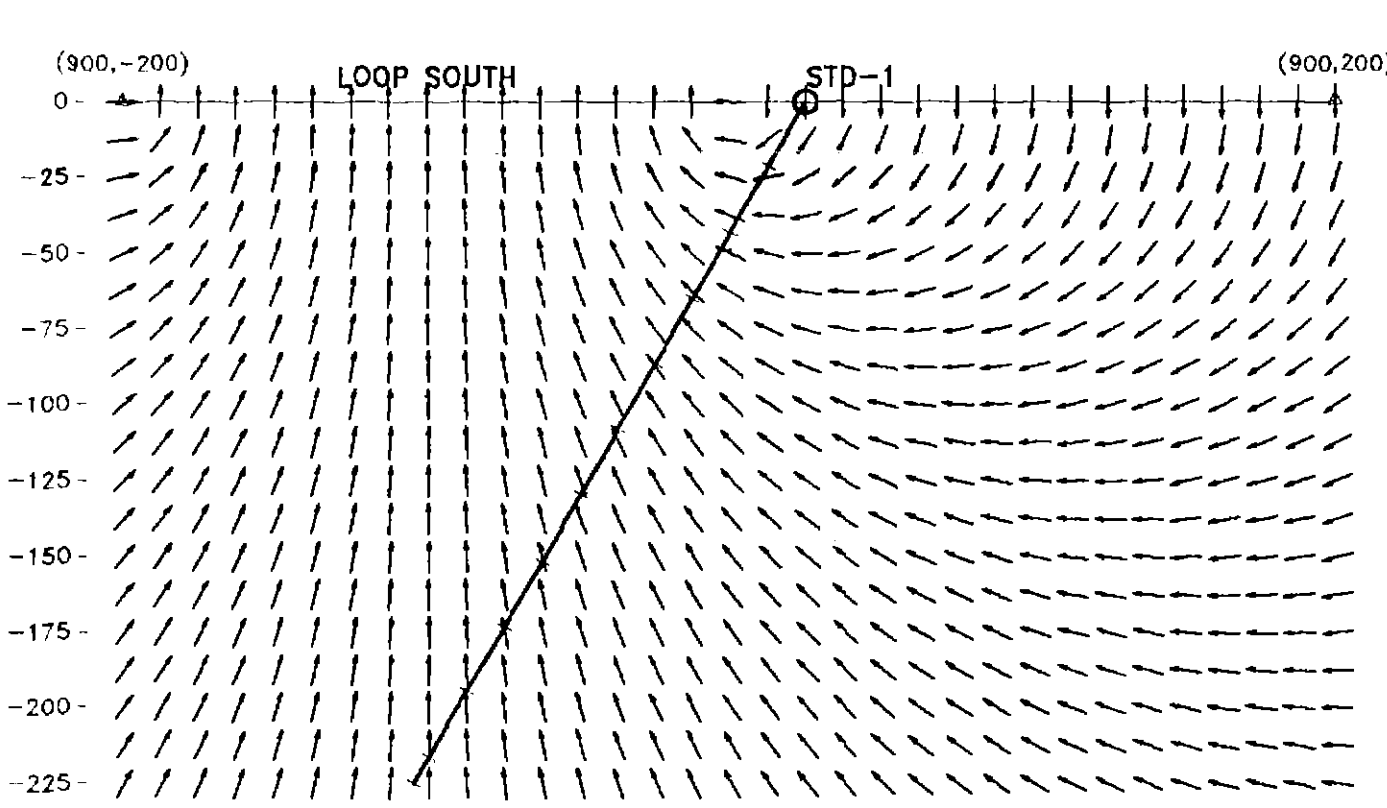
Hole Section with Primary Field

Hole: STD-1

Survey Date: Jan 14, 1993

Crone Geophysics & Exploration Ltd.

974315



5 cm

Scale 1:2500

25 0 25 50

(meters)

PLUTONIC

STAVERTON

3-D Borehole Pulse EM Survey

Hole Section with Primary Field

Hole: STD-1

Survey Date: Jan 14, 1993

Crone Geophysics & Exploration Ltd.

974316

CRONE GEOPHYSICS & EXPLORATION LTD

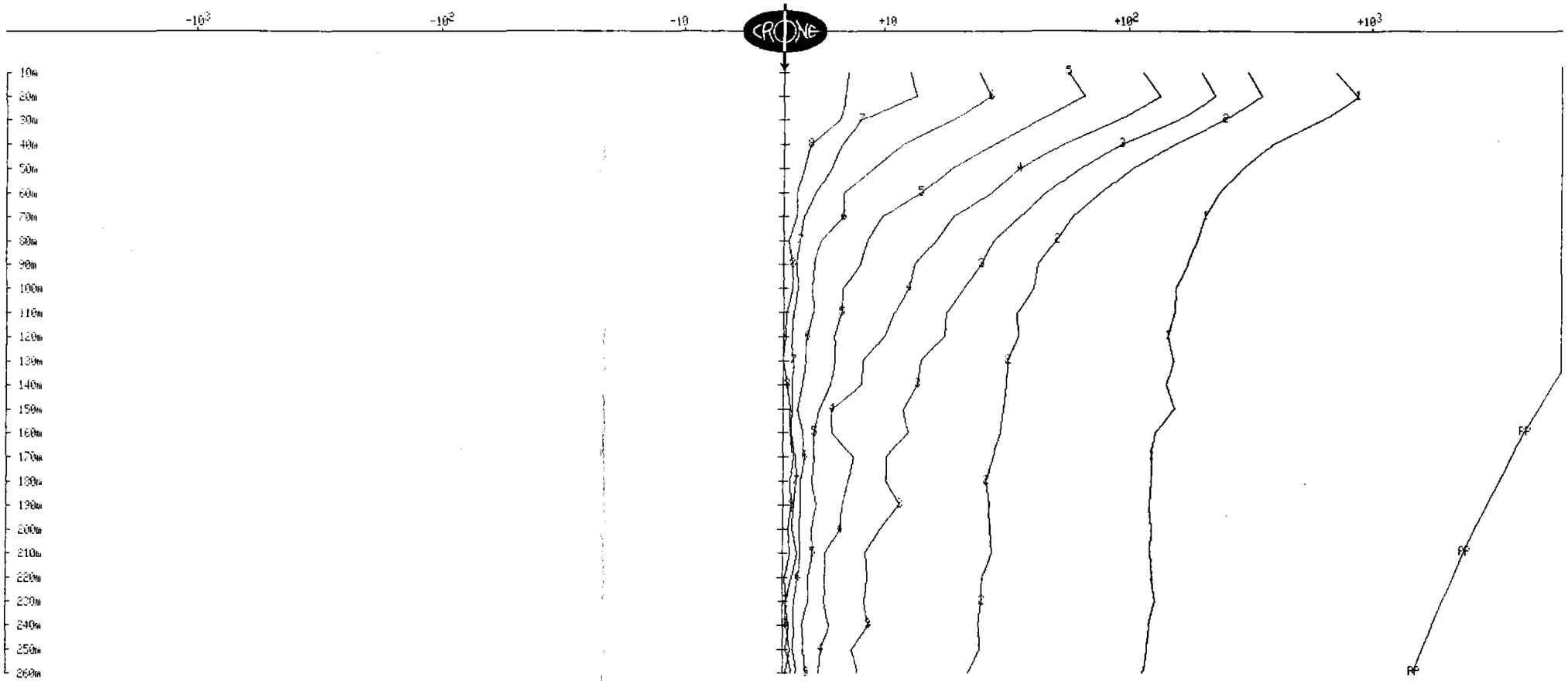
BOREHOLE PEM

5 cm

Client	: PLUTONIC	Hole	: STD-1
Grid	: STAVERTON	Tx Loop	: NORTH
Date	: Jan 14, 1993	File name	: STD1ZN.PEM

Z COMPONENT dBz/dt nanoTesla/sec - 8 channels and PP

Scale: 1:2000



9743147

CRONE GEOPHYSICS & EXPLORATION LTD

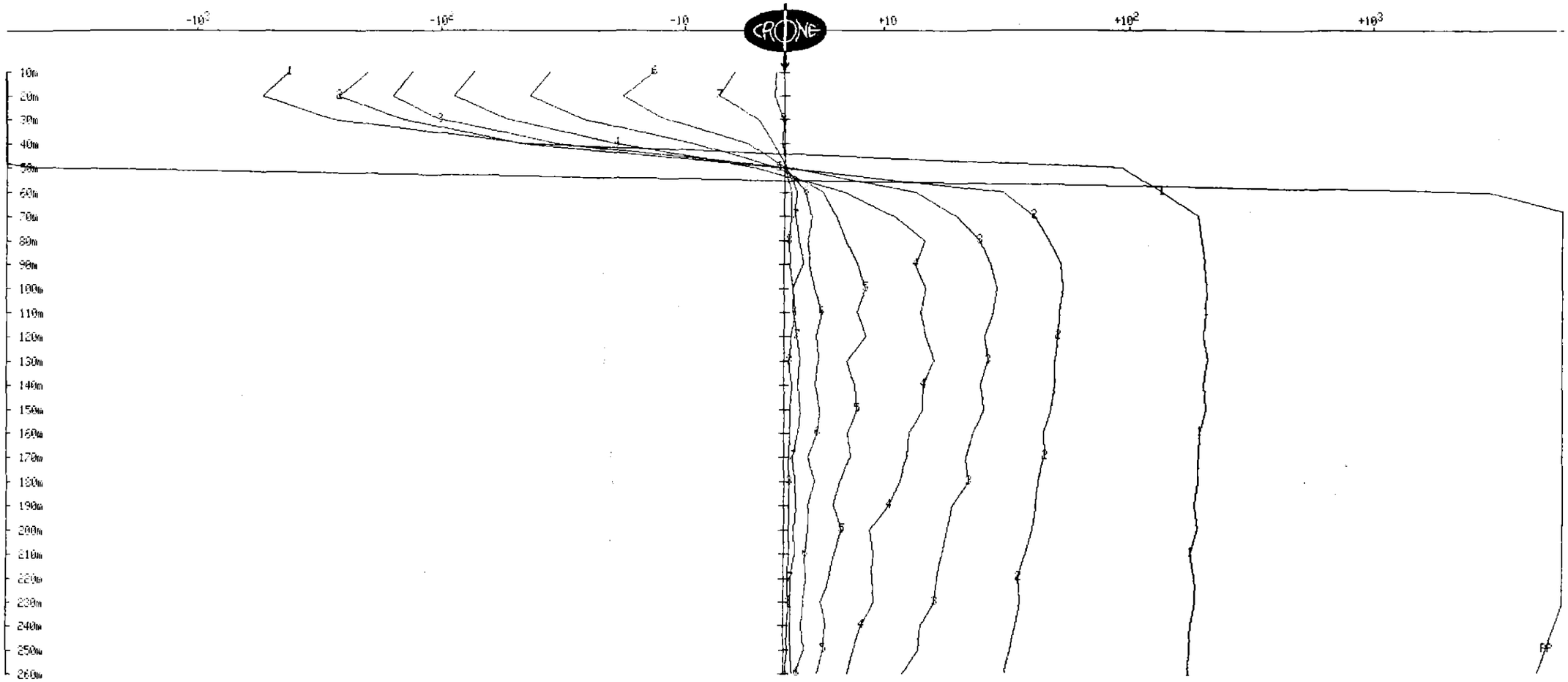
BOREHOLE PEM

5 cm

Client	: PLUTONIC	Hole	: STD-1
Grid	: STAVERTON	Tx Loop	: SOUTH
Date	: Jan 14, 1993	File name	: STD1ZS.PEM

Z COMPONENT dBz/dt nanoTesla/sec - 8 channels and PP

Scale: 1:2000



6743138

CRONE GEOPHYSICS & EXPLORATION LTD

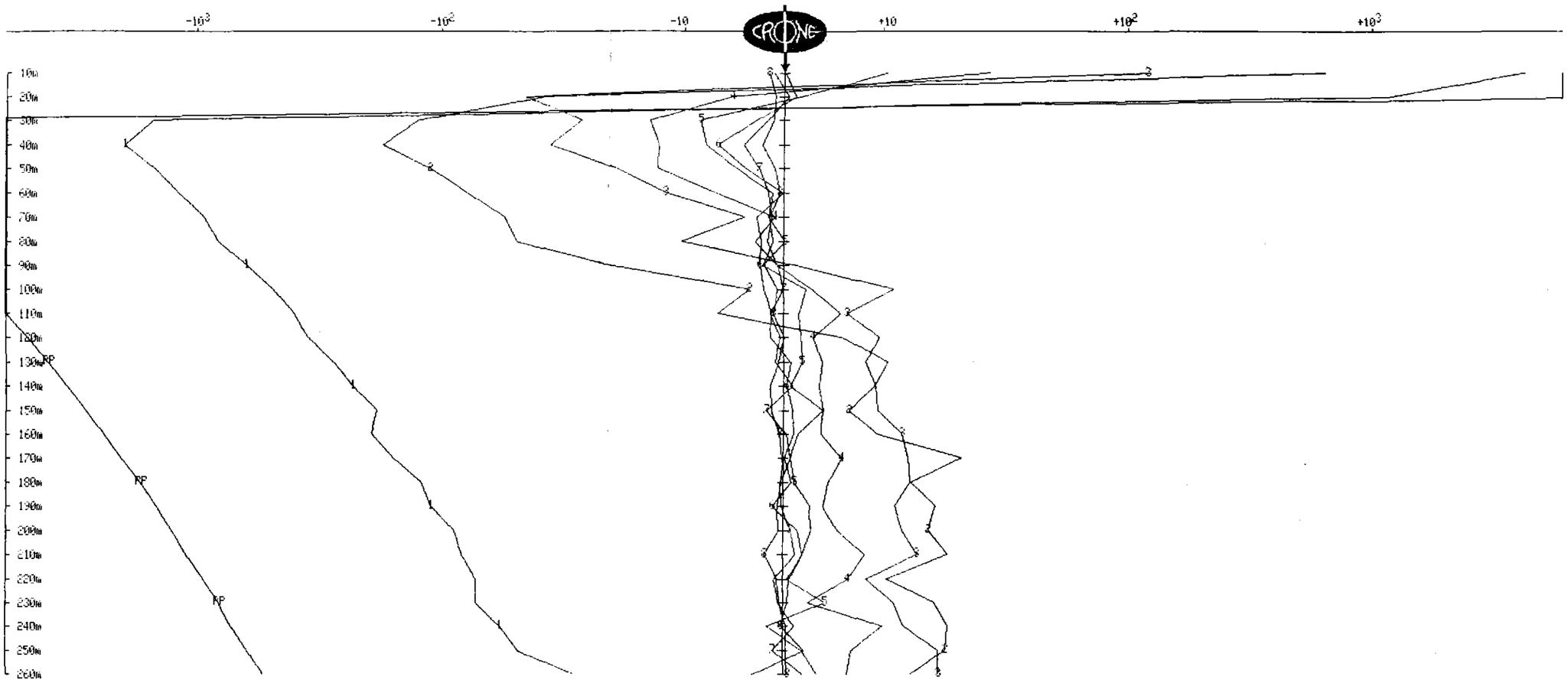
BOREHOLE PEM

Client	: PLUTONIC	Hole	: STD-1
Grid	: STAVERTON	Tx Loop	: NORTH
Date	: Jan 14, 1993	File name	: STDIXYN.PEM

5 cm

Data Corrected for Probe Rotation using Set Values
X COMPONENT dBx/dt nanoTesla/sec - 8 channels and PP

Scale: 1:2000



9743119

CRONE GEOPHYSICS & EXPLORATION LTD

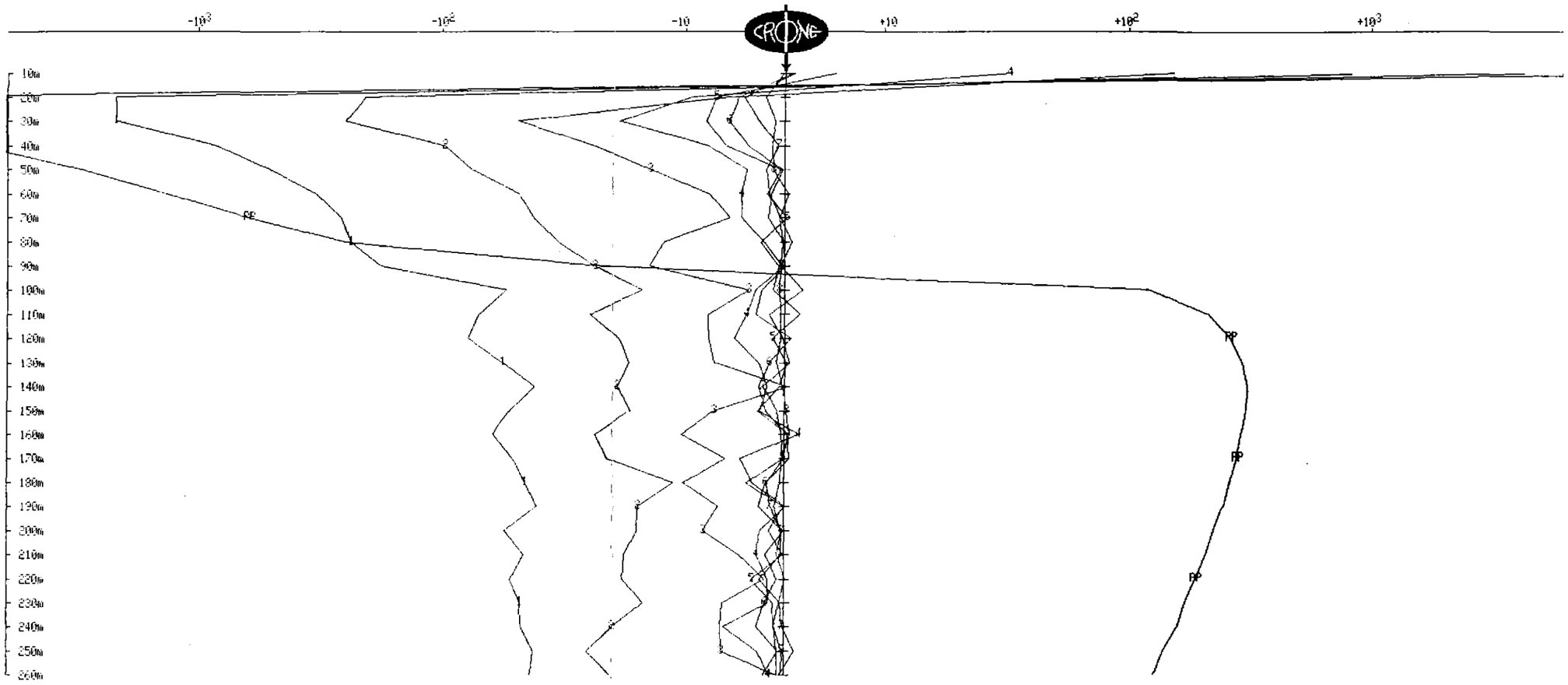
BOREHOLE PEM

5 cm

Client	: PLUTONIC	Hole	: STD-1
Grid	: STAVERTON	Tx Loop	: NORTH
Date	: Jan 14, 1993	File name	: STDIXYN.PEM

Data Corrected for Probe Rotation using Set Values
Y COMPONENT dBy/dt nanoTesla/sec - 8 channels and PP

Scale: 1:2000



974320

93-3500.

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

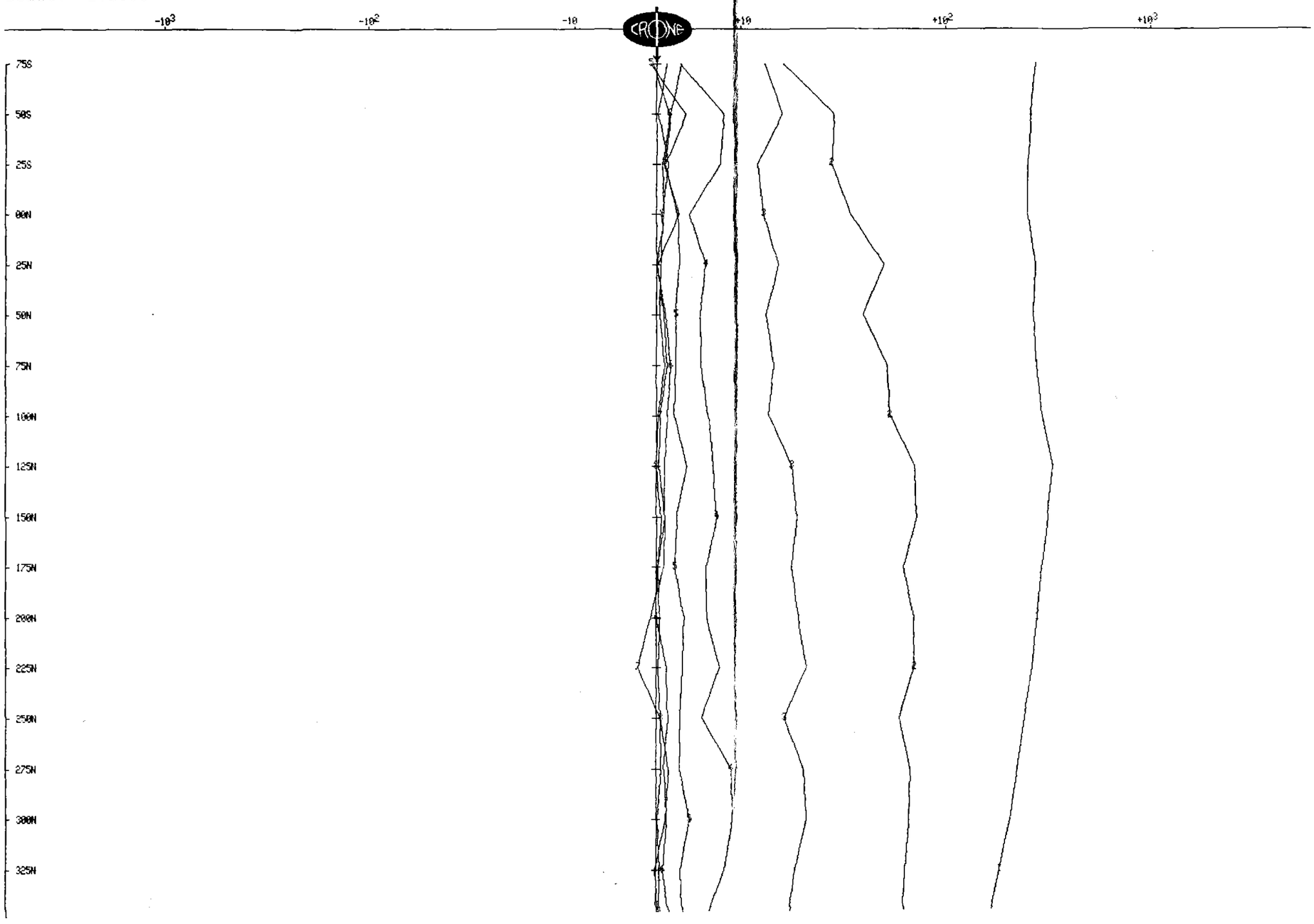
5 cm

Client : PLUTONIC
Grid : STAVERTON
Date : Jan 18, 1993

Line : 500E
Tx Loop : 2
File name : ST500E2.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000



9743321

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

97 43 22

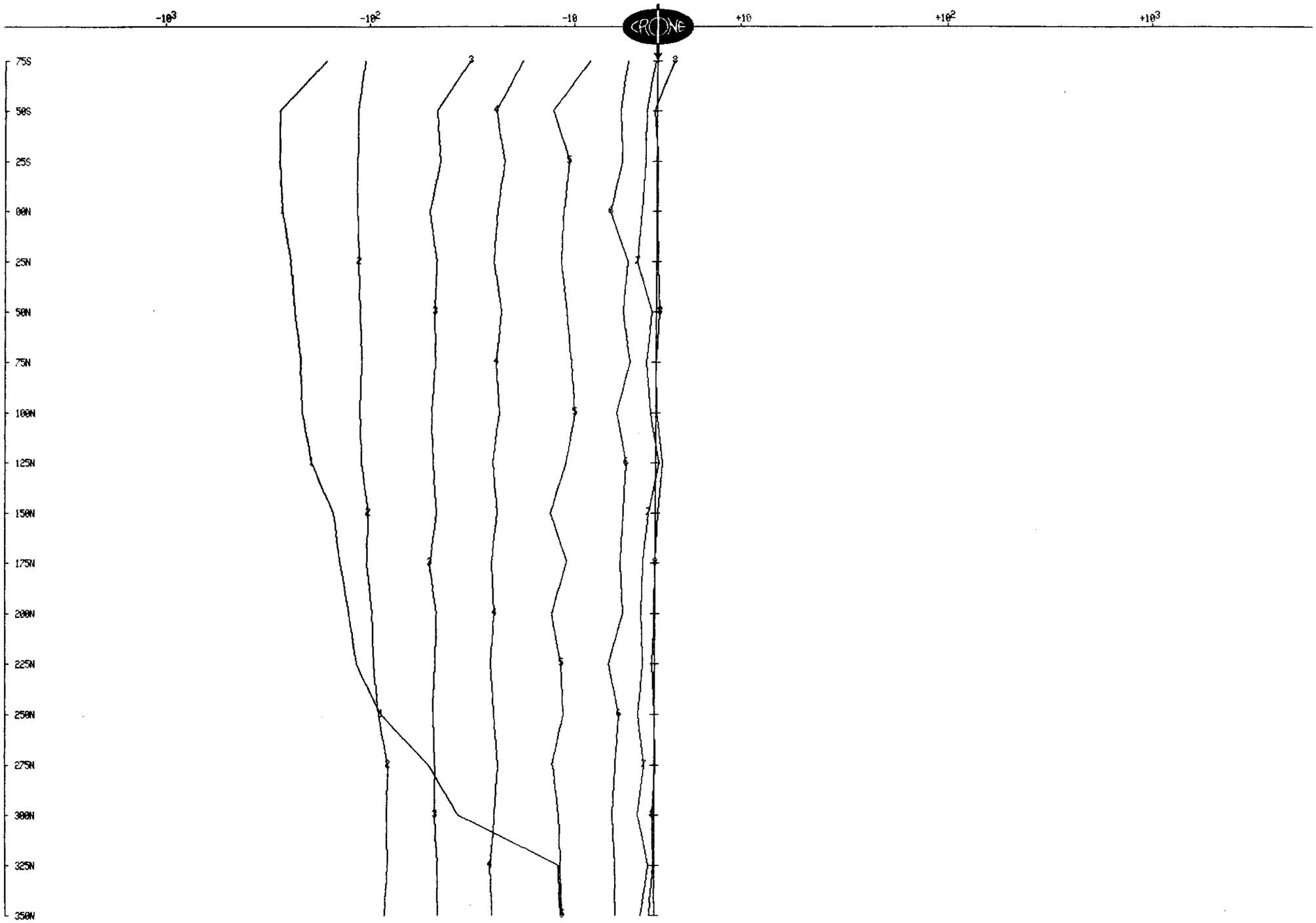
5 cm

Client : **PLUTONIC**
Grid : **STAVERTON**
Date : Jan 18, 1993

Line : **500E**
Tx Loop : **2**
File name : **ST500E2.PEM**

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

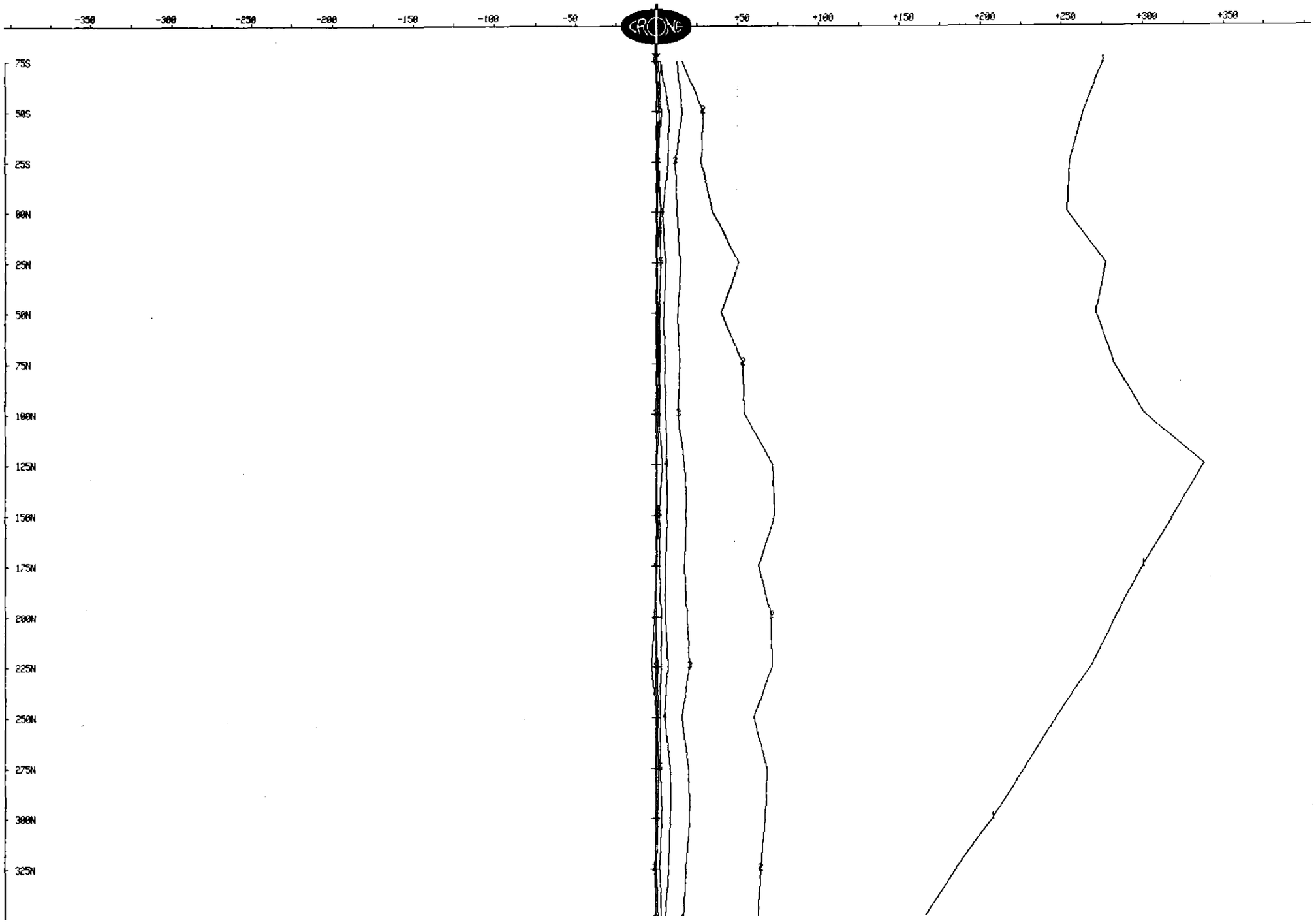
5 cm

Client	: PLUTONIC	Line	: 500E
Grid	: STAVERTON	Tx Loop	: 2
Date	: Jan 18, 1993	File name	: ST500E2.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



974323

974324

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

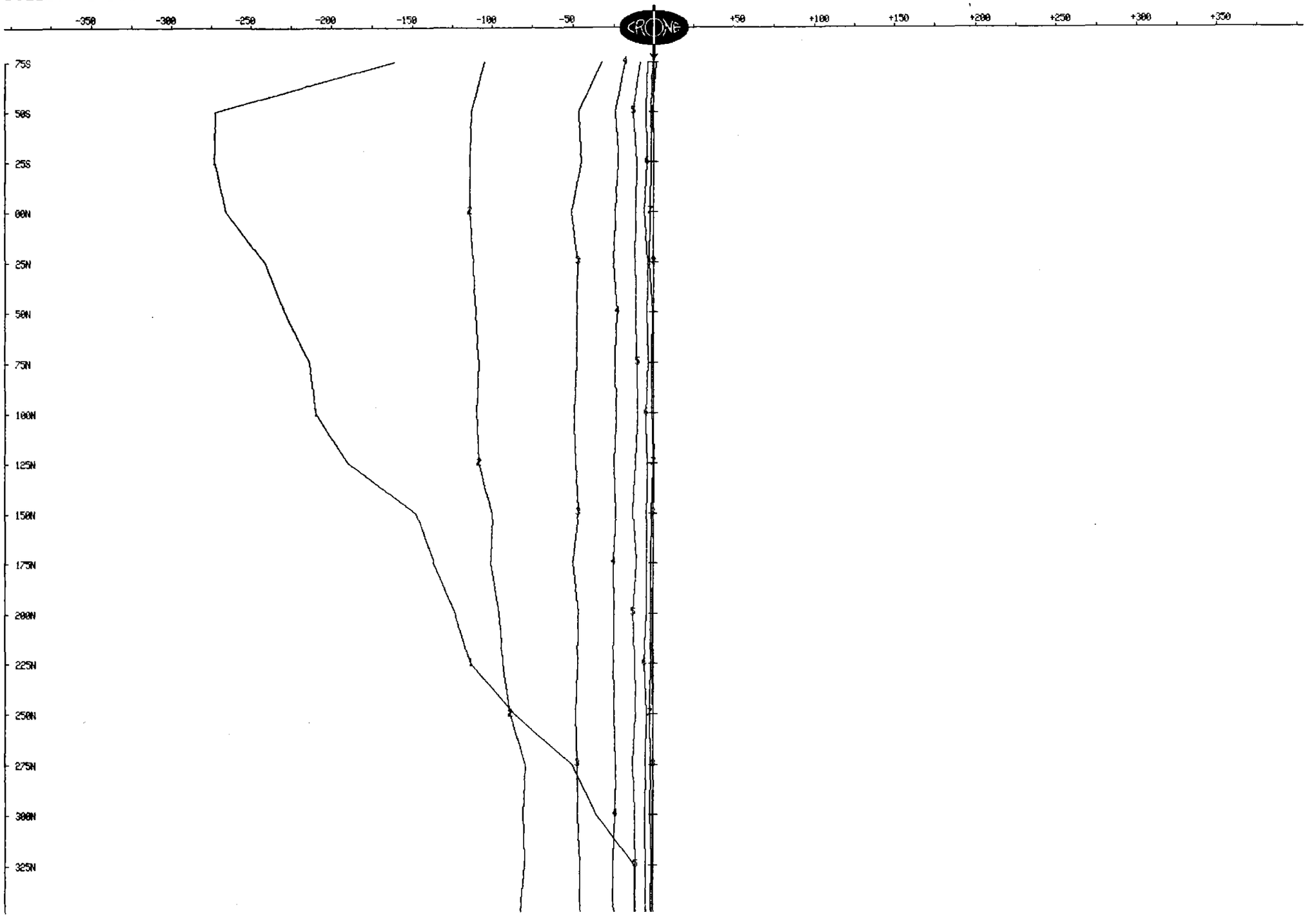
5 cm

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Grid	: STAVERTON	Tx Loop	: 2
Date	: Jan 18, 1993	File name	: ST500E2.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



93-3500.

5 cm

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

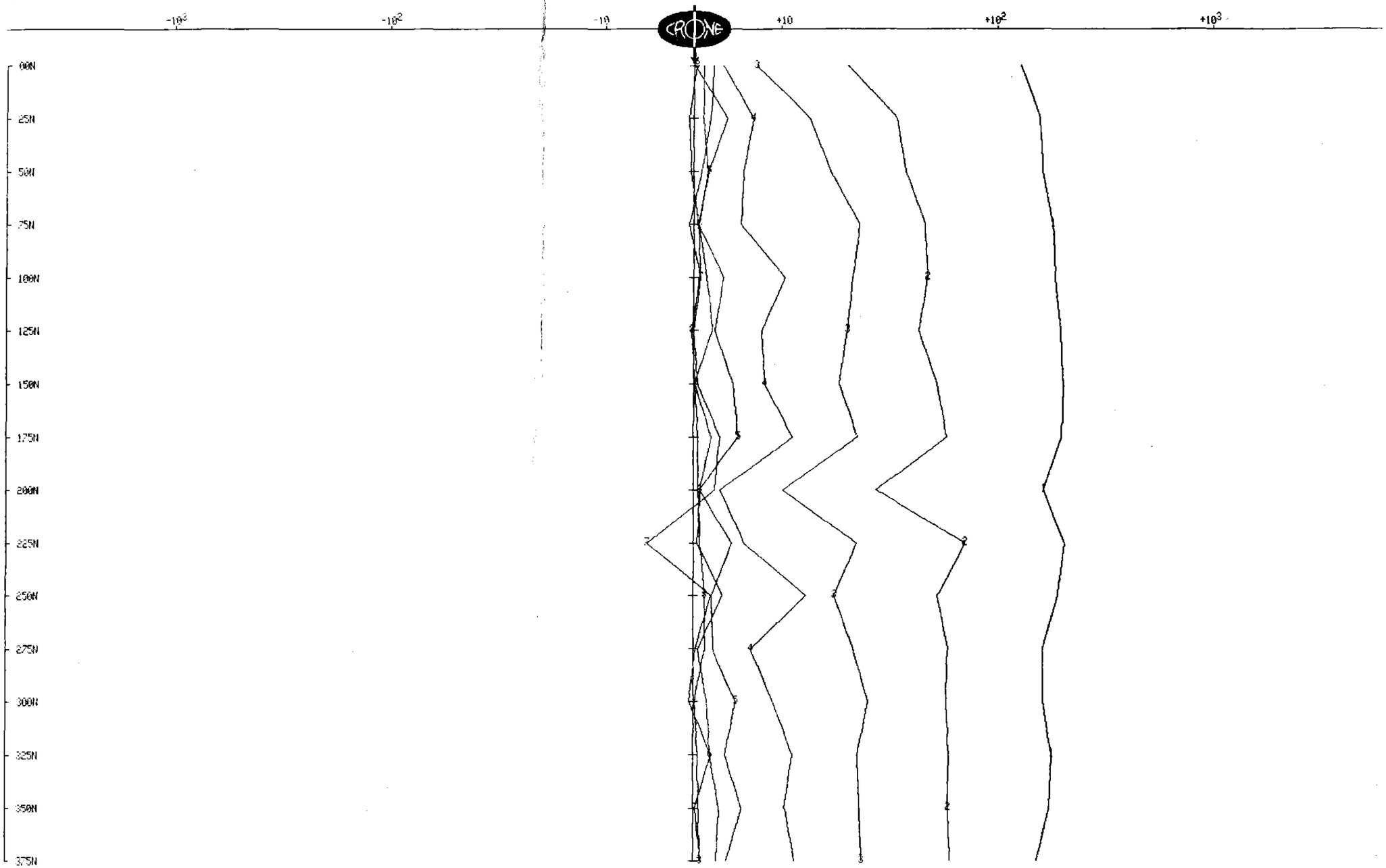
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Grid : STAVERTON
Date : Jan 18, 1993

Line : 400E
Tx Loop : 2
File name : ST400E2.PEM

974325

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

974326

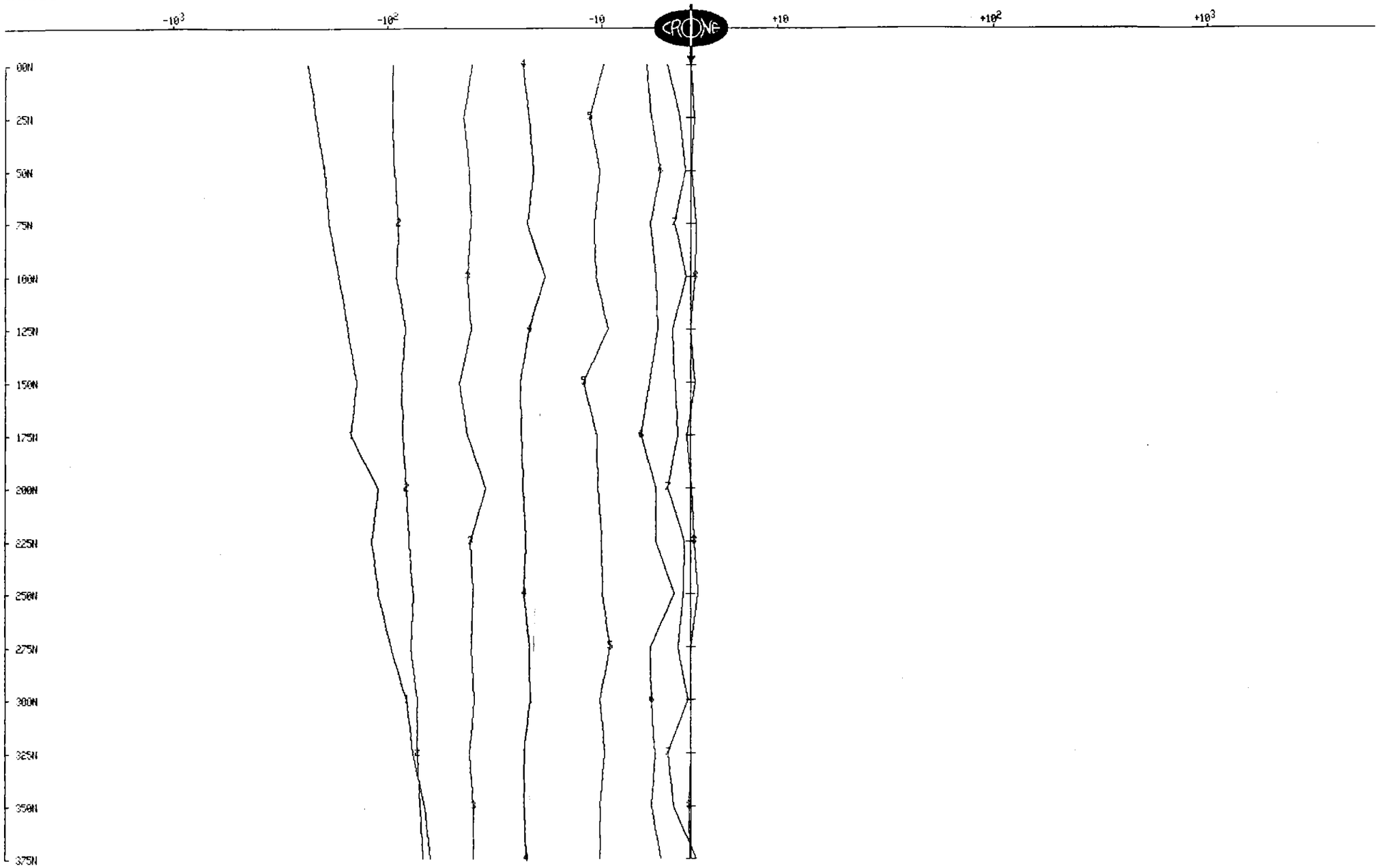
5 cm

Client : PLUTONIC
Grid : STAVERTON
Date : Jan 18, 1993

Line : 400E
Tx Loop : 2
File name : ST400E2.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

974327

5 cm

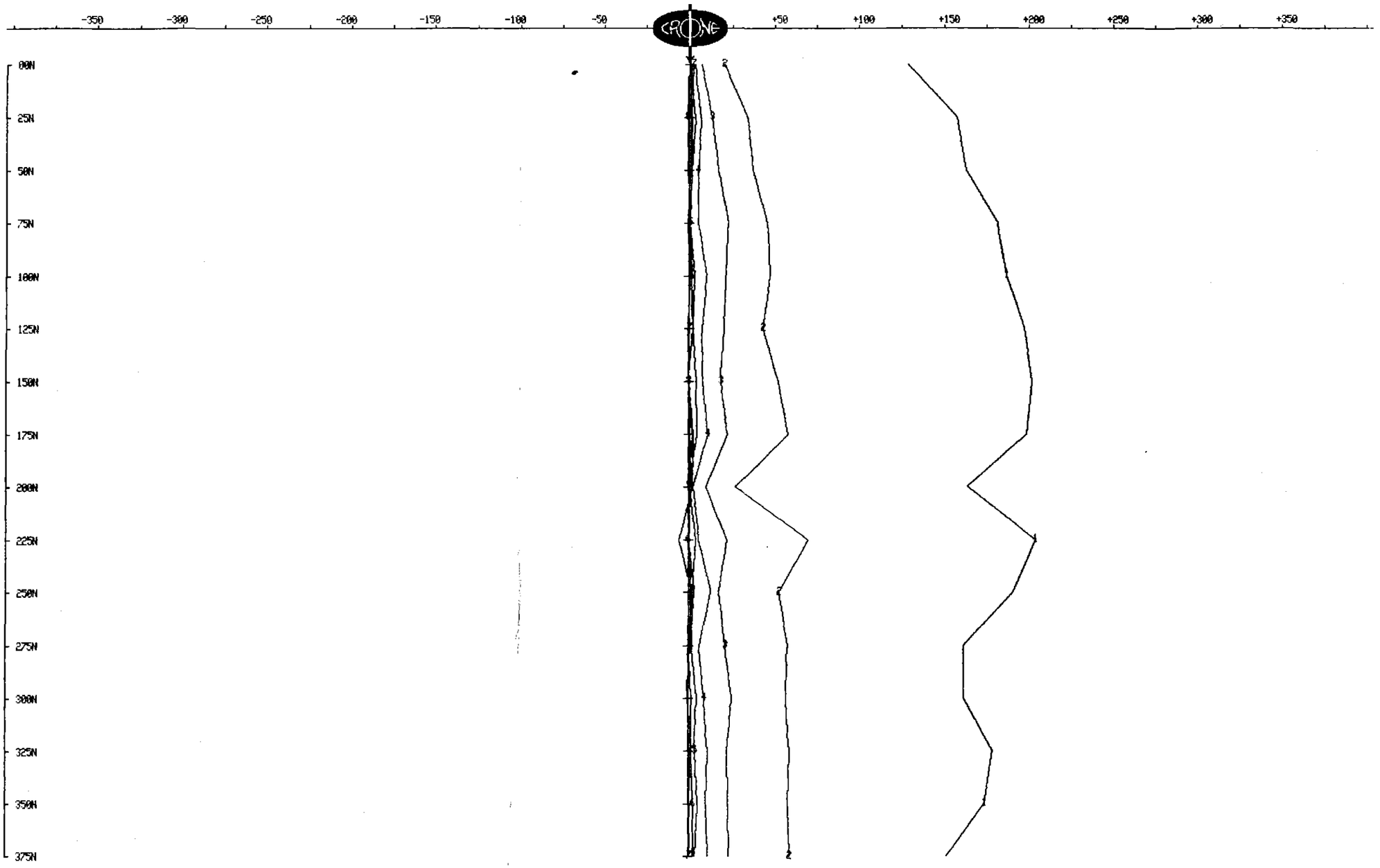
Client : **PLUTONIC**
Grid : **STAVERTON**
Date : Jan 18, 1993

Line : **400E**
Tx Loop : **2**
File name : **ST400E2.PEM**

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

974328

5 cm

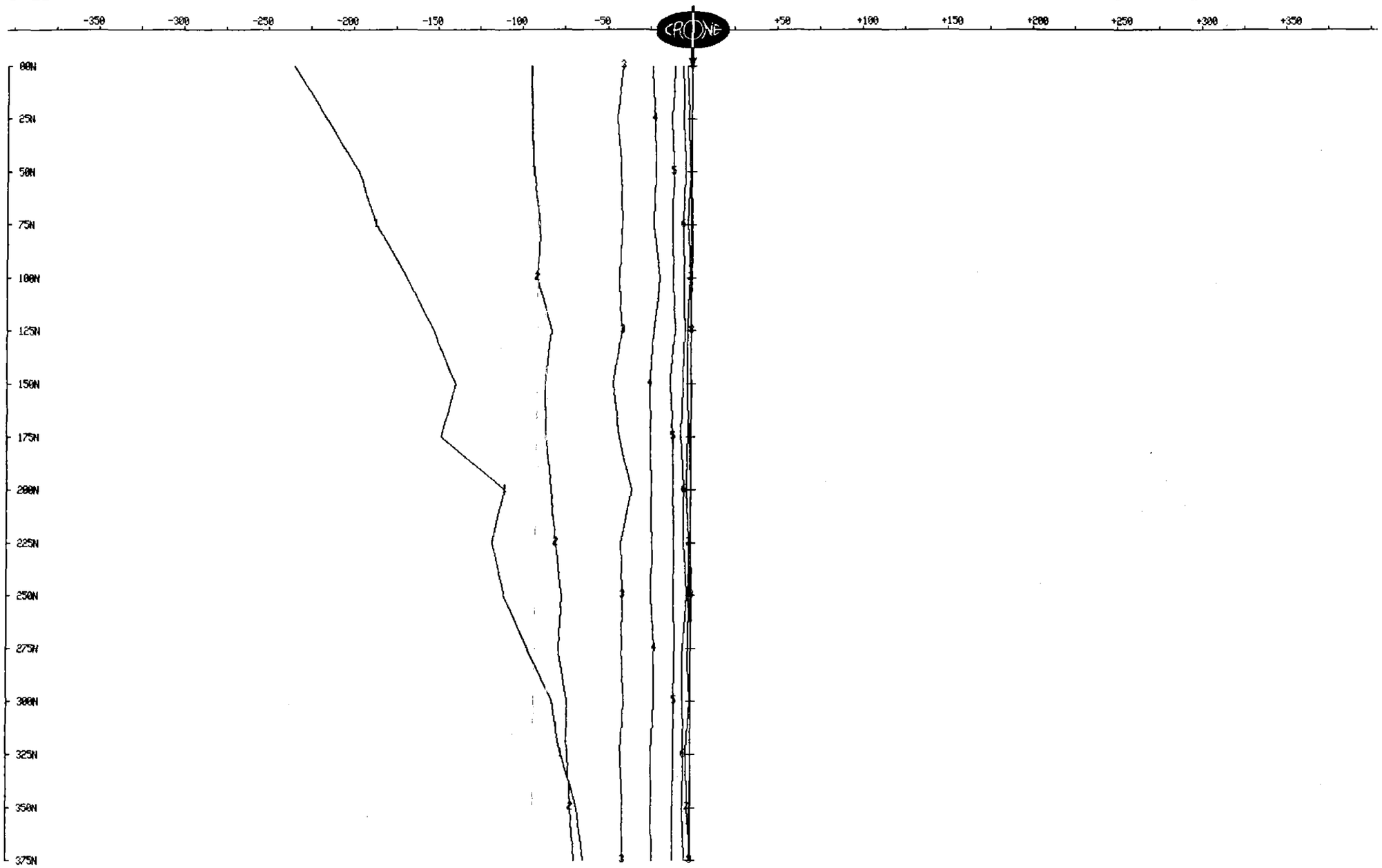
Client : **PLUTONIC**
Grid : **STAVERTON**
Date : Jan 18, 1993

Line : **400E**
Tx Loop : **2**
File name : **ST400E2.PEM**

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



93-3500.

5cm

CRONE GEOPHYSICS & EXPLORATION LTD

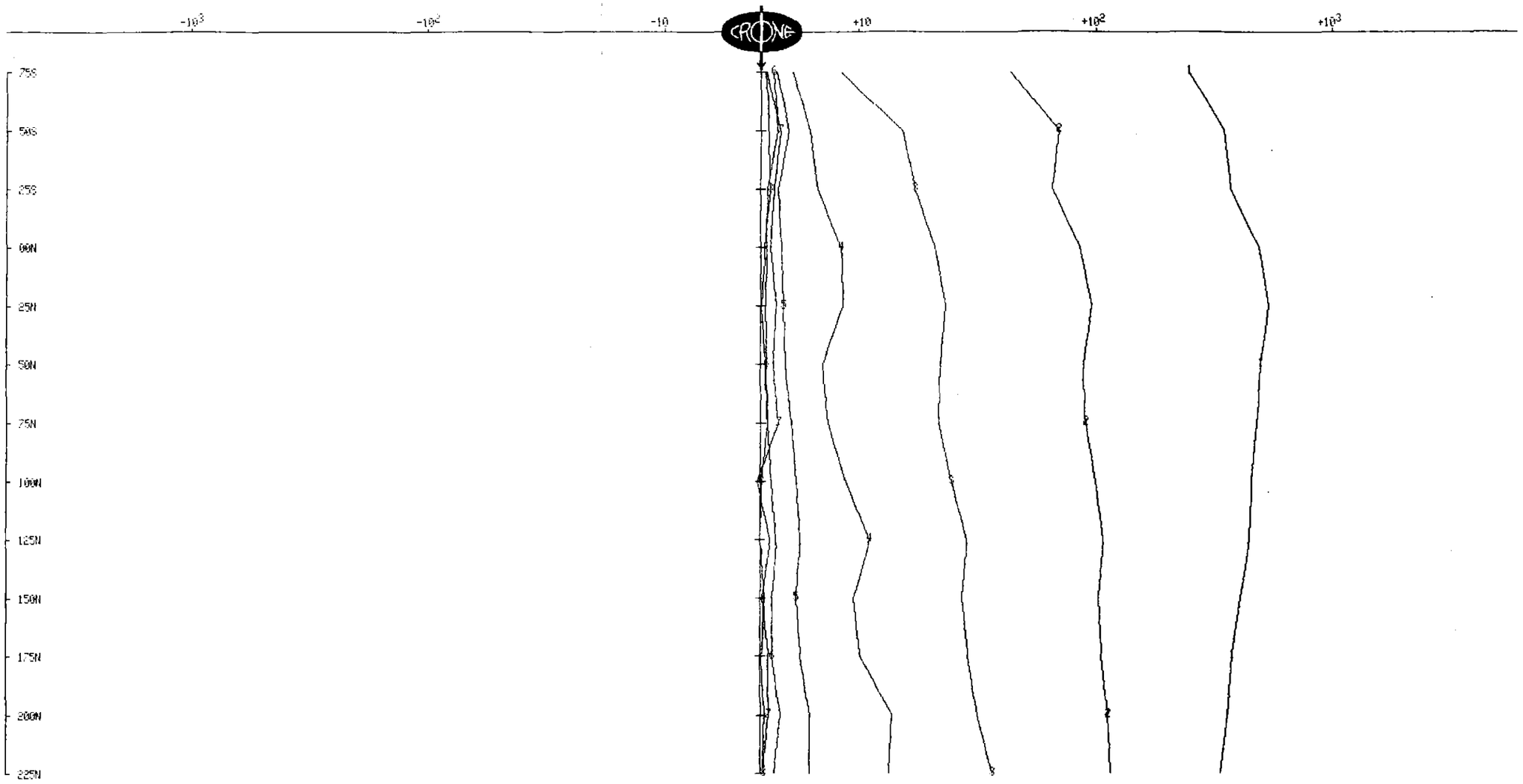
SURFACE PEM

Client : PLUTONIC
Grid : STAVERTON
Date : Jan 19, 1993

Line : 200E
Tx Loop : 2
File name : ST200E2.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000



974329

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

974330

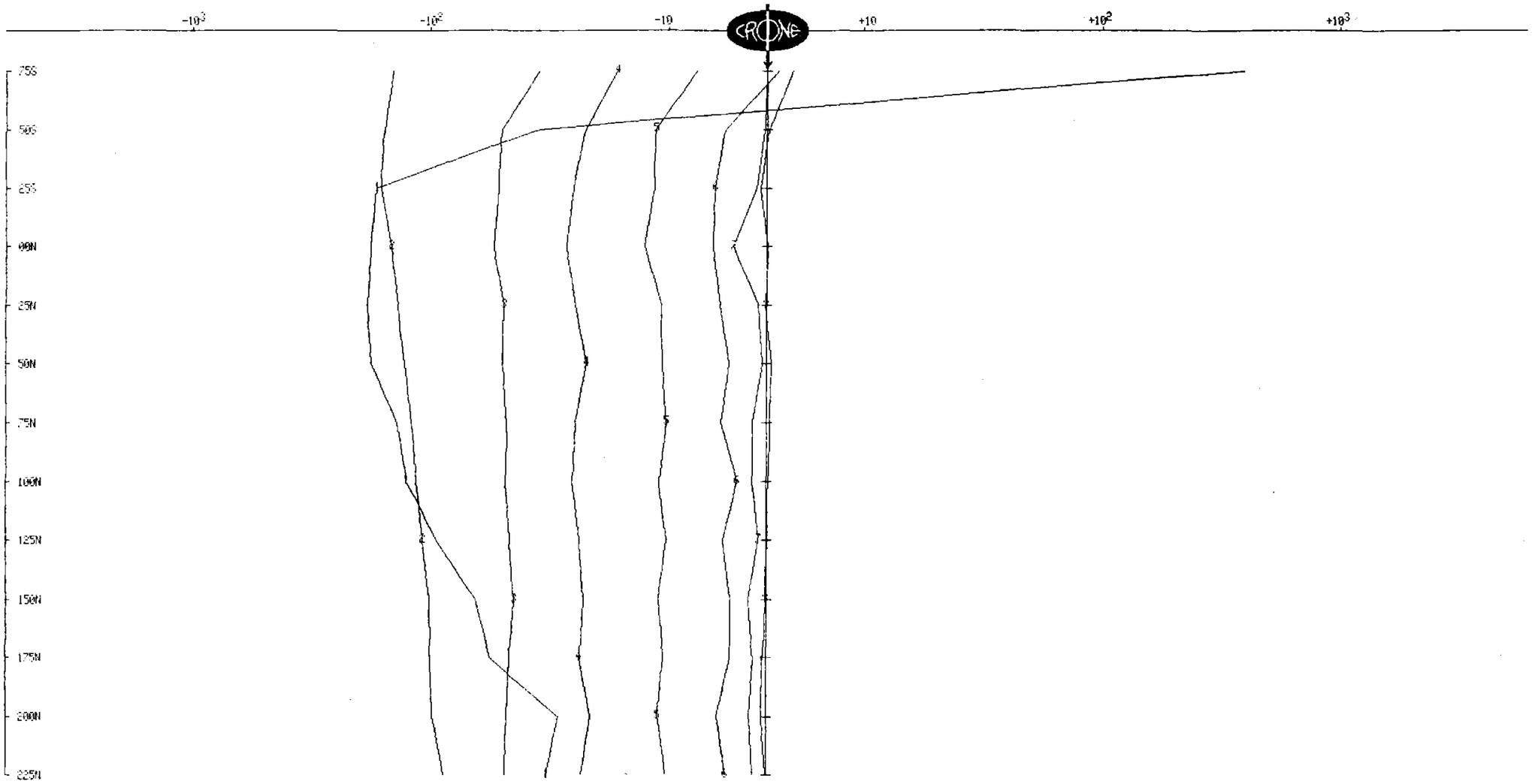
5 cm

Client : PLUTONIC
Grid : STAVERTON
Date : Jan 19, 1993

Line : 200E
Tx Loop : 2
File name : ST200E2.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

974331

5 cm

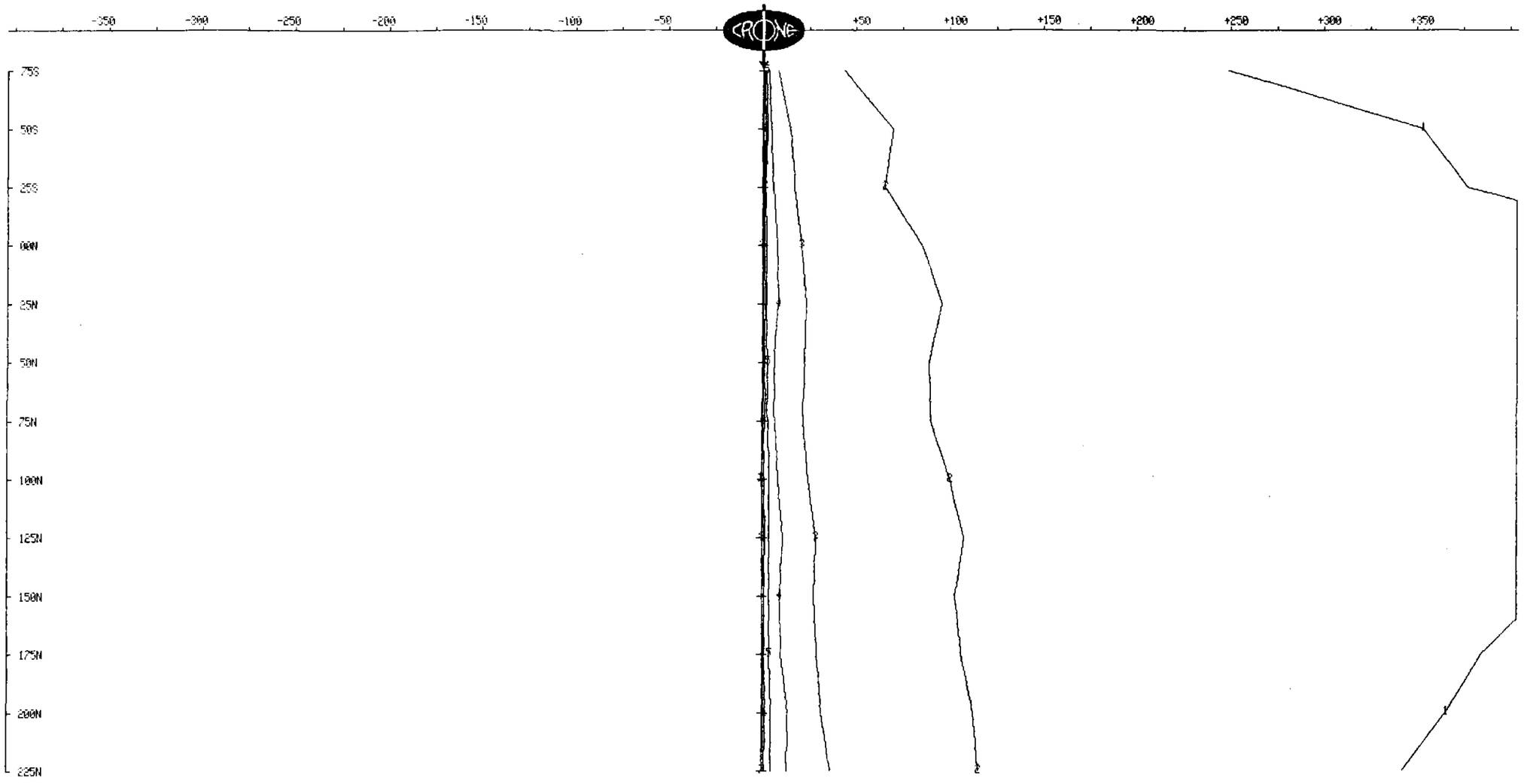
Client : PLUTONIC
Grid : STAVERTON
Date : Jan 19, 1993

Line : 200E
Tx Loop : 2
File name : ST200E2.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

9743321

5 cm

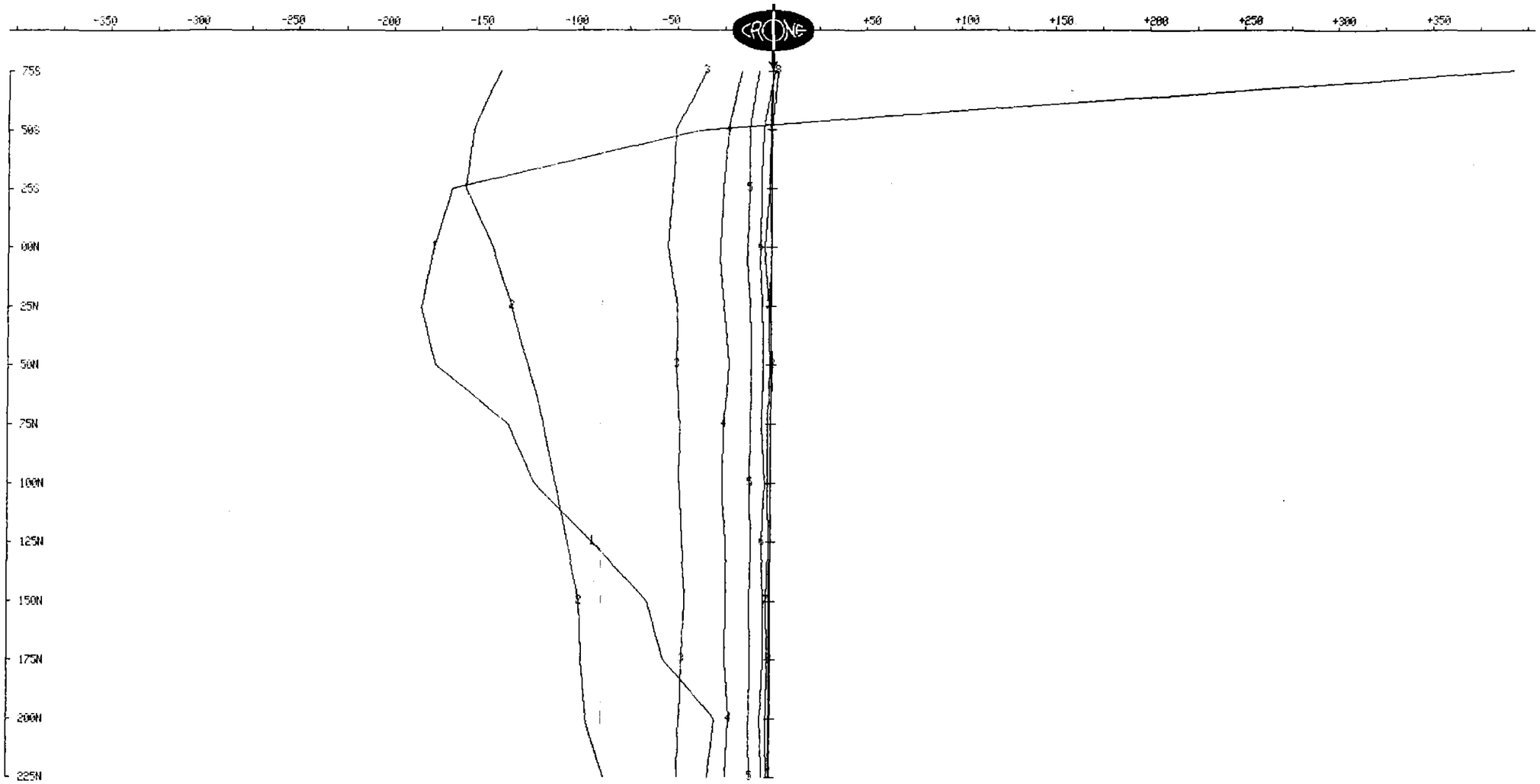
Client : PLUTONIC
Grid : STAVERTON
Date : Jan 19, 1993

Line : 200E
Tx Loop : 2
File name : ST200E2.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

974332

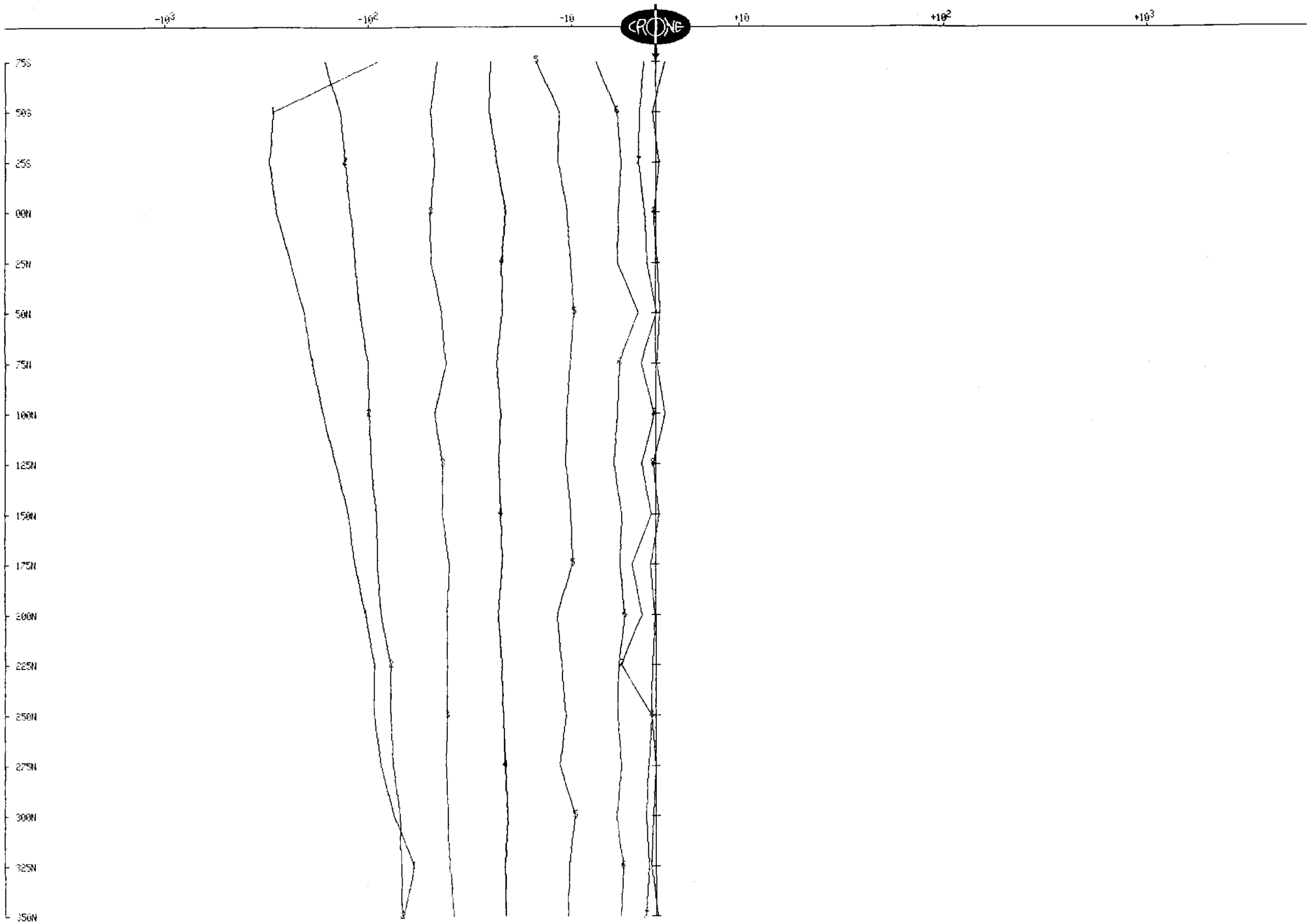
5 cm

Client : PLUTONIC
Grid : STAVERTON
Date : Jan 18, 1993

Line : 300E
Tx Loop : 2
File name : ST300E2.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000



93-3500.

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

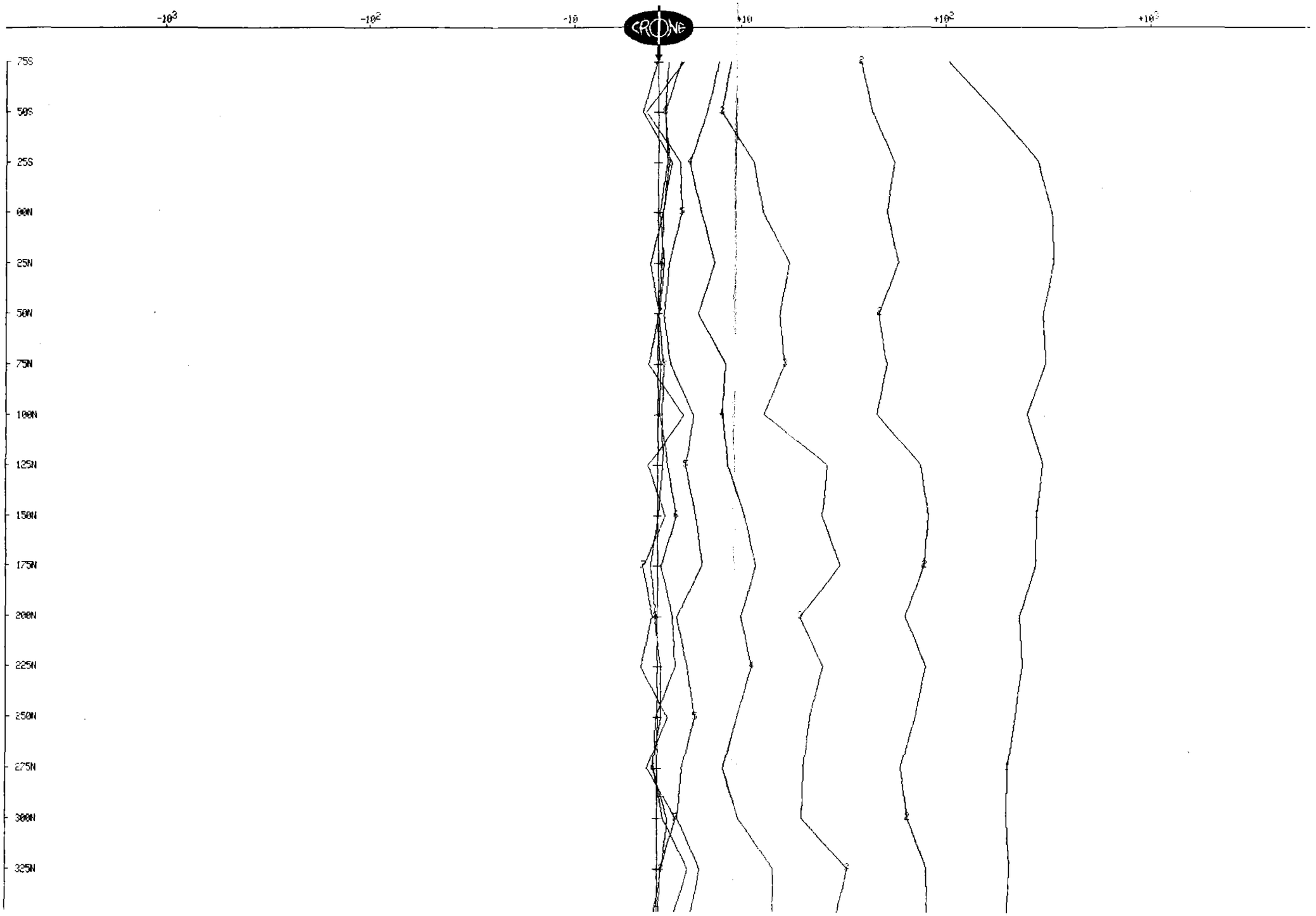
5 cm

Client : PLUTONIC
Grid : STAVERTON
Date : Jan 18, 1993

Line : 300E
Tx Loop : 2
File name : ST300E2.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000



974333

974334

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

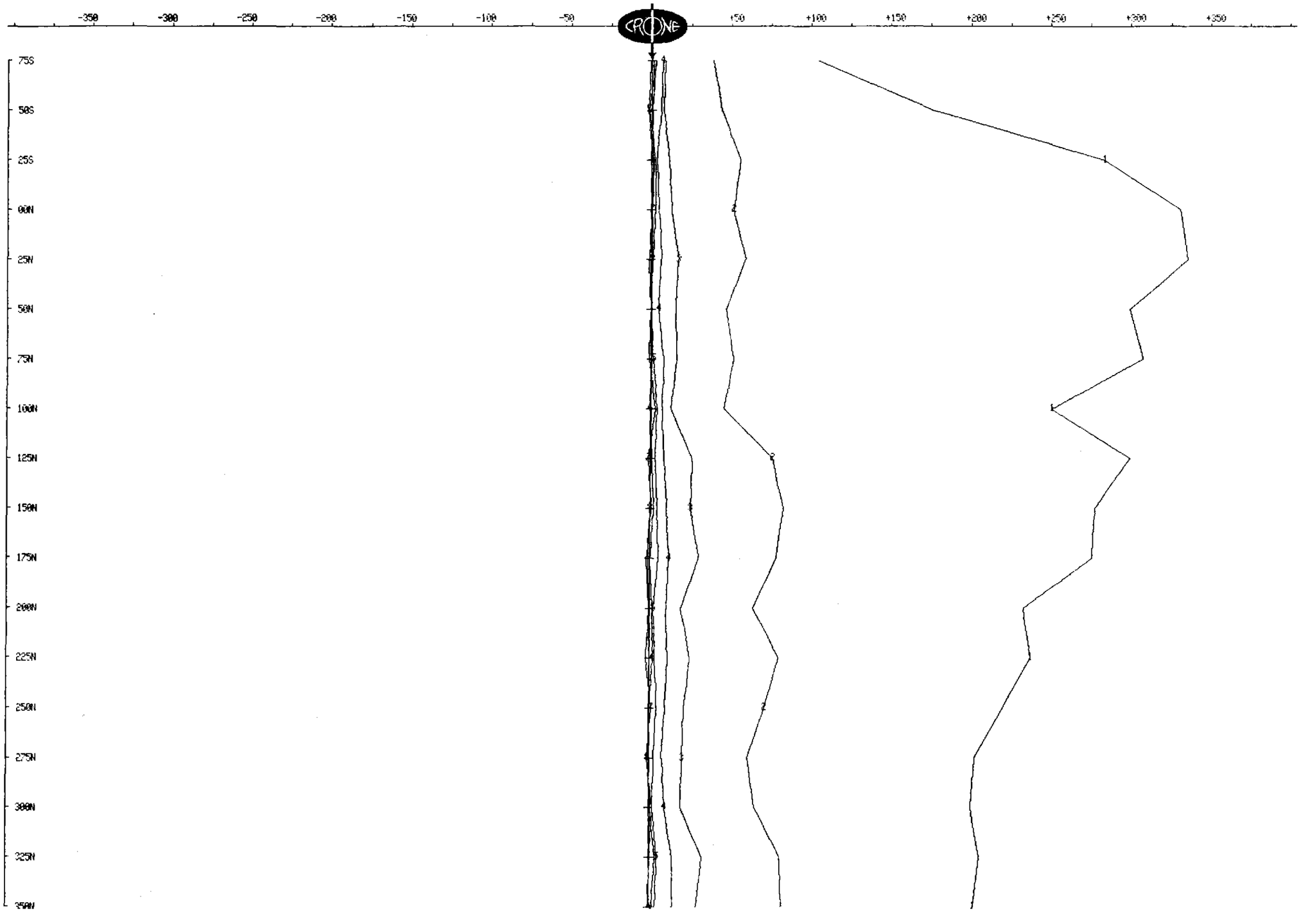
5 cm

Client	: PLUTONIC	Line	: 300E
Grid	: STAVERTON	Tx Loop	: 2
Date	: Jan 18, 1993	File name	: ST300E2.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

974335

5 cm

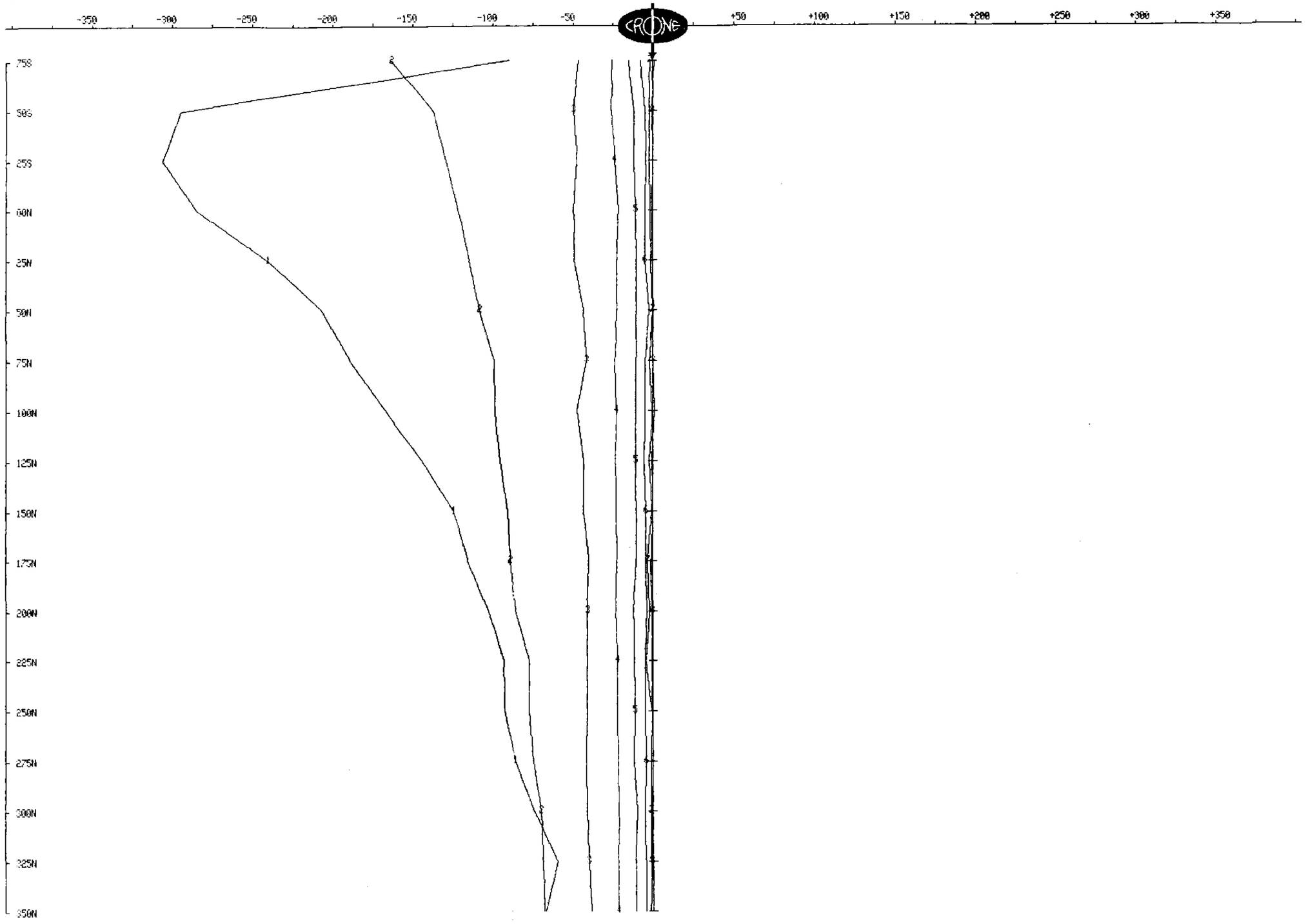
Client : PLUTONIC
Grid : STAVERTON
Date : Jan 18, 1993

Line : 300E
Tx Loop : 2
File name : ST300E2.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



93-3500.

5cm

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

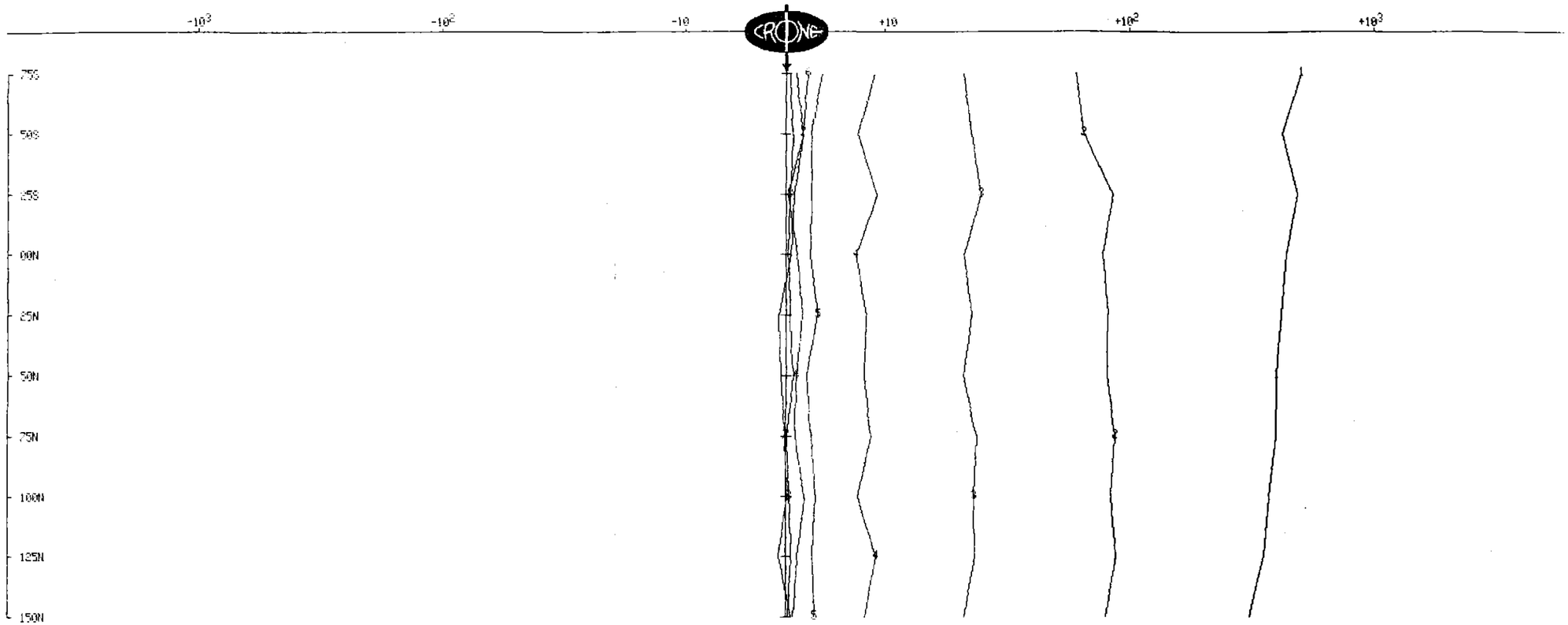
Client : PLUTONIC
Grid : STAVERTON
Date : Jan 19, 1993

Line : 100E
Tx Loop : 2
File name : ST100E2.PEM

974336

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

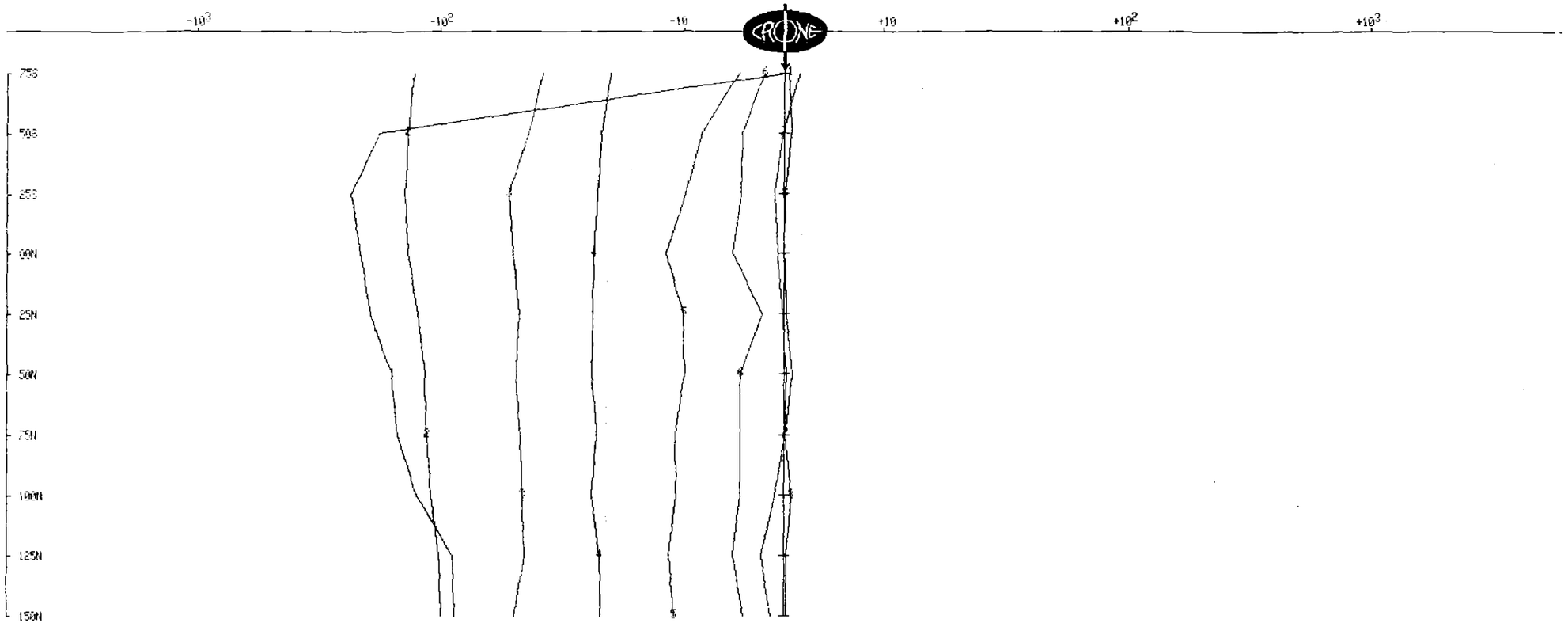
974337

5 cm

Client	: PLUTONIC	Line	: 100E
Grid	: STAVERTON	Tx Loop	: 2
Date	: Jan 19, 1993	File name	: ST100E2.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

9743338

5 cm

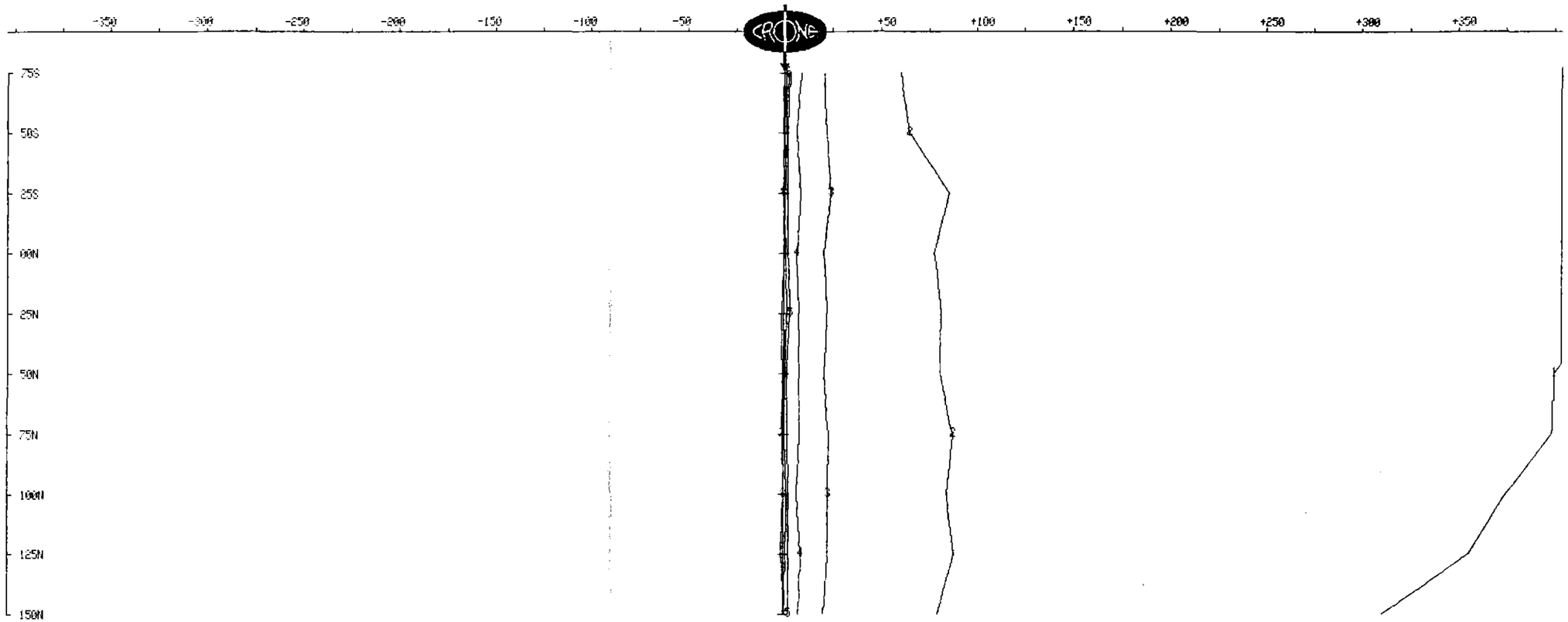
Client : PLUTONIC
Grid : STAVERTON
Date : Jan 19, 1993

Line : 100E
Tx Loop : 2
File name : ST100E2.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

974339

5 cm

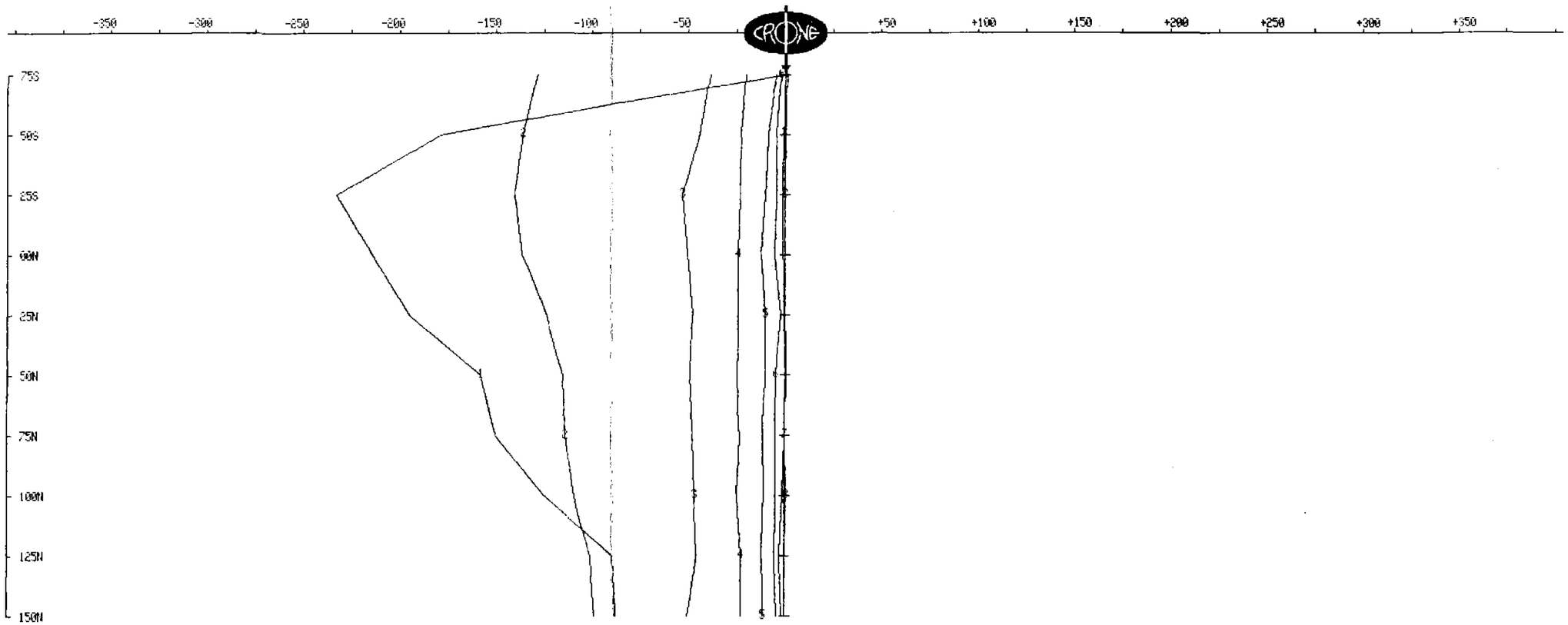
Client : PLUTONIC
Grid : STAVERTON
Date : Jan 19, 1993

Line : 100E
Tx Loop : 2
File name : ST100E2.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



9743440

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

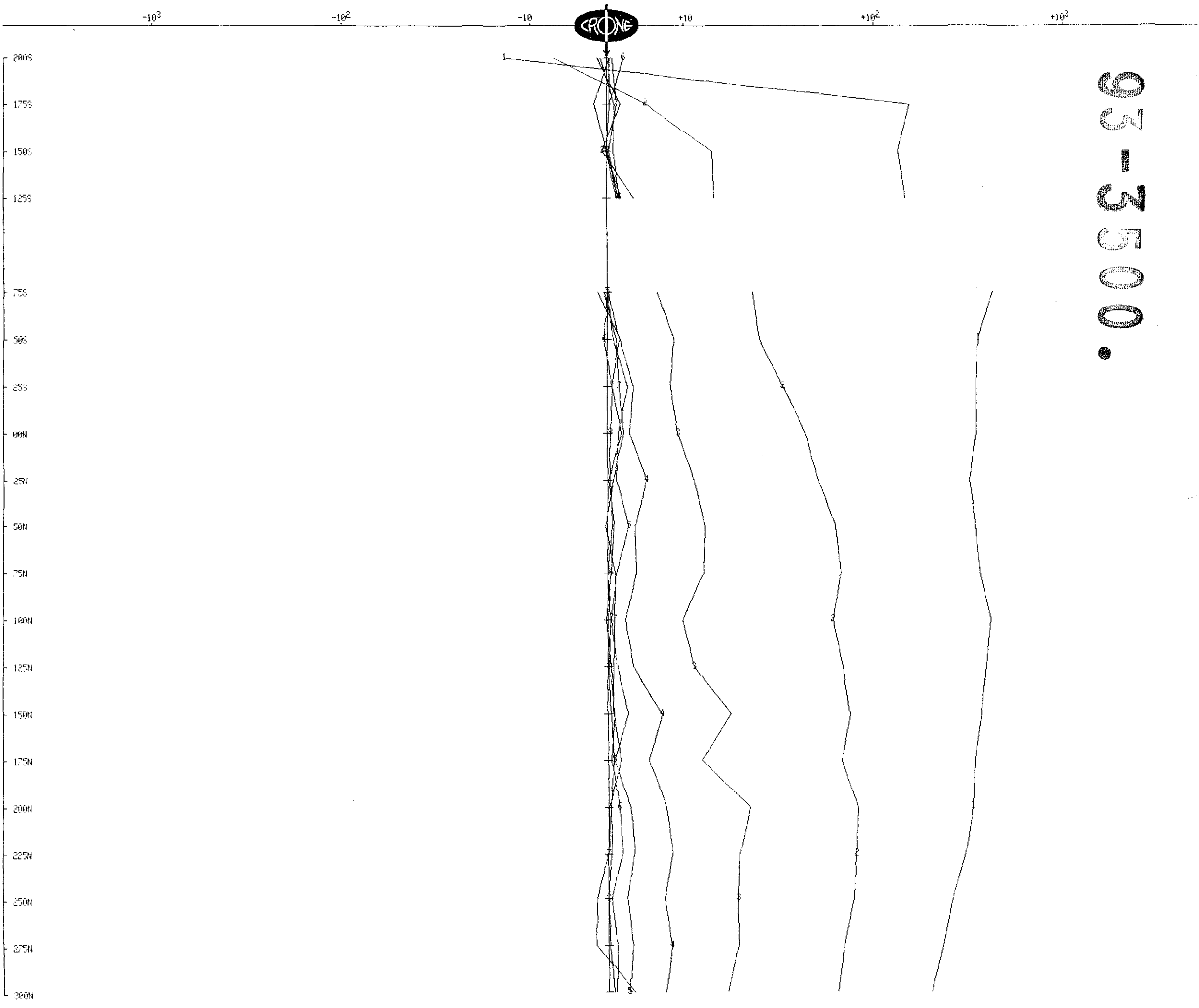
5 cm

Client : PLUTONIC
Grid : STAVERTON
Date : Jan 18, 1993

Line : 600E
Tx Loop : 2
File name : ST600E2.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000



9743440

9743411

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

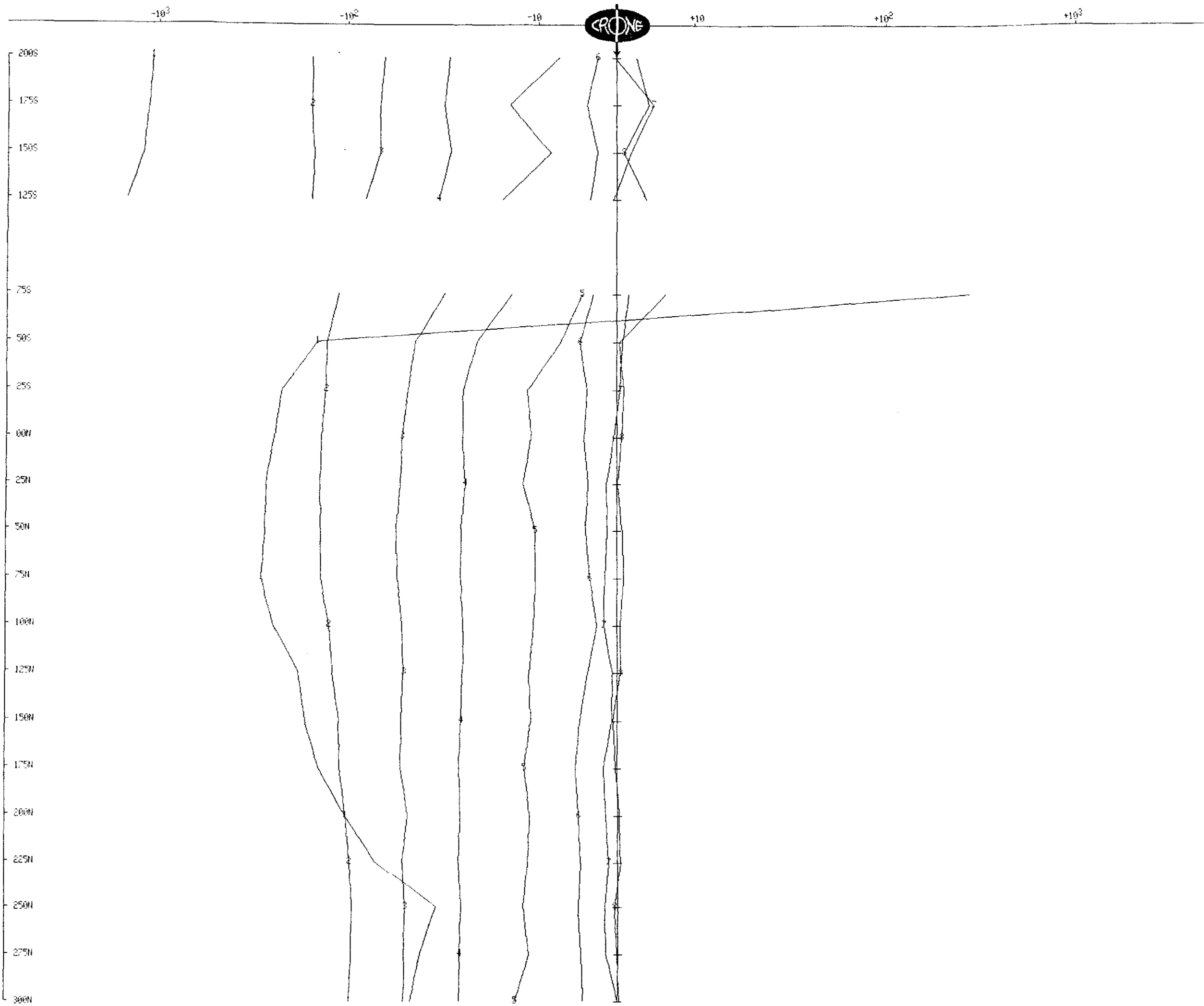
5 cm

Client : PLUTONIC
Grid : STAVERTON
Date : Jan 18, 1993

Line : 600E
Tx Loop : 2
File name : ST600E2.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000



9743 42

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

5 cm

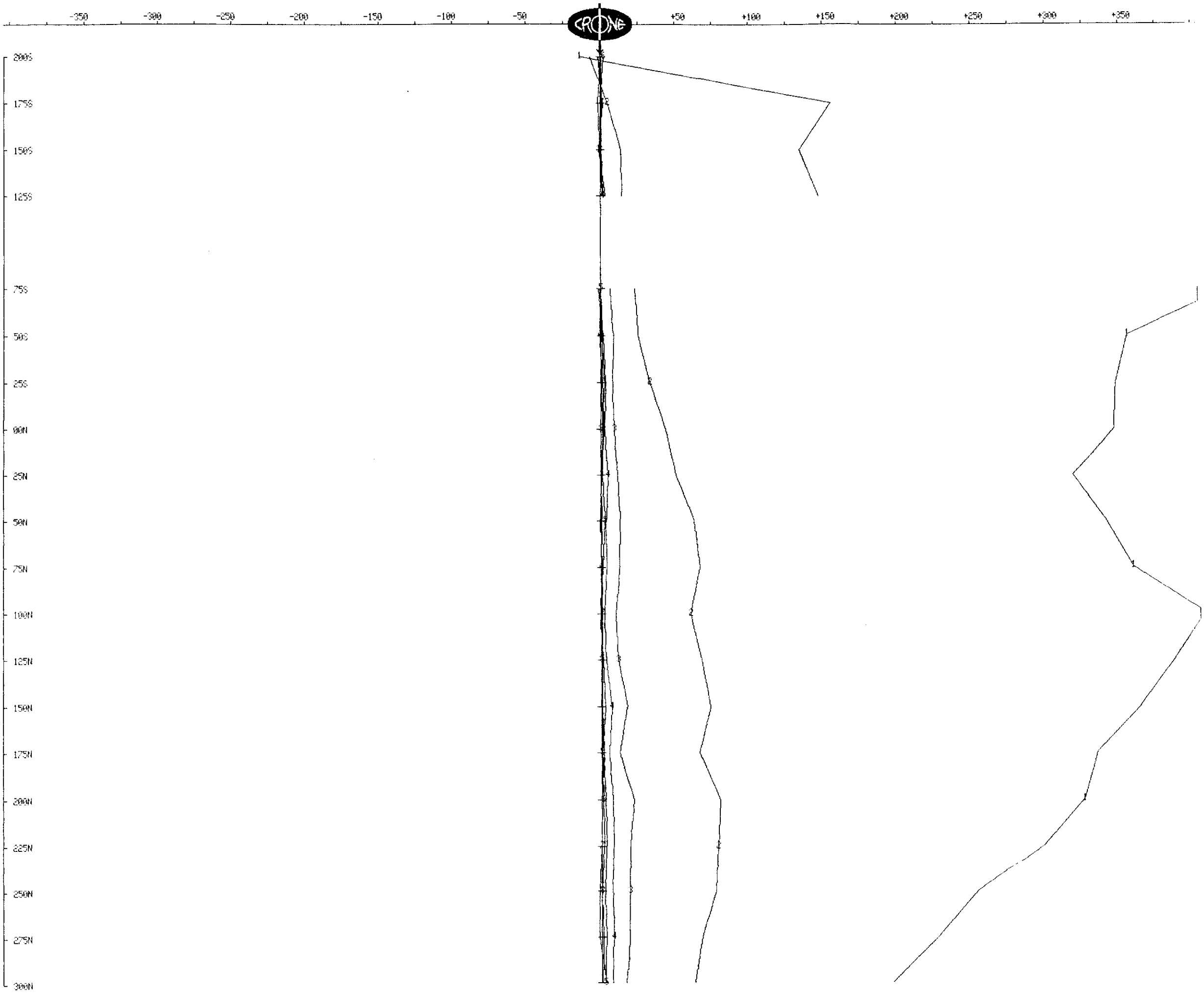
Client : PLUTONIC
Grid : STAVERTON
Date : Jan 18, 1993

Line : 600E
Tx Loop : 2
File name : ST600E2.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

97-343

5 cm

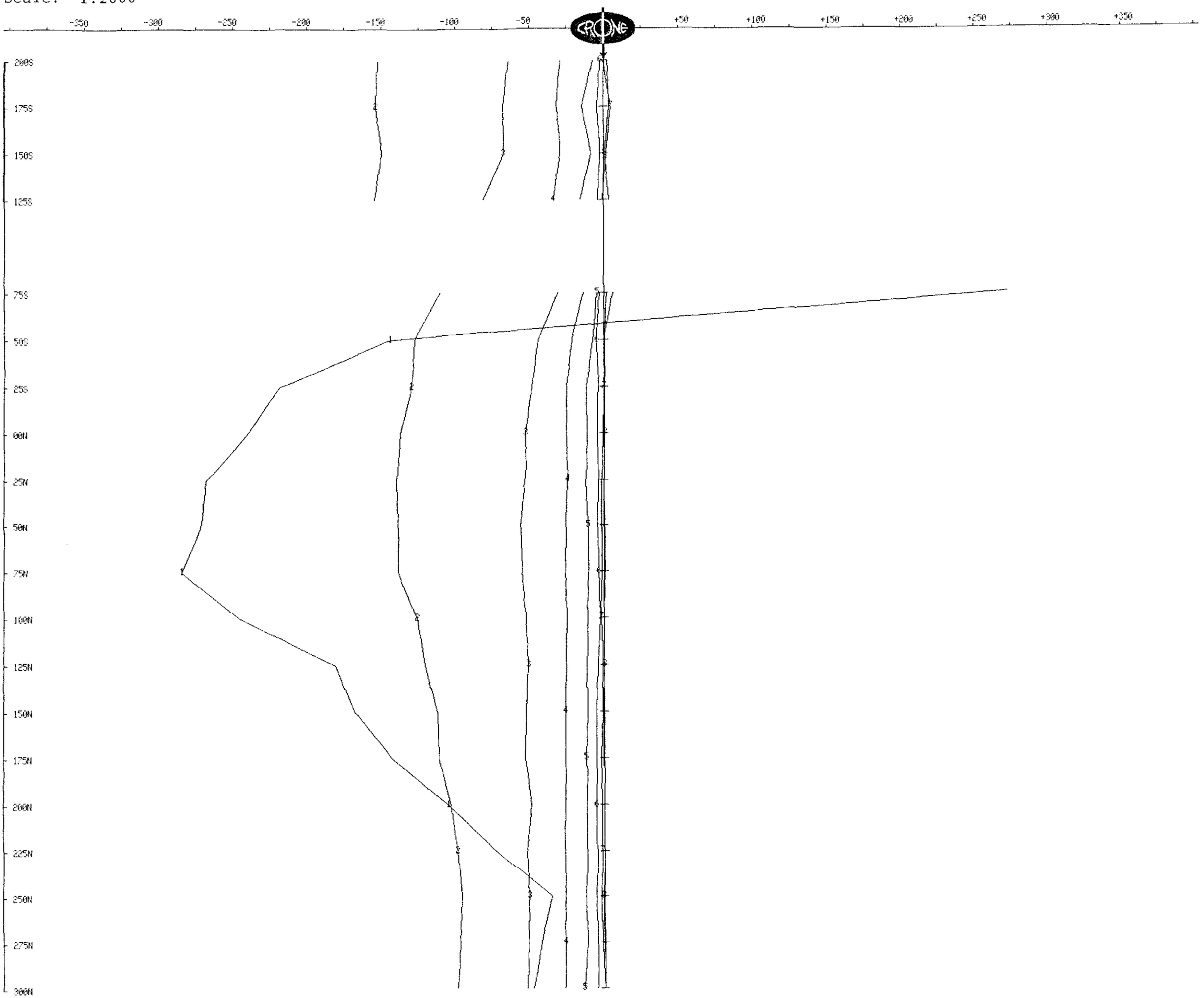
Client : PLUTONIC
Grid : STAVERTON
Date : Jan 18, 1993

Line : 600E
Tx Loop : 2
File name : ST600E2.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



93-3500.

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

974344

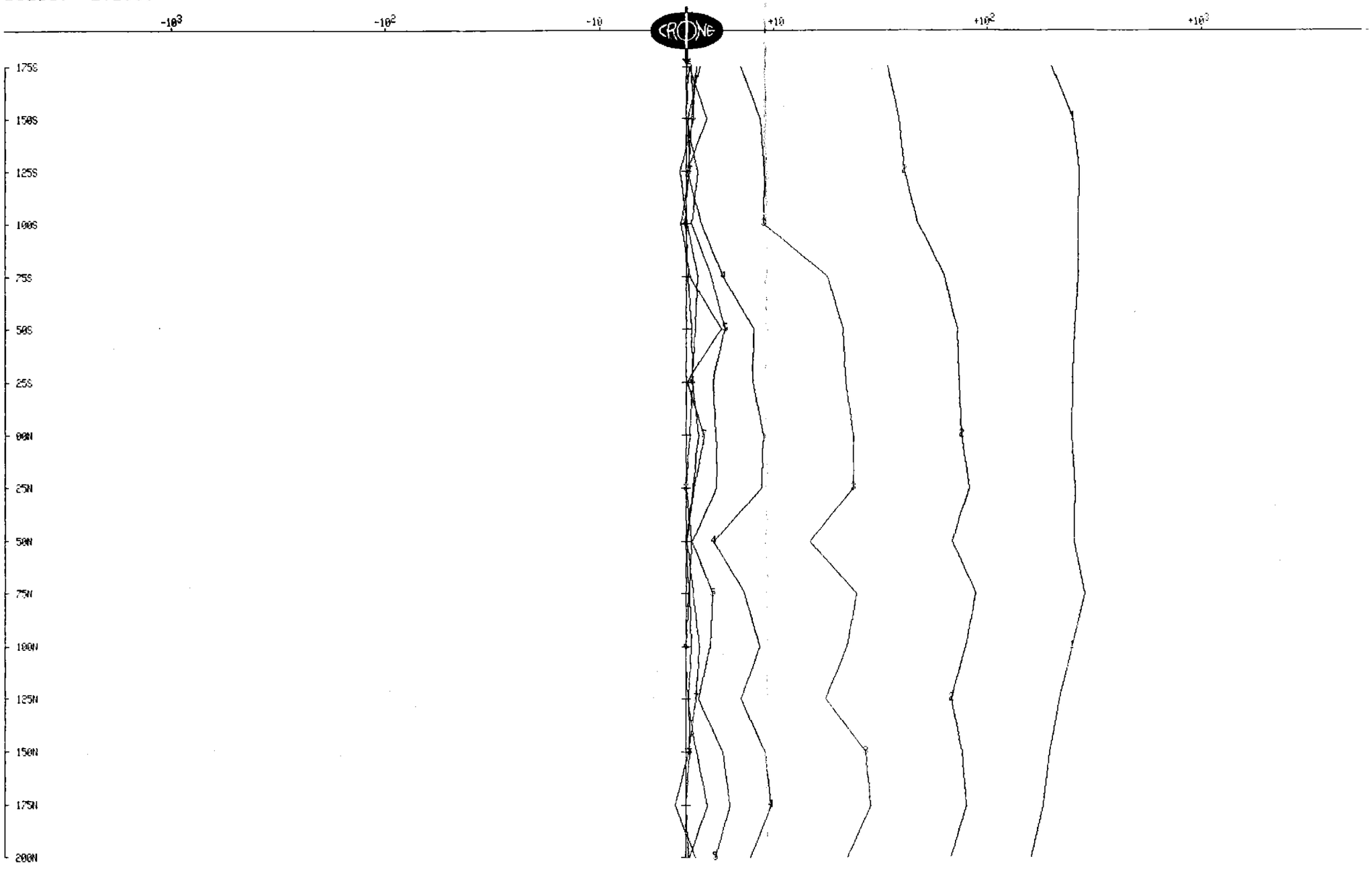
5 cm

Client : PLUTONIC
Grid : STAVERTON
Date : Jan 17, 1993

Line : 700E
Tx Loop : 1
File name : ST700E1.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000



974345

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

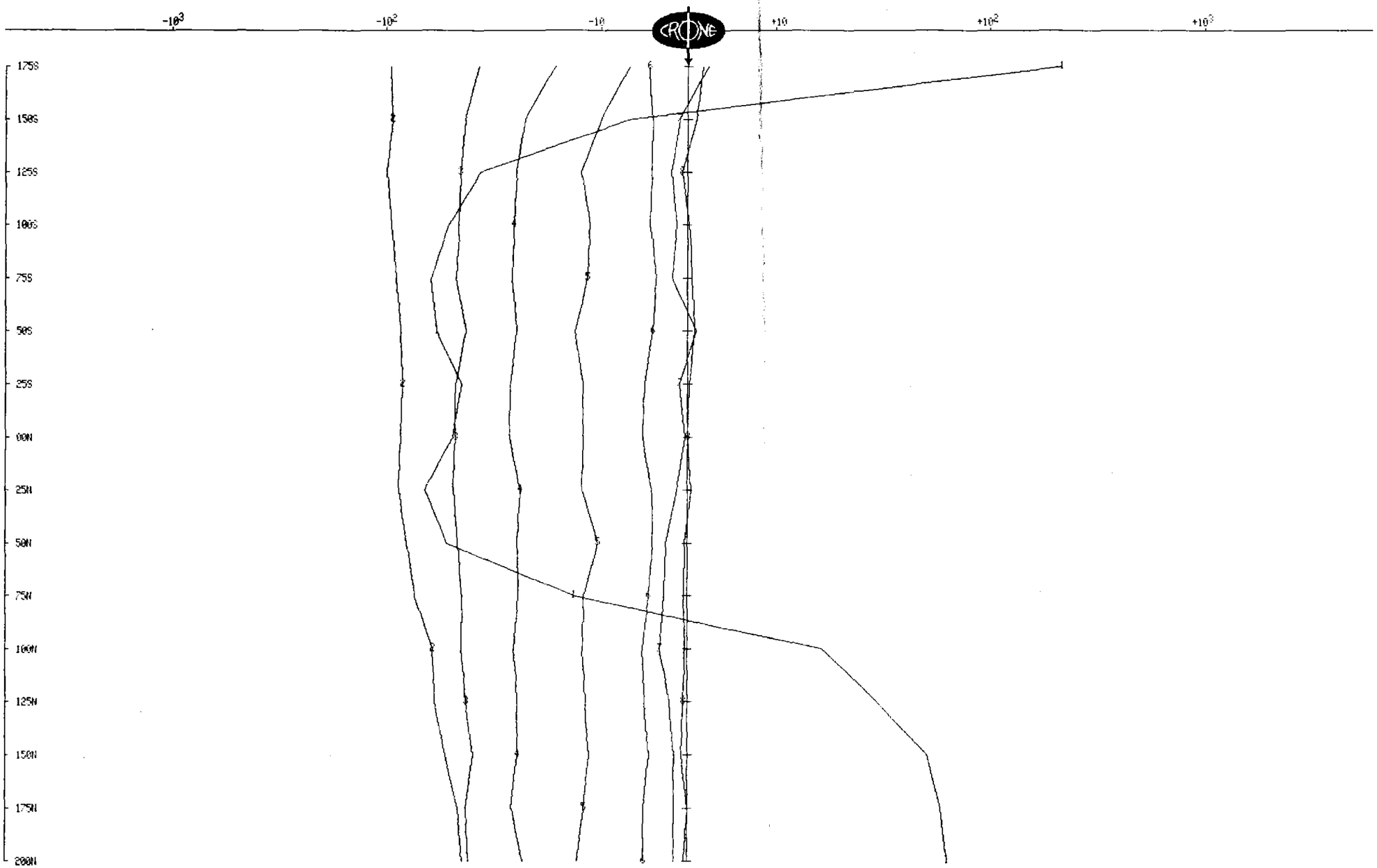
5 cm

Client : PLUTONIC
Grid : STAVERTON
Date : Jan 17, 1993

Line : 700E
Tx Loop : 1
File name : ST700E1.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

5 cm

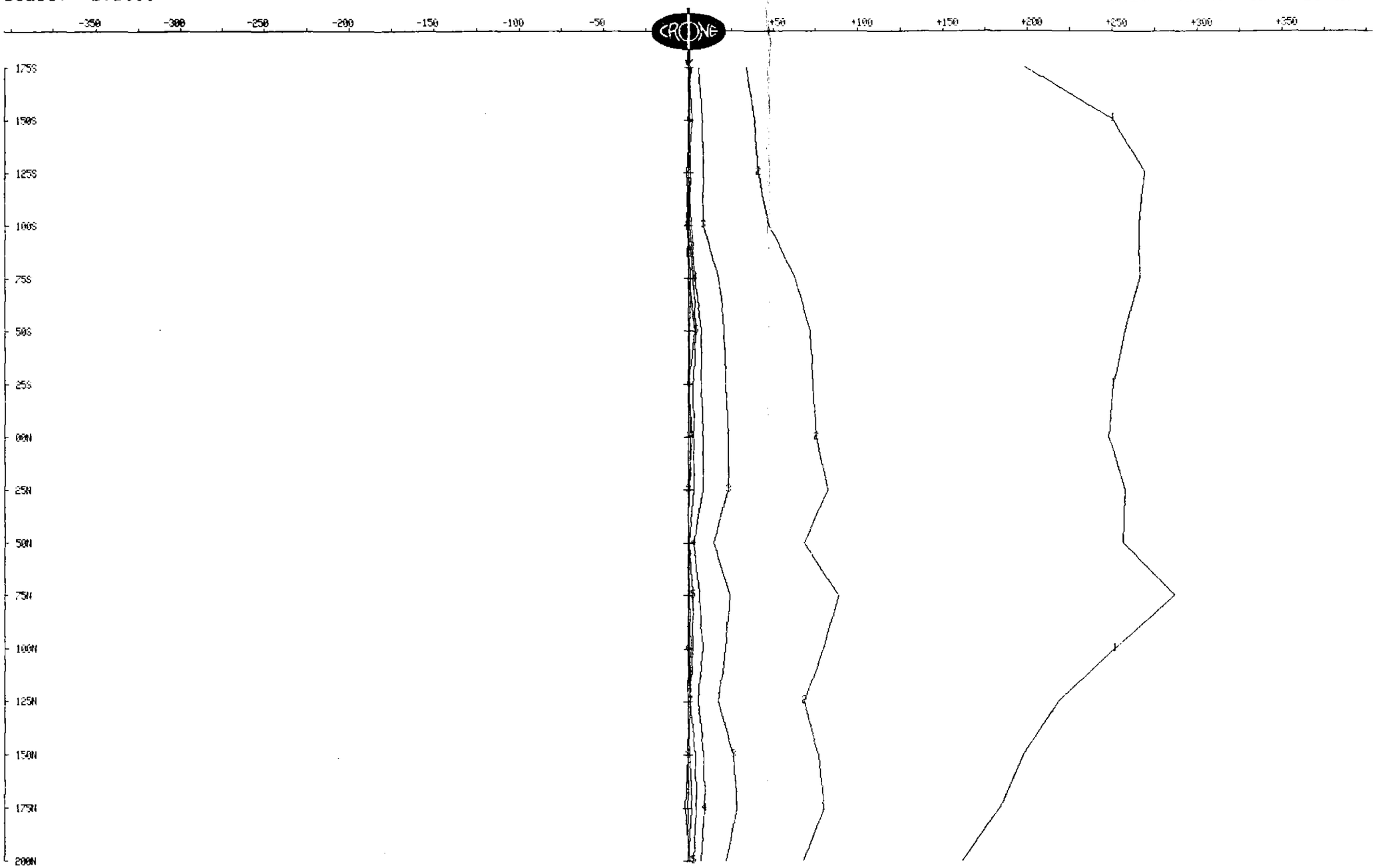
Client : PLUTONIC
Grid : STAVERTON
Date : Jan 17, 1993

Line : 700E
Tx Loop : 1
File name : ST700E1.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



974346

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

5 cm

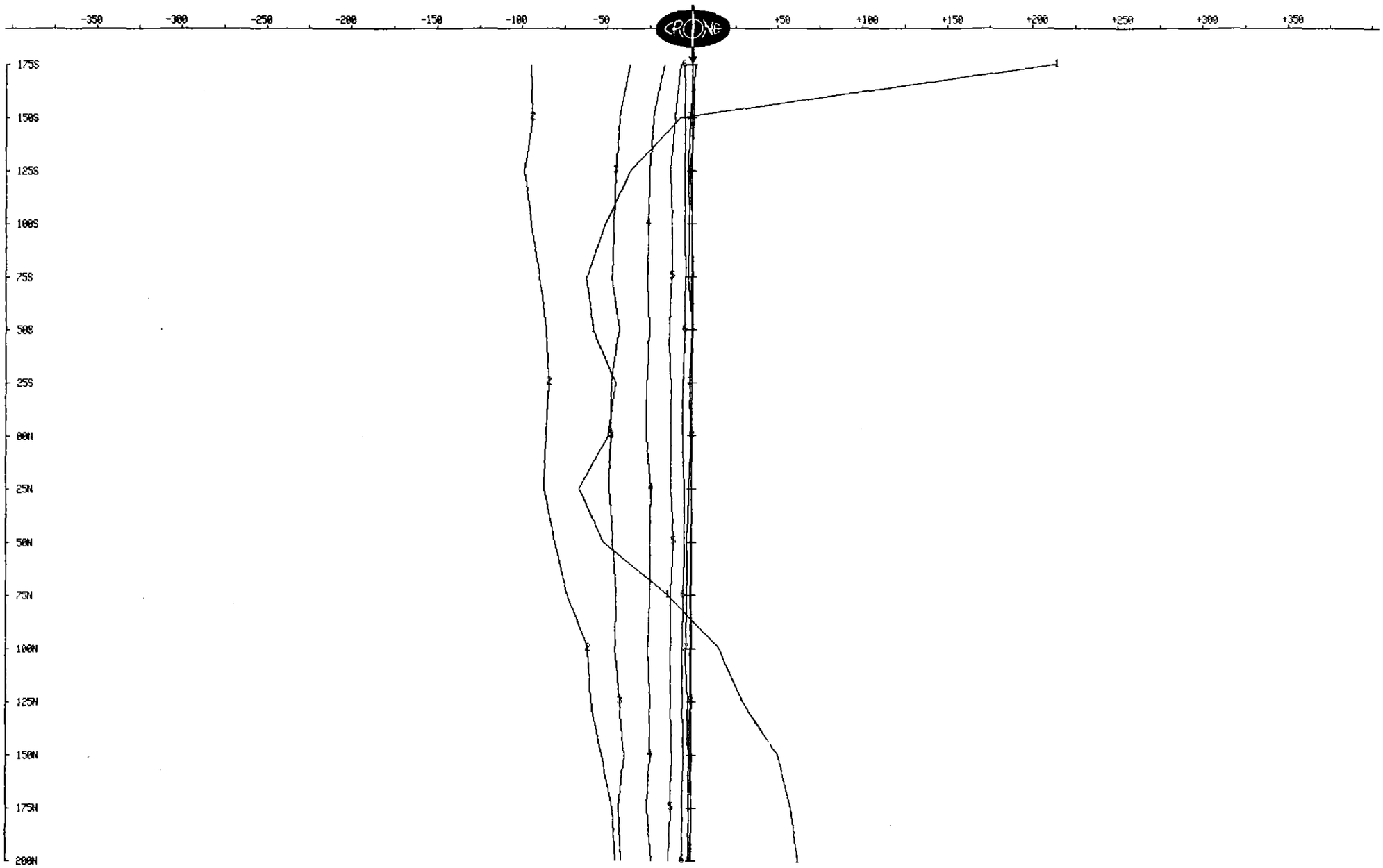
Client : PLUTONIC
Grid : STAVERTON
Date : Jan 17, 1993

Line : 700E
Tx Loop : 1
File name : ST700E1.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



974347

974348

CRONE GEOPHYSICS & EXPLORATION LTD

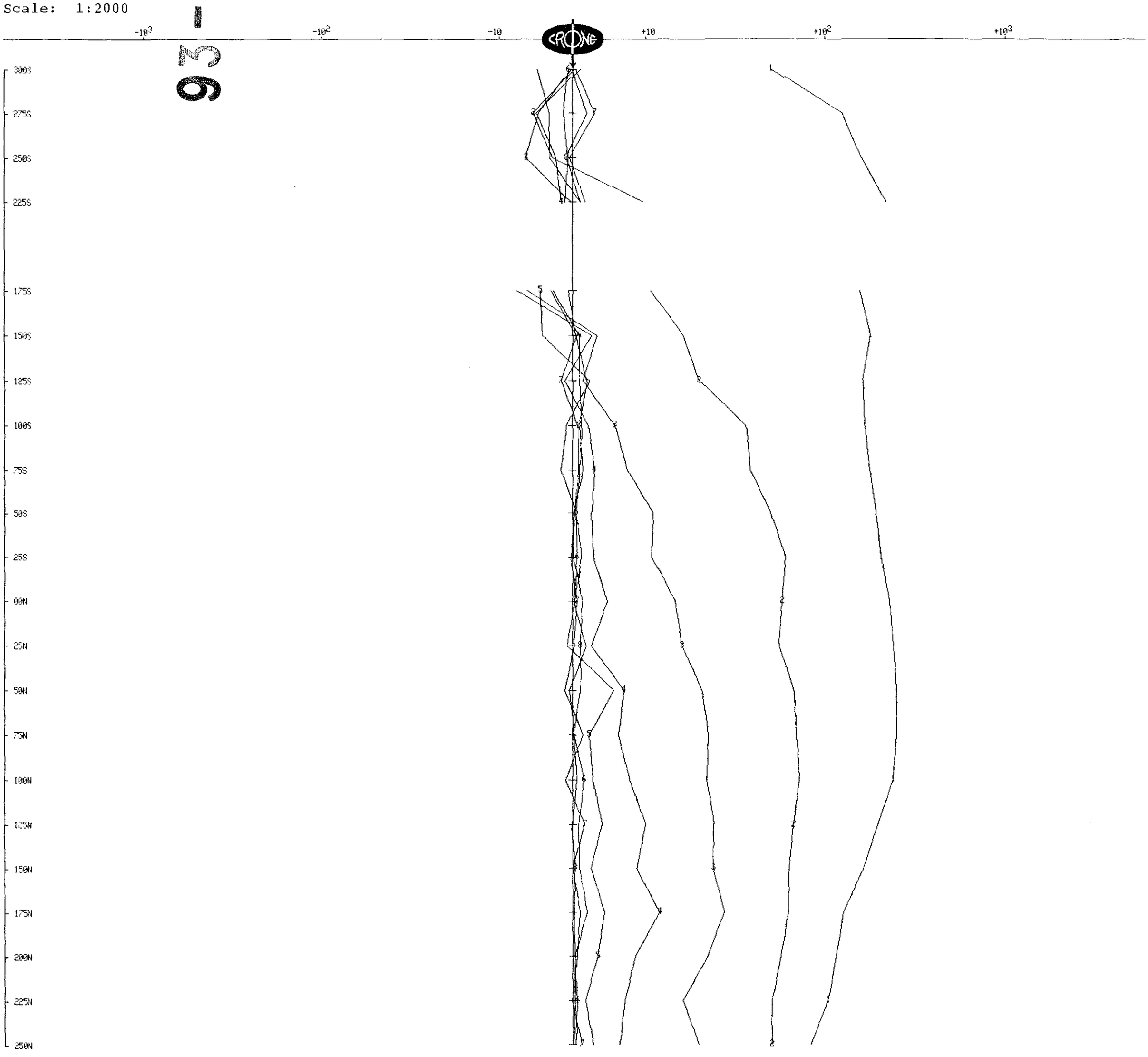
SURFACE PEM

Client	: PLUTONIC	Line	: 800E
Grid	: STAVERTON	Tx Loop	: 1
Date	: Jan 16, 1993	File name	: ST800E1.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

5 cm

Scale: 1:2000



974349

CRONE GEOPHYSICS & EXPLORATION LTD

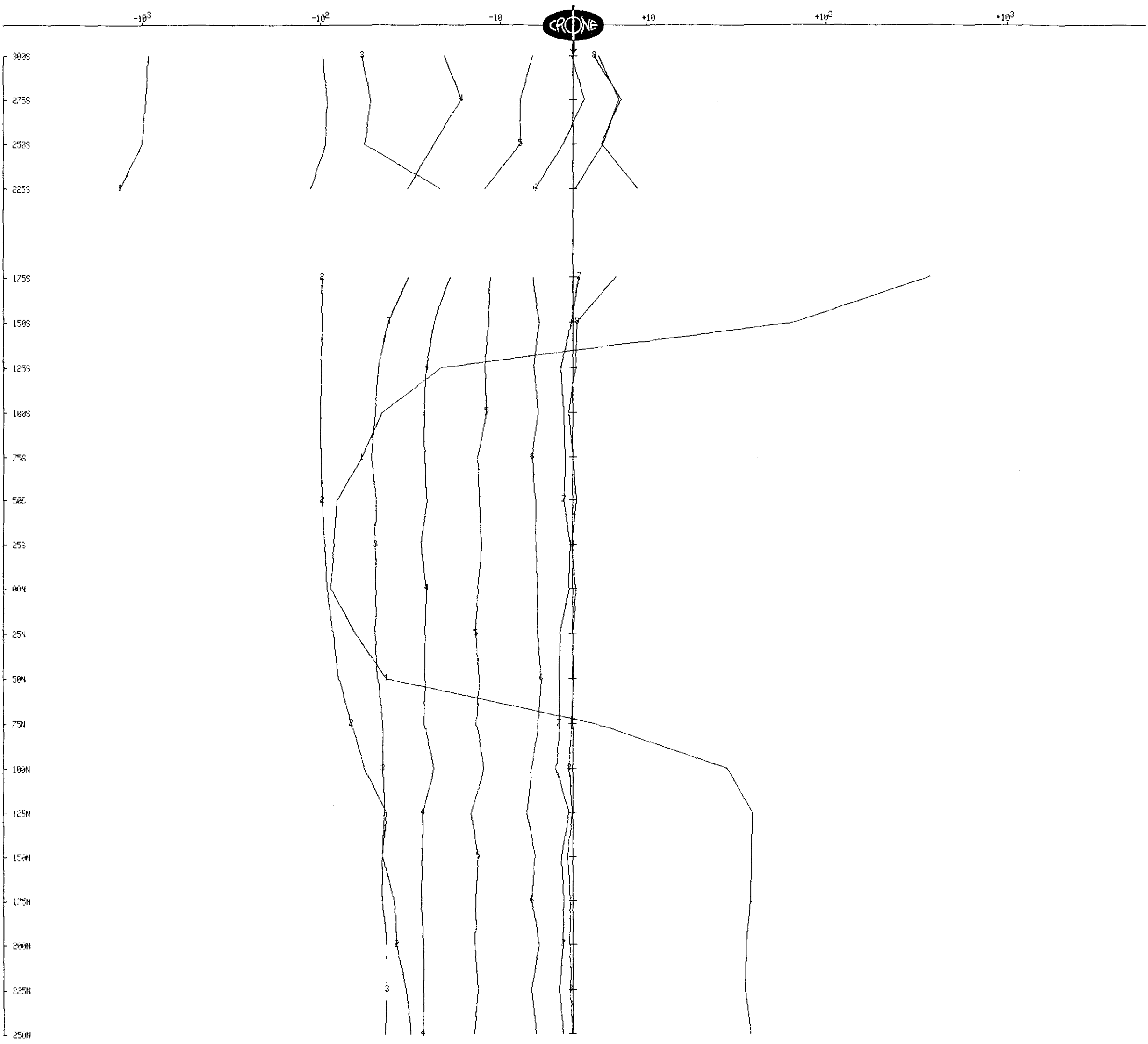
SURFACE PEM

5 cm

Client	: PLUTONIC	Line	: 800E
Grid	: STAVERTON	Tx Loop	: 1
Date	: Jan 16, 1993	File name	: ST800E1.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000



974350

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

5 cm

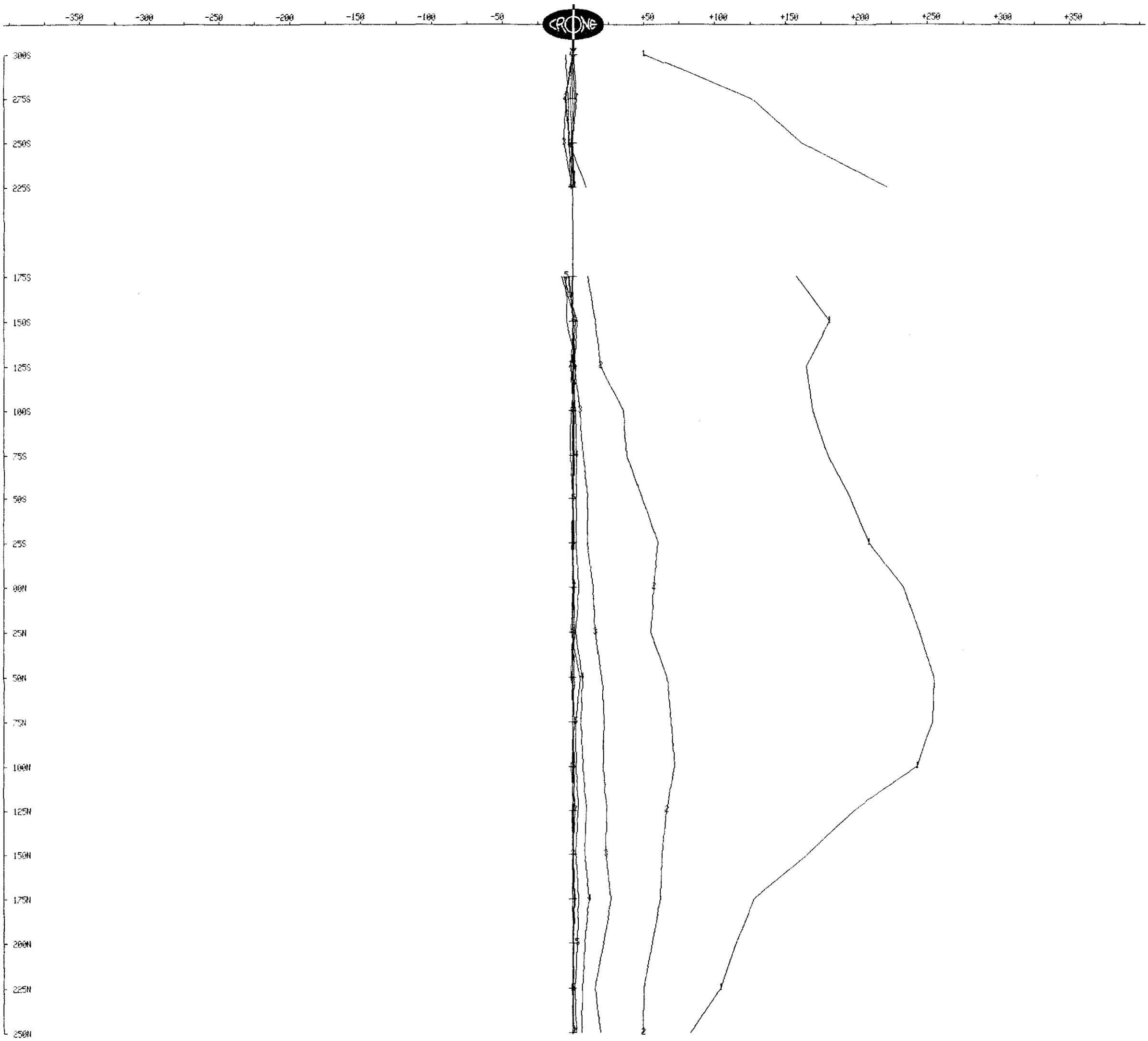
Client : PLUTONIC
Grid : STAVERTON
Date : Jan 16, 1993

Line : 800E
Tx Loop : 1
File name : ST800E1.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



974351

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

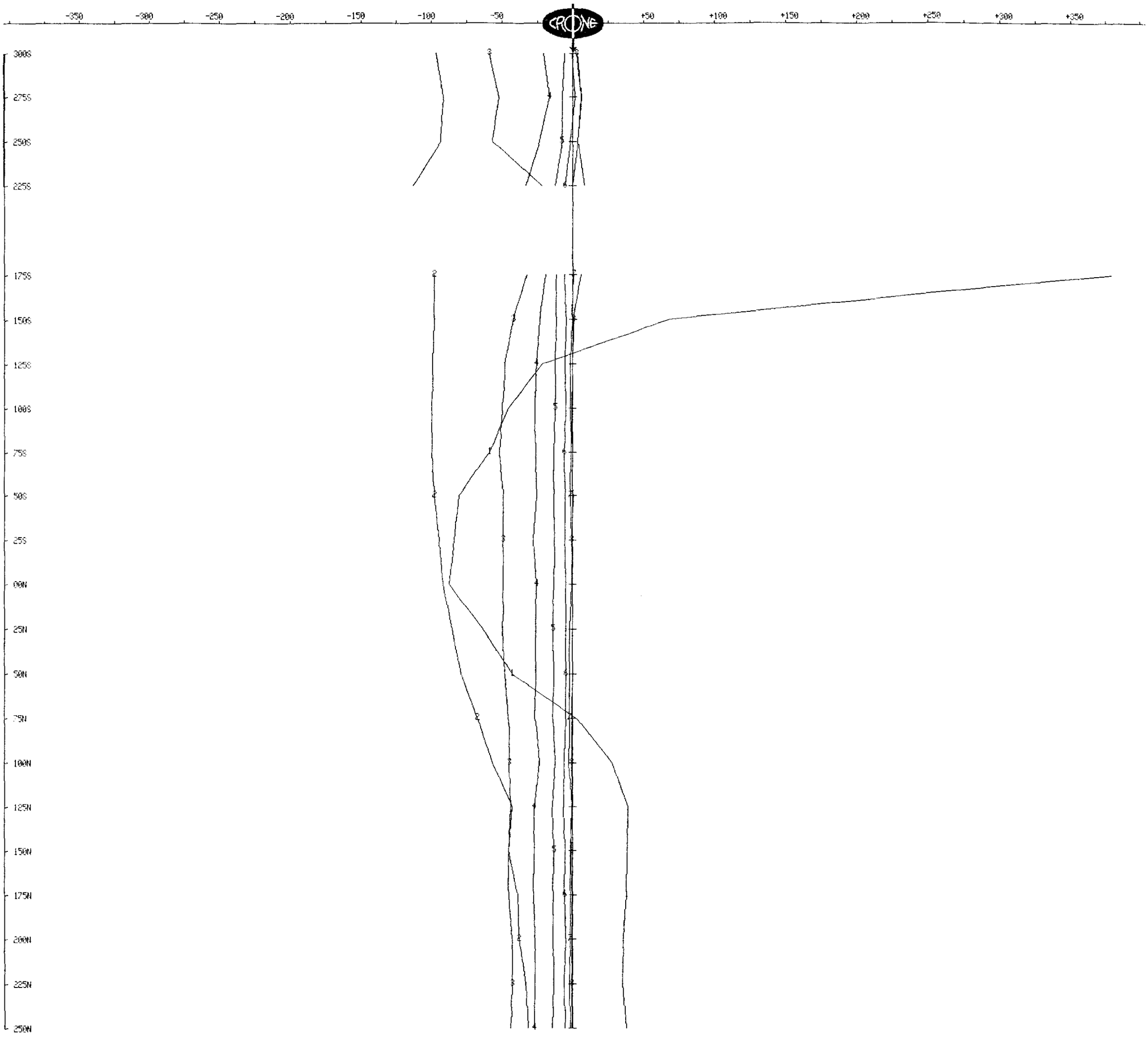
5 cm

Client	: PLUTONIC	Line	: 800E
Grid	: STAVERTON	Tx Loop	: 1
Date	: Jan 16, 1993	File name	: ST800E1.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



974352

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

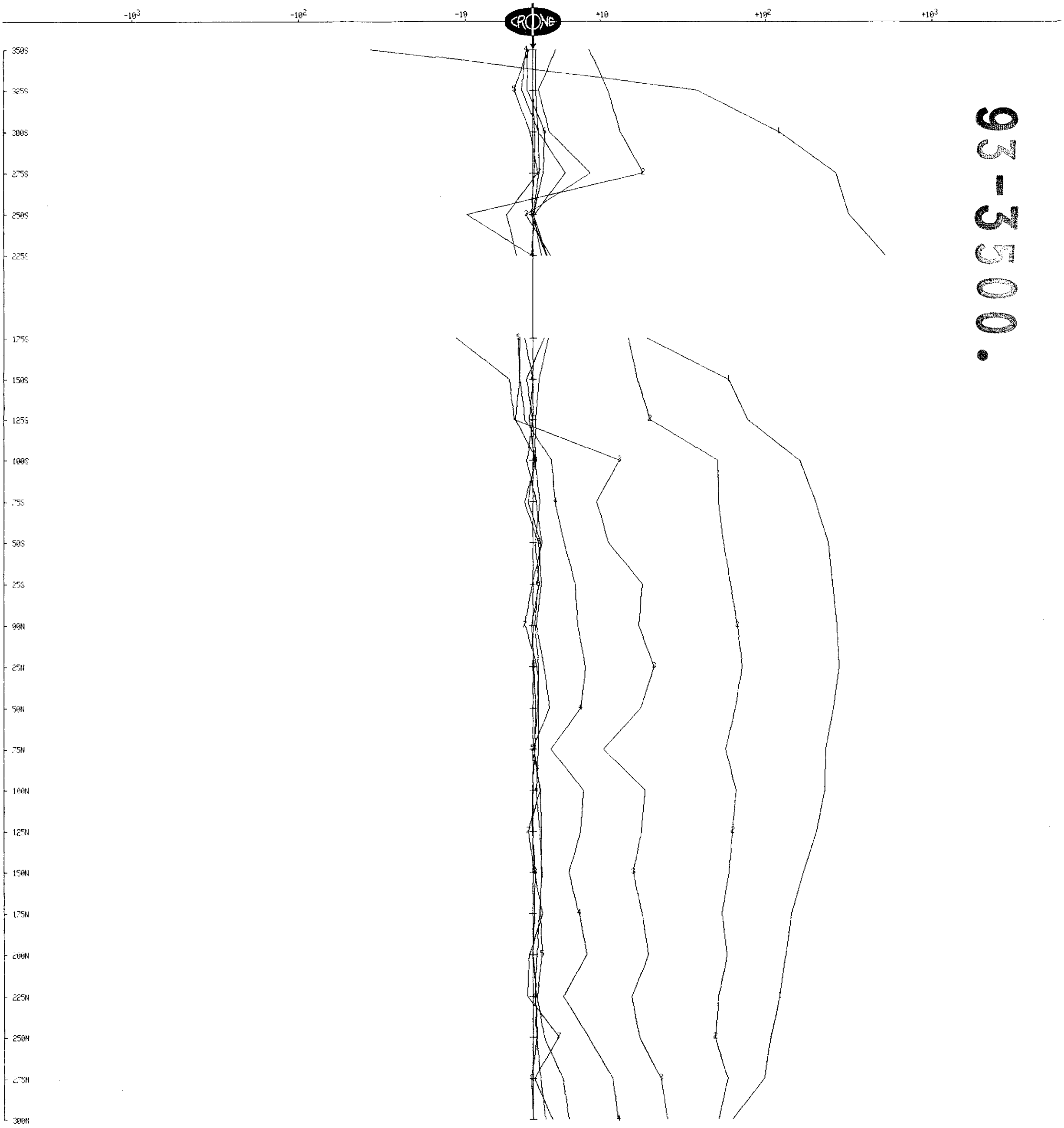
5 cm

Client : PLUTONIC
Grid : STAVERTON
Date : Jan 16, 1993

Line : 900E
Tx Loop : 1
File name : ST900E1.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000



ST900E1

974353

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

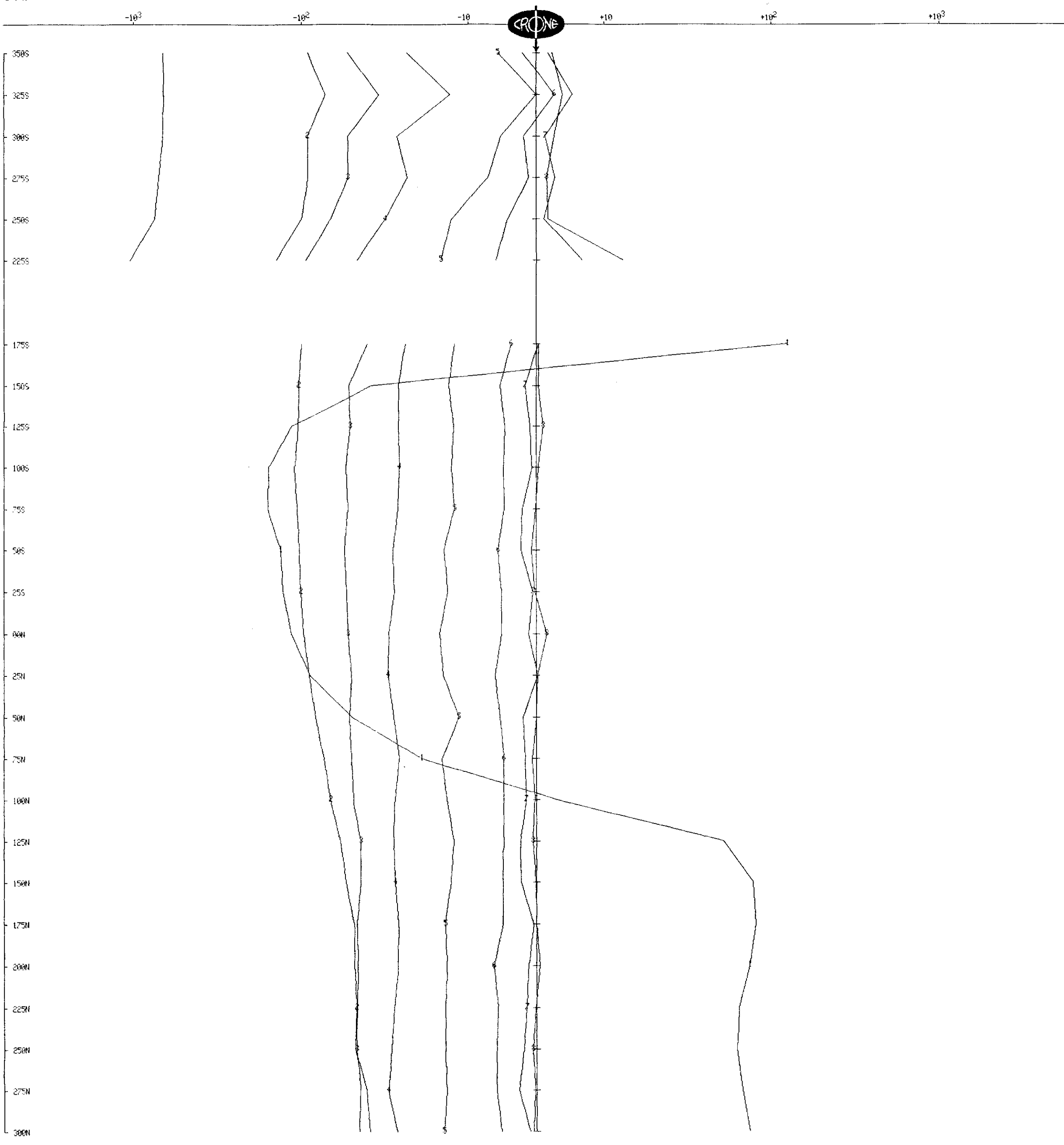
5 cm

Client : PLUTONIC
Grid : STAVERTON
Date : Jan 16, 1993

Line : 900E
Tx Loop : 1
File name : ST900E1.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000



974354

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

5 cm

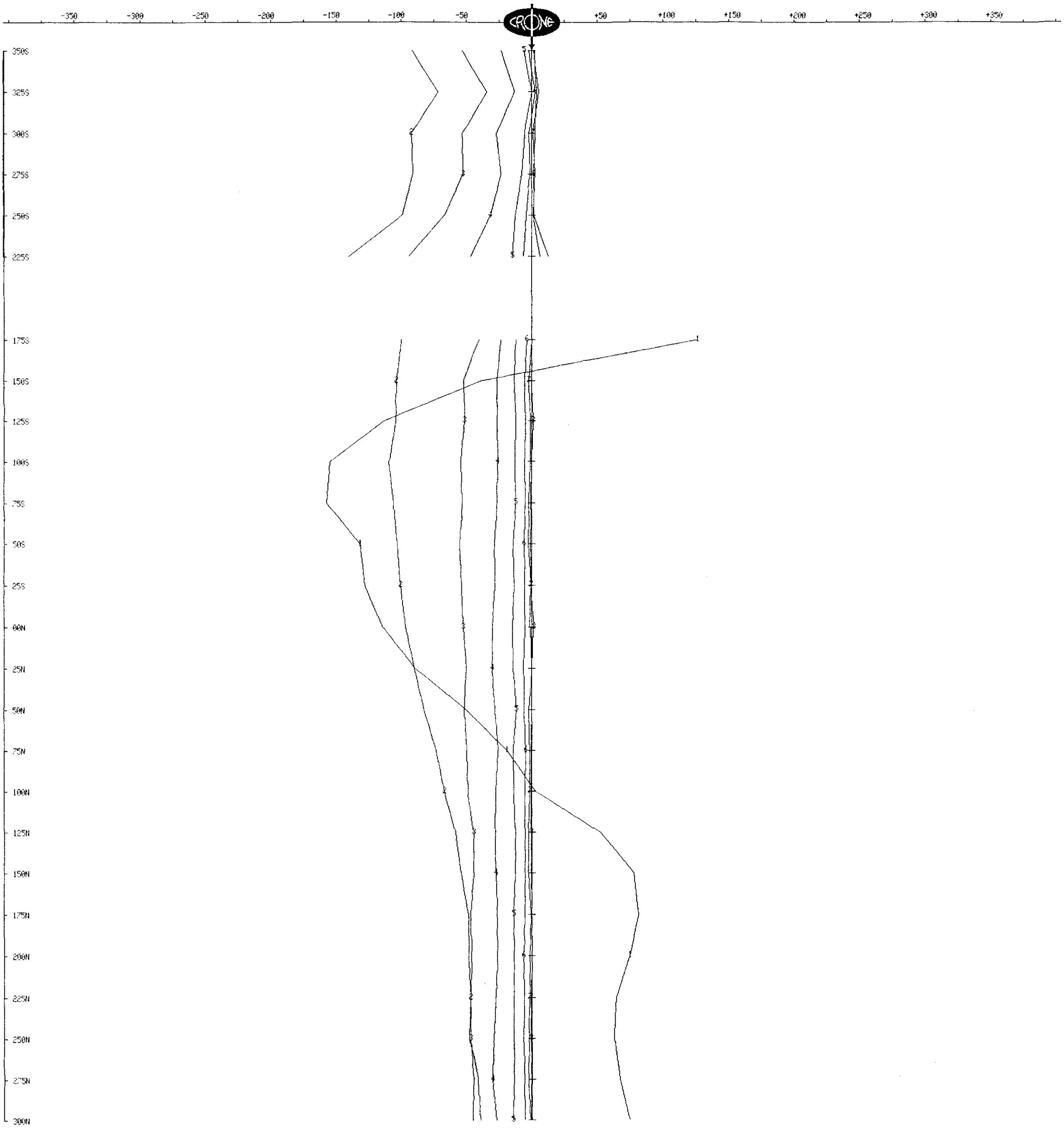
Client : PLUTONIC
Grid : STAVERTON
Date : Jan 16, 1993

Line : 900E
Tx Loop : 1
File name : ST900E1.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



974355

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

5 cm

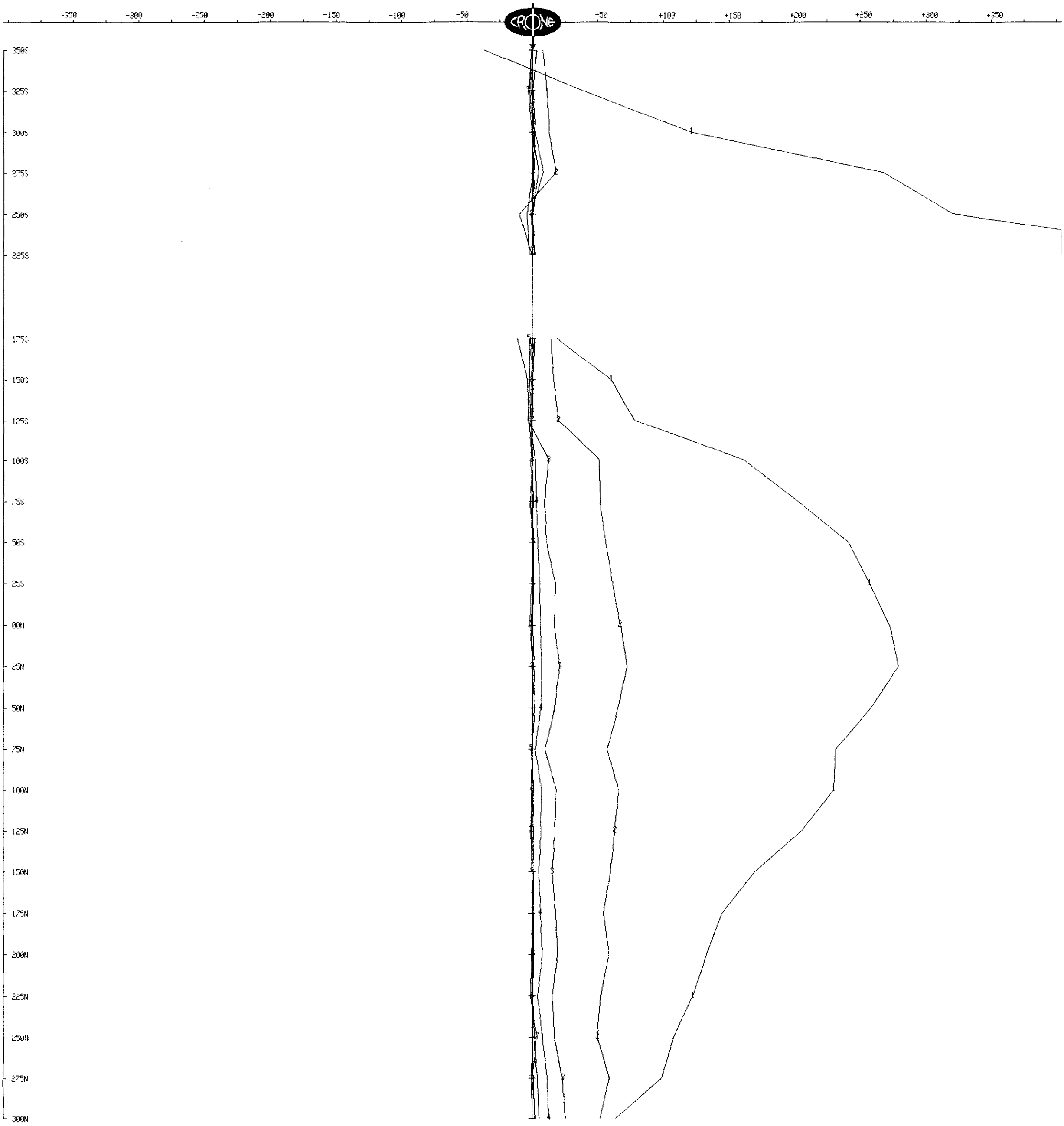
Client : PLUTONIC
Grid : STAVERTON
Date : Jan 16, 1993

Line : 900E
Tx Loop : 1
File name : ST900E1.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



974356

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

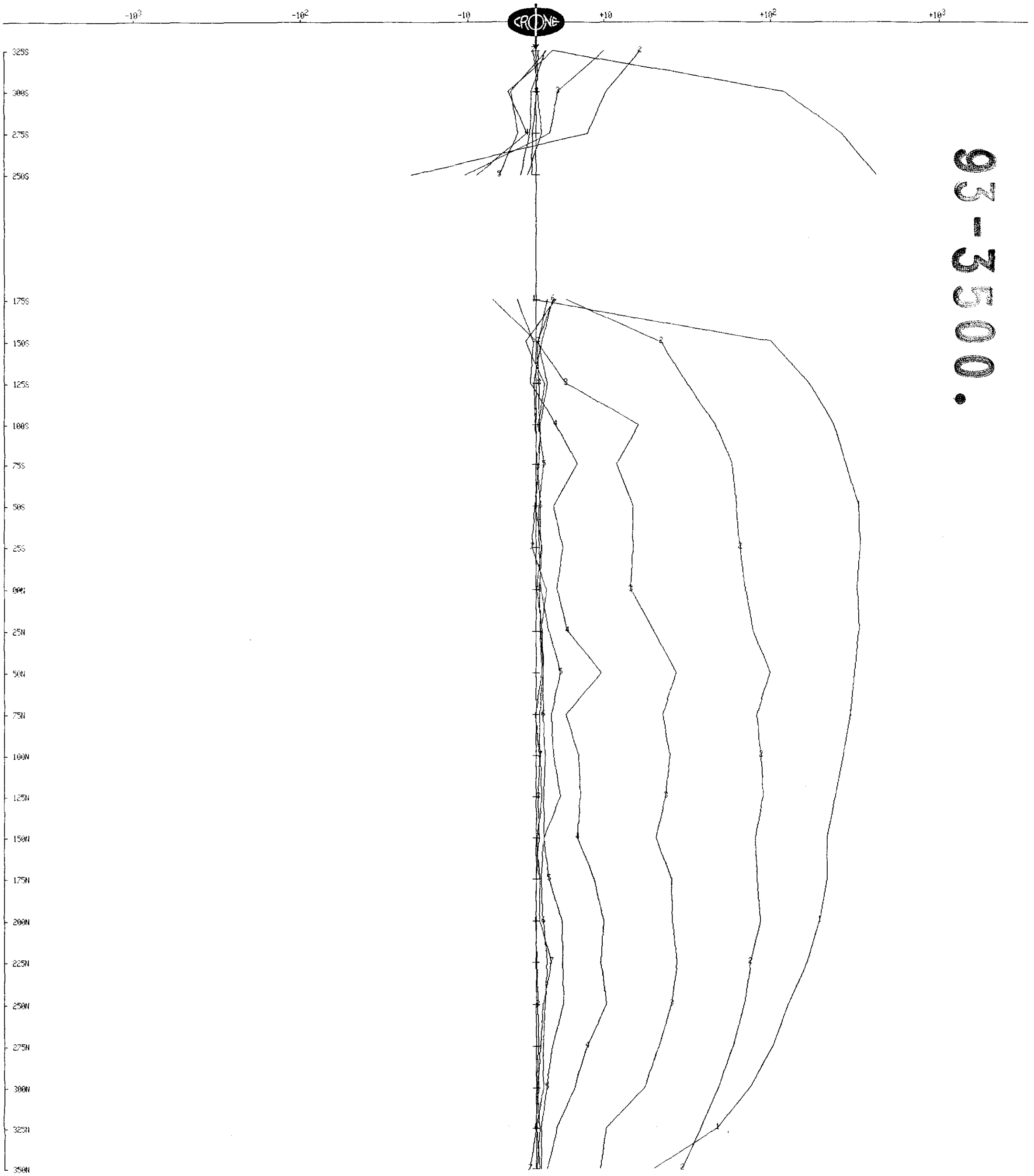
5 cm

Client : PLUTONIC
Grid : STAVERTON
Date : Jan 16, 1993

Line : 1000E
Tx Loop : 1
File name : ST1000E1.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000



CRONE

974357

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

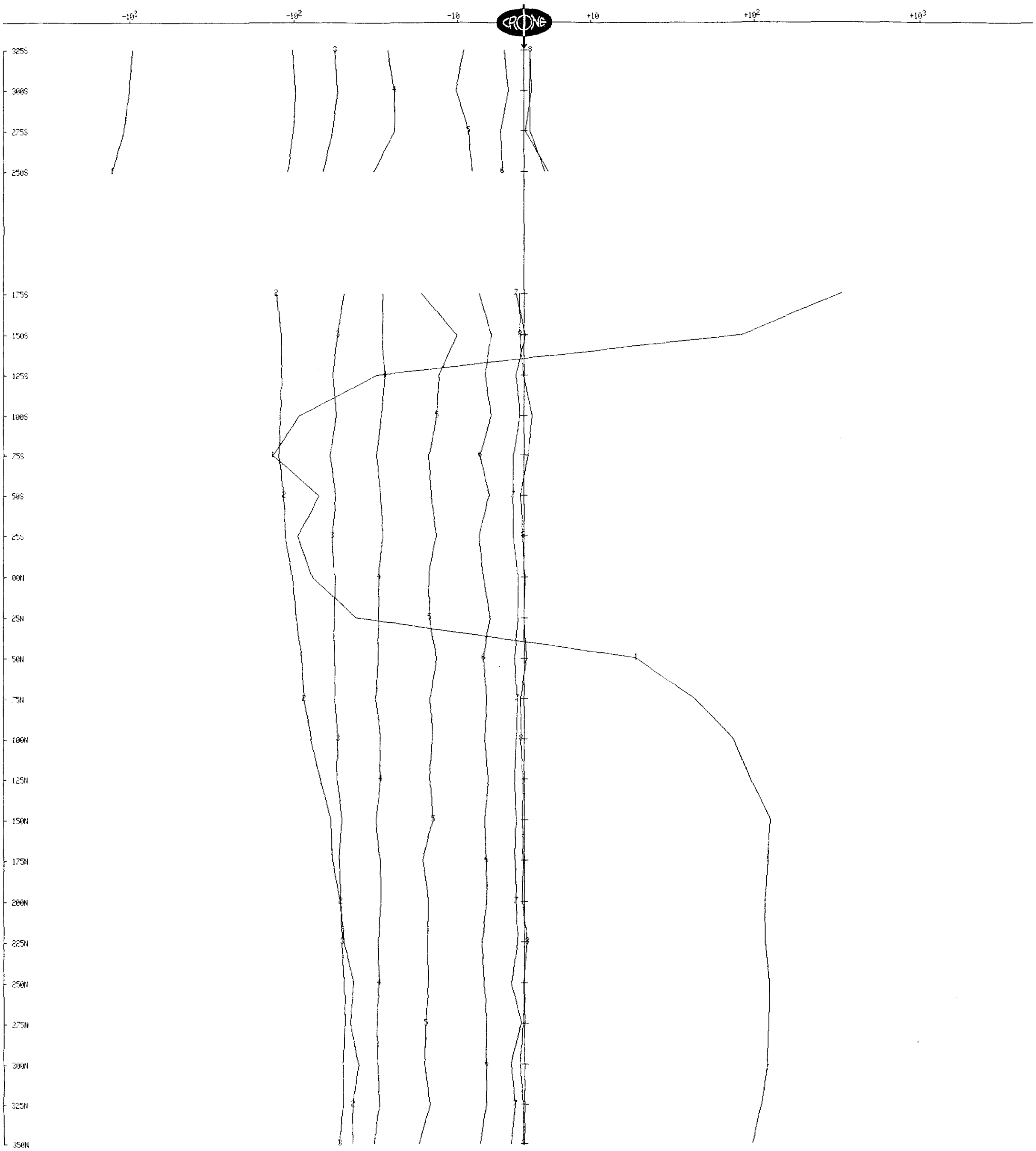
5 cm

Client : PLUTONIC
Grid : STAVERTON
Date : Jan 16, 1993

Line : 1000E
Tx Loop : 1
File name : ST1000E1.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000



974358

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

5 cm

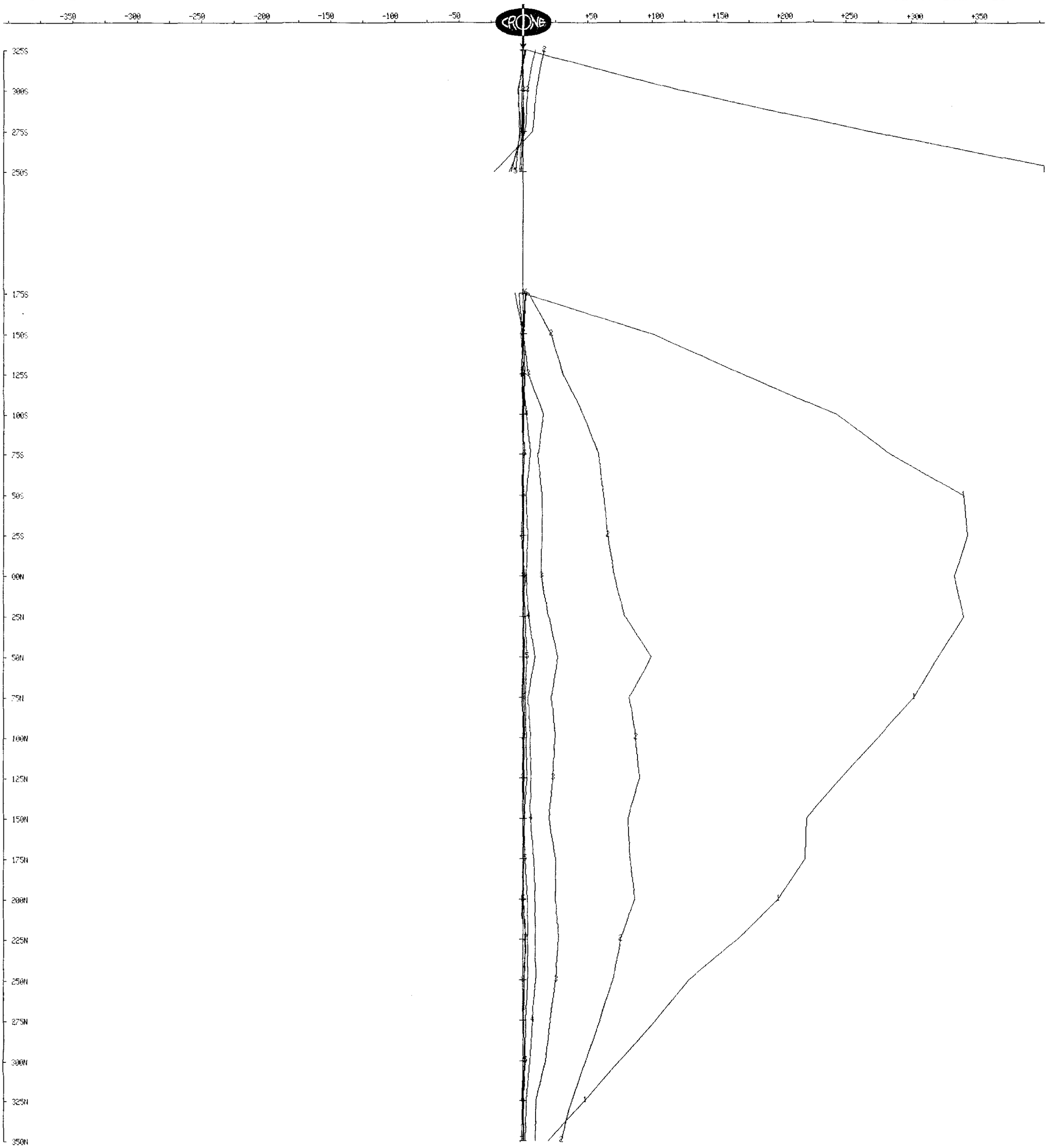
Client : **PLUTONIC**
Grid : **STAVERTON**
Date : Jan 16, 1993

Line : **1000E**
Tx Loop : **1**
File name : ST1000E1.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



974359

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

5 cm

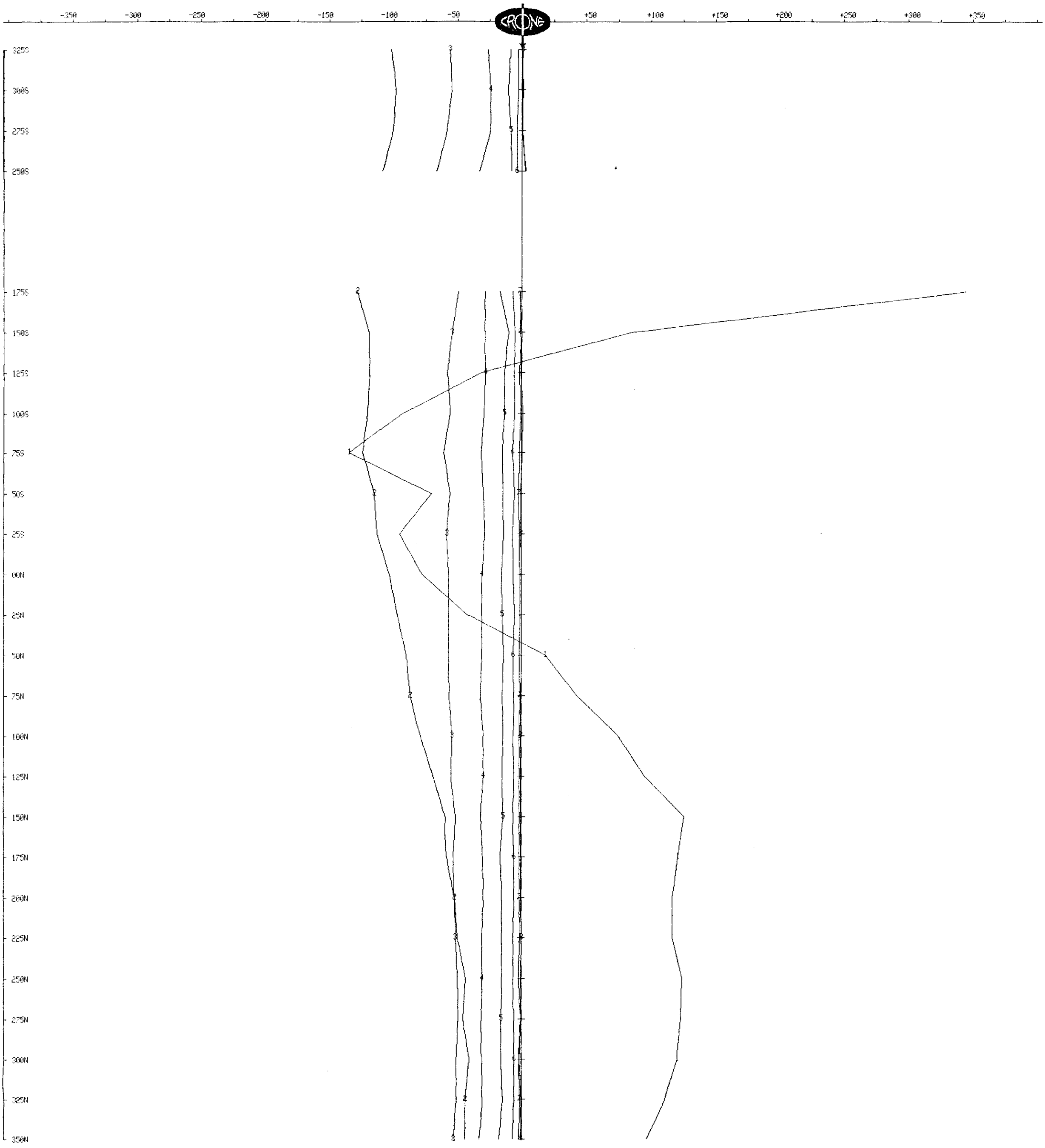
Client : **PLUTONIC**
Grid : **STAVERTON**
Date : Jan 16, 1993

Line : **1000E**
Tx Loop : 1
File name : ST1000E1.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



974360

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

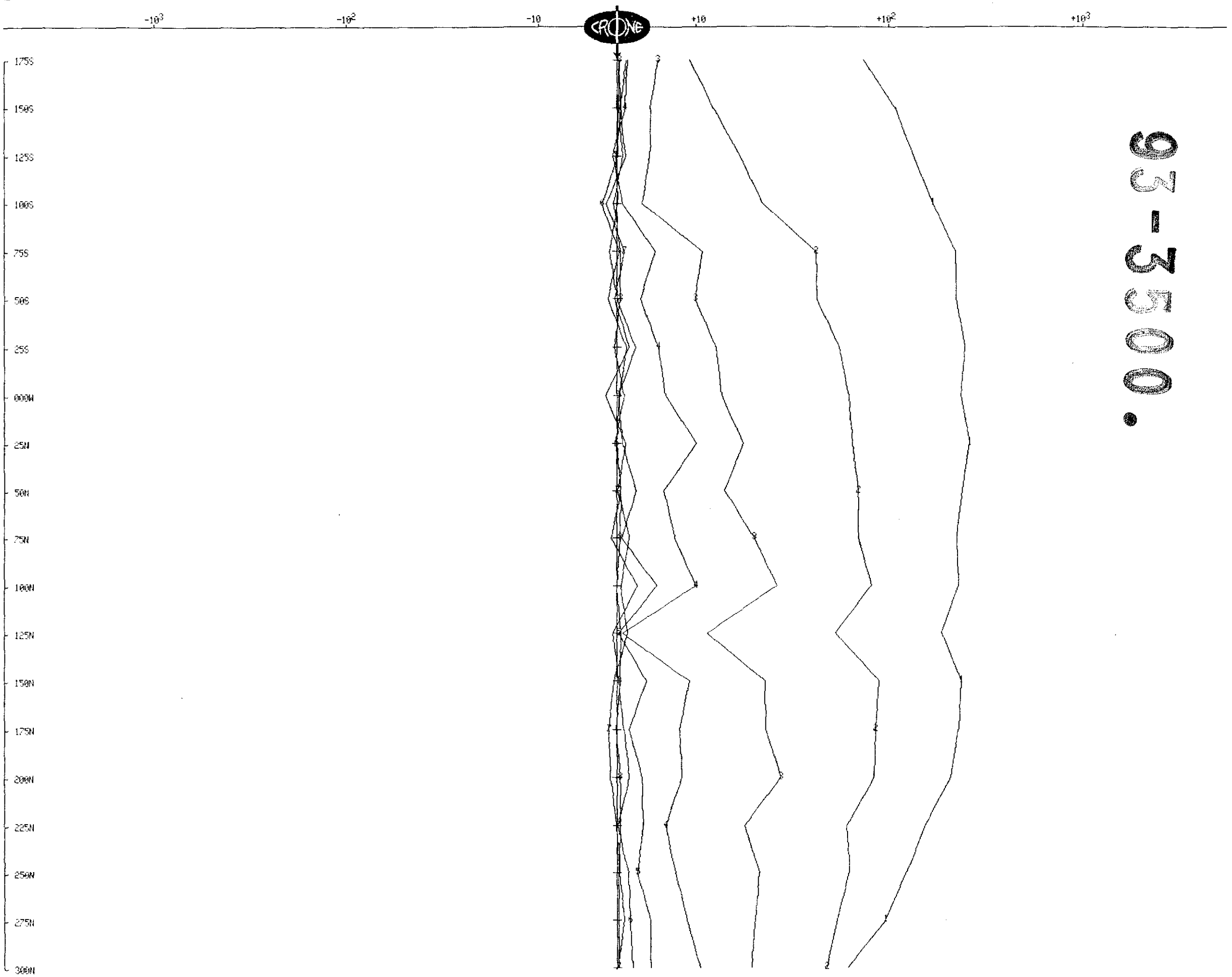
5 cm

Client : PLUTONIC
Grid : STAVERTON
Date : Jan 15, 1993

Line : 1100E
Tx Loop : 1
File name : ST1100E1.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000



974360

974361

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

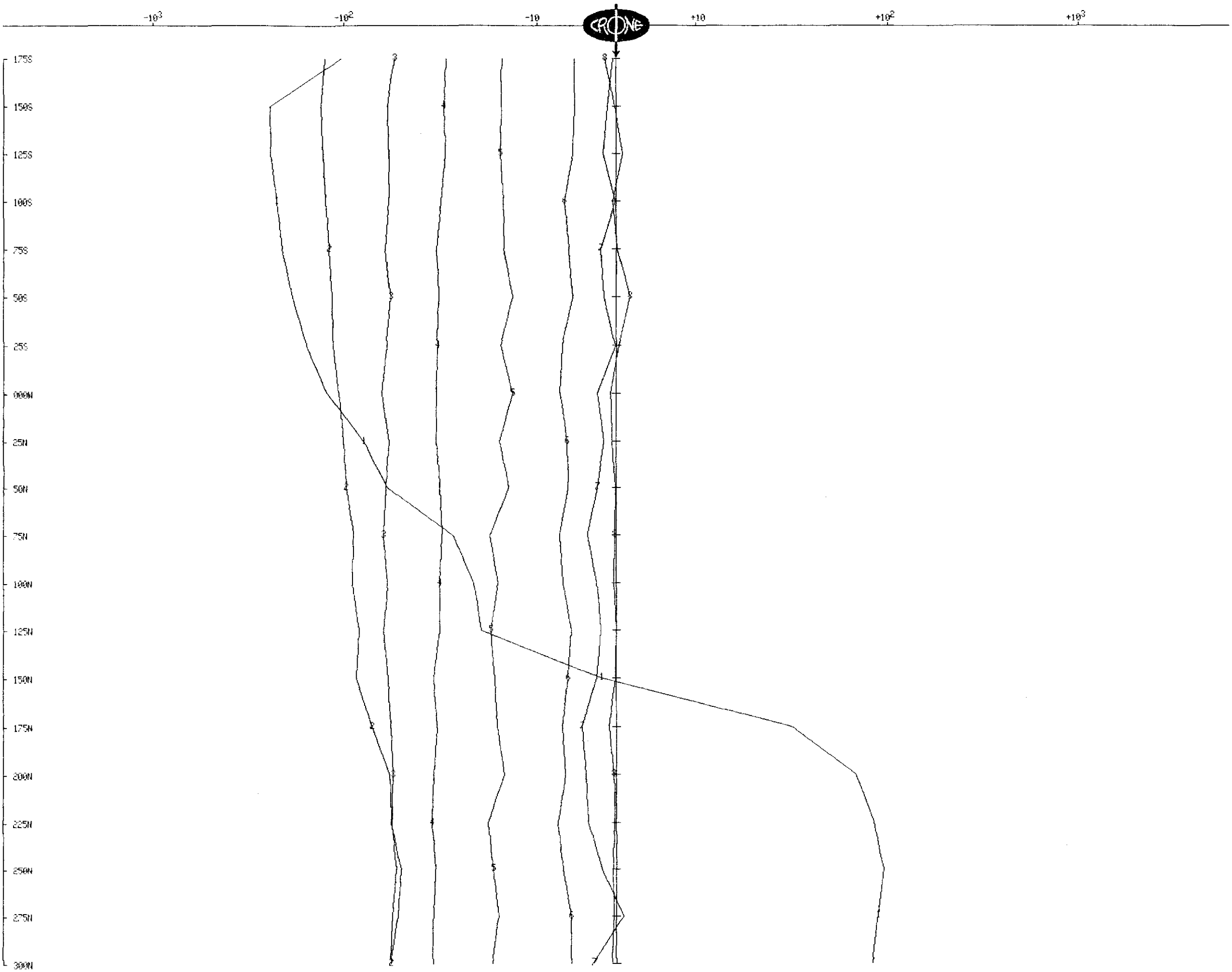
5 cm

Client : PLUTONIC
Grid : STAVERTON
Date : Jan 15, 1993

Line : 1100E
Tx Loop : 1
File name : ST1100E1.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

974362

5 cm

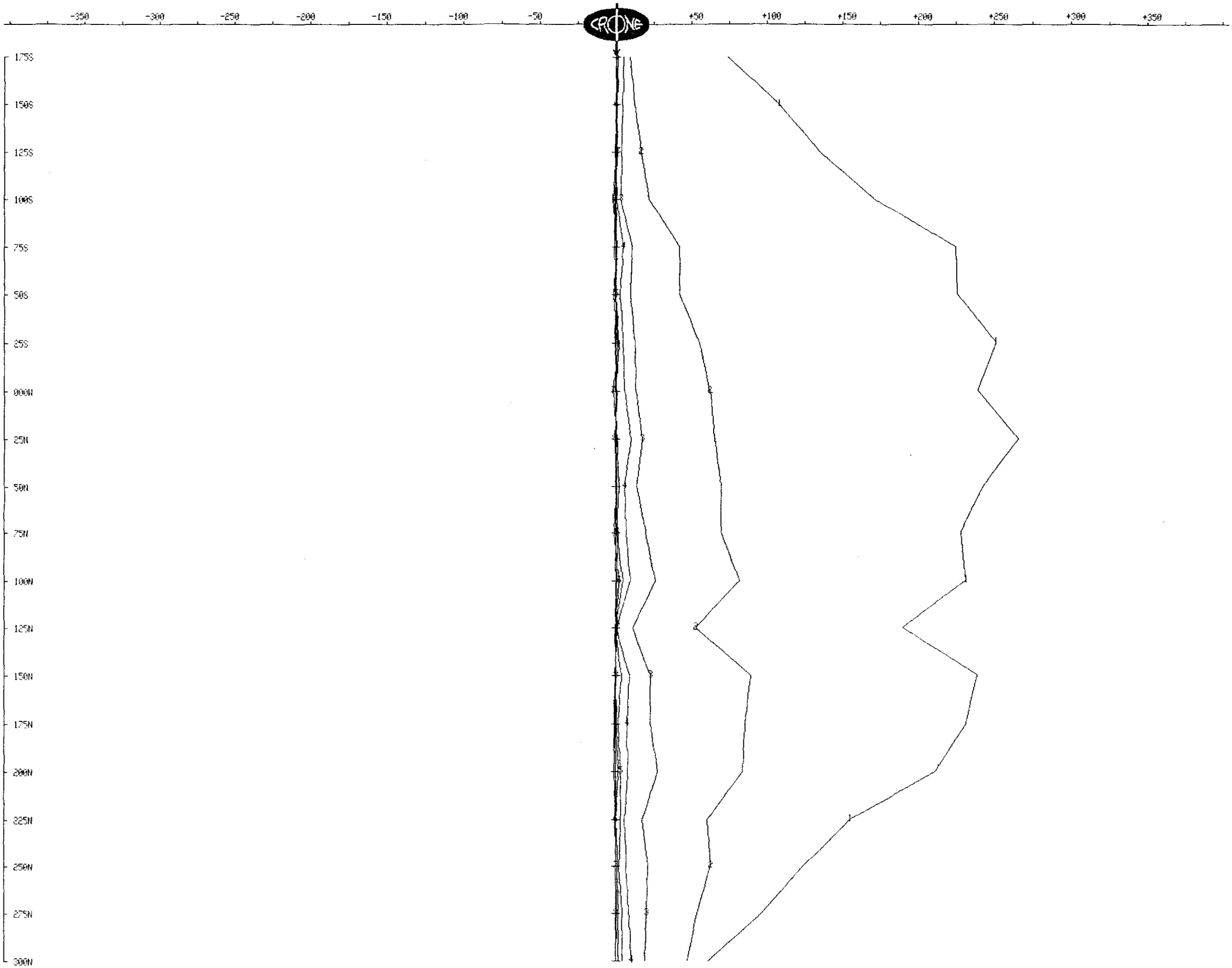
Client : **PLUTONIC**
Grid : **STAVERTON**
Date : Jan 15, 1993

Line : **1100E**
Tx Loop : 1
File name : ST1100E1.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



974363

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

5 cm

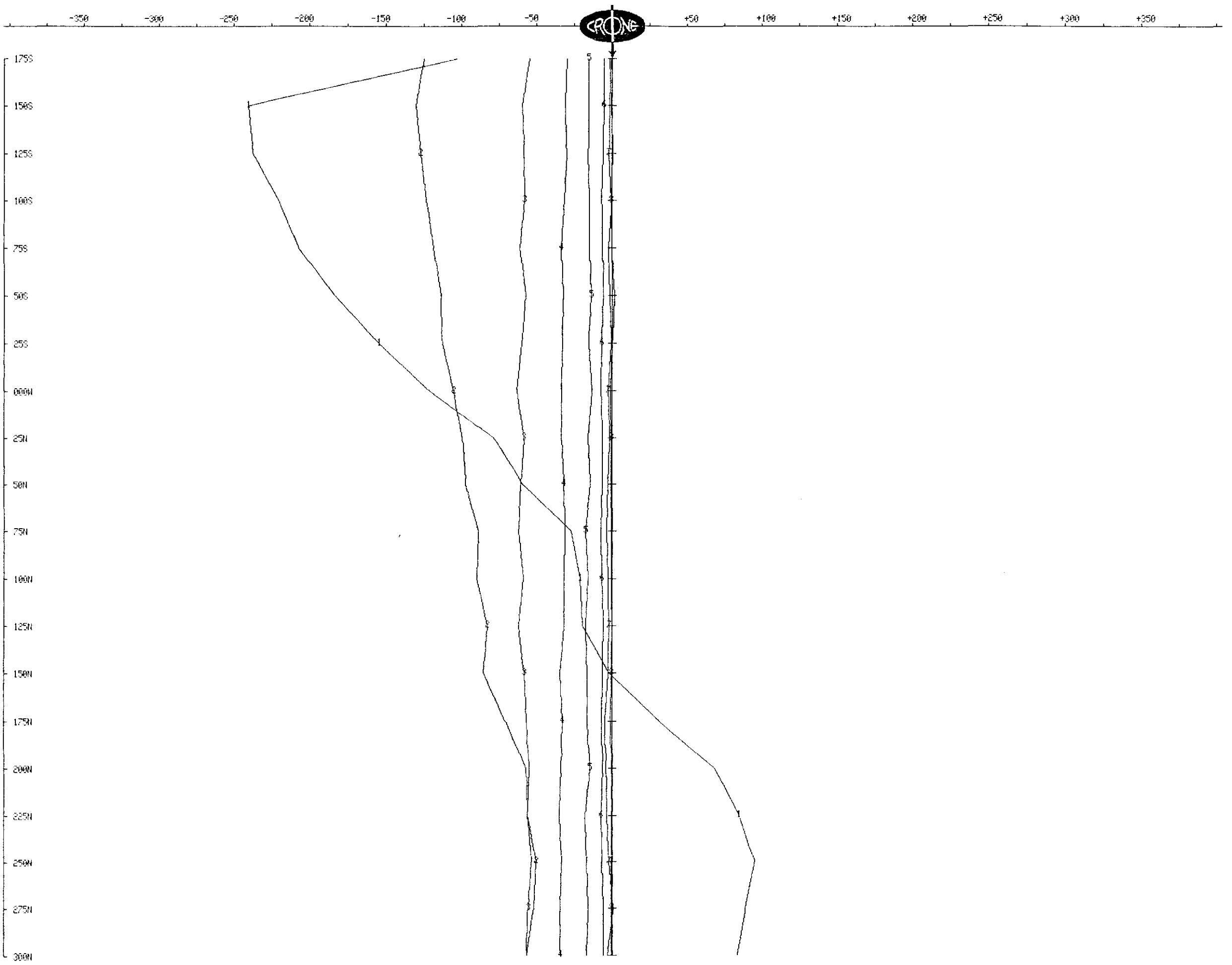
Client : PLUTONIC
Grid : STAVERTON
Date : Jan 15, 1993

Line : 1100E
Tx Loop : 1
File name : ST1100E1.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



974364

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

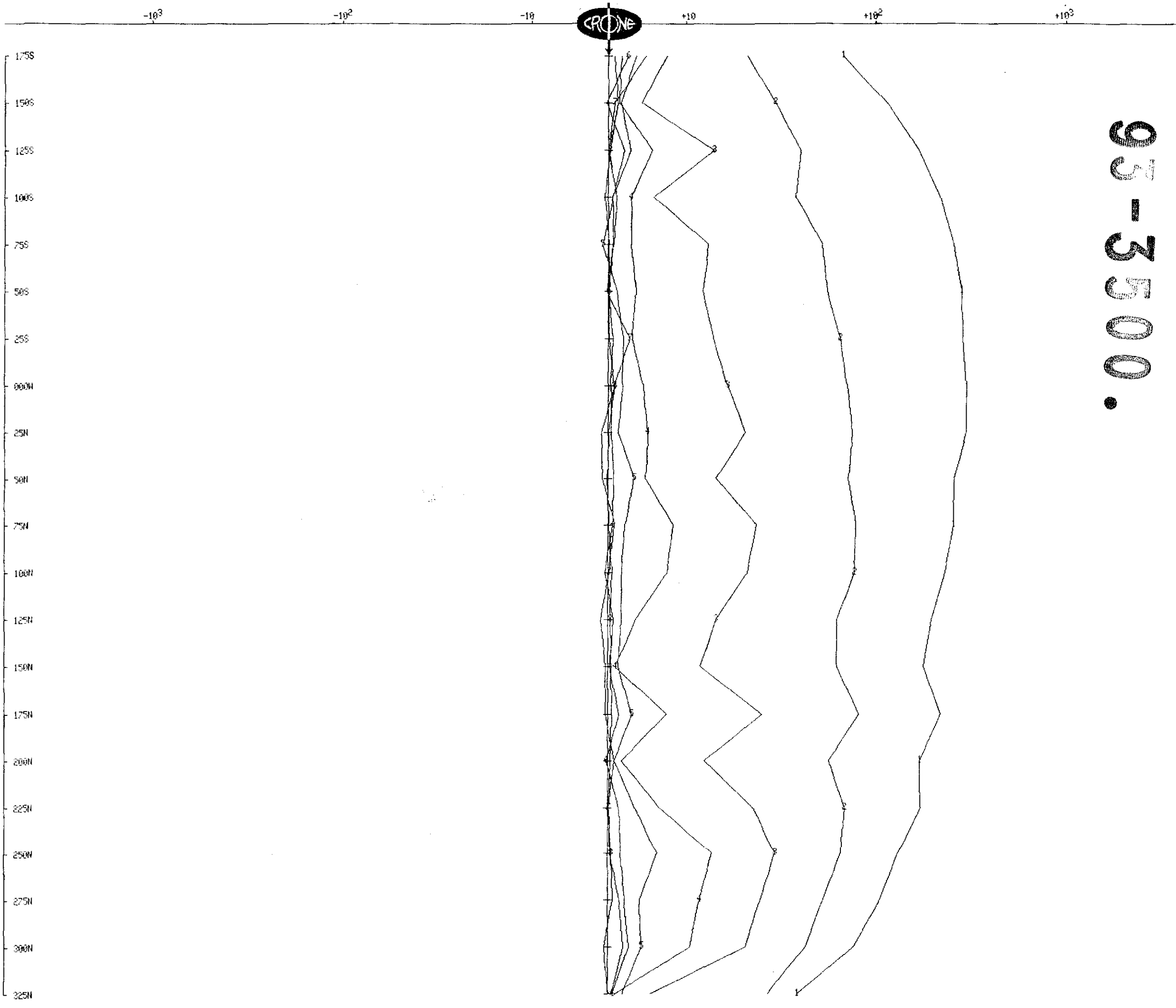
5 cm

Client : PLUTONIC
Grid : STAVERTON
Date : Jan 15, 1993

Line : 1200E
Tx Loop : 1
File name : ST1200E1.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000



CRONE
GEOPHYSICS
LIMITED

974365

CRONE GEOPHYSICS & EXPLORATION LTD

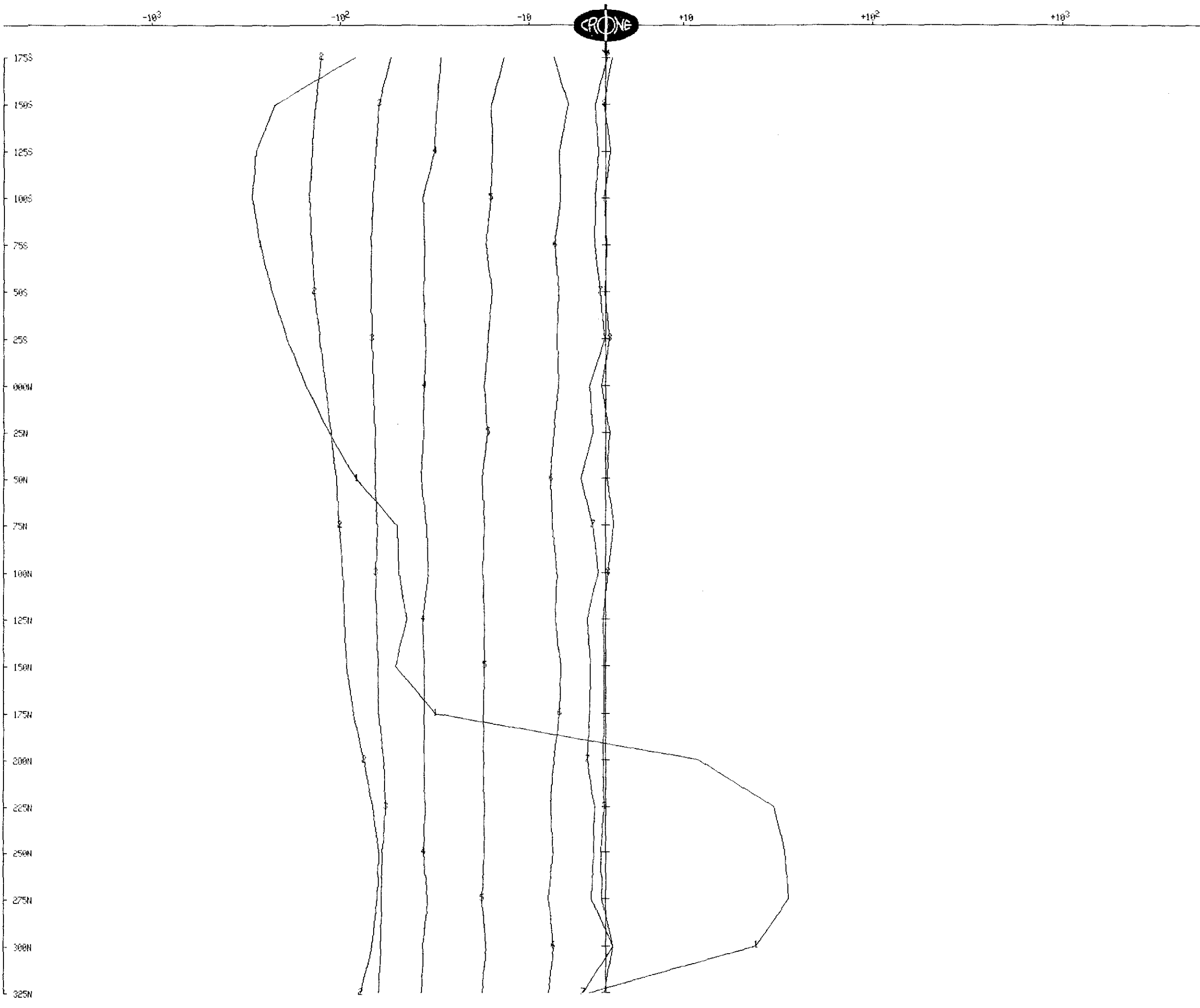
SURFACE PEM

5 cm

Client	: PLUTONIC	Line	: 1200E
Grid	: STAVERTON	Tx Loop	: 1
Date	: Jan 15, 1993	File name	: ST1200E1.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000



974366

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

5 cm

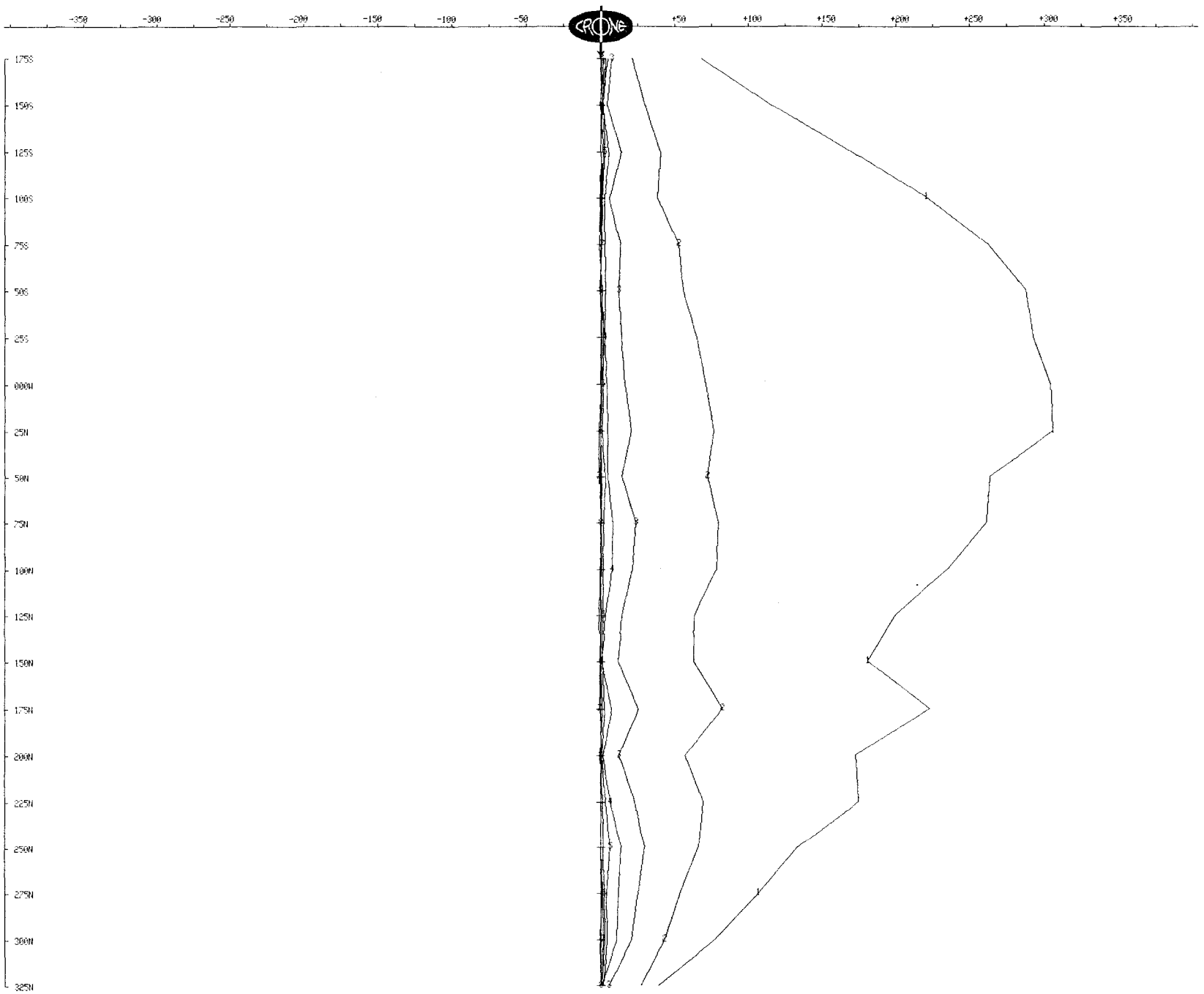
Client : PLUTONIC
Grid : STAVERTON
Date : Jan 15, 1993

Line : 1200E
Tx Loop : 1
File name : ST1200E1.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



974367

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

5 cm

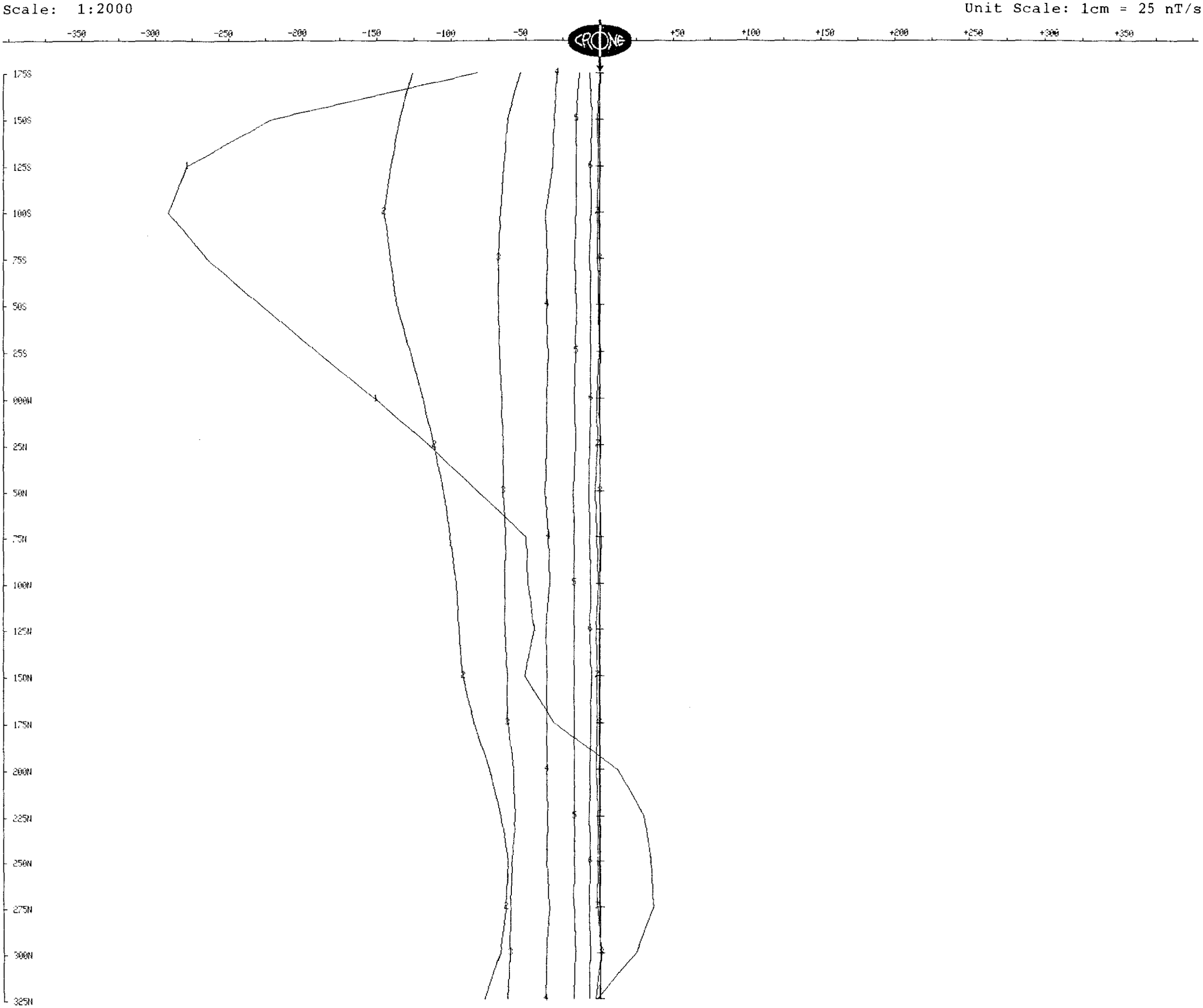
Client : PLUTONIC
Grid : STAVERTON
Date : Jan 15, 1993

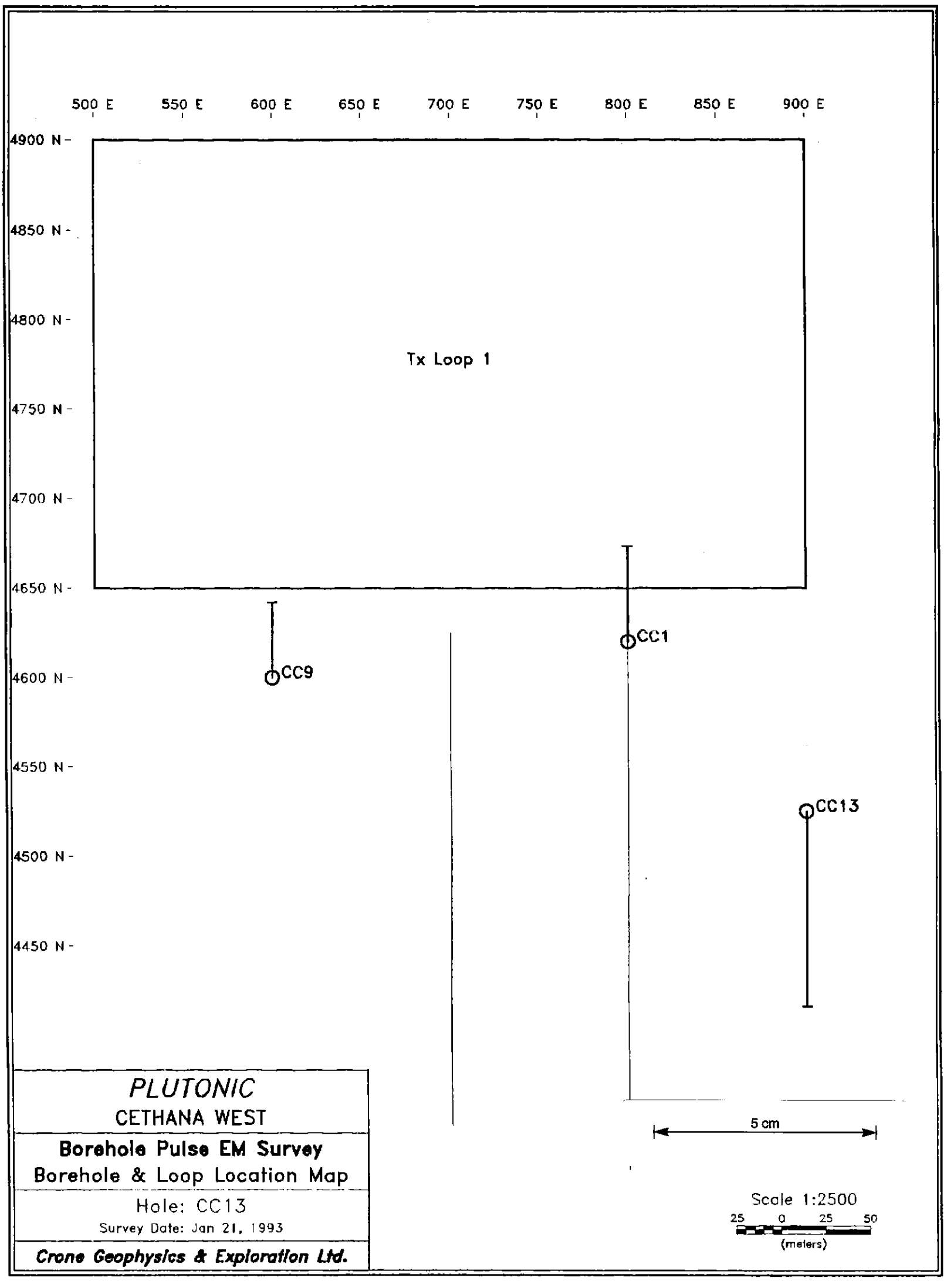
Line : 1200E
Tx Loop : 1
File name : ST1200E1.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s





974368

93-3500

CRONE GEOPHYSICS & EXPLORATION LTD
BOREHOLE PEM

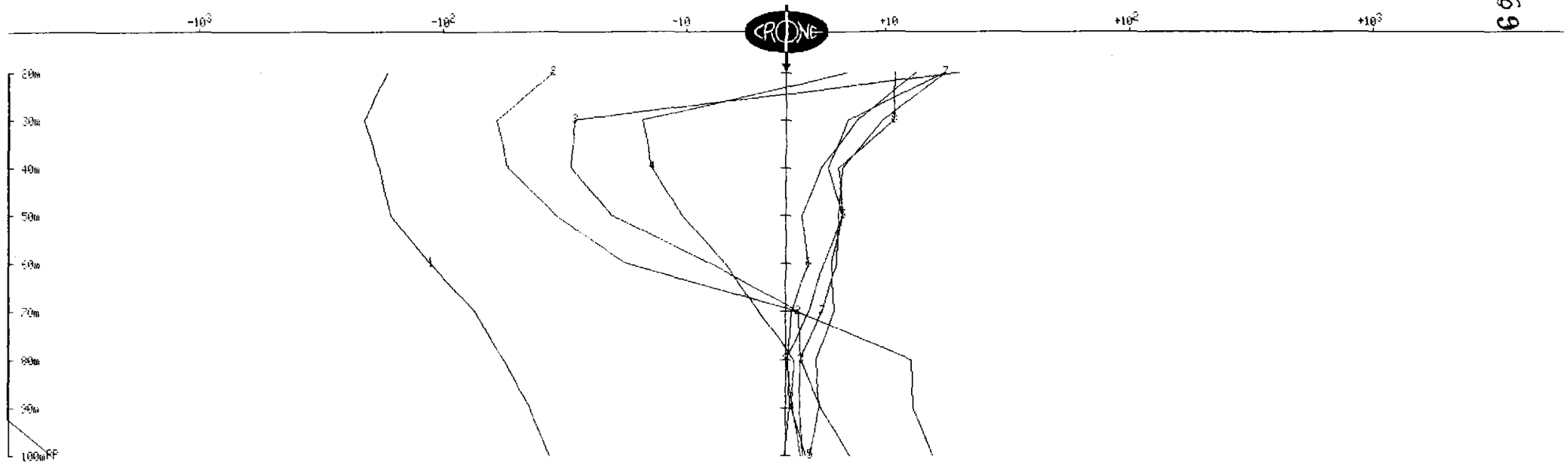
5 cm

Client : PLUTONIC
Grid : CETHANA WEST
Date : Jan 21, 1993

Hole : CC1
Tx Loop : 1
File name : CC1Z.PEM

Z COMPONENT dBz/dt nanoTesla/sec - 8 channels and PP

Scale: 1:1000



S74369

CRONE GEOPHYSICS & EXPLORATION LTD

BOREHOLE PEM

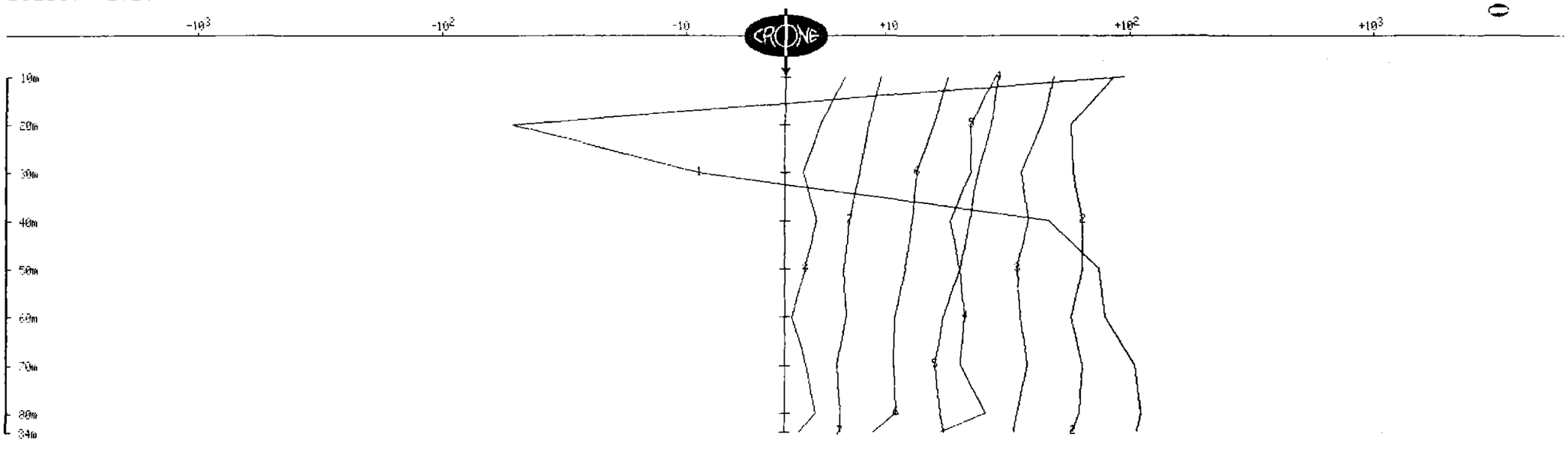
5 cm

Client : PLUTONIC
Grid : CETHANA WEST
Date : Jan 21, 1993

Hole : CC9
Tx Loop : 1
File name : CC9Z.PEM

Z COMPONENT dBz/dt nanoTesla/sec - 8 channels and PP

Scale: 1:1000



9743170

CRONE GEOPHYSICS & EXPLORATION LTD.

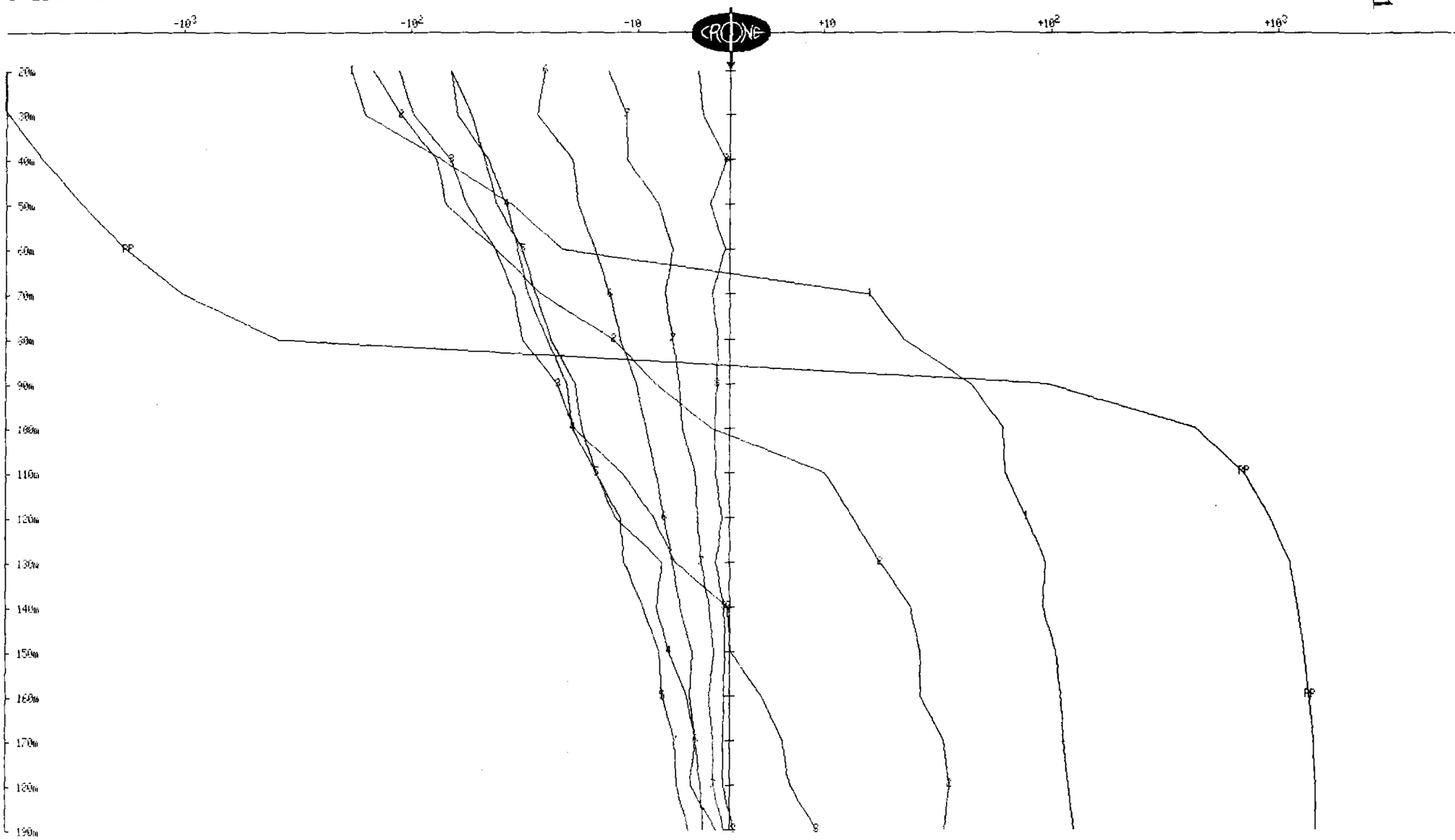
BOREHOLE PEM

5 cm

Client	: PLUTONIC	Hole	: CC13
Grid	: CETHANA WEST	Tx Loop	: 1
Date	: Jan 21, 1993	File name	: CC13Z.PEM

Z COMPONENT dBz/dt nanoTesla/sec - 8 channels and PP

Scale: 1:1000



9743711

CRONE GEOPHYSICS & EXPLORATION LTD.

SURFACE PEM

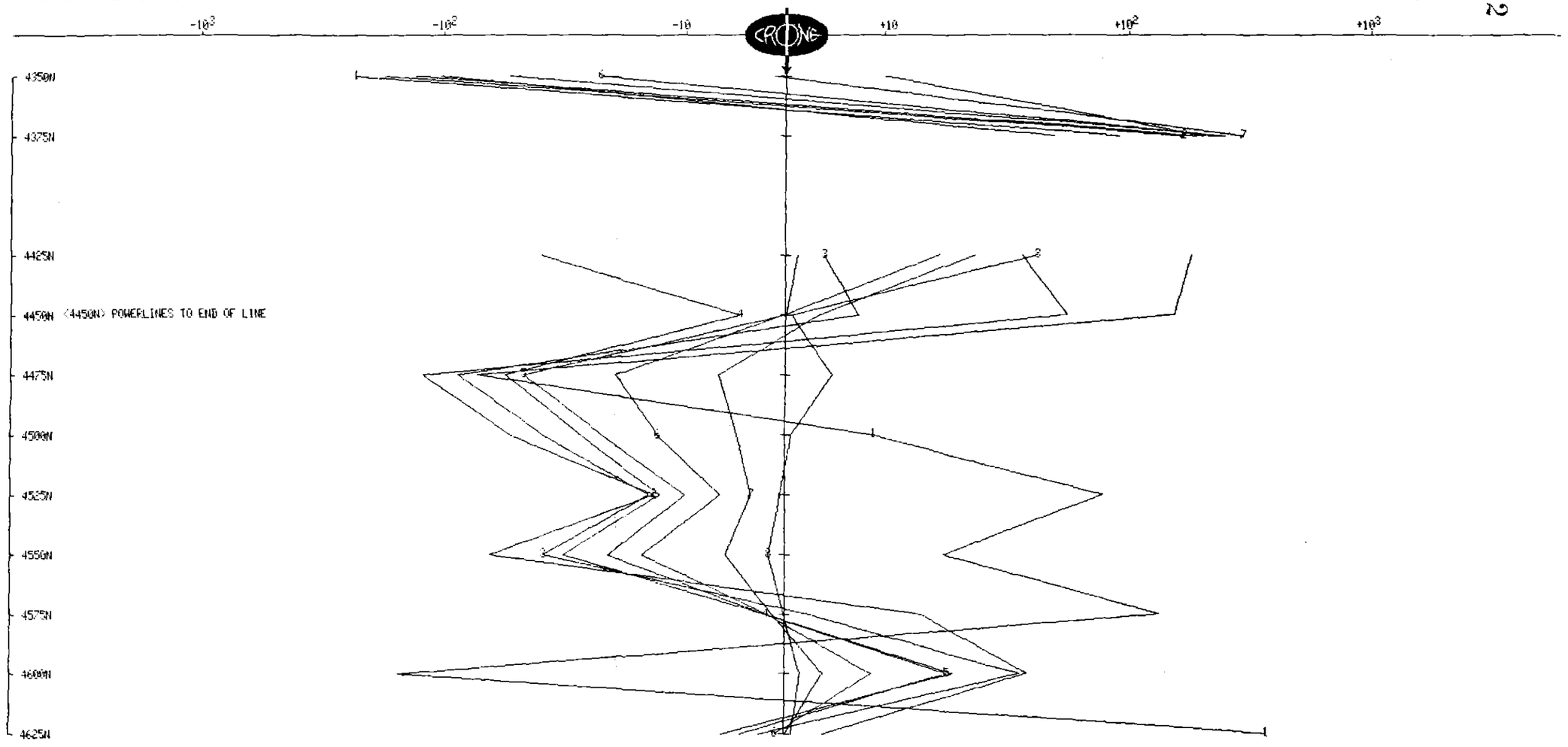
5 cm

Client : PLUTONIC
Grid : CETHANA WEST
Date : Jan 22, 1993

Line : 700E
Tx Loop : 1
File name : CW700E.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000



9743372

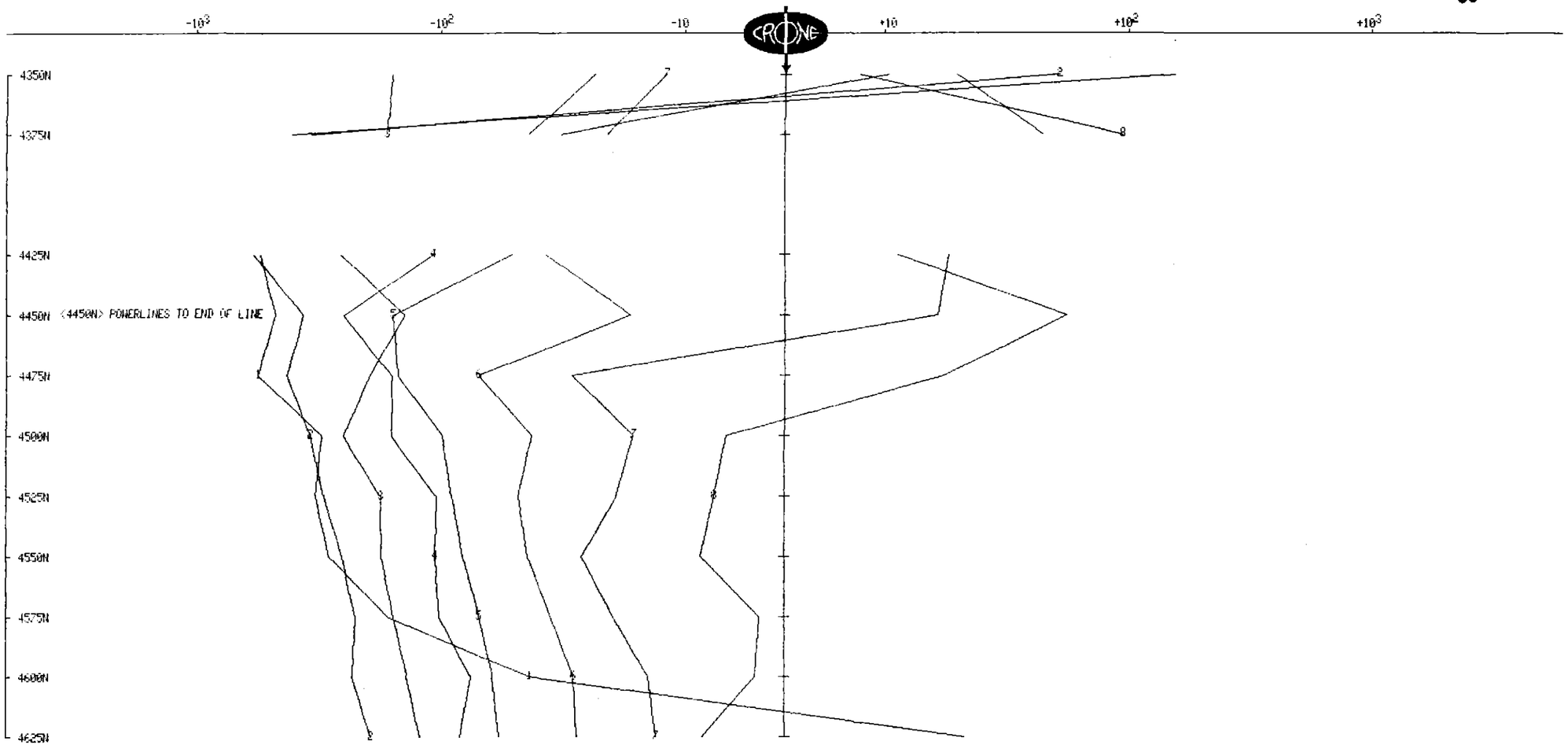
CRONE GEOPHYSICS & EXPLORATION LTD
SURFACE PEM

5 cm

Client	: PLUTONIC	Line	: 700E
Grid	: CETHANA WEST	Tx Loop	: 1
Date	: Jan 22, 1993	File name	: CW700E.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000



9743773

CRONE GEOPHYSICS & EXPLORATION LTD
SURFACE PEM

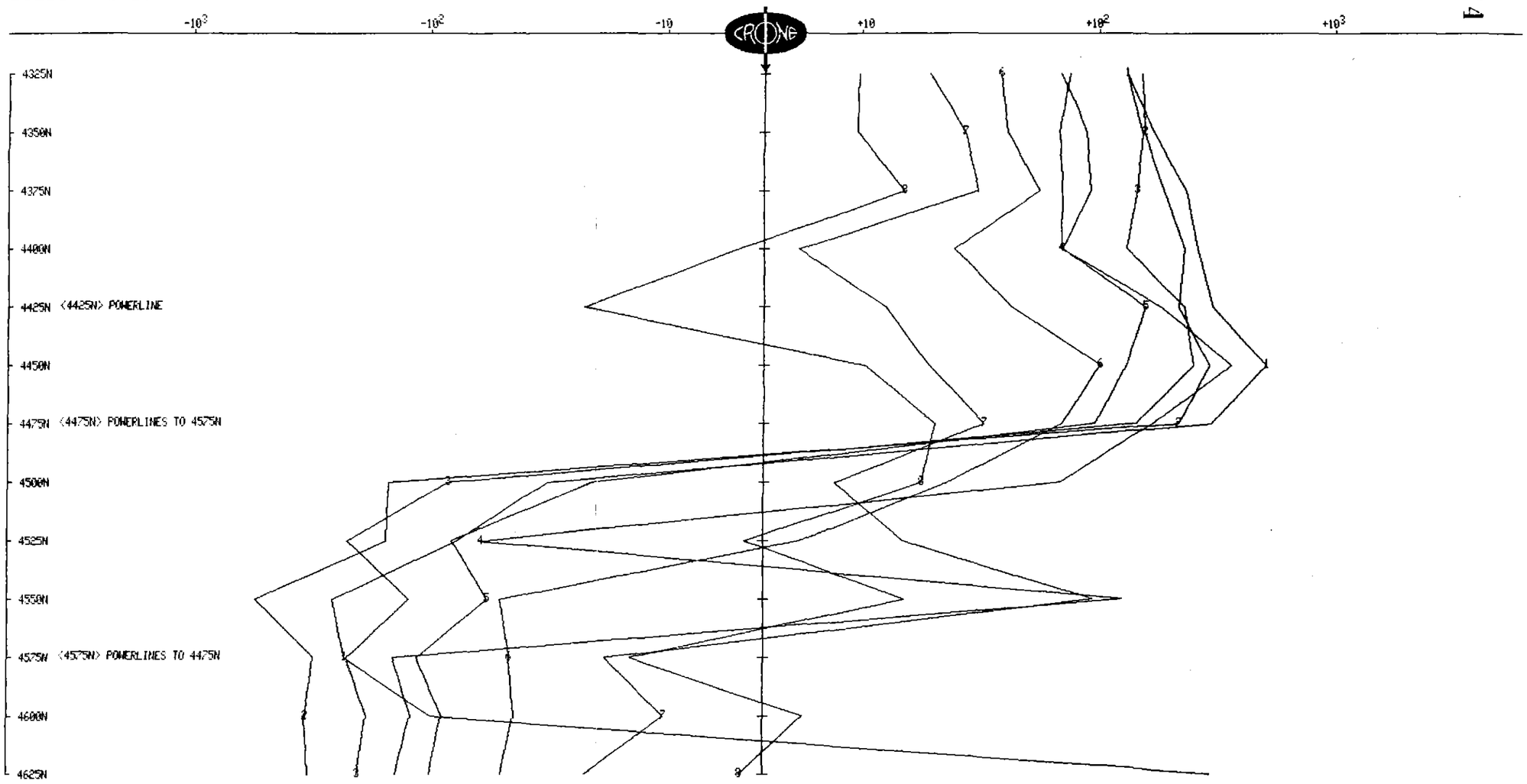
5 cm

Client : PLUTONIC
Grid : CETHANA WEST
Date : Jan 22, 1993

Line : 800E
Tx Loop : 1
File name : CW800E.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000



9243274

CRONE GEOPHYSICS & EXPLORATION LTD
SURFACE PEM

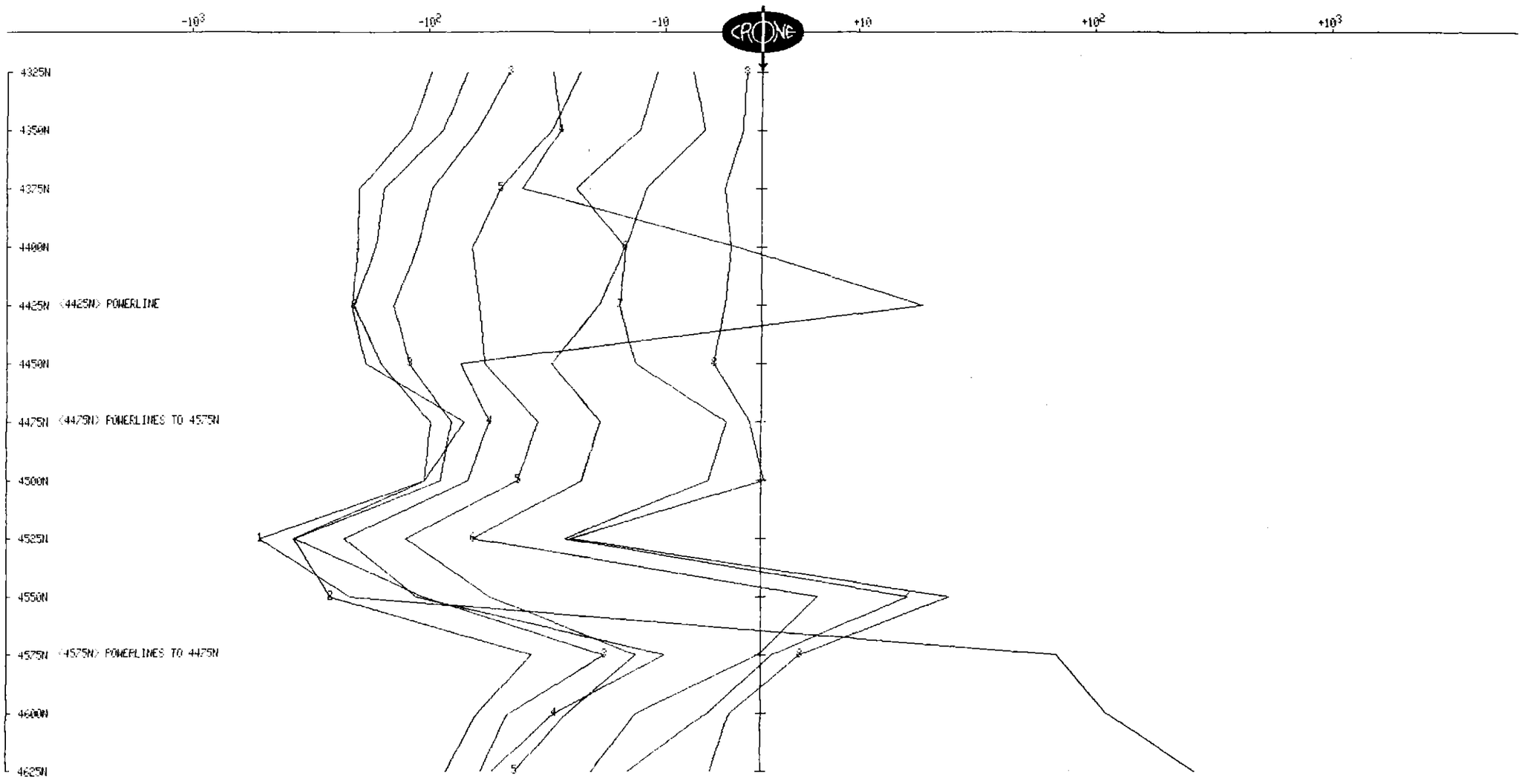
9743375

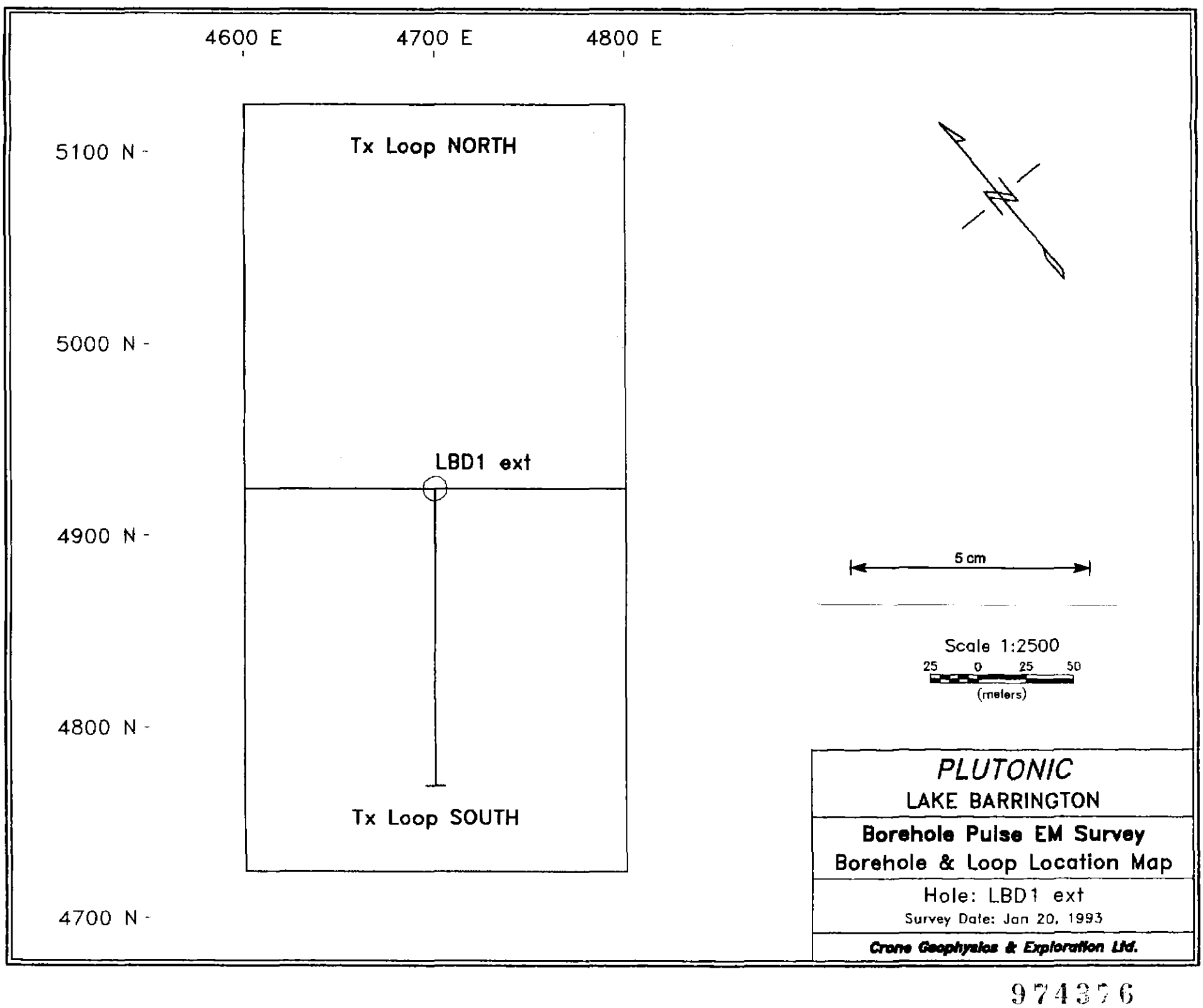
5 cm

Client	: PLUTONIC	Line	: 800E
Grid	: CETHANA WEST	Tx Loop	: 1
Date	: Jan 22, 1993	File name	: CW800E.PEM

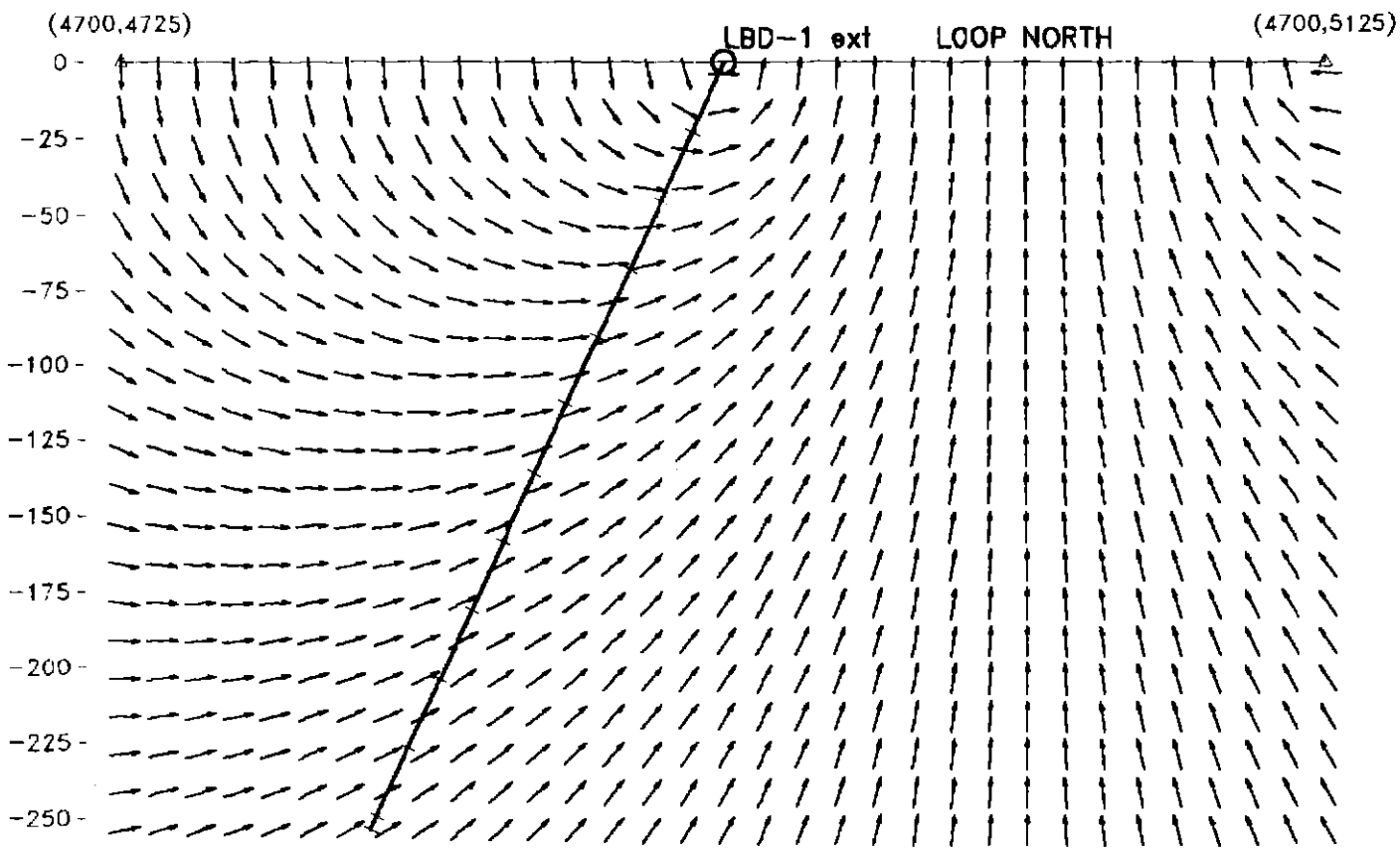
IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000




4600 E
4700 E
4800 E
5100 N
5000 N
4900 N
4800 N
4700 N
Tx Loop NORTH
LBD1 ext
Tx Loop SOUTH
5 cm
Scale 1:2500
25 0 25 50
(meters)
PLUTONIC
LAKE BARRINGTON
Borehole Pulse EM Survey
Borehole & Loop Location Map
Hole: LBD1 ext
Survey Date: Jan 20, 1993
Crone Geophysics & Exploration Ltd.

974376



5 cm

Scale 1:2500

25 0 25 50

(meters)

PLUTONIC

LAKE BARRINGTON

3−D Borehole Pulse EM Survey

Hole Section with Primary Field

Hole: LBD−1 ext

Survey Date: Jan 20, 1993

Crone Geophysics & Exploration Ltd.

974377

CRONE GEOPHYSICS & EXPLORATION LTD

BOREHOLE PEM

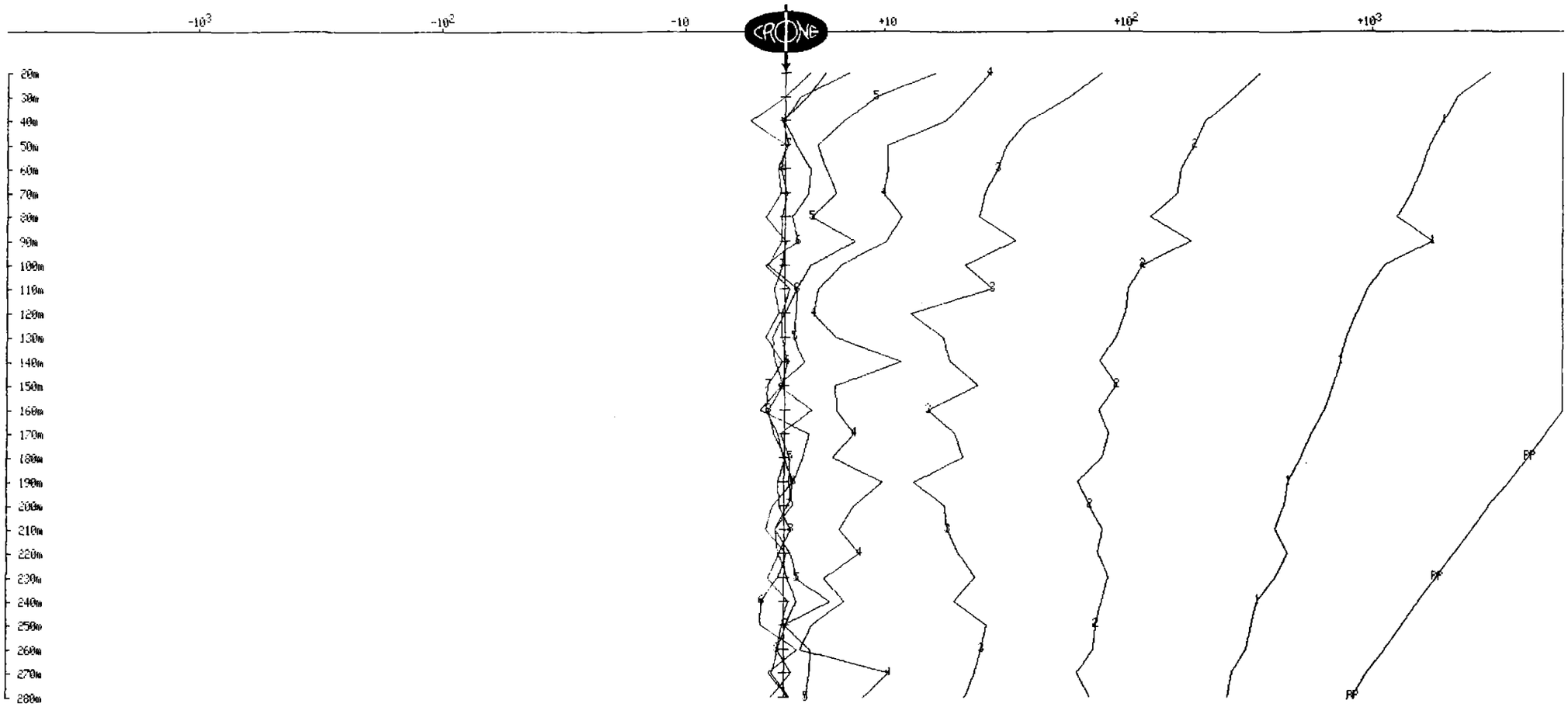
9743778

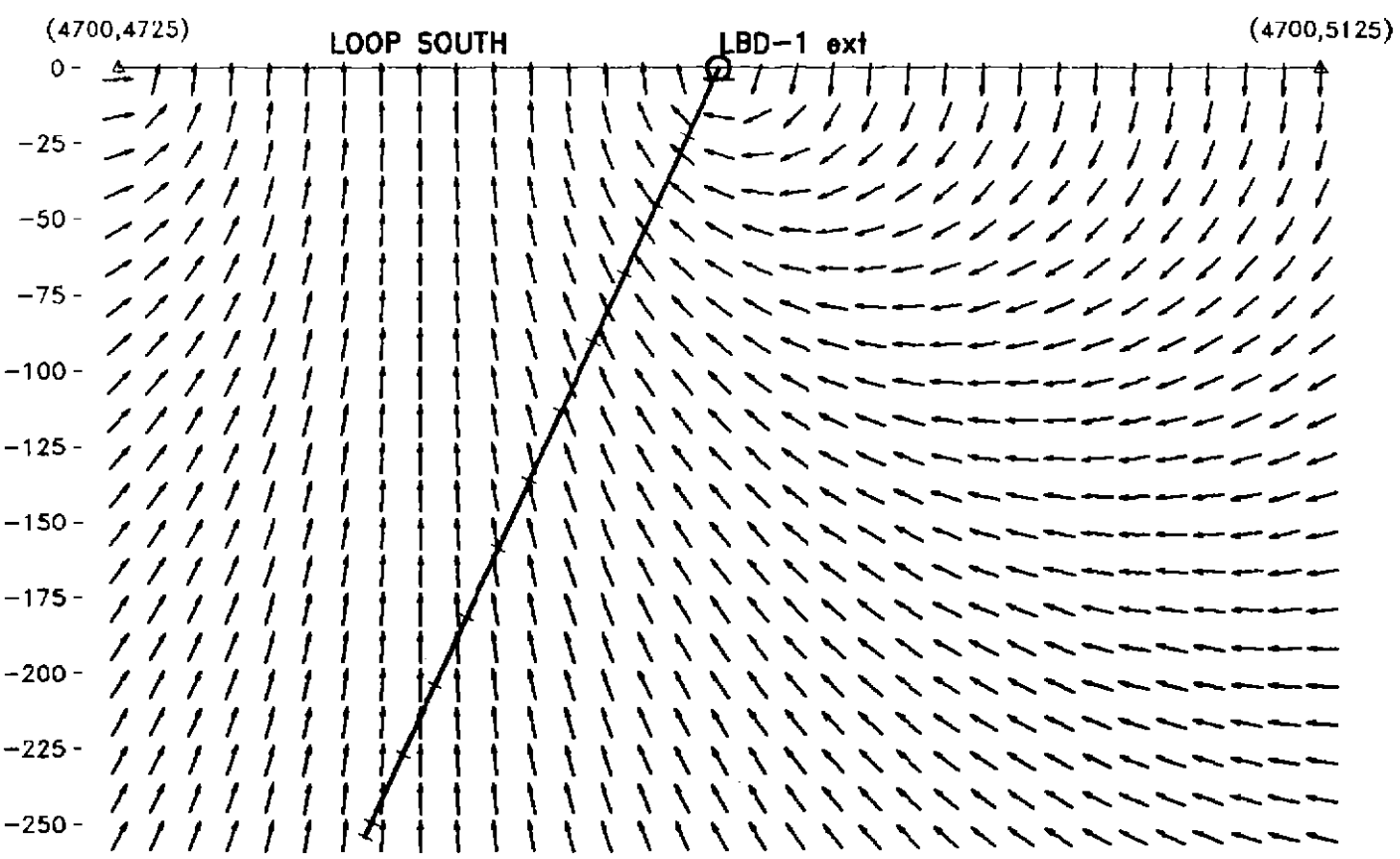
5 cm

Client	: PLUTONIC	Hole	: LBD-1 ext
Grid	: LAKE BARRINGTON	Tx Loop	: SOUTH
Date	: Jan 20, 1993	File name	: LBD1XYS.PEM

Data Corrected for Probe Rotation using Cleaned PP
X COMPONENT dBx/dt nanoTesla/sec - 8 channels and PP

Scale: 1:2000





974379

PLUTONIC
LAKE BARRINGTON

3-D Borehole Pulse EM Survey
Hole Section with Primary Field

Hole: LBD-1 ext
Survey Date: Jan 20, 1993

Crone Geophysics & Exploration Ltd.

974380

CRONE GEOPHYSICS & EXPLORATION LTD

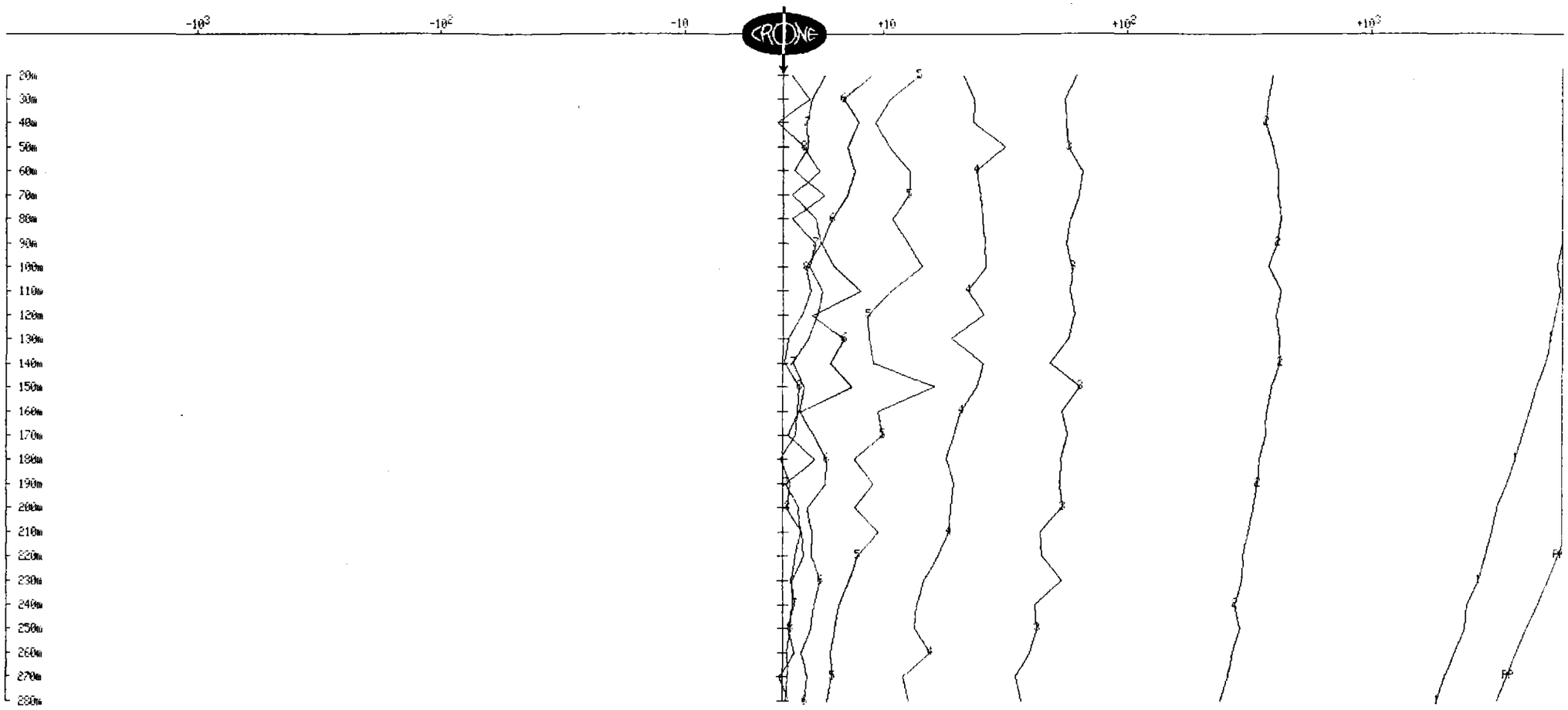
BOREHOLE PEM

5 cm

Client	: PLUTONIC	Hole	: LBD-1 ext
Grid	: LAKE BARRINGTON	Tx Loop	: SOUTH
Date	: Jan 20, 1993	File name	: LBD1ZS.PEM

Z COMPONENT dBz/dt nanoTesla/sec - 8 channels and PP

Scale: 1:2000



CRONE GEOPHYSICS & EXPLORATION LTD

BOREHOLE PEM

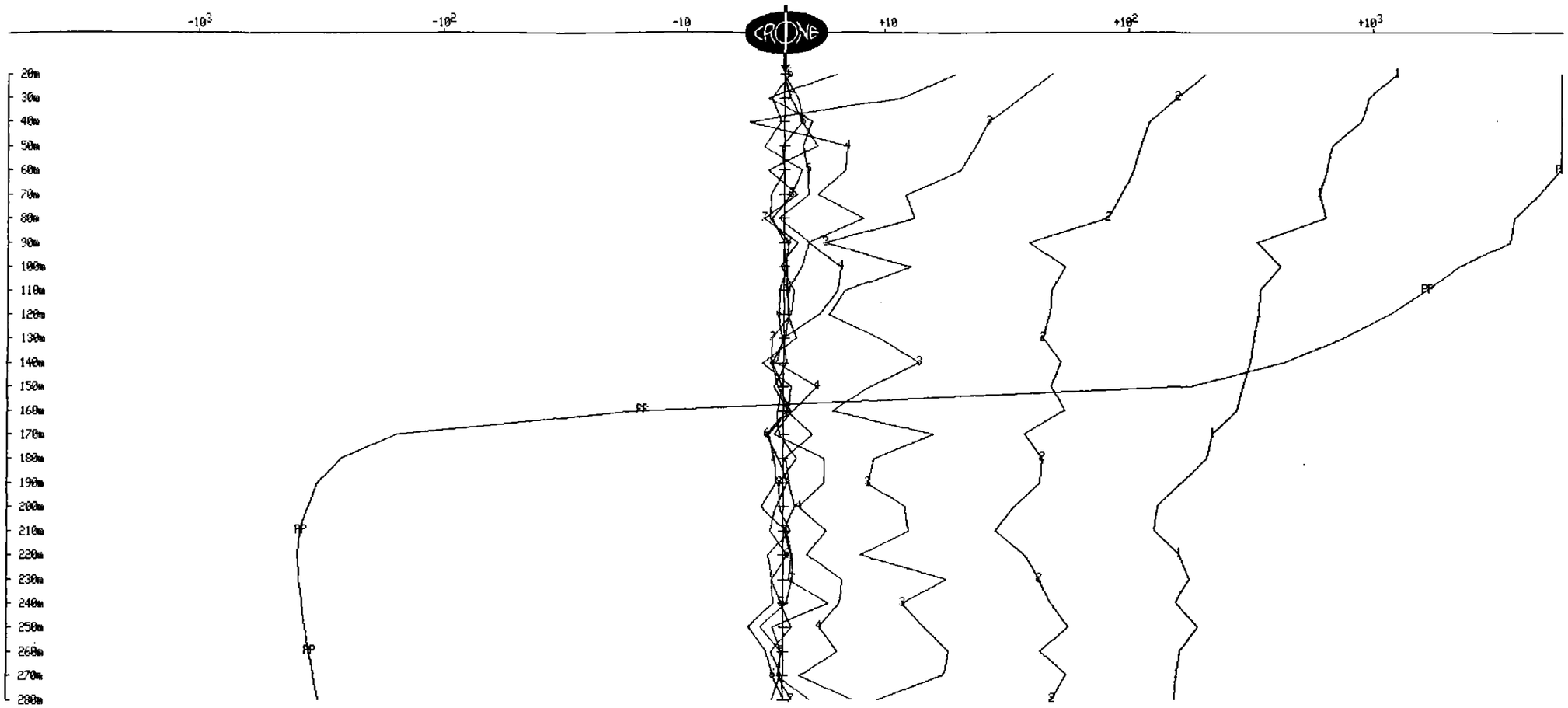
9743381

5 cm

Client	: PLUTONIC	Hole	: LBD-1 ext
Grid	: LAKE BARRINGTON	Tx Loop	: SOUTH
Date	: Jan 20, 1993	File name	: LBD1XYS.PEM

Data Corrected for Probe Rotation using Cleaned PP
Y COMPONENT dBy/dt nanoTesla/sec - 8 channels and PP

Scale: 1:2000



CRONE GEOPHYSICS & EXPLORATION LTD

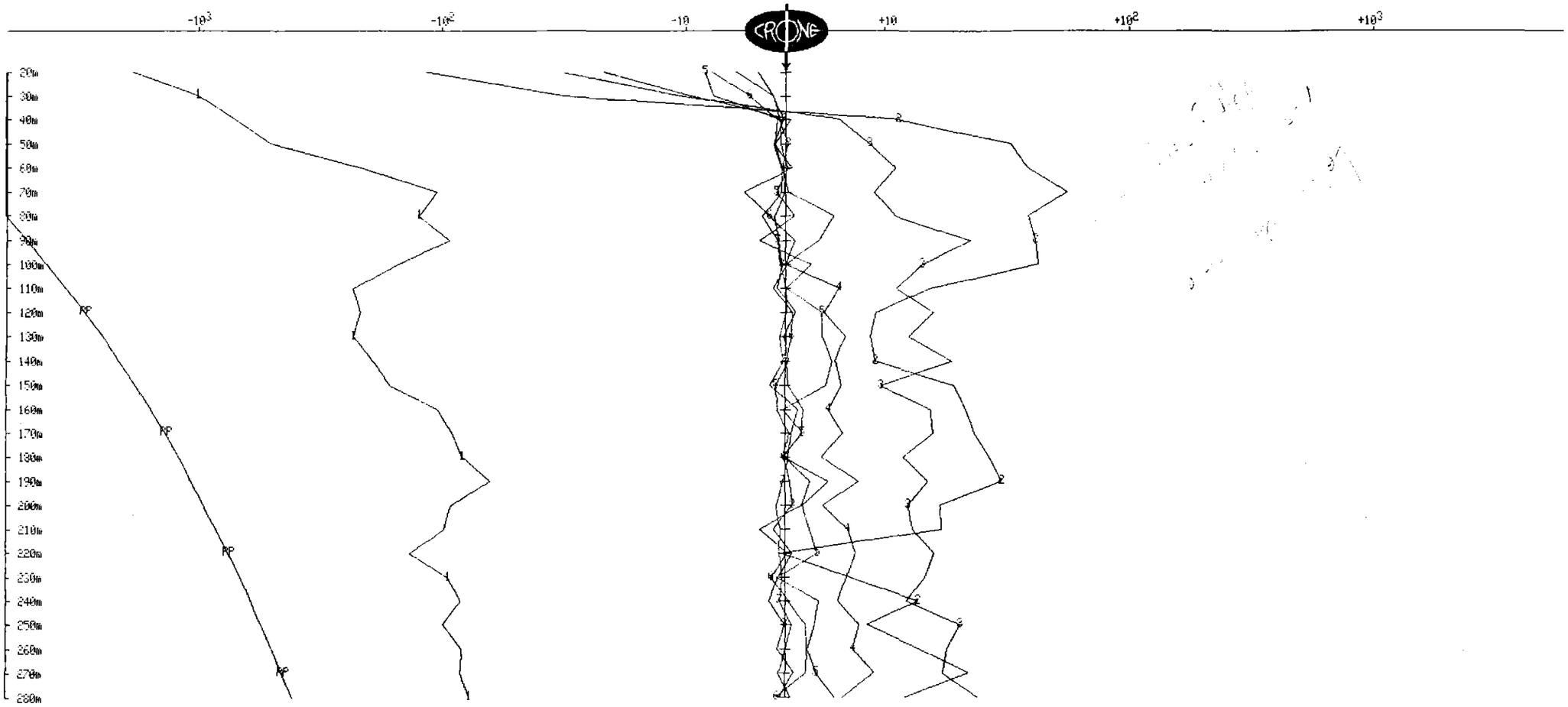
BOREHOLE PEM

Client	: PLUTONIC	Hole	: LBD-1 ext
Grid	: LAKE BARRINGTON	Tx Loop	: NORTH
Date	: Jan 20, 1993	File name	: LBD1XYN.PEM

5 cm

Data Corrected for Probe Rotation using Set Values
X COMPONENT dBx/dt nanoTesla/sec - 8 channels and PP

Scale: 1:2000



9743827

CRONE GEOPHYSICS & EXPLORATION LTD

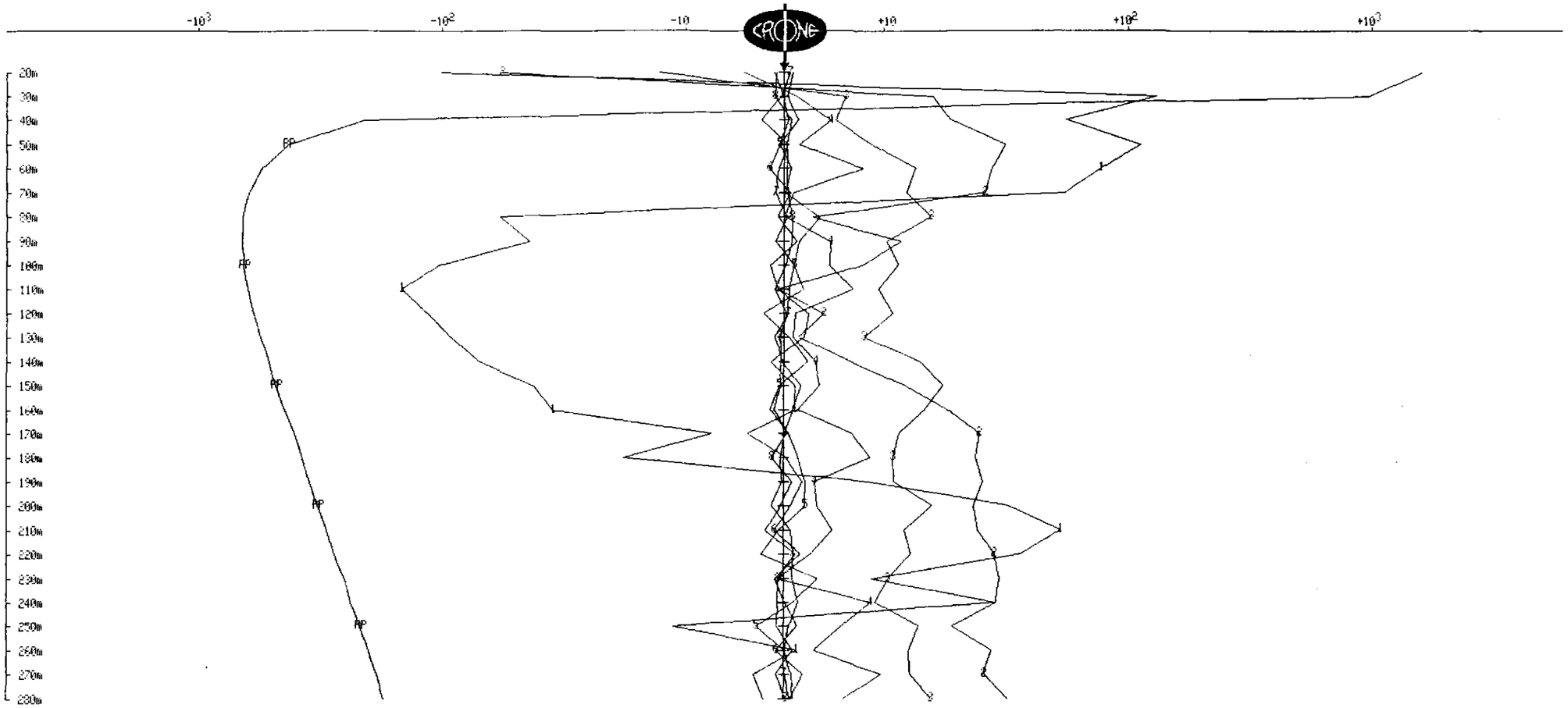
BOREHOLE PEM

5 cm

Client	: PLUTONIC	Hole	: **LBD-1 ext**
Grid	: LAKE BARRINGTON	Tx Loop	: **NORTH**
Date	: Jan 20, 1993	File name	: LBD1XYN.PEM

Data Corrected for Probe Rotation using Set Values
Y COMPONENT dBy/dt nanoTesla/sec - 8 channels and PP

Scale: 1:2000



974383

CRONE GEOPHYSICS & EXPLORATION LTD

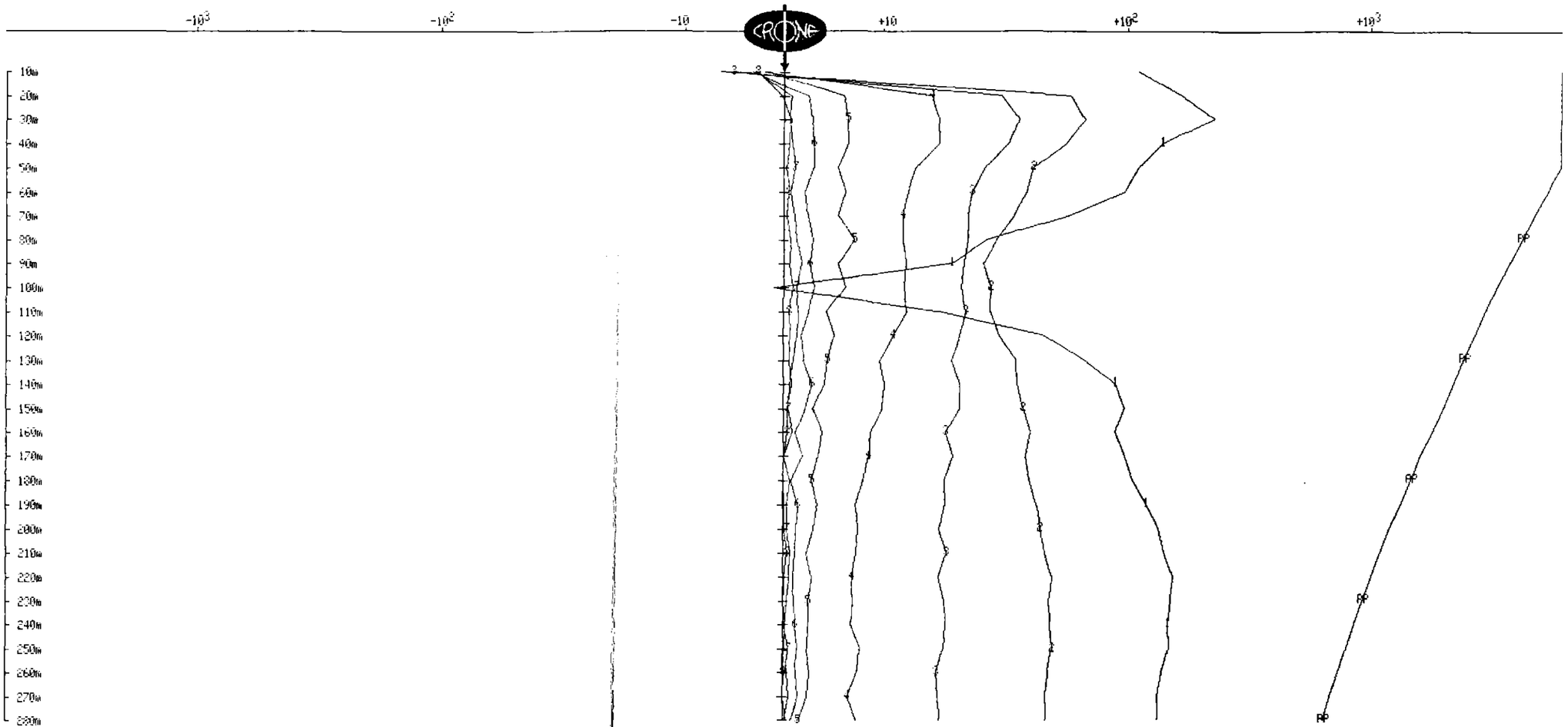
BOREHOLE PEM

5 cm

Client	: PLUTONIC	Hole	: LBD-1 ext
Grid	: LAKE BARRINGTON	Tx Loop	: NORTH
Date	: Jan 20, 1993	File name	: LBD1ZN.PEM

Z COMPONENT dBz/dt nanoTesla/sec - 8 channels and PP

Scale: 1:2000



9743841

974385

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

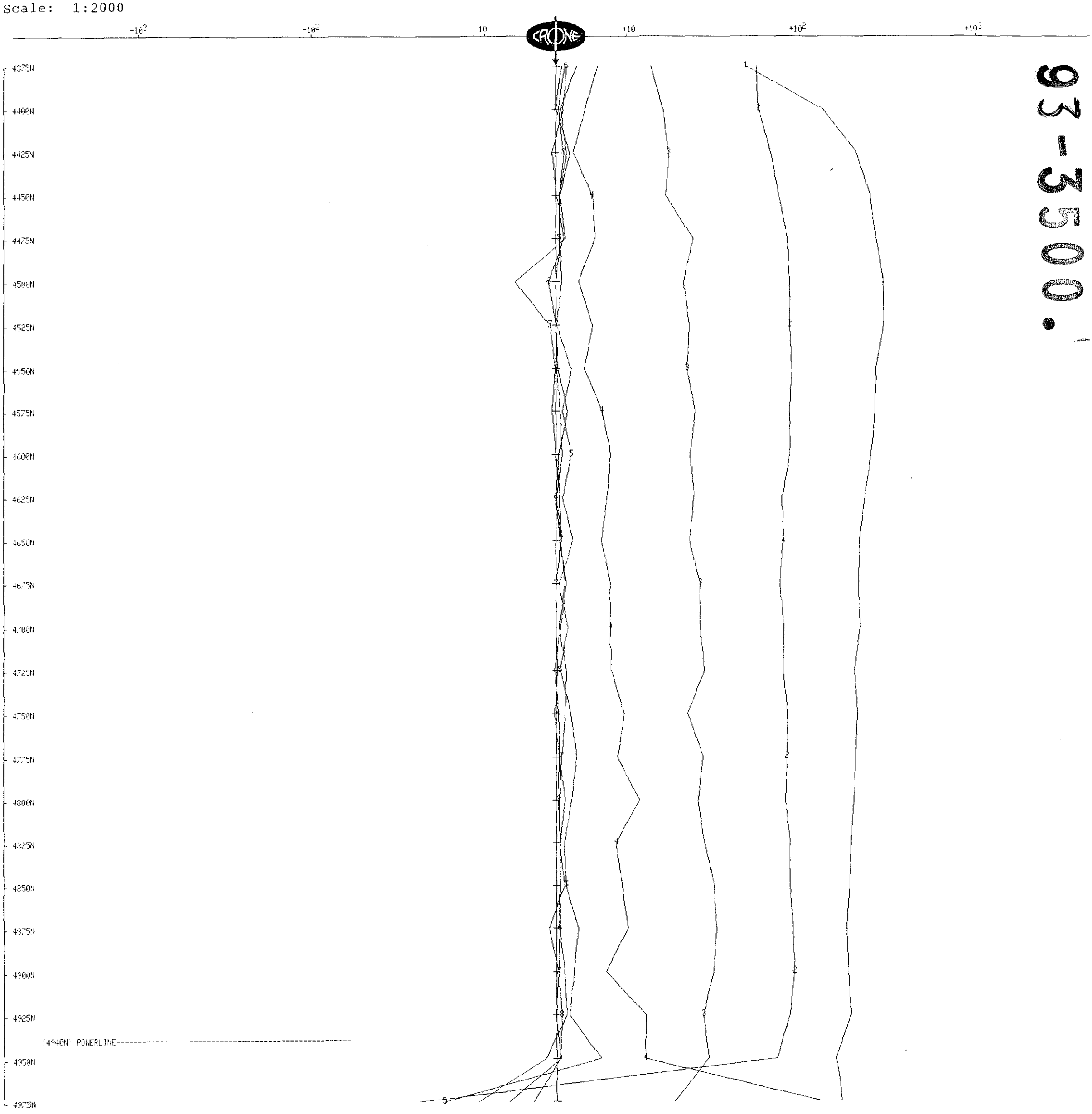
5 cm

Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 27, 1993

Line : 21100E
Tx Loop : 4
File name : 21100E4.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000



63-25-3100.

974386

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

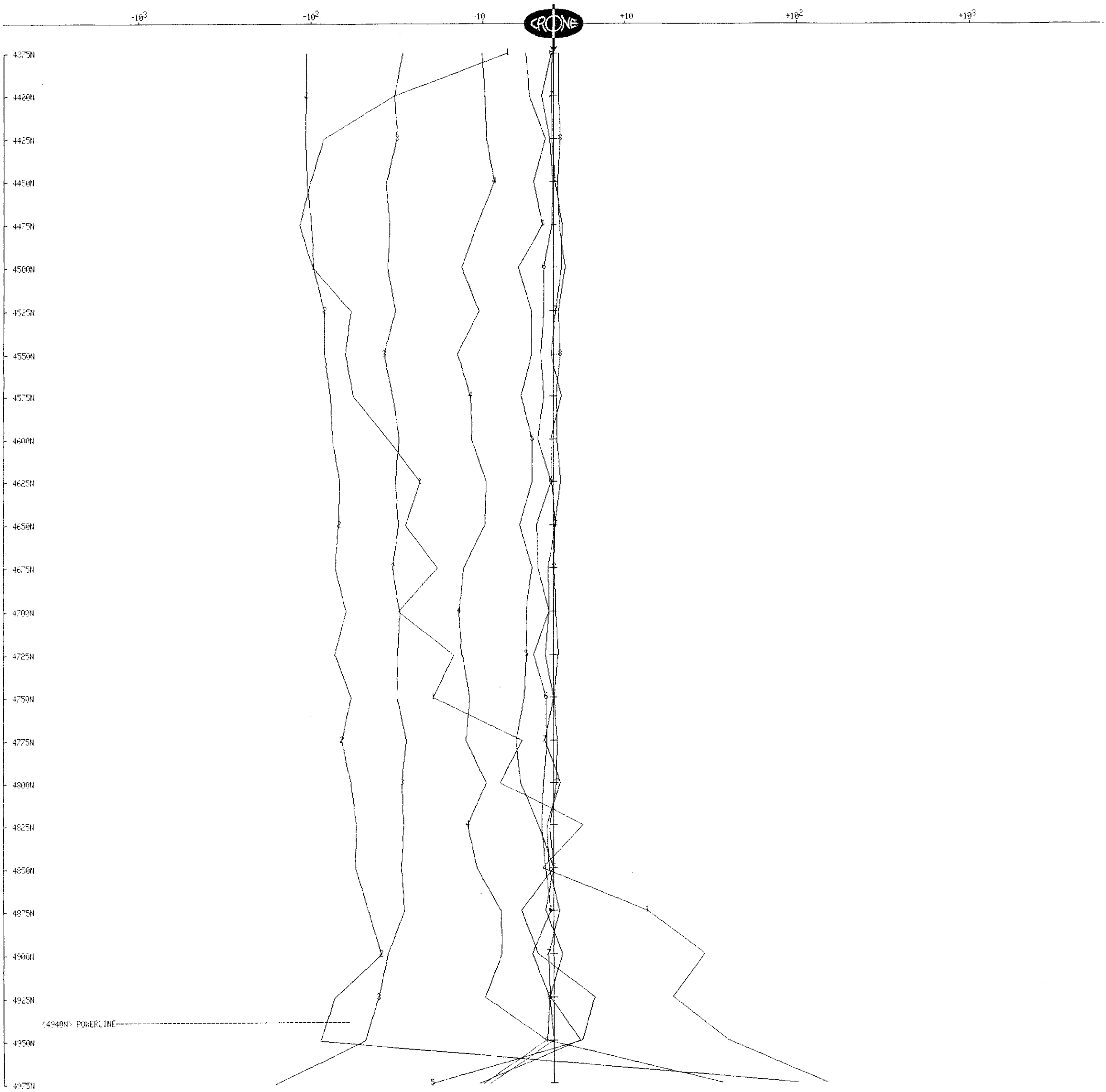
5 cm

Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 27, 1993

Line : 21100E
Tx Loop : 4
File name : 21100E4.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000



974387

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

5 cm

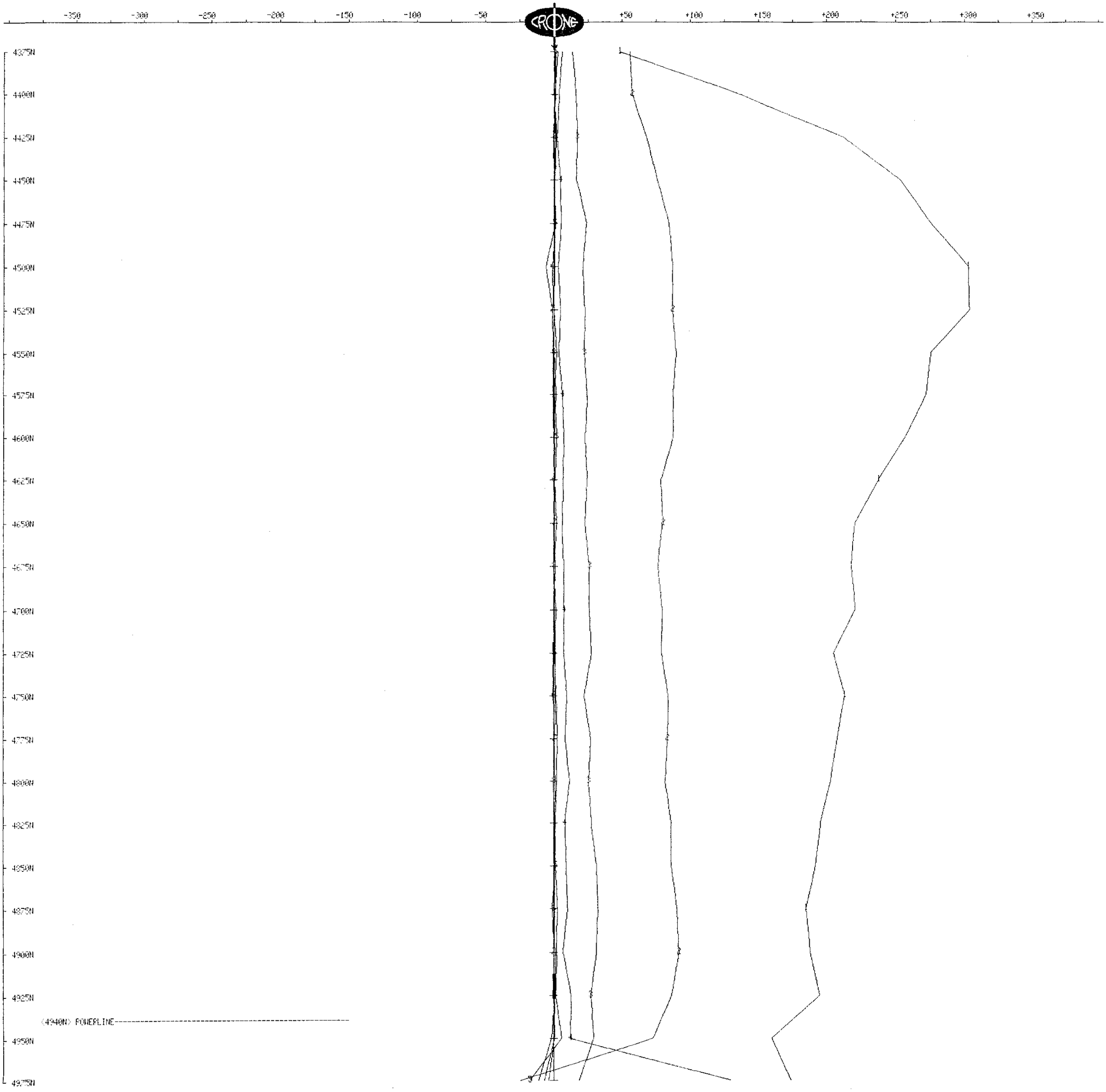
Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 27, 1993

Line : 21100E
Tx Loop : 4
File name : 21100E4.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



974388

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 27, 1993

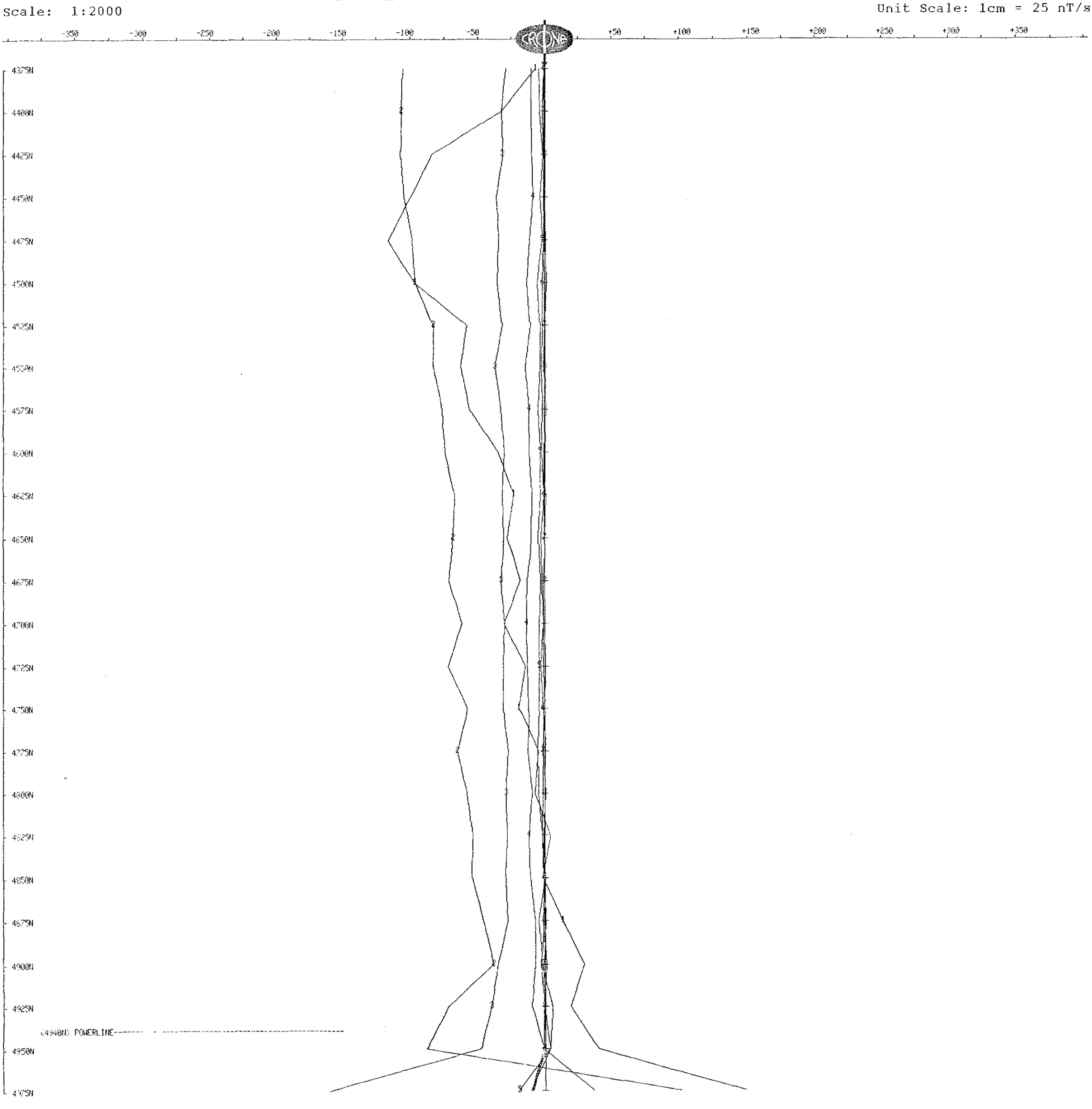
Line : 21100E
Tx Loop : 4
File name : 21100E4.PEM

5 cm

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

5 cm

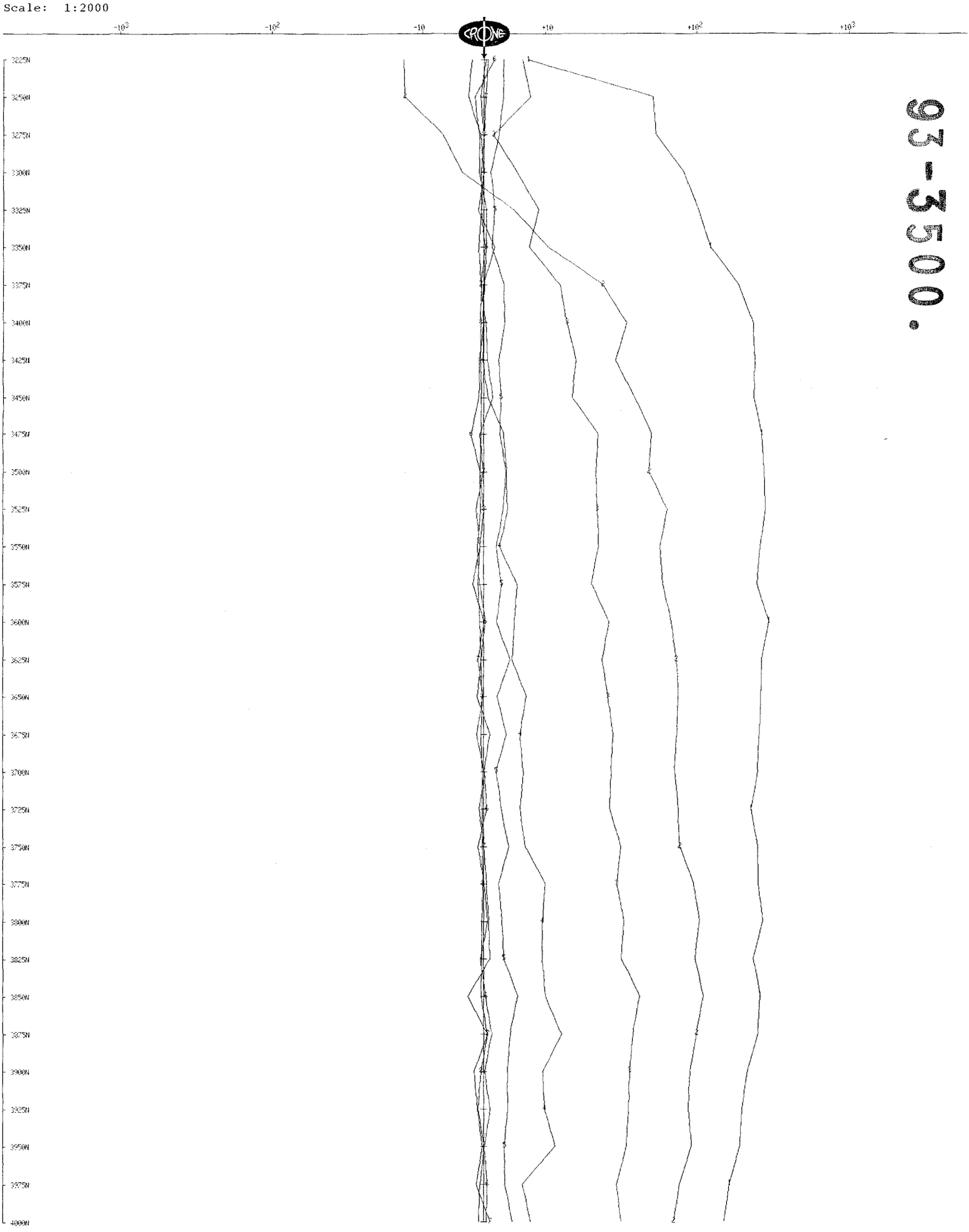
Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 25, 1993

Line : 21700E
Tx Loop : 3
File name : 21700E3.PEM

974389

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000



93-3500.

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

974390

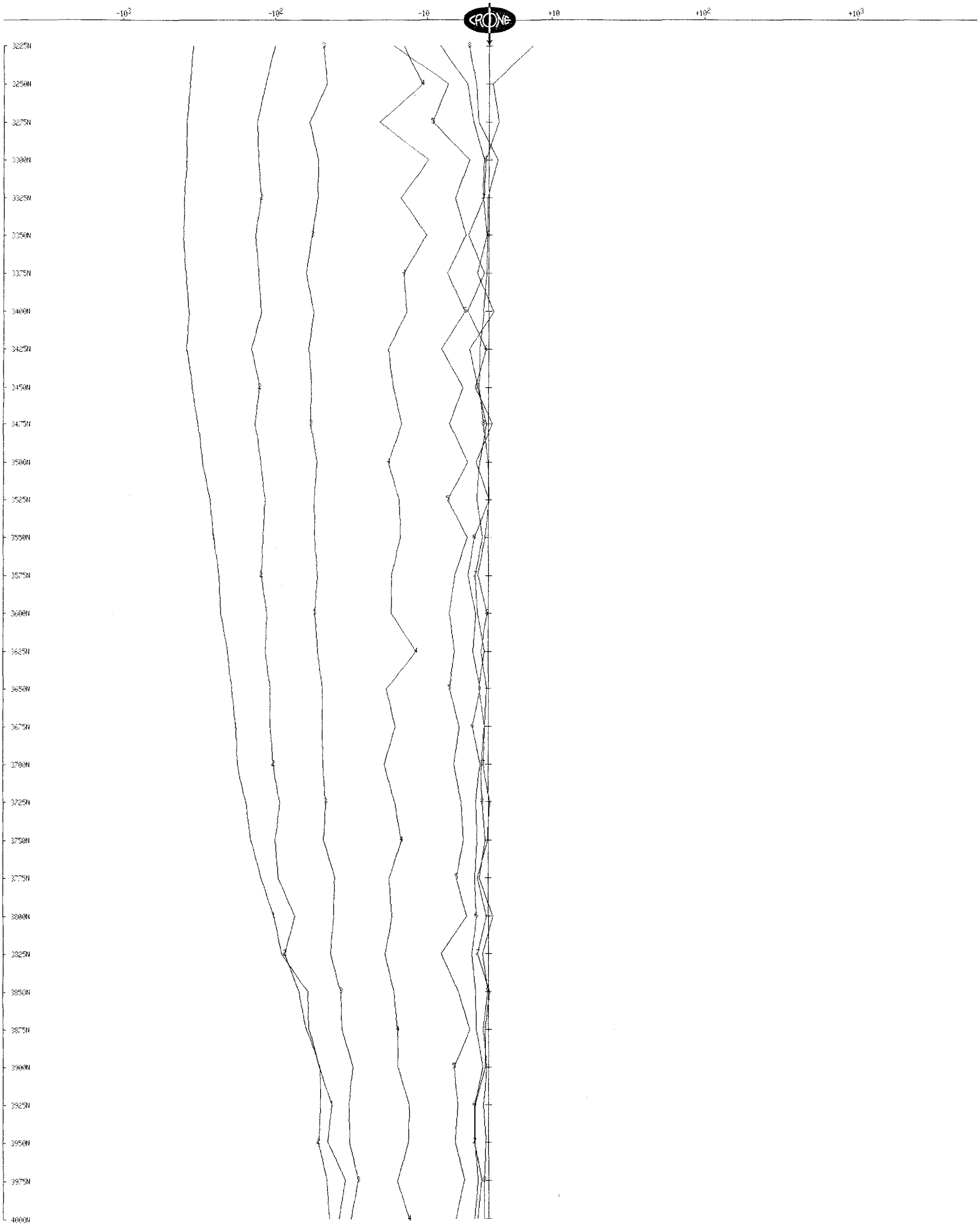
5 cm

Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 25, 1993

Line : 21700E
Tx Loop : 3
File name : 21700E3.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

974391

5 cm

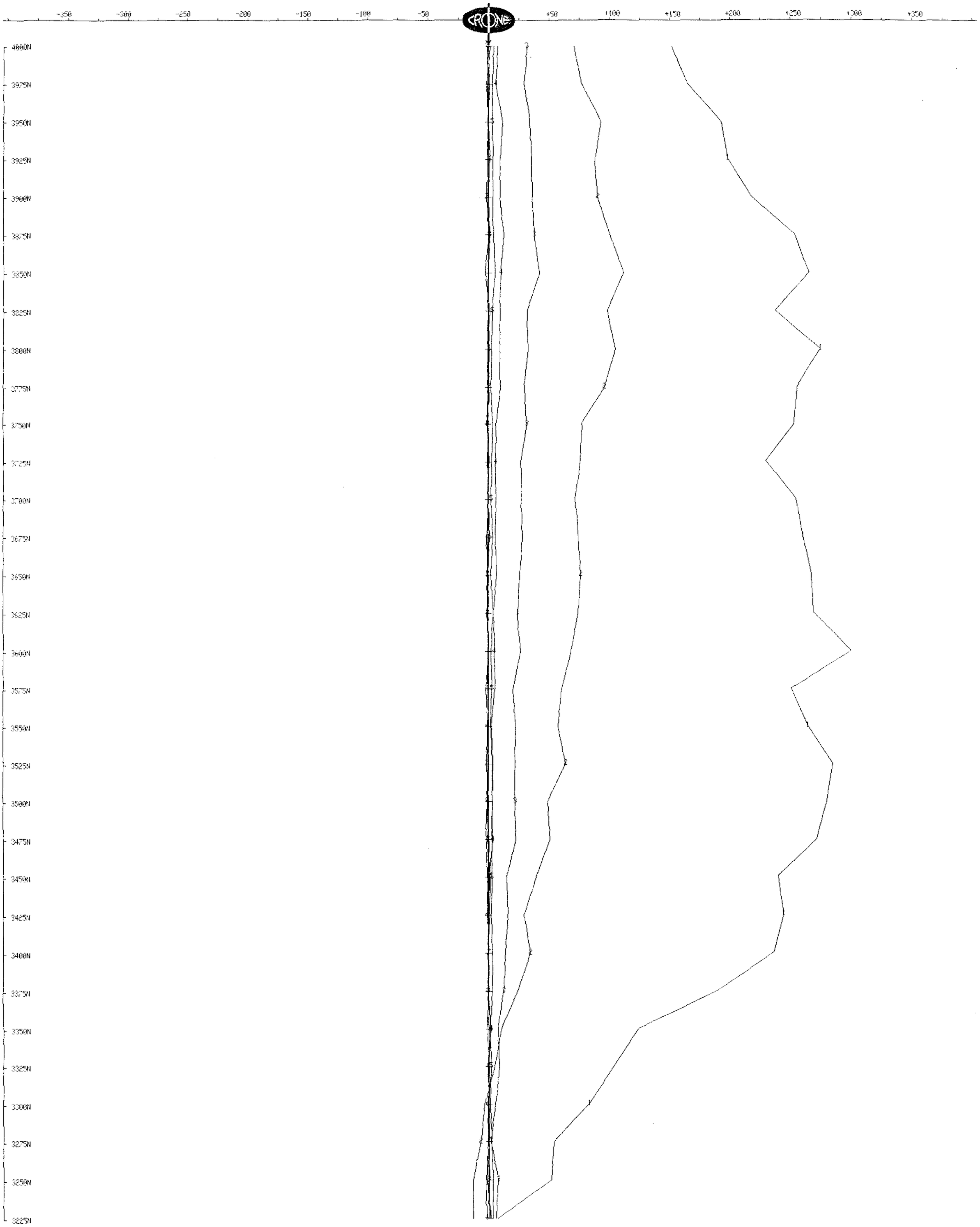
Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 25, 1993

Line : 21700E
Tx Loop : 3
File name : 21700E3.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



974392

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

5 cm

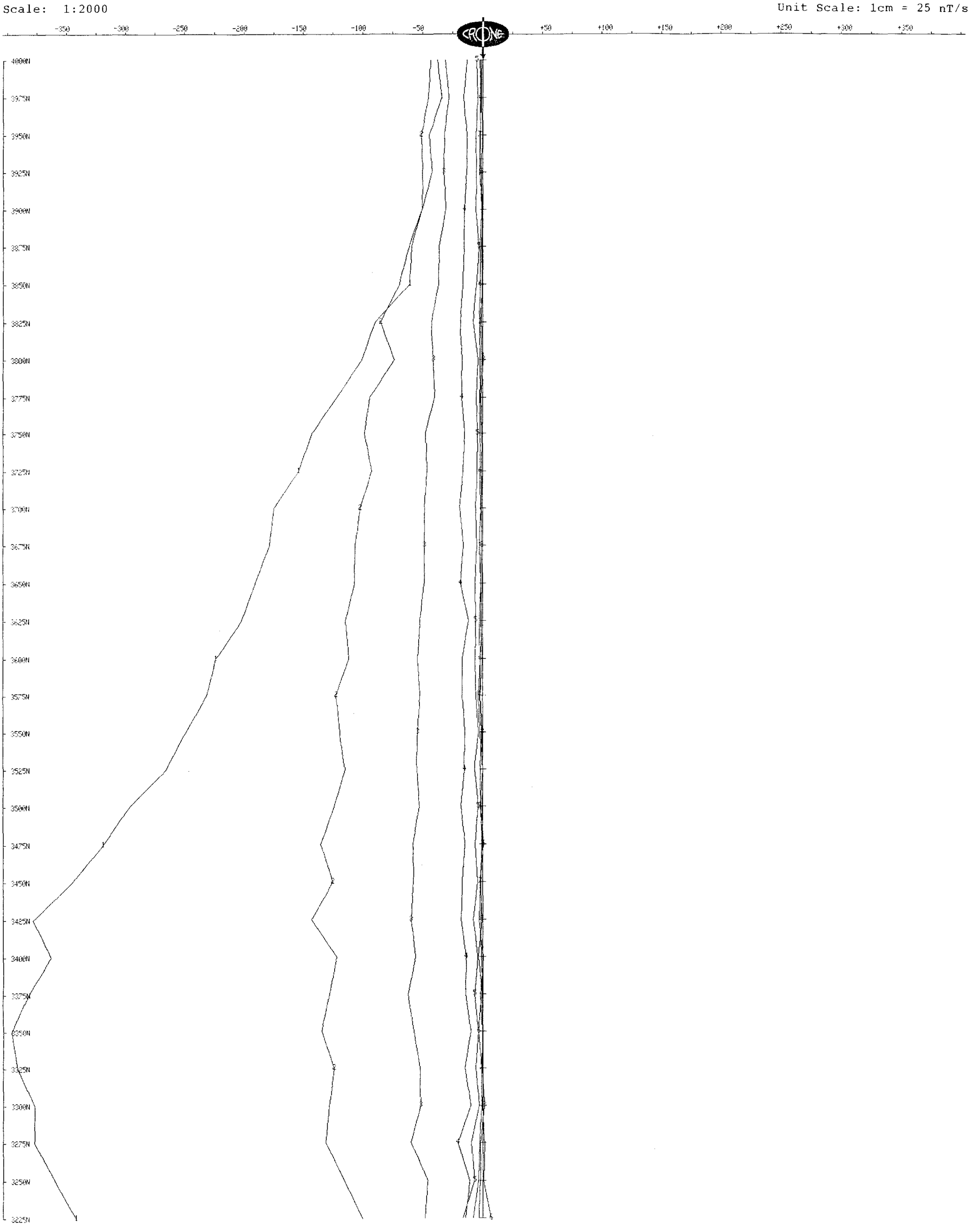
Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 25, 1993

Line : 21700E
Tx Loop : 3
File name : 21700E3.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



974393

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

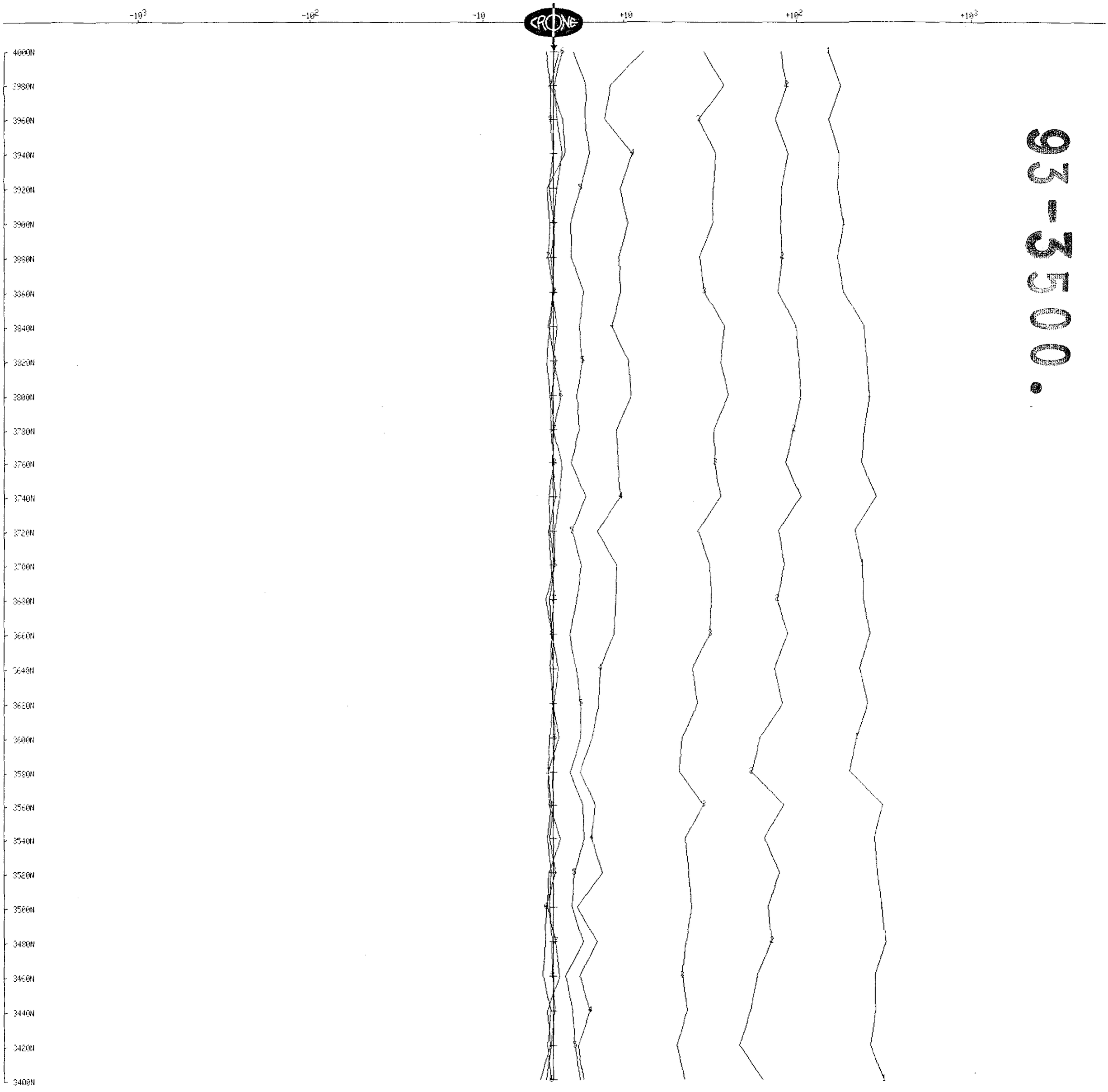
5 cm

Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 25, 1993

Line : 21600E
Tx Loop : 3
File name : 21600E3.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000



CS-6
CS-1
CS-5
CS-10.

974394

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

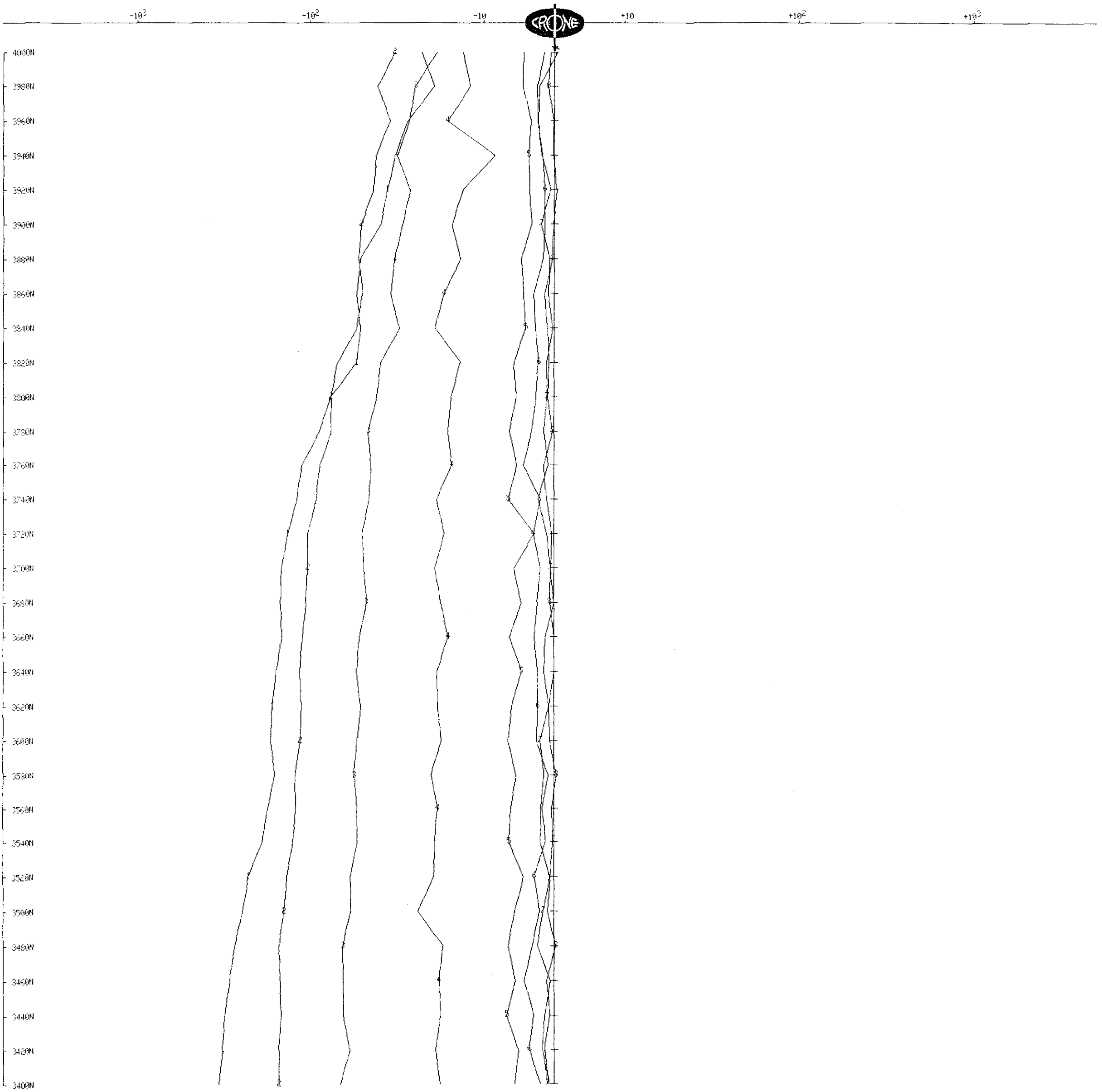
5 cm

Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 25, 1993

Line : 21600E
Tx Loop : 3
File name : 21600E3.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000



974395

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

5 cm

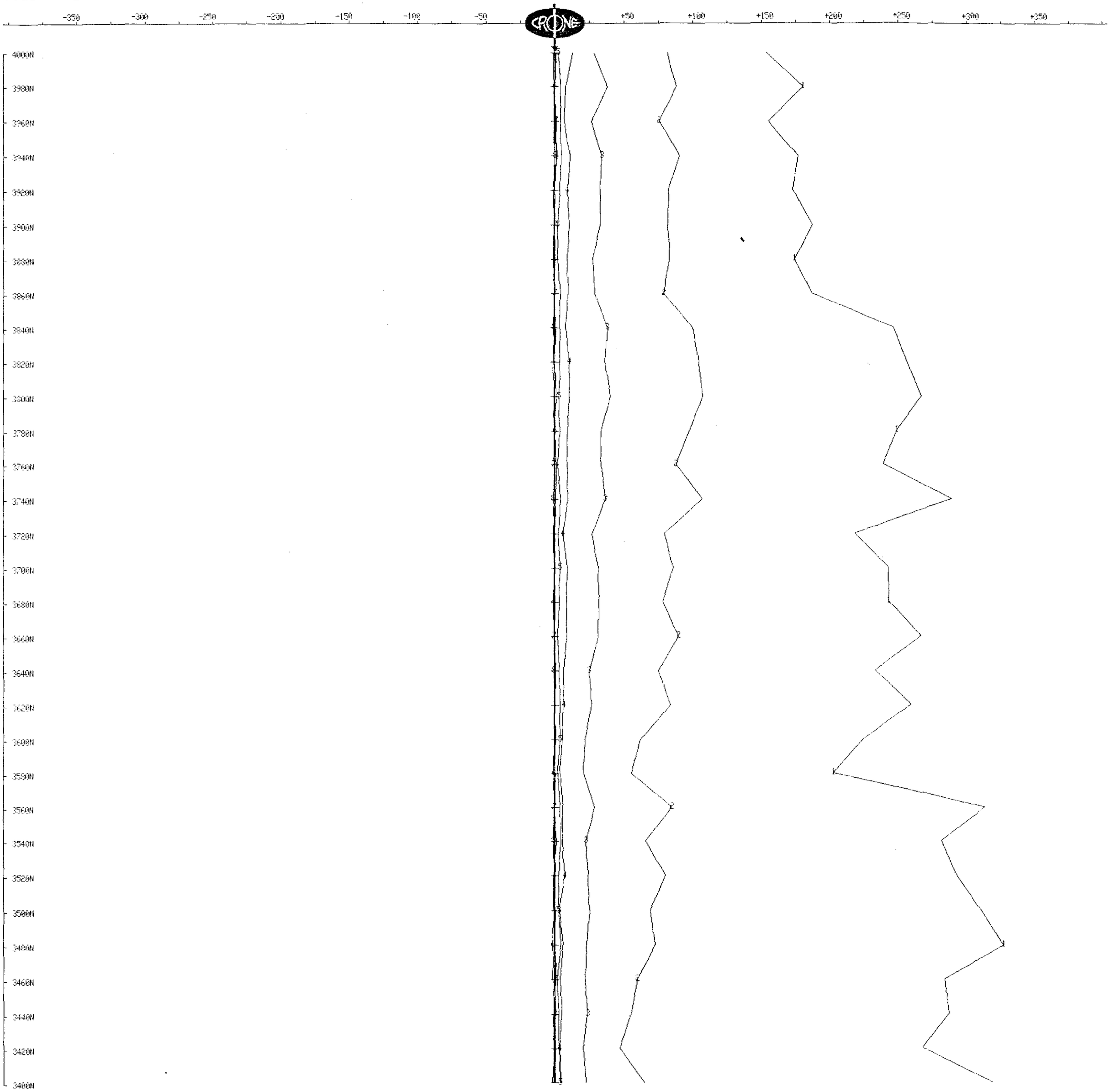
Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 25, 1993

Line : 21600E
Tx Loop : 3
File name : 21600E3.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



974396

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

5 cm

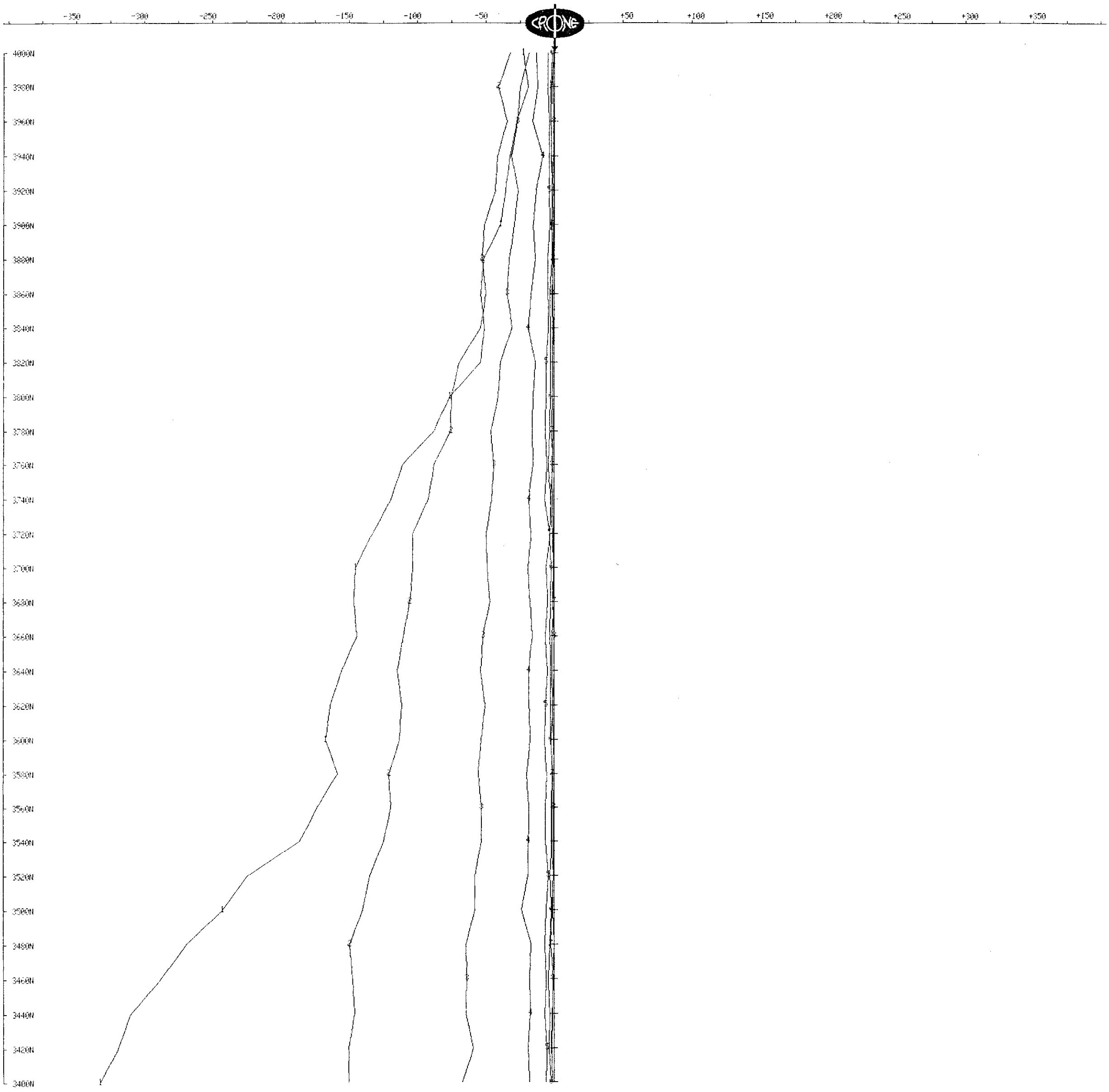
Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 25, 1993

Line : 21600E
Tx Loop : 3
File name : 21600E3.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

974397

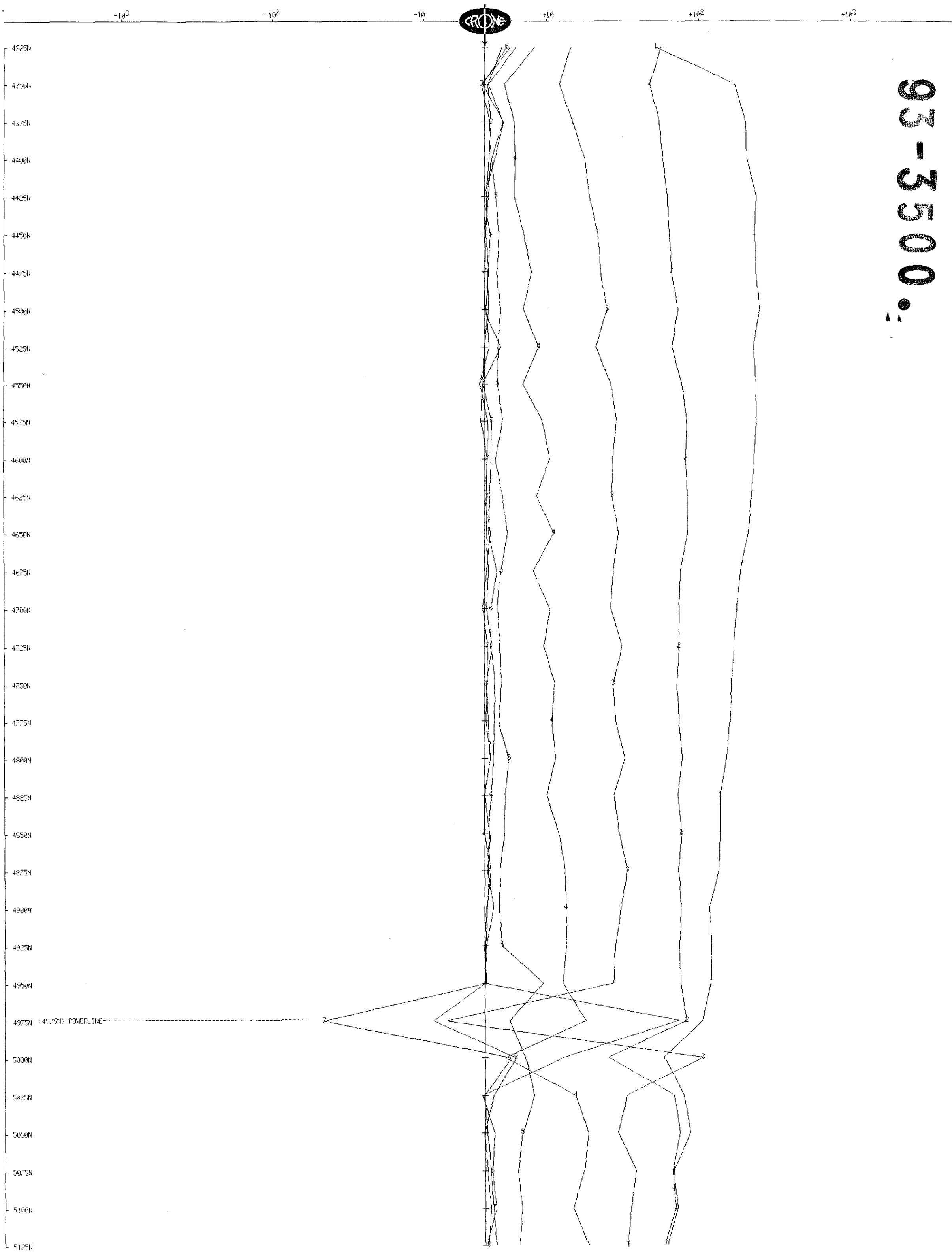
5 cm

Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 27, 1993

Line : 21500E
Tx Loop : 4
File name : 21500E4.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000



21500E

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

5 cm

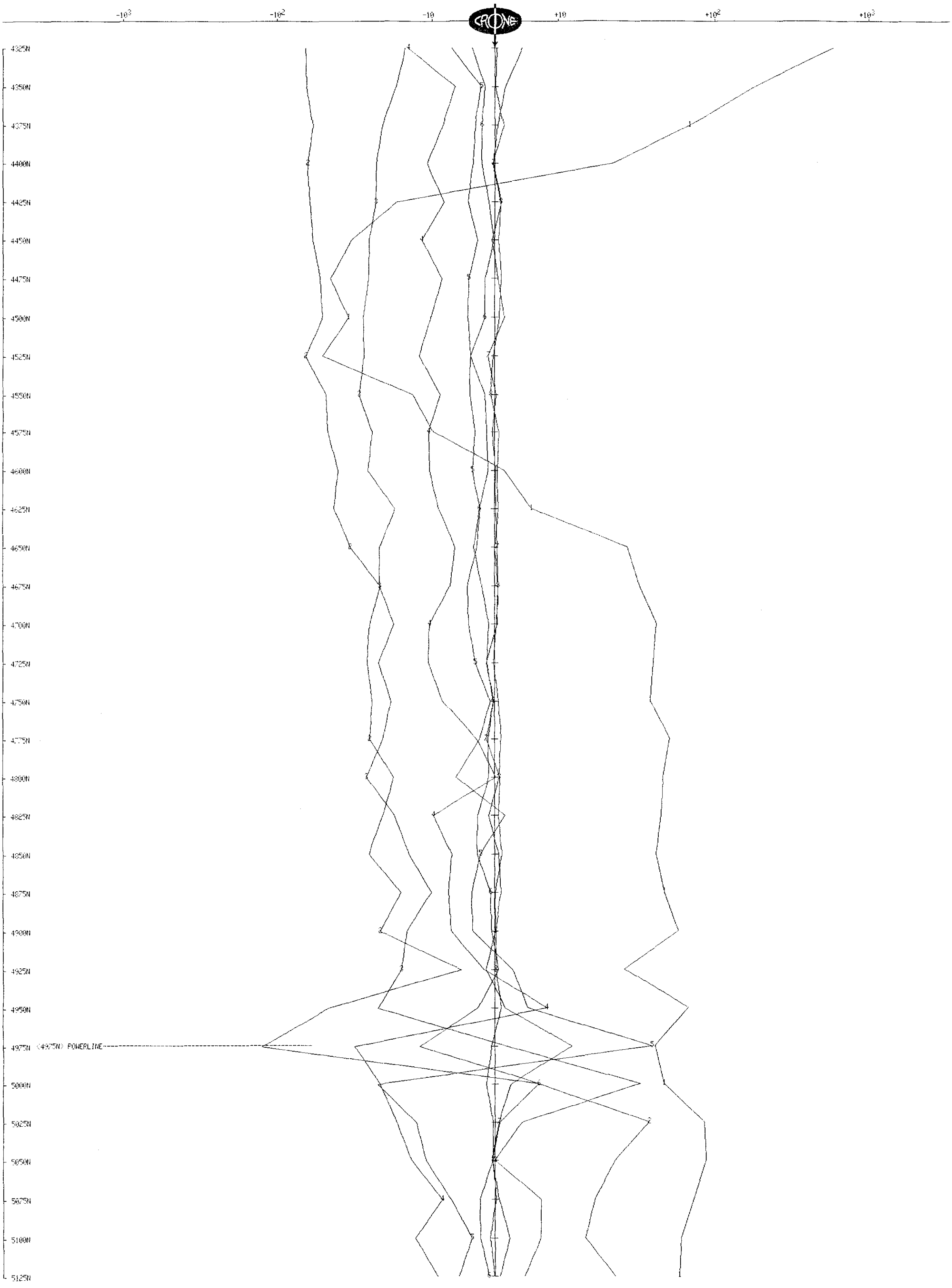
Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 27, 1993

Line : 21500E
Tx Loop : 4
File name : 21500E4.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

974398

Scale: 1:2000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

974399

5 cm

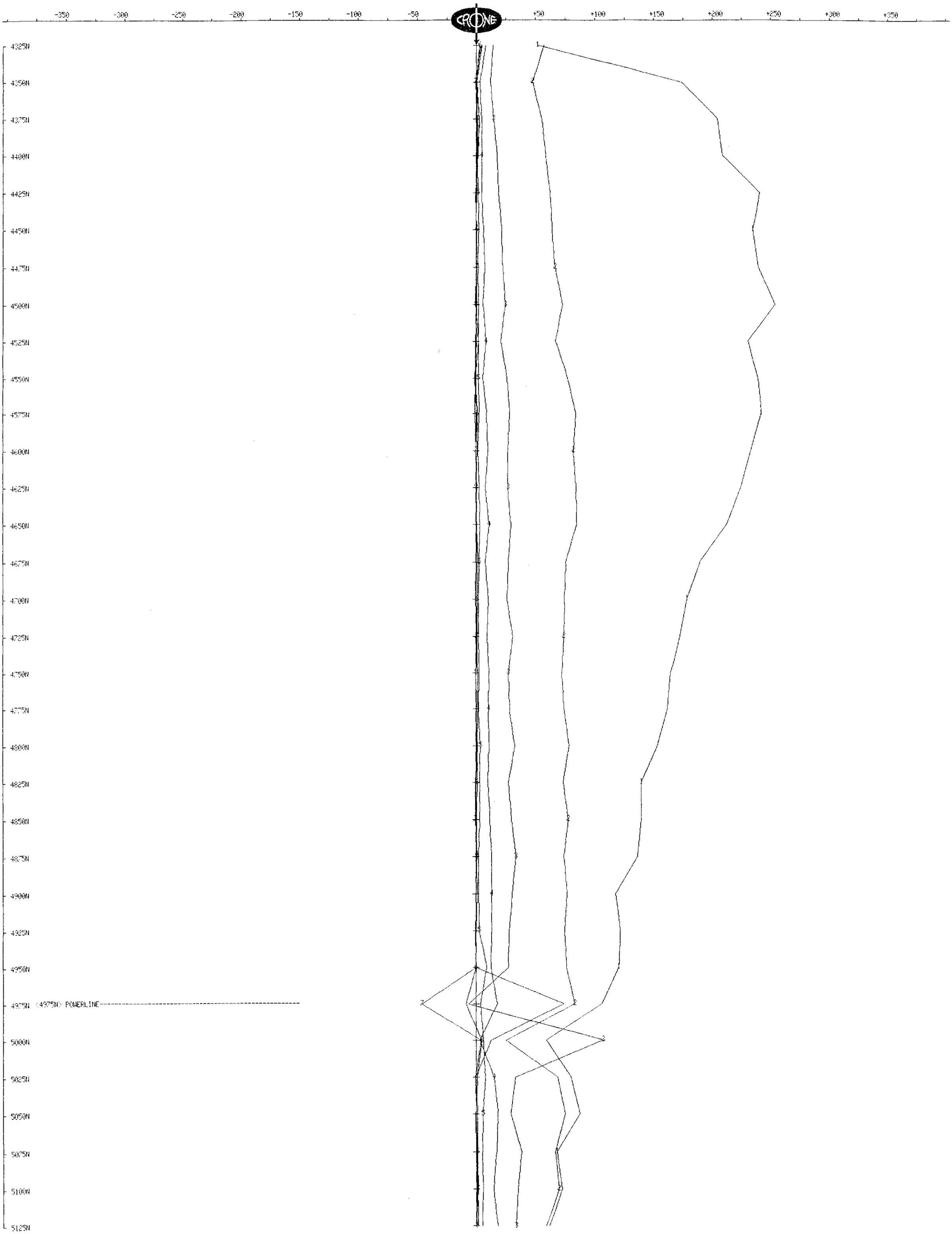
Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 27, 1993

Line : 21500E
Tx Loop : 4
File name : 21500E4.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

974400

5 cm

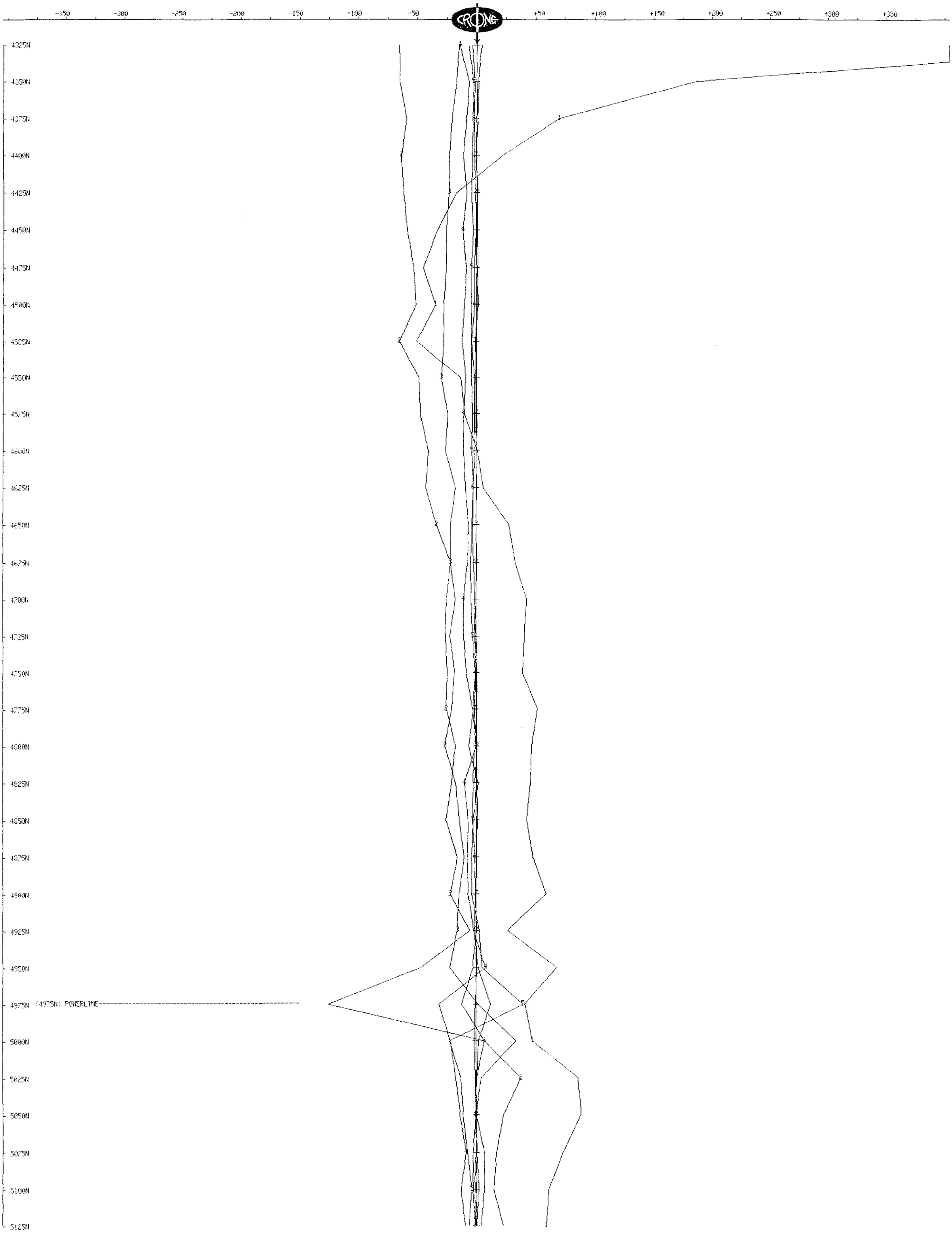
Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 27, 1993

Line : 21500E
Tx Loop : 4
File name : 21500E4.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



974401

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

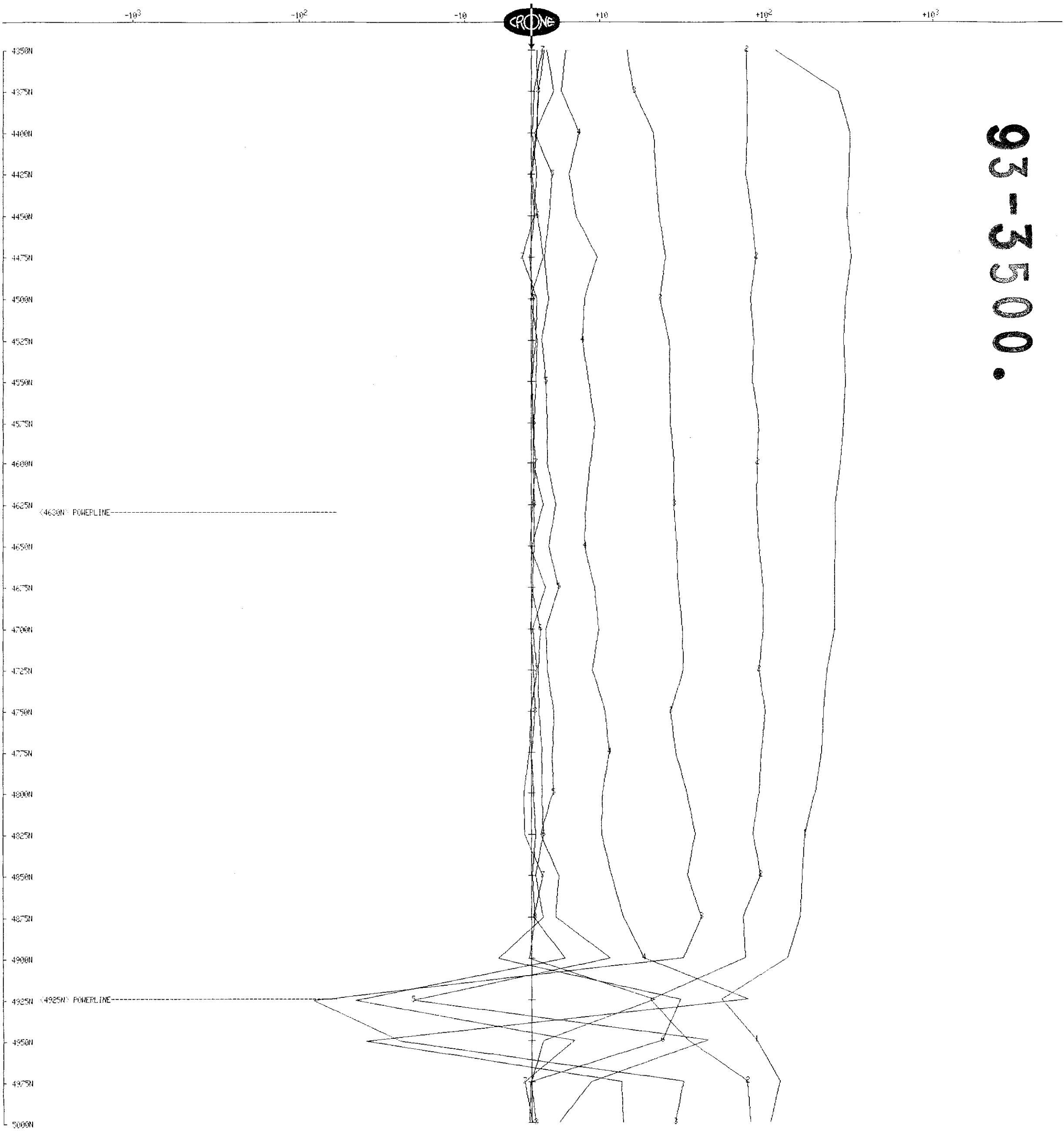
5 cm

Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 27, 1993

Line : 21300E
Tx Loop : 4
File name : 21300E4.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000



CC-26

21300.

974402

CRONE GEOPHYSICS & EXPLORATION LTD

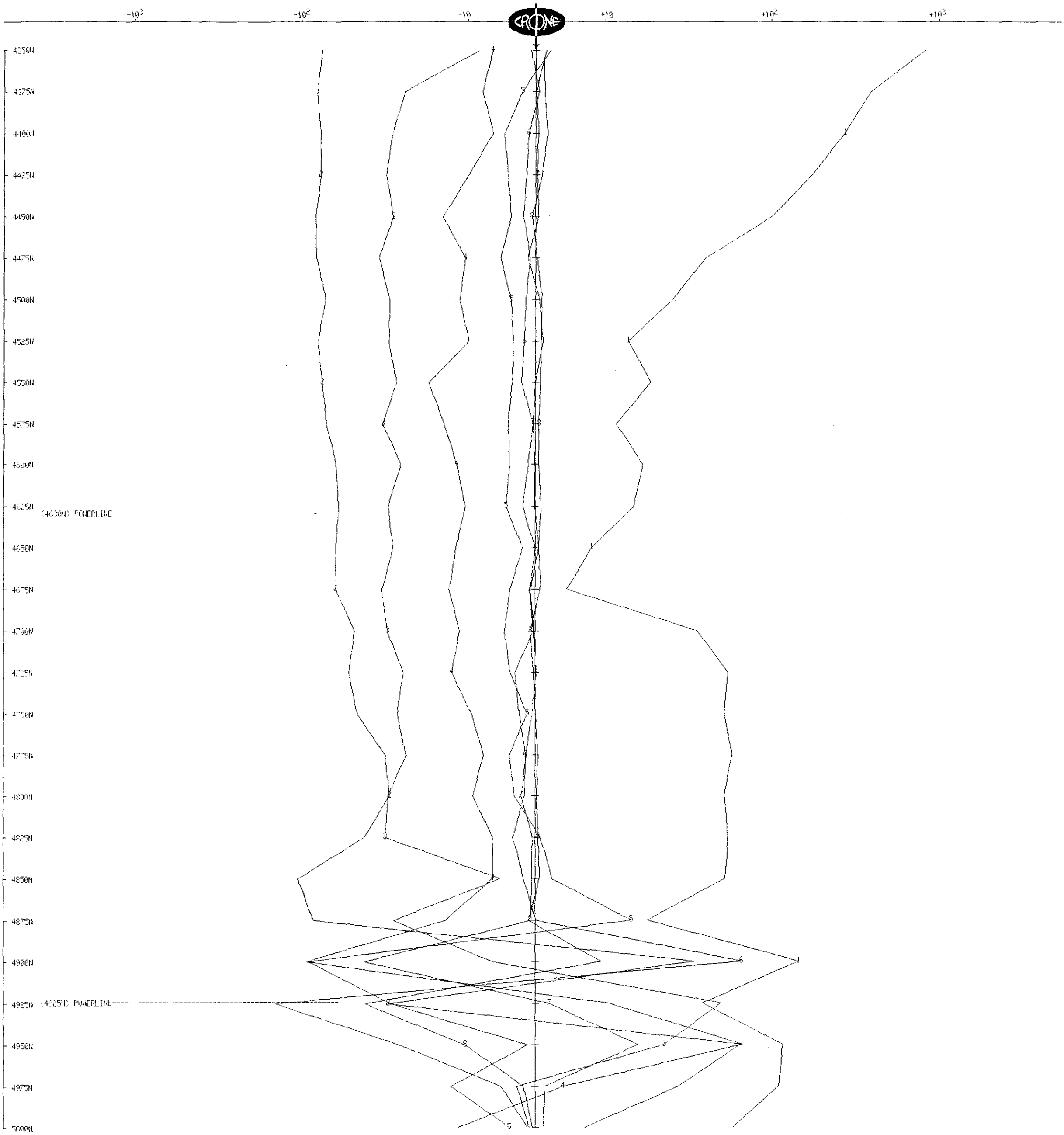
SURFACE PEM

5 cm

Client	: PLUTONIC	Line	: 21300E
Grid	: CETHANA EAST	Tx Loop	: 4
Date	: Jan 27, 1993	File name	: 21300E4.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000



974403

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

5 cm

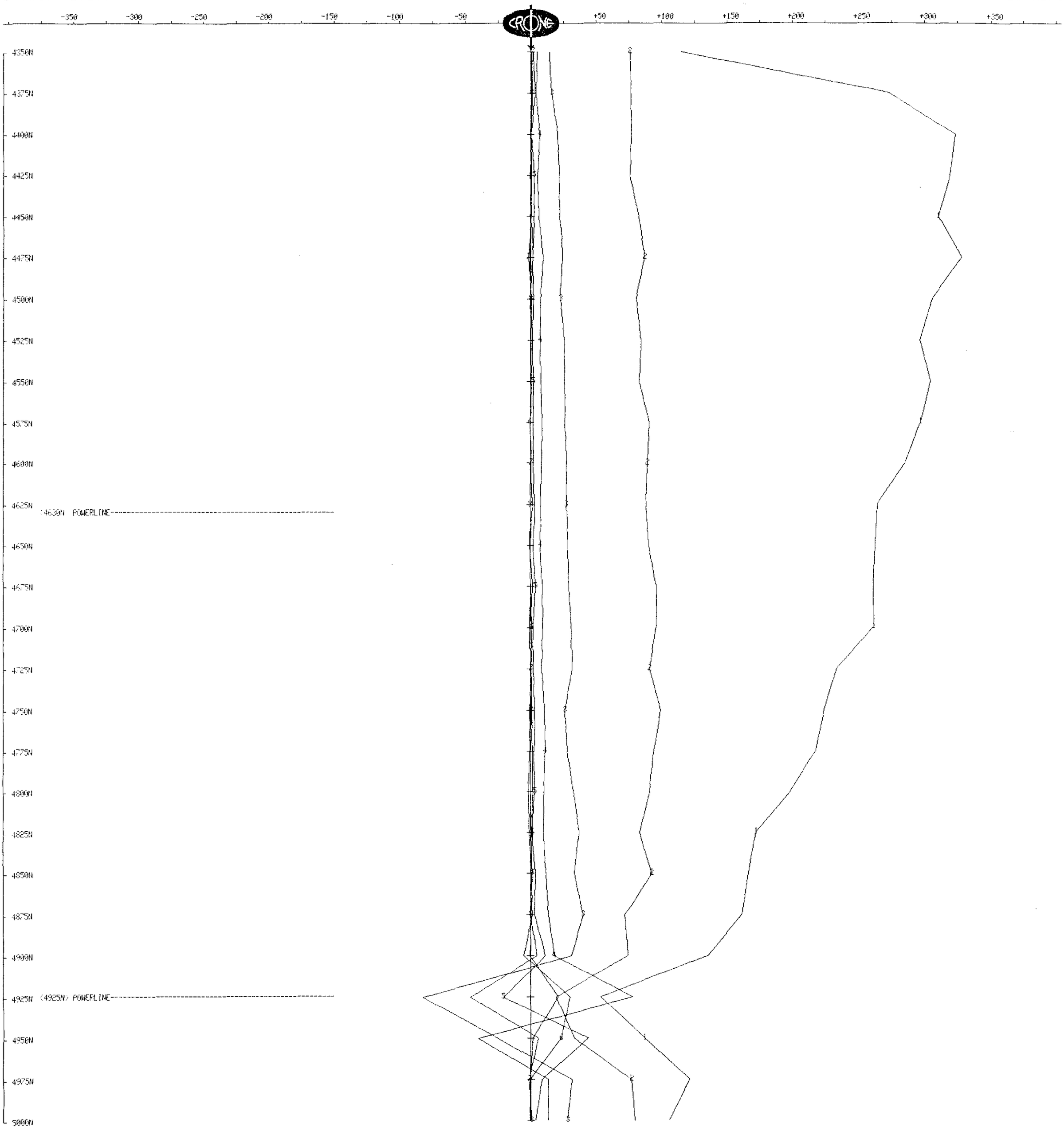
Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 27, 1993

Line : 21300E
Tx Loop : 4
File name : 21300E4.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



974404

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

5 cm

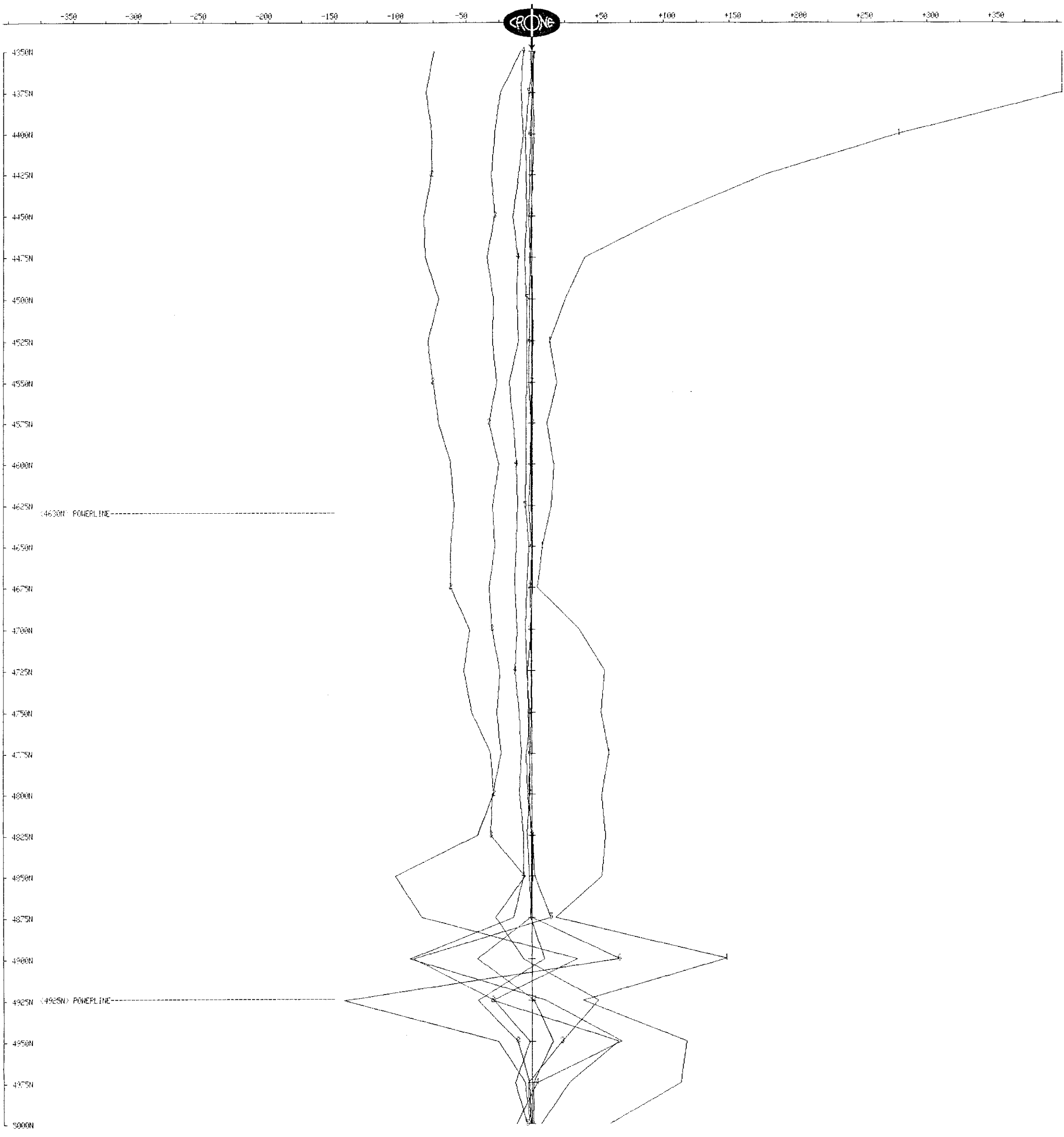
Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 27, 1993

Line : 21300E
Tx Loop : 4
File name : 21300E4.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



974405

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

5 cm

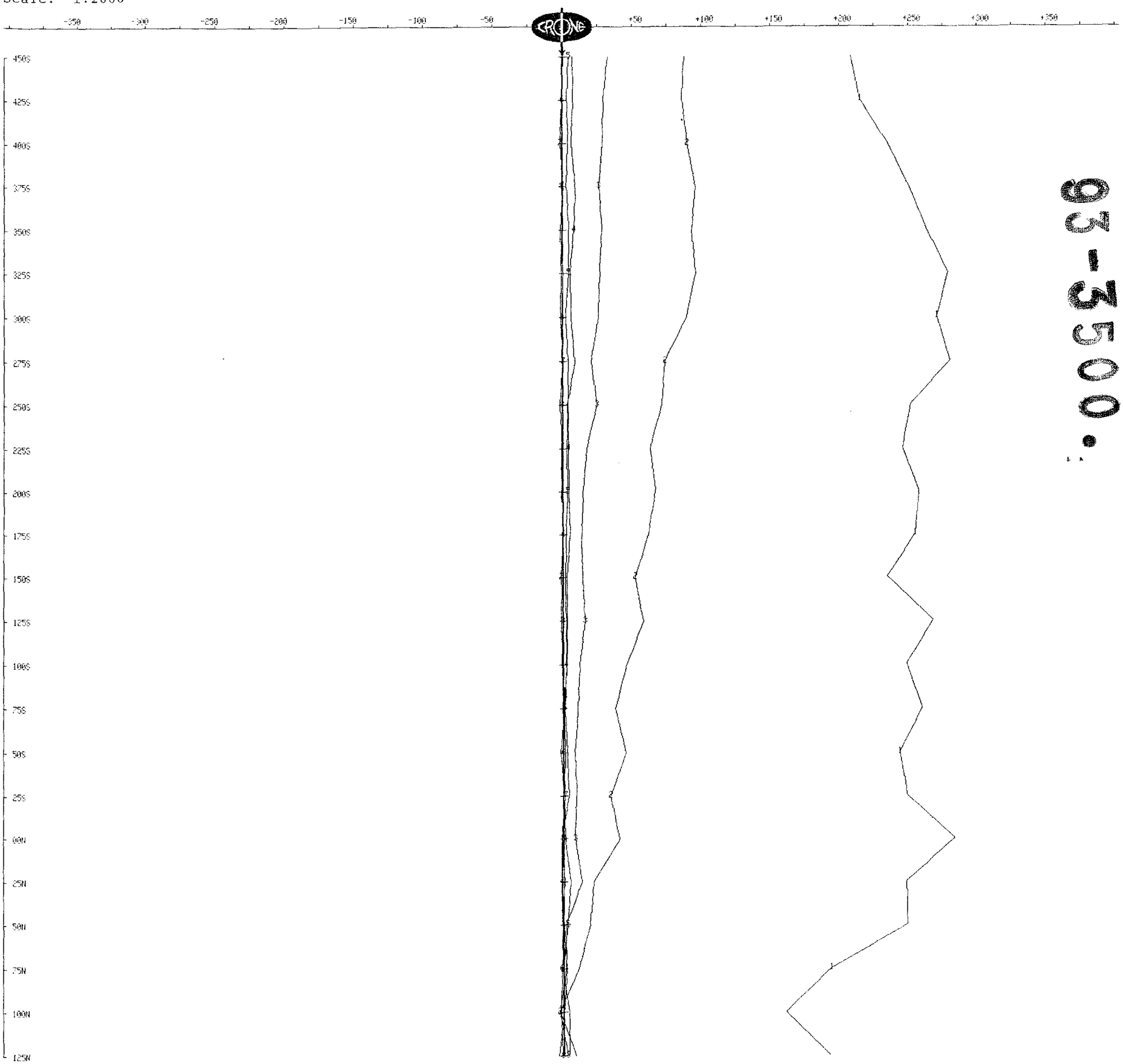
Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 23, 1993

Line : 21900E
Tx Loop : 3
File name : 21900E3.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



21900E-25000.

974406

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

5 cm

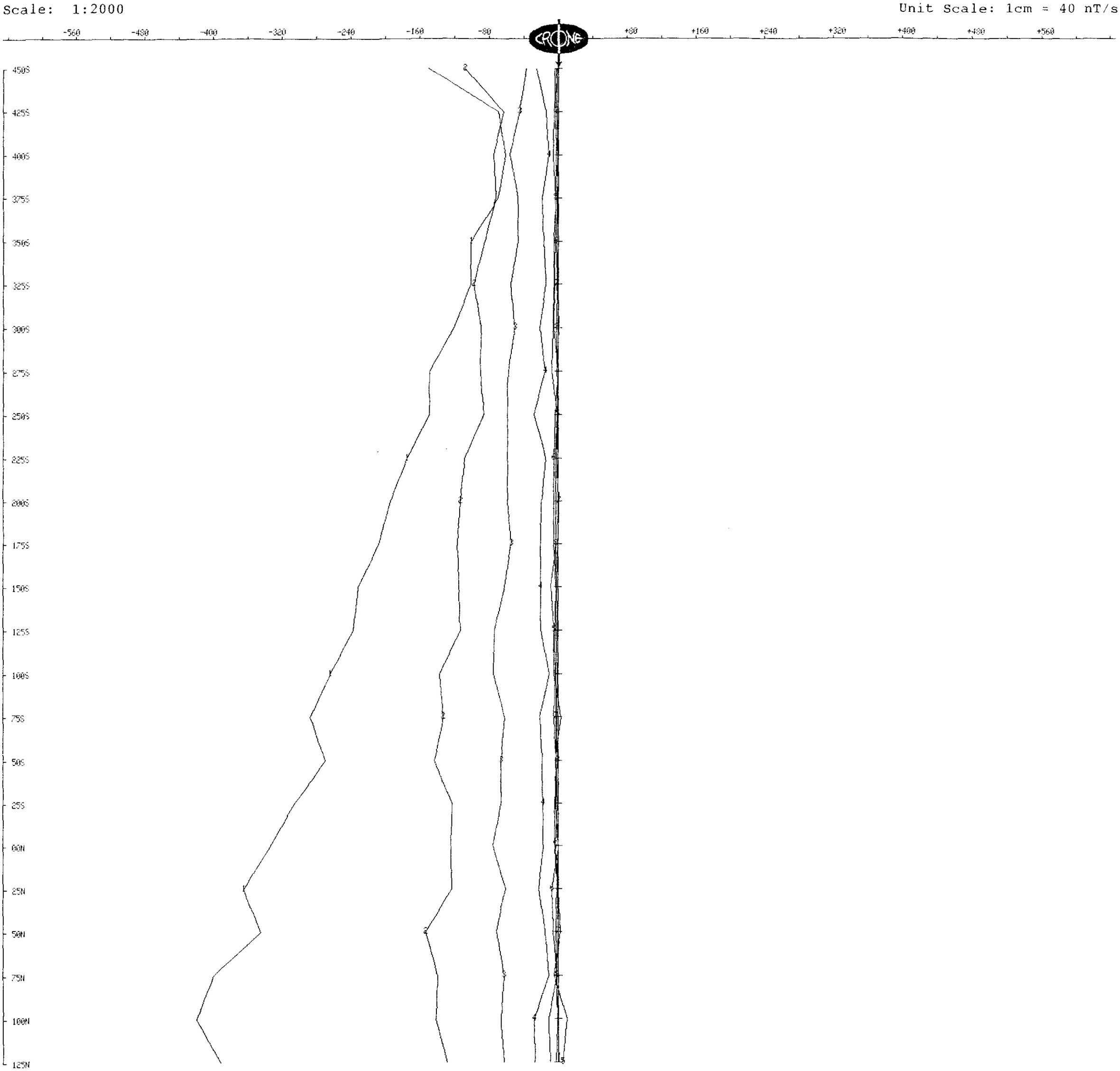
Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 23, 1993

Line : 21900E
Tx Loop : 3
File name : 21900E3.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 40 nT/s



974407

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

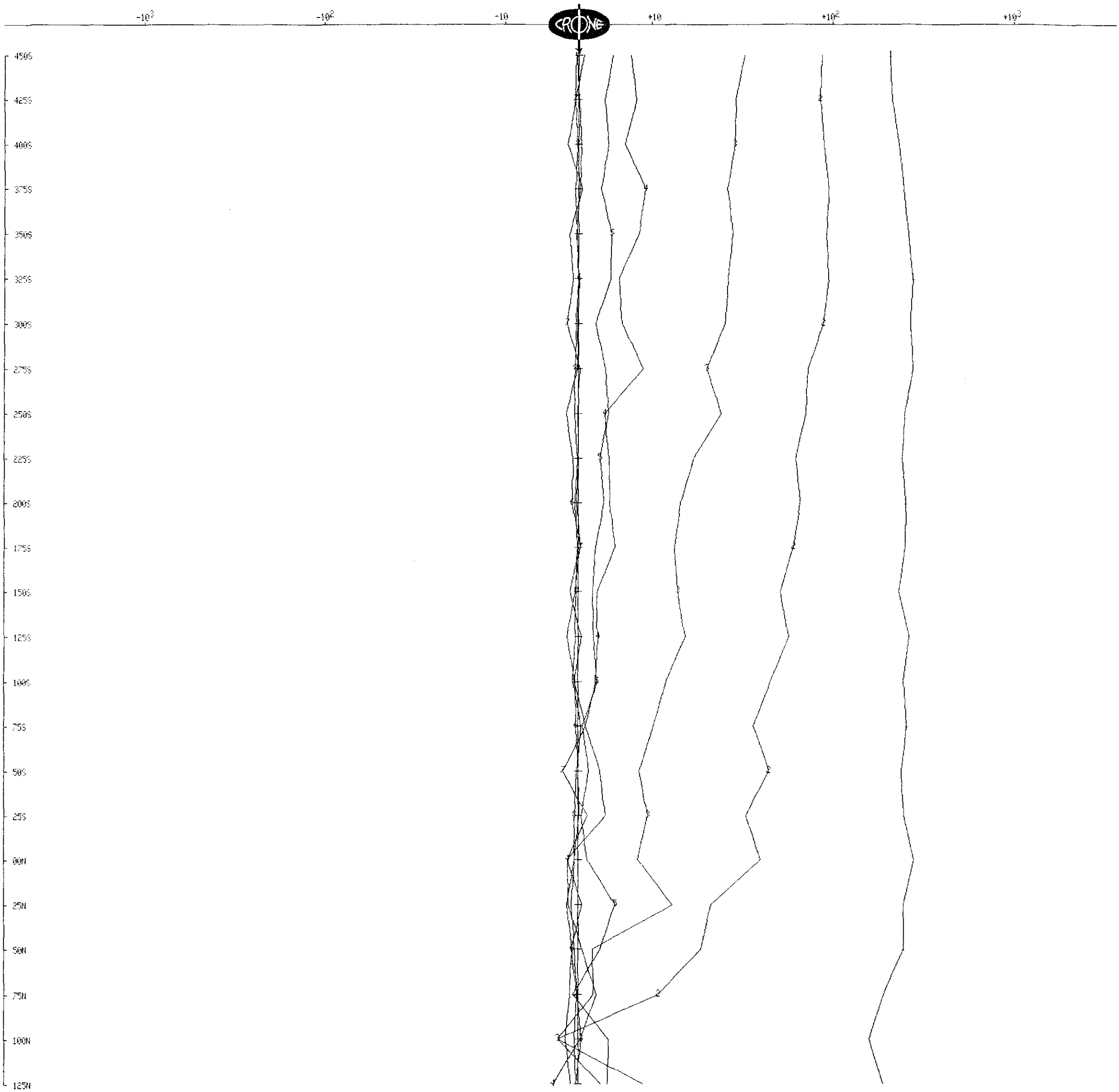
5 cm

Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 23, 1993

Line : 21900E
Tx Loop : 3
File name : 21900E3.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

974408

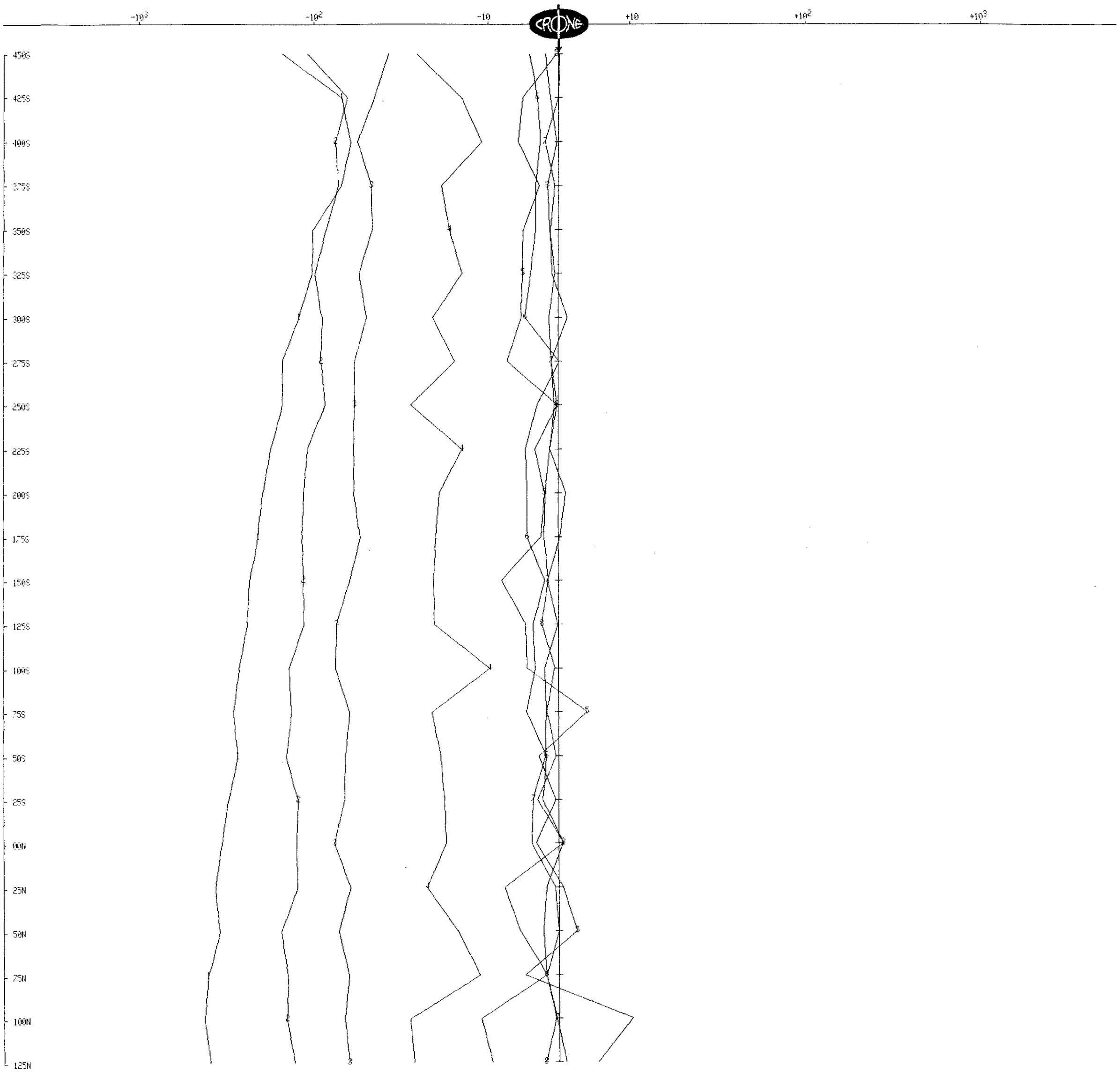
5 cm

Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 23, 1993

Line : 21900E
Tx Loop : 3
File name : 21900E3.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000



5 cm

CRONE GEOPHYSICS & EXPLORATION LTD

974409

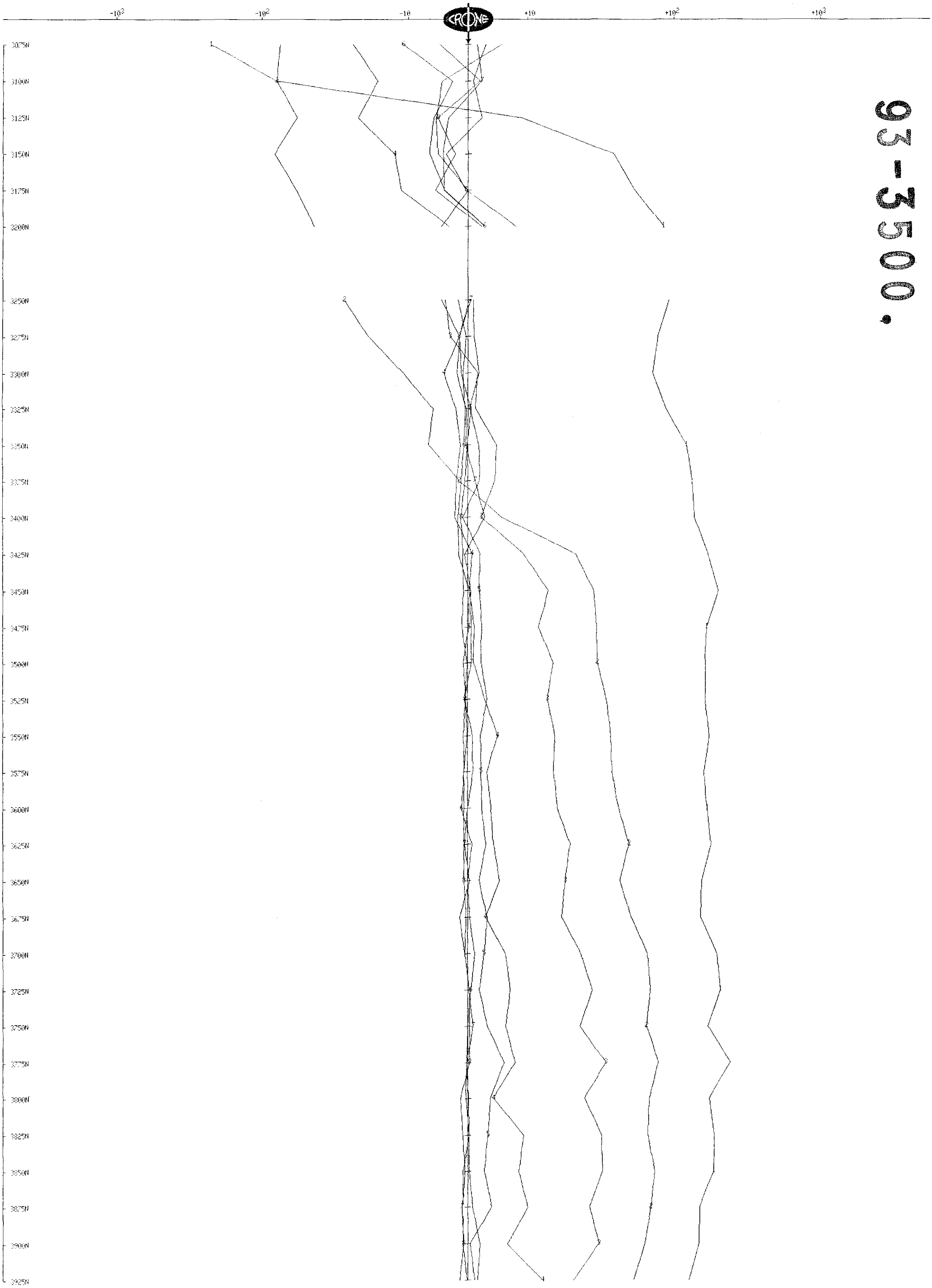
SURFACE PEM

Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 25, 1993

Line : 21800E
Tx Loop : 3
File name : 21800E3.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000



GEO-TECH 6000.

974410

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

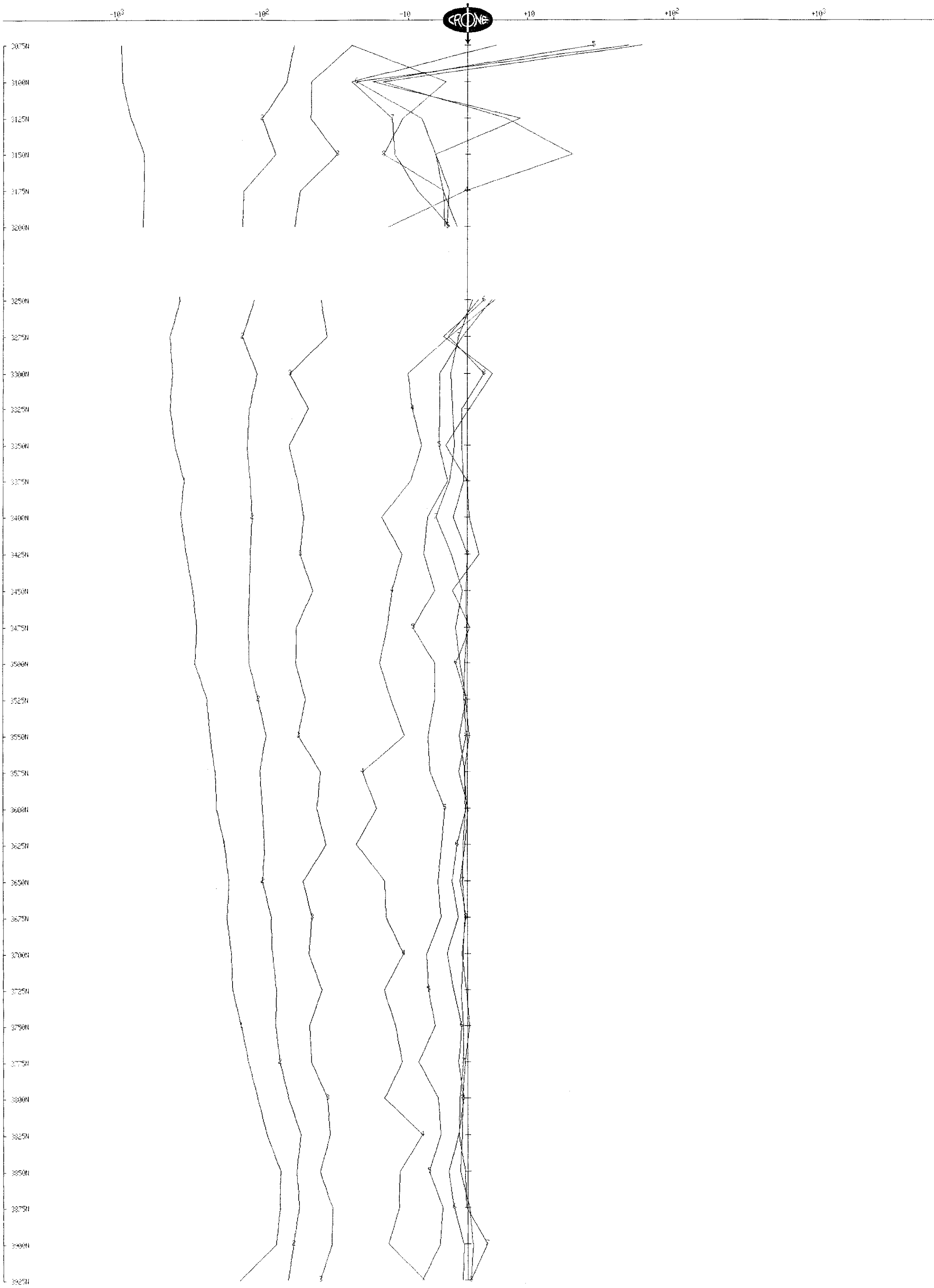
5 cm

Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 25, 1993

Line : 21800E
Tx Loop : 3
File name : 21800E3.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000



CRONE GEOPHYSICS & EXPLORATION LTD

974411

SURFACE PEM

5 cm

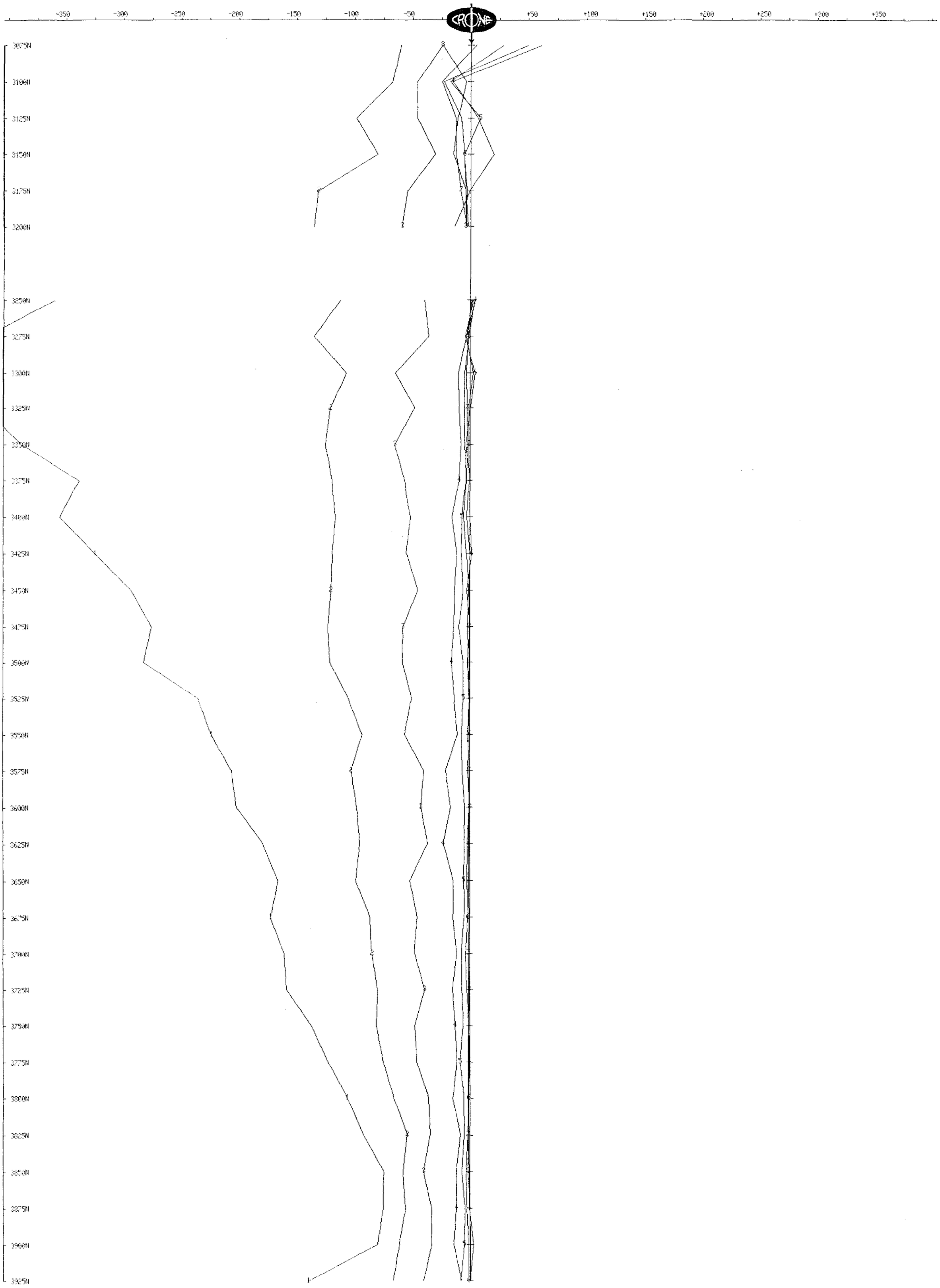
Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 25, 1993

Line : 21800E
Tx Loop : 3
File name : 21800E3.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

974412

5 cm

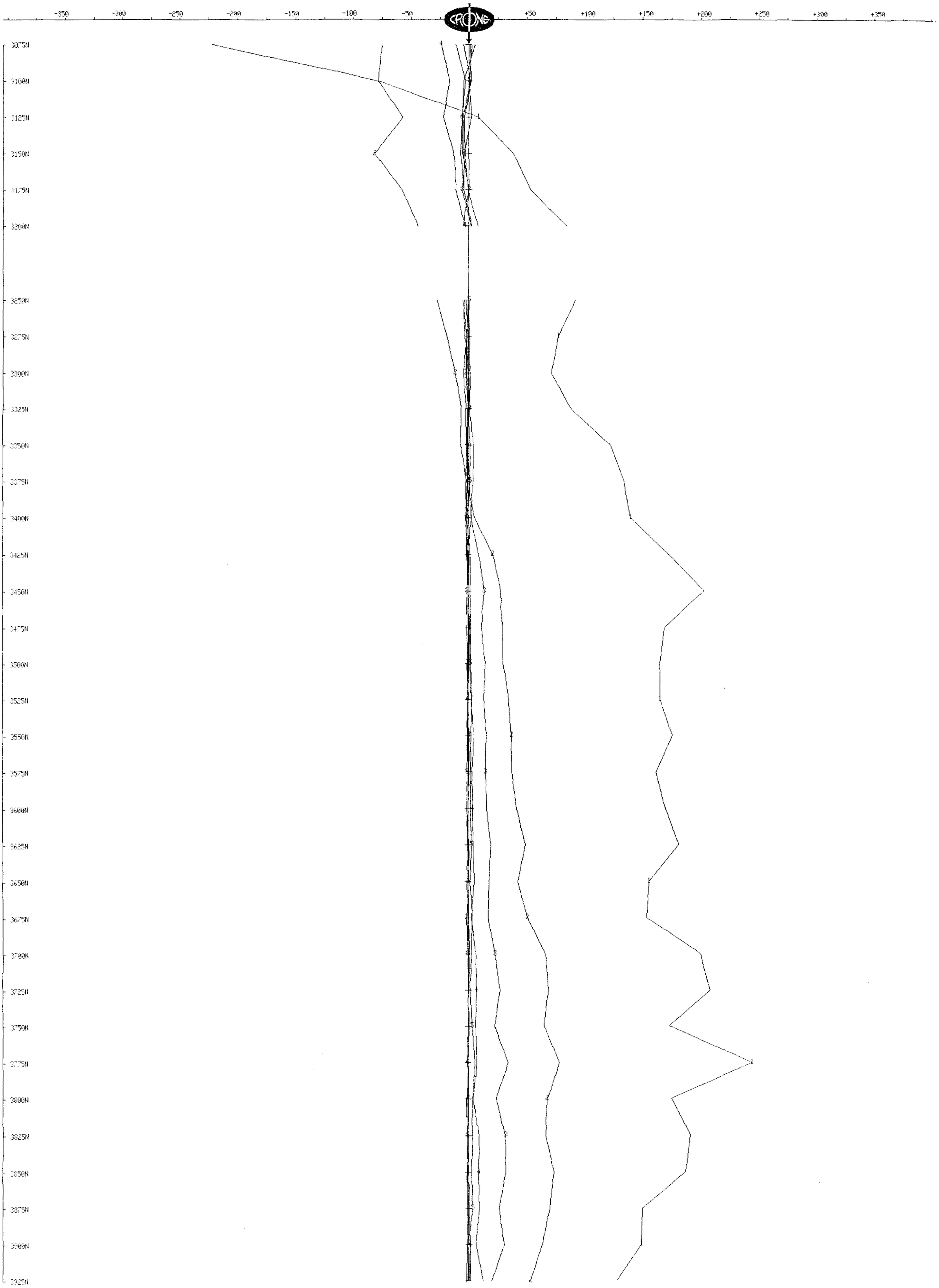
Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 25, 1993

Line : 21800E
Tx Loop : 3
File name : 21800E3.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



974413

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

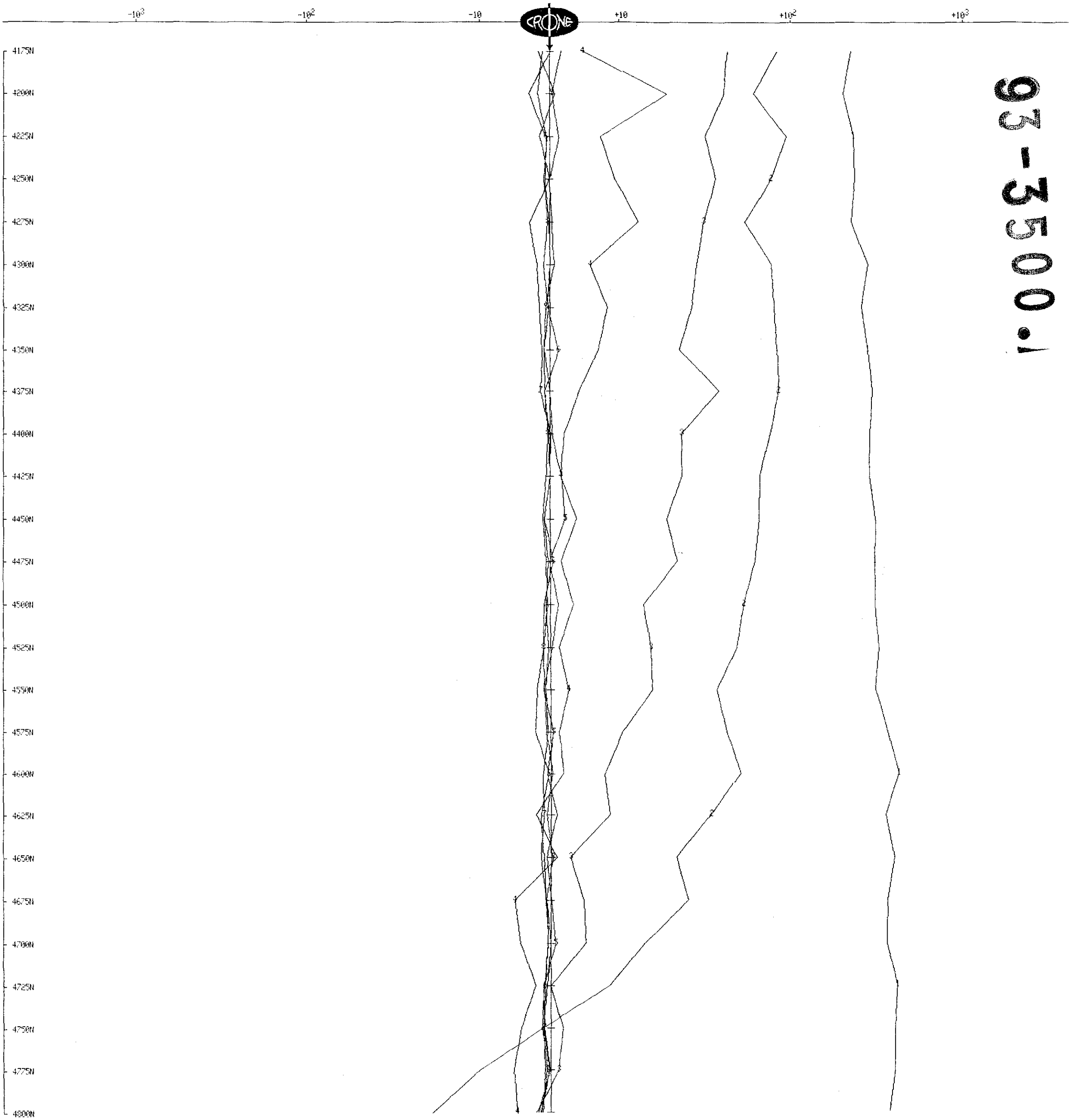
5 cm

Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 23, 1993

Line : 22100E
Tx Loop : 3
File name : 22100E3.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000



92-350

974414

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

5 cm

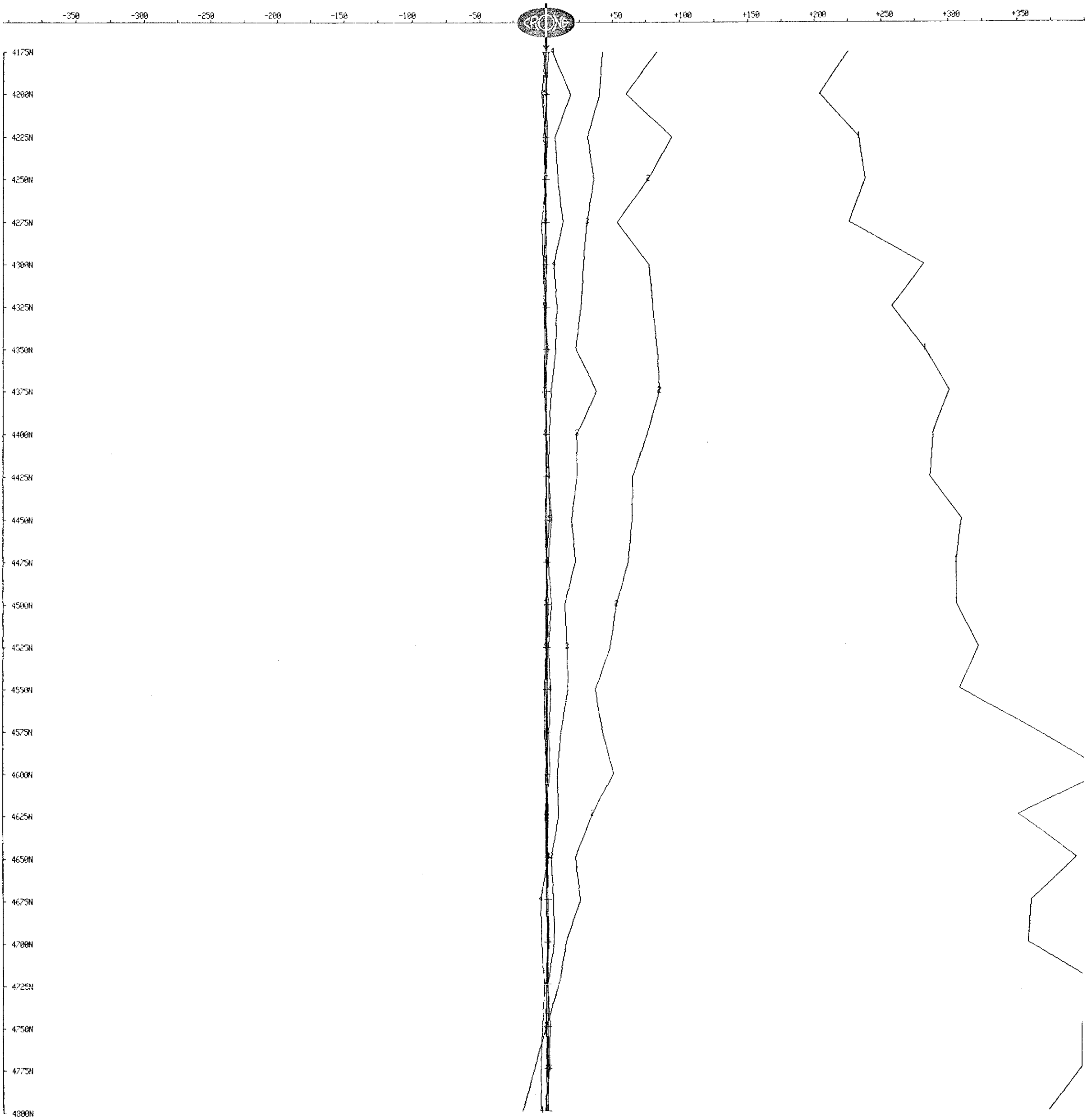
Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 23, 1993

Line : 22100E
Tx Loop : 3
File name : 22100E3.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/



974415

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

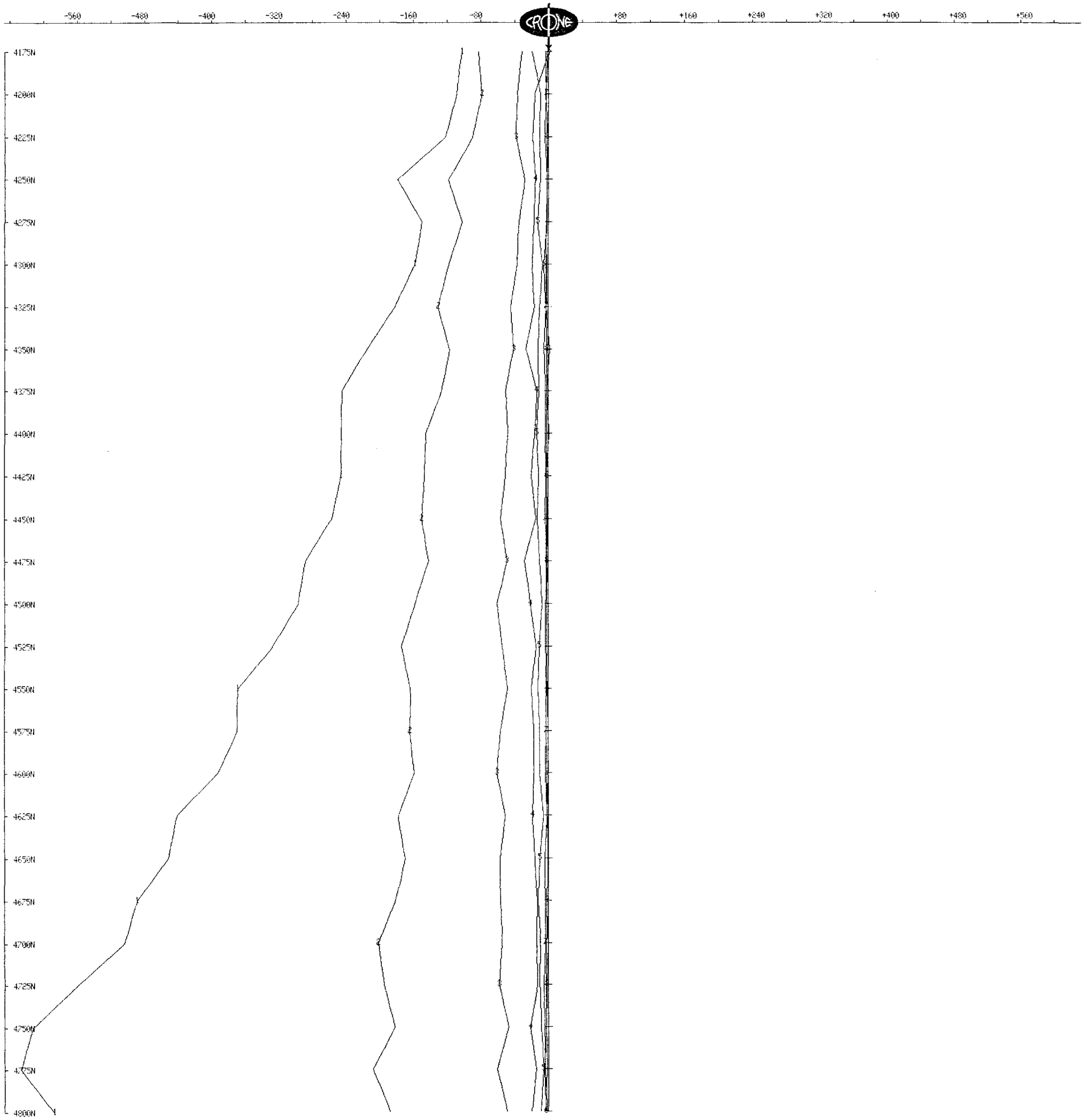
5 cm

Client	: PLUTONIC	Line	: 22100E
Grid	: CETHANA EAST	Tx Loop	: 3
Date	: Jan 23, 1993	File name	: 22100E3.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 40 nT



974416

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

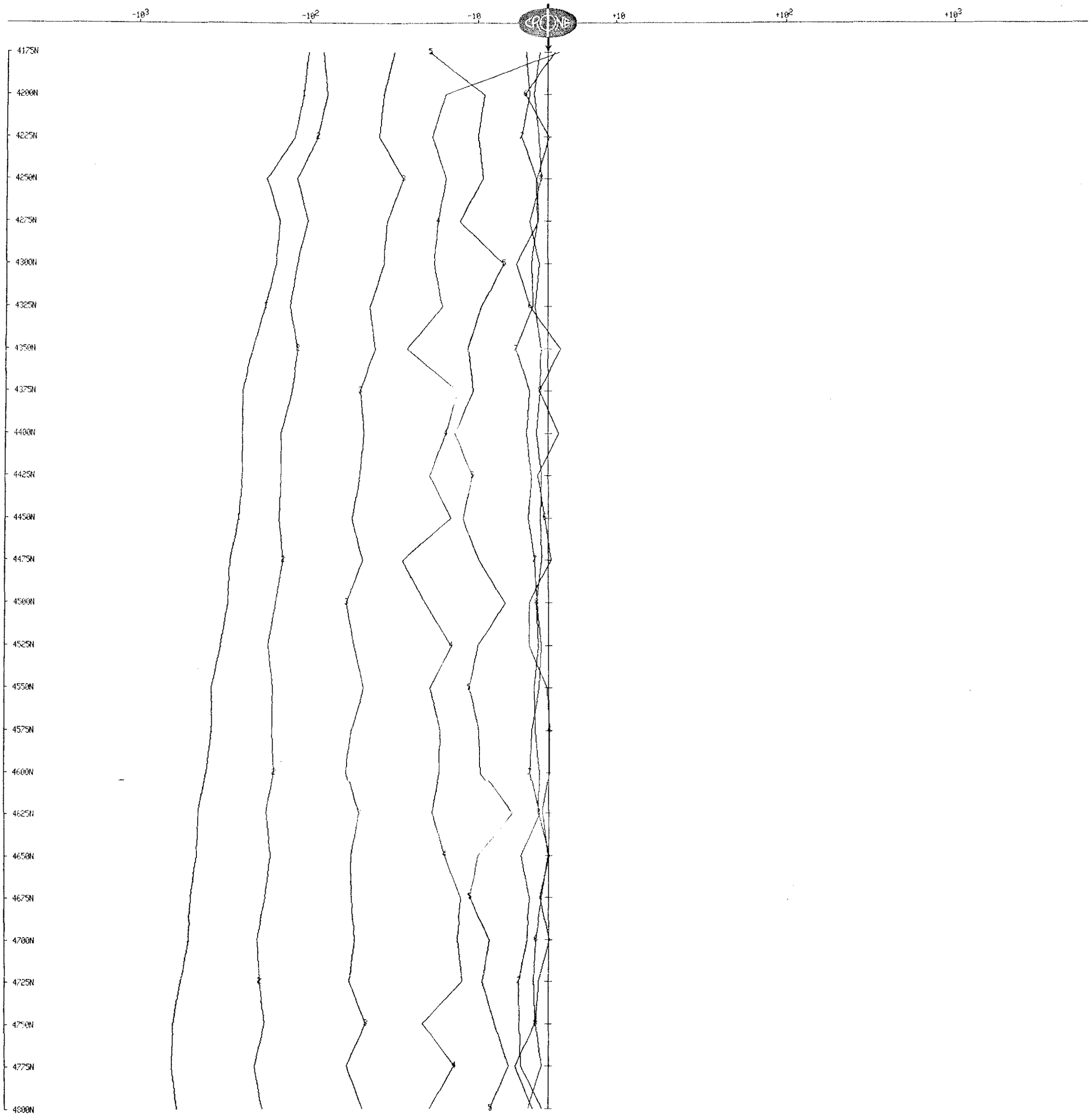
Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 23, 1993

Line : 22100E
Tx Loop : 3
File name : 22100E3.PEM

5 cm

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000



974417

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

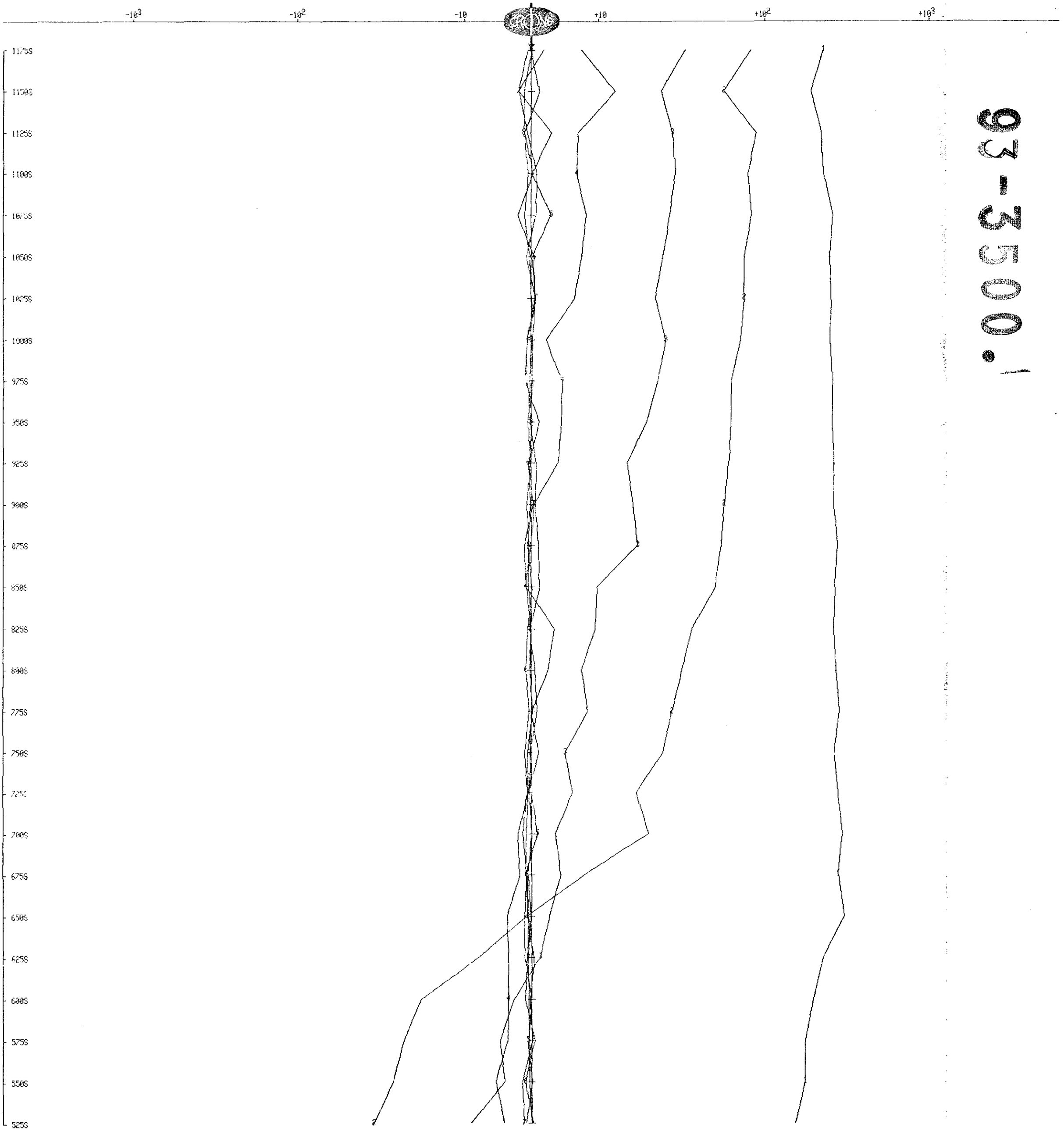
5 cm

Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 23, 1993

Line : 22200E
Tx Loop : 3
File name : 22200E3.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000



CRONE

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

974418

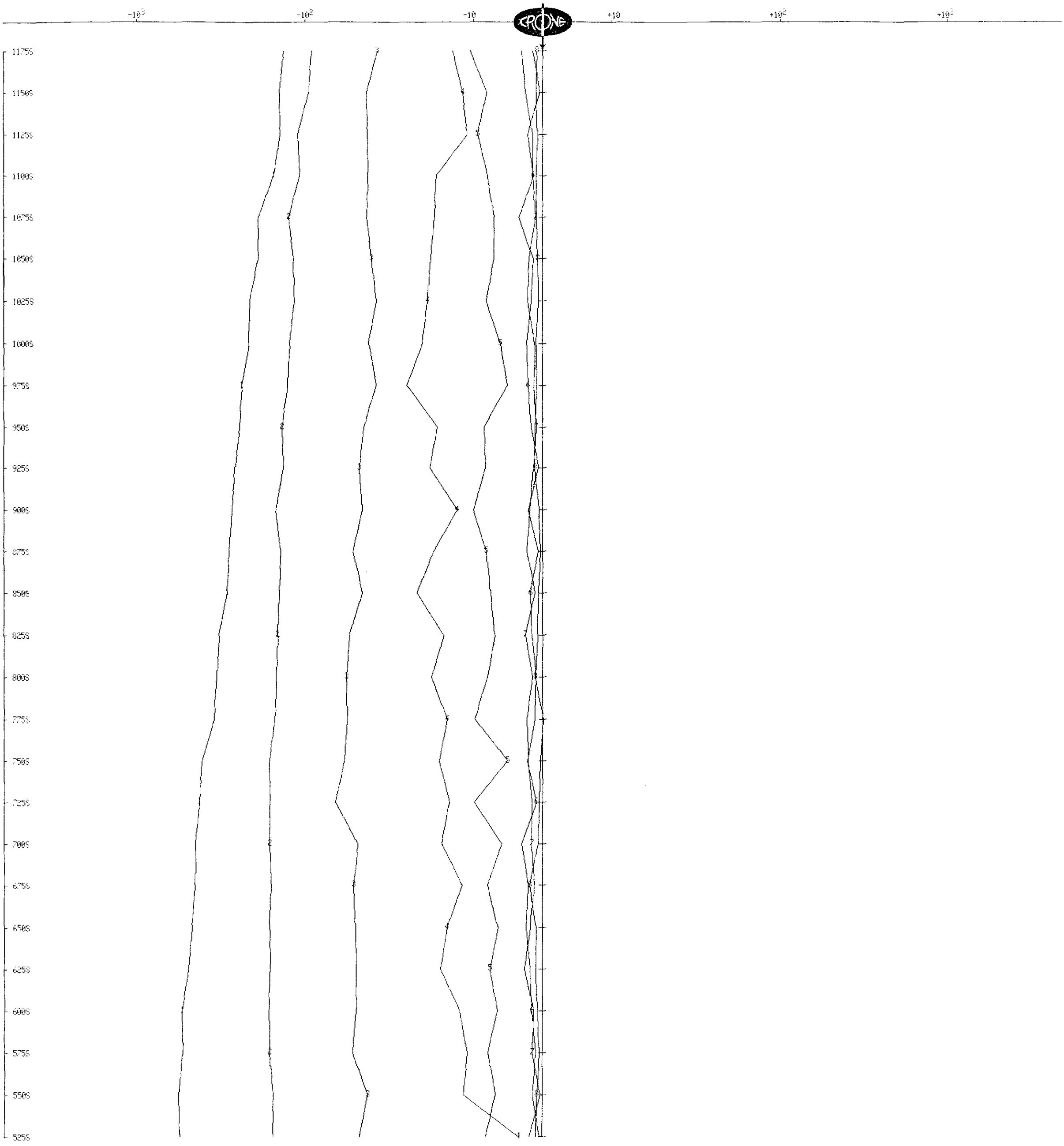
5 cm

Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 23, 1993

Line : 22200E
Tx Loop : 3
File name : 22200E3.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000



CRONE GEOPHYSICS & EXPLORATION LTD

974419

SURFACE PEM

5 cm

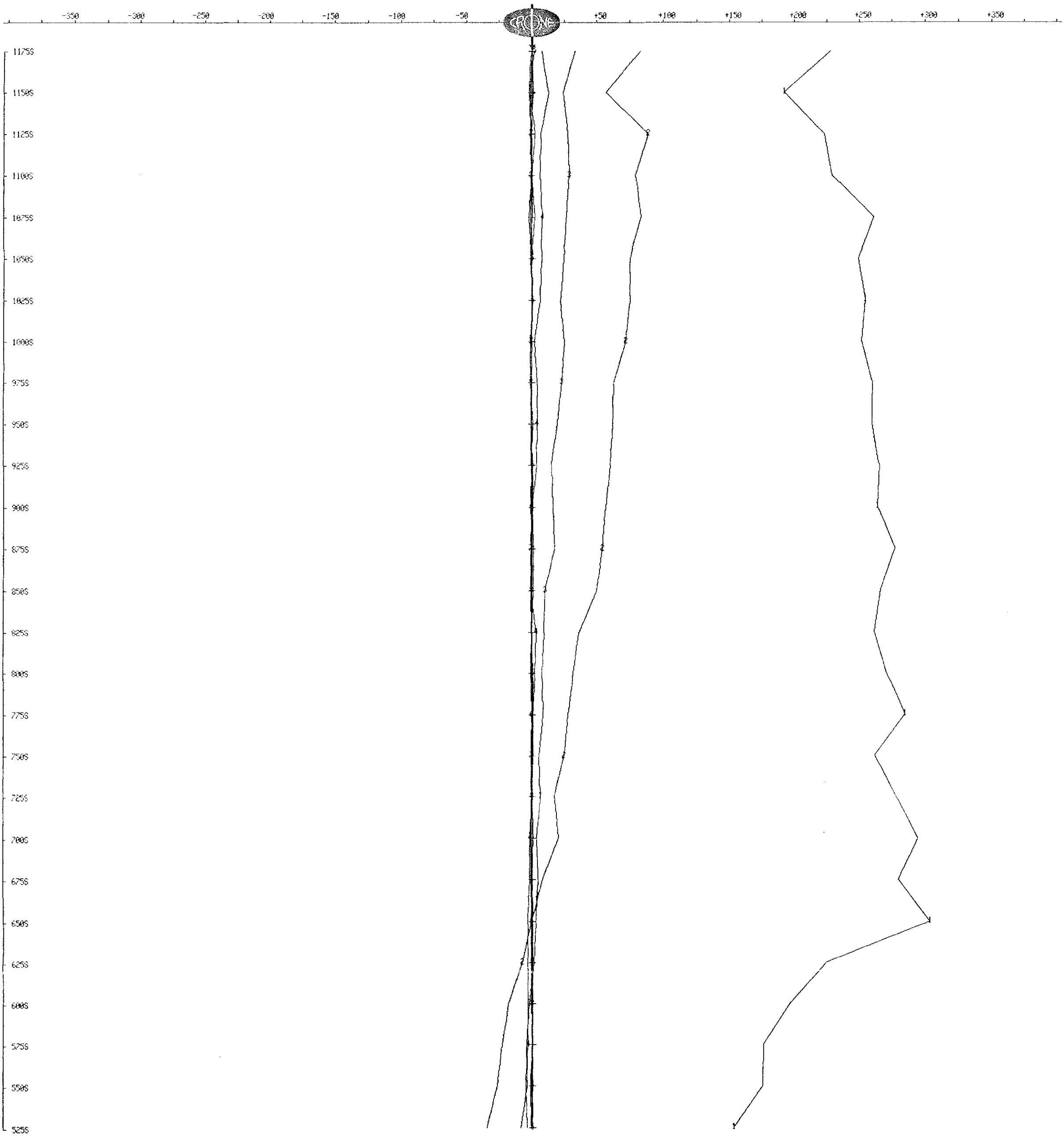
Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 23, 1993

Line : 22200E
Tx Loop : 3
File name : 22200E3.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



CRONE GEOPHYSICS & EXPLORATION LTD

974420

SURFACE PEM

5 cm

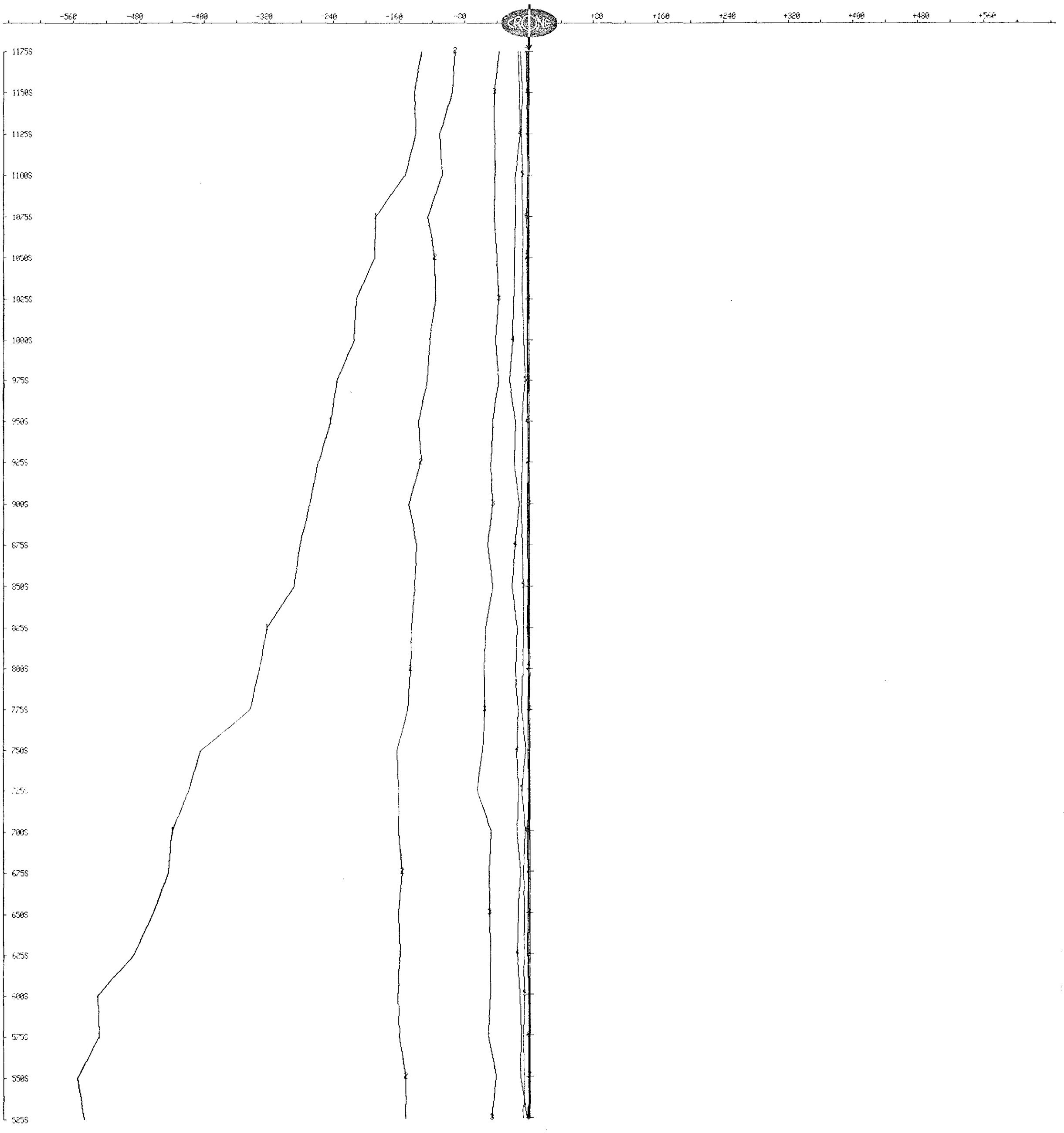
Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 23, 1993

Line : 22200E
Tx Loop : 3
File name : 22200E3.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 40 nT/s



974421

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

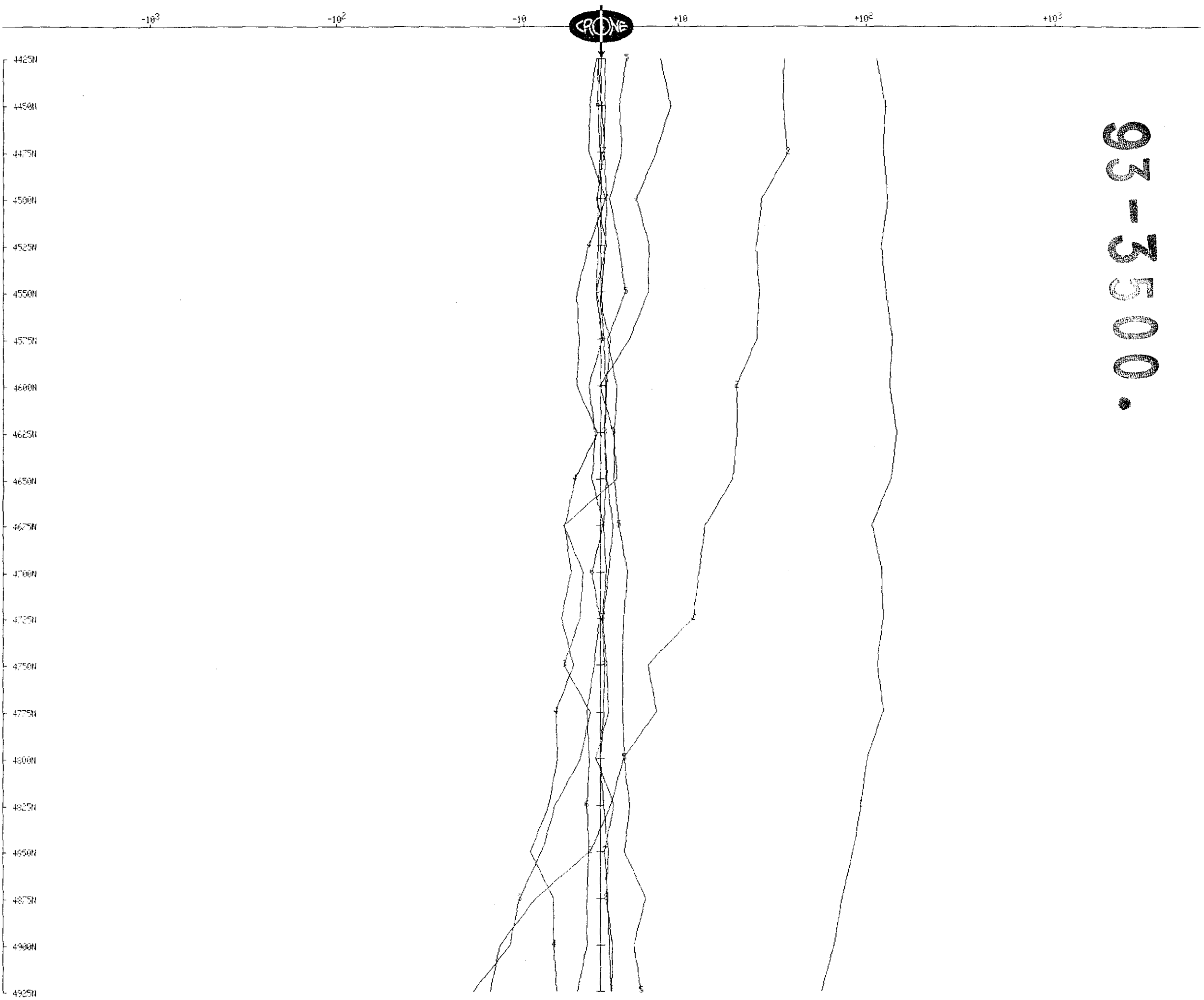
5 cm

Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 26, 1993

Line : 22300E
Tx Loop : 2
File name : 22300E2.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000



22300E

974422

CRONE GEOPHYSICS & EXPLORATION LTD

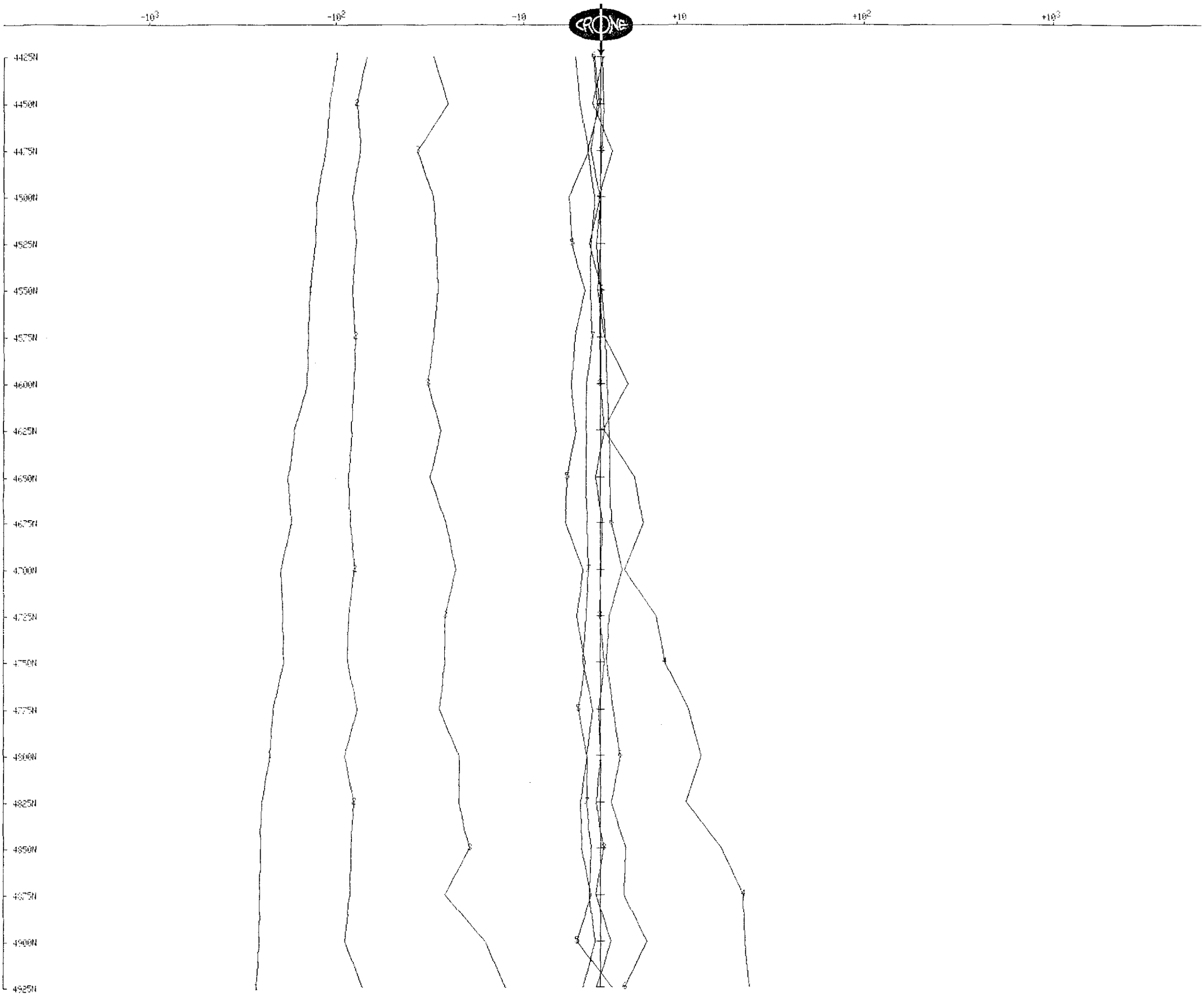
SURFACE PEM

5 cm

Client	: PLUTONIC	Line	: 22300E
Grid	: CETHANA EAST	Tx Loop	: 2
Date	: Jan 26, 1993	File name	: 22300E2.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000



974423

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

5 cm

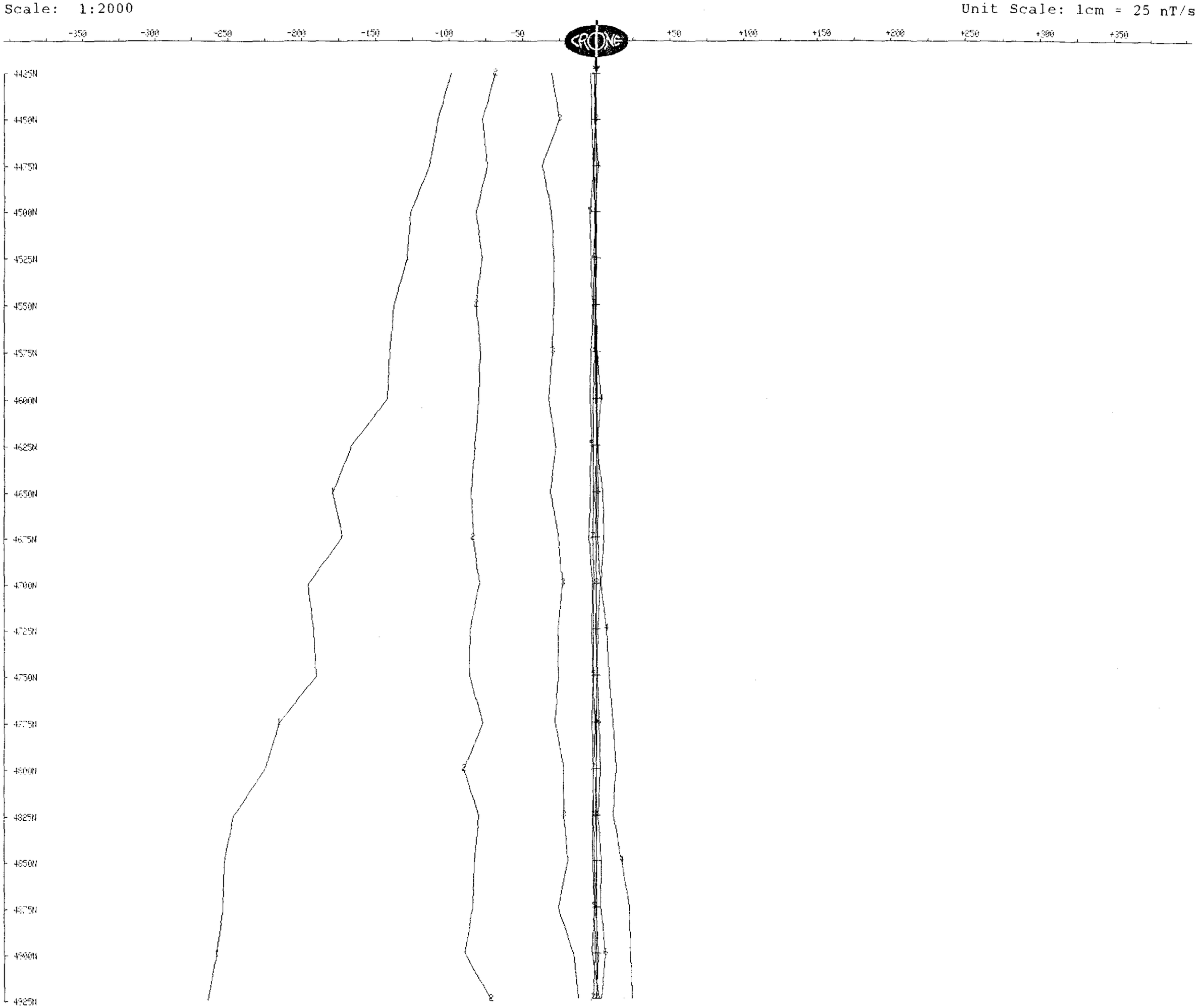
Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 26, 1993

Line : 22300E
Tx Loop : 2
File name : 22300E2.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



974424

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

5 cm

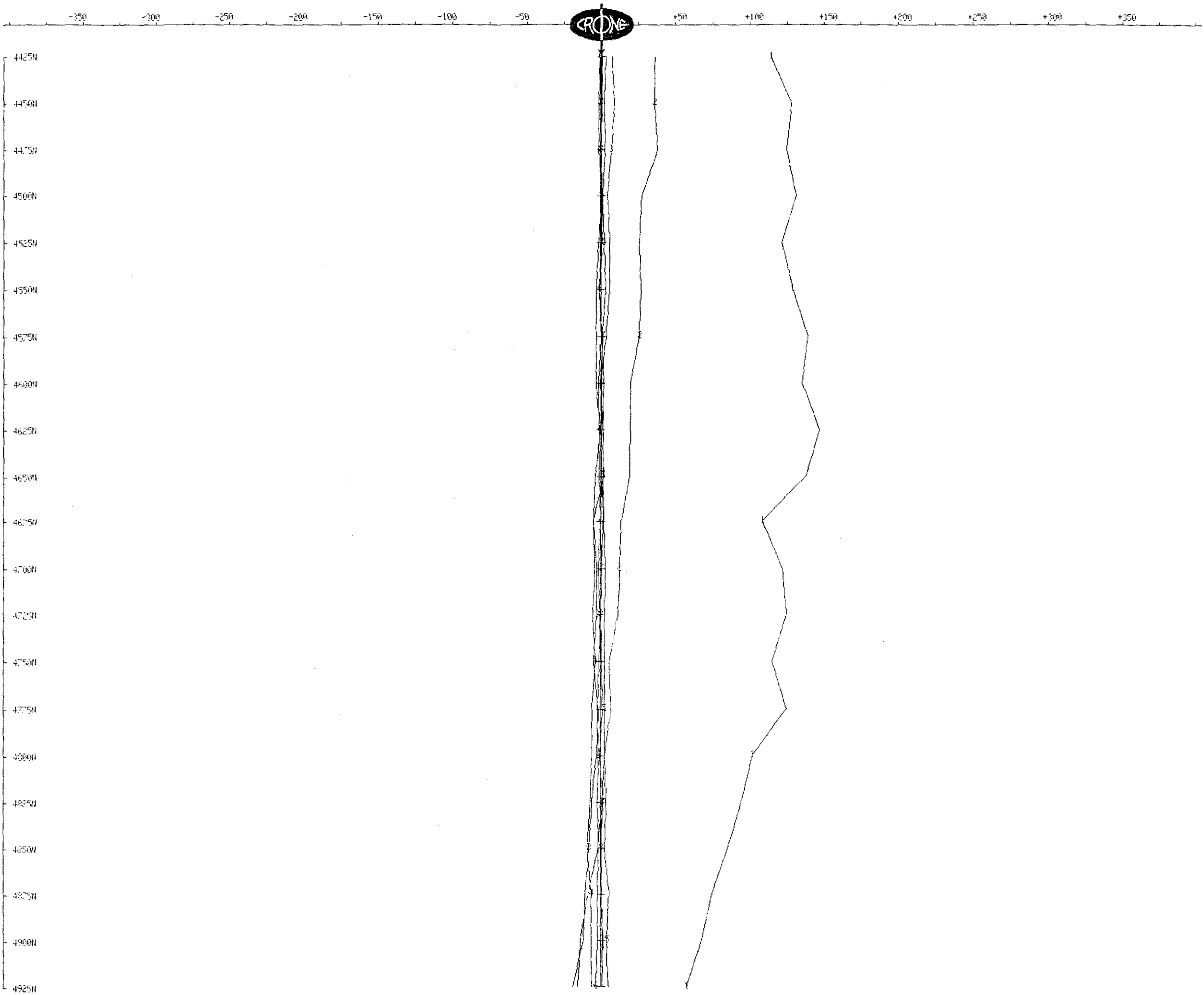
Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 26, 1993

Line : 22300E
Tx Loop : 2
File name : 22300E2.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



974425

CRONE GEOPHYSICS & EXPLORATION LTD

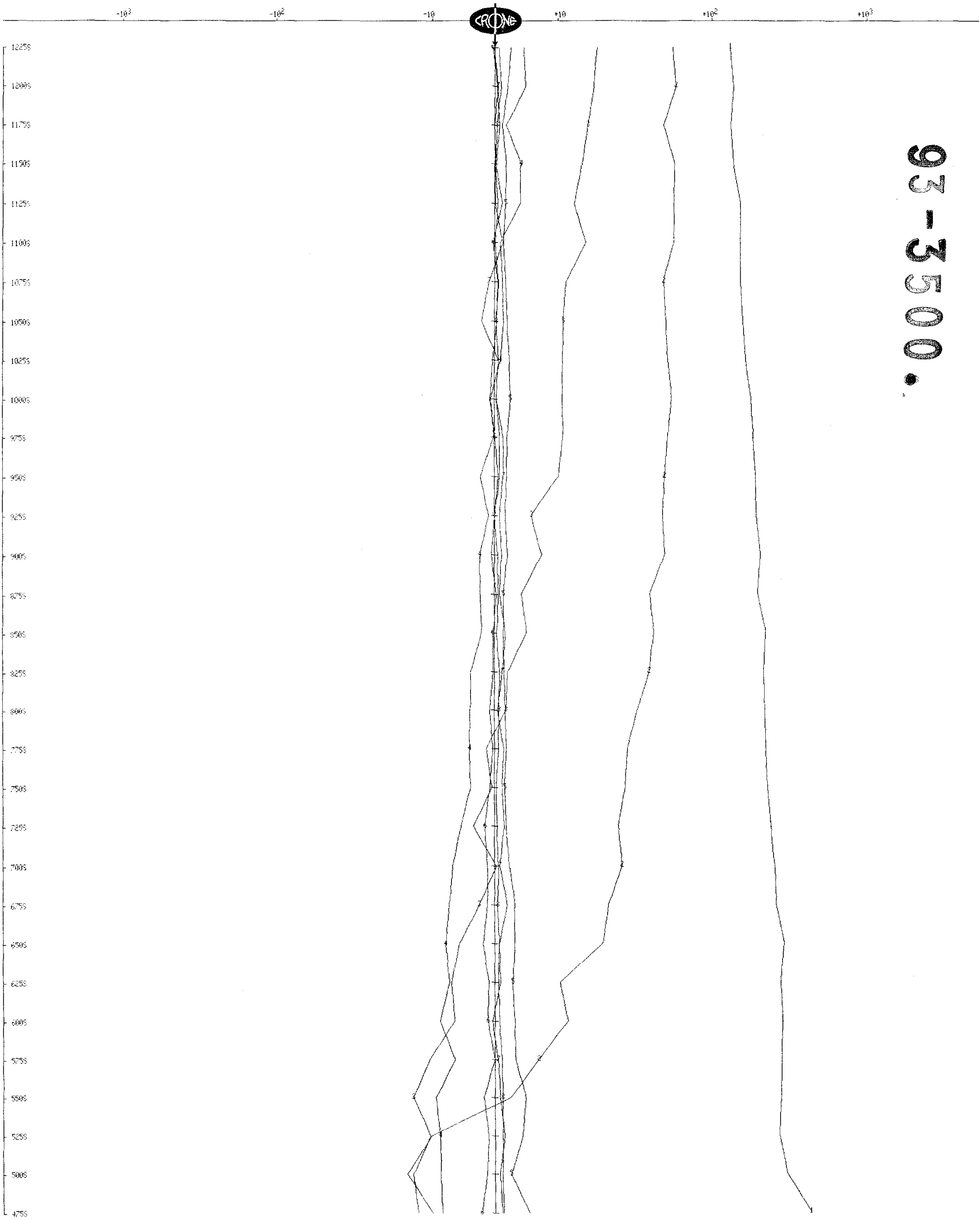
SURFACE PEM

5 cm

Client	: PLUTONIC	Line	: 22400E
Grid	: CETHANA EAST	Tx Loop	: 2
Date	: Jan 26, 1993	File name	: 22400E2.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000



22400E2.PEM

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

974426

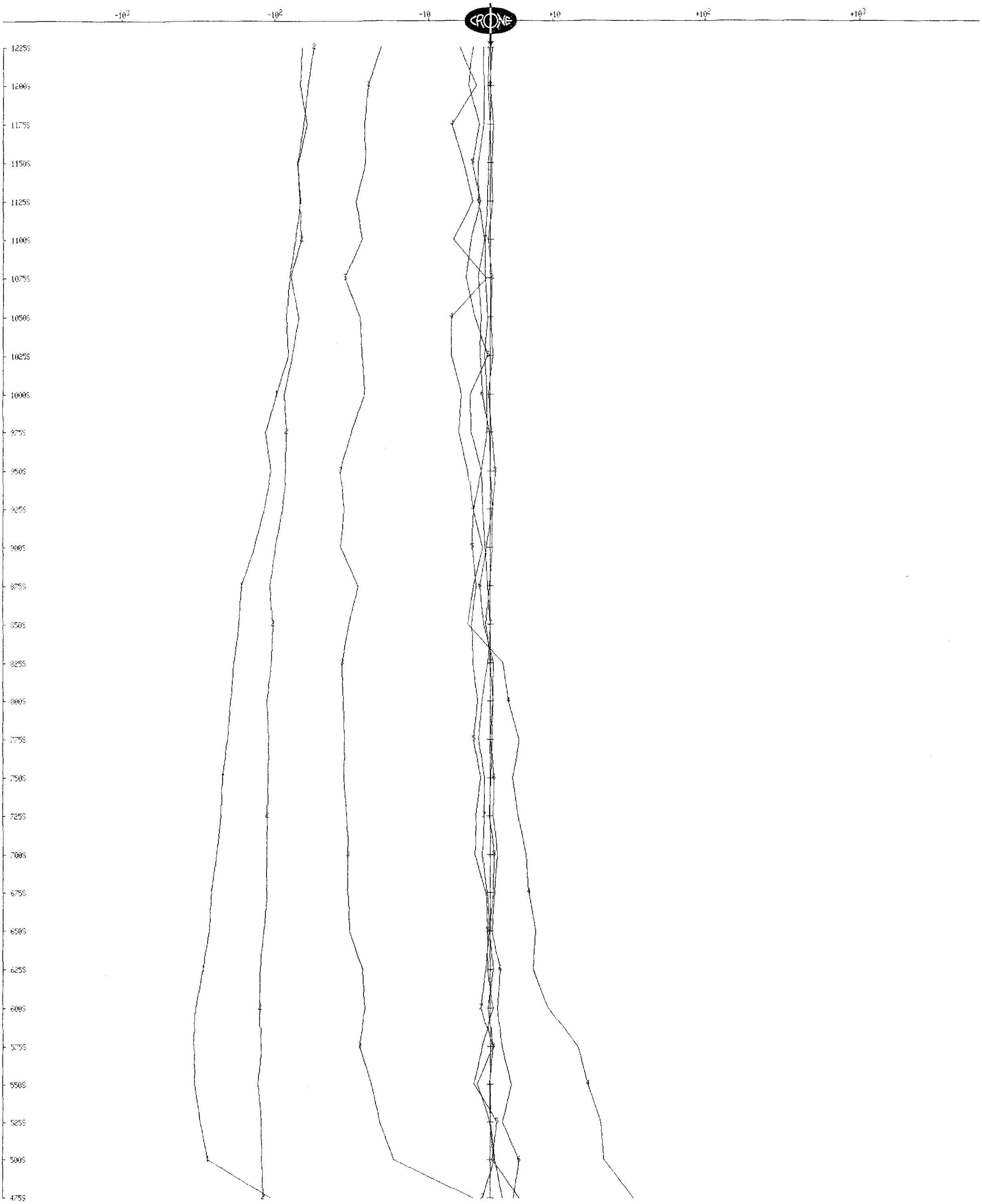
5 cm

Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 26, 1993

Line : 22400E
Tx Loop : 2
File name : 22400E2.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

974427

5 cm

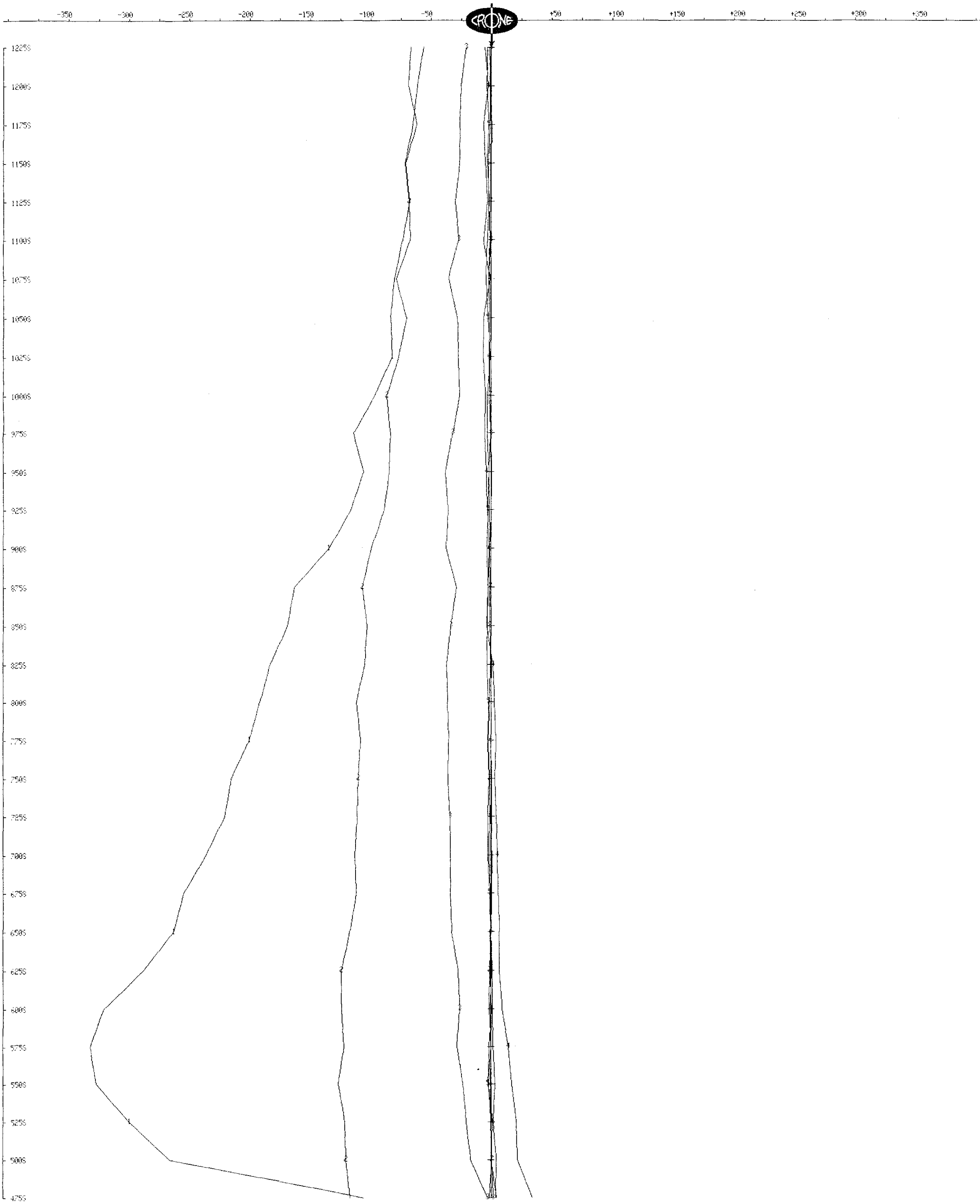
Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 26, 1993

Line : 22400E
Tx Loop : 2
File name : 22400E2.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

974428

5 cm

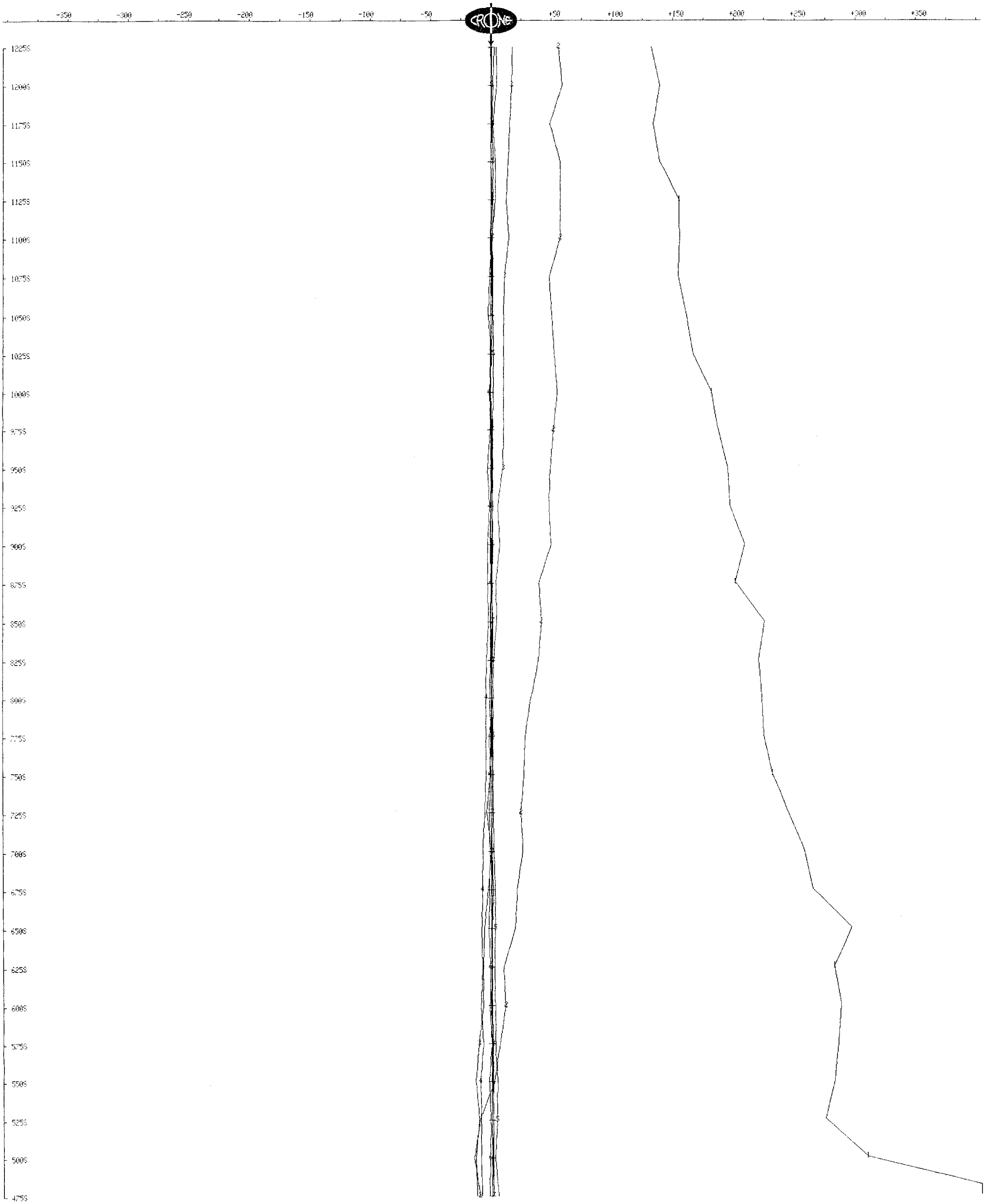
Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 26, 1993

Line : 22400E
Tx Loop : 2
File name : 22400E2.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



974429

CRONE GEOPHYSICS & EXPLORATION LTD

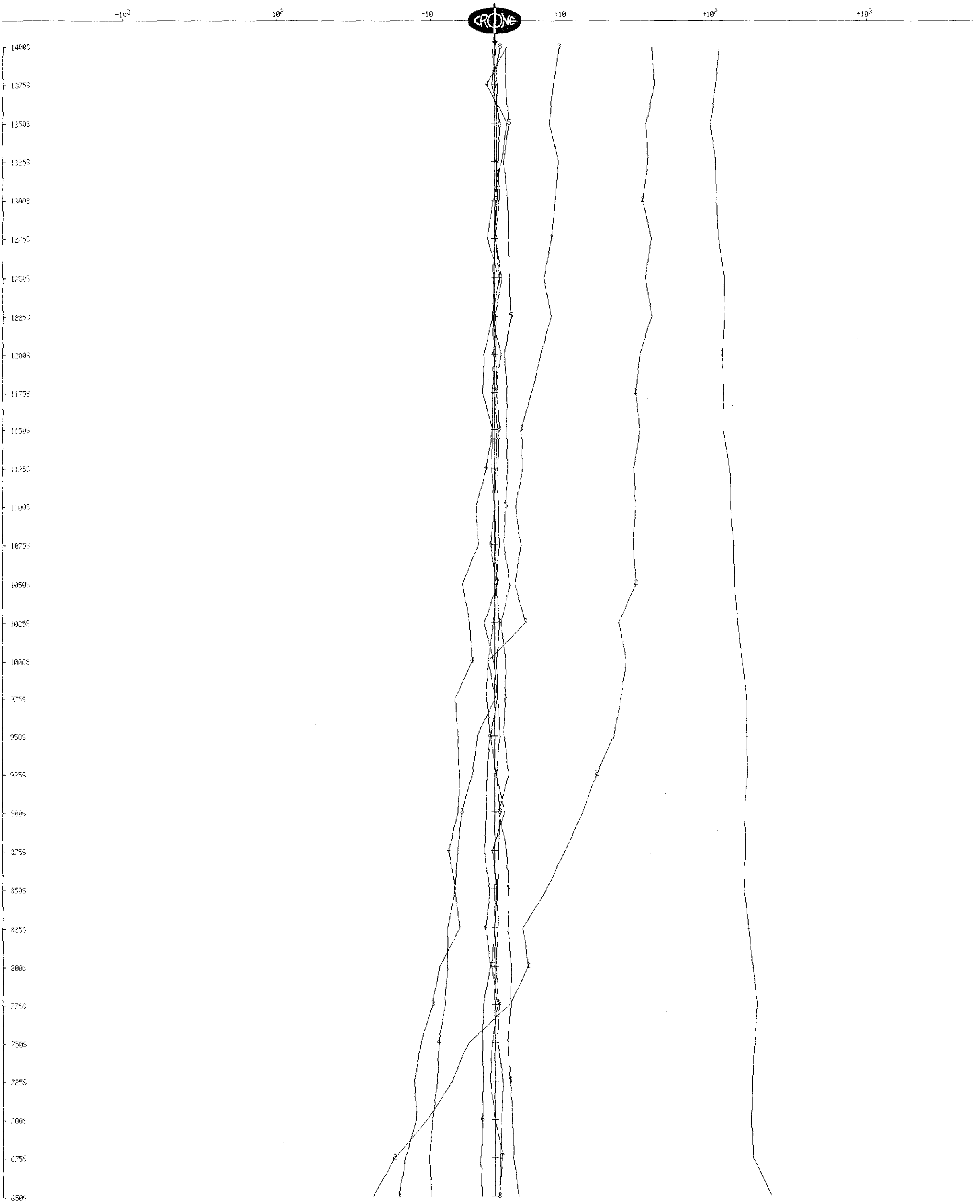
SURFACE PEM

5 cm

Client	: PLUTONIC	Line	: 22600E
Grid	: CETHANA EAST	Tx Loop	: 2
Date	: Jan 26, 1993	File name	: 22600E2.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000



974430

CRONE GEOPHYSICS & EXPLORATION LTD

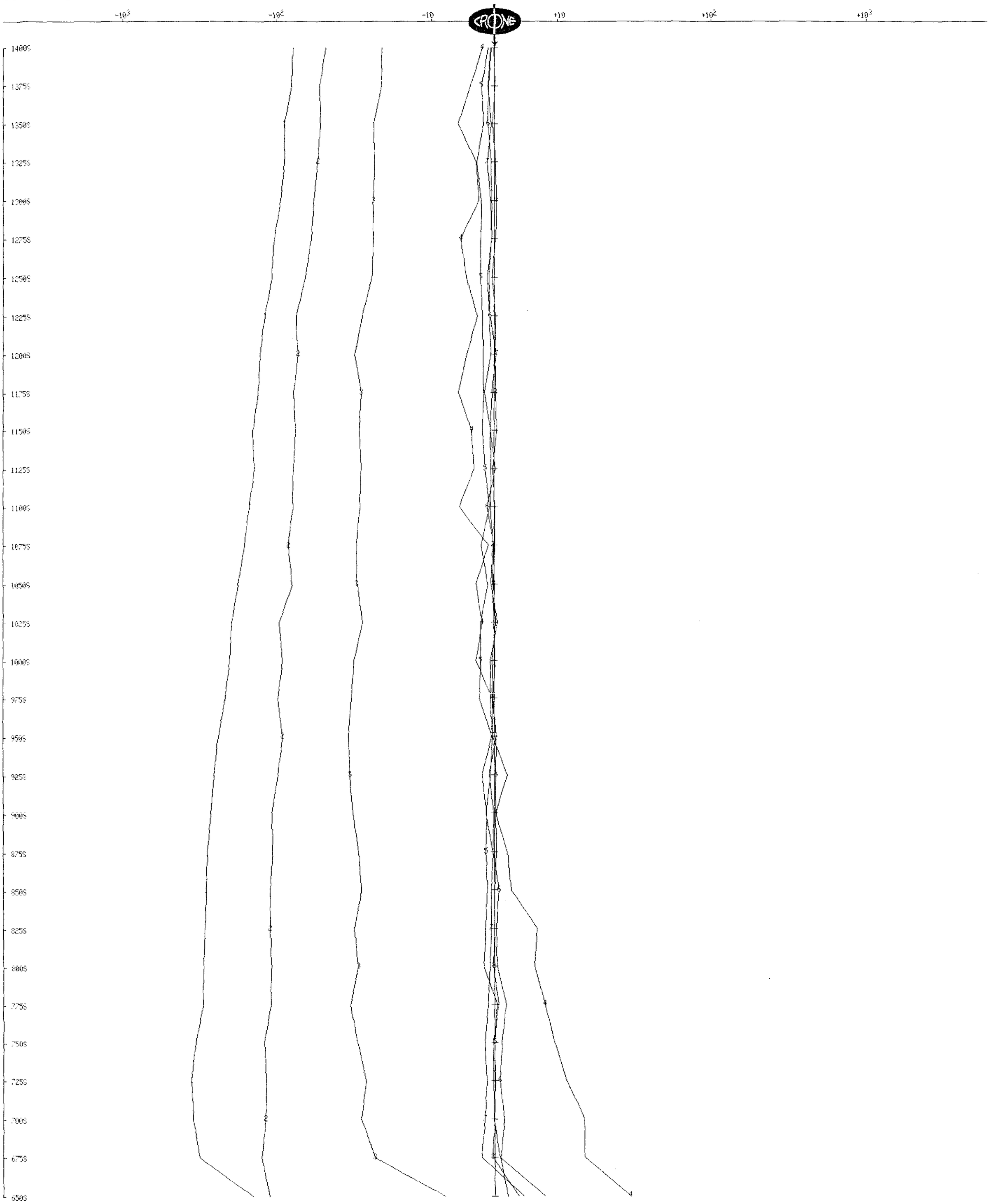
SURFACE PEM

5 cm

Client	: PLUTONIC	Line	: 22600E
Grid	: CETHANA EAST	Tx Loop	: 2
Date	: Jan 26, 1993	File name	: 22600E2.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000



CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

5 cm

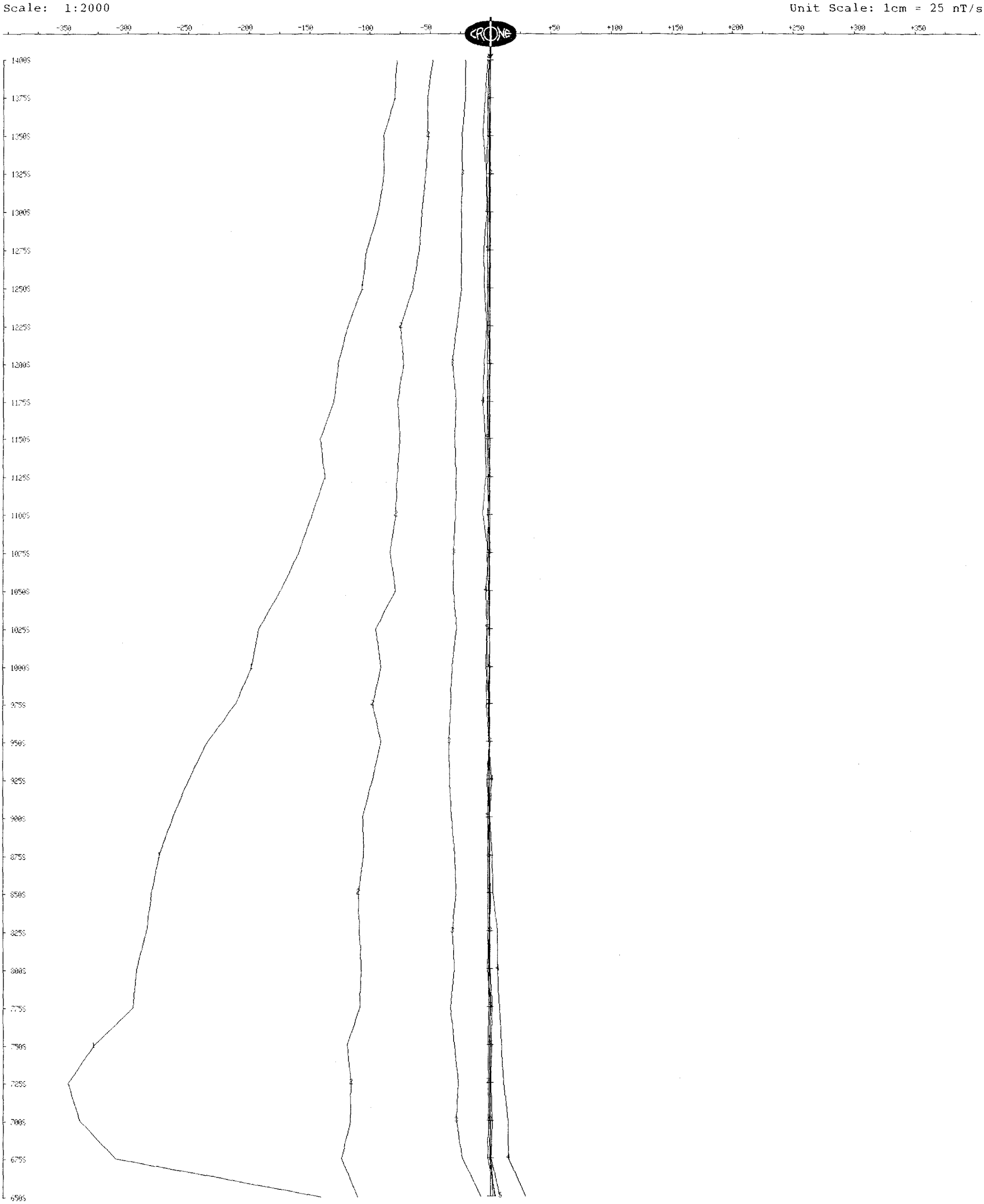
Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 26, 1993

Line : 22600E
Tx Loop : 2
File name : 22600E2.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



974482

CRONE GEOPHYSICS & EXPLORATION LTD

SURFACE PEM

5 cm

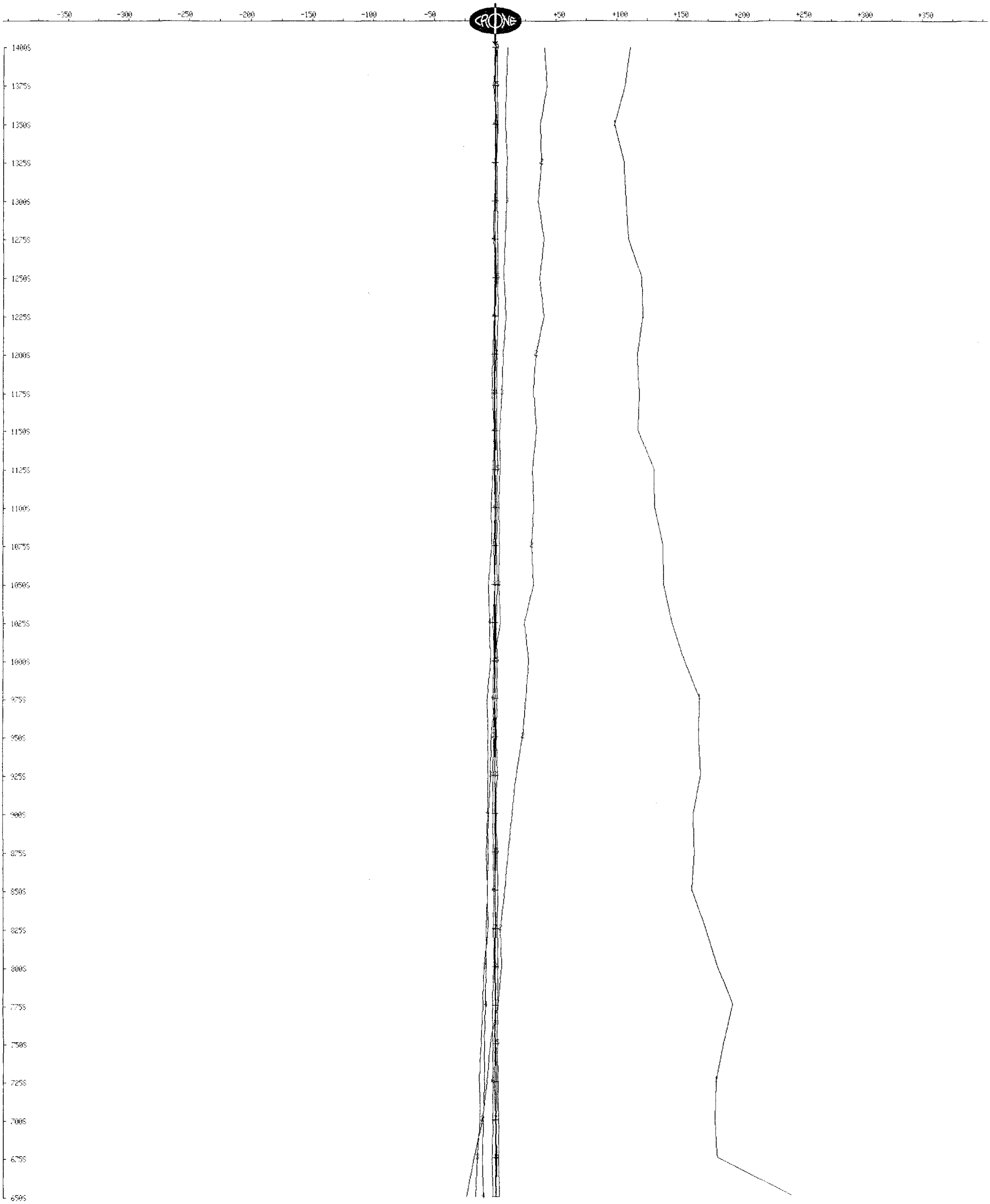
Client : PLUTONIC
Grid : CETHANA EAST
Date : Jan 26, 1993

Line : 22600E
Tx Loop : 2
File name : 22600E2.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 8 channels

Scale: 1:2000

Unit Scale: 1cm = 25 nT/s



LINE 23E

LINE 24E

LINE 25E

LINE 25/8E

LINE 27E

Lapilli Tuffs

Volcaniclastics

Volcaniclastics and Vitric Tuffaceous Pelites

Vitric Tuffaceous Pelites with interbedded Volcaniclastics

Vitric Tuffaceous Pelites

Vitric Tuffaceous Pelites (from float)

Vitric Tuffaceous Pelites Lapilli Tuffs and Sediments (from float)

Vitric Tuffaceous Pelites Tuffs and Sediments (predominatly from float)

Mass Flows and Vitric Tuffaceous Pelites (from float)

Sediments

Quartz Plagioclase ± Biotite Lava

Quartz Feldspar ± Biotite Porphyry

Roland Conglomerate

Sequence youngs to the north

LEGEND

- 6SSC — Silica – sericite – carbonate alteration
- 5C — Rolled conglomerate to Silicichastic
- 5P — Pelite, Siltstones and mudstones, sometimes chloritic (where ruled) and finely bedded, black where reted, but generally beige, green and mapped as Vitric Tuffaceous Pelites
- 5S — Psammite – Fine brown and feldspathic or green and chloritic, occasionally sericitic
- 5V — Volcaniclastic – Sometimes fine grained, often with rounded quartz eyes with visible lithic clasts in core, rarely with quartz and feldspar
- 4V — Logged in core as 5P
- 4T — Felsic tuff
- 4QFBP — Quartz Feldspar Biotite porphyry
- 4F — Quartz – Plagioclase – Biotite phyric lavas with distinctive green patches in the north-west
- 4M — Mass flows. Consists predominantly of silicecous clasts in a feldspathic or chloritic matrix
- 4L — Lapilli tuff with flattened chloritic fragments (after pumice?) and variable rounded quartz eyes

LATE CAMBRIAN

CAMBRIAN (Not in stratigraphic order)

ang angular
bdd bedded
bge beige
brn brown
clc chlorite
d dark
fg fine grained
fl float
fz fault zone
gn green
hm haematite
int interbedded
lt light
mtx matrix
occ occasional
ocy occasionally
py pyrite
qf quartz feldspar fragments
qp quartz fragments
sid siliceous
sph spherulite
t/o through out
vn veins
wy wooky
w with

- Grid peg – position known, Grid line; Grid peg – position unknown
- Outcrop in – situ
- Float
- 70 — Bedding, strike and dip
- 80 — Cleavage, strike and dip
- GP-90-8 (-55° to 174°) — DDH No. (inclination, azimuth TN) Final depth, lithologies shown
- Creek
- 4WD Tracks
- Shear / Fault zone orientation indicated
- Geological contact known
- Geological contact interpreted
- Geological contact interpreted – uncertain
- ✱ 2L8 — Thin section sample

GRID/MAGNETIC 12.5

5 cm

PLUTONIC OPERATIONS LTD. A.C.N. 004 680 997 (INC. IN N.S.W.)	
COMPILED : G.MacDonald	PROJECT : 706 – GOWRIE PARK
DATE : JUNE 1992	
DRAWN : O.Hedditch	97443
TECHNICAL REPORT No. :	GEOLOGY
REVISIONS :	FIRE TOWER PROSPECT
DRAWING No. 706 – FT – 1	SCALE 1:500 (0 10 20 METRES) FIG. No. 7

93-3500.

426 000 mE
427 000 mE
428 000 mE
429 000 mE
430 000 mE
431 000 mE
432 000 mE
433 000 mE
434 000 mE
5416 000 mN
5415 000 mN
5414 000 mN
5413 000 mN
5412 000 mN
5411 000 mN
5410 000 mN
5409 000 mN
5408 000 mN
5407 000 mN

Tertiary Basalt
Tertiary Basalt scree
5C Ordo.
5P
5S Ordo.
5C/5S Ordo.
5P/5V fc
5P/5S gwk
5P/5S lss 3M
5V fc /4F
6SS sch / 5V fc
4F lss 5V fc
4F q pphc
5V fc
5P chy
5P clc / lss 5V fc
5V/4T
4F
ibdd/ 5V/ 5P/4T
5P bk
Quaternary Glacials
"Beulah Formation"
3F/5S gwk / 5V int / 3M / 3LB / 5P musc
STAVERTON GRID
CETHANA GRID
LAKE CETHANA
ROAD
MOUNTAIN
CRADLE
BARRINGTON
LAKE
STAVERTON
Creek
Jackson's Creek
Cupran
Bellana Creek
Hurrels Creek
Jarmans
Meadowbank
CLAUDE
RIVER
Transmission Line
E.L. BOUNDARY
FOR DETAIL / OUTCROP SEE FIG. No. 2.0
FOR DETAIL / OUTCROP SEE FIG. No. 17
FOR DETAIL / OUTCROP SEE FIG. No. 22
FOR DETAIL / OUTCROP SEE FIG. No. 28
"CAMP GROUND"
Cethana Dam
STD 1

QUATERNARY		Glacials; both true glacials and Roland Conglomerate scree, tens of metres thick in places
TERTIARY		Basalt and basalt scree
LATE CAMBRIAN - ORDOVICIAN	5C Ordo.	Siliciclastic pre-cambrian derived conglomerate (Roland Conglomerate) and sandstone (Moina Sandstone)
	Beulah Formation	*Beulah Formation; interbedded andesitic to dacitic lavas, mass flows, lava breccias, intermediate volcaniclastics and tuffs, greywacke sandstones and siltstones
	6SS	Silica sericite altered felsic tuffs / volcaniclastics, invariably schistore
	4F	Felsic lavas, quartz or quartz feldspar phyric as noted
	3F	Dacitic lavas (southern part)
	3T	Dacitic tuffs (southern part)

5V	Felsic volcaniclastics with quartz eyes and variable feldspars, fine to medium grained, generally altered
5P / 5P bk	Siltstones, green to purple or black (bk) where noted
4M	Felsic mass flows dominated by felsic lava clasts
5C chy clasts	Rounded siliceous clasts in a finer grained matrix
	Fault
	Geological contact
	Outcrop
	Float
	Diamond drill hole unless prefixed PD
70	Cleavage
65	Bedding
	Younging direction

chy	cherty
clc	chloritic
cm	cream
fc	felsic
fg	fine grained
frag	fragments
fsp	feldspar
gly	generally
gn	green
gwk	greywacke
gy	grey
hmt	haematite
ibdd	interbedded
int	intermediate
lmc	limonitic
lss	lesser
ltc	lithic
mg	medium grained
musc	muscovite
mx	matrix
ocy	occasionally
Ordo.	Ordovician
pphc	porphyritic
py	pyrite
q	quartz
sch	schist
serd	sericitised
sil	siliceous
sts	schistose
vn	vein
w	with

Stream sediment survey results.
Cu ppm, Pb ppm, Zn ppm.
and
[Cu ppm, Pb ppm, Zn ppm, Ba ppm, Au (~8 # CN leach) ppt]
See also Geology Cethana West
(Cu ppm, Pb ppm, Zn ppm)

Rock sample locations shown as (408) etc. - add prefix S01 to all sample numbers.

5 cm

TN
MN
12.5°

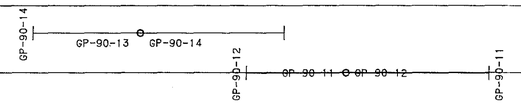
974434

93-3500.

REVISION	PLUTONIC OPERATIONS LIMITED A.C.N. 004 680 997 (INC. IN N.S.W.)	
TECHNICAL REPORT NO:	PROJECT: 706 - GOWRIE PARK	
COMPILED BY: G. MacDonald	LAKE BARRINGTON PART E.L. 10/88	
DRAWN BY: O. Hedditch	GEOLOGY & STREAM SEDIMENT GEOCHEMISTRY	
CHECKED BY:	(SOME ROCK CHIP SAMPLE LOCATIONS)	
DATE: JULY, 1993	REFERENCE	DWG. NO 6
SCALE: 1:10,000		

SECTION : 2360E +/-10M

2360E



2360E

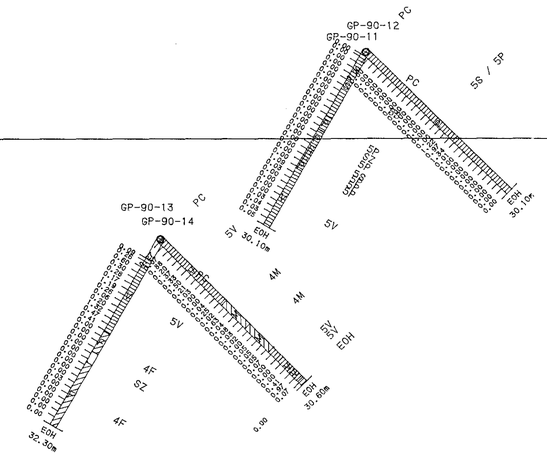
4800N

4900N

5000N

10000

9900



LEGEND

A	8A	: ALLUVIUM
X	8BX	: COLLAPSE BRECCIA
B	8CB	: CLAY WITH BEDROCK AFFINITIES
S	8CS	: CLAY - SOIL PROFILE
E	8E	: ELUVIUM
L	8L	: LATERITE
G	8G	: GOSSAN
J	8J	: JASPER
D	7D	: DIORITE
L	7DL	: DOLERITE
G	7G	: GRANITE
O	7GD	: GRANODIORITE
S	6S	: SILICA ALTERATION
S	6SS	: SILICA SERICITE ALTERATION
S	6SP	: SILICA PYRITE ALTERATION
S	6SSP	: SILICA SERICITE PYRITE ALTERATION
S	6PSS	: PYRITE SILICA SERICITE ALTERATION
S	6SSC	: SILICA SERICITE CARBONATE ALTERATION
C	6CS	: CHLORITE SILICA ALTERATION
C	6CSP	: CHLORITE SILICA PYRITE ALTERATION
	6SZ	: STRINGER ZONE
	6SM	: SEMI-MASSIVE SULPHIDES
	6MS	: MASSIVE SULPHIDES
C	5C	: CONGLOMERATE
S	5S	: PSAMMITE
P	5P	: PELITE
B	5PB	: BLACK SHALE
V	5V	: VOLCANICLASTIC
A	4A	: FELSIC AGGGLOMERATE
L	4L	: FELSIC LAPILLI TUFF
V	4V	: FELSIC VITRIC TUFF
T	4T	: FELSIC TUFF
F	4F	: FELSIC LAVA
I	4I	: FELSIC INTRUSIVE
M	4M	: FELSIC MASS FLOW
P	4QP	: QUARTZ PORPHYRY
P	4QFP	: QUARTZ FELDSPAR PORPHYRY
P	4QFBP	: QUARTZ FELDSPAR BIOTITE PORPHYRY
A	3A	: INTERMEDIATE AGGLOMERATE
L	3L	: INTERMEDIATE LAPILLI TUFF
V	3V	: INTERMEDIATE VITRIC TUFF
T	3T	: INTERMEDIATE TUFF
F	3F	: INTERMEDIATE LAVA
I	3I	: INTERMEDIATE INTRUSIVE
M	3M	: INTERMEDIATE MASS FLOW
M	2M	: MAFICS
U	1U	: ULTRAMAFICS

FZ : FAULT

QV : QUARTZ VEIN

ASSAYS : Au (ppm)

EOH : END OF HOLE

GRID N. = 354 DEGREES TRUE N.

93-3500.
974435

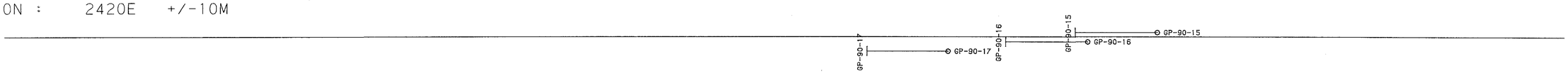
PLUTONIC RESOURCES LIMITED

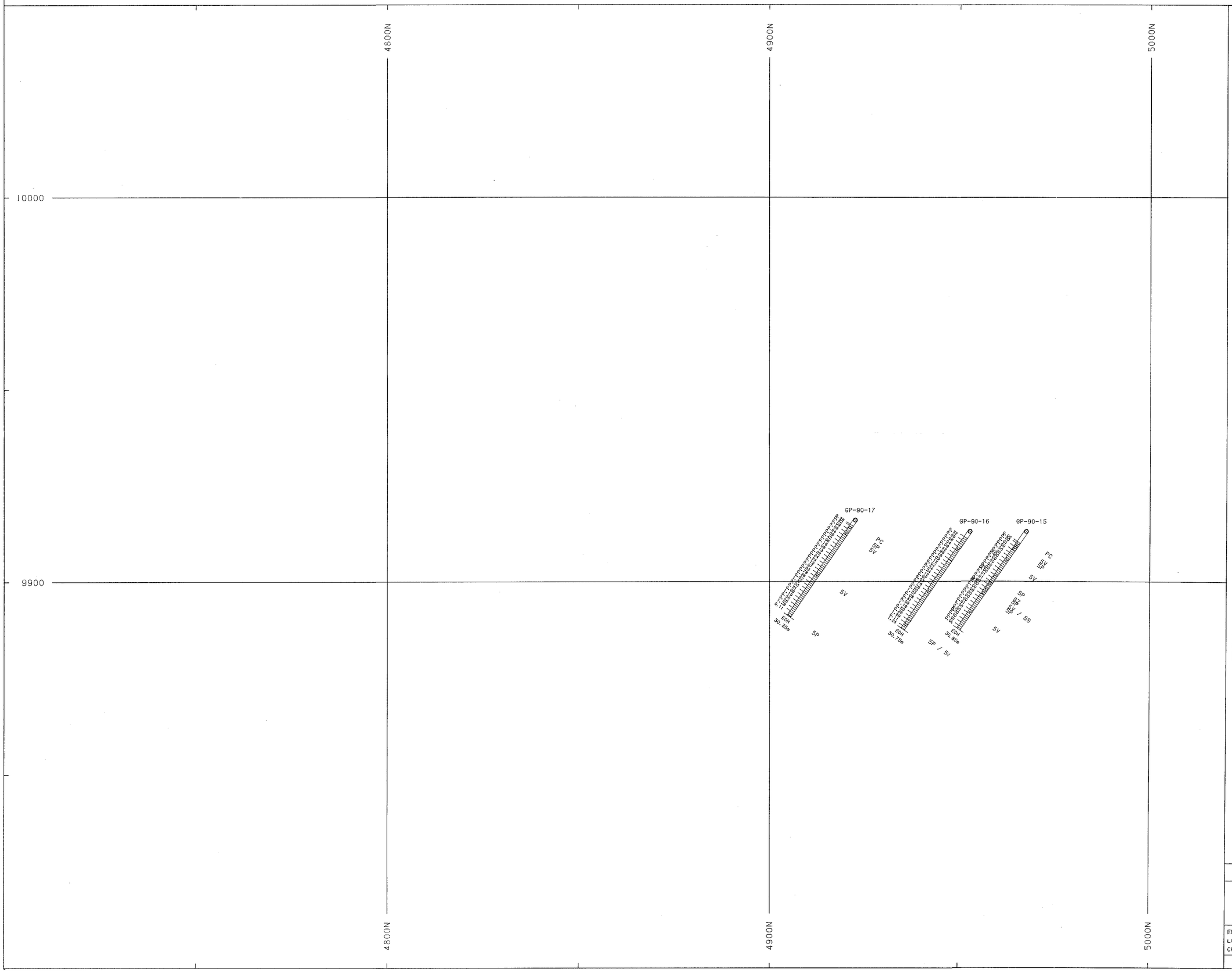
FIRE TOWER PROSPECT
SECTION 2360E
LOOKING GRID WEST
GMR- 8416 GOG RANGE, TASMANIA

EL 10/88 DATE 11/92
LOGGED BY G MacDonald DRAWN BY
CHECKED BY: DRAWING #: 8

TASMANIAN DIVISION

SECTION : 2420E +/-10M





LEGEND

A	8A	: ALLUVIUM
X	8BX	: COLLAPSE BRECCIA
B	8CB	: CLAY WITH BEDROCK AFFINITIES
S	8CS	: CLAY - SOIL PROFILE
E	8E	: ELUVIUM
L	8L	: LATERITE
G	8G	: GOSSAN
J	8J	: JASPER
D	7D	: DIORITE
L	7DL	: DOLERITE
G	7G	: GRANITE
O	7GD	: GRANODIORITE
	6S	: SILICA ALTERATION
	6SS	: SILICA SERICITE ALTERATION
	6SP	: SILICA PYRITE ALTERATION
	6SSP	: SILICA SERICITE PYRITE ALTERATION
	6PSS	: PYRITE SILICA SERICITE ALTERATION
	6SSC	: SILICA SERICITE CARBONATE ALTERATION
	6CS	: CHLORITE SILICA ALTERATION
	6CSP	: CHLORITE SILICA PYRITE ALTERATION
	6SZ	: STRINGER ZONE
	6SM	: SEMI-MASSIVE SULPHIDES
	6MS	: MASSIVE SULPHIDES
C	5C	: CONGLOMERATE
S	5S	: PSAMMITE
P	5P	: PELITE
B	5PB	: BLACK SHALE
V	5V	: VOLCANICLASTIC
	4A	: FELSIC AGGGLOMERATE
L	4L	: FELSIC LAPILLI TUFF
V	4V	: FELSIC VITRIC TUFF
T	4T	: FELSIC TUFF
F	4F	: FELSIC LAVA
I	4I	: FELSIC INTRUSIVE
M	4M	: FELSIC MASS FLOW
P	4QP	: QUARTZ PORPHYRY
P	4QFP	: QUARTZ FELDSPAR PORPHYRY
P	4QFBP	: QUARTZ FELDSPAR BIOTITE PORPHYRY
A	3A	: INTERMEDIATE AGGLOMERATE
L	3L	: INTERMEDIATE LAPILLI TUFF
V	3V	: INTERMEDIATE VITRIC TUFF
T	3T	: INTERMEDIATE TUFF
F	3F	: INTERMEDIATE LAVA
I	3I	: INTERMEDIATE INTRUSIVE
M	3M	: INTERMEDIATE MASS FLOW
M	2M	: MAFICS
U	1U	: ULTRAMAFICS

FZ : FAULT

QV : QUARTZ VEIN

ASSAYS : Au (ppm)

EOH : END OF HOLE

GRID N. = 354 DEGREES TRUE N.

93-3500.
974436

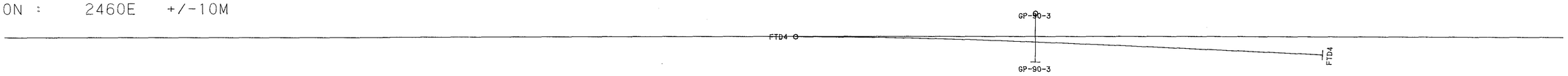
PLUTONIC RESOURCES LIMITED

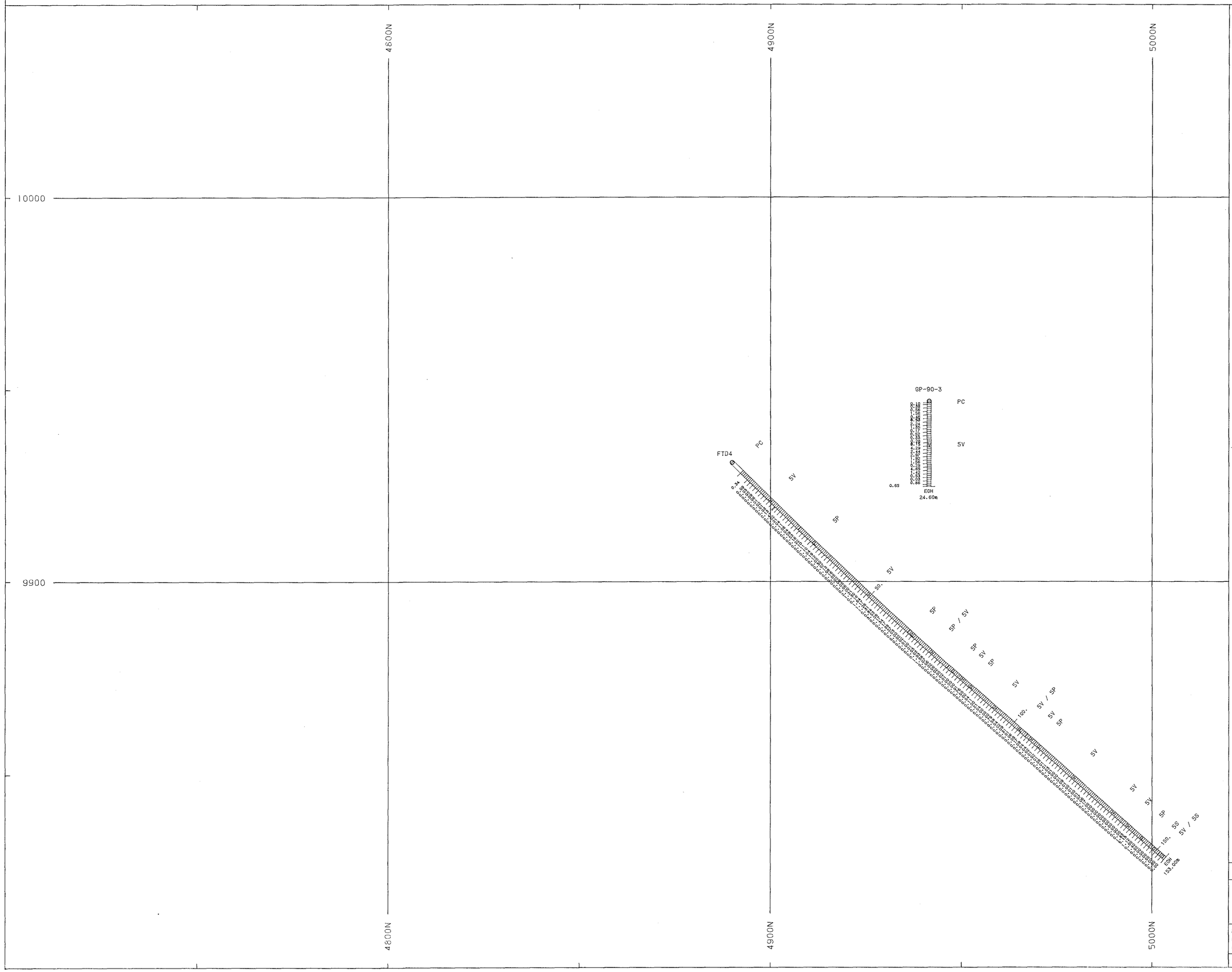
FIRE TOWER PROSPECT
SECTION 2420E
LOOKING GRID WEST
GMR 8416 GOG RANGE, TASMANIA

EL 10/88 DATE 11/92
LOGGED BY G MacDonald DRAWN BY
CHECKED BY DRAWING #: 9

TASMANIAN DIVISION

SECTION : 2460E +/-10M





LEGEND

A	8A	: ALLUVIUM
X	8BX	: COLLAPSE BRECCIA
C	8CB	: CLAY WITH BEDROCK AFFINITIES
S	8CS	: CLAY - SOIL PROFILE
E	8E	: ELUVIUM
L	8L	: LATERITE
G	8G	: GOSSAN
J	8J	: JASPER
D	7D	: DIORITE
L	7DL	: DOLERITE
G	7G	: GRANITE
O	7GD	: GRANODIORITE
S	6S	: SILICA ALTERATION
S	6SS	: SILICA SERICITE ALTERATION
S	6SP	: SILICA PYRITE ALTERATION
S	6SSP	: SILICA SERICITE PYRITE ALTERATION
S	6PSS	: PYRITE SILICA SERICITE ALTERATION
S	6SSC	: SILICA SERICITE CARBONATE ALTERATION
C	6CS	: CHLORITE SILICA ALTERATION
C	6CSP	: CHLORITE SILICA PYRITE ALTERATION
Z	6SZ	: STRINGER ZONE
M	6SM	: SEMI-MASSIVE SULPHIDES
M	6MS	: MASSIVE SULPHIDES
C	5C	: CONGLOMERATE
S	5S	: PSAMMITE
P	5P	: PELITE
B	5PB	: BLACK SHALE
V	5V	: VOLCANICLASTIC
A	4A	: FELSIC AGGGLOMERATE
L	4L	: FELSIC LAPILLI TUFF
V	4V	: FELSIC VITRIC TUFF
T	4T	: FELSIC TUFF
F	4F	: FELSIC LAVA
I	4I	: FELSIC INTRUSIVE
M	4M	: FELSIC MASS FLOW
P	4QP	: QUARTZ PORPHYRY
P	4QFP	: QUARTZ FELDSPAR PORPHYRY
P	4QFBP	: QUARTZ FELDSPAR BIOTITE PORPHYRY
A	3A	: INTERMEDIATE AGGLOMERATE
L	3L	: INTERMEDIATE LAPILLI TUFF
V	3V	: INTERMEDIATE VITRIC TUFF
T	3T	: INTERMEDIATE TUFF
F	3F	: INTERMEDIATE LAVA
I	3I	: INTERMEDIATE INTRUSIVE
M	3M	: INTERMEDIATE MASS FLOW
M	2M	: MAFICS
U	1U	: ULTRAMAFICS

FZ : FAULT

QV : QUARTZ VEIN

ASSAYS : Au (ppm)

EOH : END OF HOLE

GRID N. = 354 DEGREES TRUE N.

974438

93-3500.

PLUTONIC RESOURCES LIMITED

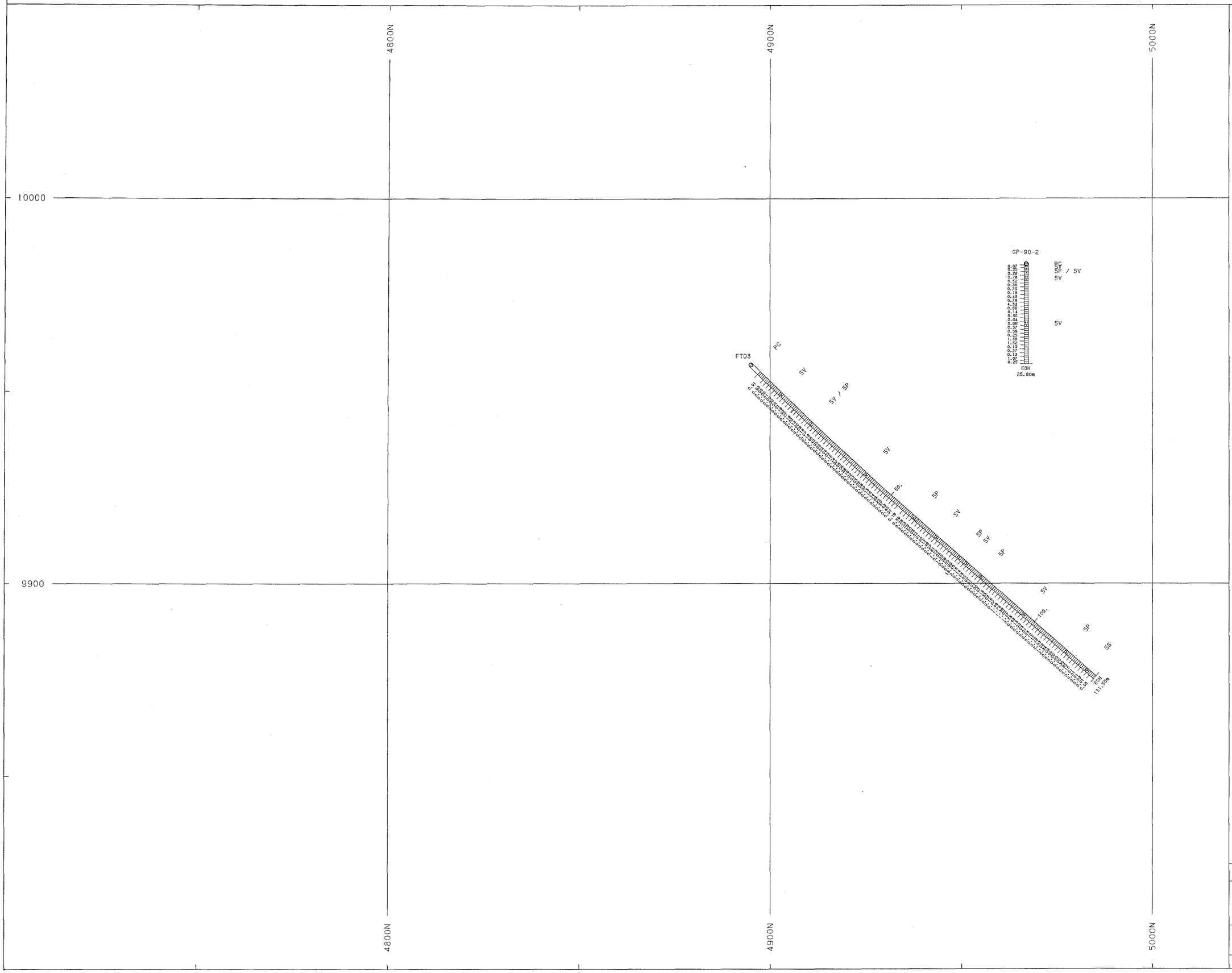
FIRE TOWER PROSPECT
SECTION 2460E
LOOKING GRID WEST
GMR 8416 GOG RANGE, TASMANIA

EL 10/88 DATE 11/92
LOGGED BY G MacDonald DRAWN BY
CHECKED BY DRAWING # 10

TASMANIAN DIVISION

SECTION : 2500E +/-10M





LEGEND

A	8A	: ALLUVIUM
X	8BX	: COLLAPSE BRECCIA
B	8CB	: CLAY WITH BEDROCK AFFINITIES
S	8CS	: CLAY - SOIL PROFILE
E	8E	: ELUVIUM
L	8L	: LATERITE
G	8G	: GOSSAN
J	8J	: JASPER
D	7D	: DIORITE
L	7DL	: DOLERITE
G	7G	: GRANITE
O	7GD	: GRANODIORITE
S	6S	: SILICA ALTERATION
S	6SS	: SILICA SERICITE ALTERATION
S	6SP	: SILICA PYRITE ALTERATION
S	6SSP	: SILICA SERICITE PYRITE ALTERATION
S	6PSS	: PYRITE SILICA SERICITE ALTERATION
S	6SSC	: SILICA SERICITE CARBONATE ALTERATION
C	6CS	: CHLORITE SILICA ALTERATION
C	6CSP	: CHLORITE SILICA PYRITE ALTERATION
Z	6SZ	: STRINGER ZONE
M	6SM	: SEMI-MASSIVE SULPHIDES
M	6MS	: MASSIVE SULPHIDES
C	5C	: CONGLOMERATE
S	5S	: PSAMMITE
P	5P	: PELITE
B	5PB	: BLACK SHALE
V	5V	: VOLCANICLASTIC
A	4A	: FELSIC AGGGLOMERATE
L	4L	: FELSIC LAPILLI TUFF
V	4V	: FELSIC VITRIC TUFF
T	4T	: FELSIC TUFF
F	4F	: FELSIC LAVA
I	4I	: FELSIC INTRUSIVE
M	4M	: FELSIC MASS FLOW
Q	4QP	: QUARTZ PORPHYRY
Q	4QFP	: QUARTZ FELDSPAR PORPHYRY
Q	4QFBP	: QUARTZ FELDSPAR BIOTITE PORPHYRY
A	3A	: INTERMEDIATE AGGLOMERATE
L	3L	: INTERMEDIATE LAPILLI TUFF
V	3V	: INTERMEDIATE VITRIC TUFF
T	3T	: INTERMEDIATE TUFF
F	3F	: INTERMEDIATE LAVA
I	3I	: INTERMEDIATE INTRUSIVE
M	3M	: INTERMEDIATE MASS FLOW
M	2M	: MAFICS
U	1U	: ULTRAMAFICS

FZ : FAULT

QV : QUARTZ VEIN

ASSAYS : Au (ppm)

EOH : END OF HOLE

GRID N. = 354 DEGREES TRUE N.

93-3500.

974437

PLUTONIC RESOURCES LIMITED

FIRE TOWER PROSPECT
SECTION 2500E
LOOKING GRID WEST
GMP 8416 GOG RANGE, TASMANIA

EL 10/88	DATE 11/92
LOGGED BY G.MacDonald	DRAWN BY .
CHECKED BY .	DRAWING #: 11

TASMANIAN DIVISION

SECTION : 2520E +/-10M

2520E



2520E

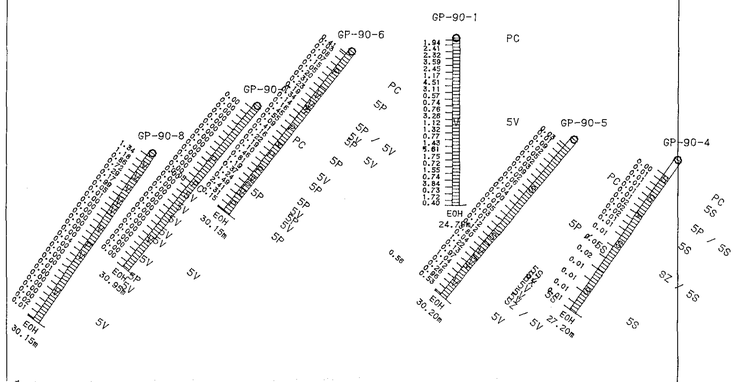
4800N

4900N

5000N

10000

9900



4800N

4900N

5000N

LEGEND

A	8A	: ALLUVIUM
X	8BX	: COLLAPSE BRECCIA
CB	8CB	: CLAY WITH BEDROCK AFFINITIES
CS	8CS	: CLAY - SOIL PROFILE
E	8E	: ELUVIUM
L	8L	: LATERITE
G	8G	: GOSSAN
J	8J	: JASPER
D	7D	: DIORITE
L	7DL	: DOLERITE
G	7G	: GRANITE
O	7GD	: GRANODIORITE
S	6S	: SILICA ALTERATION
SS	6SS	: SILICA SERICITE ALTERATION
SP	6SP	: SILICA PYRITE ALTERATION
SSP	6SSP	: SILICA SERICITE PYRITE ALTERATION
PSS	6PSS	: PYRITE SILICA SERICITE ALTERATION
SSC	6SSC	: SILICA SERICITE CARBONATE ALTERATION
CS	6CS	: CHLORITE SILICA ALTERATION
CSP	6CSP	: CHLORITE SILICA PYRITE ALTERATION
SZ	6SZ	: STRINGER ZONE
SM	6SM	: SEMI-MASSIVE SULPHIDES
MS	6MS	: MASSIVE SULPHIDES
C	5C	: CONGLOMERATE
S	5S	: PSAMMITE
P	5P	: PELITE
B	5PB	: BLACK SHALE
V	5V	: VOLCANICLASTIC
A	4A	: FELSIC AGGGLOMERATE
L	4L	: FELSIC LAPILLI TUFF
V	4V	: FELSIC VITRIC TUFF
T	4T	: FELSIC TUFF
F	4F	: FELSIC LAVA
I	4I	: FELSIC INTRUSIVE
M	4M	: FELSIC MASS FLOW
QP	4QP	: QUARTZ PORPHYRY
QFP	4QFP	: QUARTZ FELDSPAR PORPHYRY
QFBP	4QFBP	: QUARTZ FELDSPAR BIOTITE PORPHYRY
A	3A	: INTERMEDIATE AGGLOMERATE
L	3L	: INTERMEDIATE LAPILLI TUFF
V	3V	: INTERMEDIATE VITRIC TUFF
T	3T	: INTERMEDIATE TUFF
F	3F	: INTERMEDIATE LAVA
I	3I	: INTERMEDIATE INTRUSIVE
M	3M	: INTERMEDIATE MASS FLOW
M	2M	: MAFICS
U	1U	: ULTRAMAFICS

FZ : FAULT

QV : QUARTZ VEIN

ASSAYS : Au (ppm)

EOH : END OF HOLE

GRID N. = 354 DEGREES TRUE N.

93-3500.

974439

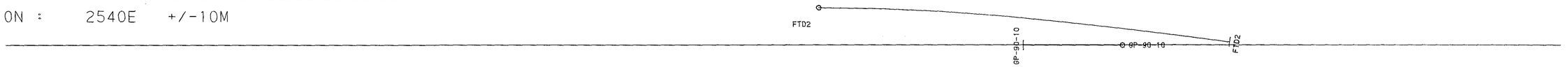
PLUTONIC RESOURCES LIMITED

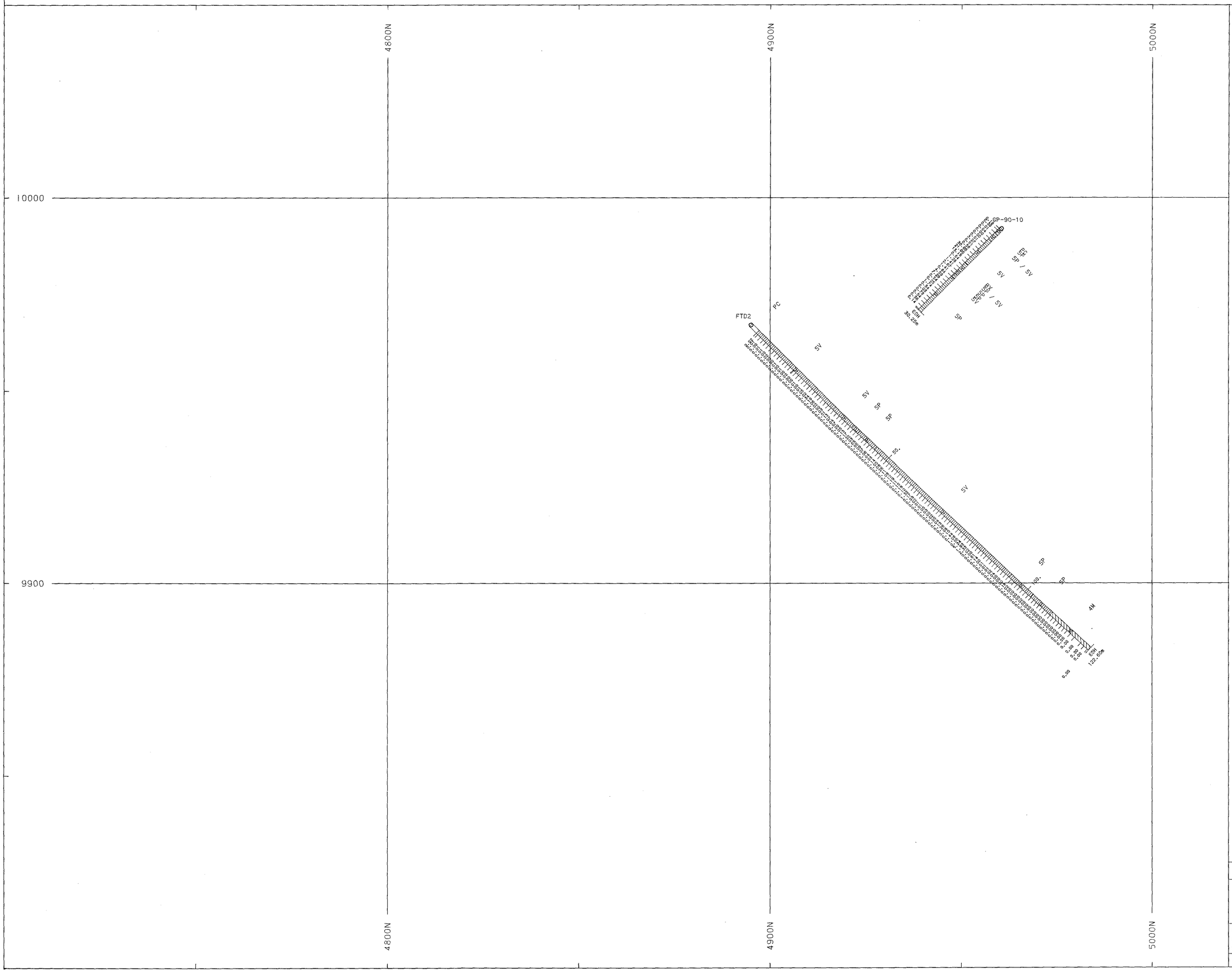
FIRE TOWER PROSPECT
SECTION 2520E
LOOKING GRID WEST
GMR- 8416 GOC RANGE, TASMANIA

EL 10/88 DATE 11/92
LOGGED BY G MacDonald DRAWN BY
CHECKED BY DRAWING # 12

TASMANIAN DIVISION

SECTION : 2540E +/-10M





LEGEND

A	8A	: ALLUVIUM
X	8BX	: COLLAPSE BRECCIA
B	8CB	: CLAY WITH BEDROCK AFFINITIES
S	8CS	: CLAY - SOIL PROFILE
E	8E	: ELUVIUM
L	8L	: LATERITE
G	8G	: GOSSAN
J	8J	: JASPER
D	7D	: DIORITE
L	7DL	: DOLERITE
G	7G	: GRANITE
O	7GD	: GRANODIORITE
S	6S	: SILICA ALTERATION
S	6SS	: SILICA SERICITE ALTERATION
S	6SP	: SILICA PYRITE ALTERATION
S	6SSP	: SILICA SERICITE PYRITE ALTERATION
P	6PSS	: PYRITE SILICA SERICITE ALTERATION
C	6SSC	: SILICA SERICITE CARBONATE ALTERATION
C	6CS	: CHLORITE SILICA ALTERATION
C	6CSP	: CHLORITE SILICA PYRITE ALTERATION
	6SZ	: STRINGER ZONE
	6SM	: SEMI-MASSIVE SULPHIDES
	6MS	: MASSIVE SULPHIDES
C	5C	: CONGLOMERATE
S	5S	: PSAMMITE
P	5P	: PELITE
B	5PB	: BLACK SHALE
V	5V	: VOLCANICLASTIC
A	4A	: FELSIC AGGGLOMERATE
L	4L	: FELSIC LAPILLI TUFF
V	4V	: FELSIC VITRIC TUFF
T	4T	: FELSIC TUFF
F	4F	: FELSIC LAVA
I	4I	: FELSIC INTRUSIVE
M	4M	: FELSIC MASS FLOW
P	4QP	: QUARTZ PORPHYRY
P	4QFP	: QUARTZ FELDSPAR PORPHYRY
P	4QFBP	: QUARTZ FELDSPAR BIOTITE PORPHYRY
A	3A	: INTERMEDIATE AGGLOMERATE
L	3L	: INTERMEDIATE LAPILLI TUFF
V	3V	: INTERMEDIATE VITRIC TUFF
T	3T	: INTERMEDIATE TUFF
F	3F	: INTERMEDIATE LAVA
I	3I	: INTERMEDIATE INTRUSIVE
M	3M	: INTERMEDIATE MASS FLOW
M	2M	: MAFICS
	1U	: ULTRAMAFICS

FZ : FAULT

QV : QUARTZ VEIN

ASSAYS : Au (ppm)

EOH : END OF HOLE

GRID N. - 354 DEGREES TRUE N.

93-3500.
974440

PLUTONIC RESOURCES LIMITED

FIRE TOWER PROSPECT
SECTION 2540E
LOOKING GRID WEST
GMR: 8416 GOG RANGE, TASMANIA

EL 10/88 DATE 11/92
LOGGED BY C.MacDonald DRAWN BY
CHECKED BY: DRAWING #: 13

TASMANIAN DIVISION

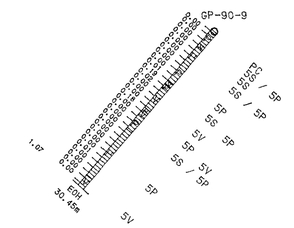
SECTION : 2560E +/-10M

2560E — GP-90-9 — 2560E

4800N 4900N 5000N

10000

9900



LEGEND

A	8A	: ALLUVIUM
X	8BX	: COLLAPSE BRECCIA
B	8CB	: CLAY WITH BEDROCK AFFINITIES
S	8CS	: CLAY - SOIL PROFILE
E	8E	: ELUVIUM
L	8L	: LATERITE
G	8G	: GOSSAN
J	8J	: JASPER
D	7D	: DIORITE
L	7DL	: DOLERITE
G	7G	: GRANITE
O	7GD	: GRANODIORITE
S	6S	: SILICA ALTERATION
S	6SS	: SILICA SERICITE ALTERATION
S	6SP	: SILICA PYRITE ALTERATION
S	6SSP	: SILICA SERICITE PYRITE ALTERATION
S	6PSS	: PYRITE SILICA SERICITE ALTERATION
S	6SSC	: SILICA SERICITE CARBONATE ALTERATION
C	6CS	: CHLORITE SILICA ALTERATION
C	6CSP	: CHLORITE SILICA PYRITE ALTERATION
Z	6SZ	: STRINGER ZONE
M	6SM	: SEMI-MASSIVE SULPHIDES
MASSIVE	6MS	: MASSIVE SULPHIDES
C	5C	: CONGLOMERATE
S	5S	: PSAMMITE
P	5P	: PELITE
B	5PB	: BLACK SHALE
V	5V	: VOLCANICLASTIC
A	4A	: FELSIC AGGGLOMERATE
L	4L	: FELSIC LAPILLI TUFF
V	4V	: FELSIC VITRIC TUFF
T	4T	: FELSIC TUFF
F	4F	: FELSIC LAVA
I	4I	: FELSIC INTRUSIVE
M	4M	: FELSIC MASS FLOW
QP	4QP	: QUARTZ PORPHYRY
QFP	4QFP	: QUARTZ FELDSPAR PORPHYRY
QFBP	4QFBP	: QUARTZ FELDSPAR BIOTITE PORPHYRY
A	3A	: INTERMEDIATE AGGLOMERATE
L	3L	: INTERMEDIATE LAPILLI TUFF
V	3V	: INTERMEDIATE VITRIC TUFF
T	3T	: INTERMEDIATE TUFF
F	3F	: INTERMEDIATE LAVA
I	3I	: INTERMEDIATE INTRUSIVE
M	3M	: INTERMEDIATE MASS FLOW
M	2M	: MAFICS
U	1U	: ULTRAMAFICS

FZ : FAULT

QV : QUARTZ VEIN

ASSAYS : Au (ppm)

EOH : END OF HOLE

GRID N. = 354 DEGREES TRUE N.

93-3500.

974441

PLUTONIC RESOURCES LIMITED

FIRE TOWER PROSPECT

SECTION 2560E

LOOKING GRID WEST

GMR- 8416 COG RANGE, TASMANIA

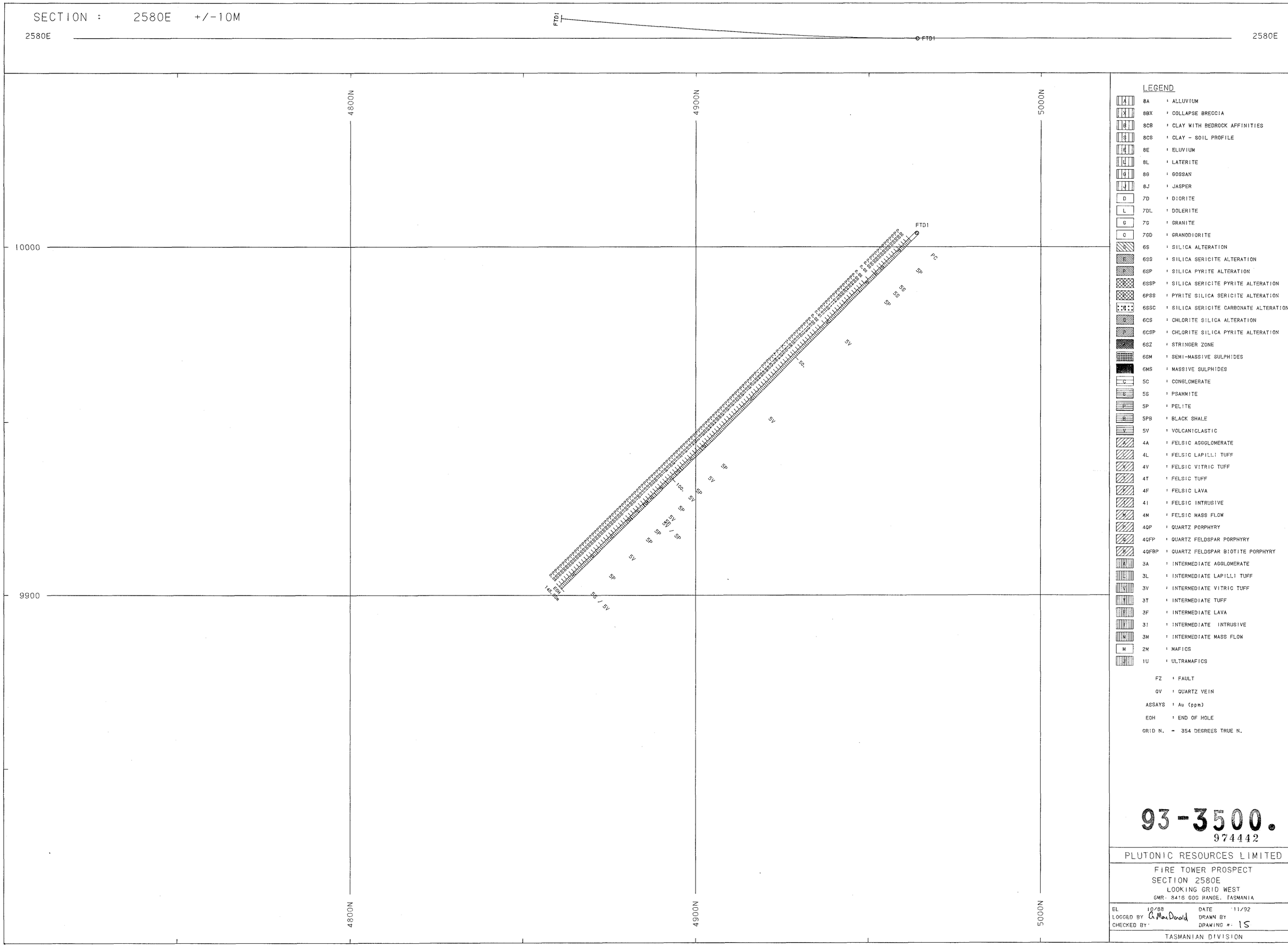
EL 10/88 DATE 11/92

LOGGED BY C.MacDonald DRAWN BY

CHECKED BY: DRAWING #. 14

TASMANIAN DIVISION

SECTION : 2580E +/-10M



LEGEND

A	8A	: ALLUVIUM
X	8BX	: COLLAPSE BRECCIA
B	8CB	: CLAY WITH BEDROCK AFFINITIES
S	8CS	: CLAY - SOIL PROFILE
E	8E	: ELUVIUM
L	8L	: LATERITE
G	8G	: GOSSAN
J	8J	: JASPER
D	7D	: DIORITE
L	7DL	: DOLERITE
G	7G	: GRANITE
O	7GD	: GRANODIORITE
S	6S	: SILICA ALTERATION
S	6SS	: SILICA SERICITE ALTERATION
S	6SP	: SILICA PYRITE ALTERATION
S	6SSP	: SILICA SERICITE PYRITE ALTERATION
S	6PSS	: PYRITE SILICA SERICITE ALTERATION
S	6SSC	: SILICA SERICITE CARBONATE ALTERATION
C	6CS	: CHLORITE SILICA ALTERATION
C	6CSP	: CHLORITE SILICA PYRITE ALTERATION
S	6SZ	: STRINGER ZONE
S	6SM	: SEMI-MASSIVE SULPHIDES
S	6MS	: MASSIVE SULPHIDES
C	5C	: CONGLOMERATE
S	5S	: PSAMMITE
P	5P	: PELITE
B	5PB	: BLACK SHALE
V	5V	: VOLCANICLASTIC
A	4A	: FELSIC AGGGLOMERATE
L	4L	: FELSIC LAPILLI TUFF
V	4V	: FELSIC VITRIC TUFF
T	4T	: FELSIC TUFF
F	4F	: FELSIC LAVA
I	4I	: FELSIC INTRUSIVE
M	4M	: FELSIC MASS FLOW
P	4QP	: QUARTZ PORPHYRY
P	4QFP	: QUARTZ FELDSPAR PORPHYRY
P	4QFBP	: QUARTZ FELDSPAR BIOTITE PORPHYRY
A	3A	: INTERMEDIATE AGGLOMERATE
L	3L	: INTERMEDIATE LAPILLI TUFF
V	3V	: INTERMEDIATE VITRIC TUFF
T	3T	: INTERMEDIATE TUFF
F	3F	: INTERMEDIATE LAVA
I	3I	: INTERMEDIATE INTRUSIVE
M	3M	: INTERMEDIATE MASS FLOW
M	2M	: MAFICS
U	1U	: ULTRAMAFICS

FZ : FAULT

QV : QUARTZ VEIN

ASSAYS : Au (ppm)

EOH : END OF HOLE

GRID N. = 354 DEGREES TRUE N.

93-3500.
974442

PLUTONIC RESOURCES LIMITED

FIRE TOWER PROSPECT
SECTION 2580E
LOOKING GRID WEST
GMR- 8416 GOG RANGE. TASMANIA

EL 10/88 DATE 11/92
LOGGED BY G. MacDonald DRAWN BY
CHECKED BY: DRAWING #: 15

TASMANIAN DIVISION

2300E
2400E
2500E
2600E
5100N
5000N
4900N
4800N
GP-90-11
30.10m
EOH
GP-90-12
GP-90-13
30.60m
EOH
GP-90-14
32.30m
GP-90-15
GP-90-16
30.85m
33.75m
GP-90-17
30.35m
FTD4
153.00m
EOH
GP-90-3
24.05m
FTD3
121.50m
GP-90-2
25.85m
GP-90-1
24.05m
GP-90-4
GP-90-5
27.20m
GP-90-6
30.15m
GP-90-7
30.90m
GP-90-8
FTD2
122.60m
GP-90-10
20.25m
GP-90-9
30.45m
FTD1
145.00m
150.
100.
50.
93-3500.
5 cm
SCALE 1:500
10 0 10 20
METRES
974443
PLUTONIC OPERATIONS LIMITED
PROJECT 112 : GOWRIE PARK
FIRE TOWER
SURFACE PROJECTION OF DRILLHOLES
GOLD ASSAYS >1.0 G/T
GMR: 8416 (GOG RANGE), TAS.
EL 10/88
LOGGED : G.MacDonald
CHECKED:
DATE :16/09/92
DRAWN :U.Wellbrock
DRAWING: 16
PLUTONIC OPERATIONS LIMITED
A.C.N. 004 680 997

PD 83 SP1
(-65° to 237°)

E.O.H
102·0m

STD 1
(-45° to 235°)

Siltstones and lesser intermediate tuffs

Felsic volcaniclastics, altered

Intermediate lavas and interbedded felsic volcaniclastics, altered, pyritic

Intermediate lavas

Intermediate / Felsic Volcaniclastics and siltstones, altered

major structure

KEY

	3T	Intermediate tuff
	3F	Intermediate lava
	4LB	Felsic lava breccia
	4F	Felsic lava
	4T	Felsic tuff
	5V	Felsic volcaniclastic
	5P	Pelite
	5S	Psammite
	6CS	Chlorite silica alteration
	6CSP	Chlorite silica pyrite (<5%) alteration
	6SS	Silica sericite alteration
	6SSP	Silica sericite pyrite (<5%) alteration

CODE

bg	bedding
bge	beige
bn	brown
clc	chloritic
cg	coarse grained
chy	cherty
conc	concordant
clv	cleavage
d	dark
f	feldspar
fg	fine grained
ft	float
goss	gossan
hm	haematitic
lmc	limonitic
mg	medium grained
mott	mottled
my	moderately
o/c	outcrop
ph	phyric
pu	pumice
q	quartz
r	rich
rdd	rounded
s/c	subcrop
sts	schistose
v	very
wy	weakly
zn	zinc
sz	shear zone
bx	breccia

4300N 000N — Grid line, grid peg

Outcrop

Sub-crop

Float

Geological boundary

Road

TN MN 13°

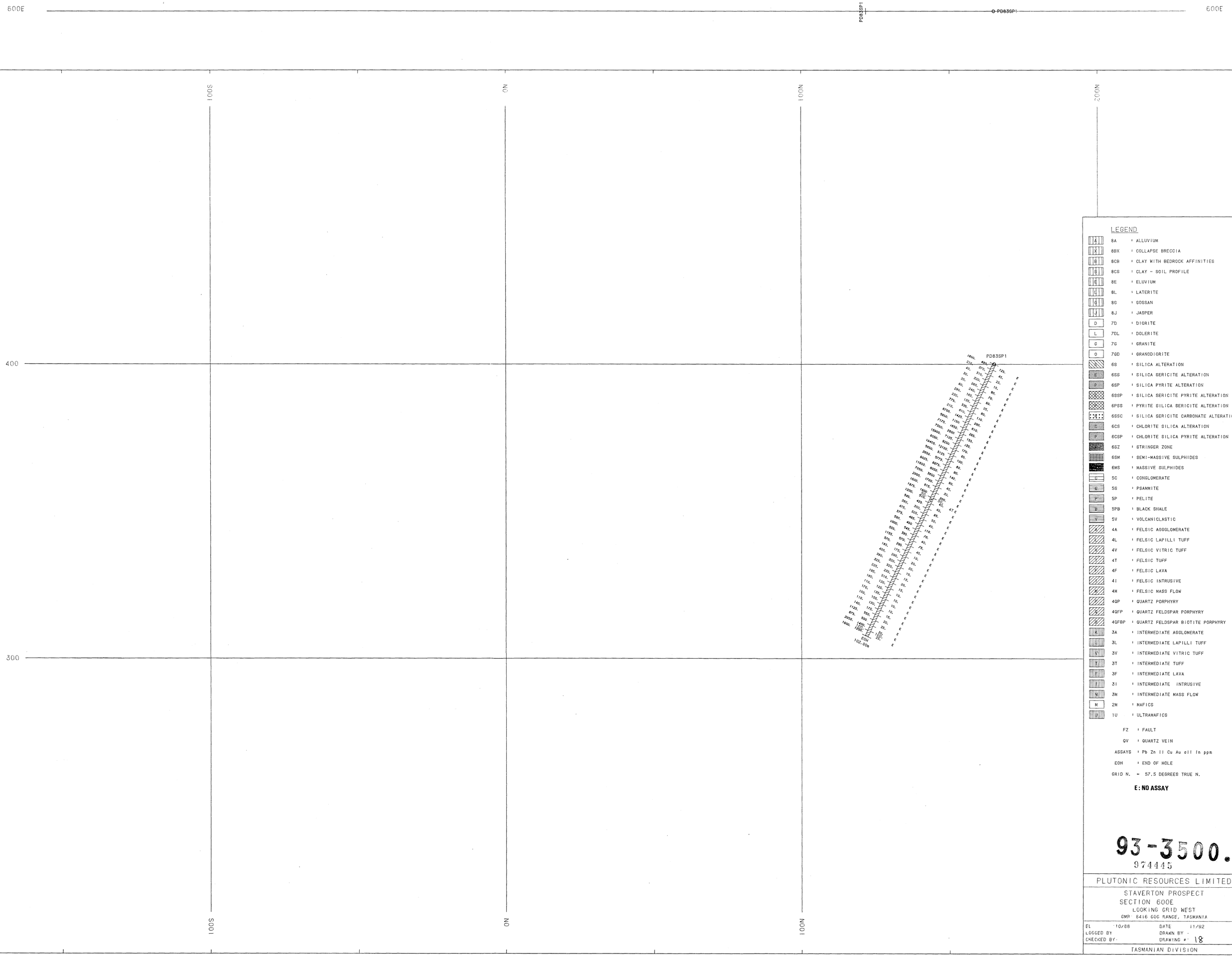
93-3500.
974444

PLUTONIC OPERATIONS LTD
A.C.N. 004 680 997 (INC. IN N.S.W.)

COMPILED: G. MacDonald	PROJECT 706 - GOWRIE PARK
SURVEYED: I. Leighton	
DATE : Dec. 1992	STAVERTON PROSPECT
DRAWN : O. Hedditch	(SOUTH SHEET)
TECHNICAL REPORT No.	
REVISIONS:	
DRAWING No.	

17

SECTION : 600E +/-20M



LEGEND

A	8A	: ALLUVIUM
X	8BX	: COLLAPSE BRECCIA
B	8CB	: CLAY WITH BEDROCK AFFINITIES
S	8CS	: CLAY - SOIL PROFILE
E	8E	: ELUVIUM
L	8L	: LATERITE
G	8G	: GOSSAN
J	8J	: JASPER
D	7D	: DIORITE
L	7DL	: DOLERITE
G	7G	: GRANITE
O	7GD	: GRANODIORITE
	6S	: SILICA ALTERATION
S	6SS	: SILICA SERICITE ALTERATION
	6SP	: SILICA PYRITE ALTERATION
	6SSP	: SILICA SERICITE PYRITE ALTERATION
	6PSS	: PYRITE SILICA SERICITE ALTERATION
	6SSC	: SILICA SERICITE CARBONATE ALTERATION
	6CS	: CHLORITE SILICA ALTERATION
	6CSP	: CHLORITE SILICA PYRITE ALTERATION
	6SZ	: STRINGER ZONE
	6SM	: SEMI-MASSIVE SULPHIDES
	6MS	: MASSIVE SULPHIDES
C	5C	: CONGLOMERATE
S	5S	: PSAMMITE
P	5P	: PELITE
B	5PB	: BLACK SHALE
V	5V	: VOLCANICLASTIC
A	4A	: FELSIC AGGGLOMERATE
L	4L	: FELSIC LAPILLI TUFF
V	4V	: FELSIC VITRIC TUFF
T	4T	: FELSIC TUFF
F	4F	: FELSIC LAVA
I	4I	: FELSIC INTRUSIVE
M	4M	: FELSIC MASS FLOW
	4QP	: QUARTZ PORPHYRY
P	4QFP	: QUARTZ FELDSPAR PORPHYRY
P	4QFBP	: QUARTZ FELDSPAR BIOTITE PORPHYRY
A	3A	: INTERMEDIATE AGGLOMERATE
L	3L	: INTERMEDIATE LAPILLI TUFF
V	3V	: INTERMEDIATE VITRIC TUFF
T	3T	: INTERMEDIATE TUFF
F	3F	: INTERMEDIATE LAVA
I	3I	: INTERMEDIATE INTRUSIVE
M	3M	: INTERMEDIATE MASS FLOW
M	2M	: MAFICS
U	1U	: ULTRAMAFICS

FZ : FAULT

QV : QUARTZ VEIN

ASSAYS : Pb Zn ll Cu Au all in ppm

EOH : END OF HOLE

GRID N. = 57.5 DEGREES TRUE N.

E: NO ASSAY

93-3500.
974445

PLUTONIC RESOURCES LIMITED

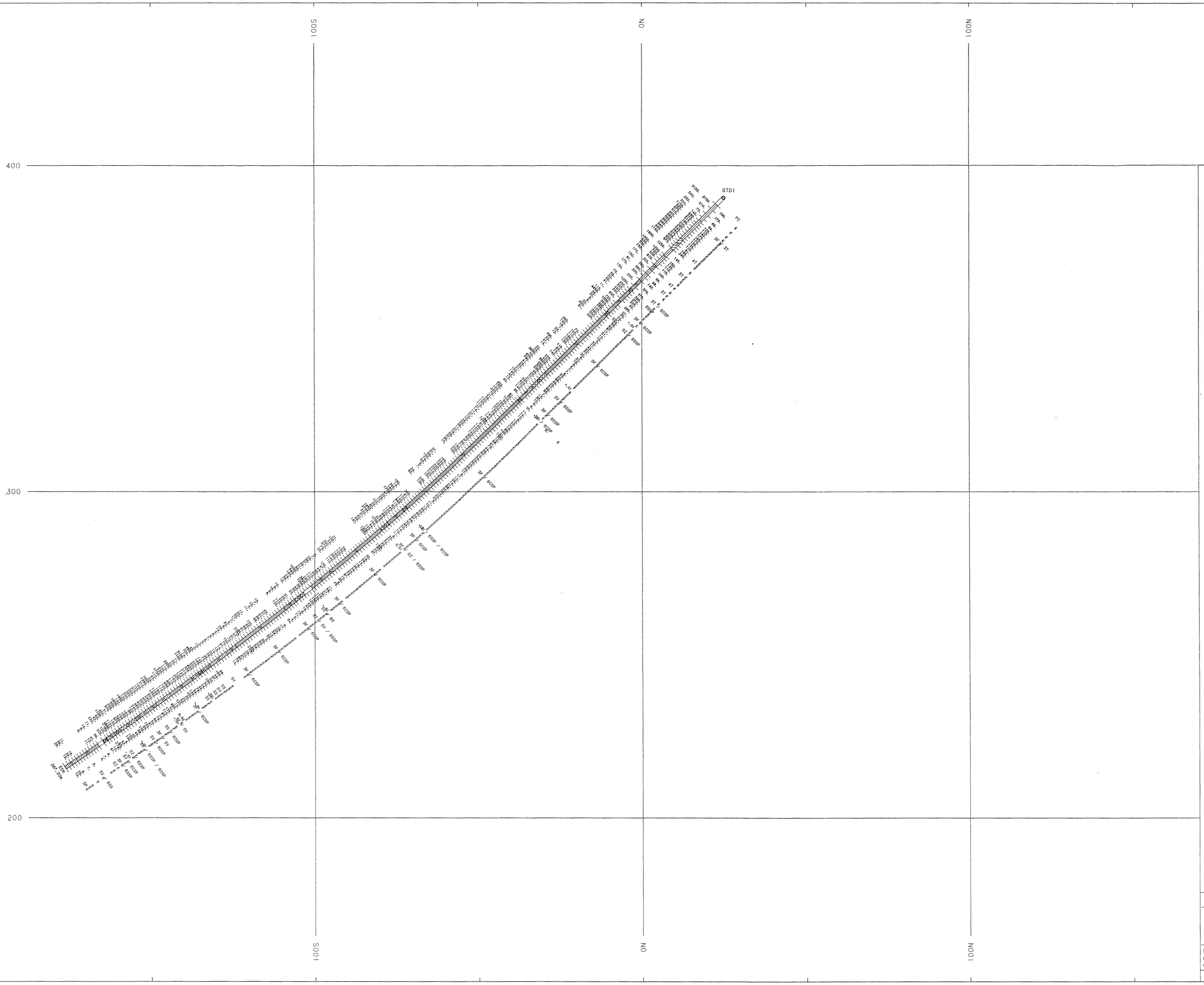
STAVERTON PROSPECT
SECTION 600E
LOOKING GRID WEST
GMR 8416 606 RANGE, TASMANIA

EL 10/88	DATE 11/92
LOGGED BY	DRAWN BY
CHECKED BY	DRAWING #: 18

TASMANIAN DIVISION

SECTION : 900E +/-20M





LEGEND

A	8A	: ALLUVIUM
X	8BX	: COLLAPSE BRECCIA
B	8CB	: CLAY WITH BEDROCK AFFINITIES
S	8CS	: CLAY - SOIL PROFILE
E	8E	: ELUVIUM
L	8L	: LATERITE
G	8G	: GOSSAN
J	8J	: JASPER
D	7D	: DIORITE
L	7DL	: DOLERITE
G	7G	: GRANITE
O	7GD	: GRANODIORITE
S	6S	: SILICA ALTERATION
S	6SS	: SILICA SERICITE ALTERATION
S	6SP	: SILICA PYRITE ALTERATION
S	6SSP	: SILICA SERICITE PYRITE ALTERATION
P	6PSS	: PYRITE SILICA SERICITE ALTERATION
C	6SSC	: SILICA SERICITE CARBONATE ALTERATION
C	6CS	: CHLORITE SILICA ALTERATION
C	6CSP	: CHLORITE SILICA PYRITE ALTERATION
Z	6SZ	: STRINGER ZONE
M	6SM	: SEMI-MASSIVE SULPHIDES
M	6MS	: MASSIVE SULPHIDES
C	5C	: CONGLOMERATE
S	5S	: PSAMMITE
P	5P	: PELITE
B	5PB	: BLACK SHALE
V	5V	: VOLCANICLASTIC
A	4A	: FELSIC AGGGLOMERATE
L	4L	: FELSIC LAPILLI TUFF
V	4V	: FELSIC VITRIC TUFF
T	4T	: FELSIC TUFF
F	4F	: FELSIC LAVA
I	4I	: FELSIC INTRUSIVE
M	4M	: FELSIC MASS FLOW
Q	4QP	: QUARTZ PORPHYRY
Q	4QFP	: QUARTZ FELDSPAR PORPHYRY
Q	4QFBP	: QUARTZ FELDSPAR BIOTITE PORPHYRY
A	3A	: INTERMEDIATE AGGLOMERATE
L	3L	: INTERMEDIATE LAPILLI TUFF
V	3V	: INTERMEDIATE VITRIC TUFF
T	3T	: INTERMEDIATE TUFF
F	3F	: INTERMEDIATE LAVA
I	3I	: INTERMEDIATE INTRUSIVE
M	3M	: INTERMEDIATE MASS FLOW
M	2M	: MAFICS
U	1U	: ULTRAMAFICS

FZ : FAULT

QV : QUARTZ VEIN

ASSAYS : Pb Zn ll Cu Au all in ppm

EOH : END OF HOLE

GRID N. = 57.5 DEGREES TRUE N.

E: NO ASSAY

97444C

93-3500.

PLUTONIC RESOURCES LIMITED

STAVERTON PROSPECT

SECTION 900E

LOOKING GRID WEST

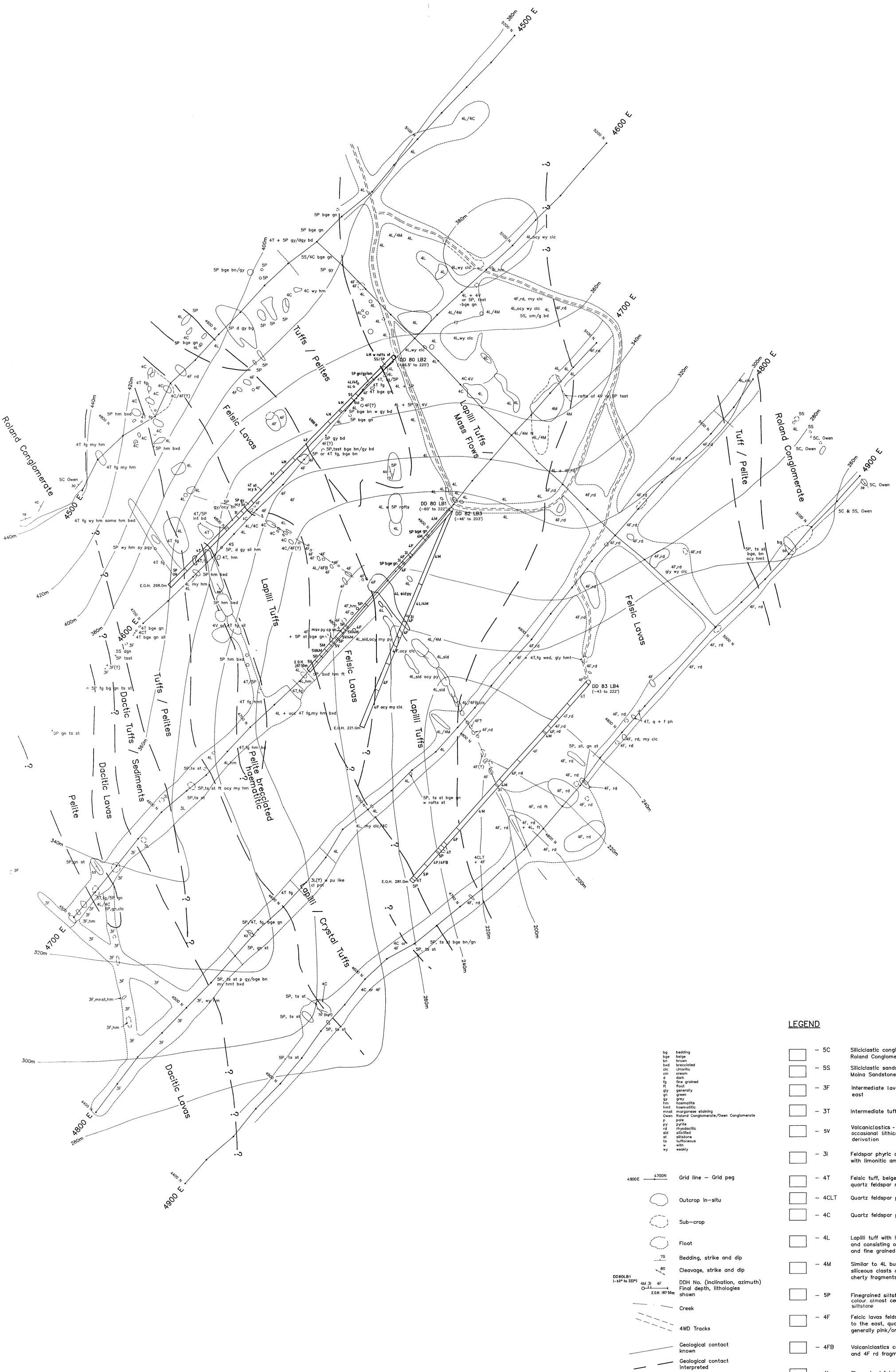
CMR 8416 GOG RANGE, TASMANIA

EL 10/88 DATE 11/92

LOGGED BY C.MacDonald DRAWN BY -

CHECKED BY - DRAWING # 19

TASMANIAN DIVISION



LEGEND

bg	bedding
bge	beige
bn	brown
bxd	brecciated
clc	chloritic
cm	cream
d	dark
fg	fine grained
ft	float
gly	generally
gn	green
gy	grey
hm	haematite
hmt	haematitic
mnst	marganese staining
Owen	Roland Conglomerate/Owen Conglomerate
p	pale
py	pyrite
rd	rhyodacitic
sld	silicified
st	siltstone
ts	tuffaceous
w	with
wy	weakly

4900E —— 4700N Grid line — Grid peg

Outcrop in-situ

Sub-crop

Float

70 Bedding, strike and dip

80 Cleavage, strike and dip

DD80LB1 (-60° to 222°) 4M 3I 4F E.O.H. 187.50m DDH No. (inclination, azimuth) Final depth, lithologies shown

Creek

4WD Tracks

Geological contact known

Geological contact interpreted

Geological contact interpreted—uncertain

5C	—	Siliciclastic conglomerate — Ordovician Roland Conglomerate, generally with a haematitic matrix
5S	—	Siliciclastic sandstone — Ordovician Moina Sandstone (?), generally with a haematitic matrix
3F	—	Intermediate lavas feldspar >quartz phyric to the east
3T	—	Intermediate tuffs, green, feldspar rich sandy to silty
5V	—	Volcaniclastics - generally medium grained quartz and occasional lithics in a fine grained matrix. Of felsic derivation
3I	—	Feldspar phyric clayey intrusive intersected in drilling with limonitic amygdules
4T	—	Felsic tuff, beige green, sandy to silty, quartz feldspar rich
4CLT	—	Quartz feldspar phyric tuff with lithics < 2mm
4C	—	Quartz feldspar phyric crystal tuff
4L	—	Lapilli tuff with lithics generally subangular and consisting of subangular felsic lava fragments and fine grained volcanics in quartz feldspar rich matrix
4M	—	Similar to 4L but with prominent subrounded siliceous clasts of fine grained volcanics and cherty fragments and exhibiting signs of reworking
5P	—	Finegrained siltstones, variably beige green grey, black in colour almost certainly reworked tuffs ie tuffaceous siltstone
4F	—	Felcic lavas feldspar > quartz + hornblende phyric (4F, rd) to the east, quartz feldspar phyric (4F) to the west, generally pink/orange or grey green when chloritic
4FB	—	Volcaniclastics consisting of subangular 4F and 4F rd fragment, possibly hyaloclastic
4I	—	Finegrained felsic intrusive in DD80 LB2, pinky orange siliceous rock

93-3500.

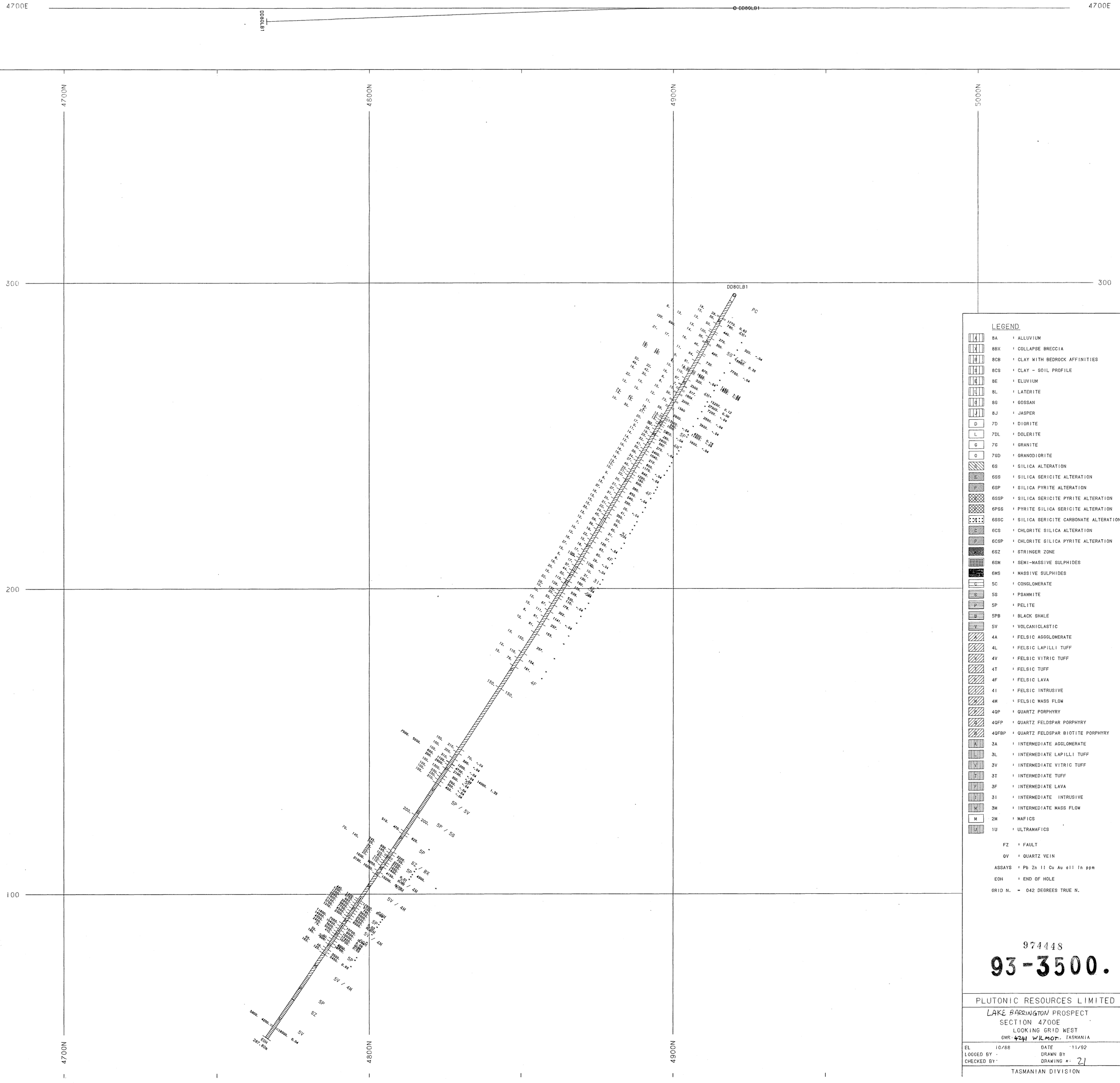
974447

PLUTONIC OPERATIONS LTD.

A.C.N. 004 680 997 (INC. IN N.S.W.)

COMPILED : G.MacDonald	PROJECT : 706 — GOWRIE PARK
SURVEYED : I. LEIGHTON	
DATE : JULY 1993	
DRAWN : O.H.	GEOLOGY
TECHNICAL REPORT No. : 706-R2	LAKE BARRINGTON PROSPECT
REVISIONS :	
DRAWING No. 706 - LB - 1	SCALE 1:1000 (0 20 40 METRES) FIG. No. 20

SECTION : 4700E +/-20M



974448

93-3500.

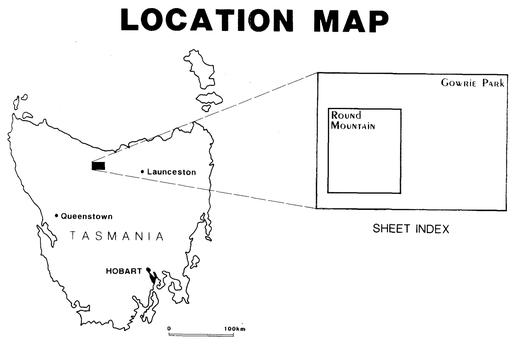
PLUTONIC RESOURCES LIMITED

LAKE BARRINGTON PROSPECT
SECTION 4700E
LOOKING GRID WEST
GMR: 4241 WILMOT, TASMANIA

EL	10/88	DATE	11/92
LOGGED BY		DRAWN BY	
CHECKED BY		DRAWING #:	21

TASMANIAN DIVISION

LOCATION MAP



LEGEND

ROAD SEALED

ROAD UNSEALED

RIVER

GRID LINE

3900 CRAE GRID

1300 NORANDA GRID

POWER LINE

5 cm

LEGEND

TERTIARY		Tertiary basalt
LATE CAMBRIAN ORDOVICIAN	5S Ordo	Molna sandstone – siliceous
	5C Ordo	Roland conglomerate – siliciclastic
CAMBRIAN (not in strati-graphic order)	6SS	Silica sericite altered schistose felsic volcaniclastic
	4T	Felsic tuffs quartz ± feldspar phyric
	5V fc	Felsic volcaniclastic with quartz eyes, generally sericite altered
	5P	Pelite, fine grained variably altered siltstone, generally derived from fine grained tuffs
	5C	Felsic volcaniclastic conglomerate with round cherty clasts, often magnetic due to haematite
	4F	Felsic lavas, quartz ± feldspar phyric
	3T	Intermediate plagioclase > quartz phyric tuffs
	3F	Intermediate plagioclase > quartz phyric lava / intrusive

age	beige
bk	black
chy	cherty
clc	chloritic
df	diffuse
dsd	disseminated
fc	felsic
fe	ferruginous
fg	fine grained
fsp	feldspar
gn	green
gwk	greywacke
gy	grey
hd	hornblende
hem	haematite
hmt	haematitic
ibdd	interbedded
limc	limonitic
lss	lesser
mg	medium grained
msv	massive
mx	matrix
my	moderately
occl	occasional
p	pale
pphc	porphyritic
ppl	purple
py	pyrite
q	quartz
r	rich
serc	sericite
serd	sericitised
sts	schistose
volc	volcaniclastic
vy	variably
wea	weathering
wy	weakly

Geological contact

Outcrop

Float

70 Cleavage

65 Bedding

DD77CC1 EOH 105m Diamond drill hole

EL 10/88

428 000mE

429 000mE

430 000mE

18 600E

19 000E

19 400E

19 800E

20 000E

20 200E

100E

200E

300E

400E

500E

600E

700E

900E

1 000E

1 100E

1 200E

1 400E

4550

4600

5005

5425

LAKE BARRINGTON

CETHANA

LORINNA ROAD

COCKATOO ROAD

MACHINERY CREEK

5 406 000mN

River gravels

5V fc sts fe

5V gwk / 5P gn

5V gwk

5V gwk / 5C chy clasts

5V fc

C106

6SS sts

5V fc / 4T

5V fc / 4T q fsp

C103

5V fc / 4T q fsp

4T serc

5V fc sts

5C chy clast / 5V gwk

5C chy clast

3F

5V fc / 5P

SP red wen

SP gn

4T / 5V

4T q fsp / 5V

4F q fsp pphc

5V fc q

5V fc

4F q pphc

5V / SP serc fc sts fe

SP gn

SP gn w lss ibdd

5V gwk

5C chy clasts

5P gn / 5V gwk

5V / SP fc serc sts fce

SP/4V

5V serc sts

SPB

4F q fsp pphc

4F wy serc

4F wy sld & serc

4F wy serc

6SS/5V fc

SP wpy/6MS?

DD 86CC12 (-55° to 232°)

6SS/5V fc

PD 86CC9

river gravels

5V serc and/or clc

5V clc sts mnst fc

5V wy serc fc

SP clc EOH 190 0m

5V clc sts fe mnst

EOH 106 40m

6SS/5V fc

SP

DD77CC1 (-55° to 045°)

6SS/5V fc

6SS sts / 5V fc sts gossanous vn

6SS/4T sts

6SS sts

5V clc sts fe

SP clc sts fe

5V clc

5V fc clc sts fe

5V fg clc sts fe

6SS/4T sts fe

6SS/4T fc sts

5V fc serc sch

5V fc clc sch

5P clc / lss 5V fc

SP fc clc sts

SP clc sts

SP clc

SP clc

5V fc clc sts

5V fc serc

5V fc clc sts

5V fc gly clc

EOH 229 5m

SP fc sts serc chy

5V fc sts serc

5V fc serc sch

DD77CC2 (-63° to 210°)

5V clc fc sch

5V fc serc sch

5V clc w ibdd 5V

5V clc sch

5V/4T clc q pphc

5V fc clc q r

EOH 164 10m

5V fc clc mott sts

5V fc clc / 5P w dsd py

5P clc w dsd py

SP clc w dsd py

SP lss 5V clc w mn dsd py

5P clc fe

5V fc clc / 5P w dsd py

5V fc my serc w mg q

5V q fsp pphc my serc

5V fc q ph fe sts

5S Ordovician

5C Ordovician

5S Ordovician

5P clc w dsd py

5S Ordovician

5C vy df hem altd and 5P clc

5C Ordo

5C Ordovician

6SS sts / 4T?

5V fc w 5P clast

5V fc wy serc

6SS/4T sts

Tertiary basalts and basal gravels

6SS/4T fsp sts

6SS/4T sts fe

6SS/4T fc my serc sts

msv hem

5V/4T fc sch serc

6SS/4T sts serc

5V fc sts serc

5V fc serc

5V fc sts serc

5V wy clc fc

5V my serc

5V fc clc sts fe

5V clc mott sts

5V sts serc

5V sts serc fe

4F ? serc

DD77CC 3 (- 60° to 208°)

6SS/5V fc

5V clc

5V sts clc

EOH 190 0m

SP clc and ibdd 5V

SP clc

5C df hem

5V sandy

5C w ibdd SP hem

5C scree / Glacials

Roland conglomerate scree - no outcrop

Roland conglomerate scree - no outcrop

Roland conglomerate scree - no outcrop

5V fc

SP / 5V fc

4F q pphc

5V fc my sts and serc

5V gr also 3F ?

5V Ordovician

SP p ppl

Tertiary Basalt

5V mg qr

5C Ordovician

5V fc

5P gn / 5V gwk

3F

3F mg hb?

4F? porf f fc vok

5C/5V w chy sil clasts

4F? porf fc+ 5P fg chy

5V gn gwk

5V gn gwk

3F fg my sts

5V gn gwk

5V cy after fc volc?

SP fg bge slt

5V serc sts q ph volc / 6SS

5V serc sts fe / 6SS

5V serc sts fe / 6SS

5V serc sts fe / 6SS

5V fg gy fc

4T q fsp pphc

5V gn gwk

5P gn

5V gn sts w ocl 5V fc fe

Tertiary Basalt

4F q pphc msv

4F q pphc msv

4F q pphc msv

4F q pphc msv

4F q pphc msv

4F q pphc msv

5V fc

5V fc

5V fc

5C Ordovician

3T

3T

4F q pphc

5V sts serc

5V sts serc fe

5V fc

SP / 5V fc

SP

5V fc

5V fc

5V fc

428 000mE

429 000mE

5 409 000mN

5 408 000mN

5 407 000mN

5 406 000mN

LAKE BARRINGTON

CETHANA ROAD

CETHANA DAM

LAKE CETHANA

LORINNA ROAD

COCKATOO ROAD

PROTECTED AREA BOUNDARY

MACHINERY CREEK

18 600E

19 000E

19 400E

19 800E

20 000E

20 200E

100E

200E

300E

400E

500E

600E

700E

800E

900E

1 000E

1 100E

1 200E

1 300E

1 400E

3075

5425

CETH

EL 10/88

Assay values from 100ppm to 400ppm are represented by 100ppm contours

Where appropriate, 50ppm contours are shown

Assay values from 600ppm to 1000ppm are represented by 200ppm contours

Assay values > 1000ppm are represented by 500ppm contours

Contour values 800 ppm and less

Contour values 1000ppm and over

Soil sample location and number (e.g. 601273)

100% rock sample shown on the soil sample plan, but the assay value has not been taken into consideration for contouring purposes (R)

Grab rock sample (scree or outcrop) location and assay values are given on plan 706-CW-04-1 (X)

No sample (N.S.)

Sample lost (S.L.)

Sample rejected (S.R.)

All assay values, where available, are given in the following order (Cu, Pb, Zn, Ag, Au, Mn)

Unless otherwise shown, all assay values are in p.p.m. All samples were assayed for silver. Assay values 1p.p.m and less are not shown on this plan

Reference: CRAE report 5 (August 1976 - 1977)

In the initial geochemical soil sampling programme, there were stations where the samples consisted of 100% rock chips instead of the usual mixture of clay, silt etc

In the case of lines 1000E to 1300E, nearly all the samples from stations south of the main road consisted of rock chips. These line sections were re-sampled, apparently to collect a representative "soil" sample. The assay values for the re sampled stations are presented on this plan.

The actual locations of most of the re-sampled stations are within 10 metres from the initial sample locations. In a few instances the distances are as large as 17 metres.

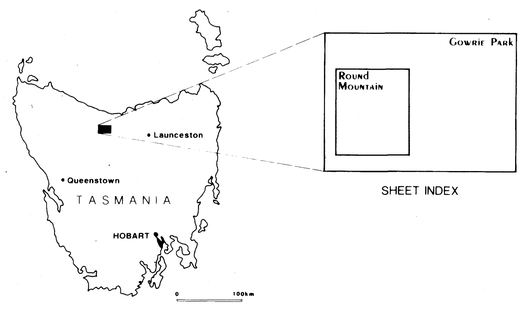
The few soil samples which were collected in the initial sampling over lines 1000E to 1300E south of the main road, are shown in Table 1 below.

On other lines, there are a few instances where a rock chip sample was collected. The assay values for these samples appear on this plan and are marked by the letter "R".

TABLE 1

Grid Co-ordinate	Sample No.	Cu	Pb	Zn	Ag
LINE 1000E					
40S	601362	4	6	12	<1
60S	601363	2	7	6	<1
80S	601364	46	290	115	1
	repeat	41	310	109	2
100S	601365	82	280	138	1
LINE 1100E					
180S	601386	54	630	530	2
	repeat	59	630	540	1
380S	601396	16	210	122	1
LINE 1200E					
60S	601427	6	23	62	<1
100S	601429	8	18	120	<1
120S	601430	5	120	130	<1
140S	601431	28	600	430	1
	repeat	28	630	450	1
160S	601432	7	65	70	1
320S	601440	330	860	800	4
	repeat	360	910	770	3
540S	601451	18	200	320	2
LINE 1300E					
40S	601455	8	70	128	<1
220S	601463	44	93	183	<1
240S	601464	32	300	43	<1

LOCATION MAP



LEGEND

- ROAD SEALED
- ROAD UNSEALED
- RIVER
- GRID LINE
- 3900 — CRAE GRID
- 1300 — NORANDA GRID
- POWER LINE

5 cm

REVIS

TECHNICAL

COMPILED B

CHECKED B

DATE July

SCALE 1:2

428 000mE

429 000mE

430 000mE

LAKE BARRINGTON

18 600E

19 000E

19 400E

19 800E

20 000E

20 200E

20 400E

100E

200E

300E

400E

500E

600E

700E

800E

900E

000E

1 100E

1 200E

1 300E

1 400E

CETHANA

5015

5425

LORINNA ROAD

COCKATOO ROAD

PROTECTED AREA BOUNDARY

MACHINERY CREEK

5 406 000mN

428 000mE

429 000mE

430 000mE

EL 10/88

Reference: CRAE report 5 (August 1976 - 1977)

In the initial geochemical soil sampling programme, there were stations where the samples consisted of 100% rock chips instead of the usual mixture of clay, silt etc.

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LINE 1100E					
180S	601386	54	630	530	2
	repeat	59	630	540	1
380S	601396	16	210	122	1
LINE 1200E					
60S	601427	6	23	62	<1
100S	601429	8	18	120	<1
120S	601430	5	120	130	<1
140S	601431	28	600	430	1
	repeat	28	630	450	1
160S	601432	7	65	70	1
320S	601440	330	860	800	4
	repeat	360	910	770	3
540S	601451	18	200	320	2
LINE 1300E					
40S	601455	8	70	128	<1
220S	601463	44	93	183	<1
240S	601464	32	300	43	<1

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Where appropriate, 50ppm contours are shown

Assay values from 600ppm to 1000ppm are represented by 200ppm contours

Assay values > 1000ppm are represented by 500ppm contours

Contour values 800 ppm and less

Contour values 1000ppm and over

Soil sample location and number 601273

100% rock sample shown on the soil sample plan, but the assay value has not been taken into consideration for contouring purposes R

Grab rock sample (scree or outcrop) location and assay values are given on plan 706-CW-04-1 X

No sample N.S.

Sample lost S.L.

Sample rejected S.R.

All assay values, where available, are given in the following order Cu, Pb, Zn Ag, Au, Mn

Unless otherwise shown, all assay values are in p.p.m. All samples were assayed for silver. Assay values 1 p.p.m and less are not shown on this plan

GOWRIE PARK

SHEET INDEX

TN MN 12.2°

93-3500.

5 cm

SCALE 1:2,500

0 50 100 150 200 250

Scale in metres

97445(

REVISION	PLUTONIC OPERATIONS LIMITED A.C.N. 004 680 997 (INC. IN NSW)
TECHNICAL REPORT NO.	PROJECT: 706 - GOWRIE PARK
COMPILED BY	CETHANA WEST - EL 10/88
CHECKED BY	COMPILATION OF CRAE AND NORANDA SOIL GEOCHEMICAL ASSAYS COPPER CONTOURS
DATE July, 1992 SCALE 1:2500	REFERENCE DWG NO ~~706-CW-04-1~~ 23

428 000mE

429 000mE

5 409 000mN

5 408 000mN

5 407 000mN

5 406 000mN

LAKE BARRINGTON

CETHANA ROAD

CETHANA DAM

LAKE CETHANA

LORINNA ROAD

COCKATOO ROAD

PROTECTED AREA BOUNDARY

MACHINERY CREEK

CETHANA

18 600E

19 000E

19 400E

19 800E

20 000E

20 200E

100E

200E

300E

400E

500E

600E

700E

800E

900E

1 100E

1 200E

1 300E

1 400E

5015

5425

500

0 400

EL 10/88

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In the case of lines 1000E to 1300E, nearly all the samples from stations south of the main road consisted of rock chips. These line sections were re-sampled, apparently to collect a representative "soil" sample. The assay values for the re-sampled stations are presented on this plan.

The actual locations of most of the re-sampled stations are within 10 metres from the initial sample locations. In a few instances the distances are as large as 17 metres.

The few soil samples which were collected in the initial sampling over lines 1000E to 1300E south of the main road, are shown in Table 1 below.

On other lines, there are a few instances where a rock chip sample was collected. The assay values for these samples appear on this plan and are marked by the letter "R".

TABLE 1

Grid Co-ordinate	Sample No.	Cu	Pb	Zn	Ag
LINE 1000E					
40S	601362	4	6	12	<1
60S	601363	2	7	6	<1
80S	601364	46	290	115	1
	repeat	41	310	109	2
100S	601365	82	280	138	1
LINE 1100E					
180S	601386	54	630	530	2
	repeat	59	630	540	1
380S	601396	16	210	122	1
LINE 1200E					
60S	601427	6	23	62	<1
100S	601429	8	18	120	<1
120S	601430	5	120	130	<1
140S	601431	28	600	430	1
	repeat	28	630	450	1
160S	601432	7	65	70	1
320S	601440	330	860	800	4
	repeat	360	910	770	3
540S	601451	18	200	320	2
LINE 1300E					
40S	601455	8	70	128	<1
220S	601463	44	93	183	<1
240S	601464	32	300	43	<1

Assay values from 100ppm to 400ppm are represented by 100ppm contours

Assay values from 600ppm to 1000ppm are represented by 200ppm contours

Assay values > 1000ppm are represented by 500ppm contours

Contour values 800ppm and less

Contour values 1000ppm and over

Soil sample location and number 601273 R

100% rock sample shown on the soil sample plan, but the assay value has not been taken into consideration for contouring purposes

Grab rock sample (scree or outcrop) location and assay values are given on plan 706-CW-04-1 X

No sample N.S.

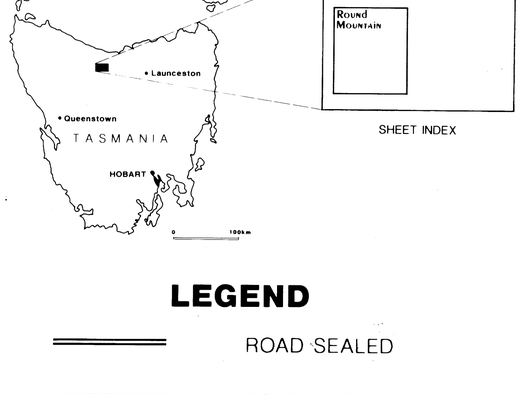
Sample lost S.L.

Sample rejected S.R.

All assay values, where available, are given in the following order Cu, Pb, Zn Ag, Au, Mn

Unless otherwise shown, all assay values are in p.p.m. All samples were assayed for silver. Assay values 1p.p.m and less are not shown on this plan

LOCATION MAP



LEGEND

ROAD SEALED

ROAD UNSEALED

RIVER

GRID LINE

3900 CRAE GRID

1300 NORANDA GRID

POWER LINE

5 cm

428 000mE

429 000mE

430 000mE

5 406 000mN

LAKE BARRINGTON

LORINNA ROAD

COCKATOO ROAD

PROTECTED AREA BOUNDARY

MACHINERY CREEK

CETHANA

18 600E

19 000E

19 400E

19 800E

20 000E

20 200E

20 400E

100E

200E

300E

400E

500E

600E

700E

800E

900E

1 000E

1 100E

1 200E

1 300E

1 400E

5075

5425

Reference: CRAE report 5 (August 1976 - 1977)

In the initial geochemical soil sampling programme, there were stations where the samples consisted of 100% rock chips instead of the usual mixture of clay, silt..... etc

In the case of lines 1000E to 1300E, nearly all the samples from stations south of the main road consisted of rock chips. These line sections were re sampled, apparently to collect a representative "soil" sample. The assay values for the re sampled stations are presented on this plan.

The actual locations of most of the re-sampled stations are within 10 metres from the initial sample locations. In a few instances the distances are as large as 17 metres.

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	repeat	59	630	540	1
380S	601396	16	210	122	1
LINE 1200E					
60S	601427	6	23	62	<1
100S	601429	8	18	120	<1
120S	601430	5	120	130	<1
140S	601431	28	600	430	1
	repeat	28	630	450	1
160S	601432	7	65	70	1
320S	601440	330	860	800	4
	repeat	360	910	770	3
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Assay values > 1000ppm are represented by 500ppm contours

Contour values 800ppm and less

Contour values 1000ppm and over

Soil sample location and number 601273

100% rock sample shown on the soil sample plan, but the assay value has not been taken into consideration for contouring purposes R

Grab rock sample (scree or outcrop) location and assay values are given on plan 706-CW-04-1 X

No sample N.S.

Sample lost S.L.

Sample rejected S.R.

All assay values, where available, are given in the following order Cu, Pb, Zn, Ag, Au, Mo

Unless otherwise shown, all assay values are in p.p.m. All samples were assayed for silver. Assay values 1 p.p.m and less are not shown on this plan

GOWRIE PARK

SHEET INDEX

EL 10/88

93-3500.

TN MN 12°2'

5 cm

SCALE 1:2,500

0 50 100 150 200 250

Scale in metres

974451

REVISION	PLUTONIC OPERATIONS LIMITED A.C.N. 004 680 997 (INC. IN NSW)
TECHNICAL REPORT NO.	PROJECT: 706 - GOWRIE PARK
COMPILED BY	CETHANA WEST - EL 10/88
CHECKED BY	COMPILATION OF CRAE AND NORANDA SOIL GEOCHEMICAL ASSAYS LEAD CONTOURS
DATE July, 1992 SCALE 1:2500	REFERENCE: DWG NO: 706-CW-04-1 24

428 000mE

429 000mE

5 409 000mN

5 408 000mN

5 407 000mN

5 406 000mN

LAKE BARRINGTON

CETHANA ROAD

CETHANA DAM

LAKE CETHANA

LORINNA ROAD

COCKATOO ROAD

PROTECTED AREA BOUNDARY

MACHINERY CREEK

CETH

5075

5125

100E 200E 300E 400E 500E 600E 700E 800E 900E 1 000E 1 100E 1 200E 1 300E 1 400E 18 600E 19 000E 19 400E 19 800E 20 000E 20 200E

EL 10/88

Reference: CRAE report 5 (August 1976 - 1977)

In the initial geochemical soil sampling programme, there were stations where the samples consisted of 100% rock chips instead of the usual mixture of clay, silt.....etc.

In the case of lines 1000E to 1300E, nearly all the samples from stations south of the main road consisted of rock chips. These line sections were re-sampled, apparently to collect a representative "soil" sample. The assay values for the re-sampled stations are presented on this plan.

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180S	601386	54	630	530	2
	repeat	59	630	540	1
380S	601396	16	210	122	1
LINE 1200E					
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120S	601430	5	120	130	<1
140S	601431	28	600	430	1
	repeat	28	630	450	1
160S	601432	7	65	70	1
320S	601440	330	860	800	4
	repeat	360	910	770	3
540S	601451	18	200	320	2
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Assay values from 100ppm to 400ppm are represented by 100ppm contours

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Assay values >1000ppm are represented by 500ppm contours

Contour values 800ppm and less

Contour values 1000ppm and over

Soil sample location and number 601273

100% rock sample shown on the soil sample plan, but the assay value has not been taken into consideration for contouring purposes R

Grab rock sample (scree or outcrop) location and assay values are given on plan 706-CW-04-1 X

No sample N.S.

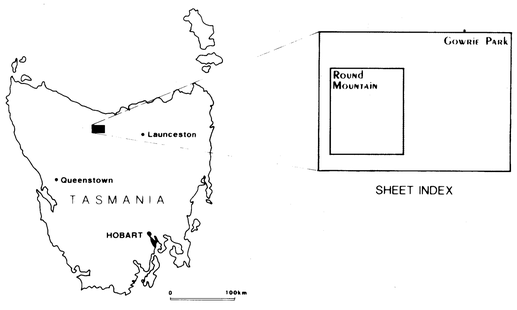
Sample lost S.L.

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Unless otherwise shown, all assay values are in p.p.m. All samples were assayed for silver. Assay values 1p.p.m and less are not shown on this plan

LOCATION MAP



SHEET INDEX

LEGEND

ROAD SEALED

ROAD UNSEALED

RIVER

GRID LINE

3900 CRAE GRID

1300 NORANDA GRID

POWER LINE

5 cm

REV.

TECHNICAL

COMPILED

CHECKED

DATE Ju

SCALE 1:

428 000mE

429 000mE

430 000mE

5 406 000mN

LAKE BARRINGTON

LORINNA ROAD

COCKATOO ROAD

CETHANA

PROTECTED AREA BOUNDARY

MACHINERY CREEK

18 600E

19 000E

19 400E

19 800E

20 000E

20 200E

20 400E

100E

200E

300E

400E

500E

600E

700E

900E

1 000E

1 100E

1 200E

1 300E

1 400E

5125

5075

500

Reference: CRAE report 5 (August 1976 - 1977)

In the initial geochemical soil sampling programme, there were stations where the samples consisted of 100% rock chips instead of the usual mixture of clay, silt.....etc.

In the case of lines 1000E to 1300E, nearly all the samples from stations south of the main road consisted of rock chips. These line sections were re-sampled, apparently to collect a representative "soil" sample. The assay values for the re-sampled stations are presented on this plan.

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LINE 1100E					
180S	601386	54	630	530	2
	repeat	59	630	540	1
380S	601396	16	210	122	1
LINE 1200E					
60S	601427	6	23	62	<1
100S	601429	8	18	120	<1
120S	601430	5	120	130	<1
140S	601431	28	600	430	1
	repeat	28	630	450	1
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320S	601440	330	860	800	4
	repeat	360	910	770	3
540S	601451	18	200	320	2
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240S	601464	32	300	43	<1

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Assay values from 600ppm to 1000ppm are represented by 200ppm contours

Assay values >1000ppm are represented by 500ppm contours

Contour values 800ppm and less

Contour values 1000ppm and over

Soil sample location and number 601273

100% rock sample shown on the soil sample plan, but the assay value has not been taken into consideration for contouring purposes R

Grab rock sample (scree or outcrop) location and assay values are given on plan 706-CW-04-1 X

No sample N.S.

Sample lost S.L.

Sample rejected S.R.

All assay values, where available, are given in the following order Cu, Pb, Zn, Ag, Au, Mn

Unless otherwise shown, all assay values are in p.p.m. All samples were assayed for silver. Assay values 1p.p.m and less are not shown on this plan

GOWRIE PARK

SHEET INDEX

EL 10/88

93-3500.

TN MN 12·2°

5 cm

SCALE 1:2,500

0 50 100 150 200 250

Scale in metres

974452

REVISION	PLUTONIC OPERATIONS LIMITED A C N 004 680 997 (INC. IN NSW)
TECHNICAL REPORT NO	PROJECT: 706 - GOWRIE PARK
COMPILED BY	CETHANA WEST - EL 10/88
CHECKED BY	COMPILATION OF CRAE AND NORANDA SOIL GEOCHEMICAL ASSAYS ZINC CONTOURS
DATE July, 1982 SCALE 1:2500	REFERENCE DWG NO 706-CW-04-5 25

428 000mE

429 000mE

5 409 000mN

5 408 000mN

5 407 000mN

5 406 000mN

LAKE BARRINGTON

CETHANA ROAD

CETHANA DAM

LAKE CETHANA

LORINNA ROAD

COCKATOO ROAD

PROTECTED AREA BOU

MACHINERY CREE

EL 10/88

18 600E

19 000E

19 400E

19 800E

20 000E

100E

200E

300E

400E

500E

600E

700E

900E

1 000E

1 100E

1 200E

1 300E

1 400E

200 R

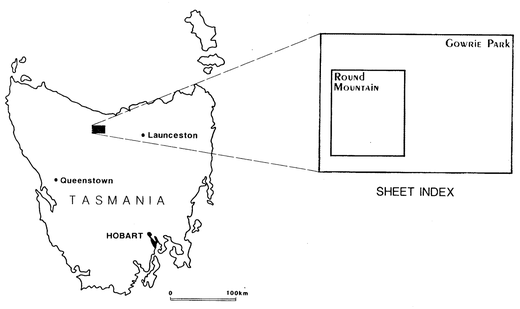
500

5075

5425

4600

LOCATION MAP



LEGEND

- ROAD SEALED
- ROAD UNSEALED
- RIVER
- GRID LINE
- 3900 — CRAE GRID
- 1300 — NORANDA GRID
- POWER LINE

5 cm

Hand written sample Nos refer to samples taken in 1992 to 1993 - cold preRx 501 to all sample NOs.

Grab rock sample (scree or outcrop) location and assay values are given on plan

Rock outcrop chip sample over interval shown

All sample numbers are prefixed by "603"

All assay values, where available, are given in the following order

Unless otherwise shown, all assay values are in p.p.m except for Na_2O which is always shown in percent

Silver assay values of 1p.p.m and less are shown by "–"

In the order of listing above, the position of any element which has not been assayed is left blank

X 217

153

Rock sample collected as part of a soil Geochemical survey

Cu, Pb, Zn, Ag Mn, Na_2O, Ba Sn, As

603143 petrological sample

428 000mE

429 000mE

430 000mE

18 600E

19 000E

19 400E

19 800E

20 000E

20 200E

20 400E

100E

200E

300E

400E

500E

600E

700E

900E

1 000E

1 100E

1 200E

1 300E

1 400E

200

500

5075

5125

2 4600

BARRINGTON

CETHANA

Gowrie Park

ET INDEX

ED

Hand written sample Nos refer to samples taken in 1992 to 1993 - cold prefix S01 to all sample Nos.

Grab rock sample (scree or outcrop) location and assay values are given on plan — X 217

Rock outcrop chip sample over interval shown — 153

Rock sample collected as part of a soil Geochemical survey — R

All sample numbers are prefixed by "603"

All assay values, where available, are given in the following order — Cu, Pb, Zn, Ag, Mn, Na_2O, Ba, Sn, As

Unless otherwise shown, all assay values are in p.p.m except for Na_2O which is always shown in percent

Silver assay values of 1p.p.m and less are shown by "–"

In the order of listing above, the position of any element which has not been assayed is left blank

LORINNA ROAD

5 406 000mN

428 000mE

429 000mE

COCKATOO ROAD

PROTECTED AREA BOUNDARY

MACHINERY CREEK

EL 10/88

TN MN 12·2°

5 cm

430 000mE

SCALE 1:2,500

0 50 100 150 200 250

Scale in metres

974453

REVISION	PLUTONIC OPERATIONS LIMITED A.C.N. 004 680 997 (INC. IN NSW)
TECHNICAL REPORT NO.	PROJECT: 706 - GOWRIE PARK
COMPILED BY: P. Zarzavatjan, G. Mac Donald	CETHANA WEST - EL 10/88
CHECKED BY:	COMPILATION OF CRAE, NORANDA AND PLUTONIC ROCK GEOCHEMICAL ASSAYS
	93-3500.
DATE: July 1992 SCALE: 1:2500	REFERENCE: DWG NO. 26

② UTEM (survey boundaries approximate)
100m lines
25m stations
1450 × 1000m loop
Discussion
Rpt. 3 Appendix I
P.E. 28/2/85
Profiles, filed separately in the large blue hardcover folder
Anomaly positions on this plan are approximate

① IP (CRAE)
Gradient
100m line
20m dipole
20m station
Rpt. 10
1976 - 1977
Dwg No. Tc56

③ IP (SURTEC)
Dipole - dipole
Lines 300E, 500E, 700E
900E, 1100E
50m dipole
Noranda Rpt. 26
Appendix I
Aug. 1990 - July 1991
Plutonic
Aug. 1991 - July 1992

⑥ IP (SURTEC)
See Ⓐ elsewhere on this plan

⑤ IP
Gradient
Rpt. 6 Appendix II
Aug. 1977 - Nov. 1979

④ IP (GEOTERREX)
Dipole - dipole
40m dipole
Rpt. 6 Appendix III
Aug. 1977 - Nov. 1979
Plotted results not legible

⑥ IP (SCINTREX)
10m dipoles
Rpt. 21
Aug. 1977
Rpt. 20
1976 - 1977

② See ② elsewhere on this plan

⑦ MAGNETICS (SCINTREX)
100 & 200m lines
10 & 20m stations
Rpt. 21
Aug. 1977

⑧ IP (SURTEC)
Dipole - dipole
50m dipole
Noranda Rpt. 26
Aug. 1990 - July 1991
Plutonic
Aug. 1991 - July 1992

⑨ UTEM
Lines 19800E, 20 000E, 20 200E, 20 400E, 20 600E
1000 × 800m loop
25m stations
Discussion
Rpt. 3 Appendix I
28 Feb. 1984 - 28 Feb. 1985
Profiles filed separately in the large blue hardcover folder

⑩ —— PEM ——
EM (CRONE)
Separated geometry
100m Tx - Rx separation
50m stations
Rpt 2 (1981 - 1982)
P.4 and Apendix II

⑪ — VLF ——
EM
20m stations
Rpt.2 (1981 - 1982)

Anomaly 36xH
(Rpt 2, 1981 - 1982)

LAKE BARRINGTON

COCKATOO ROAD

LORINNA ROAD

PROTECTED AREA BOUNDARY

MACHINERY CREEK

ETHANA

428 000mE

429 000mE

430 000mE

18 600E

19 000E

19 800E

20 000E

20 200E

20 400E

20 600E

20 800E

21 000E

LOCATION MAP

Gowrie Park

Round Mountain

Launceston

SHEET INDEX

LEGEND

- ROAD SEALED
- ROAD UNSEALED
- RIVER
- GRID LINE
- CRAE GRID
- NORANDA GRID
- POWER LINE

Geophysical survey Jan. 1993
CRONE EM
Loop layout
Ground lines read
DHEM holes read

AIRBORNE DIGHEM II ELECTROMAGNETIC (EM) ANOMALIES

Anomaly — a - depth to source, b - conductance of source

Possible anomaly

GROUND ELECTROMAGNETIC ANOMALIES

UTEM 8 — Anomaly location over a grid line and the channel number at which presence of anomaly is apparent. The smaller the number the more conductive the source.

INDUCED POLARIZATION (IP) ANOMALIES

CHARGEABILITY ANOMALIES

Dipole - dipole — strong, moderate, weak

Gradient — grid line, anomaly axis

ANOMALY IDENTIFICATION NOMENCLATURE

④ CHAR/88/CW5 — grid line; Physical parameter measured/year of survey/grid name abbreviation - anomaly number; survey reference number

Grid name abbreviations
CW Cethana West
CE Cethana East

DOWN-HOLE IP SURVEYS

DD77-CC1 Hole blocked, could not be logged
CC2, CC3 Rpt. 20 (1976 - 1977)

DOWN-HOLE EM SURVEYS

PD84-CC9, PD84-CC10 Rpt. 3 (28/2/84 - 28/2/85) Appendix 3
PD84CC9, DD77CC1, DD86CC13 Jan. 1993 survey this report
DD86-CC12(CC11), DD86-CC13 Rpt. 7 (Feb. '86 - Feb. '87)

DRILL CORE PETROPHYSICS MEASUREMENTS

DD77-CC1, DD77-CC2, DD77-CC3 Chargeability, resistivity, magnetic susceptibility measurements on selected samples Rpt. 20 (1976-1977)

NOTES

1. Grid lines 19000E to 20800E (in part) inclusive shown on this plan are part of a larger grid system that extends eastward and covers the Cethana East area. This grid was apparently established by CRA Exploration Pty Ltd in the initial exploration phase in the Cethana area.

   Grid lines 100E to 1400E were established at a later date and named the "Cethana West" grid.

   The earlier grid extending eastward from 19800E inclusive was named "Cethana East" grid.

   During the present tenure of Plutonic Operations Limited, lines 19800E to 20800E (in part) shown on this plan are to form part of the "Cethana West" grid. However, anomalies recorded over these lines in past surveys conducted by CRA Exploration Pty Ltd will continue to be referred to as Cethana East anomalies (see anomaly identification nomenclature on this plan).

   Anomalies recorded over these lines in future surveys conducted by Plutonic will be labelled as Cethana West anomalies.

2. Drill hole information on this plan have been transferred from plan TASH 2915, report 14993 (report 4).

The following regional surveys cover both the Cethana West and Cethana East grids.

Airborne Electromagnetic/magnetic survey
Dighem Limited
Report 19, July 1981

Aeromagnetic Survey
Mines Department, Tasmania 1987
Interpretation of North Tasmania Aeromagnetic survey
Mt Read volcanics Project Report

Aeromagnetic Survey
Geo Instruments Limited
February 1990
Noranda
Report 25, Appendix 3
August 1989 - July 1990

Gravity Survey
Noranda
Report 25, Appendix 2
August 1989 - July 1990

93-3500.

TN MN 12.2°

5 cm

SCALE 1:2,500

0 50 100 150 200 250
Scale in metres

974454

EL 10/88

REVISION	PLUTONIC OPERATIONS LIMITED A.C.N. 004 680 997 (INC. IN NSW)
TECHNICAL REPORT NO	PROJECT: 706 - GOWRIE PARK
COMPILED BY:	CETHANA WEST - EL 10/88
CHECKED BY:	COMPILATION OF CRAE AND NORANDA GEOPHYSICAL SURVEYS AND PLUTONIC E.M. SURVEY.
DATE: August, 1992 SCALE: 1:2500	REFERENCE: DWG NO: 206-CE-88-1 27

EL 10/88

5 409 000mN
5 408 000mN
5 407 000mN
428 000mE
429 000mE

LAKE BARRINGTON
CETHANA ROAD
CETHANA DAM
LAKE CETHANA
LORIMNA ROAD
COCKATOO ROAD
PROTECTED AREA BOUNDARY
MACHINERY CREEK

① IP (CRAE)
Gradient
100m line
20m dipole
20m station
Rpt. 10
1976 - 1977
Dwg No. Tc56

② UTEM (survey boundaries approximate)
100m lines
25m stations
1450 × 1000m loop
Discussion
Rpt. 3 Appendix I
P.E. 28/2/85
Profiles, filed separately in the large blue hardcover folder
Anomaly positions on this plan are approximate

③ IP (SURTEC)
Diopole - diopole
Lines 300E, 500E, 700E
900E, 1100E
50m diopole
Noranda Rpt. 26
Appendix I
Aug. 1990 - July 1991
Plutonic
Aug. 1991 - July 1992

④ IP (GEOTERREX)
Dipole - dipole
40m dipole
Rpt. 6 Appendix III
Aug. 1977 - Nov. 1979
Plotted results not legible

⑤ IP
Gradient
Rpt. 6 Appendix II
Aug. 1977 - Nov. 1979

⑥ IP (SCINTREX)
10m dipoles
Rpt. 21
Aug. 1977
Rpt. 20
1976 - 1977

⑥ IP (SURTEC)
See ⑥ elsewhere on this plan

② See ② elsewhere on this plan

⑨ UTEM
Lines 19800E, 20 000E, 20 200E, 20 400E, 20 600E
1000 × 800m loop
25m stations
Discussion
Rpt. 3. Appendix 1
28 Feb. 1984 - 28 Feb. 1985
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⑩ PEM
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Separated geometry
100m Tx - Rx separation
50m stations
Rpt 2 (1981-1982)
P.4 and Apendix II

⑪ VLF
EM
20m stations
Rpt.2 (1981 - 1982)

Anomaly 36xH
(Rpt 2, 1981 - 1982)

LOCATION MAP



LEGEND

- ROAD SEALED
- ROAD UNSEALED
- RIVER
- GRID LINE
- 3900 — CRAE GRID
- 1300 — NORANDA GRID
- POWER LINE

5 cm

Geophysical survey Jan. 1993
CRONE EM
Loop layout
Ground lines read
DHEM holes read

AIRBORNE DIGHEM II ELECTROMAGNETIC (EM) ANOMALIES

$^{a}O^{b}$ Anomaly a - depth to source b - conductance of source

O^{x} Possible anomaly

GROUND ELECTROMAGNETIC ANOMALIES

UTEM 8 — Anomaly location over a grid line and the channel number at which presence of anomaly is apparent. The smaller the number the more conductive the source.

INDUCED POLARIZATION (IP) ANOMALIES

CHARGEABILITY ANOMALIES

Dipole - dipole: strong / moderate / weak

Gradient: grid line / anomaly axis

ANOMALY IDENTIFICATION NOMENCLATURE

④ CHAR/88/CW5
- grid line
- survey reference number

Physical parameter measured/year of survey/grid name abbreviation - anomaly number

Grid name abbreviations
CW Cethana West
CE Cethana East

DOWN-HOLE IP SURVEYS

DD77-CC1 Hole blocked, could not be logged

DD77-CC2, CC3 Rpt. 20 (1976 - 1977)

DOWN-HOLE EM SURVEYS

PD84-CC9, PD84-CC10 Rpt. 3 (28/2/84 - 28/2/85) Appendix 3

DD86-CC12(CC11), DD86-CC13 Rpt. 7 (Feb. '86 - Feb. '87)

PD84CC9, DD77CC1, DD86CC13 Jan. 1993 survey this report

DRILL CORE PETROPHYSICS MEASUREMENTS

DD77-CC1, DD77-CC2, DD77-CC3 Chargeability, resistivity, magnetic susceptibility measurements on selected samples Rpt. 20 (1976-1977)

NOTES

1. Grid lines 19000E to 20800E (in part) inclusive shown on this plan are part of a larger grid system that extends eastward and covers the Cethana East area. This grid was apparently established by CRA Exploration Pty Ltd in the initial exploration phase in the Cethana area.

   Grid lines 100E to 1400E were established at a later date and named the "Cethana West" grid.

   The earlier grid extending eastward from 19800E inclusive was named "Cethana East" grid.

   During the present tenure of Plutonic Operations Limited, lines 19800E to 20800E (in part) shown on this plan are to form part of the "Cethana West" grid. However, anomalies recorded over these lines in past surveys conducted by CRA Exploration Pty Ltd will continue to be referred to as Cethana East anomalies (see anomaly identification nomenclature on this plan).

   Anomalies recorded over these lines in future surveys conducted by Plutonic will be labelled as Cethana West anomalies.

2. Drill hole information on this plan have been transferred from plan TASH 2915, report 14993 (report 4).

The following regional surveys cover both the Cethana West and Cethana East grids.

Airborne Electromagnetic/magnetic survey
Dighem Limited
Report 19, July 1981

Aeromagnetic Survey
Nines Department, Tasmania 1987
Interpretation of North Tasmania Aeromagnetic survey
Mt Read volcanics Project Report

Aeromagnetic Survey
Geo Instruments Limited
February 1990
Noranda
Report 25, Appendix 3
August 1989 - July 1990

Gravity Survey
Noranda
Report 25, Appendix 2
August 1989 - July 1990

REVISION	
TECHNICAL REPORT NO:	
COMPILED BY:	
CHECKED BY:	
DATE: August, 1992	REFERENCE
SCALE: 1:2500	

430 000mE

431 000mE

432 000mE

STAVERTON ROAD

Tertiary Basalt

Basalt scree

Tertiary Basalt

5V fc ?

5V gritty sand stg

5V gritty sandy mg sts

20 600E

20 800E

21 000E

21 200E

21 400E

21 500E

21 700E

21 800E

22 000E

22 400E

22 600E

DASHER RIVER

5P bk hmt in patches

3T my serd and wy stg

4F q pphc

5V clc

CLAUDE ROAD

Quaternary glacials / scree

5V fg serc

21 450E

21 600E

21 750E

21 775E

21 900E

22 100E

22 200E

22 300E

OLIVERS ROAD

5V serd

5V serc

5P graphitic?

5V fg serc hmt

5P serc sts

5P chy hmt

5V fc f mg

5P clc msv

5V f mg

5V fc f mg w lmc/hmt pods/vnt

5V fc f mg w hmt vnt'

5V fg lmc

5P chy serc w occ dsd sd

5P chy serc

5P

5P chy serc

5P chy sts w ga py and cp

5P serc sts

5V fg serc

5P chy

5V fg

5P chy serc

4F

5V

5P serc

5V serc clc

5P

5V gritty serc

5P chy

5V fg

5S - Precambrian quartzite

5C Ordo.

Quaternary scree

5C Ordo.

5C Ordo.

No outcrop

77CC8 (-55° to 192°T)

77CC6 (-55° to 192·5°T)

77CC5 (-55° to 192°T)

77CC4 (-58° to 192°T) EOH 164·2m

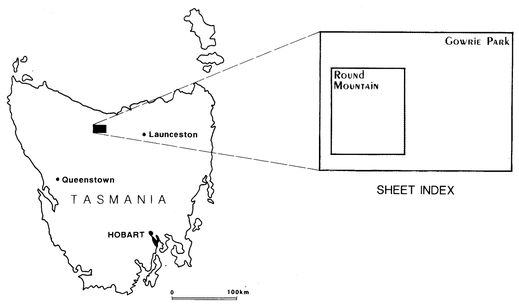
77CC7 (-50° to 192°T) EOH 137·4m

EOH 100·5m

EOH 149·7m

Roland Conglomerate scree

LOCATION MAP



SHEET INDEX

LEGEND

ROAD SEALED

ROAD UNSEALED

RIVER

GRID LINE

3900 CRAE GRID

1300 NORANDA GRID

POWER LINE

5 cm

LEGEND

	Quaternary scree and glacials
	Tertiary basalt and basalt scree
5C	Siliciclastic Roland Conglomerate
5V	Felsic volcaniclastics with fine medium grained to coarse grained quartz eyes occasional lithics and variable pumice
5P	Fine grained rock, creamy and cherty (5P chy), probably derived from vitric tuffs, (5P serc), with fine grained quartz eyes, and (5P black or graphitic)
4LB	Felsic lava breccia – hyaliclastic ?
4F	Felsic lavas
4M	Mass flow dominated by felsic volcanic debris
3T	Plagioclase phyric intermediate tuffs
3I	Intermediate dyke – plagioclase phyric
5S	Precambrian quartzite – fine grained and siliceous

chy	cherty
clc	chloritic
cp	chalcopyrite
fc	felsic
fg	fine grained
fmg	fine to medium grained
ga	galena
gn	green
goss	gossenous
hmt	haematite / haematitic
lmc	limonitic
msv	massive
py	pyrite
q	quartz
serc	sericitic
serd	sericitised
sph	sphalerite
sts	schistose
vn'	veins
vnt'	veinlets
w	with

Fault

Geological contact

Outcrop

Float

70 Cleavage

65 Bedding

77CC4 (-58° to 192°) EOH 149·7m Diamond drill hole

STAVERTON ROAD

431 000mE

432 000mE

5 409 000mN

Tertiary Basalt

Basalt scree

Tertiary Basalt

5V fc ?

5V gritty serd stg

5V gritty serc mg sts

21 000E

21 200E

21 400E

DASHER RIVER

21 500E

21 700E

21 800E

22 000E

22 400E

2700

0

22 600E

2400

0

100E

300E

ROAD

5V clc

Quaternary glacials / scree

22 200E

300

ROAD

OLIVERS

22 300E

22 100E

21 600E

21 750E

21 775E

21 900E

5V fg serc

5V serd

5V serc

5P graphitic?

S01862 - S01866

S01866-867

S01868-873

5P chy hmt

5V fc f mg

5V fc f mg q

5P gn clc

5P clc msv

5P clc mn hmt

5V fc f mg w hmt vnt'

5V fc f mg q w hmt vnt

5V mg w hmt vnt

5V fg w goss vnt'

Roland Conglomerate scree

5V fc f mg w lmc / hmt pods / vn'

5V f mg

5V fg lmc

5V fc f mg q w hmt vnt'

5V fc fg w hmt

5P chy serc

5P chy serc w oc/ dsd sd

5P

5P chy serc

5P serc chy

5P chy sts w ga py and cp

3900

3700

1200

1300

1400

5C Ordo.

5S - Precambrian quartzite

Quaternary scree

5C Ordo.

21 450E

5V

4F

5P serc

5V serc clc

5P

5P chy

5V fg

5P serc

5V gritty serc clc

5V gritty serc

77CC6 (-55° to 192·5°T)

77CC5 (-55° to 192°T)

77CC4 (-58° to 192°T)

77CC7 (-50° to 192°T)

77CC8 (-55° to 192°T)

E.O.H. 137·4m

E.O.H. 164·2m

E.O.H. 149·7m

E.O.H. 100·5m

5V gritty serc clc sts

5V gritty serc py sts

5P serc sts ± clc

5V serc sts ± clc

5V fc altd py

5V fg serc lmc sts

5P chy hmt graphitic sts

5V fg serc hmt

5P chy clc

5P serc sts

5P chy clc sts

5V clc sts

5P chy sts w py

5P chy serc

5P serc sts

5P chy serc

5P chy serc

5P chy serc

5P chy serc

5P serc chy

5P serc chy

5P serc chy

5P serc chy

5V gritty serc sts

5V gritty serc sts

5V w gritty py

5V fg lmc

5V gritty serc sts

5V fg serc lmc sts

5V fc f mg q

5P gn clc

5P clc mn hmt

5V fc f mg q

5V fc

5V fc f mg w lmc / hmt pods / vn'

5V mg w hmt vnt'

5V fc f mg q w hmt vnt'

5V fg w goss vnt'

Roland Conglomerate scree

5V fc f mg q w hmt vnt'

5V fc fg w hmt

5P chy serc

5P chy serc

5P chy serc

5P chy serc

5P chy serc

5P chy serc

5P serc sts

5P chy sts w ga py and cp

3900

3700

1200

1300

1400

5C Ordo.

OLIVERS ROAD

431 000mE

432 000mE

200E

LEGEND

	Quaternary scree and glacials
	Tertiary basalt and basalt scree
5C	Siliciclastic Roland Conglomerate
5V	Felsic volcaniclastics with fine medium grained to coarse grained quartz eyes occasional lithics and variable pumice
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fc	felsic
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fmg	fine to medium grained
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lmc	limonitic
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vn'	veins
vnt'	veinlets
w	with

Fault

Geological contact

Outcrop

Float

70 Cleavage

65 Bedding

77CC6 (-55° to 192°T) EOH 149·7m Diamond drill hole

GOWRIE PARK

SHEET INDEX

ED

ALED

E

P

TN MN 12·2°

5 cm

SCALE 1:2,500

0 50 100 150 200 250

Scale in metres

974455

REVISION	PLUTONIC OPERATIONS LIMITED A.C.N. 004 680 997 (INC. IN NSW)
TECHNICAL REPORT NO.	PROJECT: 706 - GOWRIE PARK
COMPILED BY: G. MacDonald	CETHANA EAST - EL 10/88
DRAWN BY: O. Heddi t ch	GEOLOGY
CHECKED BY:	93-3500.
DATE: July, 1993 SCALE: 1:2,500	REFERENCE: DWG NO: 28

430 000mE

431 000mE

432 000mE

STAVERTON ROAD

20 600E

20 800E

21 000E

21 200E

21 400E

21 500E

21 700E

21 800E

22 000E

22 400E

22 600E

20900E

21 450E

21 600E

21 750E

21 775E

21 900E

22 100E

22 200E

22 300E

CLAUDE ROAD

DASHER RIVER

OLIVERS ROAD

OLIVERS ROAD

2400

2700

3900

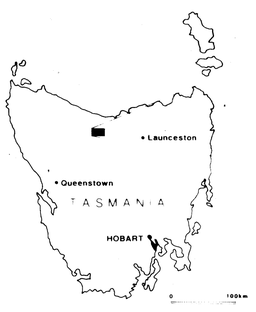
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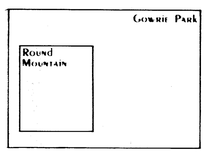
1200

1300

1400

LOCATION MAP





SHEET INDEX

LEGEND

ROAD SEALED

ROAD UNSEALED

RIVER

GRID LINE

3900 CRAE GRID

1300 NORANDA GRID

POWER LINE

5 cm

Results of 1993 soil surveys on lines 22 200E, 22400 E, 22600 E and 20900 E shown on LHS of line – uncontoured

Soil sample location and number — 601273 R

100% rock sample shown on the soil sample plan, but the assay value has not been taken into consideration for contouring purposes

Grab rock sample (scree or outcrop) location and assay values are given on plan 706-CE-04-1 — X

No sample — N.S.

Sample lost — S.L.

Sample rejected — S.R.

All assay values, where available, are given in the following order — Cu, Pb, Zn Ag, Au, t Mn

Unless otherwise shown, all assay values are in p.p.m.

Assay values from 100ppm to 400ppm are represented by 100ppm contours

Where appropriate, 50ppm contours are shown

Assay values from 600ppm to 1000ppm are represented by 200ppm contours

Assay values >1000ppm are represented by 500ppm contours

Contour values 800ppm and less

Contour values 1000ppm and over

TECHN

COMPI

CHECK

DATE

SCALE

STAVERTON ROAD

431 000mE

432 000mE

5 409 000mN

21 000E

21 200E

21 400E

21 500E

21 600E

21 700E

21 775E

21 800E

21 900E

22 000E

22 100E

22 200E

22 300E

22 400E

22 600E

100E

300E

200E

DASHER RIVER

ROAD

OLIVERS ROAD

OLIVERS ROAD

AP

GOWRIE PARK

SHEET INDEX

93-3500.

TN MN

12.2°

5 cm

SCALE 1:2,500

0 50 100 150 200 250

Scale in metres

974456

Results of 1993 soil surveys on lines 22 200E, 22400E, 22600E and 20900E shown on LHS of line – uncontoured

Soil sample location and number 601273

100% rock sample shown on the soil sample plan, but the assay value has not been taken into consideration for contouring purposes R

Grab rock sample (scree or outcrop) location and assay values are given on plan 706-CE-04-1 X

No sample N.S.

Sample lost S.L.

Sample rejected S.R.

All assay values, where available, are given in the following order Cu, Pb, Zn Ag, Au, Mn

Unless otherwise shown, all assay values are in p.p.m.

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Assay values >1000ppm are represented by 500ppm contours

Contour values 800ppm and less

Contour values 1000ppm and over

REVISION	PLUTONIC OPERATIONS LIMITED A.C.N. 009 680 99? (INC IN NSW)
TECHNICAL REPORT NO	PROJECT: 706 - GOWRIE PARK
COMPILED BY	CETHANA EAST - EL 10/88
CHECKED BY	COMPILATION OF CRAE AND NORANDA SOIL GEOCHEMICAL ASSAYS COPPER CONTOURS
DATE July 1992 SCALE 1:2500	REFERENCE DWG NO ~~706-CE-04-1~~ 29

430 000mE

431 000mE

432 000mE

STAVERTON ROAD

20 600E

20 800E

21 000E

21 200E

20900E

21 400E

DASHER RIVER

21 500E

21 700E

21 800E

22 000E

22 400E

22 600E

CLAUDE ROAD

OLIVERS ROAD

21 450E

21 600E

21 750E

21 900E

22 100E

22 200E

22 300E

1200

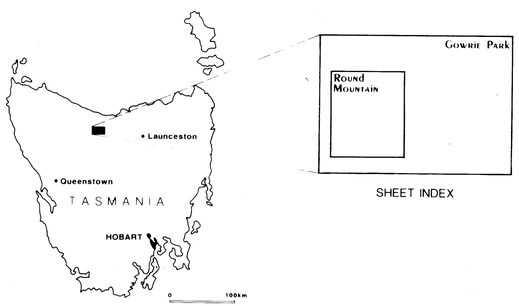
1300

3900

3700

1400

LOCATION MAP



SHEET INDEX

LEGEND

ROAD SEALED

ROAD UNSEALED

RIVER

GRID LINE

3900 CRAE GRID

1300 NORANDA GRID

POWER LINE

5 cm

Results of 1993 soil surveys on lines 22200E, 22400E, 22600E and 20900E shown on LHS of line – uncontoured

Soil sample location and number — 601273

100% rock sample shown on the soil sample plan, but the assay value has not been taken into consideration for contouring purposes — R

Grab rock sample (scree or outcrop) location and assay values are given on plan 706-CE-04-1 — X

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Assay values > 1000ppm are represented by 500ppm contours

Contour values 800ppm and less

Contour values 1000ppm and over

STAVERTON ROAD

431 000mE

432 000mE

5 409 000mN

21 000E

21 200E

21 400E

21 500E

21 600E

21 700E

21 800E

21 900E

22 000E

22 100E

22 200E

22 300E

22 400E

22 600E

100E

200E

300E

DASHER RIVER

ROAD

OLIVERS ROAD

OLIVERS ROAD

Gowrie Park

HEET INDEX

Results of 1993 soil surveys on lines 22200E, 22400E, 22600E and 20900E shown on LHS of line – uncontoured

Soil sample location and number — 601273

100% rock sample shown on the soil sample plan, but the assay value has not been taken into consideration for contouring purposes — R

Grab rock sample (scree or outcrop) location and assay values are given on plan 706-CE-04-1 — X

No sample — N.S.

Sample lost — S.L.

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Assay values from 600ppm to 1000ppm are represented by 200ppm contours

Assay values > 1000ppm are represented by 500ppm contours

Contour values 800ppm and less

Contour values 1000ppm and over

93-3500.

TN MN

12.2°

5 cm

SCALE 1:2.500

0 50 100 150 200 250

Scale in metres

974457

REVISION	PLUTONIC OPERATIONS LIMITED (INC. IN NSW) A.C.N. 004 680 997
TECHNICAL REPORT NO.	PROJECT: 706 - GOWRIE PARK
COMPILED BY	CETHANA EAST - EL 10/88
CHECKED BY	COMPILATION OF CRAE AND NORANDA SOIL GEOCHEMICAL ASSAYS LEAD CONTOURS
DATE July. 1992 SCALE 1:2500	REFERENCE — DWG NO. ~~706-CE-04-1~~ 30

430 000mE

431 000mE

432 000mE

STAVERTON ROAD

20 600E

20 800E

21 000E

21 200E

20 900E

21 400E

21 500E

21 700E

21 800E

22 000E

22 400E

22 600E

22 200E

22 100E

21 900E

21 750E

21 600E

21 450E

DASHER RIVER

CLAUDE ROAD

OLIVERS ROAD

OLIVERS ROAD

3900

3700

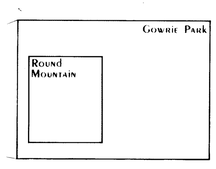
1300

1400

1200

LOCATION MAP





SHEET INDEX

LEGEND

ROAD SEALED

ROAD UNSEALED

RIVER

GRID LINE

3900 CRAE GRID

1300 NORANDA GRID

POWER LINE

5 cm

Results of 1993 soil surveys on lines 22200E 22400E 22600E and 20900E shown on LHS of line - uncontoured

Soil sample location and number — 601273 / R

100% rock sample shown on the soil sample plan, but the assay value has not been taken into consideration for contouring purposes

Grab rock sample (scree or outcrop) location and assay values are given on plan 706-CE-04-1 — X

No sample — N.S.

Sample lost — S.L.

Sample rejected — S.R.

All assay values, where available, are given in the following order — Cu, Pb, Zn, Ag, Au, Mo

Unless otherwise shown, all assay values are in p.p.m.

Assay values from 100ppm to 400ppm are represented by 100ppm contours

Assay values from 600ppm to 1000ppm are represented by 200ppm contours

Assay values > 1000ppm are requested by 500ppm contours

Contour values 800ppm and less

Contour values 1000ppm and over

TECH

COMP

CHEC

DATE

SCALE

STAVERTON ROAD

431 000mE

432 000mE

5 409 000mN

21 000E

21 200E

21 400E

DASHER RIVER

21 500E

21 700E

21 800E

22 000E

22 400E

22 600E

100E

300E

ROAD

21 450E

21 600E

21 750E

21 900E

22 100E

OLIVERS ROAD

22 200E

22 300E

200E

3900

3700

1200

1300

1400

OLIVERS ROAD

431 000mE

432 000mE

AP

GOWRIE PARK

SHEET INDEX

93-3500.

TN MN

12 2°

5 cm

SCALE 1:2,500

0 50 100 150 200 250

Scale in metres

974458

Results of 1993 soil surveys on lines 22200E 22400E 22600E and 20900E shown on LHS of line - uncontoured

Soil sample location and number 601273

100% rock sample shown on the soil sample plan, but the assay value has not been taken into consideration for contouring purposes R

Grab rock sample (scree or outcrop) location and assay values are given on plan 706-CE-04-1 X

No sample N.S.

Sample lost S.L.

Sample rejected S.R.

All assay values, where available, are given in the following order Cu, Pb, Zn, Ag, Au, Mn

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Assay values from 100ppm to 400ppm are represented by 100ppm contours

Assay values from 600ppm to 1000ppm are represented by 200ppm contours

Assay values > 1000ppm are requested by 500ppm contours

Contour values 800ppm and less

Contour values 1000ppm and over

REVISION	PLUTONIC OPERATIONS LIMITED A.C.N. 004 680 997 (INC. IN NSW)
TECHNICAL REPORT NO	PROJECT 706 - GOWRIE PARK
COMPILED BY	CETHANA EAST - EL 10/88
CHECKED BY	COMPILATION OF CRAE AND NORANDA SOIL GEOCHEMICAL ASSAYS ZINC CONTOURS
DATE July 1992 SCALE 1:2500	REFERENCE DWG NO 706-CE-04-5 31

430 000mE

431 000mE

432 000mE

STAVERTON ROAD

DASHER RIVER

CLAUDE ROAD

OLIVERS ROAD

TX Loop 1

TX Loop 2

TX Loop 3

TX Loop 4

⑧ IP (SURTEC)
Dipole-dipole
50m dipole
Noranda Rpt. 26
Aug. '90 - July '91
also
Plutonic
Aug. '91 - July '92

⑦ MAGNETICS
100 & 200m lines
10 & 20m stations
Rpt. 21
August '77

⑥ IP (SCINTREX)
10m dipole
Rpt. 21
August '77
Rpt. 20
'76 - '77

⑩ PEM
EM (CRONE)
Separated geometry
100 Tx - T2x separation
50m stations
Rpt. 2 (1981 - 1982)
P.4 and Appendix II

⑪ VLF
EM
20m stations
Rpt. 2 (1981 - 1982)

⑨ UTEM
Lines 21 100E, 21 300E
21 500E, 21 600E
1000 × 800m loop
25m stations
discussions
Rpt. 3, Appendix 1
28 Feb. '84 - 28 Feb. '85
profiles filed separately
in the large, blue, hard
cover folder

⑦ MMR (SCINTREX)
10m stations
Rpt. 21
August '77

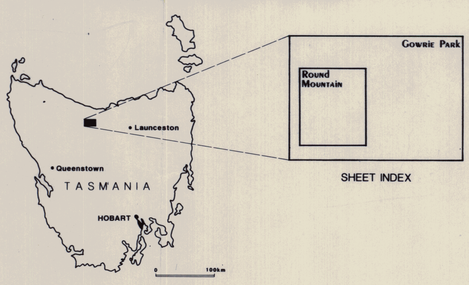
② IP (Geoterrex)
Dipole-dipole
20m dipole
Rpt. 1
Sept '77 - Sept. '79
a/50
Rpt. "An appraisal of past
Geophysical Surveys"
Jan./Feb. '89

⑧ IP (SURTEC)
Lines 21 700E, 21 800E only
See ⑧ elsewhere
on this plan

⑧ IP (SURTEC)
Lines 22 200E, 22 400E
& 22 600E only
See ⑧ elsewhere
on this plan

⑨ UTEM
Lines 22 200E, 22 300E
22 500E, 22 600E,
100E, 200E, 300E, 500E
See ⑨ elsewhere
on this plan

LOCATION MAP



LEGEND

- ROAD SEALED
- ROAD UNSEALED
- RIVER
- GRID LINE
- 3900 — CRAE GRID
- 1300 — NORANDA GRID
- POWER LINE

Geophysical surveys Jan 1993
CRONE EM
Loop layout
Lines read

AIRBORNE DIGHEM II ELECTROMAGNETIC (EM) ANOMALIES
- Anomaly a - depth to source b - conductance of source
- Possible anomaly

GROUND ELECTROMAGNETIC ANOMALIES
- UTEM 8 — Anomaly location over a grid line and the channel number at which presence of anomaly is apparent. The smaller the number the more conductive the source.

INDUCED POLARIZATION (IP) ANOMALIES
CHARGEABILITY ANOMALIES
- Dipole - dipole: strong / moderate / weak
- Gradient: grid line / anomaly axis

ANOMALY IDENTIFICATION NOMENCLATURE
- ④ CHAR/88/CW5 — grid line; Physical parameter measured/year of survey/grid name abbreviation - anomaly number; survey reference number

Grid name abbreviations
CW Cethane West
CE Cethane East

DOWN - HOLE IP SURVEYS
- DD77-CC4, DD77-CC5 — Rpt. 20 (1976 - 1977) Hole blocked, could not be logged

DRILL CORE PETROPHYSICS MEASUREMENTS
- DD77-CC4, DD77-CC5 — Chargeability, resistivity, magnetic susceptability measurements on selected samples Rpt. 20 (1976 - 1977)

NOTES
1. Lines 100E to 500E are part of a grid referred to as "Gowrie Park" grid in CRA Exploration Pty Ltd. reports.
2. Chargeability information relating to survey ⑧, lines 22300E to 22600 and 100E 500E have been transferred from plan TASh 1689, CRAE report 13109 (report 3).
3. Drill hole information on this plan have been transferred from plan TASh 2915, CRAE report 14993 (report 4).

The following regional surveys cover both the Cethana West and Cethana East grids.

Airborne Electromagnetic/magnetic survey
Dighem Limited
Report 19, July 1981

Aeromagnetic Survey
Mines Department, Tasmania 1987
Interpretation of North Tasmania Aeromagnetic survey
Mt Read volcanics Project Report

Aeromagnetic Survey
Geo Instruments Limited
February 1990
Noranda
Report 25, Appendix 3
August 1989 - July 1990

Gravity Survey
Noranda
Report 25, Appendix 2
August 1989 - July 1990

93 -

5 cm

0 50 100

Scale

974459

REVISION	"PLUTONIC ACN 004 680 997
TECHNICAL REPORT NO.	PROJECT: 706
COMPILED BY:	CETHAN
CHECKED BY:	CO CRAI GEOPH AND PL
DATE: August, 1992	REFERENCE:
SCALE: 1:2500	

STAVERTON ROAD

431 000mE

432 000mE

5 409 000mN

⑧ IP (SURTEC)
Dipole-dipole
50m dipole
Noranda Rpt. 26
Aug '90-July '91
also
Plutonic
Aug.'91- July '92

⑦ MAGNETICS
100 & 200m lines
10 & 20m stations
Rpt. 21
August '77

⑥ IP (SCINTREX)
10m dipole
Rpt. 21
August '77
Rpt. 20
'76-'77

20 800E
21 000E
21 200E
21 400E
21 500E
21 700E
21 800E
22 000E
22 200E
22 300E
22 400E
22 600E
100E
200E
300E
500E
21 450E
21 600E
21 750E
21 900E
22 100E

CLAUDE ROAD
DASHER RIVER
OLIVERS ROAD

TX Loop 3
TX Loop 2
TX Loop 4

⑨ UTEM
Lines 21 100E, 21 300E
21 500E, 21 600E
1000 × 800m loop
25m stations
discussions
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& 22600E only
See ⑧ elsewhere
on this plan

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Lines 22 200E, 22 300E
22 500E, 22 600E,
100E, 200E, 300E, 500E
See ⑨ elsewhere
on this plan

DD77-CC4
DD77-CC5
DD77-CC6
DD77-CC7
DD77-CC8
DD77-CC9

CHAR/79/CE1
CHAR/79/CE2
CHAR/79/CE3
CHAR/79/CE4
CHAR/80/CE1
CHAR/80/CE3

CATION MAP

Gowrie Park
Round Mountain
SHEET INDEX

LEGEND

ROAD SEALED
ROAD UNSEALED
RIVER
GRID LINE
CRAE GRID
NORANDA GRID
POWER LINE

Geophysical surveys Jan 1993
CRONE EM
Loop layout
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Geo Instruments Limited
February 1990
Noranda
Report 25, Appendix 3
August 1989 - July 1990

Gravity Survey
Noranda
Report 25, Appendix 2
August 1989 - July 1990

93-3500.

TN MN 12.2°

5 cm

SCALE 1:2,500

0 50 100 150 200 250
Scale in metres

974459

REVISION	PLUTONIC OPERATIONS LIMITED (INC. IN NSW) ACN 004 680 997
TECHNICAL REPORT NO:	PROJECT: 706 - GOWRIE PARK
COMPILED BY:	CETHANA EAST - EL 10/88
CHECKED BY:	COMPILATION OF CRAE AND NORANDA GEOPHYSICAL SURVEYS AND PLUTONIC E.M. SURVEY.
DATE: August, 1992 SCALE: 1:2500	REFERENCE: DWG NO: 706-CE-93-1 32

300S 200S 100S 0 100N 200N 300N

300E 400E 500E 600E 700E 800E 900E 1000E 1100E 1200E

200 240 300 400

974460

93-3500.

PLUTONIC OPS LTD.
GOWRIE PARK E.L. 19/88
STAVERTON
GROUND MAGNETIC SURVEY
1 : 1000

Contoured by
P.A. Zaczynski
Nov. 1992

5cm

fig 33.