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EXPLORATION LICENCE 19/83

MT. MUELLER, TASMANIA

FINAL REPORT

JULY, 1984.

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FIG. 1

Scale 1:1,000,000

5 cm

0 20 40 60 KILOMETRES

Centre	THE BROKEN HILL PROPRIETARY CO. LTD.	Project No.
Melbourne	EL. 19/83, MT. MUELLER, TAS.	T 70
Date	LOCATION MAP	Drawing No.
1-8-84		A4-

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1. INTRODUCTION AND SUMMARY

Exploration Licence 19/83 of 236 square kilometres was granted to the Broken Hill Proprietary Company Limited for 12 months from the 20th November, 1983.

The licence was taken out as a continuation of work done in Exploration Licence 8/79 (Maydena) which lay adjacent to the east. The main exploration target was carbonate-replacement tin mineralisation, though a more broad regional approach was also applied. Most of E.L. 8/79 was relinquished in October 1982, prior to the lifting of the moratorium on exploration in southwest Tasmania.

The work programme carried out in E.L. 19/83 was designed to follow up three unexplained Dighem II anomalies. These were located in an airborne EM survey flown in 1980 over an area of some 160 km^2. Follow up was not possible previously because of the moratorium.

In the recent programme the priority target anomaly was gridded. Ground geophysics was carried out and a significant conductor was detected. The conductor was tested by drilling.

The remaining two anomalies were tested by limited gridding, ground magnetics and soil auger sampling.

The diamond drilling on the Styx grid intersected pyritic, graphitic black shales overlying ultrabasics. This satisfactorily explained the conductivity anomaly. Elsewhere, no positive results were obtained.

The direct testing of defined geophysical anomalies failed to give any encouraging results that might have served to upgrade the overall low regional potential. The difficult terrain and the environmental sensitivity of the area are also relevant in assessing the cost effectiveness of exploration in this region. Based on a combination of these factors it was decided to relinquish the Exploration Licence.

2. GENERAL

2.1 Location and Access

The licence area extends from eight kilometres west of Maydena to Lake Gordon (Fig. 1).

Access to the area is from Australian Newsprint Mills (A.N.M.) Limited roads that join the Gordon River road and the Mueller road.

2.2 Topography and Land Use

The project area includes some very rugged terrain. In much of the country quartz ridges separate steep forested valleys. There are three main drainages, i.e.
The Florentine river to the north,
the Styx river to the south east, and
the Weld river to the south.

The average elevation is about 600 metres. The highest point is Mt. Mueller (1,205 metres) and the lowest point is Lake Gordon (320 metres).

The vegetation is mostly virgin rain forest, and approximately 90 percent of the Exploration Licence lies within the South West Conservation Area. There has been limited logging in the north eastern part of the licence area but there is no current activity.

2.3 Titles

There are no current mining lease titles within the Exploration Licence. However, there has been recent small scale prospecting at Adamsfield.

Immediately adjacent to the licence in the north east are four leases that cover the only known mineralisation in the region. These leases are :

39M/82 Held by D. Heseltine
46M/82)
47M/82) Held by W. Cherrie
48M/82)

They cover the old Mt. Mueller and Humboldt prospects, where sparse chalcopyrite, galena and barite mineralisation is present in veins and fractures. The size potential appears very limited.

2.4 Licence Application (E.L. 19/83)

Following the lifting of the moratorium in April, 1983, ELA 19/83 was pegged on 19th May. The main purpose in re-applying for this ground was to check out Dighem II anomalies disclosed by the 1980 survey outside the western boundary of E.L. 8/79.

Granting of E.L. 19/83 was delayed as various objections were lodged by local Conservation Groups; these were later dismissed by the Warden's Court. Communications were maintained with Conservation Group representatives as to the general outline of our exploration programme, and no further problems were experienced.

Prior to the licence being granted BHP submitted a detailed preliminary programme for approval to the Conservation Areas Mineral Exploration Working Group. This is included in this report as Appendix 2. Fig. 2 shows the main areas of interest as defined at that time. All work carried out during this report period was restricted to the eastern part of the Exploration Licence (Area 1). Fig. 4 shows this area in detail, with the grid locations.

3. RATIONALE

Research work carried out in 1979 led to two licence applications in the Adamsfield-Maydena area. Only E.L. 8/79 was granted, with the remaining application area (E.L.A. 12/79) falling within the South West Conservation Area. On the lifting of the moratorium part of E.L.A. 12/79, and a small portion of E.L. 8/79 were included in E.L. 19/83.

The principal target was a massive sulphide carbonate-replacement tin deposit, and the main technical reasons for selecting the area were as follows :

1) There were unexplained arsenic anomalies in streams around Mt. Mueller.

2) There were unexplained magnetic anomalies in a sequence of rocks containing dolomites.

3) Minor topaz and cassiterite were reported from alluvial osmiridium concentrates at Adamsfield.

4) Old reports suggested trace tin was present in the Styx and Weld rivers.

5) The presence of deep crustal fractures, indicated by linear serpentinites.

6) Known copper/lead mineralisation in the area (Mt. Mueller and Humboldt mines).

7) Rock units equivalent to the Crimson Creek Formation had been identified in the area.

In addition, the Dighem II survey located three anomalies that were comparatively easy to test, thus enabling the rapid upgrading or down grading of the area.

4. REGIONAL GEOLOGY

4.1 Stratigraphy

The oldest rocks in the licence area are a shallow marine mudstone and orthoquartzite sequence of Proterozoic age containing minor carbonates (Calver 1982, Turner 1984). They lie in the southern and south western parts of the licence (Fig. 5).

Unconformably overlying this succession (Calver 1982) are a series of dolomites and dolomitic breccia. The dolomites are bedded, oolitic grainstones to the east, and massive fine grained dolomites in the central part. The dolomitic breccia lies against the south eastern margin of the Florentine synclinorium. These dolomites are probably correlates of the Smithton dolomites in north western Tasmania.

The position of the Humboldt Slate (Carey and Banks 1954, Spry 1962) in relation to this succession is uncertain.

The dolomite is overlain (probably unconformably) by a succession of feldspathic, micaceous wacke, khaki and red mudstone, chert, very minor carbonate and basic volcanics. This unit is Late Proterozoic to Early Cambrian in age. The dating is uncertain as the only fossils found are hydroids on the Scotts Peak Road. This formation marks the beginning of the emplacement of the Adamsfield ultrabasics, as certain beds in the formation contain ultrabasic detritus (N. Turner 1984, pers. comm.).

A Late Middle Cambrian shallow marine succession overlies the previous formation. It is uncertain whether this unit lies above or below the Middle Cambrian unconformity.

Above this lies the Denison Sub-Group, a shallow marine orthoquartzite and mudstone sequence. This is conformably

overlain by the Gordon Sub-Group, a sequence of shallow marine limestones, with minor siltstones and sandstones (Corbett and Banks 1974).

The Wynyard tillite, of the Parmeener Supergroup lies directly above the Permo-Carboniferous unconformity. This, in turn, is succeeded by the Woody Island Siltstone.

In places, the Parmeener Supergroup is intruded by Jurassic dolerite sills. Such a sill forms the cap of Mt. Mueller.

4.2 Structure and Metamorphism

The area contains three structural zones :

The Jubilee block - comprises Proterozoic basement rocks, similar to the Tyennan Geanticline.

The Adamsfield trough - a Cambrian geosyncline largely overlapped by the Florentine Synclinorium.

The Florentine Synclinorium - a broad syncline of Ordovician rocks, formed during the Tabberabberan Orogeny.

Present day structure is largely a product of the Tabberabberan Orogeny. However, evidence for a pre-Denison Sub-Group episode of faulting and pluton emplacement is found in the sheared, ultrabasic complexes of the Adamsfield Trough (N. Turner 1984, pers. comm.).

The regional metamorphic grade is greenschist facies. South of the licence area the grade increases from slate to phyllite (Calver 1982).

4.3 Mineralisation

Alluvial osmiridium has been mined at Adamsfield since the 1920's. The osmiridium was derived from narrow veins in the serpentinites (A. McIntosh-Reid 1925). There are no current commercial operations.

The only other recorded mineralisation is at two prospects immediately north east of the licence - the Mt. Mueller and Humboldt mines. These are copper/lead and barite vein deposits of very restricted size. They are hosted by the Humboldt Slate. The Humboldt Mine was worked for a period as a "gold reward lease" (Twelvetrees 1908) but neither that, or the Mt. Mueller Mine has produced a significant volume of ore. Further examination of the mines (Henderson 1939) indicated very limited extent to the mineralisation. BHP sampling at the mines did not encourage any follow up.

5. HISTORY AND PREVIOUS EXPLORATION

The first available reports on the geology and mineral potential of the region are those by Twelvetrees (1908, 1909), following expeditions to the Gordon River. Lewis (1923) reports further on the regional geology, based on reconnaissance visits to Mt. Anne and the Weld River valley. Henderson (1939) and Hughes (1952) examined mineralisation at the Humboldt and Mt. Mueller prospects. Osmiridium has been mined on a small scale from alluvials at Adamsfield since the 1920's.

The area covered by E.L. 19/83 was included in Lyell Electrolytic Zinc Exploration Proprietary Limited's E.L. 1/59 from 1957 to 1961. From 1964, it was included in, and later was a separate part of, BHP's E.L. 13/65. More recently a portion of the eastern part was held by BHP under E.L. 8/79.

During the Lyell E.Z. and early BHP tenure, exploration effort was directed towards the base metal and asbestos potential. Hence, almost all the exploration during this period was concentrated on the ultrabasics.

An airborne geophysical survey by Lyell E.Z. around Boyes River and Adamsfield township outlined three airborne E.M. anomalies, two on ultrabasics and one west of Adamsfield. They were all ground checked and rejected. A full aeromagnetic survey by BHP (Aero Service 1966) outlined several anomalies which have mainly been ascribed to the presence of the ultrabasic rocks. Two anomalies are possibly connected with dolerite and one occurs on or close to Cambrian acid volcanics.

The Boyes River area, where few outcrops of the ultrabasics occur due to thick talus cover, was mapped and geochemically sampled during the early BHP work programme.

At Adamsfield ground magnetic, E.M. and S.P. surveys, as well as geochemical soil sampling were carried out on the northern-most part of the ultrabasics, with negative results.

The southern part of Adamsfield ultrabasics were subjected to a soil-whole rock geochemical survey, again with negative results.

All the tracks, lines and traverses on the Adamsfield ultrabasics were checked for asbestos mineralisation. A cross fibre and possible slip fibre-bearing zone on the Gordon River Road had four samples submitted for milling and testing. The latter zone did not carry fibre of economic grade or quality. No other locality showed any significant concentration of chrysotile asbestos.

Outside the ultrabasic terrain Cambrian sedimentary rocks were tested for phosphate and Precambrian pelitic schists were tested for basemetal and other elements. No encouraging results were obtained.

More recently BHP's work programme in the area west of Maydena has been covered in the Final report for E.L. 8/79. This included reconnaissance geological mapping, stream sediment and pan concentrate geochemical sampling, and limited rock chip sampling. An airborne Dighem EM survey was flown over an area

of approximately 160 km^2, overlapping westwards into the Conservation Area. All anomalies considered to be worthy of follow-up were located outside the boundary of E.L. 8/79. It was these anomalies that were further examined during the tenure of E.L. 19/83.

6. GEOPHYSICS

6.1 Dighem II Survey

A Dighem II survey was carried out in April, 1980, to aid the search for sulphide-cassiterite replacement type deposits of the Renison style. East-west flight lines were flown, with a line spacing of 250 metres and a mean bird terrain clearance of 30 metres. The area covered is shown in Fig. 2 and a full report on the Dighem survey is attached as Appendix 1.

Interpretation of the results highlighted three main zones of interest characterised by an E.M. anomaly and an associated magnetic response. These areas in Exploration Licence 19/83 were investigated during the 1983/84 work programme.

6.2 EM-37 Survey

The largest Dighem II anomaly - the Styx anomaly - was gridded and an EM-37 survey carried out by Geoterrex Pty. Ltd.

EM-37 is a frequency domain system, using a large Turam-type transmitting loop and a 20-channel mobile receiver. The loop size used in the survey was 600 metres by 300 metres. Seven survey lines were traversed, and two electromagnetic soundings were taken. Full details are provided in Appendix 3.

6.3 Ground Magnetics

The ground magnetic surveys on the three gridded areas were made using two Geoterrex G856 Proton Precession Memory Magnetometers, with a pole height of three metres. The magnetometers automatically record the station values, and the data was unloaded and processed daily using an HP 85 computer.

A report is included in Appendix 4.

7. GEOCHEMISTRY

Although most of the work in the licence was concerned with the previously identified Dighem II anomalies, some results from earlier regional reconnaissance stream sediment and rock chip sampling have been located. Sample locations are plotted in Fig. 6 and analytical results appear in Appendix 5.

A basic statistical analysis was carried out on populations of 36 minus 80 mesh stream sediment samples and 24 rock chip samples. Some of these were collected immediately east of E.L. 19/83 and reported on in the Final Report for E.L. 8/79. Results are presented in Tables 1 and 2.

Steam Sediment Samples

Element	Background Values	Mean Value	Highest Value
Cu	< 10	8	20
Pb	< 15	15	35
Zn	< 50	35	100
Ag	< 2	1	2
Ni	< 15	28	110
Co	< 10	13	25
Cr	< 400	737	1300
As	< 10	5	14
Sb (ppb)	< 50	450	4250
Au (ppb)	< 5	43	570 ?
Sn	< 5	8	20
W	< 10	20	20

Values in ppm unless otherwise stated.

TABLE 1

Rockchip Samples

Element	Background Value	Mean Value	Highest Value
Cu	< 40	30	100
Pb	< 20	33	110
Zn	< 50	99	330
Ag	< 2	3	6
Ni	< 100	762	5600
Co	< 50	60	145
Cr	< 100	160	560
As	< 10	42	480
Sb (ppb)	< 50	350	950
Au (ppb)	< 5	11	25
Sn	< 5	8	10
W	< 10	< 10	< 10
V	< 40	33	70

Values in ppm unless otherwise stated.

TABLE 2

The stream sediment and rockchip surveys produced few positive results, with most of the highest values being only double the mean. The only significantly anomalous results are for nickel and chromium. These, however, occurred over ultrabasics that showed no indication of extensive mineralisation.

During the recent work programme a total of 162 soil auger samples were collected from the grid areas. A 1.5 metre hand auger was used and samples were taken at 30 cm. intervals to bedrock, or as far as could be penetrated. If the deepest sample contained chips of rock, those were sieved and washed for geological examination.

Analyses were carried out by Amdel for tin, tungsten and arsenic by XRF, and for copper, lead, zinc, nickel and chromium by A.A.S. This sampling is considered further elsewhere in the report. Figs. 7-9 show geochemical results for the grid areas.

8. STYX GRID

The Styx grid was located to lie above Dighem anomaly E114. (Appendix 1). It is located approximately 1.5 kilometres west of the eastern licence boundary, and straddles the Mueller road and the H.E.C. powerline (see Fig. 4).

The grid lies on relatively steep, forested terrain. Drainage is southerly, via a major tributary of the Styx. Access to the area is provided by the Mueller road. Previous logging activity has left a series of tracks through the northern and eastern parts of the grid.

The grid was 800 metres EW by 700 metres NS and oriented with one side parallel to the power line. (Figs. 4 and 7). Note the northern line was not used in the detailed surveys and does not appear in Figs. 7 and 8.

Unfortunately the linecutters contracted for this grid proved to be ill-equipped and inefficient, producing a highly inaccurate grid. Because of this, the EM-37 survey was initially unable to position the anomaly accurately. Therefore, after the rough

location of the anomaly was found, the south western part of the grid was re-cut. The whole grid was then surveyed with compass and tape and tie-ins obtained to give the irregular configuration of cut lines as shown in Figs. 7 and 8!

8.1 Geology

The grid area suffers from very poor outcrop. Soils vary in thickness from one to four metres, and stream exposure is limited.

Reconnaissance mapping of the area had indicated a greater extent of Permian cover than actually exists (see Fig. 7). The Permian unit in the grid area is the Wynyard Tillite, and it was initially thought that this overlay the geophysical target anomaly.

The basement is the Late Proterozoic to Early Cambrian feldspathic, micaceous wacke sequence (λ^{pC_E} in Fig. 5). Rock types include feldspathic, micaceous wacke, chert, red and khaki mudstone and black calcareous shale. The lack of outcrop prevents any reasonable structural interpretation.

Drill hole SX1 intersected a steeply dipping shear zone (70^{o}) that contained ultrabasics. Similar structural conditions can be inferred to those existing around the Adamsfield Trough.

8.2 Geophysics

8.2.1. EM-37 Survey

The transmitter loop was laid in a rectangle with the long sides along 1200 E and 1500 E. The loop originally ran from 1300 N to 1800 N, but was later moved to 1200 N to 1700 N in an effort to reduce interference on line 1300 N.

The inaccuracy of the original grid lines meant that the initial survey could not locate the anomaly precisely. After certain lines had been re-cut, a second survey located the precise position of the anomaly.

The presence of the powerline along line 1300 N made it impossible to survey that line, even after moving the transmitter loop.

The survey detected a linear conductive anomaly striking approximately 020° true. The anomaly was located on lines 1600 N, 1500 N and 1400 N, with the strongest responses on lines 1500 N and 1400 N.

The early time responses indicated a flat-lying structure, while the late time responses indicated a steeply dipping body. This was explained when drill hole SX1 intersected flat lying pyritic, graphitic black shales over a steeply dipping shear zone containing ultrabasics.

Further details appear in Appendix 3.

8.2.2. Ground Magnetic Survey

The entire grid was surveyed for ground magnetic response. A station spacing of 25 metres was used over most of the grid. Where the gradient was steep, a station spacing of 5 metres or 10 metres was used. (See Appendix 4 for results and further comments).

8.3 Soil Auger Programme

This was designed to test the portion of the grid overlying the EM anomaly for any geochemical response, and to act as an aid to mapping.

Lines 1300 N, 1400 N and 1500 N were sampled at 25 metre intervals between 1350 E and 1500 E. It was hoped that by comparing the results of lines 1400 N and 1500 N with the results from line 1300 N, further information as to the southerly extent of the anomaly might be gained.

The thickness of the soil cover, and the dry conditions prevented the auger from penetrating to bedrock except on line 1300 N.

The analyses gave uniformly low values for all elements tested (see Table 3 and Fig. 8). It was evident that the conductivity anomaly has no associated soil geochemistry anomaly.

Geochmical Results - Soil Sampling at Styx Grid

Element	Background	Mean	Maximum
Cu	80	73	120
Pb	36	25	36
Zn	70	59	130
Ni	70	66	450
Cr	100	54	170
As	15	11	74
Sn	10	7	18
W	15	9	20

All values in ppm.

TABLE 3

8.4 Drilling

Preliminary arrangements had been made for a short drilling programme in the area before the negative geochemical results were available. In view of the clearly defined strong E.M. anomaly, and its shallow source, it was decided to proceed with one borehole.

Diamond drill hole SX1, located at local grid reference 1450 E, 1500 N was drilled to a total depth of 103 metres. A bombardier-mounted Warman 250 Scout Rig was used and drilling was carried out by Overland Drilling between 28th February and 3rd March, 1984.

Water was pumped from the creek, approximately 400 metres to the east. The hole was started using a blade bit to get through four metres of clay. Once bedrock had been reached, the hole was cored at HQ size to 19.8 metres. The remainder was NQ cored.

The sequence intersected belongs to the Late Proterozoic/ Early Cambrian succession($\overset{PEc}{\lambda}$ in Fig. 5) and the following is a summary log :

Metres

0 - 4.0	Soil and clay
4.0 - 38.5	Grey, pyritic, calcareous, fine sandstone with occasional tuff bands
38.5 - 49.5	Black, calcareous, pyritic, graphitic shales
49.5 - 53.5	Grey fine sandstone (as above)
53.5 - 56.5	Black shales (as above)
56.5 - 72.3	Highly sheared and intermixed sediments and serpentinites
72.3 - 103.0	Serpentinites with occasional red mudstone and rare chert.

Twenty five metres of core from selected depths was sawn, and the half core sent to Amdel for analysis. Petrology samples were also taken from each representative rock type.

Fig. 3 shows the log and analyses in graphic form. Further information is available in Appendices5 (analyses), 6 (drill log), 7 (petrology).

9. MT. MUELLER SOUTH GRID (Fig.8)

The Mt. Mueller South grid was located to test anomaly A115 of the 1980 Dighem II survey. The grid is sited alongside the Mueller road, approximately 3.75 kilometres west of the eastern licence boundary (see Figure 4). A total of 1800 metres of linecutting on two lines was completed.

In the ground magnetic survey, a station spacing of 25 metres was used, except in zones of high magnetic gradient, where the spacing was changed to 10 metres. The magnetic profiles follow the geology closely. The Wynyard Tillite, present in the north of the grid,gave a flat response, while the ultrabasics to the south account for the high response over that part of the grid.

The soil auger programme was designed to sample the magnetically anomalous areas, and to act as an aid to mapping. A hole spacing of 50 metres was used. Soil cover was one to two metres thick. Selected geochemical values are shown on Fig. 9 and the remainder are in Appendix 5.

Outcrop is very sparse, and most geological information comes from the auger samples. The Wynyard Tillite covers the northern half of the grid, and the remainder appears to be ultrabasics sheared into the Late Proterozoic/Early Cambrian sandstone succession.

The magnetic response and the E.M. anomaly are adequately explained by the observed presence of ultrabasics. The soil sampling programme did not discover any significant geochemistry anomalies.

10. STYX WEST GRID (Fig. 9)

This grid is located approximately 1400 metres south of the powerline, and 3.5 kilometres west of the licence boundary (see Fig. 4). It is located on a combined resistivity, electromagnetic, and magnetic anomaly.

A total of 2500 metres of linecutting on two lines was completed. Access to the grid was provided by a flagged walking track from the powerline.

The ground magnetic survey used a station spacing of 25 metres, or 10 metres if there was a high gradient. The profile showed only one major anomaly, over outcropping ultrabasics.

Soil auger samples were taken at 50 metre intervals. Selected geochemical values are shown on Fig. 10 and the remainder are in Appendix 5.

The geology, from west to east, is a dolomite succession, passing into a zone of sheared ultrabasics and sediments. The dolomites are fine grained and massive. There is occasional outcrop along the grid lines.

The ultrabasics adequately explain the EM and magnetic anomalies. The geochemistry is generally uninteresting, except for some anomalous arsenic values (including one sample at 0.42%). As the area has carbonates, ultrabasics and deep crustal shear zones, the potential exists for gold/arsenic mineralisation. Subtle anomalous gold values were detected in certain samples. Further follow up might have been attempted in a less inaccessible and environmentally sensitive area.

11. CONCLUSIONS

A rationale was put forward in 1979 to explore for Renison-style tin mineralisation in the Adamsfield-Maydena region.

The exploration carried out in E.L. 8/79 (Maydena) failed to give positive evidence for the presence of tin in the licence area. Sparse copper-lead mineralisation occurs at the Mt. Mueller prospect but this is obviously very high in the vertical zoning system associated with a presumed underlying granite. There is no evidence of any outcropping granite in the region. Despite these negative factors an airborne Dighem geophysical survey was flown and this did locate anomalies to the west of E.L. 8/79 which we considered required further investigation.

Following the granting of E.L. 19/83, these three anomalies have now been tested with negative results. The regional potential for tin mineralisation now appears to be very poor. Sparse gold values occur but the significance is not known. Overall the region has a relatively low potential for economic mineralisation. The difficult physical exploration conditions and the current environmental and political aspects both negate against further detailed work.

Having satisfactorily explained the geophysical target anomalies a decision was made to relinquish Exploration Licence 19/83.

12. EXPENDITURE

Expenditure debited to E.L. 19/83 was :

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Expenditure debited to Exploration Licence 19/83 was:

Wages and Salaries	15,283
Field Support	3,079
Drilling	7,972
Vehicles	1,988
Equipment	98
Geochemistry	2,350
Geophysics	9,385
Surveys	4,216
Tenement fees	85
Consultants	765
Sundries	221
Services	2,755
Administration & Overheads	4,819
	$53,016

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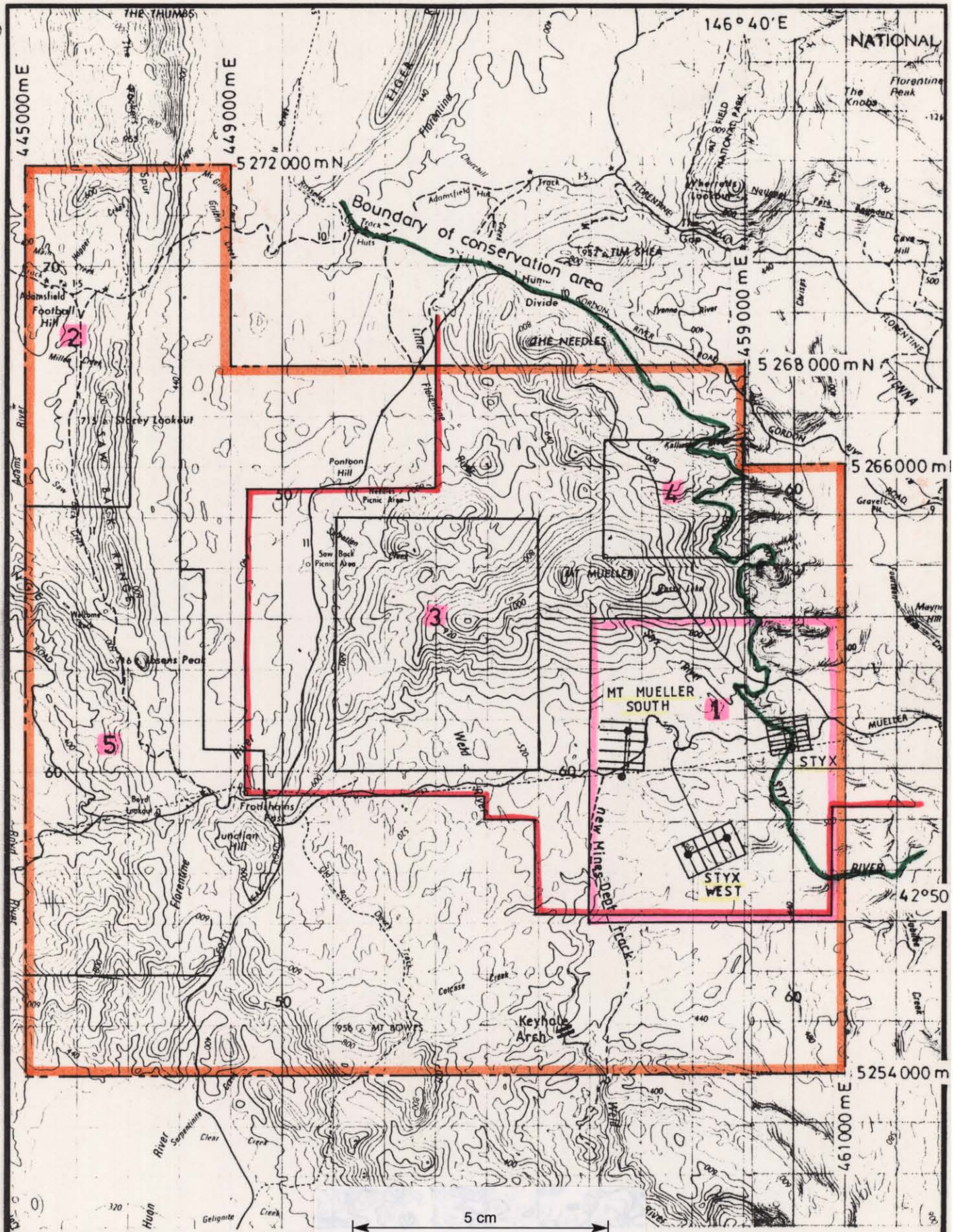
WHYTE, R.K.	1974	Stratigraphic, Structural and Sedimentological Investigations of Cambro-Ordovician Rocks between Maydena and Frodsham's Gap. Hons. Thesis, Univ. of Tas.

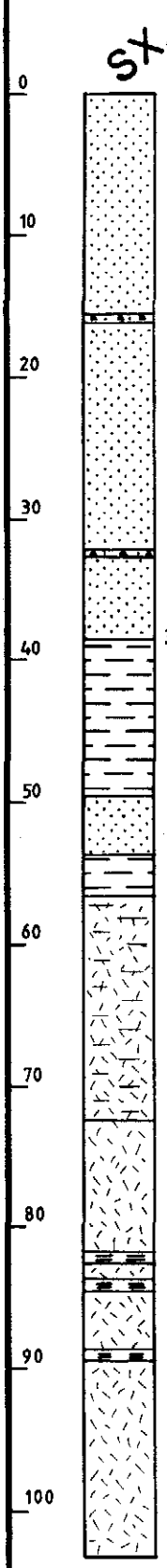
OPEN FILE REPORTS :

WOOD, B.L.	1971	E.L. 3/70 Weld River Area, for Inland Exploration. TMD Open File Rpt. 81/1.
SHIRLEY, J.E. and BOULTER, C.A.	1971	E.L. 3/70 Exploration in the Weld R. area for Inland Exploration. TMD Open File Rpt. 81/2.



Centre HOBART	THE BROKEN HILL PROPRIETARY CO. LTD.	Project No.
Date 27/7/83	Fig. 2 E.L. 19/83 MT. MUELLER MAIN AREAS OF INTEREST	Drawing No.

379030 FIG. 3



TD 103.0 metres

Vertical scale 1:500

SAMPLING ANALYSIS ppm

Sample No	Interval		Cu	Pb	Zn	Ag	Sn	W	As	Au
T70 504	14.0	15.0	100	<5	56	1	8	<10	33	–
T70 505	17.0	18.0	70	6	86	1	<4	15	<2	–
T70 506	25.0	26.0	140	<5	76	1	<4	10	2	–
T70 507	32.0	33.0	76	6	90	2	<4	10	<2	–
T70 508	38.0	39.0	60	6	86	2	12	10	<2	–
T70 509	39.0	40.0	56	6	60	1	10	15	4	–
T70 510	40.0	41.0	96	6	66	1	<4	10	7	<0.01
T70 511	41.0	42.0	66	16	96	1	<4	<10	11	<0.01
T70 512	42.0	43.0	80	16	56	1	<4	10	9	<0.01
T70 513	43.0	44.0	80	16	86	1	8	10	15	<0.01
T70 514	44.0	46.0	110	26	120	1	6	10	15	<0.01
T70 515	46.0	48.0	96	26	120	1	12	10	24	<0.01
T70 516	48.0	50.0	70	16	110	1	10	10	11	–
T70 517	52.0	53.0	90	26	100	1	8	<10	17	–
T70 518	54.0	55.0	80	16	100	1	6	15	12	–
T70 519	59.0	60.0	48	16	86	1	12	10	8	–
T70 520	64.0	65.0	90	10	80	2	8	<10	3	–
T70 521	70.0	71.0	100	6	70	2	8	<10	5	–
T70 522	73.0	74.0	290	26	90	1	12	15	9	–
T70 523	81.0	82.0	330	<5	90	1	4	<10	<2	–
T70 524	87.0	88.0	100	<5	66	1	<4	10	<2	–
T70 525	94.0	95.0	70	20	90	1	<4	10	11	–

See fig.7 for hole location.

5 cm

Centre HOBART	THE BROKEN HILL PROPRIETARY CO. LTD. E.L. 19/83, MT. MUELLER, TAS. – STYX GRID	Project No T70
Date JUNE 1984	DDH. SX. 1 GRAPHIC LOG AND GEOCHEMICAL RESULTS	Drawing No

SCALE 1: 25 000

0 2kms

EL 19/83 boundary

Area 1 (as defined on Fig.2)

contour line (100 m interval)

5 cm

MT. MUELLER

MT. MUELLER SOUTH GRID

STYX GRID

STYX WEST GRID

MUELLER ROAD

TRANSMISSION LINE

WELD

STYX

RIVER

RIVER

1200
1100
1000
900
800
700
600
500
400

03

3790 31

62
61
60
59
58
57
56

5260000mN

460000mE

EL 19/83 MT. MUELLER TASMANIA
GRID LOCATIONS (EASTERN AREA)

FIG. 4

APPENDIX 1

REPORT ON DIGHEM II SURVEY

MAYDENA, TASMANIA

032

379033

REPORT ON DIGHEM II SURVEY

E.L. 8/79, Maydena, TASMANIA

November, 1980

G. Staltari

033

379034

CONTENTS

Summary

Introduction

Discussion of Results

Conclusions and Recommendations

Appendix I

List of Figures

Figure 1 Location plan of survey area

Figure 2 Magnetic map

Figure 3 Resistivity map

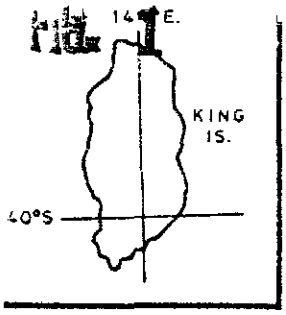
Figure 4 Electromagnetic map

Figure 5 Enhanced magnetic map

Not included in this report.

SUMMARY

The Maydena Dighem^{II} survey, carried out to assist the search for replacement style tin-sulphide deposits, detected three anomalous zones worthy of further attention. Each is characterized by an E.M. anomaly and associated magnetic response consistent with that expected from a significant pyrrhotite-cassiterite assemblage. Ground inspection and possible geochemical/geophysical followup is recommended.



148°E.

FLINDERS
ISLAND

145°E.

41°S

Burnie

Launceston

Zeehan

Queenstown

Adamsfield

Maydena

E.L. 8/79

HOBART

43°S

5 cm

KILOMETRES
0 50 100 150

Centre Melbourne	THE BROKEN HILL PROPRIETARY CO. LTD E.L.8/79 MAYDENA, TASMANIA LOCALITY MAP	Project No.
Date 17-11-80		Drawing No A4-2020

INTRODUCTION

The Maydena-Adamsfield Dighem^{II} survey (Figure 1) was carried out in April, 1980 to aid the search for sulphide-cassiterite replacement type deposits of the Renison style. Survey specifications were:-

1. A flight spacing of 250 metres.

2. Mean bird terrain clearance of 30 metres, and

3. Flight direction east-west.

Field data was compiled and processed in Canada by Dighem Ltd. and final maps and report were received in September, 1980. Analogue data, computer-generated profiles and survey maps have been studied for the purpose of defining areas of possible magnetic-sulphide mineralization.

All features of interest will be referred to by line number and identification letter, e.g. E.M. anomaly 103A, unless otherwise stated.

037

DISCUSSION OF RESULTS

The magnetic map of the survey area (Figure 2) shows a number of broad anomalies such as M2 and M3 which appear to be caused by mafic intrusives and/or serpentinite bodies at depth. They have no directly associated resistivity or E.M. anomalies and a number appear to be flat lying and of limited depth extent.

The resistivity map (Figure 3) shows a number of resistivity lows along the main east-west power line clearing - these are related to cultural interference and have been eliminated from further interest. Note that spurious E.M. anomalies (Figure 4) are also caused by the power line interference.

The Mt. Mueller-south E.M. trend is associated with a linear magnetic anomaly of upto 900 nT intensity and approximately 3km strike length. The likely cause of the magnetic anomaly is a basic intrusive or serpentinite body which has a relatively high conductivity. However, anomaly 115A occurs on the above trend as a distinct conductor - it may occur immediately adjacent to the magnetic unit.

The localized low resistivity anomaly (Figure 3) and associated E.M. anomaly at 114xE (Styx anomaly) indicate a very strong conductor at depth or at some distance from or angle to the flight line. Although no definite magnetic closure is seen on the magnetic (Figure 2) or enhanced (Figure 5) magnetic map, an associated anomaly of about 50 nT intensity can be seen on the profile data.

The styx West group of combined E.M. resistivity and magnetic anomalies occur south of Mt. Mueller-south trend. The style of magnetic response in this area differs from that over the interpreted large mafic/ultramafic bodies. Anomalies 1, 2 and 3 may be caused by discrete mafic/ultramafic plugs of relatively high conductivity due to increased weathering, or by magnetic sulphide zones.

The remaining weak E.M. anomalies which occur in the vicinity of Mt. Mueller, appear to be related to rock conductivity changes and possible aerodynamic noise.

CONCLUSIONS AND RECOMMENDATIONS

The Maydena Dighem survey has resulted in the detection of three main zones which are considered worthy of further attention:-

(i) The Mt. Mueller-South trend,

(ii) The Styx anomaly, and

(iii) The Styx-West group of anomalies.

The Styx anomaly should be given the highest priority for followup - its profile character suggests that its source may be at depth (>50m?). The Mt. Mueller-South trend appears to relate to a near surface magnetic unit. Ground inspection and possible ground geochemical/geophysical followup is strongly recommended for (i) and (ii). The Styx-West group of anomalies may be followed up by ground inspection as the magnetic profile indicate shallow depth or outcrop of magnetic units.

040

379041

APPENDIX 1

Dighem Ltd., Adamsfield

Survey Report

Adamsfield Area

The survey area is characterized by resistivities which vary from less than 30 ohm-m to in excess of 1000 ohm-m. Relatively extensive zones of resistivities less than 250 ohm-m can be readily recognized in the central and southern parts of the flight block. They reflect conductive bedrock and overburden features, as well as cultural sources.

The resistivity anomaly in the southern part of the block, which extends from 103A to 105xB, reflects conductive material which may occur at depth. Anomaly 105A indicates a bedrock conductor which occurs on the flank of a magnetic high. Contrary to the resistivity map, the magnetic maps indicate that this conductor has a separate source from 103A-105xB. Anomaly 106A appears to reflect a magnetic bedrock conductor, which according to the resistivity patterns may constitute a northeasterly extension of 105A.

The localized low resistivity anomaly centered at 114xE is of particular interest as it appears to reflect a bedrock conductor at depth. The EM traces indicate that the bird flew at a low angle to this conductor.

The resistivity anomaly in the central part of the survey area reflects a bedrock conductor at depth (note the apparent depth channel 41 on lines 112 to 116). It appears to be a flat lying conductor which has produced anomaly 115A. The EM responses indicate an excellent conductor to be present, although the 2584 mho conductance seems to be overestimated.

Other EM and resistivity anomalies appear to be caused by surface and cultural features.

The magnetic maps indicate that bodies of close to north-south strike are present in the survey area.

Respectfully submitted,

DIGHEM LIMITED

D.C. Fraser
President

Z. Dvorak
Geophysicist

ZD/ls

Twelve map sheets accompany this report:

Electromagnetics	3 map sheets
Resistivity	3 map sheets
Magnetics	3 map sheets
Enhanced magnetics	3 map sheets

044

379045

303 AREA H BHP ADAMSFIELD APR/80

LINE & ANOMALY	STANDARD COIL REAL PPM	STANDARD COIL QUAD PPM	WHALETAIL COIL REAL PPM	WHALETAIL COIL QUAD PPM	VERTICAL DIKE COND MHOS	VERTICAL DIKE DEPTH* FEET	HORIZONTAL SHEET COND MHOS	HORIZONTAL SHEET DEPTH FEET	CONDUCTIVE EARTH RESIS OHM-M	CONDUCTIVE EARTH DEPTH FEET
103A	6	17	9	33	2	0	1	87	140	0
105A	4	5	6	8	5	90	1	372	85	218
106A	4	3	2	3	7	117	2	484	66	342
110B	0	0	0	0	6	134	1	702	1034	0
111B	1	10	1	9	1	27	1	191	741	15
111C	1	36	6	60	1	0	1	19	431	0
111D	2	2	3	2	6	99	2	554	47	406
112A	4	2	0	1	16	147	3	604	21	484
113A	3	16	3	25	1	0	1	99	293	0
113B	0	0	4	6	3	81	1	445	407	149
113C	0	0	9	1	7	79	3	586	19	469
115A	5	0	3	0	2584	238	6	617	7	525
115B	1	1	6	3	15	210	3	670	22	550
122A	1	7	1	11	1	0	1	177	705	0
122B	4	22	9	42	2	0	1	85	173	0
123A	1	6	1	8	1	37	1	240	635	33

* ESTIMATED DEPTH MAY BE UNRELIABLE BECAUSE THE STRONGER PART OF THE CONDUCTOR MAY BE DEEPER OR TO ONE SIDE OF THE FLIGHT LINE, OR BECAUSE OF A SHALLOW DIP OR OVERBURDEN EFFECTS.

045

379046

303 AREA H BHP ADAMSFIELD APR/80

LINE & ANOMALY	STANDARD COIL REAL PPM	STANDARD COIL QUAD PPM	WHALETAIL COIL REAL PPM	WHALETAIL COIL QUAD PPM	VERTICAL DIKE COND MHOS	VERTICAL DIKE DEPTH* FEET	HORIZONTAL SHEET COND MHOS	HORIZONTAL SHEET DEPTH FEET	CONDUCTIVE EARTH RESIS OHM-M	CONDUCTIVE EARTH DEPTH FEET
125C	1	12	0	15	1	8	1	114	929	0
125D	4	10	0	25	1	35	1	178	295	40
126A	2	9	2	14	1	0	1	99	385	0
127A	4	3	1	2	6	160	1	526	80	368
1271C	4	19	3	21	1	0	1	108	250	0
128A	2	59	4	114	1	0	1	14	299	0
128B	2	22	3	40	1	0	1	33	475	0
1280B	1	37	1	51	1	27	1	31	452	0
1280C	15	25	0	40	4	63	1	195	99	90
1280E	4	58	2	76	1	0	1	30	340	0
1280F	24	50	6	102	3	7	1	108	75	24
130A	1	5	0	2	1	11	1	338	874	7
149A	2	7	2	11	1	36	1	224	358	57

* ESTIMATED DEPTH MAY BE UNRELIABLE BECAUSE THE STRONGER PART OF THE CONDUCTOR MAY BE DEEPER OR TO ONE SIDE OF THE FLIGHT LINE, OR BECAUSE OF A SHALLOW DIP OR OVERBURDEN EFFECTS.

APPENDIX 2

MT. MUELLER E.L.A. 19/83

PROPOSED PROGRAMME

As presented to Conservation Areas
Mineral Exploration Working Group
23/9/83

047

MT. MUELLER E.L.A. 19/83 - PROPOSED PROGRAMME

379048

The Broken Hill Proprietary Company Limited proposes to carry out a staged exploration programme, with the results of each stage being evaluated prior to commencing the next phase of activity.

Areas 1 to 5 in Fig. 1 define broad areas of interest within the licence area, based on known geology and the presence of unexplained geophysical anomalies. We are only proposing to work in Area 1 during the first year. Possible future work in the other designated areas is too hypothetical to put forward at the present time. Unless highly significant mineralisation is located within the defined areas we are very unlikely to do any exploration work elsewhere in the licence area.

STAGE 1 (Area 1) 1983/84 Field Season

1. Surveying

Planned lines shown in Fig. 2 (highlighted orange)

Staff - **2 or 3 contract fieldhands**

Details - Cutting of access lines and grid lines from existing tracks. Tape and compass surveying, with grid lines staked at 25 metre intervals with bush pegs and labelled with aluminium tags. Clearing by means of machetes, axes and small chainsaws so as to clear a line not more than one metre wide. All trees over 15 cm diameter to be skirted. Flagging tape used to mark lines - to be recovered prior to abandoning area. Line cutters to be able to recognise sensitive vegetation (e.g. King William pines) and avoid causing damage.

Total - 13 line kilometres

048

2. Geological Mapping and Rock Chip Sampling

Ground examination of Mt. Mueller South and Styx West areas when access has been established.

Collection of chips of rock from existing exposures for geochemical analysis and/or petrological description. Samples taken by use of geologists pick, up to 20 samples per area, up to 5 kg weight per sample.

3. Soil Sampling

Collection of C-horizon soil samples by means of hand-held 2-stroke power auger. Depth range 1/2-5 metres, hole diameter approximately 8 cms. Logging of soil profiles and examination of weathered rock chips.

Sampling to be done along grid lines - exact sites will depend on ground examination and visible geology. Sample size ~ 2 kg.

4. Geophysics

Initial work on the Styx anomaly to consist of ground EM and magnetics. Geonics EM-37 unit to be used - equipment includes receiver, portable motor generator and wire loops to be laid out along cut lines.

Ground magnetic data to be collected using a hand-held proton magnetometer. EM surveying to be supervised by 2 contract technical personnel. 2 fieldhands to assist with EM work and carry out ground magnetic surveying. All wire etc. to be removed on completion of survey.

5. Drilling

One borehole planned for Styx anomaly, dependent upon results of geophysical survey. Site will not be more than 150 metres from existing roads.

049

For access a dozed track 3 m wide will be required, plus a cleared area for the site of approximately 12 metres square.

Dual capacity rig to be selected (percussion/diamond drilling) with depth capability of 300 metres.

Rig selection dependent on anticipated depth, quotes etc. For similar work in other licence areas we have used a Warman 250 Scout track-mounted rig (top-drive hydraulic) with a high-pressure compressor and auxiliary mud pump. Total weight of truck and compressor approx. 10 tonnes.

Small mud sump to be dug - 3 m x 2 m x 2 m deep. Water to be pumped from nearest creek.

Staff - 2 operators per shift (may be double shift work) plus field supervisor if necessary.

Miscellaneous

Staff - For geological/technical work the BHP Hobart summer field season staff of 1 senior geologist, 2 junior geologists and 2 field assistants will be employed as required on different aspects of the work.

Tracks - No new vehicle roads or tracks are planned, other than to provide access to the possible drill site on the Styx anomaly. Mines Dept. regulations require that we get further permission prior to constructing this access. Site inspection by interested parties could be made as desired.

Timing - Provisional timing of the 1983/84 exploration programme is as follows:-

October 1983 - Surveying/Line cutting
Nov-Dec - Geological, soil sampling, ground geophysics
February 1984 - Drilling of borehole on Styx anomaly (if warranted)

050

Accommodation - No camping within the licence area. All personnel (line cutters, technical staff, drillers) to travel daily to site from Maydena or National Park.

Fire - Adequate precautions to be observed.

STAGE 2 (Area 1)

Further coverage of the Mt. Mueller South and Styx West anomalies may involve additional line cutting as shown in Fig. 2. This is dependent on results from Stage 1, but is outlined here so that we can proceed immediately with this work given some encouragement.

Surveying - Procedures as for Stage 1
13.5 line kms

Geological mapping and Rock chip sampling - limited additional work made possible by further line cutting

Soil sampling - Possible additional coverage on cut lines only

Geophysics - Possible EM-37 and ground magnetics coverage over the new gridded areas

If the above work leads to further drilling, details will be submitted for approval once targets have been delineated.

Attachments:

Fig. 1 ELA 19/83, Mt. Mueller, Main Areas of Interest (Fig 2 Final Report)
Fig. 2 Proposed Work Programme, Area 1 (Fig 4 Final Report)

APPENDIX 3

EM 37 SURVEY DATA

052

GEONICS LIMITED

EM37 Ground Transient Electromagnetic System
Technical Specifications

Transmitter

Current Waveform	-	See Fig. 1
Repetition rate	-	3Hz or 30Hz in countries using 60Hz power line frequency; 2.5Hz or 25Hz in countries using 50Hz power line frequency; all four base frequencies are switch selectable.
Turn-off time (Δt)	-	fast linear turn-off of maximum 300 μsec. at 20 amps into 300x600m loop. Decreases proportionally with current and (loop area)$^{\frac{1}{2}}$ to minimum of 20 μsec. Actual value of Δt read on front panel meter.
Transmitter loop	-	any dimensions from 40x40m to 300x600m maximum at 20 amps. Larger dimensions at reduced current. Transmitter output voltage switch adjustable for smaller loops. Value of loop resistance read from front panel meter; resistance must be greater than 1 ohm on lowest voltage setting to prevent overload.
Transmitter protection	-	circuit breaker protection against input overvoltage; instantaneous solid state protection against output short circuit; automatically resets on removal of short circuit. Input voltage, output voltage and current indicated on front panel meter.
Transmitter output voltage	-	150 volts (zero to peak) maximum; 20 volts (zero to peak) minimum
Transmitter output power	-	2.8 kw maximum
Transmitter wire supplied	-	1800m. #10 copper wire PVC insulated with nylon jacket; transmitter wire contained on 6 reels (supplied); 2 reel winders supplied.
Transmitter motor generator	-	5 HP Honda gasoline engine coupled to 120 volt, 3 phase, 400Hz alternator. Approximately 8 hours continuous operation from full (built-in) fuel tank.

Receiver

Measured quantity	-	time rate of decay of magnetic flux along 3 axes.
Sensor	-	air-cored coil of bandwidth 40 kHz; 100cm dia. by 7x5cm cross-section. Coil holder supplied to facilitate measurement along 3 axes.
Time channels	-	20 time channels with locations and widths as shown in Fig. 2. Successive operation at 30Hz, then 3Hz, effectively gives 30 channels covering range from 80 μsec. to 80 msec.
Output display	-	4 digit plus sign LED display; display also shows channel number and gain.
Integration time	-	2^n cycles at 30Hz; n=4,6,8,10,12,14 (switch selectable); similar integration times at other base frequencies.
Receiver output noise referred to input	-	typically 1.5×10^{-10} volt/m^2 at last gate at 30Hz with integration time of 34 seconds. Noise will be higher during intense local spherics activity.
Output connector	-	all 20 channels in analogue format and housekeeping functions in digital format available from output connector.
Synchronization to Tx	-	any of the following (switch selectable) (1) reference cable (2) primary pulse (3) 27 MHz radio link (40 channels) (4) high stability (oven controlled) quartz crystals.
Noise rejection circuitry	-	Selective clipping of atmospheric noise pulses at all times. Audio output of Rx coil (transmitter pulse blanked out) is available on built-in loud speaker for ready identification of interference.
Receiver batteries	-	12 volt rechargeable Gel-cell; 9 hours continuous operating time at 17°C. Two batteries and a battery charger supplied to permit charging of second battery from transmitter motor-generator during survey.

Component Dimensions

Transmitter console	25x42x36 cm
GPU	35x74x48 cm
Wirewinder	42x38x35 cm each (2 off)
Wire reels (20 amp)	33x31(dia.)cm each (6 off)
Receiver console	38x37x27 cm
Receiver coil	100 cm dia. 7x5 cm cross-section

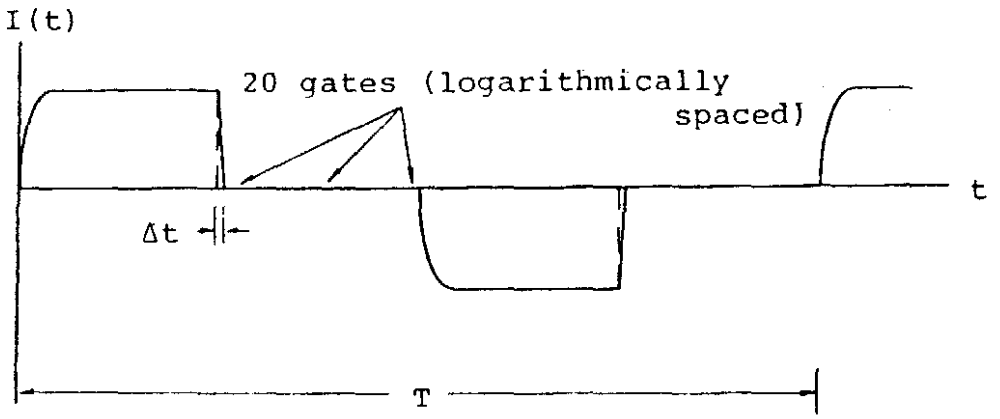
Component Weights

Transmitter console	20 kg
GPU	60 kg
Wirewinders and loaded reels (20 amp)	120 kg (total)
Receiver console (incl.20 amp-hour battery)	21.8 kg
Receiver coil	8.0 kg

Shipping Information

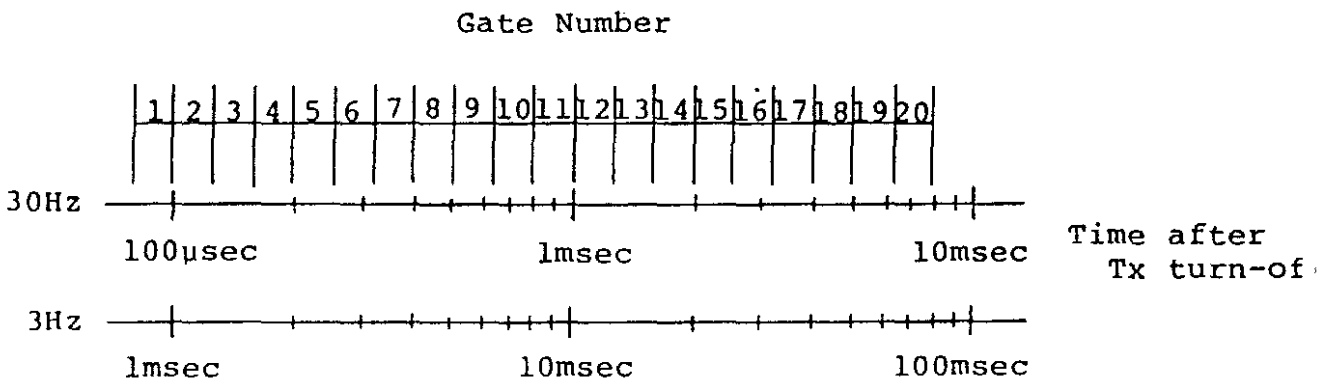
Shipment consists of 5 boxes

Two wire boxes	116x62x48 cm @ 186 kg (total)
GPU box	96x61x73 cm @ 90 kg
Receiver/transmitter box	96x75x73 cm @ 86 kg
Receiver coil/coil-holder box	110x110x20 cm @ 34 kg
Total shipping volume	1.90 cubic metres
Total shipping weight	390 kg



Transmitter Current Waveform

FIG. 1



Gate Location and Widths (30 and 3Hz)

FIG. 2

EM-37 PLOTTING AND INTERPRETATION CONVENTIONS

057

The Geoterrex fixed-loop time-domain convention system has been designed with consistency in mind. Given the great diversity of grid and loop orientations, it is most important that anomalies are of a predictable shape.

To fully understand the convention, four basic rules must be laid down:

1) The vertical primary field (Z component) is positive within any loop. To be consistent with a Cartesian co-ordinate system, the Z^+ direction is defined as 'up', i.e. the field vectors point up within the loop and down when outside the loop.

2) The X component is defined as that which points along the grid lines. Depending upon which direction the lines run, W or S is defined as X^+.

3) Using a right hand orientation where X^+ is direction of the middle finger, and Z^+ is the direction of the thumb, then Y^+ is the direction defined by the index finger.

4) North or East is always plotted to the right on the page.

With these four rules, the shapes of the half space responses for late times for all three components are uniquely defined as shown in Figures 1, 2, 3a and 3b.

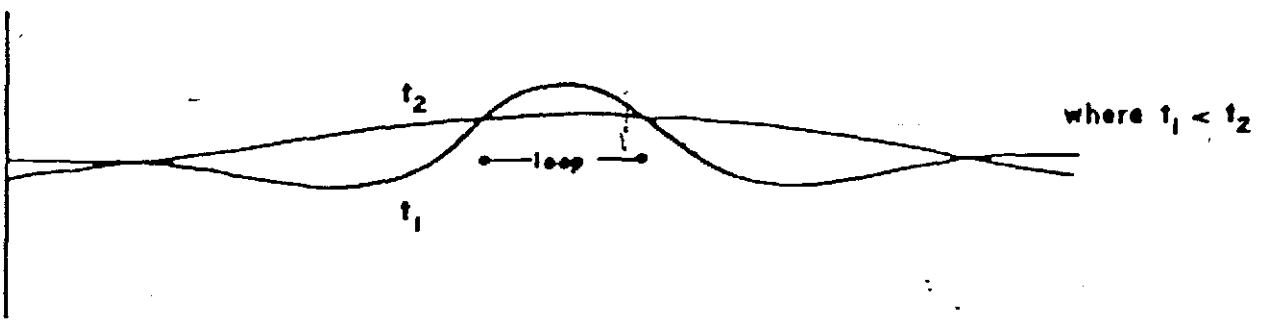


Fig. 1 Half-space response : Z component

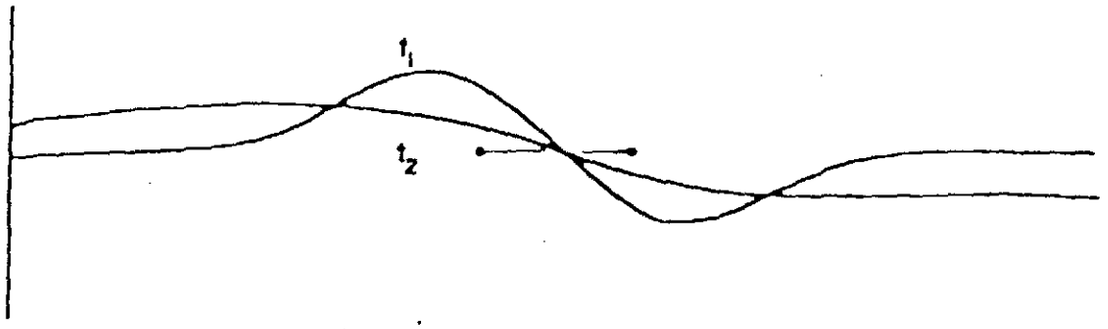


Fig. 2 Half-space response : X Component

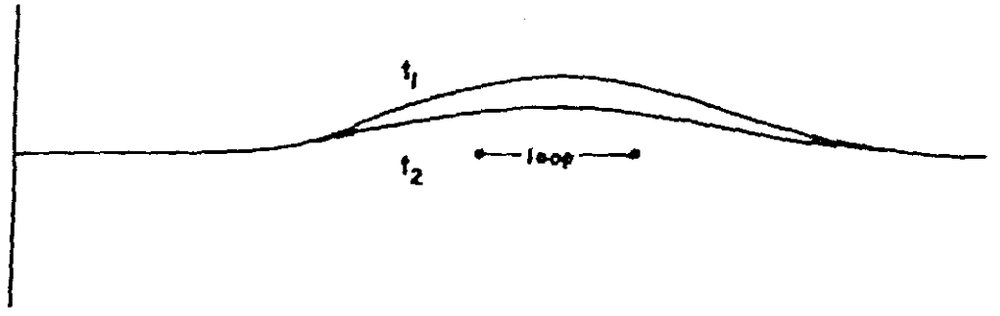
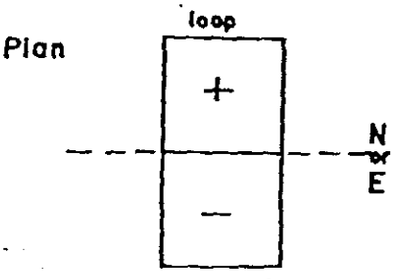


Fig. 3(a) Half-space response : Y component
(Positive half of loop)



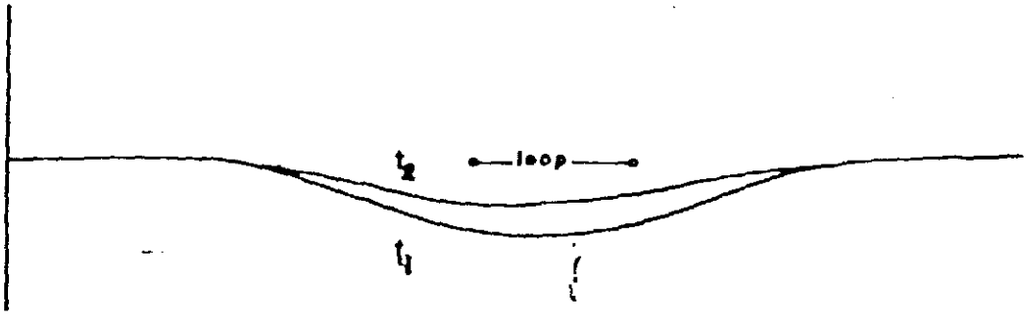


Fig. 3(b) Half-space response : Y component
(Negative half of loop)

Note: Unlike the Z component, there is only one maxima or minima for the Y component for a homogeneous half-space.

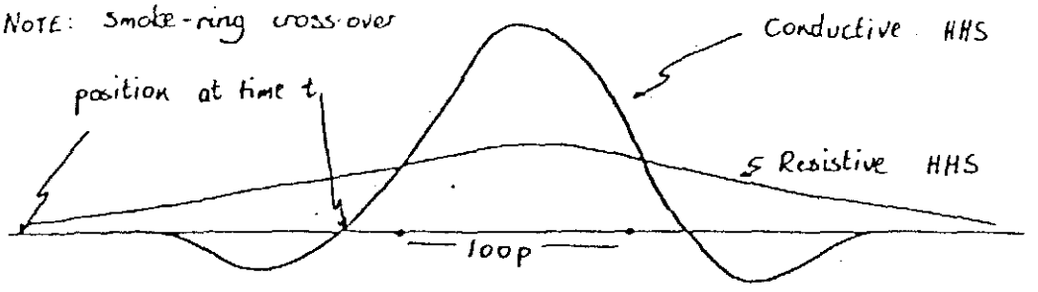


Fig 4. Comparison of conductive and resistive homogeneous half-space responses for Z-component.

A conductive homogeneous half-space is characterised by an early channel high amplitude response with a slow migration of the smoke-ring crossover from the loop.

By comparison, a resistive HHS will exhibit a lower early channel amplitude response and a rapid migration of the smoke-ring.

Note that the rate of decay of the channel amplitude responses for both conductive and resistive HHS is the same, and is proportional to t.exp (-5/2).

The migration of the smoke-ring determines the detection of a conductor with respect to time and space. For example, a conductor located beyond the smoke-ring in a relatively conductive environment will not be energised by intermediate times but may be evident at late times if the smoke-ring has passed beyond it. In short, only conductors within the limits of the smoke-ring at a given time can possibly be detected.

Confined Conductor Responses

The response due to a confined conductor is closely related to the aforementioned half-space responses and to the conductor's position with relation to the loop. Figures 5, 6, 7a and 7b show the responses for a vertical plate.

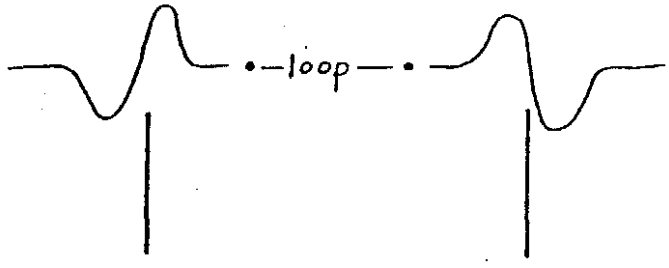


Fig. 5 Vertical conductor: z component

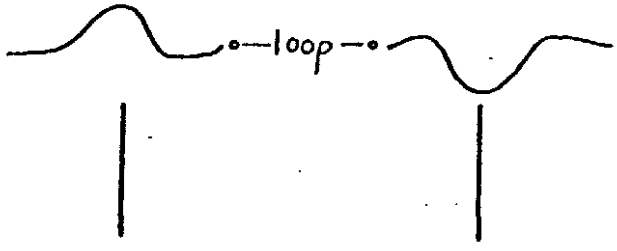
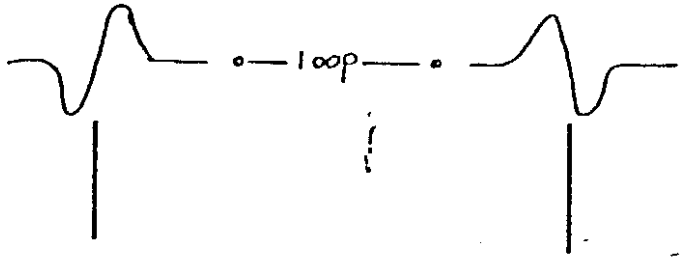
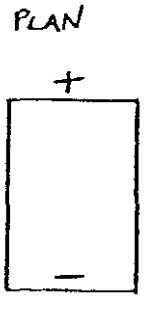


Fig. 6. Vertical conductor: X component





061

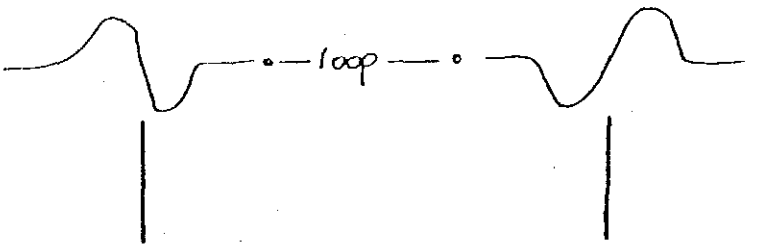


Fig. 7b Vertical conductor : Y component
(Negative side of conductor)

When the dip of the conductor is allowed to vary, the responses become more complicated. Figures 8 through to 12 show how the dip effects the vertical and horizontal components.

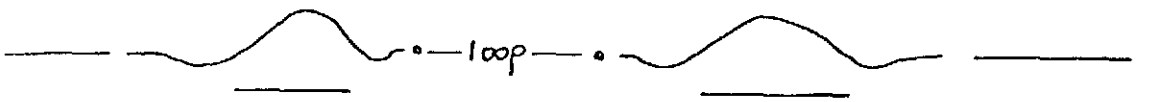


Fig. 8 Horizontal conductor : Z component

NOTE: Late-time response character both inside and outside loop the same.

NOTE: difference of amplitude

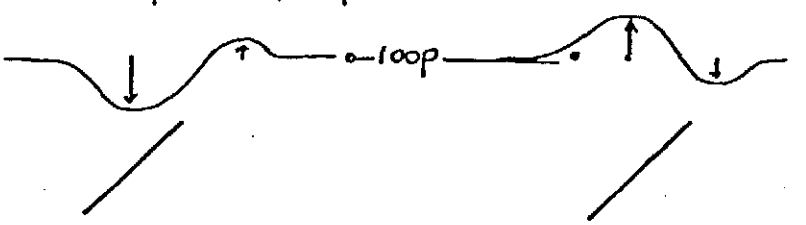


Fig. 9. Dipping conductor : Z component

NOTE: That the positive shoulders in Fig 9. are on the loop side of the anomaly.

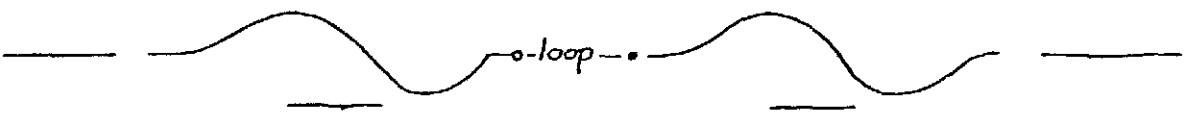
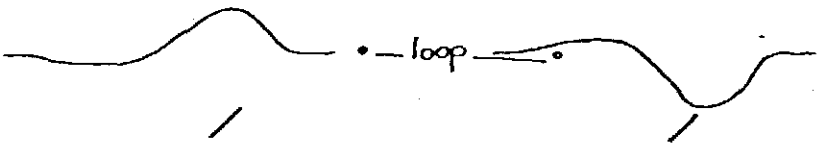


Fig. 10. Horizontal conductor : X component



062

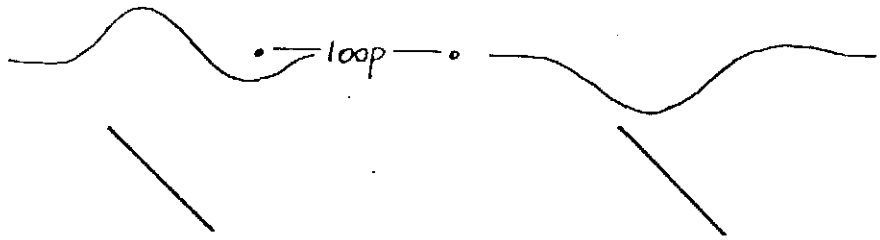


Fig. 12 Dipping conductor : X component

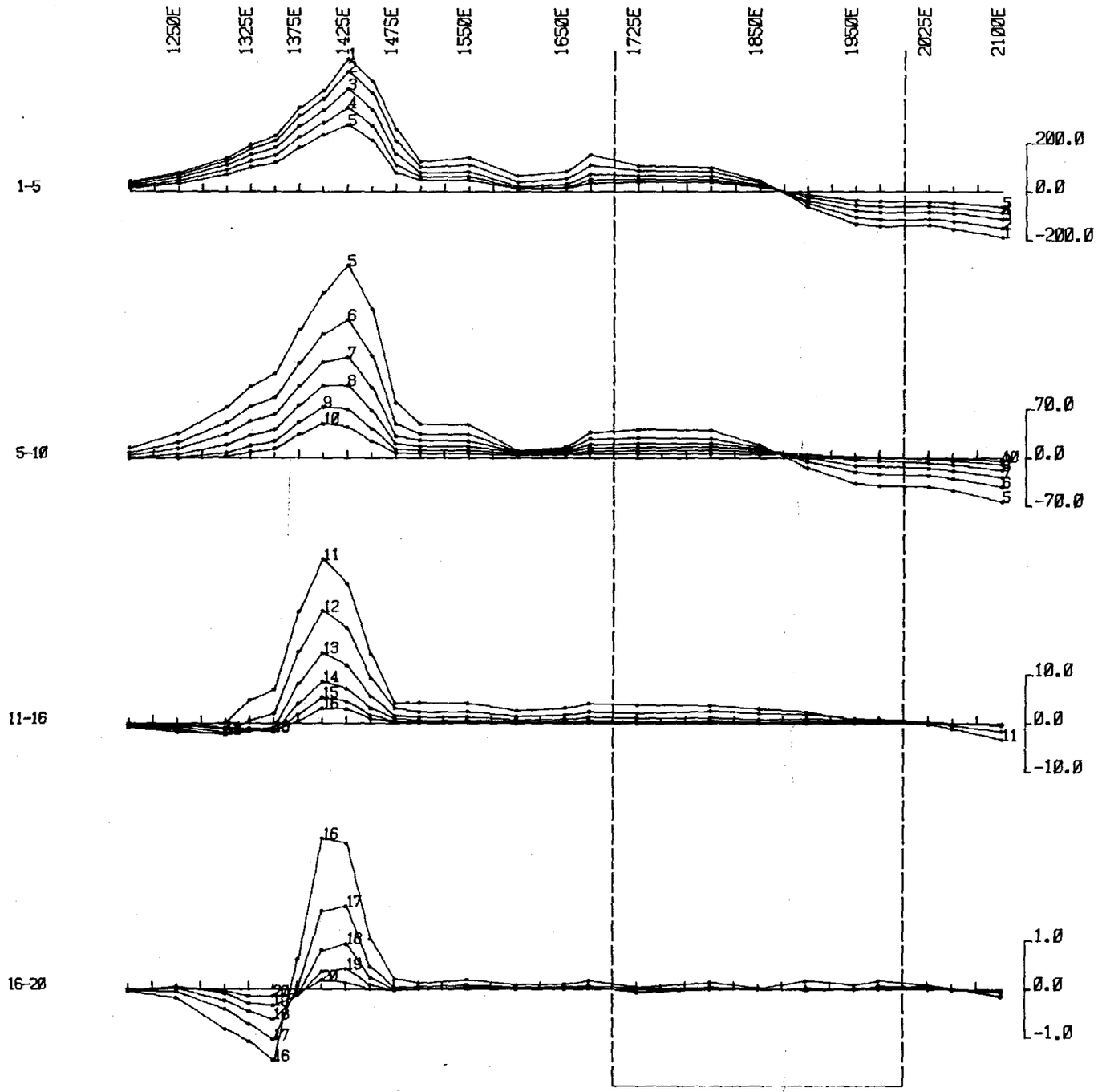
By remembering the shapes of the responses for these few simple geometrics, the identification of false anomalies can be avoided.

In conclusion, by identifying features which appear to have stable (non-diffusing) responses with respect to an appreciable length of time one can isolate confined targets from the half-space. After these interesting features have been identified, the geometry of the situation can be ascertained.

063

379064

HORIZONTAL COMPONENT B (X)



nanovolts per amp.metre squared

EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

5 cm

TX LOOP SIDES	: 1300N	1700E
	: 1900N	2000E
TX LOOP SIZE	: 300m X 600m	
TX TURN OFF TIME	: 375 microsecs	
CURRENT	: 15.5 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256 cycles	
SYNC MODE	: CRYSTAL	
HORIZONTAL SCALE	: 1:5000	
SURVEYED BY	: JP./RL	
DATE	: 04-DEC.1983	

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD.

PROJECT NO. 85-1499

CLIENT : The BHP Co. Ltd.

PROJECT : STYX

AREA : Mayderna Tasmania

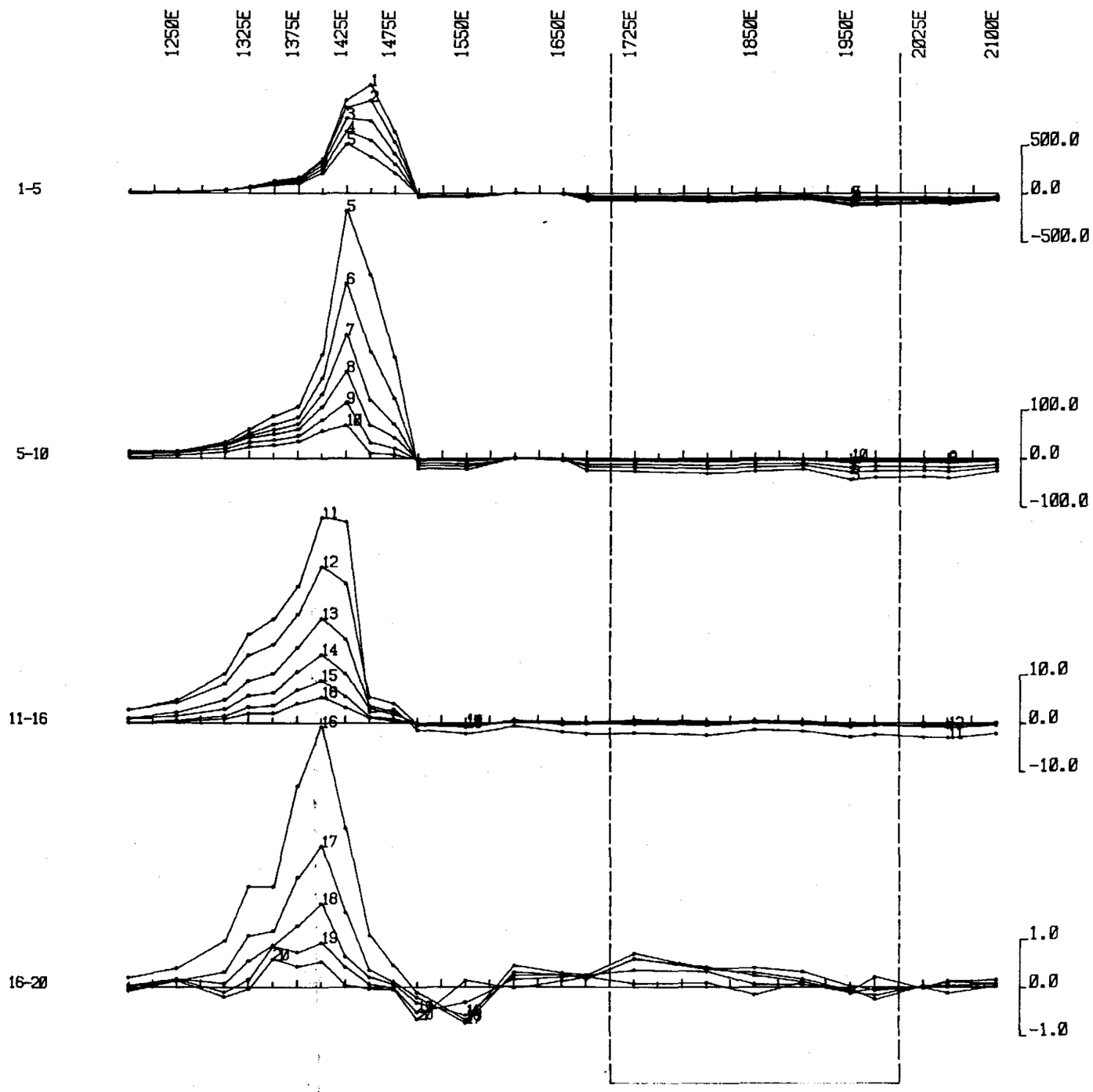
LINE : 1400N X

TX LOOP : 7

064

379065

HORIZONTAL COMPONENT B (Y)



nanovolts per amp.metre squared

EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

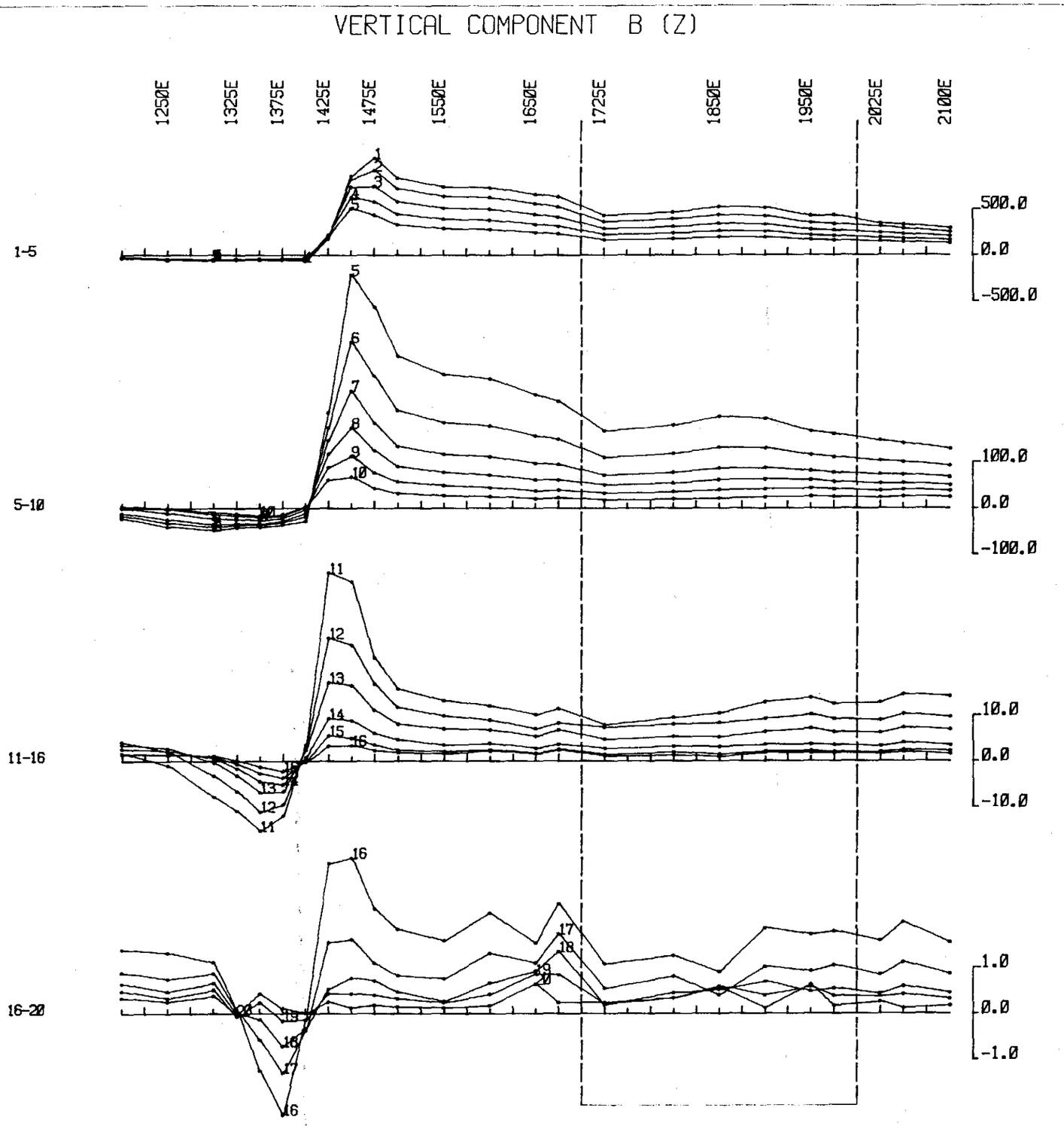
5 cm

TX LOOP SIDES	:	1300N 1700E
	:	1900N 2000E
TX LOOP SIZE	:	300m X 600m
TX TURN OFF TIME	:	375 microsecs
CURRENT	:	15.5 amps
FREQUENCY	:	25 Hz
INTEGRATION TIME	:	256 cycles
SYNC MODE	:	CRYSTAL
HORIZONTAL SCALE	:	1:5000
SURVEYED BY	:	JP./RL
DATE	:	04-DEC./1983

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD.

PROJECT NO. 85-1499

CLIENT	:	The BHP Co. Ltd.
PROJECT	:	STYX
AREA	:	Mayderna Tasmania
LINE	:	1400N Y
TX LOOP	:	7



nanovolts per amp.metre squared

EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

5 cm

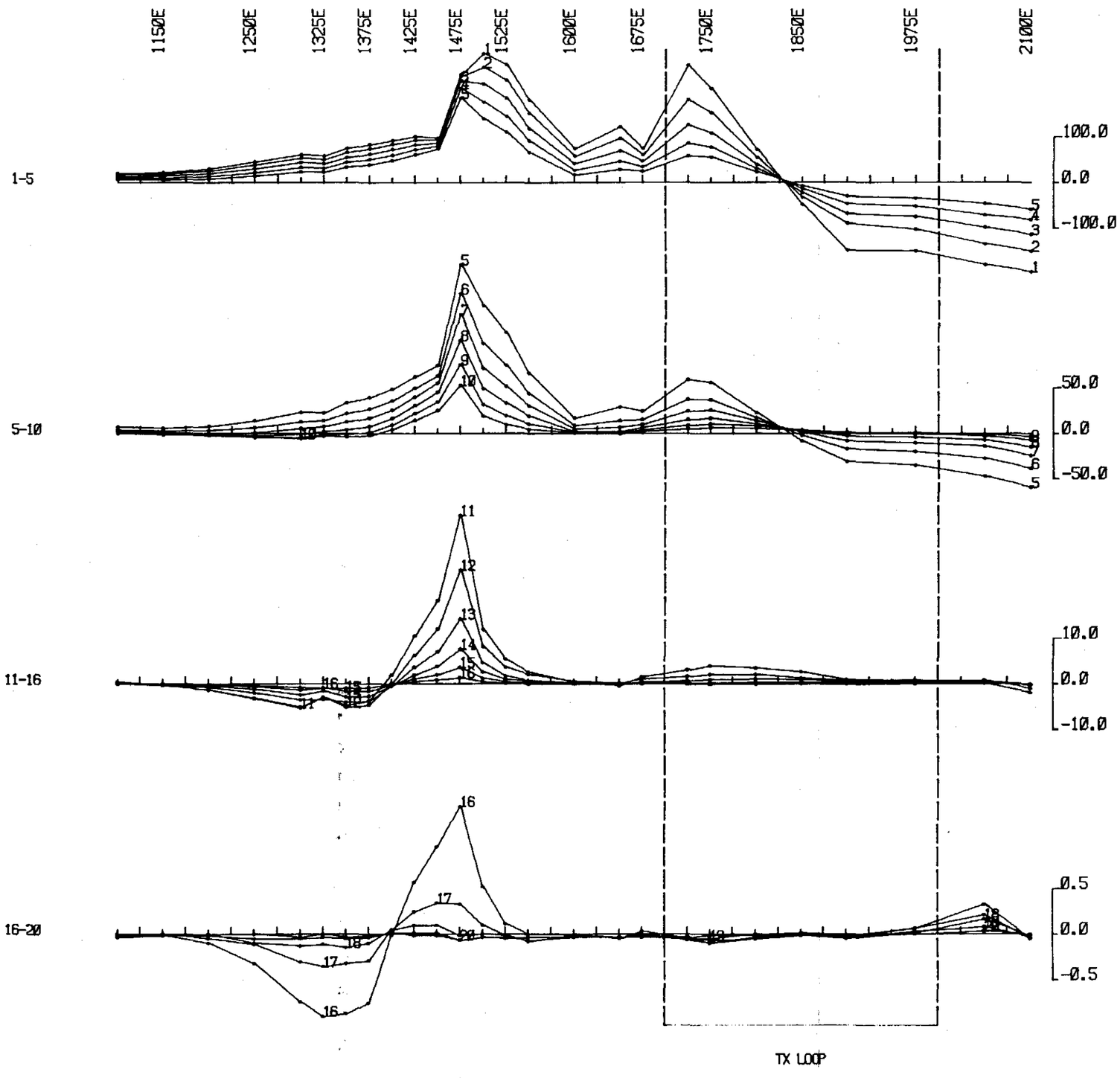
TX LOOP SIDES	:	1300N 1700E
	:	1900N 2000E
TX LOOP SIZE	:	300m X 600m
TX TURN OFF TIME	:	375 microsecs
CURRENT	:	15.5 amps
FREQUENCY	:	25 Hz
INTEGRATION TIME	:	256 cycles
SYNC MODE	:	CRYSTAL
HORIZONTAL SCALE	:	1:5000
SURVEYED BY	:	JP./RL
DATE	:	04-DEC.1983

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD.

PROJECT NO. 85-1499

CLIENT	:	The BHP Co. Ltd.
PROJECT	:	STYX
AREA	:	Maydena Tasmania
LINE	:	1400N Z
TX LOOP	:	7

HORIZONTAL COMPONENT B (X)



nanovolts per amp.metre squared

EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

5 cm

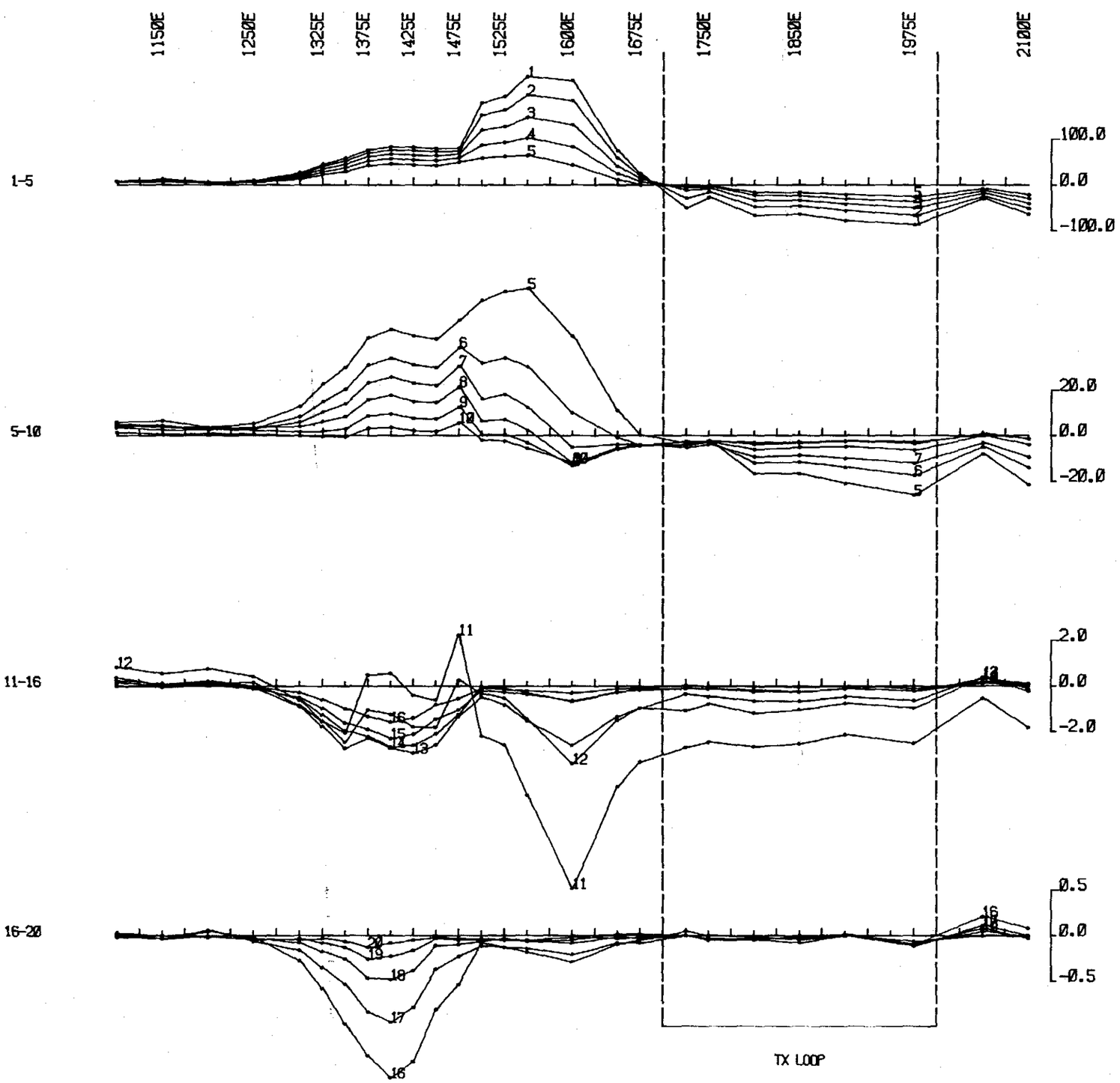
TX LOOP SIDES	:	1300N 1700E
	:	1900N 2000E
TX LOOP SIZE	:	300m X 600m
TX TURN OFF TIME	:	375 microsecs
CURRENT	:	15.5 amps
FREQUENCY	:	25 Hz
INTEGRATION TIME	:	256 cycles
SYNC MODE	:	CRYSTAL
HORIZONTAL SCALE	:	1:5000
SURVEYED BY	:	JP.,RL
DATE	:	05-DEC,1983

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD.

PROJECT NO. 85-1499

CLIENT	:	The BHP Co. Ltd.
PROJECT	:	STYX
AREA	:	Maydena Tasmania
LINE	:	1500N X
TX LOOP	:	7

HORIZONTAL COMPONENT B (Y)



nanovolts per amp.metre squared

EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

5 cm

TX LOOP SIDES	: 1300N	1700E
	: 1900N	2000E
TX LOOP SIZE	: 300m X 600m	
TX TURN OFF TIME	: 375 microsecs	
CURRENT	: 15.5 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256 cycles	
SYNC MODE	: CRYSTAL	
HORIZONTAL SCALE	: 1:5000	
SURVEYED BY	: JP./RL	
DATE	: 05-DEC.1983	

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD.

PROJECT NO. 85-1499

CLIENT : The BHP Co. Ltd.

PROJECT : STYX

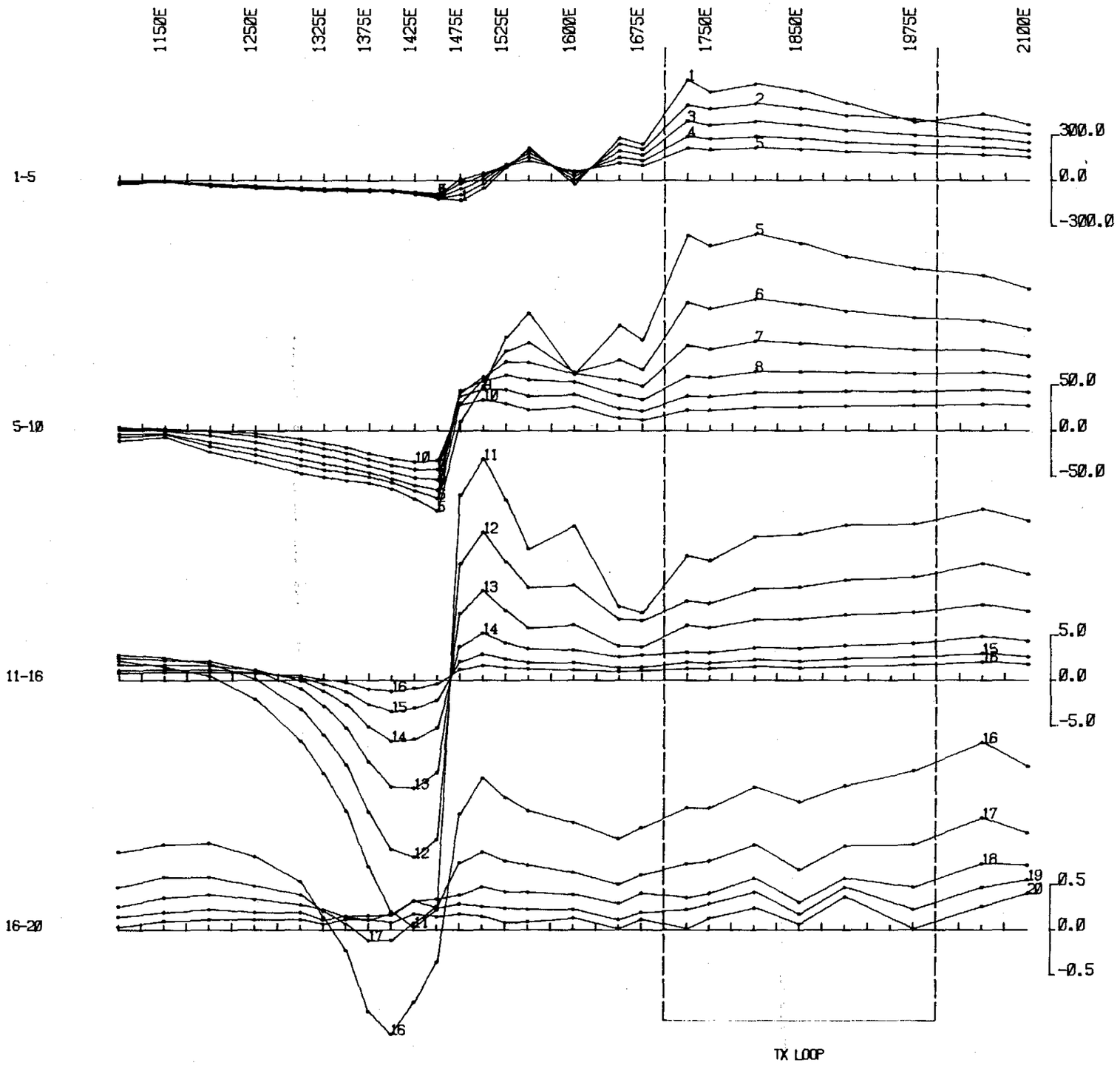
AREA : Maydena Tasmania

LINE : 1500N Y

TX LOOP : 7

068

VERTICAL COMPONENT B (Z)



nanovolts per amp metre squared

EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

5 cm

TX LOOP SIDES	:	1300N 1700E
	:	1900N 2000E
TX LOOP SIZE	:	300m X 600m
TX TURN OFF TIME	:	375 microsecs
CURRENT	:	15.5 amps
FREQUENCY	:	25 Hz
INTEGRATION TIME	:	256 cycles
SYNC MODE	:	CRYSTAL
HORIZONTAL SCALE	:	1:5000
SURVEYED BY	:	JP./RL
DATE	:	05-DEC.1983

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD.

PROJECT NO. 85-1499

CLIENT : The BHP Co. Ltd.

PROJECT : STYX

AREA : Maydena Tasmania

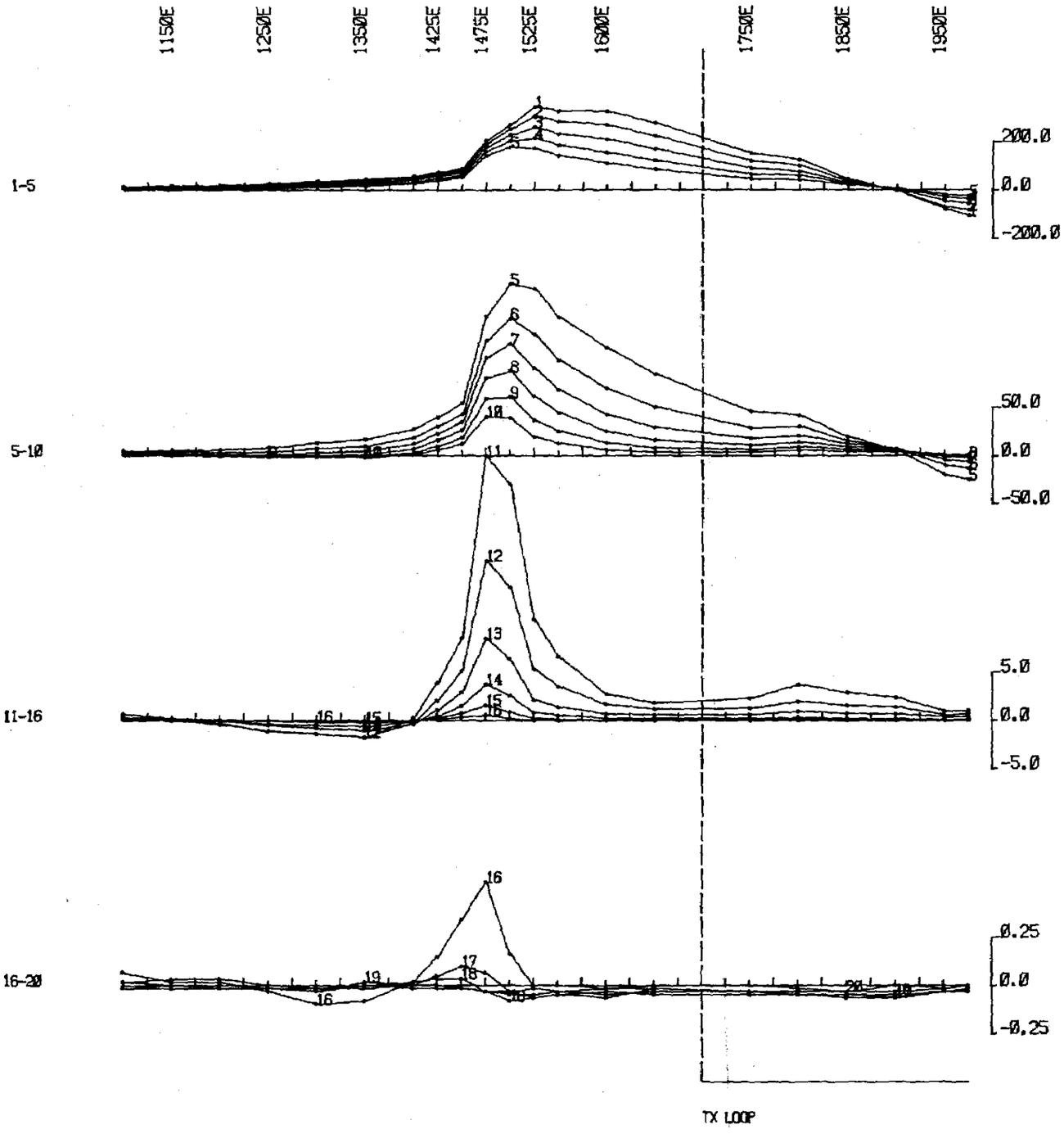
LINE : 1500N Z

TX LOOP : 7

379070

069

HORIZONTAL COMPONENT B (X)



nanovolts per amp.metre squared

EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

5 cm

TX LOOP SIDES	: 1300N	1700E
	: 1900N	2000E
TX LOOP SIZE	: 300m X 600m	
TX TURN OFF TIME	: 375 microsecs	
CURRENT	: 15.5 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256 cycles	
SYNC MODE	: CRYSTAL	
HORIZONTAL SCALE	: 1:5000	
SURVEYED BY	: JP./RL	
DATE	: 05-DEC./1983	

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD.

PROJECT NO. 85-1499

CLIENT : The BHP Co. Ltd.

PROJECT : STYX

AREA : Maydena Tasmania

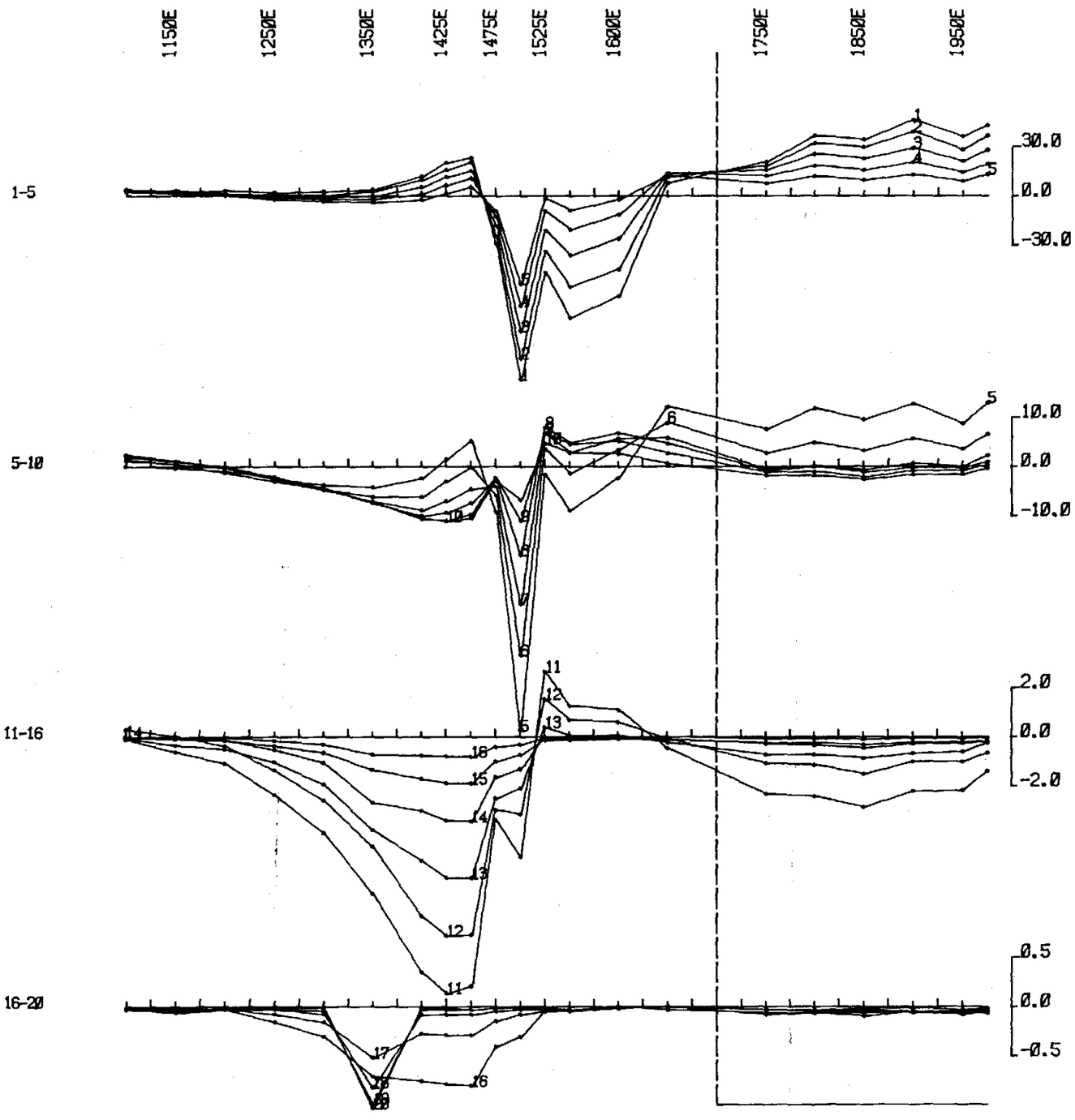
LINE : 1600N X

TX LOOP : 7

379071

070

HORIZONTAL COMPONENT B (Y)



nanovolts per amp.metre squared

EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

5 cm

TX LOOP SIDES	:	1300N 1700E
	:	1900N 2000E
TX LOOP SIZE	:	300m X 600m
TX TURN OFF TIME	:	375 microsecs
CURRENT	:	15.5 amps
FREQUENCY	:	25 Hz
INTEGRATION TIME	:	256 cycles
SYNC MODE	:	CRYSTAL
HORIZONTAL SCALE	:	1:5000
SURVEYED BY	:	JP./RL
DATE	:	05-DEC,1983

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD.

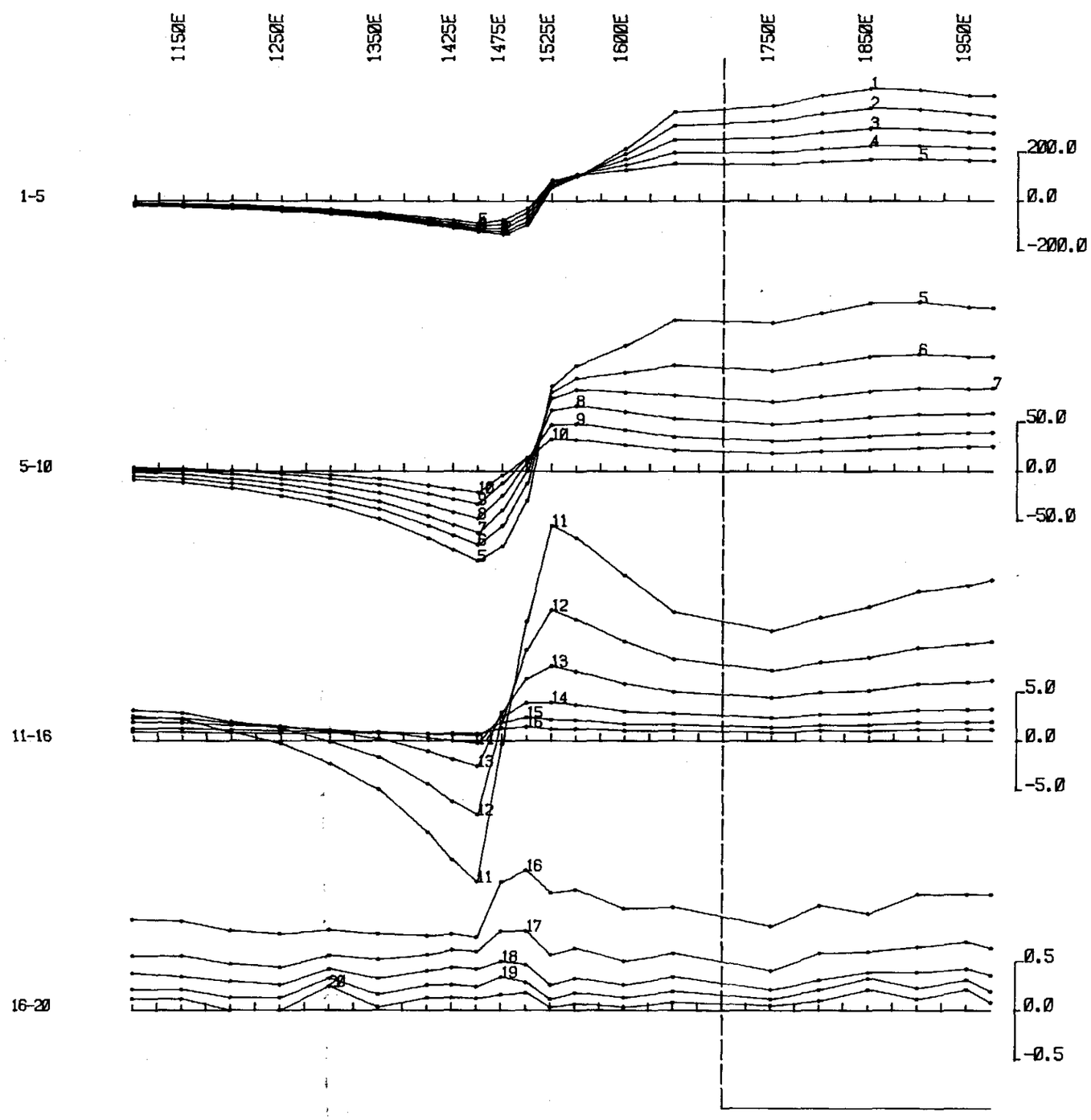
PROJECT NO. 85-1499

CLIENT	:	The BHP Co. Ltd.
PROJECT	:	STYX
AREA	:	Mayderna Tasmania
LINE	:	1600N Y
TX LOOP	:	7

379072

071

VERTICAL COMPONENT B (Z)



nanovolts per amp.metre squared

EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

5 cm

TX LOOP SIDES	:	1300N 1700E
	:	1900N 2000E
TX LOOP SIZE	:	300m X 600m
TX TURN OFF TIME	:	375 microsecs
CURRENT	:	15.5 amps
FREQUENCY	:	25 Hz
INTEGRATION TIME	:	256 cycles
SYNC MODE	:	CRYSTAL
HORIZONTAL SCALE	:	1:5000
SURVEYED BY	:	JP./RL
DATE	:	05-DEC-1983

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD.

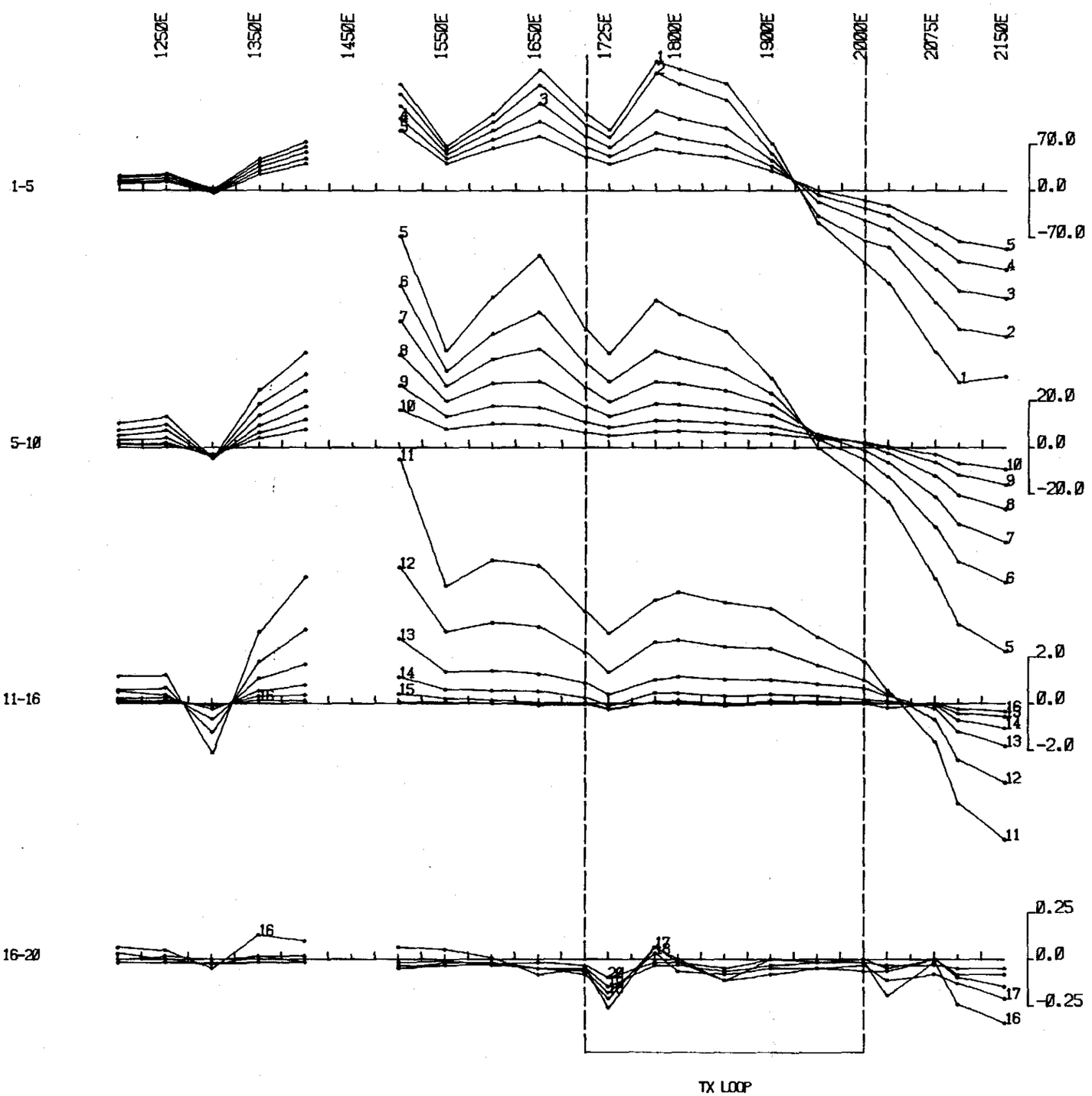
PROJECT NO. 85-1499

CLIENT	:	The BHP Co. Ltd.
PROJECT	:	STYX
AREA	:	Mayderna Tasmania
LINE	:	1600N Z
TX LOOP	:	7

072

379073

HORIZONTAL COMPONENT B (X)



nanovolts per amp-metre-squared

EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

5 cm

TX LOOP SIDES	: 1300N	1700E
	: 1900N	2000E
TX LOOP SIZE	: 300m X 600m	
TX TURN OFF TIME	: 375 microsecs	
CURRENT	: 15.5 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256 cycles	
SYNC MODE	: CRYSTAL	
HORIZONTAL SCALE	: 1:5000	
SURVEYED BY	: JP./RL	
DATE	: 06-DEC.1983	

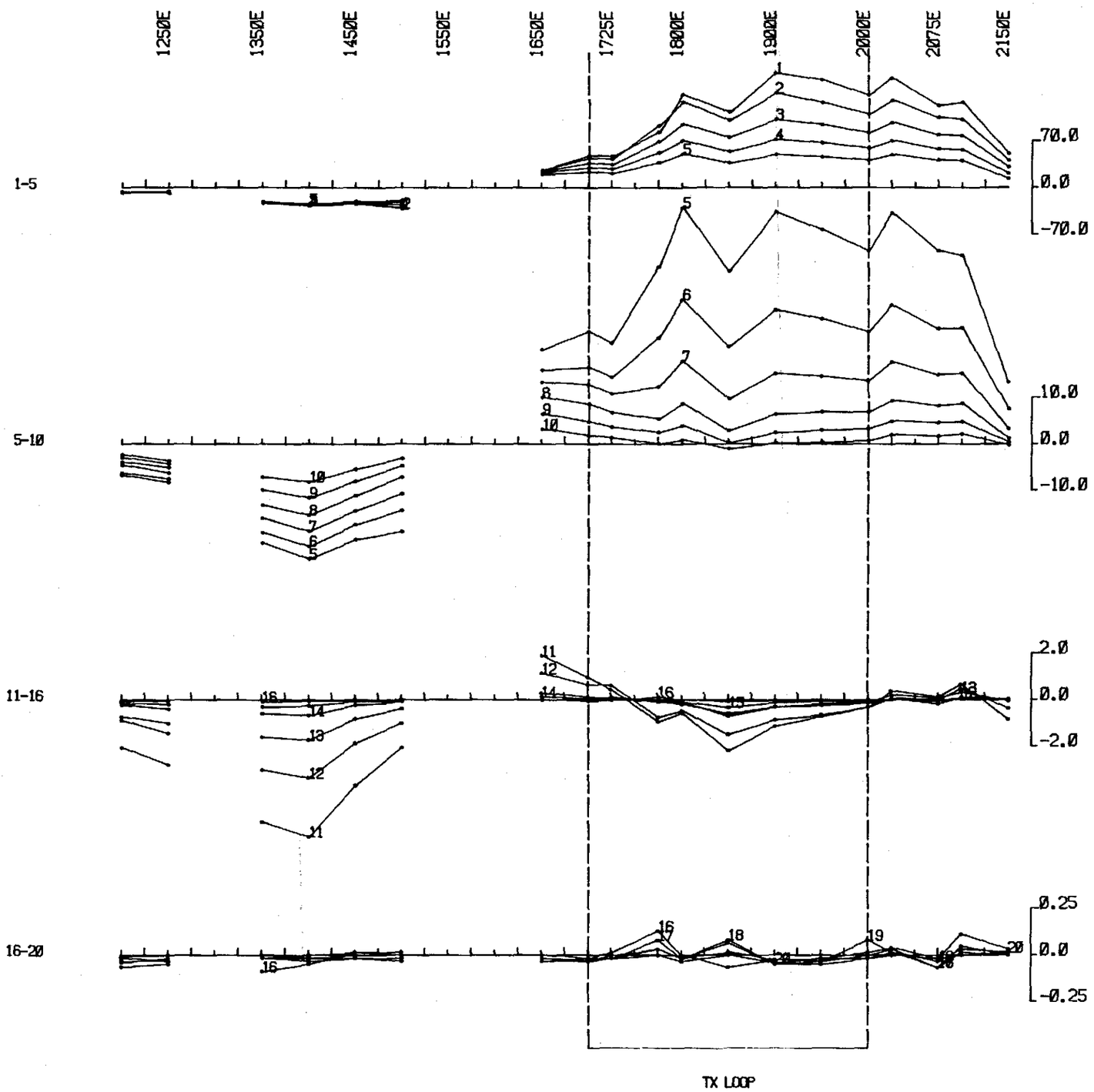
SURVEYED AND COMPILED BY	PROJECT NO.
GEOTERREX PTY. LTD.	85-1499

CLIENT : The BHP Co. Ltd.
PROJECT : STYX
AREA : Maydena Tasmania
LINE : 1700N X
TX LOOP : 7

379074

073

HORIZONTAL COMPONENT B (Y)



nanovolts per amp.metre squared

EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

5 cm

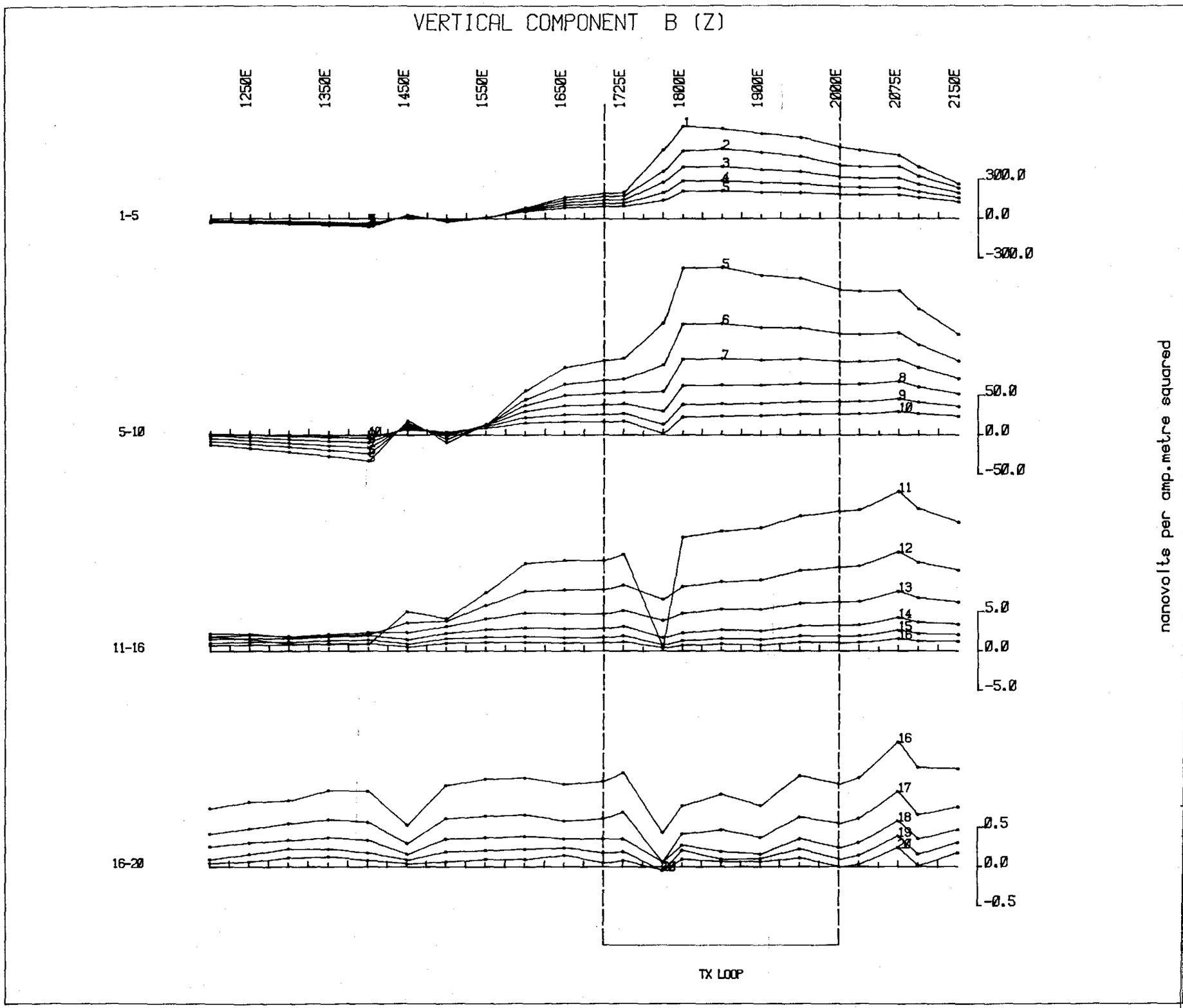
TX LOOP SIDES	: 1300N	1700E
	: 1900N	2000E
TX LOOP SIZE	: 300m X 600m	
TX TURN OFF TIME	: 375 microsecs	
CURRENT	: 15.5 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256 cycles	
SYNC MODE	: CRYSTAL	
HORIZONTAL SCALE	: 1:5000	
SURVEYED BY	: JP./RL	
DATE	: 06-DEC.1983	

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD.	PROJECT NO. 85-1499

CLIENT	: The BHP Co. Ltd.
PROJECT	: STYX
AREA	: Mayderna Tasmania
LINE	: 1700N Y
TX LOOP	: 7

074

379075



nanovolts per amp.metre squared

EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

5 cm

TX LOOP SIDES	: 1300N	1700E
	: 1900N	2000E
TX LOOP SIZE	: 300m X 600m	
TX TURN OFF TIME	: 375 microsecs	
CURRENT	: 15.5 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256 cycles	
SYNC MODE	: CRYSTAL	
HORIZONTAL SCALE	: 1:5000	
SURVEYED BY	: JP./RL	
DATE	: 06-DEC.1983	

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD.

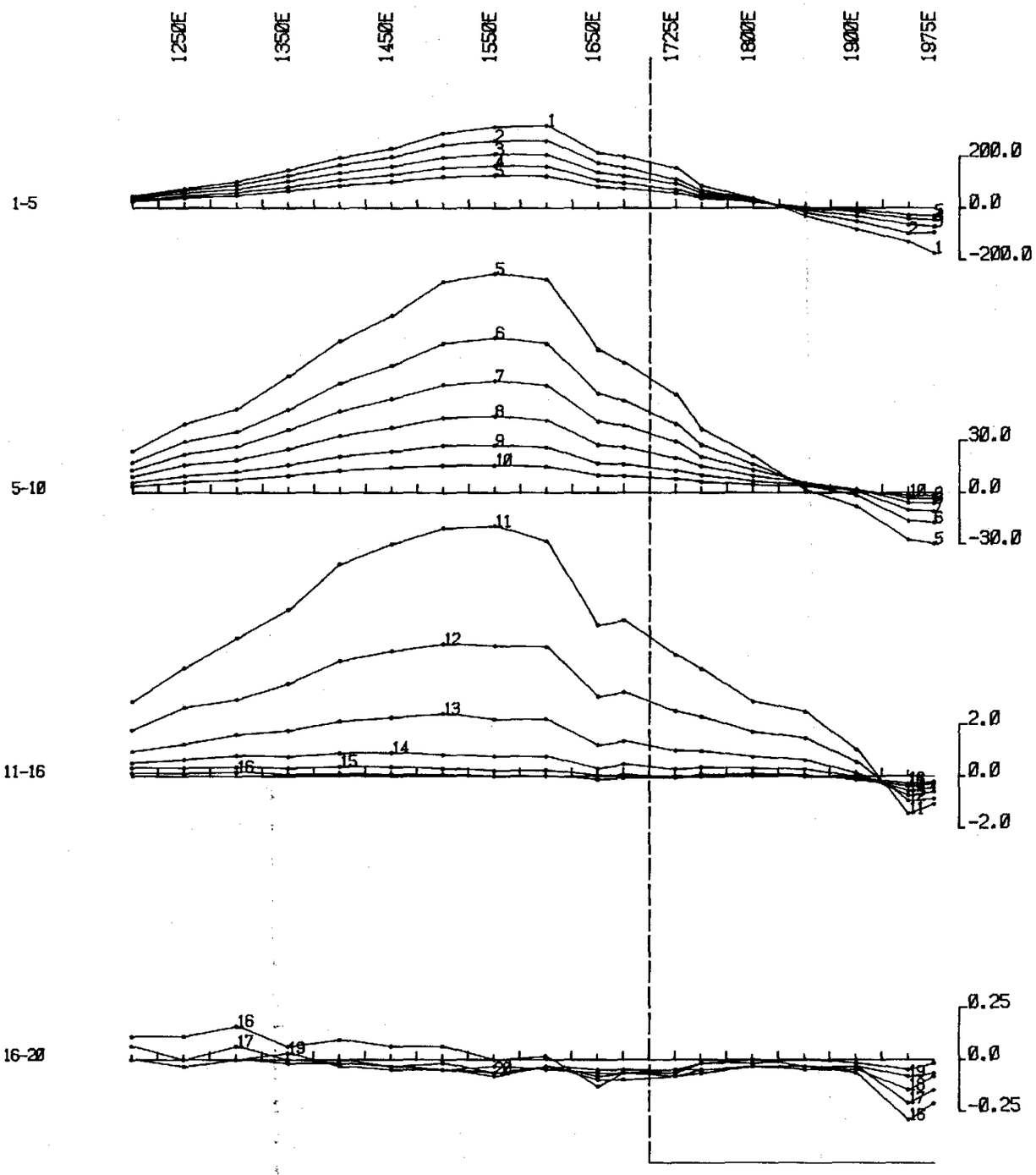
PROJECT NO. 85-1498

CLIENT	: The BHP Co. Ltd.
PROJECT	: STYX
AREA	: Maydena Tasmania
LINE	: 1700N Z
TX LOOP	: 7

379076

075

HORIZONTAL COMPONENT B (X)



nanovolts per amp.metre squared

EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

5 cm

TX LOOP SIDES	: 1300N	1700E
	: 1900N	2000E
TX LOOP SIZE	: 300m X 600m	
TX TURN OFF TIME	: 375 microsecs	
CURRENT	: 15.5 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256 cycles	
SYNC MODE	: CRYSTAL	
HORIZONTAL SCALE	: 1:5000	
SURVEYED BY	: JP./RL	
DATE	: 07-DEC./1983	

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD.

PROJECT NO. 85-1499

CLIENT : The BHP Co. Ltd.

PROJECT : STYX

AREA : Mayderra Tasmania

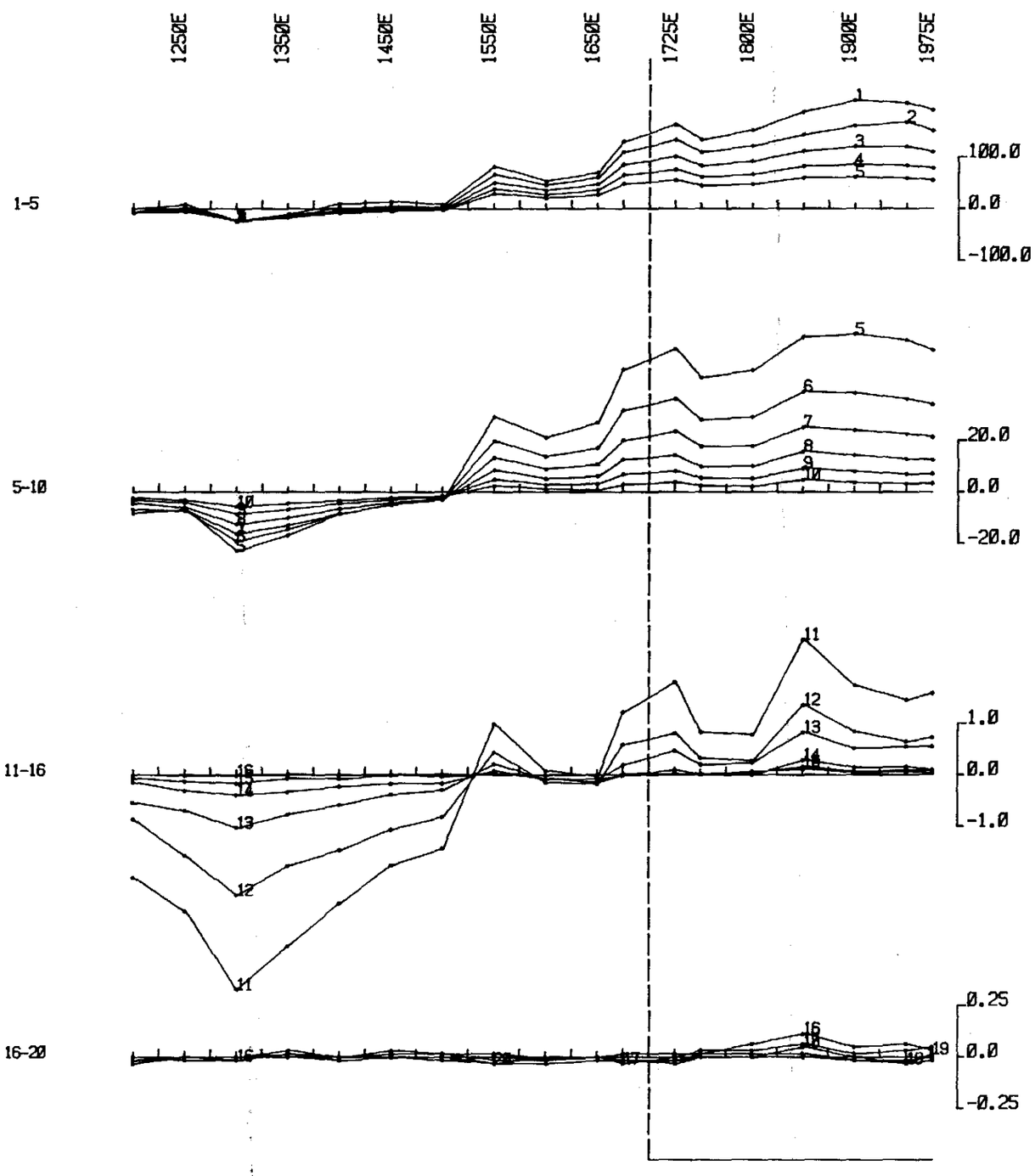
LINE : 1800N X

TX LOOP : 7

076

379077

HORIZONTAL COMPONENT B (Y)



nanovolts per amp.metre squared

EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

5 cm

TX LOOP SIDES	: 1300N	1700E
	: 1900N	2000E
TX LOOP SIZE	: 300m X 600m	
TX TURN OFF TIME	: 375 microsecs	
CURRENT	: 15.5 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256 cycles	
SYNC MODE	: CRYSTAL	
HORIZONTAL SCALE	: 1:5000	
SURVEYED BY	: JP./RL	
DATE	: 07-DEC,1983	

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD.

PROJECT NO. 85-1499

CLIENT : The BHP Co. Ltd.

PROJECT : STYX

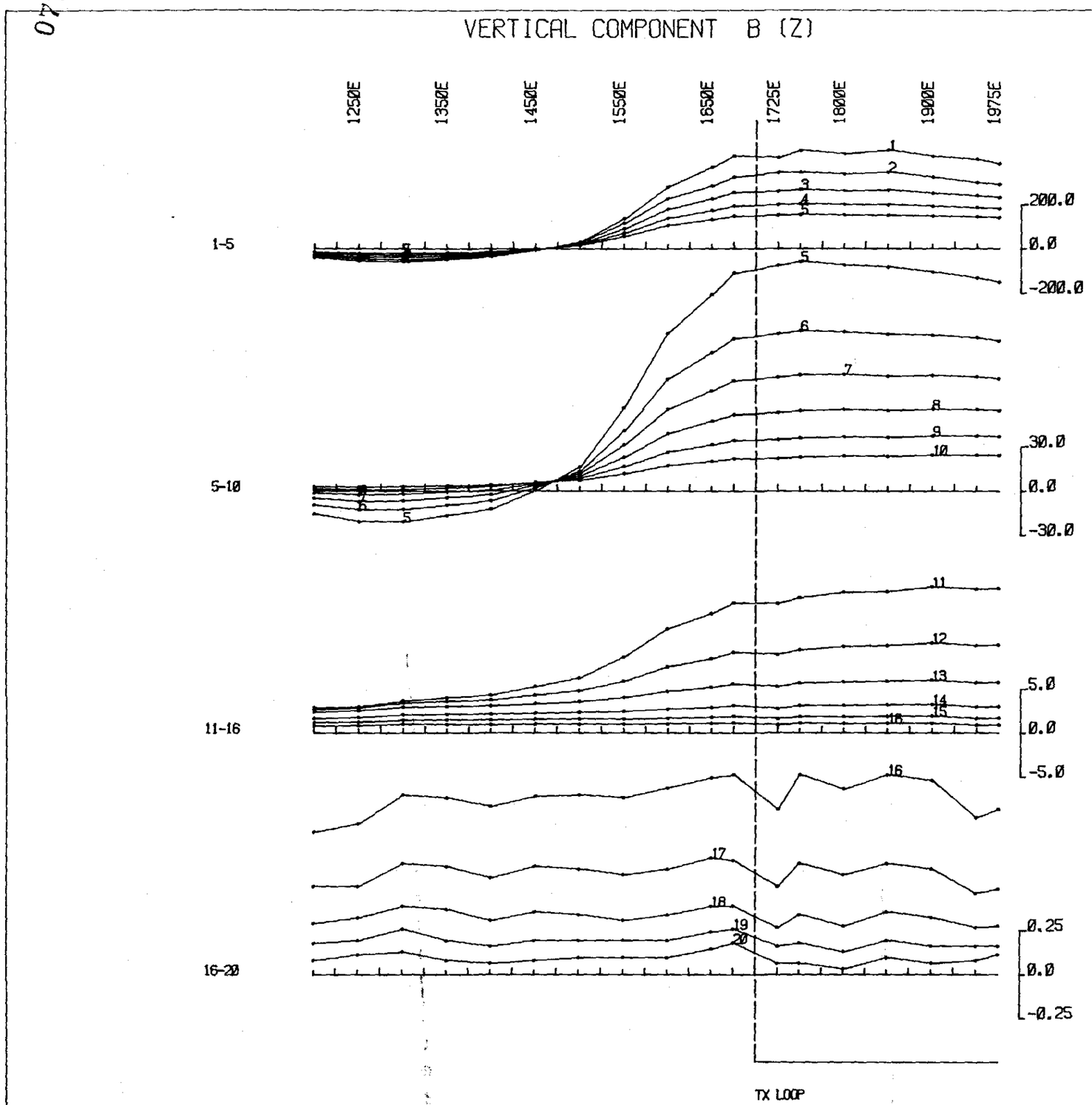
AREA : Maydena Tasmania

LINE : 1800N Y

TX LOOP : 7

379078

047



nanovolts per amp.metre squared

EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

5 cm

TX LOOP SIDES	: 1300N	1700E
	: 1900N	2000E
TX LOOP SIZE	: 300m X 600m	
TX TURN OFF TIME	: 375 microsecs	
CURRENT	: 15.5 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256 cycles	
SYNC MODE	: CRYSTAL	
HORIZONTAL SCALE	: 1:5000	
SURVEYED BY	: JP./RL	
DATE	: 07-DEC.1983	

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD.

PROJECT NO. 85-1499

CLIENT : The BHP Co. Ltd.

PROJECT : STYX

AREA : Maydena Tasmania

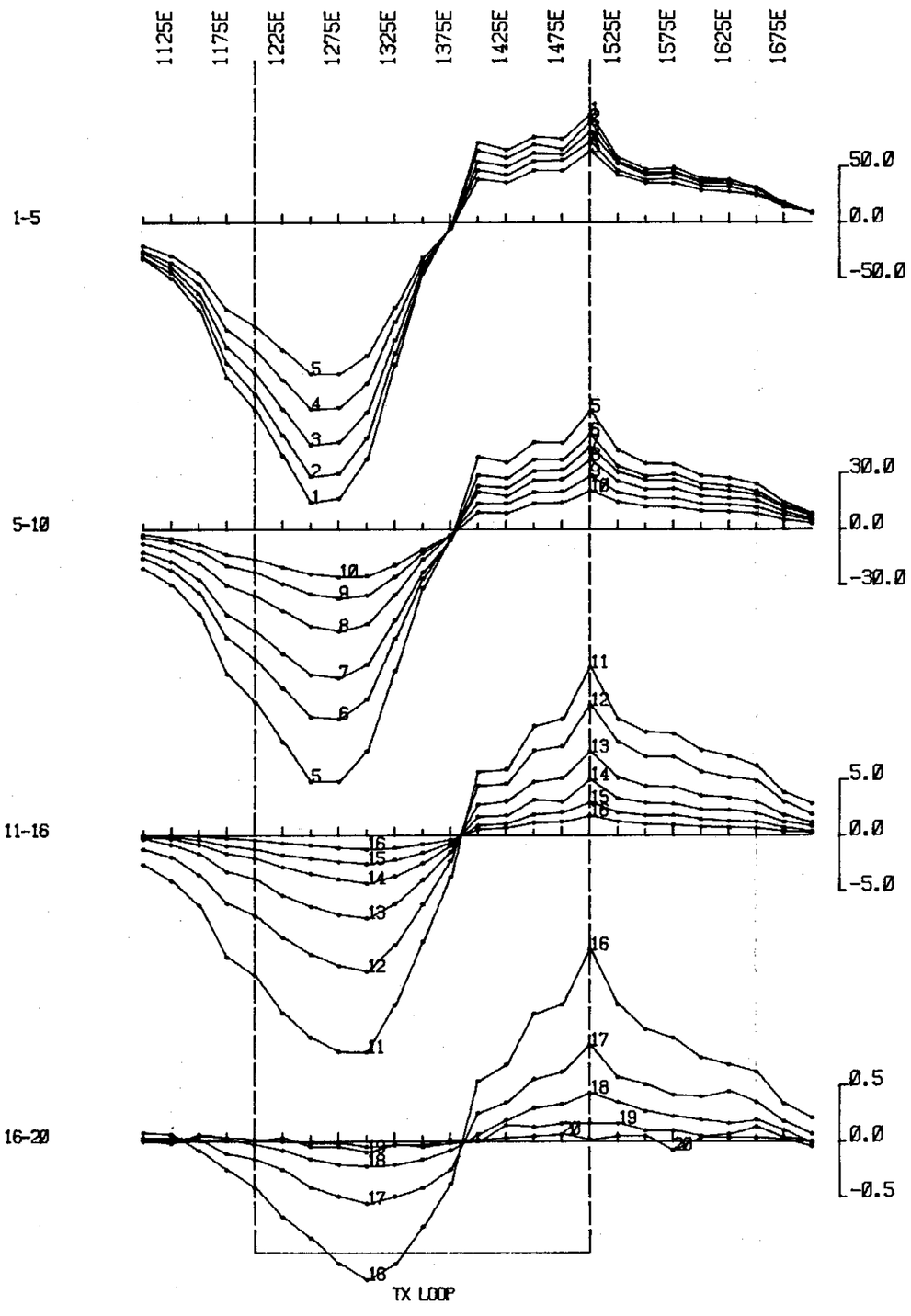
LINE : 1800N Z

TX LOOP : 7

078

379079

HORIZONTAL COMPONENT B (X)



nanovolts per amp.metre squared

EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

5 cm

TX LOOP SIDES	: 1300N	1200E
	: 1800N	1500E
TX LOOP SIZE	: 300m X 500m	
TX TURN OFF TIME	: 360 microsecs	
CURRENT	: 15.8 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256 cycles	
SYNC MODE	: CRYSTAL	
HORIZONTAL SCALE	: 1:5000	
SURVEYED BY	: R.J.L.	
DATE	: 07-JAN-1984	

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD.

PROJECT NO. 85-1499

CLIENT : THE BHP Co. Ltd.

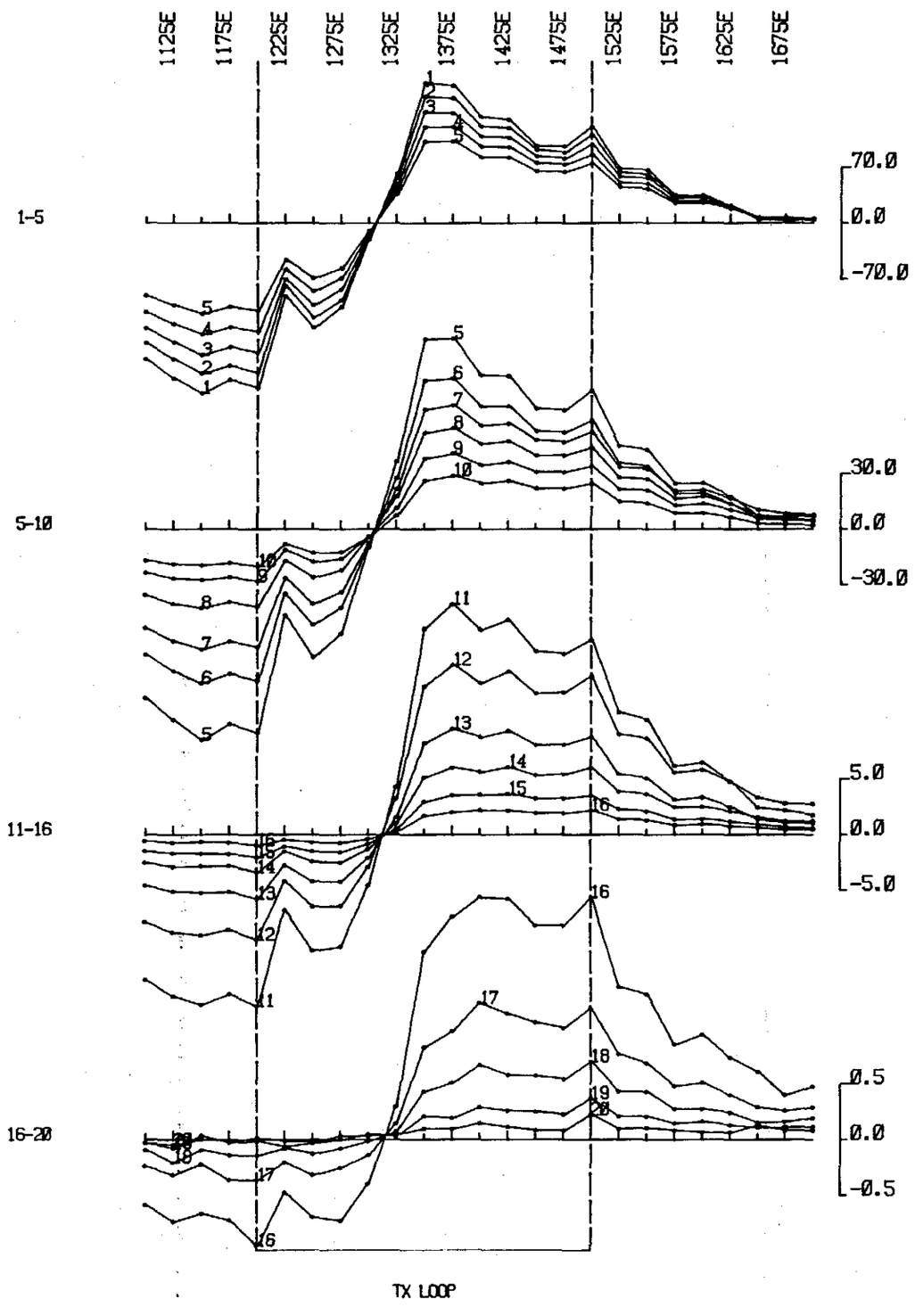
PROJECT : STYX

AREA : Maydena, Tasmania

LINE : 1200N X

TX LOOP : 8

HORIZONTAL COMPONENT B (Y)



nanovolts per amp.metre squared

EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

5 cm

TX LOOP SIDES	:	1300N 1200E
	:	1800N 1500E
TX LOOP SIZE	:	300m X 500m
TX TURN OFF TIME	:	360 microsecs
CURRENT	:	15.8 amps
FREQUENCY	:	25 Hz
INTEGRATION TIME	:	256 cycles
SYNC MODE	:	CRYSTAL
HORIZONTAL SCALE	:	1:5000
SURVEYED BY	:	RJL
DATE	:	07-JAN,1984

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD.

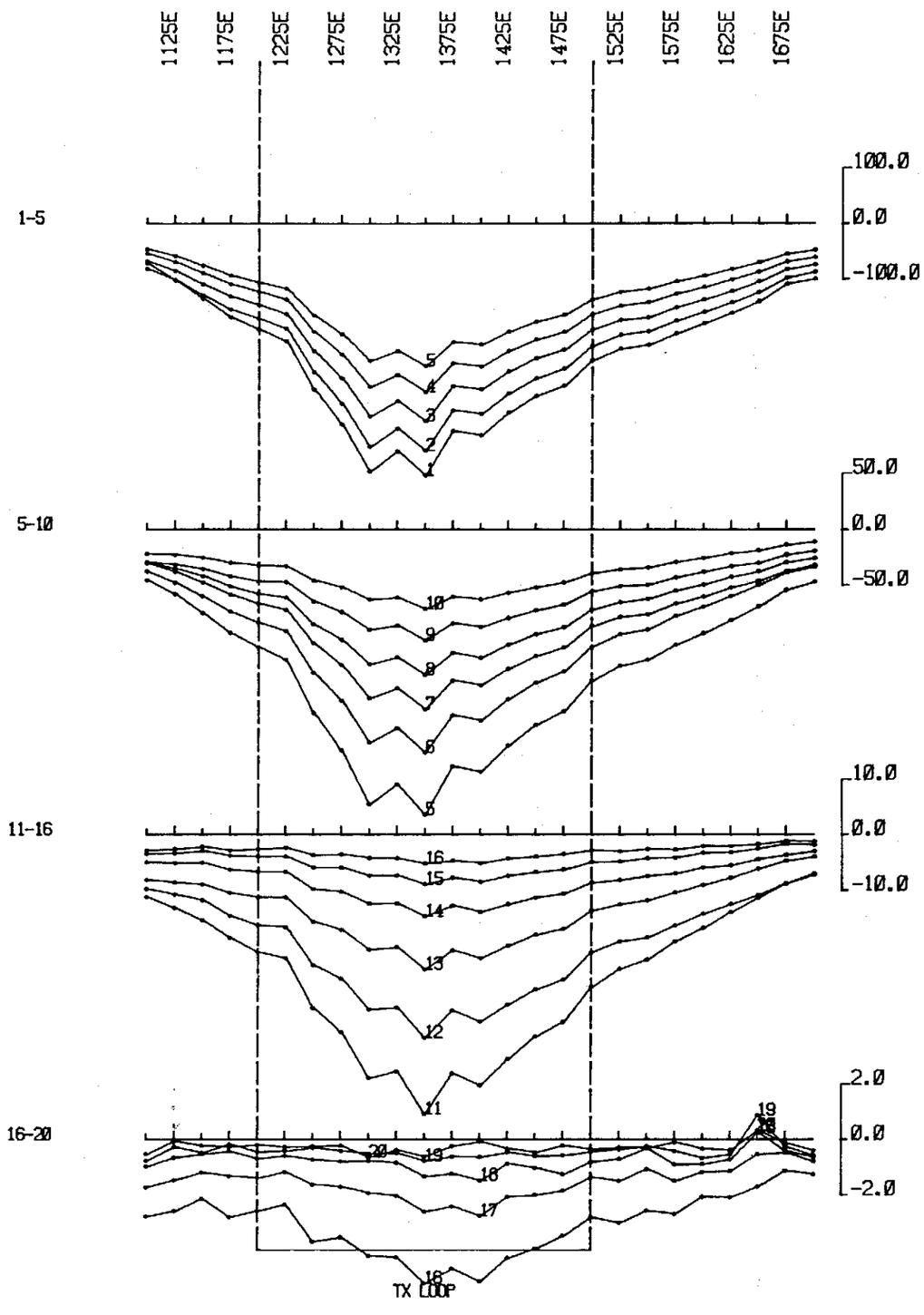
PROJECT NO. 85-1499

CLIENT	:	THE BHP Co. Ltd.
PROJECT	:	STYX
AREA	:	Maydena,Tasmania
LINE	:	1200N Y
TX LOOP	:	8

080

379081

VERTICAL COMPONENT B (Z)



nanovolts per amp.metre squared

EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

5 cm

TX LOOP SIDES	: 1300N	1200E
	: 1800N	1500E
TX LOOP SIZE	: 300m X 500m	
TX TURN OFF TIME	: 360 microsecs	
CURRENT	: 15.8 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256 cycles	
SYNC MODE	: CRYSTAL	
HORIZONTAL SCALE	: 1:5000	
SURVEYED BY	: RJL	
DATE	: 07-JAN,1984	

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD.

PROJECT NO. 85-1499

CLIENT : THE BHP Co. Ltd.

PROJECT : STYX

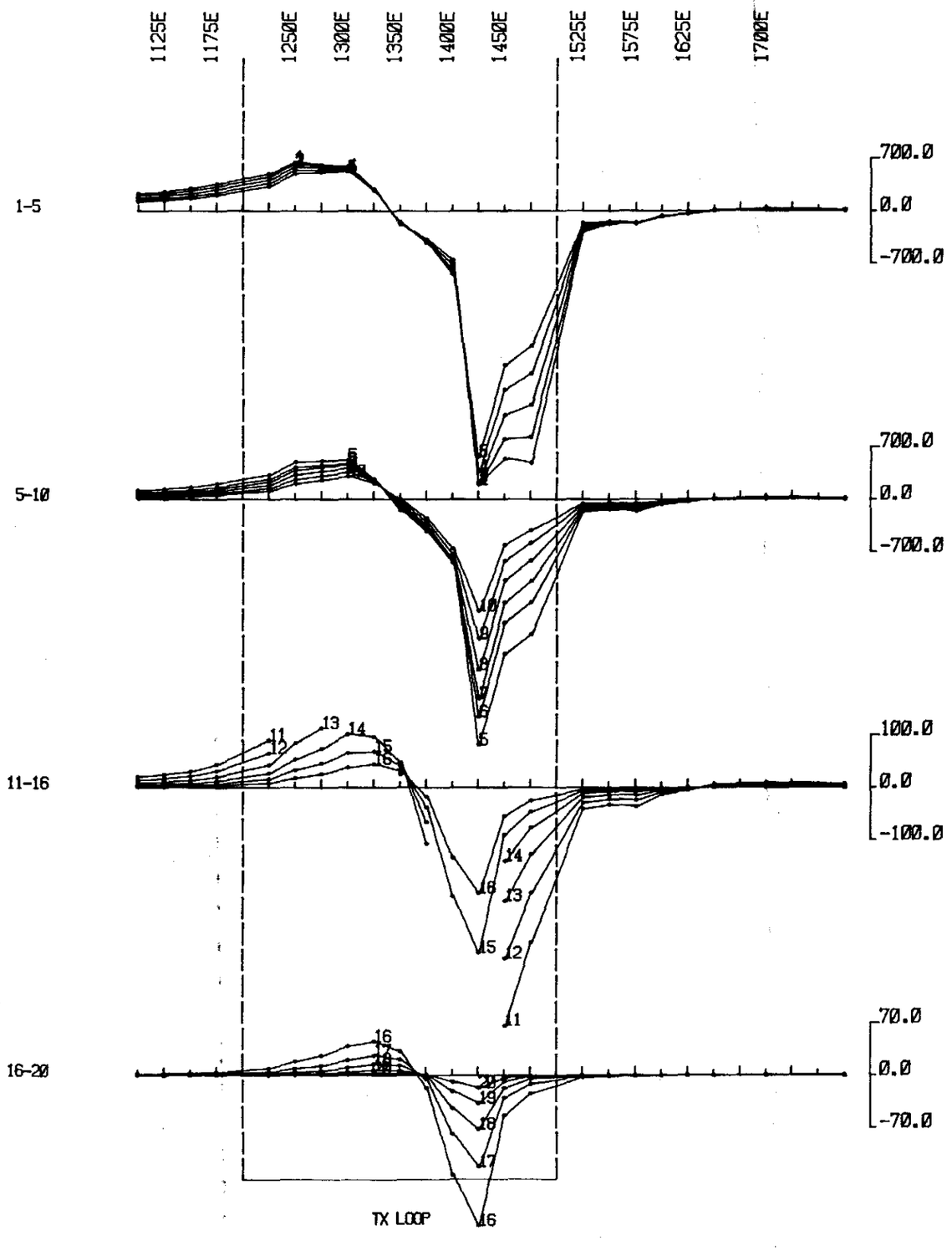
AREA : Maydena,Tasmania

LINE : 1200N Z

TX LOOP : 8

081

HORIZONTAL COMPONENT B (X)



nanovolts per amp.metre squared

EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

5 cm

TX LOOP SIDES	:	1300N 1200E
	:	1800N 1500E
TX LOOP SIZE	:	300m X 500m
TX TURN OFF TIME	:	360 microsecs
CURRENT	:	15.5 amps
FREQUENCY	:	25 Hz
INTEGRATION TIME	:	256 cycles
SYNC MODE	:	CRYSTAL
HORIZONTAL SCALE	:	1:5000
SURVEYED BY	:	R.J.L
DATE	:	08-JAN,1984

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD.

PROJECT NO. 85-1499

CLIENT : THE BHP Co. Ltd.

PROJECT : STYX

AREA : Maydena,Tasmania

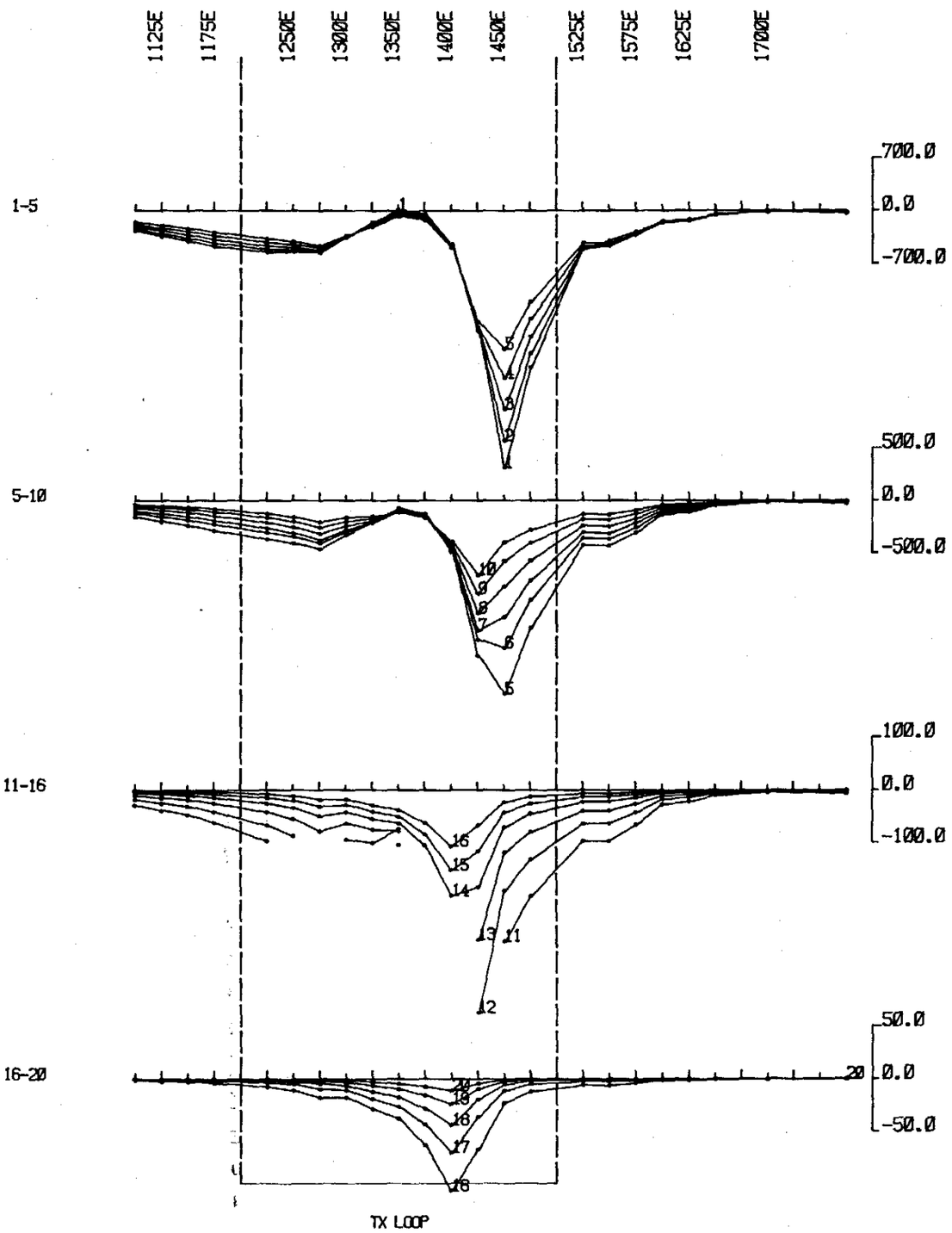
LINE : 1400N X

TX LOOP : 8

379083

082

HORIZONTAL COMPONENT B (Y)



nanovolts per amp.metre squared

EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

5 cm

TX LOOP SIDES	:	1300N 1200E
	:	1800N 1500E
TX LOOP SIZE	:	300m X 500m
TX TURN OFF TIME	:	360 microsecs
CURRENT	:	15.5 amps
FREQUENCY	:	25 Hz
INTEGRATION TIME	:	256 cycles
SYNC MODE	:	CRYSTAL
HORIZONTAL SCALE	:	1:5000
SURVEYED BY	:	R.L
DATE	:	08-JAN-1984

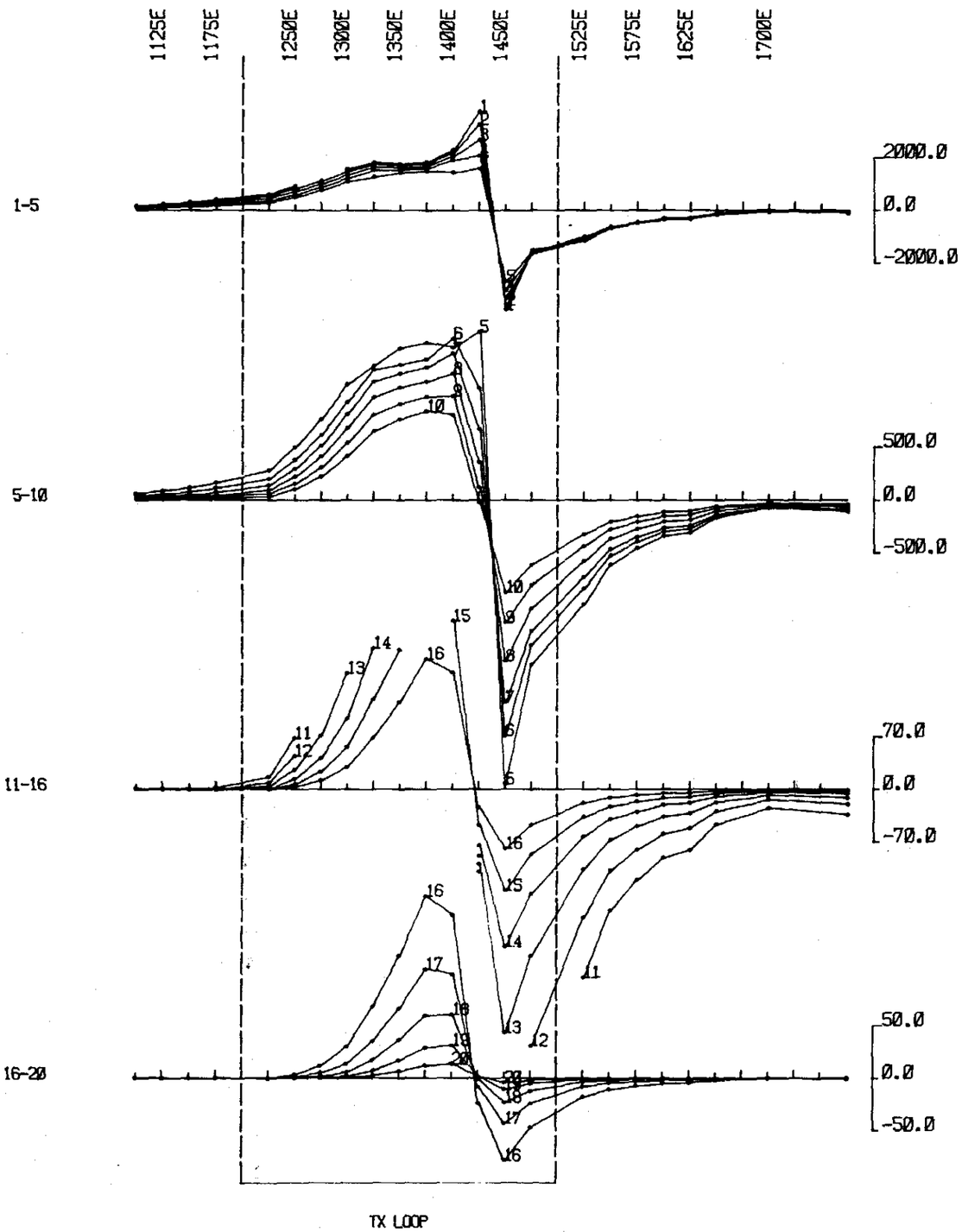
SURVEYED AND COMPILED BY GEOTERREX PTY. LTD.

PROJECT NO. 85-1499

CLIENT	:	THE BHP Co. Ltd.
PROJECT	:	STYX
AREA	:	Maydena, Tasmania
LINE	:	1400N Y
TX LOOP	:	8

083

VERTICAL COMPONENT B (Z)



nanovolts per amp.metre squared

EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

5 cm

TX LOOP SIDES	: 1300N	1200E
	: 1800N	1500E
TX LOOP SIZE	: 300m X 500m	
TX TURN OFF TIME	: 360 microsecs	
CURRENT	: 15.5 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256 cycles	
SYNC MODE	: CRYSTAL	
HORIZONTAL SCALE	: 1:5000	
SURVEYED BY	: R.J.L	
DATE	: 08-JAN.1984	

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD.

PROJECT NO. 85-1499

CLIENT : THE BHP Co. Ltd.

PROJECT : STYX

AREA : Mayderna, Tasmania

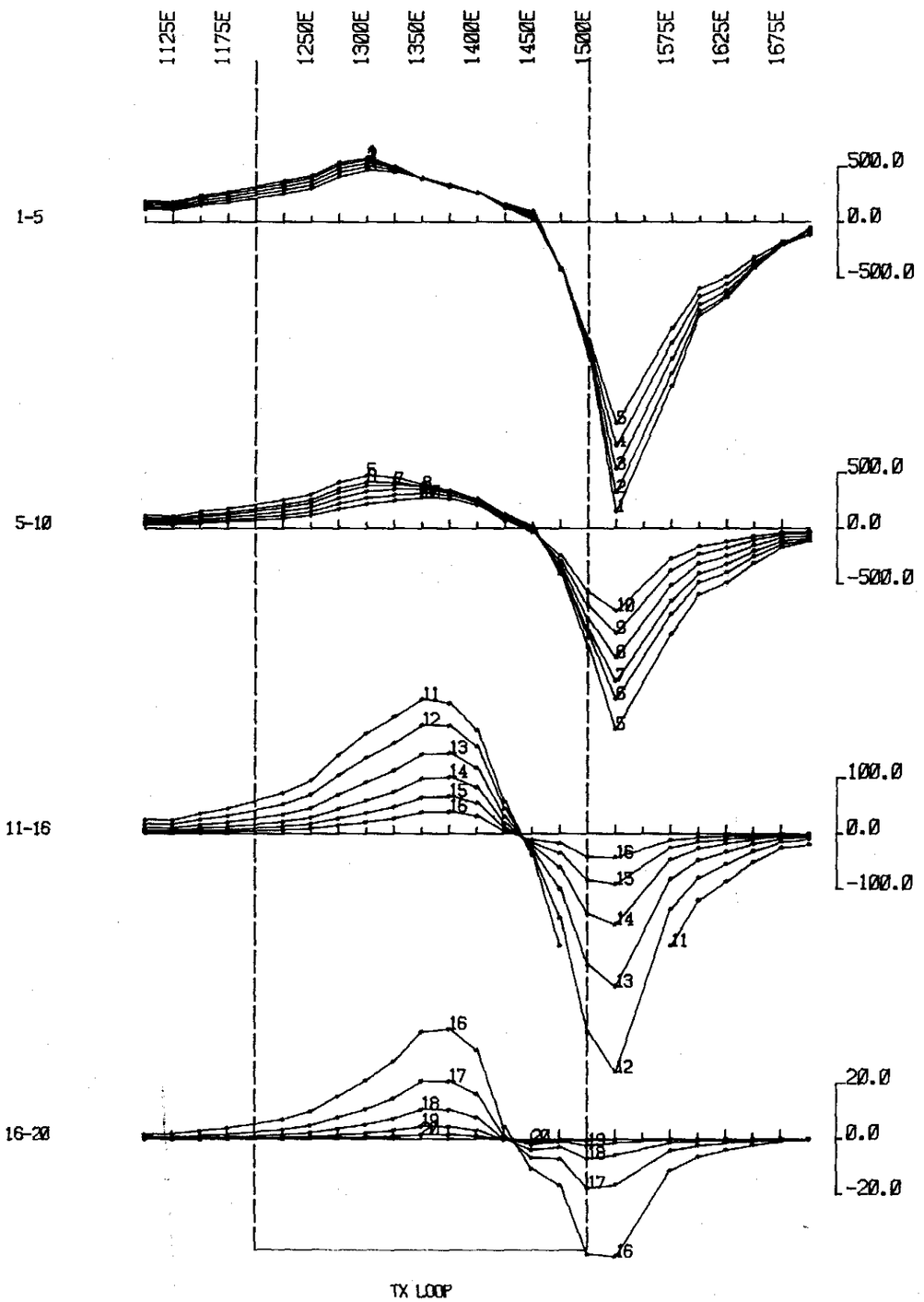
LINE : 1400N Z

TX LOOP : 8

379085

084

HORIZONTAL COMPONENT B (X)



nanovolts per amp.metre squared

EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

5 cm

TX LOOP SIDES	:	1300N 1200E
	:	1800N 1500E
TX LOOP SIZE	:	300m X 500m
TX TURN OFF TIME	:	360 microsecs
CURRENT	:	15.8 amps
FREQUENCY	:	25 Hz
INTEGRATION TIME	:	256 cycles
SYNC MODE	:	CRYSTAL
HORIZONTAL SCALE	:	1:5000
SURVEYED BY	:	R.J.L
DATE	:	08-JAN,1983

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD.

PROJECT NO. 85-1499

CLIENT : THE BHP Co. Ltd.

PROJECT : STYX

AREA : Maydena,Tasmania

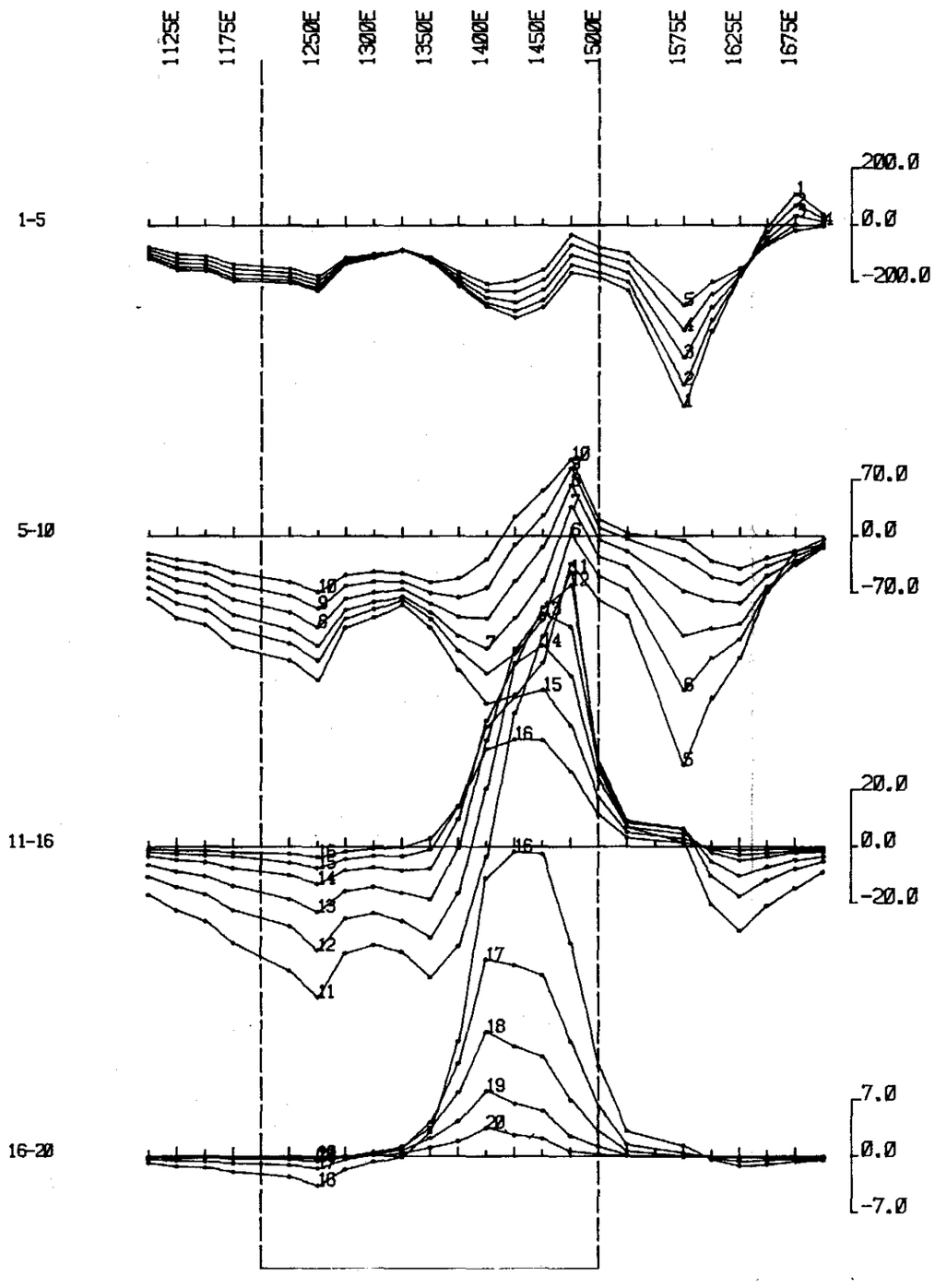
LINE : 1500N X

TX LOOP : 8

085

379086

HORIZONTAL COMPONENT B (Y)



nanovolts per amp.metre squared

EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

5 cm

TX LOOP SIDES	:	1300N 1200E
	:	1800N 1500E
TX LOOP SIZE	:	300m X 500m
TX TURN OFF TIME	:	360 microsecs
CURRENT	:	15.8 amps
FREQUENCY	:	25 Hz
INTEGRATION TIME	:	256 cycles
SYNC MODE	:	CRYSTAL
HORIZONTAL SCALE	:	1:5000
SURVEYED BY	:	R.J.L
DATE	:	08-JAN-1983

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD.

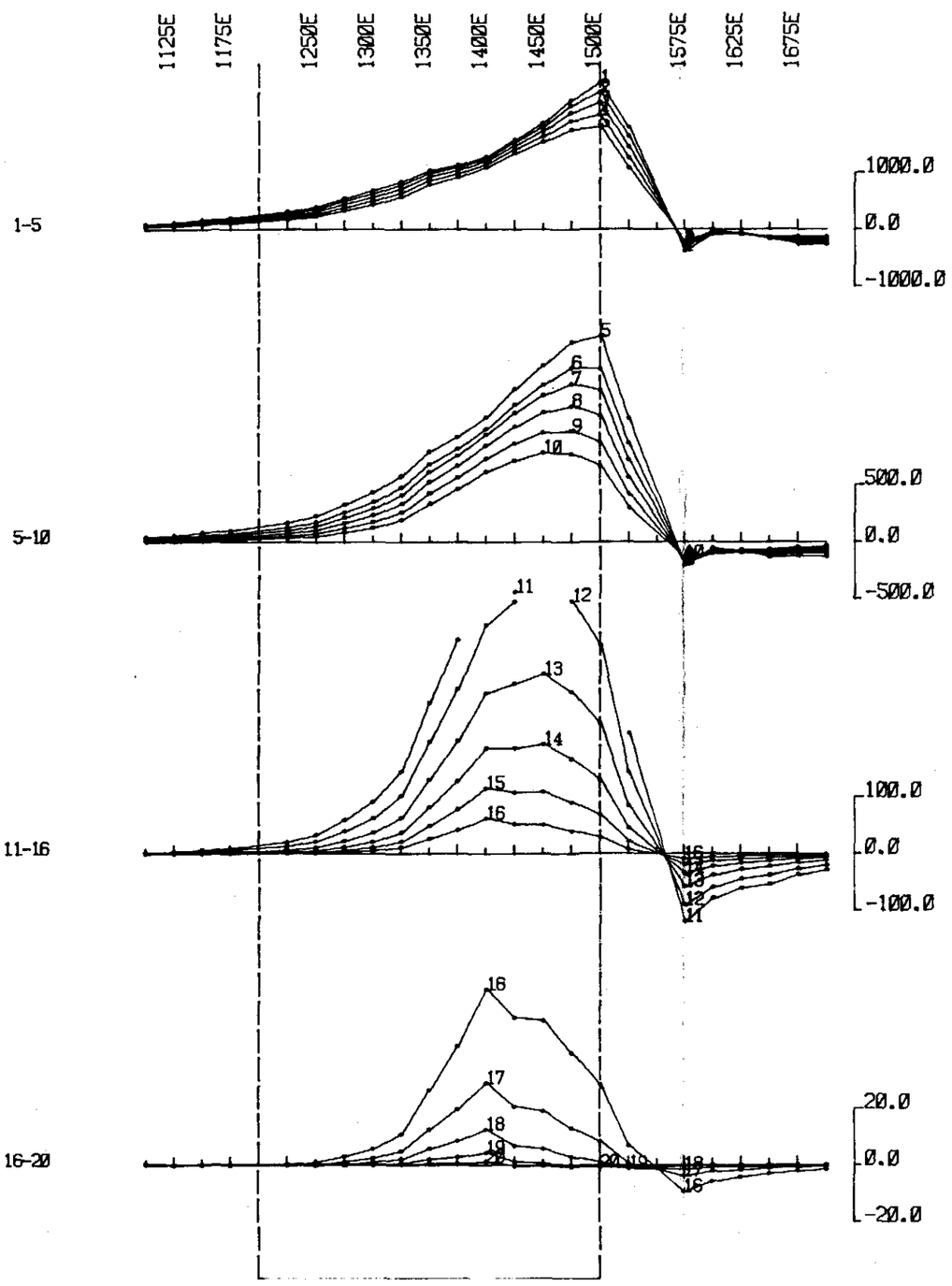
PROJECT NO. 85-1499

CLIENT	:	THE BHP Co. Ltd.
PROJECT	:	STYX
AREA	:	Mayderna, Tasmania
LINE	:	1500N Y
TX LOOP	:	8

086

379087

VERTICAL COMPONENT B (Z)



nanovolts per amp.metre squared

EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

5 cm

TX LOOP SIDES	: 1300N	1200E
	: 1800N	1500E
TX LOOP SIZE	: 300m X 500m	
TX TURN OFF TIME	: 360 microsecs	
CURRENT	: 15.8 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256 cycles	
SYNC MODE	: CRYSTAL	
HORIZONTAL SCALE	: 1:5000	
SURVEYED BY	: RJL	
DATE	: 08-JAN.1983	

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD.

PROJECT NO. 85-1499

CLIENT : THE BHP Co. Ltd.

PROJECT : STYX

AREA : Maydena,Tasmania

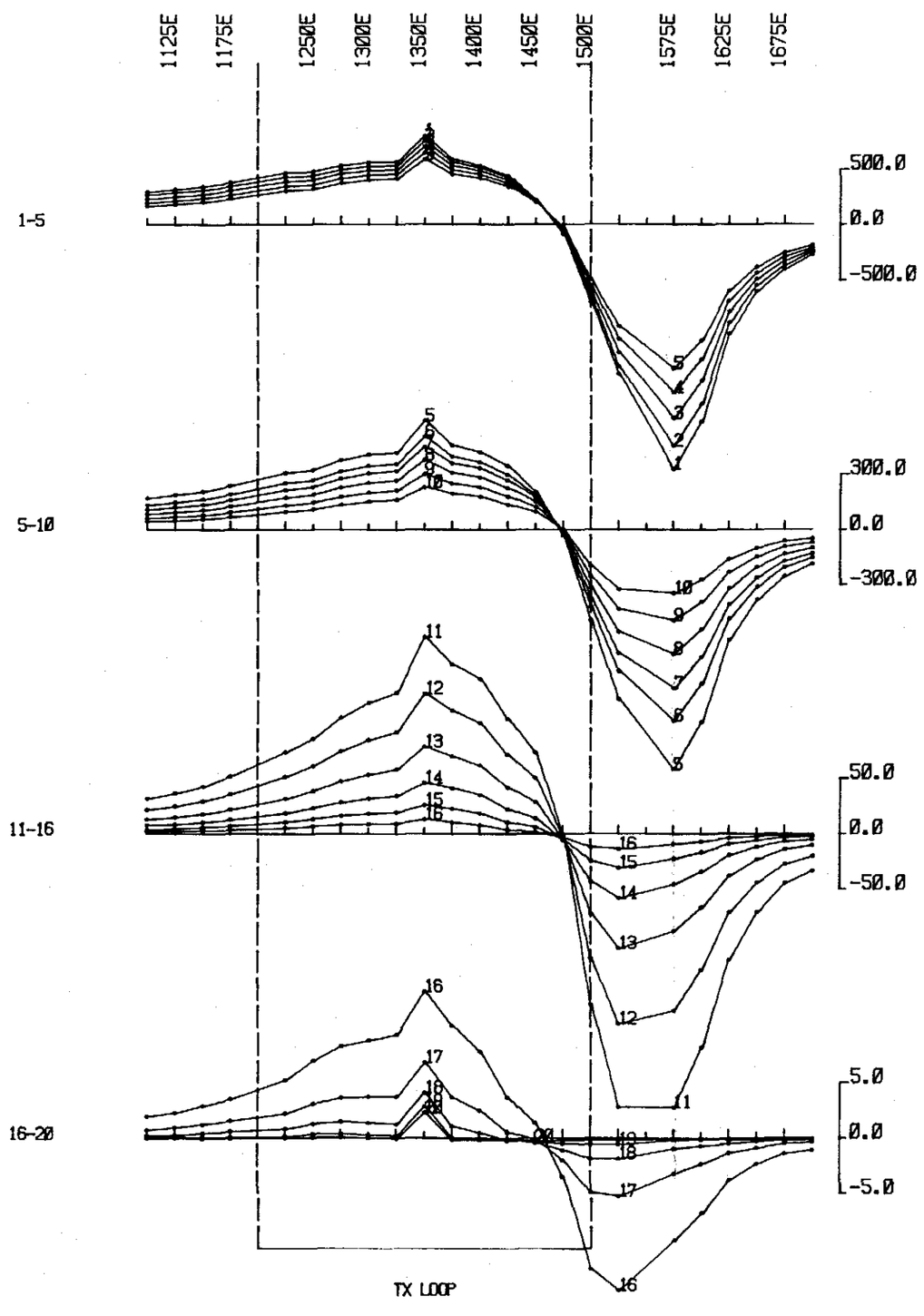
LINE : 1500N Z

TX LOOP : 8

379088

087

HORIZONTAL COMPONENT B (X)



nanovolts per amp.metre squared

EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

5 cm

TX LOOP SIDES	: 1300N	1200E
	: 1800N	1500E
TX LOOP SIZE	: 300m X 500m	
TX TURN OFF TIME	: 360 microsecs	
CURRENT	: 15.5 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256 cycles	
SYNC MODE	: CRYSTAL	
HORIZONTAL SCALE	: 1:5000	
SURVEYED BY	: R.J.L.	
DATE	: 09-JAN-1984	

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD.

PROJECT NO. 85-1499

CLIENT : THE BHP Co. Ltd.

PROJECT : STYX

AREA : Maydena, Tasmania

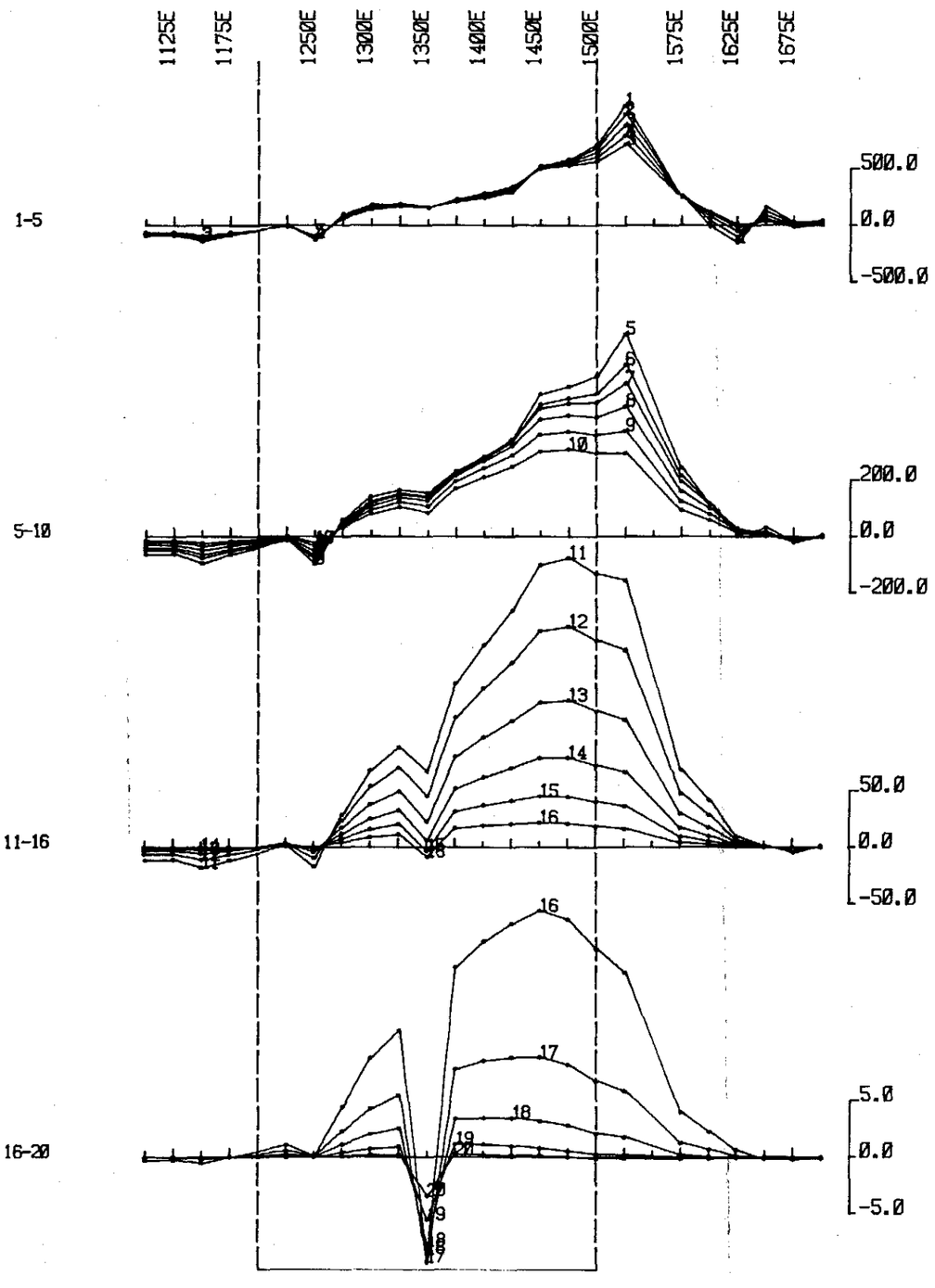
LINE : 1600N X

TX LOOP : 8

379089

088

HORIZONTAL COMPONENT B (Y)



nanovolts per amp.metre squared

EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

5 cm

TX LOOP SIDES	: 1300N	1200E
	: 1800N	1500E
TX LOOP SIZE	: 300m X 500m	
TX TURN OFF TIME	: 360 microsecs	
CURRENT	: 15.5 amps	
FREQUENCY	: 25 Hz	
INTEGRATION TIME	: 256 cycles	
SYNC MODE	: CRYSTAL	
HORIZONTAL SCALE	: 1:5000	
SURVEYED BY	: R.J.L	
DATE	: 09-JAN,1984	

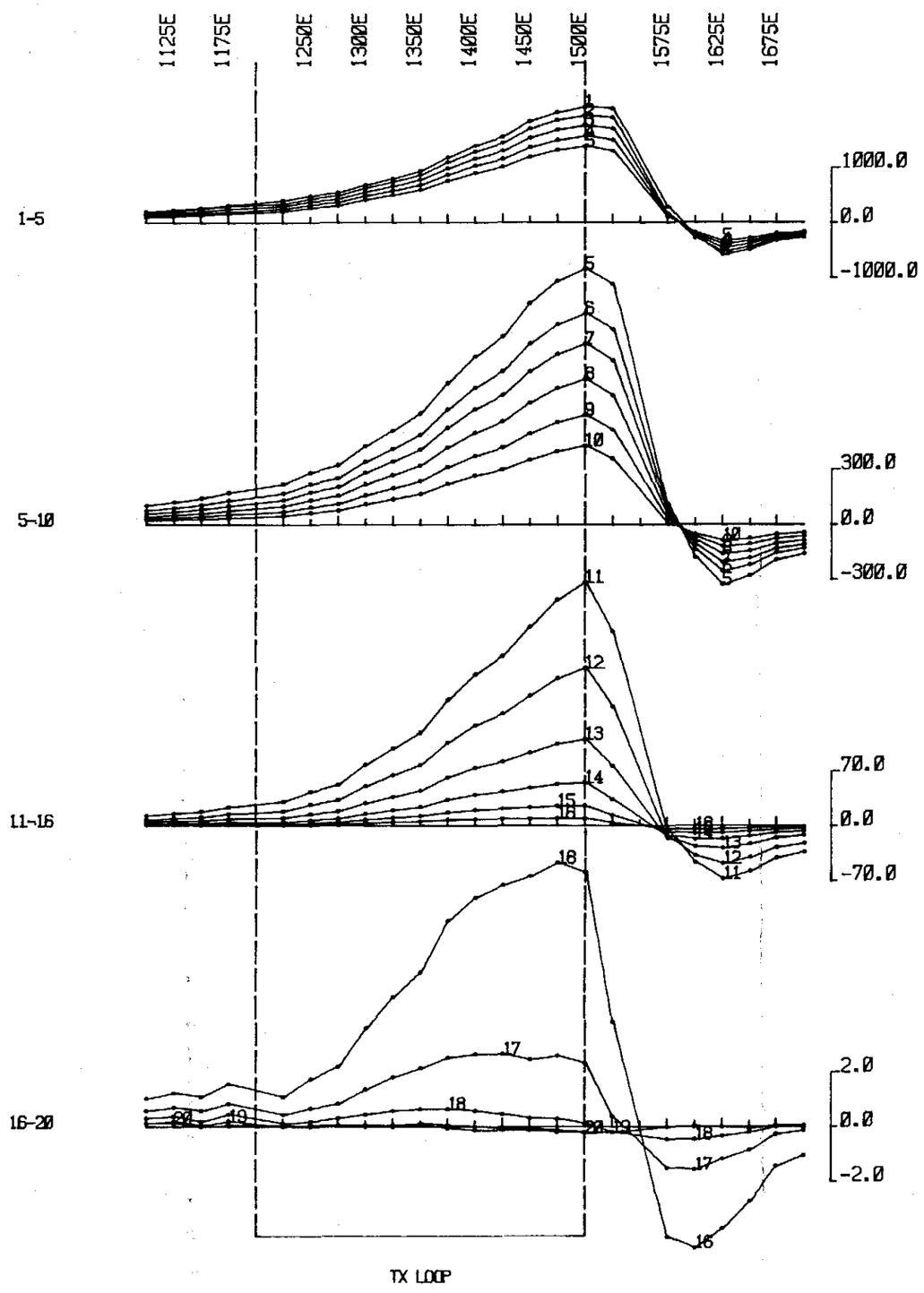
SURVEYED AND COMPILED BY GEOTERREX PTY. LTD.	PROJECT NO. 85-1499

CLIENT	: THE BHP Co. Ltd.
PROJECT	: STYX
AREA	: Maydena,Tasmania
LINE	: 1600N Y
TX LOOP	: 8

089

379090

VERTICAL COMPONENT B (Z)



nanovolts per amp.metre squared

EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

5 cm

TX LOOP SIDES	:	1300N 1200E
	:	1800N 1500E
TX LOOP SIZE	:	300m X 500m
TX TURN OFF TIME	:	360 microsecs
CURRENT	:	15.5 amps
FREQUENCY	:	25 Hz
INTEGRATION TIME	:	256 cycles
SYNC MODE	:	CRYSTAL
HORIZONTAL SCALE	:	1:5000
SURVEYED BY	:	RJL
DATE	:	09-JAN,1984

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD.

PROJECT NO. 85-1499

CLIENT : THE BHP Co. Ltd.

PROJECT : STYX

AREA : Maydena,Tasmania

LINE : 1600N Z

TX LOOP : 8

379091

Mission STYX 1 85-1499

Date December 8, 1983

S.E.
Forage

Interprétation :

260 metres	300 ohm metres
65 metres	150 ohm metres
infinite	300 ohm metres

Azimut de AB

Cote de surface

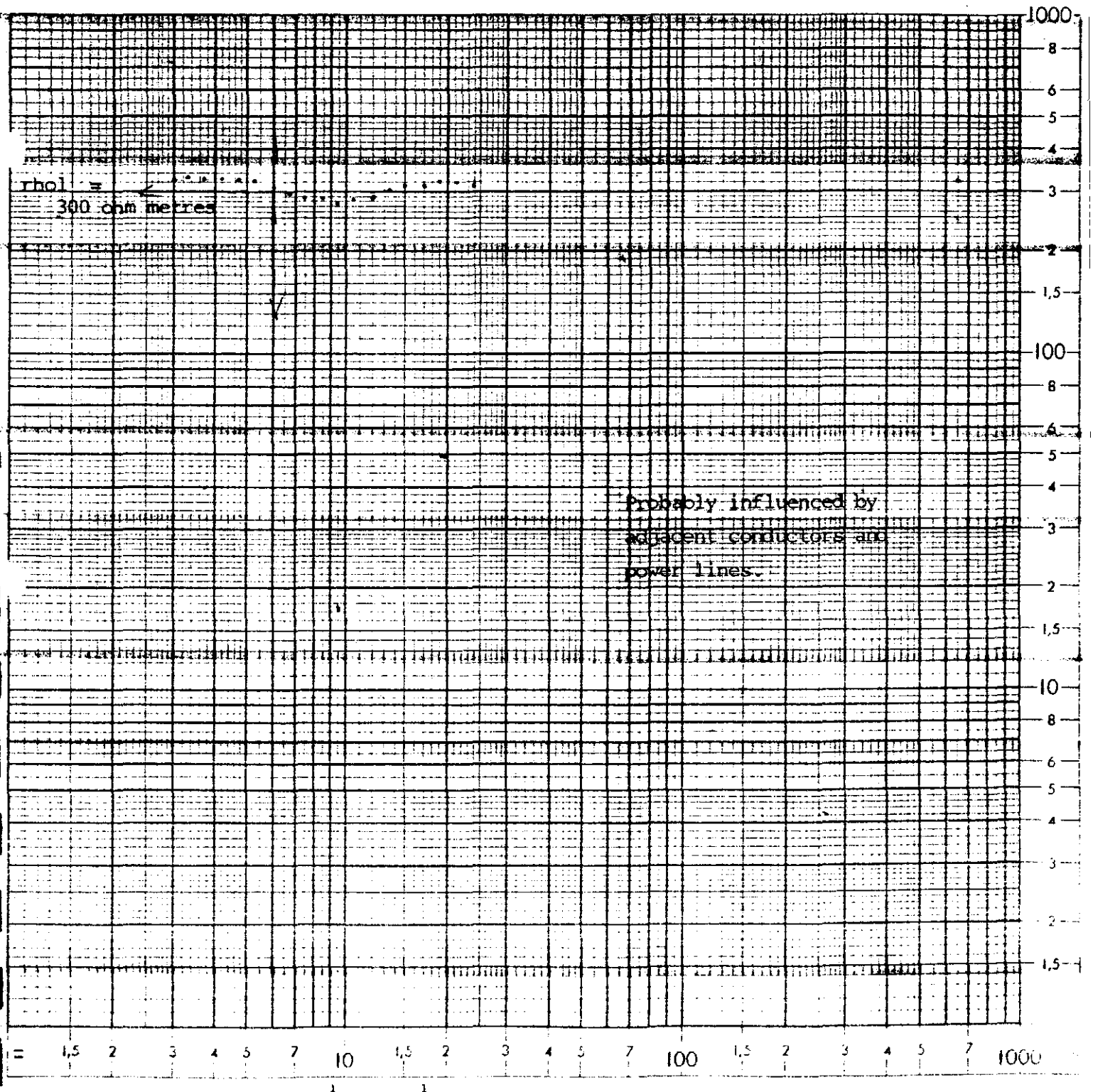
A = 300 metres

B = 300 metres

i = 15.0 amps

T/o = 270 micro sec

Coupe des terrains



091

Sounding No.:	STYX 1	A	=	300	metres
Date:	December 8, 1983	B	=	300	metres
Component:	Z	I	=	15.0	Amps
Location:	Tx centre @ (1750N, 1850E) Rx @ (1750N, 1850E)	T/o	=	270	micro sec.
		Base Frequency	=	25 Hz	

CHANNEL	TIME (msec)	GAIN	VALUE	TIME$^{\frac{1}{2}}$	Apparent Resistivity
1	.0885	6	3183.3	.30	324.6
2	.109	6	2152.0	.33	333.9
3	.140	6	1430.8	.37	329.0
4	.177	6	944.8	.42	328.8
5	.220	6	646.3	.47	324.9
6	.280	6	414.3	.53	322.7
7	.355	6	281.5	.60	306.5
8	.443	6	188.5	.67	297.4
9	.563	6	119.5	.75	289.2
10	.712	6	74.5	.84	283.6
11	.876	6/8	49.6/198.63	.94	274.9/274.7
12	1.087	8	117.28	1.04	283.0
13	1.400	7	65.08	1.18	285.3
14	1.772	8	34.23	1.33	304.1
15	2.210	8	19.68	1.49	311.1
16	2.820	8 in/8 out	10.90/11.45	1.68	313.4/303.3
17	3.570	8 in/8 out	5.95/6.70	1.89	321.6/297.2
18	4.460	8 in/8 out	3.53/4.15	2.11	318.1/285.5
19	5.667	8 in/8 out	2.05/2.55	2.38	309.7/267.7
20	7.160	8 in/8 out	.85/1.50	2.68	380.2/260.3

Interpreted Model:

260 metres	300 ohm metres
65 metres	150 ohm metres
infinite	infinite

092

Sounding No.: STYX 1

Date: December 8, 1983

Component: Z

Location: Tx centre @ (1750N, 1850E)
Rx @ (1750N, 1550E)

A = 300 metres

B = 300 metres

I = 15.0 Amps

T/o = 270 micro sec.

Base Frequency = 25 Hz

CHANNEL	TIME (msec)	GAIN	VALUE	TIME$^{\frac{1}{2}}$	Apparent Resistivity
1	.0885	8	2645.5	.30	-
2	.109	8	2076.5	.33	-
3	.140	8	1429.0	.37	-
4	.177	8	979.5	.42	-
5	.220	8	686.0	.47	-
6	.280	8	457.0	.53	-
7	.355	8	330.5	.60	-
8	.443	8	240.0	.67	-
9	.563	8	173.5	.75	-
10	.712	8	128.5	.84	-
11	.876	8	97.25	.94	-
12	1.087	8	67.95	1.04	-
13	1.400	8	45.35	1.18	-
14	1.772	8	28.85	1.33	-
15	2.210	8	18.85	1.49	-
16	2.820	8	11.45	1.68	-
17	3.570	8	6.70	1.89	-
18	4.460	8	4.15	2.11	-
19	5.667	8	2.55	2.38	-
20	7.160	8	1.50	2.68	

Interpreted Model:

Sounding No.: STYX 1

Date: December 8, 1983

Component: X

Location: Tx centre @ (1750N, 1850E)
Rx @ (1750N, 1550E)

A = 300 metres

B = 300 metres

I = 15.0 Amps

T/o = 270 micro sec.

Base Frequency = 25 Hz

CHANNEL	TIME (msec)	GAIN	VALUE	$TIME^{\frac{1}{2}}$	Apparent Resistivity
1	.0885	7	3411.0	.30	-
2	.109	8	5228.5	.33	-
3	.140	8	3720.5	.37	-
4	.177	8	2671.5	.42	-
5	.220	8	1942.0	.47	-
6	.280	8	1313.0	.53	-
7	.355	8	923.0	.60	-
8	.443	8	620.5	.67	-
9	.563	8	381.5	.75	-
10	.712	8	218.0	.84	-
11	.876	8	131.10	.94	-
12	1.087	8	67.90	1.04	-
13	1.400	8	28.50	1.18	-
14	1.772	8	9.95	1.33	-
15	2.210	8	2.40	1.49	-
16	2.820	8	.20	1.68	-
17	3.570	8	- .80	1.89	-
18	4.460	8	- .75	2.11	-
19	5.667	8	- .55	2.38	-
20	7.160	8	- .50	2.68	-

Interpreted Model:

379095

Mission STYX 2 85-1499

Date December 8, 1983

S.E.

Forage

Interprétation :

250 ohm metres

Not interpreted any more than this due to powerline noise

Azimut de AB

Cote de surface

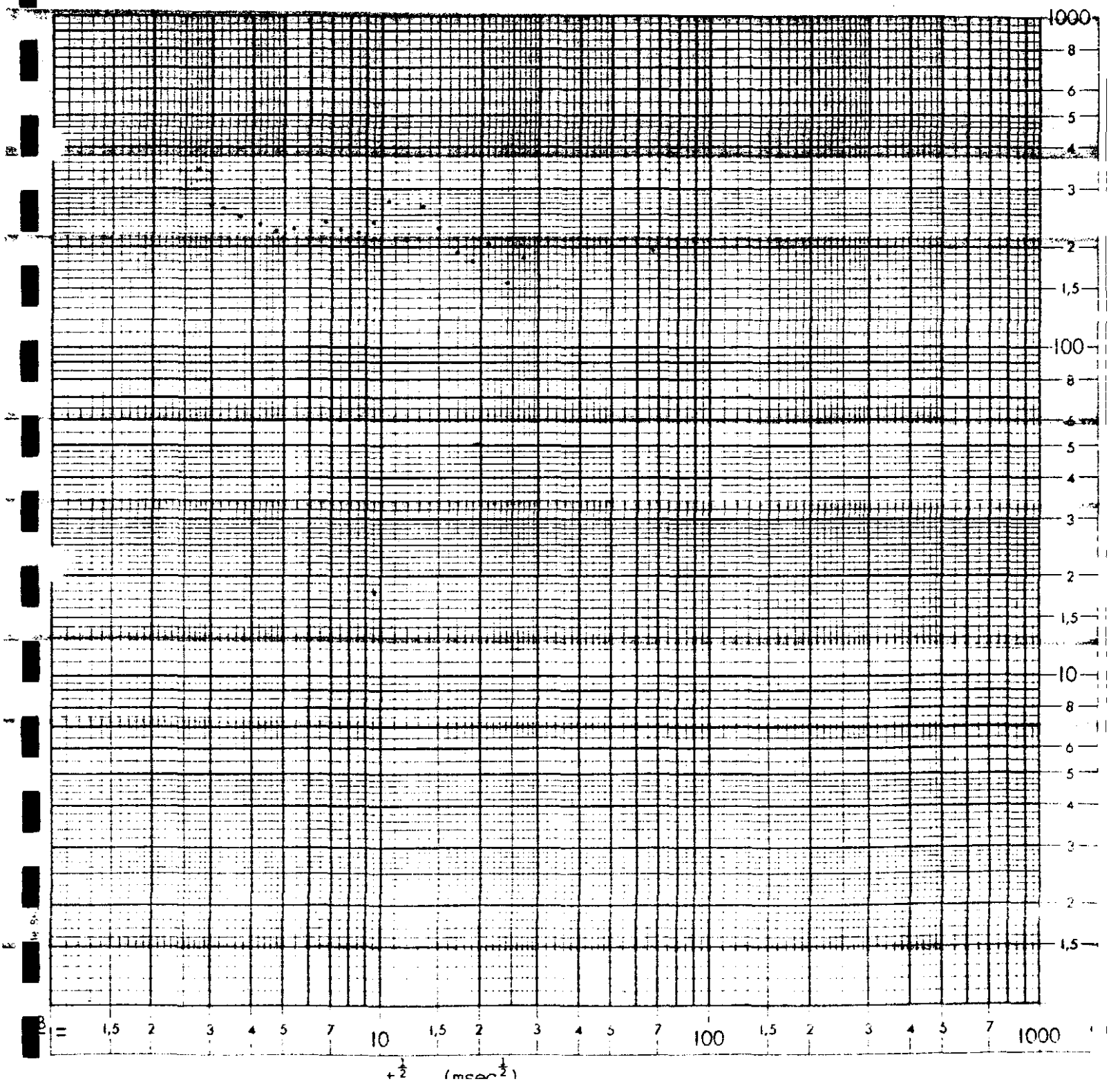
A = 300 metres

B = 300 metres

i = 16.0 amps

T/o = 252 micro sec.

Coupe des terrains



095

Sounding No.: STYX 2

Date: December 8, 1983

Component: Z

Location: Tx centre @ (1450N, 1850E)
Rx @ (1450N, 1850E)

A = 300 metres

B = 300 metres

I = 16.0 Amps

T/o = 252 micro sec.

Base Frequency = 25 Hz

CHANNEL	TIME (msec)	GAIN	VALUE	$TIME^{\frac{1}{2}}$	Apparent Resistivity
1	.0885	6	4801.3	.30	267.8
2	.109	6	3532.8	.33	259.9
3	.140	6	2505.0	.37	244.7
4	.177	7	1774.8	.42	232.8
5	.220	6	1270.5	.47	222.6
6	.280	6	782.3	.53	226.4
7	.355	6	494.3	.60	225.0
8	.443	6	294.5	.67	235.4
9	.563	6	192.3	.75	223.8
10	.712	6	118.8	.84	220.2
11	.876	6/8	66.20/270.73	.94	239.8/236.3
12	1.087	8	134.25	1.04	272.9
13	1.400	8	111.83	1.18	209.5
14	1.772	8	45.45	1.33	264.8
15	2.210	8	33.53	1.49	229.1
16	2.820	8	24.75	1.68	190.3
17	3.570	8	15.27	1.89	179.8
18	4.460	8	7.42	2.11	203.0
19	5.667	8	6.10	2.38	156.7
20	7.160	8	2.72	2.68	183.1

Interpreted Model: _____

250 ohm metres

Not interpreted any more than this due to powerline noise.

096

Mission Styx - Sounding #3
Date 09/01/84

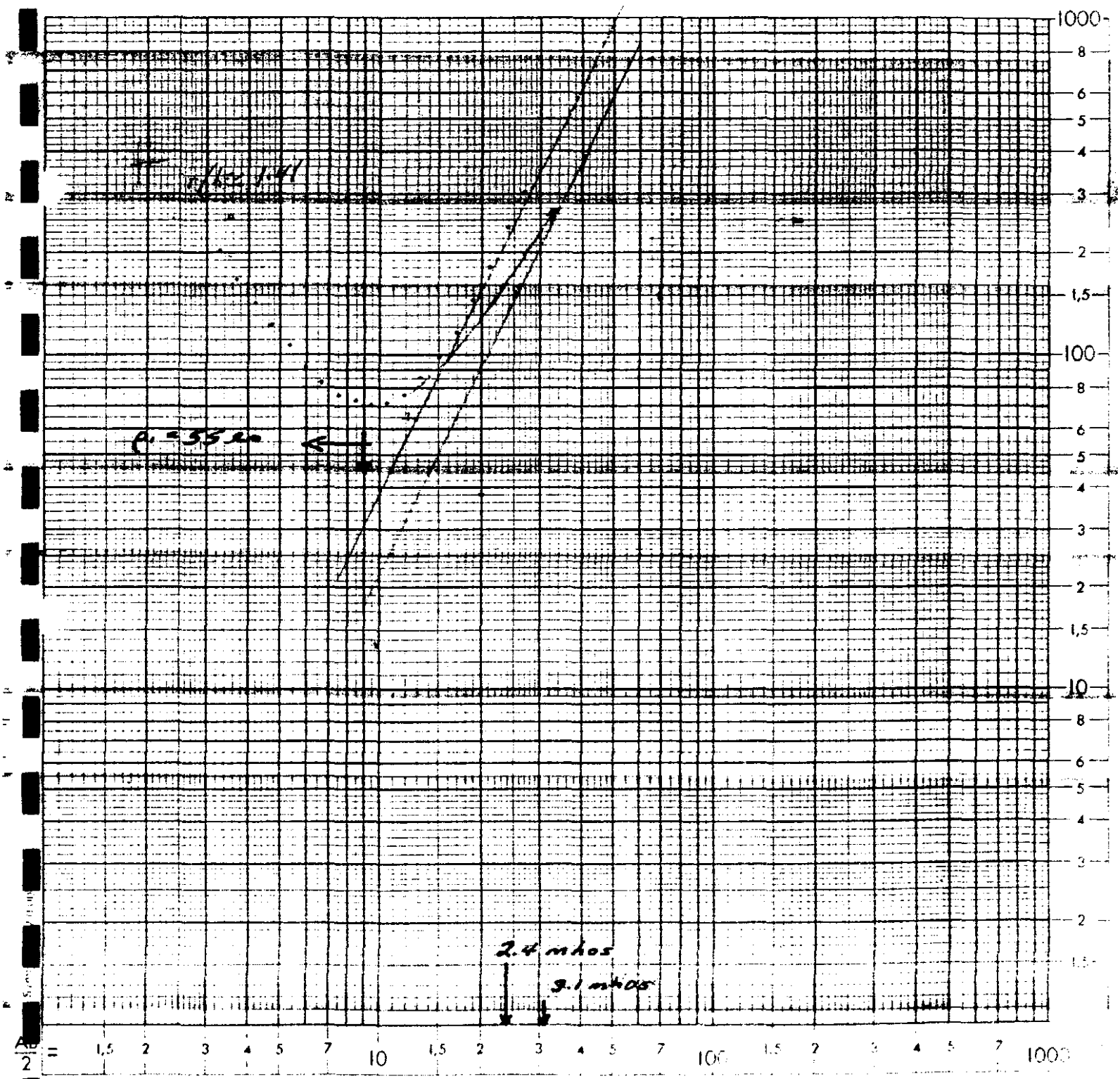
S.E.
Forage

Interprétation :

167 m	552 m
∞	∞

Azimut de AB
Cote de surface
A = 300 m
B = 300 m
i = 17.0 Amps
T/o = 322 msec

Coupe des terrains



Sounding No.:	Styx 3	A	=	300	metres
Date:	January 9, 1984	B	=	300	metres
Component:	Z	I	=	17.0	Amps
Location:	(1650N, 1050E)	T/o	=	322	micro sec.
Tx centre @ (1650N, 1350E)		Base Frequency	=	25	Hz

CHANNEL	TIME (msec)	GAIN	VALUE	TIME$^{\frac{1}{2}}$	Apparent Resistivity
1	.0885	8	3506.4	.30	-
2	.109	8	3024.0	.33	-
3	.140	8	2478.8	.37	-
4	.177	8	2017.0	.42	-
5	.220	8	1631.3	.47	-
6	.280	8	1224.3	.53	-
7	.355	8	950.3	.60	-
8	.443	8	699.3	.67	-
9	.563	8	489.0	.75	-
10	.712	8	329.5	.84	-
11	.876	8	229.18	.94	-
12	1.087	8	144.68	1.04	-
13	1.400	8	87.10	1.18	-
14	1.772	8	49.20	1.33	-
15	2.210	8	29.70	1.49	-
16	2.820	8	18.28	1.68	-
17	3.570	8	10.95	1.89	-
18	4.460	8	7.33	2.11	-
19	5.667	8	4.90	2.38	-
20	7.160	8	2.60	2.68	-

Interpreted Model:

098

379099

Sounding No.:	Styx 3	A	=	300	metres
Date:	January 9, 1984	B	=	300	metres
Component:	Z	I	=	17.0	Amps
Location:	(1650N, 1350E)	T/o	=	322	micro sec.
Rx Centre @ (1650N, 1350E)		Base Frequency	=	25 Hz	

CHANNEL	TIME (msec)	GAIN	VALUE (nV/m^2)	$TIME^{\frac{1}{2}}$	Apparent Resistivity
1	.0885	7.58	14863	.30	248.2
2	.109	7.58	13304	.33	203.5
3	.140	7.58	11698	.37	167.4
4	.177	7.58	10079	.42	140.9
5	.220	7.58	8560	.47	121.3
6	.280	7.58	6709	.53	106.2
7	.355	7.58	5398	.60	90.8
8	.443	7.58	4057	.67	82.2
9	.563	7.58	2809	.75	75.9
10	.712	7.58	1844	.84	72.4
11	.876	7.58	1250	.94	69.7
12	1.087	7.58	752	1.04	71.3
13	1.400	7.58	386	1.18	76.2
14	1.772	7.58	189	1.33	85.6
15	2.210	7.58	92	1.49	98.0
16	2.820	7.58	40	1.68	116.0
17	3.570	7.58	16	1.89	145.7
18	4.460	7.58	7	2.11	180.2
19	5.667	7.58	3	2.38	236.2
20	7.160	7.58	1	2.68	302.4

Interpreted Model:

099

379100

Sounding No.: Styx 3 A = 300 metres

Date: January 9, 1984 B = 300 metres

Component: X I = 17.0 Amps

Location: (1650N, 1050E) T/o = 322 micro sec.

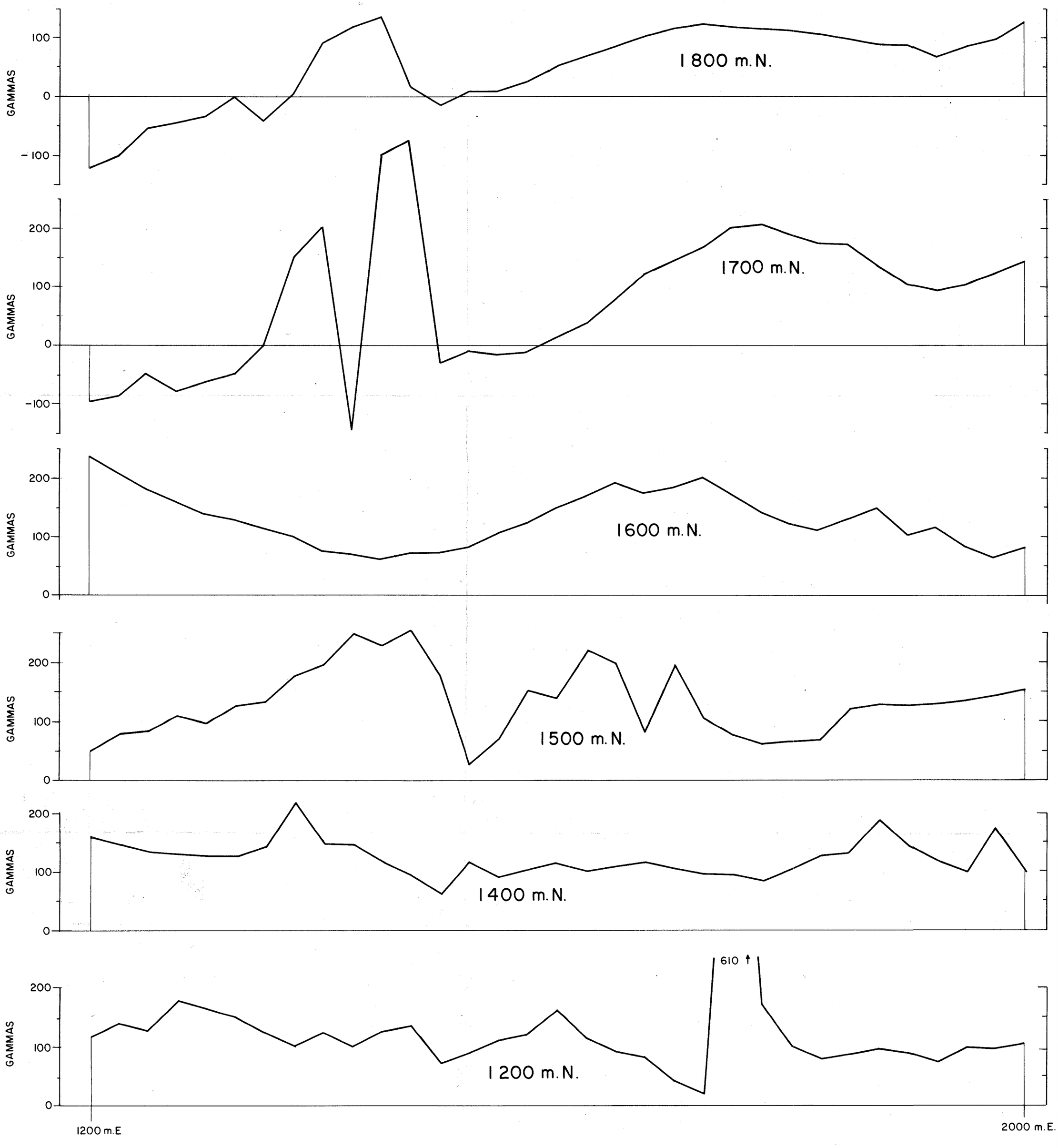
Tx centre @ (1650N, 1350E) Base Frequency = 25 Hz

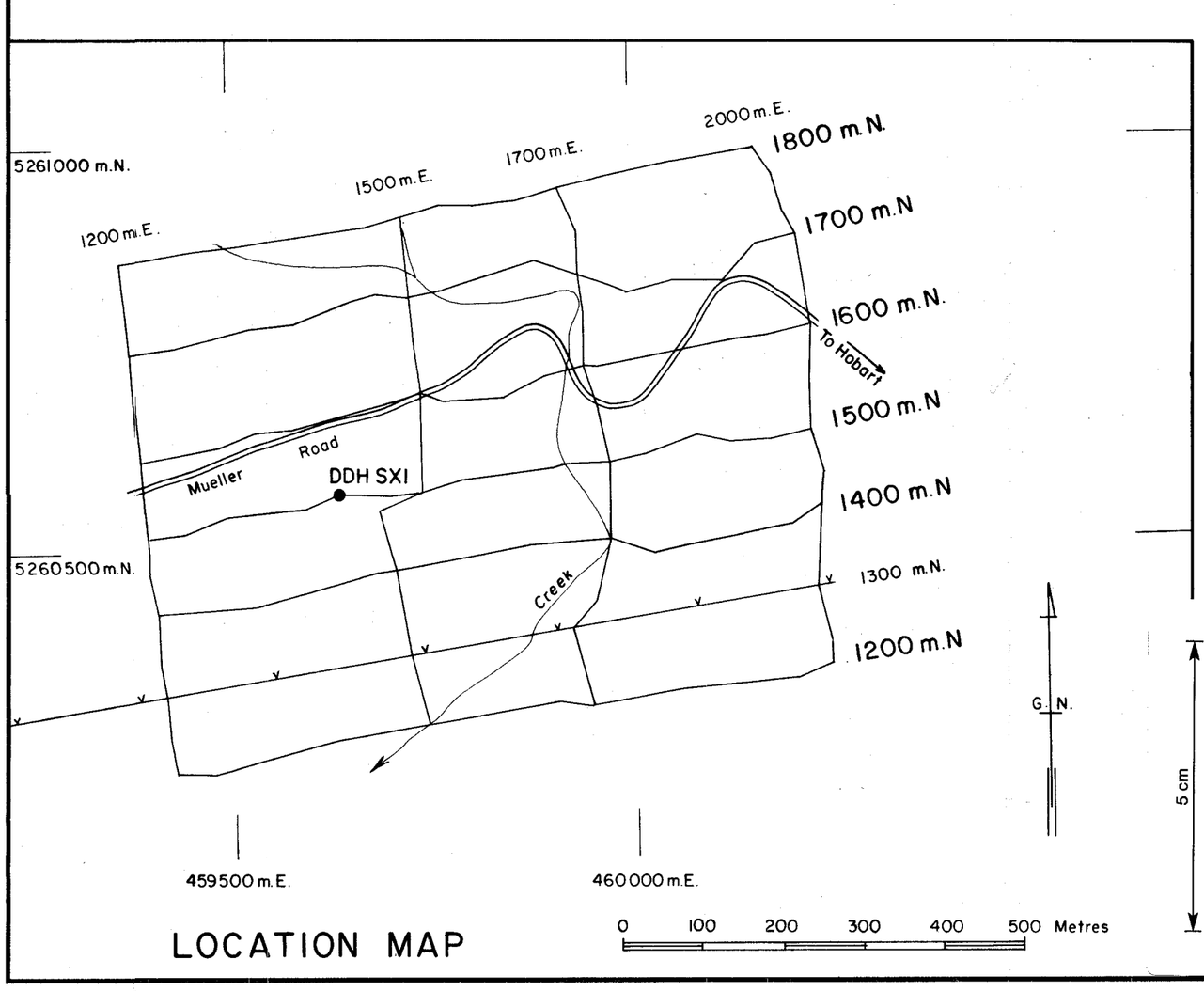
CHANNEL	TIME (msec)	GAIN	VALUE	$TIME^{\frac{1}{2}}$	Apparent Resistivity
1	.0885	8	4865.0	.30	-
2	.109	8	4403.5	.33	-
3	.140	8	3812.0	.37	-
4	.177	8	3265.0	.42	-
5	.220	8	2785.5	.47	-
6	.280	8	2190.0	.53	-
7	.355	8	1780.5	.60	-
8	.443	8	1375.0	.67	-
9	.563	8	981.5	.75	-
10	.712	8	672.0	.84	-
11	.876	8	477.95	.94	-
12	1.087	8	306.20	1.04	-
13	1.400	8	170.55	1.18	-
14	1.772	8	87.55	1.33	-
15	2.210	8	43.00	1.49	-
16	2.820	8	17.90	1.68	-
17	3.570	8	6.15	1.89	-
18	4.460	8	.45	2.11	-
19	5.667	8	- .15	2.38	-
20	7.160	8	- 1.45	2.68	-

Interpreted Model:

APPENDIX 4

GROUND MAGNETICS SURVEY DATA





5 cm

SCALE 1 : 2500

0 50 100 200 300 Metres

THE BROKEN HILL PROPRIETARY CO. LTD. EXPLORATION DEPARTMENT			
E.L. 12/83 - MT. MUELLER, TAS. STYX GRID GROUND MAGNETIC PROFILES			
Revisions:	Drawn: R. Irvine	Date: July 84.	Centre: Melbourne
	Traced: C.Osborne	Project No: T70-4	Drawing No: A2- 1519
	Checked:		

101

379102

APPENDIX 5

GEOCHEMICAL ANALYSES

Date | Centre

ROCK CHIP SAMPLE DESCRIPTION

THE BROKEN HILL PROPRIETARY CO. LTD.

REGION: ADAMSFIELD. **SHEET:** WEDGE 1:100 000 **PROSPECT:** **PROJECT No:** T70

Sample No	Grid Ref. Local AMG	Description
SWT 1	DN 497 579	Sheared serpentinite with minor carbonate, now magnetic.
SWT 2	"	Sheared serpentinitic conglomerate? mafic detritus, no carbonate, now magnetic.
SWT 3	"	Sheared serpentinitic conglomerate? light green-blue stain not copper, sheared, kaolinised.
SWT4	"	Sheared serpentinitic conglomerate? containing more leucocide mostly after serpentinite, light green stain.
SWT 5	"	Sheared serpentinitic conglomerate? chlorite-serpentinite alteration products abundant.
SWT 6	DN 478 592	Hard, dark green serpentinite, weakly magnetic, carbonate bearing.

ANALYSIS: **Laboratory:** ALS **Batch No:** 159H / M039 **Date Submitted:** 20.8.79 / 5.12.79 **Date Analysed:** 3.9.79 / 23.1.80

Element / Method / Sample No.	Sn	W	Cu	Pb	Zn	Ag	Ni	Co	Cr	As	Au	V	Sb (ppb)				
SWT 1	5	-10	35	20	60	2	720	65	500	2	10	70	50				
SWT 2	10	-10	10	20	40	3	120	20	25	5	15	-10	-50				
SWT 3	-5	-10	55	15	90	3	30	30	5	5	10	-10	50				
SWT 4	-5	-10	50	20	105	3	40	40	5	2	10	-10	-50				
SWT5	-5	-10	55	15	90	2	30	25	10	2	5	-10	-50				
SWT6	-5	-10	30	15	50	2	0.13%	80	290	2	10	50	-50				

REMARKS:

Logged or Sampled by: RH **Date:** 15/9/79

Project No. | Drawing No.

3791104

Date | Centre

ROCK CHIP SAMPLE DESCRIPTION

THE BROKEN HILL PROPRIETARY CO. LTD.

REGION: ADAMSFIELD **SHEET:** WEDGE 1:100 000 **PROSPECT:** **PROJECT No:** T70

Sample No	Grid Ref. Local AMG	Description
SWT 7	DN 478 592	Hard dark green serpentinite, sheared containing white carbonate on fractures.
SWT 8	"	Hard banded schistose serpentinite, magnetic, no carbonate.
SWT 9	"	Soft, sheared serpentinite, no carbonate, non magnetic, minor limonite.
SWT 10	"	Soft, sheared serpentinite. no carbonate, non magnetic, minor limonite
SWT 11	"	Hard dark green, serpentinite, magnetic, no carbonate.
SWT 12	"	Red, schistose conglomerate, serpentinite fragments in clayey matrix complete oxidation.

ANALYSIS: **Laboratory:** ALS **Batch No:** 159 H **Date Submitted:** 20.8.79 **Date Analysed:** 3.9.79

Element / Method / Sample No.	Sn	W	Cu	Pb	Zn	Ag	Ni	Co	Cr	As	Au	V	Sb ppb				
SWT 7	-5	-10	45	20	50	2	0.10%	70	185	6	10	50	-50				
SWT 8	-5	-10	10	20	25	2	0.20%	105	220	2	25	10	-50				
SWT 9	-5	-10	20	15	45	2	0.30%	80	460	5	5	30	-50				
SWT 10	-5	-10	10	10	65	2	0.56%	145	560	2	3	-10	-50				
SWT 11	5	-10	35	15	35	1	0.18%	85	220	5	10	20	-50				
SWT 12	-5	-10	10	10	10	1	45	10	80	3	5	10	400				

REMARKS:

Logged or Sampled by RH **Date:** 15/9/79

Project No. | Drawing No.

329105

Data | Centre

REGION: ADAMSFIELD **SHEET:** WEDGE 1:100 000 **PROSPECT:** **PROJECT No:** T70

Sample No	Grid Ref. Local AMG	Description
SWT 13	DN 570 600	Ferricrete, porous, red-orange, yellow-black limonite.
SWT 14	DN 557599	Ferricrete, porous, red-orange, yellow-black limonite
SWT 15	DN 539599	Ferricrete, porous, red-orange, yellow-black limonite
SWTB 5	DN 522663	Ferricrete, recent, false gossan? containing kaolinite, red-brown clast
SWTB 6	DN 511596	Ferricrete, mod oolitic chips, red clast, limonite.
SWTB 7	"	Heavily cleaved, red clasts

ANALYSIS: **Laboratory:** ALS **Batch No:** 159 H **Date Submitted:** 20-8-79 **Date Analysed:** 3.9.79

Element / Method / Sample No.	Sn	W	Cu	Pb	Zn	Ag	Ni	Co	Cr	As	Au	V	ppb Sb				
SWT 13	10	-10	30	80	350	5	—	—	—	115	25	—	950				
SWT 14	-5	-10	20	45	150	3	—	—	—	6	<30	—	-50				
SWT 15	-5	-10	10	40	75	6	—	—	—	-1	5	—	50				
SWTB 5	-5	-10	5	40	80	2	40	50	35	18	10	20	—				
SWTB 6	-5	-10	100	110	330	2	30	30	80	480	15	-10	—				
SWTB 7	-5	-10	75	10	40	1	20	20	10	50	10	-10	—				

REMARKS:

Logged or Sampled by: **Date:**

ROCK CHIP SAMPLE DESCRIPTION

THE BROKEN HILL PROPRIETARY CO. LTD.

Drawing No. | Project No.

379106

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TELEX ALSEV 42344

LABORATORY REPORT

106

R. W. YERBURY
DIRECTOR

379107

BATCH No.: 159 H CLIENT B.H.P. Company Ltd
ORDER No.: 791 AREA: Tasmania DATE RECEIVED: 20-
SAMPLE TYPE: Rock No.: 32 DATE COMPLETED: 3-
ATTENTION: Dr R. Hine

SAMPLE No.	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Cr ppm	As ppm	Au ppb
SWT - 1	35	20	60	2	720	65	500	2	10
2	10	20	40	3	120	20	25	5	15
3	55	15	90	3	30	30	5	5	10
4	50	20	105	3	40	40	5	2	10
5	55	15	90	2	30	25	10	2	5
6	30	15	50	2	0.13%	80	290	2	10
7	45	20	50	2	0.10%	70	185	6	10
8	10	20	25	2	0.20%	105	220	2	25
9	20	15	45	2	0.30%	80	460	5	5
10	10	10	65	2	0.56%	145	560	2	3
11	35	15	35	1	0.18%	85	220	5	10
12	10	10	10	1	45	10	80	3	5
SWT B - 1	20	15	10	1	15	10	30	4	30
2	10	20	5	1	15	10	35	4	30
3	30	20	5	1	10	10	25	2	10
4	10	15	5	1	10	10	10	3	15
5	5	40	80	2	40	50	35	18	10
6	100	110	330	2	30	30	80	480	15
7	75	10	40	1	20	20	10	50	10
8	160	30	10	-1	50	20	125	16	10
9	50	20	15	-1	50	20	45	8	3
10	560	30	20	-1	480	155	0.11%	470	30
SWT B - 11	340	20	60	1	140	50	0.36%	330	25
NET - 1	840	600	0.16%	3	30	30	75	95	20
2	480	0.34%	330	20	25	35	80	60	15
NET - 3	560	0.18%	110	12	20	15	75	190	10
NWT - 1	200	95	0.11%	3	400	120	+1.0%	120	10
2	45	0.48%	+1.0%	23	560	50	0.10%	200	10
3	10	30	180	1	0.13%	55	400	5	3
4	0.32%	45	0.19%	4	0.18%	125	240	370	-3

NATA

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METHODS: Cu, Pb, Zn, Ni, Co, Cr, Ag by method 1; As by method 5-B; Sn, W, V by method 9-A (XRF); Au by method 120-A.

Signatory G. Dunn

ALS

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TELEX ALSEV 42344

LABORATORY REPORT

379108

DR. W. YERBURY
DIRECTOR

BATCH No.: 159 H CLIENT B.H.P. Co. Ltd.

ORDER No.: AREA: DATE RECEIVED:

SAMPLE TYPE: No.: DATE COMPLETED:

ATTENTION:

SAMPLE No.	Sn ppm	W ppm	V ppm
SWT - 1	5	-10	70
2	10	-10	-10
3	-5	-10	-10
4	-5	-10	-10
5	-5	-10	-10
6	-5	-10	50
7	-5	-10	50
8	-5	-10	10
9	-5	-10	30
10	-5	-10	-10
11	5	-10	20
SWT - 12	-5	-10	10
SWT B - 1	-5	-10	10
2	-5	-10	-10
3	-5	-10	10
4	-5	-10	-10
5	-5	-10	20
6	-5	-10	-10
7	-5	-10	-10
8	-5	-10	-10
9	-5	-10	-10
10	-5	-10	-10
SWT B - 11	-5	-10	10
NET - 1	550	-10	40
2	225	-10	120
NET - 3	650	-10	140
NWT - 1	10	-10	150
2	0.10%	30	22
3	5	-10	-10
NWT - 4	1.04%	10	-10

NATA

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METHODS:

108

379109

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LABORATORY REPORT

R. W. YERBURY
DIRECTOR

BATCH No.: M039 CLIENT: BHP CO LTD- EXPLORATION DEPT
ORDER No.: T620/500 AREA: TASMANIA DATE RECEIVED: 5.12.79
SAMPLE TYPE: ~~ROCK STM SED, SOIL~~ No.: 52 DATE COMPLETED: 23.1.80
ATTENTION: DR R HINE

SAMPLE No.	Cu ppm	Pb ppm	Zn ppm	Ag ppm	As ppm	Au ppb	Sn ppm	W ppm
NET 5	35	5	15	1	6		<5	<10
6	30	10	15	1	10		<5	<10
7	* 590	0.26%	175	>25 32	60		0.23%	<10
8	80	820	30	11	6		440	<10
9	* 370	0.30%	75	14	16		0.50%	<10
10	* 510	0.54%	120	11	150		1.07%	<10
NET11	0.11%	0.12%	>1.0% 3.02	23 26	7		715	60
SWT13	30	80	350	5	115	25 *	10	<10
14	20	45	150	3	6	<3	<5	<10
14A	15	60	25	3	30	3	<5	<10
15	10	40	75	6	<1	5	<5	<10
15A	55	65	15	3	16	10 *	<5	<10
16	25	40	10	2	2	5	<5	<10
17	10	105	5	4	55	10 *	<5	<10
18	20	60	5	2	25	5	<5	<10
19	30	45	300	2	40	5	<5	<10
SWT20	50	45	210	1	20	5	<5	<10
MKC 1	15	30	105	2	6	10	<5	<10
2	10	20	20	1	2	10	<5	<10
3	20	40	105	3	8	15	<5	<10
4	50	40	145	3	10	10	<5	<10
5	10	25	55	4	9	10	<5	<10
6	20	35	60	3	8	10	<5	<10
7	10	25	60	1	4	20	<5	<10
8	10	20	45	2	3	15	<5	<10
MKC 9	15	25	40	1	3	10	<5	<10
MNS 1	15	35	45	2	3	10	<5	<10
2	10	20	40	1	2	10	<5	<10
3	10	20	10	<1	2	<3	Insufficient Sample	
MNS 4	10	10	15	<1	2	15	< 5	<10

METHODS: Cu Pb Zn Ag METHOD 1 As METHOD 5-B
Au METHOD 120A Sn W METHOD 9A XRF

Signatory

109

379110

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LABORATORY REPORT

R. W. YERBURY
DIRECTOR

BATCH No.: B 194 CLIENT B.H.P. COMPANY LIMITED

ORDER No.: AREA: DATE RECEIVED:

SAMPLE TYPE: No.: DATE COMPLETED:

ATTENTION:

SAMPLE No.	Sb ppb
BATCH NO. 159H	
SWTB 6	650
7	50
8	600
9	400
10	4400
SWBT 11	4900
BATCH 69K	
WR 1	450
2	250
3	300
4	200
5	200
WR 6	300

METHODS:

Signatory

110

379111

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LABORATORY REPORT

R. W. YERBURY
DIRECTOR

DATA BASE NOS

BATCH No.: 69K CLIENT B H P CO LTD - EXPLORATION DEPT

ORDER No.: 000603 AREA: DATE RECEIVED: 9.10.79

SAMPLE TYPE: SOIL STM SED No.: 115 DATE COMPLETED: 30.10.79

ATTENTION: R HINE

SAMPLE No.	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Sn ppm	W ppm	Ni ppm	Co ppm	Cr ppm	As ppm
21285 WR - 1	5	15	30	1	<5	<10	10	5	320	6
21286 — 2	10	35	65	1	<5	<10	30	15	480	8
21287 — 3	15	20	30	1	<5	20	40	15	0.10%	7
21288 — 4	15	15	50	1	<5	<10	110	30	0.13%	9
21289 — 5	15	25	60	1	<5	<10	40	20	440	9
21290 — 6	10	15	30	1	5	<10	30	10	880	12
1.8	20	20	70	1	5	<10				
1.9	5	30	10	1	<5	<10				
1.10	5	25	10	1	<5	<10				
1.11	10	25	15	1	5	<10				
1.12	5	35	10	1	5	<10				
1.13	10	25	20	1	5	<10				
1.14	15	55	20	1	60	<10				
1.15	10	50	10	1	95	<10				
1.16	20	75	20	1	80	<10				
1.17	10	65	10	1	25	<10				
1.18	5	60	10	1	50	<10				
1.19	5	30	10	1	55	<10				
1.20	10	45	10	1	60	<10				
1.21	5	35	10	1	65	<10				
1.22	15	115	10	2	95	<10				
1.23	5	45	10	1	60	<10				
1.24	5	25	10	1	40	<10				
1.25	5	90	10	1	85	<10				
1.26	10	45	10	1	105	<10				
1.27	SAMPLE NOT RECEIVED									
1.28	5	20	10	1	65	<10				
1.29	2	15	10	1	55	<10				
1.30	10	165	10	1	85	<10				
1.31	15	60	15	1	110	<10				

METHODS: Cu Pb Zn Ag Ni Co Cr Method 1
As Method 5B Sn W Method 9A (XRF)
Au Method 120A

Signatory G. Quinn

379112

111

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TELEX ALSEV 42344

LABORATORY REPORT

1 (A)

R. W YERBURY
DIRECTOR

BATCH No.: 69K CLIENT B H P CO LTD

ORDER No.: AREA: DATE RECEIVED:

SAMPLE TYPE: No.: DATE COMPLETED:

ATTENTION:

SAMPLE No.	Au ppb									
WR 1 21285	45									
2 86	20									
3 87	30									
4 88	570	*								
5 89	45									
WR 6 21290	30									

METHODS:

Signatory G. Dunn

379113

112

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CONSULTING CHEMISTS & ANALYSTS

OFFICE & LABORATORY
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Phone (07) 391 6866 A/H 355 0776
TELEX ALSEV 42344

LABORATORY REPORT

R. W. YERBURY
DIRECTOR

BATCH No.: B 157 CLIENT: B.H.P. COMPANY LIMITED
ORDER No.: T620/500 AREA: HOBART DATE RECEIVED: ~~26.2.80~~
SAMPLE TYPE: S/S, SOIL, ROCK, CONC. No.: 65 DATE COMPLETED: ~~10.4.80~~
ATTENTION: DR. R. HINE

SAMPLE No.	DATA BASE NO	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Sn ppm	W ppm	As ppm	Sb ppb
MM/1	21271	<2	10	10	2	5	5	10	<10	2	150
2	72	2	15	25	2	10	10	20	<10	14	<50
3	73	<2	15	50	1	15	15	<5	<10	6	<50
4	74	2	15	20	1	10	10	<5	<10	2	<50
5	75	<2	10	20	1	10	10	5	<10	<2	50
6	76	<2	10	10	<1	5	5	<5	<10	<2	300
7	77	<2	10	15	1	10	<5	<5	<10	<2	50
8	78	5	15	20	1	10	10	5	<10	<2	<50
9	79	5	15	60	2	40	15	<5	<10	4	<50
MM/10	21280	2	10	10	1	10	10	5	<10	<2	<50
11	1	10	15	30	2	15	10	<5	<10	2	<50
12	2	10	15	20	1	15	10	<5	<10	2	<50
13	3	2	15	20	1	20	10	<5	<10	<2	100
14	21284	<2	10	10	1	10	5	<5	<10	<2	400
F/1		5	15	60	2	45	15	<5	<10	4	50
2		5	20	65	2	70	20	<5	<10	2	<50
3		15	25	80	2	64	25	5	<10	2	7.6ppm
4		10	25	80	2	75	30	<5	<10	8	600
5		10	20	70	1	60	20	<5	<10	6	150
6		5	15	40	1	30	15	10	<10	<2	50
7		10	15	50	1	40	15	<5	<10	6	50
8		10	15	40	1	40	10	<5	<10	<2	<50
9		5	15	70	1	45	20	<5	<10	6	150
F/10		2	15	70	1	65	15	<5	<10	2	250
11		5	15	70	1	50	20	<5	<10	2	100
12		5	15	55	1	45	15	<5	<10	4	<50
13		2	15	75	1	45	20	<5	<10	2	50
14		2	10	25	1	25	10	<5	<10	2	<50
15		10	15	100	1	35	20	5	<10	6	<50
F/16		10	20	100	1	85	25	<5	<10	6	<50

METHODS: Cu, Pb, Zn, Ag, Ni, Co BY METHOD 1
Sn, W BY METHOD XRF 1-A
As BY METHOD XRF 1-C Sb BY METHOD 8-A

Signatory

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TELEX ALSEV 42344

LABORATORY REPORT

- 1 A -

R. W. YERBURY
DIRECTOR

BATCH No.: B 157-1 CLIENT: B.H.P. COMPANY LIMITED
ORDER No.: AREA: DATE RECEIVED:
SAMPLE TYPE: No.: DATE COMPLETED:
ATTENTION:

SAMPLE No.	Au ppb
MM/1 21271	3
2	<3
3	<3
4	5
5	<3
6	3
7	<3
8	3
9	5
MM/10 21280	3
11	<3
12	<3
13	<3
14 21284	<3
F/1	3
2	3
3	3
4	10
5	10
6	10
7	15
8	10
9	30
F/10	10
11	25
12	10
13	10
14	10
15	10
F/16	10

METHODS: Au BY METHOD 120-A

Signatory

379115

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TELEX ALSEV 42344

LABORATORY REPORT

R. W. YERBURY
DIRECTOR

BATCH No.: B 157 CLIENT B.H.P. COMPANY LIMITED

ORDER No.: AREA: DATE RECEIVED:

SAMPLE TYPE: No.: DATE COMPLETED:

ATTENTION:

SAMPLE No.	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Sn ppm	W ppm	As ppm	Sb ppb
F/17	10	15	70	<1	30	15	<5	<10	4	<50
18	5	10	15	<1	15	10	<5	<10	4	<50
S/1	10	10	55	1	35	15	<5	<10	6	<50
2	10	20	60	1	30	20	<5	<10	8	250
MNS/24	20	20	10	1	25	20	<5	<10	6	50
25	5	5	5	<1	10	5	<5	<10	4	<50
26	2	10	5	<1	10	15	5	<10	6	100
27	2	10	10	<1	10	10	<5	<10	6	<50
MA/4	20	25	60	2	35	50	<5	<10	2	<50
5	80	30	155	4	125	60	5	<10	8	50
6	30	35	80	4	90	30	<5	<10	8	50
7	25	30	120	4	70	105	<5	<10	6	<50
8	25	30	130	4	75	75	<5	<10	6	600
9	65	35	65	3	100	20	<5	<10	6	100
MA/10	145	25	105	3	175	50	<5	<10	6	50
11	120	30	110	3	180	40	<5	<10	6	<50
12A	140	25	80	3	145	55	<5	<10	6	<50
12B	180	30	110	4	190	70	<5	<10	6	50
12C	160	25	110	3	200	70	<5	<10	2	50
13	220	25	110	3	155	80	<5	<10	6	200
14	220	30	100	3	160	55	<5	<10	6	100
15	225	30	95	3	145	80	<5	<10	6	150
16	55	35	50	2	60	20	10	<10	10	50
17	5	5	2	<1	10	5	<5	<10	6	50
18	----------SAMPLE NOT RECEIVED----------									
19	<2	30	10	1	15	10	<5	<10	6	50
MAR/1	25	25	115	2	100	55	<5	<10	12	50
2	20	30	80	3	55	95	<5	<10	8	50
3	165	25	105	3	115	330	<5	<10	6	<50
4	20	15	65	1	40	20	5	<10	8	100
MAR/5	20	10	20	1	15	20	<5	<10	8	100

METHODS:

Signatory

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379116

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TELEX ALSEV 42344

LABORATORY REPORT

- 2 A -

R. W. YERBURY
DIRECTOR

BATCH No.: B 157-1 CLIENT: B.H.P. COMPANY LIMITED

ORDER No.: AREA: DATE RECEIVED:

SAMPLE TYPE: No.: DATE COMPLETED:

ATTENTION:

SAMPLE No.	Au ppb
F/17	15
18	10
S/1	10
2	15
MNS/24	10
25	10
26	10
27	10
MA/4	10
5	5
6	35
7	5
8	3
9	3
MA/10	10
11	<3
12A	10
12B	<3
12C	<3
13	5
14	3
15	10
16	<3
17	3
18	SAMPLE NOT RECEIVED
19	<3
MAR/1	<3
2	<3
3	3
4	<3
MAR/5	<3

METHODS:

Signatory

116

379117

The Australian
Mineral Development
Laboratories

emington Street, Frewville,
South Australia 5063
Phone Adelaide 79 1662
Telex AA 82520

Please address all
correspondence to
P.O. Box 114 Eastwood
SA 5063
In reply quote:

amdel

3/4/15/0 - AC 3304/84

12 March 1984

NATA CERTIFICATE

Mr. R.M. Horton,
BHP Exploration,
152 Macquarie Street,
HOBART TASMANIA 7000

REPORT AC 3304/84 Soil Augering

YOUR REFERENCE:	Despatch Sheet 006633
IDENTIFICATION:	As listed
DATE RECEIVED:	27 February 1984
NOTE:	Sample P70/1106 is listed but not received.

D. Patterson
Chief Chemist
Analytical Chemistry Division

for Brian S. Hickman
Managing Director

ij

Head Office:
Flemington Street, Frewville
South Australia 5063,
Telephone (08) 79 1662
Telex: Amdel AA82520
Pilot Plant:
Osman Place
Thebarton, S.A.
Telephone (08) 43 8053
Branch Laboratories:
Melbourne, Vic.
Telephone (03) 645 3093
Perth, W.A.
Telephone (09) 325 7311
Townsville
Queensland 4814
Telephone (077) 75 1377

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379118

Analysis code C1 Report AC 3304/84 Page 1

NATA Certificate Order No. 6633 Results in ppm

Hole #	Sample	Cu	Pb	Zn	Ni	Cr
1	P70/1000	10	20	22	20	40
	P70/1001	2	10	24	56	170
	P70/1002	6	20	46	240	260
2	P70/1003	6	10	110	1500	540
	P70/1004	4	6	40	2400	250
	P70/1005	2	10	66	2100	400
3	P70/1006	<2	<5	42	3350	150
4	P70/1007	4	10	120	2800	1700
5	P70/1008	2	10	120	2100	1300
	P70/1009	4	10	110	2100	1900
6	P70/1010	<2	6	46	2500	220
7	P70/1011	4	10	66	3400	1000
8	P70/1012	6	16	110	830	5800
9	P70/1013	18	10	34	260	520
10	P70/1014	26	16	44	130	260
11	P70/1015	28	16	70	150	180
12	P70/1016	4	10	28	40	730
13	P70/1017	4	10	14	16	640
14	P70/1018	6	10	6	26	10
	P70/1019	6	10	8	20	10
	P70/1020	2	6	8	16	70
15	P70/1021	6	16	20	40	40
	P70/1022	8	16	24	46	60
	P70/1023	4	10	10	16	30
	P70/1024	2	10	8	10	40
16	P70/1025	10	30	34	46	30
	P70/1026	20	50	56	76	20
	P70/1027	10	16	48	270	710
	P70/1028	40	16	76	1000	240
17	P70/1029	42	16	76	1400	150
	P70/1030	40	16	70	1300	120
	P70/1031	44	16	76	1200	100
	P70/1032	14	20	48	350	860
18	P70/1033	36	20	76	930	350
	P70/1034	42	16	76	1300	200
19	P70/1035	10	16	28	86	780
20	P70/1036	30	20	76	760	260
	P70/1037	28	16	56	660	920
21	P70/1038	60	20	100	2000	960
	P70/1039	66	26	100	2400	760
	Detn limit	(2)	(5)	(2)	(5)	(10)

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379119

Analysis code Cl | Report AC 3304/84 | Page 2

NATA Certificate | Order No. 6633 | Results in ppm

Sample	Cu	Pb	Zn	Ni	Cr
P70/1040	10	26	56	200	510
P70/1041	10	26	56	270	500
P70/1042	4	10	14	30	250
P70/1043	4	16	24	20	860
P70/1044	4	20	12	40	170
P70/1045	4	10	6	10	20
P70/1046	2	6	8	6	120
P70/1047	10	10	16	6	10
P70/1048	<2	10	8	6	520
P70/1049	6	16	12	26	170
P70/1050	40	26	38	70	140
P70/1051	22	16	26	110	420
P70/1052	2	10	12	10	40
P70/1053	4	6	20	16	240
P70/1054	12	10	22	66	220
P70/1055	12	10	20	100	190
P70/1056	22	16	44	350	120
P70/1057	12	10	14	40	30
P70/1058	6	10	16	16	260
P70/1059	36	30	90	1400	920
P70/1060	66	46	130	2000	570
P70/1061	70	40	150	2200	1200
P70/1062	56	30	140	2900	1100
P70/1063	30	16	56	1500	280
P70/1064	26	10	46	1500	120
P70/1065	28	10	46	1400	120
P70/1066	24	10	50	1400	110
P70/1067	46	26	70	96	80
P70/1068	70	36	110	110	50
P70/1069	66	30	96	170	90
P70/1070	70	30	100	180	50
P70/1071	70	30	110	180	50
P70/1072	12	20	70	1100	1100
P70/1073	2	10	66	2900	790
P70/1074	16	16	80	470	570
P70/1075	18	16	80	430	450
P70/1076	22	20	100	490	380
P70/1077	26	16	86	690	430
P70/1078	4	10	26	76	590
P70/1079	12	16	40	160	500
Detn limit	(2)	(5)	(2)	(5)	(10)

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379120

Analysis code C1 | Report AC 3304/84 | Page 3

NATA Certificate | Order No. 6633 | Results in ppm

	Sample	Cu	Pb	Zn	Ni	Cr
38	P70/1080	26	16	60	140	140
	P70/1081	40	20	70	180	240
39	P70/1082	30	20	24	26	50
	P70/1083	50	20	36	36	40
40	P70/1084	38	16	30	26	60
	P70/1085	70	20	42	40	80
41	P70/1086	2	10	8	6	40
	P70/1087	6	10	10	10	310
42	P70/1088	4	6	14	6	<10
	P70/1089	4	10	6	10	10
	P70/1090	18	6	4	10	50
43	P70/1091	6	10	12	6	280
	P70/1092	8	10	10	6	220
	P70/1093	26	20	10	10	120
44	P70/1094	42	10	60	860	850
45	P70/1095	38	16	50	320	450
	P70/1096	60	20	76	380	210
	P70/1097	56	20	70	340	150
	P70/1098	48	20	70	870	580
	P70/1099	42	16	70	1400	1200
46	P70/1100	36	16	56	280	150
	P70/1101	56	20	70	290	90
47	P70/1102	56	20	44	66	50
	P70/1103	70	26	66	56	20
	P70/1104	80	20	60	50	30
	P70/1105	86	20	70	60	20
48	P70/1107	60	20	56	36	40
	P70/1108	80	20	56	30	40
	P70/1109	120	26	70	36	30
49	P70/1110	90	26	46	46	40
	P70/1111	90	26	50	46	30
	P70/1112	90	26	46	40	40
	P70/1113	80	26	44	40	40
50	P70/1114	76	26	70	60	40
	P70/1115	80	26	70	56	40
	P70/1116	80	20	60	60	40
	P70/1117	90	26	70	66	40
51	P70/1118	90	26	66	60	50
	P70/1119	110	20	86	36	40
52	P70/1120	76	26	70	56	50
	Detn limit	(2)	(5)	(2)	(5)	(10)

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379121

Analysis code C1 | Report AC 3304/84 | Page 4

NATA Certificate | Order No. 6633 | Results in ppm

	Sample	Cu	Pb	Zn	Ni	Cr
52 (part)	P70/1121	60	26	56	40	70
	P70/1122	80	26	76	56	60
	P70/1123	96	26	86	70	40
53	P70/1124	56	30	76	56	80
	P70/1125	28	26	24	16	40
	P70/1126	70	30	42	26	60
54	P70/1127	76	30	46	30	60
	P70/1128	60	36	42	20	30
	P70/1129	76	26	42	36	110
55	P70/1130	110	30	56	56	50
	P70/1131	100	26	60	50	50
	P70/1132	46	26	40	30	70
	P70/1133	76	26	46	36	80
56	P70/1134	96	30	48	46	50
	P70/1135	100	30	48	46	40
	P70/1136	60	30	56	36	50
	P70/1137	90	36	70	50	30
57	P70/1138	86	30	60	56	50
	P70/1139	70	30	50	56	50
	P70/1140	80	30	70	70	80
	P70/1141	80	26	76	76	60
58	P70/1142	70	30	76	76	40
	P70/1143	70	30	76	90	50
	P70/1144	66	30	48	46	70
59	P70/1145	80	26	80	66	50
	P70/1146	86	20	86	70	40
	P70/1147	76	20	90	66	40
60	P70/1148	30	26	12	10	30
	P70/1149	34	36	12	10	20
61	P70/1150	44	26	46	46	90
	P70/1151	86	26	66	60	60
62	P70/1152	56	26	80	310	170
	P70/1153	60	26	110	450	120
63	P70/1154	60	26	66	56	50
64	P70/1155	56	16	100	76	60
65	P70/1156	56	20	130	76	60
66	P70/1157	50	10	20	16	50
	P70/1158	90	10	18	10	30
	P70/1159	38	16	24	20	90
67	P70/1160	56	16	28	26	70
	P70/1161	66	10	28	20	90
	Detn limit	(2)	(5)	(2)	(5)	(10)

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379122

Analysis code B3 | Report AC 3304/84 | Page 5

NATA Certificate | Order No. 6633 | Results in ppm

HOLE #	Sample	Sn	W	As
1	P70/1000	<4	10	26
	P70/1001	<4	<10	8
	P70/1002	<4	10	13
2	P70/1003	12	<10	11
	P70/1004	<4	<10	4
	P70/1005	4	<10	<2
3	P70/1006	5	<10	<2
4	P70/1007	<4	<10	2
5	P70/1008	<4	<10	<2
	P70/1009	5	10	<2
6	P70/1010	<4	<10	<2
7	P70/1011	<4	<10	<2
8	P70/1012	<4	<10	<2
9	P70/1013	<4	10	2
10	P70/1014	5	10	2
11	P70/1015	4	10	<2
12	P70/1016	<4	10	2
13	P70/1017	<4	<10	<2
14	P70/1018	4	<10	<2
	P70/1019	<4	<10	<2
	P70/1020	<4	<10	3
15	P70/1021	<4	<10	25
	P70/1022	<4	10	19
	P70/1023	6	<10	6
	P70/1024	4	10	5
16	P70/1025	8	10	43
	P70/1026	6	10	40
	P70/1027	<4	10	4
	P70/1028	<4	10	7
17	P70/1029	<4	<10	2
	P70/1030	<4	10	2
	P70/1031	<4	<10	2
	P70/1032	<4	<10	37
18	P70/1033	6	<10	14
	P70/1034	4	<10	4
19	P70/1035	4	10	26
20	P70/1036	<4	<10	8
	P70/1037	<4	<10	180
21	P70/1038	<4	10	290
	P70/1039	4	<10	230
	Detn limit	(4)	(10)	(2)

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379123

Analysis code B3 | Report AC 3304/84 | Page 6

NATA Certificate | Order No. 6633 | Results in ppm

HOLE X

	Sample	Sn	W	As
	P70/1040	8	10	165
22	P70/1041	4	<10	180
23	P70/1042	6	<10	16
	P70/1043	6	<10	160
24	P70/1044	6	10	120
25	P70/1045	<4	<10	4
26	P70/1046	<4	<10	<2
	P70/1047	<4	<10	16
	P70/1048	4	<10	19
27	P70/1049	4	10	12
	P70/1050	<4	<10	105
	P70/1051	<4	10	35
	P70/1052	<4	<10	<2
	P70/1053	4	10	<2
28	P70/1054	<4	<10	5
	P70/1055	<4	<10	7
	P70/1056	<4	<10	60
29	P70/1057	<4	<10	6
	P70/1058	<4	10	11
	P70/1059	<4	15	3380
30	P70/1060	<4	15	3380
	P70/1061	4	<10	4360
	P70/1062	<4	15	4240
	P70/1063	<4	<10	88
31	P70/1064	<4	<10	21
	P70/1065	<4	10	11
	P70/1066	<4	<10	5
32	P70/1067	6	<10	12
	P70/1068	10	10	12
	P70/1069	<4	10	12
33	P70/1070	4	<10	16
	P70/1071	8	10	11
34	P70/1072	<4	<10	4
35	P70/1073	<4	<10	2
	P70/1074	4	10	72
36	P70/1075	<4	10	69
	P70/1076	6	10	70
	P70/1077	4	<10	74
37	P70/1078	<4	10	15
	P70/1079	<4	<10	19
	Detn limit	(4)	(10)	(2)

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379124

Analysis code B3 Report AC 3304/84 Page 7

NATA Certificate Order No. 6633 Results in ppm

Hole #	Sample	Sn	W	As
	P70/1080	10	10	9
38	P70/1081	8	10	9
	P70/1082	6	10	8
39	P70/1083	8	<10	12
	P70/1084	<4	10	5
40	P70/1085	4	10	6
	P70/1086	<4	<10	4
41	P70/1087	4	<10	38
	P70/1088	<4	<10	<2
42	P70/1089	<4	<10	3
	P70/1090	4	10	17
	P70/1091	<4	<10	6
43	P70/1092	8	10	310
	P70/1093	<4	20	465
44	P70/1094	<4	10	185
	P70/1095	<4	15	50
	P70/1096	<4	<10	22
45	P70/1097	8	<10	20
	P70/1098	<4	<10	72
	P70/1099	6	10	155
	P70/1100	8	10	24
46	P70/1101	10	<10	8
	P70/1102	10	10	5
	P70/1103	6	<10	7
47	P70/1104	14	10	10
	P70/1105	<4	10	9
	P70/1107	12	10	15
48	P70/1108	<4	10	10
	P70/1109	<4	<10	74
	P70/1110	6	10	11
	P70/1111	6	10	17
49	P70/1112	12	10	15
	P70/1113	4	15	14
	P70/1114	6	10	8
	P70/1115	6	15	10
50	P70/1116	<4	<10	4
	P70/1117	6	10	11
	P70/1118	14	15	10
51	P70/1119	10	10	6
52	P70/1120	<4	15	12
	Detn limit	(4)	(10)	(2)

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379125

Analysis code B3 Report AC 3304/84 Page 8

NATA Certificate Order No. 6633 Results in ppm

	Sample	Sn	W	As
52(cont)	P70/1121	10	15	8
	P70/1122	<4	10	9
	P70/1123	4	10	12
53	P70/1124	10	<10	15
	P70/1125	<4	<10	13
	P70/1126	8	15	14
54	P70/1127	10	10	14
	P70/1128	10	<10	15
	P70/1129	10	10	10
55	P70/1130	<4	10	12
	P70/1131	14	<10	12
	P70/1132	6	10	12
56	P70/1133	8	15	13
	P70/1134	6	10	12
	P70/1135	8	10	12
	P70/1136	6	10	9
57	P70/1137	8	15	10
	P70/1138	12	<10	9
	P70/1139	8	20	9
	P70/1140	8	15	13
58	P70/1141	8	15	10
	P70/1142	10	10	9
	P70/1143	8	10	10
	P70/1144	10	10	9
59	P70/1145	18	15	10
	P70/1146	8	15	13
	P70/1147	8	10	10
60	P70/1148	6	10	12
	P70/1149	4	10	14
61	P70/1150	4	10	6
	P70/1151	<4	10	10
62	P70/1152	6	10	5
	P70/1153	6	<10	11
63	P70/1154	8	<10	6
64	P70/1155	8	<10	5
65	P70/1156	8	15	18
66	P70/1157	4	10	2
	P70/1158	4	10	3
	P70/1159	<4	10	6
67	P70/1160	<4	<10	6
	P70/1161	<4	15	3
	Detn limit	(4)	(10)	(2)

379126

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The Australian Mineral Development Laboratories

emington Street, Frewville,
South Australia 5063
Phone Adelaide 79 1662
Telex AA 82520

Please address all correspondence to
P.O. Box 114 Eastwood
SA 5063
In reply quote:

3/4/15/0 - AC 3752/84

6 April 1984

amdel

NATA CERTIFICATE

Mr. R.M. Horton,
The Broken Hill Proprietary Co. Ltd.,
Exploration Department,
P.O. Box 1207,
HOBART TASMANIA 7001

REPORT AC 3752/84 — Borenole 3X1

YOUR REFERENCE:	Application of 26 March 1984 Sheet No. 006635
IDENTIFICATION:	As listed
DATE RECEIVED:	28 March 1984

D. Patterson
Chief Chemist
Analytical Chemistry Division

for Brian S. Hickman
Managing Director

Head Office:
Flemington Street, Frewville
South Australia 5063,
Telephone (08) 79 1662
Telex: Amdel AA82520
Pilot Plant:
Osman Place
Thebarton, S.A.
Telephone (08) 43 8053
Branch Laboratories:
Melbourne, Vic.
Telephone (03) 645 3093
Perth, W.A.
Telephone (09) 325 7311
Townsville
Queensland 4814
Telephone (077) 75 1377

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379127

Analysis code C1/C2 Report AC 3752/84 Page 1

NATA Certificate Order No. 6635 Results in ppm

Sample	Cu	Pb	Zn	Ag
T70/504	100	<5	56	1
T70/505	70	6	86	1
T70/506	140	<5	76	1
T70/507	76	6	90	2
T70/508	60	6	86	2
T70/509	56	6	50	1
T70/510	96	6	66	1
T70/511	86	16	96	1
T70/512	80	16	56	1
T70/513	80	16	86	1
T70/514	110	26	120	1
T70/515	96	26	120	1
T70/516	70	16	110	1
T70/517	90	26	100	1
T70/518	80	16	100	1
T70/519	48	16	86	1
T70/520	90	10	80	2
T70/521	100	6	70	2
T70/522	290	26	90	1
T70/523	330	<5	90	1
T70/524	100	<5	56	1
T70/525	70	20	90	1
Detn limit	(2)	(5)	(2)	(1)

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Analysis code C3/4 Report AC 3752/84 Page 2

NATA Certificate Order No. 6635 Results in ppm

Sample	Au
T70/510	<0.01
T70/511	<0.01
T70/512	<0.01
T70/513	<0.01
T70/514	<0.01
T70/515	<0.01
Detn limit	(0.01)

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379129

Analysis code B1/1 Report AC 3752/84 Page 3

NATA Certificate Order No. 6635 Results in ppm

Sample	Sn	W	As
T70/504	8	<10	33
T70/505	<4	15	<2
T70/506	<4	10	2
T70/507	<4	10	<2
T70/508	12	10	<2
T70/509	10	15	4
T70/510	<4	10	7
T70/511	<4	<10	11
T70/512	<4	10	9
T70/513	8	10	15
T70/514	6	10	15
T70/515	12	10	24
T70/516	10	10	11
T70/517	8	<10	17
T70/518	6	15	12
T70/519	12	10	8
T70/520	8	<10	3
T70/521	8	<10	5
T70/522	12	15	9
T70/523	4	<10	<2
T70/524	<4	10	<2
T70/525	<4	10	11
Detn limit	(4)	(10)	(2)

APPENDIX 6

DRILL LOG - BOREHOLE SX 1

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379131

BROKEN HILL PROPRIETARY CO. LTD.

DRILL LOG HEADER SHEET.

Project: MT. MUELLER

Prospect: STYX

Local Grid co-ords. 1450E, 1500N

AMG co-ords 459600E, 5260700N

Drilling Co: OVERLAND

Drill type: WARMAN 250 SCOUT

Driller: R. WADDLE
T. SHEGOG.

Hole No: SX 1

Total depth: 103.0 m

Bearing:

Depression 90°

R.L. Collar:

Commenced: 28/2/84

Completed: 3/2/84

Logged by: R.M. HORTON

Sampled by: R. M. HORTON

Hole Size	From	To	Total m
Non-core	0	4	4
Core HQ	4.0	19.5	15.5
NQ	19.5	103.0	83.5
Casing 6" plastic	0	4	4
4.5cm plastic	0	103	103
Casing left. 4.5cm plastic	0	103	103

Core storage:	HOBART
No. of trays.	15
Sample storage	
Geochem. Lab.	AMDEL
Analytical reports	AMDEL
	AC 3572/84
Min. and Pet. Lab.	M.R.L.
Min and Pet. report	
	1

Hole Survey Data:

Summary Log: 0-4.0m - CLAY AND SOIL
4.0 - 38.5m - GREY PYRITIC CALCAREOUS SANDSTONE
38.5 - 49.5m - BLACK GRAPHITIC, PYRITIC SHALE
49.5 - 53.5m - GREY SANDSTONE
53.5 - 56.5m - BLACK SHALE
56.5 - 72.3m - INTENSELY SHEARED SEDIMENTS AND SERPENTINITES
72.3 - 103.0m - SERPENTINITES

Comments:

Project MT. MUELLER

THE BROKEN HILL PROPRIETARY CO. LTD.

Drillhole No SX 1

379132

Sheet 1 of 2

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DRILLING						DESCRIPTIVE LOG										
										INTERSECTION ANGLE LCA						
Core size	From m	To	Intersected m	Recovered	% Recovery	From m	To	LITHOLOGY	MINERALISATION	Sample No	Bedding	Veins		Other		Petrology etc	Box No
NON CORE	0	4	4		0	0	4	Clay and soil sludge samples only		T70 PREFIX							
HQ	4	5.5	1.5	1.5		4	38.5	GREY SANDSTONE									1
	5.5	7.0	1.5	1.5				Fine grained cherty, sandstone	Disseminated and			10°	80°				
	7.0	7.8	0.8	0.8				Veins of quartz / carbonate / pyrite	vein pyrite Graphite				-				
	7.8	8.5	0.7	0.7				Weathering extends to 12.5 m	in veins.			20°	75°				2
	8.5	10.0	1.5	1.5				Thin (30 cm) breccia band at 8.9 m depth									
	10.0	11.5	1.5	1.45	96						40°	10°	85°				
	11.5	13.0	1.5	1.5							40°						3
	13.0	14.5	1.5	1.5							40°	20°	70°			MRL 15407	
	14.5	15.4	0.9	0.9						504							
	15.4	16.9	1.5	1.45	95			Tuff band from 15.5 to 16.0			35°	20°	80°				4
	16.9	18.4	1.5	1.5						505							
	18.4	19.5	1.1	1.1							40°	20°	80°				
NQ	19.5	22.0	2.5	2.5					Increase in amount		40°						5
	22.0	25.0	3.0	3.0					of disseminated pyrite		40°	10°	80°				
	25.0	27.4	2.4	2.4						506	40°						6
	27.4	29.2	1.8	1.8								20°	70°				
	29.2	31.6	2.4	2.4							40°						
	31.6	34.0	2.4	2.4				Tuff band from 32.1 – 32.6		507		10°	70°				
	34.0	36.2	2.2	2.2													7
	36.2	37.7	1.5	1.5								10°	90°				
	37.7	39.2	1.5	1.5		38.5	49.5	BLACK SHALE		508	30°						
	39.2	40.1	0.9	0.9				pyritic graphitic	Disseminated graphite and	509		20°	60°				
	40.1	40.9	0.8	0.8				Quartz / carbonate / pyrite / graphite veins.	pyrite Vein pyrite	510							
	40.9	43.0	2.1	2.1				Very fissile and fragmented from 38.5 to 40 m	and graphite	511 512	40°	20°	50°			MRL 15406	
	43.0	46.0	3.0	3.0						513 514							8
	46.0	49.0	3.0	3.0						515 516							
	49.0	50.3	1.3	1.3		49.5	53.5	GREY SANDSTONE as above			40°	20°	60°				
	50.3	52.0	1.7	1.7													9
	52.0	53.8	1.8	1.8						517		10°	50°				
	53.8	56.5	2.7	2.7		53.5	56.5	BLACK SHALE as above brecciated at 54.5 – 54.9 m.		518							
	56.5	58.6	2.1	2.1		56.5	72.3	INTENSELY SHEARED SERPENTINISED ULTRABASICS			40°	20°	50°				
	58.6	60.6	2.0	2.0				AND SEDIMENTS		519							10
	60.6	62.5	1.9	1.9				Shearing at 30° to /cg core axis				20°	50°				
	62.5	65.0	2.5	2.5						520						MRL 15408	

Project MT. MOELLER

THE BROKEN HILL PROPRIETARY CO. LTD.

379133

Drillhole N° SX 1 132

Sheet 2 of 2

DRILLING								DESCRIPTIVE LOG			INTERSECTION ANGLE LCA						
Core size	From m	To	Inter-sected m	Recov-ered	Corrected % Recovery	From m (100% unless specified)	To	LITHOLOGY	MINERALISATION	Sample N°	Bedding	Veins		Other		Petrology etc	Box N°
NQ	65.0	67.7	2.7	2.7				Syenitic bands at 58.6-59.4, 62.5-62.8, 63.4-63.6	Disseminated pyrite	T 70 PREFIX	35°	20°	60°				
	67.7	69.0	1.3	1.3				64-64.5, 67.5-67.8, 69.8-70.5, 72.4-74.5 Numerous	minor.				-				1
	69.0	72.1	3.1	3.1				carbonate / quartz veins		521	40°						
	72.1	74.6	2.5	2.5		72.3	103	SERPENTINISED ULTRABASICS		522		10°	60°				
	74.6	77.0	2.4	2.4				Crystalline dark green ultramafics. Bands of									
	77.0	80.1	3.1	3.1				haematitic mudstone at 81.5 to 82.5, 83.5 - 84.5			30°	10°	40°				12
	80.1	82.0	1.9	1.9						523						MRL 15409	
	82.0	85.0	3.0	3.0							30°	20°	50°				
	85.0	86.5	1.5	1.5													13
	86.5	88.6	2.1	2.1						524		70°	60°			MRL 15410	
	88.6	91.0	2.4	2.4				Chert bed from 88.5 - 89.5									
	91.0	94.0	3.0	3.0								20°	60°				14
	94.0	97.0	3.0	3.0						525							
	97.0	99.0	2.0	2.0													15
	99.0	101.6	2.6	2.6								20°	70°				
	101.6	103.0	1.4	1.4				Thin (30 cm) tuff bed			40°						

APPENDIX 7

PETROLOGY

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT
Petrology Section

379135

Melbourne Research Laboratories
245-273 Wellington Road
Clayton, Victoria 3168
P.O. Box 264, Clayton
Telephone 560-7066

Memo to: DR A. CLARKE - HOBART EXPLORATION OFFICE

Date 4.7.84
Our Ref: WHR/NC
Your Ref:
File: M 718
Date:

Subject: E9/22/5-Q: PETROGRAPHY OF CORE SAMPLES FROM DIAMOND DRILL HOLE SX-1, MT MUELLER AREA, TASMANIA. (MRL 15406-10)

134

Thin sections from five samples of core, from Diamond drill hole SX-1, Mt Mueller area, Tasmania were submitted for petrographic examination and identification. Brief petrographic descriptions were requested.

Two of the samples, (MRL15406, 15407) contained abundant, submicroscopic, opaque, probably mainly carbonaceous material and were largely opaque in thin section. As a result the mineralogy is based mainly on X-ray diffraction analysis. Structural and textural descriptions are limited to those portions of the sections which transmitted light.

The mineralogy of the two samples is similar. Both are dominated by quartz which occurs as angular detrital grains, in veins, as silicifying quartz and as cherty patches together with ?chalcedony. Both rocks are rich in black carbonaceous material and pyrite, and contain minor chlorite and plagioclase. Trace quantities of zircon, rutile, leucoxene, K-feldspar, illite/sericite are also present MRL. 15407 contains veins and small patches of calcite.

The samples showed moderate to weak shaley foliation resulting from the alignment of flakes of carbonaceous material $\pm$ sericite and chlorite. Sample MRL 15407 comprises fine, silty and coarser arenaceous layers which have been disrupted by brecciation, shearing and microfaulting.

A considerable volcanogenic component in these samples is suspected. MRL15406 contains numerous small rock fragments comprising lathy, feldspar microphenocrysts in a submicroscopic textured, black, carbonaceous matrix. These chips appear to be tuffaceous fragments although they could not be identified and classified with precision. The plagioclase, K-feldspar and angular quartz could be volcanogenic detritus.

Furthermore, there is a strong possibility that the pyrite and much of the fine grained silica are volcanic exhalatives.

Sample MRL15408 was classified as a chloritised ultramafic. The rock is sheared and foliated and comprises largely colourless to olive green chlorite. Veins and patches of calcite $\pm$ quartz $\pm$ sericite (some of which pseudomorphs a lathy mineral, ?feldspar), occur throughout the section. Traces of red Ti-rich mica, probably biotite, ranging in size up to 200 µm, form occasional patches throughout the rock. Opaques include traces of fractured ilmenite and disseminated chalcopyrite, pyrite and ? chromite. Shearing and chloritisation has resulted in the virtual complete destruction of the original igneous fabric. The mineralogy and texture of the original rock is therefore unclear. It appears to have originally been

2/.. ..

a largely monominerallic ultramafic, probably a dunite or pyroxenite, which contained small amounts of Ti-rich mica, ilmenite and spinel. The vein minerals, alteration assemblages and possibly the sulphides are secondary developments.

Sample MRL15409 was classified as a slightly brecciated, iron oxide and calcite veined, laminated feldspathic siltstone. The rock is extremely fine grained (< 5 μm) and comprises mainly quartz with lesser amounts of illite/sericite and minor plagioclase. Traces of hematite, chlorite, chalcopyrite, rutile and an unidentified white metallic reflective phase are also present. This unidentified phase has been submitted for microanalysis. Minor calcite occurs in veins and small pods. The rock is finely (20 - 100 μm) laminated and weakly foliated. Fracturing and brecciation has resulted in the development of numerous, discrete, laminated blocks which are separated by chloritic ± iron oxide stained microfault planes or by calcite ± chlorite veins. Displacement and contortion of the lamination, rotation of lamination direction in some blocks, and the development of shear textures in others, are attributable to this deformation.

Sample MRL15410 was classified as a partly altered alkali basalt. The rock comprises dominantly slightly sericitised and chloritised, euhedral to subhedral, random plagioclase laths, zoned, subophitic, granular augite and semi-opaque ?leucoxene grains. Occasional chloritic patches appear to be pseudomorphs after small phenocrysts of olivine. Patches and randomly oriented veins of calcite ± chlorite with traces of quartz and opaques occur throughout the rock.

Traces of pyrite, chalcopyrite and very rare ilmenite are disseminated throughout the rock.

W.R. RINGENBERGS
PETROLOGIST

cc: M. Horton - Camberwell Office
Dr A. Goode - Camberwell Office
then: Camberwell Library

PETROGRAPHIC DESCRIPTIONS SX1 41.5 m - 88.3 m

MRL15406, Field No. SX-1 34.5m

Rock type: Silicified, carbonaceous, pyritic, arenaceous shale with volcanic association.

Mineralogy[1] (D) Quartz; (SD) Opaque carbonaceous material;
(M) Pyrite, plagioclase, chlorite;
(T) Zircon, rutile, K-feldspar, illite/sericite.

Grains of angular quartz, occasional cherty patches, plagioclase and apparent volcanic fragments (rock fragments containing lathy plagioclase microphenocrysts) in black carbonaceous, pyritic, silicified matrix. Occasional irregular veins of quartz + pyrite + trace chlorite. Abundant, finely dispersed patches (to 25 μm) of fine grained pyrite. Rare thin pyrite veinlets. Shaley foliation is distinct in hand specimen.

Thin section is largely opaque due to abundance of carbonaceous material. XRD analyses confirmed the identities of major minerals (excepting the black carbonaceous material which appears to be amorphous to X-rays) and detected trace quantities of K-feldspar and illite/sericite.

---

1 Abbreviations
(D) Dominant, (SD) Sub dominant, (CD) Co-dominant,
(Ab) Abundant, (M) Minor, (T) Trace.

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MRL15407 Field No. SX-1 14.5m

Rock Type: Foliated, brecciated, graphitic, pyritic, layered siltstone and sandstone.

Mineralogy: (D) Quartz (Ab) Opaque carbonaceous material; (M) Pyrite, calcite, chlorite, plagioclase; (T) Rutile, leucoxene, K-feldspar.

Rock comprises fine grained, silty and arenaceous layers disrupted by brecciation, shearing, microfaulting and veining. Silty areas contain traces of sericite, plagioclase, calcite, rutile, ?leucoxene and disseminated and veinlet pyrite in addition to quartz. The angular, granular quartz (to 100μm) may be detrital. Sericite flakes are moderately aligned giving a weak foliation. Arenaceous layers comprise quartz and chert grains to 0.5 mm in size, chloritic patches and traces of rutile, in a silicified matrix. Sub parallel folia of carbonaceous material bend around quartz grains, chert patches etc. (Foliated texture). Disseminated pyrite. Bands or veins of pyrite cut section. Irregular veins and patches of quartz (margins) and calcite (cores) with traces of euhedral pyrite, cut the section.

X-ray diffraction analysis has substantiated the identities of the major minerals and detected traces of K-feldspar which was not visible optically. The carbonaceous material appears to be amorphous to X-rays.

MRL15408 Field No. SX-1 63.8m

Rock Type: Chloritised ultramafic

Mineralogy: (D) Chlorite; (M) Sericite, calcite, quartz; (T) Biotite, rutile, ilmenite, opaque spinel, pyrite, chalcopyrite.

Sheared and foliated rock comprising largely colourless to olive green chlorite (possibly 2 types) with lensoidal, aligned to random texture. Quartz lenses (apparent sheared veins) contain sericitised pseudomorphs after a lathy mineral (? feldspar). Disrupted veins and patches of calcite. Small calcite veinlets cut across quartz grains. Occasional patches of partly altered pleochroic orange and red to colourless or pale orange-pink (?Ti-bearing) mica (?phlogopite/biotite-S.E.M. required). Nearby concentrations of rutile.

Disseminated fractured ilmenite (< 200 µm) in quartz patches; finer in chloritic matrix (< 30 µm). Thin veinlets and disseminations of pyrite and of chalcopyrite. Rare euhedral spinel (? chromite - S.E.M. required) < 40 µm in size.

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MRL15409 Field No. SX-1 81.5m

Rock Type: Slightly brecciated, iron oxide and calcite veined, laminated, feldspathic siltstone.

Mineralogy: D Quartz; (SD) Illite/serite; (M) Plagioclase, calcite; (T) Chlorite, hematite, chalcopyrite, rutile, bright white reflective mineral (S.E.M. required)

Extremely fine grained (< 5 μm) quartz and clay ± sericite + hematite flakes make up laminated shale. Finest laminations are on the scale of 20 - 100 μm. Small pods of calcite < 500 μm and opaques < 200 μm. Laminations are smooth and flat in large fragments, contorted in highly brecciated areas. Red iron oxide ± chlorite marks the contact of the various brecciated fragments and stains thin early veins. These iron oxide stained dislocation surfaces are cut by later sparry calcite-quartz veins with traces of chlorite. A later thinner locally banded set of sparry calcite veins cuts earlier sets of veining. Very rare disseminated chalcopyrite and rutile in matrix, very rare chalcopyrite (< 30 μm) in calcite bearing veins. A bright white reflective phase is intergrown with chalcopyrite in the veins. S.E.M. examination is required to identify this phase as it is very fine grained.

Dislocation and contortion of lamination is obvious along iron oxide stained planes and later calcite veins.

MRL15410 Field No. SX-1 88.3m

Rock Type: Partly altered Alkali basalt

Mineralogy: (D) Plagioclase; (SD) Chlorite, augite; (M) Calcite, ?Ti-oxide (T) Pyrite, chalcopyrite, quartz.

Rock comprises lathy, partly altered (chloritised, sericitised) plagioclase euhedra/subhedra (to 0.5 mm in length), zoned, subophitic-granular augite (pale brown to colourless zoning; to 0.5 mm in size) and semi-opaque euhedral grains (skeletal, white in reflected light; ? Ti-Oxide leucoxene; ? altered opaques). Occasional patches of platy, green chlorite pseudomorphs after olivine micro-phenocrysts. Veins of calcite and/or chlorite with traces of opaques and quartz. Calcite also forms occasional patches to ~ 1 cm in diameter. The veins have random orientations dividing the basalt into angular blocks and resulting in a weakly brecciated appearance. Traces of disseminated chalcopyrite (1 - 20 μm), pyrite (< 300 μm) and very rare ilmenite (< 200 μm).

Fig 5

379142

146°20'

450 000 mE

146°30'

60

MT. FIELD
NATIONAL PARK

△TIM SHEA

5270 000 mN

GORDON

Tyenna

△THE NEEDLES

River

E.L. 19/83

RIVER

ROAD

△IBSENS PEAK

△MT MUELLER

MT MUELLER SOUTH

STYX

STYX WEST

Florentine

H.E.C

Weld

△MT BOWES

42°50

Addamsfield

Cz — Alluvium, talus, glacial/periglacial

Jd — Dolerite sills

P — PARMEENER SUPERGROUP — Tillites, shales, sandstones

Angular unconformity

ORDIVICIAN

Ogl — GORDON SUB GROUP — Limestone

Odg — DENISON SUB GROUP — Quartzose sandstone, conglomerate, mudstone

CAMBRIAN

Ea — Quartzwacke, turbidites, conglomerate, interbedded mudstone

Angular unconformity (position relative to Late Middle Cambrian uncertain)

PEc — Feldspathic, micaceous, wacke, khaki and red mudstone, chert, basic volcanics, v. minor carbonate

Angular unconformity (inferred)

PROTEROZOIC

Pdo — Bedded, oolitic dolomites

Pdm — Massive, fine grained dolomite, minor mixtite

Pdb — Dolomite breccia

Phs — HUMBOLDT SLATE — Slate, minor carbonate

Angular unconformity

Pm — Red mudstone, minor carbonate, orthoquartzite

Psu — Serpentinised dunites and pyroxenites

Pss — Serpentinised ultramafics intimately sheared with sediments

ADAMSFIELD TROUGH — FLORENTINE SYNCLINORIUM — JUBILEE BLOCK

— — Fault

------- Geological boundary

Synclinal axis

Anticlinal axis

AMG GN

MN

LOCATION MAP

SCALE 1:50 000

0 1 2 3 4 5 kms

5 cm

ACKNOWLEDGEMENTS:-
Compiled from maps by:
N. Turner Tasmanian Geological Survey (Pers comm 1984)
C. Calver " " " (UR 1982/35)
H. Gerber BHP 1966
B. Flood " 1972

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

EL 19/83, MT. MUELLER, TASMANIA

GEOLOGY

Drawn: R. M. HORTON	Date: MAY 1984	Centre: HOBART
Traced: A. HANSEN	Project No. T70	Drawing No. A2-
Checked:		

Revisions

3284

Fig. 6

379143

146°20'

450 000 mE

146°30'

60

TIGER RANGE

MT. FIELD NATIONAL PARK

FLORENTINE ROAD

△TIM SHEA

5270 000 mN

Adamsfield

River

GORDON

Tyenna

△THE NEEDLES

HUMBOLDT

Little

MM9

MM8

MT MUELLER MKC9

River

Florentine River

SXI

RIVER

MM7

SWTB5

MM6

Kallista Creek

ROAD

MM5

MM4

SAW BACK RANGE

RAGGED

MM10

MM11

MM14

MM12

MM13

MM3

MM2

△ MT. MUELLER

RANGE

CLEAR

△IBSENS PEAK

MM1

LAKE GORDON

HILL

ROAD

Styx

MT MUELLER SOUTH

1000-1026

STYX

1077-1161

SWT 21

SWT 22

WR 6

S1

S2

WR5

WR4

WR3

WR2

WR1

SWT B6,7

SWT 15

SWT 14

SWT 13

Florentine

H.E.C.

SWT 6-12

JUNCTION HILL

ROAD

River

STYX WEST

1027-1076

Weld

SWT 1-5

42°50

Boyd R.

PEAK

SCOTTS

△MT BOWES

Huon River

River

E.L. 19/83

LEGEND

X SWT 14 — Rock chip

MM3 — -80# stream sediment

1000-1161 — Soil auger

——— EL Boundary

Old mine

Stream sediments

Sample Nos	Data base nos
MM 1-14	21271-21284
WR 1-6	21285-21290

5 cm

SCALE 1:50 000

0 1 2 3 4 5 kms

LOCATION MAP

AMG GN MN

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EL19/83 MT MUELLER TASMANIA

GEOCHEMICAL SAMPLE LOCATIONS

Drawn: R. M. HORTON	Date: MAY 1984	Centre: HOBART
Traced: A. HANSEN	Project No: T70	Drawing No: A2-
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379144 Fig. 7

5261000mN

460000mE

1200E 1800N

1500E 1800N

1700E 1800N

2000E 1800N

1800 N

1700 N

1600 N

1500 N

1400 N

1300 N

1200 N

ROAD

MUELLER

DDH SX1

500

1200E 1200N

1500E 1200N

1700E 1200N

2000E 1200N

61 62 63 64 65 66 67

60-90-10-4 450-170-11-6 56-50-6-8 76-60-5-8 76-60-18-8 16-50-3-4 26-90-6-<4

18 (Sn) 13 (As) 70 (Cr) 70 (Ni)

54 55 56 57 58 59 60

30-60-16-10 56-110-12-14 46-70-13-8 56-50-10-12 90-80-13-10 10-30-14-6

47 48 49 50 51 52 53

66-50-10-14 36-40-74-12 46-40-17-12 66-40-11-6 86-50-10-14 70-70-12-10 56-80-15-10

Ptl Ps Emw Emu Ec Ess

85 35 80 75 45

LEGEND

- Ps — Permian shales
- Ptl — Permian tillite
- Ec — Cambrian chert
- Emw — Cambrian feldspathic micaceous wacke with red mudstone
- Ess — Cambrian shale/sandstone sequence

Ni Cr As Sn
30-60-16-10 54 — Auger drill hole location and number with results p.p.m.

Dip and strike of bedding

Dip and strike of joint plane

Inferred angular unconformity

Fault

EM 37 anomaly

Shear zone

Geological outcrop boundary

Stream

Powerline

SCALE 1:2 500

0 50 100 150 200 250 metres

5 cm

AMG
GN
MN

E.L. 19/83

LOCATION MAP

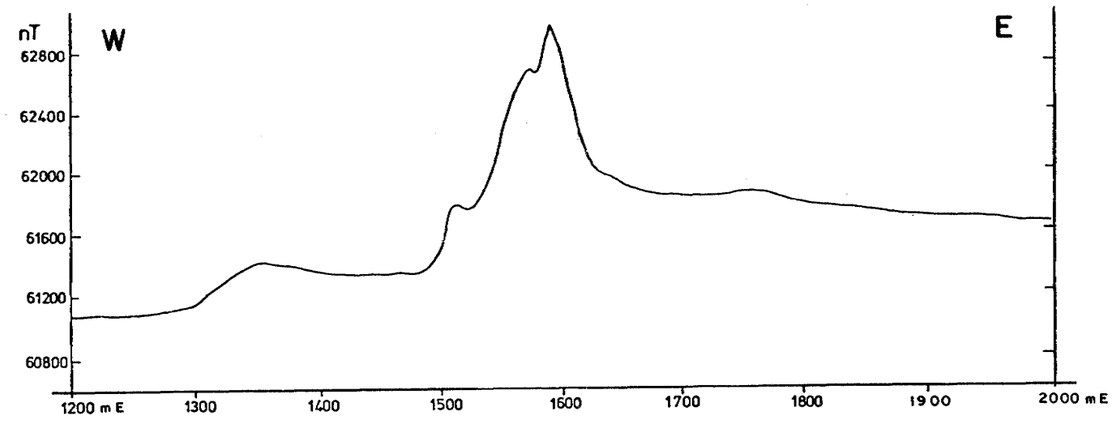
THE BROKEN HILL PROPRIETARY CO. LTD. EXPLORATION DEPARTMENT		
EL 19/83 MT MUELLER TASMANIA STYX GRID		
OUTCROP GEOLOGY AND DRILLING RESULTS		
Drawn: R.M. HORTON	Date: JUNE 84	Centre: HOBART
Traced: A. HANSEN	Project No: T70	Drawing No: A2-
Checked:		

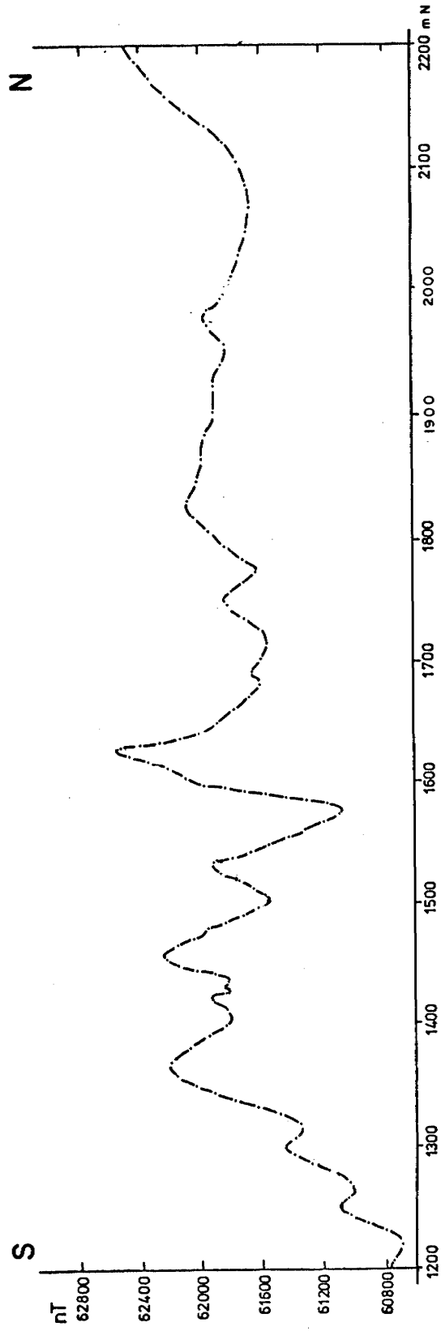
Revisions:

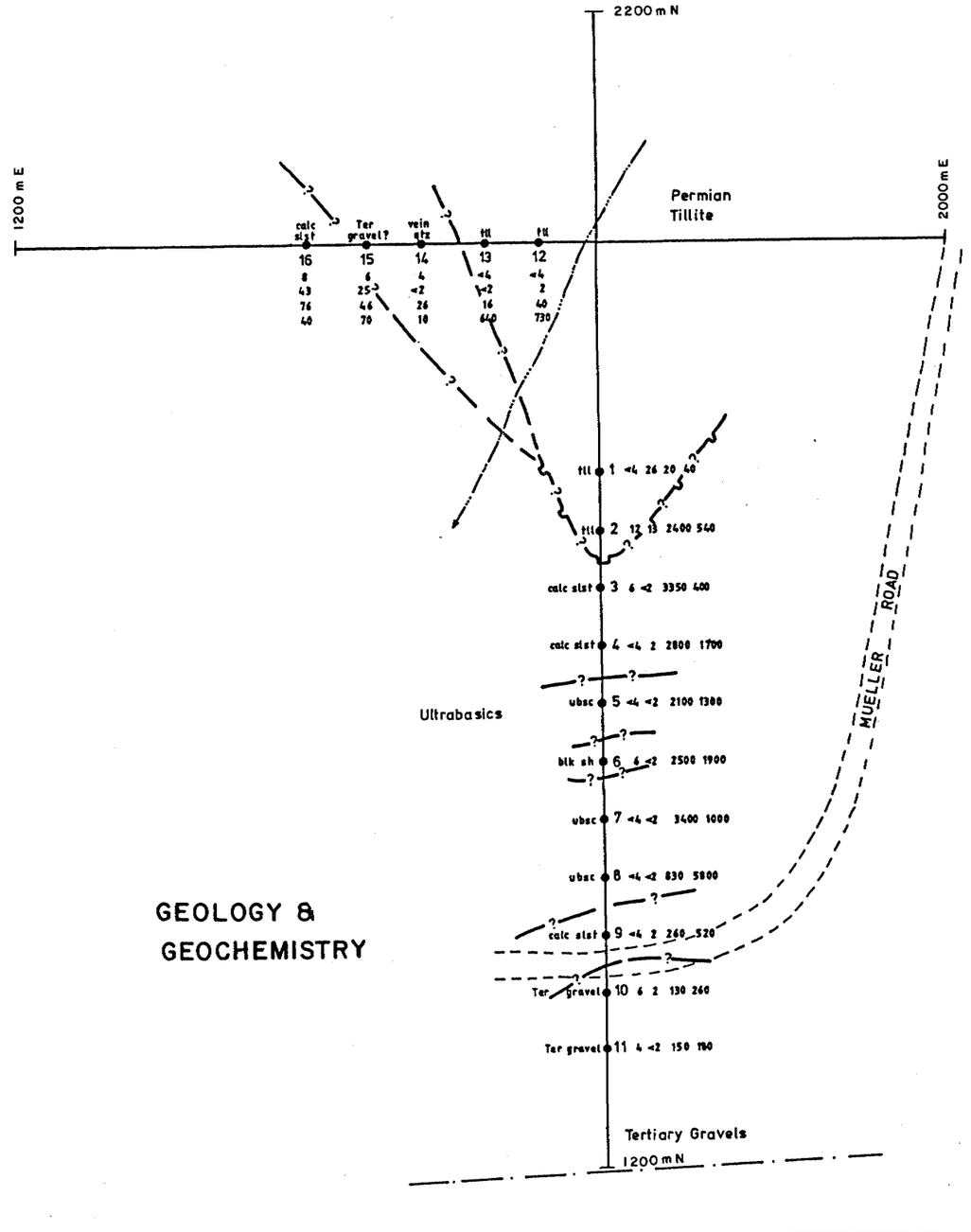
3286

379145 Fig 8

GROUND MAGNETIC PROFILES







Augerhole and No 3
Sn 6
As <2
Ni 3350
Cr 400
Highest analytical value in hole shown (ppm)

Ter gravels Tertiary gravels
ftl Permian Tillite
calc sist calcareous siltstone
blk sh black shales
ubsc ultrabasics

AMG
G N
MN

—?— geological boundary
—?~ unconformity
stream
powerline

SCALE 1:500
0 10 20 30 metres
5 cm

GEOLOGY & GEOCHEMISTRY

(13287

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EXPLORATION DEPARTMENT

E.L 19/83 MT MUELLER TASMANIA
MT MUELLER SOUTH
GEOLOGY GEOCHEMISTRY & GROUND MAGNETICS

Revisions:

Prepared by: R. M. HORTON	Centre: HOBART	
Date: JUNE 84	Project No T 70	Drawing No A3-
Drawn: A. HANSEN		

Centre HOBART

Date JUNE 84

THE BROKEN HILL PROPRIETARY CO. LTD.

EL 19/83, MT. MUELLER, TASMANIA
STYX WEST

GEOLOGY, GEOCHEMISTRY AND GROUND MAGNETICS

3288

Project No T70

Drawing No

FIG. 9

SOIL SAMPLING RESULTS

Massive dolomite with occasional calcareous siltstones and rare chert

Ultrabasics

dolomite

black shales

	ubsc	Ter. gravels	dol	slst	dol	dol	dol	dol+ ubsc	ubsc	calc slst	ubsc	ubsc	ubsc + alvm	alvm	ubsc	dol	Ter gravels
	46	45	44	43	42	41											
	10 24 290 150	8 155 1400 1200 <.01	4 185 860 850	8 465 10 280 <.01	4 17 10 50	4 38 10 310											

bik sh	calc slst	dol	calc slst	calc slst	ss	dol+ cht	dol	vein qz	dol	dol	dol	dol	dol+ ubsc	ubsc	calc slst	ubsc	ubsc	ubsc	ubsc + alvm	alvm	ubsc	dol	Ter gravels
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
6	6	4	<4	4	8	6	6	<4	<4	4	4	4	4	<4	10	8	<4	<4	6	<4	10	8	4
37	37	26	8	290	180	16	160	4	<2	105	60	11	4360	88	12	16	4	2	74	19	9	12	6
1300	1300	86	760	2400	270	30	40	10	6	110	350	40	2900	1500	110	180	1100	2900	690	160	180	36	60
860	860	780	260	960	510	250	860	20	120	520	240	260	1200	280	80	90	1100	790	570	590	240	50	60
				<.01	<.01		<.01			<.01			.08										

GROUND MAGNETIC PROFILES

nT

62900 W

62700

62500

62300

62100

61900

61700 1200E

2400E E

nT

61900 S N

61700 1700N 2000N

5 cm

alvm — alluvium
Ter gravels — Tertiary gravels
dol — dolomite
calc slst — calcareous siltstone
ss — sandstone
cht — chert
blk sh — black shales
ubsc — ultrabasics

geological boundary

stream

SCALE 1: 500

0 10 20 30 metres

Auger hole and No. 22

Sn 8
As 180
Ni 270
Cr 510
Au <.01

Highest analytical value in hole shown (ppm)