

ANNUAL REPORT
EXPLORATION LICENCES
7260, 7261, 7262, 7263, 7264 & 7341

24th May, 1994

to

23rd May, 1995

Volume 1 of 2

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Operator:	Ashton Mining Limited BHP Minerals Pty Ltd
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Authors:

B. Thompson
ASHTON MINING LIMITED
 24 Outram Street
 WEST PERTH WA 6005

M. Rennison, H. Berents et al.
BHP MINERALS PTY LTD
 3 Plain Street
 EAST PERTH WA 6004

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(Ashton Mining Limited)

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SUMMARY

During the period 24th May, 1994 to 23rd May, 1995 Ashton Mining Limited, on behalf of the Australian Diamond Exploration Joint Venture (ADE JV), carried out an exploration programme over Exploration Licences 7260, 7261, 7262, 7263, 7264 and 7341. This report provides details of work undertaken on the Nathan River Project tenements during the reporting period.

Exploration activities conducted by Ashton Mining Limited, comprised reconnaissance gravel and loam sampling. A total of sixty-three samples were collected in these programmes, and forwarded to Ashton's Perth laboratory for analysis. Positive diamond results were identified in samples taken from ELs 7263, 7264 and 7341, however laboratory processing is yet to be completed.

BHP Minerals have two concurrent exploration programmes operating on these tenements; manganese, which concluded at the end of 1994, and base metals, which is continuing. These programmes have been reported as separate sections in this report.

Exploration for base metals comprised ground TEM, soil and rock geochemical sampling, percussion and diamond drilling and the reinterpretation of a QUESTEM airborne TEM survey. Exploration for manganese comprised extensive percussion drilling, diamond drilling and downhole EM surveying.

(ii)

Exploration expenditure for the reporting period amounted to \$ 799,982 against a combined covenant of \$ 278,700.

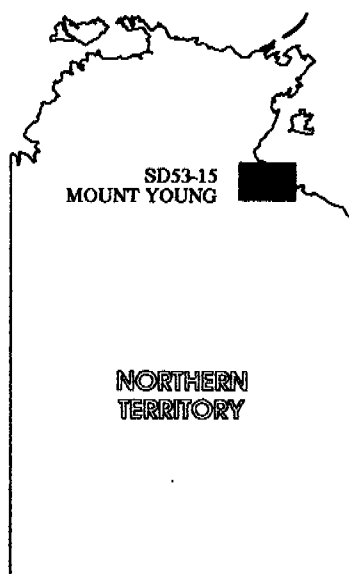
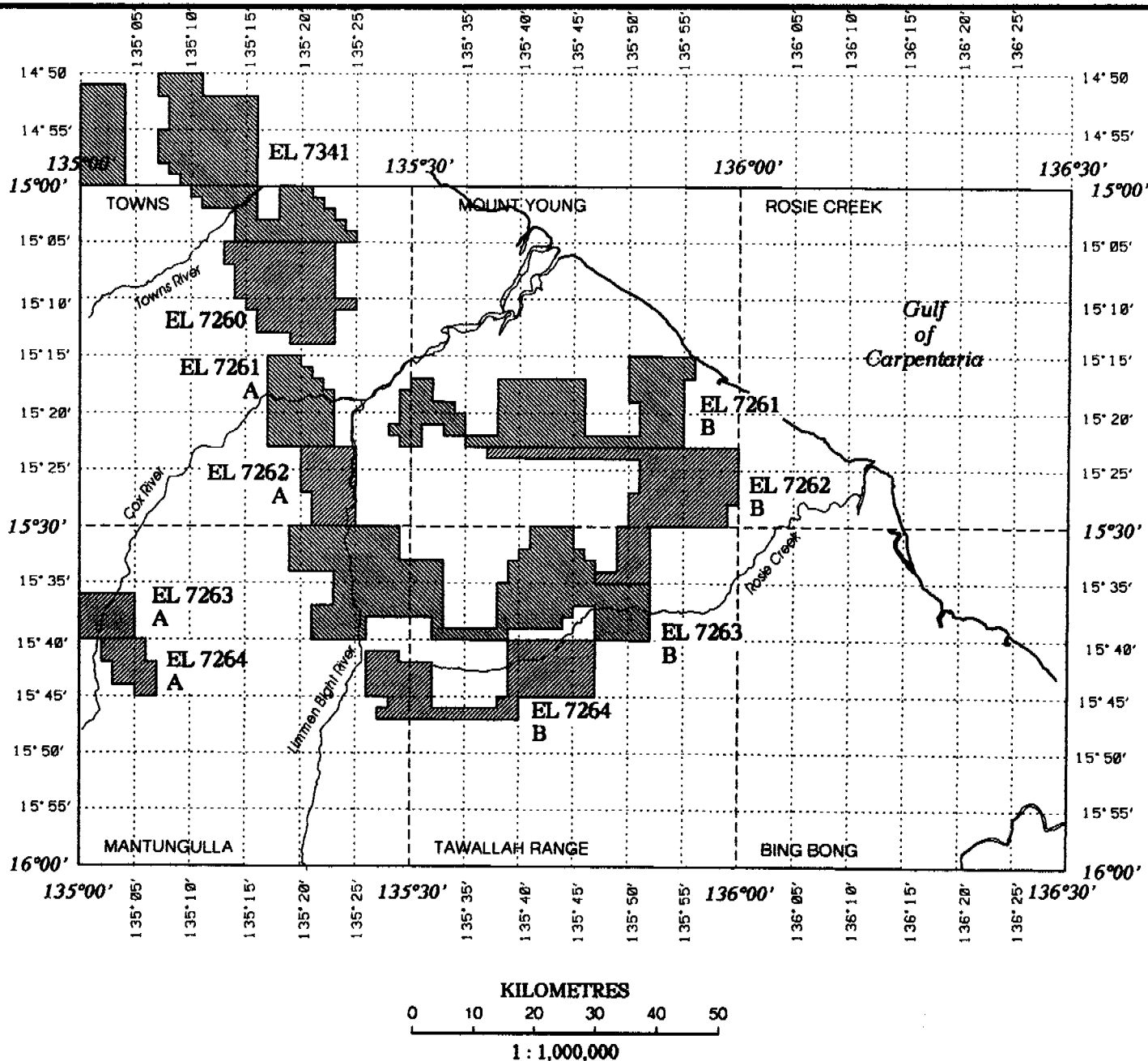
1.0 INTRODUCTION

Exploration Licences 7260, 7261, 7262, 7263, 7264 and 7341 were granted to Ashton Mining Limited in 1991, for a period of six years (see Table 1). Ashton Mining Limited is manager of the licences, on behalf of the Australian Diamond Exploration Joint Venture (ADEJV). Participants of the ADE Joint Venture also include Aberfoyle Resources and Australian Diamond Exploration Pty Ltd (ADEX).

The licences cover a combined area of 825 blocks and are located on the Mt Young (SD 53-15) and Roper River (SD 53-11) 1:250,000 map sheets. Tenement location maps are shown in Figure 1. Group reporting was requested on the 20th January, 1993 and approved by the Department of Mines & Energy in February 1993. These tenements are referred to as the Nathan River Project tenements.

TABLE 1.
NATHAN RIVER PROJECT TENEMENTS

Tenements	Date Granted	Area (blocks)	Expenditure Commitment
EL 7260	06/06/91	75	51,800
EL 7261	24/05/91	159	58,200
EL 7262	24/05/91	127	42,400
EL 7263	24/05/91	210	58,600
EL 7264	24/05/91	98	35,700
EL 7341	24/05/91	156	32,000



**ASHTON MINING LIMITED
A.D.E. JOINT VENTURE
NATHAN RIVER PROJECT AREA**

**FIGURE 1
LOCATION MAP**

JUNE, 1995

On the 24th January, 1992, Ashton Mining Limited entered into a joint venture agreement with BHP Minerals Pty Ltd which would allow BHP to earn up to 80% of the base metal rights to these tenements. The joint venture is known as the McArthur River Joint Venture.

This report provides a summary of work undertaken, both by Ashton Mining and BHP Minerals, during the reporting period 24th May, 1994 to 23rd May, 1995. A statement of expenditure for each licence is included in this report.

2.0 EXPLORATION PROGRAMME

2.1 Reconnaissance Stream Sampling

A reconnaissance stream sampling programme was completed over ELs 7260, 7262, 7263, 7264 and 7341, during the fourth year of tenure. A total of fifty-six, 2 bag stream samples were collected and forwarded to Ashton's Perth laboratory for analysis (*see Section 2.3*). Two samples returned a positive result, both containing one microdiamond. Laboratory processing is still to be completed.

Sample locations are shown on Plans 1 to 5. A complete listing of sample results is given in Appendix 1.

2.2 Reconnaissance Loam Sampling

Reconnaissance loam sampling was undertaken within ELs 7260 and 7341. A total of seven, 5 bag samples were collected and forwarded to Ashton's Perth laboratory for analysis (*see Section 2.3*). Three samples reported positive, each containing one microdiamond.

Sample locations are shown on Plans 1 and 5. A complete listing of sample results is given in Appendix 1.

2.3 Laboratory Procedure

All samples were processed by the Ashton Mining Limited Laboratory in Perth, where they were concentrated by Wilfley Table and heavy liquid separation techniques.

The heavy liquid used was tetrabromethane with a specific gravity of 2.96. The concentrates were then screened into various size fractions, further concentrated by magnetic and electrostatic separation techniques and a comprehensive grain by grain examination carried out on the minus 1.0mm plus 0.425mm fractions.

3.0 BHP EXPLORATION PROGRAMME

I. Base Metal Exploration

3.1 Geophysics

3.1.1 QUESTEM Anomaly Follow-Up

Nine anomalies from a QUESTEM survey flown in the Nathan River area by BHP in June 1992 were followed up with ground TEM in 1994. Anomaly selection was based on stratigraphic and structural grounds, and electrical characteristics. Anomaly details are given in Table 2, locations in Plate 1 and survey logistics in Table 3. Data are presented as profiles (moving loop) and apparent resistivity vs time curves (soundings) in Appendix 2.

MY6 AND MY9

Anomalies MY6 and MY9 are thought to be caused by an extensive saline water table within Proterozoic lithologies. It is characterised by a thick, moderate to highly conductive layer ($< 20 \Omega\text{m}$) at both sites. The layer is observed to dip gently to the west.

MY7

Computer inversion of soundings data from site MY7 reveals a westerly dipping conductive unit of average conductance 10 S.

MY10

Moving loop PROTEM data collected at site MY10 indicate that the observed anomalous response can be attributed to conductive sediments (up to 20 S) associated with the tidal Limmen Bight River. The eastern end of the profile in fact is terminated by the river.

MY11

Data collected at anomaly MY11 confirm the airborne TEM feature to be a shallow, west dipping conductor of low to moderate conductance (2 - 5 S).

MY13

Ground TEM detailing of MY13 clearly highlights an easterly dipping conductor with apparent resistivities ranging between 20 and 30 Ω m. The response on the northernmost profile is complicated by its proximity to the Limmen Bight River, as was the case at site MY10.

MY16

At site MY16, TEM profiling confirms the existence of west dipping conductive stratigraphy. These data are similar to those collected at site MY13.

MY17

Anomaly MY17 is identified in the ground data as a moderately conductive, east dipping unit ranging in thickness from 200 to 350 m. The most likely source is Roper Group stratigraphy.

MY21

A clearly defined east dipping conductor is highlighted at anomaly MY21. The conductor has remarkable consistency down dip, with apparent resistivities of between 11 and 14 Ω m.

3.1.2 QUESTEM Survey Reinterpretation

A detailed reinterpretation of BHP's 1992 Mount Young QUESTEM airborne TEM survey has been undertaken. The survey covers large portions of the Nathan River Project tenements. Anomaly selection was based primarily on stratigraphic and structural considerations, with new anomalies having a lower conductance than those chosen in the previous interpretations. A total of eleven anomalies were selected for ground follow-up during the 1995 field season. Anomaly details are given in Table 4.

Ground TEM follow-up commenced in mid-May 1995. Results will be reported in the next annual report.

3.2.3 Mount Young TEM Soundings

A 22 site PROTEM TEM sounding program was completed on E7262. The sites were located on seven east-west lines, giving a square grid configuration with a grid-based spacing of 1.6 km. The area is located at the eastern edge of E7262, and is to the east of a grid-based soundings program completed in 1993.

Site locations are presented in Plate 1, coordinates are given in Table 5, survey logistics in Table 6, and the data are displayed graphically as apparent resistivity vs time plots in Appendix 3.

Soundings were employed as a means of detecting bedrock conductors possibly related to base metal mineralisation in areas where the prospective Proterozoic units are covered by younger sediments. The site locations were planned using an aeromagnetic data interpretation, which delineated favourable structures in the Proterozoic units.

All the soundings indicate the presence of a very conductive surficial layer (2-17 Ωm), reaching a maximum thickness of approximately 90 m, but commonly around 50 m thick. This layer is thought to represent mudstones/claystones of Cretaceous age.

Electrical responses of the underlying Proterozoic units are variable, with resistivities ranging from 24 Ωm to more than 1000 Ωm . A group of four soundings on the western side of the grid show a conductive layer in the Proterozoic. This layer is interpreted to represent Caranbirini Member of the Lynott Formation.

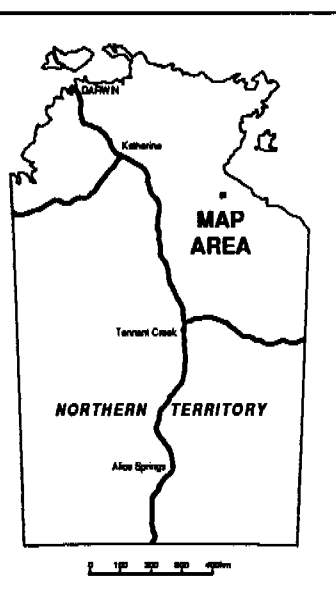
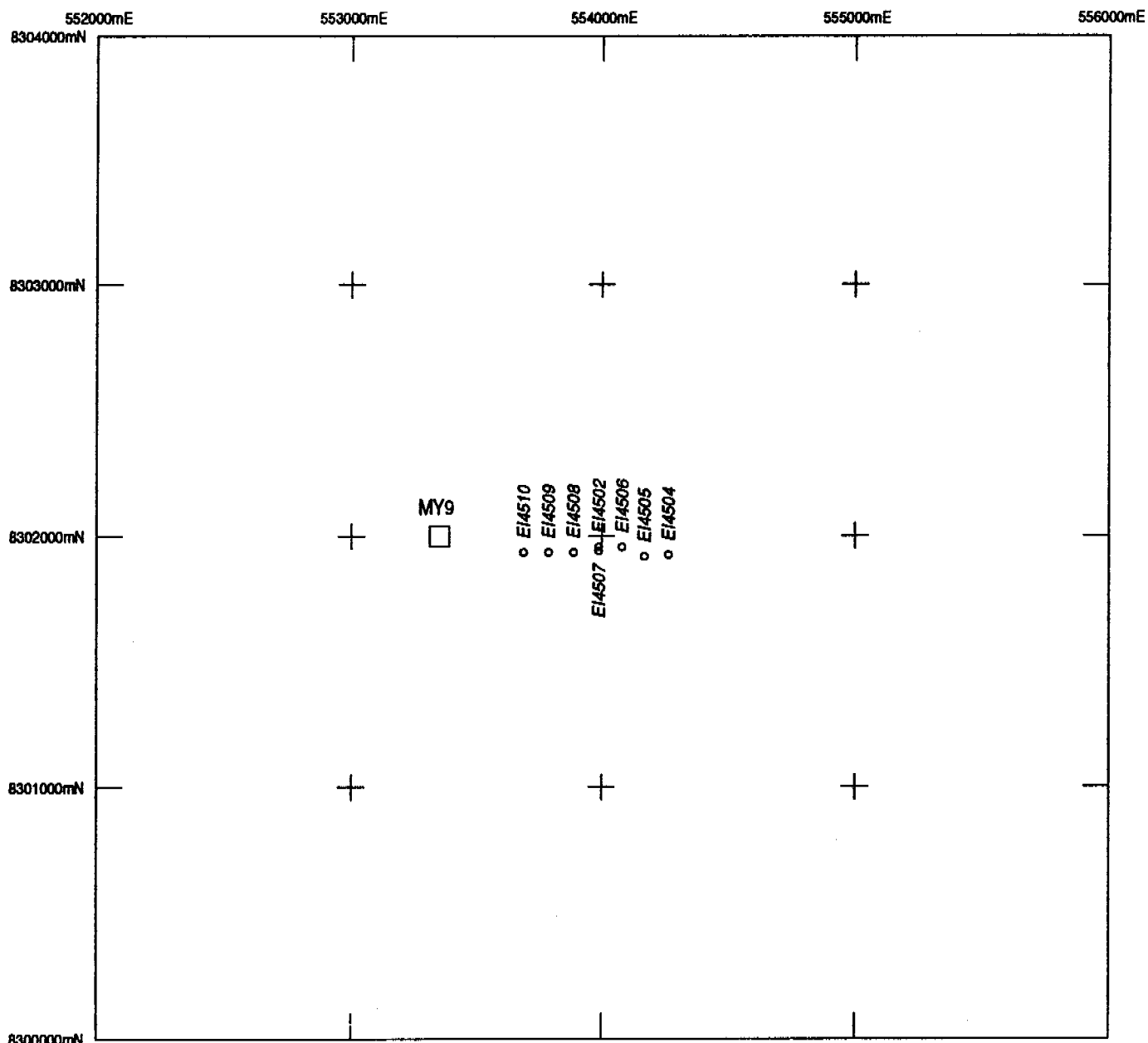
The most anomalous response identified is in sounding Y292/018, which highlights a 24 Ω m layer between approximately 35 m and 145 m depth. It is planned in the 1995 field season to conduct a further seven soundings to map the western extent of this layer, possibly followed by drill testing if strong conductors are identified.

3.2 Geochemistry

3.2.1 QUESTEM Anomaly Soil Sampling

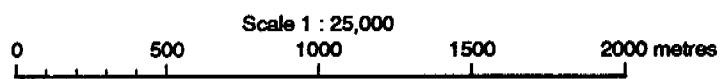
Four anomalies, MY19, MY26/28 and MY29, were followed up solely by soil geochemistry. These shallow anomalies occurred in moderately dipping Roper Group stratigraphy where the conductive horizon could reasonably be expected to outcrop or subcrop. Two further anomalies, MY9 and MY17, had one line of soil sampling completed in addition to ground TEM. Approximately 100 grams of -80 mesh fraction was sieved at each sample site. Table 7 gives details of the sampling. Locations are plotted in Figure 2, and Plates 2 and 3. Samples were submitted to Analabs Pty Ltd, Townsville, QLD for analysis. Analytical procedures and results are given in Appendix 4.

Assay results are not considered anomalous for any of the anomalies with peak values of only 25 ppm Cu, 12 ppm Pb and 33 ppm Zn. While the exact cause of these anomalies remains unknown, it is not considered to be related to significant base metal mineralisation.



○ E/4510
Soil sample location and number

MY9
□ QUESTEM anomaly



Prepared : M.Rennison

Drawn : A.R.Veale

Date : 14-6-95

Revised :



McARTHUR RIVER JV
EL7261 NYANANTU RIVER, N.T.

**LOCATION OF SOIL SAMPLE SITES
AND QUESTEM ANOMALY MY9**

Exploration - BHP Minerals
BHP Minerals Pty. Ltd., A.C.N. 006 004 782

Centre : Perth

Drg. No. : A4-5718

FIGURE 2

3.2.2 Rock Chip Sampling

A single rock chip sample was collected on E7261. The sample was a quartz vein. Analytical procedures and results are given in Appendix 4. The assay values are not considered anomalous.

3.3 Drilling

Two diamond and three RC percussion holes were drilled on the Nathan River Project during the 1994 field season. Drilling meterage totalled 552 m RC percussion and 118.2 m NQ core. Drilling was contracted to Gaden Drilling, Batchelor, NT. A Warman UDR650 drill rig was used for all holes. Drilling details are given in Table 8. Drill logs are presented in Appendix 5, and graphic summary logs in Plates 4, 5 and 6. Drill hole locations are plotted on Plate 1. Six metre, composite drill chip and third core samples were submitted to Analabs, Townsville, QLD for analysis. Analytical procedures and assays are presented in Appendix 6.

3.3.1 Percussion Drilling

MYP001

One percussion hole, MYP001 was drilled to a depth of 96 m on E7341 to test QUESTEM anomaly MY1. MY001 intersected a weathered red, brown ferruginous mudstone from 0 to 18 m underlain by a ferruginous sandstone to 20 m. Red, brown ferruginous shales were intersected from 20 m to 55 m, followed by dark grey shales to 80 m. These shales are thought to be the conductive source at MY1. Sandstone with trace muscovite and shaley

interbeds were intersected from 80 m to 96 m. MYP001 is interpreted to have intersected Mantungula Formation at the base of the Roper Group. Assays are low with a peak value of 218 ppm Zn.

MYP002

One percussion hole, MYP002, was drilled to a depth of 98 m on E7262 to test QUESTEM anomaly MY11. MYP002 intersected a weathered laminated dolomitic siltstone from 1 to 22 m. This was underlain by a black, laminated carbonaceous dolomitic siltstone to 80 m which is thought to represent the conductive source at MY11. The conductive layer is underlain by red and grey dolomitic siltstone to 88 m and a red to grey fine sandstone to 98 m which corresponds reasonably well with a basement of 424 Ω m in the TEM inversion. MYP002 is thought to have intersected Proterozoic Balbirini Dolomite of the Nathan Group. Assays are low with a peak value of 76 ppm Cu.

MYP004

One percussion hole, MYP004, was drilled to a depth of 118 m on E7263 to test QUESTEM anomaly MY21. MYP004 intersected a weathered laminated siltstone down to 16 m. This upper oxidised layer was underlain by grey, laminated carbonaceous dolomitic siltstones to 108 m which are thought to be responsible for the conductor at MY21. These rocks are underlain by a micaceous dolomitic fine sandstone from 108 to 118 m which is represented

quite well in the TEM inversion by a resistive basement of 220 Ω m. MYP004 intersected Proterozoic Mainoru Formation of the Roper Group. Assays are low with a peak value of 81 ppm Zn.

3.3.2 Diamond Drilling

MYD002

One diamond hole, MYD002, was drilled on E7263 to test QUESTEM anomaly MY24. MYD002 was pre-collared to 120 m by percussion drilling and completed to a final depth of 186.8 m by NQ diamond drilling.

MYD002 intersected highly weathered, laminated green, brown and red clayey mudstones from 0 to 30 m. From 30 to 78 m, brown and grey-green variably dolomitic mudstones were intersected, with minor fine pyrite at 62 to 64 m. MYD002 intersected dark green-grey to black, laminated, variably carbonaceous mudstones with minor quartz and carbonate veining from 78 to 182.3 m. Minor pyrite is present as fine disseminations and more commonly as blebs on fractures. Several chalcopyrite grains occur in a carbonate vein at 123 m. The underlying sequence from 182.3 to 186.8 m changes to interbedded green mudstones and fine sandstones, finishing in red-brown dolomitic mudstones with coarse silty interbeds.

The bedrock conductor at MY24 is explained by a sequence of laminated, carbonaceous mudstones. MYD002 is interpreted to have intersected the Proterozoic Mantungula Formation of the Roper Group. No anomalous base metal assays were returned.

MYD003

One diamond hole, MYD003, was drilled on E7261 to test QUESTEM anomaly MY7 (Plate 6). MYD003 was pre-collared to 120 m by percussion drilling and completed to a final depth of 171.4 m by NQ diamond drilling.

MYD003 intersected recent transported cover from 0 to 12 m, then Proterozoic mudstones with highly weathered clay horizons to 22 m. From 22 to 44 m a red-brown, laminated mudstone with minor green mudstone interbeds was intersected, underlain by interbedded light green to red-brown laminated mudstones and minor black carbonaceous mudstones to 78 m. From 78 to 161 m MYD003 intersected a sequence of dark green-grey to black, laminated, variably carbonaceous and micaceous mudstones with minor thin quartz sandstone interbeds at 144 to 151.4 m. These mudstones become less carbonaceous and change colour from black to a dark red-brown from 161 to 171.4 m.

The bedrock conductor at MY7 is explained by a sequence of laminated, carbonaceous and micaceous mudstones. MYD002 is interpreted to have intersected the Proterozoic Mantungula Formation of the Roper Group. No anomalous base metal assays were returned.

II. *Manganese Exploration*

3.4 Drilling

Gaden Drilling of Batchelor, N.T. were contracted to carry out the drilling. A UDR-650 multi-purpose drill rig mounted on a 6 x 6 truck was used. For the RC drilling most of the logging was done from two metre samples, but when mineralisation was seen the sample interval was reduced to a half or one metre. Diamond drilling consisted of PQ triple tube and was aimed at obtaining a better understanding of RC manganese intercepts. Therefore, all diamond holes were sited adjacent to RC holes with anomalous manganese.

Drill hole locations are shown on Plate 7 for the Towns area and Plate 8 for Yiyintyi area. Drilling statistics are summarised in Table 9. Drill logs and summary graphic logs are in Appendices 7 and 8 respectively.

3.4.1 RC Drilling

Drilling commenced on the 20/6/94 in the Yiyintyi area and was completed on the 5/9/94 in the northern portion of the Towns area. Most work was designed to test anomalous manganese intersections obtained from the 1993 drilling. All

drilling was carried out using a hollow hammer. This hammer was smaller than in previous years and productivity was considerably higher.

Reconnaissance drilling was completed in the Yiyintyi area as a consequence of the positive result in YER6 and occurred in the Towns area to broaden the search for manganese and better define the basement topography. Hole numbers for the Towns region are TRR94 to TRR173 for the RC drilling and TRD4 to TRD8 for the diamond drilling. Hole numbers for the Yiyintyi region are YED4, YER10 to YER26 and YER34 to YER48 for EL7263 and YER 29, YER30, YER33 and YER54 to YER60 for EL7264.

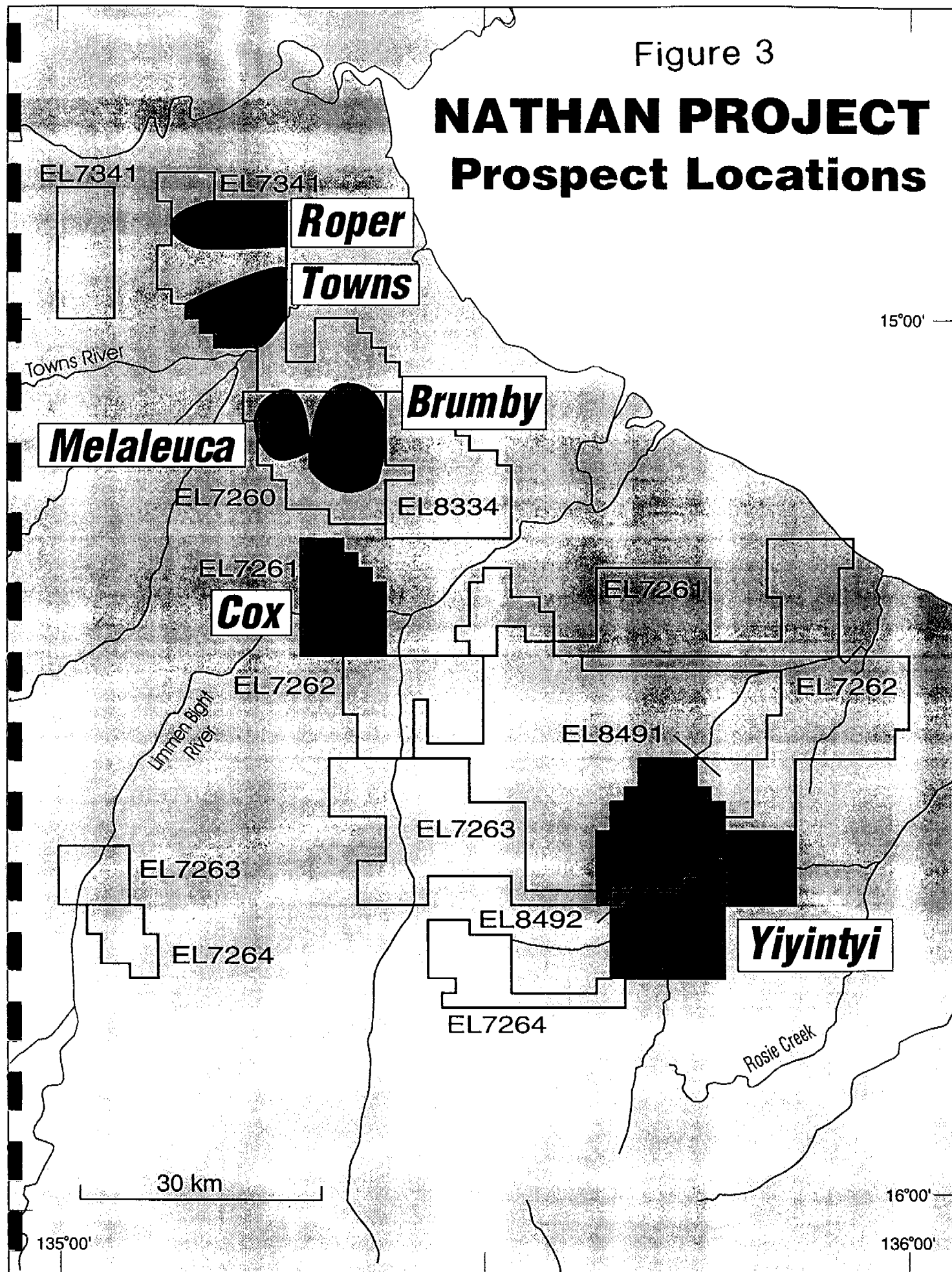
3.4.2 RC Drilling Results

The 1994 RC drilling did not meet the expectations generated from the 1993 program. Manganese mineralisation turned out to be very irregular in both its vertical and horizontal distribution. This spotty distribution must relate to primary low-grade mineralisation.

The drilling results for both the Towns and Yiyintyi areas are summarised below. The discussion is subdivided by prospects. The location of these prospects is shown in Figure 3 and a summary of results is given in Table 10. When discussing the geochemical results two types of results can occur for each sample. Samples without any suffix are 250-500 g splits of the sample interval submitted "as is" to Assaycorp, Pine Creek, NT. Samples with an 'A' suffix have been deslimed and the +0.5 mm wet sieved fraction submitted for

Figure 3

NATHAN PROJECT Prospect Locations



analysis. This process is similar to the process used for drill samples on Groote Eylandt, NT. Appendix 9 for gives the downhole analytical results for all samples collected during 1994. Table 12 gives the analytical methodology and detection limits used by Assaycorp for the analyses.

The Cox Prospect was tested by RC drill holes TRR94-101. No manganese was intersected close to TRR91 and the anomalous manganese at this locality has not been explained. However, it is clearly uneconomic. The best result was TRR100 located well north of TRR91. Manganese was intersected over 1 m and averaged 3.1% Mn. A PQ triple tube diamond hole was drilled adjacent to TRR100 and intersected a thin band of manganese within Proterozoic siltstone. Further details are given in Section 5.2.

At the Brumby Prospect four anomalous drill holes located over 8 km were intersected in 1993. The style of mineralisation was similar in all holes. During the 1994 field season RC drill holes TRR102-124, TRR133 and TRR138 tested the Brumby Prospect. The best results were:

	<u>Interval</u>	<u>Head Grade</u>	<u>Processed</u>
TRR105	42-43m	4.6% Mn	8.8% Mn
TRR108	16-16.5m	6.3% Mn	24.8% Mn
TRR120	37-38m	9.4% Mn	15% Mn

The results are very disappointing with no continuity being found and uneconomic grades intersected. Also, unlike the 1993 drilling the mineralisation occurs at a number of levels. The variation in position is interpreted as being caused by secondary remobilisation. The mineralisation will be discussed further in Section 3.4.3.

The Melaleuca Prospect was tested by RC drill holes TRR125-127 and TRR134-137. No intersections greater than a trace (up to 0.5% MnOx) were obtained in the RC drill holes. The manganese appears to be secondary occurring on ped surfaces. Although there is no definitive evidence, the association of near surface carbonate and the manganese stained clay suggests a Tertiary age. Pliocene limestone has been recorded east of the Yiyintyi Range.

RC drill holes TRR153-156 and TRR158 tested the Towns Prospect. No intersections greater than a trace (up to 0.5% MnOx) were obtained. The style is the same as the Melaleuca Prospect.

The Roper Prospect consists of a number of holes in the far north of the tenements. Trace manganese was identified in near surface clays during the 1993 drilling. Drilling of holes TRR167-170 tested the prospect with no intersections greater than a trace (up to 0.5% MnOx) obtained. The area appears to have no basement topography suitable for the concentration of manganese.

A number of areas outside the existing prospects also needed testing for their manganese potential and also to elucidate the basement palaeogeography. The only positive results were obtained immediately north of the Brumby Prospect. Four wide spaced drill holes intersected mineralisation similar to most found at Brumby. The best intersections were;

	<u>Interval</u>	<u>Head Grade</u>	<u>Processed</u>
TRR114	24.5-25m	4.4% Mn	5.1% Mn
TRR128	46-46.5m	2.7% Mn	6.1% Mn
TRR130	32.5-33m	6.4% Mn	20.9% Mn
TRR131	22-24.5m	3.5% Mn	9.5% Mn

RC drill holes TRR139-152 followed-up the above four holes but did not intersect any significant manganese. Further discussion of the results can be found in Section 3.4.3.

The palaeogeography appears to be important in localising the Groote Eylandt manganese. An indication of the Cretaceous palaeogeography in the Towns area is shown in Plate 7 where the RL of the top of the Proterozoic has been contoured. For the most part drill hole data has been used, but RLs of outcropping Proterozoic were included in the points contoured for the southern part of the area. Holes which lack a confidently interpreted Proterozoic intersection were not used.

Plate 7 agrees reasonably well with current published geological mapping and shows that a pronounced embayment in the Proterozoic surface occurs in the centre of the Towns area. The holes comprising the Brumby Prospect, which have the highest manganese assays, are located close to the southern shore of the embayment. This presumably reflects the palaeogeographic location that allowed deposition of manganese oxides at that time in the Cretaceous. Although most of the manganese intersections appear secondary the mineralisation is probably reflecting primary syn-depositional manganese.

The main focus of drilling at the Yiyintyi was to follow up YER6 from 1993. YER6 had returned an assay of 17.9% Mn headgrade and 39.1% Mn washed grade over the interval 20 to 22 metres. This result was considered very significant because it is close to ore grade and it was thought that the mineralisation could have been primary.

Extensive RC drilling around YER6 failed to locate any significant extensions of this mineralisation. Only hole YER36, located approximately 100 m WSW of YER6 intersected mineralisation. YER36 intersected 1.0 m at 10.2% Mn headgrade and 24.9% Mn washed grade. Further discussion on the mineralisation will be given in Section 3.4.3.

Additional reconnaissance drilling within the Yiyintyi area, E7263 and E7264, failed to intersect any anomalous manganese.

3.4.3 Diamond Drilling

The aim of the diamond drilling was to allow a better understanding of the mineralisation intersected from the RC drilling. PQ triple tube was employed to maximise core recovery. Drilling problems near the mineralisation still occurred.

Table 11 summarises the diamond drilling completed for manganese.

The intersection in TRR79 (drilled in 1993) was followed up by TRD3 (Plate 9) which revealed the mineralisation to occur as manganese oxide replacements making up about 10% of a silicified oolite. Smaller zones of manganese, ranging from 1 to 5% manganese oxide, occurred over intervals of up to 10 to 20 cm. Core recovery near the indicated manganese horizons was poor probably indicating major dissolution. This is confirmed by the cavernous nature of the underlying silicified dolomite. Although some manganese may be at the primary deposition site all the mineralisation is secondary. The patchy distribution is probably reflecting more the low primary grade of the manganese rather than the secondary mobilisation.

The intersection in TRR108 was followed up by diamond hole TRD4 (Plate 10). The main intersection occurs at 23.8 to 24.2 m where approximately 25% MnOx forms the matrix to a quartz sand. Minor evidence from the diamond drilling and adjacent RC drilling indicated that this style has no lateral continuity. This mineralisation has no economic significance but is interesting

in that it appears to have deposited higher in the sequence. In most instances manganese tends to migrate downwards and there is no obvious evidence for an aquaclude to reverse the fluid direction.

Hole TRD5 (Plate 11) tested TRR100 at the Cox Prospect. TRD5 intersected Proterozoic laminated pink and green siltstone with common brecciation and carbonate veining from 11.4 to 13.5 m. A stratabound 3 cm massive band of manganese occurs at 14.1 m. From 14.5 m trace manganese occurs as blocky to oblate Mn oxide replacement aligned along laminations in the siltstone host rock. The origin of the manganese is uncertain but may well be Proterozoic.

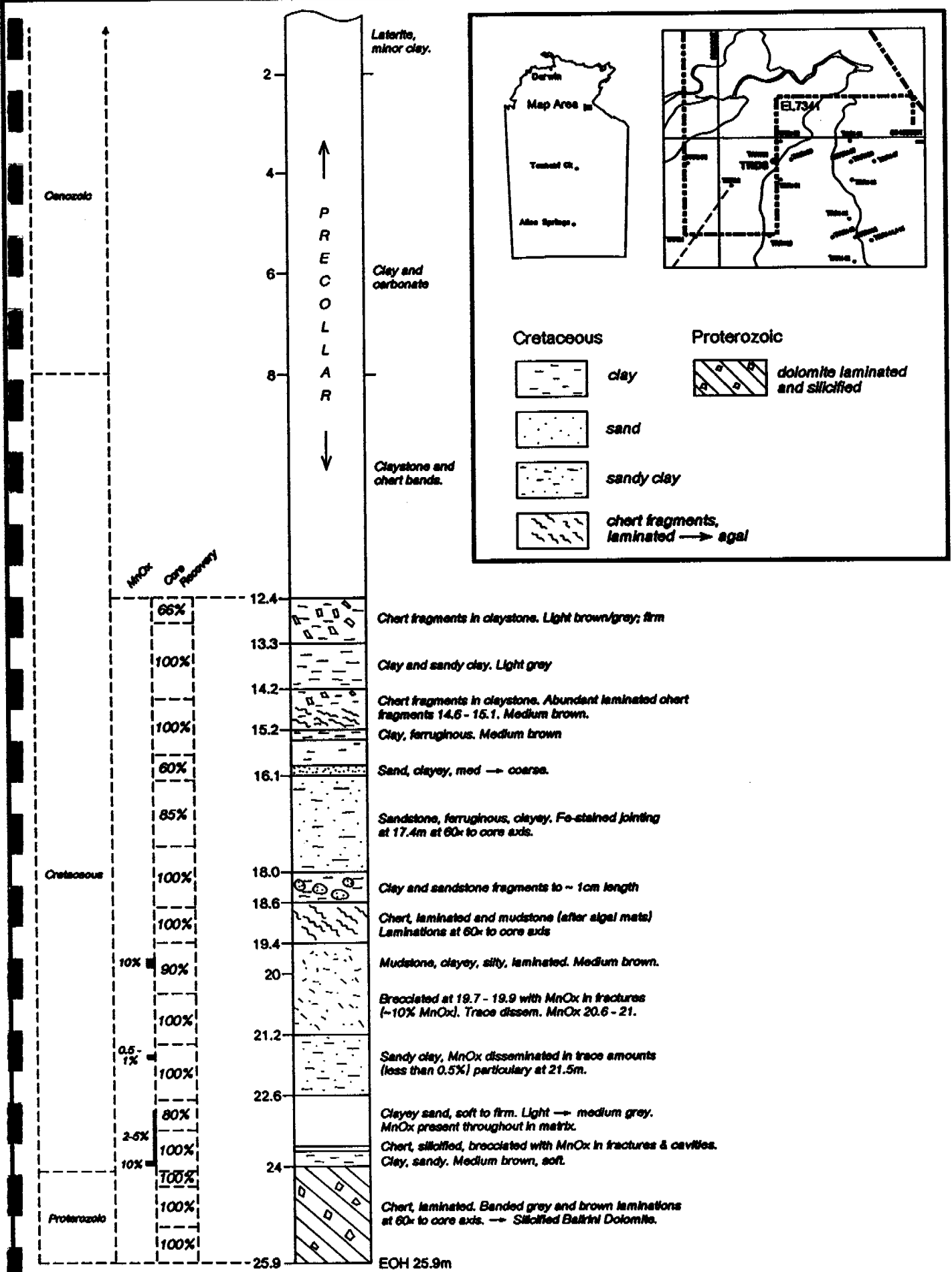
TRR67 was the best and shallowest intersection located in the Brumby Prospect during 1993. This was followed-up by TRD6 and TRD6A (Plate 12). TRD6 was abandoned at 18 m in running sands, however TRD6A confirmed the intersection obtained in TRR67. From 32.25 to 32.5 m there occurred 90% manganese oxide replacement of a silicified agal siltstone. The manganese although secondary may be replacing primary manganese. Lower grade intersections (1 to 10%) occurred intermittently throughout TRD6A including botryoidal manganese below the interpreted Cretaceous-Proterozoic boundary.

TRD7 (Plate 13) was collared adjacent to TRR15 and intersected clay and sandy clay averaging 10% manganese oxide from 8.1 to 8.3 m. The clay/sandy clay has a distinct very pale green colour and is interpreted as a Pliocene near shore deposit. Weathering has caused the manganese to form an irregular

mottling along ped boundaries. The manganese is clearly secondary but its origin is unknown.

Diamond hole TRD8 (Figure 4) was drilled three metres from TRR131 and intersected minor MnOx (up to 10%) from 22.6 to 23.7 m. The MnOx occurs in the matrix of a clayey sand from 22.6-23.6 m and for the last ten centimetres occurs as coatings on fractures and cavities of a siliceous chert. The mineralisation is probably secondary.

Diamond hole YED3 was drilled adjacent to YER6 (the two collars were about 2 metres apart) and intersected manganese mineralisation, estimated at +20% Mn from 20.2 to 21.2 m. An attempt to use our computer logging system was made on YED3. It was found to be unsatisfactory and traditional methods were used for the remaining holes. The computer generated log is located in Appendix 7. The manganese appears to be secondary but occupies a primary depositional site. The reasonable thickness but low-grade appears related to the small manganese source area. To the west of the intercept (and YER36) a basement ridge effectively isolates the area from anoxic zones to the west. The only source is a small anoxic zone a few hundred metres to the south east (YER22). The conditions were favourable for manganese deposition but the system was too small to produce an economic resource.



Prepared : H. Berents

Drawn : F. Barlow

Date : Jan 1995

Revised :



Exploration - BHP Minerals
BHP Minerals Pty. Ltd., A.O.A.L. 005 004 702

TOWNS RIVER REGION, CARPENTARIA, N.T.
DRILLHOLE TRD8 (REDRILL of TRR131)

GEOLOGICAL SECTION

Centre : Melbourne

Drg. No. : A4-3309

FIGURE 4

3.4.4 Sampling and Assay Results

Drill samples were processed in the field and analysed at Assaycorp Pty Ltd, Pine Creek, NT. The suite of elements and specifications are given in Table 12 while the results are located in Appendix 9. Significant results are summarised below.

The field sample treatment consisted of first drying the sample and splitting off approximately 250-500 g which was analysed without further processing. This analysis is referred to as the headgrade assay. The remainder of the sample was deslimed and then sieved at 0.5 mm. The minus 0.5 mm fraction was discarded and the plus 0.5 mm fraction was weighed and analysed. This second analysis is referred to as the processed assay. Sample numbers have the suffix "A" to denote processed assays. The purpose of the sample treatment was to provide a better indication of potential product grade than that provided by the headgrade assays.

The assay results generally confirm the estimated manganese intersections, although the ranking of holes changes when considering the processed analysis. In general the processed analysis will give a higher result than the headgrade analysis; a function of discarding fine clays and silica.

The Brumby Prospect offered the best potential at the start of the season. This was not confirmed by the 1994 drilling. However, the best analyses are summarised in Table 13.

Hole TRR108 has the best processed grade at 24.8% Mn. Other holes also have grade of similar magnitude; TRR100 and TRR120. In all of these holes there is an upgrading of 3 to 4 times. The grade of these intercepts is clearly uneconomic and the degree of upgrading would indicate that yields would not be satisfactory even if the grade was higher.

The only other holes from the Towns region to produce significant assays were TRR130 and TRR131. Both of these holes were sited as general reconnaissance holes north of the Brumby Prospect. A summary of the best results is given in Table 14.

For these holes processed grades up to 20.9% Mn and 12.6% Mn were obtained. As noted previously, follow up drilling around TRR130 and TRR131 failed to locate any further mineralisation.

In summary, all the analytical results from the Towns area indicate that no potentially economic intersections of manganese were obtained.

At Yiyintyi the only intersection of any significance within the areas covered by this report was YER36 (Table 15). This hole was located about 100 m WSW of YED3 and YER6 and has 1.5 m averaging 7.8% Mn head grade and 21.8% Mn processed grade.

3.4.5 Downhole Geophysics

An EM39 borehole induction tool (Geonics) was used to log 21 holes in the Yiyintyi and Towns regions. This logging was completed in an attempt to explain near surface conductors that could not be easily explained from the drill chips. The drill holes logged included eight which intersected manganese.

The conductivity readings were taken at 10 cm intervals down the hole and the recorded data dumped onto a laptop computer. It should be noted that when a layer is less than 4 m thick the EM39 does not accurately log the conductivity due to averaging of adjoining beds. The recorded conductivity is 50% of actual at 0.5 m, 75% of actual for 1 m and 90% of actual for 2 m.

The profiles with downhole geology are located in Appendix 10.

The EM39 picks out lithological boundaries quite well. The highest responses are yellow/pale green clays and manganese. From this work it is concluded that the airborne EM anomalies are being caused by discrete zones of conductive clay. There is no evidence to suggest that any of the manganese is the sole cause of any of the airborne EM anomalies tested.

4.0 EXPLORATION EXPENDITURE

Exploration expenditure for the period 24th May, 1994 to 23rd May, 1995 amounted to \$ 799,982. A detailed breakdown of expenditures is given in Appendix 11.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Diamond Exploration

Encouraging results for EL 7263 and EL 7264 on the Mantungula 1:100,000 sheet demonstrates not only the prospectivity of the region but also the difficulty in discovering and defining indicator anomalies.

Continued follow-up and reconnaissance exploration is thus warranted.

5.2 Base Metal Exploration

Ground TEM follow-up of nine QUESTEM anomalies in 1994 identified three bedrock conductors worthy of drill testing in addition to a further two conductors worthy of drill testing identified by ground TEM in 1993.

Reinterpretation of a QUESTEM airborne TEM survey flown by BHP in 1992 has resulted in the selection of a further eleven lower conductance anomalies for ground detailing in 1995. Soil sampling follow-up of four QUESTEM anomalies hosted by Roper Group sediments failed to identify any anomalous base metal geochemistry.

A 22 site TEM sounding program on E7262 has identified a significant bedrock conductor at one site. A further seven TEM soundings will be undertaken in 1995 to test the western extent of this conductive layer, possibly followed by drill testing.

Drill testing of five bedrock conductors failed to identify any anomalous base metal geochemistry. In each case, the bedrock conductor was explained by the presence of dark, variably carbonaceous and micaceous, laminated mudstones, all interpreted to be Proterozoic.

The extensive manganese exploration program carried out in the Nathan Project Tenements over the past few years has comprehensively tested the Cretaceous sediments. Although manganese has been intersected, the size and grade are not of economic significance.

Additional manganese exploration is not warranted on this area.

6.0 PROPOSED PROGRAMME AND BUDGET

The proposed programme and budget for the period 24th May, 1995 to 23rd May, 1996 is given below. Under the McArthur River Joint Venture, BHP Minerals have elected to withdraw from exploration licences 7260 and 7341. No further work will be carried out by BHP on these licences.

EL 7260

DIAMOND EXPLORATION:

1. Reconnaissance sampling.
2. Follow-up sampling if warranted.
3. Helimag survey if warranted.

PROPOSED EXPENDITURE:

Labour	7,000
Field Support	5,000
Vehicles	2,000
Helicopter Charter	8,000
Geophysics	12,000
Laboratory	5,000
Drafting/Computing	1,000
	\$ 40,000

EL 7261

DIAMOND EXPLORATION:

1. Reconnaissance sampling.
2. Follow-up sampling if warranted.
3. Helimag survey if warranted.

BASE METAL EXPLORATION:

1. Ground TEM follow-up of one QUESTEM anomaly.
2. Drill testing one QUESTEM anomaly.
3. GEOTEM survey over a magnetic anomaly.

PROPOSED EXPENDITURE:

Labour	7,000
Field Support	5,000
Vehicles	2,000
Helicopter Charter	8,000
Geophysics	12,000
Laboratory	5,000
Drafting/Computing	1,000
	\$ 40,000

EL 7262

DIAMOND EXPLORATION:

1. Reconnaissance sampling.
2. Follow-up sampling is warranted.

BASE METAL EXPLORATION:

1. Ground TEM follow-up of two QUESTEM anomalies.
2. Drill testing one QUESTEM anomaly.
3. Seven TEM soundings.
4. Drill testing one TEM sounding.

PROPOSED EXPENDITURE:

Labour	5,000
Drilling	34,000
Vehicles	2,000
Helicopter Charter	3,000
Laboratory	4,000
Drafting/Computing/Office Support	2,000
	\$ 50,000

EL 7263

DIAMOND EXPLORATION:

1. Reconnaissance sampling.
2. Follow-up sampling if warranted.
3. Helimag survey if warranted.
4. Aerial photography survey.
5. Bulk sampling.

BASE METAL EXPLORATION:

1. Ground TEM follow-up of four QUESTEM anomalies.
2. Drill testing of one QUESTEM anomaly.

PROPOSED EXPENDITURE:

Labour	6,000
Field Support	4,000
Vehicles	3,000
Helicopter Charter	4,000
Drilling	14,500
Aerial Survey	4,000
Geophysics	6,000
Laboratory	4,000
Drafting/Computing	1,000
	\$ 46,500

EL 7264

DIAMOND EXPLORATION:

1. Reconnaissance sampling.
2. Follow-up sampling if warranted.
3. Helimag survey if warranted.
4. Aerial photography survey.
5. Bulk sampling.

BASE METAL EXPLORATION:

1. Ground TEM follow-up of two QUESTEM anomalies.
2. Drill testing of one QUESTEM anomaly.

PROPOSED EXPENDITURE:

Labour	6,000
Field Support	4,000
Vehicles	2,000
Drilling	14,500
Helicopter Charter	3,000
Aerial Survey	2,000
Geophysics	4,500
Laboratory	3,000
Drafting/Computing	1,000
	\$ 40,000

EL 7341

DIAMOND EXPLORATION:

1. Reconnaissance sampling.
2. Follow-up sampling if warranted.
3. Helimag survey if warranted.

PROPOSED EXPENDITURE:

Labour	7,000
Field Support	5,000
Vehicles	2,000
Helicopter Charter	8,000
Geophysics	12,000
Laboratory	5,000
Drafting/Computing	1,000
	\$ 40,000

TABLE 2**QUESTEM ANOMALY FOLLOW-UP**

ANOMALY	EASTING	NORTHING	TENEMENT	FOLLOW-UP	COMMENTS
MY1	504650	8353000	E7341	Drill tested MYP 1.	Prn sist/shal
MY6	554650	8307000	E7261	Moving loop TEM	Saline water?
MY7	536650	8305000	E7261	TEM soundings, drill tested MYD 3.	Prn carb mst
MY9	553350	8302000	E7261	Moving loop TEM, soil sampling	Saline water?
MY10	543400	8297000	E7262	Moving loop TEM	Saline water
MY11	537050	8296000	E7262	Moving loop TEM, drill tested MYP 2.	Pnz dolo sist
MY13	542800	8291000	E7262	Moving loop TEM	Moderate bedrock
MY16	539700	8288000	E7262	Moving Loop TEM	Prn?
MY17	544300	8286000	E7263	TEM soundings, soil sampling	Pr
MY19	546200	8279000	E7263	Soil sampling	Pr
MY21	546950	8274000	E7263	Moving loop TEM, drill tested MYP 4.	Pru
MY24	539950	8270000	E7263	Drill tested MYD 2.	Prn carb sist
MY26	551300	8261000	E7264	Soil sampling	Pr low assays
MY28	551350	8259000	E7264	Soil sampling	Pr low assays
MY29	549750	8255000	E7264	Soil sampling	Pr low assays

TABLE 3

GROUND TEM SURVEY LOGISTICS

EL	:	7261, 7262, 7263	
Contractor	:	Geoterrex Pty Ltd	
Instrument	:	PROTEM receiver. TEM-37 transmitter.	
Loop Size configuration	:	100 x 100 and 200 x 200 metres/moving	(profiling)
		200 x 200 metres/fixed	(sounding)
Base Frequency	:	25 Hz, N = 20	(profiling)
		25, 6.25 and 2.5 Hz, N = 20	(sounding)
Receiver spacing/ components	:	50 m / Z only	(profiling)
		200 m / Z only	(sounding)
Date	:	June - July 1994	
Duration	:	13 days production	
Coverage	:	7 sites, 1 - 3 lines per site	(profiling)
		2 sites, 3 loops per site. Both in- and out-of-loop readings.	(sounding)
Totals	:	18.6 line km	(profiling)
		6 sounding	(sounding)

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19/06/95

TABLE 4
QUESTEM ANOMALIES FOR 1995 FOLLOW-UP

ANOMALY NUMBER	TENEMENT	AMG EASTING	AMG NORTHING	HOST
MY 38	E7261	539500	8300000	Pml
MY 40	E7262	590300	8279000	Lower Pm
MY 41	E7262	591800	8279000	Lower Pm
MY 43	E7263	590300	8274000	Lower Pm
MY 44	E7263	545400	8272000	Pnz
MY 46	E7263	546400	8270000	Pnz?
MY 48	E7263	545500	8269000	Pnz
MY 49	E7263	591000	8269000	Lower Pm
MY 56	E7264	547900	8263000	Pnz
MY 59	E7263	541800	8273000	Pnz
MY 61	E7264	566500	8255000	Ptq

TABLE 5
TEM SOUNDINGS SITE LOCATIONS

SITE	AMG	AMG
NUMBER	EASTING	NORTHING
Y297/034	603400	8297400
Y297/050	605000	8297400
Y297/066	606600	8297400
Y295/034	603400	8295800
Y295/050	605000	8295800
Y295/066	606600	8295800
Y294/034	603400	8294200
Y294/050	605000	8294200
Y294/066	606600	8294200
Y292/018	601800	8292600
Y292/034	603400	8292600
Y292/050	605000	8292600
Y292/066	606600	8292600
Y291/018	601800	8291000
Y291/034	603400	8291000
Y291/050	605000	8291000
Y291/066	606600	8291000
Y289/034	603400	8289400
Y289/050	605000	8289400
Y287/018	601800	8287800
Y287/034	603400	8287800
Y287/050	605000	8287800

TABLE 6

TEM SOUNDINGS SURVEY LOGISTICS

EL	:	7262
Contractor	:	Geoterrex Pty Ltd
Instrument	:	PROTEM receiver. TEM 37 transmitter.
Loop Size/configuration	:	300 x 300 m / fixed Diamond shaped
Base Frequency	:	25 and 6.25 Hz N = 20
Receiver spacing/ components	:	200 m / Z only
Date	:	July 1994
Duration	:	5 days production, 1 day standby
Coverage	:	22 loops Both in- and out-of-loop readings
Total	:	22 soundings

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TABLE 7

QUESTEM ANOMALY SOIL SAMPLING

ANOMALY	NO. LINES (spacing m)	NO. SAMPLES	SAMPLE SPACING (m)	Max Cu (ppm)	Max Pb (ppm)	Max Zn (ppm)
MY9	1	8	100	25	12	33
MY17	1	17	100	25	11	22
MY19	1	17	100	12	5	17
MY26/28	3 (500)	82	50	13	12	16
MY29	1	21	50	11	8	17

TABLE 8

BASE METAL DRILLING DETAILS

HOLE NO.	ANOMALY NO.	TENEMENT	EASTING	NORTHING	TOTAL DEPTH (m)	RC (m)	DIAMOND (m)
MYP001	MY1	E7341	505300	8353450	96	96	-
MYP002	MY11	E7262	536900	8295700	98	98	-
MYP004	MY21	E7263	547050	8274050	118	118	-
MYD002	MY24	E7263	539900	8270130	186.8	120	66.8
MYD003	MY7	E7261	536650	8305000	171.4	120	51.4

TABLE 9

SUMMARY OF MANGANESE DRILLING

EL NO.	RC HOLES	RC (m)	DIAMOND HOLES	DIAMOND (m)	TOTAL (m)
7341	34	1300	1	25.9	1325.9
7260	39	1662	6	155.2	1817.2
7261	8	234	1	17.4	251.4
7263	32	1134.5	1	30.8	1165.3
7264	10	287	0	0	287
<i>Totals:</i>	<i>123</i>	<i>4617.5</i>	<i>9</i>	<i>188.5</i>	<i>4846.8</i>

TABLE 10**SUMMARY OF RC DRILLING RESULTS**

PROSPECT	1993 RESULT	BEST 1994 FOLLOW-UP (in % Mn)	COMMENTS
Yiyintyi	YER6, 1m @ 39 % proc.	YER36, 1m @ 24.9 % processed	mineralisation has very limited extent
Roper	TRR54; 6-10m trace Mn	no positive results	no positive results
Towns	TRR42; 14-16m @ 2.8 %	no positive results	no positive results
Melaleuca	TRR15; 8-10m 1.5 %	no positive result	no positive result
Brumby	TRR67; 32-34m @ 17.9 %	TRR108, 0.5m @ 6.3 %, 24.8 % processed	mineralisation has extremely spotty distribution; no economic accumulations
Cox	TRR 91; 42-44m @ 5.1 %	TRR100; 10-11m @ 3.1 %	no positive results

TABLE 11**SUMMARY OF DIAMOND DRILLING**

DIAMOND HOLE	ADJACENT RC HOLE	RESULT
TRD3	TRR79 (1993)	secondary MnOx occurs irregularly from 36-45m. Best MnOx occurs at base poss. related to downward moving ground water. MnOx almost certainly related to Cretaceous not Pro.
TRD4	TRR108	secondary MnOx occurs irregularly from xxxxxxx highest grade occurs as matrix to sand. This mineralisation is very irregular.
TRD5	TRR100	thin band (3cm) of MnOx plus other traces intersected within Pro. siltstone
TRD6	TRR67 (1993)	abandoned in running sands
TRD6A	TRR67 (1993)	confirmed intersection in TRR67, no definite primary ore located. Strong indication that manganese is Cretaceous.
TRD7	TRR15 (1993)	10% MnOx occurs from 8.1-8.3 as irregular mottling, occurs on ped boundaries
TRD8	TRR131	minor MnOx (to 10%) from 22.6-23.7
YED3	YER6 (1993)	secondary manganese, including thin massive bands occur over 1.1m. Although secondary appears to be a primary deposition site. Occurrence has very limited extent.

TABLE 12

ANALYTICAL SPECIFICATIONS

ELEMENT	ANALYTICAL TECHNIQUE	DETECTION LIMIT
Mn, Ba	ICP/ FP-1	5 ppm
Fe, Al ₂ O ₃	ICP/ FP-1	0.01 %
SiO ₂	ICP/ FP-1	0.1 %
Zn, Sr, Ce	ICP/ MA-4	2 ppm
CU, Pb	ICP/ MA-4	5 ppm
La	ICP/ MA-4	1 ppm
P	ICP/ MA-4	10 ppm
CaO, K, MgO	ICP/ MA-4	0.01 %

All elements have a precision of $\pm 10\%$

TABLE 13

THE BRUMBY PROSPECT - SUMMARY OF RESULTS

HOLE	INTERVAL (m)	SAMPLE	Mn %		Fe %	
			HEAD GRADE	PROCESSED	HEAD GRADE	PROCESSED
TRR100	10-10.5	DZ1198/A	3.73	8.08	5.48	4.58
TRR100	10.5-11	DZ1199/A	2.48	4.51	7.27	9.3
TRR100	15.5-16	DZ1200/A	2.62	19.5	4.84	2.2
TRR105	42-42.5	DZ451/A	3.69	6.81	6.69	10.76
TRR105	42.5-43	DZ452/A	5.55	10.8	21.18	27.54
TRR108	16-16.5	DZ454/A	6.29	24.8	2.82	3.41
TRR120	36-36.5	DZ478/A	2.8	2.82	2.88	0.55
TRR120	36.5-37	DZ479/A	1.88	0.31	3.63	4.05
TRR120	37-37.5	DZ480/A	2.21	13.9	3.13	1.46
TRR120	37.5-38	DZ481/A	9.42	16.0	4.56	1.41
TRR120	38-38.5	DZ482/A	2.14	5.33	1.69	0.8
TRR120	41-41.5	DZ486/A	4.67	7.32	5.49	1.36

TABLE 14**HOLES TRR130 AND TRR131 - SUMMARY OF RESULTS**

HOLE	INTERVAL (m)	SAMPLE NO	Mn %		Fe %	
			HEAD GRADE	PROCESSED	HEAD GRADE	PROCESSED
TRR130	32-32.5	DZ509/A	1.94	7.48	30.48	32.85
TRR130	32.5-33	DZ510/A	6.42	20.9	2.64	12.44
TRR131	22-24	DZ511/A	3.16	8.58	12.58	3.58
TRR131	24-24.5	DZ512/A	4.85	12.6	4.76	1.28
TRR131	24.5-25	DZ513/A	4.92	10.3	5.31	0.86
TRR131	25-25.5	DZ514/A	4.07	2.81	4.98	0.81

TABLE 15

YER36 - SUMMARY OF RESULTS

HOLE	INTERVAL (m)	SAMPLE NO	Mn %		Fe %	
			HEAD GRADE	PROCESSED	HEAD GRADE	PROCESSED
YER36	20-20.5	DZ1190/A	7.95	28.2	5.56	7.97
YER36	20.5-21	DZ1191/A	12.4	21.6	7.76	5.23
YER36	21-21.5	DZ1192/A	15.7	2.9	2.22	1.09

APPENDIX 1

Sample Results

EXPLORATION LICENCE 7260 **SAMPLE RESULTS**

Sample	Result	Type	Diamond		Chromite	Other
			Micro	Macro		
MYO 0648	Neg	L	-	-	-	-
MYO 0649	Neg	L	-	-	-	-
MYO 0660	Neg	G	-	-	-	-

SAMPLE METHODS/TYPES

G = Gravel	BG = Bulk gravel	LG = Loam on grid
L = Loam	BL = Bulk loam	L PF = Loam on photofeature
R = Rock	BT = Bulk trench	DS = Drill spoil
P = Pit	TR = Trench/costean	

npro = not processed

EXPLORATION LICENCE 7262 **SAMPLE RESULTS**

Sample	Result	Type	Diamond		Chromite	Other
			Micro	Macro		
MYO 0597	Neg	G	-	-	-	-
MYO 0599	Neg	G	-	-	-	-
MYO 0720	npro	G	-	-	-	-
MYO 0721	npro	G	-	-	-	-
MYO 0722	npro	G	-	-	-	-
MYO 0723	npro	G	-	-	-	-
MYO 0724	npro	G	-	-	-	-
MYO 0725	npro	G	-	-	-	-
MYO 0726	npro	G	-	-	-	-
MYO 0727	npro	G	-	-	-	-

SAMPLE METHODS/TYPES

G = Gravel	BG = Bulk gravel	LG = Loam on grid
L = Loam	BL = Bulk loam	L PF = Loam on photofeature
R = Rock	BT = Bulk trench	DS = Drill spoil
P = Pit	TR = Trench/costean	

npro = not processed

EXPLORATION LICENCE 7263

SAMPLE RESULTS

Sample	Result	Type	Diamond		Chromite	Other
			Micro	Macro		
MYO 0559	Neg	G	-	-	-	-
MYO 0566	Neg	G	-	-	-	-
MYO 0570	Neg	G	-	-	-	-
MYO 0580	Neg	G	-	-	-	-
MYO 0581	Neg	G	-	-	-	-
MYO 0582	Neg	G	-	-	-	-
MYO 0587	npro	G	-	-	-	-
MYO 0594	Neg	G	-	-	-	-
MYO 0595	Neg	G	-	-	-	-
MYO 0596	Neg	G	-	-	-	-
MYO 0604	Neg	G	-	-	-	-
MYO 0612	Neg	G	-	-	-	-
MYO 0613	Neg	G	-	-	-	-
MYO 0614	Neg	G	-	-	-	-
MYO 0673	npro	G	-	-	-	-
MYO 0674	POS	G	1	-	-	-
MYO 0676	npro	G	-	-	-	-
MYO 0677	Neg	G	-	-	-	-

SAMPLE METHODS/TYPES

G = Gravel

L = Loam

R = Rock

P = Pit

BG = Bulk gravel

BL = Bulk loam

BT = Bulk trench

TR = Trench/costean

LG = Loam on grid

L PF = Loam on photofeature

DS = Drill spoil

npro = not processed

**EXPLORATION LICENCE 7264
SAMPLE RESULTS**

Sample	Result	Type	Diamond		Chromite	Other
			Micro	Macro		
MYO 0556	Neg	G	-	-	-	-
MYO 0557	Neg	G	-	-	-	-
MYO 0583	Neg	G	-	-	-	-
MYO 0584	Neg	G	-	-	-	-
MYO 0585	Neg	G	-	-	-	-
MYO 0589	Neg	G	-	-	-	-
MYO 0591	Neg	G	-	-	-	-
MYO 0592	Neg	G	-	-	-	-
MYO 0593	Neg	G	-	-	-	-
MYO 0664	Neg	G	-	-	-	-
MYO 0668	Neg	G	-	-	-	-
MYO 0669	Neg	G	-	-	-	-
MYO 0670	npro	G	-	-	-	-
MYO 0671	Neg	G	-	-	-	-
MYO 0672	POS	G	1	-	-	-

SAMPLE METHODS/TYPES

G = Gravel	BG = Bulk gravel	LG = Loam on grid
L = Loam	BL = Bulk loam	L PF = Loam on photofeature
R = Rock	BT = Bulk trench	DS = Drill spoil
P = Pit	TR = Trench/costean	

npro = not processed

EXPLORATION LICENCE 7341 **SAMPLE RESULTS**

Sample	Result	Type	Diamond		Chromite	Other
			Micro	Macro		
MYO 0650	Neg	L	-	-	-	-
MYO 0651	POS	L	1	-	-	-
MYO 0652	Neg	L	-	-	-	-
MYO 0653	POS	L	1	-	-	-
MYO 0654	POS	L	1	-	-	-
MYO 0655	npro	G	-	-	-	-
MYO 0657	Neg	G	-	-	-	-
MYO 0658	Neg	G	-	-	-	-
MYO 0659	Neg	G	-	-	-	-

SAMPLE METHODS/TYPES

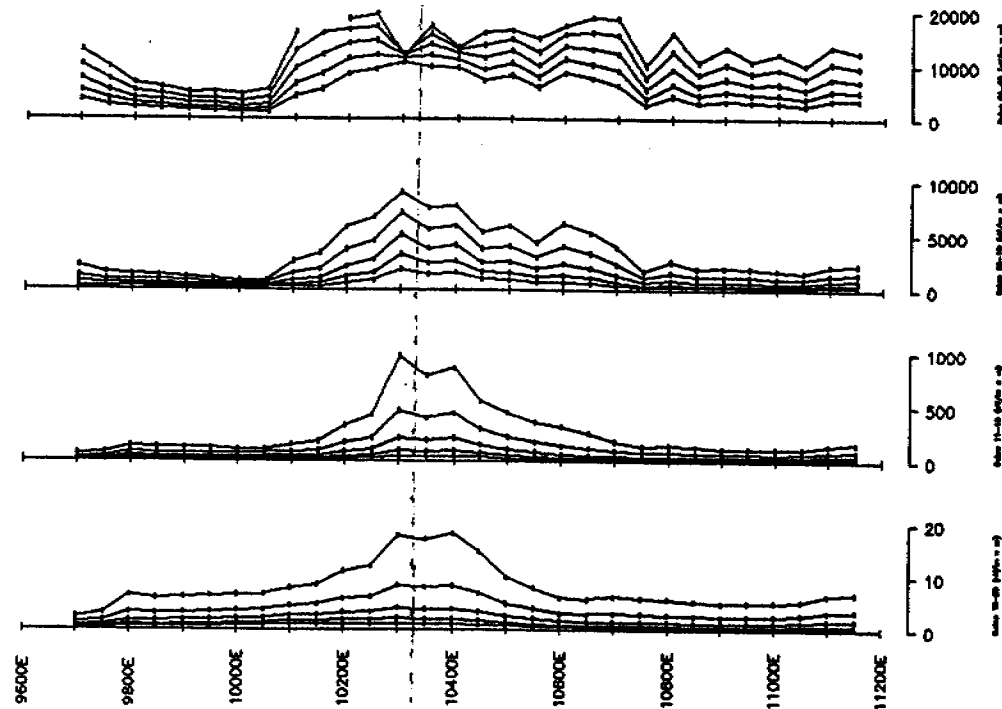
G = Gravel	BG = Bulk gravel	LG = Loam on grid
L = Loam	BL = Bulk loam	L PF = Loam on photofeature
R = Rock	BT = Bulk trench	DS = Drill spoil
P = Pit	TR = Trench/costean	

npro = not processed

APPENDIX 2

QUESTEM Anomalies - Ground TEM Data

VERTICAL COMPONENT B(Z)



PROTEM SURVEY

MOVING
TRANSMITTER

ELECTROMOTIVE FORCE INDUCED BY
SECONDARY FIELD
TIME DERIVATIVE OF FLUX DENSITY (B)

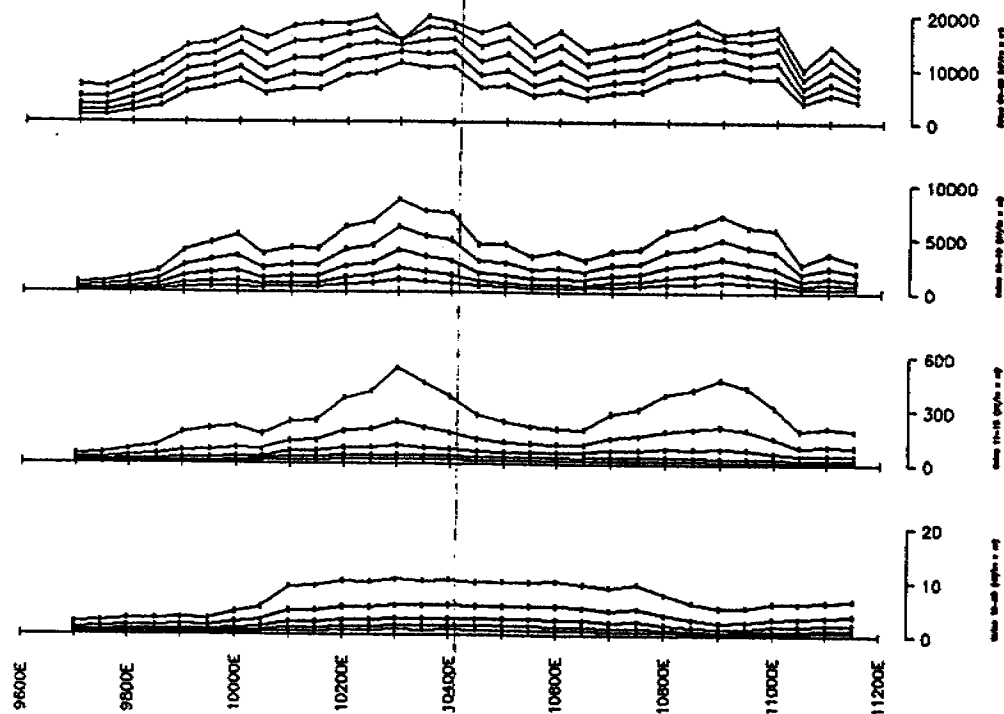
Surveyed and Compiled by GEOTERREX PTY LTD

BHP

Carpentaria Project 3-825
Anom MY6 Line 97N
LOOP: 200 x 200
Station 9700 - 11150

SCALE 1: 10,000

DATE: 15 JULY 1994



PROTEM SURVEY MOVING TRANSMITTER

ELECTROMOTIVE FORCE INDUCED BY
SECONDARY FIELD
TIME DERIVATIVE OF FLUX DENSITY (B)

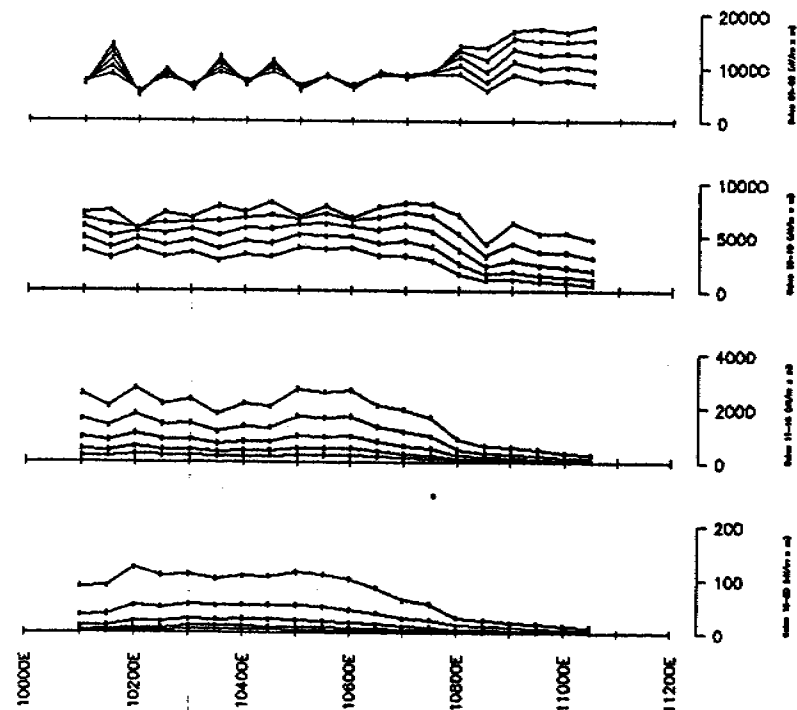
Surveyed and Compiled by GEOTERREX PTY LTD

BHP

Carpentaria Project 3-825
Anom MY6 Line 101N
LOOP: 200 x 200
Station 9700 - 11150

SCALE 1: 10,000 DATE: 15 JULY 1994

VERTICAL COMPONENT B(Z)



PROTEM
SURVEY

MOVING
TRANSMITTER

ELECTROMOTIVE FORCE INDUCED BY
SECONDARY FIELD
TIME DERIVATIVE OF FLUX DENSITY (B)

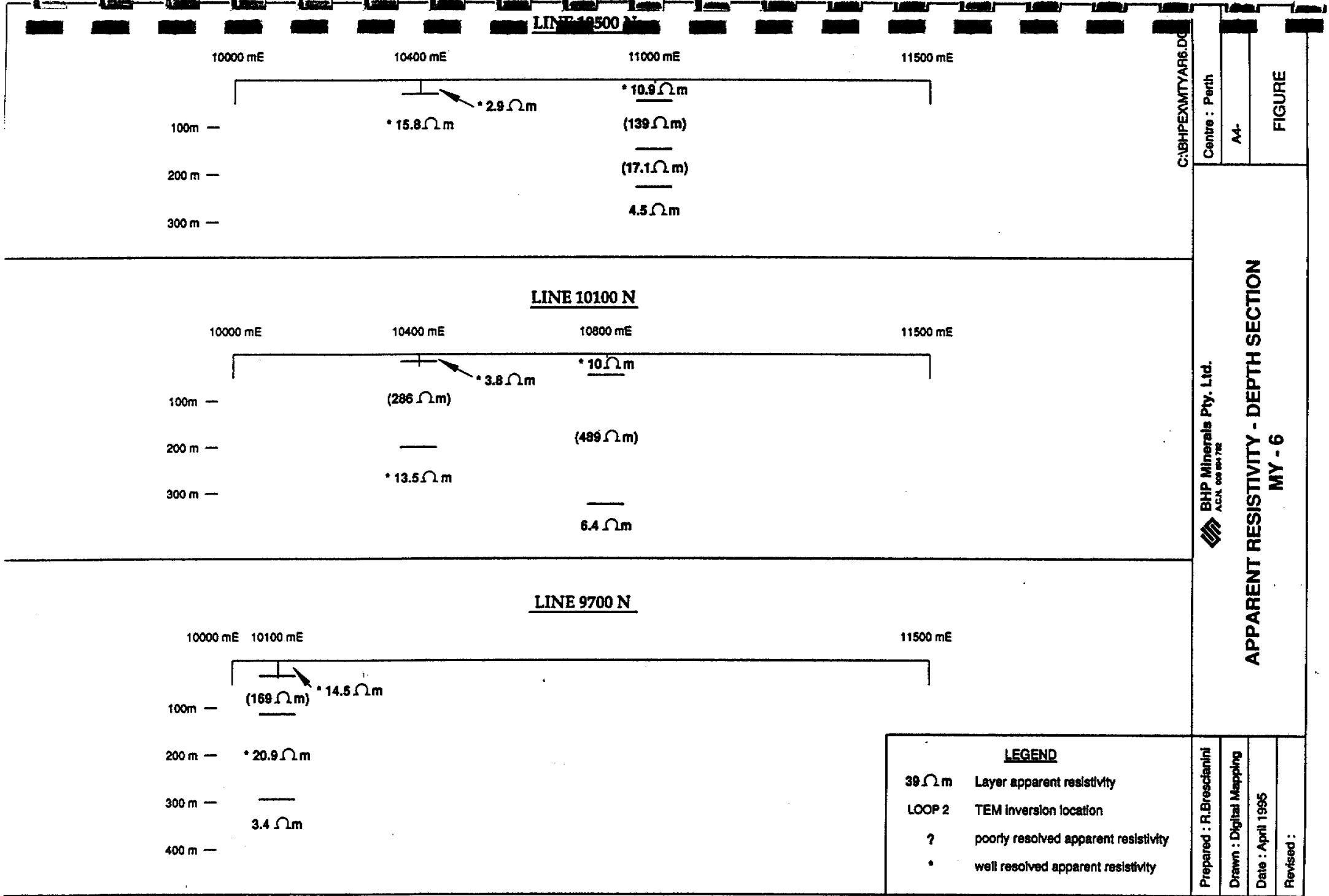
Surveyed and Compiled by GEOTERREX PTY LTD

BHP

Carpentaria Project 3-825
Anom MY6 Line 10500N
LOOP: 200 x 200
Station 10100 - 11050

SCALE 1: 10,000

DATE: 18 JUNE 1994



SOUNDING: 101512 : Vers 1
Mt Young MY7 25 Hz - 10100N 10150E

~~8.0 ohm.m~~ ~~4.1 m.~~ 4.1 m.
* 14.1 ohm.m * 62.0 m.
~~865 ohm.m~~ * 66.0 m.
865 ohm.m

STD ERR= 2.2% : S= 6 S

101512A

~~8.0~~
* 14.1
~~865~~

E= 2%
S= 6S

Sounding 101512 : Ver 1

1e3

□model

+field

100

10

time (nsec)

.1

1

10

100

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
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21
22
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79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

SOUNDING: 107512 : Vers 1

Mt Young Site MY7 25 Hz - 10100N 10750E

107512A

* 7.2 ohm.m * 19.1 m. * 19.1 m.

* 7.2

* 17.1 ohm.m * 141 m.

* 17.1

* 160 m.

(231 ohm.m)

(231)

STD ERR= 2.2% : S= 11 S

E= 2%

S= 11S

Sounding 107512 : Ver 1

1e3

□model

+field

100

10

time (msec)

.1

1

10

100

t
r
a
n
s
p
o
s

SOUNDING: 113512 : Vers 1
Mt Young Site MY7 25 Hz - 10100N 11350E

113512A

* 221 ohm.m * 93.5 m.

* 221

* 93.5 m.

* 30.6 ohm.m * 320 m.

* 30.6

* 414 m.

194 ohm.m

194

STD ERR= .6% : S= 11 S

E= 1%

S= 115

Sounding 113512 : Ver 1

1e3

□model

+field

100

10

time (nsec)

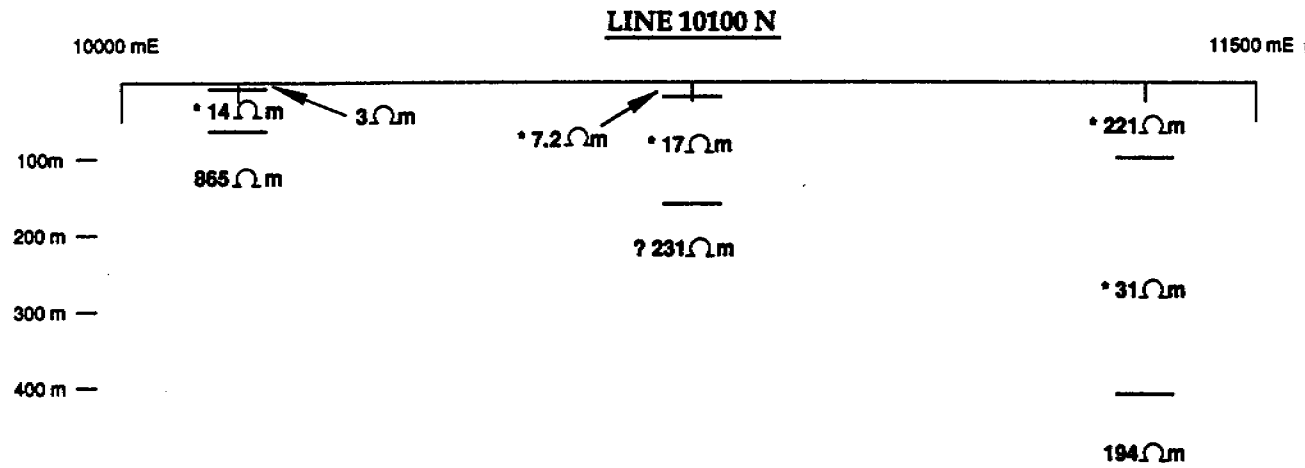
.1

1

10

100

r
e
p
e
s



LEGEND	
39 Ωm	Layer apparent resistivity
LOOP 2	TEM inversion location
?	poorly resolved apparent resistivity
*	well resolved apparent resistivity

C:\BHP\EXM\TYAR1.DGN

BHP Minerals Pty. Ltd.
A.C.N. 008 694 782

Prepared : R.Brescianini

Drawn : Digital Mapping

Date : April 1995

Revised :

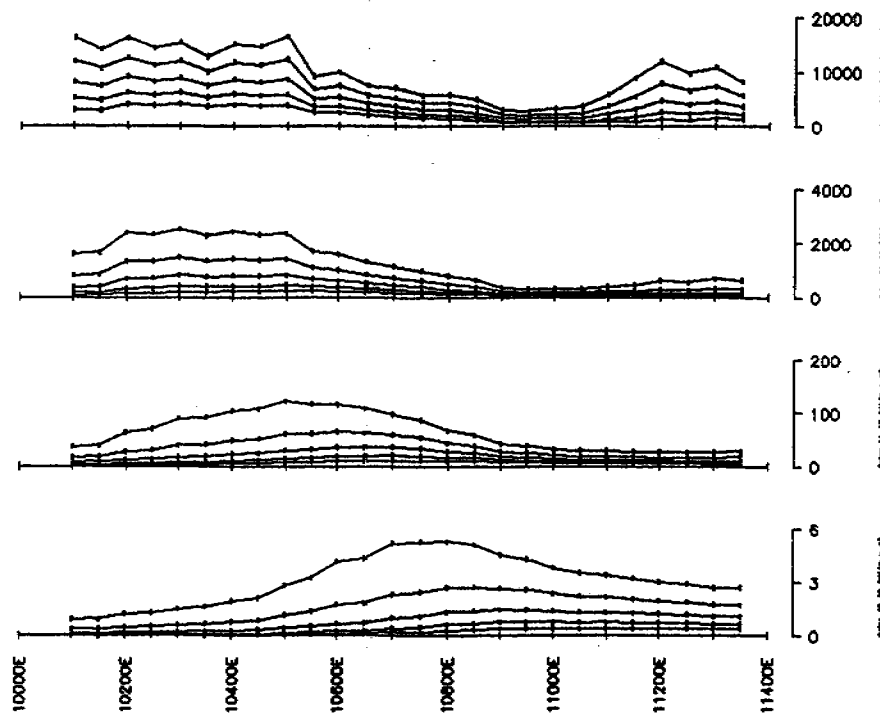
Centre : Perth

A4-

FIGURE

APPARENT RESISTIVITY - DEPTH SECTION **MY - 7**

VERTICAL COMPONENT B(Z)



PROTEM SURVEY

MOVING
TRANSMITTER

ELECTROMOTIVE FORCE INDUCED BY
SECONDARY FIELD
TIME DERIVATIVE OF FLUX DENSITY (B)

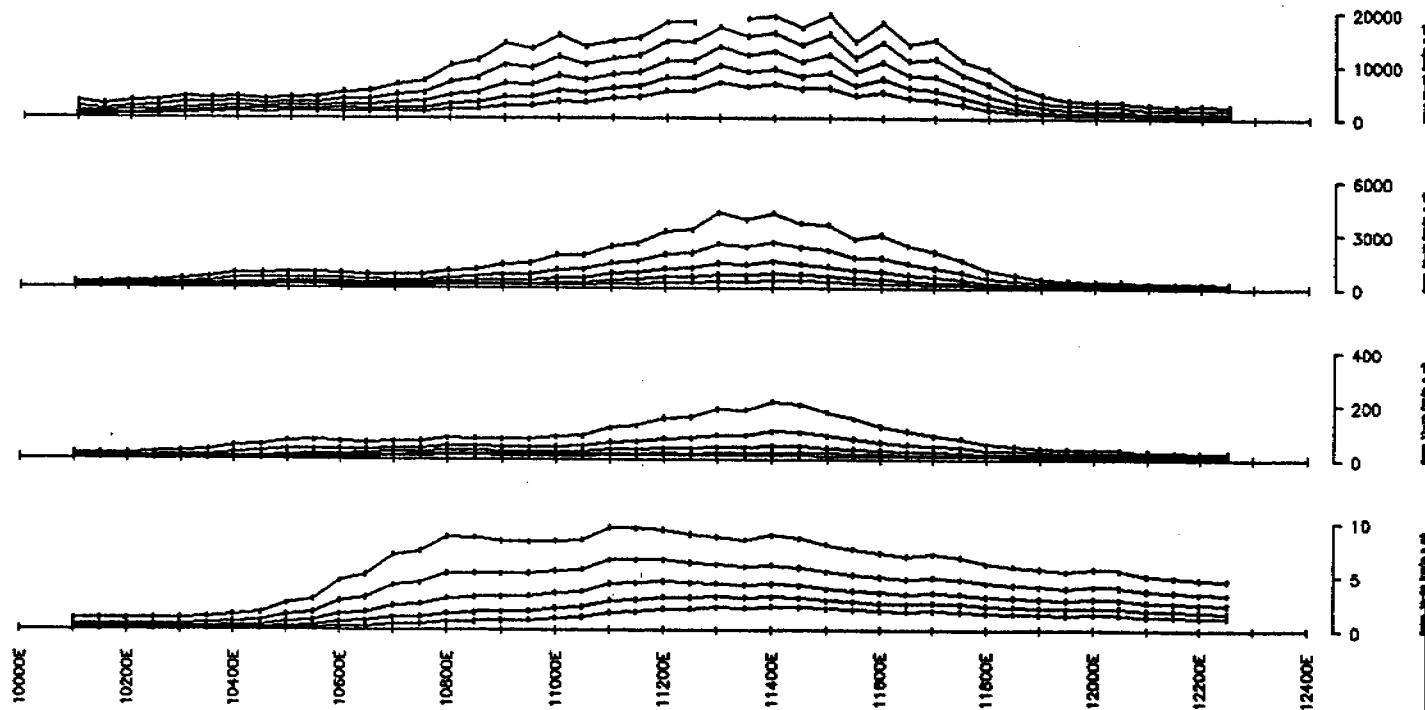
Surveyed and Compiled by GEOTERREX PTY LTD

BHP

Carpentaria Project 3-825
Anom MY9 Line 9700N
LOOP: 200 x 200
Station 10100 - 11350

SCALE 1: 10,000

DATE: 21 JUNE 1994



PROTEM SURVEY MOVING TRANSMITTER

ELECTROMOTIVE FORCE INDUCED BY
SECONDARY FIELD
TIME DERIVATIVE OF FLUX DENSITY (B)

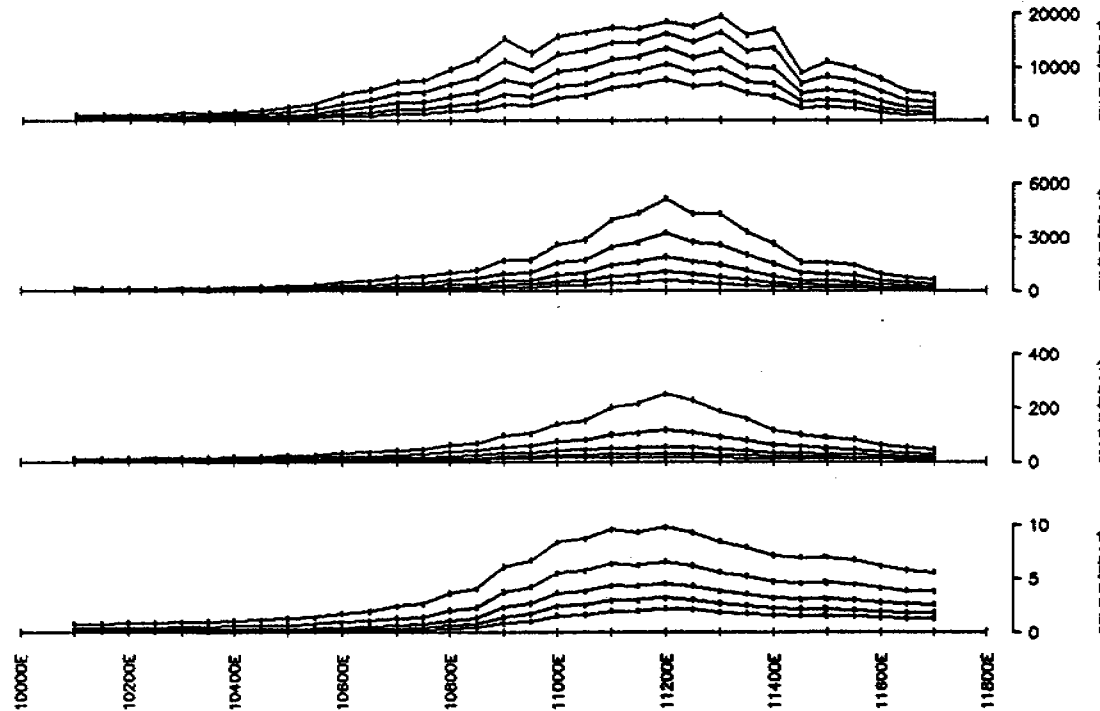
Surveyed and Compiled by GEOTERREX PTY LTD

BHP

Carpentaria Project 3-825
Anom MY-9 Line 101N
LOOP: 200 x 200
Station 10100 - 12250

SCALE 1: 10,000

DATE: 14 JULY 1994



PROTEM
SURVEY
MOVING
TRANSMITTER

ELECTROMOTIVE FORCE INDUCED BY
SECONDARY FIELD
TIME DERIVATIVE OF FLUX DENSITY (B)

Surveyed and Compiled by GEOTERREX PTY LTD

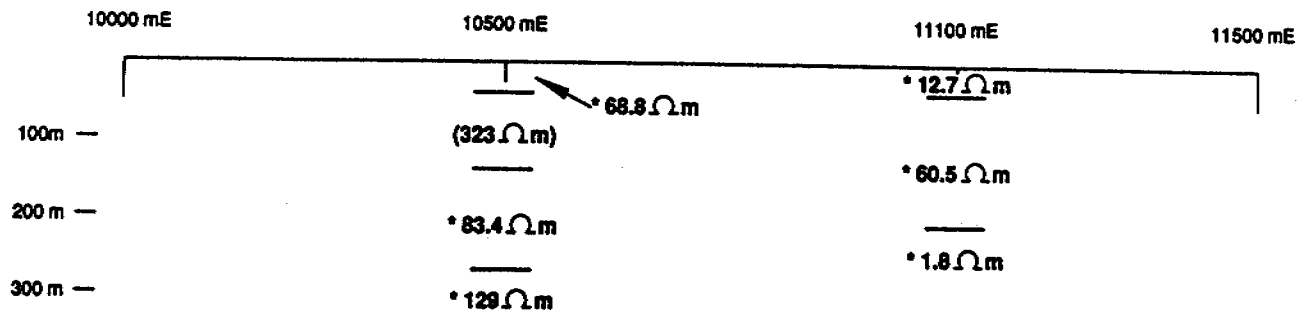
BHP

Carpentaria Project 3-825
Anom MY-9 Line 105N
LOOP: 200 x 200
Station 10100 - 11700

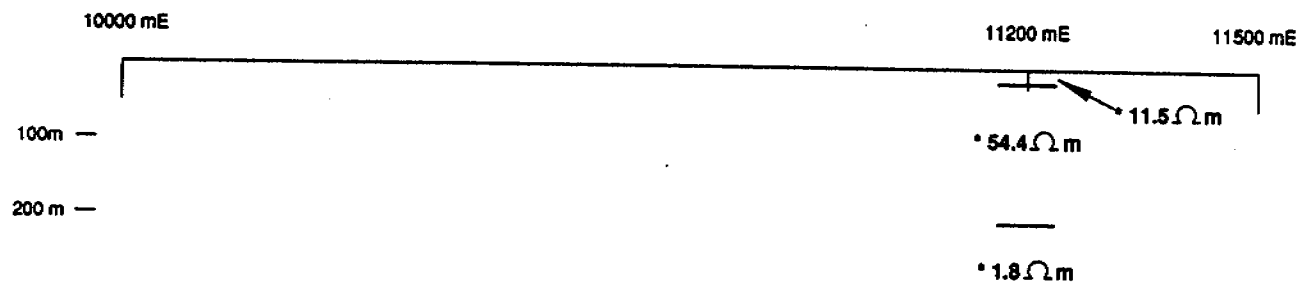
SCALE 1: 10,000

DATE: 14 JULY 1994

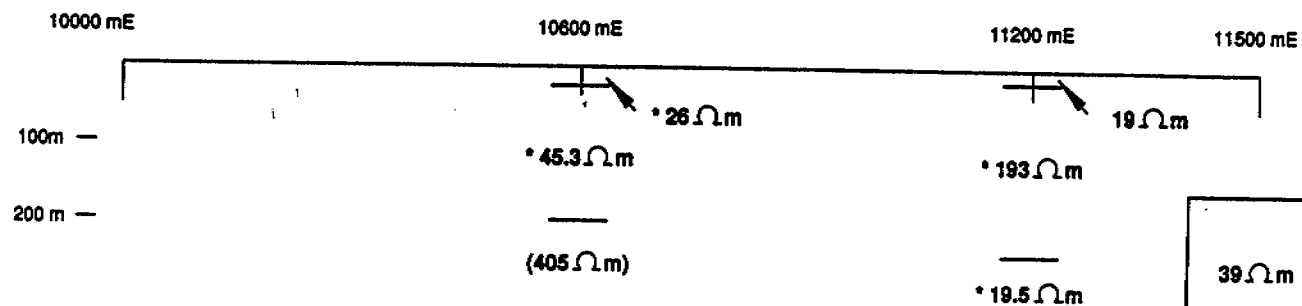
LINE 10500 N



LINE 10100 N



LINE 9700 N



LEGEND

- 39 Ω m Layer apparent resistivity
- LOOP 2 TEM Inversion location
- ? poorly resolved apparent resistivity
- $\bullet$ well resolved apparent resistivity

C:\BHP\EX\MTYAR9.DGN

BHP Minerals Pty. Ltd.
A.C.N. 008 944 782

Prepared : R. Brescianini

Drawn : Digital Mapping

Date : April 1995

Revised :

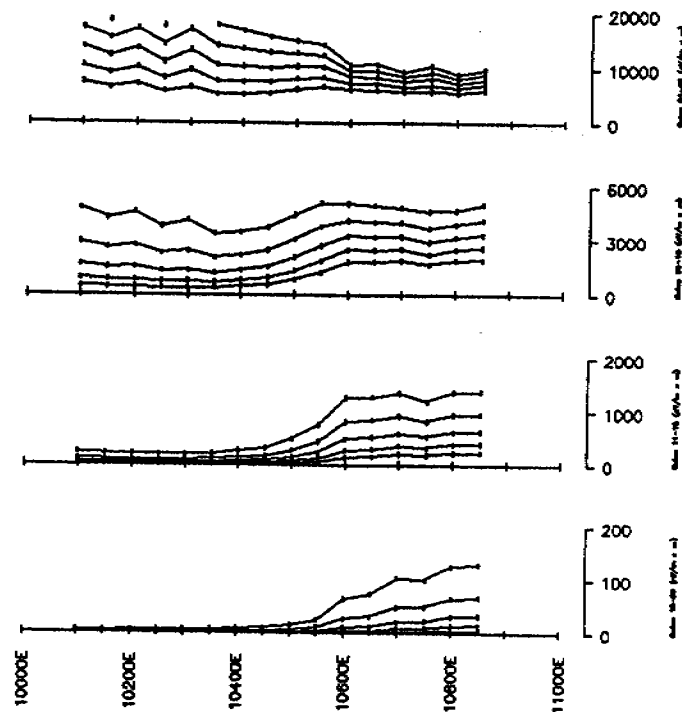
Centre : Perth

A4-

FIGURE

APPARENT RESISTIVITY - DEPTH SECTION
MY - 9

VERTICAL COMPONENT B(Z)



PROTEM SURVEY MOVING TRANSMITTER

ELECTROMOTIVE FORCE INDUCED BY
SECONDARY FIELD
TIME DERIVATIVE OF FLUX DENSITY (B)

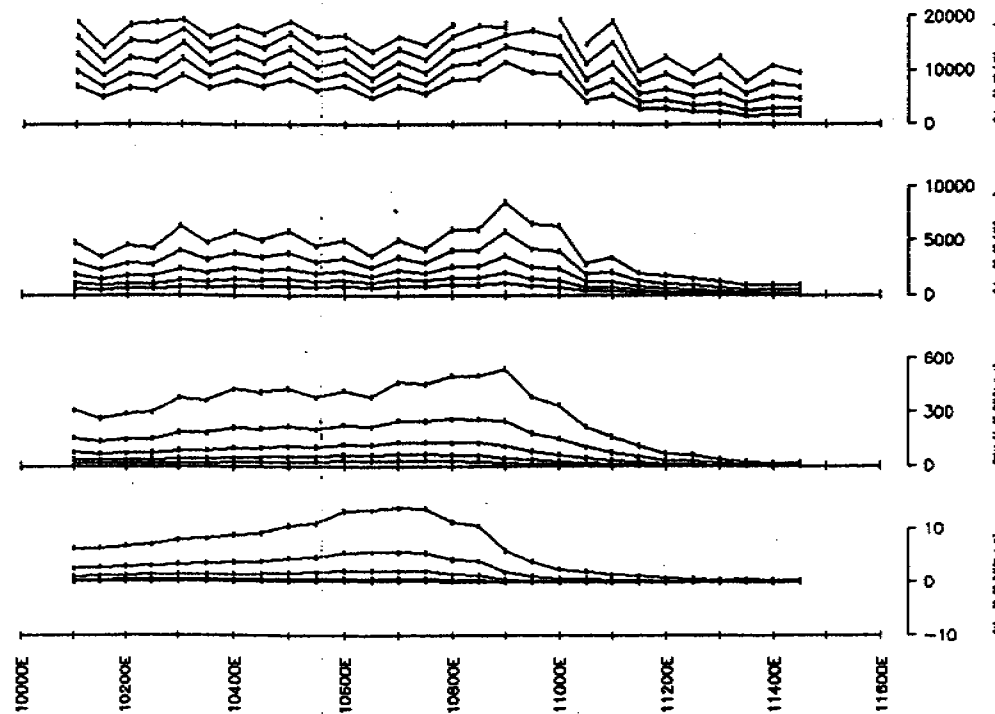
Surveyed and Compiled by GEOTERREX PTY LTD

BHP

Carpentaria Project 3-825
Anom MY10 Line 10100N
LOOP: 200 x 200
Station 10100 - 10850

SCALE 1: 10,000 DATE: 23 JUNE 1994

VERTICAL COMPONENT B(Z)



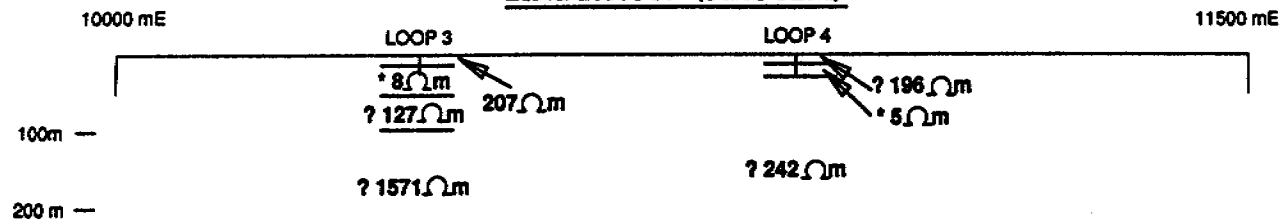
PROTEM
SURVEY
MOVING
TRANSMITTER

ELECTROMOTIVE FORCE INDUCED BY
SECONDARY FIELD
TIME DERIVATIVE OF FLUX DENSITY (B)

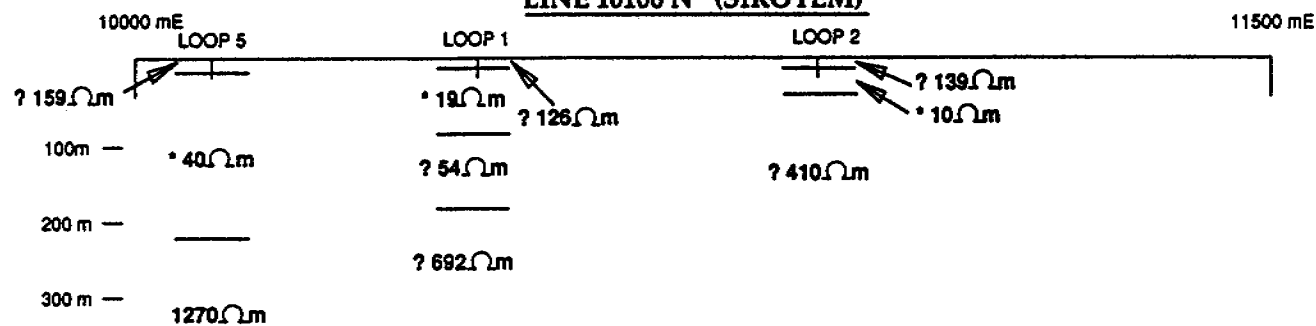
Surveyed and Compiled by GEOTERREX PTY LTD

BHP	
Carpentaria Project 3-825	
Anom MY11 Line 97N	
LOOP: 200 x 200	
Station 10100 - 11450	
SCALE 1: 10,000	DATE: 11 JUNE 1994

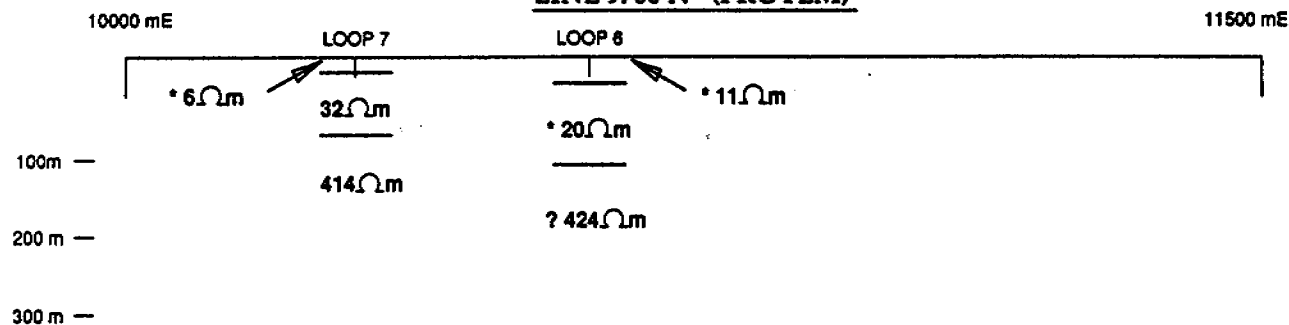
LINE 10500 N (SIROTEM)



LINE 10100 N (SIROTEM)



LINE 9700 N (PROTEM)



LEGEND

- 39 Ωm Layer apparent resistivity
- LOOP 2 TEM inversion location
- ? poorly resolved apparent resistivity
- * well resolved apparent resistivity

C:\BHP\EXM\TYAR11.DGN

BHP Minerals Pty. Ltd.
A.C.N. 000 004 762

Prepared : R.Brescianini
Drawn : Digital Mapping
Date : April 1994
Revised :

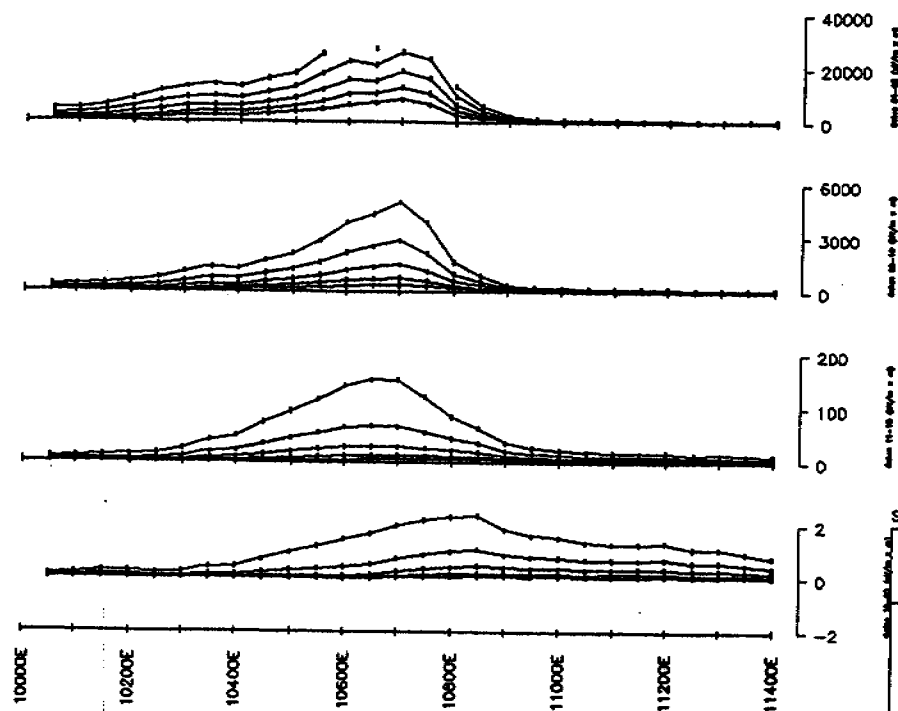
Centre : Perth

A4- S614

FIGURE

APPARENT RESISTIVITY - DEPTH SECTION
MY - 11

VERTICAL COMPONENT B(Z)



PROTEM
SURVEY

MOVING
TRANSMITTER

ELECTROMOTIVE FORCE INDUCED BY
SECONDARY FIELD
TIME DERIVATIVE OF FLUX DENSITY (B)

Surveyed and Compiled by GEOTERREX PTY LTD

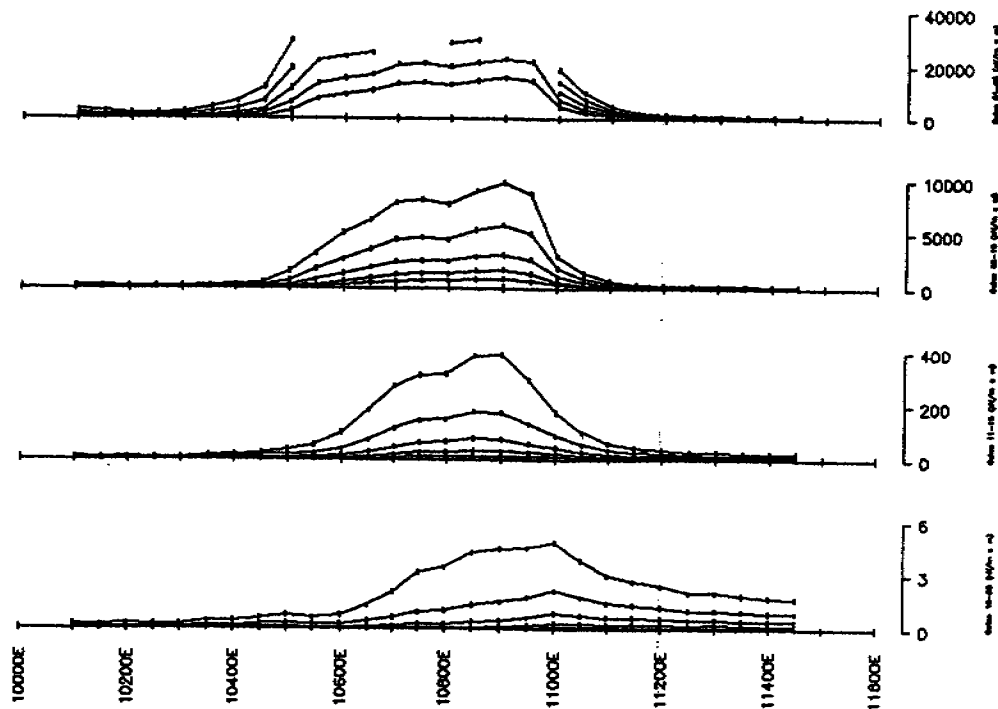
BHP

Carpentaria Project 3-825
Anom *MY* 13 Line 9650N
LOOP: 100 x 100
Station 10050 - 11400

SCALE 1: 10,000

DATE: 14 JUNE 1994

VERTICAL COMPONENT B(Z)



PROTEM
SURVEY
MOVING
TRANSMITTER

ELECTROMOTIVE FORCE INDUCED BY
SECONDARY FIELD
TIME DERIVATIVE OF FLUX DENSITY (B)

Surveyed and Compiled by GEOTERREX PTY LTD

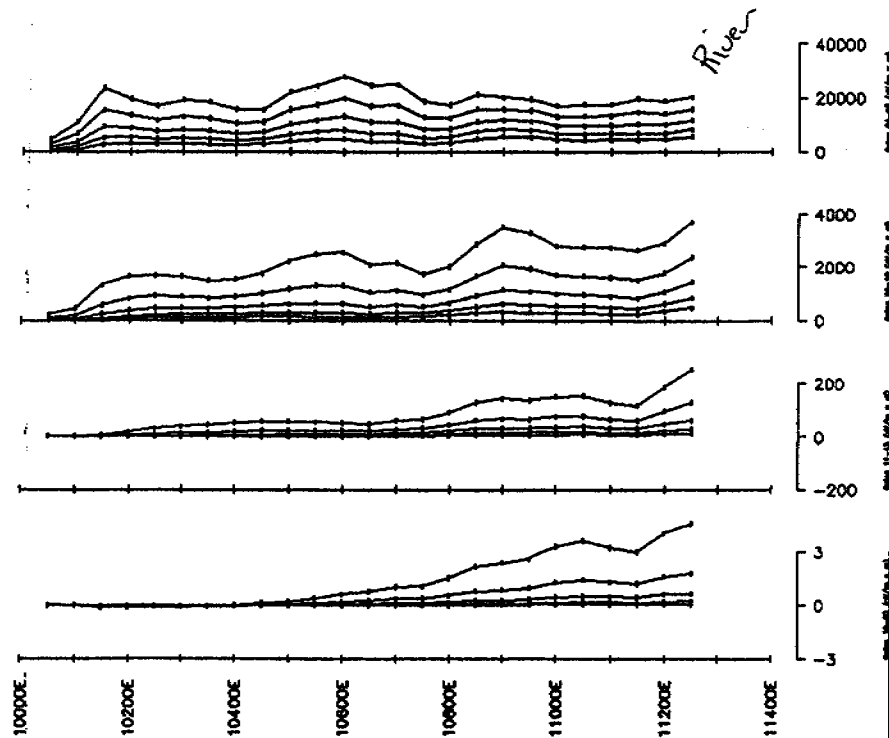
BHP

Carpentaria Project 3-825
Anom *MY* 13 Line 10050N
LOOP: 100 x 100
Station 10100 - 11450

SCALE 1: 10,000

DATE: 14 JUNE 1994

VERTICAL COMPONENT B(Z)



PROTEM
SURVEY
MOVING
TRANSMITTER

ELECTROMOTIVE FORCE INDUCED BY
SECONDARY FIELD
TIME DERIVATIVE OF FLUX DENSITY (B)

Surveyed and Compiled by GEOTERREX PTY LTD

BHP

Carpentaria Project 3-825
Anom MY 13 Line 10450N
LOOP: 100 x 100
Station 10050 - 11250

SCALE 1: 10,000

DATE: 14 JUNE 1994

C:\BHP\EXM\TYAR13.DGN

Centre : Perth

A4-

FIGURE

BHP Minerals Pty. Ltd.
ACN 008 064 172

APPARENT RESISTIVITY - DEPTH SECTION **MY - 13**

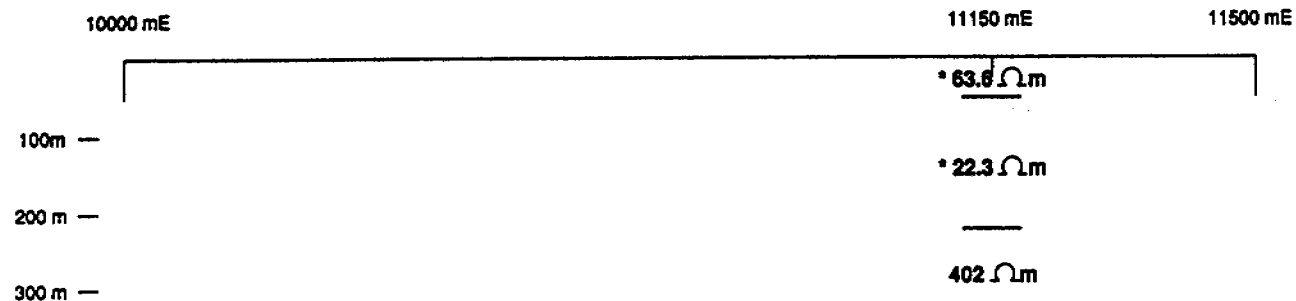
Prepared : R. Brescianini

Drawn : Digital Mapping

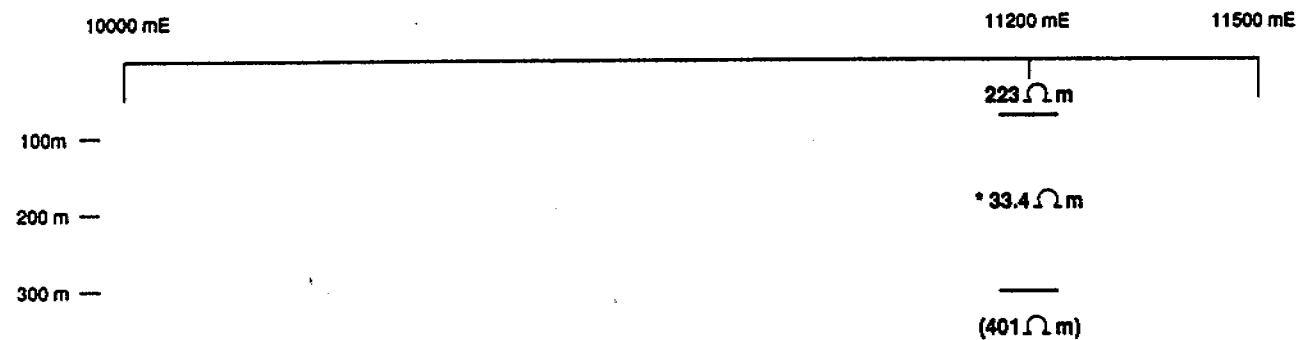
Date : April 1995

Revised :

LINE 10050 N



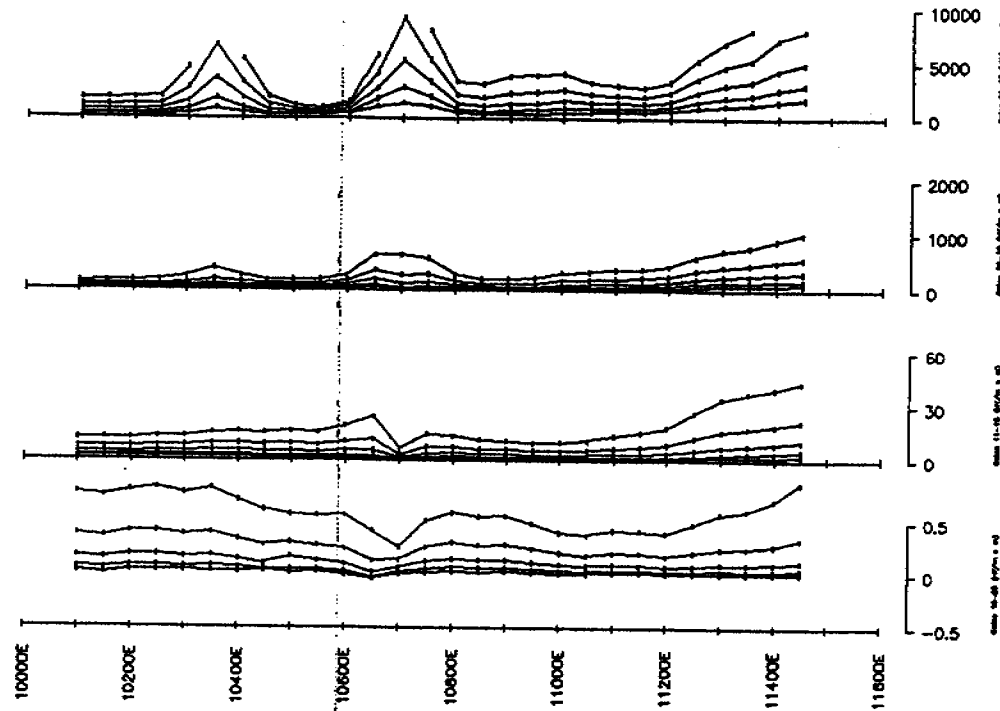
LINE 9650 N



LEGEND

- 39 Ωm Layer apparent resistivity
- LOOP 2 TEM inversion location
- ? poorly resolved apparent resistivity
- * well resolved apparent resistivity

VERTICAL COMPONENT B(Z)



PROTEM SURVEY MOVING TRANSMITTER

ELECTROMOTIVE FORCE INDUCED BY
SECONDARY FIELD
TIME DERIVATIVE OF FLUX DENSITY (B)

Surveyed and Compiled by GEOTERREX PTY LTD

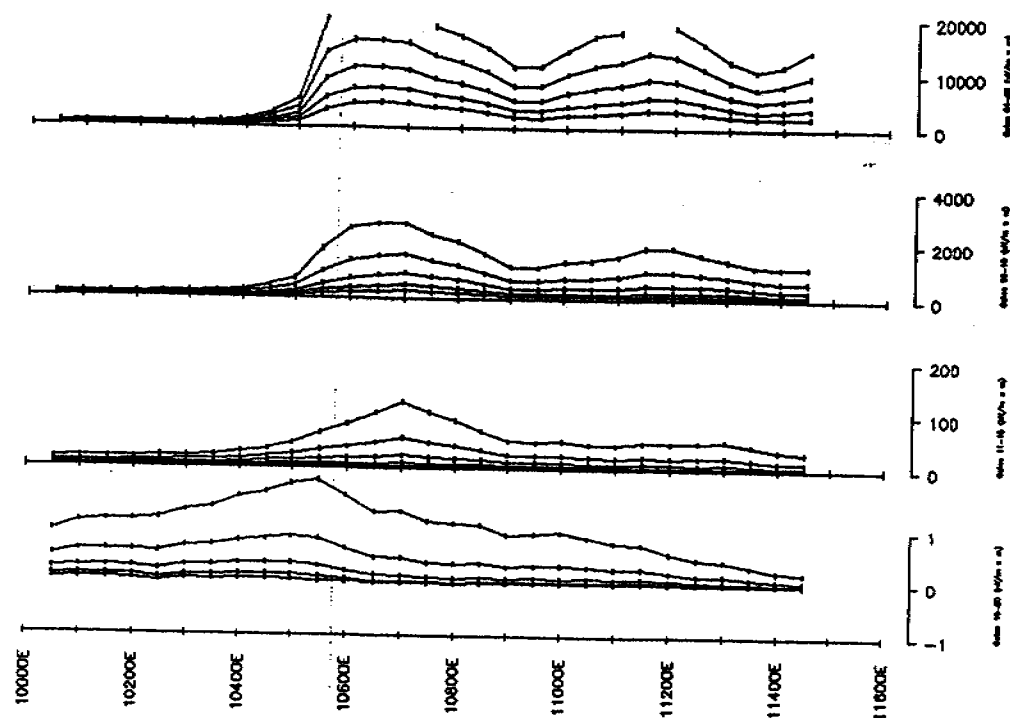
BHP

Carpentaria Project 3-825
Anom MY16 Line 96050N
LOOP: 100 x 100
Station 10100 - 11450

SCALE 1: 10,000

DATE: 16 JUNE 1994

VERTICAL COMPONENT B(Z)



PROTEM
SURVEY
MOVING
TRANSMITTER

ELECTROMOTIVE FORCE INDUCED BY
SECONDARY FIELD
TIME DERIVATIVE OF FLUX DENSITY (B)

Surveyed and Compiled by GEOTERREX PTY LTD

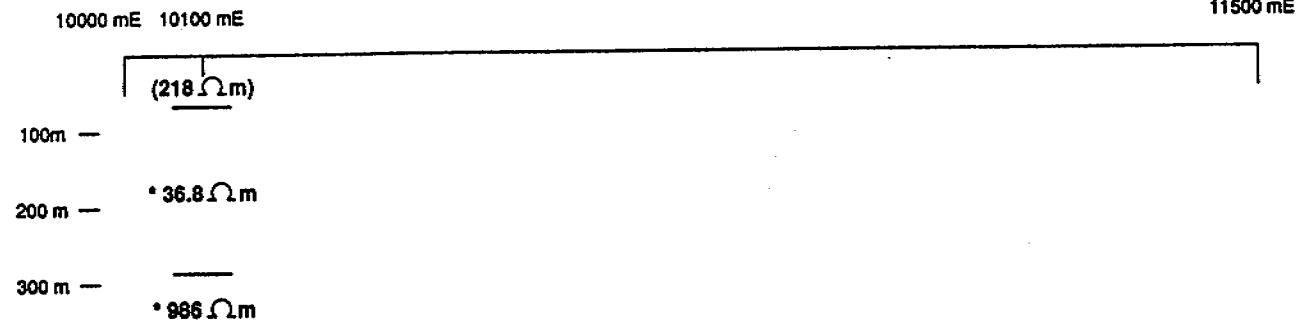
BHP

Carpentaria Project 3-825
Anom *MY* 16 Line 10450N
LOOP: 100 x 100
Station 10050 - 11450

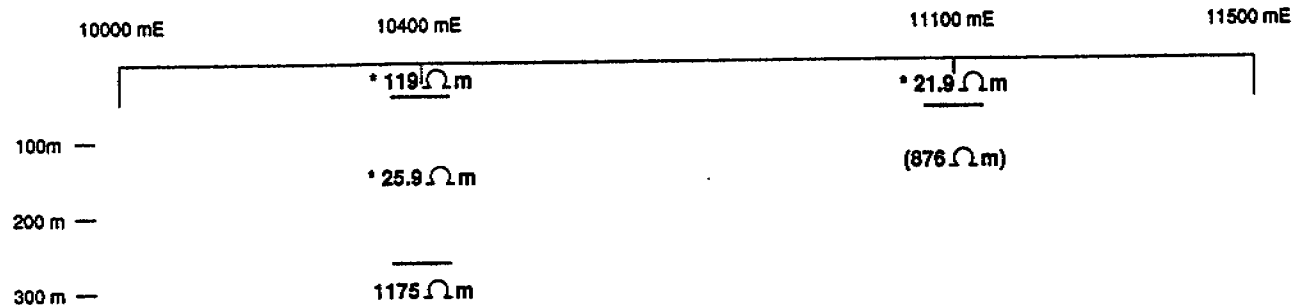
SCALE 1: 10,000

DATE: 15 JUNE 1994

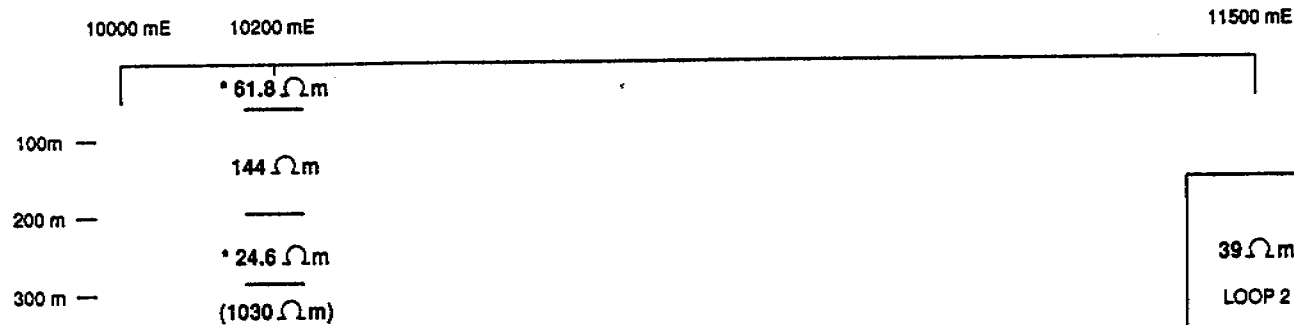
LINE 10450 N (PROTEM)



LINE 10050 N (SIROTEM)



LINE 9650 N (PROTEM)



LEGEND

- 39 Ω m Layer apparent resistivity
- LOOP 2 TEM Inversion location
- ? poorly resolved apparent resistivity
- * well resolved apparent resistivity

C:\BHP\EXAM\TYAR16.DC

Centre : Perth

A4-

FIGURE

BHP Minerals Pty. Ltd.
A.C.N. 008 694 782

APPARENT RESISTIVITY - DEPTH SECTION
MY - 16

Prepared : R.Brescianini

Drawn : Digital Mapping

Date : April 1995

Revised :

SOUNDING: 101512 : Vers 1

Mt Young Site MY17 25 Hz - 10100N 10150E

101512A

* 20.3 ohm.m

* 56.6 m.

* 20.3

* 56.6 m.

* 39.8 ohm.m

* 207 m.

* 39.8

* 264 m.

(345 ohm.m)

(345)

STD ERR= .6% : S= 8 S

E= 1%

S= 8S

Sounding 101512 : Ver 1

1e3

□model

+field

t
r
u
e

a 100

p
p

r
e
s

10

time (nsec)

.1

1

10

100



SOUNDING: 108512 : Vers 2
Mt Young Site MY17 2.5 Hz - 10100N 10850E

108512A

(98.7 ohm.m) * 76.4 m.

(98.7)

* 76.4 m.

* 15.5 ohm.m * 297 m.

* 15.5

(287 ohm.m)

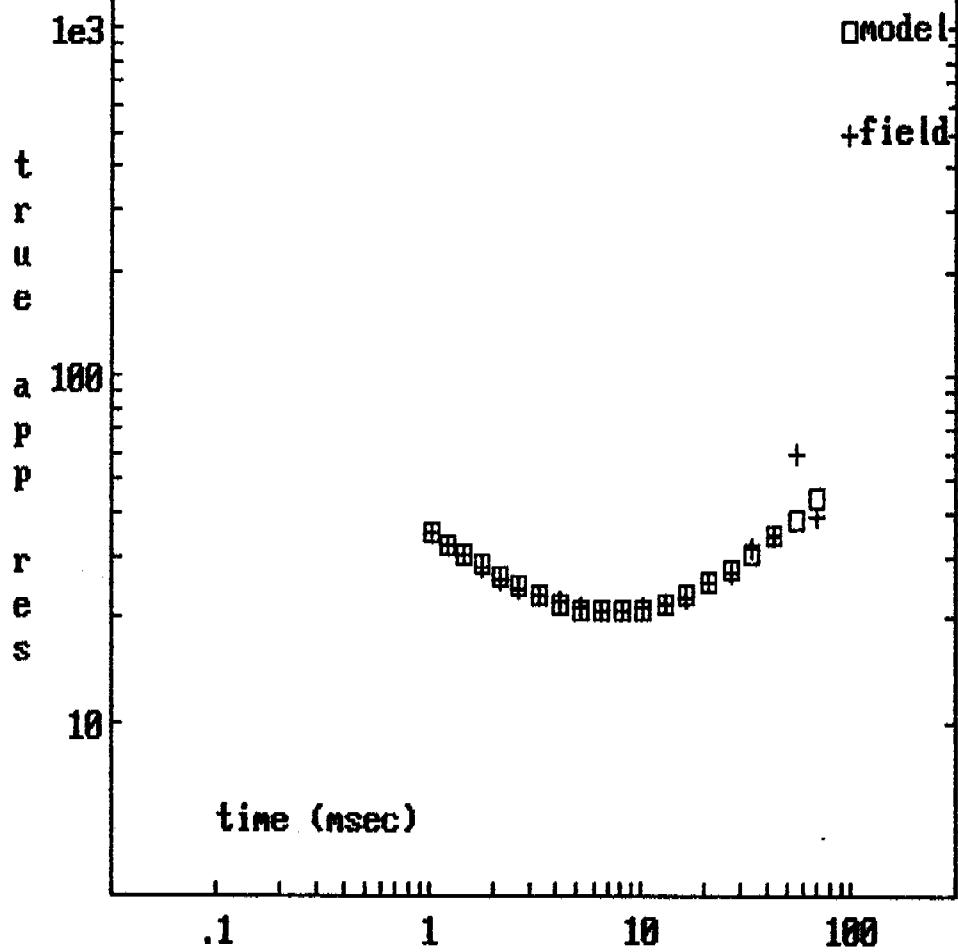
* 373 m.

(287)

STD ERR= 1.9% : S= 20 S

E= 2%
S= 20S

Sounding 108512 : Ver 2



SOUNDING: 113512 : Vers 2

Mt Young Site MY17 2.5 Hz - 10100N 11350E

113512A

(325 ohm.m) * 142 m.

(325)

* 142 m.

* 19.0 ohm.m * 362 m.

* 19.0

* 504 m.

* 49.6 ohm.m

* 49.6

STD ERR= 1.6% : S= 20 S

E= 2%

S= 20S

Sounding 113512 : Ver 2

1e3

□ model

+ field

t
r
u
e

a 100

p
p

r
e
s

10

time (nsec)

.1

1

10

100

+

+

+

+

+

+

+

+

+

+

+

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+

+

+

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+

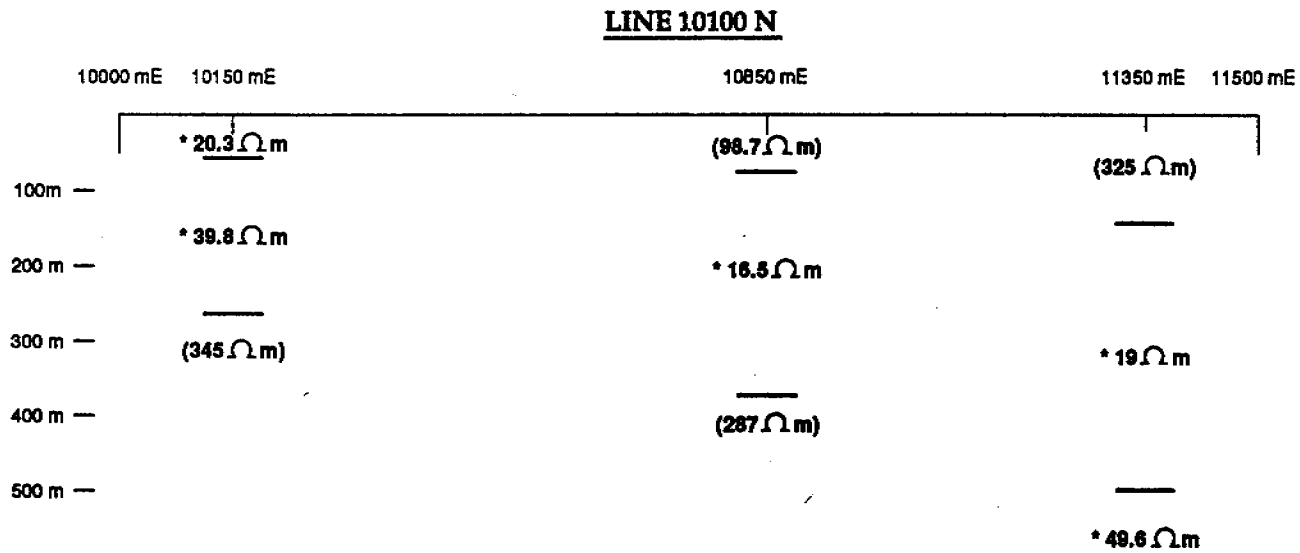
+

+

+

C:\BHP\EXM\TYAR17.DGN

Centre : Perth
A4-
FIGURE



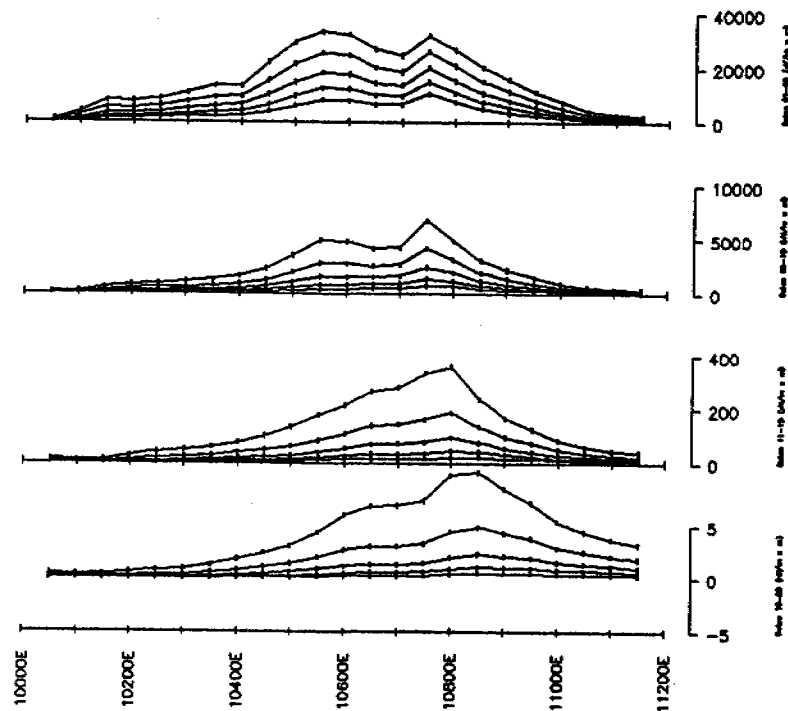
BHP Minerals Pty. Ltd.
A.C.N. 008 004 782

**APPARENT RESISTIVITY - DEPTH SECTION
MY - 17**

LEGEND	
39 Ωm	Layer apparent resistivity
LOOP 2	TEM inversion location
?	poorly resolved apparent resistivity
*	well resolved apparent resistivity

Prepared : R. Brescianini
Drawn : Digital Mapping
Date : April 1995
Revised :

VERTICAL COMPONENT B(Z)



PROTEM SURVEY MOVING TRANSMITTER

ELECTROMOTIVE FORCE INDUCED BY
SECONDARY FIELD
TIME DERIVATIVE OF FLUX DENSITY (B)

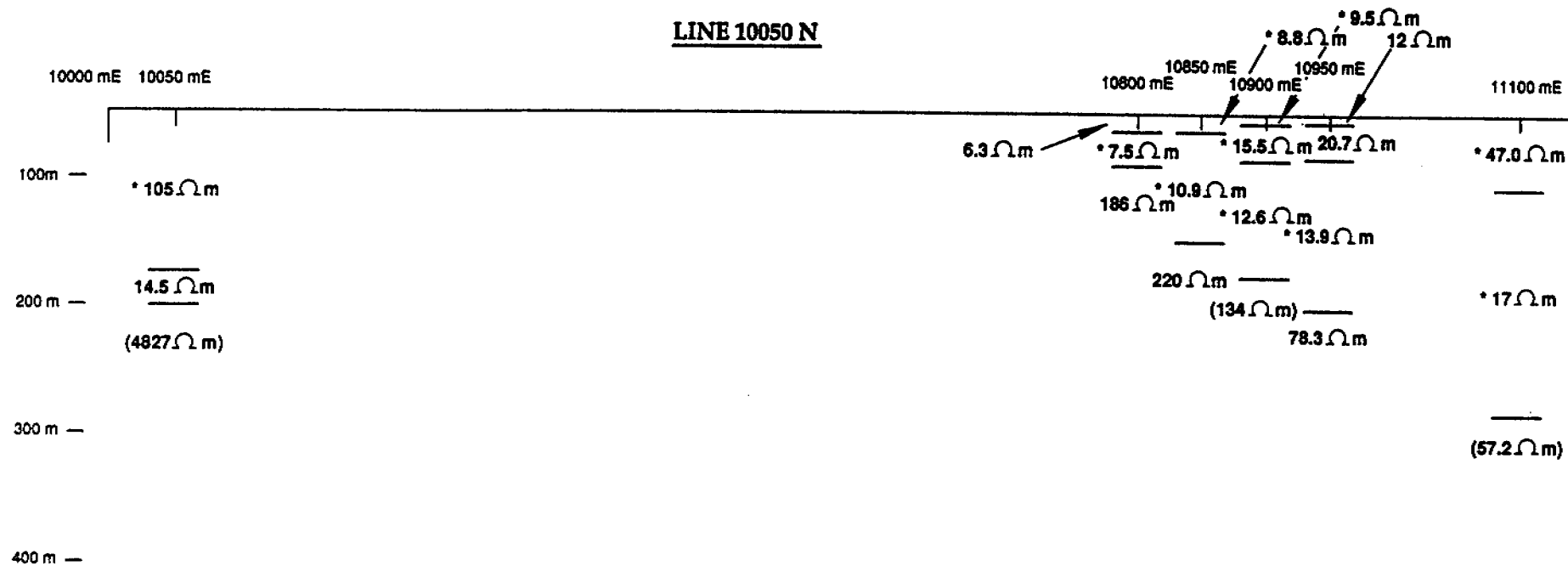
Surveyed and Compiled by GEOTERREX PTY LTD

BHP

Carpentaria Project 3-825
Anom MY21 Line 10050N
LOOP: 100 x 100
Station 10050 - 11150

SCALE 1: 10,000

DATE: 19 JUNE 1994



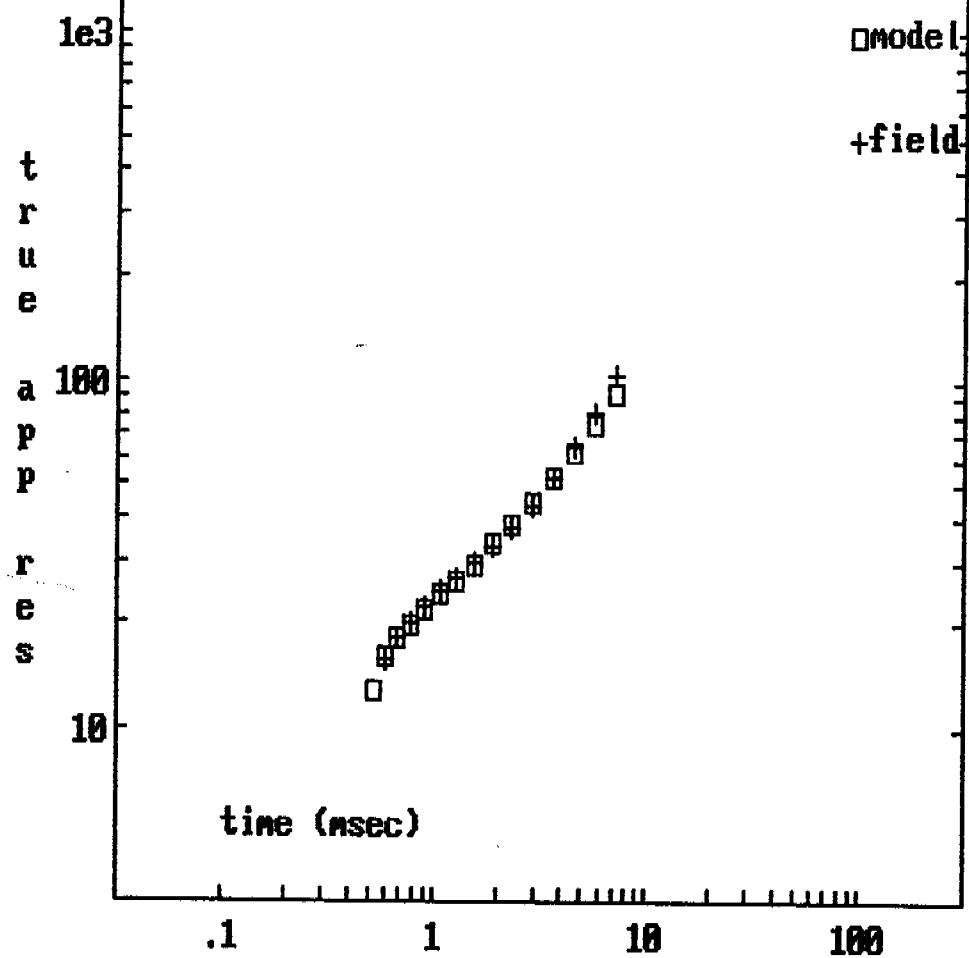
LEGEND	
39 Ωm	Layer apparent resistivity
LOOP 2	TEM inversion location
?	poorly resolved apparent resistivity
*	well resolved apparent resistivity

C:\BHP\PEX\MTY\APR\1.D	
Centre : Perth	A4-
FIGURE	
BHP Minerals Pty. Ltd. A.C.N. 008 844 782	
APPARENT RESISTIVITY - DEPTH SECTION MY - 21	
Prepared : R.Bresciani	Drawn : Digital Mapping
Date : April 1995	Revised :

APPENDIX 3.

TEM Sounding Data

Sounding 289050 : Ver 1



Y289/050

GRENDL Inversion results

Job # : 3-825 Date : 31.10.94
Program : GRENDL Version : July, 1992

Client : BHP

TEM File: 050794.TEM

Loop : 204
Line : 50E Station : 289.000

The initial model is:

I	Resistivity	Thickness	Depth
1	5.000	5.000	5.000
2	25.00	50.00	55.00
3	50.00	50.00	105.0
4	2500.		

Convergence to final model

Standard error = 14.71 percent
Standard error = 3.35 percent
Standard error = 2.83 percent
Standard error = 2.78 percent
Standard error = 2.74 percent
Standard error = 2.71 percent
Standard error = 2.69 percent
Standard error = 2.68 percent
Standard error = 2.67 percent
Standard error = 2.66 percent
Standard error = 2.65 percent
Standard error = 2.64 percent
Standard error = 2.63 percent
Standard error = 2.63 percent
Standard error = 2.62 percent
Standard error = 2.62 percent
Standard error = 2.62 percent
Standard error = 2.61 percent
Standard error = 2.61 percent
Standard error = 2.59 percent
Standard error = 2.56 percent

Final model :

TEM File: 050794.tem Loop : 204 Line : 50E Station : 289.000"

I	Resistivity	Thickness	Depth
1	8.360	3.559	3.559
2	22.83	65.92	69.48
3	36.11	44.00	113.5
4	2745.		

Error structure of fitted model

Chnl	DELAY Time (ms)	Apparent Resistivity		Observed DB/DT (nV/sq.m)	Calculated DB/DT (nV/sq.m)	Weighted percent Symmetric Error
		Observed	Calculated			
1	0.352	17.6	18.1	2154.	2111.	2.0
2	0.428	19.3	19.4	1498.	1492.	0.4
3	0.525	21.1	20.8	978.3	988.6	-1.0
4	0.647	22.9	22.5	610.7	622.7	-1.9
5	0.803	24.9	24.4	363.4	373.1	-2.6
6	1.003	27.1	26.7	207.4	210.7	-1.6
7	1.258	29.6	29.6	113.5	113.2	0.3
8	1.582	32.6	33.2	59.48	58.09	2.4
9	1.997	36.7	37.7	29.59	28.56	3.5
10	2.525	42.4	43.3	13.94	13.54	2.9
11	3.197	50.3	50.3	6.225	6.214	0.2
12	4.055	61.2	59.1	2.628	2.769	-5.2
13	5.148	76.1	70.1	1.066	1.205	0.0
14	6.543	96.4	83.9	0.4171	0.5130	0.0
15	8.323	123.8	101.1	0.1588	0.2147	0.0
16	10.592	160.2	122.7	0.5952E-01	0.8869E-01	0.0
17	13.490	237.0	149.6	0.1819E-01	0.3624E-01	0.0
18	17.188	366.9	183.0	0.5180E-02	0.1468E-01	0.0

Mean percent Symmetric error = 2.00

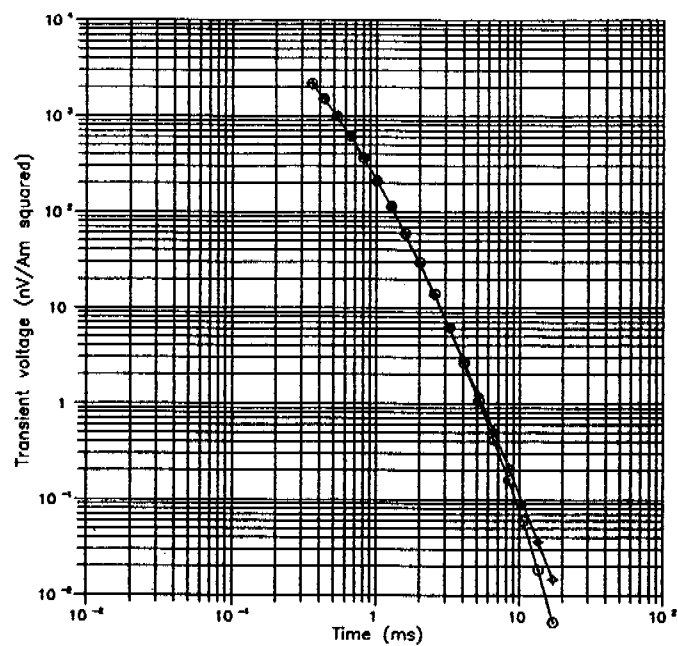
Maximum percent Symmetric error = 5.20

Maximum Symmetric error occurred at observation 12

Average predicted residual error (APRE) = 7.95 percent

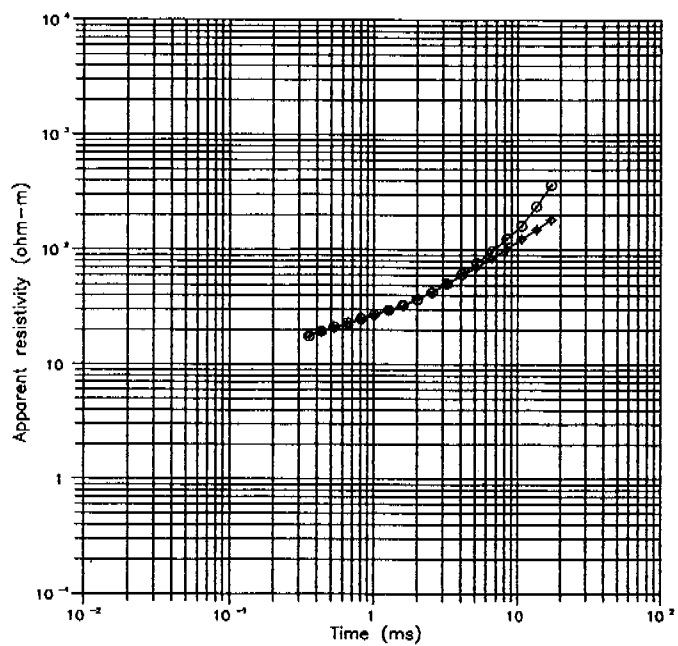
Transient decays

6.25 Hz data
 Loop : 204
 Station : 50E, 289

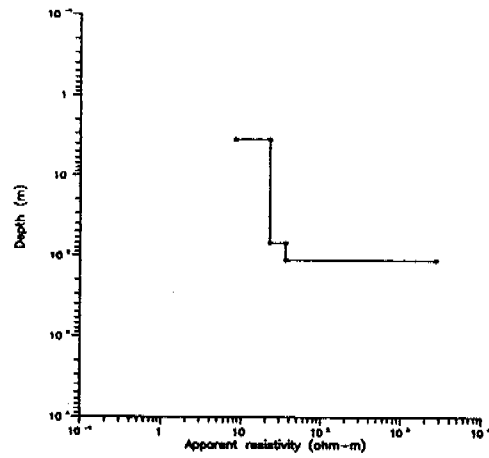


Apparent resistivity

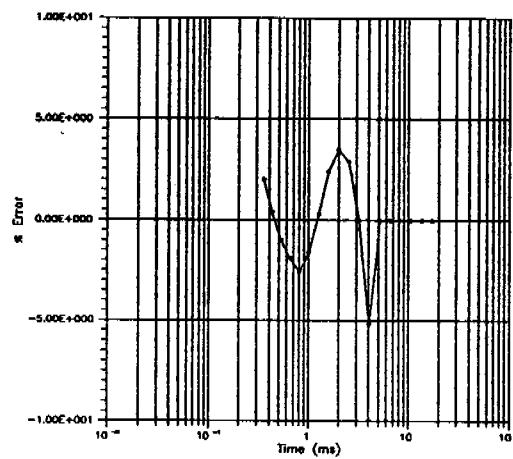
6.25 Hz data
 Loop : 204
 Station : 50E, 289



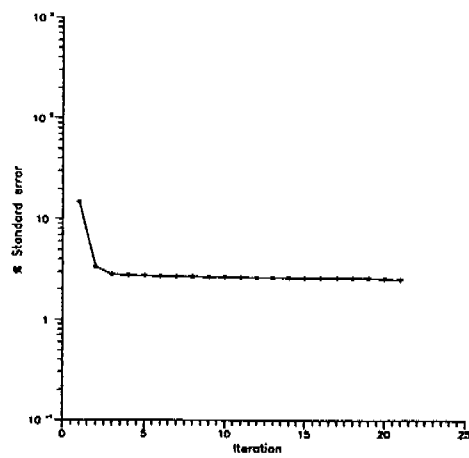
Layered-earth model
 6.25 Hz data
 Loop : 204
 Station : 50E, 289



Error structure
 6.25 Hz data
 Loop : 204
 Station : 50E, 289



Standard error per iteration
 6.25 Hz data
 Loop : 204
 Station : 50E, 289



SOUNDING: 291050 : Vers 2
Mt Young Y291/050 6.25 Hz

291050A

(79.3 ohm.m)	15.6 m	15.6 m.
* 7.1 ohm.m	* 50.6 m.	
		* 66.2 m.
(942 ohm.m)		

(79.3)
* 7.1
(942)

STD ERR= 2.2% : S= 7 S

E= 2%
S= 7S

Sounding 291050 : Ver 2

1e3

□model

+field

t
r
u
e

a
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p
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e
s

100

10

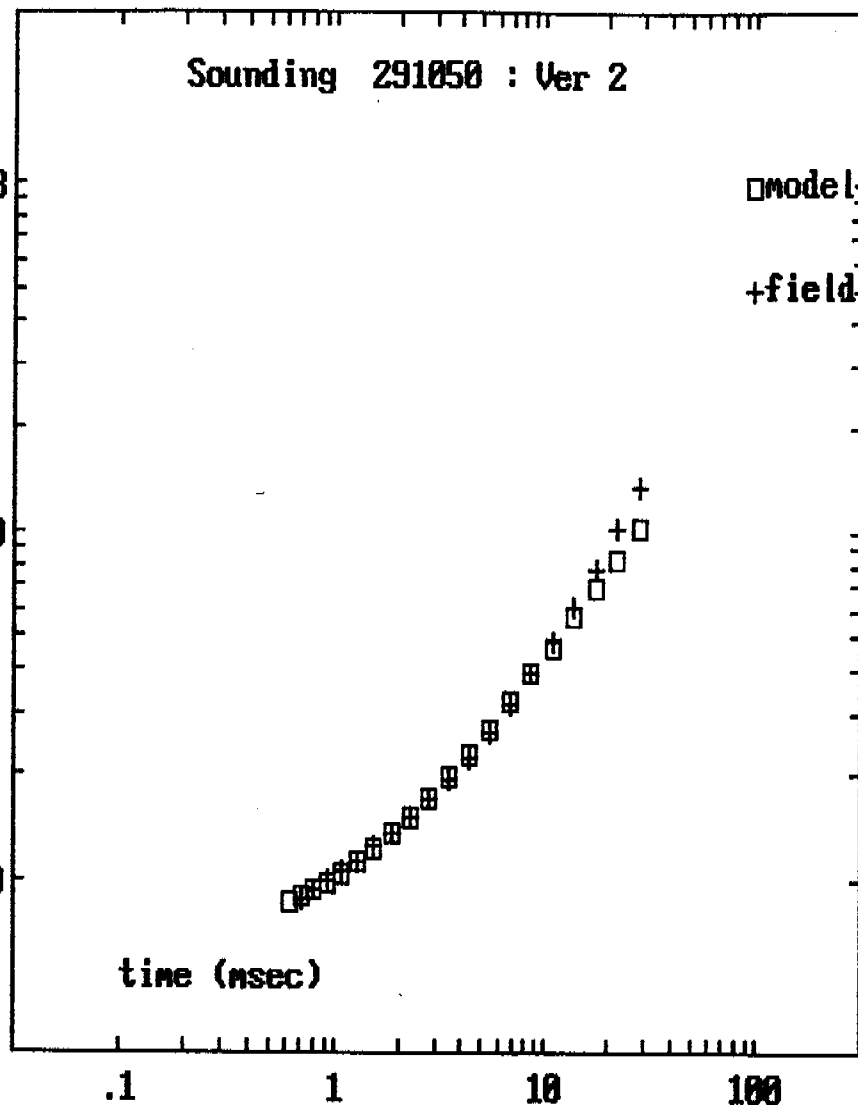
time (nsec)

.1

1

10

100



SOUNDING: 291034 : Vers 2
Mt Young Y291/034 6.25 Hz

291034A

86.3 ohm.m	* 17.6 m
* 1.7 ohm.m	* 12.5 m

30.1 m.
(823 ohm.m)

86.3
* 1.7

(823)

STD ERR= 1.2% : S= 0 S

E= 1%
S= BS

Sounding 291034 : Ver 2

□model

+field

t
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a
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s

1e3

100

10

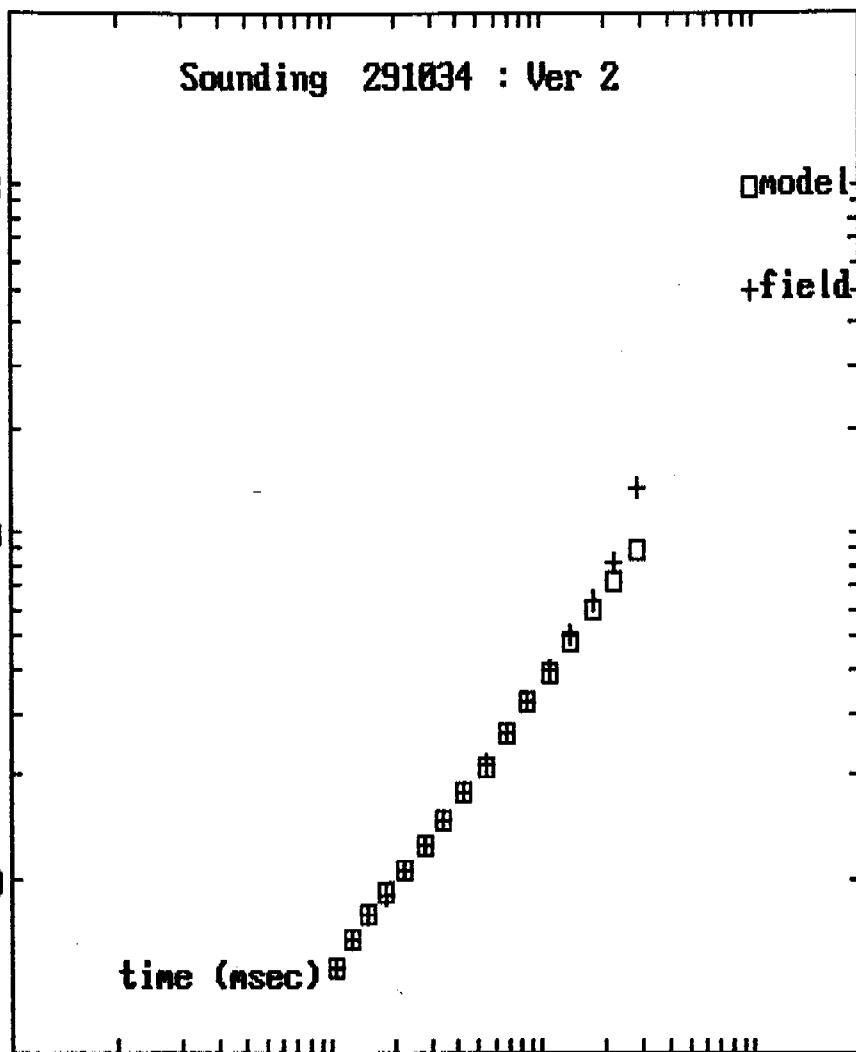
time (nsec)

.1

1

10

100



SOUNDING: 291018 : Vers 1
Mt Young Y291/018 25 Hz .

291018A

~~101 888 m~~ * ~~12 9 m~~ 12:1 m:

~~101~~

* 47.6 ohm.m * 209 m.

* 47.6

_____* 233 m.
(2488 ohm.m)

(2488)

STD ERR= .9% : S= 7 S

E= 1%
S= 75

Sounding 291018 : Ver 1

1e3

□model

+field

100

10

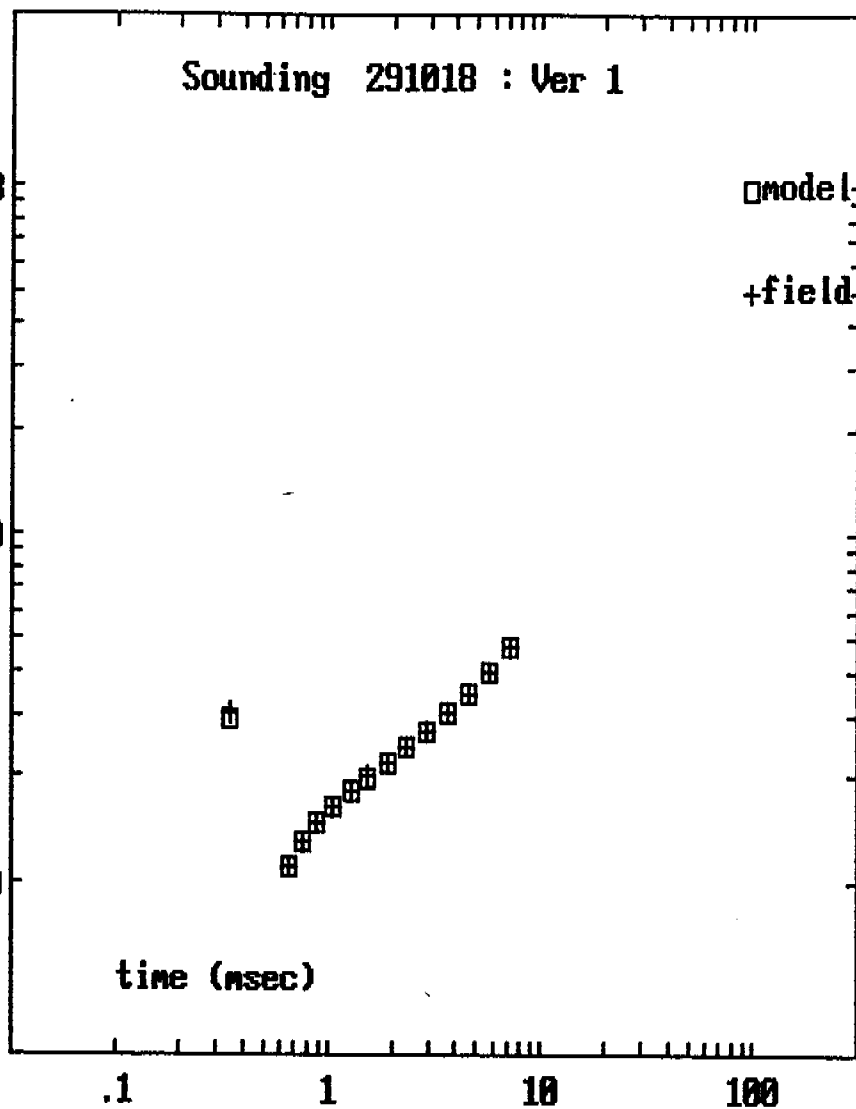
time (msec)

.1

1

10

100



Y291/018

GRENDL Inversion results

Job # : 3-825 Date : 31.10.94
Program : GRENDL Version : July, 1992

Client : BHP

TEM File: 050794.TEM

Loop : 207

Line : 2910W Station : 18.000

The initial model is:

I	Resistivity	Thickness	Depth
1	5.000	10.00	10.00
2	50.00	150.0	160.0
3	2500.		

Convergence to final model

Standard error = 58.34 percent
Standard error = 4.36 percent
Standard error = 2.00 percent
Standard error = 1.71 percent
Standard error = 1.61 percent
Standard error = 1.61 percent
Standard error = 1.61 percent
Standard error = 1.61 percent
Standard error = 1.61 percent

Final model :

"TEM File: 050794.TEM Loop : 207 Line : 2910W Station : 18.000"

I	Resistivity	Thickness	Depth
1	5.391	10.21	10.21
2	31.95	162.5	172.7
3	2532.		

Error structure of fitted model

Chnl	DELAY Time (ms)	Apparent Resistivity Observed	Apparent Resistivity Calculated	Observed DB/DT (nV/sq.m)	Calculated DB/DT (nV/sq.m)	Weighted percent Symmetric Error
1	0.352	10.4	9.4	2858.	2921.	-2.2
2	0.428	12.4	12.5	2100.	2097.	0.1
3	0.525	13.9	14.2	1443.	1421.	1.5
4	0.647	15.4	15.6	937.4	921.1	1.8
5	0.803	16.8	17.0	579.5	572.4	1.2
6	1.003	18.5	18.4	336.4	337.8	-0.4
7	1.258	20.2	20.0	188.4	191.0	-1.3
8	1.582	22.1	21.8	101.9	103.7	-1.8
9	1.997	24.2	23.9	53.38	54.11	-1.4
10	2.525	26.7	26.6	27.13	27.32	-0.7
11	3.197	29.7	29.7	13.36	13.34	0.2
12	4.055	33.5	33.7	6.373	6.308	1.0
13	5.148	38.3	38.7	2.943	2.900	1.5
14	6.543	44.5	44.9	1.318	1.298	1.5
15	8.323	52.3	52.8	0.5743	0.5671	1.3
16	10.592	62.2	62.6	0.2446	0.2428	0.8
17	13.490	76.7	74.9	0.9855E-01	0.1020	-3.4
18	17.188	98.3	90.5	0.3725E-01	0.4216E-01	0.0
19	21.903	147.2	110.3	0.1114E-01	0.1716E-01	0.0
20	27.915	862.5	135.6	0.4300E-03	0.6889E-02	0.0

Mean percent Symmetric error = 1.39

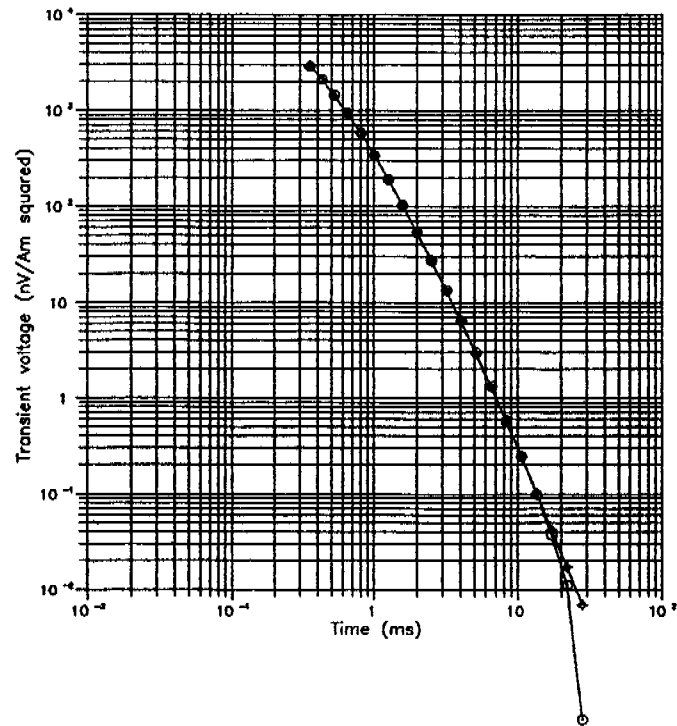
Maximum percent Symmetric error = 3.45

Maximum Symmetric error occurred at observation 17

Average predicted residual error (APRE) = 2.33 percent

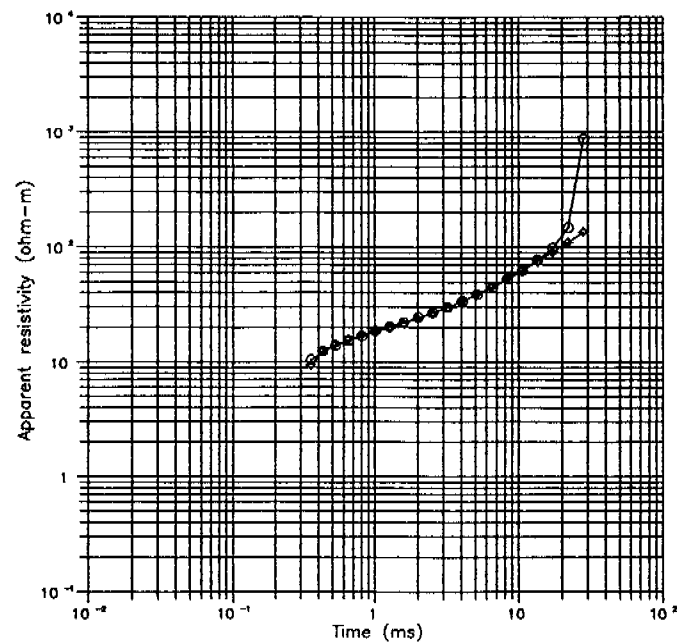
Transient decays

6.25 Hz data
 Loop : 207
 Station : 910N, 18

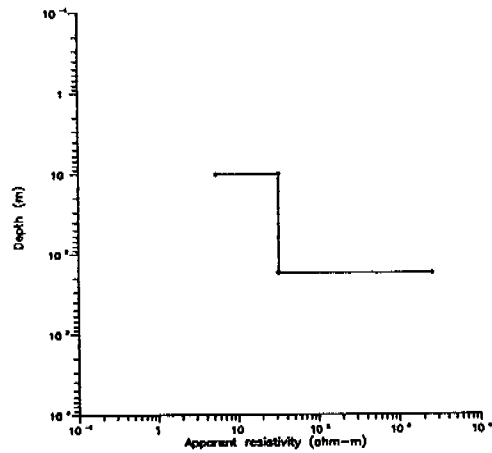


Apparent resistivity

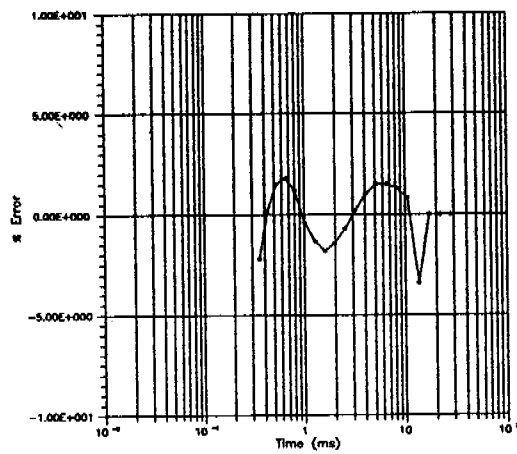
6.25 Hz data
 Loop : 207
 Station : 910N, 18



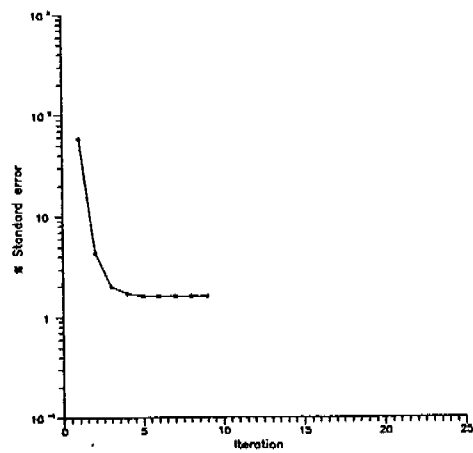
Layered-earth model
 6.25 Hz data
 Loop : 207
 Station : 910N, 18



Error structure
 6.25 Hz data
 Loop : 207
 Station : 910N, 18



Standard error per iteration
 6.25 Hz data
 Loop : 207
 Station : 910N, 18



SOUNDING: 289034 : Vers 1
Mt Young Y289/034 25 Hz

289034A

~~* 77.2 ohm.m~~ ~~* 11.8 m~~ 1.8 m.
4.8 ohm.m 23.6 m * 35.4 m.

~~* 77.2~~
~~4.8~~

38.5 ohm.m

97.7 m.

38.5

133 m.
(918 ohm.m)

(918)

STD ERR= 2.1% : S= 8 S

E= 2%

S= 8S

Sounding 289034 : Ver 1

□model

+field

t
r
u
e

a
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p
r
e
s

1e3

100

10

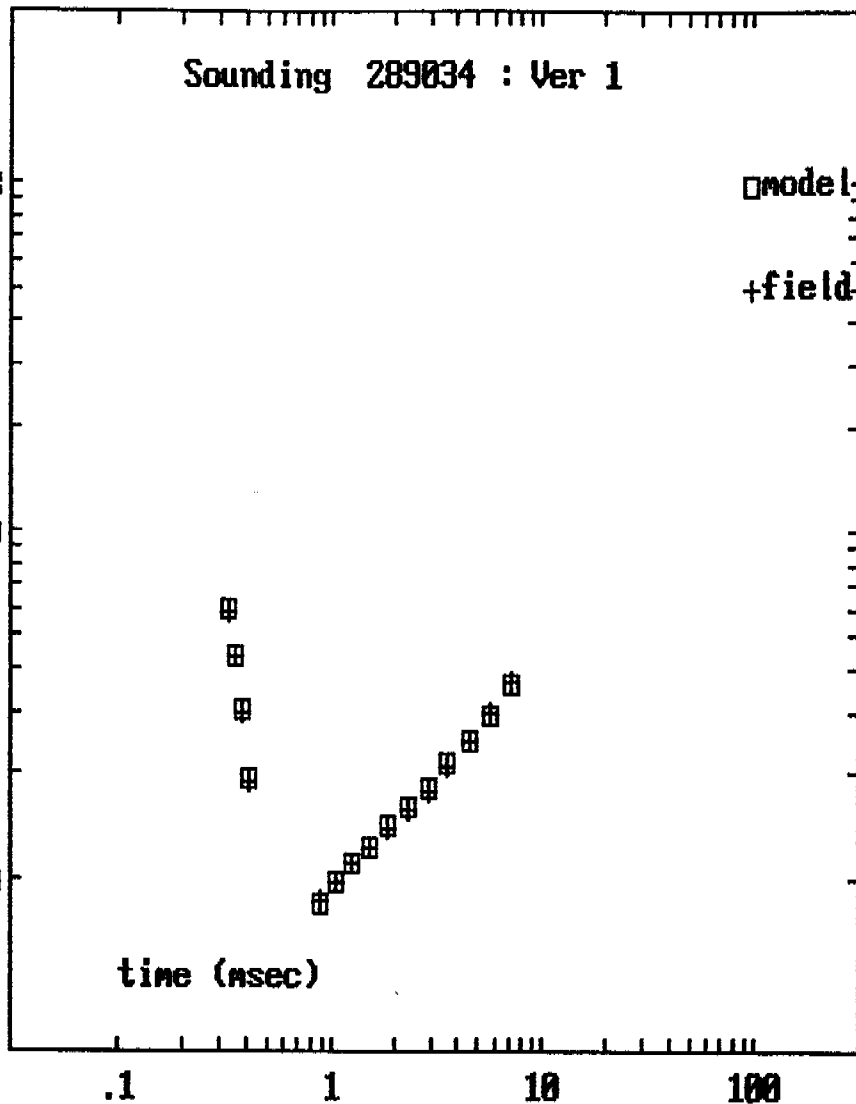
time (nsec)

.1

1

10

100



SOUNDING: 289034 : Vers 2
Mt Young Y289/034 6.25 Hz

289034A

85.1 ohm.m * 20.1 m
2.4 ohm.m 12.5 m * 32.5 m

85.1
2.4

62.4 ohm.m

121 m.

62.4

(803 ohm.m)

153 m.

(803)

STD ERR= 3.0% : S= 7 S

E= 3%

S= 75

Sounding 289034 : Ver 2

1e3

□model

+field

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100

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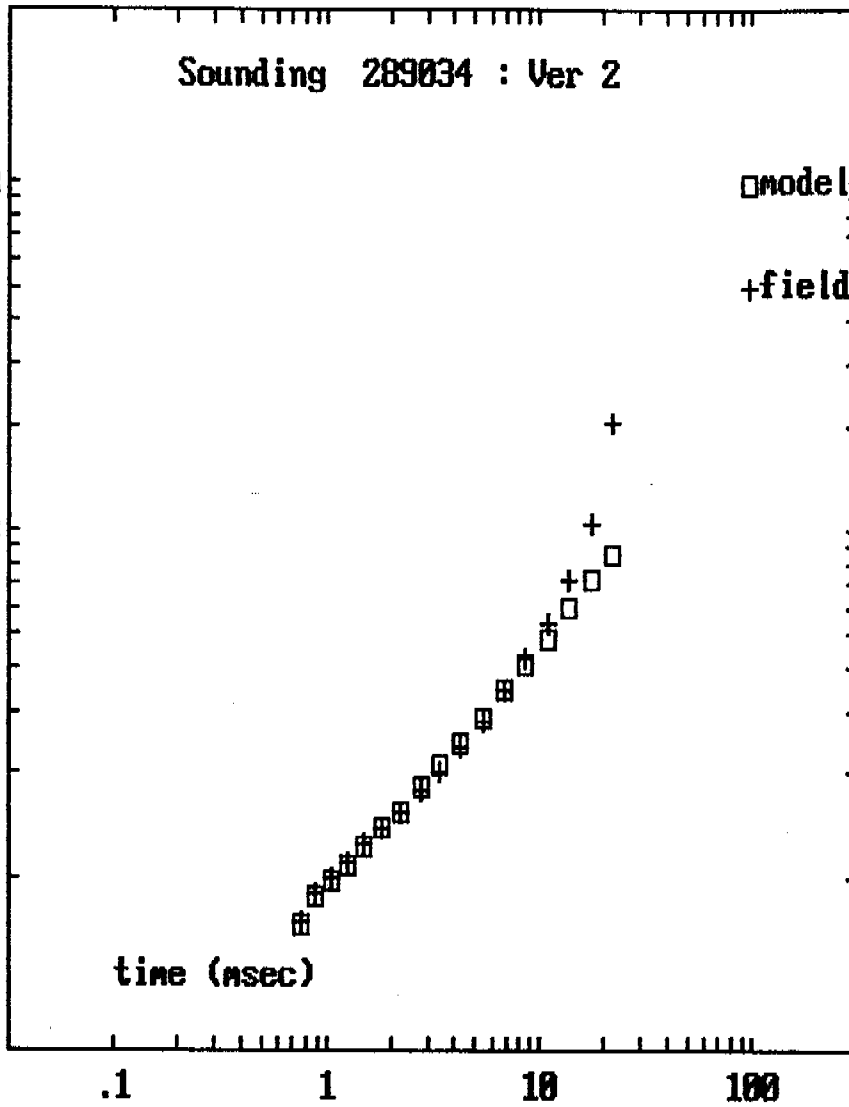
time (nsec)

.1

1

10

100



SOUNDING: 287034 : Vers 1
Mt Young Y287/034 25 Hz

287034A

* 17.6 ohm.m * 45.5 m.
* 45.5 m.

* 17.6

123 ohm.m 130 m.

123

(1057 ohm.m) 175 m.

(1057)

STD ERR= 1.4% : S= 4 S

E= 1%
S= 4S

Sounding 287034 : Ver 1

1e3

□model

+field

100

10

time (nsec)

.1

1

10

100

1
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Y287/034

GRENOL Inversion results

Job # : 3-825 Date : 31.10.94
 Program : GRENOL Version : July, 1992

Client : BHP

TEM File: 060794.TEM

Loop : 209

Line : 34E Station : 287.000

The initial model is:

I	Resistivity	Thickness	Depth
1	15.00	25.00	25.00
2	50.00	100.0	125.0
3	2500.		

Convergence to final model

Standard error = 2.30 percent
 Standard error = 2.10 percent
 Standard error = 2.08 percent
 Standard error = 1.90 percent
 Standard error = 1.54 percent
 Standard error = 0.90 percent
 Standard error = 0.89 percent
 Standard error = 0.89 percent
 Standard error = 0.88 percent
 Standard error = 0.88 percent
 Standard error = 0.88 percent

Final model :

"TEM File: 060794.tem Loop : 209 Line : 34E Station : 287.000"

I	Resistivity	Thickness	Depth
1	11.88	22.57	22.57
2	78.32	137.6	160.1
3	2039.		

Error structure of fitted model

Chnl	DELAY Time (ms)	Apparent Resistivity		Observed DB/DT (nV/sq.m)	Calculated DB/DT (nV/sq.m)	Weighted percent Symmetric Error
		Observed	Calculated			
1	0.352	21.3	21.1	1919.	1934.	-0.8
2	0.428	23.7	23.6	1279.	1280.	-0.1
3	0.525	26.3	26.4	796.6	792.9	0.5
4	0.647	29.2	29.3	472.4	468.8	0.8
5	0.803	32.6	32.7	266.0	265.1	0.3
6	1.003	36.5	36.6	142.6	142.2	0.3
7	1.258	41.3	41.3	73.17	73.13	0.1
8	1.582	47.1	46.9	36.07	36.26	-0.5
9	1.997	54.1	53.8	17.20	17.36	-0.9
10	2.525	62.5	62.2	8.009	8.078	-0.9
11	3.197	72.5	72.4	3.657	3.662	-0.1
12	4.055	84.5	85.2	1.641	1.621	1.2
13	5.148	99.8	100.8	0.7161	0.7046	1.6
14	6.543	121.3	120.2	0.2972	0.3012	-1.3
15	8.323	156.0	143.9	0.1128	0.1271	0.0
16	10.592	214.9	172.9	0.3843E-01	0.5321E-01	0.0
17	13.490	348.1	208.2	0.1024E-01	0.2212E-01	0.0

Mean percent Symmetric error = 0.74

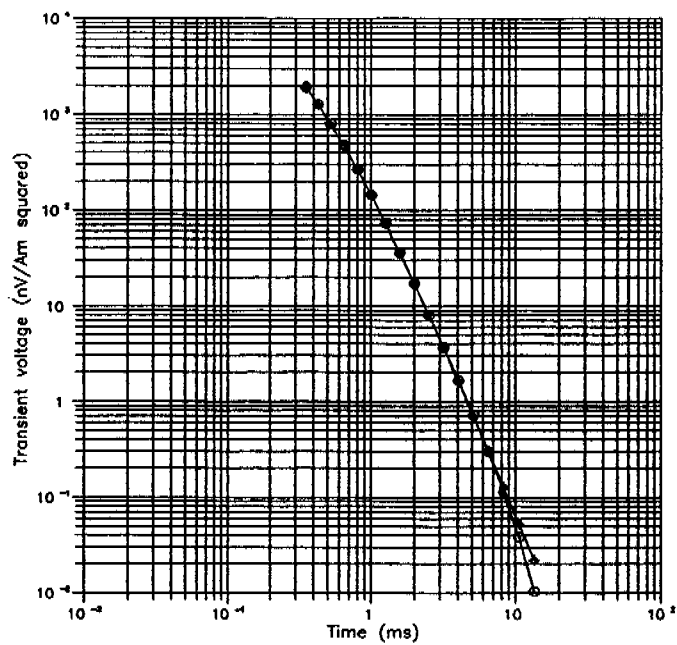
Maximum percent Symmetric error = 1.61

Maximum Symmetric error occurred at observation 13

Average predicted residual error (APRE) = 1.30 percent

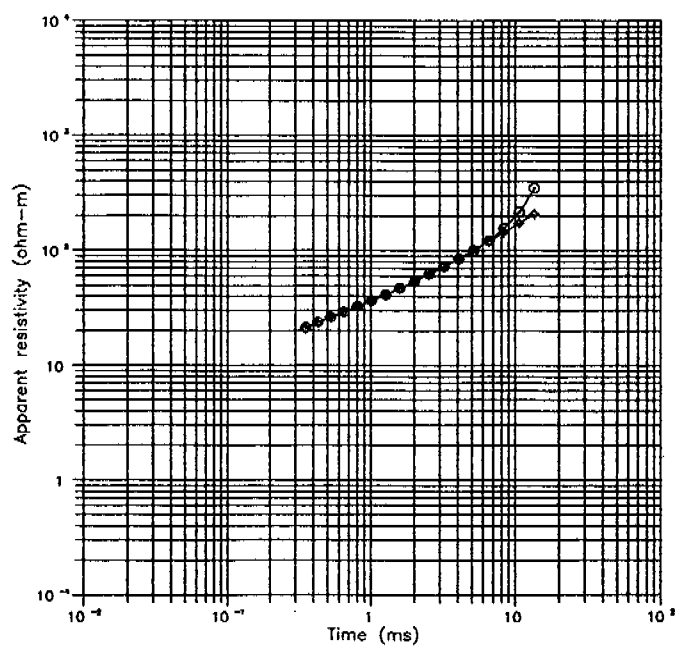
Transient decays

6.25 Hz data
 Loop : 209
 Station : 34E, 287



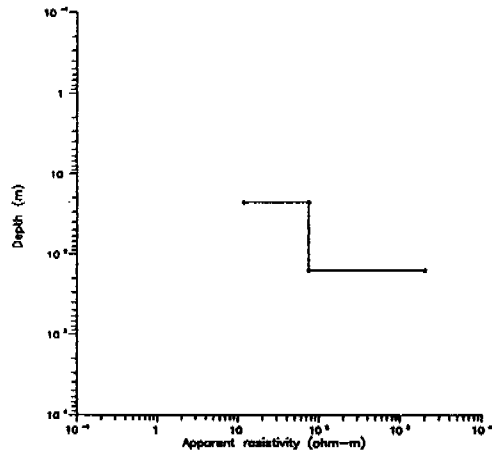
Apparent resistivity

6.25 Hz data
 Loop : 209
 Station : 34E, 287



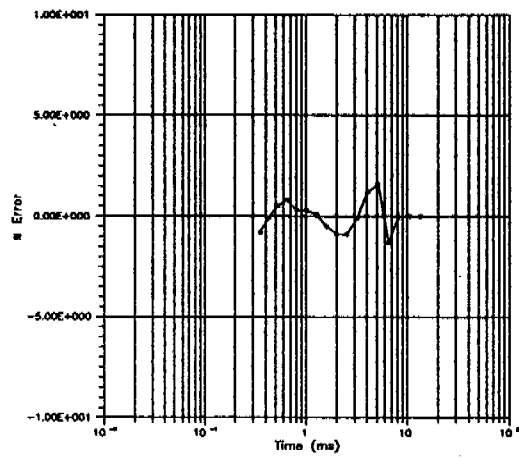
Layered-earth model

6.25 Hz data
Loop : 209
Station : 34E, 287



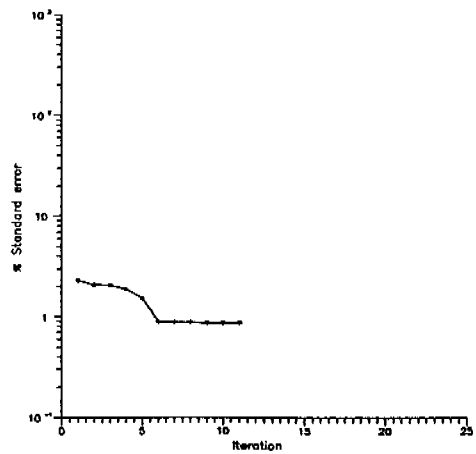
Error structure

6.25 Hz data
Loop : 209
Station : 34E, 287



Standard error per iteration

6.25 Hz data
Loop : 209
Station : 34E, 287



SOUNDING: 287018 : Vers 1
Mt Young Y287/018 25 Hz

287018A

~~x 2.2 ohm.m x 3.0 m 3.0 m.~~

~~x 2.2~~

4898 ohm.m * 789 m.

4898

~~8.4 ohm.m 30.1 m * 789 m:~~
(1973 ohm.m)

~~8.4~~
(1973)

STD ERR= 7.2% : S= 5 S

E= 7%
S= 5S

Sounding 287018 : Ver 1

□model

+field

1e3

100

10

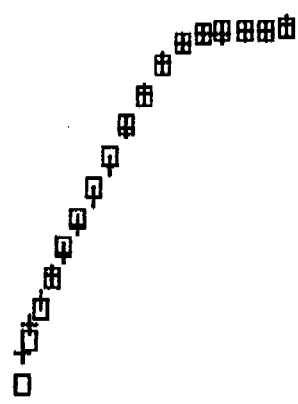
time (nsec)

.1

1

10

100



Y287/018

GRENDL Inversion results

Job # : 3-825 Date : 31.10.94
Program : GRENDL Version : July, 1992

Client : BHP

TEM File: 060794.TEM

Loop : 210
Line : 18E Station : 287.000

The initial model is:

I	Resistivity	Thickness	Depth
1	1.000	5.000	5.000
2	5000.	800.0	805.0
3	10.00	25.00	830.0
4	2000.		

Convergence to final model

Standard error = 310.52 percent
Standard error = 31.26 percent
Standard error = 4.11 percent
Standard error = 4.06 percent
Standard error = 3.99 percent
Standard error = 3.94 percent
Standard error = 3.94 percent
Standard error = 3.92 percent
Standard error = 3.91 percent
Standard error = 3.91 percent

Final model :

"TEM File: 060794.tem Loop : 210 Line : 18E Station : 287.000"

I	Resistivity	Thickness	Depth
1	2.153	2.961	2.961
2	4941.	803.1	806.1
3	8.883	28.46	834.6
4	1981.		

Error structure of fitted model

Chnl	DELAY Time (ms)	Apparent Resistivity		Observed DB/DT (nV/sq.m)	Calculated DB/DT (nV/sq.m)	Weighted percent Symmetric Error
		Observed	Calculated			
1	0.352	50.6	49.8	778.2	794.3	-2.0
2	0.428	87.8	58.2	456.9	452.8	0.9
3	0.525	68.1	69.8	243.7	215.8	3.3
4	0.647	81.0	83.6	123.6	118.3	4.4
5	0.803	98.4	101.1	58.80	56.55	3.9
6	1.003	122.3	122.9	26.06	25.88	0.7
7	1.258	153.0	148.8	11.15	11.62	-4.1
8	1.582	186.1	178.1	4.878	5.206	-6.5
9	1.997	212.8	205.0	2.301	2.435	-5.7
10	2.525	226.3	225.0	1.196	1.206	-0.9
11	3.197	230.6	233.9	0.6568	0.6431	2.1
12	4.055	230.8	236.3	0.3675	0.3548	3.5
13	5.148	232.3	237.2	0.2030	0.1969	3.0
14	6.543	235.4	240.1	0.1103	0.1071	2.9
15	8.323	246.0	246.2	0.5703E-01	0.5695E-01	0.1
16	10.592	254.2	246.3	0.2988E-01	0.3131E-01	-4.7
17	13.490	270.0	269.3	0.1500E-01	0.1506E-01	-0.4
18	17.188	321.2	293.3	0.6330E-02	0.7252E-02	0.0
19	21.903	376.3	332.6	0.2730E-02	0.3284E-02	0.0
20	27.915	320.4	376.0	0.1900E-02	0.1495E-02	0.0

Mean percent Symmetric error = 3.15

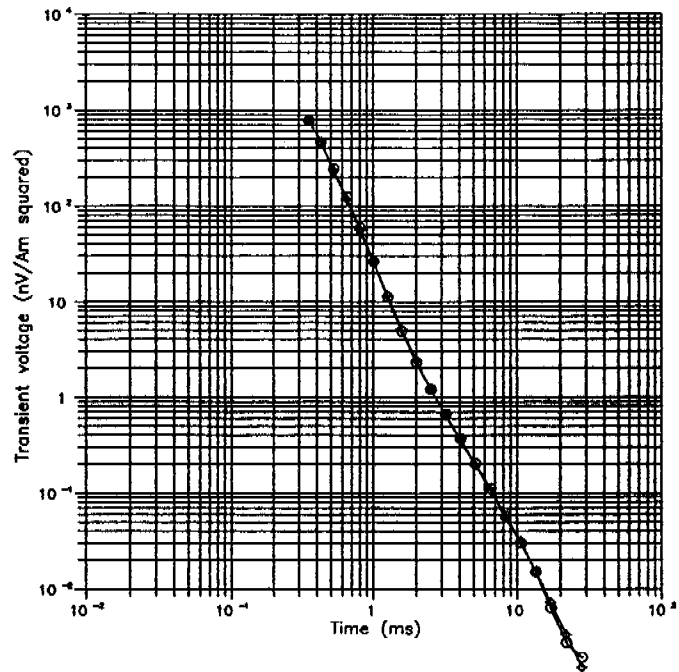
Maximum percent Symmetric error = 6.50

Maximum Symmetric error occurred at observation 8

Average predicted residual error (APRE) = 8.30 percent

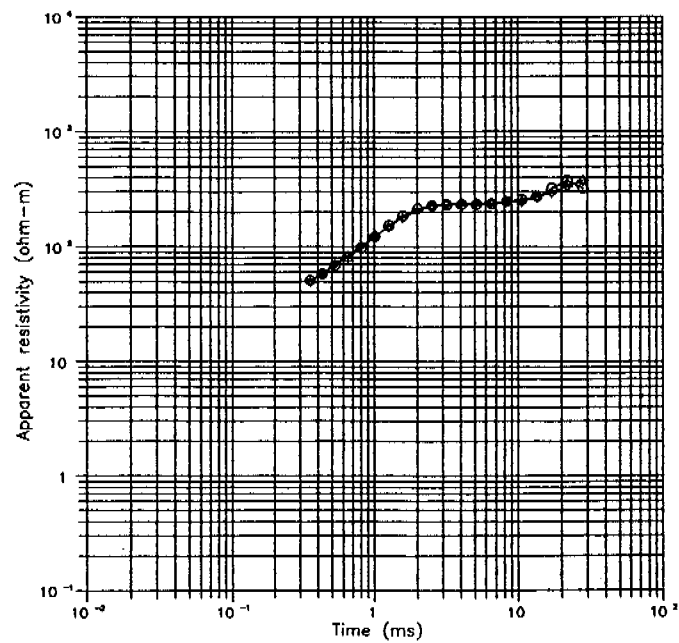
Transient decays

6.25 Hz data
Loop : 210
Station : 18E, 287



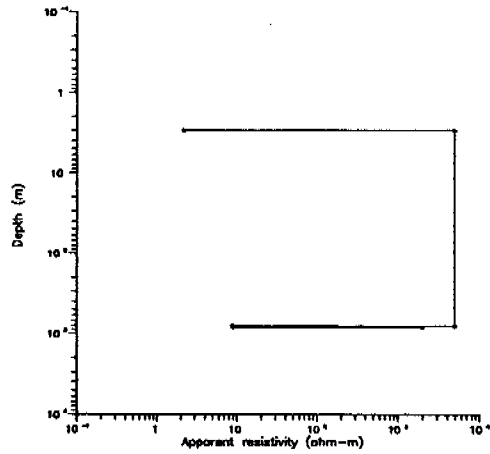
Apparent resistivity

6.25 Hz data
Loop : 210
Station : 18E, 287



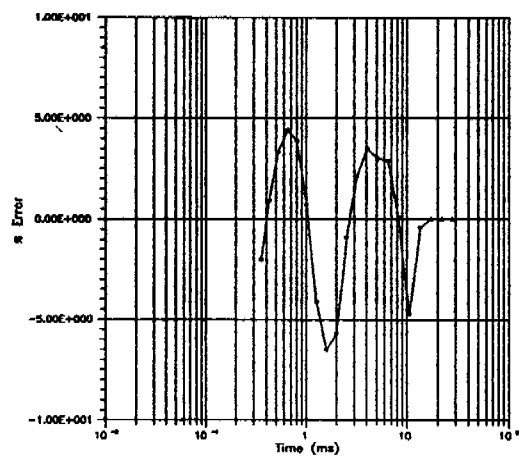
Layered-earth model

6.25 Hz data
Loop : 210
Station : 18E, 287



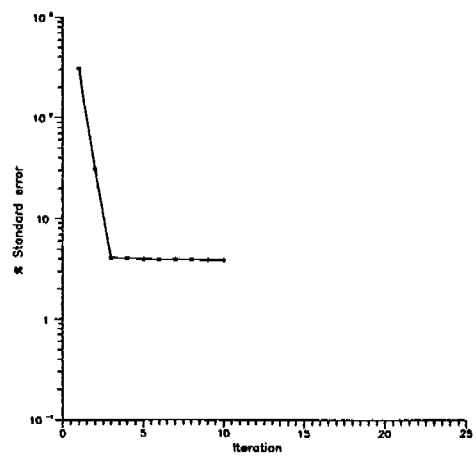
Error structure

6.25 Hz data
Loop : 210
Station : 18E, 287



Standard error per iteration

6.25 Hz data
Loop : 210
Station : 18E, 287



SOUNDING: 287050 : Vers 1
Mt Young Y287/050 25 Hz

287050A

~~* 13.2 ohm.m~~ ~~* 11.0 m~~ 11.0 m.

~~* 13.2~~

(719 ohm.m) * 175 m.

(719)

~~* 239 ohm.m~~ * 186 m.

* 239

STD ERR= 2.1% : S= 1 S

E= 2%
S= 15

Sounding 287050 : Ver 1

1e3

□model

+field

100

10

time (nsec)

.1

1

10

100

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Y287/050

GRENDL Inversion results

Job # : 3-825 Date : 31.10.94
 Program : GRENDL Version : July, 1992

Client : BHP

TEM File: 060794.TEM

Loop : 211

Line : 2878N Station : 50.000

The initial model is:

I	Resistivity	Thickness	Depth
1	50.00	50.00	
2	500.0	125.0	50.00
3	400.0	200.0	175.0
4	250.0		375.0

Convergence to final model

Standard error = 8.00 percent
 Standard error = 1.37 percent
 Standard error = 1.26 percent
 Standard error = 1.25 percent
 Standard error = 1.24 percent
 Standard error = 1.23 percent
 Standard error = 1.23 percent
 Standard error = 1.22 percent
 Standard error = 1.20 percent
 Standard error = 1.19 percent
 Standard error = 1.19 percent
 Standard error = 1.19 percent
 Standard error = 1.19 percent

Final model :

TEM File: 060794.TEM Loop : 211 Line : 2878N Station : 50.000"

I	Resistivity	Thickness	Depth
1	54.77	52.01	
2	490.3	126.9	52.01
3	390.0	206.5	178.9
4	219.5		385.4

Error structure of fitted model

Chnl	DELAY Time (ms)	Apparent Resistivity		Observed DB/DT (nV/sq.m)	Calculated DB/DT (nV/sq.m)	Weighted percent Symmetric Error
		Observed	Calculated			
1	0.352	111.5	112.4	273.8	270.9	1.1
2	0.428	122.3	121.1	163.7	165.9	-1.3
3	0.525	133.2	132.4	94.47	95.37	-0.9
4	0.647	144.1	143.5	53.82	54.18	-0.7
5	0.803	154.6	155.4	30.29	30.07	0.7
6	1.003	165.4	167.0	16.61	16.38	1.4
7	1.258	176.3	177.8	8.979	8.871	1.2
8	1.582	187.0	187.6	4.810	4.788	0.4
9	1.997	196.1	195.5	2.582	2.595	-0.5
10	2.525	204.2	202.1	1.387	1.408	-1.5
11	3.197	206.2	206.9	0.7621	0.7693	-0.9
12	4.055	211.0	210.6	0.4190	0.4202	-0.3
13	5.148	213.1	213.4	0.2303	0.2289	0.2
14	6.543	212.7	215.4	0.1281	0.1257	1.9
15	8.323	219.7	217.4	0.6746E-01	0.6850E-01	-1.5
16	10.592	217.9	218.9	0.3759E-01	0.3732E-01	0.7
17	13.490	239.1	219.7	0.1797E-01	0.2039E-01	0.0
18	17.188	248.5	225.5	0.9290E-02	0.1075E-01	0.0
19	21.903	417.0	229.3	0.2340E-02	0.5734E-02	0.0
20	27.915	1741.1	236.9	0.1500E-03	0.2986E-02	0.0

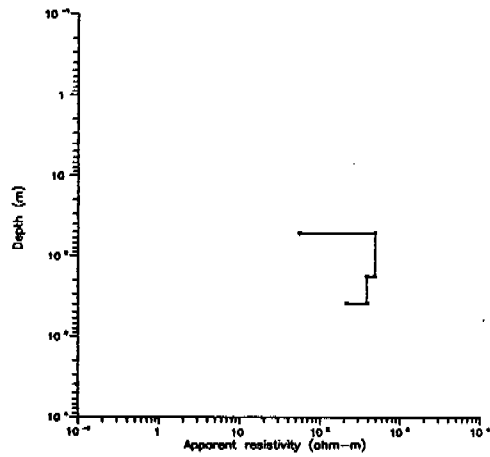
Mean percent Symmetric error = 0.96

Maximum percent Symmetric error = 1.89

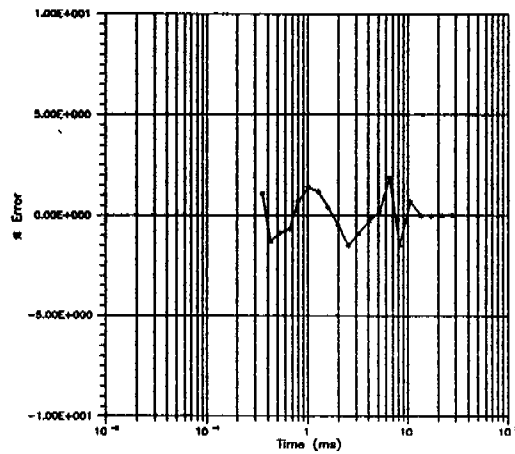
Maximum Symmetric error occurred at observation 14

Average predicted residual error (APRE) = 1.68 percent

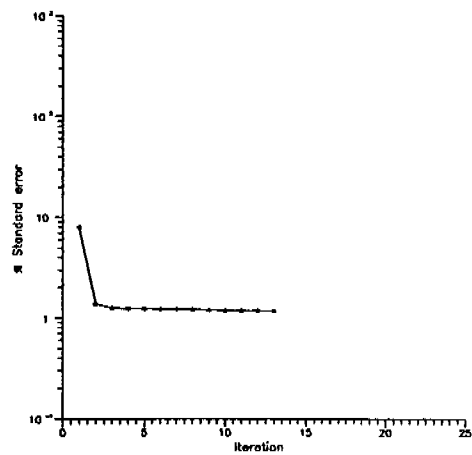
Layered-earth model
 6.25 Hz data
 Loop : 211
 Station : 878N, 50



Error structure
 6.25 Hz data
 Loop : 211
 Station : 878N, 50



Standard error per Iteration
 6.25 Hz data
 Loop : 211
 Station : 878N, 50



SOUNDING: 297034 : Vers 1
Mt Young Y297/034 25 Hz

~~(74.9 ohm.m) * 10.7 m~~ 10.7 m.
* 6.5 ohm.m * 60.5 m.
~~430 ohm.m~~ * 71.2 m.
430 ohm.m

STD ERR= 1.4% : S= 10 S

297034A

~~(74.9)~~
* 6.5
~~430~~
430

E= 1%
S= 10S

Sounding 297034 : Ver 1

1e3

□model

+field

t
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e

100

a
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10

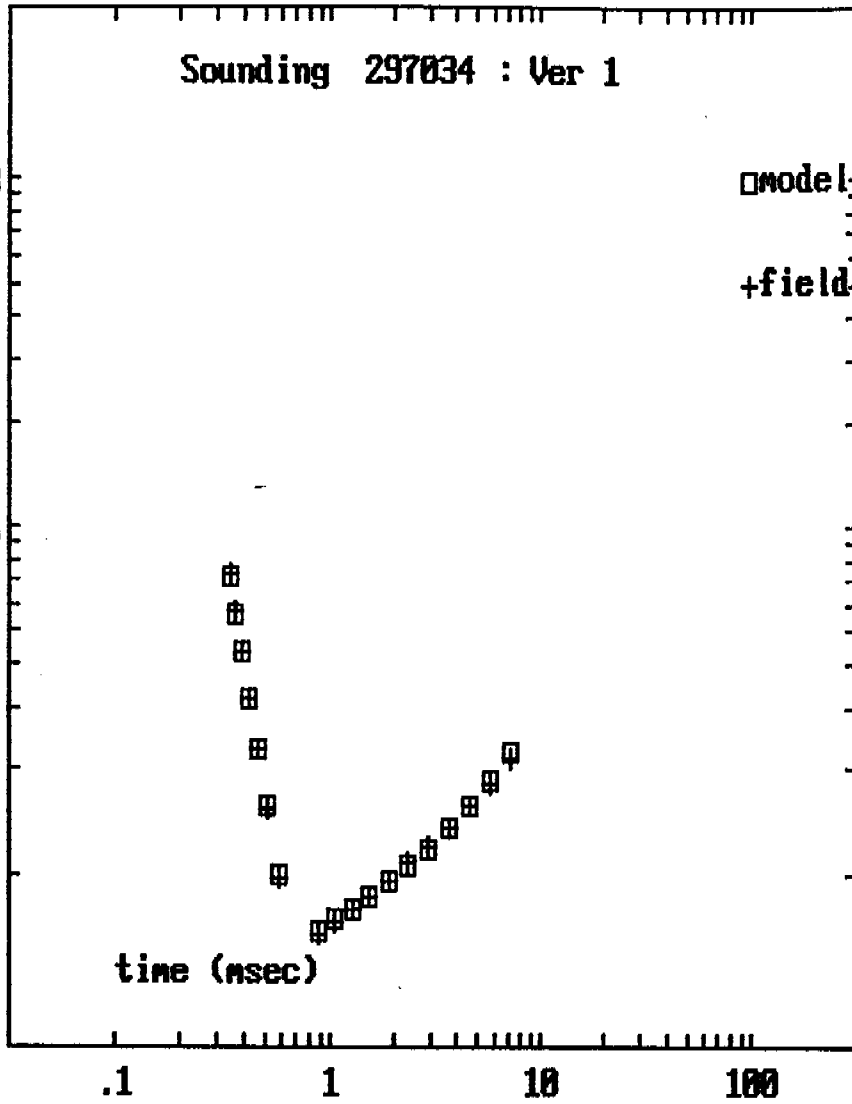
time (nsec)

.1

1

10

100



SOUNDING: 297034 : Vers 2
Mt Young Y297/034 6.25 Hz

297034A

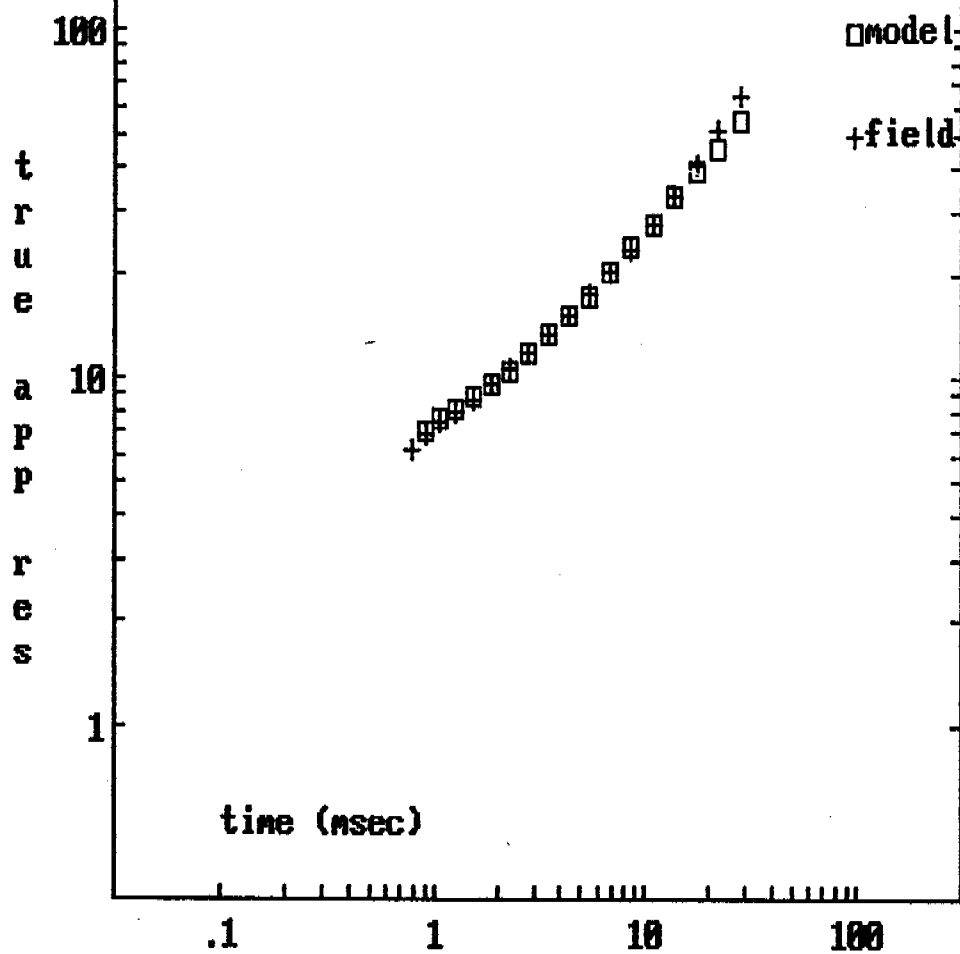
~~74.5 ohm.m~~ ~~9.2 m~~ 9.2 m.
* 7.0 ohm.m * 65.2 m.
* 74.4 m.
277 ohm.m

~~74.5~~
* 7.0
277

STD ERR= 1.1% : S= 9 S

E= 1%
S= 9S

Sounding 297034 : Ver 2



SOUNDING: 297050 : Vers 2
 Mt Young Y297/050 6.25 Hz

297050A

<u>85.1 ohm.m</u>	<u>* 25.1 m</u>	* 25.1 m.
* 3.2 ohm.m	* 31.7 m	* 56.8 m.

<u>85.1</u>
* 3.2

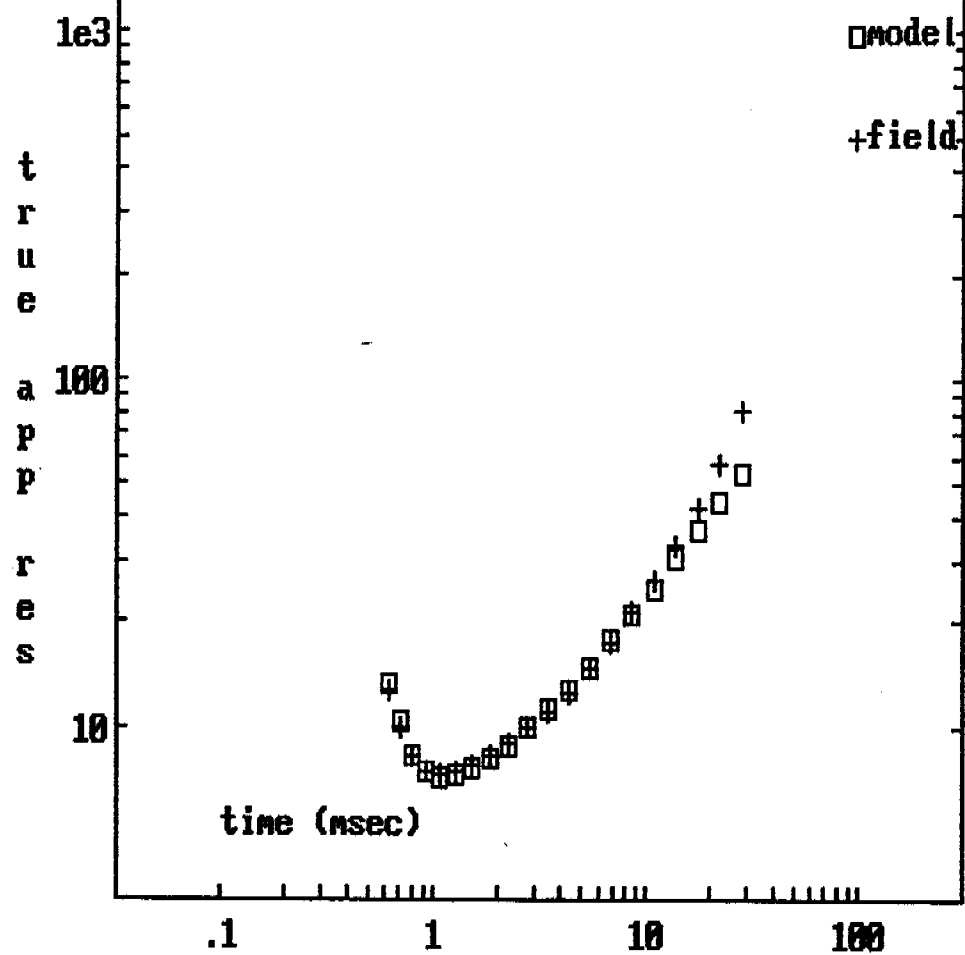
(499 ohm.m)

(499)

STD ERR= 2.5% : S= 10 S

E= 2%
 S= 10S

Sounding 297050 : Ver 2



SOUNDING: 297066 : Vers 1
Mt Young Y297/066 25 Hz

~~(78.2 ohm.m) * 7.1 m~~ 7.1 m.
* 8.8 ohm.m * 65.2 m.
----- * 72.2 m.
(2510 ohm.m)

STD ERR= 2.5% : S= 8 S

297066A

~~(78.2)~~
* 8.8

(2510)

E= 3%
S= 8S

Sounding 297066 : Ver 1

1e3

□model

+field

t
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10

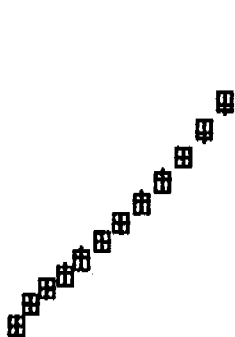
time (nsec)

.1

1

10

100



Y297/066

GRENDL Inversion results

Job # : 3-825 Date : 31.10.94
 Program : GRENDL Version : July, 1992

Client : BHP

TEM File: 020794.TEM

Loop : 192
 Line : 2974N Station : 66.000

The initial model is:

I	Resistivity	Thickness	Depth
1	15.00	25.00	25.00
2	10.00	50.00	75.00
3	2400.		

Convergence to final model

Standard error = 26.02 percent
 Standard error = 2.42 percent
 Standard error = 1.59 percent
 Standard error = 1.48 percent
 Standard error = 1.44 percent
 Standard error = 1.40 percent
 Standard error = 1.40 percent
 Standard error = 1.39 percent
 Standard error = 1.39 percent
 Standard error = 1.39 percent
 Standard error = 1.39 percent
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 Standard error = 1.39 percent
 Standard error = 1.38 percent
 Standard error = 1.38 percent
 Standard error = 1.38 percent
 Standard error = 1.38 percent
 Standard error = 1.38 percent
 Standard error = 1.38 percent
 Standard error = 1.38 percent

Final model :

TEM File: 020794.TEM Loop : 192 Line : 2974N Station : 66.000"

I	Resistivity	Thickness	Depth
1	12.10	24.45	24.45
2	9.779	54.47	78.92
3	2519.		

Error structure of fitted model

Chnl	DELAY Time (ms)	Apparent Resistivity Observed Calculated	Observed DB/DT (nV/sq.m)	Calculated DB/DT (nV/sq.m)	Weighted percent Symmetric Error
1	0.352	UNDEFINED UNDEFINED	3172.	3182.	-0.3
2	0.428	UNDEFINED UNDEFINED	2571.	2568.	0.1
3	0.525	8.5 8.6	1951.	1944.	0.3
4	0.647	9.4 9.5	1392.	1386.	0.4
5	0.803	10.3 10.3	931.2	928.9	0.3
6	1.003	11.2 11.3	580.8	580.5	0.1
7	1.258	12.4 12.3	339.0	340.8	-0.5
8	1.582	13.7 13.6	187.3	188.9	-0.9
9	1.997	15.3 15.2	98.21	99.07	-0.9
10	2.525	17.3 17.3	49.26	49.95	-0.6
11	3.197	19.8 19.8	23.70	23.73	-0.1
12	4.055	23.0 23.0	11.00	10.94	0.6
13	5.148	26.9 27.1	4.947	4.882	1.3
14	6.543	31.8 32.2	2.155	2.117	1.8
15	8.323	38.2 38.7	0.9145	0.8963	2.0
16	10.592	46.8 46.9	0.3740	0.3722	0.5
17	13.490	58.9 57.4	0.1459	0.1526	-4.0
18	17.188	75.9 70.6	0.5489E-01	0.6114E-01	0.0
19	21.903	110.5 87.5	0.1711E-01	0.2430E-01	0.0
20	27.915	183.7 109.1	0.4370E-02	0.9544E-02	0.0

Mean percent Symmetric error = 1.20

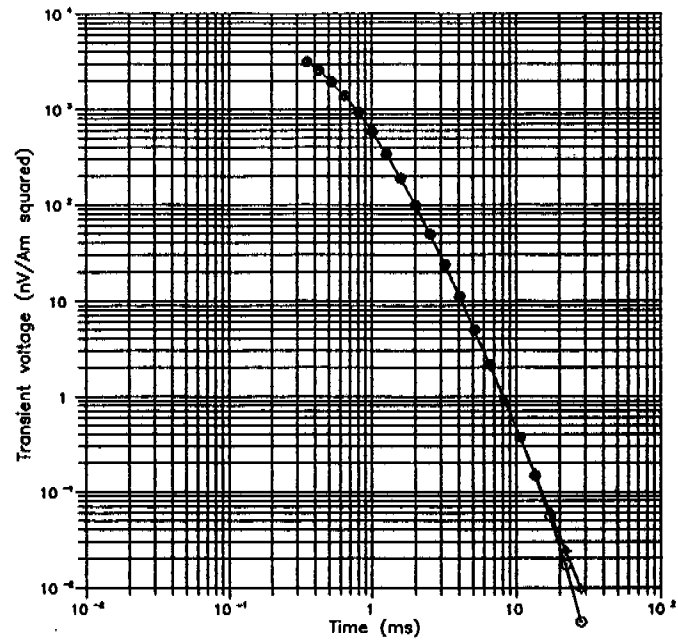
Maximum percent Symmetric error = 4.04

Maximum Symmetric error occurred at observation 17

Average predicted residual error (APRE) = 2.23 percent

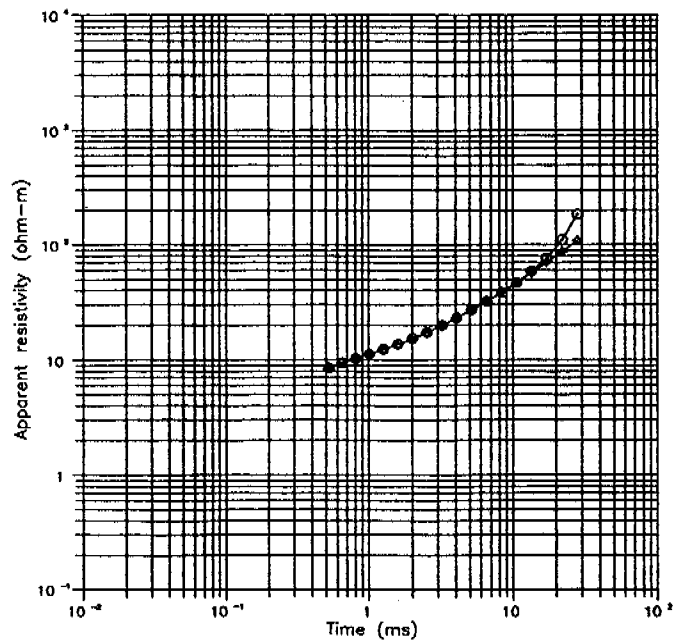
Transient decays

6.25 Hz data
Loop : 192
Station : 974N, 66

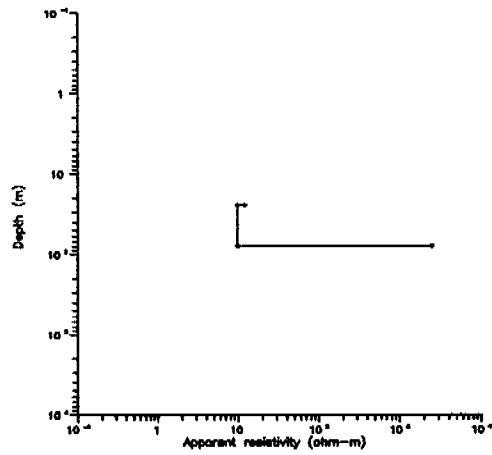


Apparent resistivity

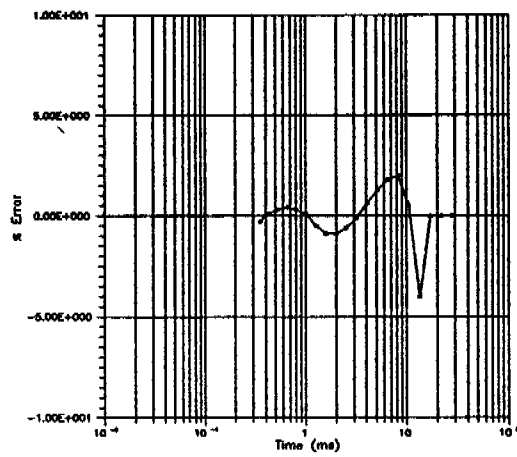
6.25 Hz data
Loop : 192
Station : 974N, 66



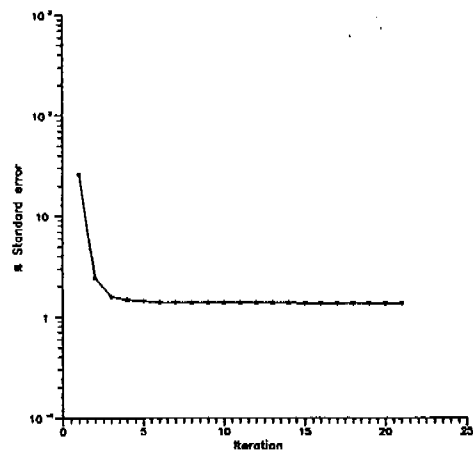
Layered-earth model
 8.25 Hz data
 Loop : 192
 Station : 974N, 66



Error structure
 8.25 Hz data
 Loop : 192
 Station : 974N, 66



Standard error per iteration
 8.25 Hz data
 Loop : 192
 Station : 974N, 66



SOUNDING: 295034 : Vers 2
Mt Young Y295/034 6.25 Hz

295034A

* 10.4 ohm.m

* 95.7 m.

* 10.4

(740 ohm.m)

* 95.7 m.

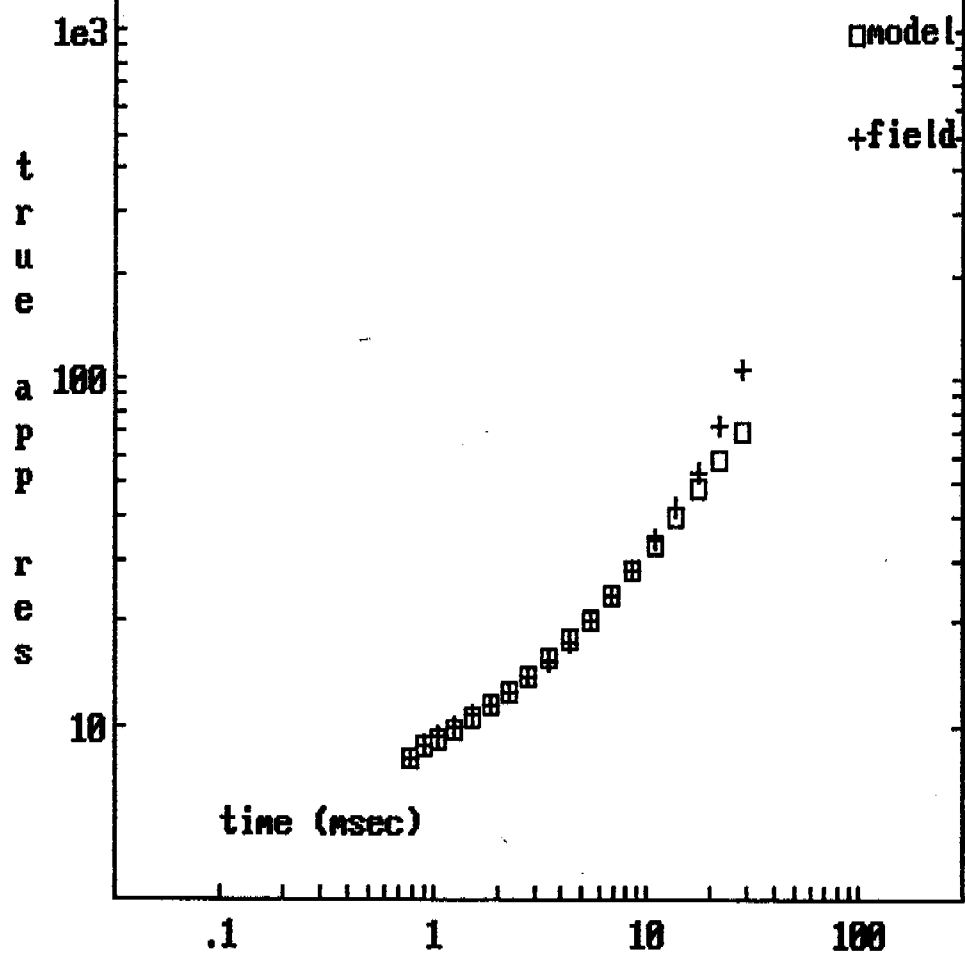
(740)

STD ERR= 1.9% : S= 9 S

E= 2%

S= 9S

Sounding 295034 : Ver 2



Y295/066

GRENDL Inversion results

Job # : 3-825 Date : 31.10.94
 Program : GRENDL Version : July, 1992

Client : BHP

TEM File: 030794.TEM

Loop : 194

Line : 2958W Station : 66.000

The initial model is:

I	Resistivity	Thickness	Depth
1	25.00	10.00	10.00
2	5.000	25.00	35.00
3	2000.		

Convergence to final model

Standard error = 17.32 percent
 Standard error = 5.09 percent
 Standard error = 3.42 percent
 Standard error = 1.52 percent
 Standard error = 0.47 percent
 Standard error = 0.41 percent
 Standard error = 0.41 percent
 Standard error = 0.41 percent
 Standard error = 0.41 percent

Final model :

TEM File: 030794.TEM Loop : 194 Line : 2958W Station : 66.000"

I	Resistivity	Thickness	Depth
1	26.09	12.28	12.28
2	5.940	32.49	44.76
3	1960.		

Error structure of fitted model

Chnl	DELAY Time (ms)	Apparent Resistivity Observed Calculated	Observed DB/DT (nV/sq.m)	Calculated DB/DT (nV/sq.m)	Weighted percent Symmetric Error
1	0.352	UNDEFINED UNDEFINED	3504.	3503.	0.1
2	0.428	UNDEFINED UNDEFINED	2788.	2791.	-0.1
3	0.525	7.2 7.2	2065.	2067.	-0.1
4	0.647	9.1 9.1	1427.	1428.	-0.1
5	0.803	10.5 10.5	919.2	918.8	0.1
6	1.003	11.9 11.9	548.4	546.3	0.4
7	1.258	13.7 13.7	303.5	303.1	0.1
8	1.582	15.7 15.7	158.4	158.1	0.2
9	1.997	18.3 18.3	77.94	77.89	0.1
10	2.525	21.6 21.6	36.55	36.67	-0.3
11	3.197	25.7 25.5	16.48	16.59	-0.7
12	4.055	30.7 30.6	7.219	7.260	-0.6
13	5.148	37.0 37.0	3.093	3.095	-0.1
14	6.543	44.9 45.1	1.297	1.291	0.5
15	8.323	55.0 55.3	0.5337	0.5293	0.8
16	10.592	67.9 68.0	0.2149	0.2144	0.2
17	13.490	83.9 84.0	0.8609E-01	0.8599E-01	0.1
18	17.188	104.5 104.0	0.3402E-01	0.3423E-01	-0.6
19	21.903	139.7 129.2	0.1205E-01	0.1355E-01	0.0
20	27.915	180.2 160.9	0.4500E-02	0.5331E-02	0.0

Mean percent Symmetric error = 0.35

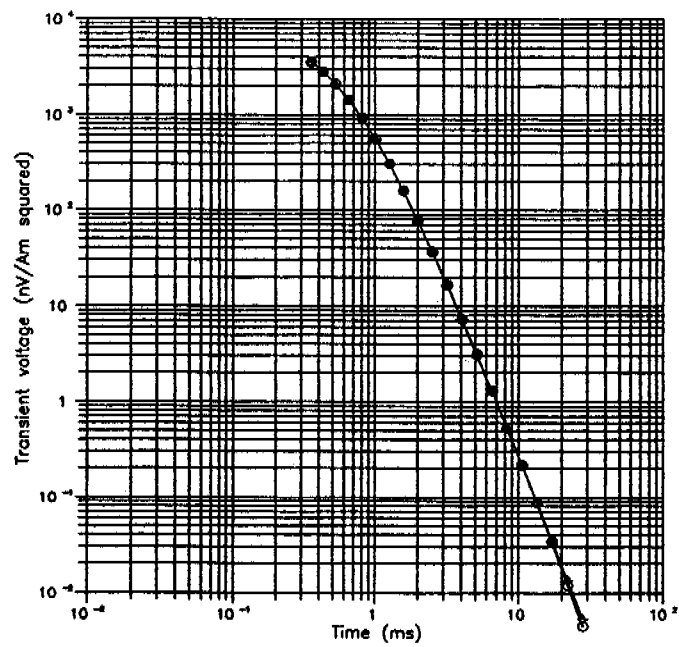
Maximum percent Symmetric error = 0.83

Maximum Symmetric error occurred at observation 15

Average predicted residual error (APRE) = 0.47 percent

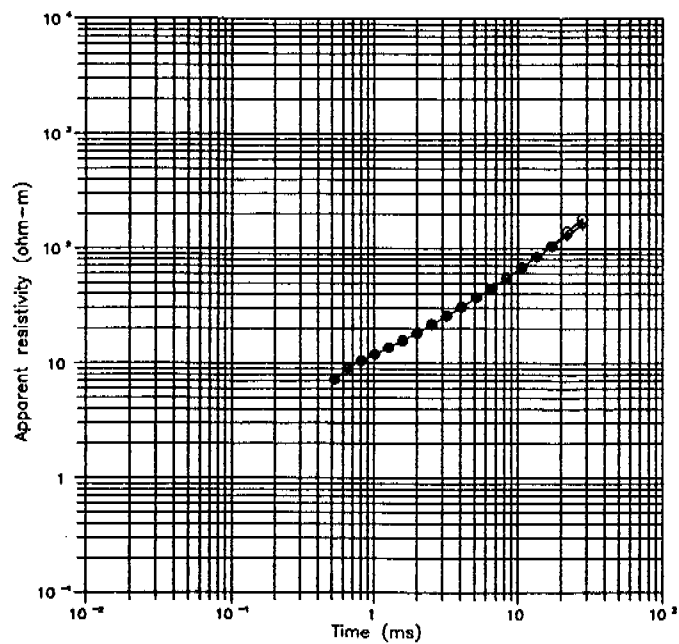
Transient decays

6.25 Hz data
Loop : 194
Station : 958N, 66



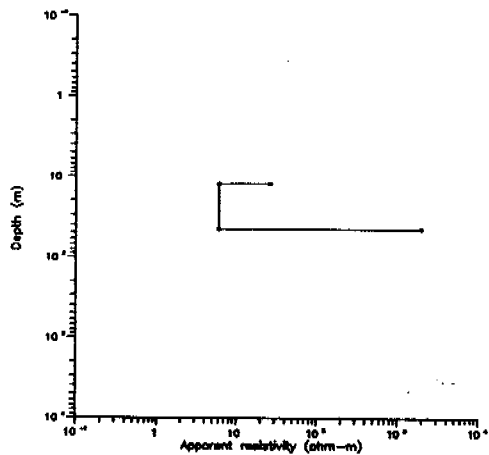
Apparent resistivity

6.25 Hz data
Loop : 194
Station : 958N, 66



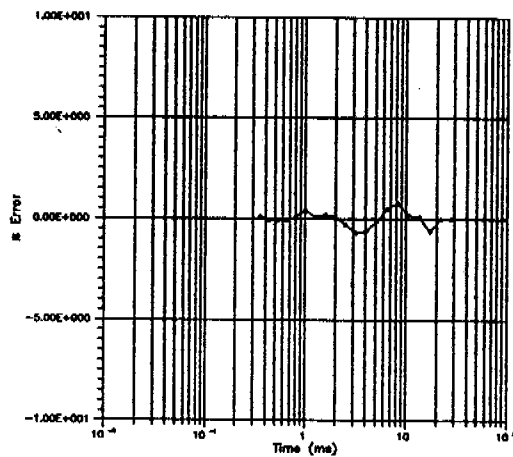
Layered-earth model

6.25 Hz data
Loop : 194
Station : 958N, 66



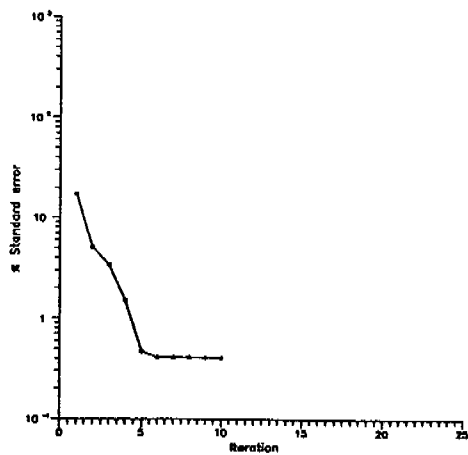
Error structure

6.25 Hz data
Loop : 194
Station : 958N, 66



Standard error per iteration

6.25 Hz data
Loop : 194
Station : 958N, 66



SOUNDING: 295050 : Vers 1
 Mt Young Y295/050 25 Hz

295050A

122 ohm.m * 22.9 m
2.1 ohm.m 10.6 m * 33.8 m.

122
2.1

89.3 ohm.m { 174 m.}

89.3

_____ (208 m.)
 (203 ohm.m)

_____ (203)

STD ERR= 5.1% : S= 7 S

E= 5%
 S= 7S

Sounding 295050 : Ver 1

1e3

□model

+field

t
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a
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p

r
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s

100

10

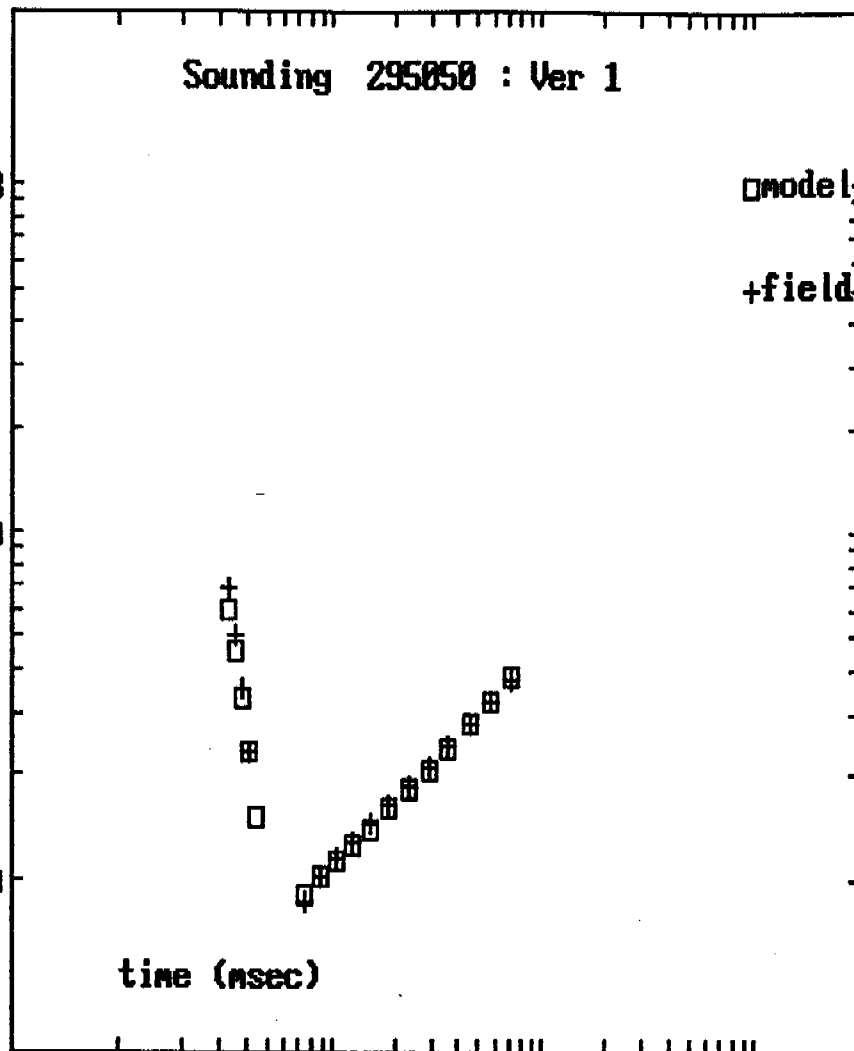
time (nsec)

.1

1

10

100



SOUNDING: 295050 : Vers 2
Mt Young Y295/050 6.25 Hz

295050A

* 11.0 ohm.m

* 62.2 m.

* 11.0

* 62.2 m.

84.6 ohm.m

170 m.

84.6

233 m.

* 282 ohm.m

* 282

STD ERR= 3.9% : S= 0 8

E= 4%

S= 85

Sounding 295050 : Ver 2

1e3

□model

+field

t
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100

10

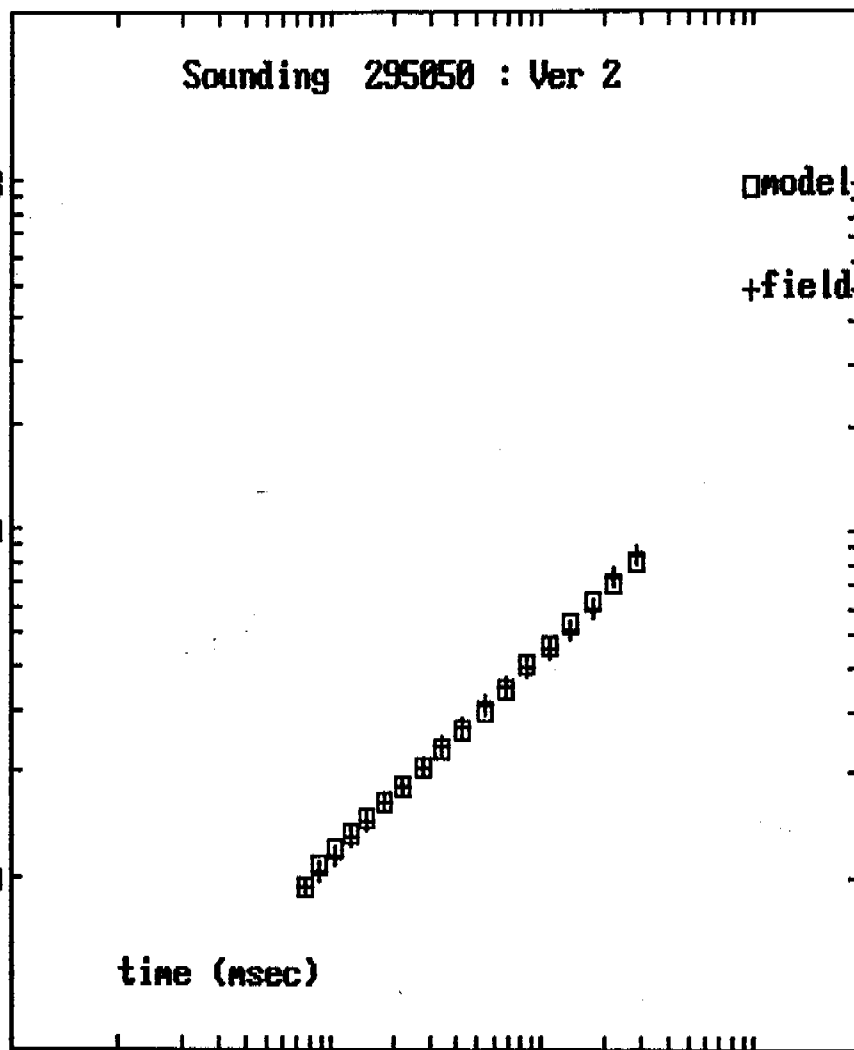
time (nsec)

.1

1

10

100



SOUNDING: 294050 : Vers 2
Mt Young Y294/050 6.25 Hz

<u>85.0 ohm.m</u>	<u>* 24.8 m</u>	* 24.8 m.
* 3.2 ohm.m	* 31.9 m.	* 56.1 m.
(489 ohm.m)		

STD ERR= 2.6% : S= 10 S

294050A

<u>85.0</u>
* 3.2
(489)

E= 3%
S= 10S

Sounding 294050 : Ver 2

1e3

□model

+field

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100

10

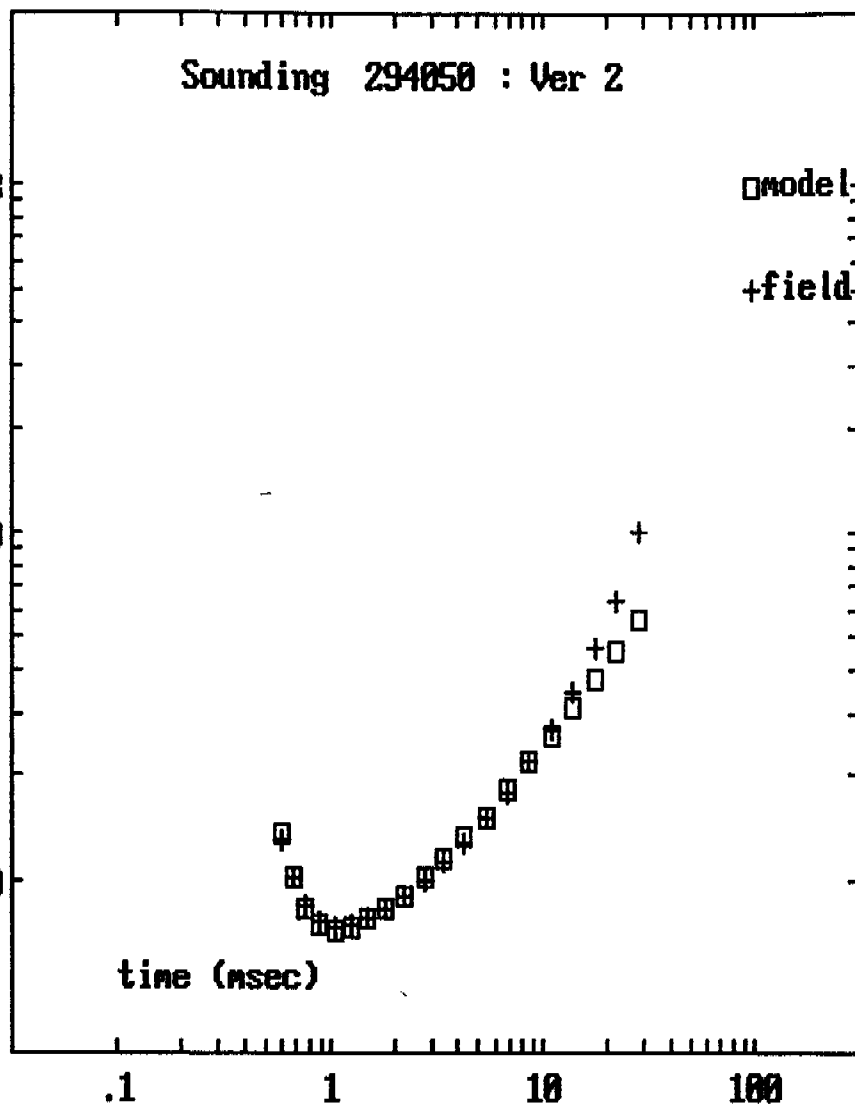
time (msec)

.1

1

10

100



SOUNDING: 294034 : Vers 1
Mt Young Y294/034 25 Hz

294034A

~~102 ohm.m~~ * ~~11.6 m~~ 11.6 m.
* 5.7 ohm.m 26.9 m. 38.4 m.

~~102~~
* 5.7

28.5 ohm.m * 118 m.

28.5

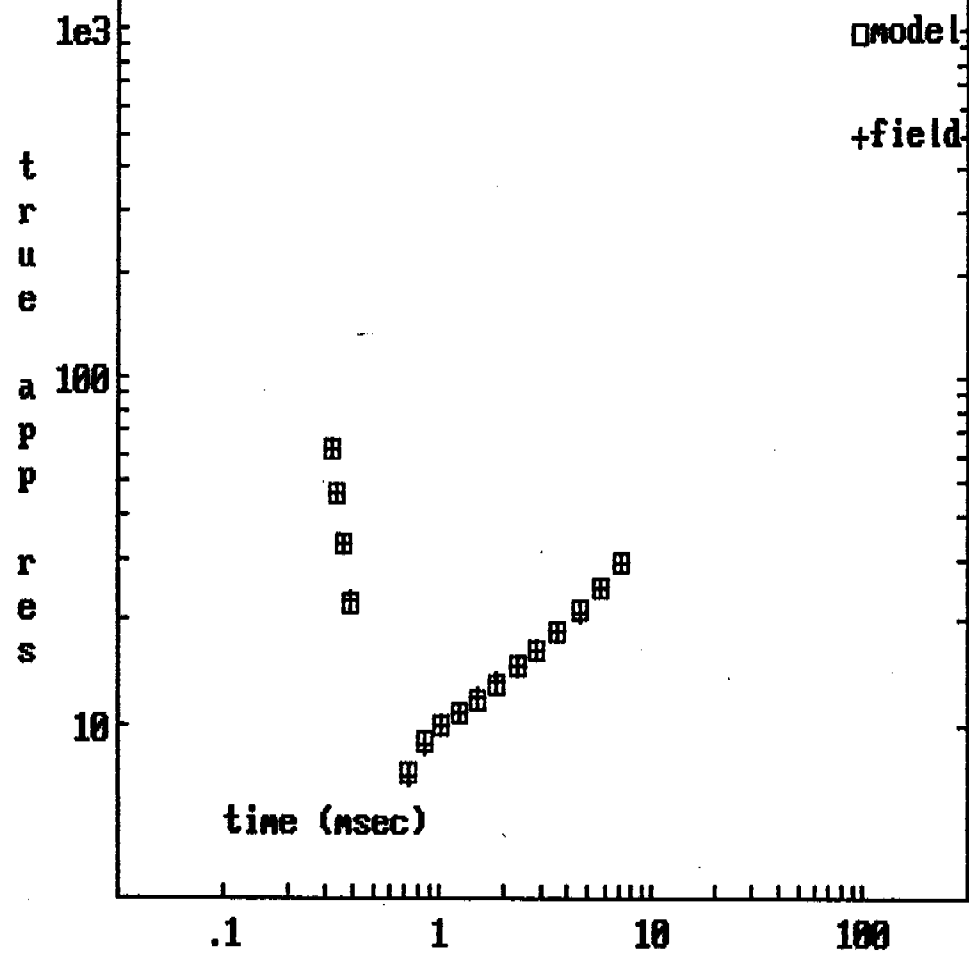
_____* 157 m.
(2551 ohm.m)

(2551)

STD ERR= .7% : S= 9 S

E= 1%
S= 9S

Sounding 294034 : Ver 1



Y294/034

GRENDL Inversion results

Job # : 3-825 Date : 31.10.94
 Program : GRENDL Version : July, 1992

Client : BHP

TEM File: 030794.TEM

Loop : 197

Line : 2942N Station : 34.000

The initial model is:

I	Resistivity	Thickness	Depth
1	10.00	25.00	25.00
2	15.00	75.00	100.0
3	2500.		

Convergence to final model

Standard error = 22.71 percent
 Standard error = 1.77 percent
 Standard error = 1.66 percent
 Standard error = 1.64 percent
 Standard error = 1.64 percent
 Standard error = 1.64 percent
 Standard error = 1.63 percent
 Standard error = 1.63 percent
 Standard error = 1.63 percent
 Standard error = 1.63 percent
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 Standard error = 1.63 percent
 Standard error = 1.63 percent
 Standard error = 1.63 percent
 Standard error = 1.63 percent

Final model :

TEM File: 030794.TEM Loop : 197 Line : 2942N Station : 34.000

I	Resistivity	Thickness	Depth
1	9.741	25.64	25.64
2	13.30	78.11	103.7
3	2621.		

Error structure of fitted model

Chnl	DELAY Time (ms)	Apparent Resistivity Observed Calculated	Observed DB/DT (nV/sq.m)	Calculated DB/DT (nV/sq.m)	Weighted percent Symmetric Error
1	0.352	UNDEFINED UNDEFINED	3282.	3321.	-1.2
2	0.428	UNDEFINED UNDEFINED	2665.	2653.	0.4
3	0.525	8.2 8.4	2021.	1999.	1.1
4	0.647	9.2 9.4	1441.	1425.	1.1
5	0.803	10.1 10.2	963.9	959.4	0.5
6	1.003	11.0 11.0	603.0	604.7	-0.3
7	1.258	12.0 11.9	355.3	359.5	-1.2
8	1.582	13.2 13.0	199.1	202.5	-1.7
9	1.997	14.5 14.3	106.6	108.3	-1.6
10	2.525	16.1 16.0	54.95	55.42	-0.8
11	3.197	18.0 18.1	27.26	27.18	0.3
12	4.055	20.5 20.7	13.03	12.82	1.6
13	5.148	23.6 24.0	5.994	5.854	2.4
14	6.543	27.7 28.2	2.654	2.592	2.4
15	8.323	33.2 33.4	1.131	1.118	1.2
16	10.592	40.3 40.1	0.4684	0.4719	-0.7
17	13.490	49.7 48.5	0.1887	0.1954	-3.5
18	17.188	62.2 59.3	0.7389E-01	0.7952E-01	0.0
19	21.903	77.6 73.0	0.2906E-01	0.3188E-01	0.0
20	27.915	97.8 90.6	0.1124E-01	0.1260E-01	0.0

Mean percent Symmetric error = 1.41

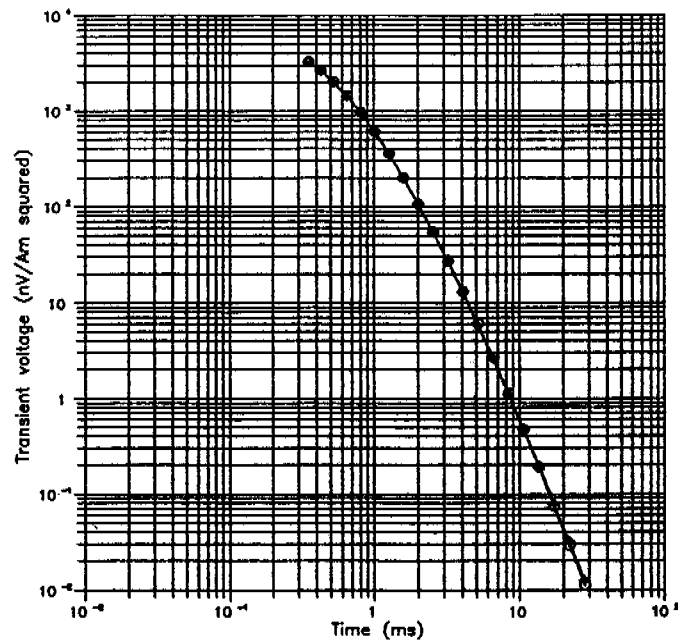
Maximum percent Symmetric error = 3.49

Maximum Symmetric error occurred at observation 17

Average predicted residual error (APRE) = 2.33 percent

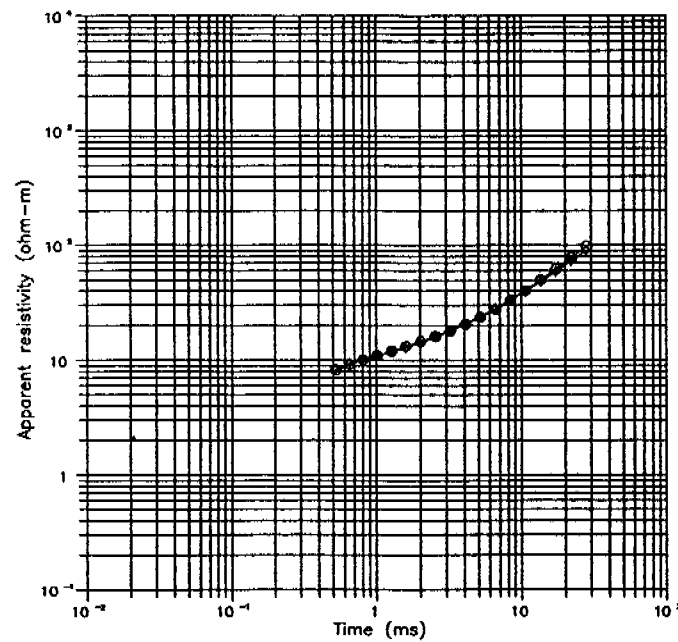
Transient decays

6.25 Hz data
Loop : 197
Station : 942N, 34



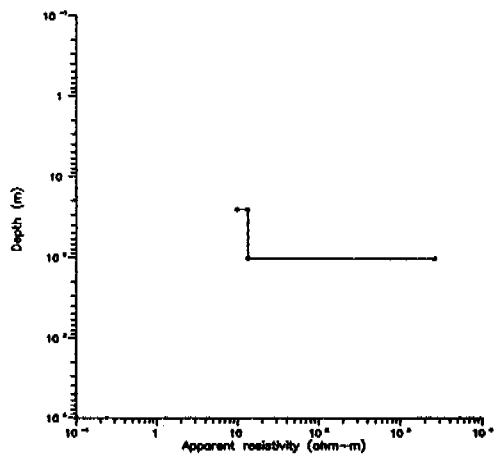
Apparent resistivity

6.25 Hz data
Loop : 197
Station : 942N, 34



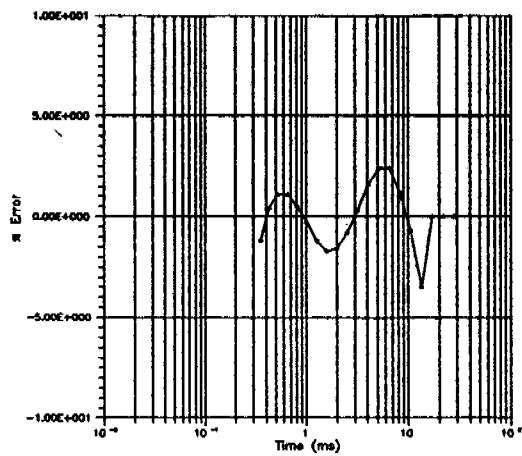
Layered-earth model

6.25 Hz data
Loop : 197
Station : 942N, 34



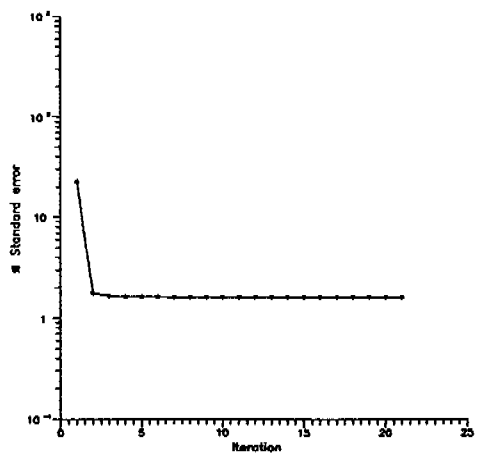
Error structure

6.25 Hz data
Loop : 197
Station : 942N, 34



Standard error per iteration

6.25 Hz data
Loop : 197
Station : 942N, 34



SOUNDING: 294066 : Vers 1
Mt Young Y294/066 25 Hz

294066A

~~SS 0 ohm.m~~ ~~5.7 m.~~
* 4.9 ohm.m 19.1 m * 24.9 m.

~~SS 0~~
* 4.9

102 ohm.m 309 m.

102

_____ 334 m.
(2206 ohm.m)

(2206)

STD ERR= .7% : S= 7 S

E= 1%
S= 7S

Sounding 294066 : Ver 1

□model

+field

1e3

100

10

time (nsec)

.1

1

10

100

40

9

12

15

18

22

25

28

32

35

38

42

45

48

52

55

58

62

65

68

72

75

78

82

85

88

92

95

98

100

102

105

108

112

115

118

122

125

128

132

135

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148

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162

165

168

172

175

178

182

185

188

192

195

198

202

205

208

212

215

218

222

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228

232

235

238

242

245

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252

255

258

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302

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945

948

952

955

958

962

965

968

972

975

978

982

985

988

992

995

998

1000

Y294/066

GRENDEL Inversion results

Job # : 3-825 Date : 31.10.94
 Program : GRENDEL Version : July, 1992

Client : BHP

TEM File: 030794.TEM

Loop : 198
 Line : 66E Station : 294.000

The initial model is:

I	Resistivity	Thickness	Depth
1	10.00	10.00	10.00
2	5.000	20.00	30.00
3	100.0	250.0	280.0
4	2000.		

Convergence to final model

Standard error = 41.94 percent
 Standard error = 2.87 percent
 Standard error = 1.67 percent
 Standard error = 1.66 percent
 Standard error = 1.66 percent
 Standard error = 1.65 percent
 Standard error = 1.64 percent
 Standard error = 1.64 percent
 Standard error = 1.63 percent
 Standard error = 1.62 percent
 Standard error = 1.61 percent
 Standard error = 1.61 percent
 Standard error = 1.60 percent
 Standard error = 1.59 percent
 Standard error = 1.59 percent
 Standard error = 1.58 percent
 Standard error = 1.58 percent
 Standard error = 1.57 percent
 Standard error = 1.57 percent
 Standard error = 1.57 percent
 Standard error = 1.56 percent

Final model :

"TEM File: 030794.tem Loop : 198 Line : 66E Station : 294.000"

I	Resistivity	Thickness	Depth
1	11.85	10.20	10.20
2	5.608	17.17	27.37
3	96.61	274.0	301.4
4	2302.		

Error structure of fitted model

Chnl	DELAY Time (ms)	Apparent Resistivity Observed Calculated	Observed DB/DT (nV/sq.m)	Calculated DB/DT (nV/sq.m)	Weighted percent Symmetric Error
1	0.382	UNDEFINED UNDEFINED	3577.	3624.	-1.3
2	0.428	UNDEFINED UNDEFINED	2665.	2679.	-0.5
3	0.525	10.1 10.1	1835.	1834.	0.1
4	0.647	12.2 12.2	1182.	1174.	0.6
5	0.803	14.1 14.2	713.4	706.5	1.0
6	1.003	16.1 16.2	400.9	397.9	0.7
7	1.258	18.5 18.6	213.9	212.8	0.5
8	1.582	21.2 21.2	109.1	109.2	-0.1
9	1.997	24.3 24.2	53.68	53.97	-0.5
10	2.525	27.9 27.7	25.70	25.97	-1.0
11	3.197	32.1 31.8	12.04	12.20	-1.3
12	4.055	37.0 36.8	5.541	5.601	-1.1
13	5.148	42.8 42.7	2.510	2.525	-0.6
14	6.543	49.8 49.9	1.119	1.116	0.3
15	8.323	58.1 58.7	0.4930	0.4850	1.6
16	10.592	68.5 69.7	0.2125	0.2074	2.4
17	13.490	82.1 83.2	0.8904E-01	0.8738E-01	1.9
18	17.188	100.2 100.1	0.3625E-01	0.3630E-01	-0.1
19	21.903	124.1 121.4	0.1440E-01	0.1488E-01	-3.3
20	27.915	168.7 148.4	0.4970E-02	0.6020E-02	0.0

Mean percent Symmetric error = 1.26

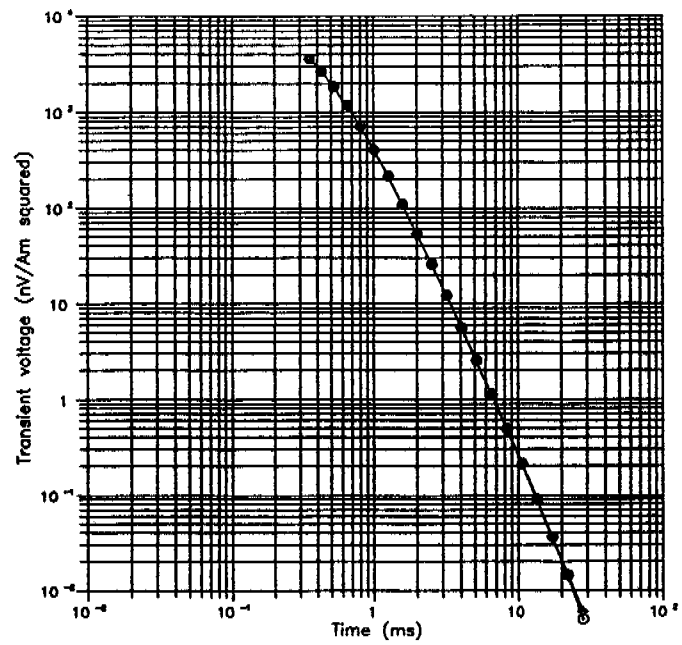
Maximum percent Symmetric error = 3.27

Maximum Symmetric error occurred at observation 19

Average predicted residual error (APRE) = 2.92 percent

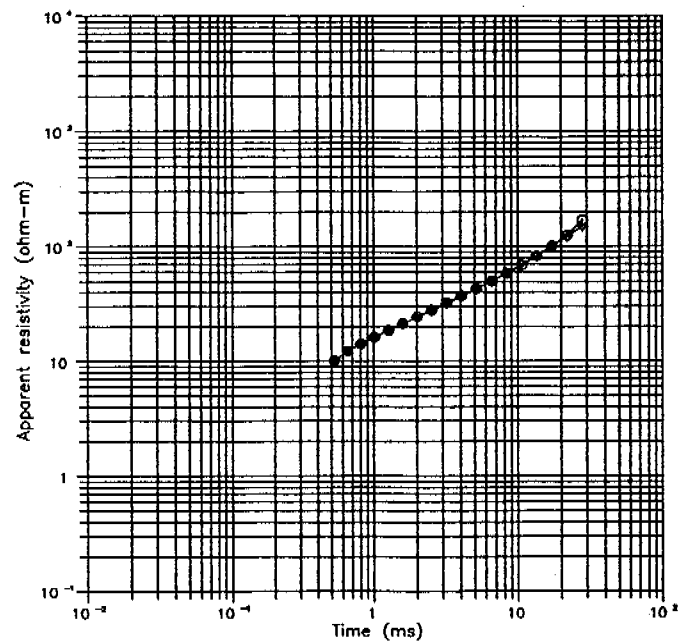
Transient decays

6.25 Hz data
 Loop : 198
 Station : 66E, 294



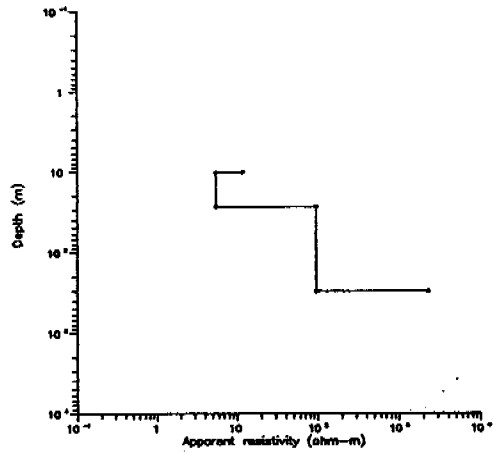
Apparent resistivity

6.25 Hz data
 Loop : 198
 Station : 66E, 294



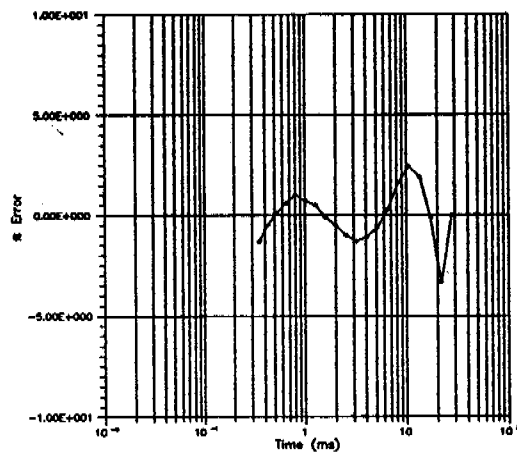
Layered-earth model

6.25 Hz data
Loop : 198
Station : 66E, 294



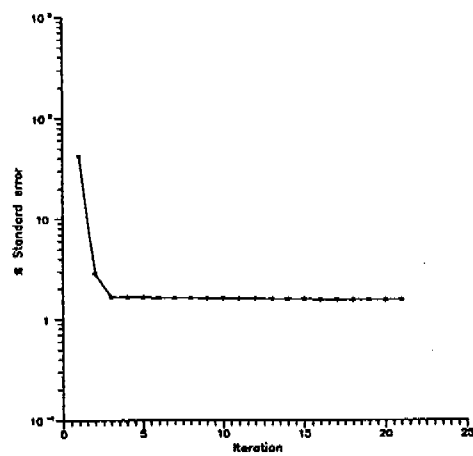
Error structure

6.25 Hz data
Loop : 198
Station : 66E, 294



Standard error per iteration

6.25 Hz data
Loop : 198
Station : 66E, 294



SOUNDING: 292050 : Vers 2
Mt Young Y292/050 6.25 Hz

<u>81.1 ohm.m</u>	<u>* 14.7 m</u>	* 14.7 m.
* 4.0 ohm.m	* 45.8 m.	
		* 60.4 m.
(465 ohm.m)		

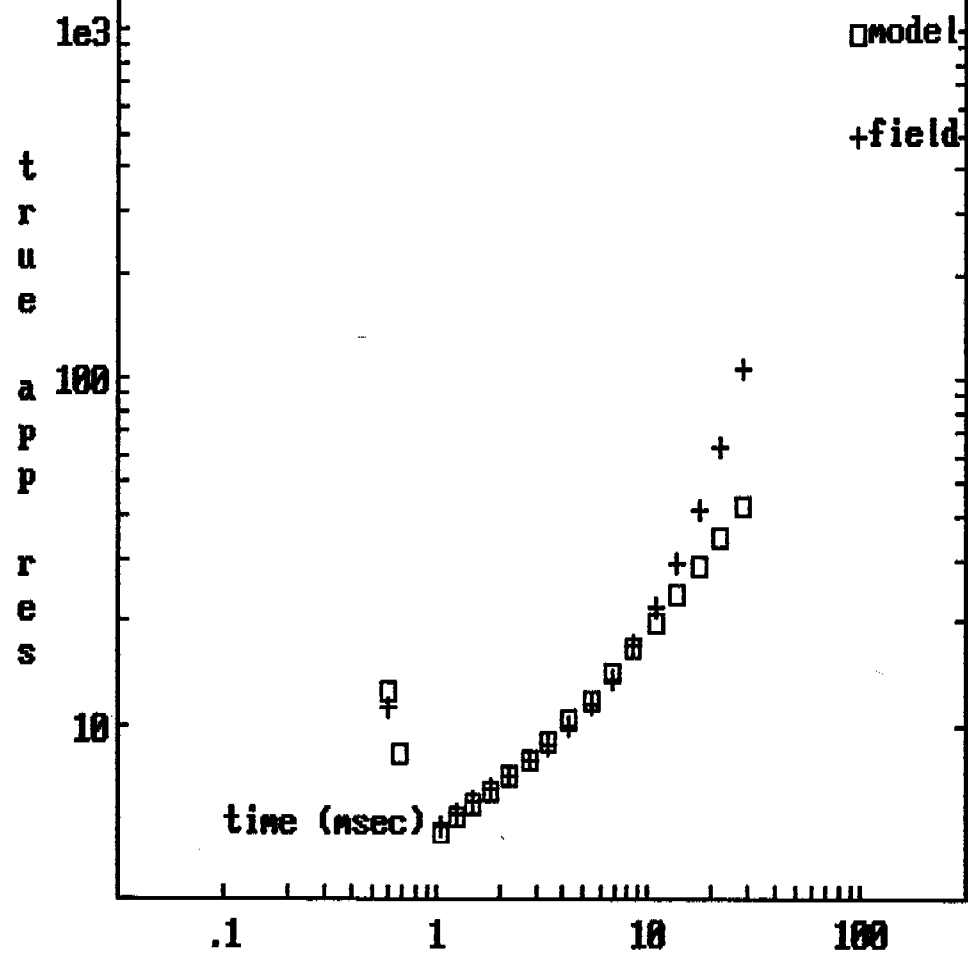
STD ERR= 2.8% : S= 12 S

292050A

<u>81.1</u>
* 4.0
(465)

E= 3%
S= 12S

Sounding 292050 : Ver 2



Y292/066

GRENDL Inversion results

Job # : 3-825 Date : 31.10.94
 Program : GRENDL Version : July, 1992

Client : BEP

TEM File: 040794.TEM

Loop : 200

Line : 66E Station : 292.000

The initial model is:

I	Resistivity	Thickness	Depth
1	10.00	50.00	50.00
2	5.000	10.00	60.00
3	2000.		

Convergence to final model

Standard error = 14.95 percent
 Standard error = 1.75 percent
 Standard error = 1.68 percent
 Standard error = 1.68 percent
 Standard error = 1.68 percent
 Standard error = 1.68 percent
 Standard error = 1.67 percent
 Standard error = 1.67 percent

Final model :

"TEM File: 040794.tem Loop : 200 Line : 66E Station : 292.000"

I	Resistivity	Thickness	Depth
1	9.502	50.93	50.93
2	4.705	10.45	61.38
3	2041.		

Error structure of fitted model

Chnl	DELAY Time (ms)	Apparent Resistivity	Observed DB/DT (mV/sq.m)	Calculated DB/DT (mV/sq.m)	Weighted percent Symmetric Error
1	0.352	UNDEFINED	3484.	3512.	-0.8
2	0.428	UNDEFINED	2888.	2880.	0.3
3	0.525	UNDEFINED	2227.	2209.	0.8
4	0.647	7.5	1601.	1588.	0.8
5	0.803	8.7	1073.	1068.	0.5
6	1.003	9.8	667.3	667.2	0.0
7	1.258	11.1	385.5	390.1	-1.2
8	1.582	12.5	211.5	214.6	-1.4
9	1.997	14.1	110.1	111.4	-1.3
10	2.525	16.1	54.81	55.13	-0.6
11	3.197	18.5	26.20	26.10	0.4
12	4.055	21.6	12.07	11.89	1.5
13	5.148	25.4	5.381	5.250	2.5
14	6.543	30.4	2.310	2.255	2.4
15	8.323	37.2	0.9511	0.9465	0.5
16	10.592	46.9	0.3732	0.3903	-4.5
17	13.490	60.5	0.1404	0.1585	0.0
18	17.188	81.6	0.4924E-01	0.6354E-01	0.0
19	21.903	119.9	0.1515E-01	0.2521E-01	0.0
20	27.915	194.0	0.4030E-02	0.9896E-02	0.0

Mean percent Symmetric error = 1.45

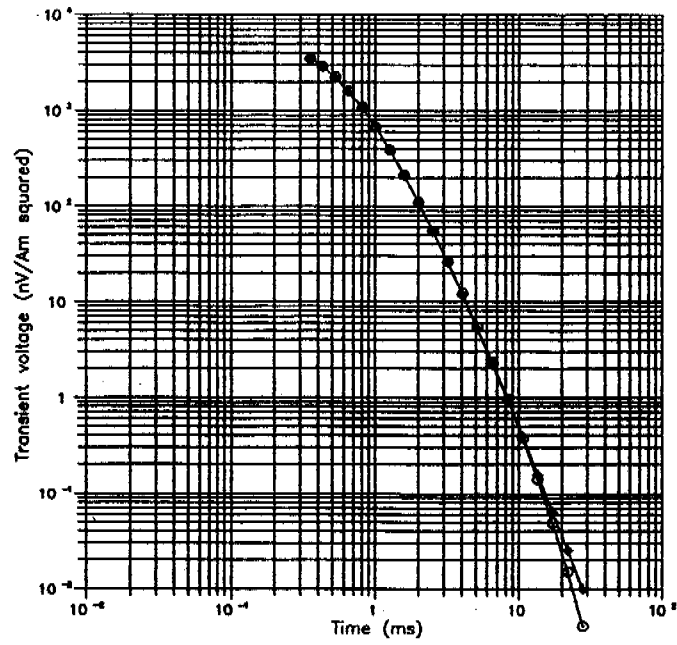
Maximum percent Symmetric error = 4.46

Maximum Symmetric error occurred at observation 16

Average predicted residual error (APRE) = 2.99 percent

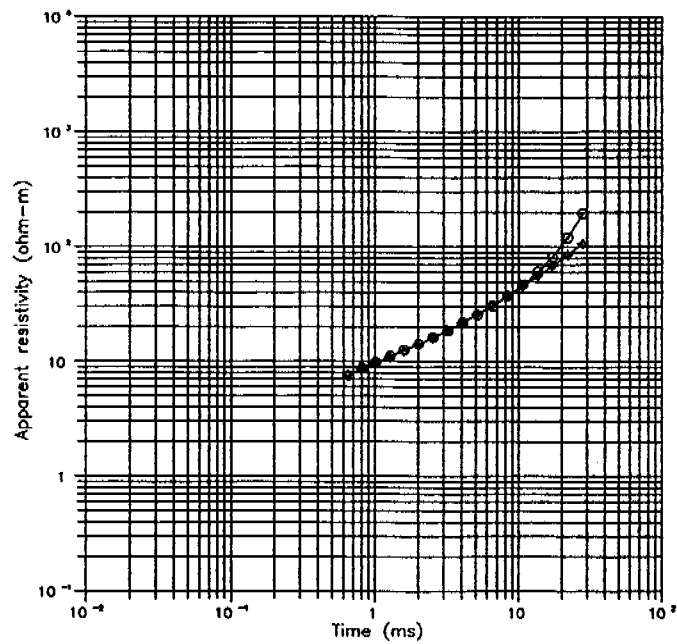
Transient decays

6.25 Hz data
Loop : 200
Station : 66E, 292

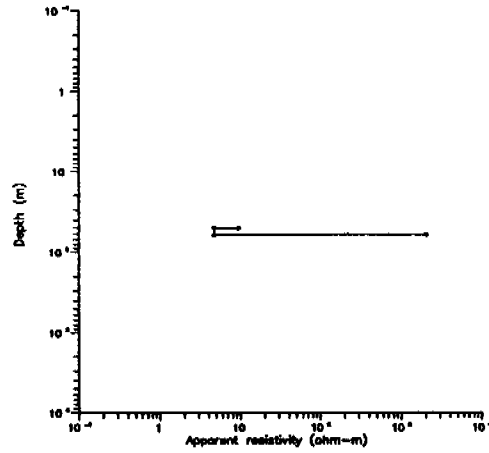


Apparent resistivity

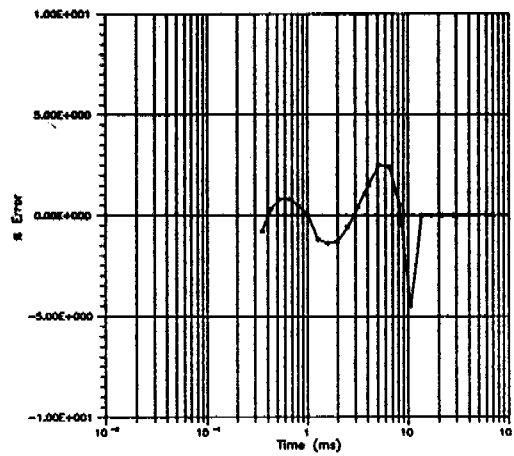
6.25 Hz data
Loop : 200
Station : 66E, 292



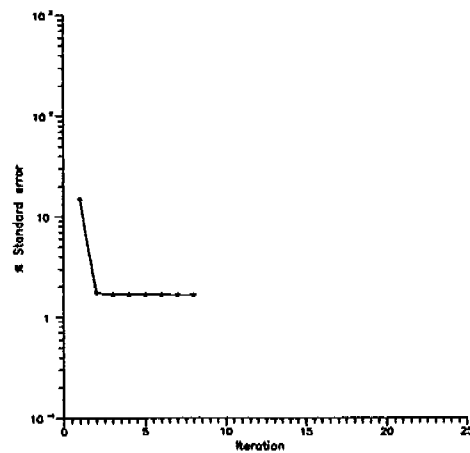
Layered-earth model
 6.25 Hz data
 Loop : 200
 Station : 66E, 292



Error structure
 6.25 Hz data
 Loop : 200
 Station : 66E, 292



Standard error per iteration
 6.25 Hz data
 Loop : 200
 Station : 66E, 292



Y291/066

GRENDL Inversion results

Job # : 3-825 Date : 31.10.94
 Program : GRENDL Version : July, 1992

Client : BHP

TEM File: 040794.TEM

Loop : 201
 Line : 66E Station : 291.000

The initial model is:

I	Resistivity	Thickness	Depth
1	50.00	15.00	15.00
2	5.000	15.00	30.00
3	550.0		

Convergence to final model

Standard error = 79.46 percent
 Standard error = 6.93 percent
 Standard error = 3.19 percent
 Standard error = 2.37 percent
 Standard error = 2.04 percent
 Standard error = 1.96 percent
 Standard error = 1.94 percent
 Standard error = 1.93 percent
 Standard error = 1.92 percent
 Standard error = 1.92 percent
 Standard error = 1.91 percent
 Standard error = 1.91 percent
 Standard error = 1.90 percent
 Standard error = 1.90 percent
 Standard error = 1.90 percent
 Standard error = 1.89 percent
 Standard error = 1.89 percent
 Standard error = 1.89 percent
 Standard error = 1.89 percent
 Standard error = 1.88 percent
 Standard error = 1.88 percent

Final model :

TEM File: 040794.tem Loop : 201 Line : 66E Station : 291.000"

I	Resistivity	Thickness	Depth
1	49.49	12.45	12.45
2	3.022	13.18	25.63
3	544.2		

Error structure of fitted model

Chnl	DELAY Time (ms)	Apparent Resistivity Observed Calculated	Observed DB/DT (nV/sq.m)	Calculated DB/DT (nV/sq.m)	Weighted percent Symmetric Error
1	0.352	UNDEFINED UNDEFINED	3650.	3654.	-0.1
2	0.428	UNDEFINED UNDEFINED	2801.	2810.	-0.3
3	0.525	8.6 8.5	1980.	1991.	-0.6
4	0.647	10.7 10.7	1301.	1307.	-0.5
5	0.803	12.6 12.6	794.4	795.4	-0.1
6	1.003	14.7 14.7	444.6	446.0	-0.3
7	1.258	17.1 17.2	234.8	233.5	0.5
8	1.582	20.1 20.3	116.8	115.5	1.2
9	1.997	23.8 24.1	55.17	54.30	1.6
10	2.525	28.5 28.8	24.93	24.62	1.2
11	3.197	34.5 34.5	10.85	10.85	0.0
12	4.055	42.1 41.6	4.595	4.677	-1.8
13	5.148	51.3 50.1	1.928	1.991	-3.2
14	6.543	61.7 60.4	0.8139	0.8397	-3.1
15	8.323	73.2 72.7	0.3489	0.3529	-1.1
16	10.592	85.0 87.1	0.1539	0.1486	3.5
17	13.490	102.0 103.8	0.6438E-01	0.6274E-01	2.6
18	17.188	124.5 123.2	0.2621E-01	0.2664E-01	-1.6
19	21.903	146.0 145.3	0.1129E-01	0.1137E-01	-0.7
20	27.915	188.8 170.8	0.4200E-02	0.4877E-02	0.0

Mean percent Symmetric error = 1.63

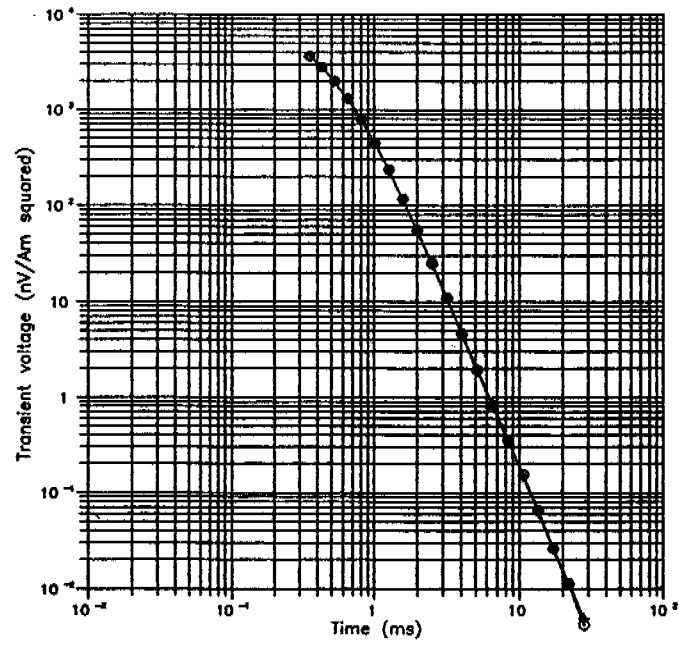
Maximum percent Symmetric error = 3.54

Maximum Symmetric error occurred at observation 16

Average predicted residual error (APRE) = 1.94 percent

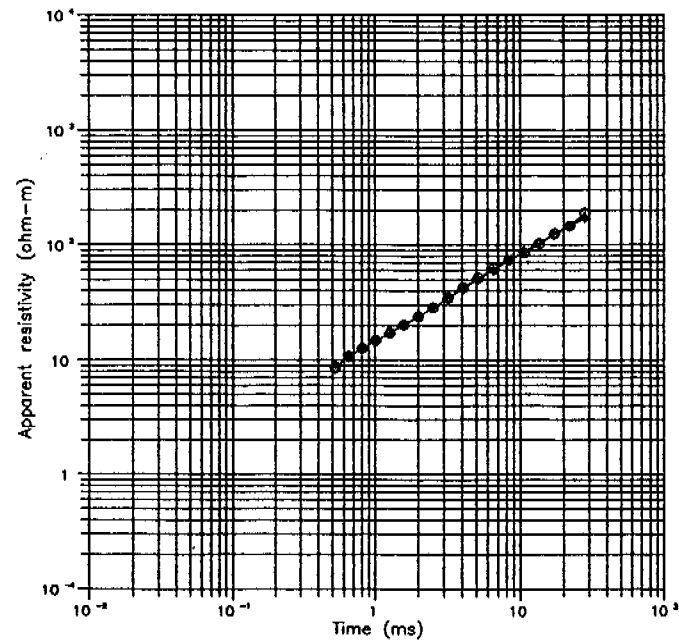
Transient decays

6.25 Hz data
 Loop : 201
 Station : 66E, 291



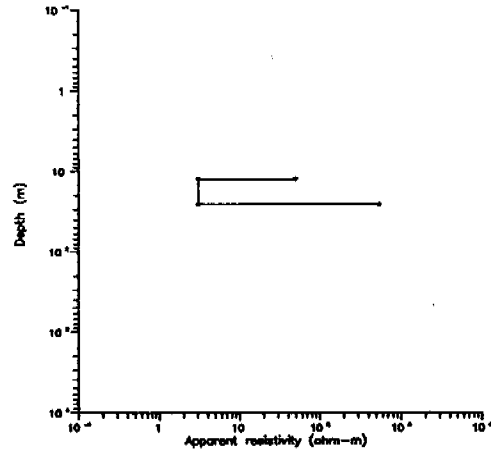
Apparent resistivity

6.25 Hz data
 Loop : 201
 Station : 66E, 291



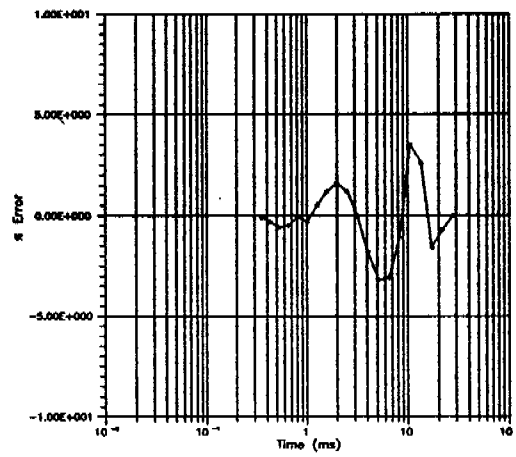
Layered-earth model

6.25 Hz data
Loop : 201
Station : 66E, 291



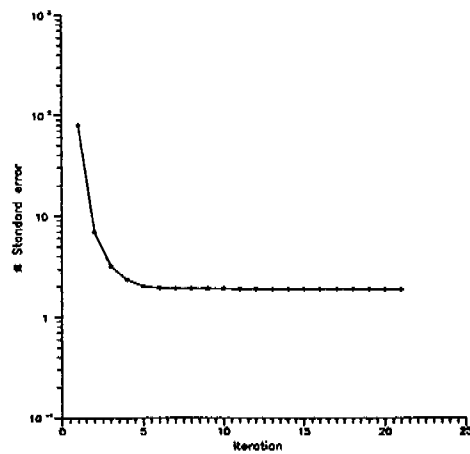
Error structure

6.25 Hz data
Loop : 201
Station : 66E, 291



Standard error per iteration

6.25 Hz data
Loop : 201
Station : 66E, 291



SOUNDING: 292034 : Vers 1
 Mt Young Y292/034 25 Hz

292034A

~~103 ohm.m~~ * ~~10.6 m~~ 10.6 m.
 * 6.5 ohm.m 33.2 m. * 43.8 m.

~~103~~
 * 6.5

46.0 ohm.m 89.5 m.

46.0

133 m.

(442 ohm.m)

(442)

STD ERR- 1.5% : S- 7 S

E= 1%
 S= 7S

Sounding 292834 : Ver 1

1e3

□model

+field

100

10

time (msec)

.1

1

10

100

1
2
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Y292/034

GRENDL Inversion results

Job # : 3-825 Date : 31.10.94
 Program : GRENDL Version : July, 1992

Client : RHP

TEM File: 040794.TEM

Loop : 202
 Line : 2926N Station : 34.000

The initial model is:

I	Resistivity	Thickness	Depth
1	10.00	75.00	75.00
2	50.00	50.00	125.0
3	750.0		

Convergence to final model

Standard error = 34.43 percent
 Standard error = 2.54 percent
 Standard error = 1.20 percent
 Standard error = 1.09 percent
 Standard error = 0.99 percent
 Standard error = 0.96 percent
 Standard error = 0.95 percent
 Standard error = 0.95 percent
 Standard error = 0.95 percent
 Standard error = 0.95 percent

Final model :

"TEM File: 040794.TEM Loop : 202 Line : 2926N Station : 34.000"

I	Resistivity	Thickness	Depth
1	11.05	67.50	67.50
2	49.79	52.48	120.0
3	666.6		

Error structure of fitted model

Chnl	DELAY Time (ms)	Apparent Resistivity		Observed DB/DT (nV/sq.m)	Calculated DB/DT (nV/sq.m)	Weighted percent Symmetric Error
		Observed	Calculated			
1	0.352	UNDEFINED	UNDEFINED	3303.	3336.	-1.1
2	0.428	UNDEFINED	UNDEFINED	2622.	2626.	-0.2
3	0.525	8.8	8.9	1942.	1933.	0.5
4	0.647	10.0	10.2	1350.	1339.	0.8
5	0.803	11.1	11.2	880.2	872.9	0.8
6	1.003	12.3	12.4	535.4	532.0	0.6
7	1.258	13.7	13.6	304.4	305.6	-0.4
8	1.582	15.3	15.2	165.0	166.4	-0.8
9	1.997	17.1	17.0	85.38	86.16	-0.9
10	2.525	19.4	19.3	42.50	42.76	-0.6
11	3.197	22.1	22.1	20.43	20.42	0.0
12	4.055	25.5	25.6	9.490	9.428	0.7
13	5.148	29.8	29.9	4.261	4.236	0.6
14	6.543	35.3	35.3	1.856	1.857	-0.1
15	8.323	42.2	41.9	0.7917	0.7991	-0.9
16	10.592	50.2	50.0	0.3375	0.3389	-0.4
17	13.490	59.1	60.0	0.1456	0.1421	2.4
18	17.188	72.6	72.3	0.5874E-01	0.5912E-01	-0.6
19	21.903	87.5	87.2	0.2429E-01	0.2444E-01	-0.6
20	27.915	124.0	105.4	0.7880E-02	0.1005E-01	0.0

Mean percent Symmetric error = 0.82

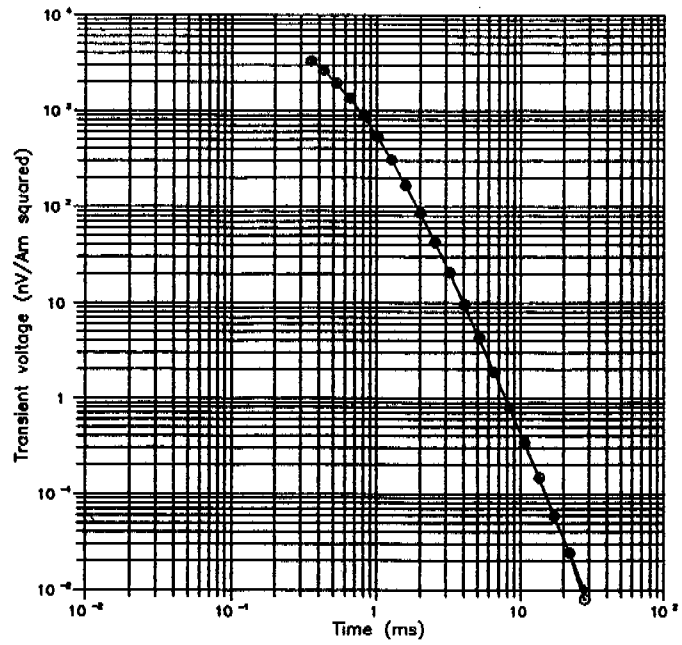
Maximum percent Symmetric error = 2.39

Maximum Symmetric error occurred at observation 17

Average predicted residual error (APRE) = 1.04 percent

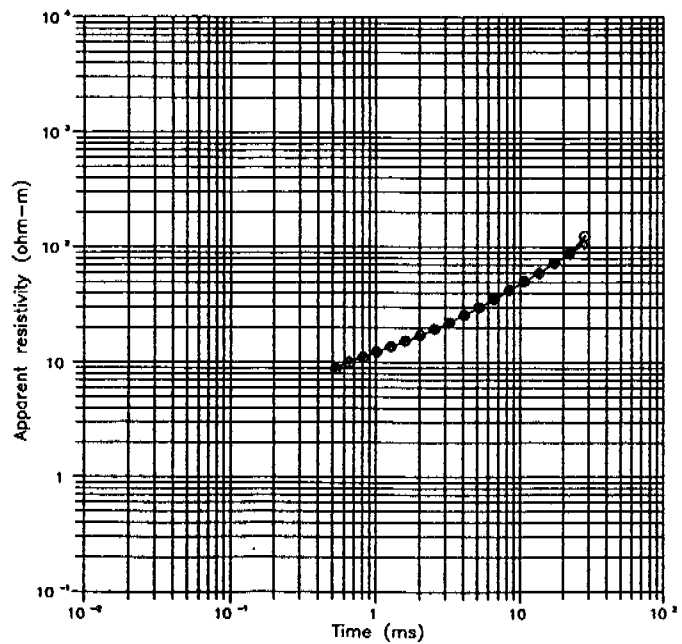
Transient decays

6.25 Hz data
Loop : 202
Station : 926N, 34



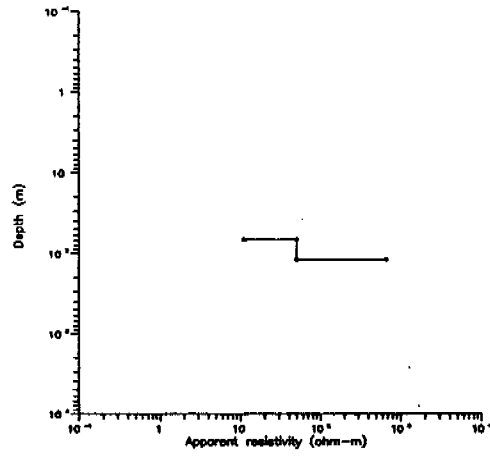
Apparent resistivity

6.25 Hz data
Loop : 202
Station : 926N, 34



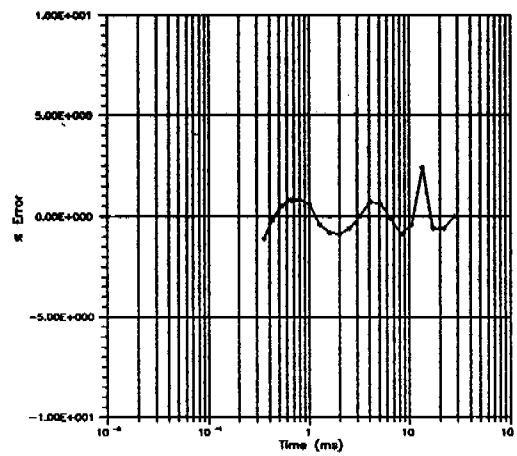
Layered-earth model

6.25 Hz data
Loop : 202
Station : 926N, 34



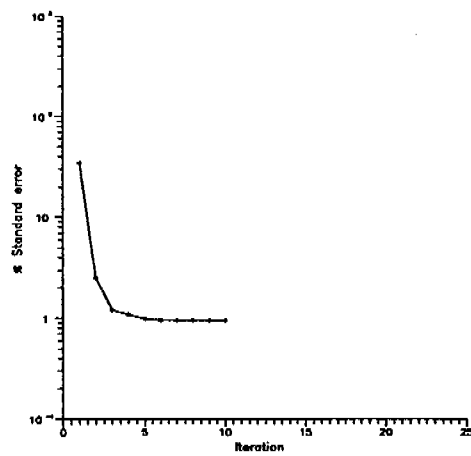
Error structure

6.25 Hz data
Loop : 202
Station : 926N, 34



Standard error per iteration

6.25 Hz data
Loop : 202
Station : 926N, 34



SOUNDING: 292018 : Vers 1
Mt Young Y292/018 25 Hz

292018A

~~84.7 ohm.m~~ ~~5.9 m~~ 5.9 m.
* 7.7 ohm.m 30.6 m. 36.5 m.

~~84.7~~
* 7.7

* 24.1 ohm.m * 111 m.

* 24.1

—————* 147 m.
(2457 ohm.m)

—————
(2457)

STD ERR= 1.2% : S= 9 S

E= 1%
S= 9S

Sounding 292018 : Ver 1

1e3

□model

+field

100

10

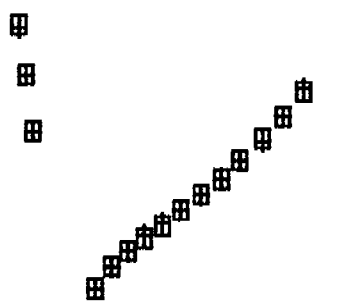
time (nsec)

.1

1

10

100



Y292/018

GRENDL Inversion results

Job # : 3-825 Date : 31.10.94
Program : GRENDL Version : July, 1992

Client : BHP

TEM File: 050794.TEM

Loop : 203

Line : 2926W Station : 18.000

The initial model is:

I	Resistivity	Thickness	Depth
1	10.00	50.00	50.00
2	15.00	75.00	125.0
3	2500.		

Convergence to final model

Standard error = 25.80 percent
Standard error = 3.27 percent
Standard error = 1.68 percent
Standard error = 1.21 percent
Standard error = 1.01 percent
Standard error = 0.99 percent
Standard error = 0.99 percent
Standard error = 0.99 percent
Standard error = 0.99 percent
Standard error = 0.99 percent

Final model :

*TEM File: 050794.TEM Loop : 203 Line : 2926W Station : 18.000"

I	Resistivity	Thickness	Depth
1	10.43	43.32	43.32
2	21.42	92.73	136.1
3	2467.		

Error structure of fitted model

Chnl	DELAY Time (ms)	Apparent Resistivity Observed	Apparent Resistivity Calculated	Observed DB/DT (nV/sq.m)	Calculated DB/DT (nV/sq.m)	Weighted percent Symmetric Error
1	0.352	UNDEFINED	UNDEFINED	3259.	3275.	-0.5
2	0.428	UNDEFINED	UNDEFINED	2569.	2559.	0.4
3	0.525	9.3	9.4	1896.	1883.	0.7
4	0.647	10.4	10.4	1320.	1313.	0.5
5	0.803	11.3	11.3	867.9	868.2	0.0
6	1.003	12.3	12.2	536.8	539.7	-0.5
7	1.258	13.3	13.2	313.8	317.8	-1.2
8	1.582	14.8	14.4	176.3	178.0	-1.0
9	1.997	15.8	15.8	94.83	95.12	-0.3
10	2.525	17.4	17.5	49.12	48.80	0.7
11	3.197	19.5	19.7	24.42	24.08	1.4
12	4.055	22.1	22.4	11.64	11.45	1.6
13	5.148	25.6	25.7	5.316	5.281	0.7
14	6.543	30.4	29.9	2.309	2.364	-2.3
15	8.323	37.1	35.3	0.9563	1.031	0.0
16	10.592	47.0	42.0	0.3719	0.4397	0.0
17	13.490	61.3	50.5	0.1377	0.1839	0.0
18	17.188	84.8	61.3	0.4649E-01	0.7553E-01	0.0
19	21.903	135.8	75.1	0.1258E-01	0.3054E-01	0.0
20	27.915	333.4	92.8	0.1790E-02	0.1216E-01	0.0

Mean percent Symmetric error = 0.86

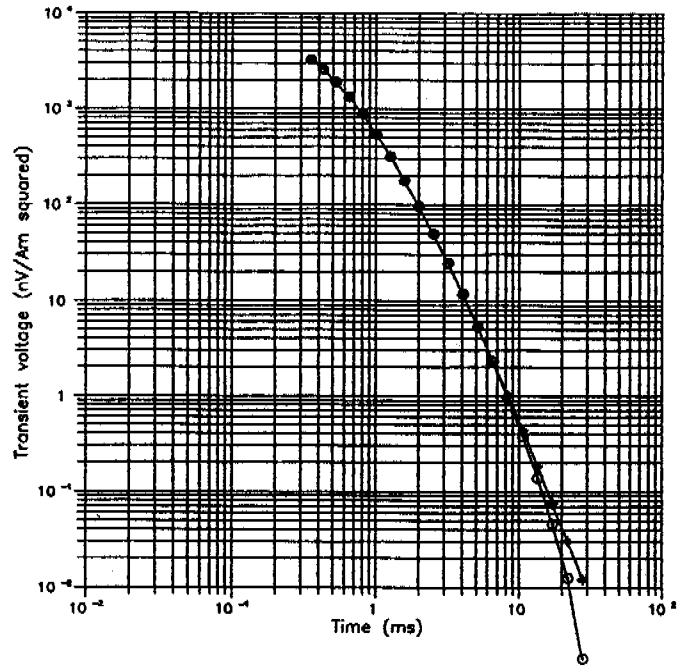
Maximum percent Symmetric error = 2.31

Maximum Symmetric error occurred at observation 14

Average predicted residual error (APRE) = 1.91 percent

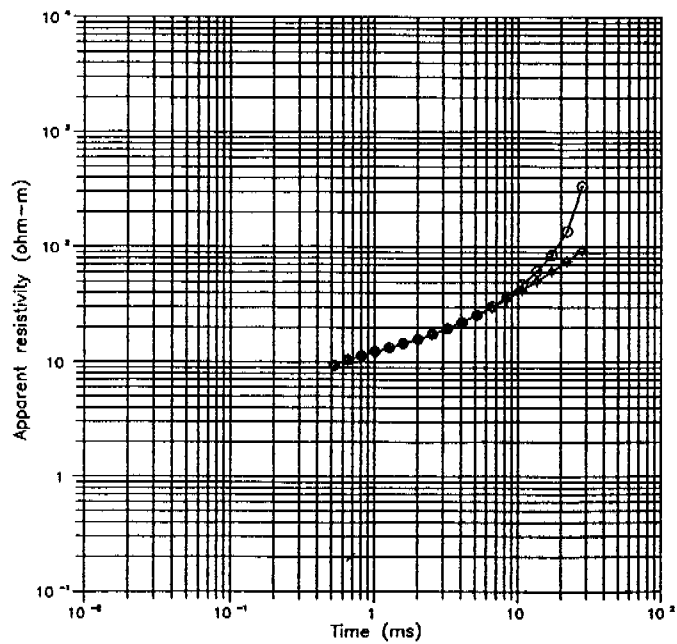
Transient decays

6.25 Hz data
Loop : 203
Station : 926N, 18



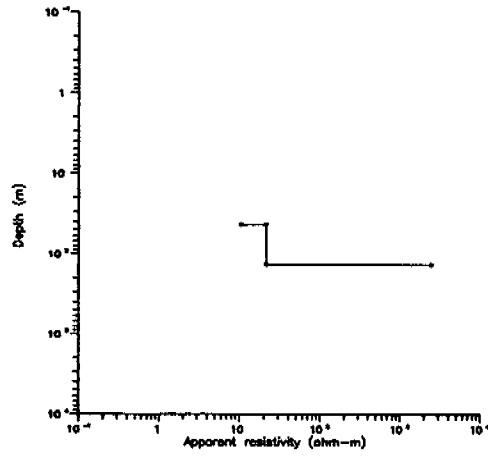
Apparent resistivity

6.25 Hz data
Loop : 203
Station : 926N, 18



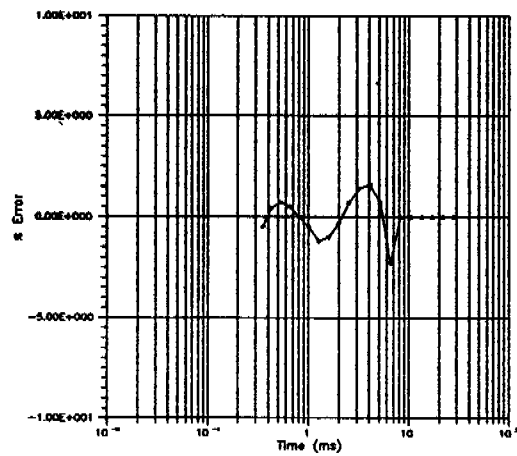
Layered-earth model

6.25 Hz data
Loop : 203
Station : 926N, 18



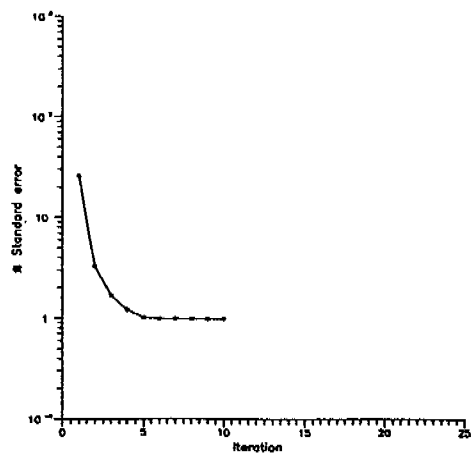
Error structure

6.25 Hz data
Loop : 203
Station : 926N, 18



Standard error per iteration

6.25 Hz data
Loop : 203
Station : 926N, 18



SOUNDING: 289050 : Vers 1
Mt Young Y289/050 25 Hz

~~8.1 ohm.m~~ ~~4.8 m.~~ 4.8 m.

* 26.9 ohm.m

* 100 m.

_____* 105 m.
(2728 ohm.m)

STD ERR= 2.7% : S= 5 S

289050A

~~8.1~~

* 26.9

(2728)

E= 3%

S= 5S

APPENDIX 4.

**Soil and Rock Sampling
Analytical Results**

SOIL SAMPLE ANALYSIS DESCRIPTION

Scheme Code: GP031

Sample preparation of soil samples; dry, fine pulverise

Scheme Code: D140

Aqua regia/perchloric acid digest (0.3g sample)

Scheme Code: GA140

AAS determination

Cu: Copper

Pb: Lead

Zn: Zinc

Fe: Iron

Mn: Manganese

1994 NATHAN RIVER PROJECT SOIL SAMPLE DETAILS

LAB BATCH	SAMPLE	AMG	AMG	AREA	Cu	Zn	Pb	Fe	Mn
CODE	NUMBER	EASTING	NORTHING		ppm	ppm	ppm	ppm	ppm
29756	EI4502	553988	8301956	MY9	19	33	12	23100	114
29756	EI4504	554266	8301925	MY9	9	10	4	5800	50
29756	EI4505	554171	8301918	MY9	4	-2	-3	5300	94
29756	EI4506	554081	8301956	MY9	6	7	3	6800	65
29756	EI4507	553988	8301941	MY9	11	10	7	7800	246
29756	EI4508	553888	8301935	MY9	9	8	3	7300	188
29756	EI4509	553788	8301935	MY9	25	22	11	16900	1210
29756	EI4510	553688	8301935	MY9	6	9	6	5900	254
30243	EH2769	543600	8286000	MY17	6	10	4	11500	320
30243	EH2774	544000	8286000	MY17	7	11	6	13900	450
30243	EH2776	544200	8286000	MY17	9	22	11	24900	250
30243	EH2775	544100	8286000	MY17	8	17	6	21700	220
30243	EH2785	545100	8286000	MY17	4	5	14	9800	110
30243	EH2784	545000	8286000	MY17	3	5	11	7900	120
30243	EH2783	544900	8286000	MY17	2	4	-3	10100	130
30243	EH2782	544800	8286000	MY17	3	4	-3	5700	100
30243	EH2781	544700	8286000	MY17	2	3	-3	6700	100
30243	EH2780	544600	8286000	MY17	3	3	-3	6100	90
30243	EH2779	544500	8286000	MY17	2	2	4	5000	110
30243	EH2778	544400	8286000	MY17	4	4	-3	4600	90
30243	EH2777	544300	8286000	MY17	7	12	6	11900	650
30243	EH2773	543900	8286000	MY17	7	12	6	11700	510
30243	EH2770	543700	8286000	MY17	10	21	9	27400	170
30243	EH2771	543730	8286000	MY17	25	18	11	15200	220
30243	EH2772	543800	8286000	MY17	8	15	5	14400	380
TV30352	EH0836	547100	8279350	MY19	9	17	3	12400	237
TV30352	EH0851	545800	8278830	MY19	7	5	-3	8200	81
TV30352	EH0850	545893	8278867	MY19	7	7	-3	6000	73
TV30352	EH0849	545986	8278904	MY19	5	6	-3	2700	87
TV30352	EH0848	546079	8278941	MY19	8	7	-3	9500	120
TV30352	EH0847	546172	8278979	MY19	12	7	-3	7100	110
TV30352	EH0846	546264	8279016	MY19	9	7	-3	6200	67
TV30352	EH0845	546357	8279053	MY19	11	11	4	11000	347
TV30352	EH0844	546450	8279090	MY19	12	10	4	12100	343
TV30352	EH0867	546808	8279676	MY19	6	5	-3	4700	150
TV30352	EH0866	546712	8279651	MY19	7	5	-3	4500	62
TV30352	EH0865	546615	8279626	MY19	7	8	-3	12900	133
TV30352	EH0864	546518	8279601	MY19	8	8	4	16400	47
TV30352	EH0863	546421	8279576	MY19	12	8	-3	13800	210
TV30352	EH0862	546324	8279551	MY19	9	7	-3	8300	189
TV30352	EH0861	546228	8279526	MY19	8	6	3	8000	60
TV30352	EH0860	546131	8279501	MY19	6	4	5	7900	148
TV30352	EH0869	547002	8279726	MY19	7	6	4	6300	105
TV30352	EH0868	546905	8279701	MY19	7	5	4	5500	92
TV30352	EH0859	546131	8279501	MY19	6	4	4	8200	157
TV30352	EH0858	546034	8279475	MY19	6	5	3	7500	76
TV30352	EH0857	545937	8279450	MY19	6	4	3	4400	44
TV30352	EH0856	545840	8279425	MY19	5	5	-3	9300	125
TV30352	EH0855	545744	8279400	MY19	6	6	3	12300	142
TV30352	EH0854	545647	8279375	MY19	9	9	-3	28600	83
TV30352	EH0853	545550	8279350	MY19	5	7	-3	6000	91
TV30352	EH0852	545707	8278793	MY19	13	12	5	24700	106
TV30352	EH0839	546914	8279276	MY19	8	10	-3	7300	91

1994 NATHAN RIVER PROJECT SOIL SAMPLE DETAILS

LAB BATCH	SAMPLE	AMG	AMG	AREA	Cu	Zn	Pb	Fe	Mn
CODE	NUMBER	EASTING	NORTHING		ppm	ppm	ppm	ppm	ppm
TV30352	EH0840	546821	8279239	MY19	9	8	4	6400	49
TV30352	EH0841	546729	8279201	MY19	7	8	3	8700	130
TV30352	EH0843	546543	8279127	MY19	7	7	3	9500	108
TV30352	EH0842	546636	8279164	MY19	7	7	3	6200	160
TV30352	EH0838	547007	8279313	MY19	11	9	-3	9700	278
TV30352	EH0837	547100	8279350	MY19	8	16	4	12000	242
TV30352	EH0883	551250	8261000	MY26/28	9	8	6	9000	236
TV30352	EH0882	551200	8261000	MY26/28	11	8	4	8400	171
TV30352	EH0881	551150	8261000	MY26/28	12	9	7	13100	257
TV30352	EH0880	551100	8261000	MY26/28	12	6	4	8700	197
TV30352	EH0879	551050	8261000	MY26/28	10	6	4	8100	102
TV30352	EH0878	551000	8261000	MY26/28	9	7	4	9100	46
TV30352	EH0877	550950	8261000	MY26/28	6	5	-3	11300	172
TV30352	EH0876	550900	8261000	MY26/28	8	8	4	8600	70
TV30352	EH0933	550705	8258897	MY26/28	6	6	3	14400	123
TV30352	EH0932	550755	8258903	MY26/28	10	9	7	20500	75
TV30352	EH0931	550805	8258908	MY26/28	5	3	3	10900	174
TV30352	EH0930	550854	8258913	MY26/28	8	6	6	18700	164
TV30352	EH0929	550904	8258918	MY26/28	11	10	11	25300	296
TV30352	EH0928	550954	8258923	MY26/28	12	-2	12	21100	103
TV30352	EH0927	551004	8258928	MY26/28	6	5	4	13000	170
TV30352	EH0926	551053	8258933	MY26/28	9	7	5	6800	71
TV30352	EH0925	551103	8258938	MY26/28	10	8	5	9100	235
TV30352	EH0924	551153	8258944	MY26/28	10	5	5	7600	47
TV30352	EH0923	551203	8258949	MY26/28	10	7	5	11100	158
TV30352	EH0922	551252	8258954	MY26/28	12	9	5	15700	370
TV30352	EH0921	551302	8258959	MY26/28	11	7	8	14400	392
TV30352	EH0920	551352	8258964	MY26/28	10	7	5	10000	314
TV30352	EH0919	551402	8258969	MY26/28	9	5	5	9000	482
TV30352	EH0918	551451	8258974	MY26/28	8	6	5	9200	366
TV30352	EH0917	551501	8258979	MY26/28	8	6	4	8900	442
TV30352	EH0916	551551	8258985	MY26/28	7	5	-3	10000	170
TV30352	EH0915	551601	8258990	MY26/28	6	6	5	17400	88
TV30352	EH0914	551650	8258995	MY26/28	6	5	4	9800	91
TV30352	EH0913	551700	8259000	MY26/28	9	8	5	20400	192
TV30352	EH0912	550506	8260108	MY26/28	11	7	4	10400	288
TV30352	EH0911	550506	8260108	MY26/28	11	8	-3	9900	298
TV30352	EH0910	550556	8260103	MY26/28	9	7	5	14500	413
TV30352	EH0909	550605	8260097	MY26/28	6	6	-3	96000	123
TV30352	EH0908	550655	8260092	MY26/28	8	11	5	36800	134
TV30352	EH0907	550705	8260086	MY26/28	9	11	6	28000	63
TV30352	EH0906	550754	8260081	MY26/28	11	10	6	16700	122
TV30352	EH0905	550804	8260076	MY26/28	11	9	6	15300	73
TV30352	EH0904	550854	8260070	MY26/28	6	5	4	11400	113
TV30352	EH0903	550904	8260065	MY26/28	3	4	5	8100	221
TV30352	EH0902	550953	8260059	MY26/28	8	8	6	11000	289
TV30352	EH0901	551003	8260054	MY26/28	5	6	3	5900	51
TV30352	EH0900	551053	8260049	MY26/28	7	6	-3	9400	25
TV30352	EH0899	551102	8260043	MY26/28	9	7	5	14400	37
TV30352	EH0898	551152	8260038	MY26/28	11	8	6	18400	129
TV30352	EH0897	551202	8260032	MY26/28	9	9	6	9700	162
TV30352	EH0896	551251	8260027	MY26/28	7	9	-3	8000	209
TV30352	EH0895	551301	8260022	MY26/28	7	-2	5	7700	131

1994 NATHAN RIVER PROJECT SOIL SAMPLE DETAILS

LAB BATCH	SAMPLE	AMG	AMG	AREA	Cu	Zn	Pb	Fe	Mn
CODE	NUMBER	EASTING	NORTHING		ppm	ppm	ppm	ppm	ppm
TV30352	EH0894	551351	8260016	MY26/28	7	6	3	6800	209
TV30352	EH0893	551401	8260011	MY26/28	8	9	4	7500	197
TV30352	EH0892	551450	8260005	MY26/28	9	10	8	21600	157
TV30352	EH0891	551500	8260000	MY26/28	4	7	3	10800	112
TV30352	EH0890	551600	8261000	MY26/28	9	10	6	18700	64
TV30352	EH0889	551500	8261000	MY26/28	9	8	5	10200	80
TV30352	EH0888	551500	8261000	MY26/28	11	10	6	12900	79
TV30352	EH0887	551450	8261000	MY26/28	9	11	7	13800	138
TV30352	EH0886	551400	8261000	MY26/28	8	7	4	7000	149
TV30352	EH0885	551350	8261000	MY26/28	9	8	4	11400	421
TV30352	EH0884	551300	8261000	MY26/28	9	8	5	8100	183
TV30352	EH0875	550850	8261000	MY26/28	12	13	4	12200	233
TV30352	EH0874	550800	8261000	MY26/28	9	10	5	23700	190
TV30352	EH0873	550750	8261000	MY26/28	7	7	5	14600	106
TV30352	EH0872	550700	8261000	MY26/28	6	9	5	16200	160
TV30352	EH0871	550650	8261000	MY26/28	10	11	5	18200	94
TV30352	EH0870	550600	8261000	MY26/28	8	10	3	21900	66
TV30352	EH0955	550164	8255058	MY29	10	6	6	12100	124
TV30352	EH0954	550118	8255076	MY29	8	5	4	10600	91
TV30352	EH0953	550072	8255094	MY29	6	4	4	8300	228
TV30352	EH0952	550026	8255112	MY29	10	7	4	12700	48
TV30352	EH0951	549980	8255130	MY29	7	7	7	17900	122
TV30352	EH0950	549934	8255148	MY29	11	5	-3	7000	257
TV30352	EH0949	549934	8255148	MY29	8	5	-3	6600	249
TV30352	EH0948	549888	8255166	MY29	11	5	-3	5000	198
TV30352	EH0947	549842	8255184	MY29	11	4	-3	7700	69
TV30352	EH0946	549796	8255202	MY29	11	5	4	11900	303
TV30352	EH0945	549750	8255220	MY29	8	3	3	7300	244
TV30352	EH0944	549704	8255238	MY29	10	4	4	8700	168
TV30352	EH0943	549658	8255256	MY29	10	5	3	8200	67
TV30352	EH0941	549566	8255292	MY29	10	6	4	9900	33
TV30352	EH0940	549520	8255310	MY29	9	4	-3	7800	65
TV30352	EH0939	549474	8255328	MY29	8	5	-3	11600	230
TV30352	EH0938	549428	8255346	MY29	9	4	5	8500	282
TV30352	EH0937	549382	8255364	MY29	5	3	5	9100	241
TV30352	EH0936	549382	8255364	MY29	6	4	5	9600	233
TV30352	EH0935	549336	8255382	MY29	14	17	7	16500	179
TV30352	EH0934	549290	8255400	MY29	10	12	8	22300	248
TV30352	EH0956	550210	8255040	MY29	7	5	7	14500	104

SOIL, DRILL CORE, DRILL CHIP ANALYSIS DESCRIPTION

Scheme Code: GP033

Sample preparation of samples; dry, jaw crush, fine pulverise

Scheme Code: D140

Aqua regia/perchloric acid digest (0.3g sample)

Scheme Code: GI140

ICPOES determination

Cu: Copper
Pb: Lead
Zn: Zinc
Fe: Iron
Mn: Manganese
As: Arsenic
Ni: Nickel
Co: Cobalt
Mo: Molybdenum
Cr: Chromium
P : Phosphorus
V : Vanadium
Cd: Cadmium
Ag: Silver

1994 NATHAN RIVER PROJECT ROCK SAMPLE DETAILS

LAB BATCH	TENEMENT	SAMPLE	ROCK	AMG	AMG	Cu	Pb	Zn	Mn	Fe	Ag	Ars	Co	Cr	Ni	P	Cd	Mo	V
CODE	NUMBER	NUMBER	TYPE	EASTING	NORTHING	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
29756	E7262	E14501	Qz Vein	554015	8301920	65	11	7	1042	29900	-0.2	17	9	64	10	79	-0.5	-2	47

APPENDIX 5.

Base Metal Drill Logs

MYP001

0-4	Weathered, red-brown ferruginous sandy mudstone.
4-18	Weathered, red-brown ferruginous shaly mudstone.
18-22	Ferruginous, shaly sandstone.
22-36	Ferruginous shale.
36-40	Ferruginous sandy shale.
40-56	Ferruginous shale.
56-72	Slate.
72-80	Sandy shale.
80-96	Variably micaceous sandstone and quartz sandstone. Minor shale interbeds.
EOH	
0-96m	Proterozoic Mantungula Formation.

MYP002

- 0-1 Soil
- 1-98 Proterozoic Balbarini Dolomite.
- 1-22 Weathered laminated dolomitic siltstone.
- 22 Box
- 22-80 Black laminated carbonaceous dolomitic siltstone.
- 80 WT
- 80-86 Black, red laminated carbonaceous dolomitic siltstone.
- 86-88 Grey laminated dolomitic siltstone.
- 88-98 Red, grey well bedded fine sandstone.

EOH

Sampled 0-98 m

CARPENTA\REP\BJ.FAF\DW

MYP004

0-1 Cainozoic Transported Cover.

Colluvial quartz pebbles.

1-118 Proterozoic Mainoru Formation.

1-16 Weathered laminated siltstone.

16 Box

16-60 Grey laminated carbonaceous siltstone.

60-70 Grey laminated carbonaceous dolomitic siltstone.

108-118 Grey well bedded micaceous dolomitic fine sandstone.

116 WT

EOH

Sampled 0-118 m

CARPENTA\REP\BJ.FAF\DW

DDH MYD002 LOG

0-14m	Green, brown and red, highly weathered, laminated mudstone. Significant clay.
14-30m	Medium brown, green and red, weathered, laminated mudstone. Minor clay.
30-36m	Medium brown, massive to laminated, fine mudstone. Minor green interbeds. Minor coarse silt sized interbeds. Base of oxidation.
36-58m	Dark green, medium red-brown and minor black, laminated mudstone. Minor green interbeds.
58-60m	Medium grey-green, dololomite. Very minor thin quartz arenite interbeds.
60-62m	Banded dark and light green, laminated, dolomitic mudstone.
62-66m	Dark grey, laminated mudstone. Trace very fine pyrite 62-64 m.
66-78m	Dark brown, bedded dolomitic mudstone. Minor green interbeds.
78-90m	Dark grey, laminated mudstone. Minor pyrite including bedded pyrite at 84-86 m. Minor quartz veining. Some bedding planes are carbonaceous.
90-120m	Dark grey to black, laminated, variably carbonaceous mudstone. Fine mica on some bedding planes? End of RC pre-collar.
120.3-146.8m	Dark green to green-grey, laminated, weakly carbonaceous mudstone. Carbonaceous material occurs as small flecks on bedding planes and in thin beds that commonly grade up into flecked mudstone. Minor carbonate veining. Minor chalcopyrite in carbonate vein at 123 m. Several small fault zones. Minor polished and striated carbonaceous slip surfaces.
146.8-148.3m	Shear zone. Four main intervals of crushed mudstone/clayey gauge within a fractured dark grey green, laminated carbonaceous mudstone. Numerous polished and striated carbonaceous slip surfaces.
148.3-155.8m	Dark green-grey, laminated, variably carbonaceous mudstone. Thin beds of highly carbonaceous mudstone commonly grading up in to carbonaceous flecked mudstone. Minor soft sediment deformation. Blebs of pyrite on fractures. Minor fine disseminated pyrite at 155.8 m.

155.8-157.3m	Dark green-grey, laminated, variably carbonaceous mudstone. Minor black carbonaceous mudstone interbeds. Extensive disruption of bedding due to soft sediment deformation.
157.3-163.7m	Darkest grey-black to black, laminated, carbonaceous mudstone. Extensive disruption of bedding due to soft sediment deformation. Carbonate veining. Blebs of pyrite on fractures.
163.7-165.4m	Medium-light green, laminated, weakly carbonaceous (finely micaceous?) mudstone. Minor black carbonaceous mudstone interbeds. Bedding commonly disrupted. Trace bedded pyrite at 164.6 m.
165.4-180.0m	Darkest green to black, laminated carbonaceous mudstone. Minor medium green mudstone interbeds. Orange-brown siderite? spots after evaporites? in several places. Blebs of pyrite on fractures. 20% disseminated pyrite bed at 175.5 m.
180.0-182.3m	Darkest green to black, micaceous carbonaceous mudstone with minor interbedded light pink coloured well sorted quartz sandstones. Soft sediment deformation common.
182.3-183.7m	Medium green, interbedded mudstone, fine sand/coarse siltstone and black carbonaceous micaceous mudstone. Becomes dolomitic at base of interval. Minor pyrite and chalcopyrite in fractures and smeared on bedding planes.
183.7-186.8m	Medium red-brown, dolomitic mudstone. Minor pyrite in veins. Some coarse silt sized interbeds.

E.O.H.

0-186.8m Proterozoic Mantungula Formation?

DDH MYD003 LOG

0-12m	Medium brown to red-brown, clay, unconsolidated sand, rounded quartz arenite pebbles, siliceous algal dolomite and dark grey siltstone fragments. Transported cover.
12-22m	Medium green to red and dark red-brown, laminated, mudstones. Highly weathered clay horizons. Chlorite? on fractures.
22-36m	Medium red-brown, laminated mudstone. Minor interbedded, fine sand sized ferruginous quartz arenite. Very minor green mudstone interbeds. Base of oxidation?
36-44m	Medium red-brown, mudstone. Interbeds of medium-dark green mudstone.
44-46m	Medium-light green, bedded, fine sand sized, quartz arenite. Lesser interbedded, red-brown, mudstone.
46-48m	Darkest grey to black, laminated, carbonaceous mudstone. Minor light green-yellow coarse silty beds.
48-62m	Medium-dark to light green, laminated mudstone. Very minor black carbonaceous mudstone interbeds.
62-78m	Medium to dark red-brown, laminated mudstone. Minor thin light green mudstone interbeds.
78-102m	Dark green-grey, laminated, weakly micaceous mudstone. Small flecks of mica visible on bedding planes.
102-120m	Dark green-grey, laminated, weakly carbonaceous mudstone. Bedded and disseminated flecks of carbonaceous material. End of RC pre-collar.
120.3-120.4m	Medium red, well sorted, fine sand sized, silicified quartz arenite. Some orange mottling.
120.4-132.0m	Dark to darkest green-grey, massive to laminated, weakly carbonaceous mudstone. Carbonaceous flecks on bedding planes.
132.0-143.5m	Dark to darkest green, massive to laminated, variably carbonaceous and micaceous mudstone. Increasingly micaceous and carbonaceous towards base of interval. Minor faulting.
143.5-143.7m	White, sandy mudstone. Evaporite replacement by silica?
143.7-151.4m	Dark green, laminated, carbonaceous, micaceous mudstone. Minor faulting. Trace chalcopyrite at 150.7 m. Minor quartz arenite beds.

151.4-151.5m	Medium green, bedded very glauconitic quartz arenite. Interbedded with green to black laminated carbonaceous, micaceous mudstone.
151.5-154.4m	Dark green to black, laminated, carbonaceous, micaceous mudstone.
154.4-154.9m	Medium green, laminated mudstone. Small grains and laths of siderite? after evaporites? Trace fine disseminated pyrite and chalcopyrite.
154.9-156.1m	Darkest green to black, laminated carbonaceous, micaceous mudstone.
156.1-156.6m	Medium green, laminated, mudstone. Very fine sand sized grains of siderite? in mud matrix.
156.6-157.3m	Darkest green to black, laminated carbonaceous, micaceous mudstone.
157.3-158.5m	Medium green, bedded mudstone. Fault at base of interval.
158.5-161.0m	Darkest green to black, laminated carbonaceous, micaceous mudstone. Mottled medium green and red zone 159-159.5 m.
161.0-163.3m	Black to red-brown to green, variably carbonaceous, micaceous mudstone. Convolute bedding in places.
163.3-166.7m	Medium green-brown to dark red (gradual change in colour), laminated, micaceous mudstone. Very minor thin grey, very fine sand sized, arenite beds towards base of interval.
166.7-171.4m	Dark red-brown, massive, micaceous mudstone. Minor faulting. Minor yellow (limonite?) and green (chlorite?) staining on fractures.

E.O.H.

0-12m	Recent cover
12-171.4m	Proterozoic Mantungula Formation.

APPENDIX 6.

**Base Metal Drilling
Analytical Results**

SOIL, DRILL CORE, DRILL CHIP ANALYSIS DESCRIPTION

Scheme Code: GP033

Sample preparation of samples; dry, jaw crush, fine pulverise

Scheme Code: D140

Aqua regia/perchloric acid digest (0.3g sample)

Scheme Code: GI140

ICPOES determination

Cu:	Copper
Pb:	Lead
Zn:	Zinc
Fe:	Iron
Mn:	Manganese
As:	Arsenic
Ni:	Nickel
Co:	Cobalt
Mo:	Molybdenum
Cr:	Chromium
P :	Phosphorus
V :	Vanadium
Cd:	Cadmium
Ag:	Silver

1994 NATHAN RIVER PROJECT DRILLING SAMPLE DETAILS

LAB BATCH	HOLE	SAMPLE	SAMPLE	SAMPLE	SAMPLE	Cu	Pb	Zn	Mn	Fe	Ag	Ars	Co	Cr	Ni	P	Cd	Mo	V
CODE	NAME	NUMBER	FROM (m)	TO (m)	TYPE	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
30243	MYD002	DJ9812	0	6	CHIP	31	11	44	637	70200	-0.2	15	14	59	16	224	-0.5	-2	50
30243	MYD002	DJ9813	6	12	CHIP	42	16	47	2018	58300	-0.2	16	26	37	18	214	-0.5	-2	46
30243	MYD002	DJ9814	12	18	CHIP	38	23	54	2593	60000	-0.2	24	22	29	18	230	-0.5	-2	58
30243	MYD002	DJ9815	18	24	CHIP	31	8	67	577	43600	-0.2	-2	17	23	17	119	-0.5	-2	61
30243	MYD002	DJ9816	24	30	CHIP	52	11	92	5083	81700	-0.2	12	21	22	20	246	-0.5	-2	64
30243	MYD002	DJ9817	30	36	CHIP	30	9	69	2418	55400	-0.2	-2	13	45	14	166	-0.5	-2	54
30243	MYD002	DJ9818	36	42	CHIP	27	11	68	902	54700	-0.2	3	12	55	15	119	-0.5	-2	62
30243	MYD002	DJ9819	42	48	CHIP	4	9	59	345	64900	-0.2	5	11	53	14	190	-0.5	-2	67
30243	MYD002	DJ9820	48	54	CHIP	2	7	59	195	59400	-0.2	4	11	38	15	129	-0.5	-2	65
30243	MYD002	DJ9821	54	60	CHIP	66	8	52	2969	48400	-0.2	9	12	11	10	129	-0.5	-2	45
30243	MYD002	DJ9822	60	66	CHIP	68	14	50	2487	32100	-0.2	16	13	36	12	-50	-0.5	-2	43
30243	MYD002	DJ9823	66	72	CHIP	8	8	55	187	60500	-0.2	5	11	32	14	279	-0.5	-2	53
30243	MYD002	DJ9824	72	78	CHIP	2	-5	49	2661	53500	-0.2	12	12	20	13	171	-0.5	-2	47
30243	MYD002	DJ9825	78	84	CHIP	29	12	49	512	66000	-0.2	8	20	29	14	193	-0.5	-2	61
30243	MYD002	DJ9826	84	90	CHIP	34	21	56	152	42100	-0.2	17	17	40	16	71	-0.5	-2	46
30243	MYD002	DJ9827	90	96	CHIP	26	18	44	837	41700	-0.2	-2	14	65	11	54	-0.5	-2	36
30243	MYD002	DJ9828	96	102	CHIP	34	10	41	382	41600	-0.2	-2	16	46	15	115	-0.5	-2	43
30243	MYD002	DJ9829	102	108	CHIP	13	10	33	117	36600	-0.2	8	12	31	12	82	-0.5	-2	41
30243	MYD002	DJ9830	108	114	CHIP	26	10	38	123	37800	-0.2	13	11	37	14	101	-0.5	-2	48
30243	MYD002	DJ9831	114	120	CHIP	12	-5	35	107	34300	-0.2	5	12	25	12	114	-0.5	-2	42
TV30367	MYD002	EI5293	120	126	1/3 CORE	10	4	40	104	35000	-0.2	-2	9	-5	15	-50	-1	-5	37
TV30367	MYD002	EI5294	126	132	1/3 CORE	31	8	41	102	34400	-0.2	7	9	-5	14	50	-1	-5	38
TV30367	MYD002	EI5295	132	138	1/3 CORE	11	3	34	80	32200	-0.2	9	10	-5	13	-50	-1	-5	37
TV30367	MYD002	EI5296	138	144	1/3 CORE	4	-2	40	81	38500	-0.2	11	13	22	14	-50	-1	-5	45
TV30367	MYD002	EI5297	144	150	1/3 CORE	6	2	33	94	36000	-0.2	5	14	8	16	-50	-1	-5	50
TV30367	MYD002	EI5298	150	156	1/3 CORE	30	3	35	126	38300	-0.2	3	15	-5	17	50	-1	-5	54
TV30367	MYD002	EI5299	156	162	1/3 CORE	17	6	29	316	38500	-0.2	16	14	-5	16	100	-1	-5	60
TV30367	MYD002	EI5300	162	168	1/3 CORE	51	13	30	326	41900	-0.2	7	31	-5	18	150	-1	-5	61
TV30367	MYD002	EI5301	168	174	1/3 CORE	19	9	34	385	45700	-0.2	14	15	-5	19	150	-1	-5	63
TV30367	MYD002	EI5302	174	180	1/3 CORE	10	11	38	316	48400	-0.2	4	15	23	16	200	-1	-5	62
TV30367	MYD002	EI5303	180	186.8	1/3 CORE	56	5	41	461	51500	-0.2	-2	16	26	15	200	-1	-5	28
30243	MYD003	DJ9832	6	12	CHIP	19	16	35	401	61300	-0.2	29	17	239	22	112	-0.5	3	116
30243	MYD003	DJ9833	12	18	CHIP	29	13	113	1676	44600	-0.2	12	47	41	42	103	-0.5	-2	57
30243	MYD003	DJ9834	18	24	CHIP	15	10	51	2051	45500	-0.2	7	10	18	10	124	-0.5	-2	44
30243	MYD003	DJ9835	24	30	CHIP	32	14	55	2708	37400	-0.2	19	10	16	10	135	-0.5	-2	49
30243	MYD003	DJ9836	30	36	CHIP	30	9	60	2317	45000	-0.2	6	10	12	10	166	-0.5	-2	52

1994 NATHAN RIVER PROJECT DRILLING SAMPLE DETAILS

LAB BATCH	HOLE	SAMPLE	SAMPLE	SAMPLE	SAMPLE	Cu	Pb	Zn	Mn	Fe	Ag	Ars	Co	Cr	Ni	P	Cd	Mo	V
CODE	NAME	NUMBER	FROM (m)	TO (m)	TYPE	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
30243	MYD003	DJ9837	36	42	CHIP	2	10	66	119	59400	-0.2	18	10	48	14	235	-0.5	-2	62
30243	MYD003	DJ9838	42	48	CHIP	23	26	52	2272	40700	-0.2	12	11	29	11	100	-0.5	-2	52
30243	MYD003	DJ9839	48	54	CHIP	22	56	30	3789	30000	-0.2	5	9	13	5	193	0.5	-2	41
30243	MYD003	DJ9840	54	60	CHIP	102	26	65	476	47300	-0.2	11	18	25	49	201	-0.5	-2	67
30243	MYD003	DJ9841	60	66	CHIP	2	9	56	167	60500	-0.2	10	10	21	15	362	-0.5	-2	57
30243	MYD003	DJ9842	66	72	CHIP	2	9	42	2552	48200	-0.2	3	8	31	8	182	-0.5	-2	48
30243	MYD003	DJ9843	72	78	CHIP	2	10	50	2393	64700	-0.2	2	10	26	12	235	0.6	-2	53
30243	MYD003	DJ9844	78	84	CHIP	65	23	53	411	50200	-0.2	13	16	53	15	109	-0.5	-2	60
30243	MYD003	DJ9845	84	90	CHIP	19	24	50	263	39800	-0.2	19	13	32	12	60	-0.5	-2	46
30243	MYD003	DJ9846	90	96	CHIP	8	26	43	408	36000	-0.2	12	14	17	12	60	-0.5	-2	42
30243	MYD003	DJ9847	96	102	CHIP	31	15	39	219	32500	-0.2	7	10	26	12	-50	-0.5	-2	20
30243	MYD003	DJ9848	102	108	CHIP	42	18	40	147	33700	-0.2	11	11	27	13	-50	-0.5	-2	23
30243	MYD003	DJ9849	108	114	CHIP	20	10	34	105	28900	-0.2	9	9	23	12	-50	-0.5	-2	18
30243	MYD003	DJ9850	114	120	CHIP	10	14	28	88	25500	-0.2	2	9	28	12	-50	-0.5	-2	17
TV30367	MYD003	EI5284	120	126	1/3 CORE	8	6	38	81	28600	-0.2	10	8	-5	13	-50	-1	-5	36
TV30367	MYD003	EI5285	126	132	1/3 CORE	10	13	41	85	30400	-0.2	8	9	-5	14	-50	-1	-5	34
TV30367	MYD003	EI5286	132	138	1/3 CORE	62	11	42	79	34600	-0.2	11	12	14	15	50	-1	-5	43
TV30367	MYD003	EI5287	138	144	1/3 CORE	13	18	49	163	33200	-0.2	-2	15	9	16	-50	-1	-5	51
TV30367	MYD003	EI5288	144	150	1/3 CORE	33	27	42	740	37300	-0.2	10	17	-5	15	50	-1	-5	47
TV30367	MYD003	EI5289	150	156	1/3 CORE	31	19	39	1440	41500	-0.2	10	14	5	16	100	-1	-5	53
TV30367	MYD003	EI5290	156	162	1/3 CORE	22	26	42	915	42000	-0.2	6	20	-5	18	150	-1	-5	54
TV30367	MYD003	EI5291	162	168	1/3 CORE	46	8	41	666	58200	-0.2	18	16	20	17	200	-1	-5	65
TV30367	MYD003	EI5292	168	171.4	1/3 CORE	5	7	49	90	62300	-0.2	2	9	17	22	200	-1	-5	56
30589	MYP001	DZ1307	0	6	CHIP	5	13	158	488	63600	-0.2	5	39	13	44	177	-0.5	-2	78
30589	MYP001	DZ1308	6	12	CHIP	-2	11	114	143	57700	-0.2	4	17	13	26	152	-0.5	-2	69
30589	MYP001	DZ1309	12	18	CHIP	-2	9	101	161	58800	-0.2	-2	16	11	21	180	-0.5	-2	70
30589	MYP001	DZ1310	18	24	CHIP	-2	10	88	126	59300	-0.2	11	17	13	23	195	-0.5	-2	69
30589	MYP001	DZ1311	24	30	CHIP	-2	11	78	160	61400	-0.2	7	16	49	19	249	-0.5	-2	78
30589	MYP001	DZ1312	30	36	CHIP	-2	9	76	162	60300	-0.2	14	16	31	19	253	-0.5	-2	77
30589	MYP001	DZ1313	36	42	CHIP	-2	10	72	134	61000	-0.2	7	16	38	20	243	-0.5	-2	84
30589	MYP001	DZ1314	42	48	CHIP	-2	6	63	136	59300	-0.2	-2	14	31	17	221	-0.5	-2	79
30589	MYP001	DZ1315	48	54	CHIP	-2	10	68	164	66000	-0.2	8	15	24	19	277	-0.5	-2	81
30589	MYP001	DZ1316	54	60	CHIP	116	25	68	1116	48100	-0.2	8	15	62	25	409	-0.5	-2	69
30589	MYP001	DZ1317	60	66	CHIP	213	139	218	3630	51700	-0.2	28	36	32	27	247	-0.5	2	79
30589	MYP001	DZ1318	66	72	CHIP	70	196	108	3278	48700	-0.2	2	30	31	24	469	0.5	-2	89
30589	MYP001	DZ1319	72	78	CHIP	52	81	96	4994	75100	-0.2	46	37	25	25	373	-0.5	-2	73

1994 NATHAN RIVER PROJECT DRILLING SAMPLE DETAILS

LAB BATCH	HOLE	SAMPLE	SAMPLE	SAMPLE	SAMPLE	Cu	Pb	Zn	Mn	Fe	Ag	Ars	Co	Cr	Ni	P	Cd	Mo	V
CODE	NAME	NUMBER	FROM (m)	TO (m)	TYPE	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
30589	MYP001	DZ1320	78	84	CHIP	68	24	43	5346	156100	-0.2	21	26	77	12	1367	-0.5	8	48
30589	MYP001	DZ1321	84	90	CHIP	4	6	11	84	29500	-0.2	-2	2	83	4	175	-0.5	2	22
30589	MYP001	DZ1322	90	96	CHIP	22	5	26	145	31100	-0.2	-2	6	39	8	187	-0.5	-2	29
TV30367	MYP002	DJ9871	0	6	CHIP	20	11	50	446	48500	-0.2	12	13	18	17	50	-1	-5	67
TV30367	MYP002	DJ9872	6	12	CHIP	17	3	45	116	37400	-0.2	2	11	10	17	100	-1	-5	48
TV30367	MYP002	DJ9872	6	12	CHIP	17	3	45	116	37400	-0.2	2	11	10	17	100	-1	-5	48
TV30367	MYP002	DJ9873	12	18	CHIP	17	3	44	97	36200	-0.2	8	9	11	19	50	-1	-5	48
TV30367	MYP002	DJ9874	18	24	CHIP	16	3	42	95	34900	-0.2	-2	9	6	16	50	-1	-5	48
TV30367	MYP002	DJ9875	24	30	CHIP	6	3	40	88	33600	-0.2	-2	9	5	14	50	-1	-5	43
TV30367	MYP002	DJ9876	30	36	CHIP	11	-2	36	83	30300	-0.2	-2	9	6	13	-50	-1	-5	38
TV30367	MYP002	DJ9877	36	42	CHIP	6	7	42	93	36700	-0.2	10	9	7	14	-50	-1	-5	43
TV30367	MYP002	DJ9878	42	48	CHIP	10	4	38	74	38700	-0.2	-2	15	9	15	-50	-1	-5	42
TV30367	MYP002	DJ9879	48	54	CHIP	76	10	40	75	40000	-0.2	-2	17	10	16	-50	-1	-5	46
TV30367	MYP002	DJ9880	54	60	CHIP	34	5	35	68	34900	-0.2	14	14	9	16	-50	-1	-5	53
TV30367	MYP002	DJ9881	60	66	CHIP	39	14	38	263	39800	-0.2	11	22	13	18	50	-1	-5	59
TV30367	MYP002	DJ9882	66	72	CHIP	55	13	34	429	41200	-0.2	3	20	14	16	100	-1	-5	62
TV30367	MYP002	DJ9883	72	80	CHIP	67	7	46	378	61000	-0.2	4	13	17	17	200	-1	-5	65
TV30367	MYP002	DJ9884	80	86	CHIP	25	6	42	203	70400	-0.2	-2	9	18	12	250	-1	-5	60
TV30367	MYP002	DJ9885	86	92	CHIP	39	10	52	718	44200	-0.2	-2	14	11	15	150	-1	-5	41
TV30367	MYP002	DJ9886	92	98	CHIP	7	6	23	1980	22600	-0.2	-2	7	14	6	150	-1	-5	31
TV30367	MYP004	DJ9851	0	6	CHIP	29	13	50	522	46000	-0.2	3	14	16	18	-50	-1	-5	49
TV30367	MYP004	DJ9852	6	12	CHIP	31	11	52	443	44000	-0.2	12	12	11	18	-50	-1	-5	47
TV30367	MYP004	DJ9853	12	18	CHIP	30	14	53	649	44300	-0.2	-2	13	10	19	100	-1	-5	46
TV30367	MYP004	DJ9854	18	24	CHIP	36	14	49	787	42700	-0.2	6	13	10	18	-50	-1	-5	47
TV30367	MYP004	DJ9855	24	30	CHIP	36	14	53	866	43800	-0.2	8	14	9	19	-50	-1	-5	44
TV30367	MYP004	DJ9856	30	36	CHIP	31	13	48	1490	43800	-0.2	4	16	9	19	100	-1	-5	46
TV30367	MYP004	DJ9857	36	42	CHIP	34	18	50	1450	44700	-0.2	-2	15	9	17	-50	-1	-5	44
TV30367	MYP004	DJ9858	42	48	CHIP	44	25	56	1840	49000	-0.2	6	18	11	19	150	-1	-5	48
TV30367	MYP004	DJ9859	48	54	CHIP	58	18	59	3250	50500	-0.2	5	20	10	22	200	-1	-5	51
TV30367	MYP004	DJ9860	54	60	CHIP	77	13	84	4290	49400	-0.2	8	18	8	20	300	-1	-5	50
TV30367	MYP004	DJ9861	60	66	CHIP	55	6	76	6450	42900	-0.2	6	22	9	20	100	-1	-5	53
TV30367	MYP004	DJ9862	66	72	CHIP	8	5	79	5600	44700	-0.2	10	23	8	19	100	-1	-5	53
TV30367	MYP004	DJ9863	72	78	CHIP	4	3	75	5880	45700	-0.2	-2	23	10	19	100	-1	-5	54
TV30367	MYP004	DJ9864	78	84	CHIP	-2	6	74	8140	46200	-0.2	7	29	7	18	100	-1	-5	59
TV30367	MYP004	DJ9865	84	90	CHIP	-2	10	67	3E+05	62600	-0.2	60	45	9	19	200	-1	-5	40
TV30367	MYP004	DJ9866	90	96	CHIP	-2	12	62	3E+05	59500	-0.2	30	50	13	17	150	-1	-5	38

1994 NATHAN RIVER PROJECT DRILLING SAMPLE DETAILS

LAB BATCH	HOLE	SAMPLE	SAMPLE	SAMPLE	SAMPLE	Cu	Pb	Zn	Mn	Fe	Ag	Ars	Co	Cr	Ni	P	Cd	Mo	V
CODE	NAME	NUMBER	FROM (m)	TO (m)	TYPE	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
TV30367	MYP004	DJ9867	96	102	CHIP	-2	13	69	22500	65800	-0.2	29	52	11	18	200	-1	-5	73
TV30367	MYP004	DJ9868	102	108	CHIP	-2	10	78	3870	58800	-0.2	-2	26	10	18	150	-1	-5	60
TV30367	MYP004	DJ9869	108	114	CHIP	37	3	71	6620	43800	-0.2	-2	24	6	16	100	-1	-5	49
TV30367	MYP004	DJ9870	114	118	CHIP	45	4	81	4480	42900	-0.2	9	21	13	17	50	-1	-5	53

WHOLE ROCK ANALYSIS DESCRIPTION

Scheme Code: GP032

Sample preparation of percussion/rock/core samples; dry, jaw crush, fine pulverise

Scheme Code: D140

Aqua regia/perchloric acid digest (0.3g sample)

Scheme Code: GI140

ICPOES determination

Cu: Copper
Pb: Lead
Zn: Zinc
Fe: Iron
Mn: Manganese
As: Arsenic
Ni: Nickel
Co: Cobalt
Mo: Molybdenum
Cr: Chromium
P : Phosphorus
V : Vanadium
Cd: Cadmium
Ag: Silver

Scheme Code: OX408

Glass fusion XRF (preferred method for silicates)

Fe₂O₃: Iron Oxide
MnO: Manganese Oxide
K₂O: Potassium Oxide
MgO: Magnesium Oxide
Na₂O: Sodium Oxide
Al₂O₃: Alumina
SiO₂: Silica
TiO₂: Titanium Dioxide
CaO: Calcium Oxide
P₂O₅: Phosphorus Pentoxide

Scheme Code: OM615

Loss on Ignition (LOI) - gravimetric

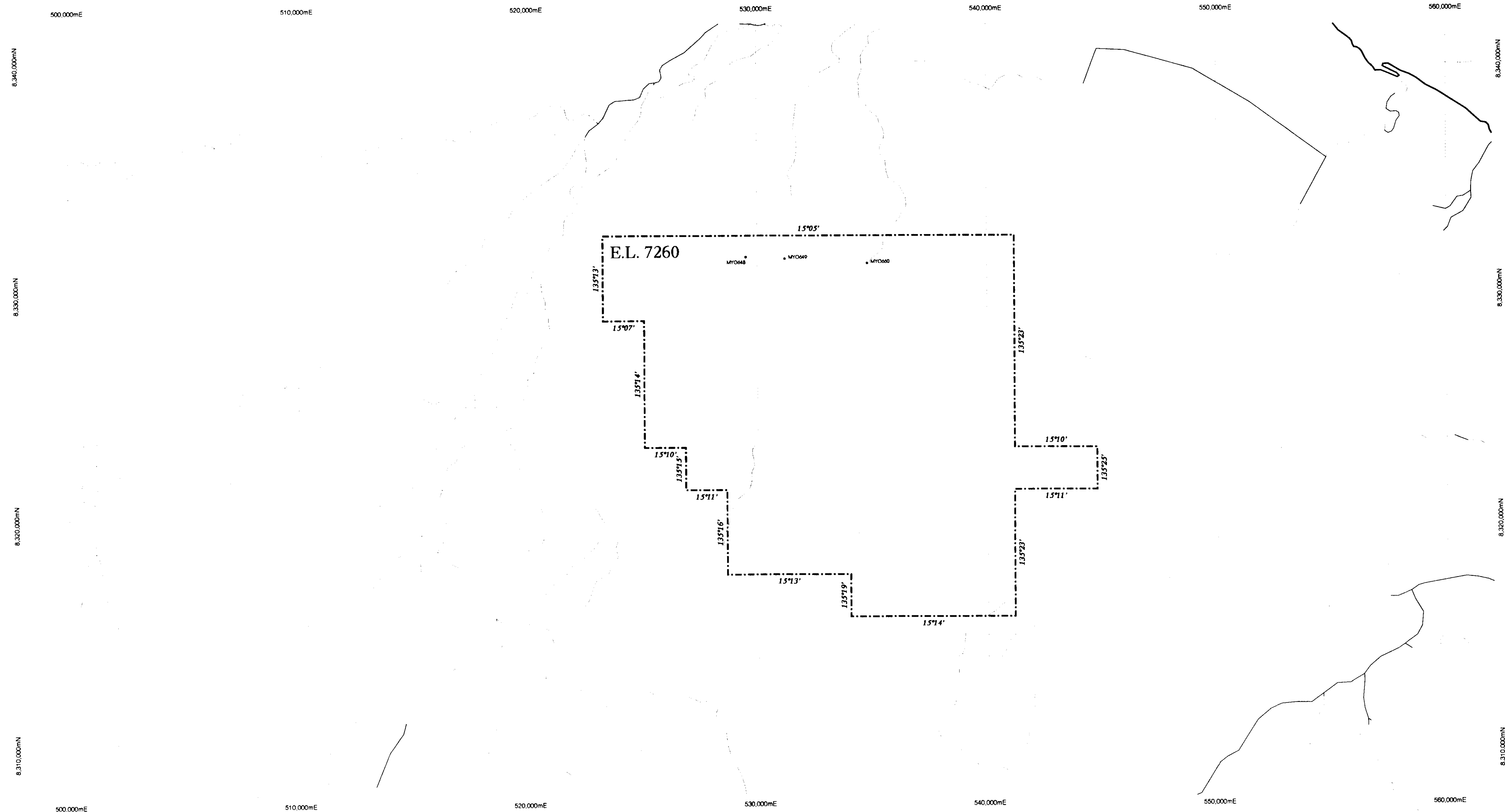
LOI: Loss on Ignition

1994 NATHAN RIVER PROJECT DRILLING WHOLE ROCK SAMPLE DETAILS

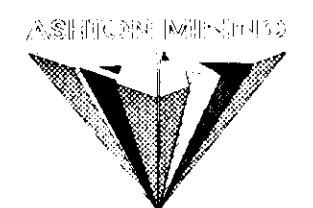
LAB BATCH	HOLE	SAMPLE	SAMPLE	SAMPLE	SAMPLE	Cu	Pb	Zn	Mn	Fe	Ag	Ars	Co	Cr	Ni	P	Cd	Mo	V
CODE	NAME	NUMBER	FROM (m)	TO (m)	TYPE	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
30589	MYD002	EI2783	62	64	CHIP	36	18	56	2100	29400	-0.2	10	15	3	15	50	-0.5	-2	40
30589	MYD002	EI2784	82	84	CHIP	6	7	46	149	31600	-0.2	10	14	8	14	50	-0.5	-2	39
30589	MYD002	EI2785	102	104	CHIP	19	6	45	149	41000	-0.2	-2	12	5	16	100	-0.5	-2	44
30590	MYD002	EK7390	124.2	124.2	1/3 CORE	25	-5	44	107	41700	-0.2	-2	11	6	15	-50	-0.5	-2	41
30590	MYD002	EK7391	144.1	144.1	1/3 CORE	-2	10	39	142	45400	-0.2	-2	13	9	14	50	0.8	-2	49
30590	MYD002	EK7392	174.3	174.3	1/3 CORE	16	6	34	964	74500	-0.2	8	17	12	13	100	-0.5	-2	60
30589	MYD003	EI2788	50	52	CHIP	29	33	28	3170	24800	-0.2	-2	7	-2	6	250	-0.5	-2	33
30589	MYD003	EI2789	70	72	CHIP	-2	8	45	3110	47400	-0.2	3	8	3	11	250	0.5	-2	42
30589	MYD003	EI2790	90	92	CHIP	9	11	51	687	44400	-0.2	-2	14	5	15	100	-0.5	-2	43
30589	MYD003	EI2791	110	112	CHIP	15	12	48	126	36400	-0.2	-2	10	5	17	150	-0.5	-2	53
30590	MYD003	EK7393	130.9	130.9	1/3 CORE	21	12	51	110	41000	-0.2	-2	13	7	15	50	-0.5	-2	46
30590	MYD003	EK7394	153.7	153.7	1/3 CORE	-2	19	67	81	35800	-0.2	24	37	11	23	50	0.7	-2	58
30589	MYP001	EI2786	58	60	CHIP	261	71	149	2100	47100	-0.2	-2	17	7	22	350	0.6	-2	76
30589	MYP001	EI2787	78	80	CHIP	54	35	69	5580	86200	-0.2	37	46	12	19	550	0.5	4	30
30589	MYP002	EI2792	28	30	CHIP	-2	-5	38	89	33400	-0.2	-2	9	3	13	100	-0.5	-2	39
30589	MYP002	EI2793	48	50	CHIP	169	7	37	76	38200	-0.2	4	15	6	14	100	-0.5	-2	40
30589	MYP002	EI2794	68	70	CHIP	32	13	36	168	41200	-0.2	-2	30	8	18	200	0.9	-2	58
30589	MYP002	EI2795	88	90	CHIP	12	23	30	1200	31900	-0.2	20	10	2	8	300	-0.5	-2	25
30589	MYP004	EI2778	28	30	CHIP	40	10	49	1280	39300	-0.2	17	14	8	18	150	-0.5	-2	50
30589	MYP004	EI2779	48	50	CHIP	54	14	49	3430	47100	-0.2	-2	18	8	19	350	-0.5	-2	48
30589	MYP004	EI2780	68	70	CHIP	18	-5	75	6000	40100	-0.2	-2	22	6	18	100	-0.5	-2	47
30589	MYP004	EI2781	88	90	CHIP	-2	6	58	34700	54600	-0.2	25	42	10	17	200	-0.5	-2	30
30589	MYP004	EI2782	108	110	CHIP	31	7	75	4550	52500	-0.2	9	26	6	16	250	-0.5	-2	53

1994 NATHAN RIVER PROJECT DRILLING WHOLE ROCK SAMPLE DETAILS

SAMPLE NUMBER	Mno wt%	K2O wt%	MgO wt%	Na2O wt%	Al2O3 wt%	SiO2 wt%	TiO2 wt%	CaO wt%	P2O5 wt%	Fe2O3 wt%	Loi
EI2783	0.28	5.18	4.3	0.15	16.16	52.15	0.52	4.7	0.06	4.73	10.69
EI2784	0.02	4.98	1.69	0.09	15.54	67.74	0.59	0.08	0.05	4.77	3.89
EI2785	0.02	5.64	1.98	0.13	18.75	61.47	0.68	0.11	0.05	6.21	4.78
EK7390	0.05	5.45	1.82	0.12	16.86	64.4	0.65	0.12	0.06	5.97	4.31
EK7391	0.02	5.69	1.76	0.08	18.44	61.4	0.58	0.44	0.05	6.38	5.04
EK7392	0.11	5.41	1.59	0.1	15.86	59.44	0.61	0.14	0.06	10.27	5.9
EI2788	0.44	2.53	10.63	0.14	8.32	31.49	0.25	15.99	0.07	4.11	26.19
EI2789	0.39	4.21	7.43	0.15	12.42	39.77	0.45	9.8	0.07	7	18.04
EI2790	0.08	4.72	2.04	0.11	16.36	64.49	0.6	0.23	0.05	6.3	5.04
EI2791	0.02	5.97	1.96	0.15	19.6	61.29	0.59	0.11	0.06	5.21	4.78
EK7393	0.02	5.34	1.99	0.11	17.61	64.33	0.49	0.08	0.05	5.66	4.42
EK7394	0.01	5.38	1.91	0.1	18.03	63.21	0.57	0.08	0.05	5.24	4.68
EI2786	0.27	5.55	1.54	0.12	19.06	58.27	0.88	0.09	0.12	7.04	6.79
EI2787	0.67	1.48	0.58	0.05	6.64	71.37	0.32	0.13	0.13	11.98	6.48
EI2792	0.02	1.19	0.27	-0.05	1.7	92.63	0.08	0.88	0.02	1.92	1.15
EI2793	0.02	0.93	0.14	-0.05	1.33	92.92	0.07	0.73	0.02	2.63	1.02
EI2794	0.01	0.6	0.14	-0.05	1.95	92.36	0.33	0.24	0.04	3.41	0.87
EI2795	0.16	1.2	11.26	0.1	4.66	35.46	0.18	16.06	0.07	4.94	25.64
EI2778	0.16	4.84	2.19	0.17	18.09	61.52	0.67	0.34	0.07	6.01	5.41
EI2779	0.45	4.54	2.32	0.48	17.58	60.2	0.66	0.35	0.12	7.13	5.87
EI2780	0.74	5.13	2.41	0.23	16.8	61.62	0.6	0.45	0.06	5.92	5.69
EI2781	4.32	4.52	2.29	0.28	13.23	57.82	0.54	0.93	0.08	8.42	7.37
EI2782	0.58	5.35	2.55	0.22	15.96	60.24	0.61	0.62	0.08	7.86	5.49

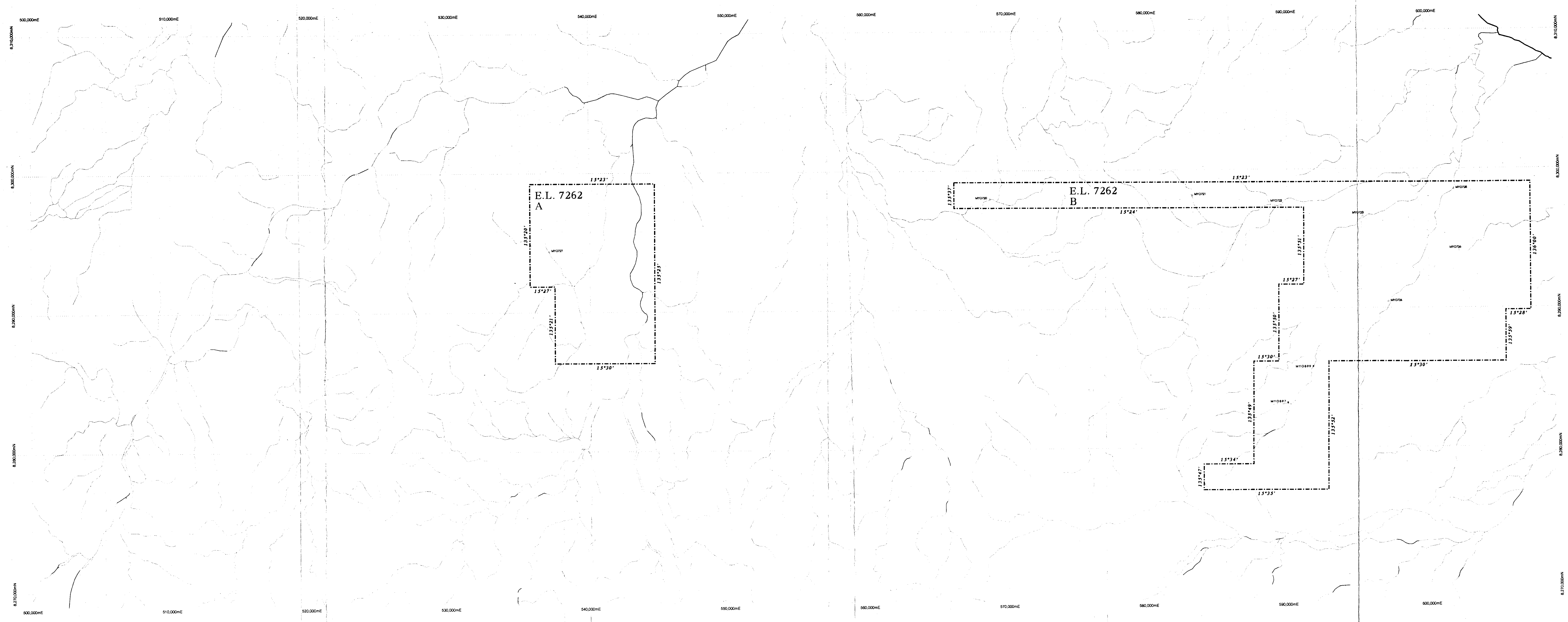


- Sample - not yet processed
- Sample - negative
- ◆ Sample - chromite positive
- ◊ Sample - diamond positive
- Sample - other indicators

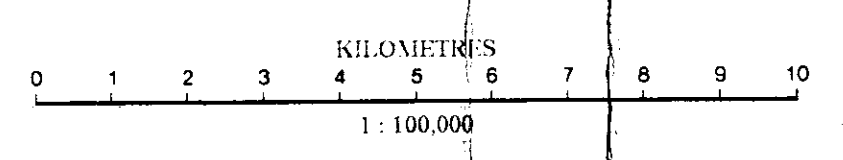


CR95/507A

ASHTON MINING LIMITED		
A.D.E. JOINT VENTURE		
EXPLORATION LICENCE 7260		
SAMPLE LOCATIONS		
PLAN 1		
Geologist :	Date : JUN 8, 1995	Report No : 51120
Drafted : M.P. Ariotti	Revised :	Drawing No :

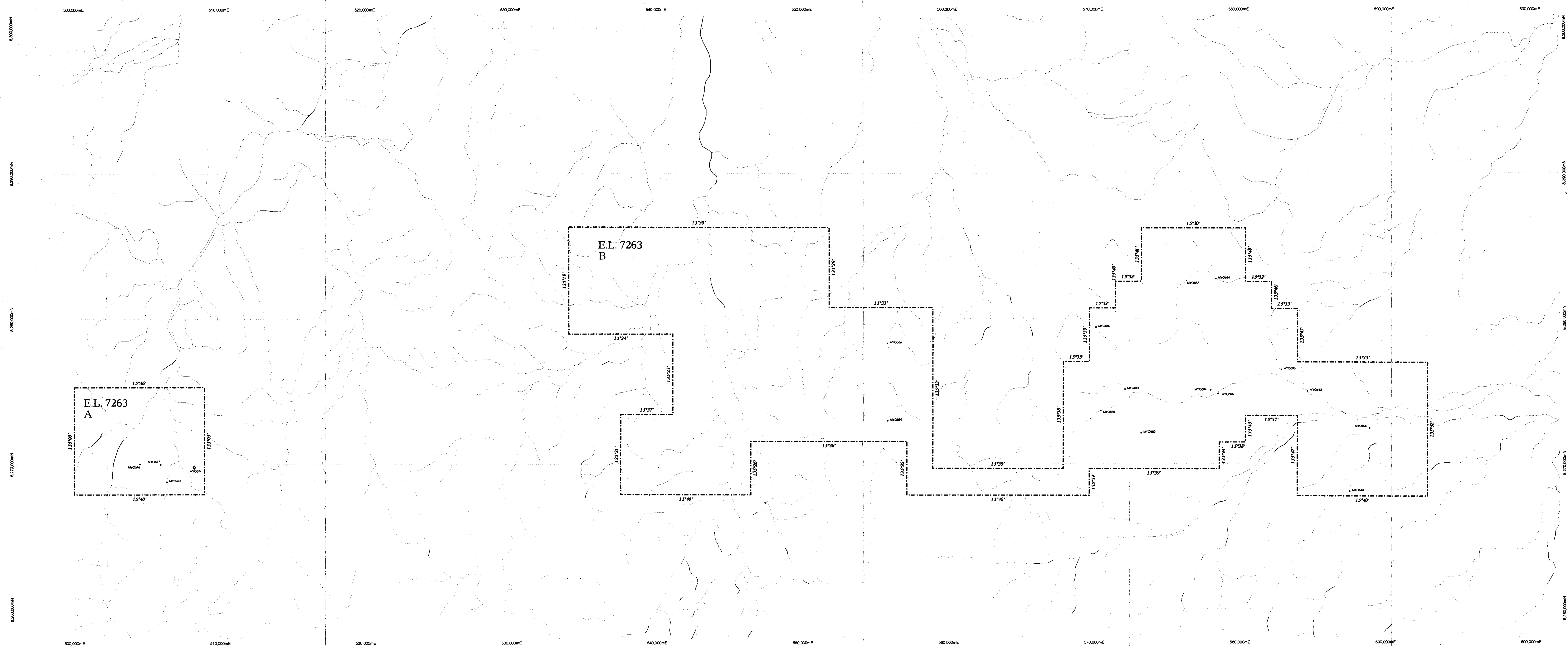


- Sample - not yet processed
- Sample - negative
- Sample - chromite positive
- Sample - diamond positive
- Sample - other indicators

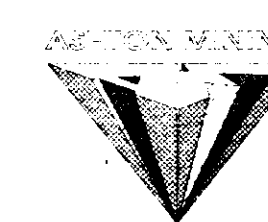
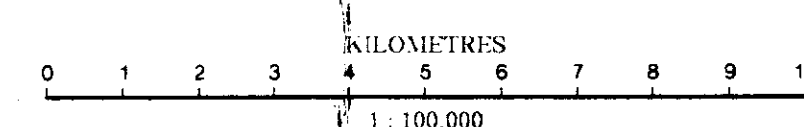


CR95/507A

ASHTON MINING LIMITED		
A.D.E. JOINT VENTURE		
EXPLORATION LICENCE 7262		
SAMPLE LOCATIONS		
PLAN 2		
Geolo. Unit :	Date : JUNE, 1995	Report No. : 51120
Drafted by : M.P. Ariotti	Revised :	Drawing No. :

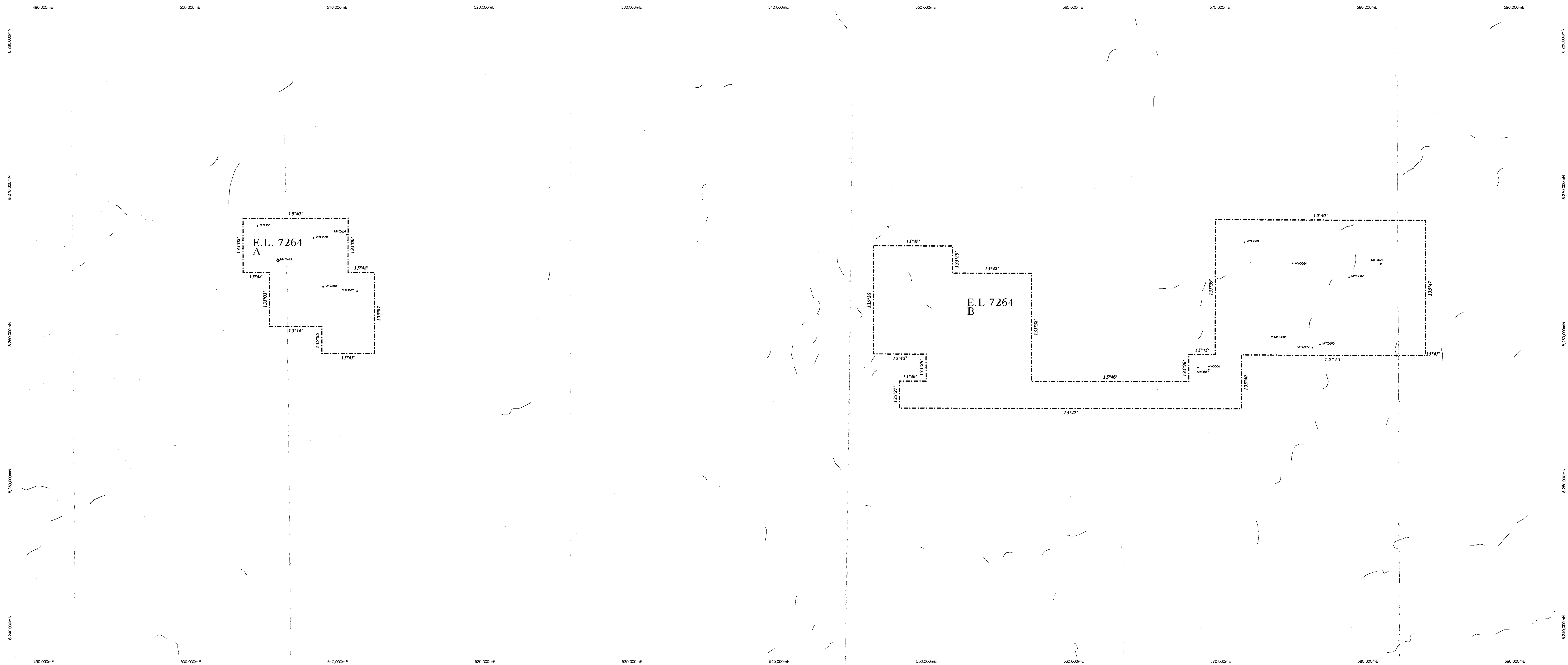


- Sample - not yet processed
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- Sample - chromite positive
- Sample - diamond positive
- Sample - other indicators

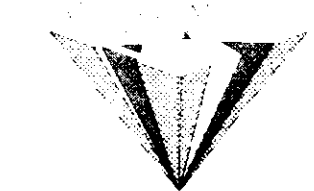
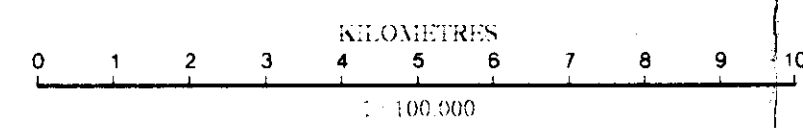


CR95/507A

ASHTON MINING LIMITED		
A.D.E. JOINT VENTURE		
EXPLORATION LICENCE 7263		
SAMPLE LOCATIONS		
PLAN 3		
Geological :	Date : JUNE, 1995	Report No : 51120
Drafted : M.P. Ariotti	Revised :	Drawing No :

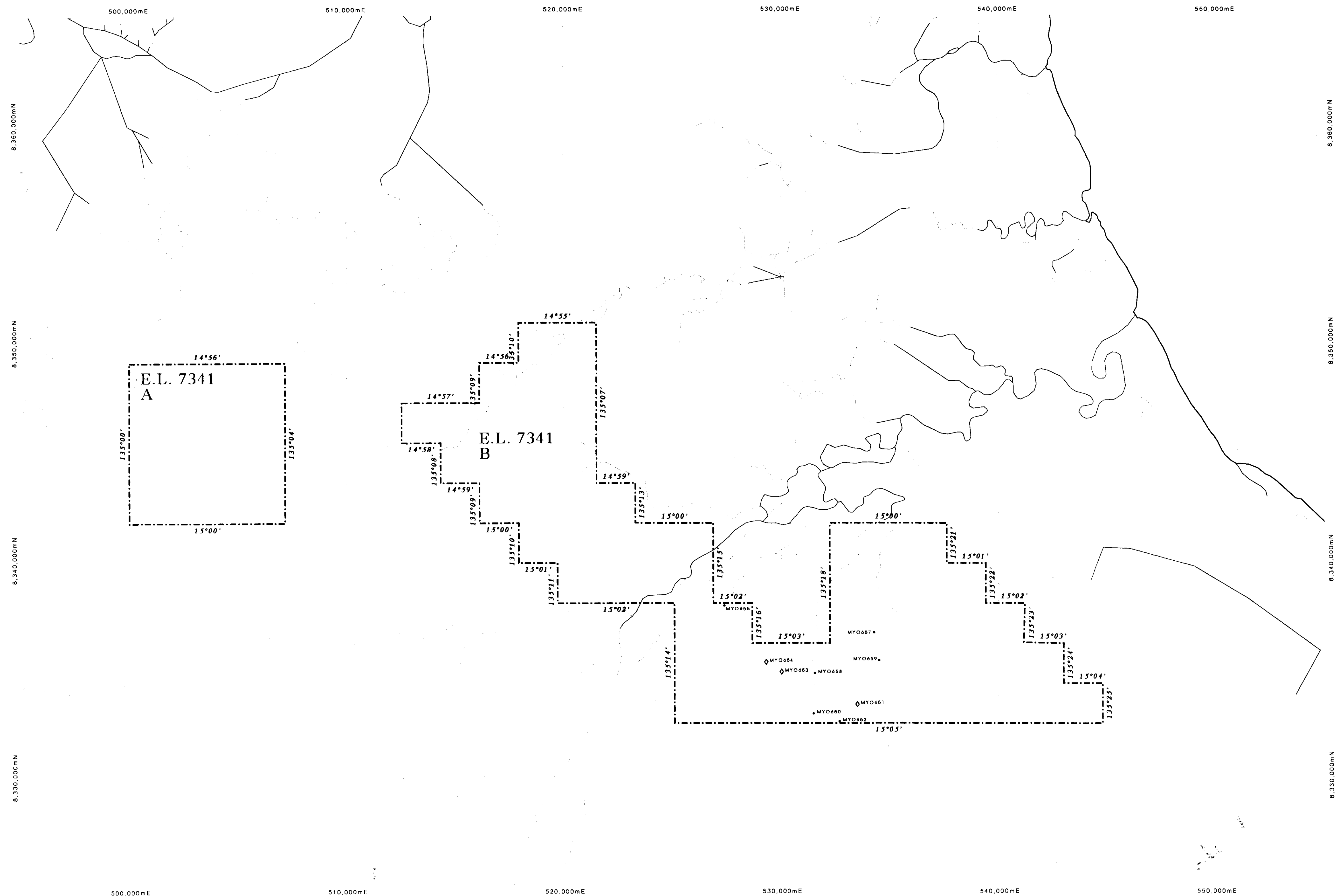


- Sample - not yet processed
- Sample - negative
- ◆ Sample - chromite positive
- ◇ Sample - diamond positive
- Sample - other indicators

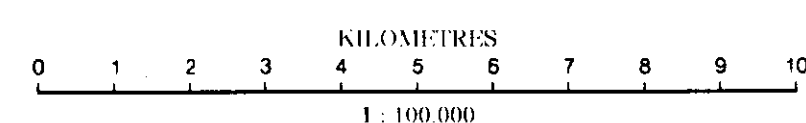


CR95/507A

ASHTON MINING LIMITED		
A.D.E. JOINT VENTURE		
EXPLORATION LICENCE 7264		
SAMPLE LOCATIONS		
PLAN 4		
Geologist :	Date : JUNE, 1995	Report No : 51120
Drafted : M.P. Ariotti	Revised :	Drawing No :

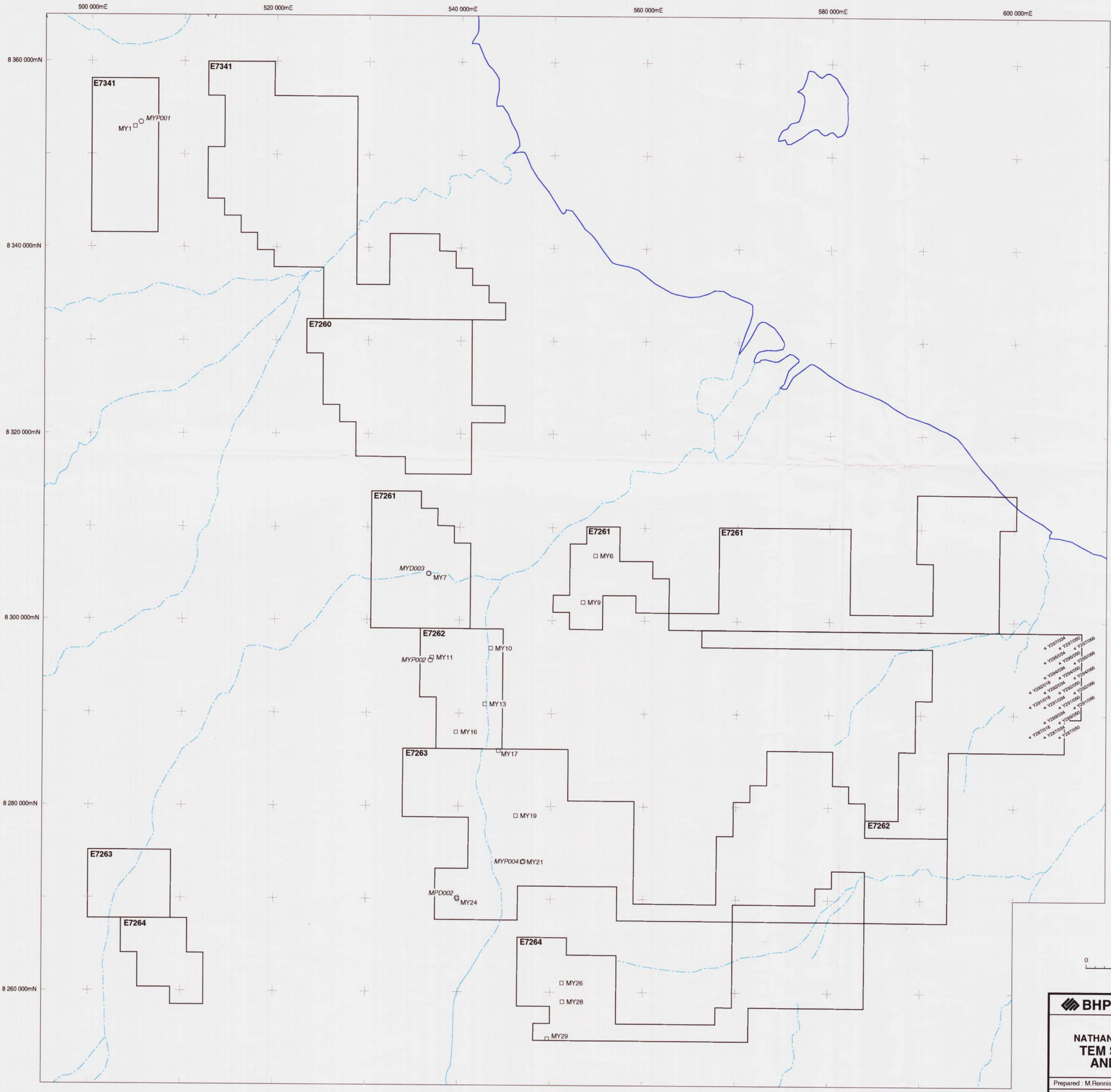


- Sample - not yet processed
- Sample - negative
- ◆ Sample - chromite positive
- ◇ Sample - diamond positive
- Sample - other indicators

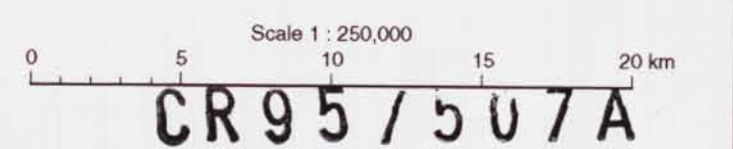


CR95 / 507A

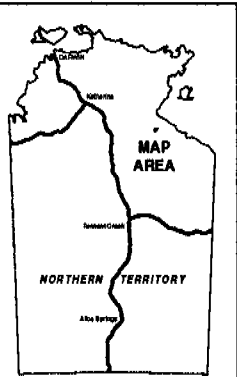
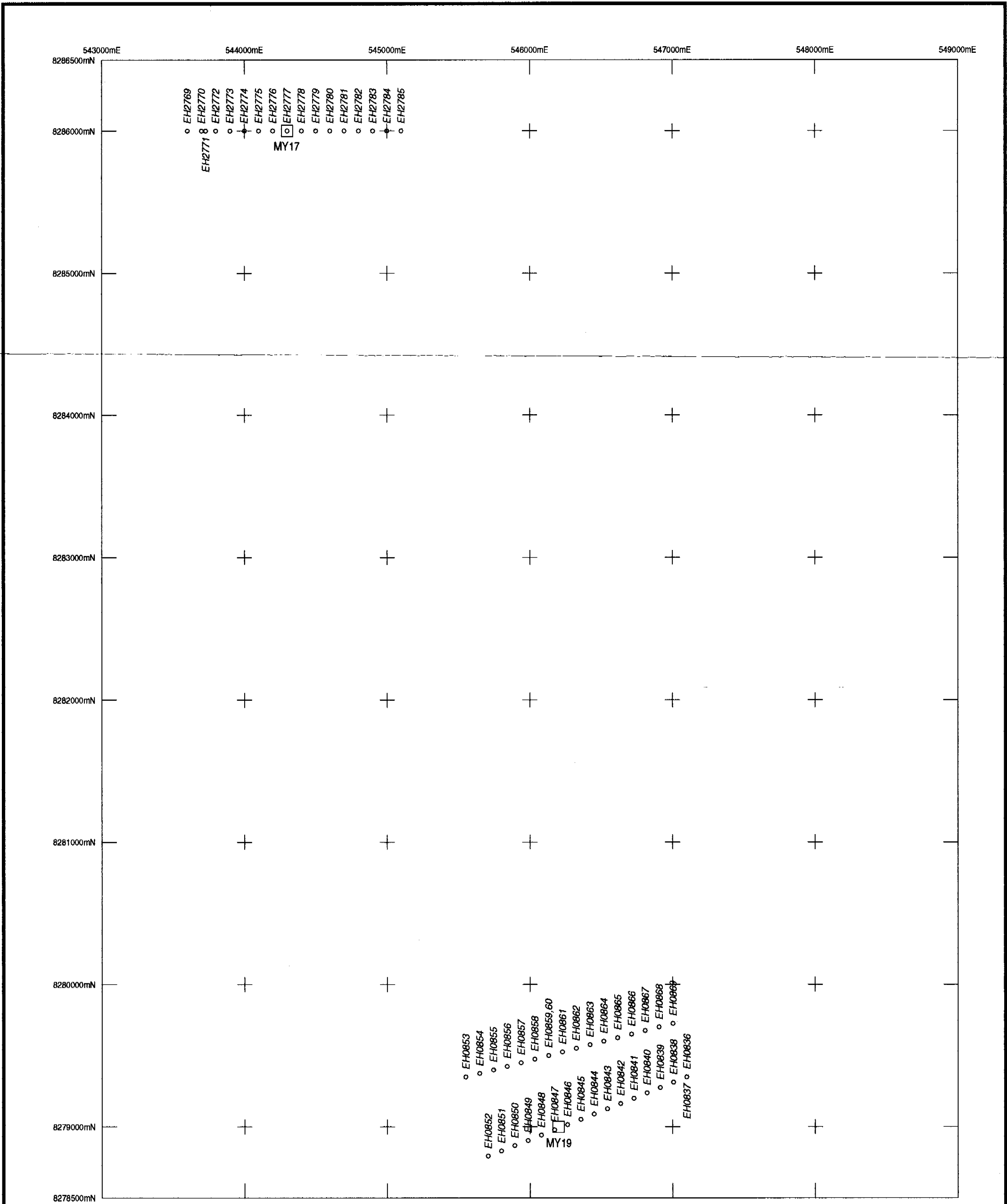
ASHTON MINING LIMITED		
A.D.E. JOINT VENTURE		
EXPLORATION LICENCE 7341 SAMPLE LOCATIONS		
PLAN 5		
Geologist :	Date : JUN8, 1995	Report No : 51120
Drafted : M.F.Ariotti	Revised :	Drawing No :



- ▲ Y287004 TEM sounding location and number
- MY19 QUESTEM anomaly
- MYP001 BHP drillhole and number



BHP		Exploration - BHP Minerals	
BHP Minerals Pty. Ltd. , A.C.N. 008 694 782			
McARTHUR RIVER JV			
NATHAN RIVER PROJECT - ELs 7260-64, 7341			
TEM SOUNDINGS, DRILLHOLES			
AND QUESTEM ANOMALIES			
Prepared : M.Rennison	Date : 20-6-95	PLATE 1	
Drawn : A.R.Veale	Revised :		
Centre : Perth	Drawing No : A2-2481		



○ EH4510

Soil sample location and number

□ MY19

QUESTEM anomaly

CR95/507A

Scale 1 : 25,000
0 500 1000 1500 2000 metres

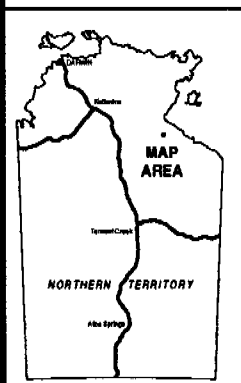
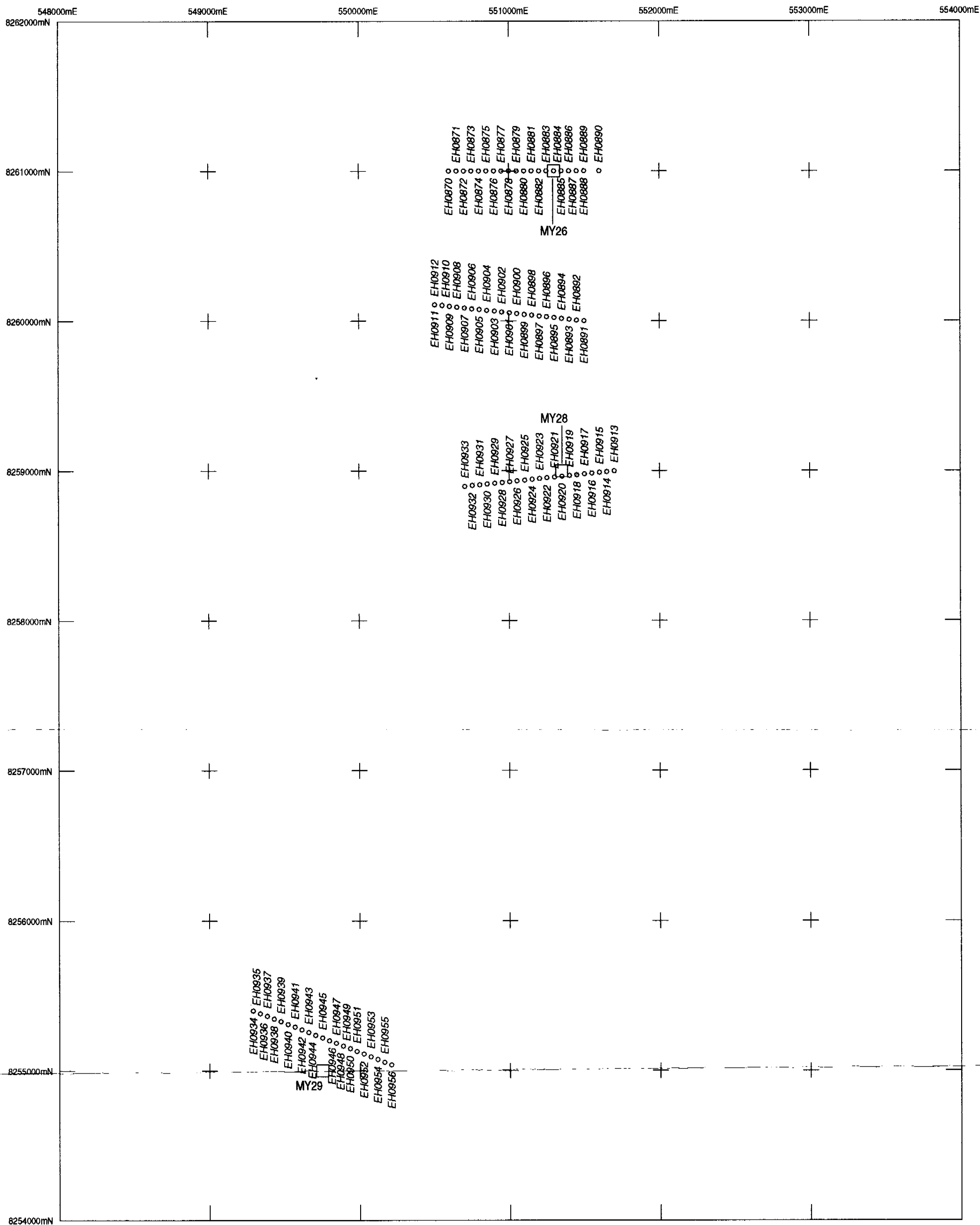


Exploration - BHP Minerals
BHP Minerals Pty. Ltd., A.C.N. 008 694 782

**McARTHUR RIVER JV
EL7263 NATHAN RIVER, N.T.
LOCATION OF SOIL SAMPLES SITES
AND QUESTEM ANOMALIES MY17 & MY19**

Prepared : M.Rennison	Date : 15-6-95
Drawn : A.R.Veale	Revised:
Centre : Perth	Drg. No.: A3-3963

PLATE 2



Scale 1 : 25,000
0 500 1000 1500 2000 metres

CR95/507A

○ EH0852
Soil sample location and number
□ MY29
QUESTEM anomaly

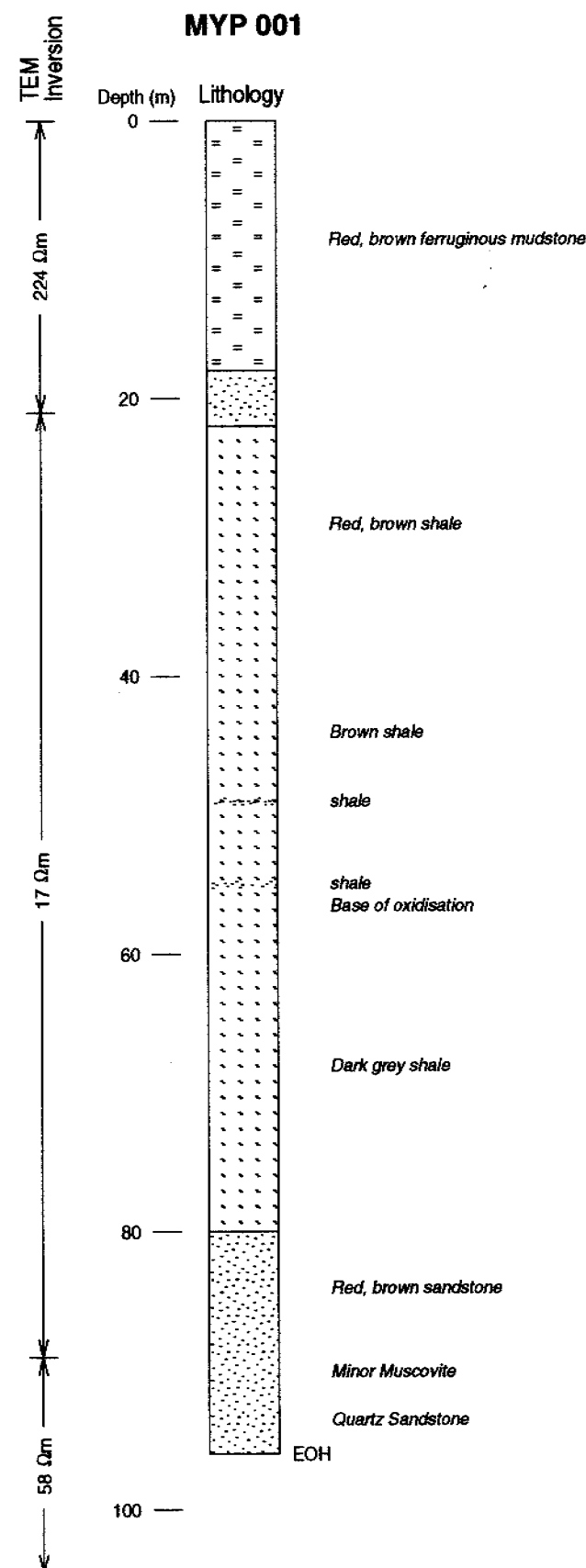


Exploration - BHP Minerals
BHP Minerals Pty. Ltd., A.C.N. 008 694 782

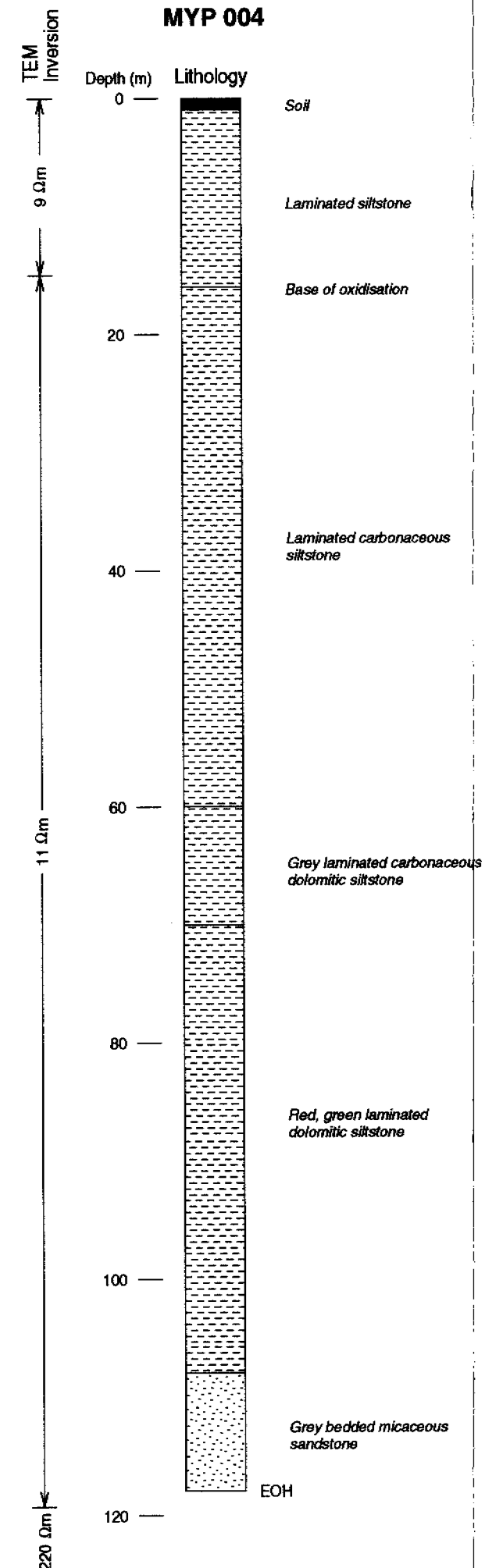
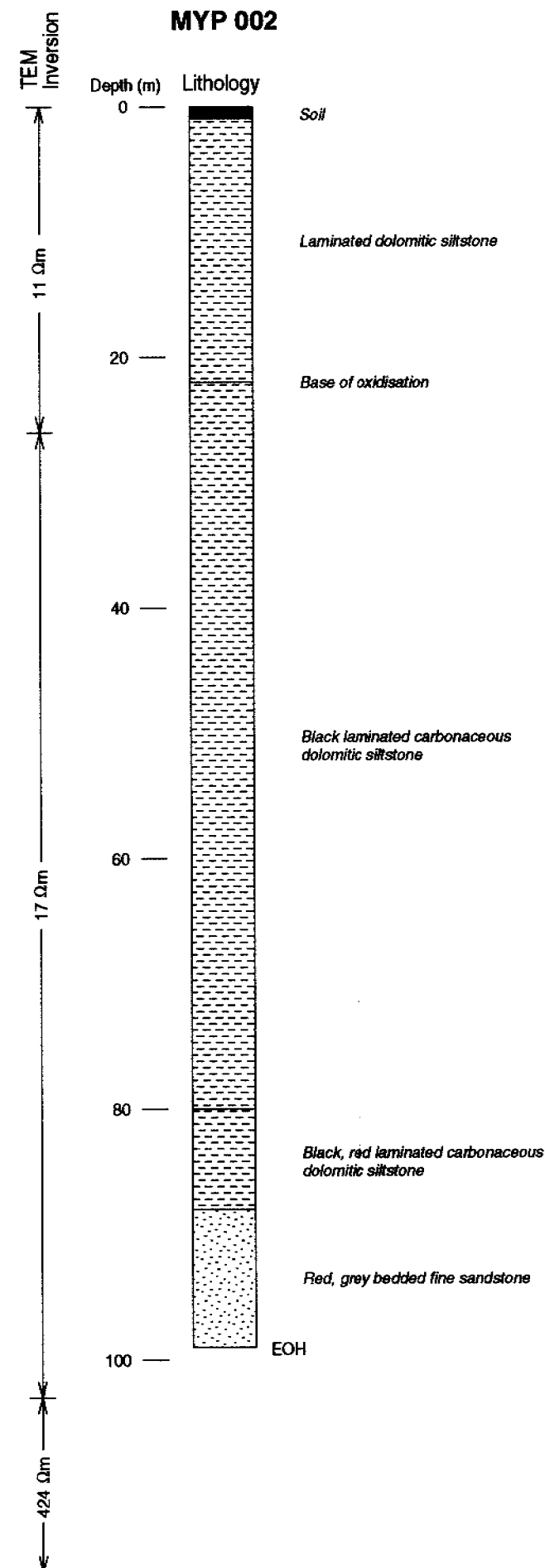
**McARTHUR RIVER JV
EL7264 ROSIE CREEK, N.T.
LOCATION OF SOIL SAMPLE SITES
AND QUESTEM ANOMALIES MY26, 28 & 29**

Prepared : M.Rennison	Date : 15-6-95
Drawn : A.R.Veale	Revised:
Centre : Perth	Drg. No.: A3-3964

PLATE 3



LEGEND



DRILLING DETAILS

MYP 001

CONTRACTOR : Gaden Drilling Pty Ltd
RIG TYPE : Universal 650
DATE COMMENCED : 03.09.94
DATE COMPLETED : 03.09.94
DECLINATION : Vertical
FINAL DEPTH : 96.0m
METHOD : 5.25 " RC Hammer
COLLAR CO-ORDINATES : 505323 mE, 8353412 mN
LOGGED : P. Darby

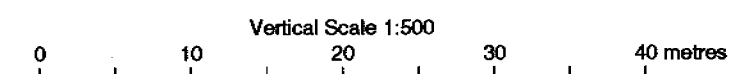
MYP 002

CONTRACTOR : Gaden Drilling Pty Ltd
RIG TYPE : Universal 650
DATE COMMENCED : 03.10.94
DATE COMPLETED : 04.10.94
DECLINATION : Vertical
FINAL DEPTH : 98.0m
METHOD : 5.25 " RC Hammer
COLLAR CO-ORDINATES : 536900 mE, 8295700 mN
LOGGED : B. Jones

MYP 004

CONTRACTOR : Gaden Drilling Pty Ltd
RIG TYPE : Universal 650
DATE COMMENCED : 06.10.94
DATE COMPLETED : 06.10.94
DECLINATION : Vertical
FINAL DEPTH : 118.0m
METHOD : 5.25 " RC Hammer
COLLAR CO-ORDINATES : 547050 mE, 8274050 mN
LOGGED : B. Jones

CR95/507A





BHP

Exploration - BHP Minerals

BHP Minerals Pty. Ltd., A.C.N. 008 694 782

CARPENTARIA PROGRAM

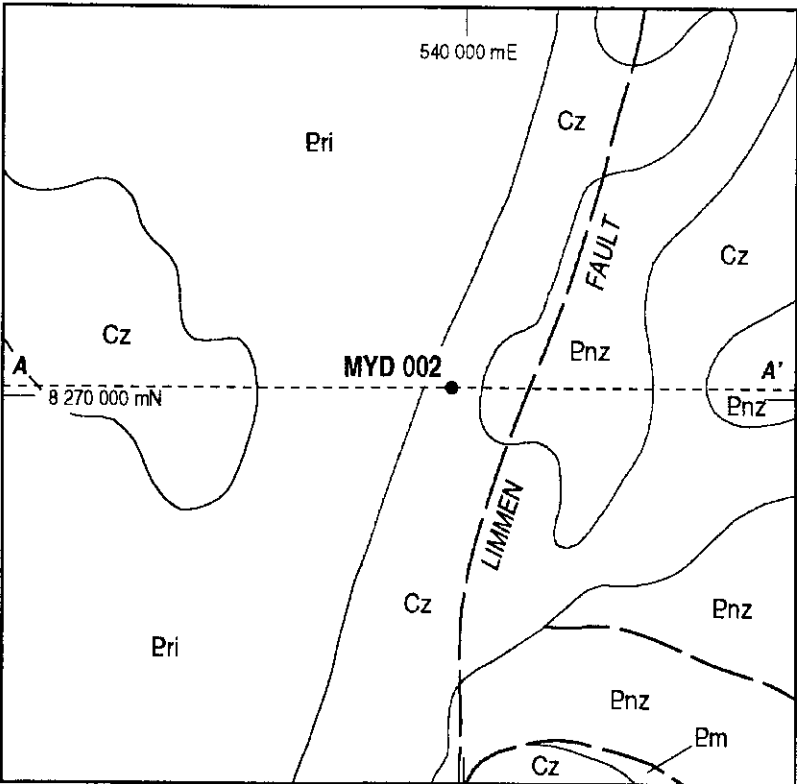
Mc ARTHUR RIVER JOINT VENTURE. E7341, E7262, E7263

GRAPHIC SUMMARY DRILL LOGS MYP 001, 002, 004

Prepared : M. Rennison	Date : 13.6.95	Plate 4
Drawn : R.J.Clark	Revised:	
Centre : Perth	Drg. No.: A3-3962	

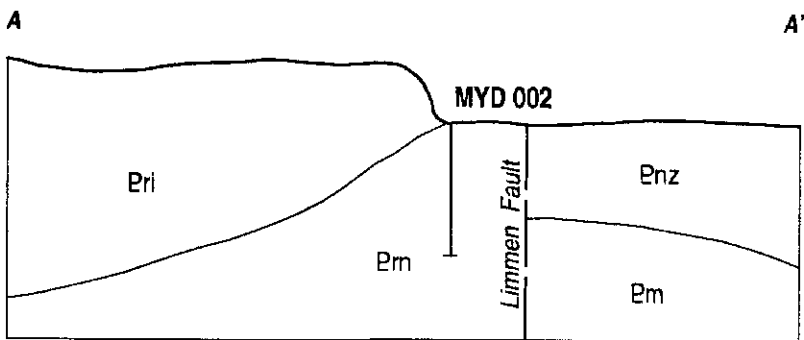
MYD 002

GEOLOGICAL SETTING



Scale 1 : 50,000

Cz	Cainozoic Cover	Pnz	Balbirini Formation
Pri	Limmen Sandstone	Pm	McArthur Formation
Pm	Mantungula Formation		

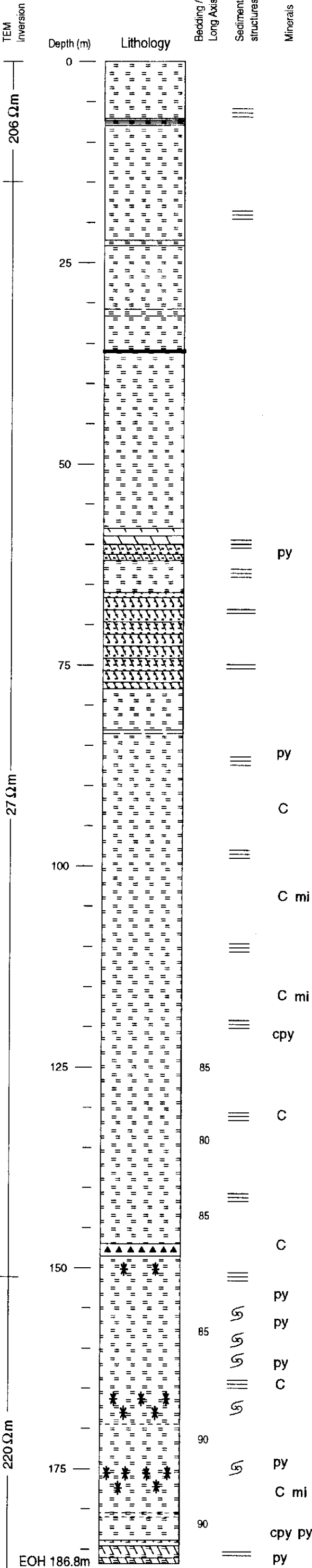


Vertical Scale 1 : 10,000

DRILLING DETAILS

CONTRACTOR:	Gaden Drilling Pty. Ltd.
RIG TYPE:	Universal 650
DATE COMMENCED:	20-09-94
DATE COMPLETED:	23-09-94
DECLINATION:	Vertical
FINAL DEPTH:	186.8m
METHOD:	5 1/4" RC Hammer to 120.0m NQ Core to 186.8m
COLLAR	AMG Easting 539900
CO-ORDINATES:	AMG Northing 8270130 AMG Zone 53
LOGGED:	M. W. Rennison, November 1994
SAMPLE:	6m composite RC chips 6m 1/3 core
ANALYSES:	Analabs Pty. Ltd., Townsville, Qld.

≡ Laminated	C Carbonaceous
≡ Bedded	mi Micaceous
≡ Disrupted bedding	cpy Chalcopyrite
* Evaporite pseudomorph	py Pyrite



SCALE 1 : 500

	Mudstone
	Dolomite
	Dolomitic mudstone

SUMMARY DESCRIPTION

Green, brown and red, highly weathered mudstone

Significant clay

Minor clay

Minor coarse silt interbeds

BASE OF OXIDISATION

Minor quartz veining

Dark green, variably carbonaceous mudstone

FAULT ZONE

Green grey mudstone

Minor quartz sandstone

Red-brown dolomitic mudstone

BHP Exploration - BHP Minerals
BHP Minerals Pty. Ltd., A.C.N. 008 694 782

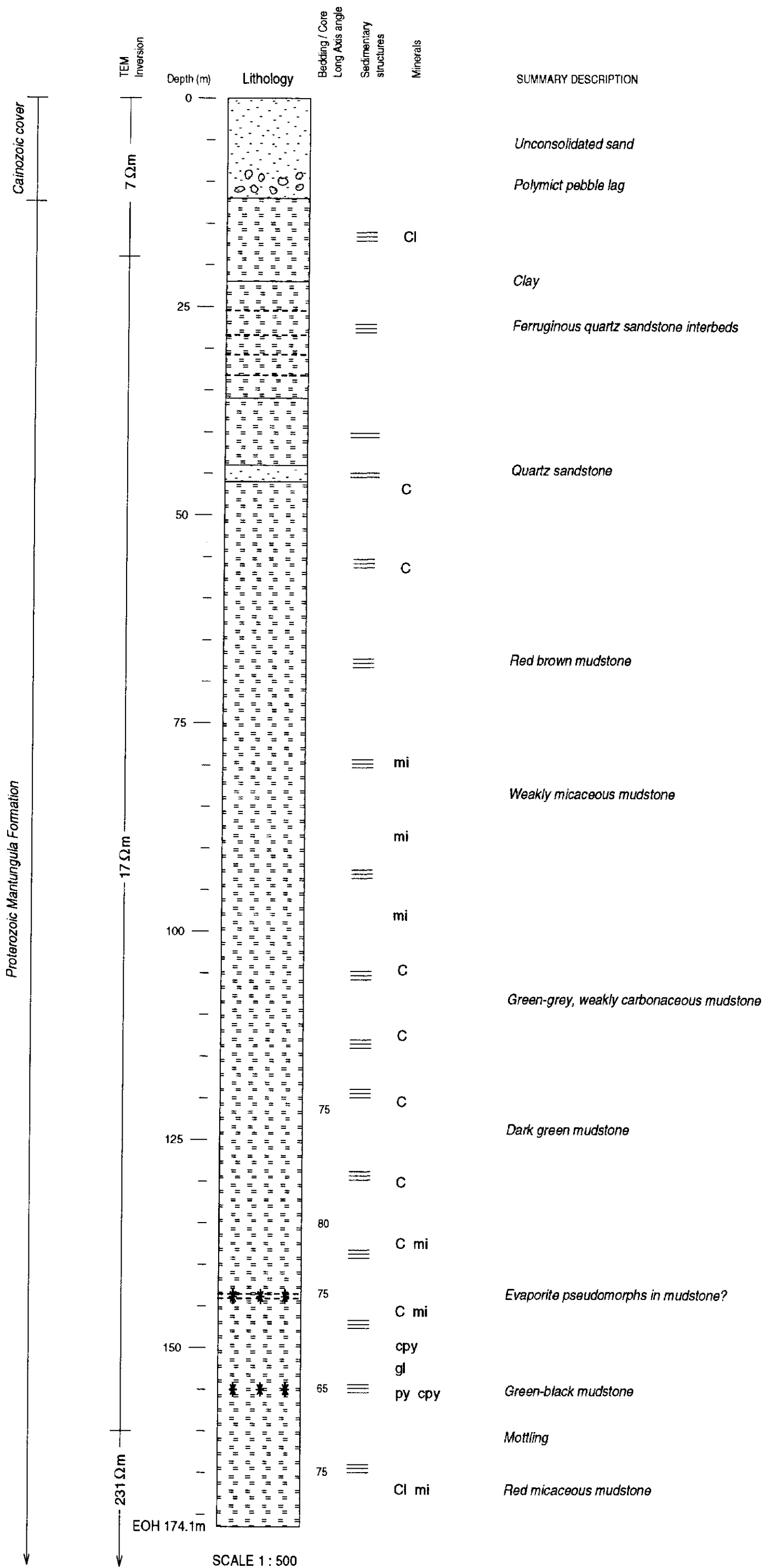
McARTHUR RIVER JOINT VENTURE
NATHAN RIVER PROJECT - E7263
MYD 002 - SUMMARY GRAPHIC LOG

Prepared : M.W.Rennison	Date : 19.6.95
Drawn : R.J.Clark	Revised :
Centre : Perth	Drawing No : A2-2479

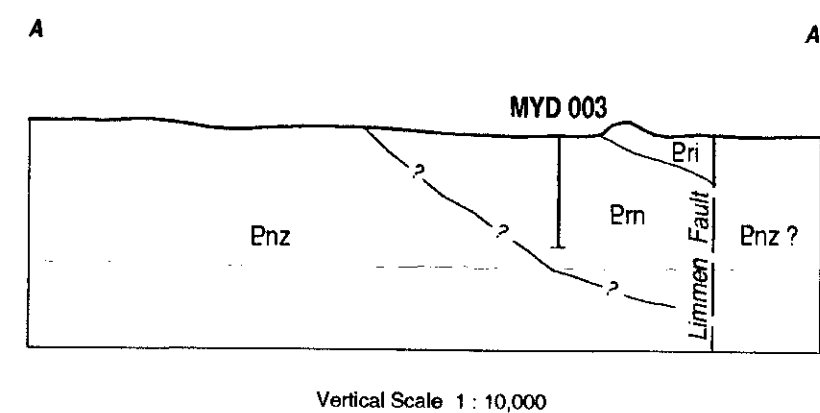
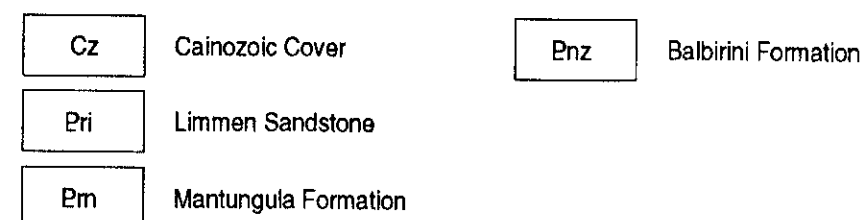
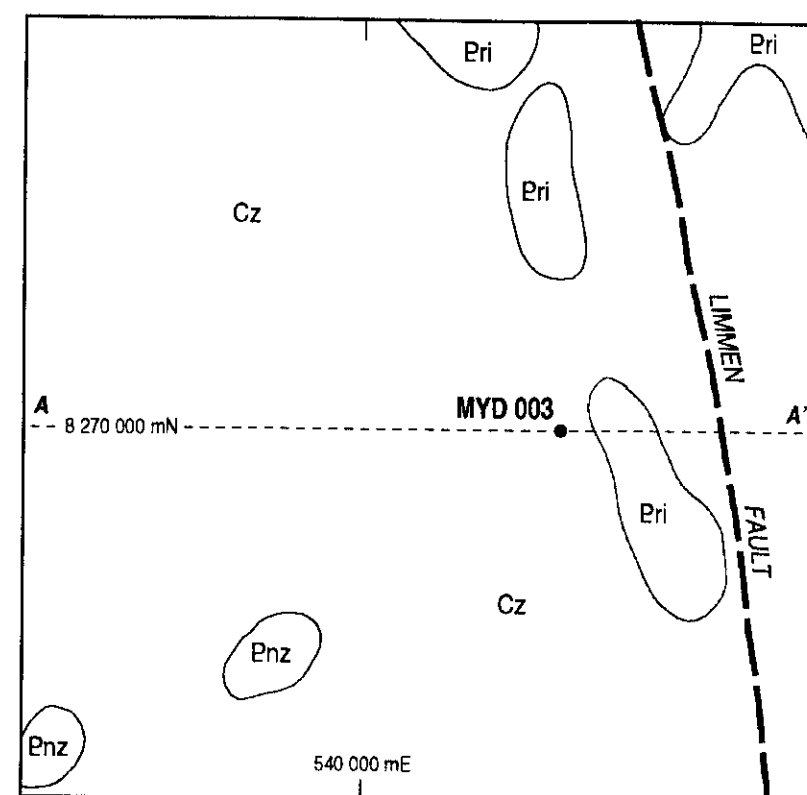
PLATE 5

CR 95 / 507A

MYD 003

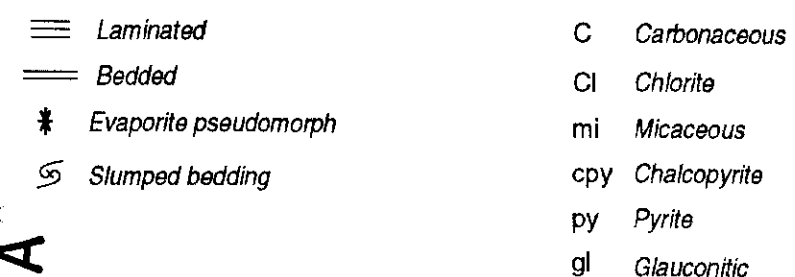


GEOLOGICAL SETTING



DRILLING DETAILS

CONTRACTOR: Gaden Drilling Pty. Ltd.
RIG TYPE: Universal 650
DATE COMMENCED: 24-09-94
DATE COMPLETED: 26-09-94
DECLINATION: Vertical
FINAL DEPTH: 171.4m
METHOD: 5 1/4" RC Hammer to 120.0m
 NQ Core to 171.4m
COLLAR: AMG Easting 536650
CO-ORDINATES: AMG Northing 8305000
 AMG Zone 53
LOGGED: M. W. Rennison, November 1994
SAMPLE: 6m composite RC chips
 6m 1/3 core
ANALYSES: Analabs Pty. Ltd., Townsville, Qld.



CR95/507A

BHP

Exploration - BHP Minerals

BHP Minerals Pty. Ltd., A.C.N. 008 694 762

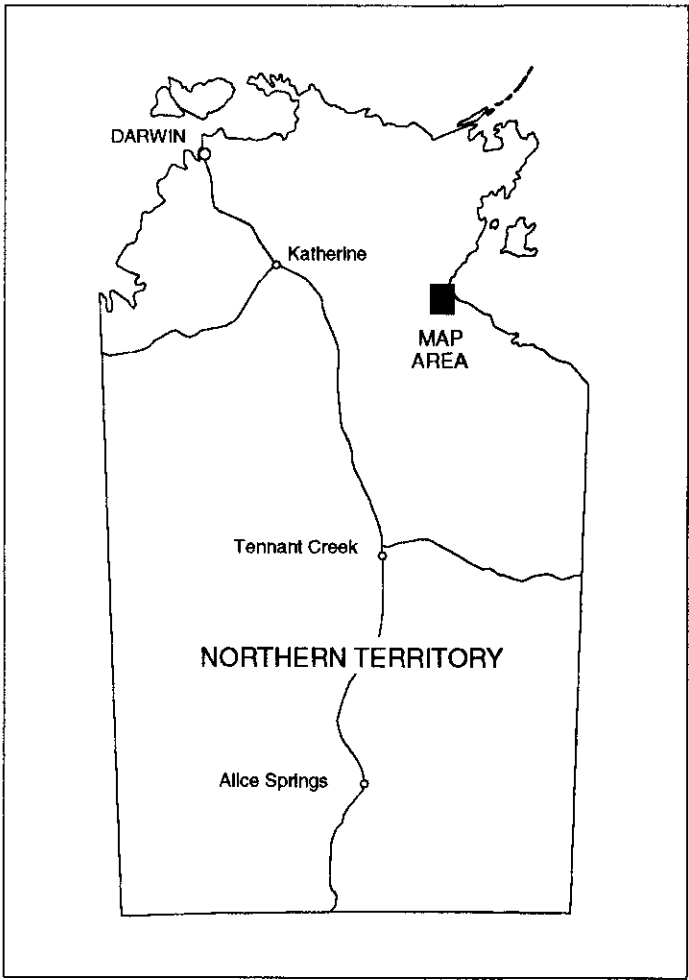
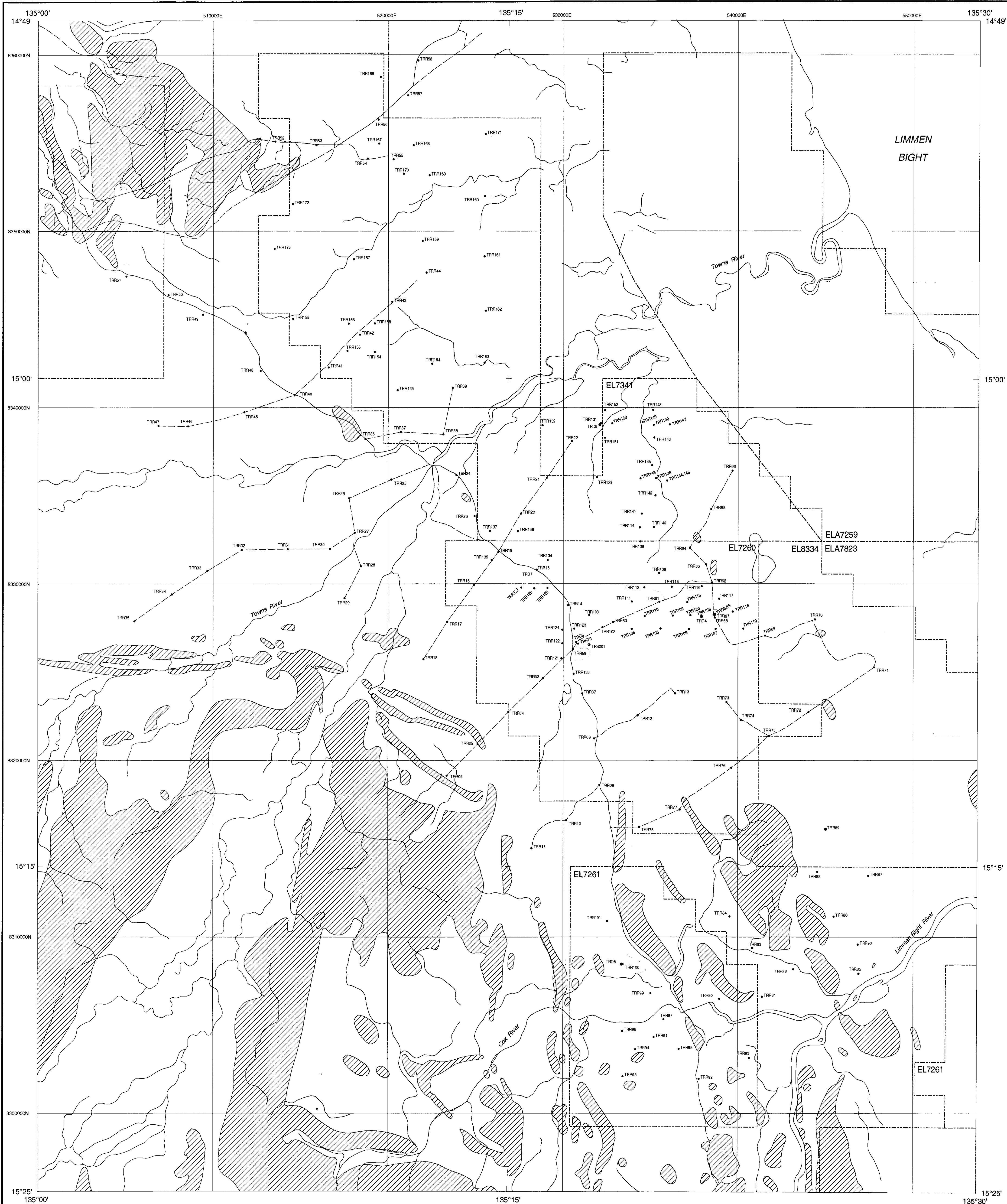
McARTHUR RIVER JOINT VENTURE

NATHAN RIVER PROJECT - E7261

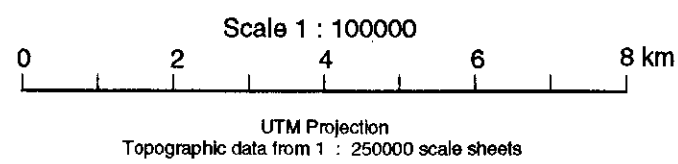
MYD 003 - SUMMARY GRAPHIC LOG

Prepared : M.W.Rennison	Date : 19.6.95
Drawn : R.J.Clark	Revised :
Centre : Perth	Drawing No : A2-2480

PLATE 6

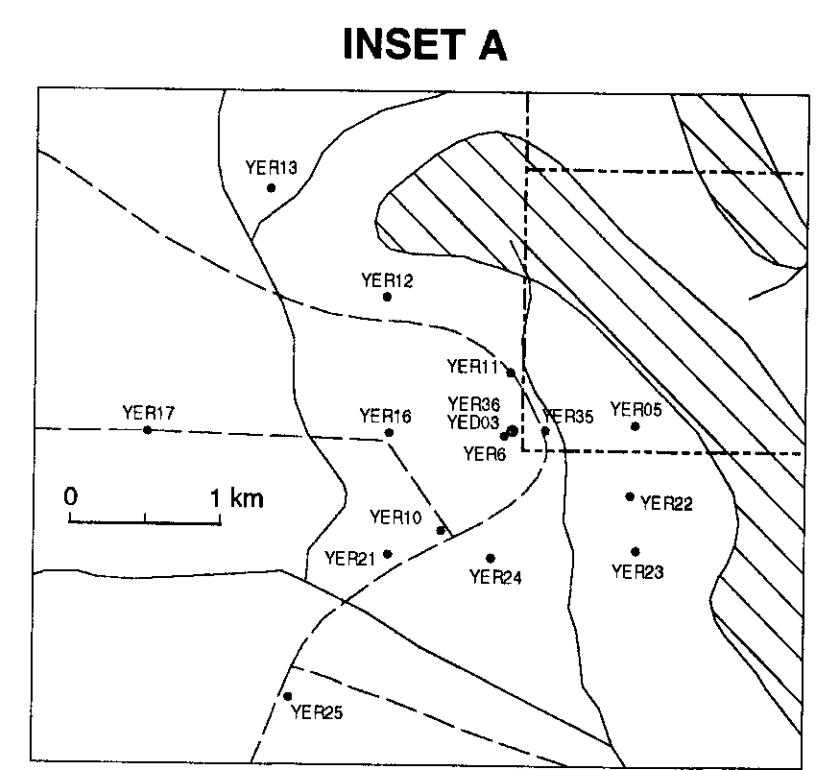
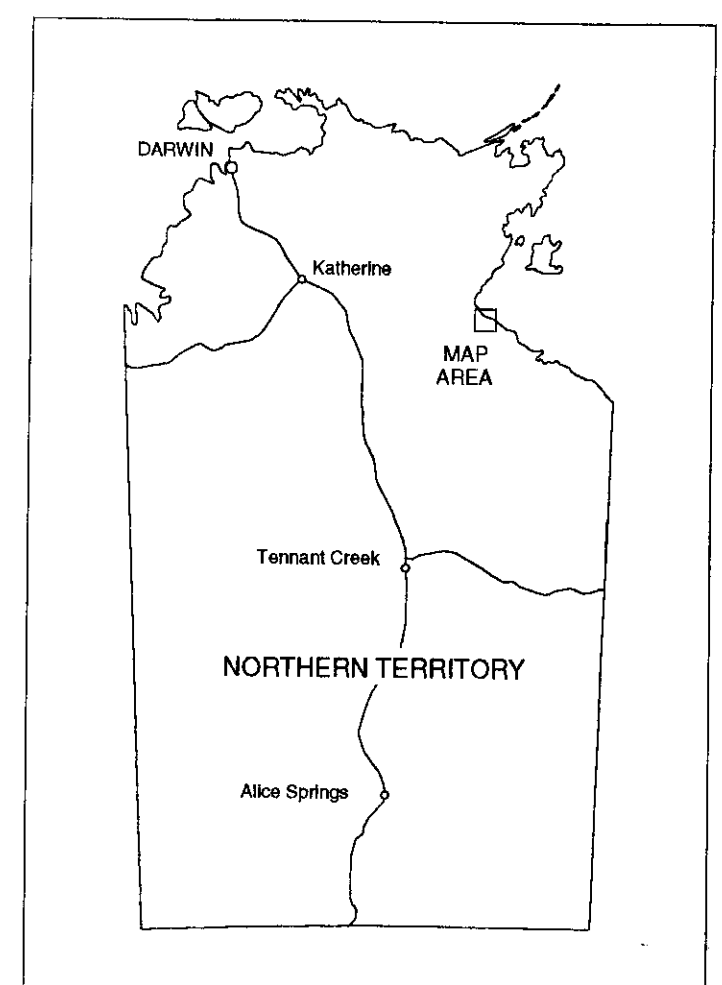
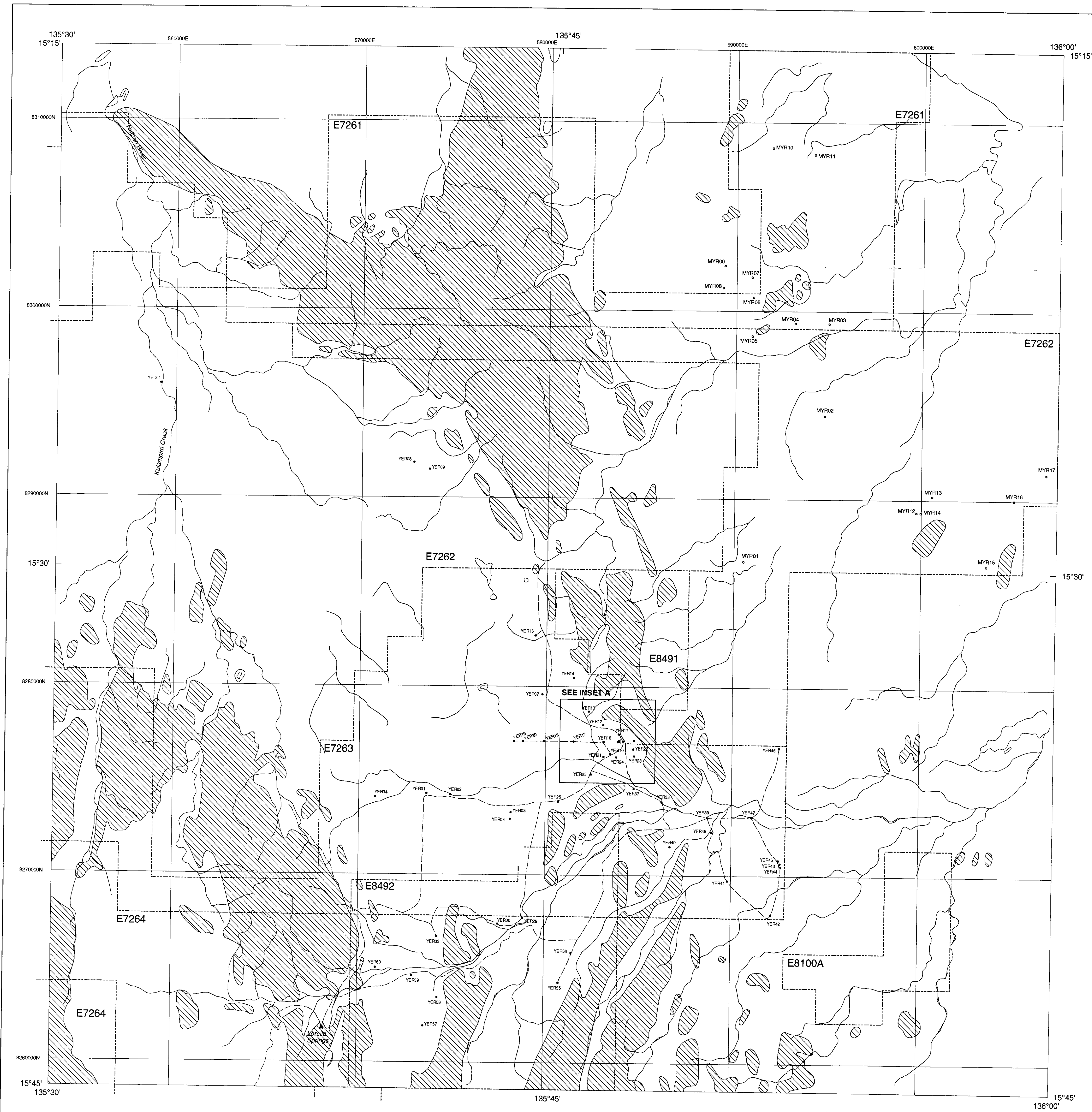


- Proterozoic outcrop
- RC drill holes (1993 & 1994)
- Diamond drill holes
- Bulldozed tracks (drilling access)

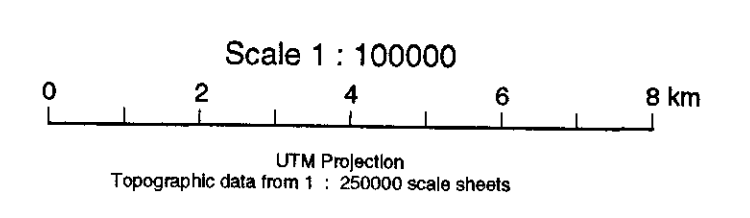


CR95/507A

 BHP		Exploration - BHP Minerals BHP Minerals Pty. Ltd. A.C.N. 008 664 782	
TOWNS RIVER REGION, N. T.			
RC DRILLING			
Prepared : H. Berents	Date : 28-7-93	PLATE 7	
Drawn : M. Rosker	Revised : 8-11-94		
Centre : Melbourne	Org No : A1-2662		

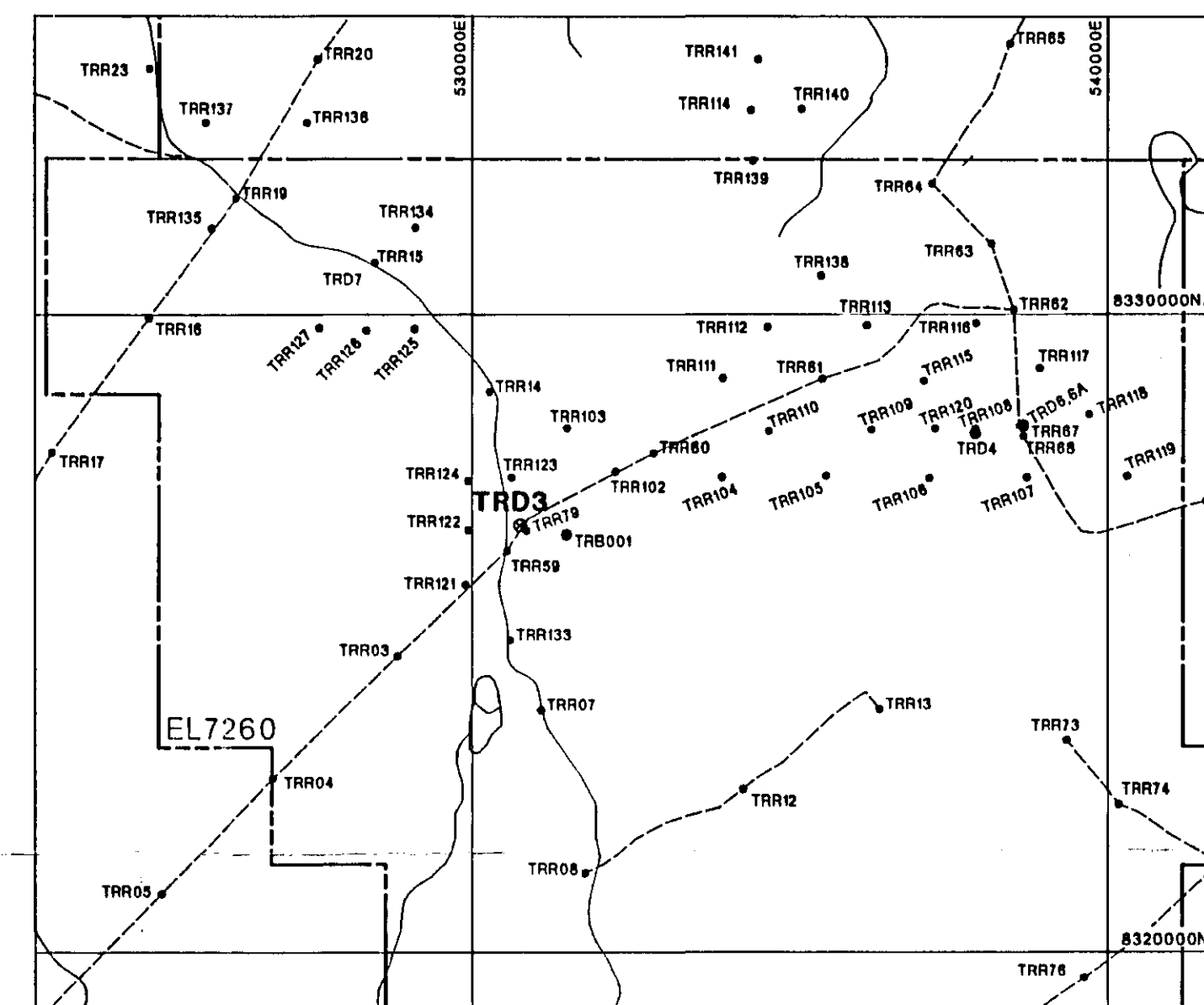
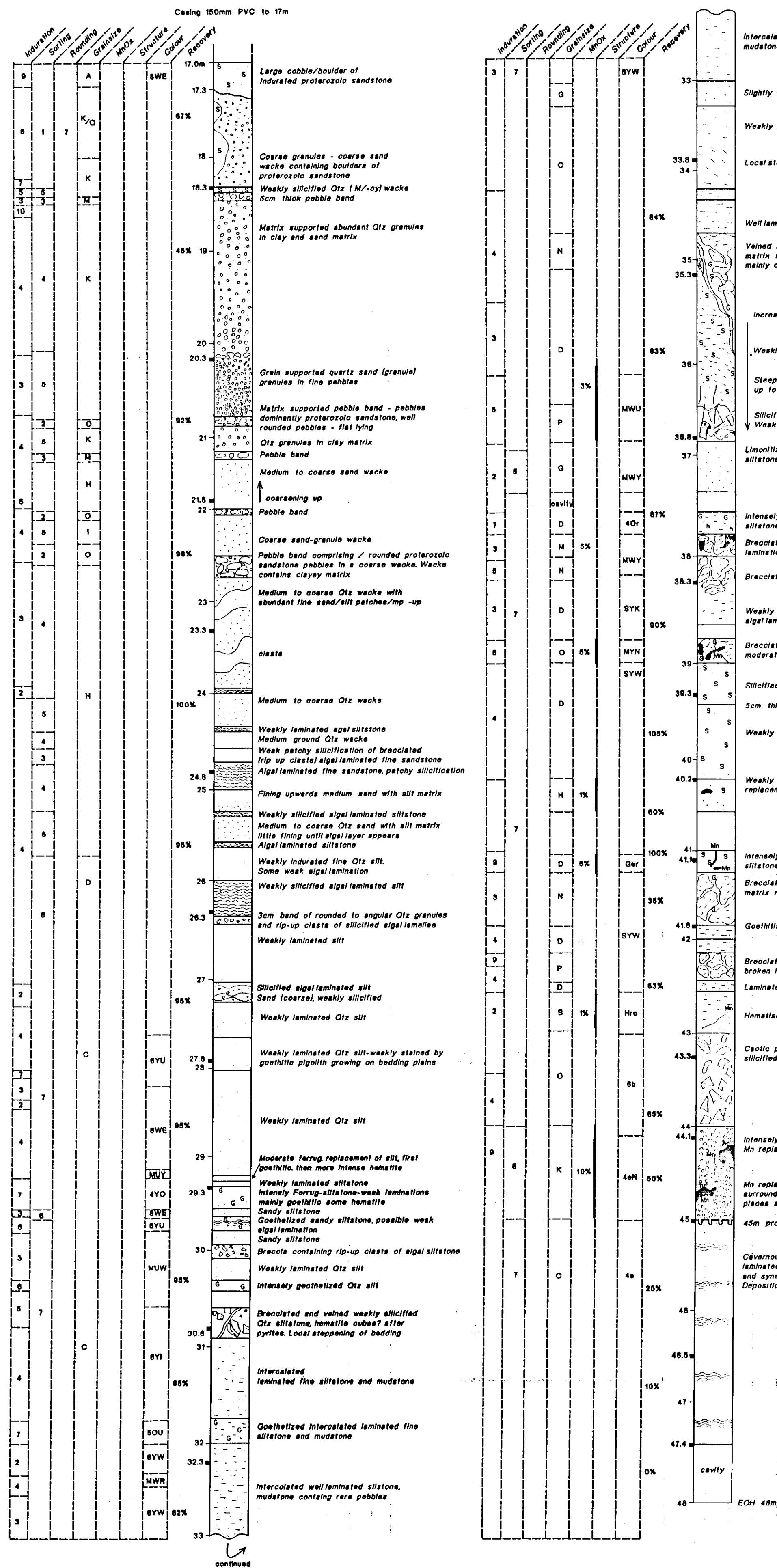


- Proterozoic outcrop
- RC drill hole (1993 & 1994)
- Diamond drill hole
- Bulldozed tracks (drilling access)



CR95/507A

		Exploration - BHP Minerals BHP Minerals Pty. Ltd. A.C.N. 008 884 782	
YIYINTYI REGION, N. T.			
RC DRILLING			
Prepared : H. Berents	Date : 28-7-93	PLATE 8	
Drawn : M. Rosker	Revised : 14-12-94		
Centre : Melbourne	Drg No : A1-2637		



INDURATION

0 loose
1 friable
2 soft
3 firm
4 stiff
5 hard
6 weak
7 mod strong
8 strong
9 very strong

SORTING

0 not
1 extremely poor
2 very poor
3 poorly
4 fairly poor
5 moderately
6 fairly well
7 well sorted
8 very well
9 extremely well

GRAINSIZE

A clay
B VF silt
C F silt
D M silt
E C silt
F VF sand
G F sand
H M sand
I C sand
J VC sand
K granule
L VS pebble
M S pebble
N M pebble
O L pebble
P cobble
Q boulder

COLOUR

Refer to standard color set

GEOLOGY

clay
silt
fine sand
coarse sand
gravel / pebbles
algal / lamination
planar lamination
contact sharp
contact gradational / diffuses
breccia fragments

Mn replacement
Mn veining
silica replacement / alt
goethite replacement
hematite replacement / alt
carbonate replacement / alt
stromatolites
position or core block
Intense veining - stockwork

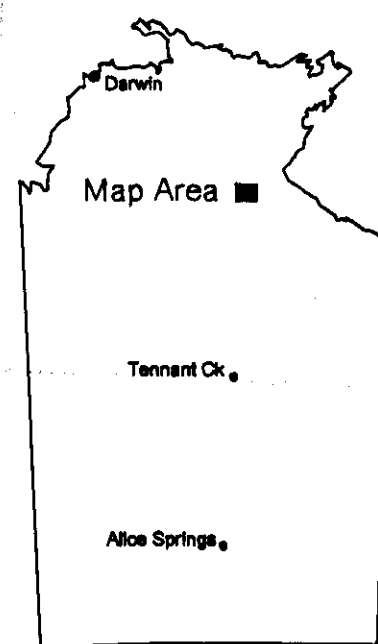
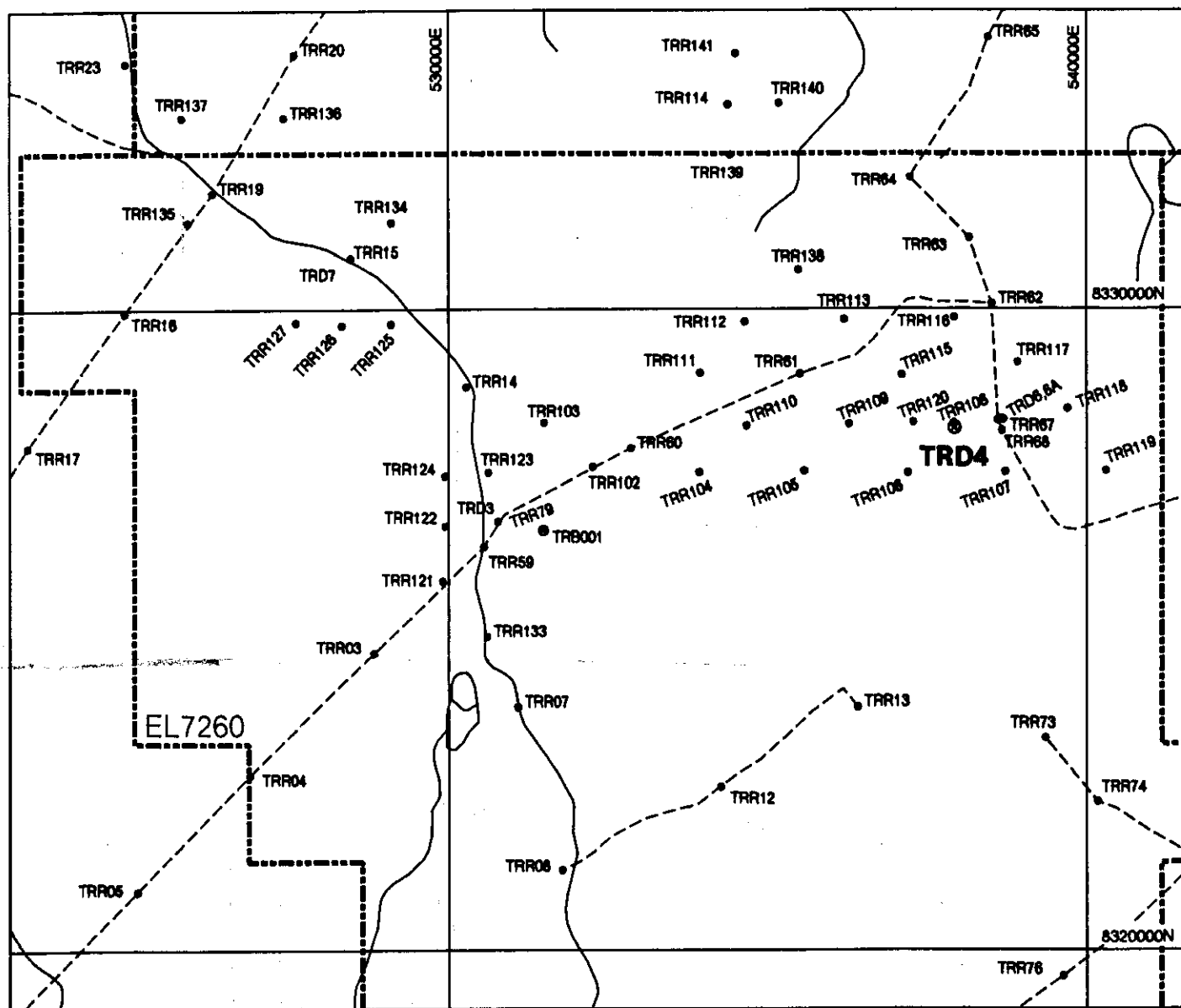
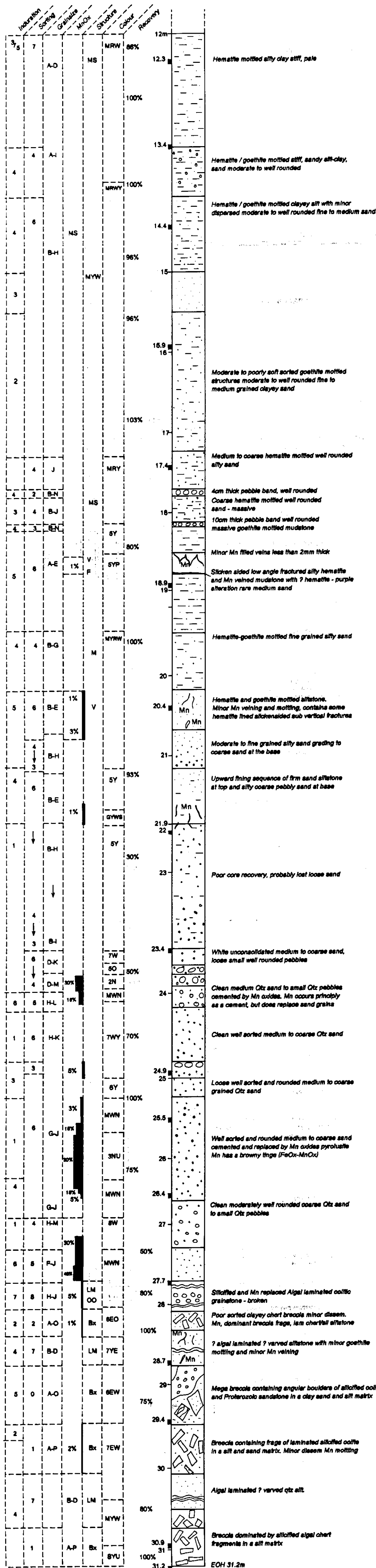
CR95/507A

Patterning drafted manually
Refer to filled copy for details

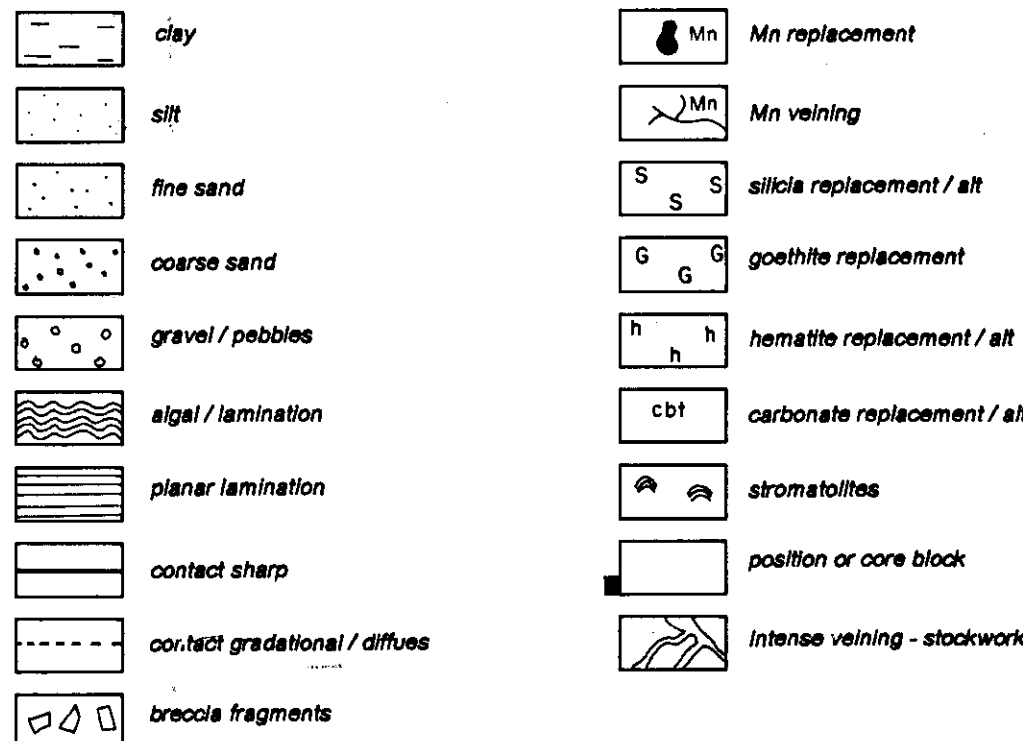


Exploration - BHP Minerals BHP Minerals Pty. Ltd., A.G. 208 684 787	
TOWNS RIVER REGION, CARPENTARIA, N.T. DRILLHOLE TRD3	
GEOLOGICAL SECTION	
Prepared by: T. O'Sullivan	Date: 1 Dec 1994
Drawn by: F. Butcher	Revised:
Checked by: F. Butcher	Drawing No: A1-26653
PLATE 9	

Casing 155mm to 12m



GEOLOGY



Patterning drafted manually
Refer to filed copy for details

INDURATION

- 0 loose
- 1 friable
- 2 soft
- 3 firm
- 4 stiff
- 5 hard
- 6 weak
- 7 mod strong
- 8 strong
- 9 very strong

SORTING

- 0 not
- 1 extremely poor
- 2 very poor
- 3 poorly
- 4 fairly poor
- 5 moderately
- 6 fairly well
- 7 well sorted
- 8 very well
- 9 extremely well

GRAINSIZE

- A clay
- B VF silt
- C F silt
- D M silt
- E C silt
- F VF sand
- G F sand
- H M sand
- I C sand
- J VC sand
- K granule
- L VS pebble
- M S pebble
- N M pebble
- O L pebble
- P cobble
- Q boulder

COLOUR

Refer to standard color set

Vertical Scale 1:30



CR95/507A



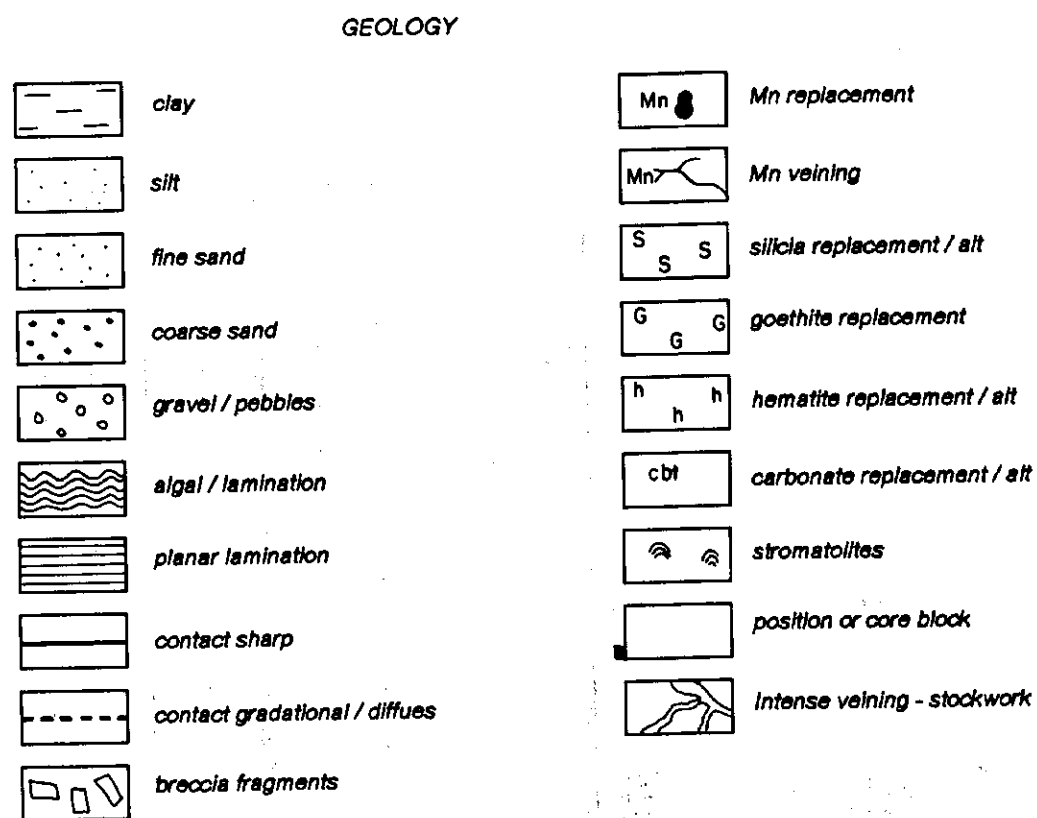
Exploration - BHP Minerals
BHP Minerals Pty. Ltd., A.G.N. 008 894 782

TOWNS RIVER REGION, CARPENTARIA, N.T.
DRILLHOLE TRD4

GEOLOGICAL SECTION

Prepared : H. Berents
Date : Dec 1994
Drawn : F. Barlow
Revised :
Centre : Melbourne
Drawing No : A1-2669b

PLATE 10



INDURATION

- 0 loose
- 1 friable
- 2 soft
- 3 firm
- 4 stiff
- 5 hard
- 6 weak
- 7 mod strong
- 8 strong
- 9 very strong

SORTING

- 0 not
- 1 extremely poor
- 2 very poor
- 3 poorly
- 4 fairly poor
- 5 moderately
- 6 fairly well
- 7 well sorted
- 8 very well
- 9 extremely well

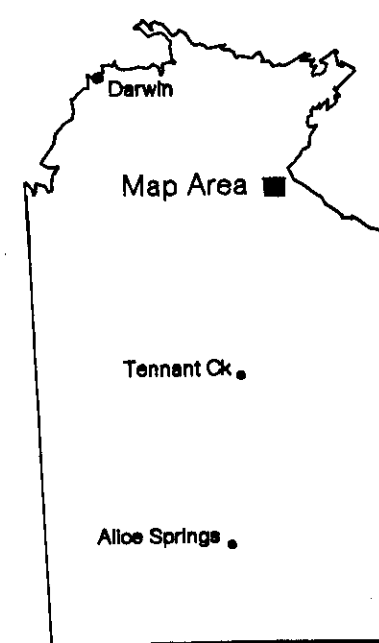
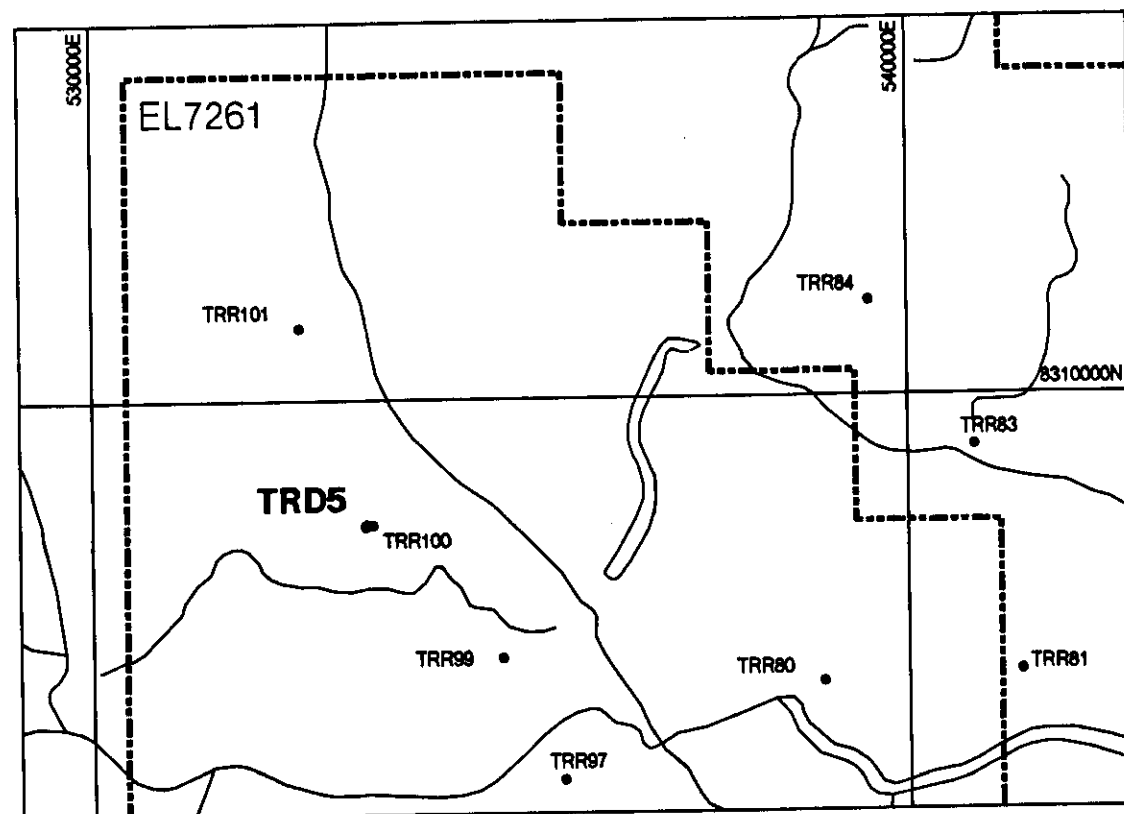
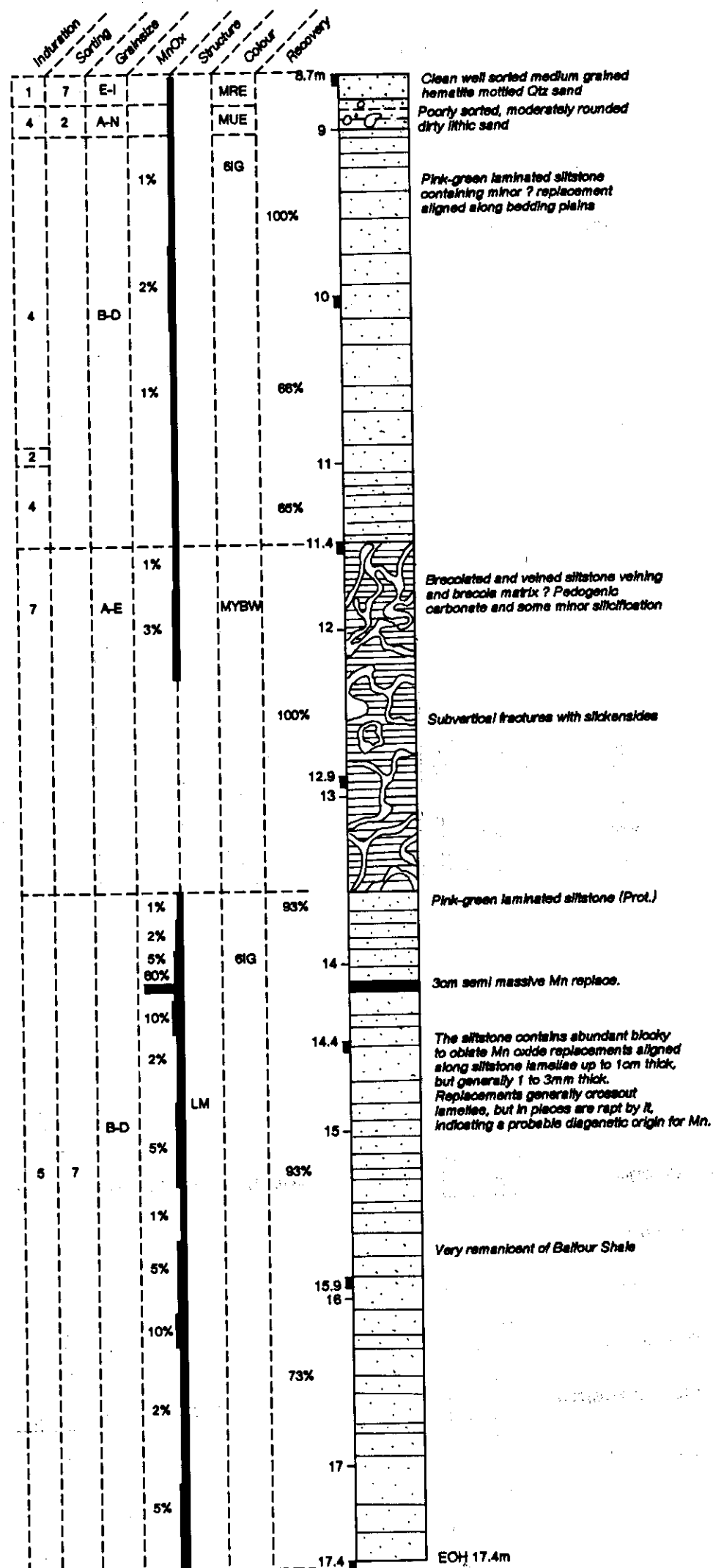
GRAINSIZE

- A clay
- B VF silt
- C F silt
- D M silt
- E C silt
- F VF sand
- G F sand
- H M sand
- I C sand
- J VC sand
- K granule
- L VS pebble
- M S pebble
- N M pebble
- O L pebble
- P cobble
- Q boulder

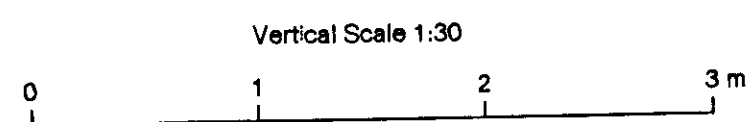
COLOUR

Refer to standard color set

Patterning drafted manually
Refer to filed copy for details



CR95/507A



BHP		Exploration - BHP Minerals BHP Minerals Pty. Ltd., A.C.N. 009 984 732	
TOWNS RIVER REGION, CARPENTARIA, N.T. DRILLHOLE TRD5			
GEOLOGICAL SECTION			
Prepared : T. O'Sullivan	Date : 4/1/95	PLATE 11	
Drawn : F. Barlow	Revised :		
Centre : Melbourne	Drawing No : A1-2669c		

APPENDIX 7.

Manganese Drill Logs

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YED03

LOCALITY: EL7263

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-650

LOGGED BY : PRD

JOB NO : MBB

DATE DRILLED: 21-JUN-94

TOTAL DEPTH : 30.8

GRID: AMG ZONE: 53 RELIABILITY: TOPO EASTING: 583915 NORTHING: 8277120 R.L.: 55.0 AZIM.: INCL.:

COMMENTS: Re-drill of YER06 from 1993

SHEET 1 OF 2 HOLE NUMBER : YED03

DEPTHS From (m)	To (m)	SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
0.0	2.0		CEN	Sand	light brown	vf sand to f sand	loose	
2.0	5.8		CRE	Clay silty Claystone	light brown	clay to vf sand	firm	
5.8	7.0		CRE	Mudstone	light grey	med silt to vf sand	weak	
7.0	7.2		CRE	Claystone ferruginous Sand clayey ferruginous	start coring at 5.8m light brown	vf sand to f sand	soft	
7.2	12.2		CRE	Mudstone ferruginous massive	grades downwards back into mudstone light grey	med silt to vf sand	weak	0.5 - 5%
12.2	12.3		CRE	Mudstone silicified	fe staining on joints; mn disseminated & in veins 11.5-11.8m light grey	med silt to vf sand	mod'ly strong	
12.3	12.4		CRE	Sand clayey ferruginous	light brown	vf sand to f sand	soft	
12.4	15.4		CRE	Mudstone massive ferruginous Carbonate algal	grades downwards back into mudstone light grey brown	med silt to vf sand	weak	trace <0.5%
15.4	15.8		CRE	Mudstone massive ferruginous	trace mn 13.4-13.5, abundant carbonate 14.1-14.3 light brown	med silt to vf sand	weak	
15.8	16.1		CRE	Carbonate algal Mudstone	light grey brown	med silt to vf sand	weak	trace <0.5%
16.1	16.4		CRE	Mudstone massive ferruginous	trace mn at 16.0m light brown	med silt to vf sand	weak	
16.4	16.8		CRE	Carbonate algal	light grey brown	med silt to vf sand	weak	

DEPTHS From To (m) (m)		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
16.8	20.2		CRE	Mudstone massive ferruginous	light grey	med silt to vf sand	weak	trace <0.5%
20.2	21.2		CRE	Manganese ore Mudstone	patchy brown black	med silt to vf sand	weak	30 - 50%
21.2	24.8		CRE	Mudstone laminated Chert	mnox as soft clay & hard fragments, banded grey brown	med silt to vf sand	mod'ly strong	trace <0.5%
24.8	28.3		CRE	Chert laminated ferruginous Mudstone	trace mn at 21.2-21.6 & at 23.7m banded grey brown	med silt to vf sand	mod'ly strong	
28.3	30.8		PRO	Siltstone massive weathered	brecciated chert with mudstone between chert fragments medium purple grey	med silt to vf sand	mod'ly strong	

EOH at 30.8 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRD3

LOCALITY: EL7260

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : APO

JOB NO : May

DATE DRILLED: 20-JUL-94

TOTAL DEPTH : 48.0

GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 530748 NORTHING: 8326700 R.L.: 20.0 AZIM.: INCL.:

COMMENTS: collared on TRR79

HOLE NUMBER : TRD3

From (m)	To (m)	GEOL. TIME	DESCRIPTION	MINERALISATION DEPTH(S) & AMOUNT
0.0	4.0	CEN	Laterite, sandy	
4.0	17.0	CRE	Predominantly sandy clay with minor sandstone	
17.0	23.9	CRE	Coarse pebbly sandstone with pebble layers, pale grey to white	
23.9	30.8	CRE	Weakly laminated sandy siltstone and mudstone with thinner laminated (algal) and silicified siltstone. Algal laminated zones are typically a few cms to 20 cms thick.	
30.8	34.5	CRE	Mudstone and laminated siltstone	
34.5	44.1	CRE	Alternating zones of brecciated siltstone and massive to laminated siltstone and sandstone. Breccia zones are silicified and veined.	36.1-36.8 3% MnOx 37.8-38.0 5% MnOx 41.0-41.2 1% MnOx
44.1	45.0	CRE	Silicified oolitic grainstone with Mn replacements occurring irregular patches.	44.1-45.0 10% MnOx
45.0	48.0	CRE	Interbedded massive chert and laminated chert.	
EOH 48.0 m				

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRD4

LOCALITY: EL7260

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : APO

JOB NO : May

DATE DRILLED: 24-JUL-94

TOTAL DEPTH : 31.2

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 537920

NORTHING: 8328200

R.L.: 20.0

AZIM.:

INCL.:

COMMENTS: collared on TRR108

HOLE NUMBER : TRD4

From (m)	To (m)	GEOLOGICAL TIME	DESCRIPTION	MINERALISATION DEPTH(S) & AMOUNT
0.0	12.0	CEN	Clay and sandy clay, lateritic for top 4 metres. Red brown colour and contains thin, hard ferruginous bands.	
12.0	19.4	CRE	Stiff, sandy clay. Goethite-hematite mottled, contains 4 cm thick pebble band at 17.75m and 10 cm thick pebble band at 18.1-18.2m. Veining filled with Mn oxide (less than 2 mm thick) around 18.6m.	18.5-18.7 1% MnOx
19.4	23.6	CRE	Sandstone, minor siltstone and loose sand. Poor core recovery (30%) from 21.9 to 23.4 due to loose sand. Minor MnOx occurs as small veins.	20.2-20.7 1-3% MnOx 21.6-21.9 1% MnOx
23.6	24.1	CRE	Medium grained quartz sand and pebbles. Pebbles cemented by Mn oxide.	23.8-24.0 30% MnOx 24.0-24.1 15% MnOx
24.1	27.7	CRE	Quartz sand and pebbly quartz sand. Sand is clean, medium to coarse grained and moderately well sorted. Mn oxide occurs as cement and as replacement of sand grains.	24.8-25.0 5% MnOx 25.2-26.4 5-30% MnOx 27.3-27.7 30-40% MnOx
27.7 metres - Cretaceous/Proterozoic contact?				
27.7	31.2	CRE/PRO?	Breccia of laminated, silicified chert (algal?) fragments in a clayey sand and silt matrix. Minor silicified oolite.	27.7-28.1 5% MnOx 28.1-28.3 1% MnOx 29.5-30.0 2% MnOx
EOH 31.2 metres				

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

LOCALITY: EL7261

SHEET : Towns

JOB NO : Maz

CONTRACTOR : GADEN DRILLING

RIG TYPE : UDR 650

DATE DRILLED: 25-JUL-94

HOLE NUMBER : TRD5

LOGGED BY : APO

TOTAL DEPTH : 17.4

GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 533440 NORTHING: 8308465 R.L.: 20.0 AZIM.: INCL.:

COMMENTS: collared on TRR100, Start coring at 8.7m

HOLE NUMBER : TRD5

From (m)	To (m)	GEOL. TIME	DESCRIPTION	MINERALISATION DEPTH(S) & AMOUNT
0.0	8.7	CEN	Brown clayey sand.	
8.7	9.0	CEN	Clean, well-sorted quartz sand and poorly sorted lithic sand.	
9.0	11.4	CRE	Pink and green laminated siltstone.	9.7-10.0 2% MnOx
11.4	13.5	CRE	Brecciated and veined siltstone. Minor silicification.	11.8-12.1 3% MnOx
13.5	17.4	CRE	Pink and green laminated siltstone. Siltstone contains many oblate to blocky Mn oxide replacements aligned along laminations. Mn oxide replacements are generally 1 to 3mm thick but occur up to 1 cm thick. Replacements usually cut across laminations, but in places are wrapped around by laminations.	13.8-14.0 2% MnOx 14.0-14.2 10% MnOx (includes 3 cm band of massive Mn) 14.2-17.4 1-10% MnOx

EOH 17.4 metres

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

LOCALITY: EL7260

SHEET : Towns

JOB NO : May

CONTRACTOR : GADEN DRILLING

RIG TYPE : UDR 650

DATE DRILLED: 04-AUG-94

HOLE NUMBER : TRD7

LOGGED BY : APO

TOTAL DEPTH : 22.0

GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 528466 NORTHING: 8330800 R.L.: 15.0 AZIM.: INCL.:

COMMENTS: collared on TRR15, start coring at 5.0m

HOLE NUMBER : TRD7

From (m)	To (m)	GEOL. TIME	DESCRIPTION	MINERALISATION DEPTH(S) & AMOUNT
0.0	5.0	CEN	Sand and laterite.	
5.0	11.8	CRE	Clay and sandy clay. Intense carbonate alteration at 10.3 m. Mn oxide occurs as mottling in clay.	8.1-8.3 10% MnOx
11.8	18.8	CRE	Coarse to very coarse sand with clay matrix. Contains clay filled burrows from 12.5 to 14.8 metres.	
18.8	19.0	CRE	Pebbles occurring in a clay matrix.	
19.0	22.0	OTH	Breccia of laminated (algal laminations?) chert and silicified quartz siltstone and sandstone clasts in a silicified matrix.	

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRD6A

LOCALITY: EL7260

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : APO

JOB NO : May

DATE DRILLED: 07-AUG-94

TOTAL DEPTH : 36.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 538610

NORTHING: 8328251

R.L.: 15.0

AZIM.:

INCL.:

COMMENTS: collared on TRR67, Redrill of TRD6
start coring at 12m

HOLE NUMBER : TRD6A

From (m)	To (m)	GEOLOGICAL TIME	DESCRIPTION	MINERALISATION DEPTH(S) & AMOUNT
0.0	12.0	CRE	Sandy clay, lateritic for top 2 metres.	
12.0	21.3	CRE	Medium to coarse quartz sand with pebble bands.	
21.3	23.3	CRE	Silicified laminated siltstone.	
23.3	24.4	CRE	Laminated siltstone and mudstone, brecciated from 23.8 to 24.1 metres. Mn oxide occurs as fine lamellae in siltstone and mudstone.	23.3-23.9 5% MnOx
24.4	27.75	CRE	Laminated siltstone and mudstone, brecciated from 26.8 to 27 m. Mn oxide occurs as replacements up to 4mm thick and as small veins.	26.3-27.0 3% MnOx 27.2-27.25 5% MnOx 27.7-27.75 10% MnOx
27.75	28.2	CRE	Silicified oolite.	
28.2	33.8	CRE	Laminated mudstone and siltstone. Possibly stromatolitic laminations at 32.8 metres. Mn occurs as minor replacements along laminations and as massive Mn replacements. Massive Mn replacement at base of Cretaceous.	29.5-31.7 5% MnOx 31.7-31.8 40% MnOx 32.1-32.25 5% MnOx 32.25-32.5 90% MnOx
33.8	36.0	PRO	Yuggy to cavernous silicified dolostone. Minor Mn oxide veining and replacements. Very poor core recovery.	@33.8m 90% MnOx 33.8-36.0 5% MnOx
EOH 36.0 metres				

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRD08

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRD

JOB NO : MBK

DATE DRILLED: 29-AUG-94

TOTAL DEPTH : 25.9

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 532148

NORTHING: 8339111

R.L.: 15.0

AZIM.:

INCL.:

COMMENTS: Re-drill of TRR131

SHEET 1 OF 2 HOLE NUMBER : TRD08

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite ferruginous pisolitic Clay calcareous	mottled red grey	clay to s pebble	hard	
2.0	12.4		CRE	Clay calcareous Siltstone	light white grey	clay to c silt	stiff	trace <0.5%
12.4	13.3		CRE	Claystone Chert	start coring at 12.4 metres light brown	clay to med silt	stiff	
13.3	14.6		CRE	Clay sandy	light grey	clay to med sand	firm	
14.6	15.9		CRE	Chert algal Clay	light grey	med silt to vf sand	stiff	
15.9	16.1		CRE	Sand quartzose	medium grey	med sand to c sand	firm	
16.1	18.7		CRE	Clay sandy	medium brown grey	clay to f sand	stiff	
18.7	19.4		CRE	Chert algal Mudstone	medium brown	med silt to vf sand	hard	
19.4	21.2		CRE	Mudstone clayey laminated	medium brown	med silt to vf sand	hard	trace <0.5%
21.2	22.6		CRE	Clay sandy	brecciated at 19.7-19.9, mnox coats medium grey	fracture surfaces clay to med sand	stiff	trace <0.5%
22.6	23.6		CRE	Sand clayey	medium grey	med sand to c sand	stiff	0.5 - 5%
23.6	23.7		CRE	Chert silicified Breccia	mnox occurs disseminated throughout matrix medium grey	med silt to vf sand	mod'ly strong	5 - 20%
					mnox occurs as coating on fractures and cavities			

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
23.7	24.0		CRE	Clay sandy	medium grey	clay to med sand	stiff	
24.0	25.9		PRO	Chert laminated	banded grey brown	med silt to vf sand	mod'ly strong	
EOH at 25.9 m					interpreted as silicified balbirini dolomite			

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

LOCALITY: EL7263

SHEET : Tawallah Range

JOB NO : HBB

CONTRACTOR : Gaden Drilling

RIG TYPE : UDR-850

DATE DRILLED: 20-JUN-94

HOLE NUMBER : YER10

LOGGED BY : PRD

TOTAL DEPTH : 44.0

GRID: ANG ZONE: 53 RELIABILITY: SATL EASTING: 583450 NORTHING: 8276459 R.L.: 55.0 AZIM.: INCL.:

COMMENTS: Water bore for camp

SHEET 1 OF 1 HOLE NUMBER : YER10

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Sand Clay	light brown	f sand to med sand	loose	
2.0	4.0		CRE	Clay ferruginous Mudstone	medium orange brown	clay to med sand	firm	
4.0	6.0		CRE	Mudstone sandy	light grey	med silt to vf sand	weak	
6.0	8.0		CRE	Mudstone sandy	light grey	med silt to vf sand	weak	
8.0	10.0		CRE	Mudstone sandy	light grey	med silt to vf sand	weak	
10.0	12.0		CRE	Mudstone sandy	light grey	med silt to vf sand	weak	
12.0	14.0		CRE	Mudstone sandy	light grey	med silt to vf sand	weak	
14.0	16.0		PRO	Siltstone	medium red brown	med silt	mod'ly strong	
16.0	44.0		PRO	Siltstone Sandstone shaly	medium red brown water at about 40m	med silt	mod'ly strong	

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER11

LOCALITY: EL7263

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-650

LOGGED BY : PRO

JOB NO : MBB

DATE DRILLED: 23-JUN-94

TOTAL DEPTH : 40.0

GRID: AMG

ZONE: 53

RELIABILITY: TOPO

EASTING: 583900

NORTHING: 8277500

R.L.: 55.0

AZIM.:

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : YER11

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Sand silty	medium red brown	f sand	loose	
2.0	4.0		CRE	Mudstone sandy ferruginous	medium red brown	med silt to vf sand	weak	
4.0	6.0		CRE	Mudstone sandy ferruginous	medium red brown	med silt to vf sand	weak	
6.0	8.0		CRE	Mudstone sandy ferruginous	medium red brown	med silt to vf sand	weak	
8.0	10.0		CRE	Mudstone sandy ferruginous	medium red brown	med silt to vf sand	weak	
10.0	12.0		CRE	Mudstone sandy ferruginous	medium red brown	med silt to vf sand	weak	
12.0	14.0		CRE	Mudstone silty ferruginous	dark red brown	clay to vf sand	soft	
14.0	16.0		CRE	Mudstone silty ferruginous	dark red brown	clay to vf sand	soft	
16.0	18.0		CRE	Mudstone silty ferruginous	dark red brown	clay to vf sand	soft	
18.0	20.0		CRE	Mudstone silty ferruginous	dark red brown	clay to vf sand	soft	
20.0	22.0		CRE	Mudstone silty ferruginous	dark red brown	clay to vf sand	soft	
22.0	24.0		CRE	Mudstone silty ferruginous	dark red brown	clay to vf sand	soft	
					0.5 metre sampling from 20 to 24 metres			
					0.5 metre sampling from 20 to 24 metres			

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Mudstone silty ferruginous	dark red brown	clay to vf sand	soft	
26.0	28.0		CRE	Mudstone silty ferruginous	dark red brown	clay to vf sand	soft	
28.0	30.0		CRE	Mudstone silty ferruginous	dark red brown	clay to vf sand	soft	
30.0	32.0		CRE	Mudstone silty ferruginous	dark red brown	clay to vf sand	soft	
32.0	34.0		CRE	Mudstone silty ferruginous	dark red brown	clay to vf sand	soft	
34.0	36.0		CRE	Mudstone silty ferruginous	dark red brown	clay to vf sand	weak	
36.0	38.0		PRO	Sandstone siliceous Siltstone	banded grey brown	vf sand to f sand	mod'ly strong	
38.0	40.0		PRO	Sandstone siliceous Siltstone	interbedded sandstone & siltstone banded grey brown	vf sand to f sand	mod'ly strong	

EOH at 40.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER12

LOCALITY: EL7263

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-650

LOGGED BY : PRD

JOB NO : HBB

DATE DRILLED: 23-JUN-94

TOTAL DEPTH : 38.0

GRID: AMG

ZONE: 53

RELIABILITY: TOPO

EASTING: 583076

NORTHING: 8277990

R.L.: 55.0

AZIM.:

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : YER12

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Sand silty Mudstone clayey ferruginous	medium red brown	vf sand to f sand	loose	
2.0	4.0		CRE	Mudstone clayey ferruginous	medium red brown	med silt to vf sand	weak	
4.0	6.0		CRE	Mudstone clayey ferruginous	medium pink brown	med silt to vf sand	weak	
6.0	8.0		CRE	Mudstone massive ferruginous	medium red brown	med silt to vf sand	weak	
8.0	10.0		CRE	Mudstone massive ferruginous	medium red brown	med silt to vf sand	weak	
10.0	12.0		CRE	Mudstone massive ferruginous	medium red brown	med silt to vf sand	weak	
12.0	14.0		CRE	Mudstone massive ferruginous	medium red brown	med silt to vf sand	weak	
14.0	16.0		CRE	Mudstone massive ferruginous	medium red brown	med silt to vf sand	weak	
16.0	18.0		CRE	Mudstone massive ferruginous	medium red brown	med silt to vf sand	weak	
18.0	20.0		CRE	Mudstone massive ferruginous	medium red brown	med silt to vf sand	weak	
20.0	22.0		CRE	Mudstone massive ferruginous	medium red brown	med silt to vf sand	weak	
22.0	24.0		CRE	Mudstone massive ferruginous	medium red brown 0.5m sampling 20-24m	med silt to vf sand	weak	

DEPTHS From To (m) (m)		SAMPLE NUMBER	GEOLOGICAL TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
24.0	26.0		CRE	Mudstone clayey	medium red brown	med silt to vf sand	weak	
26.0	28.0		CRE	Mudstone clayey	medium red brown	med silt to vf sand	weak	
28.0	30.0		CRE	Mudstone clayey	medium red brown	med silt to vf sand	weak	
30.0	32.0		CRE	Mudstone clayey Sandstone	medium red brown	med silt to vf sand	weak	
32.0	34.0		PRO	Sandstone ferruginous	medium red brown	vf sand to f sand	mod'ly strong	
34.0	36.0		PRO	Sandstone ferruginous siliceous	banded grey brown	vf sand to f sand	mod'ly strong	

EOH at 36.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn
 LOCALITY: EL7263
 SHEET : Tawallah Range
 JOB NO : M88

CONTRACTOR : Gaden Drilling
 RIG TYPE : UDR-650
 DATE DRILLED: 23-JUN-94

HOLE NUMBER : YER13

LOGGED BY : PRO
 TOTAL DEPTH : 18.0

GRID: AMG ZONE: 53 RELIABILITY: TOPO EASTING: 582300 NORTHING: 8278700 R.L.: 55.0 AZIM.: INCL.:

COMMENTS:

SHEET 1 OF 1 HOLE NUMBER : YER13

DEPTHS From (m)	To (m)	SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
0.0	2.0		CEN	Sand silty	light brown	vf sand to f sand	loose	
2.0	4.0		CRE	Sandstone ferruginous weathered	medium red brown	f sand to med sand	weak	
4.0	6.0		PRO	Sandstone siliceous	light grey	f sand to med sand	mod'ly strong	
6.0	8.0		PRO	Sandstone siliceous Mudstone ferruginous	medium red brown	f sand to med sand	mod'ly strong	
8.0	10.0		PRO	Sandstone siliceous	medium red brown	f sand to med sand	strong	
10.0	12.0		PRO	Siltstone siliceous	medium grey	med silt to vf sand	very strong	
12.0	14.0		PRO	Sandstone Siltstone	patchy khaki brown	vf sand to f sand	very strong	
14.0	16.0		PRO	Sandstone ferruginous	medium red brown	f sand	very strong	
16.0	18.0		PRO	Siltstone ferruginous	dark red brown	med silt	very strong	

EOH at 18.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER14

LOCALITY: EL7263

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UOR-650

LOGGED BY : PRO

JOB NO : MBB

DATE DRILLED: 23-JUN-94

TOTAL DEPTH : 18.0

GRID: AMG

ZONE: 53

RELIABILITY: TOPO

EASTING: 581482

NORTHING: 8280463

R.L.: 60.0

AZIM.:

INCL.:

COMMENTS:

SHEET 1 OF 1 HOLE NUMBER : YER14

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Sand silty Sandstone	light brown	vf sand to f sand	loose	
2.0	4.0		OTH	Sandstone ferruginous weathered	patchy grey brown	vf sand to f sand	mod'ly strong	
4.0	6.0		PRO	Sandstone ferruginous	medium brown	vf sand to f sand	strong	
6.0	8.0		PRO	Sandstone ferruginous	medium brown	vf sand to f sand	strong	
8.0	10.0		PRO	Sandstone massive	light grey	f sand to med sand	strong	
10.0	12.0		PRO	Sandstone massive Siltstone siliceous	light grey	f sand to med sand	strong	
12.0	14.0		PRO	Sandstone ferruginous	medium brown	f sand to med sand	strong	
14.0	16.0		PRO	Sandstone massive	light grey	f sand to med sand	strong	
16.0	18.0		PRO	Sandstone massive	light brown	f sand to med sand	strong	

EOH at 18.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mtn

LOCALITY: EL7263

SHEET : Tawallah Range

JOB NO : M8B

CONTRACTOR : Gaden Drilling

RIG TYPE : UDR-650

DATE DRILLED: 24-JUN-94

HOLE NUMBER : YER16

LOGGED BY : PRO

TOTAL DEPTH : 56.0

GRID: AMG

ZONE: 53

RELIABILITY: TOPO

EASTING: 579400

NORTHING: 8282700

R.L.: 55.0

AZIN.:

INCL.:

COMMENTS:

SHEET 1 OF 3 HOLE NUMBER : YER15

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Sand	medium red brown	vf sand to f sand	weak	
2.0	4.0		CRE	Laterite pisolitic Clay sandy	banded grey brown	clay to f sand	firm	
4.0	6.0		CRE	Clay sandy	banded grey brown	clay to f sand	firm	
6.0	8.0		CRE	Clay sandy	light grey brown	clay to f sand	firm	
8.0	10.0		CRE	Claystone sandy	light grey	clay to med silt	weak	
10.0	12.0		CRE	Claystone silty	light grey	clay to med silt	weak	
12.0	14.0		CRE	Claystone silty sandy	light grey	clay to med silt	weak	
14.0	16.0		CRE	Sandstone quartzose	light grey	med sand	mod'ly strong	
16.0	18.0		CRE	Sandstone quartzose	light grey brown	med sand	weak	
18.0	20.0		CRE	Sandstone quartzose Siltstone shaly	light brown	f sand	mod'ly strong	
20.0	22.0		CRE	Sandstone quartzose Mudstone sandy	patchy brown grey some laterite pisolites in sample - contamination?	f sand to med sand	weak	
22.0	24.0		CRE	Sandstone quartzose Mudstone sandy	light grey hammer bogged twice, trying blade bit	f sand	weak	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Mudstone sandy	light grey	med silt to vf sand	weak	
26.0	28.0		CRE	Mudstone sandy	light grey	med silt to vf sand	weak	
28.0	30.0		CRE	Mudstone Clay	light grey	med silt to vf sand	weak	
30.0	32.0		CRE	Sand clayey Clay	light grey	vf sand to f sand	soft	
32.0	34.0		CRE	Clay	light grey	clay to med silt	soft	
34.0	36.0		CRE	Clay	light grey	clay to med silt	soft	
36.0	38.0		CRE	Clay sandy	patchy grey brown	clay to med silt	soft	
38.0	40.0		CRE	Sandstone	light grey	vf sand to f sand	weak	
40.0	42.0		CRE	Sandstone clayey ferruginous	prot.? patchy grey brown	med silt to vf sand	weak	
42.0	44.0		CRE	Sandstone ferruginous	medium brown	vf sand to f sand	mod'ly strong	
44.0	46.0		CRE	Sandstone ferruginous	prot.? medium brown	vf sand to f sand	mod'ly strong	
46.0	48.0		CRE	Sandstone shaly	prot.? light grey	vf sand to f sand	mod'ly strong	
48.0	50.0		CRE	Sandstone silty	prot.? light grey	med silt to vf sand	weak	
50.0	52.0		CRE	Sandstone silty	prot.? light grey	med silt to vf sand	weak	
					prot.?			

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
52.0	54.0		CRE	Sandstone silty	light grey	med silt to vf sand	weak	
54.0	56.0		PRO	Mudstone sandy Sandstone siliceous quartzose	prot.? water - probably basement patchy grey brown	med silt to vf sand	strong	

EOH at 56.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER16

LOCALITY: EL7263

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-650

LOGGED BY : PRO

JOB NO : MBB

DATE DRILLED: 25-JUN-94

TOTAL DEPTH : 40.0

GRID: AMG

ZONE: 53

RELIABILITY: TOPO

EASTING: 583100

NORTHING: 8277100

R.L.: 55.0

AZIM.: 1

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : YER16

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Sand	medium red brown	vf sand to med sand	loose	
				Laterite pisolitic				
2.0	4.0		CEN	Laterite pisolitic	medium red brown	med silt to vs pebble	weak	
4.0	6.0		CRE	Claystone silty	light brown grey	clay to vf sand	weak	
6.0	8.0		CRE	Claystone silty	light brown grey	clay to vf sand	weak	
8.0	10.0		CRE	Claystone silty	light brown grey	clay to vf sand	weak	
10.0	12.0		PRO	Sandstone siliceous	light pink grey probably proterozoic	med sand	mod'ly strong	
12.0	14.0		PRO	Sandstone siliceous	light pink grey	med sand	mod'ly strong	
14.0	16.0		PRO	Sandstone siliceous Mudstone sandy	patchy brown grey	f sand to med sand	weak	
16.0	18.0		PRO	Sandstone siliceous Mudstone sandy	patchy brown grey	f sand to med sand	weak	
18.0	20.0		PRO	Sandstone siliceous	light pink grey	med sand	mod'ly strong	
20.0	22.0		PRO	Sandstone silty	light brown grey	med silt to f sand	weak	
22.0	24.0		PRO	Sandstone quartzose	medium pink grey	vf sand to f sand	mod'ly strong	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0	DZ1156	PRO	Fe zone Sandstone	dark brown black	vf sand to f sand	mod'ly strong	
26.0	26.5	DZ1157	PRO	Sandstone quartzose ferruginous Fe zone	medium brown	vf sand to f sand	mod'ly strong	
26.5	27.0	DZ1158	PRO	Sandstone quartzose ferruginous Fe zone	medium brown	vf sand to f sand	mod'ly strong	
27.0	27.5	DZ1159	PRO	Sandstone quartzose ferruginous Fe zone	medium brown	vf sand to f sand	mod'ly strong	
27.5	28.0	DZ1160	PRO	Sandstone quartzose ferruginous Fe zone	medium brown	vf sand to f sand	mod'ly strong	
28.0	30.0	DZ1161	PRO	Sandstone quartzose ferruginous Fe zone	medium brown	vf sand to f sand	mod'ly strong	
30.0	32.0	DZ1162	PRO	Siltstone	banded brown black	med silt to vf sand	mod'ly strong	
32.0	34.0	DZ1163	PRO	Siltstone	some black chips - mn? banded brown black	med silt to vf sand	mod'ly strong	
34.0	36.0	DZ1164	PRO	Sandstone	some black chips - mn? medium brown	med silt to vf sand	mod'ly strong	
36.0	38.0	DZ1164	PRO	Sandstone	medium brown	med silt to vf sand	mod'ly strong	
38.0	40.0	DZ1164	PRO	Sandstone	medium brown	med silt to vf sand	mod'ly strong	

EOH at 40.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER17

LOCALITY: EL7263

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-850

LOGGED BY : PRD

JOB NO : MBB

DATE DRILLED: 25-JUN-94

TOTAL DEPTH : 41.0

GRID: AMG

ZONE: 53

RELIABILITY: TOPO

EASTING: 581500

NORTHING: 8277100

R.L.: 55.0

AZIM.:

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : YER17

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite pisolitic Sand	medium red brown	med sand to s pebble	weak	
2.0	4.0		CEN	Sandstone ferruginous Laterite	medium red brown	f sand to med sand	weak	
4.0	6.0		CRE	Mudstone sandy	medium brown	med silt to vf sand	weak	
6.0	8.0		CRE	Mudstone sandy Sandstone	medium brown	med silt to vf sand	strong	
8.0	10.0		CRE	ferruginous Sandstone ferruginous	quite hard - prot. medium brown	vf sand to f sand	strong	
10.0	12.0		CRE	Mudstone ferruginous	quite hard - prot. dark brown	med silt to vf sand	strong	
12.0	14.0		CRE	Mudstone ferruginous	dark brown	med silt to vf sand	strong	
14.0	16.0		CRE	Mudstone ferruginous	dark brown	med silt to vf sand	strong	
16.0	18.0		CRE	Mudstone ferruginous Sandstone	dark brown	med silt to vf sand	strong	
18.0	20.0		CRE	Mudstone ferruginous	dark brown	med silt to vf sand	strong	
20.0	22.0		CRE	Mudstone ferruginous	dark brown	med silt to vf sand	strong	
22.0	24.0		CRE	Mudstone ferruginous	dark brown	med silt to vf sand	strong	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Mudstone ferruginous	dark brown	med silt to vf sand	strong	
26.0	28.0		CRE	Mudstone ferruginous	dark brown	med silt to vf sand	strong	
28.0	30.0		CRE	Mudstone ferruginous sandy	dark brown	med silt to vf sand	strong	
30.0	32.0		CRE	Mudstone ferruginous sandy Sandstone	dark brown	med silt to vf sand	strong	
32.0	34.0		CRE	Mudstone ferruginous sandy Sandstone	groundwater dark brown	med silt to vf sand	strong	
34.0	36.0		CRE	Mudstone shaly sandy Sandstone	dark brown	med silt to vf sand	strong	
36.0	38.0		PRO	Sandstone shaly ferruginous	dark brown	vf sand to f sand	strong	
38.0	40.0		PRO	Sandstone shaly ferruginous	trace mn as coatings on some rock fragments dark brown	vf sand to f sand	strong	
40.0	41.0		PRO	Sandstone shaly ferruginous	trace mn as coatings on some rock fragments dark brown	vf sand to f sand	strong	
EOH at 41.0 m					trace mn as coatings on some rock fragments			

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER18

LOCALITY: EL7263

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-650

LOGGED BY : PRD

JOB NO : MBB

DATE DRILLED: 25-JUN-94

TOTAL DEPTH : 60.0

GRID: AMG

ZONE: 53

RELIABILITY: TOPO

EASTING: 579900

NORTHING: 8277100

R.L.: 60.0

AZIM.:

INCL.:

COMMENTS:

SHEET 1 OF 3 HOLE NUMBER : YER18

DEPTHS From (m)	To (m)	SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
0.0	2.0		CEN	Laterite pisolitic Sand	medium red brown	med sand to granule		
2.0	4.0		CEN	Laterite pisolitic Sand	medium red brown	med sand to granule		
4.0	6.0		CRE	Sandstone ferruginous weathered	patchy red brown	f sand to med sand	weak	
6.0	8.0		CRE	Sandstone ferruginous weathered	light yellow brown	f sand to med sand	weak	
8.0	10.0		CRE	Sandstone ferruginous weathered	light yellow brown	f sand to med sand	weak	
10.0	12.0		CRE	Mudstone sandy	light yellow brown	med silt to vf sand	weak	
12.0	14.0		CRE	Sandstone quartzose	light yellow brown prot.?	f sand to med sand	mod'ly strong	
14.0	16.0		CRE	Sandstone ferruginous	light yellow brown	f sand to med sand	weak	trace <0.5%
16.0	18.0		CRE	Sandstone ferruginous silty	light yellow brown	f sand to med sand	weak	
18.0	20.0		CRE	Clay silty Sandstone	light yellow brown	clay to med silt	soft	
20.0	22.0		CRE	Clay silty	light khaki brown	clay to med silt	soft	
22.0	24.0		CRE	Sandstone clayey	light khaki brown	f sand to med sand	weak	

DEPTHS From To (m) (m)		SAMPLE NUMBER	GEOLOGICAL TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
24.0	26.0		PRO	Sandstone quartzose siliceous	light pink grey	f sand to med sand	strong	
26.0	28.0		PRO	Sandstone quartzose siliceous	light pink grey	f sand to med sand	strong	
28.0	30.0		PRO	Sandstone quartzose siliceous	light pink grey	f sand to med sand	strong	
30.0	32.0	DZ1165	PRO	Sandstone Chert	patchy grey black groundwater	med sand to c sand	strong	trace <0.5%
32.0	34.0		PRO	Sandstone Chert	light grey	f sand to med sand	strong	
34.0	36.0		PRO	Sandstone Chert	light grey	f sand to med sand	strong	
36.0	38.0	DZ1166	PRO	Sandstone Siltstone pyritic	light grey	f sand to med sand	strong	
38.0	40.0	DZ1167	PRO	Sandstone Siltstone pyritic	pyrite fragments up to 2cm diameter light grey	f sand to med sand	strong	
40.0	42.0	DZ1168	PRO	Sandstone Chert	medium grey	vf sand to f sand	strong	
42.0	44.0		PRO	Sandstone quartzose	medium grey	vf sand to f sand	strong	
44.0	46.0		PRO	Sandstone quartzose	medium grey	vf sand to f sand	strong	
46.0	48.0		PRO	Sandstone quartzose	medium grey	vf sand to f sand	strong	
48.0	50.0		PRO	Sandstone silty	medium grey	med silt to vf sand	strong	
50.0	52.0		PRO	Sandstone silty Chert	medium grey	med silt to vf sand	strong	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
52.0	54.0		PRO	Sandstone silty Chert	medium grey	med silt to vf sand	strong	
54.0	56.0		PRO	Sandstone silty Chert	medium grey	med silt to vf sand	strong	
56.0	58.0		PRO	Sandstone silty Chert	medium grey	med silt to vf sand	strong	
58.0	60.0		PRO	Sandstone silty Chert	medium grey	med silt to vf sand	strong	

EOH at 60.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER19

LOCALITY: EL7263

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-650

LOGGED BY : PRD

JOB NO : MBB

DATE DRILLED: 26-JUN-94

TOTAL DEPTH : 18.0

GRID: AMG

ZONE: 53

RELIABILITY: TOPO

EASTING: 578300

NORTHING: 8277100

R.L.: 65.0

AZIM.:

INCL.:

COMMENTS: abandoned at 18m, see YER20

SHEET 1 OF 1 HOLE NUMBER : YER19

DEPTHS From (m)	To (m)	SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
0.0	2.0		CEN	Sand	light red brown	f sand to med sand	loose	
2.0	4.0		CRE	Laterite pisolitic Claystone sandy	medium brown grey	clay to vf sand	firm	
4.0	6.0		CRE	Claystone silty	medium grey	clay to med silt	weak	
6.0	8.0		CRE	Claystone sandy	medium brown grey	clay to vf sand	mod'ly strong	
8.0	10.0		CRE	Claystone sandy	medium brown grey	clay to vf sand	mod'ly strong	
10.0	12.0		CRE	Claystone sandy	medium brown grey	clay to vf sand	weak	
12.0	14.0		CRE	Conglomerate sandy	light brown	vc sand to vs pebble	loose	
14.0	16.0		CRE	Conglomerate sandy Sand	light brown	vc sand to vs pebble	loose	
16.0	18.0		CRE	Conglomerate sandy Sand	light brown	vc sand to vs pebble	loose	

drill string stuck

EOH at 18.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER20

LOCALITY: EL7263

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-650

LOGGED BY : PRO

JOB NO : MBB

DATE DRILLED: 26-JUN-94

TOTAL DEPTH : 35.0

GRID: AMG ZONE: 53 RELIABILITY: TOPO EASTING: 578790 NORTHING: 8277100 R.L.: 65.0 AZIM.: INCL.:

COMMENTS: re-drill of YER19, and located 490 metres east of YER19

SHEET 1 OF 2 HOLE NUMBER : YER20

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Sand	light brown	vf sand to f sand	loose	
2.0	4.0		CRE	Laterite pisolitic Claystone lateritic sandy	medium red brown	clay to vf sand	weak	
4.0	6.0		CRE	Claystone lateritic sandy	medium red brown	clay to vf sand	weak	
6.0	8.0		CRE	Claystone sandy	medium orange brown	clay to vf sand	weak	
8.0	10.0		CRE	Claystone sandy	medium orange brown	clay to vf sand	weak	
10.0	12.0		CRE	Claystone sandy	medium orange brown	clay to vf sand	weak	
12.0	14.0		CRE	Claystone sandy ferruginous	medium orange brown	clay to f sand	weak	
14.0	16.0		CRE	Sandstone clayey ferruginous	medium orange brown	vf sand to f sand	weak	
16.0	18.0		CRE	Claystone sandy ferruginous	light orange brown	clay to vf sand	weak	
18.0	20.0		CRE	Sandstone clayey ferruginous	light orange brown	vf sand to f sand	weak	
20.0	22.0		CRE	Sandstone clayey ferruginous	light orange brown	vf sand to f sand	weak	
22.0	24.0		CRE	Sandstone clayey ferruginous	light orange brown	vf sand to f sand	weak	

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER21

LOCALITY: BL7263

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-650

LOGGED BY : PRD

JOB NO : MBB

DATE DRILLED: 26-JUN-94

TOTAL DEPTH : 36.0

GRID: AMG ZONE: 53 RELIABILITY: TOPO EASTING: 583100 NORTHING: 8276300 R.L.: 50.0 AZIM.: INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : YER21

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Sand quartzose silty	light grey brown	vf sand to f sand	loose	
2.0	4.0		CEN	Clay sandy lateritic	patchy red brown	clay to f sand	stiff	
4.0	6.0		CEN	Clay sandy lateritic	patchy red brown	clay to f sand	stiff	
6.0	8.0		CRE	Claystone sandy ferruginous	banded grey brown	clay to f sand	mod'ly strong	
8.0	10.0		CRE	Claystone sandy ferruginous	banded grey brown	clay to f sand	mod'ly strong	trace <0.5%
10.0	12.0		CRE	Claystone ferruginous	trace mn as dendritic coatings on some rock fragments medium brown	clay to f sand	weak	
12.0	14.0		CRE	Claystone ferruginous	medium brown	clay to f sand	weak	
14.0	16.0		CRE	Clay	medium brown	clay to f sand	firm	
16.0	18.0		CRE	Siltstone cherty Clay	medium brown	clay to f sand	firm	
18.0	20.0		CRE	Siltstone cherty Sandstone ferruginous	medium brown	vf sand to f sand	mod'ly strong	
20.0	22.0		CRE	Siltstone cherty Sandstone ferruginous	medium brown	vf sand to f sand	mod'ly strong	
22.0	24.0		CRE	Siltstone cherty Mudstone clayey Siltstone dolomitic	medium brown	med silt to vf sand	mod'ly strong	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		PRO	Sandstone shaly	medium brown	vf sand to f sand	mod'ly strong	
26.0	28.0		PRO	Sandstone shaly	medium brown	vf sand to f sand	mod'ly strong	
28.0	30.0		PRO	Siltstone laminated cherty Dolomite massive	dark grey	med silt to vf sand	strong	
30.0	32.0		PRO	Dolomite massive	dark grey	med silt to vf sand	strong	
32.0	34.0		PRO	Dolomite massive	dark grey	med silt to vf sand	strong	
34.0	36.0		PRO	Dolomite massive	dark grey	med silt to vf sand	strong	

EOH at 36.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER22

LOCALITY: EL7263

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-650

LOGGED BY : PRD

JOB NO : HBB

DATE DRILLED: 27-JUN-94

TOTAL DEPTH : 52.0

GRID: AMG ZONE: 53 RELIABILITY: TOPO EASTING: 584700 NORTHING: 8276700 R.L.: 55.0 AZIM.: INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : YER22

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Sand Laterite	light brown	vf sand to f sand	loose	
2.0	4.0		CRE	Claystone ferruginous sandy	patchy red brown	clay to f sand	soft	
4.0	6.0		CRE	Claystone Sandstone calcareous	medium brown	clay to f sand	soft	
6.0	8.0		CRE	Clay calcareous	light grey brown	clay to vf sand	firm	
8.0	10.0		CRE	Clay ferruginous silty	medium brown	clay to med silt	firm	
10.0	12.0		CRE	Clay ferruginous silty	medium brown	clay to med silt	firm	
12.0	14.0		CRE	Clay silty	medium khaki brown	clay to med silt	firm	
14.0	16.0		CRE	Clay silty	medium khaki brown	clay to med silt	firm	
16.0	18.0		CRE	Clay silty	medium khaki brown	clay to med silt	firm	
18.0	20.0		CRE	Clay silty	medium khaki brown	clay to med silt	firm	
20.0	22.0		CRE	Clay silty	medium grey	clay to med silt	firm	
22.0	24.0		CRE	Clay silty	medium grey	clay to med silt	firm	

DEPTHS From To (m) (m)		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
24.0	26.0	DZ1169	CRE	Clay organic	dark grey black sampled for palinology	clay to med silt	firm	
26.0	27.0		CRE	Clay organic	dark grey black	clay to med silt	firm	
27.0	28.0		CRE	Clay silty	medium khaki brown	clay to med silt	firm	
28.0	30.0		CRE	Clay silty organic	banded khaki black	clay to med silt	firm	
30.0	32.0		CRE	Clay	interbedded black & khaki coloured clay, beds 0.5-1m thick dark grey black	clay to med silt	firm	
32.0	34.0		CRE	Clay	groundwater dark grey black	clay to med silt	firm	
34.0	36.0		CRE	Clay	dark grey black	clay to med silt	firm	
36.0	38.0		CRE	Clay	dark grey black	clay to med silt	firm	
38.0	40.0		CRE	Clay	dark grey black	clay to med silt	firm	
40.0	42.0		CRE	Clay	dark grey black	clay to med silt	firm	
42.0	44.0		CRE	Clay	dark grey black	clay to med silt	firm	
44.0	46.0		CRE	Clay	dark grey black	clay to med silt	firm	
46.0	48.0		CRE	Clay	dark grey black	clay to med silt	firm	
48.0	50.0		CRE	Clay	dark grey black	clay to med silt	firm	
50.0	52.0	DZ1170	PRO	Mudstone shaly	medium grey green	med silt to vf sand	mod'ly strong	

EOH at 52.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER23

LOCALITY: EL7263

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-850

LOGGED BY : PRD

JOB NO : MBB

DATE DRILLED: 27-JUN-94

TOTAL DEPTH : 50.0

GRID: AMG

ZONE: 53

RELIABILITY: TOPO

EASTING: 584740

NORTHING: 8276336

R.L.: 55.0

AZIM.:

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : YER23

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Sand Laterite	patchy red brown	vf sand to f sand	loose	
2.0	4.0		CRE	Clay silty	medium khaki brown	clay to med silt	firm	
4.0	6.0		CRE	Clay silty	medium khaki brown	clay to med silt	firm	
6.0	8.0		CRE	Clay silty	light khaki brown	clay to med silt	firm	
8.0	10.0		CRE	Clay silty	medium yellow brown	clay to med silt	firm	
10.0	12.0		CRE	Clay silty	patchy brown grey	clay to med silt	firm	
12.0	14.0		CRE	Clay silty ferruginous	patchy brown grey	clay to med silt	firm	
14.0	16.0		CRE	Clay silty	patchy brown grey	clay to med silt	firm	
16.0	18.0		CRE	Clay silty	patchy brown grey	clay to med silt	firm	
18.0	20.0		CRE	Clay silty	patchy brown grey	clay to med silt	stiff	
20.0	22.0		CRE	Clay silty	medium grey	clay to med silt	stiff	
22.0	24.0		CRE	Clay silty	medium grey	clay to med silt	stiff	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Clay silty	medium khaki brown	clay to med silt	stiff	
26.0	28.0		CRE	Clay silty	medium khaki brown	clay to med silt	stiff	
28.0	30.0		CRE	Clay organic silty	dark grey black	clay to med silt	stiff	
30.0	32.0		CRE	Clay organic silty	dark grey black	clay to med silt	stiff	
32.0	34.0		CRE	Clay organic silty	dark grey black	clay to med silt	stiff	
34.0	36.0		CRE	Clay organic silty	dark grey black	clay to med silt	stiff	
36.0	38.0		CRE	Clay organic silty Sand	dark grey black	clay to med silt	stiff	
38.0	40.0		CRE	Sand quartzose	light brown	med sand to c sand	loose	
40.0	42.0		CRE	Sand quartzose	light brown	med sand to c sand	loose	
42.0	44.0		CRE	Clay Sand quartzose	medium brown	clay to med silt	soft	
44.0	46.0		CRE	Clay	medium brown	clay to med silt	soft	
46.0	48.0		PRO	Siltstone Sandstone clayey	medium brown	med silt to vf sand	weak	
48.0	50.0		PRO	Sandstone quartzose	medium brown	f sand to med sand	mod'ly strong	

EOH at 50.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER24

LOCALITY: EL7263

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-850

LOGGED BY : PRD

JOB NO : MBB

DATE DRILLED: 27-JUN-94

TOTAL DEPTH : 14.0

GRID: AMG

ZONE: 53

RELIABILITY: TOPO

EASTING: 583780

NORTHING: 8276280

R.L.: 55.0

AZIM.:

INCL.:

COMMENTS:

SHEET 1 OF 1 HOLE NUMBER : YER24

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Sand clayey	light brown	vf sand to f sand	loose	
2.0	4.0		CEN	Sandstone ferruginous Laterite	medium red brown	vf sand to f sand	weak	
4.0	6.0		?	Sandstone ferruginous Carbonate	light brown	vf sand to f sand	mod'ly strong	
6.0	8.0		PRO	Sandstone shaly	medium brown	vf sand to f sand	strong	
8.0	10.0		PRO	Sandstone shaly	medium brown	vf sand to f sand	strong	
10.0	12.0		PRO	Sandstone shaly Dolomite	dark brown grey	med silt to vf sand	strong	
12.0	14.0		PRO	Dolomite massive	dark brown grey	med silt to vf sand	strong	

EOH at 14.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER25

LOCALITY: EL7263

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UOR-650

LOGGED BY : PRD

JOB NO : MBB

DATE DRILLED: 27-JUN-94

TOTAL DEPTH : 18.0

GRID: AMG

ZONE: 53

RELIABILITY: TOPO

EASTING: 582450

NORTHING: 8275360

R.L.: 55.0

AZIM.: 1

INCL.:

COMMENTS:

SHEET 1 OF 1 HOLE NUMBER : YER25

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite	medium red brown		mod'ly strong	
				Sand clayey				
2.0	4.0		CEN	Siltstone siliceous Sandstone	patchy brown grey	med silt	strong	
4.0	6.0		CRE	Sandstone silty ferruginous Claystone	patchy brown grey	vf sand to f sand	weak	trace <0.5%
6.0	8.0		CRE	Sandstone silty ferruginous Claystone	patchy brown grey	vf sand to f sand	weak	trace <0.5%
8.0	10.0		PRO	Mudstone shaly	minor cherty siltstone fragments dark brown	med silt	weak	
10.0	12.0		PRO	Mudstone shaly	weathered (hence soft) mudstone dark brown	med silt	weak	
12.0	14.0		PRO	Mudstone shaly sandy	dark brown	med silt to vf sand	very strong	
14.0	16.0		PRO	Sandstone shaly ferruginous	dark brown	vf sand to f sand	very strong	
16.0	18.0		PRO	Sandstone shaly ferruginous	dark brown	vf sand to f sand	very strong	

EOH at 18.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER26

LOCALITY: EL7263

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-650

LOGGED BY : PRD

JOB NO : M88

DATE DRILLED: 28-JUN-94

TOTAL DEPTH : 42.0

GRID: AMG

ZONE: 53

RELIABILITY: TOPO

EASTING: 580680

NORTHING: 8273900

R.L.: 55.0

AZIM.:

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : YER26

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Sand Laterite	light red brown	vf sand to f sand	loose	
2.0	4.0		CRE	Claystone silty	patchy brown grey	clay to med silt	weak	trace <0.5%
4.0	8.0		?	Sandstone ferruginous	light brown	f sand to med sand	mod'ly strong	
6.0	8.0		?	Sandstone quartzose Claystone sandy	light brown	f sand to med sand	weak	trace <0.5%
8.0	10.0		PRO	Sandstone quartzose	light grey	f sand to med sand	mod'ly strong	
10.0	12.0		PRO	Sandstone quartzose Claystone	light grey	f sand to med sand	mod'ly strong	trace <0.5%
12.0	14.0		CRE	Claystone silty	trace mn on claystone fragments light khaki brown	clay to med silt	weak	
14.0	16.0		CRE	Claystone silty	pale khaki brown	clay to med silt	weak	
16.0	18.0		CRE	Claystone silty Sandstone ferruginous	patchy brown grey	clay to med silt	mod'ly strong	
18.0	20.0		CRE	Sandstone quartzose ferruginous Clay	medium brown	f sand to med sand	mod'ly strong	
20.0	22.0		CRE	Sandstone quartzose ferruginous Clay	prot.? medium brown	f sand to med sand	mod'ly strong	
22.0	24.0		CRE	Sandstone quartzose ferruginous Clay	prot.? medium brown prot.?	f sand to med sand	mod'ly strong	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Sandstone quartzose ferruginous Clay	medium khaki brown prot.?	f sand to med sand	mod'ly strong	
26.0	28.0		CRE	Sandstone quartzose ferruginous Clay	medium khaki brown prot.?	f sand to med sand	mod'ly strong	
28.0	30.0		CRE	Mudstone sandy Clay	light green grey prot.?	med silt to vf sand	weak	
30.0	32.0		CRE	Clay silty Sandstone ferruginous	medium brown prot.?	clay to vf sand	mod'ly strong	
32.0	34.0		CRE	Clay silty Mudstone sandy ferruginous	medium brown prot.?	clay to vf sand	mod'ly strong	
34.0	36.0		CRE	Clay silty Mudstone sandy ferruginous	medium brown prot.?	clay to vf sand	mod'ly strong	
36.0	38.0		PRO	Sandstone silty	medium brown groundwater	vf sand to f sand	mod'ly strong	trace <0.5%
38.0	40.0		PRO	Sandstone silty	medium brown	vf sand to f sand	mod'ly strong	
40.0	42.0		PRO	Sandstone silty	medium brown	vf sand to f sand	mod'ly strong	

EOH at 42.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER29

LOCALITY: EL7264

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : MBC

DATE DRILLED: 29-JUN-94

TOTAL DEPTH : 36.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 578840

NORTHING: 8267695

R.L.: 55.0

AZIM.: 1

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : YER29

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Sand	medium red orange alluvial	f sand	loose	
2.0	4.0		CEN	Sand	medium red orange alluvial	f sand	loose	
				Conglomerate	orange alluvial			
4.0	6.0		CEN	Sand	medium red orange alluvial	f sand	loose	
				Conglomerate	orange alluvial			
6.0	8.0		CEN	Sand	medium red orange alluvial	f sand	loose	
				Conglomerate	orange alluvial			
8.0	10.0		CEN	Sandstone ferruginous Conglomerate	dark yellow brown alluvial	to f sand	mod'ly strong	
10.0	12.0		CEN	Sandstone ferruginous Conglomerate	dark yellow brown alluvial	to f sand	mod'ly strong	
12.0	14.0		CRE	Clay sandy	light grey white poss uniy 2	clay to vf sand	soft	
14.0	16.0		CRE	Clay sandy	light grey white poss uniy 2	clay to vf sand	soft	
16.0	18.0		CRE	Clay sandy	medium pink white poss uniy 2	clay to vf sand	soft	
18.0	20.0		CRE	Clay sandy	medium pink white poss uniy 2	clay to vf sand	soft	
20.0	22.0		CRE	Clay	light yellow brown smectitie	clay	stiff	
22.0	24.0		CRE	Clay	light yellow brown smectitie	clay	stiff	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Clay	light yellow brown smectitie	clay	stiff	
26.0	28.0		CRE	Clay	light yellow brown smectitie	clay	stiff	
28.0	30.0		PRO	Clay	light yellow brown	clay	stiff	
30.0	32.0		PRO	Chert laminated	pale grey white		strong	
32.0	34.0		PRO	Chert	pale grey white		strong	
34.0	36.0		PRO	Chert Dolomite	pale grey white		strong	

EOH at 36.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER30

LOCALITY: EL7264

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : MBC

DATE DRILLED: 30-JUN-94

TOTAL DEPTH : 48.0

GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 577518 NORTHING: 8267390 R.L.: 55.0 AZIM.: INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : YER30

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite conglomeratic	medium orange red lat. with rock frags	granule		
2.0	4.0		CEN	Laterite sandy	mottled orange brown very sandy	granule		
4.0	6.0		CEN	Laterite	light orange brown mottled	granule		
6.0	8.0		CEN	sandy Clay lateritic	pale grey brown minor feox staining	granule		
8.0	10.0		CEN	Clay lateritic	pale red grey minor feox staining	clay		
10.0	12.0		CEN	Clay lateritic sandy	pale red grey minor feox staining	clay		
12.0	14.0		CEN	Clay ferruginous sandy	pale red grey prob still lateritic profile	clay	firm	
14.0	16.0		CRE	Clay ferruginous	pale orange red poss weathered cre clay	clay		
16.0	18.0		CRE	Clay silty	pale yellow brown	clay to med silt	firm	
18.0	20.0		CRE	Clay silty	pale yellow brown water injection	clay to med silt	firm	
20.0	22.0		CRE	Clay silty	pale yellow brown water injection	clay to med silt	firm	
22.0	24.0		CRE	Clay silty	pale yellow brown water injection	clay to med silt	firm	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Sand clayey	light yellow tan	med sand to clay	soft	
26.0	28.0		CRE	Sand clayey	light yellow tan	c sand to clay	soft	
28.0	30.0		CRE	Sand clayey	light white grey	granule to med sand	loose	
30.0	32.0		CRE	Conglomerate sandy	light white grey	granule to med sand	loose	
32.0	34.0		CRE	Conglomerate sandy	light white grey coarse up cycle	granule to med sand	loose	
34.0	36.0		CRE	Sand	light white grey	c sand to med sand	loose	
36.0	38.0		CRE	Sand clayey Conglomerate	almost no sample light white grey	c sand to med sand	loose	
38.0	40.0		CRE	Sand clayey Siltstone	some glauconite medium orange brown	med sand to med silt	weak	
40.0	42.0		CRE	Unident rock	silt below snd/cong medium brown			
42.0	44.0		CRE	Unident rock	poss base/major contamination medium brown			
44.0	46.0		PRO	Sandstone Dolomite	major contamination/water brick red light yellow brown	f sand	strong	
46.0	48.0		PRO	Dolomite	pink sst over dol pale tan brown	f sand	strong	

EOH at 48.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER33

LOCALITY: EL7264

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : MBC

DATE DRILLED: 2-JUL-94

TOTAL DEPTH : 40.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 574270

NORTHING: 8266690

R.L.: 75.0

AZIM.: 75.0

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : YER33

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Sand	pale yellow brown surficial sand	med sand	loose	
2.0	4.0		CEN	Laterite gravelly Sandstone	medium red	granule	friable	
4.0	6.0		CRE	ferruginous Sandstone	pale red	med sand	mod'ly strong	
6.0	8.0		CRE	ferruginous Sandstone	orange ?bioturbatae	med sand	mod'ly strong	
8.0	10.0		CRE	ferruginous Sandstone	pale yellow orange ?bioturbatae	med sand	mod'ly strong	
10.0	12.0		CRE	ferruginous Sandstone	medium yellow orange	med sand	mod'ly strong	
12.0	14.0		CRE	ferruginous Sandstone	light yellow orange	med sand	weak	
14.0	16.0		CRE	ferruginous Sandstone	light yellow orange	med sand	weak	
16.0	18.0		CRE	ferruginous Sandstone	medium yellow	med sand	soft	
18.0	20.0		CRE	ferruginous Sandstone	medium yellow	med sand	soft	
20.0	22.0		CRE	ferruginous Sandstone	medium yellow red	med sand	soft	
22.0	24.0		CRE	sandy Clay sandy Clay sandy	medium yellow red light yellow	med sand f sand to clay	soft	

DEPTHS		SAMPLE NUMBER	GEOLOGICAL TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT IRON OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Sandstone ferruginous	light yellow red	med sand	weak	
26.0	28.0		CRE	Sandstone ferruginous	medium orange red	med sand	weak	
28.0	30.0		CRE	Sandstone ferruginous Clay	medium orange red	med sand	weak	
30.0	32.0		PRO	Sandstone ferruginous Clay	damp at end medium orange red mod hard	med sand	mod'ly strong	
32.0	34.0		PRO	Sandstone ferruginous Clay	medium orange red mod hard	med sand	mod'ly strong	
34.0	36.0		PRO	Sandstone ferruginous Clay	medium orange red mod hard	med sand	mod'ly strong	
36.0	38.0		PRO	Sandstone ferruginous Clay	medium purple brown mod hard	med sand	strong	
38.0	40.0		PRO	Sandstone ferruginous Clay	medium purple brown mod hard	med sand	strong	

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER34

LOCALITY: EL7263

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : MBB

DATE DRILLED: 3-JUL-94

TOTAL DEPTH : 78.0

GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 570900 NORTHING: 8274000 R.L.: 65.0 AZIM.: INCL.:

COMMENTS: ase metals EM anomaly

SHEET 1 OF 3 HOLE NUMBER : YER34

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Sand	light red orange	med sand	loose	
2.0	4.0		CEN	Sand	medium red orange	med sand	loose	
4.0	6.0		CEN	Sand Laterite	light tan brown	med sand	loose	
6.0	8.0		CEN	Sand Conglomerate	medium orange brown some pebble frags	med sand	loose	
8.0	10.0		CRE	Clay sandy	light yellow brown	clay to f sand	soft	
10.0	12.0		CRE	Clay	medium yellow brown	clay	soft	
12.0	14.0		CRE	Clay	medium yellow brown	clay	soft	
14.0	16.0		CRE	Clay	water injection light brown yellow	clay	soft	
16.0	18.0		CRE	Clay	water injection light brown yellow	clay	soft	
18.0	20.0		CRE	Clay	water injection light brown yellow	clay	soft	
20.0	22.0		CRE	Clay	water injection light brown yellow	clay	soft	
22.0	24.0		CRE	Clay	water injection light brown yellow water injection	clay	soft	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Clay	light brown yellow water injection	clay	soft	
26.0	28.0		CRE	Clay	pale yellow grey water injection	clay	soft	
28.0	30.0		CRE	Clay	pale yellow grey water injection	clay	soft	
30.0	32.0		CRE	Clay	medium yellow grey water injection	clay	firm	
32.0	34.0		CRE	Clay	medium yellow grey water injection	clay	firm	
34.0	36.0		CRE	Clay	medium yellow grey water injection	clay	firm	
36.0	38.0		CRE	Clay sandy	dark grey water injection	clay	firm	
38.0	40.0		CRE	Clay sandy	dark grey water injection	clay	firm	
40.0	42.0		CRE	Clay	dark grey water injection	clay	firm	
42.0	44.0		CRE	Clay	dark grey water injection	clay	firm	
44.0	46.0		CRE	Clay sandy	dark grey water injection	clay	firm	
46.0	48.0		CRE	Clay sandy	dark grey water injection	clay	firm	
48.0	50.0		CRE	Clay sandy	dark grey water injection	clay	firm	
50.0	52.0		CRE	Clay sandy	dark grey water injection	clay	firm	
					water injection			

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
52.0	54.0		CRE	Clay sandy	dark grey	clay	firm	
54.0	56.0		CRE	Clay sandy	water injection dark grey	clay	firm	
56.0	58.0		CRE	Clay sandy	water injection dark grey	clay	firm	
58.0	60.0		CRE	Clay sandy	water injection dark grey	clay to f sand	firm	
60.0	62.0		CRE	Sand clayey	water injection medium black	clay to f sand	firm	
62.0	64.0		CRE	Sand clayey	oily h2o/poss pyrite medium black	clay to f sand	firm	
64.0	66.0		CRE	Sand clayey	no pyrite visible dark black	clay to f sand	firm	
66.0	68.0		CRE	Sand	no pyrite visible pale grey yellow	f sand	soft	
68.0	70.0		CRE	Sand	contact with black sand/silt medium yellow orange	f sand	soft	
70.0	72.0		CRE	Sand	medium yellow orange	f sand	soft	
72.0	74.0		CRE	Sand	medium yellow orange	c sand to f sand	soft	
74.0	76.0	DZ1231	PRO	Sand	pale brown orange	c sand to f sand	soft	
76.0	78.0	DZ1231	PRO	Sand	poss weathered basement pale brown orange	c sand to f sand	soft	
EOH at 78.0 m					hole aband -sands colapsing			

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER35

LOCALITY: EL7263

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : MBB

DATE DRILLED: 3-JUL-94

TOTAL DEPTH : 18.0

GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 584135 NORTHING: 8277125 R.L.: 55.0 AZIM.: INCL.:

COMMENTS: 00m from YER6

SHEET 1 OF 2 HOLE NUMBER : YER35

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite sandy	medium orange brown	granule to med sand	loose	
2.0	4.0		CEN	Laterite sandy	medium orange brown manganiferous	granule to med sand	loose	0.5 - 5%
4.0	5.0		CEN	Laterite sandy clayey	light orange brown	granule to med sand	loose	0.5 - 5%
5.0	6.0		CEN	Clay sandy Silt	? soil related manganese light red brown rare mn with clay	clay to f sand	soft	trace <0.5%
6.0	7.0		CRE	Clay sandy Silt	light red brown rare mn with clay	clay to f sand	soft	trace <0.5%
7.0	8.0		CRE	Clay sandy Silt	light red brown rare mn with clay	clay to f sand	soft	trace <0.5%
8.0	9.0		CRE	Silt	medium red orange no mn, poss weathered pro	med silt	weak	
9.0	10.0		CRE	Silt	medium red orange	med silt	weak	
10.0	11.0		CRE	Silt	medium red orange	med silt	weak	
11.0	12.0		PRO	Siltstone	dark red brown	med silt	weak	
12.0	13.0		PRO	Siltstone	dark red brown	med silt	weak	
13.0	14.0		PRO	Siltstone	dark red brown	med silt	weak	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
14.0	15.0		PRO	Siltstone	dark red brown	med silt	weak	
15.0	16.0		PRO	Siltstone	dark red brown	med silt	weak	
16.0	17.0		PRO	Siltstone	dark red brown	med silt	weak	
17.0	18.0		PRO	Siltstone	pale pink red	med silt	very strong	

EOH at 18.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER36

LOCALITY: EL7263

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : MBB

DATE DRILLED: 4-JUL-94

TOTAL DEPTH : 30.0

GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 583861 NORTHING: 8277084 R.L.: 55.0 AZIM.: INCL.:

COMMENTS: 00m west of YER6

SHEET 1 OF 2 HOLE NUMBER : YER36

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Sand	pale orange red	med sand	loose	
				Laterite sandy				
2.0	4.0		CEN	Laterite sandy	medium orange red	med sand to granule	friable	
4.0	6.0		CEN	Clay	pale green brown	clay	soft	trace <0.5%
6.0	8.0		CEN	Clay	pale green brown	clay	soft	
8.0	10.0		CEN	Clay	pale green brown	clay	soft	
10.0	12.0		CEN	Limestone	dark yellow	med silt to clay	weak	
				Silt				
12.0	14.0		CRE	Clay	prob plectocene medium yellow brown	1st clay	firm	
14.0	16.0		CRE	Clay	inject water light green grey	clay	firm	
16.0	18.0		CRE	Clay	light green grey	clay	firm	
18.0	19.0		CRE	Clay	light green grey	clay	firm	
19.0	20.0		CRE	Clay	light green grey	clay	firm	trace <0.5%
20.0	20.5	021190	CRE	Clay	rare frags of mn medium khaki brown ~5% hard mnox	clay	firm	5 - 20%

EOH at 30.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER37

LOCALITY: EL7263

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : MBB

DATE DRILLED: 4-JUL-94

TOTAL DEPTH : 30.0

GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 584739 NORTHING: 8274602 R.L.: 50.0 AZIM.: INCL.:

COMMENTS: ntersected black shale

SHEET 1 OF 2 HOLE NUMBER : YER37

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Sand clayey ferruginous	light orange brown	med sand	friable	
2.0	4.0		CEN	Sand clayey Limestone	pale orange grey pli. 1st	clay	mod'ly strong	
4.0	6.0		CEN	Limestone	pale grey white	clay	mod'ly strong	
6.0	8.0		CEN	Sand clayey Limestone	pale grey white	clay	mod'ly strong	
8.0	10.0			Sand clayey Limestone	medium grey	clay	mod'ly strong	
10.0	12.0			Limestone Shale	dark grey	vf silt	mod'ly strong	
12.0	14.0		OTH	Carbonate Shale	dark grey	vf silt	mod'ly strong	
14.0	16.0		OTH	Shale Carbonate	carb reacts strongly with 10% hcl medium grey	vf silt	strong	
16.0	18.0		OTH	Shale Carbonate	medium grey	vf silt	strong	
18.0	20.0		OTH	Shale Carbonate	medium grey	vf silt	strong	
20.0	22.0		OTH	Carbonate Shale	medium grey	vf silt	strong	
22.0	24.0		OTH	Carbonate Shale	medium grey carb still reactive	vf silt	strong	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		OTH	Carbonate Shale	medium grey	vf silt	strong	
26.0	28.0		OTH	Carbonate	rare black shale medium grey	vf silt	strong	
28.0	30.0		OTH	Carbonate	medium grey	vf silt	strong	

EOH at 30.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER38

LOCALITY: EL7263

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : MBB

DATE DRILLED: 4-JUL-94

TOTAL DEPTH : 36.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 586237

NORTHING: 8273910

R.L.: 50.0

AZIN.:

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : YER38

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Sand	pale orange	med sand	loose	
2.0	4.0		CEN	Sand Laterite	medium orange	med sand to granule	loose	
4.0	6.0		CEN	Laterite Carbonate	light tan	granule to clay	weak	
6.0	8.0		CRE	Sand	pale yellow	f sand	loose	
8.0	10.0		CRE	Clay sandy	pale tan white	clay to f sand	soft	
10.0	12.0		CRE	Clay sandy	pale tan white	clay to f sand	soft	trace <0.5%
12.0	13.0		CRE	Clay	mnox vfg/rare dark brown	clay	soft	trace <0.5%
13.0	14.0		CRE	Silt	mnox colours sample/almost no frags medium yellow brown	med silt	soft	
14.0	16.0		CRE	Silt	medium yellow brown	med silt	soft	
16.0	18.0		CRE	Silt	medium yellow brown	med silt	soft	
18.0	20.0		CRE	Silt	medium yellow brown	med silt	soft	
20.0	22.0		CRE	Siltstone	medium yellow brown	med silt	soft	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
22.0	24.0		CRE	Siltstone ferruginous Sandstone	dark brown	f sand to med silt	soft	trace <0.5%
24.0	25.0	DZ1196	CRE	Siltstone ferruginous Sandstone	dark brown	f sand to med silt	soft	trace <0.5%
25.0	25.5	DZ1197	CRE	Sandstone	mnox frags and coatings dark yellow	f sand to med silt	soft	trace <0.5%
				Siltstone	brown			
25.5	26.0		CRE	Sandstone ferruginous Siltstone	rare mn frags dark yellow brown	f sand to med silt	soft	
26.0	27.0		CRE	Sandstone ferruginous Siltstone	dark yellow brown	f sand to med silt	soft	
27.0	28.0		PRO	Dolomite	medium grey	f silt	strong	
28.0	30.0		PRO	Dolomite	medium grey	f silt	strong	
30.0	32.0		PRO	Dolomite	medium grey	f silt	strong	
32.0	34.0		PRO	Dolomite	medium grey	f silt	strong	
34.0	36.0		PRO	Dolomite	medium grey	f silt	strong	

EOH at 36.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER39

LOCALITY: EL7263

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-650

JOB NO : M88

DATE DRILLED: 5-JUL-94

LOGGED BY : HWB

TOTAL DEPTH : 45.0

GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 588708 NORTHING: 8273097 R.L.: 35.0 AZIM.: INCL.:

COMMENTS: no pvc placed on hole

SHEET 1 OF 2 HOLE NUMBER : YER39

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Sand	pale orange pink	med sand	loose	
2.0	4.0		CEN	Sand clayey	medium yellow tan	med sand	loose	
4.0	6.0		CEN	Sand clayey Laterite	medium yellow tan	med sand	loose	
6.0	8.0		CEN	Sand	light orange	c sand	loose	
8.0	10.0		CEN	Conglomerate	light orange	s pebble to c sand	loose	
10.0	12.0		CEN	Sand	pale yellow tan	c sand to granule	loose	
12.0	14.0		CEN	Sand	medium yellow tan	c sand	loose	
14.0	16.0		CEN	Sand	medium yellow tan	c sand	loose	
16.0	18.0		CEN	Sand	medium orange red	c sand	loose	
18.0	20.0		CEN	Sand	medium brown	c sand	loose	
20.0	22.0		CEN	Sand	water injection medium brown	c sand to c silt	loose	
22.0	24.0		CRE	Siltstone ferruginous Siltstone ferruginous	pale yellow tan	c silt	weak	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Siltstone ferruginous Sandstone silty	pale yellow tan	c silt	weak	
26.0	28.0		CRE	Sandstone silty ferruginous Sand clayey	pale yellow tan	c silt to f sand	weak	
28.0	30.0		CRE	Sand clayey ferruginous	pale yellow tan	c silt to f sand	soft	
30.0	32.0		CRE	Sand clayey ferruginous	pale yellow tan	c silt to med sand	firm	
32.0	34.0		CRE	Sand clayey ferruginous	pale yellow tan	c silt to med sand	firm	
34.0	36.0		CRE	Sand clayey ferruginous Conglomerate	pale yellow tan	c silt to med sand	friable	
36.0	38.0		CRE	Clay silty ferruginous	medium red brown	clay to f silt	stiff	
38.0	40.0		CRE	Clay ferruginous	light tan	clay	firm	
40.0	42.0		CRE	Clay ferruginous	light orange brown	clay	firm	
42.0	44.0		CRE	Clay ferruginous	medium yellow	clay	firm	
44.0	45.0		CRE	Clay ferruginous	medium yellow	clay	firm	

EOH at 45.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER40

LOCALITY: EL7263

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : MBB

DATE DRILLED: 5-JUL-94

TOTAL DEPTH : 36.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 588750

NORTHING: 8271540

R.L.: 45.0

AZIM.: 45.0

INCL.: 45.0

COMMENTS: hole aband. running gravel

SHEET 1 OF 2 HOLE NUMBER : YER40

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite sandy	medium orange brown	c sand to granule	friable	
2.0	4.0		CEN	Sand clayey	light orange brown	c sand to clay	soft	
4.0	6.0		CEN	Sand clayey	pale orange tan	c sand to clay	soft	
6.0	8.0		CEN	Conglomerate	light orange tan	s pebble to c sand	loose	
8.0	10.0		CRE	Sand clayey	pale white tan	med sand to clay	firm	
10.0	12.0		CRE	Sand clayey	palest white tan	c sand to clay	firm	
12.0	14.0		CRE	Clay sandy	pale white tan	clay to c sand	firm	
14.0	16.0		CRE	Clay	pale orange tan	clay	soft	
16.0	18.0		CRE	Clay	medium orange brown	clay	soft	
18.0	20.0		CRE	Clay	pale orange tan	clay	soft	
20.0	22.0		CRE	Clay	water injection pale yellow	clay	soft	
22.0	24.0		CRE	Clay	pale yellow	clay	soft	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Clay	pale yellow	clay	soft	
26.0	28.0		CRE	Clay	pale yellow	clay	soft	
28.0	30.0		CRE	Clay	pale yellow	clay	soft	
30.0	32.0		CRE	Clay	pale yellow	clay	soft	
32.0	34.0		CRE	Clay	medium yellow	clay	soft	
34.0	36.0		CRE	Conglomerate	light brown	s pebble	loose	
EOH at 36.0 m					hole aband	cong caving		

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER41

LOCALITY: EL7263

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : M88

DATE DRILLED: 5-JUL-94

TOTAL DEPTH : 30.0

GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 589810 NORTHING: 8269750 R.L.: 45.0 AZIM.: INCL.:

COMMENTS: pvc to 30m

SHEET 1 OF 2 HOLE NUMBER : YER41

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite	medium orange red	med pebble	friable	
2.0	4.0		CEN	Laterite	medium orange red	vs pebble	friable	
4.0	6.0		CEN	Laterite sandy Sand clayey	medium orange red	vs pebble	friable	
6.0	8.0		CEN	Laterite sandy	medium orange red	vs pebble	friable	
8.0	10.0		CEN	Conglomerate sandy	medium orange red	vs pebble	friable	
10.0	12.0		OTH	Sandstone ferruginous	light orange pink	f sand	weak	
12.0	14.0		OTH	Sandstone ferruginous	light orange pink	f sand	weak	
14.0	16.0		OTH	Sandstone ferruginous Conglomerate	pale yellow	f sand to granule	weak	
16.0	18.0		OTH	Sandstone ferruginous Conglomerate	some mn staining pale yellow	f sand to granule	weak	
18.0	20.0		PRO	Siltstone Sandstone	some mn staining pale yellow tan	vf sand to f sand	mod'ly strong	
20.0	22.0		PRO	Siltstone Sandstone	pale purple tan	vf sand to f sand	mod'ly strong	
22.0	24.0		PRO	Siltstone Sandstone	medium brown purple	vf sand to f sand	strong	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		PRO	Sandstone Siltstone	medium brown purple	vf sand to f sand	strong	
26.0	28.0		PRO	Sandstone Siltstone	dark brown	vf sand to f sand	strong	
28.0	30.0		PRO	Siltstone	medium yellow	f silt	weak	

EOH at 30.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER42

LOCALITY: EL7263

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : MBB

DATE DRILLED: 6-JUL-94

TOTAL DEPTH : 24.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 592140

NORTHING: 8267915

R.L.: 45.0

AZIM.:

INCL.:

COMMENTS:

SHEET 1 OF 1 HOLE NUMBER : YER42

DEPTHS From (m)	To (m)	SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
0.0	2.0		CEN	Laterite	dark red brown	c sand to s pebble	mod'ly strong	
2.0	4.0		PRO	Sandstone ferruginous	medium red brown	f sand	weak	
4.0	6.0		PRO	Sandstone ferruginous	medium tan	f sand	weak	
6.0	8.0		PRO	Sandstone ferruginous	medium tan	f sand	weak	trace <0.5%
8.0	10.0		PRO	Sandstone	mn coatings medium tan	f sand	weak	trace <0.5%
10.0	12.0		PRO	Sandstone	mn coatings medium yellow tan	f sand	weak	
12.0	14.0		PRO	Sandstone ferruginous	medium red tan	f sand	weak	
14.0	16.0		PRO	Sandstone ferruginous	medium red orange	f sand	weak	
16.0	18.0		PRO	Sandstone ferruginous	dark red brown	f sand	weak	
18.0	20.0		PRO	Sandstone ferruginous	dark red orange	f sand	weak	
20.0	22.0		PRO	Sandstone ferruginous	water table at 18m dark red orange	f sand	weak	
22.0	24.0		PRO	Sandstone ferruginous	dark red orange	f sand	weak	

EOH at 24.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER43

LOCALITY: EL7263

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-850

LOGGED BY : HWB

JOB NO : MBB

DATE DRILLED: 6-JUL-94

TOTAL DEPTH : 36.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 592620

NORTHING: 8270670

R.L.: 45.0

AZIM.: 1

INCL.:

COMMENTS: minor mn

SHEET 1 OF 2 HOLE NUMBER : YER43

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite	dark red brown	s pebble	weak	
2.0	4.0		CEN	Laterite	medium orange red	c sand	firm	
4.0	6.0		CEN	Conglomerate lateritic	light orange brown	c sand to s pebble	firm	
6.0	8.0		CEN	Clay sandy ferruginous	medium pink	clay to f sand	soft	
8.0	10.0		CEN	Clay sandy ferruginous	light pink tan	clay to med sand	soft	
10.0	12.0		CEN	Clay sandy ferruginous	light tan	clay to med sand	soft	
12.0	14.0		CRE	Clay sandy	pale tan	clay to med sand	soft	
14.0	16.0		CRE	Clay sandy	light yellow tan	clay to med sand	weak	
16.0	18.0		CRE	Conglomerate	light yellow tan	s pebble to med sand	friable	
18.0	20.0		CRE	Clay sandy ferruginous	medium red brown	clay to f sand	soft	
20.0	22.0		CRE	Clay sandy ferruginous	medium red brown	clay to f sand	soft	
22.0	24.0	DZ1175	CRE	Clay sandy	light tan	clay to f sand	soft	0.5 - 5%

mn frags and coatings

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	24.5	DZ1176	CRE	Clay sandy	pale grey white tr mn	clay to f sand	soft	trace <0.5%
24.5	25.0	DZ1177	CRE	Clay sandy pisolitic	pale grey white 1 pisolite seen	clay to f sand	soft	0.5 - 5%
25.0	25.5	DZ1178	CRE	Clay sandy	medium grey white mainly fg mn	clay to f sand	soft	0.5 - 5%
25.5	26.0	DZ1179	CRE	Clay	medium orange brown poss contaminated	clay	soft	
26.0	26.5		CRE	Sand clayey	medium red brown	c sand to clay	soft	
26.5	27.0		CRE	Sand clayey	medium red brown	c sand to clay	soft	
27.0	27.5		CRE	Clay Chert	pale white tan	clay	soft	
27.5	28.0		CRE	Siltstone	pos regressive breccia pale yellow tan indurated	f silt	mod'ly strong	
28.0	28.5		CRE	Siltstone	pale yellow tan indurated	f silt	mod'ly strong	
28.5	29.0		CRE	Siltstone	pale yellow tan mud has gel like consistency	f silt	mod'ly strong	
29.0	30.0		CRE	Siltstone	pale yellow tan	f silt	mod'ly strong	
30.0	32.0		PRO	Siltstone Chert	pale yellow tan	f silt	mod'ly strong	
32.0	34.0		PRO	Chert	medium brown	clay	strong	
34.0	36.0		PRO	Chert	medium yellow	clay	strong	

EOH at 36.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER44

LOCALITY: EL7263

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : M88

DATE DRILLED: 6-JUL-94

TOTAL DEPTH : 26.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 592655

NORTHING: 8270480

R.L.: 45.0

AZIM.: 1

INCL.: 1

COMMENTS: 200m S of YER43

SHEET 1 OF 2 HOLE NUMBER : YER44

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Sand Laterite	medium yellow orange	c sand to granule	friable	
2.0	4.0		CEN	Laterite sandy	dark orange red	c sand to granule	friable	
4.0	6.0		CEN	Conglomerate lateritic	dark orange red	c sand to s pebble	friable	
6.0	8.0		CEN	Conglomerate lateritic Clay sandy	medium tan	vs pebble to clay	soft	
8.0	10.0		CRE	Clay sandy	pale pink tan	clay to med sand	soft	
10.0	12.0		CRE	Clay sandy	medium yellow	clay to f sand	soft	
12.0	14.0		CRE	Clay sandy Conglomerate	medium yellow	clay to granule	soft	
14.0	16.0		CRE	Clay sandy Conglomerate	some pebble beds medium yellow	clay to granule	soft	
16.0	18.0		CRE	Sand clayey	some pebble beds light pink brown	med sand to clay	soft	
18.0	19.5		CRE	Sand clayey ferruginous	light pink brown	med sand to clay	soft	
19.5	20.0	DZ1174	CRE	Sand clayey ferruginous	light pink brown weathered mn	med sand to clay	soft	trace <0.5%
20.0	22.0		CRE	Clay sandy Chert	medium brown	clay to f sand	soft	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From	To							
(m)	(m)							
22.0	22.5		CRE	Clay sandy	pale grey white	clay to f sand	soft	trace <0.5%
22.5	23.0		CRE	Clay sandy Chert	tr soft mn, some pale yellow white	chert frags clay to f sand	soft	
23.0	24.0		CRE	Clay sandy	pale grey white	clay to f sand	soft	
24.0	26.0		CRE	Chert Clay sandy	medium tan	clay to f sand	mod'ly strong	

EOH at 26.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER45

LOCALITY: EL7263

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : MBB

DATE DRILLED: 6-JUL-94

TOTAL DEPTH : 25.5

GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 592530 NORTHING: 8270840 R.L.: 45.0 AZIM.: INCL.:

COMMENTS: 200m N of YER43

SHEET 1 OF 2 HOLE NUMBER : YER45

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite sandy	medium orange red	c sand	friable	
2.0	4.0		CEN	Laterite sandy	medium orange red	c sand	friable	
4.0	6.0		CEN	Conglomerate lateritic	light orange red	s pebble to med sand	loose	
6.0	8.0		CEN	Conglomerate lateritic	light orange red	s pebble to med sand	loose	
8.0	10.0		CEN	Sand clayey lateritic	medium orange yellow	med sand to clay	soft	
10.0	12.0		CRE	Sand clayey ferruginous	pale pink	med sand to clay	soft	
12.0	14.0		CRE	Sand clayey ferruginous	pale pink	med sand to clay	soft	
14.0	16.0		CRE	Sand clayey Sandstone ferruginous	light yellow tan	med sand to clay	soft	
16.0	18.0		CRE	Sand clayey	light yellow tan	med sand to clay	soft	
18.0	20.0		CRE	Sand clayey Sandstone ferruginous	pale orange red	med sand to clay	soft	
20.0	22.0		CRE	Sand clayey Sandstone ferruginous	pale orange red	med sand to clay	soft	
22.0	23.0		CRE	Sand clayey Chert	medium brown	med sand to clay	weak	trace <0.5%
					mn coatings on chert			

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
23.0	24.0		CRE	Sand clayey Chert	light yellow tan	med sand to clay	weak	
24.0	25.5		CRE	Sand clayey Chert	medium yellow tan	med sand to clay	weak	

EOH at 25.5 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER46

LOCALITY: EL7263

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : MBB

DATE DRILLED: 7-JUL-94

TOTAL DEPTH : 36.0

GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 592525 NORTHING: 8276800 R.L.: 33.0 AZIM.: INCL.:

COMMENTS: pvc to 36m

SHEET 1 OF 2 HOLE NUMBER : YER46

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite	dark red brown	s pebble to med sand	friable	
2.0	4.0		CEN	Laterite	medium yellow brown	s pebble to clay	friable	
4.0	6.0		CEN	Clay sandy Clay lateritic sandy	light yellow tan	clay to med sand	soft	
6.0	8.0		CEN	Clay lateritic sandy	light yellow tan	clay to med sand	soft	
8.0	10.0		CEN	Sand clayey	light yellow tan	f sand to clay	soft	
10.0	12.0		CEN	Sand clayey	pale yellow tan	f sand to clay	soft	
12.0	14.0		CEN	Sand clayey	pale yellow tan	f sand to clay	soft	
14.0	16.0		CRE	Sand clayey	inject water pale yellow tan	f sand to clay	soft	
16.0	18.0		CRE	Sand clayey	pale yellow tan	med sand to clay	soft	
18.0	20.0		CRE	Sand clayey	light yellow brown	med sand to clay	soft	
20.0	22.0		CRE	Sand silty	medium yellow tan	med sand to med silt	friable	
22.0	24.0		CRE	Sand silty	medium brown	med sand to med silt	friable	

DEPTHS From To (m) (m)		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
24.0	26.0		CRE	Sand silty	pale yellow tan	med sand to med silt	friable	
26.0	28.0		CRE	Sand clayey Conglomerate	pale yellow tan	med sand to med silt	friable	
28.0	30.0		CRE	Sand clayey Conglomerate	some s pebbles present pale grey tan	med sand to med silt	friable	
30.0	32.0		CRE	Conglomerate Sand clayey	pale yellow	granule to med sand	loose	
32.0	34.0		PRO	Siltstone	pale yellow	med silt	mod'ly strong	
34.0	36.0		PRO	Siltstone	pale yellow	med silt	mod'ly strong	

EOH at 36.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER47

LOCALITY: EL7263

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : M8B

DATE DRILLED: 7-JUL-94

TOTAL DEPTH : 36.0

GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 591065 NORTHING: 8273135 R.L.: 35.0 AZIM.: INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : YER47

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Conglomerate sandy	medium yellow orange alluvial	med pebble to c sand	loose	
2.0	4.0		CEN	Conglomerate sandy	medium yellow orange	med pebble to c sand	loose	
4.0	6.0		CEN	Clay ferruginous sandy	pale yellow orange	med sand to clay	soft	
6.0	8.0		CEN	Clay ferruginous sandy	pale yellow orange	med sand to clay	soft	
8.0	10.0		CEN	Clay sandy Sandstone ferruginous	light yellow tan	med sand to clay	soft	
10.0	12.0		CEN	Clay sandy Sandstone ferruginous	light yellow tan	med sand to clay	soft	
12.0	14.0		CRE	Siltstone	pale red	f silt to clay	weak	
14.0	16.0		CRE	Clay sandy Siltstone	grey poss surficial silicification	f silt	mod'ly strong	
16.0	18.0		CRE	Siltstone	medium yellow	f silt	weak	
18.0	20.0		CRE	Siltstone	?weathering at water table pale yellow orange	f silt	soft	
20.0	22.0		CRE	Siltstone	light grey brown	f silt	soft	trace <0.5%
22.0	24.0		CRE	Siltstone	a number of thin (<5cm) int.with tr mn medium yellow	f silt	soft	trace <0.5%
					same as previous int			

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From	To							
(m)	(m)							
24.0	26.0		CRE	Siltstone	light grey brown	f silt	soft	trace <0.5%
26.0	28.0		CRE	Siltstone	same as previous int light grey brown	f silt	soft	trace <0.5%
28.0	30.0		CRE	Siltstone	same as previous int light grey brown	f silt	soft	trace <0.5%
30.0	32.0		OTH	Siltstone	mn occurs on partings pale grey brown	f silt to clay	mod'ly strong	
32.0	34.0		PRO	Siltstone	pale grey brown	f silt to clay	mod'ly strong	
34.0	36.0		PRO	Siltstone	pale grey brown	f silt to clay	mod'ly strong	
				Chert				

EOH at 36.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER48

LOCALITY: EL7263

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : M8B

DATE DRILLED: 7-JUL-94

TOTAL DEPTH : 30.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 588940

NORTHING: 8272325

R.L.: 38.0

AZIM.:

INCL.:

COMMENTS: pvc to 30m

SHEET 1 OF 2 HOLE NUMBER : YER48

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Sand clayey lateritic	pale tan	c sand to clay	loose	
2.0	4.0		CEN	Laterite	medium red brown	s pebble to med sand	friable	
4.0	6.0		CEN	Sand lateritic clayey	light pink yellow	f sand to clay	soft	
6.0	8.0		CEN	Sand clayey	light orange pink	f sand to clay	soft	
8.0	10.0	DZ1180	CRE	Clay sandy	pale grey white	clay to f sand	soft	trace <0.5%
10.0	12.0	DZ1181	CRE	Clay sandy	soft with rare chips poss cen pale grey white	clay to f sand	soft	trace <0.5%
12.0	14.0		CRE	Clay sandy	?veining-certainly secondary medium brown	clay to f sand	soft	trace <0.5%
14.0	16.0		CRE	Clay sandy	water injection - medium brown	clay to f sand	weak	
16.0	18.0		CRE	Sand clayey Sandstone ferruginous	rock slightly indurated medium red brown	f sand to clay	weak	
18.0	20.0		CRE	Sand clayey	could still be cen pale grey	med sand to clay	soft	
20.0	22.0		CRE	Clay sandy	prob cre pale grey	med sand to clay	soft	
22.0	24.0		CRE	Clay sandy	pale grey	med sand to clay	soft	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From	To							
(m)	(m)							
24.0	26.0		PRO	Siltstone weathered	medium red brown poss weathered	med silt red/green shale	weak	
26.0	28.0		PRO	Siltstone weathered	pale khaki grey	med silt	weak	
28.0	30.0		PRO	Siltstone weathered	pale khaki grey	med silt	weak	

EOH at 30.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER54

LOCALITY: EL7264

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : MBC

DATE DRILLED: 9-JUL-94

TOTAL DEPTH : 18.0

GRID: ANG ZONE: 53 RELIABILITY: SATL EASTING: 582390 NORTHING: 8267485 R.L.: 60.0 AZIM.: INCL.:

COMMENTS:

SHEET 1 OF 1 HOLE NUMBER : YER54

DEPTHS From (m)	To (m)	SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
0.0	2.0		CEN	Laterite	dark red brown	granule to med sand	friable	
2.0	4.0		CEN	Laterite sandy	medium red orange	med sand to clay	friable	
4.0	6.0		CEN	Sand clayey	mottled yellow tan	med sand to clay	soft	
6.0	8.0		CEN	Sand clayey	mottled pink tan	med sand to clay	soft	
8.0	10.0		CEN	Sand clayey	mottled yellow tan	med sand to clay	soft	
10.0	12.0		CEN	Sand clayey Gravel	pale brown	med sand to clay	soft	trace <0.5%
12.0	14.0		CEN	Sand clayey Carbonate	tr ferrug. mn pale grey white	clay to med sand	weak	
14.0	16.0		PRO	Siltstone Chert	pale tan	med silt	mod'ly strong	
16.0	18.0		PRO	Siltstone	pale tan	med silt	mod'ly strong	

EOH at 18.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER55

LOCALITY: EL7264

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : MBC

DATE DRILLED: 9-JUL-94

TOTAL DEPTH : 18.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 580780

NORTHING: 8264260

R.L.: 70.0

AZIM.:

INCL.:

COMMENTS:

SHEET 1 OF 1 HOLE NUMBER : YER55

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Sand Laterite	light red tan	med sand to granule	friable	
2.0	4.0		CEN	Laterite sandy	medium red orange	med pebble to med sand	weak	
4.0	6.0		PRO	Sand clayey	light tan	f sand	weak	
6.0	8.0		PRO	Sand clayey	pale grey	med sand to clay	weak	
8.0	10.0		PRO	Sandstone weathered	pale brown	med sand	weak	
10.0	12.0		PRO	Sandstone weathered	pale grey	med sand	weak	
12.0	14.0		PRO	Sandstone weathered	pale tan	med sand	weak	
14.0	16.0		PRO	Sandstone weathered	pale tan	med sand	mod'ly strong	
16.0	18.0		PRO	Sandstone weathered	pale tan	med sand	mod'ly strong	

EOH at 18.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER56

LOCALITY: EL7264

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : HBC

DATE DRILLED: 9-JUL-94

TOTAL DEPTH : 30.0

GRID: ANG ZONE: 53 RELIABILITY: SATL EASTING: 581480 NORTHING: 8265865 R.L.: 60.0 AZIM.: INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : YER56

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite	medium red orange	med sand to granule	friable	
2.0	4.0		CEN	Laterite	mottled red red	med sand to clay	soft	
4.0	6.0		CEN	Laterite	mottled red red	med sand to clay	soft	
6.0	8.0		CEN	Clay sandy	light yellow tan	clay to med sand	soft	trace <0.5%
8.0	10.0		CEN	Clay Gravel	sec. mn with lat clay medium yellow red	clay to s pebble	soft	
10.0	12.0		OTH	Sandstone Siltstone	light tan grey	vc sand to med silt	weak	
12.0	14.0		OTH	Conglomerate Clay	set cobble at 10.5, poss unconformity pale grey	granule to c sand	loose	
14.0	16.0		OTH	Clay sandy	pale green grey	clay to f sand	soft	
16.0	18.0		OTH	Clay sandy	soft puggy clay pale green grey	clay to f sand	soft	
18.0	20.0		PRO	Silt	soft puggy clay pale tan	med silt	soft	
20.0	22.0		PRO	Silt	pale tan	med silt	soft	
22.0	24.0		PRO	Silt Chert	pale tan	med silt	soft	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From	To							
(m)	(m)							
24.0	26.0		PRO	Siltstone weathered	pale tan	med silt	soft	
26.0	28.0		PRO	Siltstone weathered	pale tan	med silt	soft	
28.0	30.0		PRO	Siltstone weathered Chert	pale tan	med silt	soft	

EOH at 30.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER57

LOCALITY: EL7264

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-650

JOB NO : MBC

DATE DRILLED: 10-JUL-94

LOGGED BY : HWB

TOTAL DEPTH : 30.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 573565

NORTHING: 8261930

R.L.: 70.0

AZIM.:

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : YER57

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Sand	medium red orange	med sand	loose	
2.0	4.0		CEN	Sand Laterite	medium red orange	med sand to s pebble	loose	
4.0	6.0		CEN	Sand Laterite	medium red orange	med sand to s pebble	loose	
6.0	8.0		CEN	Sand Laterite	medium yellow	med sand to granule	loose	
8.0	10.0		CEN	Sand Sandstone	light brown	med sand	soft	
10.0	12.0		CEN	Sand Sandstone	light brown	med sand	mod'ly strong	
12.0	14.0		CEN	Sand Sandstone	poss pro at 9m light brown	med sand	mod'ly strong	
14.0	16.0		CEN	Sand	light brown	med sand	mod'ly strong	
16.0	18.0		CEN	Sand	light brown	med sand	mod'ly strong	
18.0	20.0		CEN	Sand	insufficient sample to be sure of lithology light brown	med sand	mod'ly strong	
20.0	22.0		CEN	Sand	medium red brown	c sand to med sand	mod'ly strong	
22.0	24.0		CEN	Sand	medium red brown	med sand to c sand	mod'ly strong	

DEPTHS From To (m) (m)		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
24.0	26.0		CEN	Sand	medium red brown	med sand to c sand	mod'ly strong	
				Chert	chacodonic chert			
26.0	28.0		PRO	Chert	pale pink	clay to med silt	strong	
				Siltstone				
28.0	30.0		PRO	Chert	pale pink	clay to med silt	strong	
				Siltstone				

EOH at 30.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER58

LOCALITY: EL7264

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : MBC

DATE DRILLED: 10-JUL-94

TOTAL DEPTH : 16.0

GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 574315 NORTHING: 8263450 R.L.: 70.0 AZIM.: INCL.:

COMMENTS:

SHEET 1 OF 1 HOLE NUMBER : YER58

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Sand clayey	light yellow tan	f sand to clay	loose	
2.0	4.0		CEN	Sand clayey Gravel	light red tan	f sand to clay	loose	
4.0	6.0		CEN	Sand clayey Sand	pale tan white	f sand to clay	loose	
6.0	8.0		PRO	Sand	pale tan white	f sand to clay	weak	
8.0	10.0		PRO	Sand clayey Sand Sandstone	poss weathered basement pale tan white	f sand to clay	weak	
10.0	12.0		PRO	Sand Sandstone	pale yellow tan	f sand to clay	weak	
12.0	14.0		PRO	Sand Sandstone	pale yellow tan	f sand to clay	weak	
14.0	16.0		PRO	Sandstone	medium red tan	f sand	strong	

EOH at 16.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER59

LOCALITY: EL7264

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : MBC

DATE DRILLED: 10-JUL-94

TOTAL DEPTH : 18.0

GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 572930 NORTHING: 8264610 R.L.: 60.0 AZIM.: INCL.:

COMMENTS:

SHEET 1 OF 1 HOLE NUMBER : YER59

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Sand	medium tan	med sand	loose	
2.0	4.0		CEN	Sand	rare pebbles medium tan	med sand	loose	
4.0	6.0		CEN	Sand	medium red orange	c sand	loose	
6.0	8.0		CEN	Sand clayey	pale tan	f sand	weak	
8.0	10.0		PRO	Sand clayey Sandstone	poss weathered basement pale tan		mod'ly strong	
10.0	12.0		PRO	Sandstone	pale tan		mod'ly strong	
12.0	14.0		PRO	Sandstone	pale tan		mod'ly strong	
14.0	16.0		PRO	Chert	pale grey	clay	strong	
16.0	18.0		PRO	Siltstone siliceous Chert	laminated chert, no reaction to hcl pale grey	clay	strong	
				Siltstone siliceous				

EOH at 18.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : YER60

LOCALITY: EL7264

CONTRACTOR : Gaden Drilling

SHEET : Tawallah Range

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : MBC

DATE DRILLED: 10-JUL-94

TOTAL DEPTH : 34.0

GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 570995 NORTHING: 8265030 R.L.: 60.0 AZIM.: INCL.:

COMMENTS: MYQ1, poly to 34m

SHEET 1 OF 2 HOLE NUMBER : YER60

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Sand	light yellow orange	f sand	loose	
2.0	4.0		CEN	Sand	pale grey green	clay to f sand	soft	
				Clay sandy				
4.0	6.0		CEN	Clay sandy	pale grey green	clay to f sand	soft	
6.0	8.0		CRE	Clay	pale green grey	clay	soft	
8.0	10.0		CRE	Clay	pale green grey	clay	soft	
10.0	12.0		CRE	Clay	pale green grey	clay	soft	
12.0	14.0		CRE	Clay	pale yellow grey	clay to f sand	soft	
14.0	16.0		CRE	Clay sandy Sandstone	pale yellow grey	clay to f sand	soft	
16.0	18.0		PRO	Siltstone Chert	light yellow tan	med silt.	mod'ly strong	
18.0	20.0		PRO	Siltstone Chert	light yellow tan	med silt to clay	mod'ly strong	
20.0	22.0		PRO	Sandstone Chert	light yellow tan	med silt to clay	strong	
22.0	24.0		PRO	Sandstone Chert	light yellow tan	med silt to clay	strong	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		PRO	Sandstone Chert	light yellow tan	med silt to clay	strong	
26.0	28.0		PRO	Siltstone siliceous Chert	light yellow tan	med silt to clay	strong	
28.0	30.0		PRO	Siltstone siliceous	light yellow tan	med silt to clay	strong	
30.0	32.0		PRO	Siltstone	pale yellow tan	med silt to clay	strong	
32.0	34.0		PRO	Siltstone	interbedded medium red brown mainly maroon with minor tan and green	maroon and green silt med silt to clay	very strong	
EOH at 34.0 m								

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR94

LOCALITY: EL7261

CONTRACTOR : Gaden Drilling

SHEET : Towns

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : MAZ

DATE DRILLED: 14-JUL-94

TOTAL DEPTH : 42.0

GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 534160 NORTHING: 8303635 R.L.: 10.0 AZIM.: INCL.:

COMMENTS: follow-up of TRR91

SHEET 1 OF 2 HOLE NUMBER : TRR94

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Sand clayey	light yellow brown	f sand to clay	soft	
2.0	4.0		CEN	Clay sandy	pale brown	clay to f sand	soft	
4.0	6.0		CEN	Clay sandy	pale brown	clay to f sand	soft	
6.0	8.0		CEN	Silt clayey Carbonate	pale yellow brown	med silt to clay	soft	
8.0	10.0		CEN	Silt clayey	pale yellow brown	med silt to clay	soft	
10.0	12.0			Silt clayey	pale yellow brown	med silt to clay	soft	
12.0	14.0			Silt clayey	dark red brown	med silt to clay	soft	
14.0	16.0			Silt clayey	poss pro but very soft dark red brown	med silt to clay	soft	
16.0	18.0			Silt clayey	dark red brown	med silt to clay	soft	
18.0	20.0			Silt clayey	dark red brown	med silt to clay	soft	
20.0	22.0			Silt clayey	dark red brown	med silt to clay	soft	
22.0	24.0			Siltstone clayey	dark red brown	med silt to clay	soft	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		OTH	Siltstone clayey Sandstone	dark red brown	med silt to clay	weak	
26.0	28.0		OTH	Siltstone clayey Sandstone	dark red brown	med silt to clay	weak	
28.0	30.0		OTH	Siltstone clayey Sandstone	dark red brown	med silt to clay	weak	
30.0	32.0		OTH	Siltstone clayey Sandstone	dark red brown	med silt to clay	weak	
32.0	34.0		OTH	Siltstone clayey Sandstone	dark red brown	med silt to clay	weak	
34.0	36.0		OTH	Siltstone clayey Sandstone	dark red brown	med silt to clay	weak	
36.0	38.0		OTH	Siltstone clayey Sandstone	dark red brown	med silt to clay	weak	
38.0	40.0		OTH	Siltstone clayey Sandstone	dark red brown	med silt to clay	weak	
40.0	42.0		OTH	Siltstone clayey Sandstone	dark red brown	med silt to clay	weak	
EOH at 42.0 m					probably pro			

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR95

LOCALITY: EL7261

CONTRACTOR : Gaden Drilling

SHEET : Towns

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : MAZ

DATE DRILLED: 14-JUL-94

TOTAL DEPTH : 36.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 533450

NORTHING: 8302110

R.L.: 18.0

AZIM.: 18.0

INCL.:

COMMENTS: follow-up of TRR91

SHEET 1 OF 2 HOLE NUMBER : TRR95

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite sandy	mottled tan brown	granule to med sand	friable	
2.0	4.0		CEN	Laterite sandy clayey Sandstone	medium red brown	med sand to clay	friable	
4.0	6.0		CEN	Clay Silt	pale yellow tan	clay to med silt	soft	
6.0	8.0		OTH	Sandstone ferruginous Siltstone ferruginous	some thin gravel beds pale pink brown	vf sand to med silt	weak	
8.0	10.0		OTH	Sandstone ferruginous Siltstone ferruginous	pale pink brown	vf sand to med silt	weak	
10.0	12.0		OTH	Sandstone ferruginous Siltstone ferruginous	light pink	vf sand to med silt	weak	
12.0	14.0		OTH	Sandstone ferruginous Siltstone ferruginous	light pink	vf sand to med silt	weak	
14.0	16.0		CRE	Clay silty ferruginous Silt ferruginous	medium red	clay to med silt	firm	
16.0	18.0		CRE	Clay silty ferruginous Silt ferruginous	medium red	clay to med silt	firm	
18.0	20.0		CRE	Clay silty ferruginous Silt ferruginous	medium red	clay to med silt	firm	
20.0	22.0		CRE	Clay silty ferruginous Silt ferruginous	rare chert chips medium red	clay to med silt	firm	
22.0	24.0		CRE	Clay silty ferruginous Silt ferruginous	medium red	clay to med silt	firm	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Clay silty ferruginous Ironstone	medium red brown small ironstone	clay to med silt ?nodules	firm	
26.0	28.0		CRE	Clay silty ferruginous Ironstone	medium red brown	clay to med silt	firm	
28.0	30.0		CRE	Clay silty ferruginous Ironstone	medium red brown	clay to med silt	firm	
30.0	32.0		PRO	Siltstone ferruginous	medium red brown	med silt to vf sand	mod'ly strong	
32.0	34.0		PRO	Siltstone ferruginous	medium red brown	med silt to vf sand	mod'ly strong	
34.0	36.0		PRO	Siltstone ferruginous	medium red brown	med silt to vf sand	mod'ly strong	

EOH at 36.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR96

LOCALITY: EL7261

CONTRACTOR : Gaden Drilling

SHEET : Towns

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : MAZ

DATE DRILLED: 14-JUL-94

TOTAL DEPTH : 24.0

GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 533420 NORTHING: 8304670 R.L.: 10.0 AZIM.: INCL.:

COMMENTS: follow-up of TRR91

SHEET 1 OF 1 HOLE NUMBER : TRR96

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Sand clayey	light tan	f sand to clay	soft	
2.0	4.0		CEN	Sand clayey	light tan	f sand to clay	soft	
4.0	6.0		CEN	Sand clayey	light tan	f sand to clay	soft	
6.0	8.0		PRO	Silt Carbonate	dark red brown	med silt	soft	
8.0	10.0		PRO	Silt Sandstone	dark red brown	med silt	soft	
10.0	12.0		PRO	Silt Sandstone	dark red brown	med silt	soft	
12.0	14.0		PRO	Silt	dark red brown	med silt	weak	
14.0	16.0		PRO	Silt	dark red brown	med silt	weak	
16.0	18.0		PRO	Silt	dark red brown	med silt	weak	
18.0	20.0		PRO	Silt Sandstone	dark red brown	med silt to f sand	mod'ly strong	
20.0	22.0		PRO	Silt Sandstone	dark red brown	med silt to f sand	mod'ly strong	
22.0	24.0		PRO	Silt Sandstone	dark red brown	med silt to f sand	mod'ly strong	

EOH at 24.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR97

LOCALITY: EL7261

CONTRACTOR : Gaden Drilling

SHEET : Towns

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : MAZ

DATE DRILLED: 14-JUL-94

TOTAL DEPTH : 24.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 535775

NORTHING: 8305325

R.L.: 8.0

AZIM.: 8.0

INCL.:

COMMENTS: follow-up of TRR91

SHEET 1 OF 1 HOLE NUMBER : TRR97

DEPTHS From (m)	To (m)	SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
0.0	2.0		CEN	Sand	light tan brown	med sand	loose	
2.0	4.0		CEN	Sand clayey	mottled tan grey	med sand to clay	soft	
4.0	6.0		CEN	Sand clayey Sand	mottled tan grey	med sand to clay	soft	
6.0	8.0		CEN	Sand Chert	medium red brown srd/chert ~ 7m	c sand to clay	loose	
8.0	10.0		OTH	Chert	medium red brown	clay	mod'ly strong	
10.0	12.0		OTH	Chert	medium red brown	clay	mod'ly strong	
12.0	14.0		OTH	Chert chalcedonic	pale red brown	clay	mod'ly strong	
14.0	16.0		OTH	Chert chalcedonic	pale red brown ghert is pink and green, some is agate	clay	mod'ly strong	
16.0	18.0		PRO	Chert chalcedonic Siltstone	pale red brown damp, inject water	clay	mod'ly strong	
18.0	20.0		PRO	Chert Dolomite	light brown	clay	strong	
20.0	22.0		PRO	Dolomite	light yellow brown	clay	strong	
22.0	24.0		PRO	Dolomite siliceous Dolomite	pale pink brown sil rock poss tuff	clay	strong	

EOH at 24.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR98

LOCALITY: EL7261

CONTRACTOR : Gaden Drilling

SHEET : Towns

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : MAZ

DATE DRILLED: 14-JUL-94

TOTAL DEPTH : 24.0

GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 536640 NORTHING: 8303650 R.L.: 10.0 AZIM.: INCL.:

COMMENTS: follow-up of TRR91

SHEET 1 OF 1 HOLE NUMBER : TRR98

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Clay sandy	dark gray brown type black soil	clay to med sand	friable	
2.0	4.0		CEN	Sand clayey	dark gray brown	clay to med sand	friable	
4.0	6.0		CEN	Sand	light red orange	med sand to clay	loose	
6.0	8.0		CEN	Sand clayey Laterite gravelly	pale red orange	med pebble to med sand	friable	
8.0	10.0		CRE	Silt Clay	light yellow brown	med silt to clay	soft	
10.0	12.0		OTH	Siltstone	pale orange brown	med silt	firm	
12.0	14.0		PRO	Siltstone ferruginous	pale orange brown	med silt	weak	
14.0	16.0		PRO	Siltstone ferruginous	lam fe & khaki pale orange brown	siltstone med silt	weak	
16.0	18.0		PRO	Siltstone ferruginous	pale orange brown	med silt	weak	
18.0	20.0		PRO	Siltstone ferruginous	pale orange brown	med silt	weak	
20.0	22.0		PRO	Siltstone ferruginous	pale orange brown	med silt	weak	
22.0	24.0		PRO	Siltstone ferruginous	pale orange brown	med silt	weak	

EOH at 24.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR99

LOCALITY: EL7261

CONTRACTOR : Gaden Drilling

SHEET : Towns

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : MAZ

DATE DRILLED: 14-JUL-94

TOTAL DEPTH : 30.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 535025

NORTHING: 8306825

R.L.: 10.0

AZIM.: 10.0

INCL.:

COMMENTS: EM MYQ28,poly to 30.2m

SHEET 1 OF 1 HOLE NUMBER : TRR99

DEPTHS From (m)	To (m)	SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
0.0	2.0		CEN	Sand clayey	medium grey brown	med sand to clay	soft	
2.0	4.0		CEN	Sand	pale red orange	med sand to clay	friable	
				Sand clayey				
4.0	6.0		CEN	Sand	light red orange	med sand to clay	friable	
				Sand clayey				
6.0	8.0		CEN	Sand	light tan	f sand to med sand	loose	
8.0	10.0		CEN	Sand	pale yellow orange	f sand to med sand	loose	
10.0	12.0		CEN	Sand	pale red orange	f sand to med sand	loose	
12.0	14.0		PRO	Siltstone ferruginous micaceous	light red orange	med silt	weak	
14.0	16.0		PRO	Siltstone ferruginous micaceous	light red orange	med silt	weak	
16.0	18.0		PRO	Siltstone micaceous	pale tan grey	med silt	weak	
18.0	24.0		PRO	Siltstone micaceous	pale tan grey	med silt	weak	
24.0	30.0		PRO	Shale	medium grey	med silt	mod'ly strong	

becoming quite black in last 2m

EOH at 30.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR100

LOCALITY: EL7261

CONTRACTOR : Gaden Drilling

SHEET : Towns

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : MAZ

DATE DRILLED: 15-JUL-94

TOTAL DEPTH : 42.0

GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 533440 NORTHING: 8308465 R.L.: 15.0 AZIM.: INCL.:

COMMENTS: EM MYQ33,poly to 42m

SHEET 1 OF 2 HOLE NUMBER : TRR100

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Sand clayey	dark grey brown	med sand to clay	friable	
2.0	4.0		CEN	Sand clayey	light orange brown	med sand to clay	soft	
4.0	6.0		CEN	Sand clayey Sand	light red orange	med sand to clay	loose	
6.0	8.0		CEN	Sand	light tan orange	med sand to f sand	loose	
8.0	10.0		CEN	Sand	light tan orange	med sand to f sand	loose	
10.0	10.5	DZ1198	OTH	Siltstone Sandstone	medium grey	f sand to med silt	weak	0.5 - 5%
10.5	11.0	DZ1199	OTH	Siltstone Sandstone	mn poss in pro medium grey	f sand to med silt	weak	0.5 - 5%
11.0	12.0		OTH	Silt Silt	mn poss in pro pale tan brown	med silt	weak	
12.0	14.0		OTH	Silt Silt	pale tan brown	med silt	weak	trace <0.5%
14.0	15.0		OTH	Silt Clay	medium red tan	med silt	weak	trace <0.5%
15.0	15.5		OTH	Unident rock ferruginous siliceous Clay	medium red brown tr flaky mn	clay	soft	trace <0.5%
15.5	16.0	DZ1200	OTH	Clay Unident rock ferruginous siliceous	dark grey mn mainly fine grained	clay	soft	trace <0.5%

PROJECT : CASE LOGSHEET
 LOCALITY: EL Drilling
 SHEET : Top 50
 JOB NO : MAZUL-94
 GRID: ANG
 COMMENTS: EM HYQ33, po

HOLE NUMBER : TRR100

LOGGED BY : HWB

TOTAL DEPTH : 42.0

NORTHING: 8308465

R.L.: 15.0

AZIM.: INCL.:

SHEET 1 OF 2 HOLE NUMBER : TRR100

DEPTHS From (m)	To (m)	SAMPLE NUMBER	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
0.0	2.0		dark grey brown	med sand to clay	friable	
2.0	4.0		light orange brown	med sand to clay	soft	
4.0	6.0		light red orange	med sand to clay	loose	
6.0	8.0		light tan orange	med sand to f sand	loose	
8.0	10.0		light tan orange	med sand to f sand	loose	
10.0	10.5	DZ1198	medium grey	f sand to med silt	weak	0.5 - 5%
10.5	11.0	DZ1199	mn poss in pro medium grey	f sand to med silt	weak	0.5 - 5%
11.0	12.0		mn poss in pro pale tan brown	med silt	weak	
12.0	14.0		pale tan brown	med silt	weak	trace <0.5%
14.0	15.0		medium red tan	med silt	weak	trace <0.5%
15.0	15.5		medium red brown	clay	soft	trace <0.5%
15.5	16.0	DZ1200	tr flaky mn dark grey	clay	soft	trace <0.5%
			mn mainly fine grained			

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
16.0	17.0		OTH	Clay	pale brown	clay	soft	
17.0	18.0		OTH	Siltstone ferruginous Clay	medium brown	med silt to clay	soft	
18.0	20.0		OTH	Siltstone ferruginous Clay	light tan	med silt to clay	soft	
20.0	22.0		OTH	Siltstone ferruginous Clay	light tan	med silt to clay	soft	
22.0	24.0		PRO	Siltstone	medium brown	med silt	weak	
24.0	26.0		PRO	Siltstone	maroon & green medium brown	siltstone med silt	weak	
26.0	28.0		PRO	Siltstone	mottled red green	med silt	mod'ly strong	
28.0	34.0		PRO	Siltstone	medium red	med silt	mod'ly strong	
34.0	40.0		PRO	Siltstone	mainly maroon mottled red green	siltstone med silt	mod'ly strong	
40.0	42.0		PRO	Siltstone	medium red	med silt	mod'ly strong	

EOH at 42.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR101

LOCALITY: EL7261

CONTRACTOR : Gaden Drilling

SHEET : Towns

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : MAZ

DATE DRILLED: 15-JUL-94

TOTAL DEPTH : 12.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 532550

NORTHING: 8310895

R.L.: 18.0

AZIM.:

INCL.:

COMMENTS: EM NYQ34, poly to 12m

SHEET 1 OF 1 HOLE NUMBER : TRR101

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite sandy clayey	medium red brown	granule to med sand	friable	
2.0	4.0		PRO	Siltstone	medium red	med silt	weak	
4.0	6.0		PRO	Siltstone micaceous	medium purple red	med silt	mod'ly strong	
6.0	12.0		PRO	Siltstone micaceous ferruginous	dark red red	med silt	mod'ly strong	

EOH at 12.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR102

LOCALITY: EL7260

CONTRACTOR : Gaden Drilling

SHEET : Towns

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : MAY

DATE DRILLED: 17-JUL-94

TOTAL DEPTH : 48.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 532260

NORTHING: 8327540

R.L.: 16.0

AZIM.: 16.0

INCL.: 16.0

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR102

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite sandy	light yellow tan	s pebble to med sand	loose	
2.0	4.0		CEN	Laterite	medium red brown	s pebble to med sand	weak	
4.0	6.0		CEN	Laterite sandy clayey	light orange brown	med sand to clay	friable	
6.0	8.0		CRE	Sand	pale tan red	c sand to f sand	loose	
8.0	10.0		CRE	Sand clayey	mottled yellow pink	c sand to f sand	loose	
10.0	12.0		CRE	Sand clayey	medium red brown water injection	med sand to clay	soft	
12.0	14.0		CRE	Sand clayey Sand	pale pink	med sand to clay	soft	
14.0	16.0		CRE	Sand clayey Sand	pale pink	med sand to clay	soft	
16.0	18.0		CRE	Sand clayey	pale pink tan	c sand to clay	soft	
18.0	20.0		CRE	Sand clayey	pale tan white	vc sand to clay	loose	
20.0	22.0		CRE	Sand clayey	pale tan white	vc sand to clay	loose	
22.0	24.0		CRE	Conglomerate Sand clayey	pale pink white	vc sand to s pebble	loose	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Sand	pale tan	vc sand	loose	
				Sand clayey				
26.0	28.0		CRE	Sand clayey Sand	pale tan white	c sand to clay	loose	
28.0	30.0		CRE	Siltstone clayey Sand	mottled pink yellow	med silt to clay	weak	
				clayey	silt has fe nodules			
30.0	32.0		CRE	Siltstone	medium red brown	med silt	weak	
				Chert algal				
32.0	34.0		CRE	Siltstone	medium yellow brown	med silt to clay	weak	
				Siltstone siliceous				
34.0	36.0		CRE	Siltstone	medium yellow	med silt to clay	weak	
				Chert				
36.0	38.0		CRE	Siltstone	medium yellow	med silt to clay	weak	trace <0.5%
				Chert algal				
38.0	40.0		CRE	Siltstone	rare mn frags medium yellow brown	med silt to clay	weak	
				Siltstone siliceous				
40.0	42.0		CRE	Dolomite silty	medium yellow brown	med silt to clay	weak	
42.0	44.0		PRO	Dolomite silty	pro at 41m light yellow brown	med silt	mod'ly strong	
44.0	46.0		PRO	Dolomite silty	pale grey brown	med silt	mod'ly strong	
46.0	48.0		PRO	Dolomite silty	pale grey brown	med silt	mod'ly strong	

EOH at 48.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR103

LOCALITY: EL7260

CONTRACTOR : Gaden Drilling

SHEET : Towns

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : MAY

DATE DRILLED: 17-JUL-94

TOTAL DEPTH : 68.0

GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 531490 NORTHING: 8328225 R.L.: 16.0 AZIM.: INCL.:

COMMENTS:

SHEET 1 OF 3 HOLE NUMBER : TRR103

DEPTHS From (m)	To (m)	SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
0.0	2.0		CEN	Laterite sandy	medium red brown	s pebble to med sand	weak	
2.0	4.0		CEN	Sand lateritic clayey	mottled red white	med sand to clay	friable	
4.0	6.0		CEN	Sand Sand clayey	pale tan yellow	med sand to clay	soft	
6.0	8.0		CRE	Sand	pale tan yellow	vc sand to clay	loose	
8.0	10.0		CRE	Sand clayey Sand	pale green white	med sand to clay	loose	
10.0	12.0		CRE	Sand clayey Sand	pale green white	med sand to clay	loose	
12.0	14.0		CRE	Sand Sand clayey	pale green clay pale tan yellow	vc sand to med silt	loose	
14.0	16.0		CRE	Sand Sand clayey	pale grey white	c sand to med silt	loose	
16.0	18.0		CRE	Sand clayey Sand	pale grey white	c sand to clay	loose	
18.0	20.0		CRE	Sand Sand clayey	pale tan	c sand to clay	loose	
20.0	22.0		CRE	Sand Sand clayey	pale tan	c sand to clay	loose	
22.0	24.0		CRE	Sand Conglomerate	pale tan	vc sand to granule	loose	

DEPTHS From To (m) (m)		SAMPLE NUMBER	GEOLOGICAL TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
24.0	26.0		CRE	Conglomerate Sand	pale tan white	granule to med sand	loose	
26.0	28.0		CRE	Sand	pale tan white	c sand to med sand	loose	
28.0	30.0		CRE	Siltstone sandy	pale tan white	med silt to med sand	weak	
30.0	32.0		CRE	Siltstone Clay sandy	poss start unit 2 pale tan yellow	med silt to med sand	weak	
32.0	34.0		CRE	Siltstone algal Sand	pale tan yellow	med silt to med sand	weak	
34.0	36.0		CRE	Siltstone algal Sand	light tan yellow	med silt to med sand	weak	
36.0	38.0		CRE	Siltstone algal Conglomerate	pale yellow white	med silt to s pebble	weak	
38.0	40.0		CRE	Siltstone algal Siltstone	pale yellow	med silt to clay	weak	
40.0	42.0		CRE	Sand clayey	medium yellow	med sand to clay	weak	
42.0	44.0		CRE	Siltstone algal algal Siltstone	medium yellow	med sand to clay	weak	
44.0	46.0		CRE	Siltstone ferruginous laminated	medium yellow red	med silt	weak	
46.0	48.0		CRE	Chert pisolitic Siltstone	medium yellow	med silt	weak	
48.0	50.0		CRE	Siltstone algal	medium yellow	med silt	weak	
50.0	52.0		CRE	Siltstone ferruginous Siltstone algal	medium yellow	med silt	weak	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
52.0	54.0		CRE	Siltstone algal	medium yellow brown	med silt	weak	
54.0	56.0		CRE	Siltstone algal	medium yellow brown	med silt	weak	
56.0	58.0		CRE	Siltstone algal Siltstone	medium yellow brown	med silt	weak	
58.0	60.0		CRE	Chert pisolitic Chert	dark yellow brown oolites	clay to med silt	weak	
60.0	62.0		CRE	Chert pisolitic Siltstone algal	pale grey oolites	clay to med silt	weak	
62.0	64.0		CRE	Siltstone ferruginous Siltstone algal	oolites dark red brown odd frags mn	med silt	weak	trace <0.5%
64.0	66.0		CRE	Siltstone ferruginous Siltstone laminated	dark red brown ditto	med silt	weak	trace <0.5%
66.0	68.0		PRO	Dolomite siliceous Tuff	medium red pink vh water flow from 46m	med silt to clay	strong	
EOH at 68.0 m								

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR104

LOCALITY: EL7260

CONTRACTOR : Gaden Drilling

SHEET : Towns

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : MAY

DATE DRILLED: 17-JUL-94

TOTAL DEPTH : 54.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 533927

NORTHING: 8327450

R.L.: 16.0

AZIM.: 16.0

INCL.:

COMMENTS:

SHEET 1 OF 1 HOLE NUMBER : TRR104

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite	dark red brown	s pebble to med sand	friable	
2.0	4.0		CEN	Sand lateritic clayey	mottled yellow white	med sand to clay	soft	
4.0	6.0		CEN	Clay sandy Sand clayey	pale grey white tr mn assoc. with clay	clay to f sand	soft	trace (0.5%)
6.0	8.0		CEN	Clay sandy	pale green white pale green clay	clay to f sand	soft	
8.0	10.0		CEN	Clay sandy	pale green white	clay to f sand	firm	
10.0	12.0		CEN	Clay sandy	pale green tan	clay to f sand	firm	
12.0	14.0		CEN	Sand clayey	pale green tan	med sand to clay	soft	
14.0	16.0		OTH	Clay silty silty Siltstone	dark brown	med silt to clay	weak	
16.0	18.0		OTH	Siltstone siliceous	poss some type of weathering crust dark brown	med silt	weak	
18.0	20.0		CRE	Sand clayey	pale tan yellow	f sand to clay	soft	
20.0	22.0		CRE	Sand	v sticky, blocking hammer pale tan	med sand to clay	loose	
22.0	24.0		CRE	Sand clayey Conglomerate quartzose	pale tan	c sand to granule	loose	

DEPTHS From To (m) (m)		SAMPLE NUMBER	GEOLOGICAL TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
24.0	26.0		CRE	Sand clayey Siltstone	pale tan yellow	f sand to med silt	soft	
26.0	28.0		CRE	Siltstone Chert	poss top uni 2 pale grey white	med silt to clay	soft	
28.0	30.0		CRE	Chert Siltstone	pale grey white	med silt to clay	soft	
30.0	32.0		CRE	Sand clayey Chert	pale grey white	med silt to clay	soft	
32.0	34.0		CRE	Sand clayey Siltstone	pale grey white	med sand to clay	soft	
34.0	36.0		CRE	Sandstone algal	pale grey white	med sand to med silt	soft	
36.0	38.0		CRE	Sandstone algal	pale grey white	med sand to med silt	soft	
38.0	40.0		CRE	Siltstone algal	pale grey white	med sand to med silt	soft	
40.0	42.0		CRE	Silt sandy Chert	medium tan yellow	med silt to clay	soft	
42.0	44.0		CRE	Sand clayey Sandstone algal	light tan yellow	med sand to med silt	soft	
44.0	46.0		CRE	Siltstone ferruginous	medium red brown	med silt	weak	
46.0	48.0		CRE	Siltstone ferruginous Siltstone	dark brown	med silt	weak	
48.0	50.0		CRE	Siltstone ferruginous Siltstone	dark brown	med silt	weak	
50.0	52.0		CRE	Siltstone ferruginous Siltstone	dark brown	med silt	weak	trace <0.5%
52.0	54.0		OTH	Siltstone	light tan	med silt	weak	

poss unit 1 or pro

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR105

LOCALITY: EL7200

CONTRACTOR : Gaden Drilling

SHEET : Towns

RIG TYPE : UDR-850

LOGGED BY : HWB

JOB NO : MAY

DATE DRILLED: 18-JUL-94

TOTAL DEPTH : 48.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 535575

NORTHING: 8327465

R.L.: 18.0

AZIM.: 18.0

INCL.:

COMMENTS:

SHEET 1 OF 3 HOLE NUMBER : TRR105

DEPTHS From To (m) (m)	SAMPLE NUMBER	GEOLOGICAL TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
0.0 2.0		CEN	Laterite pisolitic sandy	medium red brown	s pebble to med sand	weak	
2.0 4.0		CEN	Laterite pisolitic sandy Sand clayey	medium tan	s pebble to med sand	weak	
4.0 6.0		CEN	Fe crete Sand clayey	medium red yellow	f sand to clay	mod'ly strong	
6.0 8.0		CEN	Siltstone Clay	poss some surficial crust light tan	med silt to clay	soft	
8.0 10.0		CEN	Siltstone Clay	clay slowly increases downwards medium yellow tan	med silt to clay	soft	
10.0 12.0		CEN	Siltstone ferruginous ferruginous Siltstone	mottled red white	med silt	weak	
12.0 14.0		CEN	Siltstone	pale grey white	med silt	weak	
14.0 16.0		CEN	Clay ferruginous Clay	mottled red white	clay	soft	
16.0 18.0		CEN	Clay ferruginous Clay	mottled red	clay	soft	
18.0 20.0		CRE	Clay ferruginous sandy	medium red orange	med sand to clay	soft	
20.0 22.0		CRE	Clay ferruginous sandy	poss bounbary with start of sand light red orange	med sand to clay	soft	
22.0 24.0		CRE	Clay sandy	light tan white poss reworked mn,v diff drilling	clay to f sand	stiff	trace <0.5%

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Sand clayey	light tan white still tr mn	clay to f sand	stiff	trace <0.5%
26.0	28.0		CRE	Sand clayey	light tan white	f sand to clay	stiff	
28.0	30.0		CRE	Sand clayey	mottled orange tan	f sand to clay	stiff	
30.0	32.0		CRE	Clay sandy	mottled tan white	clay to f sand	stiff	trace <0.5%
32.0	34.0		CRE	Clay sandy	mottled tan white	clay to f sand	stiff	trace <0.5%
34.0	36.0		CRE	Sand clayey	mottled tan white	clay to f sand	stiff	
36.0	38.0		CRE	Sand clayey	light orange tan	clay to f sand	stiff	
38.0	40.0		CRE	Clay sandy	light tan brown	clay to f sand	stiff	
40.0	41.0		CRE	Clay sandy	light tan brown	clay to f sand	stiff	
41.0	42.0		CRE	Chert oolitic Clay sandy	medium khaki	clay to f sand	weak	trace <0.5%
42.0	42.5	DZ 451	CRE	Unident rock siliceous	oolites, suff mn medium khaki	to colour water clay to f sand	weak	0.5 - 5%
42.5	43.0	DZ 452	CRE	Siltstone ferruginous Sand clayey	dark brown red oolites	med silt to clay	weak	0.5 - 5%
43.0	43.5		CRE	Siltstone ferruginous Sand clayey	dark brown red	med silt to clay	weak	trace <0.5%
43.5	44.0		CRE	Siltstone ferruginous Chert clayey	dark brown red	med silt to clay	weak	trace <0.5%

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
44.0	46.0		CRE	Siltstone ferruginous Siltstone	medium tan brown	med silt	weak	
46.0	48.0		CRE	Siltstone ferruginous	medium tan brown	med silt	weak	

EOH at 48.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR106

LOCALITY: EL7260

CONTRACTOR : Gaden Drilling

SHEET : Towns

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : MAY

DATE DRILLED: 18-JUL-94

TOTAL DEPTH : 60.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 537195

NORTHING: 8327430

R.L.: 20.0

AZIM.:

INCL.:

COMMENTS:

SHEET 1 OF 3 HOLE NUMBER : TRR106

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite sandy pisolitic	medium red orange	s pebble to med sand	friable	
2.0	4.0		CEN	Laterite sandy pisolitic	medium red orange	s pebble to med sand	friable	
4.0	6.0		CEN	Sand clayey lateritic	mottled tan white	med sand to clay	soft	
6.0	8.0		CEN	Sand	medium yellow orange	med sand	loose	
8.0	10.0		CEN	Sand ferruginous	dark red	med sand	loose	
10.0	12.0			Sandstone	medium tan yellow	med sand	strong	
12.0	14.0			Sand	medium yellow	med sand	loose	
14.0	16.0			Sand	medium yellow	med sand	loose	
16.0	18.0		PRO	Sandstone	pale yellow tan	med sand to c sand	mod'ly strong	
18.0	20.0			Sandstone	pale tan	med sand to c sand	weak	
				Sand	yellow			
20.0	22.0			Sandstone	pale tan	med sand to c sand	weak	
				Sand	yellow			
22.0	24.0			Sand	pale tan yellow odd pebble bed	med sand to vc sand	loose	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Sand	pale tan yellow	vc sand to granule	loose	
26.0	28.0		CRE	Sand	pale tan yellow	vc sand to granule	loose	
28.0	30.0		CRE	Sand	some algal sst frags pale green	vc sand to granule	loose	
				Siltstone	tan			
30.0	32.0		CRE	Conglomerate	siltstone/silt last 20cm pale green	med silt to c sand	firm	
				Siltstone	tan			
32.0	34.0		CRE	Clay sandy Sand	?cyclic pale green tan	clay to c sand	firm	
34.0	36.0		CRE	Clay sandy	?cyclic light tan green	clay to c sand	firm	
36.0	38.0		CRE	Clay sandy Sandstone algal	light tan green	clay to med sand	firm	
38.0	40.0		CRE	Clay sandy	medium yellow brown	clay to med sand	firm	
40.0	42.0		CRE	Clay sandy Chert pisolitic	light tan yellow	clay to med sand	firm	
42.0	44.0		CRE	Chert oolitic Silt	light yellow tan	clay to med silt	weak	
44.0	46.0		CRE	Chert oolitic Silt	oolitic chert light yellow tan	clay to med silt	weak	
46.0	48.0		CRE	Silt	oolitic chert light tan	clay to med silt	weak	
				Chert oolitic	oolitic chert			
48.0	50.0		CRE	Silt	pale green tan	med silt to clay	weak	
				Chert oolitic	oolitic chert			
50.0	52.0		CRE	Silt	pale yellow tan	med silt to clay	weak	
				Chert oolitic	oolitic chert			

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
52.0	54.0		CRE	Chert oolitic Silt sandy	medium yellow	med silt to clay	weak	
54.0	56.0		CRE	Chert Silt	oolitic chert pale yellow	clay to med silt	weak	
56.0	58.0		CRE	Chert oolitic	pale green yellow oolitic chert	clay	weak	
58.0	60.0		CRE	Chert oolitic Sandstone algal	pale tan	clay to f sand	weak	
EOH at 60.0 m					oolitic chert, mn horizon probably below this depth			

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR107

LOCALITY: EL7260

CONTRACTOR : Gaden Drilling

SHEET : Towns

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : MAY

DATE DRILLED: 19-JUL-94

TOTAL DEPTH : 54.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 538730

NORTHING: 8327445

R.L.: 20.0

AZIM.: 110

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR107

DEPTHS From (m)	To (m)	SAMPLE NUMBER	GEOLOGICAL TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
0.0	2.0		CEN	Laterite pisolitic sandy	mottled tan red	s pebble to med sand	friable	
2.0	4.0		CEN	Laterite pisolitic sandy	dark orange red	s pebble to med sand	friable	
4.0	6.0		CEN	Sand lateritic clayey	mottled red brown	med sand to clay	soft	
6.0	8.0		CEN	Clay sandy ferruginous	light tan	clay to med sand	soft	
8.0	10.0		CEN	Clay sandy ferruginous	water injection medium red orange	clay to med sand	soft	
10.0	12.0		CEN	Sand clayey	light tan	med sand to clay	soft	
12.0	14.0		CEN	Sand clayey	still lateritic medium red orange	med sand to clay	soft	
14.0	16.0		CEN	Sand clayey	medium red orange	med sand to clay	soft	
16.0	18.0		CEN	Sand clayey Sand	medium red orange	med sand to clay	soft	
18.0	20.0		CRE	Sand Sand clayey	medium orange red	c sand to clay	loose	
20.0	22.0		CRE	Sand	pale tan	vc sand to med sand	loose	
22.0	24.0		CRE	Sand	pale tan	vc sand to med sand	loose	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Sand	pale tan	vc sand to med sand	loose	
				Sandstone ferruginous				
26.0	28.0		CRE	Sand	pale brown	vc sand to med sand	loose	
28.0	30.0		CRE	Sand	pale brown	vc sand to med sand	loose	
30.0	32.0		CRE	Conglomerate quartzose	some pebble bes light brown	granule to c sand	loose	
32.0	34.0		CRE	Clay silty	pale yellow tan	clay to med silt	soft	trace <0.5%
34.0	36.0		CRE	Clay silty Chert	rare mn frags pale yellow tan	clay to med silt	soft	trace <0.5%
36.0	38.0		CRE	Clay sandy Chert	rare mn frags pale tan	clay to med sand	soft	
38.0	40.0		CRE	oolitic Siltstone ferruginous siliceous Chert	yellow oolitic chert pale brown	clay to med silt	soft	
40.0	42.0		CRE	Clay silty Siltstone	pale brown	med silt to clay	weak	
42.0	44.0		CRE	Siltstone ferruginous siliceous Chert	pale brown	med silt to clay	weak	
44.0	46.0		CRE	Siltstone	light brown	med silt	weak	
46.0	48.0		CRE	Siltstone ferruginous Chert	pale yellow tan	med silt to clay	weak	
48.0	50.0		OTH	Siltstone ferruginous Chert	medium yellow	med silt to clay	weak	
50.0	52.0		OTH	Siltstone ferruginous Chert	becoming harder medium yellow	poss pro med silt to clay	weak	
52.0	54.0		OTH	Siltstone ferruginous Chert	medium yellow	med silt to clay	weak	

EOH at 54.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR108

LOCALITY: EL7260

CONTRACTOR : Gaden Drilling

SHEET : Towns

RIG TYPE : UDR-650

LOGGED BY : HWB

JOB NO : MAY

DATE DRILLED: 19-JUL-94

TOTAL DEPTH : 36.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 537920

NORTHING: 8328200

R.L.: 20.0

AZIM.:

INCL.:

COMMENTS: n,24m pvc casing

SHEET 1 OF 3 HOLE NUMBER : TRR108

DEPTHS From (m)	To (m)	SAMPLE NUMBER	GEOLOGICAL TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
0.0	2.0		CEN	Laterite pisolitic sandy	mottled tan red	s pebble to med sand	loose	
2.0	4.0		CEN	Laterite sandy clayey	medium orange red	med sand to clay	friable	
4.0	6.0		CEN	Clay sandy lateritic	mottled tan white	clay to med sand	soft	
6.0	8.0		CEN	Clay sandy lateritic	mottled red	clay to med sand	weak	
8.0	10.0		CEN	Fe crete sandy Clay sandy lateritic	white hard fe bands medium orange red	clay to med sand	soft	
10.0	12.0		CEN	Fe crete sandy Clay sandy ferruginous	hard fe bands medium red brown	clay to med sand	soft	
12.0	14.0		CEN	Clay silty	mottled tan white	clay to med silt	soft	trace <0.5%
14.0	15.5		CRE	Clay silty	dark red brown	clay to med silt	soft	0.5 - 5%
15.5	16.0	DZ 453	CRE	Sand clayey	hard mn in last 50cm mottled black red	clay to f sand	soft	5 - 20%
16.0	16.5	DZ 454	CRE	silty Manganese ore silty Sand	hard nodular mn mottled red black	med sand to clay	soft	30 - 50%
16.5	17.0	DZ 455	CRE	clayey ferruginous Sand clayey	abundant hard mn, replacement textures medium yellow orange	med sand to clay	loose	0.5 - 5%
17.0	18.0		CRE	silty Sand clayey Sand	minor mn, siliceous medium yellow orange v rare mn	med sand to c sand	loose	trace <0.5%

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
18.0	20.0		CRE	Sand clayey	light yellow tan	c sand to clay	soft	trace <0.5%
20.0	22.0		CRE	Clay sandy ferruginous	trace mn, injection pale tan	clay to c sand	soft	trace <0.5%
22.0	24.0		CRE	Clay sandy	mn poss contam medium yellow tan	clay to c sand	soft	trace <0.5%
24.0	26.0		CRE	Sand	mn poss contam medium yellow brown	vc sand	loose	trace <0.5%
26.0	28.0		CRE	Sand	lithic frags medium yellow brown	vc sand	loose	trace <0.5%
28.0	29.5		CRE	Sand	lithic frags light yellow brown	granule	loose	trace <0.5%
29.5	30.0	DZ 456	CRE	Sand	sil mn to 1x, lithic frags light grey	vc sand	loose	0.5 - 5%
30.0	30.5	DZ 457	CRE	Breccia lithic	fairly massive mn medium grey	l pebble	loose	5 - 20%
30.5	31.0	DZ 458	CRE	Chert algal oolitic	sst clasts, secondary mn medium yellow grey	f sand to clay	weak	trace <0.5%
31.0	31.5	DZ 459	CRE	Chert oolitic algal Sandstone	mn dusting, oolites medium grey	c sand to clay	weak	0.5 - 5%
31.5	32.0	DZ 460	CRE	Chert algal Sandstone	oolites light grey	clay to f sand	weak	0.5 - 5%
32.0	32.5	DZ 461	CRE	Chert oolitic algal Sandstone	light grey	clay to f sand	weak	5 - 20%
32.5	33.0		CRE	clayey Sandstone	oolites pale yellow white	f sand	mod'ly strong	trace <0.5%
33.0	33.5		CRE	Chert algal Siltstone	pale grey white	med silt to f sand	mod'ly strong	
				Silt sandy				

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
33.5	34.0		CRE	Silt	medium yellow tan	med silt	hard	
34.0	35.0		PRO	Sandstone siliceous	pale khaki	f sand	strong	
35.0	36.0		PRO	Sandstone cherty	pale khaki	f sand	strong	

EOH at 36.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR109

LOCALITY: EL7260

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : APO

JOB NO : MAY

DATE DRILLED: 26-JUL-94

TOTAL DEPTH : 36.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 536279

NORTHING: 8328193

R.L.: 15.0

AZIM.:

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR109

DEPTHS From (m)	To (m)	SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
0.0	2.0		CEN	Lat mottled zone sandy ferruginous	medium red brown	med silt to f sand	strong	
2.0	4.0		CEN	Lat mottled zone ferruginous Clay sandy	mottled red brown	clay to med sand	hard	
4.0	6.0		CRE	Silt sandy	pale white grey tr disseminated mn in clay	f silt to c sand	stiff	trace <0.5%
6.0	7.5	DZ 462	CRE	Clay sandy	mottled khaki green	clay to s pebble	hard	5 - 20%
7.5	8.0	DZ 463	CRE	Sand clayey	.5 m of mn at 7m dz462 from 7.5 to 8m light white grey	clay to med pebble	hard	0.5 - 5%
8.0	8.5		CRE	Sandstone Sand	.5 m of mn at 7.5 pale white grey	f sand to s pebble	stiff	
8.5	10.0		CRE	Sandstone Sand	weakly qtz cemented sandstone and qtz sand pale white grey	f sand to s pebble	stiff	trace <0.5%
10.0	12.0		CRE	Sandstone Sand clayey	weakly qtz cemented sandstone and qtz sand m light white khaki	med silt to s pebble	hard	trace <0.5%
12.0	14.0		CRE	Sand clayey Conglomerate clayey	contains some mn stained chert frags medium yellow white	clay to med pebble	hard	
14.0	16.0		CRE	Sand clayey	contains 1% chert frags with ? oolites medium yellow white	clay to vs pebble	hard	
16.0	18.0		CRE	Sand clayey	m light yellow white water injection	clay to vc sand	stiff	
18.0	20.0		CRE	Sand clayey	medium grey white contains minor algal cher frags - water table	clay to vs pebble	stiff	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
20.0	22.0		CRE	Sand clayey	m light yellow	clay to s pebble	stiff	
22.0	24.0		CRE	Silt sandy Oolite cherty	light grey yellow	f silt to granule	stiff	
24.0	26.0		CRE	Siltstone Chert clayey Oolite cherty Clay	contains algal light grey yellow	laminated chert and clay to med sand	some qtz siltstone mod'ly strong	
26.0	28.0		CRE	Siltstone Chert clayey Oolite cherty Clay	contains algal light yellow grey	laminated chert and clay to vf sand	some qtz siltstone mod'ly strong	
28.0	30.0		CRE	Sandstone Chert clayey	contains algal medium yellow	laminated chert and clay to vf sand	some qtz siltstone mod'ly strong	
30.0	32.0	DZ 464	CRE	Chert clayey Sandstone	contains qtz siltstone medium khaki grey	clay to vf sand	mod'ly strong	trace <0.5%
32.0	34.0	DZ 465	CRE	Sandstone Chert clayey	contains qtz siltstone, and weakly mn stained chert ?prot med dark khaki green	clay to vf sand	mod'ly strong	trace <0.5%
34.0	36.0	DZ 466	OTH	Chert clayey Sandstone	contains qtz siltstone, and weakly mn stained chert ?prot medium yellow	clay to vf sand	mod'ly strong	
EOH at 36.0 m					? prot hole terminated too much fallback			

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR110

LOCALITY: EL7260

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : APO

JOB NO : MAY

DATE DRILLED: 27-JUL-94

TOTAL DEPTH : 54.0

GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 534669 NORTHING: 8328174 R.L.: 15.0 AZIM.: INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR110

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite ferruginous sandy	med dark red orange	vf silt to c sand	mod'ly strong	
2.0	4.0		CEN	Clay sandy Lat mottled zone sandy pisolitic	mottled red white	clay to vs pebble	strong	
4.0	6.0		CEN	Clay sandy Lat mottled zone sandy pisolitic	mottled yellow white minor mn dissem in lateritic clay	clay to vs pebble	mod'ly strong	trace <0.6%
6.0	8.0		CRE	Silt sandy silicified	light white red	clay to c sand	stiff	
8.0	10.0		CRE	Clay sandy silicified Lat mottled zone	light white red	clay to f sand	mod'ly strong	
10.0	12.0		CRE	Clay silty Lat mottled zone	mottled pink white	clay to f sand	stiff	
12.0	14.0		CRE	Clay sandy Lat mottled zone	mottled pink white	clay to med sand	hard	
14.0	16.0		CRE	Sand clayey	m light pink	clay to med sand	soft	
16.0	18.0		CRE	Sand clayey Clay sandy	medium yellow brown	clay to med sand	stiff	
18.0	20.0		CRE	Sand clayey Silt sandy	intercalated yellow brn cy sand and wht sa clay med dark yellow brown water injection	clay to med sand	firm	
20.0	22.0		CRE	Silt clayey	medium brown tan	clay to vf sand	firm	
22.0	24.0		CRE	Clay silty	medium yellow tan	clay to f sand	stiff	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Clay sandy	medium yellow tan	clay to f sand	stiff	
26.0	28.0		CRE	Clay sandy	■ light yellow grey	clay to f sand	stiff	
28.0	30.0		CRE	Clay silty	light yellow grey	clay to vf sand	stiff	
30.0	32.0		CRE	Clay silty	light yellow grey	clay to vf sand	stiff	trace <0.5%
32.0	34.0		CRE	Clay sandy Sand clayey	minor ? veinlet medium yellow tan	mn (3mm) thick clay to med sand	stiff	
34.0	36.0		CRE	Sand clayey Oolite cherty	medium yellow	clay to med pebble	firm	
36.0	38.0		CRE	Clay sandy	contains algal and oolitic chert medium yellow	clay to f sand	stiff	trace <0.5%
38.0	40.0		CRE	Clay silty	minor dissem mn light grey white	clay to vf sand	stiff	trace <0.5%
40.0	42.0		CRE	Clay silty	minor dissem mn light pink white	clay to vf sand	stiff	trace <0.5%
42.0	44.0		CRE	Silt clayey ferruginous	medium pink red	clay to c silt	stiff	
44.0	46.0		CRE	Silt clayey	mottled pink white	clay to c silt	stiff	
46.0	48.0		CRE	Silt clayey	pale grey white	clay to c silt	stiff	
48.0	50.0		CRE	Silt clayey	light grey khaki	clay to c silt	stiff	trace <0.5%
50.0	52.0		PRO	Siltstone Sandstone	minor dissem mn light grey khaki	clay to f sand	stiff	
52.0	54.0		PRO	Sandstone	basement contact medium yellow	c silt to med sand	strong	

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR111

LOCALITY: EL7260

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : APO

JOB NO : MAY

DATE DRILLED: 28-JUL-94

TOTAL DEPTH : 62.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 533939

NORTHING: 8328996

R.L.: 15.0

AZIM.:

INCL.:

COMMENTS:

SHEET 1 OF 3 HOLE NUMBER : TRR111

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Lat cap, hard ferruginous sandy	med dark red orange	vf silt to med sand	mod'ly strong	
2.0	3.0		CEN	Lat cap, hard ferruginous sandy	med dark red orange	vf silt to med sand	mod'ly strong	
3.0	4.0		CRE	Clay sandy	light grey white	clay to granule	stiff	
4.0	6.0		CRE	Clay sandy	light yellow white	clay to med sand	stiff	
6.0	8.0		CRE	Sand	light yellow white	f silt to med sand	firm	
8.0	10.0		CRE	Sand	light yellow white	f silt to c sand	firm	
10.0	12.0		CRE	Silt sandy Sand silty	pale white grey	f silt to med sand	firm	
12.0	14.0		CRE	Sand clayey Sand	contains 4cm bands of indurated sand light yellow white	clay to c sand	firm	
14.0	16.0		CRE	Clay sandy	m light yellow tan	clay to med sand	stiff	
16.0	18.0		CRE	Clay sandy	water injection m light yellow tan	clay to f sand	stiff	trace <0.5%
18.0	20.0		CRE	Conglomerate sandy clayey	tr dissem mn in clay m light yellow tan	clay to 1 pebble	hard	
20.0	22.0		CRE	Sand clayey	contains pebbles of prot sandstone medium yellow	clay to granule	stiff	

DEPTHS From To (m) (m)		SAMPLE NUMBER	GEOLOGICAL TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
22.0	24.0		CRE	Siltstone	med dark yellow	vf silt to f sand	hard	
24.0	26.0		CRE	Chert clayey Siltstone	some poss algal m light yellow	laminated chert vf silt to med sand	hard	
26.0	28.0		CRE	Oolite silicified algal Clay sandy Siltstone	brown some algal laminated chert medium yellow brown	clay to med sand	stiff	
28.0	30.0		CRE	Clay sandy Oolite silicified	medium yellow khaki	clay to med pebble	hard	
30.0	32.0		CRE	Clay sandy Oolite silicified	light yellow grey	clay to med pebble	hard	
32.0	34.0		CRE	Clay sandy Oolite silicified	medium yellow grey	clay to med pebble	hard	
34.0	36.0	DZ 467	CRE	Sandstone	medium yellow grey	clay to med pebble	hard	trace <0.5%
36.0	36.5	DZ 468	CRE	Oolite silicified algal Oolite silicified clayey	some mn colour medium yellow grey	to the water clay to med pebble	hard	trace <0.5%
36.5	37.0		CRE	Clay ferruginous	medium yellow grey	clay to f sand	stiff	
37.0	37.5	DZ 469	CRE	Clay ferruginous Siltstone silicified	med dark yellow khaki	clay to f sand	stiff	
37.5	38.0	DZ 470	CRE	Clay ferruginous	med dark orange red	clay to vf sand	stiff	0.5 - 5%
38.0	40.0		CRE	Oolite silicified clayey Sandstone silicified	some patchy mn medium orange yellow	clay to f sand	hard	trace <0.5%
40.0	42.0		CRE	Chert algal clayey Sandstone silicified	medium yellow khaki	clay to med sand	hard	
42.0	44.0		CRE	Chert algal clayey Sandstone silicified	large water flows medium yellow khaki	clay to med sand	hard	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
44.0	46.0		CRE	Chert algal clayey Sandstone silicified	medium yellow khaki	clay to med sand	hard	
46.0	48.0		CRE	Sandstone clayey	medium yellow khaki	clay to med sand	hard	
48.0	50.0		CRE	Sandstone clayey Oolite silicified	large water flows med dark yellow	clay to med sand	hard	
50.0	52.0		OTH	Sandstone clayey Chert algal	med dark yellow	clay to med sand	hard	
52.0	54.0		OTH	Sandstone clayey	pro ? med dark yellow	clay to f sand	weak	
54.0	56.0		OTH	Sandstone clayey	large water flow med dark yellow	clay to f sand	weak	
56.0	58.0		OTH	Sandstone clayey Siltstone	med dark yellow	clay to f sand	weak	
58.0	60.0		OTH	Sandstone clayey Siltstone	med dark yellow	clay to f sand	weak	
60.0	62.0		OTH	Sandstone clayey Siltstone	med dark yellow	clay to f sand	weak	

EOH at 62.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR112

LOCALITY: EL7260

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : APO

JOB NO : MAY

DATE DRILLED: 28-JUL-94

TOTAL DEPTH : 46.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 534646

NORTHING: 8329801

R.L.: 15.0

AZIM.: 15.0

INCL.: 15.0

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR112

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Lat cap, soft sandy pisolitic	m light brown grey	med silt to s pebble	soft	
2.0	4.0		CEN	Clay sandy Lat mottled zone	light white brown weak hematite mottling	clay to med sand	stiff	
4.0	6.0		CEN	Clay silty Lat mottled zone	medium yellow brown weak hematite mottling	clay to med sand	stiff	
6.0	8.0		CEN	Silt ferruginous Siltstone	mottled red white more intense hematite mottling	clay to vf sand	weak	
8.0	10.0		CRE	Silt ferruginous Siltstone	mottled red white more intense hematite mottling	clay to vf sand	weak	
10.0	12.0		CRE	Silt ferruginous Siltstone	mottled red white more intense hematite mottling	clay to vf sand	weak	
12.0	14.0		CRE	Clay silty	medium orange pink water injection	clay to c silt	hard	
14.0	16.0		CRE	Clay silty	m light pink	clay to c silt	hard	
16.0	18.0		CRE	Clay silty	medium yellow khaki	clay to c silt	hard	
18.0	20.0		CRE	Clay silty	m light orange red	clay to vf sand	stiff	
20.0	22.0		CRE	Clay silty	m light orange red	clay to vf sand	stiff	
22.0	24.0		CRE	Clay silty	m light yellow khaki dissem mn in clay	clay to vf sand	stiff	trace <0.5%

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	24.5		CRE	Sand clayey	m light pink orange dissem mn in clay	clay to f sand	stiff	trace <0.5%
24.5	25.0		CRE	Clay sandy	m light yellow khaki dissem mn in clay	clay to f sand	stiff	trace <0.5%
25.0	25.5		CRE	Clay sandy	m light yellow khaki dissem mn in clay	clay to f sand	stiff	trace <0.5%
25.5	26.0	DZ 471	CRE	Clay sandy	light yellow grey dissem mn in clay	clay to f sand	stiff	0.5 - 5%
26.0	26.5		CRE	Clay sandy	light white grey dissem mn in clay	clay to f sand	stiff	trace <0.5%
26.5	28.0		CRE	Chert algal clayey Sandstone	light white yellow	clay to s pebble	hard	
28.0	30.0		CRE	Oolite algal clayey Sandstone	light white yellow	clay to s pebble	hard	
30.0	32.0		CRE	Oolite algal clayey Sandstone	light white yellow	clay to med sand	hard	
32.0	34.0		CRE	Oolite algal clayey Sandstone	light white yellow	clay to med sand	hard	
34.0	36.0		CRE	Oolite algal clayey Sandstone	m light grey khaki small sample ?cavity	clay to med sand	hard	
36.0	38.0		CRE	Sandstone	medium yellow tan	f silt to f sand	weak	
38.0	40.0		CRE	Oolite algal clayey Sandstone	m light brown yellow	clay to med sand	weak	
40.0	42.0		CRE	Sandstone Chert oolitic clayey	m light brown yellow	clay to med sand	weak	
42.0	44.0		PRO	Sandstone Chert	m light brown yellow	clay to med sand	weak	
44.0	46.0		PRO	Sandstone Chert	m light brown yellow	clay to med sand	weak	

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR113

LOCALITY: EL7260

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : APO

JOB NO : MAY

DATE DRILLED: 28-JUL-94

TOTAL DEPTH : 60.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 536209

NORTHING: 8329829

R.L.: 15.0

AZIM.: 15.0

INCL.: 15.0

COMMENTS:

SHEET 1 OF 3 HOLE NUMBER : TRR113

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Lat cap, hard sandy clayey	medium brown	f silt to c sand	weak	
2.0	4.0		CEN	Clay sandy	light white khaki	clay to f sand	stiff	
4.0	6.0		CEN	Silt clayey	light white khaki	clay to c silt	stiff	
6.0	8.0		CEN	Silt clayey sandy	light pink	clay to f sand	stiff	
8.0	10.0		CEN	Silt clayey sandy	medium pink brown	clay to f sand	stiff	
10.0	12.0		CEN	Silt clayey sandy Siltstone	medium pink brown	clay to f sand	stiff	
12.0	14.0		CRE	Sand clayey	light grey white	clay to vc sand	stiff	
14.0	16.0		CRE	Sand clayey	medium yellow	clay to granule	firm	
16.0	18.0		CRE	Sand gravelly	mottled yellow grey pebble bands	clay to 1 pebble	firm	
18.0	20.0		CRE	Sand gravelly	light grey white water injection	clay to 1 pebble	firm	
20.0	22.0		CRE	Sand gravelly clayey	medium grey yellow	clay to s pebble	firm	
22.0	24.0		CRE	Sand gravelly clayey Siltstone	m light yellow grey	clay to s pebble	firm	

DEPTHS From To (m) (m)		SAMPLE NUMBER	GEOLOGICAL TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
24.0	26.0		CRE	Sand unconsol	mottled yellow white	med silt to med sand	loose	
26.0	28.0		CRE	Sand unconsol	2m thick fining upwards cycles ? light grey white	beach sand med silt to med sand	loose	
28.0	30.0		CRE	Sand unconsol gravelly	light grey white	c silt to vs pebble	loose	
30.0	32.0		CRE	Sand unconsol	light yellow	f sand to vs pebble	loose	
32.0	34.0		CRE	Sand unconsol	heavy water flows mottled yellow white	f sand to med pebble	loose	
34.0	36.0		CRE	Sand unconsol	heavy water flows mottled yellow white	f sand to med pebble	loose	
36.0	38.0		CRE	Sand unconsol	heavy water flows m light yellow	f sand to s pebble	loose	
38.0	40.0		CRE	Sand unconsol	heavy water flows m light yellow	med sand to s cobble	loose	
40.0	42.0		CRE	Sand unconsol	heavy water flows, 20% pebbles m light yellow	med sand to s cobble	loose	
42.0	44.0		CRE	Sand unconsol	heavy water flows, very well rounded; pebbles oolt and cher m light yellow	med sand to s cobble	loose	
44.0	46.0		CRE	Sand clayey	heavy water flows, very well rounded; pebbles oolt and cher m light yellow	clay to med pebble	soft	
46.0	48.0		CRE	Sand clayey	heavy water flows m light yellow	clay to med pebble	firm	
48.0	50.0		CRE	Sand clayey	heavy water flows m light yellow	clay to med pebble	firm	
50.0	52.0		CRE	Sand clayey Siltstone algal	heavy water flows, pebbles predom prot snst light white grey heavy water flows, some algal lam chert in sist	clay to med pebble	firm	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From	To							
(m)	(m)							
52.0	54.0		CRE	Sand clayey Siltstone algal	light white grey heavy water flows, some algal lam chert in sist	clay to vs pebble	stiff	
54.0	56.0		CRE	Siltstone Chert algal	white heavy water flows, some algal lam chert in sist m light	f silt to c silt clay	weak	
56.0	58.0		CRE	Siltstone Chert algal clayey	yellow white heavy water flows, some algal lam chert in sist m light	to c silt	weak	
58.0	60.0		CRE	Siltstone Chert algal clayey	yellow white heavy water flows, some algal lam chert in sist m light	to c silt clay	weak	
EOH at 60.0 m								

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR114

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : APO

JOB NO : MBK

DATE DRILLED: 28-JUL-94

TOTAL DEPTH : 48.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 534381

NORTHING: 8333197

R.L.: 15.0

AZIN.:

INCL.:

COMMENTS: pvc casing to 40m

SHEET 1 OF 3 HOLE NUMBER : TRR114

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Sand	medium yellow blue	f silt to vs pebble	hard	
				Laterite pisolitic				
2.0	4.0		CEN	Silt sandy	mottled brown white	f silt to c sand	stiff	
4.0	6.0		CRE	Siltstone silicified	pale white	clay to c silt	weak	
6.0	8.0		CRE	Siltstone silicified	pale white	clay to c silt	weak	
8.0	10.0		CRE	Siltstone silicified	light white yellow tr dissem mn	clay to c silt	weak	trace <0.5%
10.0	12.0		CRE	Siltstone silicified	mottled white yellow tr dissem mn	clay to c silt	weak	trace <0.5%
12.0	14.0		CRE	Siltstone silicified	mottled white brown	clay to c silt	weak	
14.0	16.0		CRE	Siltstone silicified	medium brown white	clay to c silt	weak	
16.0	18.0		CRE	Clay silty	medium yellow tan water injection	clay to vf sand	stiff	
18.0	20.0		CRE	Silt clayey sandy	light grey white	clay to f sand	stiff	
20.0	22.0		CRE	Silt clayey gravelly Siltstone silty	m light yellow tan pebble bands in silt	clay to med pebble	hard	
22.0	24.0		CRE	Silt clayey gravelly Chert algal	m light yellow tan some hematite alt	clay to s pebble	hard	

DEPTHS From To (m) (m)		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
24.0	24.5	DZ 472	CRE	Siltstone silicified Chert algal clayey	v dark black	clay to f sand	weak	5 - 20%
24.5	25.0	DZ 473	CRE	Siltstone silicified Chert algal clayey	water black dark grey black	clay to f sand	weak	20 - 30%
25.0	25.5	DZ 474	CRE	Siltstone silicified Chert algal clayey	water black med dark khaki green	clay to f sand	weak	5 - 20%
25.5	26.0	DZ 475	CRE	Siltstone silicified Chert algal clayey	med dark yellow tan	clay to f sand	weak	trace <0.5%
26.0	26.5	DZ 476	CRE	Siltstone silicified Chert algal clayey	med dark khaki brown	clay to s pebble	weak	trace <0.5%
26.5	27.0		CRE	Chert algal clayey Conglomerate	med dark khaki brown	clay to l pebble	weak	
27.0	27.5		OTH	Siltstone silicified Chert algal clayey	algal chert with pebble bands med dark yellow tan	clay to f sand	weak	
27.5	28.0		OTH	Siltstone silicified Chert algal clayey	? cret med dark yellow tan	clay to f sand	weak	
28.0	30.0		OTH	Siltstone silicified Chert algal clayey	? cret high water flow med dark yellow tan	clay to f sand	weak	
30.0	32.0		OTH	Siltstone silicified Chert algal clayey	? cret med dark yellow tan	clay to f sand	weak	
32.0	34.0		OTH	Siltstone silicified Oolite silicified	? cret med dark khaki tan	clay to f sand	weak	
34.0	36.0		OTH	Siltstone silicified Oolite silicified	? cret med dark khaki tan	clay to f sand	weak	
36.0	38.0		OTH	Siltstone silicified Chert algal	? cret m light khaki tan	clay to f sand	weak	
38.0	40.0		OTH	Siltstone silicified Chert algal	? cret m light khaki tan ? cret	clay to f sand	weak	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
40.0	42.0		OTH	Siltstone silicified Chert algal	m light khaki tan ? cret	clay to f sand	weak	
42.0	44.0		PRO	Siltstone silicified	m light khaki tan	f silt to f sand	mod'ly strong	
44.0	46.0		PRO	Siltstone silicified	med dark khaki tan	f silt to f sand	mod'ly strong	
46.0	48.0		PRO	Siltstone silicified	med dark khaki tan	f silt to f sand	mod'ly strong	

EOH at 48.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR115

LOCALITY: EL7260

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : APO

JOB NO : MAY

DATE DRILLED: 29-JUL-94

TOTAL DEPTH : 36.0

GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 537104 NORTHING: 8328955 R.L.: 15.0 AZIM.: INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR115

DEPTHS From To (m) (m)	SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
0.0 2.0		CEN	Lat cap, hard ferruginous pisolitic	m light pink red	f silt to s pebble	weak	
2.0 4.0		CEN	Lat mottled zone ferruginous pisolitic	medium brown yellow	f silt to s pebble	stiff	
4.0 6.0		CEN	Lat mottled zone ferruginous	medium orange red	f silt to med sand	stiff	
6.0 8.0		CRE	Clay ferruginous silty	mottled red white	clay to vf sand	stiff	
8.0 10.0		CRE	Clay ferruginous silty	medium yellow khaki	clay to f sand	stiff	
10.0 12.0		CRE	Clay ferruginous silty	medium yellow khaki	clay to f sand	stiff	
12.0 14.0		CRE	Clay ferruginous silty	mottled white tan	clay to f sand	stiff	
14.0 16.0		CRE	Clay ferruginous silty	medium yellow purple	clay to f sand	stiff	
16.0 18.0		CRE	Clay ferruginous silty	med dark yellow tan	clay to f sand	stiff	
18.0 20.0		CRE	Clay ferruginous silty	med dark yellow tan	clay to f sand	stiff	
20.0 22.0		CRE	Clay ferruginous silty	med dark yellow tan	clay to f sand	stiff	
22.0 24.0		CRE	Sand unconsol conglomeratic	water injection - water table med dark yellow brown	f sand to l pebble	hard	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Sand ferruginous conglomeratic	med dark yellow brown	f sand to 1 pebble	hard	
26.0	28.0		CRE	Siltstone	med dark yellow brown	clay to f sand	weak	
28.0	30.0		CRE	Chert algal Siltstone clayey ferruginous	med dark yellow brown	f silt to f sand	weak	
30.0	32.0		CRE	Siltstone	med dark yellow brown	clay to f sand	weak	
32.0	34.0		OTH	Chert algal clayey Siltstone ferruginous Chert	med dark yellow brown ?pro	clay to f sand	weak	
34.0	36.0		OTH	Oolite silicified	med dark yellow brown ?pro	clay to f sand	weak	

EOH at 36.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR116

LOCALITY: EL7260

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : APO

JOB NO : MAY

DATE DRILLED: 29-JUL-94

TOTAL DEPTH : 42.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 537929

NORTHING: 8329861

R.L.: 15.0

AZIM.: 15.0

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR116

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Lat cap, hard ferruginous pisolitic	medium orange red	f silt to s pebble	hard	
2.0	4.0		CEN	Lat cap, hard ferruginous pisolitic Clay sandy	mottled red brown	clay to s pebble	stiff	
4.0	6.0		CRE	Silt silicified clayey	light yellow white	clay to f sand	stiff	
6.0	8.0		CRE	Clay silty clayey	light yellow white	clay to f sand	stiff	
8.0	10.0		CRE	Clay silty clayey Siltstone silicified	m light red white	clay to f sand	weak	
10.0	12.0		CRE	Clay silty	mottled red white	clay to vf sand	stiff	
12.0	14.0		CRE	Clay silty	medium yellow brown	clay to vf sand	stiff	
14.0	16.0		CRE	Clay silty	medium yellow brown	clay to vf sand	stiff	
16.0	18.0		CRE	Clay sandy	mottled red white water injection	clay to med sand	stiff	
18.0	20.0		CRE	Sand clayey	medium orange red	clay to c sand	stiff	
20.0	22.0		CRE	Silt	m light yellow pink	f silt to vf sand	stiff	
22.0	24.0		CRE	Sand gravelly clayey	medium yellow tan	clay to l pebble	hard	

DEPTHS		SAMPLE NUMBER	GEOLOGICAL TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Sand unconsol gravelly	medium yellow tan	vf sand to 1 pebble	hard	
26.0	28.0		CRE	Sand unconsol gravelly	medium yellow tan	vf sand to 1 pebble	hard	
28.0	30.0		CRE	Sand unconsol gravelly Conglomerate	medium yellow tan	vf sand to 1 pebble	hard	
30.0	32.0		OTH	Chert algal Siltstone dolomitic	medium brown yellow ?prot	clay to med sand	mod'ly strong	
32.0	34.0		OTH	Siltstone ferruginous dolomitic Clay	med dark brown	clay to f sand	mod'ly strong	
34.0	36.0		OTH	Chert algal Siltstone dolomitic	?prot medium yellow tan	clay to f sand	mod'ly strong	
36.0	38.0		OTH	Chert algal Siltstone dolomitic	?prot medium yellow tan	clay to f sand	mod'ly strong	
38.0	40.0		OTH	Chert algal Siltstone dolomitic	?prot light yellow white	clay to f sand	mod'ly strong	
40.0	42.0		OTH	Siltstone dolomitic Chert	?prot medium yellow white	clay to f sand	mod'ly strong	
					?prot			

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR117

LOCALITY: EL7260

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 050

LOGGED BY : APO

JOB NO : MAY

DATE DRILLED: 29-JUL-94

TOTAL DEPTH : 36.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 538926

NORTHING: 8329151

R.L.: 15.0

AZIM.:

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR117

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Lat cap, hard pisolitic sandy	med dark red brown	clay to s pebble	hard	
2.0	4.0		CEN	Lat cap, hard pisolitic sandy	medium brown yellow	clay to s pebble	hard	
4.0	6.0		CRE	Clay sandy	light grey yellow	clay to c sand	stiff	trace <0.5%
6.0	8.0		CRE	Clay sandy	tr dissem mn in clay medium yellow	clay to c sand	stiff	
8.0	10.0		CRE	Sand clayey Clay sandy	pale white grey	clay to c sand	stiff	
10.0	12.0		CRE	Clay sandy Siltstone	interbedded sandy clay and clayey sand, water injection light pink yellow	clay to med sand	stiff	
12.0	14.0		CRE	Clay silty Siltstone silicified	m light grey yellow	clay to f sand	stiff	
14.0	16.0		CRE	Clay sandy	m light yellow brown	clay to med sand	stiff	
16.0	18.0		CRE	Clay sandy	medium yellow brown	clay to f sand	stiff	
18.0	20.0		CRE	Clay sandy	med dark yellow brown	clay to granule	stiff	
20.0	22.0		CRE	Clay sandy	med dark yellow brown	clay to granule	stiff	
22.0	24.0		CRE	Sand clayey	medium yellow brown	clay to granule	stiff	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Sand clayey	medium yellow brown	clay to granule	stiff	
26.0	28.0		CRE	Sand clayey gravelly	m light yellow grey	clay to 1 pebble	hard	
28.0	30.0		CRE	Sand clayey gravelly	pebbles well rounded pro snst m light yellow grey	clay to 1 pebble	hard	
30.0	32.0		OTH	Chert algal Siltstone dolomitic	pebbles well rounded pro snst, less m light yellow grey	clay to f sand	weak	
32.0	34.0		PRO	Dolomite massive	?pro m light yellow grey	vf silt to c silt	strong	
34.0	36.0		PRO	Dolomite massive	m light yellow grey	vf silt to c silt	strong	

EOH at 36.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR118

LOCALITY: EL7260

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : APO

JOB NO : MAY

DATE DRILLED: 30-JUL-94

TOTAL DEPTH : 42.0

GRID: ANG

ZONE: 53

RELIABILITY: SATL

EASTING: 539702

NORTHING: 8328430

R.L.: 15.0

AZIM.: 15.0

INCL.: 15.0

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR118

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite pisolitic ferruginous	medium orange red	f silt to s pebble	weak	
2.0	4.0		CEN	Laterite pisolitic ferruginous Clay sandy	medium orange yellow	clay to s pebble	stiff	
4.0	6.0		CRE	Clay silty	light yellow white	clay to c silt	stiff	
6.0	8.0		CRE	Clay sandy	m light yellow white	clay to f sand	stiff	
8.0	10.0		CRE	Clay silty	m light yellow white	clay to vf sand	stiff	
10.0	12.0		CRE	Clay silty	m light yellow white	clay to vf sand	stiff	
12.0	14.0		CRE	Clay sandy	m light yellow white water injection	clay to med sand	stiff	
14.0	16.0		CRE	Sand clayey	medium yellow	clay to med sand	stiff	
16.0	18.0		CRE	Clay sandy	medium yellow	clay to med sand	stiff	
18.0	20.0		CRE	Sand unconsol	pale white grey	c silt to c sand	firm	
20.0	22.0		CRE	Sand unconsol	pale white grey	c silt to c sand	firm	
22.0	24.0		CRE	Sand unconsol	pale white grey	c silt to s pebble	firm	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Sand clayey gravelly	pale white grey	clay to 1 pebble	stiff	
26.0	28.0		CRE	Sand unconsol	pale white grey	c silt to s pebble	firm	
28.0	30.0		CRE	Sand unconsol	m light white yellow high ground water flows	med sand to s pebble	firm	
30.0	32.0		CRE	Sand unconsol Chert algal clayey	medium yellow grey	clay to s pebble	hard	
32.0	34.0		CRE	Chert algal clayey Siltstone silty	medium yellow grey some mn staining in the chert	clay to f sand	mod'ly strong	trace <0.5%
34.0	36.0		OTH	Chert algal clayey Sandstone silicified	medium yellow grey some mn staining in the chert ?pro	clay to f sand	mod'ly strong	trace <0.5%
36.0	38.0		PRO	Siltstone dolomitic clayey Sandstone silicified	medium yellow grey	clay to f sand	mod'ly strong	
38.0	40.0		PRO	Sandstone silicified Chert massive	dark brown khaki mn occurs as veining in snst and as stain in chert	clay to f sand	mod'ly strong	0.5 - 5%
40.0	42.0		PRO	Sandstone silicified Chert massive clayey	dark brown khaki mn occurs as veining in snst and as stain in chert	clay to f sand	mod'ly strong	0.5 - 5%
EOH at 42.0 m								

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR119

LOCALITY: EL7260

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : APO

JOB NO : MAY

DATE DRILLED: 30-JUL-94

TOTAL DEPTH : 48.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 540304

NORTHING: 8327461

R.L.: 15.0

AZIM.: 15.0

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR119

DEPTHS From (m)	To (m)	SAMPLE NUMBER	GEOLOGICAL TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
0.0	2.0		CEN	Sand clayey lat cap, soft ferruginous pisolitic	med dark brown grey	clay to s pebble	stiff	
2.0	4.0		CEN	Sand clayey	light white yellow dissem mn in clay	clay to med sand	stiff	trace <0.5%
4.0	6.0		CRE	Sand clayey	m light grey yellow	clay to med sand	stiff	
6.0	8.0		CRE	Clay sandy	m light yellow grey	clay to med sand	stiff	0.5 - 5%
8.0	10.0		CRE	Sand clayey	15cm soft mn in clay m light yellow white	clay to med sand	stiff	
10.0	12.0		CRE	Sand clayey	m light yellow white tr dissem mn, water injection	clay to med sand	stiff	trace <0.5%
12.0	14.0		CRE	Sand clayey	m light white yellow	clay to c sand	stiff	
14.0	16.0		CRE	Sand clayey	m light white yellow	clay to c sand	stiff	
16.0	18.0		CRE	Sand clayey unconsol	less clay than above, high water flows m light yellow	clay to c sand	stiff	
18.0	20.0		CRE	Silt	high water flows, hammer blocking m light green	vf silt to c silt	hard	
20.0	22.0		CRE	Siltstone	m light green	vf silt to c silt	hard	
22.0	24.0		CRE	Clay Silt	mottled green pink	clay to c silt	hard	

DEPTHS From (m)	To (m)	SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
24.0	26.0		CRE	Clay Siltstone	mottled green pink	clay to c silt	hard	
26.0	28.0		CRE	Clay silty Siltstone	medium yellow white	clay to c silt	hard	
28.0	30.0		CRE	Chert algal Clay	med dark yellow	clay to f sand	weak	
30.0	32.0		CRE	Chert algal clayey Siltstone	m light green	clay to f sand	weak	
32.0	34.0		CRE	Clay Siltstone	mottled red yellow	clay to c silt	stiff	
34.0	36.0		OTH	Oolite silicified Siltstone silty	med dark brown tan ?cre	f silt to med sand	weak	
36.0	38.0		OTH	Oolite silicified Chert algal clayey	med dark red orange ?cre	clay to med sand	weak	
38.0	40.0		OTH	Clay Oolite silicified	medium yellow brown ?cre	clay to med sand	weak	
40.0	42.0		OTH	Clay Oolite silicified	med dark red orange ?cre	clay to med sand	weak	
42.0	44.0		OTH	Oolite silicified Siltstone	medium yellow brown ?cre	clay to med sand	weak	
44.0	46.0		OTH	Oolite silicified Chert algal clayey	medium yellow brown ?cre	clay to med sand	weak	
46.0	48.0		OTH	Clay Oolite silicified	m light khaki yellow ?cre	clay to med sand	stiff	

EOH at 48.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR120

LOCALITY: EL7260

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : APO

JOB NO : MAY

DATE DRILLED: 30-JUL-94

TOTAL DEPTH : 46.0

GRID: ANG

ZONE: 53

RELIABILITY: SATL

EASTING: 537282

NORTHING: 8328214

R.L.: 15.0

AZIM.: 15.0

INCL.:

COMMENTS:

SHEET 1 OF 3 HOLE NUMBER : TRR120

DEPTHS From (m)	To (m)	SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
0.0	2.0		CEN	Lat cap, hard ferruginous sandy	medium red orange	f silt to med sand	hard	
2.0	4.0		CEN	Lat cap, hard ferruginous sandy	medium orange yellow	f silt to med sand	hard	
4.0	6.0		CEN	Clay sandy Lat cap, hard ferruginous	light grey brown	clay to f sand	stiff	
6.0	8.0		CRE	Sandstone	light grey brown	med silt to f sand	weak	
8.0	10.0		CRE	Sandstone	light grey brown	med silt to f sand	weak	
10.0	12.0		CRE	Sand clayey Sandstone	medium yellow brown	clay to med sand	hard	
12.0	14.0		CRE	Clay sandy Sandstone ferruginous	medium khaki tan	clay to med sand	hard	
14.0	16.0		CRE	Clay sandy gravelly	medium yellow brown	clay to 1 pebble	stiff	
16.0	18.0		CRE	Sand clayey	contains pebble bands medium yellow brown	clay to granule	firm	
18.0	20.0		CRE	Sand unconsol	medium yellow	f sand to granule	soft	
20.0	22.0		CRE	Sand unconsol gravelly	contains some ferruginous cemented bands medium yellow	f sand to 1 pebble	soft	
22.0	24.0		CRE	Sand unconsol gravelly	well rounded prot snst pebbles medium yellow	f sand to 1 pebble	soft	
					well rounded prot snst pebbles			

DEPTHS From To (m) (m)		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
24.0	26.0		CRE	Sand unconsol	medium yellow	f sand to granule	soft	
26.0	28.0		CRE	Sand unconsol Sandstone	medium yellow white	f sand to granule	hard	
28.0	30.0		OTH	Sandstone	some ?algal chert medium khaki yellow	med silt to f sand	weak	
30.0	32.0		CRE	Conglomerate sandy Oolite	medium yellow tan	clay to 1 pebble	hard	
32.0	34.0		OTH	silicified Sandstone	some algal chert medium yellow	clay to f sand	weak	
34.0	36.0		OTH	Chert algal Sandstone silicified	tan ?pro medium yellow tan	c silt to f sand	weak	0.5 - 5%
36.0	36.5	DZ 478	OTH	Sandstone silicified Chert	?pro, mn occurs as veining within sandstone med dark khaki yellow	clay to f sand	weak	0.5 - 5%
36.5	37.0	DZ 479	OTH	algal Oolite silicified Chert	?pro, mn occurs within chert med dark khaki yellow	clay to f sand	weak	0.5 - 5%
37.0	37.5	DZ 480	OTH	algal clayey Sandstone silicified	?pro, mn occurs within chert, and veinlets med dark khaki yellow	c silt to f sand	weak	5 - 20%
37.5	38.0	DZ 481	OTH	Sandstone silicified Chert	?pro, mn occurs as veining/ replacement within sandstone med dark khaki yellow	clay to f sand	weak	5 - 20%
38.0	38.5	DZ 482	OTH	algal clayey Sandstone silicified	?pro, mn occurs as veining/ replacement within sandstone med dark khaki yellow	c silt to f sand	weak	trace <0.5%
38.5	39.0		OTH	Sandstone silicified	?pro, mn occurs as veining/ replacement within sandstone med dark khaki yellow	c silt to f sand	weak	trace <0.5%
39.0	39.5		PRO	Sandstone silicified	?pro, mn occurs as veining/ replacement within sandstone m light khaki grey	c silt to f sand	weak	
39.5	40.0	DZ 483	PRO	Sandstone silicified	m light khaki grey mn occurs as veining in snst	c silt to f sand	weak	0.5 - 5%

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
40.0	40.5	DZ 484	PRO	Sandstone silicified	dark khaki brown	c silt to f sand	weak	trace <0.5%
40.5	41.0	DZ 485	PRO	Sandstone silicified Chert massive	mn occurs as veining in snst dark khaki brown	clay to f sand	weak	
41.0	41.5	DZ 486	PRO	Oolite silicified Sandstone silicified	medium yellow khaki	clay to f sand	weak	0.5 - 5%
41.5	42.0		PRO	Sandstone silicified	mn occurs as replacement within snst medium yellow khaki	clay to f sand	weak	
42.0	44.0		PRO	Siltstone dolomitic	med dark grey	f silt to f sand	mod'ly strong	
44.0	46.0		PRO	Dolomite	dark grey	clay to c silt	strong	

EOH at 46.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR121

LOCALITY: EL7260

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : APO

JOB NO : MAY

DATE DRILLED: 31-JUL-94

TOTAL DEPTH : 48.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 529899

NORTHING: 8325767

R.L.: 15.0

AZIM.: 15.0

INCL.:

COMMENTS:

SHEET 1 OF 3 HOLE NUMBER : TRR121

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Sand silty	m light grey yellow	med silt to med sand	friable	
2.0	4.0		CEN	Lat mottled zone sandy Sand clayey	light pink white	clay to med sand	firm	
4.0	6.0		CEN	Lat cap, hard Sand clayey	med dark orange brown	clay to med sand	weak	
6.0	8.0		CEN	Clay sandy Lat mottled zone	light orange brown	clay to med sand	weak	
8.0	10.0		CEN	Clay sandy Lat mottled zone	mottled red white	clay to f sand	hard	
10.0	12.0		CEN	Clay sandy	m light yellow white	clay to f sand	hard	
12.0	14.0		CRE	Sand clayey	medium yellow brown water injection	clay to c sand	stiff	
14.0	16.0		CRE	Sand clayey	medium yellow brown	clay to c sand	stiff	
16.0	18.0		CRE	Sand clayey	light yellow brown	clay to vc sand	stiff	
18.0	20.0		CRE	Sand clayey	light pink	clay to vs pebble	stiff	
20.0	22.0		CRE	Clay sandy Siltstone silicified	pale pink white	clay to f sand	stiff	
22.0	24.0		CRE	Clay sandy Siltstone algal silicified	medium yellow white	clay to f sand	stiff	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Clay sandy Siltstone silicified	medium yellow	clay to f sand	stiff	
26.0	28.0		CRE	Clay sandy Siltstone silicified chalcedonic	med dark yellow	clay to f sand	stiff	
28.0	30.0		CRE	Clay sandy Siltstone silicified chalcedonic	med dark yellow	clay to f sand	stiff	
30.0	32.0		CRE	Clay sandy Siltstone silicified chalcedonic	med dark yellow	clay to f sand	stiff	
32.0	34.0		PRO	Siltstone sandy Chert massive	med dark yellow	f silt to f sand	weak	
34.0	36.0		PRO	Siltstone sandy algal Chert massive	light grey white	clay to f sand	strong	
36.0	38.0		PRO	Siltstone sandy algal Chert algal	m light yellow	clay to f sand	strong	
38.0	39.5		PRO	Siltstone sandy	dark brown	f silt to f sand	strong	trace (0.5%
39.5	40.0	DZ 487	PRO	Sandstone	medium yellow khaki	f silt to f sand	strong	5 - 20%
40.0	40.5	DZ 488	PRO	Siltstone Sandstone	mn occurs as veining and replacement in snst/sist dark brown khaki	f silt to f sand	strong	0.5 - 5%
40.5	41.0	DZ 489	PRO	Siltstone Sandstone	mn occurs as veining and replacement in snst/sist med dark brown yellow	f silt to f sand	strong	0.5 - 5%
41.0	41.5	DZ 490	PRO	Siltstone Sandstone	mn occurs as veining and replacement in snst/sist med dark brown yellow	f silt to f sand	strong	5 - 20%
41.5	42.0	DZ 491	PRO	Siltstone Sandstone	mn occurs as veining and replacement in snst/sist med dark brown yellow	f silt to f sand	strong	
42.0	44.0	DZ 492	PRO	Siltstone Sandstone	med dark brown yellow mn occurs as veining and replacement in snst/sist	f silt to f sand	strong	0.5 - 5%

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
44.0	46.0		PRO	Siltstone silicified Sandstone silicified	med dark brown yellow	f silt to f sand	strong	
46.0	48.0		PRO	Siltstone silicified Sandstone silicified	medium yellow brown	f silt to f sand	strong	trace <0.5%
EOH at 48.0 m								

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR122

LOCALITY: EL7260

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : APO

JOB NO : MAY

DATE DRILLED: 31-JUL-94

TOTAL DEPTH : 30.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 529943

NORTHING: 8326620

R.L.: 15.0

AZIM.: 15.0

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR122

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Lat cap, soft ferruginous pisolitic	medium orange red	clay to s pebble	firm	
2.0	4.0		CEN	Lat cap, hard ferruginous sandy	medium orange red	clay to s pebble	weak	
4.0	6.0		CEN	Sand clayey Lat mottled zone	m light pink red	clay to med sand	hard	
6.0	8.0		CEN	Sand clayey Lat mottled zone	m light pink brown	clay to med sand	stiff	
8.0	10.0		CRE	Sand clayey Sandstone	m light pink brown water injection	clay to med sand	hard	
10.0	12.0		CRE	Clay sandy	medium yellow tan	clay to vc sand	stiff	
12.0	14.0		CRE	Sand clayey	light grey white	clay to granule	stiff	
14.0	16.0		CRE	Sand clayey	light pink white	clay to granule	stiff	
16.0	18.0		CRE	Sand clayey gravelly	less clay than above m light yellow grey	clay to l pebble	stiff	
18.0	20.0		PRO	Sandstone silicified Siltstone silicified	medium yellow	f silt to f sand	weak	
20.0	22.0		PRO	Sandstone silicified Siltstone silicified chalcedonic	med dark yellow brown	f silt to f sand	weak	
22.0	24.0		PRO	Clay Sandstone ferruginous	v dark brown	clay to f sand	stiff	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		PRO	Sandstone silicified	med dark yellow brown	f silt to f sand	mod'ly strong	
26.0	28.0		PRO	Sandstone silicified				
				Siltstone silicified	medium yellow	f silt to f sand	mod'ly strong	trace <0.5%
				Chert				
28.0	30.0		PRO	algal oolitic	mn veinlets in sist			
				Siltstone silicified	medium yellow	f silt to f sand	mod'ly strong	trace <0.5%
				Chert				
				algal oolitic	mn veinlets in sist			
EOH at 30.0 m								

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR123

LOCALITY: EL7260

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : APO

JOB NO : MAY

DATE DRILLED: 31-JUL-94

TOTAL DEPTH : 54.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 530621

NORTHING: 8327453

R.L.: 15.0

AZIM.: 15.0

INCL.:

COMMENTS:

SHEET 1 OF 3 HOLE NUMBER : TRR123

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Lat cap, hard ferruginous pisolitic	medium red orange	clay to 1 pebble	hard	
2.0	4.0		CEN	Lat cap, hard ferruginous pisolitic Sand clayey	medium orange brown	clay to med sand	hard	
4.0	6.0		CEN	Clay sandy Lat mottled zone	mottled white pink	clay to med sand	hard	
6.0	8.0		CRE	Silt sandy ferruginous	light grey white	vf silt to f sand	stiff	
8.0	10.0		CRE	Silt sandy ferruginous	light grey yellow	vf silt to f sand	stiff	
10.0	12.0		CRE	Silt sandy ferruginous	light grey yellow	vf silt to c sand	stiff	
12.0	14.0		CRE	Sand unconsol	pale white grey	vf sand to med sand	soft	
14.0	16.0		CRE	Sand unconsol	pale white grey	vf sand to med sand	soft	
16.0	18.0		CRE	Sand clayey	pale white grey	clay to c sand	stiff	
18.0	20.0		CRE	Sand unconsol	m light yellow white	med silt to vs pebble	stiff	
20.0	22.0		CRE	Sand unconsol	m light yellow white	c silt to vs pebble	soft	
22.0	24.0		CRE	Sand unconsol	flowing sand - abundant water, small sample m light yellow white flowing sand - abundant water	c silt to vs pebble	soft	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Sand unconsol	pale yellow white flowing sand - abundant water	c silt to c sand	friable	
26.0	28.0		CRE	Sand unconsol	light white grey	c silt to vs pebble	friable	
28.0	30.0		CRE	Siltstone algal	pale white grey	vf silt to c silt	hard	
30.0	32.0		CRE	Siltstone algal Chert algal	pale white grey some mn staining in chert	clay to c silt	hard	trace <0.5%
32.0	34.0		CRE	Siltstone algal Chert algal	m light yellow tan some mn staining in chert	clay to c silt	hard	trace <0.5%
34.0	36.0		CRE	Siltstone algal Oolite silicified	m light yellow tan	clay to f sand	hard	
36.0	38.0		CRE	Siltstone algal Chert algal	m light yellow tan	clay to med sand	hard	
38.0	40.0		CRE	Siltstone algal Chert algal	m light yellow tan	clay to f sand	hard	
40.0	41.5	DZ 494	CRE	Oolite silicified Siltstone algal	med dark yellow tan 30cm mn	clay to med sand	weak	5 - 20%
41.5	42.0	DZ 495	CRE	Chert algal	dark black grey semi massive mn replacement in chert	clay to med silt	strong	5 - 20%
42.0	42.5	DZ 496	CRE	Siltstone algal Chert massive	dark black grey replacement restricted to chert	clay to vf sand	mod'ly strong	0.5 - 5%
42.5	43.0	DZ 497	CRE	Siltstone algal Chert massive	dark black grey	clay to vf sand	mod'ly strong	trace <0.5%
43.0	43.5		PRO	Siltstone silicified Sandstone	med dark khaki brown fine grained snst/sist	med silt to med sand	mod'ly strong	
43.5	44.0		PRO	Siltstone silicified Sandstone	med dark khaki brown fine grained snst/sist	med silt to med sand	mod'ly strong	

DEPTHS From To (m) (m)		SAMPLE NUMBER	GEOLOGICAL TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
44.0	44.5		PRO	Siltstone silicified Sandstone	v dark brown red	vf silt to med sand	mod'ly strong	
44.5	45.0		PRO	Siltstone silicified Sandstone	hematite cemented v dark brown red	sist/snst vf silt to med sand	mod'ly strong	
45.0	45.5		PRO	Siltstone silicified Sandstone	hematite cemented med dark red brown	sist/snst vf silt to med sand	mod'ly strong	
45.5	46.0		PRO	Siltstone silicified Sandstone	hematite cemented med dark brown yellow	sist/snst vf silt to med sand	mod'ly strong	
46.0	48.0	DZ 498	PRO	Siltstone silicified Sandstone	hematite cemented med dark brown khaki	sist/snst vf silt to med sand	mod'ly strong	0.5 - 5%
48.0	48.5	DZ 499	PRO	Siltstone silicified Chert	mn veining in snst med dark brown khaki	sist/snst vf silt to med sand	mod'ly strong	trace <0.5%
48.5	49.0		PRO	Siltstone silicified Chert	dendritic mn in chert med dark brown khaki	sist/snst vf silt to med sand	mod'ly strong	
49.0	49.5		PRO	Siltstone silicified Oolite	no return med dark yellow khaki	sist/snst vf silt to med sand	mod'ly strong	
49.5	52.0		PRO	Siltstone silicified	med dark red	vf silt to med sand	mod'ly strong	trace <0.5%
52.0	54.0		PRO	Siltstone silicified	weak mn veining in sist; med dark red	dendritic mn on bedding planes vf silt to med sand	mod'ly strong	trace <0.5%
EOH at 54.0 m					weak mn veining in sist; dendritic mn on bedding planes			

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR124

LOCALITY: EL7260

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : APO

JOB NO : MAY

DATE DRILLED: 01-AUG-94

TOTAL DEPTH : 48.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 529938

NORTHING: 8327397

R.L.: 15.0

AZIM.: 15.0

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR124

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Lat cap, hard ferruginous pisolitic	medium red orange	f silt to s pebble	hard	
2.0	4.0		CEN	Lat cap, hard ferruginous pisolitic	medium red orange	f silt to s pebble	hard	
4.0	6.0		CEN	Clay sandy	pale white	clay to med sand	stiff	trace <0.5%
6.0	8.0		CRE	Clay silty Siltstone	dendritic mn in clay pale white	clay to c silt	mod'ly strong	
8.0	10.0		CRE	Siltstone silty Clay	light grey white	clay to c silt	mod'ly strong	trace <0.5%
10.0	12.0		CRE	Clay Siltstone	dendrites in sist light grey white	clay to c silt	stiff	
12.0	14.0		CRE	Clay	water injection m light grey white	clay to c silt	stiff	
14.0	16.0		CRE	Clay	m light grey white	clay to c silt	stiff	
16.0	18.0		CRE	Clay	m light grey white	clay to f sand	stiff	
18.0	20.0		CRE	Clay sandy Sandstone	m light grey white	clay to med sand	hard	
20.0	22.0		CRE	Sand unconsol	some weakly cemented qtz sand m light grey white	c silt to c sand	friable	
22.0	24.0		CRE	Sand unconsol gravelly	hole caving m light yellow grey	c silt to l pebble	firm	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Sand unconsol	m light yellow grey	c silt to c sand	friable	
26.0	28.0		CRE	Sand unconsol	m light yellow grey	c silt to c sand	friable	
28.0	30.0		CRE	Sand clayey Siltstone	no return m light grey yellow	clay to granule	firm	
30.0	32.0		CRE	Siltstone	m light grey yellow	clay to vf sand	hard	
32.0	34.0		CRE	Siltstone Chert algal	m light grey yellow	clay to vf sand	hard	
34.0	36.0		CRE	Siltstone Chert algal	m light yellow grey	clay to vf sand	hard	
36.0	38.0		CRE	Siltstone Chert algal	m light yellow grey	clay to vf sand	hard	
38.0	40.0		PRO	Siltstone silty ferruginous	medium yellow grey	clay to vf sand	hard	
40.0	42.0		PRO	Siltstone silty ferruginous Chert algal	medium yellow grey	clay to vf sand	hard	
42.0	44.0		PRO	Siltstone silty ferruginous Chert algal	medium yellow grey	clay to vf sand	hard	
44.0	46.0		PRO	Siltstone silty ferruginous Chert algal	medium yellow grey	clay to vf sand	hard	
46.0	48.0		PRO	Siltstone silty ferruginous Chert algal	medium yellow grey	clay to vf sand	hard	

EOH at 48.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR125

LOCALITY: EL7260

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : APO

JOB NO : MAY

DATE DRILLED: 01-AUG-94

TOTAL DEPTH : 30.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 529093

NORTHING: 8329773

R.L.: 15.0

AZIM.: 15.0

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR125

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite sandy pisolitic	medium orange red	med silt to s pebble	hard	
2.0	4.0		CEN	Laterite sandy pisolitic	medium orange red	med silt to s pebble	hard	
4.0	6.0		CEN	Clay silty	light white grey	clay to c silt	stiff	trace <0.5%
6.0	8.0		CRE	Clay sandy ferruginous	dendritic mn in clay mottled yellow white	clay to med sand	stiff	
8.0	10.0		CRE	Clay sandy ferruginous	mottled yellow white dendritic mn in clay	clay to vc sand	stiff	trace <0.5%
10.0	12.0		CRE	Sand clayey	light white grey	clay to c sand	stiff	
12.0	14.0		CRE	Sand clayey	medium yellow white water injection	clay to vs pebble	stiff	
14.0	16.0		CRE	Conglomerate sandy	m light white grey	c silt to s cobble	hard	
16.0	18.0		CRE	Sand Chert algal oolitic	polymictic well m light white grey	rounded conglomeratic clay to c sand	hard	
18.0	20.0		OTH	Siltstone	algal lam chert/oolite medium yellow	vf silt to c silt	hard	
20.0	22.0		OTH	Siltstone Chert algal	?pro medium yellow	clay to c silt	mod'ly strong	
22.0	24.0		OTH	Siltstone Sandstone silicified	?pro medium yellow ?pro	f silt to f sand	mod'ly strong	

DEPTHS From To (m) (m)	SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
24.0 26.0		OTH	Siltstone	m light grey	f silt to f sand	mod'ly strong	
			Sandstone silicified	yellow ?pro			
26.0 28.0		OTH	Siltstone	m light grey	f silt to f sand	mod'ly strong	
			Sandstone silicified	yellow ?pro			
28.0 30.0		PRO	Siltstone	m light pink	f silt to c silt	mod'ly strong	
			Tuff				
EOH at 30.0 m				pink ?tuff			

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR126

LOCALITY: EL7260

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : APO

JOB NO : MAY

DATE DRILLED: 01-AUG-94

TOTAL DEPTH : 30.0

GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 528329 NORTHING: 8329747 R.L.: 15.0 AZIM.: INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR126

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Lat cap, hard ferruginous pisolitic	medium orange red	clay to vs pebble	weak	
2.0	4.0		CEN	Clay	mottled pink white	clay to vf sand	stiff	
4.0	6.0		CEN	Clay	mottled pink white	clay to vf sand	stiff	
6.0	8.0		CRE	Clay silty	medium tan	clay to vf sand	stiff	
8.0	10.0		CRE	Clay silty	medium tan pink	clay to vf sand	stiff	
10.0	12.0		CRE	Clay sandy	m light tan pink	clay to vs pebble	stiff	
12.0	14.0		CRE	Clay sandy	med dark tan brown	clay to vs pebble	stiff	
14.0	16.0		CRE	Sand clayey gravelly	coffee rock bands 10 cm thick m light tan yellow	clay to vs pebble	stiff	
16.0	18.0		CRE	Sand clayey gravelly	coffee rock bands 10 cm thick light tan white	clay to med pebble	hard	
18.0	20.0		CRE	Sand clayey gravelly	m light tan pink	clay to med pebble	hard	
20.0	22.0		CRE	Sand gravelly Conglomerate	m light pink tan	vf sand to l pebble	hard	
22.0	24.0		CRE	Clay Siltstone	light white pink	clay to c sand	stiff	

DEPTHS From To (m) (m)		SAMPLE NUMBER	GEOLOGICAL TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
24.0	26.0		PRO	Siltstone silicified	medium tan	vf silt to c silt	mod'ly strong	
26.0	28.0		PRO	Siltstone silicified Tuff	light white pink	vf silt to c silt	mod'ly strong	trace <0.5%
28.0	30.0		PRO	Siltstone silicified Tuff	some dendritic mn on bedding planes medium tan	vf silt to c silt	mod'ly strong	

EOH at 30.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR127

LOCALITY: EL7260

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : APO

JOB NO : MAY

DATE DRILLED: 02-AUG-94

TOTAL DEPTH : 30.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 527598

NORTHING: 8329794

R.L.: 15.0

AZIM.: 15.0

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR127

DEPTHS From (m)	To (m)	SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
0.0	2.0		CEN	Lat cap, hard sandy pisolitic	medium orange red	clay to vs pebble	hard	
2.0	4.0		CEN	Lat cap, hard sandy pisolitic Sand silty	m light orange red	clay to c sand	stiff	
4.0	6.0		CRE	Sand clayey	m light yellow tan	clay to c sand	stiff	
6.0	8.0		CRE	Sand clayey	m light yellow tan	clay to c sand	stiff	
8.0	10.0		CRE	Sand clayey	mottled tan white	clay to c sand	stiff	
10.0	12.0		CRE	Clay sandy	pale white	clay to c sand	stiff	
12.0	14.0		CRE	Clay sandy	pale white	clay to c sand	stiff	
14.0	16.0		CRE	Sand clayey	mottled tan white water injection	clay to granule	stiff	
16.0	18.0		CRE	Sand clayey	pale white	clay to granule	stiff	
18.0	20.0		CRE	Sand clayey	light grey white	clay to granule	stiff	
20.0	22.0		CRE	Sand unconsol	medium yellow grey high water flows	c silt to granule	friable	
22.0	24.0		CRE	Sand unconsol gravelly	medium yellow grey	med sand to 1 pebble	soft	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Sand unconsol	light yellow grey	f sand to s pebble	friable	
26.0	28.0		OTH	Sand unconsol	med dark yellow	vf silt to s pebble	hard	
				Siltstone silicified ferruginous	pro - cre contact			
28.0	30.0		OTH	Siltstone silicified Conglomerate	medium red pink	vf silt to l pebble	weak	
EOH at 30.0 m					?pro - cre contact - eoh driller refusal			

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR128

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : APO

JOB NO : MBK

DATE DRILLED: 08-AUG-94

TOTAL DEPTH : 56.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 535307

NORTHING: 8335979

R.L.: 15.0

AZIM.:

INCL.:

COMMENTS: pvc casing to 54m

SHEET 1 OF 3 HOLE NUMBER : TRR128

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		OTH	Silt	pale white	vf silt to med silt	soft	
				Chert				
2.0	4.0		OTH	Silt	cre ?, minor chert frags in diatomite? pale white	vf silt to med silt	soft	
				Chert				
4.0	6.0		CRE	Silt clayey Sandstone silicified	cre ?, minor chert frags in diatomite? light white yellow	clay to f sand	weak	
6.0	8.0		CRE	Silt clayey Sandstone silicified	abundant frgs of cherty snst in white cy silt light white yellow	clay to f sand	weak	
8.0	10.0		CRE	Silt clayey Siltstone chalcedonic	abundant frgs of cherty snst in white cy silt pale white	clay to med silt	weak	
10.0	12.0		CRE	Silt clayey Siltstone chalcedonic	? unit 3, sist poorly lam pale white	clay to med silt	weak	
12.0	14.0		CRE	Silt clayey Siltstone chalcedonic	? unit 3, sist poorly lam light yellow tan	clay to med silt	weak	
14.0	14.5	DZ 500	CRE	Silt clayey Siltstone chalcedonic	? unit 3 dark grey black	clay to c silt	weak	0.5 - 5%
14.5	15.0	DZ 501	CRE	Silt clayey sandy Siltstone chalcedonic	? unit 3 - mn hard repl/vein med dark grey black	clay to med sand	weak	0.5 - 5%
15.0	15.5	DZ 502	CRE	Silt clayey sandy Siltstone chalcedonic	? unit 3 - mn hard repl/vein, some sandy clay present medium khaki green	clay to med sand	weak	0.5 - 5%
15.5	16.0	DZ 503	CRE	Silt clayey sandy Siltstone chalcedonic	? unit 3 - mn soft, some sandy clay present medium yellow white	clay to vf sand	weak	trace <0.5%
16.0	18.0		CRE	Clay silty	med dark khaki yellow	clay to vf sand	hard	trace <0.5%

DEPTHS From To (m) (m)		SAMPLE NUMBER	GEOLOGICAL TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
18.0	20.0		CRE	Sand clayey	medium yellow	clay to f sand	stiff	
20.0	22.0	DZ 504	CRE	Clay sandy Breccia	medium yellow khaki	clay to s pebble	stiff	
22.0	24.0		CRE	Clay sandy	brec chert and fg snst frags medium white grey	clay to vf sand	stiff	0.5 - 5%
24.0	26.0		CRE	Clay silty Grit	soft mn band 5cm thick. light yellow pink	clay to med sand	stiff	
26.0	28.0		CRE	Clay silty	m light pink orange	clay to c silt	stiff	
28.0	30.0		CRE	Clay silty sandy	rare angular pebble sized frags medium yellow tan	clay to f sand	hard	
30.0	32.0		CRE	Clay silty sandy	some minor he coffee rock medium yellow tan	clay to med sand	stiff	
32.0	34.0		CRE	Clay silty sandy	less than 10% sand medium yellow tan	clay to med sand	stiff	
34.0	36.0		CRE	Clay silty sandy	less than 10% sand medium yellow khaki	clay to med sand	stiff	
36.0	38.0		CRE	Clay silty sandy	about 20% sand med dark brown orange	clay to c sand	stiff	
38.0	40.0		CRE	Clay silty sandy Chert laminated	about 30% sand, hematitic mottling med dark brown orange	clay to c sand	weak	
40.0	42.0		CRE	Chert ferruginous Clay	abundant hematitic mottling med dark brown orange	clay to c silt	weak	
42.0	44.0		CRE	Siltstone ferruginous Chert clayey	abundant hematitic mottling medium yellow tan	clay to c silt	weak	
44.0	46.0		CRE	Ironstone Chert clayey	med dark brown orange abundant he coffee rock	clay to c silt	weak	

DEPTHS From To (m) (m)		SAMPLE NUMBER	GEOLOGICAL TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
46.0	46.5	DZ 505	CRE	Ironstone	med dark khaki	clay to c silt	weak	5 - 20%
				Chert clayey				
46.5	47.0	DZ 506	CRE	Ironstone	mn hard repl, he coffe rock med dark tan	clay to c silt	weak	5 - 20%
				Chert clayey	grey			
47.0	47.5	DZ 507	CRE	Ironstone	mn hard repl, he coffee rock med dark brown	clay to c silt	weak	trace <0.5%
				Clay	khaki			
47.5	48.0		CRE	Clay	mn hard repl, he coffee rock med dark brown	clay to c silt	weak	
				Ironstone	khaki			
48.0	50.0		CRE	Clay	he coffee rock med dark brown	clay to c silt	weak	trace <0.5%
				Ironstone	tan			
50.0	52.0		CRE	Clay	he coffee rock med dark brown	clay to c silt	weak	
				Chert laminated	tan			
52.0	54.0		OTH	Clay	med dark brown	clay to c silt	weak	
				Sandstone laminated	tan			
54.0	56.0		PRO	Sandstone laminated	cre - pro boundary med dark brown tan	med silt to vf sand	strong	trace <0.5%
EOH at 56.0 m					mn occurs as veins in snst			

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR129

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : APO

JOB NO : MBK

DATE DRILLED: 08-AUG-94

TOTAL DEPTH : 36.0

GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 531943 NORTHING: 8336042 R.L.: 15.0 AZIM.: INCL.:

COMMENTS: pvc casing to 30m

SHEET 1 OF 2 HOLE NUMBER : TRR129

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CRE	Siltstone silicified Clay	light white brown	clay to c silt	hard	trace <0.5%
2.0	4.0		CRE	Siltstone silicified Clay	weak lateritic light white brown	mn dendritic mottling clay to c silt	hard	trace <0.5%
4.0	6.0		CRE	Siltstone silicified Clay	weak lateritic pale white	mn dendritic mottling, fe mottling clay to c silt	hard	
6.0	8.0		CRE	Siltstone silicified Clay	pale white	clay to c silt	hard	
8.0	10.0		CRE	Siltstone silicified Clay	pale white	clay to c silt	hard	
10.0	12.0		CRE	Siltstone silicified Clay	mottled pink white he mottling	clay to c silt	hard	
12.0	14.0		CRE	Clay	light pink orange	clay to c silt	hard	
14.0	16.0		CRE	Siltstone silicified Clay silty	he mottling m light yellow tan	clay to med silt	stiff	
16.0	18.0		CRE	Clay silty	medium yellow tan	clay to med silt	stiff	
18.0	20.0		CRE	Clay sandy	medium khaki yellow	clay to c sand	stiff	
20.0	22.0		CRE	Clay sandy	m light grey khaki	clay to c sand	stiff	trace <0.5%
20.0	22.0		CRE	Clay silty Sandstone silicified	dispersed lateritic m light yellow grey	mn clay to f sand	hard	trace <0.5%

DEPTHS From (m)	To (m)	SAMPLE NUMBER	GEOLOGICAL TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
22.0	24.0		CRE	Clay silty Sandstone silicified	m light yellow grey	clay to f sand	hard	trace <0.5%
24.0	26.0		OTH	Chert clayey Siltstone	medium khaki green	clay to f sand	strong	trace <0.5%
26.0	28.0		OTH	Chert clayey Siltstone	medium tan khaki	clay to f sand	very strong	trace <0.5%
28.0	30.0		OTH	Sandstone cherty algal Chert laminated	? pro dendritic medium tan khaki	mn on fractures clay to f sand	very strong	trace <0.5%
30.0	32.0		PRO	Dolomite massive	?pro medium yellow grey	clay to med silt	very strong	
32.0	34.0		PRO	Chert oolitic Dolomite	m light grey white	clay to med sand	very strong	
34.0	36.0		PRO	Dolomite Tuff	m light grey white	clay to c silt	strong	
EOH at 36.0 m					interlaminated brown grey dolm, green siltst and pink tuff			

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR130

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : APO

JOB NO : MBK

DATE DRILLED: 10-AUG-94

TOTAL DEPTH : 52.0

GRID: ANG

ZONE: 53

RELIABILITY: SATL

EASTING: 535174

NORTHING: 8339021

R.L.: 15.0

AZIM.: 15.0

INCL.:

COMMENTS:

SHEET 1 OF 3 HOLE NUMBER : TRR130

DEPTHS From (m)	To (m)	SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
0.0	2.0		CEN	Laterite ferruginous pisolitic Clay calcareous	mottled red white mn mottles in clay	clay to s pebble	weak	0.5 - 5%
2.0	4.0		OTH	Clay calcareous silty Laterite pisolitic	m light green white cen - cre boundary mn mottles in clay	clay to s pebble	hard	0.5 - 5%
4.0	6.0		CRE	Clay calcareous silty	m light green white mn mottles in clay, patches of green ?nontronitic clay	clay to c silt	stiff	0.5 - 5%
6.0	8.0		CRE	Clay calcareous silty	pale white to c silt	clay to c silt	stiff	
8.0	10.0		CRE	Clay calcareous silty Limestone	light white pink water injection	clay to c silt	hard	
10.0	12.0		CRE	Clay calcareous silty Limestone	light white pink	clay to c silt	hard	
12.0	14.0		CRE	Clay calcareous silty Limestone	m light white pink	clay to c silt	hard	
14.0	16.0		CRE	Clay calcareous silty	m light white yellow he mottling	clay to c silt	stiff	
16.0	18.0		CRE	Clay calcareous silty Limestone	medium yellow tan geoth mottling	clay to c silt	hard	
18.0	20.0		CRE	Clay calcareous silty Limestone	light grey white geoth mottling	clay to c silt	stiff	
20.0	22.0		CRE	Silt calcareous clayey	light grey white geoth mottling	clay to c silt	stiff	
22.0	24.0		CRE	Siltstone calcareous clayey Ironstone	med dark yellow tan goethitic coffee rock	clay to c silt	stiff	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Siltstone calcareous clayey	light yellow tan geoth mottling	clay to c silt	hard	
26.0	28.0		CRE	Siltstone calcareous clayey Clay	medium yellow tan geoth mottling	clay to c silt	hard	
28.0	30.0		CRE	Clay sandy Chert massive	medium yellow tan ? top of unit 3	clay to c silt	weak	
30.0	32.0		CRE	Chert massive Siltstone silicified	med dark brown tan	clay to med pebble	weak	
32.0	32.5	DZ 509	CRE	Clay Manganese ore	v dark brown	clay to c silt	hard	20 - 30%
32.5	33.0	DZ 510	CRE	Clay Chert	mn hard repl in clay med dark brown tan	clay to c silt	weak	0.5 - 5%
33.0	33.5		CRE	Clay Chert massive ferruginous	mn hard repl in clay med dark tan yellow	clay to c silt	weak	
33.5	34.0		CRE	Clay	med dark tan yellow	clay to f silt	stiff	
34.0	34.5		CRE	Clay gritty	med dark tan yellow	clay to c sand	stiff	trace <0.5%
34.5	35.0		CRE	Clay Siltstone sandy	med dark tan yellow	clay to f sand	weak	
35.0	36.0		CRE	Clay Siltstone sandy	dark brown tan	clay to vf sand	weak	trace <0.5%
36.0	38.0		CRE	Clay Siltstone ferruginous	medium tan khaki	clay to vf sand	weak	
38.0	40.0		CRE	Clay Siltstone ferruginous	m light tan khaki	clay to vf sand	weak	
40.0	42.0		CRE	Siltstone sandy Clay	m light tan khaki	clay to vf sand	weak	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
42.0	44.0		CRE	Siltstone sandy Clay	m light tan khaki	clay to vf sand	weak	trace <0.5%
44.0	46.0		OTH	Siltstone sandy	m light tan khaki	clay to vf sand	weak	trace <0.5%
46.0	48.0		PRO	Siltstone sandy	interlam pink and green siltstone ?pro m light tan khaki	clay to vf sand	strong	trace <0.5%
48.0	50.0		PRO	Siltstone sandy	interlam pink and green siltstone ?pro m light tan khaki	clay to vf sand	strong	trace <0.5%
50.0	52.0		PRO	Siltstone sandy	interlam pink and green siltstone ?pro m light tan khaki	clay to vf sand	strong	trace <0.5%
EOH at 52.0 m					interlam pink and green siltstone ?pro, mn veins			

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR131

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : APO

JOB NO : MBK

DATE DRILLED: 10-AUG-94

TOTAL DEPTH : 28.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 532145

NORTHING: 8339111

R.L.: 15.0

AZIM.: 15.0

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR131

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite ferruginous pisolitic Clay calcareous	mottled red grey	clay to s pebble	hard	
2.0	4.0		CRE	Clay calcareous Limestone silty	light white grey weak mn lateritic mottling	clay to c silt	stiff	trace <0.5%
4.0	6.0		CRE	Clay calcareous Limestone silty	light white grey weak mn lateritic mottling	clay to c silt	mod'ly strong	trace <0.5%
6.0	8.0		CRE	Limestone silty clayey Clay calcareous	light white yellow	clay to c silt	mod'ly strong	
8.0	10.0		CRE	Siltstone calcareous Clay calcareous	light white yellow	clay to c silt	mod'ly strong	
10.0	12.0		CRE	Siltstone silicified calcareous Clay calcareous	light white yellow	clay to c silt	mod'ly strong	
12.0	14.0		CRE	Siltstone silicified calcareous Clay calcareous	light white yellow	clay to c silt	mod'ly strong	
14.0	16.0		CRE	Siltstone silicified ferruginous Chert massive	med dark yellow brown	clay to c silt	mod'ly strong	trace <0.5%
16.0	18.0		CRE	Siltstone silicified algal Chert massive clayey	med dark yellow brown	clay to c silt	mod'ly strong	trace <0.5%
18.0	20.0		CRE	Siltstone ferruginous silicified	med dark yellow brown	clay to c silt	mod'ly strong	trace <0.5%
20.0	22.0		OTH	Siltstone ferruginous silicified	mn occurs as fracture lining m light grey brown	clay to c silt	mod'ly strong	trace <0.5%
22.0	24.0	DZ 511	OTH	Chert oolitic laminated Manganese ore	?pro interlam pink - brown cg sist med dark khaki brown mn occurs as repl of sns and oolite	clay to med sand	strong	20 - 30%

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	24.5	DZ 512	OTH	Oolite cherty Manganese ore	dark khaki black	clay to med sand	strong	20 - 30%
24.5	25.0	DZ 513	OTH	Oolite cherty Manganese ore	mn occurs as repl of sns and oolite, some botryoidal cav. fil dark khaki black	clay to med sand	strong	5 - 20%
25.0	25.5	DZ 514	OTH	Oolite cherty Sandstone silicified	mn occurs as repl of sns and oolite, some botryoidal cav. fil dark khaki black	clay to med sand	strong	0.5 - 5%
25.5	26.0		PRO	Siltstone dolomitic	as above, small sample cavity medium khaki brown	clay to c silt	strong	
26.0	28.0		PRO	Dolomite	dololutite dark grey	clay to c silt	very strong	
EOH at 28.0 m					dolomite, trace pink tuff			

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR132

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : APO

JOB NO : MBK

DATE DRILLED: 10-AUG-94

TOTAL DEPTH : 16.0

GRID: ANG ZONE: 53 RELIABILITY: SATL EASTING: 528792 NORTHING: 8339000 R.L.: 15.0 AZIM.: INCL.:

COMMENTS:

SHEET 1 OF 1 HOLE NUMBER : TRR132

DEPTHS From (m)	To (m)	SAMPLE NUMBER	GEOLOGICAL TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
0.0	2.0		CEN	Sand	light grey	clay to med sand	firm	trace <0.5%
				Clay calcareous	brown lat mn mottling			
2.0	4.0		CEN	Sand	light grey	clay to med sand	firm	trace <0.5%
				Clay calcareous	brown lat mn mottling			
4.0	6.0		CRE	Clay silty calcareous	medium yellow	clay to f sand	hard	trace <0.5%
				Siltstone calcareous	white lat mn mottling			
6.0	8.0		CRE	Siltstone calcareous	mottled yellow	clay to c silt	weak	
				Clay calcareous	white			
8.0	10.0		CRE	Siltstone calcareous cherty	medium yellow	clay to c silt	weak	
				Clay calcareous	tan			
10.0	12.0		CRE	Siltstone calcareous clayey	medium yellow	clay to vf sand	weak	
				Sandstone silicified quartz	tan			
12.0	14.0		PRO	Oolite silicified	medium yellow	clay to med sand	mod'ly strong	
				Tuff	tan			
14.0	16.0		PRO	Siltstone ferruginous dolomitic	pink tuff, balbirini med dark brown red	clay vf silt to med silt	strong	

EOH at 16.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR133

LOCALITY: EL7260

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRO

JOB NO : MAY

DATE DRILLED: 23-AUG-94

TOTAL DEPTH : 34.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 530600

NORTHING: 8324900

R.L.: 20.0

AZIM.: 1

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR133

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite Sand clayey	medium red brown	f sand to med sand	strong	
2.0	4.0		CEN	Laterite pisolitic	medium red brown	f sand to med sand	strong	
4.0	6.0		CRE	Sandstone clayey	light grey brown	vf sand to f sand	weak	
6.0	8.0		CRE	Sandstone ferruginous clayey	medium red brown	vf sand to f sand	weak	
8.0	10.0		CRE	Sandstone clayey	light brown grey	vf sand to f sand	weak	
10.0	12.0		CRE	Sandstone quartzose	light grey	f sand	mod'ly strong	
12.0	14.0		CRE	Sandstone quartzose Sand unconsol	light grey	f sand	mod'ly strong	
14.0	17.0		CRE	Sandstone quartzose Grit quartzose	light grey	med sand to granule	weak	
17.0	18.0		CRE	Clay sandy Sandstone cherty ferruginous	interbedded sand & grit medium brown	clay to f sand	weak	
18.0	20.0		CRE	Clay sandy Chert sandy algal	v. low sample recovery light grey brown	clay to f sand	weak	
20.0	22.0		CRE	Chert algal laminated Clay	unit 2 of cretaceous medium brown	clay to f sand	weak	
22.0	24.0		CRE	Clay	dark brown	clay	soft	
					unit 1 of cretaceous?			

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		?	Sandstone	banded grey brown basement?	vf sand to f sand	mod'ly strong	
26.0	28.0		?	Mudstone sandy Chert laminated algal	medium grey	med silt to vf sand	mod'ly strong	
28.0	30.0	DZ1288	PRO	Sandstone ferruginous	basement? medium orange brown	med sand	strong	
30.0	32.0	DZ1288	PRO	Sandstone ferruginous	medium orange brown	med sand	strong	
32.0	34.0	DZ1288	PRO	Sandstone ferruginous Siltstone cherty	medium orange brown	med sand	strong	

EOH at 34.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR134

LOCALITY: EL7260

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 850

LOGGED BY : PRD

JOB NO : MAY

DATE DRILLED: 23-AUG-94

TOTAL DEPTH : 30.0

GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 529100 NORTHING: 8331350 R.L.: 20.0 AZIM.: INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR134

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Sand Laterite	medium red brown	f sand to med sand	loose	
2.0	4.0		CEN	Laterite pisolitic	mottled red brown	vf sand to f sand	mod'ly strong	
4.0	6.0		CEN	Clay sandy lateritic Sand	mottled red brown	vf sand to f sand	firm	trace <0.5%
6.0	8.0		CRE	Sand clayey	light orange brown	f sand to med sand	firm	trace <0.5%
8.0	10.0		CRE	Sand clayey	light orange brown	f sand to med sand	firm	
10.0	12.0		CRE	Sand clayey Carbonate	light orange brown	f sand to med sand	firm	
12.0	14.0		CRE	Sandstone quartzose gritty	light brown grey	f sand to vc sand	weak	trace <0.5%
14.0	16.0		CRE	Sandstone quartzose gritty	light brown grey	f sand to vc sand	weak	trace <0.5%
16.0	18.0		CRE	Sandstone quartzose gritty	light brown grey	f sand to vc sand	weak	
18.0	20.0		CRE	Chert laminated algal Sandstone	light grey brown	med silt to vf sand	mod'ly strong	
20.0	22.0		CRE	Sandstone silty laminated	banded red grey	vf sand to f sand	mod'ly strong	
22.0	24.0		CRE	Sandstone silty laminated	banded red grey	vf sand to f sand	mod'ly strong	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Sandstone silty laminated	banded red grey	vf sand to f sand	mod'ly strong	
26.0	28.0		CRE	Sandstone silty laminated	banded red grey	vf sand to f sand	mod'ly strong	
28.0	30.0		CRE	Sandstone silty laminated	banded red grey	vf sand to f sand	mod'ly strong	

EOH at 30.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR135

LOCALITY: EL7260

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRD

JOB NO : MAY

DATE DRILLED: 23-AUG-94

TOTAL DEPTH : 30.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 525900

NORTHING: 8331350

R.L.: 20.0

AZIM.:

INCL.:

COMMENTS:

SHEET 1 OF 1 HOLE NUMBER : TRR135

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite	medium red brown	f sand to med sand	mod'ly strong	
2.0	4.0		CEN	Laterite Sand	medium red brown	f sand to med sand	mod'ly strong	
4.0	6.0		CRE	Sandstone silty	light red brown	vf sand to f sand	mod'ly strong	
6.0	18.0		CRE	Sandstone quartzose	light pink grey interbedded	med sand to vc sand coarse & fine sand	weak	
18.0	20.0		CRE	Grit clayey	light pink grey	med sand to granule	weak	
20.0	22.0		CRE	Chert laminated algal Clay	banded grey brown	med silt to vf sand	weak	
22.0	24.0		CRE	Chert laminated algal Clay	unit 2 of cretaceous banded grey brown	med silt to vf sand	weak	
24.0	26.0		CRE	Siltstone sandy Clay	light grey	med silt to f sand	weak	
26.0	28.0		CRE	Chert silty laminated Clay	light grey	med silt to f sand	weak	
28.0	30.0		CRE	Chert silty laminated Clay	light grey	med silt to f sand	weak	

EOH at 30.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR136

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRD

JOB NO : MBK

DATE DRILLED: 23-AUG-94

TOTAL DEPTH : 24.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 527400

NORTHING: 8333000

R.L.: 20.0

AZIM.: 1

INCL.:

COMMENTS:

SHEET 1 OF 1 HOLE NUMBER : TRR136

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite	medium red brown	vf sand to f sand	mod'ly strong	
2.0	4.0		CRE	Clay Laterite	medium khaki grey	clay to vf sand	firm	trace <0.5%
4.0	6.0		CRE	Clay sandy	light khaki grey	clay to vf sand	firm	
6.0	8.0		CRE	Clay sandy	light khaki grey	clay to vf sand	firm	trace <0.5%
8.0	10.0		CRE	Clay Sand	light grey	clay to med silt	firm	
10.0	12.0		CRE	Sand Sand clayey	interbedded sand & clay light grey	f sand to med sand	firm	
12.0	14.0		CRE	Sand clayey quartzose	pale grey	f sand	firm	
14.0	16.0		CRE	Sand clayey quartzose	light grey brown	f sand	firm	
16.0	18.0		CRE	Sand Clay sandy ferruginous	medium orange brown	vf sand to f sand	firm	
18.0	20.0		CRE	Sand ferruginous Clay sandy ferruginous	medium orange brown	vf sand to f sand	firm	
20.0	22.0		CRE	Sandstone shaly Sandstone ferruginous	banded grey brown	f sand to med sand	mod'ly strong	
22.0	24.0		CRE	Sandstone silty	banded grey brown	f sand to med sand	mod'ly strong	

EOH at 24.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR137

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRD

JOB NO : MBK

DATE DRILLED: 23-AUG-94

TOTAL DEPTH : 24.0

GRID: ANG

ZONE: 53

RELIABILITY: SATL

EASTING: 525800

NORTHING: 8333000

R.L.: 20.0

AZIM.: 91

INCL.:

COMMENTS:

SHEET 1 OF 1 HOLE NUMBER : TRR137

DEPTHS From (m)	To (m)	SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
0.0	2.0		CEN	Laterite pisolitic Sand	medium red brown	f sand to med sand	weak	
2.0	4.0		CEN	Laterite pisolitic Clay	medium red brown	f sand to med sand	weak	
4.0	6.0		CRE	Clay ferruginous	banded brown grey	clay to med silt	firm	trace <0.5%
6.0	8.0		CRE	Clay sandy	banded brown grey	clay to med silt	firm	trace <0.5%
8.0	10.0		CRE	Clay sandy Sand	light brown grey	clay to med silt	firm	
10.0	12.0		CRE	Clay sandy Sand	light brown grey	clay to med silt	firm	
12.0	14.0		CRE	Sand quartzose clayey	light grey	med sand to c sand	weak	
14.0	16.0		CRE	Sand quartzose clayey Clay	light grey	vf sand to f sand	weak	
16.0	18.0		CRE	Sand quartzose clayey Clay	light grey	med sand to c sand	weak	
18.0	20.0		CRE	Sand quartzose clayey Clay	light grey	med sand to c sand	weak	
20.0	22.0		CRE	Sandstone quartzose ferruginous	patchy brown grey basement?	f sand to med sand	strong	
22.0	24.0		CRE	Siltstone cherty Clay sandy	medium grey brown possible silicified algal material	med silt to vf sand	mod'ly strong	

EOH at 24.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR138

LOCALITY: EL7260

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRD

JOB NO : MAY

DATE DRILLED: 24-AUG-94

TOTAL DEPTH : 46.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 535490

NORTHING: 8330610

R.L.: 15.0

AZIM.:

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR138

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Clay sandy Laterite	medium orange brown	clay to vf sand	firm	
2.0	4.0		CRE	Clay sandy Carbonate	light grey	clay to vf sand	firm	trace <0.5%
4.0	6.0		CEN	Limestone	pleistocene or cretaceous? light grey	med silt to vf sand	mod'ly strong	
6.0	8.0		CEN	Limestone Clay	light grey	med silt to vf sand	mod'ly strong	
8.0	10.0		CEN	Clay sandy Limestone	light brown	clay to vf sand	weak	
10.0	12.0		CRE	Sand clayey	light brown	vf sand to f sand	firm	
12.0	14.0		CRE	Clay sandy Sandstone ferruginous clayey	medium red brown	clay to f sand	firm	
14.0	16.0		CRE	Clay sandy Sandstone ferruginous clayey	medium red brown	clay to f sand	firm	
16.0	18.0		CRE	Clay sandy	light brown	clay to f sand	firm	
18.0	20.0		CRE	Clay sandy ferruginous	patchy grey brown	clay to f sand	firm	
20.0	22.0		CRE	Clay sandy ferruginous	patchy grey brown	clay to f sand	firm	
22.0	24.0		CRE	Clay sandy Sand quartzose	light grey brown	clay to f sand	firm	

DEPTHS From To (m) (m)		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
24.0	26.0		CRE	Clay silty sandy	medium brown	clay to vf sand	firm	
26.0	28.0		CRE	Clay silty sandy	medium brown	clay to vf sand	firm	
28.0	30.0		CRE	Sandstone clayey Clay	medium grey brown	vf sand to f sand	firm	trace <0.5%
30.0	32.0		CRE	Sandstone clayey	medium grey brown	vf sand to f sand	firm	
32.0	34.0		CRE	Sandstone siliceous oolitic	medium brown grey	f sand to med sand	mod'ly strong	
34.0	36.0		CRE	Sandstone conglomeratic oolitic	light brown	f sand to vs pebble	weak	
36.0	38.0		CRE	Sandstone conglomeratic oolitic Clay sandy	light brown	f sand to vs pebble	weak	
38.0	40.0		CRE	Siltstone laminated siliceous Clay sandy	light brown	med silt to vf sand	weak	
40.0	42.0		CRE	Sandstone massive	medium brown	med sand	mod'ly strong	
42.0	44.0		CRE	Sandstone massive	basement? medium brown	med sand	mod'ly strong	
44.0	46.0		PRO	Sandstone shaly Siltstone laminated	basement? medium brown	med sand	strong	

EOH at 46.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR139

LOCALITY: EL7260

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRD

JOB NO : MAY

DATE DRILLED: 24-AUG-94

TOTAL DEPTH : 42.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 534415

NORTHING: 8332404

R.L.: 15.0

AZIM.: 15.0

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR139

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite pisolitic Sand	medium red brown	med sand to vs pebble	weak	
2.0	4.0		CEN	Clay sandy Carbonate	light grey	clay to vf sand	hard	
4.0	6.0		CEN	Clay sandy Carbonate	light grey	clay to vf sand	hard	
6.0	8.0		CEN	Carbonate Clay sandy	light grey	clay to vf sand	hard	
8.0	10.0		CEN	Carbonate Clay sandy	light grey	clay to vf sand	hard	
10.0	12.0		CRE	Sandstone clayey quartzose	light grey	vf sand to f sand	weak	
12.0	14.0		CRE	Sandstone clayey conglomeratic	light grey	med sand to vs pebble	weak	
14.0	16.0		CRE	Sandstone clayey conglomeratic Conglomerate	light grey	med sand to vs pebble	weak	
16.0	18.0		CRE	Clay ferruginous sandy Sand	interbedded snst & pebble conglomerate layers patchy brown grey	clay to f sand	firm	
18.0	20.0		CRE	Sandstone conglomeratic clayey Clay sandy	medium grey brown	f sand to vs pebble	firm	
20.0	22.0		CRE	Clay sandy Sandstone ferruginous lateritic	patchy brown grey	clay to f sand	firm	
22.0	24.0		CRE	Clay ferruginous sandy	patchy brown grey	clay to f sand	firm	

EQH at 42.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR140

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRD

JOB NO : MBK

DATE DRILLED: 24-AUG-94

TOTAL DEPTH : 42.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 535184

NORTHING: 8333220

R.L.: 15.0

AZIM.: 15.0

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR140

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT Mn OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Carbonate Clay	pale grey	clay to med silt	weak	
2.0	4.0		CEN	Carbonate Clay	pale grey	clay to med silt	weak	
4.0	6.0		CEN	Carbonate	pale grey	clay to med silt	weak	
6.0	8.0		CEN	Carbonate	pale grey	clay to med silt	weak	
8.0	10.0		CEN	Carbonate Clay sandy	pale grey	clay to med silt	weak	
10.0	12.0		CEN	Clay lateritic Carbonate	patchy red grey	clay to med silt	firm	
12.0	14.0		CRE	Clay sandy	light red grey	clay to med silt	firm	
14.0	16.0		CRE	Clay ferruginous	light red grey	clay to med silt	firm	
16.0	18.0		CRE	Clay ferruginous sandy	light pink grey	clay to vf sand	firm	
18.0	20.0		CRE	Clay ferruginous	patchy grey brown	clay to med silt	firm	
20.0	22.0		CRE	Clay ferruginous	patchy grey brown	clay to med silt	firm	trace <0.5%
22.0	24.0		CRE	Clay ferruginous	patchy grey brown	clay to med silt	firm	

DEPTHS From To (m) (m)		SAMPLE NUMBER	GEOLOGICAL TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
24.0	26.0		CRE	Clay ferruginous	patchy grey brown	clay to med silt	firm	
26.0	28.0		CRE	Clay sandy	medium brown	clay to vf sand	firm	
28.0	30.0		CRE	Clay sandy	medium brown	clay to vf sand	firm	trace <0.5%
30.0	32.0		CRE	Clay sandy	medium brown	clay to vf sand	firm	trace <0.5%
32.0	34.0		CRE	Clay sandy	medium brown	clay to vf sand	firm	
34.0	36.0		CRE	Clay sandy Sandstone ferruginous	patchy brown grey	clay to vf sand	firm	
36.0	38.0		CRE	Clay sandy Sandstone	light brown	clay to f sand	firm	
38.0	40.0		CRE	Clay sandy Sandstone	light brown	clay to f sand	firm	
40.0	42.0		CRE	Clay sandy Sandstone	light brown	clay to f sand	firm	

EOH at 42.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR141

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRO

JOB NO : MBK

DATE DRILLED: 24-AUG-94

TOTAL DEPTH : 42.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 534495

NORTHING: 8333985

R.L.: 15.0

AZIM.: 15.0

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR141

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Clay sandy Carbonate	patchy red brown	clay to f sand	firm	
2.0	4.0		CEN	Clay sandy Carbonate	light grey brown	clay to f sand	firm	
4.0	6.0		CEN	Clay sandy	light grey brown	clay to f sand	firm	
6.0	8.0		CEN	Sand quartzose	pale yellow brown	vf sand to f sand	loose	
8.0	10.0		CEN	Sand ferruginous clayey Carbonate	pale yellow brown	vf sand to f sand	loose	
10.0	12.0		CEN	Sand ferruginous clayey Carbonate	pale yellow brown	vf sand to f sand	loose	
12.0	14.0		CRE	Sandstone clayey ferruginous	fe-rich bands approx 5 cm thick patchy grey brown	vf sand to f sand	weak	
14.0	16.0		CRE	Sandstone clayey ferruginous Carbonate	patchy grey brown	vf sand to f sand	weak	
16.0	18.0		CRE	Sandstone clayey ferruginous Clay sandy	light brown grey	vf sand to f sand	weak	
18.0	20.0		CRE	Clay ferruginous sandy	light brown grey	clay to vf sand	firm	
20.0	22.0		CRE	Clay ferruginous	medium red brown	clay to med silt	firm	
22.0	24.0		CRE	Clay ferruginous	medium red brown	clay to med silt	firm	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Clay ferruginous	medium red brown	clay to med silt	firm	
26.0	28.0		CRE	Clay ferruginous	medium red brown	clay to med silt	firm	
28.0	30.0		CRE	Clay ferruginous	medium red brown	clay to med silt	firm	trace <0.5%
30.0	32.0		CRE	Clay ferruginous silty	patchy pink grey	clay to med silt	firm	
32.0	34.0		CRE	Clay ferruginous silty	patchy pink grey	clay to med silt	firm	
34.0	36.0		CRE	Clay sandy	light grey	clay to f sand	firm	
36.0	38.0		CRE	Clay sandy	light grey	clay to f sand	stiff	
38.0	40.0		CRE	Clay silty	light pink grey	clay to med silt	stiff	
40.0	42.0		CRE	Clay sandy gritty	light brown grey	clay to granule	stiff	
EOH at 42.0 m								

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR142

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRD

JOB NO : MBK

DATE DRILLED: 25-AUG-94

TOTAL DEPTH : 50.0

GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 535275 NORTHING: 8335014 R.L.: 15.0 AZIM.: INCL.:

COMMENTS:

SHEET 1 OF 3 HOLE NUMBER : TRR142

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite pisolitic Sand	medium red brown	c sand to vs pebble	weak	
2.0	4.0		CEN	Carbonate Clay	light grey	clay to med silt	weak	
4.0	6.0		CEN	Carbonate Clay	light grey	clay to med silt	weak	
6.0	8.0		CEN	Carbonate Sand	light grey brown	clay to med silt	weak	
8.0	10.0		CEN	Carbonate Sand	light pink grey	clay to med silt	weak	
10.0	12.0		CRE	Sandstone clayey	light grey	vf sand to f sand	weak	
12.0	14.0		CRE	Sandstone clayey Clay	light grey	vf sand to f sand	weak	
14.0	16.0		CRE	Chert laminated algal Clay	light grey	vf sand to f sand	weak	
16.0	18.0	DZ 515	CRE	Sandstone clayey	medium brown	f sand to med sand	weak	0.5 - 5%
18.0	18.5	DZ 516	CRE	Sandstone clayey	medium brown	f sand to med sand	weak	0.5 - 5%
18.5	19.0	DZ 517	CRE	Sandstone clayey	medium brown	f sand to med sand	weak	0.5 - 5%
19.0	19.5	DZ 518	CRE	Sandstone clayey	medium brown	f sand to med sand	weak	trace <0.5%

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
19.5	20.0	DZ 519	CRE	Sandstone clayey	medium brown	f sand to med sand	weak	trace <0.5%
20.0	22.0		CRE	Sandstone clayey	medium brown	f sand to med sand	weak	
22.0	24.0		CRE	Sandstone clayey Clay	medium brown	f sand to med sand	weak	
24.0	26.0		CRE	Sandstone clayey Clay	medium brown	f sand to med sand	weak	trace <0.5%
26.0	28.0		CRE	Sandstone clayey Clay	medium brown	f sand to med sand	weak	trace <0.5%
28.0	30.0		CRE	Clay sandy Sandstone	medium brown	clay to f sand	stiff	trace <0.5%
30.0	32.0		CRE	Clay sandy Sandstone	medium brown	clay to f sand	stiff	trace <0.5%
32.0	34.0		CRE	cherty laminated Sandstone ferruginous Clay	patchy red brown	f sand to med sand	weak	
34.0	36.0		CRE	Sandstone ferruginous Clay	patchy red brown	f sand to med sand	weak	trace <0.5%
36.0	38.0		CRE	Sandstone ferruginous Clay	patchy red brown	f sand to med sand	weak	trace <0.5%
38.0	40.0		CRE	Sandstone ferruginous Clay	medium brown	f sand to med sand	weak	trace <0.5%
40.0	42.0		CRE	Sandstone ferruginous Clay	medium brown	f sand to med sand	weak	
42.0	44.0		CRE	Sandstone ferruginous Clay	medium brown	f sand to med sand	weak	
44.0	46.0		CRE	Clay ferruginous silty	medium brown	clay to med silt	stiff	

basement?

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
46.0	48.0		CRE	Sandstone	medium brown	vf sand to f sand	mod'ly strong	
				Siltstone siliceous				
48.0	50.0		CRE	Sandstone	medium brown	vf sand to f sand	mod'ly strong	
				Siltstone siliceous				
EOH at 50.0 m					basement?			

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn
 LOCALITY: EL7341
 SHEET : Towns
 JOB NO : MBK

CONTRACTOR : GADEN DRILLING
 RIG TYPE : UDR 650
 DATE DRILLED: 25-AUG-94

HOLE NUMBER : TRR143
 LOGGED BY : PRD
 TOTAL DEPTH : 50.0
 R.L.: 15.0 AZIM.: INCL.:

GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 534418 NORTHING: 8335983

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR143

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Carbonate	pale grey	med silt to vf sand	weak	
2.0	4.0		CEN	Carbonate	pale grey	med silt to vf sand	weak	
4.0	6.0		CEN	Carbonate	pale grey	med silt to vf sand	weak	
6.0	8.0		CEN	Carbonate	pale grey	med silt to vf sand	weak	
8.0	10.0		CEN	Carbonate	pale grey	med silt to vf sand	weak	
10.0	12.0		CEN	Carbonate	light grey brown	med silt to vf sand	weak	
12.0	14.0		CRE	Sand clayey Carbonate	light grey brown	vf sand to f sand	weak	
14.0	16.0		CRE	Sand clayey Carbonate	light grey brown	vf sand to f sand	weak	
16.0	18.0		CRE	Clay sandy	medium khaki brown	clay to f sand	firm	
18.0	20.0		CRE	Clay sandy	medium khaki brown	clay to f sand	firm	
20.0	22.0		CRE	Gravel clayey Clay	patchy grey brown	clay to vs pebble	firm	
22.0	24.0		CRE	Clay	patchy grey brown	clay	firm	trace <0.5%

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Clay sandy	medium khaki brown	clay to f sand	stiff	trace <0.5%
26.0	28.0		CRE	Clay sandy	medium khaki brown	clay to f sand	stiff	trace <0.5%
28.0	30.0		CRE	Clay sandy	medium grey brown	clay to f sand	stiff	
30.0	32.0		CRE	Clay sandy Siltstone	light grey brown	clay to f sand	weak	
32.0	34.0		CRE	laminated algal Clay sandy	medium khaki brown	clay to f sand	stiff	
34.0	36.0		CRE	Clay sandy Sandstone	medium khaki brown	clay to f sand	stiff	
36.0	38.0		CRE	quartzose Sandstone ferruginous	medium brown	med sand	mod'ly strong	
38.0	40.0		CRE	Sandstone quartzose	basement? light grey	med sand	mod'ly strong	
40.0	42.0		CRE	Sandstone quartzose	basement? light grey	med sand	mod'ly strong	
42.0	44.0		CRE	Sandstone quartzose	basement? light grey	med sand	mod'ly strong	
44.0	46.0		CRE	Sandstone quartzose	basement? light grey	med sand	mod'ly strong	
46.0	48.0		CRE	Sandstone quartzose	basement? light grey	med sand	mod'ly strong	
48.0	50.0		CRE	Sandstone quartzose	basement? light grey	med sand	mod'ly strong	
EOH at 50.0 m					basement?			

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR144

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRD

JOB NO : MBK

DATE DRILLED: 26-AUG-94

TOTAL DEPTH : 44.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 535950

NORTHING: 8335850

R.L.: 15.0

AZIM.:

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR144

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite pisolitic	medium red brown	vf sand to vs pebble	weak	
2.0	4.0		CEN	Clay sandy Laterite	medium red brown	clay to f sand	stiff	
4.0	6.0		CEN	Clay sandy Carbonate	patchy grey brown	clay to f sand	weak	
6.0	8.0		CEN	Clay sandy Carbonate	patchy grey brown	clay to f sand	weak	
8.0	10.0		CEN	Clay sandy Carbonate	patchy grey brown	clay to f sand	weak	
10.0	12.0		CRE	Clay sandy Laterite	medium pink brown	clay to f sand	firm	
12.0	14.0		CRE	Clay sandy Sandstone	medium pink brown	clay to f sand	firm	
14.0	16.0		CRE	ferruginous conglomeratic Clay sandy Sandstone	medium pink brown	clay to f sand	firm	
16.0	18.0		CRE	ferruginous conglomeratic Clay	light pink grey	clay	stiff	
18.0	20.0		CRE	Clay sandy	light brown grey	clay to vf sand	weak	
20.0	22.0		CRE	Clay sandy	light brown grey	clay to vf sand	weak	
22.0	24.0		CRE	Sandstone quartzose Clay sandy	light grey	vf sand to f sand	weak	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Sandstone ferruginous	patchy grey brown	f sand to med sand	weak	
26.0	28.0		CRE	Sandstone ferruginous clayey Clay sandy	patchy grey brown	f sand to med sand	weak	
28.0	30.0		CRE	Sandstone ferruginous Clay sandy	patchy grey brown	f sand to med sand	weak	
30.0	32.0		CRE	Clay sandy ferruginous	patchy grey brown	clay to f sand	stiff	
32.0	34.0		CRE	Clay sandy ferruginous	patchy grey brown	clay to f sand	stiff	
34.0	36.0		CRE	Clay sandy ferruginous	patchy grey brown	clay to f sand	stiff	
36.0	38.0		CRE	Sandstone Clay sandy	medium khaki grey	f sand to med sand	weak	
38.0	40.0		CRE	Sandstone shaly ferruginous	medium brown	vf sand to f sand	weak	
40.0	42.0		CRE	Mudstone shaly sandy	could be basement medium brown	med silt to vf sand	weak	
42.0	44.0	DZ1289	PRO	Mudstone shaly	soft, weathered medium brown	mdst, cre or pro? med silt to vf sand	weak	
EOH at 44.0 m					base metals sample			

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR145

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRD

JOB NO : MBK

DATE DRILLED: 26-AUG-94

TOTAL DEPTH : 50.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 535138

NORTHING: 8336752

R.L.: 15.0

AZIM.: 15.0

INCL.:

COMMENTS:

SHEET 1 OF 3 HOLE NUMBER : TRR145

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Clay Laterite sandy	medium red brown	clay to vf sand	stiff	
2.0	4.0		CEN	Carbonate Sand	pale grey	clay to f sand	weak	
4.0	6.0		CEN	Carbonate Sand	pale grey brown	clay to f sand	weak	
6.0	8.0		CRE	Clay sandy Sandstone quartzose	light brown grey	clay to f sand	firm	
8.0	10.0		CRE	Clay sandy ferruginous	patchy brown grey	clay to f sand	firm	
10.0	11.0		CRE	Clay sandy ferruginous	patchy brown grey	clay to f sand	firm	trace <0.5%
11.0	11.5		CRE	Clay sandy ferruginous	patchy brown grey	clay to f sand	firm	trace <0.5%
11.5	12.0	DZ 520	CRE	Clay sandy ferruginous	patchy brown grey	clay to f sand	firm	0.5 - 5%
12.0	12.5		CRE	Clay sandy ferruginous	light grey	clay to f sand	firm	
12.5	13.0		CRE	Clay sandy ferruginous	light grey	clay to f sand	firm	
13.0	14.0		CRE	Clay sandy ferruginous	medium khaki brown	clay to f sand	firm	
14.0	16.0		CRE	Clay sandy ferruginous	medium khaki brown	clay to f sand	firm	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
16.0	18.0		CRE	Clay sandy	light khaki grey	clay to f sand	firm	
18.0	20.0		CRE	Clay sandy	light khaki grey	clay to f sand	firm	trace <0.5%
20.0	22.0		CRE	Clay sandy	light khaki grey	clay to f sand	firm	
22.0	24.0		CRE	Clay sandy ferruginous	patchy brown grey	clay to f sand	firm	
24.0	26.0		CRE	Clay sandy	light brown grey	clay to vf sand	firm	
26.0	28.0		CRE	Clay silty	light brown grey	clay to med silt	firm	
28.0	30.0		CRE	Clay silty	light brown grey	clay to med silt	firm	
30.0	32.0		CRE	Clay silty	medium brown	clay to med silt	stiff	
32.0	34.0		CRE	Clay silty	medium brown	clay to med silt	stiff	
34.0	36.0		CRE	Clay silty	medium brown	clay to med silt	stiff	
36.0	38.0		CRE	Claystone sandy	water tank empty, hence dry samples here & below light grey	clay to f sand	weak	
38.0	40.0		CRE	Clay sandy	light grey	clay to f sand	stiff	
40.0	42.0		CRE	Clay silty	light grey	clay to med silt	stiff	
42.0	44.0		CRE	Clay silty	light grey	clay to med silt	stiff	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
44.0	46.0		CRE	Clay silty	light grey	clay to med silt	stiff	trace <0.5%
46.0	48.0		CRE	Clay silty Siltstone cherty laminated	sub-millimetre thick mn bands in clay light grey	clay to med silt	stiff	
48.0	50.0	DZ1290	PRO	Sandstone quartzose siliceous	pale grey brown water table	f sand	strong	

EOH at 50.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR146

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRD

JOB NO : MBK

DATE DRILLED: 26-AUG-94

TOTAL DEPTH : 36.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 535200

NORTHING: 8338300

R.L.: 15.0

AZIM.: 15.0

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR146

DEPTHS From (m)	To (m)	SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
0.0	2.0		CEN	Laterite pisolitic Sand	medium red brown	med silt to vs pebble	weak	
2.0	4.0		CEN	Laterite pisolitic Carbonate	patchy brown grey	med silt to vs pebble	weak	
4.0	6.0		CEN	Carbonate	pale grey white	vf sand to f sand	weak	
6.0	8.0		CEN	Carbonate	pale grey	vf sand to f sand	weak	
8.0	10.0		CRE	Clay sandy	medium khaki brown	clay to f sand	stiff	
10.0	12.0		CRE	Sandstone clayey ferruginous	patchy red grey	f sand to med sand	weak	
12.0	14.0		CRE	Sandstone clayey ferruginous	light grey brown	f sand to med sand	weak	
14.0	16.0		CRE	Sandstone clayey ferruginous	light grey brown	f sand to med sand	weak	
16.0	18.0		CRE	Sandstone ferruginous Clay	medium grey	f sand to med sand	weak	
18.0	20.0		CRE	Sandstone clayey	light grey	f sand to med sand	weak	
20.0	22.0		CRE	Sandstone clayey Conglomerate	light grey	f sand to med sand	weak	
22.0	24.0		CRE	Sandstone clayey Sandstone gritty quartzose	light grey	f sand to med sand	weak	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Sandstone clayey Chert laminated	light grey	f sand to med sand	weak	
26.0	28.0		CRE	Sandstone clayey Clay ferruginous sandy	patchy brown grey	clay to f sand	stiff	
28.0	30.0		CRE	Clay ferruginous sandy	patchy brown grey	clay to f sand	stiff	
30.0	32.0		CRE	Clay silty	banded grey brown	clay to med silt	stiff	
32.0	34.0		CRE	Clay silty	banded grey brown	clay to med silt	stiff	
34.0	36.0		CRE	Clay silty	light grey	clay to med silt	stiff	

EOH at 36.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR147

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 850

LOGGED BY : PRO

JOB NO : MBK

DATE DRILLED: 27-AUG-94

TOTAL DEPTH : 36.0

GRID: ANG ZONE: 53 RELIABILITY: SATL EASTING: 536086 NORTHING: 8339037 R.L.: 15.0 AZIM.: INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR147

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Sand Laterite	medium brown	f sand to med sand	soft	
2.0	4.0		CEN	Clay sandy Laterite	medium brown	clay to f sand	firm	
4.0	6.0		CRE	Clay sandy	light grey	clay to vf sand	stiff	trace <0.5%
6.0	8.0		CRE	Clay sandy Carbonate	light grey	clay to vf sand	stiff	trace <0.5%
8.0	10.0		CRE	Claystone sandy Carbonate	light grey	clay to f sand	weak	trace <0.5%
10.0	12.0		CRE	Sandstone clayey	patchy brown grey	vf sand to med sand	weak	
12.0	14.0		CRE	Sandstone clayey quartzose	light grey	f sand to med sand	weak	
14.0	16.0		CRE	Sandstone clayey quartzose	light grey	f sand to med sand	weak	
16.0	18.0		CRE	Clay sandy	light brown	clay to f sand	firm	
18.0	20.0		CRE	Clay sandy	light brown	clay to f sand	firm	
20.0	22.0		CRE	Clay sandy	patchy brown grey	clay to f sand	firm	trace <0.5%
22.0	24.0		CRE	Sandstone chloritic Siltstone cherty	sub-millimetre medium brown grey unit 2	thick bands of mn in clay f sand to med sand	weak	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Siltstone cherty Sandstone clayey	light brown grey	med silt	weak	
26.0	28.0		CRE	Siltstone cherty Sandstone clayey	light brown grey	med silt	weak	
28.0	30.0		CRE	Siltstone cherty Sandstone clayey	light brown grey	med silt	weak	
30.0	32.0		CRE	Siltstone cherty laminated Sandstone clayey	light brown grey	med silt	weak	
32.0	34.0		CRE	Siltstone cherty laminated Sandstone clayey	light brown grey	med silt	weak	
34.0	36.0		CRE	Siltstone cherty laminated Sandstone clayey ferruginous	patchy grey brown	med silt	weak	

EOH at 36.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR148

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRD

JOB NO : MBK

DATE DRILLED: 27-AUG-94

TOTAL DEPTH : 42.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 535135

NORTHING: 8339870

R.L.: 15.0

AZIM.: 15.0

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR148

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite Sand	medium red brown		weak	
2.0	4.0		CEN	Clay lateritic sandy	medium red brown	clay to f sand	weak	
4.0	6.0		CRE	Clay sandy	medium khaki brown	clay to f sand	firm	trace <0.5%
6.0	8.0	DZ 521	CRE	Clay sandy	medium khaki brown	trace specks of mn in clay clay to f sand	firm	trace <0.5%
8.0	10.0		CRE	Clay sandy	light brown grey	clay to f sand	firm	
10.0	12.0		CRE	Clay sandy	light brown grey	clay to f sand	firm	
12.0	14.0		CRE	Clay sandy	light brown grey	clay to f sand	firm	
14.0	16.0		CRE	Clay sandy Sandstone ferruginous	patchy brown grey	clay to f sand	firm	
16.0	18.0		CRE	Clay sandy ferruginous	light grey	clay to f sand	firm	
18.0	20.0		CRE	Clay sandy ferruginous	light grey	clay to f sand	stiff	
20.0	22.0		CRE	Clay	light grey	clay to med silt	stiff	
22.0	24.0		CRE	Clay	light grey	clay to med silt	stiff	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Clay silty	banded grey brown	clay to med silt	stiff	
26.0	28.0		CRE	Clay sandy	banded grey brown	clay to med silt	stiff	trace <0.5%
28.0	30.0		CRE	Clay sandy	banded grey brown	clay to med silt	stiff	
30.0	32.0		CRE	Clay silty ferruginous	banded grey brown	clay to med silt	stiff	
32.0	34.0		CRE	Clay silty ferruginous	banded grey brown	clay to med silt	stiff	
34.0	36.0		CRE	Clay sandy	light grey	clay to vf sand	stiff	trace <0.5%
36.0	38.0		CRE	Clay sandy Sand	light grey	clay to f sand	firm	
38.0	40.0		CRE	Clay sandy	light grey brown	clay to f sand	firm	
40.0	42.0		CRE	Sandstone ferruginous gritty	patchy grey brown	med sand to granule	firm	

EOH at 42.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR149

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRD

JOB NO : MBK

DATE DRILLED: 27-AUG-94

TOTAL DEPTH : 42.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 534537

NORTHING: 8339177

R.L.: 15.0

AZIM.: 15.0

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR149

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite sandy	medium red brown	f sand to vc sand	weak	
2.0	4.0		CEN	Clay sandy Carbonate	light grey	clay to f sand	stiff	
4.0	6.0		CRE	Clay silty	light grey	clay to med silt	stiff	
6.0	8.0		CRE	Clay sandy ferruginous Sand gritty	banded grey brown	clay to vc sand	stiff	
8.0	10.0		CRE	Clay sandy Sandstone ferruginous	patchy grey brown	clay to f sand	firm	
10.0	12.0		CRE	Clay sandy ferruginous	patchy grey brown	clay to f sand	firm	
12.0	14.0		CRE	Clay sandy ferruginous	patchy grey brown	clay to f sand	firm	
14.0	16.0		CRE	Clay sandy ferruginous Chert	patchy grey brown	clay to f sand	firm	
16.0	18.0		CRE	Chert laminated Clay ferruginous	medium brown	med silt to vf sand	firm	
18.0	20.0		CRE	Chert laminated Clay ferruginous	unit 2 medium brown	med silt to vf sand	firm	
20.0	22.0		CRE	Sandstone ferruginous	unit 2 light grey	f sand to med sand	weak	
22.0	24.0		CRE	Chert laminated algal Clay	light grey	med silt	weak	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Chert laminated algal Clay	light grey	med silt	weak	
26.0	28.0		CRE	Sandstone	light grey	vf sand to f sand	weak	
28.0	30.0		CRE	Chert laminated Sandstone	light grey	vf sand to f sand	weak	
30.0	32.0		CRE	Chert laminated Clay sandy Sandstone	patchy brown grey	clay to f sand	stiff	
32.0	34.0		CRE	Chert laminated Clay	medium brown grey	med silt	weak	
34.0	36.0		CRE	Sandstone ferruginous Clay	medium brown grey	f sand to med sand	weak	
36.0	38.0		CRE	Sandstone ferruginous Clay	medium brown grey	f sand to med sand	weak	
38.0	40.0		CRE	Sandstone ferruginous	medium brown	f sand to med sand	weak	
40.0	42.0		CRE	Sandstone ferruginous	could be basement medium brown	f sand to med sand	weak	
EOH at 42.0 m					could be basement			

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR150

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRD

JOB NO : MBK

DATE DRILLED: 27-AUG-94

TOTAL DEPTH : 36.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 532812

NORTHING: 8339113

R.L.: 15.0

AZIM.:

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR150

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Clay sandy Sand	medium khaki brown	clay to f sand	firm	
2.0	4.0		CRE	Clay sandy	pale grey	clay to f sand	firm	
4.0	6.0		CRE	Clay sandy	pale grey	clay to f sand	firm	
6.0	8.0		CRE	Sand quartzose clayey Carbonate	pale grey	med sand to vc sand	friable	
8.0	10.0		CRE	Sandstone quartzose	pale grey white mn disseminated.	med sand to c sand	mod'ly strong	trace <0.5%
10.0	12.0		CRE	Sandstone quartzose Siltstone cherty laminated	light grey	calcereous cement, could be recent & not cretaceous f sand	mod'ly strong	
12.0	14.0		CRE	Sandstone silty	light orange brown	vf sand to f sand	weak	
14.0	16.0		CRE	Clay silty	light orange brown	clay to med silt	stiff	
16.0	18.0		CRE	Sandstone clayey Siltstone cherty	light orange brown	vf sand to f sand	weak	
18.0	20.0		CRE	Sandstone ferruginous	light orange brown	vf sand to f sand	weak	
20.0	22.0		CRE	Sandstone ferruginous	light orange brown	vf sand to f sand	weak	
22.0	24.0		CRE	Sandstone ferruginous	light orange brown	vf sand to f sand	weak	

DEPTHS From To (m) (m)		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
24.0	26.0		CRE	Siltstone cherty laminated Sandstone clayey ferruginous	light orange brown	med silt to vf sand	weak	
26.0	28.0		CRE	Siltstone cherty laminated Clay ferruginous	light orange brown	med silt to vf sand	weak	
28.0	30.0		CRE	Siltstone cherty laminated Clay ferruginous	light orange brown	med silt to vf sand	weak	
30.0	32.0	DZ1291	PRO	Sandstone ferruginous	medium orange brown	f sand to med sand	mod'ly strong	
32.0	34.0	DZ1291	PRO	Sandstone ferruginous	medium orange brown	f sand to med sand	mod'ly strong	
34.0	36.0	DZ1291	PRO	Sandstone ferruginous	medium orange brown	f sand to med sand	mod'ly strong	

EOH at 36.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR151

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRO

JOB NO : MBK

DATE DRILLED: 27-AUG-94

TOTAL DEPTH : 34.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 532387

NORTHING: 8338294

R.L.: 15.0

AZIM.: 15.0

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR151

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Carbonate Sand	light grey brown	vf sand to f sand	weak	
2.0	4.0		CEN	Carbonate	pale grey white	vf sand to f sand	weak	
4.0	6.0		CEN	Carbonate	pale grey white	vf sand to f sand	weak	
6.0	8.0		CEN	Sandstone gritty	pale grey brown	f sand to med sand	mod'ly strong	
8.0	10.0		CEN	Sandstone gritty	"calcretised" pale grey brown	sandstone f sand to med sand	mod'ly strong	
10.0	12.0		CRE	Sandstone ferruginous	"calcretised" medium orange brown	sandstone f sand to med sand	mod'ly strong	
12.0	14.0		CRE	Sandstone ferruginous	basement? patchy brown grey	vf sand to f sand	mod'ly strong	
14.0	16.0		CRE	Sandstone clayey Clay	patchy brown grey	vf sand to f sand	weak	trace <0.5%
16.0	18.0		CRE	Clay sandy	medium khaki brown	clay to f sand	firm	trace <0.5%
18.0	20.0		OTH	Sandstone ferruginous	light orange brown	vf sand to f sand	mod'ly strong	
20.0	22.0		OTH	Sandstone ferruginous	light orange brown	vf sand to f sand	mod'ly strong	
22.0	24.0		OTH	Sandstone ferruginous	light orange brown	vf sand to f sand	mod'ly strong	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		PRO	Sandstone shaly	light brown	vf sand to f sand	mod'ly strong	
26.0	28.0		PRO	Sandstone quartzose laminated	light grey	vf sand to f sand	mod'ly strong	
28.0	30.0		PRO	Sandstone quartzose laminated	light grey	vf sand to f sand	mod'ly strong	
30.0	32.0	DZ1292	PRO	Sandstone quartzose laminated	light grey	vf sand to f sand	mod'ly strong	
32.0	34.0	DZ1292	PRO	Sandstone quartzose laminated	light grey	vf sand to f sand	mod'ly strong	

EOH at 34.0 m

PROJECT : Carpentaria Mn
LOCALITY: EL7341
SHEET : Towns
JOB NO : MBK
GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 532396 NORTHING: 8339854 R.L.: 15.0 AZIM.: INCL.:
MANGANESE LOGSHEET
CONTRACTOR : GADEN DRILLING
RIG TYPE : UDR 650
DATE DRILLED: 29-AUG-94
HOLE NUMBER : TRR152
LOGGED BY : PRD
TOTAL DEPTH : 36.0

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR152

DEPTHS From (m)	To (m)	SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
0.0	2.0		CEN	Laterite pisolitic Sand	medium red brown	f sand to vc sand	weak	
2.0	4.0		CEN	Claystone sandy	light grey	clay to f sand	weak	
4.0	6.0		CEN	Claystone sandy	light grey	clay to f sand	weak	trace <0.5%
6.0	8.0		CEN	Claystone sandy Carbonate	light grey	clay to f sand	weak	
8.0	10.0		CEN	Limestone	light grey	clay to f sand	mod'ly strong	
10.0	12.0		CRE	Sandstone quartzose	light grey	f sand to c sand	mod'ly strong	
12.0	14.0		CRE	Sandstone quartzose	light grey	f sand to c sand	mod'ly strong	
14.0	16.0		CRE	Sandstone clayey Siltstone cherty laminated	light grey	vf sand to med sand	mod'ly strong	
16.0	18.0		CRE	Sandstone clayey Siltstone cherty laminated	light grey	vf sand to med sand	mod'ly strong	
18.0	20.0		CRE	Sandstone clayey Siltstone cherty laminated	light grey	vf sand to med sand	mod'ly strong	
20.0	22.0		CRE	Sandstone clayey	light grey	f sand	weak	
22.0	24.0		CRE	Clay sandy Siltstone cherty	light grey	clay to f sand	stiff	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Sandstone clayey	light grey	f sand to med sand	weak	
26.0	28.0		CRE	Sandstone	light grey	f sand to med sand	weak	
28.0	30.0		CRE	Siltstone cherty laminated Sandstone	light grey	f sand to med sand	weak	
30.0	32.0		CRE	Siltstone cherty laminated Clay sandy	light khaki grey	clay to f sand	firm	
32.0	34.0		CRE	Sandstone clayey Siltstone cherty laminated	light grey	vf sand to med sand	weak	
34.0	36.0		CRE	Sandstone clayey ferruginous Siltstone cherty laminated	medium brown	vf sand to med sand	weak	

EOH at 36.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR153

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRD

JOB NO : MBK

DATE DRILLED: 30-AUG-94

TOTAL DEPTH : 18.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 517665

NORTHING: 8343220

R.L.: 15.0

AZIM.: 15.0

INCL.:

COMMENTS:

SHEET 1 OF 1 HOLE NUMBER : TRR153

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	3.0		CEN	Laterite pisolitic Sand	medium red brown	med sand to s pebble	weak	
3.0	4.0		CEN	Clay lateritic	mottled brown grey	clay to vf sand	firm	
4.0	6.0		PRO	Siltstone ferruginous Dolomite siliceous	medium red brown weathered, silicified balbirini dolomite	med silt to f sand	strong	
6.0	8.0		PRO	Siltstone ferruginous	medium red brown	med silt to f sand	strong	
8.0	10.0		PRO	Siltstone ferruginous sandy	banded brown grey	med silt to f sand	strong	
10.0	12.0		PRO	Siltstone ferruginous sandy	banded brown grey	med silt to f sand	strong	
12.0	18.0	DZ1293	PRO	Siltstone ferruginous sandy	banded brown grey	med silt to f sand	strong	

EOH at 18.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR154

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRO

JOB NO : MBK

DATE DRILLED: 31-AUG-94

TOTAL DEPTH : 18.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 519220

NORTHING: 8343150

R.L.: 15.0

AZIM.: 15.0

INCL.:

COMMENTS:

SHEET 1 OF 1 HOLE NUMBER : TRR154

DEPTHS From (m)	To (m)	SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
0.0	2.0		CEN	Laterite pisolitic Sand	medium red brown	med sand to s pebble	weak	
2.0	3.0		CEN	Clay lateritic	mottled grey brown	clay to f sand	stiff	
4.0	6.0		PRO	Siltstone ferruginous laminated Sandstone	banded brown grey	med silt to vf sand	strong	
6.0	8.0		PRO	Siltstone cherty laminated	weathered, silicified balbirini dolomite? banded brown grey	med silt to vf sand	strong	
8.0	10.0		PRO	Siltstone cherty laminated Sandstone	banded brown grey	med silt to vf sand	strong	
10.0	12.0		PRO	Siltstone cherty laminated	banded brown grey	med silt to vf sand	strong	
12.0	14.0	DZ1294	PRO	Siltstone cherty laminated	banded brown grey	med silt to vf sand	strong	
14.0	18.0	DZ1294	PRO	Sandstone silty	patchy pink grey	med silt to f sand	mod'ly strong	

EOH at 18.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR155

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRD

JOB NO : MBK

DATE DRILLED: 31-AUG-94

TOTAL DEPTH : 36.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 514565

NORTHING: 8345034

R.L.: 15.0

AZIM.: 15.0

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR155

DEPTHS From (m)	To (m)	SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
0.0	2.0		CEN	Laterite pisolitic Sand	medium red brown	f sand to vs pebble	weak	
2.0	4.0		CEN	Laterite Clay sandy	medium red brown	vf sand to med sand	weak	
4.0	6.0		CRE	Siltstone ferruginous Sandstone clayey	patchy grey brown could be basement	med silt to vf sand	strong	
6.0	8.0		CRE	Siltstone ferruginous	patchy grey brown could be basement	med silt to vf sand	strong	
8.0	10.0		CRE	Siltstone ferruginous	patchy grey brown could be basement	med silt to vf sand	strong	
10.0	12.0		CRE	Siltstone ferruginous sandy	patchy grey brown could be basement	med silt to vf sand	strong	
12.0	14.0		CRE	Chert laminated Siltstone ferruginous	dark grey brown could be basement	med silt	strong	
14.0	16.0		CRE	Chert laminated Sandstone ferruginous	dark grey brown could be basement	med silt	strong	
16.0	18.0		CRE	Sandstone silty shaly	light brown could be basement	med silt to f sand	strong	
18.0	20.0		CRE	Chert Sandstone silty	could be basement banded grey brown could be basement	med silt	weak	
20.0	22.0		CRE	Chert Sandstone silty	banded grey brown could be basement	med silt	weak	
22.0	24.0		PRO	Chert laminated Sandstone silty ferruginous	banded grey brown water table	med silt	weak	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		PRO	Chert laminated Sandstone silty ferruginous	banded grey brown	med silt	weak	
26.0	28.0		PRO	Chert laminated Sandstone silty ferruginous	banded grey brown	med silt	weak	
28.0	30.0		PRO	Chert laminated Sandstone silty ferruginous	banded grey brown	med silt	weak	
30.0	32.0	DZ1295	PRO	Sandstone shaly	light brown	f sand	mod'ly strong	
32.0	34.0	DZ1295	PRO	Chert laminated	medium grey	med silt	mod'ly strong	
34.0	36.0	DZ1295	PRO	Chert laminated Sandstone	medium grey	med silt	mod'ly strong	

EOH at 36.0 m

PROJECT : Carpentaria Mn
LOCALITY: EL7341
SHEET : Towns
JOB NO : MBK
GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 517733 NORTHING: 8344770 R.L.: 15.0 AZIM.: INCL.:
MANGANESE LOGSHEET
CONTRACTOR : GADEN DRILLING
RIG TYPE : UDR 650
DATE DRILLED: 31-AUG-94
HOLE NUMBER : TRR156
LOGGED BY : PRD
TOTAL DEPTH : 36.0
COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR156

DEPTHS From (m)	To (m)	SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
0.0	2.0		CEN	Laterite pisolitic Sand	medium red brown	f sand to s pebble	weak	
2.0	4.0		CEN	Clay Laterite	mottled brown grey	clay to f sand	stiff	
4.0	6.0		CEN	Clay sandy Sandstone ferruginous	mottled brown grey	clay to f sand	stiff	
6.0	8.0		CRE	Clay sandy	patchy grey brown	clay to f sand	stiff	
8.0	10.0		CRE	Clay sandy	light grey	clay to f sand	stiff	trace <0.5%
10.0	12.0		PRO	Claystone sandy	trace disseminated mnox light grey	clay to f sand	stiff	trace <0.5%
12.0	14.0		PRO	Claystone sandy Chert	light grey	clay to f sand	stiff	trace <0.5%
14.0	16.0		PRO	Chert Sandstone clayey	light grey	med silt	weak	
16.0	18.0		PRO	Chert Sandstone clayey	light grey	med silt	weak	
18.0	20.0		PRO	Sandstone silty Chert	pale grey	vf sand	weak	
20.0	22.0		PRO	Chert laminated	light grey brown	med silt	mod'ly strong	
22.0	24.0		PRO	Chert laminated	basement? (silicified balbirini dolomite?) light grey brown basement?	med silt	mod'ly strong	

DEPTHS From (m)	To (m)	SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATE PERCENT MN OXI
24.0	26.0		PRO	Chert laminated Clay	light grey brown basement?	med silt	mod'ly strong	
26.0	28.0		PRO	Chert laminated Siltstone sandy	medium grey brown	med silt	mod'ly strong	
28.0	30.0		PRO	Chert laminated Siltstone sandy	medium grey brown	med silt	mod'ly strong	
30.0	32.0	DZ1296	PRO	Sandstone silty	light brown	med silt to f sand	mod'ly strong	
32.0	36.0	DZ1296	PRO	Chert laminated Sandstone	banded grey brown	med silt to f sand	mod'ly strong	

EOH at 36.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR157

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 850

LOGGED BY : PRO

JOB NO : MBK

DATE DRILLED: 31-AUG-94

TOTAL DEPTH : 28.0

GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 518017 NORTHING: 8348400 R.L.: 15.0 AZIM.: INCL.:

COMMENTS:

SHEET 1 OF 1 HOLE NUMBER : TRR157

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite	medium red brown	f sand to vs pebble	weak	
				Clay sandy				
2.0	4.0		OTH	Claystone sandy	pale grey white	clay to f sand	weak	
4.0	6.0		CRE	Claystone sandy	palest grey white	clay to f sand	mod'ly strong	
6.0	8.0		CRE	Claystone sandy	palest grey white	clay to f sand	mod'ly strong	
8.0	10.0		CRE	Claystone sandy	palest grey white	clay to f sand	mod'ly strong	trace <0.5%
10.0	12.0		CRE	Claystone sandy	pale brown grey	clay to f sand	weak	
12.0	14.0			No sample return				
14.0	16.0		CRE	Chert laminated Sandstone ferruginous	patchy brown grey	med silt to vf sand	weak	
16.0	18.0		CRE	Chert laminated Claystone sandy	patchy brown grey	med silt to vf sand	weak	
18.0	20.0		CRE	Chert laminated Claystone sandy	patchy brown grey	med silt to vf sand	weak	
20.0	22.0		PRO	Dolomite siliceous laminated	medium grey	med silt	strong	
22.0	24.0		PRO	Dolomite massive	balbirini dolomite dark grey	med silt	strong	
24.0	28.0	DZ1297	PRO	Dolomite laminated siliceous	dark grey	med silt	very strong	

EOH at 28.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR158

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRO

JOB NO : MBK

DATE DRILLED: 31-AUG-94

TOTAL DEPTH : 30.0

GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 519228 NORTHING: 8344774 R.L.: 15.0 AZIM.: INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR158

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite pisolitic Sand	medium red brown	med sand to s pebble	weak	
2.0	4.0		CEN	Clay lateritic	medium red brown	clay to f sand	stiff	
4.0	6.0		CRE	Claystone silty	light pink grey	clay to vf sand	weak	trace <0.5%
6.0	8.0		CRE	Claystone sandy	pale grey white	clay to f sand	weak	trace <0.5%
8.0	10.0		CRE	Claystone sandy	pale grey white	clay to f sand	weak	
10.0	12.0		CRE	Claystone sandy Sandstone ferruginous	medium red brown	clay to f sand	weak	
12.0	14.0		OTH	Siltstone sandy ferruginous Claystone sandy	medium red brown	med silt to vf sand	mod'ly strong	
14.0	16.0		OTH	Chert laminated Sandstone ferruginous	probably basement medium red brown	med silt	mod'ly strong	
16.0	18.0		OTH	Sandstone Chert laminated	banded grey brown	f sand	mod'ly strong	
18.0	20.0		OTH	Sandstone	medium grey	vf sand to f sand	mod'ly strong	
20.0	22.0		OTH	Sandstone	medium grey	vf sand to f sand	mod'ly strong	
22.0	24.0		PRO	Sandstone Chert laminated	medium grey	vf sand to f sand	mod'ly strong	

DEPTHS From To (m) (m)		SAMPLE NUMBER	GEOLOGICAL TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
24.0	26.0	DZ1298	PRO	Sandstone	medium grey	vf sand to f sand	mod'ly strong	
				Chert laminated				
26.0	28.0	DZ1298	PRO	Sandstone	medium grey	vf sand to f sand	mod'ly strong	
				Chert laminated				
28.0	30.0	DZ1298	PRO	Chert laminated Sandstone	medium grey	med silt	strong	
					silicified dolomite?			

EOH at 30.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

LOCALITY: EL7341

SHEET : Towns

JOB NO : MBK

CONTRACTOR : GADEN DRILLING

RIG TYPE : UDR 650

DATE DRILLED: 01-SEP-94

HOLE NUMBER : TRR159

LOGGED BY : PRD

TOTAL DEPTH : 30.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 521950

NORTHING: 8349450

R.L.: 15.0

AZIM.: 15.0

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR159

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT Mn OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite pisolitic Clay	medium red brown	f sand to vs pebble	stiff	
2.0	4.0		CEN	sandy ferruginous Clay calcareous sandy	medium grey	clay to f sand	stiff	trace <0.5%
4.0	6.0		CEN	Clay calcareous sandy	trace disseminated mnox, <0.5% medium grey	clay to f sand	stiff	trace <0.5%
6.0	8.0		CEN	Carbonate clayey	light grey	clay to med silt	weak	trace <0.5%
8.0	10.0		CEN	Carbonate	light grey	clay to med silt	weak	trace <0.5%
10.0	12.0		CEN	Carbonate	pale pink grey	clay to med silt	weak	trace <0.5%
12.0	14.0		CEN	Carbonate	light brown grey	clay to med silt	mod'ly strong	
14.0	16.0		CEN	Carbonate	appears to be same rock as at bottom of trr44 light brown grey	clay to med silt	mod'ly strong	
16.0	18.0	DZ 522	CRE	Clay silty	light grey	clay to vf sand	firm	0.5 - 5%
18.0	18.5	DZ 523	CRE	Clay silty	light green grey	clay to vf sand	firm	trace <0.5%
18.5	19.0		CRE	Clay silty Sandstone ferruginous	medium brown	clay to f sand	soft	
19.0	19.5		CRE	Clay silty Sandstone ferruginous	medium brown	clay to f sand	soft	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
19.5	20.0		CRE	Clay silty Sandstone ferruginous	medium brown	clay to f sand	soft	
20.0	22.0		CRE	Clay silty Sandstone silty	light brown grey	clay to f sand	firm	
22.0	24.0		PRO	Sandstone silty shaly	light green grey	vf sand to f sand	weak	
24.0	26.0	DZ1299	PRO	Sandstone silty shaly	light green grey	vf sand to f sand	weak	
26.0	28.0	DZ1299	PRO	Sandstone ferruginous	patchy grey brown	f sand to med sand	mod'ly strong	
28.0	30.0	DZ1299	PRO	Sandstone ferruginous	patchy grey brown	f sand to med sand	mod'ly strong	

EOH at 30.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR160

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRD

JOB NO : MBK

DATE DRILLED: 01-SEP-94

TOTAL DEPTH : 30.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 525500

NORTHING: 8351980

R.L.: 15.0

AZIM.: 15.0

INCL.:

COMMENTS:

SHEET 1 OF 1 HOLE NUMBER : TRR160

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite pisolitic clayey	medium red brown	clay to s pebble	stiff	
2.0	4.0		CRE	Sand ferruginous clayey	patchy grey brown	vf sand to med sand	firm	
4.0	6.0		CRE	Sand ferruginous clayey	patchy grey brown	vf sand to med sand	firm	
6.0	8.0		CRE	Clay sandy	light brown	clay to f sand	stiff	
8.0	10.0		CRE	Clay sandy	medium khaki brown	clay to f sand	stiff	
10.0	12.0		CRE	Clay silty	medium pink brown	clay to med silt	stiff	
12.0	14.0		CRE	Clay silty	medium pink brown	clay to med silt	stiff	
14.0	16.0		CRE	Clay silty	medium pink brown	clay to med silt	stiff	
16.0	18.0		CRE	Clay sandy	medium pink brown	clay to vf sand	firm	
18.0	20.0		CRE	Clay sandy	medium pink brown	clay to vf sand	firm	
20.0	22.0		OTH	Sandstone shaly silty	light green grey basement?	vf sand to f sand	weak	
22.0	24.0		PRO	Sandstone shaly silty	light green grey	vf sand to f sand	weak	
24.0	30.0	DZ1300	PRO	Sandstone shaly	medium grey	vf sand to f sand	strong	

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR161

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRO

JOB NO : MBK

DATE DRILLED: 01-SEP-94

TOTAL DEPTH : 48.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 525479

NORTHING: 8348560

R.L.: 15.0

AZIM.: 15.0

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR161

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite pisolitic Sand	medium red brown	f sand to s pebble	weak	
2.0	4.0		CEN	Sandstone ferruginous clayey	medium orange brown	f sand to med sand	weak	
4.0	6.0		CRE	Sandstone ferruginous clayey	medium orange brown	f sand to med sand	weak	
6.0	8.0		CRE	Clay sandy Sandstone ferruginous	patchy brown grey	clay to f sand	stiff	
8.0	10.0		CRE	Clay silty	light grey	clay to med silt	stiff	
10.0	12.0	DZ 524	CRE	Clay silty	light grey	clay to med silt	stiff	trace <0.5%
12.0	14.0		CRE	Clay sandy	light brown grey	clay to f sand	firm	
14.0	16.0		CRE	Clay sandy	medium brown grey	clay to med sand	firm	
16.0	18.0		CRE	Sandstone ferruginous clayey	patchy brown grey	f sand to med sand	weak	
18.0	20.0		CRE	Sandstone ferruginous clayey Clay sandy	light pink brown	f sand to med sand	weak	
20.0	22.0		OTH	Sandstone ferruginous clayey	patchy brown grey	f sand to med sand	weak	
22.0	24.0		OTH	Sandstone ferruginous clayey	patchy brown grey	f sand to med sand	weak	

DEPTHS From To (m) (m)		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
24.0	26.0		OTH	Sandstone ferruginous clayey Clay	patchy brown grey	f sand to med sand	weak	
26.0	28.0		OTH	Sandstone ferruginous clayey Clay	patchy brown grey	f sand to med sand	weak	
28.0	30.0		OTH	Sandstone clayey Clay	light brown	f sand to med sand	weak	
30.0	32.0		OTH	Sandstone quartzose clayey	light brown	f sand to c sand	weak	
32.0	34.0		OTH	Sandstone quartzose clayey	light brown	f sand to c sand	weak	
34.0	36.0		OTH	Sandstone quartzose gritty	light brown	med sand to vc sand	weak	
36.0	38.0		CRE	Grit sandy	light yellow brown	med sand to granule	weak	
38.0	40.0		CRE	Grit sandy	light yellow brown	med sand to granule	weak	
40.0	42.0		CRE	Grit sandy	light yellow brown	med sand to granule	weak	
42.0	44.0		CRE	Sand gritty Sandstone	medium brown	f sand to c sand	weak	
44.0	46.0	DZ1301	PRO	Sandstone ferruginous	medium orange brown	vf sand to f sand	mod'ly strong	
46.0	48.0	DZ1301	PRO	Sandstone ferruginous	medium orange brown	vf sand to f sand	mod'ly strong	

EOH at 48.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR162

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRD

JOB NO : MBK

DATE DRILLED: 01-SEP-94

TOTAL DEPTH : 42.0

GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 525545 NORTHING: 8345485 R.L.: 15.0 AZIM.: INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR162

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite pisolitic Sand	medium red brown	f sand to s pebble	weak	
2.0	4.0		CEN	Clay lateritic sandy	medium red brown	clay to f sand	stiff	
4.0	6.0		CRE	Clay sandy	medium brown grey	clay to f sand	stiff	
6.0	8.0		CRE	Clay sandy	medium brown grey	clay to f sand	stiff	
8.0	10.0		CRE	Sandstone	medium grey	vf sand to f sand	weak	
10.0	12.0		CRE	Chert laminated Clay sandy Chert	medium grey	clay to f sand	stiff	
12.0	14.0		CRE	Clay sandy Chert	medium grey	clay to f sand	stiff	
14.0	16.0		CRE	Clay silty	medium orange brown	clay to f sand	stiff	
16.0	18.0		CRE	Clay silty Chert	medium orange brown	clay to f sand	stiff	
18.0	20.0		CRE	Clay sandy Chert	medium orange brown	clay to f sand	stiff	
20.0	22.0		CRE	Chert laminated Sandstone	medium brown	med silt to vf sand	weak	
22.0	24.0		CRE	ferruginous clayey Sandstone ferruginous	dark brown	f sand to med sand	weak	trace <0.5%
				basement?				

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Sandstone ferruginous	dark brown	f sand to med sand	weak	
26.0	28.0		CRE	Sandstone ferruginous	dark brown	f sand to med sand	weak	
28.0	30.0		CRE	Sandstone ferruginous shaly	medium brown	vf sand to f sand	mod'ly strong	
30.0	32.0		PRO	Sandstone shaly	medium brown	med sand	mod'ly strong	
32.0	34.0		PRO	Sandstone shaly	probably pro since 22m medium brown	f sand to med sand	mod'ly strong	
34.0	36.0		PRO	Sandstone	v. minor cherty fragments medium grey brown	f sand to med sand	mod'ly strong	
36.0	38.0	DZ1302	PRO	Sandstone	medium grey brown	f sand to med sand	mod'ly strong	
38.0	40.0	DZ1302	PRO	Siltstone siliceous laminated Dolomite massive	dark grey	med silt to vf sand	strong	
40.0	42.0	DZ1302	PRO	Dolomite massive	dark grey	med silt to vf sand	strong	

EOH at 42.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR163

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRO

JOB NO : MBK

DATE DRILLED: 01-SEP-94

TOTAL DEPTH : 38.0

GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 525483 NORTHING: 8342545 R.L.: 15.0 AZIM.: INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR163

DEPTHS From (m)	To (m)	SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
0.0	2.0		CEN	Laterite pisolitic Sand	medium red brown	med sand to s pebble	weak	
2.0	4.0		CEN	Clay ferruginous sandy	medium red brown	clay to med sand	stiff	
4.0	6.0		CRE	Clay sandy	medium grey	clay to med sand	stiff	
6.0	8.0		CRE	Clay sandy	medium grey	clay to med sand	stiff	
8.0	10.0		CRE	Clay sandy Carbonate	medium grey	clay to med sand	stiff	
10.0	12.0		CRE	Clay sandy Carbonate	medium grey	clay to med sand	stiff	trace <0.5%
12.0	14.0		CRE	Sandstone ferruginous	mn occurs as small grains in carbonate fragments dark brown			
						f sand to med sand	weak	
14.0	16.0		CRE	Sandstone ferruginous Chert	dark brown	f sand to med sand	weak	
16.0	18.0		CRE	Sandstone shaly	medium brown	f sand to med sand	weak	
18.0	20.0		CRE	Sandstone shaly Chert	medium brown	f sand to med sand	weak	
20.0	22.0		CRE	laminated Sandstone shaly	basement? dark brown	f sand to med sand	weak	
22.0	24.0		CRE	Clay Sandstone ferruginous	medium orange brown	clay to vf sand	firm	

DEPTHS From To (m) (m)		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
24.0	26.0		CRE	Clay	medium orange brown	clay to vf sand	firm	
				Sandstone ferruginous				
26.0	28.0		CRE	Chert laminated algal Clay ferruginous	medium orange brown	clay to vf sand	firm	
28.0	30.0		CRE	Chert laminated Sandstone ferruginous	medium orange brown	clay to vf sand	firm	
30.0	32.0		CRE	Chert laminated Sandstone ferruginous	medium orange brown	clay to vf sand	firm	trace <0.5%
32.0	34.0		PRO	Sandstone	mn occurs as coating on fractures in sandstone medium orange brown	f sand to med sand	strong	
34.0	36.0	DZ1303	PRO	Chert laminated Sandstone massive	probably basement medium brown	f sand to med sand	strong	
36.0	38.0	DZ1303	PRO	Sandstone massive Siltstone	medium brown	f sand to med sand	strong	

EOH at 38.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR164

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRO

JOB NO : MBK

DATE DRILLED: 02-SEP-94

TOTAL DEPTH : 24.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 522500

NORTHING: 8342490

R.L.: 15.0

AZIM.: 15.0

INCL.:

COMMENTS:

SHEET 1 OF 1 HOLE NUMBER : TRR164

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite Sand	medium red brown	f sand to s pebble	weak	
2.0	4.0		CEN	Clay sandy ferruginous Carbonate	light red brown	clay to med sand	stiff	
4.0	6.0		CEN	Clay sandy ferruginous Carbonate	light red brown	clay to med sand	stiff	
6.0	8.0		CRE	Clay sandy ferruginous	patchy brown grey	clay to f sand	firm	
8.0	10.0		CRE	Clay Sandstone ferruginous	patchy brown grey	clay to f sand	firm	
10.0	12.0		CRE	Siltstone laminated Sandstone ferruginous	patchy brown grey basement?	med silt to vf sand	mod'ly strong	
12.0	14.0		CRE	Siltstone laminated Clay sandy ferruginous	patchy brown grey	med silt to vf sand	mod'ly strong	
14.0	16.0		CRE	Sandstone shaly silty Clay sandy ferruginous	patchy brown grey	f sand to med sand	weak	
16.0	18.0		PRO	Sandstone shaly ferruginous	dark brown	f sand to med sand	strong	
18.0	24.0	DZ1304	PRO	Sandstone shaly ferruginous	slight purplish tinge to deep brown dark brown	f sand to med sand	strong	

EOH at 24.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR165

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRD

JOB NO : MBK

DATE DRILLED: 02-SEP-94

TOTAL DEPTH : 30.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 520530

NORTHING: 8340990

R.L.: 15.0

AZIM.: 15.0

INCL.:

COMMENTS:

SHEET 1 OF 1 HOLE NUMBER : TRR165

DEPTHS From To (m) (m)	SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
0.0 2.0		CEN	Laterite pisolitic Sand	medium red brown	f sand to s pebble	weak	
2.0 4.0		CEN	Laterite sandy	medium red brown	f sand to med sand	weak	
4.0 6.0		CRE	Sandstone ferruginous Claystone	patchy brown grey	f sand to med sand	weak	
6.0 8.0		CRE	Sand clayey Sandstone ferruginous	light orange brown	med sand to vc sand	weak	
8.0 10.0		CRE	Sandstone Clay sandy	light grey	med sand	weak	
10.0 12.0		CRE	Claystone sandy	light grey	clay to med sand	weak	
12.0 14.0		CRE	Clay Sandstone ferruginous	medium orange brown basement?	clay to vf sand	stiff	
14.0 16.0		CRE	Sandstone clayey Clay	medium orange brown	med sand to c sand	weak	
16.0 18.0		CRE	Sandstone clayey Clay	medium orange brown	med sand to c sand	weak	
18.0 20.0		CRE	Sandstone clayey Clay	medium orange brown	med sand to c sand	weak	
20.0 22.0		OTH	Sandstone ferruginous quartzose	medium brown	med sand	mod'ly strong	
22.0 24.0		PRO	Sandstone ferruginous	probably basement medium brown	med sand	strong	
24.0 30.0	DZ1305	PRO	Sandstone ferruginous	medium brown	med sand	strong	

EOH at 30.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR166

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRD

JOB NO : MBK

DATE DRILLED: 02-SEP-94

TOTAL DEPTH : 36.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 519550

NORTHING: 8358740

R.L.: 15.0

AZIM.:

INCL.:

COMMENTS: PVC to 36 m for EM probe

SHEET 1 OF 2 HOLE NUMBER : TRR166

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Clay sandy Laterite	dark grey brown	clay to f sand	hard	
2.0	4.0		CEN	Clay sandy	medium grey brown	clay to f sand	hard	
4.0	6.0		CRE	Sandstone ferruginous weathered	patchy grey brown	f sand to med sand	mod'ly strong	
6.0	8.0		CRE	Sandstone ferruginous weathered	patchy grey brown	f sand to med sand	mod'ly strong	
8.0	10.0		CRE	Clay sandy ferruginous	patchy grey brown	clay to f sand	firm	
10.0	12.0		CRE	Conglomerate sandy ferruginous	medium red brown	f sand to s pebble	firm	
12.0	14.0		CRE	Clay silty	medium grey	clay to med silt	hard	
14.0	16.0		CRE	Clay silty	trace mn in clay medium grey	clay to med silt	hard	
16.0	18.0		CRE	Clay sandy	medium khaki grey	clay to med sand	firm	
18.0	20.0		CRE	Clay sandy	medium khaki grey	clay to med sand	firm	
20.0	22.0		PRO	Sandstone ferruginous	patchy brown grey	med sand to c sand	weak	
22.0	24.0		PRO	Sandstone ferruginous	weathered basement? patchy brown grey	med sand to c sand	weak	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		PRO	Siltstone sandy Sandstone ferruginous	light green grey	med silt to f sand	mod'ly strong	
26.0	28.0		PRO	Siltstone sandy Sandstone ferruginous	light green grey	med silt to f sand	mod'ly strong	
28.0	30.0	DZ1306	PRO	Sandstone silty Siltstone cherty laminated	light brown grey	f sand to med sand	mod'ly strong	
30.0	32.0	DZ1306	PRO	Sandstone ferruginous Siltstone cherty laminated	light brown grey	f sand to med sand	mod'ly strong	
32.0	34.0	DZ1306	PRO	Sandstone ferruginous	dark brown	f sand to med sand	mod'ly strong	trace <0.5%
34.0	36.0	DZ1306	PRO	Sandstone ferruginous	dark brown	f sand to med sand	mod'ly strong	trace <0.5%

EOH at 36.0 m

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0	DZ1323	PRO	Sandstone quartzose massive	light brown grey	med sand to c sand	strong	
26.0	28.0	DZ1323	PRO	Sandstone quartzose massive	light brown grey	med sand to c sand	strong	
28.0	30.0	DZ1323	PRO	Sandstone quartzose massive Siltstone siliceous	light brown grey	med sand to c sand	strong	

EOH at 30.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR167

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRO

JOB NO : MBK

DATE DRILLED: 03-SEP-94

TOTAL DEPTH : 30.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 519463

NORTHING: 8354958

R.L.: 15.0

AZIM.: 15.0

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR167

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite pisolitic Sand	medium red brown	f sand to vs pebble	weak	
2.0	4.0		CRE	Clay	patchy khaki grey mn "wad" in clay	clay to med silt	firm	trace <0.5%
4.0	6.0		CRE	Clay sandy	medium khaki grey	clay to med sand	hard	
6.0	8.0		CRE	Clay sandy	medium khaki grey	clay to med sand	hard	
8.0	10.0		CRE	Clay silty	light brown grey	clay to med silt	firm	trace <0.5%
10.0	12.0		CRE	Clay sandy	light pink grey	clay to f sand	firm	
12.0	14.0		CRE	Clay sandy Conglomerate	light pink grey	clay to f sand	firm	
14.0	16.0		CRE	Clay sandy Sandstone ferruginous	medium brown	clay to f sand	firm	
16.0	18.0		CRE	Clay sandy Sandstone ferruginous	medium brown	clay to f sand	firm	
18.0	20.0		OTH	Sandstone ferruginous Clay	medium brown	med sand to c sand	weak	
20.0	22.0		OTH	Sandstone ferruginous	basement? medium orange brown	med sand to c sand	weak	
22.0	24.0		OTH	Sandstone ferruginous Clay	basement? medium orange brown	med sand to c sand	weak	

appears to have laterite pisolites, weathered pro or contam.

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)					
24.0	26.0	DZ1323	PRO	Sandstone quartzose massive	strong	
26.0	28.0	DZ1323	PRO	Sandstone quartzose massive	strong	
28.0	30.0	DZ1323	PRO	Sandstone quartzose massive Siltstone siliceous	strong	
EOH at 30.0 m						

2 HOLE NUMBER : TRR167

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR168

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRD

JOB NO : MBK

DATE DRILLED: 04-SEP-94

TOTAL DEPTH : 72.0

GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 521430 NORTHING: 8354870 R.L.: 15.0 AZIM.: INCL.:

COMMENTS: PVC to 72 m for EM probe

SHEET 1 OF 3 HOLE NUMBER : TRR168

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Sand Laterite	medium red brown	f sand to vc sand	stiff	
2.0	4.0		CRE	Sandstone silty	light pink brown	vf sand to f sand	strong	
4.0	6.0		CRE	Sandstone silty Mudstone shaly	well indurated - proterozoic? light orange brown	vf sand to f sand	weak	
6.0	8.0		CRE	Mudstone ferruginous shaly	light orange brown	med silt to f sand	weak	
8.0	10.0		CRE	Mudstone clayey	light orange brown	med silt to vf sand	weak	
10.0	12.0		CRE	Mudstone clayey	light orange brown	med silt to vf sand	weak	
12.0	14.0		CRE	Claystone	light red brown	clay to med silt	weak	
14.0	16.0		CRE	Claystone	light red brown	clay to med silt	weak	
16.0	18.0		CRE	Claystone	light khaki grey	clay to med silt	weak	
18.0	20.0		CRE	Claystone	medium red brown	clay to med silt	weak	
20.0	22.0		CRE	Claystone	medium red brown	clay to med silt	weak	
22.0	24.0		CRE	Claystone	light pink grey	clay to med silt	weak	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Claystone	light pink grey	clay to med silt	weak	
26.0	28.0		CRE	Claystone	light pink grey	clay to med silt	mod'ly strong	
28.0	30.0		CRE	Mudstone ferruginous Mudstone clayey sandy	banded brown grey	clay to f sand	mod'ly strong	
30.0	32.0		CRE	Mudstone ferruginous	light orange brown water table	clay to f sand	mod'ly strong	
32.0	34.0		CRE	Claystone	medium grey	clay to med silt	weak	
34.0	36.0		CRE	Claystone	medium grey	clay to med silt	weak	
36.0	38.0		CRE	Claystone	medium grey	clay to med silt	weak	
38.0	40.0		CRE	Claystone	light grey brown	clay to med silt	weak	
40.0	42.0		CRE	Claystone	medium brown	clay to med silt	weak	
42.0	44.0		CRE	Claystone	medium brown	clay to med silt	weak	
44.0	46.0		CRE	Claystone	medium brown	clay to med silt	weak	
46.0	48.0		CRE	Claystone	medium brown	clay to med silt	weak	
48.0	50.0		CRE	Claystone	medium brown	clay to med silt	weak	
50.0	52.0		CRE	Claystone ferruginous	dark red brown	clay to med silt	weak	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
52.0	54.0		CRE	Claystone ferruginous	dark red brown	clay to med silt	weak	
54.0	56.0		CRE	Claystone ferruginous Mudstone sandy	dark red brown	clay to med silt	weak	
56.0	58.0		CRE	Mudstone clayey Clay ferruginous	banded grey brown	clay to vf sand	weak	
58.0	60.0		CRE	Mudstone ferruginous clayey	medium brown	clay to vf sand	weak	
60.0	62.0		CRE	Mudstone clayey	dark grey	clay to vf sand	weak	
62.0	64.0		CRE	Mudstone clayey	dark grey	clay to vf sand	weak	
64.0	66.0		OTH	Mudstone shaly	could be weathered basement (from 2m depth - no major change)		weak	
66.0	68.0		OTH	Mudstone shaly	dark brown	clay to vf sand	mod'ly strong	
68.0	70.0		OTH	Mudstone shaly	getting harder dark brown	clay to vf sand	mod'ly strong	
70.0	72.0	DZ1324	PRO	Shale sandy	prot? light green grey	med silt to vf sand	strong	

EOH at 72.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR169

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRO

JOB NO : MBK

DATE DRILLED: 04-SEP-94

TOTAL DEPTH : 54.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 522347

NORTHING: 8353163

R.L.: 15.0

AZIM.:

INCL.:

COMMENTS: PVC to 52 m for EM probe

SHEET 1 OF 2 HOLE NUMBER : TRR169

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite pisolitic Sand	medium red brown	med sand to s pebble	weak	
2.0	4.0		CEN	Clay lateritic sandy	mottled grey brown	clay to med sand	stiff	
4.0	6.0		CRE	Clay sandy	patchy brown grey	clay to f sand	firm	
6.0	8.0		CRE	Clay	light grey	clay to med silt	firm	trace <0.5%
8.0	10.0		CRE	Clay sandy	mn occurs as sub-millimetre laminations in clay		firm	
10.0	12.0		CRE	Clay sandy	light grey	clay to med sand	firm	
12.0	14.0		CRE	Sandstone ferruginous Claystone	trace disseminated mn patchy grey brown	med sand to c sand	weak	
14.0	16.0		CRE	<i>No sample return</i>				
16.0	18.0		CRE	Sandstone ferruginous conglomeratic	patchy grey brown	med sand to vc sand	weak	
18.0	20.0		CRE	Sandstone clayey	light grey	med sand to c sand	mod'ly strong	
20.0	22.0		CRE	Sandstone clayey Claystone	light grey	med sand to c sand	mod'ly strong	
22.0	24.0		CRE	Sandstone clayey gritty Claystone	light grey	med sand to c sand	mod'ly strong	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Sandstone clayey	light grey	vf sand to f sand	weak	
26.0	28.0		CRE	Sandstone clayey	light grey	vf sand to f sand	weak	
28.0	30.0		CRE	Sandstone clayey	light grey	vf sand to f sand	strong	
30.0	32.0		CRE	Sandstone clayey	prot. ? light grey	f sand to med sand	weak	
32.0	34.0		CRE	Sandstone clayey conglomeratic	light brown grey	f sand to vs pebble	weak	
34.0	36.0		CRE	Clay sandy conglomeratic Siltstone cherty	light yellow brown	clay to med sand	firm	
36.0	38.0		CRE	Clay sandy Sandstone ferruginous	distinct colour change light yellow brown	clay to med sand	firm	
38.0	40.0		CRE	Clay sandy Sandstone ferruginous	light yellow brown	clay to med sand	firm	
40.0	42.0		CRE	Clay sandy Sandstone ferruginous	light yellow brown	clay to med sand	firm	
42.0	44.0		CRE	Clay sandy Sandstone ferruginous	light yellow brown	clay to med sand	firm	
44.0	46.0		CRE	Clay sandy Sandstone ferruginous	light grey brown	clay to med sand	firm	
46.0	48.0		OTH	Sandstone quartzose Clay	light grey brown basement?	f sand to med sand	weak	
48.0	50.0	DZ1325	PRO	Sandstone quartzose	light grey brown	f sand to med sand	mod'ly strong	
50.0	54.0	DZ1325	PRO	Sandstone quartzose	light grey brown	f sand to med sand	mod'ly strong	

EOH at 54.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR170

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRO

JOB NO : MBK

DATE DRILLED: 04-SEP-94

TOTAL DEPTH : 28.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 520870

NORTHING: 8353260

R.L.: 15.0

AZIM.: 15.0

INCL.:

COMMENTS: PVC to 28 m for EM probe

SHEET 1 OF 1 HOLE NUMBER : TRR170

DEPTHS From To (m) (m)	SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
0.0 2.0		CEN	Laterite pisolitic Sand	medium red brown	med sand to s pebble	weak	
2.0 4.0		CEN	Clay lateritic Laterite	patchy brown grey	clay to f sand	firm	
4.0 6.0		CRE	Siltstone ferruginous	medium red brown	med silt to vf sand	mod'ly strong	
6.0 8.0		CRE	Siltstone ferruginous	medium red brown	med silt to vf sand	strong	
8.0 10.0		CRE	Siltstone ferruginous	medium red brown	med silt to vf sand	strong	
10.0 12.0		CRE	Mudstone shaly	medium red brown basement from 4m?	med silt to vf sand	mod'ly strong	
12.0 14.0		CRE	Mudstone shaly	medium red brown	med silt to vf sand	weak	
14.0 16.0		CRE	Mudstone shaly	light red brown	med silt to vf sand	weak	
16.0 18.0		CRE	Mudstone shaly	looks like same rocks as in trr168 light red brown	med silt to vf sand	weak	
18.0 20.0		CRE	Mudstone shaly Sandstone quartzose	light red brown basement?	med silt to vf sand	weak	
20.0 22.0		CRE	Mudstone shaly	light orange grey	med silt to vf sand	weak	
22.0 24.0		PRO	Sandstone quartzose siliceous	light grey	med sand to c sand	strong	
24.0 28.0	DZ1326	PRO	Sandstone quartzose siliceous	light grey	med sand to c sand	very strong	

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR171

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRD

JOB NO : MBK

DATE DRILLED: 04-SEP-94

TOTAL DEPTH : 48.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 525538

NORTHING: 8355490

R.L.: 15.0

AZIM.: 15.0

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR171

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite sandy Sand	medium red brown	f sand to vc sand	weak	
2.0	4.0		CEN	Clay lateritic	medium red brown	clay to f sand	stiff	
4.0	6.0		CRE	Clay sandy Sandstone ferruginous	patchy brown grey	clay to f sand	stiff	
6.0	8.0		CRE	Sand clayey	patchy brown grey	vf sand to med sand	firm	
8.0	10.0		CRE	Mudstone sandy	patchy brown grey	med silt to f sand	weak	
10.0	12.0		CRE	Conglomerate clayey	medium orange brown	med sand to med pebble	firm	
12.0	14.0		CRE	Clay sandy Sandstone ferruginous	pebbles to 2 cm, clasts of prot. snst patchy brown grey	clay to med sand	stiff	
14.0	16.0		CRE	Claystone sandy Sandstone ferruginous	patchy brown grey	clay to med sand	weak	
16.0	18.0		CRE	Claystone sandy Sandstone ferruginous	patchy brown grey	clay to med sand	weak	
18.0	20.0		CRE	Clay sandy	medium grey	clay to f sand	stiff	
20.0	22.0		CRE	Clay silty	medium grey	clay to med silt	stiff	
22.0	24.0		CRE	Clay sandy	medium grey	clay to med sand	stiff	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Clay sandy	medium grey	clay to med sand	stiff	
26.0	28.0		CRE	Claystone sandy Sandstone quartzose	medium grey	clay to med sand	mod'ly strong	
28.0	30.0		CRE	Claystone sandy Sandstone ferruginous	patchy brown grey	clay to med sand	mod'ly strong	
30.0	32.0		CRE	Claystone sandy Sandstone ferruginous	medium orange brown	clay to med sand	mod'ly strong	
32.0	34.0		CRE	Claystone sandy Sandstone ferruginous	medium orange brown	clay to med sand	mod'ly strong	
34.0	36.0		CRE	Clay Sandstone ferruginous	patchy brown grey	clay to f sand	firm	
36.0	38.0		CRE	Claystone Sandstone ferruginous	patchy brown grey	clay to f sand	firm	
38.0	40.0		OTH	Siltstone ferruginous	dark brown	med silt to f sand	mod'ly strong	
40.0	42.0		OTH	Siltstone ferruginous	basement? dark brown	med silt to f sand	mod'ly strong	
42.0	44.0			No sample return	basement?			
44.0	46.0		CRE	Clay Sandstone ferruginous	medium brown	clay to f sand	soft	
46.0	48.0	DZ1327	PRO	Siltstone laminated siliceous	light grey	med silt to vf sand	very strong	

EOH at 48.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR172

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRD

JOB NO : MBK

DATE DRILLED: 05-SEP-94

TOTAL DEPTH : 46.0

GRID: AMG

ZONE: 53

RELIABILITY: SATL

EASTING: 514535

NORTHING: 8351537

R.L.: 15.0

AZIM.: 15.0

INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR172

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite pisolitic Sand	medium red brown	med sand to s pebble	weak	
2.0	4.0		CEN	Clay lateritic	medium red brown	clay to f sand	stiff	
4.0	6.0		CRE	Clay sandy	medium grey	clay to f sand	stiff	
6.0	8.0		CRE	Clay sandy	medium grey	clay to f sand	stiff	
8.0	10.0		CRE	Claystone sandy	medium grey	clay to f sand	weak	
10.0	12.0		CRE	Claystone sandy	very poor sample return; hammer blocked twice, change bit			
					medium grey	clay to f sand	weak	
12.0	14.0		CRE	Claystone Sandstone	light pink grey	clay to f sand	mod'ly strong	trace <0.5%
14.0	16.0		CRE	Claystone Sandstone	light pink grey	clay to f sand	mod'ly strong	trace <0.5%
16.0	18.0		CRE	Claystone sandy	hard, change back to hammer light pink grey	clay to f sand	mod'ly strong	
18.0	20.0		CRE	Sandstone clayey	light green grey	med sand to c sand	mod'ly strong	
20.0	22.0		CRE	Sandstone clayey Chert	has lime green clay mineral in minor amounts light pink grey	f sand to c sand	mod'ly strong	
22.0	24.0		CRE	Sandstone clayey	light pink grey	f sand to c sand	mod'ly strong	

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
24.0	26.0		CRE	Sandstone clayey	light grey	f sand to med sand	mod'ly strong	
26.0	28.0		CRE	Sandstone clayey	light grey	f sand to med sand	mod'ly strong	
28.0	30.0		OTH	Sandstone massive quartzose	light brown grey	f sand to med sand	strong	
30.0	32.0		OTH	Sandstone massive quartzose	light brown grey	f sand to med sand	strong	
32.0	34.0		OTH	Sandstone massive quartzose	light brown grey	f sand to med sand	strong	
34.0	36.0		OTH	Sandstone quartzose quartzose Siltstone laminated siliceous	light grey	f sand to med sand	strong	
36.0	38.0		CRE	Clay silty	pale yellow brown	clay to med silt	firm	
38.0	40.0		OTH	Sandstone Clay	pale yellow brown	vf sand to f sand	weak	
40.0	42.0		CRE	Clay	light yellow brown	clay to med silt	soft	
42.0	46.0	DZ1328	PRO	Siltstone laminated siliceous	sample is wet clay with no rock chips banded grey brown silicified balbirini dolomite?	med silt	strong	

EOH at 46.0 m

MANGANESE LOGSHEET

PROJECT : Carpentaria Mn

HOLE NUMBER : TRR173

LOCALITY: EL7341

CONTRACTOR : GADEN DRILLING

SHEET : Towns

RIG TYPE : UDR 650

LOGGED BY : PRD

JOB NO : MBK

DATE DRILLED: 05-SEP-94

TOTAL DEPTH : 38.0

GRID: AMG ZONE: 53 RELIABILITY: SATL EASTING: 513500 NORTHING: 8348990 R.L.: 15.0 AZIM.: INCL.:

COMMENTS:

SHEET 1 OF 2 HOLE NUMBER : TRR173

DEPTHS		SAMPLE NUMBER	GEOL. TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
From (m)	To (m)							
0.0	2.0		CEN	Laterite pisolitic Sand	medium red brown	med sand to s pebble	weak	
2.0	4.0		CEN	Clay lateritic	patchy brown grey	clay to f sand	firm	
4.0	6.0		CRE	Clay sandy	light grey	clay to f sand	firm	
6.0	8.0		CRE	Claystone sandy	medium khaki grey	clay to f sand	weak	
8.0	10.0		CRE	Claystone sandy	medium khaki grey	clay to f sand	weak	
10.0	12.0		CRE	Claystone sandy	medium khaki grey	clay to f sand	weak	
12.0	14.0		CRE	Claystone	light pink grey	clay to vf sand	weak	trace <0.5%
14.0	16.0	DZ 525	CRE	Sandstone clayey Claystone	same as trr172 12-14m light pink grey	clay to vf sand	weak	0.5 - 5%
16.0	18.0		CRE	Sandstone clayey Siltstone shaly Claystone	dark grey	med silt to vf sand	strong	
18.0	20.0		CRE	Claystone Sandstone	light green grey	clay to f sand	weak	trace <0.5%
20.0	22.0		CRE	Claystone Sandstone	light green grey	clay to f sand	weak	
22.0	24.0		CRE	Claystone Sandstone ferruginous	lime green clay mineral present light green grey	clay to f sand	weak	

DEPTHS From To (m) (m)		SAMPLE NUMBER	GEOLOGICAL TIME	ROCK TYPES major/ minor	COLOUR	GRAINSIZE	STRENGTH OR HARDNESS	ESTIMATED PERCENT MN OXIDE
24.0	26.0		CRE	Sandstone quartzose ferruginous	patchy grey brown	med sand to c sand	weak	
26.0	28.0		CRE	Sandstone quartzose ferruginous Clay	patchy grey brown	med sand to c sand	weak	
28.0	30.0		CRE	Sandstone ferruginous Clay	patchy grey brown	med sand to c sand	weak	
30.0	32.0		CRE	Clay sandy	medium brown grey	clay to med sand	firm	
32.0	34.0		CRE	Clay Siltstone cherty	light brown grey	clay to med sand	firm	
34.0	35.5		CRE	Clay Siltstone cherty	light brown grey	clay to med sand	firm	
35.5	38.0	DZ1329	PRO	Dolomite massive	dark grey	med silt to vf sand	very strong	

EOH at 38.0 m

APPENDIX 8.

Manganese Summary Graphic Logs

LEGEND FOR GRAPHIC DRILL LOGS

Rock Types



Laterite, soil, surficial sand



Clay, claystone, silt, mudstone



Sand



Sandstone



Manganese ore



Mixed clay and chert



Conglomerate



Chert



Limestone, carbonate (general)



Shale, siltstone



Dolomite

Stratigraphy

CEN – undifferentiated Cenozoic

CRE – Cretaceous

PRO – undifferentiated Proterozoic

OTH – unknown

Mineralisation

MN1 <0.5% Mn Oxide

MN2 0.5–5% "

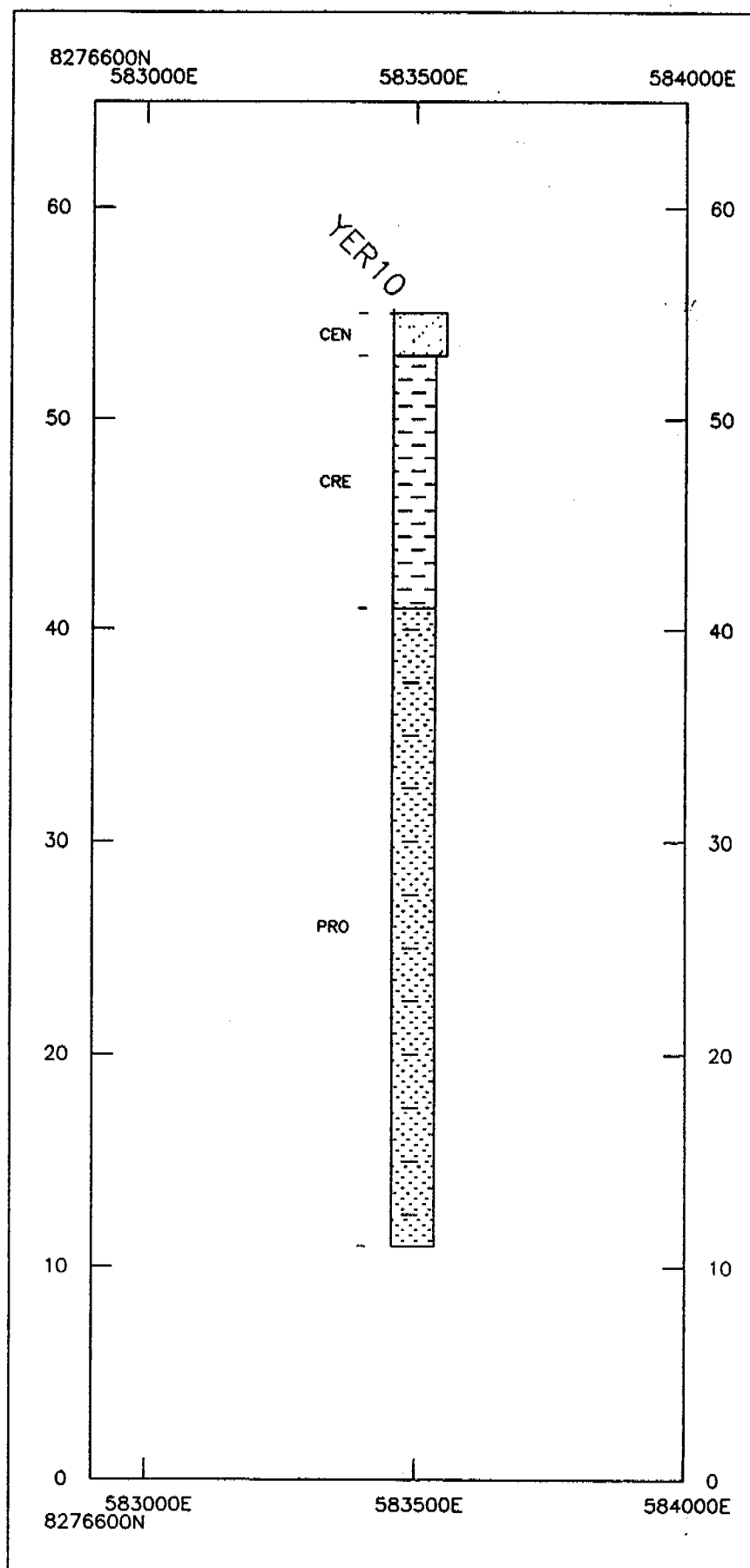
MN3 5–20% "

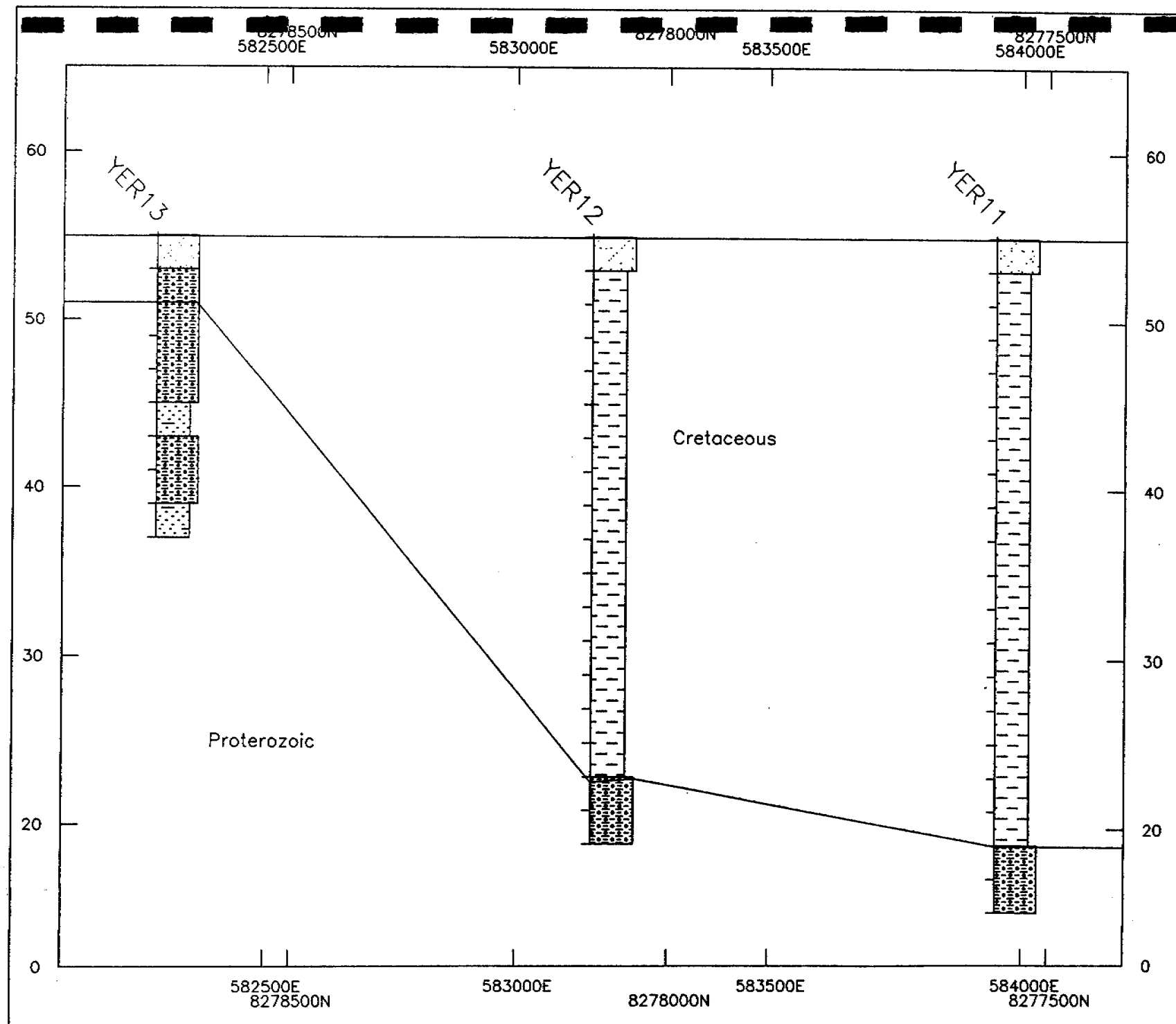
MN4 20–30% "

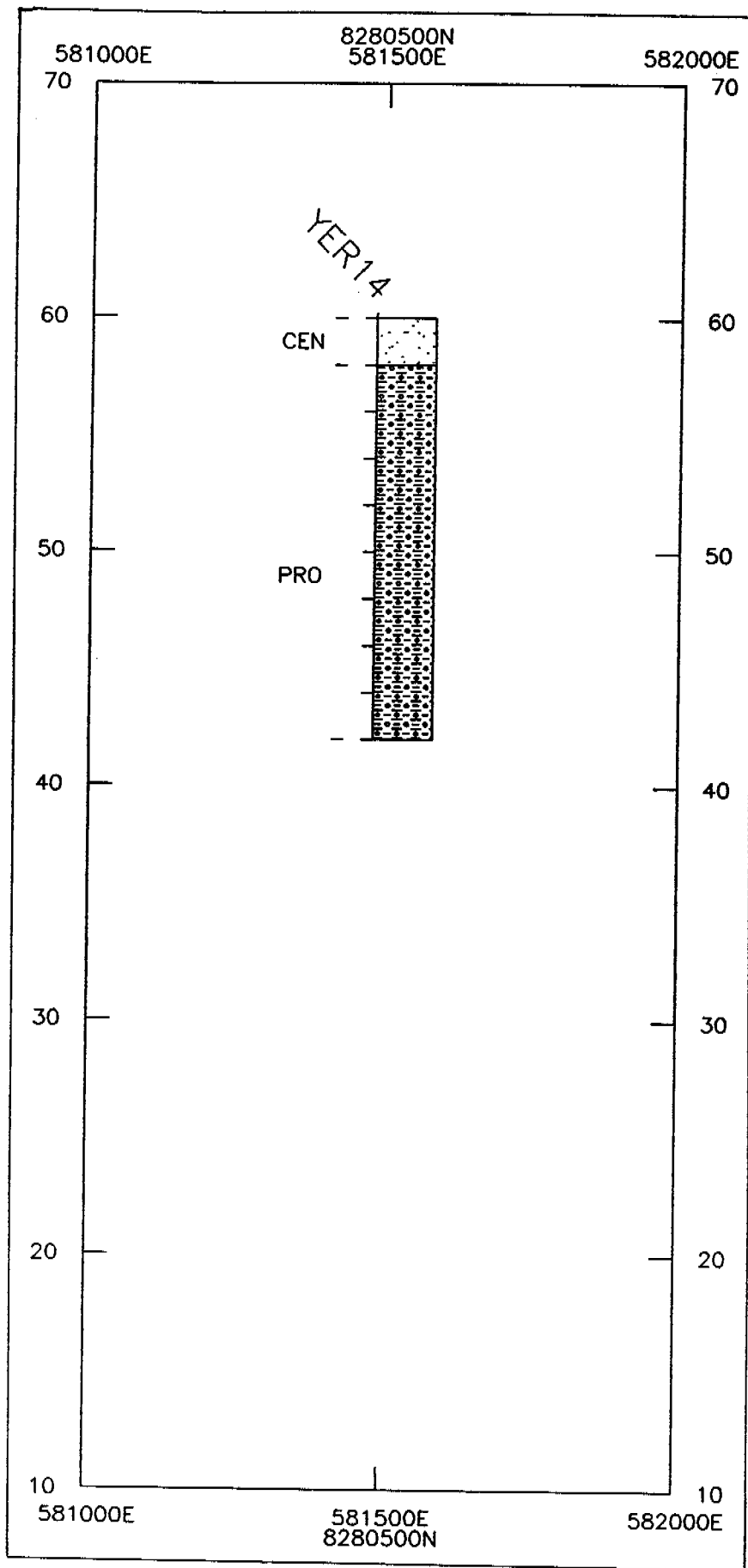
MN5 30–50% "

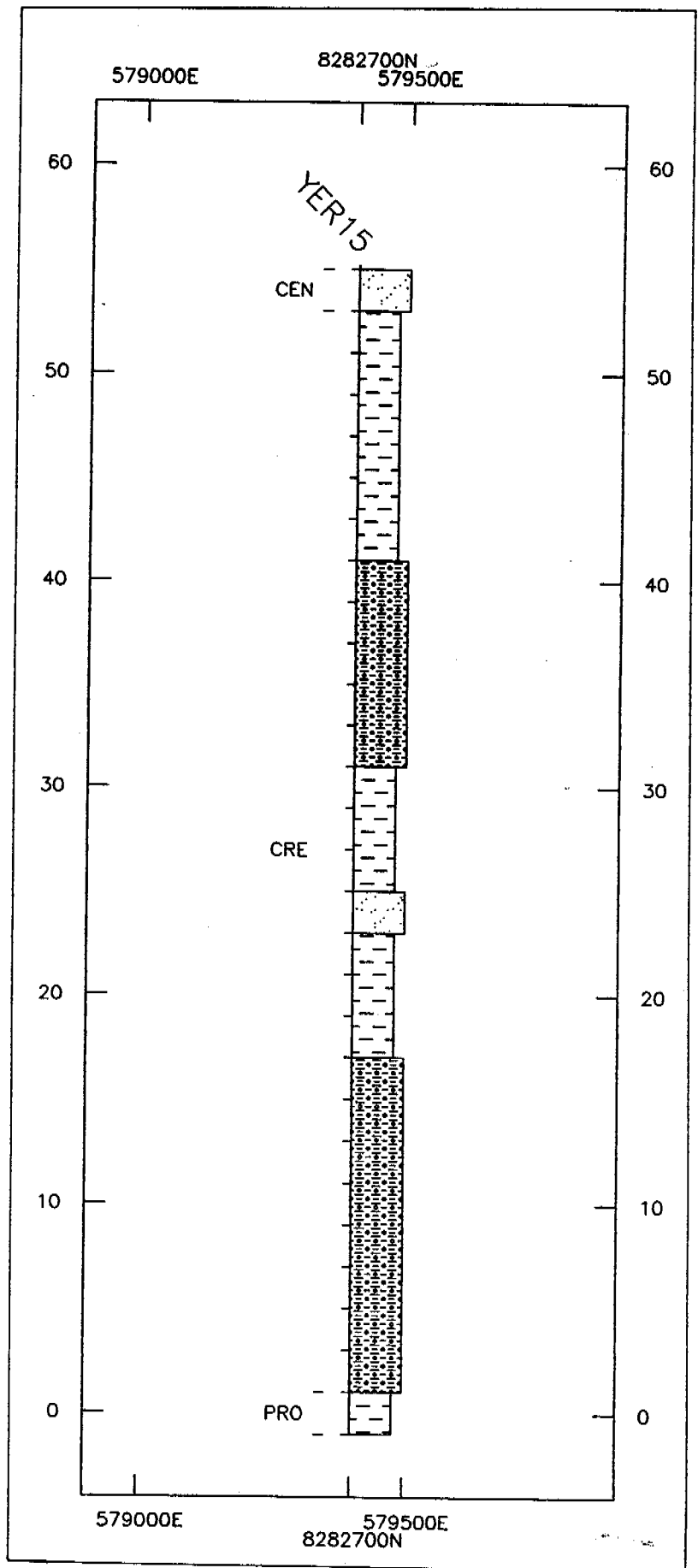
MN6 >50% "

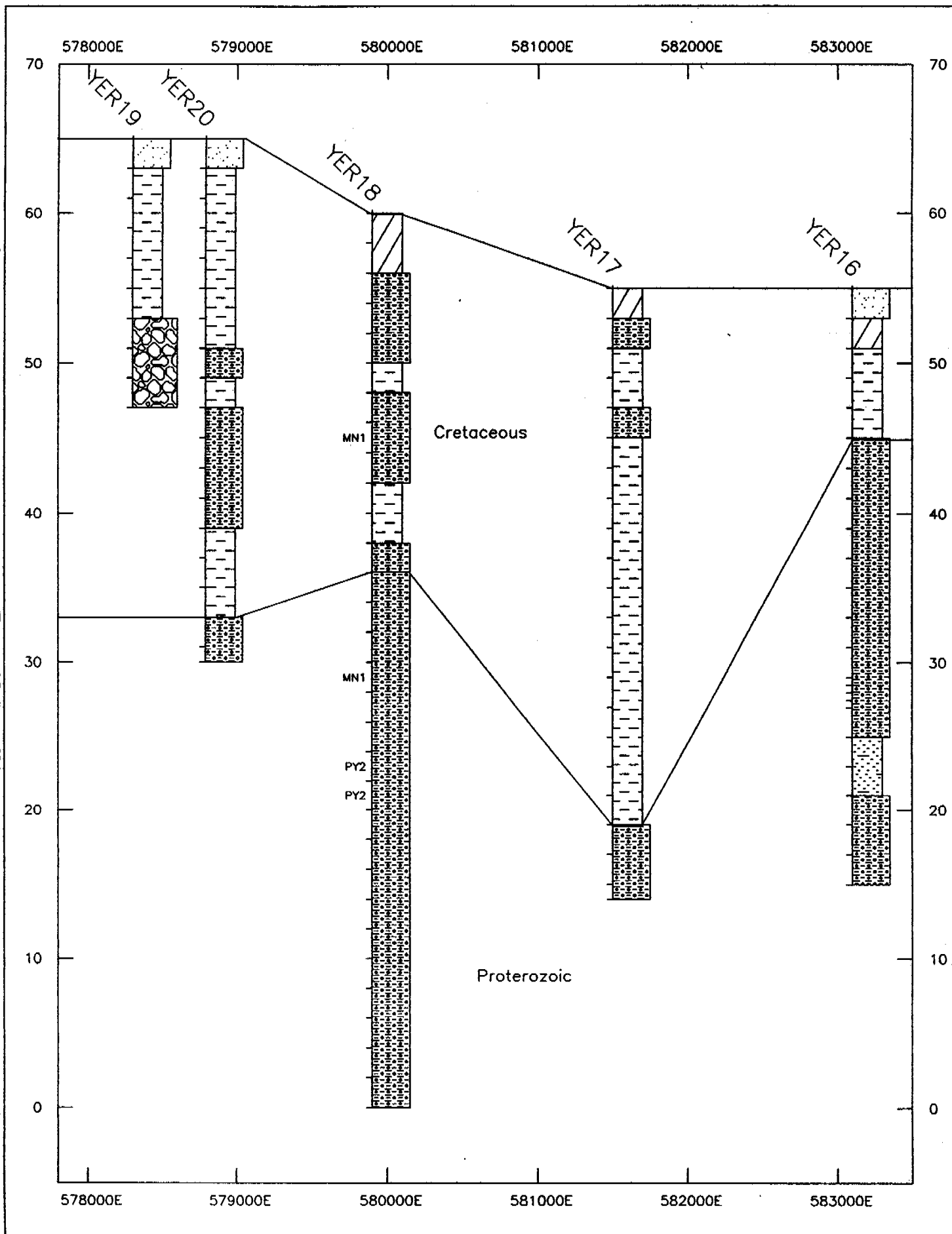
Scale: Scales vary between sections and are shown by tick marks in each section. All distances are in metres.

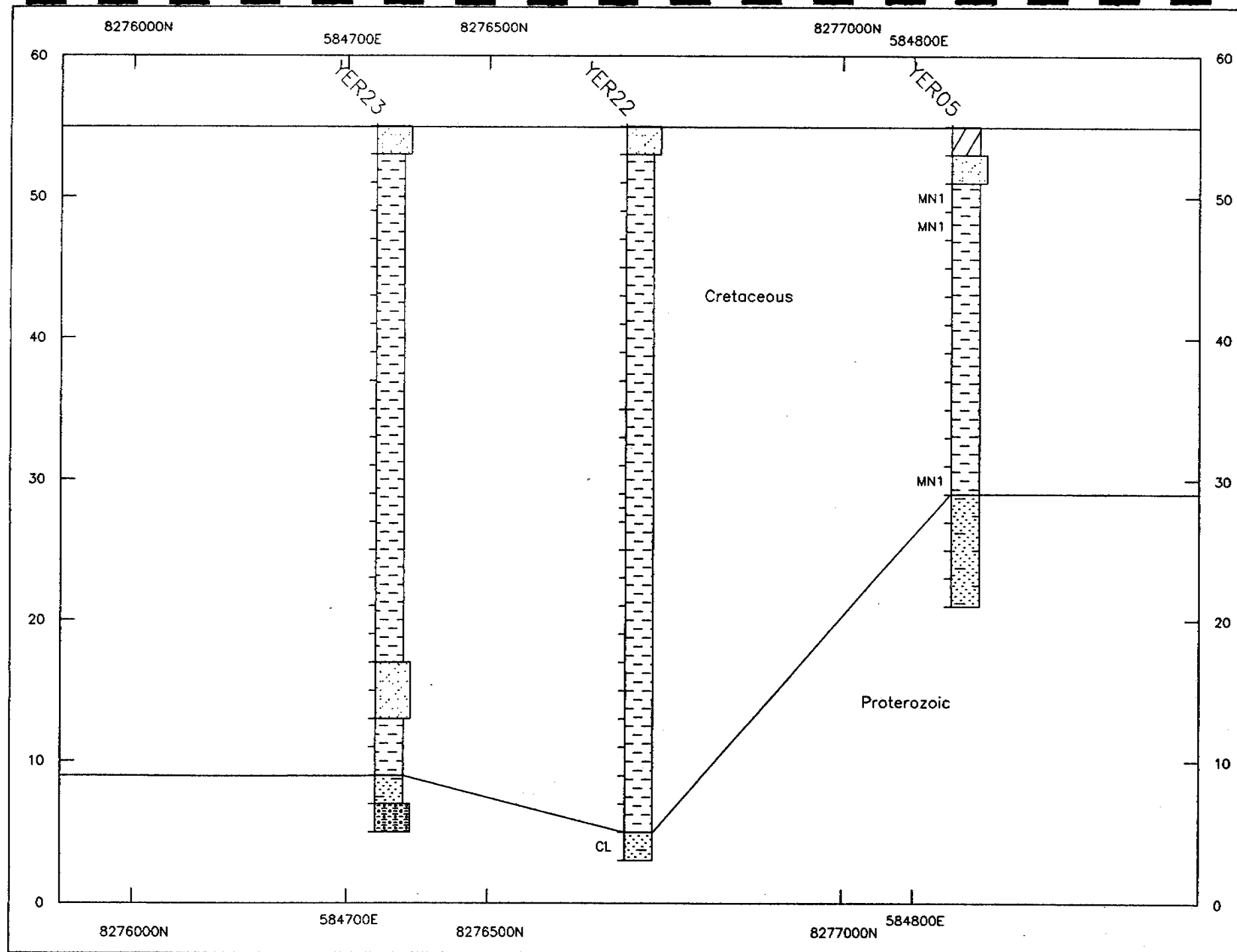


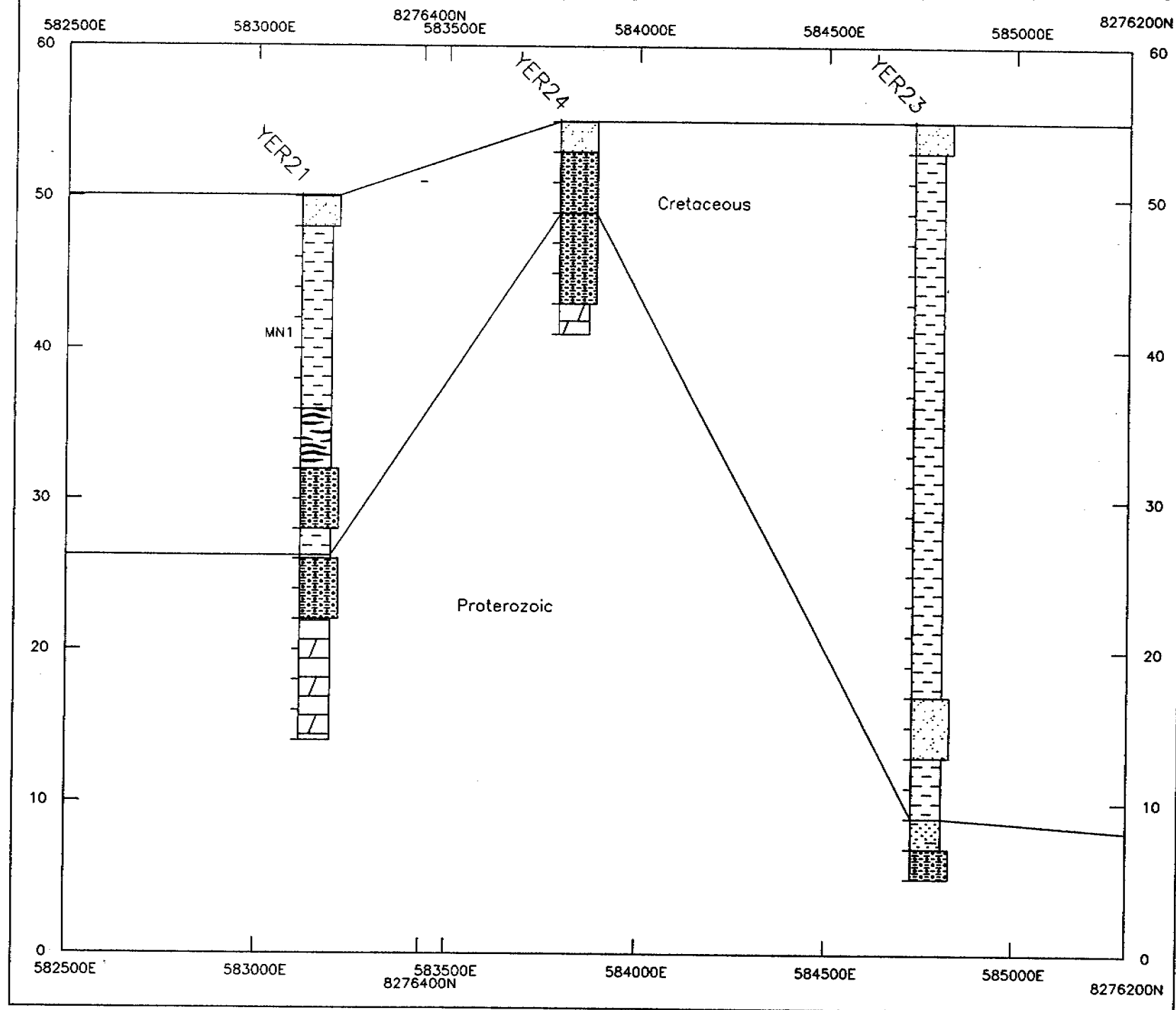


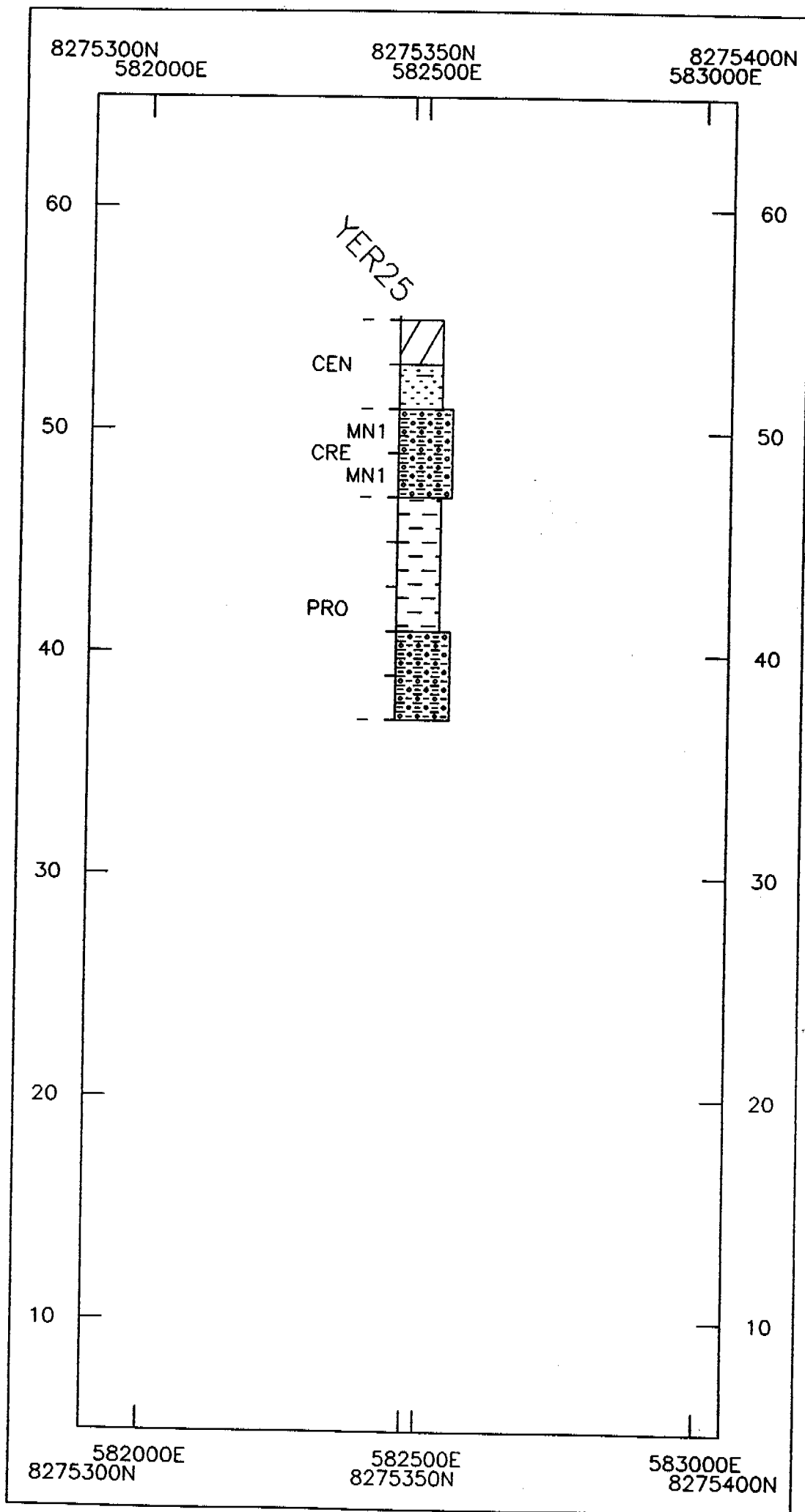


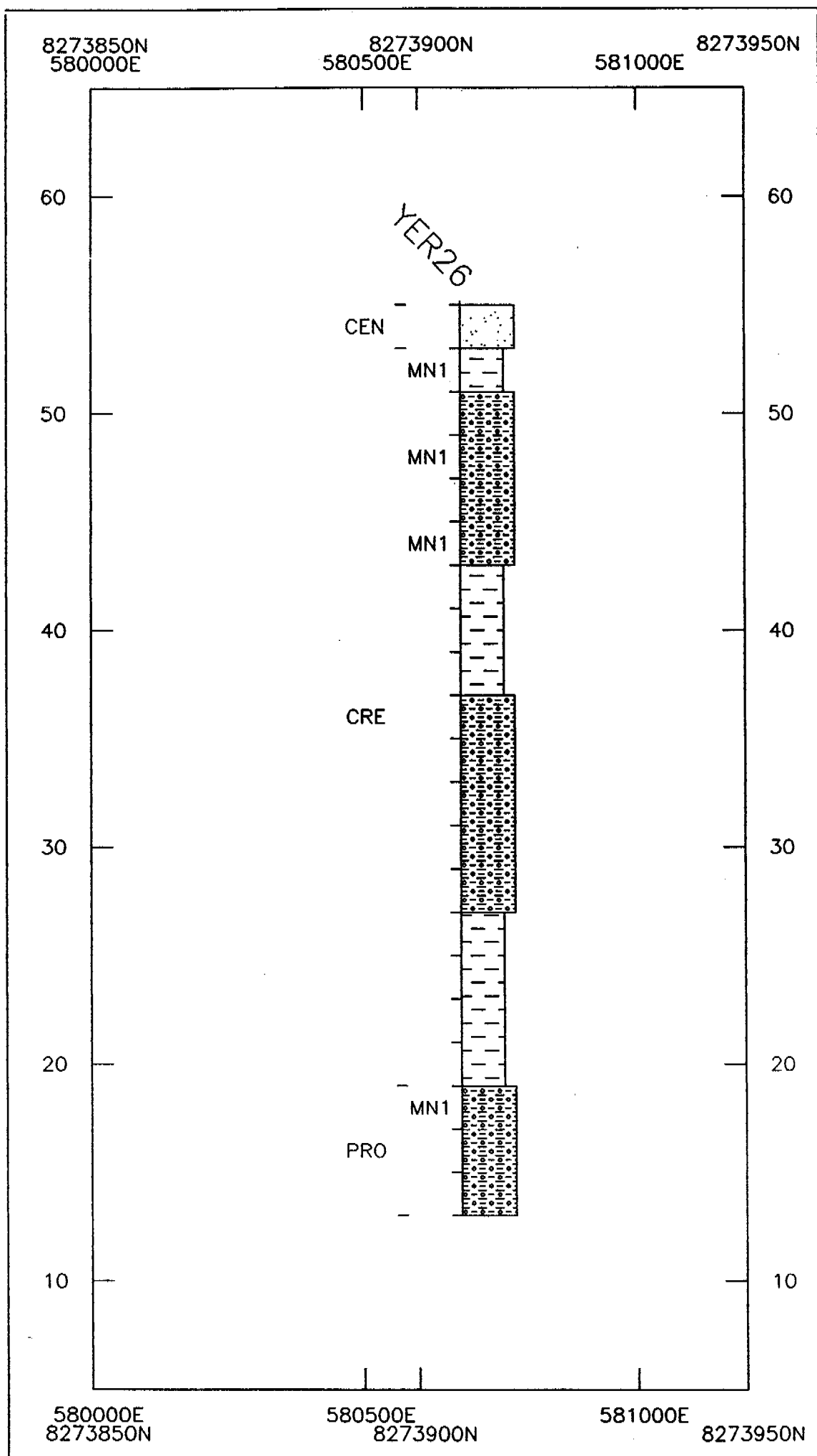


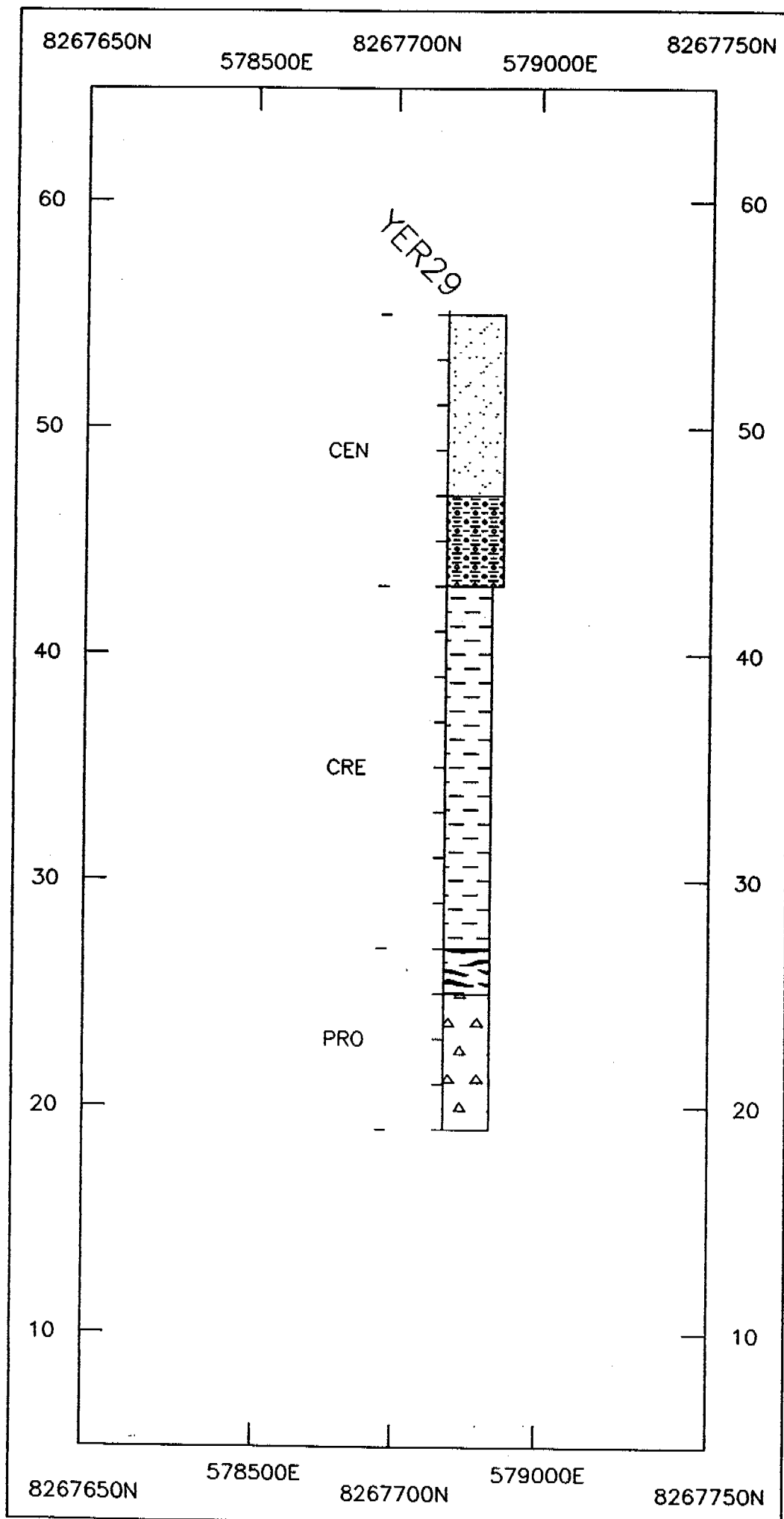


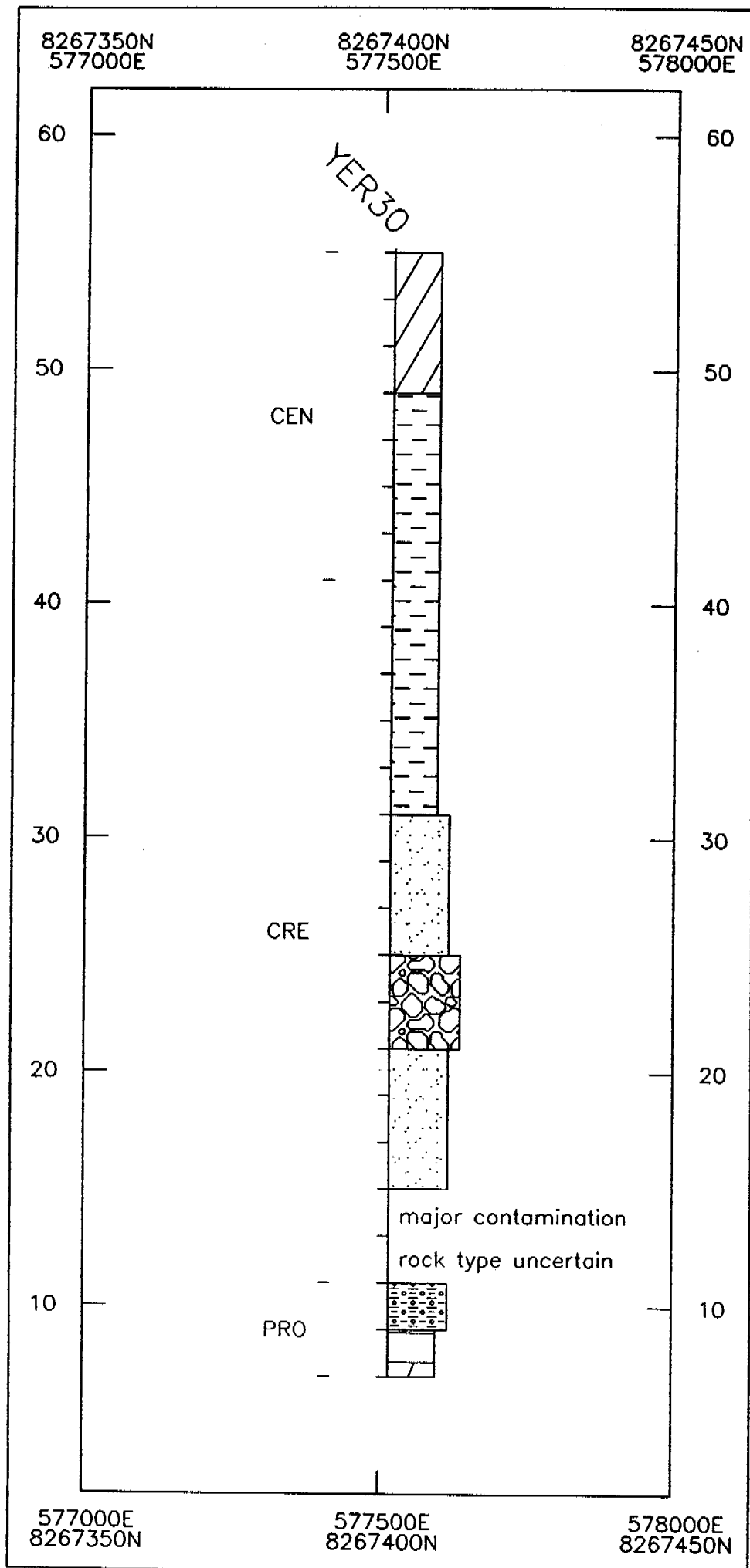


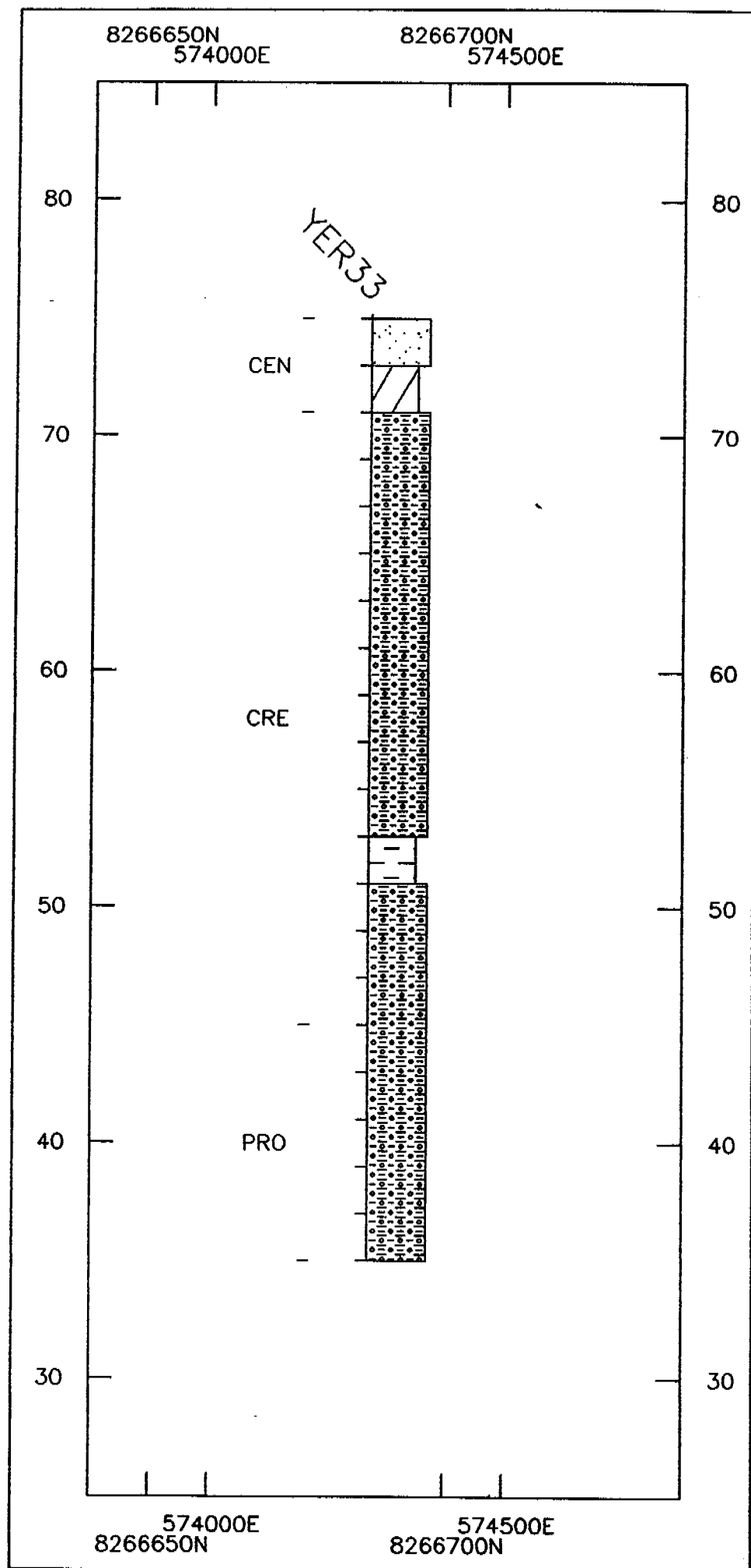


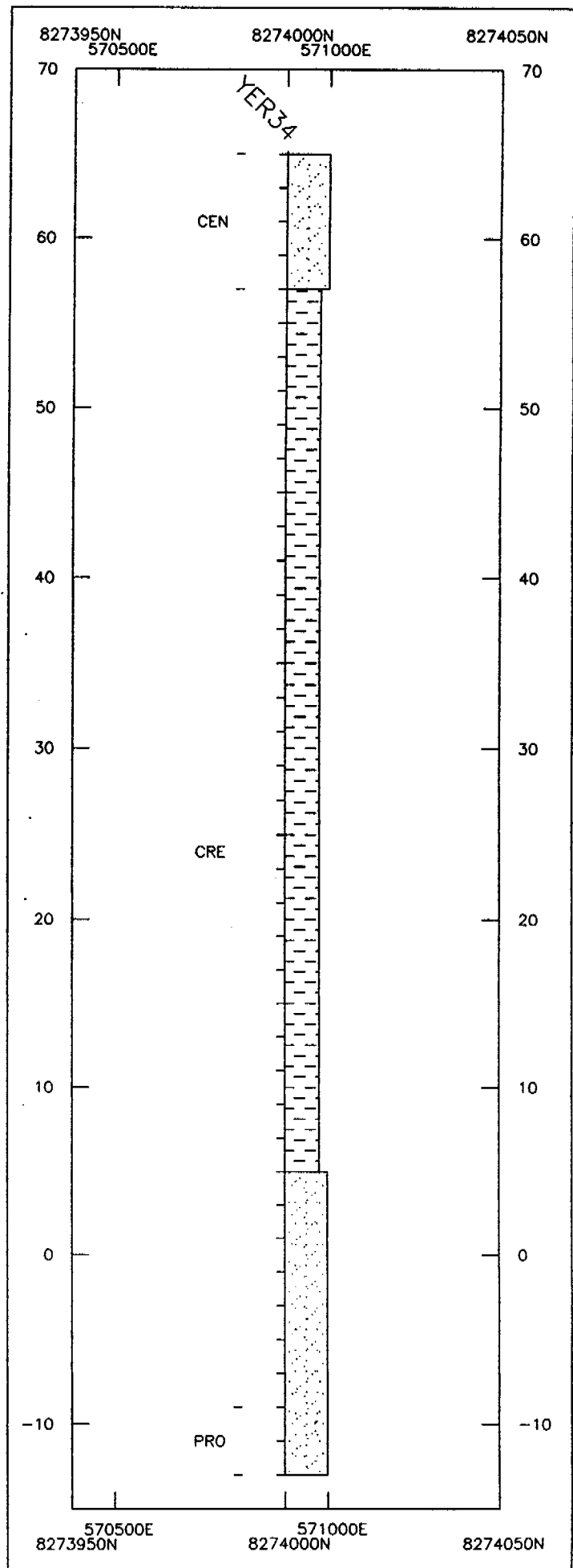


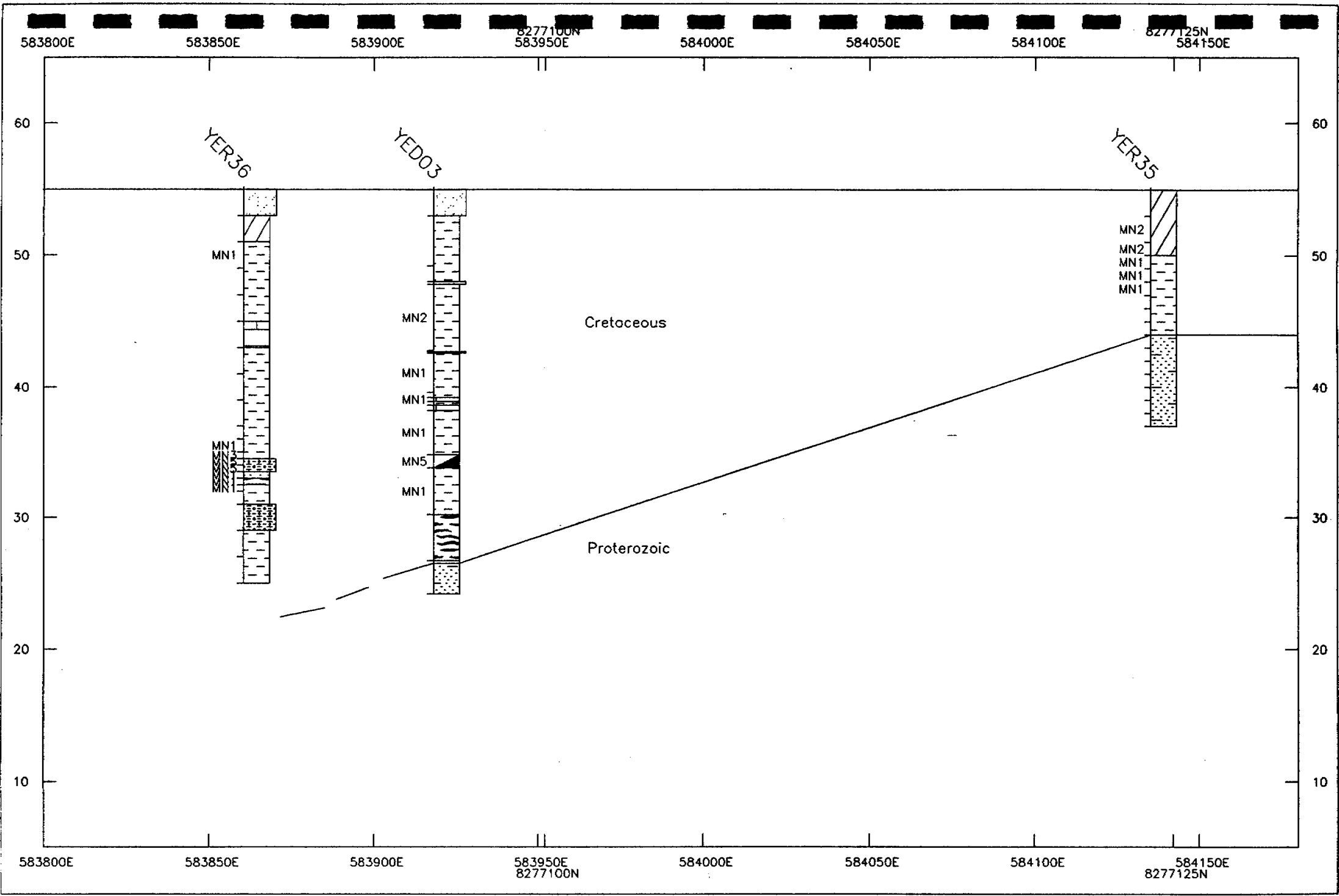


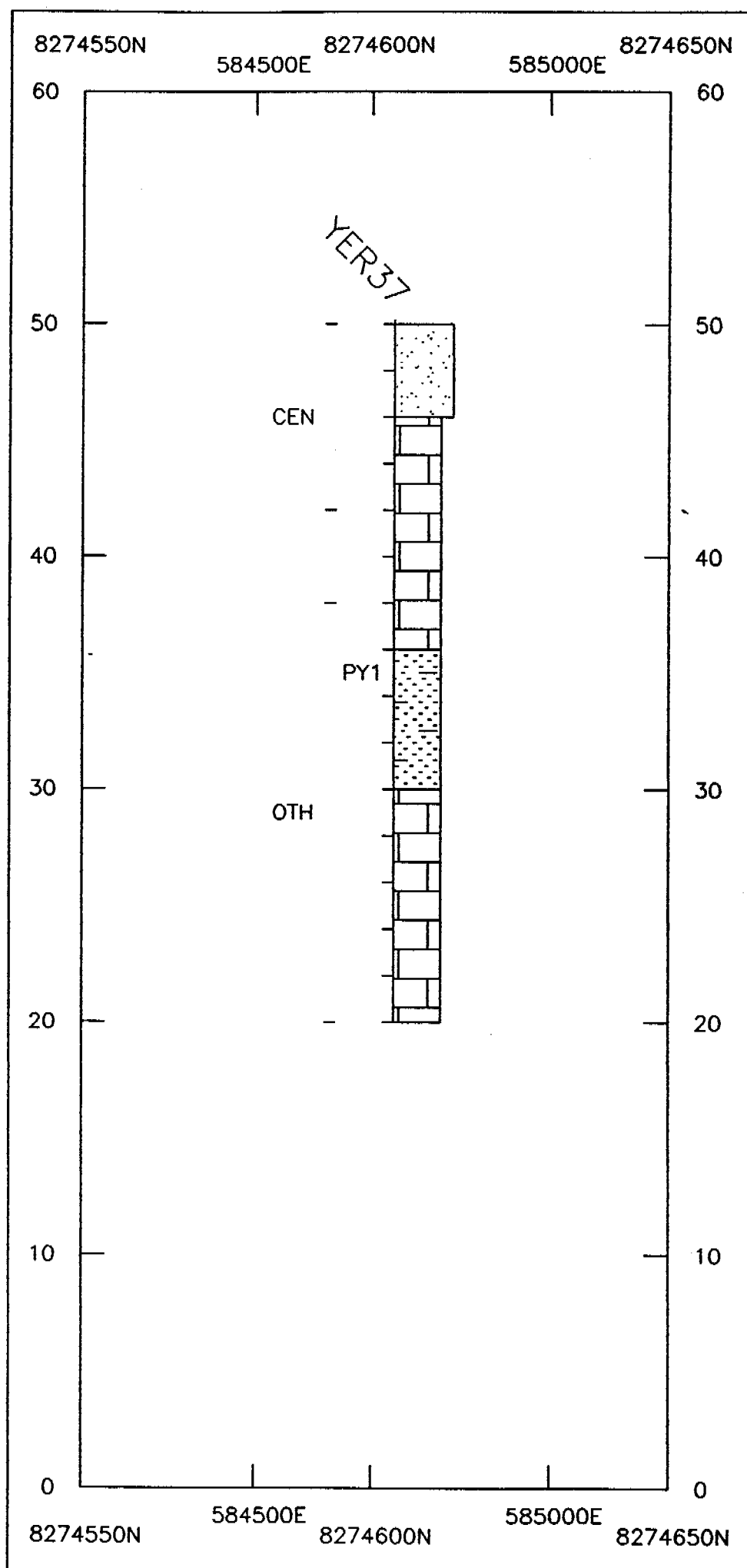


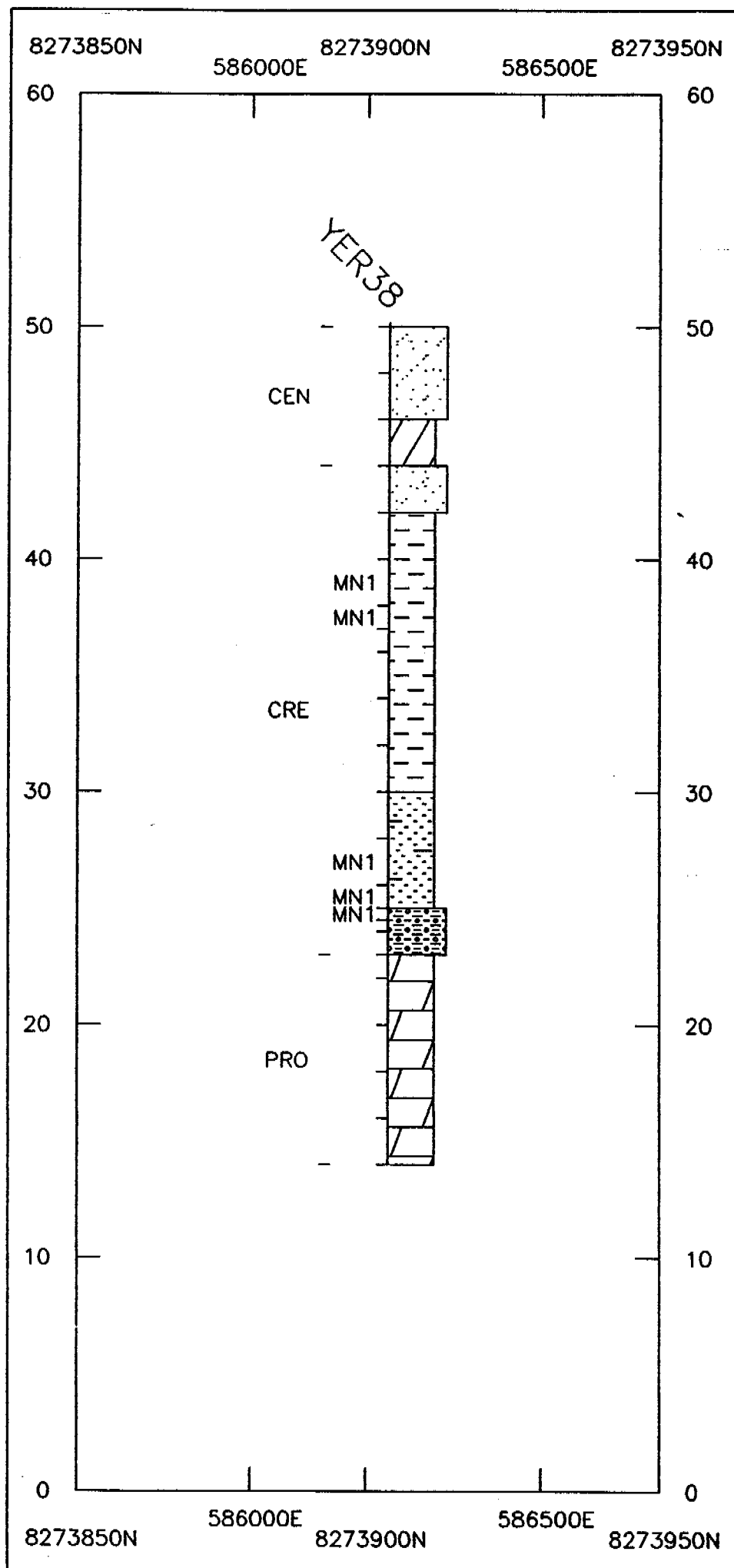


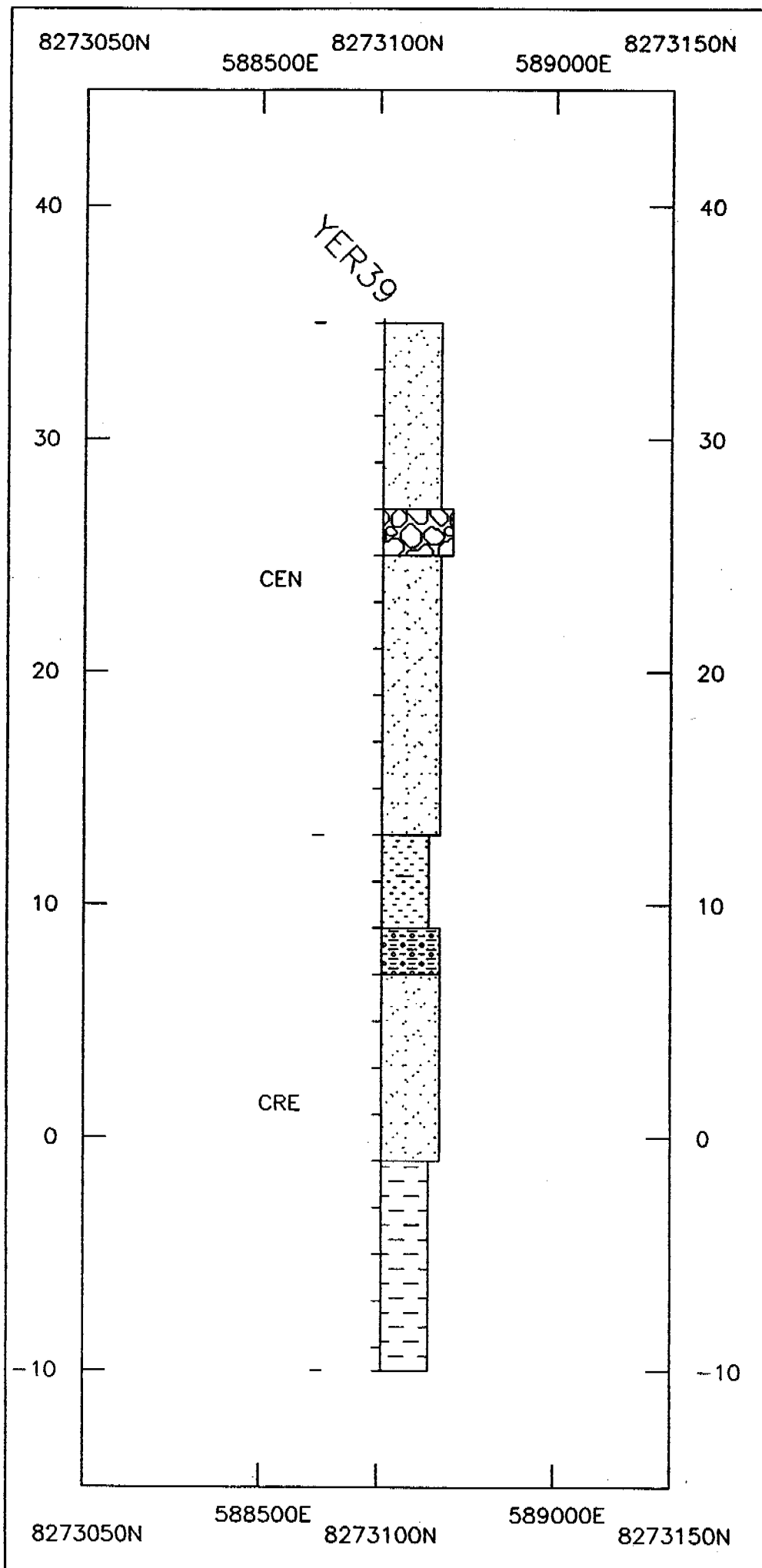


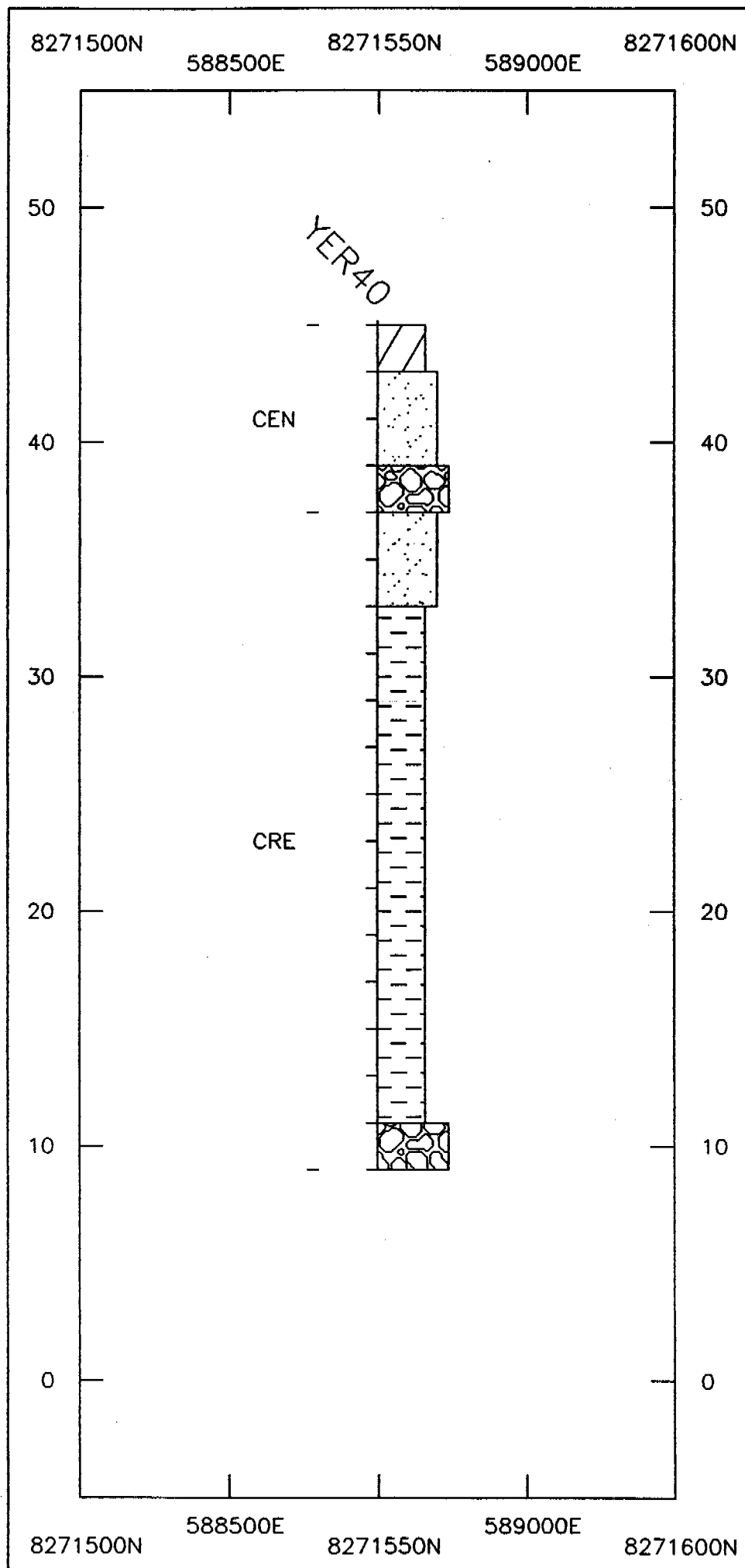


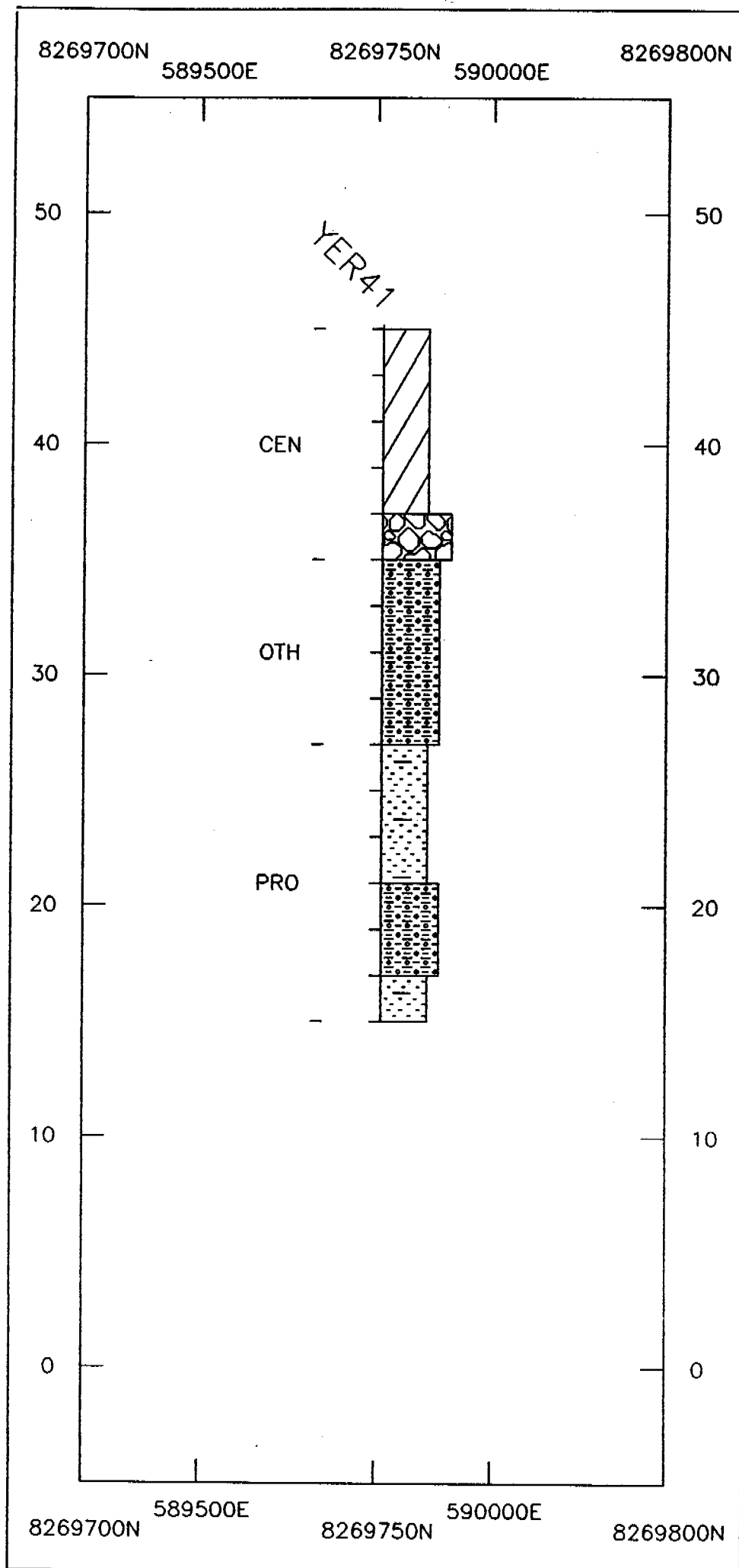


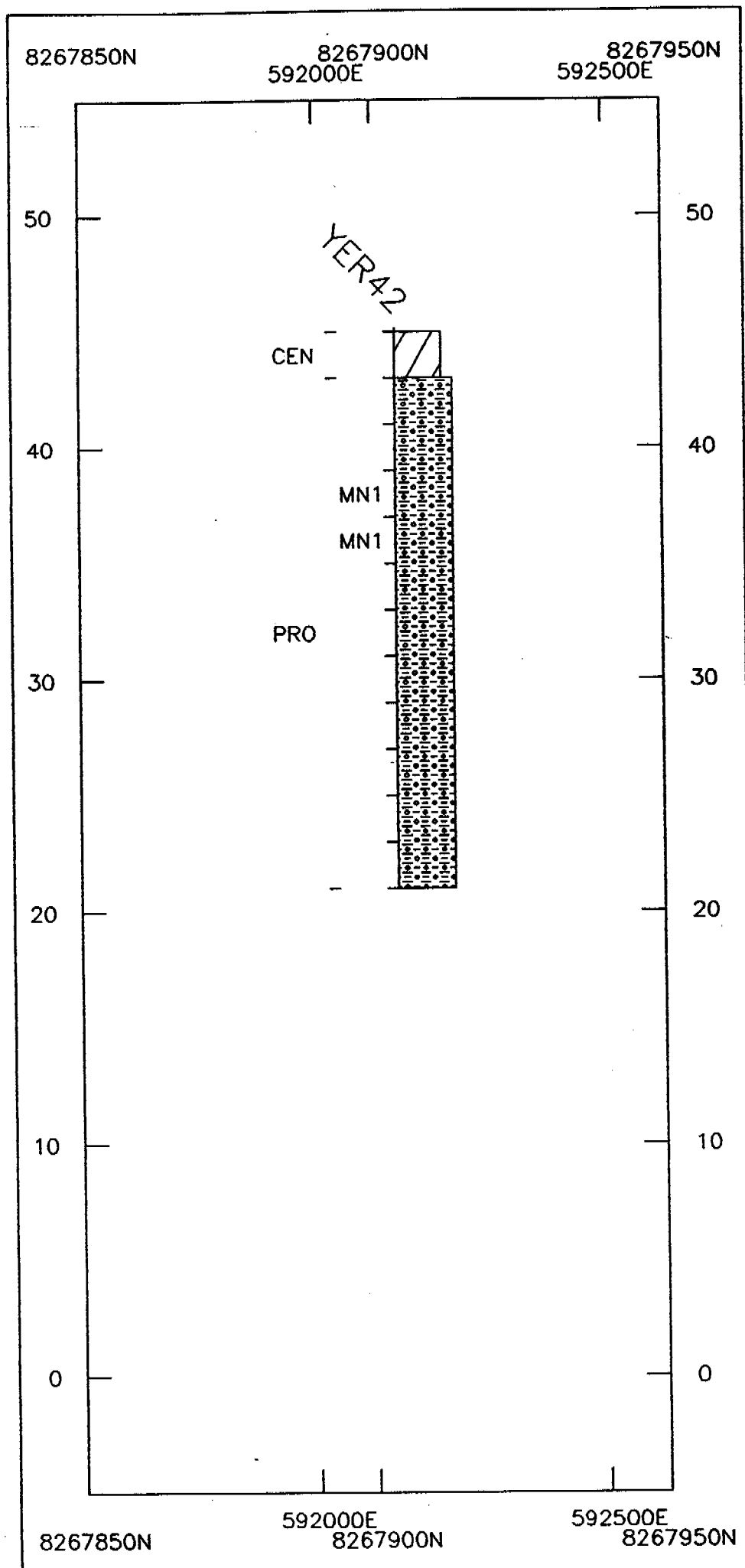


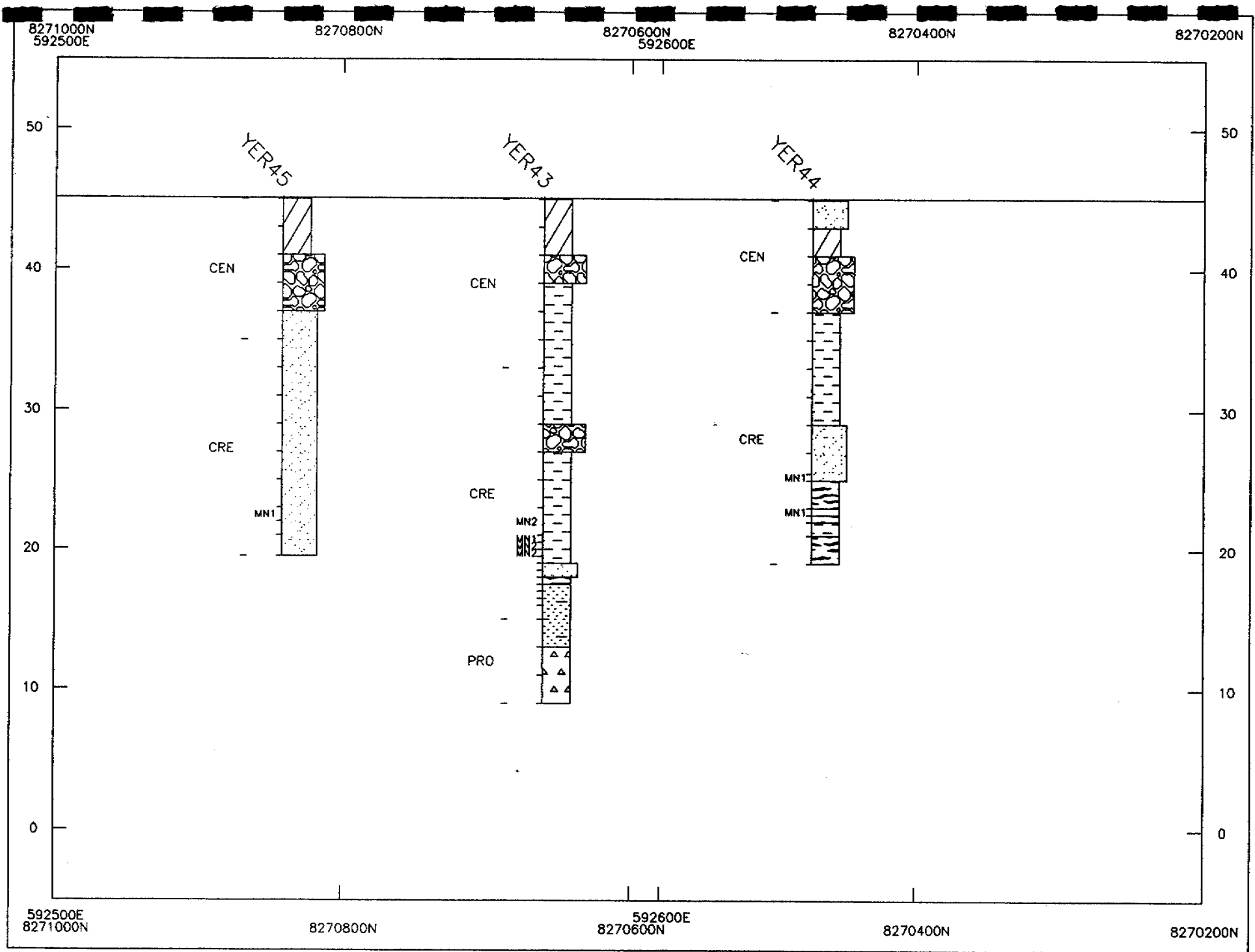


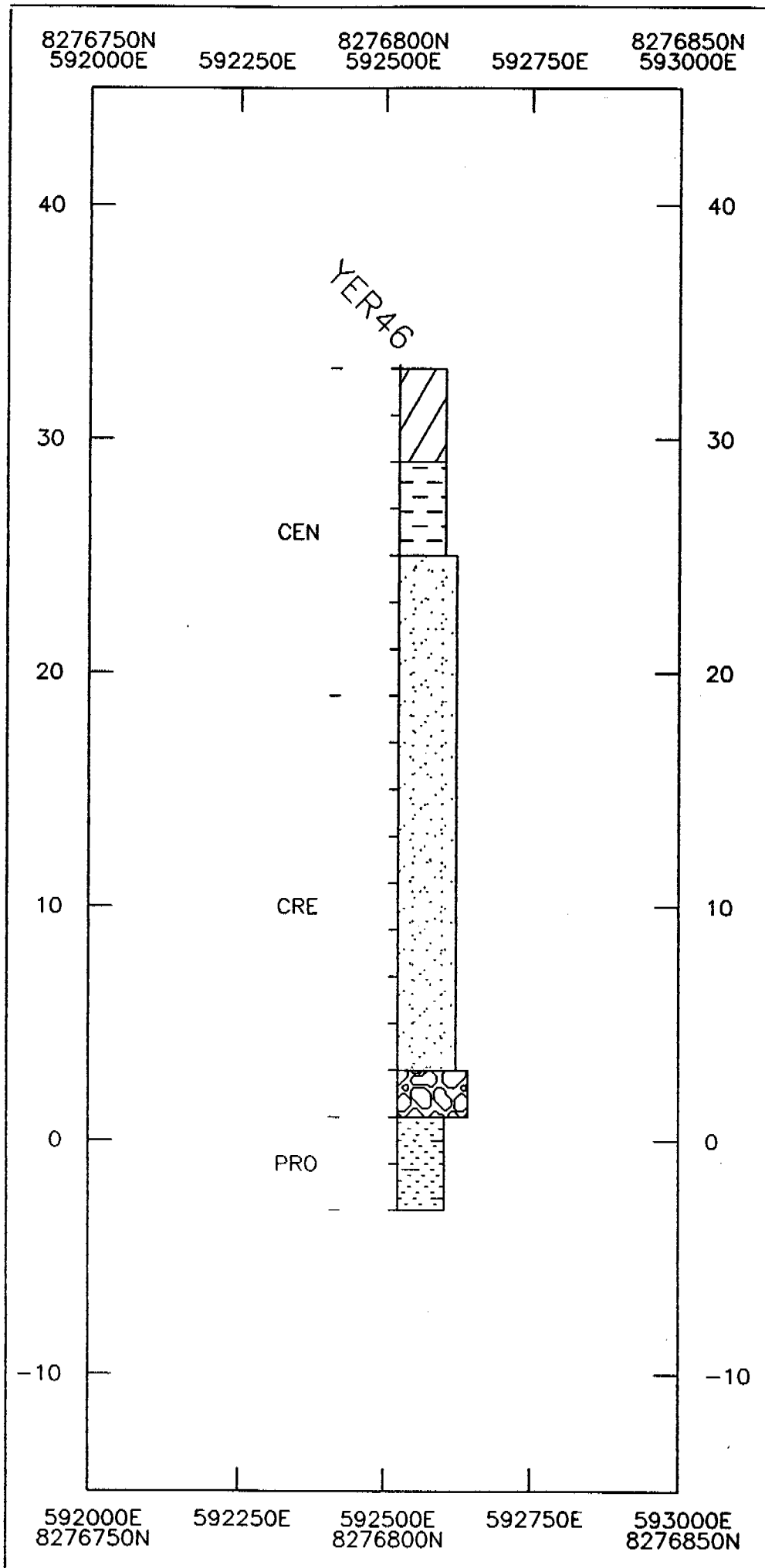


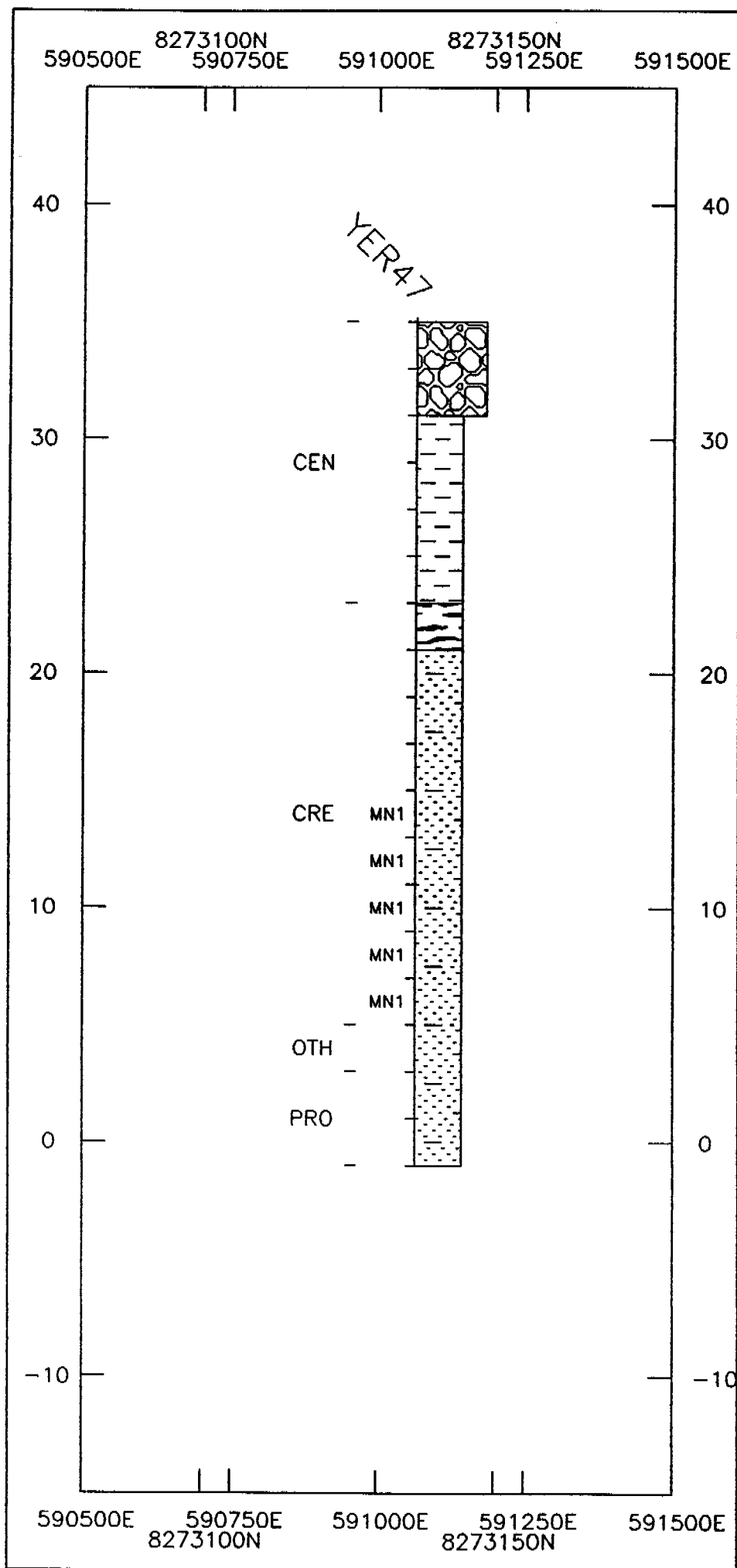


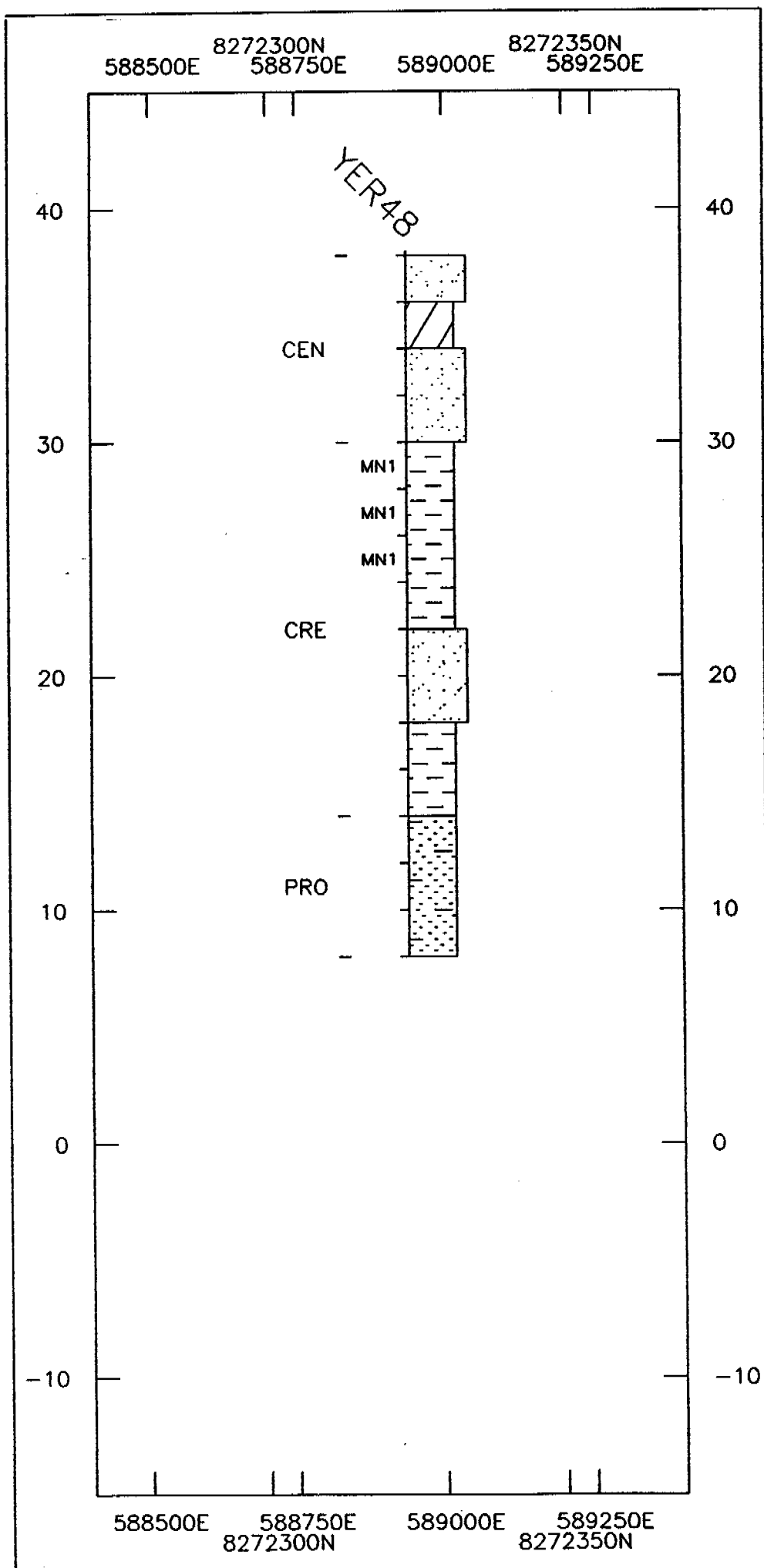


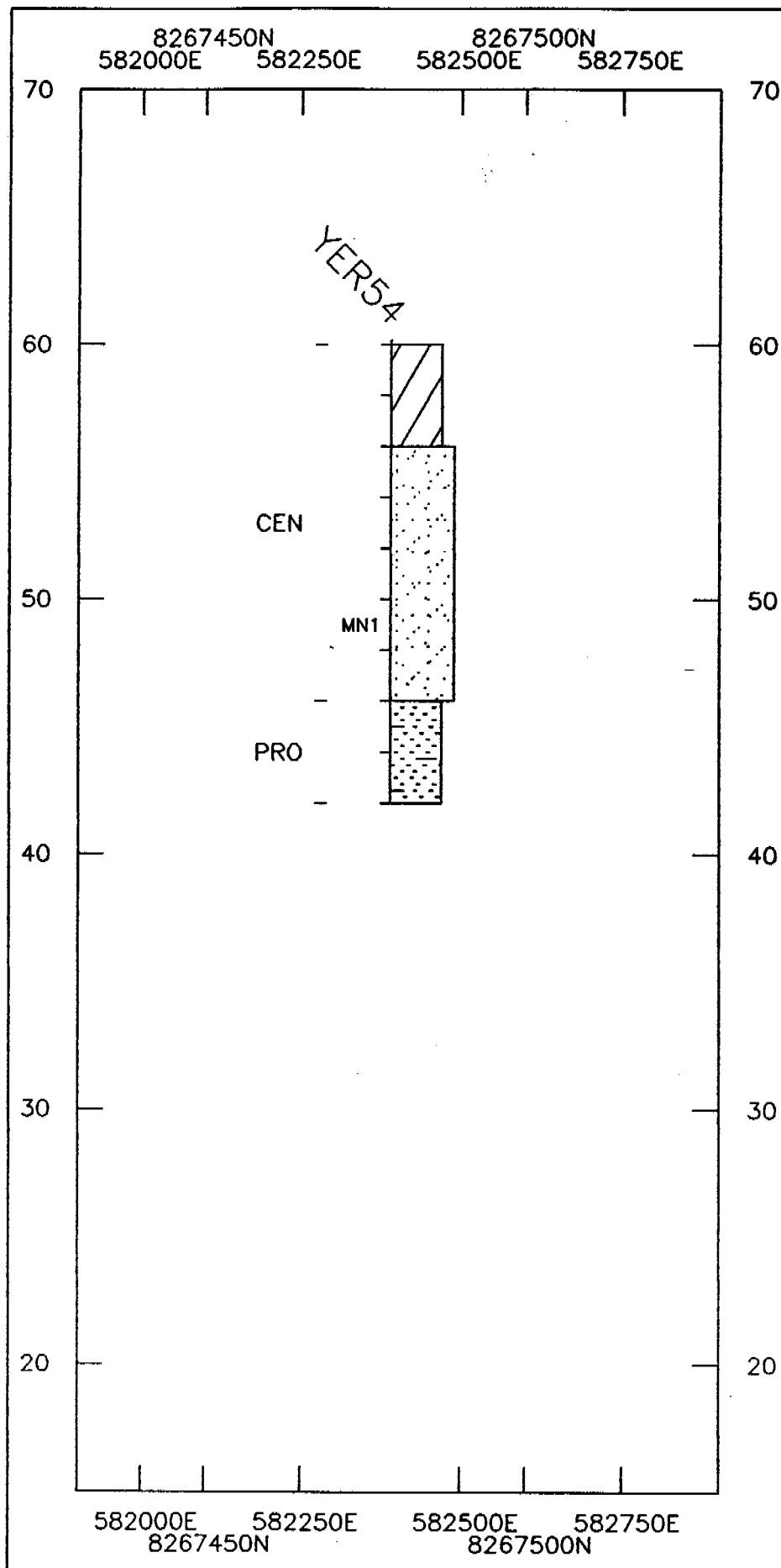


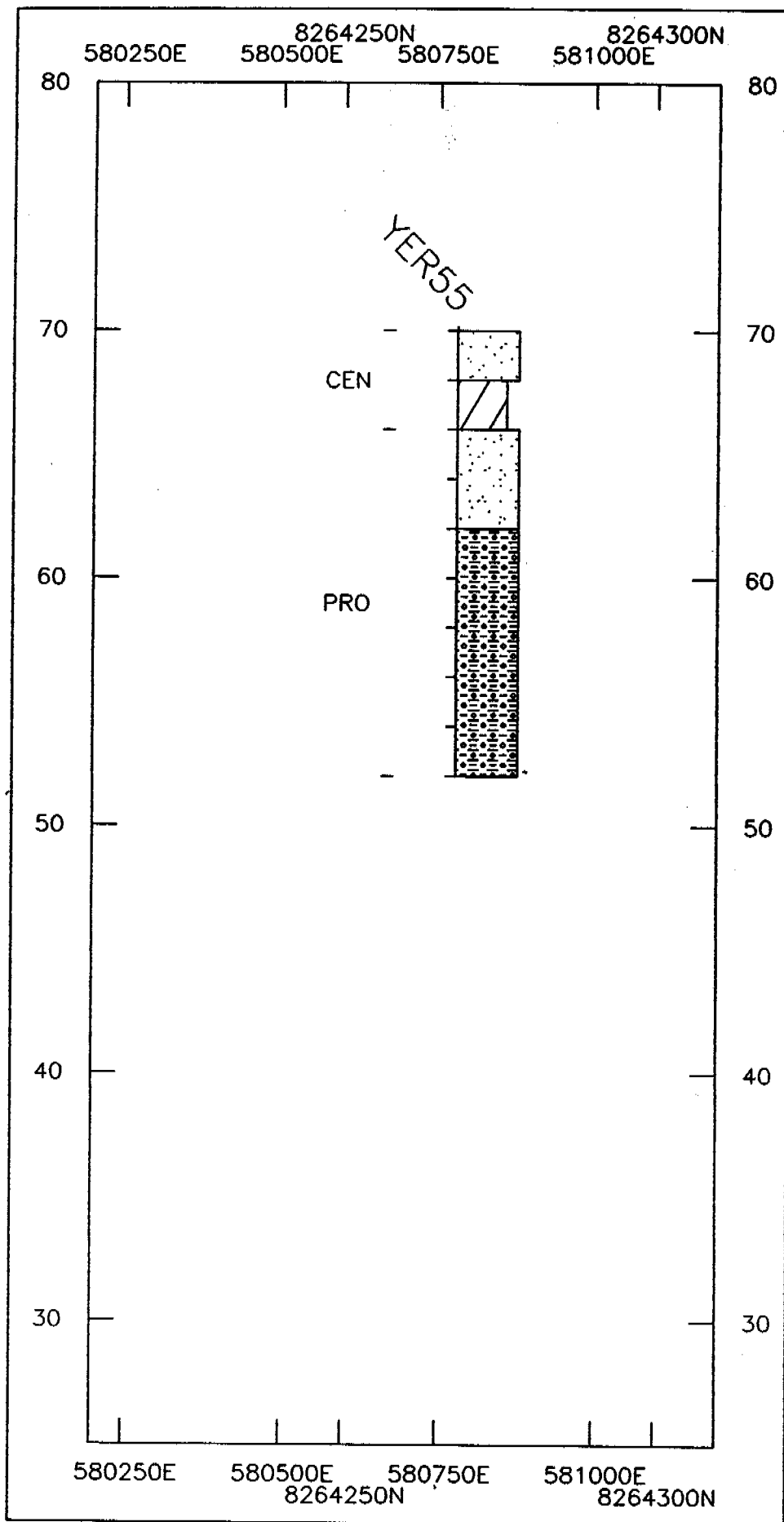


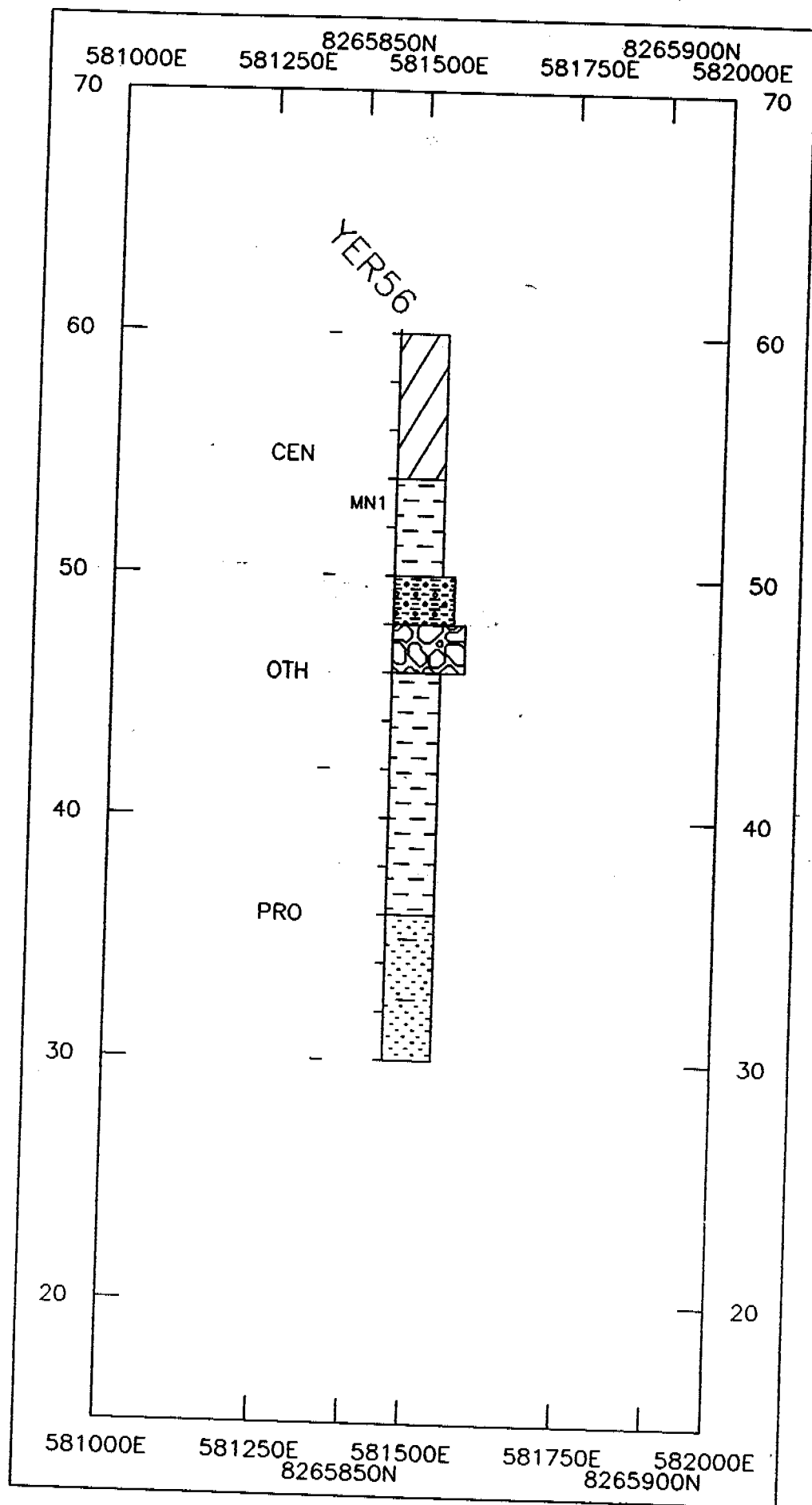


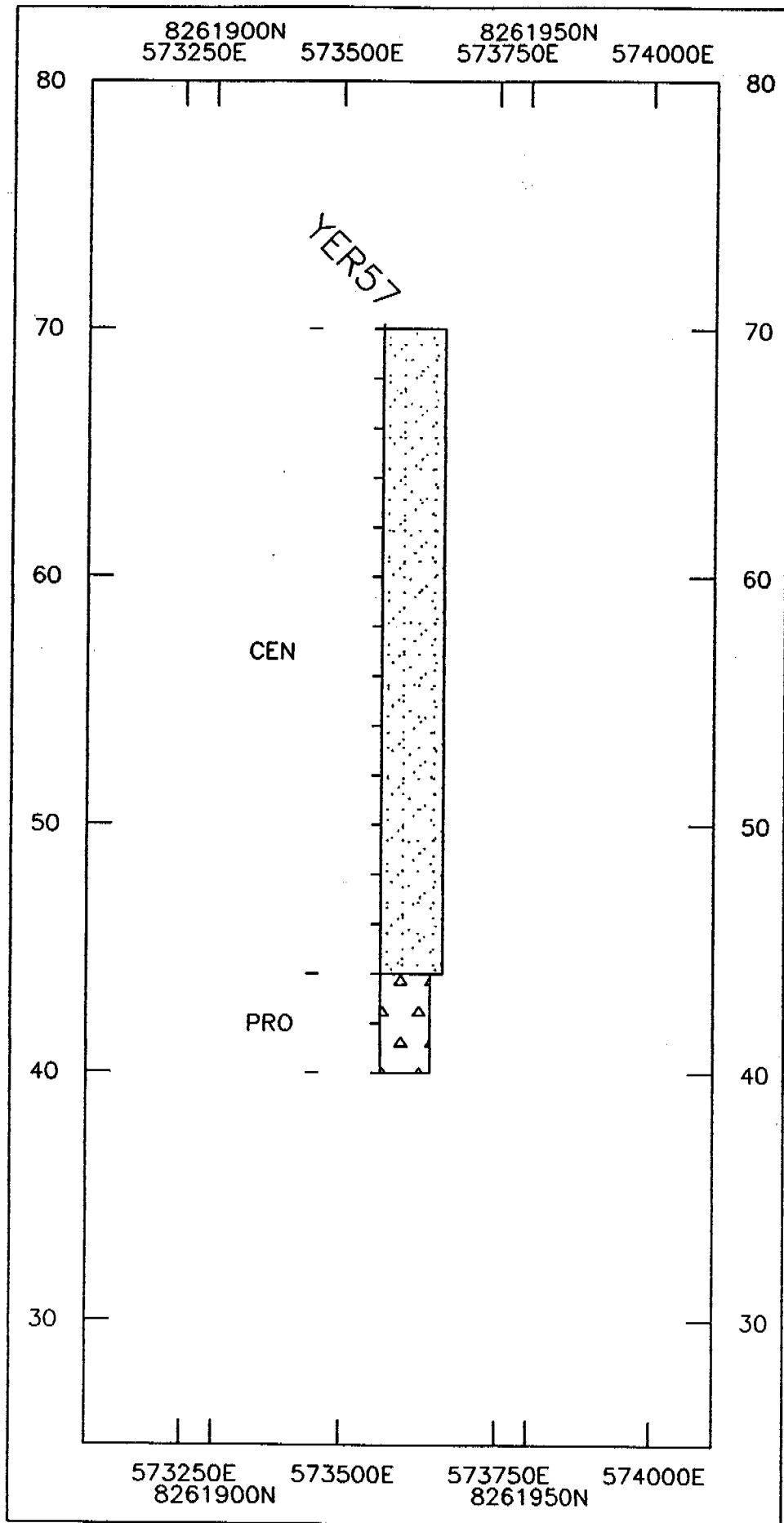


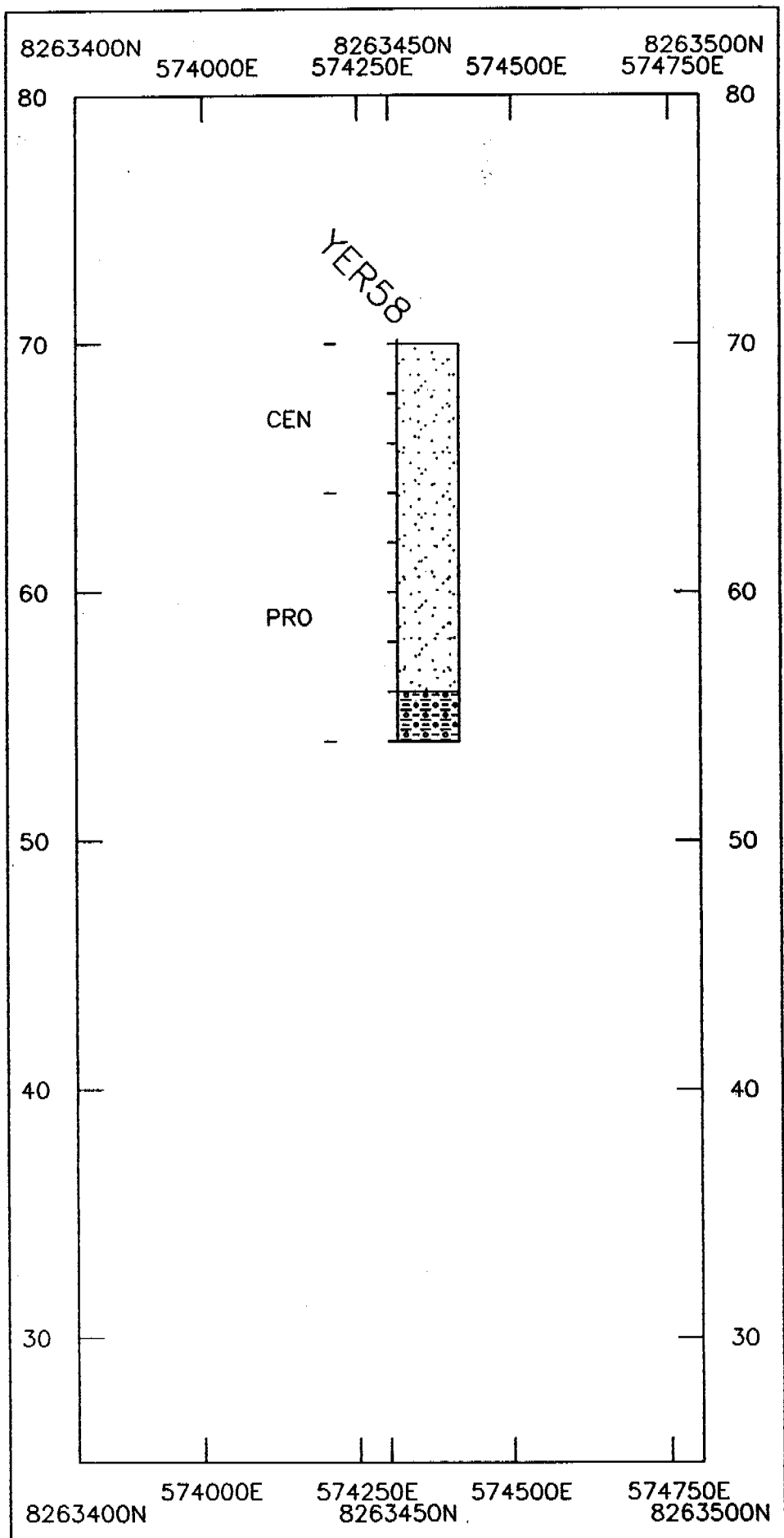


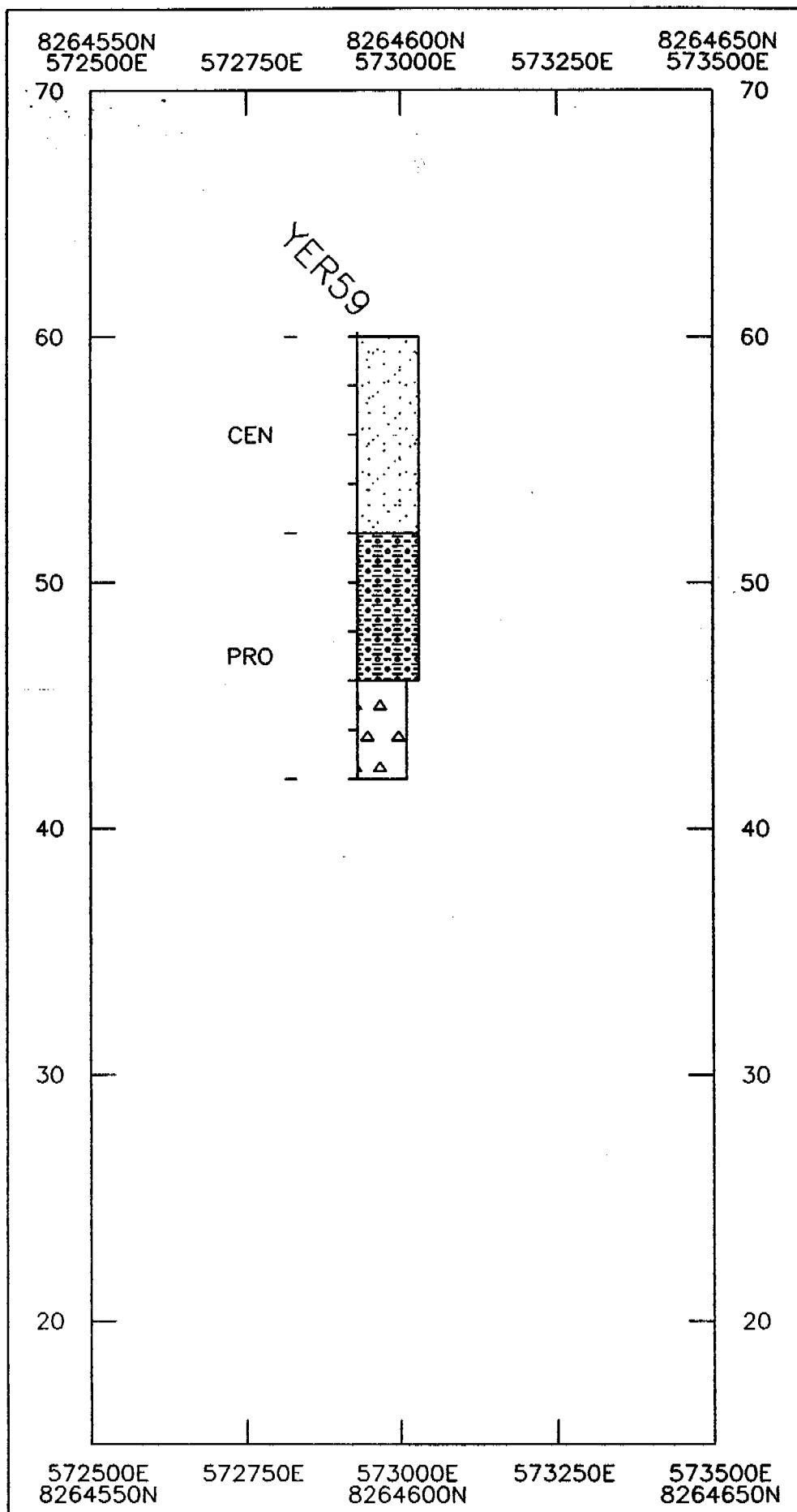


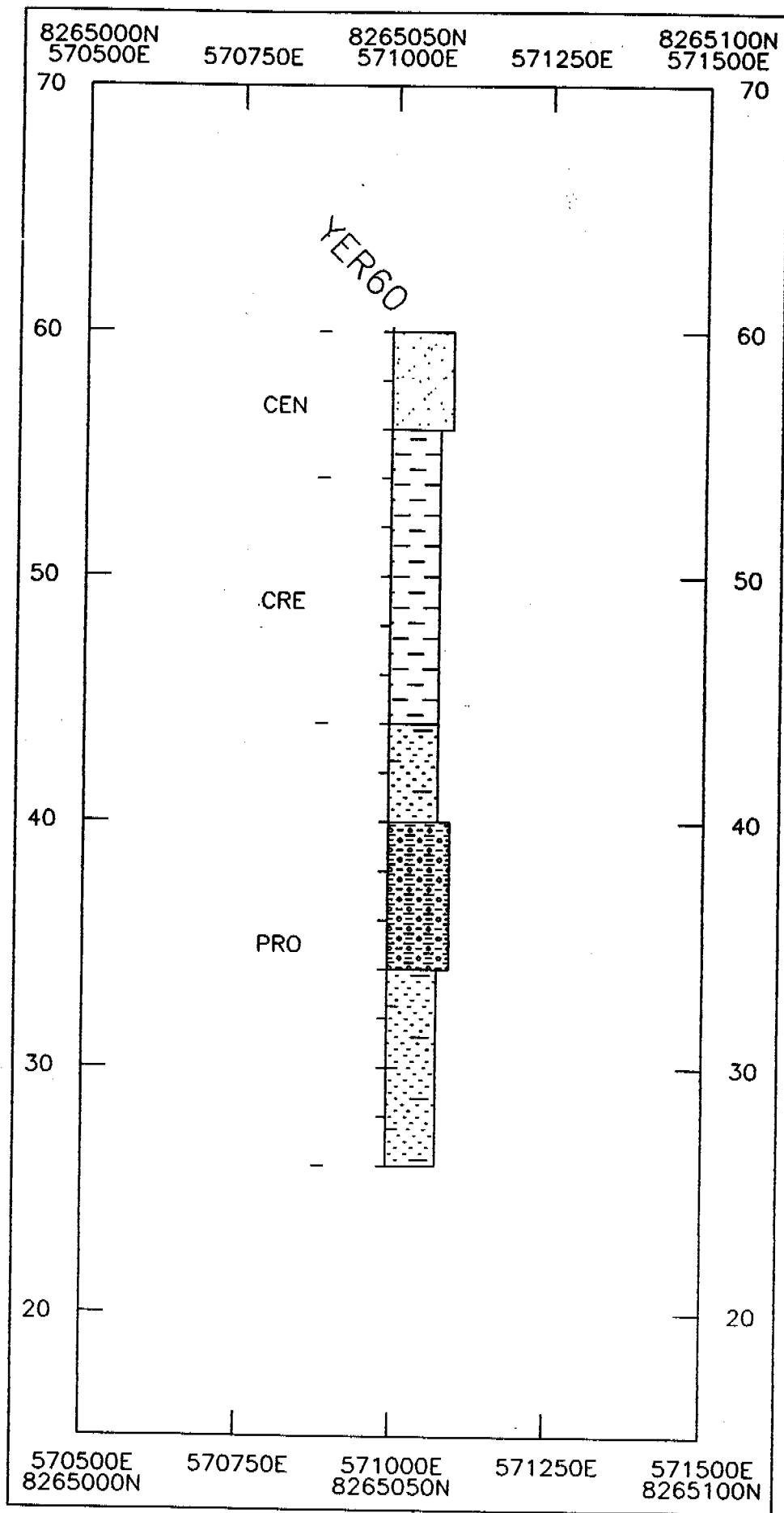












LEGEND FOR GRAPHIC DRILL LOGS

Rock Types



Laterite, soil, surficial sand



Clay, claystone, silt, mudstone



Sand



Sandstone



Manganese ore



Mixed clay and chert



Conglomerate



Chert



Limestone, carbonate (general)



Shale, siltstone



Dolomite

Stratigraphy

CEN – undifferentiated Cenozoic

CRE – Cretaceous

PRO – undifferentiated Proterozoic

OTH – unknown

Mineralisation

MN1 <0.5% Mn Oxide

MN2 0.5–5% "

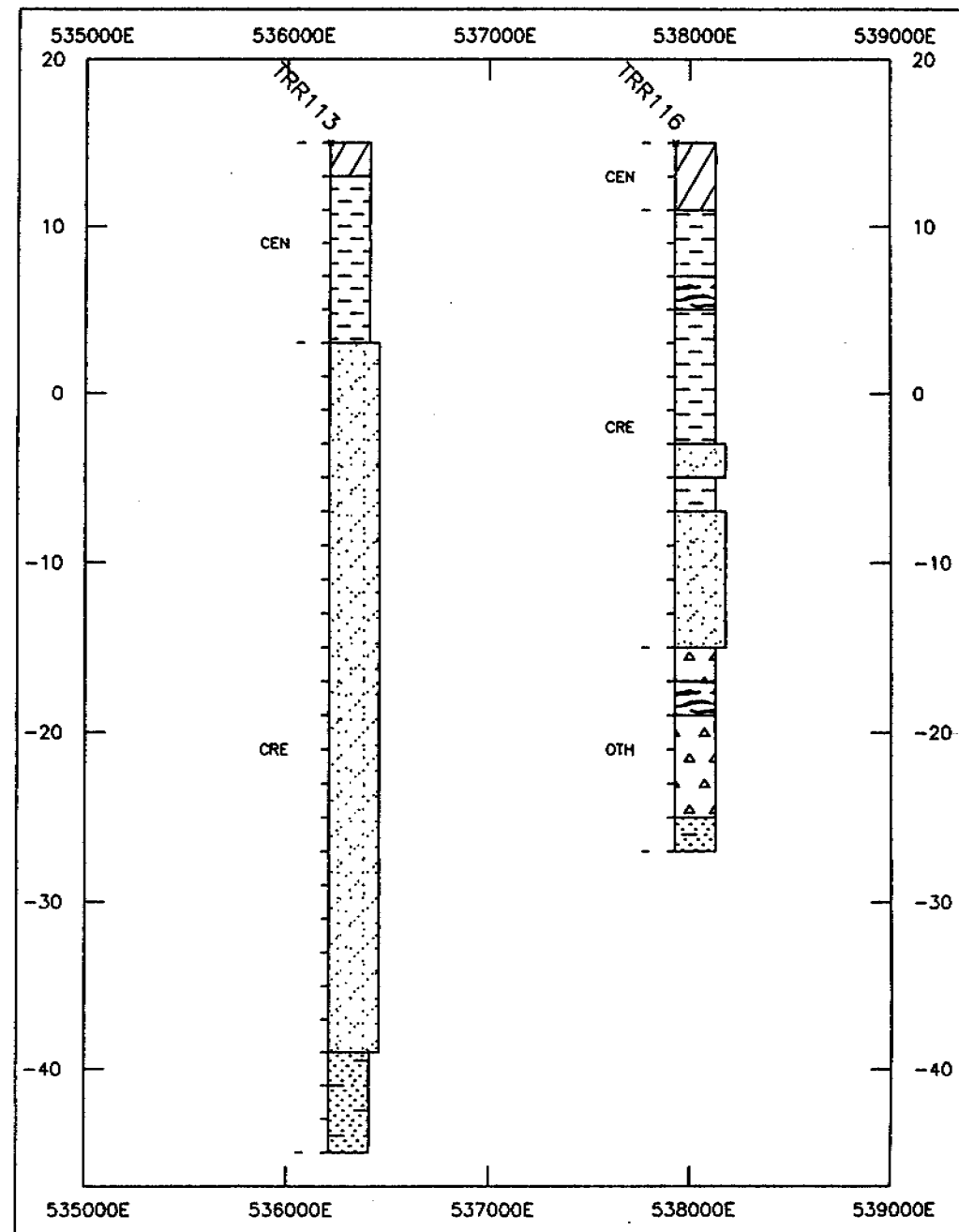
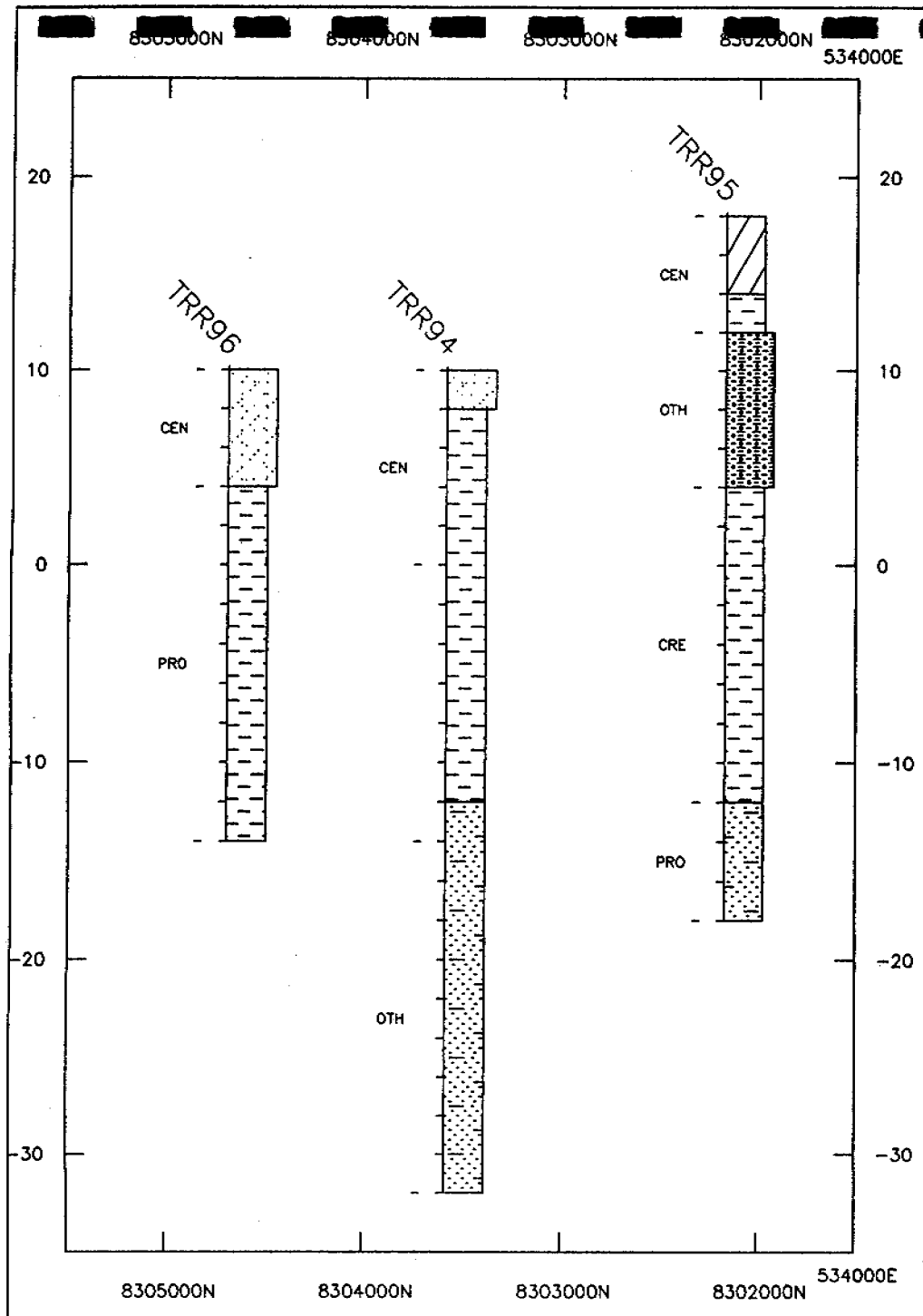
MN3 5–20% "

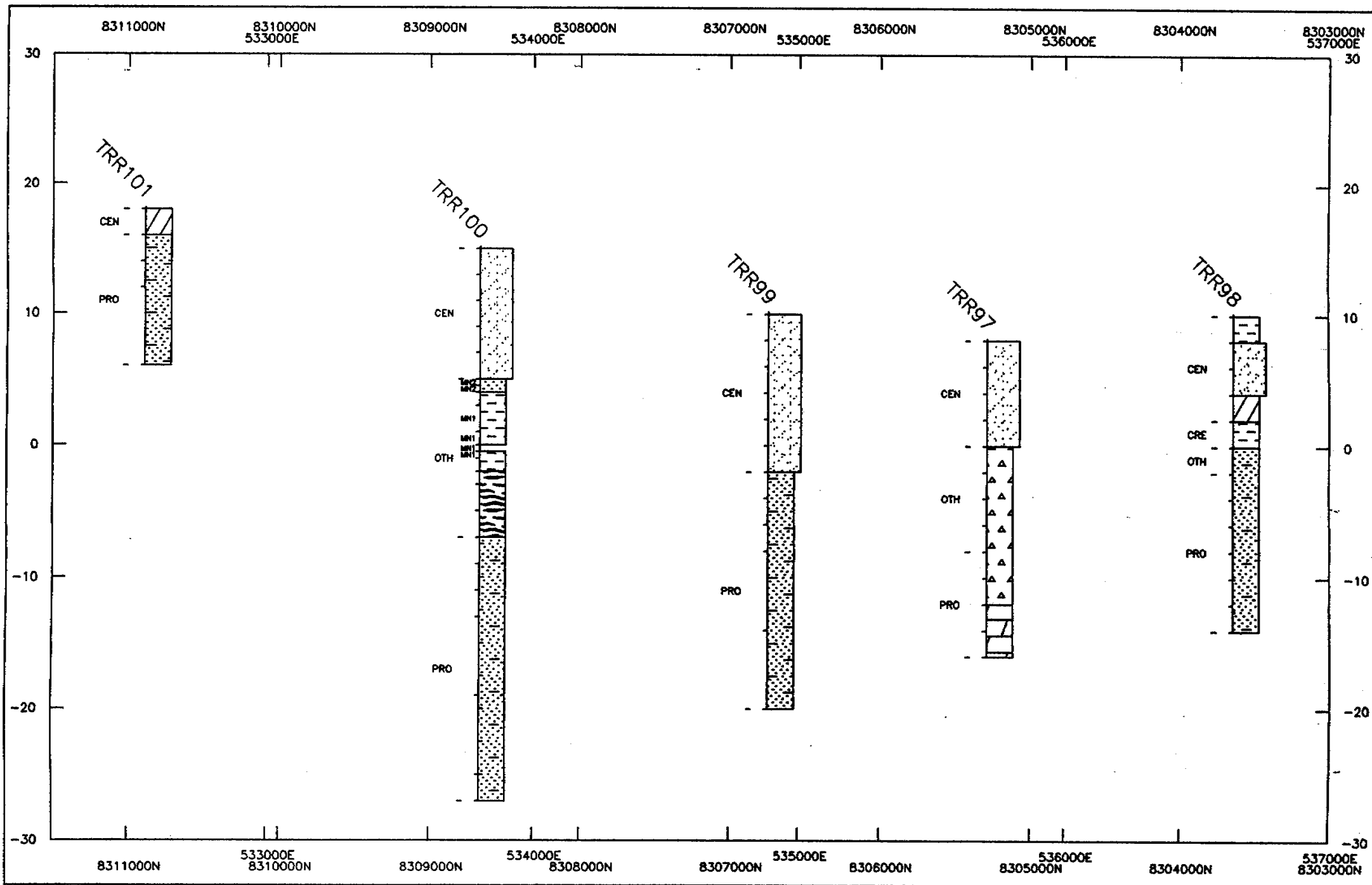
MN4 20–30% "

MN5 30–50% "

MN6 >50% "

Scale: Scales vary between sections and are shown by tick marks in each section. All distances are in metres.





8328000N
534000E

535000E

536000E

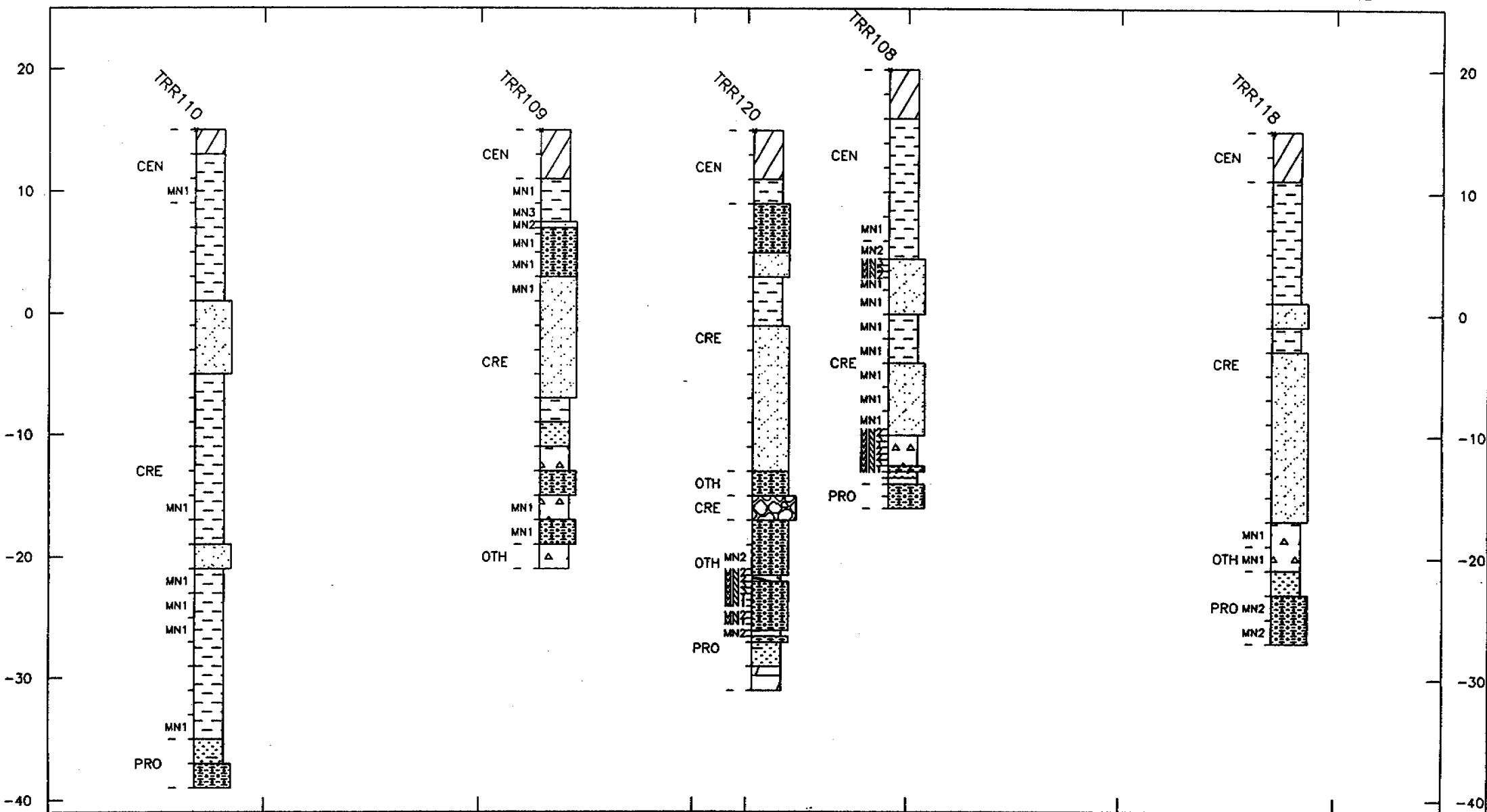
8328250N
537000E

538000E

539000E

540000E

8328500N



534000E
8328000N

535000E

536000E

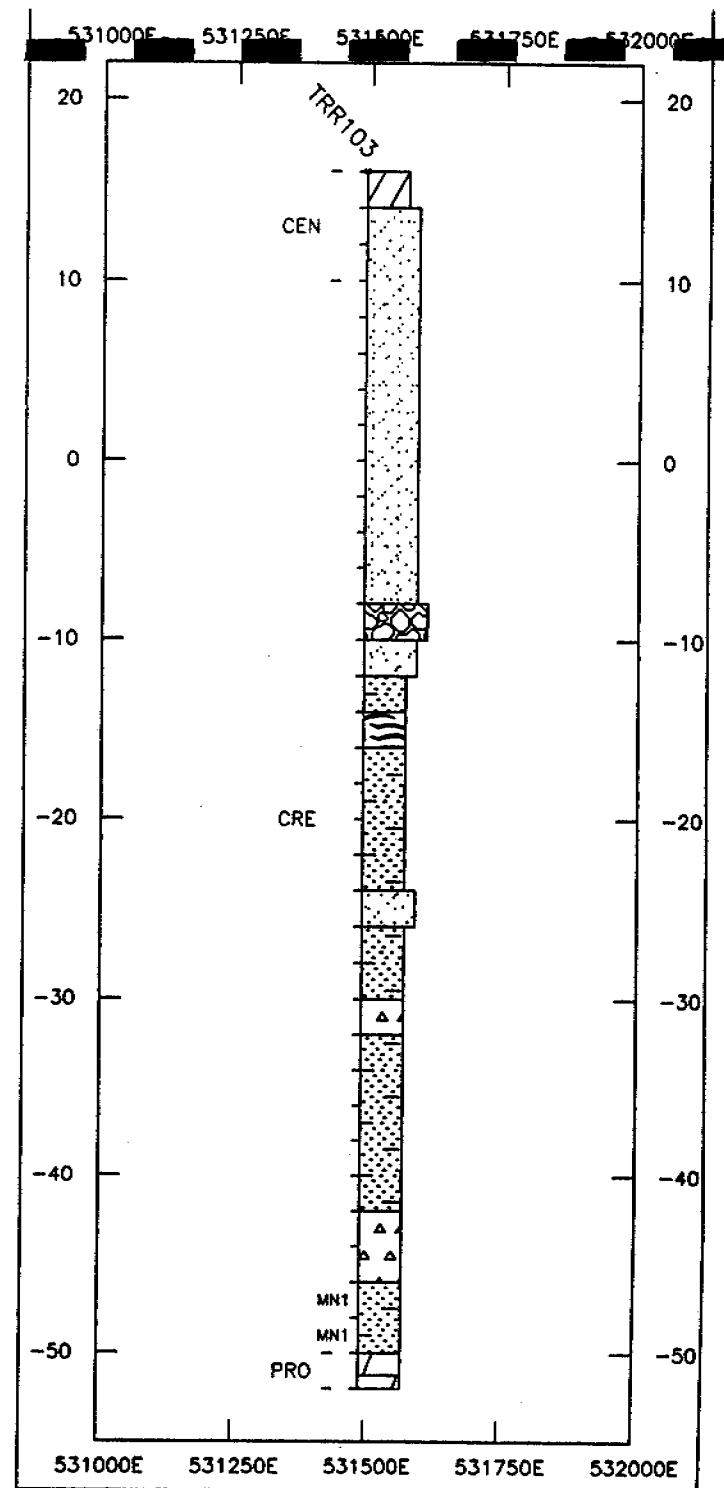
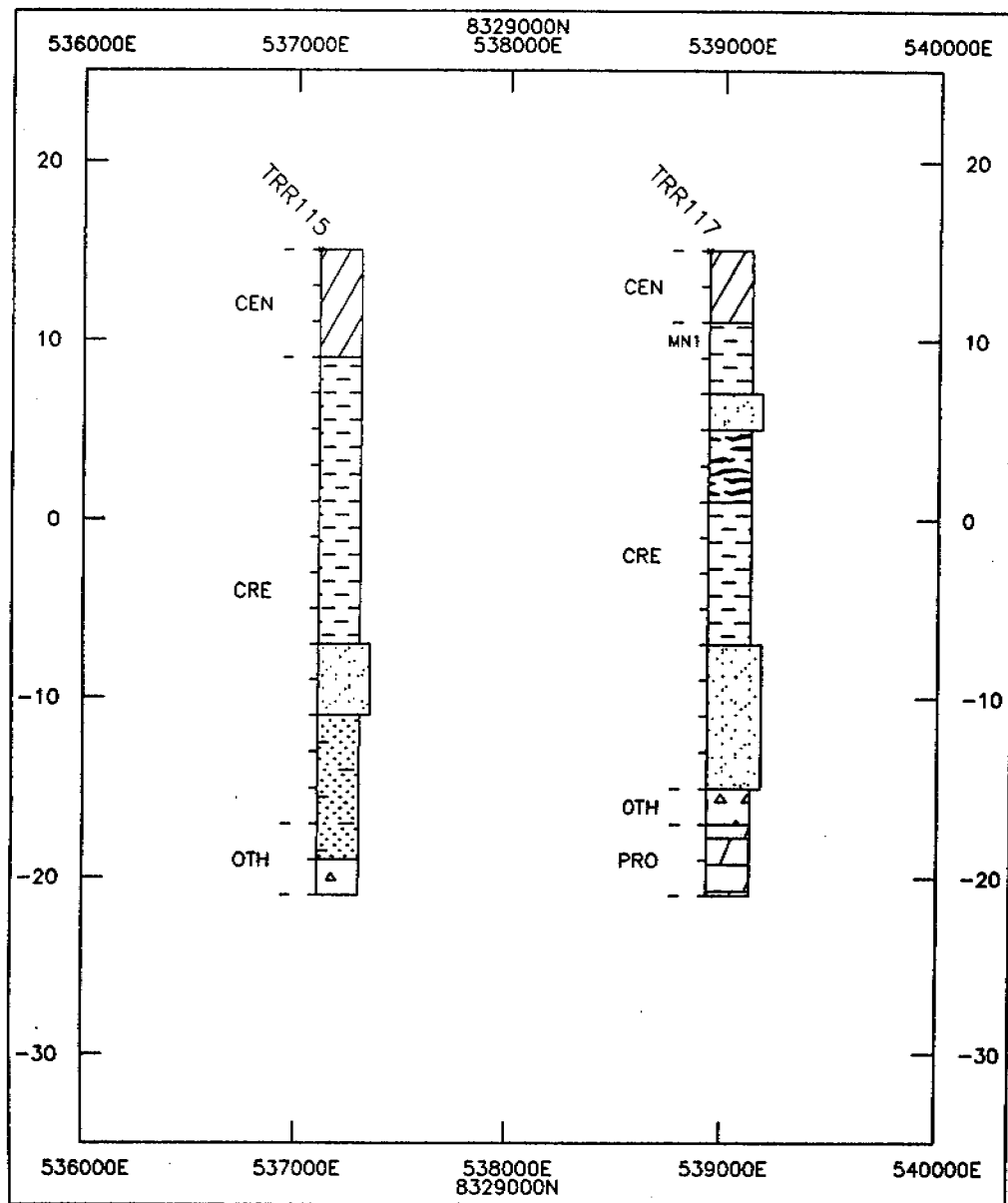
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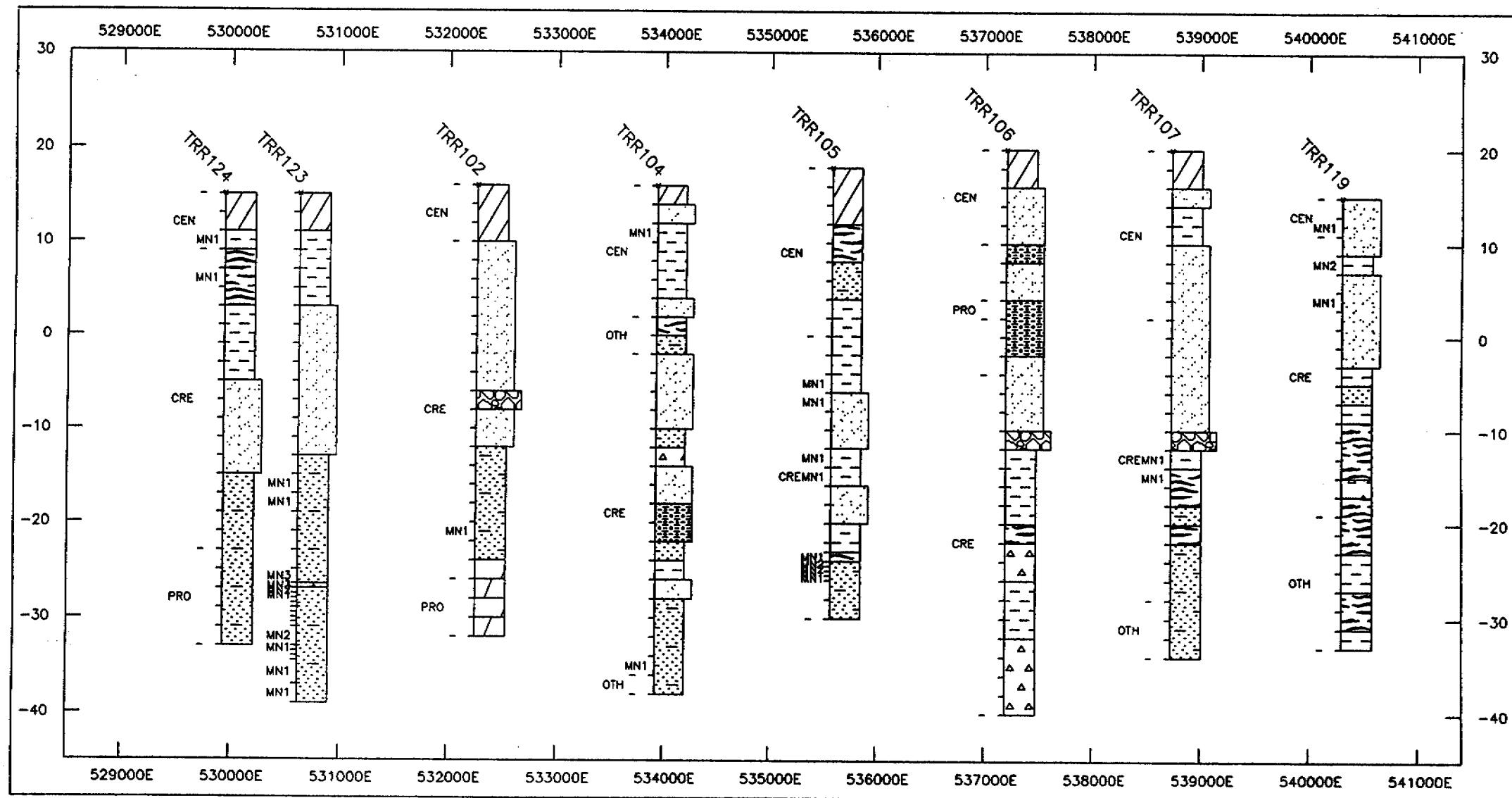
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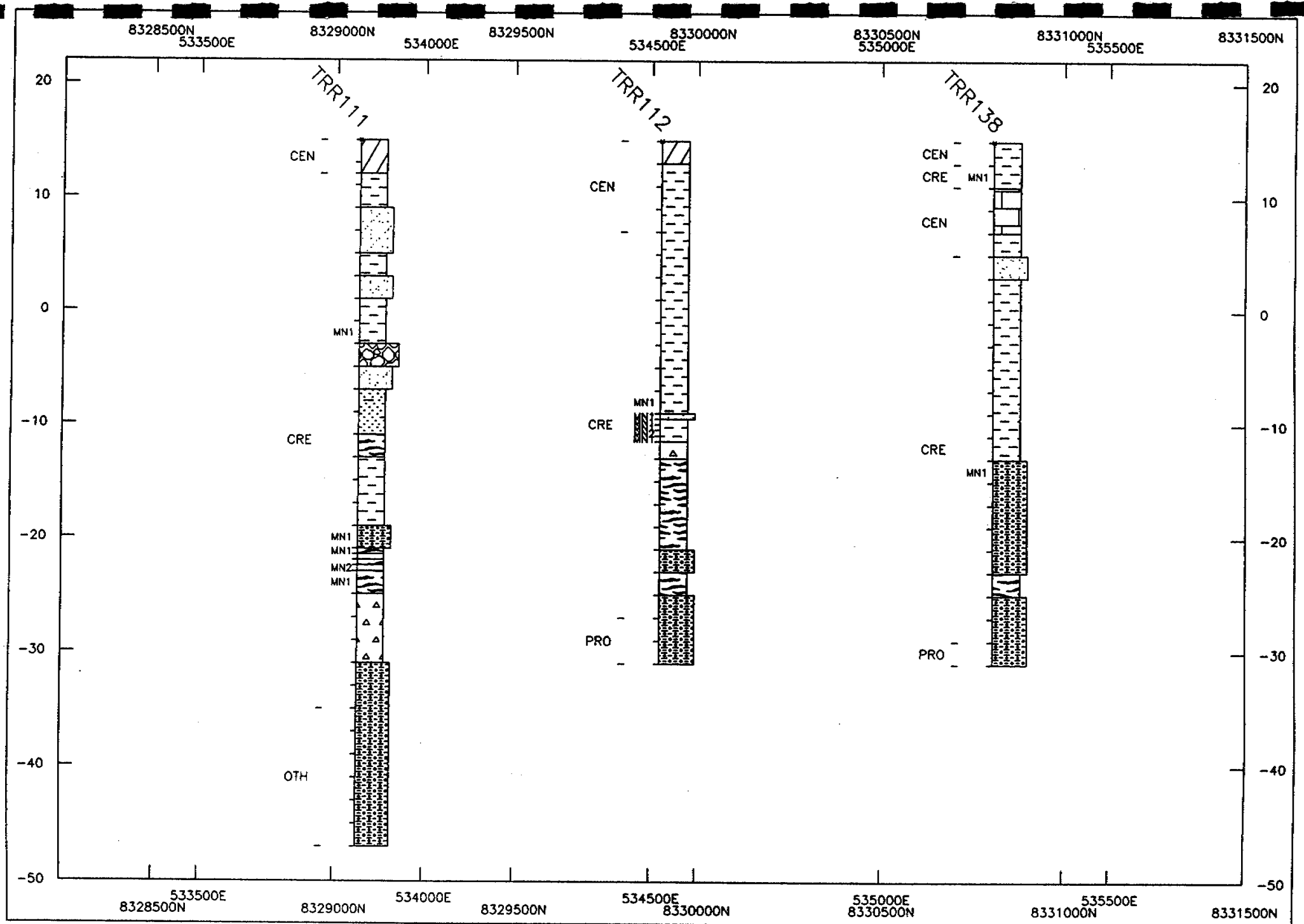
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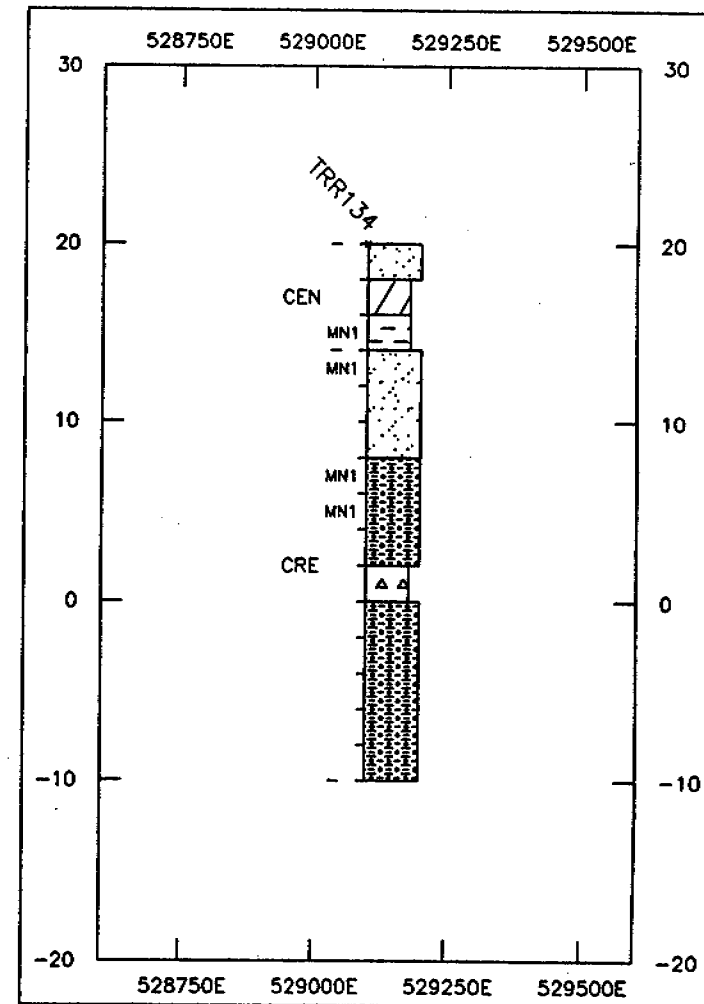
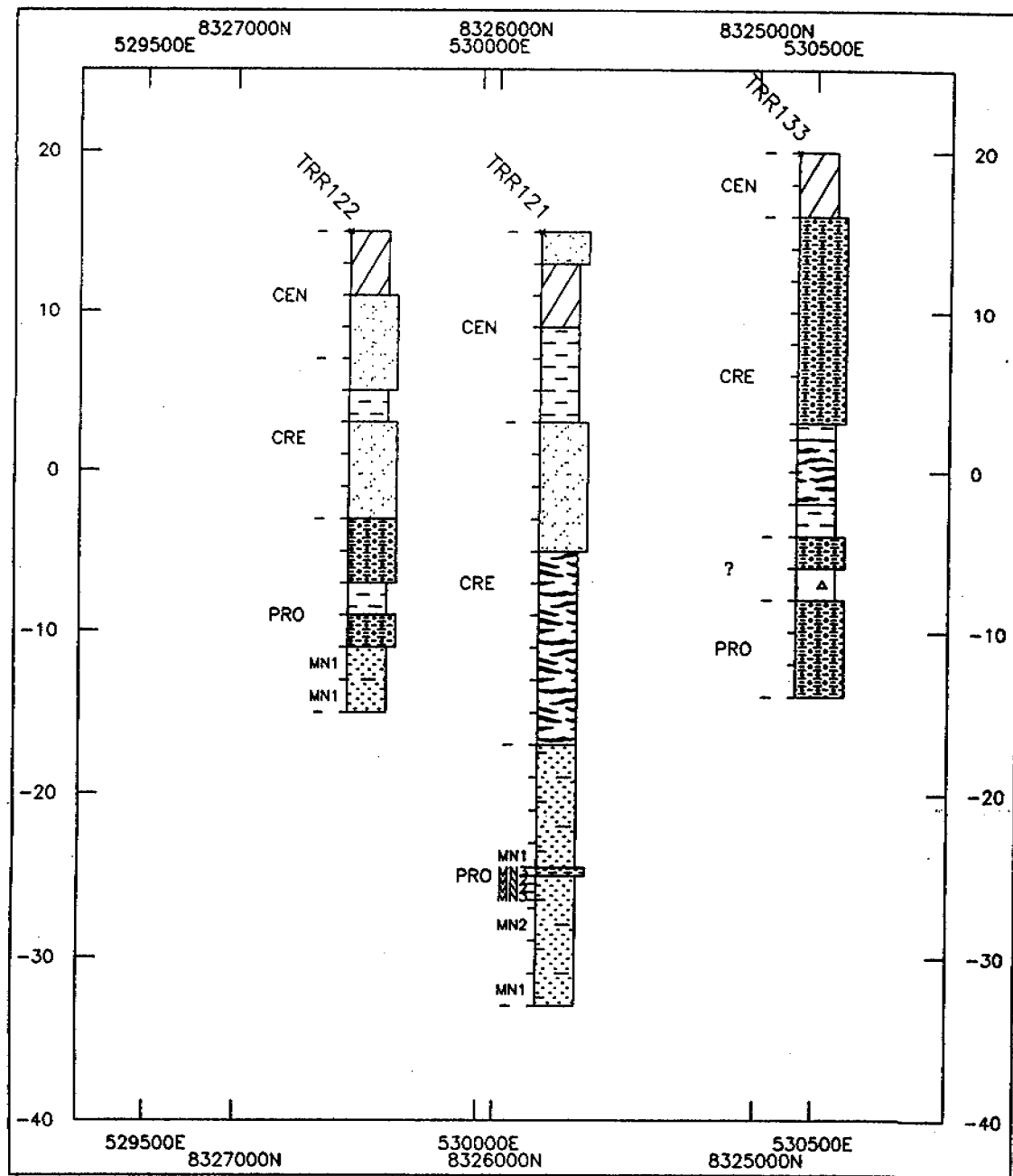
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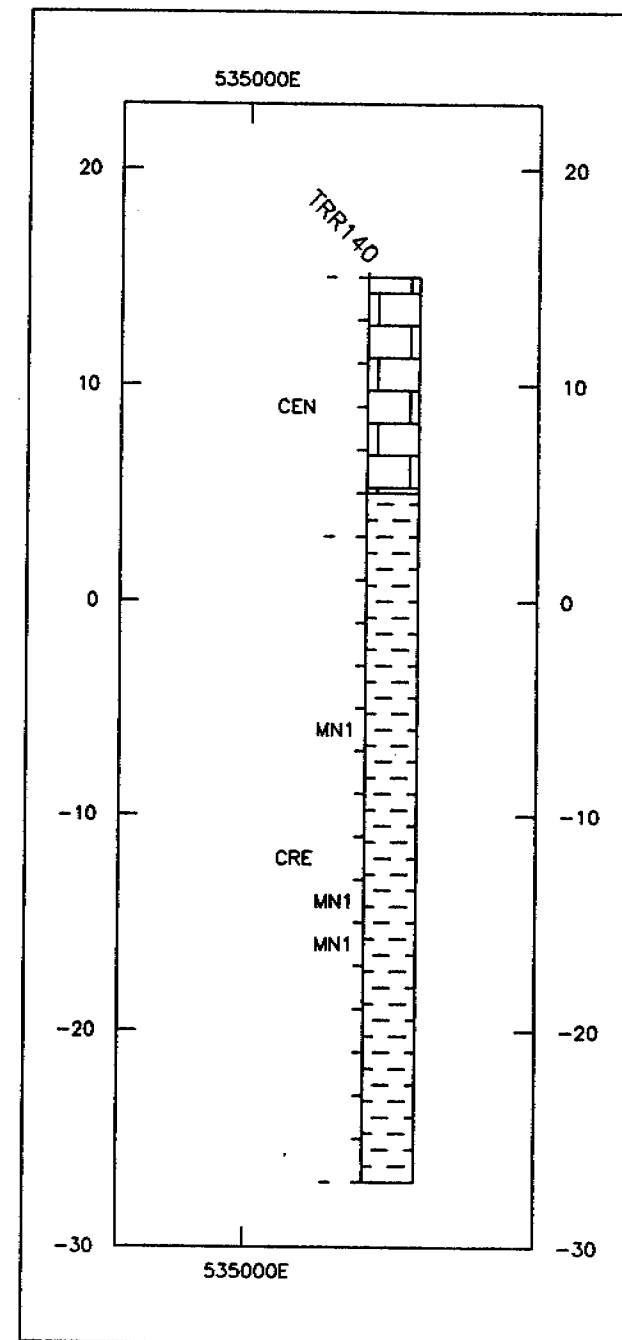
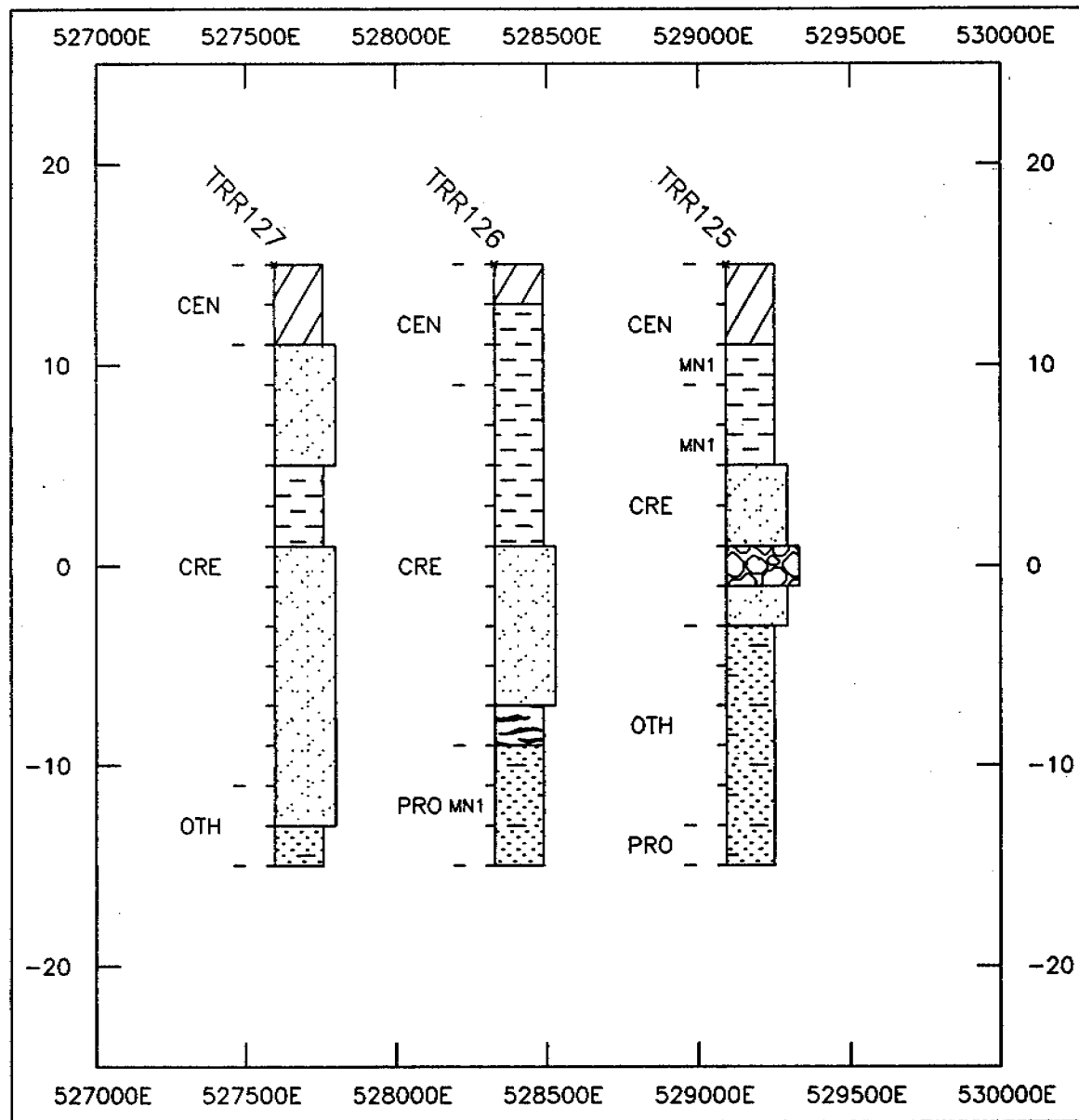
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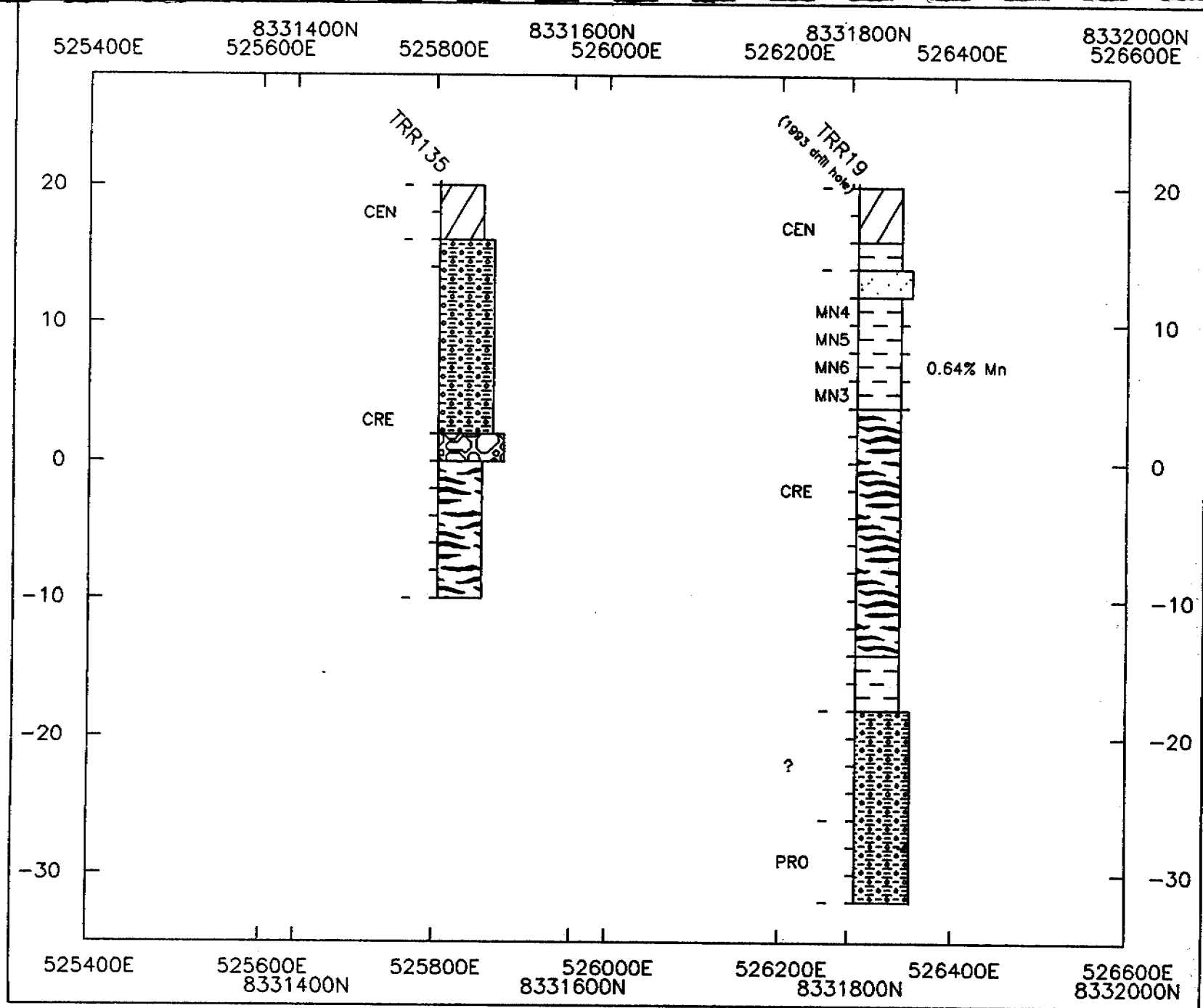


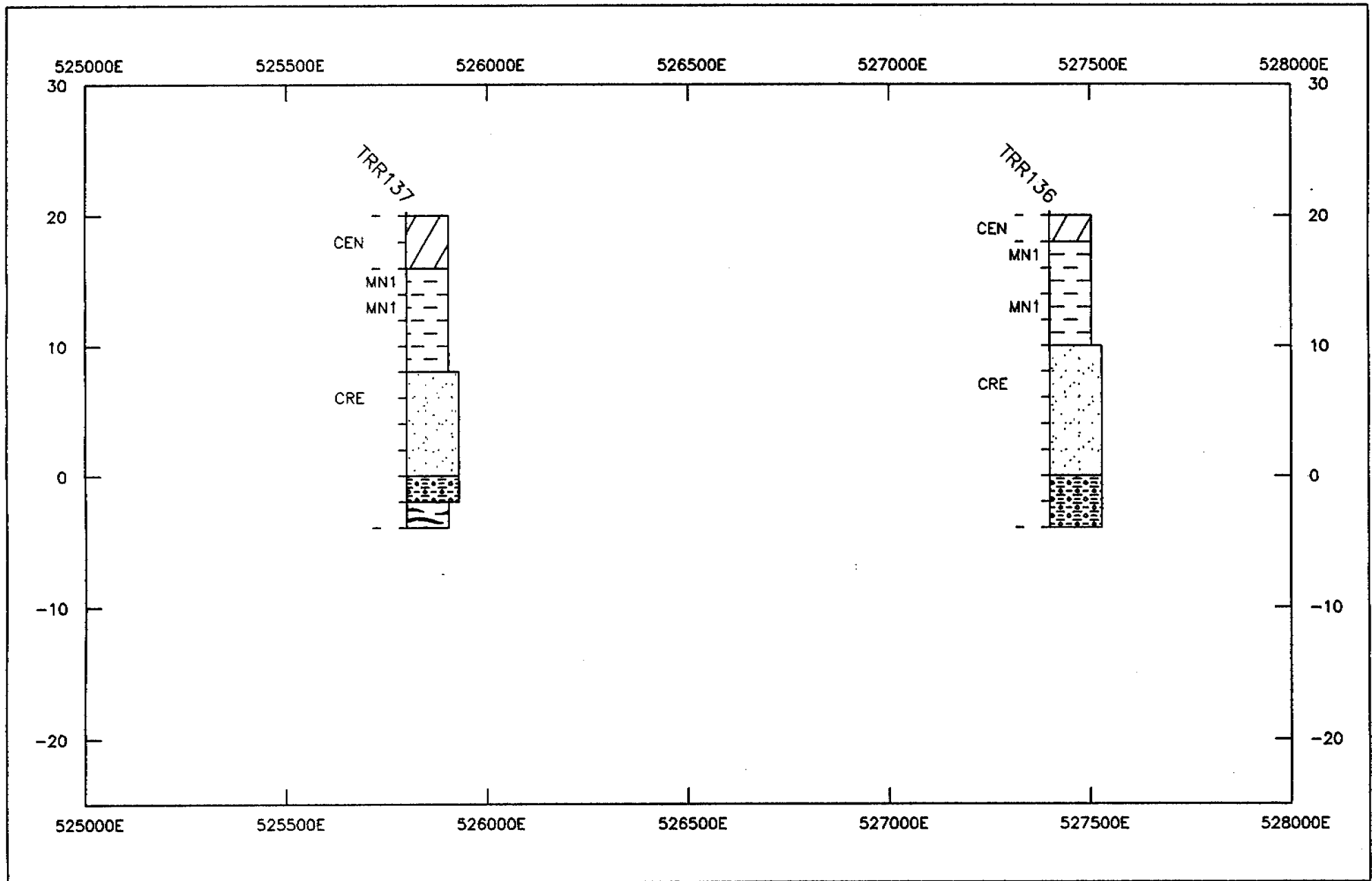


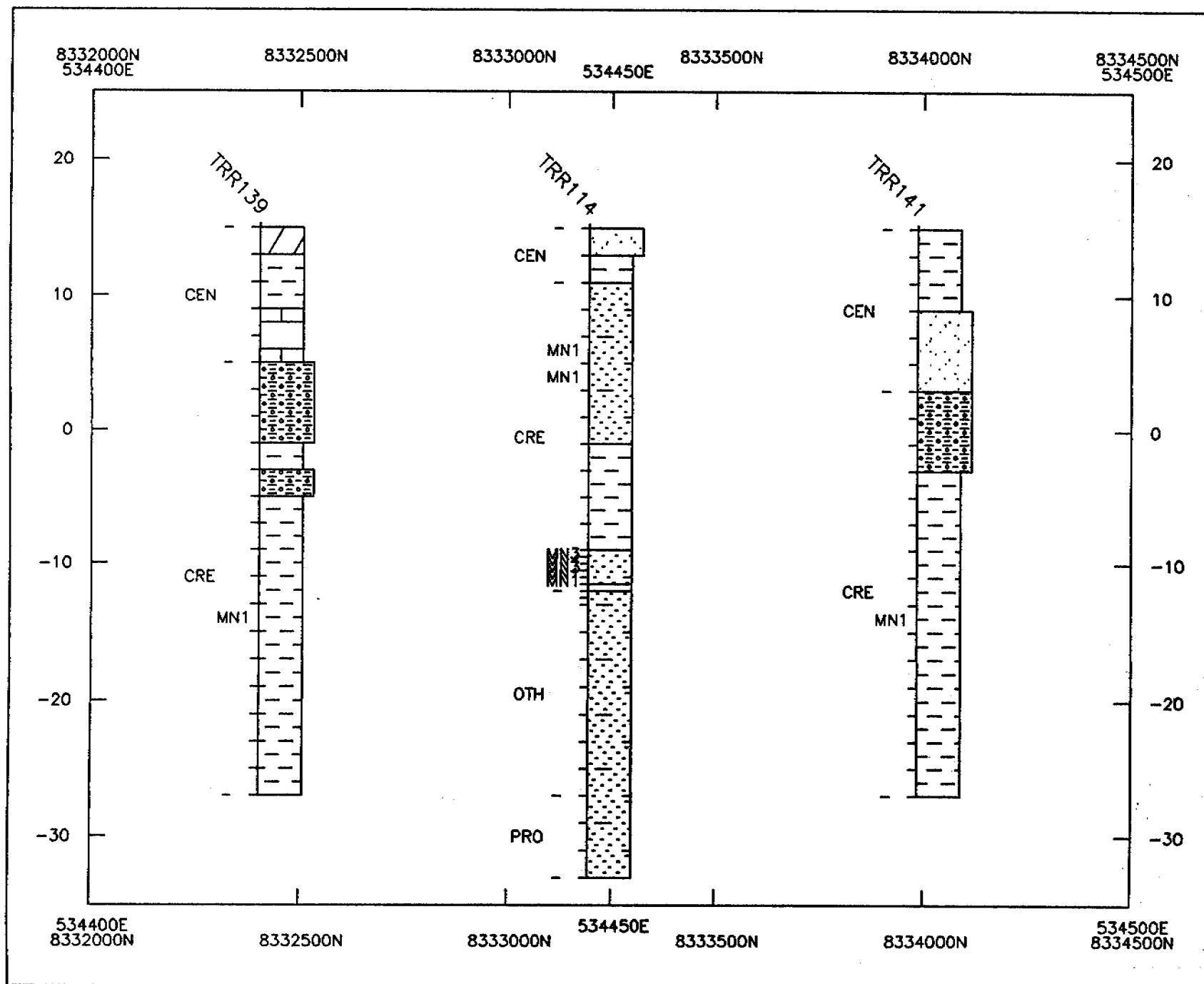


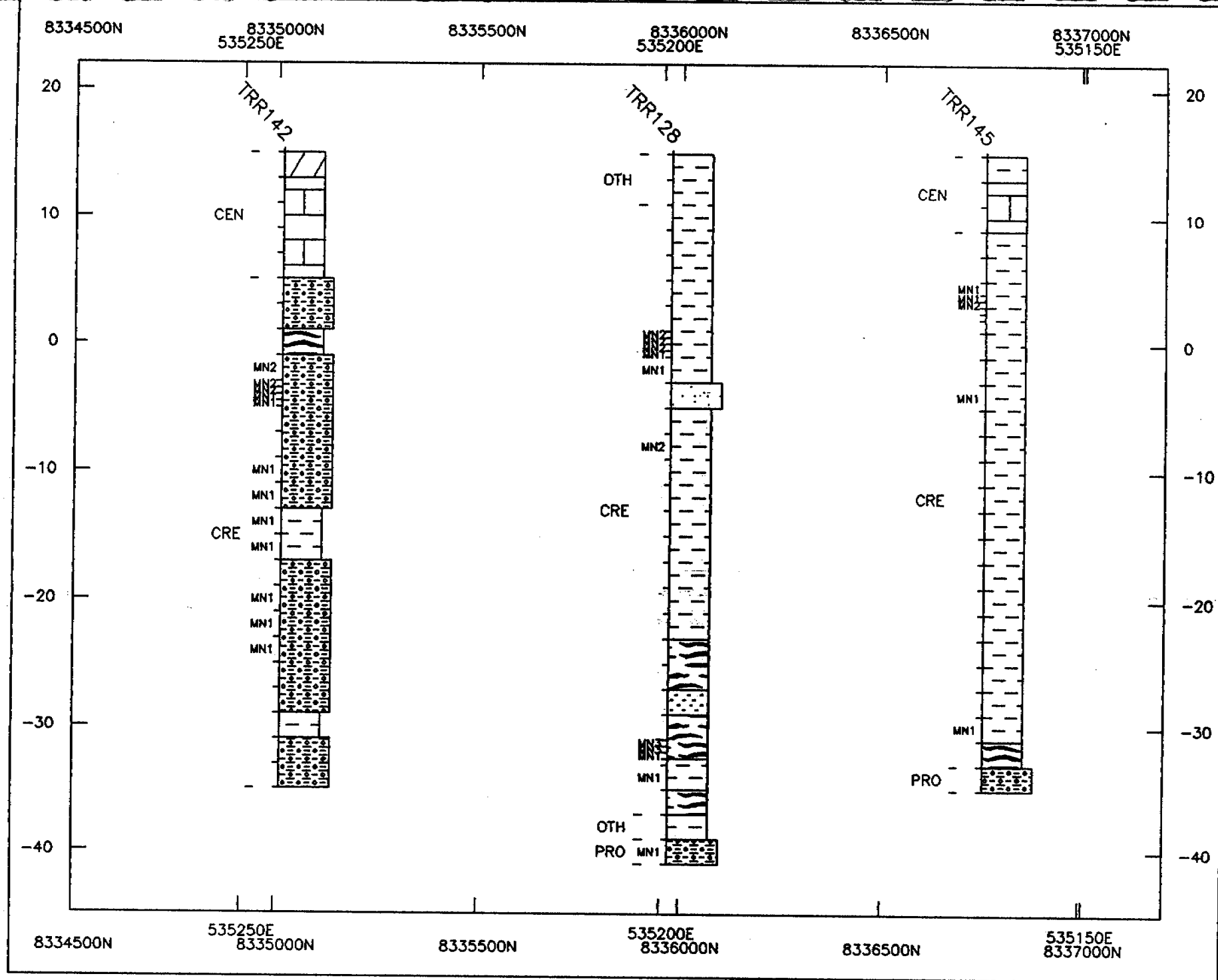


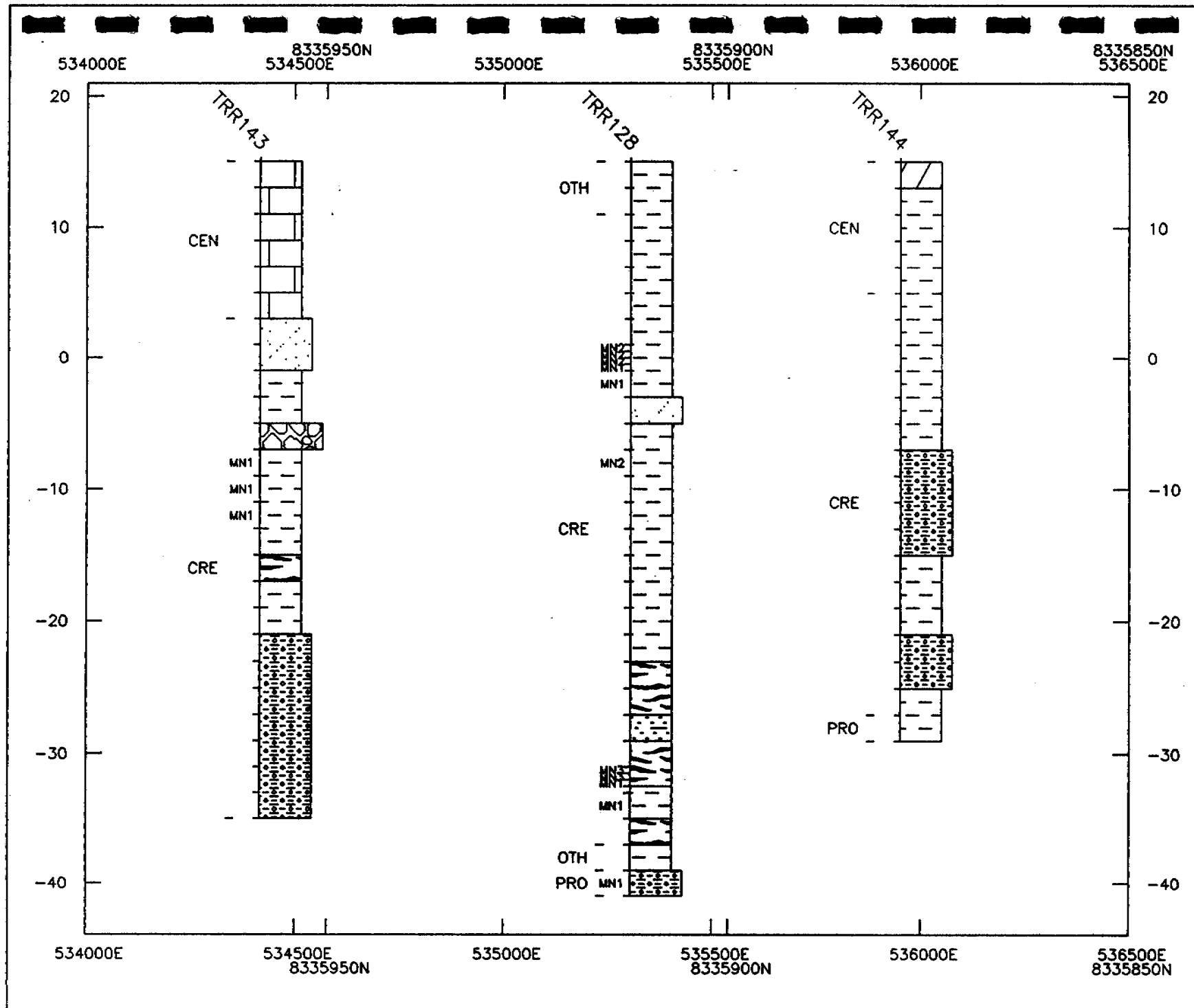


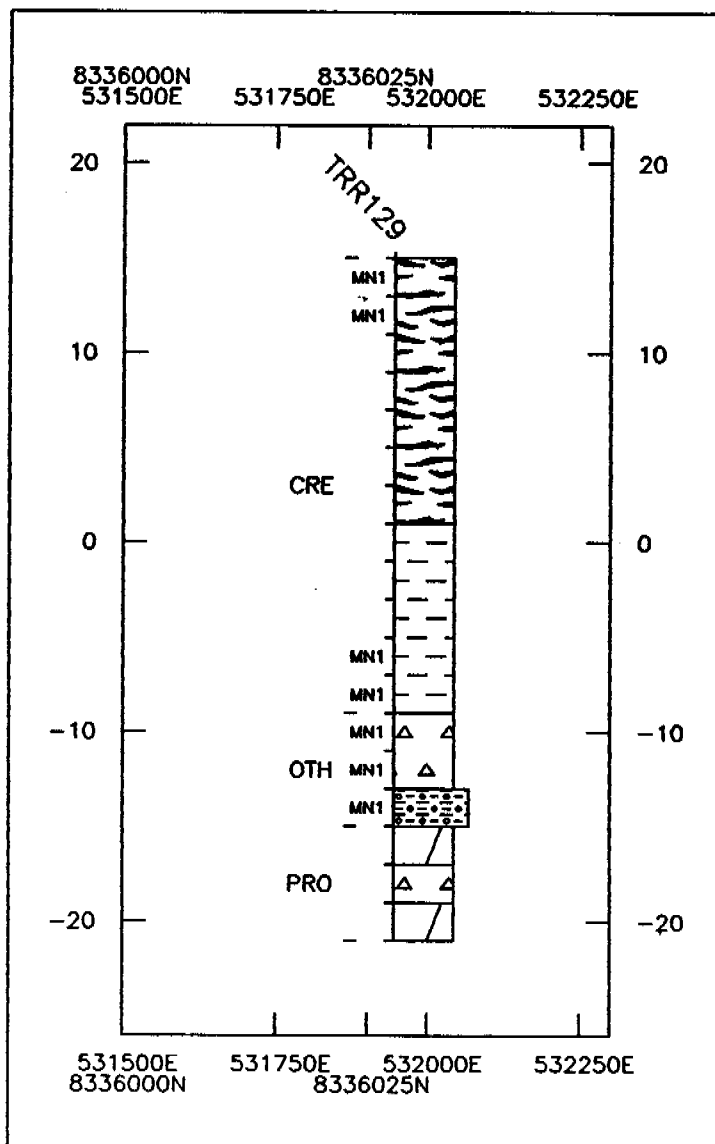


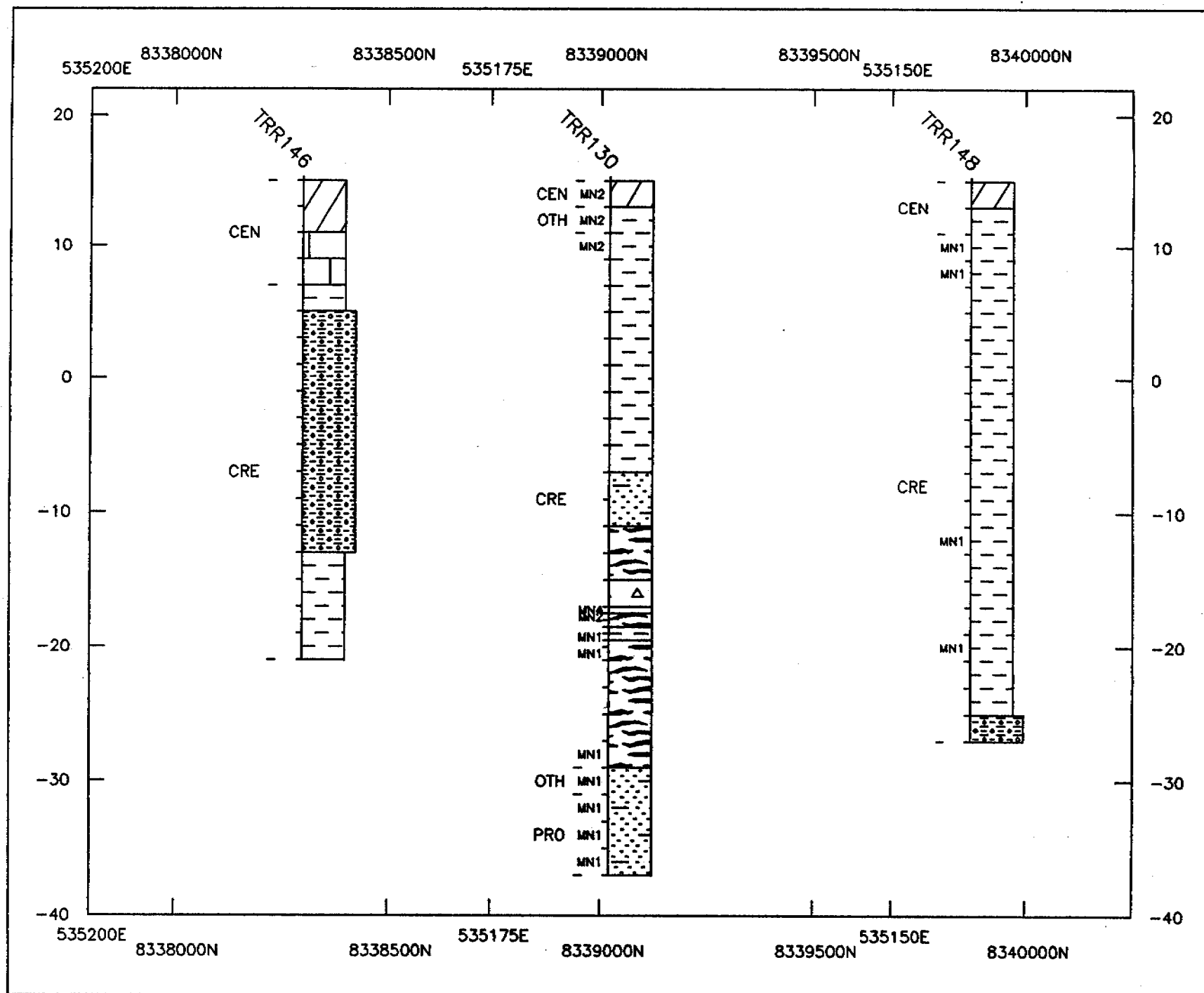


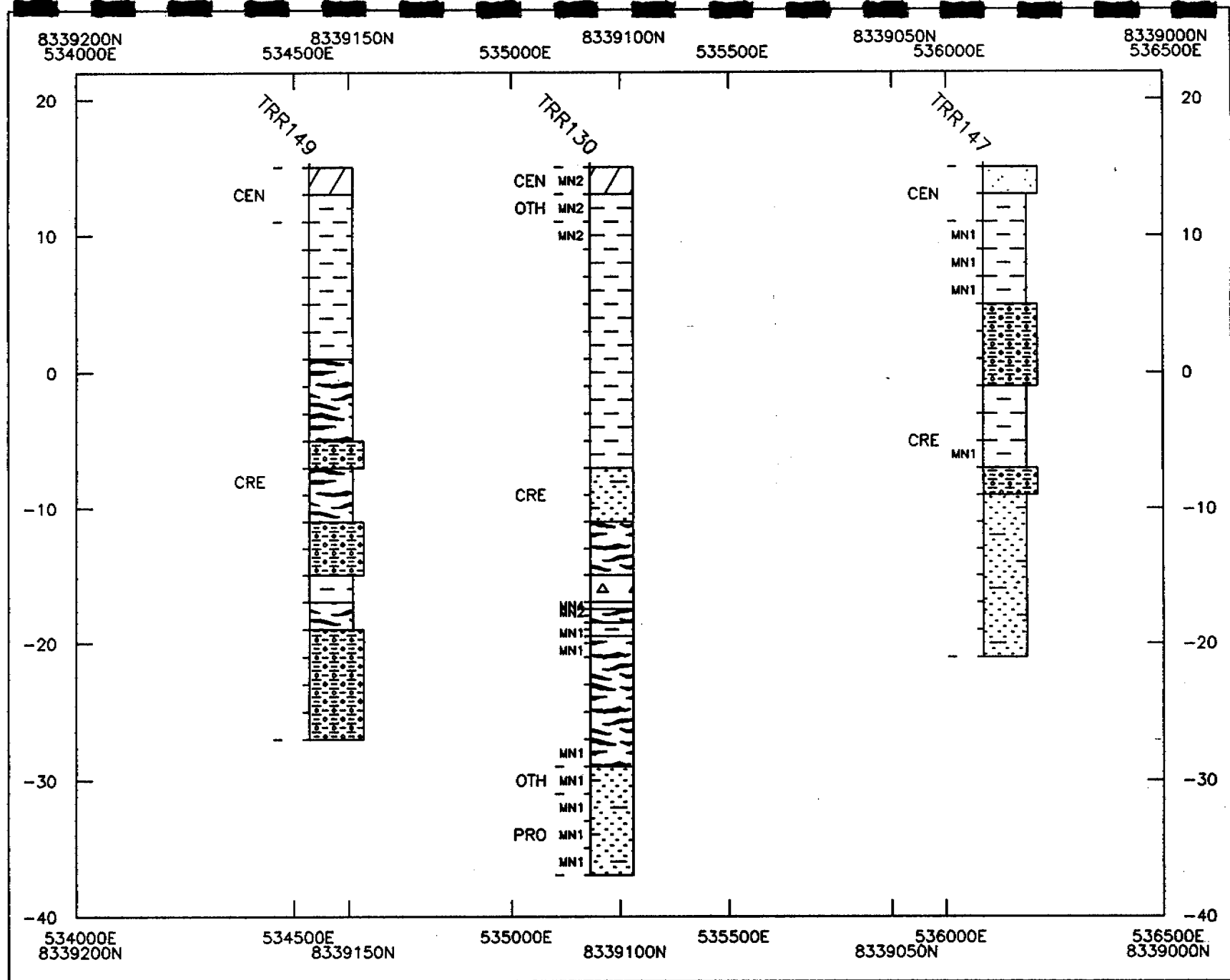


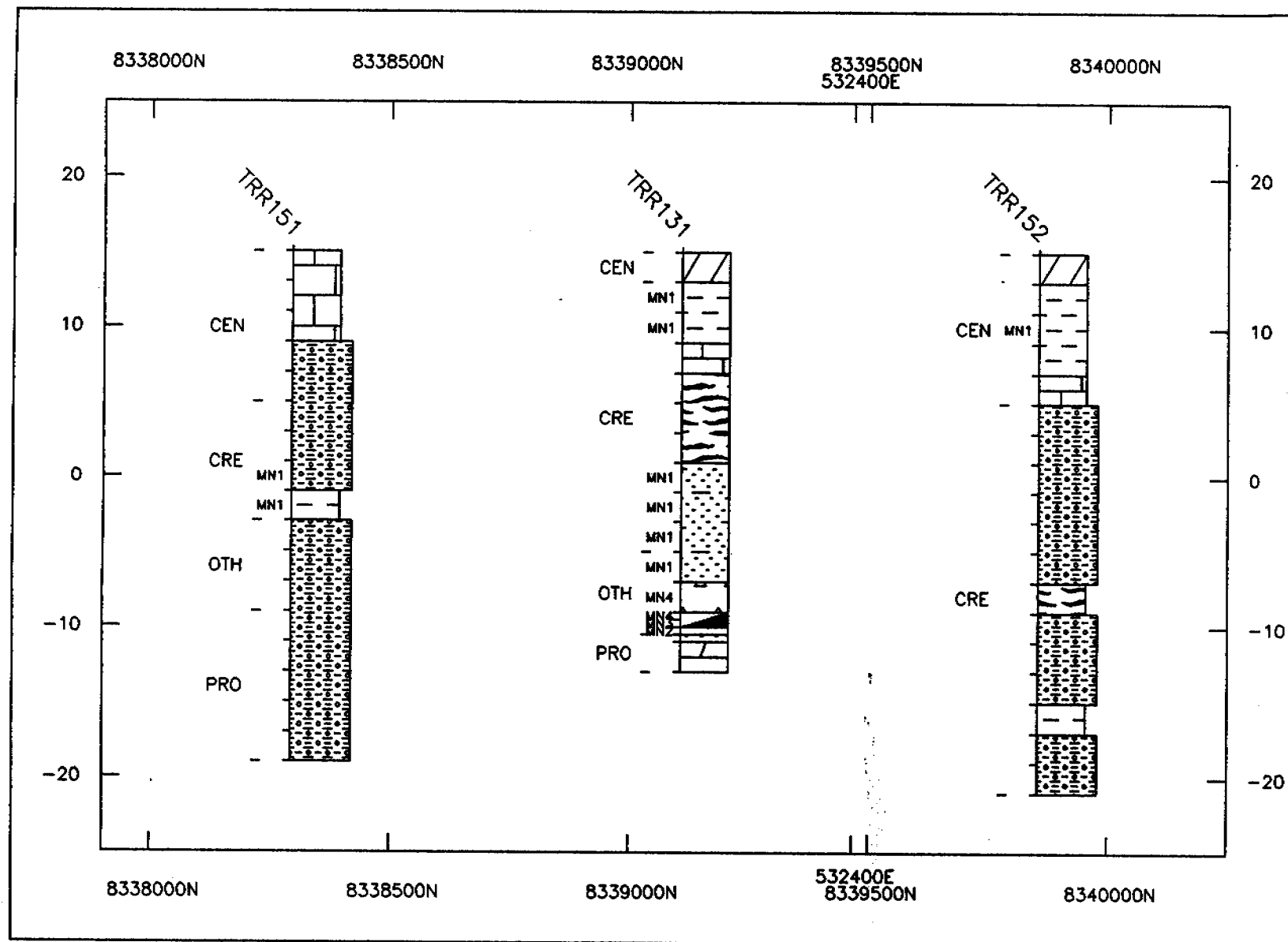


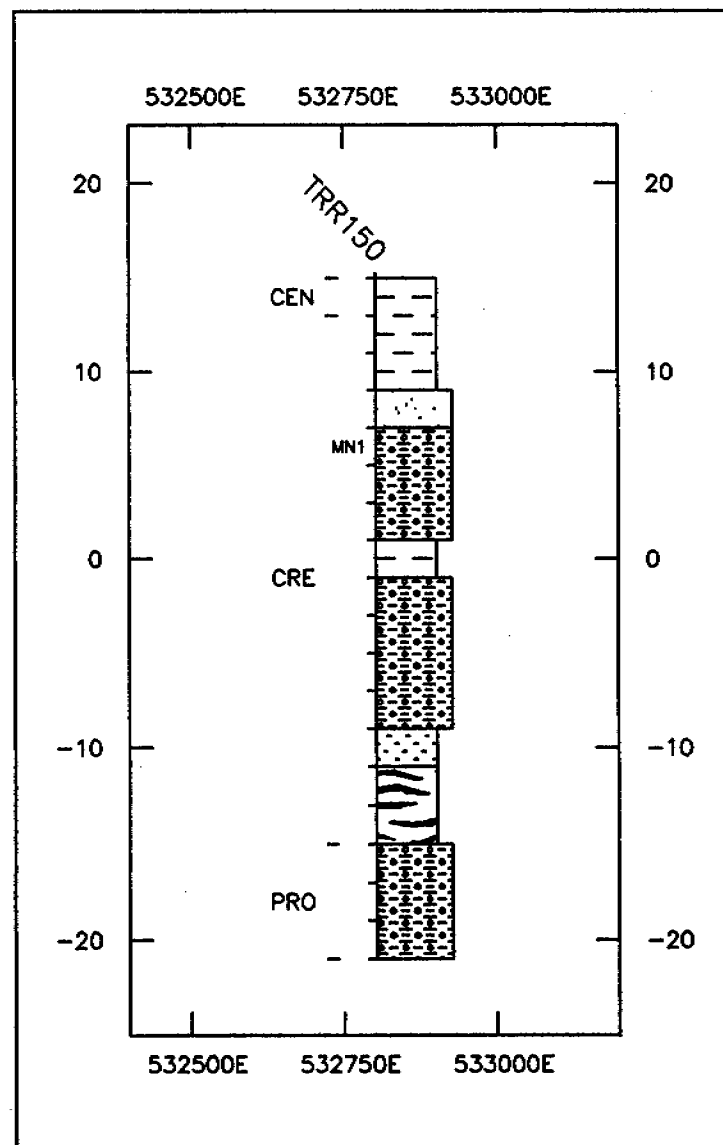
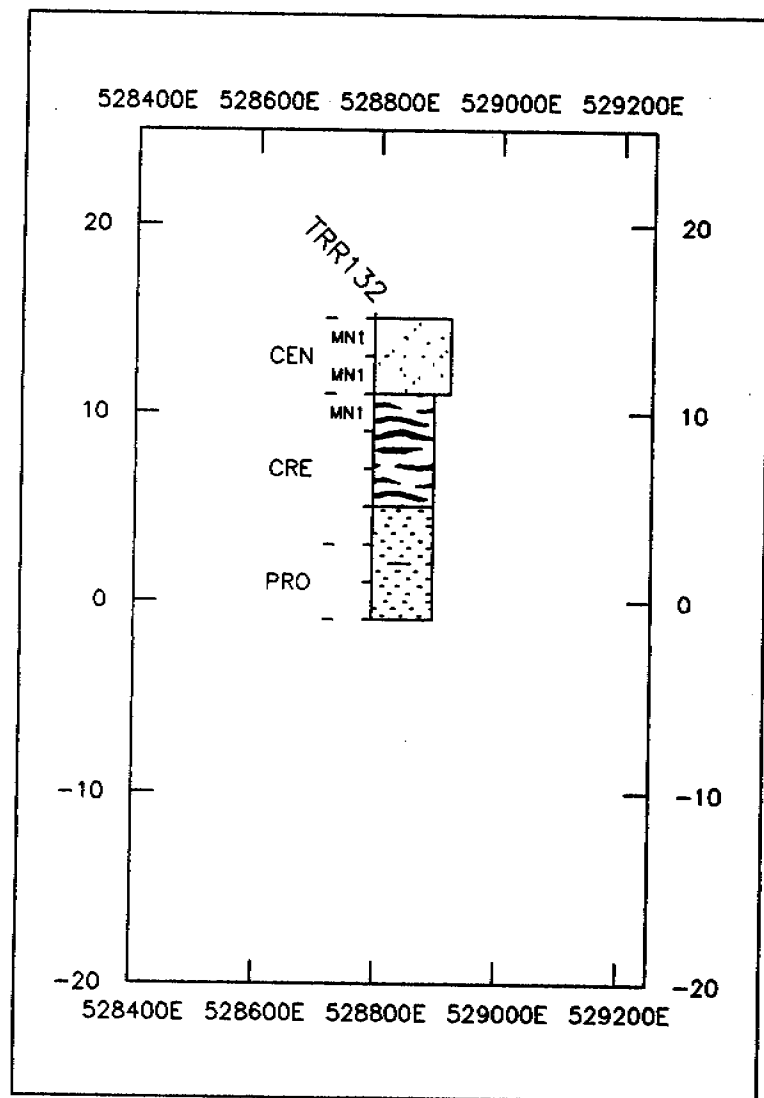


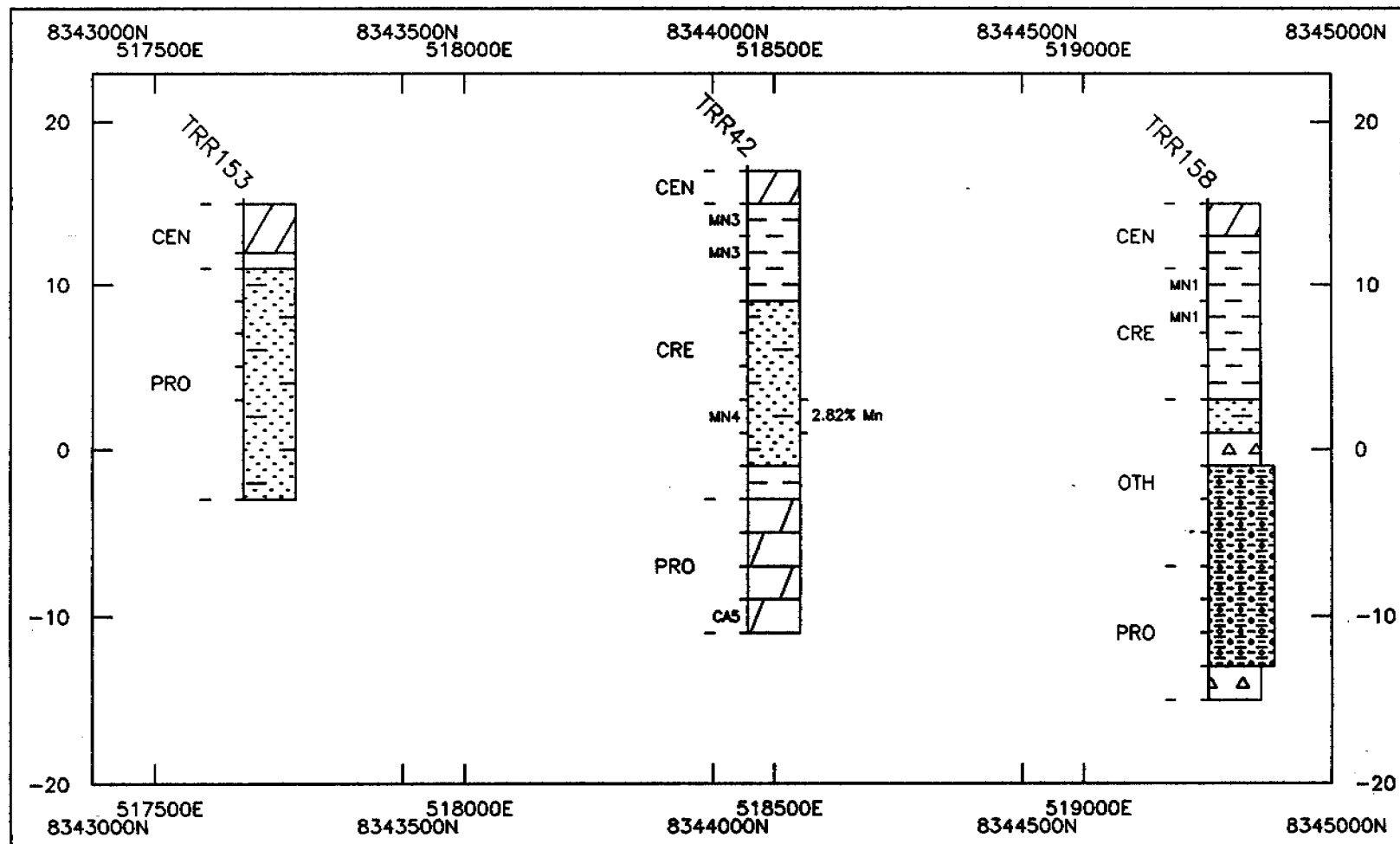


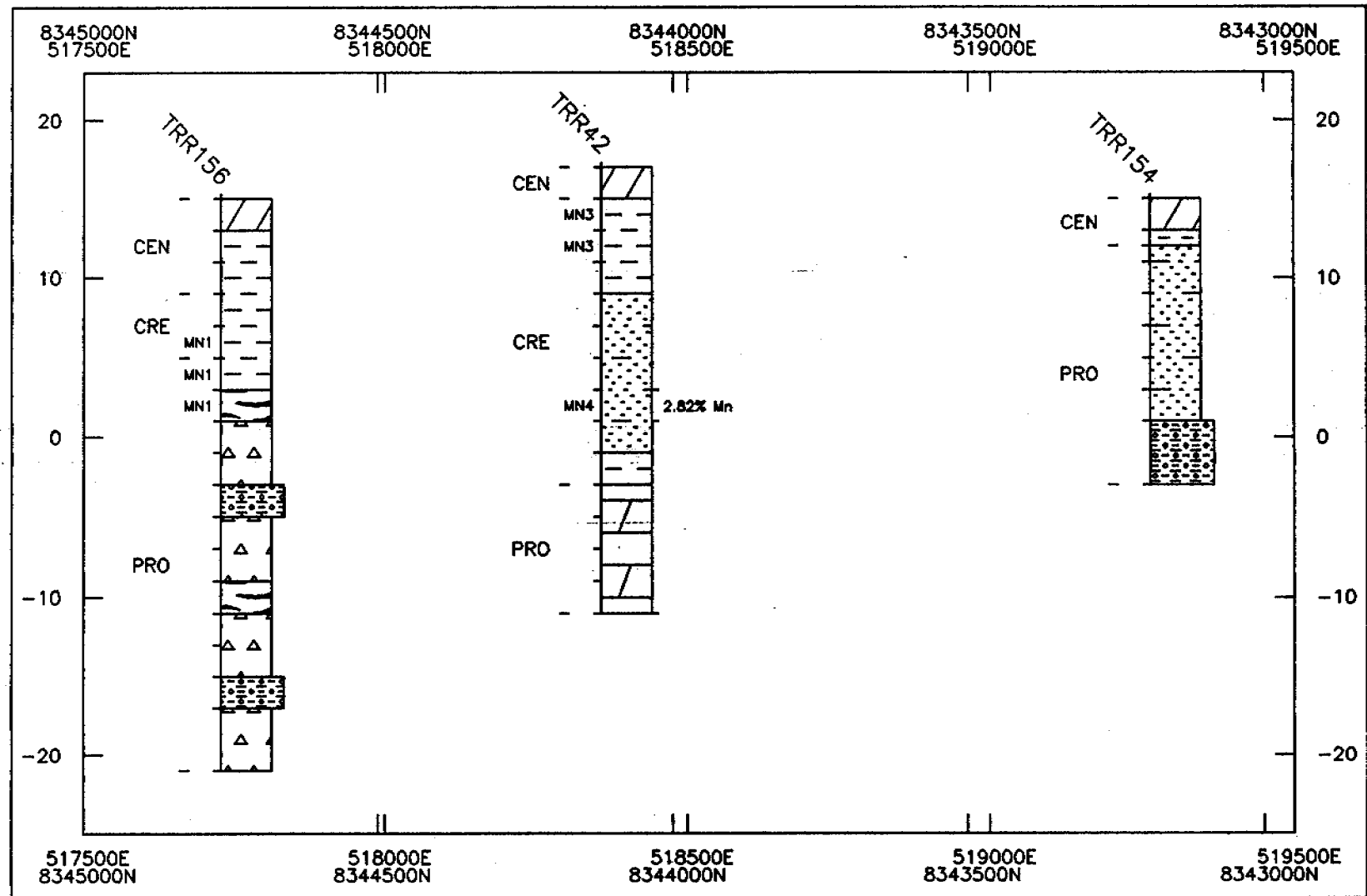


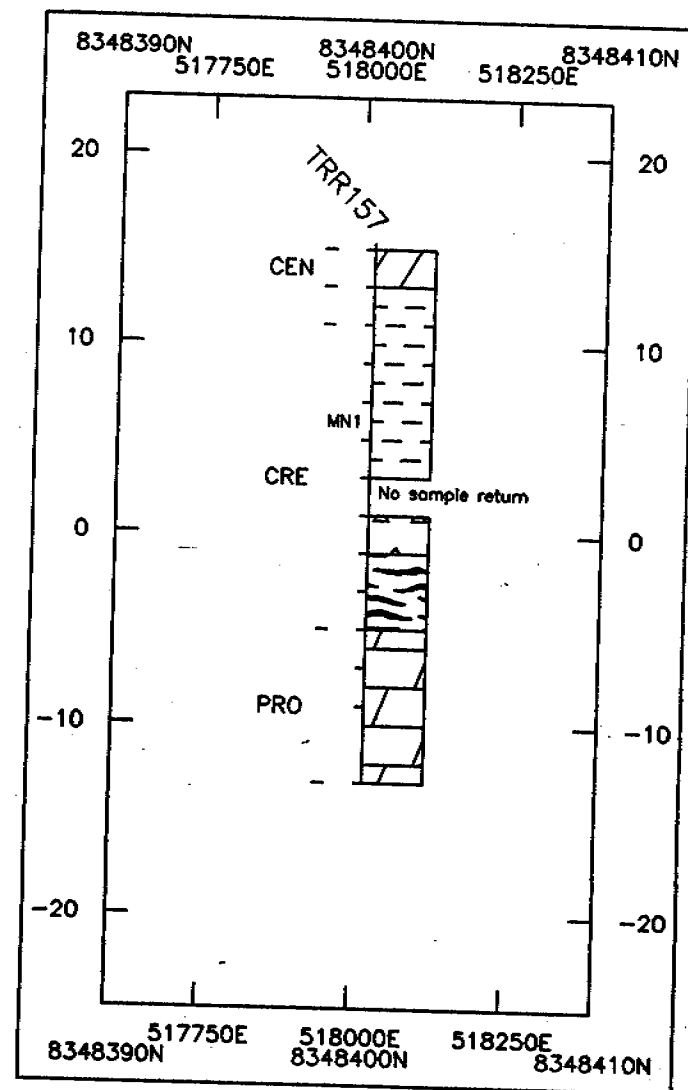
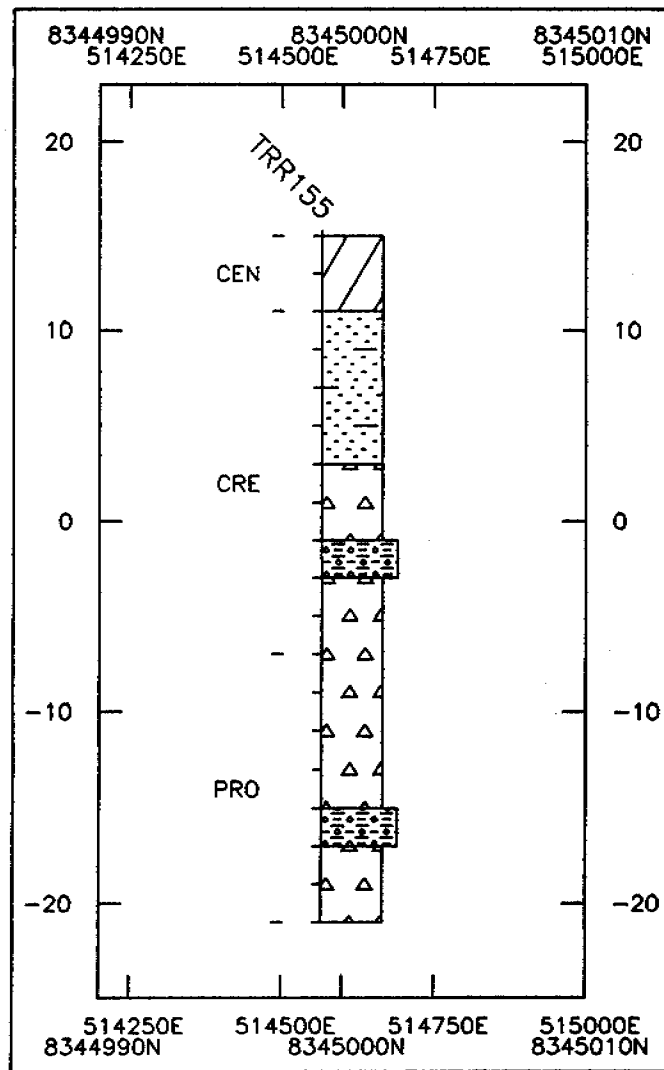


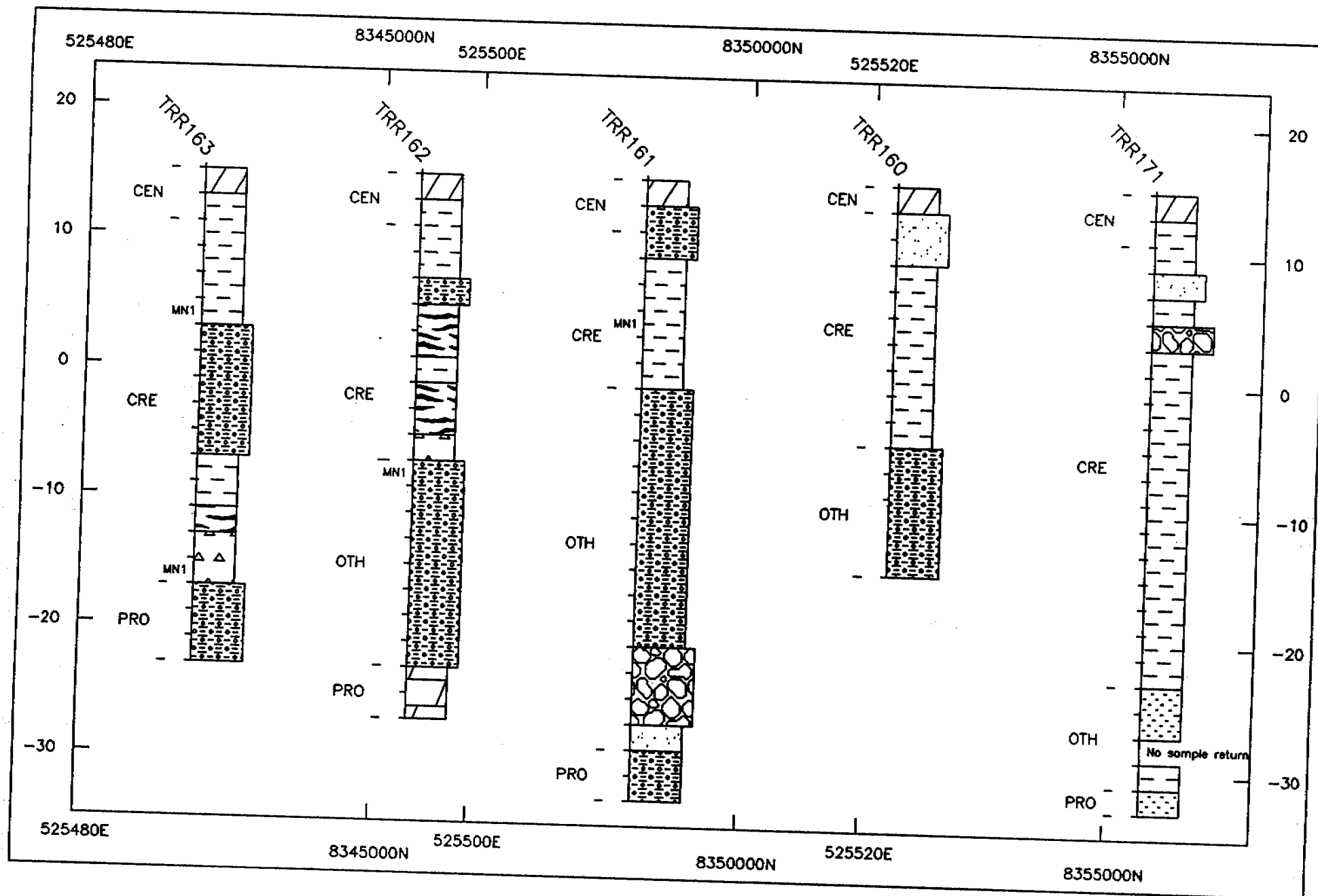


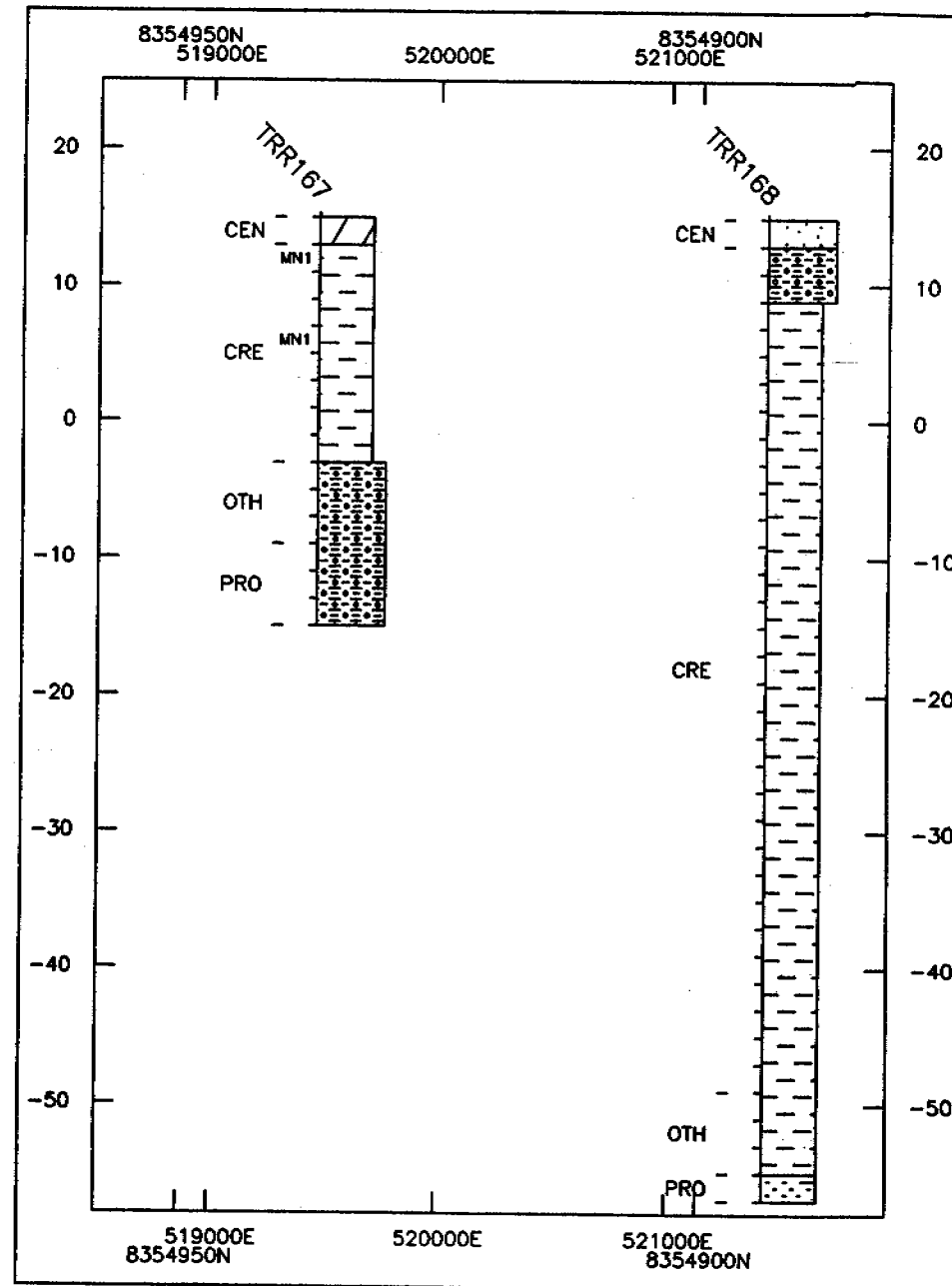
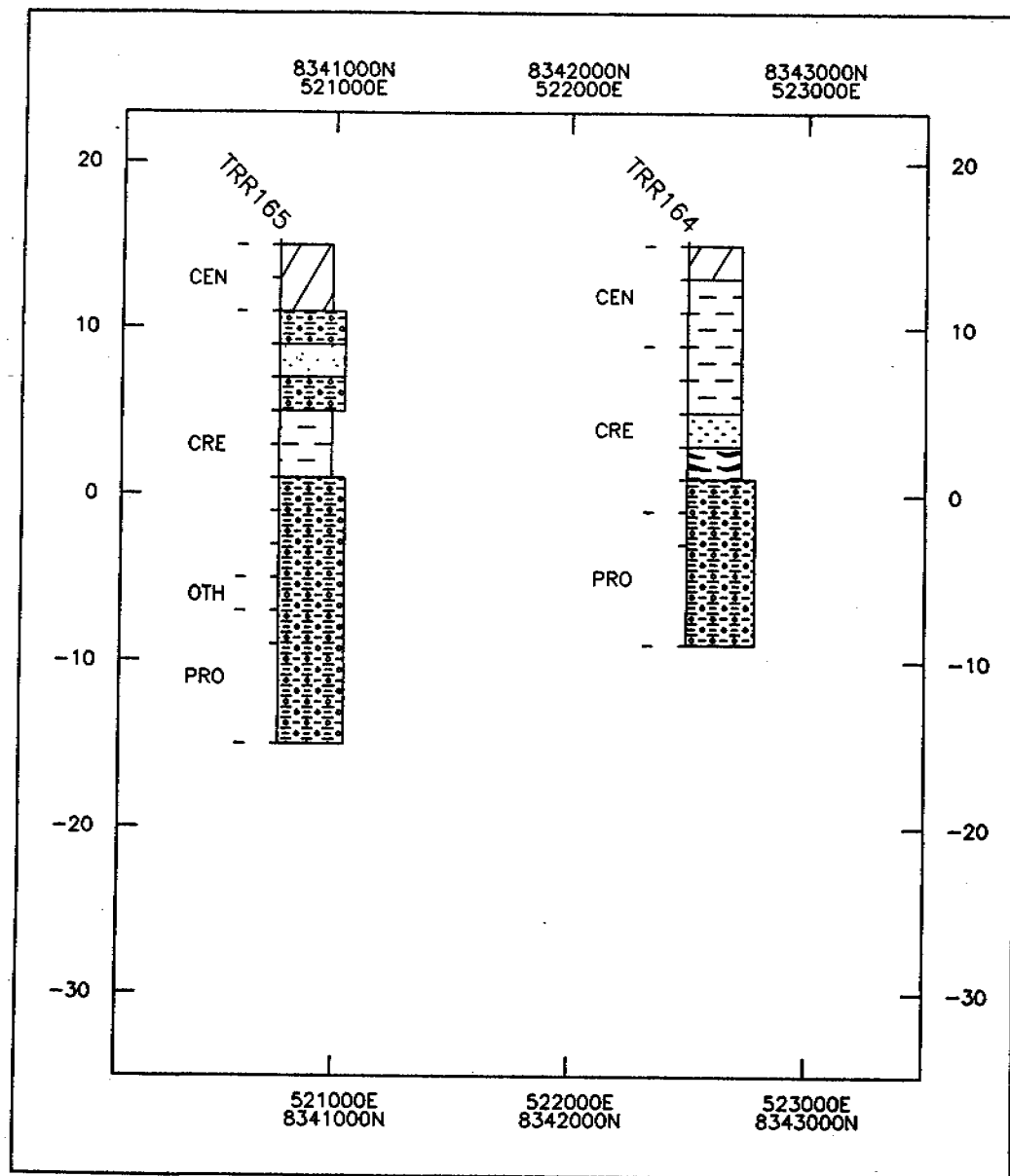


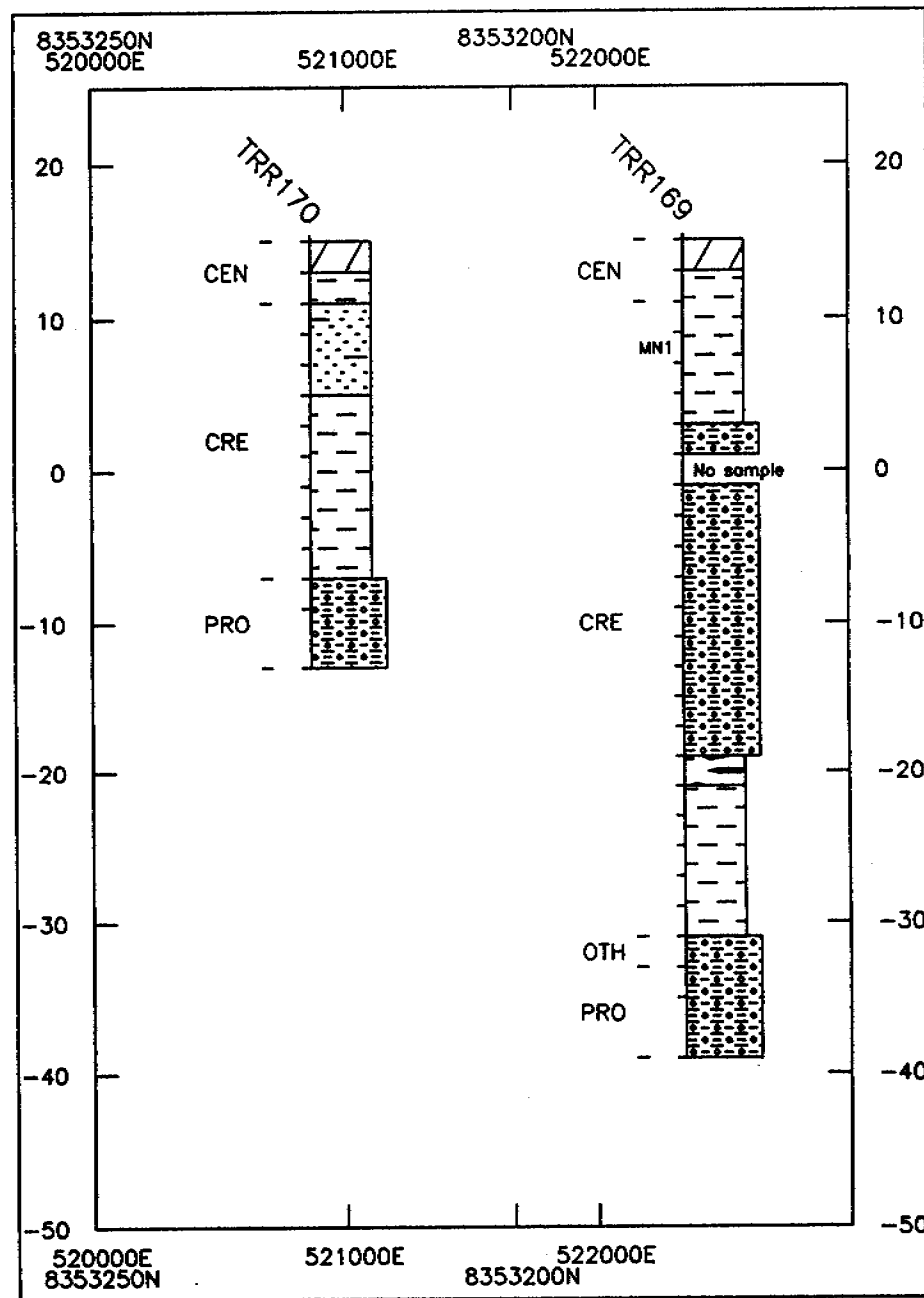
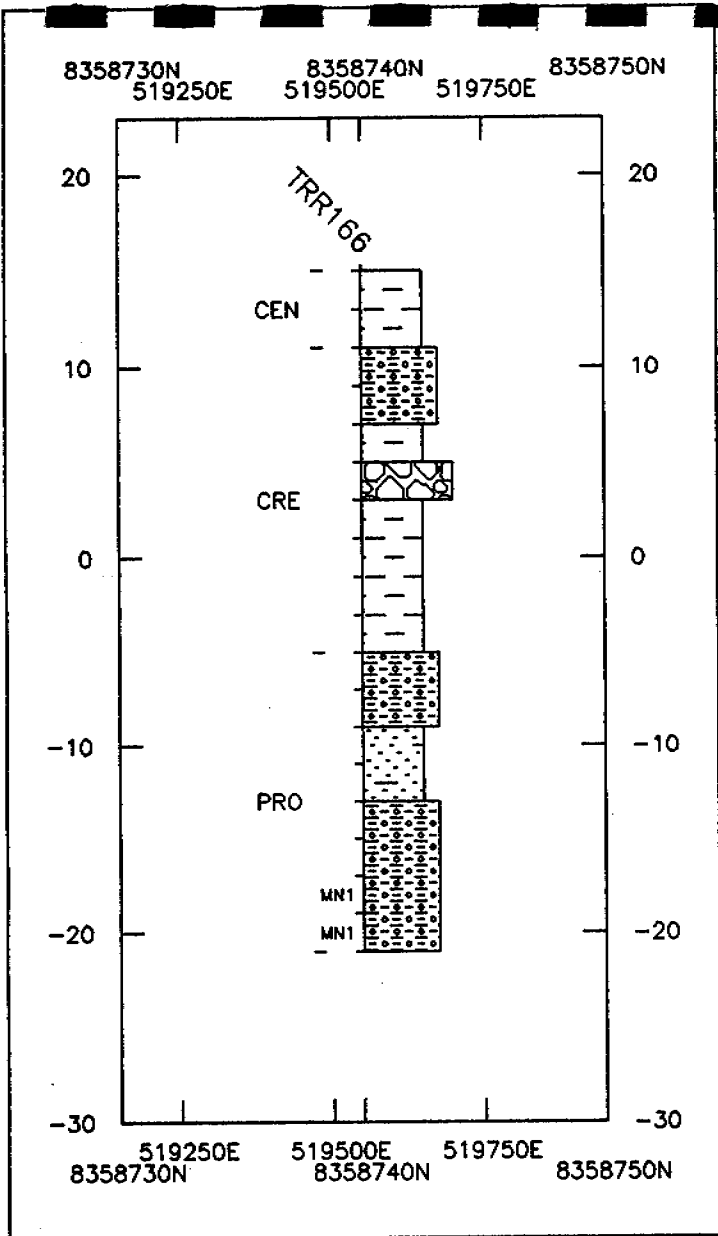


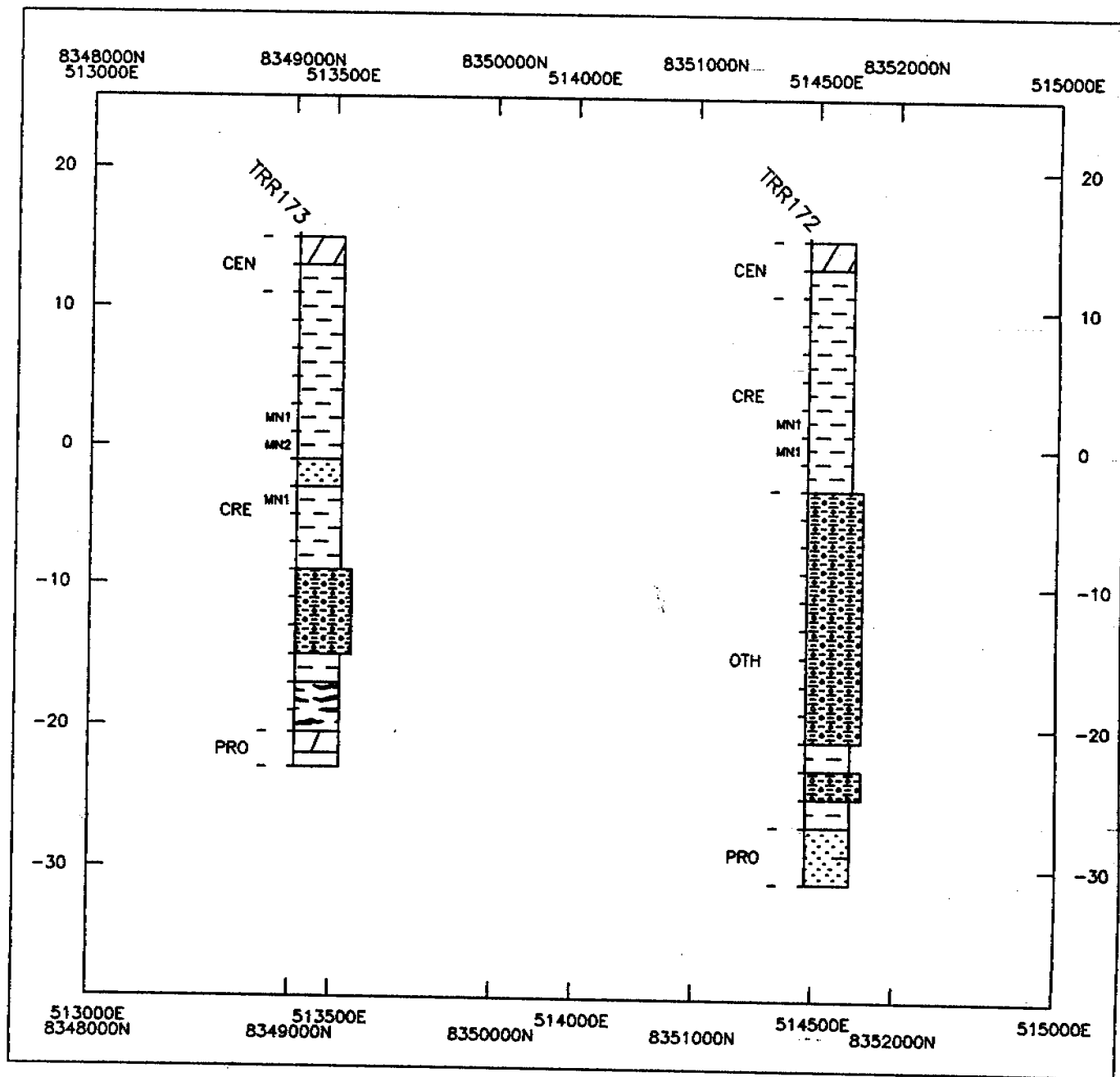
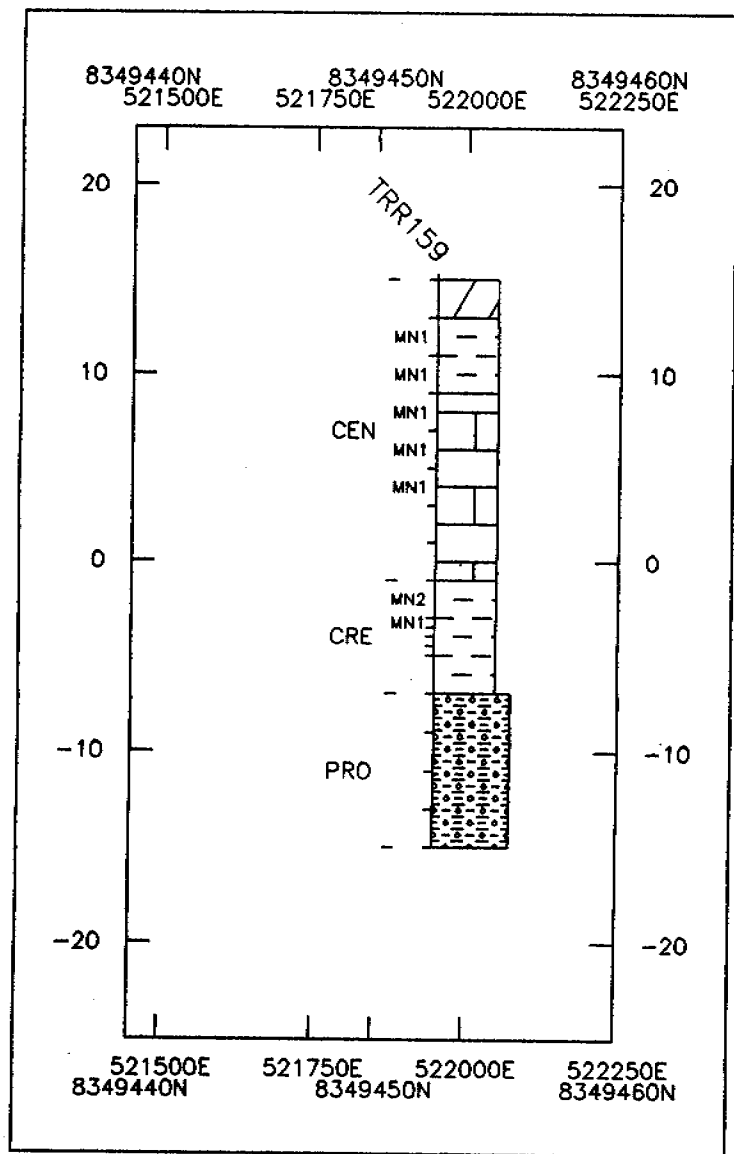












APPENDIX 9.

**Manganese Drilling
Analytical Results**

APPENDIX 3
NATHAN PROJECT TENEMENT DOWNHOLE ANALYSES
MERGED DRILL AND ANALYTICAL DATA

HOLE NO	FROM (m)	TO (m)	SAMPLE NO	Mn %	Fe %	SiO2 %	Al2O3 %	P ppm	Cu ppm	Pb ppm	Zn ppm	BaO %	Sr ppm	CaO %	K2O %	La ppm	Ce ppm	MgO %
TRR100	10	10.5	DZ1198	3.73	5.48	54.90	11.6	293	163	11	77	0.30	246	4.52	3.19	33	70	4.33
TRR100	10	10.5	DZ1198A	8.08	4.58	20.20	4.1	265	306	48	104	0.75	582	14.2	1.31	10	54	11.9
TRR100	10.5	11	DZ1199	2.48	7.27	59.10	10.4	219	146	81	89	0.24	200	3.83	3.25	30	61	3.6
TRR100	10.5	11	DZ1199A	4.51	9.30	26.60	4.54	205	222	143	141	0.50	436	11.8	1.25	8	39	10.9
TRR100	15.5	16	DZ1200	2.62	4.84	63.70	12.6	325	62	32	105	0.16	103	1.26	4.27	46	92	2.14
TRR100	15.5	16	DZ1200A	19.50	2.20	22.50	3.15	738	150	242	324	1.34	403	11.1	1.27	16	88	8.97
TRR105	42	42.5	DZ451	3.69	6.69	72.70	4.86	486	26	11	175	1.26	26	0.27	1.67	26	59	0.61
TRR105	42	42.5	DZ451A	6.81	10.76	62.90	2.63	699	36	28	269	2.14	24	0.2	1.07	19	62	0.34
TRR105	42.5	43	DZ452	5.55	21.18	41.90	6.2	1278	31	<5	208	1.74	25	0.21	2.46	23	46	0.83
TRR105	42.5	43	DZ452A	10.80	27.54	22.90	3.68	1554	43	25	215	3.19	22	0.14	1.40	20	48	0.43
TRR108	15.5	16	DZ453	1.55	3.22	79.30	8.99	138	5	10	14	0.46	50	0.2	0.23	58	114	0.27
TRR108	16	16.5	DZ454	6.29	2.82	77.10	4.84	130	7	7	45	1.68	64	0.28	0.14	59	128	0.22
TRR108	16	16.5	DZ454A	24.80	3.41	43.00	2.59	209	11	24	7	6.18	143	0.08	0.12	125	360	<0.1
TRR108	16.5	17	DZ455	0.43	2.67	87.30	6.44	108	7	7	23	0.13	34	0.49	0.17	29	46	0.38
TRR108	29.5	30	DZ456	0.56	2.43	92.20	0.45	51	16	<5	12	0.15	27	0.25	0.05	7	50	0.13
TRR108	30	30.5	DZ457	2.82	2.23	89.40	0.57	107	27	<5	20	0.49	46	0.27	0.10	7	29	0.13
TRR108	30.5	31	DZ458	0.76	1.99	89.40	2.7	58	14	10	13	0.23	18	0.18	0.54	10	16	0.32
TRR108	31	31.5	DZ459	2.23	2.14	74.40	1.06	75	23	9	11	0.64	55	0.31	0.20	<5	8	0.25
TRR108	31.5	32	DZ460	1.40	1.53	88.90	4.18	96	18	23	13	0.45	48	0.28	0.90	19	33	0.53
TRR108	32	32.5	DZ461	0.75	1.95	89.40	2.72	94	15	23	10	0.17	22	0.5	0.69	24	49	0.41
TRR109	6	7.5	DZ462	0.93	5.11	78.80	10.8	110	16	11	35	0.36	50	0.22	0.16	61	146	1.48
TRR109	7.5	8	DZ463	0.20	3.06	79.60	10.9	67	9	5	26	0.10	34	0.35	0.12	32	28	1.86
TRR109	30	32	DZ464	0.42	7.48	79.90	5.78	210	52	17	136	0.15	13	0.38	1.49	26	52	0.75
TRR109	32	34	DZ465	0.26	6.00	79.60	7.58	366	26	15	111	0.13	32	0.22	2.64	65	70	0.81
TRR109	34	36	DZ466	0.15	6.07	80.50	12.1	272	31	20	78	0.06	15	0.2	2.74	30	48	0.88
TRR111	34	36	DZ467	0.04	4.69	79.60	8.37	260	18	12	49	0.06	19	0.34	4.15	38	61	1.08
TRR111	36	36.5	DZ468	0.14	8.18	66.10	5.63	256	24	10	63	0.06	13	0.29	2.75	26	48	0.9
TRR111	37	37.5	DZ469	0.08	4.35	77.20	9.28	242	22	2	52	0.07	18	0.29	4.75	34	63	1.39
TRR111	37.5	38	DZ470	0.32	3.50	73.00	9.19	365	7	<5	48	0.17	19	0.33	4.47	30	54	1.84
TRR112	25.5	26	DZ471	0.15	2.77	65.80	11.3	165	14	8	75	0.08	82	3.99	0.54	33	74	3.7
TRR114	24	24.5	DZ472	0.84	1.62	82.30	6.65	122	24	20	34	0.29	46	1.15	0.77	38	61	1.08
TRR114	24.5	25	DZ473	4.37	1.91	83.80	2.02	143	69	22	96	1.30	176	0.39	0.25	13	20	0.32
TRR114	24.5	25	DZ473A	5.07	1.26	82.20	1.2	137	69	38	105	1.23	197	0.18	0.22	12	20	0.17
TRR114	25	25.5	DZ474	1.46	2.09	84.80	3.19	166	41	23	46	0.42	71	0.27	0.34	20	27	0.33
TRR114	25.5	26	DZ475	0.21	1.83	92.90	2.04	142	27	18	16	0.06	18	0.43	0.23	17	21	0.33
TRR114	26	26.5	DZ476	0.37	2.15	97.20	1.59	139	29	19	27	0.07	19	0.24	0.19	14	16	0.23
TRR120	36	36.5	DZ478	2.80	2.88	85.50	0.59	179	26	12	30	0.98	<10	0.21	0.23	7	16	0.15
TRR120	36	36.5	DZ478A	2.82	0.55	89.20	0.32	138	7	31	25	0.94	6	0.04	0.06	6	14	<0.1
TRR120	36.5	37	DZ479	1.88	3.63	81.60	6.71	348	26	15	64	0.71	14	0.21	3.83	27	53	0.96
TRR120	36.5	37	DZ479A	0.31	4.05	74.90	8.35	323	50	24	30	0.13	18	0.08	5.45	27	57	0.4
TRR120	37	37.5	DZ480	2.21	3.13	74.80	9.67	347	28	13	78	0.88	13	0.32	5.48	19	35	1.51
TRR120	37	37.5	DZ480A	13.90	1.46	64.50	2.8	686	33	57	90	4.04	16	0.1	1.64	15	30	0.3
TRR120	37.5	38	DZ481	9.42	4.56	86.40	2.51	821	153	19	82	3.55	19	0.27	1.42	20	35	0.4
TRR120	37.5	38	DZ481A	16.00	1.41	63.70	0.76	777	17	36	65	4.77	19	0.98	0.42	14	22	0.03

APPENDIX 3
NATHAN PROJECT TENEMENT DOWNHOLE ANALYSES
MERGED DRILL AND ANALYTICAL DATA

HOLE NO	FROM (m)	TO (m)	SAMPLE NO	Mn %	Fe %	SiO2 %	Al2O3 %	P ppm	Cu ppm	Pb ppm	Zn ppm	BaO %	Sr ppm	CaO %	K2O %	La ppm	Ce ppm	MgO %
TRR120	38	38.5	DZ482	2.14	1.69	82.40	5.33	310	14	7	30	0.92	24	0.27	3.54	24	46	0.75
TRR120	38	38.5	DZ482A	5.33	0.80	75.50	4.55	367	22	31	42	1.61	30	0.11	3.39	26	48	0.66
TRR120	39.5	40	DZ483	0.39	1.89	79.60	10.5	359	16	12	191	0.22	23	0.32	5.75	30	54	2.57
TRR120	40	40.5	DZ484	1.59	2.08	69.90	10.7	426	17	11	81	0.57	25	0.27	5.87	35	59	2.24
TRR120	40.5	41	DZ485	1.38	2.80	75.60	9.73	407	15	15	74	0.52	24	0.28	5.60	32	62	1.72
TRR120	41	41.5	DZ486	4.67	5.49	77.20	2.91	636	42	<5	58	1.80	13	0.21	1.71	20	25	0.51
TRR120	41	41.5	DZ486A	7.32	1.36	80.70	0.76	459	19	23	35	2.20	11	0.11	0.42	14	10	0.12
TRR121	39.5	40	DZ487	1.81	4.05	79.40	7.05	489	24	<5	51	0.77	28	0.18	4.11	29	58	0.43
TRR121	40	40.5	DZ488	0.50	4.28	80.20	7.12	389	30	<5	46	0.27	27	0.66	4.02	21	38	0.71
TRR121	40.5	41	DZ489	0.66	6.72	76.40	10.3	465	24	61	56	0.32	23	0.21	5.43	37	69	0.9
TRR121	41	41.5	DZ490	2.18	6.32	76.10	8.73	510	37	7	55	0.93	30	0.22	4.55	30	54	0.73
TRR121	41.5	42	DZ491	0.34	5.09	78.30	9.52	351	52	5	46	0.16	20	0.29	5.71	31	65	0.58
TRR121	42	44	DZ492	2.13	4.33	74.60	8.3	295	53	11	44	0.65	42	0.18	5.17	29	49	0.65
TRR123	40	41.5	DZ494	0.83	9.51	85.90	1.11	215	41	10	56	0.24	<10	0.17	0.23	7	20	0.2
TRR123	41.5	42	DZ495	3.47	5.25	87.20	0.36	109	53	21	34	0.90	13	0.2	0.17	<5	<5	0.13
TRR123	41.5	42	DZ495A	4.49	0.59	87.00	0.25	94	14	36	31	1.25	15	0.06	0.12	5	4	<0.01
TRR123	42	42.5	DZ496	1.97	9.16	79.20	0.66	204	45	21	63	0.57	<10	0.11	0.33	5	12	0.12
TRR123	42.5	43	DZ497	1.91	6.35	85.80	1.91	189	31	22	68	0.65	<10	0.22	1.23	12	31	0.33
TRR123	46	48	DZ498	2.10	11.46	65.20	7.86	890	15	<5	41	0.60	25	0.39	5.40	28	52	1.08
TRR123	48	48.5	DZ499	1.39	4.90	80.20	6.07	873	20	<5	25	0.40	28	0.59	4.00	23	44	1.71
TRR128	14	14.5	DZ500	1.95	1.62	82.00	5.25	86	10	7	39	0.71	54	2.78	0.25	22	40	1.26
TRR128	14.5	15	DZ501	1.97	1.33	76.20	5.63	73	12	6	28	0.85	60	6.42	0.28	18	31	1.46
TRR128	15	15.5	DZ502	0.95	1.87	77.80	7.58	89	13	7	50	0.33	55	5.22	0.40	22	39	1.33
TRR128	15.5	16	DZ503	0.22	2.29	79.80	9.67	114	11	9	65	0.09	54	3.65	0.49	27	49	0.93
TRR128	20	22	DZ504	0.36	2.23	79.00	15.8	233	15	23	61	0.12	66	0.97	0.46	57	184	0.51
TRR128	46	46.5	DZ505	2.69	21.80	47.70	10.9	839	70	15	247	0.53	67	0.22	1.04	38	123	0.4
TRR128	46	46.5	DZ505A	6.13	26.91	32.20	3.9	946	75	34	355	1.01	102	0.08	0.47	19	142	0.18
TRR128	46.5	47	DZ506	3.17	24.12	39.90	10.6	1500	60	8	272	0.63	73	0.49	0.94	35	102	0.46
TRR128	46.5	47	DZ506A	2.78	40.40	17.50	4.03	2610	78	34	419	0.41	42	0.1	0.25	13	65	0.17
TRR128	47	47.5	DZ507	1.95	29.29	33.50	11	2448	56	11	319	0.50	70	0.2	0.71	44	95	0.32
TRR128	47	47.5	DZ507A	2.08	46.20	11.50	4.09	3830	68	37	420	0.41	43	0.11	0.20	14	56	0.39
TRR130	32	32.5	DZ509	1.94	30.48	30.50	9.13	578	20	18	249	0.26	53	0.69	1.67	25	66	0.9
TRR130	32	32.5	DZ509A	7.48	32.85	18.40	7.13	601	47	73	389	1.35	103	0.27	1.24	24	86	1.12
TRR130	32.5	33	DZ510	6.42	2.64	49.50	11.4	410	28	21	177	1.20	109	0.39	2.43	41	104	1.04
TRR130	32.5	33	DZ510A	20.90	12.44	32.40	2.74	513	34	57	294	3.49	224	0.24	1.30	22	158	0.33
TRR131	22	24	DZ511	3.16	12.58	78.40	6.2	289	28	8	42	0.82	92	0.43	2.58	24	47	1.51
TRR131	22	24	DZ511A	8.58	3.58	73.60	2.23	241	22	35	42	1.80	175	0.31	0.93	16	35	0.3
TRR131	24	24.5	DZ512	4.85	4.76	81.10	0.85	126	33	<5	35	1.09	103	0.67	0.20	5	9	0.45
TRR131	24	24.5	DZ512A	12.60	1.28	77.20	0.36	138	10	21	41	2.29	198	0.29	0.18	5	6	0.24
TRR131	24.5	25	DZ513	4.92	5.31	83.80	0.3	91	40	<5	24	1.09	101	0.45	0.10	<5	<5	0.33
TRR131	24.5	25	DZ513A	10.30	0.86	75.60	0.22	133	9	20	30	2.00	167	0.34	0.10	5	4	0.26
TRR131	25	25.5	DZ514	4.07	4.98	83.50	0.59	106	22	<5	27	0.90	91	0.67	0.17	<5	7	0.33
TRR131	25	25.5	DZ514A	2.81	0.81	90.80	0.19	45	23	21	31	0.60	63	0.62	0.07	2	3	0.17
TRR142	16	18	DZ515	2.24	6.00	71.90	6.1	461	12	25	32	0.66	74	1.05	0.33	31	53	0.45
TRR142	16	18	DZ515A	2.90	6.84	78.40	4.43	409	10	<5	95	0.88	88	1.34	0.16	24	40	0.41
TRR142	18	18.5	DZ516	2.55	7.20	67.50	6.71	628	15	23	34	0.78	86	0.29	0.28	45	74	0.27
TRR142	18	18.5	DZ516A	3.04	9.65	73.40	4.96	671	9	6	38	0.93	91	0.38	0.17	31	52	0.28
TRR142	18.5	19	DZ517	2.33	2.82	79.40	5.44	329	9	25	28	0.70	99	0.14	0.27	42	72	0.21
TRR142	18.5	19	DZ517A	2.90	2.93	86.10	2.91	238	5	8	22	0.87	106	0.15	0.14	22	40	0.11
TRR142	19	19.5	DZ518	1.91	3.12	84.10	4.01	445	7	24	24	0.64	83	0.86	0.23	41	72	0.68

APPENDIX 3
NATHAN PROJECT TENEMENT DOWNHOLE ANALYSES
MERGED DRILL AND ANALYTICAL DATA

HOLE NO	FROM (m)	TO (m)	SAMPLE NO	Mn %	Fe %	SiO2 %	Al2O3 %	P ppm	Cu ppm	Pb ppm	Zn ppm	BaO %	Sr ppm	CaO %	K2O %	La ppm	Ce ppm	MgO %
TRR142	19	19.5	DZ518A	1.10	3.63	88.40	2.51	312	6	<5	22	0.44	48	0.22	0.13	27	48	0.13
TRR142	19.5	20	DZ519	1.83	3.76	86.10	4.53	500	10	27	26	0.59	77	0.12	0.23	61	104	0.13
TRR142	19.5	20	DZ519A	1.41	4.73	82.30	3.26	365	7	<5	23	0.47	56	0.19	0.13	36	65	0.11
TRR145	11.5	12	DZ520	0.20	1.75	73.60	1.23	348	13	32	344	0.06	104	0.39	0.47	59	215	1.48
TRR145	11.5	12	DZ520A	4.41	1.43	60.60	2.15	137	36	18	97	1.15	111	9.06	0.27	19	120	1.43
TRR148	6	8	DZ521	0.14	2.93	72.90	10.7	162	21	34	64	0.06	60	0.68	0.25	39	150	1.6
TRR148	6	8	DZ521A	0.49	3.37	71.90	2.91	81	14	32	15	0.18	77	5.65	0.07	29	212	2.26
TRR159	16	18	DZ522	0.43	3.23	55.90	11.9	148	29	78	31	0.12	84	3.02	0.25	71	189	4.37
TRR159	16	18	DZ522A	0.78	2.99	59.40	6.92	129	31	68	23	0.21	69	8.69	0.14	60	165	4.25
TRR159	18	18.5	DZ523	0.15	4.58	55.00	11.8	124	33	40	82	0.04	76	1.73	0.30	55	116	3.89
TRR159	18	18.5	DZ523A	0.20	2.33	80.80	3.32	69	14	18	18	0.07	25	2.4	0.12	21	42	1.64
TRR161	10	12	DZ524	0.26	3.64	57.30	14.9	208	28	66	93	0.15	102	0.33	0.48	41	184	1.49
TRR161	10	12	DZ524A	1.93	1.72	90.50	2.72	97	11	258	23	1.07	135	0.33	0.40	16	440	0.3
TRR173	14	16	DZ525	0.41	3.12	66.00	9.52	91	34	35	43	0.12	49	0.71	0.28	48	92	4.09
TRR173	14	16	DZ525A	0.87	8.88	66.00	7.3	191	30	22	19	0.20	65	0.97	0.11	61	110	4.02
YER18	30	32	DZ1165	0.51	1.54	89.00	2.21	102	29	11	42	0.17	11	0.26	0.39	12	22	0.25
YER36	20	20.5	DZ1190	7.95	5.56	51.30	14.7	622	24	20	297	0.67	340	0.5	2.52	28	54	1.48
YER36	20	20.5	DZ1190A	28.20	7.97	21.90	6.56	1320	60	102	676	1.62	1050	0.39	2.89	46	94	0.77
YER36	20.5	21	DZ1191	12.40	7.76	50.60	6.18	1165	60	34	286	0.71	357	0.35	1.54	27	56	0.66
YER36	20.5	21	DZ1191A	21.60	5.23	48.80	2.11	1118	64	44	316	0.88	538	0.25	1.30	28	59	1.68
YER36	21	21.5	DZ1192	15.70	2.22	67.00	5.05	282	46	21	70	0.11	63	0.36	0.70	13	27	0.46
YER36	21	21.5	DZ1192A	2.90	1.09	90.90	2.27	197	61	42	74	0.15	100	0.08	0.43	10	23	0.13
YER38	24	25	DZ1196	1.79	3.58	70.80	10	810	26	82	138	0.38	40	0.57	5.82	38	67	0.86
YER38	25	25.5	DZ1197	0.96	4.02	72.40	10.6	16866	29	82	149	0.20	36	0.73	6.05	39	64	0.93
YER43	22	24	DZ1175	0.82	4.52	70.10	14.4	57	46	24	32	0.17	40	0.42	0.34	63	469	1.53
YER43	24	24.5	DZ1176	0.45	5.11	67.70	9.18	90	84	<5	40	0.11	21	0.29	0.19	126	124	5.76
YER43	24.5	25	DZ1177	0.51	3.56	70.30	9.43	21	66	5	17	0.10	21	0.42	0.16	84	96	6.34
YER43	25	25.5	DZ1178	0.74	3.38	63.90	10.9	35	67	11	18	0.16	34	0.35	0.17	81	144	6.37
YER43	25.5	26	DZ1179	0.15	4.31	68.10	11.1	121	37	69	55	0.09	23	0.34	0.72	16	39	1.84
YER44	19.5	20	DZ1174	0.53	4.25	69.90	10.7	67	70	38	23	0.16	19	0.71	0.29	52	194	4.81
YER48	8	10	DZ1180	0.13	3.01	80.20	7.67	71	18	<5	15	0.06	27	0.34	0.30	26	133	1.26
YER48	10	12	DZ1181	0.33	4.96	79.40	9.11	91	23	29	10	0.10	19	0.21	0.16	39	223	0.5

note Fe2O3 converted to Fe, Ba to BaO @ K to K2O

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P.O. Box 41, Pine Creek, N.T. 0847

Telephone (089) 76 1262

Facsimile (089) 76 1310

ASSAY CODE: AC 16143

BHP Minerals

Distribution

H. BERENTS

Client Reference: 15536

Date Received: 28/08/1994

Project :

Number of Samples: 104

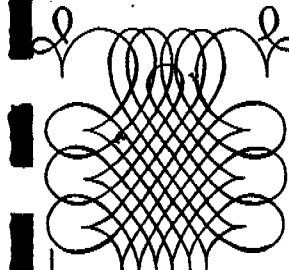
Cost Code:

Sample Preparation

Analysis	Analytical Technique	Precision & Accuracy	Detection Limit	Data Units
Mn	ICP/OES	Prec. $\pm$ 10%	5	ppm
Fe2O3	FA50	Acc. $\pm$ 15%	0.01	percent
SiO2	FA50	Acc. $\pm$ 15%	0.01	ppm
Al2O3	FA50	Acc. $\pm$ 15%	0.01	percent
P	ICP/OES	Prec. $\pm$ 10%	10	ppm
Cu	ICP/OES	Prec. $\pm$ 10%	2	ppm
Pb	ICP/OES	Prec. $\pm$ 10%	5	ppm
Zn	ICP/OES	Prec. $\pm$ 10%	2	ppm
Ba	ICP/OES	Prec. $\pm$ 10%	10	ppm
Sr	ICP/OES	Prec. $\pm$ 10%	10	ppm
CaO	CCA/	Prec. $\pm$ 10%	0.1	percent
K	ICP/OES	Prec. $\pm$ 10%	0.01	percent
La	ICP/OES	Prec. $\pm$ 10%	5	ppm
Ce	ICP/OES	Prec. $\pm$ 10%	5	ppm
MgO	ICP/	Acc. $\pm$ 5%	0.01	percent

Authorisation: Ray Wooldridge

Report Dated: 30/09/1994



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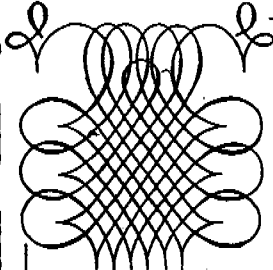
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Sample	Mn (ppm)	Fe2O3 (%)	SiO2 (ppm)	Al2O3 (%)	P (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)
DZ 1165	5124	2.20	89.0	2.21	102	29	11	42
DZ 1174	5300	6.08	69.9	10.7	67	70	38	23
DZ 1175	8200	6.46	70.1	14.4	57	46	24	32
DZ 1176	4470	7.31	67.7	9.18	90	84	<5	40
DZ 1177	5070	5.09	70.3	9.43	21	66	5	17
DZ 1178	7370	4.83	63.9	10.9	35	67	11	18
DZ 1179	1520	6.16	68.1	11.1	121	37	69	55
DZ 589	39.00%	10.2	14.3	2.12	1534	60	13	524
DZ 1180	1340	4.30	80.2	7.67	71	18	<5	15
DZ 1181	3340	7.09	79.4	9.11	91	23	29	10
DZ 1190	7.95%	7.95	51.3	14.7	622	24	20	297
DZ 1191	12.40%	11.1	50.6	6.18	1165	60	34	286
DZ 1192	15.70%	3.17	67.0	5.05	282	46	21	70



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Sample	Ba (ppm)	Sr (ppm)	CaO (%)	K (%)	La (ppm)	Ce (ppm)	MgO (%)
DZ 1165	1550	11	0.26	0.32	12	22	0.25
DZ 1174	1400	19	0.71	0.24	52	194	4.81
DZ 1175	1480	40	0.42	0.28	63	469	1.53
DZ 1176	1010	21	0.29	0.16	126	124	5.76
DZ 1177	930	21	0.42	0.13	84	96	6.34
DZ 1178	1460	34	0.35	0.14	81	144	6.37
DZ 1179	780	23	0.34	0.60	16	39	1.84
DZ 589	2.03%	871	0.57	1.86	36	94	0.33
DZ 1180	570	27	0.34	0.25	26	133	1.26
DZ 1190	5980	340	0.50	2.09	28	54	1.48
DZ 1191	6370	357	0.35	1.28	27	56	0.66
DZ 1192	1020	63	0.36	0.58	13	27	0.46

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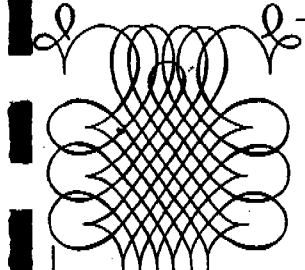
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Sample	Mn (ppm)	Fe2O3 (%)	SiO2 (ppm)	Al2O3 (%)	P (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)
DZ 1196	1.79%	5.12	70.8	10.0	810	26	82	138
DZ 1197	9600	5.75	72.4	10.6	1.66%	29	82	149
DZ 591	641	47.7	35.3	7.65	442	360	200	740
DZ 1198	3.73%	7.84	54.9	11.6	293	163	11	77
DZ 1199	2.48%	10.4	59.1	10.4	219	146	81	89
DZ 1200	2.62%	6.92	63.7	12.6	325	62	32	105
DZ 451	3.69%	9.57	72.7	4.86	486	26	11	175
DZ 452	5.55%	30.3	41.9	6.20	1278	31	<5	208
DZ 453	1.55%	4.60	79.3	8.99	136	5	10	14
DZ 454	6.29%	4.03	77.1	4.84	130	7	7	45
DZ 455	4300	3.82	87.3	6.44	108	7	7	23
DZ 456	5560	3.47	92.2	0.45	51	16	<5	12
DZ 457	2.82%	3.19	89.4	0.57	107	27	<5	20
DZ 458	7572	2.85	89.4	2.70	58	14	10	13
DZ 459	2.23%	3.06	74.4	1.06	75	23	9	11
DZ 460	1.40%	2.19	88.9	4.18	96	18	23	13
DZ 593	48.80%	0.74	1.10	0.68	1230	142	218	59
DZ 461	7500	2.79	89.4	2.72	94	15	23	10
DZ 462	9290	7.31	78.8	10.8	110	16	11	35
DZ 463	2000	4.38	79.6	10.9	67	9	5	26
DZ 464	4157	10.7	79.9	5.78	210	52	17	136
DZ 465	2610	8.59	79.6	7.58	366	26	15	111
DZ 466	1525	8.68	80.5	12.1	272	31	20	78



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Sample	Ba (ppm)	Sr (ppm)	CaO (%)	K (%)	La (ppm)	Ce (ppm)	MgO (%)
DZ 1196	3410	40	0.57	4.83	38	67	0.86
DZ 1197	1820	36	0.73	5.02	39	64	0.93
DZ 591	467	54	0.19	1.73	25	48	6.36
DZ 1198	2700	246	4.52	2.65	33	70	4.33
DZ 1199	2127	200	3.83	2.70	30	61	3.60
DZ 1200	1414	103	1.26	3.54	46	92	2.14
DZ 451	1.12%	26	0.27	1.39	26	59	0.61
DZ 452	1.55%	25	0.21	2.04	23	46	0.83
DZ 453	4130	50	0.20	0.19	58	114	0.27
DZ 454	1.49%	64	0.28	0.12	59	128	0.22
DZ 455	1123	34	0.49	0.14	29	46	0.38
DZ 456	1355	27	0.25	0.04	7	50	0.13
DZ 457	4399	46	0.27	0.08	7	29	0.13
DZ 458	2030	18	0.18	0.45	10	16	0.32
DZ 459	5720	55	0.31	0.17	<5	8	0.25
DZ 460	4030	48	0.28	0.75	19	33	0.53
DZ 593	14.40%	259	0.15	0.10	27	54	0.10
DZ 461	1500	22	0.50	0.57	24	49	0.41
DZ 462	3260	50	0.22	0.13	61	146	1.48
DZ 463	870	34	0.35	0.10	32	28	1.86
DZ 464	1310	13	0.38	1.24	26	52	0.75
DZ 465	1130	32	0.22	2.19	65	70	0.81
DZ 466	560	15	0.20	2.27	30	48	0.88

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Sample	Mn (ppm)	Fe2O3 (%)	SiO2 (ppm)	Al2O3 (%)	P (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)
DZ 467	382	6.71	79.6	8.37	260	18	12	49
DZ 468	1415	11.7	66.1	5.63	256	24	10	63
DZ 469	825	6.22	77.2	9.28	242	22	<5	52
DZ 470	3154	5.00	73.0	9.19	365	7	<5	48
DZ 594	39.10%	10.9	15.2	2.19	1956	63	46	813
DZ 471	1480	3.96	65.8	11.3	165	14	8	75
DZ 472	8400	2.32	82.3	6.65	122	24	20	34
DZ 473	4.37%	2.73	83.8	2.02	143	69	22	96
DZ 595	660	47.3	35.6	7.85	391	397	180	692
DZ 474	1.46%	2.99	84.8	3.19	166	41	23	46
DZ 475	2100	2.62	92.9	2.04	142	27	18	16
DZ 476	3697	3.07	97.2	1.59	139	29	19	27
DZ 477	<< Sample not received >>							
DZ 478	2.80%	4.12	85.5	0.59	179	26	12	30
DZ 479	1.88%	5.20	81.6	6.71	348	26	15	64
DZ 480	2.21%	4.48	74.8	9.67	347	28	13	78
DZ 481	9.42%	6.52	66.4	2.51	821	153	19	82
DZ 596	50.00%	0.39	1.00	0.76	1122	130	230	68
DZ 482	2.14%	2.42	82.4	5.33	310	14	7	30
DZ 483	3905	2.70	79.6	10.5	359	16	12	191
DZ 484	1.59%	2.97	69.9	10.7	426	17	11	81
DZ 485	1.38%	4.00	75.6	9.73	407	15	15	74
DZ 486	4.67%	7.85	77.2	2.91	636	42	<5	58
DZ 487	1.81%	5.79	79.4	7.05	489	24	<5	51
DZ 488	4962	6.13	80.2	7.12	389	30	<5	46

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Sample	Ba (ppm)	Sr (ppm)	CaO (%)	K (%)	La (ppm)	Ce (ppm)	MgO (%)
DZ 467	520	19	0.34	3.44	38	61	1.08
DZ 468	528	13	0.29	2.28	26	48	0.90
DZ 469	640	18	0.29	3.94	34	63	1.39
DZ 470	1490	19	0.33	3.71	30	54	1.84
DZ 594	2.02%	983	0.59	1.92	40	92	0.35
DZ 471	700	82	3.99	0.45	33	74	3.70
DZ 472	2630	46	1.15	0.64	38	61	1.08
DZ 473	1.16%	176	0.39	0.21	13	20	0.32
DZ 595	546	53	0.29	1.66	25	46	0.53
DZ 474	3780	71	0.27	0.28	20	27	0.33
DZ 475	555	18	0.43	0.19	17	21	0.33
DZ 476	638	19	0.24	0.16	14	16	0.23
DZ 477	<< Sample not received >>						
DZ 478	8773	<10	0.21	0.19	7	16	0.15
DZ 479	6400	14	0.21	3.18	27	53	0.98
DZ 480	7920	13	0.32	4.55	19	35	1.51
DZ 481	3.18%	19	0.27	1.18	20	35	0.40
DZ 596	14.30%	224	0.15	0.11	29	56	0.11
DZ 482	8200	24	0.27	2.94	24	46	0.75
DZ 483	1930	23	0.32	4.77	30	54	2.57
DZ 484	5098	25	0.27	4.87	35	59	2.24
DZ 485	4630	24	0.28	4.65	32	62	1.72
DZ 486	1.61%	13	0.21	1.42	20	25	0.51
DZ 487	6900	28	0.18	3.41	29	58	0.43
DZ 488	2400	27	0.66	3.34	21	38	0.71

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Sample	Mn (ppm)	Fe2O3 (%)	SiO2 (ppm)	Al2O3 (%)	P (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)
DZ 489	6568	9.62	76.4	10.3	465	24	61	56
DZ 490	2.18%	9.04	76.1	8.73	510	37	7	55
DZ 491	3390	7.28	78.3	9.52	351	52	5	46
DZ 597	39.10%	11.2	14.4	2.36	1948	57	53	828
DZ 492	2.13%	6.19	74.6	8.30	295	53	11	44
DZ 494	8265	13.6	85.9	1.11	215	41	10	56
DZ 495	3.47%	7.51	87.2	0.36	109	53	21	34
DZ 598	680	47.5	35.5	7.52	422	382	183	725
DZ 496	1.97%	13.1	79.2	0.66	204	45	21	63
DZ 497	1.91%	9.08	85.8	1.91	189	31	22	68
DZ 498	2.10%	16.4	65.2	7.86	890	15	<5	41
DZ 499	1.39%	7.01	80.2	6.07	873	20	<5	25
DZ 500	1.95%	2.32	82.0	5.25	86	10	7	39
DZ 501	1.97%	1.90	76.2	5.63	73	12	6	28
DZ 502	9513	2.67	77.8	7.58	89	13	7	50
DZ 599	50.00%	0.36	1.10	0.81	1250	130	226	70
DZ 503	2190	3.27	79.8	9.67	114	11	9	65
DZ 504	3612	3.19	79.0	15.8	233	15	23	61
DZ 505	2.69%	30.9	47.7	10.9	839	70	15	247
DZ 506	3.17%	34.5	39.9	10.6	1500	60	8	272
DZ 507	1.95%	41.9	33.5	11.0	2448	56	11	319
DZ 509	1.94%	43.6	30.5	9.13	578	20	18	249
DZ 510	6.42%	3.77	49.5	11.4	410	28	21	177
DZ 511	3.16%	18.0	78.4	6.20	289	28	8	42
DZ 512	4.85%	6.81	81.1	0.85	126	33	<5	35

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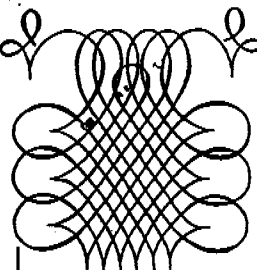
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Sample	Ba (ppm)	Sr (ppm)	CaO (%)	K (%)	La (ppm)	Ce (ppm)	MgO (%)
DZ 489	2860	23	0.21	4.51	37	69	0.90
DZ 490	8320	30	0.22	3.78	30	54	0.73
DZ 491	1419	20	0.29	4.74	31	65	0.58
DZ 597	1.93%	980	0.60	1.98	44	57	0.36
DZ 492	5820	42	0.18	4.29	29	49	0.65
DZ 494	2180	<10	0.17	0.19	7	20	0.20
DZ 495	8040	13	0.20	0.14	<5	<5	0.13
DZ 598	490	54	0.27	1.71	27	46	0.51
DZ 496	5100	<10	0.11	0.27	5	12	0.12
DZ 497	5790	<10	0.22	1.02	12	31	0.33
DZ 498	5400	25	0.39	4.48	28	52	1.08
DZ 499	3600	28	0.59	3.32	23	44	1.71
DZ 500	6360	54	2.78	0.21	22	40	1.26
DZ 501	5850	60	6.42	0.23	18	31	1.46
DZ 502	2980	55	5.22	0.33	22	39	1.33
DZ 599	14.00%	212	0.17	0.12	28	56	0.11
DZ 503	819	54	3.65	0.41	27	49	0.93
DZ 504	1110	66	0.97	0.38	57	184	0.51
DZ 505	4710	67	0.22	0.86	38	123	0.40
DZ 506	5680	73	0.49	0.78	35	102	0.46
DZ 507	4470	70	0.20	0.59	44	95	0.32
DZ 509	2310	53	0.69	1.39	25	66	0.90
DZ 510	1.07%	109	0.39	2.02	41	104	1.04
DZ 511	7310	92	0.43	2.14	24	47	1.51
DZ 512	9750	103	0.67	0.17	5	9	0.45



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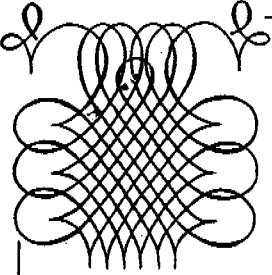
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Sample		Mn (ppm)	Fe2O3 (%)	SiO2 (ppm)	Al2O3 (%)	P (ppm)	Cu (ppm)	Pb (ppm)	Zr (ppm)
DZ	513	4.92%	7.59	83.8	0.30	91	40	<5	24
DZ	600	38.10%	11.2	14.4	2.34	1918	63	48	820
DZ	514	4.07%	7.13	83.5	0.59	106	22	<5	27
DZ	592	38.60%	10.4	14.2	2.18	1980	56	59	813



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Sample		Ba (ppm)	Sr (ppm)	CaO (%)	K (%)	La (ppm)	Ce (ppm)	MgO (%)
DZ	513	9773	101	0.45	0.08	<5	<5	0.33
DZ	600	2.08%	984	0.59	1.89	36	91	0.35
DZ	514	8030	91	0.67	0.14	<5	7	0.33
DZ	592	2.03%	969	0.75	2.10	44	56	0.32

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BHP Minerals

Distribution

H. BERENTS

L. BETTENAY

Client Reference:

Project :

Cost Code:

Date Received:

30/09/1994

Number of Samples:

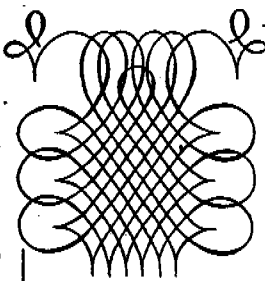
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Sample Preparation

Analysis	Analytical Technique	Precision & Accuracy	Detection Limit	Data Units
Mn	ICP/FP-1	Prec. $\pm$ 10%	1	ppm
Fe2O3	ICP/FP-1	Prec. $\pm$ 10%	0.01	percent
SiO2	ICP/FP-1	Prec. $\pm$ 10%	0.1	ppm
Al2O3	ICP/FP-1	Prec. $\pm$ 10%	0.01	percent
P	ICP/MA-4	Prec. $\pm$ 10%	10	ppm
Cu	ICP/MA-4	Prec. $\pm$ 10%	2	ppm
Pb	ICP/MA-4	Prec. $\pm$ 10%	5	ppm
Zn	ICP/MA-4	Prec. $\pm$ 10%	2	ppm
Ba	ICP/FP-1	Prec. $\pm$ 10%	5	ppm
Sr	ICP/MA-4	Prec. $\pm$ 10%	2	ppm
CaO	ICP/MA-4	Prec. $\pm$ 10%	0.01	percent
K	ICP/MA-4	Prec. $\pm$ 10%	0.01	percent
La	ICP/MA-4	Prec. $\pm$ 10%	1	ppm
Ce	ICP/MA-4	Prec. $\pm$ 10%	2	ppm
MgO	ICP/MA-4	Prec. $\pm$ 10%	0.01	percent

Authorisation: Ray Wooldridge

Report Dated: 09/10/1994



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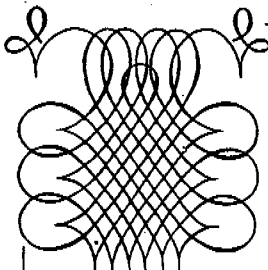
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Sample	Mn (ppm)	Fe2O3 (%)	SiO2 (ppm)	Al2O3 (%)	P (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)
DZ 1190A	28.20%	11.4	21.9	6.56	1320	60	102	676
DZ 1191A	21.60%	7.48	48.8	2.11	1118	64	44	316
DZ 1192A	2.90%	1.56	90.9	2.27	197	61	42	74
DZ 1198A	8.08%	6.55	20.2	4.10	265	306	48	104
DZ 551	6.85%	47.0	33.4	7.76	474	399	181	681
DZ 1199A	4.51%	13.3	26.6	4.54	205	222	143	141
DZ 1200A	19.50%	3.15	22.5	3.15	738	150	242	324
DZ 451A	6.81%	15.4	62.9	2.63	699	36	28	269
DZ 452A	10.80%	39.4	22.9	3.68	1554	43	25	215
DZ 554A	24.80%	4.88	43.0	2.59	209	11	24	7
DZ 552	49.40%	0.30	1.8	0.35	1000	141	227	56
DZ 473A	5.07%	1.80	82.2	1.20	137	69	38	105
DZ 478A	2.82%	0.79	89.2	0.32	138	7	31	25
DZ 479A	3100	5.79	74.9	8.35	323	50	24	30
DZ 480A	13.90%	2.09	64.5	2.80	666	33	57	90
DZ 481A	16.00%	2.02	63.7	0.76	777	17	36	65



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Sample	Ba (ppm)	Sr (ppm)	CaO (%)	K (%)	La (ppm)	Ce (ppm)	MgO (%)
DZ 550	1.88%	799	0.63	2.04	40	74	0.31
DZ 1190A	1.45%	1050	0.39	2.40	46	94	0.77
DZ 1191A	7880	538	0.25	1.08	28	59	1.68
DZ 1192A	1305	100	0.08	0.36	10	23	0.13
DZ 1198A	6670	592	14.2	1.09	10	54	11.90
DZ 551	460	50	0.27	1.60	24	47	0.48
DZ 1199A	4490	436	11.8	1.04	8	39	10.90
DZ 1200A	1.20%	403	11.1	1.05	16	88	8.97
DZ 451A	1.92%	24	0.20	0.89	19	62	0.34
DZ 452A	2.86%	22	0.14	1.16	20	48	0.43
DZ 554A	5.53%	143	0.08	0.10	125	360	<0.01
DZ 552	14.30%	210	0.17	0.10	28	41	<0.01
DZ 473A	1.10%	197	0.18	0.18	12	20	0.17
DZ 478A	8460	6	0.04	0.05	6	14	<0.01
DZ 479A	1205	18	0.08	4.52	27	57	0.40
DZ 480A	3.62%	16	0.10	1.36	15	30	0.30
DZ 481A	4.27%	19	0.98	0.35	14	22	0.03

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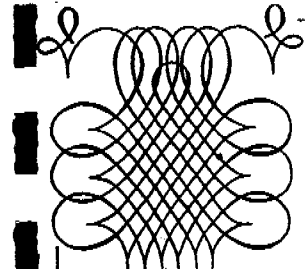
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Sample	Mn (ppm)	Fe2O3 (%)	SiO2 (ppm)	Al2O3 (%)	P (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)
DZ 553	681	46.6	32.0	7.17	334	354	178	688
DZ 482A	5.33%	1.15	75.5	4.55	367	22	31	42
DZ 486A	7.32%	1.94	80.7	0.76	459	19	23	35
DZ 495A	4.49%	0.85	87.0	0.25	94	14	36	31
DZ 505A	6.13%	38.5	32.2	3.90	946	75	34	355
DZ 506A	2.78%	57.8	17.5	4.03	2610	78	34	419
DZ 554	38.70%	11.3	14.8	2.24	1590	61	96	568
DZ 507A	2.08%	66.1	11.5	4.09	3830	68	37	420
DZ 509A	7.48%	47.0	18.4	7.13	601	47	73	389
DZ 510A	20.90%	17.8	32.4	2.74	513	34	57	294
DZ 511A	8.58%	5.12	73.6	2.23	241	22	35	42
DZ 512A	12.60%	1.83	77.2	0.36	138	10	21	41
DZ 555	49.90%	0.24	1.9	0.32	1026	143	241	60
DZ 513A	10.30%	1.23	75.6	0.22	133	9	20	30
DZ 514A	2.81%	1.16	90.8	0.19	45	23	21	31
*DZ 1173A	13.20%	9.39	61.4	1.78	147	199	42	210
*DZ 1189A	23.40%	5.84	37.6	4.78	1670	148	56	746
*DZ 452A	11.00%	40.4	22.7	3.52	1520	44	24	221
*DZ 479A	3300	5.70	72.0	8.11	345	51	24	35
*DZ 513A	10.00%	1.04	75.9	0.20	119	7	19	31



ASSAYCORP PTY LTD

A.C.N. 052 982 911

174 Ward Street, Pine Creek, N.T. 0847

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Telephone (089) 76 1262

Facsimile (089) 76 1310

ASSAY CODE: AC 17006

Page 4 of 4

Sample	Ba (ppm)	Sr (ppm)	CaO (%)	K (%)	La (ppm)	Ce (ppm)	MgO (%)
DZ 553	520	47	0.28	1.49	23	49	0.46
DZ 482A	1.44%	30	0.11	2.81	26	48	0.66
DZ 486A	1.97%	11	0.11	0.35	14	10	0.12
DZ 495A	1.12%	15	0.06	0.10	5	4	<0.01
DZ 505A	9060	102	0.08	0.39	19	142	0.18
DZ 506A	3660	42	0.10	0.21	13	65	0.17
DZ 554	1.89%	778	0.63	1.91	39	75	0.30
DZ 507A	3660	43	0.11	0.17	14	56	0.39
DZ 509A	1.21%	103	0.27	1.03	24	86	1.12
DZ 510A	3.12%	224	0.24	1.08	22	158	0.33
DZ 511A	1.61%	175	0.31	0.77	16	35	0.30
DZ 512A	2.05%	198	0.29	0.15	5	6	0.24
DZ 555	14.00%	221	0.17	0.11	28	41	0.06
DZ 513A	1.79%	167	0.34	0.08	5	4	0.26
DZ 514A	5380	63	0.62	0.06	2	3	0.17
*DZ 1173A	5200	155	0.24	1.07	10	21	0.17
*DZ 1189A	1.95%	589	0.57	2.93	99	473	1.12
*DZ 452A	3.08%	22	0.11	1.15	20	52	0.41
*DZ 479A	1300	19	0.07	4.66	28	60	0.40
*DZ 513A	1.88%	175	0.35	0.06	5	3	0.27

ASSAYCORP PTY LTD

A.C.N. 052 982 911

174 Ward Street, Pine Creek, N.T. 0847

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Facsimile (089) 76 1310

ASSAY CODE: AC 17079

BHP Minerals

Distribution

H. BERENTS

Client Reference: 15538

Date Received:

14/10/1994

Project :

Number of Samples:

37

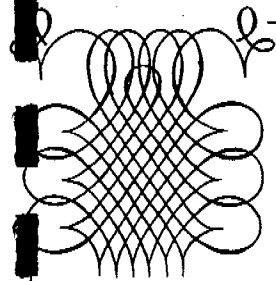
Cost Code:

Sample Preparation

Analysis	Analytical Technique	Precision & Accuracy	Detection Limit	Data Units
Mn	ICP/FP-1	Prec. $\pm$ 10%	0.01	ppm
Fe2O3	ICP/FP-1	Prec. $\pm$ 10%	0.01	percent
SiO2	ICP/FP-1	Prec. $\pm$ 10%	0.1	percent
Al2O3	ICP/FP-1	Prec. $\pm$ 10%	0.01	percent
P	ICP/MA-4	Prec. $\pm$ 10%	10	ppm
Cu	ICP/MA-4	Prec. $\pm$ 10%	2	ppm
Pb	ICP/MA-4	Prec. $\pm$ 10%	5	ppm
Zn	ICP/MA-4	Prec. $\pm$ 10%	2	ppm
Ba	ICP/FP-1	Prec. $\pm$ 10%	5	ppm
Sr	ICP/MA-4	Prec. $\pm$ 10%	2	ppm
CaO	ICP/MA-4	Prec. $\pm$ 10%	0.01	percent
K	ICP/MA-4	Prec. $\pm$ 10%	0.01	percent
La	ICP/MA-4	Prec. $\pm$ 10%	1	ppm
Ce	ICP/MA-4	Prec. $\pm$ 10%	2	ppm
MgO	ICP/MA-4	Prec. $\pm$ 10%	0.01	percent

Authorisation: Ray Wooldridge

Report Dated: 15/10/1994



ASSAYCORP PTY LTD

A.C.N. 052 982 911

174 Ward Street, Pine Creek, N.T. 0847

P.O. Box 41, Pine Creek, N.T. 0847

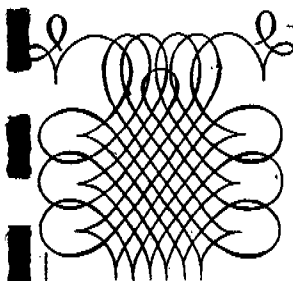
Telephone (089) 76 1262

Facsimile (089) 76 1310

ASSAY CODE: AC 17079

Page 1 of 4

Sample		Mn (ppm)	Fe2O3 (%)	SiO2 (%)	Al2O3 (%)	P (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)
DZ	515	2.24%	8.58	71.9	6.10	461	12	25	32
DZ	516	2.55%	10.3	67.5	6.71	628	15	23	34
DZ	517	2.33%	4.03	79.4	5.44	329	9	25	28
DZ	518	1.91%	4.46	84.1	4.01	445	7	24	24
DZ	519	1.83%	5.38	86.1	4.53	500	10	27	26
DZ	520	1990	2.51	73.6	1.23	348	13	32	344
DZ	521	1400	4.19	72.9	10.7	162	21	34	64
DZ	522	4290	4.62	55.9	11.9	148	29	78	31
DZ	523	1527	6.55	55.0	11.8	124	33	40	82
DZ	524	2600	5.21	57.3	14.9	208	28	66	93
DZ	556	39.0%	12.0	12.6	2.19	1664	62	59	569
DZ	525	4129	4.46	66.0	9.52	91	34	35	43



ASSAYCORP PTY LTD

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174 Ward Street, Pine Creek, N.T. 0847

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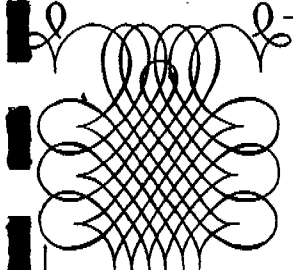
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Facsimile (089) 76 1310

ASSAY CODE: AC 17079

Page 2 of 4

Sample		Ba (ppm)	Sr (ppm)	CaO (%)	K (%)	La (ppm)	Ce (ppm)	MgO (%)
DZ	515	5880	74	1.05	0.27	31	53	0.45
DZ	516	7010	86	0.29	0.23	45	74	0.27
DZ	517	6310	99	0.14	0.22	42	72	0.21
DZ	518	5690	83	0.86	0.19	41	72	0.68
DZ	519	5290	77	0.12	0.19	61	104	0.13
DZ	520	555	104	0.39	0.39	59	215	1.48
DZ	521	510	60	0.68	0.21	39	150	1.60
DZ	522	1100	84	3.02	0.21	71	189	4.37
DZ	523	393	76	1.73	0.25	55	116	3.89
DZ	524	1380	102	0.33	0.40	41	184	1.49
DZ	556	1.88%	818	0.64	2.00	39	78	0.41
DZ	525	1030	49	0.71	0.23	48	92	4.09



ASSAYCORP PTY LTD

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174 Ward Street, Pine Creek, N.T. 0847

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Telephone (089) 76 1262

Facsimile (089) 76 1310

ASSAY CODE: AC 18156

BHP Minerals

DistributionH. BERENTS

Client Reference: 15539

Date Received:

28/11/1994

Project :

Number of Samples:

72

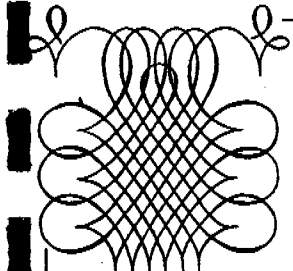
Cost Code:

Sample Preparation

Analysis	Analytical Technique	Precision & Accuracy	Detection Limit	Data Units
Mn	ICP/FP-1	Prec. $\pm$ 10%	5	ppm
Fe2O3	ICP/FP-1	Prec. $\pm$ 10%	0.01	percent
SiO2	ICP/FP-1	Prec. $\pm$ 10%	0.1	percent
Al2O3	ICP/FP-1	Prec. $\pm$ 10%	0.01	percent
P	ICP/MA-4	Prec. $\pm$ 10%	10	ppm
Cu	ICP/MA-4	Prec. $\pm$ 10%	5	ppm
Pb	ICP/MA-4	Prec. $\pm$ 10%	5	ppm
Zn	ICP/MA-4	Prec. $\pm$ 10%	2	ppm
Ba	ICP/FP-1	Prec. $\pm$ 10%	5	ppm
Sr	ICP/MA-4	Prec. $\pm$ 10%	2	ppm
CaO	ICP/MA-4	Prec. $\pm$ 10%	0.01	percent
K	ICP/MA-4	Prec. $\pm$ 10%	0.01	percent
La	ICP/MA-4	Prec. $\pm$ 10%	1	ppm
Ce	ICP/MA-4	Prec. $\pm$ 10%	2	ppm
MgO	ICP/MA-4	Prec. $\pm$ 10%	0.01	percent

Authorisation: Ray Wooldridge

Report Dated: 28/11/1994



ASSAYCORP PTY LTD

A.C.N. 052 982 911

174 Ward Street, Pine Creek, N.T. 0847

P.O. Box 41, Pine Creek, N.T. 0847

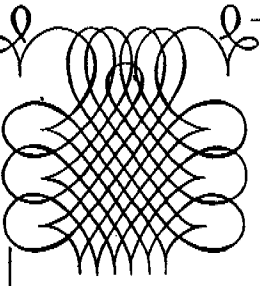
Telephone (089) 76 1262

Facsimile (089) 76 1310

ASSAY CODE: AC 18156

Page 1 of 6

Sample	Mn (ppm)	Fe2O3 (%)	SiO2 (%)	Al2O3 (%)	P (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)
DZ 515A	2.90%	9.78	78.4	4.43	409	10	<5	95
DZ 516A	3.04%	13.8	73.4	4.96	671	9	6	38
DZ 586A	36.70%	12.1	14.1	2.15	1643	62	78	546
DZ 517A	2.90%	4.19	86.1	2.91	238	5	8	22
DZ 518A	1.10%	5.20	88.4	2.51	312	6	<5	22
DZ 519A	1.41%	6.76	82.3	3.26	365	7	<5	23
DZ 520A	4.41%	2.04	60.6	2.15	137	36	18	97
DZ 521A	4890	4.82	71.9	2.91	81	14	32	15
DZ 522A	7760	4.28	59.4	6.92	129	31	68	23
DZ 523A	2020	3.33	80.8	3.32	69	14	18	18
DZ 524A	1.93%	2.46	90.5	2.72	97	11	258	23
DZ 525A	8720	12.7	66.0	7.30	191	30	22	19



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ASSAY CODE: AC 18156

Page 2 of 6

Sample	Ba (ppm)	Sr (ppm)	CaO (%)	K (%)	La (ppm)	Ce (ppm)	MgO (%)
DZ 515A	7900	88	1.34	0.13	24	40	0.41
DZ 516A	8300	91	0.38	0.14	31	52	0.28
DZ 586A	2.00%	808	2.54	1.49	40	70	1.29
DZ 517A	7780	106	0.15	0.12	22	40	0.11
DZ 518A	3900	48	0.22	0.11	27	48	0.13
DZ 519A	4200	56	0.19	0.11	36	65	0.11
DZ 520A	1.03%	111	9.06	0.22	19	120	1.43
DZ 521A	1600	77	5.65	0.06	29	212	2.26
DZ 522A	1900	69	8.69	0.12	60	165	4.25
DZ 523A	600	25	2.40	0.10	21	42	1.64
DZ 524A	9600	135	0.33	0.33	16	440	0.30
DZ 525A	1800	65	0.97	0.09	61	110	4.02

APPENDIX 10.

Downhole Geophysics

1000
900
800
700
600
500
0

YED03

1.2m
←

0 10 20

Sand clay mud st sand mudstone mn 2 sand mudstone carb mudstone grey

mn5
purple
brown
black

200

100

10

20

30

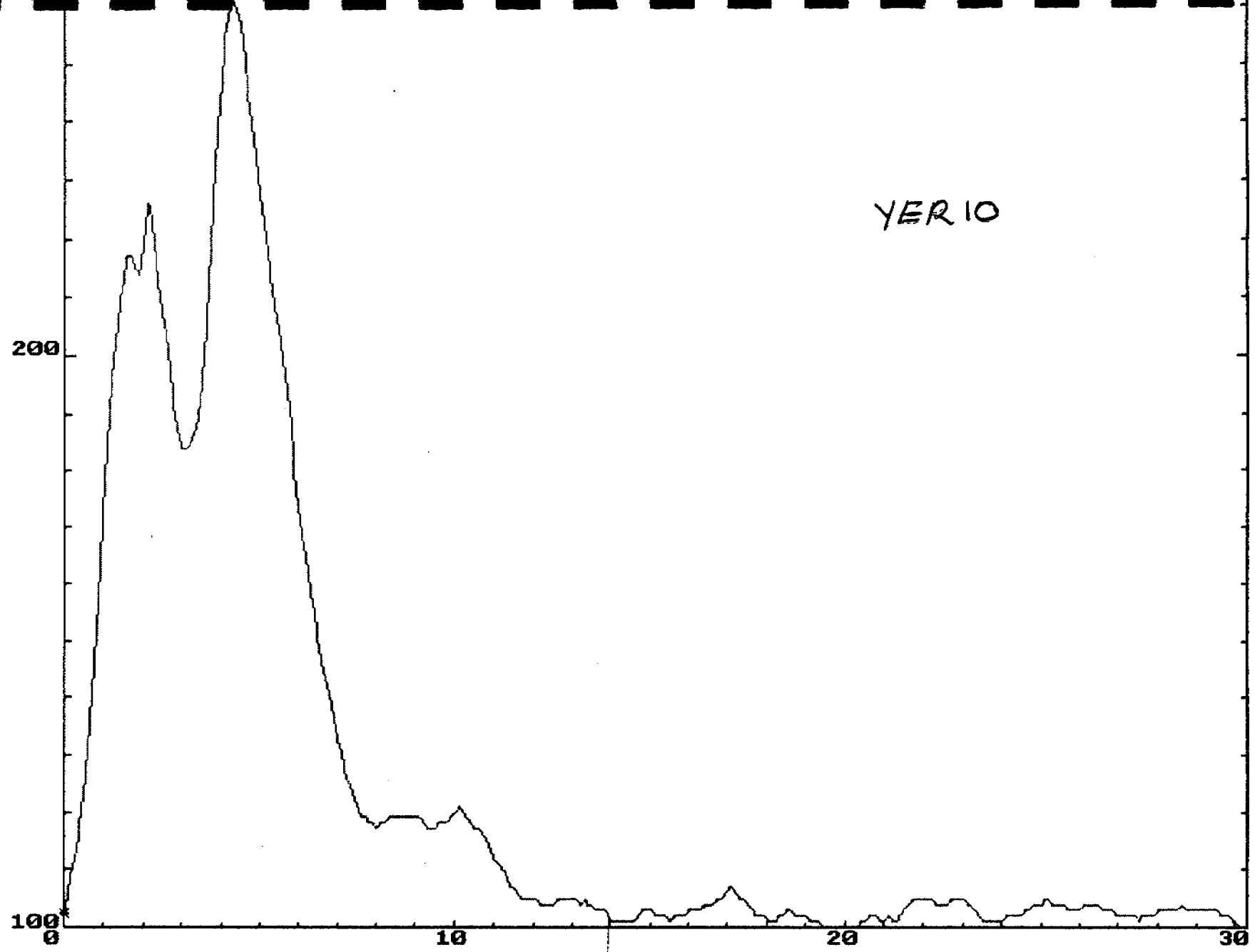
YER10

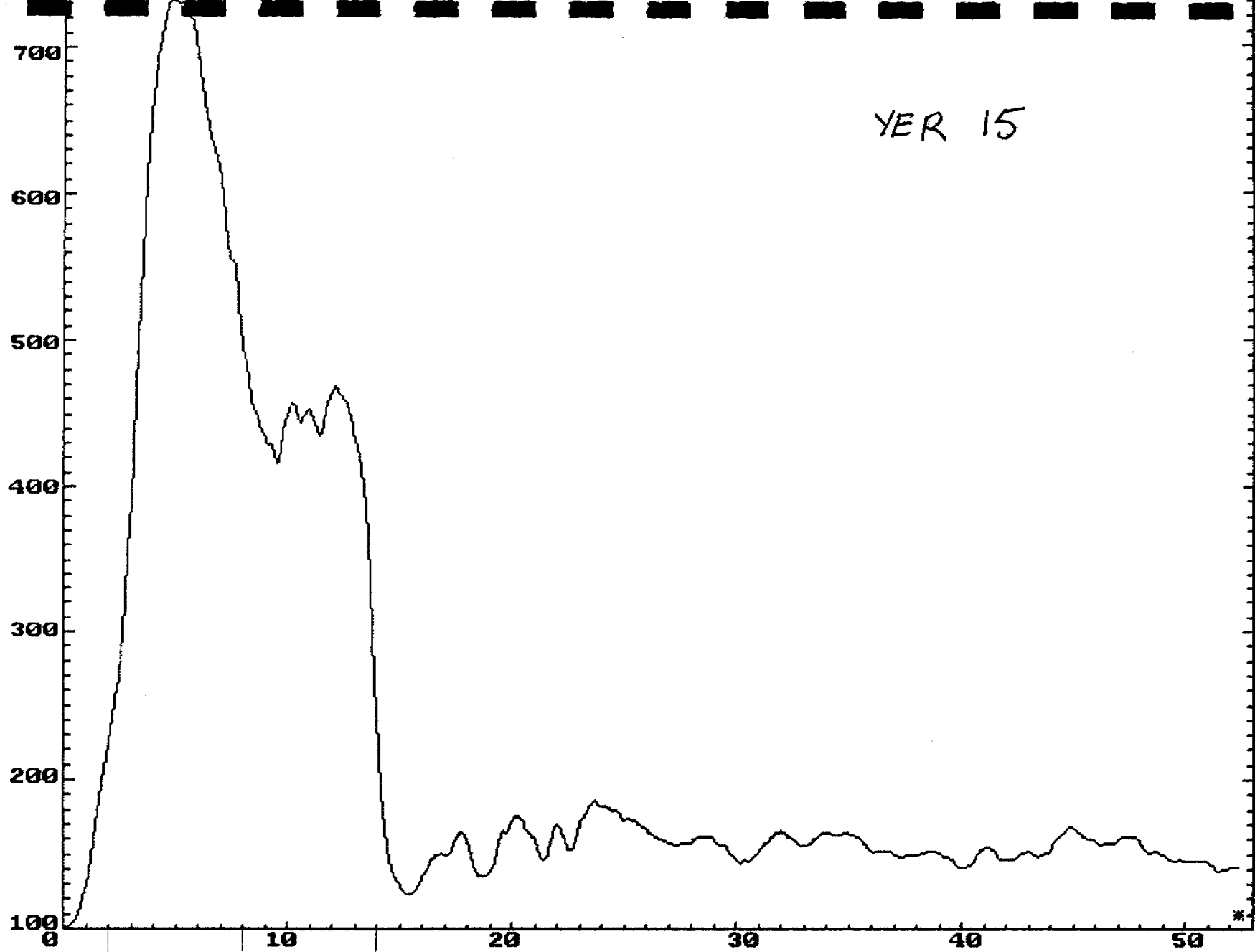
sand

clay

mudstone

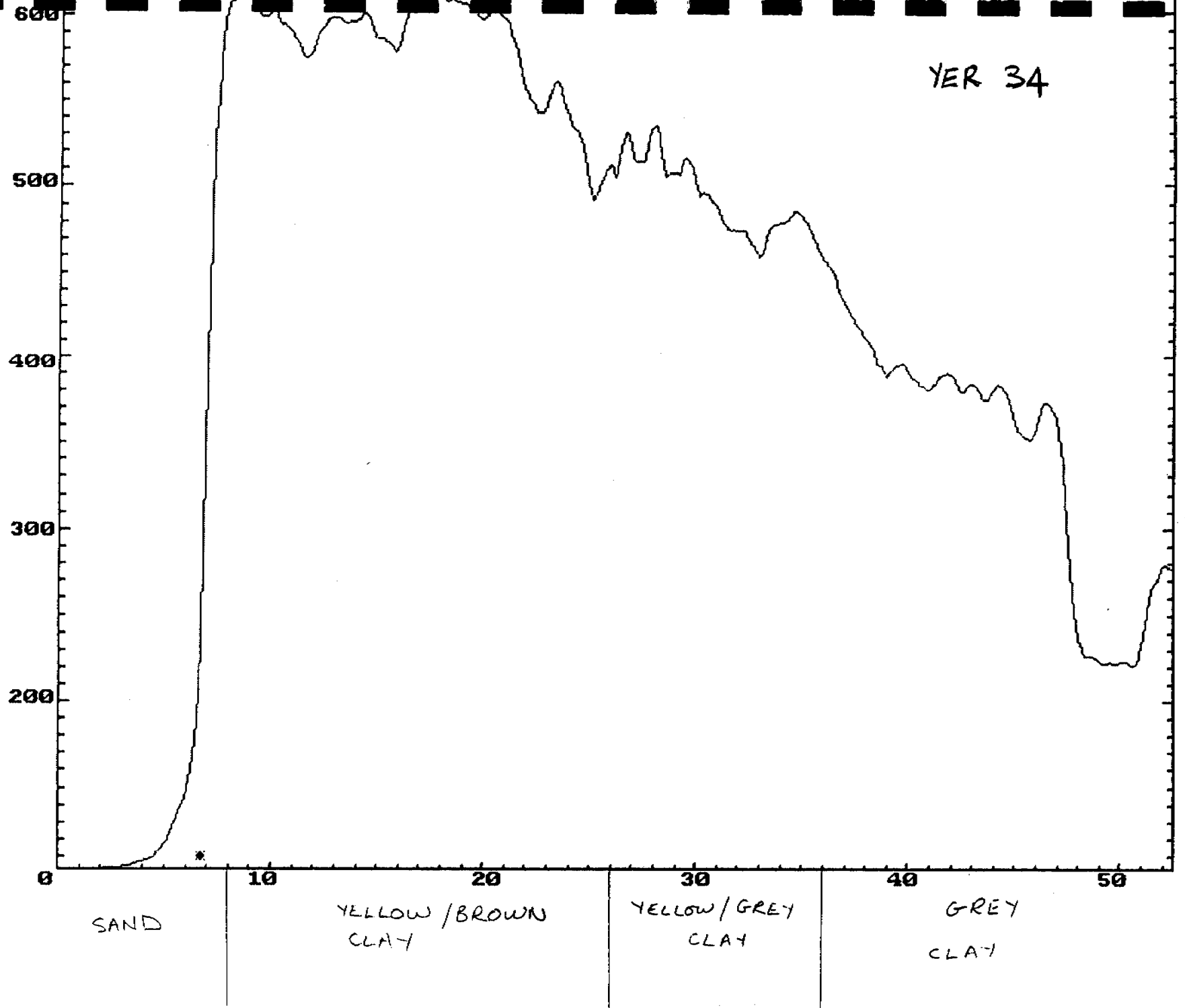
siltstone





lay claystone

sandstone



200

YER 46

100

0

10

20

30

LAT

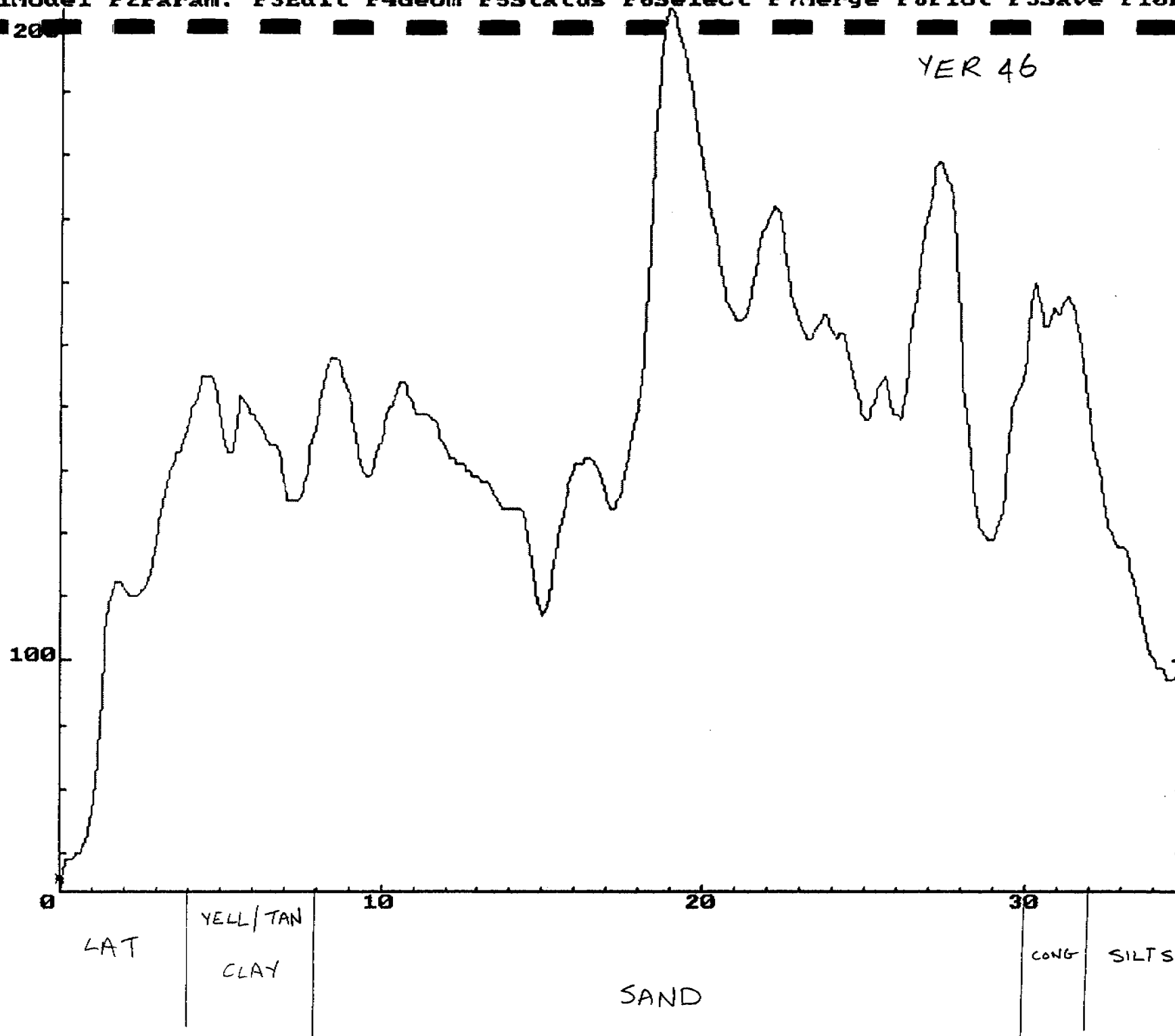
YELL/TAN

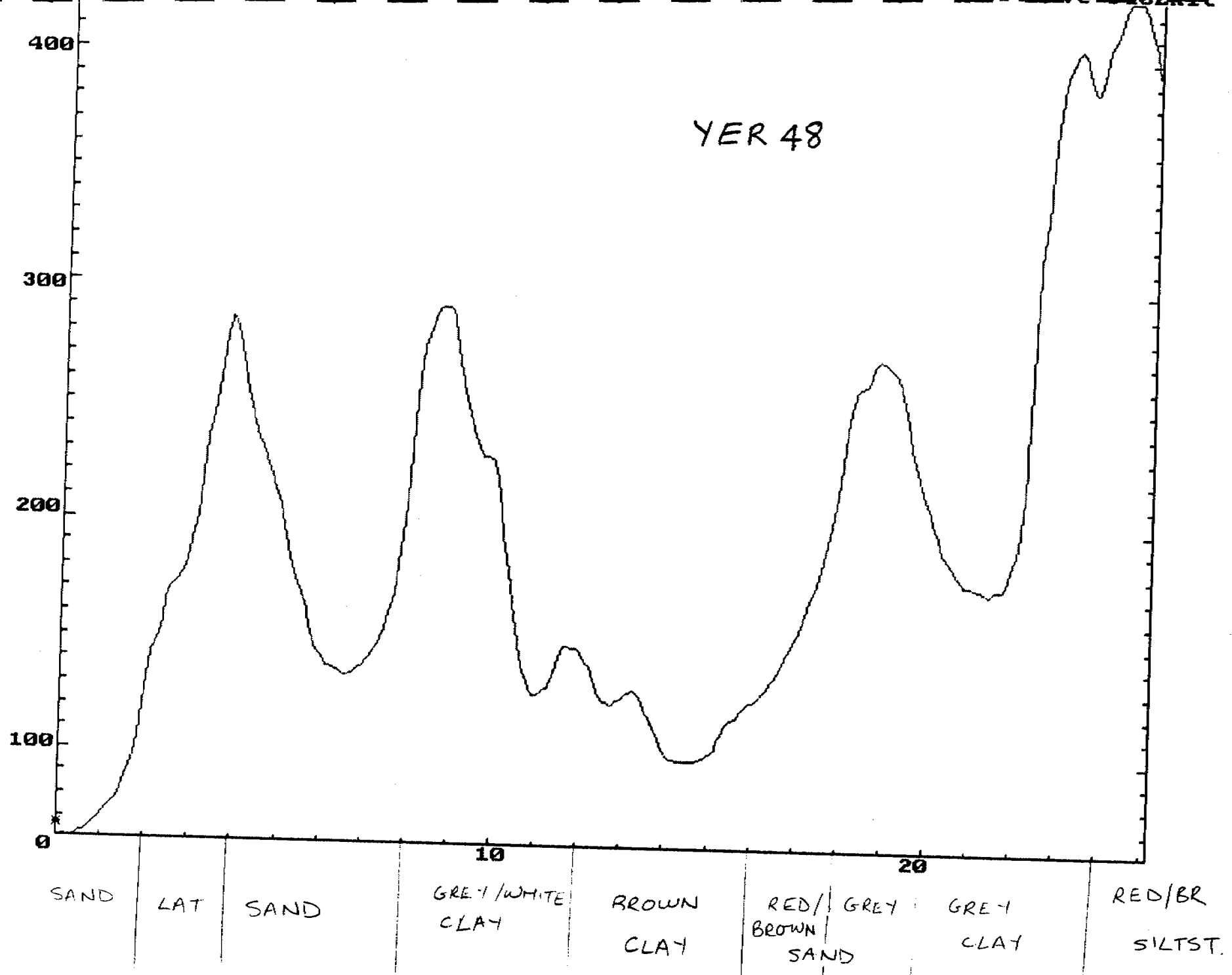
CLAY

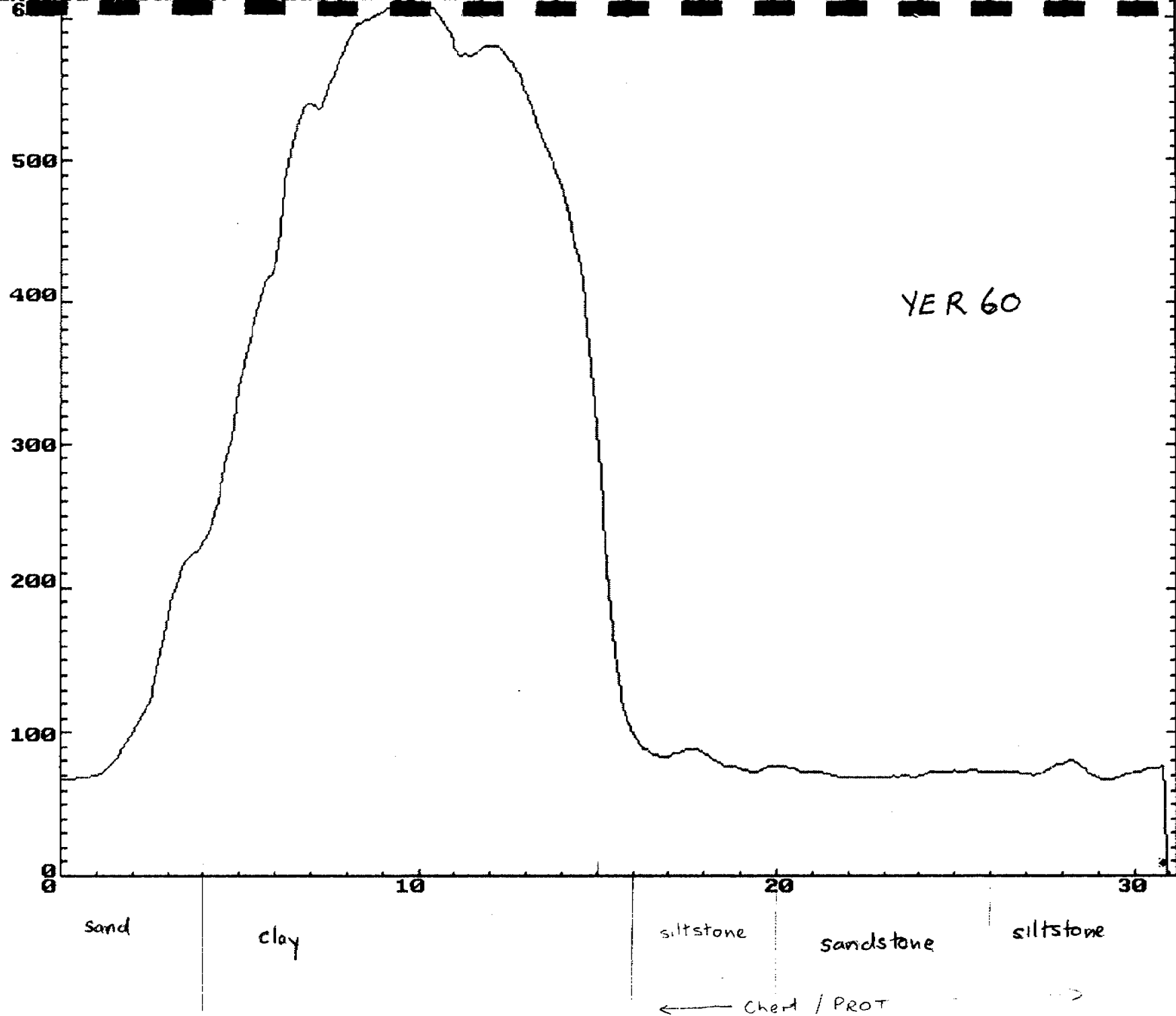
SAND

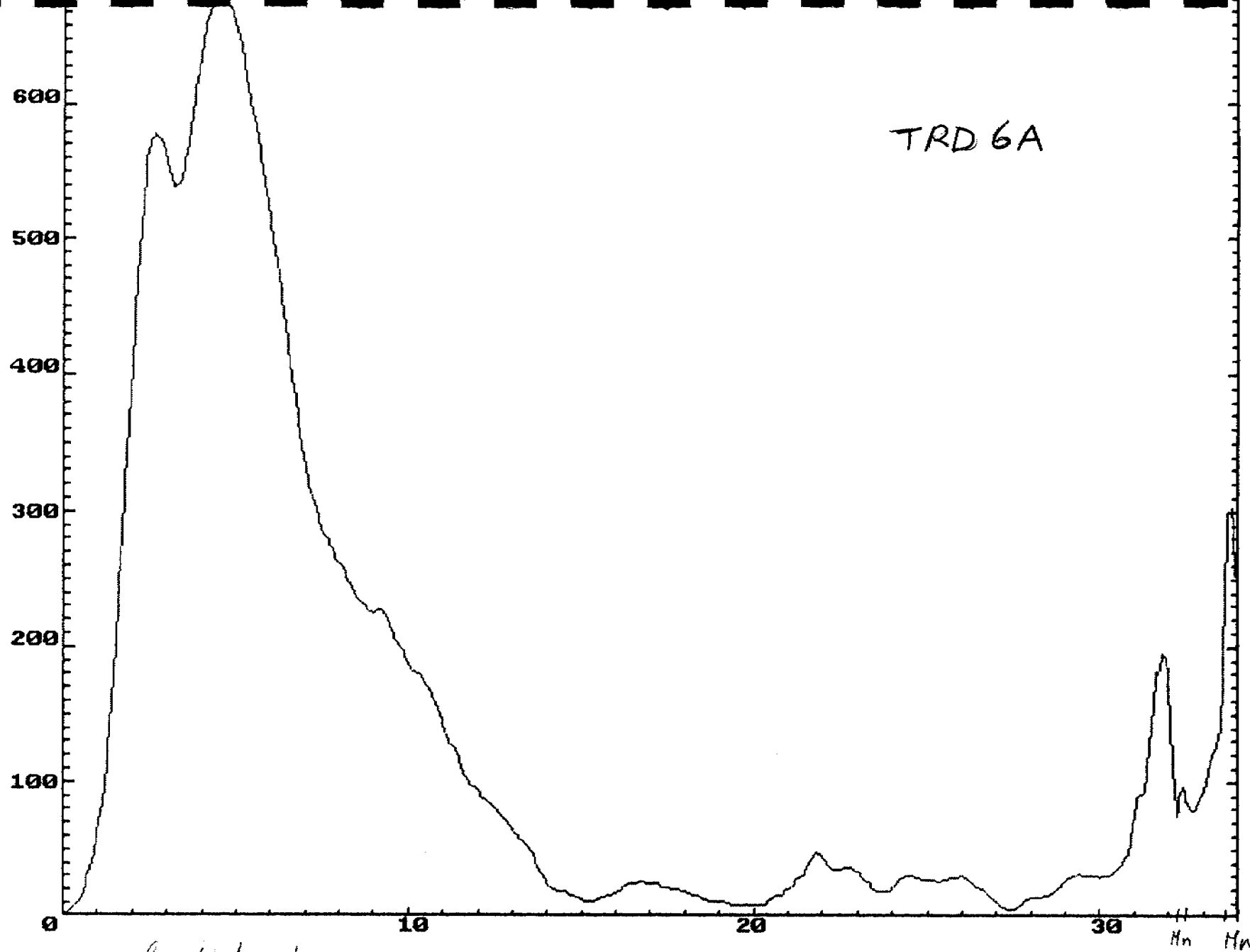
CONG

SILTST





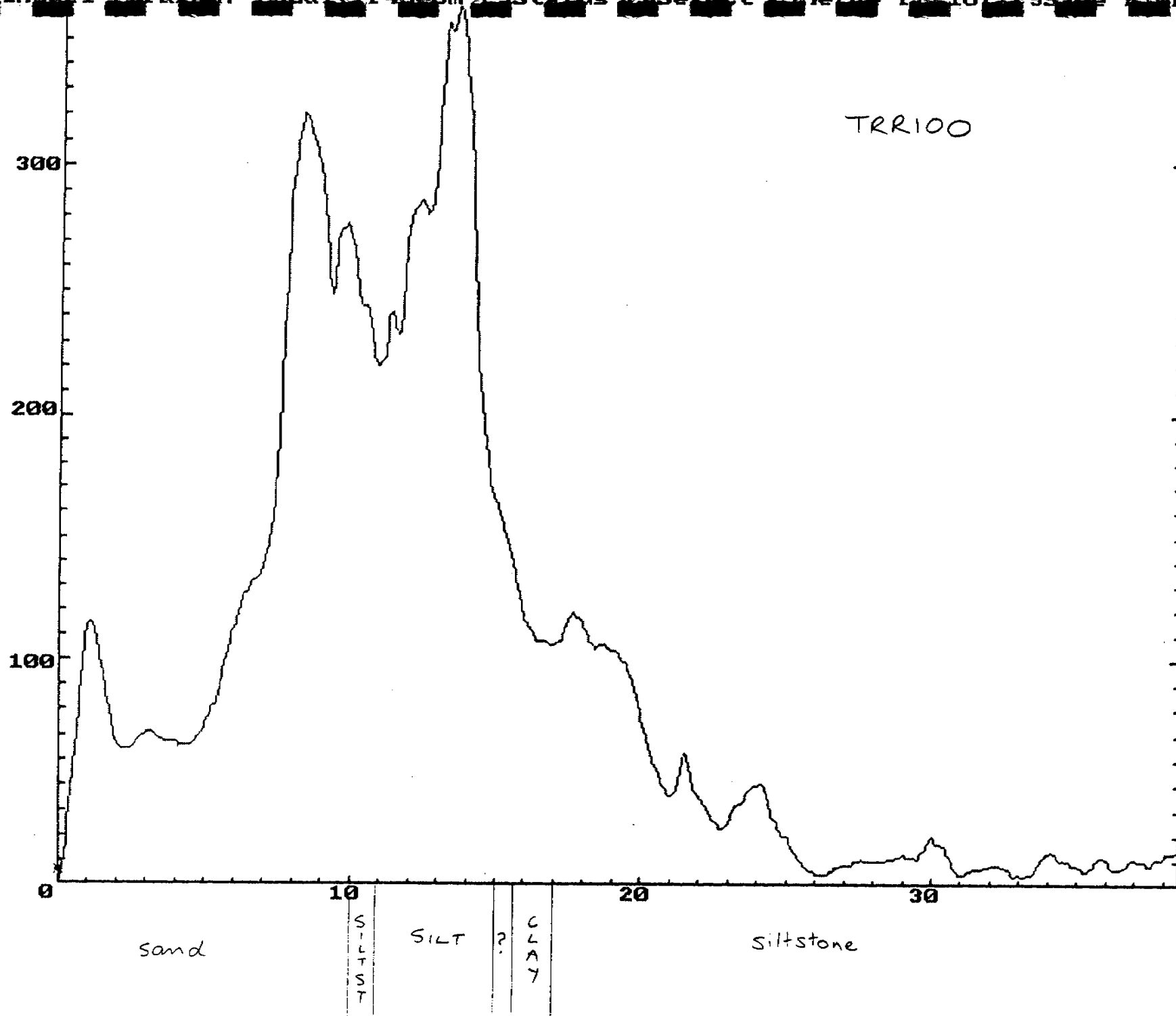




day/lat rate

Hn Hn

SHALE



200

100

0

0

TRR108

10

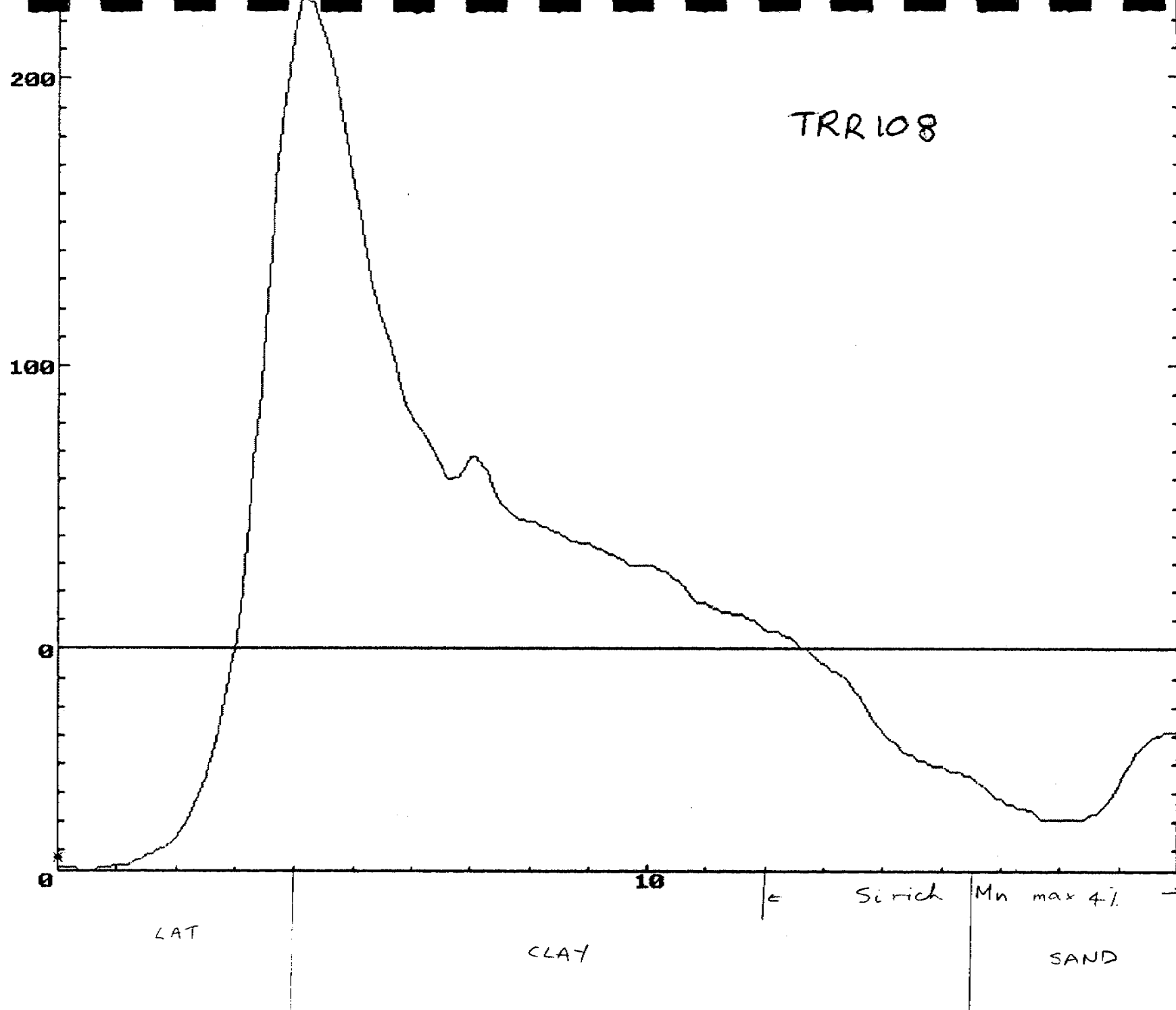
LAT

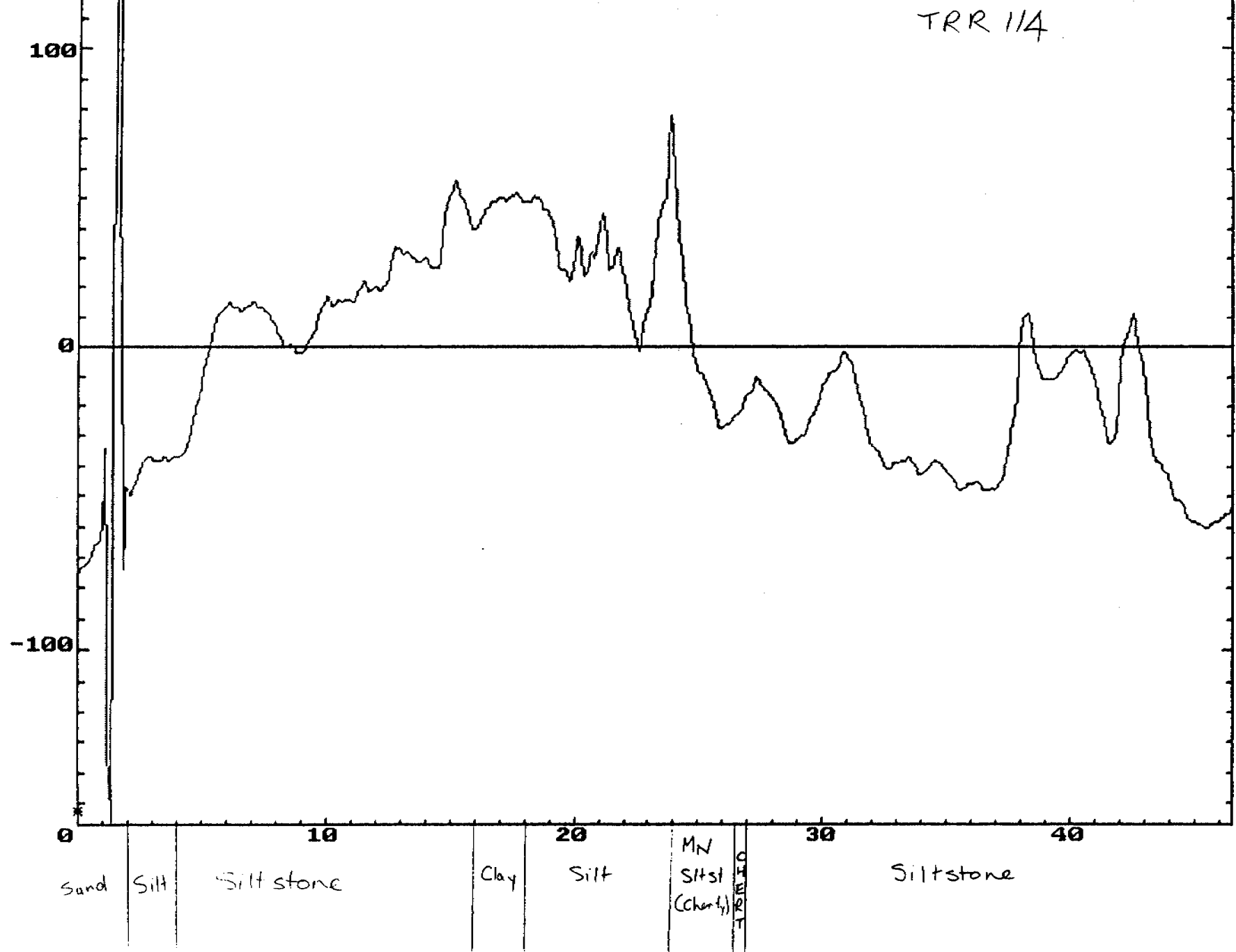
CLAY

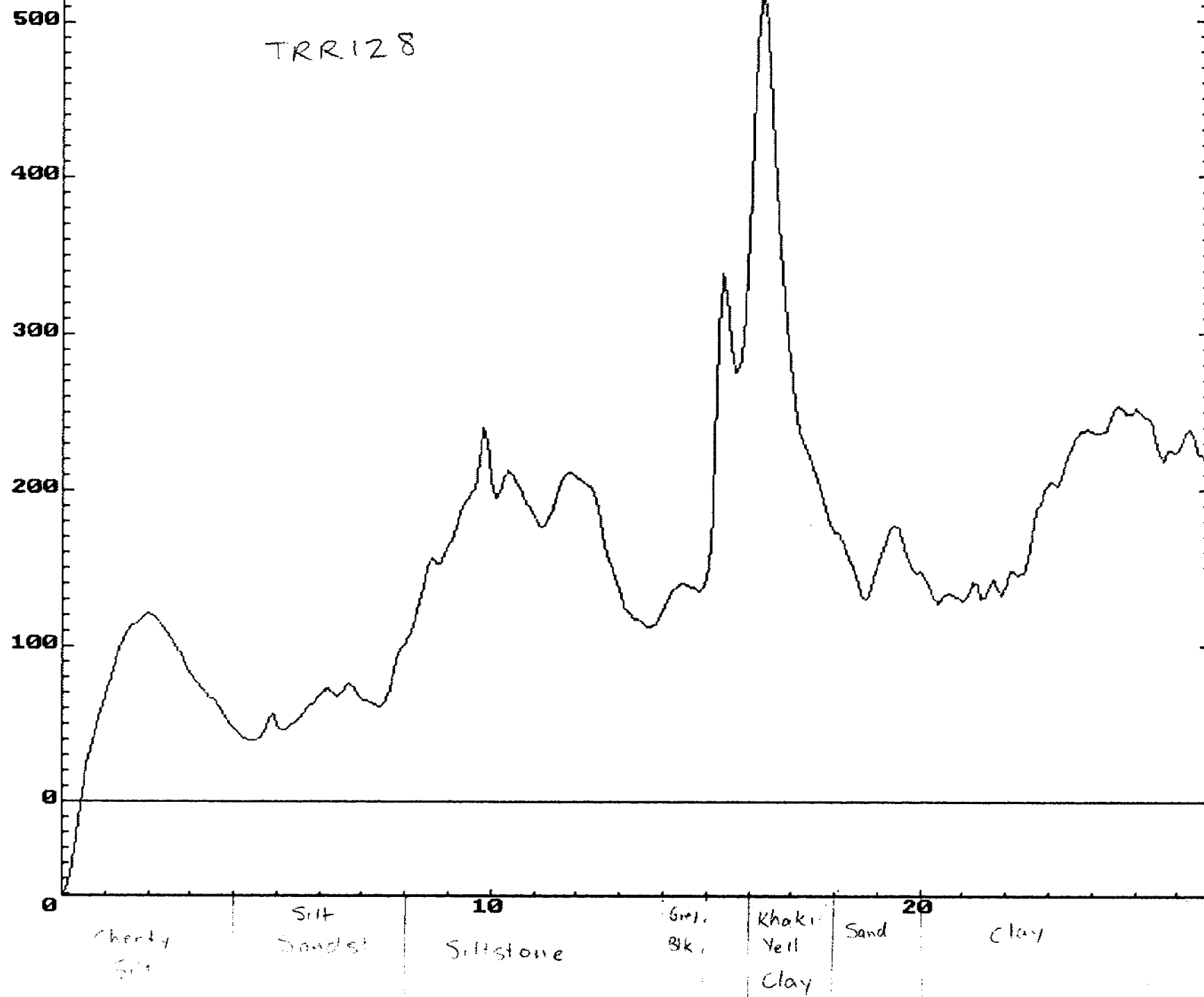
Silich

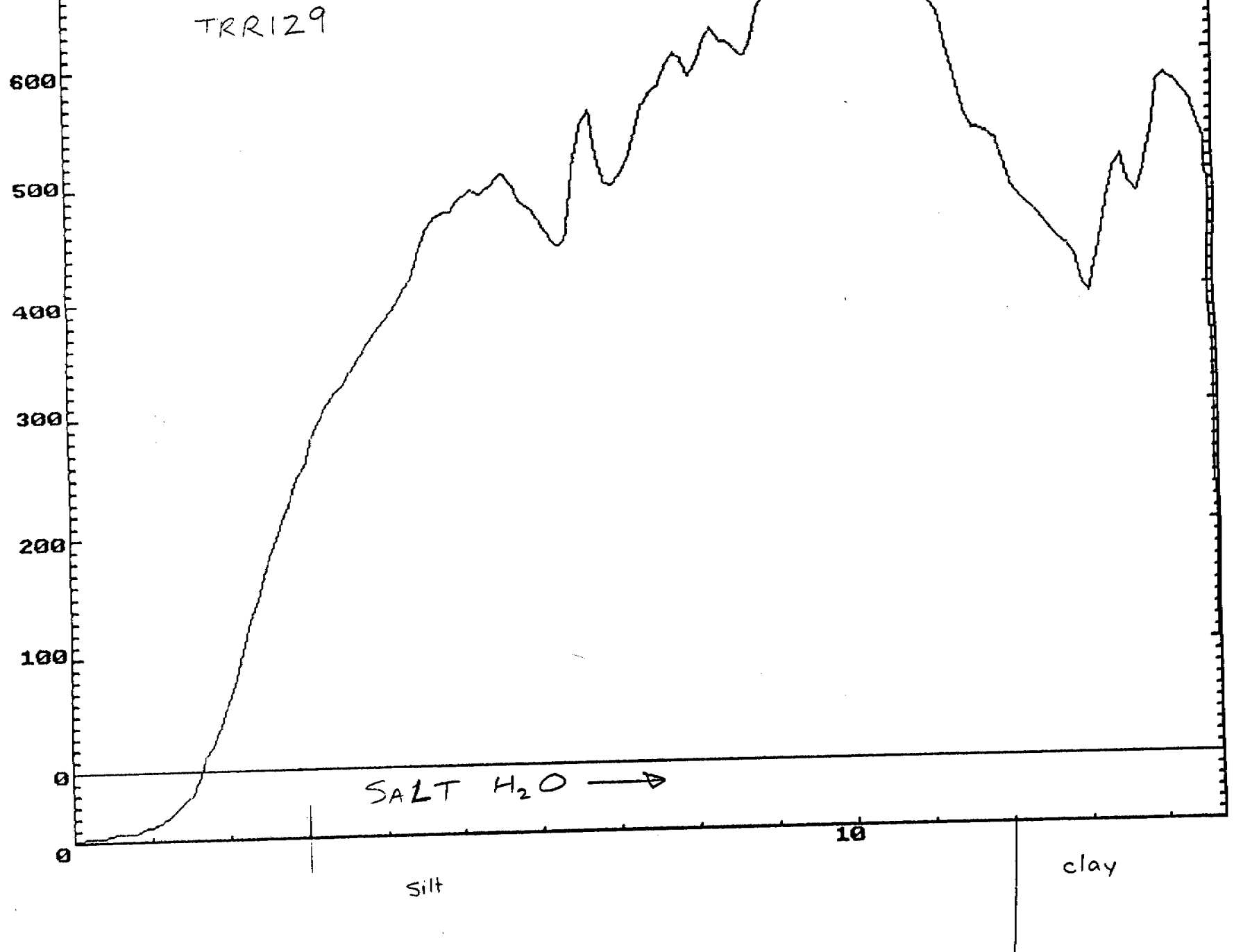
Mn max 4%

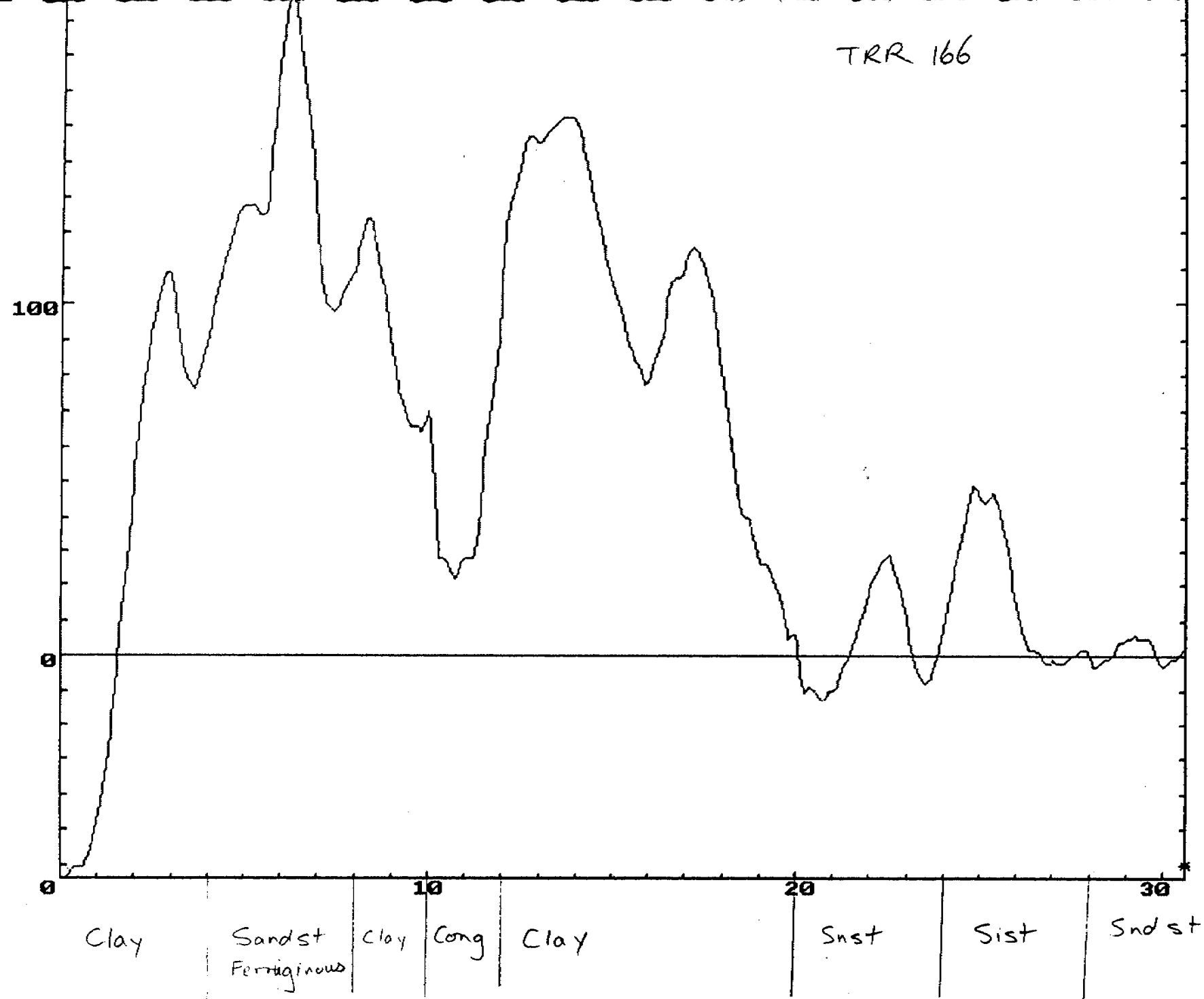
SAND



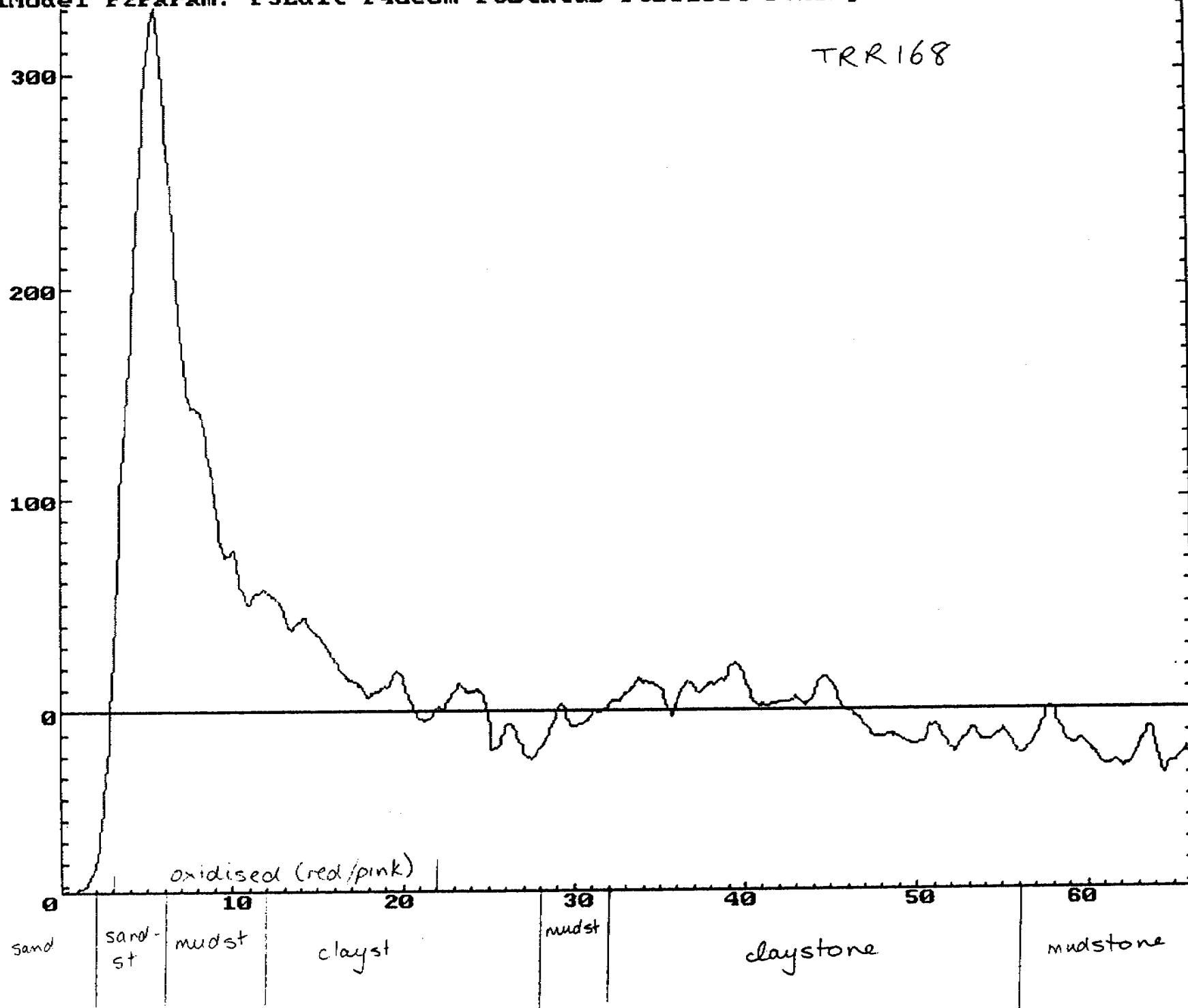








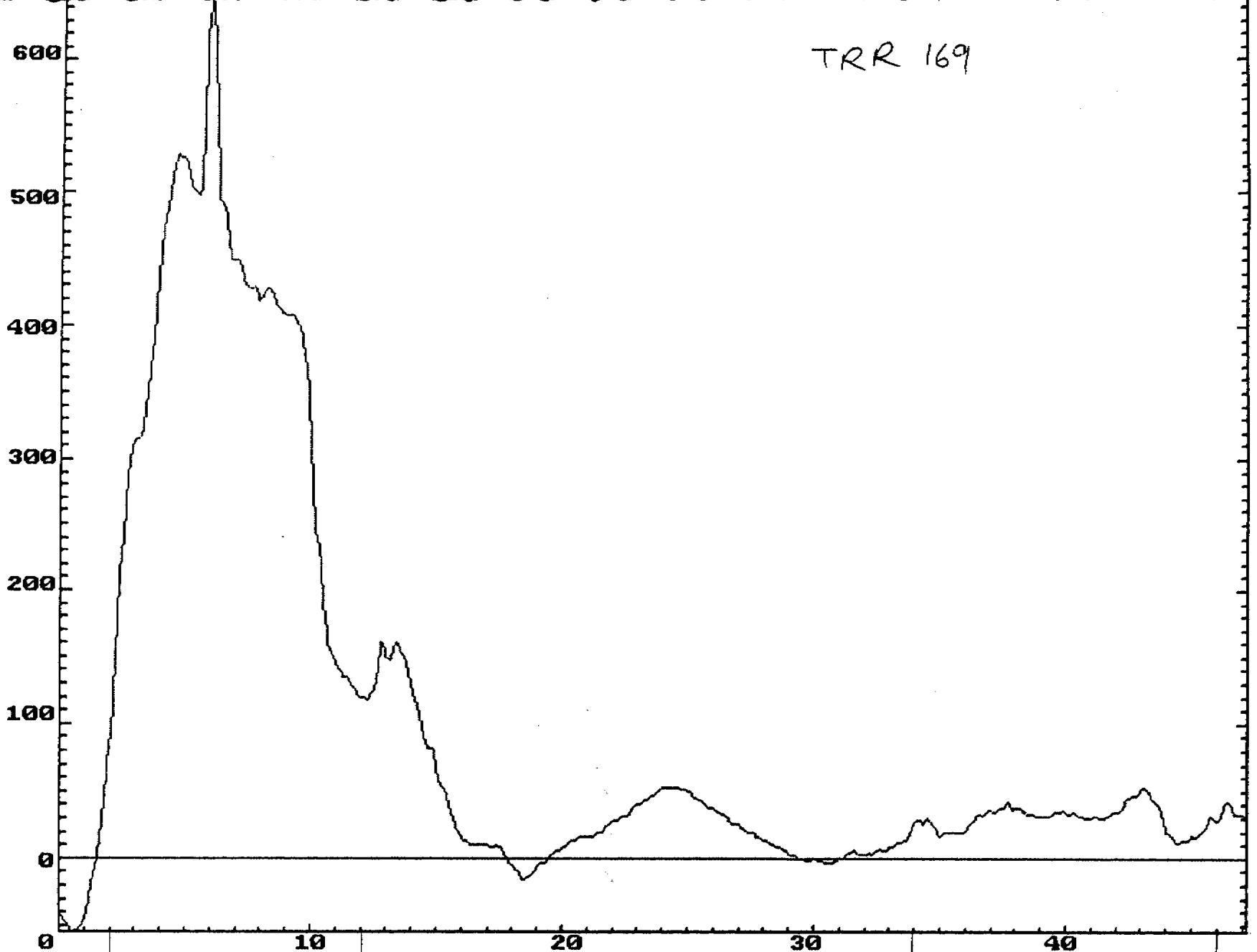
TRR168

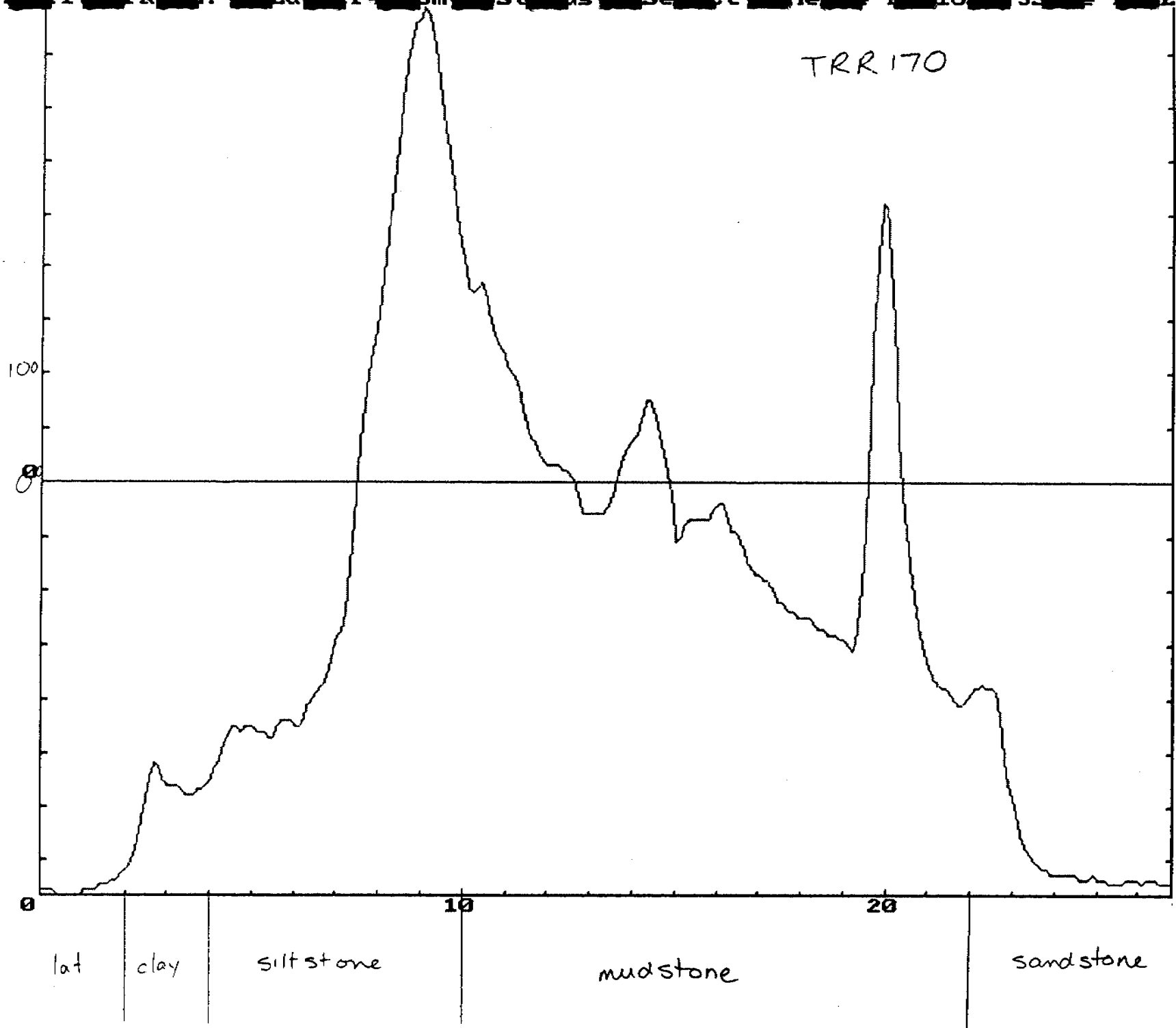


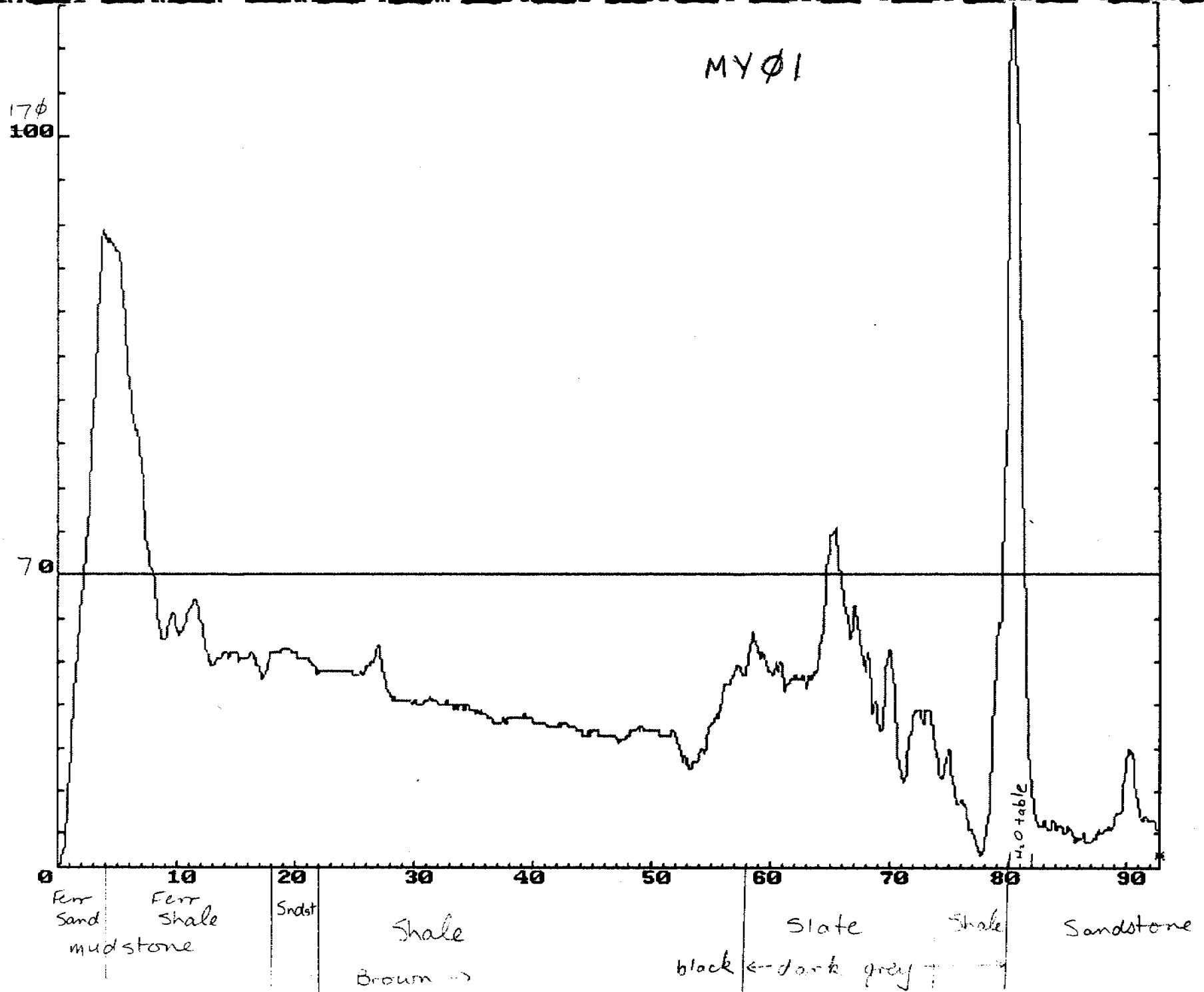
600
500
400
300
200
100
0
0

TRR 169

Lat clay grey Sandstone (clay) clay (Snst frag) Sandst







APPENDIX 11.

Statements of Expenditure

STATEMENT OF EXPENDITURE

EXPLORATION LICENCE 7260

For the period
24th May, 1994 to 23rd May, 1995

Geoscientist/Professional	34,020
Field Support/Office Staff	14,001
Other Contractors	755
Equipment	20,314
Vehicles	12,725
Helicopter Charter	4,371
Drilling	99,449
Geophysics	7,273
Surveys	8
Geochemistry	1,969
Laboratory	2,554
Drafting/Computing	667
Office Expenses	375
Library	61
Other	1,094
Sub-Total	199,636
10% Overheads	19,963
Total:	\$ 219,599

STATEMENT OF EXPENDITURE

EXPLORATION LICENCE 7261

For the period
24th May, 1994 to 23rd May, 1995

Geoscientist/Professional	17,585
Field Support/Office Staff	5,483
Other Contractors	309
Equipment	6,491
Vehicles	5,790
Fixed Wing Air Charter	2,826
Drilling	20,169
Geophysics	22,743
Survey	49
Geochemistry	1,400
Drafting/Computing	1,443
Office Expenses	247
Other	321
Sub-Total	84,856
10% Overheads	8,485
Total:	\$ 93,341

STATEMENT OF EXPENDITURE

EXPLORATION LICENCE 7262

For the period
24th May, 1994 to 23rd May, 1995

Geoscientist/Professional	13,084
Field Support/Office Staff	3,300
Other Contractors	270
Equipment	5,168
Vehicles	3,166
Helicopter Charter	3,292
Fixed Wing Air Charter	3,180
Drilling	3,389
Geophysics	36,681
Surveys	1,750
Laboratory	2,680
Geochemistry	1,750
Drafting/Computing	501
Office Expenses	551
Library	21
Other	267
Sub-Total	78,137
10% Overheads	7,813
Total:	\$ 85,950

STATEMENT OF EXPENDITURE

EXPLORATION LICENCE 7263

For the period
24th May, 1994 to 23rd May, 1995

Geoscientist/Professional	42,849
Field Support/Office Staff	20,533
Other Contractors	1,057
Travel/Accommodation/Meals	858
Equipment	9,689
Vehicles	8,365
Helicopter Charter	3,292
Fixed Wing Air Charter	5,654
Drilling	66,497
Geophysics	25,908
Surveys	1,868
Laboratory	4,801
Geochemistry	2,382
Drafting/Computing	923
Office Expenses	278
Library	21
Other	278
Sub-Total	195,745
10% Overheads	19,574
Total:	\$ 215,319

STATEMENT OF EXPENDITURE

EXPLORATION LICENCE 7264

For the period
24th May, 1994 to 23rd May, 1995

Geoscientist/Professional	19,427
Field Support/Office Staff	6,771
Other Contractors	2,288
Field Supplies	1,269
Equipment	8,836
Vehicles	5,194
Freight/Storage	628
Helicopter Charter	2,186
Fixed Wing Air Charter	314
Drilling	12,513
Surveys	1,789
Geophysics	8,609
Laboratory	2,052
Geochemistry	967
Drafting/Computing	622
Office Expenses	289
Library	351
Other	496
Sub-Total	74,601
10% Overheads	7,460
Total:	\$ 82,061

STATEMENT OF EXPENDITURE

EXPLORATION LICENCE 7341

For the period
24th May, 1994 to 23rd May, 1995

Geoscientist/Professional	13,367
Field Support/Office Staff	11,479
Other Contractors	763
Travel/Accommodation/Meals	141
Equipment	17,621
Vehicles	5,100
Helicopter Charter	2,186
Drilling	34,151
Geophysics	1,402
Laboratory	5,385
Geochemistry	1,506
Drafting/Computing	762
Office Expenses	172
Library	9
Other	240
Sub-Total	94,284
10% Overheads	9,428
Total:	\$ 103,712