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REPORT ON A
COMBINED INDUCED POLARISATION
SEISMIC AND ELECTROMAGNETIC SURVEY
IN THE
MOUNT GUNSON AREA, SOUTH AUSTRALIA
FOR
PACMINEX PTY. LTD.

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McPHAR GEOPHYSICS PTY. LTD.

REPORT ON A

COMBINED INDUCED POLARISATION,

SEISMIC AND ELECTROMAGNETIC SURVEY

IN THE

MOUNT GUNSON AREA, SOUTH AUSTRALIA

FOR

PACMINEX PTY. LTD.

SUMMARY

An orientation geophysical survey has been completed in the Mt. Gunson area for Pacminex Pty. Ltd.

The purpose of the survey was firstly to test the applicability of Induced Polarisation and Electromagnetic techniques in the detection of the known copper ore body; and secondly to test the applicability of the shallow seismic refraction method to determine the depth to the top of the Pandurra formation which is the host rock for the ore zone.

The Induced Polarisation method was successful in detecting the known ore body and several areas of interest for future exploration were also detected.

The electromagnetic method was found to be principally

affected by surface conductive zones, and could not be recommended as a viable reconnaissance tool.

The shallow seismic refraction method is shown to be useful in determining the depth to the Pandurra formation although it seems likely that the interface detected is actually the base of the weathered layer within this unit.

The Bison Signal Enhancement seismograph employed in the survey would require a more energetic source than the standard hammer if it is to be used to obtain penetration below 40 metres. The viability of using a more powerful 12 channel system should be investigated.

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S 5032A-12	60' N of DH 100/400	North
S 5032A-13	60' N of DH 100/400	South
S 5032A-14	40' S of DH CG74	South

1. INTRODUCTION

At the request of Mr. W. Langron, Chief Geophysicist for Pacminex Pty. Ltd., we have conducted an orientation geophysical survey in the Mt. Gunson area, about 90 miles north from Port Augusta, South Australia.

The main area of interest was the Cattle Grid prospect where a known deposit of copper sulphides has been proven by percussion drilling. The ore body occurs within a fossil weathered surface layer of the Pandurra Quartzite, and is overlain generally by the Whyalla Sandstone.

The sulphide body varies in thickness from zero to a few metres and its depth varies from 25 metres to 40 metres. From over-burden - ore ratios observed within the main ore body it seems unlikely that ore of the same type detected at depths greater than 40 metres would be economically viable.

It was therefore envisaged that the seismic method could be used to delineate areas where the depth to the Pandurra formation was much greater than 40 metres, and eliminate such areas from further immediate exploration.

A Bison 1750B signal enhancement seismograph was employed for the survey using a 14 lb sledgehammer as an energy source. Initially a 6 inch square steel plate was used as a hammer strike, however because of the very soft surface, a larger 15 inch diameter plate was found necessary to provide adequate energy transfer.

The Induced Polarisation and Resistivity survey was conducted using McPhar variable frequency IP equipment operating at frequencies of 2.5 and 0.3 Hz, and using the dipole-dipole array with electrode separations of 30 and 60 metres.

The electromagnetic survey employed McPhar VHEM equipment operating at frequencies of 600 and 2400 Hz. Tests were conducted using both the horizontal loop (in phase-out of phase) system and the vertical loop (broadside) system.

Previous geophysical test surveys have been conducted on this prospect and include Induced Polarisation reconnaissance lines by Geoscience Inc. in 1964, by Austral Exploration in 1971 and by C.G.G. in 1973. C.G.G. also conducted mise-a-la-masse tests in 1973.

In 1972 Austral Exploration carried out refraction seismic tests over the ore body and environs.

A grid pattern was flown over the area in 1973 with the Geoterrex INPUT system.

Pacminex Pty. Ltd. have surveyed all pegged traverses with both ground magnetometer and self potential methods.

None of the results of these previous surveys have been made available for comparison with results of the current survey.

2. RESULTS OF INDUCED POLARISATION & RESISTIVITY SURVEY

The IP results are plotted in the manner described in the notes appended to this report and are shown on the enclosed sections.

The definite, probable and possible Induced Polarisation anomalies are indicated by bars, in the manner shown on the legend, on the plan map as well as on the data plots. These bars represent the surface projection of the anomalous zones as interpreted from the location of the transmitter and receiver electrodes when the anomalous values were measured.

Since the Induced Polarisation measurement is essentially an averaging process, as are all potential methods, it is frequently difficult to exactly pinpoint the source of an anomaly. Certainly, no anomaly can be located with more accuracy than the electrode interval length; i.e., when using 60 metre electrode intervals the position of a narrow sulphide body can only be determined to lie between two stations 60 metres apart. In order to definitely locate, and fully evaluate, a narrow, shallow source it is necessary to use shorter electrode intervals. In order to locate sources at some depth, larger electrode intervals must be used, with a corresponding increase in the uncertainties of location. Therefore, while the centre of the indicated anomaly probably corresponds fairly well with the source, the length of the indicated anomaly along the line should not be taken to represent the exact edges of the anomalous material.

(a) Cattle Grid Prospect:

Two traverses were surveyed across the known ore zone on the Cattle Grid Prospect.

Line 18600N:

The grid pegs for this traverse were marked 18500N, but it has been referred to its actual grid position to simplify future relocation.

The traverse was initially surveyed from 2400E to 4110E using electrode intervals of 30 metres. The results are anomalous to some extent from 2760E to 3870E. The definite anomaly marked at 3630E to 3750E shows strong metal factors on the 3rd and 4th separations accompanied by a significant increase above background in frequency effect. This anomaly coincides with the known richest portion of the ore body. Because the anomaly showed maximum response on the larger separations the area was resurveyed using electrode intervals of 60 metres.

The probable anomaly at 3270E to 3300E reflects a shallow source (say about 20 to 30 metres) and seems likely to represent a local increase in sulphide concentration.

The probable anomaly at 3060E to 3120E reflects a slightly deeper source, as does the anomaly at 2880E to 2940E.

Both these anomalies have been covered by a survey using 60 metre electrode intervals. The former anomaly is confirmed as a source shallower than 60 metres, while the latter source is probably at a similar depth but of greater areal extent.

These areas certainly warrant testing by drilling and vertical drill holes are suggested at 3080E and 2900E.

The single high metal factor at 2805E on the 30 metre data is considered to be due to a spurious resistivity measurement and has not been given significance in the interpretation.

Line 3770E:

This traverse was surveyed using 60 metre electrode intervals, across the centre of the known ore zone.

An anomalous response was detected at 18480N to 18840N with a definite anomaly defined from 18660N to 18780N. The apparent source of the anomaly agrees closely with the observed limits of the ore zone.

A possible anomaly at 19080N to 19200N on this line is due to a shallow source and may warrant further attention. Before testing by drilling this anomaly should be confirmed by surveying with 30 metre electrode intervals.

(b) Area Near DH MG14D:

This grid was designed to test the source of an anomaly detected by the airborne INPUT survey. The grid is approximately north-south, east-west and the position of drillhole MG14D is 30 metres north and 115 metres west of the origin of the grid.

In this drillhole some minor intersections of copper sulphides have been reported.

The north-south baseline was initially surveyed using electrode intervals of 60 metres. The probable anomaly detected at 60N to 240N was confirmed using electrode intervals of 30 metres. The frequency effect response within the anomaly is only weak but it is considerably above background.

The source certainly warrants testing by drilling and a suitable site for a vertical drillhole would be at 100N on this line.

To test the possibility that the existing drillhole had already tested the source of the anomaly, Line 115W was surveyed using 30 metre electrode intervals. The defined anomaly (possible from 30N to 120N and probable north of 120N) indicates that the drillhole was sited on the very edge of a possible sulphide zone. In view of the encouraging copper horizon encountered in this hole, the area should receive high priority in any future exploration.

(c) Airstrip Area:

This traverse was designed to test the source of an anomaly detected by the airborne INPUT survey.

Line 30S was surveyed using electrode intervals of 60 metres. The possible anomaly at 180E to 240E reflects a near surface low resistivity zone which is probably the source of the airborne INPUT anomaly. Weakly anomalous frequency effects at depth are not associated with significantly lower resistivities and although the metal factors in this zone are marginally anomalous, the area is not considered to be of particular significance.

3. RESULTS OF THE ELECTROMAGNETIC SURVEY

Three traverses were surveyed using the VHEM electromagnetic system.

Line 18600N on the Cattle Grid Prospect was surveyed using the horizontal loop in-line system, measuring in-phase and out-of-phase response. Because of the low surface resistivities, signal strength was low, and some powerline interference was apparent.

There is no significant response over the area of the ore body and anomalous effects observed seem likely to be due to variations in the near surface resistivity.

The north-south baseline in the area near drillhole MG14D was surveyed using the VHEM in the vertical loop broadside technique. The transmitter was located on Line 90W.

Again signal strengths were low and the data is noisy. Two poorly defined cross-overs are observed at 60N and 195N and these probably correspond to local conductive zones within the conductive surface layer.

This conductive surface layer probably represents the source of the INPUT anomaly.

Line 30S at the airstrip was also surveyed using the broadside method with the transmitter on Line 120S. The data is noisy due to low signal strengths. One strong cross-over located at 180E is apparently due to a shallow moderate conductor. The source seems likely to be due to multiple near surface conductors and is probably related to the near surface low apparent resistivity detected at 180E to 240E on the IP survey, and probably reflects the source of the INPUT anomaly in this area.

4. RESULTS OF THE REFRACTION SEISMIC SURVEY

The purpose of the refraction seismic work was to determine the depth to the top of the Pandurra formation. From a survey carried out nearby by Bluff Minerals the following seismic velocities were known:

1.	Unconsolidated overburden	300-1500 metres/sec
2.	Whyalla sandstone	1500-2100 metres/sec
3.	Woocalla dolomite	2600-3700 metres/sec
4.	Pandurra quartzite	3800-5000 metres/sec.

With these velocity contrasts it may be shown that to reliably detect the Pandurra quartzite at depths up to 40 metres, hammer offsets in excess of 200 metres will be required. With the field techniques finally evolved during the test survey, such offsets are possible using the 14lb sledgehammer source. However, the hammer operator tires rapidly and overall production would be expected to be low on a routine basis.

The results of the test survey indicate a predominantly 4 layer situation consisting of a surface layer with a velocity of 300 to 500 metres per second, an intermediate layer with a velocity of 800 to 2200 metres per second, a third layer with a velocity of 2500 to 3500 metres per second and a basement layer with a velocity in excess of 4200 metres per second.

This structure and the observed velocities agrees well with the values reported by Bluff Minerals.

The results of the refraction survey are shown on the accompanying data plots.

<u>Setup 3570E/18600N</u>:

A detailed spread was surveyed at this site with hammer offsets at 2 metre intervals out to 20 metres.

The data shows a clearcut layer of 2.2 metres of 390 metres per second underlain by 800 metres per second. The data points at 18 and 20 metre offsets are considered to have delays due to local ground conditions and have been tentatively discarded in the interpretation.

Although this is an observed four layer case, the first two layers are apparent only because of the small station interval. The 390 metres per second and 800 metres per second layers are therefore considered to represent the overburden. The layer with a velocity of 4460 metres per second is considered to represent the Pandurra formation because no further interface was detected at hammer offsets up to 170 metres.

With the observed depth to the Pandurra of 31.7 metres the depth determined from the seismic survey is too shallow by 15%. No reverse profile was surveyed so the effect of dip of the interface has not been determined. However, the dip of the interfaces in this area is known to be relatively small and only a minor effect on the depth calculation is anticipated.

Setup 3570E/18670N:

The survey at this site detected a similar structure to that observed at 18600N.

The interpreted layers are 2.38 metres of 320 metres per second overlying 4.42 metres of 540 metres per second and 12.18 metres of 1750 metres per second which is underlain by material with a velocity of 4050 metres per second.

The observed depth to the Pandurra quartzite at this site is

33.9 metres, and if the lower layer detected is correlated with the Pandurra then the interpreted depth is much too shallow. Because hammer offsets were only measured to 100 metres, a deeper higher velocity layer could be present. It should also be noted that the area was a particularly noisy one and the data should not be regarded as entirely reliable, at least for the larger hammer offsets.

Setup 3570E/18800N:

This profile is regarded as typical of the expected structure in the area.

The surface layer consists of 5.25 metres of 360 metres per second, underlain by 13 metres of 1490 metres per second, and then 18 metres of 2730 metres per second. The basement has an apparent velocity of 5000 metres per second. Dwg. Nos. S 5032A-3 and 4 show two slightly different interpretations of the same data.

The first gives a depth to the Pandurra of 36 metres and the second a depth of 33.4 metres. With the observed depth at this site of 38 metres, both interpretations give a depth which is too shallow by 5 and 12% respectively.

Setup 3570E/18900N:

This setup was attempted twice and the results are shown in Dwg. Nos. S 5032A-5 and 6. The first profile with the hammer to the south was extremely noisy and the data is regarded as unreliable beyond the 30 metre hammer offset. The second set of data is more reliable and has been interpreted as a surface layer of 4 metres of 320 metres per second underlain by 10.5 metres of 1430 metres per second.

The underlying layer has a velocity of 3040 metres per second but the base of the layer has not been reliable detected. It seems likely that the last two data points could represent a new interface. If a 5000 metres per second layer is inferred at this point its depth would be about 37 metres which compares with the observed depth of 38 metres. Hammer offsets to at least 180 metres would be required to confirm this interpretation. Comparison of the spreads to the north and south suggests a slight southerly dip at this site.

Setup 3570E/19000N:

The data for this setup was again very noisy and the interpretation shown on Dwg. No. S 5032A-7 implies considerable smoothing. The high velocity of 6250 metres per second for the Pandurra is inferred from only two data points and is very likely subject to error. However, the presence of a higher velocity interface is apparent and the calculated depth of 37.7 metres is consistent with the observed depth of 39.6 metres.

Setup DH 300/400:

This setup was surveyed twice and the two profiles are shown on Dwg. Nos. S 5032A-8 and 9. The interpretation is similar on both profiles except that the lower high velocity layer was not detected on the first profile. Also a change in the timing method resulted in slightly lower elapsed time records and results in a higher velocity for the first layer.

The distances for the hammer offsets were nominally 10 metres. However, the station interval was paced and when measured afterwards was found to be 27 feet (8.2 m). Thus although the data is plotted for and calculated with 10 metre intervals, both the observed velocities and depths must be multiplied by .82.

The observed depth to the Pandurra at this site is 25.5 metres. This comparies with the depth calculated from the seismic survey, of 28.9 metres. It seems likely that the Pandurra may be more deeply oxidised at this point, resulting in a lower velocity in the unit immediately below the ore zone.

<u>Setup 50 feet North of CG78:</u> (Station Interval 27 feet (8.2 m)).

This site was surveyed with hammer spreads to the north and south and the profiles are shown on Dwg. Nos. S5032A-10 and 11.

Comparison of the two profiles suggests a slight northerly dip at this site. The interpretations differ slightly and the true answer probably lies between the two.

However, since the Pandurra interface was not detected and becuase this was an orientation survey only, the additional computations to resolve the differences were not performed.

If we assume that the Pandurra interface at 5000 metres per second is present just beyond the end of the spread, then the minimum depth to the interface will be about 30 metres. This compares with an observed depth of 24.8 metres and is a similar situation to that observed at DH 300/400.

Setup 60 feet North of DH 100/400: (Station Interval 27 feet (8.2 m)).

This setup was surveyed with hammer spreads to the north and south and the profiles are shown on Dwg. Nos. S 5032A-12 and 13.

On Dwg. No. 12 the interface interpreted at a depth of 21 metres and presumed to be the Pandurra quartzite, is based on only two data points and may not be valid. The observed depth to the Pandurra at this site is 32 metres, so the above conclusion seems realistic. The spread to the south from this setup contained obvious offsets due to local conditions and no interpretation was attempted.

Setup 40 feet South of DH CG74: (Station Interval 27 feet (8.2 m)).

This setup was surveyed with offsets out to 100 metres but the Pandurra interface was not detected.

5. CONCLUSIONS AND RECOMMENDATIONS

(a) Induced Polarisation Survey:

The IP survey has shown that the known ore zone at the Cattle Grid Prospect is a well defined IP source and that the method is applicable for routine reconnaissance surveying of the surrounding area.

For such reconnaissance work an electrode interval of 60 metres is suitable. This allows rapid coverage of the ground and sufficient sensitivity to detect a relatively small source. Additional followup using electrode intervals of 30 metres should be planned to detail any anomalies detected.

The survey completed on the Cattle Grid Prospect detected the main ore zone and in addition detected several other areas of interest. Two drill holes have been suggested on Line 18600N at 3080E and 2900E to test two of these sources.

On Line 3770E additional work using 30 metre electrode intervals is suggested to detail an anomaly at 19080N to 19200N.

In the area around drillhole MG14D an IP source was detected north and east of the drillhole. It seems likely that the copper mineralisation detected in this hole represents the edge of this zone. An additional drillhole at 100N on the north-south baseline has been recommended to test the source.

No significant IP anomaly was detected in the Airstrip Area.

(b) <u>Electromagnetic Survey:</u>

Electromagnetic surveys were conducted on three lines in the area using both the vertical loop and horizontal loop methods.

Signal strengths were low because of surface low resistivities and the data was very noisy. All anomalies detected are attributed to surface conductors and the method is not considered suitable for reconnaissance in this area.

(c) <u>Seismic Survey:</u>

The seismic survey has shown that the method is ideally suited to detect the known layered structure within the sediments.

With the average depth to the Pandurra quartzite of 40 metres, the hammer seismic system is operating at or beyond its reliable limit using the normal energy source.

Two alternatives are available. Either a more powerful source could be used, for example, a portable pile driver, or a normal 12 channel seismic system could be used.

From the small quantity of work so far performed it is obvious that the surface layer varies considerably in velocity and thickness and these variations can affect individual observations. Therefore a higher data density should be employed for any future work.

The 12 channel system would certainly be desirable if accurate depth information is required, because more sophisticated interpretation techniques could be applied to the high data density. If the smaller hammer system is used the survey technique should include a hammer station interval of 5 metres or less, with hammer offsets out to 200 metres, coupled with routine reciprocal shooting to take account of the dip of the beds.

McPHAR GEOPHYSICS PTY. LTD.

J.E. HAIGH
GEOPHYSICIST.

Dated; 27th September 1973.

McPHAR GEOPHYSICS

NOTES ON THE THEORY, METHOD OF FIELD OPERATION, AND PRESENTATION OF DATA FOR THE INDUCED POLARIZATION METHOD

Induced Polarization as a geophysical measurement refers to the blocking action or polarization of metallic or electronic conductors in a medium of ionic solution conduction.

This electro-chemical phenomenon occurs wherever electrical current is passed through an area which contains metallic minerals such as base metal sulphides. Normally, when current is passed through the ground, as in resistivity measurements, all of the conduction takes place through ions present in the water content of the rock, or soil, i.e. by ionic conduction. This is because almost all minerals have a much higher specific resistivity than ground water. The group of minerals commonly described as "metallic", however, have specific resistivities much lower than ground waters. The induced polarization effect takes place at those interfaces where the mode of conduction changes from ionic in the solutions filling the interstices of the rock to electronic in the metallic minerals present in the rock.

The blocking action or induced polarization mentioned above, which depends upon the chemical energies necessary to allow the ions to give up or receive electrons from the metallic surface, increases with the time that a d. c. current is allowed to flow through the rock; i. e. as ions pile up against the metallic interface the resistance to current flow increases. Eventually, there is enough polarization in the form of excess ions at the interfaces, to appreciably reduce the amount of current flow through the metallic particle. This polarization takes place at each of the infinite number of solution-metal interfaces in a mineralized rock.

When the d. c. voltage used to create this d. c. current flow is cut off, the Coulomb forces between the charged ions forming the polarization cause them to return to their normal position. This movement of charge creates a small current flow which can be measured on the surface of the ground as a decaying potential difference.

From an alternate viewpoint it can be seen that if the direction of the current through the system is reversed repeatedly before the polarization occurs, the effective resistivity of the system as a whole will change as the frequency of the switching is changed. This is a consequence of the fact that the amount of current flowing through each metallic interface depends upon the length of time that current has been passing through it in one direction.

The values of the per cent frequency effect or F. E. are a measurement of the polarization in the rock mass. However, since the measurement of the degree of polarization is related to the apparent resistivity of the rock mass it is found that the metal factor values or M. F. are the most useful values in determining the amount of polarization present in the rock mass. The MF values are obtained by normalizing the F. E. values for varying resistivities.

The induced polarization measurement is perhaps the most powerful geophysical method for the direct detection of metallic sulphide mineralization, even when this mineralization is of very low concentration. The lower limit of volume per cent sulphide necessary to produce a recognizable IP anomaly will vary with the geometry and geologic environment of the source, and the method of executing the survey. However, sulphide mineralization of less than one per cent by volume has been detected by the IP method under proper geological conditions.

The greatest application of the IP method has been in the search for disseminated metallic sulphides of less than 20% by volume. However, it has also been used successfully in the search for massive sulphides in situations where, due to source geometry, depth of source, or low resistivity of surface layer, the EM method can not be successfully applied. The ability to differentiate ionic conductors, such as water filled shear zones, makes the IP method a useful tool in checking EM anomalies which are suspected of being due to these causes.

In normal field applications the IP method does not differentiate between the economically important metallic minerals such as chalcopyrite, chalcocite, molybdenite, galena, etc., and the other metallic minerals such as pyrite. The induced polarization effect is due to the total of all electronic conducting minerals in the rock mass. Other electronic conducting materials which can produce an IP response are magnetite, pyrolusite, graphite, and some forms of hematite.

In the field procedure, measurements on the surface are made in a way that allows the effects of lateral changes in the properties of the ground to be separated from the effects of vertical changes in the properties. Current is applied to the ground at two points in distance (X) apart. The potentials are measured at two other points (X) feet apart, in line with the current electrodes is an integer number (n) times the basic distance (X).

The measurements are made along a surveyed line, with a constant distance (nX) between the nearest current and potential electrodes. In most surveys, several traverses are made with various values of (n); i.e. (n) = 1, 2, 3, 4, etc. The kind of survey required (detailed or reconnaissance) decides the number of values of (n) used.

In plotting the results, the values of the apparent resistivity, apparent per cent frequency effect, and the apparent metal factor measured for each set of electrode positions are plotted at the intersection of grid lines, one from the center point of the current electrodes and the other from the center point of the potential electrodes. (See Figure A.) The resistivity values are plotted above the line as a mirror image of the metal factor values below. On a second line, below the metal factor values, are plotted the values of the per cent frequency effect. In some cases the values of per cent frequency effect are plotted as superscripts of the metal factor value. In this second case the frequency effect values are not contoured. The lateral displacement of a given value is determined by the location along the survey line of the center point between the current and potential electrodes. The distance of the value from the line is determined by the distance (nX) between the current and potential electrodes when the measurement was made.

The separation between sender and receiver electrodes is only one factor which determines the depth to which the ground is being sampled in any particular measurement. The plots then, when contoured, are not section maps of the electrical properties of the ground under the survey line. The interpretation of the results from any given survey must be carried out using the combined experience gained from field results, model study results and theoretical investigations. The position of the electrodes when anomalous values are measured is important in the interpretation.

In the field procedure, the interval over which the potential differences are measured is the same as the interval over which the electrodes are moved after a series of potential readings has been made. One of the advantages of the induced polarization method is that the same equipment can be used for both detailed and reconnaissance surveys merely by changing the distance (X) over which the electrodes are moved each time. In the past, intervals have been used ranging from 25 feet to 2000 feet for (X). In each case, the decision as to the distance (X) and the values of (n) to be used is largely determined by the expected size of the mineral deposit being sought, the size of the expected anomaly and the speed with which it is desired to progress.

The diagram in Figure A demonstrates the method used in plotting the results. Each value of the apparent resistivity, apparent metal factor, and apparent per cent frequency effect is plotted and identified by the position of the four electrodes when the measurement was made. It can be seen that the values measured for the larger values of (n) are plotted farther from the line indicating that the thickness of the layer of the earth that is being tested is greater than for the smaller values of (n); i. e. the depth of the measurement is increased. When the F. E. values are plotted as superscripts to the MF values the third section of data values is not presented and the F. E. values are not contoured.

The actual data plots included with the report are prepared utilizing an IBM 360/75 Computer and a Calcomp 770/763 Incremental Plotting System. The data values are calculated, plotted, and contoured according to a programme developed by McPhar Geophysics. Certain symbols have been incorporated into the programme to explain various situations in recording the data in the field.

The IP measurement is basically obtained by measuring the difference in potential or voltage (ΔV) obtained at two operating frequencies. The voltage is the product of the current through the ground and the apparent resistivity of the ground. Therefore in field situations where the current is very low due to poor electrode contact, or the apparent resistivity is very low, or a combination of the two effects; the value of (ΔV) the change in potential will be too small to be measurable. The symbol "TL" on the data plots indicates this situation.

In some situations spurious noise, either man made or natural, will render it impossible to obtain a reading. The symbol "N" on the data plots indicates a station at which it is too noisey to record a reading. If a reading can be obtained, but for reasons of noise there is some doubt as to its accuracy, the reading is bracketed in the data plot ( ).

In certain situations negative values of Apparent Frequency Effect are recorded. This may be due to the geologic environment or spurious electrical effects. The actual negative frequency effect value recorded is indicated on the data plot, however the symbol "NEG" is indicated for the corresponding value of Apparent Metal Factor. In contouring negative values the contour lines are indicated to the nearest positive value in the immediate vicinity of the negative value.

The symbol "NR" indicates that for some reason the operator did not attempt to record a reading although normal survey procedures would suggest that one was required. This may be due to inaccessible topography or other similar reasons. Any symbol other than those discussed above is unique to a particular situation and is described within the body of the report.

METHOD USED IN PLOTTING DIPOLE-DIPOLE INDUCED POLARIZATION AND RESISTIVITY RESULTS

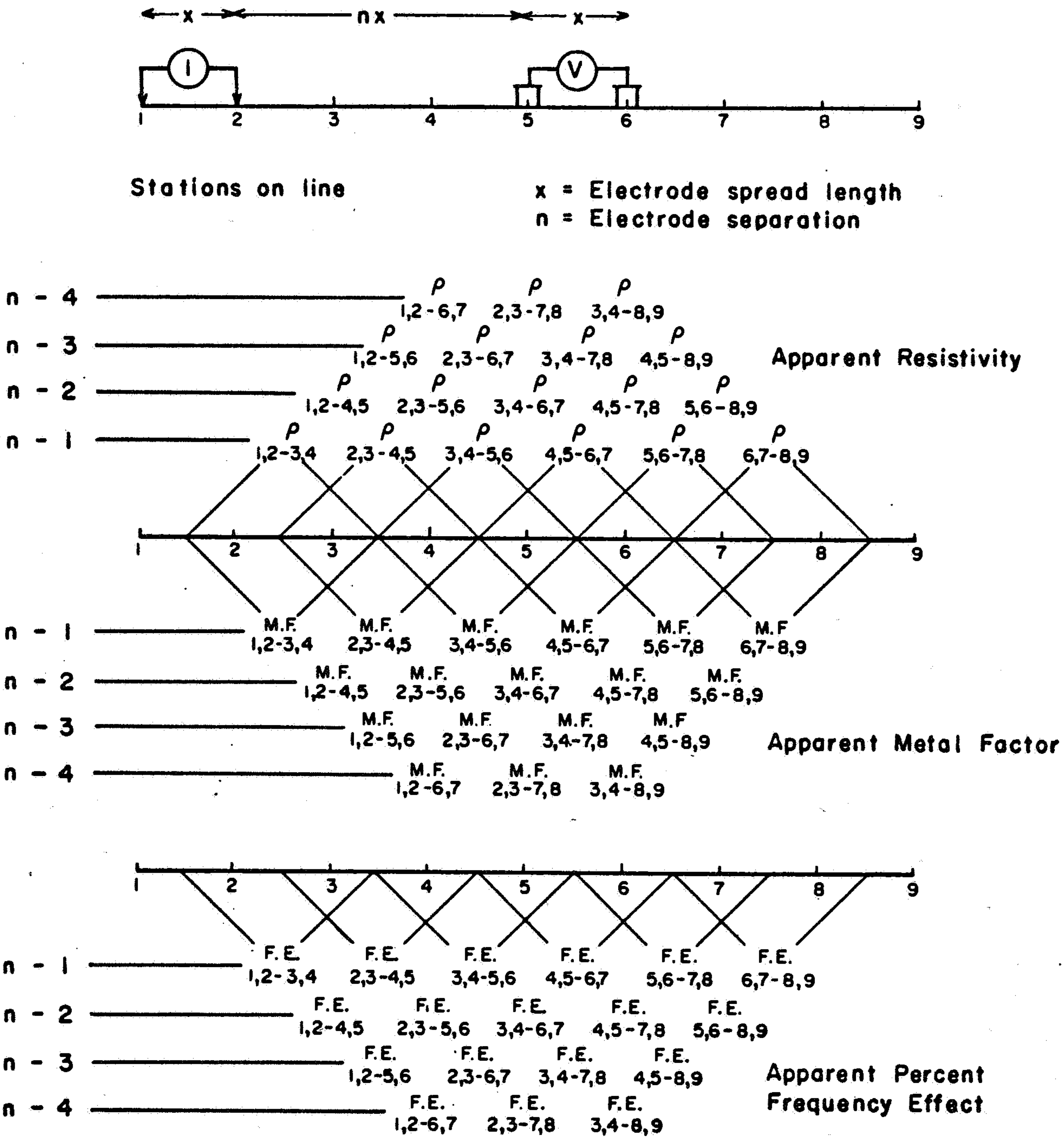


Fig. A

McPHAR GEOPHYSICS

APPENDIX

THE INTERPRETATION OF INDUCED POLARIZATION ANOMALIES FROM RELATIVELY SMALL SOURCES

The induced polarization method was originally developed to detect disseminated sulphides and has proven to be very successful in the search for "porphyry copper" deposits. In recent years we have found that the IP method can also be very useful in exploring for more concentrated deposits of limited size. This type of source gives sharp IP anomalies that are often difficult to interpret.

The anomalous patterns that develop on the contoured data plots will depend on the size, depth and position of the source and the relative size of the electrode interval. The data plots <u>are not</u> sections showing the electrical parameters of the ground. When the electrode interval (X) is appreciably greater than the width of the source, a large volume of unmineralized rock is averaged into each measurement. This is particularly true for the large values of the electrode separation (n).

The theoretical scale model results shown in Figure 1 and Figure 2 indicate the effect of depth. If the depth to the top of the source is small compared to the electrode interval (i. e. d X) the measurement for n = 1 will be anomalous. In Figure 1 the depth is 0. 5 units (X = 1. 0 units) and the n = 1 value is definitely anomalous; the pattern on the contoured data plot is typical for a relatively shallow, narrow, near-vertical tabular source. The results in Figure 2 are for the same source with the depth increased to 1. 5 units. Here the n = 1 value is not anomalous; the larger values of (n) are anomalous but the magnitudes are much lower than for the source at less depth.

When the electrode interval is greater than the width of the source, it is not possible to determine its width or exact position between the electrodes. The true IP effect within the source is also indeterminate; the anomaly from a very narrow source with a very large true IP effect will be much the same as that from a zone with twice the width and 1/2 the true IP effect. The theoretical scale model data shown in Figure 3 and Figure 4 demonstrate this problem. The depth and position of the source are unchanged but the width and true IP effect are varied. The anomalous patterns and magnitudes are essentially the same, hence the data are insufficient to evaluate the source completely.

The normal practise is to indicate the IP anomalies by solid, broken, or dashed bars, depending upon their degree of distinctiveness. These bars represent the surface projection of the anomalous zones as interpreted from the location of the transmitter and receiver electrodes when the anomalous values were measured. As illustrated in Figure 1, Figure 2, Figure 3 and Figure 4, no anomaly can be located with more accuracy than the spread length. While the centre of the solid bar indicating the anomaly corresponds fairly well with the source, the length of the bar should not be taken to represent the exact edges of the anomalous material.

If the source is shallow, the anomaly can be better evaluated using a shorter electrode interval. When the electrode interval used approaches the width of the source, the apparent effects measured will be nearly equal to the true effects within the source. When there is some depth to the top of the source, it is not possible to use electrode intervals that are much less than the depth to the source. In this situation, one must realize that a definite ambiguity exists regarding the width of the source and the IP effect within the source.

Our experience has confirmed the desirability of doing detail. When a reconnaissance IP survey using a relatively large electrode interval indicates the presence of a narrow, shallow source, detail with shorter electrode intervals is necessary in order to better locate, and evaluate, the source. The data of most usefulness is obtained when the maximum apparent IP effect is measured for n = 2 or n = 3. For instance, an anomaly originally located using X = 300' may be checked with X = 200' and then X = 100'. The data with X = 100' will be quite different from the original reconnaissance results with X = 300'.

The data shown in Figure 5 and Figure 6 are field results from a greenstone area in Quebec. The expected sources were narrow (less than 30' in width) zones of massive, high-grade, zinc-silver ore. An electrode interval of 200' was used for the reconnaissance survey in order to keep the rate of progress at an acceptable level. The anomalies located were low in magnitude.

The very weak, shallow anomaly shown in Figure 5 is typical of those located by the X = 200' reconnaissance survey. Several anomalies of this type were detailed using shorter electrode intervals. In most cases the detail measurements suggested broad zones of very weak mineralization. However, in the case of the source at 20N to 22N, the measurements with shorter electrode intervals confirmed the presence of a strong, narrow source. The X = 50' results are shown in Figure 6. Subsequent drilling has shown the source to be 12.5' of massive sulphide mineralization containing significant zinc and silver values.

The change in the anomaly that results when the electrode interval is reduced is not unusual. The X = 50' data more accurately locates the narrow source, and permits the geophysicist to make a better evaluation of its importance. The completion of this type of detail is very important, in order to get the maximum usefulness from a reconnaissance IP survey.

McPHAR GEOPHYSICS LIMITED

Theoretical Induced Polarization and Resistivity Studies

Scale Model Cases

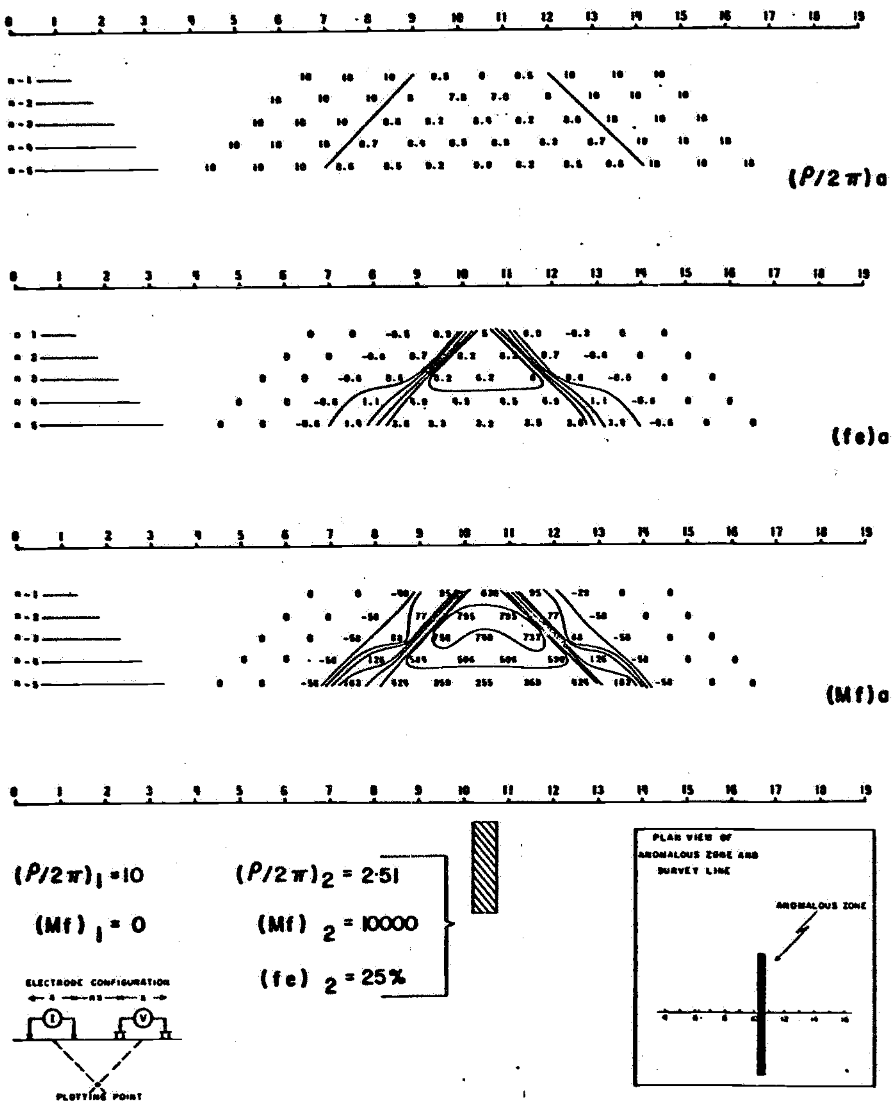


FIG. 1

CASE II-0.5-BU-10-a

McPHAR GEOPHYSICS LIMITED

Theoretical Induced Polarization and Resistivity Studies

Scale Model Cases

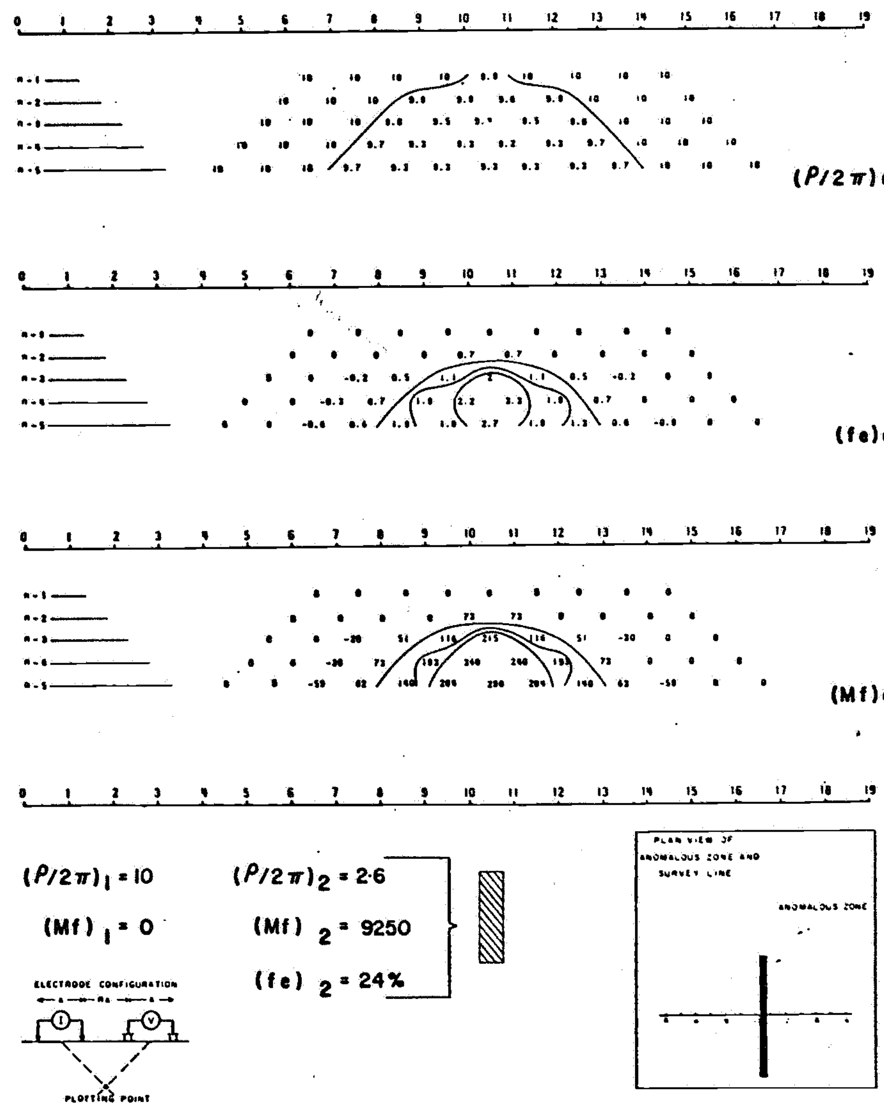
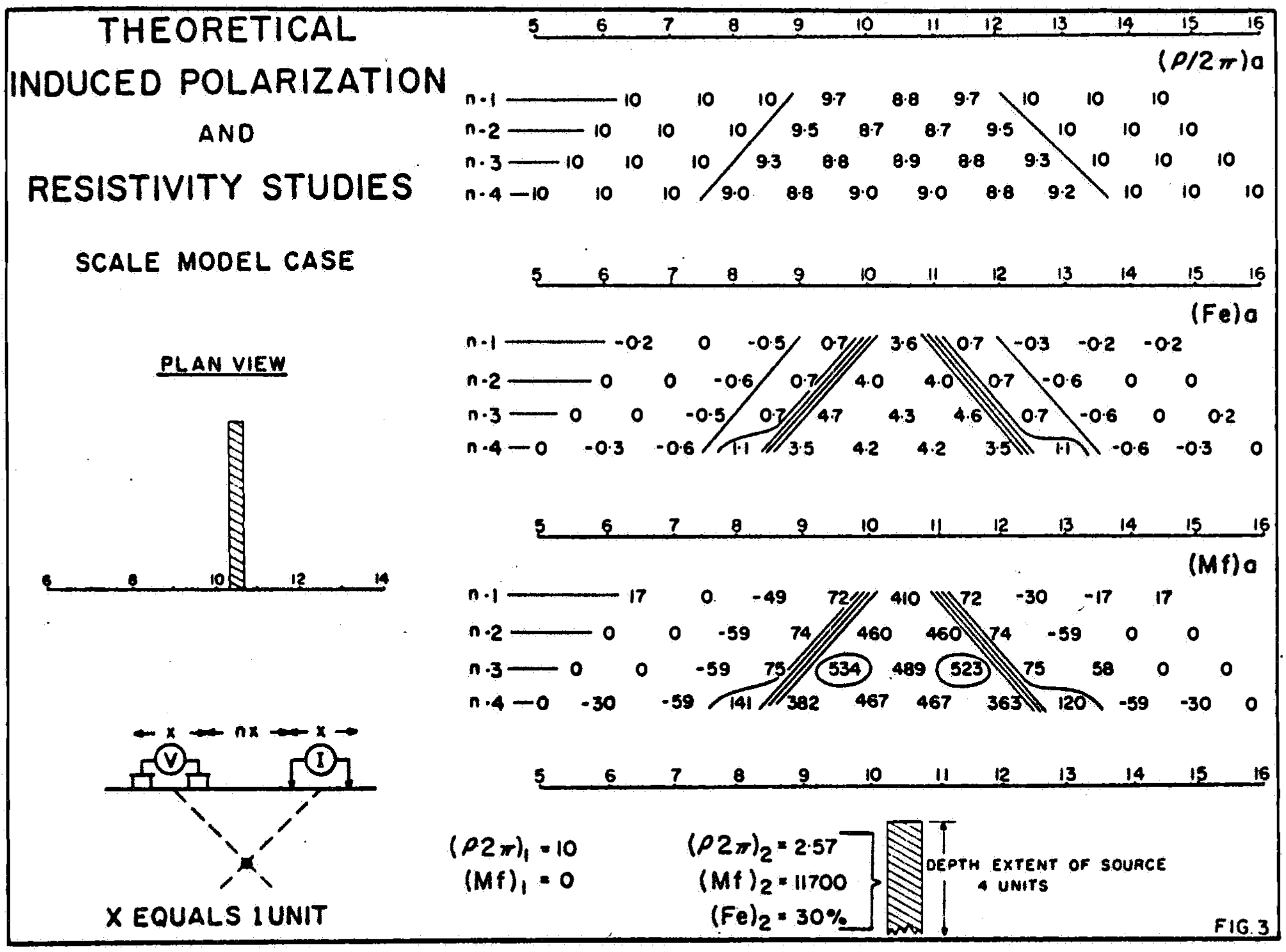
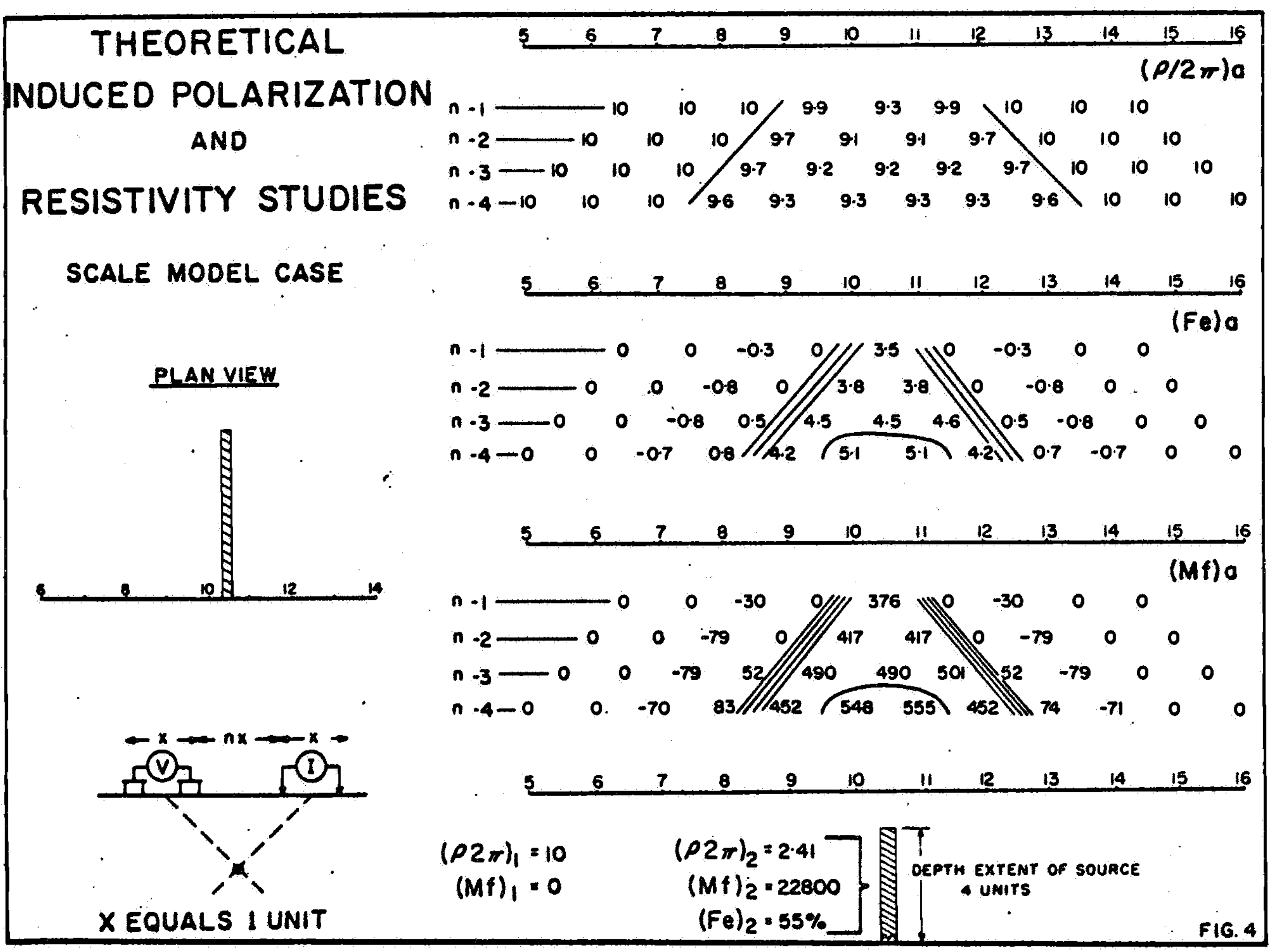


FIG. 2

CASE II-1.5-BU-10-a

- 3 -


THEORETICAL
INDUCED POLARIZATION
AND
RESISTIVITY STUDIES
SCALE MODEL CASE
PLAN VIEW
(ρ/2π)a
n-1 10 10 10 9.7 8.8 9.7 10 10 10
n-2 10 10 10 9.5 8.7 8.7 9.5 10 10 10
n-3 10 10 10 9.3 8.8 8.9 8.8 9.3 10 10 10
n-4 10 10 10 9.0 8.8 9.0 9.0 8.8 9.2 10 10 10
(Fe)a
n-1 -0.2 0 -0.5 0.7 3.6 0.7 -0.3 -0.2 -0.2
n-2 0 0 -0.6 0.7 4.0 4.0 0.7 -0.6 0 0
n-3 0 0 -0.5 0.7 4.7 4.3 4.6 0.7 -0.6 0 0.2
n-4 0 -0.3 -0.6 1.1 3.5 4.2 4.2 3.5 1.1 -0.6 -0.3 0
(Mf)a
n-1 17 0 -49 72 410 72 -30 -17 17
n-2 0 0 -59 74 460 460 74 -59 0 0
n-3 0 0 -59 75 534 489 523 75 58 0 0
n-4 0 -30 -59 141 382 467 467 363 120 -59 -30 0
X EQUALS 1 UNIT
(ρ2π)₁ = 10
(Mf)₁ = 0
(ρ2π)₂ = 2.57
(Mf)₂ = 11700
(Fe)₂ = 30%
DEPTH EXTENT OF SOURCE
4 UNITS
FIG. 3


THEORETICAL
INDUCED POLARIZATION
AND
RESISTIVITY STUDIES
SCALE MODEL CASE
PLAN VIEW
(ρ/2π)a
n-1 10 10 10 9.9 9.3 9.9 10 10 10
n-2 10 10 10 9.7 9.1 9.1 9.7 10 10 10
n-3 10 10 10 9.7 9.2 9.2 9.2 9.7 10 10 10
n-4 10 10 10 9.6 9.3 9.3 9.3 9.3 9.6 10 10 10
(Fe)a
n-1 0 0 -0.3 0 3.5 0 -0.3 0 0
n-2 0 0 -0.8 0 3.8 3.8 0 -0.8 0 0
n-3 0 0 -0.8 0.5 4.5 4.5 4.6 0.5 -0.8 0 0
n-4 0 0 -0.7 0.8 4.2 5.1 5.1 4.2 0.7 -0.7 0 0
(Mf)a
n-1 0 0 -30 0 376 0 -30 0 0
n-2 0 0 -79 0 417 417 0 -79 0 0
n-3 0 0 -79 52 490 490 501 52 -79 0 0
n-4 0 0 -70 83 452 548 555 452 74 -71 0 0
X EQUALS 1 UNIT
(ρ2π)₁ = 10
(Mf)₁ = 0
(ρ2π)₂ = 2.41
(Mf)₂ = 22800
(Fe)₂ = 55%
DEPTH EXTENT OF SOURCE
4 UNITS
FIG. 4

INDUCED POLARIZATION AND RESISTIVITY RESULTS

BATCHELOR LAKE AREA, QUEBEC.

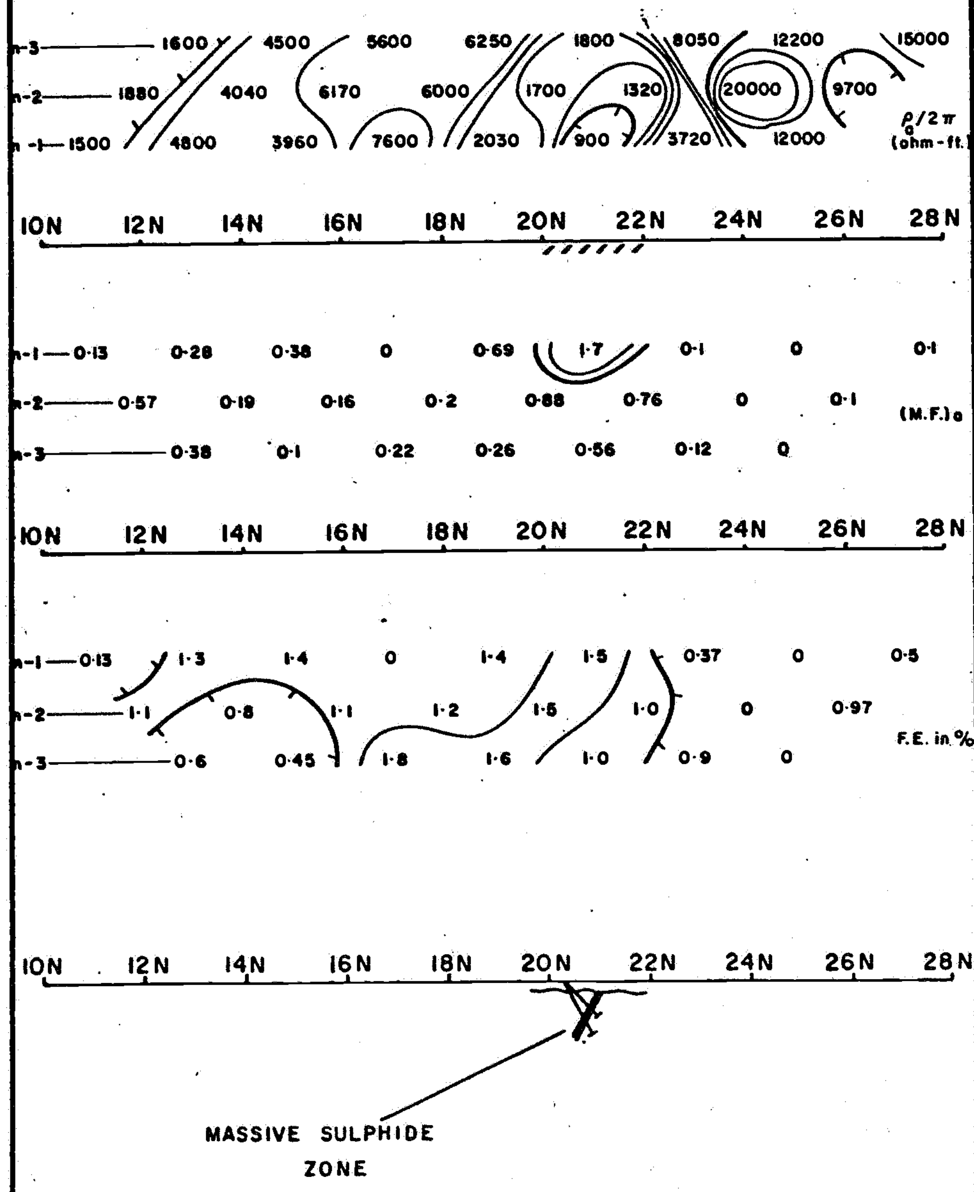


FIG. 5

INDUCED POLARIZATION AND RESISTIVITY RESULTS

BATCHELOR LAKE AREA, QUEBEC.

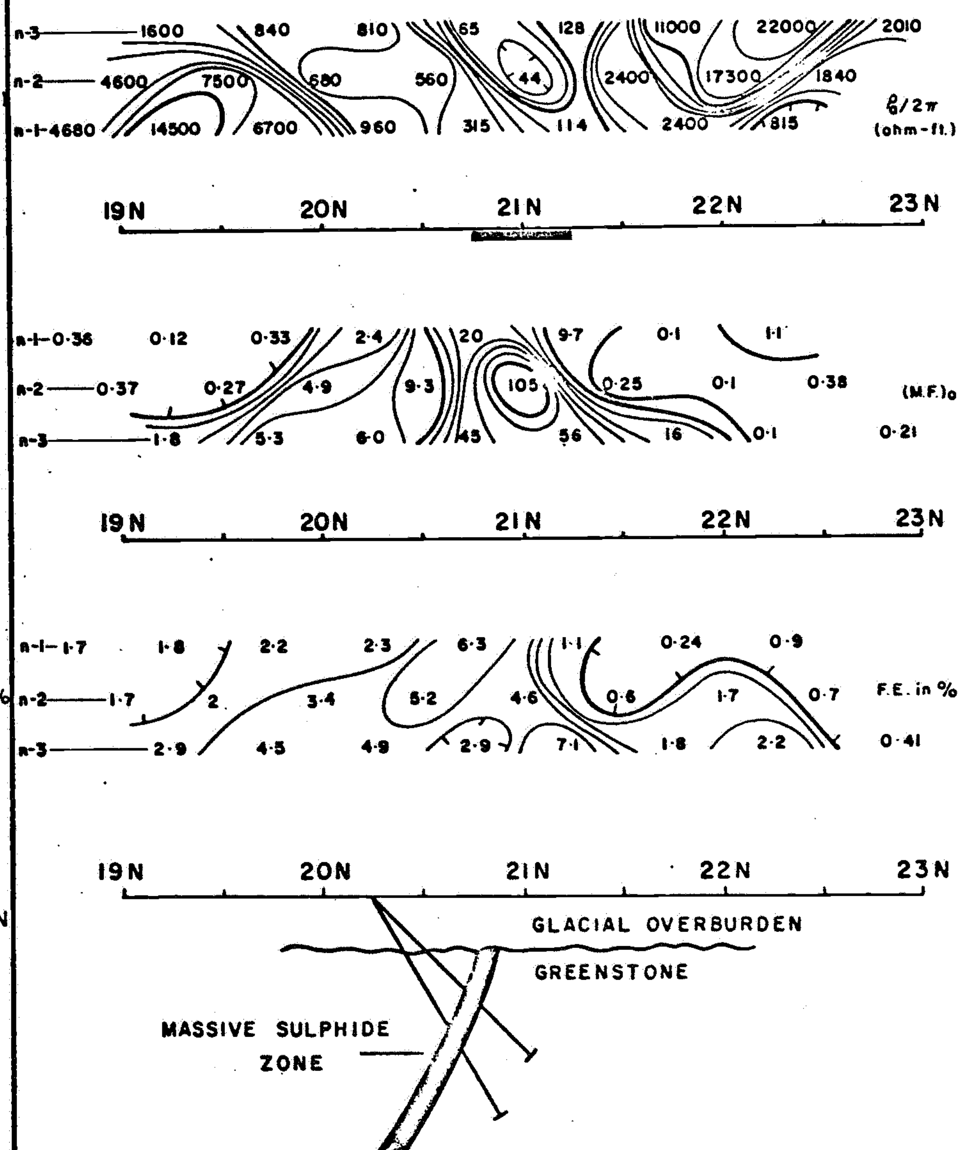


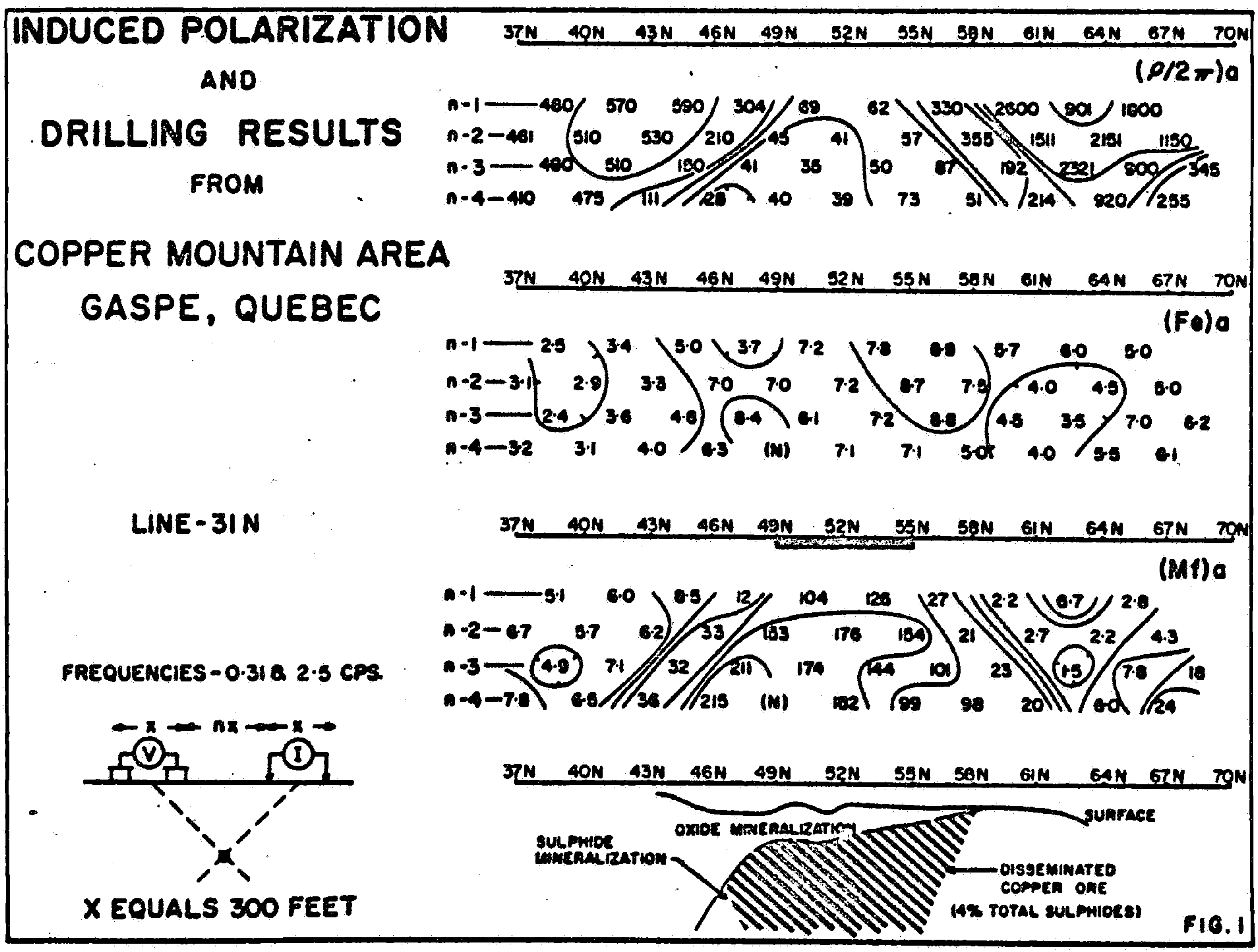
FIG. 6

McPHAR GEOPHYSICS

APPENDIX

EXPECTED IP ANOMALIES FROM "PORPHYRY COPPER" TYPE ZONES OF DISSEMINATED SULPHIDE MINERALIZATION

Our experience in other areas has shown that the induced polarization method can be successfully used to locate, and outline, zones of disseminated sulphide mineralization of the "porphyry copper" type. In most cases the interpretation of the IP results is simple and straightforward. The results shown in Figure 1 and Figure 2 are typical.



The source of the moderate magnitude IP anomaly shown in Figure 1 contains approximately 4% metallic mineralization. The zone is of limited lateral extent and enough copper is present to make the mineralization "ore grade". The presence of the surface oxidation can be seen in the fact that the apparent IP effects increase for n = 2.

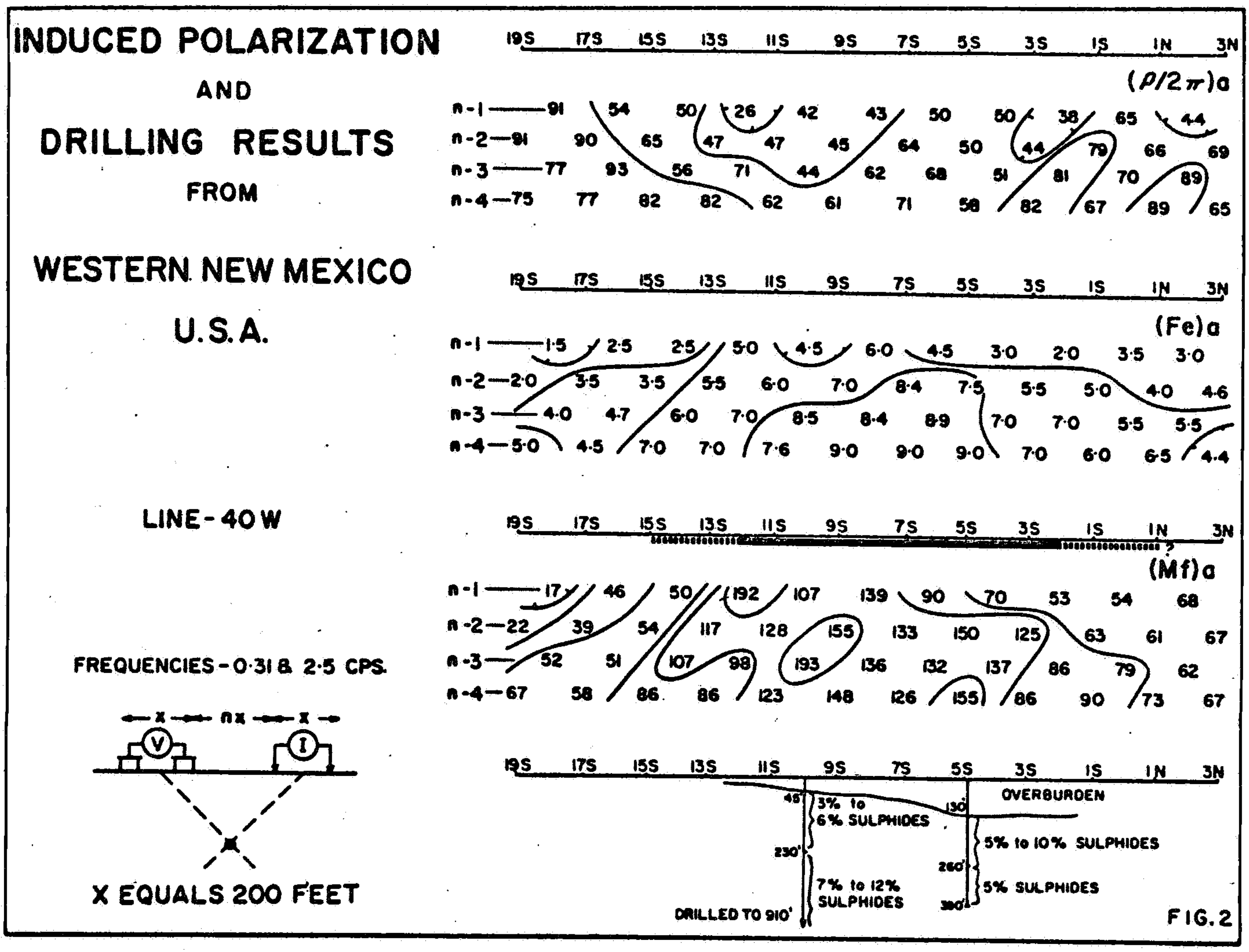


FIG. 2

The IP anomaly shown in Figure 2 has about the same magnitude as that described above. It should be noted that appreciably greater concentrations of metallic mineralization are present; further, there is little or no copper present. These results illustrate the fact that IP results can not be used to determine the exact amount of metallic mineralization present or to determine the economic importance of a mineralized zone. In some geologic situations zoning is present; the zones of mineralization of greatest economic value may contain less total metallic mineralization than other zones in the same general area.

In the proper geologic environment, the method will detect even very low concentrations of metallic mineralization. The IP results shown in Figure 3 located the ore zone at the Brenda Property near Peachland, B. C. The zone contains 1. 0 to 1. 5 per cent metallic mineralization; however, the mineralization is "ore grade" because only molybdenite and chalcopyrite are present.

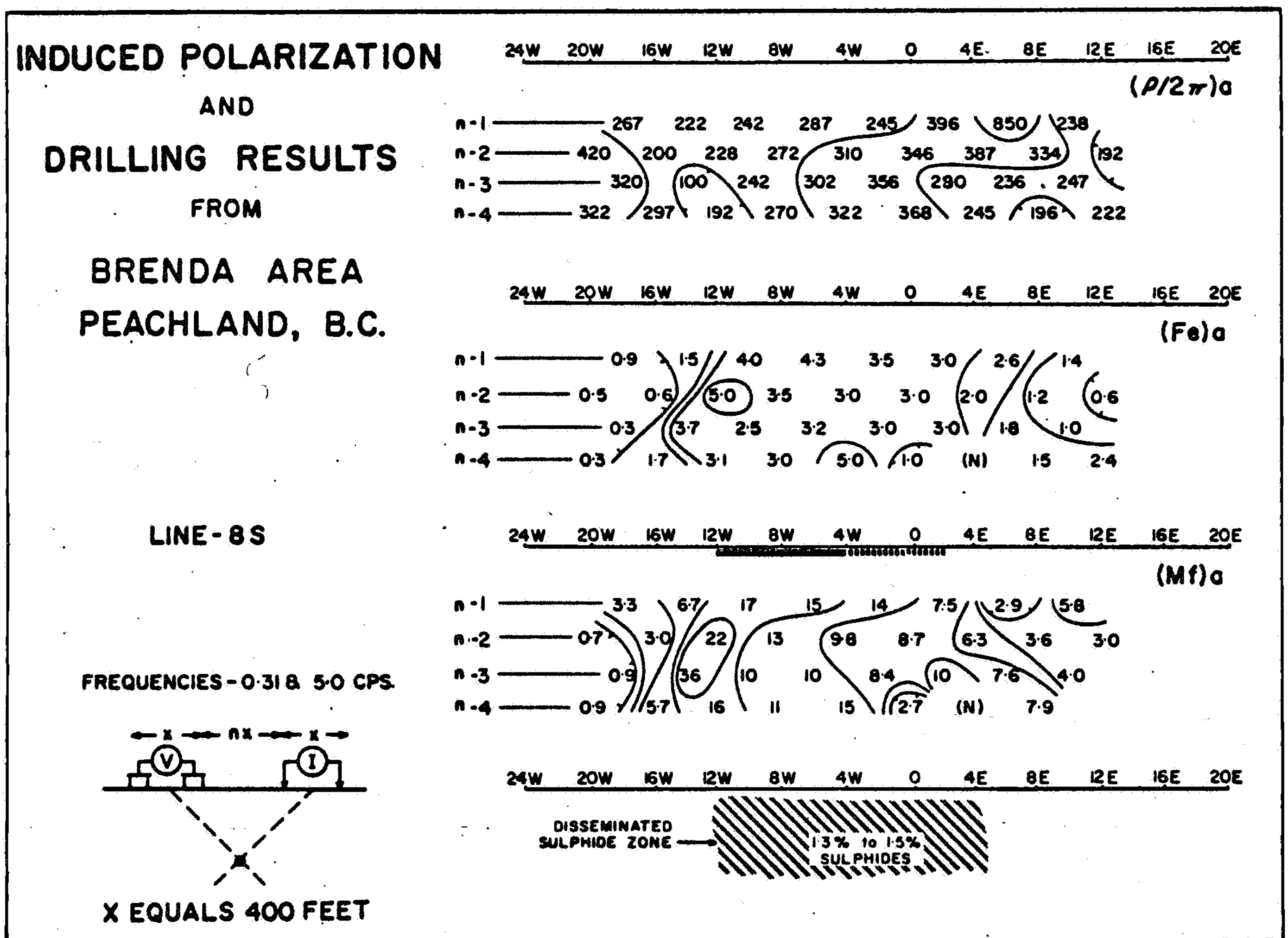
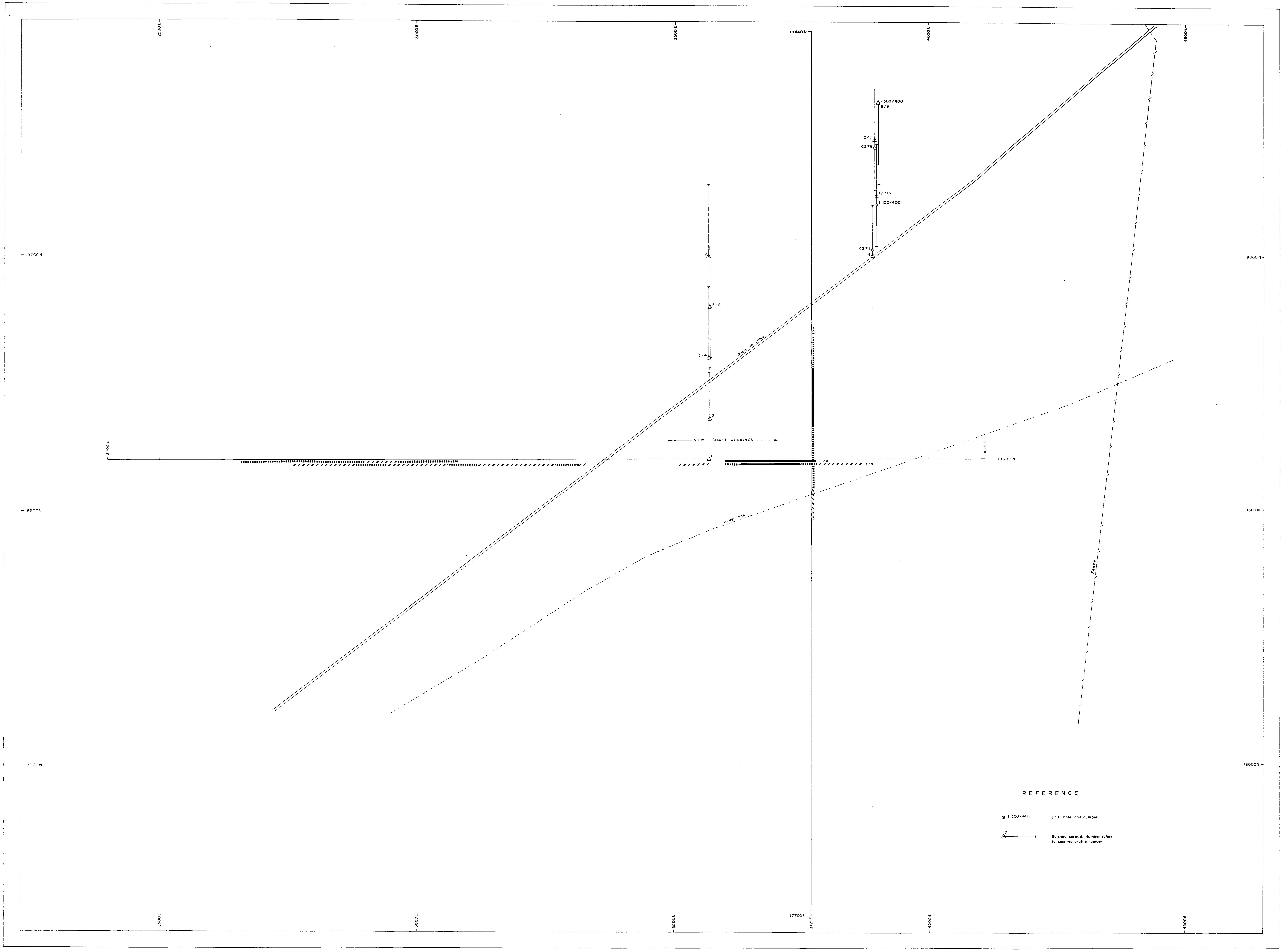


FIG.3

McPHAR GEOPHYSICS PTY. LTD.



SURFACE PROJECTIONS OF ANOMALOUS ZONES
DEFINITE
PROBABLE
POSSIBLE
NUMBER AT THE END OF ANOMALY INDICATES ELECTRODE INTERVAL

PACMINEX PTY. LIMITED
MOUNT GUNSON, CATTLE GRID PROSPECT, S.A.
INDUCED POLARIZATION AND RESISTIVITY SURVEY
SCALE 1: 2500

SCALE 50 0 50 100 150 200 METRES

6679-1

DRAWN: G.Z.
DATE: 28·9·73
APPROVED: I.E.H.

McPHAR GEOPHYSICS PTY. LTD.

DATE: NOV. '73

DWG: I.P.P. 4295 A

DWG. NO.- I.P.-5031A-1

PACMINEX PTY. LIMITED.

MT. GUNSON - CATTLE GRID AREA,
SOUTH AUSTRALIA.

LINE NO.- 18600N

ELECTRODE CONFIGURATION

PLOTTING POINT X = 30 M

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-2.5 HZ

DATE SURVEYED: SEP 1973

APPROVED: JEH

DATE: NOV 1973

McPHAR GEOPHYSICS PTY. LTD.

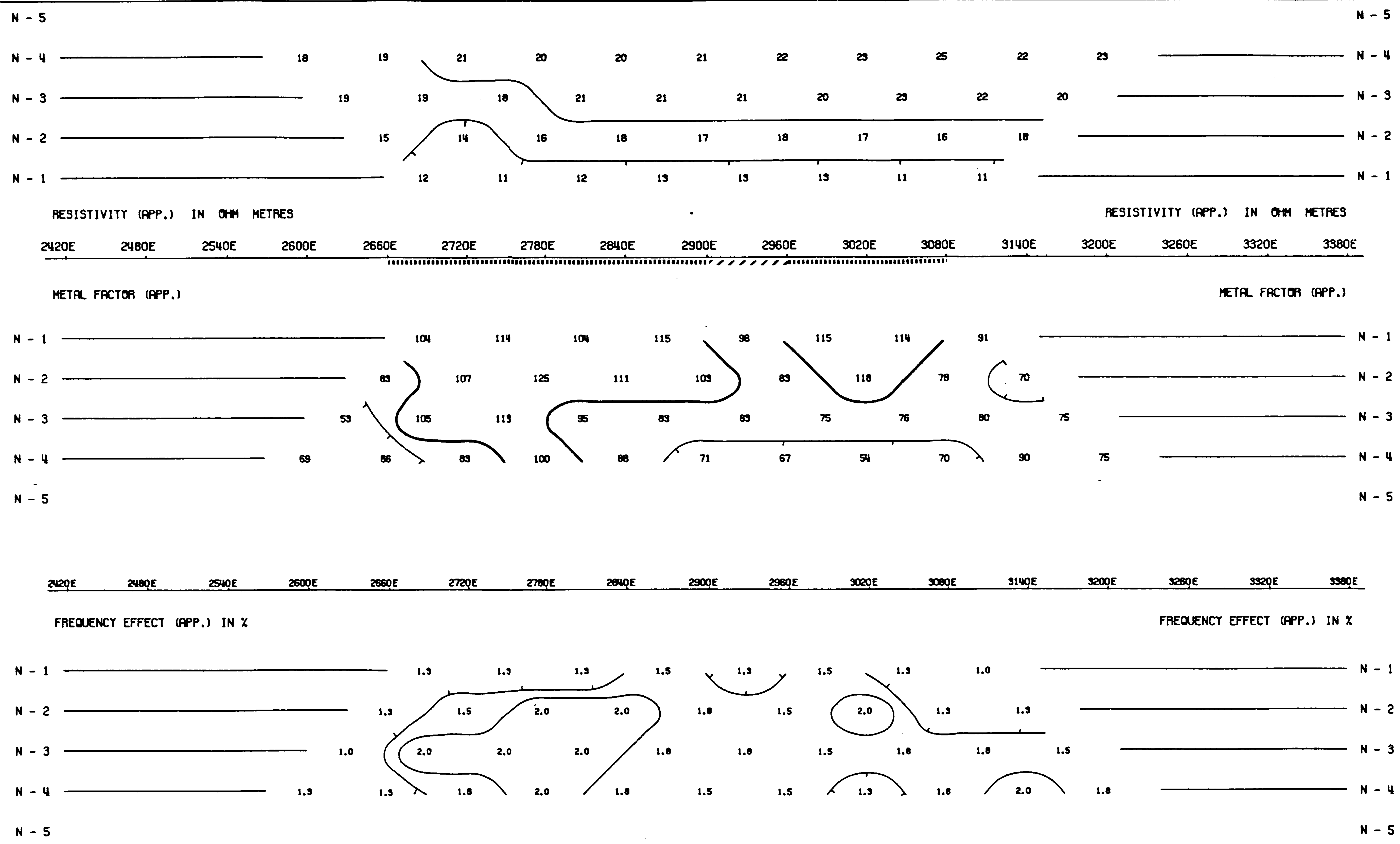
NOTE: CONTOURS AT LOGARITHMIC INTERVALS 1.-1.5-2.-3.-5.-7.5-10

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY McPHAR COMPUTER DIVISION

6679-2



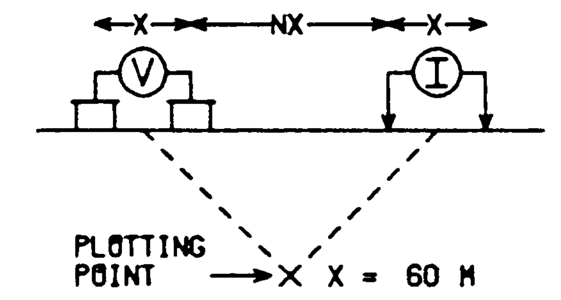
DWG. NO.- I.P.-5031A-2

PACMINEX PTY. LIMITED.

MT. GUNSON - CATTLE GRID AREA,
SOUTH AUSTRALIA.

LINE NO.- 18600N

ELECTRODE CONFIGURATION



SURFACE PROJECTION
OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-2.5 HZ

DATE SURVEYED: SEP 1973

APPROVED: JEH

DATE: NOV 1973

McPHAR GEOPHYSICS PTY. LTD.

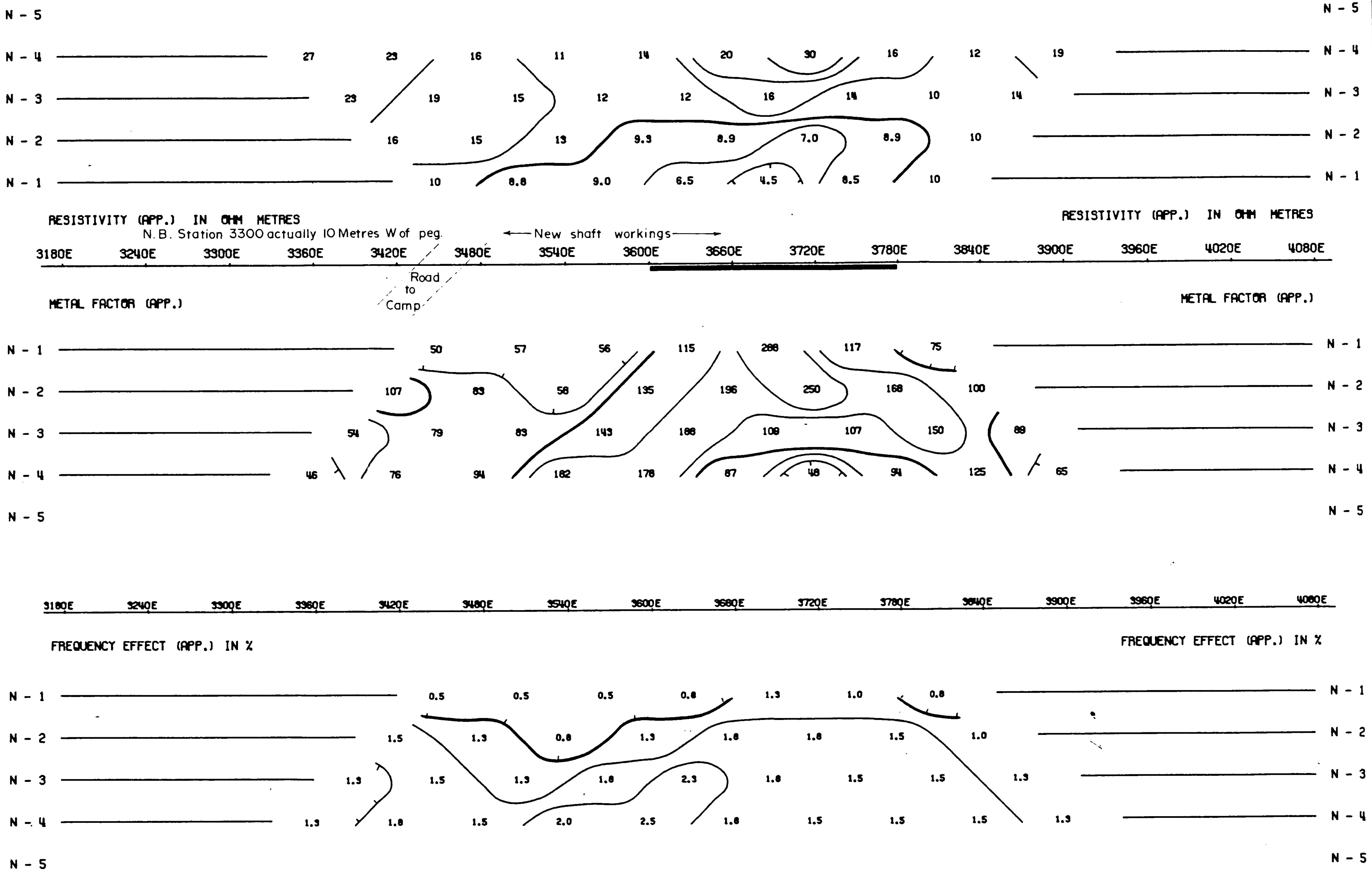
NOTE: CONTOURS AT LOGARITHMIC INTERVALS
1.-1.5-2.-3.-5.-7.5-10

6679-3

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY McPHAR COMPUTER DIVISION



DWG. NO.- I.P.-5031A-3

PACMINEX PTY. LIMITED.

MT. GUNSON - CATTLE GRID AREA,
SOUTH AUSTRALIA.

LINE NO.- 18600N

ELECTRODE CONFIGURATION

PLOTTING POINT → X X = 60 M

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-2.5 HZ

DATE SURVEYED: SEP 1973

APPROVED: JEH

DATE: NOV 1973

NOTE: CONTOURS AT LOGARITHMIC INTERVALS 1.-1.5-2.-3.-5.-7.5-10

6679-4

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY McPHAR COMPUTER DIVISION

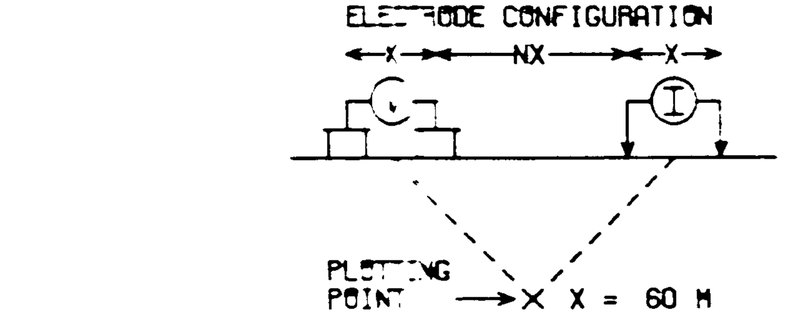
DWG. NO.- I.P.-5031A-4

PACMINEX PTY. LIMITED.

MT. GUNSON - CATTLE GRID AREA,
SOUTH AUSTRALIA.

LINE NO.- 3770E

ELECTRODE CONFIGURATION



SURFACE PROJECTION
OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-2.5 HZ

DATE SURVEYED: SEP 1973

APPROVED: JEH

NOTE: CONTOURS AT LOGARITHMIC INTERVALS
1.-1.5-2.-3.-5.-7.5-10

DATE: NOV 1973

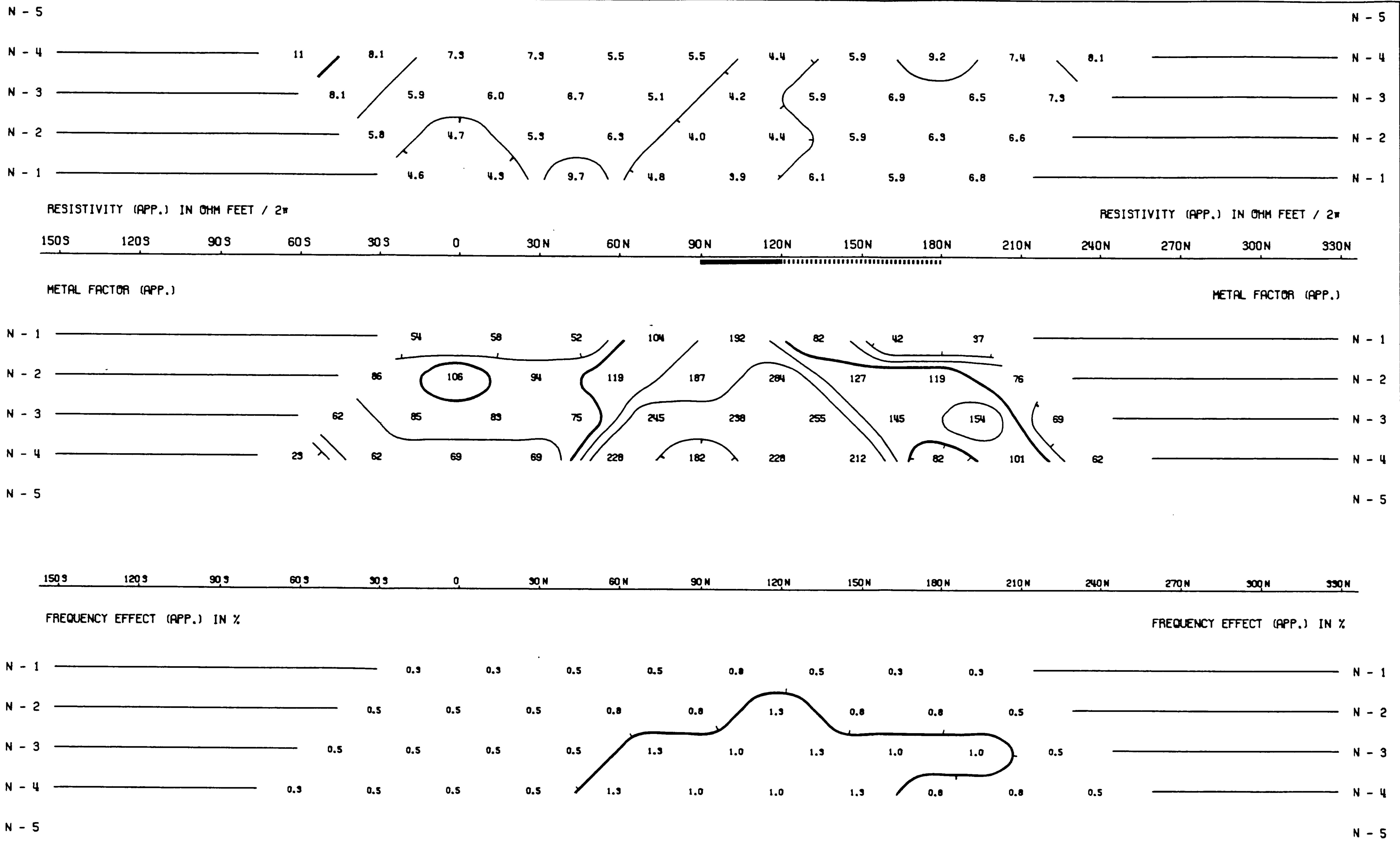
McPHAR GEOPHYSICS PTY. LTD.

6679-5

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY McPHAR COMPUTER DIVISION



DWG. NO.- I.P.-5031A-5

PACMINEX PTY. LIMITED.

MT. GUNSON - D.H. MG140.
SOUTH AUSTRALIA.

LINE NO.- 0

ELECTRODE CONFIGURATION

PLOTTING POINT X = 30 M

SURFACE PROJECTION OF ANOMALOUS ZONES
DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-2.5 HZ

DATE SURVEYED: SEP 1973

APPROVED: JEH

DATE: NOV 1973

NOTE: CONTOURS AT LOGARITHMIC INTERVALS 1.-1.5-2.-3.-5.-7.5-10

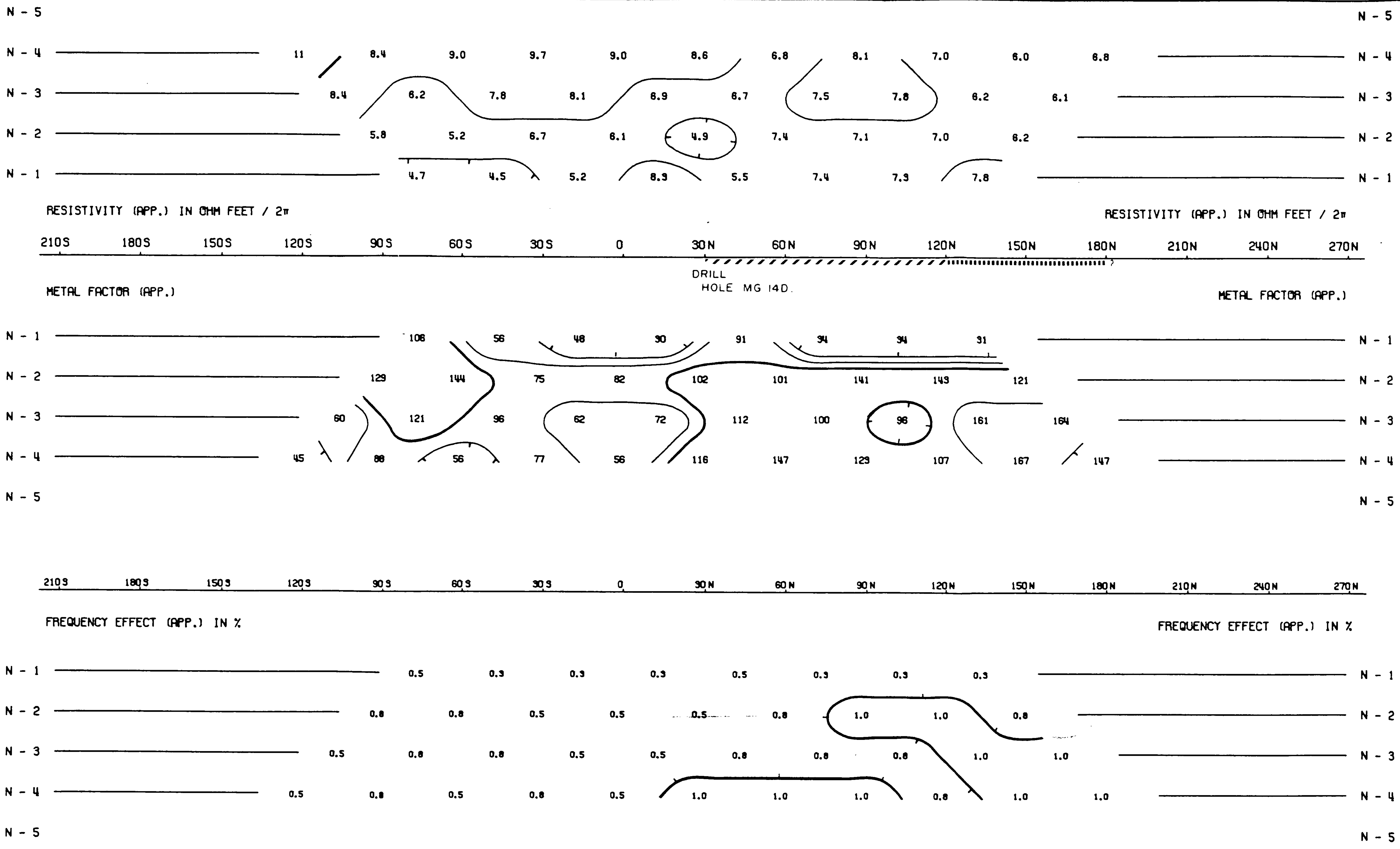
6679-6

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY McPHAR COMPUTER DIVISION


DWG. NO.- I.P.-5031A-6
PACMINEX PTY. LIMITED.
MT. GUNSON - D.H. MG14D.
SOUTH AUSTRALIA.
LINE NO.- 2
ELECTRODE CONFIGURATION
PLOTTING POINT
X = 60 M
SURFACE PROJECTION OF ANOMALOUS ZONES
DEFINITE
PROBABLE
POSSIBLE
FREQUENCIES: 0.31-2.5 HZ
DATE SURVEYED: SEP 1973
APPROVED
DATE
NOTE: CONTOURS AT LOGARITHMIC INTERVALS 1,-1.5-2,-3,-5,-7.5-10
6679-7
McPHAR GEOPHYSICS
INDUCED POLARIZATION AND RESISTIVITY SURVEY
NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION
RESISTIVITY (APP.) IN OHM FEET / 2π
METAL FACTOR (APP.)
FREQUENCY EFFECT (APP.) IN %
480S 420S 360S 300S 240S 180S 120S 60S 0 60N 120N 180N 240N 300N 360N 420N 480N
N - 1
N - 2
N - 3
N - 4
N - 5



DWG. NO.- I.P.-5031A-7

PACMINEX PTY. LIMITED.

MT. GUNSON - D.H. MG140.
SOUTH AUSTRALIA.

LINE NO.- 115N

ELECTRODE CONFIGURATION

PLOTTING POINT

X = 30 M

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-2.5 HZ

DATE SURVEYED: SEP 1973

APPROVED: JEH (McPHAR GEOPHYSICS PTY. LTD.)

DATE: NOV 1973

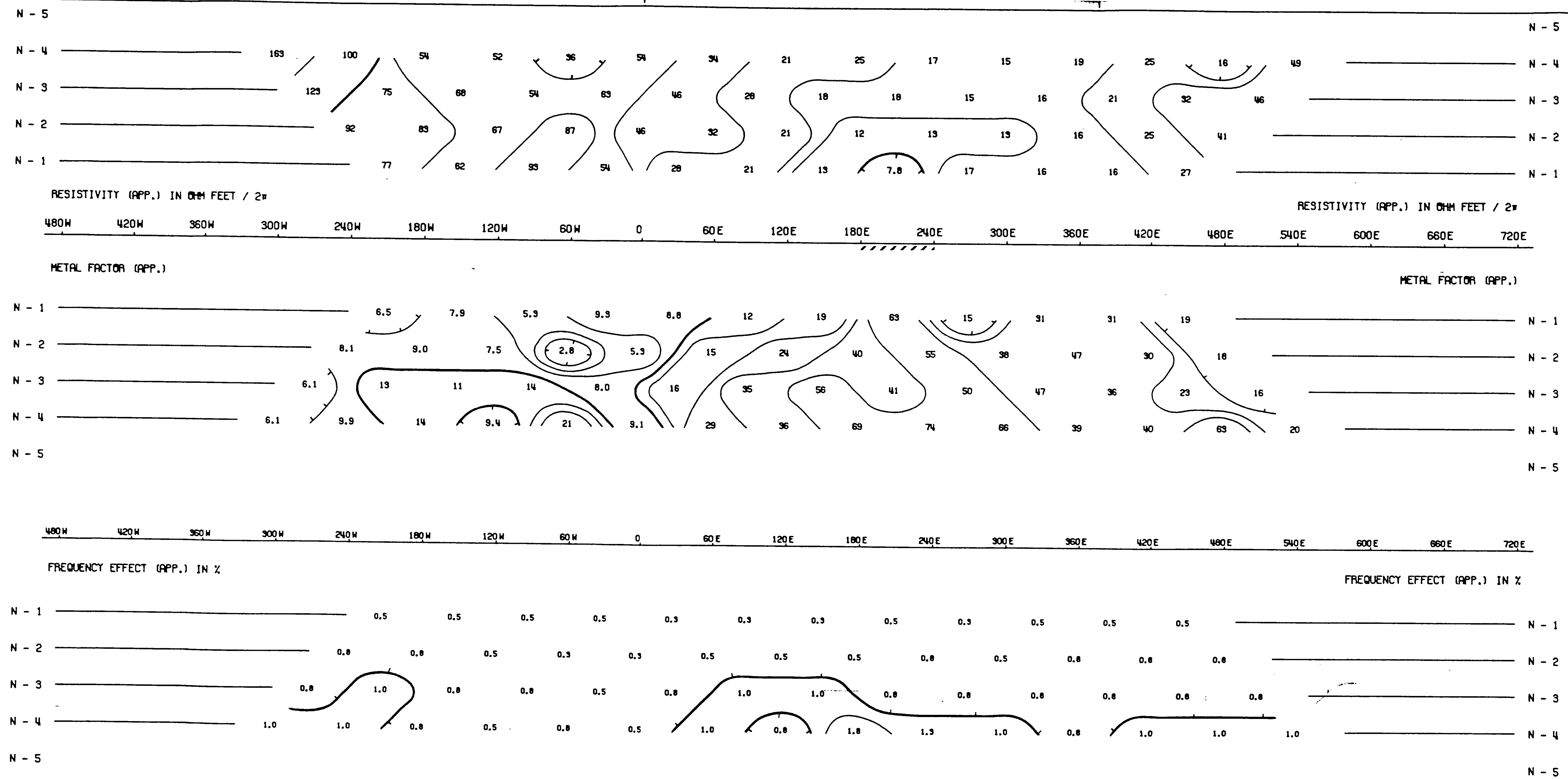
NOTE: CONTOURS AT LOGARITHMIC INTERVALS 1.-1.5-2.-3.-5.-7.5-10

6679-8

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY McPHAR COMPUTER DIVISION



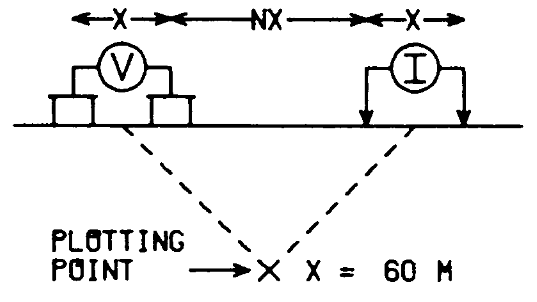
DWG. NO.- I.P.-5031A-8

PACMINEX PTY. LIMITED.

MT. GUNSON - AIRSTRIP,
SOUTH AUSTRALIA.

LINE NO.- 30S

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-2.5 HZ

DATE SURVEYED: SEP 1973

APPROVED: JEH

DATE: NOV 1973

MCPHAR GEOPHYSICS PTY. LTD.

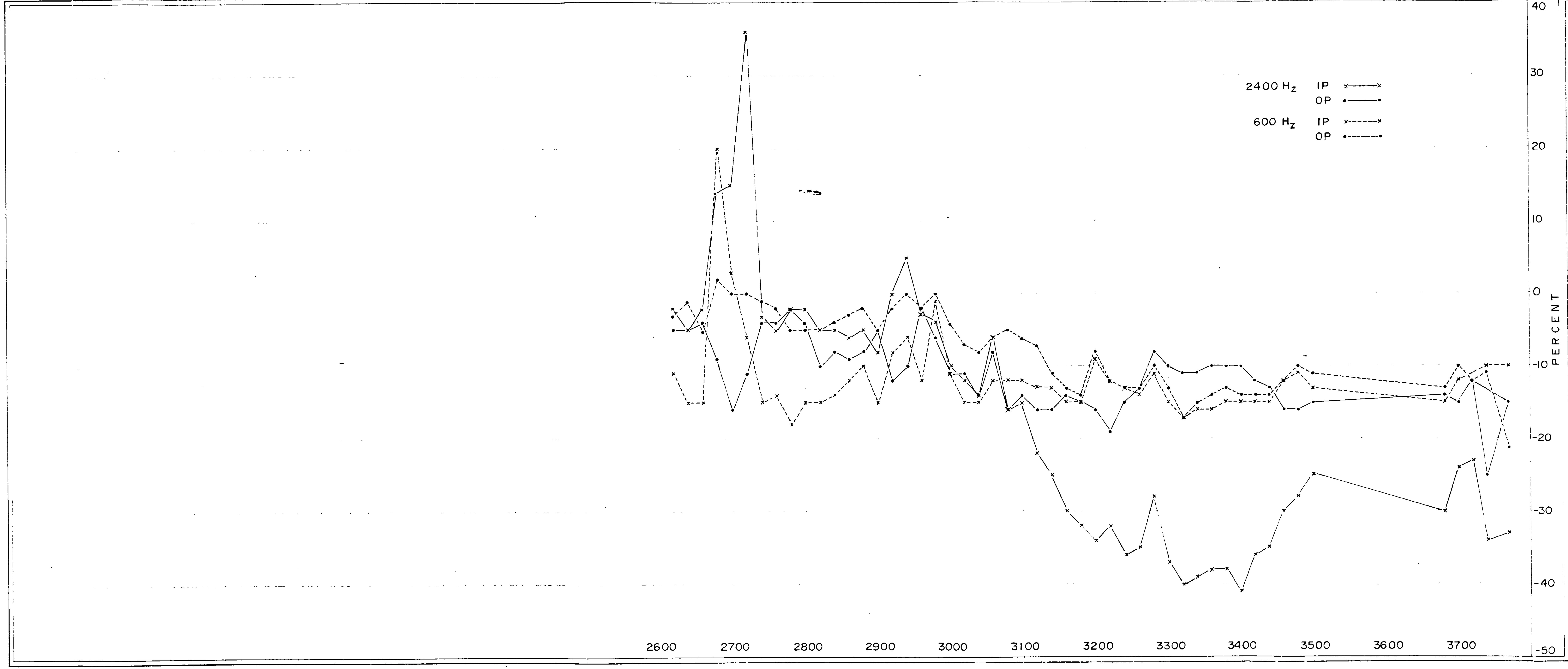
NOTE: CONTOURS AT LOGARITHMIC INTERVALS 1.-1.5-2.-3.-5.-7.5-10

6679-9

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION



McPHAR

McPHAR GEOPHYSICS PTY. LTD.
ELECTROMAGNETIC SURVEY

CLIENT PACMINEX PTY. LTD

AREA MT. GUNSON

Rx LINE No 18600 N (CATTLE GRID AREA)

ARRAY HORIZ. LOOP IN LINE

UNIT VHEM

DATE OF SURVEY SEPT. 73

Tx - Rx SEPARATION 300 FEET

VERTICAL SCALE 10 % PER INCH

PLOTTED BY R.G.Z.

FIELD CHECK

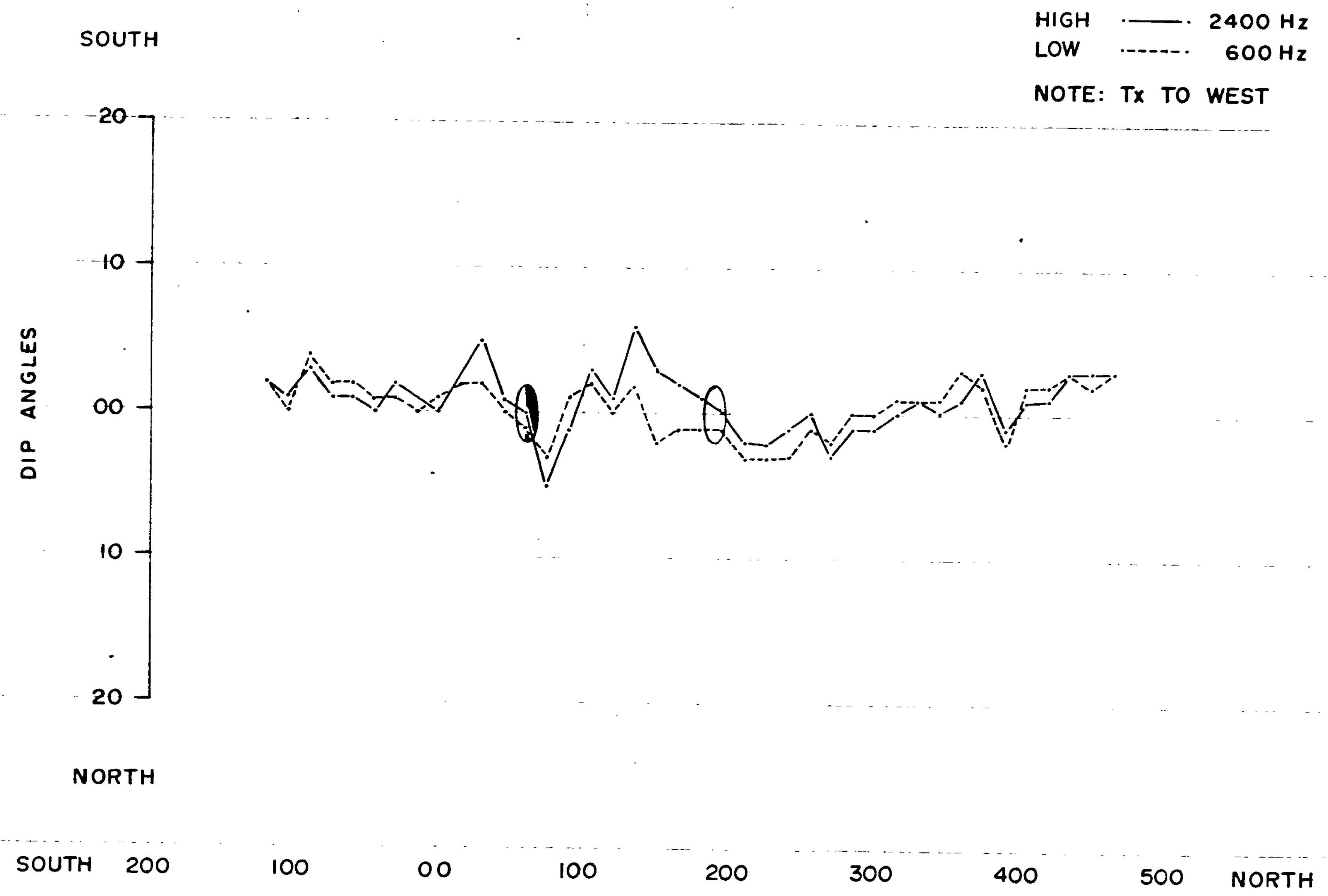
INTERPRETATION

FINAL CHECK

DISTRIBUTED

6679-10

EM 5033A-2



McPHAR

McPHAR GEOPHYSICS PTY. LTD.
ELECTROMAGNETIC SURVEY

CLIENT PACMINEX PTY. LTD.

AREA MT. GUNSON

Rx LINE No. 00 (DHMG 14D)

ARRAY VERT. LOOP BROADSIDE

UNIT VHEM

DATE OF SURVEY SEPT. 73

Tx - Rx SEPARATION 90 METRES

VERTICAL SCALE 10° PER INCH

PLOTTED BY R.G.Z.

FIELD CHECK

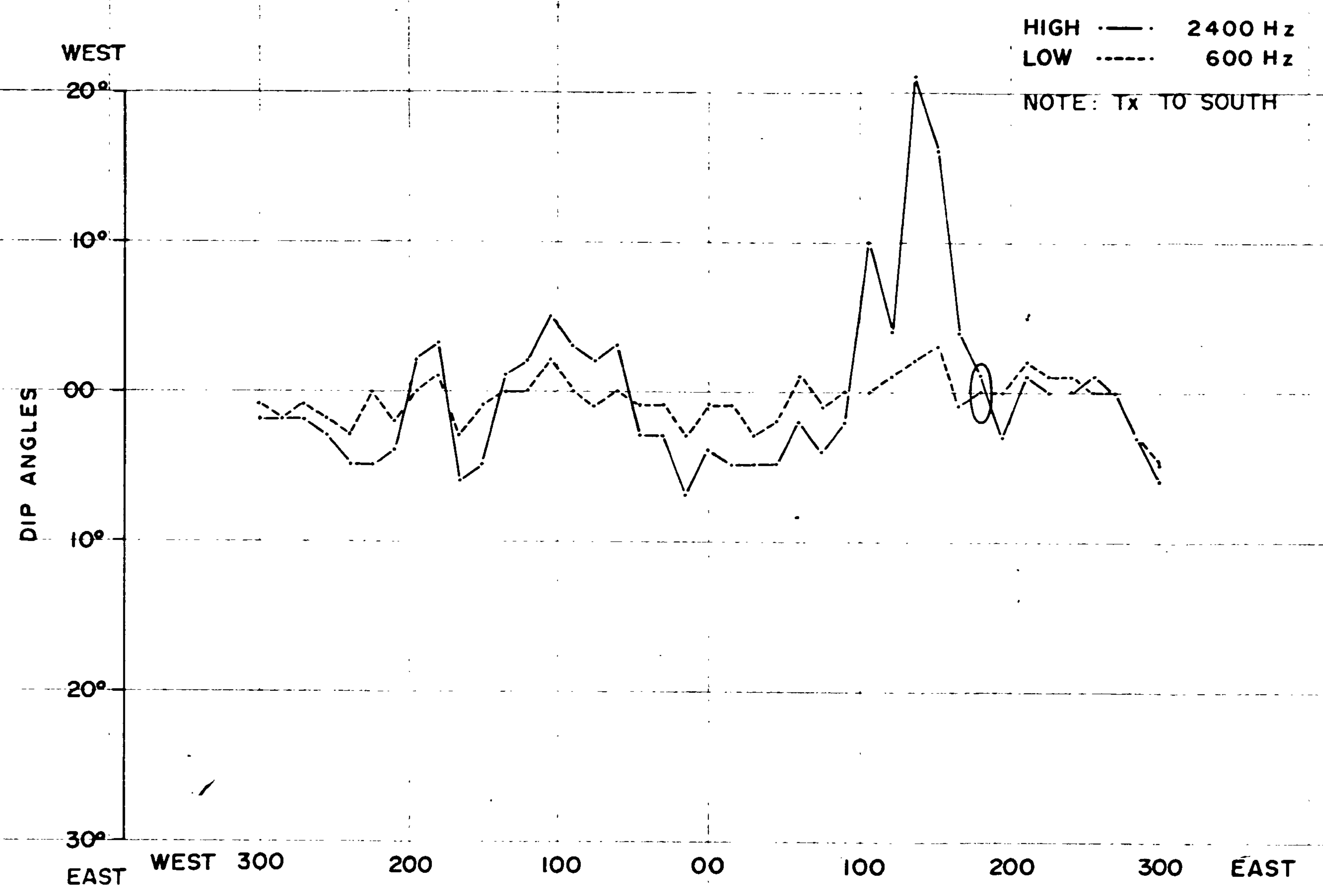
INTERPRETATION

FINAL CHECK

DISTRIBUTED

6679-11

EM 5033 A-3



McPHAR

McPHAR GEOPHYSICS PTY. LTD.
ELECTROMAGNETIC SURVEY

CLIENT PACMINEX PTY. LTD.

AREA MT. GUNSON

Rx LINE No. 30 S (AIRSTRIP AREA)

ARRAY VERT. LOOP BROADSIDE

UNIT VHEM

DATE OF SURVEY SEPT. 73

Tx - Rx SEPARATION 90 METRES

VERTICAL SCALE 10° PER INCH

PLOTTED BY R.G.Z.

FIELD CHECK

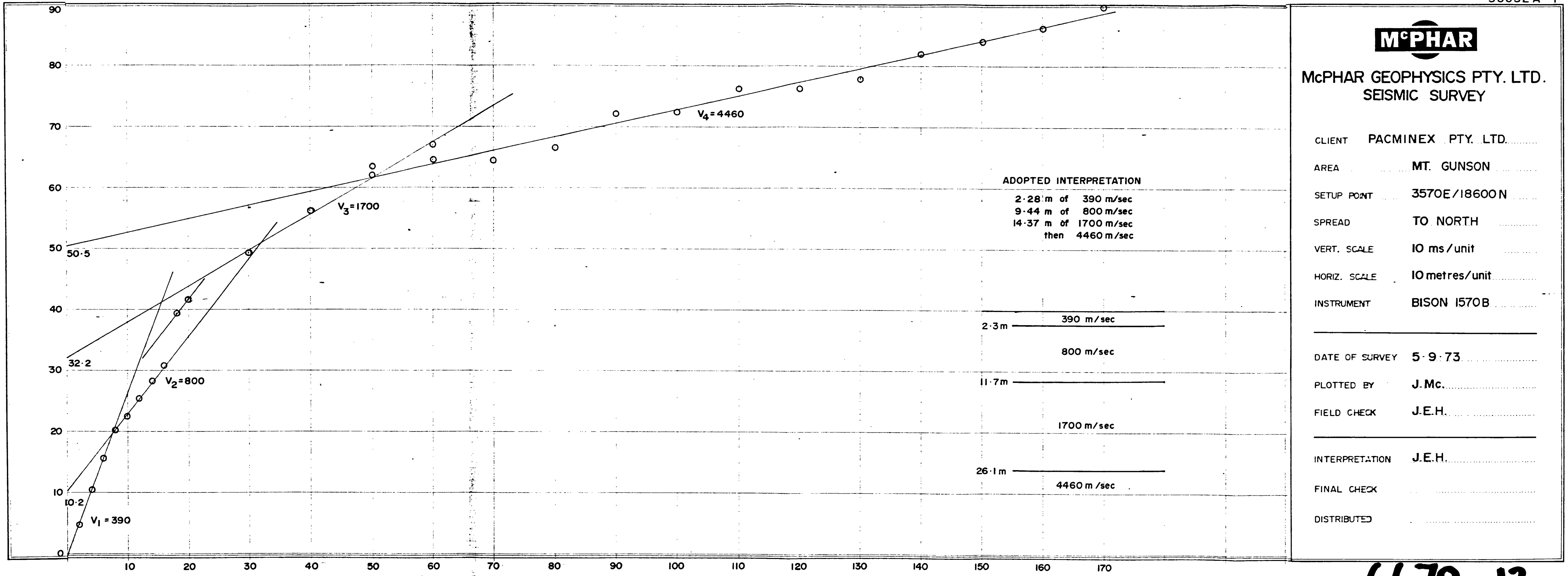
INTERPRETATION

FINAL CHECK

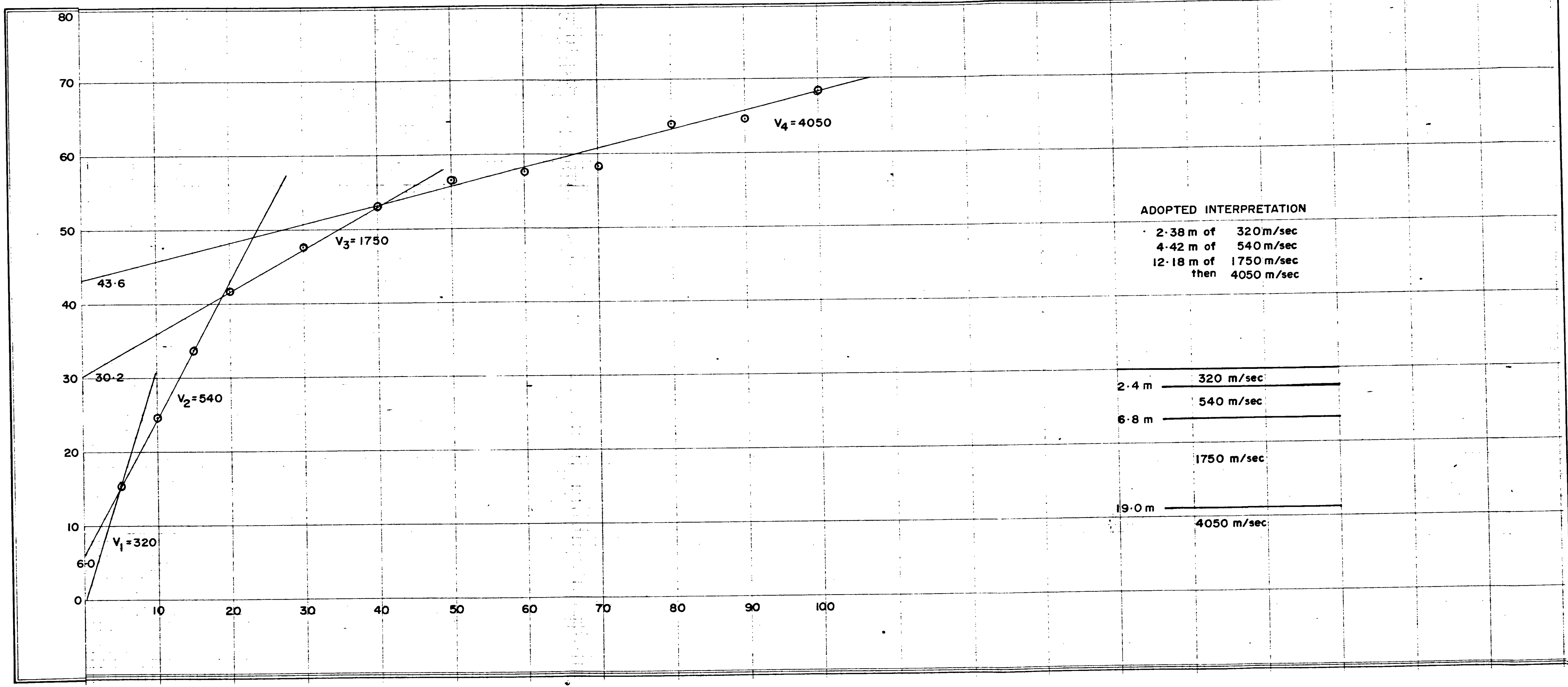
DISTRIBUTED

6679-12

S5032 A-1



6679-13



McPHAR

McPHAR GEOPHYSICS PTY. LTD.
SEISMIC SURVEY

CLIENT PACMINEX PTY. LTD.

AREA MT. GUNSON

SETUP POINT 3570E / 18680N

SPREAD TO NORTH

VERT. SCALE 10 ms/unit

HORIZ. SCALE 10 metres/unit

INSTRUMENT BISON 1570B

DATE OF SURVEY 5·9·73

PLOTTED BY J. Mc.

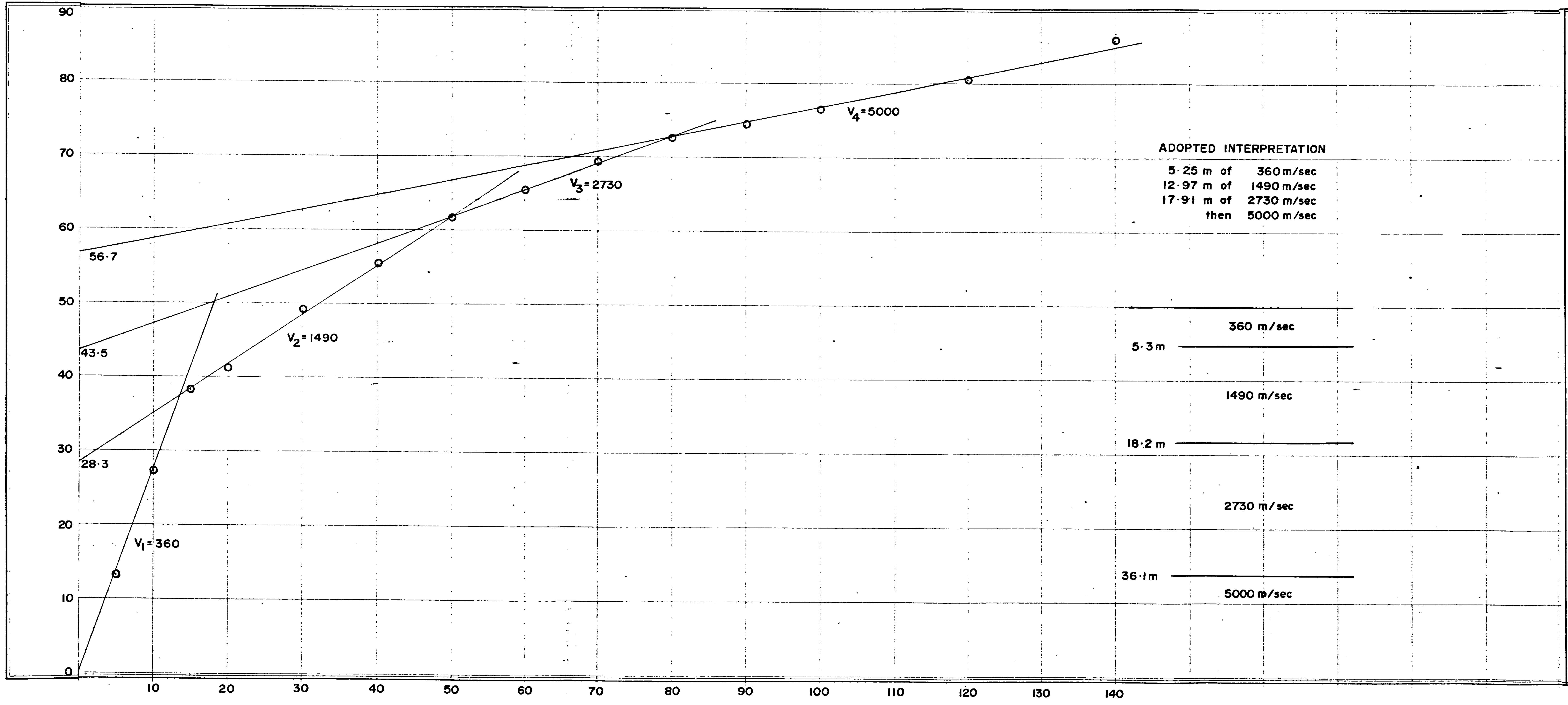
FIELD CHECK J.E.H.

INTERPRETATION J.E.H.

FINAL CHECK

DISTRIBUTED

6679 – 14

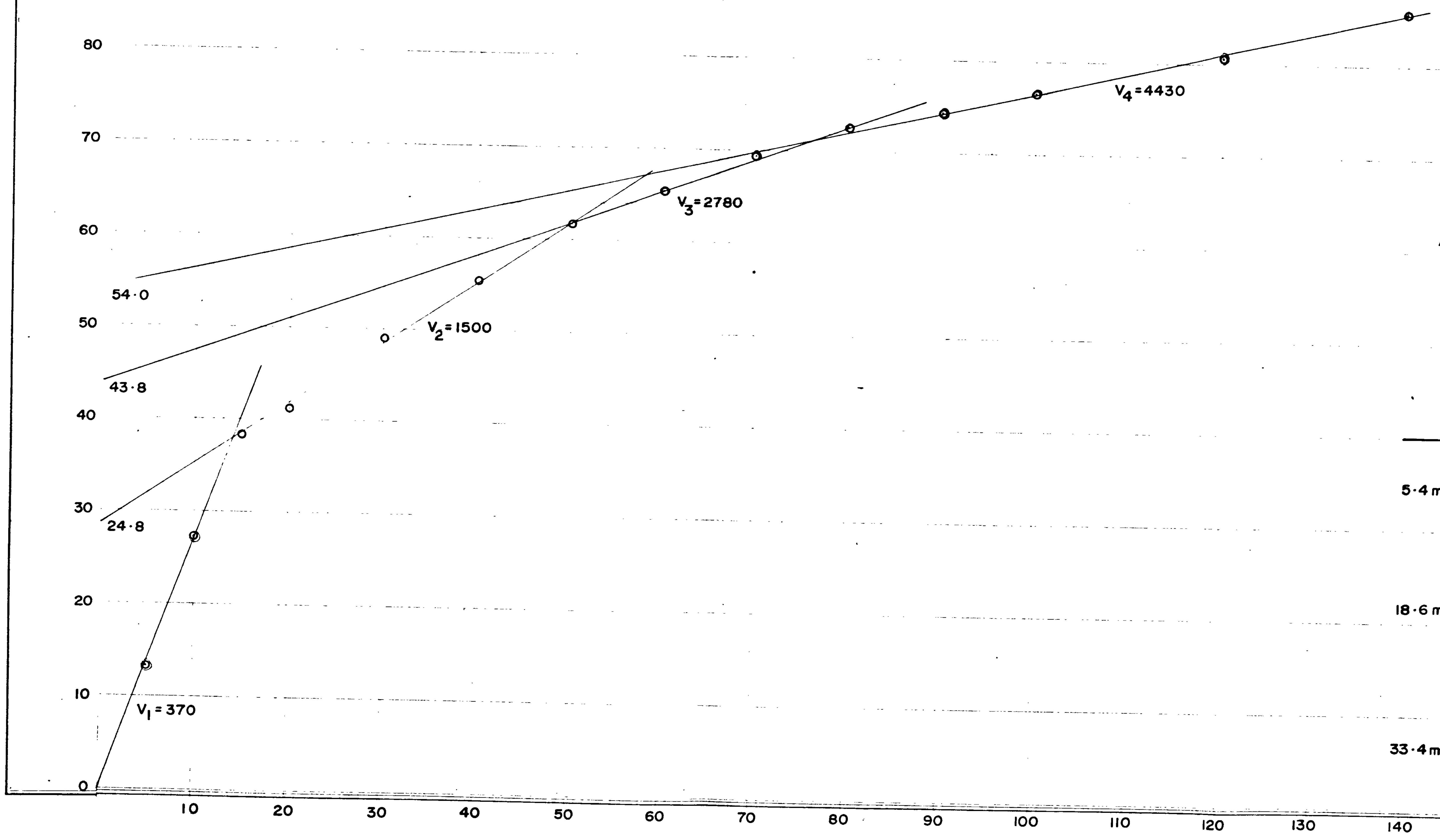


McPHAR

McPHAR GEOPHYSICS PTY. LTD.
SEISMIC SURVEY

CLIENT	PACMINEX PTY. LTD.
AREA	MT. GUNSON
SETUP POINT	3570E/ 18800N
SPREAD	TO NORTH
VERT. SCALE	10 ms/unit
HORIZ. SCALE	10 metres/unit
INSTRUMENT	BISON 1570 B
DATE OF SURVEY	6·9·73
PLOTTED BY	J.Mc.
FIELD CHECK	J.E.H.
INTERPRETATION	J.E.H.
FINAL CHECK	
DISTRIBUTED	

6679-15



ADOPTED INTERPRETATION

5·42 m of 370 m/sec
13·15 m of 1500 m/sec
14·83 m of 2780 m/sec
then 4430 m/sec

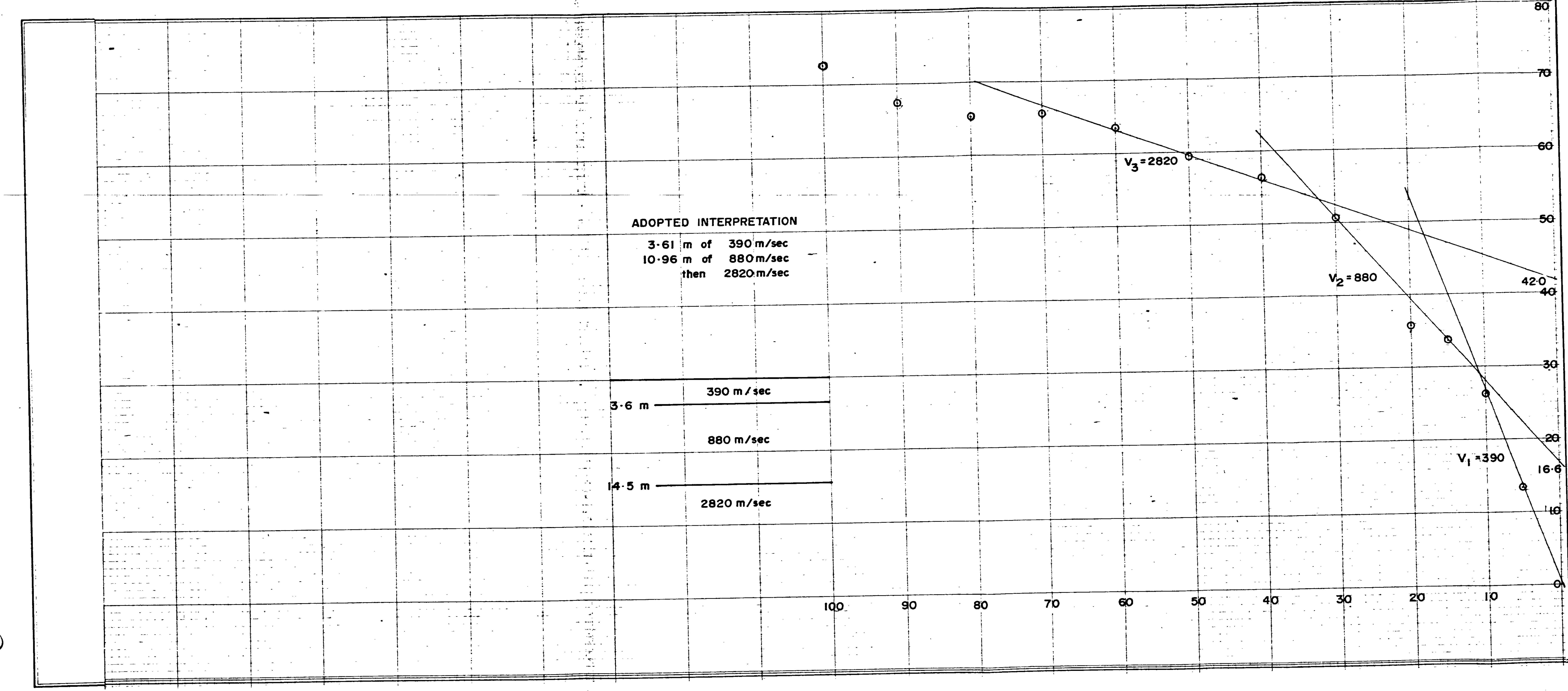
370 m/sec
5·4 m
1500 m/sec
18·6 m
2780 m/sec
33·4 m
4430 m/sec

McPHAR

McPHAR GEOPHYSICS PTY. LTD.
SEISMIC SURVEY

CLIENT	PACMINEX PTY. LTD.
AREA	MT. GUNSON
SETUP POINT	3570 E / 18800 N
SPREAD	TO NORTH
VERT. SCALE	10 ms/unit
HORIZ. SCALE	10 metres/unit
INSTRUMENT	BISON 1570 B
DATE OF SURVEY	6-9-73
PLOTTED BY	J. Mc.
FIELD CHECK	J. E. H.
INTERPRETATION	J. E. H.
FINAL CHECK	
DISTRIBUTED	

6679- 16

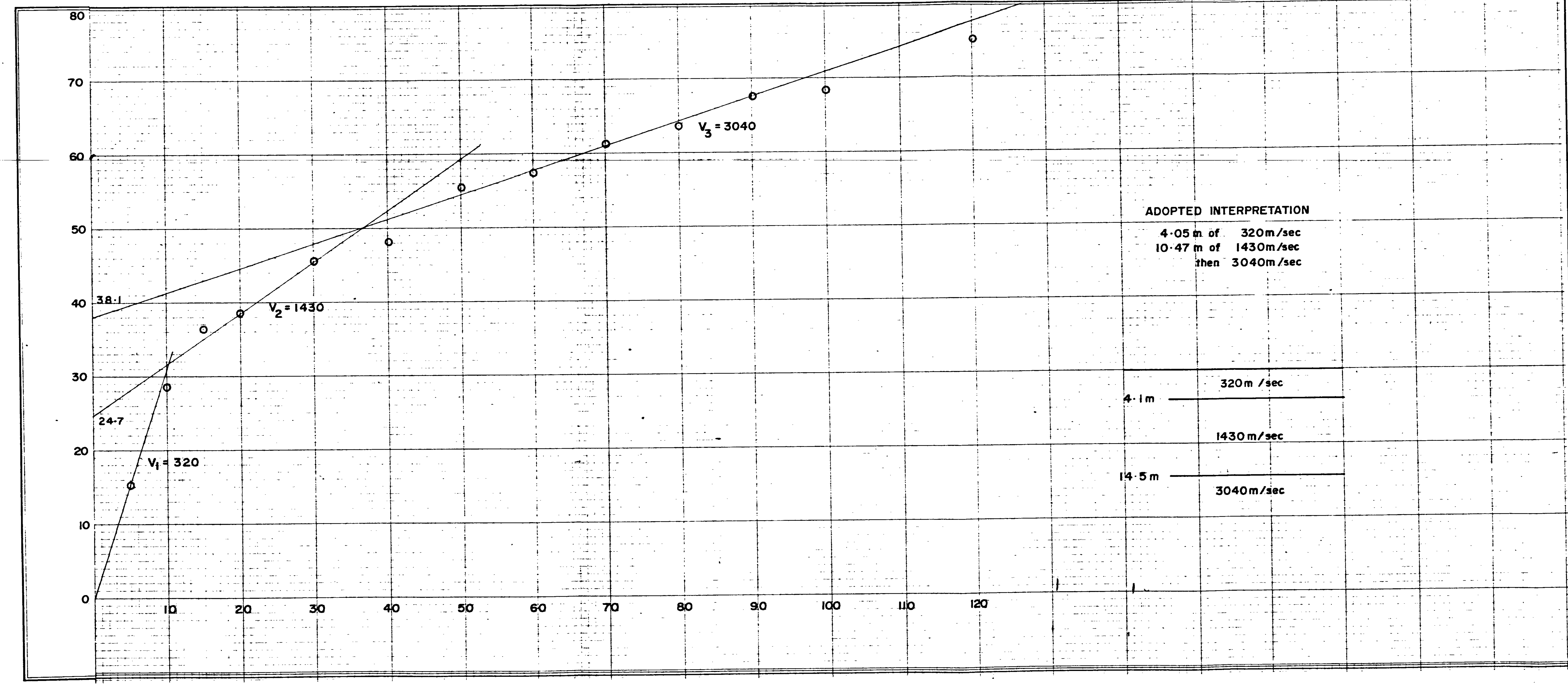


McPHAR

McPHAR GEOPHYSICS PTY. LTD.
SEISMIC SURVEY

CLIENT	PACMINEX PTY. LTD.
AREA	MT. GUNSON
SETUP POINT	3570 E / 18900 N
SPREAD	TO SOUTH
VERT. SCALE	10 ms / unit
HORIZ. SCALE	10 metres / unit
INSTRUMENT	BISON 1570 B
DATE OF SURVEY	6 · 9 · 73
PLOTTED BY	J. Mc.
FIELD CHECK	J. E. H.
INTERPRETATION	J. E. H.
FINAL CHECK	
DISTRIBUTED	

6679 – 17



McPHAR

McPHAR GEOPHYSICS PTY. LTD.
SEISMIC SURVEY

CLIENT: PACMINEX PTY LTD

AREA: MT. GUNSON

SETUP POINT: 3570E/18900N

SPREAD: TO NORTH

VERT. SCALE: 10ms/unit

HORIZ. SCALE: 10 metres/unit

INSTRUMENT: BISON 1570 B

DATE OF SURVEY: 6·9·73

PLOTTED BY: JMc

FIELD CHECK: J.E.H.

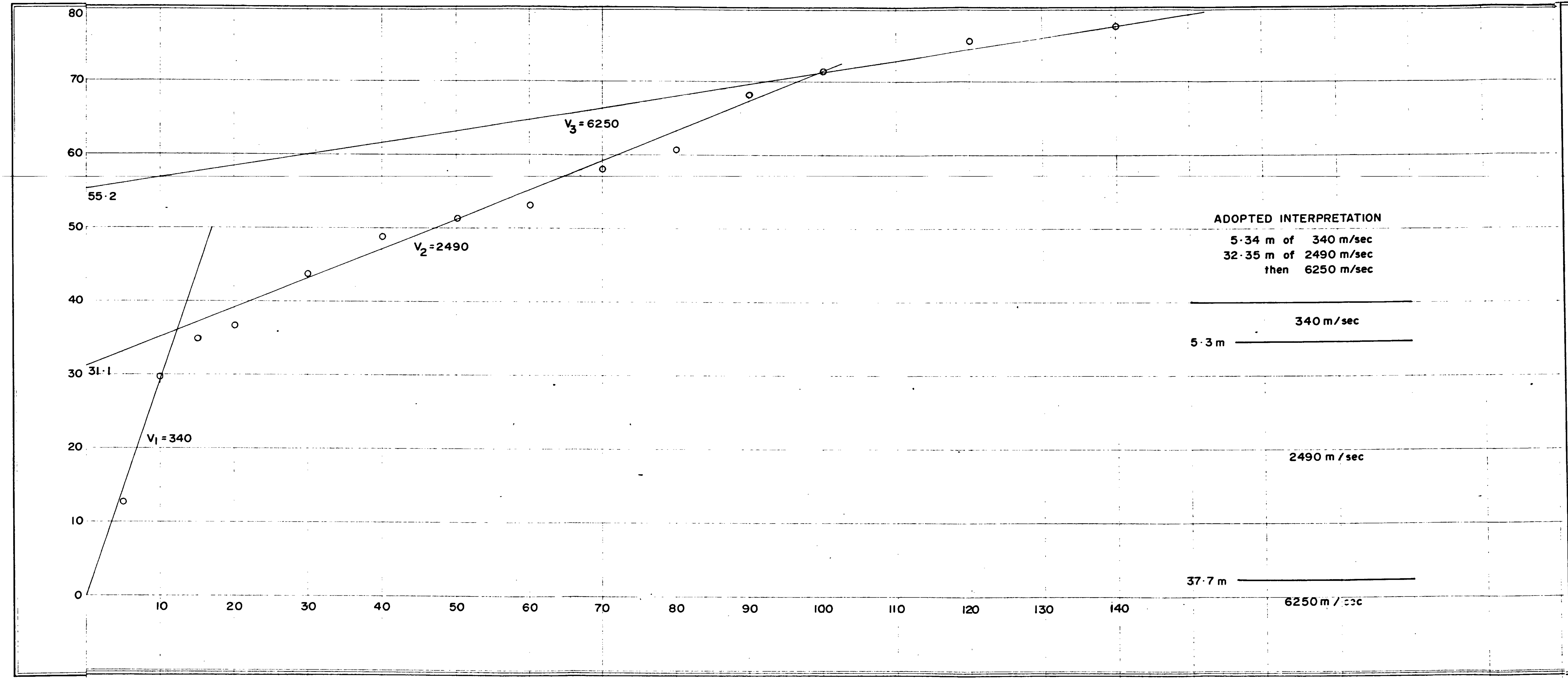
INTERPRETATION: J.E.H.

FINAL CHECK:

DISTRIBUTED:

6679-18

S5032A – 7



McPHAR

McPHAR GEOPHYSICS PTY. LTD.
SEISMIC SURVEY

CLIENT PACMINEX PTY. LTD.

AREA MT. GUNSON

SETUP POINT 3570 E/19000 N

SPREAD TO NORTH

VERT. SCALE 10 ms/unit

HORIZ. SCALE 10 metres/unit

INSTRUMENT BISON 1570 B

DATE OF SURVEY 5·9·73

PLOTTED BY J. Mc.

FIELD CHECK J.E.H.

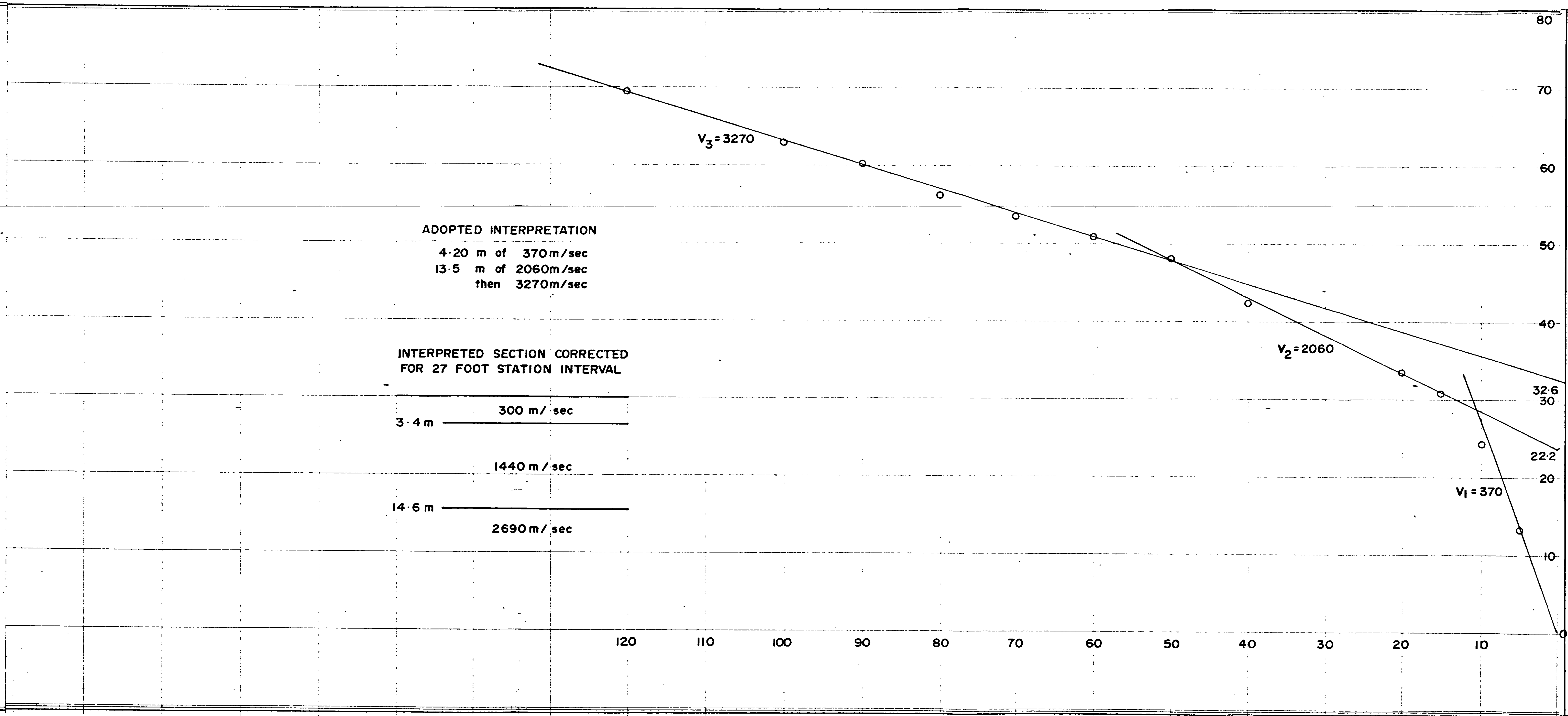
INTERPRETATION J.E.H.

FINAL CHECK

DISTRIBUTED

6679–19

S5032A-8

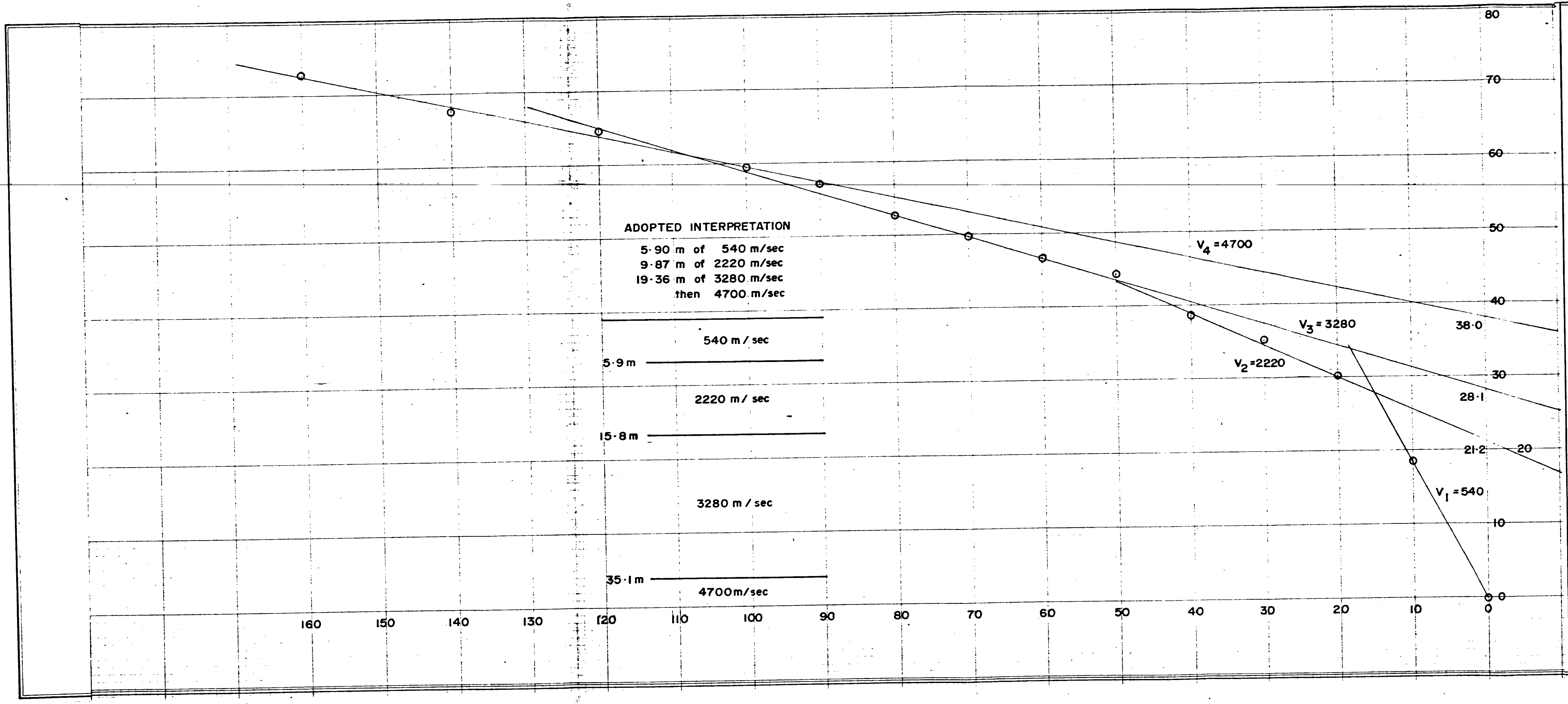


McPHAR

McPHAR GEOPHYSICS PTY. LTD.
SEISMIC SURVEY

CLIENT	PACMINEX PTY. LTD.
AREA	MT GUNSON
SETUP POINT	300 / 400 D.H.
SPREAD	TO SOUTH
VERT. SCALE	10 ms / unit
HORIZ. SCALE	10 metres / unit
INSTRUMENT	BISON 1570 B
DATE OF SURVEY	6·9·73
PLOTTED BY	J. Mc.
FIELD CHECK	J.E.H.
INTERPRETATION	J.E.H.
FINAL CHECK	
DISTRIBUTED	

6679-20

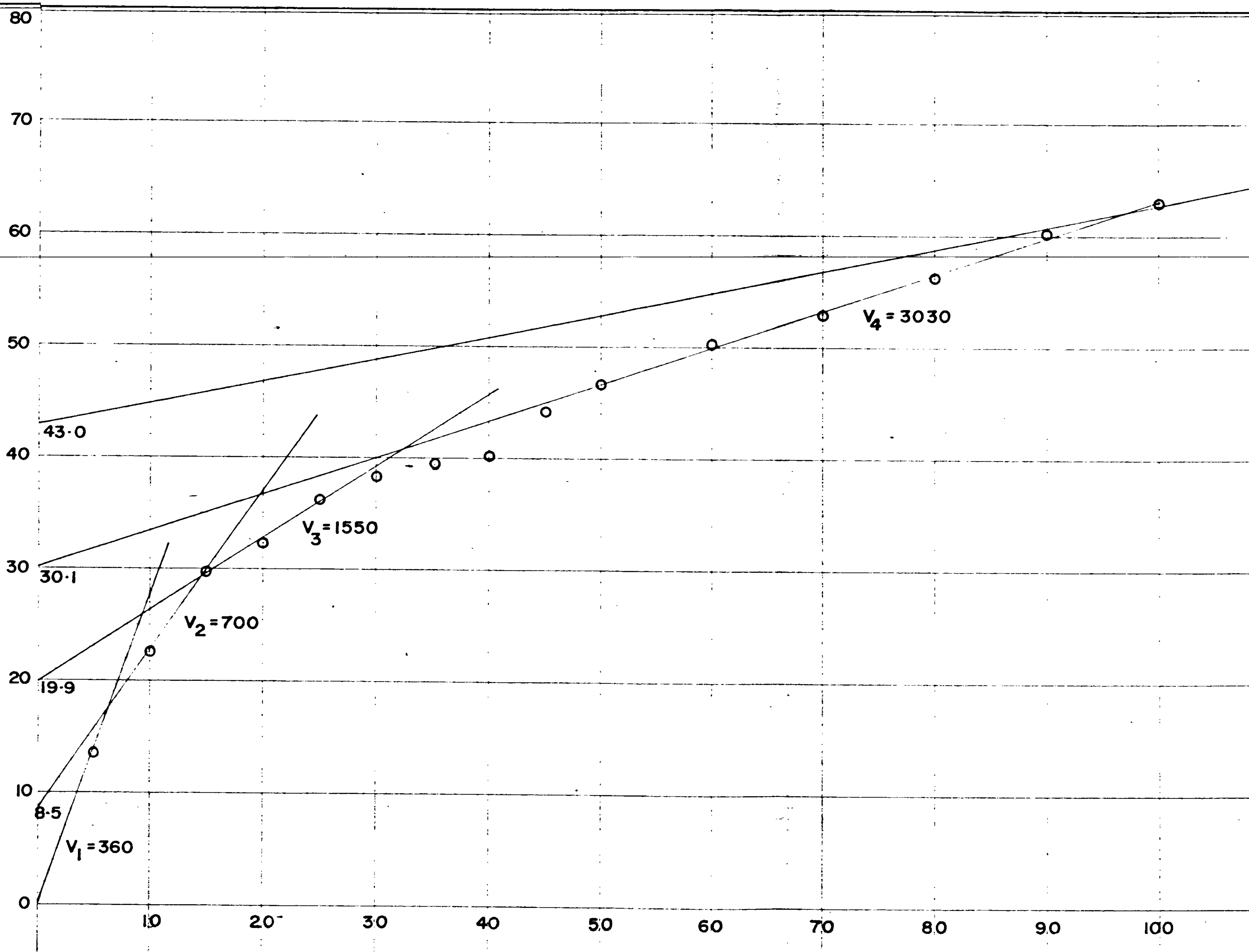


McPHAR

McPHAR GEOPHYSICS PTY. LTD.
SEISMIC SURVEY

CLIENT	PACMINEX PTY. LTD.
AREA	MT. GUNSON
SETUP POINT	300/400 D.H.
SPREAD	TO SOUTH
VERT. SCALE	10 ms/unit
HORIZ. SCALE	10 metres/unit
INSTRUMENT	BISON 1570B
DATE OF SURVEY	6·9·73
PLOTTED BY	J. Mc.
FIELD CHECK	J.E.H.
INTERPRETATION	J.E.H.
FINAL CHECK	
DISTRIBUTED	

6679–21



ADOPTED INTERPRETATION

1·78 m of 360 m/sec
4·03 m of 700 m/sec
8·19 m of 1550 m/sec
then 3030 m/sec

INTERPRETED SECTION CORRECTED FOR 27 FOOT STATION INTERVAL

300 m/sec
1·5 m
580 m/sec
4·8 m
1275 m/sec
11·5 m
2490 m/sec

McPHAR

McPHAR GEOPHYSICS PTY. LTD.
SEISMIC SURVEY

CLIENT PACMINEX PTY. LTD.

AREA MT. GUNSON

SETUP POINT 50'N of CG78

SPREAD TO NORTH

VERT. SCALE 10 ms/unit

HORIZ. SCALE 10 metres/unit

INSTRUMENT BISON 1570 B

DATE OF SURVEY 10·9·73

PLOTTED BY J. Mc.

FIELD CHECK J.E.H.

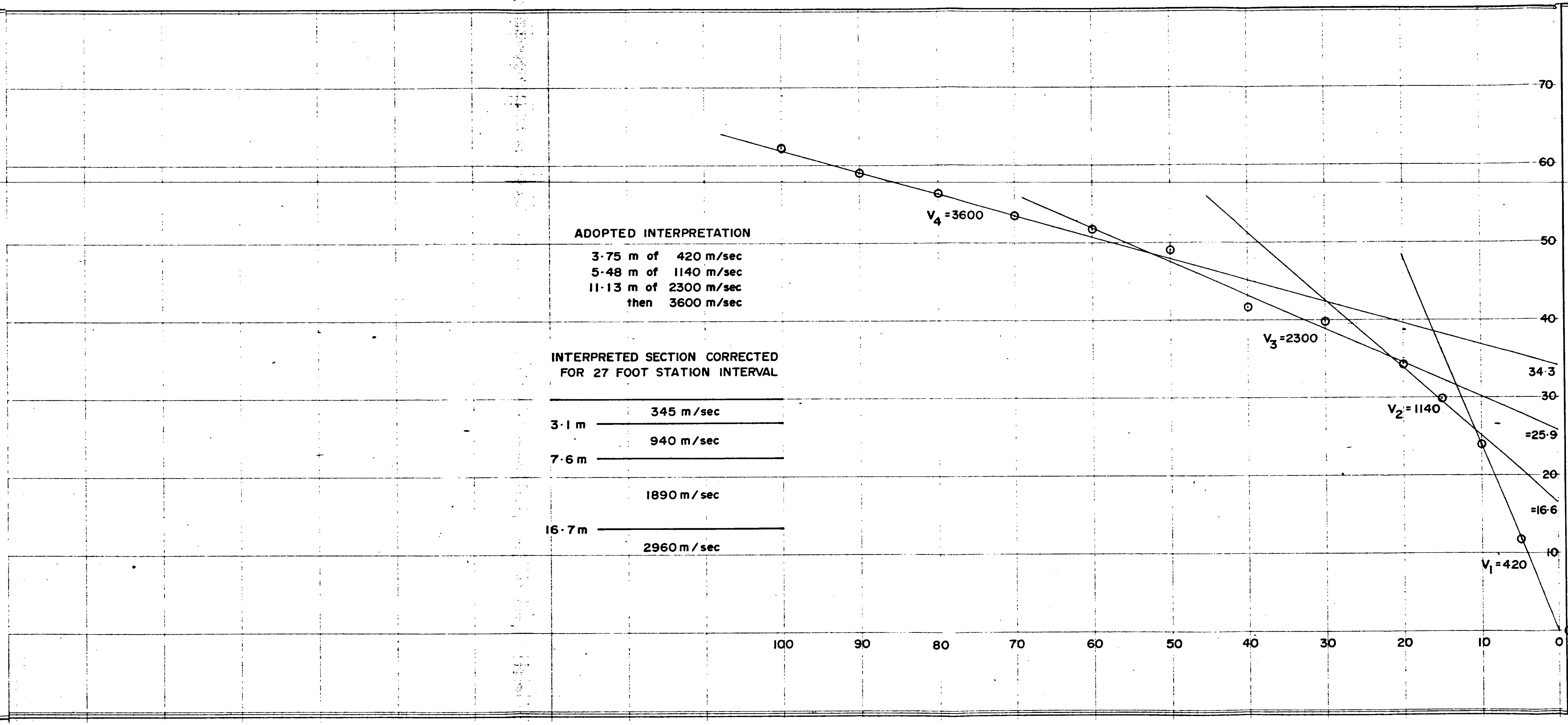
INTERPRETATION J.E.H.

FINAL CHECK

DISTRIBUTED

6679-22

S 5032 A – II



McPHAR

McPHAR GEOPHYSICS PTY. LTD.
SEISMIC SURVEY

CLIENT PACMINEX PTY. LTD.

AREA MT. GUNSON

SETUP POINT 50'N of CG78

SPREAD TO SOUTH

VERT. SCALE 10 ms/unit

HORIZ. SCALE 10 metres/unit

INSTRUMENT BISON 1570 B

DATE OF SURVEY 6·9·73

PLOTTED BY J.Mc.

FIELD CHECK J.E.H.

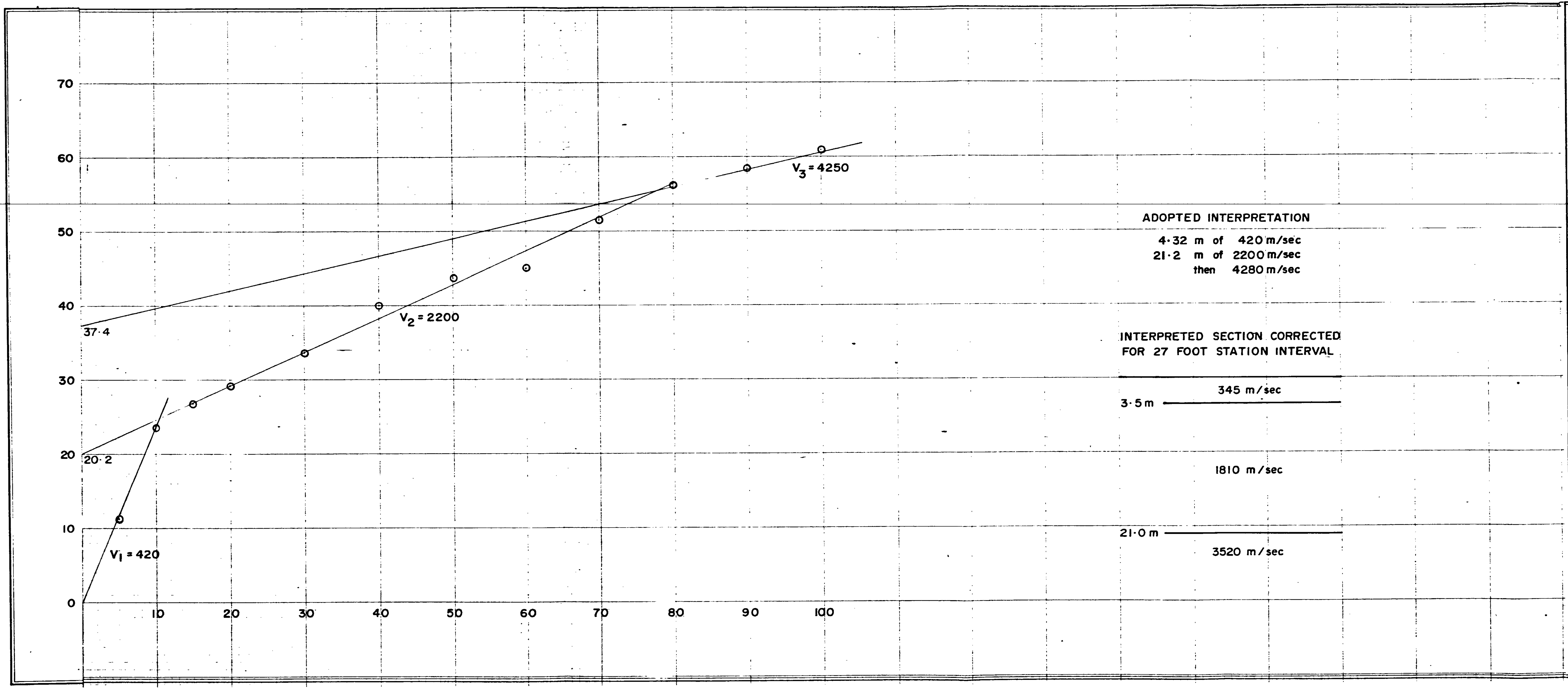
INTERPRETATION J.E.H.

FINAL CHECK

DISTRIBUTED

6679–23

S5032A-12



McPHAR

McPHAR GEOPHYSICS PTY. LTD.
SEISMIC SURVEY

CLIENT PACMINEX PTY. LTD.

AREA MT. GUNSON

SETUP POINT 60'N of D.H. 100/400

SPREAD TO NORTH

VERT. SCALE 10 ms/unit

HORIZ. SCALE 10 metres/unit

INSTRUMENT BISON 1570B

DATE OF SURVEY 6-9-73

PLOTTED BY J.Mc.

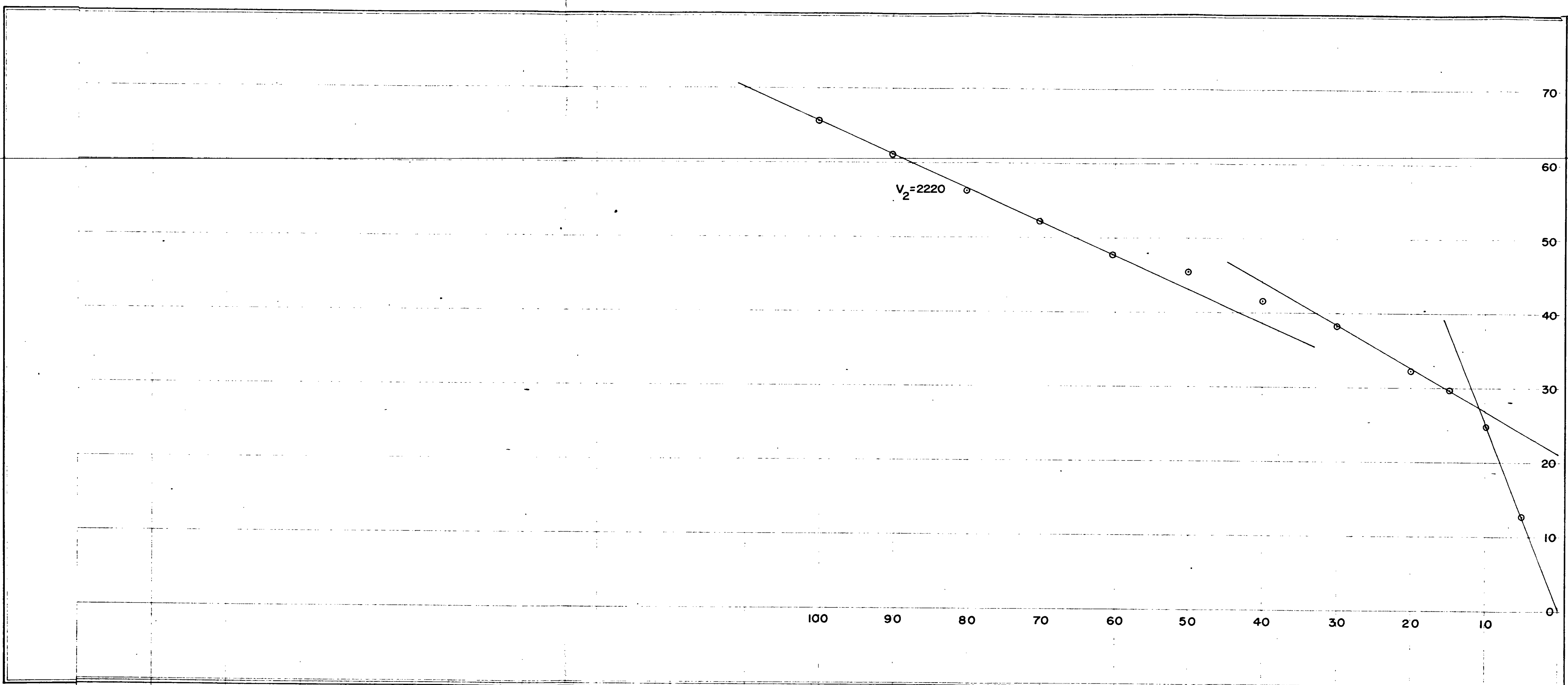
FIELD CHECK J.E.H.

INTERPRETATION J.E.H.

FINAL CHECK

DISTRIBUTED

6679-24

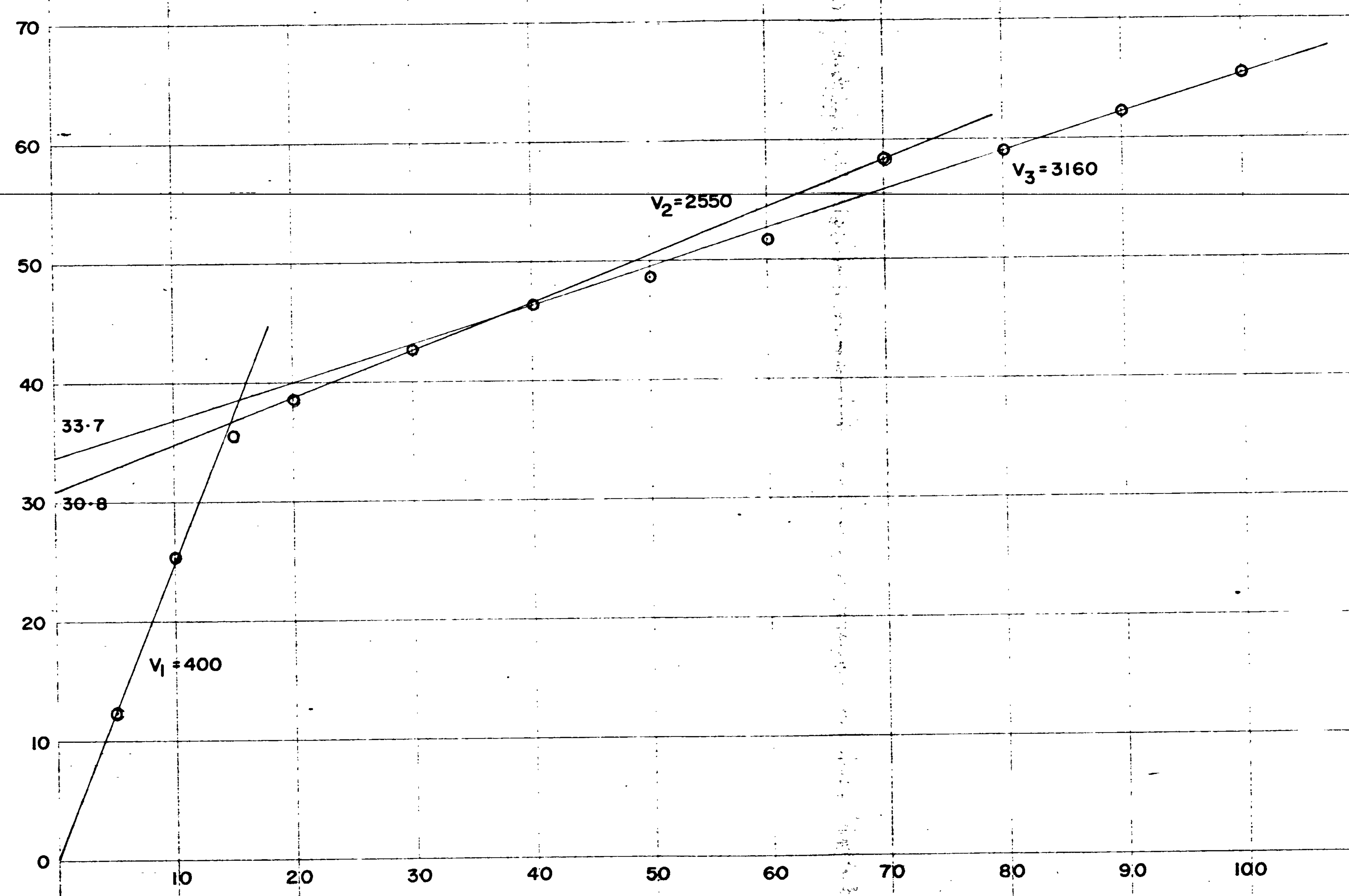


McPHAR

McPHAR GEOPHYSICS PTY. LTD.
SEISMIC SURVEY

CLIENT	PACMINEX PTY. LTD.
AREA	MT. GUNSON
SETUP POINT	60' of D.H. 100/400
SPREAD	TO NORTH
VERT. SCALE	10 ms/unit
HORIZ. SCALE	10 metres/unit
INSTRUMENT	BISON 1570 B
DATE OF SURVEY	6·9·73
PLOTTED BY	J. Mc.
FIELD CHECK	J.E.H.
INTERPRETATION	J.E.H.
FINAL CHECK	
DISTRIBUTED	

6679–25



ADOPTED INTERPRETATION

6·24 m of 400 m/sec
5·94 m of 2550 m/sec
then 3160 m/sec

INTERPRETED SECTION CORRECTED FOR 27 FOOT STATION INTERVAL

	330 m/sec
5·1 m	
	2100 m/sec
10·0 m	
	2600 m/sec

McPHAR

McPHAR GEOPHYSICS PTY. LTD.
SEISMIC SURVEY

CLIENT	PACMINEX PTY. LTD.
AREA	MT. GUNSON
SETUP POINT	40'S of CG74
SPREAD	TO NORTH
VERT. SCALE	10 ms/unit
HORIZ. SCALE	10 metres/unit
INSTRUMENT	BISON 1570 B
DATE OF SURVEY	6·9·73
PLOTTED BY	J. Mc.
FIELD CHECK	J.E.H.
INTERPRETATION	J.E.H.
FINAL CHECK	
DISTRIBUTED	

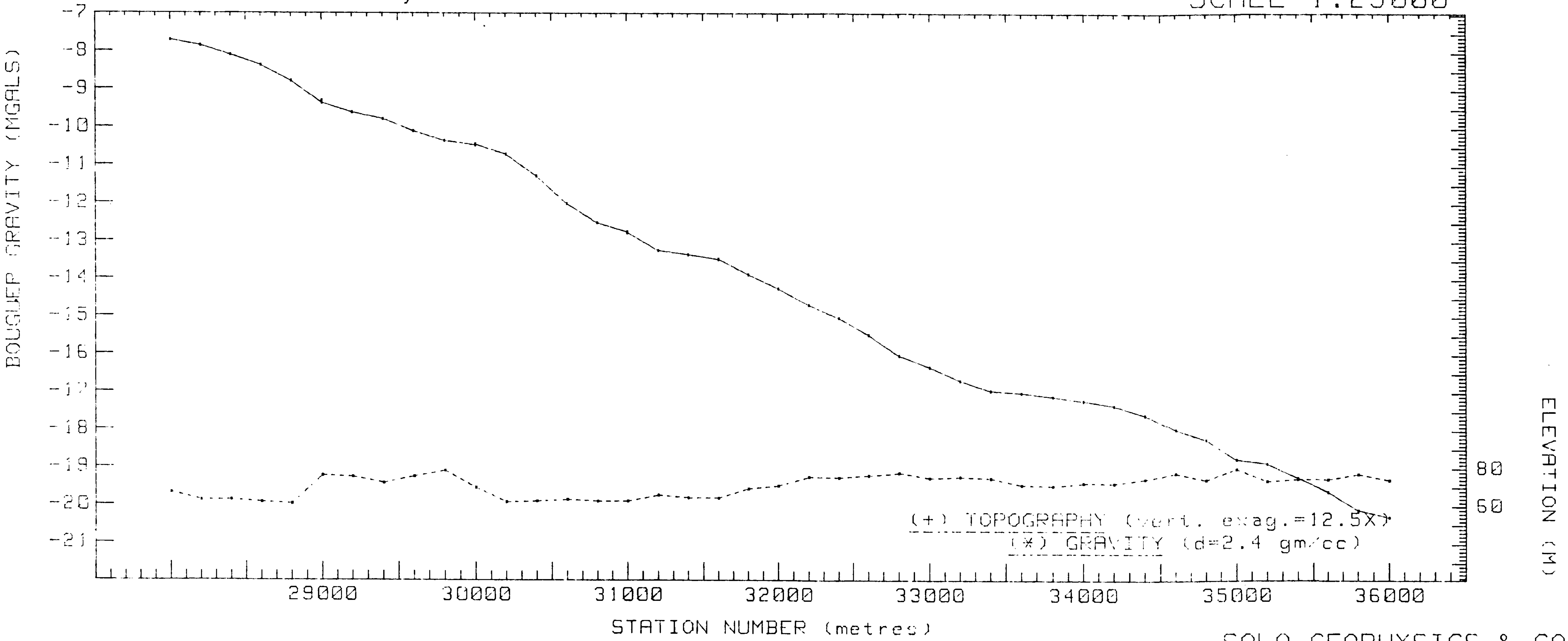
6679—26

CLIENT: C.S.R. (Minerals & Chemicals Division)

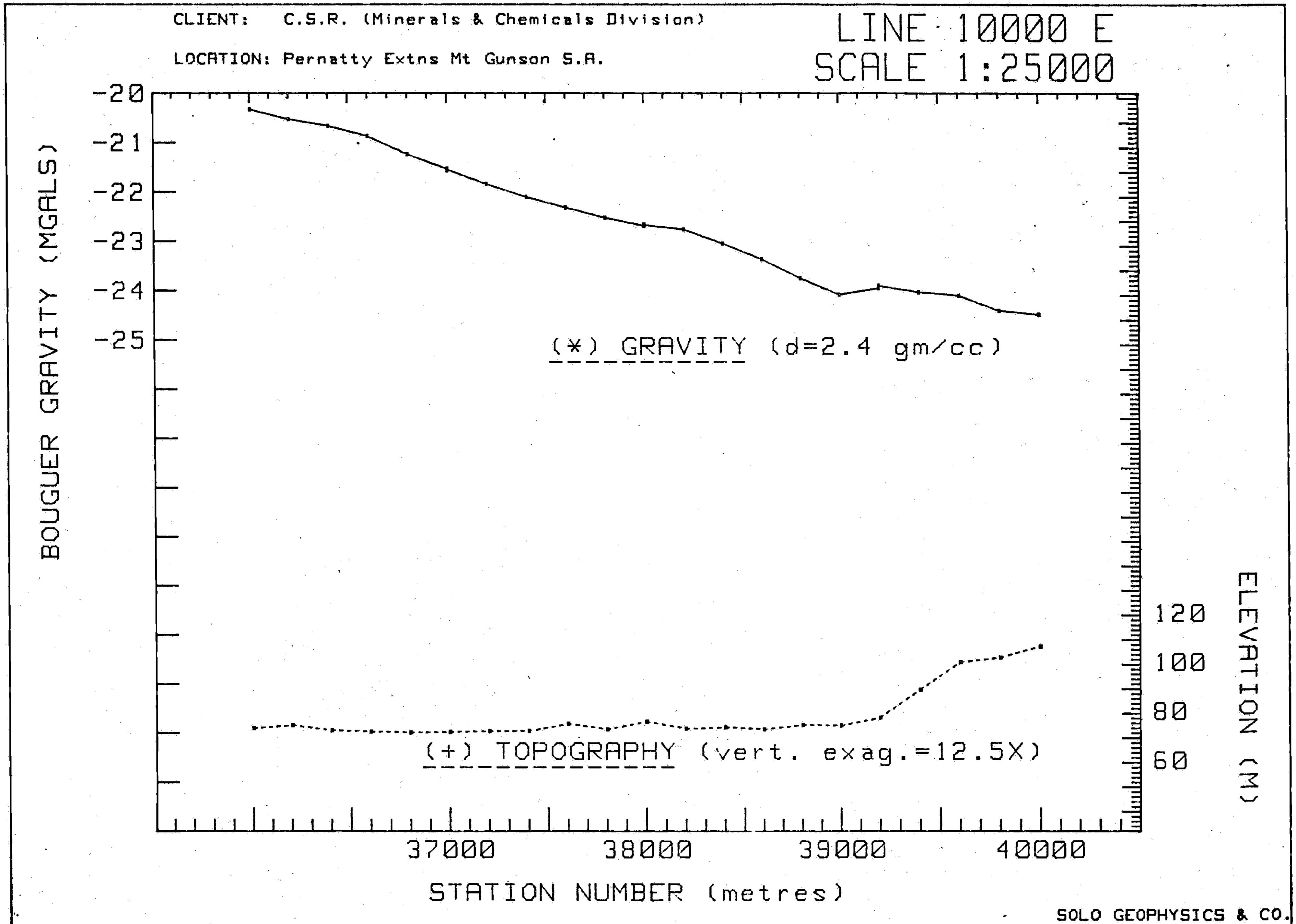
LOCATION: Pernatty Extns Mt Gunson S.A.

LINE 10000 E

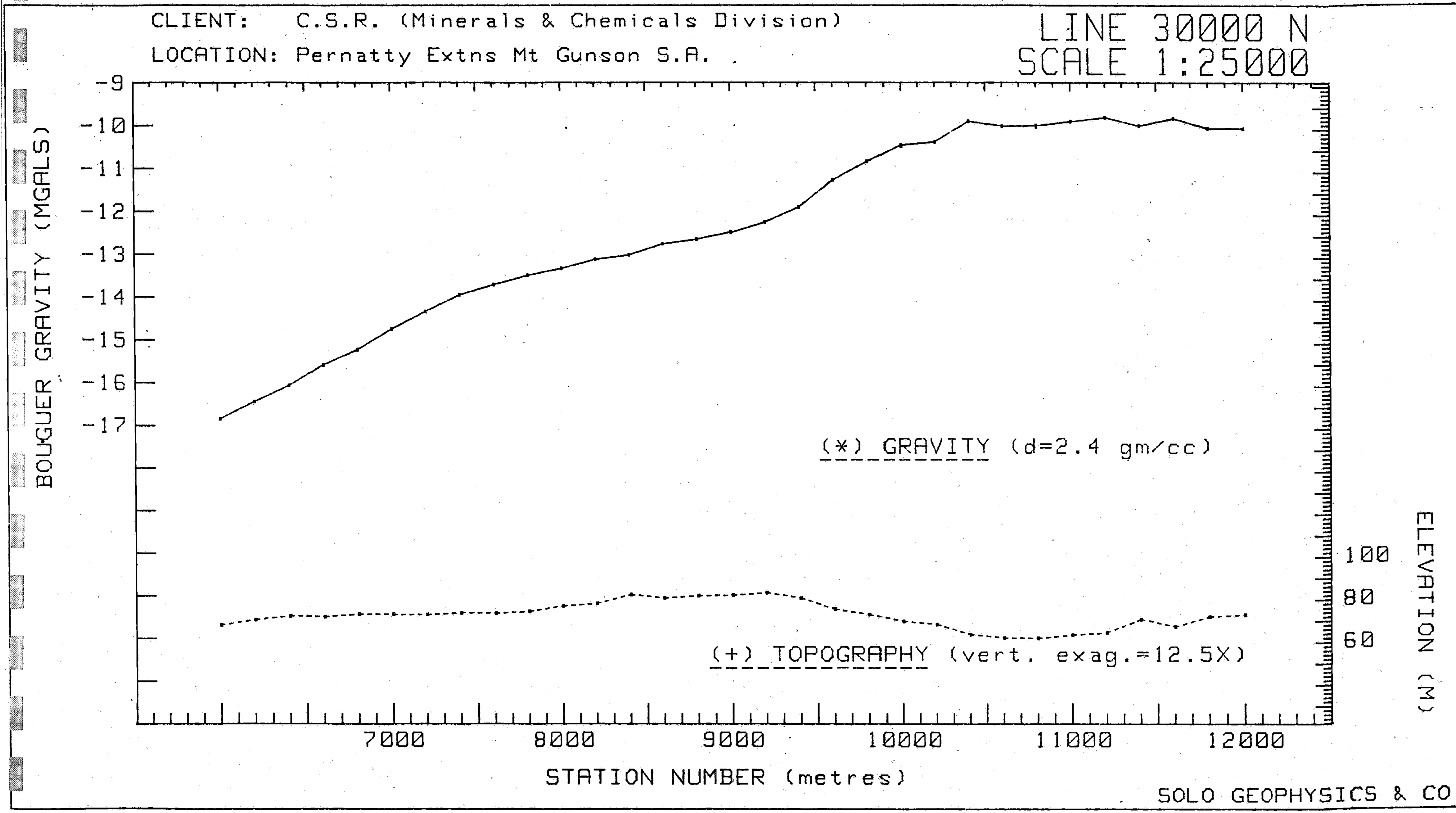
SCALE 1:25000



SOLO GEOPHYSICS & CO.

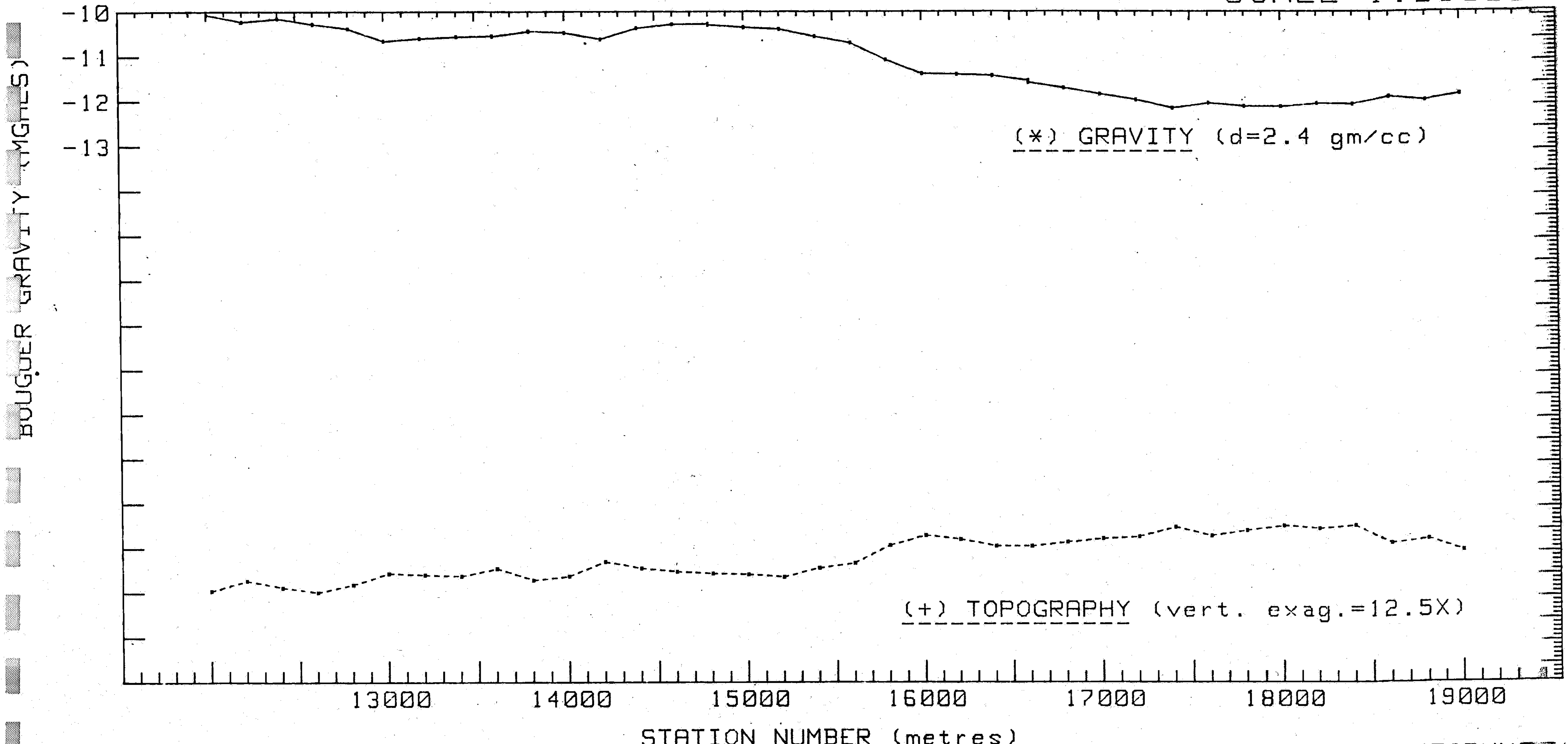


CLIENT: C.S.R. (Minerals & Chemicals Division)
LOCATION: Pernatty Extns Mt Gunson S.A.
LINE 10000 E
SCALE 1:25000
BOUGUER GRAVITY (MGALS)
-20
-21
-22
-23
-24
-25
(*) GRAVITY (d=2.4 gm/cc)
(+) TOPOGRAPHY (vert. exag.=12.5X)
120
100
80
60
ELEVATION (M)
37000
38000
39000
40000
STATION NUMBER (metres)
SOLO GEOPHYSICS & CO.

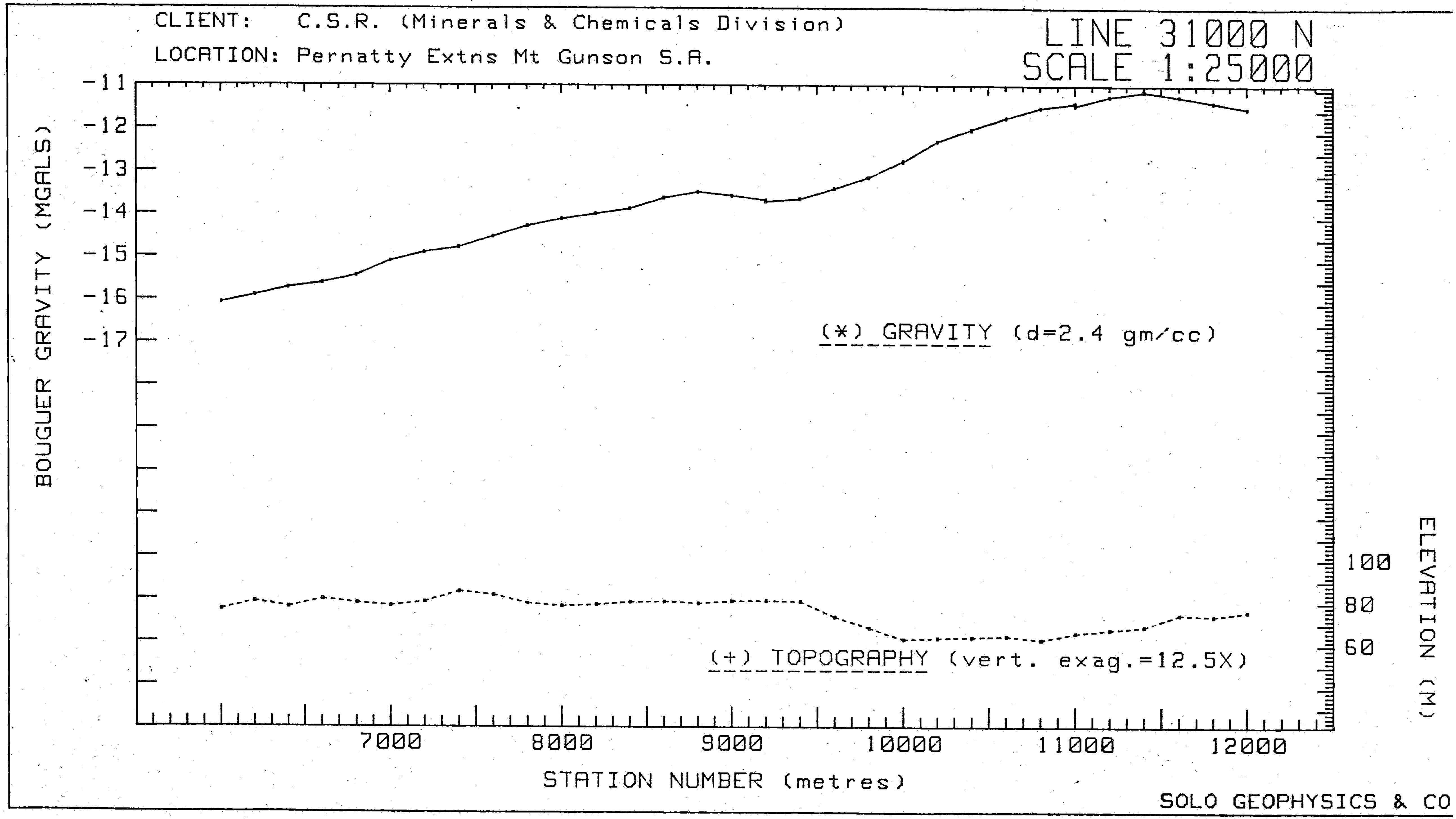

CLIENT: C.S.R. (Minerals & Chemicals Division)
LOCATION: Pernatty Extns Mt Gunson S.A.
LINE 30000 N
SCALE 1:25000
BOUGUER GRAVITY (MGALS)
-9
-10
-11
-12
-13
-14
-15
-16
-17
(*) GRAVITY (d=2.4 gm/cc)
(+) TOPOGRAPHY (vert. exag.=12.5X)
100
80
60
ELEVATION (M)
7000
8000
9000
10000
11000
12000
STATION NUMBER (metres)
SOLO GEOPHYSICS & CO.

CLIENT: C.S.R. (Minerals & Chemicals Division)
LOCATION: Pernatty Extns Mt Gunson S.A.

LINE 30000 N
SCALE 1:25000



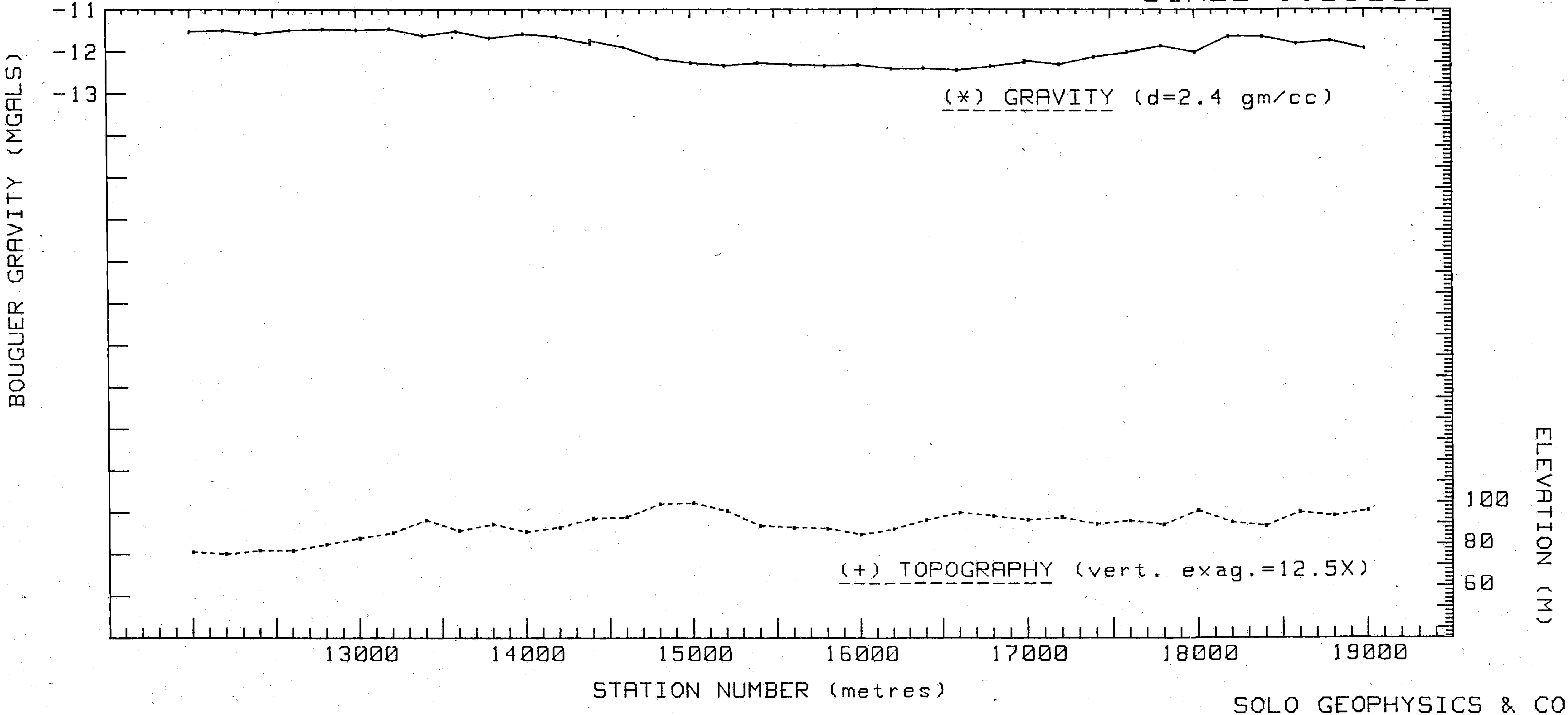
SOLO GEOPHYSI(



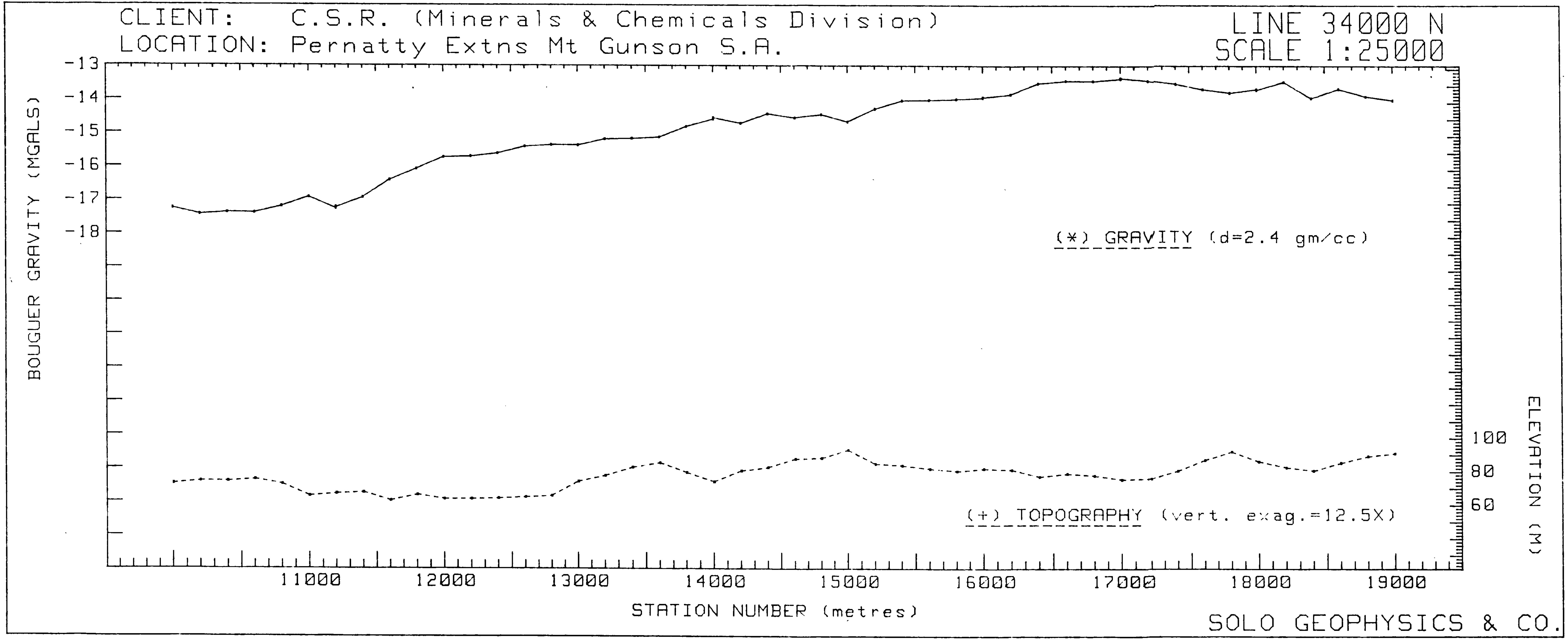
CLIENT: C.S.R. (Minerals & Chemicals Division)
LOCATION: Pernatty Extns Mt Gunson S.A.
LINE 31000 N
SCALE 1:25000
BOUGUER GRAVITY (MGALS)
-11
-12
-13
-14
-15
-16
-17
(*) GRAVITY (d=2.4 gm/cc)
(+) TOPOGRAPHY (vert. exag.=12.5X)
100
80
60
ELEVATION (M)
7000
8000
9000
10000
11000
12000
STATION NUMBER (metres)
SOLO GEOPHYSICS & CO

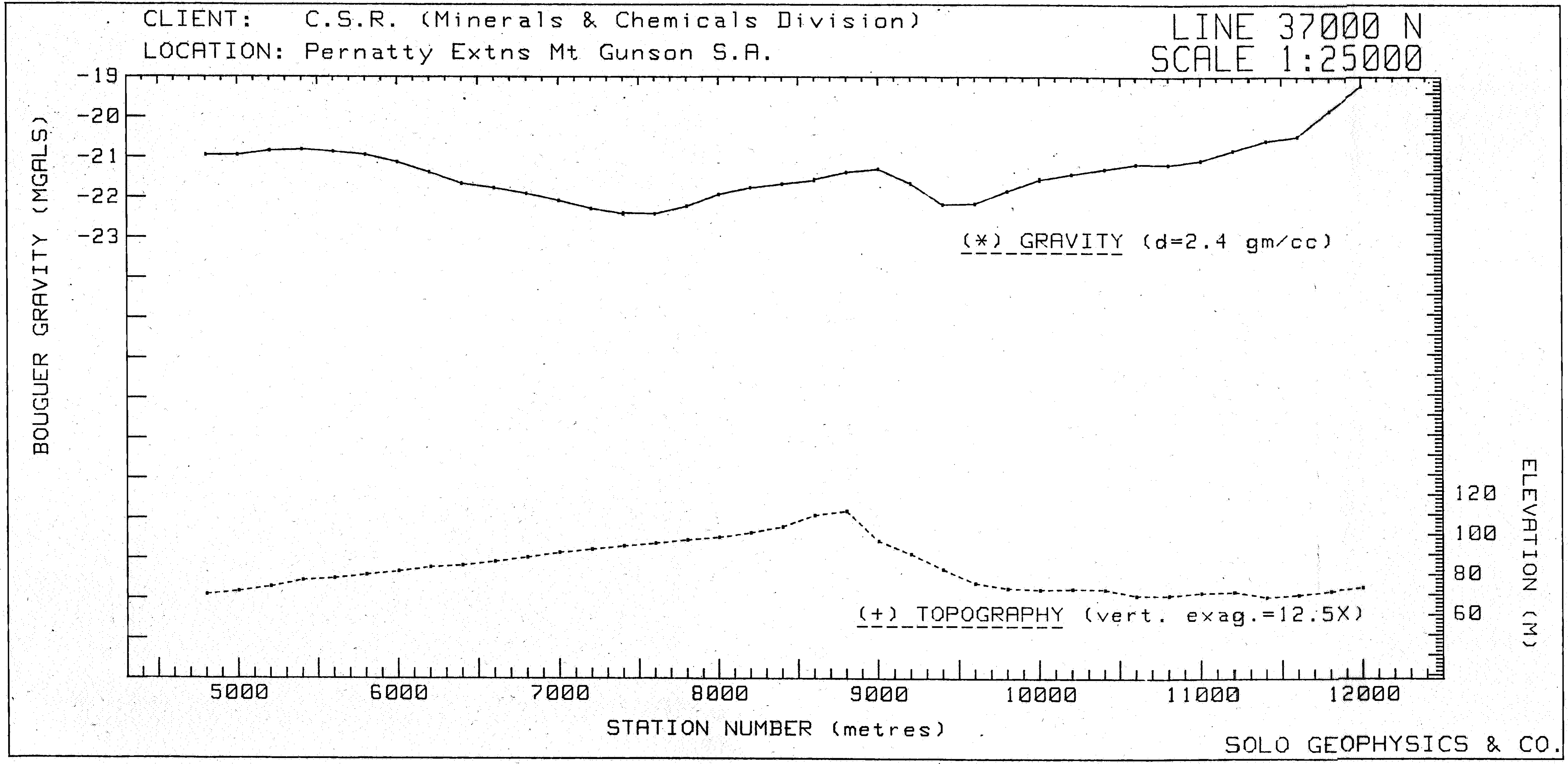
CLIENT: C.S.R. (Minerals & Chemicals Division)
LOCATION: Pernatty Extns Mt Gunson S.A.

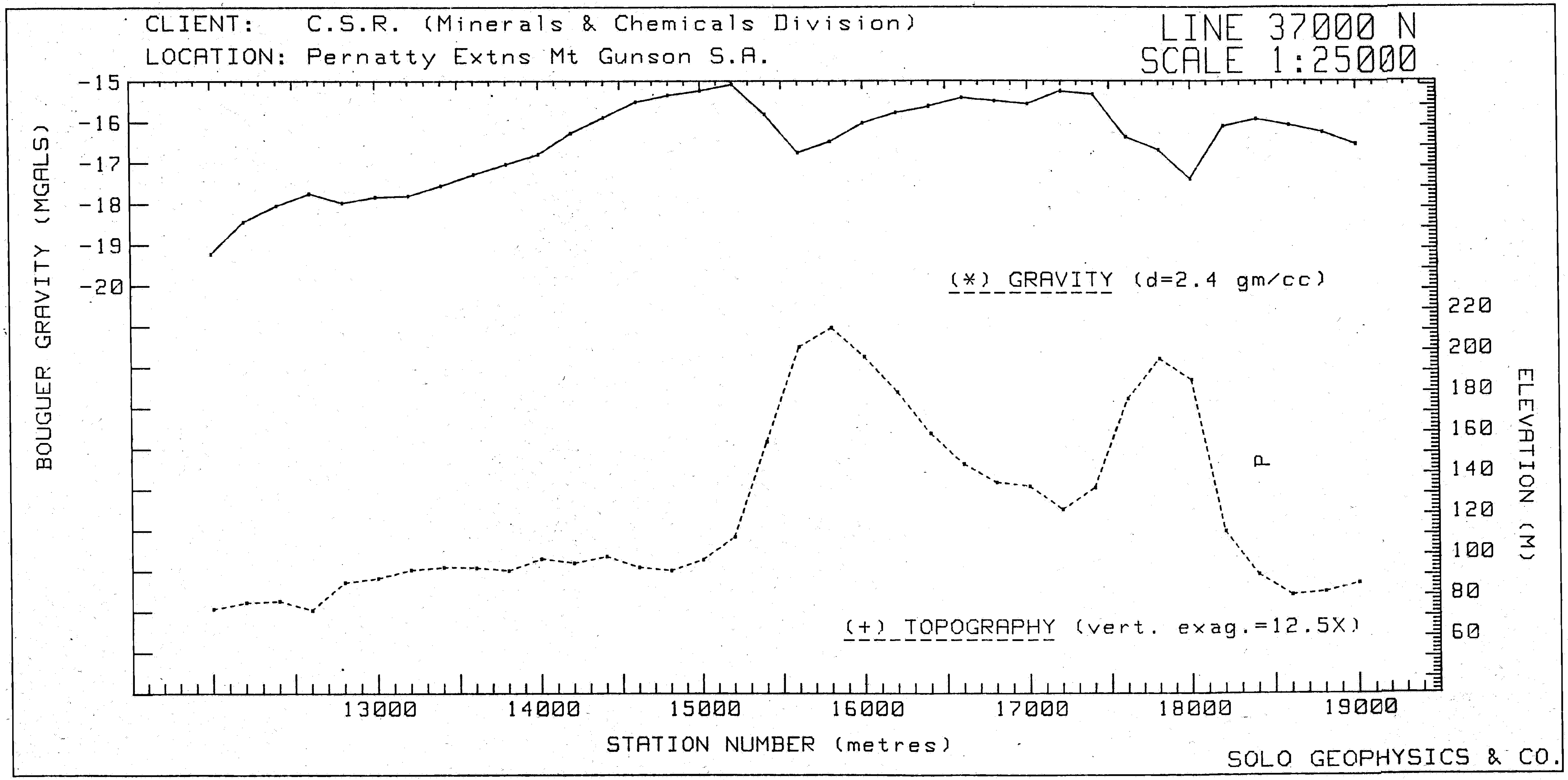
LINE 31000 N
SCALE 1:25000

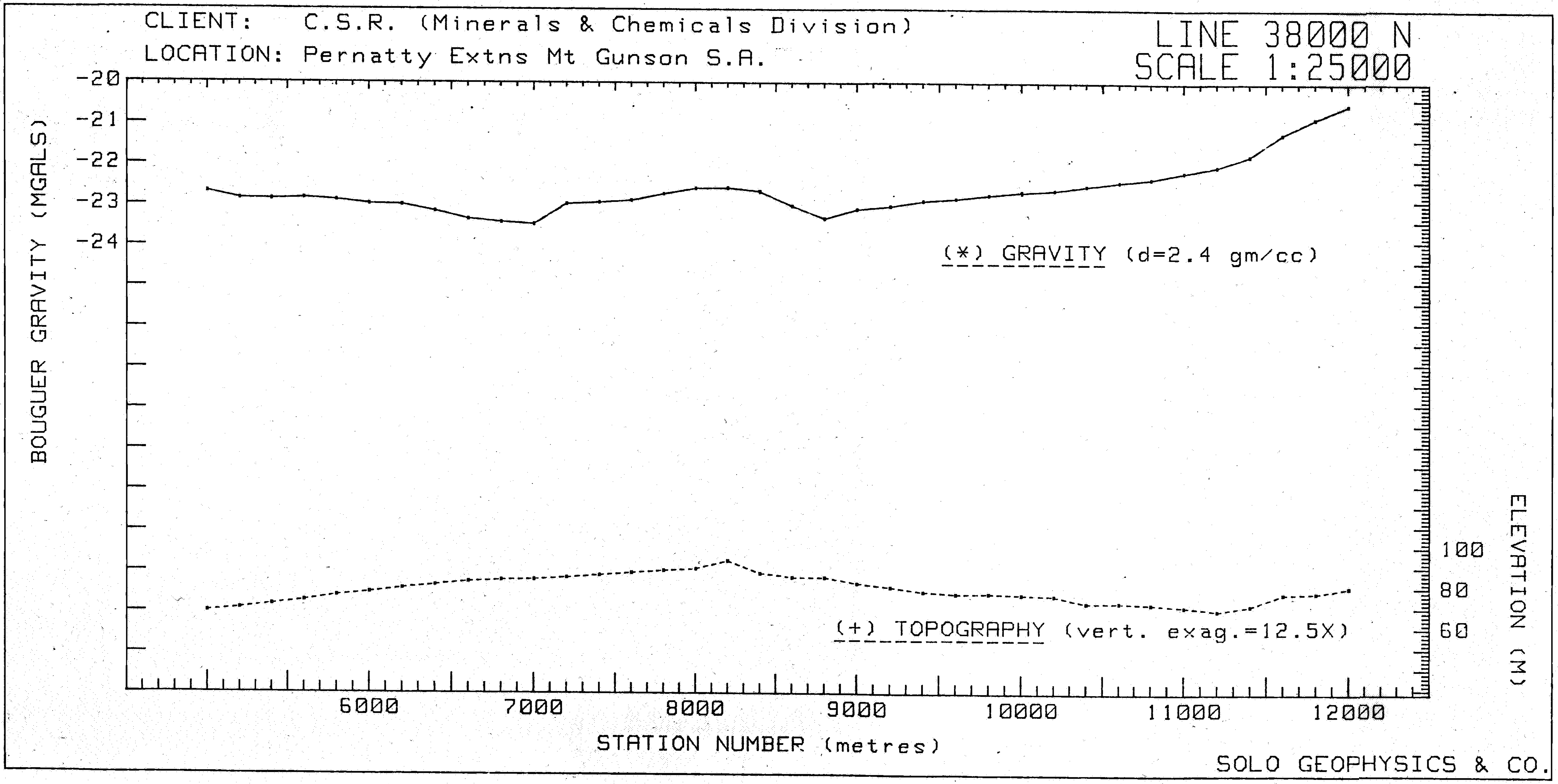


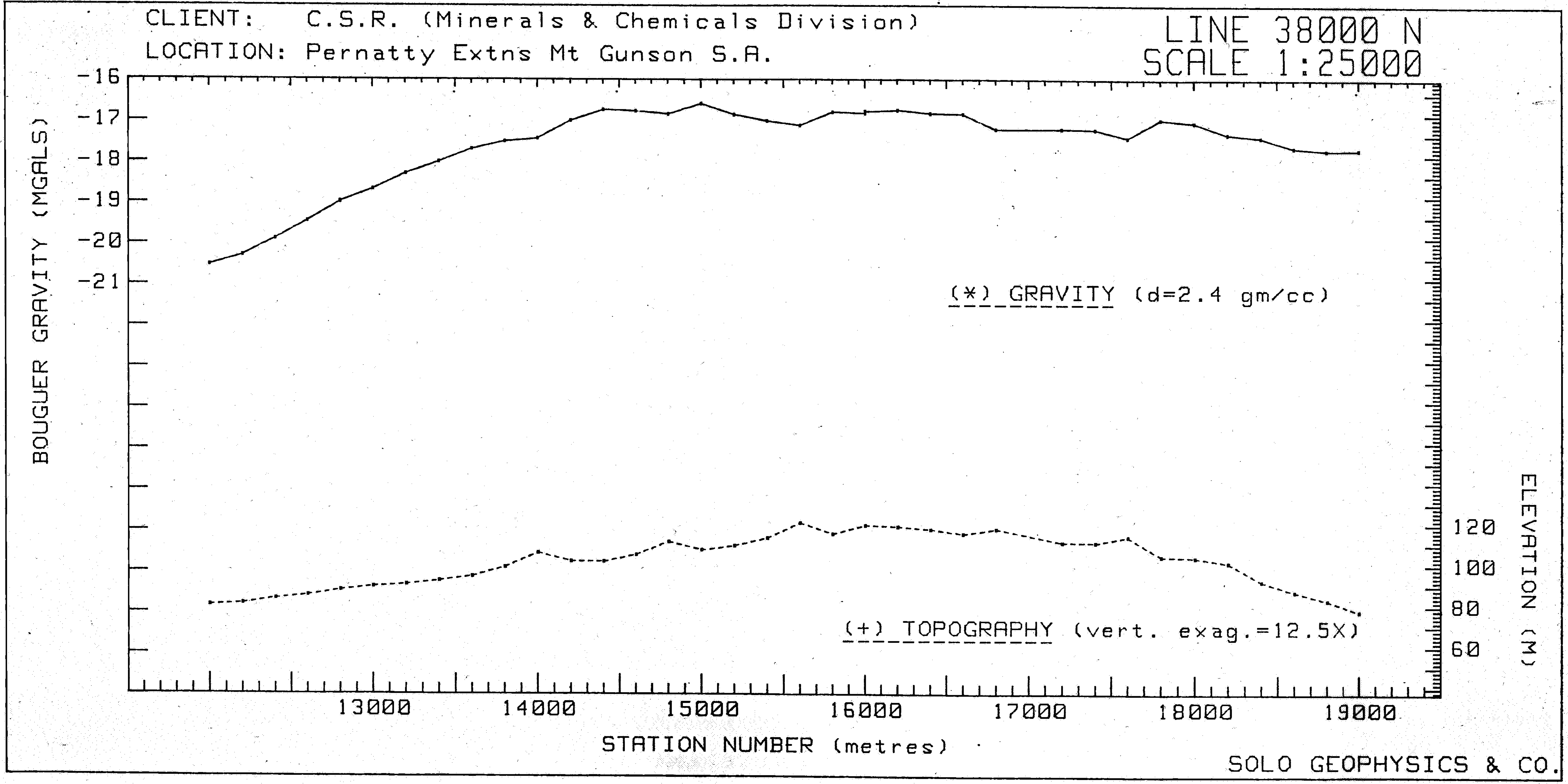
SOLO GEOPHYSICS & CO.


CLIENT: C.S.R. (Minerals & Chemicals Division)
LOCATION: Pernatty Extns Mt Gunson S.A.
LINE 34000 N
SCALE 1:25000
BOUGUER GRAVITY (MGALS)
-13
-14
-15
-16
-17
-18
(*) GRAVITY (d=2.4 gm/cc)
(+) TOPOGRAPHY (vert. exag.=12.5X)
100
80
60
ELEVATION (M)
11000
12000
13000
14000
15000
16000
17000
18000
19000
STATION NUMBER (metres)
SOLO GEOPHYSICS & CO.


CLIENT: C.S.R. (Minerals & Chemicals Division)
LOCATION: Pernatty Extns Mt Gunson S.A.
LINE 37000 N
SCALE 1:25000
BOUGUER GRAVITY (MGALS)
-19
-20
-21
-22
-23
(*) GRAVITY (d=2.4 gm/cc)
(+) TOPOGRAPHY (vert. exag.=12.5X)
120
100
80
60
ELEVATION (M)
5000
6000
7000
8000
9000
10000
11000
12000
STATION NUMBER (metres)
SOLO GEOPHYSICS & CO.


CLIENT: C.S.R. (Minerals & Chemicals Division)
LOCATION: Pernatty Extns Mt Gunson S.A.
LINE 37000 N
SCALE 1:25000
BOUGUER GRAVITY (MGALS)
-15
-16
-17
-18
-19
-20
(*) GRAVITY (d=2.4 gm/cc)
(+) TOPOGRAPHY (vert. exag.=12.5X)
P
220
200
180
160
140
120
100
80
60
ELEVATION (M)
13000
14000
15000
16000
17000
18000
19000
STATION NUMBER (metres)
SOLO GEOPHYSICS & CO.

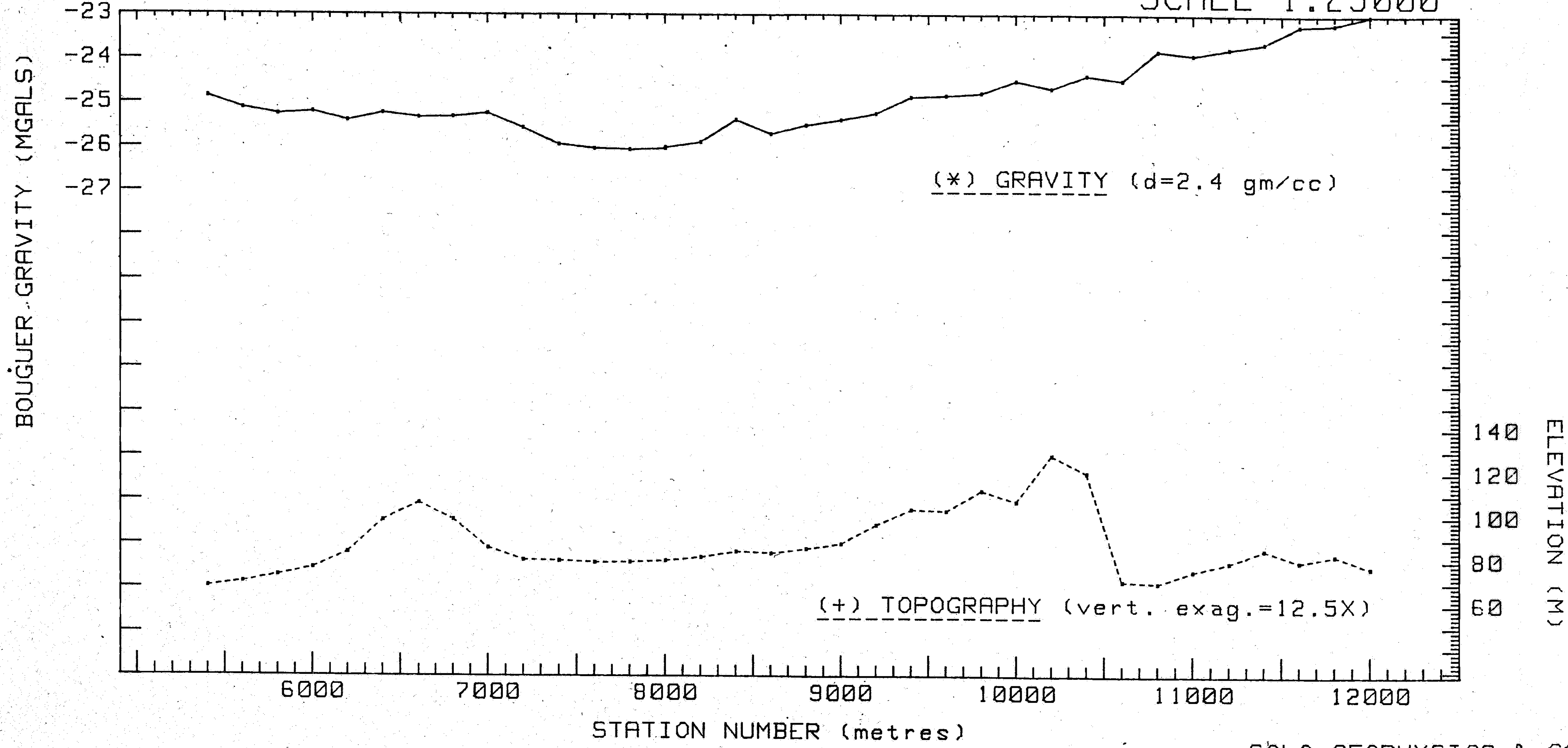

CLIENT: C.S.R. (Minerals & Chemicals Division)
LOCATION: Pernatty Extns Mt Gunson S.A.
LINE 38000 N
SCALE 1:25000
BOUGUER GRAVITY (MGALS)
-20
-21
-22
-23
-24
(*) GRAVITY (d=2.4 gm/cc)
(+) TOPOGRAPHY (vert. exag.=12.5X)
100
80
60
ELEVATION (M)
6000
7000
8000
9000
10000
11000
12000
STATION NUMBER (metres)
SOLO GEOPHYSICS & CO.



CLIENT: C.S.R. (Minerals & Chemicals Division)
LOCATION: Pernatty Extns Mt Gunson S.A.
LINE 38000 N
SCALE 1:25000
BOUGUER GRAVITY (MGALS)
-16
-17
-18
-19
-20
-21
(*) GRAVITY (d=2.4 gm/cc)
(+) TOPOGRAPHY (vert. exag.=12.5X)
120
100
80
60
ELEVATION (M)
13000
14000
15000
16000
17000
18000
19000
STATION NUMBER (metres)
SOLO GEOPHYSICS & CO.

CLIENT: C.S.R. (Minerals & Chemicals Division)
LOCATION: Pernatty Extns Mt Gunson S.A.

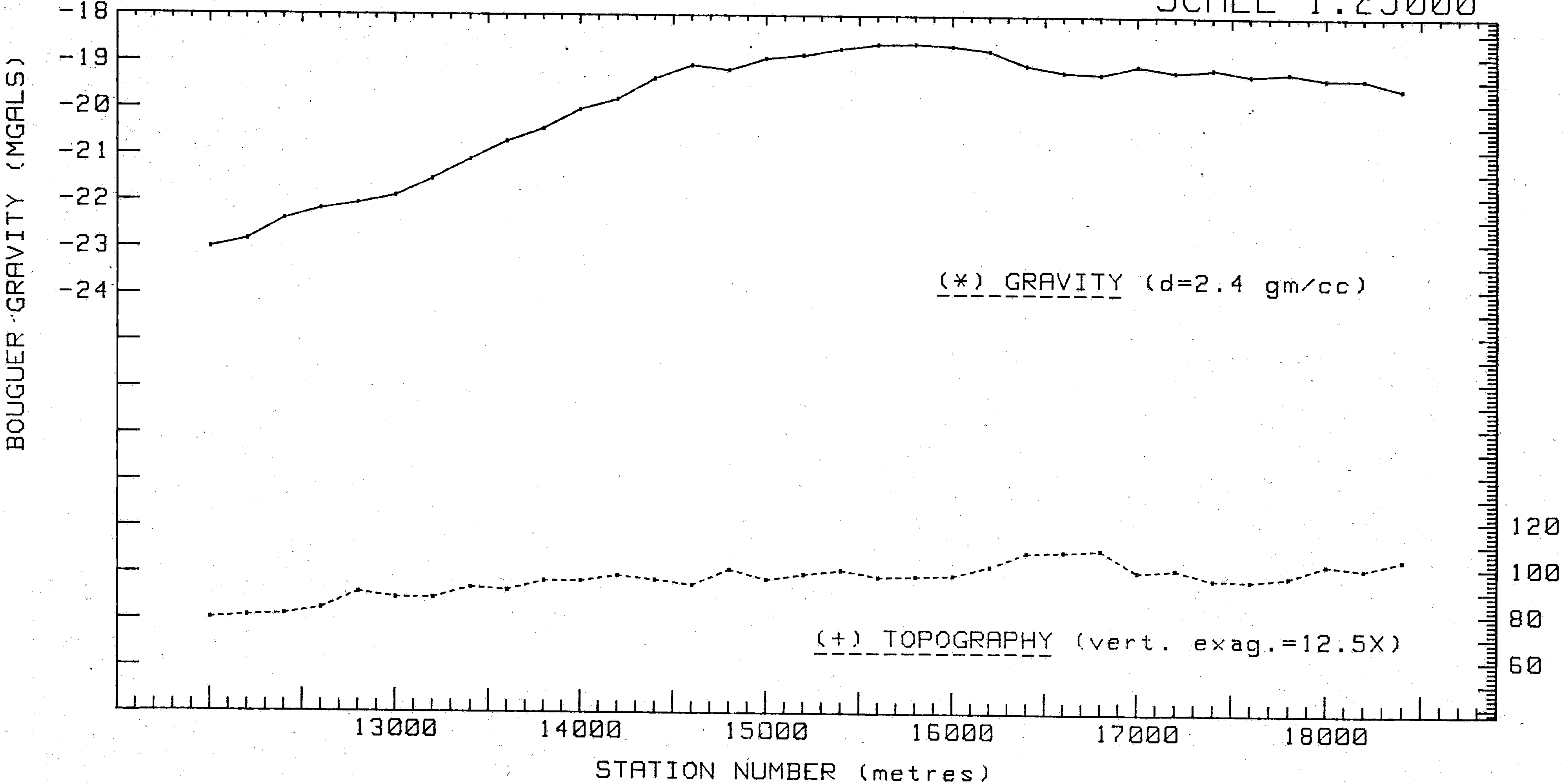
LINE 40000 N
SCALE 1:25000



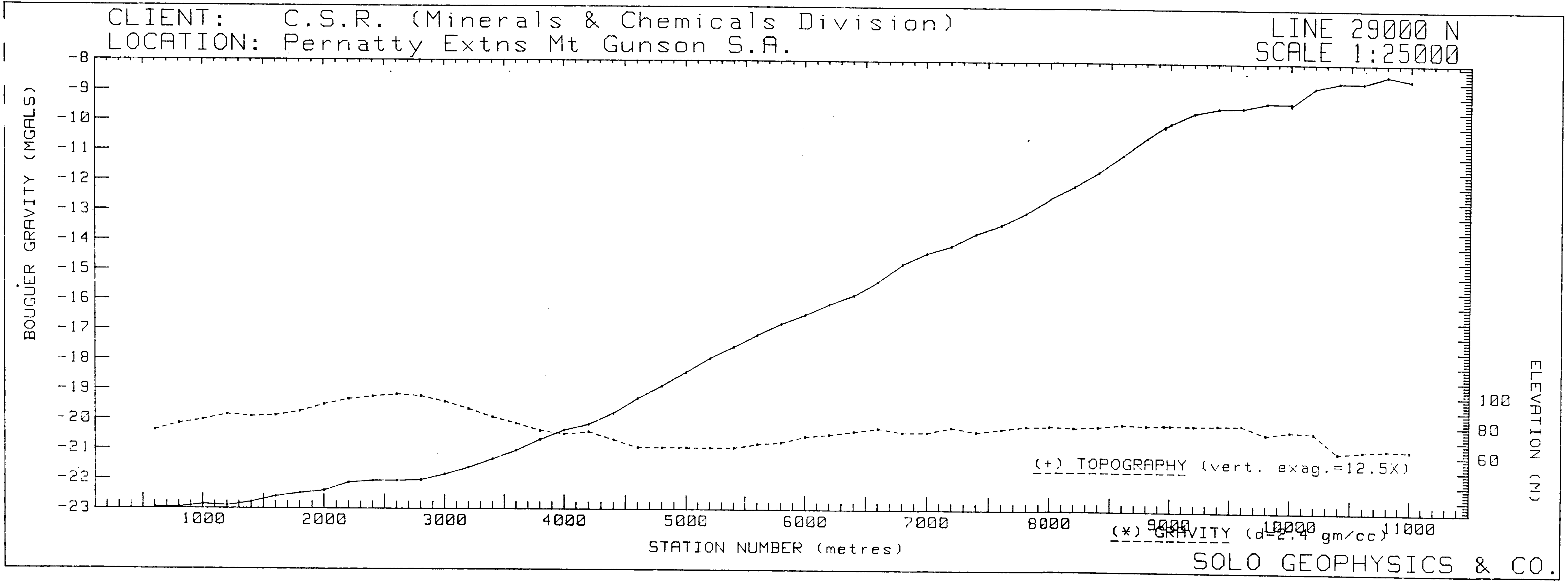
SOLO GEOPHYSICS & CO.

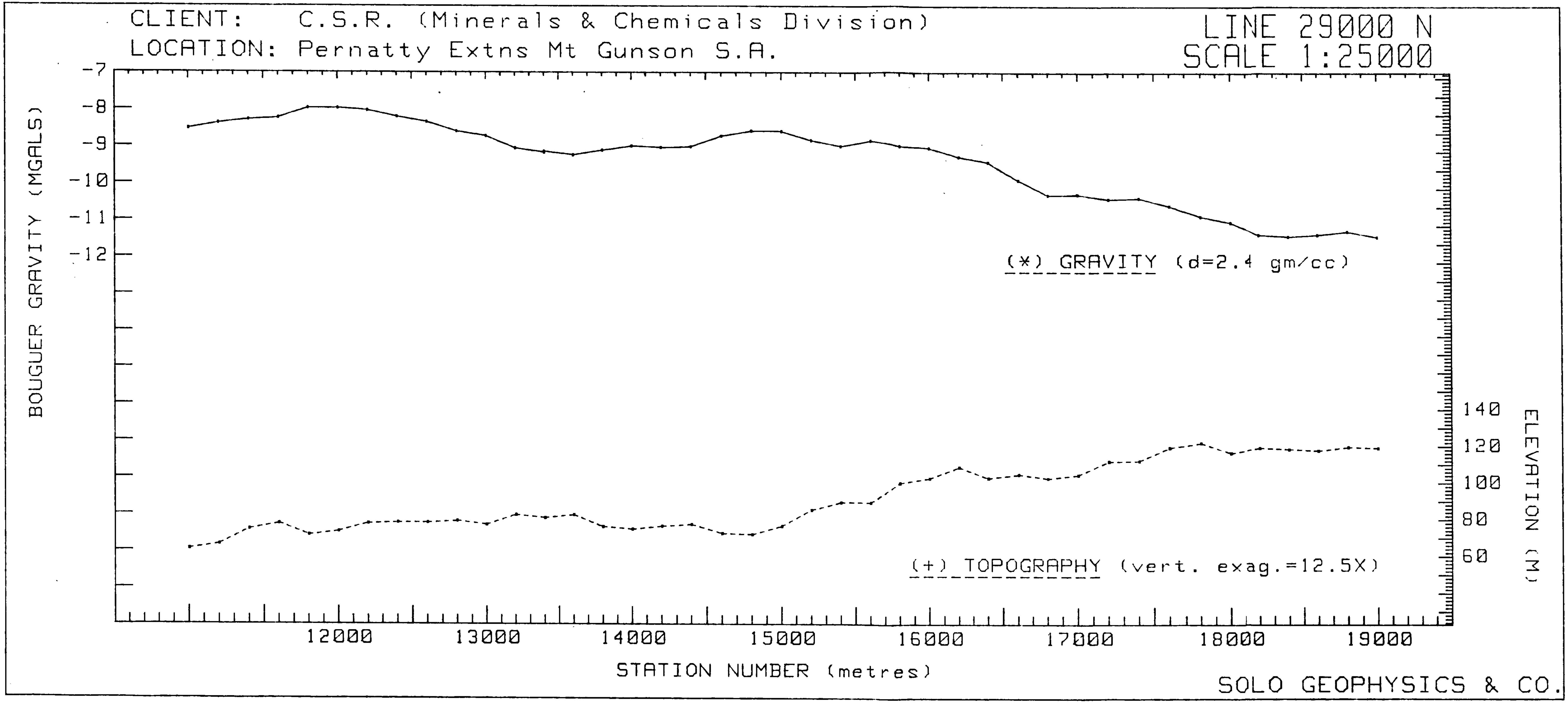
CLIENT: C.S.R. (Minerals & Chemicals Division)
LOCATION: Pernatty Extns Mt Gunson S.A.

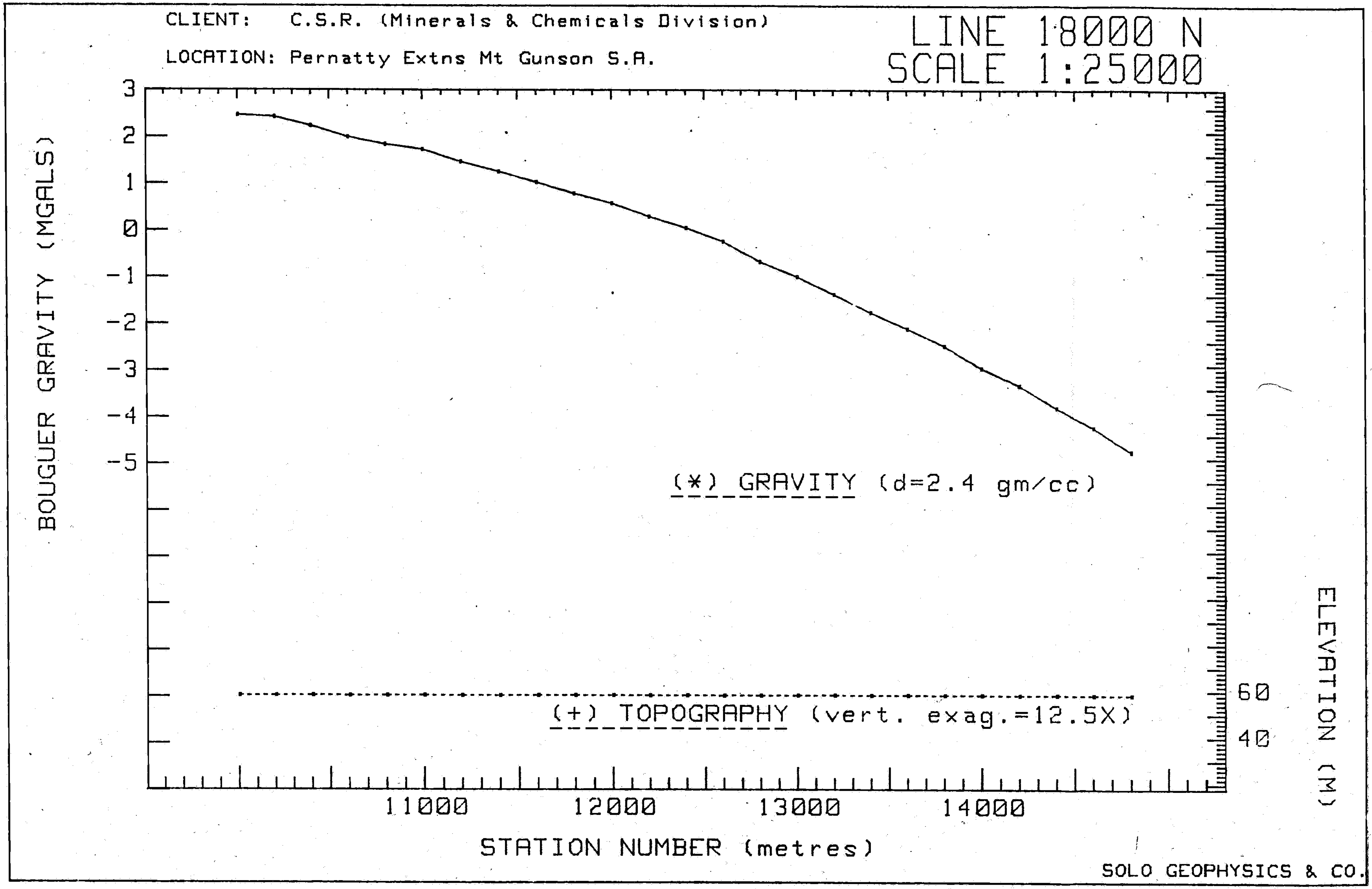
LINE 40000 N
SCALE 1:25000

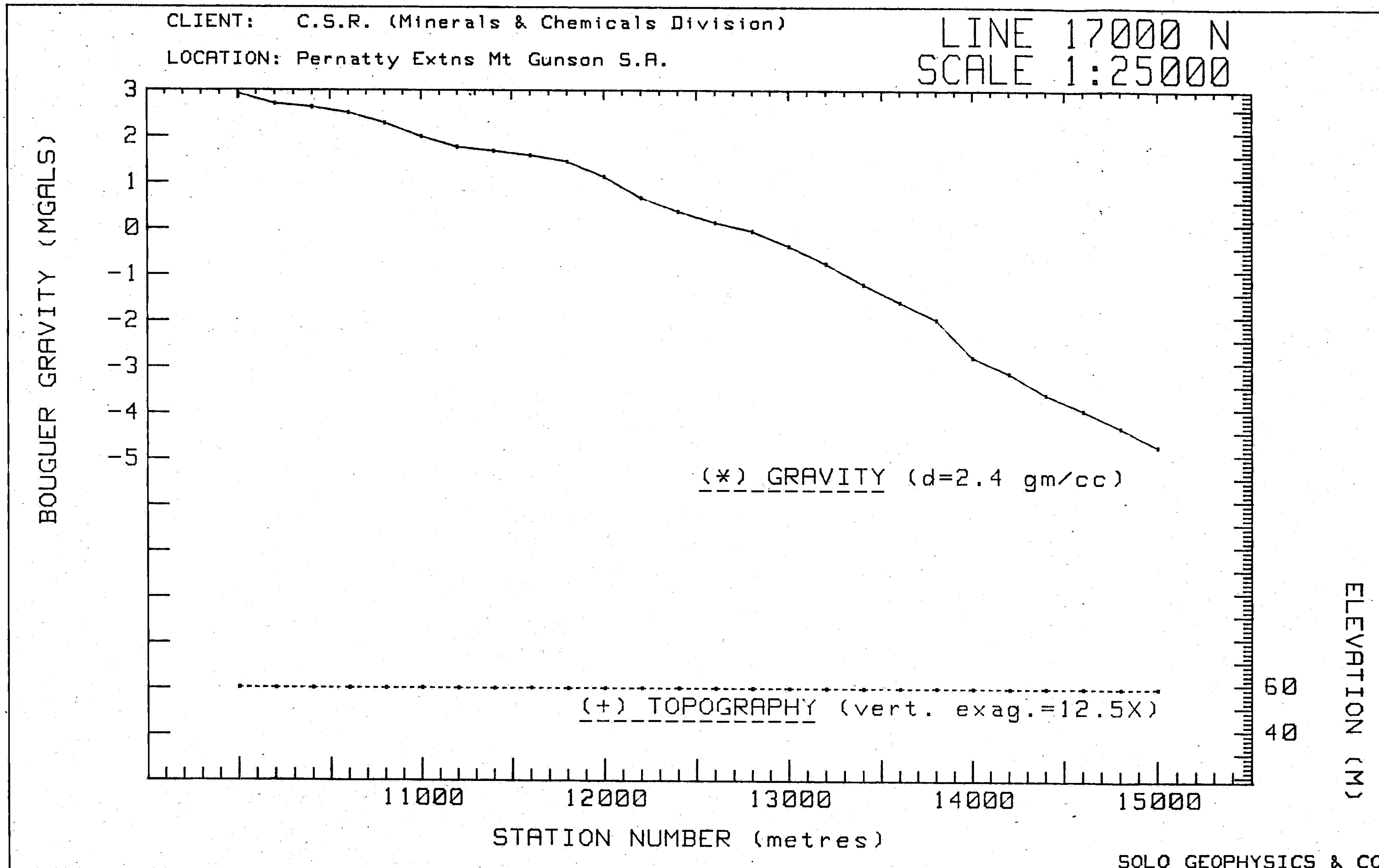


SOLO GEOPHYSICS &


CLIENT: C.S.R. (Minerals & Chemicals Division)
LOCATION: Pernatty Extns Mt Gunson S.A.
LINE 29000 N
SCALE 1:25000
BOUGUER GRAVITY (MGALS)
-8
-9
-10
-11
-12
-13
-14
-15
-16
-17
-18
-19
-20
-21
-22
-23
ELEVATION (M)
100
80
60
(+) TOPOGRAPHY (vert. exag.=12.5X)
(*) GRAVITY (d=2.4 gm/cc)
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
11000
STATION NUMBER (metres)
SOLO GEOPHYSICS & CO.

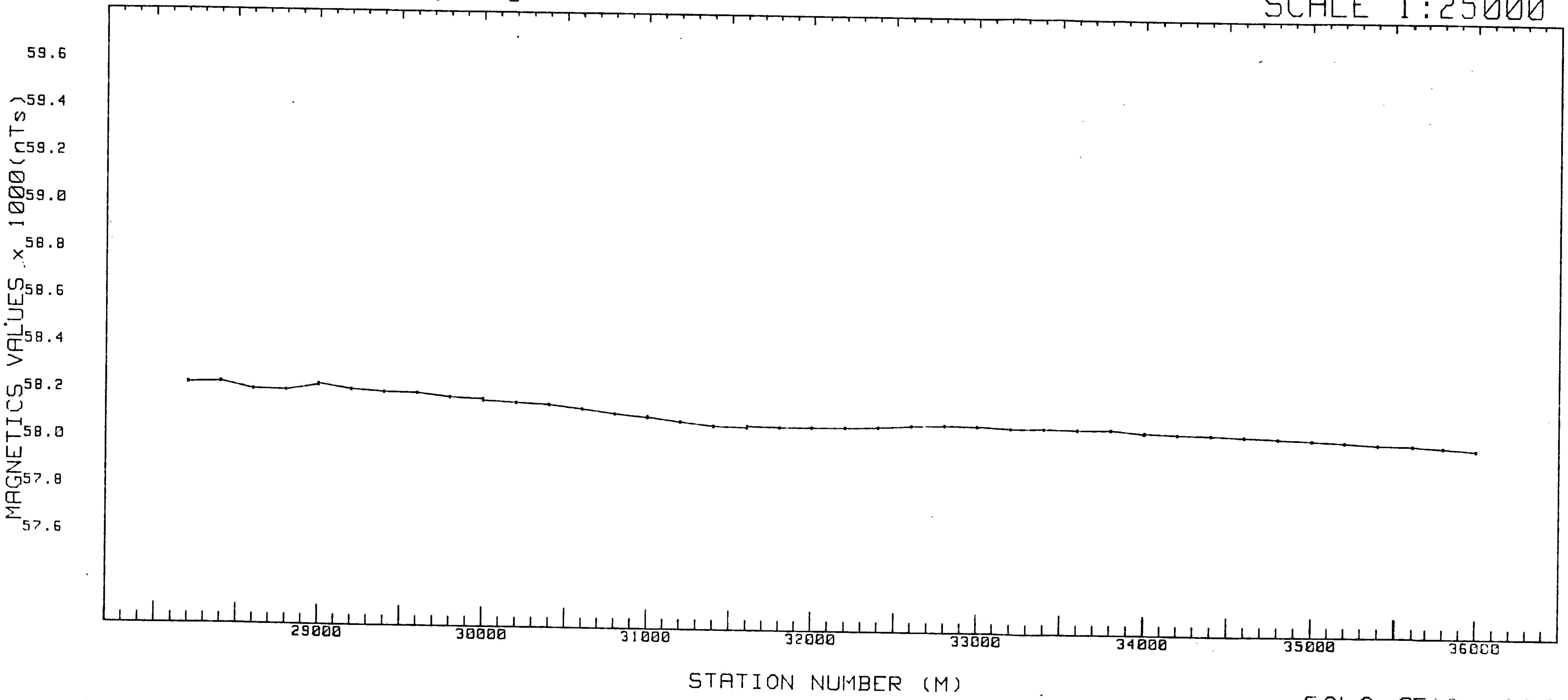

CLIENT: C.S.R. (Minerals & Chemicals Division)
LOCATION: Pernatty Extns Mt Gunson S.A.
LINE 29000 N
SCALE 1:25000
BOUGUER GRAVITY (MGALS)
-7
-8
-9
-10
-11
-12
(*) GRAVITY (d=2.4 gm/cc)
(+) TOPOGRAPHY (vert. exag.=12.5X)
140
120
100
80
60
ELEVATION (M)
12000
13000
14000
15000
16000
17000
18000
19000
STATION NUMBER (metres)
SOLO GEOPHYSICS & CO.


CLIENT: C.S.R. (Minerals & Chemicals Division)
LOCATION: Pernatty Extns Mt Gunson S.A.
LINE 18000 N
SCALE 1:25000
BOUGUER GRAVITY (MGALS)
3
2
1
0
-1
-2
-3
-4
-5
(*) GRAVITY (d=2.4 gm/cc)
(+) TOPOGRAPHY (vert. exag.=12.5X)
60
40
ELEVATION (M)
11000
12000
13000
14000
STATION NUMBER (metres)
SOLO GEOPHYSICS & CO.


CLIENT: C.S.R. (Minerals & Chemicals Division)
LOCATION: Pernatty Extns Mt Gunson S.A.
LINE 17000 N
SCALE 1:25000
BOUGUER GRAVITY (MGALS)
3
2
1
0
-1
-2
-3
-4
-5
(*) GRAVITY (d=2.4 gm/cc)
(+) TOPOGRAPHY (vert. exag.=12.5X)
60
40
ELEVATION (M)
11000
12000
13000
14000
15000
STATION NUMBER (metres)
SOLO GEOPHYSICS & CO.

CLIENT: C.S.R. (Minerals & Chemicals Division)
LOCATION: Pernatty Lagoon S.A.

LINE 10000E
SCALE 1:25000

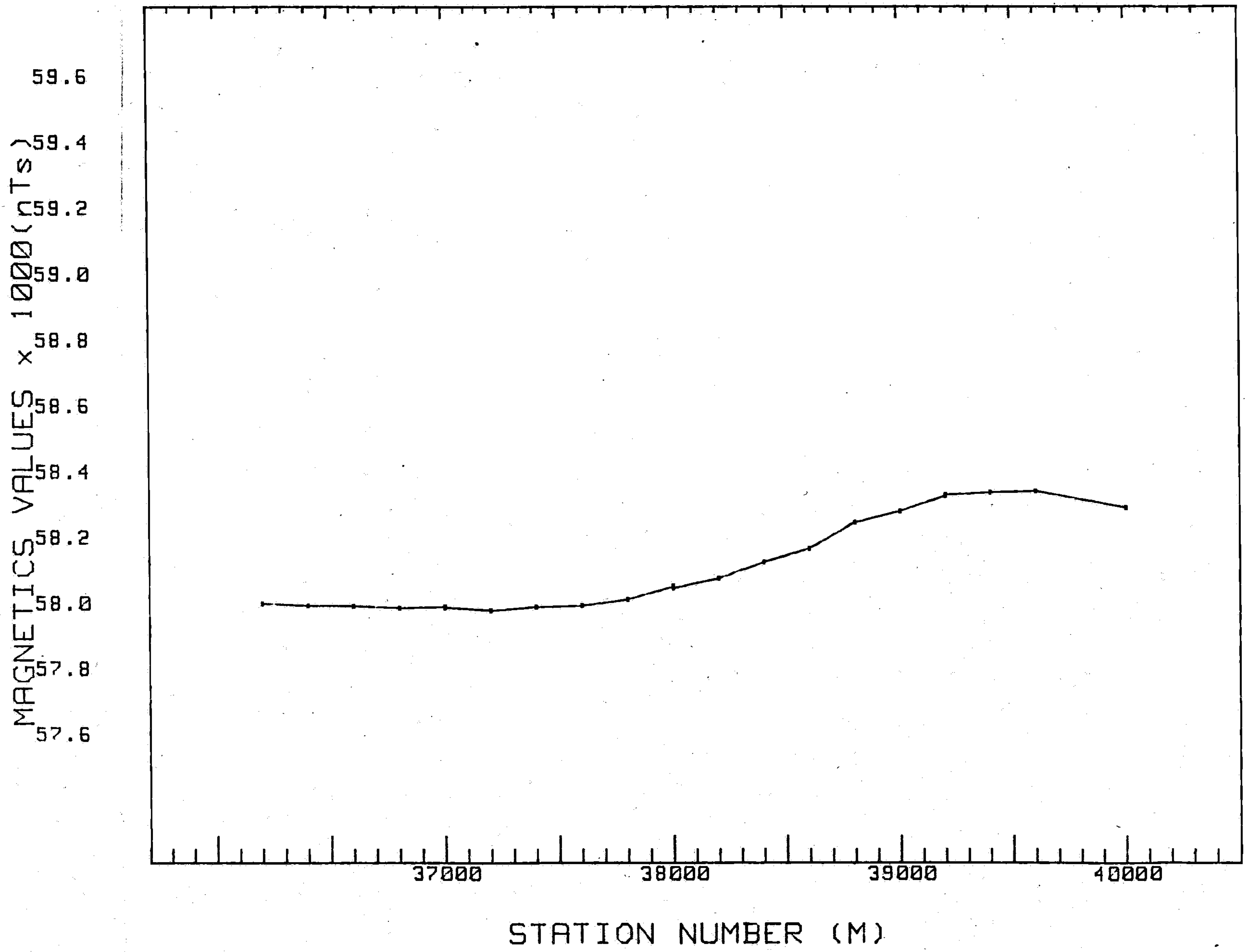


SOLO GE[illegible]CS & CO.

CLIENT: C.S.R. (Minerals & Chemicals Division)

LOCATION: Pernatty Lagoon S.A.

LINE 10000E
SCALE 1:25000

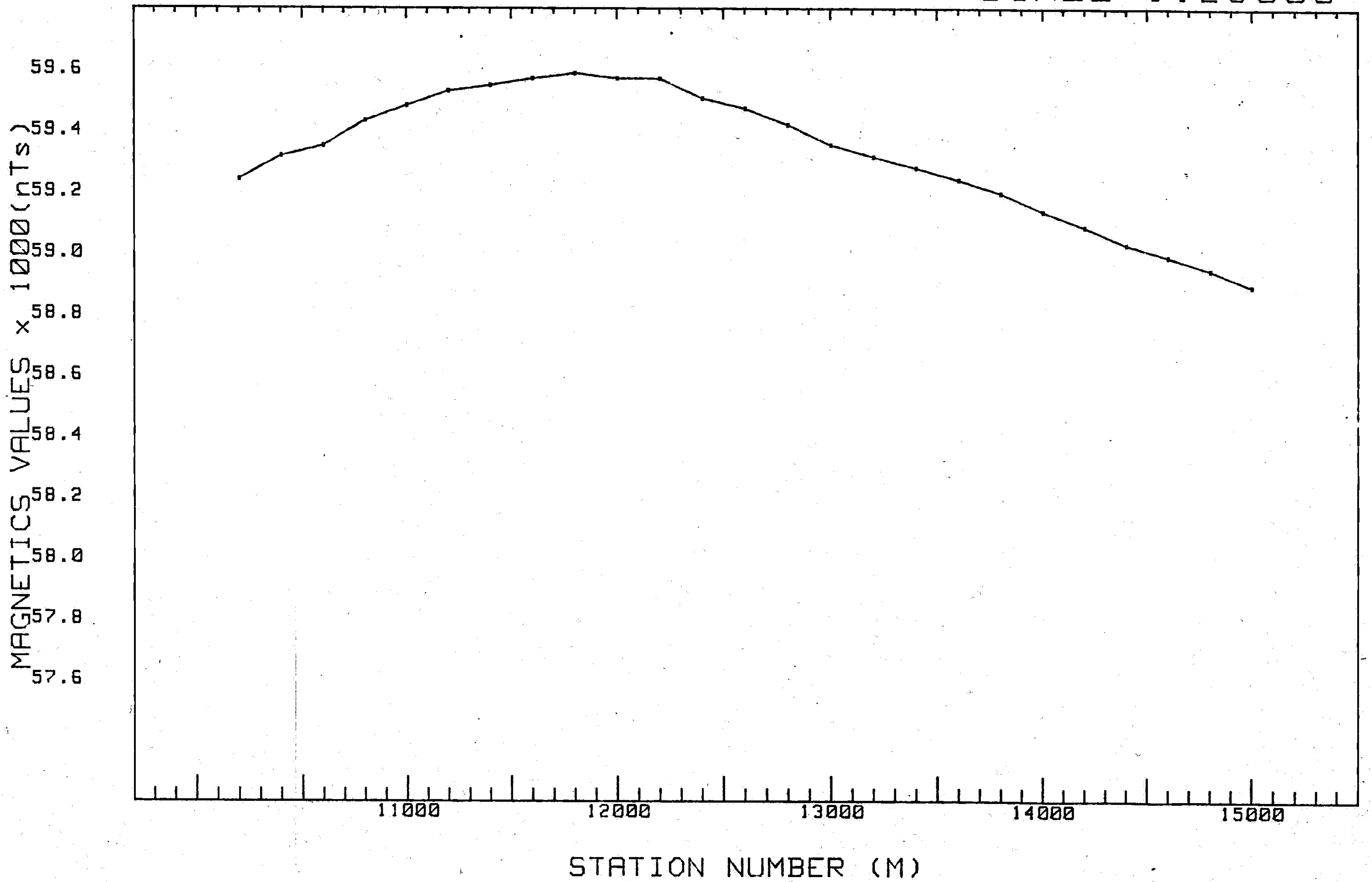


SOLO GEOPHYSICS & CO.

CLIENT: C.S.R. (Minerals & Chemicals Division)

LOCATION: Pernatty Lagoon S.A.

LINE 17000N
SCALE 1:25000

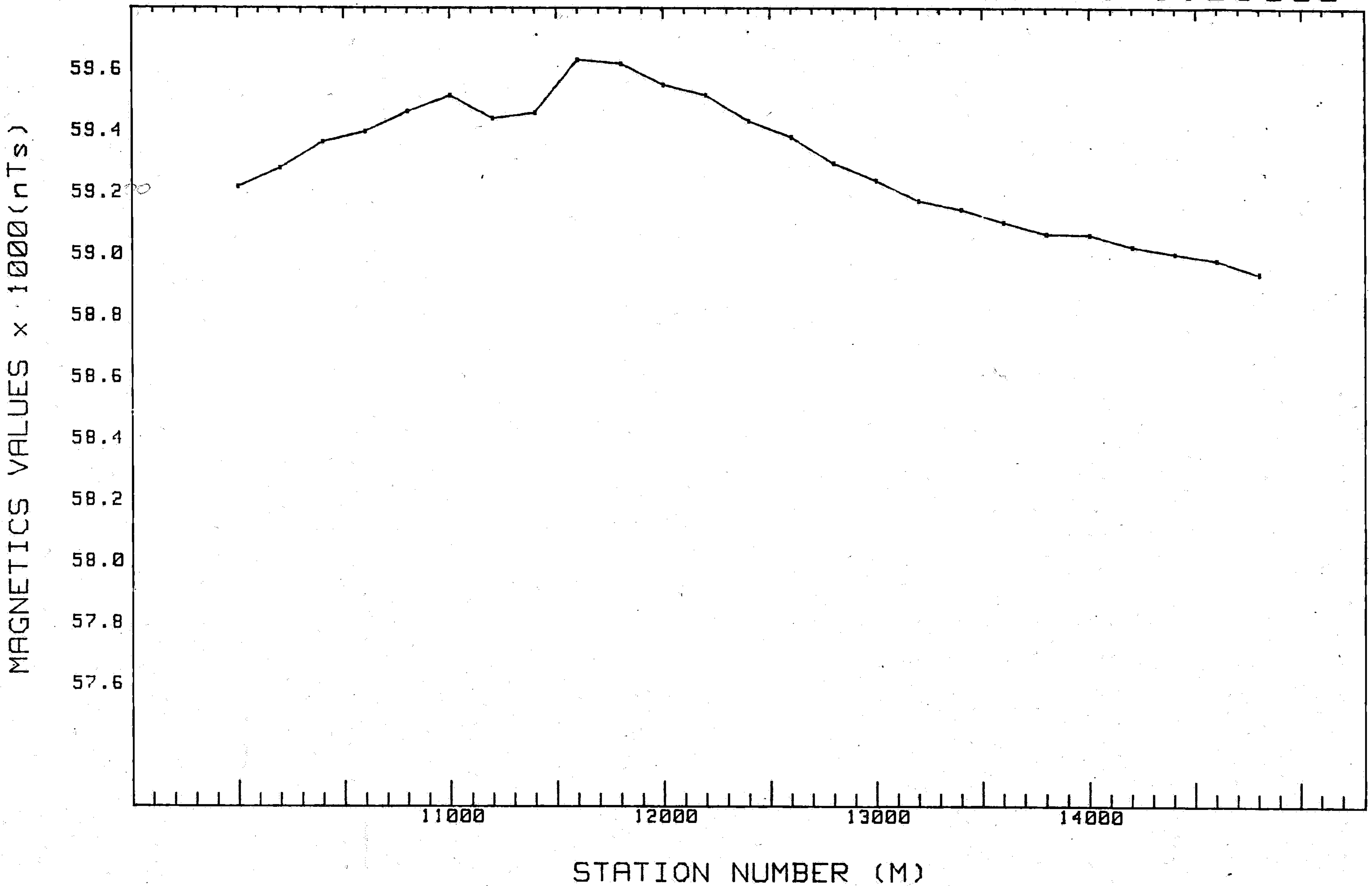


SOLO GEOPHYSICS & CO.

CLIENT: C.S.R. (Minerals & Chemicals Division)

LOCATION: Pernatty Lagoon S.A.

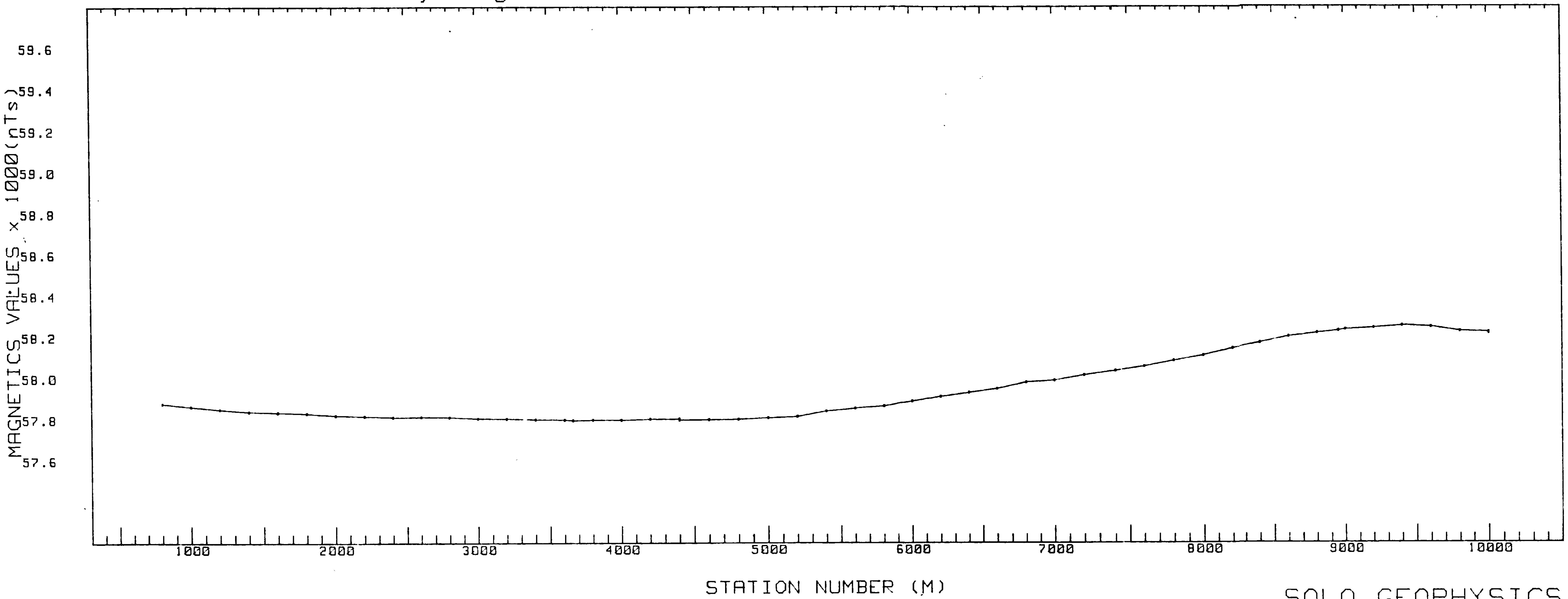
LINE 18000N
SCALE 1:25000



SOLO GEOPHYSICS & CO.

CLIENT: C.S.R. (Minerals & Chemicals Division)
LOCATION: Pernatty Lagoon S.A.

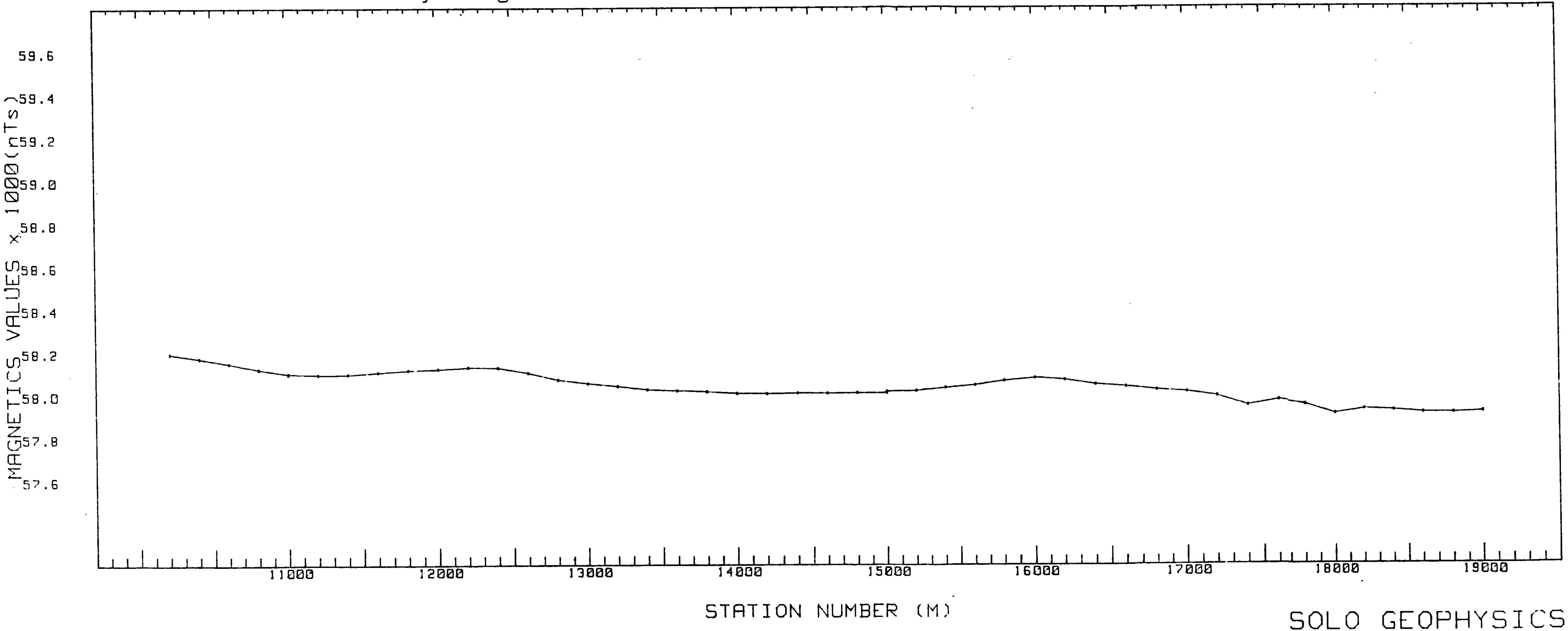
LINE 29000N
SCALE 1:25000



SOLO GEOPHYSICS & CO.

CLIENT: C.S.R. (Minerals & Chemicals Division)
LOCATION: Pernatty Lagoon S.A.

LINE 29000N
SCALE 1:25000

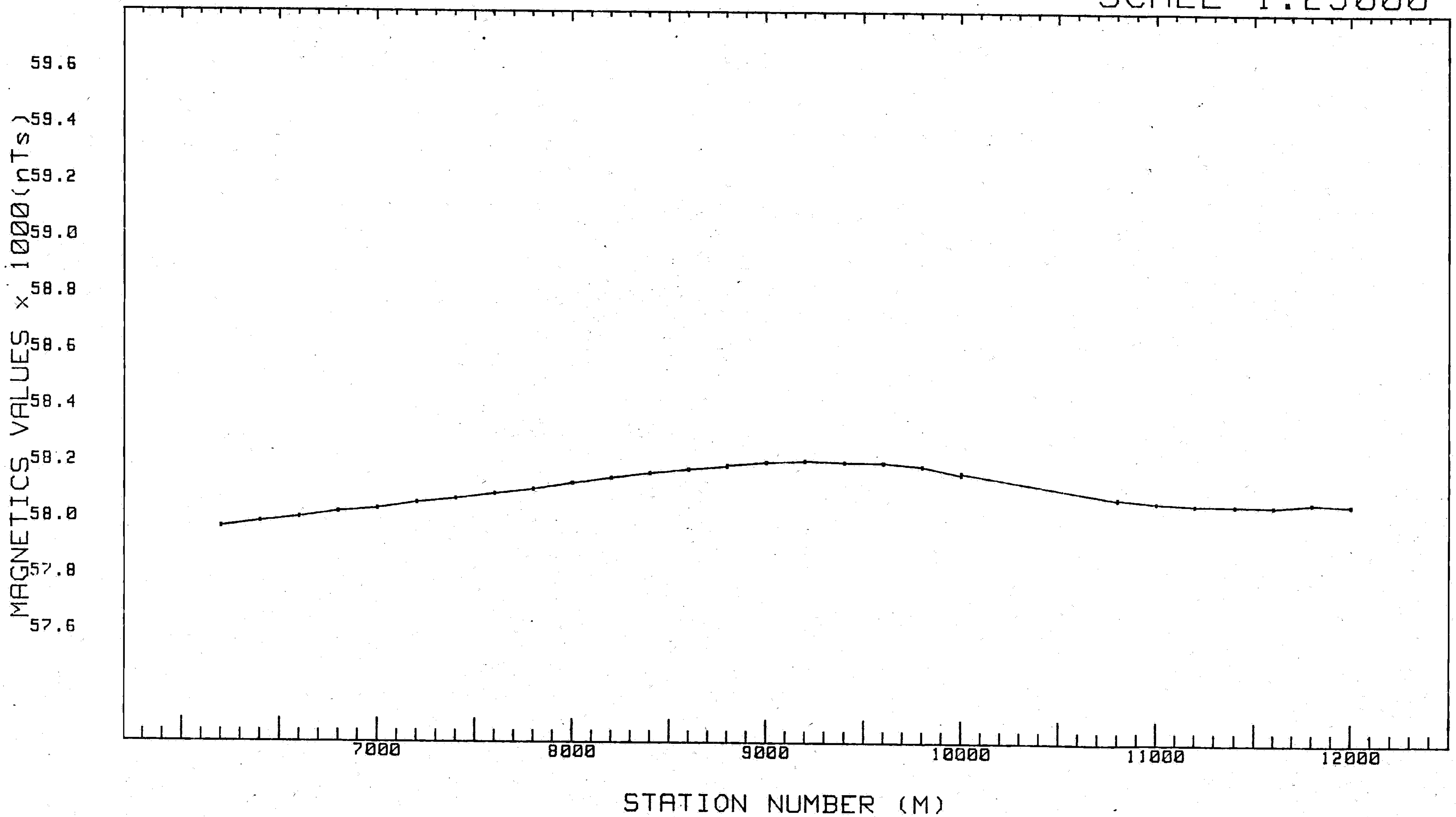


SOLO GEOPHYSICS & CO.

CLIENT: C.S.R. (Minerals & Chemicals Division)

LOCATION: Pernatty Lagoon S.A.

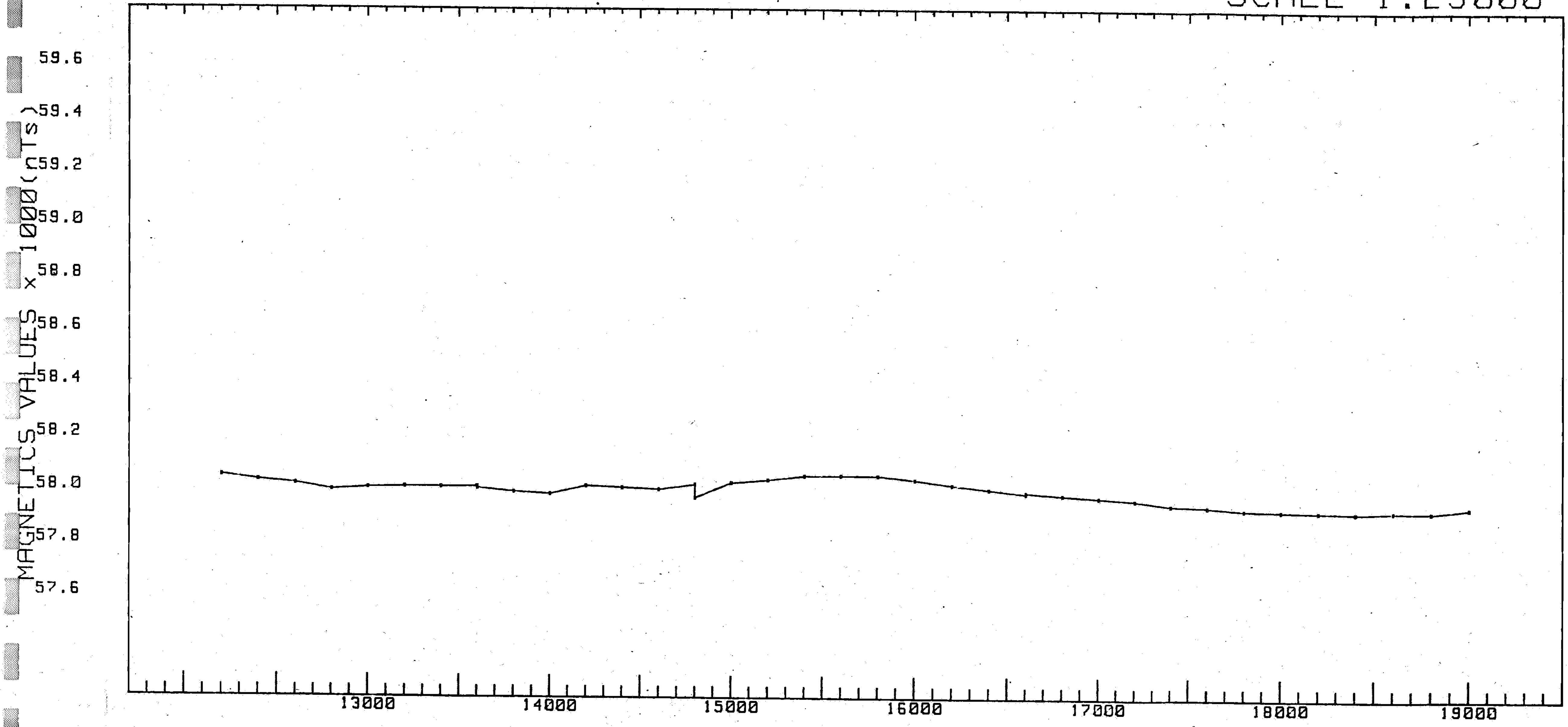
LINE 30000N
SCALE 1:25000



SOLO GEOPHYSICS &

CLIENT: C.S.R. (Minerals & Chemicals Division)
LOCATION: Pernatty Lagoon S.A.

LINE 30000N
SCALE 1:25000

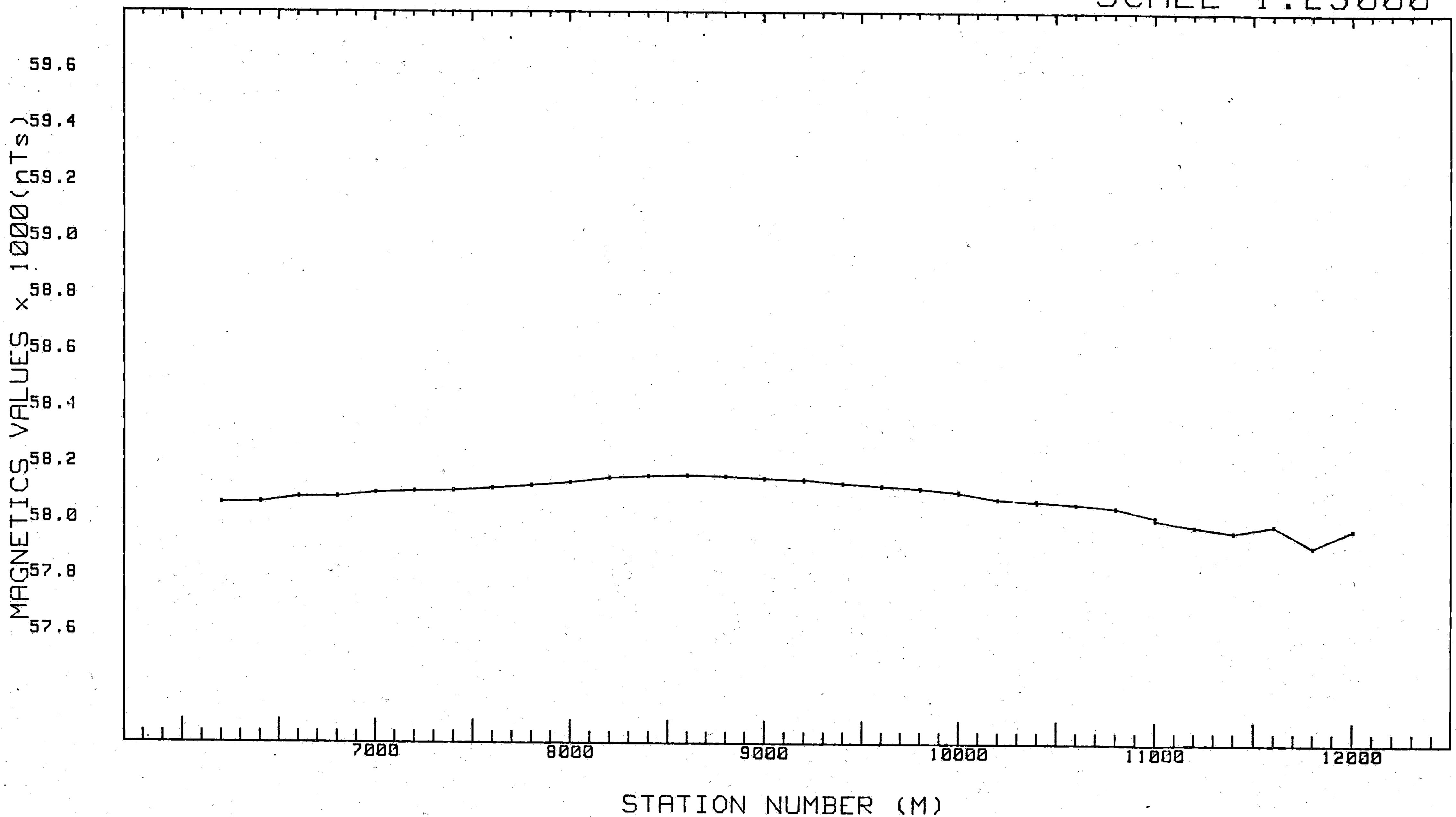


SOLO GEOPHYSICS

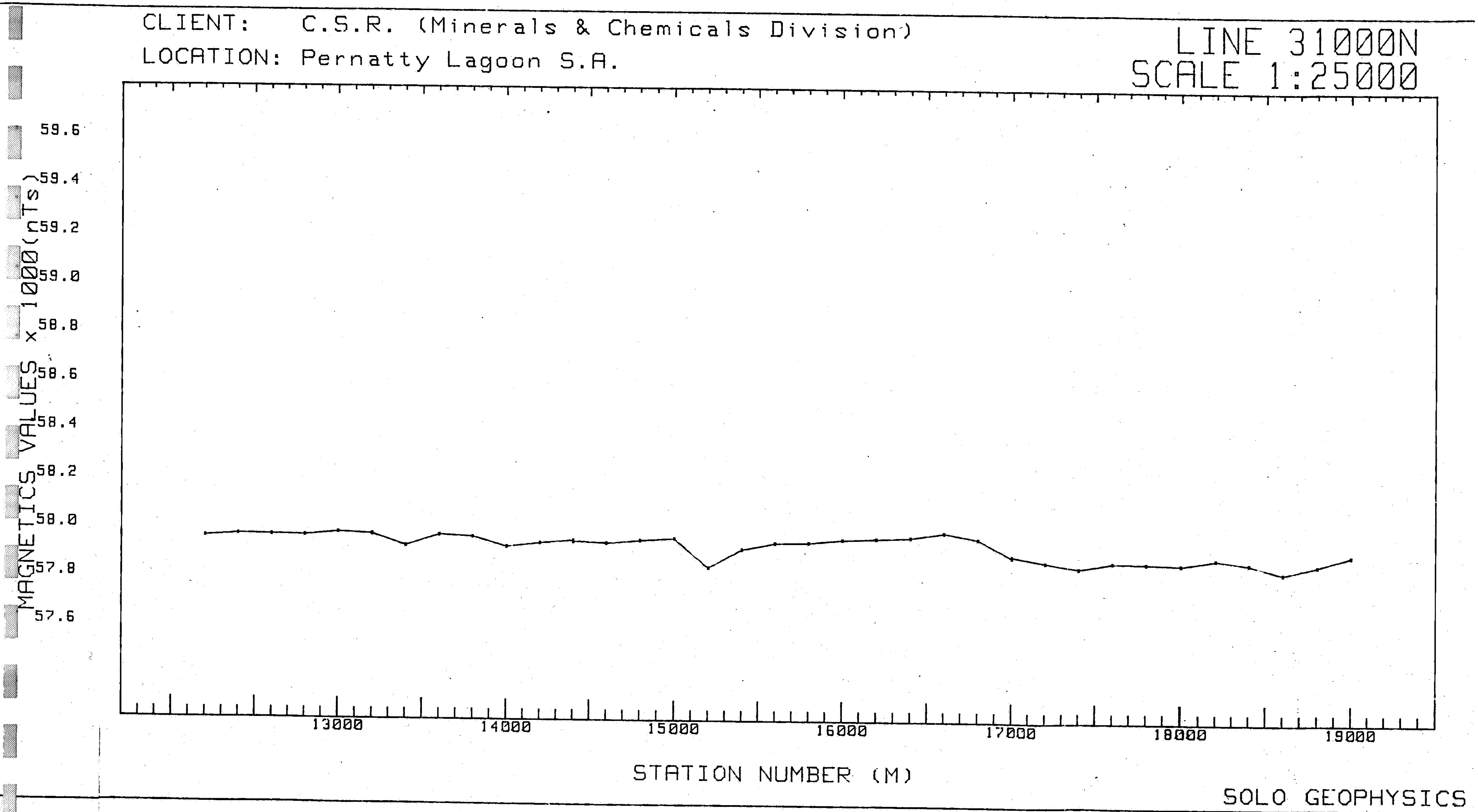
CLIENT: C.S.R. (Minerals & Chemicals Division)

LOCATION: Pernatty Lagoon S.A.

LINE 31000N
SCALE 1:25000

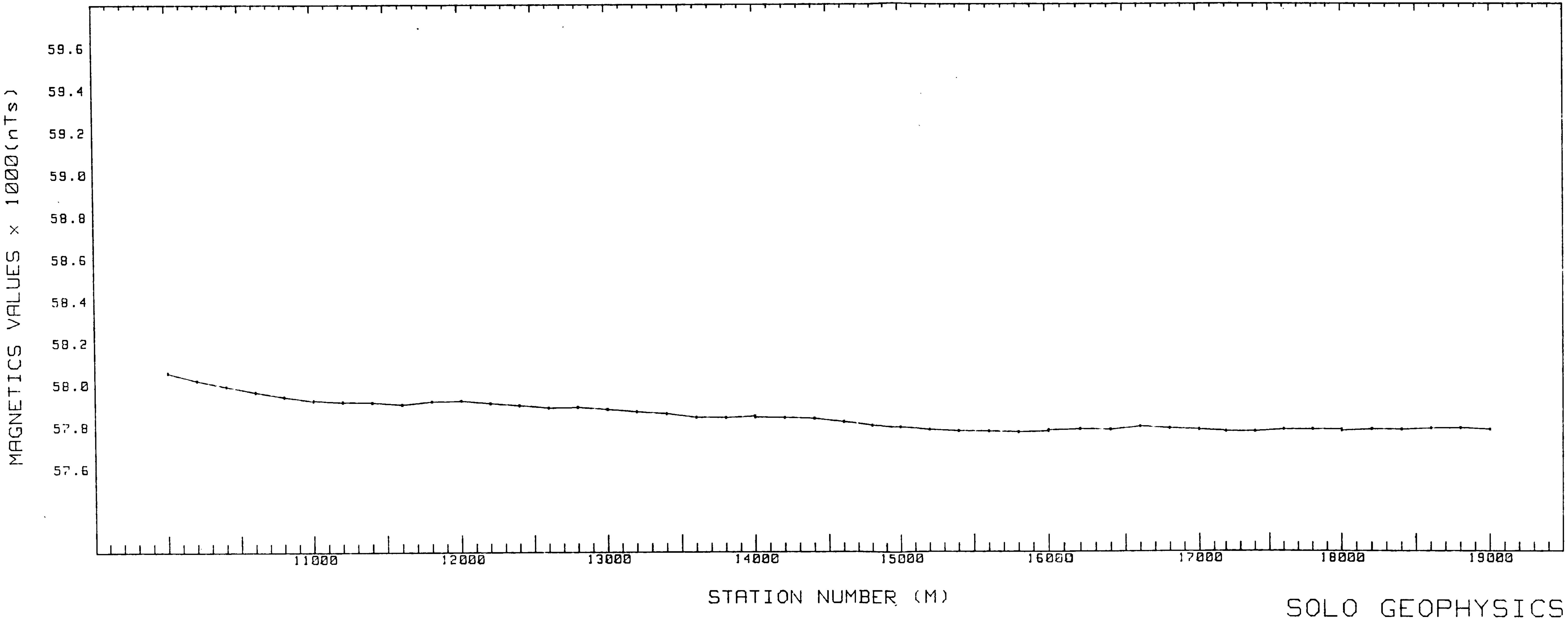


SOLO GEOPHYSICS & C(


CLIENT: C.S.R. (Minerals & Chemicals Division)
LOCATION: Pernatty Lagoon S.A.
LINE 31000N
SCALE 1:25000
MAGNETICS VALUES x 1000 (nTs)
59.6
59.4
59.2
59.0
58.8
58.6
58.4
58.2
58.0
57.8
57.6
13000
14000
15000
16000
17000
18000
19000
STATION NUMBER (M)
SOLO GEOPHYSICS

CLIENT: C.S.R. (Minerals & Chemicals Division)
LOCATION: Pernatty Lagoon S.A.

LINE 34000N
SCALE 1:25000



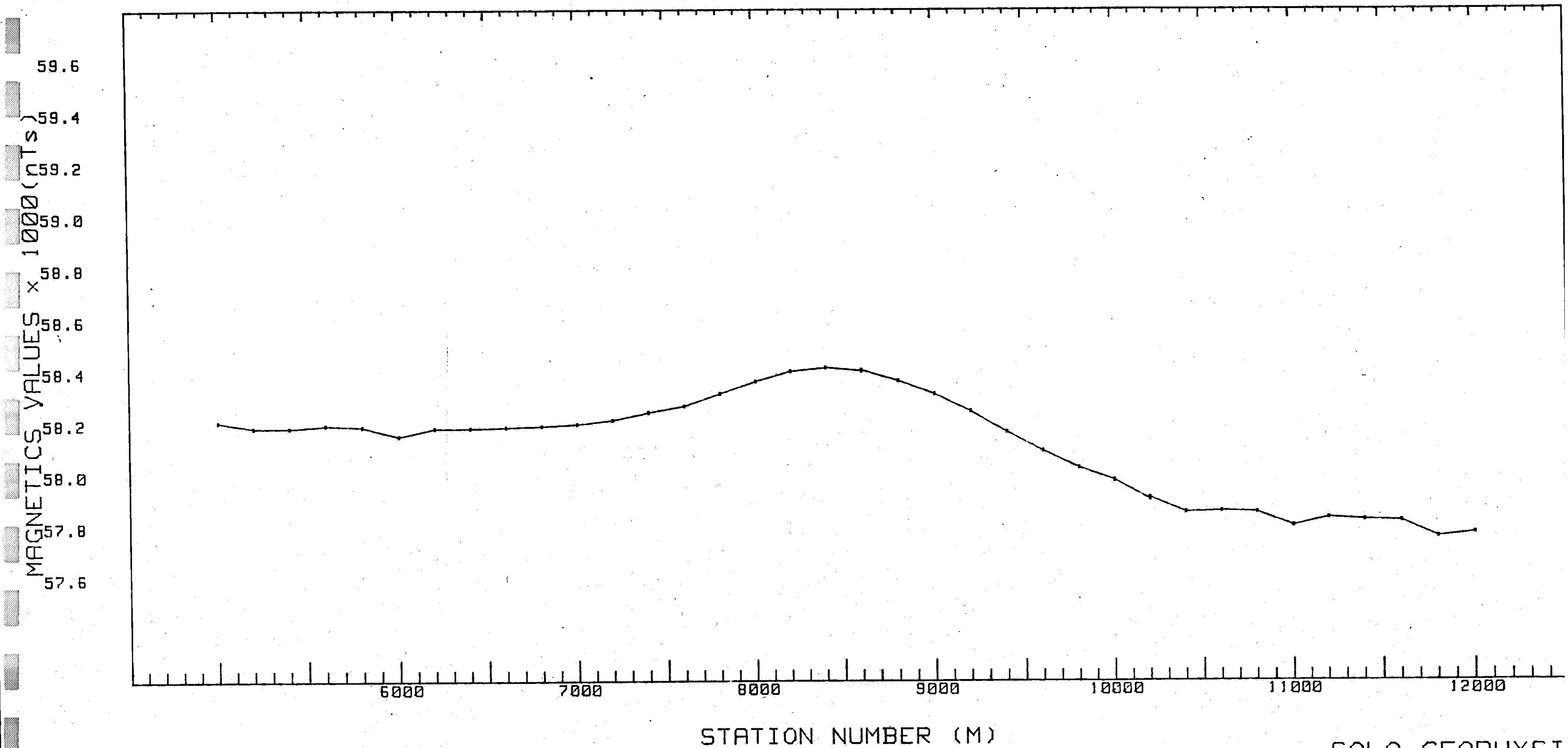
SOLO GEOPHYSICS & CO.

CLIENT: C.S.R. (Minerals & Chemicals Division)

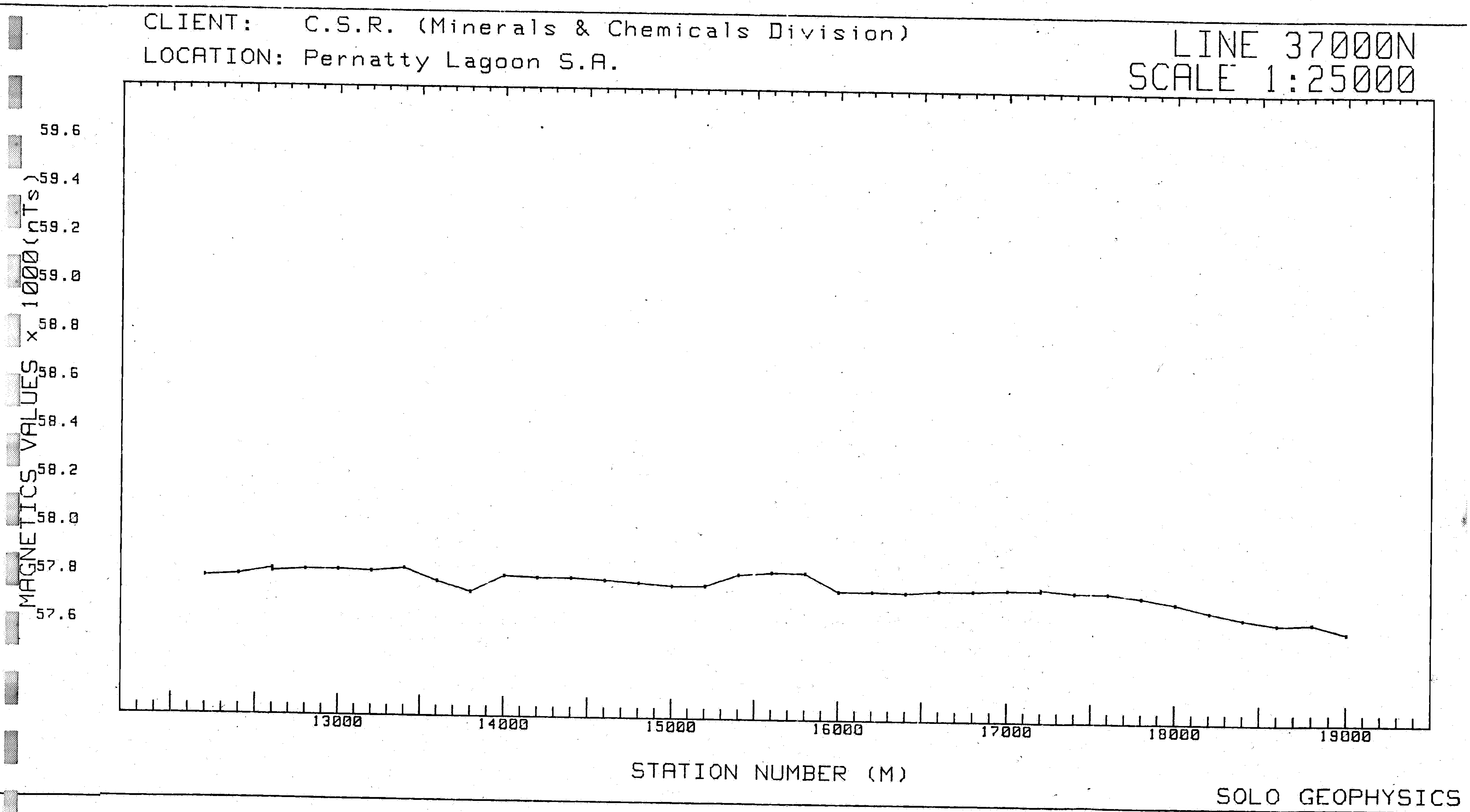
LOCATION: Pernatty Lagoon S.A.

LINE 37000N

SCALE 1:25000



SOLO GEOPHYSI

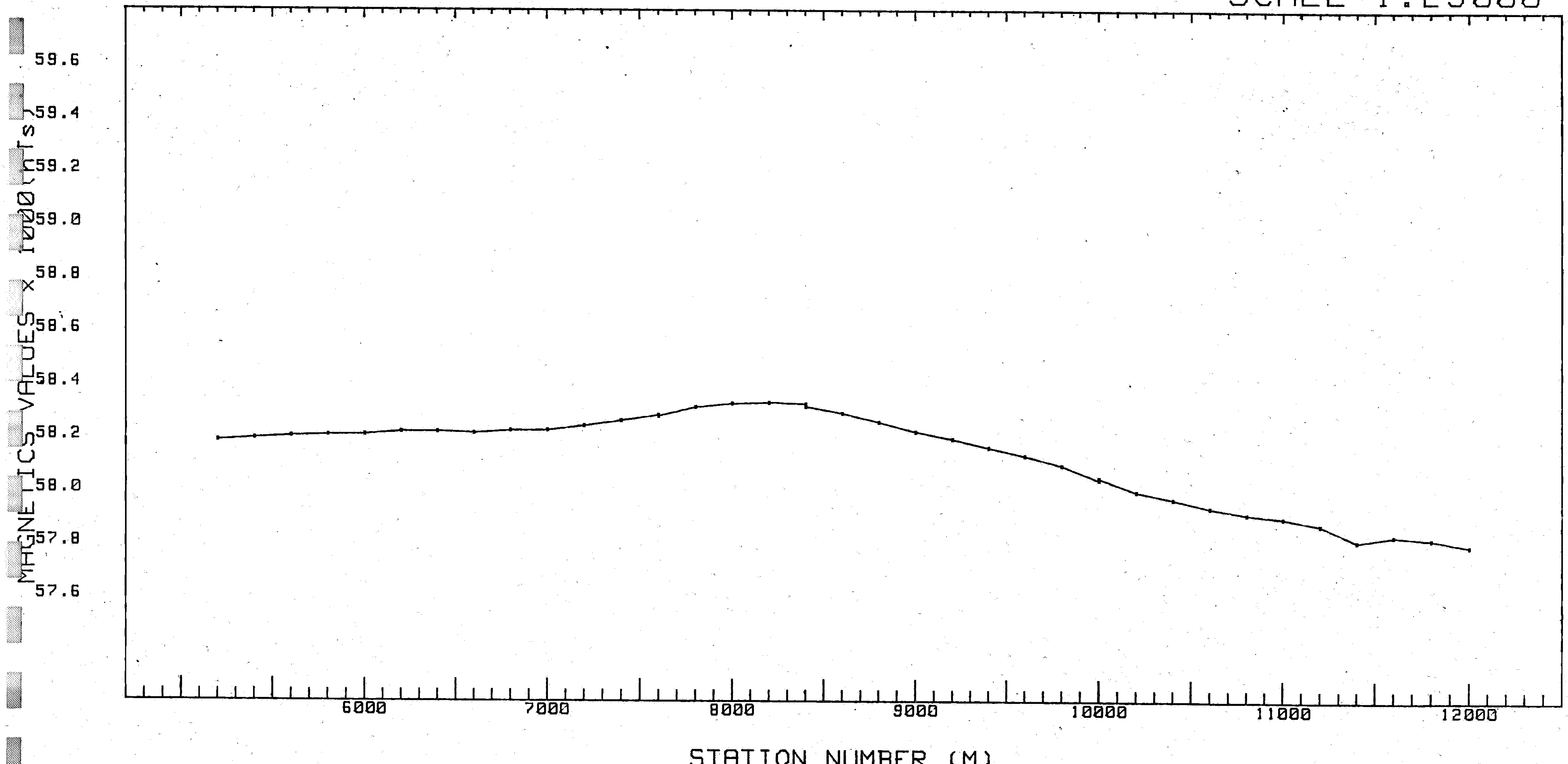

CLIENT: C.S.R. (Minerals & Chemicals Division)
LOCATION: Pernatty Lagoon S.A.
LINE 37000N
SCALE 1:25000
MAGNETICS VALUES x 1000(nTs)
59.6
59.4
59.2
59.0
58.8
58.6
58.4
58.2
58.0
57.8
57.6
13000
14000
15000
16000
17000
18000
19000
STATION NUMBER (M)
SOLO GEOPHYSICS

CLIENT: C.S.R. (Minerals & Chemicals Division)

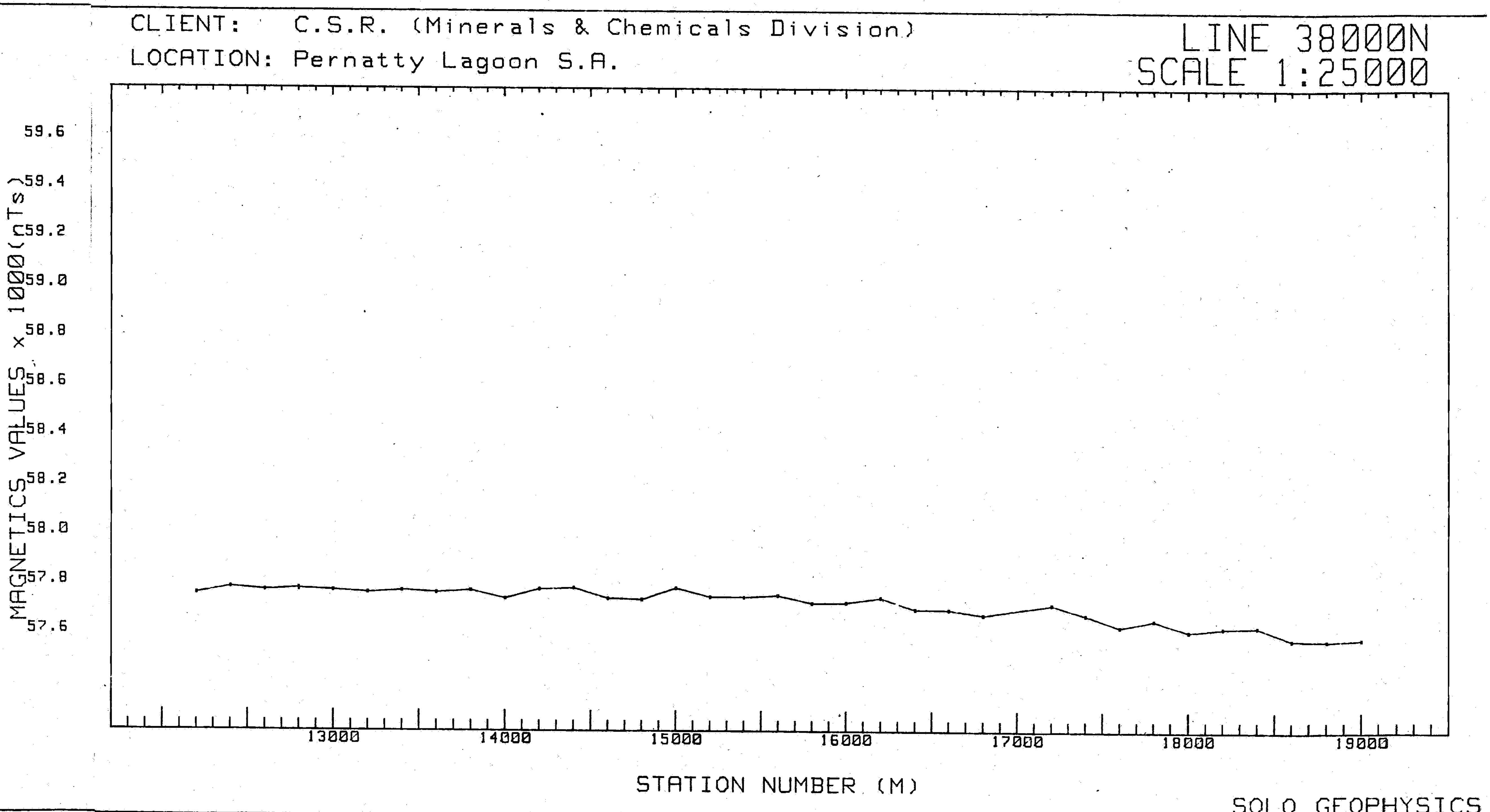
LOCATION: Pernatty Lagoon S.A.

LINE 38000N

SCALE 1:25000



SOLO GEOPHYSICS



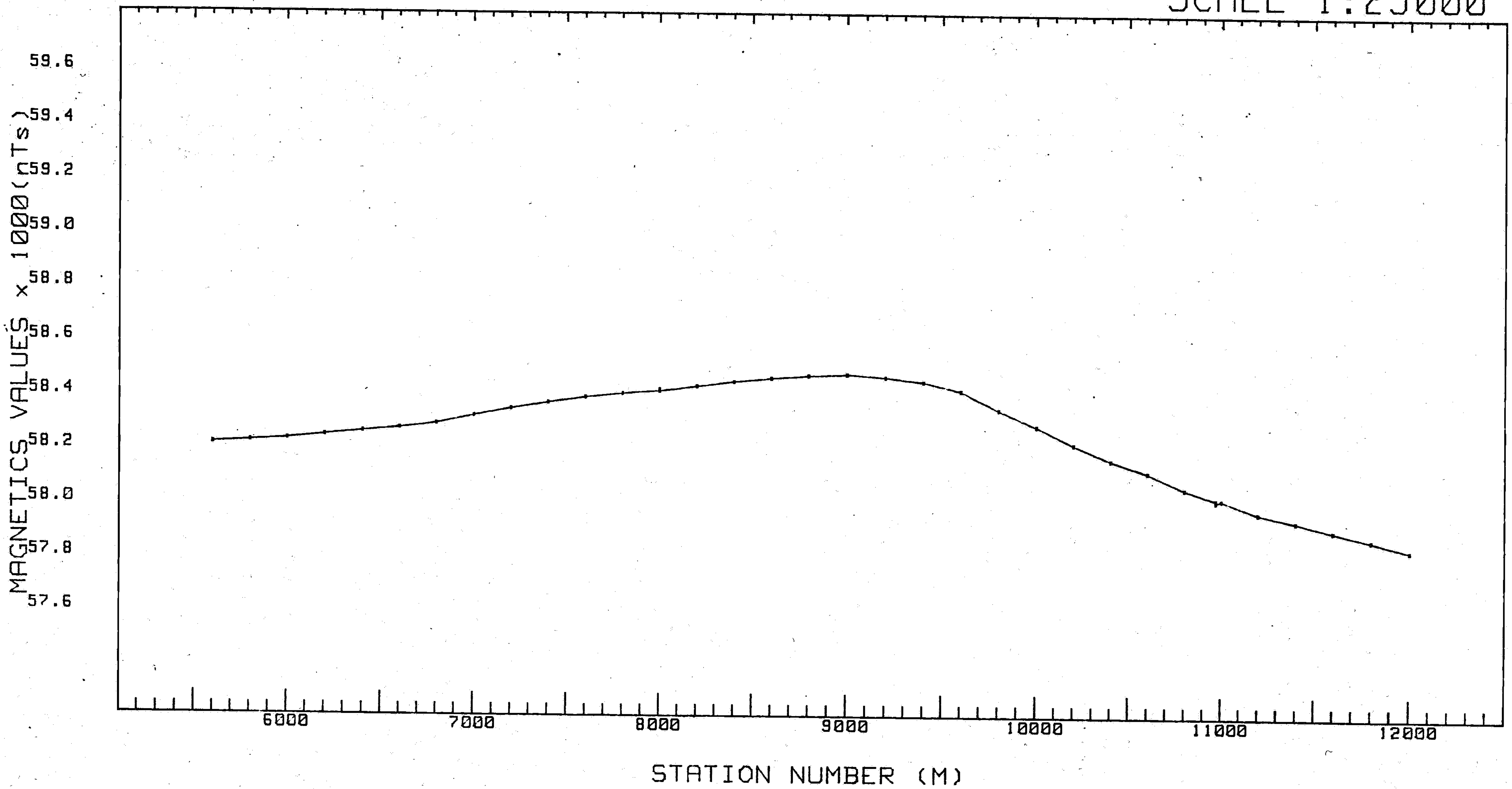
CLIENT: C.S.R. (Minerals & Chemicals Division)
LOCATION: Pernatty Lagoon S.A.
LINE 38000N
SCALE 1:25000
MAGNETICS VALUES x 1000(nTs)
59.6
59.4
59.2
59.0
58.8
58.6
58.4
58.2
58.0
57.8
57.6
13000
14000
15000
16000
17000
18000
19000
STATION NUMBER (M)
SOLO GEOPHYSICS

CLIENT: C.S.R. (Minerals & Chemicals Division)

LOCATION: Pernatty Lagoon S.A.

LINE 40000N

SCALE 1:25000

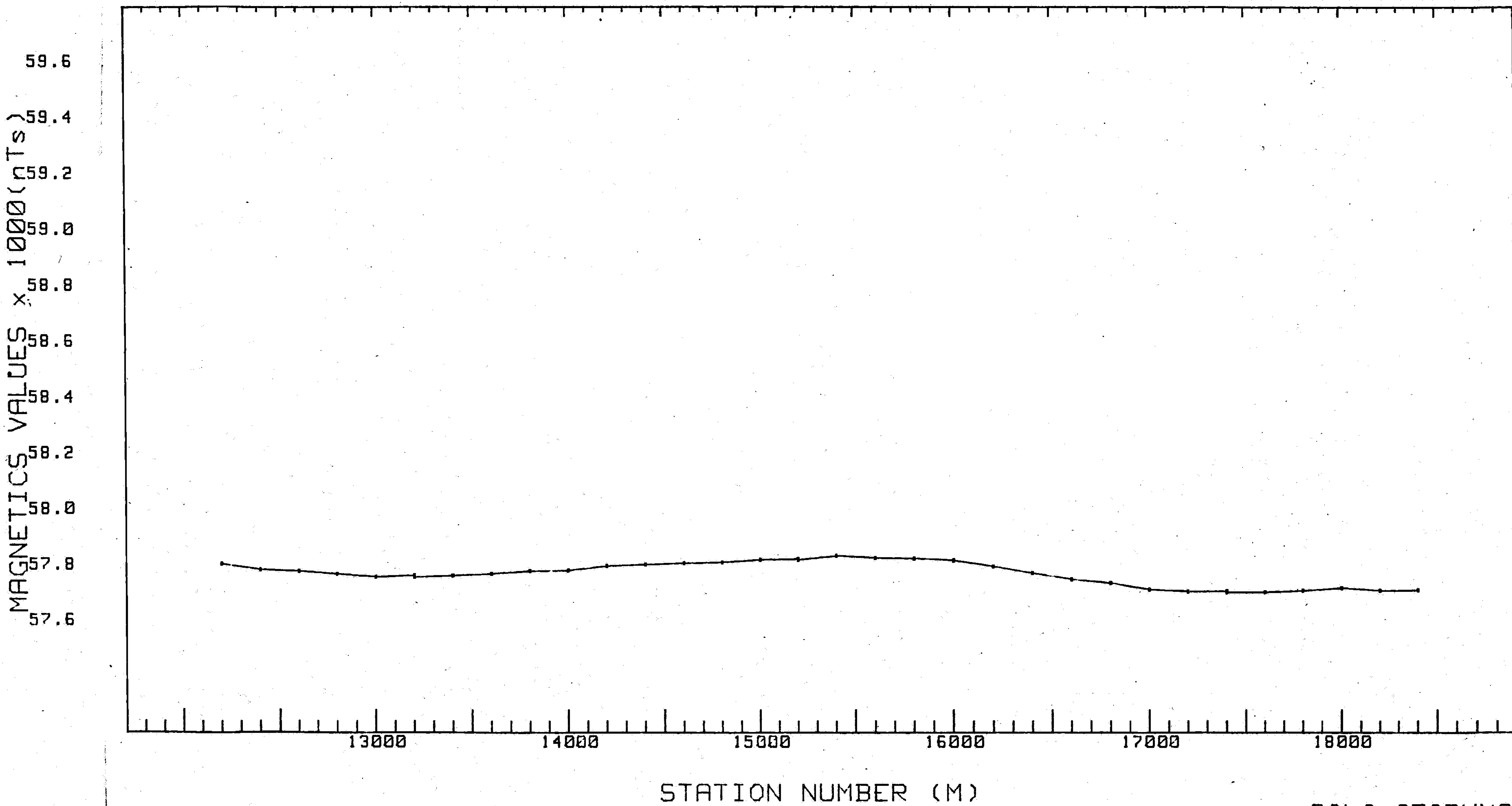


SOLO GEOPHYSI(

CLIENT: C.S.R. (Minerals & Chemicals Division)

LOCATION: Pernatty Lagoon S.A.

LINE 40000N
SCALE 1:25000



SOLO GEOPHYSICS & CO.

MT. GUNSON MAGNETIC SURVEY 12.9.83.

TRAVERSE TIE IN READINGS.

000077

STN	READING.
SOLO GEOPHYSICS GRID	
19000 N 5000 E	58324
19000 N 4600 E	58342.
HAULAGE RD TRAVERSE	
50 EAST	58332
100 "	58329.
MG. 87 TRAVERSE	
50 EAST	58209
100 "	58221
PIPE LINE TRAVERSE	
50 EAST	58156
100 "	58156.
AIR STRIP TRAVERSE.	
50 EAST	58062
100 "	58061.

MT. GUNSON MAGNETIC SURVEY 12-9-83.

HAULAGE ROAD TRAVERSE.

STN	READING.
0 EAST	58341
50	58346
100	58341
150	58341
200	58339.
250	58340
300	58344
350	58347
400	58354
450	58372
500	58388
550	58410
600	58405.
650	58398
700	58,390
750	58387
800	58376
850	58354
900	58365.
950	58370
1000	58372
1050	58374
1100	58380
1150	58387
1200	58395.
1250	58403
1300	58414
1350	58426
1400	58435.
1450	58446
1500	58458
1550	58477
1600	58487
1650	58504.
1150.	58390.

MT. GUNSON MAGNETIC SURVEY 12·9·83

MG. 87 TRAVERSE

000079

STN		READING.
200	WEST	58 213
150	"	58 215
100	"	58 213
50	"	58 210
0	EAST	58 219
50		58 225
100		58 227
150		58 228
200		58 234
250		58 243
300		58 253
350		58 267
400		58 284
450		58 301
500		58 337
550		58 338
600		58 335
650		58 336
700		58 329
750		58 325
800		58 323
850		58 322
900		58 323
950		58 322
1000		58 325
1050		58 330
1100		58 338
1150		58 346
1200		58 354
1250		58 364
1300		58.374.
1300.		58 379

MT. GUNSON MAGNETIC SURVEY 12-9-83

PIPE LINE TRAVERSE 000080

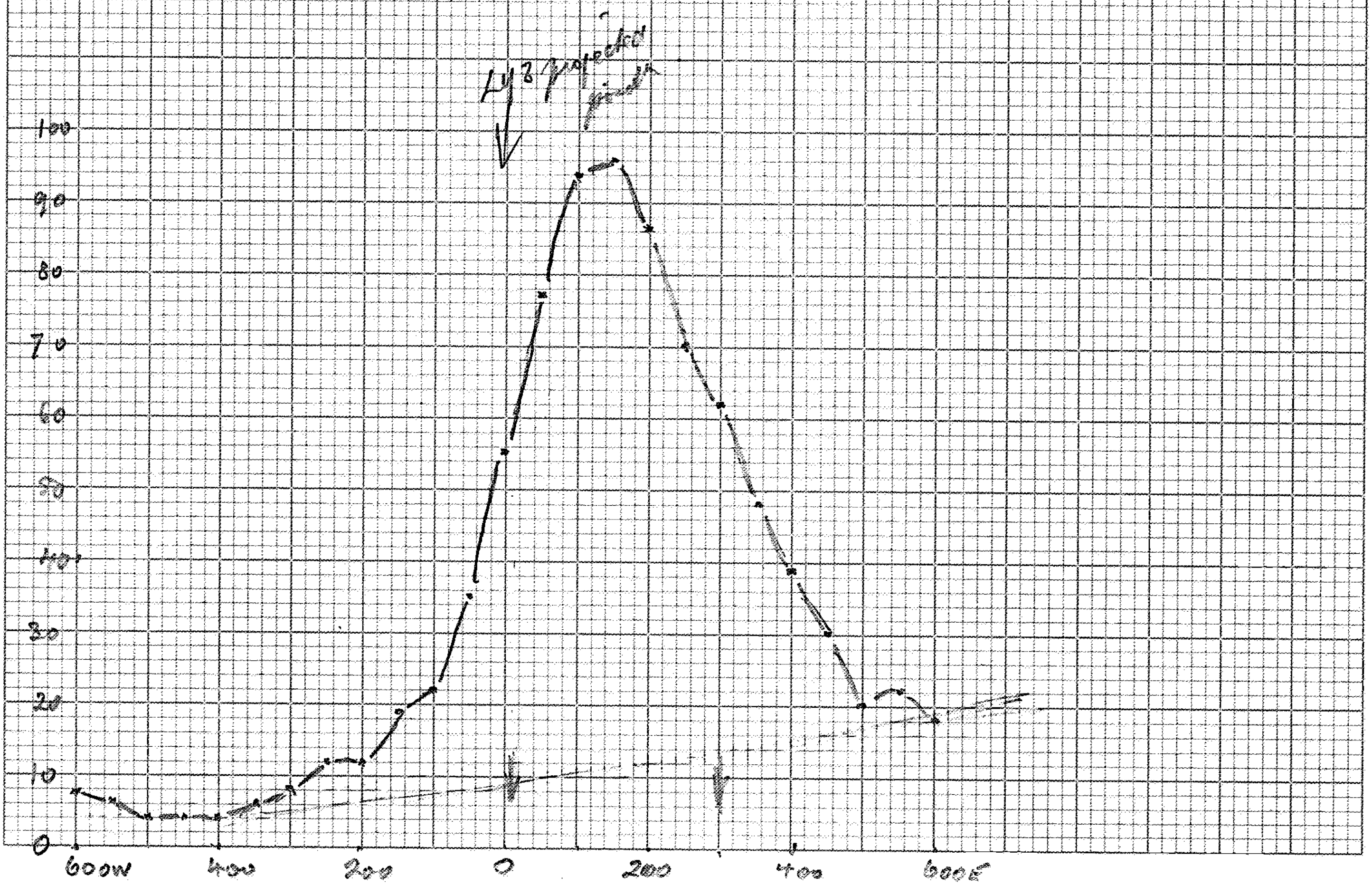
STN	READING
0	58 168
50	58 167
100	58 170
150	58 167
200	58 166
250	58 172
300	58 170
350	58 174
400	58 182
450	58 190
500	58 202
550	58 216
600	58 242
650	58 277
700	58 311
750	58 311
800	58 312
850	58 306
900	58 301
950	58 293
1000	58 287
1050	58 291
1100	58 292
1150	58 297
1200	58 299
1250	58 308
1300	58 308
1350	58 321
1400	58 327
1400	58 325.

MT GUNSON MAGNETIC SURVEY 12-9-83

AIR STRIP TRAVERSE.

000081

STN	READING.
0	58 065
50	58 068
100	58 069
150	58 075
200	58 080
250	58 083
300	58 085
350	58 092
400	58 100
450	58 111
500	58 118
550	58 137
600	58 153
650	58 174
700	58 201
750	58 237
800	58 274
850	58 301
900	58 301
950	58 298
1000	58 296
1050	58 291
1100	58 293
1150	58 296
1200	58 298
1250	58 299
1300	58 299
1350	58 311
1400	58 316
1450	58 329
1500	58 328
0	58 067


LY8 projected
100
90
80
70
60
50
40
30
20
10
0
600W
400
200
0
200
400
600E

000083

Minerals Division

CSR

RECEIVED 14 SEP 1983

TO P.R. Gidley REFERENCE WJL/sgl/401

FROM W.J. Langron DATE September 13, 1983

~~DAB~~ ① → DGT ✓ JLC to follow up
② file Gunson 401.

"BLIND DYKE"

Apropos of the buried feature to the west of and parallel to the MG14 dyke, Gunson - reference the perspective plot of ground magnetics (downward continued) which we generated recently.

During the course of the Lake Torrens Joint Venture Meeting on 2nd September, Mr. Peter Haskins of Aquitaine Australia Minerals mentioned what could be a similar case tested by Aquitaine in Joint Venture with Esso on their E.L. 1015 (Roxby Hill), subsequently relinquished.

Hole SSL/1001 was sited on a weak magnetic linear with the Sturtian trend and a 3 mgal gravity anomaly. The hole entered a "blind dyke" at 300 m from surface and stayed in the dyke material for 100+ m. There was a little pyrite in the dyke with mafics of somewhat unusual composition.

The report on this work (including assays, petrology) is on open-file and the core is stored in the SADME core library.

Our Adelaide staff should inspect this core and the report. Measurements of magnetic susceptibility on the core could be useful in our overall study of Shelf data.

W.J. Langron

cc - ~~DAB~~/DGT/JLC (Adelaide)
- RJF
- DJC/File

MT GUNSON MAGNETIC SURVEY 12-4-83

000084

AIR STRIP TRAVERSE.

STN	READING.
0	58065
50	58068
100	58069
150	58075
200	58080
250	58083
300	58085
350	58092
400	58100
450	58111
500	58118
550	58137
600	58153
650	58174
700	58201
750	58237
800	58274
850	58301
900	58301
950	58298
1000	58296
1050	58291
1100	58293
1150	58296
1200	58298
1250	58299
1300	58299
1350	58311
1400	58316
1450	58329
1500	58328
0	58067

MT. GUNSON MAGNETIC SURVEY 12-9-83

PIPE LINE TRAVERSE

STN	READING
0	58 168
50	58 167
100	58 170
150	58 167
200	58 166
250	58 172
300	58 170
350	58 174
400	58 182
450	58 190
500	58 202
550	58 216
600	58 242
650	58 277
700	58 311
750	58 311
800	58 312
850	58 306
900	58 301
950	58 293
1000	58 287
1050	58 291
1100	58 292
1150	58 297
1200	58 299
1250	58 308
1300	58 308
1350	58 321
1400	58 327
1400	58 325.

000086

MT. GUNSON MAGNETIC SURVEY 12-9-83.

HAULAGE ROAD TRAVERSE.

STN	READING.
0 EAST	58341
50	58346
100	58341
150	58341
200	58339.
250	58340
300	58344
350	58347
400	58354
450	58372
500	58388
550	58410
600	58405.
650	58398
700	58,390
750	58387
800	58376
850	58354
900	58365.
950	58370
1000	58372
1050	58374
1100	58380
1150	58387
1200	58395.
1250	58403
1300	58414
1350	58426
1400	58435.
1450	58446
1500	58458
1550	58477
1600	58487
1650	58504.
1150.	58390.

MT. GUNSON MAGNETIC SURVEY 12.9.83.

TRAVERSE TIE IN READINGS.

000087

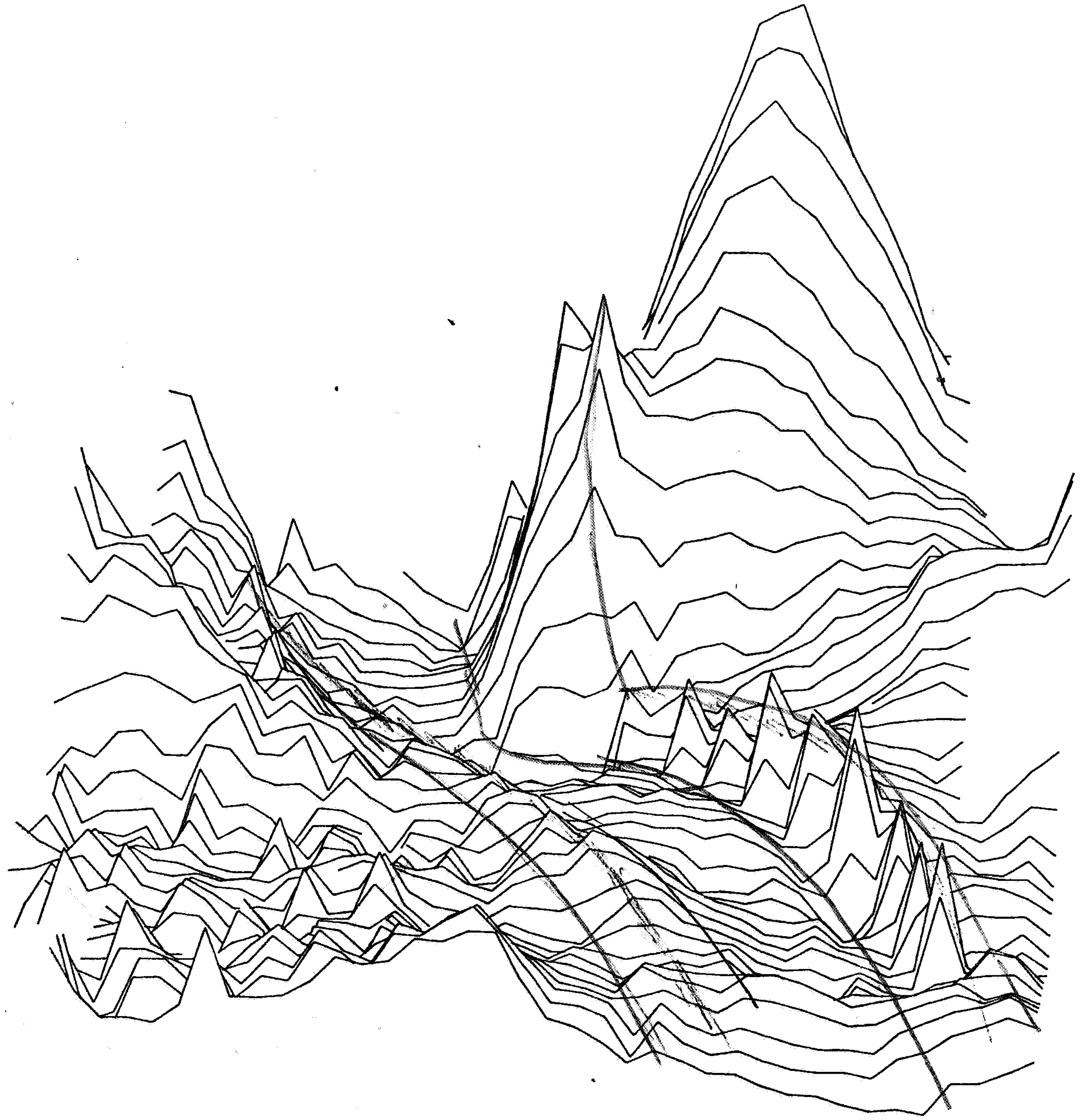
STN	READING.
SOLO GEOPHYSICS GRID	
19000 N 5000 E	58 324
19000 N 4600 E	58342.
HAULAGE RD TRAVERSE	
50 EAST	58 332
100 "	58 329.
MG. 87 TRAVERSE	
50 EAST	58209
100 "	58221
PIPE LINE TRAVERSE	
50 EAST	58156
100 "	58156.
AIR STRIP TRAVERSE.	
50 EAST	58062
100 "	58061.

MT. GUNSON MAGNETIC SURVEY 12.9.83

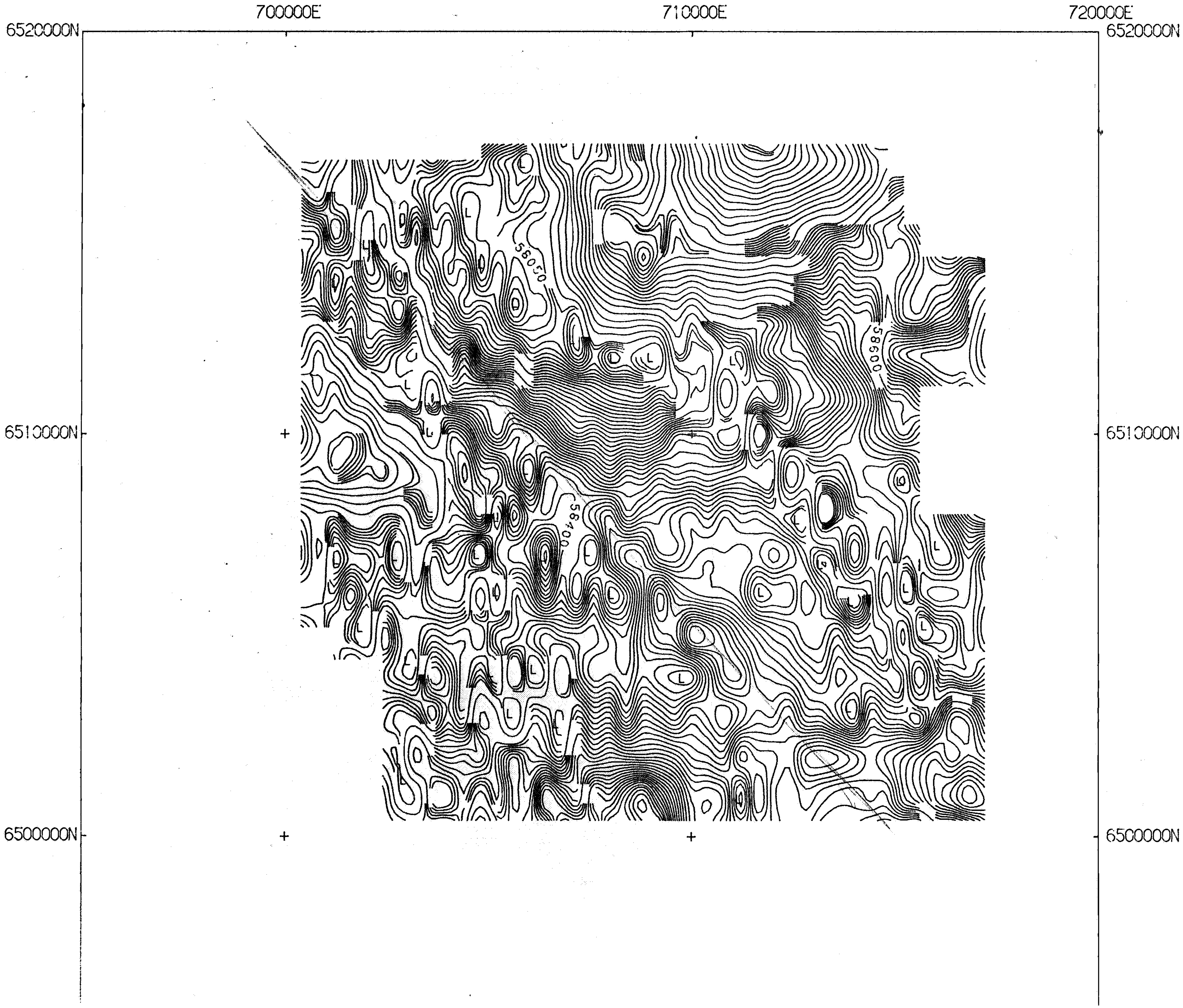
000088

MG. 87 TRAVERSE

STN		READING.
200	WEST	58 213
150	"	58 215
100	"	58 213
50	"	58 210
0	EAST	58 219
50		58 225
100		58 227
150		58 228
200		58 234
250		58 243
300		58 253
350		58 267
400		58 284
450		58 301
500		58 337
550		58 338
600		58 335
650		58 336
700		58 329
750		58 325
800		58 323
850		58 322
900		58 323
950		58 322
1000		58 325
1050		58 330
1100		58 338
1150		58 346
1200		58 354
1250		58 364
1300		58.374.
1300.		58 379



N 3D PLOT
ARD CONTINUED 200M



DATA SPECIFICATIONS

000090

LINE SPACING: 1 KM & 0.5 KM
STATION SPACING: 200 METRES
DATE ACQUIRED: JUNE-SEPTEMBER 1982
ACQUIRED BY: SOLO GEOPHYSICS ADELAIDE S.A.

PROCESSING SPECIFICATIONS

GRID SIZE: 50m X 50
REGIONAL : GRIDDED DATA DOWNWARD CONTINUED 2
RESIDUAL : ORIGINAL GRID MINUS DOWNWARD CONTINUED DATA

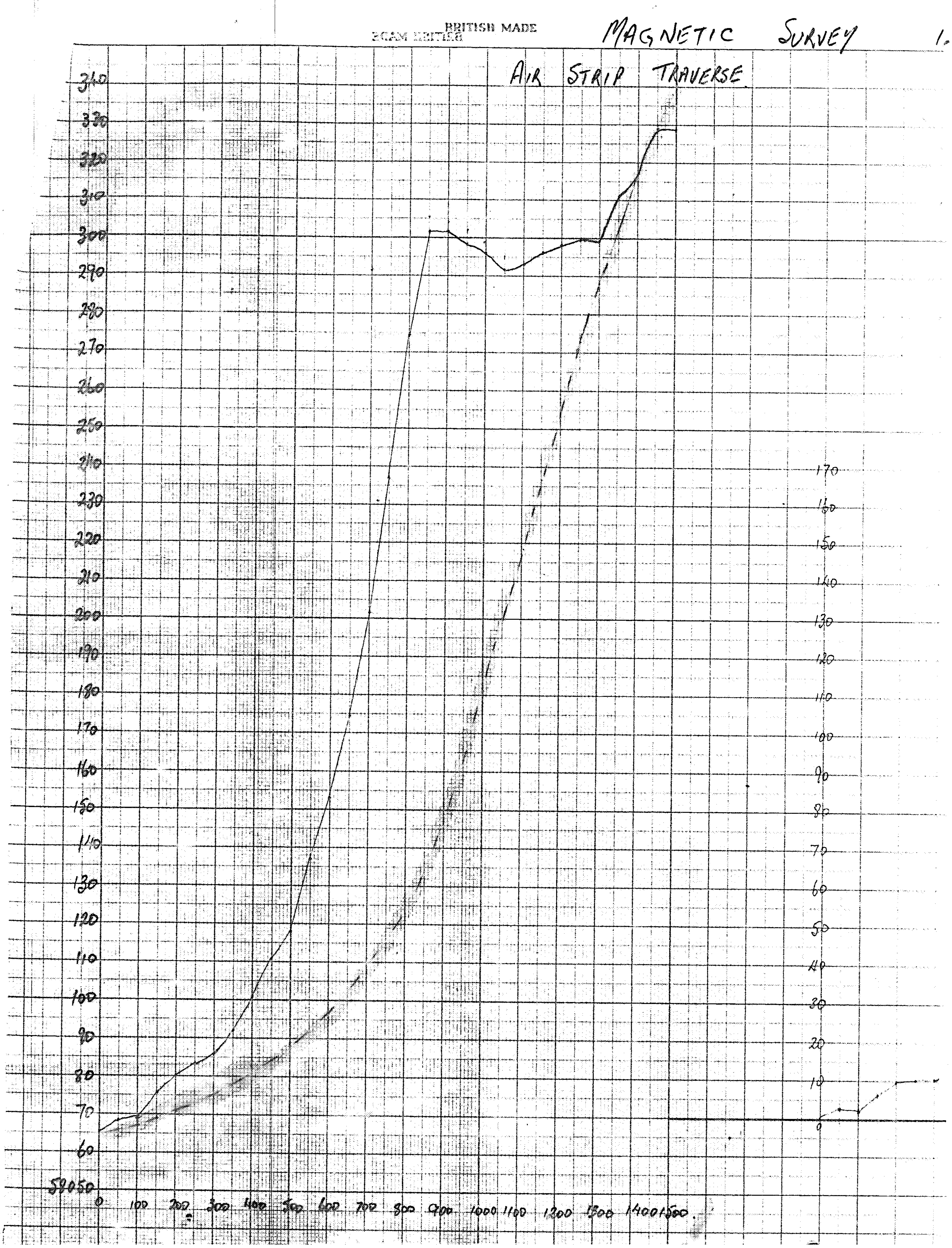
0 1 2 3 4 5 6 7 8

SCALE 1:100000

CSR

GRID NOTATION REFERS TO AUSTRALIAN MAP GRID ZONE 53

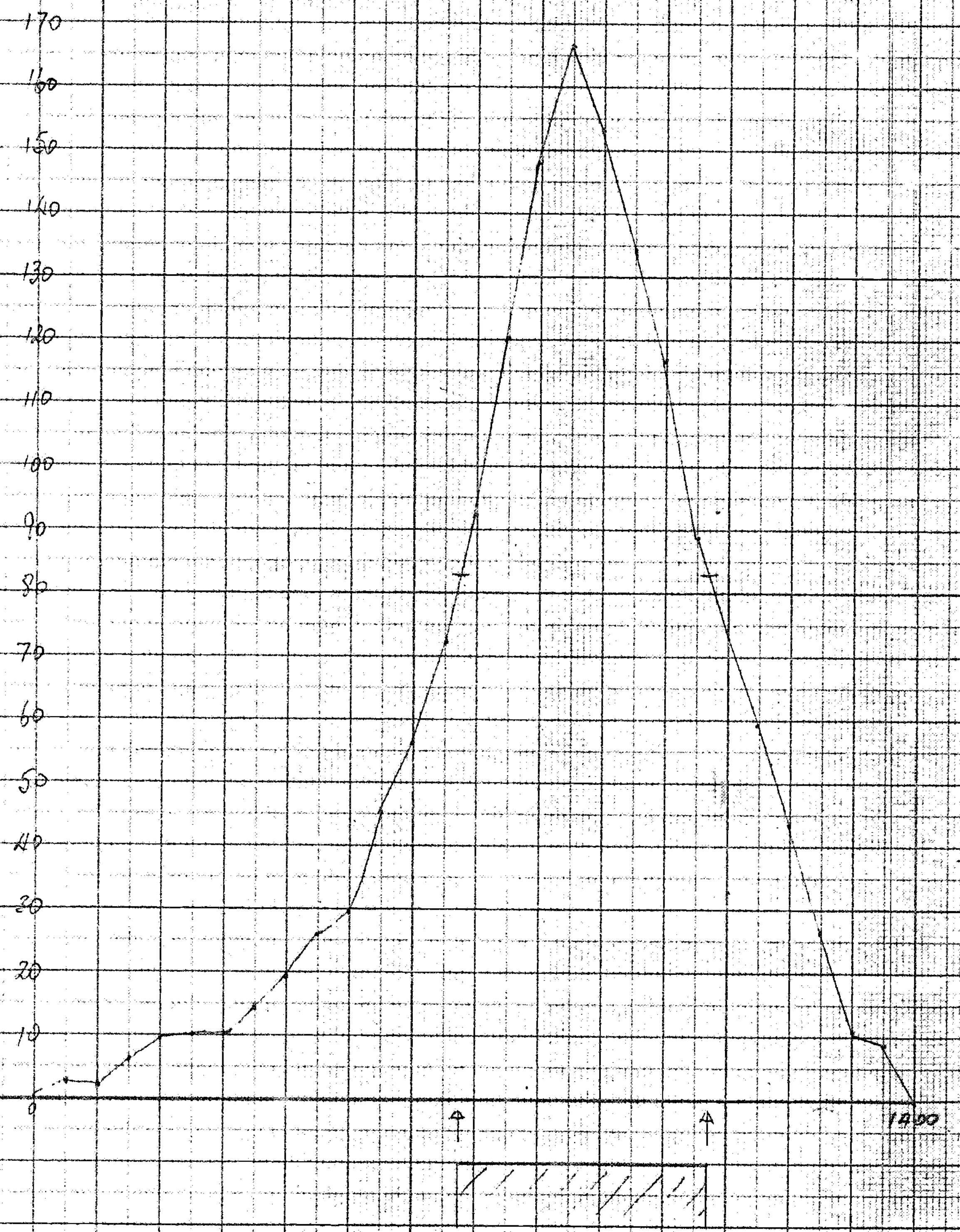
000091


BRITISH MADE
MAGNETIC SURVEY
1.
AIR STRIP TRAVERSE
59050
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500

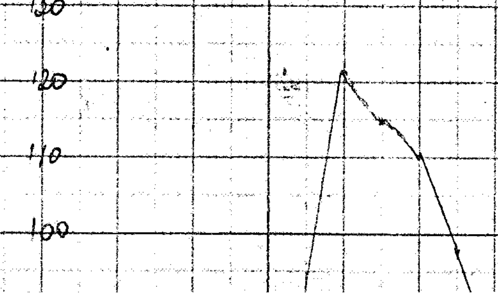
VETIC SURVEY 12-9-83

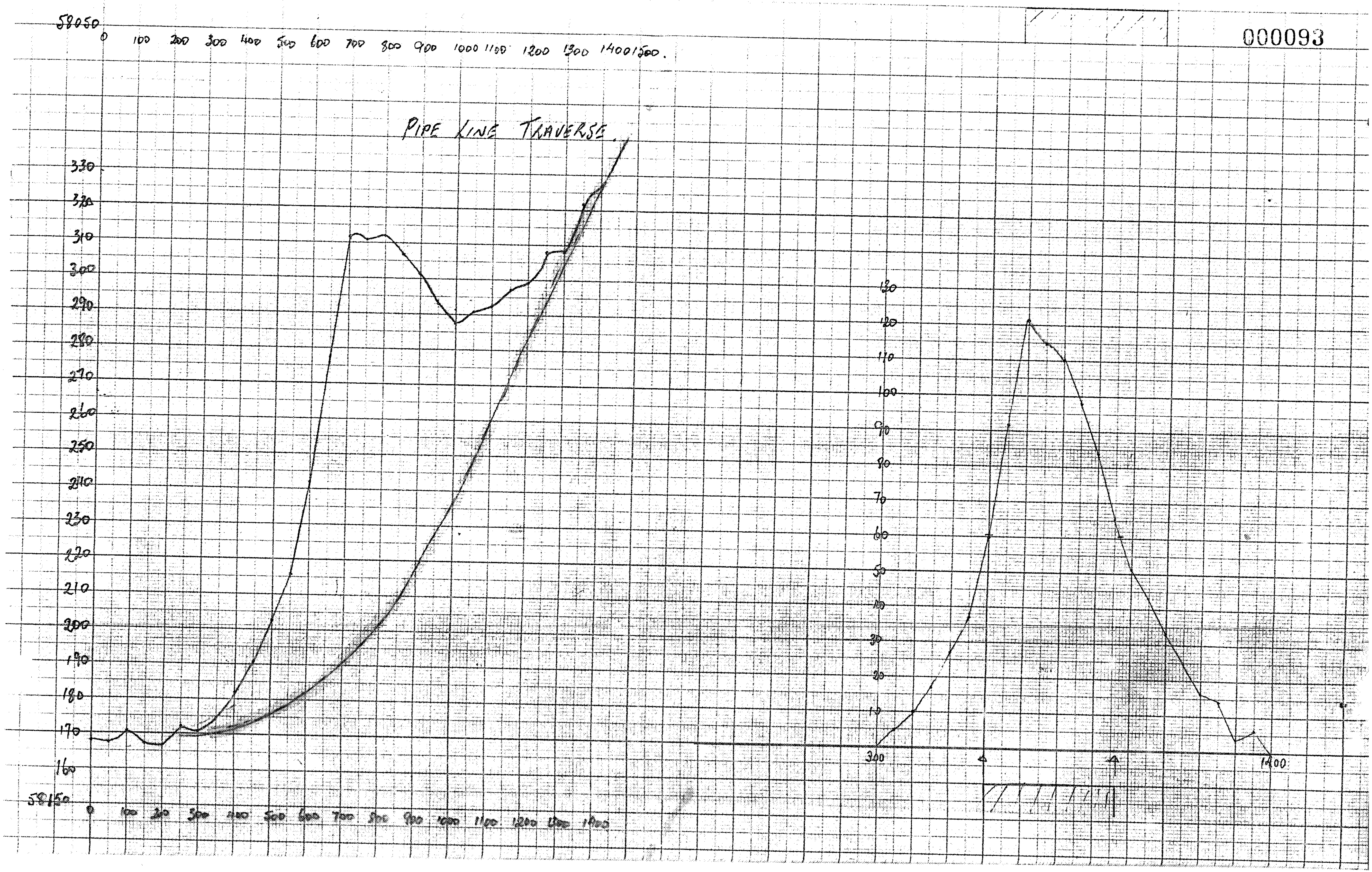
TRAVERSE

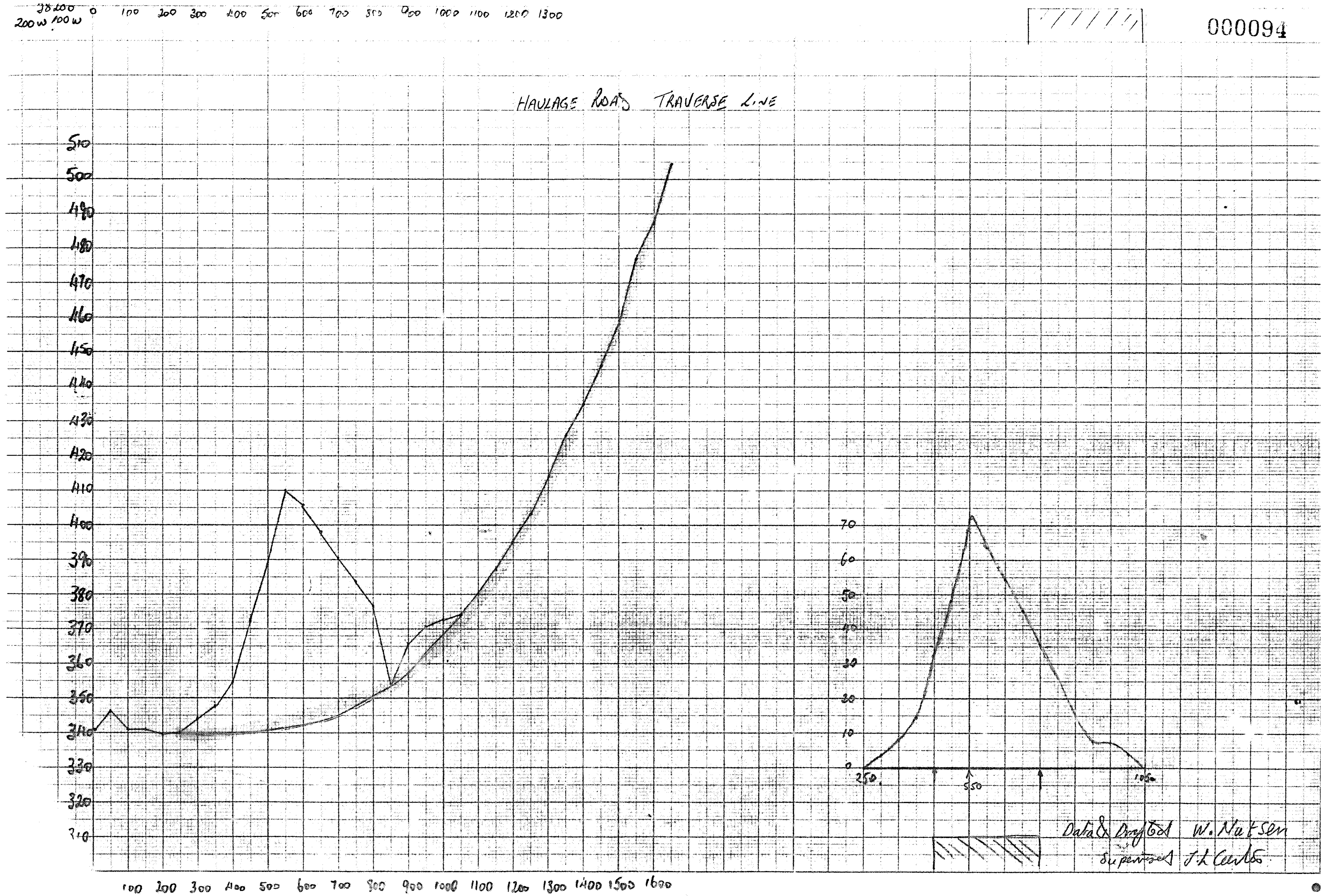
000092

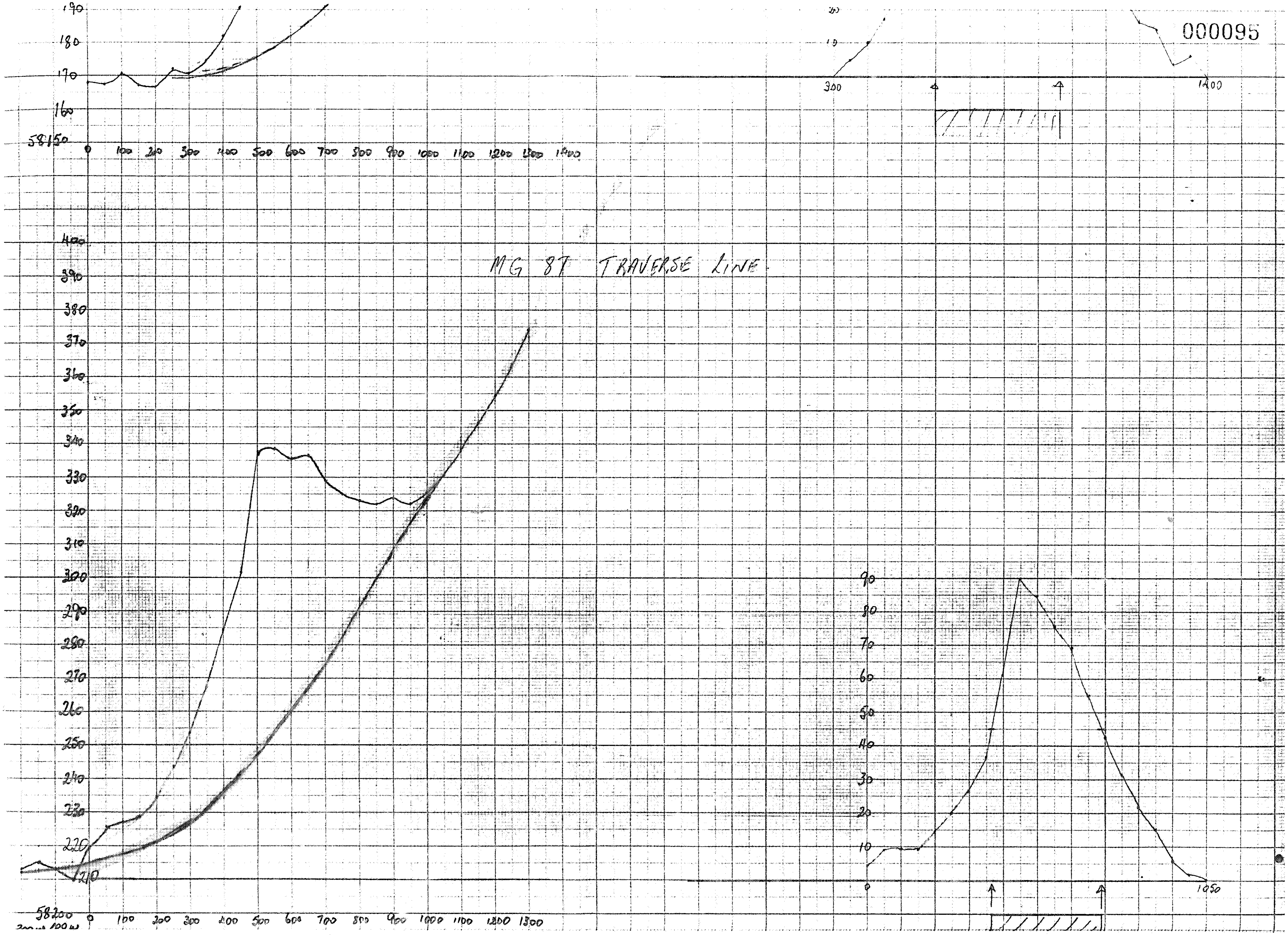


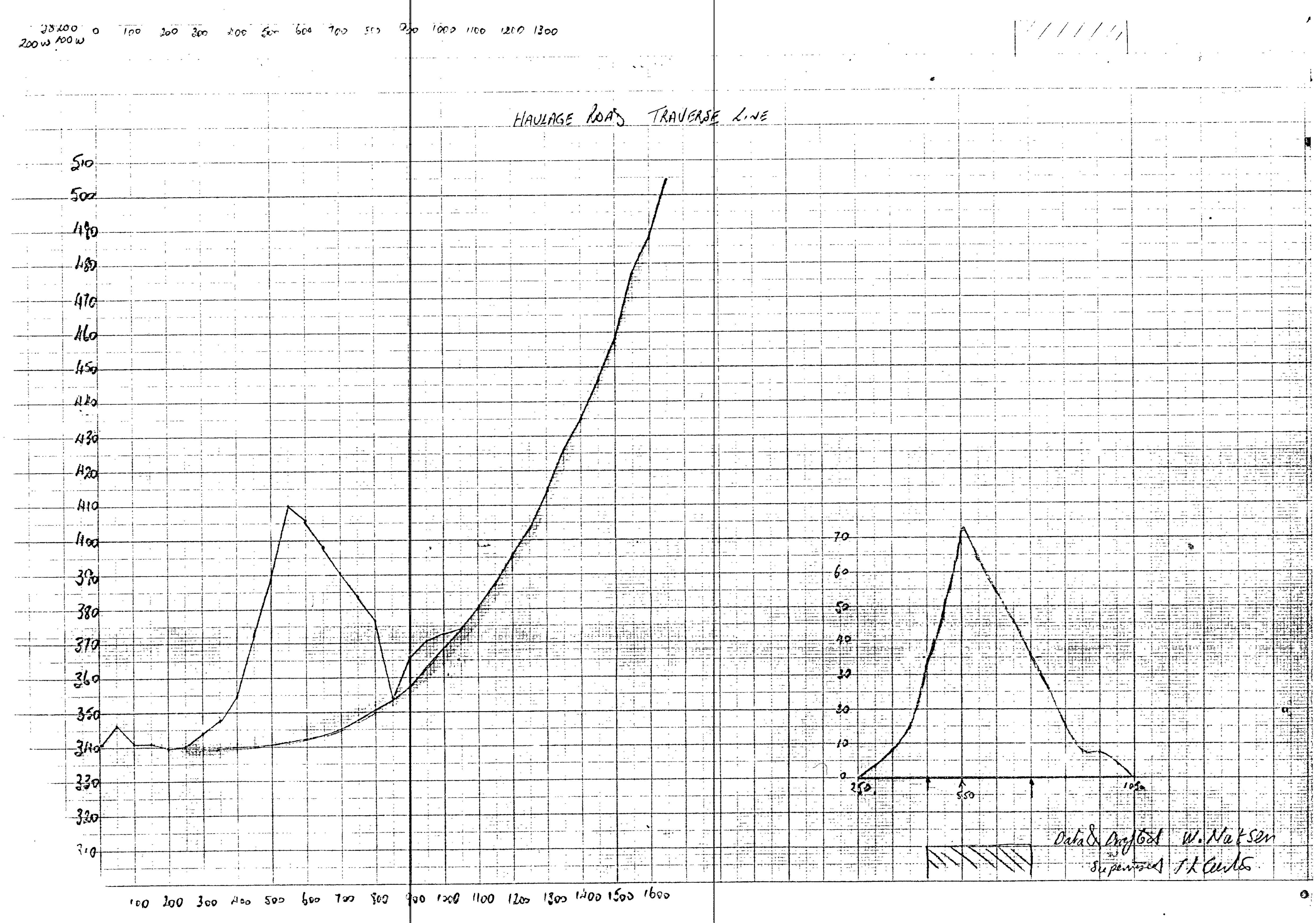
1500.

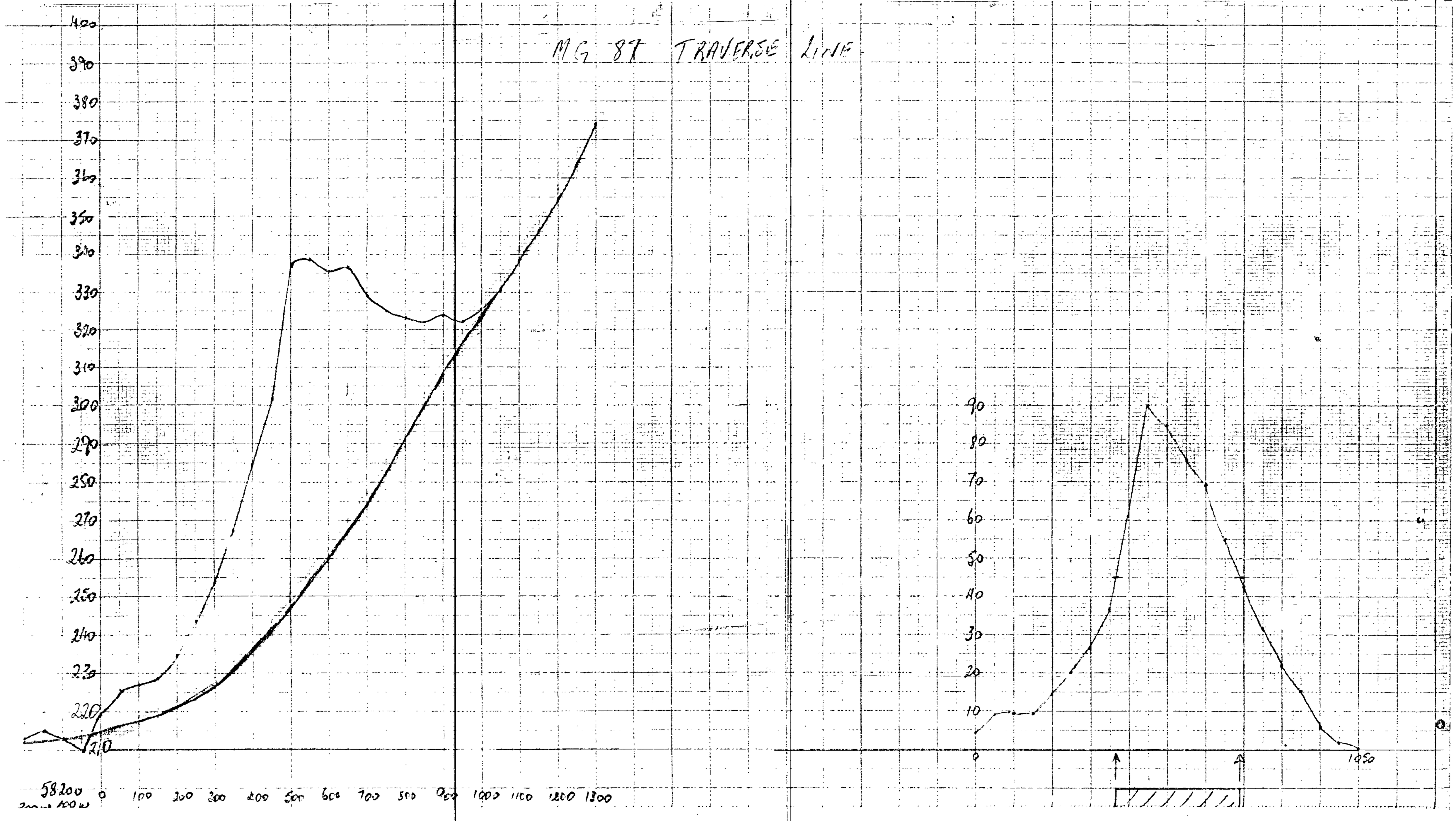


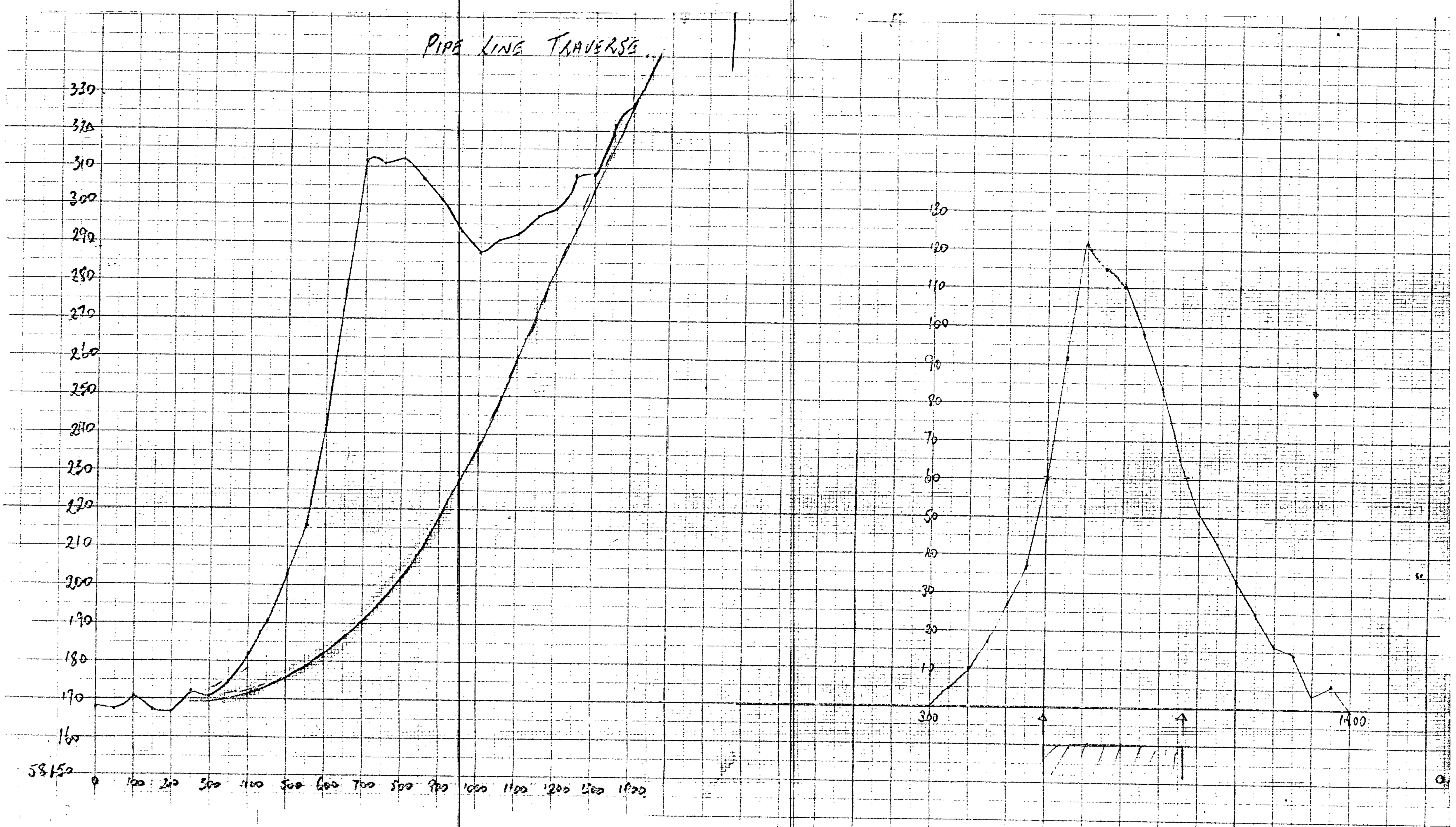

PIPE LINE TRAVERSE
58050
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500.
330
320
310
300
290
280
270
260
250
240
230
220
210
200
190
180
170
160
58150
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400
130
120
110
100
90
80
70
60
50
40
30
20
10
300
1200

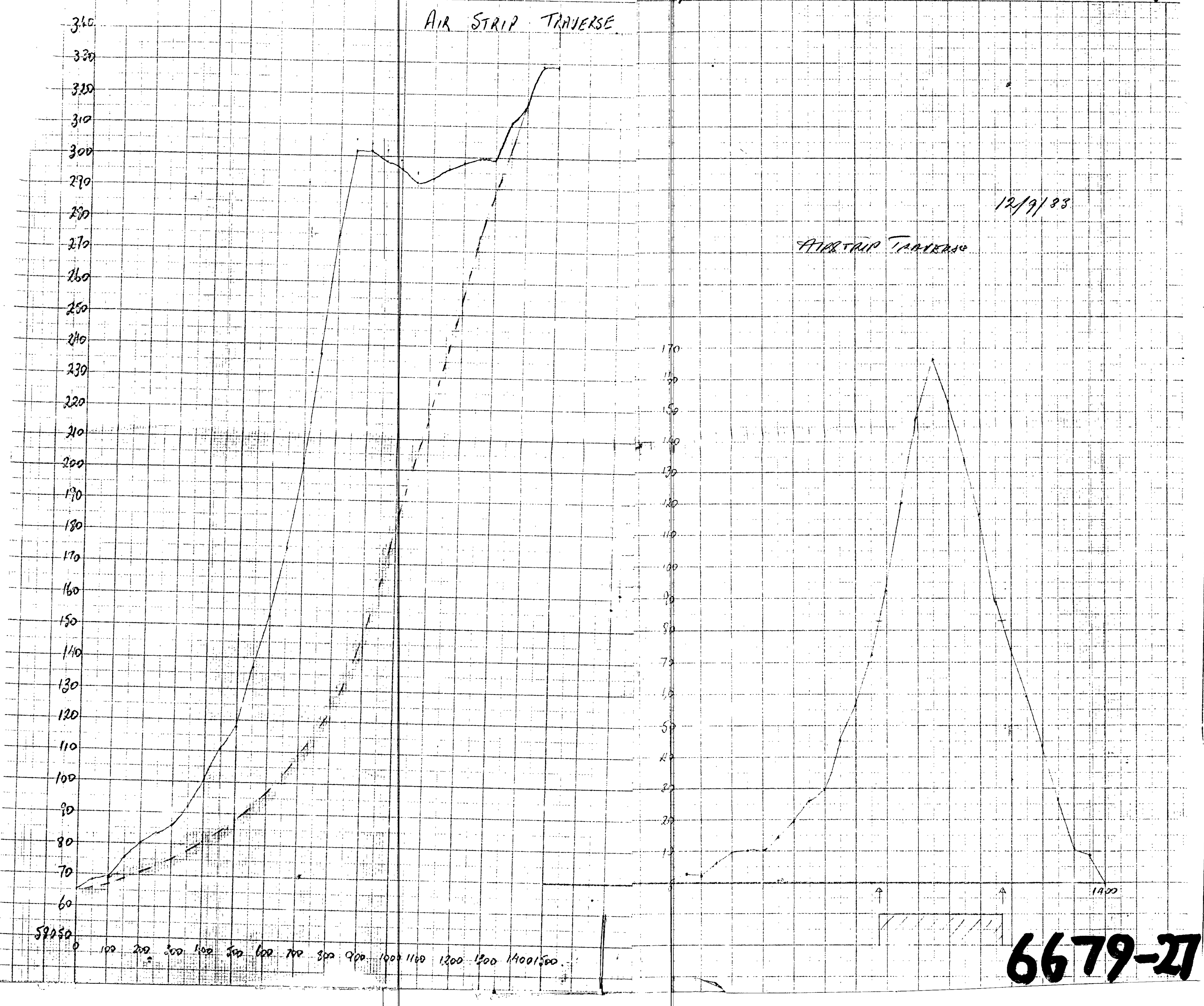

HAULAGE ROAD TRAVERSE LINE
200 W 100 W 0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300
510 500 490 480 470 460 450 440 430 420 410 400 390 380 370 360 350 340 330 320 310
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600
70 60 50 40 30 20 10 0
250 550 1050
Data & Drafted
Supervised


MG 87 TRAVERSE LINE
190
180
170
160
58150
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400
300
1200
400
390
380
370
360
350
340
330
320
310
300
290
280
270
260
250
240
230
220
210
58200
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300
90
80
70
60
50
40
30
20
10
0
1050


HAULAGE ROAD TRAVERSE LINE


MG 87 TRAVERSE LINE


PIPE LINE TRAVERSE


MAGNETIC SURVEY 12-9-83
AIR STRIP TRAVERSE
12/9/83

6679-27

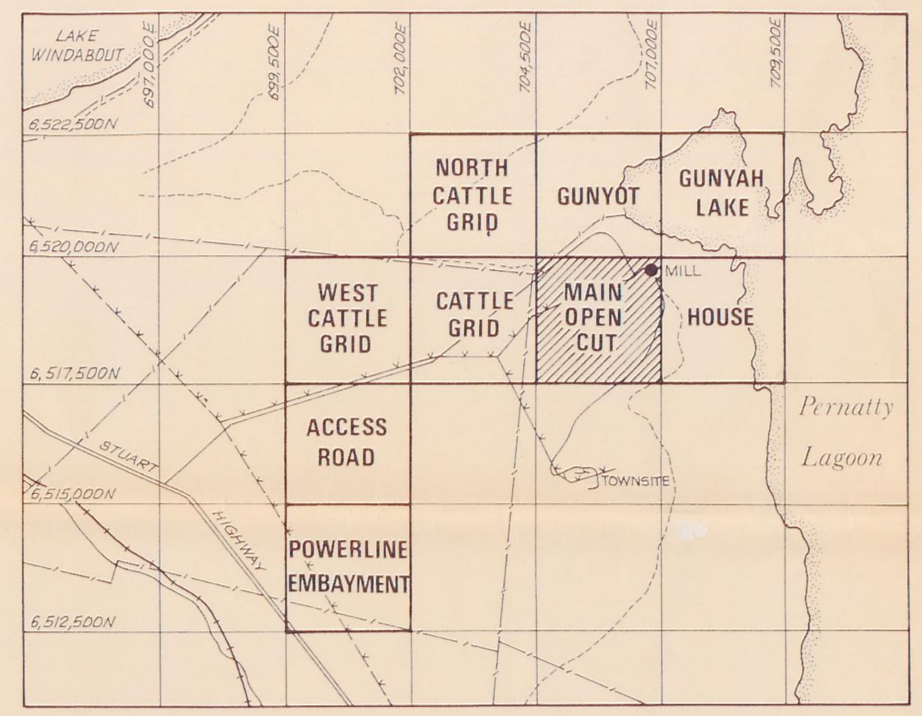
REFERENCE

- Stream
- Road, track
- Fence
- Power line
- Water pipeline

MAP REFERENCE M.G.M. 301

Contour Interval in metres

LOCATION MAP



PACMINEX PTY. LIMITED

E.L. 81 MT. GUNSON AREA S.A.

I.P. & E.M. SURVEY LOCATION PLAN

MAIN OPEN CUT SHEET

SCALE : 1 : 5000	DWG. No.	2091
DATE :		
DRAWN : D.G.T. / P.R.		
REVISED :		

6679-28