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SML 325

ORAPARINNA

PROGRESS AND FINAL REPORTS TO LICENCE EXPIRY/RENEWAL FOR THE PERIOD 22/7/1969 TO 21/7/1970

Submitted by
South Australian Barytes Ltd
1970

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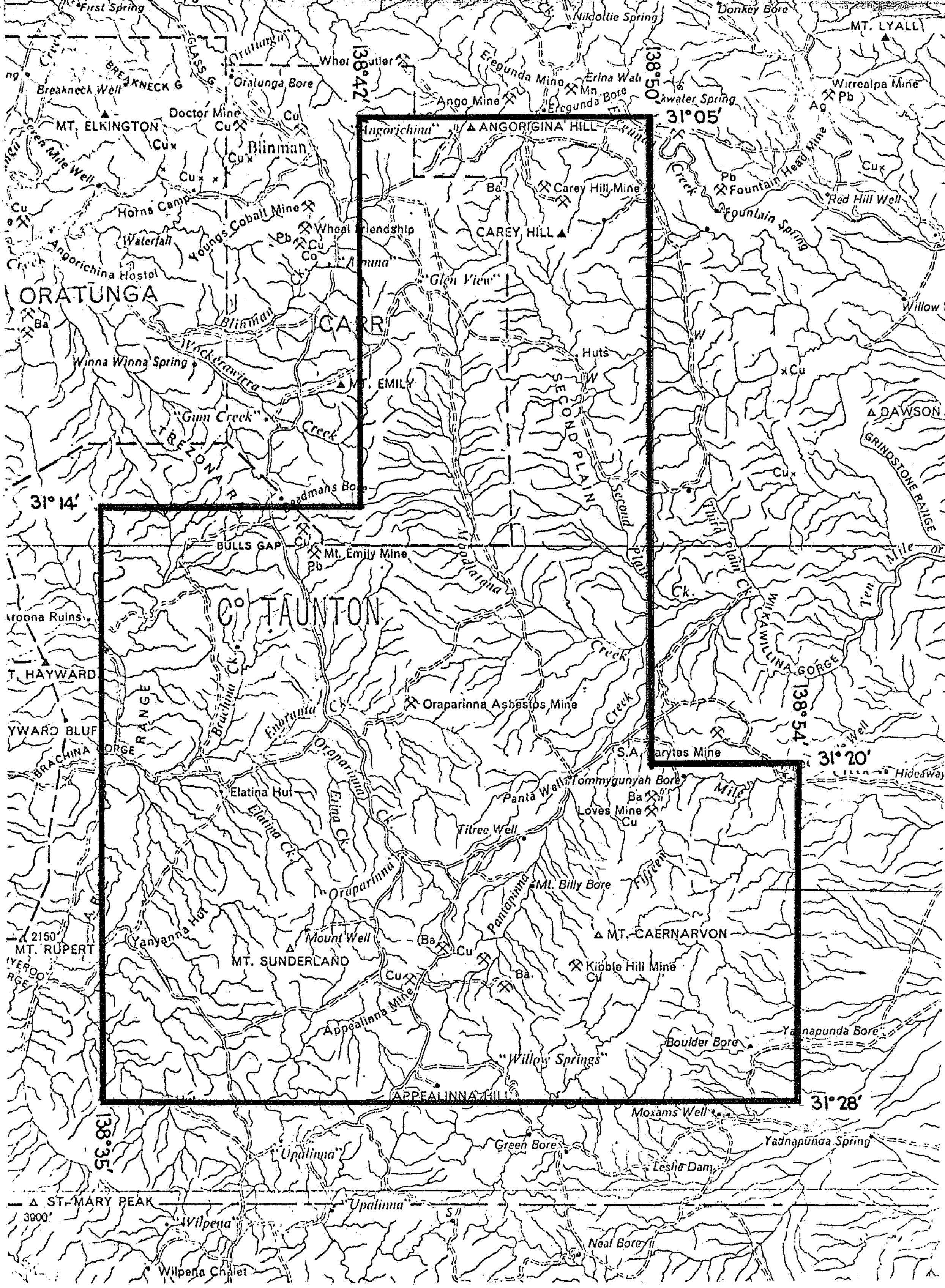
Government of South Australia
Primary Industries and Resources SA



SCALE 1:250000

SOUTH AUSTRALIAN BARYTES LTD.

DOCKET D.M. 713/69 AREA 360 SQ MILES

1:250000 PLANS . PARACHILNA

LOCALITY

S.M.L. No. 325 EXPIRY DATE 21·7·70

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TENEMENT: S.M.L. 325

TENEMENT HOLDER: S.A. Barytes Ltd.

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"	0	1381-40
"	0	1381-41
"	0	1381-42

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

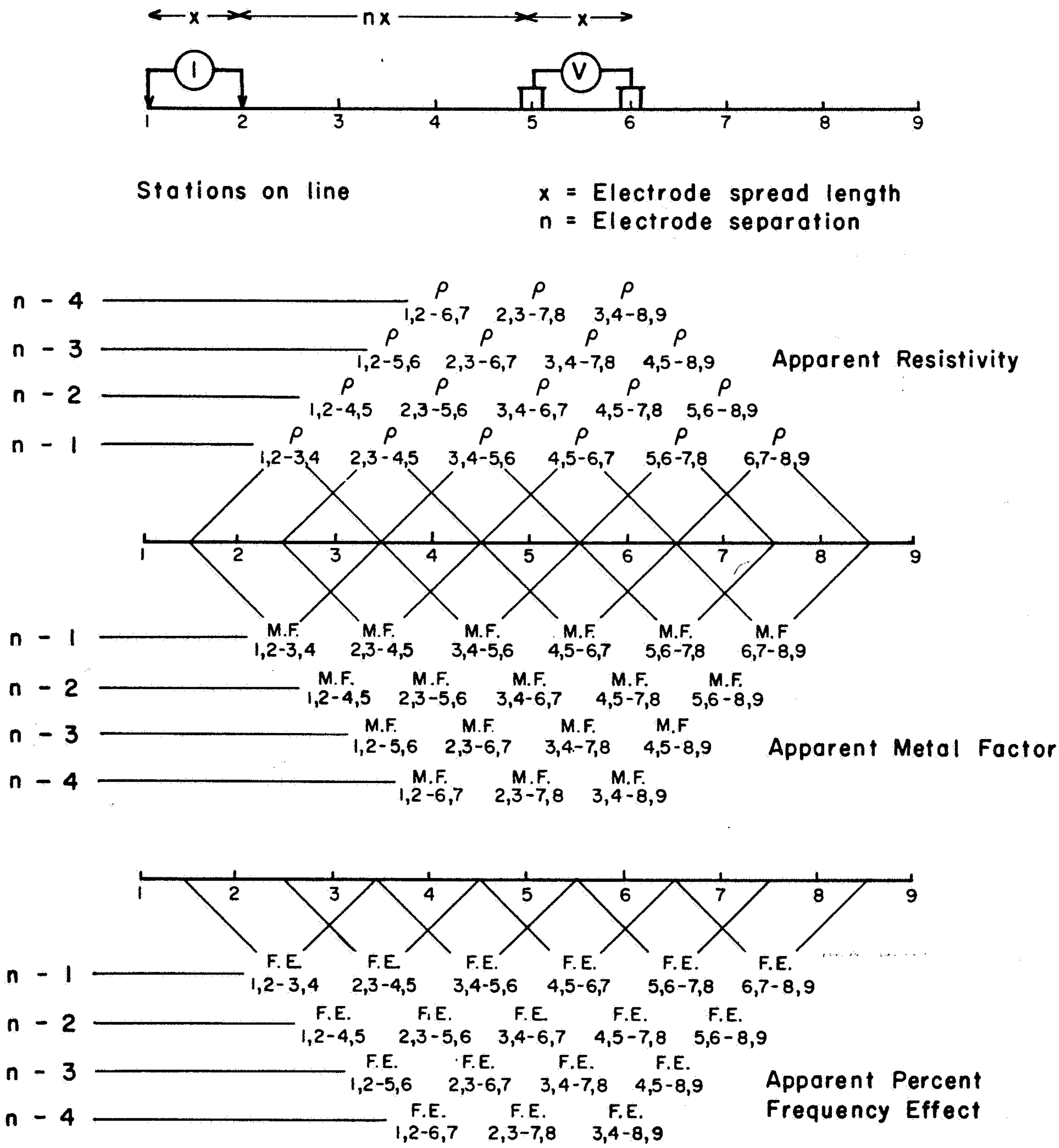

Fig. A

McPHAR GEOPHYSICS

REPORT ON THE RECONNAISSANCE INDUCED POLARIZATION AND RESISTIVITY SURVEY ON S.M.L. 325 APPEALINNA COPPER PROSPECT, S.A. FOR SOUTH AUSTRALIA BARYTES LTD.

1. INTRODUCTION

At the request of South Australia Barytes Ltd., we have completed a brief induced polarization and resistivity survey in the vicinity of the old Appealinna Copper Prospect. S.M.L. 325 lies near Hawker, South Australia.

At the old Appealinna Mine, high grade copper was extracted from narrow lodes of chalcopyrite and hematite. There is little on record regarding the history of the area. The induced polarization and resistivity survey at Appealinna was planned in an attempt to locate any other zones of metallic mineralization that might be present.

2. PRESENTATION OF RESULTS

The induced polarization and resistivity results are shown on the following enclosed data plots. The results are plotted in the manner described in the notes preceding this report.

a) Appealinna Copper Prospect

Line 0+00	200' electrode intervals	Dwg. IP 5567-1
Line 5+00E	100' electrode intervals	Dwg. IP 5567-2
Line 10+00E	200' electrode intervals	Dwg. IP 5567-3
Line 20+00E	200' electrode intervals	Dwg. IP 5567-4
	100' electrode intervals	Dwg. IP 5567-5
Line 30+00E	200' electrode intervals	Dwg. IP 5567-6
Line 35+00E	200' electrode intervals	Dwg. IP 5567-7
Line 40+00E	200' electrode intervals	Dwg. IP 5567-8
Line 50+00E	200' electrode intervals	Dwg. IP 5567-9
	100' electrode intervals	Dwg. IP 5567-10
Line 60+00E	400' electrode intervals	Dwg. IP 5567-11
	200' electrode intervals	Dwg. IP 5567-12
	100' electrode intervals	Dwg. IP 5567-13

b) Reconnaissance Lines

Mt. Emily Recon Line 30+00N	200' electrode intervals	Dwg. IP 5568-1
Mt. Emily Recon Line 10+00N	200' electrode intervals	Dwg. IP 5568-2
Mt. Emily Recon Line 0+00	200' electrode intervals	Dwg. IP 5568-3
Gum Tree Recon Line 0+00	200' electrode intervals	Dwg. IP 5568-4
2nd Plain Recon Line 0+00	200' electrode intervals	Dwg. IP 5568-5

Also enclosed with this report is Dwg. I.P.P. 3047A, a plan map of the Appealinna Prospect Grid at a scale of 1" = 400'. The definite and possible induced polarization anomalies are indicated by solid and broken bars respectively on this plan map as well as 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 polarization measurement is essentially an averaging process, as are all potential methods, it is frequently difficult to exa ctly pinpoint the source of an anomaly. Certainly, no anomaly can be located with more accuracy than the spread length; i.e. when using 200' spreads the position of a narrow sulphide body can only be determined to lie between two stations 200' apart. In order to locate sources at some depth, larger spreads 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 source, the length of the indicated anomaly along the line should not be taken to represent the exact edges of the anomalous material.

3. DISCUSSION OF RESULTS

The reconnaissance induced polarization and resistivity survey on the Appealinna Copper Prospect Grid was carried out on lines 1000' apart. Electrode intervals of 200' were used in order to complete the survey in a reasonable time. As explained in the Appendix to this report, the apparent anomaly from a narrow source will be small in magnitude when larger electrode intervals are used. In order to fully evaluate, and better locate the source, the anomalies must be checked with shorter electrode intervals.

a) Appealinna Copper Prospect

Line 0+00

A weak source may be centred at 20N or may be part of a broad, weak zone extending to 14N.

Line 5+00E

The shallow anomaly centred at 20+50N is somewhat stronger on this line.

Line 10+00E

A weak anomaly can be correlated with lode material at 23N and a possible source is indicated at 15N.

Line 20+00E

A broad zone has been confirmed with 100 foot electrode intervals. Apparently minor mineralization occurs throughout the width of the southern breccia zone. A possible anomaly is located at 17E. Parallel lines should be surveyed at 1500E and at 2500E.

Line 30+00E

A weak anomaly lies on the narrow breccia zone and a second possible source is located at 19E.

Line 35+00E

A probable anomaly at 63N lies within the breccia zone. The source is shallow using 200 foot spreads and should be confirmed with 100 foot spreads on this line and parallel lines at 4000E and 3000E. A possible anomaly at 71N should be checked with shorter electrode intervals.

Line 40+00E

The source of the well-defined anomaly at 31N appears to be in favourable lode material and appears to be north of the breccia zone. Lines 250 feet either side of the anomaly should be surveyed using 200 foot spreads to confirm continuity. There is some depth to the top of the source and measurements using wider electrode intervals should follow.

Line 50+00E

The 200 foot reconnaissance located a probable anomaly at 64N-66N on the southern side of the diapir. The anomaly was confirmed when repeated using 100 foot separations. A weak and/or narrow source is indicated. A second weak and shallow source is located at 62N-63N.

Line 60+00E

This line was first surveyed using 200 foot electrode intervals. A broad zone of anomalous IP effects begin at the north edge of the diapiric breccia on 74N and extends to 64N.

The pattern suggested a broad, shallow source and the zone was repeated using 100 foot electrode spacing. Several anomalies occur within the broad zone and probably indicate local increases in mineral content. The most definite of these occur at 73N. Probable narrow sources occur at 64N-65N, and at 67N.

Four hundred foot electrode intervals were used to check an apparently deep source at 54N (200 foot spreads). The anomaly has been confirmed and the source again appears to be at depth. A partially defined anomaly at the entrance to the south end of the line should be confirmed with an extension of the 400 foot data.

Closely spaced intermediate lines should be traversed to determine the extent of the zones.

b) Reconnaissance Lines

Mt. Emily

Three lines have been surveyed on this grid; 0+00, 10+00N and 30+00N.

The possible anomalies on Line 30+00N suggest weak or narrow sources using 200 foot spreads but shorter spread measurements may improve the IP effects.

Line 10+00N will need to be extended using 100 foot spreads from 12E to 00.

The anomalous IP effects measured on Line 0+00 could reflect two sources, but more probably the source is broad and shallow. The anomaly should be repeated using 100 foot electrode intervals. Traverses on parallel lines 400 feet either side should follow.

Gumtree

Line 0+00

A broad, weak source was located at 16E-22E with a possible increase in metallic content at 17E. The line has to be extended to the west to further define the possible narrow source. Parallel lines should be surveyed either side of Line 0+00 to trace the zone along strike.

2nd Plain

Line 0+00

A possible anomaly is located at 26W on this single traverse. Shorter electrode intervals will be required to confirm this weak and apparently shallow source.

4. CONCLUSIONS AND RECOMMENDATIONS

The reconnaissance induced polarization and resistivity survey on the Appealinna Copper Prospect Grid has located several weak anomalies on lines 1000' apart. On Dwg. I.P.P. 3047A, the anomalies have been tentatively correlated into zones. The zones have considerable strike length, but the IP anomalies do not suggest appreciable volumes of concentrated metallic mineralization.

IP anomalies have been located within the favourable breccia zone on each line that traversed the zone. While the IP effects are not large, the sources could be of economic interest if the zones prove to be extensive. The detailed measurements given in the discussion of results should be carried out before testing by drilling. Alternative means of testing can be used, e.g. back-hoe trenching or close geochemical sampling across the anomalies.

Zone A

This zone passes through the old workings and correlates with the known lode position. On Line 5+00E the measurements with X = 100' show a shallow anomaly centred at 20+50N. On Line 20+00E, the X = 100' measurements show a complex source. These are narrow, shallow anomalies centred at 21+50N and 23+50N. The 200' spread measurements on Line 40+00E show a narrow, shallow anomaly centred at 31+00N. As explained in the Appendix, the source of the anomalies could be better located, and evaluated, using shorter electrode intervals.

Zone B

This zone is formed by weaker anomalies. It lies to the south of Zone A. The anomalies are not definite enough to warrant further work at this time.

Zone C, Zone D and Zone E

These three zones lie to the northeast of the workings. The IP anomalies have the same character as those on Zone A that correlate with the known mineralization in the lode. The anomalies on Line 50+00E and Line 60+00E are typical. The anomaly centred at depth, at 73+00N on Line 60+00E, is one of the more definite located.

If the mineralization forming Zone A is found to be of economic value, further work would be warranted to check Zone C, Zone D and Zone E.

Mt. Emily

No geologic information is available. Detailed measurements on Line 0+00 and 10+00N and adjacent parallel lines will be required if surface testing is not possible. The IP effects are not strong, but are quite definite.

Gum Tree

The weak anomalies should be checked along strike in both directions.

2nd Plain

There is little of interest on this line.

Our experience has shown that a single reconnaissance traverse over any given area of interest may be useful in locating large, strong sources, but does not provide enough information to fully evaluate weaker anomalies.

McPHAR GEOPHYSICS PTY. LTD.

Philip G. Hallof

Philip G. Hallof,
Geophysicist.

E. Burnside

Edward Burnside,
Geophysicist.

Dated: October 15, 1970

McPHAR GEOPHYSICS

APPENDIX A
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 are not 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.

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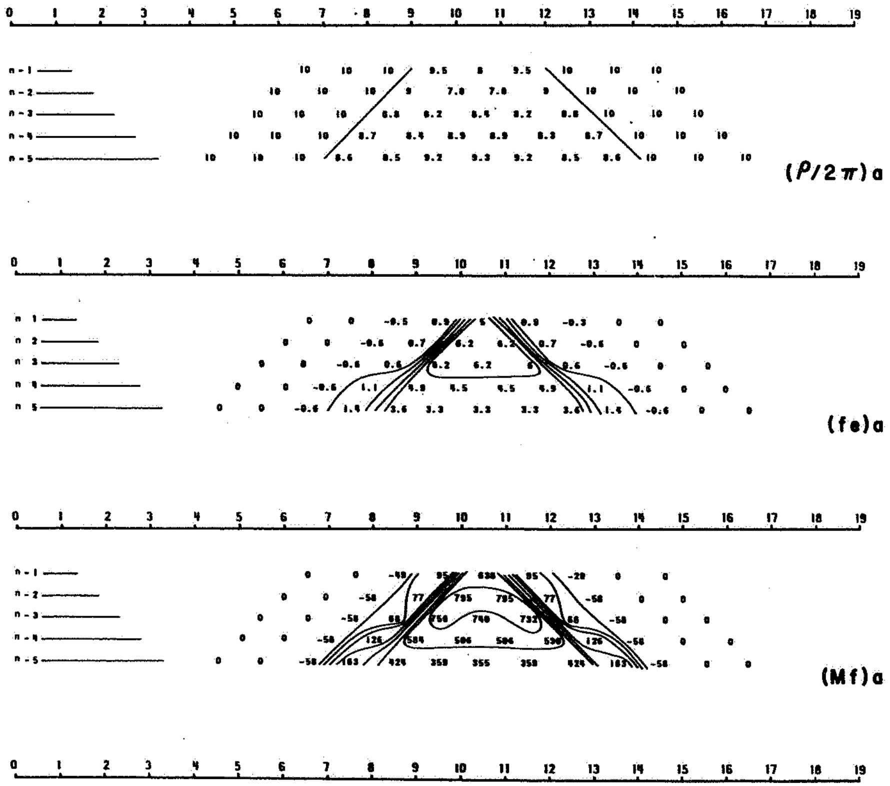
Theoretical Induced Polarization and Resistivity Studies

Scale Model Cases



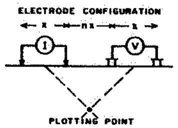
$(\rho/2\pi)_1 = 10$

$(Mf)_1 = 0$

$(\rho/2\pi)_2 = 2.51$

$(Mf)_2 = 10000$

$(fe)_2 = 25\%$



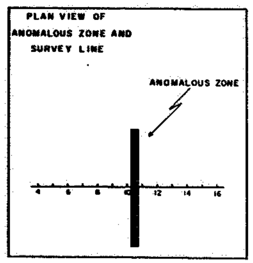


FIG. 1

CASE II-0.5-BU-10-a

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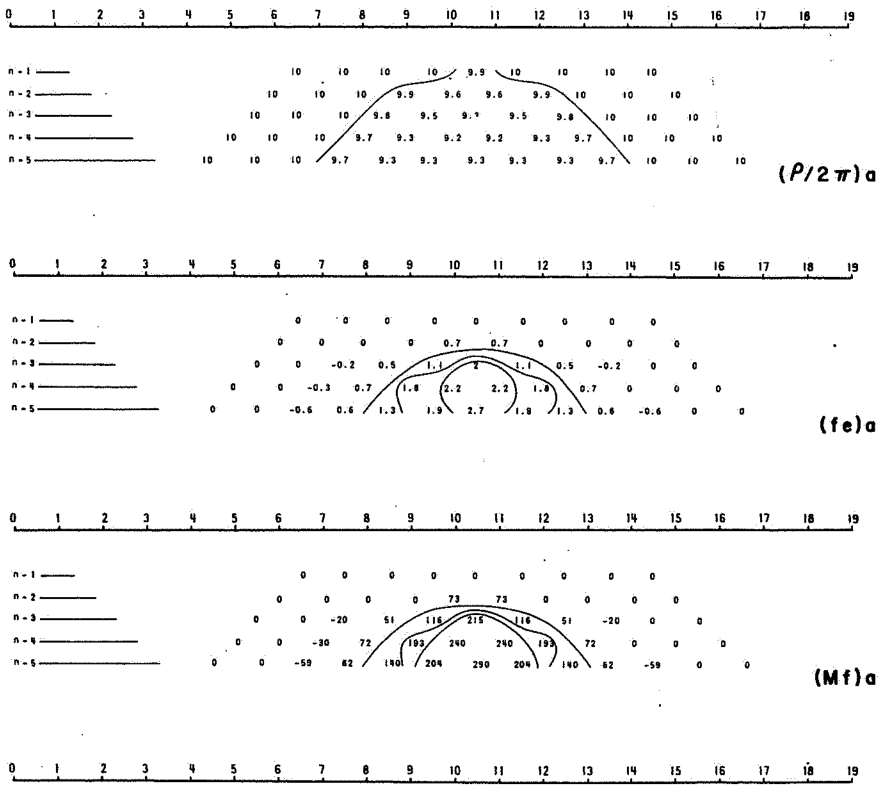
Theoretical Induced Polarization and Resistivity Studies

Scale Model Cases



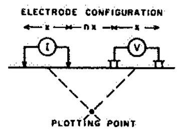
$(\rho/2\pi)_1 = 10$

$(Mf)_1 = 0$

$(\rho/2\pi)_2 = 2.6$

$(Mf)_2 = 9250$

$(fe)_2 = 24\%$



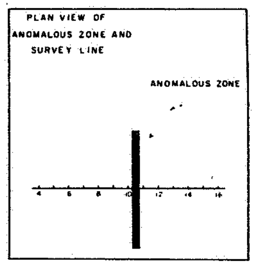


FIG. 2

CASE II-1.5-BU-10-a

30023

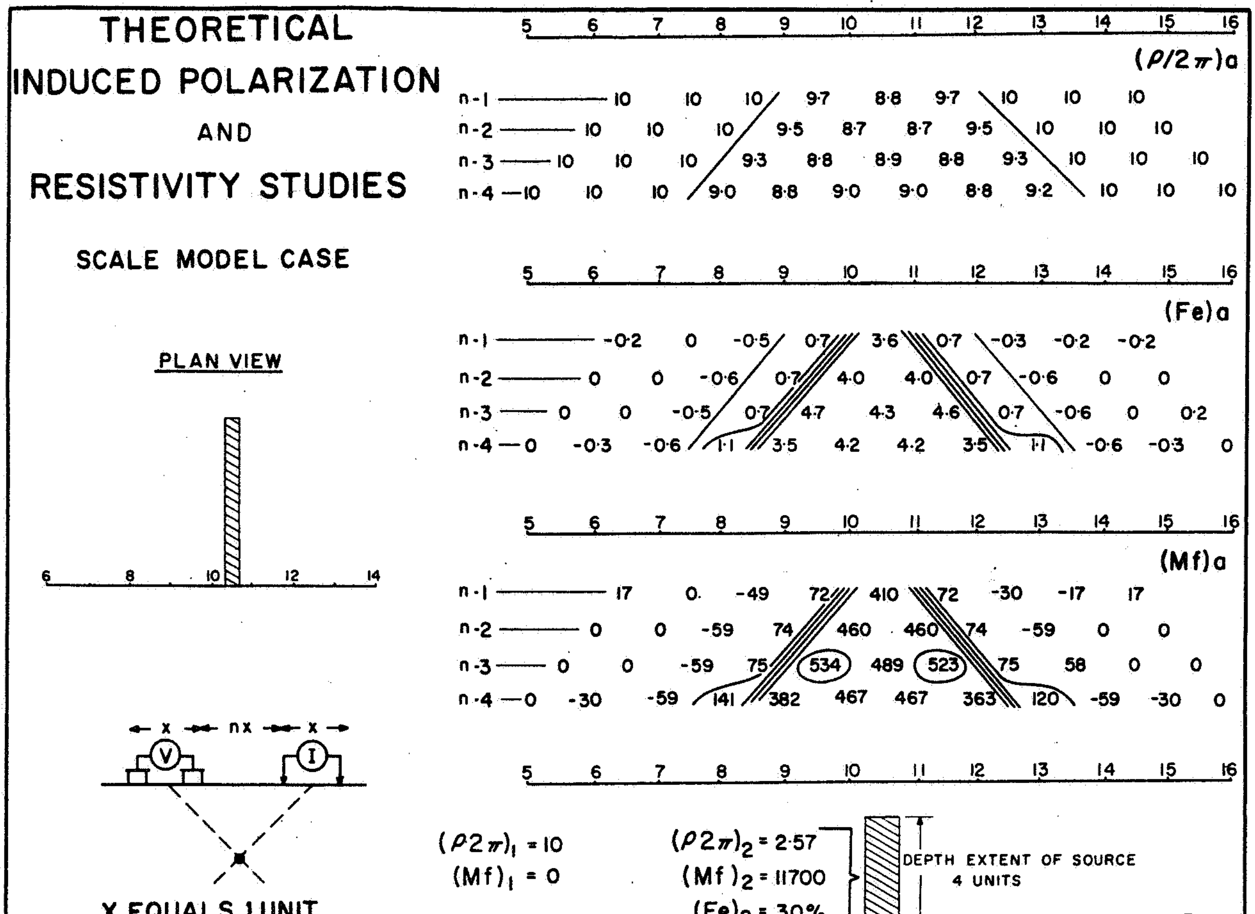

THEORETICAL
INDUCED POLARIZATION
AND
RESISTIVITY STUDIES
SCALE MODEL CASE
PLAN VIEW
6 8 10 12 14
X nX X
V I
X EQUALS 1 UNIT
5 6 7 8 9 10 11 12 13 14 15 16
(ρ/2π)a
n-1 10 10 10 9·7 8·8 9·7 10 10 10
n-2 10 10 10 9·5 8·7 8·7 9·5 10 10 10
n-3 10 10 10 9·3 8·8 8·9 8·8 9·3 10 10 10
n-4 10 10 10 9·0 8·8 9·0 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
(ρ2π)1 = 10
(Mf)1 = 0
(ρ2π)2 = 2·57
(Mf)2 = 11700
(Fe)2 = 30%
DEPTH EXTENT OF SOURCE
4 UNITS

FIG. 3

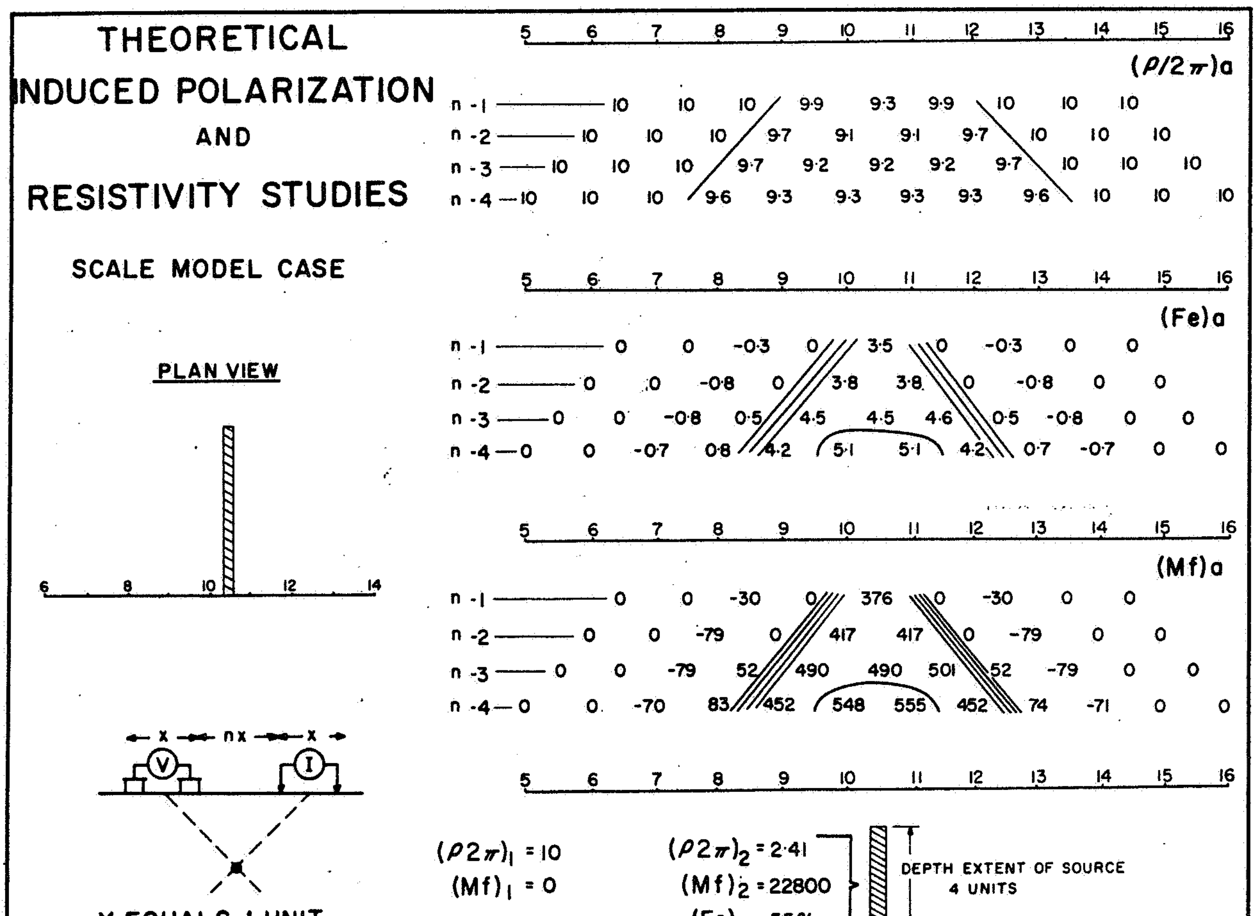

THEORETICAL
INDUCED POLARIZATION
AND
RESISTIVITY STUDIES
SCALE MODEL CASE
PLAN VIEW
6 8 10 12 14
X nX X
V I
X EQUALS 1 UNIT
5 6 7 8 9 10 11 12 13 14 15 16
(ρ/2π)a
n-1 10 10 10 9·9 9·3 9·9 10 10 10
n-2 10 10 10 9·7 9·1 9·1 9·7 10 10 10
n-3 10 10 10 9·7 9·2 9·2 9·2 9·7 10 10 10
n-4 10 10 10 9·6 9·3 9·3 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
(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.

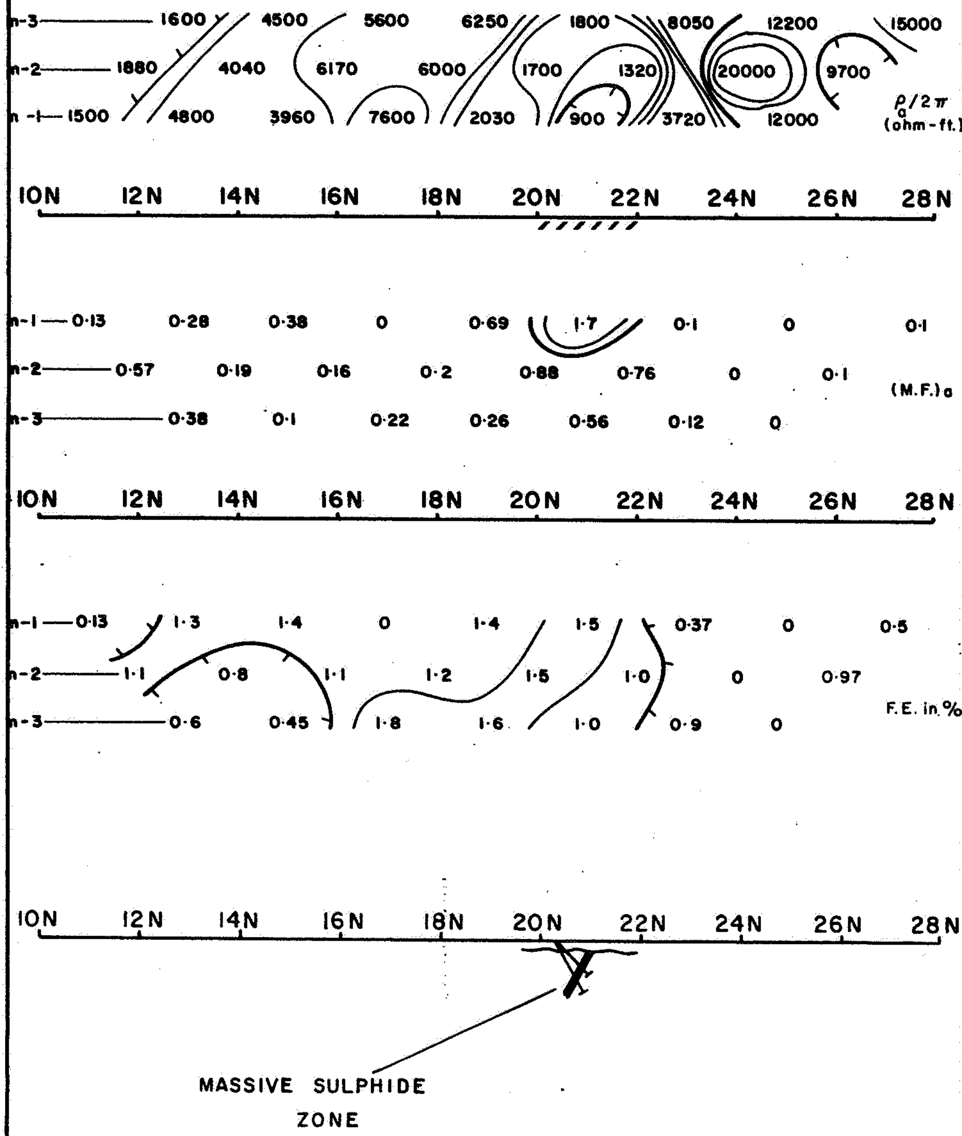


FIG. 5

INDUCED POLARIZATION AND RESISTIVITY RESULTS
BATCHELOR LAKE AREA, QUEBEC.

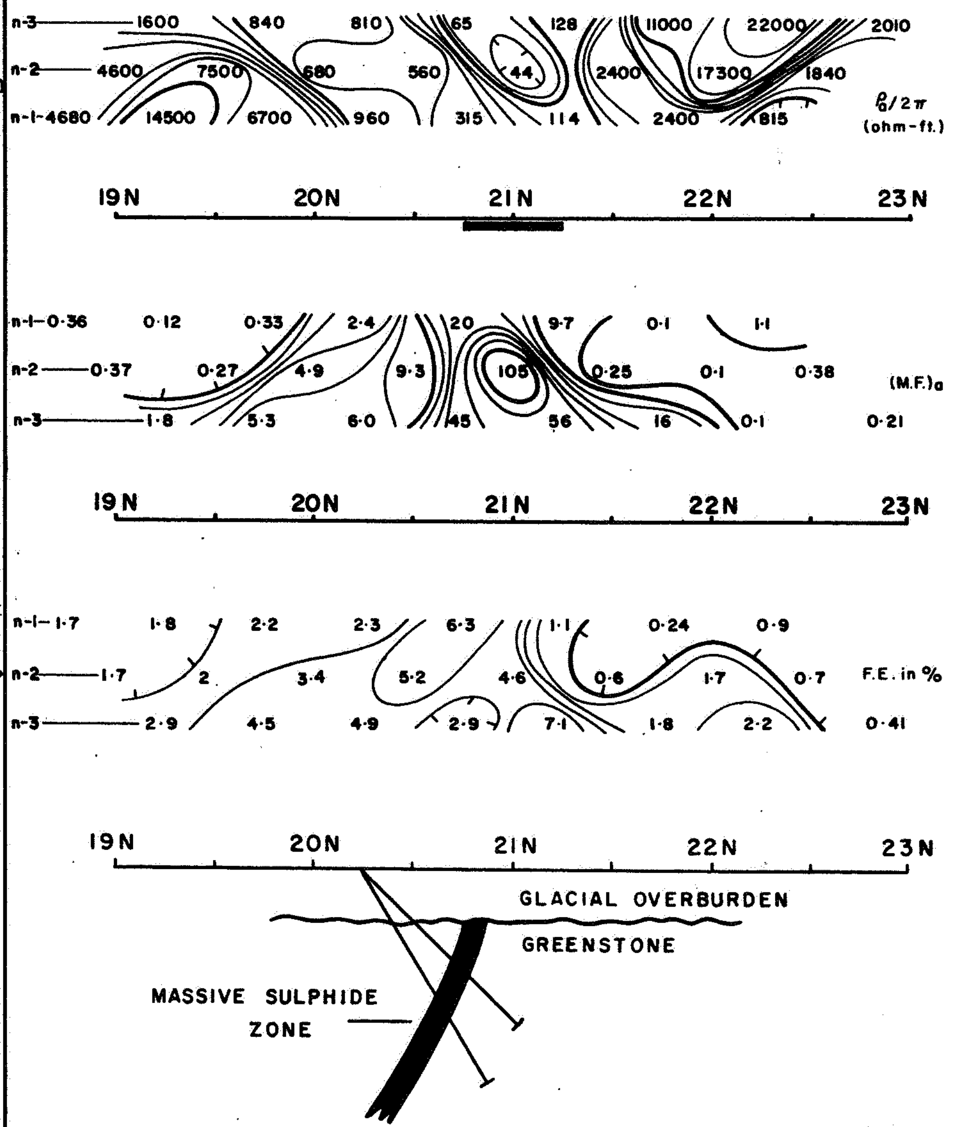


FIG. 6

900025

ENV. 1381

00026

SOUTH AUSTRALIAN BARYTES LIMITED

FINAL REPORT

ON

S.M.L. 325 ORAPARINNA

FLINDERS RANGES S. A.

BY

R.B. REID

FINAL REPORT S.M.L. 325 ORAPARINNA

Introduction:

Application for S.M.L. 325 was made with the aims:

1) To investigate the known barite deposits in close proximity to the present mine and find and evaluate any other barite deposits in the area.

2. To find and evaluate any other mineral deposits in the area close to the company's present operations.

S.M.L. 325 was granted for a twelve month period beginning July 15 1969. During this period, considerable research into the formation of barite deposits has been followed by field mapping, costeaning and analysing of the barite deposits on the S.M.L.

Field mapping, combined with geochemistry and I.P.has outlined several areas of further interest with regard to possible copper mineralisation.

Location and Access:

S.M.L. 325 covers an area of 360 square miles in the Flinders Ranges, between Willow Springs and Angorichina homesteads. It is centred on Oraparinna homestead, 50 miles N.N.E. of Hawker.

Access is by the Hawker-Blinman road, the north-south tracks on First Plain and Second Plain, the east-west road from Oraparinna Homestead to S.A.Barytes mine and by numerous station tracks. Apart from the Bunkers, the rugged mountains on the south eastern side of the Oraparinna diapir, most areas can be reached by four wheel drive vehicle.

Regional Geology

The area covered by S.M.L.325 consists of the Upper Proterozoic Umberatana and Wilpena Group sediments, ranging from conglomerates and sandstones to shales and thick sequences of limestones (map 1)

continued......

These sediments are domed upwards and pierced by a diapiric breccia which outcrops over an area of approximately 50 square miles and contains extremely large (½ mile across) fragments of shale, dolomite, and dolerite and volcanic rock. (c.f.Coates: Geology of the Blinman Diapir) overlying these Proterozoic sediments to the west and east are Cambrian limestones. There is no evidence of igneous intrusion into the exposed sediments and matamorphism is very low grade.

Exploration for Barite deposits:

From air photographs, all faults in the area were mapped (Map 2) These were then traversed on the ground and barite occurrences plotted on the map. Of the twenty three occurrences located in this way and the six previously known, eleven have been considered worthy of further documentation(i.e. larger than 2,000 tons estimated reserves minable by simple open cut methods) These are from north to south.

1. Cement Square (1.4miles N.W.Carey Hill) Outcrop in Bunyeroo Formation, Strike 75° vertical dip. Good quality barite lode 300 feet long, varies in width from 2 to 12 feet. Possible reserves (to 50 feet) 10,000 tons.

2. West Carey Hill Mine (1.4 mile NNW Carey Hill) Outcrops in Brachina Formation. Strike 80°. Narrow barite lodes containing some iron oxides outcrop for a distance of 900 feet but are not continuous on the surface.

3. East Carey Hill Mine (0.9 miles due north of Carey Hill.

Outcrop in Brachina Formation. Strike 80° vertical dip. Lode system outcrops intermittently for 1300 feet. The width varies from 2 feet to 8 feet, but the lode contains wall-rock inclusions in many areas. The best parts have been mined out, leaving possible reserves of minable ore at 10,000 tons.

4. 1.5 miles due south of Carey Hill.

Outcrop in Brachina formation. Strike 80° and dip 70° north. This deposit averages 2 feet wide for a distance of 200 feet. Possible reserves are 2,000 tons from which a bulk sample gave:

$BaSO_4$	92.6
$SrSO_4$	3.10
SiO_2	3.75

cotd..

5. <u>0.5 miles E.S.E. of Aroona Ruins.</u>

Outcrop in Bunyeroo Formation. Strike 90° and dip 80° south. This lode is 280 feet long, 2 feet wide and has been partially worked. Bulk sample gave:

$BaSO_4$	95.0
$SrSO_4$	4.80
SiO_2	0.1

6. <u>Linkies Lode.</u> (1.4 miles N.E. Appealinna Mine)

Outcrop at contact between diapiric breccia and Tapley Hill Formation slates (Map 6) This lode has a length of 4,000 feet and trends in an E.N.E.direction. It has been worked by open-cut methods for a distance of approximately 1,000 feet, where its average width is 12 feet. Average width overall is approximately 8 feet, making reserves to 50 feet below present outcrop 200,000 tons. The barite contains approximately 5% quartz, 15% siderite and ½% chalcopyrite.

7. <u>Vincent Lodes.</u> (2.8 miles N.E. of Appealinna Mine)

Outcrop in Wilyerpa Formation sandstones and shales, several lodes of low grade barite occur in this area (Map 3) Estimated reserves (to 50 feet) are 25,000 tons averaging:

$BaSO_4$	75.2%
$SrSO_4$	1.4%
SiO_2	23.4%

8. <u>Howard Lodes.</u> (3.2 miles E.S.E.Apperlinna Mine)

Outcrop in the Wilyerpa Formation shales and hematitic shales. The lodes are associated with sideritic and quartz veins, which they postdate (Map 4) Estimated reserves are 10,000 tons of barite, Bulk sample gave:

$BaSO_4$	89.5%	
$SeSO_4$	14.0%	?
SiO_2	7.9%	

continued...

9. Southern Lodes (2.5 miles S.W. of S.A. Barytes Mine)

These lodes are within the diapir. They strike N.W. and dip approximately 40° north east. The two main lodes parallel each other, about 15 feet apart, but converge and join at their N.W. end. Each lode is approximately 2 feet wide and 200 feet long, but siderite and host-rock inclusions account for 50% of these lodes.

10. Turley Lodes (1.4 miles S.W. of S.A. Barytes Mine)

Outcrop in the Brachina Formation shales. An extensive vein system is present at this location (Map 5) but the majority of veins are narrow and many contain siderite and hematite. The main lode which strikes north, has been worked to a depth of 70 feet, where it is 6 feet wide. Bulk analysis of this lode gave:

$BaSO_4$	95.2%
$SrSO_4$	2.25%
SiO_2	0.1%
Fe_2O_3	2.1%

11. Bairstowe Lodes (1.8 miles NNE of Appealinna Mine)

These two parallel lodes outcrop partially in diapiric breccia and partially in the rim-rock shales. They strike at 60°, the eastern lode being 1500 feet long, the western lode 1,000 feet long. Both lodes contain a large amount of specular hematite and quartz, though part of the eastern lode (6 feet wide) has been mined for oil-drilling grade barite. Reserves here are large, but the impurities are too high for the lodes to be mined under present conditions.

12. Far Western Lodes (2.5 miles NW of S.A. Barytes Mine)

A series of enechelon lodes, each approximately 30 feet long, with a maximum thickness of 2 feet, outcrop in the Enorama Shale. The barite is good quality but costeaning showed no increase in continuity or thickness of the lodes at a depth of 20 feet.

continued.........

Metallic Minerals:

The occurrence of copper and lead within the diapir have been documented fully by McGain and Settles (1966) and by Hosking & Allchurch (1969) These reports include a geochemical stream sediment survey and a reconnaiance I.P.Survey over the diapiric area. Outside the diapir, investigation of possible metallic mineral vein deposits was incorporated into the search for barite deposits.

A. Outside Diapiric Areas

All iron-rich vein material was analysed for Cu, Pb, Zn, Co, Ni, Ag. These results are tabled in Appendix 1. Of these results, three appear anomalous with regard to copper concentration:

B.14. (6600 ppm.Cu) was taken from a quartz-limonite vein which outcrops 0.8 miles west of Carey Hill in the Brachina Formation. The outcrop is 200 feet long and 3 feet wide. Small particles of chalcopyrite are visible.

B.22 (1300 ppm.Cu) was taken from a limonitic outcrop adjacent to the Howard Lodes. Some malachite staining is present in both slates and the barite from this area.

Od.333 (4600 ppm.Cu) was taken from quartz-limonite outcrops possibly strataform, 0.6 miles south of the Vincent Lodes. This outcrop in the Tindelpina Shale continues for half a mile towards the Howard Lodes and malachite stain is present in places.
Apart from these anomalous ironstones, two abandoned mines were investigated

1. Kibble Hill Copper Mine:

Located 2 miles south of Mt.Caernarvon, this mine is on a small siderite-chalcopyrite vein in the Tindelpina Shale. Bulk analyses of the oxidised ore gave:

Cu.18%, Pb 60 ppm, Zn 190 ppm, Co.20 ppm, Ni.15 ppm, Ag. 9 ppm.

Several other similar veins occur within the six miles north of Kibble Hill, the largest being 9 inches wide.

2. Moodlatana Creek Lead Mine

This mine is on First Plain, 4.6 miles north east of Mt.Emily Mine. A narrow (2 feet) quartz-galena vein, containing 10% galena, strikes north-south for a distance of 100 feet. Host rocks are the Enorama Shales. An I.P.line, with 200 feet electrode spacings, across the old mine workings, showed a very weak anomaly. (see Appendix 2).

contd/

B. <u>At Diapir Boundaries</u>

1. <u>Appealinna Copper Mine</u>

Appealinna Mine is in a narrow line of diapiric breccia, in an east-west trending fault. (Map 6) On either side of the breccia are shales and dolomites of the Tapley Hill Formation. Similar breccia also occurs half a mile north, adjacent to Linkie's Barite Mine. At this location chalcopyrite is present in the barite and in the breccia, where a pit has been dug on a quart-hematite vein.

Mapping of these areas has been followed by an I.P. survey which showed anomalies greater than those over the mine workings on both 200 feet and 100 feet electrode spacings. (Appendix 2)

2. <u>Mt.Emily Mine</u>

Significant copper and lead sulphide mineralisation is present in two shafts at a depth of 30 feet. The mineralisation appears to be at the contact between diapiric breccia and Etina Formation calcareous shales, which form the rim-rocks at this location. An I.P. Survey, with 200 feet electrode spacings, has showed some anomalous areas north of the mine.

C. <u>Within Diapir</u>

As mentioned above, these mineral occurrences have previously been documented. None appear to have particular significance of the thirteen I.P. anomalies reported by McGain and Battles however, eight extended to within 500 feet of the surface. Of these, three have associated geochemical copper anomalies. (Hosking & Allchurch) and two are below large outcrops of dolomites and dolomitic shales.

<u>Conclusions and Recommendations:</u>

1. BARITE ~~No large~~, pure barite deposits have been located during the course of this exploration programme.

2. One small (10,000 tons) high grade deposit has been located. This is in the Cement Square deposit 1.4 miles N.W. of Carey Hill.

3. Two larger deposits with high silica contamination, but free of iron have been located. These are the Vincent and Howard lodes, east of Appealinna Mine.

4. Linkies Lode, with reserves of 200,000 tons to a depth of 50 feet is the largest of the impure lodes and may be minable if the price of barite increases to allow magnetic separation of the iron.

COPPER

1. Appealinna Prospect:

It is recommended that six percussion holes be drilled into the I.P. anomalies to determine the source of these anomalies. If associated with economic mineralisation the anomalies should be extended with a more detailed I.P.survey.

2. Mt.Emily Prospect:

AN association between I.P.anomalies and economic mineralisation at the Appealinna Prospect would suggest similar association at Mount Emily. In this case, a more detailed I.P.survey should be undertaken, followed by drilling.

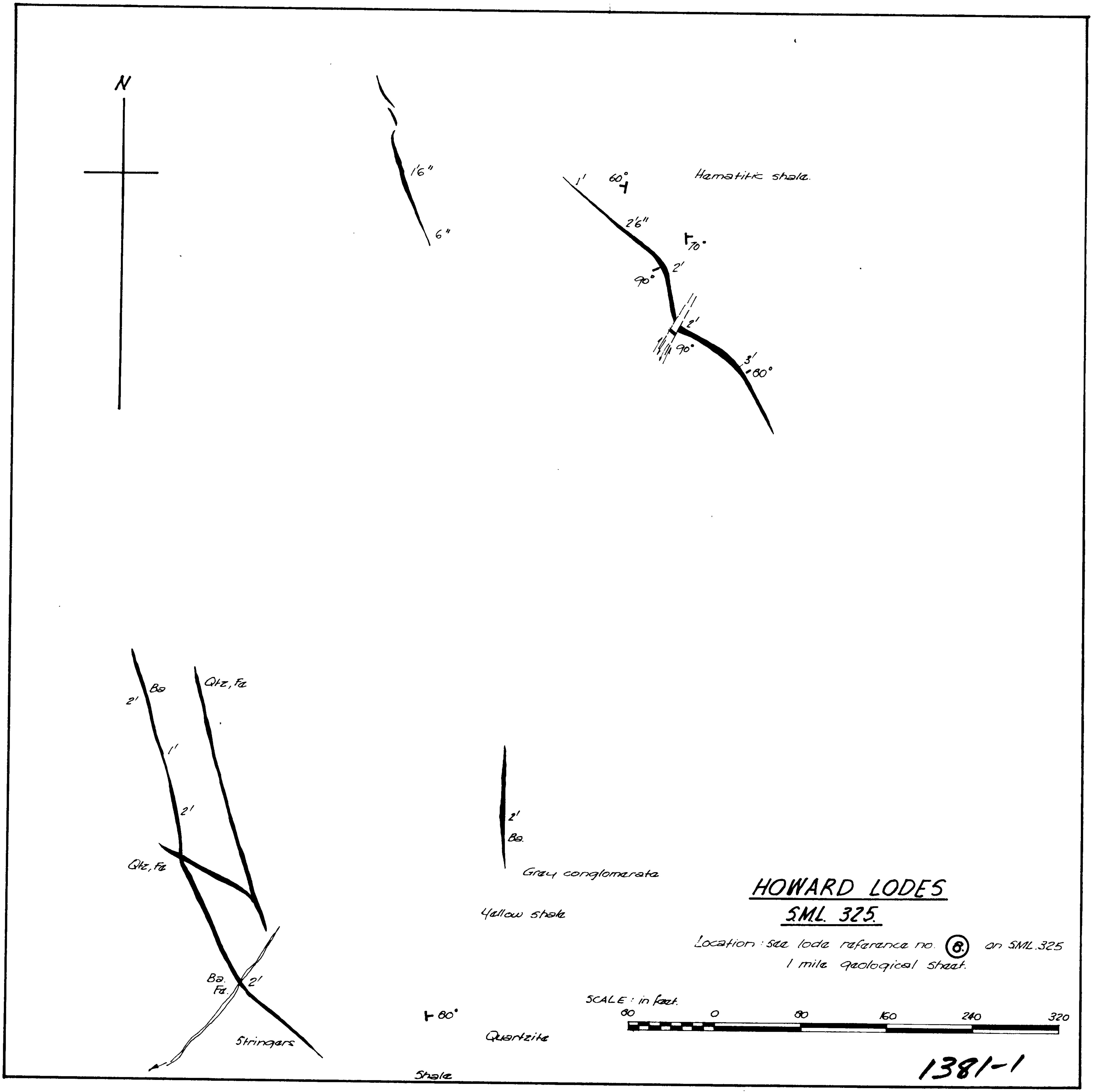
3. I.P.Anomalies within diapir.

The five anomalies showing greatest potential should be investigated by shorter electrode interval induced polarization.

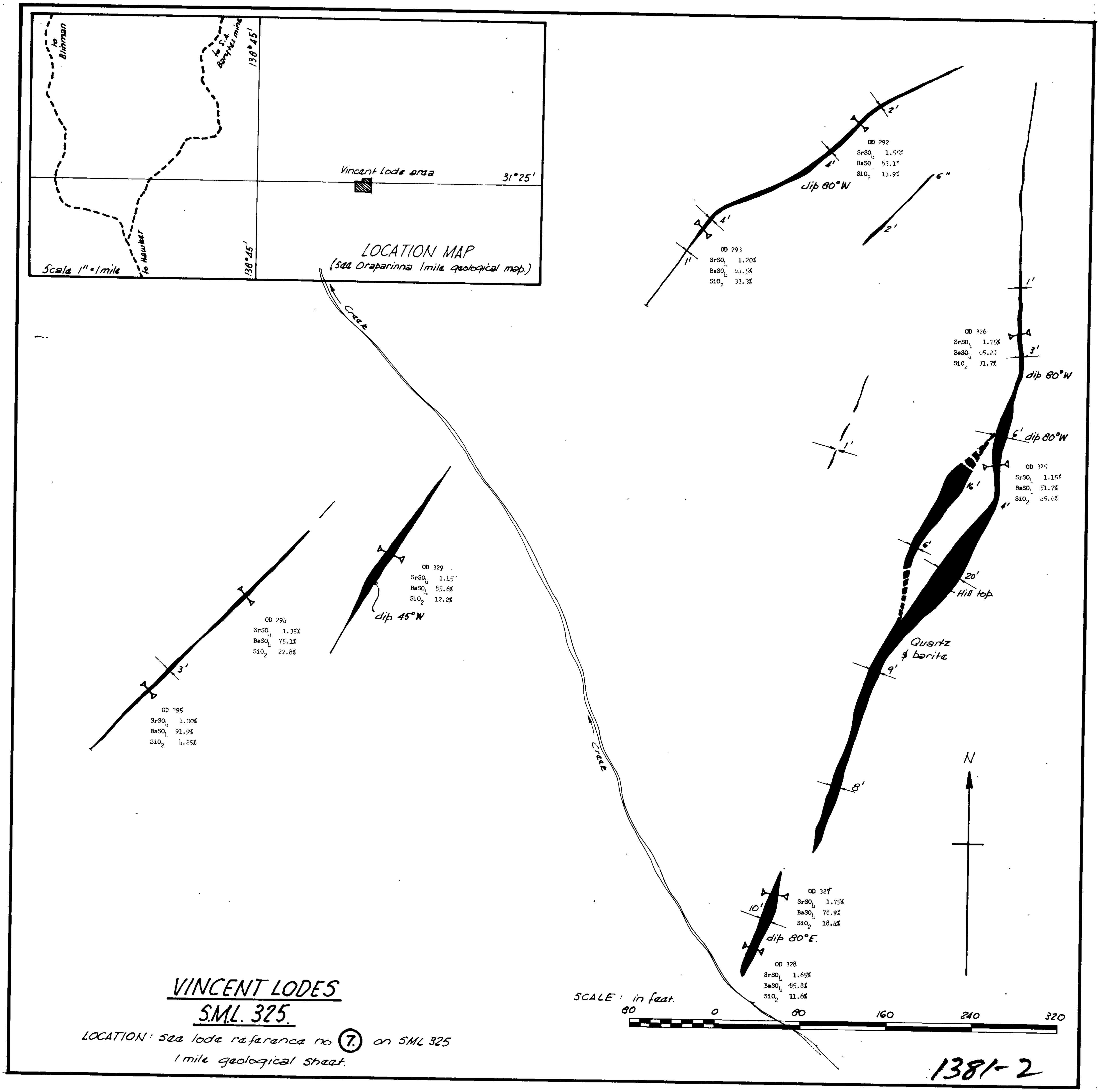
APPENDIX 1.

ANALYSES OF IRON-RICH VEIN DEPOSITS

	Ag.	Cu.	Pb.	Zn.	Co.	Ni.
B1	1	810	30	15	25	20
2		60	15	25	5	5
3		650	20	15	5	5
8		20	20	30	10	30
9		500	25	120	10	80
10						
11		6600	30	15	5	5
20		55	40	30	50	20
22		1300	25	30	50	30
OD 333		4600	20	35	5	55
300		160	25	35	30	50
301		440	75	55	20	30
302		20	25	35	30	25
303		30	15	20	25	70
304		15	20	20	25	20
305		5	20	170	25	40
306		25	25	15	20	30
307		30	30	20	70	490
308		290	15	20	50	130
309		210	15	85	30	60



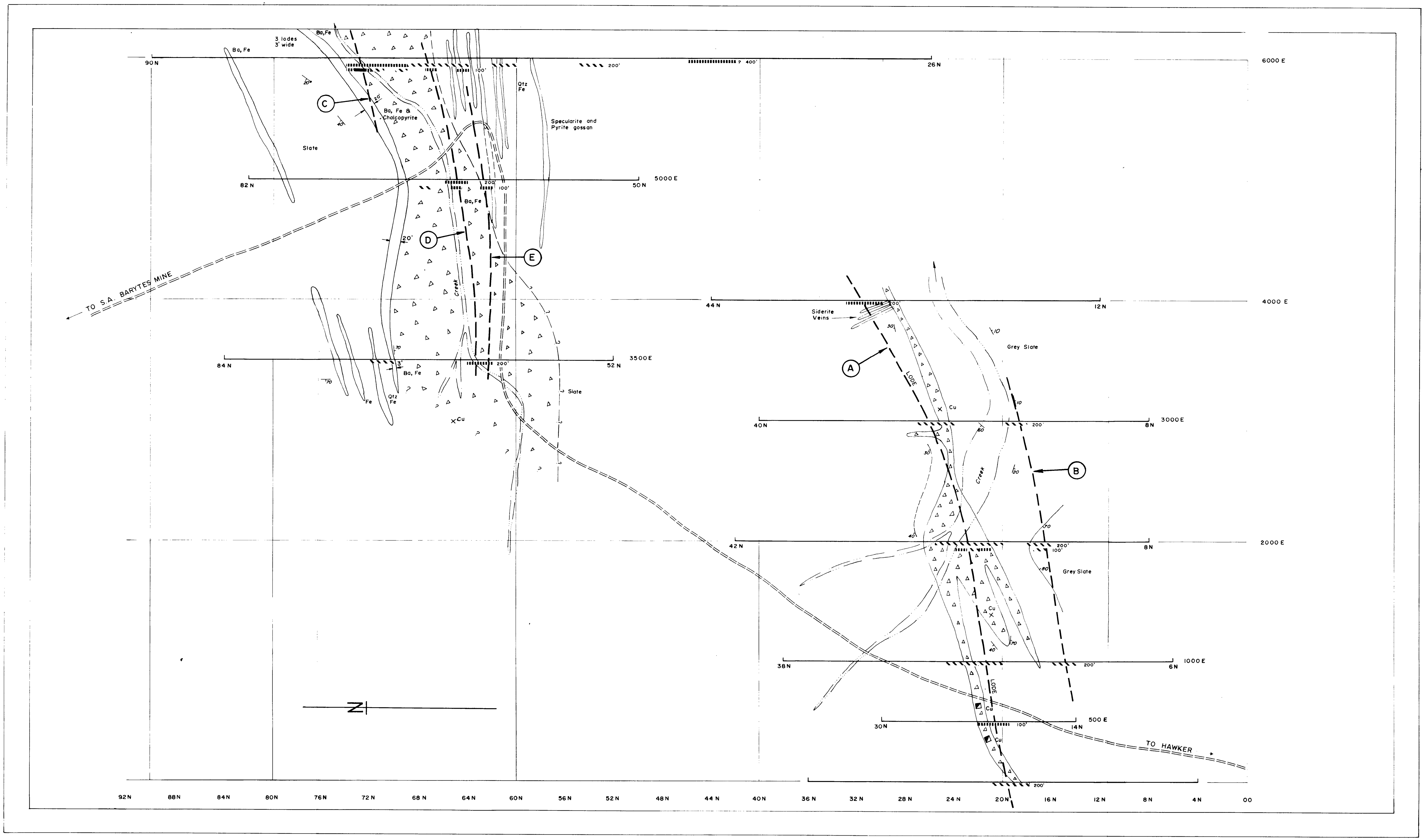
N
1'6"
6"
1'
60°
Hematitic shale.
2'6"
70°
2'
90°
2'
90°
3'
80°
Ba
2'
Qtz, Fe
1'
2'
Qtz, Fe
2'
Ba.
Grey conglomerate
Yellow shale
Ba.
Fe.
2'
Stringers
80°
Quartzite
Shale
HOWARD LODES
SML. 325.
Location: see lode reference no. 6. on SML. 325
1 mile geological sheet.
SCALE: in feet.
80 0 80 160 240 320
1381-1



to Blinman
to S.A. Barytes mine
138°45'
Vincent Lode area
31°25'
to Hawker
138°45'
Scale 1" = 1 mile
LOCATION MAP
(See Oraparinna 1 mile geological map.)
Creek
2'
4'
OD 292
SrSO4 1.55%
BaSO 83.1%
SiO2 13.9%
dip 80°W
6"
2'
4'
1'
OD 293
SrSO4 1.20%
BaSO4 64.5%
SiO2 33.3%
1'
OD 326
SrSO4 1.75%
BaSO4 65.2%
SiO2 31.7%
3'
dip 80°W
6' dip 80°W
1'
OD 325
SrSO4 1.15%
BaSO4 51.7%
SiO2 45.6%
16'
4'
6'
20'
Hill top
Quartz & barite
9'
8'
N
OD 329
SrSO4 1.45%
BaSO4 85.6%
SiO2 12.2%
dip 45°W
OD 294
SrSO4 1.35%
BaSO4 75.1%
SiO2 22.8%
3'
OD 295
SrSO4 1.00%
BaSO4 91.9%
SiO2 4.25%
Creek
OD 327
SrSO4 1.75%
BaSO4 78.9%
SiO2 18.4%
10'
dip 80°E.
OD 328
SrSO4 1.65%
BaSO4 85.8%
SiO2 11.6%
SCALE: in feet.
80
0
80
160
240
320
VINCENT LODES
S.M.L. 325.
LOCATION: see lode reference no 7 on SML 325
1 mile geological sheet.
1381-2

McPHAR GEOPHYSICS PTY. LTD.

INDUCED POLARIZATION AND RESISTIVITY SURVEY.



SURFACE PROJECTION OF ANOMALOUS ZONES
DEFINITE
PROBABLE
POSSIBLE
NUMBER AT THE END OF ANOMALY INDICTES SPREAD USED

S.A. BARYTES LTD.
APPEALINNA COPPER PROSPECT
S.M.L. 325
SOUTH AUSTRALIA

SCALE : 1 INCH = 400 FEET

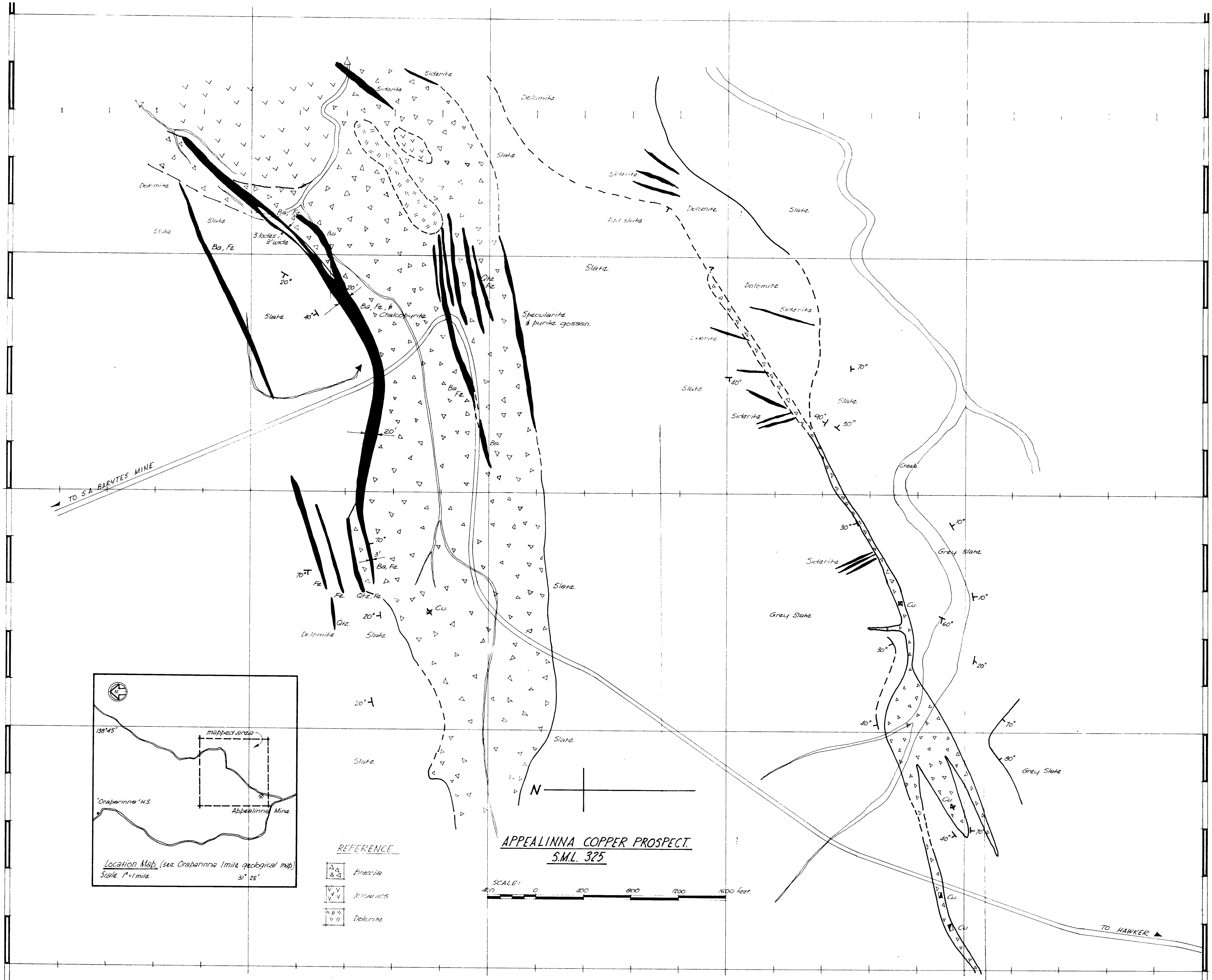
NOTE: POSSIBLE AXES OF ANOMALOUS I.P. ZONES

DRAWN: R.G.Z.
DATE: 3-7-70
APPROVED: E.B.

DATE: 10.11.70

1381-3

DWG: I.P.P. 3047 A


APPEALINNA COPPER PROSPECT.
S.M.L. 325
SCALE:
400 0 400 800 1200 1600 feet.
REFERENCE
Breccia
Volcanics
Dolerite
Location Map (see Oraparinna 1 mile geological map)
Scale 1" = 1 mile.
mapped area
138°45'
31°25'
'Oraparinna' H.S.
Appealinna Mine.
TO S.A. BARYTES MINE
TO HAWKER
N
Siderite
Dolomite
Slate
Ba, Fe
3 lodes, 3' wide
Ba, Fe, & Chalcopyrite
Qtz. Fe
Specularite & pyrite gossan.
Grey Slate
Creek
Cu.
Qtz.
Qtz. Fe.

1381-4

Plan

1381-5

Is Missing

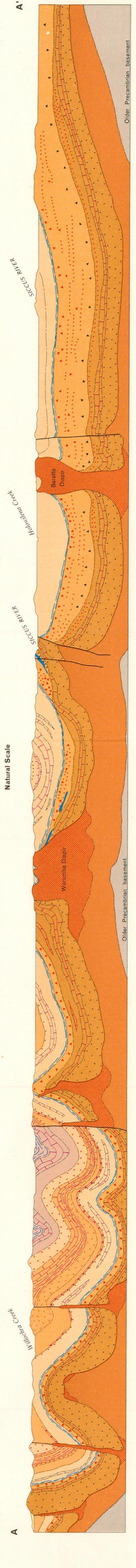
PARACHILNA

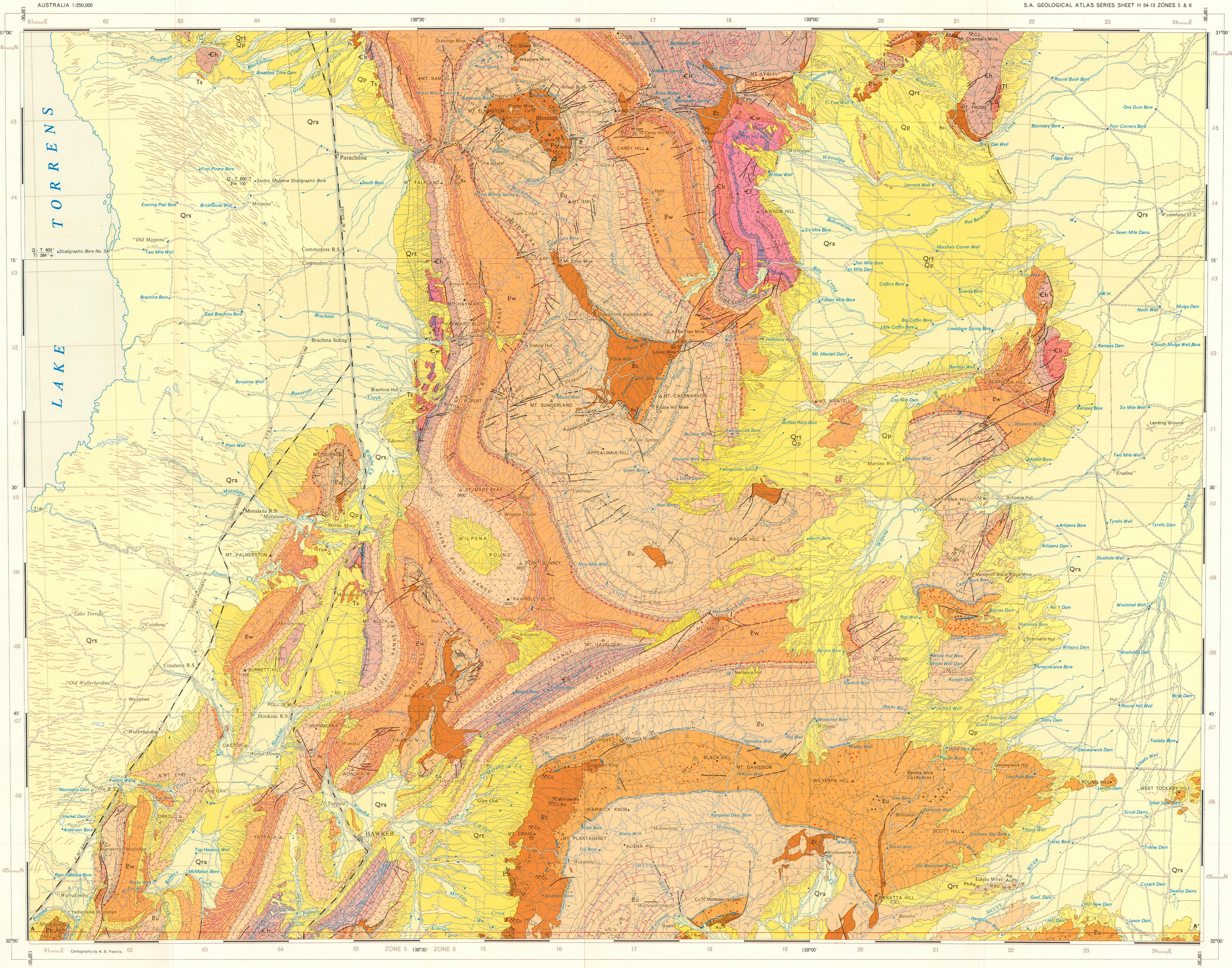
GEOLOGICAL SURVEY OF SOUTH AUSTRALIA
DEPARTMENT OF MINES ADELAIDE

AUSTRALIA 1:250,000

S.A. GEOLOGICAL ATLAS SERIES SHEET H 54-13 ZONES 5 & 6

FIRST EDITION 1966





REFERENCE

CAINOZOIC — QUATERNARY — RECENT

Lake deposits. Gypseous clays, saline silts and quartz sands.

Qra — Alluvium of drainage channels and flood plains.

Qrt — Low-angle slope deposits.

Scree deposits and well-defined outwash fans.

Qrs — Sand of ridges and dune spreads.

PLEISTOCENE

Qp — High-level dissected piedmont gravels, often kunkarised. Lacustrine sediments, gypsite and limestone. Jasper breccia east of Mt. Frome.

TERTIARY

Ts — Duricrust developed on Tertiary sands marginal to Pirie-Torrens Basin.

Tl,T? — Grey shales with basal polished pebble conglomerate. Case-hardened pebbly calcareous sands and silts near Grindstone Range.

PALAEOZOIC — PERMIAN

P — Glacial boulder clays and sandy conglomerates south of Blinman.

CAMBRIAN — MIDDLE CAMBRIAN — LAKE FROME GROUP

GRINDSTONE RANGE SANDSTONE: Crossbedded sandstones with well-rounded white quartzite pebbles in upper part.

PANTAPINNA SANDSTONE: Pink argillaceous sandstone with large scale crossbedding and heavy mineral banding.

€f — BALCORACANA FORMATION: Red-brown and green micaceous siltstones and thin grey dolomitic limestones, repetitively bedded.

MOODLATANA FORMATION: Friable red-brown arkosic sandstone. Crossbedding common. Thin dolomitic limestone near the base.

€w — WIRREALPA LIMESTONE: Grey nodular and shaly limestone with brachiopods and trilobite fragments. Massive bed at base.

€b — BILLY CREEK FORMATION: Red-brown micaceous sandstones and shales with halite pseudomorphs. Basal flaggy limestone followed by red and green shales with tuffaceous interbeds.

LOWER CAMBRIAN — HAWKER GROUP

€h — NARINA GREYWACKE: Grey-green calcareous siltstones and chloritic sandstones.

ORAPARINNA SHALE: Green carbonaceous siltstones with trilobites, brachiopods, hyolithids and rarely archaeocyathids.

BUNKERS SANDSTONE: Crossbedded sandstone with calcareous interbeds.

PARARA LIMESTONE: Dark, flaggy and silty limestones with interbedded shales.

WILKAWILLINA LIMESTONE: Massive biostromal archaeocyathid limestones with brachiopods. Dolomitic and sandy near the base with algal and oolitic beds. Local conglomerates near Frome and Wirrealpa Diapirs. Biohermal bank south of Ten Mile Creek.

PARACHILNA FORMATION: Argillaceous sandstones with vertical burrows. Oolitic and shaly lenses.

PROTEROZOIC — ADELAIDE SYSTEM — MARINOAN — WILPENA GROUP

Ꞓw — POUND QUARTZITE: Resistant white quartzite with minor shale bands above red crossbedded feldspathic sandstone.

WONOKA FORMATION: Grey calcareous shale with flaggy limestone interbeds. Becoming increasingly silty to the south-west. Pebble beds west of the Frome Diapir.

BUNYEROO FORMATION: Grey-green and red dolomitic shales.

A.B.C. RANGE QUARTZITE: Ripple-marked and cross-bedded feldspathic sandstone with heavy mineral laminae.

BRACHINA FORMATION: Brown-weathering, olive-drab siltstones with thin sandstone interbeds near the top. Purple and green shales south of Willochra Creek. Conglomerate bands near Frome Diapir. ULUPA SILTSTONE equivalent.

NUCCALEENA FORMATION: Cream-weathering, flaggy, pink-coloured dolomite.

UMBERATANA GROUP

Ꞓu — ELATINA FORMATION: Pink sandstone and feldspathic greywacke. Locally pebbles with glacial striae in red mudstone matrix. Equivalent of GRAMPUS QUARTZITE and PEPUARTA TILLITE.

AMBEROONA FORMATION EQUIVALENTS:

TREZONA FORMATION: Grey-green calcareous shale with interbeds of purple intraformational limestone breccia with shale flakes.

ENORAMA SHALE: Purplish-weathering green, silty and dolomitic shales.

ETINA FORMATION: Grey shales and interbeds of sandy and oolitic limestones. Pebble beds near Enorama Diapir.

STURTIAN

Greywacke of Mt. Burns and Sunderland Range developed locally.

WOCKERAWIRRA DOLOMITE: Grey dolomitic siltstones and yellow-weathering dolomites.

TAPLEY HILL FORMATION: Blue-grey and green laminated shales. Slump conglomerates locally near base.

MOUNT CAERNARVON GREYWACKE MEMBER: Boldly outcropping fine-to medium-grained dark sandstone.

TINDELPINA SHALE MEMBER: Finely laminated carbonaceous shales, dolomitic and pyritic.

Unnamed sandstone near Moralana.

YUDNAMUTANA SUB-GROUP

WILYERPA FORMATION: Glacial bands and siltstones overlying arkosic quartzite.

HOLOWILENA IRONSTONE: Haematite siltstones and sandstones with lenses of boulders and cobbles.

Oldest glacial units of the Bibliando Dome. Massive boulder tillite, siltstones and sandstones.

TORRENSIAN — BURRA GROUP

Ꞓb — Unnamed arkosic sandstones south-west of Worumba Diapir.

Unnamed grey and buff siltstones and minor dolomites.

SKILLOGALEE DOLOMITE: Dolomitic shale and sandy dolomites. Thin beds with magnesite pellets.

EMEROO QUARTZITE: Crossbedded feldspathic sandstones, interbedded siltstones.

WILLOURAN — CALLANNA BEDS

Ꞓc — Dolomites, siltstones, and sandstones of inferred Willouran age included as rafts in diapiric breccia.

Melaphyres, amygdaloidal in part, interbedded with tuffs and siltstones in diapiric rafts.

OLDER PRECAMBRIAN

p€g — Blocks of granite basement incorporated in Blinman Diapir.

IGNEOUS ROCKS

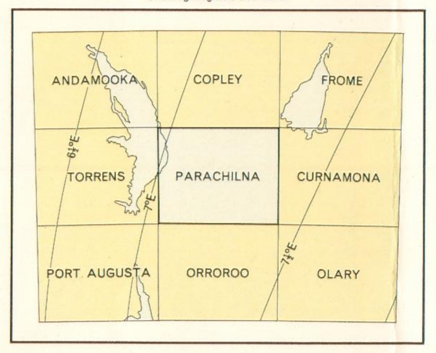
Dolerites intruding the core of the Blinman Diapir.

GEOLOGICAL BOUNDARIES
FAULTS
FAULT OR MONOCLINAL FOLD
BEDDING
INCLINED
VERTICAL
HORIZONTAL
OVERTURNED
TREND OF BEDDING
TYPE SECTION
MACRO FOSSIL LOCALITY
ALGAE OCCURRENCES
HIGHWAY
MAIN ROAD
SECONDARY ROAD
TRACK
RAILWAY
DISUSED RAILWAY
BOUNDARY FENCE
VERMIN PROOF FENCE
EPHEMERAL STREAM
CLAYPANS
TRIANGULATION STATIONS
HORIZONTAL CONTROL
IDENTIFIED POINT
WATER FEATURES
BORE
SPRING
WATERHOLE
WELL
EARTH TANK OR DAM
STRATIGRAPHIC BORE
MINE
MINERAL OCCURRENCE

COPPER	Cu	MANGANESE	Mn
LEAD	Pb	IRON	Fe
COBALT	Co	BARYTES	Ba
NICKEL	Ni	ASBESTOS	Asb

INDEX TO ADJOINING SHEETS

Showing Magnetic Declination



Copies of this map may be obtained from the Geological Survey of South Australia, Department of Mines, Adelaide, or the Bureau of Mineral Resources, Geology and Geophysics, Canberra, A.C.T. Printed for the Geological Survey of South Australia as a contribution to the Geological Map Series of the Commonwealth.

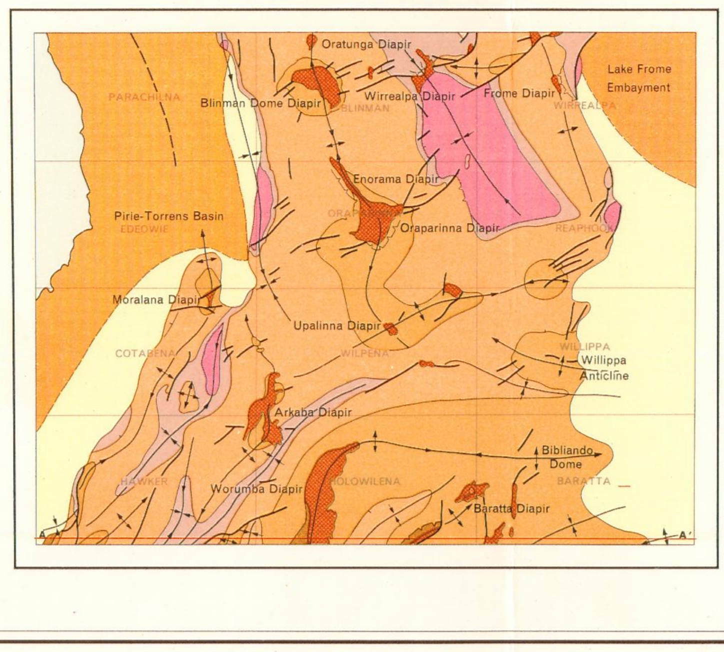
SCALE

MILES 2 1 0 2 4 6 8 10 12 14 16 18 20 MILES

KILOMETRES 5 0 5 10 15 20 25 KILOMETRES

H. J. WALL, GOVERNMENT PHOTOLITHOGRAPHER, ADELAIDE

TECTONIC SKETCH

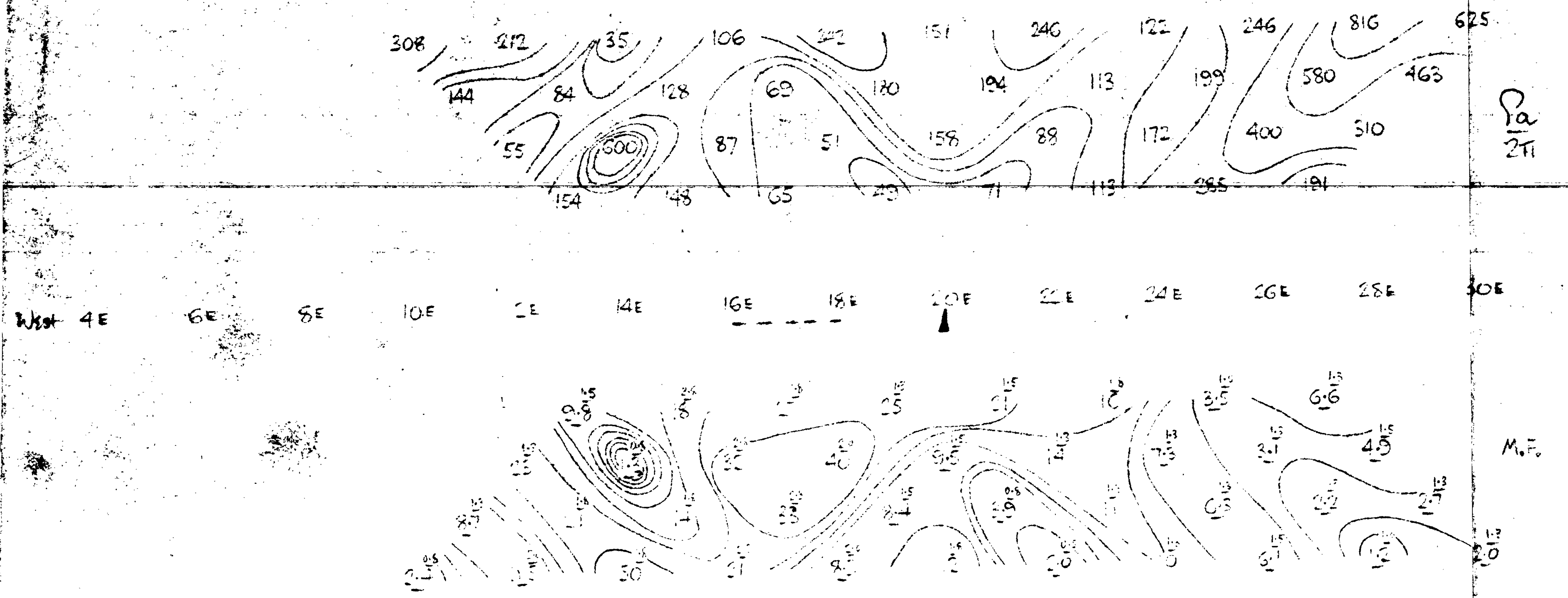


Quaternary
Tertiary
Cambrian System
Middle Cambrian Series
Lower Cambrian Series
Adelaide System
Marinoan Series
Sturtian Series
Torrensian Series
Willouran Series
Diapirs
Fault
Anticline
Syncline
Attitude of bedding
Unconformity
Geological Section

Geology by C. R. DALGARNO M.Sc., J. E. JOHNSON.
Map Preparation by Cartographic Section, Department of Mines, S.A.
Compiled under the direction of — L. W. Parkin, Deputy Government Geologist, T. A. Barnes, Government Geologist, Director of Mines.
Issued under the authority of the Honourable S. C. Bevan, M.L.C., Minister of Mines.
Published 1966.

PARACHILNA
SHEET H 54-13

1381-6



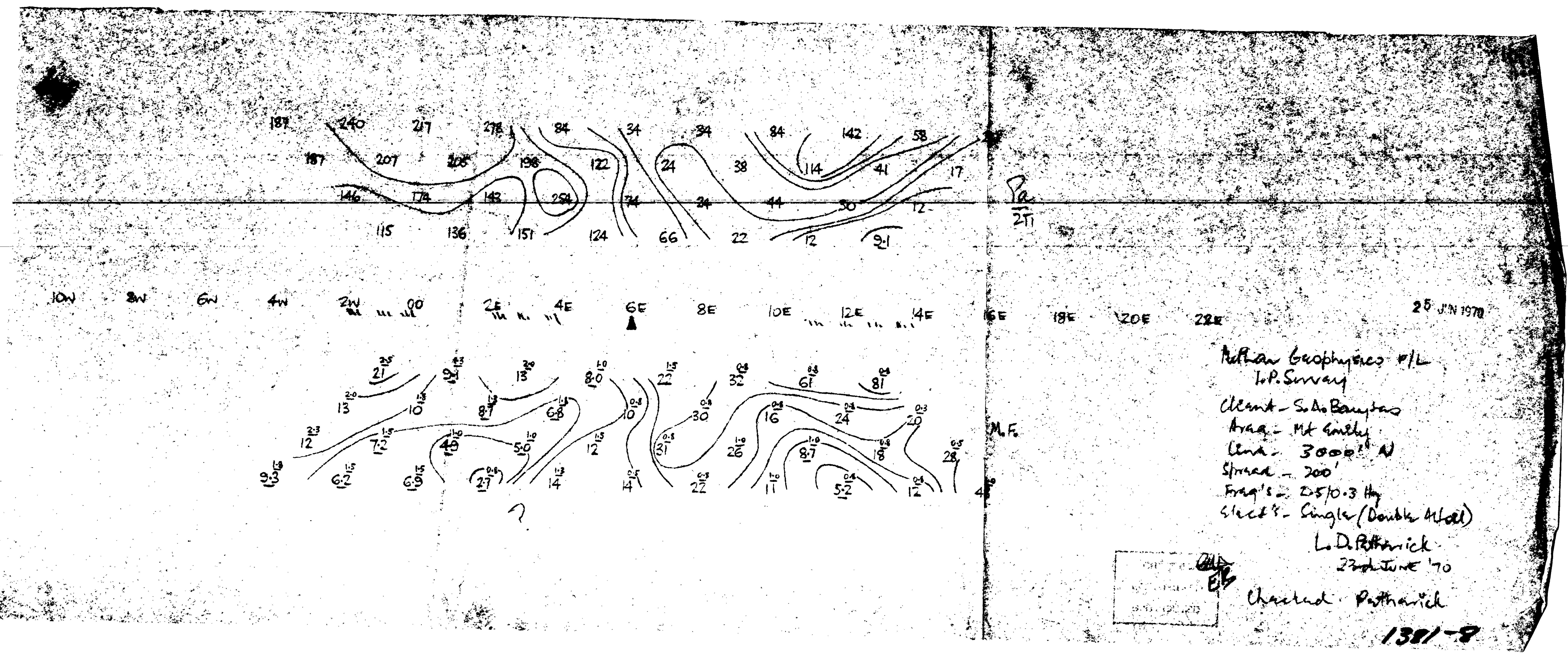
McPhar Geophysics Pty Ltd
I.P. Survey

Client - S.A. Banytas
Area - Gum Tree
Line - 00
Spread - 200 ft
Freq's - 2.5-0.3 Hz
Elect's - Single (Lout's Alfoil)

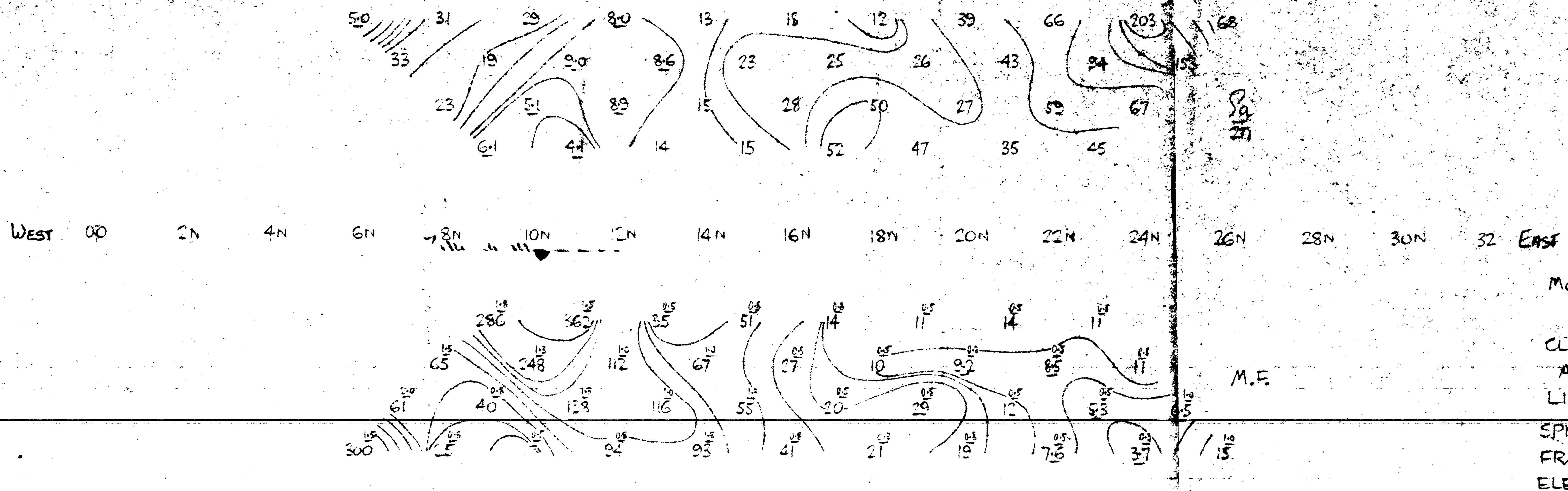
L.D. Petherick
18th June '70

Checked - D. Wilson.

1381-7



Pa
2T1
10W 8W 6W 4W 2W 00 2E 4E 6E 8E 10E 12E 14E 16E 18E 20E 22E
25 JUN 1970
M.F.
McPhar Geophysics P/L
I.P. Survey
Client - S.A. Barytes
Area - Mt Gunley
Line - 3000' N
Spread - 200'
Freq's - 2.5/0.3 Hz
Elect's - Single (Double Attd)
L.D. Patterick
23rd June '70
Checked Patterick
1381-8



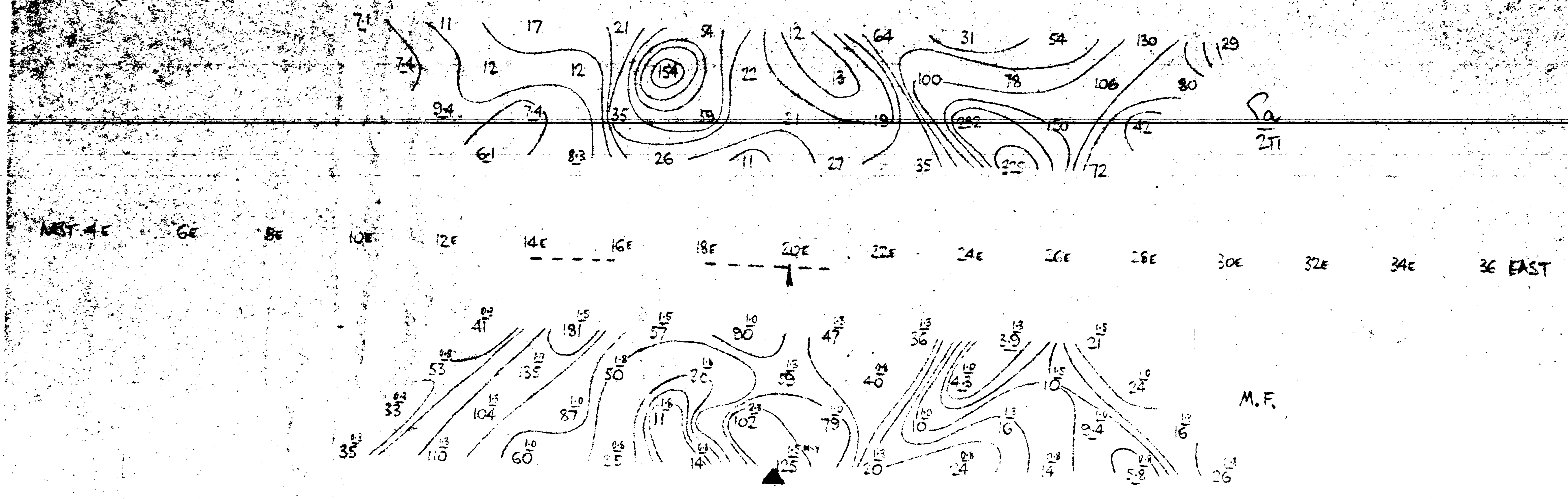
25 JUN 1970

McPHAR GEOPHYSICS PTY LTD
I.P. SURVEY
CLIENT - S.A. BARYTES
AREA - MT EMILY
LINE - 1000'N
SPREAD - 200 FT
FREQ'S - 2.5/0.3 HERTZ
ELECT'S - SINGLE (DOUBLE ALFOIL)

L. D. Pethewick
23rd JUNE '70

CHECKED - D. WILSON.

1381-9

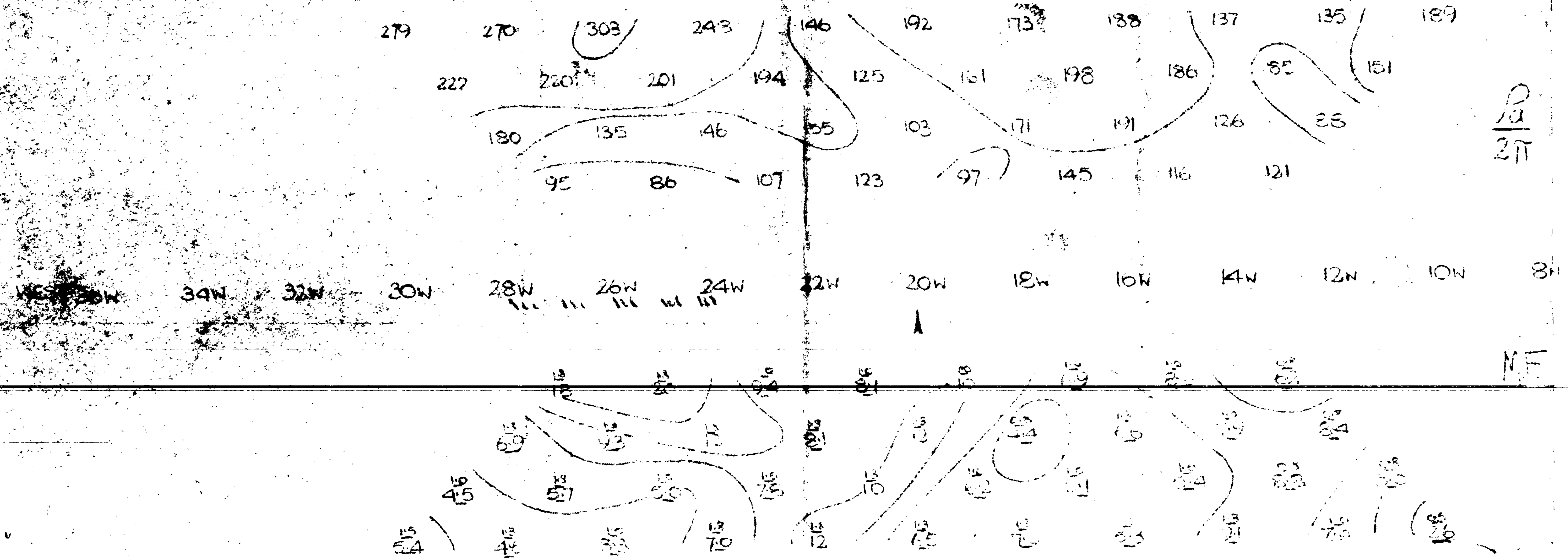


25 JUN 1970

McPHAR GEOPHYSICS PTY LTD
I.P. SURVEY
CLIENT - S.A. BARYTES
AREA - MT EMILY
LINE - 60
SPREAD - 200 FT
FREQ'S - 2.5/0.3 HERTZ
ELECT'S - SINGLE (Double Al[illegible])

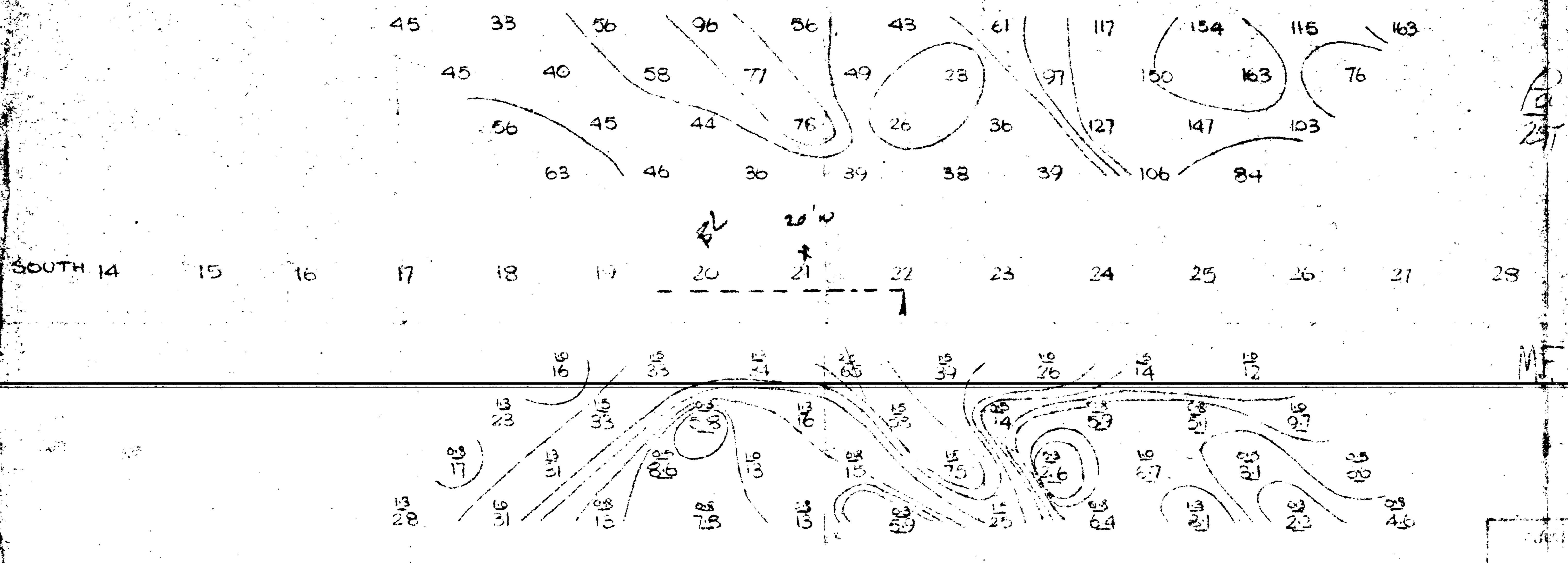
L.D. Petherick
20th JUNE '70

CHECKED - D. WILSON.



McPAR GEOPHYSICS Pty LTD
I.P. SURVEY

CLIENT-
AREA- MOOPLATANA
LINE- 00
SPREAD- 200 FT
FREQU- 2.5 / 0.3
ELECT- SINGLE (DOUBLE TON)
PLOTTED- D. WILSON
CHECKED- L FETHERICK
DATE- 20-6-70
1381-11



25 JUN 1970

McPHAR GEOPHYSICS PTY LTD

IP SURVEY

CLIENT - S.A. BARYTES

AREA - S.M.L. 325.

LINE - 600' E

SPREAD - 100 FT.

FREQU'S 2.5 / 0.3

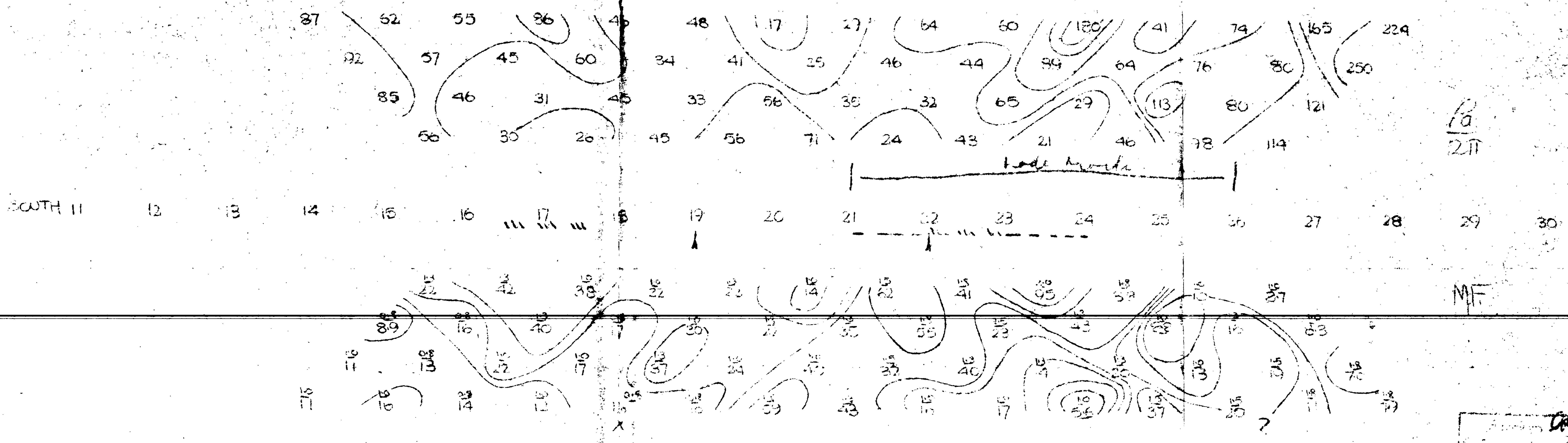
ELECT'S - SINGLE (DOUBLETON)

PLOTTED - D. WILSON

CHECKED - L. PETHERICK.

DATE - 23-6-70.

1381-12



25 JUN 1970

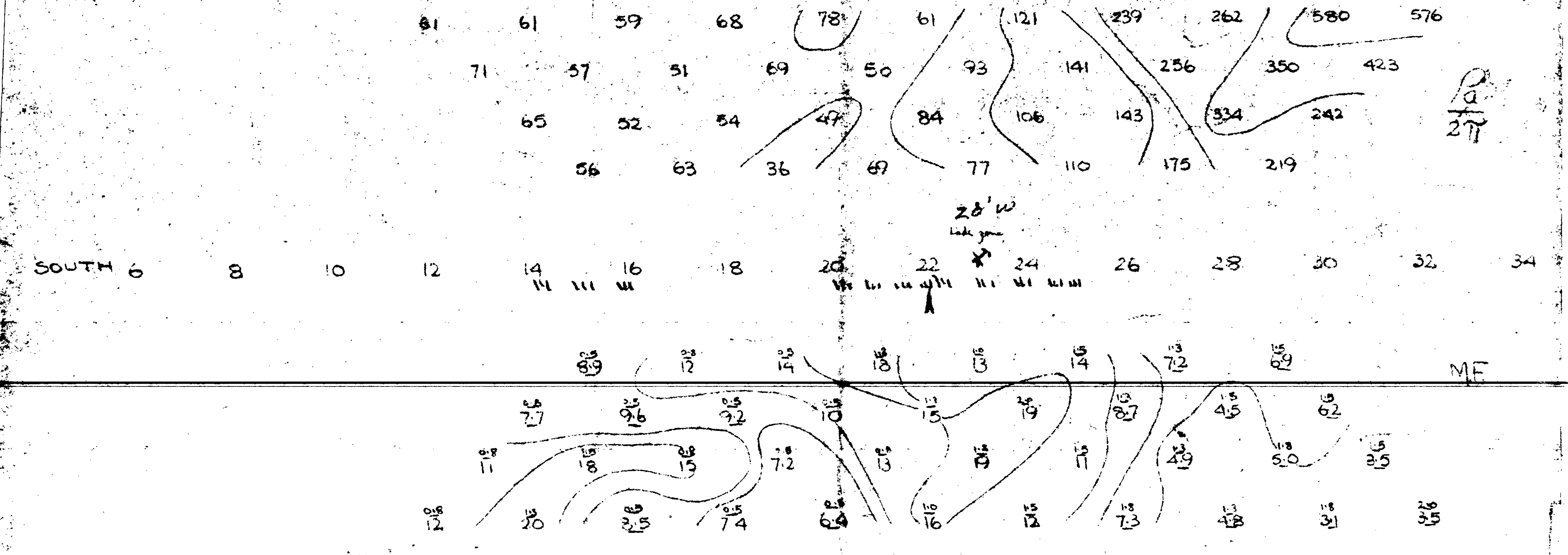
Mc PHAR GEOPHYSICS Pty Ltd

I.P. SURVEY

CLIENT- S.A. BARYTES
AREA- S.M.L. 325
LINE- 2000E
SPREAD- 100FT.
FREQU- 2.5/0.3
ELECT SINGLE (DOUBLE)
PLOTTED- D.WILSON
CHECKED- [illegible]
DATE- 22-6-70

1381-13

1381-13



McPHAR GEOPHYSICS PTY. LTD

I.P. SURVEY.

CLIENT- S.A. BARYTES

AREA- S.M.L. 325

LINE- 1000' E

FREQU- 2.5 0.3

SPREAD- 200 FT

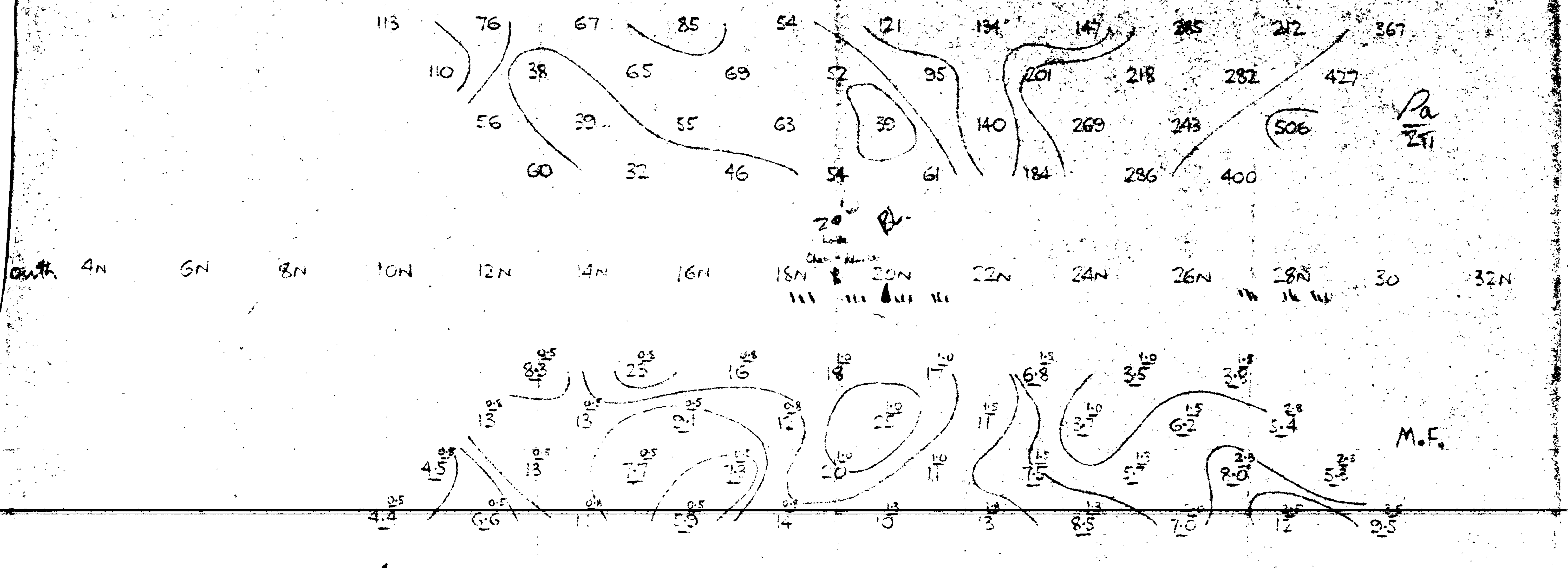
ELECTRODES- SINGLE (DOUBLE FOIL)

PLOTTED- D WILSON

CHECK- L PETHERICK 12-6

EB

1381-14



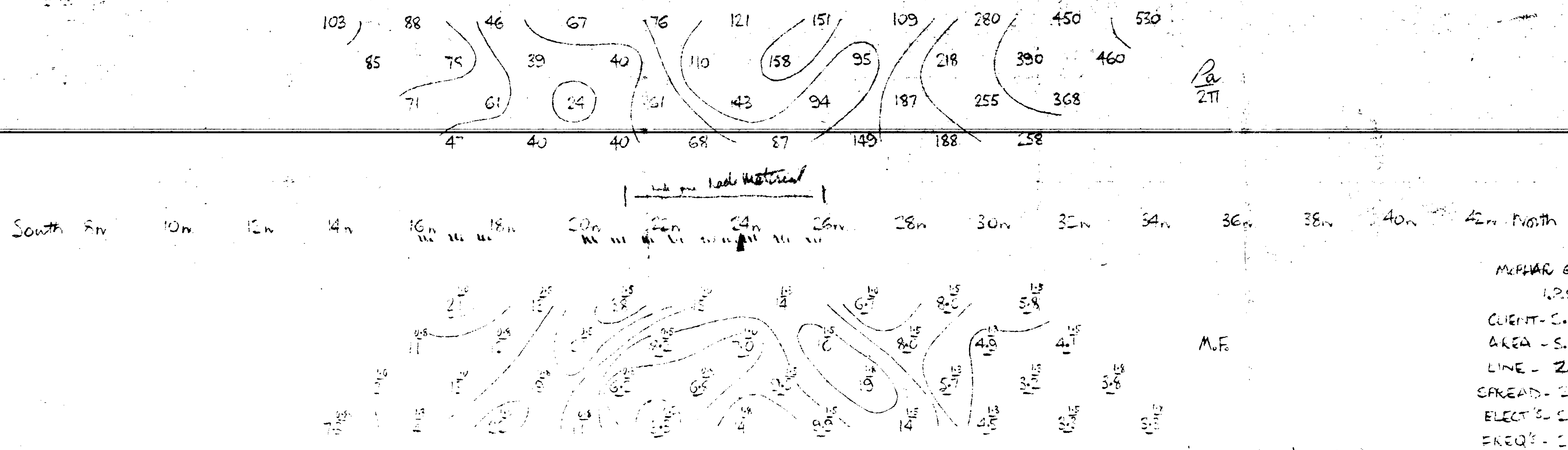
McPhar Geophysics Pty Ltd
I.P. Survey

Client - S.A. Barytes
Area - S.M.L. 325
Line - 00
Spread - 200 ft
Elect's - Singles (Double Manifold)
Freq's - 2.5 & 0.3 Hertz

L.D. Patherick
11th June '70

Checked - J. McConachy.

138/15

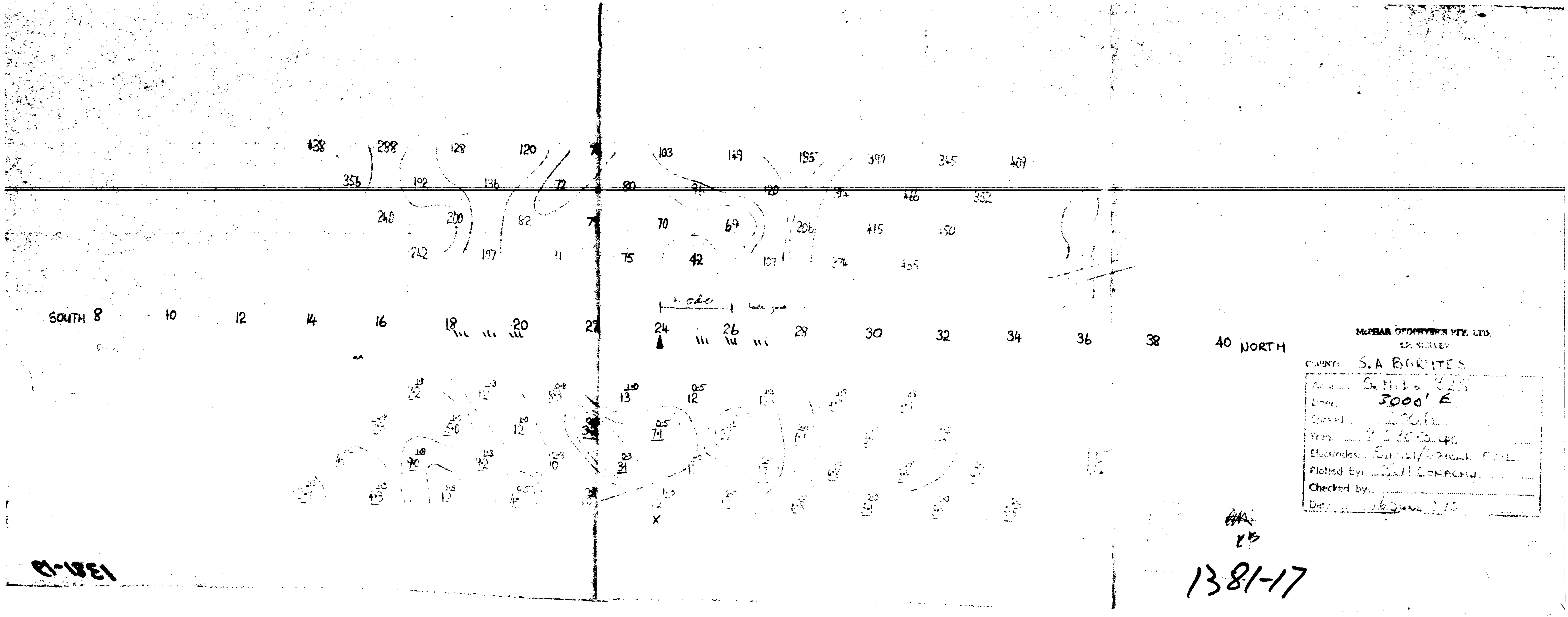


McPHAR GEOPHYSICS PTY LTD
I.P. SURVEY.
CLIENT - S.A. BARYTES
AREA - S.M.L. 325
LINE - 2000' E
SPREAD - 200 FT
ELECT'S - SINGLE (Double Alligat)
FREQ'S - [illegible] Hertz
L.D. Emerick.
[illegible] JUNE 70.
CHECKED - DONALDSON.

100' sp 16N - 26N

138/-16

DE 4821



SOUTH
8
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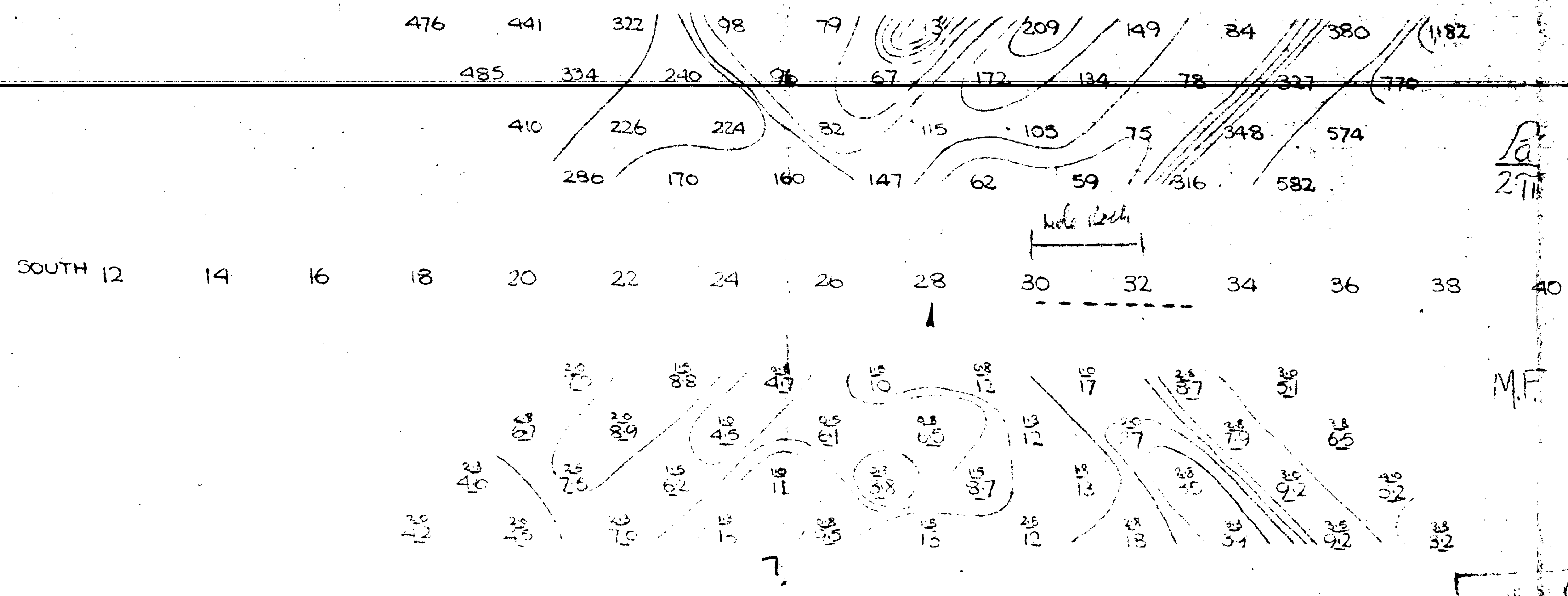
NORTH
McPHAR GEOPHYSICS PTY. LTD.
I.P. SURVEY
CLIENT: S.A BARITES
Line: 3000' E
Electrodes:
Plotted by:
Checked by:
Date:
1381-17

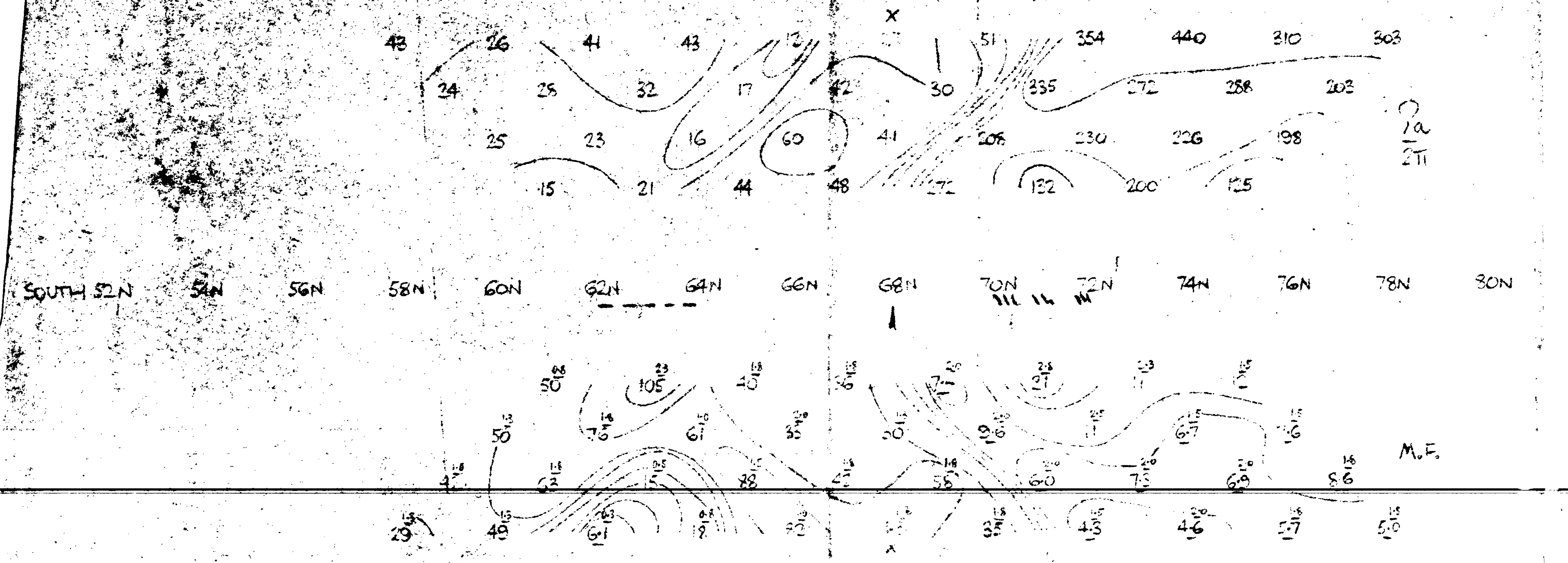


McPHAR GEOPHYSICS PTY LTD
I.P. SURVEY

CLIENT – S. AUST. BARYTES
AREA – SML 305.
LINE – 4000' E
SPREAD – 200 FT
FREQ – 2.5 / 0.3
ELECT – SINGLE (DOUBLE FOIL)
PLOTTED – D. WILSON
CHECKED – L. PETHERICK.
DATE – 18-6-70.

138/18

81-1221



McPHAR GEOPHYSICS PTY LTD
I.P. SURVEY

CLIENT - S.A. BARYTES

AREA - S.M.L. 325

LINE - 8000'E

SPREAD - 200 FT

~~FREQ [illegible]~~

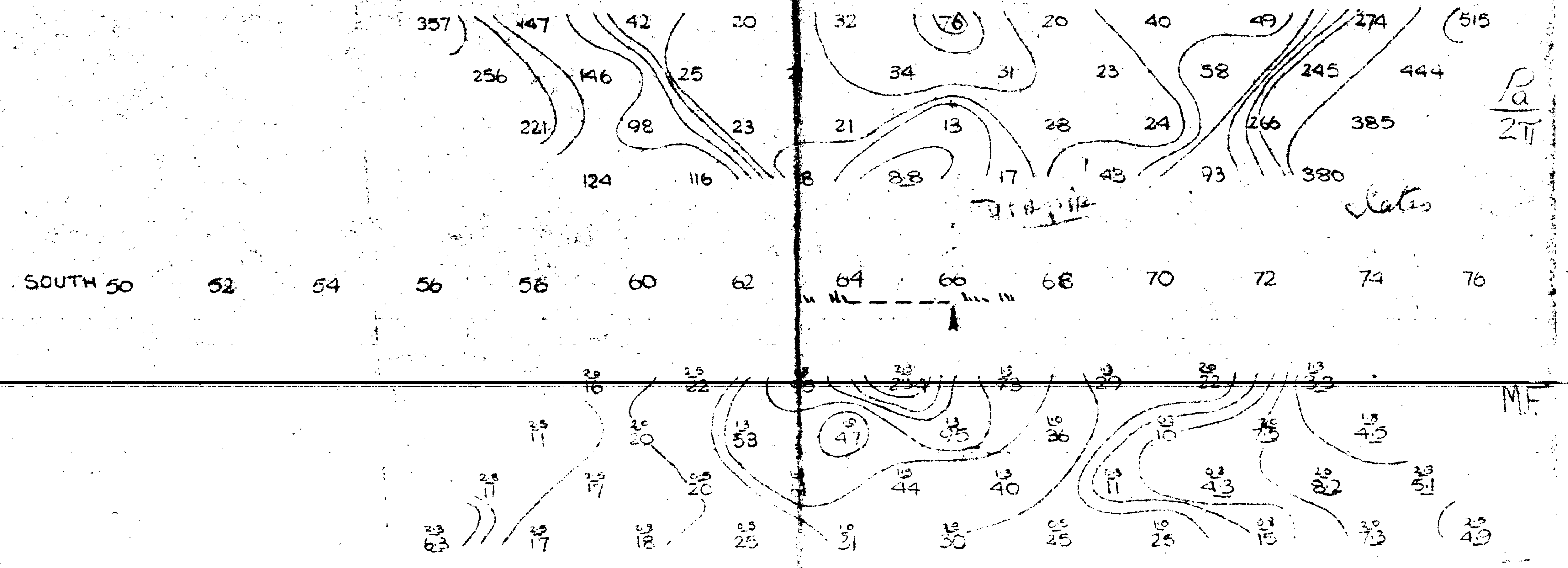
ELECT - SINGLE (Double Alfoil)

L.D. Fenwick
17th JUNE 70

CHECKED - J. McCONACHY.

EAA

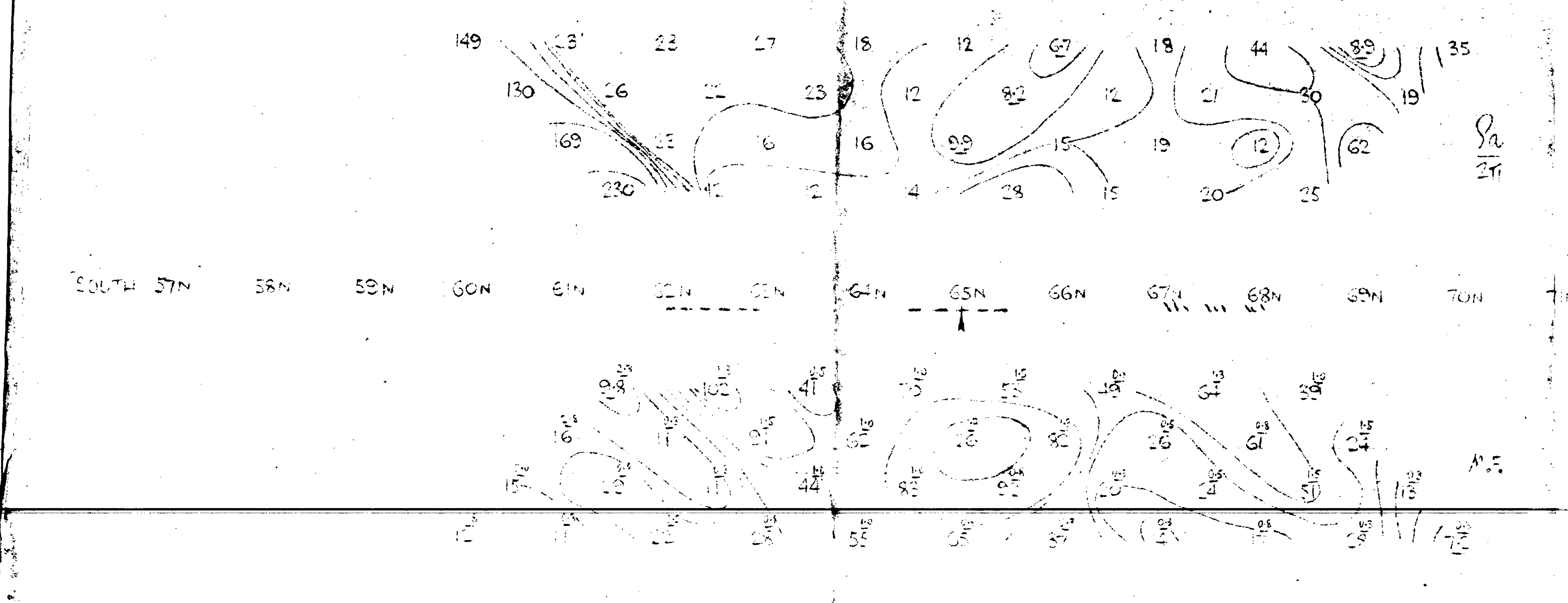
1381 E13 /19



M^c PHAR GEOPHYSICS PTY LTD.
IP SURVEY

CLIENT- S. AUST. BARYTES
AREA - S.M.L. 325
LINE- 5000' E
SPREAD- 200 FT
FREQU^S 2.5/0.3
ELECT^S SINGLE (DOUBLEPOLE)
PLOTTED BY- D. WILSON
CHECKED BY- L. PETHERICK
DATE 17-6-70

1381-20



25 JUN 1970

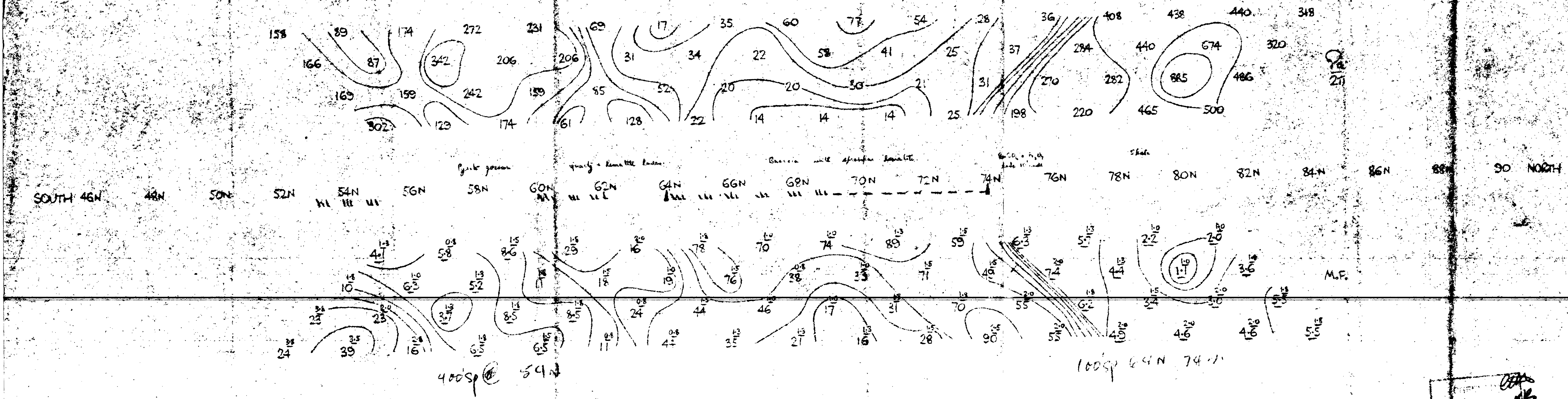
McPHAR GEOPHYSICS PTY LTD
I.P. SURVEY

CLIENT – S.A. BARYTES
AREA – S.M.L. 325
LINE – 5000' E
SPREAD – 100 FT
FREQ'S – 2.5/0.3 HERTZ
ELECT'S – SINGLE (DOUBLE ALFOIL)

L.D. FETHERICK
20th JUNE '70

CHECKED – D. WILSON.

1381-21



McPHAR GEOPHYSICS PTY. LTD.
I.P. SURVEY.

CLIENT- S.A. BARYTES

AREA- S.M.L. 325

LINE - 6000' E

SPREAD- 200 FT

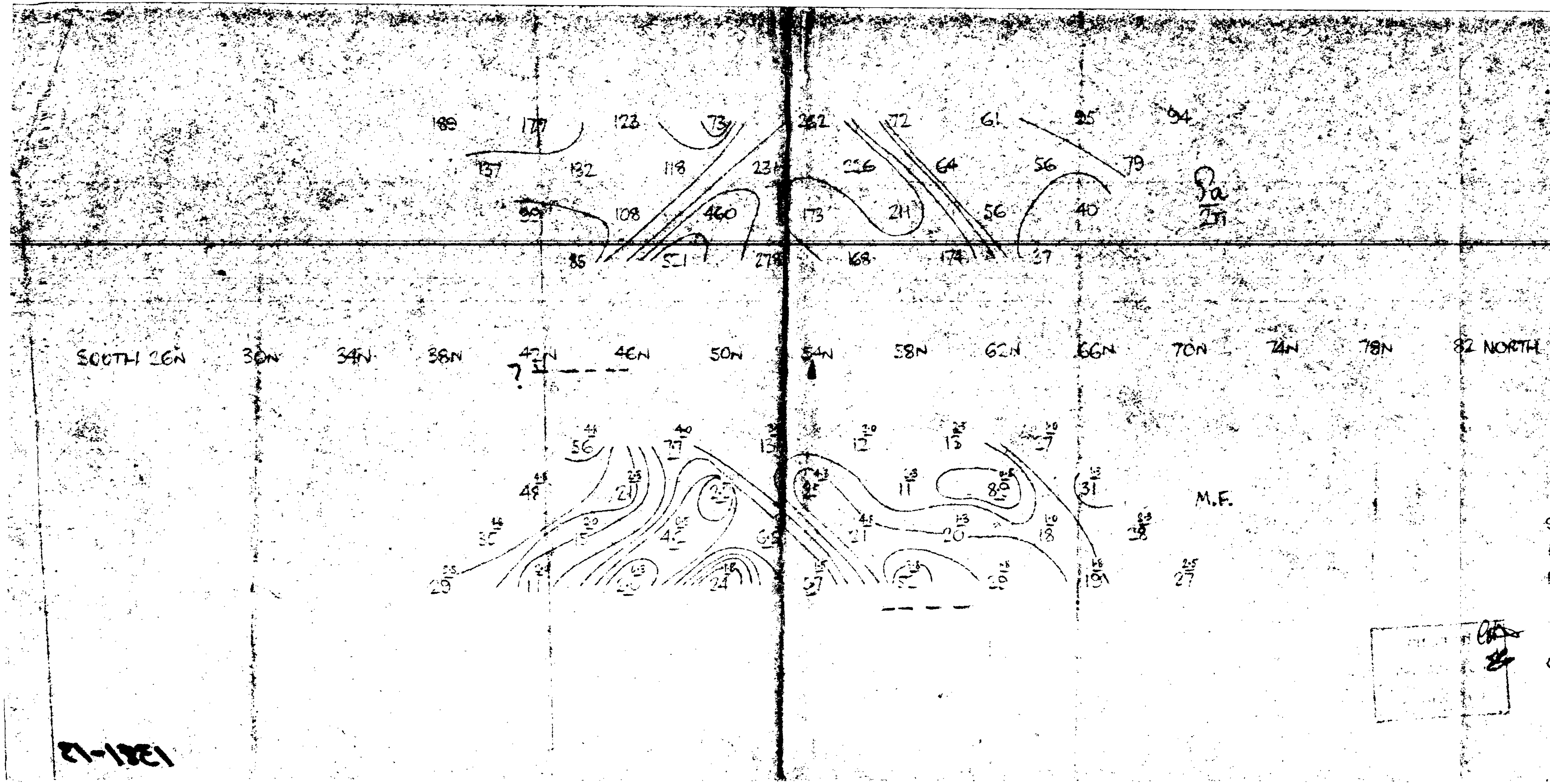
FREQ'S- 2.5/0.31 Hz

ELECT'S- SINGLE (Double Alfoil)

L.D. Petherick
16th JUNE 70

CHECKED- D. WILSON.

1381-22



25 JUN 1970

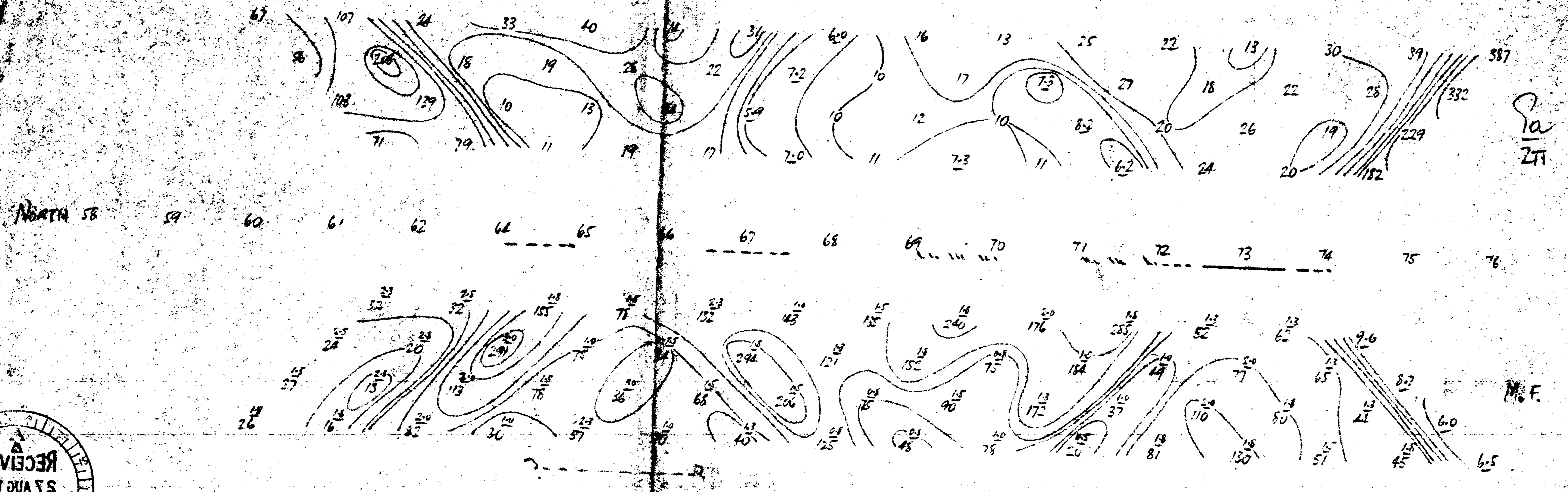
McPHAR GEOPHYSICS PTY LTD
I.P. SURVEY

CLIENT - S.A. BARYTES
AREA - S.M.L. 325
LINE - ~~6000'~~ E
SPREAD - 400 FT
ELECT'S - SINGLE (Double Alloy)
FREQ'S - 2.5/0.3 Hertz

L.D. Fetherick
21st JUNE '70

CHECKED - D. WILSON.

1381-23



79 NORTH 25 JUN 1970

CLIENT - S.A. BARYTES
AREA - SML 325
LINE - 6000' E
SPREAD - 100'
FREQ'S - 2.5/0.3 Hz
ELECT'S - SINGLE (Double [illegible])
L.D. [illegible]

1381-24

DWG. NO.- I.P.-5567-1

SOUTH AUSTRALIA BARYTES LTD.

APPEALINNA COPPER PROSPECT
S.M.L. 325
SOUTH AUSTRALIA

LINE NO.- 0

ELECTRODE CONFIGURATION

PLOTTING POINT X = 200'

SURFACE PROJECTION OF ANOMALOUS ZONES
DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-2.5 CPS

DATE SURVEYED: JAN 1970

APPROVED:

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

DATE: 10/13/70

1381-25

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED WITH AN IBM 360/75 COMPUTER AND A CALCOMP PLOTTER

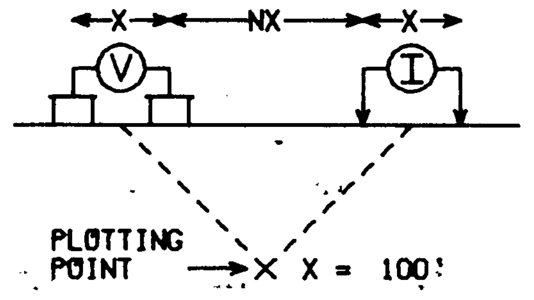
DWG. NO.- I.P.-5567-2

SOUTH AUSTRALIA BARYTES LTD.

APPEALINNA COPPER PROSPECT
S.M.L. 325
SOUTH AUSTRALIA

LINE NO.- 500E

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES
DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-2.5 CPS

DATE SURVEYED: JUN 1970

APPROVED:

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

DATE:

1381-26

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED WITH AN IBM 360/75 COMPUTER AND A CALCOMP PLOTTER

DWG. NO.- I.P.-5567-3

SOUTH AUSTRALIA BARYTES LTD.

APPEALINNA COPPER PROSPECT

S.M.L. 325

SOUTH AUSTRALIA

LINE NO.- 1000E

ELECTRODE CONFIGURATION

X — NX — X

PLOTTING POINT

X = 200'

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCIES: 0.31-2.5 CPS

DATE SURVEYED: 1970

APPROVED

DATE: 10/15/70

REGISTERED PROFESSIONAL ENGINEER PROVINCE OF ONTARIO

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

1381-27

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED WITH AN IBM 360/75 COMPUTER AND A CALCOMP PLOTTER

DWG. NO.- I.P.-5567-4

SOUTH AUSTRALIA BARYTES LTD.

APPEALINNA COPPER PROSPECT
S.M.L. 325
SOUTH AUSTRALIA

LINE NO.- 2000E

ELECTRODE CONFIGURATION

PLOTTING POINT
X = 200'

SURFACE PROJECTION OF ANOMALOUS ZONES
DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-2.5 CPS

DATE SURVEYED: JUN 1970

APPROVED:

DATE: 10/15/70

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

1381-28

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED WITH AN IBM 360/75 COMPUTER AND A CALCOMP PLOTTER

DWG. NO.- I.P.-5567-5

SOUTH AUSTRALIA BARYTES LTD.

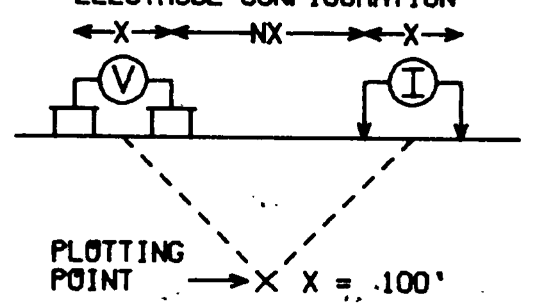
APPEALINNA COPPER PROSPECT

S.M.L. 325

SOUTH AUSTRALIA

LINE NO.- 2000E

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCIES: 0.31-2.5 CPS

DATE SURVEYED: JUN. 1970

APPROVED: P. HALLOF

DATE: 10/15/70

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

1381-29

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED WITH AN IBM 360/75 COMPUTER AND A CALCOMP PLOTTER

DWG. NO.- I.P.-5567-6

SOUTH AUSTRALIA BARYTES LTD.

APPEALINNA COPPER PROSPECT
S.M.L. 325
SOUTH AUSTRALIA

LINE NO.- 3000E

ELECTRODE CONFIGURATION

PLOTTING POINT X X = 200'

SURFACE PROJECTION OF ANOMALOUS ZONES
DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-2.5 CPS

DATE SURVEYED: JUN 1970

APPROVED

DATE:

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

1381-30

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED WITH AN IBM 360/75 COMPUTER AND A CALCOMP PLOTTER

DWG. NO.- I.P.-5567-7

SOUTH AUSTRALIA BARYTES LTD.

APPEALINNA COPPER PROSPECT
S.M.L. 325
SOUTH AUSTRALIA

LINE NO.- 3500E

ELECTRODE CONFIGURATION

X — NX — X

PLOTTING POINT → X X = 200'

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-2.5 CPS

DATE SURVEYED: JUN 1970

APPROVED:

DATE:

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

1381-31

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED WITH AN IBM 360/75 COMPUTER AND A CALCOMP PLOTTER

DWG. NO.- I.P.-5567-8

SOUTH AUSTRALIA BARYTES LTD.

APPEALINNA COPPER PROSPECT

S.M.L. 325

SOUTH AUSTRALIA

LINE NO.- 4000E

ELECTRODE CONFIGURATION

PLOTTING POINT X = 200'

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCIES: 0.31-2.5 CPS

DATE SURVEYED: JAN. 1970

APPROVED:

DATE:

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

1381-32

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED WITH AN IBM 360/75 COMPUTER AND A CALCOMP PLOTTER

DWG. NO.- I.P.-5567-9

SOUTH AUSTRALIA BARYTES LTD.

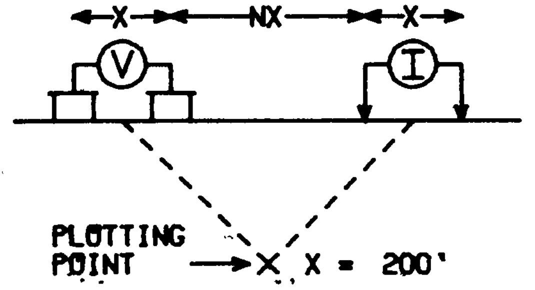
APPEALINNA COPPER PROSPECT

S.M.L. 325

SOUTH AUSTRALIA

LINE NO.- 5000E

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCIES: 0.31-2.5 CPS

DATE SURVEYED: JUN 1970

APPROVED:

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

DATE: 10/6/70

1381-33

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED WITH AN IBM 360/75 COMPUTER AND A CALCOMP PLOTTER

DWG. NO.- I.P.-5567-10

SOUTH AUSTRALIA BARYTES LTD.

APPEALINNA COPPER PROSPECT

S.M.L. 325

SOUTH AUSTRALIA

LINE NO.- 5000E

ELECTRODE CONFIGURATION

PLOTTING POINT

X = 100'

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCIES: 0.31-2.5 CPS

DATE SURVEYED: 1970

APPROVED

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

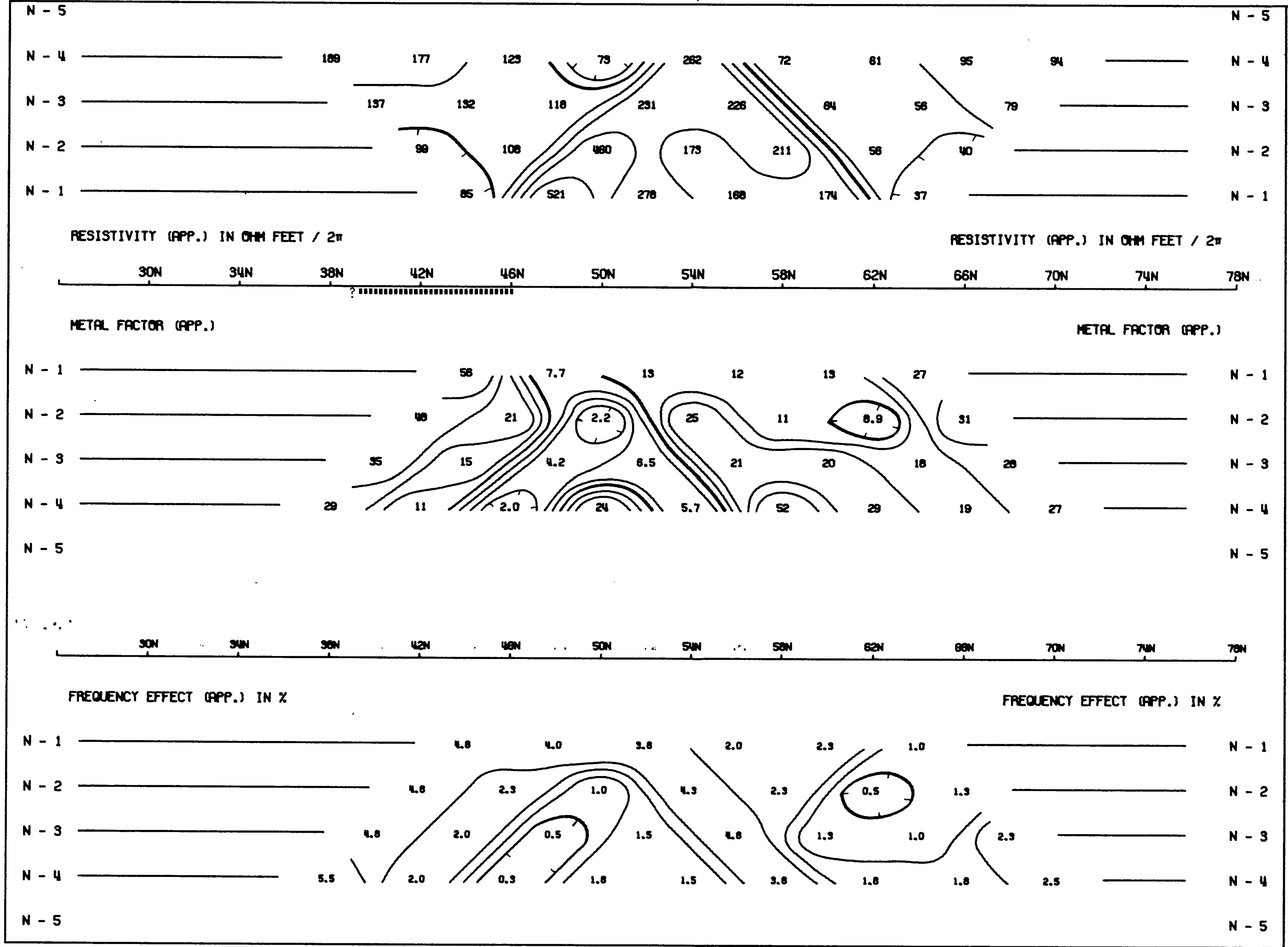
DATE:

1381-34

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED WITH AN IBM 360/75 COMPUTER AND A CALCOMP PLOTTER



DWG. NO.- I.P.-5567-11

SOUTH AUSTRALIA BARYTES LTD.

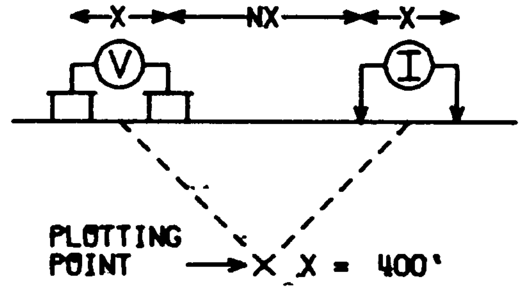
APPEALINNA COPPER PROSPECT

S.M.L. 325

SOUTH AUSTRALIA

LINE NO.- 6000E

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCIES: 0.31-2.5 CPS

DATE SURVEYED: JAN 1970

APPROVED:

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

DATE:

1381-35

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED WITH AN IBM 360/75 COMPUTER AND A CALCOMP PLOTTER

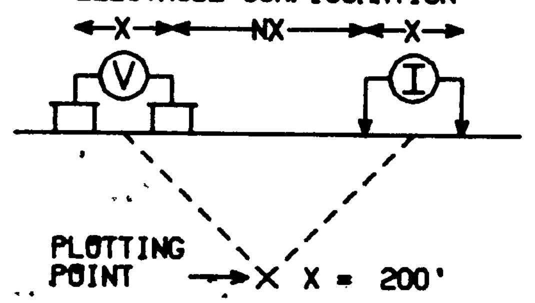
DWG. NO.- I.P.-5567-12

SOUTH AUSTRALIA BARYTES LTD.

APPEALINNA COPPER PROSPECT
S.M.L. 325
SOUTH AUSTRALIA

LINE NO.- 6000E

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES
DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-2.5 CPS

DATE SURVEYED: 1970

APPROVED:

DATE: 10/15/70

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

1381-36

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED WITH AN IBM 360/75 COMPUTER AND A CALCOMP PLOTTER

DWG. NO.- I.P.-5567-13

SOUTH AUSTRALIA BARYTES LTD.

APPEALINNA COPPER PROSPECT
S.M.L. 325
SOUTH AUSTRALIA

LINE NO.- 6000E

ELECTRODE CONFIGURATION

X NX X

PLOTTING POINT X X = 100'

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-2.5 CPS

DATE SURVEYED: JUN 1970

APPROVED:

REGISTERED PROFESSIONAL ENGINEER P. HALLOF PROVINCE OF ONTARIO

DATE: 19/5/70

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

1381-37

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED WITH AN IBM 360/75 COMPUTER AND A CALCOMP PLOTTER

DWG. NO.- I.P.-5568-1

SOUTH AUSTRALIAN BARYTES LTD.

APPEALINNA COPPER PROSPECT
MT. EMILY RECCE
SOUTH AUSTRALIA

LINE NO. 30+00N

ELECTRODE CONFIGURATION

X NX X

PLOTTING POINT X = 200'

SURFACE PROJECTION OF ANOMALOUS ZONES
DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-2.5 CPS

DATE SURVEYED: JUN 1970

APPROVED:

DATE:

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

1381-38

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED WITH AN IBM 360/75 COMPUTER AND A CALCOMP PLOTTER

DWG. NO.- I.P.-5568-2

SOUTH AUSTRALIAN BARYTES LTD.

APPEALINNA COPPER PROSPECT
MT. EMILY RECCE
SOUTH AUSTRALIA

LINE NO.- 10+00N

ELECTRODE CONFIGURATION

PLOTTING POINT — X = 200'

SURFACE PROJECTION OF ANOMALOUS ZONES
DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-2.5 CPS

DATE SURVEYED: JUN 1970

APPROVED: P. G. HALLOF

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

DATE: 10/16/70

1381-39

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED WITH AN IBM 360/75 COMPUTER AND A CALCOMP PLOTTER

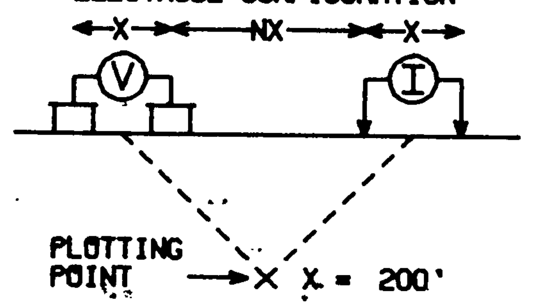
DWG. NO.- I.P.-5568-3

SOUTH AUSTRALIAN BARYTES LTD.

APPEALINNA COPPER PROSPECT
MT. EMILY RECCE
SOUTH AUSTRALIA

LINE NO.- 0

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES
DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-2.5 CPS

DATE SURVEYED: JUN 1970

APPROVED:

DATE: 10/15/70

REGISTERED PROFESSIONAL ENGINEER
P. G. HALLOF
PROVINCE OF ONTARIO

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

1381-40

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED WITH AN IBM 360/75 COMPUTER AND A CALCOMP PLOTTER

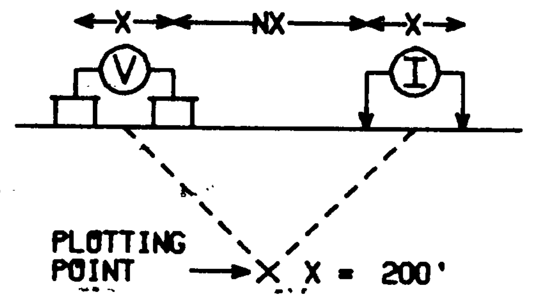
DWG. NO.- I.P.-5568-4

SOUTH AUSTRALIA BARYTES LTD.

APPEALINNA COPPER PROSPECT
GUM TREE RECCE
SOUTH AUSTRALIA

LINE NO.- 0

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES
DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-2.5 CPS

DATE SURVEYED: JAN 1970

APPROVED: P. HALLOF

DATE: 10/15/70

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

1381-41

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED WITH AN IBM 360/75 COMPUTER AND A CALCOMP PLOTTER

DWG. NO.- I.P.-5568-5

SOUTH AUSTRALIAN BARYTES LTD.

APPEALINNA COPPER PROSPECT
2ND PLAIN RECCE
SOUTH AUSTRALIA

LINE NO.- 0

ELECTRODE CONFIGURATION

X NX X

PLOTTING POINT X = 200'

SURFACE PROJECTION OF ANOMALOUS ZONES
DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-2.5 CPS

DATE SURVEYED: JUN 1970

APPROVED:

DATE:

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

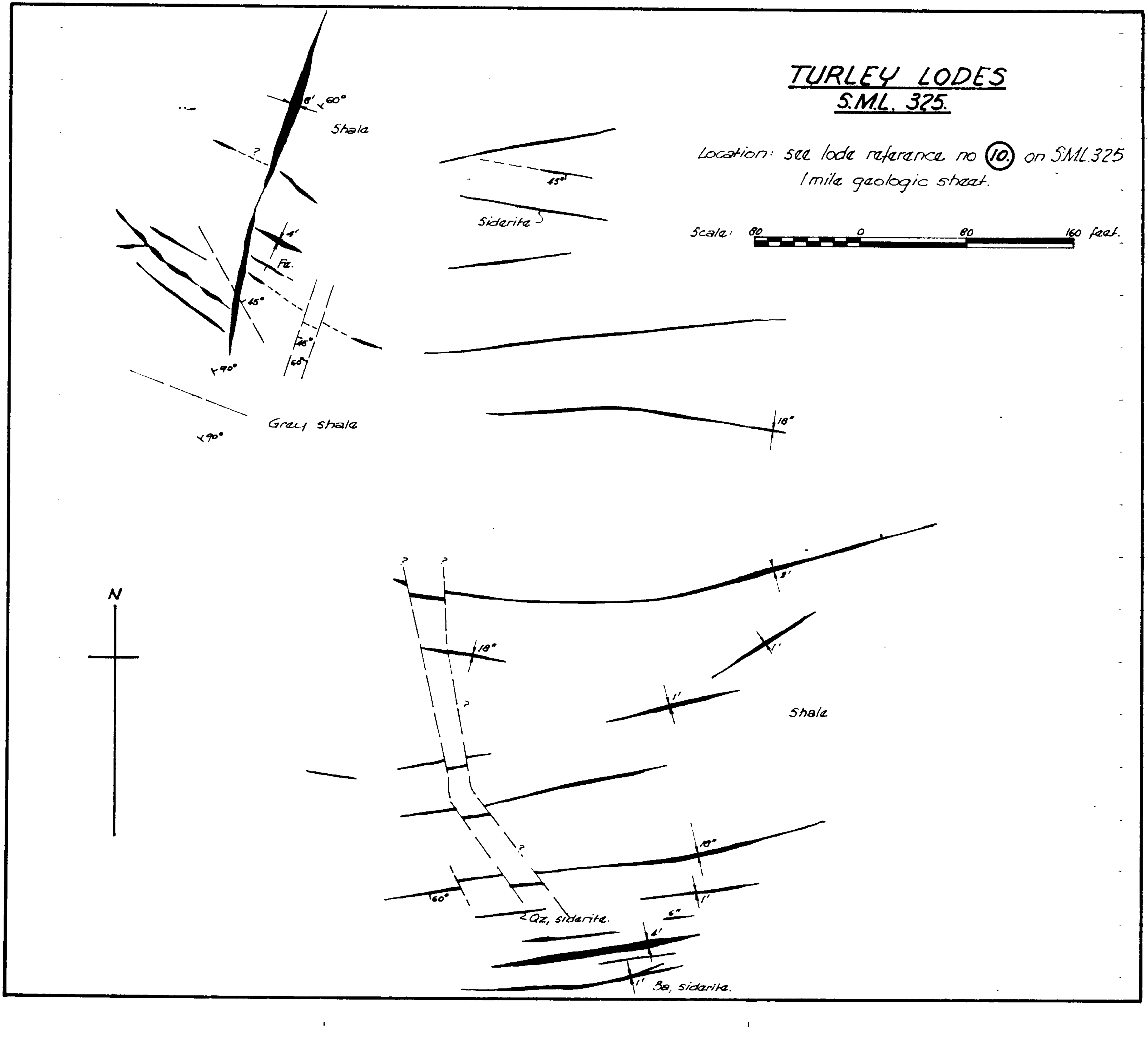
REGISTERED PROFESSIONAL ENGINEER
P. G. HALLOF
PROVINCE OF ONTARIO

1381-42

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED WITH AN IBM 360/75 COMPUTER AND A CALCOMP PLOTTER



TURLEY LODES
S.M.L. 325.
Location: see lode reference no (10) on S.M.L. 325
1 mile geologic sheet.
Scale: 80 0 80 160 feet.
N
Shale
Siderite
Fe.
Grey shale
Shale
Qz, siderite.
Ba, siderite.