000

653001

ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED

West Coast Mines

BULGOBAC EXPLORATION LICENCE E.L. 12/72

Progress Report on Activity

October, 1979 - June, 1980.

Geological Department

Report No. 132

A.J. Mollison

July, 1980

LIST OF PLATES

LIST OF APPENDICES

SUMMARY OF EXPLORATION ACTIVITY

(Refer to plan 1:50,000 Exploration Completed October, 1979 - June, 1980 Ref. No. A2-521-0060.)

The following work was undertaken between October, 1979 and June 30th, 1980, in the Bulgobac Exploration Licence.

WESTERN AREA

1. North Pinnacles Grid

Follow-up of coincident I.P. and Pb soil geochemical anomalies was carried out with further gridding, geological mapping, soil and rock geochemistry and I.P.. Stream sediment samples were collected where grid lines were intersected by active streams and a small programme of test pitting for geochemical orientation purposes was completed. Three diamond drill holes totalling 400.1m were completed.

2. Silver Falls Extension Grid

The existing grid was extended to the north-east to define the extension of a Pb/Zn soil geochemical anomaly. A total of 8.9km of reconnaissance dipole-dipole I.P. was carried out on the existing western part of the grid. Stream sediment samples were collected over the whole grid where grid lines were intersected by active streams.

1.0 INTRODUCTION.

Exploration Licence 12/72 of 94 square kms was aquired by E.Z. Co. in 1972, when Comstaff Pty. Ltd. relinquished selected areas from their E.L. 5/63. Subsequently E.L. 12/72 was joint ventured with Getty Oil Development (Aust.) Pty. Ltd. with E.Z. continuing as operators.

The initial exploration phase was concentrated on the massive lavas and pyroclastics of the Boco area which are similar to the host rocks of the Que River Pb/Zn/Cu deposit, 8km to the north. These form part of the Mt. Read Volcanics which can be traced south to the Mt. Black-Rosebery area and as such represent the most attractive host rocks for Pb/Zn/Cu deposits of the Rosebery-Que River type (E.Z. Report 128).

A small exploration programme was then carried out to determine the source of two input E.M. anomalies in the northern part of E.L. 12/72. The Boco Grid was also extended to the west (E.Z. Report 129).

This report covers work at Bulgobac carried out between October, 1979 and June 30th, 1980, and is concerned with the follow-up exploration in the period October, 1978 to October 1979 (E.Z. Report 130).

2.0 OBJECTIVES

The main targets for exploration on E.L. 12/72 are:

1. Massive volcanogenic Pb/Zn/Cu deposits of the Rosebery-Que River type associated with thin sedimentary lenses within Cambrian Volcanics.

2. More distal Pb/Zn/Cu deposits associated with sediments of the Dundas Trough.

..2/.

3. Tin deposits associated with calcareous sediments of the Dundas Trough in proximity to acid intrusives.

3.0 PREVIOUS WORK

Previous work on E.L. 12/72 has been reported in E.Z. Geological Departmental Reports 128 (1977), 129 (1978) and 130 (1979).

4.0 BOCO AREA

No work carried out.

5.0 NORTHERN AREA

No work carried out.

6.0 WESTERN AREA

6.1. North Pinnacles Grid

6.1.1. WORK COMPLETED

(Refer to 1:50,000 plan A2-521-0060)

1. Grid lines (totalling 2.2km) were cut at North Pinnacles. The lines were mapped and soil sampled.

2. Stream sediment samples were collected from the grid where grid lines were crossed by active streams.

..3/.

3. Six pits were dug to examine and analyse the soil profiles to test soil sampling procedures.

4. Two kilometers of drill site access track were constructed. The track was mapped and rock chip sampled.

5. Three diamond drill holes were completed totalling 400.1m (N.P.P. 213 - 130.1m, N.P.P. 214 - 142.0m and N.P.P. 215 - 128.0m). These holes have been logged and sampled.

6.1.2. GEOLOGY

(Refer to plan A0-525-0012 1:10,000 Geology Sheet 3)

The geology of the North Pinnacles area can be divided into two major groups according to rock type:

a) The Burns Peak Rhyolite and

b) A sequence of well bedded arkosic sandstones, siltstones and shales of probable Dundas Group affinities.

The Burns Peak Rhyolite forms a tongue trending north-south in the centre of the grid. It consists of massive quartz-poor (trachytic) rhyolitic lavas, intrusives and pyroclastics. In surface exposures, hand specimens of lavas are massive, incipiently bedded, fine grained rocks containing occasional phenocrysts of feldspar and rare quartz. Flow breccias have also been observed. These surface samples, in thin section, have been described by Cowan (see E.Z. Co., W.C.M. Geological Dept. Report No 130, October, 1979) as porphyritic sodic rhyolites.

The sequence of rocks intersected by N.P.P. 215 consist of rhyolitic to trachytic lavas, lava breccias and high level intrusives. Quartz phenocrysts are rare or absent generally with the predominant phenocryst phase being feldspars. (Cowan ; Appendix 4 C.M.S. Report 80/4/24)

..4/.

A pyroclastic unit was intersected, next to the contact between sediments and volcanics in N.P.P. 214. This is a rhyolitic fragmental considered by Cowan to be a vitric-crystal tuff (see Appendix 4 C.M.S. Report 80/3/21).

The contact between volcanics and sediments to the west is erosional with volcanoclastic, arkosic sediments overlying a vitric crystal tuff at a high angle. There is no evidence to suggest the contact is faulted.

Sediments west of the Burns Peak Rhyolite consist of a repetative, turbiditic sequence of shales, siltstones and arkosic sandstones. The angular to sub-rounded feldspar and quartz framework of the sandstones which are common in the sequence suggests a source other than the adjacent rhyolite. Cowan considers them to be of granitic origin (C.M.S. 80/2/22). The Burns Peak Rhyolite is poor in phenocrystal quartz and feldspar which is found abundantly in the adjacent sediments. Similar sediments have been exposed by bulldozing during construction of a drill site track east of the Burns Peak Rhyolite. They appear to be very similar to the sediments described above but are consistantly finer grained.

Exposures from bulldozing of tracks and drilling show that the Dundas Group sediments dip away from the Burns Peak Rhyolite. To the west of the Rhyolite the north-north-east striking bands dip at between 30° and 70° west with most dips around 55°. East of the Burns Peak Rhyolita the sediments have a shallow dip of approximately 30° near the contact on the bulldozed drill site access track.

Mapping on northern lines of the North Pinnacles grid suggests that the Burns Peak Rhyolite mass plunges toward the north and is overlain by the sediments.

..5/.

From the evidence above, the Burns Peak Rhyolite would appear to be older than Dundas Group sediments surrounding and overlying it. The rhyolite is an eroded section through a high level intrusive - volcanic complex, with intrusive units in the core and extrusive units and pyroclastics on the margins or upper levels of the mass.

The shales, siltstones and particularly the arkosic sandstones do not appear to be the erosion product of the Burns Peak Rhyolite. Framework texture and mineralogy in the Dundas Group suggest a granitic source, with a minor volcanic component. A probable source is the intrusive quartz-feldspar porphyries to the north-east of the Burns Peak Rhyolite. A more distal easterly source is unlikely as there are no pre-Cambrian type clasts (quartzite, schist, muscovite etc) in the arkosic sandstones. No other granitic source of earlier than Devonian age is exposed in the area but a westerly source, now covered by later Dundas Group sediments remains as a possibility.

6.1.3. SOIL GEOCHEMISTRY

(Refer to 1:10,000 plans A0-525-0102, 0103 & 0104)

No anomalies of significance were discovered on the 2.2km of new grid lines cut.

6.1.4. STREAM GEOCHEMISTRY

(Refer to 1:10,000 plans A0-525-0065 for Pb & Zn)

Extremely low geochemical values were obtained from the stream sediment survey considering the anomalous soil values known to be in the area. The only high stream geochemical result was from a manganese rich sample taken from a low-flow soak, where considerable concentration and scavenging would occur.

..6/.

6.1.5. ROCK CHIP SAMPLE GEOCHEMISTRY
(Refer to 1:5,000 plan A4-521-0061) Appendix 7.

Twenty rock chip samples were collected from fresh rock exposed in the drill site access track for N.P.P. 213 and 214. They show good correlation with soil geochemical data, with the highest assay of 1250 ppm Pb and 465 ppm Zn coming from a sample adjacent to the highest soil geochemical sample location.

6.1.6. SOIL PROFILE TEST PITS
(Refer to Appendix 5)

The plots of the geochemical results show that the highest geochemical concentrations are near the base of the 'C' horizon, where a podzolic soil type occurs. Where soil development is poor, this may not be the case for example the profile at 378,970E on line 5,387,100N.

6.1.7. GEOPHYSICS
(Refer to 1:10,000 plan A0-525-0033 & Appendix 1.)

A number of geophysically anomalous zones, detected by a reconnaissance I.P. dipole-dipole (100m) survey, were detailed using a 40m dipole spacing. None of the responses located in the detailed survey were considered of prime interest in their own right. However, a number of them were coincident with soil geochemical anomalies. These coincident geophysical-geochemical anomalies were generally in bands adjacent to the eastern and western volcanic - sediment contacts although some occurred entirely within the Burns Peak Rhyolite.

Significant geophysical anomalies occur at:

Line	Easting of Anomaly	Depth
5,387,300N	379,080E	less than 100m
	378,480E	less than 20m
5,387,100N	378,940E; 379,140E; 379,420E	all within 40m

..7/.

An anomaly at 5,387,300N; 378,480E was coincident with high Pb soil geochemistry and was the target for D.D.H. N.P.P. 213. The geophysical anomaly on line 5,387,100N at 378,940E was also tested, by the drilling of D.D.H. N.P.P. 215.

6.1.8. DIAMOND DRILLING

D.D.H. N.P.P. 213 (Refer to Summary of Results Sheet A1-521-0042 & Appendices 4 & 6)

N.P.P. 213 was drilled on line 5,387,300N at 378,440E to test a combined Pb soil geochemical anomaly and a low magnitude I.P. anomaly. It intersected west-facing Dundas Group shales and arkosic sandstones which flank the west side of the Burns Peak Rhyolite unit.
The sediments appear fresh and little altered. Mineralisation consists of fine pyrite, sphalerite and galena associated with calcite veins infilling tension cracks in the sediments. Chip sampling gave maximum assays of 565 ppm Pb and 1350 ppm Zn from 85 to 90m.
The nature of some of the sediments (grey carbonaceous siltstone) and the style of the mineralisation is sufficient to explain the soil geochemistry and I.P. anomalies.

D.D.H. N.P.P. 214 (Refer to Summary of Results Sheet A1-521-0053 & Appendices 4 & 6)

N.P.P. 214 was drilled (from 378,610E) on the same line as N.P.P. 213. It was targeted to test a Pb, Zn and Cu soil geochemical anomaly close to the contact of shales and arkosic sandstones with the 'Burns Peak Rhyolite'.
The hole intersected a similar sequence to N.P.P. 213 before penetrating rhyolitic pyroclastics of the Burns Peak Rhyolite. It reached a total depth of 142.0m and collapsed before a down hole I.P. survey could be run.
The hole was chip sampled and maximum values of 1250 ppm Pb and 1400 ppm Zn were obtained from 35 to 40m and 45 to 50m respectively.

..8/.

The sulphides consisted of sparce galena and sphalerite associated with fluoritic veins, which apparently predate the incipient shearing. The contact zone was not faulted.

D.D.H. N.P.P. 215 (Refer to Summary of Results Sheet A1-521-0054 & Appendices 4 & 6)

N.P.P. 215 was drilled from east to west on line 5,387,100N from 379,010E into the Burns Peak Rhyolite. The hole intersected a sequence of trachyte, quartz-trachyte and rhyolite, most of which have been identified in thin section by Cowan (see Appendix 4 Report C.M.S. 80/4/24) as intrusives. Two rocks with extrusive textures were noted. As with the other holes at North Pinnacles, galena, pyrite and sphalerite mineralisation occupies small quartz and carbonate filled tension fractures in the rock and these are seen as the source of soil geochemical anomalies. Maximum values of 3800 ppm Pb and 1.1% Zn were obtained between 45 and 50m from chip samples of the core. A zone of disseminated pyrite (up to 10%) between 30.1 and 64m in the matrix of a rhyolite breccia is probably responsible for the observed I.P. anomaly.

6.1.9. CONCLUSIONS

The three diamond drill holes completed to date show that almost all mineralisation at North Pinnacles is epigenetic, being associated with veins filling small open tension fractures in both sedimentary and volcanic units. The local association with fluorite may indicate that it is genetically associated with an intrusive at depth. Some syngenetic pyrite may be present in the rhyolites and intrusives intersected by N.P.P. 215, but as no favourable host horizons for massive Pb/Zn mineralisation were observed the potential for stratabound syngenetic Pb/Zn orebodies in this unit appears poor.

The potential for tin mineralisation in the area also appears to be low. Tin assays in N.P.P. 214 were all below the limit of detection and no favourable calcareous host was intersected by the drilling.

It is therefore not proposed to do any further work at North Pinnacles during the 1980/81 field season.

..9/.

6.2. Silver Falls Extension Grid

(Refer to 1:50,000 plan A2-521-0079)

6.2.1. WORK COMPLETED (Refer to 1:50,000 plan A2-521-0060)

A total of 7.2km of grid line was cut and pegged to trace the north-east extension of the anomalous Pb/Zn soil geochemistry.

The grid was geologically mapped and soil sampled.

Stream sediment samples were collected from the entire grid, where grid lines were crossed by active stream drainage.

A total of 8.9km of reconnaissance dipole-dipole I.P. was completed over the western part of the grid.

6.2.2. GEOLOGY

(Refer to plan A0-525-0012 1:10,000 Geology Sheet 3)

Geological mapping shows that the soil anomalies follow the strike and may be related to a particular rock type (perhaps a polymictic conglomerate observed in close proximity to the high values). The rocks consist chiefly of shales, siltstones, tuffaceous sandstones and conglomerate. Rare crystal lithic vitric tuff was also observed north of the Que River. In the north-western corner of the grid a micaceous sandstone of probable pre-Cambrian derivation was mapped.

A major soil geochemical anomaly (values upto 1.15% Pb) occurs on line 5,390,300N at 377,280E over a weathered ignimbrite.

6.2.3. SOIL GEOCHEMISTRY

(Refer to plans A0-525-0102, 0103 & 0104)

..10/.

Sampling revealed that the Pb/Zn soil geochemical anomaly extends a further 3.0km north-east to the exploration licence boundary. Its magnitude, however, diminishes greatly and the anomaly is almost negligible on line 5,392,100N.

6.2.4. STREAM GEOCHEMISTRY

(Refer to plans AO-525-0065 1:10,000 Sheet 3 for Pb & Zn)

The stream geochemistry pattern reflects the soil pattern for both Pb and Zn while copper values were very low in both soil and stream samples.

6.2.5. GEOPHYSICS

(Refer to plan AO-525-033 Geophysics - Induced Polarisation and Appendix 2.)

No anomalies were detected by the reconnaissance dipole-dipole I.P. (100m spacings).

6.2.6. CONCLUSIONS

The cause of the soil geochemical anomaly and its distribution are not clearly understood because there is almost no outcrop in the area. I.P. has not assisted in defining the source, possibly because any mineralised zones are too narrow to be defined by the dipole spacing used (100m).

Further work is required to define the style and quantity of the mineralisation responsible for the soil geochemical anomalies present. However, diamond drilling is not justified at this stage.

7.0 LANDSAT

Two computer enhanced enlargements of slides of a digital interactive analysis of the 1972 Landsat imagery of the Bulgobac area have been

..11/.

printed. A study of visible features of these enlargements and a computer analysis of linear features is being carried out.

8.0 RECOMMENDATIONS FOR FURTHER WORK

8.1. Boco Area

Past geophysical work at Boco will be reviewed by a consultant geophysist, to determine if the I.P. techniques used - in particular the gradient array technique - were able to adequately penetrate the glacial overburden and give meaningful results from the underlying bedrock.

8.2. Western Area

1. NORTH PINNACLES

   No work planned.

2. SILVER FALLS EXTENSION

   It is recommended that an access track north from the track to Silver Falls to line 5,390,300 where the best soil geochemical values occurred be constructed. The line should then be costeaned in an attempt to obtain fresh samples of the bedrock. A dipole-dipole and/or gradient array traverse should be completed over line 5,390,300N, dependent on results of the costeaning, in a further attempt to define the mineralisation with I.P.. An electrode spacing of 20-40m should be used.

8.3 Northern Area - Regional Exploration

It is proposed to explore all areas not already covered by cut grids or obscured by Tertiary basalts or Pliestocene gravels with a regional exploration programme consisting of geological mapping and associated stream sediment sampling. This work will constitute the major exploration endeavour at Bulgobac during the 1980/81 field season. It is proposed to cover approximately 30 sq.km to a sample density of 20 samples/sq.km which should be adequate to locate any potential tin and base metal mineralisation.

REFERENCES

1. Geological Department Report No. 128
"Report on Exploration Undertaken in the Bulgobac Exploration Licence 12/72". N.H. Hanson

2. Geological Department Report No. 129
"Bulgobac Exploration Licence 12/72 - Progress report on activity October, 1977 to October, 1978." J.H.A. Mill

3. Geological Department Report No. 130
"Bulgobac Exploration Licence 12/72 - Report on Work Undertaken from October, 1978 to October, 1979." J.H.A. Mill

APPENDIX 1.

Scintrex Report Tas-065ya, November, 1979

"Comments on Additional Dipole-dipole E.I.P. Surveys
Over the North Pinnacles Grid Rosebery Area, Tasmania
on behalf of Electrolytic Zinc Company of Australasia Limited."

020

653020

SCINTREX

PRIVATE AND CONFIDENTIAL

COMMENTS ON
ADDITIONAL DIPOLE-DIPOLE EIP SURVEYS
OVER THE NORTH PINNACLES GRID
ROSEBERY AREA, TASMANIA
ON BEHALF OF
ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED

BY

A.W. HOWLAND-ROSE
MSc,DIC,AMAusIMM,FGS.
GEOPHYSICIST

SYDNEY, N.S.W.

NOVEMBER, 1979

TAS-065YA

Including data and comments from Reports dated July and August, 1979 on North Pinnacles.

021

653021

SCINTREX CONTENTS

SCINTREX PTY. LTD.
GEOPHYSICAL CONSULTANTS AND CONTRACTORS

SUMMARY

This report contains brief comments on all surveys carried out over the North Pinnacles grid from January to November, 1979.

All show a significant increase in the observed background from low normal (15 millivolts/volt ±5 millivolts/volt) on the 100 metres dipole-dipole, to high normal (30 millivolts/volt ±5 millivolts/volt) on the 30 metres dipole-dipole. At this stage the GEOLOGICAL explanation is not known.

The detailed 40 metres dipole-dipole data shows the majority of anomalies located on the 100 metres reconnaissance dipole-dipole to be due to broad disseminated sources having fast decay forms inferring a fine grain size to the chargeable source.

In the Author's opinion additional corroborative information from geochemistry or geology will be required to enhance the responses defined in this survey to primary status.

1031 WELLINGTON STREET, WEST PERTH, 6005 WESTERN AUSTRALIA
TELEPHONE: 321 6934 TELEX: 92353 TELEGRAMS: SCINTREX, PERTH
6 TRAMORE PLACE, KILLARNEY HEIGHTS, 2087 N.S.W. AUSTRALIA.
TELEPHONE: 451 5367 TELEX: 26859 TELEGRAMS: SCINTREX, SYDNEY

SCINTREX

COMMENTS ON
ADDITIONAL DIPOLE-DIPOLE EIP SURVEYS
OVER THE NORTH PINNACLES GRID
ROSEBERY AREA, TASMANIA
ON BEHALF OF
ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED

INTRODUCTION

Over about three weeks in late October and early November, 1979, additional 100 metres and 40 metres dipole-dipole surveys were carried out over the North Pinnacles grid. The bulk of the work was carried out under Scintrex crew leader Mr. T. Von Strokirch,B.Sc., with one array being surveyed by Dr. R. Malor.

On-site direction and supervision was provided by Electrolytic Zinc Senior Exploration Geologist Mr. J. Mill.

The original surveys were discussed in two reports dated July and August, 1979 under the incorrect location name of Bulgobac. In order that there be no confusion, the original data profiles are re-presented in this report, with "Bulgobac" still visible but crossed out, and "North Pinnacles" added. Also, the comments on the data contained in those reports are repeated here in *italic* script.

METHOD

The method is very simply described in the attached appendix.

EQUIPMENT

Energisation was by means of a 2.5 kilowatt time domain induced polarization transmitter powered by a 3 HP Briggs and Stratton motor generator. The resultant primary and secondary fields (resistivity and chargeability) were monitored using a Scintrex IPR-8 receiver. The energisation was 2 seconds on, 2 seconds off, reverse and repeat, while the receiver used a 2 second programme analysing three decay curve slices of which M_3 only is displayed on the pseudo sections.

DATA PRESENTATION

The data has been presented in standard pseudo section format.

DISCUSSION OF RESULTS

Line 5388300N a = 100 metres, n = 1 to 4 *Surveyed 27-2-79*

This line was surveyed between 378900E and 380200E. The background resistivities are quite low at 400 to 800 ohm-metres west of about 379400E with background chargeabilities being 9 millivolts/volt (+). East of this point resistivities are about twice this level, while background chargeabilities are about 4 to 6 millivolts/volt. These noticeable differences are due to bulk changes in the underlying rocks.

One significant response was defined on the western extremity of the array seen at n = 1 as 13.8 millivolts/volt with a pseudo-section 45° east dip. A lack of readings to the west makes the interpretation of this feature uncertain as to position and depth due to the complexities of the array and the size of the dipole. However, the source position looks to be between 378900E and 379000E, while the depth to source is less than the 100 metres dipole employed. There is

no apparent contrast in the resistivity between the chargeable source and the enclosing rocks. The response should be followed up by extending the line to the west should this anomaly of secondary interest be found to have potential economic interest.

Line 5387900N 378900E to 379700E a = 100 metres, n = 1 to 4

Surveyed 7-6-79

The resistivity data shows a progressive increase in resistivity from 500 ohm-metres (±) to the east of 379200E to twice this level at depth, indicating more resistive rocks at depth. The chargeability, however, while varying about the 10 millivolts/volt(±) level, shows no definitive pattern other than to infer slightly more chargeable rocks between 379200E and 379400E within 100 metres of surface.

There are no significant anomalies of potential economic interest.

Line 5387700N 378660E to 379460E a = 100 metres, n = 1 to 4

Surveyed 7.6.79

The resistivity shows a variation from 550 ohm-metres to 2200 ohm-metres, while the chargeablity varies about the 10 millivolts/volt ±2 millivolts/volt level. While there are no significant responses of potential economic interest, progressively lower chargeability to 6 millivolts/volt from twice this level with increasing n values at 378960E, indicates a less chargeable (more acid?) rock unit at depth.

Line 5387500N a = 100 metres, n = 1 to 4 Surveyed 22-2-79

The dipole-dipole set-up was surveyed between 378500E and 380100E. The overall resistivity level observed is generally lower than that observed on other dipole-dipole set-ups above, while the chargeability level at 10 millivolts/volt ±2 millivolts/volt is somewhat higher. This infers a different bulk composition for the rocks, perhaps more mafic and less siliceous.

The most significant response was defined centred between 379100E to 379200E. Strong twice background double peak responses on all four n values to 20 millivolts/volt (±) infer a source which lies within 100 metres of the surface between the two coordinates above. As the apparent resistivities accompanying these double peaks are in the 800 to 2000 ohm-metres range, the source is considered to be either disseminated or electrically discontinuous. This anomaly can be considered of secondary to primary geophysical interest, and should the geological and/or geochemical data confirm its interest, additional detailed induced polarization will be required to define the target. An on-line gradient is favoured by the author, and second best would be a 20 and/or 40 metres pole-dipole or dipole-dipole array.

A second possibly significant source was inferred by 50% above background readings on n = 1 to 4 centred between 380000E and 380100E dipping west on the pseudo section plot. This FORM is interpreted as being the western 'leg' of a double peak anomaly whose source is centred between 380100E and 380200E, and whose depth to source is shallower than the dipole used, namely 100 metres. The accompanying resistivity data while still high could infer a very slightly LESS resistive source than the enclosing rocks. However, the source is thought to be essentially disseminated or electrically discontinuous if massive. This

anomaly is considered of secondary geophysical interest, and any detailing will require an extension of the surveyed line some 200 to 300 metres to the east. As above, an on-line gradient is favoured using a small 20 metre dipole to give both depth penetration (large current dipole) and good resolution (small potential dipole).

Line 5387500N *a = 40 metres, n = 1 to 4* *Surveyed 24-10-79*

The detailed survey was carried out between 379000E and 379320E, and the approximate cross-sectional area covered by this detail has been marked on the 100 metres reconnaissance data.

The first significant feature is a doubled chargeability background. This is a common feature on all lines surveyed in the Pinnacles area, and an explanation which fits the known geological structure in the area is not known. However, a similar doubling of background has been noted by R. White, Chief Geophysicist for Getty (personal communication) in other areas of the west coast. From a geophysical point of view an explanation would be a more chargeable zone lying near surface which is significant on the 40 metres array, but not significant on the 100 metres array. However, the shallow cover and limited weathering at North Pinnacles make this unlikely.

Returning to the data, the chargeability shows a significant contact at about 379120E with a higher background of about 45 to 50 millivolts/volt, and to the east of this point a progressive decrease in chargeability from about 35 millivolts/volt (±) to 25 millivolts/volt at 379280E and then a return to higher values east of that point.

The most chargeable zone of 44 to 58 millivolts/volt appears to be situated at 379100E and comes to within 40 metres of surface. To depth the chargeability *increases*, indicating it to be a significant feature. The relatively high resistivity associated with the high chargeability certainly infers a disseminated source. The characteristic "double peak" is probably obscured by the "dilution" due to the lower background to the east. Note, however, that only on $n = 4$ is the data subject to "dilution" (at 379120E). Also the mismatch on $n = 3$ (at 379140E) for the reciprocal value is due to dilution.

The "broad" zone of high 40 millivolts/volt readings observed on the 40 metres detail is centred at about 379040E and spread over 100 metres. This is consistent with the reconnaissance data in form, but perhaps not in amplitude.

In summary then, a chargeable source is present at a maximum depth of about 40 metres, centred at 379100E which is probably due to greater segregation of disseminated chargeable material within a resistive source. In FORM the detailed data is consistent with the reconnaissance data, but the amplitude of the former is higher.

Line 5387300N 378600E to 379800E $a = 100$ metres, $n = 1$ to 4

Surveyed 4-6-79 & 4-9-79

The main feature observed on this set-up is a marked contrast in chargeability from the 10 millivolts/volt (±) level west of about 379100E to 15 millivolts/volt (±) east of that point. To the immediate west of this contact the resistivities increase to about twice the average, while chargeabilities are lower than average, which would infer the presence of a resistive silicified

SCINTREX

acid unit.

Higher chargeability values on the n = 1 spacing of 20 millivolts/volt at 379150E, together with the usual -45° dip to a high chargeability zone to the west, can be interpreted as the western arm of a double peak anomaly whose source is broad, centred at or slightly west of 379150E, and whose depth is less than 100 metres. This response is of secondary geophysical interest, but a closer spacing (or preferably gradient run on the line) may be able to resolve the source location, width and dip more definitely.

The original 100 metre reconnaissance data was subsequently extended to 379,800E on 4th September, 1979. This data showed a distinct resistivity low centred between 379,300E and 379,450E of the order of 500 - 600 ohm metres as against more than four times this to the east and west. This zone is associated with significantly increased chargeability of two and a half times background on n = 4 at 379,400E, and less than this at lesser spacings. The overall impression of both the June and september data then infers a broad scene 100 - 150 metre wide source centred at about 379,200E. This is similar to the conclusion reached after the first survey. Detail was carried out as follows:

Line 5387300N 379000E to 379320E a = 40 metres, n = 1 to 6

Surveyed 21-10-79

This array detailed the eastern marginal anomaly referred to above. The detail shows that a high 40 millivolts/volt zone extends from 379180E in the east to about 379000E, extending to depth and seen on n = 1 to 6. This clearly identifies

SCINTREX

the source as a broad 200 metre wide zone of disseminated chargeable material with rocks of moderate resistivity (1000 ohm-metres±). As such, a disseminated source is interpreted. The data infers little or no near surface cover over the zone. The most significant chargeabilities within this broad zone were recorded 379040E on the n = 4 spacing. At this point the 53.3 millivolts/volt chargeability reached its maximum. Thus within the broad zone, an increase in chargeability, and thus sulphides (or graphite etc.) with depth is inferred, again, from a disseminated source.

To the east of 379240E the chargeability falls to 21 millivolts/volt from resistivity of 500-600 ohm-metres. While the resistivity data correlates well with the 100 metre data, the chargeability data is at twice the level

To the west of the main anomaly chargeabilities remain a high 30-35 millivolts/volt, some two fold greater than the original reconnaissance data.

The resulting data over the centre of the chargeability anomaly shows a significant increase with increasing n values for 500 ohm-metres to 1500 ohm-metres for n = 1 to n = 6. This confirms the near surface (40 metres ±) more conductive layer at 379100E.

The detail array appears to indicate a near surface broad source which the detail array was too limited in extent to define the edges of definitively. Also, it is likely that the limits are not sharply defined.

Summary:- The source of the reconnaissance array anomaly has been identified in detail between about 379000E and 379200E as disseminated material within a

SCINTREX

resistive host. The top of the source lies within 20 metres of surface and extends to depth. The maximum chargeabilities were observed over a source at 379080E ±30 metres, and a depth of the order of 100 metres ±.

Line 5387300N 378360E to 378600E a = 40 metres, n = 1 to 4

Surveyed 19-10-79

Again higher background values were observed over the detailed array than over the original reconnaissance data.

Two distinct anomalies were defined. The first was located at 378480E ±40 metres, and the second west of 378360E. Both have shallow origins, certainly less than the spacing used, namely 40 metres. The most significant was that at 378480E which is associated with low (for the area) resistivities of 200 ohm-metres, and this, together with the high chargeabilities of 40 millivolts/volt and its inferred extension to depth, infer it to be worthy of further investigation.

To the west a further significant anomaly was located whose source is inferred to lie at or west of the end of the cut line.

One significant feature is that the main anomaly at 378480E is essentially a surface feature, with chargeability decreasing on the n = 4 spacing. Also, the resistivity increases with depth. This situation is very similar in form to the Murchison River 20 metres dipole-dipole and as far as suggesting that a near surface chargeable layer may exist at North Pinnacles, this line goes some way to inferring such exists.

In summary, a shallow source centred at 378480E ±40 metres is due to a chargeable source within 20 metres of surface. This MAY extend to depth, and show interconnection between the chargeable source grains as the resistivity is a relatively low 200 ohm-metres. A second similar source is inferred at or west of the end of the line at 378360E.

Line 5387100N 378440E to 379240E a = 100 metres, n = 1 to 4

Surveyed 4-6-79

The main feature observed was a rock type change at about 378900E, indicated by higher chargeability readings to the east of 14 millivolts/volt (+), and lower chargeabilities of 9 millivolts/volt (-) to the west. The resistivity data does not show a material change, therefore the source is considered to be disseminated and probably formational only.

At 378940E lower chargeability of 5 to 7 millivolts/volt at n = 3 together with higher resistivity of 3000 ohm-metres indicates a more resistive, less chargeable rock unit, say an acid volcanic or granite, at this location.

Higher chargeability of 12 millivolts/volt (+) on the n = 2 and 3 spacings at 378740E(±) as against a background of 8 millivolts/volt show a relatively chargeable unit to be present at this location.

None of the chargeable responses located on this set-up are considered of possible economic significance.

The line was subsequently extended to the east to 379640E, and to the west to

378040E on 7th and 8th September, 1979.

These extensions showed two regions of anomalous chargeability as follows:-

The first was situated at about 378400E where a chargeability of 19 millivolts/volt was recorded at n = 1. A supporting reading to the east of 15.3/12.8 millivolts/volt and to depth infers a 200 metres wide source within 100 metres of surface. To the east and west of this anomaly, the chargeability decreases to 8 millivolts/volt ±. As the observed resistivity of 500 ohm-metres at 378390E n = 1 coincides with the highest chargeability of 19 millivolts/volt, some interconnection within the chargeable source is inferred, and thus this anomaly is of possible economic interest, and was followed up using a detailed spacing.

Line 5387100N a = 40 metres, n = 1 to 4 *Surveyed 18-10-79*

The line was surveyed between 378280E and 378520E to detail the western anomaly referred to above.

The overall resistivities are of the order of 500 ohm-metres ±, with the exception of a central resistive section at about 378340E on the n = 3 and 4 spacing.

The chargeabilities over the entire section remain a high 30 millivolts/volt in the west and 45 to 50 millivolts/volt in the east. The original reconnaissance data showed 20 millivolts/volt centred at 378390E on the a = 100, n = 1, which on this data is equated to a = 40 metres, n = 3.

The high values over the whole section are consistent with a broad chargeable source within 20 metres of surface over the whole section surveyed. The survey

ended *within* the anomalous 100 metre readings in the east, but *covered them* in the west. This *may* infer that the broad source dips to the east, and this may be inferred by a *decrease* in chargeability in the west, with increasing effective spacing (i.e. increased a x n)

The eastern values of 40 to 55 millivolts/volt are high, and infer significant disseminated and partially interconnected chargeable material, especially between 378400E and 378520E. These extend from near surface to depth.

In summary then, significant chargeability of 40 to 55 millivolts/volt was recorded between 378400E and 378520E from material whose resistivity is of the order of 550 ohm-metres ±50 ohm-metres, then remains an anomalous 30 millivolts/volt to the west. The source is considered to be disseminated and partially interconnected sulphides or graphite. The geometry suggests? an east dip.

Line 5387100N a = 40 metres, n = 1 to 6 *Surveyed 29 & 30-10-79*

This line was surveyed between 379060E and 379460E to cover the eastern anomaly located on the reconnaissance survey described above.

The resistivity data confirms the near horizontal layering observed on the reconnaissance data centred at 379140E, and the absence of any layering over the eastern section of the detail.

The detailed dipole-dipole resolved a number of distinct twice background anomalies, the most significant of which was observed on the n = 3 to 6 spacings centred at 379060E. This is interpreted as being due to a source which (i) may come close to surface at or in close proximity to 378940E, and (ii) becomes

more significant with depth.

Twice background 25 millivolts/volt readings were recorded at 379140E on the n = 2 and 3 spacings, with n =1 readings of 20 millivolts/volt and 23 millivolts/volt. A 'broad' 40 metres (+) source is suggested centred at about 379140E which shows a double peak anomaly on increasing spacings. The moderate to low resistivity of 290 to 490 ohm-metres suggests some interconnection within the source, while the form suggests a maximum depth of not greater than 40 metres.

The third anomaly was recorded centred at 379420E as a broad 20 millivolts/volt+ response from a source centred at about that point, and extending to depth. The associated resistivity ranges between 300 and 800 ohm-metres which indicates weak interconnection between the chargeable source, *or* a host to the chargeable source which is less resistive.

In summary, the detail has revealed three separate sources as follows:- 378940E(±), 379140E(±) and at 379420E ±40 metres. All three are inferred to come within 40 metres of surface at these points and to be due to chargeable material within a less resistive source and/or weak interconnection within the source itself. The detail certainly indicates a far more complex picture in detail than that observed on the 100 metres dipole.

Of the three, that at 379140E is geophysically the more interesting as it is both chargeable and shows a lower associated resistivity.

Line 5387100N 378800E to 379040E a = 40 metres, n = 1 to 6

Surveyed 9 & 10-11-79

This array was surveyed after completion of the main survey to detail the projected response inferred at 378940E on the array discussed above, but is 20 metres offset. This confirms a shallow source centred at 378920E, which is 'wide' perhaps 60 to 80 metres. The 23 millivolts/volt chargeabilities are about twice background while the associated resistivity shows only a slight depression overall above background. Thus the source is inferred to be disseminated chargeable material within moderately resistive rocks.

In summary this array confirms the location of the source at 378940E inferred in the detailed survey carried out to the immediate east, however, the source is inferred to be broad at 60 to 80 metres. The source is thought to be disseminated in nature.

Line 5386900N 378200E to 379600E a = 100 metres, n = 1 to 4

Surveyed 5-6-79

Background resistivity ranges from 1000 ohm-metres to 4500 ohm-metres while chargeability ranges between 6 millivolts/volt and 13 millivolts/volt, the mean being about 10 millivolts/volt.

The only response of possible interest shows as a 11.5 millivolts/volt response at n = 1 between 378500E and 378600E against a background of 6 to 7 millivolts/volt. The high n values, 2-4, show values of 12.1, 13.6 and 12.8 millivolts/volt to the east. This can be interpreted as being due to a source centred at, or west of 378550E, and at a depth less than the 100 metres spacing used.

The centre section at 378800E shows low chargeability (7 ± millivolts/volt) and high resistivity (2000 to 5000 ohm-metres) which passes to the east into less resistive and more chargeable rocks.

None of the features on the initial data were considered of prime or even secondary interest.

Subsequently in September the original survey was extended from 378400E to 378200E in the west, and from 379200E to 379600E in the east.

In the west the form of the response gave a clear indication of a double peak anomaly centred at 378450E of twice background. The source has a maximum depth of less than 100 metres. As the accompanying resistivities are high, the source is considered to be disseminated in origin.

The eastern detail showed a good chargeability of 50% above background centred between about 379100E to 379350E, with lower accompanying resistivity, especially on lower n values. The interpretation is of a broadly disseminated source within a moderately resistive host.

Both these anomalies were detailed as set out below:

Line 5386900N 378340E to 378580E a = 40 metres, n = 1 to 4

Surveyed 17-10-79

The resistivity recorded was lower by 50%, and the chargeability background greater by three fold than that recorded on the 100 metre dipole spacing this again shows that the surface zones are significantly less resistive than the rocks at depth.

The detailed survey shows a broad, relatively high chargeability of greater than 35 millivolts/volt between 378340E and 378580E. The form of this response with higher n values suggests a broad source centred at 378420E, but extending in diminishing intensity both east and west of this point. A 'double peak' series of chargeable maxima on n = 3 to 4 were observed culminating with n = 4 maxima of 40 millivolts/volt and 37 millivolts/volt at 378380E and 378580E.

A comparison with the 100 metre reconnaissance data shows that the high background values coincide with the internal source on the 100 metre spacing. The fall-off to 25 millivolt/volt from 40 millivolt/volt + in the centre sector (at 378460E) infers a gradual rather than a sharp contact for the chargeable material. Also, as the source is broad, the detailed array was not sufficiently large to define the limits of the source.

In summary, the 100 metres reconnaissance array located a low amplitude anomaly whose source is interpreted to be centred between 378400E and 378500E. The detailed array shows an anomaly of three times the amplitude over a broader zone between 378340E and 378540E. This can only be explained in terms of higher near surface chargeabilities over this zone. The maximum value of

44 millivolts/volt located at 378440E has a maximum depth of 40 metres. The interpreted source is disseminated chargeable material within a less resistive host, and/or weak interconnected sulphides within a more resistive host.

Line 5386900N 379060E to 379620E a = 40 metres, n = 1 to 6

Surveyed 26 & 27-10-79

The main feature over the entire detail section is the high background which ranges *about* the 30 millivolts/volt mark ±3 millivolts/volt. The observed resistivities vary from 300 ohm-metres to 2700 ohm-metres.

In the west a distinct resistivity low was noted on the n = 1 spacing between about 379140E to about 379260E which continues on larger n values at an overall dip of less than 45^{o} on the pseudo section. This tends to suggest an east dip to the section.

A distinct increase in resistivity with depth was noted on all stations to the west of 379140E. This data, when allied to the 100 metre data also suggests an east dip to the resistive rock unit at depth.

In spite of the high background there are no significant anomalous responses within that background with the possible exception of the eastern end of the array, east of 379580E, where readings in the high 30's were obtained on the n = 5 and 6 spacings at 379680E.

In summary, the high background chargeability is a feature of this detailed 40 metres profile, but within this, little material anomalism was detected. There is an inference that in the west, the dip is to the east.

CONCLUSIONS

1 - Specific conclusions are made in the summary section under each array.

2 - Invariably higher backgrounds have been observed on the 40 metres dipole dipole by 2 to 3 fold than on the 100 metres reconnaissance data. In spite of this phenomenon having been observed elsewhere on the west coast, the Author finds it difficult to explain in terms of the known geology as a near surface chargeability zone has to be involved.

One further comment on background chargeability: normal backgrounds range from 10 millivolts/volt to 30 millivolts/volt (or in terms of milliseconds 7 to 20 milliseconds). Background is related (obviously!) to the presence or absence of chargeable material. Acid rocks, i.e. those high in silica content and low in mafic mineral content whether volcanic, sedimentary or metamorphic, have low backgrounds of the order of 10 millivolts/volt $\pm$5 millivolts/volt. As the mafic mineral content is increased so the background increases. Other material which influences background included some clay minerals, and certain components (inidentified) within the weathering profile. The latter are rare, but do exist, perhaps for example in the Murchison River section.

3 - The anomalies located on the detailed surveys are generally broader and less well defined than the original reconnaissance survey data. This is due to the sources being less sharp with respect to the enclosing rocks *relative to the spacing used* for the 40 metres spacing than for the 100 metres spacing.

4 - The decay forms observed over anomalies and high background in the detailed surveys are invariably slightly faster than normal i.e. $M_1 > M_3 > M_5$. This infers a *fine grain* to the chargeable source.

5 - The anomalies which could be considered for further investigation are those with high chargeability and lower resistivity, hopefully with some other supporting data. None of the responses located on these surveys can be considered of prime interest *in its own right*.

Respectfully submitted on behalf of:

SCINTREX PTY. LTD.

A.W. HOWLAND-ROSE, MSc, DIC, AMAusIMM, FGS.

GEOPHYSICIST

042

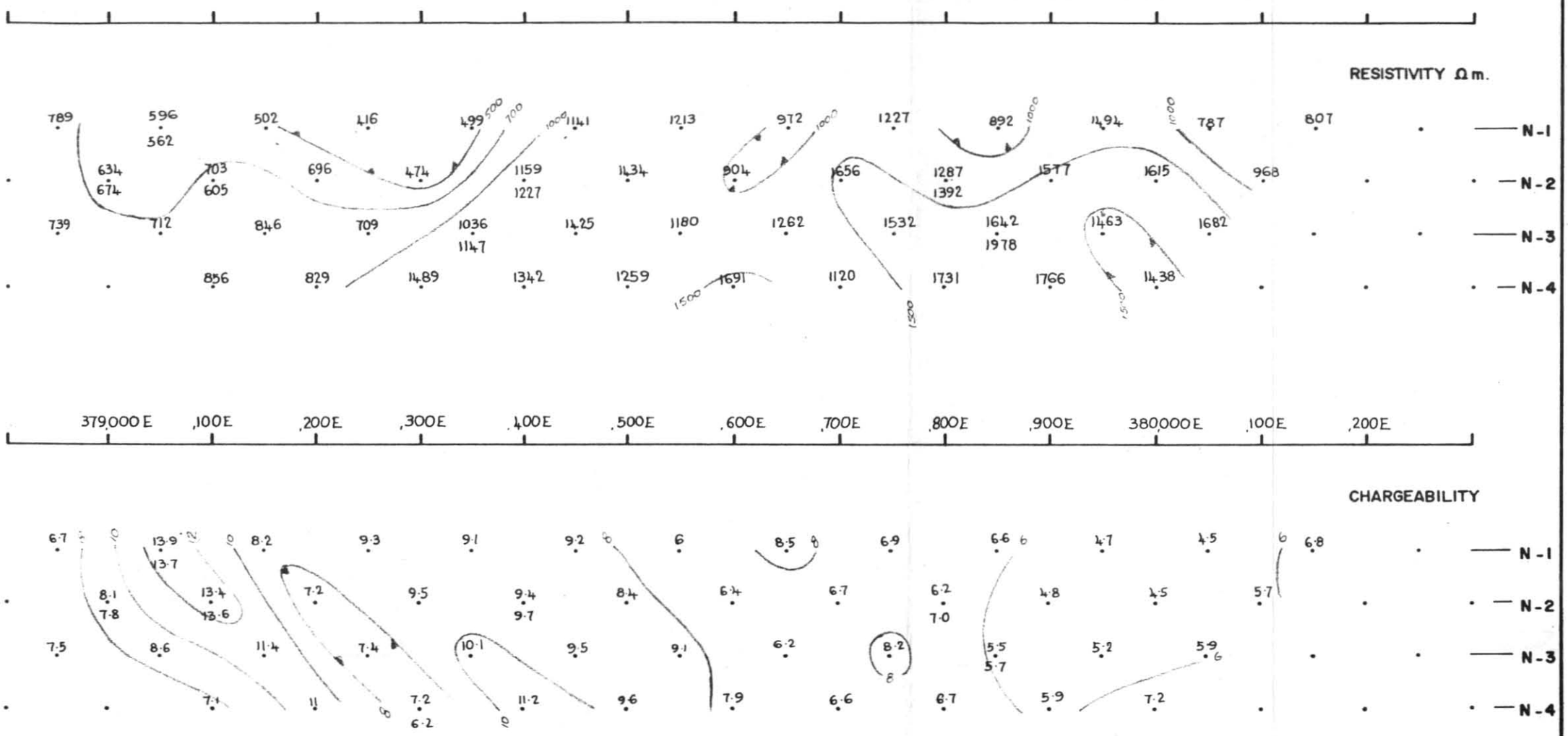
653042

SCINTREX PTY. LTD.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

DIPOLE - DIPOLE ARRAY

DATE 27 - 2 - 79		LINE No. 388,300N
PLOTTED BY B.E		PROSPECT ~~BULGOBAC~~ re-named NORTH PINNACLES
PULSE 2 secs	Rx.	
DIPOLE SPACING 100 M		JOB No. TAS-065



5 cm

653043

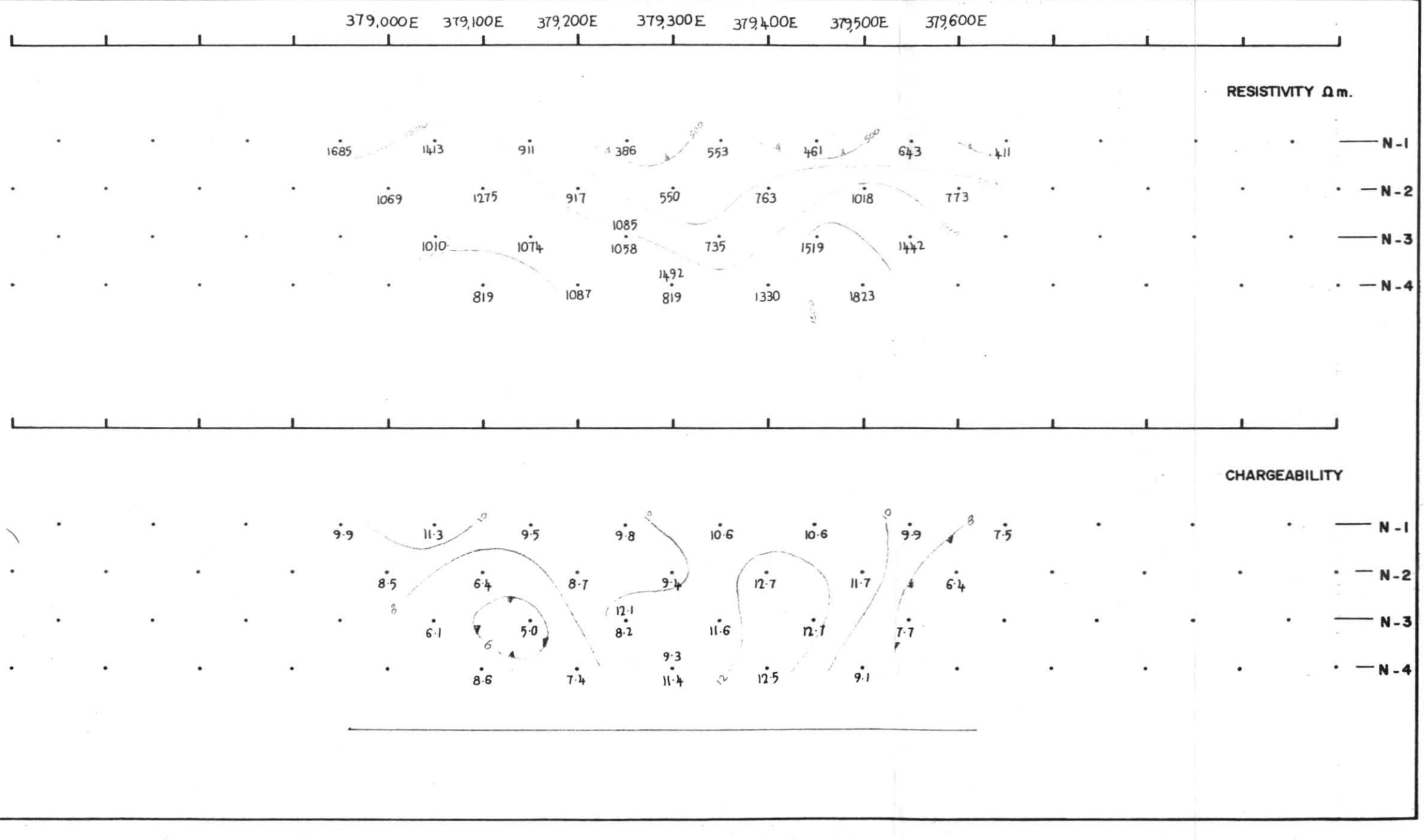
043

SCINTREX PTY. LTD.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

DIPOLE - DIPOLE ARRAY

DATE 7·6·79	LINE No. 5, 387, 900 N
PLOTTED BY D.J.T.W	PROSPECT ~~BULGOBAC~~ re-named NORTH PINNACLES
PULSE 2 sec. / Rx.	JOB No. TAS-065-D
DIPOLE SPACING 100 m	



5 cm

653044

044

SCINTREX PTY. LTD.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

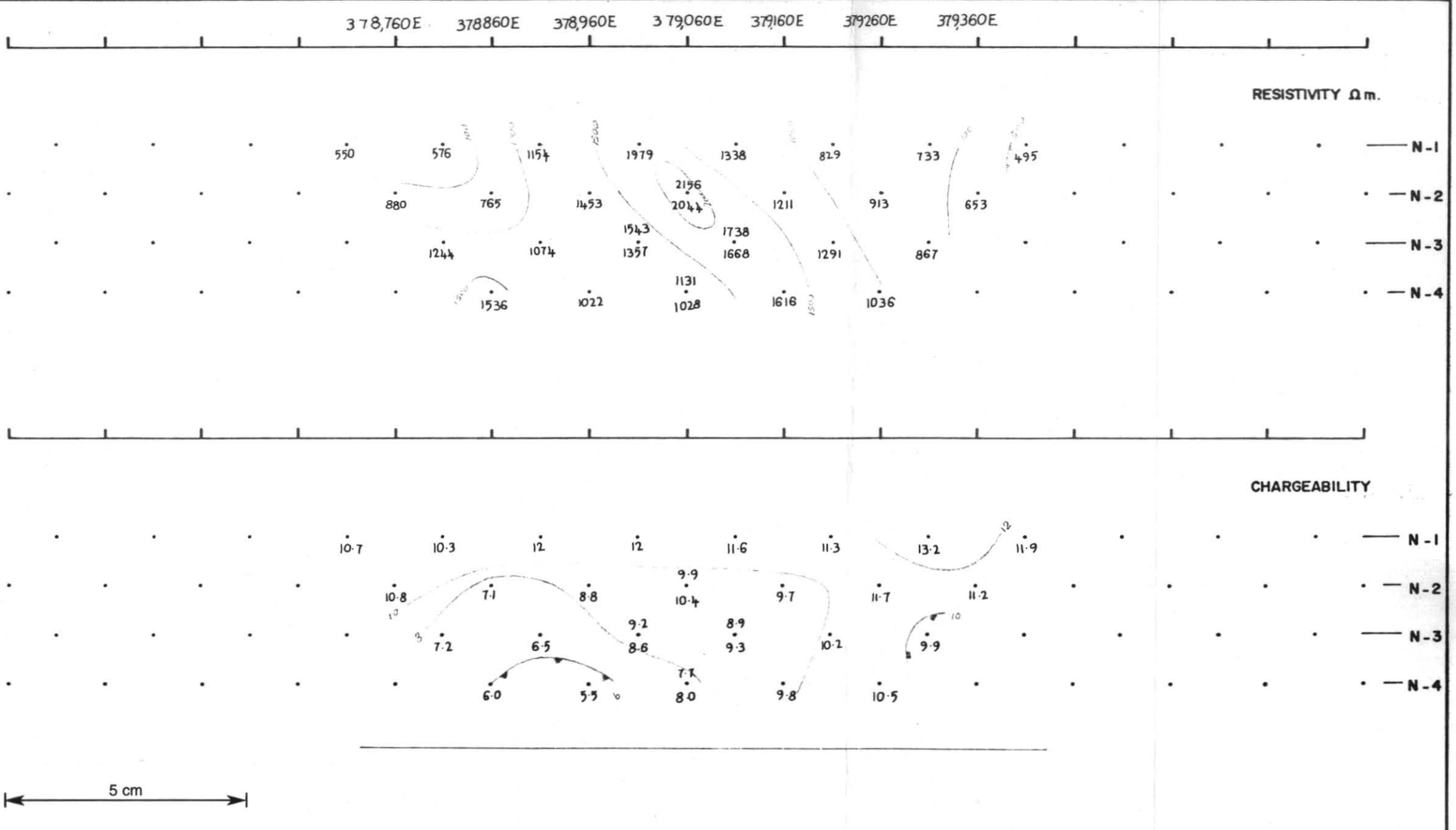
DIPOLE - DIPOLE ARRAY

DATE	7·6·79
PLOTTED BY	DJTW
PULSE	2 sec
Rx.	
DIPOLE SPACING	100 m

LINE No. 5,387,700 N

PROSPECT ~~BULGOBAC~~ re-named NORTH PINNACLES

JOB No. TAS-065-D



045

653045

045

SCINTREX PTY. LTD.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

DIPOLE - DIPOLE ARRAY

SCINTREX PTY. LTD.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

DIPOLE - DIPOLE ARRAY

DATE 22-2-79

PLOTTED BY B.E.

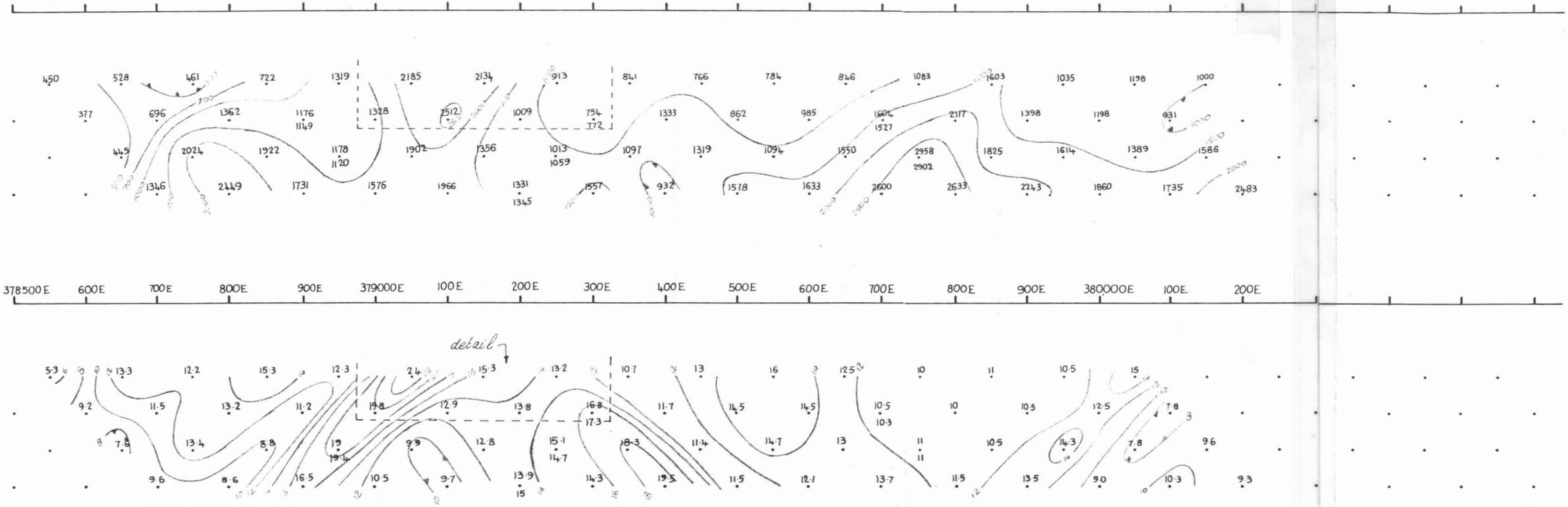
PULSE 2 sec. | Rx.

DIPOLE SPACING 100 m

LINE No. 5,387,500N

PROSPECT ~~BULGOBAC~~ re-named NORTH PINNACLES

JOB No. TAS-065



653046

046

SCINTREX PTY. LTD.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

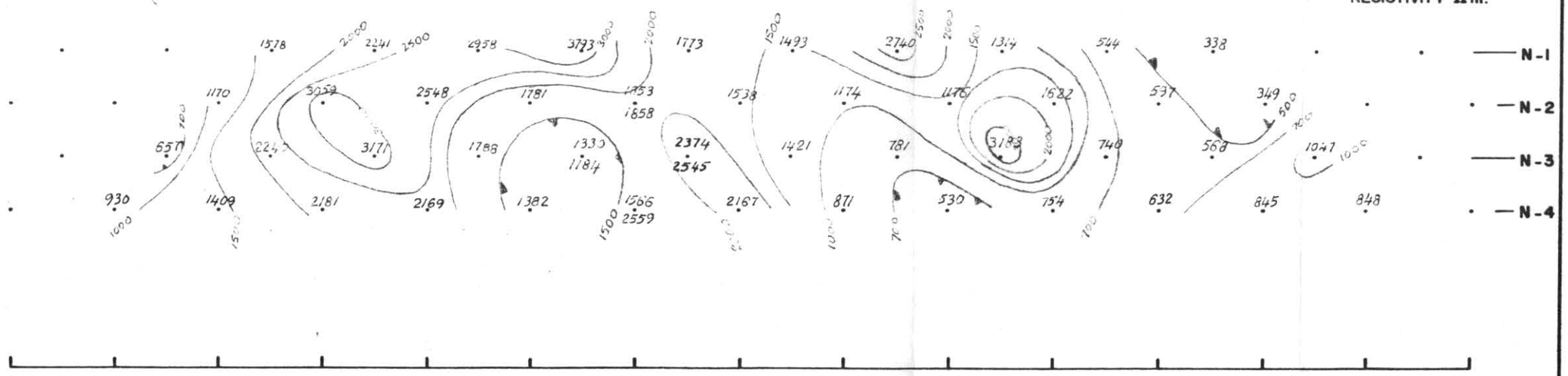
DIPOLE - DIPOLE ARRAY

DATE 24-10-79	LINE No. 5,387,500 N
PLOTTED BY KER/TVS	PROSPECT NORTH PINNACLES
PULSE 2 Sec / Rx.	JOB No. TAS-065-YA
DIPOLE SPACING 40 m	

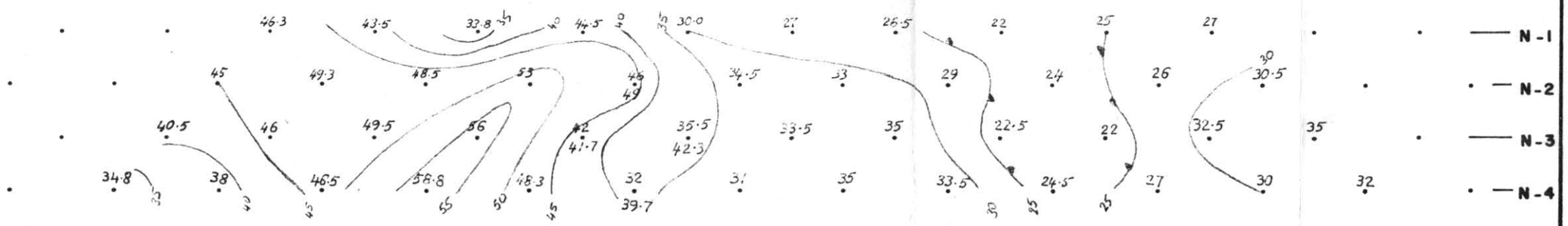
379,000E 379,040E 379,080E 379,120E 379,160E 379,200E 379,240E 379,280E 379,320E

1 2 3 4 5 6 7 8 9

RESISTIVITY Ω m.



CHARGEABILITY



047

653047

SCINTREX PTY. LTD.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

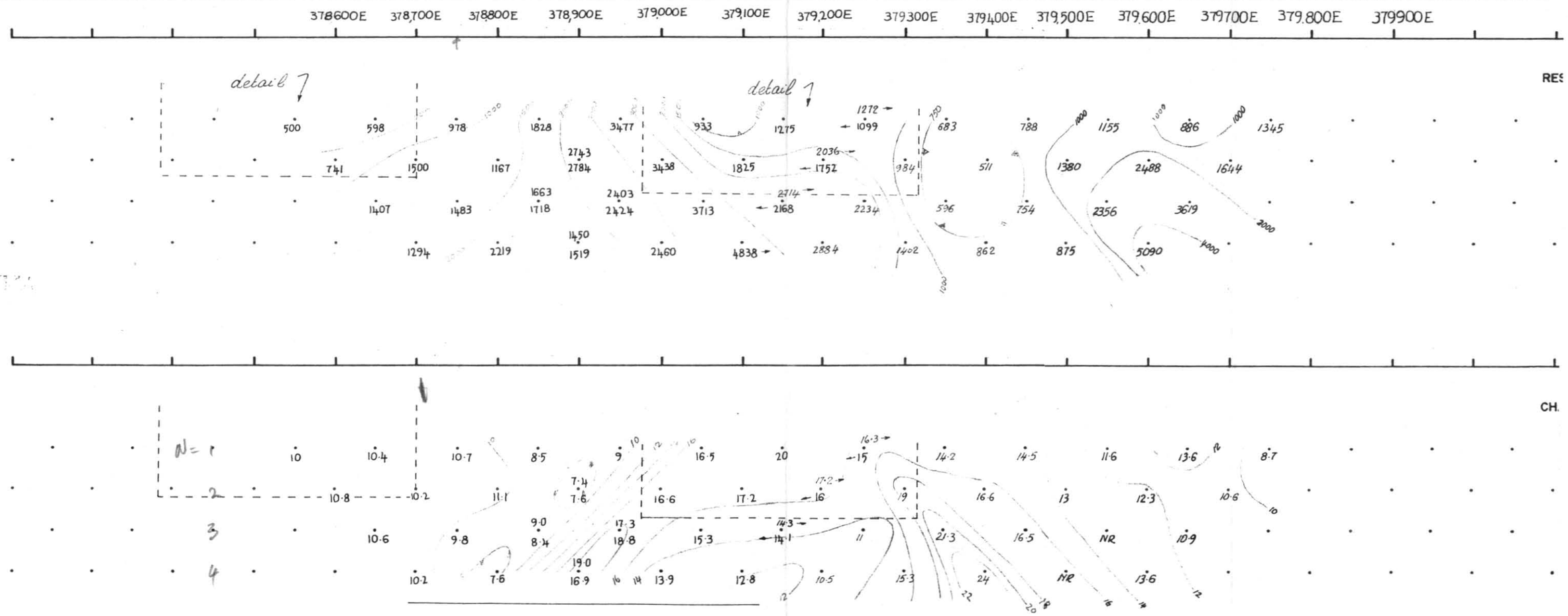
DIPOLE - DIPOLE ARRAY

DATE 4·6·79 / 5·6·79		**DATE** 4-9-79	
PLOTTED BY DJTW		**PLOTTED BY** RAB	
PULSE 2 sec	**Rx.**	**PULSE** 2 Sec	**Rx.** 726011
DIPOLE SPACING 100 m		**DIPOLE SPACING** 100 m	

LINE No. 5387300 N

PROSPECT ~~BULGOBAC~~ re-named NORTH PINNACLES

JOB No. TAS-065-YA



APPENDIX 2.

Scintrex Report Tas-075, March, 1980.

"Comments on Dipole-Dipole Reconnaissance Surveys Silver Falls Grid near Tullah, Tasmania on behalf of Electrolytic Zinc Company of Australasia Limited."

050

653049

SCINTREX

PRIVATE AND CONFIDENTIAL

COMMENTS ON
DIPOLE-DIPOLE RECONNAISSANCE SURVEYS
SILVER FALLS GRID
NEAR TULLAH, TASMANIA
ON BEHALF OF
ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED

BY

A.W. HOWLAND-ROSE
MSc,DIC,AMAusIMM,FGS.
GEOPHYSICIST

SYDNEY, N.S.W.

MARCH, 1980

TAS-075

SCINTREX

CONTENTS

052

653051

SCINTREX PTY. LTD.

GEOPHYSICAL CONSULTANTS AND CONTRACTORS

SUMMARY

A 100 metres dipole-dipole reconnaissance survey carried out over the Silver Falls area has revealed only small changes in chargeability background considered typical of formational changes. As no significant induced polarization responses were recorded, no further work can be recommended.

1031 WELLINGTON STREET,
WEST PERTH, 6005
WESTERN AUSTRALIA

TELEPHONE: 321 6934
TELEX: 92353
TELEGRAMS: SCINTREX, PERTH

6 TRAMORE PLACE,
KILLARNEY HEIGHTS, 2087
N.S.W. AUSTRALIA.

TELEPHONE: 451 5367
TELEX: 26859
TELEGRAMS: SCINTREX, SYDNEY

SCINTREX

COMMENTS ON

DIPOLE-DIPOLE RECONNAISSANCE SURVEYS

SILVER FALLS GRID

NEAR TULLAH, TASMANIA

ON BEHALF OF

ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED

INTRODUCTION

Over 35 single operator production days between 31st October and 21st December, 1979, a Scintrex Pty. Ltd. crew executed dipole-dipole electrical induced polarization surveys over lines on the Silver Falls grid. Between 30th October and 28th November, 1979 the crew leader was Dr. R. Malor and between 29th November and 21st December Mr. R. Sims acted as crew leader.

Access was difficult and the weather bad over much of the period. This, together with difficult topography and the manhandling of equipment in the survey area, resulted in very low productivity. The difficult access meant that only half a day was effectively spent actively on the survey grid for every production day worked. The bad weather and the attempts made to work and to gain access to the area resulted in a further loss of production. In addition some nine days were totally lost to production.

METHOD

The method chosen was dipole-dipole and brief notes on the method appear in the appendix. All lines were surveyed using a 100 metres

a spacing with *n* = 1 to 4. A standard 2 cycle square wave energisation was employed.

EQUIPMENT

A Scintrex IPTA 2.5 kilowatt transmitter was used powered by a 4HP Briggs and Stratton motor generator. The resultant primary and secondary fields were monitored using a Scintrex IPR-8 receiver.

DISCUSSION OF RESULTS

Each line is discussed separately.

LINE 5,392,000N 377140E - 377840E

The resistivity data shows lower background readings of 500 ±100 ohm-metres centred at 377440E, with readings at three times this level west of 377240E and east of 377640E. The chargeability data shows 5 to 6 millivolts/volt background over the central resistivity low and 9.5 millivolts/volt(±) over the higher flanking resistivities.

These changes are considered to be formational only.

LINE 5,391,964N 376840E - 377840E

The resistivity data shows a range between 400 ohm-metres and 1600 ohm-metres with lower resistivities in the central section 377340E(± 100 metres) and in the far west, west of 377040E.

SCINTREX

The chargeability data shows a background of about 9 millivolts/volt over the higher resistivity material and 5 millivolts/volt to 7 millivolts/volt over the lower resistivity in the central section.

Two mildly anomalous zones were recorded of about 15 millivolts/volt centred at 377040E and 377440E on the n = 4 spacing. These responses are not of sufficient magnitude to be considered of prime interest and may well represent formational changes only.

377700E - 378300E

A second set-up revealed a moderate internal polarization response of 17.4 millivolts/volt at n = 2 centred at 377900E. Supporting values on n = 1 and 3 confirm the anomaly. The maximum depth to source is approximately 150 metres although lower amplitudes above background of 11 and 13 millivolts/volt as against 8± millivolts/volt were observed at 377900E ±100 metres, which infer some lesser extension within say 75 metres of surface. Again, without additional geochemical or geological support, this response is at best of secondary or tertiary geophysical interest.

LINE 5,391,500N *378300E - 379100E*

The apparent resistivities on this set-up, at 2000 ±500 ohm-metres, were higher overall than those recorded to the north, while the background chargeabilities were higher at 12 millivolts/volt ±4 millivolts/volt.

An interesting series of 50% above background chargeability readings were recorded. On n = 1 at 378750E and 378850E, readings of 21.5 millivolts/volt and 18 millivolts/volt were recorded with n = 2 to 3 *reduction* in apparent chargeability to 12 millivolts/volt and 8 millivolts/volt respectively. Obviously a 'surface' chargeability layer of the order of 100 metres or less is underlain by less chargeable material. Typical 'double peak' responses were recorded from the flanks and centred at 378850E and 378650E respectively.

While the amplitude of this anomaly is low, the source should nevertheless be ascertained. It will most likely be shown to be formational in origin.

LINE 5,391,046N *376940E - 378340E*

Variations in apparent resistivity from 700 ohm-metres to 1500 ohm-metres were observed, while the background chargeabilities ranged from a low 4 millivolts/volt to 8 millivolts/volt

Over two sections - 377440E $\pm$100 metres and 377990E - n = 1 values at 12 millivolts/volt and 15 millivolts/volt respectively are markedly higher than chargeabilities at depth. The sources are shallow 'near surface' low amplitude sources, again probably formational in origin.

LINE 5,391,000N 378240E - 379240E

The resistivity background varies from 700 ohm-metres to 1500 ohm-metres, with isolated ridges of significantly higher resistivities, the most notable of which at 378540E± may also be topographic effects.

The chargeability data ranges from 7 millivolts/volt to 11 millivolts/volt. Only in one area, 378390E is a source at, or within 100 metres of surface which is moderately above the background. Again a formational origin is most likely.

LINE 5,390,500N 377020E - 378320E

The bulk of the apparent resistivity recorded on this set-up was below 1000 ohm-metres, with associated background chargeabilities the bulk of which lie in the range 6 to 8 millivolts/volt. There were not significant variations in these limits, and no anomalous responses.

LINE 5,390,300N 376880E - 377680E

The range in apparent resistivities recorded on this set-up was between 1000 ohm-metres and 2000 ohm-metres while the background chargeability was about the 11 millivolts/volt ±2 millivolts/volt.

Only one moderate above background response was recorded whose source lies within 100 metres of surface at 377230E. Here, a distinct double peak showing values to 16.8 millivolts/volt as

against 10 millivolts/volt were recorded. Slightly higher than background resistivities were associated with these higher chargeabilities. The anomaly is not considered of prime interest, but due to the large current dipole, detail *may?* be warranted.

LINE 5,390,100N 376800E - 377400E

On this limited area survey, a moderate chargeability anomaly of 16.7 millivolts/volt as against 9 millivolts/volt to the east and west was recorded. The form suggests an at, or near surface source at 367950E, however, this cannot be confirmed as the line was not surveyed to the west.

LINE 5,390,000N 376900E - 378200E

A range of resistivities from 600 ohm-metres to 4000 ohm-metres was recorded, while the chargeability background is within ± 2 millivolts/volt of 10 millivolts/volt.

Superimposed on this background a 50% to 60% chargeability anomaly was defined whose source was at, or close to, surface centred at 377450E. A 'double peak' anomaly has been interpreted as being cuased by such a source. The observed chargeability, however, is not significant in absolute terms, and therefore the changes noted are probably formational in origin.

CONCLUSION

No significant induced polarization anomalies were observed on any

SCINTREX

of the lines surveyed at Silver Falls. Increases in polarization noted on these lines all lie within the range which would be considered merely to reflect changes in rock types. Therefore, without strong supporting information from geochemistry or geology, no further work can be recommended as being of primary interest.

Respectfully submitted on behalf of:

SCINTREX PTY. LTD.

A.W. HOWLAND-ROSE, MSc, DIC, AMAusIMM, FGS.

GEOPHYSICIST

060

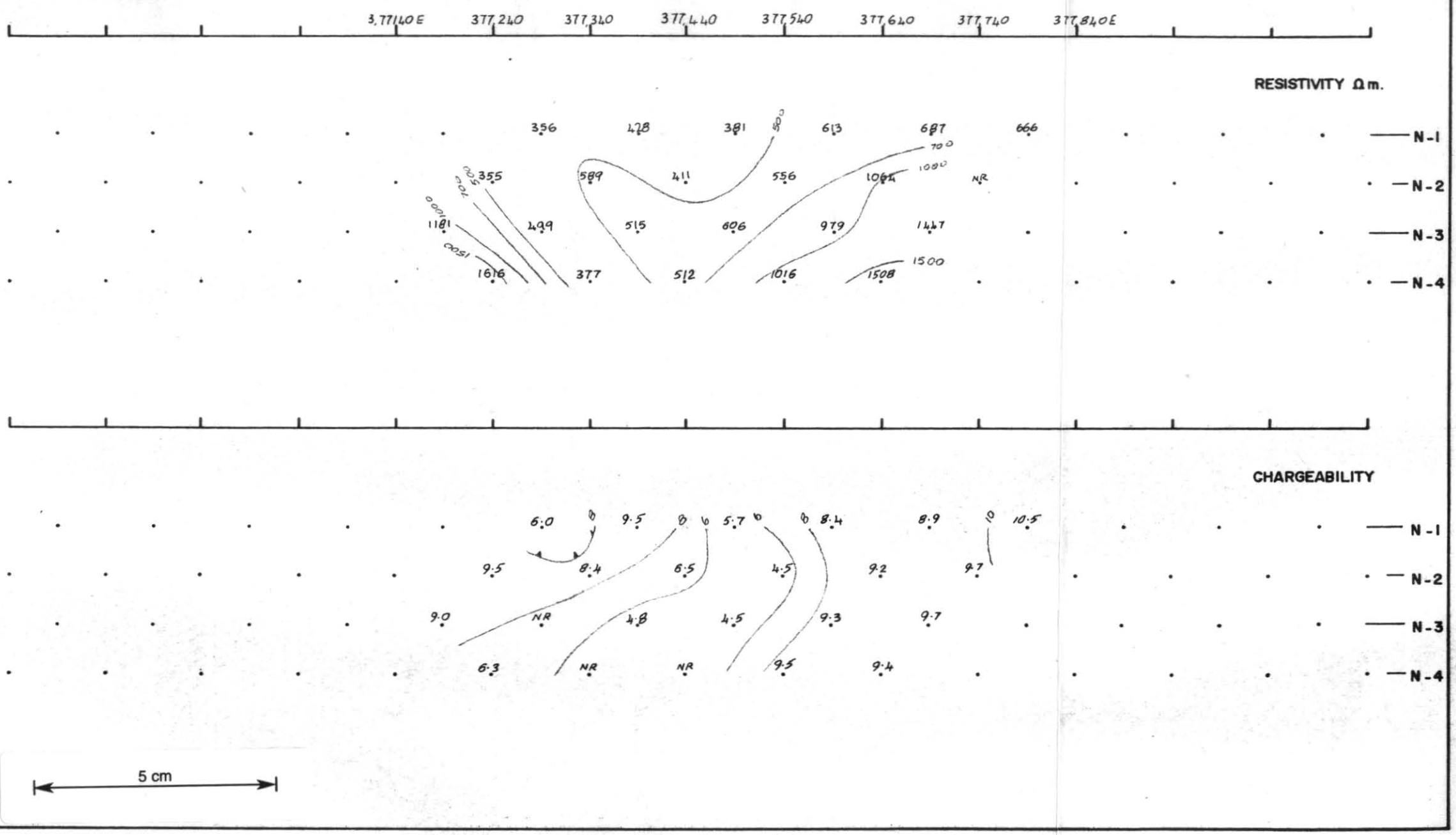
653059

SCINTREX PTY. LTD.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

DIPOLE - DIPOLE ARRAY

DATE 6-12-79	LINE No. 5,392,000N
PLOTTED BY G.S.	PROSPECT SILVER FALLS
PULSE 2 secs. / Rx.	JOB No. TAS-075
DIPOLE SPACING 100 m	



061

653060

SCINTREX PTY. LTD.

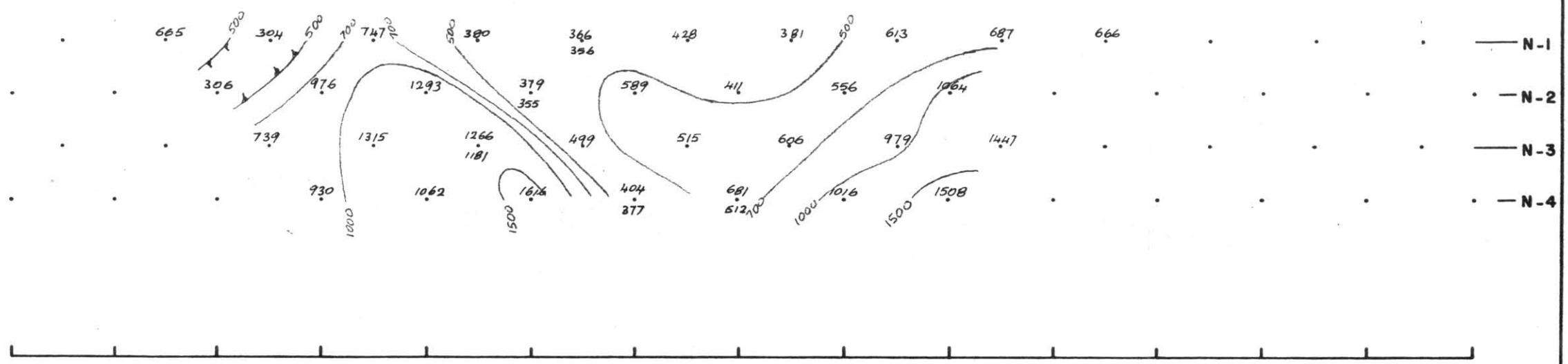
INDUCED POLARIZATION AND RESISTIVITY SURVEY

DIPOLE - DIPOLE ARRAY

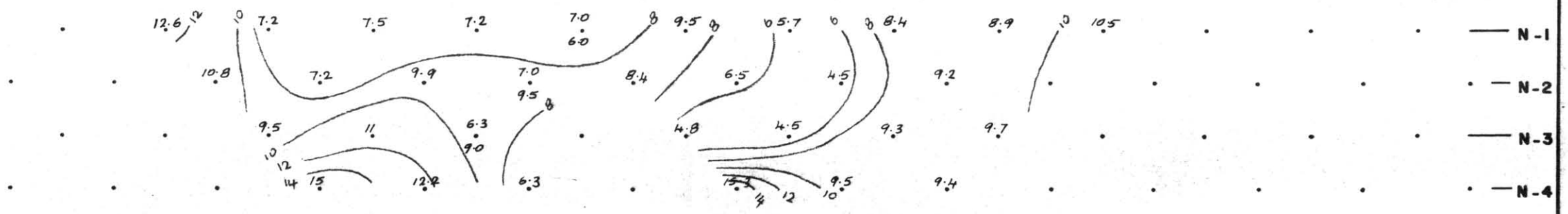
DATE 6/7-12-79	LINE No. 5,391,964N
PLOTTED BY D.S.	PROSPECT SILVER FALLS
PULSE 2 secs. / Rx.	JOB No. TAS-075
DIPOLE SPACING 100 m	

376,840E 376,940 377,040 377,140 377,240 377,340 377,440 377,540 377,640 377,740 377,840E

RESISTIVITY Ωm.



CHARGEABILITY



5 cm

062

653061

SCINTREX PTY. LTD.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

DIPOLE - DIPOLE ARRAY

DATE 12-12-79	LINE No. 5,391,964N
PLOTTED BY D.S.	PROSPECT SILVER FALLS
PULSE 2 secs. / Rx.	JOB No. TAS-075
DIPOLE SPACING 100 m	

377,500 E 377,600 377,700 377,800 377,900 378,000 378,100 378,200 378,300 E

RESISTIVITY Ωm.

N-1: 493 754 654 491 323 549
N-2: 866 537 674 630 474 545
N-3: 1396 685 477 642 634 850
N-4: 1211 1116 563 385 407

CHARGEABILITY

N-1: 9.5 13.2 11.1 4.3 8.1 7.3
N-2: 8.6 9.5 17.4 11.7 3.7 7.8
N-3: 8.5 8.0 14.5 14.4 9.4 4.9
N-4: 6.2 7.8 10.7 9.9 10.5

5 cm

063

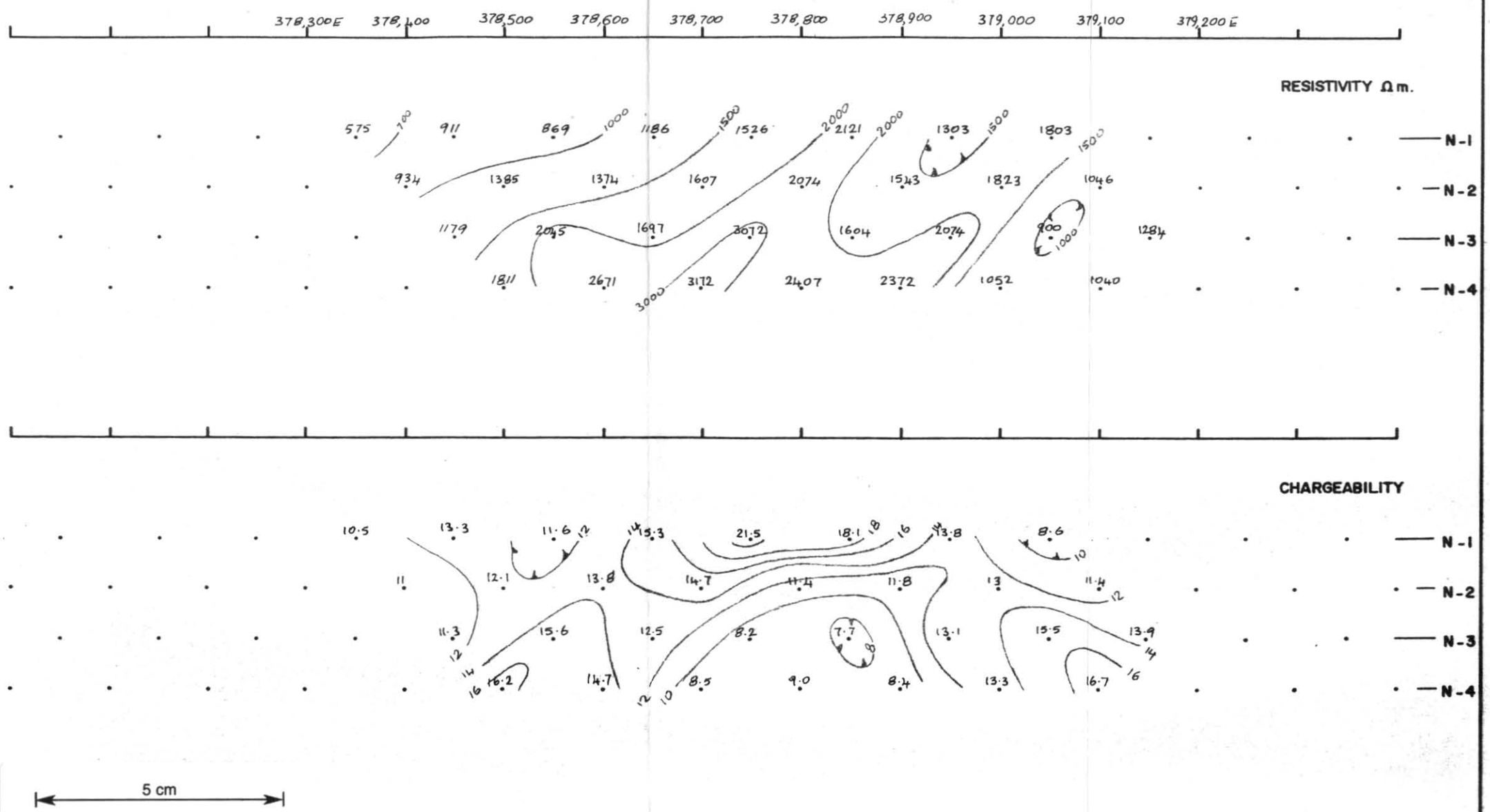
653062

SCINTREX PTY. LTD.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

DIPOLE - DIPOLE ARRAY

DATE 15-12-79	LINE No. 5,391,500N
PLOTTED BY D.S.	PROSPECT SILVER FALLS
PULSE 2 secs. / Rx.	JOB No. TAS-075
DIPOLE SPACING 100 m	



064

653063

SCINTREX PTY. LTD.

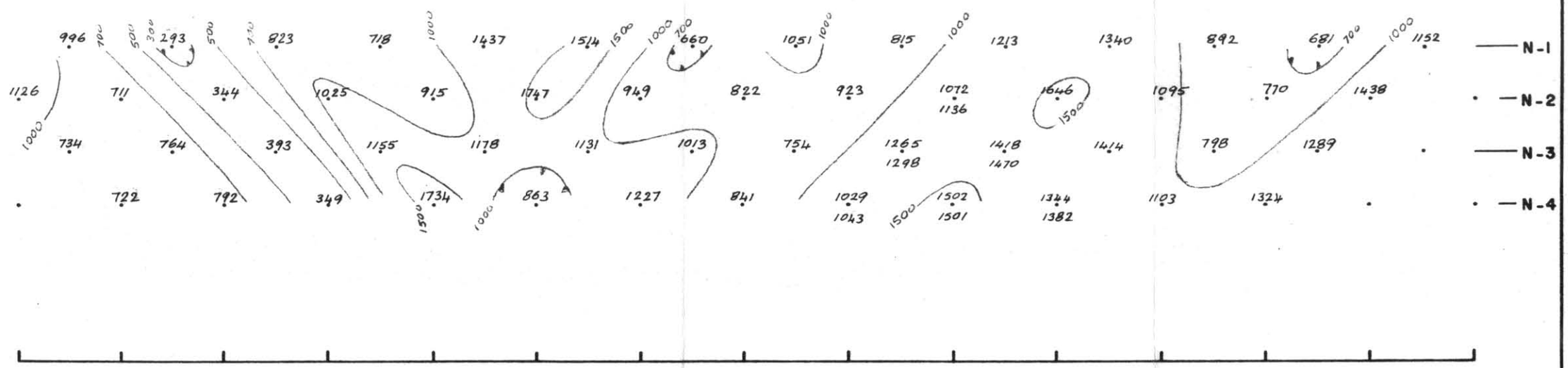
INDUCED POLARIZATION AND RESISTIVITY SURVEY

DIPOLE - DIPOLE ARRAY

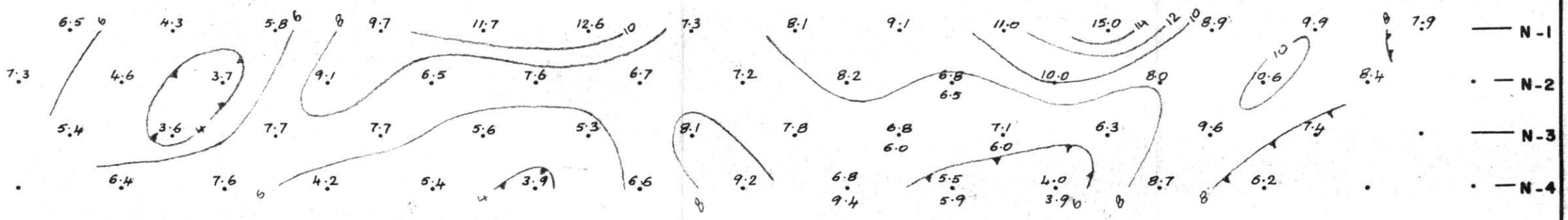
DATE 26/27/28/30-11-79	LINE No. 5,391,046N
PLOTTED BY R.M	PROSPECT SILVER FALLS
PULSE 2 secs. / Rx.	JOB No. TAS-075
DIPOLE SPACING 100 m	

376,940E 377,040 377,140 377,240 377,340 377,440 377,540 377,640 377,740 377,840 377,940 378,040 378,140 378,240 378,340E

RESISTIVITY Ω m.



CHARGEABILITY



5 cm

065

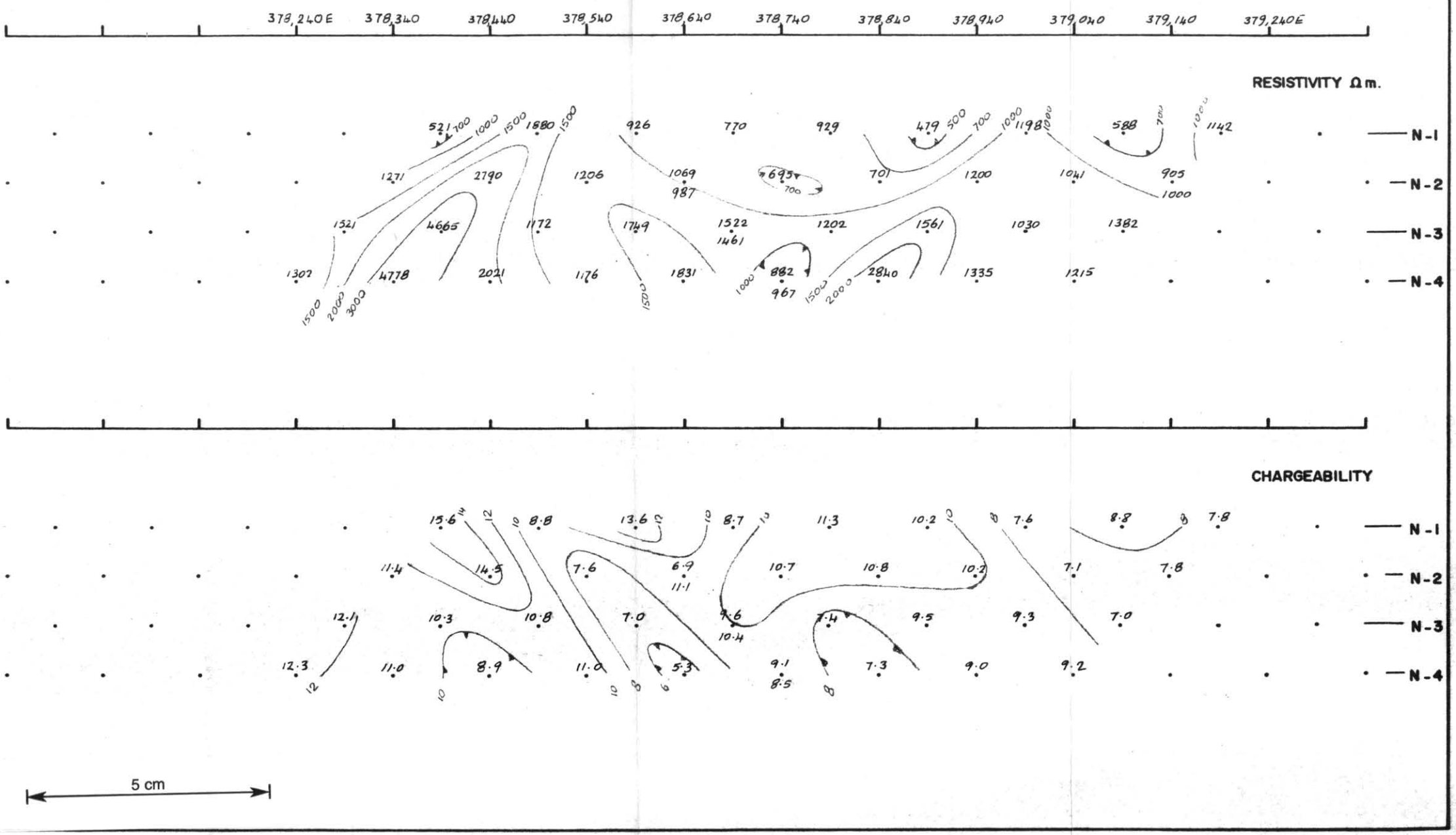
653064

SCINTREX PTY. LTD.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

DIPOLE - DIPOLE ARRAY

DATE 24/25-11-79		LINE No. 5,391,000N
PLOTTED BY R.M.		PROSPECT SILVER FALLS
PULSE 2 secs.	Rx.	JOB No. TAS-075
DIPOLE SPACING 100m		



066

653065

SCINTREX PTY. LTD.

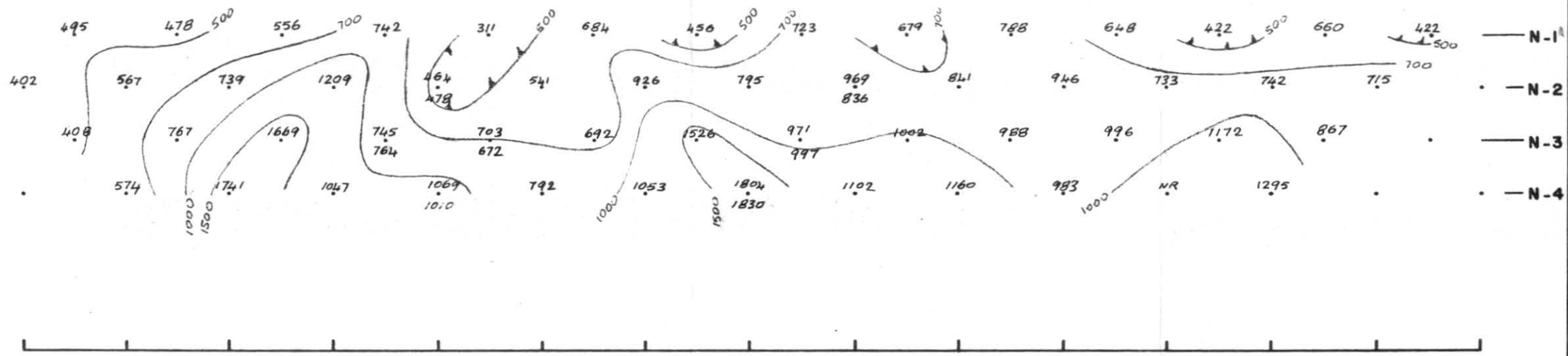
INDUCED POLARIZATION AND RESISTIVITY SURVEY

DIPOLE - DIPOLE ARRAY

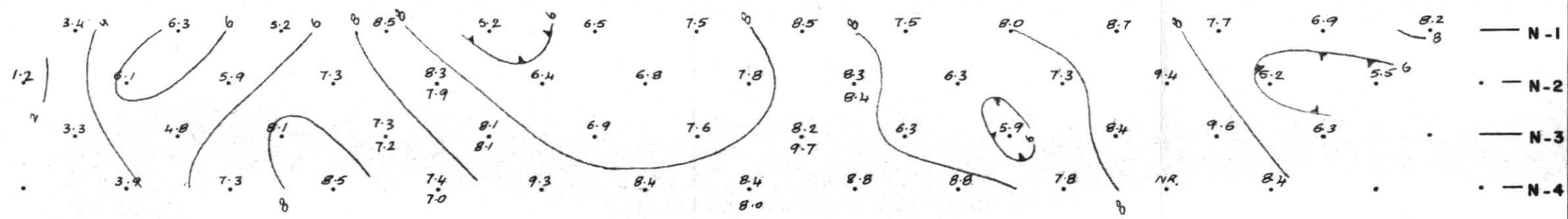
DATE 20/21/23-11-79	LINE No. 5,390,500N
PLOTTED BY R.M.	PROSPECT SILVER FALLS
PULSE 2 secs. / Rx.	JOB No. TAS-075
DIPOLE SPACING 100m	

376,920E 377,020 377,120 377,220 377,320 377,420 377,520 377,620 377,720 377,820 377,920 378,020 378,120 378,220 378,320E

RESISTIVITY Ω m.



CHARGEABILITY



5 cm

067

653066

SCINTREX PTY. LTD.

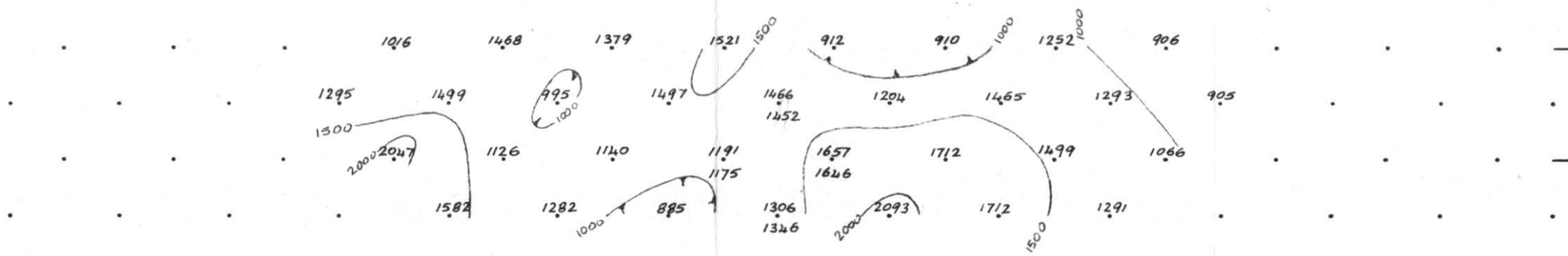
INDUCED POLARIZATION AND RESISTIVITY SURVEY

DIPOLE - DIPOLE ARRAY

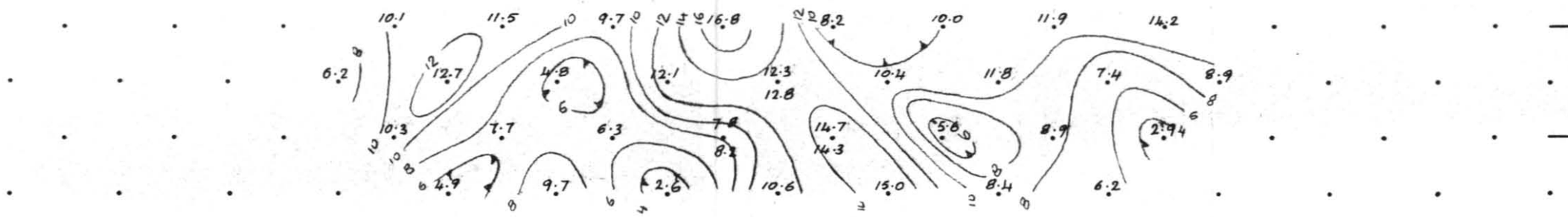
DATE 16/19-11-79	LINE No. 5,390,300N
PLOTTED BY R.M.	PROSPECT SILVER FALLS
PULSE 2 secs. / Rx.	JOB No. TAS-075
DIPOLE SPACING 100 m	

376,880E 376,980 377,080 377,180 377,280 377,380 377,480 377,580 377,680 377,780E

RESISTIVITY Ωm.



CHARGEABILITY



5 cm

063

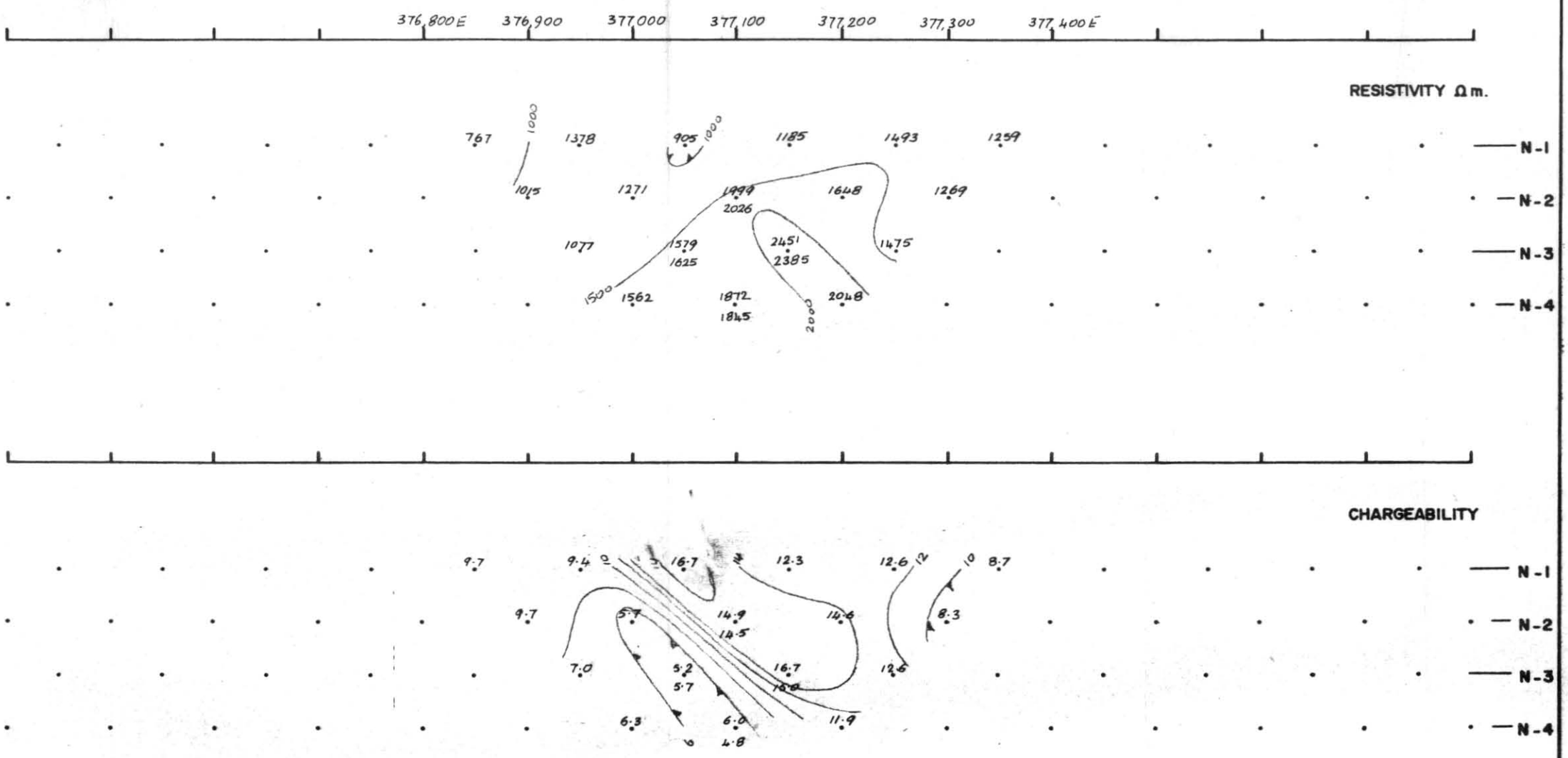
653067

SCINTREX PTY. LTD.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

DIPOLE - DIPOLE ARRAY

DATE 13|14-11-79	LINE No. 5,390,100N
PLOTTED BY R. M.	PROSPECT SILVER FALLS
PULSE 2 secs. / Rx.	JOB No. TAS-075
DIPOLE SPACING 100m.	



069

653068

SCINTREX PTY. LTD.

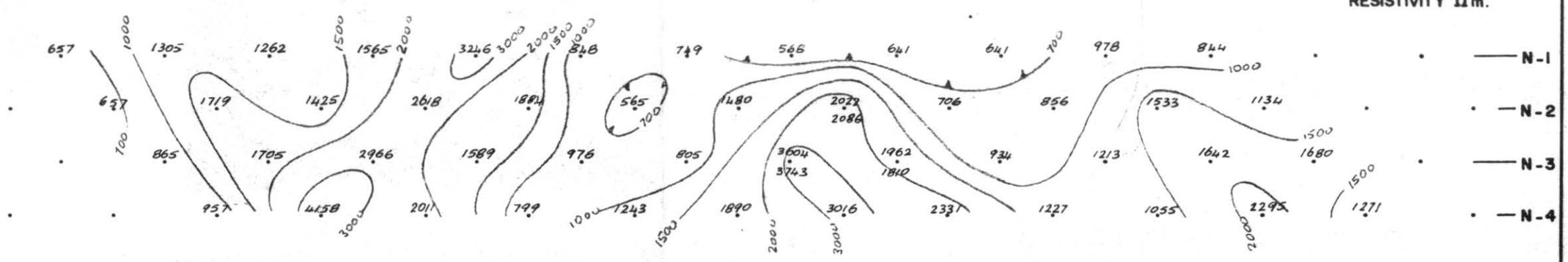
INDUCED POLARIZATION AND RESISTIVITY SURVEY

DIPOLE - DIPOLE ARRAY

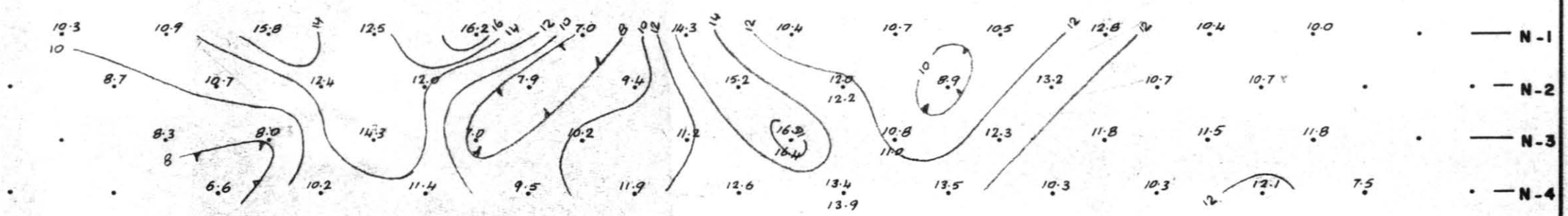
DATE 1/2 - 11 - 79	LINE No. 5,390,000N
PLOTTED BY R. M.	PROSPECT SILVER FALLS
PULSE 2 secs. / Rx.	JOB No. TAS-075
DIPOLE SPACING 100 m	

376,900E 377000 377,100 377,200 377,300 377,400 377,500 377,600 377,700 377,800 377,900 378,000 378,100 378,200E

RESISTIVITY Ω m.



CHARGEABILITY



5 cm

071

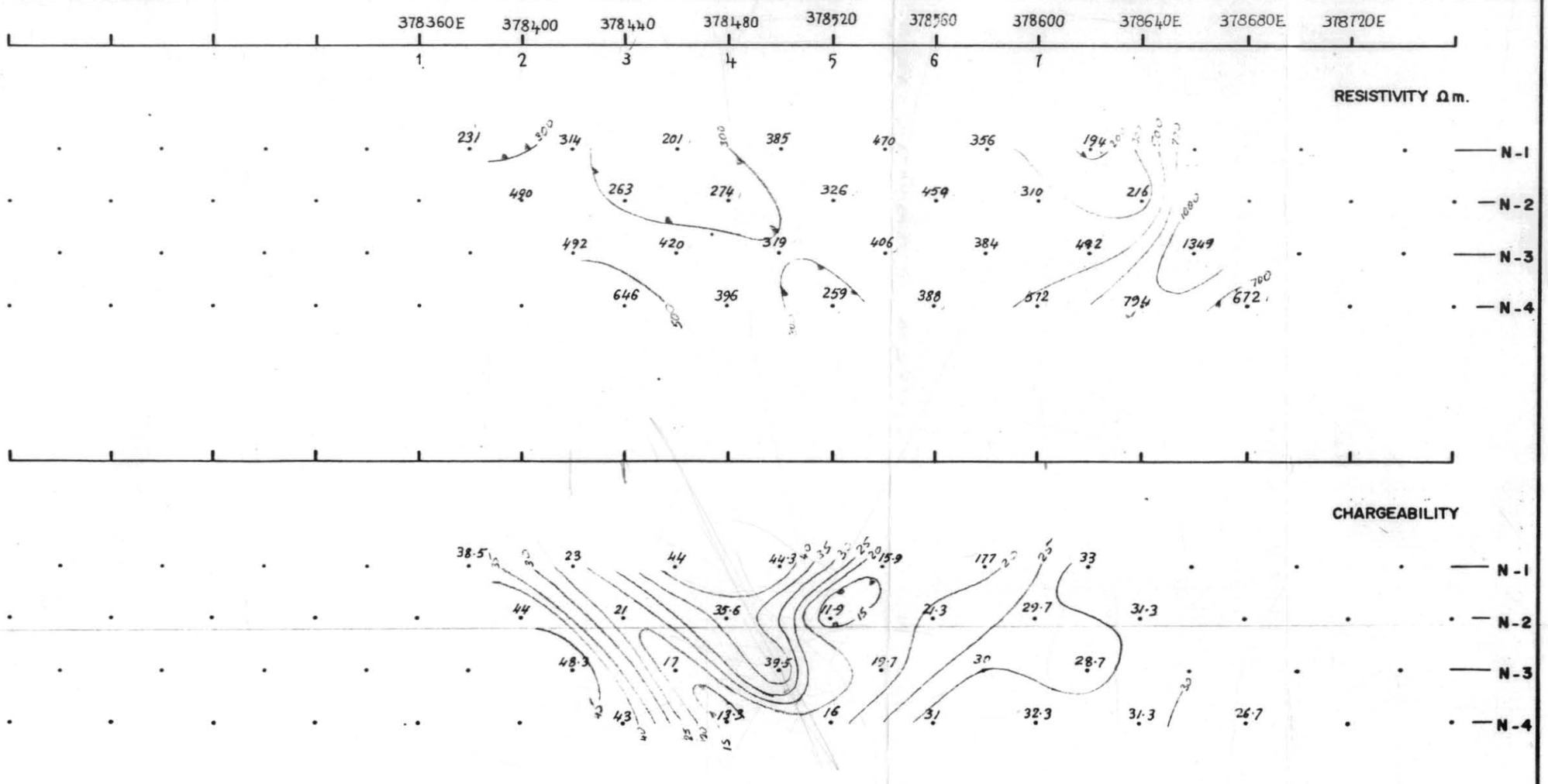
653069

SCINTREX PTY. LTD.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

DIPOLE - DIPOLE ARRAY

DATE 19-10-79	LINE No. 5,387 300 N
PLOTTED BY MJ	PROSPECT NORTH PINNACLES
PULSE 2 sec / Rx.	JOB No. TAS-065-YA
DIPOLE SPACING 40 m	



070

653070

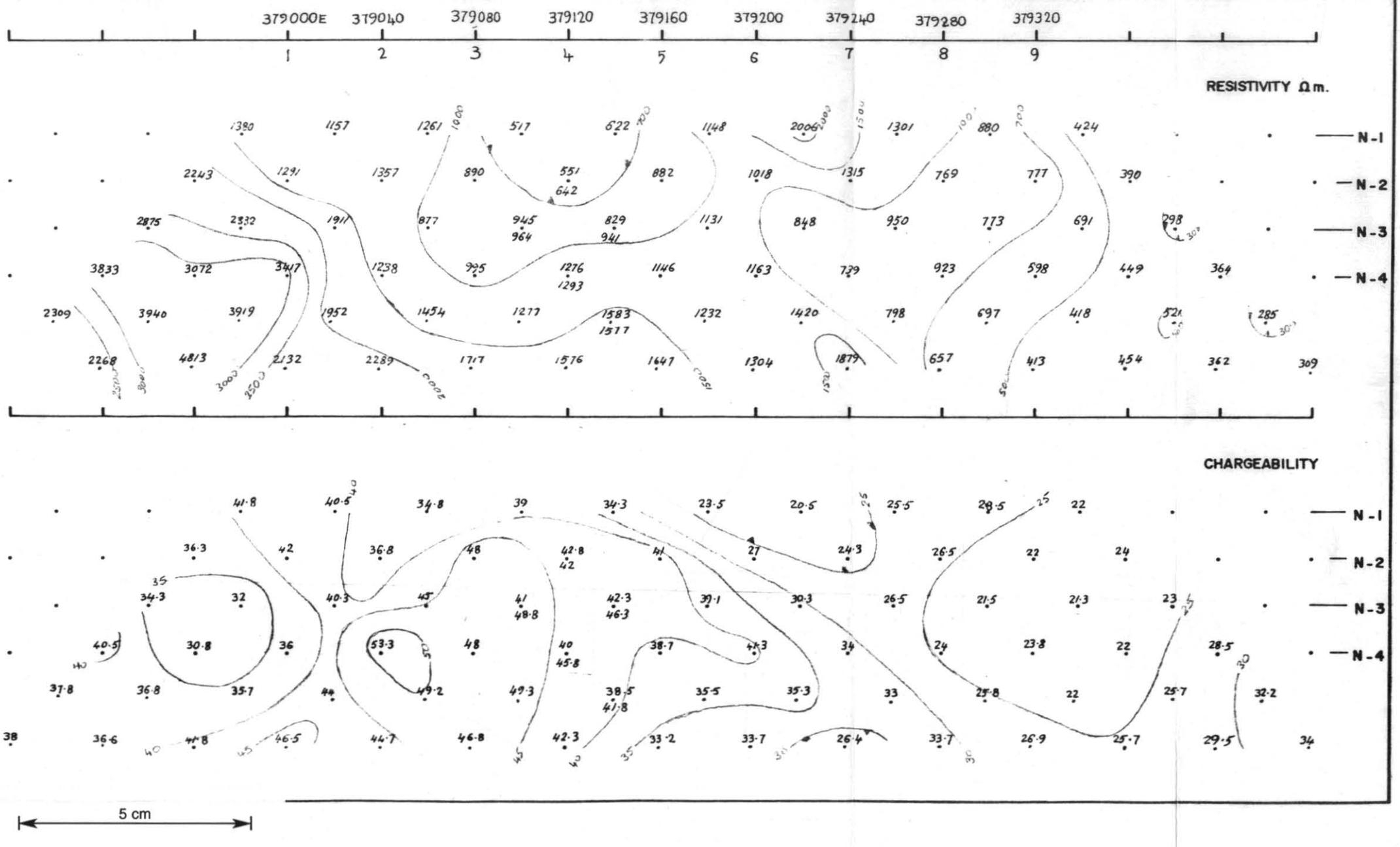
SCINTREX PTY. LTD.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

DIPOLE - DIPOLE ARRAY

DATE	21-10-79
PLOTTED BY	TYS
PULSE	2 sec
Rx.	
DIPOLE SPACING	40m

LINE No.	5,387,300 N
PROSPECT	NORTH PINNACLES
JOB No.	TAS-065-YA



653071

072

SCINTREX PTY. LTD.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

DIPOLE - DIPOLE ARRAY

DATE	7-9-79	4-6-79	8-9-79
PLOTTED BY	TVS	DJTW	PL
PULSE	2 Sec	Rx.	
DIPOLE SPACING	100m		

SCINTREX PTY. LTD.

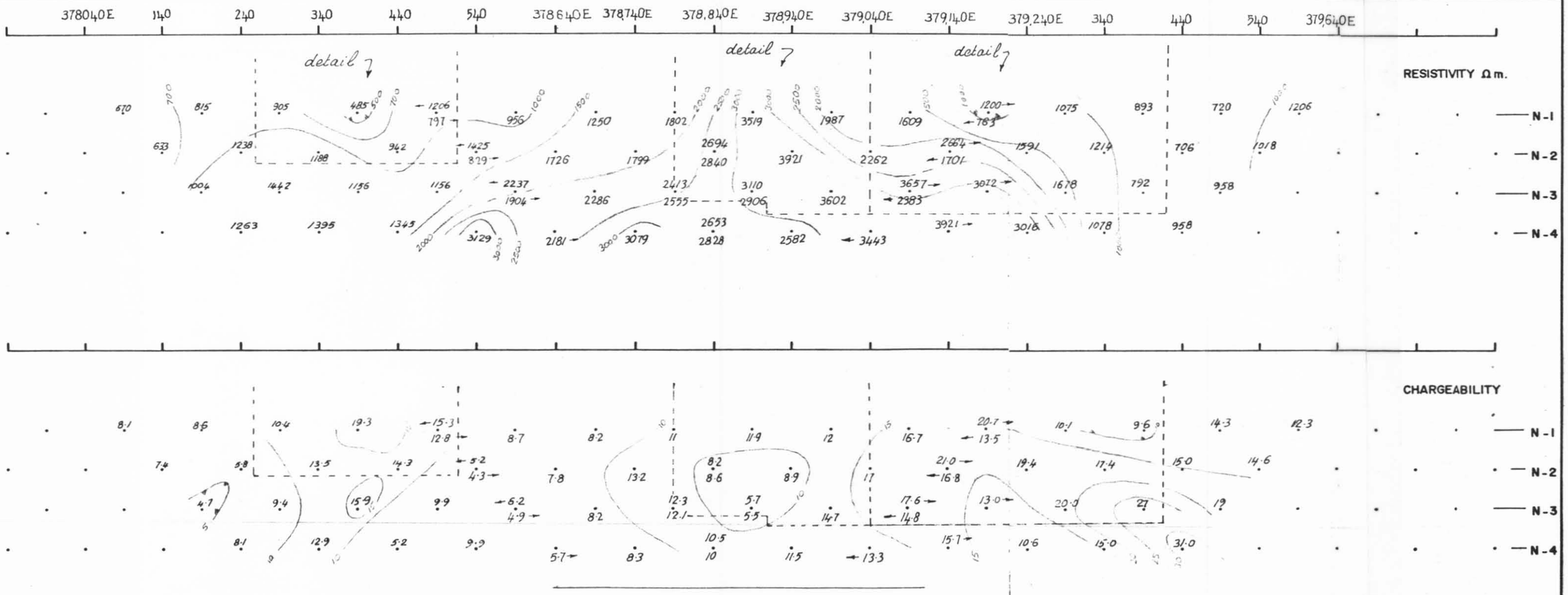
INDUCED POLARIZATION AND RESISTIVITY SURVEY

DIPOLE - DIPOLE ARRAY

LINE No. 5,387,100 N

PROSPECT NORTH PINNACLES

JOB No. TAS-065



073

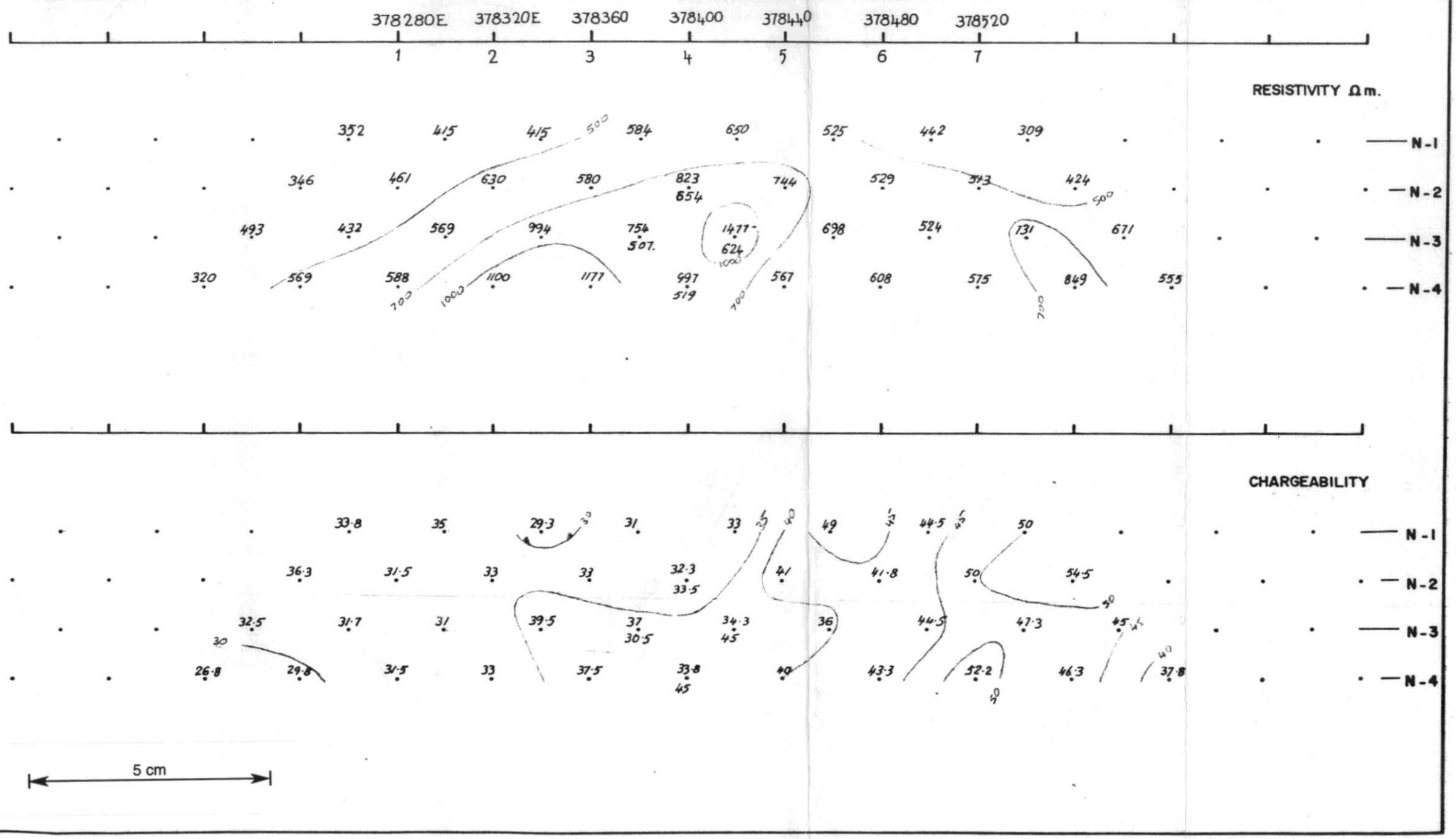
653072

SCINTREX PTY. LTD.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

DIPOLE - DIPOLE ARRAY

DATE 18-10-79	LINE No. 5,387,100 N
PLOTTED BY TVS	PROSPECT NORTH PINNACLES
PULSE 2 sec / Rx.	JOB No. TAS-065
DIPOLE SPACING 40m	



074

653073

SCINTREX PTY. LTD.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

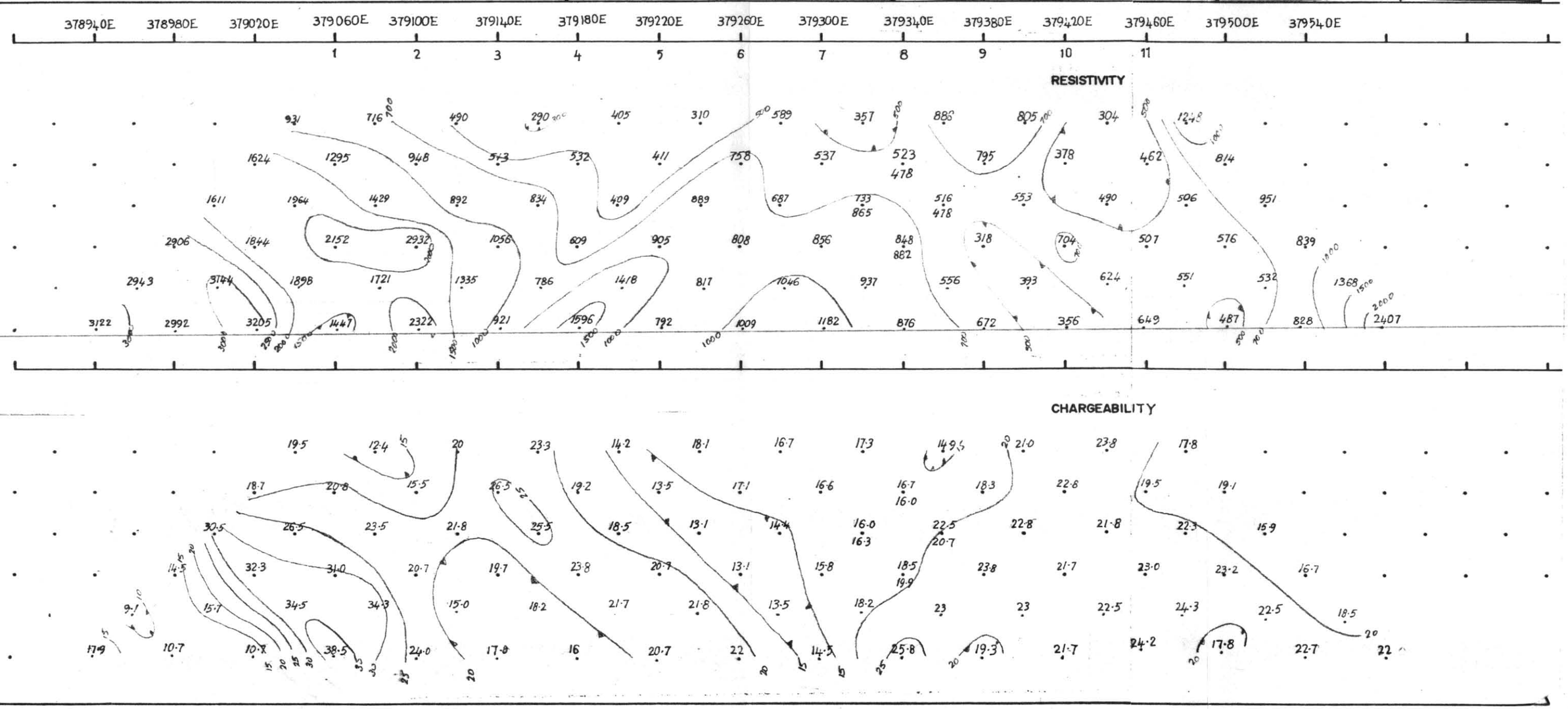
DIPOLE - DIPOLE ARRAY

DATE 29-30/10/79		DATE	
PLOTTED BY TVS		PLOTTED BY	
PULSE 2 sec	Rx.	PULSE	Rx.
DIPOLE SPACING 40m		DIPOLE SPACING	

LINE No. 5,387,100N

PROSPECT NORTH PINNACLES

JOB No. TAS-065-YA



5 cm

075

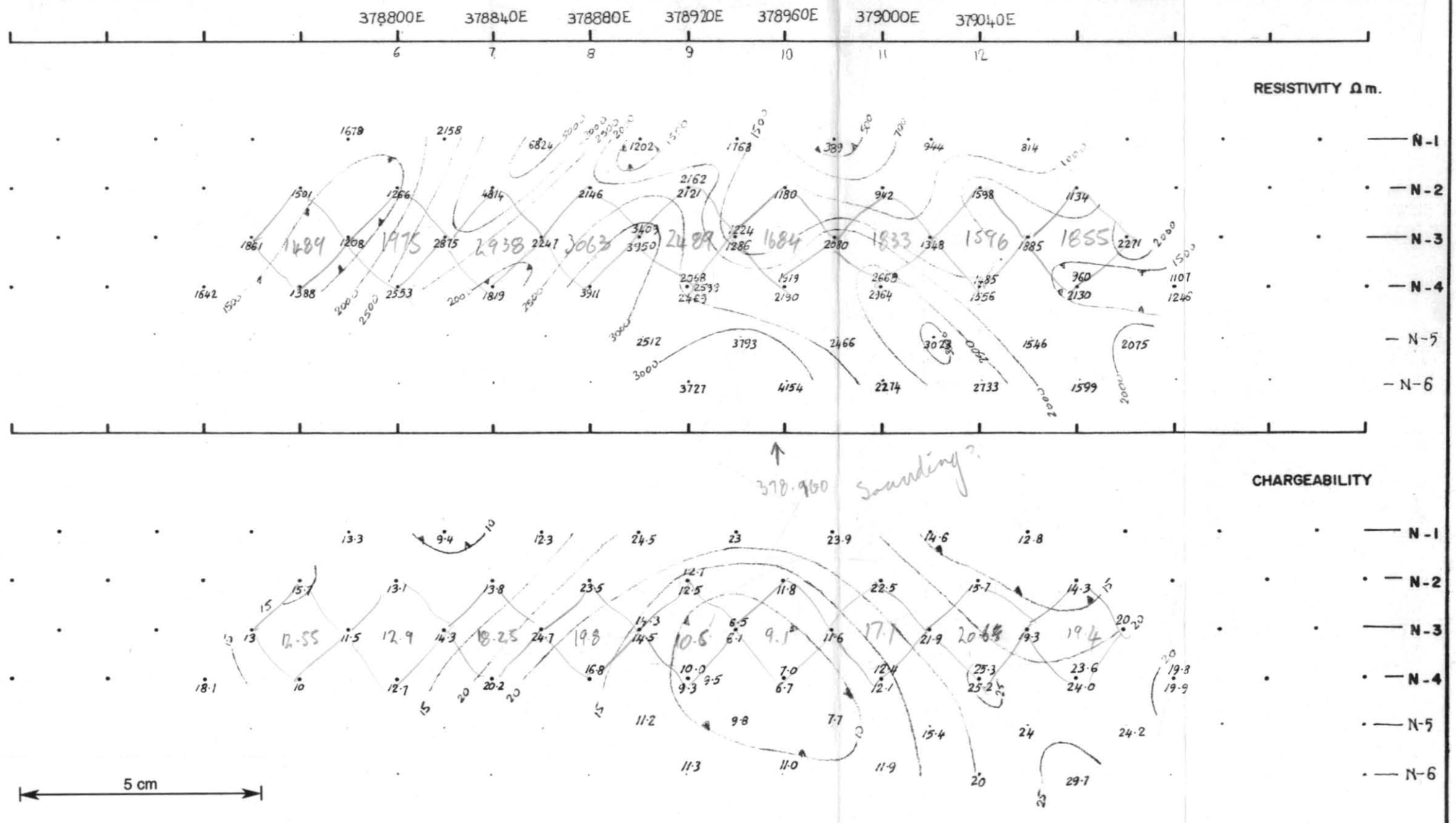
653074

SCINTREX PTY. LTD.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

DIPOLE - DIPOLE ARRAY

DATE 9/10 - 11 - 79	LINE No. 5,387,100N
PLOTTED BY R.M.	PROSPECT NORTH PINNACLES
PULSE 2 sec / Rx. 508185	JOB No. TAS-065-YA
DIPOLE SPACING 40m	



653075

SCINTREX PTY. LTD.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

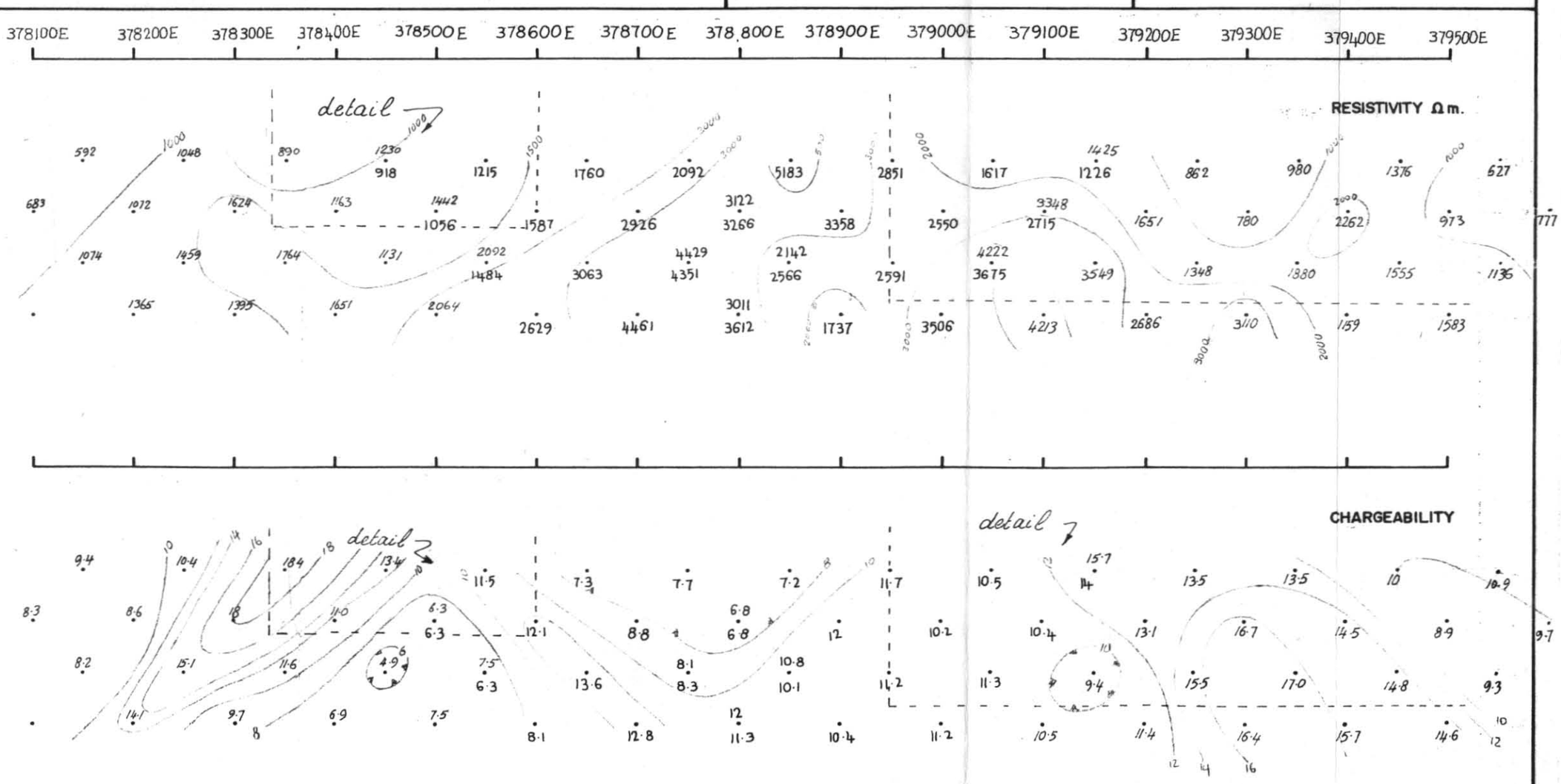
DIPOLE - DIPOLE ARRAY

DATE 2-9-79	5-6-79	1-9-79
PLOTTED BY DJTW		
PULSE 2 sec	Rx.	
DIPOLE SPACING 100 m		

LINE No. 5,386900 N

PROSPECT ~~BULOOBAC~~ re-named - NORTH PINNACLES

JOB No. TAS-065-YA



5 cm

077

653076

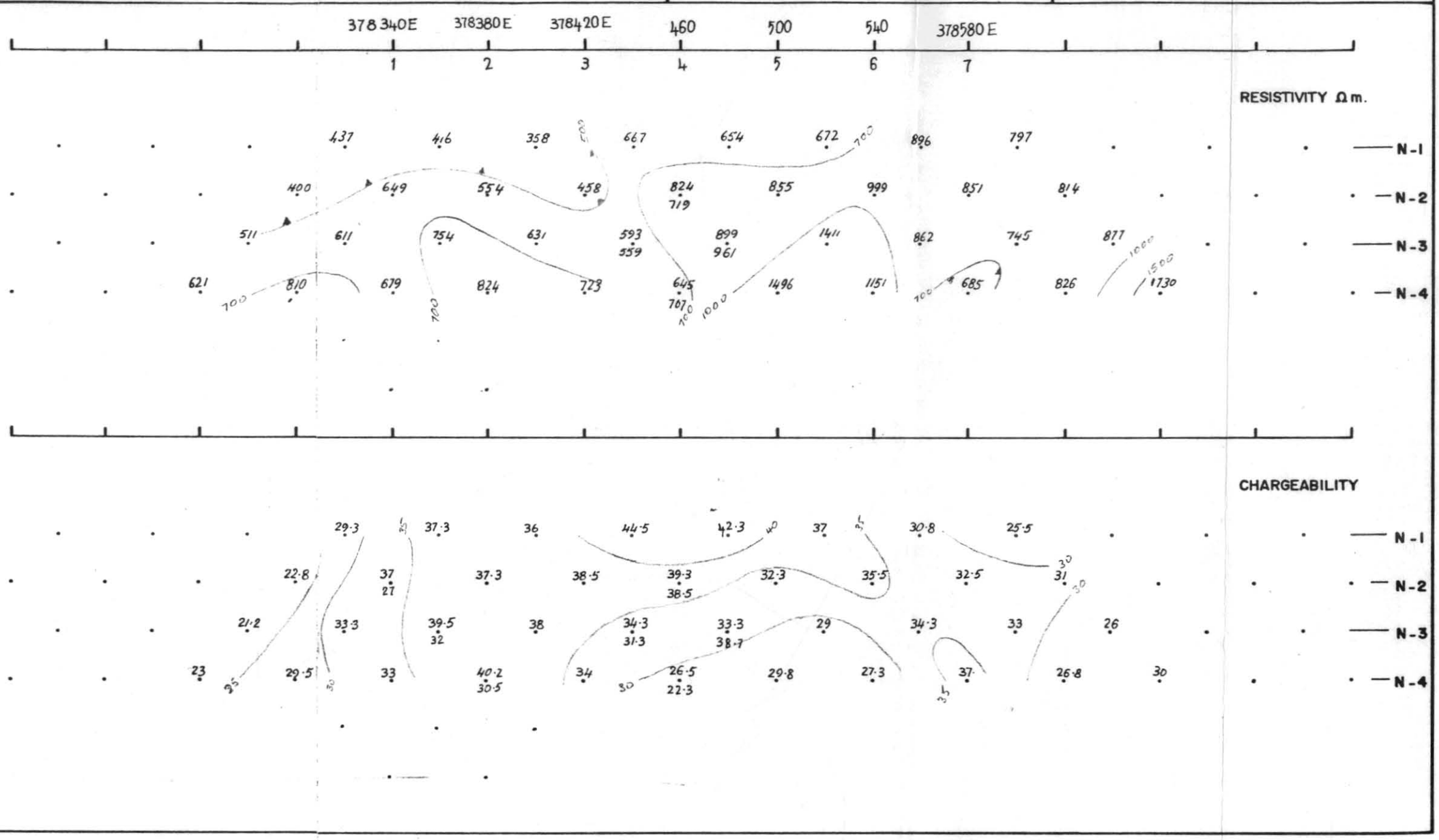
SCINTREX PTY. LTD.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

DIPOLE - DIPOLE ARRAY

DATE	17-10-79
PLOTTED BY	TVS
PULSE	2 sec
Rx.	
DIPOLE SPACING	40m

LINE No.	5,386 900 N
PROSPECT	NORTH PINNACLES
JOB No.	TAS-065YA



5 cm

078

653077

078

SCINTREX PTY. LTD.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

DIPOLE - DIPOLE ARRAY

DATE	25-10-79
PLOTTED BY	MJ
PULSE	2 Sec
Rx.	
DIPOLE SPACING	40 m
LINE No.	
PROSPECT	
JOB No.	

PTY. LTD.

ON AND RESISTIVITY SURVEY

LE ARRAY

DATE	26/27-10-79
PLOTTED BY	TVS
PULSE	2 Sec
Rx.	
DIPOLE SPACING	40 m
LINE No.	5,386,900 N
PROSPECT	NORTH PINNACLES
JOB No.	TAS-065-YA

379060E 379100E 379140E 379180E 379220E 379260E 379300E 379340E 379380E 379420E 379460E 379500E 379540E 379580E 379620E

1 2 3 4 5 6 7 1 2 3 4 5 6 7

RESISTIVITY Ω m.

N-1
N-2
N-3
N-4
N-5
N-6

CHARGEABILITY

N-1
N-2
N-3
N-4
N-5
N-6

5 cm

079

653078

APPENDIX 3.

Soil Geochem Data Sheets for Work Completed 31.10.'79 to 30.6.'80 on Silver Falls Extension Grid and North Pinnacles Grid.

653079

087.

PROJECT: Bulgobac

Nth. Pinnacles

CO-ORDINATES
LINE: 5,387,300N.
FROM: 378,340 E.
TO: 378,140 E.

SAMPLED BY: A.M.

DATE: 4/12/79

MATERIAL: Soil

DEPTH: C. Horizon

BOOK No.

SHEET No.

JOB No.

SAMPLE NUMBER	CO-ORDINATES O/S	O/W	INTERVAL -/0	Pb ppm	Zn ppm	Cu %	F.E %	MN. ppm	DESCRIPTION
30401	387,300	378,340	20	160	195	5	26.0%	210	CS
02		320		35	10	X	21.00	10	CSR
03		300		20	10	X	23.00	10	CSO
04		280		25	10	5	48.00	120	CSO
05		260		55	10	X	19.50	35	COS
06		240		50	15	X	23.50	40	CO
07		220		80	20	5	14.00%	40	CO
08		200		5	10	5	21.00	35	CO
09		180		10	10	5	40.00	50	CORS
10		160		5	15	X	61.50	65	CRS
11		140		5	10	X	11.00	25	CRS

653080

086

Moved 60m E according to survey, when plotted

PROJECT: Bulga Bal — Nt. Pinnacles

CO-ORDINATES — LINE: 5,387,900N. FROM: 378,800E. TO: 378,320E.

SAMPLED BY: AM — DATE: 4/12/79 5/12/79

MATERIAL: Soil — DEPTH: C. Horizon.

BOOK No. / SHEET No. / JOB No.

SAMPLE NUMBER	CO-ORDINATES N/S	CO-ORDINATES E/W	Interval +/-	P.b. P.P.M.	Zn P.P.M.	Cu P.P.M.	F.E.P.	M.N.	DESCRIPTION
30412	387,900	378800	20	405	210	45	1.40%	200	CRS
13		780		130	80	15	2.25%	75	CS
14		760		55	520	15	2.15%	275	CRS
15		740		155	125	X	5350	255	CSR
16		720		40	15	X	1550	45	CR
17		700		55	15	X	1.30%	115	CSR
18		680		45	30	10	1.15%	230	CRS
19		660		10	10	X	1200	30	CS
20		640		15	15	X	1550	60	CROS
21		620		10	10	5	1950	55	CRS
22		600		15	10	X	1300	35	CSR
23		580		15	15	5	2150	50	COS
24		560		45	20	5	6050	130	CSR
25		540		55	80	15	2.95%	800	CRSO
26		520		85	65	15	2.25%	280	CROS
27		500		55	35	5	1.35%	130	CR
28		480		80	50	15	2.45%	195	CSO
29		460		75	50	15	1.15%	50	SCO
30		440		10	15	5	6500	70	CQR
31		420		50	105	15	2.00%	265	CS
32		400		15	10	5	1850	35	COS
33		380		15	10	X	1500	30	CSO
34		360		20	15	X	6100	40	CSO
35		340		15	15	5	3550	45	CO
36		320		50	25	5	7900	65	CS

653081

085

Moved 60m E, according to survey, then plotted.

PROJECT: Bulga Bac. Mt. Pinnacles

CO-ORDINATES
LINE: 5,387,400N.
FROM: 378,300E.
TO: 378,280E.

SAMPLED BY: A.M.
DATE: 5/12/79

MATERIAL: Soil
DEPTH: C. Horizon

SAMPLE NUMBER	CO-ORDINATES N/S	CO-ORDINATES E/W	INTERVAL	P Pb	P Zn	Cu	Fe%	Zn	DESCRIPTION
30437	387,400	378,300	20m	30	40	10	4.20	50	CR
30438		378,280		35	25	10	1.35	80	CR

653082

084.

PROJECT: BulgaBac

Nth Pinnacles

CO-ORDINATES
LINE: 5,388,100N
FROM: 378,800 E.
TO: 378,980 E

SAMPLED BY: M. MOSIARA.

DATE: 5/12/79.

MATERIAL: Soil.

DEPTH: C. Horizon.

SAMPLE NUMBER	CO-ORDINATES N/S	CO-ORDINATES E/W	INTERVAL +/-	ppm Pb	ppm Zn	Cu	Fe%	Zn	DESCRIPTION
30439	5,388,100N	378,800E	20M	25	20	5	1.85	25	CSR
40		820		20	25	5	5.80	85	CO
41		840		25	5	5	1.65	35	CSR
42		860		30	70	5	2.20	50	CO
43		880		15	10	X	1.15	25	CRS
44		900		20	10	5	1.55	30	CRS
45		920		10	10	X	1.15	25	CRO
46		940		5	15	X	1.55	15	COR
47		960		5	5	X	0.51	10	CRO
30448		378,980E		20	15	X	4.25	25	COR

653083 080

AREA: BULGOBAC. N^R PINNACLES.

CO-ORDINATES
LINE: 5 388 100 N
FROM: 380,200 E.
TO: 379 720 E.

SAMPLED BY: WM.

DATE: 27/12/79.

MATERIAL: SOIL

DEPTH: C HORIZON.

SAMPLE NUMBER	CO-ORDINATES N/S	CO-ORDINATES E/W	INTERVAL +/-	Pb P	Zn P	Cu P	Fe % P	Mn	DESCRIPTION
30449	388100	380200		40	35	5	1·50	115	CRF
50		180		x	65	5	2·05	195	CF
51		160		x	25	x	0·58	45	SRFC
52		140		x	10	10	0·46	40	SC
53		120		x	5	x	0·18	20	SRF
54		100		x	5	x	0·27	20	SC
55		080		x	5	x	0·17	20	SRFO
56		060		5	40	15	0·41	25	CS
57		040		x	5	x	0·08	15	SRFO
58		020		x	5	x	0·12	15	CSRF
59		000		x	5	x	0·12	20	SRFO
60		379980		x	45	5	2·00	230	C
61		960		5	10	x	0·31	35	SRF
62		940		5	20	5	1·00	125	CRFO
63		920		5	10	x	0·29	35	SCRFO
64		900		5	15	5	0·40	40	CSRF
65		880		20	25	5	1·30	75	CSRF
66		860		10	50	5	2·90	145	CORF
67		840		5	5	x	0·13	20	CSORF
68		820		x	10	x	0·90	65	CRF
69		800		15	50	5	3·65	305	CRF
70		780		x	70	20	5·15	375	CS
71		760		15	30	5	2·40	130	C
72		740		15	50	5	3·00	220	CRF
30473		379720		40	40	5	3·00	170	C

653084

081

PROJECT: BULGOBAC. N^R PINNACLES.

CO-ORDINATES
LINE: 5 388100 N
FROM: 379700 E
TO: 379230 E.

SAMPLED BY: WM.

DATE: 27/12/79.

MATERIAL: SOIL

DEPTH: C HORIZON.

SAMPLE NUMBER	CO-ORDINATES N/S	CO-ORDINATES E/W	INTERVAL +/-	Pb P	Zn P	Cu P	P Fe %	Mn	DESCRIPTION
30474	388100	379700	20	25	70	10	4.40	350	CRFO
75		6850		30	30	5	1.60	115	C
76		6660		50	75	5	3.05	305	CRF
77		6440		30	35	5	1.80	120	CO
78		6220		20	55	10	2.70	170	CRF
79		6000		20	10	x	0.48	45	CRF
80		5780		10	20	x	1.35	40	CRF
81		5560		55	255	15	3.60	180	CRF
82		5340		15	20	5	1.50	45	CO
83		5120		10	100	20	4.90	305	C
84		5000		20	80	20	2.15	140	CRF
85		4680		30	20	15	1.00	45	CSRF
86		4660		30	55	10	3.75	165	C
87		4440		50	70	30	2.05	210	CSRFO
88		4220		60	70	15	2.15	255	C
89		4000		15	15	10	0.61	59	SCORF
90		3780		40	35	20	0.71	75	CRFO
91		3560		45	65	30	1.90	80	CRF
92		3340		30	355	10	1.10	95	CRF
93		3120		75	265	30	1.95	345	SC
94		3000		60	75	15	1.70	410	C
95		2780		95	80	20	2.05	575	CRF
96		2560		30	10	x	0.22	25	CO
97		2340		95	55	10	1.35	315	CRF
30498	379	2220		50	65	20	1.95	550	CRA

653085

082

AREA: BULGOBAC
Nth PINNACLES.

CO-ORDINATES
LINE: 5388100N
FROM: 379300E
TO: 379180E

SAMPLED BY: WM
DATE: 27/12/79

MATERIAL: SOIL
DEPTH: C HORIZON.

SAMPLE NUMBER	CO-ORDINATES N/S	CO-ORDINATES E/W	Interval +/-	Pb ppm	Zn ppm	Cu ppm	P %	Fe %	Mn ppm	DESCRIPTION
30499	5388100	379200		95	25	10	0.46		65	CS
30500		379180		35	5	X	0.12		15	CO

653086 083

PROJECT: Bulgabac North Pinnacles

CO-ORDINATES
LINE: 388 100N
FROM: 379 160 E
TO: 379 000 E

SAMPLED BY: B M
DATE: 27/12/79

MATERIAL: Soil Sample
DEPTH: C HORIZON

BOOK Nº
SHEET Nº
JOB Nº

SAMPLE NUMBER	CO-ORDINATES (N)/S	(E)/W	INTERVAL +/E	Pb ppm	Zn ppm	Cu ppm	Fe % ppm	Mn	DESCRIPTION
30	38810C	37916 0	20	30	15	x	0·40	35	RC S
31	38810	1440		35	55	x	1·00	60	C RF
32	38810	1200		x	10	x	0·25	10	C S RFO
33	38810	37910C		x	30	x	2·45	45	C RF
34	38810	0800		x	10	x	0·34	35	C RFO
35	3810C	0600		20	10	5	0·35	40	C RFO
36	38810C	0400		10	15	5	0·50	40	C O
37	38810C	0200		15	10	5	0·36	40	C RFO
38	38810C	37900C		30	20	5	1·10	1000	C

No C HORIZON

653087

105

PROJECT: BURGOBAC, SILVER FALLS.

CO-ORDINATES: LINE: 5,390,900 N; FROM: 377,160 E; TO: 377,640 E.

SAMPLED BY: C.M.

MATERIAL: SOIL SAMPLE.

DATE: 16-1-80

DEPTH: C HORIZON

BOOK Nº

SHEET Nº

JOB Nº

SAMPLE NUMBER	CO-ORDINATES (N/S)	CO-ORDINATES (E/W)	INTERVAL ⊕/-	Cu P	Pb P	Zn P	Fe P	Mn	DESCRIPTION
33201	390900	377160	20	15	80	35	2.75%	45	C
02		180	20	25	200	235	6.10%	140	C R F
03		200	20	15	95	75	2.30%	60	C R F
04		220	20	15	75	150	3.30%	160	C R F
05		240	20	15	45	85	5.05%	40	C
06		260	20	10	45	55	2.10%	40	C
07		280	20	10	35	55	1.50%	40	C
08		300	20	6	55	40	1.05%	35	C R F
09		320	20	5	45	35	1.20%	25	C S
10		340	20	5	35	70	1.15%	35	C
11		360	20	5	90	35	.85 00	25	C
12		380	20	5	60	35	.55 00	45	C R F
13		400	20	5	70	60	1.15%	65	C R F
14		420	20	5	40	40	3.30 00	30	C
15		440	20	10	160	1150	3.00 00	30	R F S O
16		460	20	10	130	70	1.85%	60	C R F O
17		480	20	10	155	85	2.50%	70	C
18		500	20	5	160	40	2.15%	35	C
19		520	20	5	60	35	1.90%	35	C
20		540	20	5	65	35	1.30%	40	C
21		560	20	10	110	235	5.85%	545	C R F
22		580	20	10	110	80	1.40%	110	C O
23		600	20	5	55	55	2.00%	120	C R F O
24		620	20	10	60	130	2.30%	155	C
25		640	20	5	40	50	2.20%	170	C R F

653088 104

PROJECT: BULGOBAC. SILVER FALLS

CO-ORDINATES: LINE: 5,390,900 N. FROM: 377,660 E. TO: 377,980 E.

SAMPLED BY: C. M.

DATE: 16/1/80

MATERIAL: SOIL SAMPLE

DEPTH: C HORIZON

BOOK N°

SHEET N°

JOB N°

SAMPLE NUMBER	CO-ORDINATES (N/S)	CO-ORDINATES (E/W)	INTERVAL (+/-)	Cu P	Pb P	Zn P	Fe P	Mn.	DESCRIPTION
33226	390900	377660	20	15	60	95	3.05%	105	C
227		376800	20	20	60	60	3.15%	75	C O
228		377000	20	20	75	70	2.30%	95	C O
229		377120	25	25	190	75	3.00%	130	C R F
230		377140	20	20	125	115	3.20%	320	C R F
231		377160	20	15	95	100	3.15%	620	C R F
232		377180	20	30	50	260	3.70%	1500	C R F
233		377800	20	40	140	235	4.00%	3250	C R F
234		377820	20	15	125	95	3.00%	1450	C R F
235		377840	20	20	120	90	2.70%	1650	C R F O
236		377860	20	30	240	115	3.60%	1050	C R F
237		377880	20	30	205	105	4.55%	310	C R F
238		377900	20	35	235	90	7.45%	470	C R F
239		377920	20	10	90	35	4.70%	45	C
240		377940	20	15	80	45	5.00%	45	C
241		377960	20	30	60	135	6.70%	125	C R F
242		377980	20	25	55	60	4.10%	60	C

653089

103

PROJECT: SILVER FALLS

CO-ORDINATES
LINE: 5290700N
FROM: 376760E
TO: 377240E

SAMPLED BY: BMcG
DATE: 17/1/80

MATERIAL: Soil
DEPTH: C HORIZON

BOX No
SHEET No
JOB No

SAMPLE NUMBER	CO-ORDINATES N/S	CO-ORDINATES E/W	Interval E/Fm	Cu ppm	Pb ppm	Zn ppm	Fe %	Mn ppm	DESCRIPTION
33248	39070	37760	20	X	15	25	1.90	10	
44		7780		X	25	25	2.60	10	
45		8000		10	40	55	2.6%	60	
46		8200		5	60	30	1.2%	20	
47		8400		X	45	25	5500	15	
48		8600		X	45	30	4000	20	
49		8800		5	40	20	3400	15	
33250		9000		X	50	30	2400	20	
51		9200		X	35	25	2000	25	
52		9400		X	45	25	1650	15	
53		9600		X	25	20	1100	15	
54		9800		X	25	25	950	15	
55	37700	0000		X	15	20	600	15	
56		0200		X	20	20	900	15	
57		0400		X	30	25	2000	20	
58		0600		5	270	110	2.25%	60	
59		0800		5	70	75	1.75%	40	
33260		1000		X	5	30	1800	25	
61		1200		X	20	50	5400	55	
62		1400		X	30	60	4000	40	
63		1600		X	10	35	2250	30	
64		1800		X	5	30	1550	30	
65		2000		X	5	30	2000	35	
66		2200		X	25	35	1900	30	
33267		2400		X	10	30	1450	25	

653090

102

PROJECT: Bulgobac
Silver Falls.

CO-ORDINATES
LINE: 5 390 700N
FROM: 377 260E
TO: 377 740E

SAMPLED BY: R.M.C.

DATE: 17/1/80

MATERIAL: Soil

DEPTH: C HORIZON

BOX #:
SHEET #:
JOB #:

SAMPLE NUMBER	CO-ORDINATES N/S	CO-ORDINATES E/W	INTERVAL	ppm Cu	ppm Pb	ppm Zn	ppm Fe	% Mn	DESCRIPTION
33268	39 07 00	37 26 00	20	X	10	30	1750	30	
69		28 00		X	10	30	1900	30	
33270		30 00		5	20	50	2500	35	
71		32 00		X	25	25	1300	30	
72		34 00		10	75	50	2800	45	
73		36 00		X	10	40	2700	50	
74		38 00		X	65	45	3550	50	
75		40 00		X	10	20	500	20	
76		42 00		X	40	25	1800	40	
77		44 00		X	30	25	850	30	
78		46 00		X	55	25	1150	20	
79		48 00		X	40	25	1050	30	
33280		50 00		X	45	40	2900	50	
81		52 00		X	95	45	1250	55	
82		54 00	10	150	70	2500	100		
83		56 00	5	125	55	1000	50		
84		58 00	10	140	50	1850	35		
85		60 00	10	80	50	2500	30		
86		62 00	10	80	85	4400	50		
87		64 00	5	95	30	3500	15		
88		66 00	X	25	75	3400	49		
89		68 00	X	25	230	6500	50		
33290		70 00	5	35	145	5300	30		
91		72 00	10	60	80	2900	20		
33292	37 74 00	15	60	100	4500	37	0		

SIMPLE NUMBER | CO-ORDINATES N/S | CO-ORDINATES E/W | INTERVAL | ppm Cu | ppm Pb | ppm Zn | ppm Fe | % Mn | DESCRIPTION

653091 101

PROJECT: Bridgeboro / Silver Falls

CO-ORDINATES
LINE: 5390 700N
FROM: 377 760E
TO: 377 900E

SAMPLED BY: RMcG
DATE: 17/1/80

MATERIAL: soil
DEPTH: C HORIZON

BOX No
SHEET No
JOB No

SAMPLE NUMBER	CO-ORDINATES (N)/S	(E)/W	Interval (F)-	Cu ppm	Pb ppm	Zn ppm	Fe %	P %	Mn ppm	DESCRIPTION
833293	390700	377760		25	105	130	4.2		300	
94		780		20	45	140	4.3		1200	
95		800		20	85	145	5.2		1200	
96		820		20	50	115	4.8		1800	
97		840		20	70	135	8.7		760	
98		860		5	80	90	1.65		160	
99		880		15	75	410	2.9		290	
833010		377900		15	50	125	4.1		205	

653092

099

PROJECT: Bulgobac
Silver Falls.

CO-ORDINATES
LINE: 5 380 700N
FROM: 378 140E
TO: 378 420E

SAMPLED BY: J. Sayer
DATE: 17/1/80

MATERIAL: soil
DEPTH: C HORIZON

SAMPLE NUMBER	CO-ORDINATES (N) S	(E) W	INTERVAL (+)/-	Cu P	Pb P	Zn P	Fe P	Mn	DESCRIPTION
33301	380700	378140	20	40	45	110	3.65 %	175	
02		160		10	25	75	2.15 "	145	
03		180		15	30	85	2.2 "	150	
04		200		20	25	75	3.75 "	160	
05		220		30	20	80	3.4 "	335	
06		240		20	25	65	2.3 "	50	
07		260		40	15	125	6.1 "	445	
08		280		15	10	60	1.1 "	100	
09		300		20	25	90	3.7 "	120	
10		320		15	15	80	1.0 "	135	
11		340		20	15	65	3.3 "	120	
12		360		15	120	75	2.05 "	195	
13		380		15	125	120	4.1 "	310	
14		400		15	25	65	6.3 "	185	
33315	378420			10	5	35	2.6 "	45	

653093 100

PROJECT: Bulgobac Silver Falls

CO-ORDINATES
LINE: 5 390 700 N
FROM: 377 920 E
TO: 378 120 E

SAMPLED BY: BM'O
DATE: 17/1/80

MATERIAL: soil
DEPTH: C HORIZON

SAMPLE NUMBER	CO-ORDINATES N/S	CO-ORDINATES E/W	Interval E/W	Cu P	Pb P	Zn P	Fe P	Mn	DESCRIPTION
33401	390700	377920	20	45	75	170	7.2%	175	
02		940		15	150	100	2.7%	1700	
03		960		5	65	170	3.4%	2100	
04		980		X	25	35	1.6%	50	
05		378000		10	25	60	1.7%	180	
06		020		X	25	20	1.0%	25	
07		040		35	140	120	7.3%	190	
08		060		10	50	45	3.6%	55	
09		080		X	10	15	5300	25	
10		100		5	20	20	1.1%	25	
33411		378120		10	65	40	1.3%	55	

653094

PROJECT: Bulgabac Silver Falls

CO-ORDINATES
LINE: 5 390900N
FROM: 376 980 E
TO: 377 140E

SAMPLED BY: FM

DATE: 16/1/80

MATERIAL: SOIL SAMPLE

DEPTH: C HORIZON

BOOK N°
SHEET N°
JOB N°

SAMPLE NUMBER	CO-ORDINATES (N)/S	CO-ORDINATES (E)/W	INTERVAL (+)/-	Cu ppm	Pb ppm	Zn ppm	Fe %	Mn ppm	DESCRIPTION
30992	390900S	376980	20	10	45	70	1.75	25	R C R
993		377000		10	45	15	1.50	20	C
994		377020		5	15	10	2.00	10	C O
995		377040		5	10	5	1.40	10	C
996		377060		5	5	10	0.30	10	C
997		377080		5	10	5	0.50	5	C
998		377100		10	40	35	0.75	15	C
999		377120		10	55	95	1.60	35	C
31000		377140		5	50	75	1.55	115	C R

653095

098

PROJECT: Bulgobac Silver Falls

CO-ORDINATES
LINE: 5 391 300 N
FROM: 378460E
TO: 378940E

SAMPLED BY: BM.CQ
DATE: 15/1/80

MATERIAL: SOIL SAMPLE
DEPTH: C HORIZON

BOOK N°
SHEET N°
JOB N°

SAMPLE NUMBER	CO-ORDINATES N/S	CO-ORDINATES E/W	Interval +/-	Cu P	Pb P	Zn P	Fe P	Mn.	DESCRIPTION
30963	391300	378460	20	20	45	65	3.95%	80	CR
40		4800		25	65	70	3.95%	120	CR
41		5000		15	35	120	4.05%	360	CR
42		5200		20	35	85	3.45%	105	CR
43		5400		15	25	55	3.35%	315	CR
44		5600		15	50	65	3.60%	95C	CR
45		5800		10	40	155	3.95%	1500	CR
46		6000		20	60	115	3.50%	900	CR
47		6200		20	50	90	3.80%	1700	CR
48		6400		15	55	105	4.00%	2000	CR
49		6600		55	145	175	4.60%	5300	CR
50		6800		25	70	100	3.65%	3250	CR
51		7000		15	55	105	3.20%	850	CR
52		7200		25	75	100	4.00%	1000	CR
53		7400		40	75	195	4.00%	1250	CR
54		7600		30	50	65	3.15%	4250	CR
55		7800		45	135	90	3.55%	5600	CR
56		8000		45	80	80	3.55%	5650	CR
57		8200		35	65	60	3.60%	3500	CR
58		8400		40	75	45	3.15%	1100	CR
59		8600		60	35	100	4.00%	2050	CR
60		8800		20	50	65	3.45%	600	CR
61		9000		20	50	115	5.40%	2000	CR
62		9200		20	50	75	4.75%	8600	CR
30963	391300	378940		15	45	95	2.25%	350	CR

653096

PROJECT: Bulgabac Silver Falls

CO-ORDINATES
LINE: 5 391 300N
FROM: 378960E
TO: 379440E

SAMPLED BY: BM°G
DATE: 15/1/80

MATERIAL: Soil Sample
DEPTH: C HORIZON

BOOK N°
SHEET N°
JOB N°

SAMPLE NUMBER	CO-ORDINATES N/S	CO-ORDINATES E/W	INTERVAL +/-	Cu P	Pb P	Zn P	Fe P	Mn	DESCRIPTION
30964	391300	378960	20	15	45	80	3.65%	455	C R
965		9800		10	15	35	1.40%	75	C O R
966		379000		10	25	30	1.65%	75	C R
967		9820		25	60	70	4.20%	140	C R
968		9840		10	15	20	1.30%	40	C R
969		9860		20	45	45	2.15%	110	C R
970		9880		15	45	35	3.30%	85	C R
971		9900		30	55	70	2.85%	175	C R
972		9920		10	25	35	2.20%	70	C R
973		9940		45	80	85	4.80%	635	C R
974		9960		65	90	150	4.30%	4550	C R
975		9980		15	40	30	2.70%	370	C R
976		380000		25	50	30	2.65%	150	C R
977		380020		10	25	25	3.25%	135	C R
978		380040		30	40	60	3.25%	300	C R
979		380060		25	70	70	2.90%	780	C R
980		380080		25	70	55	2.80%	1650	C R
981		380100		20	25	45	3.05%	1300	C R
982		380120		30	40	85	6.70%	570	C R
983		380140		15	40	45	2.00%	105	C R
984		380160		15	35	40	2.95%	150	C R
985		380180		20	35	55	3.40%	405	C R
986		380200		30	85	115	3.80%	2450	C R
987		380220		20	115	135	2.80%	1300	C R
30988	391300	379440		25	50	85	3.65%	355	C R

653097 096

PROJECT: Bulgarbac Silver Falls

CO-ORDINATES
LINE: 5391300N
FROM: 379460E
TO: 379500E

SAMPLED BY: BMcQ
DATE: 15/1/80

MATERIAL: SOIL SAMPLE
DEPTH: C HORIZON

BOOK N°
SHEET N°
JOB N°

SAMPLE NUMBER	CO-ORDINATES (N)/S	CO-ORDINATES (E)/W	INTERVAL (E)/-	Cu ppm	Pb ppm	Zn ppm	Fe %	Mn ppm	DESCRIPTION
30989	391300S	379460E	20	20	35	35	1.80%	140	CR
90		480		10	15	30	1.55%	35	CR
30991		379500E		20	25	55	2.65%	115	CR

653098

089

PROJECT: Bulgooba C
Silver Falls

CO-ORDINATES
LINE: 5 391 700N
FROM: 378 740 E
TO: 379 220 E

SAMPLED BY: BM
DATE: 19/1/80

MATERIAL: Soil
DEPTH: C HORIZON

SAMPLE NUMBER	CO-ORDINATES N/S	CO-ORDINATES E/W	INTERVAL	Cu ppm	Pb ppm	Zn ppm	Fe %	Mn ppm
33316	391700N	378740E	20	45	40	155	2.6%	900
17		760		80	195	190	4.7%	950
18		780		30	45	95	2.7%	1200
19		800		85	70	325	5.3%	850
20		820		20	50	90	2.6%	200
21		840		20	50	90	2.2%	85
22		860		15	25	65	3.4%	130
23		880		15	60	40	2.4%	85
24		900		15	30	25	3.3%	50
25		920		15	125	40	2.6%	95
26		940		5	30	15	2.4%	25
27		960		15	25	35	3.5%	170
28		980		35	65	100	3.1%	2550
29		37900		20	15	60	3.3%	2150
30		020		25	45	110	4.4%	415
31		040		20	20	90	2.3%	700
32		060		15	10	30	3.5%	250
33		080		35	110	115	5.4%	5200
34		100		25	50	75	2.5%	190
35		120		35	40	80	4.3%	410
36		140		25	40	80	2.49%	180
37		160		35	70	180	3.75%	300
38		180		20	65	100	3.8%	670
39		200		25	60	80	3.65%	1600
34037		37920		80	60	165	3.6%	2000

653099 088

PROJECT: Bulfobac Silver Falls.

CO-ORDINATES
LINE: 5391 700N
FROM 379 240E
TO: 379 640 E

SAMPLED BY: BM
DATE: 19/1/80

MATERIAL: Soil
DEPTH: C HORIZON

BOX No
SHEET No
FOR No

SAMPLE NUMBER	CO-ORDINATES N/S	CO-ORDINATES E/W	Interval E/Fm	Cu ppm	Pb ppm	Zn ppm	P Fe %	Mn ppm	DESCRIPTION
33341	39170	379240	20	40	65	150	3.3 %	800	
42		260		40	70	145	3.8 "	680	
43		280		35	60	155	3.65 "	730	
44		300		180	80	195	4.0 "	1000	
45		320		70	115	345	5.2 "	1400	
46		340		50	90	280	3.7 "	750	
47		360		15	50	70	3.3 "	1500	
48		380		25	55	70	3.2 "	900	
49		400		10	110	50	1.1 "	1000	
50		420		15	50	50	3.50 "	900	
51		440		40	60	75	2.55 "	2550	
52		460		50	80	145	3.2 "	1500	
53		480		65	90	235	4.1 "	630	
54		500		45	70	215	2.95 "	2800	
55		520		40	50	185	3.05 "	1800	
56		540		50	65	80	2.9 "	950	
57		560		10	20	40	1.0 "	650	
58		580		15	45	50	1.7 "	2500	
59		600		15	90	50	2.8 "	4000	
60		620		20	15	60	1.35 "	2300	
33361	37960	379640		30	50	80	3.2 "	2750	

653100 092

PROJECT: Bulgobac Silver Falls

CO-ORDINATES
LINE: 5 391 900 N
FROM: 378 980 E
TO: 379 180 E

SAMPLED BY: C.M [redacted]
DATE: 18/1/80

MATERIAL: SOIL
DEPTH: C HORIZON

SAMPLE NUMBER	CO-ORDINATES N/S	CO-ORDINATES E/W	INTERVAL	Cu ppm	Pb ppm	Zn ppm	Fe %	Mn ppm	DESCRIPTION
33454	8910	3780	20	50	80	105	3.3	4400	
55		3790		40	60	140	4.0	2300	
56		820		25	65	90	4.4	2300	
57		840		20	50	45	2.6	1200	
58		860		25	50	50	3.3	2200	
59		880		45	80	85	3.4	1150	
60		900		25	80	85	3.6	1850	
61		920		35	45	65	2.2	1200	
62		940		30	85	105	3.3	2650	
63		960		30	85	125	3.1	1500	
64		980		20	105	60	2.9	1550	

653101 093

PROJECT: Balpakac Silver Falls

CO-ORDINATES
LINE: 5 391 900 N
FROM: 379 860 E
TO:

SAMPLED BY: BMcD
DATE: 19/1/80

MATERIAL: SOIL
DEPTH: C HORIZON

DESCRIPTION

SAMPLE NUMBER	CO-ORDINATES N/S	CO-ORDINATES E/W	Interval	P Cu	Pb P	Zn P	P Fe %	Mn
33465	391900	379860	20	10	15	70	3.5	1250
66		840		15	15	45	2.9	90
67		820		30	25	60	2.5	350
68		800		15	35	65	2.5	195
69		780		5	25	50	2.15	525
70		760		20	35	145	4.45	320
71		740		10	25	65	2.9	570
72		720		10	50	105	3.6	5100
73		700		40	80	150	6.6	3100
74		680		50	95	145	6.15	1650
75		660		30	50	110	4.2	2000
76		640		30	45	140	4.5	1500
77		620		20	45	105	3.7	1900
78		600		20	70	180	2.7	1900
79		580		20	75	150	2.45	1450
80		560		5	45	40	3.0	70
81		540		20	90	70	3.0	1100
82		520		30	55	70	2.7	780
83		500		35	115	150	3.6	2200
84		480		25	75	90	2.7	800
85		460		25	60	80	3.5	520
86		440		20	30	60	3.0	400
87		420		20	35	150	3.9	2200
88		400		35	90	145	4.0	3000
89		380		35	85	170	4.0	4750

653102 090

PROJECT: Bulgobac Silver Falls

CO-ORDINATES
LINE: 5391900N
FROM: 379360 E
TO: 379700 E

SAMPLED BY: BMcQ
DATE: 19/1/80

MATERIAL: SOIL
DEPTH: C HORIZON

SAMPLE NUMBER	CO-ORDINATES N/S	CO-ORDINATES E/W	Interval +/-	Cu ppm	Pb ppm	Zn ppm	Fe %	Mn ppm	DESCRIPTION
33491	3919000	379360	20	35	160	165	3.85	4500	
91		340		40	160	150	3.75	2400	
92		320		35	150	125	3.25	700	
93		300		25	130	95	3.0	1100	
94		280		25	115	140	3.9	1150	
95		260		15	60	85	3.0	280	
96		240		50	195	270	4.0	470	
97		220		5	35	70	2.7	365	
33498		379200		10	30	45	1.1	230	

653103 094

PROJECT: Bulgobac Silver Falls

CO-ORDINATES
LINE: 5392 100 N
FROM: 380 000 E
TO: 379 520 E

SAMPLED BY: C.M.
DATE: 18/1/80

MATERIAL: SOIL
DEPTH: C HORIZON

SAMPLE NUMBER	CO-ORDINATES N/S	CO-ORDINATES E/W	INTERVAL +/-	Ag	Cu	Pb	Zn	Ex	Mn	DESCRIPTION
33412	392100	380000	20		30	365	135	2.95	170	
13		379800			45	120	85	3.7	170	
14		379600			10	70	60	2.7	125	
15		379400			20	50	145	4.5	345	
16		379200			5	25	50	3.35	115	
17		379000			10	70	90	3.35	440	
18		378800			X	75	170	5.0	440	
19		378600			X	80	90	2.75	650	
20		378400			5	65	95	3.2	680	
21		378200			15	50	100	4.6	1000	
22		378000			10	25	60	2.9	590	
23		377800			30	40	115	5.0	1900	
24		377600			40	45	145	8.0	2600	
25		377400			35	80	95	4.65	2150	
26		377200			10	25	55	3.0	950	
27		377000			15	30	70	3.4	1050	
28		376800			15	50	55	2.7	550	
29		376600			35	70	160	3.1	2350	
30		376400			30	80	150	3.4	1650	
31		376200			20	40	75	2.9	460	
32		376000			25	60	115	3.85	820	
33		375800			25	55	80	3.0	245	
34		375600			NOT	LOGGED				
35		375400								
36	391900	379520	20							

653104 095

PROJECT: Bulgobac Silver Falls

CO-ORDINATES
LINE: 5392 100N
FROM: 379 500E
TO: 379 189E

SAMPLED BY: C.M.
DATE: 18/1/80

MATERIAL: SOIL
DEPTH: C HORIZON

SAMPLE NUMBER	CO-ORDINATES N/S	CO-ORDINATES E/W	Interval + /-	ppm Cu	ppm Pb	ppm Zn	% Fe	ppm Mn	DESCRIPTION
33437	39210	37950	20	20	60	60	2.94	155	
38		480		25	90	150	3.8 "	850	
39		460		10	70	65	1.45 "	130	
40		440		35	220	100	2.85 "	255	
41		420		35	95	95	3.1 "	1100	
42		400		25	55	65	2.7 "	680	
43		380		15	40	60	2.3 "	520	
44		360		25	50	50	2.9 "	700	
45		340		45	40	60	2.9 "	1100	
46		320		75	55	70	4.4 "	580	
47		300		10	15	65	3.4 "	195	
48		280		5	15	95	3.1 "	900	
49		260		5	20	60	3.0 "	570	
50		240		5	25	25	2.0 "	60	
51		220		10	10	60	3.45 "	270	
52		200		15	25	40	3.0 "	140	
33453		189		15	10	55	3.25 "	680	

107

APPENDIX 4.

C.M.S. Reports 80/4/24
80/3/21
80/2/22

Thin Section Description of Split Core.

108

To AJM.

Central Mineralogical Services

39 Beulah Road
Norwood, S.A. 5067
Telephone 42 5659

The Manager
Geology Department
Electrolytic Zinc Co. of
Australasia Ltd.
West Coast Mines
P.O. Box 21
ROSEBERY / TAS. 7470

1st May, 1980

REPORT CMS 80/4/24

YOUR REFERENCE:	Order No. 900144
DATE RECEIVED:	24th April, 1980
SAMPLE NOS.:	33059T - 33065T
SUBMITTED BY:	A. Mollison
WORK REQUESTED:	Petrology

H.W. Fander.

H.W. Fander, M. Sc.

CENTRAL MINERALOGICAL SERVICES PTY. LTD.

Date 1st May, 1980

SAMPLE REPORT (Mineralogy, Petrology, Ore Microscopy)

IDENTIFICATION
33059T
Rhyolitic or Trachytic Lava, weakly mineralised
NPP215 - 34.0m

Job No. CMS 80/4/24 Date Received: 24th April, 1980

Reference Order No. 900144

Sample No. 33059T

Nature of Sample: D.D. Core

DESCRIPTION **SECTION No.** 31444

a. Hand Specimen:

Pale, fine-grained siliceous rock with fine sulphides; K-feldspar stain test positive.

b. Microscopic:

This is a brecciated, silicified, weakly mineralised rhyolitic or trachytic lava, perhaps trending towards a trachyte.

Phenocrysts are very rare and comprise only sericitised or silicified laths of ?plagioclase; quartz and K-feldspar phenocrysts are absent. The bulk of the rock consists of ultrafine K-feldspar or devitrified K-silicate glass, with small patches of sericite (altered feldspar crystals) and secondary, introduced quartz; primary quartz may be absent altogether, which would mean that the rock was a trachyte, originally consisting of sparse plagioclase crystals in a K-silicate glass, but this interpretation is tentative in view of the alteration.

The rock is brecciated and quartz-veined; the veins tend to be irregular and branching, with diffuse margins, suggesting a deuteric phase of silicification rather than veining after a tectonic event. Traces of sulphides accompany the veining, and comprise pyrite, sphalerite and galena; the sphalerite forms irregular patches 50-700 μ, with chalcopyrite inclusions; galena is < 50 μ. Pyrite is associated with the other sulphides and also as minute (< 5 μ) grains throughout the rock.

H.W. Fander, M. Sc.

CENTRAL MINERALOGICAL SERVICES PTY. LTD.

Date 1st May, 1980

SAMPLE REPORT (Mineralogy, Petrology, Ore Microscopy)

IDENTIFICATION
33060T
Porphyritic Trachyte (or Rhyolite) NPP215 _ 70.5m

Job No. CMS 80/4/24 Date Received: 24.4.1980

Reference Order No. 900144

Sample No. 33060T

Nature of Sample: D.D. Core

DESCRIPTION **SECTION No.** 31445

a. Hand Specimen:

Pale, fine-grained siliceous rock with small phenocrysts and traces of sulphide (?pyrite); K-stain test positive.

b. Microscopic:

This is a porphyritic trachyte or rhyolite, microfractured, but fresh; its classification depends on whether the fine quartz in the groundmass is primary or secondary/introduced. The absence of quartz phenocrysts suggests that the rock is a quartz-trachyte rather than a rhyolite; the fabric is that of a shallow or minor intrusive, rather than a lava. Flow features of any kind are absent.

The rock consists of small, well-formed prismatic crystals of albite, fresh and showing characteristic twinning, randomly-distributed and orientated in a rather featureless microcrystalline groundmass of poorly-defined K-feldspar and irregular quartz patches; the grainsize averages 20 μ.

Occasional straight-sided quartz-carbonate veins cut the rock, and there are networks of microfractures postdating (and displacing) these; the microfractures contain fine sericite and carbonate, accompanied by fine pyrite.

Even a chemical analysis would not resolve the problem of classification, since it cannot distinguish between primary and secondary quartz. The rock may well be related to 33059T, being compositionally quite similar.

H.W. Fander, M. Sc.

CENTRAL MINERALOGICAL SERVICES PTY. LTD.

Date 1st May, 1980

SAMPLE REPORT (Mineralogy, Petrology, Ore Microscopy)

IDENTIFICATION
33061T
Porphyritic Quartz-Trachyte NPP215 92.5m

Job No. CMS 80/4/24 Date Received: 24.4.1980

Reference Order No. 900144

Sample No. 33061T

Nature of Sample: D.D. Core

DESCRIPTION **SECTION No.** 31446

a. Hand Specimen:

Pale, fine-grained siliceous rock with small phenocrysts; K-stain test positive (groundmass).

b. Microscopic:

This rock resembles 33060T in terms of composition, and is best classified as a porphyritic quartz-trachyte; however, it shows some compositional and flow-banding, not necessarily indicative of extrusion, however. There is no reason why the same rock should not be in part intrusive and in part extrusive.

Phenocrysts are euhedral, prismatic to lath-shaped, relatively fresh albite crystals, up to 1.5 mm in size and both larger and more common than in the previous two rocks; they show random to subparallel orientation and are randomly distributed. The phenocrysts are set in a microcrystalline mass of felsitic intergrowths of quartz and K-feldspar, perhaps largely devitrified glass, but without relict glassy textures. Subparallel bands and lenses with variable crystallinity occur; the coarser ones are more siliceous, the finer ones are more feldspathic with ultrafine illite-sericite alteration.

Wide quartz-carbonate-sericite veins, and narrowveinlets of the same minerals, cut the rock.

The pale greenish hue in these rocks is due to illite-sericite; both chlorite and epidote are absent.

Study of the contacts may decide whether this rock was extrusive or intrusive; in the absence of evidence to the contrary, an intrusive relationship is favoured.

H.W. Fander, M. Sc.

112

653110

CENTRAL MINERALOGICAL SERVICES PTY. LTD.

Date 1st May, 1980

SAMPLE REPORT (Mineralogy, Petrology, Ore Microscopy)

IDENTIFICATION
33062T
Mineralised, Porphyritic Rhyolite 98m

Job No. CMS 80/4/24 Date Received: 24.4.1980

Reference Order No. 900144

Sample No. 33062T

Nature of Sample: D.D. Core

DESCRIPTION **SECTION No.** 31447

a. Hand Specimen:

Pale, fine-grained siliceous, felsic rock with sulphides; K-stain test positive.

b. Microscopic:

Because of the abundance of free, apparently primary quartz, this rock is classified as a porphyritic rhyolite; however, in common with the others, it is unusual in containing no quartz phenocrysts. The quartz in the groundmass may be late-magmatic or may even be a product of devitrification, representing excess SiO_2 in a K-silicate glass. In any case, it can probably be regarded as primary and thus a criterion in classification.

Fresh albite phenocrysts are haphazardly scattered through the rock, set in a micro-crystalline groundmass of shapeless quartz patches (average size = 0.05 mm) and poorly defined K-feldspar. The fabric has a vague preferred orientation, but no definite flow features or othertextures characteristic of extrusive rocks. Fine sericite has developed throughout but, as in the other rocks, ferromagnesian minerals are absent.

Patches and veinlets of carbonate occur, and are cut by younger veinlets of quartz-sulphides. The sulphides are galena, chalcopyrite, sphalerite and pyrite; of these, galena is the most common, up to 600 μ in size, but generally much finer-grained (< 100 μ). The other sulphides too, are fine-grained and poorly developed, finely intergrown with gangue minerals.

H.W. Fander, M. Sc.

113

CENTRAL MINERALOGICAL SERVICES PTY. LTD.

Date 1st May, 1980

SAMPLE REPORT (Mineralogy, Petrology, Ore Microscopy)

IDENTIFICATION
33063T
Altered Quartz-Trachyte NPP215 107.4

Job No. CMS 80/4/24 Date Received: 24.4.1980

Reference Order No. 900144

Sample No. 33063T

Nature of Sample: D.D. Core

DESCRIPTION **SECTION No.** 31448

a. Hand Specimen:

Pale grey-green, fine-grained porphyritic rock;
K-stain test positive, but weak.

b. Microscopic:

This is a sheared, almost completely altered porphyritic quartz-trachyte or rhyolite; relict textures suggest that it was originally largely glassy and very probably extrusive. Because of the alteration, the K-stain test shows no K-feldspar or K-silicate (assuming that they were present in the fresh rock.

Phenocrysts are common, but have largely been replaced by carbonate and sericite, as well as beingfairly severely fractured; available optical data suggest that they are albite. The phenocrysts show subparallel orientation and are set in a fine groundmass of clay-sericite (the clay is probably dickite or halloysite) with fine fibrous textures. Small quartz patches are sparsely scattered through the groundmass; the groundmass shows strong preferred orientation, probably partly inherited flow fabric, partly due to shearing; devitrification textures are also present. Thus, there is fair evidence that this rock was probably extrusive, in contrastto the other rocks, though very probably genetically related.

Carbonate veinlets cut the rock and fine-grained pyrite occurs in some replaced phenocrysts.

H.W. Fander, M. Sc.

114

CENTRAL MINERALOGICAL SERVICES PTY. LTD.

Date 1st May, 1980

SAMPLE REPORT (Mineralogy, Petrology, Ore Microscopy)

IDENTIFICATION
33064T
Mineralised Rhyolite NPP215 110m

Job No. CMS 80/4/24 Date Received: 24.4.1980

Reference Order No. 900144

Sample No. 33064T

Nature of Sample: D.D. Core

DESCRIPTION **SECTION No.** 31449

a. Hand Specimen:

Pale, fine-grained felsic rock, with quartz-sulphide veins.
K-stain test positive.

b. Microscopic:

This is a mineralised rhyolite or quartz-trachyte, with small (< 0.5 mm), inconspicuous phenocrysts; it is compositionally very similar to 33062T and others and has similar fabric, suggesting a shallow/minor intrusion.

Small, stout prismatic fresh albite phenocrysts are fairly sparsely and randomly scattered through the microcrystalline groundmass of poorly defined quartz and K-feldspar There is little or no preferred orientation, and the fabric is homogeneous.

Ultrafine pyrite pervades the whole rock; in addition, there are coarser sulphide patches intergrown with hydromuscovite ("sericite"). Irregular veinlets of sericite and carbonate traverse the rock, and there are conspicuous veins up to 3 mm wide, with straight walls; these consist of clear albite crystals (edges), with coarse carbonate, sulphides and quartz, as well as hydromuscovite aggregates.

The coarse sulphides comprise sphalerite, as patches up to 3 mm wide and semi-continuous in veins; it contains blebs of chalcopyrite, traces of fine galena and pyrite. There are also occasional, slightly coarser patches of galena and pyrite, as well as minute scattered pyrite crystals.

H.W. Fander, M. Sc.

653113

115

CENTRAL MINERALOGICAL SERVICES PTY. LTD.

Date 1st May, 1980

SAMPLE REPORT (Mineralogy, Petrology, Ore Microscopy)

IDENTIFICATION
33065T
Rhyolitic Lava-Breccia NPP215 125.5m

Job No. CMS 80/4/24 Date Received: 24.4.1980

Reference Order No. 900144

Sample No. 33065T

Nature of Sample: D.D. Core

DESCRIPTION **SECTION No.** 31450

a. Hand Specimen:

Pale, fine-grained, brecciated felsic rock;
K-stain test positive.

b. Microscopic:

This is a brecciated rhyolite or quartz-trachyte, and closely resembles the other rocks in this group; the rock is fairly extensively argillised/sericitised and silicified.

The rock consists of large and small, irregular, angular fragments of the same type, separated by sheared, mylonitised and sericitised equivalents. Individual fragments consist of small, relatively fresh albite phenocrysts, randomly set in a groundmass of fine quartz patches and interstitial, partly sericitised K-feldspar and/or K-silicate glass. In places, the relict textures suggest abundant glass, possibly scoriaceous or even fragmental, and the fabric as a whole could well be due to flow-brecciation (together with incorporated fragments); this, in turn, suggests that the rock may well be a lava breccia, i.e. composed of lava fragments cemented by lava. Sericitisation of parts of the rock has obscured some critical details.

Sericite veinlets traverse the rock and carry small amounts of fine pyrite. Patches of carbonate have formed sporadically, together with mosaic quartz.

Apart from close compositional similarities between all these rocks, most are regarded as intrusive, but 33063T and 33065T are very probably extrusive.

H.W. Fander, M. Sc.

116

Central Mineralogical Services

CMS
231 Magill Road
Maylands, S.A. 5069
Telephone 42 5659

Mr. D. K. Brock
Manager
West Coast Mines
Electrolytic Zinc Co. of
Australasia Ltd.
P.O. Box 21
ROSEBERY / TAS. 7470

31st March, 1980

REPORT CMS 80/3/21

YOUR REFERENCE: Order No. 900128

DATE RECEIVED: 18th March, 1980

SAMPLE NOS.: T - 29668, 29667, 29976, 29977, 29981, 29801, 29803, 29809, 29810, 29812, 29813, 29814, 35201, 35210, 35216, 35219, 29736, 29737, 29738, 29739, 29740 - NOT INCLUDED

SUBMITTED BY: G. Illff, A. Mollison, I. McDonald

WORK REQUESTED: Petrology

for

H.W. Fander, M. Sc.

REPORT CMS 80/3/21

Petrological Descriptions

T 29668 (T.S. 31156) K-stain positive.
This is an extensively sericitised and mildly sheared rhyolitic fragmental, considered as a vitric-crystal tuff, although the former presence of shards is more inferred than established over much of the area sectioned.

NF8 2W4
139 m

Crystals, crystal fragments and clusters (fragmented glomerophenocrysts) comprise up to 50 % of the rock, are poorly sorted in the 100μ - 5 mm range, show a weakly banded distribution and are largely alkali feldspar (inverted exsolved sanidine-anorthoclase, subordinate albite) with subordinate quartz. These features are accompanied by sparse rhyolitic lithic clasts (to 2.5 mm, microporphyritic lava, rare fragmental types) in a pervasively sericite-stained, microcrystalline, quartzofeldspathic matrix with patchy, very vague, relict microshard textures. There is evidence of a contorted and weakly fragmented flow fabric. These features are enhanced by the weak slaty cleavage, but are reminiscent of an autobrecciated, ignimbritic mode of origin.

Chlorite and cloudy carbonate are minor accessory alteration phases. Rare, very fine-grained clots of pretectonic pyrite are present. Much of the sericite is a pale green illite-hydromuscovite.

T 29667 (T.S. 31157) K-stain positive.
Despite its fragmental appearance in hand specimen, this rock can only be classified as a porphyritic rhyolite. The fragmental aspect reflects an early phase of veining and is enhanced by shearing.

Sterling Valley
Long John Ck.

Relict features comprise frequent coarse, variably resorbed and embayed quartz phenocrysts (to 4 mm) and accessory alkali (K-) feldspar phenocrysts in a devitrified felsic groundmass with minor accessory apatite (typical Mount Read Volcanic-type apatite, clouded with ultrafine inclusions). The groundmass exhibits a sheared perlitic structure and has been silicified. The abundant, relatively coarse and evenly disseminated phenocrysts indicate a probable minor intrusive origin.

Feldspar phenocrysts are extensively sericitised and chloritised. Perlitic cracks are outlined by sheared films of chlorite and sericitic hydromuscovite. Frequent discontinuous sheared veinlets of quartz, Mg-chlorite (or locally pale green phlogopite and sericite) include disseminated epidote and pyrite.

118

653116

Central Mineralogical Services ltd

CMS
231 Magill Road
Maylands, S.A. 5069
Telephone 42 5659

Mr. D.K. Brock
Manager,
West Coast Mines
Electrolytic Zinc Co. of
Australasia Ltd.
P.O. Box 21
ROSEBERY / TAS. 7470

14th March, 1980

REPORT CMS 80/2/22

YOUR REFERENCE: Order No. 900126

DATE RECEIVED: 28th February, 1980

SAMPLE NOS.: 29927, 29928, 29934, 29938, 29943, 29944, 29950, 29951, 29954, 29955, 29962, 29968, 29969, 29652, 29654, 29658, 29659, 29660, 29661 — NOT INCLUDED

SUBMITTED BY: D.K. Brock

WORK REQUESTED: Petrology

for

H.W. Fander, M. Sc.

Sample No. / K-Stain	Classification - Composition	Fabric	Accessories	Comments
29955 Strtt K-Positive	Porphyritic Trachyandesite. Epidotised/albitised plagioclase phenocrysts, clusters; disseminated quartz amygdales in coarsely perlitic felsitic alkali groundmass stained with chloritised biotite.	Phenocrysts to 1.5 mm, clusters to 3.5 mm. Amygdales mean 250 μ. Weakly sheared.	Disseminated magnetite, leucoxenised ilmenite, rare apatite. Sparse, partly oxidised pyrite (to 600μ).	Very similar to 29954. Frequent phenocrystal clusters may be cognate xenocrystal in part. Relatively marked biotitic alteration of groundmass.
29962 Strtt K-Positive	Porphyritic Trachyandesite. Epidotised/albitised plagioclase phenocrysts, sparse xenoliths in chlorite- and sericite-stained microcrystalline felsic groundmass. Frequent quartz-epidote amygdales.	Phenocrysts mean 350μ, amygdales to 2 mm. Strongly sheared.	Disseminated oxidised magnetite and leucoxeni semi-opaques, rare apatite.	Xenoliths sheared into lenses, but of ccognate character (sim. 29955, 54). Fragmental appearance reflects shearing. No tangible pyroclastic features.
29968 Strtt K-Negative.	Dacitic Tuff. Angular to subround, weakly sericitised, silt- to fine sand-sized plagioclase, rare lava clasts in chlorito-sericite matrix. Occasional disrupted labile pelitic interbeds.	Vague relict ?abraded shard textures in sand fraction. Slumped, moderately sheared.	Rare clastic quartz and leucoxenised opaques. Minor relict biotite (chloritised).	Fabric suggests a weakly turbiditic, subaqueous facies (tuffwacke/reworked tuff), but fine detail obliterated by alteration and slaty cleavage.
29969 Strtt K-Positive	Rhyolitic Xenotuff. Fine sand- to grit-sized angular quartz, pelitic rock fragments, subordinate alkali (K) feldspar and lava (rhyolite) clasts. Sheared quartz-sericite matrix.	Poorly sorted, incipiently bedded, strongly sheared. Relict embayed margins in quartz.	Clastic magnetite and rare clastic mica flakes (muscovite, degraded biotite).	Finer detail obliterated by shearing, but clearly proximal lithic-crystal tuff with subordinate non-pyroclastic component. Probably subaqueous.
29652 Shitt Ck Mt. Murchison K-Negative	Tuffaceous Pelite. Sericitic quartzose silty shale with silty interbeds of angular to subround quartz, minor sericitised ?abraded shards, sparse muscovite in sericite matrix.	Slumped, incipiently sheared. Scattered quartz with relict embayed margins.	Minor clastic biotite (sericitised), leucoxeni semi-opaques. Traces carbonaceous matter.	Essentially a weakly carbonaceous, quartzose silty shale with a minor reworked acid tuffaceous component. Weakly Fe-stained, but devoid of sulphides.
29654 Mt. Murchison K-Positive	Hornblende-Biotite-Adamellite. Orthoclase-microperthite and heavily sericitised ?oligoclase in near-equant proportions. Subordinate dark green hornblende, extensively chloritised dark brown biotite, quartz.	Prismatic plagioclase, amphibole, biotite in granitic quartz, orthoclase. Mean grainsize 1.5mm.	Primary magnetite and traces apatite, sphene. Minor secondary epidote and traces oxidised pyrite.	Abundant ferromags. suggest differentiation from diorite-monzonite facies. Sericite is pale green hydromuscovite and orthoclase pink. Incipiently stressed
29658 NPP213 71.30m K-Negative	Rhyolitic Ignimbrite. Sericitised/weakly carbonated feldspar and slightly subordinate quartz crystals/fragments; sericitised/chloritised lithicclasts in sericitised shardy matrix.	Poorly sorted with contorted flow-fabric. Mildly sheared. Late calcite veins.	Disseminated leucoxenised opaques and very rare apatite.	Lithic clasts include lava and pyroclastic types (vitric, vitric-crystal tuff, pumice). Gross fabric typical of flow-brecciated ignimbrite.
29659 NPP213 121.50m K-Negative	Arkosic Sandstone. Framework angular to subround oligoclase-albite and slightly subordinate quartz. Rare sericitised ?rhyolite clasts. Quartz-feldspar-sericite cement.	Poorly to moderately sorted, weakly bedded, incipiently stressed. Irregular aggregates, veins, quartz, calcite, chlorite.	Leucoxenised clastic opaques.	Medium- to coarse--grained. Clastic feldspar mildly sericitised/carbonated. Authigenic overgrowth cement with intergranular sericite. "Granitic" source.

653117

Sample No. / K-stain	Classification - Composition	Fabric	Accessories	Comments
29660 NPP214 69m K-Positive	Arkosic Sandstone. Framework variably sericitised alkali feldspar, angular to subround quartz, subordinate pelitic rock fragments, mica flakes. Matrix chlorite and sericite.	Weakly bedded silty fine sandstone. Fluorite veins, lenses (to 5 mm wide) throughout.	Clastic leucoxenic semi-opaques. Minor fine sulphide with fluorite. Carbonaceous.	Minor reworked tuffaceous component. Fluorite predates incipient shearing. Sulphides in < 100μ disseminations around margins of fluorite and in microfilms.
29661 NPP213 92.9m K-Negative (T.S. 31038)	Arkosic Psammopelite. Angular to subround (sericitised) feldspar, slightly subordinate quartz with carbonate-stained sericite matrix. Interbeds of carbonaceous silty quartzofeldspathic shale.	Weakly turbiditic, incipiently sheared. Patchy concordant veins fluorite (sim. 660).	Clastic leucoxenic semi-opaques, muscovite flakes, rare magnetite. Minor trace pyrite in fluorite.	Distinct, variably abraded tuffaceous component, particularly "volcanic" quartz, but subordinate to granitic material (feldspar, sim. 29659).

120

653118

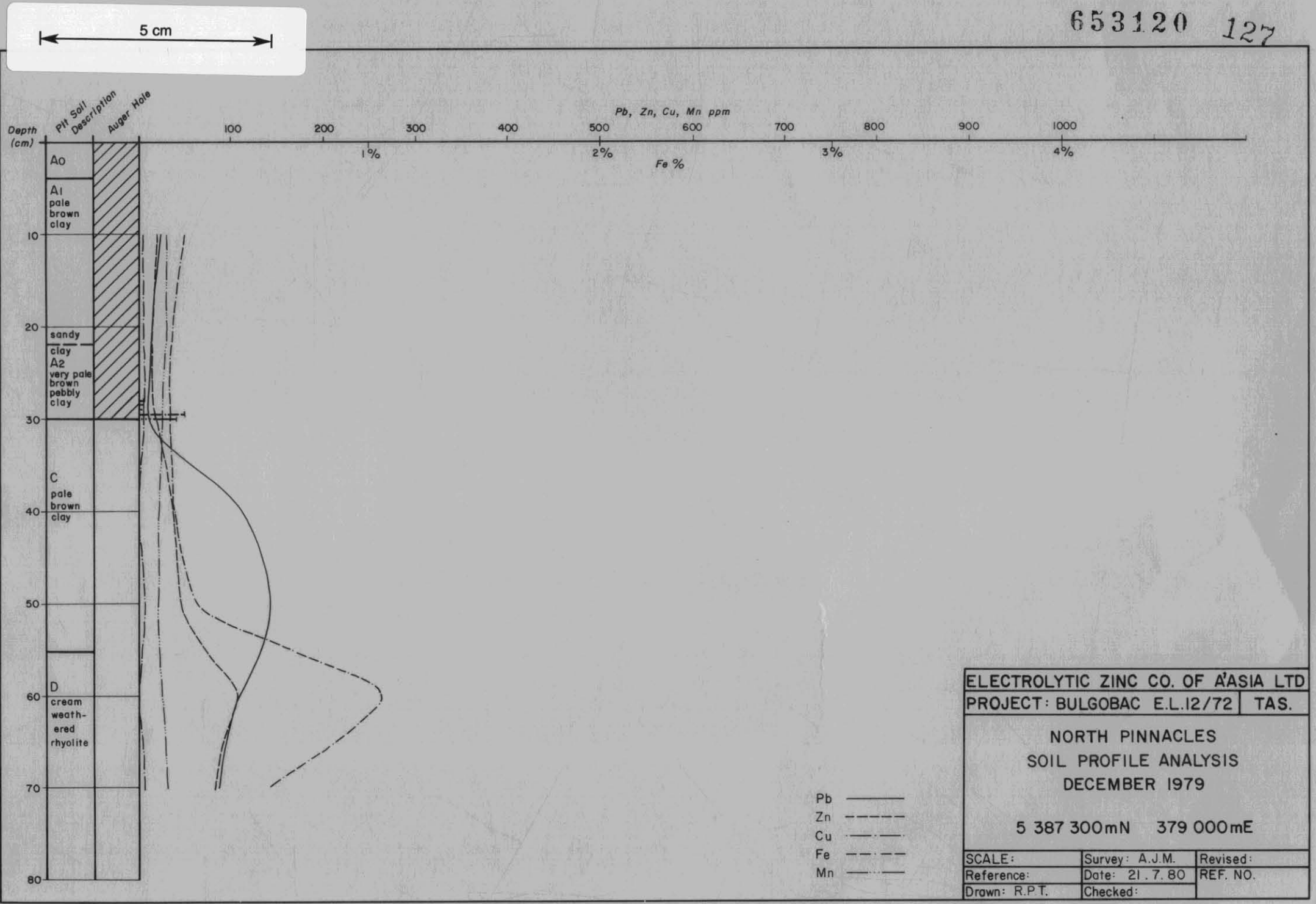
APPENDIX 5.

Soil Profile Test Pit Geochemical Plots.

North Pinnacles : Soil Profile Analysis : December 1979

5 387 300mN	379 000mE
5 387 100mN	379 340mE
5 387 100mN	379 220mE
5 387 100mN	378 970mE
5 386 900mN	378 380mE
5 386 900mN	378 320mE

653120 127



ELECTROLYTIC ZINC CO. OF A'ASIA LTD

PROJECT: BULGOBAC E.L.12/72 | TAS.

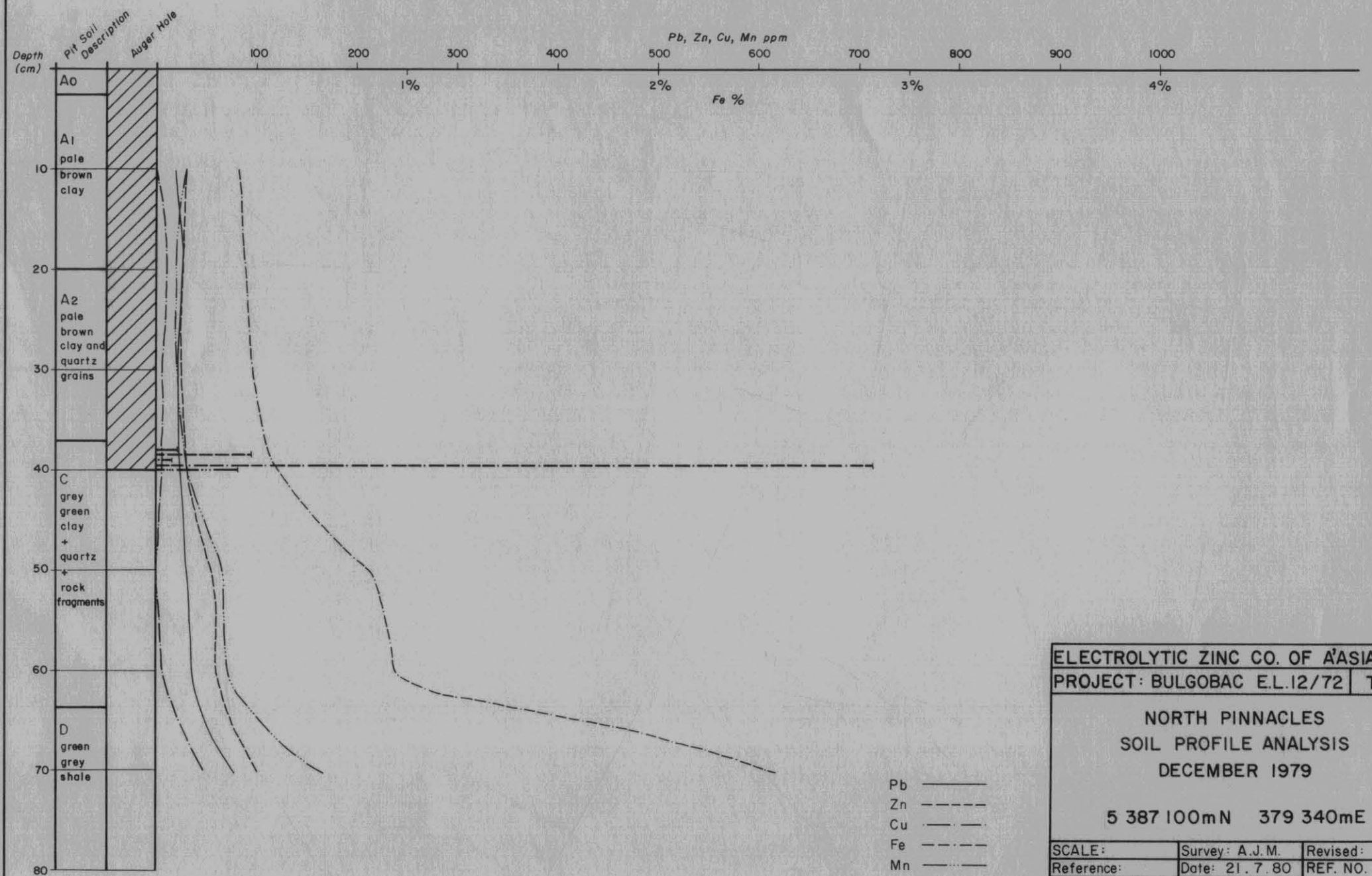
NORTH PINNACLES
SOIL PROFILE ANALYSIS
DECEMBER 1979

5 387 300mN 379 000mE

SCALE:	Survey: A.J.M.	Revised:
Reference:	Date: 21.7.80	REF. NO.
Drawn: R.P.T.	Checked:	

653121

5 cm



ELECTROLYTIC ZINC CO. OF A'ASIA LTD

PROJECT: BULGOBAC E.L.12/72 | TAS.

NORTH PINNACLES
SOIL PROFILE ANALYSIS
DECEMBER 1979

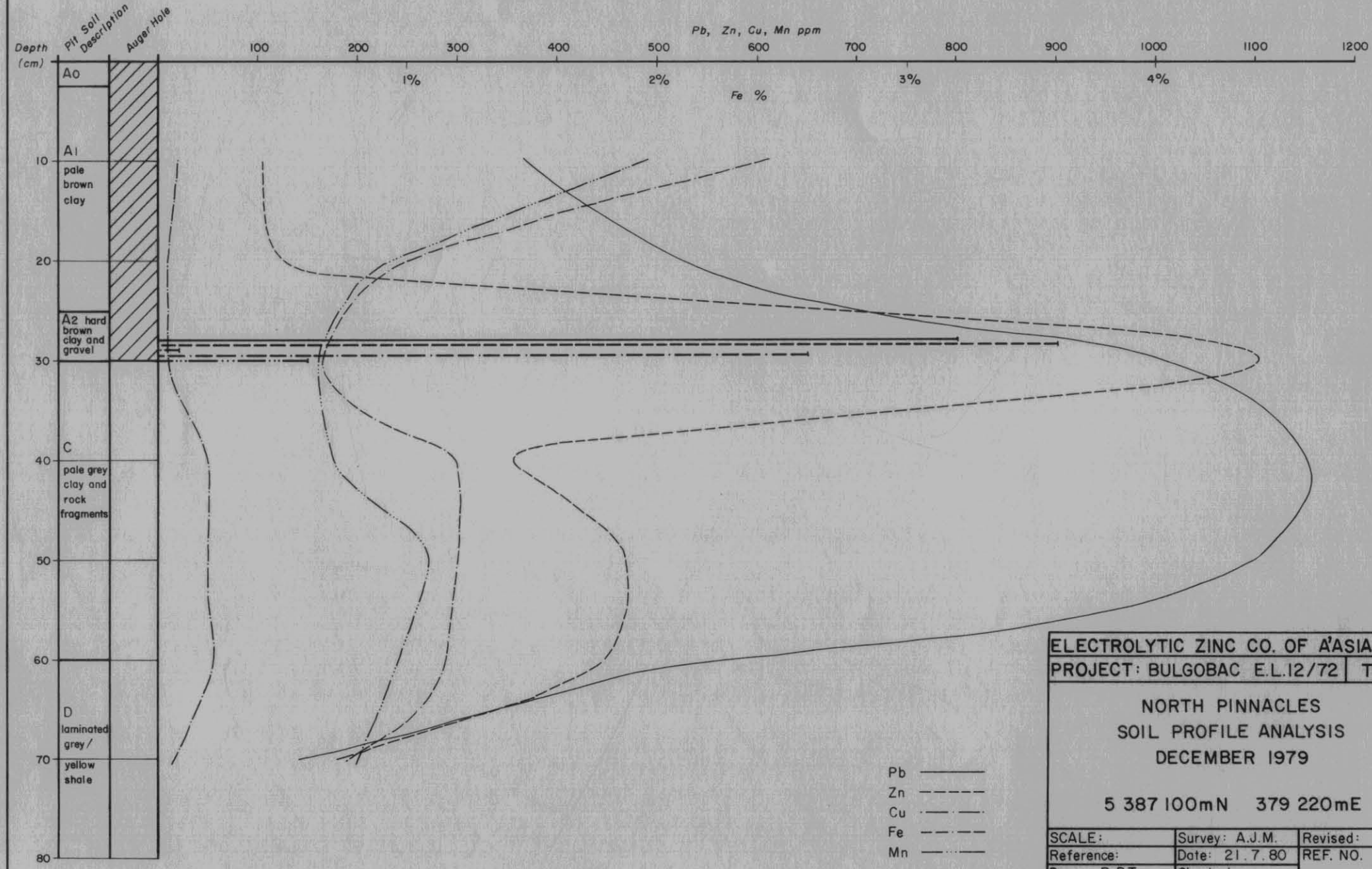
5 387 100mN 379 340mE

SCALE:	Survey: A.J.M.	Revised:
Reference:	Date: 21.7.80	REF. NO.
Drawn: R.P.T.	Checked:	

5 cm

653122

124



ELECTROLYTIC ZINC CO. OF A'ASIA LTD

PROJECT: BULGOBAC E.L.12/72 | TAS.

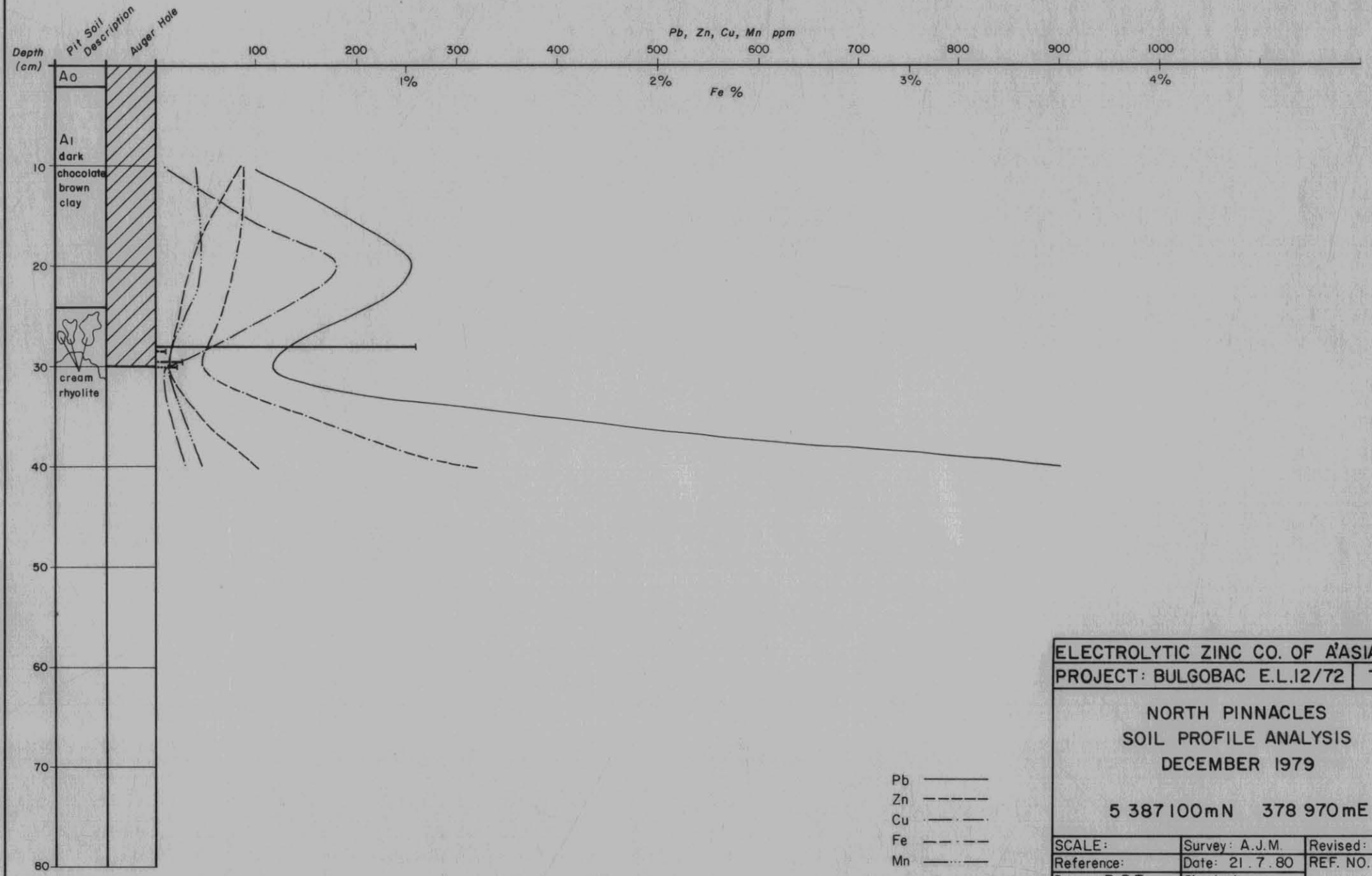
NORTH PINNACLES
SOIL PROFILE ANALYSIS
DECEMBER 1979

5 387 100mN 379 220mE

SCALE:	Survey: A.J.M.	Revised:
Reference:	Date: 21.7.80	REF. NO.
Drawn: R.P.T.	Checked:	

653123 125

5 cm



ELECTROLYTIC ZINC CO. OF A'ASIA LTD

PROJECT: BULGOBAC E.L.12/72 | TAS.

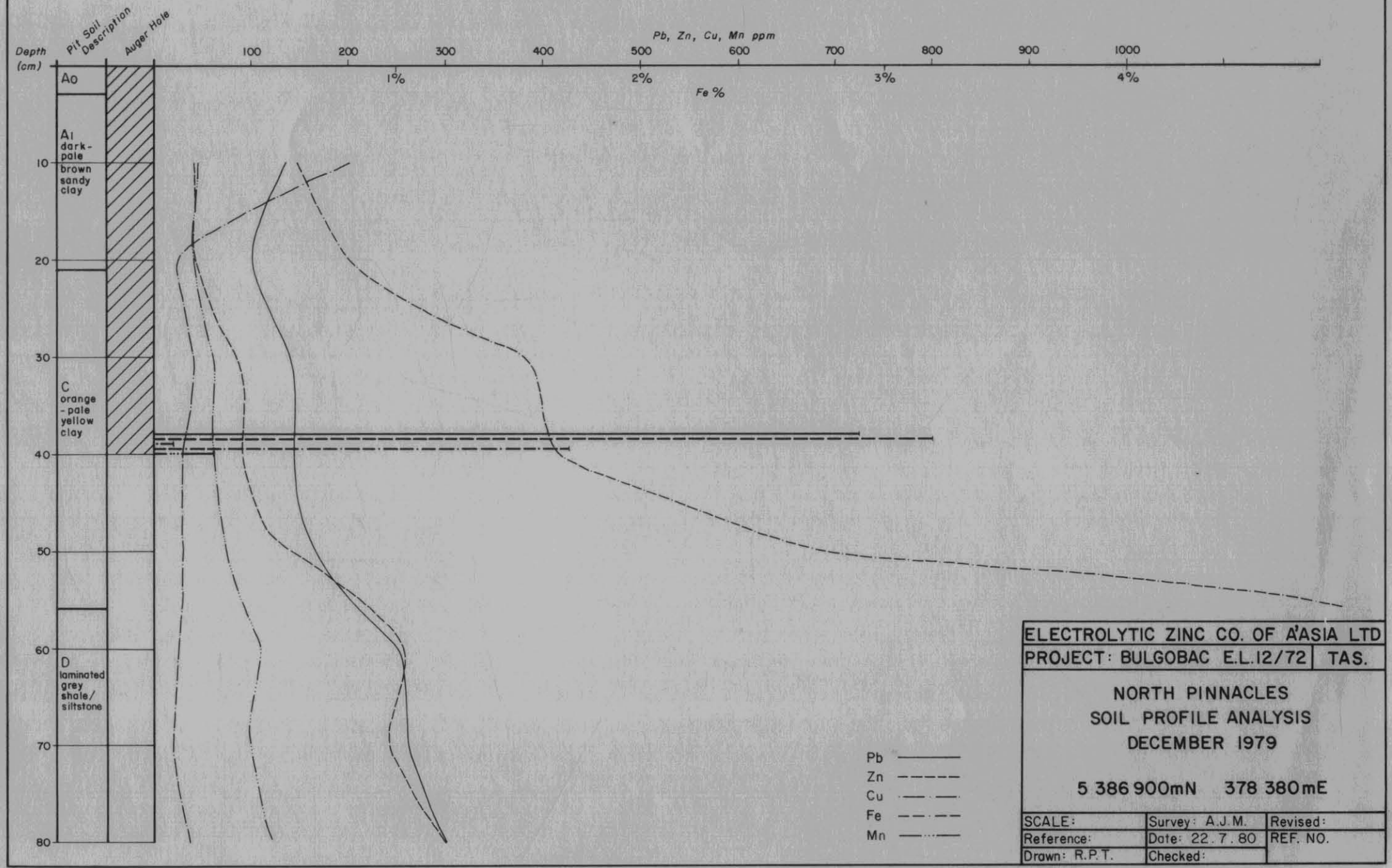
NORTH PINNACLES
SOIL PROFILE ANALYSIS
DECEMBER 1979

5 387 100mN 378 970mE

SCALE:	Survey: A.J.M.	Revised:
Reference:	Date: 21.7.80	REF. NO.
Drawn: R.P.T.	Checked:	

653124

5 cm



ELECTROLYTIC ZINC CO. OF A'ASIA LTD

PROJECT: BULGOBAC E.L.12/72 | TAS.

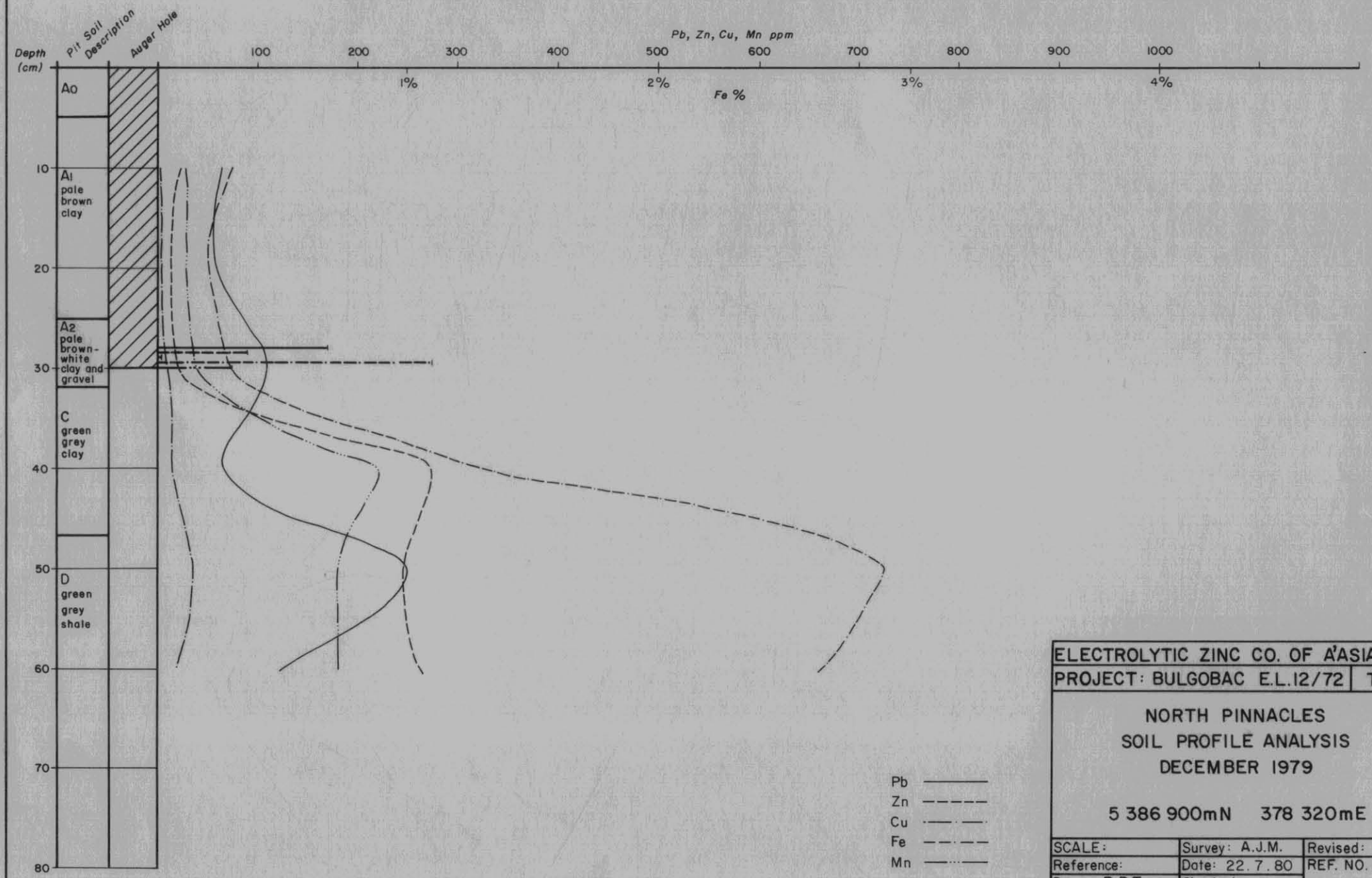
NORTH PINNACLES
SOIL PROFILE ANALYSIS
DECEMBER 1979

5 386 900mN 378 380mE

SCALE:	Survey: A.J.M.	Revised:
Reference:	Date: 22.7.80	REF. NO.
Drawn: R.P.T.	Checked:	

653125

5 cm



ELECTROLYTIC ZINC CO. OF A'ASIA LTD	
PROJECT: BULGOBAC E.L.12/72	TAS.

NORTH PINNACLES
SOIL PROFILE ANALYSIS
DECEMBER 1979

5 386 900mN 378 320mE

SCALE:	Survey: A.J.M.	Revised:
Reference:	Date: 22. 7. 80	REF. NO.
Drawn: R.P.T.	Checked:	

APPENDIX 6.

Diamond Drill Hole Logs for NPP 213, 214 and 215.

ELECTROLYTIC ZINC CO. OF A'ASIA LTD
ROSEBERY – TASMANIA

DIAMOND DRILL CORE RECORD

653127

HOLE No. NPP 213 1 of 4

LOCATION: Bulgobac, North Pinnalces Area

OBJECTIVE: To test: a) I.P. anomaly 20–30m down hole and b) a geochemical anomaly 80–90m down hole

RESULT: Trace sphalerite and galena occur between 83 and 95m, and between 108m and the end of the hole, No economic mineralisation intersected.

Depth (m)	Direction	Dip.
90	102.5° (true)	-53°

Depth (m)	Direction	Dip.

COLLAR DIP. -60°
DIRECTION 90° True
R.L. 559m
COORDINATES Grid 5,387,300mN 378,440mE
A.M.G. 5,387,296.1mN 378,424mE

TOTAL DEPTH 130.1m
HOLE SIZE NQ 42.0m BQ 130.1m
COMMENCED 11.1.'80
COMPLETED 25.1.'80
LOGGED BY A. Mollison J. Mill

DEPTH (m) FROM	DEPTH (m) TO	ROCK DESCRIPTION (REFER TO SUMMARY OF RESULTS SHEET No A1-521-0042)	MINERALISATION	SAMPLE NO.	FROM	TO	CORE REC'D	ASSAY DATA per ppm: Sample Length	Pb	Zn	Cu	Ag - g/t	Au - g/t	Fe%	Mn	CORE REC'D RUN	CORE REC'D SHORT
0	16	Banded Arkosic Sandstone, Siltstone & Shale Orange-brown & grey, limonitic, consists of 80% sandstone; 35% siltstone & 15% shale Arkosic Sandstone: orange, limonitic, friable and fine grained. Beds upto 0.3m wide. Constituents are: sub-rounded quartz and feldspar grains (up to 1mm) and sparse fragments of grey shale (up to 2cm long) sub-parallel with bedding. Siltstone & Shale: grey to orange, laminated graded interbeds between the sandstone layers. Average width 1cm, up to 5cm. Bedding to Core Axis Angles: at 3.0m - 55° 5.3m - 45° 9.2m - 47° 11.4m - 53° 14.7m - 50°	Pervasively limonite stained. Small quartz veins (up to 3mm wide) occur sporadically. No visible sulphide mineralisation	33010	0	5.0	5.0	5.0	265	240	40			4.20	145	0	
				011	5.0	10.0	5.0	5.0	295	125	20			2.35	230	6.1	-
				012	10.0	15.0	2.4	5.0	205	295	15			2.65	1000	10.6	2.4
																11.3	-
																11.7	-
																13.1	-
																13.6	-
																14.6	0.2
																16.0	0.1
16	29	Pale Grey Sandstone 90% & Laminated Grey Siltstone & Shale Arkosic Sandstone: Pale grey, poorly bedded and consisting of: well rounded quartz grains up to 4mm diameter 35%; sub-rounded pink feldspar grains generally smaller than the quartz grains up to 4mm parallel to bedding up to 3cm long. Laminated Siltstone & Shale : bands approximately 30cm thick containing lamellae of siltstone and fine sandstones up to 1cm thick. Bedding to Core Axis Angles at 22m - 50°	Pervasive limonite staining to 22m No visible mineralisation	33013	15.0	20.0	2.0	Chips at 20 cm intervals	140	505	145			2.35	3100	16.0	-
																17.0	0.7
																17.8	0.1
																19.0	1.0
				014	20.0	25.0	2.0	5.0	120	370	10			1.75	1600	20.5	1.4
				015	25.0	30.0	2.7	Sample intervals	100	240	10			1.90	3200	22.0	1.5
																24.0	1.6
																25.6	1.5
																27.5	1.5
																29.5	-

129

ELECTROLYTIC ZINC CO OF A'ASIA LTD
ROSEBERY – TASMANIA

DIAMOND DRILL CORE RECORD 653128

HOLE No. NPP 213 2 of 4

DEPTH (m) FROM	DEPTH (m) TO	ROCK DESCRIPTION	MINERALISATION	SAMPLE NO.	FROM	TO	CORE REC'D	ASSAY DATA per ppm: Sample Length	Pb	Zn	Cu	Ag - g/t	Au - g/t	Fe%	Mn	CORE REC'D RUN	CORE REC'D SHORT
20	41.5	Interbedded, Siltstone Shale & Arkosic Sandstone Well bedded and laminated grey shale and pale-grey-cream feldspathic sandstone and siltstone. Thicker sandstone units occur between 33.4–34.1m, 36.7–36.9m, 38.8–39.0m 40.3–40.5m and 41.0–41.5m. Sandstone: cream-pale grey feldspathic greywacke with a slightly calcareous groundmass. Well developed graded bedding occurs at 39.8m (fines toward collar) Siltstone and Shale Dark grey well laminated except where associated with coarse sandstone where slumping is common. Bedding to Core Axis Angles at 29.5 – 50° 30.2 – 40° 31.3 – 55° 32.0 – 50° 34.5 – 55° 39.3 – 60° 40.0 – 55°	Minor carbonate veins. Faint trace of dissminated Pyrite in sandstone with carbonate veins	33016	30.0	35.0	5.0	5.0	190	540	15			3.20	2050	29.5	–
				017	35.0	40.0	4.9	5.0	205	545	15			3.40	2350	30.2	–
																32.0	–
																33.0	–
																34.0	–
																34.05	–
																34.9	–
																35.2	–
																35.7	–
																36.5	–
																37.3	–
																37.9	–
																39.3	–
																40.0	0.1
																40.8	–
																42.0	–
41.5	65.5	Interbedded Grey Shale & Siltstone with Fine Grained to Coarse grained Arkosic Greywackes Arkosic Greywackes: pale grey with minor chloritisation. Constituents are : sub-rounded to euhedral feldspar grains up to 3mm diameter 40%; Shale matrix 30%; well rounded quartz grains 20%; shale fragments up to 5cm 10%. Shale & Siltstone: dark grey & generally well laminated. Shale is slumped & fragmented in association with coarse greywacke bands. Bedding to Core Axis Angles at: 42.3 – 45° 58.7 – 50° 47.0 – 45° 60.5 – 47° 51.2 – 55° 64.4 – 55° 54.6 – 55°	Trace pyrite blebs & grains on joint plane and adjacent calcite veins. Calcite veins are common-up to 3 cm wide.	33018	40.0	45.0	4.9	5.0	250	195	25			3.20	2450	41.5	–
				019	45.0	50.0	5.0	5.0	110	335	15			2.70	2300	42.0	–
				33020	50.0	55.0	5.0	5.0	50	220	15			2.60	2350	44.0	0.1
				021	55.0	60.0	5.0	5.0	70	150	15			2.90	2900	47.5	–
				022	60.0	65.0	5.0	5.0	70	205	10			3.15	2600	48.7	–
																50.0	–
																53.5	–
																55.6	–
																60.5	–
																62.5	–
																65.5	–

ELECTROLYTIC ZINC CO OF A'ASIA LTD
ROSEBERY -- TASMANIA

DIAMOND DRILL CORE RECORD 653129

HOLE No. NPP 213 3 of 4

DEPTH (m) FROM	DEPTH (m) TO	ROCK DESCRIPTION	MINERALISATION	SAMPLE NO.	FROM	TO	CORE REC'D	ASSAY DATA per ppm: Sample Length	Pb	Zn	Cu	Ag - g/t	Au - g/t	Fe%	Mn	CORE REC'D RUN	CORE REC'D SHORT
41.5	65.5	Graded bedding, coarsening down hole at 48.0m and 58.3m.															
65.5	78.5	Grey Water Lain Crystal, Lithic Vitric Tuff with Interclasts The constituents are : a) irregular, elongated feldspar fragments up to 5mm long 20% b) irregular quartz grains up to 5mm diameter 20% c) green, chloritised shards after vitric material up to 1cm 10% d) irregular shale fragments up to 10cm long frequently elongate and e) a grey vitric matrix. Thin section sample taken at 71.3m (No 29568) H.W. Fander describes this amples a Rhyolitic Ignimbrite.	Trace blebs of pyrite	33023	65.0	70.0	5.0	5.0	80	170	5			2.45	2350	65.5	-
				024	70.0	75.0	5.0	5.0	110	240	10			2.35	3450	68.5	-
				025	75.0	80.0	5.0	5.0	80	125	30			2.30	2050	71.5	-
																74.5	-
																77.4	-
																78.5	-
				29658	Thin Section Sample taken at 71.3m												
78.5	108.3	Well Laminated Shale, Siltstone & Arkosic Sandstone Shale and siltstone: grey grades cyclically from fine to coarse downhole. Generally very well laminated but slump features common at sandstone-shale contacts. Sandstone: reworked tuffaceous material consiting of feldspar, quartz and shale fragments up to 1mm diameter. Bedding to Core Axis Angle at 80m - 65° 95m - 66° 83m - 65° 97m - 75° 86m - 65° 101.5m - 60° 89m - 65° 104.5m - 65° 92.5m - 75° Good examples of graded beds coarsening downhole occur at 80.5 and 96.4m Thin section sample No 29661 taken at 92.9m is described by Fander as an arkosic psammopellite.	Trace pyrite, sphalerite and galena occur in fine calcite veins up to 3mm wide. Calcite veins occur throughout this unit but are most frequent between 83 and 90m. Sphalerite and galena are therefore most common between 83 and 90m.	33026	80.0	85.0	5.0	5.0	95	265	20			3.45	2150	80.5	-
				027	85.0	90.0	5.0	5.0	565	1350	5			3.40	2550	83.5	-
				028	90.0	95.0	5.0	5.0	280	795	20			3.40	2500	85.9	-
				029	95.0	100.0	5.0	5.0	160	285	25			3.85	2150	89.0	-
				33030	100.0	105.0	5.0	5.0	100	290	30			4.15	2250	92.0	-
				031	105.0	110.0	5.0	5.0	100	170	15			3.85	1800	95.1	-
																97.0	-
																101.5	-
																104.5	-
																108.3	-
																110.5	-
																113.5	-
																119.5	-
																122.5	-
																125.5	-
																128.5	-
																130.1	-

131

ELECTROLYTIC ZINC CO OF A'ASIA LTD
ROSEBERY – TASMANIA

DIAMOND DRILL CORE RECORD

653130

HOLE No. 4 NPP 213 4 of 4

DEPTH (m) FROM	DEPTH (m) TO	ROCK DESCRIPTION	MINERALISATION	SAMPLE NO.	FROM	TO	CORE REC'D	ASSAY DATA per ppm: Sample Length	Pb	Zn	Cu	Ag - g/t	Au - g/t	Fe%	Mn	CORE REC'D RUN	CORE REC'D SHORT
108.3	130.1	Pale Grey Arkosic Sandstone, & Grey Shale Arkosic Sandstone: pale grey, graded and bedded. Unit consists of: a) sub-rounded to irregular white feldspar grains 40% b) rounded quartz grains 30% c) rounded to irregular green chloritic fragments (after vitric shards) 10% and d) dark grey shale fragments. All grains generally less than 3mm. Shale & Siltstone: well laminated bands up to 10cm wide less abundant than sandstone. There are minor carbonate veins, throughout this unit, which may be up to 2cm wide. Bedding to Core Axis Angle at 122.4m – 70° 125.0m – 60° 128.5m – 65° Thin section sample No 29659 was taken at 121.5m. Fender describes it as an arkosic sandstone with rhyolite clasts.	Very minor traces of pyrite and sphalerite occur in association with the carbonate veins in this unit	33032	110.0	115.0	5.0	5.0	100	295	10			2.95	2100	110.5 113.5 119.5 122.5 125.5 128.5 130.1 EOH	– – – – – – –

132

ELECTROLYTIC ZINC CO. OF A'ASIA LTD
ROSEBERY – TASMANIA

DIAMOND DRILL CORE RECORD

653131

HOLE No. NPP 214 1 of 4

LOCATION	Bulgobac, North Pinnacles
OBJECTIVE	To test a Pb geochemical anomaly & contact zone on the western side of the Burns Peak Rhyolite
RESULT	Trace pyrite, galena and sphalerite explain anomalous geochemical values. No economic mineralisation was intersected.

Depth(m)	Direction	Dip.	Depth (m)	Direction	Dip.
100m	-	-53.5°			Grid A.M.G.

COLLAR DIP. -53.5°
DIRECTION 86° 13'
R.L. 600m
COORDINATES 5,387,300N 378,610E
5,387,296.0mN 378,595.6mE

TOTAL DEPTH 142m
HOLE SIZE NQ 130.0m BQ 142.0m
COMMENCED 4. 2. '80
COMPLETED 29. 2. '80
LOGGED BY A. Mollison

DEPTH (m) FROM	DEPTH (m) TO	ROCK DESCRIPTION REFER DDH SUMMARY SHEET A1-521-0053	MINERALISATION	SAMPLE NO.	FROM	TO	CORE REC'D	ASSAY DATA Sample Length	Pb	Zn	Cu	Ag - g/t	Mn per ppm	Fe%	Sn	CORE REC'D RUN	CORE REC'D SHORT
0	13.8	Banded Shale, Siltstone & Arkosic Sandstone Shale & Siltstone Well laminated dark grey, coarsening down-hole to sandstone. Slump features common bands less than 3cm wide. Arkosic Sandstone Pale grey-yellow forms fine lamellae within the shale as well as occasional bands up to 20cm wide. Consists of a) rounded quartz grains 50% b) sub-rounded to a circular feldspar grains 30%, with a matrix of grey shale. Minor quartz veins are present in this unit. Core Angles at 4.8m - 50° Angles of bedding 7.0m - 58° to long core axis 11.1m - 55° 13.7m - 62° Facings 3.6-3.9m graded bedding becoming finer up hole.	Minor blebs of disseminated pyrite in slump fractures.	33033	0	5	3.3	5.0	115	170	10	0.4	750	2.90		0	-
				034	5	10	4.0	5.0	125	950	15	0.7	660	2.20		4.8	1.6
				035	10	15	4.7	5.0	155	315	20	0.8	800	2.70		6.9	0.5
																7.8	-
																11.1	-
																12.8	0.3
																13.8	-
13.8	16.7	Arkosic Sandstone with Clasts of Shale Arkosic Sandstone Poorly bedded yellow greeny grey with considerable variation of grain size up to 4mm for rounded quartz grains. Constituents are: rounded quartz grains 30%; sub-rounded to bladed feldspar grains up to 3mm diam. 30% with a shale matrix minor chloritic fragments. Shale Clasts: irregular lenticular clasts occur within the coarser bands of sandstone where the texture is chaotic. They are up to 5cm long. Quartz veins up to 2cm thich are common in this band. Some contain chlorite.	Minor blebs of disseminated pyrite occur within this band particularly in the coarser zones with most chaotic texture	33036	15	20	5.0	5.0	220	550	15	0.8			x	15.7	-
																16.7	-

133

ELECTROLYTIC ZINC CO OF A'ASIA LTD
ROSEBERY – TASMANIA

DIAMOND DRILL CORE RECORD 653132 HOLE No. NPP 214 2 of 4

DEPTH (m) FROM	TO	ROCK DESCRIPTION	MINERALISATION	SAMPLE NO.	FROM	TO	CORE REC'D	ASSAY DATA per ppm Sample Length	Pb	Zn	Cu	Ag - g/t	Mn	Fe%	Sn	CORE REC'D RUN	SHORT
13.8	16.7	Core Angles: at 14.3m 45° Bedding to 16.7m 53° Long core axis															
16.7	42.5	Banded Shale, Siltstone & Arkosic Sandstone Shale Dark grey well bedded, bands up to 10cm wide, commonly 3mm–10mm wide. Siltstone Grey-grey green, weakly chloritised, forms lamellae within shale up to 10mm wide. Arkosic Sandstone Pale grey-green forms in bands up to 40cm wide commonly 5cm wide. Consists of: rounded-sub rounded quartz grains 30%, sub rounded to angular feldspar grains 20% Chloritic fragments 10–40% with a shale matrix. Occasional quartz veins up to 2cm wide commonly 3mm wide occur throughout the rock particularly in the sandstone. Core Angles at 18.0 60° Bedding to long 21.5 55° Core Axis 25.0 45° 26.0 53° 34.8 30° 36.4 41° 38.6 55° 42.0 60°	Disseminated pyrite occurs throughout this band in trace amounts. Very minor galena occurs as vein fillings. Facings up to collar, graded bedding, slump structures at 23m and 26m	33037 038 039 33040	20 25 30 35	25 30 35 40	5.0 5.0 2.5 4.8	5.0 5.0 5.0 5.0	215 215 360 1250	430 400 710 645	10 15 5 15	0.8 1.0 0.5 0.9	605 665 380 690	2.25 2.80 2.45 2.90	x x x x	16.7 17.4 18.8 22.0 25.0 28.0 31.0 31.7 34.0 37.0 40.0	– – – – – – 1.4 0.3 0.8 – 0.3
42.5	47.5	Grey Ashfall Crystal Vitric Tuff with Interbeds of Shale Tuff Grey vitric matrix forms 70% of rock with white feldspar shards, up to 4mm long of elongate, angular shape. The feldspar grains are evenly spaced through the matrix. There are also occasional yellow-grey soft fragments after pumice up to 2 cm diam. Core axis to bedding angle at 47.5m 45°	No mineralisation	33041	40	45	2.0	5.0	450	1000	10	1.1	2200	3.55	x	42.5 47.5	– 3.0

134

ELECTROLYTIC ZINC CO OF A'ASIA LTD
ROSEBERY – TASMANIA

DIAMOND DRILL CORE RECORD 653133

HOLE No. NPP 214 3 of 4

DEPTH (m) FROM	DEPTH (m) TO	ROCK DESCRIPTION	MINERALISATION	SAMPLE NO.	FROM	TO	CORE REC'D	ASSAY DATA per ppm: Sample Length	Pb	Zn	Cu	Ag - g/t	Mn	Fe%	Sn	CORE REC'D RUN	CORE REC'D SHORT
																47.5	–
47.5	94.0	Banded Grey Shale, Siltstone & Pale Grey Arkosic Sandstone	Occasional blebs of pyrite up to 5mm diameter occur throughout this section.	33042	45	50	5.0	5.0	410	1400	20	1.8	1800	3.30	x	52	–
				043	50	55	5.0	5.0	255	950	10	0.9	800	2.75	x	55	–
		Arkosic Sandstone – pale grey, fine to medium grained. Consists of sub-rounded quartz grains up to 2mm diameter 50%; sub rounded to rectangular white feldspar grains up to 4mm diameter; irregular elongate shale fragments generally 2-5mm long with some chaotic aggregates up to 5cm long in coarser sandstone 10% and chloritic fragments up to 3mm long.		044	55	60	5.0	5.0	285	805	10	0.7	800	2.85	x	61	–
				045	60	65	5.0	5.0	365	1000	10	1.0	700	2.75	x	64	–
				046	65	70	5.0	5.0	405	1050	10	0.8	710	2.40	x	67	–
				047	70	75	5.0	5.0	550	1050	10	0.5	850	2.40	x	70	–
				048	75	80	5.0	5.0	130	240	15	0.4	1000	3.20	x	71.5	–
				049	80	85	5.0	5.0	155	575	10	0.9	680	2.30	x	73	–
				33050	85	90	5.0	5.0	260	560	20	0.8	1400	2.60	x	76	–
				051	90	95	5.0	5.0	250	1150	20	0.7	2500	3.15	x	79	–
				052	95	100	5.0	5.0	165	480	10	0.7	1700	2.70	x	82	–
																85	–
																88	–
		Shale & Siltstone – well laminated, dark grey, some good slump structure giving facings up hole. Shale bands generally 1-5cm wide up to 15cm wide.														91	–
																94	–
																97	–
		Occasional quartz veins, generally 1-5mm wide up to 2cm wide, occur, particularly between 67m and 72m. Chlorite associated with larger quartz veins.	Thin section sample No 29660 was taken at 69m Fander describes it as an arkosic sandstone.														
		Facings 76.3m – graded bedding coarsening downhole. 65.7m load of coarse sandstone in underlying shale.															
		Angles: core axis to bedding at:															
		50.6 50° 73.1 60°															
		55.0 52° 76.8 65°															
		57.1 47° 79.0 70°															
		61.0 45° 81.8 48°															
		64.0 50° 84.8 55°															
		66.2 55° 88.0 42°															
		69.8 45° 91.0 45°															
		72.2 56° 94.0 50°															
94	124.5	Pale Grey Reworked Vitric Crystal Tuff with Shale Interbeds															
		Tuff															
		Pale grey to grey reworked lithic vitric crystal tuff of acid composition. Constituents are: rounded to irregular quartz grains up to 8mm diameter 40%; sub-rounded to euhedral feldspar grains up to 5mm with indistinct grain boundaries 30%;	Oolitic blebs of pyrite (disseminated) occur in trace amounts through out the unit, mainly in the more coarse tuff bands. Blebs are up to 3mm diameter.														

ELECTROLYTIC ZINC CO OF A'ASIA LTD
ROSEBERY – TASMANIA

DIAMOND DRILL CORE RECORD 653134

HOLE No. NPP 214 4 of 4

DEPTH (m) FROM	DEPTH (m) TO	ROCK DESCRIPTION	MINERALISATION	SAMPLE NO.	FROM	TO	CORE REC'D	ASSAY DATA Sample Length	Pb	Zr.	Cu	Ag - g/t	Mn per	Fe ppm	Sn	CORE REC'D RUN	CORE REC'D SHORT
94	124.5	Shale fragments approximately 5mm long up to interbed size 15%; chloritic fragments up to 5mm long 10% and carbonates 5%. Shale Well laminated interbeds to itregular clasts of shale form approximately 15% of this unit. Interbeds may be up to 50cm wide. Carbonate veins are quite common in the tuff and shale Quartz veins also occur both are up to 2cm wide generally 3-5mm wide. Core axis to bedding angles at: 94m 50° 114.3m 60° 97.5m 55° 119.5m 60° 100.0m 70° 124.0m 60° 103.0m 50°	High Pb & Zn concentrations (100-120m) result from galena & sphalerite in veins up to 5mm wide associated with coarse tuffs	33053	100	105	5.0	5.0	190	755	15	0.5	1500	1.80	x	97.0	–
				054	105	110	5.0	5.0	565	1100	5	0.6	1150	1.55	x	100.0	–
				055	110	115	5.0	5.0	215	770	10	0.6	2100	2.35	x	106.0	–
				056	115	120	5.0	5.0	385	1050	10	0.8	1800	2.60	x	109	–
				057	120	125	5.0	5.0	190	395	10	0.4	2200	3.20	x	112	–
																115	–
																118	–
																121	–
																127	–
124.5	142	Fragmental Crystal Vitric Tuff Constituents of this rock unit are: a) equant, sub-rounded feldspar grains with indistinct, welded grain boundaries up to 6mm diameter 50%; b) rounded quartz grains up to 8mm diameter 20%; c) dark grey vitric matrix & d) minor shale clasts up to 3mm long. Quartz veins occur through out this unit and are between 5mm and 2cm wide. This unit appears to be partially silicified and chlorite occurs in quartz veins. Thin section sample T 29668 was described by D. Cowan as a rhyolitic vitric crystal tuff (see CMS report 80/3/21)	Trace disseminated pyrite blebs occur throughout this unit with very minor traces of galena present in quartz veins.	33058	125	129	4.0	4.0	30	110	20	x	1400	2.40	x	124.5	–
					129	142	NOT SAMPLED									127	–
																130	–
																133	–
																136	–
																139	–
																142	–
																EOH	

136

ELECTROLYTIC ZINC CO. OF A'ASIA LTD
ROSEBERY – TASMANIA

DIAMOND DRILL CORE RECORD

653135

HOLE No. NPP 215 1 of 2

LOCATION: Bulgobac, North Pinnacles
OBJECTIVE: To tes: Geochemical and I.P. anomalies
RESULT: The I.P. and Pb geochemical anomalies were adequately tested by the drill hole. No economic mineralisation was intruded.

Depth	Direction	Dip.
60		-53°
90		-55°
120		-52°

Depth	Direction	Dip.
		Grid
		A.M.G.

COLLAR DIP. -55°
DIRECTION 270° True
R.L. 605m
COORDINATES 5,387,100mN 379,310mE
5,387,078mN 379,007mE

TOTAL DEPTH 128.0m
HOLE SIZE NQ 38m BQ 128m
COMMENCED 11.3.'80
COMPLETED 31.3.'80
LOGGED BY J. Mill A Mollison

DEPTH (m) FROM	TO	ROCK DESCRIPTION	MINERALISATION	SAMPLE NO.	FROM	TO	CORE REC'D	ASSAY DATA per ppm: Sample Length	Pb	Zn	Cu	Ag - g/t	Au - g/t	Fe	Mn	CORE REC'D RUN	SHORT
0	4.	Rhyolite orange-grey fine grained porphyritic rhyolite - weathered	Limonitic	29771	0	5	3.0	5.0	365	220	20			3.3%	115	0	-
				772	5	10	2.0	5.0	480	395	20			3.4%	190	2.0	0.4
				773	10	15	2.0	5.0	505	355	20			2.3%	160	3.0	0.3
4	13.5	Rhyolitic Fragmental As above with subtle fragmental texture. Minor chloritised fragments. Porphyritic texture of feldspar, up to 3mm diameter, minor quartz in fine grained ground - mass.	Limonitic	774	15	20	4.8	5.0	850	330	10			1.8%	105	4.0	0.4
				775	20	25	3.0	5.0	2250	355	25			2.4%	70	10	4.0
				776	25	30	3.7	5.0	2150	430	20			2.0%	215	11	0.3
				777	30	35	4.8	5.0	2300	1850	20			2.0%	50	12	0.4
				778	35	40	4.4	5.0	1000	1700	10			8500	70	13	0.4
				779	40	45	5.0	5.0	2450	2950	30			1.2%	105	14	-
13.5	21.5	Rhyolitic Fragmental Dark-pale green mottled texture consisting of dark green chloritic blobs and fiamme like fragments in an orange porphyritic fine grained, ground mass - weathered	Limonitic	29780	45	50	5.0	5.0	3800	1.1%	60			1.9%	330	15	0.5
				781	50	55	4.7	5.0	770	3950	15			1.0%	330	16	-
				782	55	60	4.9	5.0	1400	2550	15			1.8%	415	19	-
				783	60	65	5.0	5.0	1400	2700	20			1.9%	565	20	0.2
				784	65	70	5.0	5.0	2950	4100	25			1.3%	520	22	0.3
21.5	30.1	Rhyolitic Breccia Orange porphyritic rhyolite, brecciated in places, fragments up to 6cm diameter. Feldspar and quartz phenocrysts up to 3mm diameter in a fine grained feldsparphyric matrix.	Limonite stained joints and local manganese staining	785	70	75	5.0	5.0	185	360	10			4650	300	23	1.6
				786	75	80	4.0	5.0	310	590	10			6200	460	28	0.9
				787	80	85	5.0	5.0	250	900	5			4800	320	30	0.3
				788	85	90	5.0	5.0	2000	3100	20			5200	475	31	0.1
				789	90	95	5.0	5.0	2900	1.05%	55			1.1%	730	34	0.2
				29790	95	100	4.8	5.0	3500	4900	45			6950	660	37	0.1
30.1		Base of complete oxidation.		791	100	105	5.0	5.0	1650	7350	20			1.0%	1200	38.5	0.5
				792	105	110	4.5	5.0	465	850	5			2.7%	1250	41.5	0.8
																44.5	-
30.1	64	Rhyolite Breccia Grey to pale green & pink fragments of occasionally banded rhyolite in a matrix of quartz, feldspar and chlorite. Feldspar locally incipiently epidotised.	Disseminated pyrite occurs as vein infillings up to 10% of core volume, average 1-3% associated with fine grained traces of galena & sphalerite. Disseminated pyrite occurs in trace amounts within rhyolite.													49.5	-
																50.5	-
				33059	34			Thin section sample				Rhyolitis or trachytic lava weakly mineralised.				51.5	0.3
																53.5	-
				33060	70.5			"	"	"		Porphyritic trachyte (or rhyolite)				54.3	-
																56.5	-
				061	92.5			"	"	"		Porphyritic Quartz Trachyte				57.5	0.1
																58.5	-
64	92	Rhyolite grey-pale green massive porphyritic, siliceous rhyolite. Small phenocrysts of feldspar in a fine grained siliceous ground-mass. Locally subtley flow banded ie 86.5-87.5m. Epidote and chlorite alteration on fractures, particularly epidotised at 64m	Trace fine grained galena and sphalerite as fracture filling up to 1% betwee 88.5-92m. 64-88.5 The rhyolite itself is virtually unmineralised except for fine trace pyrite throughout and occasional blebs of sphalerite.	062	98			"	"	"		Mineralised porphyritic rhyolite				60.5	-
																63.5	-
				063	107.4			"	"	"		Altered quartz-trachyte				66.5	-
																67.5	-
																69.5	-
						SEE	C.M.S. REPORT 80/4/24									72.5	-
																74.8	-

137

ELECTROLYTIC ZINC CO OF A'ASIA LTD
ROSEBERY – TASMANIA

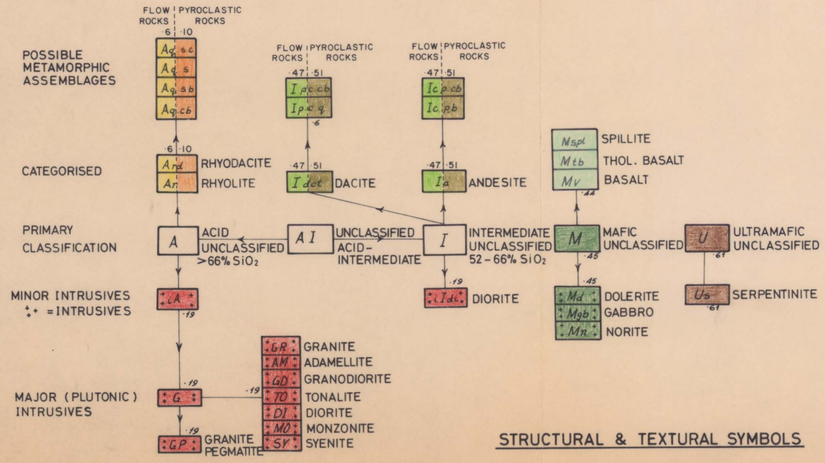
DIAMOND DRILL CORE RECORD

653136

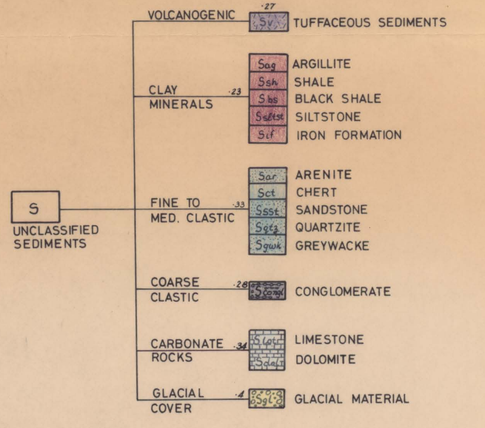
HOLE No. NPP 215 2 of 2

DEPTH (m) FROM	DEPTH (m) TO	ROCK DESCRIPTION	MINERALISATION	SAMPLE NO.	FROM	TO	CORE REC'D	ASSAY DATA per ppm: Sample Length	Pb	Zn	Cu	Ag - g/t	Au - g/t	Fe	Mn	CORE REC'D RUN	CORE REC'D SHORT
																77.5	1.0
92	93	Rhyolitic Fragmental dark green slightly cleaved epidotised banded rhyolitic fragmental.	Trace fine grained galena & sphalerite on shear faces	29793	110	115	5.0	5.0	710	1050	15			2.4%	1100	78.5	–
			Trace disseminated pyrite fine grained.	794	115	120	3.9	5.0	480	2950	40			1.0%	950	81.5	–
				795	120	125	4.6	5.0	350	535	5			7250	1200	84.5	–
				796	125	128	4.7	3.0	370	780	5			1.2%	1400	87.5	–
93	106.5	Rhyolite pale grey fractured porphyritic siliceous rhyolite minor quartz and carbonate veins.	Trace sphalerite & galena associated with tension fractures with occasional chalcopyrite. Up to 2% total sulphides.													88.5	–
																90.5	–
																93.5	–
				33062	98		Thin	section sample								96.5	0.2
				063	110		"	"		"		Mineralised rhyolite				102.5	–
			Trace disseminated pyrite in ground mass.	064	125		"	"		"		Rhyolite lava-				108.5	0.5
												breccia				111.5	–
																114.5	–
106.5	109.5	Trachy-rhyolite olive green porphyritic cleaved (flow banded?) trachy-rhyolite intrusive? Phenocrysts of feldspar. Fragments of siliceous rhyolite. Fine grained olive green matrix	Trace dissemination pyrite, quartz and carbonate veins.													117.5	0.9
																120.5	0.3
																123.5	0.4
																126.5	0.3
																128	–
109.5	121.4	Rhyolite dark grey porphyritic locally brecciated massive siliceous rhyolite cut by quartz and carbonate veins up to 2cm wide.	Well mineralised upto 10% pyrite by volume in fractures and disseminated throughout rhyolite. Up to 2% galena & sphalerite associated with late stage fracturing and veining. Mineralisation less concentrated with depth														
121.4	128	Rhyolite Breccia grey-pale green-pink mottled rhyolite breccia consisting of fragments of porphyritic siliceous rhyolite up to 8cm in length in a fine grained matrix of smaller fragments, sericite, chlorite. Slightly epidotised in places.	Trace disseminated pyrite and galena.														

IGNEOUS ROCKS



SEDIMENTARY ROCKS



STRUCTURAL SYMBOLS

- FAULT
- DEFINITE CONTACT OR OUTCROP LIMIT
- APPROXIMATE CONTACT OR RUBBLE BOUNDARY
- INTERPRETED CONTACT OR FLOAT BOUNDARY
- SCHISTOSE ZONE
- UNCONFORMITY
- BEDDING
- OVERTURNED BEDDING
- CLEAVAGE
- PRIMARY FOLIATION
- JOINTING
- PLUNGE
- FOLD AXIS PLUNGE
- FACING

STRUCTURAL & TEXTURAL SYMBOLS

- t UNDIFERENTIATED TUFF
- lt LITHIC TUFF
- xt CRYSTAL TUFF
- vt VITRIC TUFF
- lpt LAPILLI TUFF 4-32mm.
- b BRECCIA >32mm.
- ag AGGLOMERATE >32mm.
- bm BOMBS
- fm (3) FIAMME (LENGTH IN cms.)
- pm PUMICE
- ash ASH FLOW
- qfeld QUARTZ EYES/AUGEN TEXTURE
- pil PILLOWS
- fb FLOW BANDING
- fbr FLOW BRECCIA
- LAVA
- a AMYGDALOIDAL
- s SPHERULITIC
- p PORPHYRITIC
- cl CLOTS
- ac ACICULAR
- oph OPHITIC
- CHILLED MARGIN
- pg PEGMATIC
- vns VEINS
- m MASSIVE
- clvd CLEAVED
- sch SCHIST
- ox OXIDISED
- lat LATERITE
- bd BEDDED
- x bd CROSS BEDDED
- THbd THICK BEDDED
- thbd THIN BEDDED
- lam LAMINATED
- gd GRADED OR DIRECTION OF DECREASING GRAIN SIZE
- LODE CAST
- sf SCOUR & FILL
- ves VESICULAR
- jtd JOINTED
- stain STAINING
- ash FALL

IGNEOUS GRAIN SIZE

- vcg VERY COURSE GRAINED >5 cm
- cg COARSE GRAINED 5cm-5mm
- mg MEDIUM GRAINED 5mm-1mm
- fg FINE GRAINED <1mm

SILICATE MINERALOGY

- q QUARTZ
- k K-FELSPAR
- ab ALBITE
- p PLAGIOCLASE
- a AMPHIBOLE
- px PYROXENE
- b BIOTITE
- c CHLORITE
- cb CARBONATE
- s SERICITE
- e EPIDOTE
- t TALC
- ba BARITE (STAEDTLER 104-10)
- f FELSPAR
- hb HORNBLENDE
- sd SIDERITE

- a'b ALBITISED
- cb'd CARBONATED
- c'd CHLORITISED
- s'd SERICITISED
- Si SILICIFIED

SULPHIDE & OXIDE MINERALOGY

- bx BOXWORK
- sul SULPHIDES
- gos GOSSAN (ERD 1/N)
- pn PENTLANDITE
- hm HEMATITE
- cc CHALCOCITE
- cv COVELLITE
- bn BORNITE
- cp CHALCOPYRITE
- sp SPHALERITE
- ga GALENA
- po PYRRHOTITE
- py PYRITE
- il ILLMENITE
- lx LEUCOXENE
- mag MAGNETITE

MINERALISATION

- DISS 10% DISSEMINATED (STAEDTLER 104-2)
- DISS 10-20% "
- DISS ~25% "
- STR STRINGER
- MAS MASSIVE

COLOURS

- ple PALE
- dk DARK
- pk PINK
- rd RED
- org ORANGE
- yel YELLOW
- ol OLIVE
- grn GREEN
- bl BLUE
- gry GREY
- blk BLACK
- brn BROWN
- wht WHITE
- crm CREAM
- purp PURPLE

TOPOGRAPHICAL SYMBOLS

- WATER RACE
- FENCE
- FORMED ROAD
- TRACK
- RAILWAY
- RAILWAY (ABANDONDED)
- RIVER
- STREAM
- LAKE
- SWAMP
- BUILDING
- POWERLINE
- TRIG. STATION
- HILL (BALD HILL)
- SHAFTS
- ADIT
- TRENCH
- MINE OR QUARRY
- DRILL HOLE - BARREN
- DRILL HOLE - COLOUR FOR MINERALISATION
- (i) DRILL HOLE - SIGNIFICANT OR POSSIBLE ORE GRADE AND WIDTH (STAEDTLER 104-2)
- (ii) DRILL HOLE - MINOR OR POSSIBLE SUB-ORE GRADE MINERALISATION (STAEDTLER 104-10)
- DRILL HOLE - FAILED TO REACH TARGET

OPERATION OF LEGEND

DESCRIBING ROCK UNITS

1. CAPITAL LETTER - INDICATES PRIMARY CLASSIFICATION eg S = SEDIMENTARY ROCKS, A = ACID IGNEOUS ROCKS
2. LOWER CASE LETTERS - INDICATES THE FOLLOWING:

2i AS PREFIXES IN PROGRESSIVE ORDER

(a) COLOURS eg (i) grn M = GREEN MAFIC IGNEOUS ROCK

(ii) pk/grn A = PINK FRAGMENTS OR PHENOCRYSTS IN AN ACID IGNEOUS ROCK WITH A GREEN MATRIX

(b) STRUCTURAL OR TEXTURAL FEATURES

eg wx.t.A. = CRYSTAL TUFF OF ACID COMPOSITION

(ii) x b d.S. = CROSS BEDDED SEDIMENTARY ROCK

2ii AS SUFFIXES IN PROGRESSIVE ORDER

(a) CATEGORISED: e.g. (i) Ar = RHYOLITE; (ii) Ssh = SHALE;

(b) MINERALOGY: e.g. (i) pAr.s. = RHYOLITE WITH FELSPAR PHENOCRYSTS.

(ii) Ag.s = QUARTZ SERICITE ROCK OF ACID IGNEOUS ORIGIN

(iii) Ar.a'b = ALBITISED RHYOLITE

EXAMPLE - pk/grn. clvd. x.v.t. A.rd. ab. c'd

pk/grn (COLOURS) - PINK CRYSTALS IN A GREEN MATRIX; clvd (STRUCTURAL FEATURE) - CLEAVED; x.v.t. (TEXTURE) - CRYSTAL VITRIC TUFF; A (PRIMARY SUBDIVISION) - ACID IGNEOUS ROCK; rd. (CATEGORISED) - RHYODACITE; a.b. (PRIMARY MINERALOGY) - ALBITE PHENOCRYSTS; c'd. (ALTERATION MINERALOGY) - CHLORITISED.

10 = COLOUR OF CUMBERLAND "DERWENT" N° 19 PENCIL

ELECTROLYTIC ZINC CO. OF A'ASIA. LTD.	
PROJECT: MT. BLACK	TAS.
GEOLOGICAL LEGEND FOR EXPLORATION MAPPING	
DATE: 10/75 REVISED: 12/78	REF. NO. PLATE 17

80-1461

653137 2838

380 000 mE

390 000 mE

5 400 000 mN

BULGOBAC E.L. 12/72

to Burnie

EMU BAY RAILWAY

Harfield River

Que River

Que River Grid

QUE RIVER
Pb, Zn, Cu

Que River

Silver Falls
Extension Grid

Access Track

SOCK CREEK
Pb, Zn

Northern HIGHWAY

MURCHISON

MT. CHARTER
Ba

Bulgobac River

5 390 000 mN

SILVER FALLS
Pb, Zn

North Pinnacles Grid

NPP 213

NPP 214

NPP 215

BOCO SIDING

Boco Grid

BP 209

BP 207

BP 208

BURNS PEAK
Pb, Zn

to Chester Mine, H.E.C. Road

PINNACLES
Pb, Zn

MT. BLACK
E.L. 1/62

to Tullah 6 km

5 380 000 mN

LEGEND

- Line Cut, Pegged, Soil Sampled and Geologically Mapped
- Line I.P. Dipole - dipole
- D.D.H. Track Bulldozed, Rock Sampled and Geologically Mapped
- Area Covered by Stream Sediment Sampling
- Diamond Drill Holes Completed
- Soil Profile Test Pit

ELECTROLYTIC ZINC CO. OF A'ASIA LTD.

PROJECT: BULGOBAC E.L. 12/72 | TAS.

C53138

EXPLORATION COMPLETED

OCTOBER 1979 - JUNE 1980

5 cm

SCALE: 1 : 50,000	Survey: A.J.M.	Revised:
Reference:	Date: 28. 7. 80	REF. No.
Drawn: R.P.T.	Checked:	A2 - 521 - 0060

80-1461

2837

NOTE : No survey control exists for the Silver Falls Extension Grid. The grid has been plotted 60mE of co-ordinate numbers to correlate with the topography.

5 394 000 mN
5 393 000 mN
5 392 000 mN
5 391 000 mN
5 390 000 mN
5 389 000 mN
5 388 000 mN
5 387 000 mN
5 386 000 mN

375 000 mE
376 000 mE
377 000 mE
378 000 mE
379 000 mE
380 000 mE
381 000 mE
382 000 mE
383 000 mE
384 000mE
385 000 mE

SILVER FALLS

E.L. 12/72

NPP213
NPP214
NPP215

1	2
3	4
5	6
28	7
8	
30	9
10	
32	11

NB. This plan supersedes a full topo version drawn up 28.1.76, reference number also AO-525-0012, which is now suitably inferred in the vault.

ELECTROLYTIC ZINC CO. OF A'ASIA. LTD.

PROJECT: BULGOBAC E.L.12/72 | TAS.

GEOLOGY

053139

5 cm

SCALE: 1:10,000	Survey: J.M.	Revised: 29.7.80
Reference:	Date: 14.5.80	REF NO.
Drawn: R.P.T.	Checked:	AO-525-0012

80-1461

E Z PLAN CABINET TRIM LINE

A0 TRIM LINE

SILVER FALLS EXTENSION GRID

ABERFOYLE SILVER FALLS GRID

NORTH PINNACLES GRID

BOCO GRID

5 394 000 mN
5 393 000 mN
5 392 000 mN
5 391 000 mN
5 390 000 mN
5 389 000 mN
5 388 000 mN
5 387 000 mN
5 386 000 mN

374 000 mE
375 000 mE
376 000 mE
377 000 mE
378 000 mE
379 000 mE
380 000 mE
381 000 mE
382 000 mE
383 000 mE
384 000 mE

E.L. 12/72

	1	2	
	3	4	
	5	6	
28	7	8	
30	9	10	
32	11		

Pb LEGEND

1000 p.p.m.
500 p.p.m.
200 p.p.m.

ELECTROLYTIC ZINC CO. OF A'ASIA. LTD.

PROJECT: BULGOBAC E.L. 12/72 | TAS.

C53140

SOIL GEOCHEMISTRY : Pb

5 cm

SCALE:	Survey: A.J.M.	Revised:
Reference:	Date: 20.5.80	REF. NO.
Drawn: R.W.	Checked:	A0-525-0102

2840

80-1401

E.Z. PLAN CABINET TRIM LINE

2940

SILVER FALLS EXTENSION GRID

ABERFOYLE SILVER FALLS GRID

NORTH PINNACLES GRID

BOCO GRID

E.L. 12/72

5 394 000 mN
5 393 000 mN
5 392 000 mN
5 391 000 mN
5 390 000 mN
5 389 000 mN
5 388 000 mN
5 387 000 mN
5 386 000 mN

375 000 mE
376 000 mE
377 000 mE
378 000 mE
379 000 mE
380 000 mE
381 000 mE
382 000 mE
383 000 mE
384 000 mE
385 000 mE

28	1	2	
30		4	
32	5	6	
	7	8	
	9	10	
	11		

Zn LEGEND

1000 p.p.m.
500 p.p.m.
200 p.p.m.

ELECTROLYTIC ZINC CO. OF A'ASIA. LTD.

PROJECT: BULGOBAC E.L. 12/72 | TAS.

653141

SOIL GEOCHEMISTRY : Zn

5 cm

SCALE:	Survey: A.J.M.	Revised:
Reference:	Date: 20.5.80	REF. NO.
Drawn: R.W.	Checked:	A0-525-0103

SO-11461

E Z PLAN CABINET TRIM LINE

A0 TRIM LINE

2841

2841

SILVER FALLS EXTENSION GRID

ABERFOYLE SILVER FALLS GRID

NORTH PINNACLES GRID

BOCO GRID

E.L. 12/72

5 394 000 mN
5 393 000 mN
5 392 000 mN
5 391 000 mN
5 390 000 mN
5 389 000 mN
5 388 000 mN
5 387 000 mN
5 386 000 mN

374 000 mE
375 000 mE
376 000 mE
377 000 mE
378 000 mE
379 000 mE
380 000 mE
381 000 mE
382 000 mE
383 000 mE
384 000 mE
385 000 mE

	1	2	
		4	
	5	6	
28	7	8	
30	9	10	
32	11		

Cu LEGEND

100 p.p.m.
50 p.p.m.

ELECTROLYTIC ZINC CO. OF A'ASIA. LTD

PROJECT: BULGOBAC E.L. 12/72 | TAS.

653142

SOIL GEOCHEMISTRY : Cu

5 cm

SCALE:	Survey: A.J.M.	Revised:
Reference:	Date: 20.5.80	REF. NO.
Drawn: R.W.	Checked:	AO-525-0104

2842

E.Z. PLAN CABINET TRIM LINE

2842

A0 TRIM LINE

SILVER FALLS
EXTENSION GRID

NORTH PINNACLES
GRID

E.L. 12/72

5 394 000 mN
5 393 000 mN
5 392 000 mN
5 391 000 mN
5 390 000 mN
5 389 000 mN
5 388 000 mN
5 387 000 mN
5 386 000 mN

372 000 mE
377 000 mE
378 000 mE
379 000 mE
380 000 mE
381 000 mE
382 000 mE
383 000 mE
384 000 mE
385 000 mE

LEGEND

Pb, Zn
Cu, Co
Mn, Fe

NOTES

1. Samples collected from the North Pinnacles and Silver Falls Extension Grids were taken where active streams cross grid lines.
2. Samples were sieved to -80# analysed for Cu, Pb, Zn, Co, Mn, Fe after perchloric/nitric acid digestion.

1	2		
	4		
5	6		
28	7	8	
30	9	10	
32	11		

Pb	Zn	Cu	
			50 - 99 ppm
			100 - 199 ppm
			> 199 ppm

5 cm

ELECTROLYTIC ZINC CO. OF A'ASIA. LTD.

PROJECT: BULGOBAC E.L. 12/72 TAS.

STREAM SEDIMENT SAMPLES

- 80 #

653143

Pb

SCALE 1:10,000	Survey: A.J.M.	Revised: 3.6.80
Reference:	Date 24.1.80	REF. NO.
Drawn: R.P.T.	Checked:	AO-525-0065

2843

80-1461

E Z PLAN CABINET TRIM LINE

A0 TRIM LINE

SILVER FALLS
EXTENSION GRID

NORTH PINNACLES
GRID

E.L. 12/72

5 394 000 mN
5 393 000 mN
5 392 000 mN
5 391 000 mN
5 390 000 mN
5 389 000 mN
5 388 000 mN
5 387 000 mN
5 386 000 mN

375 000 mE
376 000 mE
377 000 mE
378 000 mE
379 000 mE
380 000 mE
381 000 mE
382 000 mE
383 000 mE
384 000 mE
385 000 mE

LEGEND

Pb, Zn
Cu, Co
Mn, Fe

NOTES

1. Samples collected from the North Pinnacles and Silver Falls Extension Grids were taken where active streams cross grid lines.
2. Samples were sieved to -80# analysed for Cu, Pb, Zn, Co, Mn, Fe after perchloric/nitric acid digestion.

1	2	
3	4	
5	6	
28	7	8
30	9	10
32	11	

Pb	Zn	Cu	
			50 - 99 ppm
			100 - 199 ppm
			> 199 ppm

5 cm

ELECTROLYTIC ZINC CO. OF A'ASIA. LTD.

PROJECT: BULGOBAC E.L. 12/72 | TAS.

653144

STREAM SEDIMENT SAMPLES

- 80 #

Zn

SCALE: 1:10,000	Survey: A.J.M.	Revised: 3.6.80
Reference:	Date: 24.1.80	REF NO.
Drawn: R.P.T.	Checked:	AO-525-0065

2844

80-1461

EZ PLAN CABINET TRIM LINE

AO TRIM LINE

E.L.12/72

Silver Falls
Extension Grid

a = 100m

Aberfoyle
Silver Falls Grid

Contours are Percent
Frequency Effect not
Chargeability

North Pinnacles Grid

E.L.12/72

E.L.12/72

Boco Grid

5 394 000 mN
5 393 000 mN
5 392 000 mN
5 391 000 mN
5 390 000 mN
5 389 000 mN
5 388 000 mN
5 387 000 mN
5 386 000 mN

374 000 mE
375 000 mE
376 000 mE
377 000 mE
378 000 mE
379 000 mE
380 000 mE
381 000 mE
382 000 mE
383 000 mE
384 000 mE
385 000 mE

NOTES:

1. Chargeability contours (millivolts / volt) compiled from following Gradient Array Surveys:

   a) Boco Grid – Scintrex 1976, see report TAS 033, Oct – Nov. 1976.
   Extended Scintrex 1978, see report TAS 051, May 1978.

2. All dipole – dipole anomalies defined on basis of chargeability or frequency effect values.

3. Dipole – dipole spreads compiled from the following surveys:

   a) Boco Grid – Scintrex 1978, 1979 (Time domain) see reports TAS 051, May 1978 and TAS 065, Aug 1979.

   b) North Pinnacles Grid – Scintrex 1979 (Time domain) see reports TAS 065, Aug 1979, TAS 065 July 1979 and TAS 065 19 Nov. 1979

   c) Silver Falls Grid – Aberfoyle 1979 (Freq. domain) (Aberfoyle) From plate MOC 16, report for year ending August 1979.

   d) Silver Falls Extension Grid – Scintrex 1979 (Time domain) see report TAS 065 Jan. 1980

   e) For details of Schlumberger arrays SX 1, SX 2 and SX 3, refer to Scintrex Report TAS-033 Oct./Nov. 1976.

4. Silver Falls Extension Grid, Silver Falls Grid, Boco Grid, North Pinnacles Grid : see notes on plan AO-525-0067.

LEGEND

- Dipole-dipole spread showing Electrode interval.
- Location of Definite Anomalies. (Primary and or secondary anomalies)
- Location of possible Anomalies. (Tertiary anomalies)
- Contours of chargeability in MV/V.
- centre of array — Schlumberger arrays, line surveyed, 15m depth to source of anomaly.

1	2	
	4	
	5	6
28	7	8
30	9	10
32	11	

ELECTROLYTIC ZINC CO. OF AASIA. LTD.

PROJECT: BULGOBAC EL. 12/72 | TAS.

653145

INDUCED POLARIZATION

5 cm

SCALE: 1:10,000	Survey: J.M.	Revised:
Reference:	Date: 17.7.79	REF. NO.
Drawn: R.P.T.	Checked:	AO-525-0033

2845

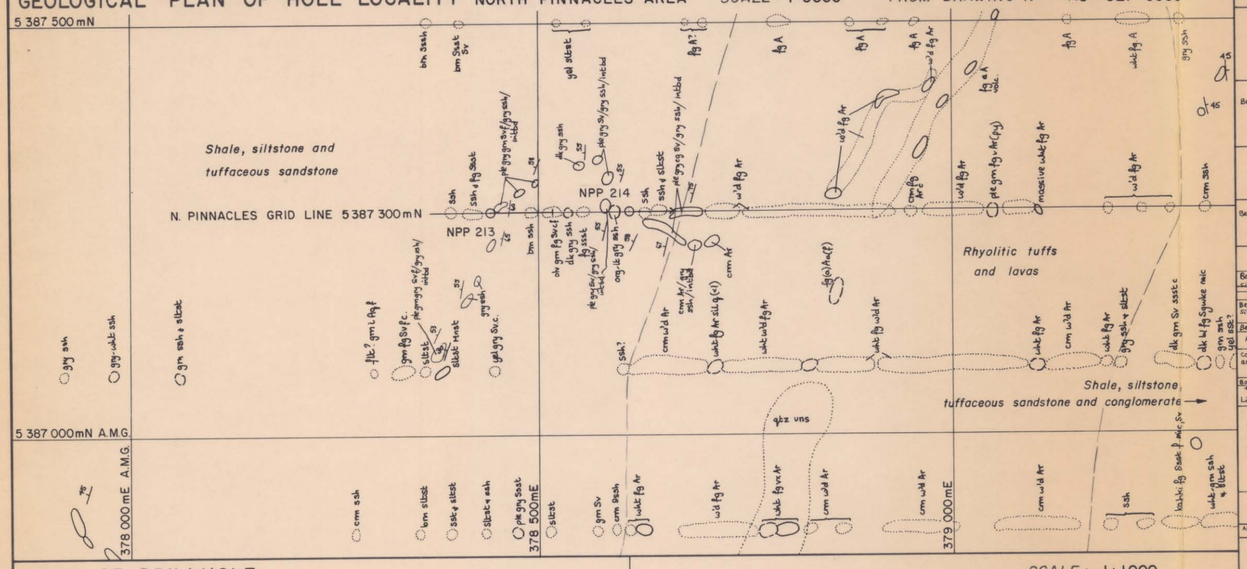
80-1461

2845

E.Z. PLAN CABINET TRIM LINE

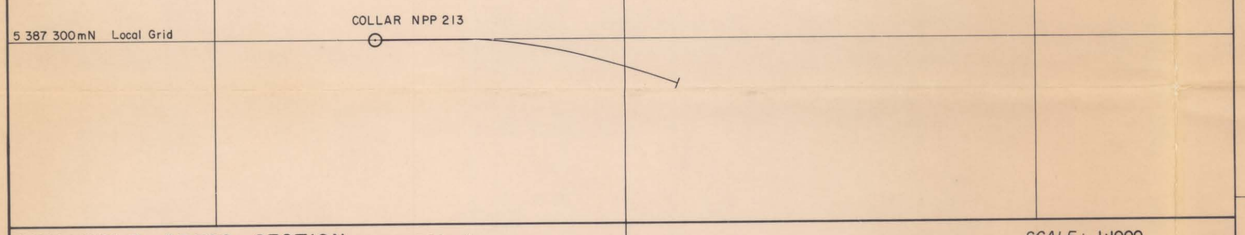
GEOLOGICAL PLAN OF HOLE LOCALITY NORTH PINNACLES AREA

SCALE: 1:5000 FROM DRAWING NO: AO - 521 - 0033



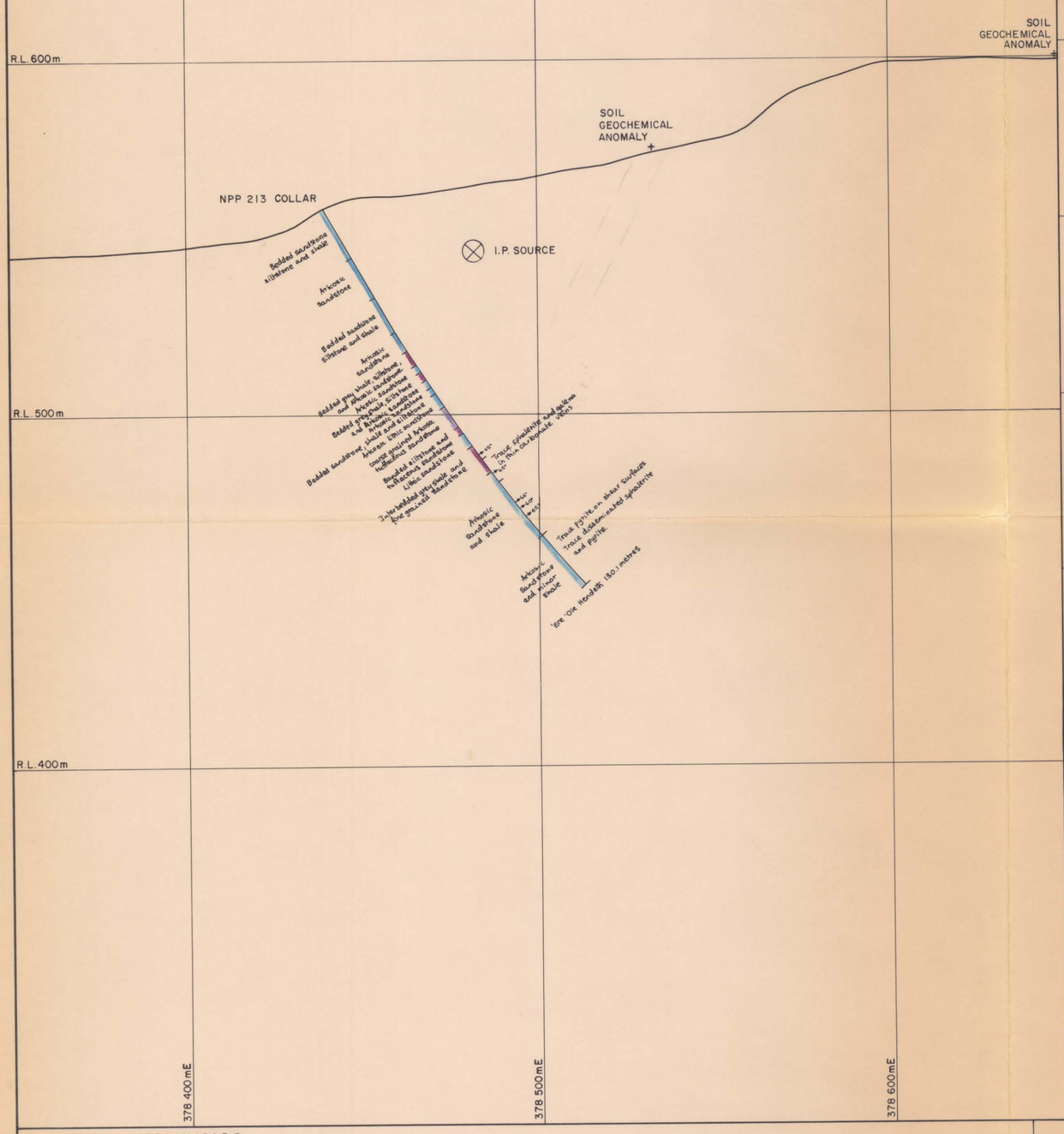
PLAN OF DRILLHOLE

SCALE: 1:1000

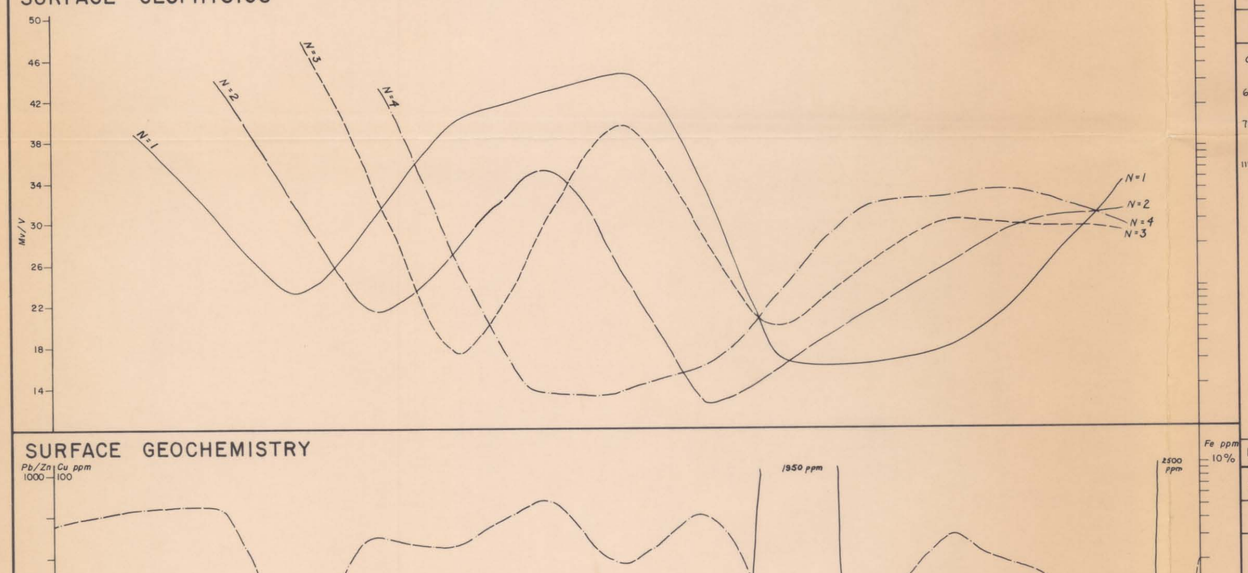


DRILLHOLE CROSS SECTION 5 387 300 mN

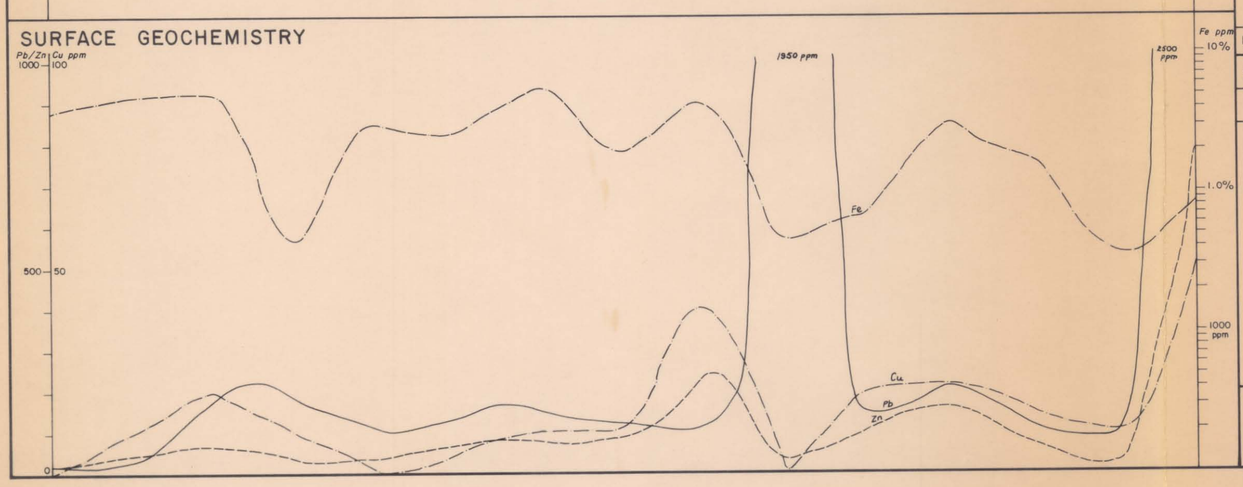
SCALE: 1:1000



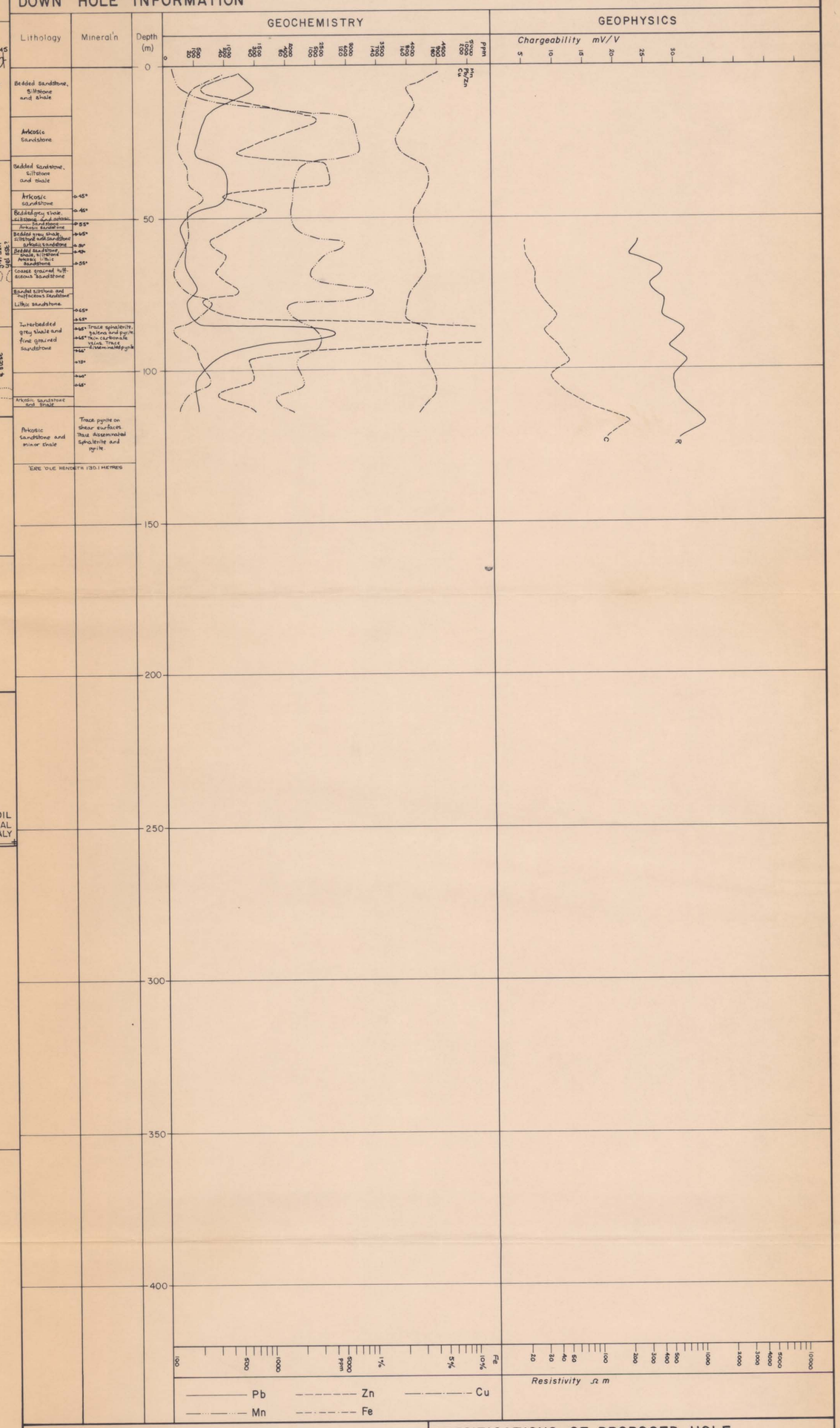
SURFACE GEOPHYSICS



SURFACE GEOCHEMISTRY



DOWN HOLE INFORMATION



SUMMARY OF COMPLETED HOLE

CO-ORDINATES	NORTHING	EASTING	R.L.
LOCAL GRID North Pinnacles	5387300 mN	378 440 mE	559 m
A.M.G.	5 387 296.1	378 424.5	

AZIMUTH: 90° A.M.G. DIP: -60° TOTAL DEPTH: 130.1 m

COMMENCEMENT DATE: 11.1.1980 COMPLETION DATE: 25.1.1980

INTERNAL SURVEY INFORMATION

DEPTH	AZIMUTH	DIP	DEPTH	AZIMUTH	DIP
90 m	102.5° (TRUE)	-53°			

HOLE SIZE	FROM	TO	HOLE SIZE	FROM	TO
NQ	0.0 m	42.0			
BQ	42.0	130.1			

DRILLED GEOLOGY (SUMMARISED)

DEPTH (m)	LITHOLOGY	MINERALISATION AND SIGNIFICANT ASSAYS
0-65.5	Interbedded grey shale, siltstone and arkosic sandstone	Nil.
65.5-79.1	Coarse grained lithic feldspathic sandstone and minor shale. Tuffaceous.	Nil.
79.1-111.5	Laminated shale and fine grained arkosic sandstone.	84.0-92.0m trace sphalerite, galena and pyrite associated with minor carbonate veining.
111.5-130.1	Arkosic sandstone and minor grey shale.	111.5-130.1m trace pyrite on shear surfaces and trace disseminated sphalerite and pyrite in sandstone.

LOGGED BY: A.M., J.M. DATE:

SAMPLE DATA

SAMPLED INTERVAL	SAMPLE NUMBERS	SAMPLE TYPE	ELEMENTS DETERMINED	LAB. METHOD
0-110.0 (5m intervals)	33010-33031	CHIP	Pb, Zn, Cu, Fe, Mn	A.A.S.
110.0-113.5	33032	"	"	"

NOTES:

THIS HOLE IS PLOTTED ON LOCAL GRID CO-ORDINATES, NOT A.M.G.

(N.B. A.M.G. is the abbreviation for Australian Metric Grid.)

SPECIFICATIONS OF PROPOSED HOLE

CO-ORDINATES	NORTHING	EASTING	R.L.
LOCAL GRID North Pinnacles	5 387 300 mN	378 440 mE	559 m
A.M.G.			

AZIMUTH: 077.5° mag. DIP: -60° DESIGNED DEPTH: 200 m

ESTIMATED COMMENCEMENT: November 1979

ANTICIPATED GEOLOGY

DEPTH	LITHOLOGY	NATURE OF TARGET AND ANTICIPATED DEPTH
0-152m	Interbedded shale, siltstone and tuffaceous sandstone.	Discrete I.P. response in sediments at 67.0m down hole.
152-200m	Massive rhyolitic flows and pyroclastics.	Geochem anomaly associated with sedimentary volcanic contact at 152m downhole.

DESIGNED BY: J.M., A.M. DATE: November 1979

AIM OF HOLE:

To evaluate the cause of I.P. and geochemical anomalies associated with the Burns Peak Rhyolite and flanking sediments.

NOTES:

DDH NPP 213 was stopped short of its projected depth because both I.P. and soil geochemical anomalies have been adequately tested by the hole. DDH NPP 214 will be collared at 378610 mE, 5 387 300 mN to test a soil geochem anomaly at 378 648 mE and the sediment/volcanic contact.

5 cm

ELECTROLYTIC ZINC CO. OF A'ASIA LTD.

PROJECT: BULGOBAC E.L. 12/72 TAS.

SPECIFICATIONS AND SUMMARY OF RESULTS

EXPLORATION DIAMOND DRILL HOLE No. NPP 213

653146

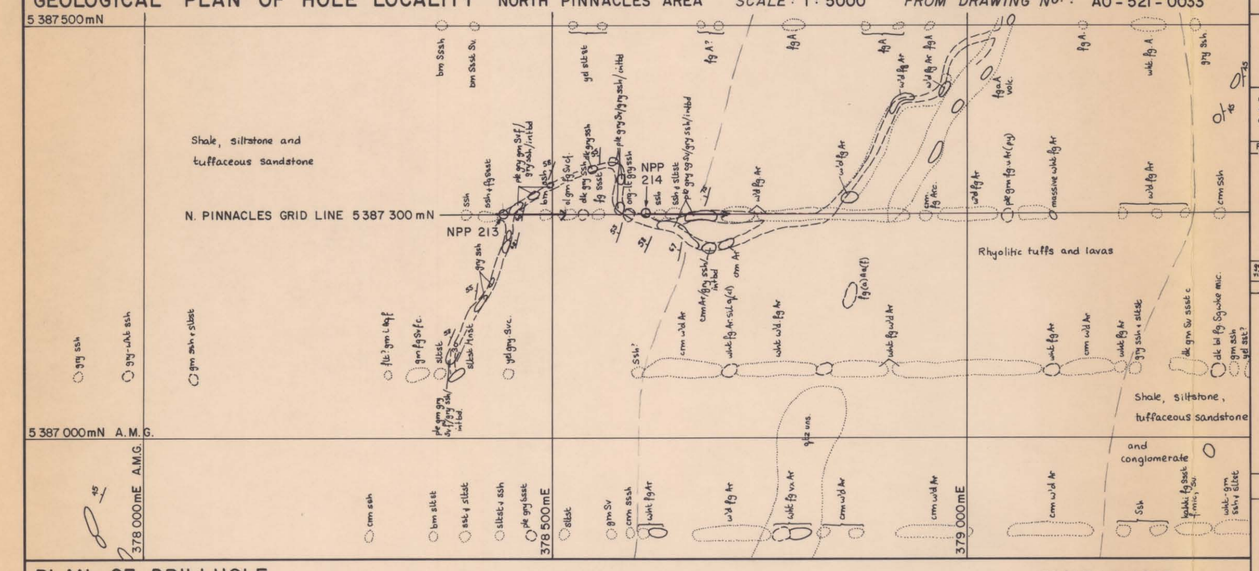
SCALE: As shown	Survey: J.M.	Revised: 30.5.80
Reference:	Date: 26.11.79	REF. No.
Drawn: R.P.T.	Checked:	AI - 521 - 0042

80-1461

2846

GEOLOGICAL PLAN OF HOLE LOCALITY

NORTH PINNACLES AREA SCALE: 1:5000 FROM DRAWING NO.: A0-521-0033

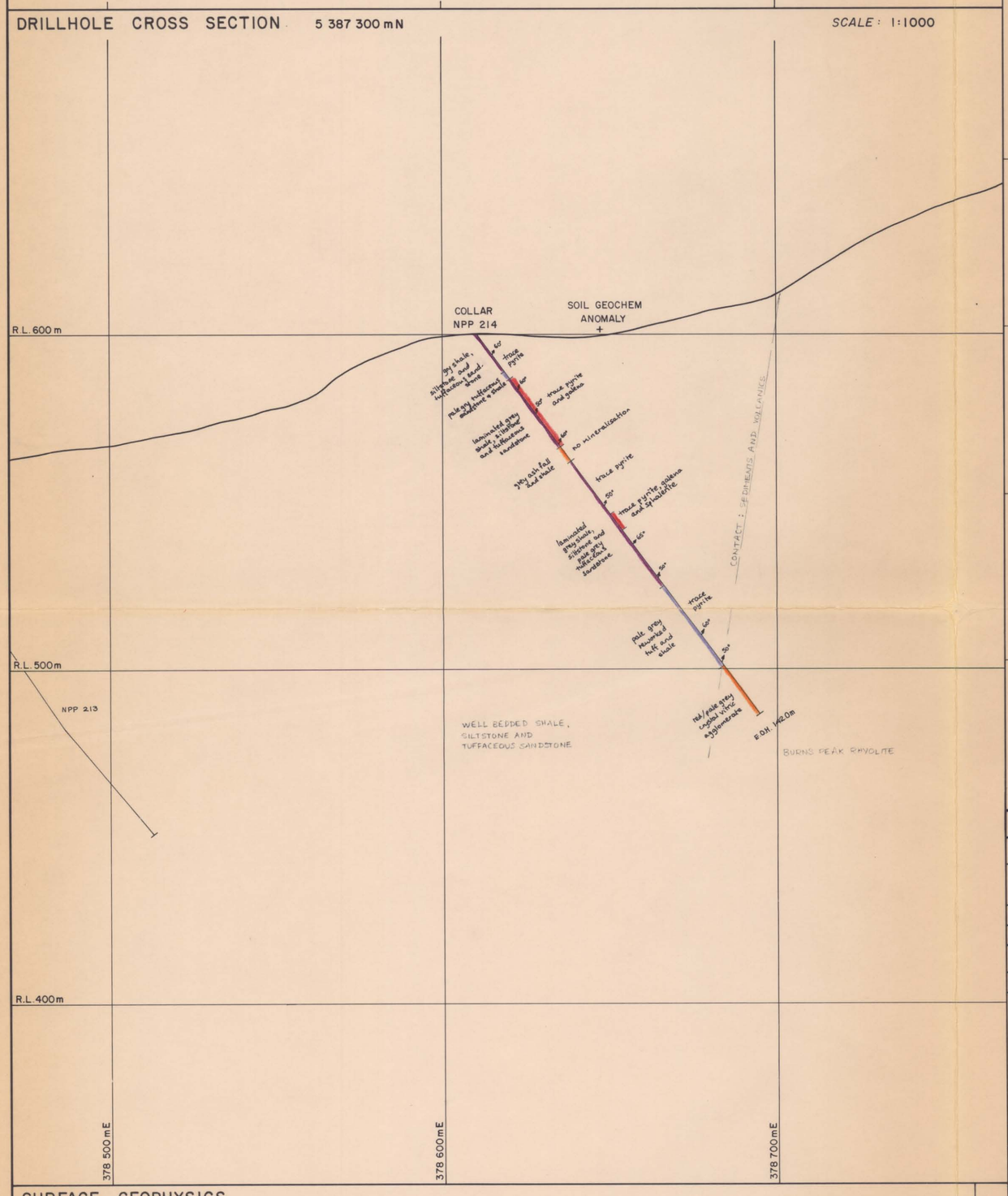


PLAN OF DRILLHOLE

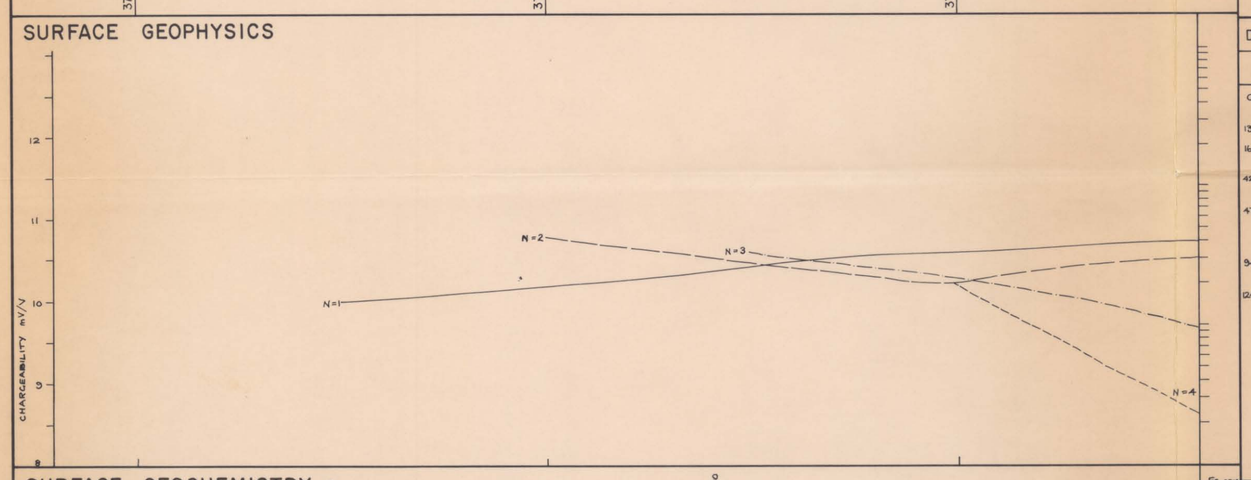
SCALE: 1:1000

DRILLHOLE CROSS SECTION

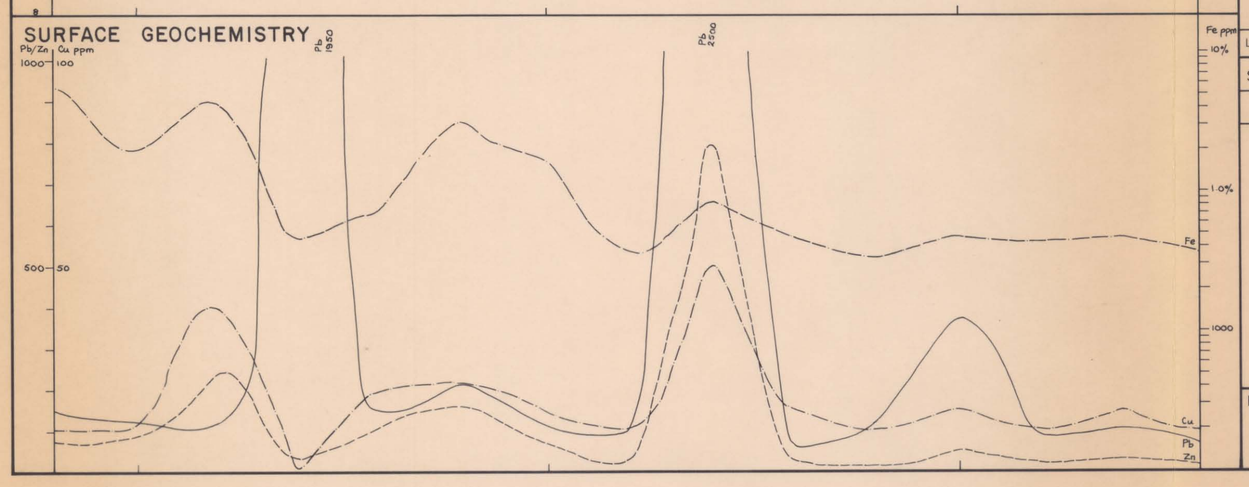
5 387 300 mN SCALE: 1:1000



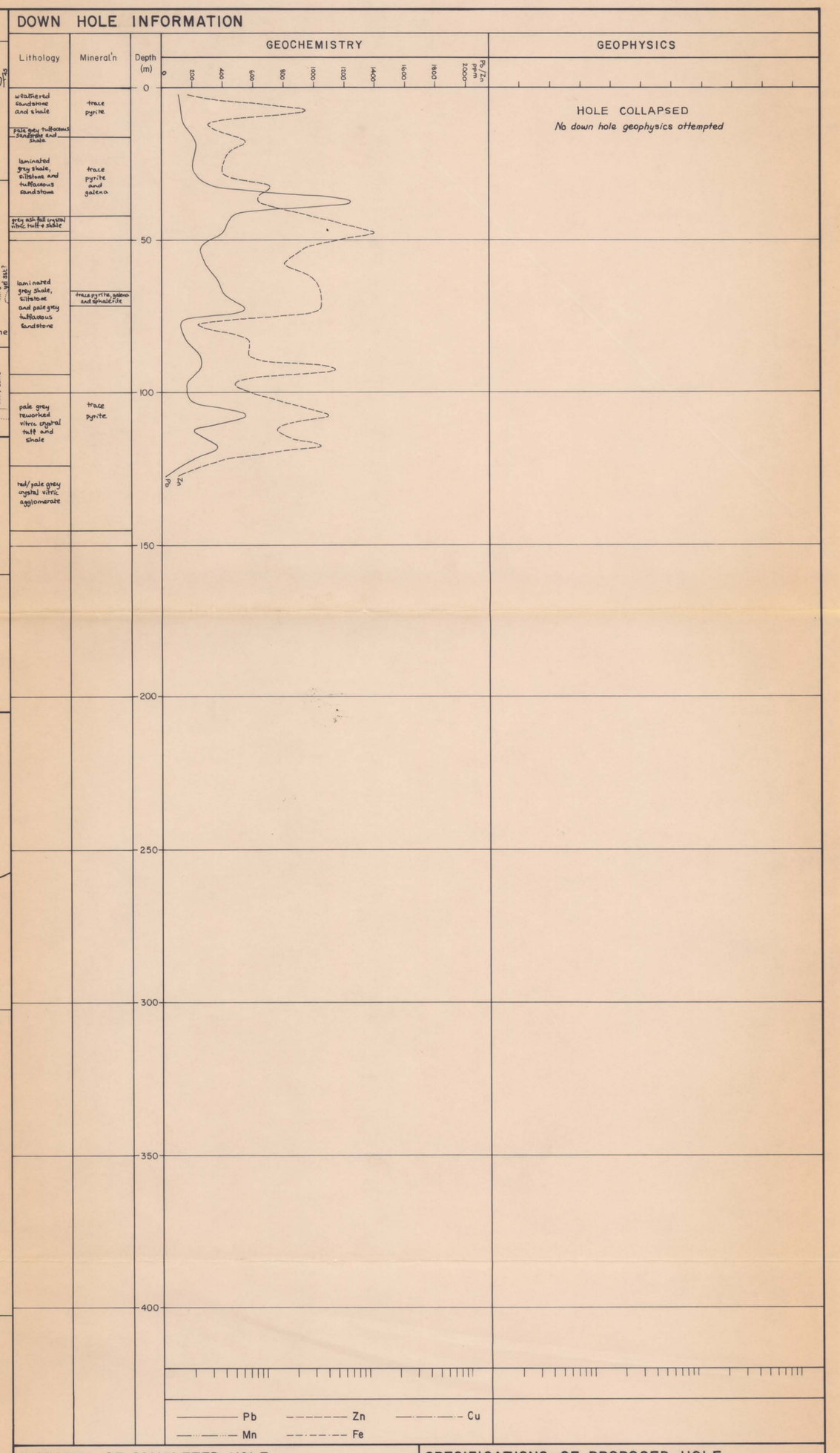
SURFACE GEOPHYSICS



SURFACE GEOCHEMISTRY



DOWN HOLE INFORMATION



SUMMARY OF COMPLETED HOLE

CO-ORDINATES	NORTHING	EASTING	R.L.
LOCAL GRID North Pinnacles	5 387 300 mN	378 610 mE	600 m
A.M.G.	5 387 296.0 mN	378 595.6 mE	

AZIMUTH: 86° 13' Grid N DIP: -53.5° TOTAL DEPTH: 142.0m

COMMENCEMENT DATE: 4.2.80 COMPLETION DATE: 29.2.80

INTERNAL SURVEY INFORMATION

DEPTH	AZIMUTH	DIP	DEPTH	AZIMUTH	DIP
100 m		-53.5°			

HOLE SIZE	FROM	TO	HOLE SIZE	FROM	TO
NQ	0	130 m			
BQ	130	145 m			

DRILLED GEOLOGY (SUMMARISED)

DEPTH	LITHOLOGY	MINERALISATION AND SIGNIFICANT ASSAYS
0-13.8m	Banded shale, siltstone and tuffaceous sandstone	Trace disseminated pyrite
13.8-16.7m	Tuffaceous sandstone with clasts of shale	Trace disseminated pyrite
16.7-42.5m	Banded shale, siltstone and tuffaceous sandstone	Trace disseminated pyrite and galena in association with calcite veins
42.5-47.5m	Grey ash fall crystal vitric tuff with interbeds of shale	No mineralisation
47.6-94.0m	Banded grey shale, siltstone and tuffaceous sandstone	Trace disseminated pyrite. 67-72m trace pyrite, galena and sphalerite associated with fluorite rich quartz veins
94.0-124.5m	Pale grey reworked vitric crystal tuff with shale interbeds	Trace disseminated pyrite
124.5-142.0m	Red to grey fragmental crystal vitric tuff with minor shale interclasts	Trace disseminated pyrite and trace galena in quartz veins.

LOGGED BY: A.M. DATE: 7.3.1980

SAMPLE DATA

SAMPLED INTERVAL	SAMPLE NUMBERS	SAMPLE TYPE	ELEMENTS DETERMINED	LAB. METHOD
0.0-129.0m	33033-33058	CHIP	Pb, Zn, Cu, Fe, Mn, Sn	A.A.S.
69.0m	29660	HALF CORE	THIN SECTION	
139.0m	29668	HALF CORE	THIN SECTION	

NOTES:

SPECIFICATIONS OF PROPOSED HOLE

CO-ORDINATES	NORTHING	EASTING	R.L.
LOCAL GRID North Pinnacles	5 387 300 mN	378 610 mE	600m
A.M.G.			

AZIMUTH: 90° A.M.G. DIP: -55° DESIGNED DEPTH: 150 m

ESTIMATED COMMENCEMENT: FEBRUARY 1980

ANTICIPATED GEOLOGY

DEPTH	LITHOLOGY	NATURE OF TARGET AND ANTICIPATED DEPTH
0-103m	Well bedded shale, siltstone and tuffaceous sandstone.	Disseminated Pb/Zn/Fe mineralisation within the banded sediments at 50m down hole.
103-150m	Massive 'quartz poor' rhyolitic flows and pyroclastics.	Sulphides associated with the Sedimentary/volcanic contact at 103m down hole.

DESIGNED BY: A.M. DATE: 2.2.80

AIM OF HOLE:

To test a Pb geochemical anomaly and contact zone on the western side of the Burns Peak Rhyolite.

NOTES:

DDH NPP 214 has adequately tested both the Pb geochemical anomaly and the contact zone on the western side of the Burns Peak Rhyolite.

5 cm

ELECTROLYTIC ZINC CO. OF A'ASIA LTD.

PROJECT: BULGOBAC E.L. 12/72 TAS.

SPECIFICATIONS AND SUMMARY OF RESULTS

EXPLORATION DIAMOND DRILL HOLE No. NPP 214

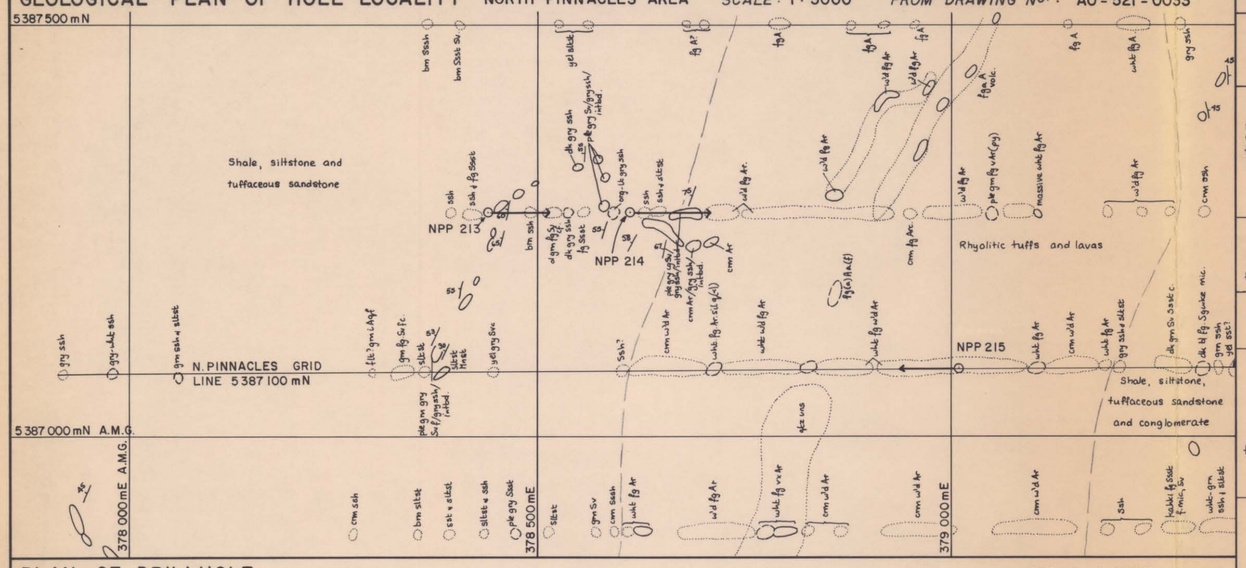
653147

SCALE: As shown	Survey: A.M.	Revised: 11.4.80
Reference:	Date: Feb 1980	REF. No.
Drawn: R.P.T.	Checked:	A2-521-0053

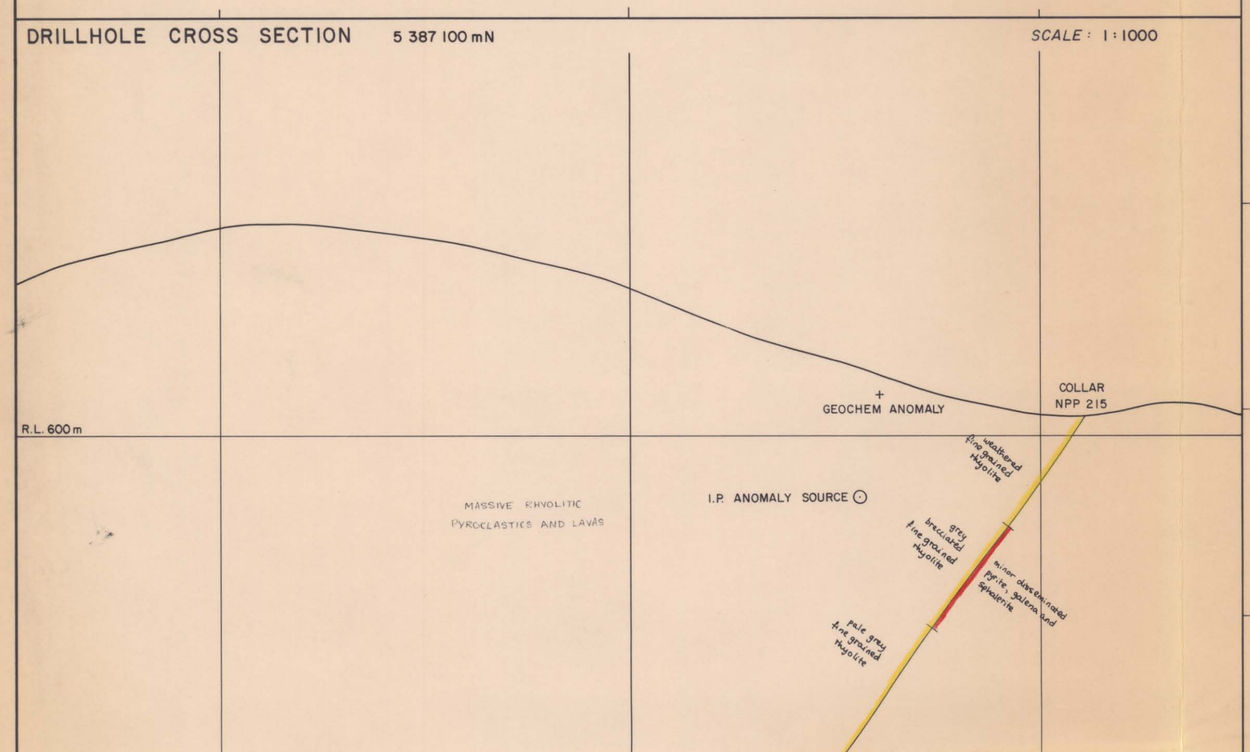
80-1461

2847

GEOLOGICAL PLAN OF HOLE LOCALITY — NORTH PINNACLES AREA — SCALE: 1:5000 — FROM DRAWING NO.: A0-521-0033

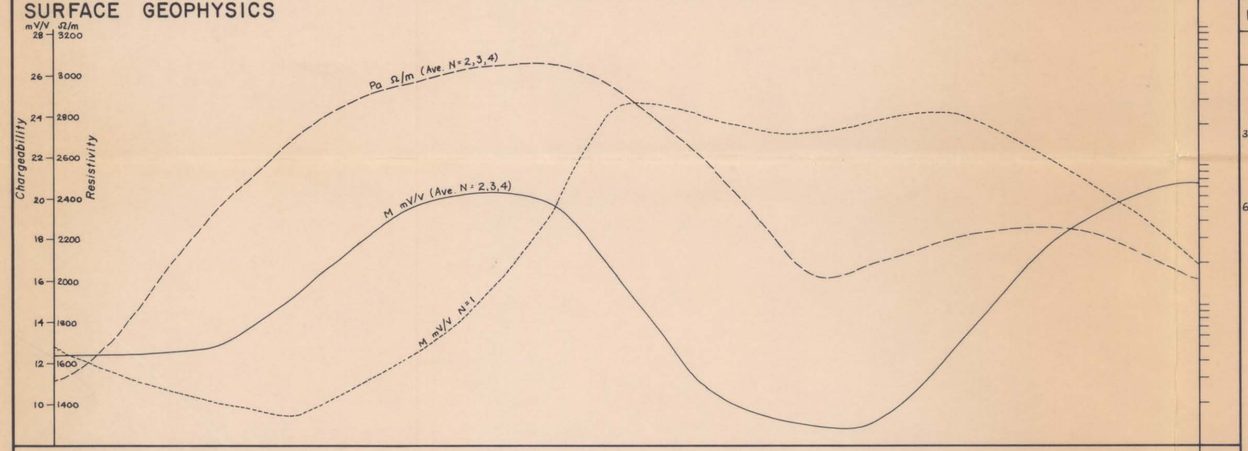


PLAN OF DRILLHOLE — SCALE: 1:1000

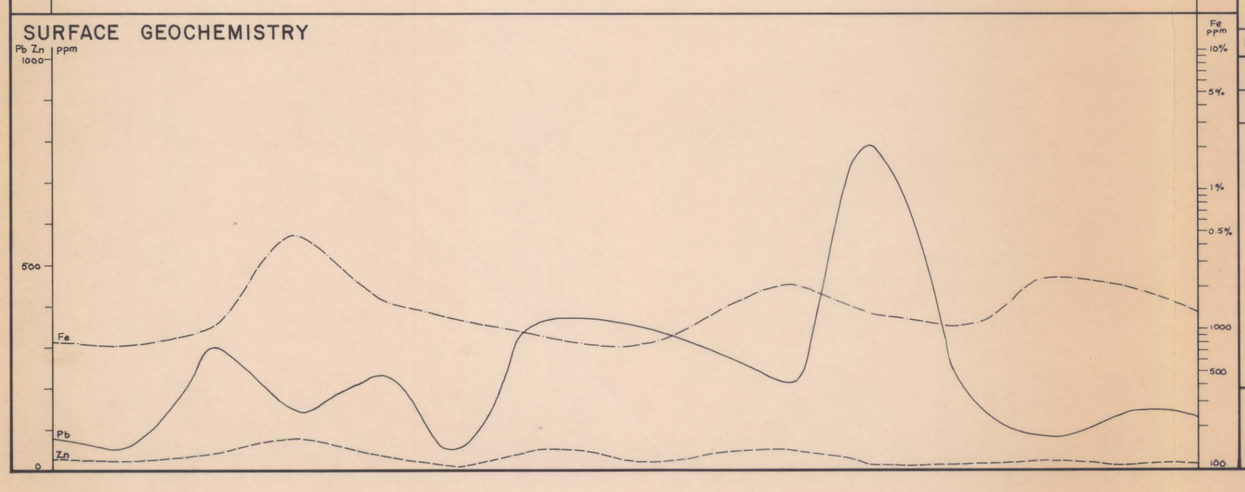


DRILLHOLE CROSS SECTION — 5387100 mN — SCALE: 1:1000

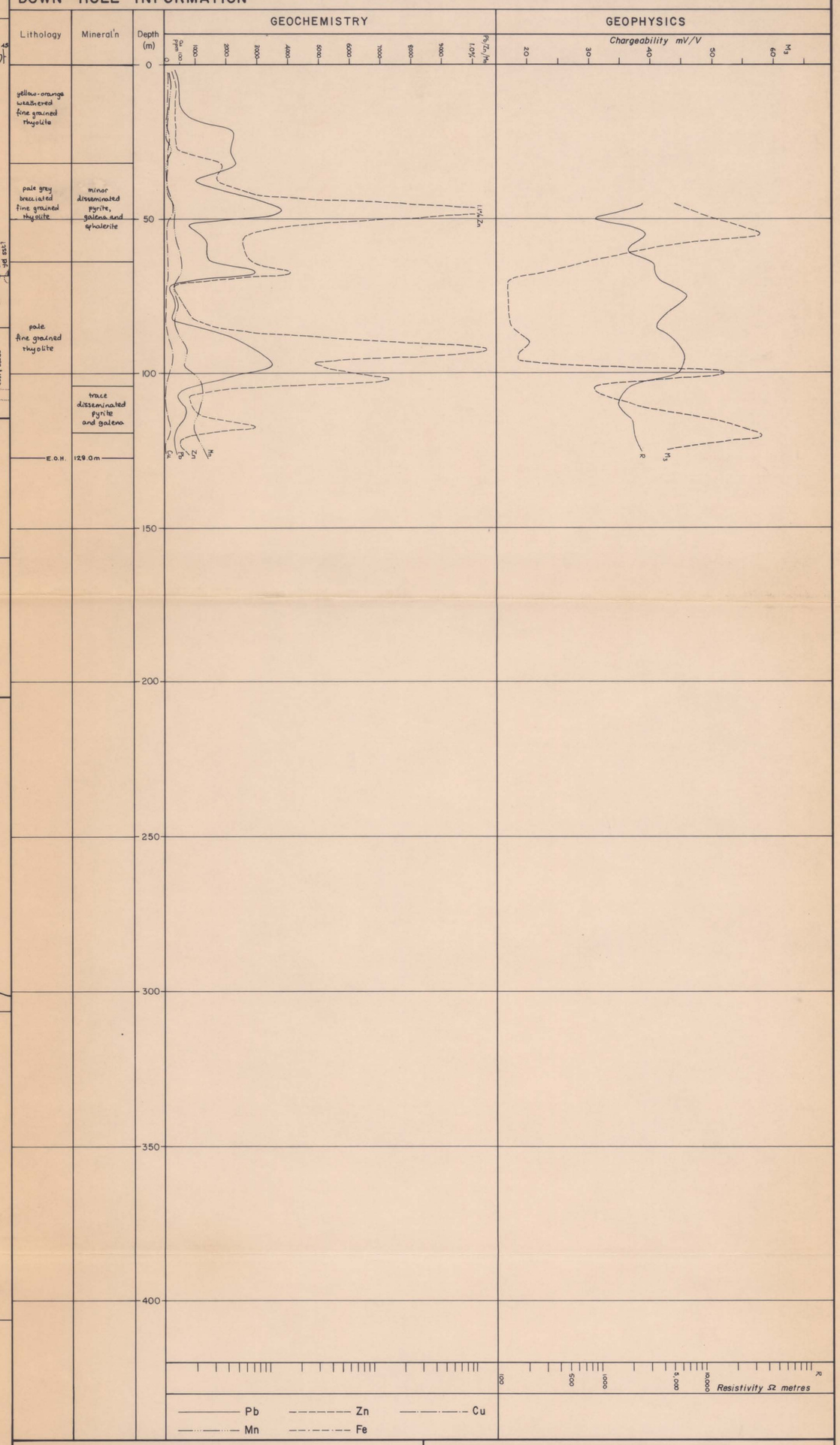
SURFACE GEOPHYSICS



SURFACE GEOCHEMISTRY



DOWN HOLE INFORMATION



SUMMARY OF COMPLETED HOLE

CO-ORDINATES	NORTHING	EASTING	R.L.
LOCAL GRID North Pinnacles A.M.G.	5387100mN	379010mE	605m

AZIMUTH: 270° A.M.G. DIP: -55° TOTAL DEPTH: 128.0m

COMMENCEMENT DATE: 11.3.80 COMPLETION DATE: 31.3.80

INTERNAL SURVEY INFORMATION

DEPTH	AZIMUTH	DIP	DEPTH	AZIMUTH	DIP
60.0m		-53°			
90.0m		-55°			
120.0m		-52°			

HOLE SIZE	FROM	TO	HOLE SIZE	FROM	TO
NQ	0.0	38.0m			
BQ	38.0	128.0m			

DRILLED GEOLOGY (SUMMARISED)

DEPTH	LITHOLOGY	MINERALISATION AND SIGNIFICANT ASSAYS
0-33.2m	Weathered fine grained porphyritic acid rhyolite and (?) pyroclastics.	Limonite staining after pyrite mineralisation.
33.2-64.0	Brecciated fine grained porphyritic acid rhyolite.	Minor disseminated pyrite, sphalerite and galena infillings associated with brecciation.
64.0-128.0	Massive fine grained porphyritic acid rhyolite.	105.0m to 120.0m trace disseminated pyrite and galena.

LOGGED BY: A.M. DATE: 9.4.80

SAMPLE DATA

SAMPLED INTERVAL	SAMPLE NUMBERS	SAMPLE TYPE	ELEMENTS DETERMINED	LAB. METHOD
0-5.0m and at 5m intervals to 125.0-128.0m	29771	CHIP	Pb, Zn, Cu, Fe, Mn	A.A.S.
	29772-29795	"	"	"
	29796	"	"	"

NOTES:

SPECIFICATIONS OF PROPOSED HOLE

CO-ORDINATES	NORTHING	EASTING	R.L.
LOCAL GRID North Pinnacles A.M.G.	5387100mN	379010mE	605m

AZIMUTH: 270° A.M.G. DIP: -50° DESIGNED DEPTH: 150m

ESTIMATED COMMENCEMENT: FEBRUARY 1980

ANTICIPATED GEOLOGY

DEPTH	LITHOLOGY	NATURE OF TARGET AND ANTICIPATED DEPTH
0-150m	Massive rhyolitic flows and pyroclastic.	Disseminated Pb/Zn/Fe Sulphides 80m below surface, 100m down hole.

DESIGNED BY: A.M. DATE: 9.2.1980

AIM OF HOLE:

To test coincident I.P. and Pb geochemical anomalies in massive acid pyroclastics and lavas of the Mt. Read Volcanics.

NOTES:

The I.P. and Pb geochemical anomalies were adequately tested with the presence of mineralisation associated with brecciation in two zones. A secondary I.P. anomaly away from the hole was picked up by the a = 20m down hole I.P. survey.

5 cm

ELECTROLYTIC ZINC CO. OF A'ASIA LTD.

PROJECT: BULGOBAC E.L. 12/72 TAS.

SPECIFICATIONS AND SUMMARY OF RESULTS

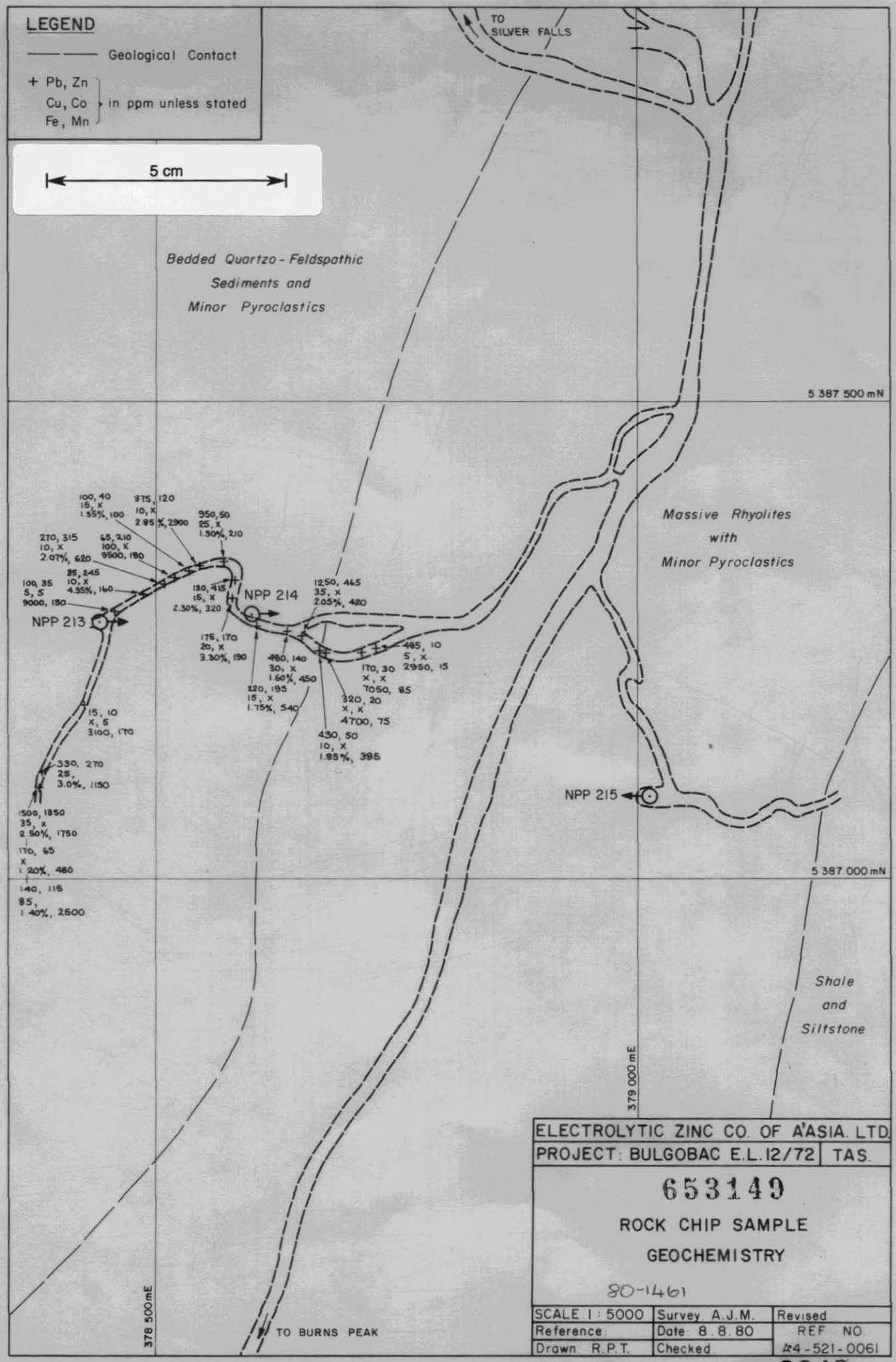
EXPLORATION DIAMOND DRILL HOLE No. NPP 215

653148

SCALE: As shown	Survey: J.M.	Revised: 10.6.80
Reference:	Date: 12.2.80	REF. No.
Drawn: R.P.T.	Checked:	AI-521-0054

80-1461

2848


LEGEND
Geological Contact
+ Pb, Zn
Cu, Co
Fe, Mn
in ppm unless stated
5 cm
TO SILVER FALLS
Bedded Quartzo - Feldspathic Sediments and Minor Pyroclastics
Massive Rhyolites with Minor Pyroclastics
Shale and Siltstone
5 387 500 mN
5 387 000 mN
379 000 mE
378 500 mE
NPP 213
NPP 214
NPP 215
100, 40 15, X 1.55%, 100
375, 120 10, X 2.95%, 2900
950, 50 25, X 1.30%, 210
270, 315 10, X 2.07%, 620
65, 210 100, X 9500, 180
85, 245 10, X 4.35%, 160
100, 35 5, 5 9000, 180
130, 415 15, X 2.30%, 320
1250, 465 35, X 2.05%, 420
175, 170 20, X 3.30%, 190
480, 140 30, X 1.60%, 450
220, 195 15, X 1.75%, 540
485, 10 5, X 2950, 15
170, 30 X, X 7050, 85
320, 20 X, X 4700, 75
430, 50 10, X 1.85%, 385
15, 10 X, 5 3100, 170
330, 270 25, 3.0%, 1150
1500, 1350 35, X 2.50%, 1750
170, 65 X 1.20%, 480
140, 115 85, 1.40%, 2500
TO BURNS PEAK
ELECTROLYTIC ZINC CO. OF A'ASIA. LTD.
PROJECT: BULGOBAC E.L. 12/72 TAS.
653149
ROCK CHIP SAMPLE GEOCHEMISTRY
80-1461
SCALE 1 : 5000
Survey A.J.M.
Revised
Reference
Date 8.8.80
REF NO
Drawn R.P.T.
Checked
A4-521-0061

2849