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GEOPEKO LIMITED

KING ISLAND

REPORT No. KI/74/7

**MICROFILMED**

FINAL REPORT ON THE MINERAL POTENTIAL  
OF EXPLORATION LICENCE 23/69.

by

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KING ISLAND

SEPTEMBER, 1974.

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### INTRODUCTION

Exploration Licence 23/69, covering an area of 141 square kilometres in north eastern King Island, was granted to King Island Scheelite Limited on 16th October 1969. The eastern portion of the area was previously held by Quest Exploration under Exploration Licence 3/67.

At the present time this licence, after two reductions in area, covers 15 square kilometres on the northern Mt. Counsel granite contact.

Since the 1969 programme of regional mapping, a literature search and photo interpretation programme has been carried out and subsequently reported on in a series of progress reports by Geopeko geologists to March 1971.

This report records the results of all exploration work undertaken within Exploration Licence 23/69 since October 1969. During this period the following exploration programmes have been conducted.

- Base map compilation from aerial photographs scale 1:12000.
- Regional photo controlled geological mapping at an approximate scale of 1:12000.
- A regional geochemical and geological sampling programme involving gemco auger drilling to bedrock (277 holes, 2815.56 metres).
- Detailed bedrock geochemical and geological sampling programmes on the following prospects: Investigator 14 (35 holes, 267.76 metres); Investigator 20 (50 holes, 487.68 metres); 'N' track (26 holes, 451.40 metres).
- An airborne radiometric and aeromagnetic survey.
- Reconnaissance bedrock geochemical and geological sampling programmes on the following prospects: Magnetic Anomaly No. 4 (8 holes, 61.87 metres); Magnetic Anomaly No. 14 (8 holes, 52.42 metres).
- Percussion drilling in the Investigator 20 - Magnetic Anomaly No. 4 area totalling 76.20 metres in 3 holes.

SUMMARY

During the reconnaissance geological and geochemical sampling carried out along the roads and tracks within the Exploration licence, three geochemically anomalous areas were outlined. These were designated:-

Investigator 14 (W, Zr, Ti)

Investigator 20 (Anomaly A, Sn; Anomaly B, Cu; and Anomaly C, Zn)

'N' Track (Alluvial Sn).

The area of sampling was restricted by the road and track system especially in the south east.

The anomalous tungsten values recorded at Investigator 14 were shown to be due to the presence of detrital scheelite in concentrations of heavy minerals within the sands immediately overlying the bedrock. The area tested by drilling contained only small amounts of heavy minerals, however a sizeable deposit may occur in surrounding areas where the reworking of the sands may have been more intensive.

At Investigator 20, Anomaly A was shown to be an alluvial tin deposit of very small extent occurring within the sands and not bedrock derived.

Anomaly B recorded only low values (up to 340ppm Cu) in auger holes and was not tested further.

The anomalous zinc values encountered at Anomaly C were shown by percussion drilling (PDH 20-2) to be due to the occurrence of sphalerite and galena in very narrow quartz veins transecting the mica schists. These veins are thought to have an irregular distribution and to be restricted in extent and width similar to other occurrences of mineralized quartz veins in the island (Barrier Creek, Investigator 19). The grade of mineralization recorded in bulk samples is low the highest value being 4000ppm Zn over a 5 foot intersection in the weathered clays. The low grade and lack of any favourable host rocks make it unlikely that the mineralization will be concentrated into economic deposits.

The 'N' Track tin deposit contains values up to 1200ppm occurring in a quartz rich boulder drift with the overlying sands. This deposit, although of reasonable grade, is covered by approximately 20m of alluvial sands making evaluation difficult.

004-A

Magnetic Anomaly No. 4 was shown to be due to an intrusive plug of magnetite rich olivine basalt. No anomalous geochemical values were recorded from auger drilling within the basalt or its contact zone.

Magnetic Anomaly No. 14 appears to be due to a local increase in magnetite content within the West Coast granite. There is no field evidence of favourable host rocks in which economic mineral deposition would be expected to occur, the rocks being granites and mica shists.

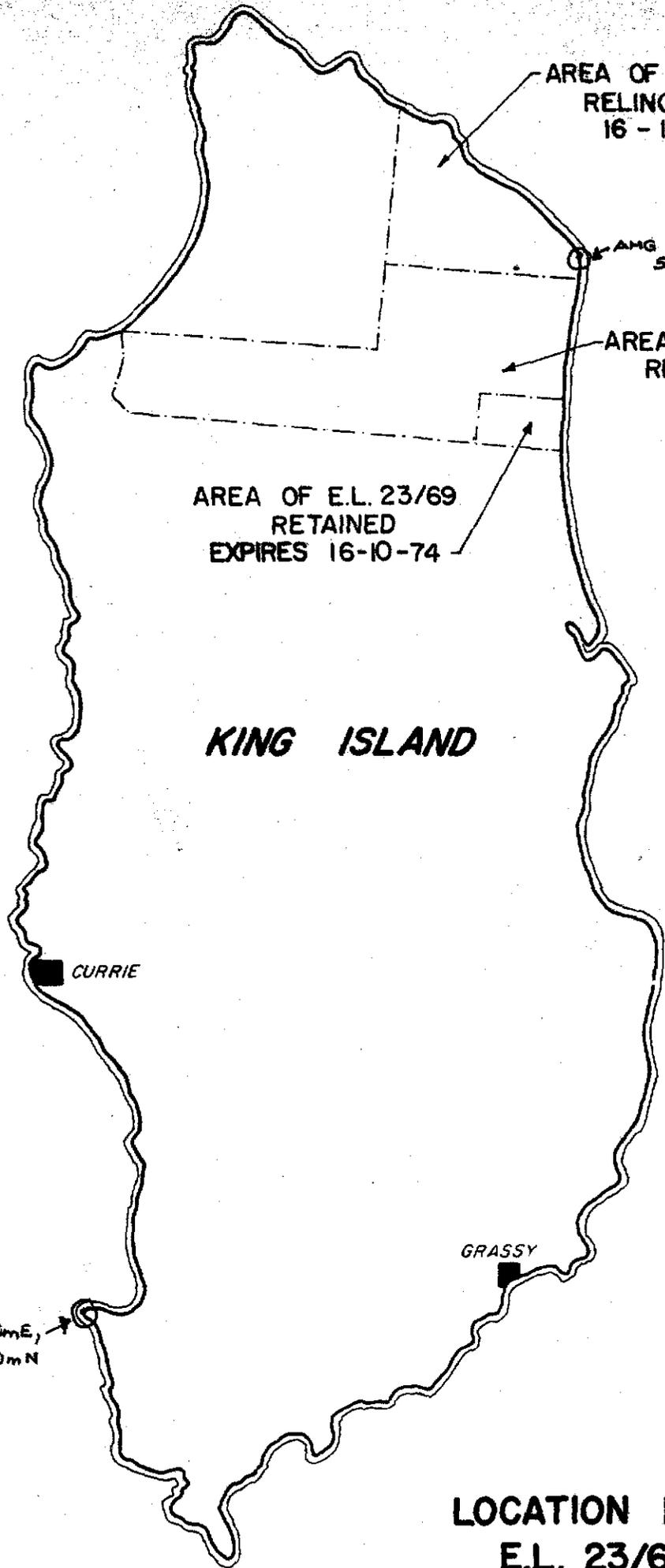
No other geochemically anomalous areas were outlined in the regional programme and it is concluded that there is little likelihood of the area within EL 23/69 containing economic mineral deposits within the bedrock.

CONCLUSIONS

1. Geologically the area appears unfavourable for bedrock mineral deposits. Granites and metasediments intruded in places by basalt plugs are known to be present by field observation. These rocks would not be expected to be good host rocks for mineralization.
2. Magnetic Anomaly No. 4 is due to an intrusive plug of magnetite rich olivine basalt.
3. Magnetic Anomaly No. 14 is considered to be due to irregularities in the magnetite content of the West Coast Granite.
4. The zinc mineralization occurring in quartz veins intruded into the mica schists at Investigator 20 Anomaly C is considered to have no economic potential.
5. The tin mineralization occurring as an alluvial deposit within the sands at Investigator 20 Anomaly A is considered a local concentration restricted in size and is in itself of no economic potential.
6. The tin mineralization at 'N' Track is estimated at about 200,000 cu. yds. at a grade of approximately 2 lb/cu. yd.
7. The values obtained from the alluvial tin deposit at 'N' Track are considered minimum values due to the method of sampling which allows contamination of the samples by the overlying sands.

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AREA OF E.L. 23/69  
RETAINED  
EXPIRES 16-10-74

AREA OF E.L. 23/69  
RELINQUISHED  
16-10-73

AREA OF E.L. 23/69  
RELINQUISHED  
16-4-74

**KING ISLAND**

**CURRIE**

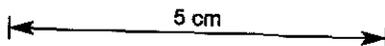
**GRASSY**

AMG 232100mE,  
560550mN

AMG 252920mE,  
5604900mN

**LOCATION MAP  
E.L. 23/69**

AMG REFERENCE POINTS ADDED



## GEOLOGY

Geological mapping was carried out over the entire licence area on an approximate scale of 1:12000 using photo controlled regional base maps obtained from 1967 aerial photographs using the slotted template method of photo laydown.

Very little structural information is available due to a thick sand cover over approximately 90% of the licence area. Calcrete, consolidated sand layers and old boulder beach deposits are present throughout and have proved impenetrable to gemco drilling in some areas.

### The West Coast Granite.

This is more properly termed the West Coast Granite Complex and consists of granitic rocks, mainly adamellite, granodiorite and phorphyritic biotite granite, as well as granitized sediments.

The granite outcrops along the north coast as a series of small exposures as far east as Penny Lagoon. The granite is usually weakly foliated, light grey, medium grained and relatively poor in mafics being mainly composed of granular quartz and feldspar. In the Boulder Point area a more mafic phorphyritic phase with euhedral feldspars occurs.

Thin sections of these rocks show signs of deformation, undulose extinction of quartz and bending of micas. The age of emplacement has been stated at 715 my. based on potassium argon dating of the micas in the granite and they are therefore considered to be Precambrian.

The contact between this unit and the Reekara schists is ill defined and irregular due to the inclusion of large blocks of sediment in the granitic complex and the intrusion of granite dykes into the surrounding mica schists.

### The Reekara Schists.

Mica schists and micaceous quartzites with minor quartzites form the majority of the bedrock within the Exploration Licence but almost never occur as float or outcrops due to the very thick (up to 110 metres in one location) deposits of overlying sand. For this reason structural information is limited to the coastal outcrops only.

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Petrographic examination of rock chips obtained from auger drilling show them to be quartz-muscovite schists finely phorphyroblastic and well foliated with elongated detrital quartz grains and large muscovite flakes set in a fine schistose matrix. The matrix is muscovite rich and has minor granular quartz and albite with fine grained rutile wide spread in the micaceous layers. Some layers are rich in granular apatite.

The rocks would appear to be derived by metamorphism of fine grained silty and probably argillaceous, quartz sandstones, containing accessory fine heavy minerals.

#### Mount Counsel Granite.

The Mount Counsel Granite is considered to be a single phase intrusion radiometrically dated as Devonian in age. The granite itself is a homogeneous medium grained rock with quartz, feldspar and biotite as the main constituents. Accessory amounts of magnetite, analcime, zircon, rutile, apatite, sphene and chlorite are also present.

The granite does not outcrop within the licence area and auger drilling carried out in the extreme south east over the granite contact as interpreted from the aeromagnetic survey results has confirmed the presence of the sub outcropping granite.

#### The Contact Rocks.

These rocks also do not outcrop within the Exploration Licence.

In other areas where the contact rocks do outcrop (Exploration Licence 4/68) they are identified as quartz-andalusite-sillimanite-cordierite-biotite assemblages being strongly contact metamorphosed pelitic siltstones and sandstones.

Similar rock chips have been obtained from auger drilling carried out in the extreme south east of Exploration Licence 23/69 where auger drilling is continuing.

#### Other Rock Types.

A small (non outcropping) basalt plug occurs, intruded through the mica schists, in the Investigator 20 area. Rock chips of olivine basalt have been obtained from percussion

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drilling. The groundmass consists of random microcrystalline aggregates of plagioclase, minor hornblende, pyroxene, altered glass and fine disseminated magnetite. Large porphyritic crystals of olivine and pyroxene are visible in the chips.

The plug is the source of magnetic anomaly No. 4 located by the aeromagnetic survey.

Recent fossiliferous limestone and ironstained (limonite) consolidated sands occur as layers within the dunes and have proved impenetrable to auger drilling.

## GENERAL ECONOMIC GEOLOGY

There is no known economic mineralization within the licence area. The occurrence of sphalerite in thin quartz veins at Investigator 20, and the alluvial tin deposit at 'N' track are the only mineralization of interest located.

### Granites.

An assessment of the tin bearing potential of the granites on King Island was carried out in 1971 by J. J. Gresham and P. Cottam using 'remote sensing' techniques. Based on the assumption that certain parameters of granite chemical composition are related directly to the granites ability to act as a source for tin mineralization, silicate analysis of a number of samples of King Island granites were carried out. The report concluded that all King Island granites lay outside the geochemical parameters based on analysis of most of the tin bearing granites of the world.

### Reekara Schists.

As previously stated there is no rock outcrop within the licence area except on the coastal fringe, all rock samples have been obtained by auger drilling.

Apart from syngenetic pyrite which appears to be abundant in the Reekara schists, the only sulphides encountered were sphalerite and minor chalcopyrite occurring in very narrow quartz veins. The veins are irregular in occurrence and low in abundance and the absence of suitable replacement type host rocks gives the area a low potential for mineral deposits.

### Contact Rocks.

Auger drilling (bedrock sampling) of this zone is presently being carried out. To date no definite results have been obtained as to the suitability of these rocks as favourable replacement type source rocks.

### Basalt Plug.

All rock chip samples analysed from this plug and the immediate contact rocks gave only background values for all elements analysed. The basalt plugs are therefore considered not to possess any economic potential.

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Beach Sands.

Heavy minerals were encountered within alluvial sand deposits in several areas although economically significant amounts were encountered in only one of the areas tested ('N' Track).

Due to access problems only a few scout lines were drilled within areas of thickest sand deposits and the possibility of economic deposits of heavy minerals (especially tin) has not been discounted.

It is noted that in two of the four scout lines drilled, anomalous tin values were recorded in alluvial deposits ('N' Track and Investigator 20 Anomaly A).

The Hawkes Alluvial deposit consists of a boulder drift rich in vein quartz containing concentrations of detrital cassiterite and overlain by alluvial sand cover. Such a situation occurs at 'N' track.

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GEOFYSICS

A low level airborne radiometric and aeromagnetic survey was carried out for Geopeko Limited during January - February 1973 by Canadian Aero Services. The results of the survey were presented on 1:25000 scale plans.

Although no useful information was obtained from the radiometrics due to the thick cover of sand overburden, the aeromagnetic contours delineated a number of broad features reflecting variations in the bedrock meta-sediment units. Three features of interest were delineated, Magnetic Anomaly No. 4, Magnetic Anomaly No. 14 and the northern contact of the Mount Counsel granite.

A ground magnetometer survey carried out to locate Magnetic Anomaly No. 4 showed this to be a small circular anomaly of intense magnetic character shown by later percussion drilling to be due to an olivine basalt plug.

GEOCHEMISTRY

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Geochemical sampling has been the main exploration tool. All sampling has been bedrock 'C' horizon using both a Gemco trailer mounted and a Jacro truck mounted auger drill rig.

A fairly high success rate has been obtained in penetrating the overlying sands although contamination of the bedrock sample by these sands has occurred in some holes. A small number of holes drilled in the dunal area were sampled in 2 metre intervals down the hole.

The work was carried out in two phases:- a broad regional programme of widely spaced geochemical sampling followed up by more detailed programmes on areas of potential as located from the first phase.

Phase I - Regional Sampling

Initially this programme was carried out along the roads and tracks within the area at an average spacing of 1,000 feet and was designed to obtain both geochemical and geological data.

Closer spaced drilling at about 200 feet intervals was carried out around any holes drilled in the broad spaced programme which reported anomalous results.

A total of 277 (gemco) auger holes (2,815.56 metres) were sampled in the regional programme. Groups of anomalous values were obtained for tungsten at Investigator 14 and 20, for tin at Investigator 20 and 'N' track and for copper, lead and zinc at Investigator 20. Grids were established over these areas to allow a detailed examination to be carried out.

Phase II - ProspectsInvestigator 14.

A grid was established over an area of anomalous tungsten values encountered from drilling along Haines Road during the regional sampling programme.

Geologically the area lies on the contact between the West Coast Granite and the meta-sediments.

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Bedrock geochemical sampling was carried out on a series of three lines on a 50 m X 100 m grid using a Gemco auger drill. A total of 35 holes were sampled and analysed for Cu, Pb, Zn, Ni, Bi, Mo, W and Sn. In addition twelve samples from line 10,000N were assayed for Ti and Zr.

The graphical plots for the tungsten results showed an irregular distribution with only 15 values being greater than 50 ppm W. Panning of bulk samples showed that the tungsten occurred as very fine specks of detrital scheelite in the heavy mineral fraction.

In no case was scheelite seen to occur in the actual rock chips.

A mineralogical study of the samples showed that the scheelite occurred in a heavy mineral assemblage containing detrital tourmaline, garnet, stauralite, rutile, zircon, and very minor scheelite.

The anomalous tungsten values were therefore due to traces of scheelite in the heavy minerals at the base of the overlying sands rather than being derived from bedrock mineralization.

The heavy mineral content of the sands is low (<1%) and only small pockets of enrichment would be expected in the areas of deeper sand deposition.

Geologically the Investigator 14 area would appear to have little potential for bedrock mineral deposits as no suitable host rocks have been encountered. The granite / meta-sediment contact appears very complex with blocks of sediments occurring in the granite and outliers of granite being encountered in the sediments at quite considerable distances from the assumed contact.

#### Magnetic Anomaly No. 14.

This is a broad magnetic anomaly, which was located during the airborne geophysical survey, lying in the extreme west of Exploration Licence 23/69 within the west coast granitic complex.

One line of five gemco auger holes were drilled in an approximate east-west (magnetic) direction extending from the centre of the anomaly to beyond its assumed eastern limit. All samples were analysed for Cu, Pb, Zn, Ni, Sn, W, Mo, Ti and Zr.

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In one sample an anomalous value of 200 ppm W was recorded and three close spaced auger holes were drilled around it, resulting in background values only.

In all cases good bedrock chips of quartz rich west coast granite were obtained and it would appear that the anomalous tungsten value was due to a small amount of heavy minerals within the overlying sands.

The magnetic anomaly is thought to reflect some irregularity in the magnetite content of the granite in this area.

#### Magnetic Anomaly No. 4.

This intense circular magnetic anomaly which occurs just west of the Investigator 20 grid was first located by the airborne geophysical survey.

A ground magnetic traverse carried out to locate the aeromagnetic anomaly showed that the anomaly was due to a small group of highs occurring in close proximity.

The initial line of auger holes for geological / geochemical sampling was located slightly too far to the east of one of the anomalies and the five jacro holes missed the source by about 15 metres, and consequently encountered only mica schists. A further 2 holes drilled 25 and 50 metres west of the base line encountered magnetite rich olivine basalt.

All samples were assayed for Cu, Pb, Zn, Mo, Ni, W and Sn but no anomalous values were recorded.

Percussion drill hole PDH M.A.4-1 was drilled at 75W - 00N, in the approximate centre of the magnetic anomaly, and encountered olivine basalt from 7 feet to 50 feet. E.O.H. All samples were assayed for Cu, Pb, Zn, Ni, Co, Cr, V and As, and no anomalous values resulted.

It would appear from the results of the five basalt plugs tested in the north end of the Island that there is no mineralization existing in either the plugs or the surrounding schists.

#### Investigator 20.

The Investigator 20 grid lies in the eastern portion of Exploration Licence 23/69 and covers a series of 3 geochemical anomalies encountered on 'M' track during the regional sampling programme.

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A total of 54 bedrock geochemical samples were taken using a gemco auger rig from all three areas covered by the grid.

The anomalies are designated from south to north:-

Anomaly A a tin anomaly (maximum 6100 ppm Sn)

Anomaly B an area of low anomalous copper (maximum 340 ppm Cu)

Anomaly C an area of anomalous Zn, Pb and Sn (maximum 1500 ppm Zn).

#### Anomaly A.

A total of 14 holes were drilled on a 50 m X 50 m grid and all auger drill samples assayed for Cu, Pb, Zn, W, Ni and Sn. Although anomalous values were recorded for tin in these samples the results were much lower than those initially recorded in the scout drilling programme.

In all cases these holes terminated at about 15 metres in a pebble deposit consisting of rounded quartz pebbles, mica quartzite and mica schist. The horizon was thought to be overlying bedrock.

A mineralogical study of the rock chips from sample M 41 (6100 ppm Sn) showed the tin mineralization occurred as angular cassiterite-quartz-tourmaline aggregates derived from quartz tourmaline veins. A detrital heavy mineral suite consisting of magnetite, pyrite, garnet and minor chalcopyrite was also present.

A percussion drill hole, PDH INV.20-1, was drilled on the peak of the anomaly to test for mineralization below the pebble bed. The hole continued to 24.5 metres in overlying sands with some consolidated horizons and showed that the mineralization causing the anomaly occurs within a pebble bed resting on recemented sands.

No anomalous results for any of the elements analysed, Cu, Pb, Zn, Ni, W and Sn were recorded below 15 metres.

It is concluded therefore that the mineralization is limited to a very thin layer of heavy minerals and mineralized pebbles. This layer occurs within the overlying sand deposits at a point well above bedrock where a recemented lime rich horizon has, during deposition, provided a base on which the pebble deposit has been laid.

The economic potential of such a deposit must be considered very small.

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Anomaly B.

A total of 11 auger holes were drilled on a 100 m X 100 m grid over this low copper anomaly and all samples were assayed for Cu, Pb, Zn, Ni, W and Sn. In all cases the results obtained were lower than those recorded in the scout programme.

Bedrock chips of mica schist and micaceous quartzite were recovered from the holes. No mineralization was visible in any of these rock chips and the occasional chips of vein quartz were also barren.

Since the highest value recorded in this area was 340 ppm Cu, and there was no evidence of suitable host rocks, no further work was deemed to be necessary.

The anomaly B area would appear to have no economic potential, the small amounts of copper detected probably being derived from minor chalcopyrite occurring in thin quartz veins transecting the mica schists.

Anomaly C.

A total of 22 holes were drilled on a 100 m X 100 m grid pattern over this zinc anomaly and all samples analysed for Cu, Pb, Zn, Ni, W and Sn. Graphical plots of the results showed an irregular distribution for all elements with a few small scattered areas of anomalous zinc values which tend to substantiate the anomalous areas obtained from the scout programme.

Good bedrock chips were obtained in almost all holes, the area being underlain by quartz mica schists and mica quartzites of the Reekara type with some minor quartz veins present in places. Some minor mineralization consisting of pyrite with minor chalcopyrite and sphalerite was visible in the quartz tourmaline chips from several samples.

Subsequently a percussion drill hole (INV.20-2) was drilled in the area of the highest zinc value (1500 ppm) obtained from the auger drilling.

The hole penetrated sands and clays for 24.5 metres then mica schists to a total depth of 36.8 metres, and confirmed that the mineralization was confined to the narrow quartz veins transecting the mica schists.

Values of up to 4000 ppm Zn and 300 ppm W were obtained in clays containing fragments of mineralized quartz veins overlying bedrock. A higher percentage of quartz vein fragments were present in the clays than in the bedrock samples, and the amount of quartz veining and mineralization in the bedrock decreases from 24.5 metres to 36.8 metres.

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No mineralization was seen in the chips of mica schists, only in the vein quartz chips.

It would appear therefore that the higher values were obtained in the clays by a concentration of the mineralized quartz veins due to their resistance to weathering. The potential for economic mineralization to be associated with these quartz veins must be considered extremely low.

#### 'N' Track

This area of alluvial tin was initially defined during the regional sampling when results as high as 720 ppm Sn were recorded.

A total of 26 gemco auger holes were drilled on a 100 X 100 metre grid, their distribution being a little irregular due to the difficulty of access. All samples were analysed for Cu, Pb, Zn, Ni, W and Sn and results as high as 1200 ppm Sn were obtained.

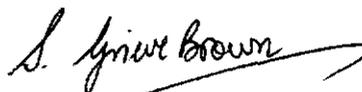
The tin mineralization occurs as detrital cassiterite within heavy minerals. The deposit forms part of an impenetrable (by gemco drills) horizon in the overlying sand deposits containing a large amount of rounded pebbles of vein quartz. The heavy mineral assemblage consists of detrital cassiterite, tourmaline, garnet, straurolite, andalusite, pyrite and pyritized bryozoans.

Although a probable resource of nearly 200,000 cu. yds. of material at greater than 2 lb / cu. yd. has been shown to be present in the area, no attempt has been made to test the surrounding areas due to the thick sand overburden (~20 m) and difficulties of access.

It should be noted that the method of obtaining the samples is by using solid stemmed auger rods. In cases where the horizon being sampled underlies very thick sand cover, as at 'N' Track, inaccuracy will occur due to contamination from the sides of the hole when withdrawing the rods. This problem can lead to the results obtained being lower than the values present in the horizon being tested.

The minimum requirements to test for alluvial deposits in sand would be hollow stemmed augers with wireline sampling.

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BIBLIOGRAPHY

- Arendt, W.J., January 1970. Progress Report Exploration Licences 23/69 and 4/69. Unpublished Geopeko Ltd. Company Report.
- Billinghamurst, W.M., April 1967. Investigation of Beach Sands from East Coast King Island. Unpublished Quest Exploration Pty. Ltd. Company Report.
- Brown, S.G., August 1974. Final Report on the Mineral Potential of Exploration Licence 5/69. Unpublished Geopeko Ltd. Company Report.
- June 1974. Final Report on the Mineral Potential of Exploration Licence 17/72. Unpublished Geopeko Ltd. Company Report.
- June 1974. Final Report on the Mineral Potential of Exploration Licence 20/73. Unpublished Geopeko Ltd. Company Report.
- Cottam, P., April 1971. Final Report EL 4/68. Unpublished Geopeko Ltd. Company Report.
- March 1972. Progress Report EL 5/69. Unpublished Geopeko Ltd. Company Report.
- Grey, D., February 1970. Granites of the West Coast of King Island. Geopeko Ltd. Technical Seminar 13th Feb. - 20th Feb. 1970.
- Gresham, J.J., May 1972. Regional Geology of King Island. Unpublished Geopeko Ltd. Company Report.
- Gresham, J.J. and Cottam, P., Criteria for the assessment of the Mineral Potential of the Mount Counsel Granite Body. Geopeko Ltd. Technical Seminar Tennant Ck. 1971.
- Hawkes, H.E. and Webb, J.S., 1962. Geochemistry in Mineral Exploration. Harper and Rowe Publishers.
- Hoskings, K.F.G., 1965. The Search for Tin. Min. Mag. Vol. 113 Nov. 4, 5 and 6.
- Hughes, T.D., May 1951. Lime Deposits of King Island Report to the Director of Mines.
- Jennings, J.N., 1959. The Coastal Geomorphology of King Island Bass Strait in Relation to Changes in the Relative level of land and sea. Queen Victoria Museum, Launceston Records New Series.

020

King Island Scheelite Limited Geological Dept., May 1968.  
Geological Report on Exploration area North East  
King Island. Unpublished K.I.S. Report.

Le Messurier, P. and Lister, G., 1970. Progress Report  
EL 23/69. Unpublished Geopeko Ltd. Company Report.

Mayer, W., March 1971. Geological Progress Report EL's  
4/69 and 23/69. Unpublished Geopeko Ltd. Company  
Report.

McDougall, I., and Leggo, P.J., 1965. Isotopic Age  
determinations on Granite rocks from Tasmania.  
J. Geol. Soc. Aust. Vol. 12pp 295 - 332.

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APPENDIX 1

LOG OF P.D.H. INV. 20-1

0 - 50'

SANDS

Medium to fine grained recent unconsolidated sands.

50 - 55'

FOSSIL BEACH

A zone of recemented sand overlain by pebbles of vein quartz and mica schists.

55 - 80'

UNCONSOLIDATED SANDS

Medium to fine grained recent sands.

This hole showed that the tin mineralization at this point is due to heavy mineral concentrations in the old beach deposits and are not related to local bedrock.

80' E.O.H.

APPENDIX 2LOG OF P.D.H. INV. 20-2

0 - 10'

SAND

A medium grained well rounded quartz rich sand.

10 - 35'

SANDY CLAY

A dark grey clay rich unit with iron staining apparent in some of the clay clods. The clay contains more weathered rock chips from 15' but it is not until about 25' that these are recognisable as weathered mica schists.

The 30 - 35' sample contains quite large chips of vein quartz with pyrite and minor chalcopyrite mineralization present in them.

35 - 70'

CLAY

A dark grey very puggy clay with quite large chips of vein quartz containing pyrite, chalcopyrite and tourmaline occurring in what appears to be a very weathered mica schist between 40 - 50'.

70 - 80'

CLAY PLUS ROCK CHIPS

As above dominantly a very puggy clay with good chips of vein quartz with tourmaline needles, pyrite and lesser chalcopyrite present in them. Some very weathered chips of dark mica schists are present in these samples.

80 - 120'

MICA SCHISTS

The samples now consist of pulverized light grey-green mica schists which contain bands of mica quartzites and some almost pure quartzites. Quartz veins are still present with tourmaline and pyrite being the dominant accessories in them.

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The amount of good chips of mica schist present in these samples increases down the hole especially from 100' onwards from which depth only minor chips of quartz tourmaline vein material is encountered.

120' E.O.H.

APPENDIX 3LOG OF P.D.H. MAG. AN. 4

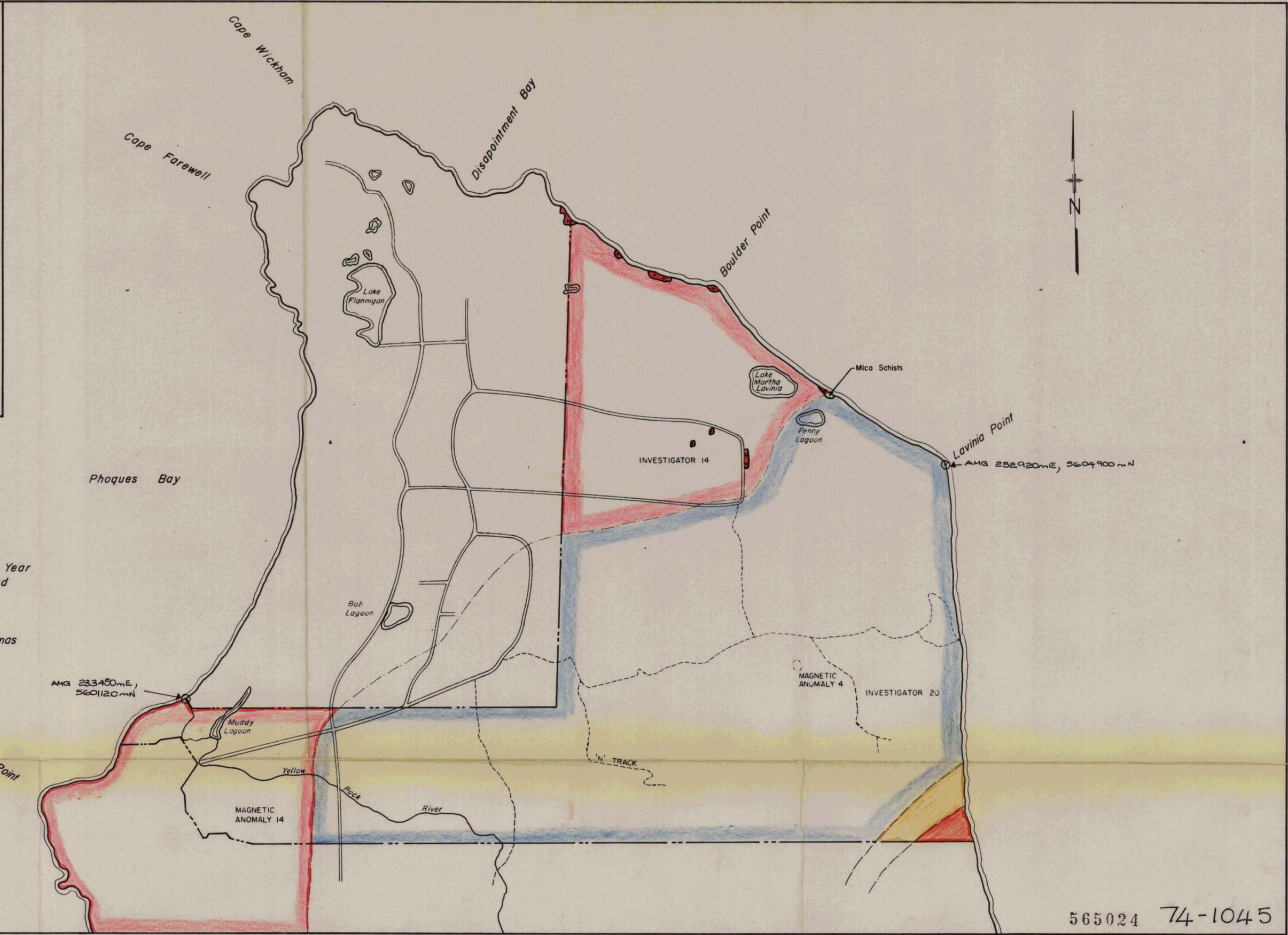
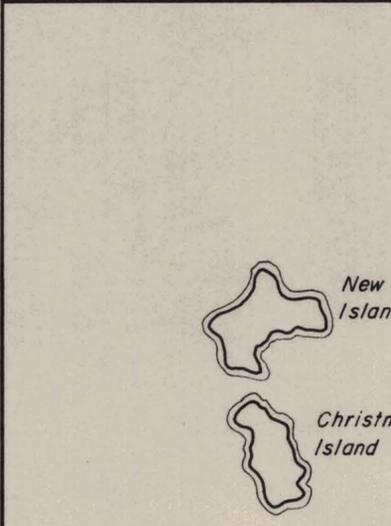
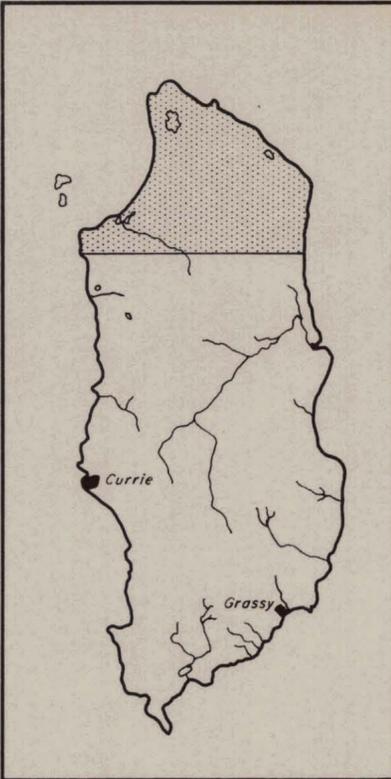
0 - 10' SOIL AND CLAY

10 - 50' OLIVINE BASALT

Large chips of a very hard dense black basalt with quite large crystals of olivine visible in it.

This basalt is quite magnetic and is sufficient to account for the Aeromagnetic anomaly No. 4.

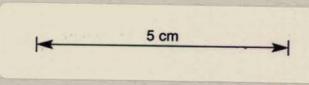
50' E.O.H.



**Legend:**  
 - - - - TRACK  
 = = = = ROAD  
 - - - - GEOLOGICAL BOUNDARY

TERTIARY LIMESTONE	MOUNT COUNSEL GRANITE - CONTACT
WEST COAST METASEDIMENTS	MOUNT COUNSEL GRANITE
WEST COAST GRANITE	
REEKARA SCHIST	

AMG REFERENCE POINTS ADDED



DATE JULY '74  
 GEOLOGIST: S.G.B.  
 DRAWN: R.F.  
 CHECKED: S.G.B.

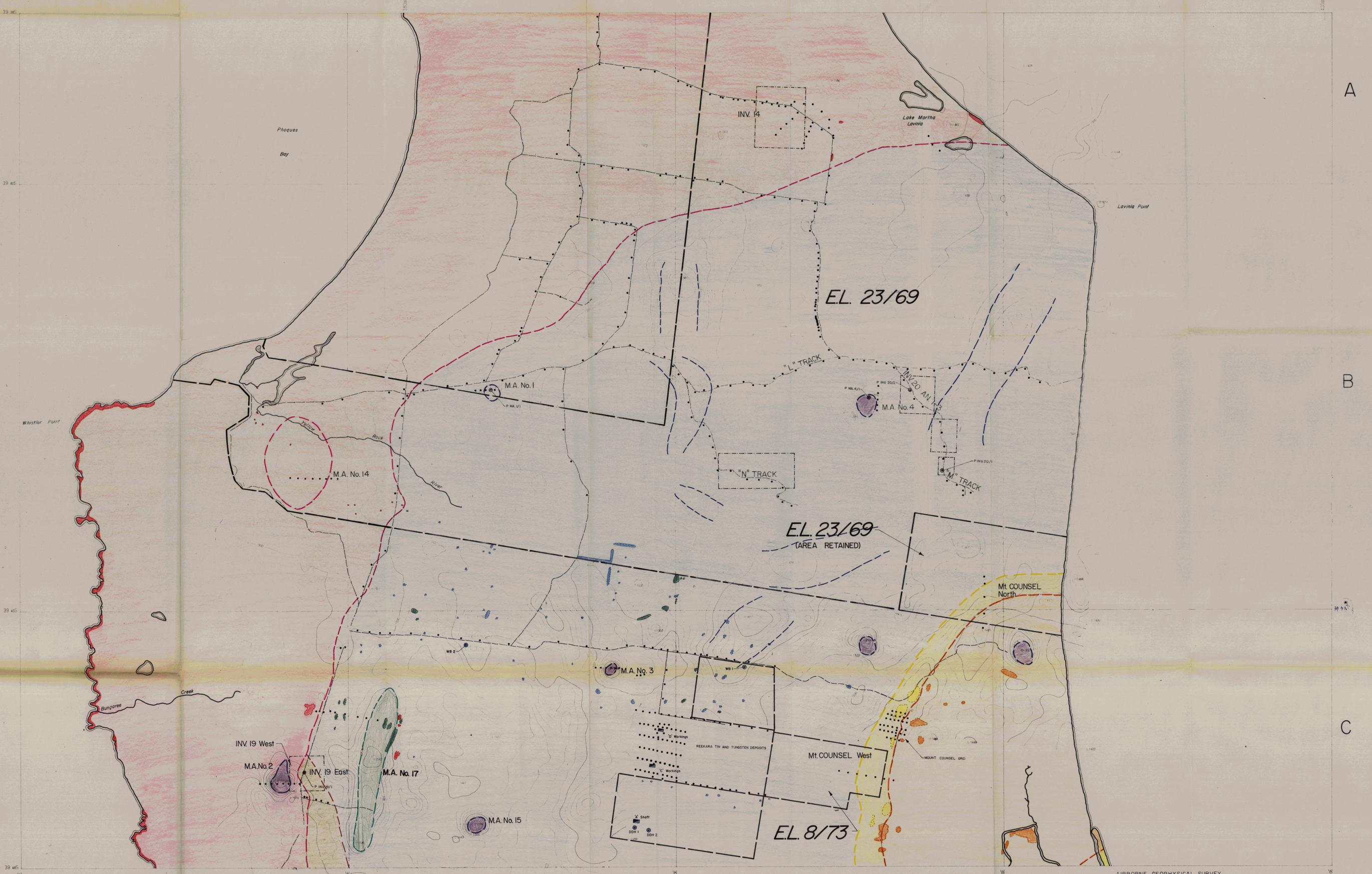
565024 74-1045  
**GEOPEKO LIMITED**  
 KING ISLAND GROUP  
 No. KG 15-20  
 SCALE: 1 mile to 1 inch

E.L. 23/69  
**GEOLOGICAL PLAN**  
 1734 Q2/5

A

B

C



**MAGNETIC CONTOUR PLAN**  
**SHOWING LOCATION OF AUGER DRILL HOLES**

- Percussion Drill Hole
- Geoco Hole
- Road
- Boundary E.L.
- Boundaries of areas covered by larger scale maps

FLIGHT ALTITUDE 92 METRES  
 FLIGHT INTERVAL 5 KILOMETRES  
 CONTOUR INTERVAL 25 GAMMAS  
 CONTOUR INTERVAL 25 GAMMAS  
 PROJECTION INTEGRATED CO-ORD SYSTEM  
 SURVEYED AND COMPILED MARCH - MAY 1973  
 A.S.G. PROJECT NO. 7302

SHEET	INDEX
3	3
2	2
1	1

AIRBORNE GEOPHYSICAL SURVEY  
 KING ISLAND  
 TASMANIA  
 GEOPEKO LIMITED  
 TOTAL MAGNETIC INTENSITY  
 REGIONAL FIELD REMOVED  
 SCALE 1:25,000

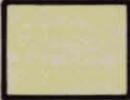
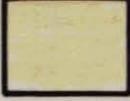
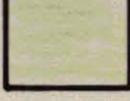
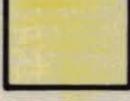
4

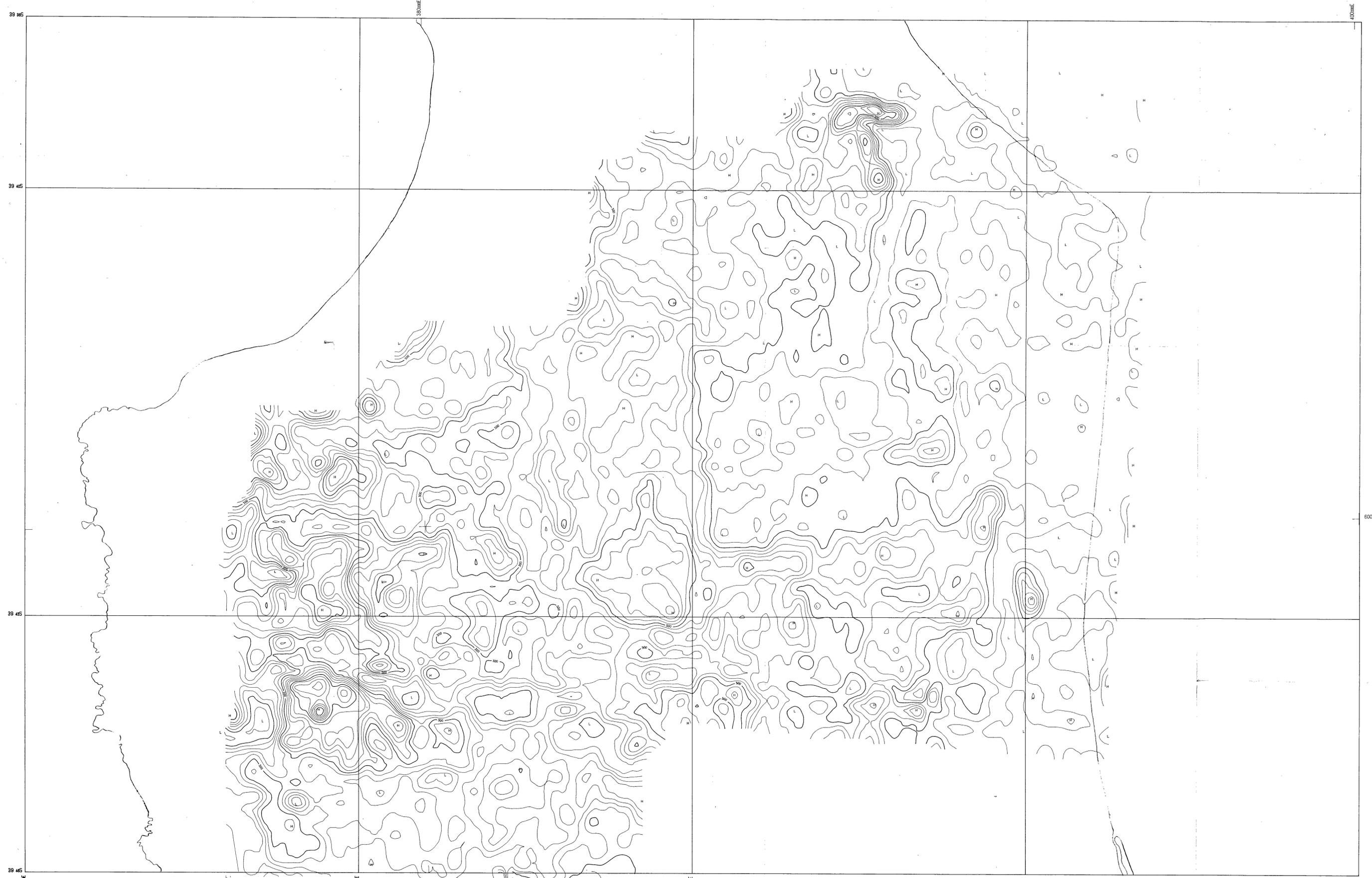
74-1045

5 cm

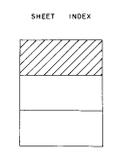
FLOWN AND COMPILED BY AERO SERVICE (AUSTRALIA) LTD.

## *Geological Legend*

- |   |  |
|---|--|
|    | EAST COAST SANDSTONES - SHALES                                   |
|    | REEKARA QUARTZ MUSCOVITE SCHISTS                                 |
|   | WEST COAST METASEDIMENTS<br>(quartzites and quartz mica schists) |
|  | DEVONIAN GRANITE   |
|  | WEST COAST GRANITE COMPLEX                                       |
|  | BASALT   |
|  | BASIC DYKES  |
|  | Mt. COUNSEL METAMORPHIC AUREOLE                                  |

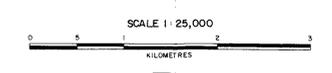


FLIGHT ALTITUDE 92 METRES  
 FLIGHT INTERVAL 200 METRES  
 TRAVERSE 200 METRES  
 THE LINE 4 KILOMETRES  
 TOTAL MAGNETIC INTENSITY TOTAL COUNT  
 CONTOUR INTERVAL 25 GAMMAS  
 TOTAL COUNT  
 PROJECTION INTEGRATED CO-ORD SYSTEM  
 SURVEYED AND COMPILED MARCH - MAY 1972  
 ASC PROJECT NO. 7502

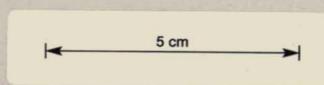
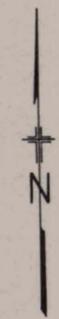
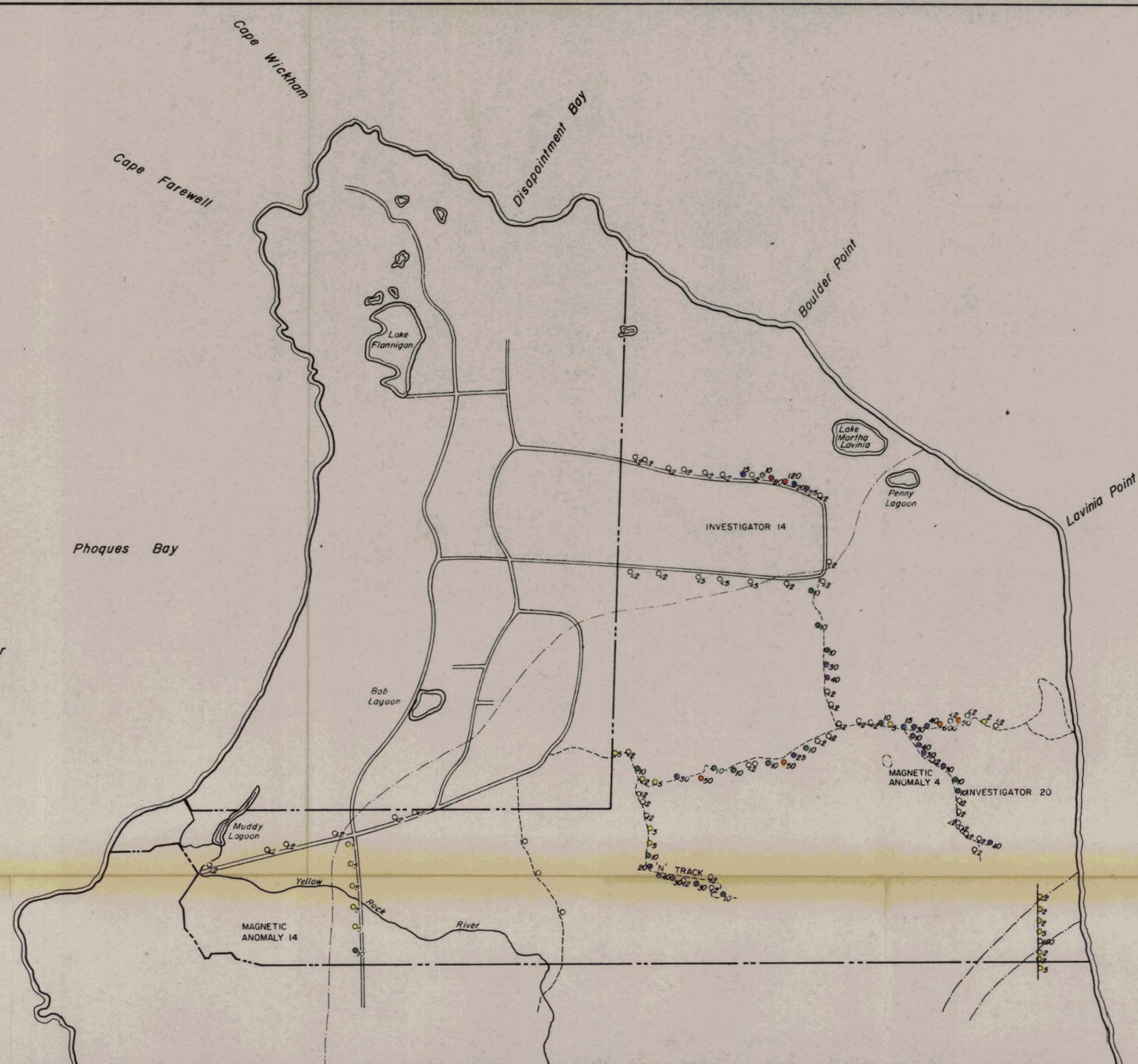
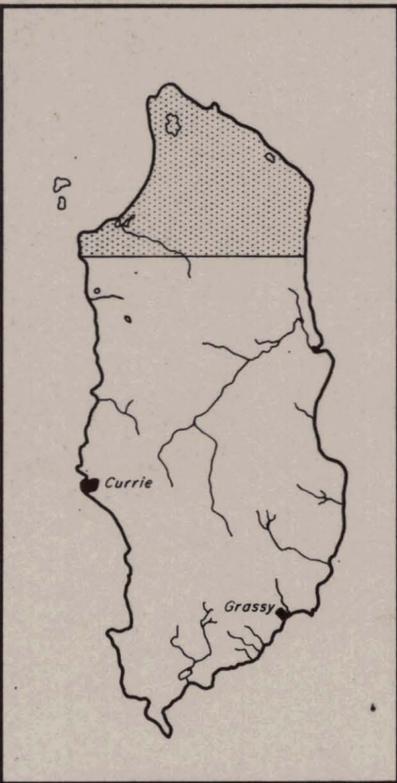


AIRBORNE GEOPHYSICAL SURVEY  
 KING ISLAND  
 TASMANIA  
 GEOPEKO LIMITED  
 TOTAL COUNT

74-1045



DRAWN AND COMPILED BY  
 AIRPO SERVICE (AUSTRALIA) PTY LTD  
 CAMERATA, N.S.W.



**Legend:**  
 - - - TRACK  
 = = = ROAD  
 - - - GEOLOGICAL BOUNDARY

**Tungsten (p.p.m.)**  
 ○ <2  
 ● 2-5  
 ● 6-10  
 ● 11-20  
 ● 21-40  
 ● 41-60  
 ● >60

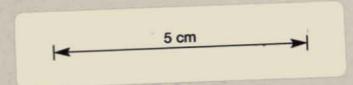
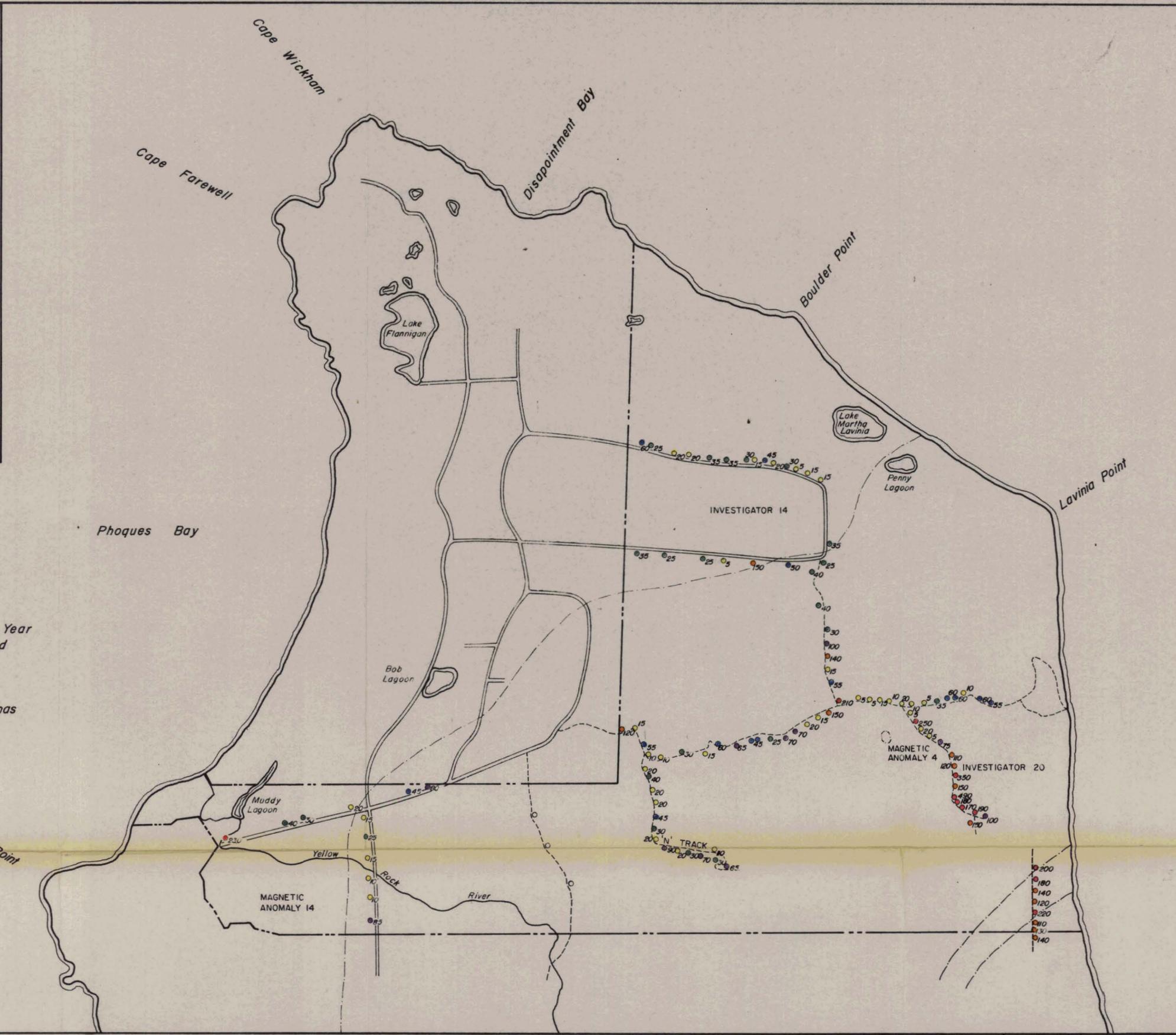
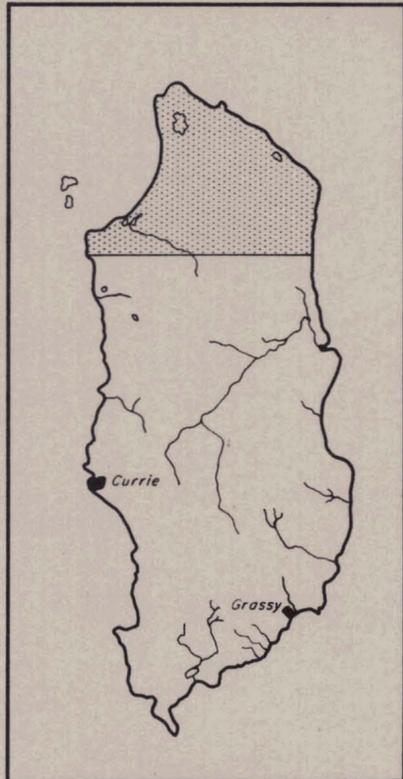
**NOTE:**  
 RESULTS ARE FOR BOTTOM OF HOLE SAMPLES OBTAINED USING A "GEMCO" AUGER DRILL RIG.  
 VALUES < 2 NOT PLOTTED  
 TUNGSTEN ANALYSED BY MODIFIED DITHIOL METHOD FOLLOWING POTASSIUM PYROSULPHATE FUSION ON 0.1 GRAM SAMPLE.

  
 DATE: JULY, '74  
 GEOLOGIST: S.B.B.  
 DRAWN: R.F.  
 CHECKED: S.G.B.

565028 74-1045

**GEOPEKO LIMITED**  
 KING ISLAND GROUP  
 SCALE: 1 mile to 1 inch No. KG 15-23

**E.L. 23/69**  
**GEOCHEMICAL RESULTS**  
**1738 TUNGSTEN** Q2/5



565029 74-1045

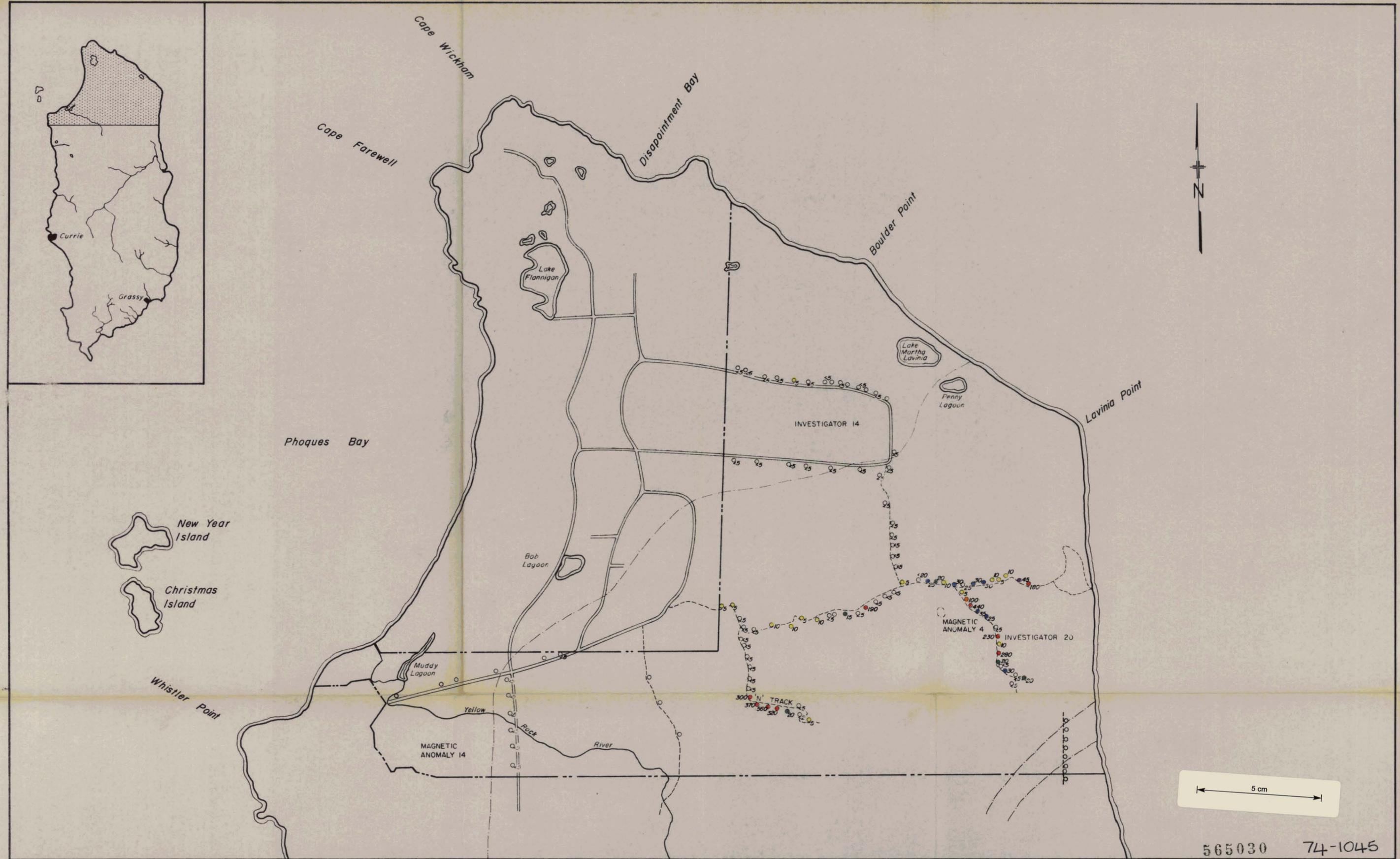
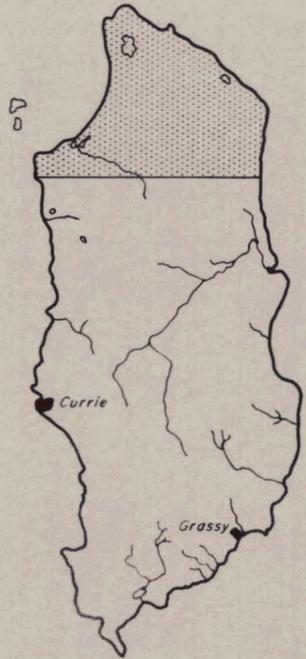
**Legend:**  
 - - - TRACK  
 = = = ROAD  
 - - - GEOLOGICAL BOUNDARY

**Zinc (p.p.m.)**  
 ● 0-20  
 ● 21-40  
 ● 41-60  
 ● 61-100  
 ● 101-160  
 ● >160

**NOTE:**  
 RESULTS ARE FOR BOTTOM OF HOLE SAMPLES OBTAINED USING A "GEMCO" AUGER DRILL RIG. VALUES  $\geq 20$  NOT PLOTTED.  
 ANALYSIS BY ATOMIC ADSORPTION SPECTROSCOPY FOLLOWING HOT HCL LEACHED FOLLOWED BY HCL/HNO<sub>3</sub> IN THE LATER STAGES FOR 1.0 HOUR ON A 0.25 GRAM SAMPLE.

DATE: JULY '74  
 GEOLOGIST: S.G.B.  
 DRAWN: R.F.  
 CHECKED: S.G.B.

**GEOPEKO LIMITED**  
 KING ISLAND GROUP  
 No. KG 15-23  
 SCALE: 1 mile to 1 inch  
**E.L. 23/69**  
**GEOCHEMICAL RESULTS**  
**ZINC**  
 1739 *Q2/5*



**Legend:**  
 - - - TRACK  
 = = = ROAD  
 - - - GEOLOGICAL BOUNDARY

**Tin (p.p.m.)**  
 ○ < 5  
 ● 5-10  
 ● 11-20  
 ● 21-40  
 ● 41-80  
 ● 81-160  
 ● > 160

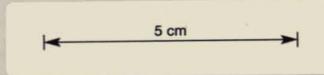
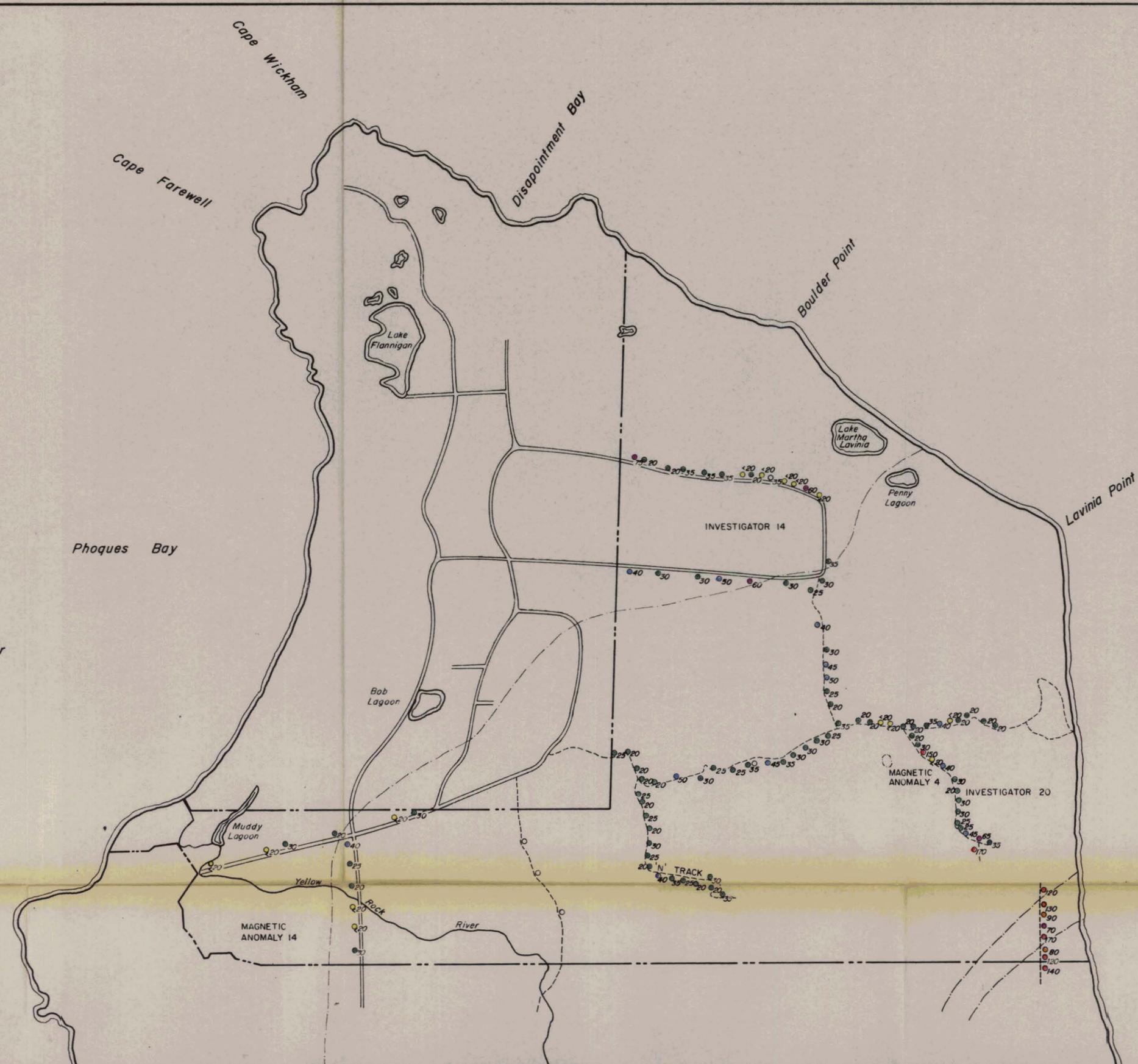
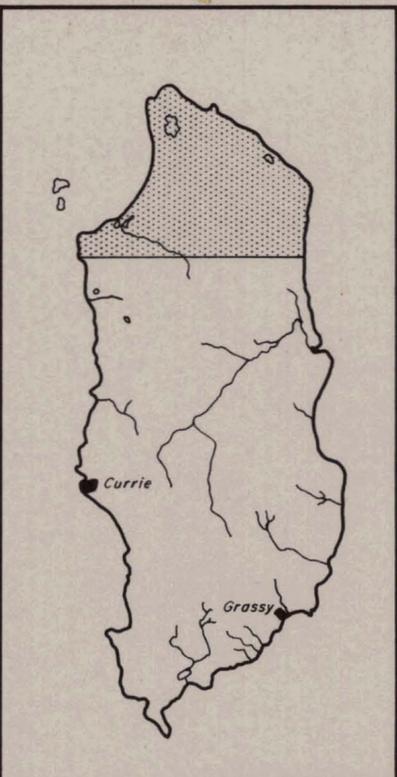
**NOTE:**  
 RESULTS ARE FOR BOTTOM OF HOLE SAMPLES OBTAINED USING A "GEMCO" AUGER DRILL RIG.  
 VALUES 5 NOT PLOTTED.  
 TIN ANALYSED BY THE GALLIEN METHOD ON A 0.5 GRAM SAMPLE.

DATE: JULY '74  
 GEOLOGIST: S.G.B.  
 DRAWN: R.F.  
 CHECKED: S.G.B.

565030 74-1045  
**GEOPEKO LIMITED**  
 KING ISLAND GROUP  
 No. KG 15-21  
 SCALE: 1 mile to 1 inch

**E.L. 23/69**  
**GEOCHEMICAL RESULTS**  
**TIN**

q2/5  
 1740



505031 74-1045

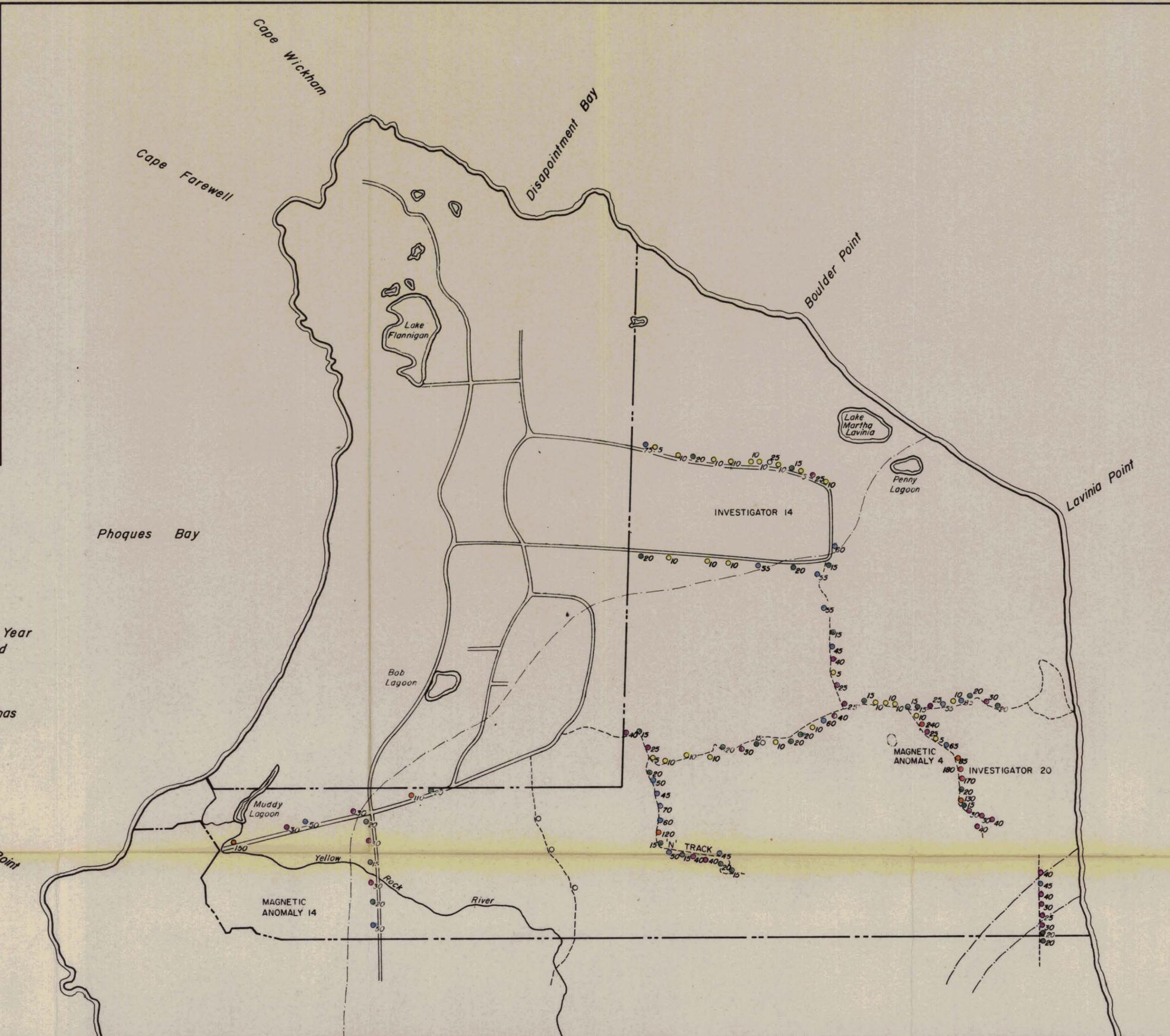
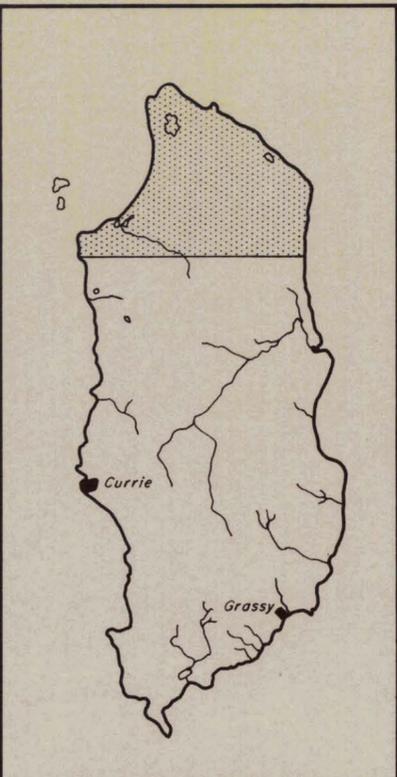
**Legend:**  
 - - - TRACK  
 = = = ROAD  
 - - - GEOLOGICAL BOUNDARY

**Lead (pp.m.)**  
 ● <20  
 ● 20-40  
 ● 40-60  
 ● 60-80  
 ● 80-100  
 ● >100

**NOTE:**  
 RESULTS ARE FOR BOTTOM OF HOLE SAMPLES OBTAINED USING A "GEMCO" AUGER DRILL RIG.  
 VALUES ≤ 20 NOT PLOTTED.  
 ANALYSIS BY ATOMIC ADSORPTION SPECTROSCOPY FOLLOWING HOT HCL LEACHED FOLLOWED BY HCL/HNO<sub>3</sub> IN THE LATER STAGES FOR 1.0 HOUR ON A 0.25 GRAM SAMPLE.

DATE: JULY '74  
 GEOLOGIST: S.G.B.  
 DRAWN: R.F.  
 CHECKED: S.G.B.

**GEOPEKO LIMITED**  
 KING ISLAND GROUP  
 No. KG15-22  
 SCALE: 1 mile to 1 inch  
**E.L. 23/69**  
**GEOCHEMICAL RESULTS**  
**LEAD**  
 Q2/5  
 1741



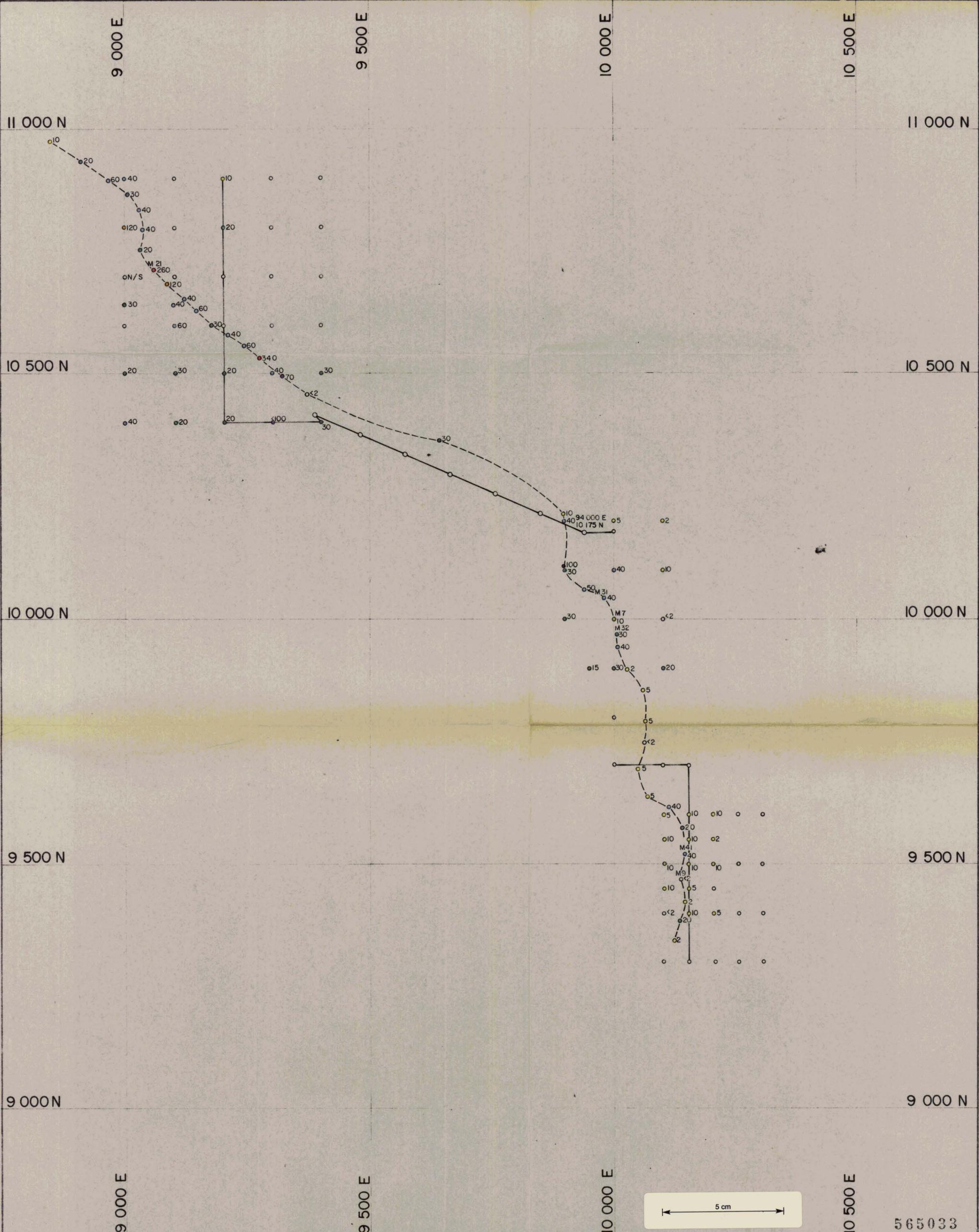
**Legend:**  
 - - - TRACK  
 = ROAD  
 - - - GEOLOGICAL BOUNDARY

**Copper (p.p.m.)**  
 ● 0-10  
 ● 11-20  
 ● 21-40  
 ● 41-80  
 ● 81-160  
 ● >160

**NOTE:**  
 RESULTS ARE FOR BOTTOM OF HOLE SAMPLES OBTAINED USING A "GEMCO" AUGER DRILL RIG.  
 VALUES  $\leq 10$  NOT PLOTTED  
 ANALYSIS BY ATOMIC ADSORPTION SPECTROSCOPY FOLLOWING HOT HCL LEACHING FOLLOWED BY HCL/HNO<sub>3</sub> IN THE LATER STAGES FOR 1.0 HOUR ON A 0.25 GRAM SAMPLE.

DATE: JULY, '74  
 GEOLOGIST: S.G.B.  
 DRAWN: R.F.  
 CHECKED: S.G.B.

565032 74-1045  
**GEOPEKO LIMITED**  
 KING ISLAND GROUP  
 No. KG 15-24  
 SCALE: 1 inch to 1 mile  
**E.L. 23/69**  
**GEOCHEMICAL RESULTS**  
**COPPER**  
 Q2/5



LEGEND:

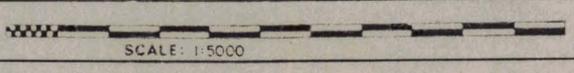
- < 2
- 2-10
- 11-30
- 31-60
- 61-100
- 101-200
- > 200

NOTE: scout holes in which anomalous values were encountered are prefixed 'M'.  
: grid north 9° East of Magnetic.



DATE JAN. 1974  
GEOLOGIST: S.G.B.  
DRAWN: R.F. & K.D.  
CHECKED: S.G.B.

GEOPEKO LIMITED  
KING ISLAND GROUP



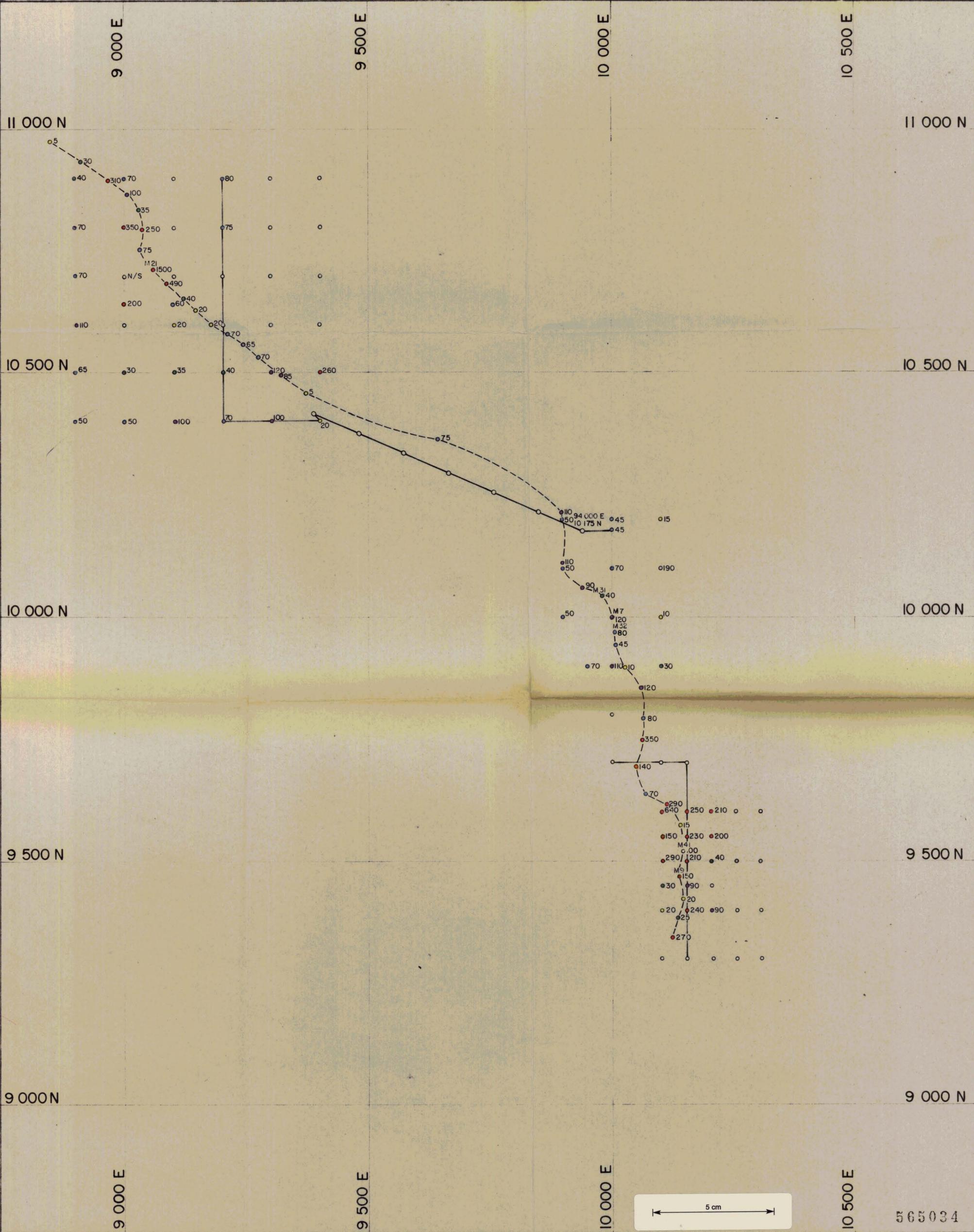
No. KGI 20-6

INVESTIGATOR 20  
GEOCHEMICAL RESULTS  
TUNGSTEN

74-1045

1743 02/5

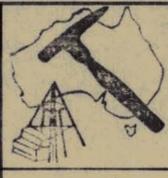
565033



LEGEND:

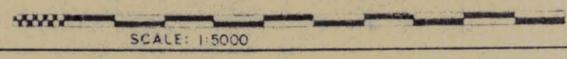
- 0-20
- 21-40
- 41-80
- 81-120
- 121-160
- >160

NOTE: scout holes in which anomalous values were encountered are prefixed 'M'.  
: grid north 9° East of Magnetic.



DATE JAN. 1974  
GEOLOGIST: S.G.B.  
DRAWN R.F. & K.D.  
CHECKED: S.G.B.

GEOPEKO LIMITED  
KING ISLAND GROUP



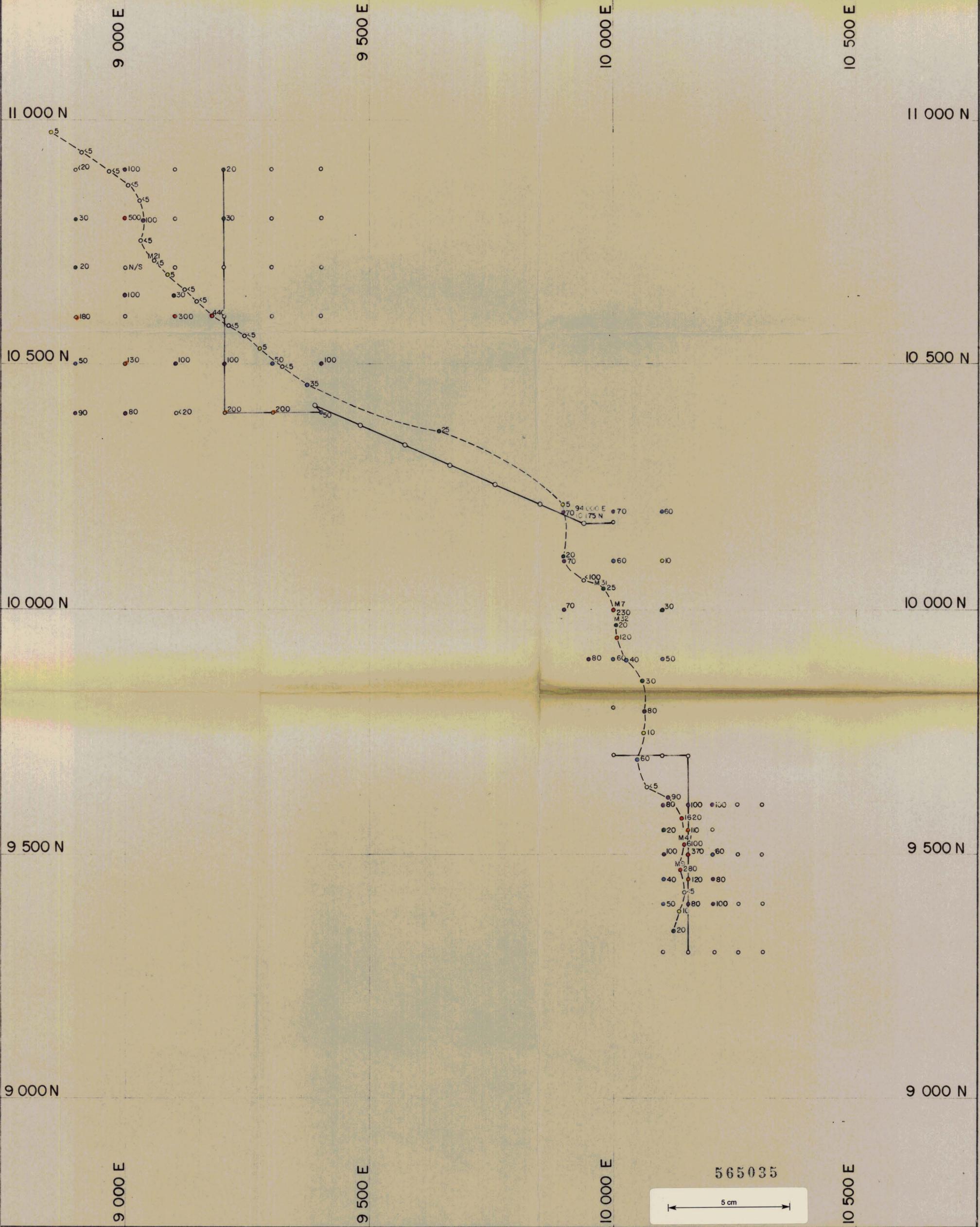
No. KGI 20-4

INVESTIGATOR 20  
GEOCHEMICAL RESULTS  
ZINC

74-1045

1744 2/5

565034



LEGEND:

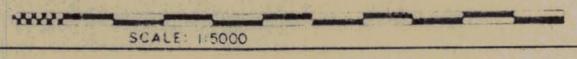
- < 2
- 2-10
- 11-30
- 31-60
- 61-100
- 101-200
- >200

NOTE: scout holes in which anomalous values were encountered are prefixed 'M'.  
: grid north 9° East of Magnetic.



DATE JAN. 1974  
GEOLOGIST: S.G.B.  
DRAWN R.F. & K.D.  
CHECKED S.G.B.

GEOPEKO LIMITED  
KING ISLAND GROUP

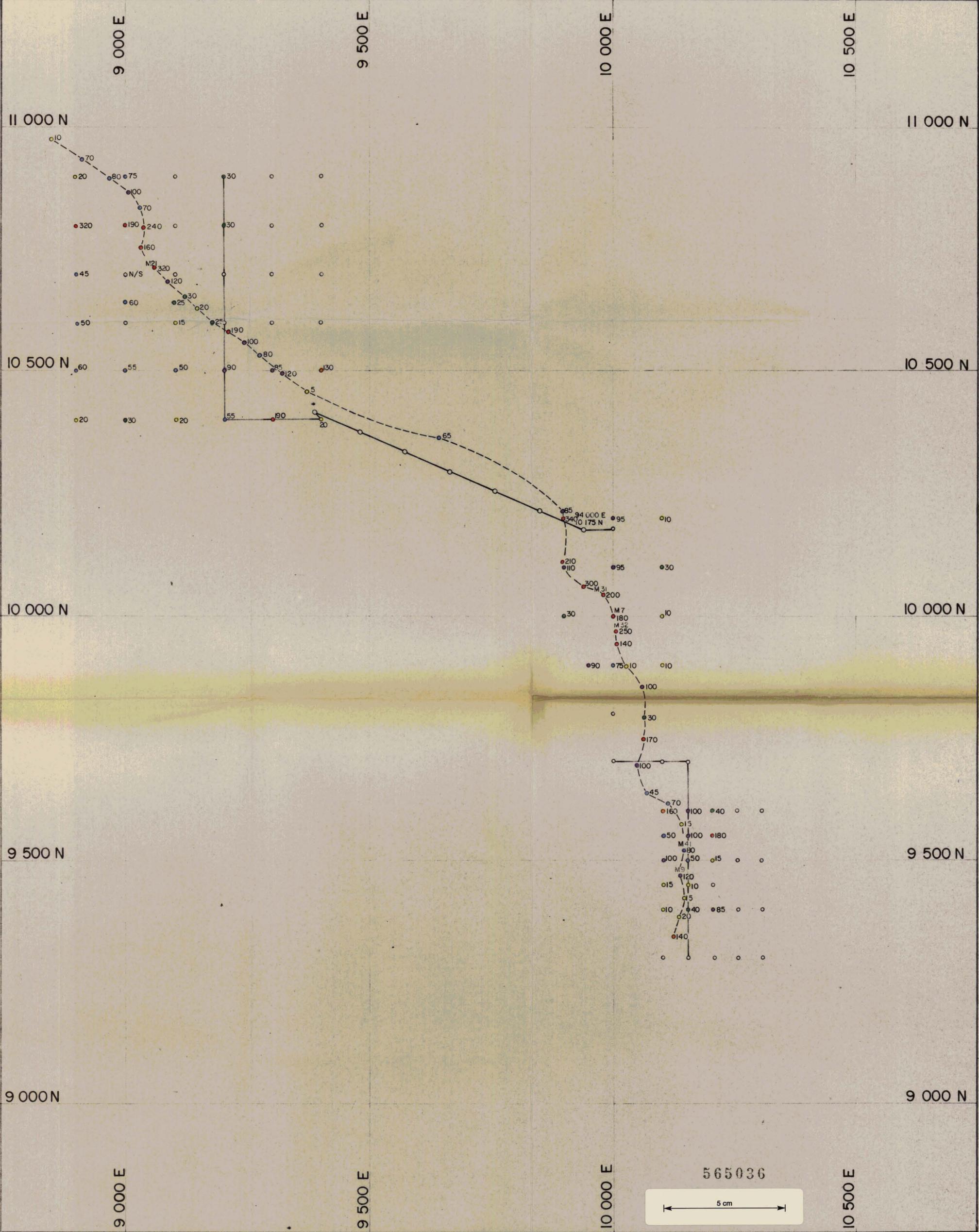


No. KGI 20 - 2

INVESTIGATOR 20  
GEOCHEMICAL RESULTS  
TIN

74-1045

1745 Q2/5



LEGEND:

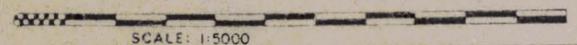
- 0 - 20
- 21 - 40
- 41 - 80
- 81 - 120
- 121 - 160
- > 160

NOTE: scout holes in which anomalous values were encountered are prefixed 'M'.  
: grid north 9° East of Magnetic.



DATE JAN, 1974  
GEOLOGIST: S.G.B.  
DRAWN: R.F. & K.D.  
CHECKED: S.G.B.

GEOPEKO LIMITED  
KING ISLAND GROUP

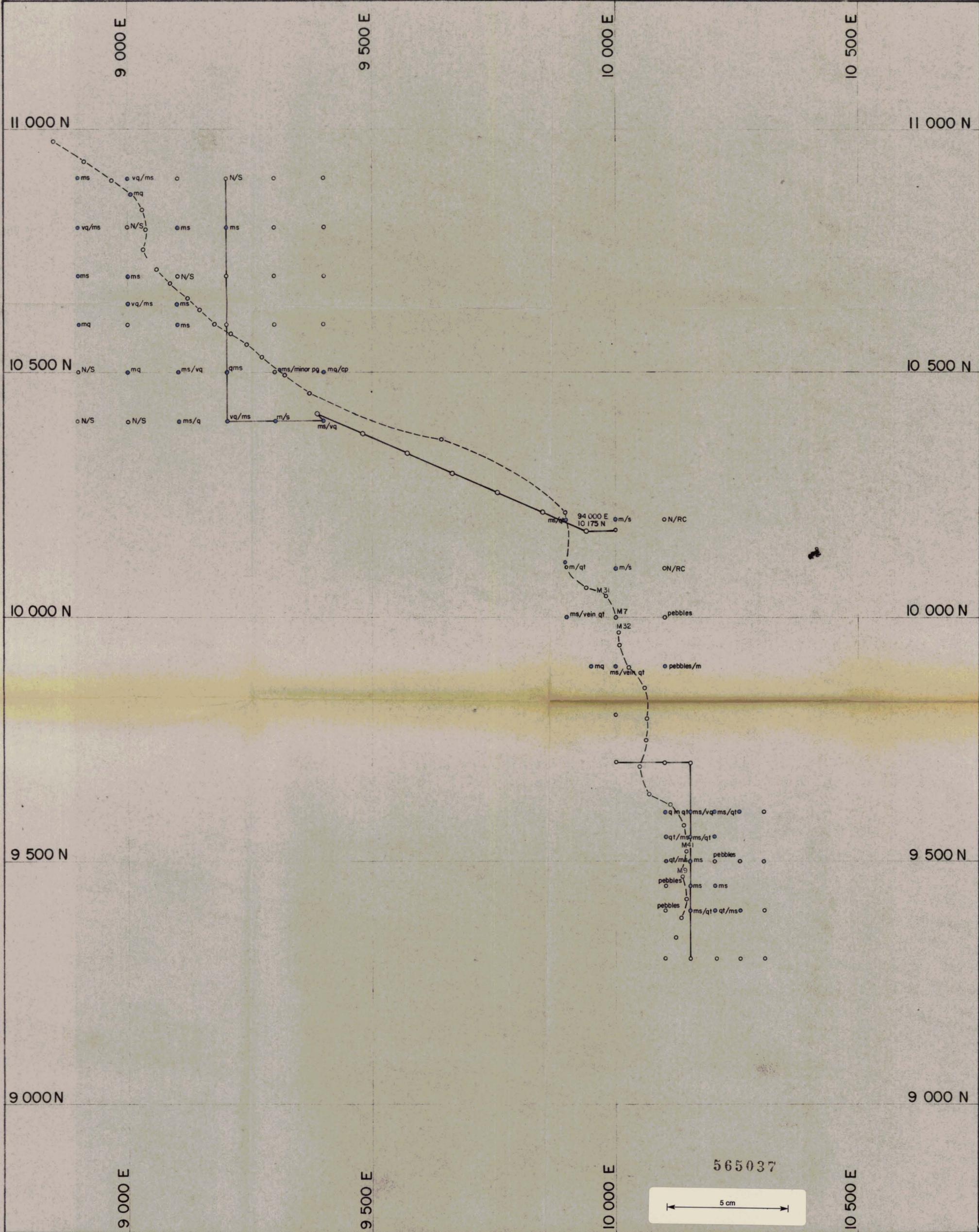


No. KGI 20 - 3

INVESTIGATOR 20  
GEOCHEMICAL RESULTS  
COPPER

74-1045

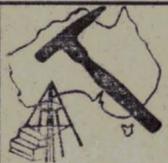
Q2/5



LEGEND:

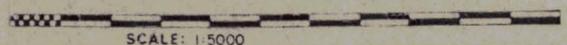
- c Ironstone
- qt Quartzite
- qms Quart Mica Schists
- ms Mica Schists
- m Mica
- s Siliceous Chert
- vq Vein Quartz
- q Quartz
- g Granite
- p Pegmatite
- N/S No Sample
- N/RC No Rock Chip

NOTE: scout holes in which anomalous values were encountered the prefixed 'M'.  
: grid north 9° East of Magnetic.



DATE JAN. 1974  
GEOLOGIST: S.G.B.  
DRAWN: R.F. & K.D.  
CHECKED: S.G.B.

GEOPEKO LIMITED  
KING ISLAND GROUP



No. KGI 20 - 1

INVESTIGATOR 20  
GEOLOGY

74-1045

02/5

560 7000 N

245 000 E

246 000 E

560 7000 N

560 6000 N

245 000 E

246 000 E

560 6000 N

565038

LEGEND:

- Auger Drill Holes
- Road
- Tracks
- - - - Drain

Tungsten (p.p.m.)

- <2
- 2-10
- 11-30
- 31-50
- 51-70
- >70

NOTE: Surveyed on I.S.G. grid.

5 cm



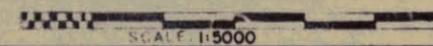
DATE AUG. '74

GEOLOGIST SGB

DRAWN KD

CHECKED MCR

GEOPEKO LIMITED  
KIVULU ISLAND GROUP



No KGI 14-9

INVESTIGATOR 14  
GEOCHEMICAL RESULTS  
TUNGSTEN

1748

74-1045

Q2/5

560 7000 N

245 000 E

246 000 E

560 7000 N

560 6000 N

245 000 E

246 000 E

560 6000 N

565039

LEGEND:

- Auger Drill Holes
- Road
- - - Tracks
- · - · - Drain

Titanium

- 0-500
- 500-1000
- 1000-2000
- 2000-4000
- 4000-8000
- >8000

NOTE: Surveyed on I.S.G. grid.

5 cm

Ti  
Zr



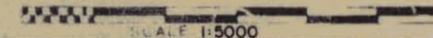
DATE AUG. '74

GEOLOGIST SGB

DRAWN KD

INDEXED MCR

GEOPEKO LIMITED  
ADRIAN ISLAND GROUP



No KGI 14-8

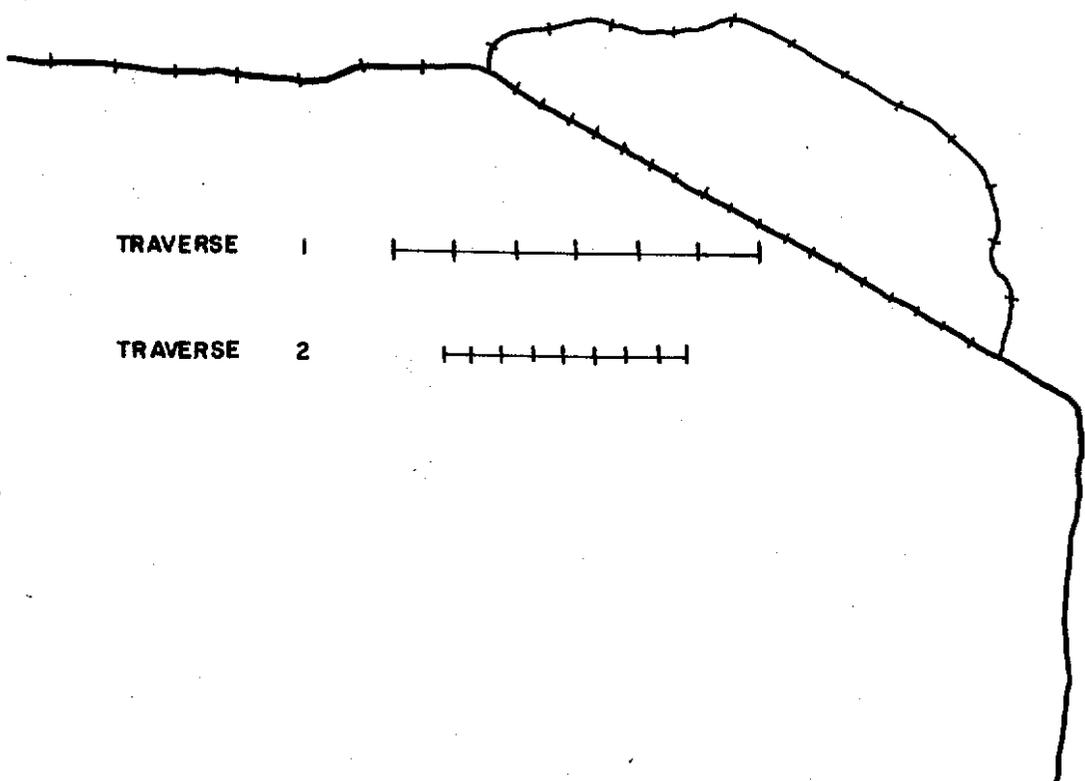
INVESTIGATOR 14  
GEOCHEMICAL RESULTS  
TITANIUM and ZIRCON

1749

74-1045

Q2/5

565040



TRVERSE 1

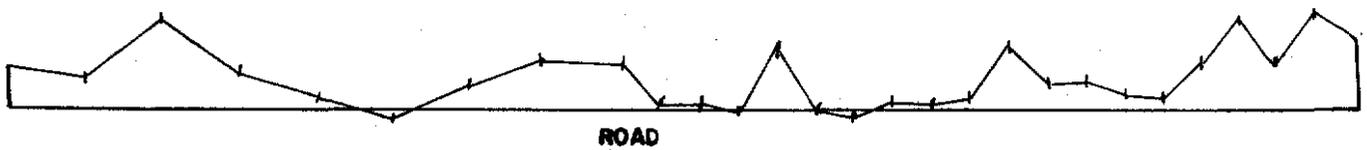
1

TRVERSE 2

2



TRACK



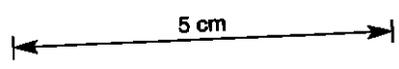
ROAD



TRVERSE 1



TRVERSE 2



5 cm

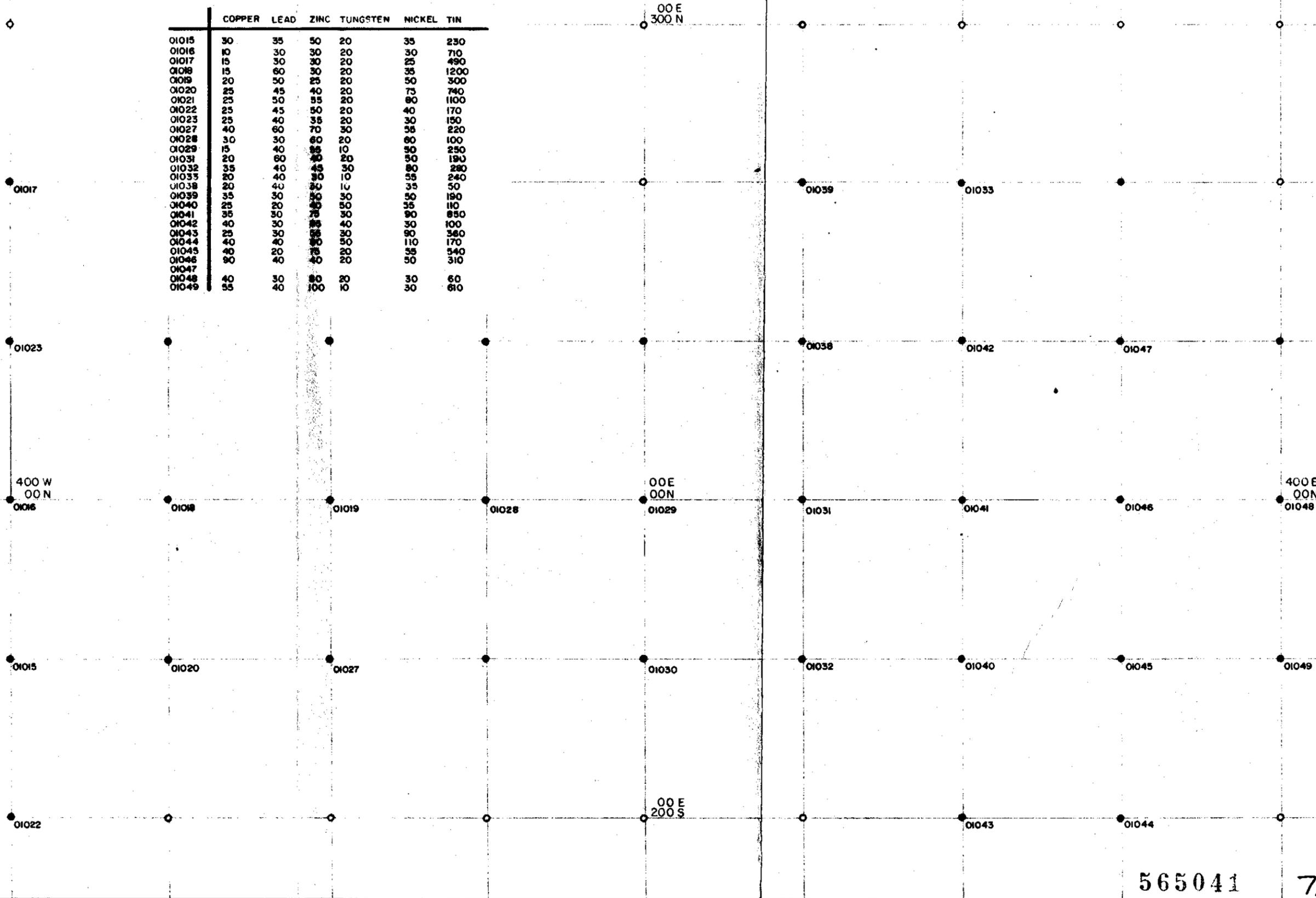
INVESTIGATOR 14

MAGNETIC RECONAISSANCE SURVEY  
(VERTICAL CPT)

DATUM AT 200' SCALE 50' / cm  
L.A.R. & ASSOCIATES 1973

# GEOCHEMICAL RESULTS

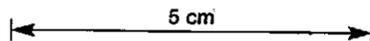
	COPPER	LEAD	ZINC	TUNGSTEN	NICKEL	TIN
01015	30	35	50	20	35	230
01016	10	30	30	20	30	710
01017	15	30	30	20	25	490
01018	15	60	30	20	35	1200
01019	20	50	25	20	50	300
01020	25	45	40	20	75	740
01021	25	50	55	20	80	1100
01022	25	45	50	20	40	170
01023	25	40	35	20	30	150
01027	40	60	70	30	55	220
01028	30	30	60	20	60	100
01029	15	40	55	10	50	250
01031	20	60	40	20	50	190
01032	35	40	45	30	80	280
01033	20	40	30	10	55	240
01038	20	40	30	10	35	50
01039	35	30	30	30	50	190
01040	25	20	20	50	35	110
01041	35	30	75	30	90	850
01042	40	30	35	40	30	100
01043	25	30	55	30	90	360
01044	40	40	50	50	110	170
01045	40	20	75	20	35	540
01046	90	40	40	20	50	310
01047						
01048	40	30	80	20	30	60
01049	55	40	100	10	30	610



**LEGEND:**

- Pegs inaccessible to Gemco
- Pegs Gemco drilled
- 01234 Geochemical Sample No.'s

NOTE: surveyed on magnetic north.



DATE: MAR 1974  
 GEOLOGIST: S.G.B.  
 DRAWN: K.D.  
 CHECKED: M.C.R.

**GEOPEKO LIMITED**  
 KING ISLAND GROUP

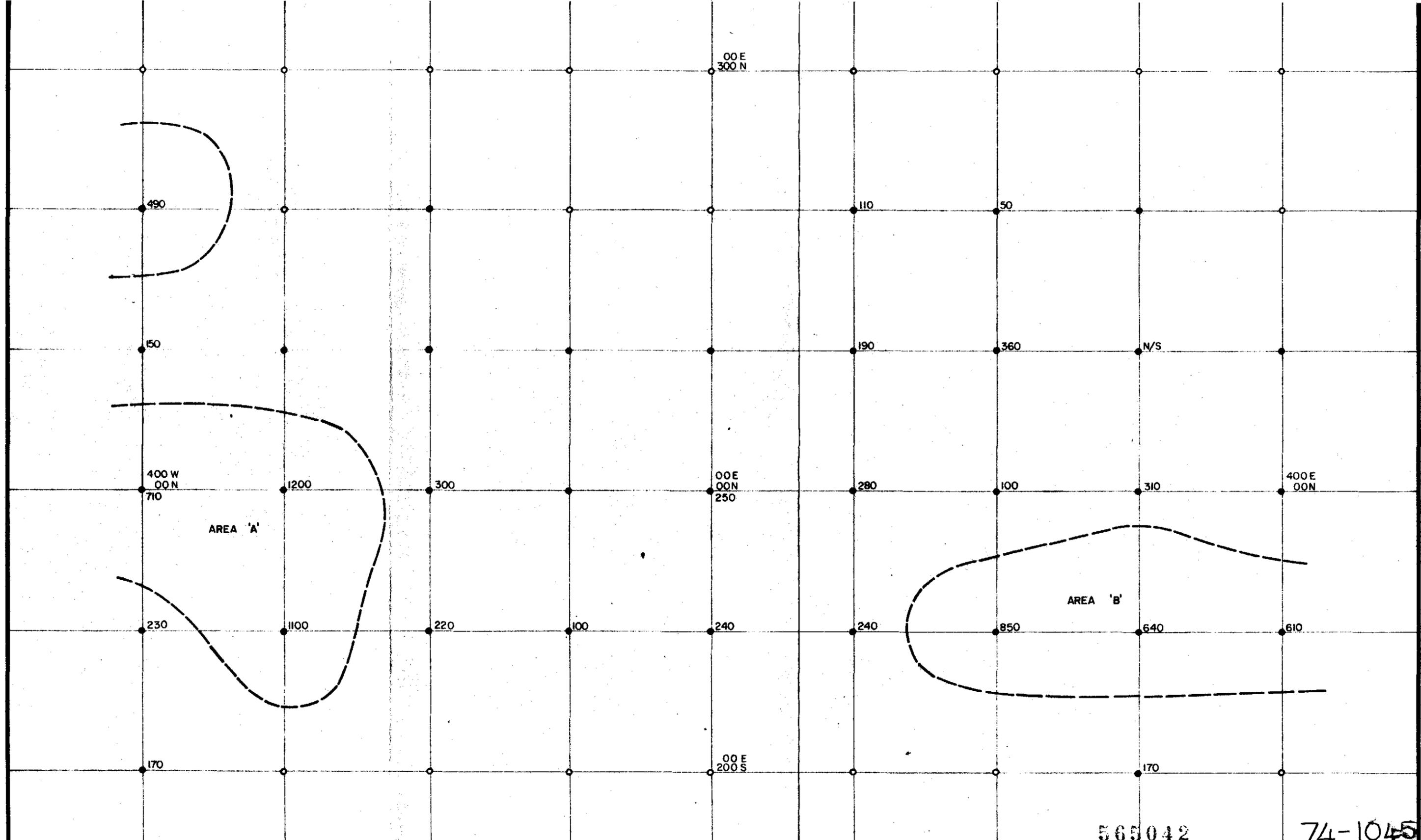


No. KG 15-18

'N' TRACK  
 GEOCHEMICAL RESULTS  
 1751

565041 74-1045

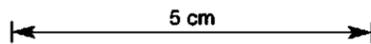
02/5



**LEGEND:**

- Pegs inaccessible to Gemco
- Pegs Gemco drilled
- Area 'A' 88,000 cu/yds at 3lb/cu.yd
- Area 'B' 110,000 cu/yds at 2lb/cu.yd

NOTE: surveyed on magnetic north.



DATE: MAR. 1974  
 GEOLOGIST: S.G.B.  
 DRAWN: K.D.  
 CHECKED: M.C.R.

565042

74-1045

**GEOPEKO LIMITED**  
 KING ISLAND GROUP



No. KG 15-18/6

'N' TRACK  
 GEOCHEMICAL RESULTS

1752

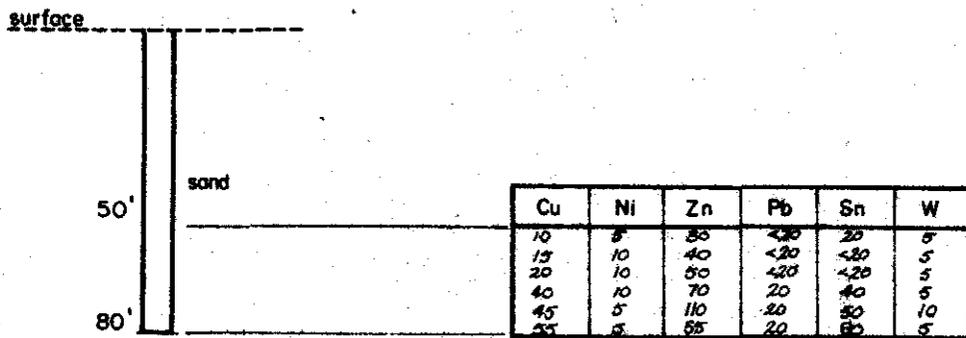
TIN

02/5

surface

10'	soil	Cu	Pb	Zn	Ni	Co	Cr	V	As
		20	<20	30	85	20	100	300	<.5
		35	30	60	150	40	80	300	<.5
		30	20	70	190	45	90	500	<.5
	olivine basalt	30	20	55	140	35	70	500	<.5
		25	<20	60	130	30	80	200	<.5
		30	20	60	160	35	110	300	<.5
		25	20	50	120	25	80	300	<.5
50'		20	<20	40	90	20	60	300	<.5

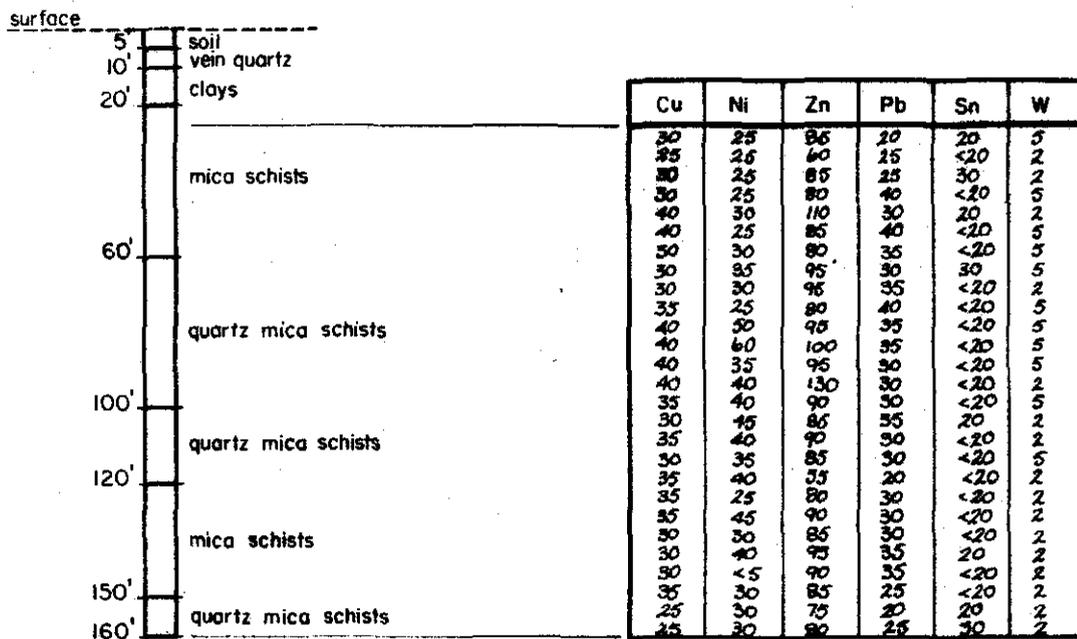
E.L. 23/69  
 MAGNETIC ANOMALY No. 4-1  
 Geological Log and Geochemistry



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 INVESTIGATOR No. 20-1  
 Geological Log and Geochemistry

surface		Cu	Ni	Zn	Pb	Sn	W	W XRF
10'	sand	20	5	55	40	<20	10	
		10	42	15	20	50	20	
		170	85	500	40	110	>100	290
35'	sandy clay	530	60	460	60	50	>100	220
		45	60	400	65	80	>100	140
		110	60	1900	20	130	100	100
		260	30	620	95	180	>100	150
		550	45	1500	140	400	>100	190
		290	90	1000	100	290	>100	200
70'	clay	400	60	520	110	300	100	160
		210	70	780	110	320	>100	190
		350	75	1600	120	150	>100	210
		140	95	2000	110	70	>100	290
		280	110	4000	260	220	>100	300
		580	80	2600	210	300	>100	150
80'	clay & rock chips	360	60	2000	160	170	100	100
		400	25	2700	120	140	20	
		170	30	1300	120	190	20	
120'	mica schists	210	50	1500	120	170	20	
		190	45	1600	170	130	20	
		80	30	360	40	50	15	
		150	25	1800	80	20	15	
		120	40	720	60	50	15	
		70	25	300	35	40	10	

E.L. 23/69  
 INVESTIGATOR No. 20-2  
 Geological Log and Geochemistry



E.L. 5/69  
 WATER BORE No. 2  
 Geological Log and Geochemistry