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TRIAL HARBOUR AREA

S.P.L. 129

ANNUAL REPORT 1979-80

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SUMMARY

Gradient array I.P. was carried out over the East Heemskirk Grid North of the Trial Harbour road. Following evaluation of that data, three diamond drill holes were completed on the grid. No significant tin mineralisation was intersected, but the holes encountered a serpentinous carbonate horizon and showed that the eastern contact of the Heemskirk Granite dips outwards at 10° - 15°.

Work recommended for 1980-81 included detailed evaluation of the Globe Mine, possibly followed by diamond drilling, preparation of a new cut grid on the south-east portion of the granite, followed by geophysical and geochemical surveys thereon, and 1:5000 scale geological mapping of the eastern end of the licence.

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1. INTRODUCTION

S.P.L. 129 is located south-west of Zeehan, West Tasmania, and extends from Zeehan in the east to Trial Harbour in the west (Plan 1). The licence area covers a faulted and deformed sequence of Upper Proterozoic and Paleozoic sediments and basic intrusives, and the south-eastern margin of the Heemskirk Granite.

Historically, mining activity has concentrated in the eastern part of the licence where vein-type silver - lead - zinc mineralization was exploited in a series of small mines. Other workings were developed in the magnetite deposits of Tenth Legion, stanniferous polymetallic sulfides at the Globe Mine and cassiterite-bearing veins at Kelvin and Maynes Mine (Plan 2).

Since the S.P.L. was granted in 1973, systematic exploration for tin and base metals — including six diamond drill holes, geological mapping, and geophysical and geochemical surveys — has been carried out over the East Heemskirk and Area D grids.

During 1979-80, work has involved I.P. and diamond drilling on the East Heemskirk Grid north of the Trial Harbour road. Vehicular access has been made up to the Globe Mine with a view to doing further work in 1980-81.

Work to be undertaken during 1980-81 should involve:

(i) Detailed geological and geophysical examination of the Globe workings, possibly followed by diamond drilling.

(ii) Preparation of a cut grid in the south-east portion of the Heemskirk Granite between the Globe and Sweeney's, followed by geophysical and geochemical surveys thereon. Of this, approximately one third should lie within S.P.L. 129, the rest being within E.L. 11/76.

(iii) Geological mapping at 1:5000 scale of the eastern end of the licence area where it covers the south-west portion of the Zeehan mining field.

2. EXPENDITURE

Expenditure during 1979-80 amounted to $46,657. Of this, Renison's share (at 76%) was $35,459 with Mt Lyell paying the remainder. Total expenditure on the licence to date is $206,326.

The final diamond drill hole in the East Heemskirk program, TH6, was finished during July 1980. Of the costs associated with it, $6,244 will report to the 1980-81 figures.

Work proposed for 1980-81 is expected to cost $69,735.

3. LAND TENURE

S.P.L. 129 is held by the Mt Lyell Mining and Railway Company Limited. Since 1978, exploration has been carried out by Renison Limited under a Joint Venture Agreement. Renison's share is currently 76%.

Within the Licence area, the following leases are held by other parties (Plan 2):

(i) M.L.s 10M/70 and 1M/73, held by S.A. Clark over the Swansea Mine and covering 26.3 ha.

(ii) Part of Consolidated Lease 123M/47 held by the E.Z. Company over the Comstock Workings.

(iii) M.L. 64M/73, held by S.A. Clark and G.B. Francesconi over the Kynance and Silver Stream Workings, covering 6 ha.

(iv) M.L.s 50M-54M/75 held by Industrial and Mining Investigations Pty Ltd over areas of ironstone, including the Tenth Legion Mine, east of the Heemskirk Granite and north of the Trial Harbour road, covering 145 ha. Extensive exploratory work on the East Heemskirk grid covered these leases with the understanding that they were granted for iron ores only, and therefore that Renison and Mt Lyell were free to explore there for any other minerals. Following correspondence between all the parties concerned and the Mines Department in February - April this year, the Director of Mines ruled that the leases are not part of S.P.L. 129 and hence no further work is contemplated over them.

(v) M.L.s 90M/72 and 4M/73, held by F.J. Griffiths over Kelvin and Maynes Mine, covering 32.4 ha.

(vi) M.L. 80M/77, held by M.S. Robertson and E.W. Coleman, north of Trial Harbour, covering 2 ha.

(vii) M.L. 39M/80, held by C.R. Parker and S.A. Clark, near the Nickel Reward Mine, covering 21 ha.

(viii) M.L. 36M/80, held by S.A. Clark and J.B. Francesconi, adjacent to 39M/80, covering 4 ha.

During 1979-80, vacant M.L.s 49M/75 (Spray Mine), 2M/74 (Colonel North's) and 6M/73 (Stonehenge) covering a total area of 67 ha., were pegged by Renison and incorporated into the S.P.L. As M.L. 49M/75 extended outside the S.P.L. boundary, the licence area has been slightly enlarged.

4. EAST HEEMSKIRK GRID

4.1. Work Completed 1979-80

During 1979-80 work concentrated on the northern part of the grid where encouraging geochemical and geophysical results have been obtained in previous years (Stephenson, 1978, and Ross, 1979).

4.1.1. Geophysics

Following a recommendation of the 1978-79 Annual Report, gradient array I.P. was carried out in November - December 1979 over the grid west of the baseline (2100E) and north of the Trial Harbour road, including the infill lines and extensions cut in 1978 (Plans 3 and 4, Figure 1) This work overlapped the previous pole - dipole I.P. Survey completed in 1978 along the original 400m-spaced grid lines (Scintrex Report Tas-052a). For a detailed description of the gradient array I.P., the reader is referred to Scintrex Report Tas-074C. In summary, the results were:

(a) 48 chargeability/resistivity anomalies were outlined, graded from A to D. Of these, 13 were classified as A or A/B and therefore of primary interest.

(b) The pole-dipole results were largely confirmed by the gradient array work, but the latter pinpointed the anomaly locations more accurately.

(c) Bedrock geology of the area surveyed comprises granite and hornfelsed Crimson Creek Formation (?) sediments. The latter

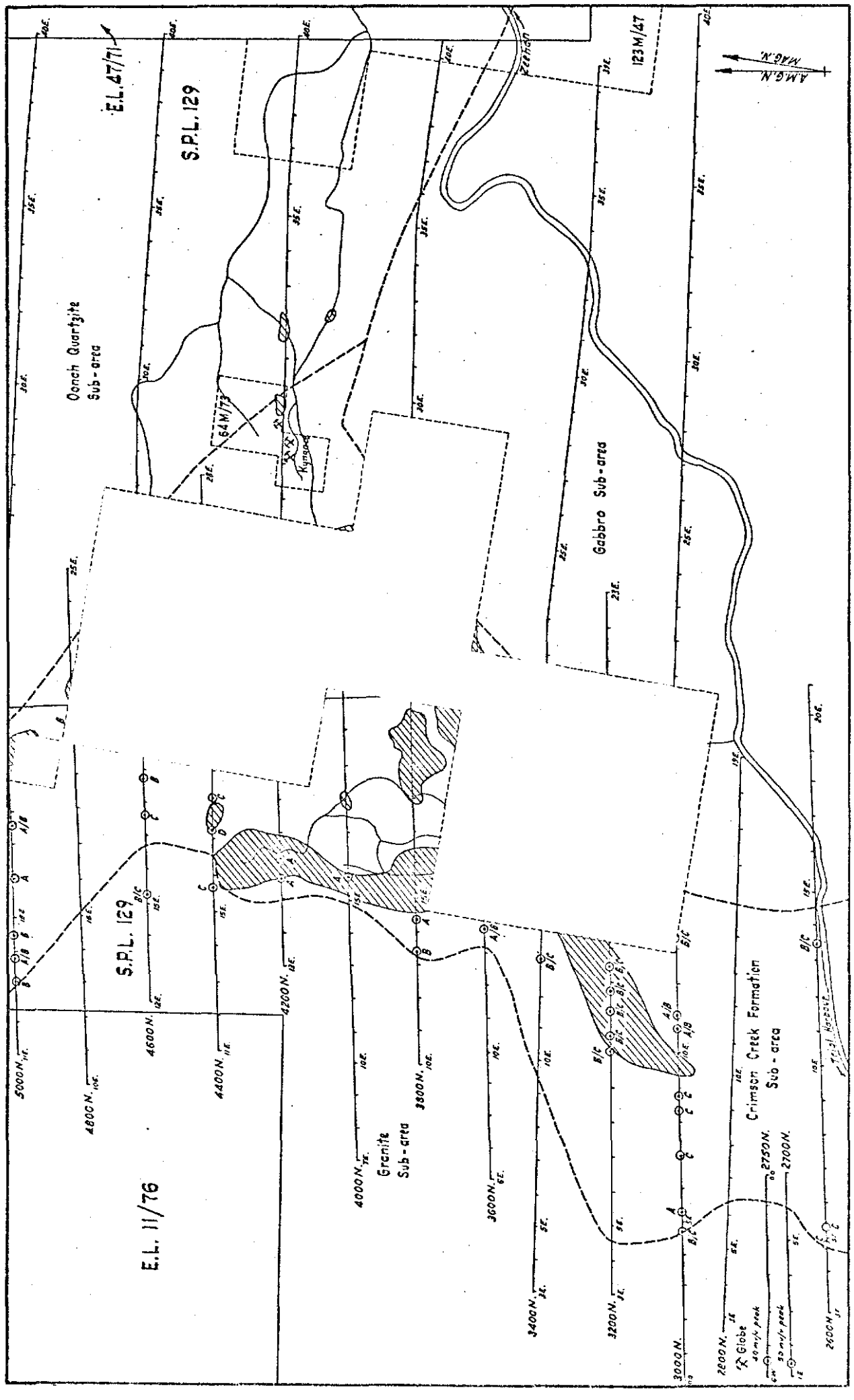

FIGURE 1 EAST HEEMSKIRK GRID - GRID LOCATION, GRADIENT ARRAY I.P. ANOMALIES & IRONSTONE LOCATIONS.

(Ticks on grid lines 100m. apart; ⊙ gradient array I.P. anomalies graded from A to D; ironstones hatched.)

show variable chargeability and resistivity response and contain numerous anomalies whereas the granite shows a more consistent pattern of low chargeability and high resistivity. The Crimson Creek (?) rocks contain ubiquitous disseminated pyrite, whereas the granite is generally fresh and sulfide-poor, so these responses are consistent with observed geology.

(d) Anomalous chargeability responses (up to 50 mv/v) were found within the granite near the Globe Mine on the western end of lines 2700 and 2750N. In the light of I.P. results over endogranitic sulfide mineralization elsewhere in the Heemskirk Granite, (i.e. Sweeneys, Scintrex Report Tas-047) these anomalies may signify massive sulfide mineralization at or near the Globe despite the high associated resistivities (>1000Ωm).

4.1.2. Geochemistry

Line 2750N was cut and pegged in September 1979 with the intention of traversing the Globe workings. This was not done, however, and the line passes 50m to the south of the mine (Plan 5a). Nevertheless soil samples were taken along the line at a 25m spacing and the -180μm fraction was analysed for Sn, As, Cu, Pb and Zn. Sn values are high, particularly in the vicinity of the Globe and probably reflect detrital cassiterite shed from mineralization there and quartz/tourmaline veins further upslope. A sharp As/Pb/Cu peak occurs at 300N downslope from the Globe but on the opposite (north) side of Agnew Creek; this may be a leakage anomaly from massive sulfide mineralization.

All of the geochemical data for the northern part of the grid has been re-examined. The area has been subdivided into four discrete sub-areas defined by bedrock geology, namely Granite, Crimson Creek/Ironstone, Gabbro and Oonah Quartzite. The data has been re-contoured using different contour intervals for different sub-areas where appropriate, and allowing the geological data to bias the inter-line correlation (Figures 2 - 6). The following comments are relevant:

(a) Granite. This area is characterized by low values in all elements, the only exception being an irregular high Sn (low soluble Sn) zone on lines 2600 - 3200N and anomalous As/Cu/Pb/Zn values downslope from the Globe Mine. These results confirm the prospectiveness of the Globe.

(b) Crimson Creek/Ironstone. This area is characterized by abundant anomalies of all the elements assayed. Anomalous Sn (high soluble Sn) contents are largely confined to two areas of ironstone outcrop, one a semi-continuous zone roughly parallelling the granite contact extending from 2800 to 4200N and the other the main Tenth Legion magnetite lode (Figure 2). Of the other elements, many of the anomalies have probably resulted from scavenging by iron and manganese oxides particularly in soils overlying ironstone outcrop. Multi-element anomalies occur over the two Sn-rich zones described above (anomalies 1 and 2), as well as a thin, sharply defined north-trending zone extending from 3000 to 4600N (anomaly 3) a discontinuous zone parallelling the gabbro contact centred around 3200 - 3800N (anomaly 4)

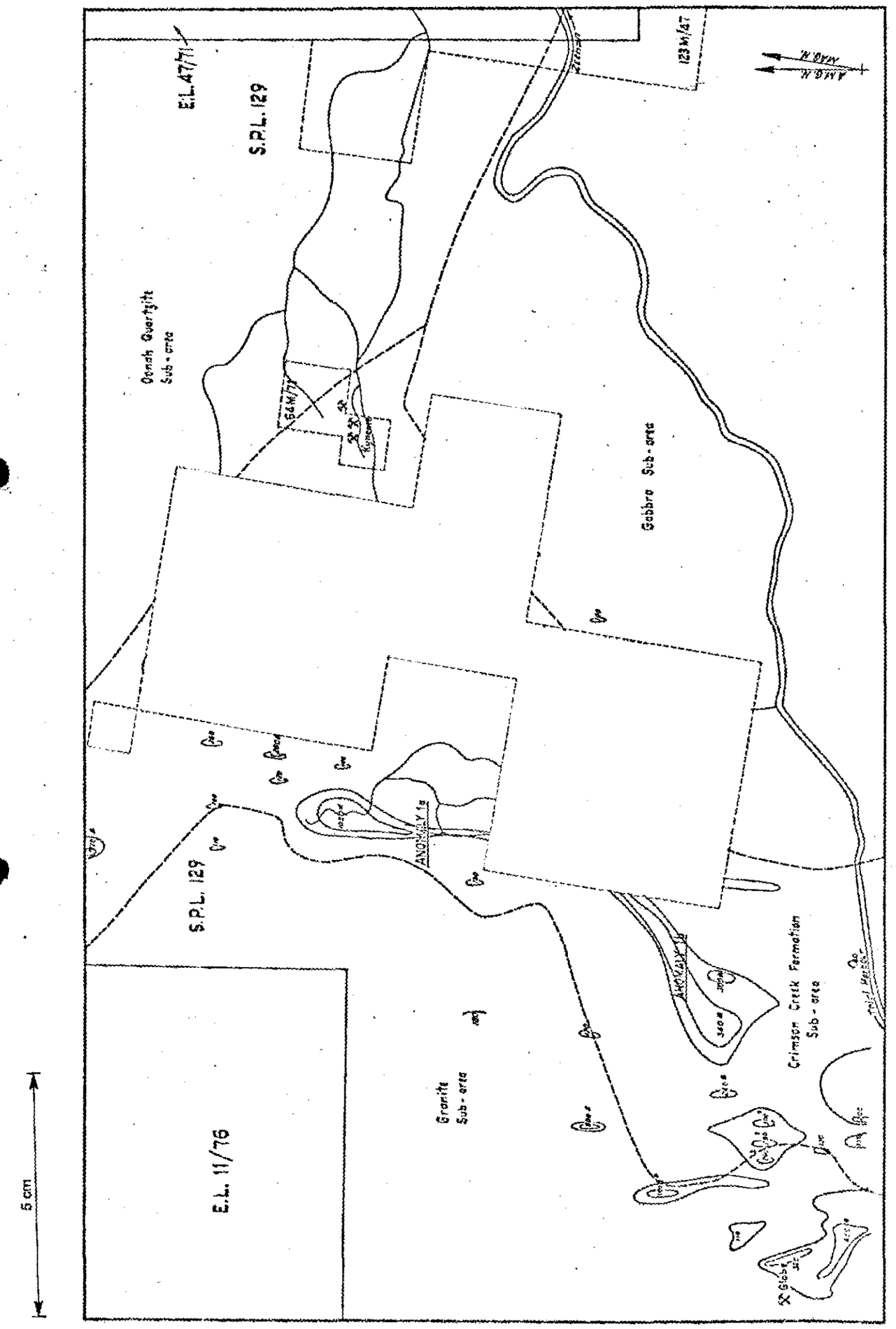

FIGURE 2 EAST HEEMSKIRK GRID - TIN SOIL GEOCHEMISTRY

(Contours 100, 200 ppm; spot highs in ppm; + high soluble Sn ◦ low soluble Sn)

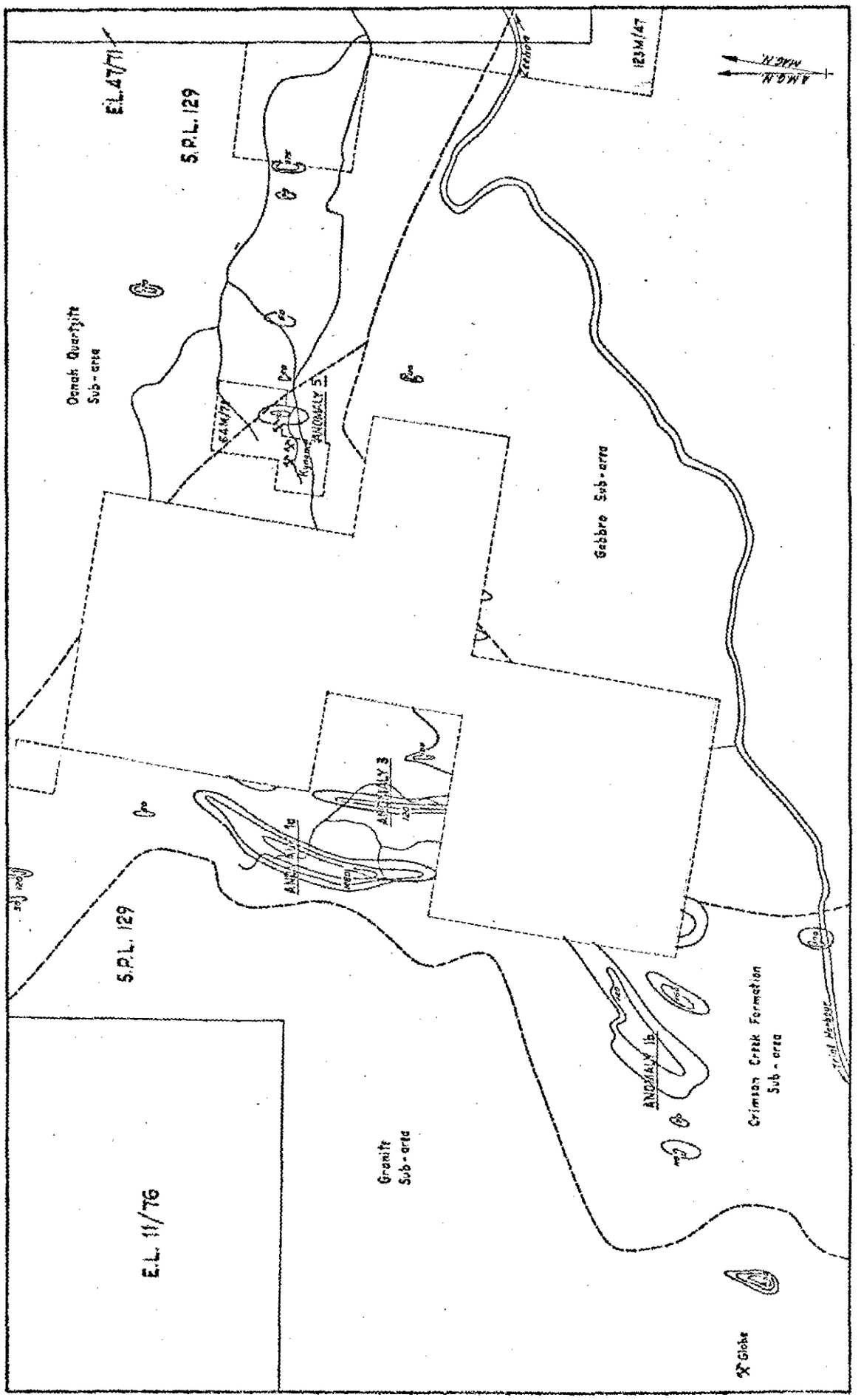

FIGURE 3 EAST HEEMSKIRK GRID - ARSENIC SOIL GEOCHEMISTRY

(Cont urs Donah Crimson Creek limestone Gabbro 50 100 200 ppm Granite 25,50 100 ppm

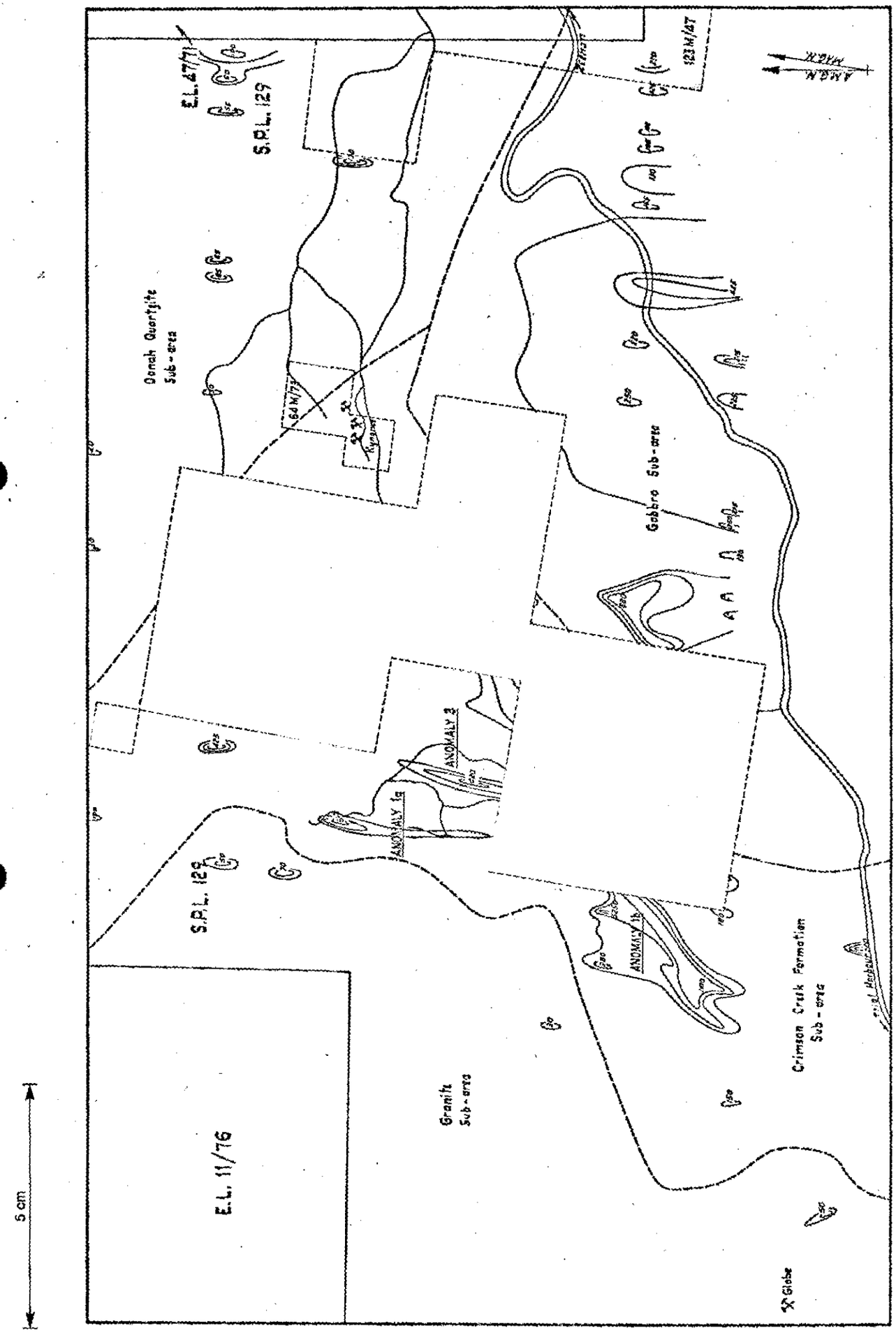

FIGURE 4 EAST HEEMSKIRK GRID - COPPER SOIL GEOCHEMISTRY

(Contours Donah Granite 25 50 100 p.p.m, Crimson Creek/Ironstone Gabbro 100 200 300 p.p.m

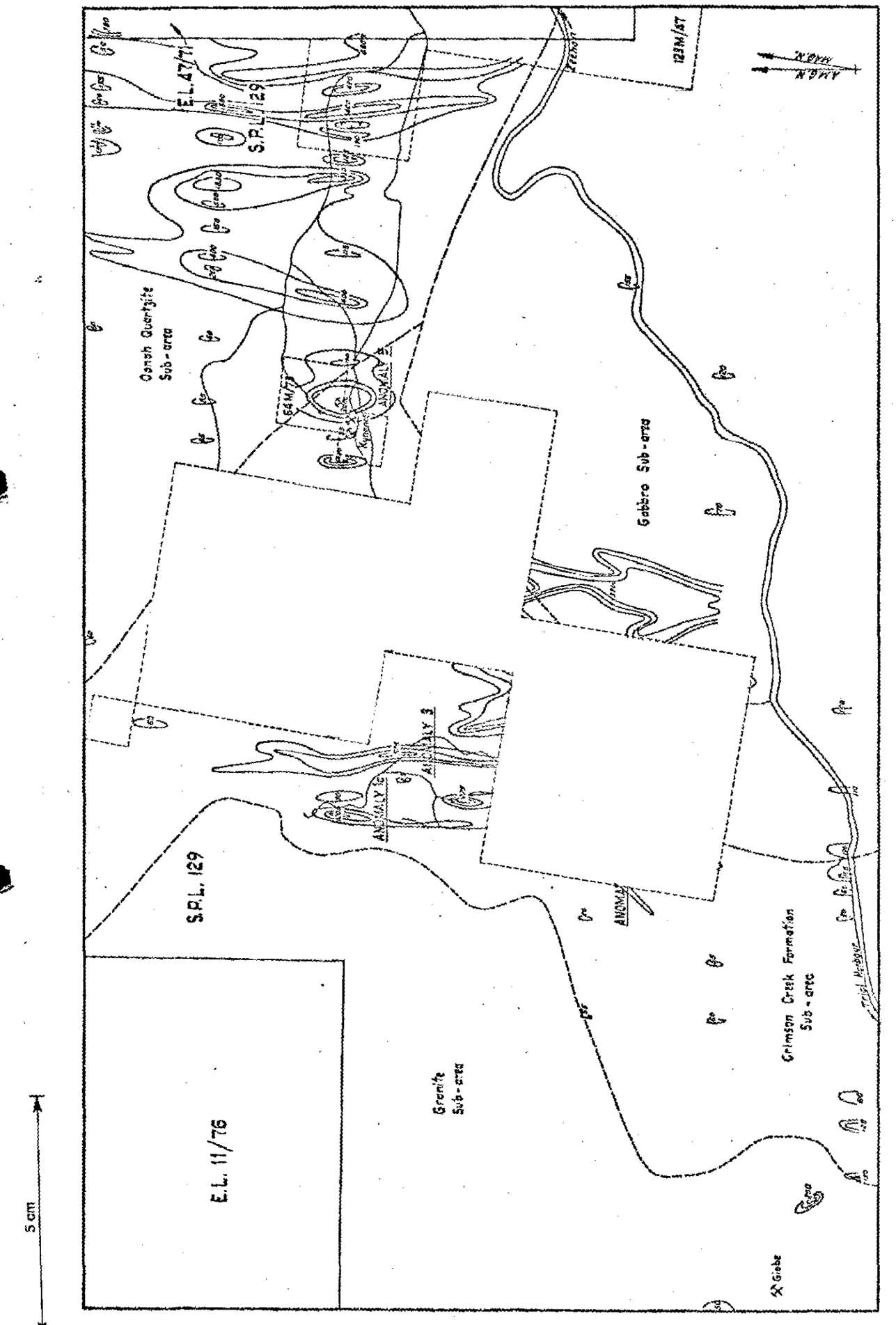

FIGURE 5 EAST HEEMSKIRK GRID - LEAD SOIL GEOCHEMISTRY

(Contours: Ganah, Granite, Crimson Creek/Ironstone 50,100,200 p.p.m; Gabbro 100,200,300 p.p.m; Spot highs in p.p.m)

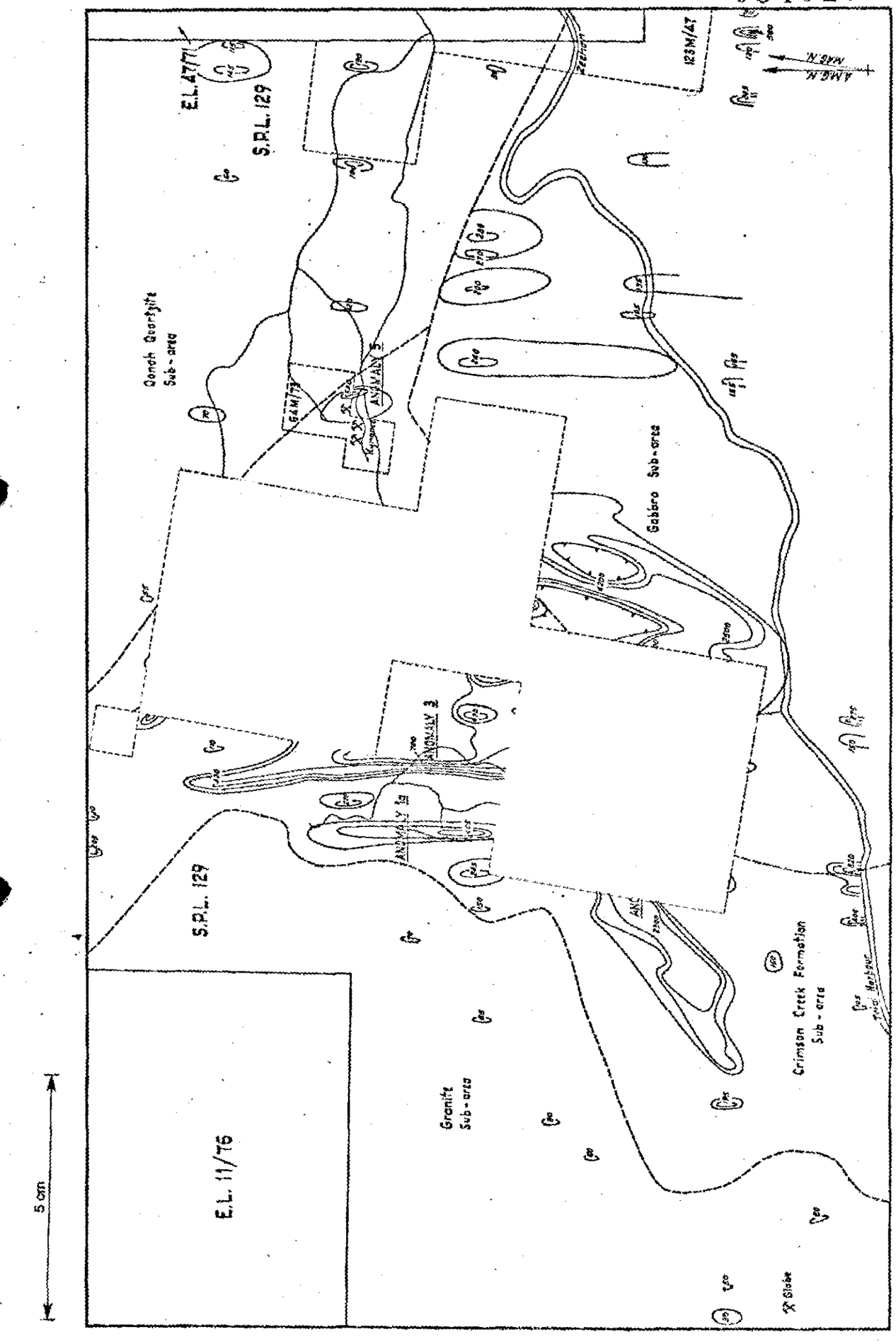

FIGURE 6 EAST HEEMSKIRK GRID - ZINC SOIL GEOCHEMISTRY

(Contours: Conoh Granite 50, 100, 200 p.p.m; Crimson Creek/Ironstone, Gabbro 100, 200, 300 p.p.m; Spot highs in p.p.m)

and around the Kynance workings (anomaly 5) (see Figures 3 - 6).

It is difficult to interpret these results because of the likelihood of scavenging and contamination near old workings. Nevertheless this area is prospective on geochemical grounds, consequently the three drill holes completed in 1979-80 were designed to test geochemical anomalies.

(c) Gabbro. This area contains low Sn and As throughout. Cu and Zn anomalies cover large areas and probably reflect high background levels in the bedrock. A single large Pb anomaly is present coincident with the western side of a swamp downstream from the Kynance Mine. As background Pb contents in mafic rocks are low (Levinson, 1974) this is ascribed to contamination. This area is not considered prospective.

(d) Oonah Quartzite. This area is also low in Sn and As. The only significant Cu and Zn anomalies lie at the eastern end of the grid, particularly on line 4600N. Pb is broadly anomalous east from 3100E and this can be ascribed to a combination of contamination from old workings and primary vein-style (?) Ag - Pb mineralization. The area is prospective for such mineralization but tonneages are probably small. In any case, the most attractive areas in the vicinity of the grid are held by other parties (i.e. M.L. 64M/73, Clark and Francesconi; and M.L. 123M/47, E.Z.).

4.1.3. Diamond Drilling

Three holes were diamond drilled for a total of 366.5m in May - July 1980. The drill targets were selected on the basis of anomalous geochemistry and I.P. in areas of favourable geology outside the leases held by Industrial and Mining Investigations Pty Ltd. Drill logs are appended. Details are as follows.

TH4 119.6m long, was drilled at an inclination of -45^{o} along 270^{o} (A.M.G.) from a collar at 1650E/3990N. The target zone is indicated highly anomalous soil geochemistry, a strong gradient array I.P. response (graded AA in the Scintrex report) centred at 1570E/4000N and ironstone float. The latter is the surface indication of an elongate ironstone body, striking north-south (parallel to bedding) and extending from 3600 to 4400N (Plan 6). The hole was designed to test the possibility that this is a mineralized skarn zone.

The hole encountered 31.6m of superficial clays and strongly weathered clay rock (derived from carbonates ?) before intersecting 4.4m of partly brecciated, serpentinous marble with minor magnetite but insignificant Sn or WO_3. Below this the hole intersected metasomatized hornfelses before reaching granite at 44.2m, much shallower than expected. The hole was drilled on to 119.6m within granite to test below the anomalies and to ensure that the granite was connected to the main intrusion and not an isolated dyke or cusp.

Outcropping sediments with measurable bedding orientations near the collar indicate bedding strikes approximately north - south. Assuming that this is so at TH4, B.C.A. readings show that bedding dips east either at 5 - 25° or 65 - 85°. Given the results of TH5 (200m further north) the first possibility is more likely, and hence the clayrock and carbonate intersections are probably the downdip extension of the target zone.

TH5 109.8m long, was drilled at an inclination of -30° along 270° (A.M.G.) from a collar at 1695E/4200N. The hole was designed initially at -45° from 1710E but this was changed because of the apparent shallowness of the granite contact in TH4. The target zone is indicated by highly anomalous geochemistry, strong gradient array I.P. responses (grade A in the Scintrex report) centred at 1570E and 1625E and ironstone float. The latter represents the ironstone body described above (at TH4).

The hole encountered 20.8m of clayey overburden and sediments before intersecting strongly weathered clayrock (derived from carbonates ?) down to 32.8m. This was succeeded by 14.2m of serpentinous marble with minor interbedded hornfels and patchy minor magnetite. The hole continued through hornfels and metasomatized sediments, also with patchy minor magnetite, to 74.0m, where it intersected unaltered "red" granite, staying in granite to completion (109.8m).

As with TH4, the bedding probably strikes north - south and hence the B.C.A. readings indicate that bedding either dips east at 10 - 20° or west at 70 - 80°. As all recorded bedding readings are east dipping, the second possibility is discounted. Hence here, and at TH4, bedding dips parallel to the granite contact (Plan 6). Again the clay-rock and carbonate intersections are probably the down-dip extension of the target zone.

TH6 137.1m long, was drilled at an inclination of -40° along 270° (A.M.G.) from a collar at 1300E/3200N. The target zone is indicated by a broad zone of anomalous geochemistry, a series of gradient array I.P. anomalies (classified as B/C in the Scintrex report) and ironstone outcrop. The latter is a broad, elongate body striking north-east parallel to the granite contact. The hole was designed to drill west along line 3200N because that is where the geochemical and geophysical anomalies were recorded. This was thought preferable to drilling normal to the ironstone's strike as it was not known what relation any possible mineralization might have to the ironstone, given the general lack of structural knowledge prior to drilling.

The hole intersected 113.3m of hornfels containing minor magnetite and pervasive traces of sulfide before reaching unaltered, fine grained "red" granite. Intervals containing significant sulfides or magnetite were assayed but contain insignificant Sn or WO_3.

Mapping along the access road prepared for TH6 indicated that bedding strikes parallel to the ironstone body and dips south-east at 45° to 60°. B.C.A. values are consistent with this. It is now clear that the ironstone does not represent a skarn or carbonate horizon in contrast to the ironstone tested by TH4 and TH5. Instead it probably reflects a laterite development over iron-rich bedrock.

Magnetic susceptibility measurements were taken over intersections of unweathered sediments to assist correlation between drill holes. The results are included with the drill logs (Appendix 2).

18 core samples were submitted to Central Mineralogical Services for petrological examination (Appendix 3). The following points are relevant:

(a) The carbonate-rich lithologies logged in TH4 and TH5 were described as carbonated serpentinites. Following discussions with H.W. Fander (of C.M.S.) it became apparent that, in a granite contact environment, true serpentinites (i.e. of ultrabasic origin) can be confused with "pseudoserpentinites" in which serpentine is derived from the humite group minerals. This is true even when residual "olivine" is described because olivine is optically very similar to clinohumite. Therefore these rocks may have been derived from sedimentary carbonate. In addition, there is some petrological evidence that metasomatism associated with granite intrusion postdated carbonate development irrespective of the carbonate's

origin (e.g. TH4 28.5m). Thus the carbonate "horizon" is prospective for stanniferous skarn mineralization even if it originated as an ultrabasic. However its actual location and orientation may differ from the current interpretation (Plan 6).

(b) The only Sn-bearing species identified were of the ludwigite-paigeite-hulsite group. These minerals are Fe-Mg borates and can contain up to 7% Sn. They seem to be associated with magnetite, and probably account for most of the Sn recorded in the Tenth Legion magnetite mineralization.

4.1.4. Geology

Limited geological mapping along drill hole access roads was carried out without any significant change to the geological interpretation (Plan 6). For a more detailed discussion of the grid geology, see previous Annual Reports (Stephenson, 1978, and Ross, 1979).

4.1.5. Globe Mine

The available data suggests that polymetallic sulfide mineralization similar to that at Sweeney's (on E.L. 11/76) is present at the Globe. To date, four wheel drive access has been prepared up to the workings; in the process three adits and one shaft have been revealed. Results of soil geochemistry and I.P. near the Globe are summarized elsewhere in this report.

4.2. Discussion

Work to date has revealed two areas within the grid of significant economic interest:

(a) Globe. Although work here is at an early stage, results have been encouraging. Detailed mapping and sampling of the workings is required. The apparent similarities with Sweeneys suggest that geophysical techniques successful there could also be used here. In particular, a detailed pole-dipole I.P. survey should be effective in delineating drilling targets.

(b) Crimson Creek/Ironstone Area. Although the drilling results were disappointing, they confirmed that the area is prospective for stanniferous skarn mineralization. The following comments are relevant:

(i) At least one carbonate body is present within the sequence. Assuming that it is derived from either sedimentary carbonate or an ultramafic sill, it can be mapped as a stratigraphic horizon which dips east at about 15° beneath holes TH4 and TH5 and probably contacts the granite just south of line 4400N. Further south it either pinches out or its dip steepens and its strike veers south-west, crossing line 3200N west of 1000E (Plan 6).

(ii) Ironstones overlie both carbonates and hornfelsed sediments. The carbonates apparently weather to an iron-rich clay down to a depth of about 20m. The clay in turn appears to be converted to an ironstone (or laterite) near the surface. The fact that the ironstones also overlie hornfelses suggests that a widespread pre-erosion,

laterite surface may have existed over the area. As carbonate rocks are more deeply weathered, ironstones may be preferentially preserved over them.

(iii) The granite contact dips outwards at 10 - 15° over at least 1 km.

(iv) The strong I.P. anomalies at TH4 and TH5 were not explained by the drilling results. They may reflect sulfide mineralization which pinches out at depth or they may have been caused by a membrane I.P. effect in the clays derived from the carbonate horizon. The I.P. anomalies at TH6 probably reflected disseminated sulfide mineralization in the hornfelses.

(v) The strong geochemical anomalies at the three drill sites were not explained by the drilling results. It is possible that they all reflect sulfide mineralization which pinches out at depth but this seems improbable. The only other explanation is scavenging by iron and manganese oxides.

(vi) Further evaluation of this area is seriously constrained by land tenure problems. The area cannot be properly evaluated by drilling one or two holes outside of the leases held by Industrial and Mining Investigations Pty Ltd, especially as those leases are unsurveyed and operations near the boundaries may be subject to dispute.

5. OTHER AREAS

5.1. South-East Margin of Heemskirk Granite

This area includes two known bodies of stanniferous polymetallic mineralization, i.e. Sweeneys and the Globe. To date only Sweeneys has been diamond drilled, and this work has shown that:

(a) The ore contains significant Sn, Ag and Zn, with minor Cu, As and Pb. Most Sn occurs as cassiterite with lesser stannite.

(b) Although insufficient drilling has been done to allow the calculation of a reserve estimate, it has demonstrated that this mineralization style has significant tonneage potential, possibly as a series of small (≤500,000 tonnes) orebodies.

(c) The ore host is coarse grained "red" (older) granite intruded by an irregular aplite dyke.

(d) The ore is sulfide-rich, containing approximately 10% S.

Results of soil geochemistry near the Globe and over Sweeneys show that, as expected, good anomalies are developed near outcropping mineralization.

Detailed I.P. over Sweeneys showed that pronounced chargeability and resistivity anomalies only occur over a 50m diameter area around outcropping ore (Scintrex report Tas-047). Beyond there I.P. responses are relatively subtle (i.e. chargeability < 10 mv/v above background). Reconnaissance I.P. for Sweeney-type orebodies should therefore be carried out on lines spaced 100m apart or less.

The area between Sweeneys and the Globe is an obvious place to look for more sulfide mineralization. It is relevant that:

(a) The "red" granite, which is present throughout the area and south to the granite contact, is the host rock at both Sweeneys and the Globe.

(b) Although it is unlikely, there is some possibility that an outcropping orebody remains undiscovered. Much of the alluvial Sn is coarse and has been shed from quartz/tourmaline veins. Previous prospectors "following" cassiterite up a creek to its source may have by-passed a sulfide orebody with fine cassiterite (Sweeneys cassiterite is usually $\leq 50\mu m$) for a quartz/tourmaline vein further up-slope, particularly if the sulfide ore/gossan outcrop was distant from any creek (Sweeneys and the Globe are both adjacent to major creeks) in thick rainforest.
In addition, there is no reason why hidden orebodies cannot exist.

A combined I.P. and soil geochemistry program should reveal outcropping or hidden orebodies within 50m of the surface providing that:

(a) Grid lines are 100m apart or less.

(b) Subtle anomalies are followed up.

(c) The lines are also covered by ground magnetics and geological mapping.

5.2. Eastern End S.P.L. 129

This area covers the south-western portion of the Zeehan mining field. In the past, mining activity has concentrated on Ag/Pb/Zn veins or fault infillings. These have little economic interest because of low tonneage potential, but the area is also prospective for major Sn mineralization.

Aberfoyle Limited, in joint venture with Gippsland Oil and Minerals N.L., has outlined about one million tonnes of mineralization averaging 1.1% Sn at Queen Hill, 1.5 km north of the licence boundary. The major part of the ore there occurs as stratabound, pyritic, massive sulfide probably of replacement origin. Minor tin mineralization is reported from a number of other workings in the district, nearly all of which cluster around Queen Hill (Plan 7). Thus it is a common view that Queen Hill is at the centre of a Sn-rich zone overlying a hidden tin-granite cupola. The very shallow outward dip of the Heemskirk Granite, indicated by holes TH4 - 6, supports this view.

The eastern end of S.P.L. 129 is prospective for economic Sn mineralization in a fault-bound or Queen Hill type situation because:

(a) The host rock sequence is the same, consisting of Crimson Creek Formation and Oonah Quartzite sediments with minor basic rocks.

(b) Both areas are characterized by numerous faults, some of which were probably "plumbing" for hydrothermal fluids. Fault intensity seems greater around Queen Hill, but that may reflect a better geological understanding of the area resulting from the larger number of underground workings there.

(c) If a tin-granite cupola does underlie Queen Hill this does not downgrade the potential of S.P.L. 129. The situation may represent an uneroded version of the Renison Mine geology where the cupola is equivalent to the Pine Hill porphyry and deeply concealed replacement or fault-bound mineralization occurs over a relatively flat granite contact.

Any major Sn orebody in this area is almost certainly concealed. The district has been intensively prospected and so virtually all outcropping mineralization should already be known. There may be a hidden orebody sufficiently shallow to permit discovery by conventional geophysics and/or geochemistry but this is unlikely because such ("Queen Hill type") mineralization should be haloed by outcropping stanniferous vein or fault lodes. However, given Renison's experience with strata-bound replacement and fault-bound Sn orebodies, a geologically oriented exploration program may be successful. The following comments are relevant:

(a) A great deal of geological data has been accumulated in the past 90 years through mining operations. This information should be compiled in a comprehensive literature survey.

(b) Geological maps compiled in the past are contradictory and, because of limited outcrop, strongly interpretative. A new geological map should be prepared. Particular care must be taken to elucidate the stratigraphy and structure of the area. Some thought should be given to ways of mapping reactive rocks which tend not to outcrop (e.g. carbonates).

(c) When the literature survey and geological map are complete, it is hoped that the concepts outlined previously can be sufficiently refined to allow definition of either drilling targets or areas

requiring geophysical/geochemical follow-up. If the mapping results in too ambiguous an interpretation, geophysical mapping aids such as low-level airborne magnetics should be considered.

5.3. Kelvin and Maynes

These two mines yielded over 217 tonnes of Sn concentrate from alluvial sources and primary mineralization in thin veins. The vein systems are of limited economic interest but, given the unreactive nature of the host rocks (Oonah Quartzite), there is potential for stanniferous greisen development in a cupola of Heemskirk Granite below the workings. The East Kemptville deposit in Nova Scotia is a known example of this mineralization style (Newnham, pers. comm.).

Recently Renison has been approached by Mr Griffiths, who holds the M.L.s covering the workings. If an Option to Purchase can be successfully negotiated with him, then some work, including diamond drilling, is justified here.

6. RECOMMENDATIONS 1980-81

(i) The Globe Mine is prospective for polymetallic sulfide mineralization similar to that at Sweeneys (on E.L. 11/76). A small grid, totalling 1.7 line km, with lines spaced 40m apart and oriented at 025° (A.M.G.) should be cut in the vicinity of the workings (Plan 8). Detailed pole-dipole I.P. over this grid is recommended to help delineate sulfide mineralization beneath superficial cover and at depth.

(ii) A new grid should be cut in the area between Sweeneys and the Globe and out to the granite contact (Plan 9). Grid line spacing should be 100m with pegs 30m apart. The proposed grid is oriented at 330° (A.M.G.) and the estimated length is 43.8 line km (including a cut base-line). Of this, 16.4 line km lies within S.P.L. 129, the remainder being within E.L. 11/76.

(iii) The eastern end of S.P.L. 129 is prospective for fault-controlled or stratabound tin mineralization. Geological mapping at 1:5000 scale, in conjunction with a comprehensive literature survey, is recommended.

(iv) In the light of land tenure problems over Crimson Creek Formation rocks on the East Heemskirk grid, no further work is recommended there for 1980-81. However, the Mines Department should be asked to arrange for the survey of Industrial and Mining Investigation's leases so that any potential conflict in future years can be avoided.

(v) Kelvin and Maynes workings have potential for hidden stanniferous greisen mineralization. The property is currently covered by two M.L.s held by Mr F.J. Griffiths. If an Option to Purchase Agreement can be negotiated, detailed examination of the workings, probably followed by diamond drilling, should be carried out in 1980-81.

(vi) 500 metres of diamond drilling is budgetted for 1980-81. It is proposed that this be used at the Globe and/or Kelvin and Maynes. Detailed recommendations regarding siting and orientation of drill holes will be made when results of preliminary work on the two prospects are known.

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APPENDIX 1

EXPENDITURE BREAKDOWNS AND PROPOSED BUDGET 1980-81

TOTAL EXPENDITURE 1979-80

	Expenditure $	% of Total Expenditure
Salaries (including loading)	8,380	18
Consumables	663	1
Travel & Accommodation	65	
Renison Services (Survey, Assay, Research, Vehicles)	570	1
Outside Services (Track Cutting, Geochemical, Geophysical, etc.)	14,017	30
Road and Drill Site Construction	9,639	21
Diamond Drilling	12,962	28
Lease Payments	361	1
Sub-Total	46,657	
24% charged to Mt Lyell	- 11,197	
Rounding	- 1	
TOTAL	35,459	100

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PROPOSED BUDGET 1980-81

	Expenditure $	% of Total Expenditure
Salaries (including loading)	12,972	19
Consumables	2,316	3
Renison Services (Survey, Assay, Vehicles, etc.)	5,409	8
Outside Services (Track Cutting, Geophysical, Geochemical, etc.)	23,009	33
Road and Drill Site Construction	675	1
Diamond Drilling	25,304	36
Lease Payments	50	
Sub-Total	69,735	100
24% charged to Mt Lyell	-16,736	
TOTAL	52,999	

APPENDIX 2

DIAMOND DRILL LOGS

RENISON LIMITED - DRILL CORE RECORD

HOLE NUMBER	TH 4
PURPOSE	TO TEST COINCIDENT IP AND GEOCHEMICAL ANOMALIES.
LOCATION	EAST HEEMSKIRK GRID ~3990N/1650E
COLLAR R.L.	247.51
CO-ORDINATES	5360627.03N 354794.82E
LENGTH	119.6m
HOLE SIZE	0 - 10.6 HQ 10.6 - 45.8 NQ 45.8 - 119.6 BQ
DATE DRILLED	30.4.80 - 24.5.80
SIGNIFICANT CORE LOSS ZONES	28.9 m loss between 0 - 31.7m.
ORE ZONE GROUND CONDITIONS	
LOGGED BY	P. ROBERTS

SURVEY			From - To	Distance D	VERTICAL		HORIZONTAL	
Depth	Bearing	Dip			D.Sin.Dip	R.L.	D.Cos.Dip	Prog. Total
(m)	(AMG)							
Collar	-	- 45.5°	0 - 26.2	26.2	18.36	229.15	18.69	18.69
52.4	274°	- 45°	26.2-67.4	41.2	29.13	200.02	29.13	47.82
82.4	279°	- 45°	67.4-97.4	30.0	21.21	178.81	21.21	69.03
112.4	283°	- 44.5°	97.4-119.6	22.2	15.83	162.98	15.56	84.59

COMMENTS

The hole was designed to intersect the downdip extension of a geochemically and geophysically anomalous ironstone zone outcropping at the surface. This was hoped to represent one or more stanniferous sulphide - bearing skarn zones. The target zone was not intersected because the Heemskirk Granite dips outward much more shallowly than was previously thought, cutting out the sediments at shallow depth. The economic potential of this area has been reduced by this hole because of the small potential volume of mineralized (?) sediments. One encouraging aspect was the 4.2m intersection of partly skarnized carbonates. This is the first definite indication that this sequence contains carbonate beds.

SUMMARY - ASSAY DATA

LODE NAME	FROM	TO	LENGTH (m)	AVERAGE WEIGHTED ASSAYS													B.C.A.
				Sn.	Acid Sol. Sn.	Cu.	As.	S.	Pb.	Zn.	Bi.	WO_3	Ag g/t				
	32.0	36.0	4.0	0.02	0.02	0.02			<0.01	0.04		<0.01	2				

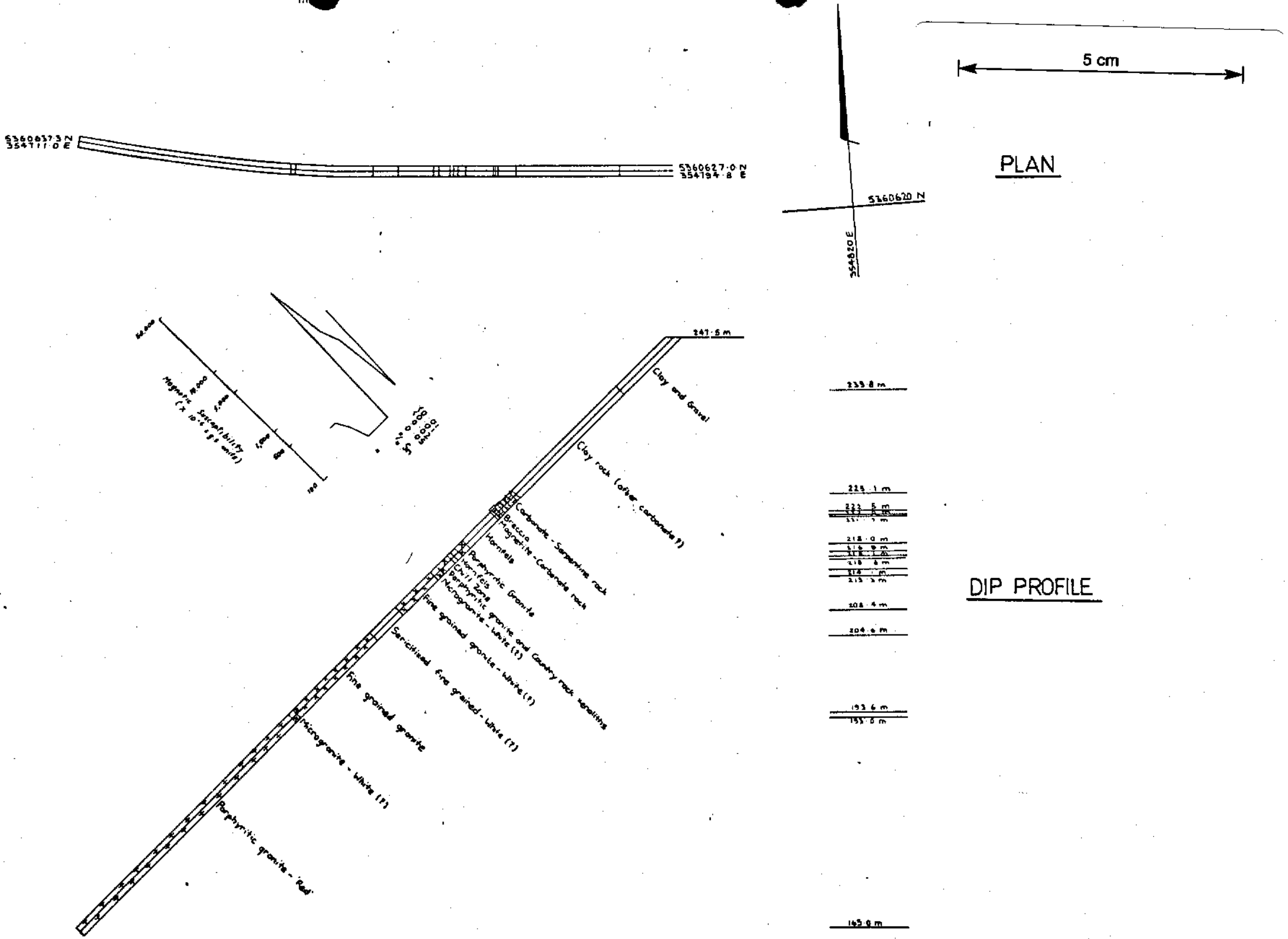
NWPS 27344

RENISON LIMITED

DIAMOND DRILL HOLE PLOT

HOLE No TH4

SCALE: 0 20



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DIAMOND DRILL RECORD

HOLE NUMBER : T E4

LOGGED BY : P.R.

RWPS

INTERVAL (m) FROM	TO	RECOVERY m	%	DESCRIPTION	FORM.	% Sn. FROM	TO	TOTAL	ACID SOL.	% Cu	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO_3
0.0	10.6	-	-	0.0 - 10.6 CLAY & GRAVEL No recovery													
10.6	31.7	2.8	13	10.6-31.6 CLAYROCK brown-black olive-brown, yellow laminated and partly brecciated, very soft. B.C.A. averages 60°. Coarse muscovite at 22.5m Extremely poor core recovery. Possibly derived from carbonate. Thin section 28.4m.													
31.7	35.4	3.4	92	31.6-35.3 CARBONATE-SERPENTINE ROCK grey weakly laminated marble interspersed with irregular masses of pale green serpentinous carbonate. Minor magnetite. B.C.A. varies 30 - 45°. Few veinlets of calcite. Brecciated with increasing proportion of magnetite 34.8 - 35.3m. Thin section 33.8m.		32.0	33.0	<0.01	0.01	0.02			<0.01	<0.01		2	<0.01
						33.0	34.0	<0.01	0.01	0.03			<0.01	<0.01		2	<0.01
						34.0	35.0	0.02	0.04	0.02			<0.01	0.10		2	<0.01
				35.3 - 35.4 GREY CLAY 5cm core loss.													
35.4	38.4	3.0	100	35.4-35.7 BRECCIA Comprising calcite, magnetite and pale green serpentinous carbonate. Skarn-type assemblage. Thin section 35.5m. Gradational change to:		35.0	36.0	0.05	0.05	0.02			<0.01	0.06		1	<0.01
				35.7-36.0 MAGNETITE-CARBONATE ROCK Similar to above but progressively less brecciated, minor serpentine. B.C.A.(?) 60 - 70°.													
38.4	41.4	3.0	100	36.0-41.8 HORNFELS, pale grey, laminated (BCA averages 50°) Minor local contortion and brecciation. Brown mica (phlog ?) lines laminae and in veinlets, locally disseminated throughout rock. Few veinlets of moderately soft black material (serpentine ?). Alteration increases in lower 1.5m. Thin section 38.4m													
41.4	43.4	2.0	100	41.8-43.4 PORPHYRITIC GRANITE, Pale grey-brown, green-grey phenocrysts packed white feldspar laths (av. 5mm long, rarely >1cm diam.), black tourmaline as clots or individual crystals, set in a sericitized aphanitic ground-mass. Contacts marked by chill zones.													
43.4	45.8	2.0	83	43.4-44.2 ALTERED HORNFELS, cream, pale grey, laminated (BCA 70°) hornfels/mudstone (?). Abundant mica along laminae and locally impregnating rock. Soft in places, 40cm core loss.													
				44.2-44.9 CHILL ZONE, pale grey or pale brown, aphanitic. Includes veins or veinlets of soft black material, one of which includes pyrite euhedra at 44.6m.													

DIAMOND DRILL RECORD

HOLE NUMBER : TH 4

LOGGED BY : P.R.

NWPS

INTERVAL (m) FROM	TO	RECOVERY m	%	DESCRIPTION	FORM.	% Sn. FROM	TO	TOTAL	ACID SOL.	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO_3
45.8	47.6	1.6	89	44.9-47.0 PORPHYRITIC GRANITE Similar to 41.8 - 43.4, but including abundant rounded, hornfelsed country rock xenoliths. Latter infrequent below 45.9m.													
47.6	50.6	3.0	100	47.0-48.3 MICROGRANITE, pale grey, very fine grained with few phenocrysts of quartz, feldspar, sericite (after feldspar ?) and chlorite (after biotite ?). Minor black tourmaline in small (av. 1cm diam.) clots of quartz/tourmaline. Gradational change to:													
50.6	56.6	6.0	100	48.3-55.2 FINE GRAINED GRANITE consisting largely of equigranular quartz and feldspar. Fine grained black tourmaline disseminated throughout. Few quartz and sericitized feldspar phenocrysts. Occasional nodules of fine grained quartz / tourmaline.													
56.6	59.6	3.0	100	55.2-60.5 SERICITIZED GRANITE, pale grey-green, finer grained c.f. above, feldspars totally sericitized. Includes central zone at 58.0 - 59.5m which consists of sericite and/or clay with coarsely crystalline, pale brown siderite. Few tourmaline/quartz nodules.													
59.6	62.6	3.0	100	60.5-62.7 FINE GRAINED GRANITE Similar to 48.3 - 55.2 but less tourmaline. Minor sericitization of feldspars.													
62.6	77.6	15.0	100	62.7-76.0 FINE GRAINED GRANITE, mostly stained a brick red colour, equigranular quartz and feldspar, minor dissem. black tourmaline. Rare quartz and sericitized feldspar phenocrysts. Rare quartz/tourmaline in veinlets and small nodules. Minor biotite or chlorite after biotite. Sharp lower contact ~50° to c.a.													
				76.0-76.9 MICROGRANITE, white. Chill zone?. Very felsic. Very minor disseminated biotite and tourmaline. Few sericitized feldspar phenocrysts. Few small (1cm) quartz/tourmaline nodules.													
77.6	119.6	42.0	100	76.9-119.6 PORPHYRITIC GRANITE Pink-grey. Comprises pink K-feldspar and white or pale green (sericitized) plagioclase phenocrysts set in a finer grained groundmass.													

DIAMOND DRILL RECORD

HOLE NUMBER : TE 4

LOGGED BY : P.R.

KWPS

INTERVAL (m) FROM	TO	RECOVERY m	%	DESCRIPTION	FORM.	% Sn. FROM	TO	TOTAL	ACID SOL.	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO_3
				Abundant biotite. Minor black tourmaline in veinlets and clots of tourmaline/quartz. Contrast between phenocryst and groundmass grainsize increases markedly at ~87.0m. Rimming of pink K-feldspar by white plagioclase (?) common below that point. Includes:												
				109.1 - 109.2 White microgranite dyke, contacts at 30 to c.a.													
				118.3 Vein of magnetite, banded, with banding and contacts at 40 to c.a.													
				END OF HOLE AT 119.6m.													

DIAMOND DRILL RECORD

HOLE NUMBER : TH4

LOGGED BY : P.R.

NWPS

INTERVAL (m) FROM	INTERVAL (m) TO	RECOVERY m	RECOVERY %	DESCRIPTION MAGNETIC SUSCEPTIBILITY ($x10^{-6}$ c.g.s. units)
31.7	32.0			4200
	33.0			200
	34.0			1800
	35.0			3500
	36.0			14300
	37.0			100
	38.0			4100
	39.0			100
	40.0			100
	41.0			100
	42.0			200
	43.0			300
	44.0			300

FORM.	% Sn. FROM	% Sn. TO	% Sn. TOTAL	% Sn. ACID SOL.	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO_3

034045

SCALE:

RENISON LIMITED
DIAMOND DRILL HOLE PLOT

HOLE No.: TH 4

G.M.S. REPORT 80/8/30

DEPTH (m)	ROCK TYPE - COMPOSITION	FABRIC	MINOR MINERALS	COMMENTS
28.4m (T.S. 33538)	Weathered Schist Foliated masses of degraded, iron-stained ?antigorite-chlorite and talc. Clusters of very small ?hydrogarnet grains.	Rough schistosity, cremulated and deformed. Fine-grained.	Fine granular topaz.	Rock is derived from serpentinite, with later metasomatism and introduction of hydrogrossular and topaz.
33.8m	Serpentinite Large antigorite pseudomorphs with fine magnetite, progressively replaced by granular siderite and calcite masses.	Excellent network textures preserved. Incipient banding.	Possible small tufts of ?ilvaite.	Relatively undisturbed orthodox serpentinised coarse ultramafic rock, fresher version of 28.4m.
35.5m	Serpentinite Coarse antigorite pseudomorphs, partly replaced by coarse and fine tremolite needles, now replaced by carbonate fibres and grains.	Coarse serpentinite textures; relict amphibole textures.	Colloform-banded carbonate/ Fe-silicate (?canby ite) veins.	Successive replacement phases, serpentinite by tremolite and tremolite by carbonate.
38.4m	Calc-Silicate Hornfels Dominantly granular to acicular diopside, as finer and coarser parallel bands, with a few thin bands of hydromuscovite flakes.	Excellent banding, due only to grainsize variations; random orientation.	Conformable and cross-cutting veins/lenses of green pumpellyite.	Pumpellyite is hydrothermal, metasomatic, replacing diopside. Rock is contact-metamorphosed carbonate.

RENISON LIMITED - DRILL CORE RECORD

HOLE NUMBER	TH5
PURPOSE	To test coincident IP and geochemical anomalies
LOCATION	East Heemskirk Grid 4200N/1695E
COLLAR R.L.	239.78
CO-ORDINATES	5360813.18N 354819.15E
LENGTH	109.8m
HOLE SIZE	0 - 39.0 HQ (triple tube 13.9 - 39.0m). 39.0 - 75.4 NQ 75.4 - 109.8 BQ
DATE DRILLED	29/5/80 - 14/6/80
SIGNIFICANT CORE LOSS ZONES	23.6m loss 0 - 33.2m 2.5m loss 47.7 - 58.2m
ORE ZONE GROUND CONDITIONS	
LOGGED BY	P. Roberts

SURVEY			From - To	Distance D	VERTICAL		HORIZONTAL	
Depth	Bearing	Dip			D.Sin.Dip	R.L.	D.Cos.Dip	Prog. Total
(m)	(AMG)							
Collar	-	-31.2°	0 - 42.5	42.5	22.01	217.77	36.35	36.35
85.0	263°	-29°	- 96.5	54.0	26.18	191.59	47.23	83.58
109.0	272°	-28.5°	-109.8	13.3	6.35	185.24	11.69	95.27

COMMENTS

The target zone is represented at the surface by strong IP and geochemical anomalies coincident with ironstone. This was hoped to represent one or more stanniferous sulphide-bearing skarn horizons. Initially it was intended to drill this hole at - 45° from the present location. When TH4 indicated that the Heemskirk Granite probably dips outward very shallowly, it became necessary to adjust the proposal. The site was not moved West (towards the main anomalies) because by doing so it would have left geochemical anomalies (coincident with ironstone outcrop) untested. Instead the inclination was shallowed to -30°. Core recovery in the weathered zone (0 - 32.8m) was improved relative to TH4 by use of triple tube HQ (29% of 96)

SUMMARY - ASSAY DATA

LODE NAME	FROM	TO	LENGTH (m)	AVERAGE WEIGHTED ASSAYS													B.C.A.
				Sn.	Acid Sol. Sn.	Cu.	As.	S.	Pb.	Zn.	Bi.	WO_3	Ag g/t				
	44.0	47.0	3.0	<0.01	0.01	0.02			<0.01	0.18	0.004	<0.01	5				
	56.2	58.2	2.0	0.02	0.01	0.04			0.05	0.04	0.002	0.01	4				
	66.0	74.0	8.0	<0.01	<0.01	0.02			<0.01	0.04	0.002	0.01	3				

NWPS 27344

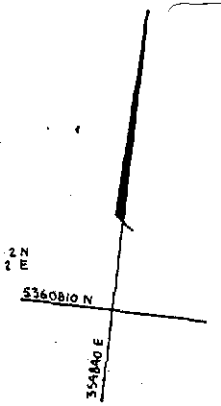
RENISON LIMITED

HOLE No.: TH 5

SCALE: 0 10 m

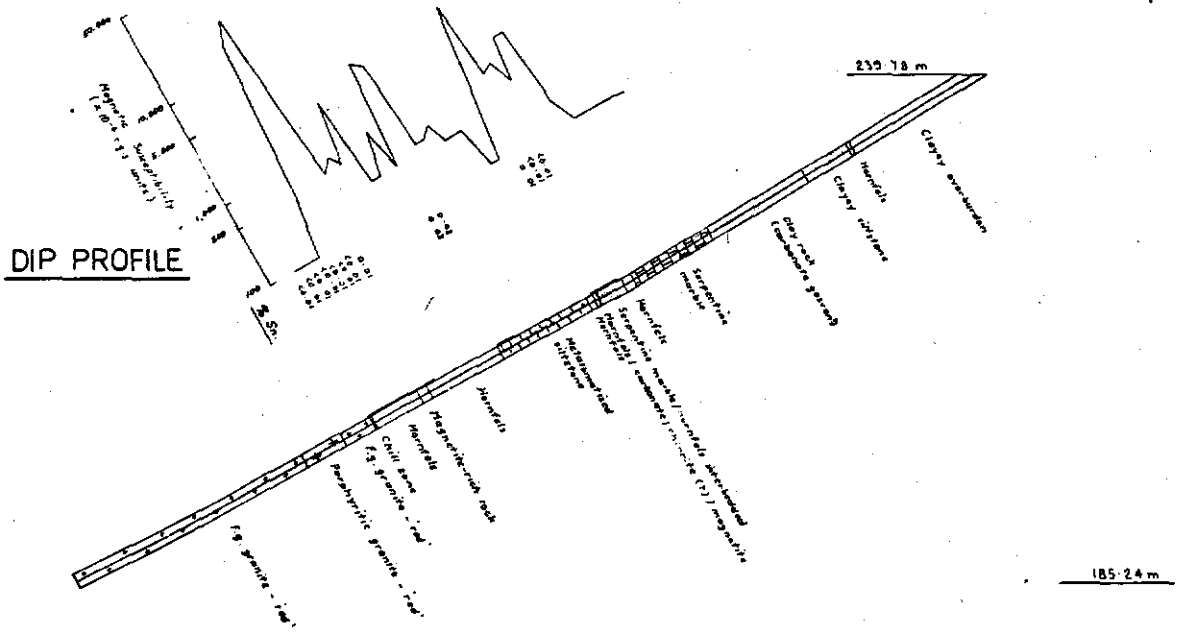
DIAMOND DRILL HOLE PLOT

5 cm



PLAN

DIP PROFILE



DIAMOND DRILL RECORD

HOLE NUMBER : TH5

LOGGED BY : P.R.

NWPS

INTERVAL (m) FROM	INTERVAL (m) TO	RECOVERY m	RECOVERY %	DESCRIPTION	FORM.	% Sn. FROM	% Sn. TO	% Sn. TOTAL	% Sn. ACID SOL.	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO_3
0.0	14.8	0.40	3	0.0 - 14.8 CLAYEY OVERBURDEN Yellow-brown clay and rounded pieces of black-brown goethitic material. 14.4m core loss.													
14.8	16.1	0.55	42	14.8 - 15.3 HORNFELS *White and grey, finely laminated, contorted* (overturned, with respect to C.A. in places). Broken along brown-black goethite coated joints. Irregular quartz veining, partly between laminae.													
16.1	17.6	0.10	7	15.3 - 17.5 CLAYEY SILTSTONE (?) Yellow-brown. Veined by brown-black goethite. Only 5cm recovered (i.e. 2.15m core loss)													
				17.5 - 17.7 HORNFELS Greenish white, partly laminated. Includes flecks of dark green material. Partly brecciated (?), strongly contorted.													
17.6	20.6	1.5	50	17.7 - 20.8 CLAYEY SILTSTONE (?) Yellow-orange-brown, very soft, fine laminated Includes dark brown clayey interbeds. Broken particularly along goethite-coated joints or veins. Possibly weathered calcareous siltstone. BCA 30^{0} - 45^{0}. 1.5m core loss. Thin section 19.7m.													
20.6	33.2	7.1	56	20.8 - 32.8 CLAYROCK (CARBONATE GOSSAN?) Dark brown, pale yellow, pale brown, very soft. Some lamination visible - very contorted. *Ferruginous. 5.5m core loss.* Includes : 25.2 - 25.4 grey and pale green serpentinous marble.													
33.2	43.8	10.0	94	32.8 - 42.4 SERPENTINE MARBLE White, pale green or pale grey. Laminated (?) - lamination mostly indicated by wispy serpentine. Original (?) dark grey and grey limestone/marble appears to have been invaded by white calcite or green serpentinous carbonate, the latter sometimes encloses relict													

DIAMOND DRILL RECORD

HOLE NUMBER : TH5

LOGGED BY : P.R.

NWPS

INTERVAL (m) FROM	TO	RECOVERY m	%	DESCRIPTION	FORM.	% Sn. FROM	TO	TOTAL	ACID SOL.	% Cu	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO_3
				fragments. Few irregular calcite veinlets. Trace magnetite. Serpentine content increases downwards. Upper contact pitted (indicating solution of carbonate?). BCA varies : 35° at 33m, 75° at 37m, ~ 50° below 37m. Includes : Thin Sections 33.2, 41.5m													
				41.0 - 41.7m dark grey, chloritic (?) calcareous rock.													
				42.4 - 43.5 HORNFELS Grey, weakly laminated, bedding indicated by dark grey (chloritic?) material - BCA 45°. Numerous carbonate-filled joints or veinlets at ~40° to C.A. *Hornfelsed sandstones and* siltstones (?)													
43.8	46.8	3.0	100	43.5 - 46.6 INTERBEDDED SERPENTINE MARBLE/HORNFELS grey, olive green, green-black, mostly crudely banded (∠ to C.A. ~ 45°). Partly chloritic (?). Appears very altered. In places green serpentinous carbonate seems to *be replacing/intruding into grey limestone/* marble. Quartz veinlets (1 - 3mm thick). Very minor magnetite.		44.0	45.0	<0.01	0.01	0.02			<0.01	0.01	0.004	7	<0.01
						45.0	46.0	<0.01	<0.01	0.02			<0.01	0.20	0.004	5	<0.01
						46.0	47.0	0.01	0.01	0.03			<0.01	0.34	0.004	4	0.01
46.8	47.7	0.9	100	46.6 - 47.0 HORNFELS/CARBONATE/CHLORITE/MAGNETITE ROCK Grey-black, partly brecciated (?), magnetite content increasing downwards. Thin Section 46.8m													
				47.0 - 47.7 HORNFELS Similar to 42.4 - 43.5m, BCA 75° average.													
47.7	58.2	8.0	76	47.7 - 58.5 METASOMATIZED SILTSTONE (?) White, pale grey, quartz-rich (?), laminated, very broken along bedding planes. With abundant mica throughout. Contorted down to 52.5m, BCA varies 40° - 50° thereafter. Soft black greasy material coats bedding planes and joints, probably Fe/Mn rich. Soft and friable. With magnetite 56.3 - 58.2m. 2.5m core loss. Thin section 48.9m.		56.2	57.2	0.02	0.01	0.04			0.10	0.05	0.001	6	0.01
						57.2	58.2	0.02	0.01	0.04			<0.01	0.03	0.002	2	0.01

DIAMOND DRILL RECORD

HOLE NUMBER : THS

LOGGED BY : P.R.

NWPS

INTERVAL (m) FROM	TO	RECOVERY m	%	DESCRIPTION		FORM.	% Sn. FROM	TO	TOTAL	ACID SOL.	% Cu	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO_3
58.2	66.8	8.4	98	58.5 – 67.1	HORNFELS													
					White to pale grey, mostly finely laminated													
					(BCA averages 45°). Minor magnetite in occasional													
					patches or along laminae, particularly 62.3 –													
					62.5m where it is interbedded with soft, pale													
					yellow clayey material. Broken mostly along													
					joints (less frequently cf. 47.7 – 58.5m)													
66.8	68.0	0.9	75	67.1 – 68.4	MAGNETITE-RICH ROCK													
					Brown-black with lesser goethite (?) and fine		66.0	67.0	0.01	0.01	0.02			<0.01	0.09	0.002	3	0.01
					mica, interspersed with minor amounts of white,		67.0	68.0	<0.01	0.01	0.02			<0.01	0.15	0.003	3	0.01
					pale yellow soft silty material (?). Last 20cm													
					laminated iron-rich rock in which brown-black													
					material (as above) interbedded with soft pale													
					grey, pale yellow material (BCA 50°). 50cm core													
					loss. Thin Section 67.7m													
68.0	69.3	1.1	85	68.4 – 69.3	HORNFELS													
					Grey, finely laminated. Minor black interbeds		68.0	69.0	<0.01	0.01	0.03			<0.01	0.06	0.002	3	0.02
					include magnetite in places.													
69.3	73.8	4.5	100	69.3 – 74.0	HORNFELS													
					Mauve-grey (pale green 69.3 – 69.8m), finely		69.0	70.0	<0.01	<0.01	0.02			<0.01	0.01	0.002	1	0.01
					laminated, contorted and pervasively quartz		70.0	71.0	<0.01	<0.01	0.03			<0.01	<0.01	0.003	2	0.01
					veined. With mica and minor sulphides (pyrite/		71.0	72.0	<0.01	0.01	0.02			<0.01	<0.01	0.002	3	<0.01
					pyrrhotite) throughout. Thin Section 72.2m		72.0	73.0	<0.01	<0.01	0.02			<0.01	<0.01	0.002	4	<0.01
							73.0	74.0	<0.01	<0.01	0.01			<0.01	<0.01	0.001	4	0.01
73.8	76.8	3.0	100	74.0 – 74.2	CHILL ZONE													
					Pink and pale green; granite margin. Gradational													
					change to :													
76.8	79.8	3.0	100	74.2 – 78.6	FINE GRAINED GRANITE													
					Pale grey-green to 75.3m and pink thereafter.													
					Feldspars greenish white or red, minor chlorite													
					(after biotite), minor disseminated black													
					tourmaline. Gradational lower margin.													
79.8	82.8	3.0	100	78.6 – 82.3	PORPHYRITIC GRANITE													
					Pink, comprising pink and greenish white													
					(slightly sericitized) feldspar phenocryste													
					(3 – 8mm diameter) and few rounded quartz													
					phenocryste set in a fine grained matrix of													
					feldspars, quartz and biotite.													

DIAMOND DRILL RECORD

HOLE NUMBER : TH5

LOGGED BY : P.R.

INTERVAL (m) FROM	INTERVAL (m) TO	RECOVERY m	RECOVERY %	DESCRIPTION	FORM.	% Sn. FROM	% Sn. TO	% Sn. TOTAL	% Sn. ACID SOL.	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO_3
				Minor black tourmaline in small clots and rare veinlets of quartz/tourmaline.													
82.8	109.8	27.0	100	82.3 – 109.8 FINE GRAINED GRANITE Pink, equigranular. Pink and greenish white feldspars. Abundant biotite (partly chloritized). Minor black tourmaline in small (1 – 2cm diameter) quartz/tourmaline nodules and rare, thin (≤ 5mm thick) veinlets. Includes : 92.1 5cm dyke of microgranite 108.1 – 109.6 fine to medium grained, weakly altered granite, feldspars partly converted to green sericite.												
				End of hole 109.8m													

DIAMOND DRILL RECORD

HOLE NUMBER : TH5

LOGGED BY : P.R.

NWPS

INTERVAL (m) FROM	TO	RECOVERY m	%	DESCRIPTION	FORM.	% Sn FROM	TO	TOTAL	ACID SOL.	% Cu	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO_3
				MAGNETIC SUSCEPTIBILITY (x 10^{-6} c.g.s. units)													
33.0	34.0			<100													
	35.0			100													
	36.0			100													
	37.0			<100													
	38.0			<100													
	39.0			<100													
	40.0			100													
	41.0			200													
	42.0			1500													
	43.0			1500													
	44.0			500													
	45.0			900													
	46.0			800													
	47.0			4700													
	48.0			900													
	49.0			100													
	50.0			100													
	51.0			300													
	52.0			300													
	53.0			300													
	54.0			500													
	55.0			400													
	56.0			400													
	57.0			3500													
	58.0			4000													
	59.0			300													
	60.0			900													
	61.0			300													
	62.0			300													
	63.0			2800													
	64.0			600													
	65.0			800													
	66.0			600													
	67.0			4000													
	68.0			23000													
	69.0			16000													
	70.0			500													
	71.0			100													
	72.0			100													
	73.0			100													
	74.0			100													

034053

RENISON LIMITED

SCALE :

DIAMOND DRILL HOLE PLOT

C.M.S. REPORT 80/8/30

HOLE No. : TH 5

DEPTH (m)	ROCK TYPE - COMPOSITION	FABRIC	MINOR MINERALS	COMMENTS
19.7m	Weathered Clay Fine ferruginous clay with radiating textures; patches of colourless chlorite-antigorite. Spongy goethite patches.	Not banded or schistose. Relict features unrecognisable.	Semi-opaque, cloudy ?hydrogrossular. MnO_2 films/veins.	Original rock unknown, but possibly a calc-silicate. Not quartzose, no relict serpentine features.
33.2m	Metasomatised Serpentinite Antigorite patches with relict pyroxene, extensively replaced by carbonate and cut by zones/veins of diopside crystals.	Original network textures preserved, coarse-grained.	Parallel veins of fibrous phlogopite/tremolite/ antigorite (?).	Metasomatic phases are contact effects. Diopside replaces carbonate.
41.5m	Carbonated Serpentinite Antigorite masses with relict olivine and pyroxene, extensively replaced by granular carbonate; radiating crystals of ludwigite-paigeite.	Relict network textures preserved; complex granular textures.	Antigorite-fibrous carbonate veins. Minor magnetite.	Probably orthodox serpentinite; the ludwigite-paigeite may be stanniferous (i.e. grading into hulsite).
46.8m	Carbonated Serpentinite Relict small antigorite patches and occasional pyroxene grains; abundant replacive fibrous and granular carbonate. Magnetite.	As above. Fibrous carbonate may be after tremolite(?).	Fibrous ludwigite-paigeite patches. Sphalerite aggregates.	Similar to 41.5m, and acid-soluble Sn may be present in the Fe/Mg borate phase.
48.9m	Phlogopite-Diopside Rock Massive, finely-granular diopside, with folded lenses and bands of matted pale phlogopite flakes.	Complex ptygmatic folding/ overfolding of bands.	Intergranular crystals, veinlets of pale green ?melilite (var. gehlenite).	A metasomatic rock, compositionally banded. Presence of ?melilite unusual, but not impossible; identification tentative.
67.7m	Altered Schist Highly porous chloritic or serpentinous schist, extensively impregnated with fine MnO_2 and limonite.	Relict schistosity recognisable, but textures poorly preserved.	None detected.	Resembles TH 4/28.4m and may be of similar origin. Evidently from a fault zone.
72.2m	Banded, Metasomatised Hornfels Very thin bands of quartz, altered feldspar, chloritised ?tremolite or biotite; replacive dravite crystals, phlogopite, ultrafine ?diopside, sericite patches.	Fine bands are folded, disrupted by veins. Fine-grained.	Scattered pyrite, pyrrhotite, ultrafine sphene and oxide opaques.	Originally a fine-grained, laminated sediment, first contact-metamorphosed, then pervasively metasomatised.

SCALE :

RENISON LIMITED
DIAMOND DRILL HOLE PLOT

HOLE No. : TH 6

C.M.S. REPORT 80/8/30

DEPTH (m)	ROCK TYPE - COMPOSITION	FABRIC	MINOR MINERALS	COMMENTS
30.8m	Metasomatised Schist Alternating bands of fine antigorite flakes, fine matted diopside, muscovite with andradite-diopside-magnetite grains.	Fine schistosity in micaceous bands. Some relict folding.	Veins of coarser diopside. Traces of sulphide (?pyrrhotite).	Original rock was perhaps a banded carbonate-antigorite schist, derived from ?serpentinite.
38m	Calc-Silicate Rock Mainly fine intergrowths of prismatic-acicular diopside and amphibole (edenite), with patches of Na-amphibole (hastingsite/ arfvedsonite).	Blotchy aggregates, shapeless, *structureless; no relict* textures.	Small patches of fibrous ludwigite-paigeite. Sulphides (?chalcopyrite) in veins.	Two different sodic amphiboles occur. No indication of identity of original rock.
42.2m	Calc-Silicate Hornfels Extremely fine-grained, intergrown diopside and Ca-garnet (grossularite), with zones of interstitial fine quartz.	Crude compositional zoning/ banding. Average grainsize = 10-20 μ.	Fine granular sphene. Coarser diopside veins. Traces fine sphalerite, galena.	Probably originally a calcareous rock (?sediment), but no real evidence of identity.
45.9m	Banded, Metasomatic Rock Bands of fine diopside, fine quartzose hornfels, matted phlogopite, altered hornfels (TH 5/72.2m), magnetite-rich serpentinite.	Contrasting compositional banding. Very fine-grained textures.	Scattered pyrite; pyrrhotite veinlets. Chrysotile veinlets.	May have been banded quartzose/ calcareous rock with a small serpentinite sill/intrusion, selectively metasomatised.
56.4m	Metasomatised Shale Finely-laminated rock, pervasively replaced by ultrafine dravite, diopside, pale phlogopite. Coarser quartz-albite patches. Interstitial fine quartz.	Relict fine slaty or schistose fabric well-preserved; folded and brecciated.	A few needles, radiating crystals of ?humite. Fine sulphides.	Relict fabric indicates a sedimentary origin, probably shale or siltstone.
71.3m	Metasomatised Shale Ultrafine clastic components, pervasively replaced by fine phlogopite, dravite, diopside and matted tremolite.	Compositional banding reflects original bedding/lamination.	Conspicuous pyrrhotite patches in some zones.	Quite similar to 56.4m in terms of original rock and subsequent metasomatism, but not folded or brecciated.
94.3m (T.S. 33555)	Metasomatised Shale Fine, banded diopside rock merging into coarser massive diopside with patches of matted phlogopite flakes.	Good relict bedding/ lamination preserved. Fine-grained.	Actinolite veinlets. Irregular patches of granular pyrite. *Fluorite patches.*	Similar to 56.4m, 71.3m; all form part of a fine-grained sedimentary *sequence pervasively metasomatised.*

RENISON LIMITED - DRILL CORE RECORD

HOLE NUMBER	TH6
PURPOSE	To test coincident I.P. and geochemical anomalies.
LOCATION	East Heemskirk Grid - 3195N, 1300E
COLLAR R.L.	249.61
CO-ORDINATES	5359 945.19N, 354552.41E
LENGTH	137.1m
HOLE SIZE	0 - 13.0 HQ 13.0 - 48.5 NQ 48.5 - 137.1 BQ
DATE DRILLED	24.6.80 - 4.7.80
SIGNIFICANT CORE LOSS ZONES	
ORE ZONE GROUND CONDITIONS	
LOGGED BY	P. ROBERTS
COMMENTS	This hole was designed to test a series of IP and geochemical anomalies extending from 1000 to 1250E on line 3200N. As in the other two holes drilled in this program, granite was intersected at shallow depth. This suggests that the embayment of the granite contact North West of the site probably does not represent a fault as previously thought. Only one down hole survey was successfully carried out because artesian water pressure made it impossible to place the Eastman camera down the hole.

SURVEY			From - To	Distance D	VERTICAL		HORIZONTAL	
Depth	Bearing	Dip			D.Sin.Dip	R.L.	D.Cos.Dip	Prog. Total
(m)	(AMG)							
Collar	270°	-40°	0 - 66.5	66.5	42.75	206.86	50.94	50.94
133.0	279°	-36°	66.5-137.1	70.6	41.50	165.36	57.12	108.06

SUMMARY — ASSAY DATA

LODE NAME	FROM	TO	LENGTH (m)	AVERAGE WEIGHTED ASSAYS													B.C.A.
				Sn.	Acid Sol. Sn.	Cu.	As.	S.	Pb.	Zn.	Bi.	WO_3	Ag g/t				
	29.1	32.3	3.2	<0.01	<0.01	0.02			<0.01	0.02	0.001	0.02	3				
	45.6	46.6	1.0	<0.01	0.01	0.04			<0.01	0.12	0.002	0.03	4				

NMPS 27344

034056

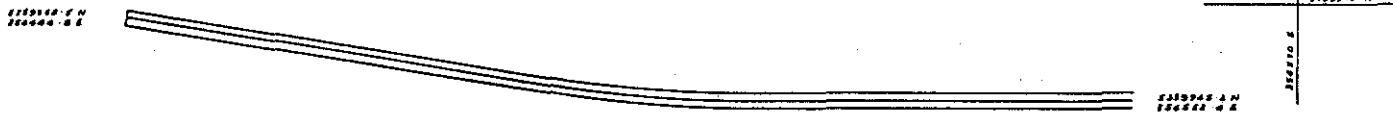
RENISON LIMITED

HOLE No TH 6 SCALE

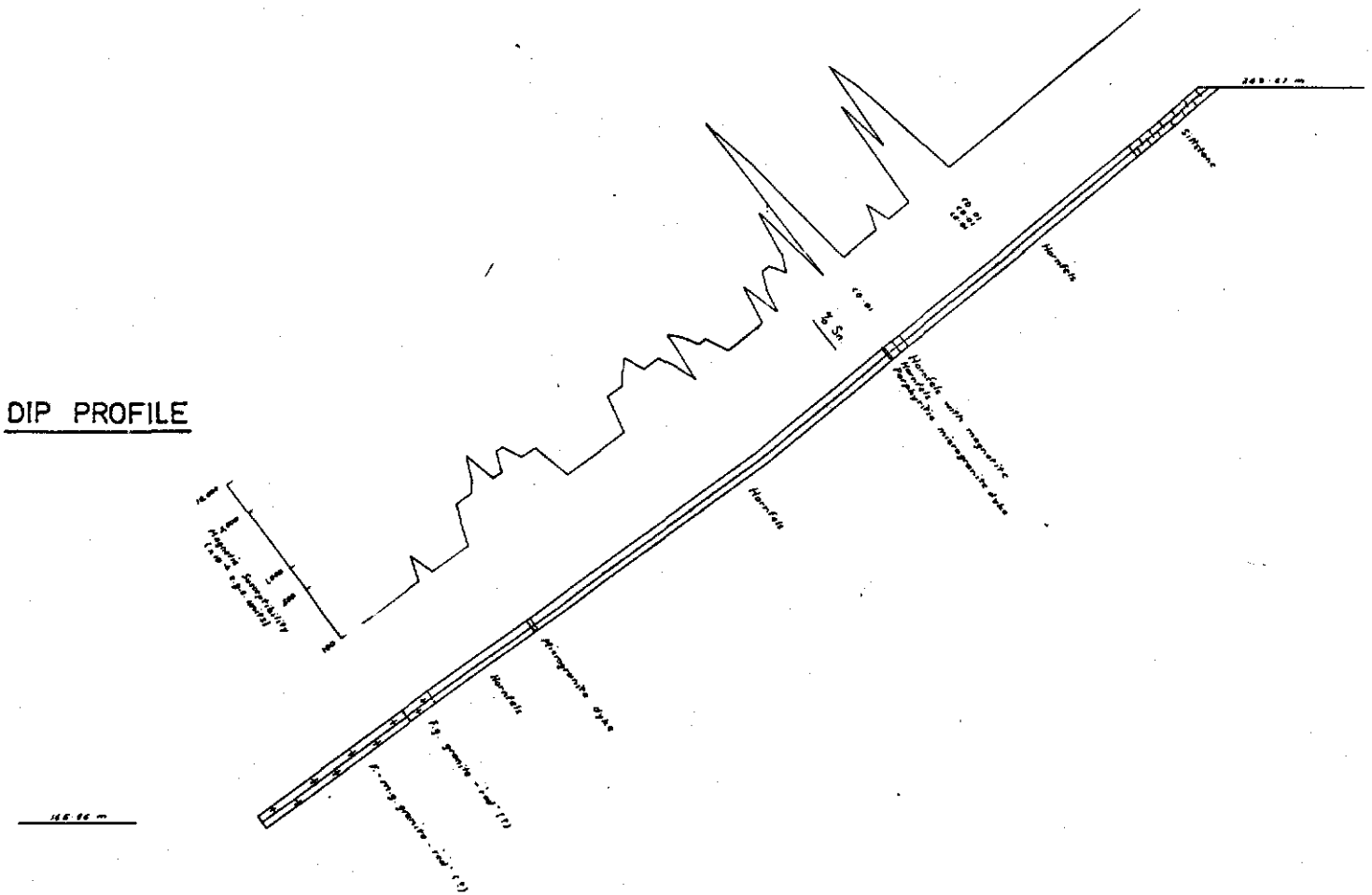
DIAMOND DRILL HOLE PLOT

5 cm

PLAN



DIP PROFILE



034057

DIAMOND DRILL RECORD

HOLE NUMBER : TH6

LOGGED BY : P. ROBERTS

xwps

INTERVAL (m) FROM	TO	RECOVERY m	%	DESCRIPTION	FORM.	% Sn. FROM	TO	TOTAL	ACID SOL.	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO_3
0.0	11.8	8.5	72	0.0 - 11.5 SILTSTONE Very pale grey to white, generally uniform and unbedded. Very badly broken, largely along irregular joints coated with brown-black ferruginous (and manganiferous?) material. Includes harder, partly laminated, pale grey hornfels (BCA 20°) between 7.6-10.7m.													
11.8	29.1	16.6	96	11.5 - 29.1 HORNFELS Pale grey, occasionally pink or mauve-brown, generally laminated, pervasively quartz veined. Largely hornfelsed argillite but minor hornfelsed sandstone (?) Strongly altered and/or brecciated, with veinlets or impregnations of black tourmaline (?) and clots of chlorite at 13.0 - 14.2, 17.1-17.6, 17.9-22.7, 24.6-25.3m. Rare blebs of pyrite. BCA varies: ~15° from 11.5-13.0m, 25-30° 14.2-15.5m, 35-40° 15.5-17.1m, 45° 22.7-23.5m, 60-70° 23.5-29.1m.													
29.1	32.1	3.0	100	29.1 - 32.3 HORNFELS Pale grey, similar to above with interbeds of green-black chlorite (or serpentine?), associated with magnetite beds from 30.9-32.3m BCA 70°. Thin Section 30.8m.		29.1	30.1	<0.01	<0.01	0.02			<0.01	0.03	0.002	2	0.02
						30.1	31.1	<0.01	<0.01	0.02			<0.01	0.01	0.001	4	0.02
						31.1	32.3	<0.01	<0.01	0.02			<0.01	0.02	0.001	3	0.02
32.1	38.1	6.0	100	32.3 - 39.3 HORNFELS Grey, strongly altered, laminated and folded. Minor veining of dark grey-green material, minor magnetite and muscovite, minor veinlets and blebs of pyrite and pyrrhotite. Includes altered microgranite dyke (?) 32.5-33.0m. BCA varies: 70° from 32.3-32.5, ~20° 33.0-33.4m ~40° 33.4-34.3m, ~10° 34.8-36.3, ~30° (overturned of previous reading) 36.3-36.7m 70-80° 36.7-37.7m 45-55° 37.7-38.7m. Thin Section 38.0m.													
38.1	44.1	6.0	100	39.3 - 42.8 HORNFELS Pale pink or pale green, generally unbedded, at least partly brecciated, containing variously oriented siliceous boudins (?) in a hornfels matrix. Pervasively veined by quartz. Cherty 42.0-42.6m, containing irregular patches of brown material. BCA (where visible) ~45°. Thin section 42.2m													
44.1	47.1	3.0	100	42.8 - 45.6 HORNFELS Similar to 11.5-29.1m, weakly laminated (BCA ~45°), trace pyrite and pyrrhotite. Includes microgranite intruded parallel to bedding 44.8 - 44.9m.													
				45.6 - 46.6 HORNFELS WITH MAGNETITE Grey with magnetite roughly conformable to bedding. Minor green-black chlorite (?). Thin section 45.9m		45.6	46.6	<0.01	0.01	0.04			<0.01	0.12	0.002	4	0.03

DIAMOND DRILL RECORD

HOLE NUMBER : TE6

LOGGED BY : P. ROBERTS

NWPS

INTERVAL (m) FROM	TO	RECOVERY m	%	DESCRIPTION	FORM.	% Sn. FROM	TO	TOTAL	ACID SOL.	% Cu.	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO_3
47.1	113.1	65.6	99	46.6 - 113.3 HORNFELS		Analyser Results (comparator setting 130)											
				Mauve-brown, pale grey-green, grey, finely laminated. Traces of		48.5	49.0	<0.1									
				pyrite and pyrrhotite in thin veinlets or finely disseminated		49.0	50.0	<0.1									
				throughout. Trace black tourmaline in thin veinlets mostly		50.0	51.0	<0.1									
				nearly parallel to c.a. Minor quartz veining. Tuffaceous (?)		51.0	52.0	<0.1									
				in part, particularly from 55.7-57.1 and 102.7-113.3m. BCA		52.0	53.0	<0.1									
				varies: 45° from 46.6-52.0m, 35° 52.0-58.0m, 40-45° 58.0-93.0m,		53.0	54.0	<0.1									
				20-40° 93.0-94.2, 40° 94.2-98.0m, ~50° 99.3-106.8m, 60-70°													
				106.8 - 113.0m. Includes:		66.0	67.0	<0.1									
						67.0	68.0	<0.1									
				47.9 - 48.1 Sericitized porphritic microgranite (?) dyke													
				intersected at ~10° to c.a.		70.0	71.0	<0.1									
				49.2 3cm Magnetite bed.		77.3	78.0	<0.1									
						78.0	79.0	<0.1									
				52.8 - 53.4 Pale green hornfels interspersed with masses of		79.0	80.0	<0.1									
				green-black chlorite (?).		80.0	81.0	<0.1									
						81.0	82.0	<0.1									
				66.7 - 66.9 Vein of grey-green chlorite (?) quartz, minor		82.0	83.0	<0.1									
				pyrite, trace pyrrhotite.		83.0	84.0	<0.1									
						84.0	84.6	<0.1									
				77.5 - 77.6 Several thin veins of quartz and fine tourmaline (open													
				space filling).		92.1	93.0	<0.1									
						93.0	94.0	<0.1									
				87.5 - 98.7 Includes greenish, strongly altered, strabound zones		94.0	95.0	<0.1									
				with pyrite ± quartz veins, unbedded (bedding obli-		95.0	95.8	<0.1									
				terated by alteration?).													
				98.7 - 99.3 Microgranite dyke, white, bearing disseminated black													
				tourmaline. Contacts near-conformable.													
				Thin sections 56.4, 71.3, 94.3m													
113.1	116.1	3.0	100	113.3 - 116.9 FINE GRAINED GRANITE													
				Very pale grey-green, or very pale yellow, mottled. Very fine													
				grained at contact, becoming progressively coarser grained													
				downwards. Slightly altered. Includes several quartz/tourmaline													
				/feldspar nodules (open-space filling).													
116.1	137.1	21.0	100	116.9 - 137.1 FINE TO MEDIUM GRAINED GRANITE													
				Grey, minor pink or very pale yellow colouration. Abundant													
				nodules (1-3 cm diameter) and veins/veinlets of quartz/tourmaline													
				Minor sericitization of plagioclase (?) feldspars throughout.													
				Becoming porphyritic 134.0 - 137.1m.													
				END OF HOLE 137.1m.													

DIAMOND DRILL RECORD

HOLE NUMBER : TH6

LOGGED BY : P.R.

NWTS

INTERVAL (m) FROM	TO	RECOVERY m	%	DESCRIPTION
				MAGNETIC SUSCEPTIBILITY (x 10^{-6} c.g.s. units)

FROM	TO	M.S.
0.0	1.0	100
	2.0	<100
	3.0	100
	4.0	<100
	5.0	<100
	6.0	<100
	7.0	<100
	8.0	<100
	9.0	<100
	10.0	<100
	11.0	<100
	12.0	<100.
	13.0	<100
	14.0	<100
	15.0	<100
	16.0	<100
	17.0	<100
	18.0	<100
	19.0	<100
	20.0	100
	21.0	<100
	22.0	100
	23.0	<100
	24.0	<100
	25.0	<100
	26.0	<100
	27.0	<100
	28.0	<100
	29.0	<100
	30.0	600
	31.0	~2500
	32.0	~5000
	33.0	500
	34.0	2000
	35.0	100
	36.0	100
	37.0	100
	38.0	100
	39.0	200
	40.0	<100
	41.0	<100

FROM	TO	M.S.
41.0	42.0	<100
	43.0	<100
	44.0	<100
	45.0	100
	46.0	~3000
	47.0	~10000
	48.0	100
	49.0	~1000
	50.0	300
	51.0	200
	52.0	300
	53.0	300
	54.0	200
	55.0	100
	56.0	200
	57.0	100
	58.0	100
	59.0	100
	60.0	<100
	61.0	<100
	62.0	100
	63.0	200
	64.0	200
	65.0	300
	66.0	400
	67.0	100
	68.0	200
	69.0	300
	70.0	300
	71.0	300
	72.0	500
	73.0	400
	74.0	300
	75.0	300
	76.0	300
	77.0	100
	78.0	<100
	79.0	100
	80.0	100
	81.0	<100
	82.0	100

FROM	TO	M.S.
82.0	83.0	100
	84.0	<100
	85.0	100
	86.0	300
	87.0	300
	88.0	300
	89.0	500
	90.0	500
	91.0	300
	92.0	300
	93.0	700
	94.0	400
	95.0	300
	96.0	300
	97.0	300
	98.0	200
	99.0	100
	100.0	<100
	101.0	100
	102.0	100
	103.0	100
	104.0	100
	105.0	200
	106.0	100
	107.0	100
	108.0	100
	109.0	100
	110.0	<100
	111.0	100
	112.0	<100
	113.0	100
	114.0	100

FORM. FROM	TO	% Sn. TOTAL	ACID SOL.	% Ce.	% As.	% S.	% Pb.	% Zn.	% Bi.	g/t Ag	% WO_3

034060

APPENDIX 3

PETROGRAPHIC DESCRIPTIONS

REPORT CMS 80/8/30

Eighteen drill core samples were received for thin-section preparation and petrological examination; two other samples were also examined, one marked "Trial Harbor Magnetite", the other "West Federation". A polished section was prepared of the magnetite, and a thin-section of the other sample, which was very small.

The eighteen drill-cores are briefly described in the accompanying tables, the other two are described separately.

Summary

TH 4 consists of serpentinites down to 38.4 m, where a hornfels is intercepted which is similar to those encountered in previous drillholes. TH 5 also contains apparently igneous serpentinites (as opposed to the "pseudo-serpentinites" at St. Dizier), and then passes into hornfelses (48.9 m, 72.2 m) and an extremely altered rock evidently from a fault zone (67.7 m). However, all the intersections examined from TH 6 are hornfelses and metasomatised sediments; no serpentinites were seen (perhaps they occur, but were not sampled).

The main feature of interest is the presence of ludwigite-paigeite in TH 5: 41.5 m, 46.8 m; these are Fe-Mg borates previously recorded from St. Dizier, and would almost certainly be responsible for any Sn present in acid-soluble form. In fact, the examination of the "Trial Harbor Magnetite" confirms the presence of this mineral group, some as extremely fine (< 10 μ) inclusions in magnetite. It is believed that possibly all the Sn is in this form, but was not liberated or completely dissolved on analysis (i.e. of the 960 ppm Sn present, the 600 ppm soluble Sn represents only the material actually available to acid attack). This matter will be followed up.

H.W. Fander, M. Sc.

Sample No.	Rock Type - Composition	Fabric	Minor Minerals	Comments
TH 4 28.4 m (T.S. 33538)	Weathered Schist. Foliated masses of degraded, iron-stained ?antigorite-chlorite and talc. Clusters of very small ?hydrogarnet grains.	Rough schistosity, crenulated and deformed. Fine-grained.	Fine granular topaz.	Rock is derived from serpentinite, with later metasomatism and introduction of hydrogrossular and topaz.
33.8 m	Serpentinite. Large antigorite pseudomorphs with fine magnetite, progressively replaced by granular siderite and calcite masses.	Excellent network textures preserved. Incipient banding.	Possible small tufts of ?livaite.	Relatively undisturbed orthodox serpentinised coarse ultramafic rock, fresher version of 28.4 m.
35.5 m	Serpentinite. Coarse antigorite pseudomorphs, partly replaced by coarse and fine tremolite needles, now replaced by carbonate fibres and grains.	Coarse serpentinite textures; relict amphibole textures.	Colloform-banded carbonate/Fe-silicate (?canbyite) veins.	Successive replacement phases, serpentinite, by tremolite and tremolite by carbonate.
38.4 m	Calc-Silicate Hornfels. Dominantly granular to acicular diopside, as finer and coarser parallel bands, with a few thin bands of hydromuscovite flakes.	Excellent banding, due only to grainsize variations; random orientation.	Conformable and cross-cutting veins/lenses of green pumpellyite.	Pumpellyite is hydrothermal, metasomatic, replacing diopside. Rock is contact-metamorphosed carbonate.
TH 5 19.7 m	Weathered Clay. Fine ferruginous clay with radiating textures; patches of colourless chlorite-antigorite. Spongy goethite patches.	Not banded or schistose. Relict features unrecognisable.	Semi-opaque, cloudy ?hydrogrossular. MnO_2 films/veins.	Original rock unknown, but possibly a calc-silicate. Not quartzose, no relict serpentine features.
33.2 m	Metasomatised Serpentinite. Antigorite patches with relict pyroxene, extensively replaced by carbonate and cut by zones/veins of diopside crystals.	Original network textures preserved, coarse-grained.	Parallel veins of fibrous phlogopite/tremolite/antigorite(?).	Metasomatic phases are contact effects. Diopside replaces carbonate.
41.5 m	Carbonated Serpentinite. Antigorite masses with relict olivine and pyroxene, extensively replaced by granular carbonate; radiating crystals of ludwigite-paigeite.	Relict network textures preserved; complex granular textures.	Antigorite-fibrous carbonate veins. Minor magnetite.	Probably orthodox serpentinite; the ludwigite-paigeite may be stanniferous (i.e. grading into hulsite).
46.8 m	Carbonated Serpentinite. Relict small antigorite patches and occasional pyroxene grains; abundant replacive fibrous and granular carbonate. Magnetite.	As above. Fibrous carbonate may be after tremolite(?).	Fibrous ludwigite-paigeite patches. Sphalerite aggregates.	Similar to 41.5 m, and acid-soluble Sn may be present inthe Fe/Mg borate phase.
48.9 m	Phlogopite-Diopside Rock. Massive, finely-granular diopside, with folded lenses and bands of matted pale phlogopite flakes.	Complex ptygmatic folding/overfolding of bands.	Intergranular crystals, veinlets of pale green ?melilite (var. gehlenite).	A metasomatic rock, compositionally banded. Presence of ?melilite unusual, but not impossible; identification tentative.

Sample No.	Rock Type - Composition	Fabric	Minor Minerals	Comments
TH 5 67.7 m	Altered Schist. Highly porous chloritic or serpentinous schist, extensively impregnated with fine MnO_2 and limonite.	Relict schistosity recognisable, but textures poorly preserved.	None detected.	Resembles TH 4/28.4 m and may be of similar origin. Evidently from a fault zone.
72.2. m	Banded, Metasomatised Hornfels. Very thin bands of quartz, altered feldspar, chloritised ?tremolite or biotite; replacive dravite crystals, phlogopite, ultrafine ?diopside, sericite patches.	Fine bands are folded, disrupted by veins. Fine-grained.	Scattered pyrite, pyrrhotite, ultrafine sphene and oxide opaques.	Originally a fine-grained, laminated sediment, first contact-metamorphosed, then pervasively metasomatised.
TH 6 30.8 m	Metasomatised Schist. Alternating bands of fine antigorite flakes, fine matted diopside, muscovite with andradite-diopside-magnetite grains.	Fine schistosity in micaceous bands. Some relict folding.	Veins of coarser diopside. Traces of sulphide(?pyrrhotite).	Original rock was perhaps a banded carbonate-antigorite schist, derived from ?serpentinite.
38 m	Calc-Silicate Rock. Mainly fine intergrowths of prismatic-acicular diopside and amphibole (edenite), with patches of Na-amphibole (hastingsite/arfvedsonite).	Blotchy aggregates, shapeless, structureless; no relict textures.	Small patches of fibrous ludwigite-paigeite. Sulphides (?chalcopyrite) in veins.	Two different sodic amphiboles occur. No indication of identity of original rock.
42.2 m	Calc-Silicate Hornfels. Extremely fine-grained, intergrown diopside and Ca-garnet (grossularite), with zones of interstitial fine quartz.	Crude compositional zoning/banding. Average grainsize = 10-20 μ.	Fine granular sphene. Coarser diopside veins. Traces fine sphalerite, galena.	Probably originally a calcareous rock (?sediment), but no real evidence of identity.
45.9 m	Banded, Metasomatic Rock. Bands of fine diopside, fine quartzose hornfels, matted phlogopite, altered hornfels (TH 5/72.2 m), magnetite-rich serpentinite.	Contrasting compositional banding. Very fine-grained textures.	Scattered pyrite; pyrrhotite veinlets. Chrysotile veinlets.	May have been banded quartzose/calcareous rock with a small serpentinite sill/intrusion, selectively metasomatised.
56.4 m	Metasomatised Shale. Finely-laminated rock, pervasively replaced by ultrafine dravite, diopside, pale phlogopite. Coarser quartz-albite patches. Interstitial fine quartz.	Relict fine slaty or schistose fabric well-preserved, folded and brecciated.	A few needles, radiating crystals of ?humite. Fine sulphides.	Relict fabric indicates a sedimentary origin, probably shale or siltstone.
71.3 m	Metasomatised Shale. Ultrafine clastic components, pervasively replaced by fine phlogopite, dravite, diopside and matted tremolite.	Compositional banding reflects original bedding/lamination.	Conspicuous pyrrhotite patches in some zones.	Quite similar to 56.4 m in terms of original rock and subsequent metasomatism, but not folded or brecciated.
94.3 m (T.S. 33555)	Metasomatised Shale. Fine, banded diopside rock merging into coarser massive diopside with patches of matted phlogopite flakes.	Good relict bedding/lamination preserved. Fine-grained.	Actinolite veinlets. Irregular patches of granular pyrite. Fluorite patches.	Similar to 56.4 m, 71.3 m; all form part of a fine-grained sedimentary sequence pervasively metasomatised.

APPENDIX 4

GEOCHEMICAL ANALYTICAL RESULTS - LINE 2750N

GLOBE MINE AREA

034066

SOIL GEOCHEMISTRY RESULTS (ppm) LINES 2750

	Sn	As	Cu	Pb	Zn		Sn	As	Cu	Pb	Zn		Sn	As	Cu	Pb	Zn
00						00W	<5	15	5	50	25	00					
25						25	20	10	5	20	10	25					
50						50	170	15	5	10	15	50					
75						75	10	20	5	20	10	75					
00						100W	50	5	<5	<10	10	00					
25						25	<5	10	<5	20	<5	25					
50						50	35	10	<5	10	5	50					
75						75	25	5	<5	10	10	75					
00						200W	60	5	<5	20	10	00					
25						25	25	5	<5	10	5	25					
50						50	20	20	5	10	10	50					
[redacted]						75	25	25	10	20	10	75					
00						300W	35	450	35	60	25	00					
25						25	30	220	5	20	15	25					
50						50	110	15	<5	<10	5	50					
75						75	65	20	<5	10	5	75					
00						400W	320	10	<5	10	5	00					
25						25	55	10	<5	<10	5	25					
50						50	190	10	<5	10	5	50					
75						75	185	5	<5	20	10	75					
00						500W	145	5	5	10	5	00					
25						25	130	5	5	10	5	25					
[redacted]						50	35	5	5	10	10	50					
75						75	55	5	<5	10	15	75					
00						600W						00					
25						25						25					
50						50						50					
75						75						75					
00						00						00					
25						25						25					
50						50						50					
75						75						75					
00						00						00					
25						25						25					
50						50						50					
75						75						75					

APPENDIX 5

GROUND PROTON MAGNETIC RESULTS - LINE 2750N

Form No. 73/269 RENISON LIMITED 034068

PROTON MAGNETOMETER FEILD RECORDINGS

Date: Dec 1979 Operator: Poltocks Grid Location: 275ON EAST HEEMSKIRK "GLOBE MINE AREA"

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
00W	61 981			
	987			
	995			
	61 995			
50.	62005			
	012			
	021			
	033			
100	037			
	038			
	043			
	046			
150	048			
	050			
	063			
	068			
200	075			
	093			
	107			
	125			
250	140			
	157			
	168			
	187			
300	198			
	210			

Form No. 73/269 RENISON LIMITED 034069

PROTON MAGNETOMETER FEILD RECORDINGS

Date: Dec 1979 Operator: Poltocks Grid Location: 275ON E.H.G. "GLOBE MINE AREA"

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
	62232			
350	245			
	251			
	259			
	270			
400	277			
	283			
	287			
	290			
450	294			
	296			
	298			
	303			
500	308			
	310			
	311			
	319			
550	320			
	325			
	324			
	325			
600	62332			

80-1492

PLAN 1

E.L. 47/71
GIPPSLAND MINERALS N.L.

Mt Agnew

INDUSTRIAL & MINING INVESTIGATIONS PTY LTD
51M/75
55 ha

Globe
(Pb Zn Ag Sn)

Lake Cumberland

S.P.L. 129

E.L. 11/76
RENISON LIMITED

SOUTHERN OCEAN

Empress (Sn)
135

138
Cliff (Sn)

90M/72 16 ha
F.J. GRIFFITHS

Tungsten and Molybdenum (Sn)

4M/73 16 ha
F.J. GRIFFITHS

81M/72
2 ha
M.S. ROBERTSON & E.W. COLEMAN

Remine

Nickel-Reward (Ni)
136

Trial Harbour

36M/80
4 ha
S.A. CLARK & P.B. FRANCESCONI

39M/80 21 ha
C.R. PARKER & S.A. CLARK

S.P.L. 129

EL 4/78

Henty River

Zeehan

ZEEHAN A/4 | ZEEHAN B/3
ZEEHAN C/2 | ZEEHAN D/1

5 cm

RENISON LIMITED

ZEEHAN C/2

S.P.L. 129

LAND TENURE & LOCATION OF OLD WORKINGS

SCALE 1 10,000 METRES

DRAWN	P.A.R.
TRACED	T.G.D.S.
DATE	Oct 1980
SCALE	1:10000
DRAWING No	ZEEHAN C/2

50-1492

034071

PLAN 2

RENISON LIMITED	DRAWN	PAR
ZEEHAN D/1	TRACED	TGDS
S P L 129	DATE	Oct 1980
LAND TENURE & LOCATION OF OLD WORKINGS	SCALE	1:10,000
SCALE. 1:10 000 METRES	DRAWING No.	ZEEHAN D/1

ZEEHAN B/3	ZEEHAN B/4
ZEEHAN D/1	ZEEHAN D/2

5 cm

80-1492 034072 PLAN 26

350 000 E

351 000 E

352 000 E

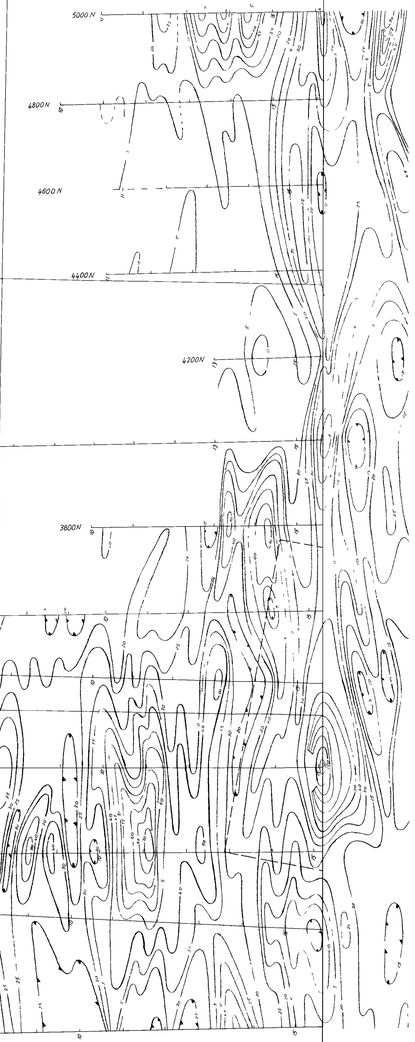
353 000 E

354 000 E

5 362 000 N

5 361 000 N

5 360 000 N



GRADIENT ARRAY
EIP SURVEY

CHARGEABILITY
CONTOUR PLAN

SURVEYED & COMPILED BY
SCINTREX

NOVEMBER 1979

Jeb K TAS 074 C 5m 1:2

RENISON LIMITED

ZEEHAN C2/2

5 cm

SCALE 1 5000 METRES

100 0 100 200

PLAN 3a

330-1492

034673

355 000 E

356 000 E

357 000 E

358 000 E

359 000 E

5 362 000 N

5 361 000 N

5 360 000 N

5000 N

4800 N

4600 N

4400 N

4200 N

4000 N

3800 N

3600 N

3400 N

3200 N

3000 N

2800 N

2600 N

T.N

GRADIENT ARRAY
EIP SURVEY

CHARGEABILITY
CONTOUR PLAN

SURVEYED & COMPILED BY
SCINTREX

NOVEMBER 1973

Job Nº 7A5 076 C Sht 2 of 2

RENISON LIMITED

ZEEHAN D1/1

5 cm

SCALE 1:5000 METRES

100 0 100 200

PLAN 3b

80-14-92

034074

391,000 E

392,000 E

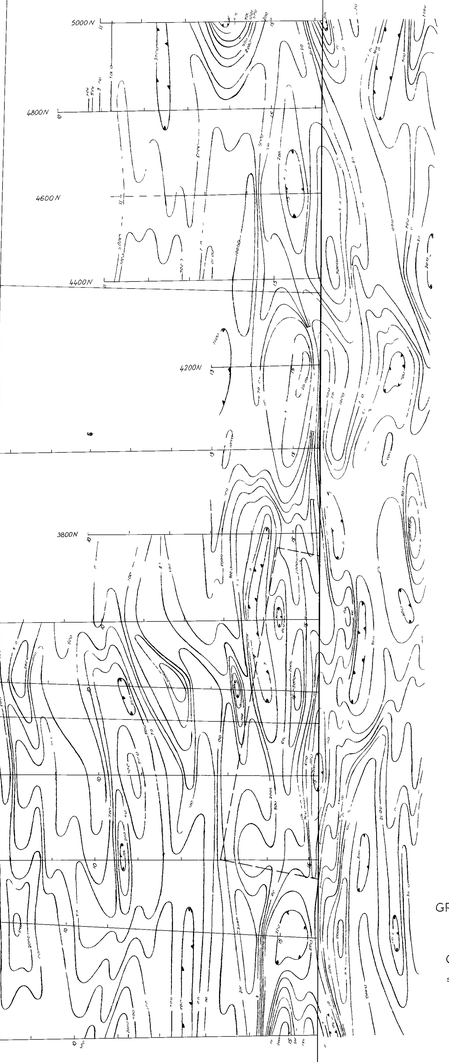
393,000 E

394,000 E

5 362 000 N

5 361 000 N

5 360 000 N



GRADIENT ARRAY
E I P SURVEY

RESISTIVITY
CONTOUR PLAN

SURVEYED & COMPILED BY
SCINTREX
NOVEMBER 1979

Job Nº TAS 074 C Skt 1of2

RENISON LIMITED

ZEEHAN C2/2

5 cm

SCALE 1:5000 METRES
100 0 100 200

PLAN 4a

80-1492

351 000 E

356 000 E

361 000 E

366 000 E

371 000 E

5 362 000 N

5 361 000 N

5 360 000 N

9000 N

4800 N

4600 N

4400 N

4200 N

4000 N

3800 N

3600 N

3400 N

3200 N

3000 N

2800 N

2600 N

TN

GRADIENT ARRAY
EIP SURVEY

RESISTIVITY
CONTOUR PLAN

SURVEYED & COMPILED BY
SCINTREX

NOVEMBER 1979

Job No TAS 074 C Sht 2 of 2

RENISON LIMITED

034076 ZEEHAN D1/1

5 cm

SCALE 1:5000 METRES

100 0 100 200

PLAN 4b

80-1492

Line 2750 N

IP Data – GRADIENT ARRAY

Resistivity in Ohm-metres: 10,000 / 5,000 / 2,500 / 1,000 / 500 / 250 / 100 / 50 / 25 / 10

Chargeability in millivolts per volt: 50 / 40 / 30 / 20 / 10 / 0

Geochemistry

PPM: 1000 / 800 / 500 / 100 / 50 / 10

Total Magnetic Field (γ)

64 000 / 63 000 / 62 000 / 61 000 / 60 000

(———) SCALE COARSE

Topography & Geology

HEIGHT ABOVE SEA LEVEL - (METRES): 300 / 200 / 100

GLOBE MINE
(60m N of Line)

Creek

Creek

034077

700 600 500 400 300 200 100 00

RENISON LIMITED	
EAST HEEMSKIRK GRID SPL 129	
LINE 2750 N	
SCALE 1 2000 METRES (40 0 40 80 120)	
DRAWN	A ROSS
TRACED	E VICKERS
DATE	JULY 79
SCALE	1 2000
DRAWING No	PLAN 5a

I P DATA
CHARGEABILITY & RESISTIVITY
POLE - DIPOLE
n 1 — n 1
xn 2 — xn 2
n - 3 — n - 3
n=4 — n - 4

MAGNETICS
Erratic magnetometer reading

GEOCHEMISTRY
As

I P DATA
CHARGEABILITY & RESISTIVITY
GRADIENT ARRAY
M3
Pa

GEOLOGY
Swamp
Heemskirk granite
5 cm
Precambrian? - Cambrian sediments
Magnetite goethite limonite "gossan"
Hornfelsed siltstones calc - silicates
Predominantly quartzites shales siltstones
Cambrian gabbro and related basic rocks

80-1492

RENISON LIMITED	DRAWN	A Ross
EAST HEEMSKIRK GRID SPL 129	TRACED	TGDS
LINE 3200 N	DATE	JULY '79
300 E - 2300 E	SCALE	1 : 2000
SCALE 1 : 2000 METRES	DRAWING No.	TH 377

I P DATA — CHARGEABILITY & RESISTIVITY — POLE - DIPOLE: n = 1, n = 2, n = 3, n = 4

MAGNETICS: 5000 Scale; "Smoothed" Curve; Erratic magnetometer reading

GEOCHEMISTRY

I P DATA — CHARGEABILITY & RESISTIVITY — GRADIENT ARRAY: M3, ρa

GEOLOGY: Swamp; Heemskirk granite; Precambrian? - Cambrian sediments; Magnetite goethite limonite "gossan"; Hornfelsed siltstones calc - silicates; Predominantly quartzites shales siltstones; Cambrian gabbro and related basic rocks

80-1492

PLAN 5b

RENISON LIMITED		DRAWN	R. Ross
EAST HEEMSKIRK GRID SPL 129		TRACED	T G D S
LINE 4000 N		DATE	JULY '79
700 E - 2500 E		SCALE	1 2000
SCALE 1 2000 METRES		DRAWING No.	TH 381

80-1492

PLAN 5c

RENISON LIMITED	DRAWN	R Ross
EAST HEEMSKIRK GRID SPL 129	TRACED	TGDS
LINE 4200 N	DATE	JULY '79
1300 E - 4000 E	SCALE	1 2000
SCALE 1 2000 METRES	DRAWING No.	TH 382

I P DATA — CHARGEABILITY & RESISTIVITY, POLE - DIPOLE: n-1, n 2, n 3, n 4

MAGNETICS — 5000 Scale; Smoothed curve; Erratic magnetometer reading

GEOCHEMISTRY — Sn, Cu, Pb, Zn, As

I P DATA — CHARGEABILITY & RESISTIVITY, GRADIENT ARRAY: M_3, ρ_a

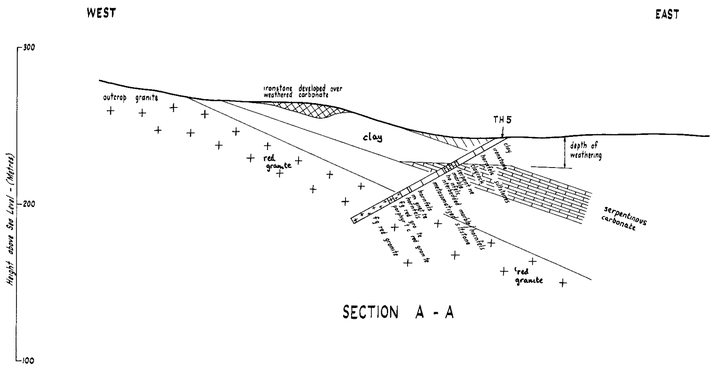
GEOLOGY
- Swamp
- Heemskirk granite
- Precambrian? - Cambrian sediments
- Magnetite, goethite, limonite 'gossan
- Hornfelsed siltstones calc silicates
- Predominantly quartzites shales siltstones
- Cambrian gabbro and related basic rocks

5 cm

80-1492

PLAN 5d

SECTIONS



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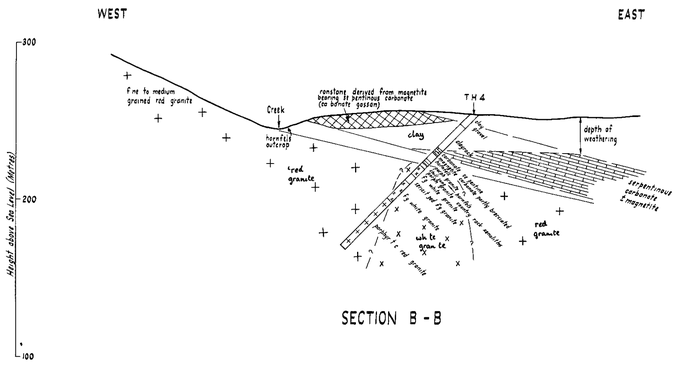

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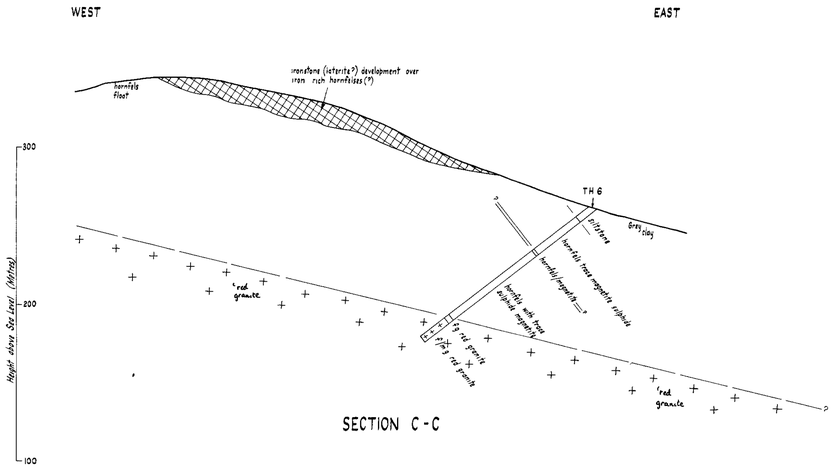

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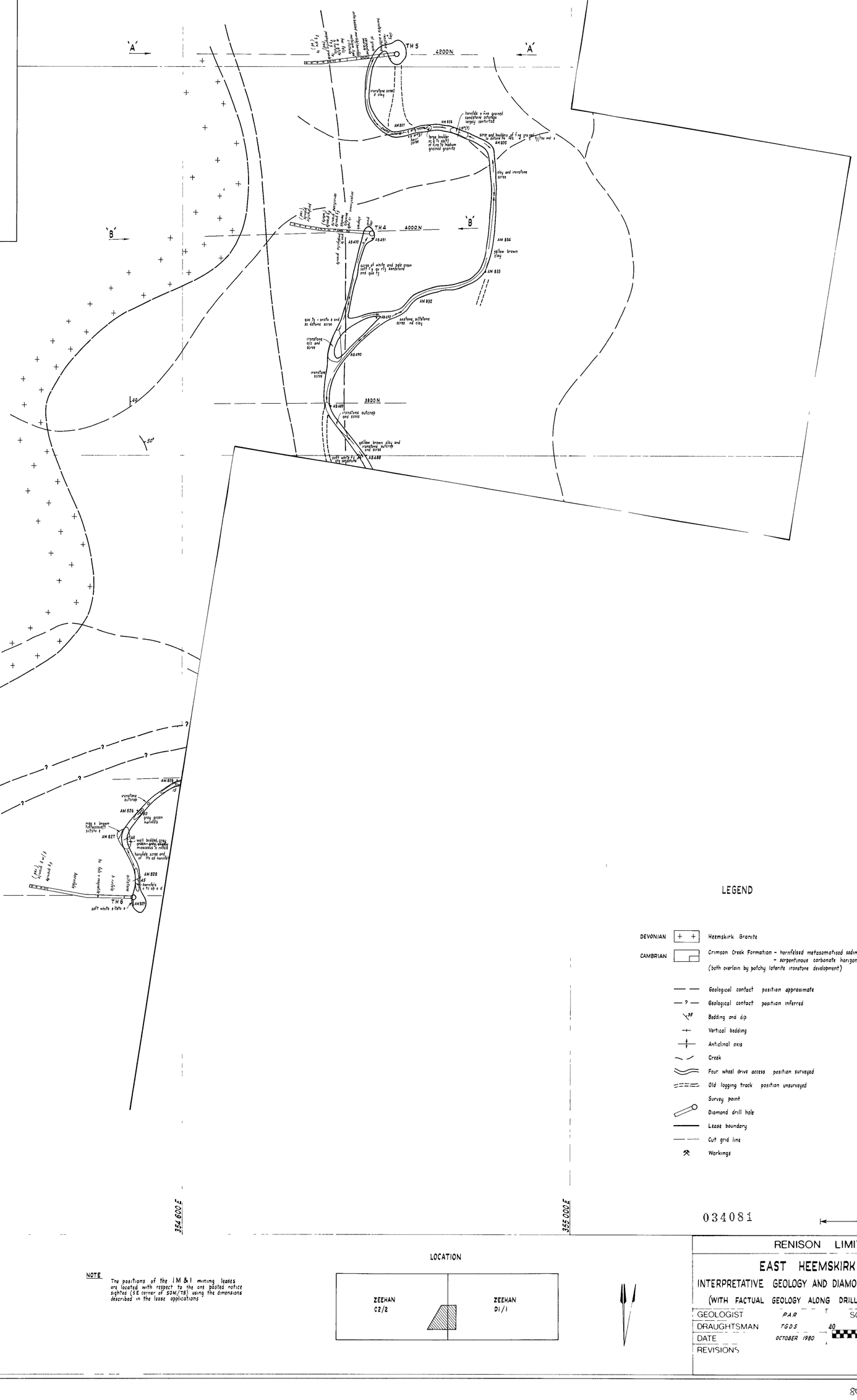


LEGEND

DEVONIAN — Heemskirk Granite

CAMBRIAN — Crimson Creek Formation - hornfelsed metasomatised sediments - serpentinous carbonate horizon (both overlain by patchy laterite ironstone development)

- Geological contact position approximate
- ? Geological contact position inferred
- Bedding and dip
- Vertical bedding
- Anticlinal axis
- Creek
- Four wheel drive access position surveyed
- Old logging track position unsurveyed
- Survey point
- Diamond drill hole
- Lease boundary
- Cut grid line
- Workings

034081

5 cm

NOTE

The positions of the I.M.&I. mining leases are located with respect to the ons posted notice sighted (S.E. corner of SOM/78) using the dimensions described in the lease applications

LOCATION

RENISON LIMITED

EAST HEEMSKIRK GRID

INTERPRETATIVE GEOLOGY AND DIAMOND DRILLING RESULTS

(WITH FACTUAL GEOLOGY ALONG DRILL ACCESS ROADS)

GEOLOGIST	P.A.R.	SCALE 1 2000 METRES
DRAUGHTSMAN	T.G.O.S.	40 0 40 80
DATE	OCTOBER 1980	
REVISIONS		DRAWING No PLAN 6

80-1492

SPL 129

To Corinna

Big Ben

Montana Silver Lead

Barnetts Lode

Beauty

Zeehan Western Boundary

Montana

Oonah

Junction

Poverty Point

Despatch

No 2 Montana

Stormsdown

No 2 Queen

Clarkes Lode

No 4 Queen

Paynes

ZEEHAN

Zeehan

Faheys Lode

No 3 Argent

No 1 Argent

Florence

Featherstones Lode

Argent

No 6 Argent

Nike

No 2 Argent

Balstrup No 1

Central Balstrup

Montague

Maxim

New Spray

Old Spray

Victoria Zeehan

Colonel North

Sunshine

North Tasmanian

Nubeena

Tasmanian

Grubbs

Swansea

Austral

Sunrise

Zeehan Bell

South King

Silver King

Oceana

Doric

Silver Stream

Sylvester

Comstock

South Comstock

Boss

Susannite

Britannia

TLE

Stonehenge

To Trial Harbour

To Queenstown

Puo

Pt

Sc

Om

Og

Sa

Sk

S

Df

Db

Oz

€g

€c

A.M.G. NORTH

MAGNETIC NORTH

LEGEND

PERMIAN	Pt	Tillite
DEVONIAN	Db	Bell Shale
	Df	Florence Quartzite
SILURIAN	S	Austral Creek Siltstone
	Sk	Keel Quartzite
	Sa	Amber Shale
	Sc	Crotty Quartzite
ORDOVICIAN	Og	Gordon Limestone
	Om	Moina Sandstone
	Oz	Mt Zeehan conglomerate
CAMBRIAN	€g	McIvor Hill Gabbro
	€c	Crimson Creek Argillite
PROTEROZOIC CAMBRIAN	Puo	Success Creek phase Oonah Quartzite and Slate

Swansea Mine location

Road

Tram or railway

Fault

Conformable boundary

Unconformity

5 cm

Mine locations, names and Geology after Both and Williams 1972

RENISON LIMITED

MINES OF THE ZEEHAN FIELD

GEOLOGIST	PAR
DRAUGHTSMAN	TGDS
DATE	October 1980
REVISIONS	

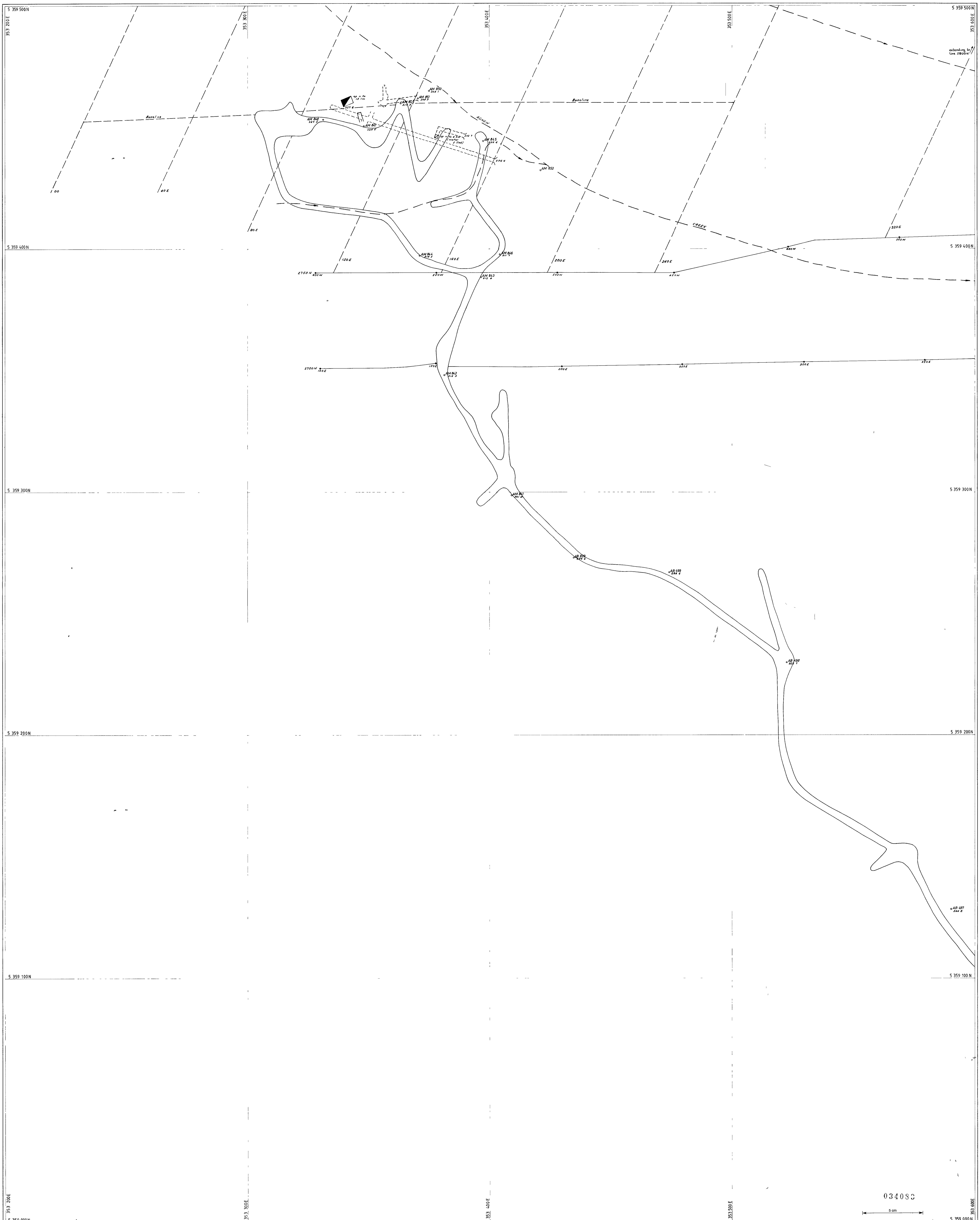
SCALE 1 20,000 METRES

200 0 200 400 600

DRAWING No PLAN 7

034082

80-1492



TD 13	TD14	TD15
TE 13	TE 14	TE 15

AM 841 301 6 Survey station and R L
Cut grid line
Proposed grid line
Adit
Shaft
Winze
Trench
Creek

RENISON LIMITED

GLOBE MINE

ACCESS
and PROPOSED GRID

GEOLOGIST	P ROBERTS	SCALE 1 500 METRES
DRAUGHTSMAN	F COLSON	
DATE	Oct 1980	
REVISIONS		DRAWING No TE 14

80-1492 PLAN 8a

5 360 000N

353 200E

353 300E

353 400E

353 500E

353 600E

5 359 900N

5 359 800N

5 359 700N

3000N

5 359 600N

2800N

AGNEW

CREEK

5 359 500N

034084

Survey station and R.L

Cut grid line

Proposed grid line

Adit

Shaft

Winze

Trench

Creek

5 cm

TD13	TD14	TD15
TE13	TE14	TE15

RENISON LIMITED

GLOBE MINE AREA

ACCESS
and PROPOSED GRID

GEOLOGIST	P. ROBERTS
DRAUGHTSMAN	F. COLSON
DATE	Oct 1980
REVISIONS	

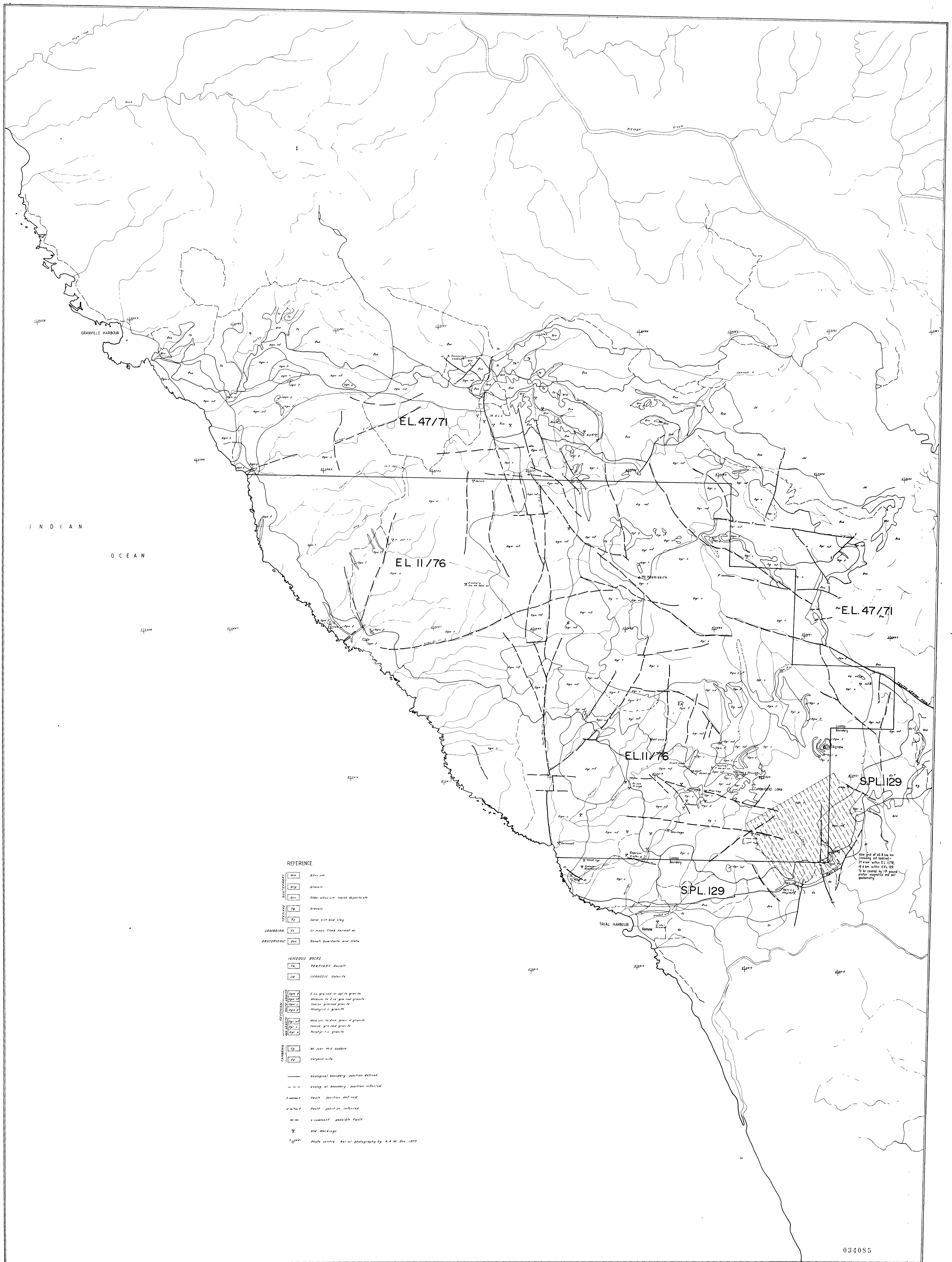
SCALE 1 500 METRES

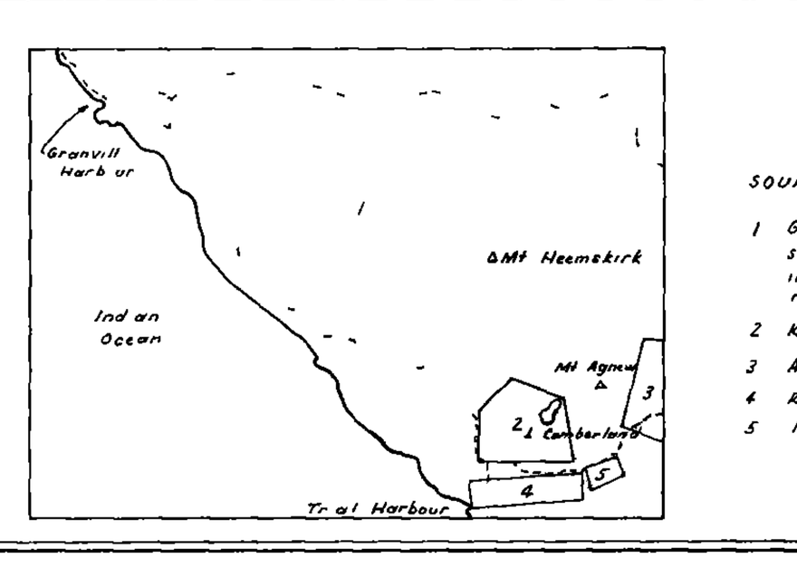
10 0 10 20

DRAWING No
TD 14

80-114921

PLAN 86





SOURCE DIAGRAM

1 Granite outline l n aments and sed m nt b undar es by Laston Hunt ng intra gran te b undar es by J Klom nsky m nor add t ons by P Roberts
2 K Wells m nor add t ons by P Roberts
3 A Ross
4 R N Lees
5 K Wells

41°00			
	SANDY CAPE 7815	ARTHUR RIVER 7915	HELLYER 8015
41 30	CONICAL ROCKS 7814	PIEMAN 7914	SOPHIA 8014
42°00	144 30	145°00 / 145 30	146 00

RENISON LIMITED

HEEMSKIRK AREA

LOCATION OF PROPOSED AGNEW GRID AND GEOLOGY

GEOLOGIST	P ROBERTS	SCALE 1 25000 METRES (500 0 500 1000)
DRAUGHTSMAN	TGDS	
DATE	October 1980	
REVISIONS		DRAWING No PLAN 9

80-1492