RENISON LIMITED

DKSG

S.P.L. 129 - TRIAL HARBOUR AREA

ANNUAL REPORT

1977-78

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1. SUMMARY

Exploration during the year was confined to the East Heemskirk Grid, which was established in 1977 over an area considered favourable for the discovery of tin-bearing skarn and carbonate replacement bodies.

Work consisted of geological mapping, and ground magnetic, I.P. and soil sampling surveys, incurring an expenditure of $29.259 for the year. This work confirmed the geologically favourable nature of the area and succeeded in defining several interesting geochemical and geophysical anomalies.

An exploration programme is recommended for 1978/79 with an estimated expenditure of $40,600.

2. INTRODUCTION

The East Heemskirk Grid is located 7 km west of Zeehan on the eastern margin of the Heemskirk granite. Steeply dipping Cambrian (? Pre-Cambrian) sediments have been intruded by the fault bounded (?) Cambrian McIvor Hill gabbro, both subsequently being intruded by the Devonian Heemskirk granite. The sediments show signs of metasomatic alteration, while the gabbro/amphibolite has been altered to an assemblage of calc-silicate rocks and serpentinite, containing lenses of magnetite and capped by ironstone. The Tenth Legion mine in the north of the area explored some of these magnetite lenses.

At least two large faults occur in the area, both striking N.W.-S.E. with a displacement of south block east, viz. the Tenth Legion fault zone which terminates the gabbro northwards, and a fault interpreted as terminating the gabbro to the south.

The sediments belong to the Crimson Creek Formation, and possibly in the north of the area to the Oonah Formation, and this area is therefore in a similar stratigraphic position to Renison Bell, Cleveland, Mt Bischoff and Mt Lindsay areas.

In view of the favourable stratigraphic position, the presence of an altered basic intrusion, the proximity to a known tin-bearing granite, and the presence of a potential plumbing system in the form of large faults, this area is considered to have potential for the discovery of tin-bearing fault zones and tin-bearing magnetite or sulphide skarn bodies, formed either from sedimentary carbonate beds and/or from altered basic rocks.

3. LAND TENURE

S.P.L. 129 is held under a joint venture agreement by Renison Limited and the Mt Lyell Mining and Railway Co. Limited, and under a letter of agreement dated 14th June 1978, Renison holds a 68% interest and Mt Lyell 32%. Five mine leases for iron ore only are held by Industrial and Mining Investigations Pty Ltd in the area covered by the grid.

4. PREVIOUS WORK

No previous substantial exploration for tin has been undertaken in this area.

Geophoto conducted a limited exploration programme over the Tenth Legion fault zone in 1972, and part of this area falls in the north-western corner of S.P.L. 129.

Exploration of magnetite lenses within the altered basic intrusive was carried out between 1885 and 1936 in the Tenth Legion mine and elsewhere, although the mine was never an established producer.

In 1957 the Tasmanian Mines Department drilled two angled diamond holes under the mine workings to test the downward extension of the magnetite lenses. In 1974 the Mt Lyell Mining and Railway Co. Limited assayed grab samples from these holes for several elements including tin; the results are summarised in appendices.

5. WORK COMPLETED 1977-78

A ground magnetometer survey was carried out along the grid lines, a 3 m staff being used in order to minimise the interference from magnetite bearing ironstone rubble. At the same time, the lines were geologically mapped. Numerous rock samples of both outcrop and float material were collected; most were assayed for a variety of elements, and representative sections sent to Central Mineralogical Services for petrological descriptions.

Scintrex Pty Ltd were contracted to carry out an I.P. survey, while Ashton Exploration Pty Ltd conducted a geochemical soil sampling programme.

This area was included in the photogeological work carried out by Loxton, Hunting and Associates (1978) for Renison Limited as part of a more regional assessment of the Heemskirk Granite and its intruded sediments.

5.1 Geology

Geological mapping of the grid lines was carried out in conjunction with the magnetic survey. Several hand samples were collected, and assayed for several elements; the results being plotted on the interpretive geology plan (Map 2).

The major units existing in the area consist of the Heemskirk granite, the McIvor Hill gabbro/amphibolite extensively altered, and Cambrian/? Pre-Cambrian sediments. The N.W. striking sinistral Tenth Legion fault zone cuts through the northern part of the grid.

5.1.1 Granite

The Devonian Heemskirk granite, technically an adamellite, is known to be tin-bearing, and is considered by Taylor (1974) to be intermediate between deep volcanic and plutonic. Total tin production from the South Heemskirk tinfield is 485 tonnes. In the area covered by the grid, the granite is a red, medium-grained variety, often porphyritic, containing abundant nodules of tourmaline. This occasionally merges into a white granite near the contact.

North of line 3800N, it forms tor-like outcrops on the button-grass slopes of Mt Agnew, while south of this line, few outcrops were seen but its position can be inferred from magnetic and I.P. data, scree and vegetation changes.

No information is available on the dip of the granite, however it is likely that, as with other West Coast granite batholiths, the dip will be vertical or steeply outwards.

5.1.2 Sediments

Two distinct lithological units exist, separated by the fault which cuts line 3400N at 1450E.

South of this fault the sediments are variably metasomatised and hornfelsed, fine-grained tuffaceous greywackes and pelites belonging to the Crimson Creek Formation.

Intercalated calcareous bands occur, and these are represented by skarn assemblages. Actinolite is ubiquitous, as a staining and in veinlets; diopside is common, and phlogopite, albite and cordierite have also been described with minor accessory sphene.

Few strikes and dips were mapped, however, the general trend appears to be approximately parallel to the granite contact, i.e. N - S, swinging to N.E. - S.W. south of the grid.

Sulphides are common throughout this unit, fine-grained disseminated pyrite being dominant. Minor pyrrhotite and traces of chalcopyrite also occur, while in the skarn lenses magnetite is common with minor pyrite (partly pyritised pyrrhotite). Significant sphalerite was recorded in a specimen of skarn material (2200N, 1538E) which assayed 0.48% Zn. From magnetic and I.P. data, it appears that the sulphide distribution is lithologically controlled.

North of the fault the dominant lithology is a banded, often contorted quartzite/chert, similar in many respects to the Oonah Quartzites north of the Tenth Legion fault. Bands of tuffaceous greywacke also occur. This unit is generally less magnetically active than the Crimson Creek rocks south of the fault, and has been tentatively assigned to the Pre-Cambrian Oonah formation.

5.1.3 Gabbro

The Cambrian McIvor Hill gabbro, or gabbro/amphibolite, outcrops along the Trial Harbour road, and on the eastern sections of lines 2600N, 3000N and 3400N. It is described by Fander as a thoroughly uralitised gabbro.

5.1.4 Ironstone

A gossanous, usually magnetic, ironstone occupies much of the northern part of the grid. By its nature it tends to form large scree areas obscuring the underlying geology and probably exaggerating the size of its outcrop and is cut off by the Tenth Legion fault zone on line 4600N; the Tenth Legion magnetite deposit occurs at the contact. A smaller branch strikes northwards from line 3400N, contacts the granite on line 4200N and apparently terminates before line 4600N. Two small outcrops also occur on line 5000N.

The ironstone has formed as a capping on the altered gabbro/amphibolite intrusion by a process of weathering with secondary enrichment of the magnetite. The rocks occurring below this capping are seldom seen in outcrop, usually being covered by ironstone scree, but have been well documented in adits and drill holes designed to test the extent of the magnetite deposits. They consist of an assemblage of calc-silicate rocks and serpentinite with lenses and segregations of magnetite and were probably derived by metasomatic alteration related to the granite intrusion as follows:

Gabbro/amphibolite → serpentine → dolomite
serpentine → Ca - Mg silicates
(Hughes 1958)

Various authors have disagreed on whether the magnetite was derived from the granite or the basic intrusion; the present author favours the former, mainly because of the close relationship between tin (undoubtedly granite-derived) and magnetite as demonstrated in the two Mines Department drill holes (Appendix 9).

Several samples were sent to a petrological consultant; one (4200N, 1575E) was described as a pseudogossan representing a thoroughly weathered skarn, while an assemblage of rocks mapped at 3400N, 1450E included a fosterite-magnetite-talc-hunnite rock interpreted as an altered dunite and a talc rock with disseminated magnetite which may represent vein material in the altered dunite. Similar rocks occur at the St Dizier/ Big H tin prospects on North Heemskirk, and suggest that the original basic intrusion also included ultra-basic rocks.

5.1.5 Tectonic Structures

The Tenth Legion fault zone is a well established W.N.W. striking southerly dipping sinistral complex fault zone which displaces the granite approximately 1 km horizontally. It terminates the altered gabbro northwards and may have acted as a plumbing system, allowing the migration of tin and possibly iron out from the granite.

A parallel fault with a similar direction of displacement has been interpreted with reasonable confidence as terminating the gabbro southwards. The horizontal displacement of the granite on this fault is not known, but is anticipated to be less than that of the Tenth Legion fault.

A third fault, striking more north-westerly, and with a dextral displacement, occurs between these two faults and brings possible Oonah Formation rocks to the north against Crimson Creek Formation rocks to the south. It is thought to displace the granite 100 - 200 m, but has no apparent effect on the altered gabbro, probably due to the steep dip of the latter.

These other two faults may also have provided an escape-way for the late stage volatiles from the granite.

The remaining faults and joint patterns shown on the geology plan have been taken from the photo-geological interpretation of the Heemskirk area carried out by Loxton, Hunting and Associates (1978).

5.1.6 Rock Samples

A number of rock samples were collected as the lines were mapped. Eight ironstone samples were assayed for Sn, Cu, As, Pb, Zn, Co, Ni, Cr, Mn and S; fourteen specimens of sediments were assayed for Sn, Soluble Sn, As, Cu, Pb, Zn, Bi, Ag, WO_3 and S; and thirty samples including most of those assayed were sent to Central Mineralogical Services for petrological descriptions. The results are shown on the geology plan and listed in tables.

It was hoped, by comparing varying ratios of Cr, Mn, Ni, Cu, and Zn (Stephens - Hoare 1973), to determine whether the ironstone was derived only from basic/ ultrabasic rocks or also from sedimentary rocks. Because of the doubtful applicability of this method to Western Tasmanian rocks, all that can be concluded from the results is that all the ironstone sampled is probably derived from the same parent rock.

(Comments on assays left until soluble Sn assays available).

In all the sediment samples assayed, significant sulphide was recorded. This was usually as disseminated pyrite or pyrrhotite, however the assays also reflect the occurrence of minor amounts of chalcopyrite, arsenopyrite and sphalerite, with a sample of skarn material recording 0.48% Zn. Four samples contained geochemically anomalous quantities of tin, and in one of these approximately 30% is present as soluble tin.

5.2 Magnetics

The lines were surveyed with a Geometrics G816 proton magnetometer using a 3 m staff. Readings were taken every 25 m, the results being plotted at 1:5,000 and contoured at 1,000 gamma intervals. Several readings were taken in areas of high magnetic gradients (marked by an asterisk on the plan and profiles) and the results averaged.

The readings are uniform over both the granite (commonly reading 62300) and the unaltered gabbro, which varies from 60300 - 61800.

The Crimson Creek rocks are magnetically very active, with several significant anomalous zones parallelling the strike of the beds. The Pre-Cambrian ? sediments north of line 3400N are by comparison much less active. An anomaly on the western side of lines 1800N - 2600N is related to the granite contact.

A broad anomaly, 400 - 500 gamma above background exists over 450 m to the end of line 3000N. An outcrop of skarn containing magnetite occurs within this zone.

Several anomalies occur within the ironstone following the general trend of the outcrops. These outline concentrations of magnetite with perhaps some serpentine and/or pyrrhotite contributing. A large anomaly over part of the Tenth Legion fault zone suggests the occurrence of magnetite within the fault. Readings are required along the baseline in order to more accurately define the trend of the Tenth Legion magnetite deposit.

A good correlation exists between magnetic anomalies and tin in soil samples, strengthening the observation made in the Mines Department drill holes.

5.3 I.P. Survey

A pole-dipole I.P. survey using a potential electrode spacing of 25 m, and sampling four depths, was carried out by Scintrex Pty Ltd, and the reader is referred to Scintrex report no. Tas. 052A for details.

Generally, the granite and unaltered gabbro are characterised by high resistivity and low chargeability.

The sulphide-bearing Crimson Creek sediments show strong I.P. responses, reflecting the disseminated nature of the sulphides. Most anomalies broadly correlate with magnetic anomalies, hence it is probable that magnetite usually accompanies the sulphides, or the sulphide is largely pyrrhotite.

The strong magnetic anomaly on the western end of line 3000N has a coincident I.P. anomaly.

Except for a zone close to the granite contact, the ? Pre-Cambrian sediments north of line 3400 show generally low background chargeability and resistivity. The westernmost anomalies that occur on both the northern and southern sections of the grid point to a halo of disseminated sulphides with some magnetite occurring along the granite boundary.

Anomalies within the ironstone usually coincide with magnetic anomalies, and are caused by zones of magnetite; in some cases sulphides and/or serpentinite must also make a contribution. The broad anomaly on line 3400N is partly over Crimson Creek sediments and partly over an assemblage of ironstones and altered ultrabasics, and includes the fault which separates the Cambrian and ? Pre-Cambrian rocks.

5.4 Geochemical Survey

All lines on the East Heemskirk Grid were soil sampled at 25 metre intervals. Samples were taken using a hand held soil auger and were collected from as deep as the soil profile would permit.

The minus 80 mesh fractions were assayed for Sn, Cu, Pb, Zn, As, and results are presented both on plans and line profiles.

Several rock samples collected during the mapping of the grid were also analysed and results from these samples are presented on the attached geological maps.

5.4.1 Tin:

Because of its normal inertness, it is felt that tin will only be detected as a geochemical anomaly in soils if either rocks anomalously high in tin virtually outcrop, or if tin species other than cassiterite are present in deeper underlying rocks. Thus it is not considered a good element to use in looking for deeply concealed cassiterite ore zones.

In well prospected areas such as Heemskirk, it is highly unlikely that near outcropping cassiterite bodies would not have some old workings on them.

Thus, in a skarn environment such as on the East Heemskirk Grid, when strong tin anomalies are located in soils in an area devoid of old tin workings, then the results have to be considered cautiously.

However, the fact remains that several very impressive tin anomalies were defined, viz:

(i) Line 4600N, in the vicinity of the Tenth Legion fault.

(ii) Line 4200N, in a mapped ironstone area where a surface rock sample assayed 0.57% Sn. A second assay on this rock ran 0.96% Sn but it was all in an acid soluble form.
This anomaly runs south to line 3000N.

(iii) Line 3000N, 850 - 1150E, a strong broad anomaly in a structurally complex and interesting area.

(iv) A large confused zone of anomalies exist on the western halves of lines 1200N - 2600N. Some caution is required in assessing these anomalies as they could be caused by cassiterite shed from the adjacent Heemskirk Granite.

5.4.2 Arsenic:

Arsenic is regarded as a good geochemical indicator in soils of hydrothermal deposits.

Several strong anomalies were defined, principally on lines north of the main road, on lines 3000N - 4600N, in those areas largely mapped as being covered with ironstone.

5.4.3 Copper, Lead, Zinc:

As would be anticipated in an environment such as this one, there were many Cu, Pb, Zn anomalies, but of particular note is the very extensive, high zinc anomaly, again essentially co-inciding with the ironstone outcrop.

A strong, somewhat distinct, combined Cu - Pb - Zn anomaly lies along the extreme eastern ends of lines 4200N and 3800N, just to the west of the Kynance workings.

6. CONCLUSIONS AND RECOMMENDATIONS

As a result of the geological mapping, geophysical and geochemical surveys completed on the East Heemskirk Grid, several most interesting anomalous zones have been defined, and further work is obviously required, most of it on the area north of the main Trial Harbour Road.

In this area it is therefore recommended that:

(i) Six intermediate lines be cut north of the road (lines 2800, 3200, 3600, 4000, 4400 and 4800N).

(ii) Lines 3000N and 3400N be extended West onto the granite.

(iii) Lines 3000 - 4600N be extended east over the Tenth Legion Fault Zone to the Licence boundary.

(iv) That on all these above lines magnetic and soil sampling surveys of the type undertaken last year be completed.

(v) Some limited, more definitive I.P. gradient array work be undertaken over certain anomalous areas.

On the gridded area south of the Heemskirk Granite, it is recommended that one diamond drill hole be completed on Line 24E as shown on the accompanying plan of Area D and the profile of Line 24E. Such a hole would test that mineralised conglomeratic zone intersected in D.D.H.2 further to the south near its intersection with what is believed to be a major N - S Fault. There are also strong magnetic and I.P. anomalies in this area, together with stanniferous soils and gossan. A 300 metre hole is recommended.

Finally, in addition to the above field work, it is proposed to recompile all existing data from both the East and South Heemskirk Grids onto standard 1:5,000 state sheets, so that a better appreciation of the overall area can be made.

A budget of $40,600 is proposed. Details are presented in Appendix 1.

RENISON LIMITED — BUDGET. 1978/1979.

ITEM	REF.	P#01.	P#02.	P#03.	P#04.	P#05.	P#06.	P#07.	P#08.	P#09.	P#10.	P#11.	P#12.	TOTAL
GEOLOGY -S.P.L 129 TRIAL HARB														
SALARIES	L740702	210	525	1050	1066	533	533	540	1080	1080	821	328	274	8040
SALARY LOADING	L740749	31	79	157	160	80	80	81	162	162	123	49	42	1206
CONSUMABLES	C740751	106	106	528	107	107	107	109	109	109	110	55	55	1608
RENISON SERVICES	L740753	105	525	105	107	533	107	108	270	108	109	55		2132
DIAMOND DRILLING	N740791			6000	6000									12000
SITE AND ACCESS DEVELOPMENT	N740793		1500					500	5000					7000
CONSULTANTS & CONTRACTORS	L740827				1066		1066	2161	3241	1080				8614
SECTION TOTAL		452	2735	7840	8506	1253	1893	3499	9862	2539	1163	487	371	40600

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RENISON LIMITED
GEOLOGY DEPARTMENT

S.P.L. 129 TRIAL HABOUR RESPONSIBILITY 074 W/E 27/ 6/78

THIS WEEK ACTUAL	THIS WEEK VARIANCE	ACCOUNT NAME	ACCOUNT NUMBER	MONTH TO DATE ACTUAL	MONTH TO DATE VARIANCE	YEAR TO DATE ACTUAL	YEAR TO DATE VARIANCE
905	905 L	SALARIES	010740702	949	378 L	6105	5103 G
		CONSUMABLES	010740751	18	18 L	2254	115 L
		VEHICLES	010740755				
		DRILLING	010740791				20000 G
		TRACK CUTTING	010740792				
		ROAD CONSTRUCTION	010740793				2000 G
		BULLDOZER	010740794				
		SURVEY	010740799				
		CHARGES FROM PARTNERS	010740806				
2155	2155 L	OUTSIDE SERVICES	010740827	2932	2932 L	20900	14148 L
		ROUNDING					
3060	3060 L	TOTAL	010749999	3899	3328 L	29259	12840 G

226019

APPENDIX 2

EAST HEEMSKIRK GRID

ASSAY RESULTS ON IRONSTONE HAND SAMPLES (in p.p.m.)

Co-ords	Sn	Cu	As	S	Pb	Zn	Co	Ni	Cr	Mn
3000N - 930E	2300	290	550	3100	20	230	180	770	1400	680
" - 1415E	20	250	50	1200	30	520	160	1400	110	6100
3400N - 1440E	320	230	140	2000	30	110	110	30	70	4200
" - 1512E †	700	40	35	1200	30	110	60	60	60	1.4%
" - 2040E*	17	200	135	1200	90	410	80	40	110	3100
3800N - 2200E*	40	2800	57	4200	150	660	100	120	110	14.2%
4200N - 1575E	5700	330	60	3900	30	480	40	20	80	4100
4600N - 10th LEG.*	100	70	150	4000	130	210	50	30	120	1400

* Bulked results from several samples taken in the area

† This is a talc/magnetite rock included here because it was assayed for the same elements as the ironstone.

	Sn	Sol. Sn	Cu	
4200N - 1575E.	0.96%	0.96%	0.036%.	} Assays on another piece of the sample.
3000N - 930E	0.05%	0.02%	0.015%	

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EAST HEEMSKIRK GRID

ASSAY RESULTS ON ROCK SAMPLES (in p.p.m.)

Co-ords	Sn	Sol. Sn	As	Cu	Pb	Zn	Bi	Ag	WO_3	S
1400N - 220E	70	10	15	30	10	50	20	2	< 100	900
1400N - 390E	60	30	75	30	10	80	20	2	< 100	1700
1400N - 460E	90	30	35	30	10	40	20	< 1	< 100	4900
1400N - 595E	70	10	35	70	10	30	20	< 1	< 100	4200
1800N - 517E	70	30	10	40	10	30	20	< 1	< 100	2700
1800N - 558E	240	30	30	240	30	50	10	1	< 100	1.52%
1800N - 1250E	280	30	140	170	20	90	30	2	< 100	5400
1800N - 1478E	10	30	140	680	60	230	10	1	< 100	1.39%
2200N - 610E	20	50	35	210	20	80	10	1	< 100	1.85%
2200N - 1538E	70	30	60	60	80	4800	10	1	< 100	3000
2600N - 1110E	180	< 10	< 5	10	< 10	10	10	< 1	< 100	600
3000N - 900E	320	110	25	170	20	260	20	< 1	< 100	7800
3400N - 1300E	25	30	80	30	10	10	10	< 1	< 100	600
3[illegible]0N - 2270E	15	30	5	10	120	300	20	1	< 100	800

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NOTES:

In general terms this suite of rocks is representative of a sequence of tuffaceous greywackes with associated quartz-rich pelitic sediments and intercalated "limey" sediments. On petrological grounds this sequence appears closely related to the Renison Mine Sequence and has undergone a similar style of contact metamorphic/metasomatic alteration.

To date carbonate rocks are represented only by metasomatic (skarn) assemblages. One or two rocks are interpreted as metasomatised ultramafics and there are some analogies here with the Serpentine Hill complex. In addition, the few specimens of "granite" show quite marked petrological affinities with the Pine Hill Porphyry.

Thus a number of comparisons can be drawn between the East Heemskirk and Renison areas with respect to lithologies and styles of alteration. As such the East Heemskirk area is considered as of some interest in terms of potential tin mineralisation.

D. Cowan, B. Sc.

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REPORT CMS 78/3/2

PETROLOGICAL DESCRIPTIONS (TS 23503 to TS 23531 Inclusive)

1400N/460E "Hornfels with thin actinolite veins".

This is a hornfelsed and metasomatised tuffaceous greywacke very similar to those of the Crimson Creek formation in the Renison mine sequence.

The sediment is poorly to moderately well sorted in the fine to medium sand range and bedded on a millimetric scale with faint relict grading evident in places. The framework comprises mainly microcrystalline lava clasts with angular to rounded shapes and of andesitic-trachytic affinities. Subordinate to minor clastic feldspar is present along with minor traces of quartz. Partly leucoxenised clastic opaques (typical of Crimson Creek Formation greywackes/tuffs) are common throughout.

Hornfelsing is evident in partial recrystallisation of the lithic clasts. Fine grained green to brownish green actinolite pervades the matrix and partially replaces the framework particles. This phase is accompanied by subordinate but variable amounts of colorless diopside. Thin (rarely > 1mm) veins of actinolite and diopside with patchy blue-brown schorl quartz and albite are disseminated throughout. Sphene is an accessory alteration phase and there are traces of an- to subhedral pyrite.

1400N/595E "Similar to 1400N/460E but banded".

This is a finer grained tuffaceous greywacke with frequent intercalated bands of quartzofeldspathic pelitic sediment. Alteration is analogous to that at 1400N/460E.

Relict millimetric scale bedding has been deformed by slumping and subsequent microfracturing more or less contemporaneous with hornfelsing/metasomatism. Clastic material is poorly defined but overall similar although finer grained to that in the previous specimen. Pelitic bands have a silty clastic fabric with fine scale bedding outlined by leucoxene staining and appear to have consisted of fine (?reworked) ashy material. These bands locally grade into impure chert bands or elsewhere into thin lamellae of silty shale.

Fine grained pale actinolite is pervasive throughout the rock. Extremely fine diopside is present although relatively sparsely developed. Shaley bands tend to be phlogopitised. Minor traces of ultrafine sphene and virtually colorless tourmaline are present. Semi-continuous actinolite veinlets occur sporadically. Fine grained pyrite (+ marcasite) is sparsely disseminated throughout the rock and much of this material appears to be secondary after pyrrhotite.

1400N/750E "Greywacke with coarse actinolite vein".

This is a hornfelsed and metasomatised tuffaceous greywacke essentially similar to that at 1400N/460E but finer grained.

The rock is weakly bedded, incipiently graded in places and shows good evidence of preconsolidation deformation (slumping). Sorting is poor to moderate in the silt to fine sand range with rare medium sand sized megaclasts. Grain shapes are angular to subrounded. Compositionally the altered framework is very similar to that at 1400N/460E although clastic quartz is relatively abundant and more distinctly bedded in its distribution. Clastic opaques are abundant.

Alteration is marked by weak hornfelsing/recrystallisation and virtually pervasive development of fine grained pale actinolite. Reddish phlogopitic mica appears as an accessory alteration phase but diopside is absent and this indicates a decrease in alteration "grade" eastward.

Irregular intersecting veins of relatively coarse actinolite heal late stage fractures. These features include sparsely disseminated ultrafine particles of ?chalcopyrite.

1400N/813E "Dolerite".

This is an altered tuffaceous greywacke similar and closely related to that at 750E.

The rock is weakly bedded, incipiently graded locally and sorted mainly in the silt to fine sand range with occasional clasts of medium sand dimensions. Grain shapes are widely variable from splintery through angular and subrounded (particularly quartz which is relatively abundant). There is evidence of incipient slumping and the rock includes thinly dispersed clastic particles of chert and fine grained quartzite.

Incipient hornfelsing is evident. Alteration is marked by semi-pervasive development of virtually colorless tremolite-actinolite with subordinate but variable amounts of phlogopite. Diopside is absent and there are no detectable sulphides.

1400N/833E "Hornfels or 'basalt' with actinolite".

This is a thoroughly altered tuffaceous pelite. The primary fabric is largely obliterated although there are obvious similarities with the pelitic (silty) bands at 1400N/595E. Relict, somewhat disrupted (?slumped) fine scale bedding laminations are outlined by fine leucoxenic semi-opaques. A few silt-sized splintery to angular clastic particles of quartz persist and there are occasional "ghosts" of silt to fine sand sized rock fragments.

Intense alteration is reflected in pervasive development of fine randomly orientated hastingsite. Minor fine grained albite is present and irregular veins of semi-fibrous hastingsite occur sporadically. There are no detectable sulphides.

1400N/1050E "Hornfelsed pelite".

This is a spotted hornfels derived from a labile (?tuffaceous) pelite with some similarities to those at 595E and 833E.

The rock consists largely of very fine random pale phlogopite with subordinate closely intergrown acicular tremolite. Relict millimetric-scale bedding is reflected in subtle variations in grainsize and in the distribution of ultrafine opaques (sim. e.g. 833E). A few bands contain frequent poorly resolved poikiloblasts (mean 150-200μ) of cordierite.

Irregular to straight-walled variably continuous veinlets of phlogopite and tremolite are common throughout the rock. Locally these features include extremely fine grained Fe-sulphide disseminations possibly with minor associated traces of chalcopyrite.

1400N/1350E "Dolerite".

This is a relatively weakly altered tuffaceous greywacke rather similar to the rock at 813E.

The rock is weakly bedded with incipient grading and is generally poorly sorted in the silt to medium sand range. The framework (65-70%) comprises mainly angular to subangular microcrystalline intermediate lava clasts (approximately 50%) with subordinate angular alkali feldspar (5-10%) angular to subrounded quartz (10-15%) siliceous psammopelitic rock fragments (2-3%) and splintery quartzofeldspathic features with the appearance of abraded shards (around 15%). Accessory opaques are common. The matrix/cement consists of chlorite stained argillaceous material.

The more labile clastic particles are variable stained with ultrafine phlogopite and pale actinolite (trend hastingsite). These phases also stain the matrix, weakly, but more or less pervasively. Irregular but semi-continuous actinolite veinlets occur sporadically. Alteration is closely analogous to that at 813E but slightly less marked.

1400N/1465E "Dolerite".

This is a weakly to moderately altered tuffaceous greywacke similar and closely related to the rock at 1350E.

General features are similar to the previous specimen to the extent that little special comment is necessary apart from noting that this rock is slightly coarser grained, relatively poorly sorted, and slightly deficient in clastic quartz. In common with previous samples the rock is weakly bedded on a millimetric scale with bedding largely reflected in a moderately developed dimensional orientation of the more platey particles. Very incipient grading is evident in some bands. Clastic opaques are common and in this case there are rare well rounded detrital grains of tourmaline.

Alteration largely affects the matrix and is reflected in semi-pervasive fine grained tremolite-actinolite. Irregular veins of secondary amphibole occur sporadically and marginal to these features alteration is relatively intense with much of the clastic material completely tremolitised. These replacement selvedges range in width up to a few millimetres and are devoid of sulphide.

2200N/1538E "Actinolitised and mineralised chert".

This is a rather fine grained diopside-epidote-tremolite-garnet rock or skarn with accessory sphene, magnetite and traces of sulphide.

The rock is compositionally banded with some bands (to 1cm+) consisting largely of twinned granular grossular-andradite and others largely of diopside and/or epidote. A few tremolite rich bands are also present although this phase is usually an accessory associated particularly with diopside. Magnetite forms fine-grained spongy aggregates and crude lenses and is partly banded in its distribution. Small spongy aggregates and fine-grained disseminations of sphalerite are associated with magnetite and there are minor traces of Fe-sulphide. Sphene occurs as fine granules, sporadic coarse (to 1mm+) poikilitic crystals and in late stage semi-continuous tremolitic veinlets.

2600N/512E "Phlogopitised sediment".

This is a banded talc-phlogopite rock with disseminated magnetite and sulphide.

The rock is banded with respect to composition and grainsize. It consists largely of randomly orientated talc flakes with subordinate similarly textured phlogopite which is a pale orange brown variety and largely restricted to isolated bands up to 2mm in width. Phlogopite locally shows a color zoning and may be marginally altered to talc. Possibly talc in general has developed from phlogopite although there is little textural evidence to support this.

Minor traces of apatite occur as weakly clustered granules. Magnetite is banded in its distribution generally fine grained and often partly intergrown with the mica flakes. Fine grained pyrite (+ marcasite, pyritised pyrrhotite) occurs in crudely banded spongy aggregates.

The rock is rather featureless in terms of interpretation although the banding suggests it represents either an altered dolomite or a vein. Unfortunately there are no diagnostic features and an altered ultramafic origin cannot be completely ruled out.

2600N/840E "Tourmalinised highly altered granite".

This is a quartz tourmaline rock consisting virtually entirely of granular weakly interlocking quartz and subordinate color zoned blue to brown pleo-

chroic schorl as single grains and clusters. Sparsely disseminated virtually opaque microscopic particles of ?xenotime are present and there are rare fine scale limonite pseudomorphs of magnetite or pyrite.

The rock is fairly featureless in terms of origin. There are, however, some similarities with strongly altered (tourmalinised) portions of the Pine Hill Porphyry and this tends to confirm the altered granite interpretation. Assay for Sn would be warranted.

2600N/1110E "Carbonaceous sandstone with sulphide".

This is a thoroughly tourmalinised silty sandstone thought to have been a greywacke-type similar to those on line 1400N.

The rock consists virtually entirely of quartz and fine grained anhedral brown schorl. Quartz occurs partly as relict detrital silt to fine sand sized grains with angular to subrounded shape and incipient overgrowths. There are a few recognisable siliceous lithic clasts (chert, fine grained quartz and silicified ?andesite) and the altered matrix also contains microcrystalline quartz. The remainder of the clastic material (75%+) has been completely replaced by tourmaline.

Relict millimetric scale bedding laminations persist with some vague evidence of grading. Accessory clastic opaques, typical of the associated tuffaceous greywackes (e.g. line 1400N) are represented by fine clots of near opaque leucoxenic material and are bedded in their distribution. Overall, there is reasonable analogy with the tuffaceous greywackes.

Poorly defined veinlets (tourmaline ± quartz) occur sporadically. There are no detectable sulphides.

2600N/1750E "Coarse grained gabbro".

This rock is a thoroughly uralitised gabbro originally coarse grained, weakly porphyritic in pyroxene, and with a distinctly ophitic to gabbroic (i.e. granular) fabric).

Inferred primary composition is approximately 50-60% labradorite and 40-50% clinopyroxene with mean grainsize about 2mm. The pyroxene is virtually completely altered to brownish green hornblende and actinolite more or less pseudomorphously. Some actinolite-stained relics of labradorite persist but the majority has been more or less completely replaced by fine grained actinolite with a little associated epidote. Rare patches of diopsidic augite persist locally. Despite the distinctly (altered) gabbroic nature of the rock opaques are conspicuous by their absence.

Irregular actinolite veinlets occur sporadically. Traces of chlorite, or rarely talc, develop as a late stage alteration of the amphiboles. The chlorite locally occurs as crude veins and one of these includes rare

small patches of blue tourmaline suggesting a "granitic" phase of alteration postdating the ?deuteric uralitisation.

3000N/900E "Hornfels with sulphides".

This is a diopside-actinolite rock or skarn. The rock is weakly banded with respect to composition and modal grainsize and on petrological grounds could be correlated with 2200N/1538E although the pyrometasomatic "grade" is relatively lower. The fabric is generally granular with widely variable grainsizes.

Accessory constituents include traces of epidote sphene and Fe-Mg chlorite which develops as a late stage replacement of actinolite. Small spongy intergrowths of pyrrhotite and fine grained magnetite occur sporadically and as at 2200N/1538E these are incipiently banded in their distribution. Probably minor traces of ultrafine chalcopyrite are present. Pyrrhotite is locally pyritised.

3000N/930E "Gossan or laterite".

This is a limonite rock representing a thoroughly weathered/ferruginised metasediment. As such it is a pseudogossan although possibly minor traces of fine grained sulphide were present.

The rock has been partly leached and "recemented" with limonite and much of it is texturally featureless in terms of the original rock type. However, a crude relict banding persists. In places limonite clearly represents completely degraded granular and fairly coarse grained silicates. Whilst few of these structures are meaningful in terms of former mineralogy a calc-silicate paragenesis is reasonably inferred. This tends to be confirmed by disseminated relics of fine grained magnetite as isolated particles and spongy clusters similar to those at (3000N/) 900E.

Elsewhere minute particles of green and brown tourmaline are loosely cemented by late secondary microcrystalline quartz lining cavities within spongy limonite aggregates. Tourmaline is partly euhedral but some grains (usually brown) show distinctly rounded detrital shapes. These features are evidently locally derived and are the only tangible indication of a clastic sediment.

Thus the evidence suggests the rock represents a thoroughly weathered skarn with at least minor intercalations of altered fine grained clastic sediment. There are no tangible sulphide boxworks, however, minor fine grained sulphides may have been present if only by analogy with the associated metasediments.

3000N/1115E "Tourmalinised banded chert".

This is a metasomatised and partly recrystallised laminated turbidite-like intercalation of siltstone, silty shale and shale.

Relict bedding is on a sub- to millimetric scale and planar to weakly lenticular. Detritus comprised mainly quartz and argillaceous material which is now largely replaced by ultrafine fibrous pale brown tourmaline. Sedimentation comprised essentially an alternation of highly siliceous siltstone bands and argillaceous (shaley) lamellae. The siliceous (siltstone) bands have been recrystallised but frequently show grading in terms of grainsize and in the distribution of the subordinate argillaceous component. Locally grading is enhanced by discontinuous microscale "placers" of heavy mineral particles at the base of the thin siltstone units.

Discontinuous irregular quartz veinlets of diagenetic character have been intersected and locally segmented by irregular microfractures partly healed with ultrafine tourmaline. This rock can be closely compared with tourmalinised pelites in the Renison mine sequence.

3000N/1415E "Magnetite gossan".

This is a slightly weathered magnetite rock. It consists of near-massive granular to euhedral magnetite of variable but generally coarse grainsize, which is incipiently martitised and locally replaced by limonite. Sporadic small intergranular patches of limonite (rarely > 1mm) may represent altered minor accessory sulphide (?pyrrhotite) but there are no tangible boxworks to confirm this. There are thinly dispersed completely degraded/ferruginised mica (?chlorite) flakes representing a minor accessory silicate component.

The virtually massive granular nature of this rock suggests a pyrometasomatic origin. Polished section examination reveals the magnetite to be non- or only weakly chromiferous and devoid of cumulate-type features. This tends to negate a gravity settling paragenesis or an association with the "gabbro" or related ultramafics.

3400N/1512E(1) "Micaceous ?quartzite".

This is a banded forsterite-magnetite-talc-humite rock.

The rock consists largely of granular forsterite weakly banded with respect to modal grainsize and partly altered to serpentine along microfractures. Talc occurs mainly as random flakes interstitially to olivine and appears to have developed pseudomrophously from phlogopite flakes. Humite is not common occurring as disseminated partly serpentinised single grain and aggregates closely intergrown with olivine. The mesoscopic banding reflects the distribution of accessory fine grained magnetite which tends to occur as semi-continuous bands and lenses up to a few millimetres in width. There is localised development of late-stage fine grained talc

(steatite) after olivine and ultrafine secondary opaques are weakly disseminated throughout the rock these being "exsolved" during partial serpentinisation of olivine.

Despite the association with pyrometasomatic assemblages this rock can only be interpreted as a partly altered dunite. The banding appears to be a gravity settling or (cumulate-) phenomenon.

3400N/1512E(2) "Hematite-mica rock".

This is an unusually coarse grained talc rock with disseminated magnetite.

Talc occurs as random, slightly buckled flakes up to 4mm diameter with subtle grainsize variations defining a crude banding. Interstitial areas consist of relatively finer grained talc opaques or locally of fine serpentine with patchy olivine- (or humite-) derived mesh structures. Thus the rock appears to be a talc vein or segregation associated with the partly altered dunite described above.

The sparsely disseminated magnetite is granular to semi-fibrous where intergrown with talc. Granular magnetite shows sparse included blades of (?high -Ti) hematite and is incipiently martitised in places.

Being coarse grained and with easily-removable accessories this rock may be of some economic importance.

3800N/1775E "Altered calc-silicate".

This is an altered somewhat weathered vesuvianite-diopside garnet-"olivine" rock or skarn.

The rock is fine to medium grained with a generally granular fabric. An irregular banding is evident but this is highly discontinuous and disrupted suggesting the rock may be a metasomatised breccia. Diopside and vesuvianite (largely degraded to semi-isotropic yellow to brown alteration products) are the main silicate phases forming semi-continuous bands and aggregates including disseminated grains and crude vein-like masses of yellow grossular-andradite and occasional patches of serpentine representing altered olivine (and/or humite).

Rare extremely fine particles of ?magnetite and dark virtually opaque sphalerite are present. Late crosscutting veinlets of Fe-chlorite and cloudy Fe-carbonate occur sporadically.

Considering the silicate assemblage there is little to choose between a pyrometasomatised impure dolomite and a similarly altered ultramafic.

3800E/2270E "?Dolomite with ?galena".

This is a fine grained calc-silicate hornfels consisting largely of micro-

crystalline diopside forming irregular essentially massive aggregates or elsewhere enclosing in granular semi-lustre mottled carbonate (calcite). The rock shows a crudely banded disrupted breccia-like fabric similar to that at (3800N) 1775E.

Accessory amounts of Mg-chlorite occur in disseminated patches and irregular veinlets which are intersected by late stage veinlets of carbonate and Fe-chlorite (similar to 3800N/1775E). An- to subhedral magnetite crystals (to 500μ) are sparsely disseminated throughout and traces of very fine grained cloudy virtually opaque sphalerite occur as inclusions in calcite.

4200N/1575E "Gossan".

This limonite rock is a pseudogossan and represents a thoroughly weathered and ferruginised amphibole-rich calc-silicate rock or skarn.

Much of the original fine textural detail has been preserved although the rock now consists virtually entirely of secondary limonite. Much of this pseudomorphs lath-like to ragged and granular amphibole (?actinolite) grains. Subordinate to minor amounts of limonite pseudomorph a granular pyroxene (?diopside) and there are thinly dispersed patches of limonite after garnet and/or vesuvianite.

The original rock was medium-grained with a random fabric. There is some vague evidence of banding. Fine grained accessory magnetite persists as relics. There are no tangible sulphide boxworks but fine sparsely disseminated opaque limonite may represent accessory ultrafine sulphide.

4200N/1825E "Altered ?calc-silicate".

This is a hornfelsed and strongly metasomatised fine grained labile sediment considered as a tuffaceous greywacke partly by analogy with the less altered rocks on line 1400N.

Relict millimetric scale bedding laminations are outlined partly by the distribution of very fine leucoxenic semi-opaques which are partly replaced by secondary sphene. Silt to fine sand sized clastic fabrics persist in places. There is evidence of slumping and vague evidence of graded bedding. Much of the clastic material was clearly feldspathic.

Much of the rock has been replaced by ultrafine cloudy diopside. This "grades" into coarser grained diopside aggregates. Fine grained tremolite-actinolite is also common and some bands are preferentially replaced by the amphibole. Grossular-andradite is an accessory alteration phase as disseminated anhedra and granular aggregates often selvedged with fine grained diopside. Patchy secondary albite and K-feldspar are present and there are minor traces of epidote and vesuvianite. There are no detectable sulphides.

4600N/1275E "Pink granite with tourmaline segregation".

This is a weakly altered biotite microgranite.

The rock is weakly porphyritic with sparsely disseminated quartz, albite and orthoclase-microperthite phenocrysts up to 2.5mm diameter. These are enclosed in a granular fairly even grained groundmass of orthoclase with slightly subordinate quartz and albite and disseminated biotite flakes. Irregular patches of graphic quartz and feldspar are present and overall the fabric is typical of a marginal or minor intrusive phase.

A few quartz grains are rutilated. Minor accessory zircon and partly metamict ?monazite are present and there are local segregations of dark schorl in the groundmass. Alteration is rather weak with partial argillisation of feldspars and extensive vermiculitisation (probably in response to weathering) of the dark weakly titaniferous biotite. Overall this rock exhibits a number of similarities with the more extensively altered Pine Hill Porphyry.

4600N/2100E "Banded chert and quartzite".

This is a metasomatically altered turbidite-like labile pelite.

Bedding is well preserved on a sub- to millimetric scale, essentially planar and often distinctly graded. Sorting is in the silt range and the framework comprised mainly feldspathic material with subordinate quartz and a little mica along with the ubiquitous clastic opaques. Overall the rock is fairly typical of the tuffaceous greywackes although relatively fine grained.

Alteration is marked by semi-pervasive development of very fine tremolite. Discontinuous/irregular veins of coarser subradiating ragged to fibrous tremolite are common. These features postdate a phase of incipient regional metamorphism reflected in a weak slatey cleavage that is slightly crenulated. Diopside, quartz, alkali feldspar and sphene appear as minor accessory alteration phases. Sporadic late stage microfractures are healed with microscopic films of cloudy Fe-carbonate.

5000N/2100E "Tourmalinised banded quartzite".

This is a thoroughly tourmalinised fine scale intercalation of quartz-rich siltstone shal and silty shale very similar to the rock at 3000N/1115E.

The rock is bedded on a sub- to millimetric scale with an alternation of siliceous siltstone and argillaceous bands and partings. The siltstone bands have recrystallised to a compact fine grained quartzite fabric but retain some clastic features (e.g. sparse heavy mineral grains, incipient recrystallised graded bedding). In contrast the argillaceous bands have been completely replaced by fine to ultrafine dravite.

The rock shows some evidence of slumping but this is largely obscured by development of irregular tourmaline quartzveins and veinlets. Minor traces of cloudy semi-opaque sphene are present. There are no detectable sulphides.

1800N/558E "Hornfels/quartzite breccia with pyrrhotite".

This is a brecciated and strongly altered tuffaceous greywacke with sparsely disseminated pyrrhotite.

The original sediment was bedded on a relatively coarse scale comprised mainly fine to medium grained poorly sorted sandstone which "graded" into a fairly well sorted fine sandstone and into a labile siltstone. Clastic material is heavily altered and thus poorly resolved but appears to have been mainly angular to subangular lithic (?lava) clasts and feldspar grains with relatively minor traces of quartz occasional chert clasts and the usual accessory opaques.

Alteration is marked by pervasive development of pale brown green amphibole with subordinate but variable fine grained diopside and accessory amounts of dark brown tourmaline. Brecciated areas are healed with granular diopside aggregates enclosing occasional small patches of pyrrhotite. Pyrrhotite also occurs as thin discontinuous crosscutting veinlets. A few late stage veinlets of prehnite are present and these grade into fine grained films of albite and tremolite.

1800N/1050E "Banded chert with actinolite veins".

This is a hornfelsed and metasomatised labile pelite bedded on a sub- to millimetric scale and sized mainly in the finer portion of the silt range. Detritus appears to have been largely feldspar with relatively minor quartz traces of mica and accessory opaques.

The rock has an extremely fine grained hornfelsic fabric. It is more or less pervasively stained with ultrafine diopside and carries disseminated fine scale porphyroblasts of cordierite which are "stuffed" with microscopic inclusions of diopside.

Frequent intersecting fractures are healed with pale semi-fibrous actinolite. Diopside is relatively abundant marginal to the fractures forming semi-continuous replacement selvedges up to 1mm in width. Sphene is an accessory alteration phase and there are very rare ultrafine sulphide (?pyrrhotite) particles within the diopsidic selvedges.

1800N/1478E "Chert with small sulphide blebs".

This is a deformed, weakly hornfelsed and metasomatised labile pelite rather similar to that at (1800N)1050E. General features require little special comment except to note that there are sporadic thin bands of chert and that much of the deformation in this rock reflects slumping.

Alteration is marked by semi-pervasive development of fine grained tremolite often accompanied by cloudy microcrystalline diopside. Irregular veins of tremolite and diopside are common and hastingsite and green tourmaline are present as accessory alteration phases. The rock is more or less pervasively stained with fine grained Fe-sulphide (pyrite pyrrhotite) disseminations. These are weakly bedded in their distribution and possible recrystallised/ syngenetic in origin at least in part. The veins are virtually devoid of sulphide.

1800N/1250E "Thoroughly actinolitised hornfels".

This is a relatively coarse grained hornblende biotite rock representing an altered and partly recrystallised basic igneous rock.

The fabric is random comprising mainly lath-like to semi-ragged, pale green hornblende with disseminated biotite flakes. Vague thoroughly saussurite-stained relics of feldspar laths are disseminated throughout and in placed the rock has a certain ophitic (or doleritic) character. Cloudy sphene is common and developed in part from accessory titaniferous opaques. Fine grained euhedral magnetite of relict primary character is sparsely disseminated throughout the rock and subacicular apatite is common.

Incipient recrystallisation is evident in the saussuritic material and locally in the hornblende. Semi-continuous veins of actinolite occur sporadically and these include rare interstitial particles of pyrrhotite.

D. Cowan, B.Sc.

Form No. 73/269 RENISON LIMITED

APPENDIX 5

226035

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 20/2/78 Operator: P.R.S. Grid Location: East Heemskirk.

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
5000N. 1100E	62197		Button grass slopes.	Slightly porph. m.gr. nodular red granite.
	62190		Uphill	"
	62201			"
	62213		Crest.	Ditto but white gran.
1150E	62199		Level.	"
	62193			"
	62193			"
	62185			"
1200E	62175			"
	62165		Open forest. Downhill	
	62149			
	62141			
1250E	62119		Button grass.	
	62071		Level.	
?Contact. (Based on mag.)	62023			
	62059		Downhill.	
1300E	62413			
	63151			
	60250	60000-60500	Level.	
	61250	61000-61500	Low Titree & gum.	
1350E	61210			
	58430			
	58323			o/c banded qtzite
	61547			"
1400E	62134		Low thin scrub.	"
	62596			
	62507			
	63771		Creek.	

037

Form No. 73/269 RENISON LIMITED 226036

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 20/2/78. Operator: P.R.S. Grid Location: East Heemskirk.

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
5000N. 1450E.	63223			
	63526			
	62824			Qtzite float.
	61263			
1500E	59758			
	59386		~~Downhill.~~ Gently uphill.	Qtzite float.
	60133			"
	60582			o/c qtzite.
1550E	59450	59100-59800	Scrubby gum.	o/c tourm. qtzite. Strike ~N. Dip vert. Goss. float.
	63900	62300-65500		Gossan float.
	64000	62500-65500		RH
	63850	62200-65500	Button grass.	RHS. Goss. o/c in gum trees. LHS. Button grass.
1600E	64150	63700-64600		"
	62900	62600-63200	Level.	"
	63650	63300-64000		"
	63900	63300-64500	Downhill.	
1650E	69450		Level.	
	65784			
	63392			
	63236			
1700E	63082			Scree mainly of quartz, with tourm. + qtzite.
	63218			"
	63453		Gently uphill.	"
	63495			"
1750E	63460			"
	63261			"
	63087			"
	62356.			"

038

Form No. 73/269 RENISON LIMITED 226037

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 20/2/78 Operator: P.R.S. Grid Location: East Heemskirk.

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
5000N. 1800E	62850			Scree mainly of quartz, with tourm + qtzite
	62742			Scree of qtz/tourm. veined qtzite.
	62646			"
	62602		Small gully.	"
1850E	62606		Gently uphill	"
	62638			"
	62702		Level	"
	62317			"
1900E	63382			"
	64231		Gently downhill.	
	65350			Scree of vein quartz + tourm.
	66496			
1950E	67662			
	67732			
	67430			Forest 30m to right. ? 10th Legion fault.
	66742			
2000E	62900	62500-63300	Gully.	Float of tourm. qtzite.
	62050	61300-62800	Uphill.	"
	64135		Level.	"
	63586		Small gully.	"
2050E	63843		Uphill.	"
	63283			"
	63145			"
	63067			"
2100E	62397		Gently uphill.	o/c qtz/tourm. veined tourmalinised qtzite
	62322			"
	62861		Level.	"
	62817			"

039.

Form No. 73/269 RENISON LIMITED 226038

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 20/2/78. Operator: P.R.S. Grid Location: East Heamskirk.

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
5000N. 2150E.	62778			o/c ditto.
	62708		Downhill.	Float ditto.
	62613		Small gully	
	62559		"	
2200E	62540		Uphill	Float ditto
	62507		Level	"
	62467			
	62439		Downhill	
2250E	62404			
	62355		Small gully	
	62377		Level	
	62358			Float ditto
2300E	62327		Downhill.	"
	62293			
	62221			
	62260		Into patch of forest.	
2350E	62266		Gently downhill	
	62255		Level.	Small creek at 2360 - sed. float.
	62267			
	62273			
2400E.	62262			
	End of line.			

040

Form No. 73/269 RENISON LIMITED 226039

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 17/2/78 Operator: P.R.S. Grid Location: East Heemskirk.

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
4600N. 1200E.	62287		Button grass slopes.	o/c of m.gr. slightly porphyritic nodular red granite with tourmaline veining.
	62288			
	62282		Much tourm. float.	"
	62256		Downhill	"
1250E	62254			"
	62257			"
Sample	62259		Swampy gully	"
	62248		" "	"
1300E	62258		Uphill	"
	62264		Crest	"
	62290		"	"
	62255		Gently downhill	"
1350E	62274		Steeply downhill	"
	62327			"
	62503			"
	62209			"
1400E	62142		~~Gently~~ level. ~~downhill~~	"
	62008			
	62138			Qtz. & tourm. scree.
	62145.		Downhill.	
1450E	62105			Scree of tourm. & vuggy qtz in m.gr. granite. Hill slopes right to left
?Contact based on l.p. & soil descriptions.	62075			
	62043		level.	
	62000			
1500E	61325			
	61858			
	61758			
	61646			

041

Form No. 73/269 RENISON LIMITED

226040

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 17/2/78 Operator: P.R.S. Grid Location: East Heemskirk.

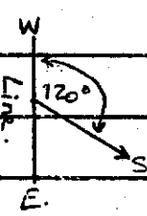
Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
4600N. 1550E	61604		Gently uphill.	
	61796			
	61896			
	61350			
1600E	61378		Level	? Dyke.
	61387			o/c m.gr. granite. Float tourm. nodules
	61390			
	61384			
1650E	61372		Downhill	
	61351			
	61327		Level.	
	61302			
1700E	61875			
	61853			
	61824		Boura or Titree Gently downhill.	
	61787			
1750E	61749			
?Granite ~~contact~~.	61779			
	62095			
	62615		Forest.	
1800E	62305			Sed. float.
	62344			" "
	62380			
	62512		Forest + Titree.	
1850E	62082			Sed. float.
	61870			
	63670	63620-63720		o/c banded qtzite.
	62290		Forest.	" " "

042

Form No. 73/269 RENISON LIMITED 226041

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 17/2/78. Operator: P.R.S. Grid Location: East Hearnskirk.

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
4600N. 1900E	61390		Forest.	o/c banded qtzite.
	61889		Swampy bolton - grass. plain.	"
	61317			o/c banded qtzite/ chert.
				
				Strike ~ 017° Mag.
				Dip ~ vertical.
	62151			"
1950E	61351			"
	61439			
	61548			
	61552			
2000E	61536			
	61478			
	61393			
	61274			
2050E	61152			
	60353			
	60812			
	60687			
Sample 2100E	60604			o/c banded qtzite/chert. Folded. Strike & dip ~ 017° Mag/Vert.
	60522			
	60277			
	60143		Flat Titer swamp.	
2150E	60391			

043

Form No. 73/269 RENISON LIMITED

226042

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 17/2/78 Operator: P.R.S. Grid Location: East Heemskirk.

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
4600N.	60212			
	59832		Forest. Slightly uphill	Weathered brown ? siltstone!
	59560			
2200E	59512			Siltstone float. Soil gossanous.
	58378			
	58785		Level	Qtzite float.
	57852			" "
2250E	57247			
	57374			Gossan float.
	57235		~~Str~~ Uphill.	" "
	56550	56300 - 56800		" "
2300E	57370			" "
	61850	61300 - 62400		" "
	65404			" "
	60050	59800 - 60300		" "
2350E	62050	61300 - 62800		Gossan o/c
	64250	63000 - 65500	Road.	" "
	63050	62300 - 63800	Forest. level.	" "
	63250	61000 - 65500		" "
2400E	64400	63300 - 65500		" "
	64800	64100 - 65500		" "
	62950	61300 - 64600		" "
	64300	64100 - 64500		" "
2450E	63750	63300 - 64200		" "
	69400			" "
	69480		Road.	" "
Prob. contact.	70650	70300 - 71000	Forest.	" "
2500E	69341			

End. of marked line

044. Form No. 73/269 RENISON LIMITED 226043

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 17/2/78. Operator: P.R.S. Grid Location: East Heamskirk.

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
4600N.	69478		Button grass.	
	67721			
	67664			Sed. & gossan float
2550E.	66683.			
(line extended to cross contact)				

04S

Form No. 73/269 RENISON LIMITED 226044

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 16/2/78. Operator: P.R.S. Grid Location: East Heemskirk.

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
4200N. 1300E.	62256		Button grass sloped. Steeply downhill.	Porph. nod. red granite. Phen. of feldspar.
	62211		"	"
	62347			"
	62213			"
1350E	62171			M.gr. nod. red granite
	62157			"
	62142			"
	62124			"
1400E.	62103.			"
	62082		Gently downhill	"
	62069			"
	62053			"
1450E	62039			"
	62030			"
	62002			"
	61363			"
1500E.	61325			Granite float.
	61859			"
	61776			"
?Granite contact. →	62300.	61400-63200	Forest. heavy.	"
1550E	61820.			
	62495		heavy.	
Sample	S9780		old logging track. Downhill	Gossan float.
	61700	61200-62200		" "
1600E	61400	61300-61500	Tangled forest.	" "
	61500	61100-62100		
	62700	61200-64200.		Gossan float.
	61590			

046

Form No. 73/269 RENISON LIMITED

226045

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 16/2/78. Operator: P.R.S. Grid Location: East Heemskirk.

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
4200N. 1650E.	61700	61300-62100		Gossan float.
	61192		level.	"
	61750	61200-62300		Gossan float.
	62350		old road.	Mixture of sed. & gossan float.
1700E	61821		Forest.	
	61490			
	61035			
	61677			
1750E	61606			
	61664		Thick Titree.	
	62241			
	63723		Forest + regrowth	
1800E	61050	60300-61800		
	61658			
Sample	61677		Swampy Titree.	Float banded sed.
	62305			
1850	61000	60600-61400	Titree.	Gossan float
	62325		"	
	62336		"	Gossan float.
	62240		"	" "
1900	61703		"	" "
	61807		"	" "
	62500	61600-63400	"	
	61500	60800-62300	"	
1950E.	61850	61100-62600.	Thick Titree.	Gossan float
	61518		"	" "
	61850	61400-62300	"	" "
	61364		"	" "

047

Form No. 73/269 RENISON LIMITED 226046

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 16/2/78. Operator: P.R.S. Grid Location: East Heemskirk.

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
4200N. 2000E	63353		Thick Titree.	Gossan float.
	63020		" "	" "
	61750	61200-62300	" "	" "
	60811		" "	
2050E	60155		Swampy Titree.	
	61900	61100-62700	" "	
	62900	61300-64500	" "	
	60500	59300-61700	Titree	Gossan float
2100E	60300	59200-61400.	"	" "
	63850	63500-64200	Young gum + myrtle	Gossan o/c
	61400	60100-62700		"
	62400	62300-62500		Gossan float
2150E	63250	62300-64200		" "
	61700	60400-63000		" "
	62800	62000-63600	Titree plain	
	63050	62300-63800		
2200E	62450	61300-63400		
	65500	61600-69400		
	62550	62000-63100		
	61050	60300-61800		
2250E	66069		Forest.	Abundant qtz. float. Small mound here prob. qtz blow.
	64651			
	64225			Small creek.
	63885.			
2300E	63677			
	63702			
	63566			
	63465.		Swampy forest.	

048

Form No. 73/269 RENISON LIMITED 226047

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 16/2/78. Operator: P.R.S. Grid Location: East Heemskirk.

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
4200N. 2350E	63378			
	63225			
	63142			White qtz. float.
	62353			
2400E	62879		Swampy Titree.	
	62742			
	62531			
	62379			
2450E	61382			
	62363			
	65712			
	61884			
2500E.	62554		Tangled forest.	
Beginning of line.				
Note the gradually increasing mag. readings from the contact inwards on the granite. These were checked to ensure the trend was real.				

049. -1

Form No. 73/269 RENISON LIMITED 226048

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 15/2/78. Operator: P.R.S. Grid Location: East Heemskirk

Grid Station	Gamma Reading	Time	Diurnal correction Button grass slopes	Corrected Reading
3800N.	62307		level.	o/c porph. granite
	62302		Downhill	"
	62310			Creek. "
End of line. 1000E.	62305		Uphill.	"
	62312		Crest.	"
	62306.		Downhill.	"
	62301		Gully.	
1050E	62304		Uphill	m.gr. red granite + phenocrysts of qtz and feldspar and tourm. nodules.
	62303			
	62330		Crest.	"
	62306		Downhill	"
1100E.	62273		Gully at 1105.	m-cogr. nodular red granite
	62265		Uphill.	"
	62305			"
	62262			m.gr. nodular red granite
1150E	62295			"
One reading short.	62277		Downhill	m.-fgr. white nodular granite.
	62243		Gully.	"
1200E	62241		Uphill	"
	62242			"
	62244			"
	62253		Crest.	"
1250E	62242		Downhill.	"
One reading short.	62230			"
	62223.			"
1300E	62230			o/c. f.gr. nodular red granite
	62065			"
Sample.	60490.		Scrubby + few gums.	Float banded qtzite

050.

Form No. 73/269 RENISON LIMITED 226049

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 15/2/78. Operator: P.R.S Grid Location: East. Heemskirk.

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
3800N.	61355		Scrubby + few gums.	Float banded qtzite
1350E.	64135		Level.	"
Peg 1400E not found.	63620.		Uphill	o/c of banded qtzite or hornfelsed sedx
Thus one reading short.	61391		Crest.	"
1400E.	61340		Downhill	Large boulders of same.
	59094		Tangled forest.	Ditto - qtzite slightly Contorted.
	66650			Float banded qtzite.
	63540			"
1450E	61750			"
One reading short.	61832			Float banded mic. qtzite
Sample	61823			"
1500E	61631			
	61703			Float qtzite
	61237			" "
	61198		Level.	
1550E	60350		On old logging road	
	60677		Gently downhill	Gossan float
	62130		"	" "
	62453		"	" "
1600E	62740		"	" "
	62129		"	" "
	61755		Just off road.	" "
	61301		On road.	" "
1650E	62306		"	" "
	62413		Tangled forest.	
	62194			Small creek at 1680. Float soft weathd siltst
	62269		Uphill	
1700E.	62015		Open forest + regrowth.	

051

Form No. 73/269 RENISON LIMITED

226050

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 15/2/78. Operator: P.R.S. Grid Location: East Heemskirk.

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
3800N.	61314		Creek.	Road made of banded sedo.
	61324			
	61301		Downhill	
1750E	61317		Boggy Titree + gum.	
	61794		Flat.	Light brown clay. Prob. overlying sed.
Sample	62394			Float ? calc silicate.
	61616			
1800E	61680			
	61505			
	61622			Small creek. No o/c.
	61832		Thick Titree	
1850E	62853			
	64547		Flat Titree & gum.	
	61354			Float of gossan and vein quartz.
	62210			" .
1900E	61865		Small conifers. Flat.	
	62821			Float of gossan.
	62338			
	61862			
1950E	61047			
	61773		Titree plain.	
	61870			
	62399			
2000E	63774			
	66430			
	64700	62300 - 67100		Float goss. & vein qtz.
	65285			Float gossan.
2050E	63352			

052. -1

Form No. 73/269 RENISON LIMITED 226051

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 15/2/78 Operator: P.R.S. Grid Location: East Heemskirk.

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
3800N.	63129		Flat button - grass plain.	
	62629			
	62107			
2100E	62007			
	61700			
	61685			
	62308			
2150E	61550			Few qtz. pebbles.
	61744			
Peg 2200E not found.	61719.		Scrubby Titree.	Gossanous soil.
One reading short.	62755			
	61645		Main access road.	Float of gossan, qtzite & qtz.
	64950	64300-65800	"	
	63550	63300-63800	Downhill Tangled forest.	
2250E	62120			Float qtzite.
	57650	57300-58000		
Sample	58470		Creek at 2270.	o/c ?calc. qtzite + ?sulph. Iron rich weathering
	63635		Uphill.	
2300E	62035		Level.	
	62670	62655-62700		Gossan on old road.
	63891			
	66450	66100-66800		
2350E	65303			
	63234		Small creek at 2360	
	66550	66300-66800	Gently uphill.	
	61150			
2400E.	66700	66300-67100.		
Beginning of line.				

Notes (a) The granite/sed. contact on this line is marked by ① a gully. ② change from open gum forest to button grass slopes ③ levelling off in magnetics.
(b) The gullies in the granite are parallel and follow a strong joint

053

Form No. 73/269 RENISON LIMITED 226052

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 14/2/78 Operator: P.R.S. Grid Location: East Heemskirk.

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
3400N.	62338		Downhill	
	62360		Titree & forest.	
(600) End of cut line. 700E.	62359			Granite boulders.
	62335		Tangled forest.	
	62305		~~Downhill.~~	
	62280		Uphill.	Small creek at 735.
(850) 750E.	62318			
	62339			
	62353			
(900) 800E.	62341		Titree regrowth.	
	62342		~~Uphill.~~ Level.	
	62332			
	62321			
	62320			
(950) 850E	62328	? Granite	contact if granite is present	
	62997			
	62555			
(1000) 900E	63051			
	63697			
	64132			
	63593			
(1050) 950E	61337			
	61950	60700–63200.	Downhill.	
	62800.	62300–63300.	Level.	
	63333		Open forest.	Downhill.
(1100) 1000E	64149		~~Downhill~~	
	62442		Level.	
	63241.			

labelled 100 out. Bracketed

From 1400E numbers are West wards, pegs are laid along Hwy 3 should be

054

Form No. 73/269 RENISON LIMITED

226053

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 14/2/78. Operator: P.R.S. Grid Location: East Heemskirk.

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
3400N.	63638.			
	63200	62300-64100.		
~~(1150)~~ 1050E.	62377.			
	62413.		Downhill.	
	62222			
	62165			
~~(1200)~~ 1100E	62158			
	62206			
	62264			
	62374			
~~(1250)~~ 1150E	62538			
	62730			
	63148.			
	65837		Swampy tangled forest.	
~~(1300)~~ 1200E	64650	64610-64690		Float. of qtzite + ?trace sulphide.
	62697			
	62417			Float banded chert + massive quartz.
	62271			"
~~(1350)~~ 1250E	62133			"
	64189			"
	62486			"
	61683			
2 Samples (1400) 1300E.	60601			Float qtz veined chert.
This is	61300			Float qtzite + chert + minor po.
how the pegs are	62500			
Sample marked.	62200	61700-62700.	Open forest.	Float gossan breccia
1450E	63500	62500-64500.		Float of gossan.
	61200	59600-62800.		Float of gossan & haematite rock.

055

Form No. 73/269 RENISON LIMITED

226054

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 14/2/78. Operator: P.R.S. Grid Location: East Heemskirk.

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
3400N.	63650		63300 - 64000	Float of gossan.
	66276			" " "
1500E	66440		Tangled forest.	Qtzite & gossan float
3 samples	65300	65100 - 65500		Float of haem/mica rock + mic. qtzite + gossan.
	63500	63200 - 63800.		Creek. o/c seds.
	61900		Uphill.	Gossan float
1550E	62450	62100 - 62800		" "
	61700	61300 - 62100		" "
	61950	61500 - 62400	Top of slope.	" "
	61400.	61000 - 61800.		" "
1600E.	61700	60600 - 62800	Open forest.	Mag. gossan.
	62450	61300 - 63600.		" "
	63750		Forest + regrowth. W. side of logging road.	" "
	61700		E. side " " "	Float mag. gossan.
1650E	61250	61000 - 61500		" " "
	61850	61500 - 62200	W. side of logging road.	" " "
	58397		E. side " " "	
	58390		Titree swamp.	
1700E	58487			
	59850	59500 - 60800		Creek at 1705.
	56795			
	60610		Uphill. Merges into forest.	
1750E	67049			Gossan float.
	65518			" "
Note. Peg. 1800E not found. Thus 2 readings short.	62650	61700 - 63600		" "
	63950	63200 - 64700	Level.	" "
	63510			" "
	59850.	59700 - 60000		

056 Form No. 73/269 RENISON LIMITED 226055

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 14/2/78 Operator: P.R.S. Grid Location: East Hamaki'ok.

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
3400N. 1850E.	55020.			Mag. goss. float.
	56144.			"
	57325			
	56762			
1900E	57887		Horizontal.	Mag. goss. float.
	58364			" " "
	58480			
	58882			Mag. goss. float.
1950E.	59159			
	59087			Pebbles gossan.
	59273			
	59541			
2000E	60022			
	60242			
	60030			
	60118		Titree swamp.	Road. (Main access) Mag. goss. scree.
2050E	60118			
	60133			o/c gabbro.
	60383			
	60441			
2100E.	60402			o/c gabbro.

057

Form No. 73/269 REVISON LIMITED 226056

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 8.2.78 Operator: P.R.S. Grid Location: East Heemskirk

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
3000N 500E	65600	{ Varies 65000-66300	Horizontal scrub	
	66100	{ Varies 65200-67000	"	
	67621		"	Chert or hornfels float.
	67501		"	
550E	67000	{ Varies 66300-67800	"	
	67373		"	Sed. float.
	67527		"	
	67594		"	
600E	67523		Old track.	Sed. float.
	67066		Horizontal scrub	
	67900	{ Varies 67600-68300	"	
	67571		"	Sed. float.
650E	67707		"	
	67511		"	
	67464		"	
	64600	{ Varies 63700-65500	"	
Original end of line. 700E	67606	{ Varies 66300-69600	Old track.	
	67100		Horizontal scrub	
	67009		"	
	67351		"	Clayey soil.
750E	67350		"	Float of banded cherts and siltsts.
	67309		"	Grey clayey soil.
	67900	{ Varies 67100-68800	"	"
	65006	{ Varies 64300-67700	"	"
800E	67000	{ Varies 66200-67900	"	"
	65900	{ Varies 65100-66800	"	o/c of grey mudst. with minor S.
	66693		"	
	66850	{ Varies 66500-67200	"	Sed. float.

058

Form No. 73/269 RENISON LIMITED 226057

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 8-2-78 Operator: P.R.S. Grid Location: East Heemskirk

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
3000N 850E	66872		Horizontal scrub.	
	67600	{Varies 67000-68200	Creek.	o/c. sed. + minor po.
	67450	{Varies 67100-67800	Horizontal scrub.	
	67500	{Varies 67200-67800	"	
900E	67180		"	
Sample.	64900	{Varies 64300-65500	"	o/c chert & qtzite. Float: sed + po.
	66621		"	
	66476		"	
	66750		Uphill	
950E	64853			
	63610			
	64334		Horizontal scrub.	
	64553		" + myrtle.	Sed. float.
1000E	62358		"	
	64315		"	
	62693		"	Granite float.
	62549		"	Clayey soil (i.e. prob. sed.)
1050E	63205		Level. "	
	65519		"	Qtzite float.
	65517		Downhill "	
	64700	{Varies 64000-65500	"	Sed. float.
1100E	59308		"	
	60383		Uphill. "	
Sample.	61372		"	Siltst o/c.
	61164		"	
1150E	61643		"	
	61775		Top of slope.	
	61739			

059

Form No. 73/269 RENISON LIMITED

226058

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 7·2·78 Operator: P.R.S. Grid Location: East Heemskirk

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
3000N	61787			
1200E	62004		Downhill.	
	62590		Level.	
	63156		"	
	63616		"	o/c hornfels.
1250E	64851			"
Sample.	65764			"
	65334			
	61652			
1300E	61063			
	61688			Hornfels float.
	62146			Light brown clayey soil.
	62003		Steeply downhill.	
1350E	60368		"	
	63480		Myrtle + horizontal.	
	66100	Varies 65600–66600	Myrtle forest	Lumps of iron gossan. (ie prob gabbro underneath)
	65238		"	"
1400E	59255		"	"
Sample.	62006	Varies 61100–63000	"	"
	62100	Varies 60300–64000	"	
	65984		"	
1450E	61158		"	
	60152		Gently downhill.	
	60051		Ti tree swamp + myrtle.	
	59808		Overgrown track.	
1500E	59383			
	59551			
	59520			

060

Form No. 73/269 RENISON LIMITED 226059

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 8-2-78 Operator: P.R.S. Grid Location: East Heemskirk

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
3000N	59726		Titrea swamp + myrtle.	large creek.
1550E	59733		"	"
	59852		"	"
	59398		"	"
	60161		"	"
1600E	60299		Swampy; scrubby hilly terrain.	c/c unaltered gabbro.
	60418		"	"
	60544		"	"
	60658		"	"
1650E	60754		"	"
	60842		"	"
	60307		"	"
	60386		"	"
1700E	61085		"	"
	61136		"	"
	61170		"	"
	61215		"	"
1750E	61281		"	"
	61310		"	"
	61355		"	"
	61396		"	"
1800E	61508		"	"
	61454		"	"
	61489		"	"
	61624		"	"
1850E	61664		"	"
	61684		"	"
	61690		Track.	"

061.

Form No. 73/269 RENISON LIMITED 226060

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 8.2.78 Operator: P.R.S. Grid Location: East Heemskirk

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
3000N	61641			Gabbro o/c
1900E	61645		Track.	"
Finish of line.				

062

Form No. 73/269 RENISON LIMITED 226061

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 7.2.78 Operator: P.R.S. Grid Location: East Heemskirk

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
2600N	62329		Thin scrub. Steeply downhill.	
300E	62328		"	
	62329		"	
	62337		"	
	62342		"	
350E	62355		"	
	62365		Myrtle forest.	
	62388		"	
	62423		"	
400E	62466		"	
	62531		"	
Possible granite contact →	62648		"	Small creek.
	63002		"	
450E	63338		"	
	62558		"	
	66408		"	
	63518		"	
Sample 500E	64536		"	Float of granite and very micaceous silt.
	58432		"	"
	63698		"	
	66480		"	
550E	64677		"	
	68001		"	
	65618		Medium scrub.	
	62646		"	
600E	61384		Swampy button grass flat.	
	61646		"	
	61794		"	

063

Form No. 73/269 RENISON LIMITED 226062

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 7-2-78 Operator: P.R.S. Grid Location: East Heemskirk

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
2600N	61895		Swampy bottom-grass flat.	
650E	61356		"	Small creek
	61392		"	
	62031		"	Small creek
	62074		"	
700E	62135		"	
	62197		"	
	62185		"	Small creek
	62350		"	
750E	62383		"	
	62311		"	
	62712		"	Small creek at 770 E.
	62157		"	
800E	61857		"	
	61379		"	o/c tourm. qtz veined pelite.
	62034		"	
Sample	62085			o/c. or float of highly tourm granite + float of tourm. silicified pelite.
850E	62111			
	62151			
	62168			? o/c of silic. ? tourm. pelite + some qtzite
	62187			"
900E	62197			
Sample	62194			Float of granite and tourm. banded siltst.
	62174			
	62123			
950E	62077			Float of banded sil. siltst.
	62073			
	62094			

064

Form No. 73/269 RENISON LIMITED 226063

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 7-2-78 Operator: P.R.S. Grid Location: East Heemskirk

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
2600N	62162			
1000E	62289			Float of granite, quartz and hornfels.
	62683			"
	62762			"
	62679			
1050E	62639			
	63009			
	65101			
	65774			
1100E	64525			Small creek at 1090.
Sample	69352			o/c. psammite + ? sulph.
	68692		Scrubby.	
	65322			
1150E	63608		Swampy & scrubby.	
	62788		"	
	62378		"	
	62213		"	
1200E	62180		On main road.	
	62092		Along main road.	
	62066		"	
	62023		"	
1250E	61360		"	
	61858		"	
	61726		"	
	61316		"	Float of gabbro, and hornfelsed qtz banded siltst.
1300N	62595		"	
	63663		"	
	64013		"	Gabbro float.

065

Form No. 73/269 RENISON LIMITED 226064

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 7-2-76 Operator: P.R.S. Grid Location: East Heemskirk

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
2600N	64143		Along main road.	
1350mE	60767		"	o/c gossan.
	62521		"	"
Varies 66300-67000	66650		"	"
	65777		"	"
Varies 61300-61500 1600 E	61400		"	
	60871		"	
	61673		"	
	61576		"	
1650 E	61533		"	
	61605		"	o/c gabbro
	61648		"	"
	61641		"	"
1500 E	61762		"	"
	61863		"	"
	61763		"	
	61797		"	
1550E	61844		"	
	61300		"	Minor gossan ? o/c.
	61359		"	W. side of creek.
	61869		~~On main road~~.	E. side of creek.
1600E	61805	Edge of main road	Hilly scrubby terrain.	o/c gabbro.
	61316		"	"
	62032		"	"
	61804		"	"
1650E	61775	(metal near).	"	"
	61845		"	"
	61305		"	"

U66

Form No. 73/269 RENISON LIMITED 226065

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 7-2-78 Operator: P.R.S. Grid Location: East Heemskirk

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
2600N	61332		Hilly scrubby terrain.	o/c gabbro.
1700E	61311		"	"
	61887		"	"
	61887		"	"
	61302		"	"
Sample 1750E	61888		"	"
	61303		"	"
	61311		"	"
	61899		"	"
1800E	61863		"	"
	61882		Marshy flat	
	61884		"	
	61878		"	
1850E	61877		"	
	61880		"	
	61881		"	Gabbro o/c.
	61880		"	
1900E	61884		"	
	61885		"	Small creek.
	61887		Scrubby hilly terrain	o/c gabbro.
	61897		"	"
1950E	61897		"	"
	61304		"	"
	61898		"	"
	61301		"	"
2000E	61862		"	"
	61861		Marshy flat.	
	61870		"	Minor gabbro float

Form No. 73/269 RENISON LIMITED 226066

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 7-2-76 Operator: P.R.S. Grid Location: East Heemskirk

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
2600N	61890		Marshy flats	
2050E	61894		"	
(weakly gossanous).	61392		Scrubby hilly terrain.	o/c gabbro.
	61726		"	"
	61319		"	"
2100E	61313.		"	"
	END.			

U68

Form No. 73/269 RENISON LIMITED

226067

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 7.2.78 Operator: P.R.S. Grid Location: East Heemskirk

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
				Main Trial Harbour road
2200N	62173			
	62159			Button grass flat.
	62150			
350E	62147			
	62143			
	62136			Granite float + white quartz
	62123			
400E	62101			
	62071			
	62039			
	61394			
450E	61362			Aplite float.
	61307			
	61886			Myrtle + lot of regrowth.
	61870			Granite float.
500E	61863		? ~~water race~~ Creek.	" "
	61801		? water race.	" "
	62068			" "
	62382			
550E	62698		Just west of Cooneys track.	
	62802			
Probable granite contact →	63165			
	65108			
600E	61016			
Sample	64393			Qtzite or hornfels ?o/c + sulph. Finely banded.
	59400			
	63179			
650E	66851			

069

Form No. 73/269 RENISON LIMITED 226068

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 7.2.78 Operator: P.R.S. Grid Location: East Heemskirk

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
2200N	63838		Myrtle + lot of regrowth.	
	63153		"	
	64297		"	
700E	64585		"	
	64018		"	
	64089		"	
	63362		"	
750E	63457		"	
	63559		"	
	63856		Myrtle + young gum.	
	62653		Titree swamp	granite
800E	63529		"	Some ?~~gabbro~~ float.
	67068		"	
	66413		"	
	67462		"	
850E	65519		Swampy button grass plain.	
	64869		"	
	63536		"	
	62553		"	
900E	62448		"	
	63381		"	
	62499		"	
	63016		"	o/c fine hornfels or q/zeite with q/z/ tourmaline veining. +pyrite
950E	62310		"	
	62236		"	
	62602		"	o/c q/z veined q/zeite
	63523		Low Titree	
1000E	62165		"	

070

Check mapping round 950 - 1000.

Form No. 73/269 RENISON LIMITED

226069

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 7.2.78 Operator: P.R.S. Grid Location: East Heemskirk

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
2200N	61841			float of cherty qtzite.
Sample.	61880		Titree swamp.	Occ. o/c of qtz vened ~~qtzite~~ gabbro. qtzite + gabbro float.
	62129		"	
1050E	62370		"	
	62632		"	
	62749		"	
	62158		"	
1100E	61450		"	
	61783		"	
	62356		"	
	62484		"	
1150E	62508		"	
	62469		"	
	62504		"	
	62547		"	
1200E	62605		"	
	62651		"	
	62890		"	
	63088		"	
1250E	63289		Scrubby myrtle + horizontal.	
	63465		"	
	63896		"	
	63702		"	
1300E	63623		"	
	66347		"	
	65869		"	
	64636		"	
1350E	63842		"	

071

Form No. 73/269 RENISON LIMITED 226070

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 7.2.78 Operator: P.R.S. Grid Location: East Heemskirk

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
2200N	63813		Scrubby myrtle + horizontal	
	64010		"	
	61400		"	
1400E	59292		"	
	61752		"	
	61759		"	
	62587		"	Creek at 1445E.
1450	61380		"	
	63489		"	
	64624		"	
	65619		"	
1500E	64137		"	
	65645		"	
	63250		"	
Sample Varies 64000 – 65300	64600		"	o/c PY. & magnetite in alt. breccia chert.
1550E	63274		"	
Varies 57300 – 59300	57800		"	
	67776		"	
	67118		Merges into dry myrtle Forest.	
1600E	65300			
	65077		"	
	62245		"	
	62057		"	
1650E	62251		"	
	62413		"	
	62494		"	
	62411		"	
1700E	62468		"	

072...

Form No. 73/269 RENISON LIMITED 226071

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 17.2.78 Operator: P.R.S. Grid Location: East Heemskirk

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
2200N	62626		old track.	
	62614		Mainly young gum	
	62489		"	
1750E	62474		"	
	62396		"	
	62157		"	
	62119		"	
1800E	61381		"	
	62027		"	
	62130		Downhill. "	
	61380		"	
1850E	61357		"	
	61888		Bank of river	In river, banded f.gr. grey cherts & schists dipping ~20° to S.E.
	61332		Bank of river.	
	62204			
1900E	62421			
	END			

U73

Form No. 73/269 RENISON LIMITED 226072

PROTON MAGNETOMETER FEILD RECORDINGS

Date: Feb '77. Operator: T. LEAHEY. Grid Location: East Heemskirk.

Geology by P.R. Stephenson, Feb'78.

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
1800 N. N275E				Main road.
			Be Hon - grass slopes	
300 E	62082			
	62035			
	61949			
	61789			
350E	61475		Low forest.	
	61746			Granite float.
	61875			
? Contact.	61889			
400E	66400 *			Float grey qtzite
	65520		←	Titree + blade grass.
	67650 *			Small creeks at 413E and 421E
	61623			
450E	61708			
	61801		Dry young myrtle.	
	61963		Swampy low titree.	
	61990			Small creek at 490
500E	61985		Dry forest.	
~~500E~~	61987			
Sample	62040			Float hornfels + actin. Veins with po. & py.
	62111			
550E	62040			
Sample.	61937			o/c hornfels/dol. breccia? with po.
	62365			
	62056			Float hornfels
600E	62194			Float qtzite.

074

Form No. 73/269 RENISON LIMITED 226073

PROTON MAGNETOMETER FEILD RECORDINGS

Date: Feb'77. Operator: T. LEAHEY. Grid Location: East Heemskirk.

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
1800N.	61665		Thick timber & swamp	
	61885			"
	61735			
650E	61720			
	61702.			
	61730			
	61626			
700E	61666			
	61665			
	61655		Open forest.	
	61614			
750E	61630			
	61684			
	61770			
	61967			
800E	62272			
	62640		Fern covered ridge.	Float highly tourm. granite + banded siltst. ?old track
	62959			"
	63182		Swampy burnt timber.	
850E	63292			
	63329			
	63389			
	63465			
900E	63579			
	63657			
	63656		Dry open scrub	
	63739			
950E	63807			

U75

Form No. 73/269 RENISON LIMITED 226074

PROTON MAGNETOMETER FEILD RECORDINGS

Date: Feb'77. Operator: T. Leahey. Grid Location: East Heemskirk.

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
1800N	63836			
	63796		Swampy open scrub.	
	63879			
1000E	64030			Track on ridge. Float granite + contorted sed.
	63819			
	63129			
	63511			Numerous o/c of contorted banded cherts + extensive actin. veining & leaching Strike ~ 110° Mag
Sample 1050E	61480 *			
	62838			"
	64280			"
	63272			"
1100E	65519		Low myrtle.	"
	61080			"
	64677			Mainly hornfels + actinolite * veining.
	63400 *			"
1150E	66700 *			"
	66090 *			"
	66160			
	63600 *			~~As above~~ + As above + chert
1200E	60507 *			"
	62747			"
	62222			"
	62016			"
Sample 1250E	61710			Thoroughly actinolitised ? rock + subblide
	61461			"
	61669			"
	62061			"
1300E	65519			Ditto + white chert

076

Form No. 73/269 RENISON LIMITED 226075

PROTON MAGNETOMETER FEILD RECORDINGS

Date: Feb'77. Operator: T. Loahey. Grid Location: East Heemskirk

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
1800N.	65846			"
	66942		Forest + regrowth.	"
	65520			
1350E	65528			
	65531			
	65530			
	62021			Float hornfels + actinolite
1400E	65408			"
	69486			
	64700 *			
	65531			
1450E	65530			
	65530			Float ? calc silicate.
Sample	60012			Float ditto + py & ? magnetite.
	60920			
1500E	61428		(Previous float may be vein material)	Float actinolitised rock + ? calc. veins.
	61758		Creek at 1510E.	Float grey & brown hornfels & greywacke + actin. veining
	61325			
	62624			
1550E	62420			
	62100			
	62133			
	63072			
1600E	65336			
	62410			
	62377			
	62441			
1650E	62462			

077.

Form No. 73/269 RENISON LIMITED 226076

PROTON MAGNETOMETER FEILD RECORDINGS

Date: Feb'77. Operator: T. Leahey. Grid Location: East Heemskirk.

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
1800N.	62506			
	62484			
	62690			
1700G	63298			
	64080			
	64266			
	64044			
1750G	62775			
	62186			
	61970			
	61931			Logging track
1800G	62315			" "
	62481			
	62520			
	62844			
1850G	62987			
	62745			
	62547		Downhill	
	62478			
Bush pg 1900G.	62399			
1906G				Float grey hornfels or gtzite
~1950			River.	
Line appears to end at 1900G				

078

Form No. 73/269 RENISON LIMITED 226077

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 25/3/77. Operator: A.F.R. Grid Location:

Geology P.R.S. 20/2/78. East Heemskirk.

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
1400N. 0	62276		Dozed area.	
	62271			o/c granite.
	62267			
	62260			
50E	62251			
	62242		Button grass slopes	
	62238			
	62235			
~~0~~	62253			
100E	62261			Float m.gr. red granite
	62262			
	62318			
	62383			
	62281			
150E	62240			
? Contact (based on vegetation)	62200			
	62156		Young forest.	
	62126			
	62106			
200E	62095			
	62073			
Sample	62055			Float hornfels + minor pyrite
	61971			
	61937		Titrea swamp.	
250E	61908			
	61990			
	62581			
	62886.		Small creek at 275E.	

079 Form No. 73/269 RENISON LIMITED 226078

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 25/3/77. Operator: A.F.R. Grid Location: East Heemskirk.

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
1400N	64266			
300E.	65463			
	64516			
	62738			
	62862			
	62021			
350E	61365			
	61665		Young forest.	Boulders of massive grey qtzite.
	62037			
Sample	62097			o/c cum float of hornfelsed slightly mic. sst or greywacke. Often thin po & py. veins
	62478			
400E	64836			"
	65518			"
	65520			"
	61157			"
	60185			"
450E	64095	Erratic.		"
Sample.	59500	59000~60000		" (more igneous looking)
	58500	Erratic		"
	63720			~~Float hornfels or chert with py. veins.~~
	61034			"
500E	60775			"
	61621			
	61955			
	62131			
	62056			
550E.	61777			
	60454			

080

Form No. 73/269 RENISON LIMITED

226079

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 25/3/77. Operator: A.F.R. Grid Location: East Heemskirk.

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
1400N.	66920	Erratic		
	61949			Float hornfels or chert with pyrite veins.
	60977			
Sample. 600E	61453		Tangled forest (Sub horizontal)	Float greywacke / chert + pyrite veins.
	60570			
	58780	Erratic		
	57025			
	61532			
650E	61658			
	61971			
	61585			Float of hornfels + ? calc. veining. Pitted & weathered.
	64229		Young gum forest.	
700E	62702			Float banded qtzites + sulph.
	62088			
	62160			
	62121			
	62094			
Sample 750E	62108		Boggy burnt out forest.	Float greywacke + actinolite vein.
	62173			
	62339			
	62210			Brown ? greywacke + some actinolite veining.
	62225			
800E	62233		Thick young gum & +tree.	Float of chert.
Sample	62280			Float dolerite.
	62318			
	62806		Light forest.	O/C hornfels. + coarser bands & actinolite veins.
	62208			Pitted & weathered. Same as at 675E.
850E	62492			"

081

Form No. 73/269 RENISON LIMITED

226080

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 25/3/77 Operator: A.F.R. Grid Location:

East Heemskirk.

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
1400N.	62624			o/c ditto
	62952			"
	62629			"
	62323			"
900E	62631			"
	61945.			"
	62874			"
	62785			"
	62223			"
950E	61289			"
	61508			"
	63924			"
	62550			"
	62068			"
1000E	62116			"
	61884			
	61767			
	62044		Light tangled forest.	
	62218			
Sample 1050E	62266			Float f.gr. hornfels.
	62241			
	62130			
	62081		Thick ferns & burnt gum.	
	62000			
1100E.	62229			

082

Form No. 73/269 RENISON LIMITED 226081

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 20/2/78 Operator: P.R.S. Grid Location: East Heemskirk.

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
1400N.	62887		Thick ferns + burnt gum	
	62840			
	63573			
1150E.	62378			
	63475			
	64255			
	65360	65300-65420	Titree + burnt gum.	
1200E	65550	65300-65800		
	65587			
	64484		Swampy titree.	
	64380			
1250E	63372			
	64510			
	64124			
	63029			
1300E	62651		Forest.	
	62568			
	62575			
	62651		Tangled forest.	
(Labelled 1300) 1350E	62745			Float ?dolerite. Sample
	62831		Very small creek.	"
	63022			"
	63061			
(Labelled 1350) 1400E	62854			
	62828			
	62757			Float basalt or dolerite
	62707			"
(Labelled 1400) & 1450E	62710		Downhill.	

Form No. 73/269 RENISON LIMITED

226082

PROTON MAGNETOMETER FEILD RECORDINGS

Date: 20/2/78 Operator: P.R.S. Grid Location: East Heemskirk.

Grid Station	Gamma Reading	Time	Diurnal correction	Corrected Reading
1400N. Sample	62780		Creek at 1465.	o/c micaceous hornfels
	62328		Uphill	
	62315		Level.	
(Bush peg). 1500E.	62879			
	62845			
	62806			
	62792			
(Bush peg) 1550E	62777			
	62846			
	62326			
	62392			
(Bush peg) 1600E	63006			
	63058		Gently downhill	
	63112			
	63119			
(Bush peg) 1650E	63199			
	63330		Level	
	63443			
	63387		Gently uphill	
(Bush peg) 1700E	63237			
	63310			
	63759		Level.	
	63780			
(Bush peg) 1750E	63611		Downhill.	

084

226083

Form No. 69/88

RENISON LIMITED

FIELD REPRODUCTION SHEET FOR MAGNETOMETER SURVEY

AREA TRIAL H. TRAVERSE 1200 mN DATE 27/8/76 OBS A.F.R.

SPL 129

STATION	TIME	READING	SCALE	DRIFT	BASE CORR	ANOMALY	REMARKS
0	12·50 pm	62904					
		63722					
		63600					
		64645					
50		62440					
		63583					
		64844					flat
		64182					
100		62950					
		62445					
		62233					ridge - Small
		62144					
150		61950					swamp.
		61652					
		62146					
		61970					swamp.
200		61798					creek.
		61757					T. track.
		60708					
		62649					
250		62385					swamp.
		61915					
		61933					swamp
		61965					
300		62366					flat.
		62303					
		61891					
		61780					
350		63450					flat.
		62096					

085.

226084

Form No. 69/88

RENISON LIMITED

FIELD REPRODUCTION SHEET FOR MAGNETOMETER SURVEY

AREA TRIAL H. TRAVERSE 1200mN DATE 27/6/76 OBS A.F.R.

SPL 129

STATION	TIME	READING	SCALE	DRIFT	BASE CORR	ANOMALY	REMARKS
		64487					flat
		65577					
400		63535					
		62300					
		60943					
		62454					
450.		63364					descent.
		62488					
		61275					
		63219					flat.
500		63648					
		65330					
		63770					
		63085					
550		63286					flat.
		62271					
		61314					edge of Ti Tree.
		60755					
600.		58850					
		65968					
		62885					
		65707					Swamp.
650		65648					
		63826					
		62458					swamp.
700.		62336					
		62296					
		62284					
		62229					
750.		62427					

,86

226085

Form No. 69/88

RENISON LIMITED

FIELD REPRODUCTION SHEET FOR MAGNETOMETER SURVEY

AREA TRIAL H. SPL 129 TRAVERSE 1200mN DATE 27/8/76 OBS A.F.R.

STATION	TIME	READING	SCALE	DRIFT	BASE CORR	ANOMALY	REMARKS
		62835					
		62979					swamp.
		62786					
800		62413					small creek
		62355					
		62336					
		62518					
850		62568					end of swamp.
		62529					edge of gum forest.
		62540					
		62554					
900		62570					
		62596					flat.
		62641					
		62698					
950		62725					
		62770					
		62780					
		62743					
1000	2.15pm	62714					
		62720					
		62679					
		62675					
1050		62652					
		62625					
		62586					swamp
		62567					swamp
1100		62528					swamp
		62637					
		62694					

087

Form No. 69/88

226086

RENISON LIMITED

FIELD REPRODUCTION SHEET FOR MAGNETOMETER SURVEY

AREA TRIAL H. SPL 129 TRAVERSE 1200 mN DATE 27/8/76 OBS A.F.R.

STATION	TIME	READING	SCALE	DRIFT	BASE CORR	ANOMALY	REMARKS
		62718					
1150		62726					
		62760					T.track.
		62831					
		62824					
1200		62813					
		62794					
		62810					
		62823					
1250		62848					No Peg.
		62863					
		62980					
		63742					
1300		62206					Bush Peg.
		62744					
		62827					
		62870					
1350		62883					Bush Peg.
		62902					Descent.
		62925					Swamp.
		63048					
1400		63220					Knoll.
		63480					Steep descent
		63613					"
		63586					"
1450		63387					"
		63075					"
		62833					CREEK flowing
		62849					steep ascent.
1500		62876					"

088

226087

Form No. 69/88

RENISON LIMITED

FIELD REPRODUCTION SHEET FOR MAGNETOMETER SURVEY

AREA TRIAL H. TRAVERSE 1200mN DATE 27/8/76 OBS A.F.R.

SPL 129

STATION	TIME	READING	SCALE	DRIFT	BASE CORR	ANOMALY	REMARKS
		62866					
		62892					
		62926					ascent.
1550		62957					"
		63110					ascent
		63222					top
		63279					
1600		63073					steep descent.
		63096					"
		63200					clear bench to E. to right.
		63167					flat
		63232					"
1650		63383					
		63637					
		63769					old line?
		63519					
1700.	3.00pm	63360.					END. at CREEK.

089

226088

Form No. 69/88

RENISON LIMITED

FIELD REPRODUCTION SHEET FOR MAGNETOMETER SURVEY

(1000N)

AREA TRIAL H. TRAVERSE BASELINE (E-Z.) DATE 27/6/76 OBS A.F.R.

SPL 129.

STATION	TIME	READING	SCALE	DRIFT	BASE CORR	ANOMALY	REMARKS
29E	10.00am	66034					track.
		62235					flat.
		63642					"
		64074					"
550		64330					"
		64793					"
		62136					T. track.
		63091					flat.
600		64134					"
		63711	erratic.				"
		65714					"
		64955					T. track.
650		66440					T. track.
		65526					flat
		63305					"
		61722					"
700		61462					"
		61253					t. track
		61879					t. track
		62503					flat
750		63406					"
		62092					"
		62278					"
		62211					"
800		62456					"
		62165					edge of basement
		62201					flat
		62208					"
850		62205					"
		62200					"

030

226089

Form No. 69/88

RENISON LIMITED

FIELD REPRODUCTION SHEET FOR MAGNETOMETER SURVEY

AREA TRIAL H. SPL 129 TRAVERSE BASELINE (E.Z.) DATE 27/8/76 OBS I.F.R.

STATION	TIME	READING	SCALE	DRIFT	BASE CORR	ANOMALY	REMARKS
		62186					swamp.
		62305					swamp.
900		62946					flat.
		63017					swamp.
		62512					flat.
		62361					T. track.
950		62322					flat.
		62287					flat
		62307					flat
		62329					T. track
1000		62378					flat
		62475					"
		62568					"
		62631					"
1050		62691					"
		62756					"
		62732					T. track
		62716					flat
1100	10.55am	62710					"
		62758					"
		62851					"
		63004					T. track
1150		63051					flat.
		62998					"
		63006					open
		63016					open
1200		63033					open.
		63060					open.
		63103					slope to right.
		63141					"

091c

226090

Form No. 69/88

RENISON LIMITED

FIELD REPRODUCTION SHEET FOR MAGNETOMETER SURVEY

AREA TRIAL H. TRAVERSE BASELINE (E.2) DATE 21/8/76 OBS A.F.R.

SPL 129

STATION	TIME	READING	SCALE	DRIFT	BASE CORR	ANOMALY	REMARKS
1250		63190					steep gully on right.
		63287					slope to right.
		63385					descent.
		63383					descent
1300		63255					descent.
1312.		64587	erratic.				IN CREEK
		66554					on other bank
	11.10am	63785					"

092.

LINE 5000N

APPENDIX 6

226091 (1)

Feet N. of 5000

RENISON LIMITED

FIELD SHEET FOR GEOCHEMICAL SURVE

AREA | TRAVERSE LINE 5000N | DATE CBS

LINE 5000N

STATION	SAMPLE	DEPTH		DESCRIPTION
1100E	Stopped.	2'	6"	QUARTZ + Grey Rock Pebbles in Black Mud.
25		3'	0"	Yellow/Brown Coarse Sand.
50	✓	2'	0"	Granite.
75	✓		6"	Brown soil on Granite.
1200E	✓		6"	"
25	Stopped.	1'	6"	Quartz Fragments.
50	Stopped.	2'	9"	Whitish pebbled Rock.
75		3'	0"	Whitish yellow Powder.
1300E		3'	0"	" " " + some Quartz Fragments.
25	✓?	3'	0"	Beige white soil + Rock Fragments.
50	Stopped.	3'	0"	Rock Fragments in black Mud.
75	✓		9"	Siltstone?
1400E	✓		6"	"
25	Stopped ✓?	1'	0"	Quartz Pebbles + black siltstone?
50	✓	2'	9"	Siltstone Fragments.
75	✓?	2'	9"	" "
1500E	✓	3'	0"	" "
25	✓	1'	3"	on outcrop.
50	✓		10"	Ironstone.
75	✓		8"	"
1600E	✓		6"	"
25	✓	1'	6"	Quartz Fragments + Ironstone.
50		3'	0"	Whitish Tan Clay.
75		3'	0"	" " " + Quartz Pebbles.
1700E	✓	1'	2"	Weathered siltstone? + " "
25	✓	1'	0"	" " ?
50	✓		10"	" " ?
75	✓	1'	4"	" "
1800E.	Stopped. ✓?	2	1"	" " " "

093

Line 5000N.

226092

(2)

Form No. 65/69

RENISON LIMITED

FIELD SHEET FOR GEOCHEMICAL SURVEY

AREA _____ TRAVERSE LINE 5000N DATE _____ OBS _____

LINE.
5000N

STATION	SAMPLE NO.	DEPTH		DESCRIPTION
1825E	✓		9"	Siltstone/shale?
50	✓	1'	3"	Siltstone? Fragments.
75	✓	1'	3"	" "
1900E	✓	1'	4"	" "
25	✓		7"	" " samples 5 metres north of line.
50	✓	2'	3"	" " + Quartz Fragments.
75	✓?	2'	6"	" " " "
2000E	✓	1'	6"	" " " "
25	✓		8"	Weathered Quartzite?
50	✓	2'	1"	" " ?
75.	✓		11"	" " ?
2100E	✓	1'	6"	" " ?
25	✓		6"	Siltstone? chips.
50	✓	1'	6"	Quartzite chips in whitish Clay.
75		3'	0"	Orange Grey white clay.
2200E	✓	1'	7"	Weathered siltstone? in Brown White Clay.
25	✓?	2'	10"	Quartzite chips in Brown white clay.
50	Stopped.	2'	0"	" Fragments.
75	✓	2'	3"	Brown Yellow siltstone? chips.
2300E	✓	2'	2"	Siltstone chips + Quartzite Fragments in Brown white clay.
25	✓	1'	3"	" " in white Grey clay.
50	Stopped.		12"	" + Quartzite " " " "
75	Stopped. ✓?		9"	Siltstone chips. (Mainly Schist?)
2400E.	✓	1'	6"	" " in white grey clay.
	TOTAL	53	Samples.	
				33- Definite Bedrock 8- Possible Bedrock
				5- Stopped before 3' Deep.
				7- taken to 3' but no bedrock.

LINE 5000N

094

4600N

Line 4600N

226093

Form No. 69/89

RENISON LIMITED

FIELD SHEET FOR GEOCHEMICAL SURVEY

(3)

AREA Line 4600N TRAVERSE Line 4600N DATE OBS

STATION	SAMPLE NO.	DEPTH		DESCRIPTION
1200E	✓		3"	Black Soil on Granite.
25	✓		10"	" "
50	✓	1'	3"	" "
75		3'	0"	Brown Clay + Coarse Sand. in small valley.
1300E	✓		7"	Black soil on Granite.
25	✓		6"	" "
50	✓		3"	" "
75	✓		12"	" "
1400E	✓?	1'	3"	" " mainly scree?
25	✓		8"	Quartz Fragments + Chips in black soil.
50	✓?		9"	" " "
75	✓?	1'	3"	" " "
1500E		3'	0"	Tan Clay + Quartz Fragments.
25		3'	0"	"
50	✓?	1'	6"	Green brown Clay + some Mica? (weathered schist?)
75	✓?	3'	0"	Yellow Brown Sand. (Weathered Rock?)
1600E	✓		12"	Brown Coarse grained volcanic Rock?
25	✓	1'	10"	" " " " "
50	close.	3'	0"	Yellow white Orange clay.
75	✓?	1'	6"	Black siltstone chips + Quartz Fragments in Black Soil.
1700E		3'	0"	Orange white clayey sand.
25	close.	3'	0"	Orange Tan white Powder + some weathered Sandstone? chips
50	✓	2'	6"	Brown Grey Clayey sand + weathered chips
75	✓	1'	6"	Weathered Grey Green + beige Volcanic Rock?
1800E		3'	0"	White Fawn + Orange clay.
25		3'	0"	Grey white Orange clay.
50	✓	1'	6"	Tan Brown clay + siltstone? chips.
75		3'	0"	Field notes ineligible.
1900E	✓		6"	In Outcrop containing PYRITES

U95 · 4600'

Line 4600N

226094

Form No. 69/89

(4)

RENISON LIMITED

FIELD SHEET FOR GEOCHEMICAL SURVEY

AREA TRAVERSE Line 4600N DATE OBS

Line 4600N

STATION	SAMPLE NO.	DEPTH		DESCRIPTION
1925E	✓	1'	6"	Brown Tan Clay + Rock chips & Fragments.
50	✓		7"	Black Mud + Rock chips & Fragments
75	✓	2'	3"	Grey Green Clay + weathered Rock.
2000E		3'	0"	Tan Brown Clay + Quartz Fragments.
25		3'	0"	Tan " " " "
50		3'	0"	" " " " "
75	√?	3'	0"	Tan Green Clay + Rock chips & Fragments.
2100E	√?	3'	0"	Green white clay + Brown Mud + chlorite schist? & siltstone? chips
25		3'	0"	Green white Tan clay + schist? chips in creek line.
50		3'	0"	" " " " + weathered schist?
75	√?		8"?	Ironstone? (Field notes ineligible)
2200E	√?		12"	Ironstone Pebbles in clay.
25	√?		11"	" " + Quartz & Chlorite chips at bottom
50	√?	1'	4"	" " & chips in clay.
75	stopped √?		10"	" " "
2300E	√?		12"	" " in brown Yellow clay.
25	√?		6"	" " " " "
50	✓		12"	" "
75	✓		2"	" "
2400E	✓		4"	" "
25	Stopped. √?		9"	" " in Tan Clay.
50	✓		9"	" " in Brown Soil.
75	✓		8"	" " " (on track)
2500E.	√?		12"	Quartz chips & Fragments in whitish clay. Some Ironstone Pebbles Down to 9"
	TOTAL	53	Samples.	22 - Definite Bedrock
				17 - Possible Bedrock
				14 - Taken to 3' but no bedrock

Line 4600N

4200N

096.

226095

Line 4200N

(5)

Post No. 65/88

RENISON LIMITED

FIELD SHEET FOR GEOCHEMICAL SURVEY

AREA | TRAVERSE Line 4200N | DATE | OBS

Line 4200N

STATION	SAMPLE NO.	DEPTH		DESCRIPTION
1300E	✓		3"	Black Soil & Vegetation on Granite.
25	✓		8"	" " "
50	✓		9"	" " "
75	✓		9"	" " "
1400E	✓	1'	10"	" " "
25	✓?	2'	6"	Red Brown Clay in Granite Scree? stopped.
50	✓?		5"	Black soil on granite. scree?
75	✓?	2'	0"	" " " " "
1500E	✓	1'	5"	" "
25	✓		12"	" "
50	✓	1'	3"	Brown Coarse Clayey Sand + Granite chips.
75	✓		5"	Red Brown Clayey Soil + Ironstone chips on outcrop.
1600E	✓	2'	6"	Yellow Siltstone chips in Red Orange clay.
25		3'	0"	Black & Brown Orange clay.
50	✓	1'	5"	Yellow Brown clay + Ironstone chips.
75	✓	1'	7"	" " " "
1700E	✓		11"	" " " "
25		0-3'	0"	Dark brown Mud.
50		3'	0"	Whitish Grey beige clay (very oily?)
75		3'	0"	Grey Green clay.
1800E		3'	0"	Green clay.
25	✓?	3'	0"	Brown Mud + Siliceous? siltstone? chips.
50	✓		3"	Brown Soil & vegetation on Ironstone.
75	✓		3"	Black " " " "
1900E	✓		8"	Yellow Brown Soil on Ironstone.
25		3'	0"	Brown Mud & Clay.
50		3'	0"	Orange Brown Clay & Ironstone Pebbles.
75	✓		7"	Brown Soil + Ironstone chips.
2000E	✓		6"	" " " "

097

Line 4200N.

226096

4200N

Form No. 69/09

RENISON LIMITED

FIELD SHEET FOR GEOCHEMICAL SURVEY

(6)

AREA _____ TRAVERSE Line 4200N DATE OBS

Line 4200N

STATION	SAMPLE NO.	DEPTH		DESCRIPTION
2025E	✓		8"	Yellow Brown Soil + Ironstone chips.
50		3'	0"	Fine Gravel (Quartz) in Brown Mud.
75		3'	0"	Beige, Green Grey Black Clay (weathered schist?)
2100E	✓		6"	Ironstone Pebbles.
25	✓		5"	" "
50	✓		6"	" "
75		3'	0"	Brown clay + Quartzite Fragments.
2200E	✓?	2'	0"	Quartzite chips in Tan Pasty clay.
25		3'	0"	Beige clay.
50	✓		9"	Quartz + Quartzite chips on outcrop.
75	✓	1'	5"	Siltstone? chips in beige clay.
2300E	✓	1'	4"	Grey shale? chips in Green Brown Clay.
25	stopped.	1'	6"	Quartz Fragments in Tan White clay.
50		0 3'	0"	Brown Mud + Vegetation in swamp.
75		3'	0"	Green Grey Clay.
2400E	stopped.	2'	0"	Quartz Fragments in Brown Mud
25		0 - 3'	0"	Rust Coloured Mud + Vegetation + Grey Clay at bottom (in swamp)
50		0 - 3'	0"	" " " " "
75		3'	0"	Whitish grey clay.
2500E.		3'	0"	Tan white + Orange clay.
	Total 49	Samples.		
				25 - Definite Bedrock
				5 - Possible Bedrock
				2 - Stopped before 3' Deep.
				17 - taken to 3' but no bedrock

.098.

3800N

Line 3800N

226097

(7)

Form No. 39/69

RENISON LIMITED

FIELD SHEET FOR GEOCHEMICAL SURVEY

AREA | TRAVERSE Line 3800N | DATE | OBS

Line 800N

STATION	SAMPLE No.	DEPTH		DESCRIPTION
1000E	✓		11"	Black Soil + Granite chips
25		3'	0"	Yellow & Orange sand + Brown Mud at top.
50	✓		9"	Black Soil + Granite chips
75	✓	1'	1"	" " + " "
1100E	✓		11"	" " + " "
25	✓	1'	1"	" " + " "
50	✓		12"	" " + " "
75	✓	1'	2"	" " + " "
1200E	✓	1'	2"	" " + " "
25	✓	2'	0"	Black Soil + " "
50	✓		7"	Brown Soil + " "
75	✓		3"	Black Soil + Granite chips
1300E	✓		5"	Brown & Black Soil + Granite chips.
25	✓		12"	Grey Coarse Granite Soil + Silicified? siltstone?
50	close	3'	0"	Brown Soil & weathered siltstone.
75	✓		5"	Black soil & Vegetation on Coarse siltstone? outcrop
1400E	✓		6"	Grey Soil & Quartzite? chips on outcrop containing Pyrite.
25	✓	1'	6"	Yellow Orange Soil + Sandstone? chips
50	✓		7"	As below.
75	✓		7"	Yellow Brown Soil + Sandstone? chips.
1500E	✓	1'	3"	Yellow Brown soil & siltstone? chips.
25	✓	3'	0"	Orange tan Clay & weathered siltstone chips
50	close	3'	0"	Orange Yellow Red Clayey soil + siltstone chips.
75	✓		10"	Ironstone chips in Yellow brown soil.
1600E	✓		9"	" " " brown soil.
25		3'	0"	As below.
50		3'	0"	Orange & white clay (Ironstone on Surface)
75		3'	0"	Orange & white clay.
1700E	✓	1'	10"	Orange Yellow clay + weathered Ironstone chips.

1100 N800N

099

3800N

226098

Line 3800N

Form No. 65/69

RENISON LIMITED

FIELD SHEET FOR GEOCHEMICAL SURVEY

8

AREA _____ TRAVERSE Line 3800N DATE _____ OBS _____

Line 3800N

STATION	SAMPLE NO.	DEPTH		DESCRIPTION
~~1725E~~	✓	2'	9"	Orange Yellow clay + weathered Ironstone chips
1750E	✓	3'	0"	Orange Yellow clay + Ironstone chips
75	✓		8"	Orange brown Clay + altered Quartzite?
1800E	✓	2'	6"	Tan beige Mud + Ironstone chips.
25		3'	0"	Yellow Clayey sand + Quartz Fragments.
50	✓	2'	0"	Quartz chips in Coarse white sand.
75	✓	1'	4"	White Tan Orange Black clay + Quartz + Ironstone.
1900E	✓		2"-6"	Brown Soil + Ironstone chips + Pebbles.
25	✓	1'	3"	Ironstone chips in orange Mud.
50		3'	0"	Grey Mud + Clay + Quartz pebbles.
75		3'	0"	Beige clay + weathered siltstone.
2000E	✓		11"	Ironstone chips in Brown Mud.
25	✓		12"	Ironstained Quartz in Dark brown Soil.
50	✓		4"	Ironstone chips in brown soil.
75		3'	0"	Beige Tan Clay + Vegetation + Mud + Quartz Fragments.
2100E	✓	1'	6"	Quartz Fragments + Vegetation in Black Mud.
25	✓	2'	6"	Brown Mud + Black + Cream weathered rock chips
50	✓		11"	Quartz + Ironstone chips in brownish clay.
75		3'	0"	Orange Clay.
2200E	✓		5"	Ironstone chips + Fragments in black soil + vegetation.
25	✓	1'	9"	Black Orange brown clay + as below.
50	✓	1'	3"	Brown Tan Clay + chips of Ironstained Quartzite?
75		3'	0"	Black Red Brown clayey soil
2300E	✓	2'	0"	Black Orange Clay + Ironstone chips.
25	✓	1'	3"	Orange Red Clay + Ironstone chips.
50		3'	0"	Orange brown Clay + Mica?
75	✓	1'	6"	Green Orange Clay + weathered siltstone? chips
2400E	✓		10"	Beige Brown Clayey Soil + Ironstone Fragments.

Total 57 Samples. 44-Definite Bedrock. 13- taken to 3' Deep but no bedrock

Line 3800N.

100.

Line 3400N

226099

3400N

Form No. 69/80

RENISON LIMITED

FIELD SHEET FOR GEOCHEMICAL SURVEY

(9)

AREA TRAVERSE Line 3400N DATE OBS

Line 3400N

STATION	SOIL SAMPLE NO.	DEPTH		DESCRIPTION
800E	✓		5"	Black Soil + Vegetation + Granite chips.
25	✓	1'	6"	" " " "
50	✓	1'	9"	Weathered Orange & Yellow Pegmatite?
75	✓	2'	6"	Yellow weathered Granite?
900E	✓?	2'	0"	Black Muddy Soil + Quartz & Quartzite chips.
25	✓	2'	0"	Yellow brown weathered Rock.
50	✓	2'	4"	" Orange " "
75		3'	0"	Orange white sand.
1000E	✓	2'	0"	Greyish weathered siltstone? + clay & brown Mud.
25	✓?	1'	6"	Black Mud & Granite (could be scree)
50	✓		12"	" "
75	✓		8"	Black Muddy Soil & siltstone? chips
1100E	✓?	2'	0"	Quartz? scree? stopped.
25	✓	1'	10"	Brown Yellow Weathered Rock.
50	✓	2'	11	Yellow Brown Clay + Rock chips
75	clear	3'	0"	Whitish Orange Brown Powdery Sand.
1200E	✓	2'	6"	Orange Powdery Sand + Grey Rock chips
25	✓?	1'	2"	Quartzite chips & fragments (could be scree)
50		3'	0"	Whitish Grey Clay + Rock chips
75	clear	3'	0"	Whitish Tan Orange Clay & Chips
1300E	✓		5"	Tan Grey Soil + siltstone chips & fragments.
25	✓?		12"	Grey Clay in Quartzite & siltstone? scree? stopped.
50	✓	1'	6"	Whitish grey Coarse clay & Grey Rock chips
75	✓		7"	Tan Clay + Vegetation & siltstone chips & Fragments
1400E	✓?	1'	6"	stopped. Tan Clay + Quartz & siltstone fragments & chips.
25		2'	0"	Brown Mud & Clay + Rock chips stopped.
50	✓	1'	2"	Red Brown Soil + Ironrich Siltstone? chips & Fragments
75	OLD COSTEAN?	5'	6"	Orange Brown Black Clay (Weathered Blackshale?) STAKED IN EASTWEST COSTEAN 2 METRES NORTH OF LINE!
1500E	~~Stopped~~ COSTEAN?		12"	Ironstone chips & Pebbles. (could be scree)

Line 3400N

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Line 3400N

226100

3400+

(10)

Form No. 69/69

RENISON LIMITED

FIELD SHEET FOR GEOCHEMICAL SURVEY

AREA | TRAVERSE Line 3400N | DATE | OBS

Line 3400N

STATION	SAMPLE NO.	DEPTH		DESCRIPTION
1525E	√?	1'	9"	Coarse Yellow orange Sand + Siltstone + Quartz chips.
50		3'	0"	Orange Clay + blackweathered Rock. (or Carbon.)
75	√?	1'	2"	Ironstone chips + Nodules in Red Brown Soil (could be scree)
1600E	√		12"	" " "
25	Stopped.	2'	3"	" " " " (hole caving in)
50	√		11"	" " "
75		2'	0"	Tan Muddy Coarse Clay + Rock Fragments stopped.
1700E	√?	1'	6"	Yellow Orange Clay + Brown Mud. Stopped
25		3'	0"	Yellow Orange Sandy Clay.
50		3'	0"	Yellow Orange Red Clay.
75	√		2"	Black + Brown Soil + Vegetation on Ironstone outcrop.
1800E	√		2"	Black " " " "
25	√		6"	Yellow Tan Soil + Ironstone chips + fragments.
50	√	2'	0"	Brown Black Yellow clay + Pink white Rock at bottom.
75		3'	0"	Brown Orange + black Clay.
1900E	close	3'	0"	Yellow Brown Black Clay + Weathered Rock.
25	√	2'	6"	Tan Brown + Black Clay + weathered Rock.
50	√?	1'	1"	Ironstone chips + pebbles in Brown Yellow clay. Stopped but probably bedrock
75		3'	0"	Yellow brown + black clay.
2000E		3'	0"	Yellow brown + white clay.
25		3'	0"	Yellow brown Tan + white clay.
50		3'	0"	Turquoise clay in swamp.
75		3'	0"	Tan white Orange clay.
2100E.		3'	0"	Yellow Orange Clay.
	TOTAL 53	Samples.		
				23 — Definite Bedrock 10-Possible Bedrock
				4 - Stopped before 3' Deep.
				16 — Taken to 3' Deep but no bedrock.

Line 3400N

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Line 3000N

3000N

226101

Form No. 55/69

RENISON LIMITED

FIELD SHEET FOR GEOCHEMICAL SURVEY

(11)

AREA TRAVERSE Line 3000N DATE OBS

Line 3000N

STATION	SAMPLE No.	DEPTH		DESCRIPTION
500E	√?		6"	White beige Clay + Roots + Quartzite chips
25	√		6"	" " " " " "
50	√		5"	" " " " " "
75	√		8"	" " " " " "
600E	stopped		10"	Brown Mud + Grit in Scree.
25	stopped	1'	6"	Grey beige Coarse Clay + Rock Fragments.
50	√		10"	Brown Grey Clay + siltstone? chips
75	√		10"	Tan Grey Clay + Orange siltstone? chips.
700E		3'	0"	Black Silver Grey Clay (Specular hematite)
25		3'	0"	Orange white clay.
50	√	2'	9"	Weathered Grey + Orange Siltstone?
75	√	2'	0"	" " " "
800E	stopped		8"	Tan Clayey Soil + siltstone? scree.
25	√?	2'	0"	Grey weathered Rock + Brown Mud.
50	√		5"	Brown Clayey Mud + Siltstone chips (mainly scree?)
75	√	1'	6"	Tan Clay + Granite chips (scree?)
900E	√		12"	Tan Clay 2 mtrs from Quartzite? outcrop containing pyrites
25	√	2'	6"	Orange weathered rock + some clay.
50	√	1'	10"	" Grey " " " "
75	√?		11"	stopped. Tan Clayey soil + Ironstone fragments
1000E	√		11"	Orange Tan Clay + siltstone chips
25	√?		12"	Brown Orange " " " (scree?)
50		3'	0"	" " " + Dark Grey weathered rock.
75	√	2'	0"	Brown Soil + Roots on Yellow Orange siltstone.
1100E		3'	0"	Orange Tan black Clay.
25	√		8"	White beige clay + Roots + siltstone? chips
50		3'	0"	Yellow Orange weathered Rock.
75		3'	0"	Brown Orange fine Sandy Clay.
1200E		3'	0"	Yellow Orange Clay.

Line 3000N

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3000N

Line 3000N

226102

Form No. 3-/69

(12)

RENISON LIMITED

FIELD SHEET FOR GEOCHEMICAL SURVEY

AREA Line 3000N TRAVERSE Line 3000N DATE OBS

STATION	SAMPLE NO.	DEPTH		DESCRIPTION
1225E		3'	0"	Green Brown Sandy Clay.
50		3'	0"	" " "
75		3'	0"	Orange Brown Clay.
1300E		3'	0"	" " "
25		3'	0"	" " "
50	dose	2'	10"	" " " + Rock chips
75	dose	3'	0"	" " " + " " "
1400E		3'	0"	Mauve Brown Clay.
25	√?		10"	stopped. Ironstone Nodules in Red Brown Soil.
50	√?	1'	2"	stopped. " " " " "
75		3'	0"	Grey Green Clay + Brown Mud.
1500E		3'	0"	Orange Beige Sandy Clay.
25	stopped.	1'	9"	Grit in Brown Mud.
50		3'	0"	Green Brown Gritty Clay + Brown Mud.
75	stopped.	2'	9"	Grit in Brown Mud.
1600E	✓		6"	Brown Clayey Soil + Roots. on outcrop of?
25	✓		6"	Orange Brown Soil & chips.
50	✓		10"	Tan Brown Clay
75	✓		10"	Brown Clayey soil + Roots & chips.
1700E	✓		6"	Tan Soil & chips
25	✓		6"	Brown Mud & Vegetation
50	dose	3'	0"	Orange Brown Muddy Clay + Brown Mud + weathered Rock
75	✓		6"	Brown Mud & Vegetation & chips.
1800E	✓		5"	" Soil & " & "
25	✓		9"	Tan Brown Clay + chips
50	dose	3'	0"	Orange Brown Clay + weathered Rock.
75		3'	0"	Tan white clay.
1900E	dose.	3'	0"	Tan white Orange black Clay & weathered Rock.
TOTAL 57 Samples.				24- Definite Bedrock 6- Possible bedrock. Line 3000N 7- Stopped before 3' 20- Taken to 3' bed

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Line 2600N

2600N
226103

Form No. 80/69

RENISON LIMITED

FIELD SHEET FOR GEOCHEMICAL SURVE

AREA TRAVERSE Line 2600N DATE OBS

Line 2600N Bedrock

STATION	SAMPLE NO.	DEPTH		DESCRIPTION
2100E	✓		6"	Beige Khaki soil on outcrop.
75	✓		5"	" " " " "
50	✓	2'	10"	" " Orange clay + Rock chips in swamp
25		3'	0"	Muddy Clay in swamp.
2000E		3'	0"	Yellow Brown Clay.
75	close	3'	0"	Orange Brown Clay + Rock Fragments
50	✓	2'	10"	Orange Soil + Clay + Rock chips (stopped?)
25		3'	0"	Brown Mud + Orange clay.
1900E		3'	0"	Brown Khaki muddy Clay.
75	✓?	1'	2"	Beige Brown Muddy Clay.
50	close	3'	0"	White Tan Orange Clayey weathered Rock?
25	✓	2'	0"	Whitish green clay + weathered rock chips.
1800E	✓		10"	Black Soil + Rock chips in scree/outcrop.
75	✓		4"	Brown Orange clayey soil in float/ outcrop?
50	✓		8"	" " soil in outcrop.
25	✓		4"	Beige " " "
1700E	✓		11"	" " " "
75	✓		5"	" " " "
50	✓		5"	" " " " + Roots
25	✓		6"	Beige Brown Clayey Soil on outcrop.
1600E		3'	0"	Yellow Orange sand (alluvial)
75	stopped	2'	0"	Brown Grey sandy Mud
50	✓	0-1'	6"	Brown Mud in Outcrop
25	✓		7"	Tan Orange Brown soil on outcrop
1500E	✓	0-	9"	Whitish Green clay Black Mud + Vegetation on outcrop
75	✓	3'	0"	Whitish Green clay + Brown Mud
50	stopped	1'	6"	Beige Grey Clay + Coarse Sand + Brown Mud.
25	✓		5"	Red Brown Soil + Ironstone Fragments.
1400E	✓		3"	" " " " "

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Line 2600N

2600N

226104

Form No. G3/65

RENISON LIMITED

FIELD SHEET FOR GEOCHEMICAL SURVEY

AREA | TRAVERSE Line 2600N | DATE | OBS

Line 2600N

Bedrock.

STATION	SAMPLE No.	DEPTH		DESCRIPTION
1375E	✓	2'	6"	Grey Clay + Black Muck
50	✓		6"	Ironstone Nodules + Red Brown Soil.
25	✓?		9"	Tan Brown Soil on float? stopped.
1300E		3'	0"	Brown Muck + Grey Clay.
75		3'	0"	Brown Muck + Grey Clay.
50		3'	0"	Grey Clay + Brown Muck.
25		3'	0"	Grey Brown Clay + Brown Muck.
1200E	stopped	1'	8"	Beige Clay + Brown Muck + Qtz fragments.
75	stopped	1'	5"	Brown Muck + Coarse Grit + Rock chips + Fragments
50	stopped.	1'	6"	" " " " " " "
25	stopped	1'	7"	Brown Muck + ~~Coarse Grit~~ Rock fragments + chips (quartzite?)
1100E	stopped	1'	8"	Grey Coarse Muddy Clay + Rock chips + Fragments.
75	stopped	1'	2"	Orange Clay + Rock chips (quartzite?)
50		3'	0"	Khaki Green Clay.
25	✓	1'	6"	Brown weathered siltstone chips/powder +Qtz Veins in Black muck.
1000E.	✓		9"	" " " "
75	✓		8"	" " " " + clay.
50	✓		12"	" Orange " " " "
25	✓		12"	" " " " "
900E	✓		6"	Black soil + Roots + Quartzite chips + pebbles.
75	✓	1'	2"	Coarse Grit + Quartz fragments.
50	✓		8"	Black gritty soil + Roots + Quartzite chips + pebbles
25	✓		7"	Grey " " " + " " "
800E	stopped	1'	6"	Grey gritty clay + Quartzite chips + fragments.
75	stopped.	1'	6"	" " " " "
50		3'	0"	Brown Clayey Sand. (in old prospectors pit)
25		3'	0"	Brown Coarse Sandy Soil.
700E		3'	0"	Brown Gritty muddy soil + Quartzite pebbles.
1675E	stopped ✓?	2'	9"	Brown Gritty mud + Quartzite chips.
			Line	2600N

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Line 2600N

2600N

226105

Form No. 69/80

RENISON LIMITED

FIELD SHEET FOR GEOCHEMICAL SURVEY

AREA _____ TRAVERSE Line 2600N DATE _____ OBS _____

2600N bedrock "

STATION	SAMPLE NO.	DEPTH		DESCRIPTION
650E	✓	2'	10"	Brown Gritty Mud + Rock chips.
25	✓	2'	0"	Brown & White weathered siltstone? + Gritty black Mud
600E	✓	2'	0"	Brown weathered siltstone? + " Grey Mud.
75	✓	1'	6"	Coarse Grit + weathered rock in Grey soil.
50	✓	1'	6"	Brown Siltstone? powder + Gritty black Mud
25	✓	2'	0"	" " " + " Grey "
500E	✓		6"	Gritty grey brown soil + rock chips.
75	OLD DAM IN CREEK?		12"	Grey rock chips in gritty soil.
50	✓	1'	4"	Brown siltstone? powder + Coarse grey grit.
25	stopped	2'	0"	Coarse grit in Grey black Mud.
400E	✓	2'	9"	Grey grit + rock chips. stopped.
75	✓	1'	7"	Brown siltstone? powder + Gritty black soil.
50	✓		12"	Black soil + Granite? chips.
25	stopped ✓?	1'	4"	Quartz + Rock chips in Gritty black soil.
300E	✓	1'	10"	Brown siltstone? Powder + Quartz Fragments in Grey Clay/Mud

2600N

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Line 2200N

2200N

226106

Form No. 65/65

RENISON LIMITED

FIELD SHEET FOR GEOCHEMICAL SURVEY

AREA _____ TRAVERSE Line 2200N DATE _____ OBS _____

Line 2200N Bedrock

STATION	SAMPLE NO.	DEPTH	DESCRIPTION
300E	stopped	1' 6"	Beige Clay + Quartz Pebbles & Grit.
25		3' 0"	Brown weathered Rock (Siltstone?)
50	stopped	2' 0"	Yellow Tan Coarse Sand (or Powdered Rock)
75	stopped	9"	Black Gritty soil + Quartz chips & Fragments
400E	stopped	1' 6"	Grey soil + Qtz chips & pebbles
25	stopped	1' 3"	Black soil + " "
50	stopped	1' 1"	" " + " "
75	stopped	1' 2"	" " + " "
500E		8"	Sandy Brown Soil from bank of Creek
25	stopped	~~2' 0"~~ 11"	Black Soil & Roots + Qtz fragments & Pebbles
50	stopped	~~1' 11"~~ 2'0"	Grey Brown Muddy Coarse Grit
75	✓	~~3' 0"~~ 1'1"	Brown siltstone? chips & clay.
600E		~~1' 6"~~ 3'0"	Orange grey clay + Black Mud & Qtz pebbles
25	stopped	~~2' 0"~~ 1'6"	Brown Mud & Coarse Grit.
50	stopped	~~3' 0"~~ 2'0"	" Muddy Gritty Clay.
75		~~2' 9"~~ 3'0"	Grey clay + Grit & Mud.
700E	✓?	~~3' 0"~~ 2'9"	Brown Grey Clay (weathered siltstone?)
25		~~1' 5"~~ 3'0"	Grey gritty muddy clay.
50	stopped	~~1' 9"~~ 1'5"	Grey Clay + Mud + Rock Fragments
75	stopped	~~1' 3"~~ 1'9"	" " " " + Grit
800E	stopped	~~1' 7"~~ 1'3"	Grey mud & Qtz Fragments.
25	stopped	~~1' 6"~~ 1'7"	" " " " + Grit
50	stopped	~~2' 0"~~ 1'6"	Black Mud & Qtz pebbles.
75	stopped	~~2' 0"~~ 2'0"	Brown Mud & Coarse Grit.
900E	stopped	~~1' 8"~~ 2'0"	" " " "
25	stopped	~~1' 6"~~ 1'8"	" " " "
50	stopped ✓?		1'6" " " " + Brown weathered (Siltstone?) Rock
75		3' 0"	Grey Beige Clay + Brown Mud.
1000E	✓	12"	Black Gritty Soil on Outcrop

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Line 2200N

Line 2200

226107

Form No. 59/69

RENISON LIMITED

FIELD SHEET FOR GEOCHEMICAL SURVEY

AREA TRAVERSE Line 2200N DATE OBS

2200N Bedrock

STATION	SAMPLE NO.	DEPTH		DESCRIPTION
1025E	stopped ✓?	2'	9"	Orange Brown White Grey Clay + Rock chips.
50	✓	2'	0"	Brown Orange Clay & Powdered Rock (Grey clay & Qtz above)
75	✓	1'	2"	Brown Clay & Brown siltstone chips. (Grey clay above)
1100E		3'	0"	Tan Grey clay + Brown Mud.
25		3'	0"	" " " " Gritty "
50		3'	0"	" Brown " + " " "
75		3'	0"	" " " + " — "
1200E	✓?	2'	9"	" " " & Powdered Clayey Rock. (very hard clay)
25	✓?	1'	6"	" " " " " " (" ")
50	stopped	1'	6"	Brown Mud & Rock Fragments
75		3'	0"	Brown Tan Clay + Some Rock Fragments
1300E		3'	0"	Tan Grey clay + Brown Mud.
25		3'	0"	Tan Grey Clay + Brown Mud.
50		3'	0"	Grey Clay & Brown Mud.
75	stopped ✓?	1'	5"	Grey Coarse Grit.
1400E	✓	2'	9"	Grey Green clay + Brown Mud on Bedrock.
25	✓?	1'	3"	As below.
50	✓		5"	Dark Grey Soil & Rock chips on bedrock
75	stopped ✓?	2'	0"	Coarse Grit & Brown Mud
1500E	✓		6"	Brown Mud on Bedrock
25	✓		5"	Brown Mud on Bedrock.
50	✓		6"	Grey white Rock chips in clayey soil.
75	✓	1'	7"	Grey White clay / weathered Rock & Brown Mud
1600E	stopped	1'	7"	Khaki Mud & Coarse Grit.
25		3'	0"	Orange-Khaki Clay.
50		3'	0"	" " "
75		3'	0"	Orange clay + Khaki Mud
1700E		3'	0"	Orange clay + Khaki Mud
25	✓		7"	Khaki Soil & Siltstone chips & Fragments.

2300N

Line 2200N

226108

Form No. 84/69

RENISON LIMITED

FIELD SHEET FOR GEOCHEMICAL SURVEY

AREA _____ TRAVERSE Line 2200N DATE _____ OBS _____

2200N Bedrock

STATION	SAMPLE No.	DEPTH		DESCRIPTION
1750E	dose.	3'	8"	Orange khaki clay + siltstone? Rock chips.
75	✓	2'	0"	Orange Yellow Powdered Rock
1800E		3'	0"	Yellow Brown/Orange clay/weathered Rock.
25	✓	2'	8"	Orange Yellow Clay + Yellow siltstone? chips.
50	dose.	3'	0"	Orange-Yellow Clay + Yellow siltstone? chips
75	✓	1'	6"	GREY Rock chips in Orange Brown clay.
1900E.	✓		12"	Grey Rock chips in Orange Brown Clay.
		END.		

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1800N

Line 1800N 226109

Form No. 69/69

RENISON LIMITED

FIELD SHEET FOR GEOCHEMICAL SURVEY

AREA TRAVERSE Line 1800N DATE OBS

1800N Bedrock

STATION	SAMPLE NO.	DEPTH		DESCRIPTION
1900E	✓	1'	9"	Beige Brown Clay & Rock chips.
75		3'	0"	" " "
50		3'	0"	" ORange "
25	done	3'	0"	Khaki clay + Rock chips.
1800E	✓	1'	5"	" " + Grey " "
75		3'	0"	ORange Khaki clay.
50		3'	0"	Khaki Clay.
25		3'	0"	ORange khaki clay.
1700E	✓	2'	10"	" " Grey clay + weathered Rock.
~~25~~		3'	0"	Khaki Yellow clay.
50	done	3'	0"	Grey Orange beige clay.
25		3'	0"	Orange Khaki clay.
1600E		3'	0"	" Yellow Brown clay.
75	✓	2'	10"	Tan clay + Grey rock chips.
50	✓	2'	7"	Tan Orange clay + Greyweathered rock + Grey Rockchips
25	✓	2'	6"	Brown Orange clay + Grey Rock chips
1500E	✓	1'	2"	Orange beige Grey weathered rock & chips.
75	✓		2"	Black Soil & Vegetation on outcrop
50	✓	1'	7"	" Gritty Mud + Grey Green weathered rock.
25	✓		9"	" " " + Beige Rock chips.
1400E	✓		3"	Black Soil & Vegetation on outcrop.
75	✓	1'	4"	" Gritty Mud over bedrock.
50	✓	1'	6"	" " " " "
25	✓		6"	Black Soil & Vegetation on outcrop
1300E	✓		8"	" Alluvial " + " " " "
75	✓		8"	" Soil + " " " "
50	✓		3"	Black Mud + " " "
25	✓		2"	" Soil + " " "
1200E	✓		5"	" Mud + " " "

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Line 1800N

226110 1800N

Form No. 69/89

RENISON LIMITED

FIELD SHEET FOR GEOCHEMICAL SURVEY

AREA TRAVERSE Line 1800N DATE OBS

1800N Reddish

STATION	SAMPLE NO.	DEPTH		DESCRIPTION
1175E	✓		10"	Black gritty Mud + Vegetation over bedrock
50	✓		3"	Black Soil + " on outcrop.
25	✓		6"	" " + " " "
1100E	✓		4"	" " + " " "
75	✓		12"	Black gritty mud. + " on bedrock.
50	✓		12"	" " " + " " "
25		3'	0"	Tan Grey Clay
1000E	close	3'	0"	— " "
75		3'	0"	" + Beige Clay.
50	stopped	1'	9"	Coarse Grit in Grey brown Mud.
25		3'	0"	Tan Grey Clay.
900E		3'	0"	" " "
75		3'	0"	" " "
50		3'	0"	— Grey "
25	stopped	1'	6"	Grey gritty soil + 1 chip of Tan Rock at bottom.
800E	stopped		12"	" " " + Rock chips
75		3'	0"	Beige Grey Clay
50	✓	1'	4"	Grey + beige Rock chips in Grey soil
25		3'	0"	Tan Grey Clay
700E		3'	0"	Grey Clay + Brown Mud.
75	stopped	1'	2"	Brown Gritty Mud + Rocks
50	stopped	1'	6"	" " " "
25		3'	0"	Grey Clay
600E		3'	0	Orange Clay.
75	✓	1'	5"	Khaki orange Powdered Rock.
50	✓		8"	Orange Khaki Pod + Rock chips + Fragments
25	✓	1'	7"	" Brown Clay + Powdered Rock.
500E	stopped.		11"	Black Gritty Mud + Vegetation + Rock fragments
475E		3'	0"	Coarse Grit in Brown Muddy Clay

1800N

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Line 1800N

226111 1800N

Form No. 69/69

RENISON LIMITED

FIELD SHEET FOR GEOCHEMICAL SURVEY

AREA TRAVERSE Line 1800N DATE OBS

1800N Reject

STATION	SAMPLE NO.	DEPTH		DESCRIPTION
450E		3'	0"	Coarse Grit in Brown Mucky Clay + Pebbles.
25	stopped	1'	3"	Beige Brown Sandy Soil + Rock Frags. (Caving in)
400E	✓	1'	5"	Orange Clayey Soil + Rock chips.
75	✓	2'	2"	" Khaki clay + Powdered Rock.
50	✓	2'	6"	Grey clay + Powdered Rock + chips.
25		3'	0"	Black Gritty Soil / Mud + Brown clay at bottom
300E	✓?	3'	0"	Orange Brown sand / weathered Rock
275E	✓?	1'	10"	" " " / weathered Rock
				END.

1200N

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Line 1400N

1400N

226112

Form No. 66/68

RENISON LIMITED

FIELD SHEET FOR GEOCHEMICAL SURVEY

AREA _____ TRAVERSE Line 1400N DATE 085

1400N Bedrock

STATION	SAMPLE NO.	DEPTH		DESCRIPTION
1750E		3'	0"	Orange Brown Clay + Rock Frags.
25		3'	0"	Greenish Tan clay + " "
1700E	✓	2'	6"	Orange Brown Clay + Rock chips (silt stone?)
75		3'	0"	Yellow Orange clay/weathered rock.
50		3'	0"	Khaki clay.
25		3'	0"	" " (Gritty at bottom)
1600E	✓	2'	6"	Orange Brown Clay/Weathered rock + Rock chips
75		3'	0"	Khaki Grey Orange clay/weathered rock.
50	✓	1'	1"	Khaki Orange clay + rock chips.
25	✓		8"	Khaki soil + Roots + Rock chips + Fragments.
1500E	✓	1'	4"	Orange Brown clay + Rock chips
75	dose	3'	0"	Tan Grey clay + rock Fragments.
50	✓	1'	6"	Tan clay + rock chips in outcrop/scree
25	dose	3'	0"	Orange khaki weathered rock + chips.
1400E	✓	1'	6"	Khaki clay + rock chips.
75	stopped?		11"	Khaki clay in scree/outcrop.
50	✓		3"	Brown soil + Roots on outcrop.
25	✓	2'	0"	Orange clay + grey rock chips.
1300E		3'	0"	Khaki + Orange clay.
75	✓	1'	3"	Grey gritty weathered rock + Brown Mud.
50		3'	0"	Blurry Grey clay + Brown Mud.
25		3'	0"	Green beige clay + " "
1200E	✓	2'	9"	Tan Clay + Greenish rock chips.
75	dose	3'	0"	Red Tan Orange clay + weathered rock
50	✓	3'	0"	Orange khaki clay + rock chips.
25	✓	2'	6"	Orange khaki clay + " "
1100E	✓	1'	5"	Orange khaki clay + " "
75	✓		12"	Khaki Grey clay + " "
1050E	✓		3"	Brown Mud + Vegetation on outcrop.

Line 1400N.

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Line 1400N

1400N

226113

Form No. 64-08

RENISON LIMITED

FIELD SHEET FOR GEOCHEMICAL SURVEY

AREA TRAVERSE Line 1400N DATE OBS

1400N Bedrock "

STATION	SAMPLE NO.	DEPTH		DESCRIPTION
1025E	✓		3"	Brown Muo + Vegetation on outcrop.
1000E	✓		6"	" " " " "
75	✓		4"	" " " " "
50	✓		4"	" " " " "
25	✓		3"	Grey Soil + " " "
900E	✓		9"	Orange Brown Soil on outcrop.
75	✓		6"	" " " " "
50	✓		3"	Black Soil + Vegetation on outcrop.
25	✓		7"	Brown " + " " "
800E	✓		3"	" " " " "
75	✓		3"	" Muo + " " "
50	✓		8"	" " + " + Rock Fragments "
25		3'	0"	Khaki Brown clay (Orange clay at top of hole)
700E	✓	1'	3"	Yellow Brown soil on outcrop/sluice
75	✓		3"	Black Soil + Vegetation on outcrop
50	✓		8"	Black Muo + " " "
25	✓		3"	" " + " " "
600E	✓		5"	" " + " " "
75	✓	2'	6"	Powdered Sandy Orange Brown Weathered rock
50	✓	2'	0"	Orange brown Clay + Grey rock chips.
25		3'	0"	Yellow brown clay.
500E	✓		9"	Yellow brown Soil on outcrop.
75	✓	1'	6"	Grey Clay + Rock chips (from base of fallen tree)
50	✓		7"	Red Beige soil + Roots on outcrop.
25	✓		7"	Black soil + Muo + Roots " "
400E	✓		5"	Black Orange Soil + Veg on " "
75	✓	1'	4"	Brown Soil + Rock chips.
50	stopped?	1'	9"	Coarse Grit + Brown Muo.
325E	stopped ✓2	2'	0"	" " + " "

1400N

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Line 1400N

1400N

226114

RENISON LIMITED

FIELD SHEET FOR GEOCHEMICAL SURVE

GR. TRAVERSE Line 1400N DATE 085

1400N Bedrock

LOC.	OVERBURDEN	DEPTH		DESCRIPTION
300E	stopped ✓?	2'	9"	Coarse Grit + Brown Mud
75	stopped ✓?	2'	1"	" " " " "
50	stopped ✓?	1'	4"	" " " " " + small pebbles
25		3'	0"	Black gray mud + fine grit.
200E	✓	2'	9"	Brown Grey clay + beige rock chips
75	✓	1'	8"	Quartz Flagmark in grey soil + brown rock chips?
50	✓		12"	" " " Black " " " " "
25	✓	1'	3"	" " " " " " " " "
100S	stopped		12"	" " " " "
75	✓	2'	2"	" " " Black " " " "
50	✓	1'	7"	Brown Sand / weathered Rock.
25	✓		4"	Clay? / " "
0E	✓		2"	" " " " "
				END.

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1200N

Line 1200N

226115

Form No. 69/89

RENISON LIMITED

FIELD SHEET FOR GEOCHEMICAL SURVEY

AREA _____ TRAVERSE Line 1200N DATE _____ OBS _____

1200N Bedrock

STATION	SAMPLE NO	DEPTH		DESCRIPTION
0E	✓		12"	Orange tan Clay + Rock chips.
25	✓	2'	0"	" " " + " "
50	✓	1'	4"	" Brown Clay + Grey " "
75	✓	1'	6"	Tan Orange Clay + " " "
100E	✓		5"	Brown Soil + Roots + Rock chips + Fragments.
25	✓		8"	Khaki Tan Clay + " "
50	✓		9"	Brown Orange Clayey Soil + Rock chips.
75	✓	1'	5"	" " " " + " "
200E	✓		9"	Grey Soil + Roots on bedrock/scree?
25	✓	2'	0"	Orange brown clay + Khaki Green Powdered Rock
50		3'	0"	Coarse Grit in Black Muck.
75	stopped.	2'	6"	" " " " "
300E	✓		12"	Orange Grey clay + grey rock chips.
25	✓	1'	6"	Orange clay + " " "
50	✓		12"	Red Clayey soil + Khaki Rock chips.
75	✓		7"	Khaki brown soil + Rocks + Rock chips.
400E.	✓	2'	0"	Orange Brown clayey soil + " "
25	✓		7"	Brown Clayey Soil + Rock chips.
50	✓		11"	Orange Brown Clay + " "
75	✓		6"	Tan Brown Clayey Soil on bedrock
500E	✓		2"	Brown Muck + Vegetation on outcrop. (some Quartz bags)
25	✓		8"	Beige Clay + Rocks on outcrop.
50	✓		8"	Beige Soil + Roots on Outcrop.
75	✓		5"	Black + Tan Soil + Vegetation on outcrop.
600E	✓		5"	Black Soil + Roots on outcrop.
25	✓	2'	9"	Yellow Orange Clay + Rock Chips.
50	✓	2'	10"	Purple Grey Clay + weathered rock.
75	stopped.	2'	9"	Grey beige clay
700E	stopped/dense		12"	Brown Muck + Rock Fragments.

1200N

Line 1200N

1200N

226116

Form No. 69/69

RENISON LIMITED

FIELD SHEET FOR GEOCHEMICAL SURVEY

AREA TRAVERSE Line 1200N DATE OBS

1200N bedrock

STATION	SAMPLE No.	DEPTH		DESCRIPTION
725E	✓		5"	Black Muck + Vegetation on Float/outcrop.
50		3'	0"	Grey clay + Brown Muck.
75	✓		9"	Brown Muck + Vegetation on Outcrop?
800E	✓		2"	Black Muck + Vegetation in Float? Virtually A Stream Sediment Sample.
25	✓		9"	Brown Soil + Vegetation + Rock Fragments + chips
50	✓	2'	5"	Orange Brown Clay + Grey rock chips.
75	✓		12"	Khaki clay on bedrock.
900E	✓	1'	4"	Tan & Khaki clay on bedrock.
25	✓		9"	Khaki Brown clay + rock chips.
50		3'	0"	Orange Brown Clay.
75		3'	0"	Orange clay + Brown Muck.
1000E	✓		2"	Black Soil + Vegetation + Rock chips + Fragments
25	✓		8"	Khaki Brown Soil + roots + bluey grey rock chips
50	✓	2'	0"	Khaki Orange clay + weathered rock
75	✓	1'	10"	" " " + " "
1100E	✓?	2'	3"	Bluey gray clay + Brown Muck + weathered rock.
25		3'	0"	Orange beige clay.
50	close	3'	0"	Orange ~~clay~~ Khaki clay.
75	✓	2'	10"	Orange + Grey clay + rock chips.
1200E		3'	0"	Khaki + Orange clay.
25	✓	2'	6"	Orange Yellow weathered rock + clay.
50	✓	2'	10"	Orange Yellow Clay + weathered rock.
75	✓	2'	0"	Orange clay + Rock chips.
1300E	✓	2'	11"	Orange Yellow Grey Clay + weathered rock + chips.
25		3'	0"	Orange clay.
50	✓		11"	Khaki brown clay + rock chips.
75	✓	1'	6"	Khaki grey clayey soil + rock chips.
1400E	✓	1'	4"	Orange Brown Clay + Red + Clay rock chips.
1425E	✓		10"	Orange Brown Clayey soil + Rock chips

1200N

Line 1200N

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Form No. 69/89

RENISON LIMITED

FIELD SHEET FOR GEOCHEMICAL SURVEY

AREA | TRAVERSE Line 1200N | DATE | OBS

1200N. Bedrock

STATION	SAMPLE NO	DEPTH		DESCRIPTION
1450E	✓		9"	Tan Clay + Rock chips
75	✓		8"	Black Soil + Rock chips + fragments on outcrop.
1500E	✓	1'	5"	Khaki Orange clay + Grey Rock chips.
25		3'	0"	Khaki clay + Orange sandy clay.
50		2'	6"	Orange grey clay + rock chips.
75		3'	0"	Orange Brown Clay.
1600E	✓	2'	9"	Tan Khaki clay + Rock chips.
25	✓	1'	2"	Tan clay + bedrock/Scree? chips.
50		3'	0"	Yellow Orange clay + Yellowish rock chips
75	clone	3'	0"	" " " + " " "
1700E		3'	0"	Beige Orange clay
				END.

Line 1000N

Line 1000N

226118

Form No. 69/69

RENISON LIMITED

FIELD SHEET FOR GEOCHEMICAL SURVEY

AREA TRAVERSE Line 1000N DATE OBS

1000N Bedrock

STATION	SAMPLE NO.	DEPTH		DESCRIPTION
1300E		3'	0"	Orange khaki fine sandy clay.
75	close	3'	0"	Orange Brown clay + rock chips.
50	✓	1'	6"	Khaki Orange clay + siltstone chips
25	✓	1'	9"	" " " + " "
1200E	✓	2'	2"	" " Grey " + " "
75	✓	2'	3"	" " " + " "
50	close	3'	0"	Orange Tan khaki clay + " "
25		3'	0"	" white " " + weathered Rock.
1100E		3'	0"	Yellow brown Grey clay + Grey Mud.
75		3'	0"	Khaki Orange Clay.
50		3'	0"	" " Yellow "
25		3'	0"	" " "
1000E	✓	2'	0"	" Clay + Orange Rock chips.
75		3'	0"	Orange Brown weathered rock + Qtz fragments
50		3'	0"	" " " " + Clay.
25		3'	0"	Bluey Grey clay + Brown Mud.
900E		3'	0"	Grey " + " "
75		3'	0"	" " + " "
50	stopped	1'	5"	Coarse Qtz grit in Grey clay.
25	✓		8"	Grey soil + Vegetation + Rock chips.
800E		3'	0"	Tan Grey clay + Brown Mud.
75	✓		3"	Beige clay + Vegetation + Qtzite? chips
50	✓	2'	0"	Brown Soil + Orange Red weathered rock chips
25	stopped ✓?	1'	5"	Grey clay + Rock chips
700E	✓		6"	Grey Soil + vegetation + Qtzite? chips.
75	✓		6"	Brown clayey soil + Rock chips on outcrop
50	✓		5"	" " " + " "
25	✓		9"	Orange " " + " "
600E	✓	2'	0"	Tan Grey clay + " "

1000N

120 /

1000N

Line 1000N

226119

Form No. 69/69

RENISON LIMITED

FIELD SHEET FOR GEOCHEMICAL SURVEY

AREA | TRAVERSE Line 1000N | DATE | OBS

1000N Red rock

STATION	SAMPLE NO.	DEPTH		DESCRIPTION
575E	✓		6"	Brown Mud + Vegetation + Rockchips on outcrop
50	✓		8"	" " + " + " "
25	✓		8"	" " + " + " "
29E OR 500E	✓		8"	" " Muddy Soil + " + " "
				END

1000N

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Baseline 2100E

B/L 2100E

226120

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Form No. 69/69

RENISON LIMITED

FIELD SHEET FOR GEOCHEMICAL SURVEY

AREA | TRAVERSE Baseline 2100E | DATE | OBS

B/L 2100E

STATION	SAMPLE NO.	DEPTH		DESCRIPTION
4975N		3'	0"	Grey Muddy Clay + Siltstone fragments.
50	✓	2'	1"	Tan Clay + weathered siltstone chips.
25	✓	2'	3"	Brown Clay + Siltstone chips
4900N	✓?	1'	8"	Black Muck in Marsh + siltstone chips (stopped)
75		3'	0"	Brown white Sandy Clay in marsh + siltstone + Quartz fragments
50	stopped	1'	9"	Brown Clay + Misc. pebbles in Marsh (stopped 3 times.)
25		3'	0"	Brown Sandy Clay in Marsh next to creek.
4800N		3'	0"	Brown Sand next to creek.
75	✓		6"	Yellow Brown Clayey Soil on Ironstone outcrop.
50	✓		3"	Ironstone Pebbles + chips.
25	✓		12"	" " " " + Red Brown soil
4700N		3'	0"	Yellow Brown Clay + Ironstone Pebbles.
75	✓?	2'	3"	" " Siltstone? fragments.
50		3'	0"	Yellow Red Brown white clay + Quartz Fragments
4625N		3'	0"	Silver Grey Clay in creek bed (weathered schist?)
4600N	See Line 4600N			
4575N	✓?	1'	3"	Quartz Fragments in black soil (stopped)
50	✓	1'	3"	Brown Coarse Grained Rock.
25	✓?		12"	Quartz chips + Fragments in Tan Clay (stopped)
4500N		3'	0"	Tan Clay.
75	✓	2'	10"	Beige grey weathered siltstone?
50	✓	2'	0"	Brown weathered rock + ft. Tan Clay.
25	✓	1'	5"	Soft Brown Yellow siltstone? chips.
4400N		3'	0"	Yellow Orange Sandy Clay.
75		3'	0"	" " " "
50	✓	1'	8"	Yellow Orange Clay + siltstone? chips.
25	✓		8"	Ironstained siltstone? chips + Pebble on outcrop
4300N	✓		8"	Ironstone nodules on outcrop.
4275N	✓		9"	" " "

B/L 2100E

122.

Baseline 2100E

226121

B/L 2100E

Form No. 58/68

RENISON LIMITED

FIELD SHEET FOR GEOCHEMICAL SURVEY

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AREA TRAVERSE Baseline 2100E DATE OBS

B/L 2100E

STATION	SAMPLE NO.	DEPTH		DESCRIPTION
4250N	✓?	3'	0"	Coral Pink Clay + Rockchips + Brown Mud.
25	✓	2"–2'	0"	Yellow Brown Clay + Ironstone on Surface.
4200N	See Line 4200N			
4175N	✓		7"	Ironstone fragments on outcrop
50		3'	0"	Beige Grey Clay + Brown Mud.
25	✓	2'	1"	Beige Brown Clay + Quartzite chips.
4100N	✓	1'	6"	" " " " "
75	✓	1'	3"	Brown Soil + Ironstone Fragments on outcrop
50	✓	1'	6"	Quartzite fragments + chips in Dark brown Mud.
25	✓	1'	6"	" " " in Black Mud + Vegetation.
4000N	✓		12"	" " " " " "
75	✓		10"	" " " Black Brown Soil.
50		3'	0"	Beige Brown Sandy Clay + Black Mud.
25	✓?	2'	10"	Quartz Fragments in Black Mud.
3900N	✓		12"	" " " " "
75	✓	2'	6"	Tan Brown Clay + Weathered Quartzite chips.
50	✓	2'	0"	" " " " " "
25	✓	1'	6"	" " " + Quartz chips in Black Mud.
3800N	See line	3800N		
3775N	done	3'	0"	Green white clay + weathered rock.
50		3'	0"	Dark Green clay + vegetation.
25	✓		10"	Ironstone chips + Pebbles.
3700N	✓	2'	4"	" " in Orange clay.
75		3'	0"	Yellow Orange Clay (Ironstone on surface)
50		3'	0"	Brown Orange Clay (" " ") Samples 5 more west of line
25	✓	1'	2"	Ironstone chips + Nodules in Red Brown Soil.
3600N	✓		12"	" " " " " "
75	✓		11"	" " " " " "
50	✓		7"	" " " + vegetation + Light Brown Soil.

B/L 2100E.

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2100E.

Baseline 2100E

226122

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Form No. 99/80

RENISON LIMITED

FIELD SHEET FOR GEOCHEMICAL SURVEY

AREA B/L 2100E | TRAVERSE Baseline 2100E | DATE | OBS

STATION	SAMPLE NO.	DEPTH		DESCRIPTION
3525N	✓		12"	Ironstone chips + Nodules in Red Brown Soil.
3500N		3'	0"	Whitish Orange Clay.
75	✓?	2'	10"	Orange Clay + Orange Grey weathered Rock-chips.
50		3'	0"	White Orange clay + charcoal? chips?
3425N		3'	0"	White green clay.
3400N	See line	3400N.		
	TOTAL 60	SAMPLES		33 - Definite Bedrock
				7 - Possible Bedrock
				1 - Stopped before 3' Deep.
				19 - Taken to 3' but no bedrock

B/L 2100E

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REPEATED SAMPLES.

226123

Form 08 - 35700

RENISON LIMITED

FIELD SHEET FOR GEOCHEMICAL SURVEY

AREA TRAVERSE DATE OBS

STATION	SAMPLE No.	DEPTH		DESCRIPTION
Line 5000N.				
1525E	stopped. ✓?	1'	6"	Brown Tan Clay + Weathered rock + Black Mud.
1550E	stopped ✓?	1'	7"	Tan Clay + Coarse Grit (including Ironstone nodules)
1575E	✓		5"-8"	Ironstone nodules + Rocks.
1600E	✓		3"-8"	" " + "
1625E.	stopped.	1'	9"	Orange clay + Brown Mud.
Line 4600N				
1875E		3'	0"	Silver Grey clay / weathered Rock (specular haematite?) Ironstone nodules down to 12N
1900E	✓	2'	6"	Yellow Brown clay + weathered Rock + chips
25	✓		10"	Quartz? chips + whitish clay + Ironstone nodules
50	stopped.	1'	10"	Yellow Brown Clay + Rock Fragments + chips.
75	stopped.	1'	7"	(caving in) Ironstone Nodules
2300E	stopped ✓?		10"	Beige Muddy Clay + Rock Frags
25		3'	0"	Yellow Orange clay + weathered rock (sandstone?)
50	✓	1'	6"	Ironstone Nodules (2 bags.)
75	✓		2"	" " Roots + Vegetation
2400E	✓?		2"	" " Blacksoil + "
25	✓?		7"	" " + Beige Mud + "
50	✓		8"	" " Brown Soil + "
75	✓		5"	" " (2 bags)
2500E.	✓?		12"	White Grey clay/Mud + Qtz chips/fragments.

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RENISON LIMITED 226124 APPENDIX 7

GEOCHEMICAL SOIL SAMPLES

AREA EAST HEEMSKIRK GRID. -85 MESH FRACTI

LINE NO. 5000N. P.P

LOCATION	Sn	As	Cu	Pb	Zn	Ni		
1100E	30	<5	<10	10	30			
1125	40	"	"	40	10			
1150	15	"	"	20	10			
1175	20	"	"	<10	<10			
1200	<5	"	"	10	"			
1225	50	"	"	10	"			
1250	15	"	"	20	"			
1275	15	15	30	10	"			
1300	15	<5	<10	"	"			
1325	25	15	70	"	10			
1350	35	20	<10	"	"			
1375	25	10	"	20	"			
1400	20	35	"	"	"			
1425	30	<5	"	<10	<10			
1450	20	"	"	20	10			
1475	35	"	20	20	"			
1500	15	"	<10	10	<10			
1525			20	10	20			
1550			10	25	30			
1575	See Repeats		50	30	205			
1600			15	10	25			
1625	100	50	60	45	15			
1650	10	15	50	40	10			
1675	30	5	100	30	130			
1700	15	<5	<10	10	<10			
1725	50	"	"	"	"			
1750	5	"	"	<10	"			
1775	35	"	"	"	"			
1800	20	"	"	"	"			

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RENISON LIMITED

GEOCHEMICAL SOIL SAMPLES

AREA EAST HEEMSKIRK GRID. -85 MESH FRACTION

LINE NO. 5000N. p.p.m

LOCATION	Sn	As	Cu	Pb	Zn	Ni		
1825	25	<5	<10	10	<10			
1850	15	"	"	20	"			
1875	20	"	"	<10	"			
1900	20	"	"	"	"			
1925	25	"	"	10	"			
1950	10	"	"	20	"			
1975	80	"	"	<10	"			
2000	<5	"	"	"	"			
2025	25	"	"	"	"			
2050	5	"	"	"	"			
2075	35	"	"	10	"			
2100	15	"	"	<10	"			
2125	40	"	"	10	"			
2150	5	"	"	"	"			
2175	30	"	20	20	10			
2200	20	"	<10	60	<10			
2225	40	"	"	10	"			
2250	15	10	"	<10	"			
2275	10	15	10	20	"			
2300	10	5	<10	10	"			
2325	15	15	"	<10	"			
2350	5	10	20	"	"			
2375	<5	20	<10	"	"			
2400	15	<5	"	"	"			

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RENISON LIMITED

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GEOCHEMICAL SOIL SAMPLES

AREA EAST HEEMSKIRK GRID. -85 MESH FRACTION

LINE NO. 5000N REPEAT SAMPLES. P.P.

LOCATION	Sn	As	Cu	Pb	Zn	Ni		
~~1500E~~								
1525	30	10						
1550	80	10						
1575	770	50						
1600	160	<5						
1625	80	120						

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RENISON LIMITED

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GEOCHEMICAL SOIL SAMPLES

AREA EAST HEEMSKIRK GRID. — 85 MESH FRACTION

LINE NO. 4600N. p.p.m

LOCATION	Sn	As	Cu	Pb	Zn	Ni		
1200 E	<5	10	<10	20	10			
1225	15	<5	"	10	10			
1250	35	"	"	10	20			
1275	40	"	"	20	10			
1300	10	"	"	10	10			
1325	<5	"	"	10	10			
1350	40	"	"	10	<10			
1375	60	"	"	10	<10			
1400	30	"	"	20	10			
1425	50	"	"	20	<10			
1450	40	"	"	<10	"			
1475	70	"	"	<10	"			
1500	20	"	50	10	20			
1525	30	"	30	<10	"			
1550	110	"	<10	10	"			
1575	30	"	"	20	10			
1600	20	"	"	10	"			
1625	30	"	"	30	"			
1650	40	"	"	10	<10			
1675	100	"	"	<10	<10			
1700	40	"	"	10	10			
1725	30	"	20	10	10			
1750	30	"	40	10	420			
1775	70	50	60	50	250			
1800	10	<5	70	20	10			
1825	70	10	<10	30	50			
1850	35	10	<10	10	10			
1875	360	15	425	35	110			
1900	35	<5	<10	10	10			
1925	30	"	"	"	30			
1950	30	"	"	"	10			

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RENISON LIMITED

GEOCHEMICAL SOIL SAMPLES

AREA EAST HEEMSKIRK GRID. -85 MESH FRACTION

LINE NO. 4600N. p.p.m.

LOCATION	Sn	As	Cu	Pb	Zn	Ni		
1975 E	80	<5	<10	10	50			
2000	25	"	"	"	30			
2025	25	"	"	"	20			
2050	20	10	70	"	10			
2075	25	10	30	"	70			
2100	20	<5	30	"	140			
2125	40	15	20	"	60			
2150	50	180	530	30	700			
2175	35	15	10	20	20			
2200	120 (40)	50 (40)	10	20	20			
2225	70 (60)	240 (10)	<10 (5)	10 (<5)	10 (15)			
2250	220	80.	25	60	50.			
2275	220 (170)	700 (1060)	40 (35)	40 (80)	100 (170)			
2300	80 (70)	90 (60)	<10 (10)	10 (10)	20 (25)			
2325	240 (50)	380 (800)	20 (75)	40 (125)	90 (160)			
2350	1220	40	65	55	120			
2375	1600	80.	30	80	210			
2400	520	100.	60	125	150			
2425	200 (190)	100 (50)	15	45	25			
2450	120	130	15	50	70			
2475	140	130.	20	120	145			
2500	35	<5	10	5.	10.			

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RENISON LIMITED

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GEOCHEMICAL SOIL SAMPLES

AREA EAST HEEMSKIRK GRID. -85 MESH FRACTION

LINE NO. 4200N. p.p.m.

LOCATION	Sn	As	Cu	Pb	Zn	Ni		
1300 E	<5	<5	<5	10	20			
1325	15	<5	<5	5	10			
1350	15	<5	<5	5	20			
1375	<5	<5	<5	5	5			
1400	20	<5	<5	5	20			
1425	<5	<5	<5	5	10			
1450	10	<5	<5	5	10			
1475	10	<5	<5	5	15			
1500	<5	<5	<5	5	5			
1525	<5	<5	<5	5	10			
1550	20	<5	<5	5	140			
1575	620	20	35	35	155			
1600	1050	300	115	60	210			
1625	900	650	510	1200	1100			
1650	320	100	30	45	80			
1675	680	250	95	80	270			
1700	300	140	55	50	195			
1725	120	40	20	25	100			
1750	45	10	25	120	80			
1775	80	<5	5	140	550			
1800	100	15	5	135	405			
1825	35	<5	5	15	20			
1850	10	70	10	40	170			
1875	10	60	15	65	510			
1900	20	45	10	30	225			
1925	<5	70	50	50	1250			
1950	15	120	55	90	1500			
1975	20	70	15	45	235			
2000	10	60	10	15	80			

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RENISON LIMITED

GEOCHEMICAL SOIL SAMPLES

AREA EAST HEEMSKIRK GRID. −85 MESH FRACTION

LINE NO. 4200N. p.p.m.

LOCATION	Sn	As	Cu	Pb	Zn	Ni		
2025E	5	70	5	5	155			
2050	<5	<5	5	5	90			
2075	5	420	120	70	28,000			
2100	45	20	10	30	560			
2125	35	35	15	20	235			
2150	60	50	85	25	120			
2175	<5	10	10	65	20			
2200	20	<5	5	15	15			
2225	<5	10	105	60	15			
2250	25	<5	5	5	25			
2275	10	10	15	100	20			
2300	30	10	10	40	20			
2325	25	<5	<5	5	20			
2350	35	50	280	1350	1270			
2375	90	10	15	100	380			
2400	30	<5	85	155	900			
2425	50	120	385	2250	1300			
2450	40	200	1150	4600	2250			
2475	45	10	65	120	148			
2500	35	5	25	35	60			

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RENISON LIMITED

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GEOCHEMICAL SOIL SAMPLES

AREA EAST HEEMSKIRK GRID. -85 MESH FRACTION

LINE NO. 3800N. p.p.m.

LOCATION	Sn	As	Cu	Pb	Zn	Ni		
1000 E	180	10	5	10	65			
1025	15	10	5	35	40			
1050	15	<5	5	10	20			
1075	30	<5	<5	5	5			
1100	35	<5	<5	5	5			
1125	20	<5	<5	5	5			
1150	20	<5	<5	5	5			
1175	15	5	<5	<5	5			
1200	<5	<5	<5	<5	5			
1225	15	<5	<5	<5	5			
1250	10	<5	5	10	5			
1275	15	<5	<5	5	5			
1300	5	5	<5	10	5			
1325	50	15	<5	5	5			
1350	35	<5	30	20	150			
1375	30	15	<5	10	15			
1400	20	<5	<5	5	5			
1425	100	10	5	25	120			
1450	80	<5	10	25	245			
1475	40	<5	15	20	115			
1500	30	<5	20	20	125			
1525	45	10	35	15	40			
1550	35	15	95	25	40			
1575	160	130	270	55	465			
1600	80	90	75	25	465			
1625	20	20	65	25	40			
1650	25	30	160	775	40			
1675	15	15	90	60	70			
1700	<5	30	170	25	30			

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RENISON LIMITED

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GEOCHEMICAL SOIL SAMPLES

AREA EAST HEEMSKIRK GRID. -85 MESH FRACTION

LINE NO. 3800N. p.p.m.

LOCATION	Sn	As	Cu	Pb	Zn	Ni		
1725 E	40	<5	420	20	45			
1750	15	<5	380	15	45			
1775	20	120	50	135	360			
1800	35	70	95	75	700			
1825	70	5	10	30	70			
1850	40	<5	5	25	35			
1875	40	<5	30	215	130			
1900	20	15	<5	75	55			
1925	35	100	5	25	180			
1950	20	15	30	65	470			
1975	15	<5	165	15	245			
2000	25	10	5	15	105			
2025	20	15	5	15	95			
2050	15	<5	<5	5	10			
2075	15	50	75	155	1525			
2100	25	<5	<5	5	35			
2125	<5	50	50	60	4,000			
2150	40	100	25	90	70			
2175	70	340	415	85	400			
2200	40	260	110	150	135			
2225	35	80	75	40	1150			
2250	25	80	75	175	550			
2275	35	200	1,300	850	1450			
2300	10	60	1,450	625	975			
2325	20	50	95	285	95			
2350	40	<5	20	50	520			
2375	20	<5	10	45	345			
2400	10	<5	5	10	10			

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RENISON LIMITED

GEOCHEMICAL SOIL SAMPLES

AREA EAST HEEMSKIRK GRID. — 85 MESH FRACTION

LINE NO. 3400N. p.p.m.

LOCATION	Sn	As	Cu	Pb	Zn	Ni		
800E	20	<5	<5	10	5			
825	40	<5	<5	10	5			
850	15	<5	<5	10	5			
875	20	<5	<5	15	5			
900	70	15	<5	5	5			
925	120	10	5	15	5			
950	20	15	35	55	5			
975	<5	5	5	25	5			
1000	20	10	5	15	5			
1025	20	10	<5	5	5			
1050	15	<5	<5	5	5			
[illegible]	<5	5	<5	10	5			
1100	<5	<5	5	10	25			
1125	<5	<5	30	20	25			
1150	60	80	280	30	40			
1175	45	40	145	25	30			
1200	30	45	180	35	25			
1225	60	<5	5	10	25			
1250	45	15	20	25	10			
1275	40	5	135	50	15			
1300	5	<5	5	10	10			
1325	15	40	3250	20	240			
1350	60	5	75	15	160			
1375	50	10	15	15	5			
[illegible]	50	15	15	15	25			
1425	100	5	20	15	40			
1450	180	40	460	40	800			
1475	200	60	480	320	925			
1500	140	60	75	25	220			

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RENISON LIMITED

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GEOCHEMICAL SOIL SAMPLES

AREA EAST HEEMSKIRK GRID. -85 MESH FRACTION

LINE NO. 3400N p.p.m.

LOCATION	Sn	As	Cu	Pb	Zn	Ni		
1525 E	50	<5	10	30	225			
1550	80	35	425	85	575			
1575	60	70	150	40	600			
1600	40	110	105	20	335			
1625	45	180	75	25	410			
1650	45	90	30	25	370			
1675	80	60	45	65	1850			
1700	70	80	40	40	305			
1725	120	30	175	75	1500			
1750	60	80	60	95	366			
1775	40	<5	15	25	320			
1800	40	35	50	85	240			
[illegible]25	30	<5	20	30	80			
1850	25	<5	25	55	210			
1875	70	45	140	100	385			
1900	30	30	100	95	350			
1925	60	30	120	60	305			
1950	50	25	35	25	115			
1975	70	35	65	40	485			
2000	380	30	30	45	210			
2025	40	15	45	55	260			
2050	30	5	5	20	1700			
2075	5	<5	5	25	340			
2100	20	<5	20	30	160			

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RENISON LIMITED

GEOCHEMICAL SOIL SAMPLES

AREA EAST HEEMSKIRK GRID. -8S MESH FRACTION

LINE NO. 3000N. p.p.m.

LOCATION	Sn	As	Cu	Pb	Zn	Ni		
500E	50	5	25	10	5			
525	30	<5	10	10	10			
550	40	<5	5	5	10			
575	20	<5	5	5	15			
600	120	10	5	10	40			
625	120	5	20	10	65			
650	15	<5	5	5	15			
675	50	<5	10	5	30			
700	70	15	150	20	195			
725	240	110	95	15	105			
750	45	60	35	5	15			
775	70	20	45	10	60			
[illegible]	40	5	15	15	55			
825	180	70	85	10	235			
850	120	35	60	20	250			
875	240	35	40	20	190			
900	200	60	55	20	270			
925	340	45	280	60	140			
950	120	70	150	15	55			
975	280	120	30	20	80			
1000	100	60	55	15	45			
1025	120	50	55	25	170			
1050	180	70	1100	35	155			
1075	300	15	125	30	110			
1100	280	35	90	55	305			
1125	20	25	10	5	20			
1150	25	160	95	20	85			
1175	MISSING							
1200	20	80	60	25	45			

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RENISON LIMITED

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GEOCHEMICAL SOIL SAMPLES

AREA EAST HEEMSKIRK GRID. -85 MESH FRACTIO

LINE NO. 3000N. P.P.

LOCATION	Sn	As	Cu	Pb	Zn	Ni		
1225 E	25	20	90	15	80			
1250	10	10	60	15	70			
1275	40	45	180	25	45			
1300	45	35	100	25	20			
1325	20	50	60	20	25			
1350	60	100	195	25	295			
1375	120	130	190	125	350			
1400	10	180	220	150	800			
1425	160	160	70	20	180			
1450	260	60	40	10	90			
1475	80	150	140	55	380			
1500	90	15	60	65	70			
1525	60	5	20	20	90			
1550	40	<5	15	45	190			
1575	35	<5	10	35	75			
1600	10	<5	15	15	40			
1625	<5	<5	5	25	45			
1650	10	<5	5	20	25			
1675	<5	<5	5	15	20			
1700	5	5	5	15	15			
1725	40	5	5	20	30			
1750	120	25	205	40	360			
1775	15	5	15	20	55			
1800	10	10	10	20	35			
1825	10	5	10	25	30			
1850	50	<5	40	35	65			
1875	<5	10	35	40	90			
1900	10	<5	170	50	115			

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RENISON LIMITED

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GEOCHEMICAL SOIL SAMPLES

AREA EAST HEEMSKIRK GRID. -8S. MESH FRACTION

LINE NO. 2600N. p.p.m

LOCATION	Sn	As	Cu	Pb	Zn	Ni		
3000	20	<5	5	5	10.			
325	90	<5	20	5	10			
350	450	<5	10	5	10.			
375	90	<5	15	5	10			
400	180	<5	5	5	10			
425	120	<5	15	20	10			
450	120	<5	10	10	10			
475	120	<5	10	5	10			
500	20	<5	30	130	15			
525	20	<5	5	35	20			
550	40	<5	<5	30.	15			
575	25	<5	5	15	15			
[illegible]00	35	<5	10.	45.	30.			
625	170	10	5	25	15			
650	170	25	25	125	40.			
675	35	10	10	45	65.			
700	200	5	10	20	10			
725	120	15	20	80	60			
750	160	5	15	50	35			
775	120.	5	5	5	5			
800	160.	<5	5	10.	15			
825	100	5	5	5	5			
850	90	10	5	5	5.			
875	140	<5	5	5	5			
900	120	<5	5	5	5			
925	70	<5	35	5.	85			
950	50	<5	30	5	10.			
975	80	5	5	15	45.			
1000	90.	<5.	10	5	10			
1025	70	10	10	10	10			
1050	15	<5	5	10	105			
1075	30	45	10	10	75			
1100	30	<5	5	10	50.			

Rd. 1/4 mile road 65 OE

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RENISON LIMITED

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GEOCHEMICAL SOIL SAMPLES

AREA EAST HEEMSKIRK GRID. -85. MESH FRACTION

LINE NO. 2600N. p.p.m.

LOCATION	Sn	As	Cu	Pb	Zn	Ni		
1125	15	5	5	5	35			
1150	25	<5	15	20	45			
1175	140	<5	10	10	25			
1200	15	<5	10	25	55			
1225	30	10	920	15	85			
1250	20	<5	65	15	55			
1275	50	10	45	50	60			
1300	15	5	80	45	400			
1325	10	5	10	15	35			
1350	15	100	10	60	75			
1375	20	50	75	25	220			
1400	25	85	15	105	250			
1425	25	45	10	50	110			
1450	90	35	15	50	330			
1475	<5	<5	15	190	820			
1500	10	<5	20	110	75			
1525	10	10	5	20	45			
1550	10	<5	25	35	30			
1575	15	<5	10	15	25			
1600	20	<5	15	25	40			
1625	10	<5	5	30	45			
1650	10	<5	5	110	30			
1675	10	<5	10	25	30			
1700	20	5	5	15	25			
1725	25	<5	5	15	20			
1750	35	<5	10	25	35			
1775	40	5	15	25	35			
1800	20	<5	10	15	25			
1825	35	10	35	70	150			
1850	5	5	35	40	125			

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RENISON LIMITED

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GEOCHEMICAL SOIL SAMPLES

AREA EAST HEEMSKIRK GRID. -85. MESH FRACTION

LINE NO. 2600N. p.p.m.

LOCATION	Sn	As.	Cu	Pb	Zn	Ni		
1875 E	15	<5	10	75	65			
1900	30	10	35	150	275			
1925	15	<5	30.	55	60.			
1950	35	15	90	60	50			
1975	15	5	55	25	30			
2000	5	10	55	45	45			
2025	70.	<5	20	30	40			
2050	<5.	10.	25	20	80			
2075	20	<5	10	20	20			
2100	15.	5	5	10.	15.			

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RENISON LIMITED

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GEOCHEMICAL SOIL SAMPLES

AREA EAST HEEMSKIRK GRID. -85. MESH FRACTION

LINE NO. 2200N. p.p.m.

LOCATION	Sn	As	Cu	Pb	Zn	Ni		
300 E.	60	<5	5	5	10			
325	45	5	5	5	10			
350	<5	<5	<5	35	10.			
375	140	<5	10	5	10			
400	150	10	<5	<5	10			
425	150	5	<5	<5	10			
450	100	<5	25	<5	10			
475	~~120~~	<5	10	<5	10			
500	340	20	15	20	35			
525	140	10	10	15	25			
550	240	<5	10	5	10			
575	260	40	90	15	255			
600	100	40	290	20	85			
625	180	50	120	15	20			
650	70	15	95	10	75			
675	30	15	20	10	100			
700	200	30	65	15	100			
725	110	10	40	10	50.			
750	90	15	10	10	20.			
775	90	10	10	15.	35			
800	160	10	10	10	15			
825	100	10.	~~65~~ 15	~~75~~ 10	~~50~~ 15	} Both Marked 825E		
850	160	<5	15	10	20			
875	430	<5	20	5	15			
900	320	10	5	5	20			
925	220	10	10	5	15			
950	140	5	10	10	10			
975	140.	120.	1700	85	1750			
1000	45	15	10	10	15.			
1025	5	10	135	10	55.			
1050	25	10.	5	15	50.			

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RENISON LIMITED

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GEOCHEMICAL SOIL SAMPLES

AREA EAST HEEMSKIRK GRID. -85 MESH FRACTION

LINE NO. 2200N. p.p.m.

LOCATION	Sn	As	Cu	Pb	Zn	Ni		
1075 E	25	10	5	10	25			
1100	60	20	100	15	55			
1125	140	65	30	155	475			
1150	25	30	200	15	95			
1175	25	15	40	10	25			
1200	15	20	40	10	40			
1225	30	20	285	15	85			
1250	160	10	15	5	10			
1275	30	90	650	40	50			
1300	70	45	200	25	335			
1325	30	35	40	15	115			
1350	20	15	40	15	80			
1375	35	15	5	10	20			
1400	25	5	55	15	80			
1425	40	10	10	55	35			
1450	70	20	10	55	25			
1475	75	20	85	30	45			
1500	55	10	15	65	35			
1525	65	10	20	75	20			
1550	35	<5	10	25	45			
1575	55	15	35	290	1900			
1600	25	20	75	50	115			
1625	40	30	110	30	60			
1650	45	5	130	35	20			
1675	20	25	100	30	25			
1700	35	15	255	50	55			
1725	35	30	105	35	45			
1750	45	<5	160	25	50			
1775	50	15	230	45	25			
1800	60	<5	190	75	25			

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RENISON LIMITED

GEOCHEMICAL SOIL SAMPLES

AREA EAST HEEMSKIRK GRID -85 MESH FRACTION

LINE NO. 2200N p.p.m.

LOCATION	Sn	As	Cu	Pb	Zn	Ni		
1825 E	45	<5.	55	75	50.			
1850	50	<5	165	75	45.			
1875	50	<5	65	30	25.			
1900	50	<5.	15	40	15.			

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RENISON LIMITED

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GEOCHEMICAL SOIL SAMPLES

AREA EAST HEEMSKIRK GRID. -85 MESH FRACTION

LINE NO. 1800N. p.p.m.

LOCATION	Sn	As	Cu	Pb	Zn	Ni		
275E	20	5	10	20	55			
300	20	5	5	10	20			
325	20	<5	10.	35.	25.			
350	20	30	200	15	50			
375	50	<5	30	25	120			
400	50	15	45.	15	40.			
425	2170	20	10	20	40			
450	380	<5	10	15	25			
475	160	<5	5.	15	35.			
500	220	20	20	10	55			
525	60	15	85	15	45			
550	130	15	40.	15.	35			
575	80	25	75	20	35.			
600	110	25	95.	20	60			
625	25	20	145	10.	125.			
650	80	5	30.	5	30			
675	150	20	20	10	25.			
700	45	<5	40	10	110			
725	30	100	10	10.	95.			
750	150	<5	10.	5.	25			
775	20	25	45	5	80			
800	360	<5	5.	5	15			
825	760	<5	10	5.	15.			
850	20	5	35.	10	120			
875	25	5	15	10	70.			
900	30	<5	10.	10	95			
925	15.	15.	195	10	75.			
950	220	5	10	5	20			
975	25	<5	15.	15.	120.			
1000	30	<5	70	10	255			
1025	30	<5	10	10	85			

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RENISON LIMITED

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GEOCHEMICAL SOIL SAMPLES

AREA EAST HEEMSKIRK GRID. —85 MESH FRACTION

LINE NO. 1800N. p.p.m.

LOCATION	Sn	As	Cu	Pb	Zn	Ni		
1050 E	100	5	10	10	70			
1075	220	<5	20	5	35			
1100	130	<5	15	5	40			
1125	25	<5	25	10	40			
1150	<5	5	15	20	30			
1175	80	<5	15	10	30			
1200	25	5	35	25	45			
1225	20	<5	10	15	35			
1250	35	<5	30	25	45			
1275	15	25	190	55	45			
1300	75	<5	15	5	25			
[illegible]75	<5	<5	105	45	30			
1350	50	<5	30	10	20			
1375	60	5	35	10	25			
1400	25	15	45	20	25			
1425	45	5	75	55	40			
1450	60	5	55	25	60			
1475	20	20	55	45	40			
1500	50	40	40	140	50			
1525	20	15	45	40	90			
1550	30	10	20	25	85			
1575	35	<5	25	35	70			
1600	15	15	55	35	40			
[illegible]25	20	20	45	30	45			
1650	35	10	40	35	75			
1675	20	5	40	35	85			
1700	40	<5	15	35	80			
1725	30	20	65	45	75			
1750	25	20	75	45	60			
1775	40	10	55	30	90			

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RENISON LIMITED

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GEOCHEMICAL SOIL SAMPLES

AREA EAST HEEMSKIRK GRID — 85 MESH FRACTION

LINE NO. 1800N.

p.p.m.

LOCATION	Sn	As	Cu	Pb	Zn	Ni		
1800 E	15	15	40	25	50			
1825	25	15	65	30	70			
1850	15	10	90	25	100			
1875	25	5	85	35	115			
1900	15	15	75	30	75			

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RENISON LIMITED

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GEOCHEMICAL SOIL SAMPLES

AREA EAST HEEMSKIRK GRID -85 MESH FRACTION

LINE NO. 1400N p.p.m.

STATION	Sn	As	Cu	Pb	Zn	Ni		
0 E	40	<5	5	15	15			
25	150	10	5	10	5			
50	160	15	5	5	5			
75	260	5	5	5	15			
100	60	5	5	5	5			
125	60	5	5	5	10			
150	40	10	5	<5	15			
175	40	<5	10	<5	15			
200	25	<5	100	15	65			
225	40	<5	10	5	15			
250	15	<5	10	10	15			
[illegible]	1020	5	15	15	20			
300	140	5	10	15	15			
325	140	<5	5	10	10			
350	250	<5	15	25	20			
375	40	20	20	15	15			
400	60	5	35	30	20			
425	20	<5	35	25	15			
450	60	<5	30	25	30			
475	30	10	15	10	20			
500	50	30	80	20	20			
525	30	25	145	20	25			
550	30	50	30	15	20			
[illegible]	10	70	135	30	20			
600	70	<5	15	10	10			
625	100	5	15	10	5			
650	200	<5	15	10	5			
675	10	10	35	25	25			
700	80	90	100	25	15			
725	40	30	125	20	60			

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RENISON LIMITED

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GEOCHEMICAL SOIL SAMPLES

AREA EAST HEEMSKIRK GRID. −85 MESH FRACTION

LINE NO. 1400N. p.p.m.

LOCATION	Sn	As	Cu	Pb	Zn	Ni		
750E	50	30	35	20	25			
775	80	20	40	20	110			
800	40	10	15	10	30			
825	50	10	15	15	35			
850	60	15	30	55	65			
875	40	10	20	30	30			
900	40	15	20	40	50			
925	20	10	25	30	35			
950	<5	20	25	25	40			
975	5	10	15	25	25			
1000	15	15	45	30	25			
1025	10	15	40	25	45			
1050	10	15	30	20	30			
1075	40	5	20	10	10			
1100	60	<5	35	40	25			
1125	40	10	95	30	50			
1150	45	15	70	30	50			
1175	40	30	45	45	65			
1200	50	20	70	55	50			
1225	20	15	70	80	75			
1250	35	50	200	25	550			
1275	25	10	100	30	190			
1300	25	15	105	55	75			
1325	35	25	65	35	45			
1350	<5	<5	10	20	105			
1375	40	5	30	25	90			
1400	25	20	35	30	160			
1425	50	<5	70	35	205			
1450	35	15	35	30	125			
1475	35	<5	20	15	195			

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RENISON LIMITED

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GEOCHEMICAL SOIL SAMPLES

AREA EAST HEEMSKIRK GRID -85 MESH FRACTION

LINE NO. 1400N. p.p.m.

LOCATION	Sn	As	Cu	Pb	Zn	Ni		
1500E	40	40	40	~~20~~ 15	60			
1525	40	20	10	25	75			
1550	35	45	10	~~30~~ 15	90			
1575	60	30	30	30	140			
1600	50	10	35	20	95			
1625	40	20	65	25	65			
1650	35	30	60	25	45			
1675	45	15	125	55	60			
1700	50	10	90	30	150			
1725	20	10	60	20	95			
1750	45	30	50	25	80			

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RENISON LIMITED

GEOCHEMICAL SOIL SAMPLES

AREA EAST HEEMSKIRK GRID. -85. **MESH FRACTION**

LINE NO. 1200N. **p.p.m.**

[redacted]ION	Sn	As	Cu	Pb	Zn	Ni		
0 E	60	25	95	15	40			
25	80	20	35	20	40			
50	60	5	25	15	25			
75	25	35	5	15	25			
100	25	10	15	20	25			
125	40	10	10	10	15			
150	20	10	15	15	25			
175	35	5	25	15	25			
200	25	<5	5	10	10			
225	25	10	80	45	70			
250	400	<5	15	20	65			
[redacted]	300	10	10	15	30			
300	30	10	25	15	30			
325	30	40	105	25	50			
350	50	25	50	25	125			
375	5	<5	10	15	60			
400	35 (15)	5 (<5)	50 (20)	30 (35)	75 (65)			
425	15	10	15	15	55			
450	50	20	15	15	55			
475	<5	15	20	25	30			
500	<5	15	25	25	30			
525	5	15	20	20	35			
550	40	50	45	35	50			
575	30	<5	10	35	50			
[redacted]00	70	10	10	25	35			
625	50	<5	215	45	55			
650	30	<5	470	15	260			
675	45	60	30	30	305			
700	160	<5	10	10	25			
725	140	<5	25	20	20			

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RENISON LIMITED

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GEOCHEMICAL SOIL SAMPLES

AREA EAST HEEMSKIRK GRID. —85. MESH FRACTION

LINE NO. 1200N. p.p.m.

LOCATION	Sn	As	Cu	Pb	Zn	Ni		
750 E	5	<5	15	30	300			
775	280	<5	10	15	20			
800	90	<5	20	15	25			
825	20	<5	35	20	55			
850	25	10	55	25	65			
875	15	<5	45	15	90			
900	5	<5	55	15	40			
925	20	<5	45	20	40			
950	30	10	115	25	50			
975	40	<5	80	25	65			
1000	15	<5	30	35	70			
1025	<5	<5	15	15	25			
1050	25	<5	65	20	130			
1075	20	<5	45	15	75			
1100	20	<5	55	20	160			
1125	15	<5	130	25	70			
1150	20	<5	105	25	125			
1175	<5	15	50	25	95			
1200	15	25	95	65	50			
1225	15	10	170	215	30			
1250	30	15	130	975	340			
1275	35	15	65	90	30			
1300	25	20	650	120	95			
1325	25	15	115	30	45			
1350	40	<5	45	30	30			
1375	10	<5	50	30	65			
1400	20	5	50	30	75			
1425	15	30	55	40	45			
1450	35	40	20	25	55			
1475	15	5	40	45	80			

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GEOCHEMICAL SOIL SAMPLES

AREA EAST HEEMSKIRK GRID. -85 MESH FRACTION

LINE NO. 1200N. p.p.m.

LOCATION	Sn	As	Cu	Pb	Zn	Ni		
1500N	15	<5	115.	40	55			
1525	30	10	45	25	30			
1550	30	<5	60	40	60			
1575	15	<5	30	25	55			
1600	20	<5	80	25	45			
1625	10	<5	60	25	50			
1650	10	<5	70	35	50			
1675	20	<5	70	35	50			
1700	30	<5	35	50	30			

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GEOCHEMICAL SOIL SAMPLES

AREA EAST HEEMSKIRK GRID. -85 MESH FRACTION

LINE NO. 1000N. p.p.m.

OCATION	Sn	As	Cu	Pb	Zn	Ni		
500E	20	5	40	15	20			
525	5	10	35	15	15			
550	90	5	20	15	10			
575	30	<5	20	10	10			
600	50	25	65	20	25			
625	45	<5	15	20	10			
650	80	10	15	20	20			
675	<5	<5	35	25	15			
700	20	<5	5	10	15			
725	45	<5	5	10	25			
750	15	5	15	15	20			
775	10	5	5	15	15			
[illegible]	25	5	200	15	245			
825	30	10	10	10	15			
850	50	15	5	5	5			
875	15	20	5	15	160			
900	20	15	10	15	170			
925	45	15	10	15	75			
950	30	10	60	15	50			
975	35	5	110	45	65			
1000	40	<5	30	20	25			
1025	20	<5	70	15	45			
1050	30	<5	50	15	35			
1075	25	<5	70	20	110			
1100	15	150	40	20	35			
1125	35	5	45	15	65			
1150	15	<5	85	25	135			
1175	40	<5	30	40	90			
1200	30	45	105	20	35			
1225	45	5	85	15	95			
1250	35	20	70	30	100			
1275	70	50	110	30	110			
1300	25	5	90	25	100			

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GEOCHEMICAL SOIL SAMPLES

AREA EAST HEEMSKIRK GRID. −85 MESH FRACTION

LINE NO. BASELINE (2100E) p.p.m.

LOCATION	Sn	As	Cu	Pb	Zn	Ni		
3425 N	<5	<5	10	30	130			
3450	70	"	"	20	40			
3475	20	"	20	30	450			
3500	<5	10	70	"	110			
3525	10	50	20	"	80			
3550	20	90	50	70	80			
3575	30	80	140	100	130			
3600	30	90	250	180	230			
3625	25	70	50	30	60			
3650	10	140	580	385	620			
3675	20	100	275	120	135			
3700	25	150	200	75	120			
3725	35	120	105	110	140			
3750	<5	140	210	125	3450			
3775	15	240-	115	90	2550			
3800	See 3800 N sheet.		—	—				
3825	<5	<5	<5	<5	15			
3850	10	"	<5	10	15			
3875	<5	"	<5	35	10			
3900	"	"	<5	5	20			
3925	"	"	<5	5	15			
3950	"	"	<5	5	10			
3975	"	"	<5	5	10			
4000	"	"	<5	5	10			
4025	"	"	<5	<5	15			
4050	"	"	<5	5	20			
4075	10	"	5	10	25			
4100	<5	"	5	15	350			
4125	5	"	35	25	500			
4150	20	"	55	50	950			
4175	45	15	15	35	285			
4200	See 4200 N sheet.							

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RENISON LIMITED

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GEOCHEMICAL SOIL SAMPLES

AREA EAST HEEMSKIRK GRID. -85 MESH FRACTION

LINE NO. BASELINE (2100E). p.p.m.

LOCATION	Sn	As	Cu	Pb	Zn	Ni		
4225 N	100	60	130	50	1050			
4250	100	50	280	50	550			
4275	50	50	115	40	720			
4300	80	30	77	20	140			
4325	45	40	190	25	300			
4350	160	100	300	60	105			
4375	20	20	85	75	40			
4400	20	30	140	30	35			
4425	15	20	80	30	20			
4450	45	<5	5	<5	10			
4475	10	5	145	10	35			
4500	10	15	460	10	35			
4525	15	<5	<5	<5	10			
4550	30	"	<5	<5	10			
4575	20	"	<5	<5	20			
4600	See 4600N sheet.		-	-	-			
4625	30	25	25	35	960			
4650	10	<5	235	30	40			
4675	30	60	45	20	40			
4700	220	180	105	55	125			
4725	420	15	60	55	100			
4750	600	30	75	35	125			
4775	100	50	20	10	40			
4800	20	15	<5	15	20			
4825	15	<5	<5	15	30			
4850	20	"	5	25	25			
4875	10	"	5	10	10			
4900	10	"	<5	<5	10			
4925	20	"	<5	10	10			
4950	<5	"	<5	45	10			
4975	"	"	<5	5	5			
5000	See 5000N sheet		-	-	-			

APPENDIX 8

REPORT ON MAGNETITE DEPOSITS IN COMSTOCK DISTRICT - TASMANIA

PRELIMINARY STATEMENT:

This report was undertaken in connection with a general investigation of the iron ore resources of Australia under the direction of Dr. W.G. Woolnough, Commonwealth Geological Adviser. After preliminary inspections the latter recommended that a survey of certain of the Comstock deposits be made in conjunction with a sampling campaign of accessible under-ground workings. To this end three caved adits were re-conditioned, while two others were found to be sufficiently open for examination and sampling purposes. A theodolite survey of the most promising bodies was then carried out. Other iron lenses immediately west of the area examined were not included in the survey as these were considered, after inspection, to be unimportant.

The accompanying topographical and geological plan defines the outcropping iron zones and shows the mine workings in correct relation to boundaries of mineral leases. Eight plans of the underground works (13 adits) are also included. These indicate the rocks and iron lenses encountered in driving and, in the five accessibl adits, the position, width and numbers of samples taken.

Information concerning the inaccessible adits was obtained from reliable miners who were engaged in driving these works, and from previous Geological Survey publications.

Sampling was carried out by Mr. T.D. Hughes of the Geological Survey Staff, who also assisted in the survey.

The assaying of samples was undertaken by the staff of the Government Chemist and Assayer.

LOCATION AND ACCESS:

Comstock Township Reserve is situated three miles west-south-west of Zeehan railway station and the iron deposits are located 1¼ miles further west on mineral leases 59M/38 to 65M/38 in the name of G. Howard.

Zeehan, the nearest settlement, is connected with the Port of Burnie, on the North West Coast, by Emu Bay railway, in a distance of 88 miles. A Government railway line also connectes Zeehan with Strahan, on the West Coast, at Macquarie Harbour, in a distance of 29 miles.

Access to the iron deposits is gained by way of Zeehan - Trial Harbour road for four miles to the crossing of Comstock tramline. The latter is followed for half a mile westerly to the terminus and thence along the Kynance tram line for 1½ miles as far as Kynance Prospecting Syndicate's mineral section (66I/M). From the latter, foot tracks deviate north-westerly and south-westerly to the several iron deposits.

PREVIOUS LITERATURE: Several official reports have been published in the past in which reference is made to portions of the Comstock iron deposits. The list includes the following:-

(1)	G.A. Waller:	Report on the Iron and Zinc-lead Ore Deposits of the Comstock District, 1903.
(2)	W.H. Twelvetrees and L.K. Ward:	The Ore-Bodies of the Zeehan field. (Geo. Survey Bulletin No. 8), 1910.
(3)	L.L. Waterhouse:	The South Heemskirk Tin Field (Geo. Survey Bulletin No. 21), 1916.

TOPOGRAPHY: The area is represented by low wooded hills and ridges rising to nearly 1,000 feet above sea level and 150 feet above narrow button grass plains to the west. On west side of the latter foot-hills merge into Mt. Agnew, the south-eastern peak of Heemskirk Range, which attains a height of 2,800 feet above sea level.

Drainage is effected by means of two systems. The waters of northern part of the area flow north by way of head tributaries of Pine Creek to join Pieman River, while the southern portion is drained by Kynance Creek flowing southerly to Little Henty River.

GEOLOGY: The Heemskirk Range to the west of the area consist of a granite batholith of Devonian age. The granite intruders quartzites and slates of Cambro-Ordovician age which are on contact on the lower eastern slopes of Mt. Agnew and extend easterly into the principal locality concerned in this report. Fringing the granite within half a mile of contact, dykes of Devonian serpentine intrude the Cambro-Ordovician sedimentary rocks.

From evidence obtained in various parts of the State it is generally conceded that the acid and ultra-badic igneous rocks were drived by a process of differentiation from the one parent magma. The acid rocks, however, ascended at a slightly later period than the consolidation of the ultra-basic type.

A feature of the serpentine dykes in some localities is the distribution of masses of lime silicate hornstone or massive diopside, along the contact of serpentine with the intruded sedimentary rock. The hornstone is dense in form and consists almost entirely of silicates of lime and magnesia with small amounts of alumina and iron. Crystalline dolomite and diopside are also present in smaller quantities. Other associated minerals consist of phlogophite (mica), talc calcite, quartz, garnet, epidote, vesuvianite, serpentine etc.

This phenomenon is apparently due to the effects of contact metamorphism and the alteration has taken place in the outer part of the dyke rocks rather than in the adjacent slates and quartzites. The contact rocks were probably formed by assimilation of material from the ultra-basic rocks and the chemical reactions by magmatic emanations, in the form of carbonated vapours and solutions, issuing from the adjacent magma, which traversed

planes of weakness along the periphery of the serpentine dykes.

The serpentine composing the dykes is largely altered and decomposed especially adjoining the contact rocks where it usually appears in the form of a yellow-brown clay.

ECONOMIC GEOLOGY: (1) General:

The iron deposits consist principally of magnetite with minor amounts of haematite and limonite. They occur as irregaulrly shaped and discontinous lenses almost wholly contained in serpentine dykes and the asscciated lime silicate hornstone etc. It is probable that at least one of the lenses occurs in slates and quartzites, but this was not definitely proved.

At surface, the iron is very purs, being only slightly hydrated in some localities, and generally free from gangue minerals. It occurs as massive crustifications of magnetite and there is little doubt that it represents a secondary enrichment and concentration. At shallow depths the character of the deposits alters and the magnetite is present in intimate association with altered and decomposed serpentine and tremolite etc. in the form of clay and with lime silicate hornstone in places. Away from the influences of weathering the iron bodies are massive to a large extent, except for the inclusion of clay particles. Nearer the surface the magnetite is generally loosely compact and occurs as fine grains in the clay. In some instances the iron and clay appear as loose running masses, causing underground workings to cave and fill.

In general the massive parts of the iron lenses are non-crystalline but cavities are occasionally present in which well-formed rombic dodecahedra have crystallised out in clusters; suggesting pseudomorphis after garnet.

A little pyrite is directly associated with the magnetite below water level in some of the minor lenses, but generally the iron is free from sulphides. Small veins of pyrite occur rarely along the walls and in the vicinity of the iron bodies.

The origin of the magnetite deposits appears to be related to contact metamorphic effects of the granite intrusion. The iron lenses are, in no instance, far distant from the granite, and other lenses in adjacent areas occur almost at the contact. Elsewhere in the Heemskirk district similar magnetite deposits, occurring about the granite margin, are not confined to the basic rocks and are, therefore, not connected with anything in the nature of magmatic segregations. It is considered that the magnetite was deposited from solutions emanating from the acedic magma prior to consolidation of the granite massif. This took place at the same period, or immediately following the alteration of outer edges of serpentine dykes to lime silicate hornstone etc.

(2) History:

The Comstock iron deposits have been known to exist since about 1885. The first prospecting was undertaken by the Tenth Legion Company many years ago when exploring for silver-lead deposits. An adit was commenced from

south bank of Pine Creek and passed through several lenses of magnetite.

The area was aquired by numerous interests at various periods from 1887 to 1920. In the latter year, when the lease holder was G. & C. Hoskins Company Limited, a vigorous campaign was instituted to test the iron deposits of the district. In the following 16 years, 17 adits were driven with the object of proving the continuity of the iron below surface in the various o occurrences. During this period the leases were transferred to Hoskins Iron and Steel Company Ltd. and later to Australian Iron and Steel Ltd. The area covered by the deposits is at present leased in the name of G. Howard.

No other mining development has been undertaken and, with the exception of small samples for assay and experimental purposes, no ore has been removed from the property.

The area described below includes an east-west belt containing the Tenth Legion zones Nos. 1 and 2 and a north-south belt, commencing 20 chains south of the former and consisting of zones No. 3 to 11.

(3) <u>The Deposits</u>:

(a) Sections 60M/38 - 29 acres (Tenth Legion Mine) and 59M/38 - 10 acres - G. Howard, Lessee.

The Tenth Legion, or No. 1 zone, outcrops strongly along the top of a well defined ridge extending 12° north of west through the greater portion of the mineral lease, and rising to a maximum height of 170 feet above Pine Creek. The eastern end of the outcrop extends for a short distance into Kynance Prospecting Syndicate lease, No. 5142/93M. At surface the deposit consists of dense magnetite along a length of 1700 feet, which is exposed here and there over an average width of 240 feet. In places where outcrops are well defined belts of clay are exposed between magnetite lenses, while in other localities iron boulders obscure the underlying features.

Underground workings consist of adit cross-cuts numbered 1 to 4 and spaced at regular intervals along the northern fall of ridge above Pine Creek. The most eastern adit (No. 4) did not reach the objective but the remainder penetrated a zone of parallel composite lenses, dipping north at high angles. The lenses of iron ore are not well defined underground but have been divided for convenience of description into A, B, and C in that order from north to south.

As illustrated in Plan No. 2 the whole of principal series was passed through in No. 1 adit, B and C, together with several insignificant occurrences in No. 2 adit and C lense only in No. 3 adit. Each lense, with the possible exception of No. 1, is divided within itself into several sub-lenses by the inclusion of irregular bands of decomposed serpentine and lime silicate hornstone etc. which contains only a little magnetite of no consequence.

During the survey No. 2 adit only was open for inspection and sampling but information obtainable from various sources with regard to Nos. 1, 2 and 3 has been plotted in correct relation and shown on plan No. 2. The latter indicates "C" lense as being the most important, having an average width, excluding bands, of 49 feet. As this almost certainly corresponds with the strong outcrop along 1700 feet of the ridge top, the lense is the longest of the series. "B" lense was not cut in No. 3 Adit so that the length is limited westerly to a point between Nos. 2 and 3 adits. East of No. 1 Adit this lense probably extends to the termination of the outcrop, since the general width in that direction is sufficient to include both "C" and "B" lenses. The length of "B" lense has been taken as 1400 feet and the average width, excluding bands, as 28 feet.

The backs obtainable in the lowest adit (No. 1) for "C", "B" and "A" lenses are 100, 90, and 70 feet respectively.

(b) Section 59M/38 - 10 acres. G. Howard, Lessee

No. 2 Zone is situated on west side of Pine Creek, seven chains north-west of Tenth Legion Zone. Magnetite outcrops solidly along the upper part of a small ridge on a bearing of 292°. from eastern boundary of the section, for a distance of 350 feet. The outcrop then turns north and eventually curves to the north-east, making a total length of 530 feet with an average width of 35 feet.

No. 12 Adit (Plan No. 3) was driven as a crosscut south-westerly from a small branch of Pine Creek, 80 feet below the ridge top. Dense magnetite encountered at 120 feet was driven into for four feet before work was discontinued.

One iron lense only is present from surface indications but this was not proved owing to incomplete underground development.

(c) Section 61M/38 - 25 acres. G. Howard, Lessee

No. 3 Zone occurs about ¼ mile south of Tenth Legion Zone and extends west-north-westerly from eastern boundary of the enclosing mineral section over a maximum length of 600 feet. The greatest width of iron exposed at surface is 250 feet, about centre of outcrop, but is much less at either end. Solid magnetite is not prominent at surface.

No. 10 Adit (Plan No. 4) driven 303 feet north-easterly from south-west side of outcrop, passed through three magnetite lenses, separated by bands of decomposed rock. No. 1 lense commences 20 feet from portal and extends over a width of 31 feet. No. 2 lense was encountered at 94 feet and proved to be 63 feet wide. No. 3 lense was cut at 169 feet and continued to 272 feet.

The approximate amount of backs obtainable in adit on No. 1, 2 and 3 lenses are 15 feet, 25 feet, and 40 feet respectively.

Large quantities of magnetite coated with limonite are stacked at approach to adit.

(d) Section 62M/38 - 40 acres. G. Howard, Lessee

This area includes Zones No. 4 to 10. No. 4, 6 and 7 Zone, crossing northern boundary of the section, are present at

surface in the form of magnetite and limonite boulders and gravel with minor outcrops in some localities. No underground development has been attempted.

No. 5 Zone is exposed in north-east quarter of the section in the form of massive magnetite on a prominent hill-top, which rises 140 feet above Kynance Creek plains, to the west. The zone can be traced at surface for 460 feet along a north-west trending belt, with an average width of 73 feet.

Underground developments (Plan No. 5) consist of an adit and tunnel (Nos. 3 and 5) both of which were open for inspection. The adit is the lower opening, being 53 feet below tunnel, and was driven on a bearing of 303° for a distance of 245 feet from creek level on south-east side of hill. At 22 feet from portal, six feet of magnetite with some included clay crosses the adit. A little magnetite occurs in clay up to 106 feet. From that point a lense of dense magnetite extends for 50 feet. This was sampled throughout. Near centre of lense a small seam of pyrite traverses a clay band. On west side of the magnetite body the adit is caved and the remainder could not be examined, but it is reported that a mixture of magnetite and decomposed serpentine continues for approximately 30 feet farther. At 77 feet in adit, crosscuts open to the north-east and south west for 103 feet and 146 feet respectively. In north-east cross-cut no defined body of iron is visible although bunches of magnetite occur in serpentine clay along the lower part of the first 20 feet. Between 20 feet and 60 feet from adit veins and bunches of pyrite occur frequently. In the first few feet of south-west crosscut a little pyrite is visible in clay. At nine feet from adit the iron lense was cut and continued over a width of 84 feet.

No. 5 Tunnel commences on south-west side of hill at 42 feet below the crest. It was driven on a bearing of 71° and the level penetrated to surface on east side of hill in a distance of 237 feet. A body of fine granular magetite and clay, dipping at a low angle to the east, was cut at 87 feet from mouth and extended over a width of 138 feet. A cross-cut to the north-west, at 106 feet in tunnel, reveals similar material for 42 feet, also dipping easterly.

No. 8 Zone is situated in west-centre of the section on east side of Kynance Creek. Loose gravel and boulders of magetite and limonite cover the surface in a meridional direction along a length of 330 feet. Towards the north end 50 feet of solid iron is disclosed in an east-west trench. Two hundred feet further south loose hydrated boulders of iron are exposed in a shaft and trench. No.0 Adit (Plan No. 4) was driven northerly from the fall to Kynance Creek, on what appears to be a south-easterly extension of the zone. For the first 100 feet in the adit small amounts of magnetite were encountered, in the form of bunches and minor bands, scattered through serpentine clay. From the evidence obtained No. 8 zone is apparently of little importance.

No. 9 Zone trends north-westerly across a small branch of Kynance Creek in southern part of the mineral section. The strike is north-westerly along a length of approximately 240 feet and average width 60 feet. It is generally parallel to Zones 5, 6, and 7 and, like the former, the iron dips to the north-east. Dense magnetite outcrops on the hillslope 30 feet above No. 2 Adit.

Underground workings consist of No. 2 Adit (Plan No. 6) driven 142 feet north-easterly from a point on eastside of, and 40 feet above, Kynance Creek. At 62 feet from mouth pyrite occurs ober a width of two feet in serpentine clay. Solid magnetite of good quality commenced at 68 feet and continued for 63 feet, including a one foot band of decomposed serpentine at 119 feet from portal. A cross-cut to the east at 90 feet in adit exposed magetite along the first 37 feet. This included a narrow band of serpentine at 30 feet, corresponding with that encountered at 119 feet in adit.

No. 10 Zone strikes in a south-westerly direction along ridge from west side of Kynance Creek, across south boundary of the section and extends to the middle of abandoned lease 8431/M. The total length approximates 680 feet and average width 40 feet. Outcrops of magnetite occur in few localities but the surface is strewn with quantities of iron boulders. Two adits (Plan No. 6) were driven north-westerly from the fall to Kynance Creek with the object of cross-cutting the iron body. No. 1 Adit is located in the leased section at 60 feet below the highest adjacent outcrop on the ridge above. Ih commences on a bearing of 294° and at 27 feet branches deviate 69 feet north-west and 74 feet to the south-west. In the latter a lense of magnetite with clay inclusions extends across 42 feet and dips at 80° to the south-east. Magnetite is exposed for at least 55 feet in north-west branch and probably continues to the face, but the adit is caved and is now inaccessible for the last 14 feet approximately. No. 4 Adit is situated 4½ chains to the south and 27 feet lower than No. 1 adit. It was directed north-westerly for 260 feet towards a narrow outcrop of iron on the ridge above, but only penetrated three minor bands containing magnetite between 160 and 198 feet from portal.

(e) Section 63M/38 - 5 acres - G. Howard, Lessee

No. 11 Zone courses diagonally from north-east to south west through this section over a length of 590 feet. Solid magnetite outcrops strongly along the greater portion of this length, along the top of a prominent spur. Underground workings consist of an adit crosscut started near northern boundary of lease at 40 feet below outcrop. This was driven south-easterly and cut the iron lense at 146 feet from the mouth.

The latter proved to be 88 feet in width and consists principally of fine magnetite aggregates with interstitial clay and weathered serpentine. Occasional boudler-like masses of solid magnetite also occur. (See No. 11 adit on Plan 4).

4. Quality of the Iron Ore

In all 42 samples were taken as a series of sections across the lenses in the accessible adits developed on Zones No. 1, 5, 10 and 11.

The assays invloved were carried out in the Mines Department Laboratory, Launceston.

From the assays of the sampled sections the following tables have been compiled.

Bit No.	Iron	Acid Insol.	Silica	Manganese	Phosphoric Acid	Titania Oxide	Alumina	Lime	Magnesium Oxide	Sulpur	Sample No.	Width of sample Ft.	in.
3	60.6	7.28	7.08	0.49	0.05	0.07	1.48	Tr.	0.62	0.07	1	6	2
"	61.5	0.96	0.92	0.15	0.07	0.04	0.87	Tr.	0.36	0.14	2	10	
"	59.5	1.20	1.08	0.04	0.14	0.04	0.57	0.06	0.13	0.16	3	10	
"	62.9	1.64	1.48	0.27	0.08	0.02	0.96	Tr.	0.72	0.13	4	10	
"	63.9	0.88	0.76	0.23	0.02	Tr.	0.54	0.06	0.62	0.07	5	10	
"	63.5	1.16	0.96	0.33	0.03	Tr.	1.32	Tr.	0.68	0.04	6	9	6
"	51.9	15.24	14.88	0119	0.09	0.17	2.27	Tr.	0.26	0.10	7	20	
"	58.1	7.20	7.04	0.23	0.09	0.11	1.86	Tr.	0.46	0.10	8	20	
"	56.4	9.20	9.00	0.25	0.10	0.16	2.03	Tr.	0.34	0.09	9	20	
"	52.6	13.40	12.96	0.27	0.08	0.17	2.17	0.06	0.36	0.14	10	12	
"	48.9	15.36	15.04	0.80	0.09	0.15	3.97	Tr.	0.32	0.15	11	12	
H Legion)	65.8	0.92	-	0.80	0.08	0.02	1.67	Tr.	2.24	0.01	12	9	
"	67.0	0.88	-	0.80	0.03	0.07	2.20	Tr.	1.70	0.03	13	8	9
"	66.5	1.56	1.36	0.93	0.03	0.07	1.57	0.06	1.72	0.02	14	8	
"	67.3	1.08	-	1.12	0.08	0.03	0.90	Tr.	1.56	0.02	15	3	8
"	65.7	1.84	1.72	0.80	0.03	0.08	2.84	Tr.	1.62	0.02	16	6	6
"	68.2	0.76	-	0.53	0.02	0.04	1.21	Tr.	1.98	0.02	17	9	
"	69.1	0.48	-	0.71	0.02	0.03	0.48	Tr.	1.96	0.02	18	13	6

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Acid No.	Iron	Acid Insol.	Silica	Manganese	Phosphoric Acid	Titanic Oxide	Alumina	Lime	Magnesium Oxide	Sulphur	Sample No.	Width Sampl ft.
2 (10 Legion)	67.4	3.32	2.08	0.28	0.02	Tr.	0.98	0.06	1.50	0.01	19	10
"	65.0	5.80	3.12	0.31	0.02	Nil	0.41	0.06	2.30	0.12	20	10
"	61.9	4.63	4.50	0.58	0.08	0.08	0.61	0.06	3.68	1.43	21	11
"	67.9	0.68	-	0.90	Tr.	0.03	1.72	0.26	1.30	0.05	22	11
"	68.0	0.40	-	1.02	0.02	Tr.	1.41	0.34	1.38	0.03	23	12
"	67.2	0.52	-	0.76	0.03	0.02	1.05	0.22	1.36	0.05	24	10
"	60.2	5.24	5.14	0.76	0.06	0.05	0.92	Tr.	0.74	0.10	25	10
"	56.6	4.80	4.68	0.44	0.09	0.08	1.08	Tr.	0.10	0.18	26	10
"	62.1	2.00	1.88	0.48	0.05	0.04	1.17	Tr.	0.74	0.10	27	10
"	65.4	2.12	1.96	0.98	0104	0.04	1.45	Nil.	1.22	0.06	28	10
"	66.5	1.70	1.50	0.80	0.03	0.04	1.38	Nil.	1.20	0.04	29	10
"	67.1	0.60	-	1.59	0.03	0.03	0.51	Nil.	1.36	0.04	30	10
"	67.6	0.48	-	0.99	0.02	0.03	1.52	Tr.	1.30	0.04	31	10
"	67.4	0.68	0.24	1.09	0.02	0.03	1.03	Tr.	1.42	0.03	32	10
"	66.4	0.88	-	1.35	0.02	0.04	0.81	Tr.	1.30	0.07	33	10
"	62.3	1.06	0.98	1.90	0.02	0.04	3.70	Tr.	1.42	0.05	34	15
11	66.4	1.00	-	1.78	0.01	0.05	0.73	Nil.	1.52	0.02	35	20
"	64.9	2.52	2.44	0.98	0.03	0.06	1.20	Tr.	2.88	0.08	36	20
"	67.0	0.24	-	1.31	0.04	0.07	1.31	Tr.	1.54	0.06	37	20

TABLE 1 (Cont.)

Adit No.	Iron	Acid Insol.	Silica	Manganese	Phosphoric Acid	Titanic Oxide	Alumina	Lime	Magnesium Oxide	Sulphur	Sample No.	Width Sample ft.
11	65.3	0.32	0.20	1.18	0.03	0.08	3.57	0.06	1.30	0.05	38	14
"	64.7	0.70	0.66	1.02	0.06	0.04	3.01	0.06	1.40	0.07	399	14
"	66.1	0.48	-	1.02	0.06	0.08	0.77	0.06	1.00	0.04	40	14
"	66.6	0.44	-	1.43	0.04	0.05	0.98	0.06	1.06	0.05	41	14
"	66.1	0.68	0.48	2.84	0.03	0.05	1.31	0.10	1.22	0.02	42	14

TABLE 11

QUALITATIVE RESULTS OF FURTHER TREATMENT OF VARIOUS SAMPLES

Gold	Silver	Nickel	Cobalt	Chromium	Sample No.
-	-	Nil	Tr.	Nil	1
Nil	Nil	-	-	-	8
-	-	Nil	Tr.	Nil	9
Nil	Nil	-	-	-	15
-	-	Nil	Tr.	Nil	18
Nil	Nil	-	-	-	24
-	-	Nil	Tr.	Nil	27
Nil	Nil	-	-	-	30
Nil	Nil	Nil	Tr.	Nil	[illegible]

TABLE 111

WEIGTHED AVERAGE ASSAYS OF CONSTITUENTS IN LENSES SAMPLED

	Iron	Acid Insol.	Silica	Manganese	Phosphoric Acid	Titanic Acid	Alumina	Lime	Manganium Oxide	Sulphu
No. 1 ZONE ("B" Lense	66.5	1.23	1.20	.87	.05	.055	1.91	Tr.	1.81	.02
("C" Lense	66.4	2.90	2.14	.50	.03	.03	.71	.03	2.30	.32
No. 5 ZONE	61.4	4.35	4.20	.61	.05	.06	1.60	.04	.73	.13
No.11 ZONE	65.76	1.02	0.98	1.28	.03	.06	1.78	Tr.	1.78	.05
No.10 ZONE	66.27	.53	.46	1.76	.04	.06	1.02	.07	1.09	.04

It will be seen from the assays in Table 111 that the ore is generally of high quality and consists essentially of iron (61.4 - 66.5%), with inconsiderable amounts of impurities in the form of silica (0.46 - 4.2%, managanese (0.5 - 1.76%), phosphoric acid (0.03 - 0.05%), Titanic Oxide (0.03 - 0.06%), alumina (0.71 - 1.91%), lime (trace - 0.07%), magnesium oxide (0.73 - 2.3%) and sulphur (0.02 - 0.32%).

(5) QUANTITY OF ORE AVAILABLE

In estimating quantities of ore only those zones are included in which the iron lenses have been proved by underground workings to extend below surface at contact with the country rocks.

The tonnages given below are calculated according to the average percentage pf magnetite as indicated by sampling the average lengths and widths as shown by surface and underground measurement, and the depths to lowest adit in each zone which the iron was proved to extend.

The following figures represent quantities of ore available for mining by open-cut methods:-

		Long tons.
No. 1 Zone	("A" Lense	60,540
	("B" Lense	443,710
	("C" Lense	986,300
No. 2 Zone		192,700
No. 3 Zone		269,200
No. 5 Zone		291,000
No. 9 Zone		58,280
No. 10Zone		144,500
No. 11Zone		273.500
		2,719,730

In addition moderate quantities of probable ore exist both in the developed lenses below the proved depths, and in the several small undeveloped bodies in this and adjacent area to the west.

The above estimates show that the quantities of ore obtainable at Comstock must be considered as small under present economic conditions. The deposits are of inadequate size to render uninterrupted supplies for a sufficient term to allow for amortization of plant and capital, in the consideration of large scale blast furnace smelting operations. It is in the development of small electric smelting units that the Comstock magnetites have potential possibilities in the future.

(6) MINING AND TRANSPORT:

The Comstock iron deposits are so situated, on hills and ridges rising above the general level of adjacent low-lying tracts that the ore could be extracted by open-cut methods of mining

However, since the ore bodies are comparatively small, and scattered over a wide area, mining costs would inevitably be high.

Transport to the sea-board at the port of Strahan could readily be made available by an extension of the railway line, of approximately six miles, from Zeehan to the deposits, making a total distance of 35 miles.

(7) CONCLUSIONS:

The survey of Comstock magnetite deposits has revealed that numerous short and narrow lenses occur in a sporadic manner in the locality. Several of the bodies have been proved by underground workings to extend to moderate depths below surface. The quantities of ore available are relatively small and, although open-cut methods are fesaible, mining costs would probably be high.

Rail transport to a shipping port, 30 miles in length, is available and an extension of the line for six miles from present rail-head to the deposits presents no difficulties.

F. BLAKE
A/GOVERNMENT GEOLOGIST

Mines Department,
HOBART.

19th February, 1940.

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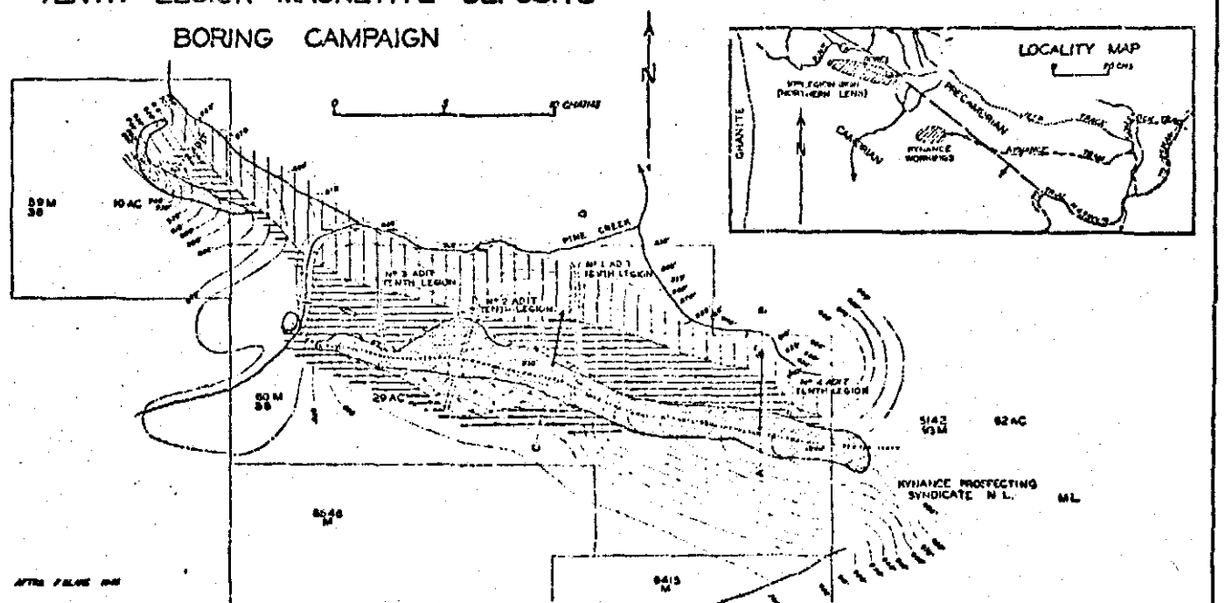
APPENDIX 9

TENTH LEGION MAGNETITE DEPOSITS

BORING CAMPAIGN



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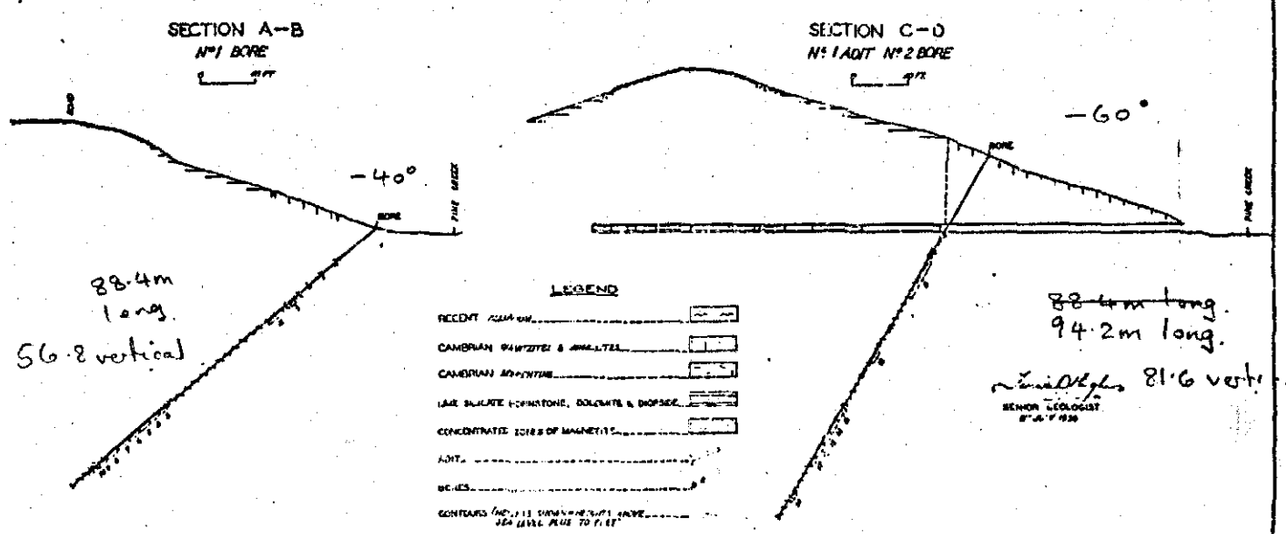

SENIOR GEOLOGIST

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OUT

Silver Lode (1 Lode).—Vein quartz containing sphalerite, with a bluish iridescent surface.

Skarn Rock opposite Fletcher's Adit.—The rock contains a quartz vein carrying magnetite and a little pyrite.

3 *Lode*.—Vein quartz with pyrite and black marmatite sphalerite.

4 *Lode*, near Fletcher's Adit.—Several pieces of lodestuff carrying pyrite, sphalerite and galena.

Magnetite Deposits at Tenth Legion, Comstock District

by Terence D. Hughes

Introduction.

During the past two years added attention has been focussed on the Iron Ore Resources of Tasmania. Many deposits of iron oxide in the West and North West have been investigated by both aerial and ground geophysical methods. The Tenth Legion deposits have not been examined geophysically, but more information concerning them has been obtained by means of two drill holes, recently completed. The deposits had not been drilled previously although the driving of several adits to an average length of 250 feet had allowed inspection and sampling of the iron.

Only the northern or main lens of the magnetite deposits was drilled and this report concerns only that portion of the field.

Situation and Access.

The Tenth Legion Magnetite deposits are located in the Comstock District, five miles west of Zeehan in Western Tasmania. Three miles from Zeehan on the Trial Harbour Road is the crossing of the former Comstock Tram. The tram formation is still in good order for jeep travel but because the bridge over a large creek has been destroyed this formation cannot be followed westward from the Trial Harbour Road towards the iron deposits. Instead, a track leading from the road half a mile beyond the tram crossing can be followed for 20 chains to the old Comstock Workings. From here a bull-dozed track has recently been made, across the button-grass plains for a mile and a half to the drill sites. This track has some soft patches and steep grades are encountered particularly near the drill site, but a jeep can, with care, negotiate it under normal weather conditions. The southern portion of the magnetite deposits, which are not dealt with in this report, were once reached most easily by following the Kynance Tram-way, however, this has now become overgrown and a deviation from the new track is the best route.

Previous Reports.

A comprehensive report on these deposits was written by G. A. Waller in 1903. At that time only one adit had been driven to intersect the magnetite. Waller considered that the host rocks formed a contact metamorphic zone round the granite mass of the Heemskirk Range and

postulated this granite magma as the source
deposits were briefly mentioned by Twelvet
(Geological Survey Bulletin No. 8) and b
(Geological Survey Bulletin No. 21). In
Australia-wide basis, was focussed on iron
connaissance of the deposits was made by
Geological Advisor Dr. W. G. Woolnough
sampling and mapping campaign was unde
1940 he prepared a Departmental report (ty
assays and indicated tonnages of the variou

Topography.

Along the course of the track to, and to th
deposits, the country shows the typical veg
regions underlain by Precambrian rocks: tha
intersected by small gullies, forming a dend
The deposits themselves and the Cambrian
covered by dense vegetation and this area
small streams. Half a mile to the west of the d
contours of the granite mass of the Heems
steeply to culminate in Mt. Agnew, at 2800 f

The northern magnetite lens occupies the s
a little north of west and rising to over a
Creek. This creek forms the northern bound
and is a tributary of the Pieman River.

Geology.

No attempt was made to map, on the gro
of the area, but the position of the fault sepa
from the Precambrian to the north has been
graphs. Likewise the boundary between the
the Cambrian rocks is shown as it appears on
relationships are shown on the accompanyin

The country rocks are a series of quartz
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(1 Lode).—Vein quartz containing sphalerite, descent surface.
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postulated this granite magma as the source of the magnetite. The deposits were briefly mentioned by Twelvetrees and Ward in 1910 (Geological Survey Bulletin No. 8) and by Waterhouse in 1916 (Geological Survey Bulletin No. 21). In 1939-40 interest on an Australia-wide basis, was focussed on iron ore deposits and a reconnaissance of the deposits was made by the then Commonwealth Geological Advisor Dr. W. G. Woolnough. As a result a detailed sampling and mapping campaign was undertaken by F. Blake. In 1940 he prepared a Departmental report (typewritten) which quoted assays and indicated tonnages of the various magnetite lenses.

Topography.

Along the course of the track to, and to the north of, the magnetite deposits, the country shows the typical vegetation and drainage of regions underlain by Precambrian rocks: that is, button grass plains intersected by small gullies, forming a dendritic pattern of drainage. The deposits themselves and the Cambrian rocks to the south are covered by dense vegetation and this area shows less dissection by small streams. Half a mile to the west of the drill sites are the rounded contours of the granite mass of the Heemskirk Range, which rises steeply to culminate in Mt. Agnew, at 2800 feet above sea level.

The northern magnetite lens occupies the summit of a hill, trending a little north of west and rising to over a hundred feet above Pine Creek. This creek forms the northern boundary of the magnetite hill and is a tributary of the Pieman River.

Geology.

No attempt was made to map, on the ground, the regional geology of the area, but the position of the fault separating the Cambrian rocks from the Precambrian to the north has been obtained from air photographs. Likewise the boundary between the granite to the west and the Cambrian rocks is shown as it appears on the photographs. These relationships are shown on the accompanying map. (fig 30).

The country rocks are a series of quartzites and argillites showing little shearing or cleavage. The argillites are grey in colour, both where well weathered and where only slightly so, as at 50 feet in the bore. The quartzites are cream and weather to buff. These rocks are tentatively regarded as Cambrian and may belong to the Dundas Group. They are in faulted relationship with a series of rather schistose, quartz impregnated rocks assigned to the Precambrian. The strike of this fault is north-west and the downthrow side is to the south-west. It passes a few chains north of the magnetite deposits.

The Cambrian rocks have been intruded by a series of basic bodies which are the host rocks of the magnetite, as well as by the large granite mass forming the Heemskirk Range. The basic intrusion probably occurred during the Cambrian, and the age of the granite is regarded as Devonian.

The petrology of the basic intrusive suite of rocks is extremely interesting and would make an ideal study for detailed petrological work. Thin sections have been cut from various footages of the core and a description of these by Petrologist G. Everard is appended to this report.

It would appear that the rock as originally intruded was an amphibolite, consisting principally of hornblende and oligoclase. However alteration products have been formed by various metasomatic processes. Whether this alteration took place in one or two stages, however, is not certain. The alteration of serpentine to dolomite is not uncommon (it can be observed in the cores of more recent bores at the Kapi Mine North Dundas) and the formation of diopside-tremolite rocks from magnesium carbonate rocks by increase in temperature has been described by Turner (1948). From the examination of bore cores and adits in this area, it would appear that although the more normal alteration of serpentine to dolomite does occur, an alteration to calcium magnesium silicates has also taken place. Calcite in veins and bunches is qute plentiful throughout the core and the presence of this may be due to the metasomatism during the alteration of the dolomites, rather than to direct mineralization from the granite magma.

At ninety feet and again at one hundred and ten feet in No. 2 Bore, is a curious looking rock resembling a fault breccia. On closer examination, however, it can be seen that the dark angular fragments of rock are areas of serpentine and the lighter groundmass is composed of carbonates and calc-silicates, which have formed by the alteration of the serpentine, leaving little cores of the latter unaltered.

Waller (1903) suggested that this host rock had been formed by the action of hot siliceous solutions, emanating from the granite magma, on beds of limestone, and that it was a contact metamorphic rock rather than an altered basic one.

An interesting comparison may be made between this rock and one described by Baker and Edwards (1957) from Andersons Creek near Beaconsfield. Here a hornblende gabbro has been subjected to a process of lime metasomatism so that the hornblende has been altered to a pale greyish or greenish substance, still retaining crystal outlines, and partly replaced by idocrase and diopside and the felspar almost completely altered to the garnet, grossularite. This rock has been called a rodingite.

The Iron Deposits.

The iron is almost wholly in the form of magnetite and is considered to be derived from the Cambrian basic intrusion and not, as has been postulated in the past, from the Devonian granite magma. These irregularly spaced concentrations of magnetite, occurring in definite zones in an altered basic rock bear strong resemblance to the more extensive deposits of the Savage River District (Hughes 1957).

In the portion of the Tenth Legion deposits under review, the magnetite forms the summit of a small ridge trending at 285° and rising to an average height of one hundred feet above Pine Creek, which forms its northern boundary. In outcrop the iron oxide is very pure and massive although clay beds show where the host rock has weathered away. In the bore cores, the magnetite appears quite compact, but in some adits it is apt to be friable and occasionally will run. The magnetite itself is very pure but unfortunately it is so mixed with the host rock, rather in the form of segregations than of defined lenses, that a high iron assay could not be obtained over any appreciable footage in any bore. On the surface, the magnetite outcrops over a distance of 1700 feet, with an average width of 150 feet. The widths of the magnetite zone are 240 feet in No. 1 Adit, 150 feet in

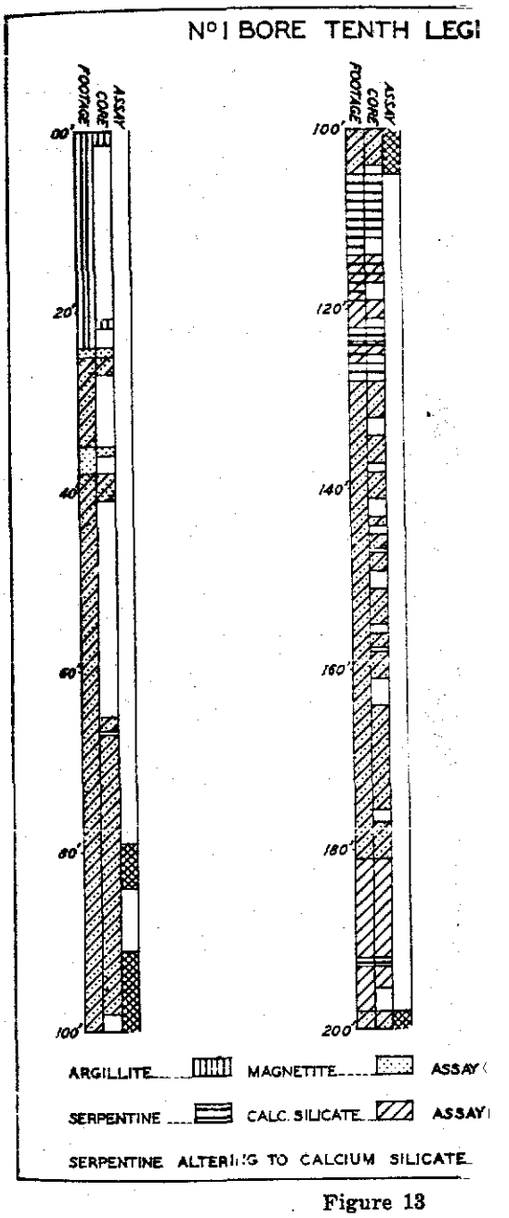

Figure 13

ear that the rock as originally intruded was an sting principally of hornblende and oligoclase. n products have been formed by various metasomatic r this alteration took place in one or two stages, certain. The alteration of serpentine to dolomite (it can be observed in the cores of more recent bores North Dundas) and the formation of diopside- rom magnesium carbonate rocks by increase in een described by Turner (1948). From the examina- and adits in this area, it would appear that although alteration of serpentine to dolomite does occur, an m magnesium silicates has also taken place. Calcite hes is qute plentiful throughout the core and the ay be due to the metasomatism during the alteration ather than to direct mineralization from the granite

and again at one hundred and ten feet in No. 2 looking rock resembling a fault breccia. On closer er, it can be seen that the dark angular fragments f serpentine and the lighter groundmass is composed calc-silicates, which have formed by the alteration leaving little cores of the latter unaltered.

suggested that this host rock had been formed by siliceous solutions, emanating from the granite f lime one, and that it was a contact metamorphic n a d basic one.

comparison may be made between this rock and one and Edwards (1957) from Andersons Creek near a hornblende gabbro has been subjected to a asomatism so that the hornblende has been altered or greenish substance, still retaining crystal out- replaced by idocrase and diopside and the felspar altered to the garnet, grossularite. This rock has gite.

most wholly in the form of magnetite and is con- d from the Cambrian basic intrusion and not, as d in the past, from the Devonian granite magma. spaced concentrations of magnetite, occurring in n altered basic rock bear strong resemblance to the osits of the Savage River District (Hughes 1957).

of the Tenth Legion deposits under review, the he summit of a small ridge trending at 285° and ge height of one hundred feet above Pine Creek, rthern boundary. In outcrop the iron oxide is very although clay beds show where the host rock has In the bore cores, the magnetite appears quite e adits it is apt to be friable and occasionally will e itself is very pure but unfortunately it is so mixed rather in the form of segregations than of defined iron assay could not be obtained over any ap- any bore. On the surface, the magnetite outcrops 1700 feet, with an average width of 150 feet. The netite zone are 240 feet in No. 1 Adit, 150 feet in

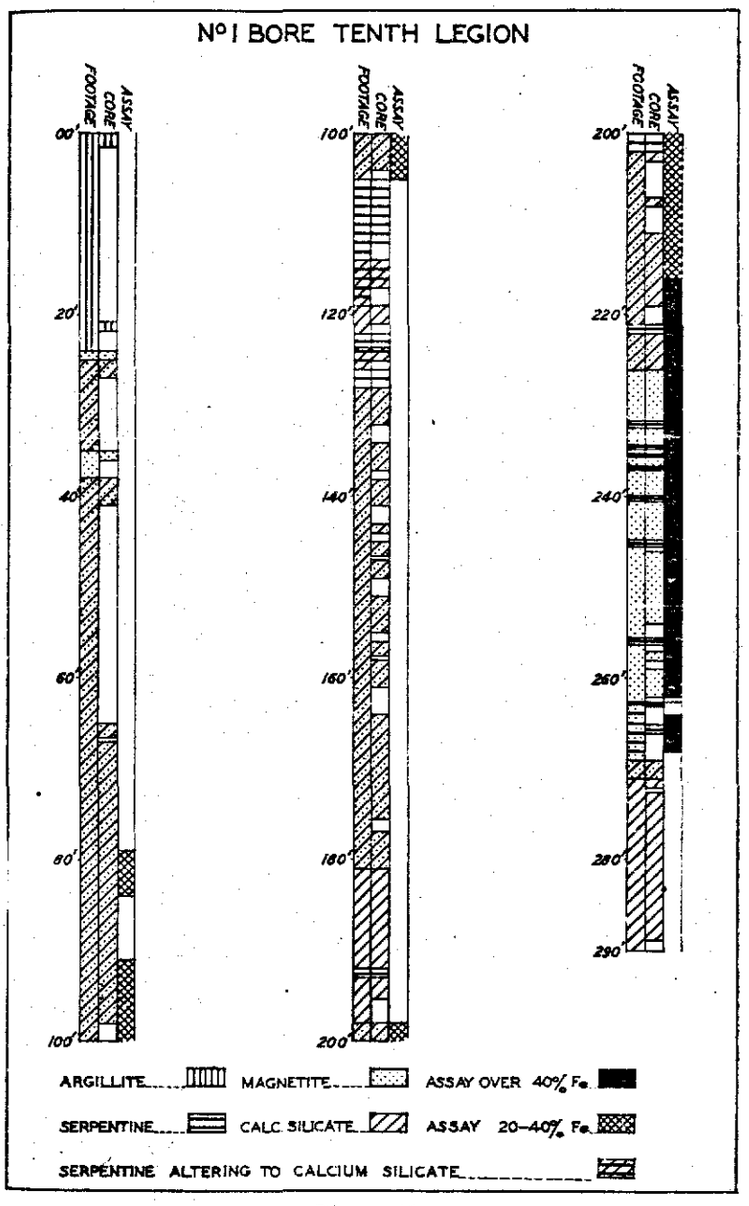

Figure 13

No. 2 Adit and 80 feet in No. 3 Adit, but the width occupied by magnetite of any appreciable concentration averages only 70 feet in each adit. The width of the main magnetite concentration in No. 1 Bore is 60 feet and there is another 15 foot concentration further to the north. In No. 2 Bore magnetite occurs over a width of 150 feet but less than 50% of this contains appreciable quantities of iron oxide. The reserves indicated by the outcrop, adits and two bores in this area amount to nearly three million tons, the depth being taken at 200 feet as revealed by the drilling.

The grade of the ore deteriorates from the surface down. This is partly due to the rapid weathering of the host rock near the surface, leaving only magnetite at the outcrop and partly to the dilution of the magnetite in the host rock at depth. Assays of samples taken by Blake in 1940 are only available for No. 2 Adit which is to the west of the bores, but these show much higher iron values than those taken from the bores. In the adit, samples taken intermittently over 150 feet showed an assay of 66% iron for 90 feet. In No. 1 Bore, assay of the core showed an average of 42% iron over 70 feet. Individual samples could have been taken over shorter distances which would have yielded a higher iron figure and the highest for 10 feet was 52% iron. In No. 2 Bore, the magnetite was even less concentrated and the highest 10 foot sample assayed only 35% iron.

In drawing cross sections, no attempt can be made to connect up the concentrations of magnetite in the bore, in the adit and on the surface. Similarly, in longitudinal sections, the iron concentrations should not be joined from adit to adit or bore to bore. The iron occurs not in regular lodes or lenses, but in irregular segregations throughout the host rock. This does not mean that the actual zone containing these segregations cannot be delineated and an average iron content assumed throughout this zone. The three million tons mentioned above probably averages about 50% iron, but to obtain this about twice that tonnage averaging 25% iron would have to be mined. As the ore is magnetite, it is not expected that there would be any great difficulty in separating the iron ore from the serpentine, calc-silicates and carbonates which contain it. It should be noted that, in the bore cores, the magnetite appears to be more closely associated with serpentine than with the alteration products.

The percentages of impurities in the samples taken from the adit and from the two bores vary considerably. An average of ten samples from No. 2 adit showed:—

	%
Acid Insoluble	2.1
MnO	0.7
P_2O_5	0.04
TiO_2	0.04
Al_2O_3	1.3
CaO	0.03
MgO	2.0
S	0.17

The average of eight samples showed only 0.02% sulphur but one sample contains 1.43%. The surprising result is the percentage of lime, many samples showing but a trace. It would be expected that as lime silicates are host materials, a much higher percentage of lime would occur. It seems likely that the principal impurity is the unaltered serpentine, as silica and magnesia are the highest impurities.

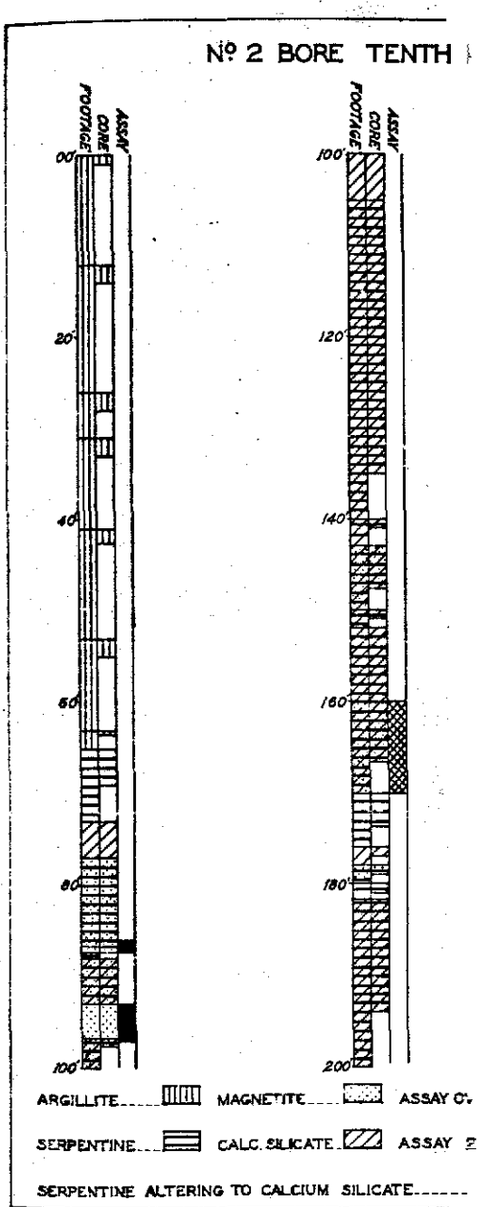

Figure 14

0 feet in No. 3 Adit, but the width occupied by appreciable concentration averages only 70 feet width of the main magnetite concentration in No. 1 there is another 15 foot concentration further to the ore magnetite occurs over a width of 150 feet but this contains appreciable quantities of iron oxide. ated by the outcrop, adits and two bores in this area three million tons, the depth being taken at 200 feet drilling.

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	%
Acid Insoluble	2.1
MnO	0.7
P_2O_5	0.04
TiO_2	0.04
Al_2O_3	1.3
CaO	0.03
MgO	2.0
S	0.17

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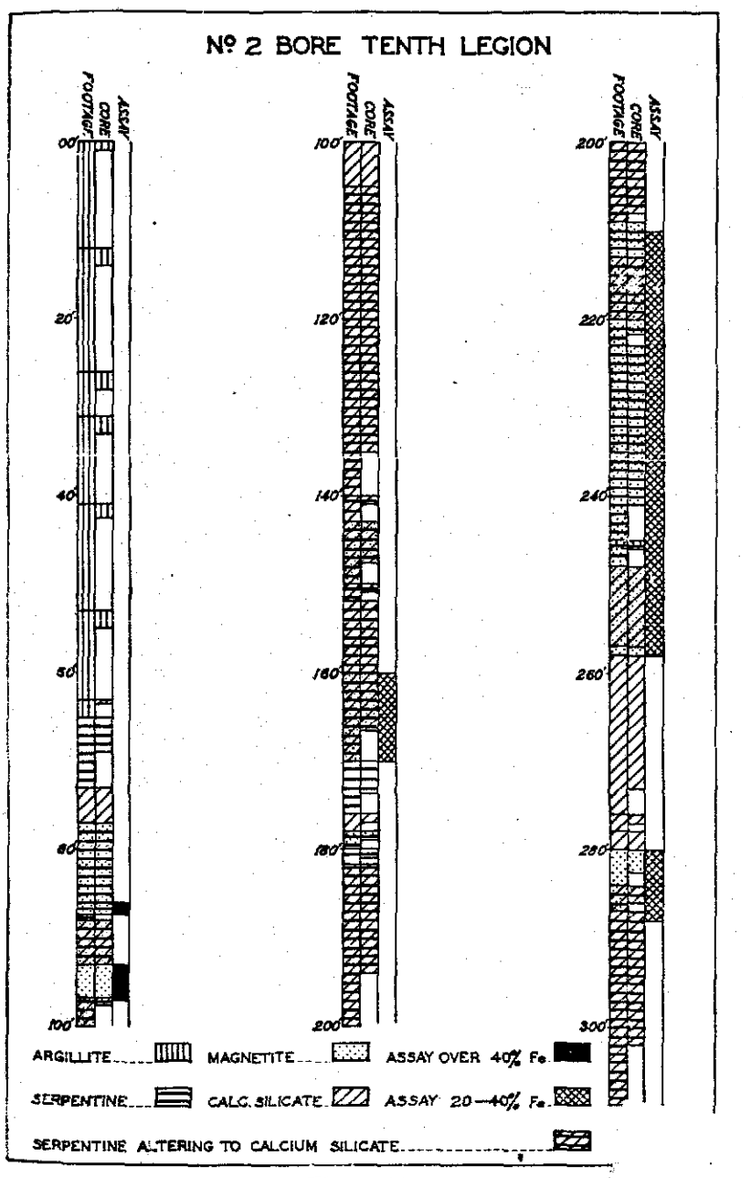

Figure 14

The small percentage of titanium compared with that found in the Savage River iron is interesting. Percentages of certain impurities were calculated for a composite sample from each bore. These showed:—

	No. 1 Bore	*No. 2 Bore*
	%	%
SiO_2	4.80	12.7
TiO_2	0.03	0.07
P_2O_5	0.03	0.04
S	0.14	0.22

The percentages of impurities likely to be "troublesome" e.g. titanium, sulphur and phosphorus are like those estimated from adit samples. quite low.

Conclusions.

Although the boring campaign was very limited it has revealed one important aspect of the magnetite concentrations. The magnetite does extend to a depth of at least two hundred feet below the surface, but concentrations become more sporadic at depth and a much lower grade of ore results. In the adits, definite bands of material up to 30 feet in width and assaying over 60% iron can be recognised. From information obtained from the bore cores the magnetite appears to be more disseminated, occurring in favourable zones of the country, particularly those composed mainly of serpentine.

The iron deposits of the Tenth Legion are small and taken over all are of low grade. However the magnetite may be easily separated from the country rock and the deposits may yet be utilised as an adjunct to the larger Savage River deposits.

References.

BLAKE, F., 1940.—Magnetite Deposits in the Comstock District (unpublished).
TURNER, P. J., 1948.—Geol. Soc. America, Memoir 30.
WALLER, G. A., 1903.—Report on Iron and Zinc-Lead Deposits of Comstock District. Tas. Dept. Mines.

APPENDIX I.

By G. B. Everard, Mineralogist and Petrologist. The following petrographic descriptions apply to sections of cores from Nos. 1 and 2 D.D.H's. on the Tenth Legion Mine in the Zeehan District.

D.D.H. No. 1.

89′ Light grey, very fine grained rock with dark cloudy patches.
In thin section the rock is an interlacing mass of tremolite needles with interstitial diopside and sericite. In the dark areas, magnetite fills the interstices between the tremolite crystals.

106′ Dark green, fine grained rock, easily scratched.
In thin section the rock shows a fine grained structureless mass of interlacing crystals. Serpentine is prominent in patches and disseminated radiating crystals with very low birefringence. Hornblende also is plentiful in plates, corroded to appear acicular or granular masses, according

to whether orientation is alo
Idocrase appears as small gr
masses of neutral tint sho
anomalous polarisation colou
rock is an amphibolite.

115′ Fine grained greenish mottled ro
In thin section, the rock is sc
interlacing needles of hornble
have been altered to serpenti
granular masses and magnetit
inated. There are also severa
oligoclase into which hornble
oligoclase areas may consist
fitting tightly together in a
sometimes showing simple t
amphibolite.

192′ Dark greyish green mottled rock
In thin section, a composite s
textures and mineral assem
different areas. Plastic flow t
lets containing quartz, quartz
cut through the rock. There a
—sericite mosaic, heavily di
cubes up to about 1 mm. acro
dark coloured graphite serici
in lines and bunches of very fin
areas show confused banding

272′ Mottled light grey rock.
In thin section the rock is se
large irregular corroded cryst
in smaller laths about 2 mm.
idocrase, yellow or colourless
section in angular grains an
anomalous interference colou

D.D.H. No. 2.

97′ Contact specimen showing se
silicate, with veinlets of serp
silicate and gradually passing
selves.
In thin section the rock is
granular diopside, stained
material. Some porphyroblas
long are present also. Area
some pale green mica make
micaceous areas contain som

107′ The rock is a breccia of angul
light green groundmass.
Thin section shows the gro
fragments of serpentine occu
carbonates together with fibro
line patches of serpentine
material.

·tage of titanium compared with that found in the ·n is interesting. Percentages of certain impurities for a composite sample from each bore. These

No. 1 Bore	*No. 2 Bore*
%	%
4.80	12.7
0.03	0.07
0.03	0.04
0.14	0.22

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Magnetite Deposits in the Comstock District (unpublished).
48.—Geol. Soc. America, Memoir 30.
1903.—Report on Iron and Zinc-Lead Deposits of Comstock Dept. Mines.

APPENDIX I.

·rard, Mineralogist and Petrologist. The following ·ıptions apply to sections of cores from Nos. 1 and Tenth Legion Mine in the Zeehan District.

y, very fine grained rock with dark cloudy patches. n section the rock is an interlacing mass of tremolite es with interstitial diopside and sericite. In the dark , magnetite fills the interstices between the tremolite ls.

·ı, fine grained rock, easily scratched.

n section the rock shows a fine grained structureless of interlacing crystals. Serpentine is prominent in cs and disseminated radiating crystals with very ·efringence. Hornblende also is plentiful in plates, ded to appear acicular or granular masses, according

to whether orientation is along or normal to the c axis. Idocrase appears as small grains and larger irregular masses of neutral tint showing cleavage and with anomalous polarisation colours of the first order. The rock is an amphibolite.

115′ Fine grained greenish mottled rock.

In thin section, the rock is seen to consist of masses of interlacing needles of hornblende, which in some areas have been altered to serpentine. Calcite is plentiful in granular masses and magnetite is rather sparsely disseminated. There are also several small irregular areas of oligoclase into which hornblende needles project. The oligoclase areas may consist of small anhedral crystals fitting tightly together in a mosaic or single crystals, sometimes showing simple twinning. The rock is an amphibolite.

192′ Dark greyish green mottled rock, not easily scratched.

In thin section, a composite structure is revealed, definite textures and mineral assemblages being confined to different areas. Plastic flow texture is prominent. Veinlets containing quartz, quartz and sericite, and serpentine cut through the rock. There are areas of quartz—felspar —sericite mosaic, heavily disseminated with pyrite in cubes up to about 1 mm. across. Other areas consist of dark coloured graphite sericite schist, containing pyrite in lines and bunches of very fine particles. These schistose areas show confused banding and minute folding.

272′ Mottled light grey rock.

In thin section the rock is seen to consist of tremolite in large irregular corroded crystals about 1 mm. across and in smaller laths about 2 mm. long. A small amount of idocrase, yellow or colourless, is scattered through the section in angular grains and subhedral crystals with anomalous interference colours.

D.D.H. No. 2.

97′ Contact specimen showing serpentine and white calc-silicate, with veinlets of serpentine penetrating the calc-silicate and gradually passing over to calc-silicates themselves.

In thin section the rock is seen to consist mainly of granular diopside, stained by translucent greenish material. Some porphyroblasts of diopside up to 1 mm. long are present also. Areas of sericite together with some pale green mica make up part of the rock. The micaceous areas contain some magnetite.

107′ The rock is a breccia of angular pieces of serpentine in a light green groundmass.

Thin section shows the groundmass, in which angular fragments of serpentine occur, to consist principally of carbonates together with fibrous coiled bands and crystalline patches of serpentine and light coloured opaque material.

123′ Light green, fine grained rock with irregular dark green patches and veinlets.

The rock consists of minute crystals of diopside. The crystals are usually equidimensional in outline, but rods and laths and sheaf-like aggregates are also prominent. The darker patches occur when serpentine and magnetite occur with diopside. Veinlets of serpentine and carbonates traverse the rock.

APPENDIX II.

ASSAYS OF BORE CORES.

The cores were split and half the core forwarded for assay.

No. 1 Bore

Sample No.	Footage	%HCl soluble Iron
1	79′—84′	24.3
2	91′—105′	31.2
3	199′—207′	22.1
4	207′—216′	28.8
5	216′—226′	48.0
6	226′—236′	52.3
7	236′—246′	51.5
8	246′—257′	43.1
9	257′—262′6″	56.2
10	264′—268′	42.8

No. 2 Bore

11	86′—87′ } 93′—97′ }	43.5
12	160′—170′	27.7
13	210′—220′	11.1
14	220′—230′	16.6
15	230′—240′	29.1
16	240′—250′	35.3
17	250′—258′	28.3
18	280′—288′	33.4

APPENDIX III.

BORE LOGS

No. 1 Bore	*Core Obtained.*		*Rock.*
0 — 20′ 6″	1′ 6″	BX	Broken country and boulders
20′ 6″— 24′	9″	BX	Argillite
24′ — 25′	1′	BX	Magnetite
25′ — 35′	2′	AX	Calc-silicate with some magnetite
35′ — 38′	1′	AX	Magnetite
38′ — 65′	3′	AX	Calc-silicate with some magnetite
65′ — 67′	1′ 6″	AX	ditto
67′ — 71′	4′	AX	ditto
71′ — 79′	8′	AX	ditto

No. 1 Bore	*Core Obtained.*	
79′ — 84′	5′	EX
84′ — 90′	6′	EX
90′ —105′	12′	
105′ —114′	7′	
114′ —119′	3′	
119′ —122′	2′	
122′ —123′ 6″	1′ 6″	
123′ 6″—126′	1′ 6″	
126′ —128′	2′	
128′ —134′	4′	
134′ —138′	3′	
138′ —143′	3′	
143′ —145′	1′	
145′ —147′	1′ 6″	
147′ —151′	2′	
151′ —154′	3′	
154′ —156′	1′	
156′ —158′	1′ 6″	
158′ —164′	3′	
164′ —174′	10′	
174′ —177′	1′ 6″	
177′ —181′	4′	
181′ —192′	9′	
192′ —193′	1′	
193′ —198′	2′	
198′ —200′	2′	
200′ —202′	2′	
202′ —207′	1′	
207′ —211′	1′	
211′ —216′	5′	
216′ —221′	3′	
221′ —226′	5′	
226′ —236′	10′	
236′ —246′	9′ 6″	
246′ —257′	8′	
257′ —259′	9″	
259′ —262′ 6″	3′	

green, fine grained rock with irregular dark green ...es and veinlets.

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No.	Footage	%HCl soluble Iron
	79'—84'	24.3
	91'—105'	31.2
	199'—207'	22.1
	207'—216'	28.8
	216'—226'	48.0
	226'—236'	52.3
	236'—246'	51.5
	246'—257'	43.1
	257'—262'6"	56.2
	264'—268'	42.8
	86'—87' }	
	93'—97' }	43.5
	160'—170'	27.7
	210'—220'	11.1
	220'—230'	16.6
	230'—240'	29.1
	240'—250'	35.3
	250'—258'	28.3
	280'—288'	33.4

APPENDIX III.

BORE LOGS

Core Obtained.		*Rock.*
1' 6"	BX	Broken country and boulders
9"	BX	Argillite
1'	BX	Magnetite
2'	AX	Calc-silicate with some magnetite
1'	AX	Magnetite
3'	AX	Calc-silicate with some magnetite
1' 6"	AX	ditto
4'	AX	ditto
8'	AX	ditto

No. 1 Bore		*Core Obtained.*		*Rock.*
79'	— 84'	5'	EX	Calc-silicate mainly magnetite
84'	— 90'	6'	EX	ditto—mainly calc-silicate
90'	—105'	12'		ditto—mainly magnetite
105'	—114'	7'		Serpentine
114'	—119'	3'		Serpentine altering to calc-silicates
119'	—122'	2'		Calc-silicate
122'	—123' 6"	1' 6"		Serpentine
123' 6"	—126'	1' 6"		Serpentine altering to calc-silicates
126'	—128'	2'		Serpentine
128'	—134'	4'		Calc-silicate with sparse serpentine and magnetite
134'	—138'	3'		ditto
138'	—143'	3'		ditto
143'	—145'	1'		ditto
145'	—147'	1' 6"		ditto
147'	—151'	2'		ditto
151'	—154'	3'		ditto
154'	—156'	1'		ditto
156'	—158'	1' 6"		ditto
158'	—164'	3'		ditto
164'	—174'	10'		Calc-silicate with little magnetite
174'	—177'	1' 6"		ditto
177'	—181'	4'		ditto
181'	—192'	9'		Calc-silicate
192'	—193'	1'		Black rock (see Appendix I)
193'	—198'	2'		ditto
198'	—200'	2'		Magnetite in calc-silicate
200'	—202'	2'		Serpentine
202'	—207'	1'		Magnetite in calc-silicate
207'	—211'	1'		ditto
211'	—216'	5'		ditto
216'	—221'	3'		ditto
221'	—226'	5'		ditto Serpentine 221'—222'
226'	—236'	10'		Magnetite ½" serp. at 232', 234' 6" and 235' 6"
236'	—246'	9' 6"		Magnetite serp. at 236' 6"—237' 239' 6"—240' 6" 243' 6"—244' 6"
246'	—257'	8'		Magnetite, 1" serpentine at 2!
257'	—259'		9"	Magnetite
259'	—262' 6"	3'		Magnetite — friable

No. 1 Bore	*Core Collected.*		*Rock.*
262′ 6″—265′	6″		Serpentine
265′ —269′	1′		Serpentine
269′ —271′	2′		Calc-silicate with little magnetite
271′ —272′ 6″	6″		Calc-silicate
272′ 6″—290′	16′		Calc-silicate
No. 2 Bore			
0′ — 12′	6″	BX	Argillite pieces very broken and oxidised
12′ — 26′	2′	BX	Hard argillite—some weathering
26′ — 27′	6″	BX	ditto
27′ — 31′	1′ 6″	BX	ditto
31′ — 41′	2′	AX	Hard argillite (Some secondary silicification)
41′ — 53′	1′ 6″	AX	ditto (weathered)
53′ — 55′	4″	AX	ditto (weathered)
55′ — 57′	6″	AX	Soft argillite
57′ — 58′	9″	AX	Argillite (some silicification)
58′ — 60′	4″	AX	Quartzite (weathered)
60′ — 63′	3″	AX	ditto
63′ — 65′	3″	AX	Soft argillite—very weathered — some calcite crystals
65′ — 67′	7″	EX	Serpentine
67′ — 69′	9″	EX	Serpentine (calcite veins)
69′ — 71′	1′ 6″	EX	Serpentine
71′ — 73′	1′ 2″	EX	Serpentine
73′ — 74′	11″		Serpentine — nearly all altered to calc-silicate
74′ — 76′	1′ 6″		ditto
76′ — 77′	1′		ditto
77′ — 80′	3′		Serpentine altering to calc-silicate
			Nearly all serpentine — 78′ — 79′ sparse magnetite
80′ — 82′	1′ 9″		Mainly serpentine
82′ — 83′	9″		ditto
83′ — 85′	1′ 6″		ditto
85′ — 88′	3′		ditto 86′ 6″—87′ 6″ magnetite
88′ — 90′	1′ 4″		Serpentine altering to calc-silicate — some magnetite — breccia-like rock
90′ — 92′ 6″	2′		ditto little magnetite
92′ 6″— 95′	1′ 7″		Mainly magnetite

No. 2 Bore	*Core Collected.*
95′ — 97′	1′ 5″
97′ — 99′	1′ 5″
99′ —105′	4′ 6″
105′ —113′	8′
113′ —123′	10′
123′ —127′	4′
127′ —140′	8′
140′ —143′	1′
143′ —150′	4′ 6″
150′ —152′	1′
152′ —154′	2′
154′ —159′	5′
159′ —160′ 8″	1′ 8″
160′ 8″—171′	5′ 6″
171′ —176′	2′ 6″
176′ —178′	1′
178′ —180′	1′
180′ —181′	9″
181′ —181′ 6″	4″
182′ —184′	1′ 6″
184′ —186′	1′ 6″
186′ —190′	3′
190′ —192′	2′
192′ —194′	2′
194′ —197′	1′ 6″
197′ —201′	1′ 6″

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Core Collected.		*Rock.*
6″		Serpentine
1′		Serpentine
2′		Calc-silicate with little magnetite
6″		Calc-silicate
16′		Calc-silicate
6″	BX	Argillite pieces very broken and oxidised
2′	BX	Hard argillite—some weathering
6″	BX	ditto
1′ 6″	BX	ditto
2′	AX	Hard argillite (Some secondary silicification)
1′ 5″	AX	ditto (weathered)
4″	AX	ditto (weathered)
6″	AX	Soft argillite
9″	AX	Argillite (some silicification)
4″	AX	Quartzite (weathered)
3″	AX	ditto
3″	AX	Soft argillite—very weathered — some calcite crystals
7″	EX	Serpentine
9″	EX	Serpentine (calcite veins)
1′ 6″	EX	Serpentine
1′ 2″	EX	Serpentine
11″		Serpentine — nearly all altered to calc-silicate
1′ 6″		ditto
1′		ditto
3′		Serpentine altering to calc-silicate
		Nearly all serpentine — 78′ — 79′ sparse magnetite
1′ 9″		Mainly serpentine
9″		ditto
1′ 6″		ditto
3′		ditto 86′ 6″—87′ 6″ magnetite
1′ 4″		Serpentine altering to calc-silicate — some magnetite — breccia-like rock
2′		ditto little magnetite
1′ 7″		Mainly magnetite

No. 2 Bore		*Core Collected.*	*Rocks.*
95′	— 97′	1′ 5″	Magnetite to 96′ 8″ then calc-silicate
97′	— 99′	1′ 5″	Calc-silicate very sparse magnetite
99′	—105′	4′ 6″	ditto (becoming weathered)
105′	—113′	8′	Serpentine altering to calc-silicate breccia appearance some calcite at 105′ 6″
113′	—123′	10′	Serpentine altering to calc-silicate (sparse magnetite)
123′	—127′	4′	ditto
127′	—140′	8′	ditto (Weathered and oxidised 130′—145′)
140′	—143′	1′	ditto (Calcite veins 141′—142′)
143′	—150′	4′ 6″	ditto (Magnetite 144′—146′)
150′	—152′	1′	ditto
152′	—154′	2′	ditto (Calcite at 153′ 6″)
154′	—159′	5′	ditto (25% calcite veins)
159′	—160′ 8″	1′ 8″	ditto
160′ 8″	—171′	5′ 6″	Mainly magnetite (170′—171′ serpentine)
171′	—176′	2′ 6″	Serpentine with sparse magnetite (Calc. silicate 175′—176′)
176′	—178′	1′	Serpentine altering to calc-silicate little magnetite and pyrite
178′	—180′	1′	Serpentine with sparse magnetite
180′	—181′	9″	ditto
181′	—181′ 6″	4″	ditto (some pyrite) to calc-silicate
182′	—184′	1′ 6″	ditto
184′	—186′	1′ 6″	ditto
186′	—190′	3′	ditto (sparse magnetite)
190′	—192′	2′	Serpentine altering to calc-silicate
192′	—194′	2′	ditto (little pyrite)
194′	—197′	1′ 6″	ditto
197′	—201′	1′ 6″	ditto

No. 2 Bore.	*Bore Collected.*	*Rock.*
201′ —202′	1′	ditto (sparse magnetite)
202′ —204′	1′ 6″	ditto
204′ —207′	3′	ditto
207′ —209′	2′	ditto
209′ —209′ 6″	6″	Serpentine
209′ 6″—213′	3′ 6″	Serpentine and magnetite
213′ —220′	7′	Serpentine altering to calc-silicate intermittent magnetite
220′ —223′	1′ 6″	Serpentine and magnetite
223′ —227′	4′	Mainly magnetite little serpentine
227′ —236′	9′	ditto
236′ —239′	3′	Mainly magnetite little serpentine
239′ —245′	2′	ditto
245′ —248′	1′	Magnetite & quartz —little serpentine
248′ —251′	3′	Calc-silicate with little magnetite
251′ —255′	4′	Magnetite in calc-silicate
255′ —261′	5′	Calc-silicate (magnetite 257′—258′)
261′ —268′	6′ 6″	Calc-silicate with sparse magnetite
268′ —276′	5′ 6″	ditto
276′ —278′	1′	Calc-silicate
278′ —280′	2′	ditto
280′ —281′	1′	Mainly magnetite
281′ —284′ 6″	1′ 6″	Mainly magnetite—little calc-silicate
284′ 6″—287′	1′ 6″	Serpentine to calc-silicate (281′—287′ some pyrite) some magnetite
287′ —293′	4′	Serpentine altering to calc-silicate
293′ —298′	5′	ditto
298′ —307′	5′	ditto
307′ —309′	1′	ditto

Brick-Making Materials near Mt. Rumney

by Terence D. Hughes & F. Blake

General

In recent years difficulty has been experienced in obtaining suitable economic deposits of brick-making materials within easy reach of Hobart by Motor transport.

Following a wide search for such materials in various localities, an examination was requested of two likely areas of shales on the lower western slopes of Mt. Rumney.

Location and Access.

No. 1 Area is situated immediately south ten chains from the junction with Tasman Tunnel Hill. This area lies within seven m Highway.

No. 2 Area is located ¾ of a mile south ea from Hobart is six miles by way of Tasman Tunnel Hill, then southerly along Pass Road f leading ¼ mile easterly to the south end of th Sanitary Depot. From this point a sandy roa shale deposits in a distance of three hundred fe

Geology

The rocks in both areas consist of a shal thickness from 25 feet at the northern end to dipping to the south-south-west at 4°—5°.

The shales overlie and are succeeded by tones. The overlying sandstones have been la remnants now exist in the areas surveyed. In t 2 Area seventy feet of overlying sandstone be hilltop.

These rocks are of Triassic age and corre lofty Sandstone and Shale of the Hobart dis

It has not been possible to trace the f between the two areas surveyed and it would a displaced them in that locality.

Jurassic dolerite, exposed in a roadside has intruded the lower sandstones to a limited have been indurated up to three feet from the

The Brick Material

Quality: These shales (or siltstones) of used extensively for brickmaking in the Hoba Crisp and Gunn's Brickworks have used shal Hobart Brick Company from New Town, Chig and the Granton Brick Company from Grant beds of any great thickness of ideal brick m layers or without an overburden of sandstor nages of rock have to be discarded.

It is expected that a thickness of about t may be found at the No. 1 site and sixty feet Rumney. Except for narrow sandy beds near appear to be of good even grade. Outcrop, as is extremely limited but a bulldozed trench pu shows most of the beds a foot or so below the su to be harder than the average shale and the la developed so that it may perhaps be better On the outcrop it weathers quickly and a atmosphere for some time, breaks up into sm

Quantity: The No. 2 site has for calculat up into two parts. That south of the sands and that to the west of it No. 2A area. It is tons of shale may be obtained in No 2 area a

184

Assays carried out by Mt. Lyell in 1975 on two Tasmanian Mines Department drill holes in the Tenth Legion area. (in p.p.m.)

		Sn	As	Cu	Pb	Zn	Ba	Mo
T.L. 1	8'	160	30	< 10	10	185	80	< 10
	20'	60	20	95	60	65	200	< 10
	30'	40	15	70	15	35	200	< 10
	40'	40	45	145	15	120	200	< 10
	50'	20	30	135	20	75	240	< 10
	60'	40	45	25	< 10	45	120	< 10
	70'	70	20	85	120	60	200	< 10
	80'	50	65	< 10	10	120	120	< 10
	90'	740	65	10	65	270	80	< 10
	100'	500	30	10	35	720	160	20
	110'	20	15	10	< 10	410	240	40
	120'	20	130	80	25	170	80	< 10
	130'	330	65	40	25	115	200	< 10
	140'	50	20	< 10	460	750	760	< 10
	150'	20	20	35	70	115	680	< 10
	160'	50	10	15	10	75	80	< 10
	170'	20	50	10	30	170	80	< 10
	180'	20	10	< 10	15	30	80	< 10
	190'	20	15	< 10	160	255	120	< 10
	200'	240	125	50	30	265	120	< 10
	210'	700	165	15	370	900	120	< 10
	220'	800	65	75	125	125	120	< 10
	230'	1 100	55	15	400	170	80	< 10
	240'	780	55	30	< 10	700	80	< 10
	250'	340	70	30	< 10	285	120	< 10
	260'	210	65	35	25	240	560	< 10
	270'	50	45	< 10	20	590	1240	< 10
	280'	50	15	< 10	10	65	280	< 10
	290'	80	20	10	< 10	370	1020	< 10

226184

		Sn	As	Cu	Pb	Zn	Ba	Mo
T.L. 2	10'	20	20	*2000	65	75	520	620
	20'	20	280	*103	< 10	455	1860	< 10
	30'	40	10	*1180	25	85	360	80
	40'	40	10	10	20	90	640	< 10
	50'	60	20	165	10	70	180	< 10
	60'	40	20	10	75	160	1140	< 10
	70'	80	30	< 10	10	45	1160	< 10
	80'	60	10	10	10	480	180	< 10
	90'	60	250	20	80	55	880	< 10
	100'	20	280	35	20	200	120	< 10
	110'	20	200	30	10	345	260	< 10
	120'	40	70	15	190	520	180	< 10
	130'	20	80	20	< 10	130	160	< 10
	140'	60	540	20	40	170	360	< 10
	150'	20	170	< 10	30	50	240	< 10
	160'	80	20	15	< 10	135	160	< 10
	170'	60	70	70	< 10	80	160	< 10
	180'	20	170	15	40	35	640	< 10
	190'	60	90	65	< 10	55	1300	< 10
	200'	100	1 060	45	< 10	85	120	< 10
	210'	20	120	10	< 10	280	200	< 10
	220'	250	40	35	10	760	180	< 10
	230'	20	70	300	545	990	2600	10
	240'	20	120	15	10	75	180	< 10
	250'	3 030	70	60	< 10	250	200	< 10
	260'	20	120	< 10	< 10	330	260	< 10
	270'	20	130	< 10	< 10	550	260	< 10
	280'	20	140	15	< 10	420	240	< 10
	290'	50	70	85	< 10	250	180	< 10
	300'	90	20	45	65	260	950	< 10

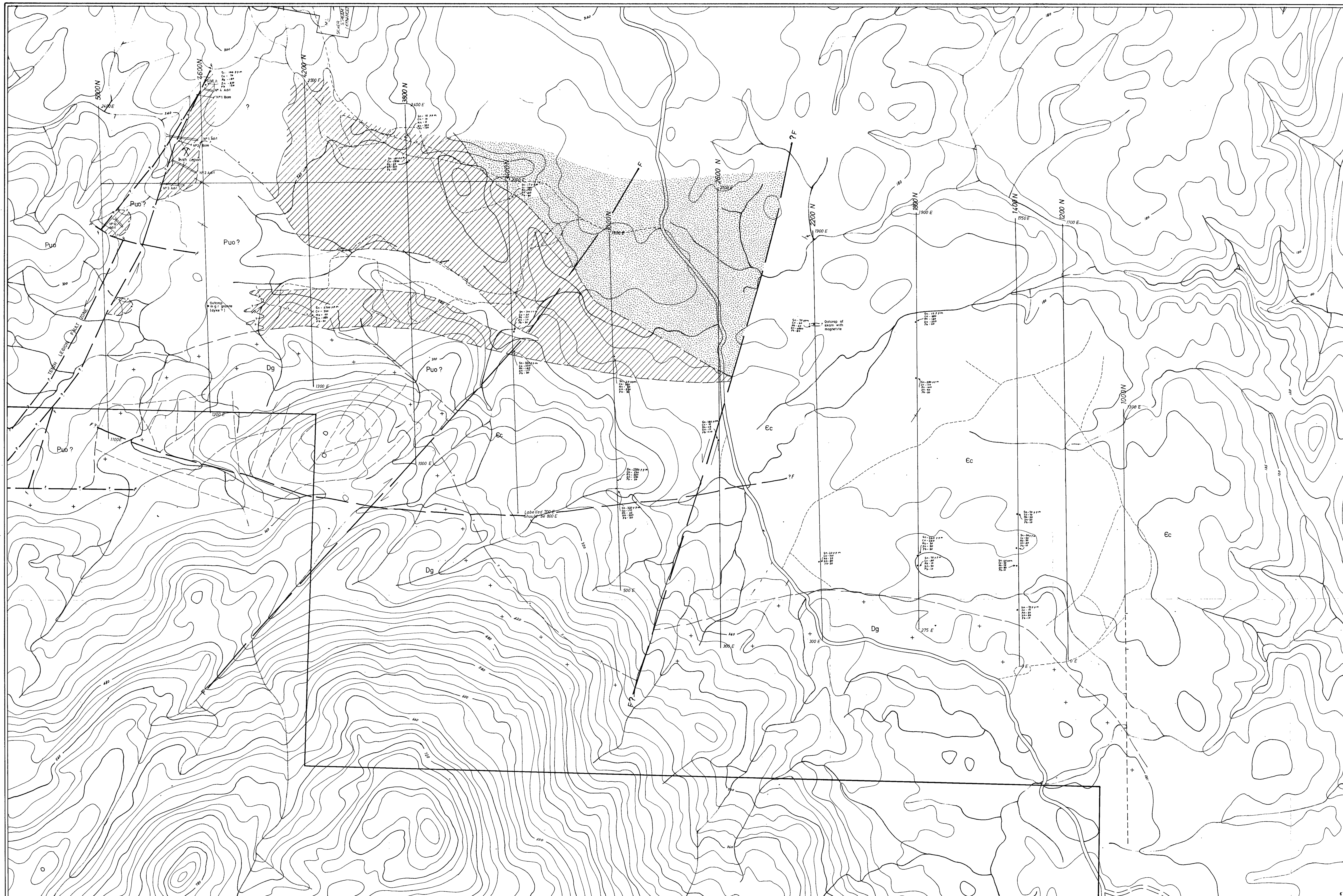
* High copper values. Contamination from Mount Lyell sample mill?

RENISON LIMITED

MAPS:

1.	Locality Plan	1 : 50000
2.	EHG Interpretative Geology	1 : 5000
3.	EHG Geology Fact Plan	1 : 5000
4.	EHG Proton Magnetics	1 : 5000
5.	EHG Geochemical Plans a) Sn b) As c) Cu d) Pb e) Zn	1 : 5000
6.	EHG Composite Line Profiles a) EHG Line 1000N b) EHG Line 1200N c) EHG Line 1400N d) EHG Line 1800N e) EHG Line 2200N f) EHG Line 2600N g) EHG Line 3000N h) EHG Line 3400N i) EHG Line 3800N j) EHG Line 4200N k) EHG Line 4600N l) EHG Line 5000N	1 : 2000
7.	Area 'D' Geological Map (showing proposed DDH)	1 : 5000
8.	Line 24E Composite Profile (showing proposed DDH)	1 : 2000

78-1300 Vol II



INTRUSIVES

+ Dg +	DEVONIAN HEEMSKIRK GRANITE
(stipple)	CAMBRIAN McIVOR HILL GABBRO
(hatching)	IRONSTONE (? Derived from intrusive)

CAMBRIAN

Єc	UNDIFFERENTIATED TUFFS, PELITES AND GREYWACKES — CRIMSON CREEK FORMATION (LOWER CAMBRIAN)

PRECAMBRIAN

Puo	QUARTZITE - OONAH FORMATION

GEOLOGICAL CONTACT

FAULT

JOINTING IN GRANITE

DRILL HOLE

ADIT

226187

5 cm

The locations of the drill holes and adits on the 10th Legion Mine have been taken from Hughes 1958. Therefore the positioning may not be accurate

The positions of the grid lines and logging tracks are estimated - they have not yet been surveyed

This map incorporates work carried out by Geophoto (Thigpen 1972) and by Loxton, Hunting and Associates (1978)

Magnetic North

True North

1068

RENISON LIMITED 78-1300

EAST HEEMSKIRK GRID

INTERPRETATIVE GEOLOGY

NB TRAVERSE LINES NOT SURVEYED

GEOLOGIST	: P R Stephenson	SCALE 1:5,000 METRES (100 0 100 200)
DRAUGHTSMAN	: J M Matthews	
DATE	: July 1978	
REVISIONS	: 1068	DRAWING No. 2

226188

[ ] Petrological description

5 cm

RENISON LIMITED 78-1300	
EAST HEEMSKIRK GRID GEOLOGY FACT PLAN N.B TRAVERSE LINES NOT SURVEYED	
GEOLOGIST : P.R. Stephenson	SCALE 1:5,000 METRES (100 0 100 200)
DRAUGHTSMAN : F.A. Colson	
DATE : July '78	
REVISIONS : 1069	DRAWING No. 3

M.L.
SILVER STREAM
(YANACO)

TENTH LEGION

4600N
4200 N
3800 N
3400N
3000N
2600 N
2200 N
1800 N
1400 N
1200 N
1000N

2500E
2400E
2100E
2000E
1900E
1750 E
1700E
1500E
1300E
1200 E
1100 E
1000E
500E
300 E
275E
0E

. labelled 700E should be 800E -

S.P.L. 129
E.L. 11/76

226189

5 cm

RENISON LIMITED 76-1300

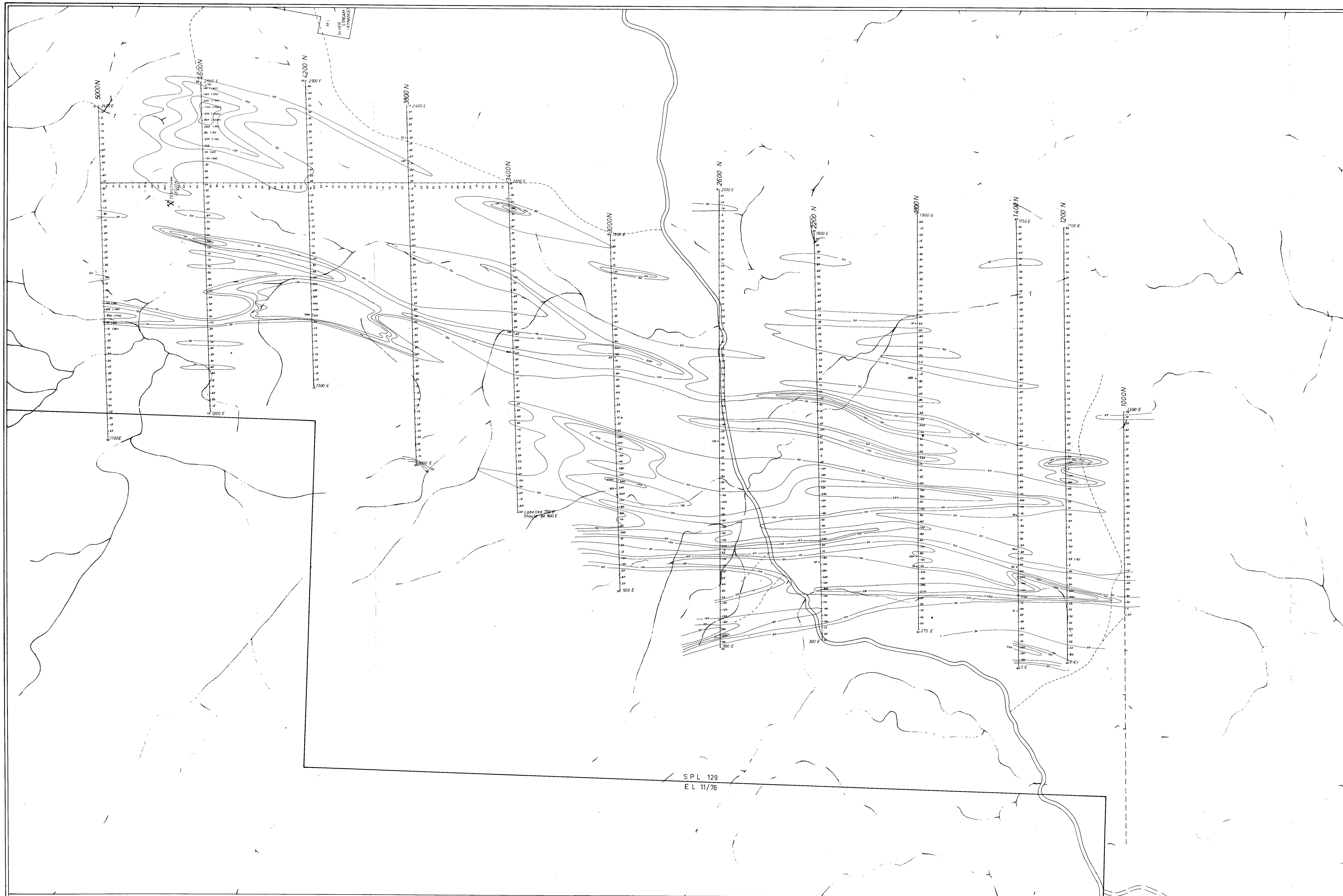
EAST HEEMSKIRK GRID

PROTON MAGNETICS

N.B. TRAVERSE LINES NOT SURVEYED

* ERRATIC READING

GEOLOGIST	P.R. Stephenson	SCALE 1 : 5,000 METRES	
DRAUGHTSMAN	F.A. Colson	100 0 100 200	
DATE	Dec. '77		
REVISIONS	April '78	1070	DRAWING No. 4



LEGEND

	<50 ppm
	50 - 100 ppm
	100 - 150 ppm
	150 - 250 ppm
	>250 ppm

226190

5 cm

MAG
TRUE
NORTH

• Rock chip sample

10 (20) Sample value in brackets refers to a repeat sample, in cases where the original sample was too small (first value) for accurate analysis

RENISON LIMITED 78-1300

EAST HEEMSKIRK GRID

SOIL SAMPLING – TIN VALUES (PPM)

NB TRAVERSE LINES NOT SURVEYED

GEOLOGIST	P R Stephenson	SCALE 1 5,000 METRES
DRAUGHTSMAN	J M Matthews	100 0 100 200
DATE	August 1978	
REVISIONS	1071	DRAWING No 5a

M.L.
SILVER BEAM EXTENDED

5000N
4600N
4200 N
3800 N
3400N
3000N
2600 N
2500 N
1800 N
1400 N
1200 N
1000N

1100E
1200 E
1300 E
1000 E
2400 E
2500 E
2100 E
1900 E
1900 E
1900 E
1750 E
1700 E
1300 E

« Labelled 700 E
Should Be 800 E

500 E
900 E
300 E
275 E
0 E
0 E

S.P.L. 129
E.L. 11176

LEGEND

- <25 p p m
- 25 - 50 p p m
- 50 - 100 p p m
- >100 p p m

226191

5 cm

RENISON LIMITED 78-1300

EAST HEEMSKIRK GRID

SOIL SAMPLING - ARSENIC VALUES (PPM)

N.B. TRAVERSE LINES NOT SURVEYED

GEOLOGIST P.H. Stephenson	SCALE 1:5,000 METRES
DRAUGHTSMAN J.M. Matthews	100 0 100 200
DATE August 1978	
REVISIONS	DRAWING No
1072	5b

MAG
TRUE
NORTH

+ Rock chip sample
Sample values in brackets refer to a repeat sample, in cases where the original sample was too small (first value) for accurate analysis.

M.L. SILVER BEAM (EXPIRED)

5000N 4600N 4200N 3800N 3400N 3000N 2600N 2200N 1800N 1400N 1200N 1000N

2500 E 2400 E 2100 E 1900 E 1750 E 1700 E 1300 E 1100 E 1000 E 900 E 800 E 375 E 300 E 0 E

Labelling 200 E Shown As 800 E

S.P.L. 129
E.L. 11/76

LEGEND

- <50 p.p.m
- 50 - 100 p.p.m
- 100 - 150 p.p.m
- 150 - 200 p.p.m
- >200 p.p.m

226192

5 cm

MAG NORTH
TRUE

• Rock chip sample
Sample values in brackets refer to a repeat sample, in cases where the orgional sample was too small for accurate analysis

PENISON LIMITED TS-7300

EAST HEEMSKIRK GRID

SOIL SAMPLING - COPPER VALUES (PPM)

NB TRAVERSE LINES NOT SURVEYED

GEOLOGIST	P.R. Stephenson
DRAUGHTSMAN	J.M. Matthews
DATE	August 1978
REVISIONS	

SCALE 1: 5,000 METRES

100 0 100 200

1073

DRAWING No 5c

M.L.
SILVER
(EXPIRED)

5000N
3600N
4200 N
3800 N
3400N
3000N
2600 N
2200 N
1800N
1400N
1200 N
1000N

2500 E
2400 E
2100 E
1900 E
1750 E
1700 E
1300 E
1200 E
1100E
1100 E
1000 E
900 E
800 E
700 E
600 E
500 E
400 E
300 E
275 E
200 E
100 E
0 E

Labelled 700 E
Should be 800 E

S.P.L. 129
E.L. 11/76

LEGEND

- <50 p p m
- 50 – 100 p.p.m
- 100 – 150 p p m
- 150 – 200 p.p.m.
- >200 p p m

5 cm

226193

MAG NORTH
TRUE

* Rock chip sample

Sample values in brackets refer to a repeat sample, in cases where the original sample was too small (first value) for accurate analysis

RENISON LIMITED 78-1300

EAST HEEMSKIRK GRID

SOIL SAMPLING – LEAD VALUES (PPM)

NB TRAVERSE LINES NOT SURVEYED

GEOLOGIST	: P.R Stephenson
DRAUGHTSMAN	: J.M Matthews
DATE	: August 1978
REVISIONS	

SCALE 1-5,000 METRES
100 0 100 200

DRAWING No.
1074 5d

5000N
4600N
4200 N
3800 N
3400N
3000N
2600 N
2200 N
1800N
1400N
1000N
2400 E
2500 E
2300 E
2200 E
2100 E
1900 E
1700 E
1500 E
1300 E
1100 E
1000 E
900 E
800 E
700E
600 E
500 E
400 E
300 E
275 E
200 E
100 E
0 E
1950 E
Labelled 200 E Should be 800 E
TECHNICAL CLAIM
S.P.L. 129
E.L. 11/76
MAG
TRUE
NORTH
+ Rock chip sample
(xOm) Sample values in brackets refer to a repeat sample, in cases where the original sample was too small. First value is for accurate analysis
LEGEND
<50 p p m
50 - 100 p p m
100 - 150 p p m
150 - 200 p p m
>200 p p m
226194
5 cm
RENISON LIMITED 48-1300
EAST HEEMSKIRK GRID
SOIL SAMPLING - ZINC VALUES (P P M)
NB TRAVERSE LINES NOT SURVEYED
GEOLOGIST P.R Stephenson
DRAUGHTSMAN J.M Matthews
DATE August 1978
SCALE 1 5,000 METRES
100 0 100 200
REVISIONS
1075
DRAWING No
5e

Geochemistry
PPM

I.P Data
CHARGEABILITY IN MILLIVOLTS/VOLT (——)
RESISTIVITY IN Ohm-METRES (- - -)

Total Magnetic Field (γ)
FINE SCALE (- - - -)
COARSE SCALE (——)

Topography & Geology
HEIGHT ABOVE SEA LEVEL - (METRES)

Track
Track
Track
Track
Track
Track
Track
Track
Creek

226195

RENISON LIMITED TR-1300

EAST HEEMSKIRK GRID S.P.L.129

LINE 1000 N

SECTION LOOKING N.W. 1.076

SCALE. 1: 2000 METRES

DRAWN	P R S
TRACED	J M M
DATE	2 3 78
SCALE	1 - 2000
DRAWING No.	

6 a

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

MAGNETICS
500γ Scale
100γ Scale
ERRATIC MAGNETOMETER READINGS

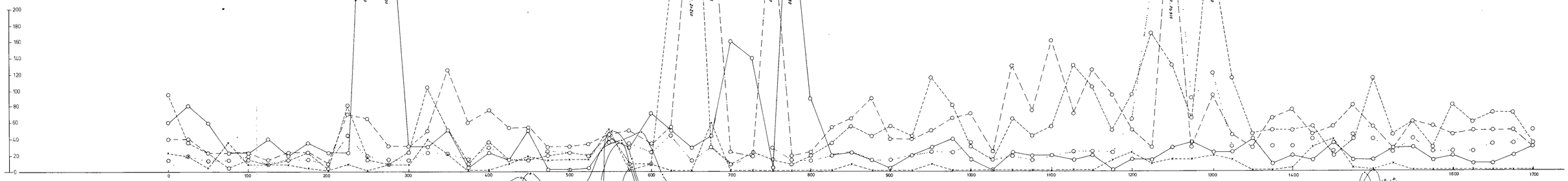
GEOCHEMISTRY
Cu
Pb
Zn
As
W

GEOLOGY

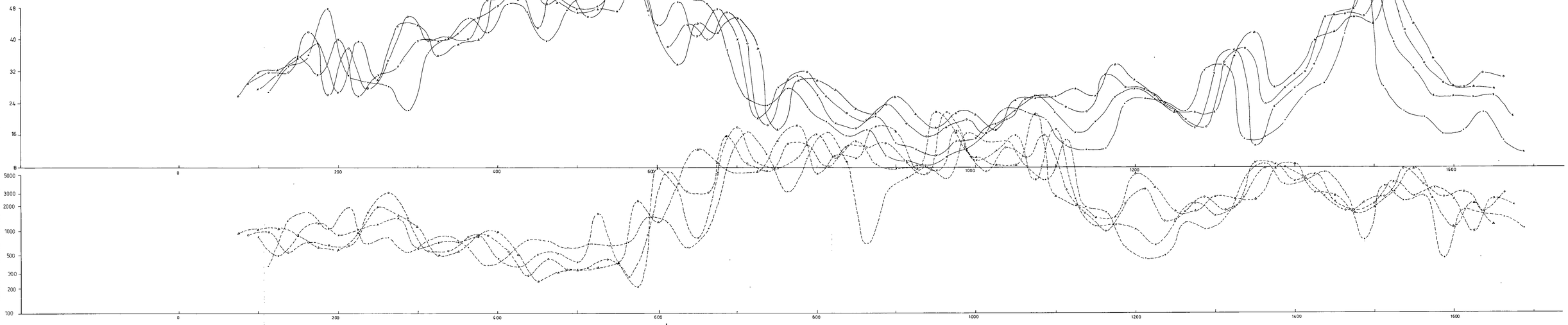
5 cm

Geochemistry

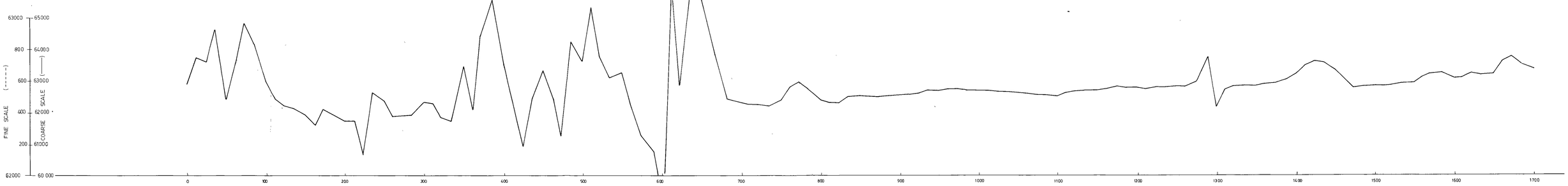
PPM



I.P. Data

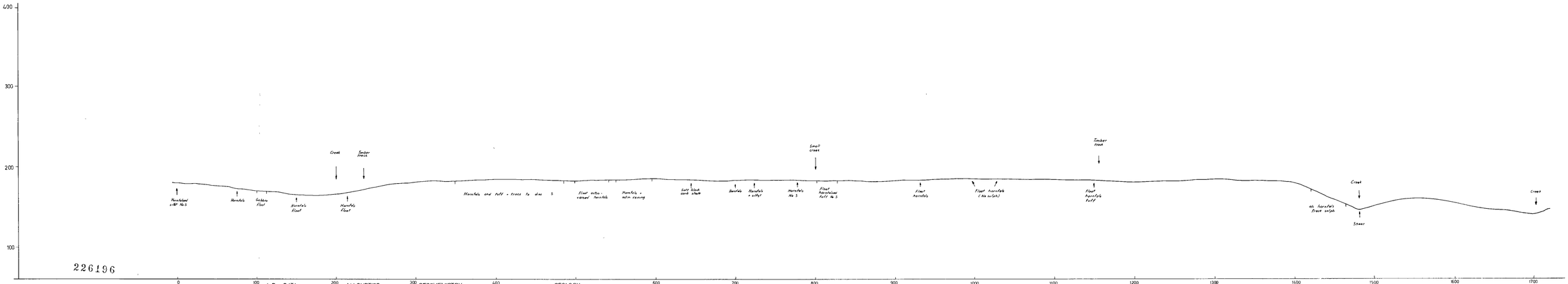


Total Magnetic Field (δ)



Topography & Geology

HEIGHT ABOVE SEA LEVEL - (METRES)



226196

RENISON LIMITED TE-1300	DRAWN P R S
EAST HEEMSKIRK GRID S.P.L. 129	TRACED J M M
LINE 1200 N 1077	DATE 2 3 78
SECTION LOOKING N W	SCALE 1:2000
SCALE. 1: 2000 METRES 40 0 40 80 120	DRAWING No. 6b

I P DATA

CHARGEABILITY & RESISTIVITY

POLE - DIPOLE

n=1 n=1

n=2 n=2

n=3 n=3

n=4 n=4

MAGNETICS

5000 Scale

1000 Scale

* ERRATIC MAGNETOMETER READINGS

GEOCHEMISTRY

Sn

Cu

Pb

Zn

As

W

GEOLOGY

5 cm

Geochemistry
P.P.M

I. P. Data
CHARGEABILITY IN MILLIVOLTS/VOLT (——)
RESISTIVITY IN Ohm - METRES (- - - -)

Total Magnetic Field (γ)
FINE SCALE (- - - -)
COARSE SCALE

Topography & Geology
HEIGHT ABOVE SEA LEVEL - (METRES)

Creek
ok granite
float granite
float hornfels + minor sulph
Boulders of massive grey granite
ok vein float hornfelsed slightly, mic sst or greywacke. Often thin po + py veins
float sheared hornfels + py
float hornfels
float granite + pulph
float greywacke + strong silicification
float chert
float chloritic
p/s hornfels with actinolite veins
float f.g. hornfels
float dolerite
Creek
ok mic hornfels

226197

RENISON LIMITED 78-1505

EAST HEEMSKIRK GRID S.P.L.129
LINE 1400 N
SECTION LOOKING N.W

SCALE. 1: 2000 METRES
0 40 80 120

DRAWN	P R S
TRACED	J M M
DATE	2 3 78
SCALE	1:2000
DRAWING No.	6c

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

MAGNETICS
5000 Scale
1000 Scale
* ERRATIC MAGNETOMETER READINGS

GEOCHEMISTRY
Sn
Cu
Pb
Zn
As
W

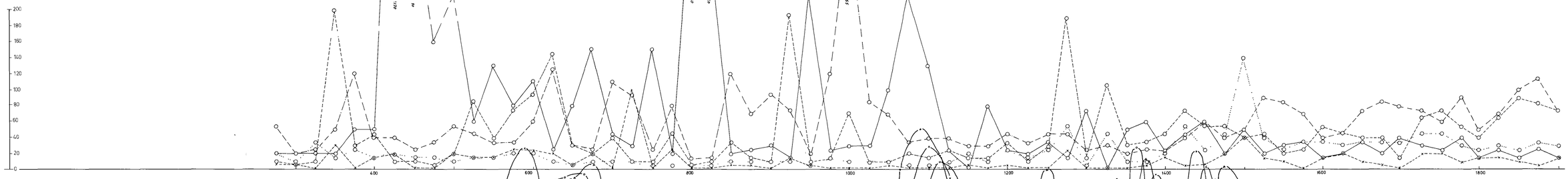
GEOLOGY

5 cm

1078

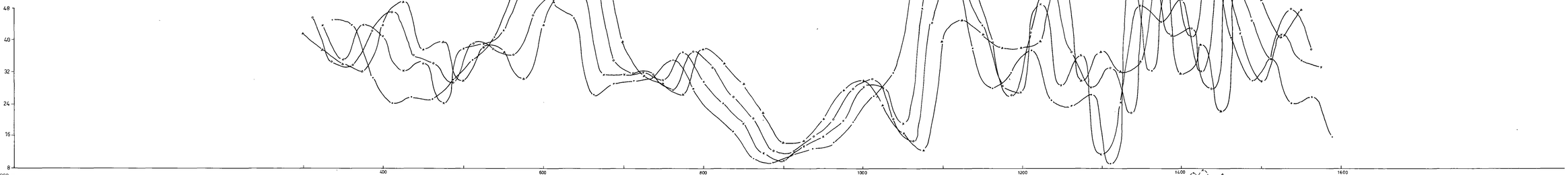
Geochemistry

PPM

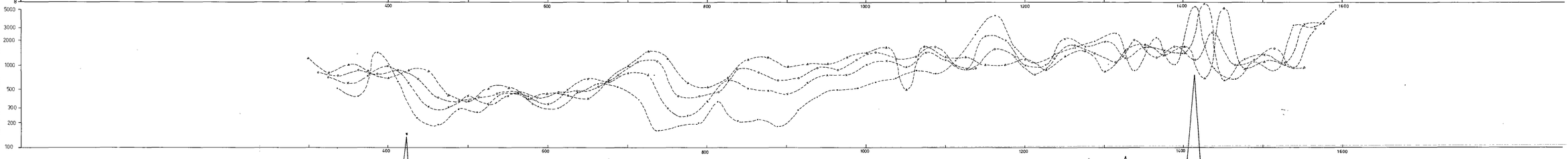


I. P. Data

CHARGEABILITY IN MILLIVOLTS/VOLT (——)



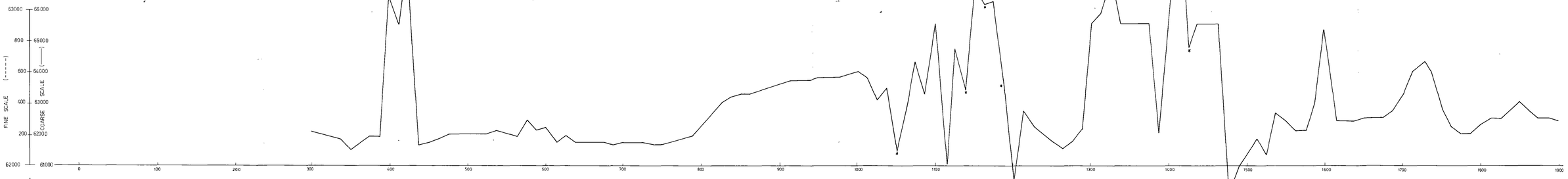
RESISTIVITY IN Ohm - METRES (- - - -)



Total Magnetic Field (γ)

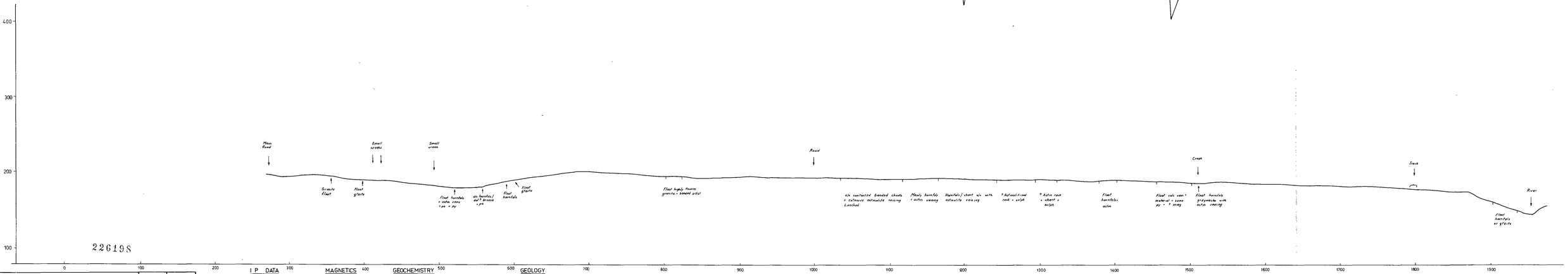
FINE SCALE (- - - - -)

COARSE SCALE



Topography & Geology

HEIGHT ABOVE SEA LEVEL - (METRES)



226198

RENISON LIMITED 78-1208

EAST HEEMSKIRK GRID S.P.L. 129

LINE 1800N

SECTION LOOKING N W

1079

SCALE. 1: 2000 METRES

60 0 60 80 120

DRAWN	P R S
TRACED	J M M
DATE	14-2-78
SCALE	1-2000
DRAWING No.	6d

I P DATA

CHARGEABILITY & RESISTIVITY

POLE - DIPOLE

n=1 n=1

n=2 n=2

n=3 n=3

n=4 n=4

MAGNETICS

5000 Scale

1000 Scale

ERRATIC MAGNETOMETER READINGS

GEOCHEMISTRY

Sn

Cu

Pb

Zn

As

W

5 cm

GEOLOGY

Geochemistry
PPM

I.P. Data
CHARGEABILITY IN MILLIVOLTS/VOLT (——)
RESISTIVITY IN Ohm - METRES (- - - -)

Total Magnetic Field (γ)
FINE SCALE (- - - -)
COARSE SCALE (——)

Topography & Geology
HEIGHT ABOVE SEA LEVEL - (METRES)

Road
Track
Creek
River
Track
Float granite + quartz
Float mafics
Granite float
* mic. gtzite or hornfels, and gossan
Minor granite float
mic quartzite/hornfels + gtz/fuchsite veins + pyrite
ch gtzl strong quartzite
ch gtzite + float pebbles
mic py & mag in ch breccia chert
Boulder f.p. chert/hornfels

226199

RENISON LIMITED 78-1300
EAST HEEMSKIRK GRID S.P.L.129
LINE 2200 N 1080
SECTION LOOKING N W
SCALE. 1: 2000 METRES 0 40 80 120

DRAWN	P R S
TRACED	J M M
DATE	15-2-78
SCALE	1: 2000
DRAWING No.	6e

I P DATA
CHARGEABILITY & RESISTIVITY
POLE – DIPOLE
n=1 n=1
n=2 n=2
n=3 n=3
n=4 n=4

MAGNETICS
5000 Scale
1000 Scale
* ERRATIC READINGS MAGNETOMETER

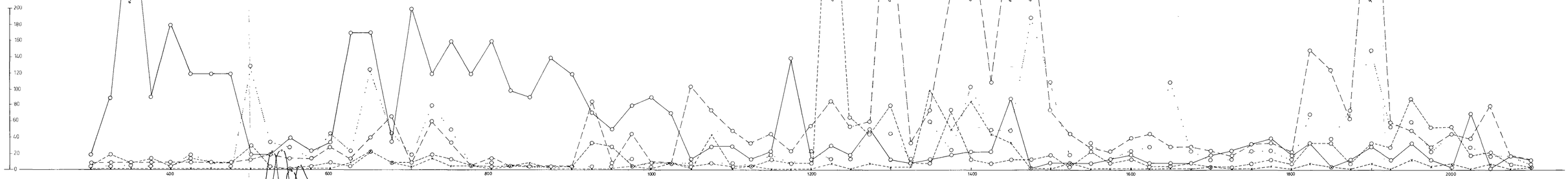
GEOCHEMISTRY
Sn
Cu
Pb
Zn
As
W

GEOLOGY

5 cm

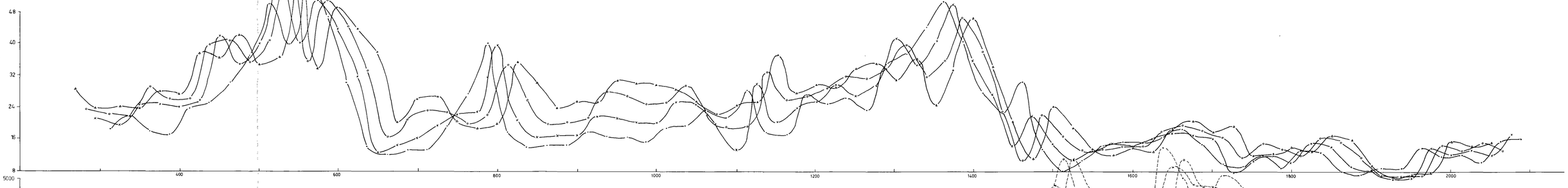
Geochemistry

PPM

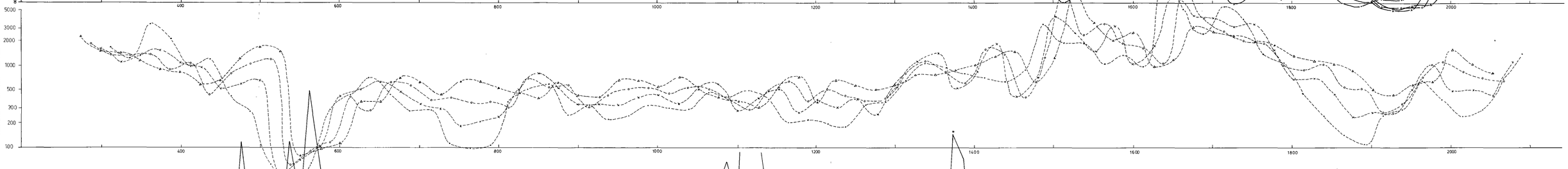


I. P. Data

CHARGEABILITY IN MILLIVOLTS/VOLT (——)

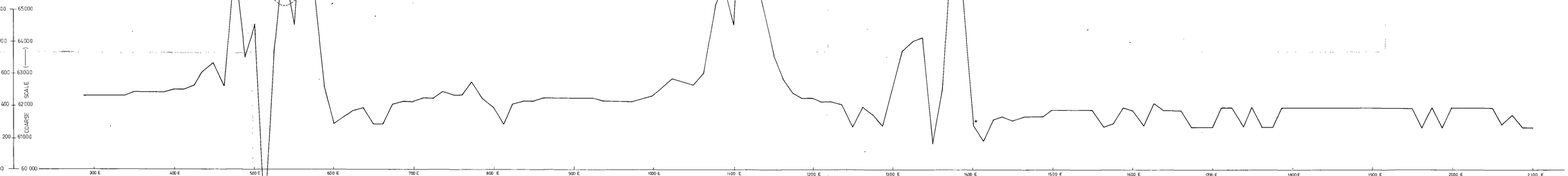


RESISTIVITY IN Ohm - METRES (- - - -)



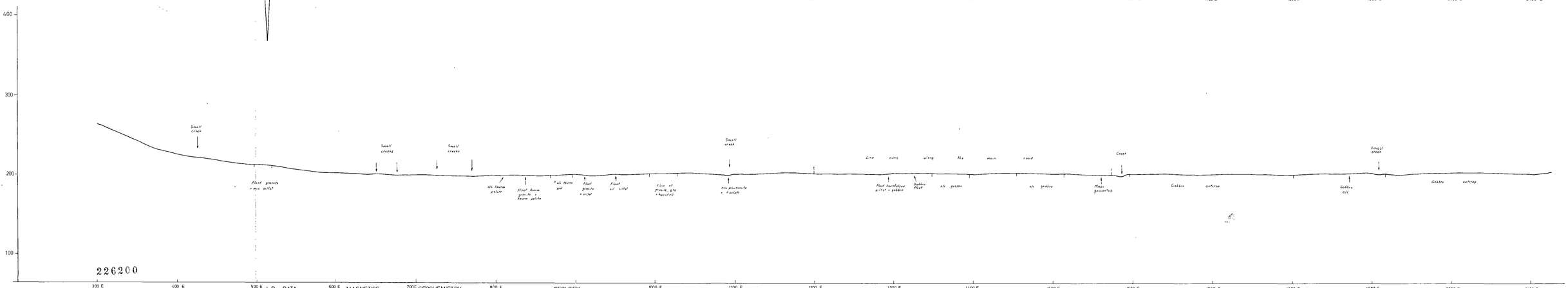
Total Magnetic Field (δ)

FINE SCALE (- - - -) COARSE SCALE (——)



Topography & Geology

HEIGHT ABOVE SEA LEVEL - (METRES)



226200

RENISON LIMITED 78-1300

EAST HEEMSKIRK GRID S.P.L. 129

LINE 2600 N 1081

SECTION LOOKING N W

SCALE. 1: 2000 METRES

40 0 40 80 120

DRAWN	P R S
TRACED	J M M
DATE	15-2-78
SCALE	1 2000
DRAWING No.	6 f

I P DATA

CHARGEABILITY & RESISTIVITY

POLE - DIPOLE

n = 1 n = 1

n = 2 n = 2

n = 3 n = 3

n = 4 n = 4

MAGNETICS

5000 Scale

1000 Scale

* ERRATIC MAGNETOMETER READINGS

GEOCHEMISTRY

Sn

Cu

Pb

Zn

As

W

5 cm

GEOLOGY

Geochemistry
PPM

I.P. Data
CHARGEABILITY IN MILLIVOLTS/VOLT (——)
RESISTIVITY IN Ohm - METRES (- - - -)

Total Magnetic Field (δ)
FINE SCALE
COARSE SCALE

Topography & Geology
HEIGHT ABOVE SEA LEVEL (METRES)

226201

RENISON LIMITED 78-1300

EAST HEEMSKIRK GRID S.P.L.129
LINE 3000 N
SECTION LOOKING N W 1082

SCALE. 1: 2000 METRES
0 40 80 120

DRAWN	P R S
TRACED	J M M
DATE	15-2-78
SCALE	1" 2000
DRAWING No.	69

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

MAGNETICS
5000 Scale
1000 Scale
ERRATIC MAGNETOMETER READINGS

GEOCHEMISTRY
Sn
Cu
Pb
Zn
As
W

GEOLOGY
INTRUSIVES
+Dg+ DEVONIAN HEEMSKIRK GRANITE
CAMBRIAN MOUNT HILL GABBRO
IRONSTONE (? Derived from intrusive)

CAMBRIAN
Ec UNDIFFERENTIATED TUFFS, PELITES AND GREYWACKES — CRIMSON CREEK FORMATION (LOWER CAMBRIAN)
PRECAMBRIAN
Puo QUARTZITE - OONAH FORMATION

GEOLOGICAL CONTACT
FAULT
JOINTING IN GRANITE
DRILL HOLE

RENISON LIMITED 78-1300	DRAWN	P R S
EAST HEEMSKIRK GRID S.P.L. 129	TRACED	J M M
LINE 3400 N	DATE	27 2 78
SECTION LOOKING N W 1083	SCALE	1: 2000
SCALE. 1: 2000 METRES (40 0 40 80 120)	DRAWING No.	6 h

I P DATA

CHARGEABILITY & RESISTIVITY
POLE - DIPOLE

n = 1 n = 1
n = 2 n = 2
n = 3 n = 3
n = 4 n = 4

MAGNETICS

5000 Scale
1000 Scale
✱ ERRATIC MAGNETOMETER READINGS

GEOCHEMISTRY

Sn
Cu
Pb
Zn
As
W

GEOLOGY

INTRUSIVES

+ Dg + DEVONIAN HEEMSKIRK GRANITE
CAMBRIAN McIVOR HILL GABBRO
IRONSTONE (? Derived from intrusive)

CAMBRIAN

Єc UNDIFFERENTIATED TUFFS PELITES AND GREYWACKES — CRIMSON CREEK FORMATION (LOWER CAMBRIAN)

PRECAMBRIAN

Puo QUARTZITE - OONAH FORMATION

GEOLOGICAL CONTACT
FAULT
JOINTING IN GRANITE
DRILL HOLE

5 cm

Geochemistry
PPM

I.P. Data
CHARGEABILITY IN MILLIVOLTS/VOLT (——)
RESISTIVITY IN Ohm - METRES (- - - -)

Total Magnetic Field (γ)
(- - - -)
FINE SCALE
COARSE SCALE

Topography & Geology
HEIGHT ABOVE SEA LEVEL - (METRES)

226203

RENISON LIMITED
EAST HEEMSKIRK GRID S.P.L. 129
LINE 3800 N
SECTION LOOKING N W
1084
SCALE. 1: 2000 METRES

DRAWN	P R S
TRACED	J M M
DATE	2 3 78
SCALE	1: 2000
DRAWING No.	61

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

MAGNETICS
5000 Scale
1000 Scale
* ERRATIC MAGNETOMETER READINGS

GEOCHEMISTRY
Sn
Cu
Pb
Zn
As
W

GEOLOGY
INTRUSIVES
+ Dg +
IRONSTONE (? Derived from intrusive)
DEVONIAN
HEEMSKIRK GRANITE
CAMBRIAN
McIVOR HILL GABBRO
CAMBRIAN
Ec
PRECAMBRIAN
Puo
UNDIFFERENTIATED TUFFS PELITES AND GREYWACKES
CRIMSON CREEK FORMATION (LOWER CAMBRIAN)
QUARTZITE - DONAH FORMATION

GEOLOGICAL CONTACT
FAULT
JOINTING IN GRANITE
DRILL HOLE

5 cm

Geochemistry
PPM

I. P. Data
CHARGEABILITY IN MILLIVOLTS/VOLT (——)
RESISTIVITY IN Ohm - METRES (- - - -)

Total Magnetic Field (γ)
FINE SCALE (- - - -)
COARSE SCALE

Topography & Geology
HEIGHT ABOVE SEA LEVEL - (METRES)

226204

RENISON LIMITED 78-2300

EAST HEEMSKIRK GRID S.P.L.129
LINE 4200N
SECTION LOOKING N.W. 1935

SCALE. 1: 2000 METRES
40 0 40 80 120

DRAWN	P.R.S.
TRACED	J.M.M.
DATE	23-2-78
SCALE	1:2000
DRAWING No.	6j

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

MAGNETICS
5000 Scale
1000 Scale
* ERRATIC MAGNETOMETER READINGS

GEOCHEMISTRY
Sn
Cu
Pb
Zn
As
W

GEOLOGY
INTRUSIVES
+Dg+ DEVONIAN HEEMSKIRK GRANITE
CAMBRIAN McNOR HILL GABBRO
IRONSTONE [? Derived from intrusive]

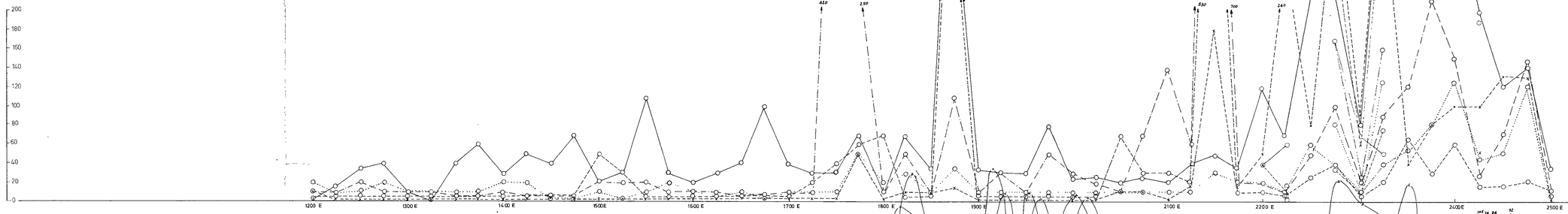
CAMBRIAN
Ec UNDIFFERENTIATED TUFFS, PELITES AND GREYWACKES — CRIMSON CREEK FORMATION (LOWER CAMBRIAN)

PRECAMBRIAN
Puo QUARTZITE — OONAH FORMATION

GEOLOGICAL CONTACT
FAULT
JOINTING IN GRANITE
DRILL HOLE

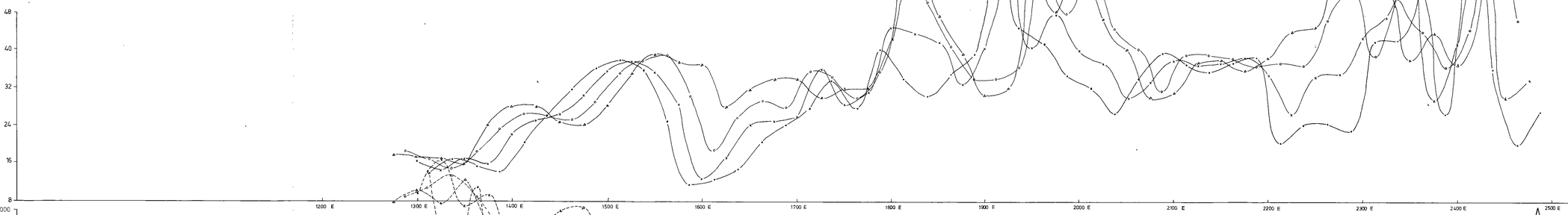
5 cm

Geochemistry PPM

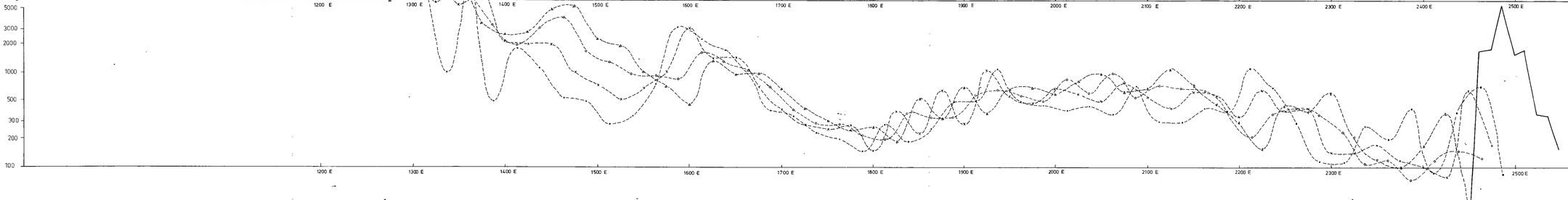


I.P Data

CHARGEABILITY IN MILLIVOLTS/VOLT (——)

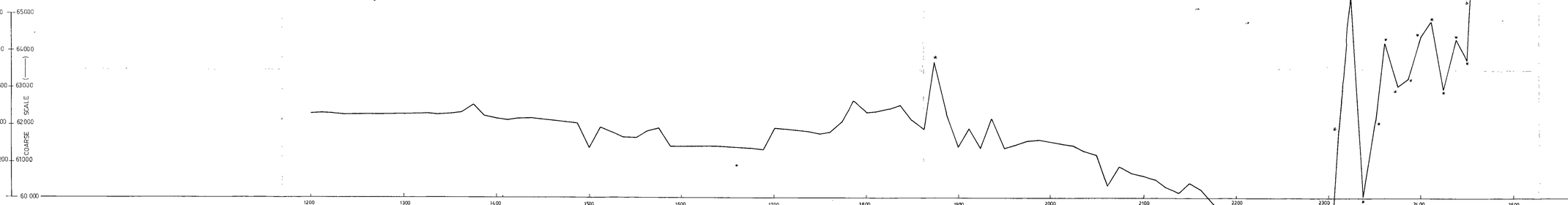


RESISTIVITY IN Ohm - METRES (----)



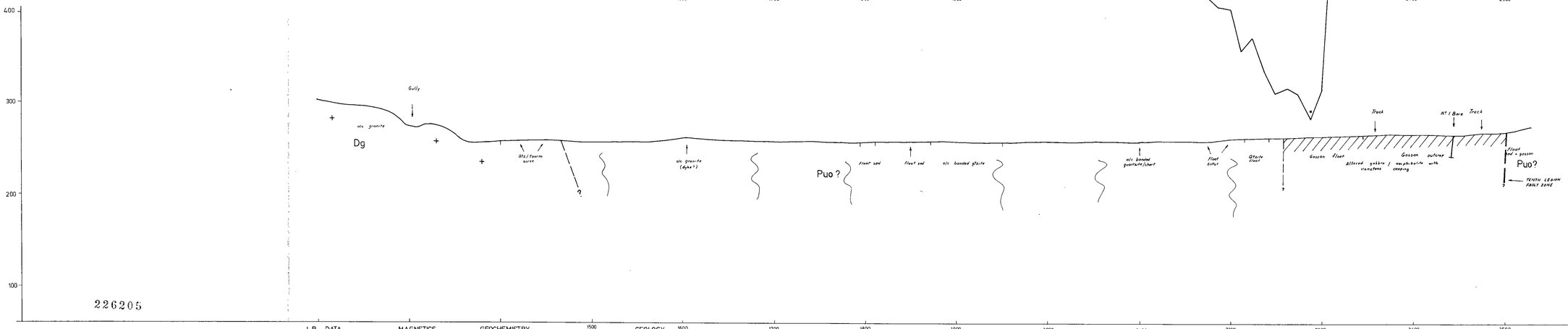
Total Magnetic Field (δ)

FINE SCALE (-----) COARSE SCALE (——)



Topography & Geology

HEIGHT ABOVE SEA LEVEL - (METRES)



226205

RENISON LIMITED 78-1300

EAST HEEMSKIRK GRID S.P.L. 129

LINE 4600 N

SECTION LOOKING N W 1086

SCALE. 1: 2000 METRES 0 40 80 120

DRAWN	P R S
TRACED	J M M
DATE	1 3 78
SCALE	1:2000
DRAWING No.	6 k

I P DATA

CHARGEABILITY & RESISTIVITY

POLE - DIPOLE

n=1 n=1

n=2 n=2

n=3 n=3

n=4 n=4

MAGNETICS

5000 Scale

1000 Scale

* ERRATIC MAGNETOMETER READINGS

GEOCHEMISTRY

Sn

Cu

Pb

Zn

As

W

GEOLOGY

INTRUSIVES

+ Dg +

DEVONIAN
HEEMSKIRK GRANITE

CAMBRIAN
McIVOR HILL GABBRO

IRONSTONE (? Derived from intrusive)

CAMBRIAN

Ec

UNDIFFERENTIATED TUFFS PELITES AND GREYWACKES — CRIMSON CREEK FORMATION (LOWER CAMBRIAN)

PRECAMBRIAN

Puo

QUARTZITE - DONAH FORMATION

GEOLOGICAL CONTACT

FAULT

JOINTING IN GRANITE

DRILL HOLE

5 cm

Geochemistry
PPM

I. P Data
CHARGEABILITY IN MILLIVOLTS/VOLT (——)
RESISTIVITY IN Ohm - METRES (----)

Total Magnetic Field (δ)
FINE SCALE (-----)
COARSE SCALE (——)

Topography & Geology
HEIGHT ABOVE SEA LEVEL - (METRES)

Creek
Gully
Small creek
Dg
Puo ?
Puo
n/s granite
n/s gtz/tourm veined granite
Float of tourm gtzite
Float of gtz/tourm veined quartzite
Float tourm gtzite
Float gtzite
Float greisen
n/s greisen
South Lyndon Fault Zone
Screes mainly of quartz kiss fourm and gtzite
Scree of gtz/tourm veined gtzite

226206

RENISON LIMITED 78-1300

EAST HEEMSKIRK GRID S.P.L.129
LINE 5000 N
SECTION LOOKING N W 1087

SCALE. 1: 2000 METRES
40 0 40 80 120

DRAWN	P R S
TRACED	J M M
DATE	27 2 78
SCALE	1 2000
DRAWING No.	

61

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

MAGNETICS
5000 Scale
1000 Scale
* ERRATIC MAGNETOMETER READINGS

GEOCHEMISTRY
Sn
Cu
Pb
Zn
As
W

INTRUSIVES
+ Dg +

GEOLOGY
DEVONIAN
HEEMSKIRK GRANITE
CAMBRIAN
MENOR HILL GABBRO
IRONSTONE (? Derived from intrusive)

CAMBRIAN
Ec
PRECAMBRIAN
Puo
UNDIFFERENTIATED TUFFS PELITES AND GREYWACKES } CRIMSON CREEK FORMATION (LOWER CAMBRIAN)
QUARTZITE - DONAH FORMATION

GEOLOGICAL CONTACT
FAULT
JOINTING IN GRANITE
DRILL HOLE

8 cm

MINE LEASES HELD BY F.J. GRIFFITHS AND D.C. DUNKLEY OVER THE KELVIN AND HAYNES WORKINGS

90 M/72

4M/73

BOUNDARY S.P.L. 129

PROPOSED ROAD

PROPOSED DDH 3

DDH 1

DDH 2

Orient Mine

Unaltered Ec ?

Puo?

Sc?

Ec

Dg

F

F?

Kelvin River

Henley Creek

Little

INTRUSIVES

DEVONIAN

Dg — ADAMELLITE – HEEMSKIRK GRANITE

CAMBRIAN

GABBRO / MICROGABBRO – McIVOR HILL GABBRO ?

QUATERNARY

— SWAMP

SILURIAN

Sc? — CROTTY QUARTZITE ?

CAMBRIAN

Ec

- m m — Metasomatised contact altered argillaceous rocks containing upto 50% quartz–tourmaline–tremolite
- S S — Altered, partly hornfelsed, silicified argillaceous
- UNALTERED ? — As above with disseminated sulphides, mainly pyrrhotite, pyrite and minor arsenopyrite.
- Unaltered seds Volcanic component less?
- Altered, sheared? conglomerate

CRIMSON CREEK FORMATION (LOWER CAMBRIAN)

PRECAMBRIAN

Puo? — QUARTZITE – OONAH FORMATION

ZEEHAN C2/2	ZEEHAN D1/1
ZEEHAN C2/4	ZEEHAN D1/3

POSITIONS OF GRID LINES, 4 WHEEL DRIVE TRACK AND ORIENT MINE ESTIMATED, NOT SURVEYED

5 cm

RENISON LIMITED 78-1300

ZEEHAN C2/4.

TRIAL HARBOUR AREA S.P.L. 129

AREA 'D' GEOLOGY MAP 1088

SCALE. 1: 5000 METRES

DRAWN	K.W.
TRACED	J.M.
DATE	MAY '77
SCALE	1:5000
DRAWING No.	7

226207

Geochemistry

Pb & Zn: 00, 100, 200, 300, 400

Sn, As & Cu: 00, 20, 50, 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000

5 S, 0, 5 N, 10 N, 15 N, 20 N, 25 N, 30 N

I. P. Data

RESISTIVITY IN Ohm METRES (– – –): 100, 200, 300, 400, 1000, 2000, 3000, 4000, 5000

CHARGEABILITY IN MILLISECONDS (——): 0, 10, 20, 30, 40, 50

POLE–DIPOLE UNDERTAKEN AT RIGHT ANGLES TO GRID LINES

5 S, 0, 5 N, 10 N, 15 N, 20 N, 25 N, 30 N

Total Magnetic Field (γ)

58 000, 59 000, 60 000, 61 000, 62 000, 63 000, 64 000, 65 000, 66 000, 67 000, 68 000

5 S, 0, 5 N, 10 N, 15 N, 20 N, 25 N, 30 N

Topography & Geology

HEIGHT ABOVE SEA LEVEL + 2000 m

1700, 1800, 1900, 2000, 2100, 2200

GOSSAN SAMPLE FROM HERE AVERAGED 0·19 Sn

SIMILAR SAMPLE FURTHER EAST ASSAYED 0·23 Sn

CREEK

DIP –50°
570 N (N.B. Grid measurements in feet)

CREEK

RELATIVELY UNALTERED ZONE

FAULT ZONE

FAULT ?

SULPHIDES

STRONGLY METASOMATISED

300 m +

PROPOSED DRILL HOLE D D H 3

5 S, 0, 5 N, 10 N, 15 N, 20 N, 25 N, 30 N

226208

RENISON LIMITED 78-1300

S.P.L. 129
TRIAL HARBOUR AREA
LINE 24 E. PROFILE

GEOLOGIST	K WELLS	SCALE 1 2000 METRES (40 0 40 80)
DRAUGHTSMAN	J MATTHEWS	
DATE	MAY, 1976	
REVISIONS	AUG. 1978	DRAWING No 1089 8

I P
CHARGEABILITY
RESISTIVITY

GEOCHEMISTRY
Sn
Cu
Pb.
Zn
As
W

DEVONIAN
ADAMELLITE (Heemskirk Granite)

CAMBRIAN
GABBRO
ARGILLITES (Altered, hornfelsed and silicified) (Crimson Creek Formation)

5 cm