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RENISON LIMITED

PROGRESS REPORT ON SOUTH DUNDAS -

SPL27 TASMANIA

*EL42/71*

1969/70 FIELD SEASON

**MICROFILMED**

**OPEN FILE**

By: K. McI. Ferguson.

16/7/70

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Introduction:

The previous report of this area, dated 16/1/70, summarised all work done by Renison Limited, up to that date on SPL 27. The work done has been of a regional nature, covering most of the area with magnetics, soil sampling and geological mapping. A general picture of the lease was presented with description, geography, soil, drainage etc. and geology. The results of the work done were presented and certain conclusions and recommendations were given to guide further work in the narrowing down of areas of specific interest for more detailed study.

The work done on the area since that report then has been principally concerned with getting as much information as possible on the more restricted, interesting, anomalous areas delineated by it.

Brief Summary:

Broadly the rocks in SPL 27<sup>27</sup> ~~28~~ *Young* from north to south. The northern part of the area is taken up by argillites of the Crimson Creek formation (Cambrian). These are overlain to the south by an arcuate, sill-like Ultrabasic body composed of pyroxenite-norites and gabbros and serpentinites produced by alteration of these. These are associated with a sequence of extrusive rocks, including spilites, known as the Melba Spilites. Lying partly conformably, on top of these are the lower members of the Cambrian Dundas Group of alternating shales, siltstones and conglomerates. The youngest rocks in the SPL are Devonian qtz. porphyries, and a complex, stock-like, intrusion with radiating dykes at Pine Hill. This has produced an extensive metamorphic and metasomatic aureole.

Areas of particular interest were: -

- 1. The Serpentinites Significant geochemical anomalies were detected over these by soil sampling, good values for Ni being obtained.
- 2. Kapi Creek Area The Kapi Creek fault runs through here carrying known weak lead-zinc type mineralisation. A tin anomaly was shown here by soil sampling.
- 3. Pine Hill Area Metasomatic processes associated with the Quartz porphyry produced tin bearing quartz-tourmaline - magnetite vein, bodies of varying size and continuity. Bodies of this type were thought to be the cause of very interesting tin soil anomalies and magnetic anomalies between Pine Hill and Commonwealth hill.

Recent Activities:

The Serpentinites It was decided to run an Induced Polarisation survey over the Serpentinites to test the nickel soil anomalies.

Nickel sulphides had previously been detected in small quantities in the Serpentinite and the survey was planned to establish whether these sulphides at any place reached economic concentrations.

The survey was carried out between early April and late May by a crew from the Compagnie Generale de Geophysique Brisbane, led in the field by M. Claude Bruneau. As the survey was only completed recently a full report has not yet been received from Brisbane but preliminary plans of the areas covered are available, see figs. 2, 3 and 4.

The first Serpentinite mass covered by I.P. is at Serpentine Hill and is shown in figure 2. A strong anomaly of over 40 ms can be seen to occupy the position of the Serpentinite. This is also an area of very disturbed magnetics, see previous reports. It is thought that this anomaly is mainly produced by magnetite lenses in the serpentinite. The most interesting anomaly, however, occurs beyond the north contact of the Serpentinite in the Crimson Creek Argillites with values of up to 48.5 ms. This is almost exactly coincident with a strong Self-Potential anomaly of up to 150. Self Potential over the Serpentinite however is very low. Furthermore there is no magnetic anomaly in this area so the anomaly does not seem to be directly due to the Serpentinite. All the evidence would seem to suggest - massive, nonmagnetic sulphide body or graphitic shales. Outcrop being poor in this area, a road was cut through the anomaly by the serpentine contact to try and establish the reason for the anomaly. The outcrop exposed in this way, however, has shown little sign of either possibility, encountering fairly normal weathered argillite, with coarse grits, silty sandstones and siltstones.

The road did uncover an interesting rock type on the contact of the argillites and serpentinite. For a width of up to 20ft. from the contact into the argillite a rather black, crumbly, slightly gossanous, altered rock was encountered. Chip sampling and assaying indicated that this rock had nickel values similar to those in the Serpentinite (1000-3000ppm) indicating a possible movement of Ni bearing solutions from Serpentinite to argillite probably during movement along the contact which is thought to be a major slide the outcrops of this rock are shown in Fig. 2, and do not seem to coincide with the I.P. - S.P. anomaly. It is proposed that the two phenomena can best be examined with a programme of shallow angle drill holes, drilling from north to south into the slope of the hill.

Fig. 3 shows the results of the I.P. survey over the Razorback Serpentinite at 200' = 1". This is only preliminary and little

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can be said as yet about what is indicated. This map can be compared with the magnetic or soil sampling plans, see previous report. There seems to be an interesting coincidence of I.P. anomalies with the west margin of the Serpentinite, in the position of the tin anomaly running north from the Razorback Mine. Also broad strong anomalies appear in the nose of the Serpentinite coinciding with the strongest Ni anomaly. Electrical soundings carried out during the I.P. survey revealed a very conductive layer 100 to 200 ft. below the surface over most of the Razorback serpentinite. The reason for this will have to be tested by drilling but one possibility is that the serpentinite is a shallow body here extending only a few hundred feet below the surface and that the conductive layer may be produced by the same type of mineralisation seen as the contact of the serpentinite where it is exposed i.e. at the Razorback Mine.

The third area covered by I.P. is shown in Fig. 4, which also covers I.P. over the Pine Hill magnetic-geochemical anomaly in the argillites. A broad strip of serpentinite runs close to the baseline and sub-parallel to it. Oddly, here the magnetics are strong over the Serpentinite, see Fig. 5, but there are only two small I.P. anomalies over 40 ms. One of these is interesting as it coincides with a Ni anomaly of 1800ppm.

At this stage it is not possible to say which, if any of the anomalies over Serpentinite indicate possible sulphides. CGG are carefully comparing the magnetic results with the I.P. results and their conclusions will be contained in their report.

Asbestos - Serpentine Hill The Serpentine Hill mass has already been mapped geologically, on a 400 ft. grid. The recent, larger scale, geological mapping, with emphasis on the occurrence of asbestos, and the limited geochemical sampling in the Mill Cut quarry area, are possibly preliminary to a more exhaustive study.

The asbestos fibres are found principally in semi concentric veins in the serpentine around pyroxenite nodules. The cores may be up to five feet in diameter, the asbestos bearing mantle extending another two to three feet. The fibres may reach  $3/4$ " -  $1\frac{1}{2}$ " in length but more frequently are  $1/4$ " -  $1/2$ " of cross vein crysotile and are pale green to white in colour. Rare cross fibres veins are seen to extend from the core at some distance into the barren serpentine and also in rare fissures or shears on the rock. The length of the fibre bears no relation to the distance from the core or the position on the mantling vein.

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these pyroxenite cores are not continuous along strike, but appear as scattered groups, and sometimes as singular occurrences. The cores, however, appear to be most common in a band stretching along the northern margin of the mass. The most common strike of the shears within the serpentine being parallel to the northern boundary and the dip being to the SSE, this may be the surface expression of an asbestos bearing horizon within the rock.

Geochemical sampling in the Mill Cut quarry showed low results for SP but higher results for chromium and nickel. It is interesting to note that specimens taken near a zone of stichtite do not show high chromium values. These are not sufficient results however, to show possible trends of the higher values.

Razorback Mine. No follow up work has as yet been done on the tin anomaly north of the Razorback workings. A summary of the workings is given in the previous SPL27, Progress Report, and indicates that the lode material seems to run out of depth. The northern extension of the tin anomaly may be drilled when drilling proceeds on the Razorback serpentinite especially with the evidence of IP as a further guide.

Kapi Ck Fault. The grid of short traverses recommended has been cut, and pegging magnetometering and soil sampling are at present in progress.

Pine Hill Area. In many ways the most interesting area in the lease, this has been studied closely and work has proceeded as far as drilling.

The Pine Hill Quartz Porphyry, see fig.8 seems to be a stock like intrusion of somewhat larger dimensions than was previously suspected. This is the first reasonably detailed plan of its boundaries. Fig.2 of the previous report shows an older though roughly similar outline, and shows that the mass is in fact on Renison Mining Lease. Most of it, however, is on the Pine Hill Grid and was worked on at the same time as the rest of the Northern part of SPL27, so, for the sake of unity it is included in the same study. Also many of the metamorphic and metasomatic effects of the surrounding country rocks extend into the SPL. The mass shows a system of radiating dykes, one of which extends as far as Renison Bell township in the north. The main metamorphic effect of the mass is a hornfelsing of the argillites which obliterates bedding structures, and hardens the rock considerably in an aureole of about 2000 ft. radius. Metasomatic processes associated with the mass are much less extensive and seem to be confined to the mass itself and to, in most cases, relatively small bodies or concentrations of complex veining and alteration in the country rock roughly concentric to the mass, see fig. 8. The porphyry is made up of phenocrysts of quartz and orthoclase in a quartz feldspar ground mass. Later stage minerals such as tourmaline and cassiterite pervade the mass to a varying degree and can be seen within the ground mass. They also however show a tendency to replace earlier minerals and feldspars completely pseudomorphed by tourmaline are quite common. Tourmaline and cassiterite along with minor minerals such as pyrrhotite pyrite, magnetite, fluorite, and topaz are most commonly associated with late stage quartz veins and are introduced into other rocks by metasomatic fluids emanating from the veins. Black aureoles of tourmaline surrounding quartz veins are common both in the qtz porphyry and in the country rock.

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A different stage of veining metasomatic action produces axinite veins with associated garnet and tremolite-actinolite mineralisation.

The qtz tourmaline veining and metasomatism appears to be the more extensive of the two types and a number of complex vein bodies of this type have been explored by old workings. These old workings were mapped and sampled in detail in order to get a picture of the type of mineralisation which might be causing the strong anomalies shown west of Pine Hill in the regional study and to get a possible connection with one or more of them.

LK Ward in his study of the North Dundas Tinfield in 1909 described most of the old workings that can be seen today at a time when they were still being worked or had just recently folded. Most of them were found to contain the type of complex country rock totally altered by introduction of these minerals to a hard quartz tourmaline rock. Most of the bodies were unfortunately small with great variations in tin concentrations and all the small companies failed. The largest workings seemed to be those of the Penzance Tin Mines N.L., see open-cut in Fig. 9. In the open-cut today two or three shafts can be seen following narrow qtz. tourmaline veinbodies but the underground workings which are reported to have been worked on several levels mining both vein stuff and country rock, have fallen in and no plans or records seem to have survived.

The only other workings of any size were those of the Mt. Lyell Copper Estates Co. Ltd. working on the north fall of the saddle between Pine Hill and Commonwealth Hill. These comprise a 150 ft. adit with two 30ft. crosscuts and a system of trenches on the surface. They worked a complex gossanous veinlode which is now very weathered in the workings. From the reports it seemed that the company had failed before the true extent of this reasonably rich body had been determined. This made the workings very interesting considering their close proximity to the magnetic and soil anomalies already mentioned. Ward's report mentions magnetite in the hard indurated state on the contacts of the complex lode which agrees with the strong magnetic anomalies seen in this area.

The workings were cleared and sampled in detail. The lode is represented on the surface by a large gossan which when sampled gave good tin values ranging from 0.3% to over 1% Sn. see Fig.9. Values were poorer in the adit itself but rose to 0.34% Sn.

While the old workings were being studied a road was being cut by bulldozer from Silver Saddle to just north of the Penzance open-cut and then along the south slope of Commonwealth Hill to explore a section of the rock across the strong magnetic and

geochemical anomalies. Between A & B on Fig. 8, the road encountered very altered rock containing magnetic, tourmaline, tremolite-actinotite and pyrrhotite with evidence of total metasomatic alteration of the original rock. Chip sampling of the road revealed tin values between 0.1% and 0.41%. The rock was so altered however, that little idea could be got of the strike and dip of the mineralisation. Tracing float and a little outcrop of the mineralised rock through the bush suggested that it might connect up with the Mt. Lyell Co. Estates workings and a grid of 100ft. interval traverses was cut to investigate this, see Fig. 9. Strong magnetic values on traverse 1700' W of the Pine Hill Grid, where it cut the mineralisation suggested a close tie between the two so it was possible that strong magnetics on Traverse 2100W showed a westward extension of the mineralisation from its outcrop or the road, thus the grid of 100ft. lines was extended to cover this. Fig. 9 shows the completed grid of lines with magnetics and the results of tin assays of chip samples. The results seem to show a distinct gap between the Mt. Lyell orebody and that exposed on the road though chip sampling shows 0.5% tin in samples in the magnetic gap. This possibly means that the connection between mineralisation and magnetics is not as close as at first thought and that the lode is in fact continuous. On the evidence accumulated thus far it was decided to drill the anomaly. The eastern part of the anomaly was chosen first as some information on the dip of the body was available from its oriculation in the Mt. Lyell workings. It was seen to dip to the S.E. at about  $50^{\circ}$  so the first hole, S271, was drilled north (Mine North) at  $45^{\circ}$  from vertical to intersect the lode almost at right angles. The hole intersected sulphide rich altered tourmalinised, argillite between 87ft and 133ft with tin values from 0.1% to 0.3%, this closely associated with qtz tourmaline veins. As the hole struck no further major mineralisation in 70ft. this mineralisation is taken to be a continuation of the Mt. Lyell lode which appears to strike to the south much more quickly than was anticipated from the original interpretation of the magnetics. A steeper hole ( $85^{\circ}$ ) is at present being drilled from the same site to establish the dip of the mineralisation. Similar holes to S271 are planned to drill the whole length of the anomaly from the south at about  $45^{\circ}$  if the dip of the body proves to be the S or S.E.

A reinterpretation of all the magnetic results to the West of the quartz porphyry Fig. 5, shows the extent of complex anomalies striking almost E.W. Most of the anomalies shown seem to be less significant than that at present being tested but will merit closer attention in the near future. The preliminary results of the I.P. survey in the same area are shown in Fig. 4, and though no interpretation of them has as yet been received they show quite extensive strong anomalies over much of the area covered by strong magnetics and will require close study. The present known mineralisation strangely shows only as a minor 30+ ms anomaly. A few interesting anomalies appear close to the serpentinite contact and may be a continuation of the type of anomaly seen north of Serpentine Hill. Here though there is no corresponding SP anomaly.

In studying the area of sheet C3 with a view to drilling targets it has been necessary to largely ignore the soil sampling results for tin shown in the previous report, at 400' = 1". These have been discredited since the discovery of sample contamination on some of the lines.

#### Conclusions:

Study of SPL 27 has now reached a stage where it is necessary to drill the most interesting anomalies which have been located. Much of the future drilling programme depends on the results and recommendations in the forthcoming report on the I.P. survey being prepared. Drilling is already planned to test the Pine Hill mineralisation further and a series of holes is also planned to cover the I.P.SP anomaly and the north contact of the Serpentine at Serpentine Hill. Some of these anomalies may be costeamed prior to drilling.

Further work is required on magnetic anomalies on the south slope of Commonwealth Hill to the most of the present drilling. Road access will be required to expose rock and detailed chip sampling and magnetics may be used. Work will continue on the Kapi Creek fault with the intention of selecting a drilling target if it is warranted.

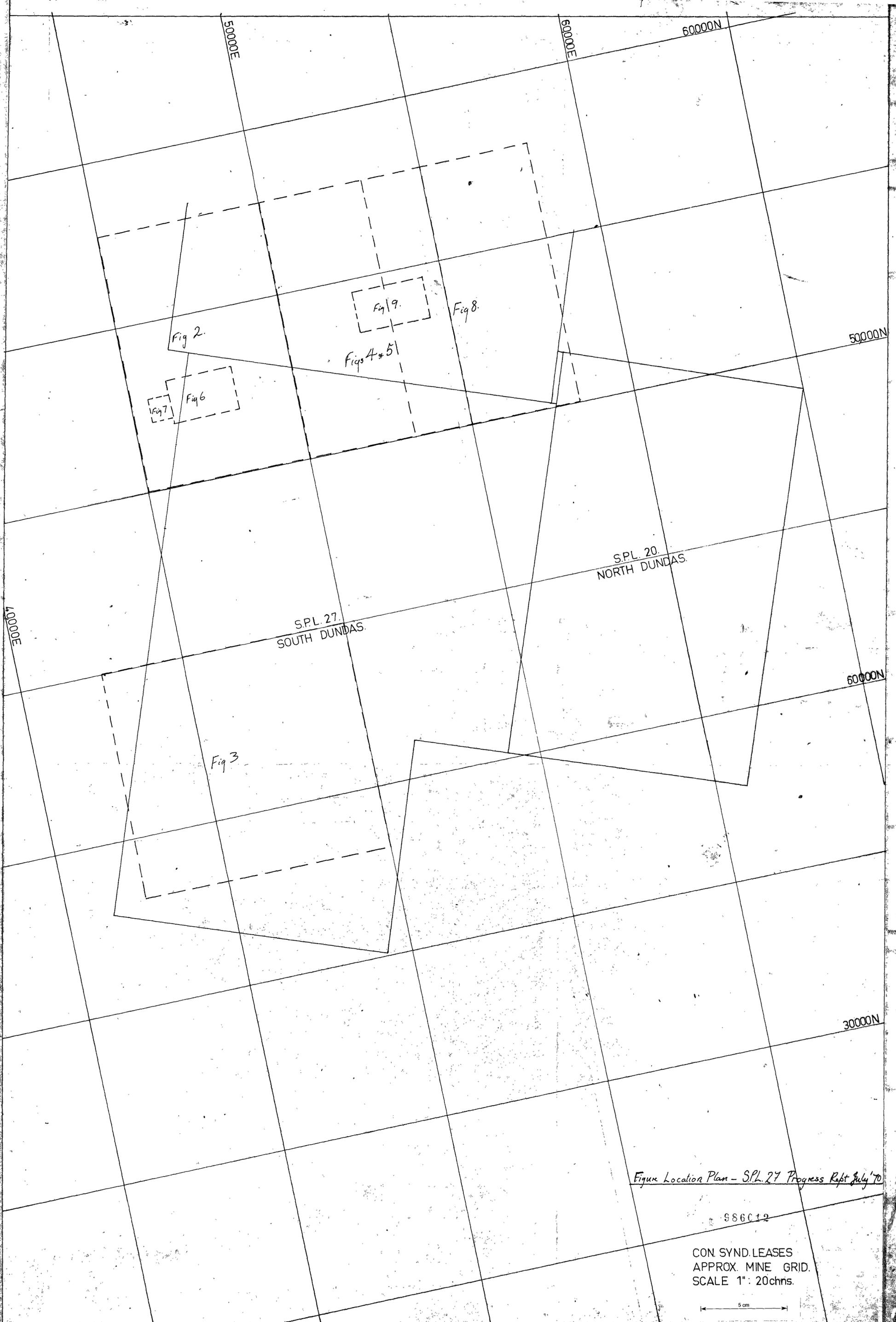
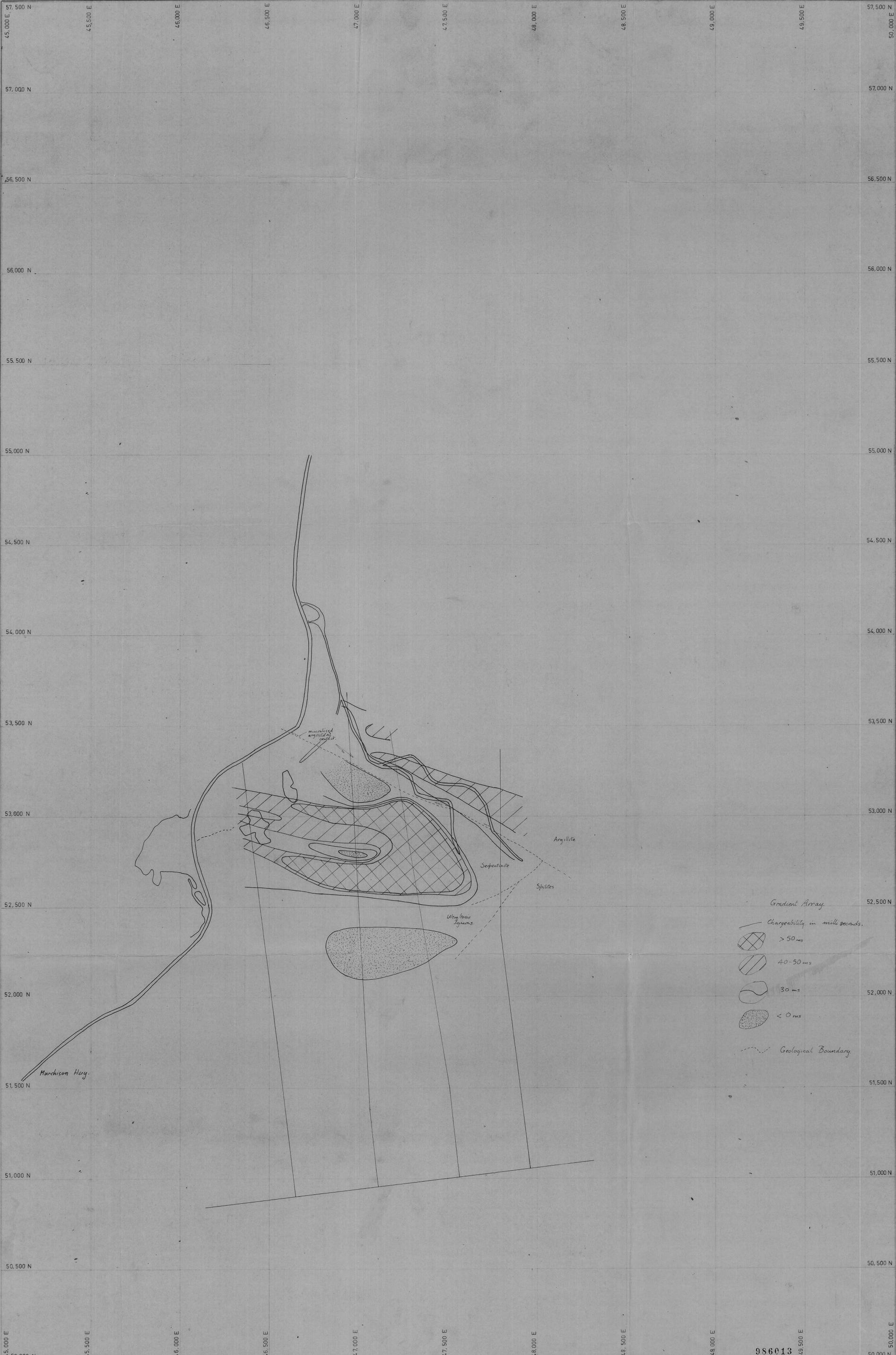


Figure Location Plan - S.P.L. 27 Progress Rept July '70

986012

CON SYND. LEASES  
APPROX. MINE GRID.  
SCALE 1" : 20chrs.

5cm

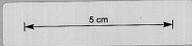


986013

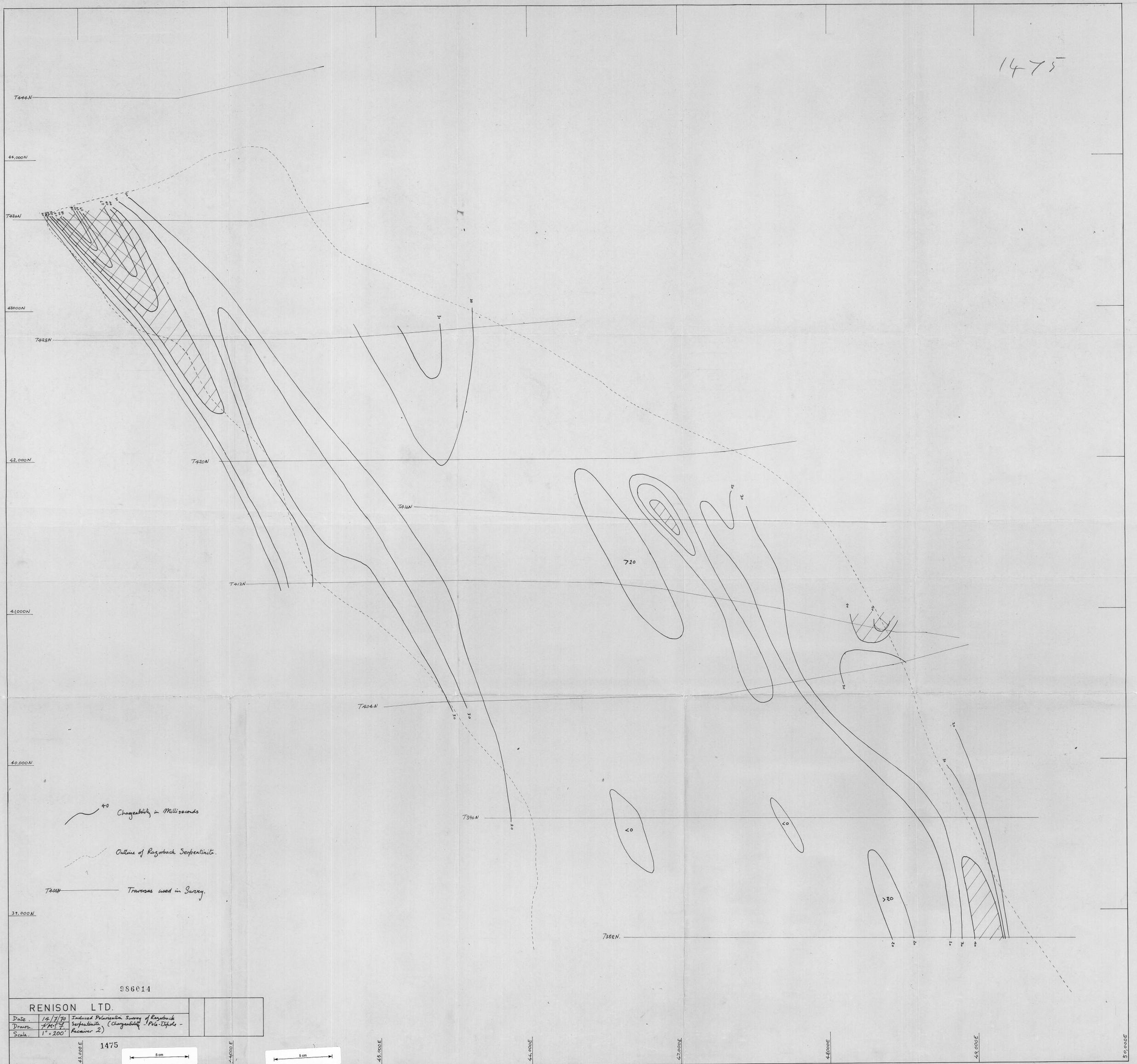
RENISON LIMITED

Scale 1" to 200'  
 Date 26/6/70  
 Drawn K.M.S.  
 Traced also Generalised Geology

C 2  
 1474



1475



40 Chargeability in Milliseconds

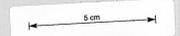
Outline of Rosetack Serpentine.

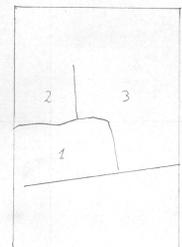
Traverses used in Survey.

986014

RENISON LTD.	
Date	14/7/90
Drawn	Induced Polarisation Survey of Rosetack Serpentine (Chargeability - Pole-Dipole - Receiver 2)
Scale	1" = 200'

1475





- Chargeability in Milliseconds
- > 50 ms
  - 40-50 ms
  - 30 ms
  - < 0 ms.

- Geological Boundary.
1. - Gradient Array, 1st electrode setting.
  2. - " " " " 2nd " "
  3. - Pole-Dipole Array.

5 cm

RENISON LIMITED

Scale 1" = 200'

Date 25/6/70

Drawn R M F

Trace

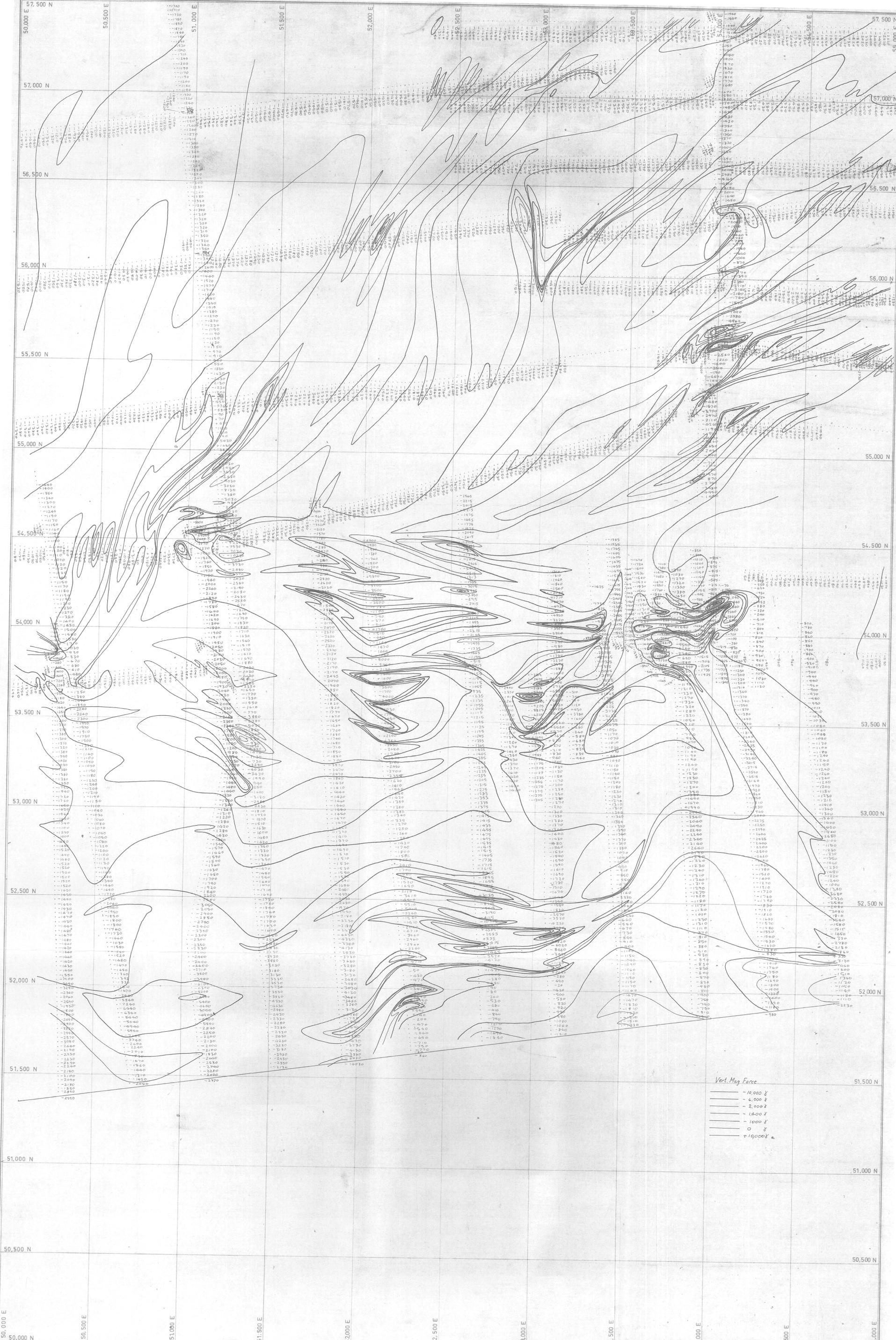
Induced Polarisation Survey carried out by C.G.G. - Autumn 1970 also Generalised Geology.

986015 50,000 N

1476

C 3

Fig 4. 70-653

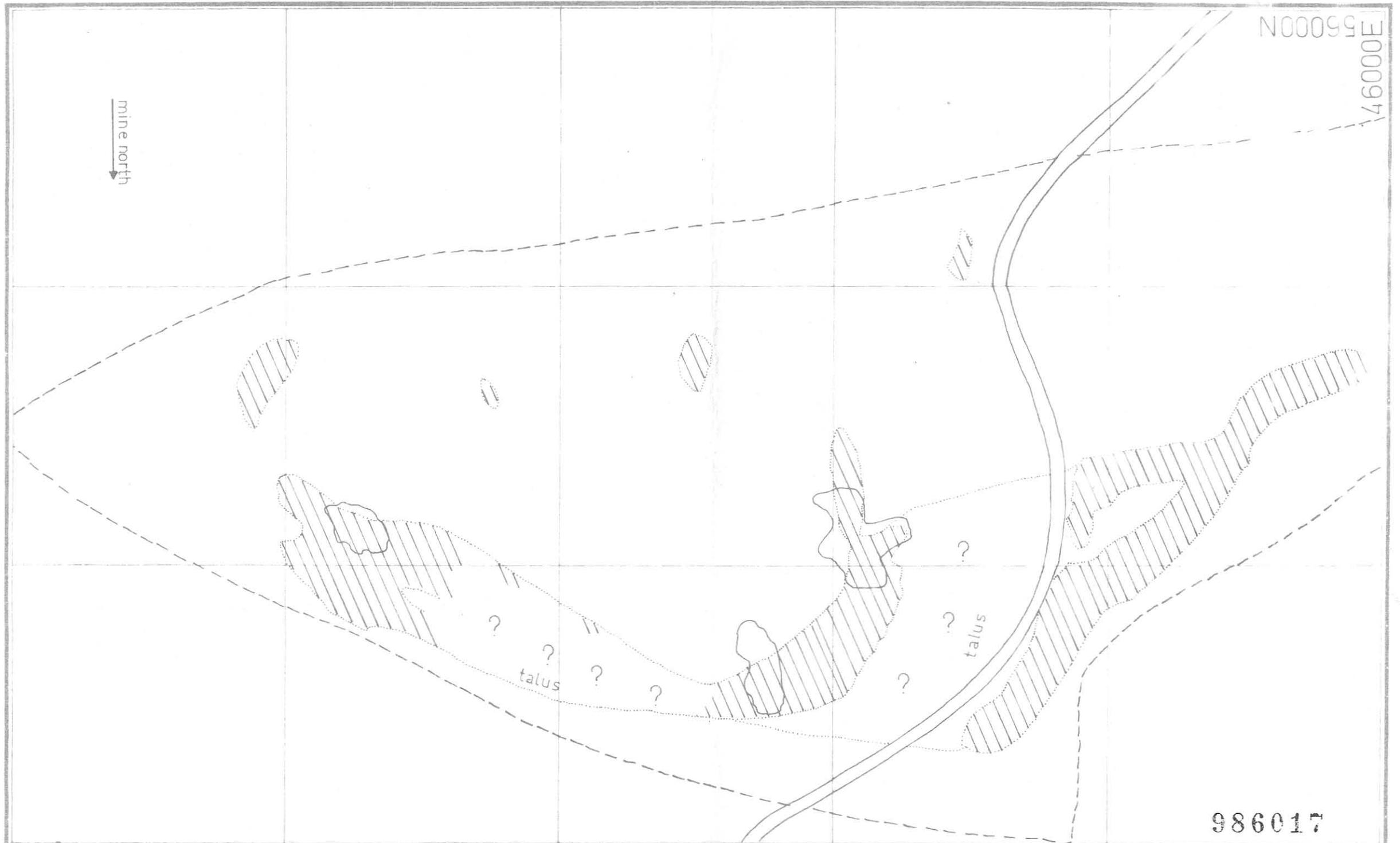


Vert. Mag. Force

- 10,000 f
- 6,000 f
- 2,000 f
- 1,000 f
- 0 f
- +10,000 f

RENISON LIMITED		1477
Scale	1" to 200'	Magnetics on Pine Hill Grid, South Reasonson Ball Hill Grid and Common- wealth Hill Grid.
Date	25/6/70	
Drawn	K.M.P.	
Traced		
5 cm		C 3

Fig 5. 70-653



986017

DATE	June '67
DRAWN	J.F.
asbestos present	
asbestos inferred	
SCALE	1"=200'

RENISON LIMITED

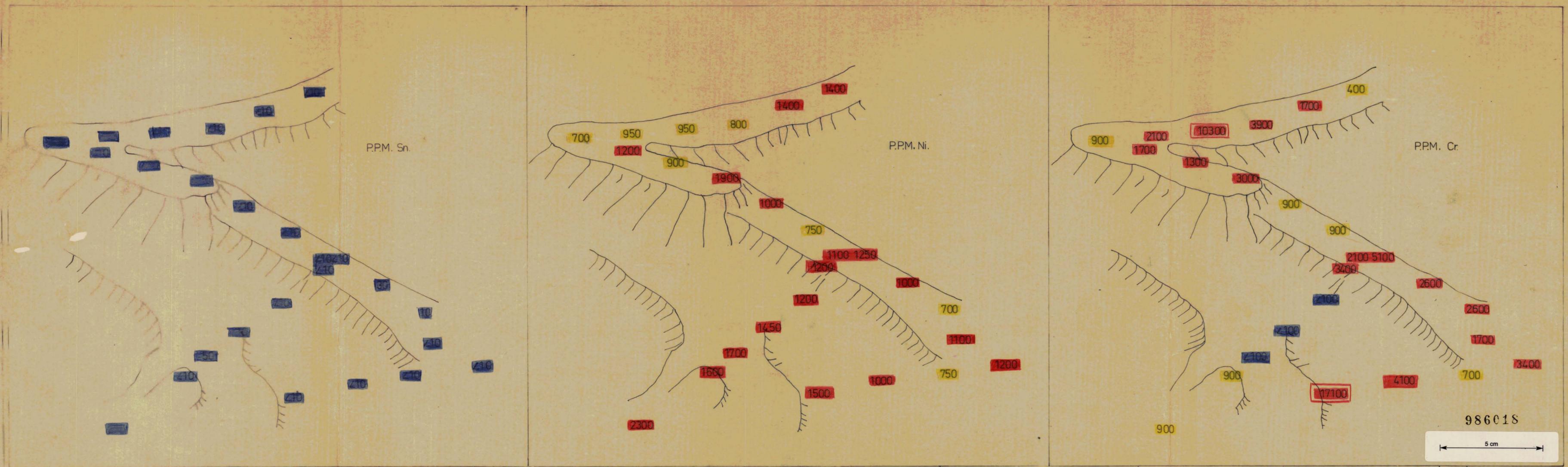
SERPENTINE HILL - ASBESTOS

DRAWING No.	
<b>E</b>	
ISSUE	A

5 cm

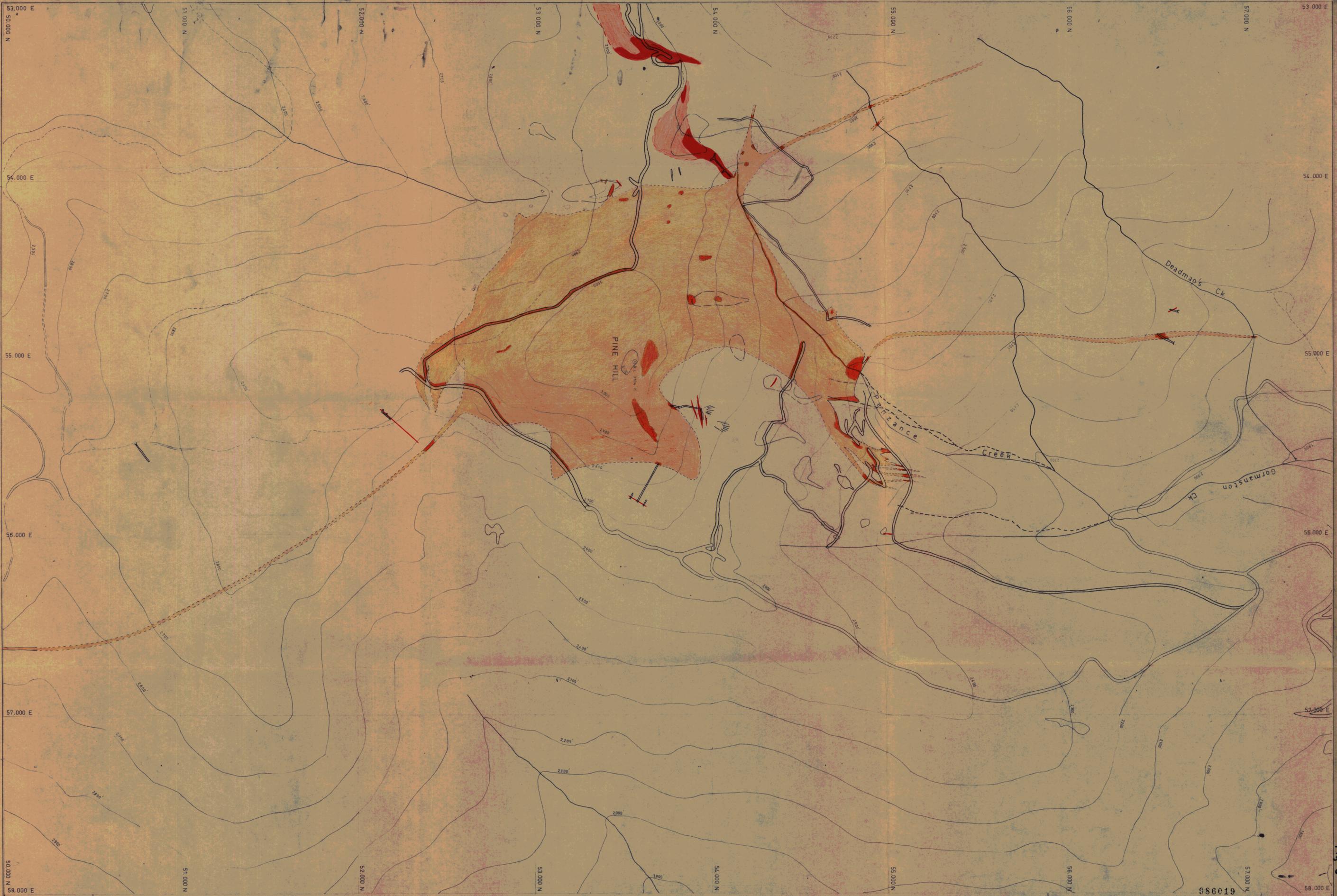
Fig 6. 70-653

ASBESTOS QUARRY - SERPENTINE HILL



GEOCHEMISTRY		RENISON LIMITED	
0-100ppm.	<span style="color:blue">■</span>	Scale	1" = 25'
101-300ppm.	<span style="color:green">■</span>	Date	
301-1000ppm.	<span style="color:yellow">■</span>	Drawn	
1000+ppm.	<span style="color:red">■</span>	Traced	

Fig 7.



986019

RENISON LIMITED 1480

DATE	AUG. 1968
DRAWN	A. C.
SCALE	1" TO 100'

PINE HILL AREA  
Geology - K. A. E. F., May 1970

*Pine Hill County  
Perthshire showing  
old workings and  
of 35 tonnage, concrete  
basin area, with it.*



Mt Lyell Copper  
Estates Ltd Wiggins

S.271 45°  
S.272 85°

S.27

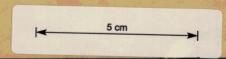
Vert. Magnetic Force



Chip Sample Sn Assays



Penzance  
Open-Cut



RENISON LIMITED		1481
Scale	1" = 50'	Magnetics & Geochemistry over Pine Hill - Commonwealth Hill Anomaly.
Date	25/6/70	
Drawn	K. Met. F.	

Fig 9. 70-653.

986020