

Q97 N63

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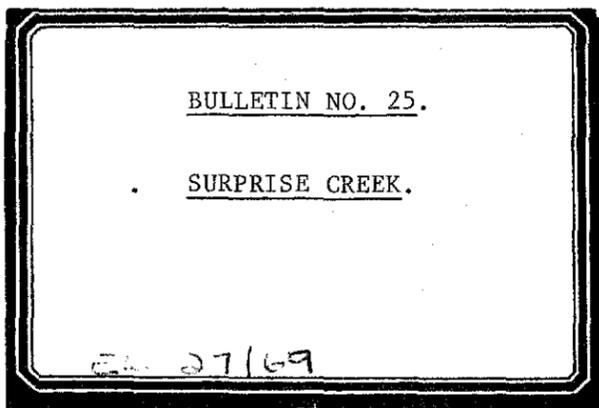
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QUAD 97

Rocky Boat Harbour District.

U.C. Services & A.P.M.
Joint Venture

71-836



Surprise Cr Area, Rocky Boat Harbour.

U.C. Services & A.P.M.

A.S. Chang
104

1970-71.

793D

MICROFILMEDBULLETIN 25.SURPRISE CREEK.1. Attached.

Plan showing locality of E.L. 27/69 Scale 1:500,000. (Plan No. 1)

Plan showing position of the Serpentinite and Stream, Rock and Beach samples Scale 1 inch = $\frac{1}{4}$ mile approx. (Plan No. 2)

2. Introduction.

On 9th December 1969, E.L. 27/69 covering $16\frac{1}{2}$ square miles was granted to Australian Paper Manufacturers Limited for a period of 6 months i.e. until the 9th June 1970. By arrangement with Australian Paper Manufacturers, U.C. Services, which have a 50% interest in the area, were to carry out geological investigations. The costs are being shared by the two companies.

Messrs. B. Hicky (A.P.M.) and J. Craig spent the period 4th February 1970, to 11th February 1970, camped in the area and carried out a reconnaissance geological investigation of a serpentinite shown on the Tasmanian Geological map, and reported on by F. Blake in 1938.

3. Locality and Access.

The Exploration Licence is situated near the southern tip of Tasmania, as shown on Plan No. 1. It is approximately 60 miles south-southwest from Hobart and 30 miles in the same direction from Geeves-ton. A walking track passes through the area and links with Catamaran at Recherche Bay about 20 miles to the East. Part of the track was originally graded as a packtrack but this section stops short of the area. Small boats can land in the sheltered waters of Rocky Boat Harbour in very good weather when a light easterly breeze is blowing - this is unusual. Helicopters can land in the buttongrass clearings and for any geological work this is the obvious mode of entry.

4. Topography, Climate and Vegetation.

Topography is fairly rugged but more subdued than the renowned area further west. Slopes are steep with relief of the order of 500 feet.

The region is very wet with an average rainfall of 60" distributed throughout the year but with a winter maximum. The rainfall tends to be in the form of prolonged light "drizzle". The region is temperate with a mild summer.

The best months for geological field work are January and February.

Vegetation falls into three categories:-

(i) Buttongrass Plains.

These are fairly open patches covered by closely spaced "clumps" of a coarse variety of grass. This type of growth is common in marshy areas generally too water-logged to support more robust growth. This is by far the easiest type of country to walk through but can still be difficult and slow.

The western portion of the area shown in Plan No. 2 consists largely of buttongrass. See Plate No. 1.

(ii) Coastal Scrub.

Coastal Scrub is well developed in a strip along the south-west coast of the region investigated and also often forms a narrow fringe between the buttongrass plains and the rain forest regions. Made up largely of closely spaced tea-tree, bowre and peppermint eucalypts up to 15 feet tall, it is often impenetrable. Very dense coastal scrub lines the banks of most of Strong's Creek and its tributaries.

(iii) Rain Forest.

The rain forest of south western Tasmania is justly impressive. However, tall towering eucalypts forming a complete canopy to a lower tier of tangled ferns, "cutting rush" and horizontal scrub are hardly conducive to observant geology. Progress on foot is painstakingly slow and arduous; rock outcrops virtually non-existent. Plate 2, 3, and 4 give a fair impression of the type of growth - it is little wonder that the greater part of this region is geologically unmapped.

5. History (Largely ex F. Blakes).

In 1915 F. Robinson, who marked out the original foot track, reportedly found gold near Strong's Creek. He and five other prospectors returned in 1924 and recovered osmiridium from the beach east of the mouth of Strong's Creek. In all 50 ozs. of osmiridium are reported to have been recovered and up to 30 men worked in the area at one time. There is no sign of previous work in the vicinity.

Green traversed the western tributary of Surprise Creek (Green's Creek) and found osmiridium near the headwaters. The osmiridium was very fine grained though some coarse metal and small nuggets were recovered by the two parties who sluiced the area. It is reported that all metal in the area was recovered-once again no sign of old workings could be found, but considering the climate and vegetation this is hardly surprising.

Robinson and others sluiced Green's Creek north of the old track but recovered only 1 dwt of osmiridium.

Numerous prospecting pits were sunk on the alluvial flats of Milford Creek. These were inspected by Blake in 1938. Small amounts of fine osmiridium were found in these pits which could not be found during the latest visit. Some osmiridium was reportedly found in a prospect on Rocky Boat Plains.

The minor "boom" lasted less than 12 months because of the "unpayable nature of the deposits" and the discovery of rich osmiridium at Adamsfield.

6. General Geology.

The region has not been accurately geologically mapped, but in the area of immediate concern (Plan No. 2) the predominant rocks are Cambro-Ordovician slates, cherts, quartzites, dolomites, limestones and conglomerates overlain by patches of Quaternary sands. The sand-covered areas shown on Plan No. 2 have been interpolated from the aerial photographs and have not been subdivided into beach, dune and reconstituted wind-blown dune, or alluvial deposits.

Blake considered the massive conglomerates on the beach at Rocky Boat Plain (Plate V) to be younger (Permo-Carboniferous) than the massive, Cambro-Ordovician conglomerates exposed at Rocky Boat Harbour (Plate VI). They are very similar in appearance - both being massive and poorly sorted with angular to rounded pebbles and boulders up to 9" in size set in a coarse grained, sandy matrix. Pebbles consist of quartz, quartzites, cherts of various colours including jasper, and weathered green igneous and metamorphic rocks. A few serpentinite pebbles were noted. The conglomerate colour varies from grey and buff through shades of green to maroon. No attempt was made to determine the relative ages of these conglomerates.

To the north of the area shown on Plan No. 2, intrusive Jurassic dolerites form the impressive ranges from Pinders Peaks to Precipitous Bluff (Plate 1).

The serpentinite was reported by Blake to be a narrow dyke-like body 3/4 mile long and 330 feet to 660 feet wide.

7. Present Programme.

The aim of the reconnaissance survey was to check on the serpentinite body as located by Blake and to collect drainage sediment samples from the Surprise Creek basin. Beach samples were taken to check for heavy mineral content.

(i) Serpentinite Chip Sampling.

The Serpentinite body was located and 4 chip sample traverses carried out across it. The serpentinite outcrops as a series of disconnected fern-covered boulders and groups of boulders. The relationships to the country rock are impossible to observe let alone infer.

Blake (1938) reported the serpentinite to be "generally massive" and apparently "completely serpentinitised, while no trace of the original ultrabasic rock" was visible. This is certainly the case for the southern traverse (SC2) where the rocks are dark, blackish green, typical serpentinites. Scattered crystals of magnetite, and chromite with magnetite rims occur, as do minute crystals (generally 5 μ and rarely) as big as 10 μ) of pentlandite. Significantly this is the only specimen to return an average Ni result.

The rocks at SC1 are dark green, coarse-grained with a semblance of crystalline texture and a much lower degree of serpentinitization. Ore microscopy revealed no magnetite but irregular grains of a complex zoned spinel with chromite cores. Trace amounts of minute chalcopyrite? or pyrite were observed, but no pentlandite.

The two northern traverses are of much more acid character. They could be an acidic differentiate forming part of a sequence with the ultrabasic rocks constituting the other end member (suggested purely by the linear arrangement of outcrop along the ridge) - or they could be doleritic rocks. No contact or gradational relationships could be determined between isolated outcrops.

In general the results from the two definite serpentinite outcrops (SC1 and SC2) are not encouraging. The higher value of 2400 ppm is average as a background result. However, if the serpentinite is differentiated we do not know how close to the contact we are sampling. A sulphide layer with Ni and Os

content may only be a few inches wide!. Because of the dense undergrowth and thick layer of decomposed vegetation with poor outcrop, this could only be established by deep conste-
aning or diamond drilling.

(ii) Stream Sampling.

Twelve samples were collected from the Surprise Creek drainage basin. The -20 + 80 and -80 mesh fraction were subjected to heavy mineral analysis with special reference to chromite, osmiridium, ilmenite and magnetite. No osmiridium was found, and chromite emerged as the best indicator. Obviously this was not unexpected. The -80 mesh fraction was analysed for Cu, Ni, Pt and Pd.

a) Detrital Minerals. (See Plan No. 2)

Stream development in the area is very variable from fast flowing (Surprise Creek) to very sluggish through dense vegetation (Green's Creek). Because of this a "chromite factor" taking into account the total heavy mineral content of each sample has been employed. The -20 + 80 fraction was found to be more suitable and the chromite factor for this fraction is shown on Plan No. 2.

At first glance it appears anomalous that the samples in Surprise Creek nearest the serpentinite body contained no chromite. However, the rocks at SC3 and SC4 contain no chromite and there is a subsidiary ridge separating the SC1 and SC2 sample areas from the headwaters of Surprise Creek. In fact the absence of chromite in these samples vindicates the method.

The samples SS1, SS2, SS13, SS14, and SS15 are all rich in chromite. Samples SS1, SS13 and SS14 in fact strongly suggest that a serpentinite body is concealed in the region south of the known outcrop. Two traverses in this region located no outcrops, and no sign of serpentinite was found along the walking track.

b) Chemical Analysis.

The results of the chemical analysis are shown in Table 1. The number of samples is obviously too small to show up backgrounds etc, but in general they reveal no highly anomalous figures. Except for the Cu values of SS12, SS13, SS14 and SS15 (anomalously low and possibly suspect) the Ni:Cu ratio is approximately 2:1. This is reflected in Fig. 1 which also shows the relative metal high in the Surprise Creek samples to be associated with samples of nil chromite factor. As no other significant heavy minerals were reported, this indicates that the Cu/Ni values in these samples are probably due to adsorbed ions in the clay fraction associated with the sedimentary and dolerite hinterland.

Significant also in fig. 1 is the noticeable increase in Ni values in samples SS14 and SS15, i.e. close to the known serpentinite.

DATA BASE NO.

Table 1.

Sample No.	Cu.	Ni.	Pt.	Pd.
21001 SS1	24	30	X	0.01
2 SS2	30	50	0.04	X
3 SS3	24	46	0.04	X
4 SS4	24	60	0.04	0.02
5 SS5	44	88	0.10	X
6 SS6	46	102	0.11	X
7 SS7	30	68	0.06	X
8 SS8	36	58	0.23	X
21012 SS12	4	36	0.07	X
13 SS13	6	36	0.11	X
14 SS14	8	70	0.11	X
15 SS15	4	86	0.04	X
16 SS16	na	na	0.15	na

All values as ppm

X - less than 0.03 ppm Pt.

X - less than 0.01 ppm Pd.

(iii) Beach Samples.

7 Beach samples were collected and tested for heavy mineral content. None of the samples returned values of economic interest - see table on Plan No. 2. ~~Samples.~~

(iv) Other Possibilities.

A sample of pyritic, cherty shale (RS2) from the eastern end of the Rocky Boat Plains beach assayed 88 ppm Cu and 130 ppm Zn.

To sample the massive conglomerates would be a major undertaking. One likely looking band (RS1) from the western end of Rocky Boat Plains Beach assayed .0.07 ppm Pt., 0.01 ppm Pd., < 0.01 ppm Au.

8. Conclusions.

It is concluded that:

- (i) The work carried out to date is insufficient to accurately assess the economic potential of the serpentinite.
- (ii) The chromite factors of the samples taken from the Surprise Creek - Green Creek drainage basin indicate a possible serpentinite area to the south of that originally considered to be the target.

- (iii) In the one absolutely genuine serpentinite outcrop located, (SC1), minute grains of pentlandite have been identified. The history of the area indicates that the serpentinite almost certainly contains osmiridium.
- (vi) Ground geology is very difficult both from an access and observation point of view. Any exploration requiring heavy equipment for follow-up costeaning or drilling would be expensive. A service road would have to be constructed into the area.
- (iv) A return visit to the area is necessary to investigate the area south of the known serpentinite - the potential serpentinite area of Plan No. 2. To do this satisfactorily will require approximately 6 miles of track cutting - a 2 mile access track along the top of the ridge with $\frac{1}{2}$ mile crosscutting traverse tracks spaced at $\frac{1}{4}$ mile intervals. It is hoped that with Australian Paper Manufacturers' assistance this could be accomplished prior to the geological visit to the area.
- (v) If rock outcrop is too poor to clarify the presence or otherwise of a southern extension of the established serpentinite a magnetic survey might be considered.

9. Recommendation.

It is recommended that:

1. A return visit be made to the area at the end of the winter season. Line cutting should preferably be complete before the geological party enters the area.
2. The E.L. should be maintained until such time as the economic mineral potential has been adequately assessed.

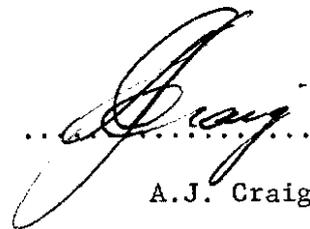

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A.J. Craig.



PLATE I

Buttongrass plain with dolerite pinnacle of Precipitous Bluff in the background.



PLATE II

Tree ferns in coastal rain forest.



PLATE III

Vertical growth shooting from fallen, moss-covered tree (diagonally across bottom left corner). Part of horizontal scrub in rain-forest.



PLATE IV.

Bracken ferns in "clearing" in rain forest.



PLATE V

Permo-Carboniferous? conglomerate on the beach
at Rocky Boat Plain.



PLATE VI

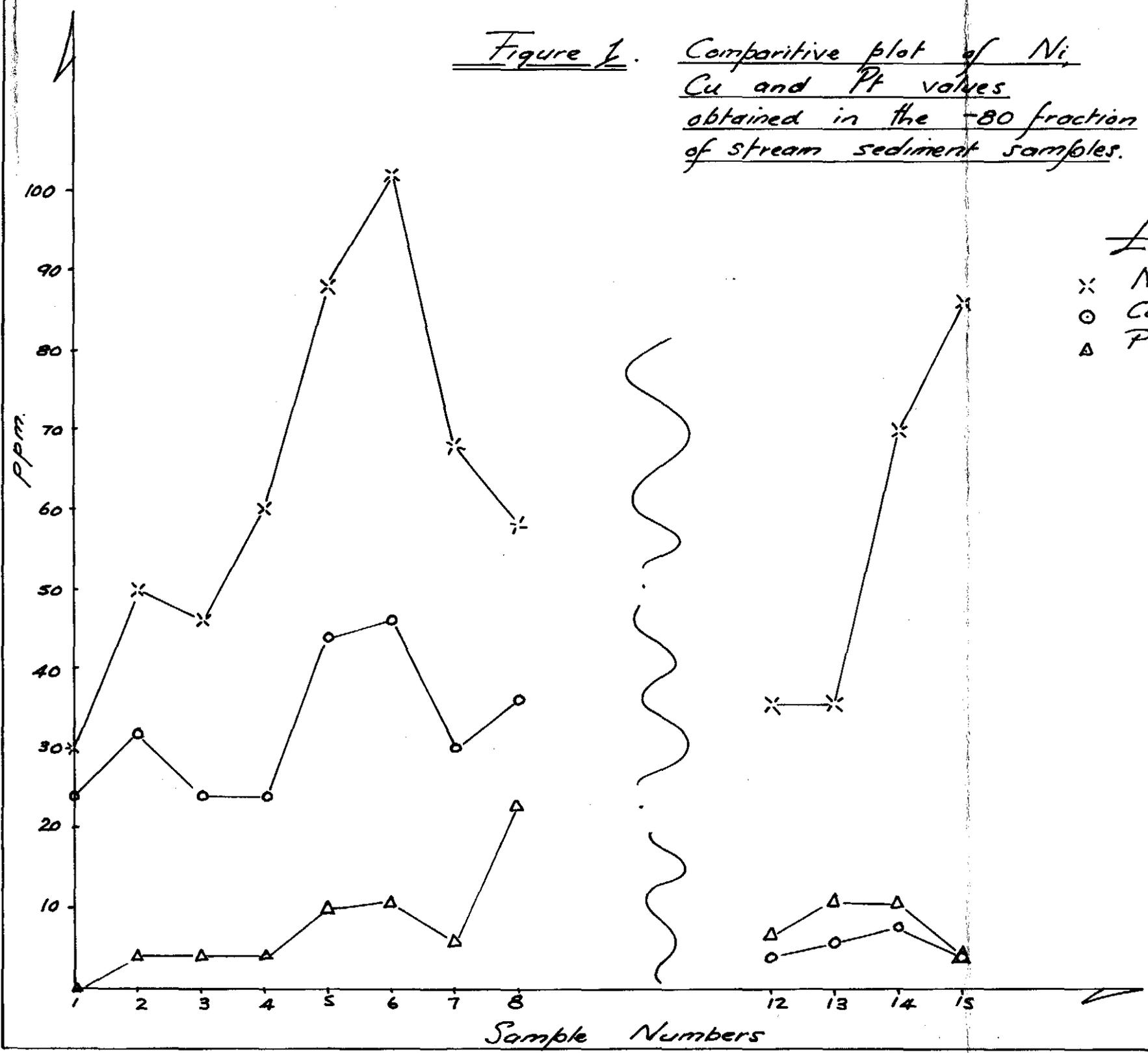
Cambro-Ordovician conglomerate at Rocky Boat
Harbour.

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m

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793011

Figure 1. Comparitive plot of Ni,
Cu and Pt values
obtained in the -80 fraction
of stream sediment samples.



Legend.

- x Nickel (ppm)
- o Copper (ppm)
- Δ Platinum (p.p.m. x 100)

TASMANIA

HOBART

Geeveston

AMG REFERENCE POINTS ADDED

AM9
460300E
5180700N

New River
Lagoon.

E.L. 27/69

Catamaran

Recherche Bay

Surprise Bay.

AMG
485900E
5167500N

TASMAN SEA

T. N.

5 cm

U.C. SERVICES (AUST.) PTY. LTD.

BULLETIN N°25

U.C. SERVICES - AUSTRALIAN PAPER MANUFACTURERS

Plan Showing Locality of E.L. 27/69

Scale :— 1: 500,000

Note. E.L. 27/69 held by Australian Paper Manufactures.
Geological survey by U.C. Services as Joint Ventures 22/4/70

AK



Sample Legend

4 ppm Copper
 86 ppm Nickel
 0.04 ppm Platinum

STREAM SEDIMENT
 DATA BASE NOS
 IN RED

BEACH SAMPLES

Sample No	Heavy Mineral Content %	Composition of Heavy Mineral Fraction	Ilmenite %	Chromite %	Rutile %	Zircon %
SB1	0.3	NIL	4.0	3	5	
SB2	0.5	NIL	4.5	2	1	
SB3	36.7	NIL	73.5	35	5	
SB8	0.2	2.0	3	Tr	1	
SB9	0.5	Tr	NIL	1	Tr	
SB10	0.5	Tr	Tr	3	3	
SB11	0.1	NIL	NIL	NIL	NIL	

U.C. SERVICES (AUSTRALIA) PTY. LTD. BULLETIN N° 25

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Plan Showing Position of Serpentinite and Stream, rock and Beach Samples
(Map compiled from aerial photographs)

More like 1 inch = 1/8 mile (1:7920)
 Scale: Approx 1 inch = 1/4 mile
 i.e. 1:15840? RJC

22/4/70

Note: E.L. 2769 held by Australian Paper Manufacturers Geological Survey by U.C. Services as Joint Venturers

5 cm

DEPT.	SEA	CG	CCWA	DSME
RECEIVED				Reg. No.
11 JUN 1971				REG. NO.
ANSWERED				
DEPT. OF MINES				
REF. NO.				

U.C. SERVICES (AUSTRALIA) PTY. LTD.

BULLETIN 25 ADDENDUM No. 1

SURPRISE CREEK

AJC/RR
11th March, 1971.

BULLETIN 25 ADDENDUM No. 1Surprise Creek1) Attached

The following are attached :-

Plan No. 1 Plan showing the topography and location of the Second Phase baseline. Scale: 1" - 0.5 mile.

Plan No. 2 Plan showing Magnetics, Geochemistry and Partly Inferred Geology of the Surprise Creek Area. Scale: 1" - 300 feet.

2) Introduction

Messrs. Craig and Randell spent the period 8th to 15th December inclusive in the field at Surprise Creek. Prior to this Australian Paper Manufacturers had a team in the field for three weeks cutting grid lines. This team was under the supervision of Mr. Basil Hickey who remained in the field during the geological programme. All camp facilities and communications were organized by Mr. Hickey.

The aim of the operation was to follow-up the initial programme carried out in February 1970 and reported on in Bulletin 25.

3) Method of Approach

The grid pattern was based on the distribution of chromite in the stream sediment samples collected in the first phase programme, and is shown on Plan No. 2. The aim was to carry out a close interval magnetometer survey to delineate the serpentinite body, and to concentrate soil geochemical sampling over this zone. In practice this approach worked very well.

The access tracks assisted in relating the geophysical results to geology as more outcrop was exposed, particularly in the impetrable "cutting rush" which was found to favour the serpentinite soil.

4) Geology (See Plan No. 2)

The distribution of rock types as indicated by geological observation, geophysics and geochemistry is shown on Plan No. 2. The south-east closure of the main serpentinite body could not be established because of lack of suitable access to allow extending the magnetic programme eastwards. A magnetometer traverse along the old walking track from the BASE eastwards to Surprise Creek did not locate the serpentinite. It had been planned to carry out a magnetometer traverse up Surprise Creek from its intersection point with the walking track to near station O but the stream was in flood and this was impossible.

Stations O and O^A correspond to SO4 and SO3 of Bulletin 25. In this report there was some doubt regarding the relationship between these rocks and the obvious serpentinites. Thin section investigations have confirmed that most of the rocks in the vicinity of stations O and O^A are dolerites. Some of the finer grained more altered varieties are described as having "basaltic textures" and one was considered to be an "indurated tuff". The microscope work was carried out by an outside laboratory, not U.C. Services.

2.

Talc-carbonate rocks were located at the western extremities of lines 2 and 2A. Microscope investigation has revealed that these are highly altered serpentinites. They bear no resemblance to the serpentinites of the main body and there is no obvious connection between them.

5) Results

A. Magnetics (See Plan No. 2)

The ground magnetics were carried out using a McPhar M700 fluxgate magnetometer which performed very satisfactorily. Readings were taken at 10 pace intervals (± 300 feet) along the base line and cross traverses.

Readings over the sedimentary rocks were found to be fairly uniform in the general range of 250γ - 350γ (the instrument was set to give a reading of 150γ at the BASE station - no corrections were made for diurnal variations). Widely fluctuating readings were characteristic of serpentinite and enabled a fairly close correlation to be made between the traverse lines. Readings ranged from $+6,000\gamma$ to $-6,000\gamma$. The dolerite at the north-east end of the grid is characterized by broad negative anomalies seldom exceeding 800γ .

B. Soil Geochemistry (See Plan No. 2)

After the serpentinite had been delineated by magnetics and geological observation, soil geochemistry was carried out over the serpentinite area. Similar geochemistry was undertaken over the dolerite area in the north-east. Samples were taken from the base of the soil profile by means of 1" carpenters augers; sample depths seldom exceeded 18". A total of 310 soil samples were collected and analysed for copper and nickel.

Copper values over the serpentinite were invariably very low (< 20 ppm) and the nickel values are not anomalous. The highest nickel value was 2,600 ppm and there is no evidence of secondary enrichment in the thin soil profile. A minor coincident Cu/Ni "anomaly" occurs 550 feet west of the base line on line 2 but the values do not suggest that this is significant. Serpentinite outcrops in this vicinity revealed no visible mineralization.

Copper values in the dolerite soil are considerably higher than those of the serpentinite soil. They range up to a maximum of 240 ppm about 390 feet east of 0 base station. Nickel values in the dolerite soil are very low, usually less than 100 ppm with a few values up to 150 ppm. No sulphides were observed in any of the dolerite outcrops.

The values returned by the copper/nickel soil geochemistry programme suggest that there is no economic sulphide mineralization in the serpentinite rocks investigated.

C. Rock Geochemistry (See Plan No. 2)

Several grab and chip samples were collected from the scattered outcrops revealed by the line cutting. The positions of these samples and the assay values of platinum, palladium, nickel and copper are shown on Plan No. 2. No significant values were returned. The values shown for sample 56 do not agree with those obtained from other serpentinite samples and are considered to be suspect.

No sulphide mineralization was observed in any of the serpentinite outcrops investigated.

3.

6) Conclusions

It is concluded that :-

- i) The magnetic survey was successful in locating and delineating a serpentinite body suggested by the stream sediment sampling programme carried out in February 1970 (Bulletin 25).
- ii) Soil and chip sampling returned no anomalous platinum, palladium, copper or nickel values.
- iii) No economically viable orebody is developed in the serpentinite investigated at Surprise Creek.

7) Recommendation

It is recommended that :-

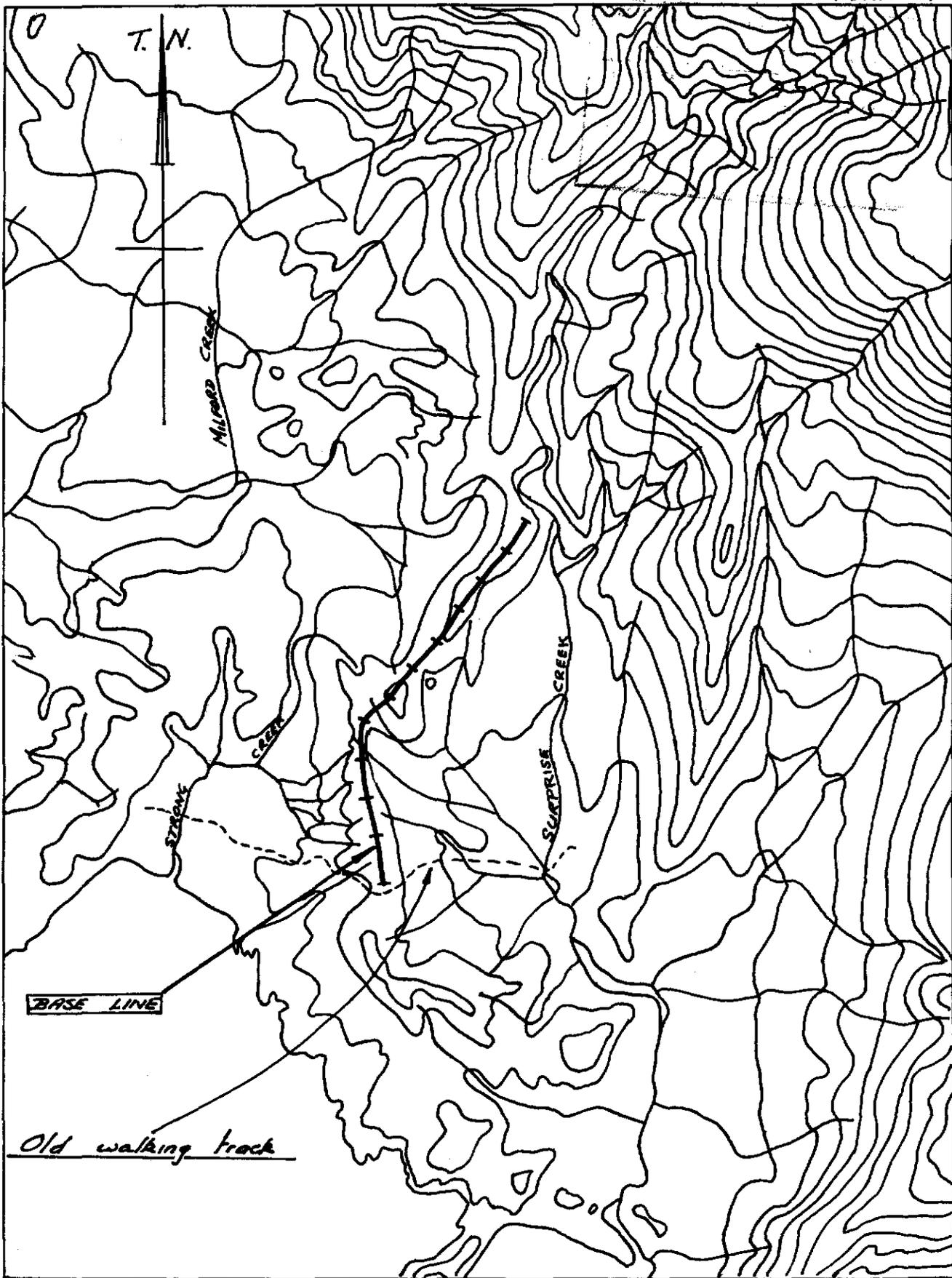
- i) No further geological prospecting be carried out in E.L. 27/69.
- ii) That Australian Paper Manufacturers allow E.L. 27/69 to lapse.

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A.J. Craig

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PLAN 1.



U.C. SERVICES (AUST) PTY LTD.

BULLETIN 25 / Add. N°1

U.C. SERVICES - AUSTRALIAN PAPER MANUFACTURERS

E.L. 27/69 - SURPRISE CREEK

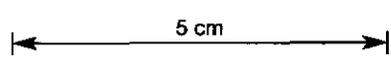
PLAN SHOWING TOPOGRAPHY AND LOCATION

OF SECOND PHASE BASE LINE

CONTOUR INTERVAL - 40 metres

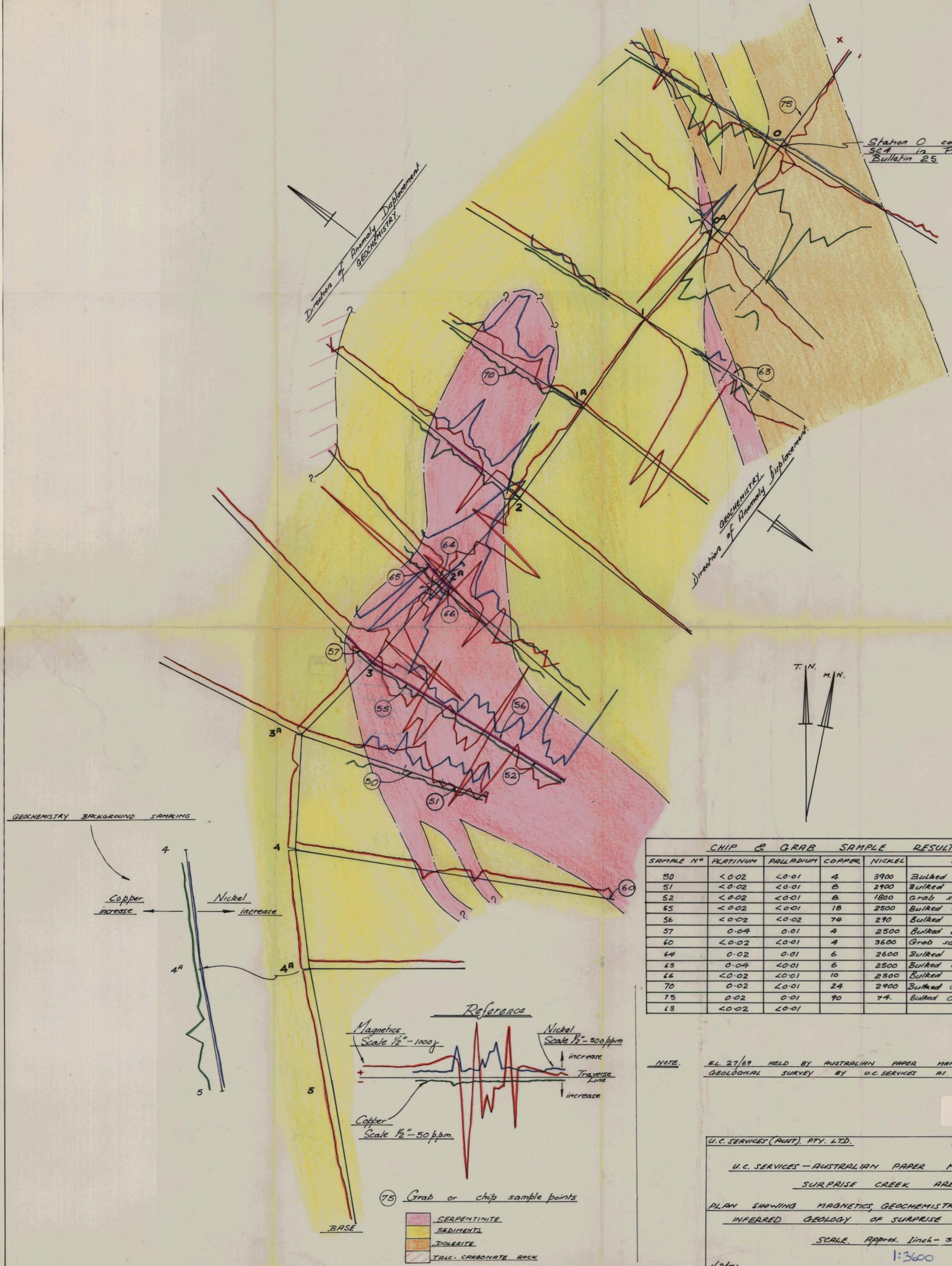
SCALE 1" - 0.5 mile

26/1/71

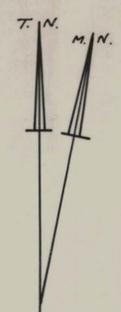


R.J.C.

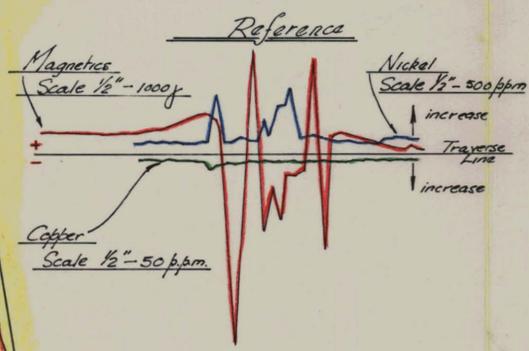
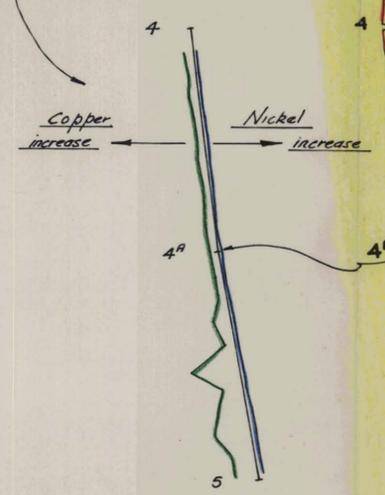
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Station 0 corresponds to position 5C4 in Plan 2 of original Bulletin 25



GEOCHEMISTRY BACKGROUND SAMPLING

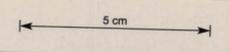


(75) Grab or chip sample points

- SERPENTINITE
- SEDIMENTS
- DOLERITE
- TALC-CARBONATE ROCK

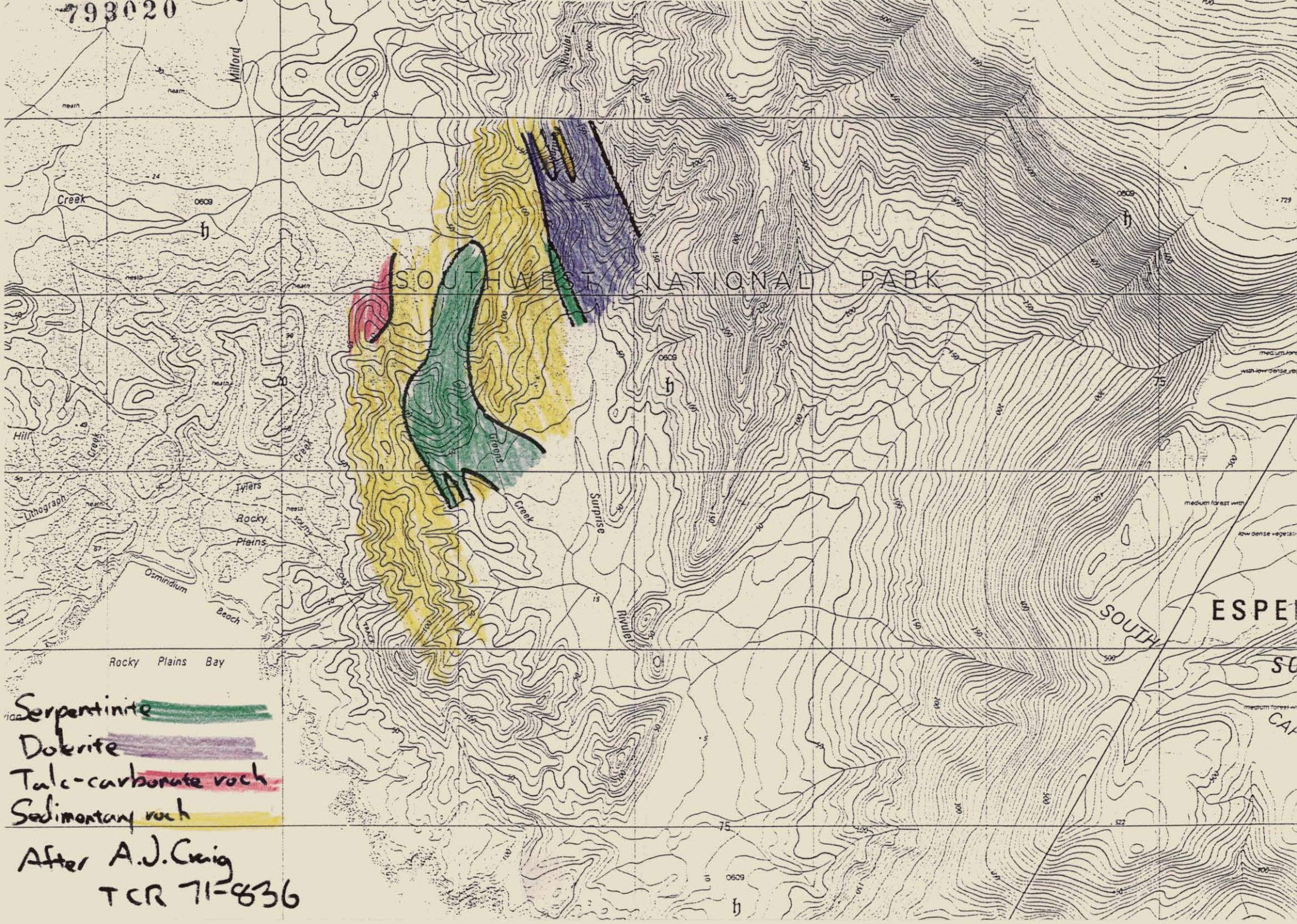
CHIP & GRAB SAMPLE RESULTS (All p.p.m.)					
SAMPLE NO	PLATINUM	PALLADIUM	COPPER	NICKEL	REMARKS
50	<0.02	<0.01	4	3900	Bulked chip sample. Serpentine
51	<0.02	<0.01	8	2900	Bulked chip sample. "
52	<0.02	<0.01	8	1800	Grab sample - iron stained. "
55	<0.02	<0.01	18	2500	Bulked chip sample. Serpentine
56	<0.02	<0.02	74	290	Bulked chip sample. "
57	0.04	0.01	4	2500	Bulked chip sample. "
60	<0.02	<0.01	4	3600	Grab sample. "
64	0.02	0.01	6	2600	Bulked chip sample. "
65	0.04	<0.01	6	2500	Bulked chip sample. "
66	<0.02	<0.01	10	2500	Bulked chip sample. "
70	0.02	<0.01	24	2900	Bulked chip sample. "
75	0.02	0.01	90	74	Bulked chip sample. Dolerite
83	<0.02	<0.01			Serpentine.

NOTE. E.L. 27/67 HELD BY AUSTRALIAN PAPER MANUFACTURERS GEOLOGICAL SURVEY BY U.C. SERVICES AS JOINT VENTURERS.



U.C. SERVICES (AUST.) PTY. LTD. BULLETIN 25, Add. 1.
 U.C. SERVICES - AUSTRALIAN PAPER MANUFACTURERS
 SURPRISE CREEK AREA
 PLAN SHOWING MAGNETICS, GEOCHEMISTRY AND PARTLY
 INFERRED GEOLOGY OF SURPRISE CREEK AREA.
 SCALE. Approx. 1 inch = 300 feet. 793019
 1/3/71. 1:3600 A.J.C.

793020



- Serpentinite
- Dobrite
- Talc-carbonate rock
- Sedimentary rock

After A.J. Craig
TCR 71-836