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TIN AT ELLIOTT BAY

TASMANIA

EL 27/76

The 1978 field programme

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002

CONTENTS

	Page No
Acknowledgements	2
Introduction	3
Conclusions	4
Recomendations	5
Exploration activity	
Initial Reconnaissance	6
Mapping	6
Pitting	8
Drilling	9
Dune and Beach Samples	11
Stream Sediment Samples	11
Discussion	
The pebble deposits as the tin anomaly source.	12
Origin of the pebble deposits	13
Origin of the tin within the pebble deposits.	15
Grade and Tonnage of the Pebble deposits	16
Reference	17
Appendix 1 Field Notes and Pit and trench Descriptions	18
2 Drill logs	21
3 Analyses results	34

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ACKNOWLEDGEMENTS

The work reported on herein was completed in 3 weeks only because of the substantial assistance and co-operation of all those involved in the 1978 Elliott Bay field team.

I am indebted to all those responsible for the organization and establishment of this particularly well run field party.

Further assistance was provided by David Jennings from the Tasmanian Mines Department, who was able to accompany us to Elliott Bay for a week. His expertise in Tasmanian tinfields was of invaluable assistance in this programme.

INTRODUCTION

During the 1977 Stream sediment survey over EL 27/76 at Elliott Bay, Tasmania, a number of significant tin anomalies were found in -80 mesh sediments collected primarily for base metal exploration. The anomalies were located over bedrock of acid volcanics, but in close proximity to two known Cambrian granite outcrops. In January 1978, a programme of follow up work was carried out using techniques specifically intended for tin exploration in order to check the anomalies and their source(s) and to investigate whether tin mineralization was associated with the known granites.

A programme of mapping, stream sediment sampling, auger drilling and pitting was carried out in which large samples were collected to minimise sampling error. These were then panned and analysed by XRF. Some samples were also subjected to size analysis by the Tasmanian mines department.

The ⁽¹⁹⁷⁷⁾ coarser grained samples were discarded, and never tested for cassiterite. Subsequent sampling indicated high tin values in -80 mesh samples did not indicate high tin values in coarser grades. If cassiterite exclusive to fine-sand grain-size there is a suggestion of blown sand origin or distribution.

D. J. J.

CONCLUSIONS

The tin anomalies in stream sediment samples at Elliott Bay derive from a thick, extensive recent alluvial deposit of sand and quartzite pebbles. No evidence was seen that the known granite outcrops in the vicinity are in any way associated with tin mineralization.

The pebble deposits, although fairly extensive, are of such a low tin grade that they do not constitute an economic tin deposit.

However the ultimate source of the tin in these deposits is not known, and is likely to be due to tin mineralization within the Precambrian rocks near Elliott Bay. Limited Stream Sediment sampling upstream of any known pebble beds has shown interesting tin anomalies to the NE of Elliott Bay. The source of these anomalies and the ultimate source of the tin in the pebble deposits is likely to be outside the boundary of EL 27/76.

RECOMMENDATIONS.

1. No further work be done to evaluate the tin potential of the Elliott Bay Pebble deposits.
2. An extended stream sediment survey be undertaken to find the source of the tin now located in the pebble deposits.
3. This would almost certainly require taking tenure over the area adjacent to and East of our EL 27/76.
4. Examination of existing records of the area East and North East of Elliott Bay in an attempt to outline a source for the tin. This should include:-
 1. Magnetics - to look for possible Renison Bell type deposits.
 2. Airborne Electrical results - again to look for possible Renison Bell type deposits.
 3. Geology - to look for domal structures in the precambrian within which there may be shallowly buried granites.
 4. Geology - to determine whether any limestones are present in the region (c.f. Renison Bell deposit).
5. Photointerpretation to try and determine the eastward and/or North eastward continuation of the known pebble deposits, and hence to outline a source area for the tin.

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Generally the Precambrian terrain is more elevated, but even so small relics of pebble deposits would be expected to the E. of the fault line.

J.J.V.



EXPLORATION ACTIVITY

Initial Reconnaissance

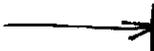
Initial inspection of the outlined anomalies showed them to occur in areas remote from outcrop. In each case coarse, well rounded quartzite pebbles were common both in the streams and on the adjacent hills. Panning in the streams gave fairly low recoveries of fine grained heavies, very little of which were cassiterite. These points indicated that the tin anomalies were sourced by the extensive, dissected recent alluvial deposits overlying the bedrock rather than being directly related to the nearby granite occurrences.

Eight samples of heavy mineral concentrates (Bulk Samples 1 to 7) were collected and particle size distributions carried out on each by the Tasmanian Mines Dept. This showed the cassiterite to be mainly fine grained, predominantly less than 150 microns in diameter. (about 100 mesh). Analyses also showed that only a small fraction of the concentrates were cassiterite.

Inspections of the granites and local bedrock gave no indication of them being a possible tin source, and so further work was concentrated on outlining the tin potential of the pebble horizon.

Mapping

The area was mapped at a scale of 1:10000, and the maps are attached. This mapping does not differentiate the bedrock geology at all and is intended only to delineate the occurrences of pebble and sand deposits. These deposits occur as an approximately linear feature oriented West-East and extending for some 12km East from the coast across to the major fault separating the Precambrian from the Cambrian sequences.



The Pebble deposit shows several characteristic flat horizontal surfaces, now dissected by a more recent drainage pattern. These surfaces make the deposits readily identifiable and at least 3 surfaces occur, the most prominent of which is some 200 feet above sea level. In several places the southern limit of the pebble deposits is formed by a steep drop from the "plateau" level to the coastal plain level.

The deposits are generally poorly sorted and comprised of clean white quartz sands and well rounded quartzite pebbles varying from sand sized up to

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about 5 cm in diameter. No clay or silt deposits were observed. Some better sorted quartz sand sections with only rare pebbles do occur but their distribution is quite erratic and not mappable.

The thickness of these deposits is also quite variable and ranges to in excess of 17 metres (Auger hole 13). No fossils were ever found in these deposits, and nor were any rounded pebbles of the immediately underlying acid volcanics ever found.

Because the deposits are unconsolidated and grass covered they are difficult to observe at the surface.

During mapping note was therefore made of the presence of outcrop, quartz veins and granite derived (as against quartzite derived) sands in order to define where the pebble deposits did not occur. The assumption was made (and where tested proven correct) that the presence of quartz vein outcrop indicates that the depth to bedrock is quite shallow, generally of the order of 30cms.

Pitting

In order to examine any structure within the pebble deposits 3 deep pits and 3 trenches on hillsides were dug by hand. Channel samples were collected from these excavations and descriptions of them are presented in the attached field notes, Appendix 1.

This work confirmed the irregularity of distribution of sorted and poorly sorted materials and no zoning or stratification could be seen. Nor was it possible to discern any bedding.

Two of the trenches were solely within C horizon of the bedrock, despite their being in close proximity to pits within the pebble deposits. This demonstrated the highly variable thickness of the deposits.

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Drilling

Thirty four 4" diameter shallow auger holes were drilled to test the areal extent and grade of the pebble deposits. Samples were taken over 1.5m intervals except when obvious horizon boundaries were encountered. All samples were weighed, panned and reweighed to determine the percentage of heavy minerals present which were then submitted to ACS Adelaide for XRF analysis. Logs of these holes are presented in Appendix 2.

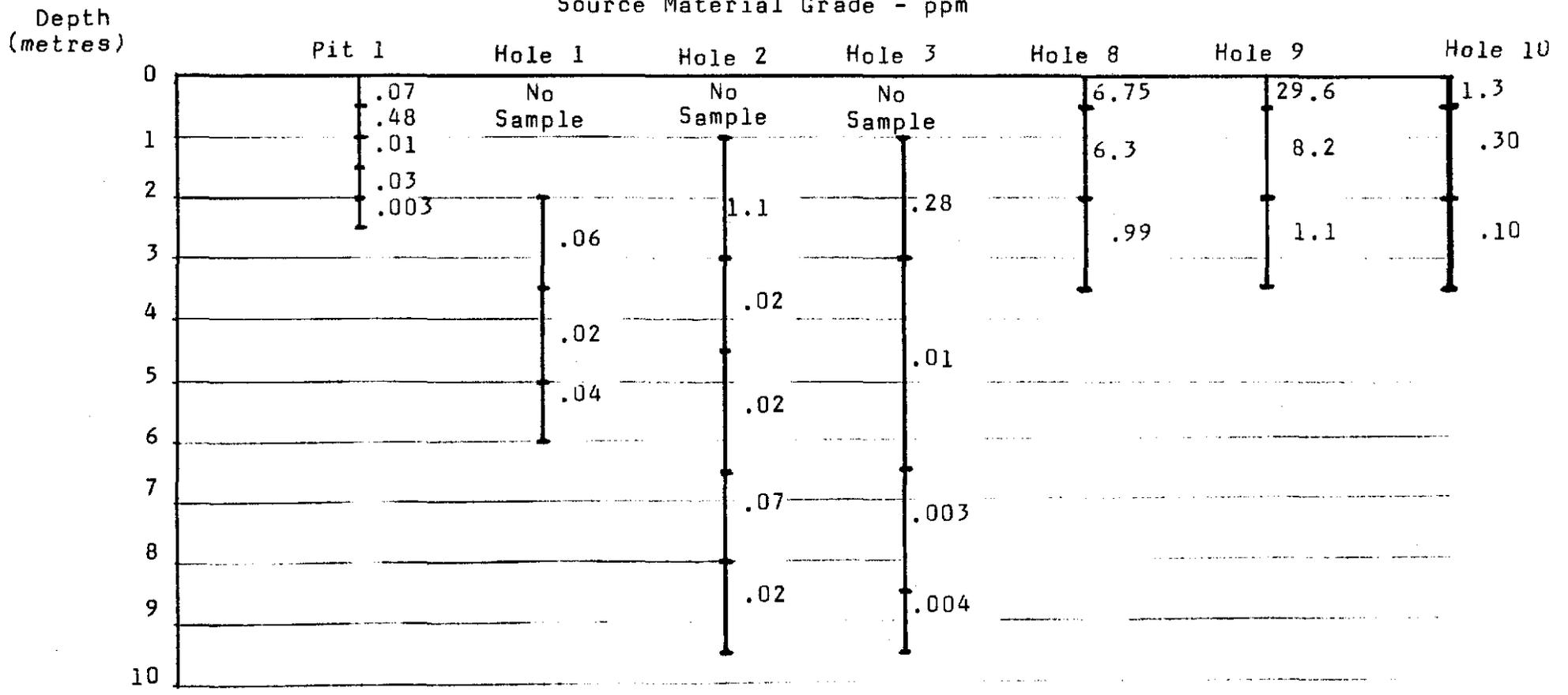
It was rarely possible to drill completely through the pebble deposits because of the groundwater present. The impermeable clays resulting from bedrock weathering usually caused a major groundwater accumulation at the base of the pebble beds. The auger rig was unable to recover this material from the hole and severe sample loss and contamination occurred when this wet layer was encountered. This frequently caused abandonment of the hole. Further problems were caused by the coarse pebbles and poor consolidation of the material comprising the hole walls. It was rarely possible to drill deeper than 10m even in dry material, for these reasons.

At one location, 6 holes were drilled over a 1m radius (holes 1,2,3,8,9 and 10) to test the variability due to both drill sampling and deposit inhomogeneity. From these results (Table 1) it is seen that there is substantial residual accumulation in the top 0.5m. However the 3 grades measured range from 1 to 30ppm which indicates substantial sampling error and/or inhomogeneity within the deposit. The regularly decreasing grades of the deeper samples in holes 8,9 and 10 suggests the occurrence of between sample contamination.

Sampling error and contamination are quite serious and it is necessary to interpret the drilling results very cautiously in regard to grade estimates.

Table 1

Source Material Grade - ppm



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Dune and Beach Samples

Several samples (KS 2879 - KS 2884) were collected from present day active and inactive dunes along the shoreline to investigate the behaviour of wind and marine longshore transport of the heavy minerals. The heavy minerals in these samples were visually very similar (grainsize, degree of rounding) to those derived from the pebble deposits.

Stream Sediment Samples

Samples were collected from streams which were not sampled in the previous survey, and in particular from streams draining the westernmost of the granite outcrops. These were collected in order to check whether the granites were the source of the tin, but in all cases the tin values were only background level.

Some samples were also collected from the area of Precambrian outcrop to the east and upstream of any known pebble deposits. One of these showed a significant tin content and further sampling is necessary to find its source.

DISCUSSIONThe pebble deposits as the tin anomaly source

All the tin anomalies outlined in the stream sediment survey occur in streams whose headwaters rise within the pebble deposits, and the more significant anomalies are in areas of more complete bedrock cover by thick pebble deposits. In the region of 383500E, 5243500N the pattern of the anomalies is such that the pebble deposit source is quite conclusively demonstrated. Pits, trenches and drilling show the pebble deposits to be particularly well developed in this area.

All the heavy minerals obtained during panning are fine grained, which indicates extensive transport distances and stream working. This would be expected from their association with the pebble deposits which have also been subjected to substantial transport.

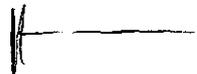
Although two areas of granite outcrop occur nearby, stream sediment samples draining these areas and areas of country rock adjacent to them, show uniformly low tin results. Inspection of the granites showed them to lack any greisenisation, quartz-chlorite veining, albitization or alteration characteristics often seen in tin bearing granitoids. These granitoids are considered to be of Cambrian age, while other Tasmanian tin associated granites are of Devonian age, and this also mitigates against their being the tin source at Elliott Bay.

It is quite certain that the tin anomalies at Elliott Bay are sourced by the recent pebble deposits and are most likely unrelated to the known granite outcrops. The ultimate source of the tin now present in the pebble deposits is however not yet known.

The occurrence of detrital tin anomalies caused by ancient erosion processes has been documented in Cornwall by Dunlop and Meyer. They consider that the tin anomalies in stream sediments were derived from known distant primary mineralization during the Pliocene by a previous erosional cycle and widely distributed during a marine transgression. Modern tin anomalies are not therefore related to local mineralization within the modern drainage system and the ultimate source of the tin is thought to be some 15km away. A directly analagous situation is considered to have caused the anomalies at Elliott Bay.

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Compare to marine erosion terraces as demonstrated
south of Bridport. D.S.S.



Origin of the Pebble Deposits

It has not been possible to show conclusively whether these deposits are of marine (including estuarine or beach) or of river alluvial (or lacustrine) origin. Some points in favour of each hypothesis are tabulated below:-

Marine

Terrestrial

- 1. Deposits are quite poorly sorted including sands and coarse pebbles.
- 2. No clays or silts observed.
- 3. Proximity of existing deposits to and parallel with the modern coastline
- 4. Possible discontinuous occurrence of deposits along the 12km E-W line.

- 1. Pebbles are of rock types which only occur remote from present deposits - transport distances up to at least 15km are known.
- 2. Unlike modern beach deposits no pebbles of the underlying bedrock occur in the deposits
- 3. No fossils were observed (although it is an unlikely environment for preservation)

Observation of the present day longshore drift along the coastline shows transport distances of less than 1km for beach pebbles. It is therefore considered that, because of the transport distance involved, the pebble deposits are more likely to be of river alluvial than marine origin.

The occurrence of three distinct "plateau" levels in the deposits shows a fairly involved formation history and implies a recent sea level up to 200feet above the present level. The pebble materials were derived from the East by an East to West flowing river whose headwaters were in the Precambrian rocks to the East and Northeast of Elliott Bay. This river may predate the Eastern fault, separating the Cambrian and Precambrian which also seems to truncate the pebble deposits, but insufficient data is available to be sure of this.

Although units other than quartzites occur in the precambrian (e.g. schists and phyllites) these rock types are not represented in the pebble deposits and are only very poorly represented in modern streams because of their softness and susceptibility to weathering.

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Origin of the Tin within the Pebble Deposits

Tin occurs as fine grained cassiterite within the pebble beds, and is presumed to have come from the same locality as the pebble deposits themselves. (This is reasonable if the deposits are of alluvial origin but if the deposits are of marine origin two separate sources would be possible). Its grainsize indicates significant transport. The main associated heavy minerals are zircon and ilmenite. Two distinct morphological varieties of zircon occur, one well rounded and the other quite angular, but the significance of this is not fully understood.

Although cassiterite is common in other coastal gravel and dune deposits in Tasmania (e.g. Ringarooma Bay and the Heemskirk granite area) the occurrence at Elliott Bay is very much more distant from any known tin occurrences than elsewhere. Hence a tin source within the precambrian rocks near Elliott Bay is suggested. This source would possibly be within a radius of 30-50km and most likely to the East and North East of Elliott Bay.

No granites are known in this region, but there may be unexposed granites within the Precambrian (c.f. Renison Bell) with which the tin is associated. A dome structure may occur over this granite and be detectable by geological mapping, but the existing Mines dept. 1:250 000 map is insufficiently detailed to show such a structure.

The type of source is pure speculation but by analogy with N.W. Tasmania either quartz-cassiterite or cassiterite-sulphide mineralization might occur in this region.

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Grade and Tonnage of the Pebble Deposits

Analyses results from the auger drilling programme are presented in Appendix 3. Although serious sampling errors have been demonstrated (see the section on drilling, this report) the grades are so dismally low that despite any sampling errors the deposit is unlikely to be economic.

The total area of pebble deposits revealed by the mapping is some 3 square kilometers, with thicknesses exceeding 17m in places but probably averaging 6m. A total volume of some 18 million cubic metres is estimated, with an estimated grade in the vicinity of 1ppm Sn as cassiterite. As this is some 2 to 3 orders of magnitude from being economic no reserves estimate has been attempted.

Reference

Dunlop A.C., Meyer W.T.

Detrital Tin patterns in stream sediments and soils
in Mid-Cornwall

Journal of Geochemical Exploration V10 No. 3 Dec. 1978.

APPENDICES

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APPENDIX 1

Elliott Bay Tin Project

Field Notes

Jan 1977

Introduction

At the beginning of this work, David Jennings from the Mines dept., Tasmania accompanied us for the first week and we are indebted to him for his assistance with the initial work of explaining the anomalies found in the 1977 stream sediment survey.

He also arranged for detailed analyses, including size fractionation, of 8 samples collected during this work.

Further work by Geopeko personel was carried out in the following weeks in order to complete the investigation of the tin anomalies.

NOTES

Samples panned from the south flowing stream at 383900E 5241400N show a reasonable content of black heavy minerals but they are less dense than cassiterite should be. Concentrates from several places upstream of this point in this creek were bulked together as "Bulk sample 1" (mines dept designation), KS2863 (Geopeko designation). A few specks of gold were seen in these concentrates. The gold was still quite angular and had not been transported far, but the other heavies were very fine grained and had probably been transported a long way. Further upstream a small tributary at 383500E 5243300N gave high tin values in the 1977 stream sediment survey.

Several pan samples from this creek gave dissappointing results. There seem to be plenty of dark, moderately dense minerals present but no cassiterite. No gold was seen in the concentrates from this creek, which were called "Bulk sample 2" (Mines dept. designation). Insufficient sample was collected to enable duplicate analysis by Geopeko.

Well rounded pebbles were common in this stream and to investigate their source a hole 40cms deep was dug on the hilltop to the NE of this stream. This penetrated quartzose sands and well rounded pebbles in an ancient beach/river valley deposit. Panning this material showed it to have an exceedingly low content of heavy minerals, which are however similar in type and grain size to the concentrates from the nearby creeks. These pebble deposits could therefore have sourced the observed concentrates.

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Two other nearby creeks in which Sn anomalies were also found, both drain this area of pebble deposits. These pebble beds form flat topped hills, and at least 4 different levels were observed. Bedrock outcrop occurs occasionally, and milky quartz veins outcrop commonly in the whole area.

High Sn values in the 1977 stream sediment survey were also obtained in the creek at 385 500E 5242 800N. This creek again drains an area of pebble deposits. Again the heavy mineral concentrates in this creek were very fine grained. The concentrates also had a slight mauve colouration and probably contain some zircon or rutile. Bulk sample 3 (Mines dept. designation) was collected from several localities in this creek, and was split and also numbered KS 2864 (Geopeko designation). A very minor amount of fine grained gold was found in this sample. The flat topped hills are well developed here, and at least 3 levels occur with a fourth level which is probably a river cut terrace.

Near 385000E 5241200N there is an unusual conglomerate outcrop which may be remnants of the Owen conglomerate. (A much younger unit than local bedrock) or else a silicified tertiary river/beach deposit.

Walking along the coastal granite outcrop to the SE of the mouth of Low Rocky River, the granite is fairly monotonous. Away from the contact zone there are rare cobweb structures which result from tectonic movement, rare xenoliths and rare barren quartz veins. The granite is coarse grained (3-5mm) and biotite bearing. Very rarely the quartz veins are associated with massive chlorite masses, and some massive chlorite occurs in fault zones. No greisen zones were seen, nor is there any greisenization adjacent to the quartz veins. It is a very uniform and unexciting granite, and is not considered to be at all similar to the Sn bearing granites in NE Tasmania.

In the vicinity of 381500E, 5242500N a number of high tin values were obtained in the 1977 stream sediment survey. At 381600E 5242500N the heavy mineral concentrates from the creek were very fine grained, and no gold was seen. This sample was called "Bulk sample 4" (Mines dept. designation) and insufficient sample was available for duplication by Geopeko. To the south of this point concentrates were panned from a west flowing tributary (381 700E 5242 400N). These were much coarser than seen elsewhere, the grains being rounded and faceted and up to 1 or 2mm in diameter. Again they are not thought to be cassiterite. No gold was seen. This was sampled as "Bulk sample 4A" (Mines dept. designation) and insufficient sample was available for Geopeko duplication.

On the west coast, near Pender's prospect concentrates were panned from the junction of 2 creeks at 377 600E, 5242 000N. The % recovery of heavy minerals in these

creeks was quite low, but higher than usual amounts of gold were recovered. (although still quite uneconomic). Rounded pebbles were present in the stream, and they seem to be ubiquitous over the entire western granite although nowhere do they seem to occur as any more than a very sparse and thin surface scree.

At Pender's prospect (377 400E, 5 242 000N) sulphides occur as a band within porphyries. Most sulphide is pyrite with some chalcopyrite and possible pyrrhotite. Much magnetite occurs. Some minor copper staining is present on the rock surfaces.

In order to check for the occurrence of granite derived tin, concentrates were panned from a stream which drained solely the western granite. (location 379 200E 5240200N) The concentrates were still well rounded and fine grained, no coarser materials being present at all. Trace amounts of somewhat rounded gold occurred, and this may have been transported some distance. This sample was called "Bulk sample 6" (Mines dept. designation) and was split and also numbered KS 2865 (Geopeko designation). The amount of heavy minerals in this material was only a very low percentage. Rounded quartz pebbles are common in this creek also.

"Bulk sample 7" (Mines department designation) (no equivalent Geopeko sample) was collected by Colin Strickland and David Jennings in my absence, from the Eastern area near or in the area of Precambrian rocks (probable location 388500E 5242400N). The concentrates were described as being similar to those seen elsewhere (i.e. fine grained) and some rounded pebbles were observed.

In low Rocky River, upstream of the fault contact with the Precambrian two stream sample heavy mineral concentrates were collected on a later visit. Only a very low percentage recovery of fine grained heavy minerals was obtained, and these were fine grained. No rounded pebbles were found in this sediment. This was numbered KD 1008 (389070E, 5241980N).

Just upstream of this sample point, sample KD 1009 was collected from a small tributary at 389090E, 5242000N. This gave a fairly reasonable recovery of heavy minerals which were slightly coarser than usual. No well rounded pebbles of apparent pebble bed origin were seen, and most of the sediment was only subrounded. Micaceous schist and phyllite were quite common, although 90% of the rock fragments were quartzites.

Above the Precambrian fault contact no pebble bed deposits were found and well rounded pebbles were exceptionally rare. Immediately west of the fault scarp, a hole 30cms deep at 388700E 5242600N showed fine white sands and well rounded pebbles. These pebbles seemed slightly darker coloured than those seen in the more westerly pebble deposits, and they seemed to show more obvious relict Precambrian bed-rock texture.

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Pit Profiles

Pit 1 383500E 5243350N
R.L. (top) 91.483m

0 - 0.5m Brown soil with beach pebbles becoming common downwards and becoming a white pebbly sand at .5m. Sample KS 2851

0.5 - 1.0m Pebble horizon of sand and rounded pebbles. pebbles are up to 3cm diameter and are not cemented. Sample KS 2852.

1.0 - 1.5m Pebble horizon as above with a 10cm thick very clean layer containing only coarse pebbles at 1.25m. Sample KS 2853.

1.5 - 2.0m Pebble horizon as above. Sample KS 2854.

2.0 - 2.7m Pebble horizon as above. Sample KS 2855.

Bottom.

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Pit 2 383570E 5242790N
R.L. (top) 82.214m

- 0. - 0.3m Brown soil with pebbles
- 0.3 - 0.5m unsorted quartz sand and pebble horizon with rounded pebbles up to 5cms. Some angular quartz fragments. Sample KS 2856
- 0.5 - 1.0m As above. Sample KS 2857.
- 1.0 - 1.5m As above with frequent angular quartz vein fragments in the interval 1.4 to 1.5m. Sample KS 2858
- 1.5 - 1.7m As above. Sample KS 2859.
- 1.7 - 1.9m "basal conglomerate" of brown organic pebbly material. Sample KS 2860.
- 1.9 - 2.3m Fine grained organic (?) rich silts, almost vertical "bedding" of the organic rich layers. Fairly massive, very hard to dig, clayey and shows possible jointing. Almost certainly C horizon of the bedrock. Sample KS 2861.

Bottom.

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- Pit 3 384000E 5241400N
- 0 - 0.5m Brown soil with pebbles and vein quartz fragments down to 0.3m with a hard partially silicified sandy pebble bed below. This contains unsorted materials ranging from fine sand to 5cm well rounded pebbles. Sample KS 2871.
- 0.5 - 1.0m Unsorted sands and rounded pebbles ranging from fine sand to 5cm diameter pebbles. The sand is angular and the larger pebbles are well rounded while intermediate sized materials are of variable degree of rounding, ranging up to sub-angular (none are angular). Sample KS 2872
- 1.0 - 1.5m As above
Sample KS 2873.
- 1.5m - 2.0m Unsorted sandy pebble materials with a higher percentage of coarse materials than the above interval. The lower contact of this horizon is quite irregular.
Sample KS 2874.
Sample KS 2875 was collected at 2.0m, being the basal layer of this coarse horizon.
- 2.0 - 2.5m Well sorted fine sand with lateral facies changes to brown, organic, clayey silts. Highly irregular contact.
Sample KS 2876.
- 2.5 - 3.0m As above.
Sample KS 2877.
- 3.0 - 3.1m As above with some coarse pebbles which are rounded. Poorly sorted.
Sample KS 2878.
- Bottom.

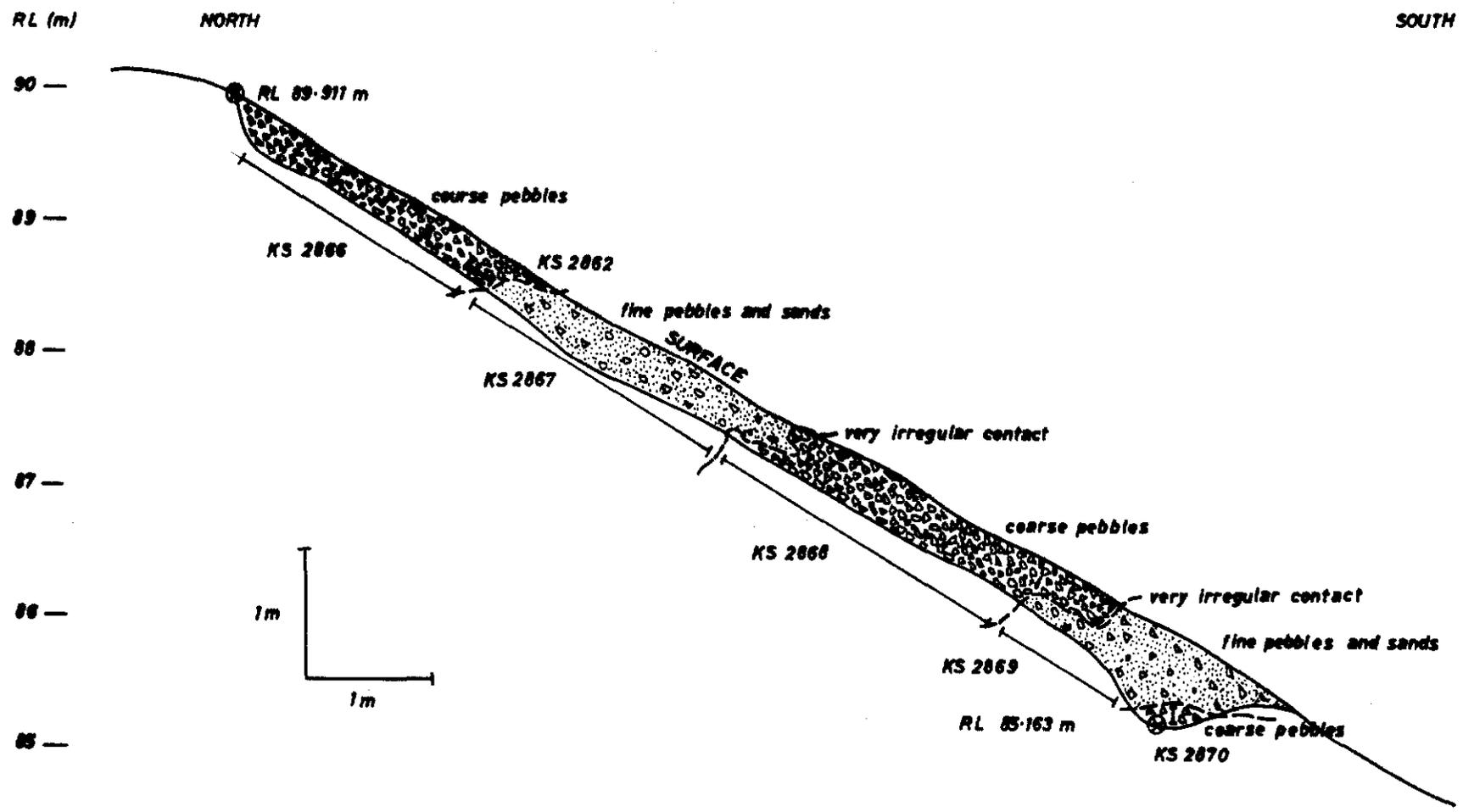


FIG1 ELLIOT BAY TIN PROJECT TASMANIA
TRENCH 2 DIAGRAMMATIC SECTION (viewed facing east)
 (length and slope estimated) natural scale

Trench Profiles.

Three trenches were dug by hand on the sides of hills in order to see a complete cross section of the pebble horizon right down to the bedrock contact. Because of the thickness of the deposits it was not possible to see such a complete cross section in the pits alone.

Trench 1. 383560E 5243340N
R.L. (top) 88.560m
 (bottom) 82.338m

This trench was in the C horizon of the bedrock at all points. Even the upper white leached horizon is weathered bedrock which shows a porphyritic texture. This intensely leached upper horizon is about 30cms thick, below which are dark brown clayey materials showing the same porphyritic texture. Small porphyritic bipyramidal quartz crystals occur. At the upper end of the trench a thin crosscutting quartz vein was observed.

As the pebble horizon does not occur in this trench no section diagram has been prepared, and no samples were collected.

Trench 2 383350E 5243440N
R.L. (top) 89.911m
 (bottom) 85.163m

This trench was in pebble material all the way. Three layers of coarse pebbles and two layers of fine sandy materials were recognised, but the contacts between them were often highly irregular and it is not therefore expected that the stratification observed would be at all consistent throughout the pebble deposits.

Samples KS 2862 and KS 2866 to KS 2870 were collected from this trench.

A diagrammatic section of this trench is shown in Fig. 1.

Trench 3 383570E 5242790N
R.L. (top) 80.324m
 (bottom) 73.922m

This trench was in the C horizon of weathered volcanic bedrock all the way and it did not intersect any pebble materials at all. The RL at the top of the trench, is within 10cms of the RL of the bedrock contact (80.314m) in the nearby Pit 2, some 5 to 10m away.

As this trench did not intersect any pebble materials no samples were collected and no section has been prepared.

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APPENDIX 2

ELLIOTT BAY TIN PROJECT VOYAGER 8

Auger hole logs
January 1978.

Hole 1 383500E 5243350N
R.L. 91.483m

		0. - .5m	Soil					
		.5 - 2m	Rounded pebbles and white sands					
KS 2801		2 - 3.5m	"	"	"	"	"	"
2802	3.5	- 5m	"	"	"	"	"	"
2803	5	- 6m	Cream sands with rare rounded pebbles.					

End of hole - rods jamming in hole.

Hole 2 383500E 5243350N
R.L. 91.483m

		0 - 5m	Soil					
		.5 - 1m	Rounded pebbles and white sands					
KS 2084		1 - 3m	"	"	"	"	"	"
2805		3 - 4.5m	"	"	"	"	"	"
2806	4.5	- 6.5m	"	"	"	"	"	"
2807	6.5	- 8m	"	"	"	"	"	"
2803	8	- 9.5m	"	"	"	"	"	"

End of hole - too hard to drill.

Hole 3 383500E 5243350N
R.L. 91.483m

		0 - .5m	Soil					
		.5 - 1m	Rounded pebbles and white sands					
KS 2809		1 - 3m	"	"	"	"	"	"
2810		3 - 6.5m	"	"	"	"	"	"
2811	6.5	- 8.5m	"	"	"	"	"	"
2812	8.5	- 9.5m	"	"	"	"	"	"

End of hole - too hard to drill - possible clay at bottom.

Hole 4 383350E 5243440N
R.L. 90.415m (collar)

KS 2813		0m - 3m	Soil becoming rounded pebbles and white sands at .5m.					
		3m - 5m	Rounded pebbles and white sands					
2815	5	- 8.5m	"	"	"	"	"	"
2816	8.5	- 11m	"	"	"	"	"	"
2817	11	- 14m	"	"	"	"	"	"

End of hole - Poor sample return - lower section very wet, probably in coarse sands.

Hole 5 383570E 5242790N

KS 2818		0 - 2m	Soil and white sandy pebbles					
2819		2 - 3.5m	Pebbles and white sands					
2820	3.5	- 5m	Brown fine silts with sands.					
2821	5	- 6.5m	"	"	"	"	"	"
2822	6.5	- 8m	"	"	"	"	"	"

End of hole - Too hard, poor return.

029

Hole 6 383420E 5243580N
R.L. 100.000m - Datum level (collar)

- 0 - 1m Soil becoming white sands and pebbles.
- KS 2823 1 - 3.5m Pebbles and white sands
- 2824 3.5 - 5m Medium grained white sands, rare pebbles.
- 2825 5 - 8m Medium grained white sands, rare pebbles.
- 2826 8 - 9.5m Medium grained white sands, rare pebbles.
- 2827 9.5 - 12.5m Medium grained white sands, rare pebbles.
- 2828 12.5 - 14m Medium grained white sands, rare pebbles.

End of hole - Poor return.

Hole 7 384000E 5241400N

- KS 2829 0 - 2.5m Black soil becoming white pebbly sand at 0.5m becoming darker coloured near 2.5m.
- 2830 2.5 - 4m Assorted brown and yellow clays and sandy clays with some pebbles.
- 2831 4 - 5.5m Brown clayey sands with some pebbles.
- 2832 5.5 - 7m Dark brown clays with sands.

End of hole. - target depth.

Hole 8 383500E 5243350N

R.L. 91.483m

- KS 2833 0 - .5m Soil and cream pebble sands.
- 2834 .5 - 2m Pebbles passing into fine sand horizon. at 1.5m. This fine sand horizon was not intersected in the pit 3m away!
- 2835 2 - 3.5m Fine white sands becoming cream coloured at 3m then white again.

End of hole - target depth.

Hole 9 383500E 5243350N

R.L. 91.483m

- KS 2836 0 - .5m Soil and fine white sands.
- 2837 .5 - 2m White sands and pebbles.
- 2838 2 - 3.5m White unsorted medium - fine grained sands.

End of hole - target depth.

Hole 10 383500E 5243350N

R.L. 91.483m

- KS 2839 0 - .5m Soil and cream pebbly sands.
- 2840 .5 - 2m White pebbly sands becoming white fine sands.
- 2841 2 - 3.5m White pebbly sands.

End of hole - target depth.

030

Hole 11 383550E 5243770N
 KS 2842 0 - .5m Soil and pebbles.
 2843 .5 - 2m White pebbly sands becoming white fine sands. Hard layer at 1.0m.
 2844 2 - 3.5m Damp, white, unsorted coarse sand becoming brown and clayey sand with very well rounded quartz grains.
 2845 3.5 - 5m Brown clayey coarse sand with well rounded grains. Very wet.
 2846 5 - 5.5m As above becoming much harder at 5.5m.
 End of hole - Too hard to drill - very wet - probably C horizon.

Hole 12 383060E 5243480N
 KS 2847 0 - .5m Soil and white sands
 2848 .5 - 2m Coarse pebbles becoming white medium grained sands.
 2849 2 - 3.5m White pebbly medium grained sands.
 2850 3.5 - 5m White fine sand with many very coarse (1cm) rounded pebbles.
 KS 3001 5 - 6.5m White fine sand becoming grey with significant content of very fine grained dark material.
 3002 6.5 - 8m White and cream fine sands, still with same minor fine grained dark mineral content becoming pebbly at base.
 3003 8 - 9.5m white fine sands with pebbles. Still has a minor fine grained dark mineral content.
 3004 9.5 - 11m White pebbly sands.
 3005 11 - 12.5m White and brown pebbly sands.
 End of hole - no return.

Hole 13 382840E 5243480N
 KS 3006 0 - .5m Soil and fine white sands
 3007 .5 - 2m White sands with occasional pebbles.
 3008 2 - 3.5m White pebbly sands becoming grey.
 3009 3.5 - 5m White fine sand, occasional pebbles.
 3010 5 - 6.5m Pebbly white sand.
 3011 6.5 - 8m White pebbly sand with coarser layer at 7.5m.
 3012 8 - 9.5m White pebbly sands.
 3013 9.5 - 11m " " "
 3014 11 - 12.5m " " "
 3015 12.5 - 14m " " "
 3016 14 - 15.5m " " "
 3017 15.5 - 17m " " "
 End of hole - Bad Return - WET.

Hole 14 382960E 5243180N
 Ks 3018 0 - .5m Soil and pebbly sands
 3019 .5 - 2m Very fine white sand, even grained, rare pebbles, possibly windblown
 3020 2 - 3.5m As above
 3021 3.5 - 5m As above
 3022 5 - 6.5m White fine sand with some coarser particles.
 3023 6.5 - 8m Pebbly white sand.
 3024 8 - 9.5m Fine white sand.
 3025 9.5 - 11m Fine white sand with pebbles.
 End of hole - Poor sample return - slow progress.

031

Hole 15 383290E 5243170N
 KS 3026 0 - .5m Soil and pebbly white sands
 3027 .5 - 2m White fine sands
 3028 2 - 3.5m Cream fine sands becoming white fine
 sands - minor very fine grained dark
 minerals.
 3029 3.5 - 5m White fine sands with very fine dark
 mineral (0.5%)
 3030 5 - 6.5m Fine white sands, trace of very fine
 dark materials. Some pebbles at 6m.
 3031 6.5 - 7.5m White fine sands with pebbles.
 End of Hole - Rock - too hard to drill.

Hole 16 383130E 5242910N
 KS 3032 0 - .5m Soil and pebbles.
 End of hole - weathered volcanic bedrock - Basement.

Hole 17 383060E 5242500N
 KS 3033 0 - .5m Soil and pebbly white sands.
 3034 .5 - 2m White sand with rounded coarse pebbles
 3035 2 - 3.5m White pebbly sand with many coarse
 (2cm) rounded pebbles. Finer grained
 particles are angular.
 3036 3.5 - 5m White sands with frequent coarse
 (2-3cm) rounded pebbles.
 3037 5 - 6.5m White sands with very frequent very
 coarse rounded pebbles.
 3038 6.5 - 8m As above
 3039 8 - 9.5m As above
 3040 9.5 - 11m Cream sands and pebbles (Bad sample)
 End of Hole - No Return - hard to drill.

Hole 18 383300E 5242440N
 KS 3041 0 - .5m Soil and white fine sands with
 medium sized pebbles.
 3042 .5 - 2m Medium/Coarse rounded pebbles with
 white sand.
 3043 2 - 3.5m As above
 3044 3.5 - 5m As above
 3045 5 - 6.5m As above
 3046 6.5 - 8m As above
 End of hole - poor return - Possible weathered bedrock
 clays in bottom of hole.

Hole 19 380870E 5242920N
 KS 3047 0 - .5m Soil and pebbly sand
 3048 .5 - 2m Very wet brown clay with quartz
 fragments and small pebbles.
 3049 2 - 3.5m Very wet brown sandy clays with
 possible bedrock fragments.
 3050 3.5 - 5m Very wet brown sandy clays, quartz
 generally angular. Possible bedrock
 fragments, trace mica.
 End of hole - Too wet - possible bedrock.

Hole 20 381500E 5242985N
 KS 2951 0 - .5m Soil and pebbles.
 2952 .5 - 2m White fine sands becoming brown
 clayey wet fine sands.
 2953 2 - 3.5m Brown clayey fine sands. Very wet.
 End of Hole - No return - Pyritic sands at bottom.

032

Hole 21 382000E 5242600N
 KS 2954 0 - 0.5m Soil and white pebbly sand.
 2955 0.5 - 2.0m Pebbly white sand becoming white very fine (dune?) sand.
 2956 2.0 - 3.5m White very fine (dune?) sands.
 2957 3.5 - 5.0m White fine sands becoming brown clayey medium grained sands with rounded grains.

End of Hole 8m - No Return - Rods jammed - one rod lost in hole - joint sheared off.

Hole 22 382250E 5241960N
 KS 2958 0 - 0.5m Soil becoming volcanic derived clays no pebble horizon.

End of hole - Bedrock.

Hole 23 382680E 5242430N
 KS 2959 0 - 0.5m Soil and pebbles.
 2960 0.5 - 2.0m White pebbly sand becoming white fine sand.
 2961 2.0 - 3.5m Medium to fine white sands (.2 - 2mm)
 2962 3.5 - 5.0m As above with some pebbles to 1cm.
 2963 5.0 - 6.5m " " " " " " "
 2964 6.5 - 8.0m Sand as above becoming brown clayey sand with well rounded grains (.2-2mm).
 2965 8.0 - 9.5m Brown clayey sands (.2 - 2mm) with rounded grains.
 2966 9.5 - 11.0m As above, damp.
 2967 11.0 - 12.5m As above "
 2968 12.5 - 14.0m As above, very wet.

End of hole - Poor return - very wet.

Hole 24 382630E 5243050N
 KS 2969 0 - 0.5m Soil and pebbly white sand.
 2970 0.5 - 2.0m Pebbly white sand with rounded pebbles to 2cm.
 2971 2.0 - 3.5m White fine sand (dune?), even grained
 2972 3.5 - 5.0m White fine sand slightly less even grained than above.
 2973 5.0 - 6.5m White medium grained sand (less well sorted) becoming brown. Thin black band, returning to dark brown medium grained sand with rounded grains (.2 - 2mm).
 2974 6.5 - 8.0m Grey clayey pebble sand, pebbles to 1cm.

End of hole 9m - No return.

Hole 25 383460E 5242230N
 KS 2975 0 - 0.5m Soil and pebbly white sands.
 2976 0.5 - 2.0m Pebbly white sands - high fines content - pebbles to 1.5cm, rounded pebbles.
 2977 2.0 - 3.5m As above.
 2978 3.5 - 5.0m Coarse pebbly white sands - pebbles to 2cm.
 2979 5.0 - 6.5m As above.
 2980 6.5 - 7.5m As above.

End of Hole - Rock.

033

Hole 26 384310E 5242080N
 KS 2981 0 - 0.5m Soil and white pebbly sands
 2982 0.5 - 2.0m White fine (dune?) sand, well sorted
 even grained.
 2983 2.0 - 3.5m White pebbly sand (.2 - 5mm),
 possibly high fines content.
 2984 3.5 - 5.0m White sand becoming yellow (.2 - 5mm)
 2985 5.0 - 6.5m Yellow sand (.2 - 5mm).
 2986 6.5 - 8.0m Yellow sand, slightly coarser than
 above, more clayey.
 2987 8.0 - 9.5m As above.
 End of hole - poor return.

Hole 27 385070E 5242170N
 KS 2988 0 - 0.5m Soil and pebbly sands.
 2989 0.5 - 2.0m White sandy pebbles becoming brown
 volcanic derived clays at 1.5m.
 End of hole - Bedrock.

Hole 28 385310E 5242150N
 KS 2990 0 - 0.5m White pebbly sands, med grained
 (.2 - 2mm).
 2991 0.5 - 2.0m White pebbly sands (.2 - 2mm) with
 some pebbles to 2cm.
 2992 2.0 - 3.5m Very white pebbly sands (.2 - 2mm),
 pebbles well rounded.
 2993 3.5 - 5.0m As above.
 2994 5.0 - 6.5m As above becoming brown clayey pebbly
 sands.
 2995 6.5 - 8.0m Brown clayey pebbly sands.
 End of hole 9.5m - No return - very wet.

Hole 29 385350E 5242310N
 KS 2996 0 - 0.5m White pebbly sands.
 2997 0.5 - 2.0m White, medium grained sands with
 some pebbles.
 2998 2.0 - 3.5m White medium grained sands, pebbles
 to 2cm, becoming damp.
 2999 3.5 - 5.0m As above becoming brown clayey,
 very wet.
 3000 5.0 - 6.5m Brown very wet sand.
 End of hole - No return - very wet.

Hole 30 385390E 5242820N
 KS 3051 0 - 0.5m White pebbly sand.
 3052 0.5 - 2.0m White sand, .2 - 2mm, with rounded
 pebbles to 2cm.
 3053 2.0 - 3.5m As above becoming damp, with rare
 larger (.5mm) dark grains.
 3054 3.5 - 5.0m Damp white sand becoming brown then
 dark brown clayey wet sand, rounded
 pebbles to 2cm.
 End of hole 6.5m - No return - very wet.

APPENDIX 3

Analyses Results.

All samples were weighed and manually panned to give a heavy mineral concentrate which was sent away for analysis at ACS laboratories, Adelaide.

Weights and grades have been used to recalculate the grade of the starting material.

Samples were analysed by XRF except when there was insufficient material and they were then analysed by emission spectroscopy (marked with an asterisk in the tabulation).

Abbreviations

- G Greater than
- L less than
- A Approximately
- * Analysis by emission spectroscopy
- NA Not analysed (or not weighed)
- IS insufficient sample.

164037 036

Stream Sediment Sample Number	AMG Co-ordinates.		Location
	East	North	
KD 1001	383940	5241420	Stream Sample 1 Light sub fraction
1002	"	"	" Sample 1 heavy sub fraction.
1003	"	"	" Sample 2 heaviest sub fraction.
1004	"	"	" " 2 heavy sub fraction.
1005	"	"	" " 2 light " "
1006	"	"	" " 2 lightest sub fraction.
1007	388400	5240700	"Precambrian"Creek.
1008	389070	5241980	Low Rocky River in Precambrian
1009	389090	5242000	"Precambrian" Creek.
1010	385000	5241000	Mouth of Low Rocky River
1011	381600	5242320	Western Granite
1012	381350	5241250	" "
1013	381390	5240900	" "
1014	380780	5241000	" "
1015	380570	5241560	" "
1016	379980	5241630	" "
1017	379680	5241260	" "
1018	379580	5241210	" "
1019	379230	5240100	" "
1020	378660	5240410	" "
1021	378980	5241320	" "
KD 1003-1006	383940	5241420	Combined total of fractions

Init Wt. (Wet) Kg.	Final Wt. (Dry) grams.	% Recovery	% Sn in heavies	ppm Sn in Source material
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7.7	39.68	G 0.515	0.05	G 2.58
7.7	2.10	G 0.0273	G 1*	-
197.5	16.10	G 0.00815	4.81	G 3.92
197.5	26.89	G 0.0136	0.12	G 0.163
197.5	472.35	G 0.239	0.43	G 10.3
197.5	380.51	G 0.193	0.0084	G 0.162
A 8	1.24	A 0.0155	.1*	A 0.155
A 8	3.88	A 0.0485	0.25	A 1.21
A10	3.40	A 0.034	3.43	A 11.7
49.8	323.40	G 0.649	0.71	G 46.1
31	137.6	G 0.443	0.071	G 3.1
32.7	17.44	G 0.053	0.068	G 0.36
31.3	42.36	G 0.135	0.038	G 0.51
28.85	9.77	G 0.034	0.11	G 0.37
29.7	17.82	G 0.060	0.023	G 0.14
31.5	12.29	G 0.039	0.090	G 0.35
27.6	37.70	G 0.137	0.058	G 0.79
28.2	11.68	G 0.041	0.046	G 0.19
37.2	60.86	G 0.164	0.170	G 2.78
25.4	8.85	G 0.035	0.073	G 0.25
31.4	25.91	G 0.083	0.089	G 0.73
197.5	895.85	G 0.454	0.32	14.5

164038

Sample No.	AMG Co-ords		Description.
	East	North	
KS 2801	383500	5243350	Hole 1, pit 1, 2 - 3.5m
2802	"	"	" " " " 3.5 - 5m.
2803	"	"	" " " " 5 - 6m
2804	"	"	Hole 2, Pit 1, 1 - 3m
2805	"	"	" " " " 3 - 4.5m
2806	"	"	" " " " 4.5 - 6.5m
2807	"	"	" " " " 6.5 - 8m
2808	"	"	" " " " 8 - 9.5m
2809	"	"	Hole 3, Pit 1, 1 - 3m
2810	"	"	" " " " 3 - 6.5m
2811	"	"	" " " " 6.5 - 8.5m
2812	"	"	" " " " 8.5 - 9.5m
2813	383350	5243440	Hole 4, Trench 2 0 - 3m
2814	"	"	" " " " 3 - 5m
2815	"	"	" " " " 5 - 8.5m
2816	"	"	" " " " 8.5 - 11m
2817	"	"	" " " " 11 - 14m
2818	383570	5242790	Hole 5, Pit 2 0 - 2m
2819	"	"	" " " " 2 - 3.5m
2820	"	"	" " " " 3.5 - 5m
2821	"	"	" " " " 5 - 6.5m
2822	"	"	" " " " 6.5 - 8m
2823	383420	5243580	Hole 6 1 - 3.5m
2824	"	"	" " " " 3.5 - 5m
2825	"	"	" " " " 5 - 8m
2826	"	"	" " " " 8 - 9.5m

Init Wt. Kg (Dry)	Final Wt. gms (Dry)	% recovery	% Sn in heavies	ppm Sn in source material
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6.5	1.25	0.0192	0.03*	0.0577
8.3	0.60	0.00723	0.03*	0.0217
9.3	1.18	0.0127	0.03*	0.0381
7.0	1.56	0.0223	0.5*	1.11
7.5	0.60	0.008	0.03*	0.024
10.0	1.69	0.0169	0.01*	0.0169
10.25	0.72	0.00702	0.1*	0.0702
7.5	0.42	0.0056	0.03*	0.0168
9.0	5.05	0.0561	0.05	0.281
13.0	0.83	0.00638	0.02*	0.0128
10.75	0.65	0.00605	0.005*	0.00302
7.5	0.66	0.0088	0.005*	0.0044
9.0	1.05	0.0117	0.1*	0.117
7.75	4.14	0.0534	0.1*	0.534
8.5	2.32	0.0273	0.1	0.273
7.9	7.80	0.0987	0.05	0.494
5.1	2.30	0.0451	0.1*	0.451
8.5	10.23	0.120	0.17	2.05
8.0	1.64	0.0205	0.03*	0.0615
9.0	1.38	0.0153	0.2*	0.307
8.0	2.04	0.0255	0.02	0.0510
11.5	8.73	0.0759	0.0066	0.0501
11.9	43.96	0.369	0.64	23.6
9.0	82.29	0.914	0.63	57.6
13.5	32.51	0.241	0.49	11.8
7.5	28.76	0.383	0.48	18.4

164040

164041

040

37

Sample No.	AMG Co-ords.		Description	Description
	East	North		
KS 2827	383420	5243580	Hole 6	9.5 - 12.5m
2828	"	"	" "	12.5 - 14m
2829	384000	5241400	Hole 7 Pit 3	0.0 - 2.5m
2830	"	"	" " " "	2.5 - 4.0m
2831	"	"	" " " "	4 - 5.5m
2832	"	"	" " " "	5.5 - 7.0m
2833	383500	5243350	Hole 8 Pit 1	0.0 - .5m
2834	"	"	" " " "	.5 - 2.0m
2835	"	"	" " " "	2.0 - 3.5m
2836	"	"	Hole 9 " "	0.0 - .5m
2837	"	"	" " " "	.5 - 2.0m
2838	"	"	" " " "	2.0 - 3.5m
2839	"	"	Hole 10 " "	.0 - .5m
2840	"	"	" " " "	.5 - 2.0m
2841	"	"	" " " "	2.0 - 3.5m
2842	383550	5243770	Hole 11	0 - 0.5m
2843	"	"	" "	0.5 - 2.0m
2844	"	"	" "	2.0 - 3.5m
2845	"	"	" "	3.5 - 5.0m
2846	"	"	" "	5.0 - 5.5m
2847	383060	5243480	Hole 12	0 - 0.5m
2848	"	"	" "	0.5 - 2.0m
2849	"	"	" "	2.0 - 3.5m
2850	"	"	" "	3.5 - 5.0m

164042

Init Wt. (Dry) kg.	Final Wt. (Dry) grams.	% Recovery	% Sn in heavies	ppm Sn in Source material
4.9	17.76	0.362	0.62	22.5
9.2	24.14	0.262	0.56	14.7
9.25	0.50	0.00541	0.1*	0.0541
6.85	1.47	0.0215	0.2*	0.429
6.0	1.05	0.0175	0.5*	0.875
13.95	2.36	0.0169	0.5*	0.846
1.7	1.35	0.0794	0.85	6.75
6.9	2.12	0.0307	2.05	6.299
8.9	2.09	0.0234	0.42	0.986
2.2	4.09	0.1860	1.59	29.560
11.8	10.04	0.085	0.96	8.168
8.1	1.84	0.0227	0.5000*	1.136
1.7	0.45	0.0265	0.5*	1.323
11.6	0.77	0.0066	0.46	0.305
12.1	0.60	0.0049	0.2*	0.099
1.2	0.60	0.05	0.3*	1.5
11.0	1.09	0.0093	0.02	0.019
8.2	4.15	0.0506	0.13	0.658
7.7	4.46	0.0579	0.36	2.085
17.7	20.75	0.1172	0.14	1.641
1.9	3.21	0.1689	0.37	6.251
10.7	2.84	0.0265	0.20	0.530
11.1	1.52	0.0137	0.17	0.232
9.1	26.56	0.2919	0.45	13.134

Sample No.	AMG Co-ordinates		Description		
	East	North			
KS 3001	383060	5243480	Hole 12	5.0	- 6.5m
3002	"	"	" "	6.5	- 8.0m
3003	"	"	" "	8.0	- 9.5m
3004	"	"	" "	9.5	- 11.0m
3005	"	"	" "	11.0	- 12.5m
3006	382840	5243480	Hole 13	0	- 0.5m
3007	"	"	" "	0.5	- 2.0m
3008	"	"	" "	2.0	- 3.5m
3009	"	"	" "	3.5	- 5.0m
3010	"	"	" "	5.0	- 6.5m
3011	"	"	" "	6.5	- 8.0m
3012	"	"	" "	8.0	- 9.5m
3013	"	"	" "	9.5	- 11.0m
3014	"	"	" "	11.0	- 12.5m
3015	"	"	" "	12.5	- 14.0m
3016	"	"	" "	14.0	- 15.5m
3017	"	"	" "	15.5	- 17.0m
3018	382960	5243180	Hole 14	0	- 0.5m
3019	"	"	" "	0.5	- 2.0m
3020	"	"	" "	2.0	- 3.5m
3021	"	"	" "	3.5	- 5.0m
3022	"	"	" "	5.0	- 6.5m
3023	"	"	" "	6.5	- 8.0m
3024	"	"	" "	8.0	- 9.5m
3025	"	"	" "	9.5	- 11.0m
3026	383290	5243170	Hole 15	0	- 0.5m
3027	"	"	" "	0.5	- 2.0m
3028	"	"	" "	2.0	- 3.5m
3029	"	"	" "	3.5	- 5.0m

164044

Init Wt. (Dry) Kg.	Final Wt. (Dry) grams.	% Recovery	% Sn in heavies	ppm Sn in Source material
7.6	102.10	1.3434	0.55	73.888
15.9	73.31	0.4610	0.67	35.041
11.7	46.65	0.3987	0.56	22.328
7.1	25.95	0.3655	0.55	20.102
12.2	24.40	0.2	0.60	12.0
2.2	0.44	0.02	0.03*	0.06
9.15	2.32	0.0253	0.25	0.634
8.7	13.04	0.1499	0.23	3.447
7.8	17.00	0.2179	0.33	7.192
14.4	8.57	0.0595	0.41	2.440
12.5	15.68	0.1254	0.24	3.010
8.9	12.18	0.1369	0.29	3.969
8.75	16.90	0.1931	0.24	4.635
14.3	24.49	0.1713	0.22	3.768
9.65	13.66	0.1415	0.22	3.114
10.1	10.61	0.1050	0.045	0.4727
16.95	17.60	0.1038	0.26	2.699
2.5	8.19	0.3276	0.23	7.534
9.7	19.07	0.1966	0.38	7.470
8.45	19.75	0.2337	1.61	37.630
12.2	15.05	0.1234	1.30	16.037
19.95	15.35	0.0769	1.21	9.310
8.5	7.63	0.0898	0.60	5.386
11.45	15.41	0.1346	0.74	9.959
14.2	19.32	0.0136	0.89	12.109
2.4	2.90	0.1208	0.53	6.404
9.8	10.48	0.1069	0.53	5.668
10.5	24.39	0.2323	0.74	17.189
8.5	59.91	0.7048	0.80	56.386

164045

044

39

Sample No.	AMG Co-ordinates				Description
	East	North			
KS 3030	383290	5243170	Hole	15	5.0 - 6.5m
3031	"	"	"	"	6.5 - 7.5m
3032	383130	5242910	Hole	16	0 - 0.5m
3033	383060	5242500	Hole	17	0 - 0.5m
3034	"	"	"	"	0.5 - 2.0m
3035	"	"	"	"	2.0 - 3.5m
3036	"	"	"	"	3.5 - 5.0m
3037	"	"	"	"	5.0 - 6.5m
3038	"	"	"	"	6.5 - 8.0m
3039	"	"	"	"	8.0 - 9.5m
3040	"	"	"	"	9.5 - 11.0m
3041	383300	5242440	Hole	18	0 - 0.5m
3042	"	"	"	"	0.5 - 2.0m
3043	"	"	"	"	2.0 - 3.5m
3044	"	"	"	"	3.5 - 5.0m
3045	"	"	"	"	5.0 - 6.5m
3046	"	"	"	"	6.5 - 8.0m
3047	380870	5242920	Hole	19	0 - 0.5m
3048	"	"	"	"	0.5 - 2.0m
3049	"	"	"	"	2.0 - 3.5m
3050	"	"	"	"	3.5 - 5.0m
2951	381500	5242985	Hole	20	0 - 0.5m
2952	"	"	"	"	0.5 - 2.0m
2953	"	"	"	"	2.0 - 3.5m
2954	382000	5242600	Hole	21	0 - 0.5m
2955	"	"	"	"	0.5 - 2.0m
2956	"	"	"	"	2.0 - 3.5m
2957	"	"	"	"	3.5 - 5.0m
2958	382250	5241960	Hole	22	0 - 0.5m

164046

Init Wt. (Dry) Kg.	Final Wt (Dry) grams.	% Recovery	% Sn in heavies	ppm Sn in Source material
15.5	53.12	0.3427	0.87	29.816
17.35	53.70	0.3095	0.79	24.451
2.3	0.65	0.0282	0.042	0.118
3.4	0.83	0.0244	0.11	0.268
14.0	5.79	0.0414	0.13	0.537
11.3	0.88	0.0077	0.48	0.373
11.5	0.89	0.0077	0.10	0.077
13.3	0.56	0.0042	0.29	0.122
16.1	3.36	0.0209	0.21	0.438
4.9	1.05	0.0214	0.27	0.579
3.8	0.51	0.0134	0.13	0.174
3.1	0.28	0.0090	0.5*	0.452
12.35	1.12	0.0090	0.083	0.075
12.4	2.10	0.0169	0.079	0.134
11.0	0.74	0.0067	0.18	0.121
14.7	1.61	0.0109	0.084	0.092
15.25	11.20	0.0734	0.063	0.463
2.8	0.56	0.02	0.061	0.122
11.3	1.61	0.0142	0.045	0.064
9.3	2.49	0.0268	0.003	0.0080
12.2	2.47	0.0202	0.023	0.047
2.3	5.66	0.2461	0.45	11.074
7.9	88.76	1.1235	0.084	9.438
3.8	17.84	0.4694	0.17	7.981
3.2	0.42	0.0131	0.1*	0.131
10.95	11.3	0.1037	0.21	2.167
6.9	7.86	0.1139	0.053	0.604
6.5	1.16	0.0178	0.2*	0.357
2.3	0.2	0.0087	0.1*	0.087

164047

046

40

Sample No.	AMG Co-ordinates		Description		
	East	North			
KS 2959	382680	5242430	Hole 23	0	- 0.5m
2960	"	"	" "	0.5	- 2.0m
2961	"	"	" "	2.0	- 3.5m
2962	"	"	" "	3.5	- 5.0m
2963	"	"	" "	5.0	- 6.5m
2964	"	"	" "	6.5	- 8.0m
2965	"	"	" "	8.0	- 9.5m
2966	"	"	" "	9.5	- 11.0m
2967	"	"	" "	11.0	- 12.5m
2968	"	"	" "	12.5	- 14.0m
2969	382630	5243050	Hole 24	0	- 0.5m
2970	"	"	" "	0.5	- 2.0m
2971	"	"	" "	2.0	- 3.5m
2972	"	"	" "	3.5	- 5.0m
2973	"	"	" "	5.0	- 6.5m
2974	"	"	" "	6.5	- 8.0m
2975	383460	5242230	Hole 25	0	- 0.5m
2976	"	"	" "	0.5	- 2.0m
2977	"	"	" "	2.0	- 3.5m
2978	"	"	" "	3.5	- 5.0m
2979	"	"	" "	5.0	- 6.5m
2980	"	"	" "	6.5	- 7.5m
2981	384310	5242080	Hole 26	0	- 0.5m
2982	"	"	" "	0.5	- 2.0m
2983	"	"	" "	2.0	- 3.5m
2984	"	"	" "	3.5	- 5.0m
2985	"	"	" "	5.0	- 6.5m
2986	"	"	" "	6.5	- 8.0m
2987	"	"	" "	8.0	- 9.5m

Init Wt. (Dry.) Kg.	Final Wt (Dry) grams.	% Recovery	% Sn in heavies	ppm Sn in Source material
2.4	0.17	0.0070	0.2*	0.142
8.6	1.00	0.0116	0.12	0.139
8.1	0.61	0.0075	0.1*	0.075
9.1	0.59	0.0065	0.1*	0.065
6.4	0.42	0.0066	0.1*	0.066
6.7	1.20	0.0179	0.17	0.304
7.8	1.48	0.0189	0.16	0.316
9.8	0.85	0.0086	0.097	0.084
23.6	0.49	0.0020	0.003*	0.0006
14.4	2.24	0.0155	0.1	0.155
2.2	0.47	0.0214	0.05*	0.107
12.2	1.06	0.0676	0.33	2.231
7.3	8.25	0.1130	0.22	2.486
9.15	4.45	0.0486	0.28	1.361
14.8	31.55	0.2131	0.042	0.895
5.6	6.00	0.1071	0.015	0.161
2.2	1.36	0.0618	0.13	0.804
8.35	0.63	0.0075	0.070	0.053
12.8	0.51	0.0039	0.17	0.068
10.4	IS	-	IS	-
12.4	0.79	0.0063	0.40	0.255
5.7	0.91	0.0159	0.042	0.067
1.5	0.13	0.0086	0.2*	0.173
7.7	1.08	0.0140	0.023	0.032
6.4	0.44	0.0068	0.06	0.041
8.4	0.24	0.0038	0.05*	0.014
7.6	0.71	0.0093	0.0058	0.005
7.0	0.11	0.0016	0.1*	0.016
12.7	0.53	0.0042	0.1	0.041

164048

Sample No.	AMG Co-ordinates		Description	Description	
	East	North			
KS 2988	385070	5242170	Hole 27	0	- 0.5m
2989	"	"	" "	0.5	- 2.0m
2990	385310	5242150	Hole 28	0	- 0.5m
2991	"	"	" "	0.5	- 2.0m
2992	"	"	" "	2.0	- 3.5m
2993	"	"	" "	3.5	- 5.0m
2994	"	"	" "	5.0	- 6.5m
2995	"	"	" "	6.5	- 8.0m
2996	385350	5242310	Hole 29	0	- 0.5m
2997	"	"	" "	0.5	- 2.0m
2998	"	"	" "	2.0	- 3.5m
2999	"	"	" "	3.5	- 5.0m
3000	"	"	" "	5.0	- 6.5m
3051	385390	5242820	Hole 30	0	- 0.5m
3052	"	"	" "	0.5	- 2.0m
3053	"	"	" "	2.0	- 3.5m
3054	"	"	" "	3.5	- 5.0m
3055	385900	5242620	Hole 31	0	- 0.5m
3056	"	"	" "	0.5	- 2.0m
3057	"	"	" "	2.0	- 3.5m
3058	"	"	" "	3.5	- 4.5m
3059	385900	5242340	Hole 32	0	- 0.5m
3060	"	"	" "	0.5	- 2.0m
3061	"	"	" "	2.0	- 3.5m
3062	385750	5241500	Hole 33	0	- 0.5m

164050

Init Wt. (Dry) Kg.	Final Wt (Dry) grams.	% Recovery	% Sn in heavies	ppm Sn in Source material
0.9	0.35	0.0389	G1*	G 0.388
6.0	0.98	0.0163	3.42	5.586
1.7	0.30	0.0176	G1*	G 0.176
6.4	0.45	0.0070	8.62	6.060
11.0	0.92	0.0083	3.44	2.877
8.5	0.93	0.0109	1.18	1.291
14.7	1.60	0.0108	2.85	3.102
2.4	IS	-	IS	-
2.0	0.99	0.0495	0.56	2.772
7.6	1.70	0.0223	2.80	6.263
9.7	1.71	0.0176	2.69	4.742
7.1	1.41	0.0199	3.42	6.791
8.9	0.79	0.0088	3.43	3.044
2.35	0.39	0.0165	1.02	1.693
11.4	0.94	0.0082	2.83	2.333
10.5	1.21	0.0115	2.02	2.328
8.25	1.34	0.0162	1.29	2.095
2.8	0.22	0.0078	G1*	G 0.786
8.5	0.94	0.0110	9.84	10.881
12.2	1.25	0.0102	5.47	5.604
7.7	0.58	0.0075	6.21	4.677
2.9	0.53	0.0182	2.46	4.495
9.8	2.97	0.0303	1.66	5.030
1.9	NA	-	NA	-
2.0	NA	-	NA	-

Sample No.	AMG East	Co-ords North	Description			
KS 2851	383500	5243350	Pit 1	Channel		0 - 0.5m
2852	"	"	" "	"		0.5 - 1.0m
2853	"	"	" "	"		1.0 - 1.5m
2854	"	"	" "	"		1.5 - 2.0m
2855	"	"	" "	"		2.0 - 2.5m
2856	383570	5242790	Pit 2	"		0 - 0.5m
2857	"	"	" "	"		0.5 - 1.0m
2858	"	"	" "	"		1.0 - 1.5m
2859	"	"	" "	"		1.5 - 1.7m
2860	"	"	" "	"		1.7 - 1.9m
2861	"	"	" "	"		1.9 - 2.3m C. Horizon
2862	383350	5243440	Trench 2	Channel Junction	upper	coarse/fine
2863	384000	5242000	Broad Area	"Bulk sample"		1
2864	386000	5242700	Broad Area	"Bulk sample"		3
2865	379250	5240100		"Bulk sample"		6
2866	383350	5243440	Trench 2, channel,		upper	coarse
2867	"	"	" "	"		upper fine
2868	"	"	" "	"		lower coarse
2869	"	"	" "	"		lower fine
2870	"	"	" "	"		bottom coarse
2871	384000	5241400	Pit 3, channel,			0 - 0.5m
2872	"	"	" "	"		0.5 - 1.0m
2873	"	"	" "	"		1.0 - 1.5m
2874	"	"	" "	"		1.5 - 2.0m
2875	"	"	" "	"		at 2m.
2876	"	"	" "	"		2.0 - 2.5m
2877	"	"	" "	"		2.5 - 3.0m
2878	"	"	" "	"		3.0 - 3.1m

164052

051

Init Wt. Kg (Dry)	Final Wt. gms (Dry)	% recovery	% Sn in heavies	ppm Sn in source material
24.5	1.75	.00714	.1*	.0714
29.35	2.81	.00957	.5*	.479
34.55	1.71	.00495	.03*	.0148
32.6	4.92	.0151	.02	.0302
37.2	1.28	.00344	.01*	.00344
33.0	2.01	.00609	.3*	.183
36.05	0.76	.00211	.03*	.00632
36.4	0.92	.00253	.01*	.00253
24.5	1.94	.00792	.03*	.0238
22.35	1.56	.00698	.005*	.00349
20.15	IS	-	IS	-
22.45	1.46	.00650	.2*	.130
NA	NA	-	.78	-
NA	NA	-	3.2	-
NA	NA	-	.32	-
28.05	3.60	.0128	.5*	.642
22.0	2.16	.00982	.03*	.030
62.35	19.57	.0314	.05*	.157
21.4	5.43	.0254	.07	.178
33.7	11.58	.0344	.12	.412
32.0	5.68	.0178	3.16	5.609
33.8	2.84	.0084	1.55	1.302
36.4	.40	.0011	.3*	0.032
36.0	.49	.0013	.03*	.0041
35.7	.32	.0009	.3*	.0268
31.4	3.65	.0116	.68	.7904
29.8	4.29	.0143	1.21	1.741
34.6	1.52	.0044	4.96	2.179

164053

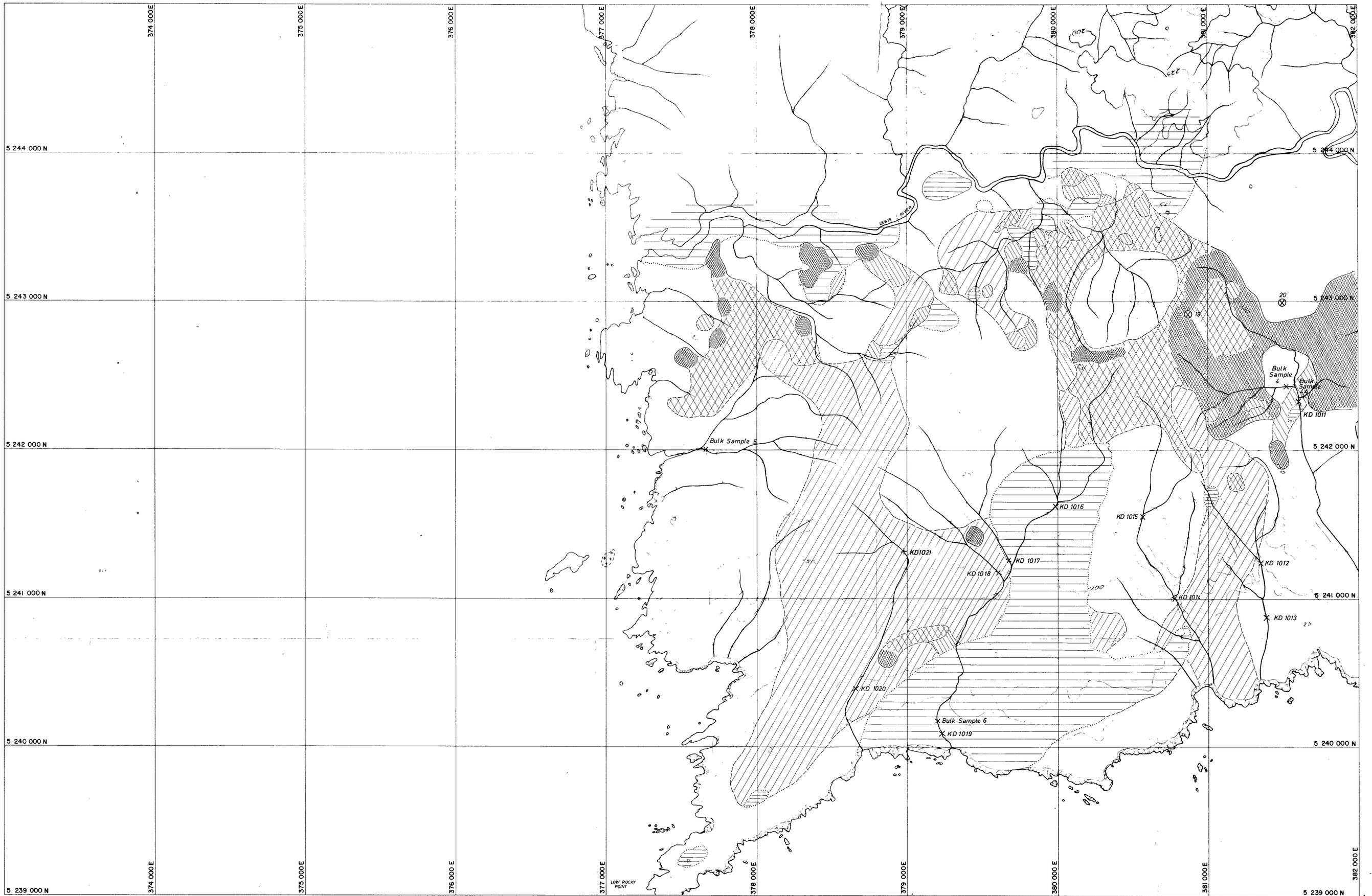
052

43

Sample No.	AMG East	Co-ords North	Description
KS 2879	385000	5241000	Active Dune, Low Rocky River
2880	"	"	Inactive Dune, Low Rocky River
2881	383850	5241200	Beach - conglomeratic soil
2882	"	"	Beach - Inactive dune base
2883	"	"	Beach - Active Dune base
2884	"	"	Beach - Volcanic derived sand

Init. Wt. Kg. (Dry)	Final Wt. gms (Dry)	% recovery	% Sn in heavies	ppm Sn in source material
34.8	30.35	.0872	.06	.523
34.75	75.98	.219	.06	1.31
43.3	2.77	.0064	.03*	.019
23.45	0.25	.00107	.005*	.001
22.3	0.69	.00309	.02*	.006
54.8	5.51	.0101	.06	.060

164054



164055 19-1256

- | | | | |
|--|---|--|---|
| | PEBBLE BEDS (DEFINITE) | | INFERRED CONTACT |
| | PEBBLE BEDS (PROBABLE) | | KNOWN CONTACT |
| | BEDROCK OUTCROP -
NEGLECTIBLE SUPERFICIAL DEPOSITS | | FAULT |
| | QUARTZ VEIN OUTCROP -
INFERRED SHALLOW BEDROCK AND
NEGLECTIBLE SUPERFICIAL DEPOSITS | | 27 AUGER HOLE |
| | ANGULAR GRANITE DERIVED SAND
INFERRED NEGLECTIBLE SUPERFICIAL
DEPOSITS | | KD 1017 STREAM SEDIMENT
SAMPLE LOCATION AND NUMBER |
| | GEOLOGY INDETERMINATE
GRASS OR FOREST COVERED | | PITS OR COSTEANS |
| | | | STREAMS |
| | | | TOPOGRAPHICAL CONTOURS |

DATE: JAN 1979
GEOLOGIST:
DRAWN: FLC
CHECKED: KGB

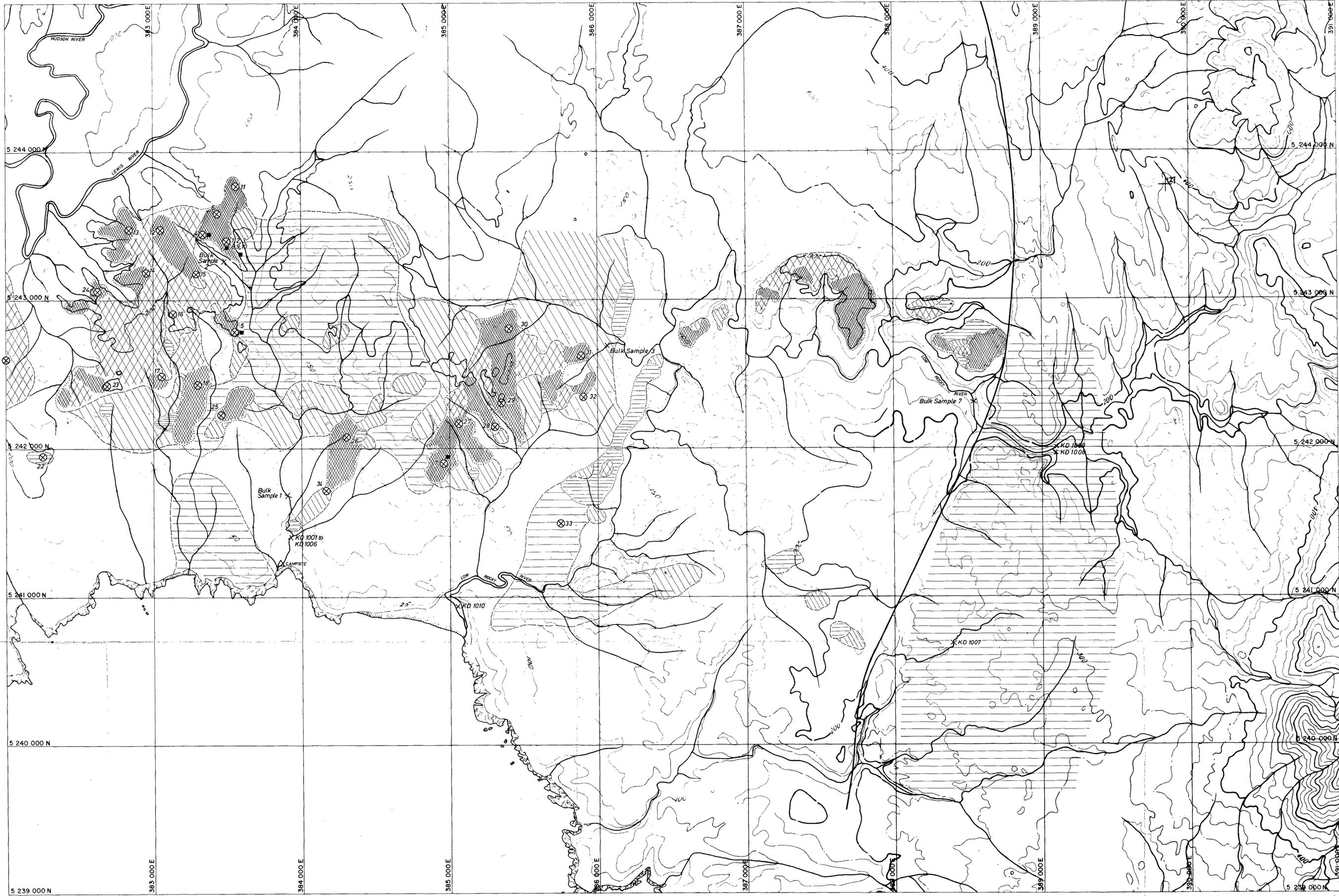
GEOPEKO LIMITED
KING ISLAND GROUP

SCALE: 1:10,000

E.L. 27/76 001
ELLIOTT BAY, TASMANIA
GEOLOGY OF THE
SUPERFICIAL DEPOSITS

No. KT27/76-7	
KT27/76-1	KT27/76-2
KT27/76-3	KT27/76-4
KT27/76-5	KT27/76-6
KT27/76-7	KT27/76-8

5 cm



- | | | | |
|--|---|--|---|
| | PEBBLE BEDS (DEFINITE) | | INFERRED CONTACT |
| | PEBBLE BEDS (PROBABLE) | | KNOWN CONTACT |
| | BEDROCK OUTCROP -
NEGLECTIBLE SUPERFICIAL DEPOSITS | | FAULT |
| | QUARTZ VEIN OUTCROP -
INFERRED SHALLOW BEDROCK AND
NEGLECTIBLE SUPERFICIAL DEPOSITS | | AUGER HOLE |
| | ANGULAR GRANITE DERIVED SAND
INFERRED NEGLECTIBLE SUPERFICIAL
DEPOSITS | | STREAM SEDIMENT SAMPLE
LOCATION AND NUMBER |
| | GEOLOGY INDETERMINATE
GRASS OR FOREST COVERED | | PITS OR COSTEANS |
| | | | STREAMS |
| | | | TOPOGRAPHICAL CONTOURS |

DATE JAN 1979
 GEOLOGIST
 DRAWN FLC
 CHECKED: KGB

GEOPEKO LIMITED
KING ISLAND GROUP

164056

SCALE 1:10,000

E.L. 27/76 002
ELLIOTT BAY, TASMANIA
GEOLOGY OF THE
SUPERFICIAL DEPOSITS

KT27/76-1	KT27/76-2
KT27/76-3	KT27/76-4
KT27/76-5	KT27/76-6
KT27/76-7	KT27/76-8

No. KT27/76-8

79-1256

5 cm