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GEOPEKO

A DIVISION OF PEKO-WALLSEND OPERATIONS LIMITED

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ELLIOTT BAY AREA - TASMANIA

PROGRESS REPORT: EXPLORATION LICENCE 27/76

MICROFILMED

by

C.D. STRICKLAND

DEVONPORT, TASMANIA

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SUMMARY

Exploration Licence 27/76 is currently held by Geopeko Limited and occupies a total area of 329 square kilometres.

The Lewis River Volcanics exposed within E.L. 27/76 are considered correlatives of the Mt. Read Volcanics and thus by analogy with the Mt. Lyell - Rosebery area are potentially favourable host rocks for base metal mineralization.

Prospecting activities within this area began during the period 1890 - 1920, since that time the concensus of opinion has been that the area is devoid of economic base metal mineralization. Serious doubts exist concerning the validity of some of the exploration techniques used to form the basis of that opinion, such as low sensivitity airborne electromagnetics and shallow soil geochemistry.

This report details the nature and results of Phase 1 of the exploration programme which incorporated two field seasons activities and involved the following methods:

1. Regional: (1976-77)
   - geological mapping and rock sampling at 1:10,000 scale.
   - 545 stream sediment samples for geochemical purposes from the southern portion of E.L. 27/76.
   - 358 rock samples collected, sawn and examined for regional mapping purposes.
   - 21 rock samples petrographically examined for geological map compilation.
   - 80 rock samples geochemically analysed for regional backgrounds and trends.

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2. Prospects: (1976-77)

Voyager 1. 377300E, 5242000N (A.M.G.)
- 2300 metres of tape and compass gridding.
- 52 C-horizon auger holes at 25 and 12.5 metre centres for geochemical purposes, a total of 59 samples including duplicates for a total depth of 80.60 metres.
- geological outcrop and float mapping at 1:10,000 scale.
- ground geophysics involving S.P. V.L.F. (E.M.) and gradient array I.P. techniques.

Voyager 2. 384250E, 5245750N (A.M.G.)
- 1350 metres of tape and compass gridding.
- 31 C-horizon auger holes at 25 and 12.5 metre centres for geochemical purposes, a total of 35 samples including duplicates for a total depth of 26.95 metres.
- geological outcrop and float mapping at 1:10,000 scale.
- ground geophysics involving magnetic and V.L.F. (E.M.) techniques.

Voyager 3. 382700E, 5241300N (A.M.G.)
- 1000 metres of tape and compass gridding.
- ground geophysics involving magnetic and V.L.F. (E.M.) techniques.

Voyager 11. 378300E, 5242100N (A.M.G.)
- 3100 metres of tape and compass gridding.
- ground geophysics involving V.L.F. (E.M.) methods.

Voyager 4. 381800E, 5244700N (A.M.G.)
- 1650 metres of tape and compass gridding.
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Voyager 5. 378400E, 5242800N (A.M.G.)

- 3050 metres of tape and compass gridding.
- ground geophysics involving magnetic and V.L.F. (E.M.) techniques.

Voyager 6. 380300E, 5243800N (A.M.G.)

- 800 metres of tape and compass gridding.
- ground geophysics involving magnetic and V.L.F. (E.M.) techniques.

3. Prospects: (1977-78)

Voyager 1. Area

- 2.8 kilometres of theodolite gridding (Baseline).
- 17.575 kilometres of range-pole gridding (Traverses).
- geological mapping and rock sampling at 1:5,000 scale.
- C-horizon auger sampling for geochemical purposes at 25 metre centres over areas of Lewis River Volcanics. A total of 287 holes were completed for a total depth of 528.8 metres, an average depth of 1.84 metres per hole.
- 6.85 kilometres of Dipole-Dipole I.P. survey.
- 18.0 kilometres of magnetometer survey.
- 1.0 kilometre of Schlumberger vertical electrical sounding.
- 1.8 kilometres of V.L.F. (E.M.) survey.

Voyager 2.

- 7.00 kilometres of theodolite and range pole gridding at 200m x 50m centres.
- geological mapping and rock sampling at 1:5,000 scale.
- C-horizon auger sampling for geochemical purposes at 25 metre centres along the grid traverses.

A total of 215 holes were completed for a total depth of 303.4 metres, an average depth of 1.4 metres per hole.

- 4.2 kilometres of Dipole - Dipole I.P. survey.
- 4.6 kilometres of magnetometer survey.
- 1.0 kilometre of Schlumberger vertical electrical sounding.
- 2.6 kilometres of V.L.F. (E.M.) survey.
- 1.4 kilometres of S.P. survey.

Voyager 3. Area

- 12.6 kilometres of theodolite gridding.
- geological mapping and rock sampling at 1:5,000 scale.
- C-horizon auger sampling for geochemical purposes at 50 metre centres along the grid traverses. A total of 233 holes were completed for a total depth of 451.60 metres, and average depth of 1.94 metres per hole.
- 11.15 kilometres of Dipole - Dipole I.P. survey.
- 12.0 kilometres of magnetometer survey.
- 2.0 kilometres of Schlumberger vertical electrical sounding.

Voyager 8. Tin Study Area.

- 34 auger holes were completed for a total of 162 samples and 241 metres.
- 3 pits were hand dug for a total of 8.1 metres and 19 bulk samples.
- 45.5 metres of hand dug trenching was completed for 6 bulk samples.
- 2500kg of samples were panned, including soil, dune and stream sediment samples.
- 35 square kilometres of geological mapping at 1:10,000 scale.
- 10 work sites were theodolite leveled.

Voyager 9.

- 4.0 kilometres of theodolite gridding (Baseline).
- 4.3 kilometres of range pole gridding (Traverses).
- geological mapping and rock sampling at 1:10,000 scale.
- C-horizon auger sampling for geochemical purposes at 50 metre centres along the grid traverses. A total of 88 holes were completed for a total depth of 140.10 metres, an average depth of 1.60 metres per hole.
- 2.8 kilometres of Dipole - Dipole I.P. survey.
- 8.3 kilometres of magnetometer survey.

Phase 1 of the exploration programme has indicated that four prospect areas have initially been selected as favourable for massive sulphide mineralization of the Cu, Pb and Zn type.

- Voyager 1 Area.
- Voyager 2.
- Voyager 3 Area.
- Voyager 10

Recommendations for Phase 2 of the onward exploration programme are given in this report.

INTRODUCTION

Exploration Licence 27/76 termed Elliott Bay, currently held by Geopeko Limited, occupies an area of 329 square kilometres in the land district of Montgomery, south west Tasmania.

This area, previously held by B.H.P. Co. Ltd, as E.L. 13/65, was pegged by Geopeko Limited on the 8.9.76 and officially granted by the Department of Mines on the 13.1.1977.

Previous exploration within the more accessible portions of this area, dating from the 1890-1910 period, has recorded evidence of anomalous base metal mineralization and traces of alluvial gold. Government and Company exploration activities since the 1920's has verified the presence of rhyolitic lavas, porphyries and pyroclastic rock types which have a potential to host massive copper, lead and zinc sulphide orebodies.

This report reviews Phase 1 of the field exploration programme at Elliott Bay up until April 1978 and thus incorporates two field seasons activities.

1976 - 77 exploration programme consisted of:

(a) Base map preparation.
(b) Regional geological mapping at 1:10,000 scale.
(c) Geochemical stream sediment sampling.
(d) Reconnaissance gridding of selected prospects.
(e) C-horizon soil geochemistry of prospects.
(f) Ground geophysics of prospects, utilizing magnetic, Gradient-Array I.P. and V.L.F. (E.M.) techniques - Deakin, 1977.

1977 - 78 exploration programme consisted of:

(a) Accurate prospect gridding.
(b) Prospect geological mapping at 1:5,000 scale.

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(c) C-horizon soil geochemistry of prospect grids.

(d) Detailed prospect geophysics involving magnetics, Dipole - Dipole I.P., S.P., and V.L.F. (E.M.) techniques - Mudge, 1978.

(e) Reporting.

CONCLUSIONS

REGIONAL

1. Geological mapping, aided by the petrographic study of selected rock samples, has shown that the Cambrian Lewis River Volcanics within E.L. 27/76 are equivalents of the Mt. Read Volcanics and consist of:

   - Rhyolitic porphyritic lavas.
   - Rhyolitic porphyries.
   - Rhyolitic lithic, crystal and vitric tuff pyroclastics.
   - Volcaniclastic sediments.

2. The exploration approach selected for the Phase 1 programme during 1976-77 and 1977-78 has shown that the zone of exposed Lewis River Volcanics is prospective for massive sulphide Cu, Pb and Zn mineralization.

3. Geological mapping using surface outcrop has shown that the apparent structural trend of the rock lithologies is north-south. This direction parallels the faulted unconformity with the Precambrian Arthur Group to the east and the Dundas Trough to the west.

   Structural trends within the Cambrian rock units are largely dominated by an intense north-south cleavage pattern, however a westerly dip is interpreted for the lithologies.

4. Detailed petrographic examination has indicated that in a gross sense the porphyry and porphyritic lava facies within E.L. 27/76 are predominantly rhyolitic.

The presence of granitic and andesitic rock units within the southern portion of E.L. 27/76 provides a minor variation to the dominantly acid volcanic environment.

5. Geological mapping has indicated a major trend in lithology from east to west, from a coarse grained rhyolitic feldspar-quartz-biotite porphyry in the east, interpreted as an extrusive or high level intrusive, to a rhyolitic quartz-feldspar lava containing both minor intercalated tuffaceous horizons and more extensive units of tuffaceous, volcaniclastic and sedimentary lithologies to the west. This broad major trend is also present north of the Moores Valley (Macquarie Harbour) graben within E.L. 9/74 (Geopeko-Union Oil Joint Venture).

6. Geochemical drainage sampling, i.e. stream sediment analysis, appears to be a successful regional reconnaissance technique for delineating zones anomalous in Cu, Pb or Zn. Within this environment of shallow weathering and high run off subtle anomalous responses are the norm.

   Aided by eyeball techniques, a detailed statistical appraisal derived anomalous threshold values for the Cu, Pb and Zn results. Against a regional background of (2ppm Cu, (20ppm Pb and 15ppm Zn results have been interpreted as anomalous when they have equalled or exceeded 5ppm, 65ppm and 55ppm Cu, Pb and Zn respectively.

7. Although the original rationale of selecting elements for analysis is considered sound, it is evident that certain elements have either no response in the area tested using stream sediment techniques or are not useful given the expense of analysis. These include Mn, Fe, Ag and Ba.

8. From the results of the orientation soil sampling carried out within the Lucas Volcanics E.L. 9/74 (Geopeko-Union Oil), augering to 2 metres (or bedrock which ever was the lesser) was considered adequate for sampling the C-horizon within the Lewis River Volcanics.

9. Prospect evaluation by pattern C-horizon power auger sampling is a rapid (35 holes per day) technique which not only provides an uncontaminated sample of moderate volume but in addition provides rock chips for geological logging in valuable in localities of minimal outcrop.

10. The Geoex H-400 magnetic - electromagnetic survey flown during 1975 appears from the regional geophysical follow up programme to accurately position both A.E.M. and aeromagnetic featues on the recovery maps.

Location and evaluation of A.E.M. anomalies by reconnaissance V.L.F. (E.M.) techniques appears successful however prospects require adequate geological input prior to extensive additional geophysical coverage on account of the methods inability to define conductor types or the geometry of the causative bodies.

PROSPECTS

Phase 1 of the exploration programme has indicated that the following 4 prospect areas appear favourable for massive sulphide mineralization of the Cu, Pb and Zn type.

These prospect areas are presented below in the order of their interpreted potential.

A. Voyager 3 Area

The broad wide spaced geological, geochemical and geophysical investigation has delineated inland an extension of the mineralization visible along the coastal section of Elliott Bay. A geochemcially anomalous zone of approximately 1 sq kilometre centered on 383,000E, 5 241,500N, A.M.G. is considered favourable for significant Cu, Pb and Zn mineralization and is associated with the following:

- favourable geological environment.
- highly anomalous C-horizon geochemistry values.
- significant Dipole-Dipole I.P. anomalies.

1. Geological mapping has indicated a favourable geological environment in the Voyager 3 Area. A broad complex sequence of crystal tuff and vitric tuff pyroclastics occur intercalated with the more regionally dominant porphyritic lava lithologies.

2. C-horizon soil geochemical results obtained from traverses 9,400N, 9,600N and 10,000N indicate the presence of strongly anomalous Cu, Pb and Zn. Spot peak values are 1300ppm Cu, 2200ppm Pb and 10,000 ppm

   Peak values from regional rock samples collected along the coastal section of Elliott Bay to the south of Voyager 3 are 350ppm Cu, 3850ppm Pb and 6500ppm Zn.

3. Significant Dipole-Dipole I.P. anomalies were detected at 9600N 8850E, 9600N, 10,000E and 10,000N, 9600E. These anomalies are considered characteristic of polarizable sources with a near surface expression.

B. Voyager 2 Area

This 1.5sq kilometre area is considered a favourable zone for significant Cu, Pb and Zn mineralization and is associated with the following:-

- favourable geological environment.
- highly anomalous C-horizon geochemistry values
- visible siderite lode over a strike length of 400 metres associated with evidence of historical workings.
- Dipole-Dipole I.P. polarizable zone.

1. Geological mapping using surface outcrop has indicated a complex unit of dominantly vitric tuff and rarer lithic tuff varieties. Present also are volcaniclastic sediments representing well reworked tuffs. This "sedimentary" facies is within a broad unit of porphyritic rhyolitic lava which in turn is boarded to the east by an intrusive? massive feldspar-quartz biotite porphyry.

2. C-horizon soil geochemical results obtained from the 200m x 25m survey indicated the presence of strongly anomalous Cu, Pb and Zn. Spot peak values are 1400 ppm Cu, 14,750 ppm Pb and 4,500 ppm Zn.

   Of greatest significance is the presence of Cu-Pb anomalies higher in the sequence paralleling the known mineralized horizon and the foliation of the host lithologies.

3. The visible gossanous lode contains evidence of old workings (Lewis River Prospect), however the vein like deposit consists dominantly of siderite, black manganese oxides and quartz. Within this assemblage occurs blebs and stringers of pyrite and chalcopyrite with very rare sphalerite.

   Peak values obtained from rock samples of the mineralized lode were 4200 ppm Cu, 740 ppm Pb and 510 ppm Zn.

4. The Dipole-Dipole I.P. survey located a narrow north-south striking polarizable zone along 10,050E, the most encouraging anomalies occur on lines 9600N and 9800N. A significant V.L.F. (E.M.) anomaly was detected in association with the I.P. anomalies on line 10,000N. The siderite lode was not suited to S.P. techniques.

C. Voyager 1 Area (including Voyagers 1, 5 and 11)

This prospect area, encompassing 6sq kilometres, although geochemically disappointing following the regional evaluation is considered a favourable area for additional exploration.

- favourable geological environment.
- encouraging regional magnetic characteristics.

1. This area consists of a unit of Lewis River Volcanics immediately west of the Low Rocky Point granite body. The volcanics are highly sheared porphyritic lavas complexly intercalated with pyroclastic tuffs.

   Penders Prospect (Voyager 1) occurs on the coast as two concordant parallel zones of pyrite mineralization, one unit of which is strongly magnetic.

2. The well defined linear magnetic horizon detected almost continuously north from Voyager 1 possibly represents the extension of magnetite lode, and considering its considerable strike length is unlikely to be a simple vein deposit.

The magnetic horizon and associated pyrite horizon warrant additional investigation in so far as they may represent strataform mineralization.

D. Voyager 10 Area

This 1.5 square kilometre area is considered a favourable zone for potential Cu, Pb and Zn mineralization based upon the following factors:

- regional stratigraphic trends position the Voyager 10 prospect along strike from Voyager 2, although regional mapping to date has not located any volcaniclastic or pyroclastic lithologies.
- anomalous stream sediment results.
- location of A.E.M. 16.

1. Approximately 1000 metres to the north west occurs the volcaniclastic and pyroclastic horizons of the Voyager 2 prospect, 800 metres to the south of the Voyager 10 prospect regional mapping has also located a 100 metre wide horizon of similar lithologies. The existing structural information from the Voyager 2 prospect positions Voyager 10 along strike to the south.

2. Anomalous stream sediment geochemical values are present draining an area of approximately 2 square kilometres. Peak values for Cu, Pb and Zn are 10ppm, 100ppm and 160ppm respectively.

3. A.E.M. 16 (Geoex 1975) has yet to be investigated, its close proximity to the area of anomalous stream sediment sample results is encouraging.

Tin Evaluation

Voyager 8

For a comprehensive report on the Voyager 8 tin study refer to the report presented by Mr. K. Burlinson (Geochemist).

RECOMMENDATIONS

Phase 1 of the exploration programme of the southern portion of E.L. 27/76 successfully highlighted several prospects considered favourable for potential Cu, Pb and Zn mineralization. Existing minor sulphide mineralization together with historical workings are present at both Voyager 1 and Voyager 2. Reconnaissance stream sediment sampling also lead to the discovery of a potential alluvial tin prospect which was evaluated in detail.

Phase 2 of the exploration approach in this southerly area of E.L. 27/76 is aimed at a more detailed appraisal of selected anomalous areas involving more detailed prospect gridding, C-horizon geochemistry geological mapping, ground geophysics and culminating in the shallow diamond drilling of selected targets.

It is recommended that Phase 2 of the exploration programme involve the following steps.

REGIONAL

It is highly important to continue the regional evaluation of E.L. 27/76 to enable a systematimatic development of favourable prospects throughout the whole area in the order of their potential.

It is recommended that detailed field planning be undertaken to enable a division of man-power and equipment midway during the summer season. Thus while the diamond drilling of prospect targets was continuing in the southern portion of the E.L. the regional reconnaissance could recommence from a separate base camp established further north.

Regional reconnaissance investigations would involve the following:

- geological mapping at 1:10,000 scale.
- stream sediment sampling at 10-15 samples per square kilometre.
- location and investigation of A.E.M. anomalies and magnetic anomalies generated by the Geoex 1975 survey.

PROSPECTS

A. Voyager 3 Area

- close up grid between 8750E - 9400E/9400N - 10200N at 100m x 50m centres.
- geological mapping at 1:5000 scale on all traverses.
- C-horizon auger drilling at 100m x 25m centres.
- experimental conductivity and pH survey of ground water in C-horizon auger holes.
- ground geophysics on grid involving selected techniques (Dipole-Dipole I.P., V.L.F. (E.M.), possibly Turam E.M., S.P.)
- hallow diamond drill testing of selected targets.

B. Voyager 2 Area

- experimental conductivity survey on ground water from C-horizon auger holes drilled during 1977-78 season, dependant upon results of Voyager 3 survey orientation..
- shallow diamond drill testing of C-horizon geochemical, and Dipole-Dipole E.P. anomalies. The following targets are recommended.

a) 10,200N, 10,050E. Pb geochemical anomaly
b) 10,000N, 9,825E. Cu, Pb geochemical anomaly
c) 10,000N, 10,200E. I.P., V.L.F. (E.M.) anomaly
d) 9,630N, 10,020. Cu geochemical anomaly.

C. Voyager 1 Area (including Voyagers 1,5 and 11)

- shallow diamond drill testing of the linear magnetic anomaly extending northwards from the Voyager 1 prospect (Penders Prospect). Geophysical consultation necessary to plan target.
- shallow diamond drill testing to define Low Rocky Point granite/Lewis River volcanics contact and test coincident magnetic and I.P. anomalies at Voyager 5.

D. Voyager 10 Area

- grid at 200m x 50m centres. This grid to be tied into the southern traverse (9200N) of the existing Voyager 2 grid.
- geological mapping of all grid traverses at 1:5000 scale, together with logging of all C-horizon rock chips.
- C-horizon geochemistry at 200m x 25m centres.
- ground geophysical techniques involving V.L.F. (E.M.) and Dipole-Dipole I.P.
- follow up of selected targets by shallow diamond drill testing.

E. Voyager 8 Area

- Recommendations for future evaluation of the Elliott Bay tin potential are presented in the report by Mr. K. Burlinson (Geochemist).

ACTION SHEET

PREVIOUS WORK AND MINERAL OCCURRENCES

The first attempt at exploration and prospecting of this area was made during the 1890-1910 period when the Macquarie Harbour-Port Davey track was established. This was an era of vigorous prospector activity in which Zeehan, Mt. Bischoff, Mt. Lyell and many other small metalliferous deposits were discovered on the west coast. Similarly, south of Macquarie Harbour numerous small shows were recorded along the track to Port Davey, such as the Birthday Bay copper prospect, Spero River asbestos, Cypress Creek - Mainwaring River gold traces, Penders Copper prospect. The small shafts and trenches observed near the Lewis River prospect probably date back to this period.

In the 1920-1930 period government geologists began mapping the more accessible areas of south-west Tasmania. Nye. P.B. and Howard C. (1926) described both quartz vein and pyritic mineralization during a short inspection of the Low Rocky Point district in 1926.

Prior to January, 1955 an Airborne Scintillometre Survey was conducted along the south-west coastline by a Dakota aircraft for the B.M.R. A total of four runs were flown and a second order anomaly (2-3 times background) was detected in the Lewis River area on all runs.

The Mt. Lyell Mining and Railway Company - Electrolytic Zinc Exploration (L.E.E.) joint venture carried out an extensive aeromagnetic survey over E.L. 13/65 during 1957 - 1958. The Lewis River area was flown in 1958. The aeromagnetic survey was successful in delineating the Hibbs Ultrabasic belt, Spero Ultrabasics and in the area under discussion, there is a sharp demarcation between the Mainwaring Group and the Lewis River Volcanics - Osmund Conglomerate. The Lewis River Volcanics generally reflect a flat magnetic profile however several discrete anomalies were identified near the Lewis River and investigated later by B.H.P. Co. Ltd.

Airborne electromagnetic data was recorded during the aeromagnetic survey of the Lewis River Volcanics and approximately 60% of the original E.L. 13/65 was flown. Taylor (1966) considers that 'the vast majority of the E.M. anomalies recorded on the flight tapes and maps are terrain clearance anomalies'. Considering the flat terrain in the Lewis River area this assumption is probably not applicable.

An airborne scintillometer survey was also apparently carried out in conjunction with this electromagnetic - magnetic survey however no results have been reported and it is presumed that no anomalies were recorded.

Detailed ground follow up by L.E.E. was concentrated on the A.E.M. anomalies utilizing magnetic, E.M., gravity, I.P., AFMAG, geological mapping and geochemical techniques. No ground geophysics or geological investigations were however carried out on the magnetic anomalies of the Lewis River Volcanics.

L.E.E. investigated Penders Prospect (Voyager 1) and considered it to be uneconomic due to the low grade, apparent lack of extension and isolated geographical position. Further work on this prospect was recommended depending upon the results of the airborne E.M. survey. This survey, flown during 1958, did not record an anomaly over the prospect and all future work was abandoned.

The Drake Creek prospect (Voyager 3) was studied and further work recommendations were made pending the airborne E.M. survey. No E.M. anomaly was recorded and apparently on this basis, the prospect was eliminated.

L.E.E. carried out geological investigations at the Lewis River Prospect (Voyager 2) during the period January - February 1957, January 1958, and again in February 1958. Detailed geological mapping was undertaken and some gossan samples were analysed. The prospect gave no airborne E.M. response during the 1958 survey but was re-examined during 1959 and additional rock samples were collected for geochemical analysis.

L.E.E. concluded that the Lewis River Volcanics were of no further interest because the airborne E.M. anomalies proved to be due to sources other than base metal mineralization, and all the prospects examined were of insufficient tonnage and grade.

Broken Hill Proprietary Co. Ltd. contracted Aeroservice Ltd to conduct an aeromagnetic survey over a large (3550 square miles) area of South Central Tasmania. The survey, flown during February - May 1965 and February - May 1966, covered only the northern part of the Lewis River Volcanics. The aeromagnetic contours obtained, however, are essentially identical with those obtained from the 1958 L.E.E. survey.

During February 1968 B.H.P. carried out a helicopter borne scintillometer survey. The results confirmed the 1955 B.M.R. anomaly in the Lewis River area and several other anomalies of lower magnitude were detected in the Low Rocky Point, Wart Hill and Mt. Osmund areas.

Ground follow up exploration by Broken Hill Proprietary Co. Ltd., involved extensive stream sediment sampling of the whole of the Lewis River Volcanics, together with soil geochemistry over some selected aeromagnetic anomalies and Penders Prospect. Ground magnetics was also carried out over a few prospective areas. Geological mapping was undertaken in detail thoughout the area.

During April 1975 B.H.P. contracted Geoex. Pty. Ltd., to fly a H400 helicopter borne magnetic and electromagnetic survey over the Lewis River area of South-West Tasmania. This survey encompasses the total area of E.L. 27/76.

All previous workers have concluded that the area is devoid of economic base metal mineralization. All prospects found so far have been considered to be of insufficient grade and tonnage to warrant further interest. Geophysical and geochemical methods have been used without success for the detection of less obvious mineralization.

There is however, some doubt concerning technical validity of several of the exploration tools used, namely airborne electromagnetics, geochemical stream sediment sampling and soil geochemical sampling.

The airborne electromagnetic surveys carried out prior to the 1975 Geoex H400 survey were of low sensitivity, and geochemical techniques may have been effected by the geochemical environment. Both methods strongly influenced the assessment of the Lewis River Volcanics by L.E.E. and B.H.P.

LOCATION AND ACCESS

Exploration Licence 27/76 is located on the south west coast of Tasmania, between Macquarie Harbour and Port Davey. The area extends north from Elliott Bay to just north of the Wanderer River (See Fig. 1.).

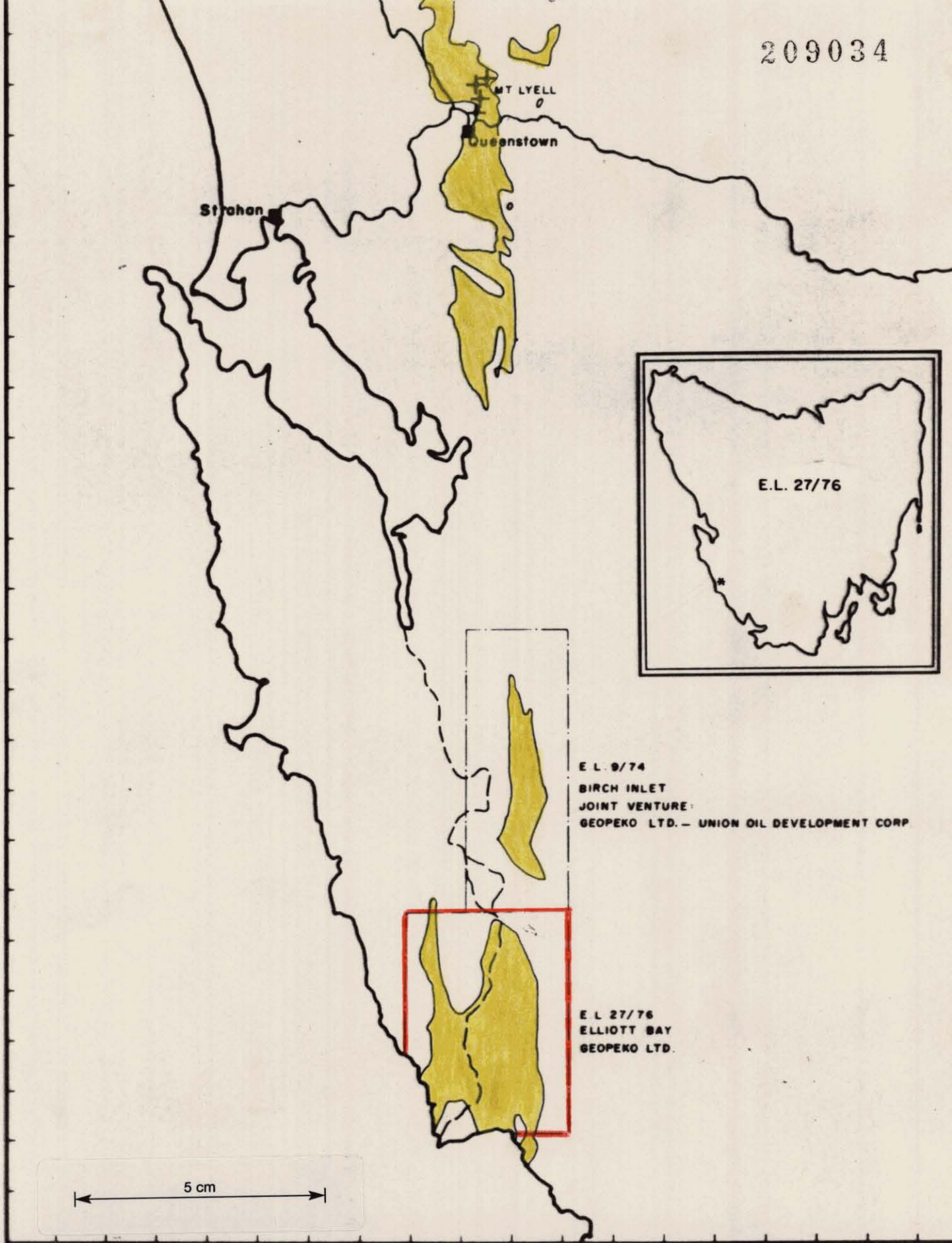
The area is within the west coast portion of the origional E.L. 1/64 which covered the whole of south west Tasmania an area of 6000 square miles.

Access to this area is generally quite difficult and during bad weather it is totally inaccessible. The area is reached by launch from Strahan to the head of Birch Inlet, a distance of 50 kilometres. A rough wooden landing known as the Bombardier Landing exists a further 2 kilometres up the Sorell River. Lighters carrying heavy equipment, namely bulldozers, can only be off loaded at the Birch Inlet camp approximately 3 kilometres north of the head of Birch Inlet. Difficult swamp country separates the two landings from the bulldozed track which continues south for 45 kilometres to the Moore Valley camp and airstrip. The airstrip, situated 5 kilometres S.S.E. of the camp site is serviceable for litht aircraft except in very wet weather when the quartz gravel surfacr becomes soft. The airstrip is approximately 30 kilometres from the Lewis River area of E.L. 27/76. Helicopter access is highly convenient either from Hobart or from the Hydro Electric Commission base at Strathgordon, 45 kilometres to the north east.

A Bombardier track continues south from the Moores Valley airstrip to the Low Rockly Point lighthouse. The Wanderer and the Lewis Rivers have been bridged by the Lighthouse Commission and although both bridges are substantial steel frame constructions, the Lewis River bridge must be treated with caution due to a deteriating timber decking. Bulldozers must ford the Wanderer River close to the bridge site. Immediately south of the Wanderer a bulldozed sidetrack extends west from the main track to the Cypress Creek grid in the Mainwaring River region.

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LEGEND

- Significant Basemetal Mineralization
- Mt. Read Acid Volcanics
- Road
- Track

DATE 18-4-78
GEOL C.D.S
DWN J.P.M.
CHKD CDS.

GEOPEKO LIMITED
KING ISLAND

Scale: 1:500 000 | Fig No. 1

LOCATION MAP

E.L. 27/76

Within the Lewis River volcanic belt vehicle access is only possible by the use of tracked machines. Two Bombardiers, a 'J5' and a 'Muskeg' gave excellent service during the 1976/77 and 1977/78 field seasons, providing a means of constructing tracks and a transport medium for personnel and supplies.

The streams are generally difficult to follow on foot, there being a thick network of scrubby T-tree and Banksia intertwined with Bauera, occasional horizontal scrub also exists. The majority of the area under discussion is button grass and overland access is rapid, rain forest zones however are almost impenetrable. Cut line access is essential for these more heavily timbered areas.

PHYSIOGRAPHY

The southern portion of the Elliott Bay area under discussion in this report is generally flat, gradually sloping seaward and is approximately 60 - 150 metres in elevation. (See Photo No. 1). The dominant features are Mt. Osmund (368 metres) and Wart Hill (238 metres). The Lewis, Hudson and Little Rocky Rivers and their tributaries are deeply incised and thickly vegetated.

North of Mt. Osmund and including the Wanderer and the Mainwaring rivers region the topography varies from gently indulating to steeply dissected exposed stopes.

VEGETATION AND CLIMATE

The low lying areas consist dominantly of poorly drained peat soils and support hummocky button grass and sedge varieties. The majority of the area under discussion is covered with a mixture of button grass, low Eucalypts, Titree and Bauera vine. This type of vegetation is exclusive to areas underlain by rock types which produce a very poor spil horizon but a fairly thick peat cover (See Photo No. 2).

Dense rain forest containing Myrtle, Celery Top Pine, Sassafras, Leatherwood and horizontal varieties occur as isolated zones dependant upon more favourable soil types. The influence of rock type and thus soil type on the vegetation is well illustrated at the boundary between the Osmund (Owen Type) Conglomerates and the Mainwaring Group (pyroclastics).

The average rainfall in this area is approximately 80 inches. The west coast climate restricts active field exploration to the period from mid-December to late April. Outside of this period, the weather may be fine and clear ocassionally, but snow and very heavy rain storms are possible. Extremely boggy conditions and river flooding make it impossible to work this area during the winter months.



Photo No. 1. View looking South West towards Elliott Hill (209m) over gently undulating button grass covered lowlands.



Photo No. 2. View of the Lewis River campsite situated between the open button grass plain and the densly timbered river banks.

EXPLORATION PROGRAM - PHASE 1

Phase 1 of the exploration programme conducted by Geopeko Limited consisted of the following exploration steps.

A. 1976 - 77 Field Season.

1. Black and white aerial photographs at an approximate scale of 1:40000 and 230mm x 230mm size were obtained giving stereo coverage of the area. Enlargements to 1:10000 scale for field mapping were also obtained.

2. Positive transparencies of the machine plots at 1:10000 scale of the Rocky Point 1:100000 scale topographical series prepared by the Lands Department were obtained for the area. Minor redraughting highlighted the stream systems and produced eight B1 size base maps which cover the whole of E.L. 27/76.

3. Geopeko Limited's existing field equipment stocks were supplimented by hired equipment for the duration of the exploration programme. A rapidly constructed, easily portable camp site based upon tents and locally fabricated shelters, together with bottled L.P. gas operated refrigeration and cooking appliances, was considered suitable for this regional exploration project.

4. Field personnel and equipment reached the Lewis River camp site by helicopter and Bombardier on the 19th March 1977, having completed Phase 1 of the exploration programme of E.L. 9/74 Birch Inlet (Geopeko Limited - Union Oil Development Corporation).

5. Field work consisting of detailed geological mapping, geochemical drainage sampling, C-horizon auger sampling and ground follow up of airborne magnetic and electromagnetic anomalies was carried out intensively over the southern portion of the Lewis River volcanics.

Due to deteriorating climatic conditions the programme was halted on the 7th April 1977.

6. A total of 545 stream sediment samples were collected from the streams, creeks and rivers draining the prospective area. A duplicate sample was collected at every tenth location. The area sampled is approximately 51 square kilometres and the overall sample density over the prospective area was approximately 11 samples per square kilometre. It was decided prior to the survey that oversampling to a degree would be preferred considering the cost of resampling.

The sample location points were measured off from a known starting point and all locations were marked with flagging tape and numbered aluminium tags. The nature of the sample, location number and assay values were recorded in sample books which are in storage at the Devonport Office.

The samples were dried, rebagged if required and forwarded to A.C.S. Laboratories, Adelaide. The -80 mesh fraction was separated and analysed for Cu, Pb, Zn, Ag, Mn and Fe by A.A.A. Ba and Sn were determined by Emission Spectrographic analysis schemes E.S.2 and E.S.3. A total of 16 samples were selected for X.R.F. Sn and W analysis based upon their anomalous Emission Sn results. In addition 27 samples were selected on their resulting Pb and Zn analyses for Semiquantitative Emission Spectrographic analysis schemes E.S.1-4 and E.S.6. The sample book numbers and assay results are enclosed as appendices Nos. 1, 2 and 3.

7. Cumulative frequency plots of the log 10 concentrations of Cu, Pb and Zn were calculated in order to determine statistical threshold values, the results of which are shown in figure 2. Sheets KT 27/76 5B-8B in the folder of this report show the Cu, Pb and Zn results obtained at each stream sediment sample location and display in coloured symbolic form zones considered anomalous by a combination of eyeball and statistical methods.

8. A total of 358 rock samples were collected during the reconnaissance regional mapping to aid in later correlation for the geological map preparation. All rocks are in storage at Geopeko Limited, Devonport and their field locations are described on Sheets KT 27/76 5D-8D included in the folder of this report.

21 samples selected from throughout the area were thin sectioned and petrographically described by I.R. Pontifex and Associates, Adelaide. The samples were of representative rock types, altered rock types and rocks where the field determination was vague. The locations of the thin sectioned samples are recorded on the geological maps, Sheets KT 27/76 5A-8A in the folder of this report.

A selection of 80 rock samples, diagnostic of areas containing significant chlorite or sericite alteration and visible sulphide mineralization was despatched to A.C.S. Laboratories, Adelaide for geochemical analysis. Cu, Pb, Zn Ag, Mn, Cd and Fe were determined by A.A.S. techniques, As was analysed by the modified Gutzeit method and Sn by Emission Spectrography. A total of 19 samples were reassayed for Sn by X.R.F. methods and 7 samples, selected on their anomalous As results, were analysed for low level Au by the C.R.A./A.A.S. method. In addition 4 samples were selected on their resulting Pb and Zn analyses for Semiquantitative Emission Spectrographic analysis schemes E.S.1-4 and E.S.6. The sample numbers, locations and assay results are recorded on the geological maps Sheets KT 27/76 5A-8A enclosed in the folder of this report and in numerical order as appendices No's. 7, 8, 9 and 10.

9. 94 soil samples, including 11 duplicates were collected from 83 holes during the C-horizon geochemical programme over the Voyager 1 and Voyager 2 prospects. Experience within E.L. 9/74 (Birch Inlet) had shown that for geochemical sampling purposes - the optimum sample depth was 2.0 metres or bedrock.

Soil sampling was carried out by a Jacro 200 auger rig mounted on the rear of a Muskeg Bombardier. Holes inaccessable to the drilling rig were hand augered to refusal.

041

The nature of the sample, location number, depth taken and assay values were recorded in sample books which are in storage at the Devonport Office. The samples were dried, rebagged if necessary and despatched to A.C.S. Laboratories, Adelaide. The -80 mesh fraction was separated and analysed for Cu, Pb, Zn, Ag, Fe and Mn by A.A.S. Ba and Sn were determined by Emission Spectrographic analysis schemes E.S. 2 and E.S. 3. In addition 6 samples were selected on their resulting Pb and Zn analyses for Semiquantitative Emission Spectrographic analysis schemes E.S. 1-4 and E.S. 6. The sample book numbers and assay results are enclosed as appendices No's 4,5 and 6.

10. Geophysical work carried out by Geopeko Limited consisted of ground follow up of airborne electromagnetic and magnetic anomalies detected by the 1975 Geoex survey flown for B.H.P. An electromagnetic anomaly interpretation and contoured aeromagnetics were available to aid the final selection of anomalies considered worthy of ground follow up. Ground reconnaissance techniques involved V.L.F. (E.M.), magnetics and gradient array I.P. Details of the geophysical programme and results are provided in a report by Deakin, (1977).

B. 1977 - 78 Field Season

1. Detailed gridding was carried out over the Voyager 1,2, 3 and 9 prospect/areas. This programme involved a total of 48.13 kilometres of line clearing with 1m white pegs located accurately at 50m centres. Both theodolite and range pole techniques were used during the prospect gridding, utilzing a Wild T16 instrument for the establishment of all baselines and those traverses in rugged topography. Range pole gridding methods were considered sufficiently accurate for grid traverses in areas of low to undulating relief.

The baselines at Voyagers 1,2 and 3 were orientated in a True North direction, however for the purpose of easier magnetic modelling the Voyager 9 baseline was orientated Magnetic North.

2. A total of 262 rock samples were collected during the prospect grid mapping to aid in later correlation for the geological map preparation. All rocks were diamond sawn and numbered at the Elliott Bay camp prior to geological examination. These rocks are now in storage at Geopeko Limited, Devonport and their field locations are described on Sheets KT 27/76 V1-6, KT 27/76 V2-6, KT 27/76 V3A-11, KT 27/76 V3B-12 and KT 27/76 V9-6.

3. A total of 934 soil samples, including 76 duplicates were collected from 858 holes during the C-horizon geochemical programme over the Voyager 1,2, 3 and 9 prospect/areas. Experience within E.L. 9/74 and E.L. 27/76 has shown that for geochemical sampling purposes the optimum sample depth is 2.0 metres or bedrock.

Soil sampling was carried out by a Jacro 200 auger rig mounted on the rear of a Muskeg Bombardier. Holes inaccessable to the drilling rig were hand augered to refusal using suitably modified 38mm diameter wood augers.

The nature of the sample, location number, depth taken and assay values were recorded in sample books which are in storage at the Devonport office. The samples were dried, rebagged if necessary and despatched to A.C.S. Laboratories, Adelaide. The -80mesh fraction was separated and analysed for Cu, Pb, Zn, Ag, Mn and Fe by A.A.S. Ba and Sn were determined by Emission Spectrographic analysis schemes E.S. 2 and 3. In addition 46 samples were selected on their resulting Pb and Zn analyses for Semi-quantitative Emission Spectrographic analysis schemes E.S. 1-4 and E.S. 6. The sample book numbers and assay results are enclosed as appendices No's 11, 12 and 13.

Maps showing soil sample number locations and auger hole depths, auger hole rock chip geology and contoured Cu, Pb and Zn results for Voyagers 1,2,3 and 9 prospect/areas are included in the folder of this report.

4. Geophysical work carried out by Geopeko Limited on the Voyager 1,2,3 and 9 prospect/areas involved a total of 25.0 kilometres of Dipole-Dipole I.P. , 42.90 kilometres of magnetometer survey, 4.0 kilometres of Schlumberger vertical electrical soundings, 4.40 kilometres of V.L.F. (E.M.) and 1.40 kilometres of S.P.

Details of the geophysical programme and results are provided in a report by Mudge, (1978).

5. A detailed geochemical investigation was carried out in the Voyager 8 area for the purpose of assessing a major pebble horizon, from which anomalous tin values, found during the 1976-77 field programme, were thought to have originated.

Mr. D. Jennings (Tasmanian Mines Department) assisted with this study in its preliminary stages.

Geochemical techniques used during the anomaly investigation included stream sediment sampling auger hole sampling and the sampling and mapping of hand dug pits and trenches. In total approximately 2500 kg of samples were panned and 35 sq kilometres of geological mapping completed.

Details of the geochemical programme and results are provided in a report by Burlinson, (1978).

C. The expenditure incurred by Geopeko Limited up until the end of the finanical year 1977-78 is shown as follows:-

Drilling Maintainance	12,223.49
Geology	24,777.86
Drafting	2,385.37
Leasing	1,693.27
Gridding	12,316.29
Geochemistry (Base) (including auger drilling)	31,715.41
Geophysics (Base)	7,964.58
General Field Expenses	32,315.09

Administration Expenses	18,570.00
Geochemistry (Sydney)	8,520.00
Geophysics (Sydney)	23,652.00
TOTAL	$176,133.36

GEOLOGY

REGIONAL SETTING AND TECTONIC HISTORY

The Lower-Middle Cambrian rocks within Exploration Licence 27/76 are known locally as the Lewis River Volcanics and are equivalents of the Mount Read Volcanics which were defined by Campana and King (Banks 1962a), with the type section in the Mt. Read-Red Hills area. They recognised that the volcanics extended south of Macquarie Harbour to Elliott Bay and north to Deloraine, forming an arcuate belt around the Tyennan Geanticline.

Essentially the Lewis River Volcanics consist of a sequence of fine to coarse grained porphyritic quartz-feldspar rhyolitic lavas, pyroclastics, volcaniclastic sediments and a high level intrusive coarse grained rhyolitic porphyry.

The eastern feldspar-quartz-biotite porphyry intrusion is faulted against the Precambrian quartzites, quartz schists and quartz-chlorite schists of the Arthur Group by the north-south trending Lewis Fault. Complex structures within the Precambrian suggest at least three periods of folding.

At Low Rocky Point and the north eastern zone of Elliott Bay the Lewis River Volcanics are intruded by small bodies of feldspar-quartz-biotite granite. The Low Rocky Point Granite is generally finer grained and white coloured in its western portion, becomming pink and coarser grained towards the east. Both granite bodies are characterized by schistose faulted contacts with the surrounding volcanics however detailed mapping on a local scale has shown considerable complexity of the contact especially in the southern portion of the Voyager 1 area. The Low Rocky Point Granite has been dated as Uppermost Cambrian*(McDougall, 1965, Aust. Nat. University) and has been partly deformed by the same tectonism, mainly shearing, as the Lewis River Volcanics.

* 407 million years minimum age, - based on potassium - argon dating of biotite.

The sedimentary trough which developed between the Mt. Read Volcanic Belt and the Rocky Cape Geanticline to the west is referred to as the Dundas Trough (Campana and King, 1963; Bradley, 1956). South of Macquarie Harbour the trough is filled by two main sequences, the earlier Mainwaring Group and a younger Dundas Group.

The best development of the Mainwaring Group is in the Cypress Creek area and rocks of this group extend from the Urquhart River to just south of Sassafras Creek, where the basal slate of the Mainwaring Group makes contact with the Lewis River Volcanics. Consisting dominantly of intermediate volcanics the Mainwaring Group rocks include andesite, basalt, volcanic breccia, agglomerate, tuff and gabbro. The volcanic suite is generally chloritized, epidotized and sheared. Shales, slates and phyllites comprise a minor constituent of the Group.

The Dundas group is considered a typical turbidite sequence and contains interbedded siltstone, argillite and greywacke. Graded bedding is common and has shown that the outcrops along the west coast from north of Wanderer River southwards to Abo Creek become younger towards the west.

In the Mt. Osmund - Wart Hill area the Lewis River Volcanics are unconformably overlain by the Ordovician conglomerate of the Mt. Osmund syncline which is believed to be a correlative of the Owen Conglomerate of the Mt. Lyell area on lithological grounds. It is reported by Cuffley, 1971 that a thin bed of black carbonaceous siltstone occurs at this unconformity.

The northern boundary of the Lewis River Volcanics is marked by the Moores Fault a major south-east trending feature which brings the volcanics and the overlying Ordovician conglomerate into contact with the Tertiary sediments of the Macquarie Harbour Graben.

LOCAL GEOLOGY

For this section refer to the geological maps, Sheets KT 27/76 5A-8A (1:10000 scale) in the folder of this report, and to the Mineralogical Report No 2261 by I.R. Pontifex and Associates, Appendix No 14.

The geological maps are essentially 'fact maps' but also display a certain amount of interpretation. A close inspection of the mapping along the streams will show that in areas of good bedrock exposure the local geology is complex.

The silica-clay-sericite alteration within the rhyolitic lava groundmass and in the tuff matrix, together with the pseudo-porphyritic appearance of the coarser tuff crystals and the often superimposed cleavage, often seriously prohibits the accurate field distinction between tuffs, lavas, tuff lavas and porphyries in the hand specimen.

In addition to the many rocks identified and plotted during the geological mapping, 620 rocks were sampled for closer macroscopic study after diamond sawing. In an attempt to overcome the problems of individual rock identification and thus the definition of rock units within the Lewis River volcanics, 21 rock samples were selected for petrographic examination by I.R. Pontifex. The selection contained both 'problem' rocks and those representative of major rock suites within the area. In few cases were his interpretative descriptions contrary to the origional field name. The detailed petrographic report occurs as an appendix to this report.

PRECAMBRIAN

Undifferentiated quartzites and metasediments

The Precambrian Arthur Group lithologies of the Tyennan Geanticline located to the east of the Lewis River Volcanics and separated from those volcanics by the Lewis Fault consist of undifferentiated quartzites, quartz mica schists and micaceous quartzites.

Geological mapping along the western boundary of the Precambrian has highlighted an abundance of secondary quartz veining throughout the westerly dipping quartzites. The complex structural trends and areal extent of this unit are evident from photogeological techniques.

CAMBRIAN

Porphyritic quartz-feldspar rhyolitic lava :

This massive unit dominates the lithologies of the Lewis River Volcanics and is mappable as a continuous belt from the southern coastline at Elliott Bay north to the Moores Fault a total exposure length of 20 kilometres. This report however, is restricted in its coverage, to the southern 5 kilometres of the lava belt. The width of this unit remains generally constant in the area under discussion with a maximum width of approximately 10 kilometres immediately north of the granite bodies.

Although mapped and discussed as a single unit, minor macroscopic differences are present throughout this lava belt. It is conceivable to assume that several stratigraphic equivalents are present.

Essentially the rock contains subhedral to enhedral phenocrysts of quartz and feldspar randomly disposed within a homogeneous microcrystalline groundmass showing relict flow textures. The quartz phenocrysts are commonly subrounded and embayed, with an average diameter of about 2mm. Quartz crystals usually amount for 30% of the total rock, with the feldspar content averaging approximately 20%.

The groundmass consists of diffuse cryptocrystalline to microcrystalline potash feldspar with abundant, small (0.1mm) mottled allotriomorphic quartz crystals. Commonly a penetrative hydrothermal alteration of the glassy groundmass results in a fairly uniform gross composition of extremely fine clays, shredded sericite and fine mottled patches of ultra-fine quartz.

This is a lava of gross rhyolitic composition, examples of which are represented by KR 3300 and KR 3606.

Feldspar-quartz-biotite rhyolitic porphyry:

This unit is the second most dominant massive lithology of the Lewis River Volcanics and abuts the eastern contact of the porphyritic quartz-feldspar rhyolitic lava throughout its exposure from 387,300E, 5 245,000N, (A.M.G.) (northern limit of reconnaissance geological mapping 1976-77) to the southern boundary of E.L. 27/76.

Characteristically this unit is green to dark green in colour and contains phenocrysts of feldspar (plagioclase and or orthoclase), quartz and biotite. The phenocrysts are generally within the medium grained (1-5mm) size category, however some feldspar phenocrysts have been observed to measure up to 10mm. The phenocrysts occur in a homogeneous, fine but not necessarily microcrystalline, mosaic of quartz and potash feldspar containing minor fine chlorite and biotite. Throughout this porphyry the biotite phenocrysts are generally highly chloritized often completely replaced by chlorited and titaniferous granules. The feldspar phenocrysts are variably replaced by sericite and clays.

Within this unit there is generally no clear evidence of primary flow, however wide spread shearing associated with shredded streaky meto-morphic sericite is present.

This porphry unit is of gross rhyolitic composition and is interpreted to be of extrusive or very high level intrusive origin, examples are represented by KR 3344 and KR 3442.

Rhyolitic lithic pyrolcastics

The nomenclature used in this report for the classification of lithic pyroclastics is based largely on the size of the contained fragments and follows that terminology described by Joplin (1971) in 'A Petrography of Australian Igneous Rocks'. Fragments over 32mm in diameter are called bombs and when compacted and cemented they give use to a coarse grained rock called agglomerate. Fragments measuring from 4mm to 32mm are called lapilli and smaller ash fragments form tuffs.

Within the southern portion of E.L. 27/76, as shown on Sheets KT 27/76 5A-8A, numerous zones of rhyolitic lithic pyroclastics have been mapped, it is considered that several of these zones may however be stratigraphic equivalents.

Characteristically the lithic tuff pyroclastics vary from pale to dark green in colour and are composed of a tightly packed semi-fused and roughly bedded aggregate of volcanic rock fragments of common composition averaging about 2mm in diameter. These fragments consist of a patchy diffuse microcrystalline to cryptocrystalline mosaic of potash feldspar, subordinate quartz and extremely fine sericite and biotite, minor scattered volcanic quartz crystals are also identified. Occasional fresh samples exhibit patchy, streaky textures in the ground-mass of the fragments indicative of a turbulent flow.

KR 3412 is an example of an extensively tectonised lithic quartz crystal tuff from the Voyager 1 area.

Rhyolitic crystal pyroclastics

The nomenclature used in this section of the report is identical to that described for the lithic pyroclastics, however in this case the fragments are mainly shattered crystalline material.

Within the area described on Sheets KT 27/76 5A-8A, numerous zones of rhyolitic crystal pyroclastics have been mapped, it is considered that several of these zones may however be stratigraphic equivalents.

The crystal pyroclastic lithology mapped within the Elliott Bay Area is of gross rhyolitic composition and characteristically is composed of a loosely packed aggregate of subrounded to subhedral and enlarged quartz crystals the average size of which vary between 1.5mm to 2mm. Minor crystals of potash feldspar, plagioclase, altered glass and mosaic quartz all form part of this aggregate situated within a chloritic and sericitic matrix containing ultra fine quartz and clouded ultra fine potassic material.

Thin section No KR 1496, situated to the east of Voyager 6 near the Lewis River is an example of a moderately sheared crystal lithic tuff. KR 3350 from the Voyager 3 area is a characteristic example of a quartz crystal tuff which, even though metamorphic textures make accurate petrography difficult, Pontifex considers that based upon the mode of occurrence of the quartz crystals and the lack of evidence of significant original feldspar this lithology is not lava.

Rhyolitic vitric pyroclastics

Examples of this unit occur throughout the mapped portion of E.L. 27/76, however appear to be more widespread within the Voyager 2 and 3 prospects.

Distinct boundaries for these exposures are somewhat hypothetical as these lithologies are considered, for the purpose of geological mapping to be gradational into the units of lithic and crystal tuff pyroclastics.

These rock units have a gross rhyolitic composition and are characterized by being extremely fine grained and composed of broken crystals of quartz (0.3mm) potash feldspar and angular tiny fragments of devitrified glass throughout a matrix of ultra fine quartz commonly crowded with micro foliae of sericite. KR 1467 is an example from the Voyager 2 prospect.

Volcaniclastic sediments

Numerous examples of volcaniclastic sediments have been mapped within the southern portion of E.L. 27/76 despite the fact that these fine grained friable sediment zones are highly prone to weathering and thus outcrops even within the creek beds are sparse. Locally the geology within these zonesxis complex, and when insufficient outcrop, distorted bedding, penetrative cleavage and alteration effects are considered, a wide variety of lithological types have been grouped to form this unit of volcaniclastic sediments.

Broadly the unit is characterized by pale grey to dark green fine grained laminated shales, however the grain size does vary from siltstone range to sandstone. Macroscopically the unit is poorly sorted with loosely packed aggregates of quartz grains within an extremely fine quartz-clay matrix. Within the coarser sandstone varieties single quartz crystals together with volcanic fragments, occur as hetrogeneous, loosley packed grains in an ultra fine chloritic clay matrix.

Well developed rounding and sorting within several of these units, particularly within the Voyager 2 area indicate that considerable reworking has taken place and although the source was likely to have been tuffaceous these units are now true sediments.

Penetrative cleavage is widespread and destructive to these fine grained rocks, in the more massive varieties discontinuous streaks of sericite throughout the matrix imply an incipient cleavage.

KR 3302 is an example of a reworked quartz crystal tuff? and is composed largely of volcanic quartz.

UPPER CAMBRIAN

Granite

Early workers regarded the granitic rocks of the Low Rocky Point and Little Rocky River plutons as being Devonian in age because of their massive and unaltered character in contrast to the cleaved and altered Darwin and Murchison granites which were regarded as Cambrian. Potassium-argon age dating of biotite from the adamellite at Low Rocky Point yields a Silurian age of 407 million years (McDougall and Leggo, 1965) which was regarded as a minimum due to the alteration of the biotite. White, N.C. 1975 regards the granitic rocks as Cambrian and considers they are related to either the Lewis River volcanics or to the Jukesian Orogency which deformed the volcanics in the late Cambrian.

The Low Rocky Point granite is generally finer grained and white coloured in its western portion, becomming pink and coarser grained towards the east. Both granite bodies are characterized by schistose faulted contacts with the surrounding volcanics, however detailed geological mapping on a local scale has shown considerable complexity of the contacts especially in the southern portion of the Voyager 1 area.

KR 3382 and KR 3464 are examples of the Little Rocky River granite and the Low Rocky Point granite respectively.

ORDOVICIAN

Owen conglomerate

This unit consists of an oligomictic quartz conglomerate of variable thickness represented sporadically by fine quartz sandstone and pebble beds.

In the northern portion of the area studied, due west of Voyager 9 and shown on Sheet KT 27/76 5A large isolated zones of siliceous conglomerate are interpretated as the southern extension of the Osmund Syncline. This interpretation is based upon photogeological techniques in the absence of regional mapping between Voyager 9 and the Wart Hill _ Mt Osmund area.

Numerous large float outcrops, interpreted as Owen Conglomerate, were located during the Voyager 3 geological mapping, occuring generally west of the Little Rocky River approximately 500 metres north of Big Beach. These remants display both brecciated and conglomeratic textures and are characteristically highly siliceous with an abundance of quartzite pebbles.

TERTIARY

Macquarie Beds

Reconnaissance in the northern portions of E.L. 27/76 is yet to be undertaken, thus information on the Tertiary Macquarie Beds of the Macquarie Harbour Graben (Moores Valley Graben?) is based upon experience gained during their study within E.L. 9/74 Birch Inlet. The Macquarie Beds are typically flat or gently dipping sediments which consist of unconsolidated sands and conglomerates.

Extensive thin pebble and sand horizons exposed in the Elliott Bay area north of Voyager 3 and studied in detail during the Voyager 8 Tin Study are tentatively interpreted as shallow marine deposits of Tertiary age. Local thickening of these deposits was investigated by drilling, pit and trenching techniques and a maxinum depth of in excess of approximately 14 metres was achieved in one locality.

QUATERNARY

Alluvial and colluvial deposits

Detritus, coarse and fine scree, alluvium and fluvioglacial sands and silts occur sporadically throughout the area. These units have not been mapped and were avoided during the geochemical stream sediment sampling programme.

It was found in all but the smallest streams that evidence of Cambrian lithologies was available where the drainage had cut down through the alluvial and fluvioglacial deposits of the large valleys.

GEOCHEMISTRY

Stream Sediment Sampling

Stream sediment sampling was selected as an appropriate exploration technique for the Elliott Bay area. The sample spacing of 200 metres and the size fraction for analysis, -80 mesh, were selected based upon experience within northern and south western Tasmania.

A total of 545 samples of the fine sediment material were collected from the streams, creeks and rivers draining the prospective area of Lewis River Volcanics. In addition to samples being taken every 200 metres along the drainage systems, one in ten locations were resampled to serve as checks.

Due to the difficulty of accurately positioning the sample locations on aerial photographs in this region, film copies of the 1:10,000 scale base maps were used to record the locations, each point being measured on the ground from a recognisable stream junction.

The sample locations were marked by flagging tape and numbered aluminuim tags. Details of location and type of sample were recorded on cards (KD series) which are filed in the Devonport office.

The samples were dried and rebagged as necessary prior to despatch to A.C.S. Laboratories, Adelaide. The -80 mesh fraction was separated and analysed for Cu, Pb, Zn, Ag, Mn, Fe, Ba and Sn. In addition 27 samples were selected on their resulting Pb and Zn analysed for Semi quantitative Emission Spectrographic Analysis Schemes E.S. 1-4 and E.S. 6. A total of 30 samples were selected for W analysis, 16 of which were also analysed for Sn. Both elements were analysed by X.R.F. methods.

The rationale in selecting the elements other than Cu, Pb and Zn was that the survey should be aimed at locating not only 'obvious' ore occurrences but also geochemically prospective areas in which the mineralization is non-outcropping or sub-outcropping.

The methods of sample preparation and analysis and the analytical results are tabulated in Appendices No's 1,2 and 3 and are presented on the following maps located in the folder of this report.

- Drainage Sample Location Map.
  Sheets KT 27/76 5C - 8C

- Drainage Geochemical Results.
  Copper, Lead and Zinc:
  Sheets KT 27/76 5B - 8B

- Drainage Geochemical Results.
  Tin:
  Sheets KT 27/76 5E - 8E.

C-Horizon Auger Sampling

Previous experience base upon geochemical orientation soil sampling within the Mt. Read Volcanics and its correlatives has indicated a sample depth of 2.0m or bedrock as the optimum depth of C-horizon geochemical soil sampling.

C-horizon soil sampling was carried out using a Jacro 200 auger rig mounted on the rear of a Muskeg Bombardier. Holes inaccessable to the drilling rig were hand augered to refusal using suitably modified 38mm diameter wood augers.

Auger sampling during the 1976-77 season was carried out at 25 metre centres on tape and compass reconnaissance grid traverses over the Voyager 1 and Voyager 2 prospects. Portions of the grids were sampled at 12.5 metre centres over zones considered to warrant a more detailed survey.

All soil samples were dried and rebagged, as necessary, prior to despatch to A.C.S. Laboratories, Adelaide. The -80 mesh fraction was separated and analysed for Cu, Pb, Zn, Ag, Fe, Mn, Ba and Sn. In addition 6 samples were selected on their resulting Pb and Zn analyses for Semi-quantitative Emission Spectrography schemes E.S. 1-4 and E.S. 6. The sample book numbers (KS series), method of preparation and analysis and the analytical results are tabulated in Appendices No's 4,5 and 6.

The results of the C-horizon auger sampling programme at Voyagers 1 and 2 are presented in profile form for Cu, Pb and Zn on the following map located in the folder of this report.

- C-Horizon Geochemical Results.
  Copper, Lead and Zinc Profiles:
  Voyager 1.
  Sheet KT 27/76-1E

- C-Horizon Geochemical Results.
  Copper. Lead and Zinc Profiles:
  Voyager 2.
  Sheet KT 27/76-1E

C-horizon auger sampling completed during the 1977-78 field programme was carried out at 25 metre centres on the Voyager 1 and Voyager 2 grids, however on account of the reconnaissance nature of the Voyager 3 and Voyager 9 surveys, the sample spacing was increased to 50 metre centres.

Rock chips returned to the surface with the auger cuttings during the C-horizon drilling were collected from each hole, washed and macroscopically examined to aid in the geological map compilation.

All samples were dried, rebagged as necessary and despatched to A.C.S. Laboratories. The -80 mesh fraction was analysed for Cu, Pb, Zn, Ag, Fe, Mn, Ba and Sn. 46 samples were selected on their resulting Pb and Zn analyses for Semi-quantitative Emission Spectrography schemes E.S. 1-4 and E.S. 6.

The sample book numbers (KS series), method of preparation and analysis and the analytical results are tabulated in Appendices No's 11, 12 and 13.

Maps presenting the contoured Cu Pb and Zn results of the C-horizon auger programmes carried out over the Voyager 1,2,3 and 9 prospects, together with maps showing the soil sample locations and auger hole depths, are enclosed in the folder of this report and listed in detail in the contents.

Rock Sample Analysis

In conjunction with the detailed geological mapping and stream sediment sampling, during the 1976-77 regional evaluation of the southern portion of E.L. 27/76, a total of 358 rock samples were collected.

A selection of 80 rock samples, diagnostic of areas containing significant chlorite or sericite alteration and visible sulphude mineralization was despatched to A.C.S. Laboratories, Adelaide for geochemical analysis. Cu, Pb, Zn, Ag, Mn, Cd and Fe were determined by A.A.S. As was analysed by the modified Gutzeit method and Sn by Emission Spectrography. A total of 19 samples were reassayed for Sn by X.R.F. methods and 7 samples, selected on their anomalous As results were analysed for low level Au by the C.R.A./A.A.S. method . In addition 4 samples were selected on the resulting Pb and Zn analyses for Semi-quantitative Emission Spectrographic analysis schemes E.S. 1-4 and E.S. 6.

The sample numbers, locations and assay results are recorded on the geological maps Sheets KT 17/76 5A - 8A in the folder of this report. The method of preparation, analysis and the results, recorded in numerical order are included as appendices No's 7, 8, 9 and 10.

Statistical Treatment

For the purpose of determining 'threshold' approximations for the Cu, Pb and Zn results from the geochemical drainage sampling survey, the area of Cambrian Lewis River Volcanics, approximately 51 square kilometres, was treated as a single population.

The probability density distribution plots or 'cumulative frequency' plots of the log 10 concentrations of Cu, Pb and Zn were calculated in order to determine the threshold values or approximate dividing points between overlapping log normal distributions. The results are shown in Figure No 2.

The method of selection of thresholds is subjective as several assumptions are required; the most important being that the accuracy of assaying is as good as the reported figures imply.

In this case the cumulative frequency plots for the Cu, Pb and Zn results approximate to straight lines and the points of inflection are not altogether obvious. Cu and Zn both showed a single point of inflection (P1), however Pb in addition to the higher P1 threshold is also characterized by a P2 inflection point.

The following are the thresholds above which the values can be considered statistically anomalous. The number of values above the threshold is expressed as a percentage of the total (in brackets).

	Elliott Bay E.L. 27/76		Lewis River Volcanics
	Cu	Pb	Zn
P1	5ppm (3.0%)	130ppm (0.3%)	55ppm (2.0%)
P2		50ppm (2.0%)	

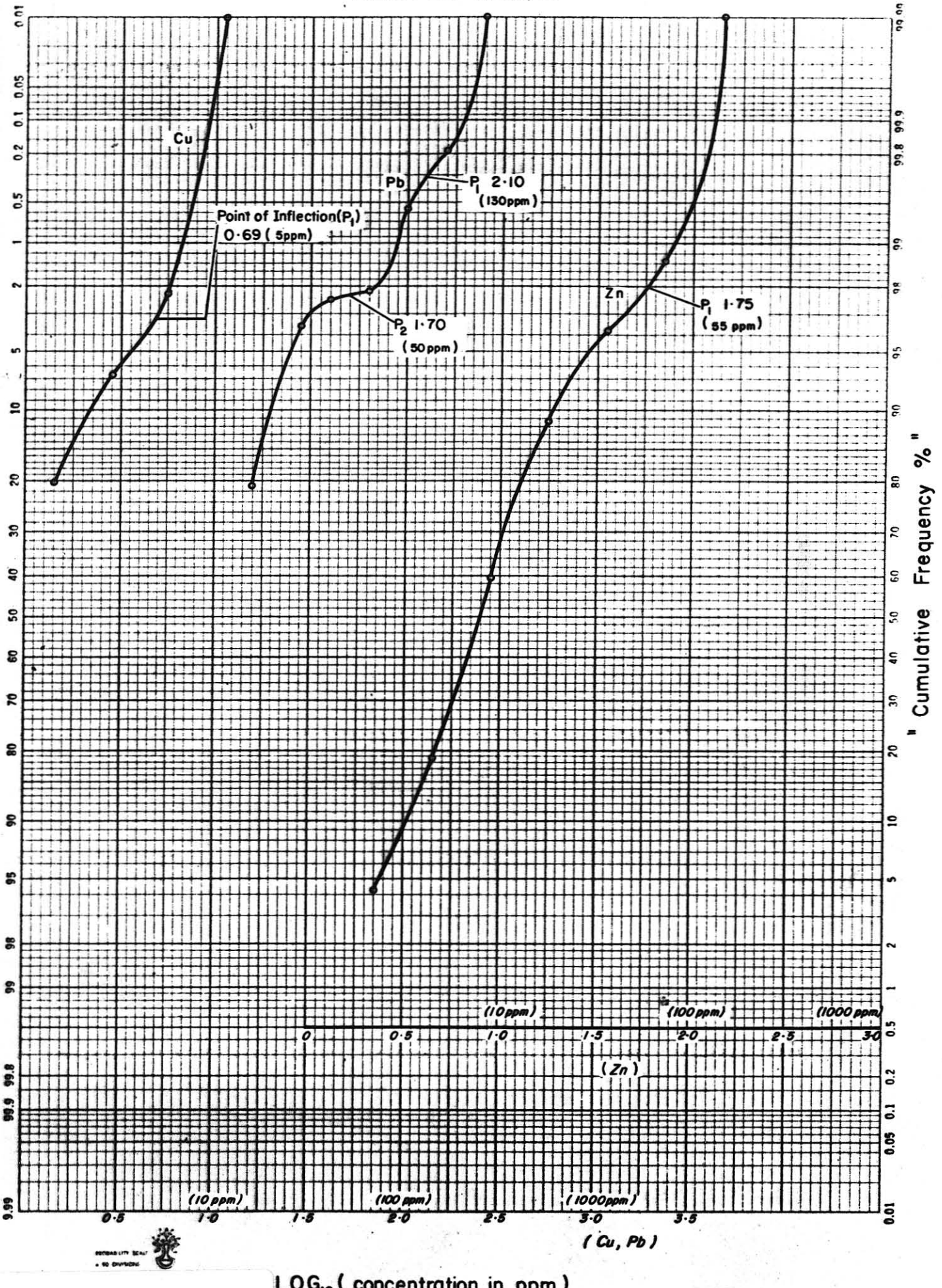
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Cumulative Frequency Plots — *stream sediment geochemistry*

Cu, Pb and Zn results : Lewis River Volcanics

ELLIOTT BAY E.L. 27/76



5 cm

Fig. No. 2.

For the purposes of displaying areas significantly anomalous in Cu and Zn within the zone of Cambrian Volcanics, it was found that the statistically derived thresholds (above) were highly satisfactory and closely approximated threshold values defined by eyeball techniques. The choice of higher or lower threshold values seriously affected the natural groupings of values highlighted by the statistical approach.

In the case of Pb however, the statistically derived upper threshold (Pl) was found to be highly restrictive. Eyeball techniques, aided by the statistical treatment of the data, were selected as the most appropriate method for interpreting the anomalous Pb values. By choosing a lower threshold value and thus incorporating a higher total percentage of values above the threshold, a more natural grouping of anomalous results was possible.

Four major groupings of anomalous results have been observed, namely Voyager 2, Voyager 3 Area, Voyager 9 Area and Voyager 10 which are detailed in the discussion section of this report.

Sheets KT 27/76 5B-8B display in colour coded symbolic format the creek systems interpreted as anomalous by a combination of statistical and eyeball techniques. Threshold values for Cu, Pb and Zn are 5ppm, 65ppm and 55ppm respectively.

GEOPHYSICS

Geophysical investigations carried out by Geopeko Limited - L.A. Richardson and Associates during the 1976-77 field season consisted of V.L.F. (E.M.) follow up of airborne electromagnetic anomalies resulting from the Geoex (1975) electromagnetic and aeromagnetic survey flown for the Broken Hill Proprietary Company. Ground surveys involving magnetics and Gradient Array induced polarization were also carried out on reconnaissance tape and compass traverses over zones of known mineralization, namely Voyager 1. A detailed report on all aspects of the 1976-77 geophysical survey is presented by Deakin, (1977).

During the 1977-78 field season geophysical investigations carried out by Geopeko Limited - L.A. Richardson and Associates consisted of systematic prospect evaluation surveys on prepared grids. The techniques utilized comprised V.L.F. (E.M.), magnetics, S.P. Dipole - Dipole induced polarization and Schlumberger vertical depth soundings. Detailed geophysical reports on all aspects of these surveys are presented by Mudge (1978).

V.L.F. (E.M.) (Very Low Frequency - Electro Magnetics.)

A Geonics E.M. 16 instrument was utilized as an easily portable rapid reconnaissance technique for ground follow up location of airborne electromagnetic anomalies. Anomalies comparable in strength and character to case history anomalies over known orebodies both in Tasmania and elsewhere were recorded, however the V.L.F. (E.M.) method is unable to discriminate between conductor types or define the geometry of the anomalous body.

The results need to be considered with the following points in mind.

- Any E.M. method is unable to discriminate between ionic and electronic conductors. In this S.W. Tasmanian environment

conductive shear zones give rise to large E.M. anomalies comparable to those anticipated from orebodies.

- In this environment near surface and sub-surface resistivities are very high. Consequently even poor conductors provide a large conductivity contrast and are easily detected by E.M. techniques.

- Broad E.M. anomalies may be the effect of a variation in lithology with no associated 'anomalous' conductor.

Magnetics

A Geometrics Uni Mag portable proton magnetometer (Model G-836) was used briefly as a ground reconnaissance tool during the 1976-77 field season to locate and investigate airborne E.M. and aeromagnetic anomalies. The restricted nature of the ground traverses, although verifying the existence of magnetic anomalies, was insufficient for adequate anomaly definition.

Detailed magnetics were carried out on all prospect grid traverses during the 1977-78 field season. The Geometrics Uni Mag (G836) was utilized for the Voyager 3 Area grid and for the initial location of the Voyager 9 magnetic anomaly centre, however a Geometrics field proton magnetometer (Model G-816) was used for the detailed magnetometer surveys of Voyager 1,2 and 9.

Induced Polarization

a. Gradient array induced polarization

During the 1976-77 survey I.P. was carried out on a single tape and compass traverse at Voyager 1 using a gradient array configuration. A 25 metre receiving dipole spacing was utilized and the signal received on a Scintrex (IPR-8) instrument.

b. Dipole - Dipole induced polarization

In an attempt to achieve a more effective depth discrimination of the anomalies while at the same time sacrificing structural information, it was decided to use the Dipole - Dipole configuration for induced polarization surveys during the 1977-78 field season.

Detailed I.P. was carried out on grid traverses at Voyager 1,2 and 3 using a Scintrex (IPR-8) receiver. All field results were plotted in the form of contoured pseudosections incorporating chargeability, resistivity and metal factor data.

Self Potential

S.P. has had a very limited use within E.L. 27/76 by Geopeko Limited. During 1976-77 a single traverse was read across Voyager 1 using an L.A. Richardson designed instrument.

The 10,000N grid traverse on the Voyager 2 prospect was read using S.P. during the 1977-78 field season utilizing a Fluke 8020A digital multimeter.

Schlumberger Vertical Depth Soundings

As a possible aid in the interpretation of the resistivity component of the Dipole - Dipole I.P. pseudosections, a series of Schlumberger Vertical Depth Soundings were carried out. Based on the existing geological information zones of uniform lithology in the Voyager 1,2 and 3 areas were chosen for the soundings.

DISCUSSION OF RESULTS.

The results of the 1976-77 and 1977-78 Elliott Bay Phase 1 exploration programmes are here discussed in detail. Prospects have been termed 'Voyager' and all exploration areas have been designated with (A.M.G.) Australian Map Grid co-ordinates relating to the approximate geographic centre of the anomalous area. The reader is refered to the 1:10,000 scale Geological Maps Sheets KT 27/76 5A-8A in the folder of the report on which all the prospects under discussion are located. The prospect location information is duplicated for reference on Figure 3. The Voyager 1,2 and 3 prospect/area geological mapping data is presented, in the interests of detail and clarity, as separate 1:5,000 scale maps in the folder of this report; Sheets KT 27/76 V1-2, KT 27/76 V2-2 and KT 27/76 V3A-3 / KT 27/76 V3B-4 respectively.

VOYAGER 1 AREA. (377,500E, 5 242,000N. A.M.G.)

Gridding.

During the 1976-77 field season, activities were concentrated on Voyager 1 (Penders Prospect). Four parallel reconnaissance grid lines, orientated approximately True North and spaced 50 metres apart, were established using tape and compass techniques, a total of 2300 metres.

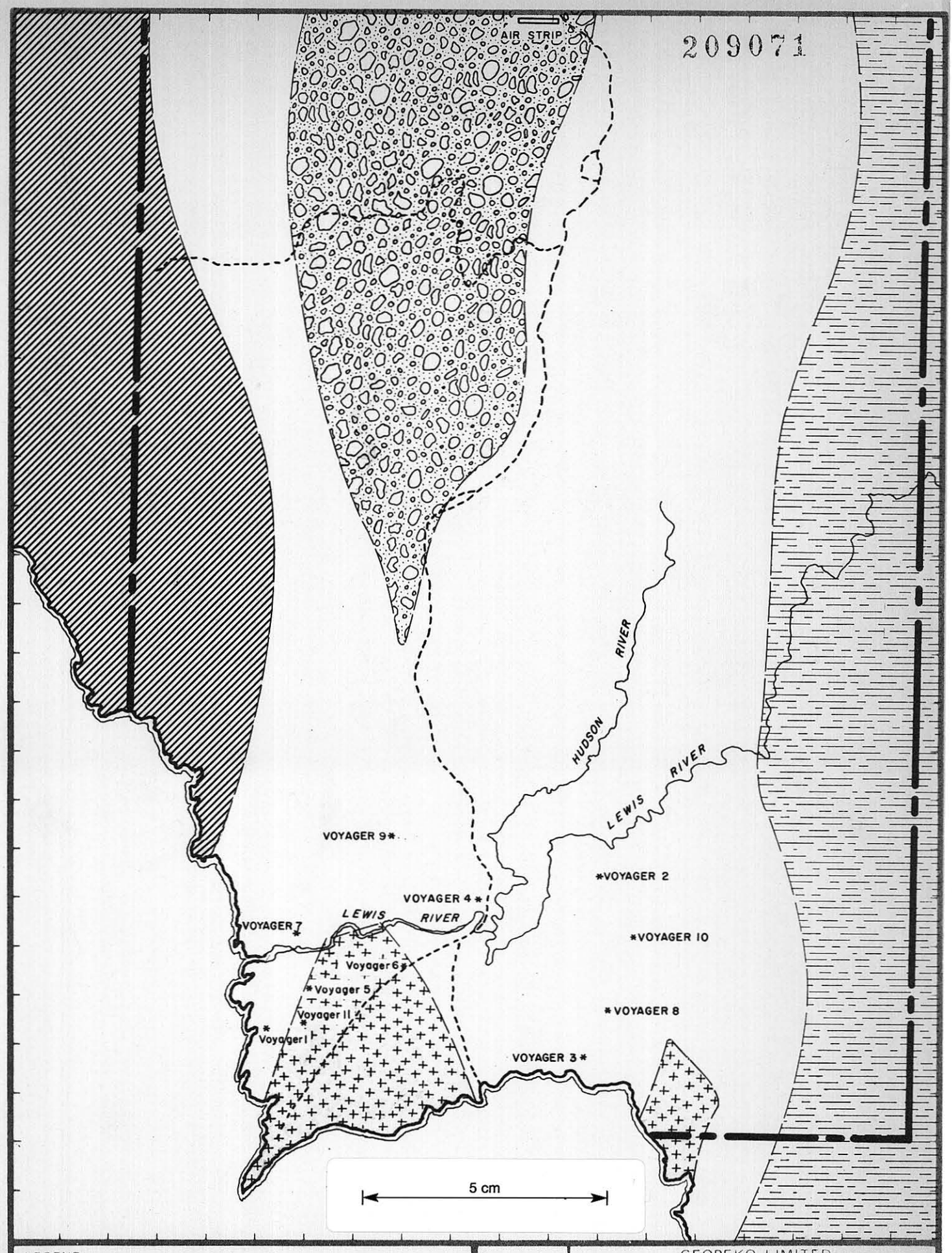
Sheet KT 27/76 7A details the reconnaissance grid layout at Voyager 1.

Resulting from the geological mapping, C-horizon auger drilling, rock geochemistry and geophysics carried out over the Voyager 1 grid during 1976-77, together with the brief geophysical investigations at Voyager 5 and Voyager 11 , the Voyager 1 Area Grid was designed and implemented during the 1977-78 field season.

This grid formed the basis of a systematic study of the Lewis River Volcanics to the west of the Low Rocky Point granite.

070

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LEGEND:

- Ordovician conglomerate
- € granite
- € Mt READ volcanics
- € Dundas group
- P € quartzite

GEOPEKO LIMITED
KING ISLAND

Scale 1:100 000

Fig 3

DATE May '79
GEOL C.D.S.
DWN J.P.M.
CHKD

ELLIOTT BAY
E.L. 27/76
Prospect Location Map

Complete analytical results for Cu, Pb, Zn, Ag, Mn, Fe, Ba and Sn for the C-horizon samples at Voyager 1 are tabulated in Appendices No's 4,5 and 6.

Peak values obtained from rock samples of the mineralized zone at Voyager 1 were)10,000 ppm Cu, 2650 ppm Pb and 3020 ppm Zn. Complete analytical results for Cu, Pb, Zn, Ag, Mn, Fe, Cd, As, Sn and Au from Voyager 1 rock geochemistry are tabulated on Sheet KT 27/76 7A and presented in Appendices No's 7, 8, 9 and 10.

During the 1977-78 season, C-horizon geochemistry was carried out at 25 metre centres on the Voyager 1 Area grid traverses. Based on geological mapping the geochemical survey was restricted to the Lewis River Volcanics and the contact zone of these volcanics with the Low Rocky Point granite.

Augering was carried out using a Jacro 200 rig mounted on a Muskeg Bombardier and C-horizon samples were obtained from an optimum depth of 2.0 metres of refusal. In areas inaccessable to the rig, augering was completed by hand auger techniques.

A total of 287 holes were augered, producing 318 samples (including duplicates) for a total depth of 528.80 metres. The 1 in 10 duplicate sampling procedure acts as an assaying check.

The analytical results for Cu, Pb and Zn are presented in contoured form on map numbers:

KT 27/76 V1-3	C-horizon Geochemical Results, Copper Contours
KT 27/76 V1-4	C-horizon Geochemical Results, Lead Contours
KT 27/76 V1-5	C-horizon Geochemical Results, Zinc Contours

Complete analytical results for Cu, Pb, Zn, Ag, Mn, Fe, Ba and Sn from the Voyager 1 Area grid C-horizon geochemical programme are presented in Appendices No's 11, 12 and 13.

A control station was established at 378,000 E, 5 241,000 N (A.M.G.) corresponding to grid co-ordinates 10,100 E, 11,000 N. The baseline, 10,000 E, was surveyed between 9,600 N and 12,400 N using a theodolite. Pegs were placed at 50 metre intervals along the baseline. Crosslines were surveyed normal to the baseline every 200 metres with pegs located at 50 metres either side of the baseline. Crosslines were range poled and pegged at 50 metre centres. In total 2,800 metres of theodolite gridding and 17,575 metres of range pole gridding were completed.

Sheet KT 27/76 V1-2 details the Voyager 1 Area grid layout and peg positions.

Geochemistry.

Reconnaissance C-horizon auger sampling during 1976-77 was carried out at 25 metre centres on lines 50 E and 150 E of the Voyager 1 (Penders Prospect) grid. To enable more accurate testing of the proposed north easterly extension of the Voyager 1 mineralized zone, the auger hole spacing was closed up to 12.5 metre centres on line 50 E between 00 N and 250 S and on line 150 E between 100 N and 100 S.

Augering was carried out using Jacro 200 rig mounted on a Muskeg Bombardier and C-horizon samples were obtained from an optimum depth of 2.0 metres of refusal. In areas inaccessable to the rig, augering was completed by hand-auger techniques.

A total of 52 holes were augered, producing 59 samples (including duplicates) for a total depth of 80.60 metres. The 1 in 10 duplicate sampling procedure acts as an assaying check.

The Cu, Pb and Zn results are presented in profile form on Sheet KT 27/76 1G. Line 150 E shows the greater base metal response with peak values of 55 ppm Cu, 80 ppm Pb and 140 ppm Zn. These results were of sufficient character to confirm the existence of a narrow north easterly extension of the Voyager 1 mineralized zone.

Soil sample numbers (KS Series) and auger hole depths are shown on Sheet KT 27/76 V1-7.

Geology.

Sheet KT 27/76 V1-2 presents a detailed geological interpretation of the Voyager 1 Area. In addition to the many rocks identified and plotted during the reconnaissance geological mapping (1976-77) and the Voyager 1 Area grid mapping (1977-78) 141 rocks were collected for closer macroscopic study after diamond sawing. The plan location of these samples is shown on Sheet KT 27/76 V1-6, the rocks are in storage at Geopeko Limited, Devonport.

Rock chip samples from the 287 C-horizon auger holes were also logged to aid in the geological map compilation. Sheet KT 27/76 V1-8 displays in symbolic format the rock chips geology.

In total 7 rock samples from this area were despatched to I.R. Pontifex and Associates, Adelaide for petrological examination. Appendix 14, Mineralogical Report Number 2261 provides details of this study.

All grid traverses and outcrops within the Voyager 1 Area were geologically mapped at 1:5,000 scale. Sheet KT 27/76 V1-2 displays the results of the 1:5,000 scale mapping together with the replotted 1:10,000 scale reconnaissance geological results.

The Voyager 1 area consists of a unit of Lewis River Volcanics immediately west of the Low Rocky Point granite body extending from the coastal exposures of that granite in the south, north to the Lewis River.

The western margin of the Low Rocky Point granite is ill defined in land due to a scarsity of outcrop, and the geological interpretation in this region is based largely upon auger hole rock chip data. The south western coastal exposures of the granite display on a local scale considerable alteration and dyke intrusion. Basic dykes and highly altered porphyritic lava units containing trace magnetite are present. Adjacent to the Lewis River in the north eastern portion of this study area evidence of andesite was noted.

The Lewis River volcanics in this study area are dominantly sheared pale fine grained porphyritic quartz feldspar rhyolitic lavas complexly intercalated in part with pyroclastic tuffs. Coastal exposures commonly display at least two major phases of deformation within the volcanics. The first appears to have produced tight folding with slaty cleavage and the second deformation folded the slaty cleavage and imposed a crenulation cleavage.

The Voyager 1 Prospect (Penders Prospect) was examined in detail as an example of known sulphide mineralization within this suite of dominantly cleaved sericitic porpheritic lavas and pyroclastic lithologies. The prospect consists of two concordant parallel zones up to 2 metres in width approximately 10 metres apart. They consist of intensely chloritic rock containing abundant pyrite and minor chalcopyrite. The gangue consists of chlorite, sericite, carbonate, magnetite and quartz. Local concentrations of chalcopyrite together with chlorite pyrite and quartz and disseminations of pyrite are visible irregularly along this coastal section, particularly towards the granite contact in the south.

Geophysics

Reconnaissance geophysics carried out on the Voyager 1 prospect grid 1976-77 involved V.L.F. (E.M.) on all four traverses and S.P., I.P. and resistivity on traverse 150E. Although broad in-phase V.L.F. (E.M.) lows were recorded on lines 50E, 100E and 150E, these anomalies were not supported by coincident I.P. effects, which suggests the cause of the E.M. response is non-metallic and probably reflects a lithological differentiation.

No anomalous S.P. character was recorded on line 150E.

During the 1977-78 field season, ground geophysical techniques involving magnetics, I.P., V.L.F. (E.M.) and vertical electrical sounding were used over the extensive Voyager 1 Area grid.

There was little correlation between magnetic and I.P. results.

The I.P. survey located the extent of the outcropping mineralization at the Voyager 1 prospect and indicated the polarizable source to be of small dimensions.

An accurate position of the Low Rocky Point Granite - Lewis River Volcanics contact was defined by interpretation of the I.P. chargeability data.

Strong in-phase V.L.F. (E.M.) anomalies were detected over the zone of the I.P. anomalies.

The high resistivities of the environment and the good correlation between V.L.F. (E.M.) and I.P. anomalies indicate that the V.L.F. (E.M.) method may prove useful for further work within E.L. 27/76.

Discussion

Although the detailed regional evaluation of the Voyager 1 area was geochemically disappointing the geological environment and the regional ground magnetic survey results are encouraging. The narrow linear magnetic horizon extending north from the Voyager 1 prospect warrants additional investigation in so far as it may represent a strataform mineralized horizon.

As concluded by previous workers, the mineralization present at the Voyager 1 prospect has value only in its academic interest.

VOYAGER 2. (384,250 E, 5 245,250 N. A.M.G.)

Gridding.

During the 1976-77 field season two parallel reconnaissance grid lines, orientated approximately 90° Mag. and spaced 500 metres apart, were established over Voyager 2 (Lewis River Prospect) using tape and compass techniques, a total of 1,350 metres.

Sheet KT 27/76 6A details the reconnaissance grid layout at Voyager 2.

Resulting from the geological mapping, C-horizon auger drilling, rock geochemistry and geophysics carried out over the reconnaissance grid during 1976-77, the Voyager 2 grid was designed and implemented during the 1977-78 field programme.

This grid formed the basis of a systematic study of the 'Lewis River Prospect' and environs.

A control station was established at 384,500 E, 5 245,200 N (A.M.G.) corresponding to grid co-ordinates 10,200 E 9,800 N. The baseline 10,000 E was surveyed between 9,200 N and 10,000 N using a theodolite. Due to topographic difficulties between 10,000 N and 10,400 N the baseline was offset to 9,850 E. Pegs were placed at 50 metre intervals along the baseline. Crosslines were surveyed normal to the baseline every 200 metres with pegs located at 50 metres either side of the baseline. Cross lines were range poled and pegged at 50 metre centres. In total 1,200 metres of theodolite gridding and 5,800 metres of range pole gridding were completed.

Sheet KT 27/76 V2-2 details the Voyager 2 grid layout and peg positions.

Geochemistry.

Reconnaissance C-horizon auger sampling during 1976-77 was carried out at 25 metre centres on lines 00 N and 500 S of the Voyager 2 (Lewis River Prospect) grid. To enable more accurate

evaluation of the known mineralized outcrop zone the auger hole spacing was closed up to 12.5 metre centres on line 00 N between 200 E and 300 E.

Augering was carried out using a Jacro 200 rig mounted on a Muskeg Bombardier and C-horizon samples were obtained from an optimum depth of 2.0 metres or refusal. In areas inaccessable to the rig, augering was completed by hand-auger techniques.

A total of 31 holes were augered, producing 35 samples (including duplicates) for a total depth of 26.95 metres. The 1 in 10 duplicate sampling procedure acts as an assaying check.

The Cu, Pb and Zn results are presented in profile form on Sheet KT 27/76 1G. Lines 00 N and 500 S show coincident anomalous Cu, Pb and Zn results. Peak values of 1,140 ppm Cu, 160 ppm Pb and 140 ppm Zn were obtained on traverse 500 S approximately 550 metres south east of the old workings. This brief reconnaissance survey indicated an significant extension to the Voyager 2 mineralized zone.

Complete analytical results for Cu, Pb, Zn, Ag, Mn, Fe, Ba and Sn for the C-horizon samples at Voyager 2 are tabulated in Appendices No's 4, 5, and 6.

Peak values obtained from rock samples of the mineralized zone at Voyager 2 were 4200 ppm Cu, 740 ppm Pb and 510 ppm Zn. Complete analytical results for Cu, Pb, Zn, Ag, Mn, Fe, Cd, As, Sn and Au from Voyager 2 rock geochemistry are tabulated on Sheet KT 27/76 6A and presented in Appendices No's 7, 8, 9 and 10.

During the 1977-78 season, C-horizon geochemistry was carried out at 25 metre centres on the Voyager 2 grid traverses. The geochemical survey was planned to evaluate the base metal potential of the Lewis River Volcanics in the vicinity of the Voyager 2 mineralized zone, with special reference to along strike extensions.

Augering was carried out using a Jacro 200 rig mounted on a Muskeg Bombardier and C-horizon samples were obtained from an optimum depth of 2.0 metres or refusal. In areas inaccessable to the rig, augering was completed by hand auger techniques.

A total of 215 holes were augered, producing 234 samples (including duplicates) for a total depth of 304.40 metres. The 1 in 10 duplicate sampling procedure acts as an assaying check.

The analytical results for Cu, Pb and Zn are presented in contoured form on map numbers:

KT 27/76 V2-3 C-horizon Geochemical Results, Copper Contours.
KT 27/76 V2-4 C-horizon Geochemical Results, Lead Contours.
KT 27/76 V2-5 C-horizon Geochemical Results, Zinc Contours.

Complete analytical results for Cu, Pb, Zn, Ag, Mn, Fe, Ba and Sn from the Voyager 2 grid C-horizon geochemical programme are presented in Appendices No's 11, 12 and 13.

Soil sample numbers (KS Series) and auger hole depths are shown on Sheet KT 27/76 V2-7.

Geology.

Sheet KT 27/76 V2-2 presents a detailed geological interpretation of the Voyager 2 prospect. In addition to the many rocks identified and plotted during the reconnaissance geological mapping (1976-77) and the Voyager 2 grid mapping (1977-78) 103 rocks were collected for closer macroscopic study after diamond sawing. The plan location of these samples is shown on Sheet KT 27/76 V2-6, the rocks are in storage at Geopeko Limited, Devonport.

Rock chip samples from the C-horizon auger holes were also logged to aid in the geological map compilation. Sheet KT 27/76 V2-8 displays in symbolic format the rock chip geology.

In total 2 rock samples from this area were despatched to I.R. Pontifex and Associates, Adelaide for petrological examination. Appendix 14, Mineralogical Report Number 2261 provides details of this study.

All grid traverses and outcrops within the Voyager 2 area were geologically mapped at 1:5,000 scale. Sheet KT 27/76 V2-2 displays the results of the 1:5,000 scale mapping together with the replotted 1:10,000 scale reconnaissance geological results.

The Voyager 2 prospect consists of a complex unit of dominantly vitric tuff pyroclastics intercalated with both crystal tuff and rarer lithic tuff varieties. Present also are volcaniclastic sediments representing well reworked tuffs. To the east of the prospect occurs the more widespread rhyolitic porphyritic quartz-feldspar lava lithology which contacts, further to the east, from regional mapping, a unit of massive feldspar-quartz-biotite porphyry.

The host rocks are very similiar to those encountered in the Voyager 3 area along the coastal section of Elliott Bay.

The Voyager 2 prospect (Lewis River Prospect) was examined in detail as an example of known sulphide mineralization within the Lewis River volcanics. The mineralization visible occurs patchely over a strike length of approximately 400m and varies from 5cm to 2m in width. Two small shafts and a costean are evidence of historical activity on the widest and most consistent portion of the occurrence which strikes approximately 140^{o} and dips to the west at between 45^{o}-60^{o}..

The vein like deposit has a typical gossanous outcrop and consists of dark yellow-brown siderite, black manganese oxides and white quartz, the latter often the dominating gangue mineral. Within this assemblage occurs blebs and stringers, from a few mm to 2-3cm of pyrite, chalcopyrite and very rare sphalerite. Sulphides are very scarce in the quartz dominated parts

of the deposit. The contacts with the surrounding host rocks are sharp and no obvious alteration features are visible in the pale fine tuffs. Rare pyrite cubes were the only sulphide mineralization visible in the surrounding host lithologies.

Geophysics

Ground geophysics carried out over the Voyager 2 prospect reconnaissance grid during the 1976-77 season involved V.L.F. (E.M.) and magnetics.

No anomalous magnetic character was recorded on either traverse.

Due to insufficient V.L.F. (E.M.) coverage no positive conclusions were reached. On the basis of the geochemical and geological considerations additional geophysics in this area was warranted.

During the 1977-78 field season ground geophysical methods involving magnetics, I.P., V.L.F. (E.M.), S.P. and vertical electrical sounding were used over the Voyager 2 grid.

The I.P. survey located a narrow north-south striking polarisable zone along 10,050E, the most encouraging anomalies occur on lines 9,600N and 9,800N. A significant V.L.F. (E.M.) anomaly was detected in association with the I.P. anomalies on line 10,000N.

No magnetic anomaly was detected in the Voyager 2 prospect area, confirming the results of the airborne survey.

The known sulphide mineralization produced no S.P. anomaly indicating that either the environment or the mineralization is not suited to the S.P. method or that insufficient sulphide mineralization is present for the development of a significant S.P. response.

Discussion

The detailed geological, geochemical and geophysical investigation of the Voyager 2 prospect highlighted a significant geochemical character associated with a favourable geological environment of pyroclastic and volcaniclastic lithologies. Of greatest significance is the presence of Cu-Pb anomalies higher in the sequence paralleling both the known mineralized horizon and the foliation of the host lithologies.

This prospect has now been adequately tested both geochemically and geophysically and has generated several targets for shallow auger core testing for additional siderite-sulphide lodes.

VOYAGER 3 AREA. (384,000E, 5 241,500N. A.M.G.)

Gridding.

During the 1976-77 field season a single 900 metre tape and compass traverse was established at approximately 90° (TRUE) in the vicinity of the Voyager 3 prospect (A.E.M. No. 3) for geophysical and geological purposes..

Sheet KT 27/76 8A details the reconnaissance grid lay out at Voyager 3.

Resulting from the regional geological mapping in the coastal region of Elliott Bay the Voyager 3 Area grid was designed to form the basis of a systematic study of the irregularly mineralized Lewis River Volcanics immediately to the north of Elliott Bay and the environs of Voyager 3, involving geological mapping, C-horizon auger drilling, rock sample geochemistry and geophysics.

The implementation of the Voyager 3 Area grid occurred during the 1977-78 field season.

A control station was established at 384,000 E, 5 241,400 N (A.M.G.) corresponding to grid co-ordinates 10,000 E, 9,600 N. Two major traverses 9,600 N and 10,000 N were completed for the evaluation programme and a third traverse 9,400 N was established during the exercise for immediate follow up purposes. Theodolite gridding techniques were used throughout with pegs located at 50 metre intervals.

Sheets KT 27/76 V3 A-3 and KT 27/76 V3 B-3 detail the Voyager 3 Area grid lay out and peg positions.

Geochemistry.

Rock samples collected along the coastal section of Elliott Bay to the south and east of the Voyager 3 prospect resulted in peak values of 350 ppm Cu, 3850 ppm Pb and 6500 ppm Zn. Complete analytical results for Cu, Pb, Zn, Ag, Mn, Fe, Cd, As, Sn and Au from the Voyager 3 rock geochemistry are tabulated on Sheet KT 27/76 8A and presented in Appendices No's 7,8,9 and 10.

During the 1977-78 field programme, C-horizon geochemistry was carried out at 50 metre centres on the Voyager 3 Area grid traverses. The geochemical survey was planned to evaluate the base metal potential of an area of approximately 10 square kilometres showing irregular mineralization during coastal geological mapping.

Augering was carried out using a Jacro 200 rig mounted on the rear of a Muskeg Bombardier and C-horizon samples were obtained from an optimum depth of 2.0 metres or refusal. In areas inaccessable to the rig, augering was completed by hand auger techniques.

A total of 233 holes were augered, producing 263 samples (including duplicates) for a total depth 451.60 metres. The 1 in 10 duplicate sampling procedure acts as an assaying check.

The analytical results for Cu, Pb and Zn are presented in contoured form on map numbers:

KT 27/76 V3 A - 5,	C-horizon Geochemical Results,	Copper Contours
KT 27/76 V3 B - 6,	C-horizon Geochemical Results,	Copper Contours
KT 27/76 V3 A - 7,	C-horizon Geochemical Results,	Lead Contours
KT 27/76 V3 B - 8,	C-horizon Geochemical Results,	Lead Contours
KT 27/76 V3 A - 9,	C-horizon Geochemical Results,	Zinc Contours
KT 27/76 V3 B -10,	C-horizon Geochemical Results,	Zinc Contours

Complete analytical results for Cu, Pb, Zn, Ag, Mn, Fe, Ba and Sn from the Voyager 3 Area grid C-horizon geochemical programme are presented in Appendices No's 11, 12 and 13.

Soil sample numbers (KS Series) and auger hole depths are shown on Sheets KT 27/76 V3 A-13 and KT 27/76 V3 B-14.

Geology.

Sheets KT 27/76 V3 A-3 and KT 27/76 V3 B-4 present a detailed geological interpretation of the Voyager 3 Area. In addition to the many rocks identified and plotted during the reconnaissance geological mapping (1976-77) and the Voyager 3 Area grid mapping (1977-78) rocks were collected for closer macroscopic study after diamond sawing. The plan location of these samples is shown on Sheets KT 27/76 V3 A-11 and KT 27/76 V3 B-12, the rocks are in storage at Geopeko Limited, Devonport.

Rock chip samples from the 233 C-horizon auger holes were also logged to aid in the geological map compilation. Sheets KT 27/76 V3 A-15 and KT 27/76 V3 B-16 display in symbolic format the rock chip geology.

In total 6 rock samples from this area were despatched to I.R. Pontifex and Associates, Adelaide for petrological examination. Appendix 14, Mineralogical Report Number 2261 provides details of this study.

All grid traverses and outcrops within the Voyager 3 Area were geologically mapped at 1:5,000 scale. Sheets KT 27/76 V3 A-3 and KT 27/76 V3 B-4 display the results of the 1:5,000 scale mapping together with the replotted 1:10,000 scale reconnaissance geological results.

The Voyager 3 Area study concentrated on the 4km wide zone of Lewis River volcanics situated immediately north of the Elliott Bay coastline between the Low Rocky Point granite and the Little Rocky River granite. Dominantly the Lewis River volcanics in this area are composed of rhyolitic quartz-feldspar porphyritic lavas, however west of Barrel Creek there exists a complex sequence of crystal tuff and vitric tuff pyroclastics intercalated with rarer lithic tuff and porphyritic lava lithologies.

The coastal area of Elliott Bay consists of several flat plateau surfaces covered with low button grass, thus with the percentage of outcrop in the order of 10% the prospect geological interpretation has drawn heavily on geological data obtained from the C-horizon geochemical auger drill holes.

Mineralization occurs at the Drake Creek prospect and also in the vicinity of Barrel Creek. This mineralization was reported by L.E.E. in 1957, however due to the visible lack of grade and tonnage no workings are present. The host rocks are strongly cleaved rhyolitic pyroclastics and lavas? and the mineralization consists of disseminated and veined pyrite, minor galena, chalcopyrite and malachite. Sphalerite was not observed but is present as indicated by analysis of sample KR 1464, Cu 350ppm, Pb 3850, Zn 6500ppm. The mineralized rocks are often high in limonite and hematite and assay up to 40% Fe.

The host rocks are very similar to those encountered in the Voyager 2 area approximately 4km to the north.

Geophysics

Ground geophysics carried out on the reconnaissance traverse at Voyager 3 involved V.L.F. (E.M.) and magnetics. Dense rain forest conditions prevented the extension of this traverse further to the west.

Magnetic data recorded no anomalous character and a geophysical interpretation of the V.L.F. (E.M.) noise suggests the possibility of an anomaly to the west. The Voyager 3 prospect was inadequately located and remained untested.

On the basis of favourable rock lithologies, visible minor mineralization and significant rock geochemistry, the Voyager 3 Area grid was read with a variety of geophysical techniques during the 1977-78 field season, including magnetics, I.P. and vertical electrical sounding.

Significant I.P. anomalies were detected at 9600N, 8850E, 9600N, 10000E, and 10000N, 9200N. These anomalies are characteristic of polarizable sources with a near surface expression.

A broad magnetic anomaly associated with a small I.P. response was detected on line 10,000N. This anomaly which may represent a polarizable magnetic body was detected by the Geoex 1975 airborne survey.

A weak magnetic anomaly, also detected by the Geoex survey, was recorded on the western granite contact and may be related to the I.P. response on line 9400N.

Discussion

The broad wide spaced geological, geochemical and geophysical investigation of the Voyager 3 area was intended to delineate inland the location and character of the visible coastal mineralization at the Voyager 3 prospect and to investigate regionally the background responses of the various lithologies of the Lewis River volcanics and the granite bodies.

The investigation highlighted a significant geochemical character in the vicinity of the Voyager 3 prospect associated with a favourable geological environment of pyroclastic lithologies.

The 400m x 50m and 200m x 50m sample spacing has inadequately defined the Cu, Pb and Zn C-horizon geochemical anomalies present at the Voyager 3 prospect additional follow up exploration based upon at 100m x 25m grid is warranted to produce accurate geochemical and geophysical targets for shallow auger-core testing.

VOYAGER 4 (381,800 E, 5 244, 700 N. A.M.G.)

Gridding

Two parallel reconnaissance tape and compass traverses orientated at approximately 67° (Mag) and spaced 100 metres apart were established during the 1976-77 field season to enable ground geophysical investigations of the Geoex (1975) airborne E.M. anomaly No 18. A total of 1650 metres of gridding was completed.

Sheet KT 27/76 7A details the reconnaissance grid layout at Voyager 4.

Geochemistry.

Although no prospect geochemical evaluation has been carried out to date, the creeks and streams within this area were tested during the 1976-77 regional stream sediment sampling programme.

An anomalous Cu, Zn response is present immediately south of Voyager 4 and approximately 600 metres north of the prospect several anomalous Cu, Pb and Zn results occur.

Rock sample KR 3494, an example of porphyritic quartz-feldspar rhyolitic lava containing minor pyrite, reported background values of 10 ppm Cu, <20 ppm Pb and 30 ppm Zn. Complete analytical results are tabulated on Sheet KT 27/76 7A and presented in Appendices No's 7,8,9 and 10.

Geology.

Sheet KT 27/76 7A presents a geological interpretation of the Voyager 4 prospect based upon the 1:10,000 scale reconnaissance mapping programme.

Brief reconnaissance geological mapping in the environs of this prospect indicates that it is situated within a broad zone of rhyolitic quartz-feldspar porphyritic lava. Minor pyrite veining was noted in one locality and general pervasive sericitic alteration is widespread.

Geophysics

Ground geophysical investigations carried out over the Voyager 4 prospect during the 1976-77 season involved both V.L.F. (E.M.) and magnetics.

No anomalous magnetic character was recorded during the survey of line 00N.

Inconclusive V.L.F. (E.M.) results were achieved with both high and low frequency in - phase displacements present.

No additional geological, geochemical or geophysical investigations were carried out during the 1977-78 season.

Discussion

Geophysically the prospect is incompletely located and based upon several nearby stream sediment results the environs of Voyager 4 are geochemically interesting. However until such times that the reconnaissance investigation of the northern portion of E.L. 27/76 is carried out the Voyager 4 prospect does not warrant further study.

VOYAGER 5. (378,400 E, 5 242,800 N. A.M.G.)

Gridding.

Four parallel reconnaissance tape and compass traverses orientated at approximately 90° (TRUE) and spaced 100 metres apart were established during the 1976-77 field season to enable ground geophysical investigations of a Geoex (1975) airomagnetic anomaly. A total of 3050 metres of gridding was completed.

Sheet KT 27/76 7A details the reconnaissance grid layout at Voyager 5.

During the 1977-78 season the Voyager 1 Area Grid design incorporated the Voyager 5 prospect within the Voyager 1 Study Area. Sheet KT 27/76 V1-2 details the Voyager 1 Area grid layout and peg positions.

Geochemistry.

As this prospect is situated within the Low Rocky Point Granite no detailed or regional geochemical evaluation has been considered warranted at this stage.

Geology.

Sheet KT 27/76 7A presents a geological interpretation of the Voyager 5 prospect based upon the 1:10,000 scale reconnaissance mapping programme.

All grid traverses and outcrops within the Voyager 1 Area were geologically mapped at 1:5,000 scale. Sheet KT 27/76 V1-2 displays the results of the 1:5,000 scale mapping together with the replotted 1:10,000 scale reconnaissance geological results.

An almost total absence of outcrop in this area of gently undulating plateau necessitated the geological interpretation to be based largely upon the auger hole rock chip data. This interpretation positions Voyager 5 within the Low Rocky Point granite body.

An isolated outcrop of rhyolitic vitric-crystal tuff pyroclastics at 12000N/100E together with the geophysical interpretation of the I.P. resistivity data suggests that the Lewis River volcanics/Low Rocky Point contact could be further to the east in close proximity to Voyager 5.

Geophysics

Reconnaissance geophysics carried out on the Voyager 5 prospect grid involved magnetics on all four traverses and V.L.F. (E.M.) on lines 00N and 200N.

The broad magnetic anomaly was adequately located but insufficiently defined to enable shape and extent to be determined.

The V.L.F. (E.M.) survey recorded three significant anomalies of inconclusive origin which were considered of sufficient potential to warrant I.P. follow up.

On the basis of the encouraging reconnaissance ground geophysics during the 1976-77 season, the Voyager 5 prospect was more closely examined geophysically as part of the Voyager 1 Area grid programme.

A detailed magnetometer survey defined the Voyager 5 anomaly between lines 11,600N and 12,400N, bounded at the east by 10,500E and to the west by 9,900E. This prominent aeromagnetic anomaly (Geoex 1975) is a series of magnetic highs of about 1000nT amplitude orientated in a north west direction.

A small well developed I.P. anomaly of limited extent was detected at Voyager 5.

Discussion

Significant magnetics together with a coincident I.P. anomaly at Voyager 5 make this prospect worthy of further investigation to the point of verifying the location of the granite contact.

VOYAGER 6 (380,300 E, 5 243,800 N. A.M.G.)

Gridding.

A single 800 metre tape and compass traverse orientated at approximately 90° (Mag) was established during the 1976-77 field season to enable ground geophysical investigations of a Geoex (1975) aeromagnetic anomaly.

Sheet KT 27/76 7A details the reconnaissance grid layout at Voyager 6.

Geochemistry.

Although no prospect geochemical evaluation has been carried out to date, the creeks and streams within this area were tested during the 1976-77 regional stream sediment sampling programme.

No significant anomalous Cu, Pb and Zn results occur over the prospect, however a single anomalous Cu result is present approximately 700 metres to the south west.

Geology.

Sheet KT 27/76 7A presents a geological interpretation of the Voyager 6 prospect based upon the 1:10,000 scale reconnaissance mapping programme.

Regional reconnaissance geological mapping in the environs of the Voyager 6 magnetic anomaly during the geophysical survey and the stream sediment geochemical programme has indicated that this prospect is situated in close association with the northern faulted contact of the Low Rocky Point granite and the Lewis River volcanics. The volcanics consist of pale

cleaved rhyolitic quartz-feldspar porphyritic lavas containing no evidence of magnetite.

The origin of the magnetic anomaly is unknown.

Geophysics

Ground reconnaissance geophysics during 1976-77 involved magnetics and V.L.F. (E.M.) on the single Voyager 6 traverse.

Magnetics located the anomaly although additional ground follow up will be necessary to adequately define the prospect.

A 'reasonable' V.L.F. (E.M.) anomaly was recorded on the eastern margin of the magnetic anomaly.

No additional investigations have been carried out over the Voyager 6 prospect. Additional testing of discrete magnetic anomalies like Voyager 6 and 7 awaits conclusive favourable results from either Voyager 5 or Voyager 9.

Discussion

The single traverse of ground magnetics has verified the existence of the aeromagnetic anomaly however additional exploration of discrete magnetic anomalies within E.L. 27/76 awaits the results of investigation at Voyager 9.

VOYAGER 8 (384,500 E, 5 242,500 N. A.M.G.)

A detailed geochemical investigation was carried out in the Voyager 8 area during the 1977-78 field season. Mr. K. Burlinson (Geopeko Limited), assisted by Mr. D. Jennings (Tasmanian Mines Department) in the study's preliminary stages, evaluated a major pebble horizon from which anomalous tin values, found during 1976-77, were thought to have originated.

A brief listing of the evaluation activities is presented in the Summary of this report.

A comprehensive report on the Voyager 8 Tin Study programme will be presented by Mr. K. Burlinson.

VOYAGER 9. (380,000 E, 5 246,000 N. A.M.G.)

Gridding.

To enable a detailed geological, geochemical and geophysical evaluation of the Voyager 9 magnetic anomaly a broad grid, incorporating two cross lines and a single baseline, was designed and implemented during the 1977-78 field season.

A control station was established at 380,000 E, 5 245,600 N (A.M.G.) corresponding to grid co-ordinates 10,000 E, 10,000 N. The baseline 10,000 E was, for geophysical purposes, orientated Mag. North. Theodolite techniques were used for the establishment of the baseline between 8,300 N and 12,300 N. Cross lines were surveyed using range pole methods. All lines were pegged at 50 metre intervals. In total 4,000 metres of theodolite gridding and 4,300 metres of range pole gridding were completed.

Sheet KT 27/76 V9-2 details the Voyager 9 grid layout and peg positions.

Geochemistry.

During the 1977-78 season, C-horizon geochemistry was carried out at 50 metre centres on traverses 9,500 N and 10,850 N of the Voyager 9 grid.

Augering was completed using a Jacro 200 rig mounted on a Muskeg Bombardier and C-horizon samples were obtained from an optimum depth of 2.0 metres or refusal. In areas inaccessable to the rig, augering was carried out by hand auger techniques.

A total of 88 holes were augered, producing 97 samples (including duplicates) for a total depth of 139.10 metres. The 1 in 10 duplicate sampling procedure acts as an assaying check.

The analytical results for Cu, Pb and Zn are presented in contoured form on map numbers:

KT 27/76 V9-3,	C-horizon Geochemical Results,	Copper Contours
KT 27/76 V9-4,	C-horizon Geochemical Results,	Lead Contours
KT 27/76 V9-5,	C-horizon Geochemical Results,	Zinc Contours

Complete analytical results for Cu, Pb, Zn, Ag, Mn, Fe, Ba and Sn from the Voyager 9 grid C-horizon geochemical programme are presented in Appendices No's 11, 12 and 13.

Soil sample numbers (KS Series) and auger hole depths are shown on Sheet KT 27/76 V9-7.

Geology.

Sheet KT 27/76 V9-2 presents a detailed geological interpretation of the Voyager 9 prospect. In addition to the many rocks identified and plotted during the reconnaissance geological mapping (1976-77) and the Voyager 9 grid mapping (1977-78), 157 rocks were collected for closer macroscopic study after diamond sawing. The plan location of these samples is shown on Sheet KT 27/76 V9-6, the rocks are in storage at Geopeko Limited, Devonport.

Rock chip samples from the 88 C-horizon auger holes were also logged to aid in the geological map compilation. Sheet KT 27/76 V9-8 displays in symbolic format the rock chip geology.

All grid traverses and outcrops at the Voyager 9 prospect were geologically mapped at 1:10,000 scale. Sheet KT 27/76 V9-2 displays the results of 1976-77 and 1977-78 1:10,000 scale geological mapping.

Two rock samples representing highly chloritized lithologies were despatched to I.R. Pontifex and Associates for petrographic description. The location of these examples is shown on Sheet KT 27/76 V9-6.

The prospect is located approximately 2.0 kilometres north of the Low Rocky Point granite and from detailed 1:10,000 scale reconnaissance geological mapping, carried out on the two grid traverses, appears to comprise a broad complex suite of pyroclastic lithologies dominated by crystal and lithic tuff varieties.

No rock types experiencing any anomalous magnetic character were identified, however pyrite mineralization was noted in auger hole rock chips at 10850N/9950E and 9500N/9650E.

Outcrops of sandstone and conglomerate present on traverse 10850N are interpreted to be the southern extension of the Ordovician Owen Type conglomerate of the Osmund Syncline which unconformably overlies the Cambrian.

Rock No KR 3606 is a typical example of the massive rhyolitic quartz-feldspar porphyritic lava unit dominating the surrounding region of Voyager 9. Rock No's KR 2096 and KR 2093 are examples of the intercalated pyroclastics KR 2093 being unusual in so far as it has a dacitic composition, the majority of pyroclastics within the Elliott Bay area investigated to date are of gross rhyolitic composition.

Geophysics

The Voyager 9 prospect, comprising two large intense aeromagnetic anomalies (Geoex 1975 survey), was investigated during the 1977-78 season with magnetic techniques.

Reconnaissance tape and compass ground magnetic traverses were initially used to locate the anomaly centres, the Voyager 9 prospect grid was later established to enable a more detailed magnetic survey.

The brief magnetometer investigation located the area of the magnetic "highs". Due to the limited amount of magnetic data available interpretation of the magnetic sources are not possible, however a well developed resistivity anomaly on line 10800N does indicate the presence of a broad body centred about 975E.

Discussion

This prospect is incompletley investigated to date and thus remains a highly significant zone. However the geophysical investigation indicated a relatively deep (100m^{+}) source, and taking into account the magnitude of the evaluation necessary to fully magnetically model the anomaly, it is considered more practical to utilize a smaller magnetic anomaly i.e (Voyager 7) to evaluate the magnetic character of this portion of the Lewis River Volcanics.

VOYAGER 10 (385,000 E, 5 244,000 N. A.M.G.)

Gridding

To date no gridding operations have been carried out in the Voyager 10 prospect area.

Geochemistry

Although no prospect geochemical evaluation has been carried out to date, the creeks and streams within this area were tested during the 1976-77 regional stream sediment sampling programme.

Significant Cu, Pb and Zn results occur within several streams draining a prominent ridge. Peak values for Cu, Pb and Zn are 10ppm, 100ppm and 160ppm respectively and are displayed in colour coded symbolic format on Sheet KT 27/76 8B.

Complete analytical results for Cu, Pb, Zn, Ag, Mn, Fe, Ba and Sn for the stream sediment samples in the Voyager 10 prospect area are tabulated in Appendices No's 1,2 and 3.

Rock sample numbers KR 3324 and KR 3325 are examples of porphyritic quartz-feldspar rhyolitic lava containing rare pyrite mineralization. Peak values for Cu, Pb and Zn are 15ppm, (20ppm and 40ppm respectively. Complete analytical results are tabulated on Sheet KT 27/76 8A and presented in Appendices No's 7,8,9 and 10.

Geology

Sheet KT 27/76 8A presents a geological interpretation of the Voyager 10 prospect based upon the 1:10,000 scale reconnaissance mapping programme.

The dominant rock type present in the prospect area is a pale green rhyolitic quartz feldspar porphyritic lava containing in isolated examples rare pyrite crystals. Original flow banding was identified in several hand specimen however the regional cleavage has destroyed almost all traces of primary textures.

Approximately 1000 metres to the north west occurs the volcaniclastic and pyroclastic horizons of the Voyager 2 prospect, 800 metres to the south of the Voyager 10 prospect regional mapping has also located a 100 metre wide horizon of crystal vitric lithic pyroclastics. Detailed mapping in this area may detect similar lithologies to those at Voyager 2, based upon the stratigraphic trends of this region.

Geophysics

No ground geophysical investigations have yet been carried out on the Voyager 10 prospect.

Based on information obtained from the Geoex (1975) survey this prospect is not associated with any anomalous magnetic or E.M. character. The prospect is situated approximately 500 metres west of a class D category (Geoex) A.E.M. anomaly.

Discussion

This prospect is considered worthy of additional exploration based upon the following:

1. Regional stratigraphic trends position the Voyager 10 prospect along strike from Voyager 2, although to date no volcaniclastic or pyroclastic lithologies have been mapped.

2. Investigation of the anomalous stream sediment results will enable that geochemical reconnaissance method to be evaluated.

3. A.E.M. 16 is located approximately 500 metres to the north.

Investigation of the prospect would involve the establishment of a 200m x 50m grid extended south from the existing Voyager 2 grid. Prospect evaluation techniques, namely geological mapping, C-horizon soil sampling at 25m centres and ground geophysics (I.P. and V.L.F. (E.M.)) are recommended.

VOYAGER 11 (378,300 E, 5 242,100 N. A.M.G.)

Gridding.

Two parallel reconnaissance tape and compass traverses orientated at approximately True North and spaced 200 metres apart were established during the 1976-77 field season to enable ground geophysical investigations of the Geoex (1975) airborne E.M. anomaly No.7. A total of 3100 metres of gridding was completed.

Sheet KT 27/76- 7A details the reconnaissance grid layout at Voyager 11.

During the 1977-78 season the Voyager 1 Area Grid design incorporated the Voyager 11 prospect within the Voyager 1 Study Area. Sheet KT 27/76 V1-2 details the Voyager 1 Area Grid layout and peg positions.

Geochemistry.

As this prospect is situated within the Low Rocky Point granite no detailed or regional geochemical evaluation has been considered warranted at this stage.

Geology.

Sheet KT 27/76 - 7A presents a geological interpretation of the Voyager 11 prospect based upon the 1:10,000 scale reconnaissance mapping programme.

All grid traverses and outcrops within the Voyager 1 Area were geologically mapped at 1:5,000 scale. Sheet KT 27/76 V1-2 displays the results of the 1:5,000 scale mapping together with the replotted 1:10,000 scale reconnaissance geological results.

Based upon detailed geological mapping the Voyager 11 prospect appears to be situated within the Low Rocky Point granite body. The airborne E.M. anomaly due to its orientation and extent is likely a reflection of the granite contact approximately 300 metres to the west.

Geophysics

Ground reconnaissance geophysics during 1976-77 involved V.L.F. (E.M.) on both traverses of the Voyager 11 grid. V.L.F. (E.M.) data was highly noisy and uncharacteristic of favourable anomalous zones.

During the 1977-78 Voyager 1 Area grid ground geophysical survey, the Voyager 11 prospect was read with magnetics, with no significant results.

Based on geological evidence and the negative results of the 1976-77 V.L.F. (E.M.) survey this prospect is thought to be due to the contact between the Low Rocky Point granite and the Lewis River Volcanics.

Discussion

The Voyager 11 prospect E.M. anomaly appears to be a contact effect and as such requires no further investigation.

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The author would like to take this opportunity to thank Messrs. G.L. Buckland (Geologist) and S. Mudge (Geophysicist) for their help during the 1976-77 and 1977-78 field seasons, in the collection and field interpretation of the geological, geochemical and geophysical data.

GEOPEKO LIMITED.

C.D. STRICKLAND,
SENIOR GEOLOGIST.

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APPENDIX NO. 1

ANALYTICAL RESULTS

SAMPLE NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe %
KD 2917	(2	(20	10	(2	65	0.10
8	(2	(20	15	(2	35	0.03
9	(2	30	15	(2	65	0.05
20	(2	(20	5	(2	10	0.02
1	(2	20	5	(2	15	0.01
2	(2	(20	15	(2	5	0.02
3	2	(20	10	(2	25	0.02
4	(2	20	2	(2	(5	(0.01
5	10	(20	5	(2	25	0.02
6	(2	(20	2	(2	(5	(0.01
7	(2	(20	5	(2	(5	0.01
8	(2	(20	70	(2	15	0.15
~~9**~~	~~(2~~	~~(20~~	~~10~~	~~(2~~	~~90~~	~~0.02~~
9	(2	(20	10	(2	95	0.02
30	10	(20	20	(2	30	0.03
1	(2	(20	15	(2	25	0.03
2	(2	(20	5	(2	50	0.02
3	(2	(20	20	(2	55	0.04
4	(2	(20	5	(2	40	0.02
5	(2	(20	15	(2	80	0.03
6	(2	(20	15	(2	130	0.03
7	(2	(20	10	(2	45	0.03
8	(2	(20	5	(2	35	0.03
9	2	(20	10	(2	10	0.02
40	(2	(20	2	(2	15	0.01
1	5	(20	10	(2	30	0.01
2	(2	(20	15	(2	20	0.02
3	2	(20	20	(2	10	0.02
4	(2	20	15	(2	20	0.02
5	2	(20	15	(2	10	0.02
6	(2	(20	10	(2	15	0.02
7	(2	(20	10	(2	25	0.02
8	(2	(20	10	(2	15	0.02
9	(2	(20	10	(2	15	0.02
KD 2950	(2	(20	10	(2	10	0.03
KD 2967	(2	(20	25	(2	(5	0.02
8	2	(20	15	(2	5	0.03
9	(2	(20	15	(2	10	0.03
70						
1 *	10	(20	30	(2	15	0.09
2	15	(20	25	(2	20	0.10
3	5	(20	10	(2	5	0.02
4	(2	20	10	(2	20	0.05
5	2	(20	20	(2	10	0.03
KD 2976	(2	40	10	(2	20	0.22

* Denotes duplicate of previous sample.

** Denotes repeat and check.

(Denotes less than.

SAMPLE NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe %
KD 2977	(2	20	5	(2	15	0.11
8	(2	(20	10	(2	15	0.04
9	5	(20	5	(2	10	0.06
80	5	(20	20	(2	70	0.11
1*	5	(20	5	(2	55	0.08
2	(2	(20	20	(2	15	0.03
3	2	(20	15	(2	20	0.07
4	(2	(20	10	(2	140	0.22
5	(2	(20	20	(2	120	0.08
6	2	(20	30	(2	390	0.33
7	2	(20	15	(2	740	0.37
8	(2	(20	15	(2	130	0.18
9	(2	(20	25	(2	380	0.15
90	(2	(20	5	(2	210	0.07
1*	(2	(20	10	(2	220	0.07
2	(2	(20	5	(2	5	0.01
3	(2	(20	15	(2	5	0.02
4**	2	(20	20	(2	55	0.02
~~4~~	~~2~~	~~(20~~	~~15~~	~~(2~~	~~60~~	~~0.02~~
5	10	20	40	(2	260	0.72
6	2	(20	10	(2	60	0.07
7	5	(20	35	(2	55	0.08
8	5	(20	25	(2	60	0.68
9	(2	(20	20	(2	180	0.18
KD 3000	(2	20	30	(2	35	0.15
KD 3029	(2	(20	10	(2	10	0.05
30	(2	20	20	(2	10	0.09
1	(2	(20	10	(2	(5	0.03
2	(2	(20	15	(2	5	0.03
3	(2	(20	15	(2	15	0.26
4	(2	(20	20	(2	10	0.13
5	(2	(20	30	(2	5	0.03
6	(2	(20	15	(2	10	0.08
7	(2	(20	10	(2	10	0.10
8	(2	(20	15	(2	5	0.04
9	2	(20	40	(2	15	0.07
40	(2	(20	10	(2	10	0.02
1*	2	(20	5	(2	10	0.02
2	5	20	10	(2	10	0.05
3	2	(20	15	(2	20	0.04
4	(2	(20	15	(2	10	0.02
5	(2	20	15	(2	65	0.12
6	(2	(20	5	(2	15	0.08
7	(2	(20	25	(2	190	0.08
8	(2	20	10	(2	5	(0.01
9	(2	(20	20	(2	250	0.06
50	(2	(20	10	(2	50	0.02
1*	(2	(20	10	(2	140	0.04
2	(2	(20	15	(2	310	0.11
3	2	(20	150	(2	250	0.17
4	(2	(20	10	(2	(5	(0.01
KD 3055	(2	(20	15	(2	10	0.06

* Denotes duplicate of previous sample.

** Denotes repeat and check.

(Denotes less than.

SAMPLE NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe %
KD 3056	(2	(20	5	(2	15	0.01
7	(2	30	15	(2	330	0.03
8	(2	(20	20	(2	240	0.03
9	(2	(20	10	(2	20	(0.01
60	5	20	20	(2	950	0.11
1*	2	40	20	(2	960	0.08
2	2	(20	10	(2	10	0.02
3	2	20	30	(2	40	0.02
4	(2	(20	15	(2	330	0.12
5	(2	(20	15	(2	190	0.13
6	(2	(20	15	(2	580	0.11
7	(2	(20	75	(2	280	0.08
8	(2	(20	30	(2	340	0.30
9	(2	20	30	(2	200	0.20
70	(2	(20	10	(2	40	0.02
1*	(2	(20	15	(2	40	0.02
1**	(2	(20	10	(2	35	0.02
2	(2	(20	5	(2	5	(0.01
3	(2	(20	5	(2	(5	(0.01
4	(2	(20	15	10	180	0.14
5	(2	(20	25	(2	300	0.50
6	(2	(20	10	(2	260	0.10
7	(2	(20	15	(2	440	1.14
8	(2	(20	15	(2	50	0.28
9	(2	20	50	(2	25	0.12
80	2	(20	25	(2	20	0.06
1*	(2	(20	30	(2	20	0.08
2	(2	100	60	(2	460	0.17
3	(2	20	20	(2	110	0.14
4	(2	20	20	(2	60	0.28
5	(2	20	15	(2	40	0.06
6	2	20	20	(2	50	0.09
7	(2	(20	20	(2	40	0.17
8	(2	(20	20	(2	35	0.13
9	10	(20	160	(2	160	0.28
90	2	(20	15	(2	20	0.08
1*	(2	(20	10	(2	30	0.10
2	5	20	100	(2	80	0.24
3	10	20	110	(2	50	0.24
4	(2	30	15	(2	90	0.16
5	(2	(20	10	(2	45	0.16
6	(2	(20	10	(2	65	0.12
7	(2	20	30	(2	35	0.11
8	(2	(20	15	(2	25	0.08
9	(2	(20	20	(2	30	0.06
100	2	(20	10	(2	40	0.07
1	(2	(20	15	(2	55	0.18
2	(2	20	20	(2	60	0.10
3	(2	(20	10	(2	70	0.08
4	2	(20	10	(2	25	0.14
5	5	20	10	(2	80	0.14
6	2	30	10	(2	95	0.14
7	(2	20	10	(2	240	0.13
8	2	20	30	(2	260	0.62
KD 3109	(2	(20	10	(2	80	0.08

* Denotes duplicate of previous sample.

** Denotes repeat and check.

(Denotes less than.

SAMPLE NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe %
KD 3110 **	(2	(20	10	(2	240	0.15
~~10~~	~~(2~~	~~(20~~	~~15~~	~~(2~~	~~240~~	~~0.15~~
1*	(2	(20	10	(2	110	0.08
2	(2	(20	10	(2	20	0.02
3	(2	20	15	(2	70	0.12
4	2	(20	10	(2	120	0.29
5	(2	20	10	(2	100	0.06
6	(2	(20	10	(2	(5	0.01
7	(2	(20	5	(2	5	(0.01
8	(2	(20	10	(2	90	0.02
9	(2	(20	5	(2	45	(0.01
20	(2	(20	5	(2	60	0.02
1	(2	(20	5	(2	30	(0.01
2*	(2	20	10	(2	40	0.01
3	(2	(20	20	(2	30	0.02
4	(2	(20	15	(2	65	0.04
5	5	20	85	(2	25	0.06
6	(2	(20	10	(2	25	0.03
7	(2	(20	15	(2	20	0.02
8	(2	(20	10	(2	(5	0.02
9	2	20	10	(2	50	0.03
30	(2	20	10	(2	70	0.02
1	(2	(20	15	(2	50	0.04
2	(2	(20	5	(2	35	0.06
3*	5	20	10	(2	55	0.10
4	(2	(20	5	(2	20	0.02
5	(2	(20	5	(2	40	0.03
6	(2	(20	10	(2	25	0.05
7	2	(20	20	(2	60	0.11
8	(2	(20	10	(2	300	0.07
9	(2	(20	10	(2	310	0.06
40	(2	(20	10	(2	40	0.05
1	(2	(20	30	(2	210	0.08
2	(2	(20	10	(2	440	0.13
3	2	20	10	(2	130	0.13
4*	(2	(20	10	(2	110	0.13
5	(2	(20	10	(2	140	0.08
6	(2	(20	25	(2	170	0.10
7	(2	(20	15	(2	220	0.11
8	2	20	25	(2	280	0.13
9	5	20	30	(2	590	0.15
50	2	(20	15	(2	540	0.22
1	(2	(20	10	(2	10	0.02
2	2	20	20	(2	15	0.03
3	2	20	20	(2	5	0.01
4	2	(20	15	(2	20	0.03
5	2	(20	50	(2	25	0.03
6	(2	(20	35	(2	10	0.04
7	2	20	45	(2	600	0.35
8	(2	(20	20	(2	580	0.21
9	(2	20	15	(2	75	0.15
60 **	(2	40	25	(2	2240	1.56
~~60~~	~~(2~~	~~50~~	~~30~~	~~(2~~	~~2200~~	~~1.57~~
1*	2	40	35	(2	2440	1.52
KD 3162	(2	(20	20	(2	15	0.09

* Denotes duplicate of previous sample.

** Denotes repeat and check.

(Denotes less than.

SAMPLE NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe %
KD 3163	5	20	15	(2	190	0.20
4	(2	20	10	(2	5	0.02
5	5	20	15	(2	15	0.06
6	10	20	15	(2	35	0.18
7	2	20	20	(2	100	0.06
8	5	20	15	(2	80	0.04
9	2	(20	15	(2	5	0.02
70	2	(20	25	(2	110	0.05
1*	(2	(20	15	(2	85	0.04
2	2	20	20	(2	250	0.20
3	2	20	15	(2	10	0.02
4	(2	(20	10	(2	(5	0.01
5	(2	(20	10	(2	(5	0.01
6	(2	(20	15	(2	10	0.02
7	(2	(20	10	(2	85	0.16
8	2	20	30	(2	170	0.16
9	2	(20	10	(2	15	0.03
80	(2	(20	10	(2	40	0.04
1*	(2	(20	10	(2	25	0.03
2	(2	(20	10	(2	200	0.03
3	(2	(20	20	(2	840	0.11
4	(2	(20	5	(2	10	0.02
5	2	(20	10	(2	70	0.05
6	(2	(20	20	(2	60	0.05
7	(2	20	15	(2	80	0.04
8	(2	20	20	(2	230	0.05
9	(2	(20	10	(2	80	0.05
90	(2	20	10	(2	90	0.05
1*	(2	20	10	(2	75	0.05
2	(2	(20	10	(2	70	0.07
3	(2	20	5	(2	55	0.04
4	(2	(20	10	(2	100	0.08
5	(2	20	15	(2	200	0.11
6	(2	(20	10	(2	30	0.05
7	(2	(20	10	(2	90	0.06
8	(2	(20	10	(2	20	0.03
9	2	(20	10	(2	5	0.04
200	(2	(20	5	(2	15	0.04
1*	(2	(20	5	(2	10	0.05
2	(2	20	5	(2	25	0.06
3	(2	20	20	(2	100	0.58
4	(2	(20	25	(2	40	0.09
5	2	(20	10	(2	25	0.04
6	(2	(20	5	(2	35	0.04
7	(2	(20	5	(2	20	0.04
8	(2	(20	10	(2	30	0.05
9	(2	20	10	(2	25	0.06
10	2	(20	20	(2	20	0.07
1*	5	(20	15	(2	20	0.08
2	(2	(20	10	(2	5	0.02
3	5	30	110	(2	280	0.69
4	2	20	20	(2	420	0.14
~~5**~~	~~(2~~	~~(20~~	~~20~~	~~(2~~	~~490~~	~~0.13~~
5	(2	(20	20	(2	510	0.12
KD 3216	(2	20	20	(2	25	0.02

* Denotes duplicate of previous sample.

** Denotes repeat and check.

(Denotes less than.

SAMPLE NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe %
KD 3217	(2	20	20	(2	30	0.03
8	(2	(20	25	(2	55	0.03
9	(2	(20	40	(2	70	0.05
20	2	(20	45	(2	90	0.05
1*	5	20	110	(2	100	0.08
2	(2	(20	25	(2	110	0.05
3	2	(20	30	(2	180	0.48
4	5	40	50	(2	590	0.89
5	5	100	20	(2	2760	0.52
6	5	60	80	(2	40	0.09
7	2	30	30	(2	90	0.05
8	2	40	25	(2	440	0.24
9	(2	(20	20	(2	100	0.07
30	(2	(20	20	(2	120	0.03
1*	(2	(20	15	(2	45	0.05
2	(2	(20	10	(2	120	0.09
3	(2	(20	5	(2	110	0.08
4	(2	20	25	(2	250	0.25
5	(2	(20	15	(2	40	0.05
6	(2	(20	15	(2	25	0.05
7	(2	(20	30	(2	70	0.06
8	(2	(20	20	(2	30	0.04
9	(2	(20	20	(2	25	0.03
40	(2	(20	15	(2	20	0.02
1*	(2	(20	15	(2	20	0.04
2	(2	(20	15	(2	35	0.05
3	(2	(20	10	(2	20	0.04
4	(2	(20	15	(2	30	0.03
5	(2	(20	10	(2	140	0.08
6	(2	(20	30	(2	180	0.11
7	(2	(20	30	(2	270	0.15
8	(2	(20	20	(2	45	0.21
9	(2	(20	10	(2	10	0.02
50	(2	(20	10	(2	5	0.02
1	(2	(20	10	(2	75	0.06
2	(2	200	25	(2	150	0.17
3	(2	(20	10	(2	40	0.03
4	(2	(20	10	(2	45	0.05
5	(2	(20	5	(2	10	0.03
6	(2	(20	5	(2	5	0.02
7	(2	(20	10	(2	5	0.02
8	(2	(20	10	(2	5	0.03
9	(2	(20	15	(2	(5	0.02
60	(2	(20	2	(2	(5	0.02
1*	(2	(20	5	(2	(5	0.02
2						
3	(2	(20	5	(2	(5	0.02
4**	(2	(20	10	(2	(5	0.02
4	(2	(20	10	(2	(5	0.02
5	(2	(20	2	(2	(5	0.01
6	(2	(20	(2	(2	(5	0.01
7	(2	(20	2	(2	(5	(0.01
8	(2	(20	5	(2	5	0.02
9	(2	(20	5	(2	(5	0.02
KD 3270	(2	(20	5	(2	(5	0.01

* Denotes duplicate of previous sample.

** Denotes repeat and check.

(Denotes less than.

SAMPLE NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe %
KD 3271	(2	(20	5	(2	(5	0.02
2*	2	(20	2	(2	5	0.04
3	(2	(20	5	(2	(5	0.03
4	(2	(20	5	(2	(5	0.03
5	(2	(20	5	(2	5	0.03
6	(2	(20	10	(2	10	0.03
7						
8	(2	(20	(2	(2	(5	0.03
9	(2	(20	10	(2	20	0.06
80	(2	(20	2	(2	25	0.03
1*	(2	(20	5	(2	30	0.04
2	5	(20	5	(2	170	0.11
3	(2	(20	5	(2	35	0.04
4	(2	(20	2	(2	120	0.05
5	2	(20	5	(2	40	0.03
6	(2	(20	5	(2	60	0.03
7	(2	(20	10	(2	160	0.07
8	(2	(20	5	(2	130	0.04
9	(2	(20	2	(2	60	0.04
90	(2	(20	2	(2	45	0.03
1*	(2	(20	5	(2	45	0.03
2	(2	(20	10	(2	90	0.04
3	(2	(20	10	(2	25	0.03
4	(2	(20	20	(2	70	0.18
5	(2	(20	5	(2	15	0.04
6	(2	(20	10	(2	15	0.03
7	(2	(20	10	(2	30	0.02
8	(2	(20	10	(2	95	0.13
9	(2	(20	10	(2	90	0.04
300**	(2	(20	10	(2	30	0.04
300	(2	(20	10	(2	35	0.04
1	(2	(20	30	(2	60	0.07
2	(2	(20	25	(2	40	0.06
3	(2	(20	10	(2	40	0.05
4	(2	(20	10	(2	45	0.04
5	(2	(20	30	(2	50	0.06
6	(2	(20	15	(2	25	0.03
7	(2	(20	20	(2	35	0.02
8	(2	(20	30	(2	50	0.27
9	5	(20	35	(2	50	0.44
10	(2	(20	55	(2	55	0.28
1*	(2	(20	15	(2	50	0.48
2	(2	(20	30	(2	150	0.36
3	(2	(20	10	(2	50	0.24
4	2	(20	45	(2	200	1.01
5	2	(20	15	(2	75	0.19
6	2	(20	10	(2	50	0.14
7	2	(20	20	(2	120	0.23
8	(2	(20	15	(2	65	0.15
9	(2	(20	15	(2	20	0.03
20	(2	(20	15	(2	20	0.04
1*	(2	(20	10	(2	20	0.05
2	(2	(20	10	(2	15	0.05
3	2	(20	15	(2	10	0.04
4	(2	(20	15	(2	20	0.07
KD 3325	(2	(20	10	(2	30	0.05

* Denotes duplicate of previous sample.

** Denotes repeat and check.

(Denotes less than.

SAMPLE NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe %
KD 3326	(2	(20	15	(2	40	0.15
7	(2	(20	15	(2	10	0.03
8	(2	(20	20	(2	20	0.05
9	(2	(20	15	(2	25	0.06
30	(2	(20	5	(2	25	0.06
1*	(2	(20	5	(2	15	0.04
2	(2	(20	10	(2	5	0.03
3	(2	(20	10	(2	5	0.02
4	(2	(20	15	(2	10	0.03
5	(2	(20	5	(2	(5	(0.01
6	(2	(20	10	(2	(5	(0.01
7	(2	(20	10	(2	10	0.09
8	(2	(20	5	(2	5	0.02
9	(2	(20	10	(2	40	(0.01
40	(2	(20	5	(2	15	0.10
1 *	(2	(20	5	(2	15	0.09
2	(2	(20	5	(2	10	0.04
3	(2	(20	5	(2	5	0.05
4	(2	(20	5	(2	15	0.04
5	(2	(20	5	(2	20	0.04
6	(2	(20	2	(2	5	0.02
7	(2	(20	20	(2	65	0.13
8	(2	20	10	(2	1080	0.42
9	(2	(20	10	(2	15	0.07
50	(2	(20	15	(2	15	0.14
1	(2	(20	2	(2	35	0.03
2	(2	(20	2	(2	80	0.05
3						
4	(2	(20	(2	(2	100	0.06
5	(2	(20	5	(2	45	0.02
6	(2	(20	5	(2	50	0.03
7	(2	(20	10	(2	45	0.03
8	2	(20	85	(2	(5	0.03
9	(2	(20	5	(2	40	0.02
60	(2	(20	5	(2	30	0.04
1	(2	(20	5	(2	100	0.07
2	(2	30	5	(2	160	0.22
3	(2	(20	5	(2	20	0.02
4	(2	(20	2	(2	5	0.02
5	(2	(20	5	(2	10	0.02
6	(2	(20	(2	(2	10	0.02
7	(2	(20	2	(2	(5	0.01
8	(2	(20	5	(2	10	0.02
9	(2	(20	2	(2	10	0.02
70	(2	(20	(2	(2	15	0.02
1	2	(20	5	(2	25	0.03
2	(2	(20	10	(2	10	0.03
3	(2	(20	5	(2	10	0.04
4	(2	(20	15	(2	75	0.54
5	2	20	20	(2	110	0.76
6	(2	20	15	(2	15	0.12
7	2	(20	15	(2	30	0.13
8	10	30	20	(2	170	3.80
KD 3379	(2	(20	10	(2	15	0.14

* Denotes duplicate of previous sample

* * Denotes repeat and check

(Denotes less than

SAMPLE NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe %
KD 3380	(2	(20	5	(2	10	0.04
1*	(2	(20	15	(2	10	0.03
2	(2	20	25	(2	10	0.04
3	(2	(20	25	(2	10	0.03
4	(2	(20	20	(2	5	0.03
5	(2	20	20	(2	10	0.04
6	(2	20	15	(2	5	0.02
7	(2	(20	20	(2	10	0.04
8	(2	20	15	(2	10	0.04
9	(2	30	15	(2	35	0.15
90	(2	(20	10	(2	65	0.27
1*	(2	(20	10	(2	65	0.28
2	(2	30	10	(2	5	0.03
3	(2	20	10	(2	10	0.04
4	(2	(20	10	(2	10	0.02
5	(2	(20	15	(2	10	0.04
6	(2	(20	10	(2	10	0.02
7	(2	(20	10	(2	15	0.04
8	(2	20	15	(2	20	0.03
9	(2	(20	10	(2	20	0.03
3400	(2	(20	10	(2	10	0.03
3451	(2	(20	5	(2	5	0.01
2	(2	(20	10	(2	25	0.10
3	(2	(20	10	(2	10	0.04
4	(2	20	130	(2	370	0.12
5						
6	(2	80	75	(2	340	0.59
7**	(2	(20	20	(2	220	0.29
~~7~~	~~(2~~	~~(20~~	~~25~~	~~(2~~	~~220~~	~~0.29~~
8	(2	(20	50	(2	230	0.25
9						
60						
1*						
2						
3	2	(20	5	(2	10	0.03
4	(2	(20	5	(2	(5	0.04
5	(2	(20	10	(2	10	0.04
6	(2	(20	5	(2	5	0.03
7	(2	(20	2	(2	10	0.04
8	(2	(20	10	(2	5	0.02
9	(2	(20	10	(2	20	0.04
70	(2	(20	20	(2	85	0.09
1*	(2	(20	20	(2	110	0.10
2	(2	(20	10	(2	40	0.08
3	2	(20	25	(2	35	0.06
4	(2	(20	10	(2	50	0.11
5	(2	(20	15	(2	45	0.07
6	(2	(20	15	(2	90	0.19
7	(2	(20	20	(2	15	0.04
8	(2	(20	20	(2	65	0.61
9	2	(20	10	(2	20	0.08
80	2	(20	30	(2	10	0.10
1*	5	(20	20	(2	10	0.11
KD 3482	2	(20	15	(2	5	0.05

* Denotes duplicate of previous sample

** Denotes repeat and check.

(Denotes less than

SAMPLE NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe %
KD 3483	(2	(20	10	(2	10	0.04
4	2	(20	15	(2	5	0.09
5	(2	(20	10	(2	10	0.04
6	(2	(20	20	(2	25	0.05
7	(2	(20	15	(2	15	0.12
8	(2	(20	15	(2	30	0.07
9	2	(20	10	(2	(5	0.02
90	(2	(20	15	(2	35	0.15
1*	(2	(20	15	(2	25	0.13
2	(2	(20	20	(2	10	0.04
3	(2	(20	15	(2	35	0.10
4	(2	(20	10	(2	30	0.05
5	(2	(20	15	(2	30	0.06
6	(2	(20	30	(2	65	0.13
7	(2	(20	10	(2	110	0.08
8	(2	(20	20	(2	35	0.08
9	(2	(20	20	(2	95	0.23
KD 3500	(2	(20	20	(2	110	0.35
KD 4000						
1	2	(20	20	(2	95	0.25
2	(2	(20	10	(2	35	0.04
3	(2	(20	10	(2	50	0.12
4	(2	(20	15	(2	35	0.06
5	(2	(20	15	(2	30	0.16
6	(2	(20	20	(2	20	0.06
7	(2	(20	15	(2	20	0.05
8	(2	(20	10	(2	25	0.07
9	(2	(20	20	(2	15	0.03
10	(2	(20	15	(2	20	0.04
1*	(2	(20	10	(2	20	0.03
2	(2	(20	10	(2	35	0.04
3	(2	(20	15	(2	30	0.03
4	(2	(20	15	(2	15	0.03
5	(2	(20	10	(2	15	0.03
6	(2	(20	15	(2	40	0.05
7	(2	(20	10	(2	30	0.03
8	(2	(20	10	(2	10	0.04
9	(2	(20	20	(2	20	0.05
20	(2	(20	15	(2	10	0.03
1*	(2	(20	15	(2	10	0.03
2	(2	(20	10	(2	10	0.03
3	(2	(20	15	(2	15	0.03
4	(2	(20	15	(2	15	0.04
5	(2	(20	10	(2	5	0.01
6	(2	(20	10	(2	15	0.02
7	(2	(20	10	(2	15	0.05
KD 4028	(2	(20	10	(2	10	0.03

* Denotes duplicate of previous sample

* * Denotes repeat and check

(Denotes less than

SAMPLE NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe %
KD 4101	(2	(20	10	(2	15	0.03
2	(2	(20	10	(2	15	0.04
3	(2	20	20	(2	20	0.05
4	(2	20	5	(2	(5	0.02
5	(2	(20	5	(2	10	0.02
6	2	50	55	(2	640	0.65
7	2	30	40	(2	640	0.53
8	(2	(20	20	(2	300	0.11
9	2	(20	10	(2	85	0.06
10	2	(20	20	(2	680	0.26
1*	(2	(20	25	(2	390	0.37
2	(2	(20	20	(2	230	0.16
3	(2	(20	15	(2	70	0.07
4	(2	(20	10	(2	50	0.06
5	(2	(20	10	(2	100	0.06
6	(2	(20	15	(2	130	0.05
7	(2	(20	20	(2	70	0.07
8	(2	(20	10	(2	10	0.12
9	(2	(20	10	(2	30	0.10
20	(2	(20	10	(2	50	0.18
1	2	140	20	2	2040	1.30
2*	5	80	20	(2	3280	1.45
3	(2	(20	10	(2	75	0.14
4	(2	(20	20	(2	30	0.03
5	(2	(20	10	(2	30	0.09
6	(2	20	10	(2	40	0.43
7	(2	20	10	(2	350	0.95
8	10	80	55	(2	960	3.80
KD 4129	(2	30	15	(2	90	1.00
	2	20	2	2	5	0-01?

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PREPARATION: Dried and sieved to -80 mesh.

ANALYTICAL METHODS: Cu, Pb, Zn, Ag, Mn and Fe by A.A.S. following conc. HCL leach and HCL/HNO_3 leach in latter stages for 1 hour of 0.25 g sample.

* Denotes duplicate of previous sample

* * Denotes repeat and check.

(Denotes less than.

APPENDIX NO. 2.

ANALYTICAL RESULTS

SAMPLE NUMBER	Ba ppm	Sn ppm
KD 2917	500	50
8	100	30
9	100	30
20	50	10
1	(30	10
2	30	50
3	100	50
4	100	20
5	50	20
6	30	10
7	(30	10
8	300	3
9	200	10
30	300	(1
1	50	(1
2	300	10
3	300	10
4	100	(1
5	200	5
6	50	30
7	300	500
8	300	10
9	(30	200
40	30	(1
1	(30	5
2	30	20
3	100	3
4	30	30
5	(30	(1
6	(30	20
7	30	300
8	100	300
9	30	(1
KD 2950	30	(1
KD 2967	300	20
8	300	(1
9	300	3
70		
1*	I.S.	I.S.
2	500	100
3	1000	(1
4	300	(1
5	30	3
KD 2976	300	(1

SAMPLE NUMBER	Ba ppm	Sn ppm
KD 2977	500	(1
8	100	5
9	300	5
80	300	5
1*	200	3
2	300	300
3	300	(1
4	300	3
5	300	10
6	500	20
7	500	5
8	300	10
9	200	50
90	300	500
1*	300	(1
2	30	500
3	30	100
4	(30	10
5	300	(1
6	100	10
7	100	(1
8	100	30
9	300	100
3000	300	(1
KD 3029	100	30
30	300	500
1	100	(1
2	100	(1
3	300	50
4	300	30
5	200	10
6	100	(1
7	200	50
8	100	30
9	500	30
40	30	5
1*	30	(1
2	300	200
3	100	(1
4	(30	(1
5	(30	300
6	30	500
7	50	1000
8	(30	20
9	200	1000
KD 3050	50	5

* Denotes duplicate of previous sample.

** Denotes repeat and check.

I.S. Denotes insufficient sample.

(Denotes less than.

SAMPLE NUMBER	Ba ppm	Sn ppm
KD 3051*	100	100
2	50	5
3	300	(1
4	30	(1
5	50	500
6	30	10
7	50	20
8	100	5
9	30	10
60	200	300
1*	300	300
2	(30	300
3	(30	(1
4	200	300
5	300	(1
6	200	(1
7	300	2
8	200	300
9	300	50
70	200	200
1*	30	200
2	(30	100
3	(30	10
4	50	500
5	200	(1
6	100	30
7	300	30
8	200	(1
9	100	(1
80	100	(1
1*	300	30
2	I.S.	I.S.
3	300	50
4	200	30
5	300	50
6	300	30
7	300	50
8	500	50
9	500	50
90	300	30
1*	200	30
2	500	30
3	300	50
4	300	10
5	100	30
6	100	30
7	100	30
8	50	30
9	100	30
100	100	100
1	100	5
2	200	30
3	100	10
4	100	10
KD 3105	200	500

SAMPLE NUMBER	Ba ppm	Sn ppm
KD 3106	100	500
7	100	50
8	300	300
9	300	50
10	100	(1
1*	100	30
2	100	(1
3	100	50
4	200	300
5	200	10
6	(30	100
7	(30	50
8	30	50
9	(30	30
20	50	100
1	(30	(1
2*	(30	(1
3	50	(1
4	100	30
5	100	100
6	100	5
7	100	10
8	30	20
9	200	500
30	300	300
1	100	300
2	200	500
3*	300	1000
4	50	50
5	30	30
6	200	1000
7	500	30
8	300	50
9	300	50
40	100	30
1	100	30
2	300	30
3	100	30
4*	500	30
5	300	50
6	300	30
7	500	50
8	300	50
9	300	50
50	300	50
1	100	50
2	30	50
3	30	5
4	(30	20
5	30	30
6	200	50
7	300	10
8	200	10
9	300	30
KD 3160	1000	50

* Denotes duplicate of previous sample.

I.S. Denotes insufficient sample.

** Denotes repeat and check.

(Denotes less than.

SAMPLE NUMBER	Ba ppm	Sn ppm
KD 3161*	1000	30
2	300	10
3	1000	20
4	1000	10
5	1000	10
6	1000	10
7	300	200
8	1000	10
9	(30	10
70	300	300
1*	50	20
2	500	50
3	500	30
4	(30	10
5	(30	10
6	(30	10
7	100	30
8	300	500
9	500	20
80	300	30
1*	200	30
2	200	300
3	200	5
4	1000	30
5	300	50
6	200	20
7	300	30
8	300	50
9	300	30
90	300	20
1*	300	10
2	300	30
3	300	30
4	300	50
5	300	30
6	300	10
7	300	50
8	300	200
9	300	(1
200	100	(1
1*	200	(1
2	100	10
3	300	30
4	200	20
5	200	5
6	300	10
7	300	20
8	100	10
9	500	20
10	300	30
1*	500	5
2	300	5
3	1000	20
4	300	30
5	300	10
KD 3216	50	5

SAMPLE NUMBER	Ba ppm	Sn ppm
KD 3217	300	5
8	300	5
9	200	3
20	300	5
1*	300	3
2	300	3
3	300	10
4	300	30
5	300	20
6	1000	3
7	300	100
8	500	10
9	300	100
30	200	3
1*	100	10
2	100	30
3	100	5
4	300	10
5	500	100
6	300	10
7	100	10
8	50	5
9	100	5
40	200	5
1*	300	30
2	200	10
3	500	100
4	300	10
5	100	5
6	500	20
7	500	(1
8	300	10
9	100	(1
50	100	5
1	30	5
2	100	30
3	30	100
4	300	30
5	50	5
6	100	3
7	200	5
8	300	5
9	200	10
60	30	10
1*	100	1
2	I.S.	I.S.
3	50	20
4	30	10
5	30	10
6	30	10
7	30	10
8	50	200
9	30	10
70	300	10
1	30	100
KD 3272*	50	10

* Denotes duplicate of previous sample.

** Denotes repeat and check.

I.S. Denotes insufficient sample.

(Denotes less than.

SAMPLE NUMBER	Ba ppm	Sn ppm
KD 3273	50	10
4	300	100
5	300	200
6	300	30
7	I.S.	I.S.
8	300	5
9	300	5
80	200	50
1*	200	10
2	500	10
3	300	3
4	100	3
5	50	3
6	100	3
7	500	10
8	300	10
9	200	10
90	300	5
1*	300	5
2	100	10
3	300	5
4	500	10
5	200	10
6	100	10
7	100	10
8	100	200
9	200	30
300	100	30
1	300	30
2	100	10
3	100	10
4	100	10
5	100	10
6	30	10
7	30	10
8	500	50
9	500	50
10	500	50
1*	500	30
2	300	20
3	300	50
4	500	30
5	300	50
6	200	3
7	300	(1
8	300	20
9	30	300
20	200	200
1*	200	10
2	200	300
3	100	3
4	100	100
5	300	10
6	300	30
7	30	300
KD 3328	30	3

SAMPLE NUMBER	Ba ppm	Sn ppm
KD 3329	50	30
30	(30	30
1*	30	3
2	100	3
3	100	(1
4	(30	5
5	30	(1
6	(30	3
7	300	50
8	200	200
9	50	500
40	300	300
1*	300	30
2	300	100
3	300	3
4	300	10
5	30	10
6	30	10
7	100	5
8	300	5
9	200	5
50	200	5
1	200	30
2	100	30
3	I.S.	I.S.
4	300	10
5	50	30
6	50	30
7	30	5
8	500	(1
9	100	(1
60	50	50
1	50	500
2	30	50
3	30	30
4	50	3
5	(30	10
6	30	10
7	30	10
8	50	20
9	30	10
70	50	20
1	100	20
2	30	20
3	30	20
4	500	50
5	500	300
6	200	10
7	200	10
8	300	50
9	30	50
80	30	(1
1*	100	(1
2	200	(1
3	100	(1
KD 3384	100	(1

* Denotes duplicate of previous sample.

** Denotes repeat and check.

I.S. Denotes insufficient sample.

(Denotes less than.

SAMPLE NUMBER	Ba ppm	Sn ppm
KD 3385	200	100
6	500	5
7	100	5
8	50	5
9	300	10
90	100	50
1*	300	300
2	50	(1
3	300	3
4	30	(1
5	100	5
6	50	3
7	50	3
8	300	(1
9	200	(1
3400	50	(1
3451	100	20
2	30	30
3	500	5
4	500	30
5	Not received	
6	300	20
7	200	3
8	50	20
9	Not received	
60	Not received	
1*	Not received	
2	Not received	
3	50	10
4	30	10
5	50	3
6	100	5
7	30	(1
8	50	(1
9	100	(1
70	200	(1
1*	200	3
2	200	3
3	50	10
4	200	5
5	100	10
6	200	5
7	100	5
8	100	30
9	50	10
80	50	3
1*	30	5
2	100	30
3	50	10
4	100	(1
5	50	5
6	50	3
7	200	5
8	200	3
9	50	3
KD 3490	300	3

SAMPLE NUMBER	Ba ppm	Sn ppm
KD 3491*	50	10
2	300	10
3	100	10
4	50	10
5	300	10
6	100	10
7	100	20
8	200	20
9	200	10
KD 3500	300	30
KD 4000	I.S.	I.S.
1	100	10
2	200	20
3	100	10
4	300	20
5	200	20
6	300	20
7	200	300
8	50	10
9	50	10
10	50	5
1*	100	5
2	200	5
3	200	5
4	200	10
5	100	3
6	500	5
7	300	5
8	300	100
9	100	10
20	300	10
1*	30	10
2	30	5
3	300	3
4	100	3
5	I.S.	3
6	30	5
7	30	3
KD 4028	50	3
KD 4101	50	(1
2	100	(1
3	100	10
4	(30	(1
5	(30	(1
6	300	3
7	300	5
8	300	(1
9	300	(1
10	300	(1
1*	I.S.	I.S.
KD 4112	300	(1

* Denotes duplicate of previous sample.

** Denotes repeat and check.

I.S. Denotes insufficient sample.

(Denotes less than.

SAMPLE NUMBER	Ba ppm	Sn ppm
KD 4113	200	(1
4	300	(1
5	300	(1
6	300	(1
7	200	(1
8	300	(1
9	30	(1
20	200	(1
1	300	10
2*	200	(1
3	50	(1
4	200	(1
5	100	(1
6	300	(1
7	300	20
8	300	3
KD 4129	200	(1
	Pulp 30	1

SAMPLE NUMBER	Sn* ppm	W ppm
KD 2947	120	(20
KD 2972	-	(20
KD 2990	210	(20
1	I.S.	I.S.
2	620	(20
3	210	21
KD 3029	-	20
9**	-	20
30	I.S.	(20
KD 3033	I.S.	I.S.
KD 3037	-	140
8	-	(20
9	-	(20
9**	-	(20
KD 3047	810	44
KD 3049	3060	58
KD 3051	I.S.	I.S.
KD 3055	I.S.	I.S.
KD 3060	180	(20
KD 3062	780	43
KD 3070	510	(20
KD 3074	250	46
KD 3076	75	(20
KD 3130	85	23
KD 3133	690	37
KD 3136	370	43
7	20	28
KD 3167	120	35
KD 3182	I.S.	I.S.
KD 3312	-	(20
KD 3320	-	(20
1	-	(20
KD 3327	-	(20

SAMPLE NUMBER	Sn* ppm	W ppm
KD 3354	-	(20
5	-	(20
KD 3359	-	(20
	-1	20

Preparation:

Dried and sieved to -80 mesh.

Analytical Methods:

Sn, Ba analysis by Emission Spectrography, Schemes ES2 and 3
Sn*, W analysis by X.R.F.

* Denotes duplicate of previous sample.

Sn* Denotes analysis by X.R.F.

I.S. Denotes insufficient sample.

** Denotes repeat and check.

(Denotes less than.

GEOCHEMICAL RESULTS

SEMI-QUANTITATIVE EMISSION SPECTROSCOPY

All values in ppm

GROUP		SAMPLE NUMBER							
		KD 2377	KD 2928	KD 2976	KD 3053	KD 3061	KD 3067	KD 3089	KD 3092
ES 1	Be	1	3	1	3	3	3	3	3
	Co	(5	(5	(5	10	(5	10	(5	(5
	Cr	(20	30	(20	(20	50	30	30	30
	Ir	(2	(2	(2	(2	(2	(2	(2	(2
	Mn	100	20	30	300	1000	300	100	100
	Mo	(3	(3	(3	(3	(3	(3	(3	(3
	Nb	(20	(20	(20	(20	(20	(20	(20	(20
	Ni	10	30	10	5	5	10	10	20
	Os	(10	(10	(10	(10	(10	(10	(10	(10
	Pd	(10	(10	(10	(10	(10	(10	(10	(10
	Pt	(10	(10	(10	(10	(10	(10	(10	(10
	Re	(10	(10	(10	(10	(10	(10	(10	(10
	V	50	100	10	20	10	30	30	50
	W	50	(50	(50	(50	(50	(50	(50	(50
	Ta	(100	(100	(100	(100	(100	(100	(100	(100
	Th	(100	(100	(100	(100	(100	(100	(100	(100
ES 2	Ag	(0.1	(0.1	(0.1	(0.1	0.3	0.2	(0.1	(0.1
	As	(50	(50	(50	(50	100	(50	(50	(50
	Au	(3	(3	(3	(3	(3	(3	(3	(3
	Bi	30	10	10	10	30	10	30	20
	Cd	10	(3	(3	(3	10	5	(3	(3
	Cu	10	3	3	3	3	3	10	3
	Ge	(1	(1	(1	(1	(1	(1	(1	(1
	In	(5	(5	(5	(5	(5	(5	(5	(5
	Pb	30	10	30	10	50	10	10	30
	Sb	(30	(30	(30	(30	(30	(30	(30	(30
	Sn	100	3	(1	(1	300	2	50	30
	Tl	(1	(1	(1	(1	(1	(1	(1	(1
	Zn	(20	100	(20	100	20	100	200	100
ES 3	Ba	300	300	300	300	300	300	500	500
	Co	100	1000	200	500	1000	100	500	200
	Ce	(300	(300	(300	(300	(300	(300	(300	(300
	La	(100	(100	(100	(100	(100	(100	(100	(100
	Sc	(50	(50	(50	(50	(50	(50	(50	(50
	Sr	30	30	(30	30	30	30	(30	(30
	Ti	500	1000	3000	1000	2000	500	3000	3000
	Y	(10	(10	(10	(10	30	(10	(10	(10
	Zr	(100	300	100	(100	300	(100	100	(100
ES 4	Hg	(30	(30	(30	(30	(30	(30	(30	(30
	P	100	(100	(100	(100	200	(100	(100	(100
	Te	(20	(20	(20	(20	(20	(20	(20	(20
ES 6	B	50	10	10	10	50	10	10	10

(Denotes less than

) Denotes greater than

GEOCHEMICAL RESULTS

SEMI-QUANTITATIVE EMISSION SPECTROSCOPY

All values in ppm

GROUP		SAMPLE NUMBER							
		KD3093	KD 3160	KD 3161	KD 3213	KD 3221	KD 3225	KD 3226	KD 3228
ES 1	Be	3	1	3	3	5	3	3	5
	Co	(5	10	10	(5	(5	10	(5	5
	Cr	30	100	100	30	(20	(20	(20	(20
	Ir	(2	(2	(2	(2	(2	(2	(2	(2
	Mn	50	2000	3000	300	100	3000	30	300
	Mo	(3	(3	(3	(3	(3	(3	(3	(3
	Nb	(20	(20	(20	(20	(20	(20	(20	(20
	Ni	10	30	20	20	5	10	10	10
	Os	(10	(10	(10	(10	(10	(10	(10	(10
	Pd	(10	(10	(10	(10	(10	(10	(10	(10
	Pt	(10	(10	(10	(10	(10	(10	(10	(10
	Re	(10	(10	(10	(10	(10	(10	(10	(10
	V	100	100	30	50	30	(10	20	30
	W	(50	(50	(50	(50	(50	(50	(50	(50
	Ta	(100	(100	(100	(100	(100	(100	(100	(100
	Th	(100	(100	(100	(100	(100	(100	(100	(100
ES 2	Ag	0.2	0.2	0.5	(0.1	(0.1	0.3	(0.1	(0.1
	As	(0.1	(50	(50	(50	(50	(50	(50	(50
	Au	(3	(3	(3	(3	(3	(3	(3	(3
	Bi	30	50	50	40	50	50	3	10
	Cd	(3	5	5	3	3	3	(3	(3
	Cu	10	2	2	5	5	5	5	2
	Ge	(1	(1	(1	(1	(1	(1	(1	(1
	In	(5	(5	(5	(5	(5	(5	(5	(5
	Pb	20	40	30	30	20	100	50	30
	Sb	(30	(30	(30	(30	(30	(30	(30	(30
	Sn	50	50	30	20	3	20	3	10
	Tl	*(1	(1	(1	(1	(1	(1	(1	(1
	Zn	100	30	30	100	100	(20	100	30
ES 3	Ba	300	1000	1000	1000	300	300	1000	500
	Ca	200	500	300	3000	300	300	200	500
	Ce	(300	(300	(300	(300	(300	(300	(300	(300
	La	(100	(100	(100	(100	(100	(100	(100	(100
	Sc	(50	(50	(50	(50	(50	(50	(50	(50
	Sr	30	(30	(30	(30	(30	(30	50	(30
	Tl	2000	2000	1000	5000	1000	5000	500	3000
	Y	(10	10	10	(10	(10	10	(10	(10
	Zr	(100	(100	(100	(100	(100	(100	(100	100
ES 4	Hg	(30	(30	(30	(30	(30	(30	(30	(30
	P	(100	200	200	(100	(100	(100	200	(100
	Te	(20	(20	(20	(20	(20	(20	(20	(20
ES 6	B	10	10	10	10	10	10	(10	10

(Denotes less than

) Denotes greater than

GEOCHEMICAL RESULTS

SEMI-QUANTITATIVE EMISSION SPECTROSCOPY

All values in ppm

GROUP		SAMPLE NUMBER							
		KD 3252	KD 3314	KD 3353	KD 3454	KD 3456	KD 4106	KD 4107	KD 4121
ES 1	Be	3	3	1	5	5	10	5	1
	Co	(5	(5	(5	(5	(5	(5	(5	(5
	Cr	(20	30	(20	(20	30	20	20	20
	Ir	(2	(2	(2	(2	(2	(2	(2	(2
	Mn	100	200	(5	300	300	500	500	2000
	Mo	(3	(3	(3	(3	(3	(3	(3	(3
	Nb	(20	(20	(20	(20	(20	(20	(20	(20
	Ni	10	10	3	50	50	30	5	10
	Os	(10	(10	(10	(10	(10	(10	(10	(10
	Pd	(10	(10	(10	(10	(10	(10	(10	(10
	Pt	(10	(10	(10	(10	(10	(10	(10	(10
	Re	(10	(10	(10	(10	(10	(10	(10	(10
	V	50	30	(10	30	30	50	30	20
	W	(50	50	(50	(50	(50	(50	(50	(50
	Ta	(100	(100	(100	(100	(100	(100	(100	(100
	Th	(100	(100	(100	(100	(100	(100	(100	(100
ES 2	Ag	(0.1	(0.1	(0.1	(0.1	(0.1	0.5	0.2	0.5
	As	(50	(50	(50	(50	(50	(50	(50	(50
	Au	(3	(3	(3	(3	(3	(3	(3	(3
	Bi	10	10	(1	10	10	50	30	30
	Cd	(3	(3	(3	(3	(3	10	3	10
	Cu	2	2	2	1	1	2	2	2
	Ge	(1	(1	(1	(1	(1	(1	(1	(1
	In	(5	(5	(5	(5	(5	(5	(5	(5
	Pb	200	1	(1	20	100	50	30	100
	Sb	(30	(30	(30	(30	(30	(30	(30	(30
	Sn	30	30	(1	30	20	(1	(1	10
	Tl	(1	(1	(1	(1	(1	(1	(1	(1
	Zn	30	50	100	100	100	50	30	20
ES 3	Ba	100	500	500	500	300	300	300	300
	Ca	300	1000	200	1000	1000	2000	3000	5000
	Ce	(300	(300	(300	(300	(300	(300	(300	(300
	La	(100	(100	(100	(100	(100	(100	(100	(100
	Sc	(50	(50	(50	(50	(50	(50	(50	(50
	Sr	(30	30	50	(30	(30	(30	30	30
	Tl	3000	3000	100	2000	3000	3000	3000	1000
	Y	(10	(10	(10	(10	(10	(10	(10	(10
	Zr	(100	(100	(100	100	(100	300	(100	300
ES 4	Hg	(30	(30	(30	(30	(30	(30	(30	(30
	P	(100	(100	(100	(100	(100	(100	200	300
	Te	(20	(20	(20	(20	(20	(20	(20	(20
ES 6	B	10	10	(10	(10	(10	20	10	20

(Denotes less than

) Denotes greater than

GEOCHEMICAL RESULTS

SEMI-QUANTITATIVE EMISSION SPECTROSCOPY

All values in ppm

GROUP		SAMPLE NUMBER							
		KD 4122	KD 4128	KD 3074					
ES 1	Be	1	1	10	-1				
	Co	(5	(5	(5	5				
	Cr	(20	(20	30	20				
	Ir	(2	(2	(2	2				
	Mn	3000	1000	200	-1				
	Mo	(3	(3	(3	3				
	Nb	(20	(20	(20	20				
	Ni	10	10	3	-1				
	Os	(10	(10	(10	10				
	Pd	(10	(10	(10	10				
	Pt	(10	(10	(10	10				
	Re	(10	(10	(10	10				
	V	20	10	30	10				
	W	(50	(50	(50	50				
	Ta	(100	(100	(100	100				
	Th	(100	(100	(100	100				
ES 2	Ag	0.3	(0.1	10	0.1 ?-1				
	As	(50	(50	(50	50				
	Au	(3	(3	(3	3				
	Bi	50	30	20	1				
	Cd	10	10	(3	3				
	Cu	5	10	2	-1				
	Ge	(1	(1	(1	-1				
	In	(5	(5	(5	5				
	Pb	100	100	(1	1				
	Sb	(30	(30	(30	30				
	Sn	(1	3	500	1				
	Tl	(1	(1	(1	1				
	Zn	20	50	(20	20				
ES 3	Ba	200	300	50	-1				
	Ca	300	200	100	-1				
	Ce	(300	(300	(300	300				
	La	(100	(100	(100	100				
	Sc	(50	(50	(50	50				
	Sr	(30	30	30	30				
	Ti	1000	1000	1000	-1				
	Y	(10	(10	10	10				
	Zr	(100	(100	100	100				
ES 4	Hg	(30	(30	(30	30				
	P	300	(100	(100	100				
	Te	(20	(20	(20	20				
ES 6	B	20	(10	30	10				

(Denotes less than

) Denotes greater than

APPENDIX NO. 4

ANALYTICAL RESULTS

SAMPLE NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe %
KS 2309	10	30	20	5	20	0.34
10	(2	(20	20	(2	5	0.16
1*	(2	20	25	(2	5	0.15
2	5	(20	40	(2	660	1.44
3	40	(20	30	(2	50	1.18
4	5	(20	60	(2	260	2.7
5	(2	(20	10	(2	10	0.11
6	(2	(20	20	(2	15	0.16
7	20	30	20	(2	30	0.32
8	20	(20	25	(2	20	0.21
9	30	(20	20	(2	5	0.17
20	10	(20	15	(2	10	0.11
1*	15	(20	20	(2	5	0.09
2	5	(20	20	(2	20	0.37
3	50	(20	15	(2	15	0.21
4**	20	(20	15	(2	5	0.07
4	15	(20	15	(2	5	0.07
5	55	20	15	(2	10	0.20
6	2	20	25	(2	15	0.54
7	(2	(20	15	(2	5	0.13
8	40	80	55	(2	20	3.4
9	20	30	40	(2	15	0.68
30	15	(20	110	(2	130	2.0
1*	15	(20	110	(2	140	2.1
2	10	(20	55	(2	120	1.32
3	10	20	40	(2	10	0.09
4	25	(20	140	(2	45	0.90
5	20	20	50	(2	30	0.72
6	5	30	80	(2	30	0.34
7	10	(20	30	(2	30	0.24
8	2	(20	40	(2	70	0.73
9	(2	(20	30	(2	130	1.14
40	(2	(20	35	(2	200	1.13
1*	(2	(20	35	(2	180	1.02
2	2	(20	45	(2	310	1.70
3	(2	(20	30	(2	100	0.77
4	10	(20	20	(2	65	0.26
5	5	(20	20	(2	15	0.29
6	(2	(20	15	(2	10	0.14
7	2	(20	20	(2	15	0.22
8	(2	(20	20	(2	20	0.14
9	10	(20	20	(2	10	0.13
50	(2	(20	10	(2	10	0.10
1*	(2	(20	10	(2	(5	0.09
2	5	(20	20	(2	15	0.22
3	2	(20	10	(2	10	0.22
4	(2	(20	20	(2	5	0.11
KS 2355	2	(20	15	(2	10	0.13

* Denotes duplicate of previous sample.

** Denotes repeat and check.

(Denotes less than.

SAMPLE NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe %
KS 2356	(2	(20	35	(2	140	1.39
7	(2	(20	15	(2	10	0.16
8	2	(20	10	(2	70	0.16
9	(2	(20	15	(2	20	0.23
60	(2	(20	15	(2	30	0.08
1*	2	(20	10	(2	30	0.09
2	2	40	25	(2	5	0.06
3	5	(20	30	(2	5	0.09
4	2	20	10	(2	10	0.07
5	10	(20	40	(2	45	1.05
6	(2	(20	15	(2	5	0.10
7	2	(20	10	(2	10	0.08
8	(2	(20	10	(2	5	0.10
9	2	(20	20	(2	5	0.11
70	5	(20	20	(2	40	0.28
1*	10	(20	45	(2	40	0.28
2	5	(20	30	(2	120	2.5
3	(2	(20	15	(2	10	0.12
4	5	(20	30	(2	100	1.40
5	(2	(20	15	(2	10	0.11
6	(2	20	70	(2	450	2.7
7	2	(20	20	(2	15	0.19
8	5	(20	10	(2	15	0.20
9	(2	(20	10	(2	5	0.10
80	1140	160	140	(2	15	3.4
1*	1130	170	140	(2	20	3.4
2	10	120	15	(2	5	0.12
3	10	(20	15	(2	10	0.08
4	170	60	90	(2	90	0.57
5	5	(20	10	(2	(5	0.07
6	10	(20	15	(2	(5	0.07
7**	20	20	30	(2	15	0.11
7	20	20	30	(2	20	0.12
8	20	(20	15	(2	170	0.21
9	2	40	50	(2	45	0.13
90	2	(20	10	(2	45	0.08
1*	2	(20	10	(2	45	0.08
2	2	(20	10	(2	5	0.05
3	45	30	20	(2	25	0.26
4	2	(20	15	(2	5	0.09
5	(2	(20	10	(2	10	0.08
6	2	(20	15	(2	5	0.06
7	65	40	15	5	10	0.75
8	5	20	10	(2	10	0.09
9	70	30	40	(2	20	0.73
400	170	90	80	(2	9600	6.2
1*	170	80	75	(2	9400	6.1
2	2	(20	15	(2	10	0.10
3	25	(20	10	(2	40	0.19
4	10	(20	10	(2	15	0.16
5	15	20	10	(2	5	0.18
6**	5	(20	10	(2	5	0.07
6	5	(20	10	(2	5	0.07
KS 2407	20	30	20	(2	5	0.14

* Denotes duplicate of previous sample

** Denotes repeat and check.

(Denotes less than.

SAMPLE NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe %
KS 2408	2	20	15	(2	(5	0.12
9	10	(20	10	(2	5	0.12
10	5	20	15	(2	10	0.44
KS 2411 *	5	20	10	(2	10	0.44

PREPARATION: Dried and sieved to -80mesh.

ANALYTICAL METHODS: Cu, Pb, Zn, Ag, Mn and Fe by A.A.S. following hot conc. HCL . leach and HCL/HNO_3 leach in latter stages for 1 hour of 0.25 g sample.

* Denotes duplicate of previous sample

** Denotes repeat and check.

(Denotes less than.

APPENDIX NO. 5

ANALYTICAL RESULTS

SAMPLE NUMBER	Ba ppm	Sn ppm
KS 2309	1000	50
10	1000	30
1*	1000	20
2	1000	100
3	1000	100
4	1000	30
5	1000	10
6	1000	10
7	1000	20
8	500	10
9	1000	10
20	1000	10
1*	1000	10
2	1000	10
3	300	10
4	1000	5
5	1000	10
6	1000	5
7	300	5
8	300	10
9	200	3
30	1000	10
1*	1000	10
2	1000	20
3	500	20
4	1000	20
5	1000	20
6	1000	5
7	1000	5
8	1000	20
9	300	20
40	300	20
1*	500	20
2	300	10
3	300	30
4	1000	20
5	1000	20
6	500	5
7	300	3
8	500	10
9	500	(1
50	200	(1
1*	1000	3
2	1000	3
3	1000	5
4	1000	5
5	500	3
KS 2356	500	3

SAMPLE NUMBER	Ba ppm	Sn ppm
KS 2357	1000	3
8	500	3
9	500	5
60	500	3
1*	1000	5
2	300	(1
3	500	3
4	200	(1
5	1000	3
6	1000	(1
7	500	(1
8	1000	3
9	500	5
70	300	(1
1*	300	5
2	300	5
3	500	(1
4	200	5
5	200	3
6	200	10
7	1000	(1
8	500	3
9	500	3
80	300	10
1*	200	5
2	500	3
3	500	(1
4	200	5
5	300	10
6	200	5
7	300	10
8	300	3
9	500	3
90	500	3
1*	300	5
2	500	3
3	300	5
4	300	5
5	300	3
6	300	3
7	300	10
8	100	10
9	300	10
400	200	10
1*	100	10
2	300	10
3	300	3
KS 2404	200	(1

* Denotes duplicate of previous sample.

** Denotes repeat and check.

(Denotes less than.

APPENDIX NO. 5 cont.

SAMPLE NUMBER	Ba ppm	Sn ppm	SAMPLE NUMBER	Ba ppm	Sn ppm
KS 2405	200	3			
6	200	(1			
7	100	(1			
8	100	(1			
9	500	10			
10	500	5			
KS 2411	500	5			

PREPARATION: Dried and sieved to -80mesh.

ANALYTICAL METHODS: Sn, Ba analysis by Emission Spectrography, Schemes ES2 and 3.

* Denotes duplicate of previous sample.

* * Denotes repeat and check.

(Denotes

GEOCHEMICAL RESULTS

SEMI-QUANTITATIVE EMISSION SPECTROSCOPY

All values in ppm

GROUP		SAMPLE NUMBER							
		KS 2328	KS 2334	KS 2380	KS 2381	KS 2400	KS 2401		
ES 1	Be	(1	(1	3	(1	(1	3		
	Co	(5	(5	(5	(5	10	30		
	Cr	20	(20	(20	(20	(20	(20		
	Ir	(2	(2	(2	(2	(2	(2		
	Mn	30	50	20	20	10000	10000		
	Mo	(3	(3	(3	(3	(3	(3		
	Nb	(20	(20	20	(20	(20	(20		
	Ni	3	5	5	3	5	10		
	Os	(10	(10	(10	(10	(10	(10		
	Pd	(10	(10	(10	(10	(10	(10		
	Pt	(10	(10	(10	(10	(10	(10		
	Re	(10	(10	(10	(10	(10	(10		
	V	10	20	30	20	20	30		
	W	(50	(50	(50	(50	(50	(50		
	Ta	(100	(100	(100	(100	(100	(100		
	Th	(100	(100	(100	(100	(100	(100		
ES 2	Ag	(0.1	(0.1	0.5	0.5	0.2	0.2		
	As	(50	(50	(50	(50	(50	(50		
	Au	(3	(3	(3	(3	(3	(3		
	Bi	30	50	50	50	50	50		
	Cd	(3	(3	(3	(3	5	5		
	Cu	30	30	1000	1000	200	200		
	Ge	(1	(1	(1	(1	(1	(1		
	In	(5	(5	(5	(5	(5	(5		
	Pb	100	10	200	200	100	100		
	Sb	(30	(30	(30	(30	(30	(30		
	Sn	10	20	10	5	10	10		
	Tl	(1	(1	(1	(1	(1	(1		
	Zn	50	100	100	100	100	100		
ES 3	Ba	300	1000	300	300	200	100		
	Ca	100	50	300	50	200	100		
	Ce	(300	(300	(300	(300	(300	(300		
	La	(100	(100	(100	(100	(100	(100		
	Sc	(50	(50	(50	(50	(50	(50		
	Sr	(30	(30	(30	(30	(30	(30		
	Ti	500	500	500	300	500	300		
	Y	(10	(10	(10	(10	(10	(10		
	Zr	100	100	100	(100	(100	(100		
ES 4	Hg	(30	(30	(30	(30	(30	(30		
	P	(100	100	300	100	300	300		
	Te	(20	(20	(20	(20	(20	(20		
ES 6	B	10	10	(10	10	(10	(10		

(Denotes less than

) Denotes greater than

APPENDIX NO. 7

ANALYTICAL RESULTS

SAMPLE NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe %
KR 1423	200	120	3020	2	5300	24.0
4	25	20	20	(2	600	0.82
5	)10000	120	600	90	4300	26.0
1446**	40	(20	20	(2	230	0.35
6	40	(20	15	(2	240	0.34
7	60	40	30	(2	210	4.7
8	560	(20	70	(2	55	2.5
1450	50	(20	20	(2	320	1.22
1	190	(20	40	(2	400	1.72
1459	20	80	310	(2	390	7.3
60	10	40	80	(2	550	1.02
1	10	(20	40	(2	40	0.54
2	50	90	60	(2	70	0.38
3	230	240	160	(2	200	3.4
4	350	3850	6500	2	1400	40.0
6	1200	70	70	2	)10000	41.0
8	3500	20	70	5	)10000	31.0
9	4200	180	90	7	)10000	34.0
70	1650	480	20	10	)10000	37.0
1	1600	460	130	15	)10000	44.0
3	2300	460	60	10	)10000	30.5
4	690	260	190	5	4200	48.0
6	25	(20	20	(2	550	0.62
7**	20	20	20	(2	130	0.32
7	40	(20	15	(2	240	0.34
8	2500	740	210	10	)10000	37.0
1479	3050	330	510	5	)10000	34.0
3290	50	20	20	(2	140	0.51
3300	30	20	(2	(2	190	0.35
3312	20	20	(2	(2	550	0.58
3318	35	40	10	(2	190	0.74
3320	10	(20	40	(2	1500	0.83
24	15	20	40	(2	120	0.49
25	10	(20	35	(2	40	0.41
30	10	30	10	(2	50	0.33
1	15	(20	40	(2	60	0.60
2	10	(20	10	(2	55	0.63
3	20	40	3650	(2	70	0.72
4	10	(20	20	(2	60	1.28
5	15	(20	20	(2	60	2.2
6	15	(20	10	(2	80	1.90
7	30	(20	20	(2	160	1.26
9	10	30	20	(2	75	1.22
40	20	(20	(2	(2	160	0.81
3341	220	(20	30	(2	130	1.49
3382	10	(20	(2	(2	140	1.25
3	30	(20	(2	(2	140	1.29
KR 3384	35	20	170	(2	1750	9.3

* Denotes duplicate of previous sample.

** Denotes repeat and check.

(Denotes less than.

) Denotes greater than .

SAMPLE NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe %
KR 3385	10	(20	10	(2	70	0.54
KR 3396	15	(20	(2	(2	110	1.59
7	20	(20	70	(2	1650	6.0
8	20	(20	20	(2	200	2.8
KR 3400	180	(20	10	(2	290	2.4
1	770	20	130	(2	500	10.4
2	50	(20	30	(2	50	9.9
KR 3404	30	(20	40	(2	1800	2.8
KR 3408**	30	(20	40	(2	350	3.0
8	30	(20	40	(2	340	3.0
9	30	(20	(2	(2	200	5.2
KR 3415	)10000	220	690	20	)10000	31.0
6	10000	280	280	15	)10000	17.0
7	)10000	300	310	20	)10000	19.0
KR 8	2200	2650	140	65	8100	41.0
KR 3421	1500	320	820	15	800	42.0
KR 3428	60	60	30	(2	310	0.92
KR 3434	30	20	50	(2	230	0.96
KR 3440	30	20	20	(2	450	1.04
KR 3442	30	(20	120	(2	850	2.7
KR 3448	10	(20	30	(2	240	2.2
KR 3458	70	20	90	(2	140	0.99
KR 3466**	40	(20	10	(2	140	1.01
6	40	(20	10	(2	140	1.00
KR 3468	70	(20	20	(2	60	0.49
KR 3470	10	(20	20	(2	300	1.34
KR 3494	10	(20	30	(2	190	1.39
KR 3505	10	20	110	(2	1050	3.6
6	60	200	80	(2	400	2.5
KR 3511	30	40	20	(2	260	1.55
2	10	(20	30	(2	240	1.07
3	25	40	150	(2	1400	3.8
KR 3523	5	(20	40	(2	230	0.46
KR 3604	10	(20	30	(2	140	0.87
KR 3614	5	(20	20	(2	50	0.61
KR 3618	5	(20	20	(2	110	0.46

PREPARATION: Crushed and pulverised.

ANALYTICAL METHODS: Cu, Pb, Zn, Ag, Mn and Fe by A.A.S. following hot conc. HCL leach and HCL/HNO_3 leach in stages for 1 hour of 0.25 g sample.

* Denotes duplicate of previous sample.

** Denotes repeat and check.

(Denotes less than.

) Denotes greater than.

APPENDIX NO. 8

ANALYTICAL RESULTS

SAMPLE NUMBER		Au ppb
KR	1466	(20
	1470	30
	1471	30
	1473	55
	1478	20
	3418	)500
KR	3421	150

● Denotes duplicate of previous sample.

●● Denotes repeat and check.

Au analysed by Special Low Level C.R.A./A.A.S.

(Denotes less than.

APPENDIX NO. 9

ANALYTICAL RESULTS

SAMPLE NUMBER	Cd ppm	As ppm	Ba ppm	Sn ppm	Sn▲ ppm	W ppm
KR 1423	10	30		(1		
4	(2	(5		5		
5	2	40		3		
1446**	(2	5		(1		
6	(2	(5				
7	(2	(5		(1		
8	(2	(5		5		
1450	(2	(5		(1		
1	(2	(5		20	(20	
1459	(2	35		20		
60	(2	(5		20		
1	(2	(5		3		
2	(2	(5		5		
3	(2	20		(1		
4	5	80		(1		
6	(2	200		(1		
8	2	35		(1		
9	5	30		(1		
70	2	130		(1		
1	5	200		(1		
3	2	100		(1		
4	2	15		3		
6	(2	15		(1		
7**	(2	(5		3		
7	(2					
8	5	100		(1		
1479	5	20		(1		
3290	(2	(5		3		
3300	(2	(5		20		
3312	(2	(5		(1		
3318	(2	(5		(1		
3320	(2	(5		5		
24	(2	(5		(1		
25	(2	(5		20		
30	(2	(5		10		
1	(2	(5		20	25	
2	(2	(5		5	(20	
3	15	(5		3	(20	
4	(2	(5		20	(20	
5	(2	(5		3	(20	
6	(2	(5		30	26	
7	(2	(5		20	20	
9	(2	(5		30	20	
40	(2	(5		30	30	
3341	(2	10		100	130	
3382	(2	(5		10		
3	(2	(5		100	110	
KR 3384	(2	(5		80	100	

● Denotes duplicate of previous sample.

●● Denotes repeat and check.

▲ Analysed by XRF methods

(Denotes less than.

SAMPLE NUMBER	Cd ppm	As ppm	Ba ppm	Sn ppm	Sn▲ ppm	W ppm
KR 3385	(2	(5		(1		
3396	(2	(5		30		
7	(2	(5		30		
8	(2	(5		30		
3400	(2	(5		5		
1	(2	10		5		
2	(2	(5		500	410	
3404	(2	(5		10		
3408**	(2	(5		3		
8	(2					
9	(2	(5		10		
3415	2	60		3		
16	2	30		3		
17	2	20		(1		
18	5	100		(1		
3421	5	100		(1		
3428	(2	(5		(1		
3434	(2	(5		3		
3440	(2	(5		10		
3442	(2	(5		30		
3448	(2					
3458	(2	(5		(1		
3466**	(2	(5		(1	(20	
66	(2	(5				
3468	(2	(5		20	(20	
3470	(2	(5		20	(20	
3494	(2	(5		10		
3505	(2	(5		10		
6	(2	60		(1		
3511	(2	10		(1	(20	
12	(2	(5		5	(20	
13	(2	(5		30		
3523	(2	(5		5		
3604	(2	(5		5		
3614	(2	(5		(1		
KR 3618	(2	(5		3		
KR 1466**		200				
KR 3421**		100				

PREPARATION: Crushed and pulverised.

ANALYTICAL METHODS: Cd by A.A.S. following hot conc. H.C.L. leach and HCL/HNO_3 leach in latter stages for 1 hour of 0.25g sample.
As by modified Gutzeit method Sn by Emission Spectrography Scheme ES2.
Sn▲ by X.R.F. methods.

* Denotes duplicate of previous sample.

** Denotes repeat and check.

▲ Analysed by XRF methods

(Denotes less than.

GEOCHEMICAL RESULTS

SEMI-QUANTITATIVE EMISSION SPECTROSCOPY

All values in ppm

GROUP		SAMPLE NUMBER							
		KR 1423	KR 1464	KR 3333	KR 3418				
ES 1	Be	(1	(1	(1	(1				
	Co	(5	(5	(5	30				
	Cr	(20	(20	(20	(20				
	Ir	(2	(2	(2	(2				
	Mn	5000	1000	50	8000				
	Mo	(3	(3	(3	(3				
	Nb	(20	(20	(20	(20				
	Ni	(3	5	3	5				
	Os	(10	(10	(10	(10				
	Pd	(10	(10	(10	(10				
	Pt	(10	(10	(10	(10				
	Re	(10	(10	(10	(10				
	V	(10	10	10	(10				
	W	(50	(50	(50	(50				
	Ta	(100	(100	(100	(100				
	Th	(100	(100	(100	(100				
ES 2	Ag	2	2	(0.1	50				
	As	(50	100	(50	100				
	Au	(3	(3	(3	(3				
	Bi	50	30	10	500				
	Cd	10	3	10	3				
	Cu	200	300	30	2000				
	Ge	(1	(1	(1	(1				
	In	(5	(5	(5	(5				
	Pb	100	4000	30	3000				
	Sb	(30	(30	(30	(30				
	Sn	(1	(1	3	(1				
	Tl	(1	(1	(1	(1				
	Zn	3000	6000	3000	100				
ES 3	Ba	100	30	500	30				
	Ca	2000	100	200	300				
	Ce	(300	(300	(300	(300				
	La	(100	(100	(100	(100				
	Sc	(50	(50	(50	(50				
	Sr	(30	(30	(30	(30				
	Ti	100	300	2000	500				
	Y	(10	(10	(10	(10				
	Zr	(100	100	(100	300				
ES 4	Hg	(30	(30	(10	(10				
	P	5000	300	300	5000				
	Te	(20	(20	(20	(20				
ES 6	B	30	(10	10	30				

(Denotes less than

) Denotes greater than

209142

APPENDIX NO. 11

ANALYTICAL RESULTS

SAMPLE NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe %
KS 2885	5	600	280	(2	110	0.77
6	45	1600	2250	(2	25	0.28
7	(2	40	150	(2	180	0.64
8	(2	120	290	(2	150	0.80
9	70	200	100	(2	20	0.17
90	80	880	270	5	420	2.70
1	70	820	240	5	430	2.65
2	25	80	160	(2	340	1.24
3	10	30	90	(2	220	0.61
4	1300	760	10000	5	80	0.71
5	5	30	200	(2	50	0.26
6	15	80	120	(2	25	0.20
7	15	100	230	(2	110	0.48
8	200	140	180	(2	115	2.80
9	(2	(20	40	(2	20	0.12
2900	120	60	140	(2	85	1.07
1*	(2	40	20	2	95	4.65
2	(2	20	10	(2	20	0.11
3	(2	40	10	(2	20	0.09
4	(2	20	10	(2	25	0.12
5	(2	40	25	(2	50	0.11
6	(2	20	10	(2	(2	0.07
7	(2	20	5	(2	(2	0.06
8	(2	(20	5	(2	20	0.17
9	2	(20	10	(2	10	0.10
10	(2	20	10	(2	40	0.62
1	300	20	45	(2	20	0.28
2*	(20	20	55	(2	20	0.27
3	20	20	80	2	310	3.80
4	120	20	10	2	60	0.48
5	20	(20	15	(2	120	1.06
6	20	20	20	2	110	0.86
7**	(20	(20	45	(2	360	4.70
7	(20	(20	40	(2	360	4.25
8	40	(20	20	2	40	1.34
9	50	40	80	2	650	4.55
20	20	(20	40	2	240	3.30
1*	(20	(20	40	(2	230	3.50
2	(20	(20	20	(2	40	0.68
3	(20	20	10	(2	40	0.58
4	(20	20	25	2	70	0.89
5	(20	20	10	(2	(5	0.06
6	(20	20	30	(2	50	1.00
7	20	20	25	(2	70	1.16
8	40	20	50	(2	280	1.82
9	100	(20	40	(2	30	0.42
30	20	20	20	(2	20	0.42
KS 2931	40	(20	10	(2	10	0.06

* Denotes duplicate of previous sample.

** Denotes repeat and check.

(Denotes less than.

SAMPLE NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe %
KS 2932*	40	(20	10	(2	10	0.06
3	200	20	25	(2	170	1.09
4	40	20	20	(2	80	0.47
5**	(20	20	50	(2	290	1.60
5	20	20	50	(2	300	1.53
6	20	20	85	(2	550	2.25
7	(20	(20	10	2	20	0.27
8	20	(20	5	(2	10	0.06
9	(20	20	15	(2	40	0.28
40	(20	(20	35	(2	60	0.65
1*	(20	(20	35	5	60	0.65
2	(20	20	10	(2	10	0.07
3	(20	20	20	(2	20	0.20
4	20	20	5	(2	10	0.04
5	(20	30	5	(2	(5	0.06
6	(20	(20	10	2	20	0.15
7	(20	30	30	(2	85	0.54
8	(20	20	85	(2	550	4.10
9	(20	40	80	(2	340	3.30
KS 2950	20	40	20	(2	60	0.11
KS 3063*	140	50	410	(2	100	1.05
4	15	30	30	(2	20	0.14
5	(2	(20	30	(2	65	0.10
6	10	1700	1000	2	100	0.55
7	(2	(20	20	(2	100	0.48
8	35	20	60	(2	320	1.72
9	10	(20	50	(2	110	0.88
70**	110	30	130	(2	950	2.65
70	110	30	140	(2	950	2.55
1	90	(20	130	(2	900	2.30
2	10	80	30	(2	30	0.15
3	10	80	75	(2	330	1.40
4	360	140	65	(2	450	1.41
5	65	40	40	(2	220	0.67
6	5	40	110	(2	950	3.00
7	15	(20	150	(2	700	3.00
8	20	70	75	(2	1000	3.10
9	25	50	120	(2	1050	4.50
80	25	20	50	(2	90	1.15
1*	15	(20	45	(2	70	1.00
2	5	(20	60	(2	120	1.18
3	5	100	75	(2	240	1.20
4	15	(20	20	(2	50	0.21
5	25	30	90	(2	500	2.25
KS 3086	5	(20	10	(2	30	0.14

* Denotes duplicate of previous sample

** Denotes repeat and check.

(Denotes less than.

SAMPLE NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe %
KS 3087	(2	(20	20	(2	70	0.20
8	(2	(20	15	(2	70	0.19
9	10	20	100	(2	340	1.02
90	10	40	80	(2	180	0.53
1	5	100	200	(2	390	0.61
2*	5	100	20	(2	410	0.64
3	(2	20	40	(2	160	0.35
4	5	(20	70	(2	120	0.30
5	5	50	80	(2	280	0.52
6	10	200	190	(2	1050	2.10
7	20	180	280	(2	650	2.85
8	5	(20	290	(2	550	2.65
9	10	70	290	(2	370	2.20
100	10	30	290	(2	1300	2.50
1*	10	40	260	(2	1300	2.60
2	5	60	75	(2	1800	12.50
3	10	40	55	(2	390	1.11
4	5	20	70	(2	270	0.86
5	25	80	230	(2	75	0.29
6	10	40	160	(2	900	1.90
7	10	40	60	(2	430	1.17
8	20	120	80	(2	800	1.53
9	10	120	60	(2	650	1.57
10	35	180	1500	(2	800	2.30
1*	50	80	1600	(2	800	2.40
2	10	20	110	(2	470	1.24
3	5	20	90	(2	440	2.10
4	15	20	140	(2	170	1.11
5**	5	60	100	(2	320	1.27
5	10	80	95	(2	320	1.30
6	10	40	50	(2	310	1.33
7	5	(20	45	2	200	1.33
8	5	(20	35	(2	120	1.23
9	5	20	25	(2	75	0.32
20	15	(20	80	(2	240	2.50
1*	15	(20	90	(2	230	2.40
2	10	20	70	(2	340	2.50
3	10	(20	60	(2	70	0.38
4	5	(20	40	(2	20	0.12
5	5	(20	40	(2	35	0.33
6	5	40	70	(2	15	0.09
7	10	40	120	(2	460	2.60
8	5	50	100	2	280	1.09
9	10	(20	150	(2	750	1.30
30	5	120	250	(2	1250	2.80
1*	10	100	220	(2	1300	2.80
2	10	(20	110	(2	600	1.37
3	15	20	110	(2	650	1.87
4	5	20	140	(2	700	1.78
5	10	290	550	(2	170	0.40
6	10	60	160	(2	180	0.54
7	5	210	600	(2	70	0.36
KS 3138	10	80	220	(2	80	0.31

* Denotes duplicate of previous sample

** Denotes repeat and check.

(Denotes less than.

SAMPLE NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe %
KS 3139	170	320	2000	2	280	0.83
40	10	80	1000	(2	250	0.71
1*	10	70	1000	(2	230	0.64
2	30	320	30	(2	10	0.10
3	10	140	45	(2	10	0.08
4**	45	880	320	(2	110	1.10
4	45	880	330	(2	120	1.14
5	30	740	200	(2	550	4.55
6	25	40	350	(2	140	0.82
7	20	120	50	(2	30	0.16
8	20	100	70	(2	140	0.46
9	5	30	10	(2	290	0.34
50	5	30	45	2	580	0.72
1*	10	(20	20	(2	660	0.69
2	10	20	35	(2	360	1.02
3	10	60	35	(2	370	0.64
4	5	120	140	(2	500	0.82
5	40	360	240	(2	1700	1.34
6	(2	(20	15	2	280	0.27
7	10	660	450	(2	330	0.94
8	15	120	30	5	510	0.99
9	(2	40	25	2	600	0.68
60**	5	50	30	(2	450	0.61
60	5	50	20	(2	500	0.74
1*	5	60	30	(2	450	0.60
2	10	50	55	(2	950	1.36
3	180	80	120	(2	700	4.05
4	15	40	260	(2	50	0.21
5	20	80	190	(2	40	0.56
6	20	(20	120	2	15	0.24
7	5	90	40	5	35	0.17
8	10	20	50	5	330	1.57
9						
70	(2	(20	5	(2	20	0.27
1*	(2	20	20	5	20	0.32
2	30	520	800	(2	250	1.45
3	15	100	120	2	120	0.25
4	10	200	1400	10	320	1.63
5	5	30	30	(2	10	0.20
6						
7	5	20	20	(2	20	0.17
8	(2	(20	(2	(2	30	0.21
9	10	(20	60	2	550	1.29
80	(2	30	100	2	250	0.82
1*	(2	20	25	2	260	0.86
2	5	40	20	(2	200	1.17
3	(2	40	20	2	25	0.27
4	(2	(20	20	5	330	0.18
5	(2	(20	5	(2	15	0.21
6	(2	(20	10	(2	10	0.19
7	(2	(20	10	(2	25	0.17
8	(2	(20	5	(2	10	0.14
9	20	30	160	(2	70	0.24
KS 3190**	170	100	170	2	50	0.25

* Denotes duplicate of previous sample

** Denotes repeat and check.

(Denotes less than.

SAMPLE NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe %
KS 3190	170	120	180	(2	60	0.30
1*	160	100	180	(2	50	0.27
2	60	(20	200	2	340	0.92
3	500	200	220	10	50	0.29
4	10	(20	10	5	40	0.24
5	(2	(20	10	(2	30	0.21
6	60	(20	50	2	70	0.51
7	5	(20	20	(2	40	0.40
8	15	(20	550	(2	550	1.08
9	20	20	150	10	170	0.42
200**	90	80	45	(2	600	0.51
200	85	80	45	(2	550	0.53
1	40	120	90	(2	550	1.90
2*	40	100	110	5	600	2.05
3	800	(20	25	5	400	1.25
4	30	100	150	(2	2000	6.30
5	160	200	190	(2	330	1.90
6	80	40	120	2	900	1.70
7	1100	70	160	2	950	3.15
8	5	(20	40	(2	80	0.48
9	5	40	20	(2	25	0.74
10	10	(20	70	2	180	0.45
1*	15	(20	70	2	320	0.55
2	(2	(20	110	(2	750	1.90
3	1-	420	340	(2	900	1.90
4						
5	(2	60	230	(2	1000	1.85
6	5	(20	60	5	270	1.05
7	10	(20	320	(2	2600	2.05
8	(2	20	160	2	280	1.45
9	(2	70	310	(2	230	0.96
20	(2	(20	60	2	220	0.72
1*	(2	(20	70	(2	210	0.70
2						
3	(2	(20	30	5	140	1.18
4	5	(20	50	2	20	0.19
5	(2	20	20	(2	50	0.30
6	5	(20	10	(2	170	0.25
7	10	30	25	(2	190	0.87
8	(2	(20	(2	(2	70	0.65
9	5	50	40	5	220	1.40
30**	(2	(20	10	(2	10	0.20
30	(2	(20	5	(2	10	0.24
1	(2	40	50	2	40	0.17
2	20	40	25	(2	310	0.85
3*	20	(20	50	(2	280	0.80
4	5	30	20	2	340	0.95
5	(2	(20	(2	(2	70	0.12
6	5	(20	(2	(2	20	0.21
7	5	(20	10	(2	20	0.20
8	5	30	10	(2	120	0.25
9	1300	400	110	(2	370	0.70
40	85	340	160	(2	60	0.21
KS 3241*	110	340	160	(2	60	0.21

* Denotes duplicate of previous sample

** Denotes repeat and check.

(Denotes less than.

SAMPLE NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe %
KS 3242	40	240	100	(2	40	0.29
3	(2	30	15	(2	120	0.23
4	15	40	50	(2	200	1.59
5**	(2	(20	10	(2	20	0.23
5	(2	(20	10	(2	20	0.23
6	10	20	30	(2	50	0.24
7	(2	60	15	(2	120	0.41
8	5	70	15	(2	25	0.21
9	(2	(20	15	(2	25	0.34
50	(2	(20	10	(2	15	0.17
1*	(2	(20	20	(2	10	0.16
2	(2	(20	25	(2	170	0.11
3	(2	(20	20	(2	5	0.05
4	(2	(20	40	(2	380	0.12
5	(2	(20	55	(2	3500	3.90
6	(2	(20	15	(2	350	0.22
7	20	2200	110	(2	6500	2.82
8	5	40	15	(2	40	0.06
9	(2	40	20	(2	150	0.04
60**	5	20	30	(2	290	1.12
60	5	(20	30	(2	290	0.12
1*	(2	80	30	(2	320	0.11
2	5	(20	40	(2	30	0.87
3	(2	(20	10	(2	5	1.11
4	(2	20	15	(2	(5	0.12
5	5	(20	20	(2	110	0.10
6	5	120	40	(2	10	0.07
7	5	120	30	(2	700	1.52
8	(2	(20	10	(2	55	1.33
9	5	(20	15	(2	25	0.07
70	(2	40	10	(2	5	0.09
1*	(2	(20	10	(2	10	0.10
2	10	100	20	(2	5	0.05
3	(2	40	20	(2	5	0.15
4	(2	(20	10	(2	35	0.10
5	(2	20	70	(2	450	1.63
6	(2	20	15	(2	70	0.10
7	5	120	45	(2	950	0.12
8	5	100	35	(2	100	0.13
9	5	240	55	(2	45	0.26
80**	(2	(20	10	(2	30	0.04
80	(2	(20	20	(2	30	0.34
1*	(2	(20	25	(2	35	0.04
2	(2	(20	15	(2	5	0.06
3	(2	20	25	(2	(5	0.07
4	10	120	30	(2	(5	0.05
5	25	2150	120	(2	250	1.73
6	50	40	70	(2	15	0.24
7	5	120	20	(2	15	0.14
8	5	700	95	(2	240	5.11
9	(2	20	5	(2	10	0.16
90	(2	20	20	(2	15	0.06
1*	(2	(20	15	(2	10	0.06
KS 3292	5	40	20	(2	10	0.04

* Denotes duplicate of previous sample

** Denotes repeat and check.

(Denotes less than.

SAMPLE NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe %
KS 3293	(2	(20	10	(2	5	0.08
4	(2	(20	10	(2	10	0.08
5	(2	(20	10	(2	20	0.13
6	(2	(20	5	(2	50	0.34
7	2	(20	10	(2	5	0.10
8	(2	(20	10	(2	10	0.10
9	2	(20	10	(2	15	1.13
3300	(2	(20	15	(2	5	0.26
1	(2	20	15	(2	5	0.07
2	40	(20	10	(2	5	0.25
3	5	120	10	(2	70	0.22
4	30	20	20	(2	170	0.32
5	310	(20	5	(2	15	0.28
6	1400	580	140	10	4000	1.90
7	90	(20	5	(2	45	0.32
8	10	20	20	(2	20	0.62
9	1800	320	40	(2	260	1.36
10**	(2	(20	15	(2	10	0.16
10	(2	(20	10	(2	5	0.15
1*	15	(20	10	(2	5	0.14
2	20	20	15	(2	30	0.51
3	5	(20	10	(2	60	0.46
4	(2	60	25	(2	55	0.73
5	5	40	30	(2	70	1.22
6	(2	(20	40	(2	60	1.33
7	(2	(20	15	(2	25	0.36
8	5	20	30	(2	210	1.50
9	5	20	25	(2	60	0.91
20	(2	20	10	(2	15	0.39
1*	(2	20	10	(2	15	0.34
2	(2	(20	10	(2	5	0.13
3	5	(20	70	(2	45	0.54
4	(2	(20	25	(2	70	0.63
5	45	40	55	(2	40	0.19
6	380	200	60	(2	35	1.13
7	110	140	230	(2	35	0.19
8	(2	20	110	(2	210	0.81
9	40	140	180	(2	40	0.39
30						
1	5	320	290	(2	110	0.25
2*	10	540	340	(2	110	0.25
3	(2	(20	10	(2	45	0.09
4	10	290	130	(2	110	0.21
5	(2	140	10	(2	45	0.12
6	5	60	15	(2	80	0.10
7	(2	(20	30	(2	20	0.04
KS 3338	(2	140	60	(2	70	0.15
KS 3340	(2	(20	20	(2	10	0.065
1	(2	20	40	(2	10	0.076
2	10	20	10	(2	10	0.088
3	(2	(20	20	(2	5	0.048
KS 3344	(2	(20	15	(2	(5	0.038

* Denotes duplicate of previous sample

** Denotes repeat and check.

(Denotes less than.

SAMPLE NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe %
KS 3345	(2	(20	25	(2	20	0.08
6	(2	(20	25	(2	20	0.19
7	20	40	80	(2	340	0.89
8	(20	(20	35	(2	310	0.72
9	(20	(20	20	(2	110	2.10
50	(20	(20	15	(2	5	0.08
1	25	20	10	(2	55	0.32
2	(2	(20	20	(2	370	0.27
3	15	(20	15	(2	10	0.06
4**	430	160	20	5	20	0.35
4	450	140	30	5	20	0.32
5	30	140	50	(2	10	0.13
6	10	(20	5	(2	(5	0.18
7	(2	40	10	(2	(5	0.09
8	40	(20	5	(2	(5	0.10
9	10	120	10	(2	(5	0.09
60	5	40	5	(2	5	0.06
1*	5	20	10	(2	(5	0.06
2	(2	40	5	(2	5	0.05
3	10	20	10	(2	10	0.44
4	100	260	25	(2	75	0.86
5	15	20	30	5	45	1.52
6	20	50	80	(2	35	0.68
7	55	120	10	(2	120	1.39
8	20	60	100	(2	55	0.97
9	10	40	10	(2	50	0.57
70	20	40	65	(2	150	1.04
1** *	20	40	55	(2	160	1.06
1	20	60	60	(2	160	1.03
2	35	180	350	(2	1350	0.86
3	5	80	10	(2	35	0.26
4	(2	(20	180	(2	35	0.19
5	(2	(20	30	(2	20	0.37
6	(2	(20	10	(2	15	0.14
7	5	20	5	(2	20	0.15
8	(2	30	20	(2	(5	0.05
9	10	(20	55	(2	25	0.51
80	5	(20	20	(2	40	0.24
1	5	(20	15	(2	70	0.23
2*	2	(20	10	(2	70	0.22
3	20	(20	10	(2	95	0.71
4	5	(20	20	(2	30	0.11
5	20	60	15	(2	45	0.29
6	10	20	30	(2	55	0.19
7	130	72	80	(2	120	1.40
8	(2	40	10	(2	25	0.48
9	5	(20	15	(2	170	0.44
90	60	(20	80	(2	75	1.04
1*	40	40	95	(2	70	0.89
2	5	(20	10	(2	10	0.15
3	85	60	40	(2	2000	3.12
4	5	(20	(2	(2	(5	0.07
5	10	(20	55	(2	10	0.14
6	5	20	10	(2	10	0.30
KS 3397	40	(20	190	(2	(5	0.20

* Denotes duplicate of previous sample.

** Denotes repeat and check.

(Denotes less than.

SAMPLE NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe %
KS 3398	190	(20	70	(2	10	0.22
9	170	(20	95	(2	1000	1.71
400	20	(20	(2	(2	(5	0.11
1** *	25	20	10	(2	10	0.12
1	25	20	5	(2	10	0.13
2	(2	40	10	(2	10	0.06
3	(2	(20	10	(2	10	0.07
4	(2	40	10	(2	10	0.09
5	(2	(20	20	(2	5	0.05
6	10	60	80	(2	7000	4.85
7	10	80	110	(2	370	3.41
8	10	40	50	(2	2500	3.30
9	5	20	5	(2	15	0.06
10	25	(20	15	(2	10	0.09
1*	10	(20	10	(2	5	0.08
2	15	30	5	(2	10	0.09
3	10	20	15	(2	35	1.34
4	(2	(20	40	(2	80	2.90
5	750	50	10	(2	5	0.07
6	5	20	5	(2	(5	0.03
7	5	20	20	(2	45	1.27
8**	5	(20	20	(2	5	0.05
8	5	(20	20	(2	5	0.05
9	10	1400	280	(2	1350	1.33
20	85	1.47%	1750	10	10	0.28
1*	110	1.45%	4500	15	40	0.36
2	10	80	10	5	15	0.15
3	10	(20	25	(2	210	1.77
4	5	(20	5	(2	40	0.18
5	10	300	15	(2	70	0.47
6	25	(20	10	(2	20	0.85
7	30	80	20	(2	25	0.70
8	10	(20	10	(2	25	0.20
9	10	(20	5	(2	10	0.07
30	(2	140	5	(2	10	0.05
1*	(2	120	5	(2	5	0.04
2	(2	(20	5	(2	10	0.05
3	10	20	10	(2	(5	0.07
4	10	(20	10	(2	5	0.07
5	30	(20	10	(2	10	0.08
6	70	(20	25	(2	30	3.41
7	10	(20	10	(2	10	0.03
8	35	(20	20	(2	(5	0.03
9	130	20	10	(2	(5	0.14
40	240	20	20	(2	2500	0.85
1*	300	80	15	(2	3000	0.93
2	270	40	20	(2	700	0.77
3	25	20	5	(2	10	0.17
4	95	(20	10	(2	35	0.26
5	15	(20	10	10	(5	0.05
6	5	(20	10	(5	(5	0.05
7	45	290	100	(2	15	0.15
8**	5	20	10	(2	20	0.11
8	10	20	10	(2	20	0.10
KS 3449	150	180	30	(2	65	0.81

* Denotes duplicate of previous sample.

* * Denotes repeat and check.

(Denotes less than.

SAMPLE NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe %
KS 3450	5	(20	140	(2	450	1.43
1*	10	80	190	(2	400	1.36
2	60	40	20	(2	25	0.17
3	20	(20	30	(2	10	0.23
4	40	160	320	(2	20	0.20
5	5	(20	10	(2	25	0.17
6	10	30	5	(2	20	0.31
7	10	(20	10	(2	(5	0.09
8	20	(20	10	(2	25	0.38
9	25	(20	10	(2	15	0.15
60	30	(20	10	(2	10	0.27
1*	20	20	5	(2	5	0.24
2	10	(20	10	(2	15	0.36
3	20	200	130	(2	15	0.07
4	(2	(20	10	(2	(5	0.06
5**	10	(20	10	(2	10	0.10
5	10	(20	10	(2	10	0.11
6	540	(20	10	(2	5	0.13
7	10	(20	5	(2	5	0.19
8	30	(20	10	(2	10	0.10
9	5	(20	(2	(2	10	0.10
70	5	60	5	(2	10	0.07
1*	(2	80	5	(2	10	0.07
2	65	(20	25	(2	60	0.55
3**	5	(20	5	(2	10	0.08
3	5	(20	5	(2	10	0.08
4	30	20	50	(2	40	0.26
5	20	(20	45	(2	20	0.39
6	10	(20	5	(2	20	0.19
7	(2	(20	5	(2	20	0.08
8	(2	(20	(2	(2	5	0.03
9	30	40	30	(2	50	0.54
80	250	40	65	(2	440	4.60
1*	230	80	60	2	440	4.65
2	10	(20	20	(2	30	0.30
3	30	(20	60	(2	220	2.15
4	5	20	30	(2	30	0.44
5	40	20	65	(2	45	1.34
6	75	(20	30	(2	30	0.42
7	10	160	170	(2	15	0.42
8	5	(20	10	(2	10	0.07
9	230	540	100	5	15	0.85
90	20	40	80	(2	230	3.00
1*	5	40	95	(2	190	2.60
2	20	(20	15	(2	30	0.33
3	40	(20	5	(2	20	0.11
4**	(2	(20	5	(2	10	0.07
4	(2	(20	5	(2	10	0.07
5	15	20	30	(2	25	0.09
6	5	20	5	(2	10	0.04
7	(2	(20	(2	(2	20	0.06
8	200	60	10	2	10	0.15
9	10	(20	5	(2	10	0.06
3500	10	(20	10	(2	25	0.13
KS 3501*	15	(20	15	(2	50	0.41

* Denotes duplicate of previous sample.

** Denotes repeat and check.

(Denotes less than.

SAMPLE NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe %
KS 3502	75	40	50	(2	180	1.39
3	10	(20	5	(2	10	0.07
4	20	(20	10	(2	20	0.10
5	(2	(20	20	(2	130	1.30
6	(2	(20	(2	(2	10	0.07
7	(2	20	15	(2	20	0.08
8	(2	(20	5	(2	20	0.12
9	15	40	40	(2	10	0.44
10	140	20	20	2	10	0.14
1*	150	40	10	2	5	0.16
2	10	(20	10	(2	(5	0.03
3	(2	(20	25	(2	(5	0.05
4	30	20	30	(2	10	0.15
5	140	20	50	(2	65	1.64
6	60	(20	40	(2	15	0.36
7	30	(20	30	(2	20	0.20
8	320	(20	15	(2	10	0.09
9	(2	(20	5	(2	10	0.05
20**	5	20	10	(2	(5	0.02
20	5	20	10	(2	5	0.03
1*	5	(20	(2	2	(5	0.03
2	15	20	140	(2	260	4.75
3	30	20	340	(2	600	5.10
4	10	100	650	2	160	1.15
5	90	190	240	(2	10	0.11
6	10	100	250	(2	40	0.66
7	35	40	95	(2	550	3.35
8	70	50	80	(2	220	2.90
9	10	40	50	2	280	2.45
30	(2	80	10	(2	20	0.11
1*	5	60	10	(2	15	0.11
2	10	50	65	(2	500	3.65
3	5	(20	40	(2	450	2.00
4	5	20	15	(2	10	0.12
5	10	40	10	(2	85	0.35
6	(2	(20	5	(2	10	0.16
7	10	20	10	(2	35	0.30
8	5	(20	15	(2	20	0.86
9	(2	(20	10	(2	5	0.06
40	2	30	30	(2	25	1.14
1*	(2	20	25	(2	30	1.41
2**	(2	(20	10	(2	30	0.37
2	5	(20	10	(2	30	0.35
3	(2	20	50	(2	20	0.35
4	5	(20	10	(2	10	0.11
5	(2	(20	15	(2	25	0.48
6	(2	(20	20	(2	5	0.04
7	15	(20	15	(2	5	0.06
8	(2	(20	15	(2	40	0.21
9	5	(20	20	(2	25	0.60
50	5	(20	20	(2	60	0.61
1*	10	(20	20	(2	60	0.69
2	5	20	20	(2	110	1.15
3	(2	(20	20	(2	30	0.35
KS 3554	(2	(20	10	(2	130	1.33

* Denotes duplicate of previous sample.

** Denotes repeat and check.

(Denotes less than.

SAMPLE NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe %
KS 3555	(2	(20	10	(2	5	0.05
6	(2	40	15	(2	85	0.59
7	(2	20	35	(2	110	1.50
8	(2	20	25	(2	70	2.40
9	5	20	15	(2	10	0.17
60	(2	20	10	(2	5	0.14
1*	(2	20	10	(2	10	0.14
2	(2	20	10	(2	(2	0.19
3	(2	(20	10	(2	10	0.11
4	(2	(20	5	(2	10	0.10
5	5	(20	15	(2	45	0.73
6	30	40	25	(2	190	2.60
7	(2	(20	20	2	150	1.15
8	5	(20	10	(2	30	0.28
9	(2	(20	40	(2	220	1.48
70	5	20	30	(2	120	2.35
1*	5	20	30	(2	110	2.20
2	(2	20	30	(2	65	1.34
3	(2	30	30	(2	45	0.61
4	5	(20	10	2	(2	0.07
5	(2	(20	10	(2	10	0.30
6	(2	(20	10	(2	20	0.11
7	(2	(20	5	(2	10	0.09
8	(2	(20	5	(2	(2	0.06
9	(2	(20	10	2	40	0.20
80**	(2	(20	15	(2	5	0.06
80	(2	20	20	(2	10	0.07
1*	5	20	15	(2	10	0.10
2	2	(20	15	(2	20	0.12
3	10	(20	10	(2	20	0.37
4	(2	20	15	(2	310	0.54
5	(2	(20	5	(2	(2	0.03
6	(2	30	5	(2	5	0.04
7	5	(20	10	(2	15	0.11
8	5	(20	20	(2	70	1.32
9	5	(20	5	2	5	0.18
90	5	20	35	(2	170	2.15
1*	5	20	30	(2	170	2.20
2	(2	20	35	(2	120	1.76
3	5	20	50	(2	130	3.39
4	(2	(20	10	(2	10	0.23
5	(2	20	20	2	40	0.82
6	(2	(20	35	(2	15	0.08
7	10	20	30	(2	35	0.05
8	(2	(20	20	2	15	0.10
9	(2	(20	15	5	5	0.05
600	5	20	2	(2	10	0.11
1*	2	(20	5	(2	5	0.11
2	20	20	2	(2	20	0.30
3	(2	(20	10	(2	35	0.52
4	(2	(20	5	(2	10	0.05
5	(2	(20	25	2	70	0.80
6	2	(20	15	(2	65	0.70
7	100	(20	16	2	15	0.15
KS 3608	(2	(20	5	(2	5	0.04

* Denotes duplicate of previous sample.

** Denotes repeat and check.

(Denotes less than.

SAMPLE NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe %
KS 3609	5	(20	15	(2	20	0.27
10	10	20	10	(2	5	0.09
1*	15	(20	130	(2	20	0.26
2	(2	20	140	2	220	1.70
3	10	(20	60	(2	120	1.47
4	5	(20	35	(2	15	0.28
5	(2	(20	60	(2	35	1.20
6	30	20	30	(2	10	0.29
7	(2	(20	20	(2	5	0.11
8	5	(20	20	(2	15	0.18
9	10	(20	15	(2	40	0.51
20	5	30	20	(2	55	1.00
1*	(2	20	15	(2	55	0.98
2	(2	20	5	(2	5	0.15
3	5	(20	5	(2	10	0.15
4	85	120	20	(2	5	0.21
5	65	20	10	2	10	0.18
6	5	(20	10	(2	20	0.13
7	35	660	170	(2	5	0.08
8	20	(20	50	(2	220	1.69
9	2	(20	20	(2	40	1.01
30	(2	40	5	(2	5	0.07
1*	5	(20	10	(2	5	0.07
2	2	(20	10	2	5	0.05
3	2	(20	35	(2	35	0.56
4	2	20	10	(2	10	0.16
5	430	(20	35	(2	60	0.47
6	10	(20	2	(2	10	0.13
7	(2	(20	5	(2	5	0.05
8	5	(20	10	(2	30	0.57
9	2	(20	25	(2	70	1.06
40	(2	(20	15	(2	30	0.78
1*	(2	(20	10	(2	30	0.80
2	2	30	15	(2	45	1.18
3**	40	(20	10	(2	30	0.34
3	40	(20	10	(2	25	0.31
4	140	40	10	(2	75	0.66
5	15	(20	35	(2	200	2.50
6	40	(20	25	(2	190	1.31
7	15	40	20	(2	110	1.50
8	10	(20	10	(2	15	0.09
9	10	40	65	(2	550	2.60
50	5	(20	50	(2	50	0.88
1*	5	(20	50	(2	55	0.77
2	5	40	50	(2	140	1.45
3	(2	(20	5	(2	5	0.05
4	10	(20	(2	(2	10	0.05
5	30	20	2	(2	5	0.06
6	10	40	80	(2	15	0.07
7	5	20	20	(2	10	0.43
8	(2	40	45	(2	170	2.15
9	25	(20	15	(2	10	0.09
60	20	(20	20	(2	10	0.10
1*	15	20	15	(2	10	0.09
KS 3662	60	20	30	(2	10	0.09

* Denotes duplicate of previous sample.

** Denotes repeat and check.

(Denotes less than.

SAMPLE NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe %
KS 3663	35	40	15	(2	10	0.04
4	10	(20	10	(2	5	0.09
5**	2	20	5	(2	10	0.06
5	2	(20	5	(2	10	0.06
6	(2	20	20	(2	10	0.07
7	5	(20	20	(2	45	0.54
8	5	(20	15	(2	20	0.41
9	5	(20	45	(2	280	2.10
70	(2	20	15	(2	25	0.73
1*	2	(20	15	(2	30	0.68
2	10	30	30	2	110	1.41
3	30	30	20	(2	20	0.25
4	160	20	20	(2	30	0.62
5	30	30	20	2	25	0.33
6	160	(20	40	(2	35	0.17
7	20	20	15	(2	(2	0.25
8	(20	20	10	(2	10	0.56
9	(20	(20	50	(2	40	0.65
80	20	60	75	(2	20	0.55
1*	20	30	70	(2	15	0.57
2	(20	(20	20	(2	85	1.62
3	(20	(20	15	(2	25	0.22
4**	(20	(20	40	(2	125	1.81
4	(20	(20	40	(2	130	1.92
5	40	20	110	(2	320	2.05
6	(20	20	10	(2	(5	0.11
7	(20	(20	15	2	15	0.11
8	20	(20	15	(2	5	0.33
9	20	(20	10	(2	10	0.94
90	(20	40	40	(2	140	0.66
1*	(20	(20	30	(2	140	0.64
2	20	20	20	(2	10	0.18
3	20	(20	10	(2	5	0.11
4	(20	40	10	(2	10	0.08
5	(20	20	10	(2	5	0.09
6	(20	20	10	2	(2	0.06
7	20	20	150	2	250	4.30
8	(20	30	10	(2	(5	0.02
9	20	(20	25	(2	5	0.06
700	(20	(20	10	(2	(5	0.05
1	(20	(20	15	(2	(5	0.05
2	(20	(20	10	(2	10	0.59
3	20	20	30	(2	30	0.75
4	(20	20	20	2	15	0.54
5	(20	(20	10	(2	10	0.20
6	(20	(20	20	(2	25	1.05
7	(20	(20	35	2	40	1.12
8	20	30	10	2	5	0.31
9	(20	20	40	5	55	0.99
10	160	20	20	(2	65	0.96
1*	40	(20	20	2	70	0.86
2	(20	(20	15	(2	10	0.09
3	(20	(20	30	(2	230	1.78
4	(20	20	25	(2	25	1.14
KS 3715	(20	20	20	(2	20	0.81

* Denotes duplicate of previous sample.

** Denotes repeat and check.

(Denotes less than.

SAMPLE NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe %
KS 3716	60	20	10	(2	(5	0.10
7**	20	20	20	(2	5	0.12
7	20	20	20	(2	10	0.12
8	20	(20	15	(2	15	0.37
9	20	(20	20	2	45	0.94
20	(20	20	10	(2	10	0.17
1*	20	20	30	(2	10	0.14
2	(20	20	80	(2	110	0.58
3**	(20	20	20	(2	90	0.22
3	(20	20	15	(2	100	0.33
4	40	40	30	(2	5	0.08
5	(20	(20	40	(2	10	0.20
6	(20	120	290	(2	10	0.15
7	20	(20	55	2	10	1.38
8	20	(20	20	5	20	0.88
9	20	(20	90	(2	150	1.77
30	(20	(20	30	(2	10	0.32
1*	(20	(20	25	(2	(5	0.28
2	60	20	35	(2	10	0.48
3	20	(20	70	2	190	1.21
4	(20	20	30	(2	20	0.83
5	20	20	30	2	20	0.32
6	(20	40	80	(2	10	0.14
7	(20	20	15	(2	10	0.20
8	(20	(20	30	2	10	0.09
9	(20	20	15	(2	10	0.05
40	20	40	60	2	20	0.24
1*	(20	20	55	(2	20	0.24
2	(20	(20	10	(2	10	0.07
3	(20	(20	40	(2	(5	0.19
4	20	20	10	(2	5	0.02
5	(20	20	25	2	(5	0.12
6	(20	20	30	(2	10	0.27
7	(20	40	60	(2	80	0.71
8	(20	20	35	(2	70	0.32
9	20	20	35	(2	(5	0.36
50**	(20	40	20	(2	10	0.50
50	(20	30	20	(2	10	0.54
1*	(20	20	20	(2	10	0.56
2	(20	40	50	(2	40	2.70
3	(20	20	10	(2	5	0.16
4	20	(20	10	5	10	0.24
5	40	20	70	2	450	4.25
6	20	(20	160	(2	1400	7.00
7	(20	20	20	(2	180	1.15
8	(20	20	40	2	300	3.01
9	(20	(20	20	(2	150	1.08
60	(20	(20	30	(2	110	0.91
1*	20	(20	25	2	100	0.91
2	20	(20	240	2	1750	7.35
3	20	20	20	2	70	1.20
4	(20	(20	45	(2	20	0.42
5	(20	(20	35	(2	230	1.67
6	(20	(20	30	(2	50	0.98
KS 3767	(20	40	30	2	330	1.83

* Denotes duplicate of previous sample.

** Denotes repeat and check.

(Denotes less than.

SAMPLE NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe %
KS 3768	(20	(20	10	(2	10	0.11
9**	80	100	370	(2	1200	5.60
9	80	120	370	(2	1200	4.70
70	20	40	45	5	110	1.23
1*	(20	30	50	(2	130	1.54
2	(20	30	15	(2	15	0.21
3	(20	40	35	2	10	0.11
4	20	(20	40	2	150	1.65
5	20	20	55	(2	160	1.54
6	(20	20	40	(2	70	0.91
7	40	20	50	(2	20	0.31
8	(20	(20	20	(2	100	0.40
9	600	20	150	(2	1650	8.05
80	(20	20	15	(2	20	0.16
1*	(20	20	20	(2	10	0.13
2	(20	(20	20	2	20	0.17
3	80	(20	20	(2	20	0.39
4	20	(20	30	(2	100	1.00
5	(20	(20	15	(2	10	0.14
6	(20	20	5	(2	5	0.06
7	(20	(20	15	(2	25	0.08
8	(20	30	15	(2	(5	0.09
9	(20	(20	10	(2	20	0.08
90	20	(20	50	2	10	0.06
1*	(20	(20	50	(2	10	0.09
2	20	(20	20	2	5	0.10
3	20	(20	20	(2	60	1.23
4	(20	(20	20	(2	50	0.81
5	(20	20	20	(2	90	0.64
6	20	20	30	2	250	1.64
7	20	20	60	(2	320	2.95
8	20	(20	30	(2	190	1.76
9	(20	20	25	2	140	0.91
3800	(20	60	35	2	200	1.44
1	(2	(20	20	(2	10	0.07
2	(2	20	130	(2	630	1.08
3	5	20	25	(2	100	0.11
4	5	50	55	(2	600	1.43
5	5	30	15	(2	30	0.12
6	(2	20	15	(2	30	0.11
7	(2	(20	20	(2	5	0.05
8	10	100	65	(2	5	0.06
9	10	(20	45	(2	15	0.11
10**	(2	(20	20	(2	15	0.11
10	(2	(20	15	(2	20	0.11
1	(2	(20	10	(2	15	0.12
2	5	(20	10	(2	30	0.12
3	(2	(20	25	(2	90	0.38
4	(2	20	15	(2	(2	0.06
5	(2	40	80	(2	800	1.33
6	(2	20	20	(2	100	0.25
7	5	20	140	(2	1300	9.10
8	5	(20	45	(2	290	1.25
9	(2	(20	10	(2	10	0.10
KS 3820	(2	(20	15	(2	10	0.09

* Denotes duplicate of previous sample.

** Denotes repeat and check.

(Denotes less than.

SAMPLE NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe %
KS 3821	(2	(20	15	(2	20	0.09
2	(2	(20	25	(2	50	0.22
3	15	(20	40	(2	220	0.91
4	10	30	35	(2	550	1.90
5	(2	20	50	(2	640	1.43
6	5	20	20	(2	80	0.32
7	10	40	120	(2	2150	2.40
8	(2	(20	90	(2	230	2.30
9	10	20	50	(2	80	0.42
30	20	20	80	(2	250	1.10
1	10	(20	35	(2	220	0.95
2	10	(20	35	(2	220	0.86
3	5	30	25	(2	100	0.50
4	20	50	25	(2	270	0.91
5	(2	40	95	(2	70	0.53
6	(2	50	50	(2	150	0.69
7**	(2	(20	20	(2	160	0.49
7	(2	(20	20	(2	180	0.53
8	2	20	70	(2	85	0.30
9	80	260	950	(2	20	0.30
40	10	80	110	(2	100	0.69
1	10	20	75	(2	220	0.76
2	10	20	60	(2	200	0.68
3	15	40	70	(2	150	0.91
4	65	40	150	(2	15	0.69
5	10	40	65	(2	190	1.05
6	(2	(20	5	(2	20	0.06
7	5	30	130	(2	40	0.36
8	5	(20	10	(2	25	0.21
9	(2	(20	25	(2	100	0.59
50	(2	(20	75	(2	140	1.36
1	(2	(20	70	(2	140	1.45
2	5	(20	25	(2	50	0.58
3	(2	30	60	(2	600	1.03
4	(2	30	20	(2	20	0.09
5	(2	20	15	(2	20	0.08
6	(2	20	10	(2	36	0.23
7	(2	30	330	(2	120	0.13
8	5	20	20	(2	330	0.10
9	10	50	40	(2	90	0.11
60	20	280	360	(2	1200	2.55
1	20	180	320	(2	1000	2.30
2	5	20	180	(2	170	0.24
3	(2	20	30	(2	70	0.21
4	10	(20	10	(2	430	0.15
5	(2	(20	10	(2	75	0.19
6	(2	(20	10	(2	140	0.07
7	(2	40	10	(2	130	0.06
8	(2	50	10	(2	40	0.06
9	5	40	45	(2	160	0.08
70	5	80	60	(2	20	0.09
1	(2	40	50	(2	20	0.07
2	10	340	280	(2	340	0.88
KS 3873	5	20	5	(2	(2	0.15

* Denotes duplicate of previous sample.

** Denotes repeat and check.

(Denotes less than.

SAMPLE NUMBER	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe %
KS 3874	10	60	15	(2	5	0.07
5	10	20	30	(2	110	1.15
6	(2	20	40	(2	290	2.00
7	10	40	180	(2	600	3.25
8	140	20	85	(2	800	5.00
9	20	50	50	(2	550	2.15
80	10	20	35	(2	350	1.00
1**	5	(20	30	(2	340	0.98
1	(2	(20	15	(2	45	0.25
2	30	(20	90	(2	450	2.50
3	30	60	130	(2	550	1.80
4	25	40	60	(2	500	2.15
5	30	30	85	(2	630	2.00
6	5	50	95	(2	710	1.95
7	20	40	70	(2	590	1.88
8	(2	20	20	(2	15	0.12
9	5	20	190	(2	10	0.14
90	(2	180	400	(2	70	0.68
1	10	160	400	(2	65	0.66
2	(2	90	80	(2	130	1.13
3	10	20	280	(2	340	2.40
4	10	20	95	(2	270	1.95
5	5	120	75	(2	580	1.45
6	10	20	10	(2	20	1.13
7	(2	20	40	(2	50	0.64
8	(20	(20	10	(2	(5	0.07
9	(20	(20	15	(2	20	0.09
900	20	(20	15	(2	60	0.07
1	20	40	10	2	10	0.18
2	20	(20	10	5	25	0.59
3**	(20	120	90	(2	20	0.56
3	20	140	100	(2	20	0.52
4	(20	50	100	(2	290	3.10
5	20	240	120	(2	130	1.84
6	60	30	70	(2	320	1.76
7	20	60	10	5	(5	0.10
8	20	180	370	(2	25	0.20
9	20	40	100	(2	35	0.35
10	20	20	180	2	220	1.27
KS 3911*	20	50	130	(2	230	1.36

PREPARATION: Dried and sieved to -80 mesh.

ANALYTICAL METHODS: Cu, Pb, Zn, Ag, Mn and Fe by A.A.S. following hot conc. H.C.L. leach and H.C.L/H.N.O_3 leach in latter stages for 1 hour of 0.25g sample.

* Denotes duplicate of previous sample.

** Denotes repeat and check.

(Denotes less than.

APPENDIX NO. 12

ANALYTICAL RESULTS

SAMPLE NUMBER	Ba ppm	Sn ppm
KS 2885	1000	50
6	3000	(1
7	1000	(1
8	500	(1
9	500	(1
90	500	(1
1	500	100
2	500	(1
3	500	(1
4	500	(1
5	500	(1
6	1000	(1
7	500	(1
8	500	30
9	500	20
2900	500	(1
1*	2000	(1
2	2000	(1
3	3000	(1
4	3000	1
5	2000	(1
6	1000	(1
7	1000	(1
8	2000	(1
9	2000	(1
10	2000	(1
1	3000	30
2*	3000	10
3	3000	3
4	3000	100
5	10000	100
6	10000	30
7	10000	30
8	3000	50
9	3000	3
20	3000	10
1*	3000	10
2	3000	5
3	3000	10
4	10000	10
5	10000	30
6	5000	30
7	3000	30
8	5000	20
9	3000	20
30	5000	1
1	5000	3
2*	10000	20
KS 2933	)10000	20

SAMPLE NUMBER	Ba ppm	Sn ppm
KS 2934	)10000	(1
5	)10000	20
6	)10000	10
7	)10000	30
8	10000	10
9	10000	20
40	5000	20
1*	5000	10
2	5000	10
3	10000	20
4	10000	20
5	3000	(1
6	3000	1
7	3000	(1
8	3000	(1
9	3000	1
KS 2950	300	(1
KS 3063*	500	200
4	500	(1
5	300	(1
6	500	(1
7	500	(1
8	500	(1
9	500	(1
70	500	(1
1	500	(1
2	300	(1
3	300	(1
4	500	(1
5	500	(1
6	300	(1
7	)10000	(1
8	1000	(1
9	500	100
80	500	(1
1*	1000	(1
2	1000	(1
3	500	(1
4	2000	(1
5	500	(1
6	500	(1
KS 3087	1000	300

* Denotes duplicate of previous sample.

** Denotes repeat and check.

(Denotes less than.

APPENDIX NO. 12 cont.

SAMPLE NUMBER	Ba ppm	Sn ppm	SAMPLE NUMBER	Ba ppm	Sn ppm
KS 3088	3000	(1	KS 3142	1000	(1
9	1000	(1	3	1000	(1
90	1000	(1	4	1000	(1
1	1000	(1	5	1000	(1
2*	2000	(1	6	2000	(1
3	1000	(1	7	2000	(1
4	1000	(1	8	2000	300
5	)10000	50	9	2000	(1
6	1000	(1	50	2000	30
7	1000	(1	1*	2000	20
8	1000	(1	2	1000	(1
9	300	(1	3	1000	(1
100	1000	(1	4	1000	(1
1*	1000	(1	5	1000	10
2	1000	(1	6	1000	(1
3	1000	50	7	1000	(1
4	1000	(1	8	1000	(1
5	1000	(1	9	1000	(1
6	1000	(1	60	1000	(1
7	1000	100	1*	1000	(1
8	2000	(1	2	300	(1
9	1000	50	3	300	(1
10	1000	(1	4	500	30
1*	)10000	(1	5	500	(1
2	500	(1	6	300	(1
3	1000	(1	7	2000	(1
4	1000	(1	8	2000	(1
5	1000	(1	9		
6	1000	(1	70	)10000	(1
7	1000	(1	1*	500	(1
8	)10000	(1	2	500	(1
9	1000	(1	3	1000	(1
20	1000	(1	4	1000	(1
1*	1000	200	5	1000	(1
2	)10000	100	6	1000	(1
3	500	(1	7		
4	500	(1	8	100	(1
5	300	(1	9	2000	(1
6	500	(1	80	2000	(1
7	1000	(1	1*	1000	(1
8	100	(1	2	2000	(1
9	500	(1	3	3000	(1
30	)10000	(1	4	1000	(1
1*	1000	(1	5	1000	(1
2	1000	(1	6	1000	(1
3	1000	(1	7	300	(1
4	500	(1	8	2000	(1
5	500	(1	9	1000	(1
6	1000	(1	90	3000	(1
7	1000	(1	1*	2000	(1
8	2000	(1	2	1000	(1
9	500	(1	3	1000	(1
40	1000	(1	4	1000	(1
KS 3141*	500	(1	KS 3195	2000	(1

* Denotes duplicate of previous sample.

** Denotes repeat and check.

(Denotes [illegible]

APPENDIX NO. 12 cont.

SAMPLE NUMBER	Ba ppm	Sn ppm	SAMPLE NUMBER	Ba ppm	Sn ppm
KS 3196	1000	(1	KS 3250	500	(1
7	)10000	(1	1*	1000	3
8	500	(1	2	1000	1
9	2000	(1	3	2000	1
200	1000	(1	4	2000	(1
1	500	(1	5	2000	(1
2*	500	10	6	2000	3
3	500	(1	7	1000	(1
4	1000	(1	8	2000	(1
5	3000	(1	9	100	(1
6	2000	(1	60	1000	(1
7	2000	(1	1*	1000	3
8	1000	(1	2	1000	10
9	2000	(1	3	2000	5
10	2000	(1	4	3000	10
1*	1000	(1	5	3000	1
2	3000	(1	6	300	(1
3	2000	(1	7	300	(1
4			8	1000	1
5	500	(1	9	1000	1
6	3000	(1	70	2000	1
7	500	(1	1*	2000	(1
8	3000	(1	2	1000	(1
9	3000	(1	3	3000	(1
20	500	(1	4	1000	(1
1*	1000	(1	5	3000	(1
2			6	2000	10
3	2000	(1	7	2000	10
4	)10000	(1	8	1000	5
5	2000	(1	9	2000	(1
6	1000	(1	80	2000	(1
7	300	(1	1*	2000	(1
8	1000	(1	2	1000	5
9	1000	(1	3	2000	1
30	500	(1	4	3000	1
1	2000	(1	5	2000	(1
2	1000	(1	6	2000	5
3*	1000	(1	7	3000	3
4	1000	(1	8	1000	(1
5	1000	(1	9	3000	30
6	1000	(1	90	2000	30
7	1000	(1	1*	1000	30
8	1000	(1	2	2000	30
9	1000	(1	3	2000	1
40	1000	(1	4	3000	3
1*	1000	(1	5	3000	2
2	500	(1	6	2000	1
3	500	(1	7	2000	2
4	500	(1	8	1000	(1
5	500	(1	9	1000	1
6	1000	(1	300	3000	(1
7	1000	(1	1	3000	30
8	500	(1	2	3000	30
KS 3249	500	(1	KS 3303	2000	30

* Denotes duplicate of previous sample.

** Denotes repeat and check.

(Denotes less th

APPENDIX NO. 12 cont.

SAMPLE NUMBER	Ba ppm	Sn ppm	SAMPLE NUMBER	Ba ppm	Sn ppm
KS 3304	3000	5	KS 3357	1000	10
5	1000	50	8	1000	30
6	1000	30	9	2000	20
7	2000	5	60	1000	10
8	1000	5	1*	1000	(1
9	1000	5	2	1000	10
10	1000	30	3	1000	10
1*	1000	30	4	1000	20
2	500	30	5	1000	10
3	1000	30	6	1000	5
4	1000	1	7	1000	20
5	2000	30	8	1000	20
6	2000	20	9	1000	20
7	2000	5	70	1000	20
8	2000	30	1*	1000	10
9	1000	30	2	1000	5
20	1000	20	3	1000	10
1*	2000	20	4	1000	10
2	2000	30	5	1000	20
3	2000	20	6	1000	30
4	1000	30	7	1000	20
5	1000	30	8	1000	3
6	1000	30	9	1000	1
7	1000	10	80	1000	3
8	2000	30	1	1000	5
9	2000	3	2*	1000	10
30			3	1000	5
1	2000	3	4	1000	5
2*	2000	20	5	1000	3
3	2000	10	6	1000	5
4	2000	10	7	1000	1
5	2000	10	8	1000	5
6	2000	30	9	1000	1
7	2000	5	90	1000	3
KS 3338	1000	5	1*	1000	1
			2	1000	(1
			3	500	10
KS 3340	2000	10	4	1000	5
1	2000	30	5	1000	5
2	2000	20	6	1000	10
3	3000	20	7	1000	1
4	3000	30	8	1000	10
5	2000	30	9	1000	5
6	1000	10	400	500	3
7	3000	(1	1*	1000	3
8	5000	(1	2	1000	3
9	5000	1	3	10000	10
50	1000	(1	4	2000	50
1	1000	10	5	1000	30
2	1000	20	6	1000	30
3	1000	20	7	1000	1
4	1000	30	8	1000	(1
5	1000	20	9	1000	20
KS 3356	1000	10	KS 3410	1000	(1

* Denotes duplicate of previous sample.

** Denotes repeat and check.

(Denotes less t

APPENDIX NO. 12 cont.

SAMPLE NUMBER	Ba ppm	Sn ppm	SAMPLE NUMBER	Ba ppm	Sn ppm
KS 3411*	1000	(1	KS 3465	1000	(1
2	1000	50	6	1000	(1
3	500	(1	7	5000	10
4	1000	(1	8	3000	30
5	1000	30	9	3000	20
6	1000	(1	70	3000	10
7	500	10	1*	3000	10
8	1000	(1	2	2000	30
9	1000	3	3	3000	20
20	1000	1	4	2000	10
1*	1000	1	5	3000	50
2	500	(1	6	3000	30
3	1000	.1	7	3000	20
4	1000	(1	8	3000	10
5	1000	3	9	3000	10
6	1000	(1	80	2000	50
7	1000	1	1*	2000	30
8	1000	(1	2	3000	50
9	1000	1	3	2000	30
30	1000	(1	4	3000	30
1*	1000	1	5	2000	50
2	1000	10	6	2000	30
3	1000	(1	7	3000	30
4	2000	(1	8	3000	30
5	1000	10	9	2000	30
6	500	(1	90	2000	30
7	1000	(1	1*	1000	30
8	500	(1	2	3000	30
9	1000	(1	3	2000	30
40	1000	1	4	3000	20
1*	1000	1	5	3000	30
2	500	(1	6	3000	30
3	500	(1	7	3000	30
4	500	(1	8	2000	30
5	500	(1	9	3000	10
6	1000	(1	500	3000	20
7	1000	1	1*	3000	10
8	1000	1	2	3000	30
9	1000	1	3	3000	20
50	500	1	4	2000	20
1*	1000	1	5	2000	20
2	1000	(1	6	3000	10
3	1000	(1	7	5000	30
4	1000	(1	8	3000	50
5	1000	1	9	3000	3
6	1000	1	10	3000	30
7	1000	(1	1*	5000	30
8	1000	(1	2	3000	30
9	1000	1	3	3000	10
60	1000	1	4	3000	20
1*	1000	3	5	3000	10
2	1000	3	6	3000	20
3	1000	1	7	2000	10
KS 3464	1000	(1	KS 3518	3000	20

* Denotes duplicate of previous sample.

** Denotes repeat and check.

(Denotes [illegible]

APPENDIX NO. 12 cont.

SAMPLE NUMBER	Ba ppm	Sn ppm	SAMPLE NUMBER	Ba ppm	Sn ppm
KS 3519	3000	20	KS 3573	1000	1
20	3000	10	4	2000	3
1*	3000	20	5	2000	10
2	2000	10	6	3000	30
3	1000	20	7	2000	1
4	2000	10	8	3000	(1
5	2000	10	9	2000	5
6	2000	20	80	2000	5
7	2000	20	1*	2000	(1
8	3000	10	2	2000	10
9	3000	10	3	2000	30
30	3000	10	4	2000	20
1*	3000	3	5	2000	20
2	3000	1	6	2000	3
3	3000	10	7	3000	5
4	2000	3	8	3000	30
5	2000	3	9	3000	30
6	2000	1	90	2000	10
7	2000	2	1*	2000	50
8	2000	(1	2	1000	50
9	2000	10	3	2000	30
40	2000	1	4	1000	5
1*	2000	1	5	1000	1
2	2000	1	6	1000	(1
3	3000	5	7	500	1
4	2000	3	8	2000	(1
5	2000	3	9	2000	1
6	2000	10	600	3000	3
7	2000	5	1*	3000	5
8	1000	10	2	5000	1
9	2000	3	3	3000	30
50	2000	10	4	3000	10
1*	2000	10	5	1000	3
2	2000	3	6	1000	5
3	2000	5	7	2000	5
4	2000	3	8	2000	10
5	2000	5	9	2000	10
6	2000	(1	10	3000	3
7	2000	3	1*	3000	10
8	2000	10	2	1000	20
9	2000	10	3	2000	50
60	2000	3	4	2000	30
1*	2000	3	5	2000	30
2	2000	1	6	2000	50
3	1000	5	7	1000	30
4	3000	5	8	1000	5
5	2000	10	9	2000	30
6	1000	10	20	2000	30
7	3000	5	1*	2000	30
8	2000	3	2	3000	30
9	2000	10	3	3000	1
70	2000	5	4	3000	50
1*	1000	5	5	2000	20
KS 3572	1000	10	KS 3626	2000	10

* Denotes duplicate of previous sample.

** Denotes repeat and check.

(Denotes

APPENDIX NO. 12 cont.

SAMPLE NUMBER	Ba ppm	Sn ppm	SAMPLE NUMBER	Ba ppm	Sn ppm
KS 3627	2000	3	KS 3681*	)10000	1
8	2000	10	2	300	(1
9	3000	20	3	)10000	10
30	3000	30	4	10000	30
1*	2000	20	5	10000	50
2	2000	10	6	)10000	30
3	2000	20	7	)10000	(1
4	2000	20	8	10000	5
5	2000	3	9	3000	30
6	3000	5	90	3000	30
7	3000	20	1*	3000	1
8	1000	20	2	10000	30
9	2000	20	3	10000	20
40	2000	20	4	)10000	5
1*	2000	20	5	)10000	20
2	2000	30	6	10000	30
3	2000	20	7	10000	20
4	3000	30	8	10000	30
5	3000	50	9	10000	20
6	1000	300	700	10000	10
7	2000	50	1	10000	20
8	1000	1	2	10000	50
9	2000	30	3	10000	30
50	1000	100	4	10000	10
1*	2000	100	5	10000	30
2	2000	50	6	10000	300
3	1000	30	7	10000	5
4	1000	1	8	)10000	10
5	2000	10	9	5000	300
6	2000	20	10	10000	50
7	1000	1	1*	10000	50
8	2000	3	2	10000	10
9	2000	5	3	10000	50
60	1000	5	4	10000	50
1*	1000	5	5	)10000	1
2	1000	(1	6	)10000	5
3	1000	10	7	10000	5
4	1000	5	8	)10000	1
5	1000	5	9	10000	5
6	2000	20	20	10000	5
7	2000	30	1*	5000	20
8	1000	20	2	10000	10
9	1000	30	3	5000	10
70	2000	20	4	5000	5
1*	2000	50	5	)10000	5
2	2000	30	6	)10000	5
3	2000	(1	7	)10000	(1
4	500	50	8	5000	(1
5	10000	50	9	10000	10
6	10000	50	30	)10000	1
7	100	30	1*	10000	5
8	1000	300	2	)10000	3
9	)10000	10	3	10000	1
KS 3680	)10000	50	KS 3734	1000	(1

* Denotes duplicate of previous sample.

** Denotes repeat and check.

(Denotes

APPENDIX NO 12 cont.

SAMPLE NUMBER	Ba ppm	Sn ppm	SAMPLE NUMBER	Ba ppm	Sn ppm
KS 3735	)10000	10	KS 3789	10000	20
6	)10000	30	9	10000	20
7	)10000	10	90	10000	20
8	)10000	5	1*	)10000	20
9	10000	10	2	5000	20
40	10000	10	3	5000	10
1*	10000	(1	4	3000	10
2	10000	5	5	1000	30
3	10000	30	6	1000	20
4	10000	50	7	1000	50
5	10000	(1	8	500	20
6	10000	10	9	500	30
7	10000	20	800	3000	30
8	10000	10	1	500	(1
9	5000	300	2	2000	(1
50	10000	(1	3	1000	(1
1*	10000	20	4	2000	(1
2	10000	30	5	2000	(1
3	)10000	10	6	3000	1
4	10000	5	7	2000	1
5	1000	10	8	2000	(1
6	10000	10	9	)10000	(1
7	2000	20	10	1000	10
8	5000	30	1	30	10
9	10000	20	2	2000	(1
60	5000	50	3	10000	(1
1*	1000	50	4	3000	1
2	500	3	5	3000	(1
3	1000	50	6	2000	(1
4	3000	30	7	1000	(1
5	10000	20	8	3000	(1
6	5000	3	9	1000	(1
7	10000	50	20	5000	(1
8	5000	30	1	10000	(1
9	5000	20	2	10000	(1
70	10000	20	3	10000	(1
1*	5000	20	4	3000	(1
2	1000	20	5	2000	(1
3	3000	20	6	3000	(1
4	)10000	30	7	)10000	50
5	10000	10	8	3000	(1
6	)10000	20	9	5000	(1
7	10000	20	30	)10000	(1
8	5000	30	1	5000	(1
9	10000	10	2	5000	(1
80	10000	20	3	1000	(1
1*	5000	20	4	3000	(1
2	)10000	20	5	3000	(1
3	)10000	20	6	3000	(1
4	5000	20	7	2000	(1
5	10000	20	8	3000	(1
6	5000	3	9	1000	(1
7	10000	20	40	10000	(1
KS 3788	)10000	20	KS 3841	10000	(1

* Denotes duplicate of previous sample.

** Denotes repeat and check.

(Denote

APPENDIX NO. 12 cont.

SAMPLE NUMBER	Ba ppm	Sn ppm
KS 3842	10000	(1
3	1000	(1
4	5000	1
5	3000	1
6	2000	(1
7	10000	1
8	5000	(1
9	10000	(1
50	10000	(1
1	10000	(1
2	5000	(1
3	5000	(1
4	10000	(1
5	5000	(1
6	5000	(1
7	3000	(1
8	5000	(1
9	5000	(1
60	5000	(1
1	10000	(1
2	5000	(1
3	10000	(1
4	5000	(1
5	3000	(1
6	10000	(1
7	5000	(1
8	5000	(1
9	10000	(1
70	3000	(1
1	5000	(1
2	5000	(1
3	5000	(1
4	5000	(1
5	3000	(1
6	)10000	(1
7	5000	1
8	10000	(1
9	3000	(1
80	10000	(1
1	5000	(1
2	5000	(1
3	5000	(1
4	5000	(1
5	5000	(1
6	5000	(1
7	3000	(1
8	2000	(1
9	5000	(1
90	5000	(1
1	3000	(1
2	5000	(1
3	3000	(1
4	3000	(1
KS 3895	10000	(1
KS 3896	2000	(1
7	2000	(1
8	500	(1
9	300	(1
900	3000	(1
1	3000	1
2	3000	3
3	5000	1
4	3000	1
5	3000	1
6		3
7		1
8		1
9		1
10		(1
KS 3911*	5000	(1

PREPARATION: Dried and sieved to -80 mesh.

ANALYTICAL METHODS: Sn, Ba analysis by Emission Spectrography, Schemes ES2 and 3.

* Denotes duplicate of previous sample.

* * Denotes repeat and check.

(Denote[illegible]

GEOCHEMICAL RESULTS

SEMI-QUANTITATIVE EMISSION SPECTROSCOPY

All values in ppm

GROUP		SAMPLE NUMBER							
		KS 2889	KS 2894	KS 2936	KS 3066	KS 3139	KS 3144	KS 3157	KS 3172
ES 1	Be	(1	(1	5	(1	(1	(1	(1	(1
	Co	(5	(5	20	(5	(5	(5	30	30
	Cr	(20	(20	(20	(20	(20	(20	(20	30
	Ir	(2	(2	(2	(2	(2	(2	(2	(2
	Mn	50	100	500	100	100	100	300	300
	Mo	(3	50	(3	30	30	30	(3	(3
	Nb	(20	(20	(20	(20	(20	(20	(20	(20
	Ni	(3	(3	3	(3	(3	(3	(3	(3
	Os	(10	(10	(10	(10	(10	(10	(10	(10
	Pd	(10	(10	(10	(10	(10	(10	(10	(10
	Pt	(10	(10	(10	(10	(10	(10	(10	(10
	Re	(10	(10	(10	(10	(10	(10	(10	(10
	V	(10	(10	30	(10	(10	(10	(10	(10
	W	(50	50	(50	(50	(50	(50	(50	(50
	Te	(100	(100	(100	(100	(100	(100	(100	(100
	Th	(100	(100	(100	(100	(100	(100	(100	(100
ES 2	Ag	(1	5	(1	1	1	1	(1	(1
	As	(50	(50	(50	(50	(50	(50	(50	(50
	Au	(3	(3	(3	(3	(3	(3	(3	(3
	Bi	(1	(1	(1	(1	(1	(1	1	3
	Cd	(3	(3	(3	(3	(3	(3	20	500
	Cu	100	1000	30	3	300	100	10	30
	Ge	(1	(1	(1	(1	(1	(1	(1	(1
	In	(5	(5	(5	(5	(5	(5	(5	(5
	Pb	100	200	30	200	100	200	500	500
	Sb	(30	(30	(30	(30	(30	(30	(30	(30
	Sn	10	30	1	10	10	30	1	(1
	Tl	(1	(1	(1	(1	(1	(1	(1	(1
	Zn	100	3000	100	1000	1000	1000	500	1000
ES 3	Ba	2000	1000	2000	1000	2000	1000	2000	2000
	Ca	300	300	5000	100	100	100	200	200
	Ce	(300	(300	(300	(300	(300	(300	(300	(300
	La	(100	(100	(100	(100	(100	(100	(100	(100
	Sc	(50	(50	(50	(50	(50	(50	(50	(50
	Sr	(30	(30	(30	(30	(30	(30	(30	(30
	Ti	300	300	300	200	300	200	2000	3000
	Y	(10	(10	(10	(10	(10	(10	(10	(10
	Zr	(100	(100	(100	(100	(100	(100	(100	(100
ES 4	Hg	(30	(30	(30	(30	(30	(30	(30	(30
	P	(100	(100	(100	(100	(100	(100	100	300
	Te	(20	(20	(20	(20	(20	(20	(20	(20
ES 6	B	30	50	10	50	30	30	30	30

(Denotes less than

) Denotes greater than

GEOCHEMICAL RESULTS

SEMI-QUANTITATIVE EMISSION SPECTROSCOPY

All values in ppm

GROUP		SAMPLE NUMBER							
		KS 3174	KS 3207	KS 3239	KS 3257	KS 3285	KS 3288	KS 3306	KS 3331
ES 1	Be	(1	(1	(1	30	20	20	20	20
	Co	10	50	50	(5	(5	(5	(5	(5
	Cr	(20	(20	(20	30	(20	20	20	20
	Ir	(2	(2	(2	(2	(2	(2	(2	(2
	Mn	300	1000	300	5000	200	200	5000	100
	Mo	(3	(3	(3	(3	(3	(3	(3	(3
	Nb	(20	(20	(20	(20	(20	(20	(20	(20
	Ni	(3	(3	(3	10	10	10	10	10
	Os	(10	(10	(10	(10	(10	(10	(10	(10
	Pd	(10	(10	(10	(10	(10	(10	(10	(10
	Pt	(10	(10	(10	(10	(10	(10	(10	(10
	Re	(10	(10	(10	(10	(10	(10	(10	(10
	V	(10	(10	(10	10	10	10	10	10
	W	(50	(50	(50	(50	(50	(50	(50	(50
	Ta	(100	(100	(100	(100	(100	(100	(100	(100
	Th	(100	(100	(100	(100	(100	(100	(100	(100
ES 2	Ag	10	3	(1	(1	(1	(1	(1	(1
	As	(50	(50	(50	(50	(50	(50	(50	(50
	Au	(3	(3	(3	(3	(3	(3	(3	(3
	Bi	3	3	30	(1	(1	(1	1000	(1
	Cd	500	100	30	(3	(3	3	(3	(3
	Cu	10	1000	1000	20	20	5	1000	5
	Ge	(1	(1	(1	(1	(1	(1	(1	(1
	In	(5	(5	(5	(5	(5	(5	(5	(5
	Pb	200	100	800	2000	2000	1000	500	300
	Sb	(30	(30	(30	(30	(30	(30	(30	(30
	Sn	(1	(1	(1	1	3	3	1	1
	Tl	(1	(1	(1	(1	(1	(1	(1	(1
	Zn	1000	200	100	100	100	100	100	300
ES 3	Ba	2000	3000	2000	3000	10000	5000	5000	5000
	Ca	100	200	3000	1000	3000	3000	3000	500
	Ce	(300	(300	(300	(300	(300	(300	(300	(300
	La	(100	(100	(100	(100	(100	(100	(100	(100
	Sc	(50	(50	(50	(50	(50	(50	(50	(50
	Sr	(30	(30	(30	(30	(30	(30	(30	(30
	Ti	2000	3000	2000	2000	3000	3000	2000	2000
	Y	(10	(10	(10	(10	(10	(10	(10	(10
	Zr	(100	(100	(100	(100	(100	(100	(100	(100
ES 4	Hg	(30	(30	(30	(30	(30	(30	(30	(30
	P	300	300	100	(100	(100	(100	(100	(100
	Te	(20	(20	(20	(20	(20	(20	(20	(20
ES 6	B	30	30	30	100	100	100	300	100

(Denotes less than

) Denotes greater than

GEOCHEMICAL RESULTS

SEMI-QUANTITATIVE EMISSION SPECTROSCOPY

All values in ppm

GROUP		SAMPLE NUMBER							
		KS 3332	KS 3419	KS 3420	KS 3421	KS 3441	KS 3487	KS 3489	KS 3524
ES 1	Be	20	20	20	20	20	30	30	30
	Co	(5	(5	(5	(5	(5	(5	(5	(5
	Cr	20	20	30	30	20	(20	(20	30
	Ir	(2	(2	(2	(2	(2	(2	(2	(2
	Mn	100	1000	10	50	300	10	10	100
	Mo	(3	(3	(3	(3	3	(3	(3	(3
	Nb	(20	(20	(20	(20	(20	(20	(20	(20
	Ni	10	10	30	30	10	10	10	10
	Os	(10	(10	(10	(10	(10	(10	(10	(10
	Pd	(10	(10	(10	(10	(10	(10	(10	(10
	Pt	(10	(10	(10	(10	(10	(10	(10	(10
	Re	(10	(10	(10	(10	(10	(10	(10	(10
	V	10	10	10	10	10	10	10	10
	W	(50	(50	(50	(50	(50	(50	(50	(50
	Ta	(100	(100	(100	(100	(100	(100	(100	(100
	Th	(100	(100	(100	(100	(100	(100	(100	(100
ES 2	Ag	(1	(1	10	10	(1	(1	5	1
	As	(50	(50	(50	(50	(50	(50	(50	(50
	Au	(3	(3	(3	(3	(3	(3	(3	(3
	Bi	(1	(1	(1	(1	(1	(1	(1	3
	Cd	(3	50	100	30	(3	(3	10	3
	Cu	10	10	100	100	300	10	100	10
	Ge	(1	(1	(1	(1	(1	(1	(1	(1
	In	(5	(5	(5	(5	(5	(5	(5	(5
	Pb	500	1000	)10000	)10000	100	200	500	100
	Sb	(30	(30	(30	(30	30	(30	(30	(30
	Sn	3	10	10	10	20	10	30	20
	Tl	(1	(1	(1	(1	(1	(1	(1	(1
	Zn	300	300	1000	1000	(20	200	100	500
ES 3	Ba	5000	5000	3000	3000	3000	5000	5000	5000
	Ca	1000	3000	500	500	5000	500	500	1000
	Ce	(300	(300	(300	(300	(300	(300	(300	(300
	La	(100	(100	(100	(100	(100	(100	(100	(100
	Sc	(50	(50	(50	(50	(50	(50	(50	(50
	Sr	(30	(30	(30	(30	(30	(30	(30	(30
	Ti	2000	2000	2000	3000	2000	3000	3000	5000
	Y	(10	(10	(10	(10	(10	(10	(10	(10
	Zr	(100	(100	(100	(100	(100	(100	(100	(100
ES 4	Hg	(30	(30	(30	(30	(30	(30	(30	(30
	P	(100	(100	(100	(100	(100	(100	(100	(100
	Te	(20	(20	(20	(20	(20	(20	(20	(20
ES 6	B	100	100	100	100	100	300	100	30

(Denotes less than

) Denotes greater than

GEOCHEMICAL RESULTS

SEMI-QUANTITATIVE EMISSION SPECTROSCOPY

All values in ppm

GROUP		SAMPLE NUMBER							
		KS 3525	KS 3611	KS 3612	KS 3613	KS 3624	KS 3627	KS 3649	KS 3656
ES 1	Be	30	(1	(1	(1	10	(1	(1	(1
	Co	(5	(5	(5	(5	(5	(5	(5	(5
	Cr	100	30	20	(20	100	(20	(20	20
	Ir	(2	(2	(2	(2	(2	(2	(2	(2
	Mn	10	20	200	100	5	5	500	10
	Mo	(3	(3	(3	(3	(3	(3	(3	(3
	Nb	(20	(20	(20	(20	(20	(20	(20	(20
	Ni	10	30	50	10	30	20	10	20
	Os	(10	(10	(10	(10	(10	(10	(10	(10
	Pd	(10	(10	(10	(10	(10	(10	(10	(10
	Pt	(10	(10	(10	(10	(10	(10	(10	(10
	Re	(10	(10	(10	(10	(10	(10	(10	(10
	V	10	(10	(10	(10	(10	(10	(10	(10
	W	(50	(50	(50	(50	(50	(50	(50	(50
	Te	(100	(100	(100	(100	(100	(100	(100	(100
	Th	(100	(100	(100	(100	(100	(100	(100	(100
ES 2	Ag	(1	(1	1	(1	(1	(1	(1	(1
	As	(50	(50	(50	(50	(50	(50	(50	(50
	Au	(3	(3	(3	(3	(3	(3	(3	(3
	Bi	3	(1	1	3	1	1	3	(1
	Cd	10	10	3	10	50	30	10	3
	Cu	100	10	(1	10	100	30	10	10
	Ge	(1	(1	(1	(1	(1	(1	(1	(1
	In	(5	(5	(5	(5	(5	(5	(5	(5
	Pb	100	20	10	20	100	1000	50	50
	Sb	(30	(30	(30	(30	(30	(30	(30	(30
	Sn	20	10	10	30	50	10	50	10
	Tl	(1	(1	(1	(1	(1	(1	(1	(1
	Zn	300	100	100	50	20	200	50	100
ES 3	Ba	5000	5000	1000	5000	10000	5000	5000	5000
	Ca	500	)10000	)10000	)10000	)10000	)10000	)10000	)10000
	Ce	(300	(300	(300	(300	(300	(300	(300	(300
	La	(100	(100	(100	(100	(100	(100	(100	(100
	Sc	(50	(50	(50	(50	(50	(50	(50	(50
	Sr	(30	(30	(30	(30	(30	(30	(30	(30
	Tl	5000	(100	(100	(100	(100	(100	(100	(100
	Y	(10	(10	(10	(10	(10	(10	(10	(10
	Zr	(100	(100	(100	(100	(100	(100	(100	(100
ES 4	Hg	(30	(30	(30	(30	(30	(30	(30	(30
	P	(100	1000	1000	1000	500	500	1000	500
	Te	(20	(20	(20	(20	(20	(20	(20	(20
ES 6	B	100	10	(10	100	100	50	30	10

(Denotes less than

) Denotes greater than

GEOCHEMICAL RESULTS

SEMI-QUANTITATIVE EMISSION SPECTROSCOPY

All values in ppm

GROUP		SAMPLE NUMBER							
		KS 3658	KS 3685	KS 3697	KS 3726	KS 3756	KS 3762	KS 3769	KS 3779
ES 1	Be	(1	10	10	10	20	10	3	3
	Co	(5	50	100	20	1000	1000	300	300
	Cr	300	20	50	30	500	300	300	30
	Ir	(2	(2	(2	(2	(2	(2	(2	(2
	Mn	200	300	300	10	1000	2000	1000	1000
	Mo	(3	(3	(3	(3	30	10	10	10
	Nb	(20	(20	(20	(20	(20	(20	(20	(20
	Ni	20	10	20	3	300	100	100	(3
	Os	(10	40	(10	(10	(10	(10	(10	(10
	Pd	(10	(10	(10	(10	(10	(10	(10	(10
	Pt	(10	(10	(10	(10	(10	(10	(10	(10
	Re	(10	(10	(10	(10	(10	(10	(10	(10
	V	(10	100	100	30	500	100	100	100
	W	(50	50	50	(50	100	(50	(50	(50
	Te	(100	(100	(100	(100	(100	(100	(100	(100
	Th	(100	(100	(100	(100	(100	(100	(100	(100
ES 2	Ag	(1	(1	3	(1	(1	1	(1	(1
	As	(50	(50	(50	(50	(50	(50	(50	(50
	Au	(3	(3	(3	(3	(3	(3	(3	(3
	Bi	5	(1	(1	(1	(1	(1	(1	(1
	Cd	(3	(3	(3	(3	(3	(3	(3	(3
	Cu	(1	30	30	3	20	20	100	100
	Ge	(1	(1	(1	(1	(1	(1	(1	(1
	In	(5	(5	(5	(5	(5	(5	(5	(5
	Pb	50	30	30	100	1	(1	100	30
	Sb	(30	(30	(30	(30	(30	(30	(30	(30
	Sn	10	50	100	50	(1	1	(1	3
	Tl	(1	(1	(1	(1	(1	(1	(1	(1
	Zn	50	100	200	300	100	300	300	100
ES 3	Ba	3000	1000	3000	3000	1000	500	1000	1000
	Ca	)10000	500	1000	500	)10000	10000	)10000	10000
	Ce	(300	(300	(300	(300	(300	(300	(300	(300
	La	(100	(100	(100	(100	(100	(100	(100	(100
	Sc	(50	(50	(50	(50	(50	(50	(50	(50
	Sr	(30	(30	(30	(30	(30	(30	(30	(30
	Ti	(100	200	500	300	500	300	300	200
	Y	(10	(10	(10	(10	(10	(10	(10	(10
	Zr	(100	(100	300	(100	100	(100	(100	(100
ES 4	Hg	(30	(30	(30	(30	(30	(30	(30	(30
	P	500	(100	(100	(100	(100	(100	(100	(100
	Te	(20	(20	(20	(20	(20	(20	(20	(20
ES 6	B	30	20	20	30	20	(10	(10	10

(Denotes less than

) Denotes greater than

GEOCHEMICAL RESULTS

SEMI-QUANTITATIVE EMISSION SPECTROSCOPY

All values in ppm

GROUP		SAMPLE NUMBER							
		KS 3839	KS 3860	KS 3861	KS 3872	KS 3890	KS 3908		
ES 1	Be	10	(1	3	3	(1	5		
	Co	(5	(5	(5	(5	(5	(5		
	Cr	20	300	100	20	50	50		
	Ir	(2	(2	(2	(2	(2	(2		
	Mn	300	500	1000	300	100	200		
	Mo	(3	(3	(3	(3	(3	(3		
	Nb	(20	(20	(20	(20	(20	(20		
	Ni	100	100	50	(3	3	3		
	Os	(10	(10	(10	(10	(10	(10		
	Pd	(10	(10	(10	(10	(10	(10		
	Pt	(10	(10	(10	(10	(10	(10		
	Re	(10	(10	(10	(10	(10	(10		
	V	(10	(10	(10	(10	(10	100		
	W	300	1000	100	300	200	(50		
	Te	(100	(100	(100	(100	(100	(100		
	Th	(100	(100	(100	(100	(100	(100		
ES 2	Ag	(1	(1	(1	(1	(1	(1		
	As	(50	(50	(50	(50	(50	(50		
	Au	(3	(3	(3	(3	(3	(3		
	Bi	(1	(1	(1	(1	(1	(1		
	Cd	(3	(3	(3	(3	(3	(3		
	Cu	100	30	300	30	30	3		
	Ge	(1	(1	(1	(1	(1	(1		
	In	(5	(5	(5	(5	(5	(5		
	Pb	300	300	300	300	300	200		
	Sb	(30	(30	(30	(30	(30	(30		
	Sn	10	20	20	(1	10	1		
	Tl	(1	(1	(1	(1	(1	(1		
	Zn	(20	(20	(20	(20	(20	500		
ES 3	Ba	2000	3000	1000	2000	2000	3000		
	Ca	10000	)10000	10000	10000	5000	5000		
	Ce	(300	(300	(300	(300	(300	(300		
	La	(100	(100	(100	(100	(100	(100		
	Sc	(50	(50	(50	(50	(50	(50		
	Sr	(30	(30	(30	(30	(30	(30		
	Ti	(100	(100	(100	(100	(100	300		
	Y	(10	(10	(10	(10	(10	(10		
	Zr	500	500	(100	(100	100	100		
ES 4	Hg	(30	(30	(30	(30	(30	(30		
	P	(100	(100	(100	(100	(100	(100		
	Te	(20	(20	(20	(20	(20	(20		
ES 6	B	30	(10	(10	30	30	10		

(Denotes less than

) Denotes greater than

Ian R. Pontifex & Associates Pty. Ltd.

TEL. 332 6744
A.H. 31 3816

26 KENSINGTON ROAD, ROSE PARK
SOUTH AUSTRALIA

P.O. BOX 91, NORWOOD
SOUTH AUSTRALIA 5067

APPENDIX NO. 14

MINERALOGICAL REPORT NO. 2261

18th November, 1977

TO:	Mr. C. D. Strickland, GeoPeko Ltd., P.O. Box 598, DEVONPORT, Tasmania 7310
YOUR REFERENCE:	Your letter dated 20/10/77 Order No. K.P. 1554
MATERIAL:	Rock samples (21)
IDENTIFICATION:	KR 1423 to KR 3619
WORK REQUESTED:	Petrological description and comments as requested
SAMPLES & SECTIONS:	Returned to you

PONTIFEX & ASSOCIATES PTY. LTD.

COMMENTS

Most of these rocks can be classified in terms of the rock groupings and nomenclature outlined in previous report 2228, and indeed directly compared with previously described samples (and photomicrographs of them presented as figures which accompany report 2228). These comparisons are as follows:-

1. "Porphyries"

In this suite	Report 2228
3344	1117 (fig. 46)
3442	1284 (fig. 21)

2. "Rhyolitic (and porphyritic) lavas"

1424	3141 (fig. 22)
3300	1276 (fig. 11)
3606	1276 (figs. 11 to 14)

3. Tuff-lavas

3619 distinctly ignimbritic affinities	1188 (figs. 31, 32)
? 3350)	3155 (fig. 23)
? 3405)	1302 (fig. 28)
? 3447)	
? 3479)	1228 (fig. 1)

.../2

4. Tuffs

	This suite	Report 2228
	1467	1209, 1234 (figs 6 and 15)
	1496	1234 (fig 15)
	3412 extensively tectonised	no obvious equivalent
	3475 volcanic breccia	" " "
	3484	1234, 1042 (figs 15 and 49)
	3547	no obvious equivalent
?	3350 (inc. chlorite + pyrite)	3155 (fig 23)
?	3405 " " + "	1302 (fig 28)
?	3447 " " + "	1228 (fig 1)
?	3479	

5. Others

1423	sheared quartz carbonate chlorite magnetite pyrite mineralisation
1483	altered fine andesite
3302	chloritic sericitic quartz sandstone, ?reworked tuff (possibly equivalent to 1042 previously classified as a tuff)
3382	granite
3464	granite

Primary textures and mineralogy in samples 3350, 3405, 3447 and 3479 are dominated by metamorphic reconstitution to the extent that a positive interpretation of genesis is extremely difficult to establish.

Essentially they consist of fairly sparse small subhedral to euhedral, and some broken quartz crystals scattered through a matrix of ultra fine quartz mosaic with ubiquitous fine shredded streaky sericite. Minor to subordinate chlorite and accessory pyrite occurs in the first three listed of these samples.

.../3

It appears that the matrix in all four of these samples is original glass, but whether glassy lava or pyroclastic flow material is uncertain.

Answers to specific questions in your covering letter -

1. Samples 3344 and 3442 are essentially the same, identified as biotite felspar quartz porphyry, characterised largely by the presence of small biotite phenocrysts and of the fine crystalline (but not really cryptocrystalline), and unsheared groundmass.

2. Sample 3344 does belong to the same group of "porphyries" as 1031, 1117, and 1153 in report 2228.

--

KR1423: sheared and irregularly crystallised mass of ?hydrothermal chlorite-quartz carbonate carrying euhedral pyrite and (fractured) magnetite

Field note: dark siliceous, fine grained rock with pyrite and magnetite

This rock consists of a combined sheared-brecciated, roughly layered and partly foliated mass of mainly quartz and carbonate in similar abundance. Fine euhedral, and fractured granules of magnetite (10-12%), and relatively more clearly defined and slightly coarser euhedral pyrite crystals (7-10%) are scattered more or less along the layering.

Dark green chlorite (10-15%) forms braided foliae, throughout the rock, but is locally more concentrated in thin foliated bands, carrying magnetite dust.

The quartz and carbonate form diffuse attenuated mosaic, with irregular patches of quartz recrystallised around pyrite and magnetite, using those grains as a "nucleus".

Minor coarse, extensively stressed and recrystallised quartz ?phenocrysts are scattered.

KR1424: extensively sheared and recrystallised, possibly primarily flow banded, porphyritic rhyolite

Field note: *porphyritic rhyolite*

Relict, stressed and some recrystallised quartz phenocrysts (10-15%) up to 2 mm, and similarly stressed slightly smaller plagioclase crystals (7-10%) are randomly, but fairly evenly distributed. They occur in a fairly homogeneous, microcrystalline quartz mosaic crowded with an essential abundance of extremely fine sericite, and abundant closely spaced shredded streaks of sericite. These may simply indicate extensive shearing and recrystallisation of an original, fine quartzo-felspathic groundmass. However the contact between some sericitic lenses and the fine quartz is so sharp that it may also reflect primary ?flow banding.

Accessory (5-7%), extremely fine carbonate tends to be grouped around recrystallised plagioclase, and in attenuated lenses in the groundmass.

KR1467: sheared (lithic) vitric quartz-Kspar crystal tuff; trace pyrite

Field note: vitric crystal tuff

Small (0.3 mm) broken crystals of quartz (10-12%) and of potash felspar (10-12%), much smaller splinters of these minerals and small angular fragments of devitrified glass (10-15%), have an even, vaguely bedded distribution; through a matrix of ultra fine quartz crowded with extremely fine shredded threads and micro-foliae of sericite.

The crystals and fragments are undoubtedly tuffaceous, the matrix almost certainly has a related origin and is interpreted as sheared and recrystallised glass. This produced the qualifying rock term of vitric.

Trace fine pyrite crystals are present.

KR1483: moderately chloritised sericitised and weakly cleaved, fine grained andesite

Field note: dark green fine grained, intermediate ?intrusive

This is a homogeneous, massive very fine grained igneous rock, with a very vague ? primary flow texture, superimposed and dominated by a cleavage, outlined by wavy sericitic and chloritic foliae through the groundmass.

Abundant, more or less euhedral laths of plagioclase (30-35%) are evenly scattered with very vague similar orientation. They occur in an extremely fine crystalline groundmass of plagioclase, chlorite and minor sericite, with ubiquitous ultra fine Fe and/or Ti grains.

Several quartz stringers with sericitic and chloritic margins are present.

KR1496: moderately sheared, crystal lithic tuff

Field note: crystal lithic tuff

This rock consists essentially of a loosely packed aggregate of single "volcanic" quartz crystals (25-30%), average size about 1.5 mm, also subhedral crystals of plagioclase (5-7%), potash felspar (7-10%), of similar size. These are all stressed, slightly deformed, rarely broken and recrystallised.

These occur in a patchy, ultra-fine matrix of clays, quartz, sericite and potash felspar. It is patchy, with minor variations in composition and texture reflecting a primary fragmental origin (including variations in the incorporated coarser quartz-felspar crystals). Staining emphasises the patchy variations of potash felspar crystals and matrix.

This heterogeneous texture is superimposed by an extremely fine sericitic cleavage.

KR3300: rhyolite porphyritic in quartz; sheared and recrystallised (?fine flow textured) groundmass; no sulphides

Field note: quartz felspar porphyry (rhyolite) ?sulphides

Generally small (1 mm) single subhedral to subrounded and embayed quartz phenocrysts (10%) are evenly disposed. They occur in a groundmass of patchy, diffuse quartz micro-mosaic, intimately intergrown with a similar abundance of equally diffuse lenses of cryptocrystalline potash felspar.

Wavy shredded streaks and threads of sericite are ubiquitous through this fine quartzo-felspathic mosaic -- which almost certainly represents devitrified and otherwise altered rhyolitic glass. These streaks define a weak cleavage, but this appears to be superimposed on a primary fine flow texture.

KR3302: (chloritic), sericitic quartz sandstone in which the quartz is derived from a volcanic source (?chloritised and sericitised reworked tuff)

Field note: dark green, fine grained, ?intermediate ?intrusive

This rock consists of a generally loosely packed aggregate of reasonably evenly sized single quartz crystal grains, average size 0.6 mm. These have a volcanic origin, as indicated by their subhedral and corrded outlines; they are stressed, some are recrystallised and locally clustered together into vague patchy aggregates.

On a macro- scale these grains appear to be vaguely layered (bedded). The matrix between the grains consists of a compact mass of sericite, with minor fine chlorite widespread and tending to immediately surround quartz grains, or fill narrow fissures between them ± recrystallised quartz. Fe and/or Ti dust is dispersed. There are no relicts of former minerals within the sericite.

This rock is not an intrusive, rather it appears to be a sediment, composed largely of volcanic quartz - but not as a primary pyroclastic. It is identified as a reworked, quartz crystal tuff.

KR3344: (chloritised) biotite, (sericitised) plagioclase, quartz porphyry

Field note: porphyritic rhyolite, quartz felspar biotite

Phenocrysts in this rock consist of subrounded and embayed quartz crystals (25-30%), rarely up to 10 mm; generally smaller plagioclase crystals (15%), lesser potash felspar (10%), and single biotite flakes (10-12%). The plagioclase is almost completely altered to (attenuated) patches of sericite; the biotite is virtually completely replaced by chlorite + titaniferous granules.

These components are randomly disposed through a fairly homogeneous, fine crystalline mosaic of potash felspar and quartz in similar abundance, lesser plagioclase, minor biotite. Accessory oxidised Ti crystals and clouded epidote are disseminated.

This rock is characteristic of the "Porphyry" category of rocks defined in report 2228.

KR3350: (?vitric) quartz crystal tuff with a cleaved (sheared and recrystallised) sericitic chloritic quartzose very fine matrix; trace pyrite

Field note: rhyolitic quartz porphyry

Single, subhedral to subrounded and embayed quartz crystals (20%) are scattered in discontinuous but fairly definite layers. They have variable size up to 2 mm, some are broken. Minor small streaky lenses of fine chlorite, and trace euhedral pyrite crystals, zircon and Ti granules occur more or less within these same layers. Most quartz crystals are enveloped in a corona of recrystallised matrix-groundmass.

The bulk of the rock, essentially acting as host to these layers consists of fairly homogeneous microcrystalline quartz mosaic, with ubiquitous, fine, commonly oriented chlorite and sericite in variable but generally minor abundance.

The sericite is conceivably sheared and retrograded primary felspar, but it appears to be insufficient to represent the amount and distribution of felspar expected in an original rhyolite.

Although metamorphic textures dolinate this rock, the mode of occurrence of quartz crystals and lack of evidence of significant original felspar, indicates an original quartz crystal tuff (in an altered glassy matrix) rather than a lava.

* Note this is at variance with the list of rock names sent to M. Rogers 16/11/77.

KR3382: stressed and locally recrystallised medium to coarse granite; accessory magnetite zircon sphene, chloritised biotite

Field note: granite

This rock has an original medium to coarse allotriomorphic to hypidiomorphc granular texture, but it is now somewhat inequigranular due largely to shearing, recrystallisatior and minor, related brecciation.

Coarse, highly irregular anhedral crystals of perthitic potash felspar (35-40%), highlighted on the stained off-cut, are randomly intergrown with equally coarse irregular grains of quartz (40%). Minor subhedral and generally smaller crystals of plagioclase (10-15%), small clusters of chloritised biotite (10%), ± accessory magnetite, zircon and sphene are randomly scattered.

All components are stressed, the quartz in particular is locally dislocated and recrystallised along internal fractures.

KR3405: weakly quartz crystal vitric tuff, extensively sheared and recrystallised to produce an ultra-fine chlorite-sericite-quartz matrix; minor carbonate, trace pyrite

Field note: vitric tuff

Single quartz crystals (10-15%) average size about 1.2 mm, and commonly aligned lenses of ultra-fine sericite (20%) which appear to represent sheared and completely altered felspar crystals, are fairly evenly disposed. The quartz crystals are stressed dislocated and partly recrystallised.

These components occur in a fairly homogeneous matrix of diffuse microcrystalline to almost cryptocrystalline quartz mosaic. This contains minor to locally subordinate, extremely fine commonly al;igned sericite and chlorite, and fine shredded streaks of sericite. This groundmass has been extensively sheared and recrystallised.

Minor quartz carbonate veins cut the rock. Recrystallisation in pressure shadow areas adjacent to some quartz grains and accessory small pyrite crystals results in small localised mosaics of quartz and carbonate.

Metamorphic textures dominante this rock. It is very similar to 3350 described above and interpreted as a tuff. It is also similar to 3155, 1302, 1322, figs. 23, 28, and 45 respectively, described in report 2228, where their genesis is admitted as doubtful, but probably original weakly porphyritic glassy lavas or tuff-lavas.

The reconsideration of this group of rocks favours the interpretation of a recrystallised, weakly quartz crystal, vitric tuff (also comparable with 3350 above).

KR3412: lithic quartz crystal tuff, extensively sheared and micro-crenulation folded, as a result sericitised chloritised and silicified

Field note: dark fine grained siliceous rock (altered quartz felspar porphyry, rhyolitic)

This is the most extensively 'tectonised' sample in the suite, manifest as sericitic and chloritic shears, combined with micro-crenulation (kink) folding, mainly within the matrix but also incorporating some relict lithic fragments, and/or altered felspar crystals.

Relict single crystal, quartz crystals (25%), average size 1 mm, and a similar abundance of 'patches' of microcrystalline quartz-sericite-chlorite, which appear to be altered lithic fragments are randomly disposed. These are volcanic crystals and fragments, extensively stressed and variably recrystallised.

The matrix has a similar composition (and origin) as the patches, composed of microcrystalline to cryptocrystalline quartz, crowded with a set of parallel fine shear planes and micro-crenulation folds outlined by variable concentrations of chlorite and sericite. Accessory micaceous hematite is present.

KR3442: biotite quartz felspar porphyry;
biotite chloritised felspar
phenocrysts completely sericitised

Field note: porphyritic rhyolite or lithic crystal tuff

Phenocrysts of subrounded to almost euhedral quartz crystals (20%) up to 10 mm, euhedral plagioclase crystals (20-25%), and more or less single flakes of biotite (10-12%) are randomly disposed through a fine crystalline groundmass.

The quartz crystals are stressed and partly recrystallised, plagioclase is completely replaced by fine sericite, and the biotite is completely chloritised and crowded with titaniferous granules ± associated small epidote crystals some of which grade to the orthite variety.

The groundmass consists of a fine mosaic (not necessarily microcrystalline) of essential quartz and potash felspar, with disseminated fine chloritised biotite.

This is highly characteristic of the quartz felspar porphyry group defined in report 2228. In this suite it compares with 3344.

KR3447: sheared and fairly extensively recrystallised (quartz crystal, lithic) vitric tuff or sparsely, micro-porphyritic glassy rhyolitic lava

Field note: flow banded fine quartz felspar porphyry (rhyolitic)

Coarse components in this rock are quite sparse, composed essentially of single quartz crystals (7-10%), average size 1 mm. These are randomly scattered through a matrix of diffuse microcrystalline quartz mosaic, crowded with a similar abundance of commonly oriented ultra-fine sericite and closely packed shredded streaks of relatively concentrated sericite representing fine shear foliae.

Minor fine chlorite is intimately intergrown with the sericite. Minor extremely fine carbonate occurs locally along the foliae. Several lenses of fine diffuse quartz mosaic, relatively crowded with fine chlorite ± Ti granules may be sheared out fragments (of a tuff), or specific domains within a former glassy groundmass of a rhyolitic lava.

Oblique shears are relatively chloritic and carry accessory fine pyrite, essentially the same as in 3405 and 3350.

The dominance of metamorphic fabric, makes it extremely difficult to know if this is an original quartz crystal vitric tuff (i.e. glassy matrix), or a sparsely micro-porphyritic, glassy, flow banded, rhyolitic lava.

The somewhat patchy and probable relict, now sheared fragments, and perhaps the presence of chlorite favours a tuff interpretation. It is however almost certainly the same as 3405 and 3350.

KR3464: stressed, medium grained granite, gradational to adamellite; plagioclase shows sericite-epidote alteration, biotite is completely chloritised

Field note: granite

This rock has a fairly homogeneous, medium (5 mm) allotriomorphic granular aggregate texture. It is stressed and shows incipient local recrystallisation, but the primary texture is considerably more intact than the other granite 3382 in this suite.

It consists of perthitic potash felspar (35-40%), intergrown with a similar abundance of allotriomorphic quartz (35%), and subhedral crystals of plagioclase (15-20%). Clusters of finer chloritised biotite (10%) ± zircon titaniferous granules and ? magnetite are scattered.

The plagioclase is selectively partly altered to clouds of fine muscovite, sericite and fine granular epidote. Potash felspar is virtually unaltered.

KR3475: volcanic breccia of porphyritic glassy rhyolite, and minor epidotised dacitic material

Field note: crystal lithic tuff (quartz felspar chlorite)

The stained off-cut shows patchy domains up to 20 mm which have a distinctly potassic matrix, distinct from other areas of similar size which are not potassic.

These domains have a predominantly, porphyritic rhyolitic glassy lava composition. Phenocrysts of subhedral quartz (15%) up to 2 mm, of altered potash felspar (15%) also altered plagioclase (7%), occur in a sheared, diffuse micro-crystalline quartz mosaic, crowded with extremely fine chlorite, which depicts a wavy ?flow layering. Minor foliae are marked by relatively coarser chlorite, studded with minute titaniferous granules ± fine epidote.

Areas between these domains are non-potassic, and consist of a diffuse micro-mosaic of quartz, crowded with ultra-fine epidote, also with scattered, embayed quartz crystals, veins and patches of relatively coarser epidote. These areas have a gross epidotised dacitic composition.

Within the rather limiting size of this sample, it is interpreted to consist of breccia fragments of porphyritic glassy rhyolite, with interfragmental epidotised dacitic material, which would appear to indicate the most appropriate rock name of volcanic breccia.

KR3479: (?lithic) vitric crystal tuff; with a sheared and recrystallised extremely fine quartz-sericite matrix

Field note: vitric crystal tuff

Small single crystals of quartz (25-30%), measuring between 0.2 and 2 mm are disseminated, but roughly layered throughout an extremely fine quartz-sericite matrix. These crystals are variably subhedral, embayed, anhedral, broken-angular and splintery, indicating an almost certain tuffaceous derivation. Minor sericitised felspar crystals are also tentatively identified.

The groundmass consists of somewhat patchy, diffuse microcrystalline quartz, crowded with abundant fine sericite and shredded streaks of sericite. It is interpreted to be a sheared and recrystallised glassy ?tuffaceous matrix with incorporated, similarly altered glassy fragments.

It is not absolutely certain if this is an original tuff or lava, however it is essentially the same as KR1234 and KR3273 (report no. 2228) in which definite lithic ash and rare lapilli were also identified, thus confirming the tuff genesis (see figs. 4, 15 and 16 in that report.)

KR3484: fine quartz crystal, vitric tuff;
sheared and recrystallised matrix

Field note: crystal vitric tuff

Small (0.1 to 0.3 mm) crystals and splinters of quartz (10-15%) and potash felspar (5%) and accessory siliceous lithic fragments, are disseminated, but vaguely layered through a cleaved, extremely fine and highly potassic matrix. These crystals and fragments are of undoubted tuffaceous origin.

The matrix consists of clouded extremely fine potash felspar (indicated largely by staining), tightly packed shreds of sericite with dispersed, ultra-fine titaniferous granules, and minor quartz. Minor streaks of biotite occur within some sericitic foliae.

This rock probably has a similar genesis to KR3479 but it is finer and more potassic. It is very similar to KR1042 (fig. 49), and KR1234 (fig. 15) report 2228.

KR3547: massive vitric lithic crystal tuff;
sericitised (and silicified) matrix

Field note: tuffaceous sediment

This rock consists of a very loose, poorly sorted and random aggregate of generally angular, lesser subrounded and corroded quartz crystals (30%), extensively clouded, altered fragments of volcanic ?felsic glass (20-25%) and accessory fragments of cryptocrystalline silica (after glass).

These are randomly disposed through a matrix of diffuse micro-mosaic of quartz, crowded by a similar abundance of extremely fine shredded sericite, without any really distinctive development of metamorphic foliation. This matrix is interpreted to be largely derived from glass, as in many of the tuffs described immediately above.

This is a vitric lithic crystal tuff, rather more crowded with quartz crystals than most tuffs in this suite, but there is no evidence of reworking or 'normal' clastic detritus which may indicate 'sediment'.

KR3606: fairly coarse potash felspar-quartz porphyry, almost certainly a rhyolite; sheared and recrystallised groundmass

Field note: quartz felspar porphyry

Generally euhedral to lesser subhedral phenocrysts of quartz (15%) and potash felspar (15%) are randomly disposed through a sheared, recrystallised, and apparently relict flow textured groundmass. These phenocrysts are stressed and some are recrystallised along fractures.

The groundmass consists of small patches and lenses of diffuse microcrystalline quartz mosaic within compacted shredded streaks, and apparently attenuated, variolitic flow structures, composed of sericite, minor biotite and chlorite, clouded by ?titania dust. This groundmass is interpreted to have derived very largely from flow textured glass, more likely in a lava, than in a pyroclastic flow rock (although this cannot be proven.)

KR3619: potash felspar quartz porphyritic tuff-lava, of ignimbritic affinities

Field note: quartz felspar porphyry ?(ignimbritic affinities)

Subrounded and corroded quartz phenocrysts (20-25%) up to 4 mm and smaller, euhedral potash felspar phenocrysts (7%), are randomly disposed through a micro-crystalline quartz mosaic crowded with fine shredded streaks and lenses of sericite. The quartz crystals are extensively stressed and some are recrystallised although there is no real cleavage developed in the rock. Thus this crystal deformation appears to be largely primary.

The groundmass is distinguished from all other fine quartz-sericite common throughout the suite, by virtue of abundant, crowded devitrified shards, producing an irregular eutaxitic texture, thus indicating a pyroclastic flow rock with ignimbritic affinities. (To have deduced this in hand specimen was brilliant.)

KR 2093 : meta, tuff or tuff-lava of gross dacitic composition

About 65% of this rock consists of a fairly continuous and reasonably homogeneous (albeit somewhat patchy), fine crystalline groundmass. This is composed of a somewhat diffuse, or 'loose' aggregate of uniformly microcrystalline quartz, with abundant ultrafine sericite, and minor equally fine chlorite, ubiquitous, more or less intergranular.

These fine micas are similarly, but not precisely, commonly oriented and this is manifest in hand specimen by a fairly well-advanced lineation fabric. Locally they are relatively concentrated (virtually without quartz), into streaks and flame-like patches, which are also more or less elongated along this common direction. Minor chlorite fills several small cross-cutting fissures, and between relict primary discontinuities.

Coarser, single crystals of quartz (20%), measure from 0.1 to 2 mm in maximum dimension. These may be angular (including some broken), but more commonly they are euhedral to subrounded, embayed, and otherwise corroded margins.

Accessory ghost-like relicts of plagioclase crystals in this size range are almost completely resorbed by the groundmass and/or virtually completely sericitised.

This is a volcanic rock with a gross dacitic composition but whether a tuff or lava is not absolutely certain. The moderate metamorphic recrystallisation partly destroys the primary microscopic textures, however the patchy and fine aggregate nature of the groundmass, the vaguely layered coarse crystals, including some broken ones, and chlorite apparently filling between some fragments, all point to at least a partial tuffaceous genesis (?tuff-lava), if not a totally pyroclastic rock (tuff).

KR 2096 : intercalated, very fine tuff or tuffaceous pelite and coarser quartzose crystal tuff; brecciated, extensively, partly differentially silicified and chloritised by epithermal agencies

About half of this section consists of 'bands' of extremely fine chloritic material, about 10 mm thick, and quite discontinuous due to dislocation and local attenuation to produce flame-like forms. Whereas the bulk of these consist of ultrafine chlorite, subordinate silt to sand size, probably tuffaceous quartz is dispersed, and minor equally fine greenish biotite is intimately intergrown.

Poorly defined bands between those described above, and partly gradational into them, consist of a poorly sorted quartzose aggregate (up to coarse sand size). This is mixed with, indeed appears to be superimposed by a random dissociated aggregate of quartz prisms (characteristic of epithermal quartz); also fine crystalline chlorite is randomly interstitial. Patches of diffuse quartz micromosaic mixed with ultrafine quartz are present and rare limonite replicas after fine pyrite are disseminated.

The rock is interpreted as a tuff composed of intercalated, extremely fine (? glassy) and possibly pelitic layers, and coarser quartz crystal detritus; brecciated and invaded by epithermal quartz with extensive related chloritisation.

374 000 E | 375 000 E | 376 000 E | 377 000 E | 378 000 E | 379 000 E | 380 000 E | 381 000 E | 382 000 E

5 250 000 N | 5 249 000 N | 5 248 000 N | 5 247 000 N | 5 246 000 N | 5 245 000 N

E.L. 27/76 BOUNDARY

Refer to Geological Map Sheet 27/76 V9-2 for 1:10 000 scale Geological Interpretation

VOYAGER 9 ✱

SAMPLE NUMBER	ROCK SAMPLE GEOCHEMICAL RESULTS										
	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Fe %	Mn ppm	Cd ppm	As ppm	Sn ppm	Sn^{α} ppm	Au ppb
KR 3604	10	<20	30	<2	0·87	140	<2	<5	5		
3614	5	<20	20	<2	0·61	50	<2	<5	<1		
3618	5	<20	20	<2	0·46	110	<2	<5	3		

ANALYTICAL METHOD: Cu, Pb, Zn, Ag, Fe, Mn and Cd by AAS following hot conc. HCL leach and HCL/HNO₃ leach in latter stages for 1 hour of 0·25g sample.
Au by special Low Level CRA/AAS.
As by modified Gutzeit method.
Sn by Emission Spectrography Scheme ES 2.
Sn^{α} by XRF.
α where applicable.

209201

OPERATOR OF RECORD:

Capital letter = indicates predominant rock type, e.g. 'F' sedimentary, lapilli K, basaltic M, basaltic lava

Lower case letters = indicate the following:
(1) Category, e.g. pa = pyroclastic, lithic fragments in an ash crystal rock with a green matrix.
(2) Textural or structural features, e.g. vit = vitreous tuff or dust composition, eg. pA= porphyritic lava rock, e.g. cxA= oxidised solid rock.

To be suffixed in progressive order:
(1) Categories - e.g. pa= rhyolite, eg. To = intermediate rock of andesitic composition.
(2) Mineralogy - e.g. pArhy = porphyritic rhyolite with feldspar phenocrysts, e.g. lat f/a = lithic crystal tuff with feldspar (phenocryst component) and biotite (phenocryst mafic component), e.g. lat f/g = lithic crystal tuff with (major) feldspar crystals and (minor) quartz crystals, e.g. fd mg pArqfp = block species lithic bonded porphyritic rhyolite with quartz (major phenocryst component), kaolinite (minor phenocryst component), sericite (groundmass component), and block species (minor undifferentiated accessory minerals).

NOTE: This map has been compiled from enlargements of the Tasmanian Lands Department's 1:15 840 scale topographic machine plots.

SYMBOLS

IGNEOUS
A — acid igneous undifferentiated
Ar — rhyolite
T — intermediate, igneous undifferentiated
To — andesite
Td — dacite
M — basic igneous undifferentiated
Mv — basalt
Md — dolerite
Gr — granite

SEDIMENTARY
lst — lithic
sltst — siltstone
slst — siltstone
qtz — quartzite
Sconglc — conglomerate
Sv — volcaniclastic sediment

STRUCTURAL and TEXTURAL
f — tuff undifferentiated
lt — lithic tuff
vt — crystal tuff
vt — vitric tuff
fb — flow banding
p — porphyritic
cleaved
shear
xx — xenolithic
ign — igneous
brec — brecciated
sch — schistose

GRAIN SIZE
fg — fine grained (< 1 mm)
mg — medium grained (1 mm - 5 mm)
cg — coarse grained (5 mm - 5 cm)

STRUCTURAL
— — — —

383 000E 384 000E 385 000E 386 000E 387 000E 388 000E 389 000E 390 000E 391 000E

5 250 000N

5 249 000N

5 248 000N

5 247 000N

5 246 000N

5 245 000N

*MAGNETIC ANOMALY 6

Refer to Geological Map Sheet 27/76 V2-2 for 1:5000 scale Geological Interpretation

EL 27/76 BOUNDARY

VOYAGER 2

Part of Voyager 4 grid

SAMPLE NUMBER	ROCK SAMPLE GEOCHEMICAL RESULTS									
	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Fe %	Mn ppm	Cd ppm	As ppm	Sn ppm	Sn* ppm	Au ppm
KR 1466	1200	70	70	2	41·00	>10 000	<2	200	<1		<20
1468	3500	20	70	5	31·00	>10 000	2	35	<1		
1469	4200	180	90	7	34·00	>10 000	5	30	<1		
1470	1650	480	20	10	37·00	>10 000	2	130	<1		30
1471	1600	460	130	15	44·00	>10 000	5	200	<1		30
1473	2300	460	60	10	30·50	>10 000	2	100	<1		55
1474	690	260	190	5	48·00	4 200	2	15	3		
1476	25	<20	20	<2	0·62	550	<2	15	<1		
1477	20	20	20	<2	0·32	130	<2	<5	3		
1478	2500	740	210	10	37·00	>10 000	5	100	<1		20
1479	3050	330	810	5	34·00	>10 000	5	20	<1		

ANALYTICAL METHOD: Cu, Pb, Zn, Ag, Fe, Mn and Cd by AAS following hot conc. HCL leach and HCL/HNO3 leach in latter stages for 1 hour of 0·25g
Au by special Low Level CRA/AAS.
As by modified Gutzeit method.
Sn by Emission Spectrography Scheme ES 2
Sn* by XRF.
* where applicable.

209202

OPERATION OF LEGEND

Capital letter — indicates primary classification eg S = sedimentary rock . A = acid rock . M = basic rock

Z Lower case letters — indicate the following
(.) Colours : e.g. pk/gr(ch) = pink fragments in an acid igneous rock with a green matrix
(..) Texture or structural features - e.g. ytA = crystal tuff of acid composition , e.g. pA = porphyritic acid rock, e.g. oxA = oxidised acid rock

b As suffixes in progressive order:
(i) Categorised - e.g. pAr = rhyolite, e.g. Io = intermediate rock of andesitic composition .
(ii) Mineralogy - e.g. pAr1 = porphyritic (crystals) with feldspar phenocrysts , e.g. ytA f/b = lithic crystal tuff with feldspar (phenocrysts component) and biotite (prominent matrix component), e.g. ytA fgr = lithic crystal tuff with (major) feldspar crystals and (minor) quartz crystals, e.g. fb mg,bfgrh = black specks in flow banded porphyritic rhyolite with quartz (major phenocryst component, size range 1 mm - 5 mm), feldspar (minor phenocryst component), sericite (prominent matrix component), and black specks (minor undifferentiated accessory mineral).

NOTE
This map has been compiled from enlargements of the Tasmanian Lands Department's 1:15840 scale topographic machine plots

SYMBOLS

IGNEOUS
A acid igneous unclassified
Ar rhyolite
I intermediate igneous unclassified
Io andesite
Id docite
M basic igneous unclassified
Md basalt
Md dolerite
Gr granite

SEDIMENTARY
Ish shale
Sslts siltstone
Sscst scrubstone
Sqtz quartzite
Scong conglomerate
Sv volcaniclastic sediment

STRUCTURAL and TEXTURAL
t tuff unclassified
lt lithic tuff
xt crystal tuff
vt vitric tuff
fb flow banding
p porphyritic
clvd cleaved
shd sheared
ox oxidized
vns veins
ign ignimbrite
brec brecciated
sch schistose

GRAIN SIZE
fg fine grained (<1 mm)
mg medium grained (1 mm - 5 mm)
cg coarse grained (5 mm - 5 cm)

STRUCTURAL
outcrop limit
rubble boundary
interpretative contact
bedding
joint
cleavage
primary foliation
fault
unconformity

COLOURS
pk pink
grn green
brn brown
ple pale
dk dark
wte white
gry grey
pur purple

SILICATE MINERALOGY
q quartz
f feldspar
mus muscovite
b biotite
c chlorite
s sericite
cb carbonate
mafics mafics
hb hornblende
sid siliceified
ferromag ferromagnesians

SULPHIDE MINERALOGY
* sulphides
py pyrite
cpy chalcopyrite
gn galena
hm haematite
mag magnetite
gos gossan
tm tenorite

MISCELLANEOUS
TS 5033 Thin section and rock No
* 1172 Geochemical analysis and rock No
Grid traverse
Anomaly centre (approximate)
Old workings
Composite

GEOLOGICAL INTERPRETATION

Period No			
19-1		TERT	(Macquarie Beds)
19-6		L ORDO	Conglomerate (Owen type), sandstones. (Scongl, Ssst)
19-50		Io	Andesite
19-67		M	Basic dyke
19-10		UG ?	Granite (Gr)
19-13		G	Sandstone (Ssst)
19-17		G	Fine grained volcaniclastic sediments. (fg Sv(sst), Sv(Sshl,)
19-18		G	Coarse grained sedimentary breccia (cg S(brec))
19-19		G	Porphyritic quartz - feldspar rhyolitic lavas (fbpkrpf)
19-21		G	Feldspar - quartz - biotite porphyry (cg pkrfqb)
19-24		G	Rhyolitic vitric pyroclastics Vitric tuff, minor crystal tuff (ytq , vtq)
19-28		G	Rhyolitic crystal pyroclastics Crystal tuff, crystal lithic tuff (ytq , xtqf)
19-32		G	Rhyolitic lithic pyroclastics Lithic tuff, lithic crystal tuff, lithic vitric tuff, (cgltqf, mgltqf, ltqf)
19-70		PRE G	Undifferentiated quartzite, quartz mica schist (Sqtz, fgtom sch Sshmus)

Part of Voyager 4 grid

GEOPEKO LIMITED
KING ISLAND GROUP

SCALE: 1:10,000

No. KT27/76-6A

78-1317

E.L. 27/76
ELLIOTT BAY, TASMANIA

GEOLOGICAL MAP

002

5 cm

DATE: August 1978
GEOLOGIST: C.D.S
DRAWN: J.P.M.
CHECKED: C.R.S.

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

Refer to Geological Map Sheet 27/76 V9-2
for 1:10 000 scale Geological Interpretation

Refer to Geological Map Sheet 27/76 V1-2
for 1:5000 scale Geological Interpretation

Refer to Geological Map Sheet 27/76 V3A-3
for 1:5000 scale Geological Interpretation

SAMPLE NUMBER	ROCK SAMPLE GEOCHEMICAL RESULTS									
	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Fe %	Mn ppm	Cd ppm	As ppm	Sn ppm	Sn* ppm	Au* ppb
KR 1423	200	120	3280	2	24·0	5300	10	30	<1		
1424	25	20	20	<2	0·82	600	<2	<5	5		
1425	>10 000	120	600	90	26·0	4300	2	40	3		
3290	50	20	20	<2	0·51	140	<2	<5	3		
3300	30	20	<2	<2	0·35	190	<2	<5	20		
3335	15	<20	20	<2	2·2	60	<2	<5	3	<20	
3336	15	<20	10	<2	1·9	80	<2	<5	30	26	
3337	30	<20	20	<2	1·26	160	<2	<5	30	20	
3339	10	30	20	<2	1·22	75	<2	<5	30	20	
3340	20	<20	<2	<2	0·81	160	<2	<5	30	30	
3341	220	<20	30	<2	1·49	130	<2	10	100	130	
3382	10	<20	<2	<2	1·25	140	<2	<5	10		
3383	30	<20	<2	<2	1·29	140	<2	<5	100	110	
3384	35	20	170	<2	9·3	1750	<2	<5	80	100	
3385	10	<20	10	<2	0·54	70	<2	<5	<1		
3396	15	20	<2	<2	1·59	110	<2	<5	30		
3397	20	<20	70	<2	6·0	1650	<2	<5	30		
3398	20	<20	20	<2	2·8	200	<2	<5	30		
3400	180	<20	10	<2	2·4	290	<2	<5	5		
3401	770	20	130	<2	10·4	500	<2	10	5		
3402	50	<20	30	<2	9·9	50	<2	<5	500	410	
3406	30	<20	40	<2	2·8	1600	<2	<5	10		
3408	30	<20	40	<2	3·0	350	<2	<5	3		
3409	30	<20	<2	<2	5·2	200	<2	<5	10		
3415	>10000	220	690	20	31·0	>10000	2	60	3		
3416	10000	280	280	15	17·0	>10000	2	30	3		
3417	>10000	300	310	20	19·0	>10000	2	20	<1		
3418	2200	2650	140	65	41·0	8100	5	100	<1		>500
3421	1500	320	820	15	42·0	800	5	100	<1		150
3494	10	<20	30	<2	1·39	190	<2	<5	10		

ANALYTICAL METHODS: Cu, Pb, Zn, Ag, Fe, Mn and Cd by AAS following hot conc. HCL leach and HCL/HNO3 leach in latter stages for 1 hour of 0·25g sample.
Au* by special Low Level CRA/AAS.
As by modified Gutzeit method.
Sn by Emission Spectrography Scheme ES 2.
Sn* by XRF.
* where applicable.

NOTE: This map has been compiled from enlargements of the Tasmanian Lands Department's 1:15840 scale topographic machine plots.

OPERATION OF LEGEND:

1. Capital letter — indicates primary classification eg. S = sedimentary rock, A = acid rock, M = basic rock
2. Lower case letters — indicate the following:
   (i) Colours - e.g. pk/grn/k = pink fragments in an acid igneous rock with a green matrix.
   (ii) Textural or structural features - e.g. sfA = crystal tuff of acid composition, e.g. pA = porphyric acid rock, e.g. aA = aciduleed acid rock
   b. As suffixes in progressive order
   (i) Categorised - e.g. pAr = rhyolite, e.g. Zo = intermediate rock of andesitic composition
   (ii) Mineralogy - e.g. pArf = porphyritic (rhyolite) with feldspar phenocrysts, e.g. lat f/b = lithic crystal tuff with feldspar(phenocrysts component) and biotite (prominent matrix component), e.g. lat f qv = lithic crystal tuff with(major) feldspar crystals and (minor) quartz crystals, e.g. fb mg pArqfs (black specks in flow banded porphyritic rhyolite with quartz (major phenocryst component, size range 1mm - 8mm), feldspar (minor phenocryst component), sericite (prominent matrix component), and black specks (minor undifferentiated accessory mineral).

SYMBOLS:

IGNEOUS:
A acid igneous unclassified
Ar rhyolite
I intermediate igneous unclassified
Id andesite
Id dacite
M basic igneous unclassified
Mv basalt
Md dolerite
Gr granite

SEDIMENTARY
Sch shale
Sstne siltstone
Sscr sandstone
Sqtz quartzite
Scong conglomerate
Sv. volcaniclastic sediment

STRUCTURAL and TEXTURAL:
t tuff undissected
lt lithic tuff
vt crystal tuff
vt vitric tuff
fb flow banding
p porphyritic
cleved cleaved
shd sheared
ox oxidized
vns veins
lam laminated
brec brecciated
sch schistose

GRAIN SIZE:
fg fine grained (<1mm)
mg medium grained (1mm - 5mm)
cg coarse grained (5mm - 5cm)

STRUCTURAL:
outcrop limit
rubble boundary
interpretative contact
bedding
joint
cleavage
primary foliation
fault
unconformity

COLOURS:
pk pink
grn green
brn brown
pale pale
dk dark
wte white
gy grey
pur purple

SILICATE MINERALOGY:
q quartz
f feldspar
mus muscovite
b biotite
c chlorite
s sericite
cb carbonate
mafick mafics
hb hornblende
sid silicified
ferromag ferromagnesians

SULPHIDE MINERALOGY:
py pyrite
cpy chalcopyrite
gn galena
hm hematite
mag magnetite
goe goesite
cpy limonite

MISCELLANEOUS:
TS 3035 Thin section and rock No.
+ 1162 Geochemical analysis and rock No.
Grid traverse
Anomaly centre (approximate)
Old workings
Campsite

GEOLOGICAL INTERPRETATION

Pencil No.			
19-1		TERT	(Macquarie Beds)
19-6		L ORDO	Conglomerate (Owen type), sandstones (Scongl, Sscr)
19-50		Id	Andesite
19-67		M	Basic dyke
19-10		uG ?	Granite (Gr)
19-13		€	Sandstone (Sscr)
19-17		€	Fine grained volcaniclastic sediments (fg Sv(sst), Sv(Sch))
19-18		€	Coarse grained sedimentary breccia (cg S(brec))
19-19		€	Porphyritic quartz - feldspar rhyolitic lava (fp pArqf)
19-21		€	Feldspar - quartz - biotite porphyry (cg pArfqb)
19-24		€	Rhyolitic vitric pyroclastics Vitric tuff, vitric crystal tuff (vtq, vtqfp)
19-28		€	Rhyolitic crystal pyroclastics Crystal tuff, crystal lithic tuff (vtq, vltqf)
19-32		€	Rhyolitic lithic pyroclastics Lithic tuff, lithic crystal tuff, lithic vitric tuff, (lqtf, mglatqf, vltqf)
19-70		PRE €	Undifferentiated quartzite, quartz mica schist (Sqtz, fglam sch Sschmus)

GEOPEKO LIMITED
KING ISLAND GROUP

SCALE: 1:10,000

No. KT27/76-7A

DATE: AUGUST 1978
GEOLOGIST: C.D.S.
DRAWN: J.P.M.
CHECKED: C.D.S.

E.L. 27/76
ELLIOTT BAY, TASMANIA
GEOLOGICAL MAP

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

78-1317

209203

005

Refer to Geological Map Sheet 27/76 V2-2
for 1:5000 scale Geological Interpretation

Refer to Geological Map Sheet 27/76 V3A-3
for 1:5000 scale Geological Interpretation

E.L. 27/76 BOUNDARY

AEM 16

OLD WORKINGS

VOYAGER 10

VOYAGER 3

Dominant joint pattern

383 000 E
384 000 E
385 000 E
386 000 E
387 000 E
388 000 E
389 000 E
390 000 E
391 000 E

5 244 000 N
5 243 000 N
5 242 000 N
5 241 000 N
5 240 000 N
5 239 000 N

SAMPLE NUMBER	ROCK SAMPLE GEOCHEMICAL RESULTS										
	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Fe %	Mn ppm	Cd ppm	As ppm	Sn ppm	Sn* ppm	Au* ppb
KR 1446	40	<20	20	<2	0·35	230	<2	<5	<1		<20
1447	60	40	30	<2	4·7	210	<2	<5	<1		
1448	560	<20	70	<2	2·0	55	<2	<5	5		
1450	50	<20	20	<2	1·22	320	<2	<5	<1		
1451	190	<20	40	<2	1·72	400	<2	<5	20		
1459	20	80	310	<2	7·3	390	<2	35	20		
1460	10	40	80	<2	1·02	550	<2	<5	20		
1461	10	<20	40	<2	0·54	40	<2	<5	3		
1462	50	90	60	<2	0·38	70	<2	<5	5		
1463	230	240	160	<2	3·4	200	<2	20	<1		
1464	350	3850	6500	<2	40·0	1400	<5	80	<1		
3312	20	20	2	<2	0·58	550	<2	<5	<1		
3318	35	40	10	<2	0·74	190	<2	<5	<1		
3320	10	<20	40	<2	0·83	1500	<2	<5	5		
3324	15	<20	40	<2	0·49	120	<2	<5	<1		
3325	10	<20	35	<2	0·41	40	<2	<5	20		
3330	10	30	20	<2	0·33	50	<2	<5	10		
3331	15	<20	40	<2	0·60	60	<2	<5	20	25	
3332	10	<20	10	<2	0·63	55	<2	<5	5	<20	
3333	20	40	3650	<2	0·72	70	15	<5	3	<20	
3334	10	<20	20	<2	1·28	60	<2	<5	20	<20	
3428	60	60	30	<2	0·92	310	<2	<5	<1		
3434	30	20	50	<2	0·96	230	<2	<5	3		
3440	30	20	20	<2	1·04	450	<2	<5	10		
3442	30	<20	120	<2	2·7	850	<2	<5	30		
3448	10	<20	30	<2	2·2	240	<2				
3458	70	20	90	<2	0·99	140	<2	<5	<1		
3466	40	<20	10	<2	1·01	140	<2	<5	<1	<20	
3468	70	<20	20	<2	0·49	60	<2	<5	20	<20	
3470	10	<20	20	<2	1·34	300	<2	<5	20	<20	
3505	10	20	110	<2	3·6	1050	<2	<5	10		
3506	60	200	80	<2	2·5	400	<2	60	<1		
3511	30	40	20	<2	1·55	260	<2	10	<1	<20	
3512	10	<20	30	<2	1·07	240	<2	<5	5	<20	
3513	25	40	150	<2	3·8	1400	<2	<5	30		
3523	5	<20	40	<2	0·46	230	<2	<5	5		

ANALYTICAL METHODS: Cu, Pb, Zn, Ag, Fe, Mn and Cd by AAS following hot conc HCL leach and HCL/HNO3 leach in latter stages for 1 hour of 0·25g sample.
Au* by special Low Level CRA/AAS.
As by modified Gutzeit method.
Sn by Emission Spectrography Scheme ES 2.
Sn* by XRF

209204

OPERATION OF LEGEND:

1. Capital letter — indicates primary classification eg. S = sedimentary rock, A = acid rock; M = basic rock
2. Lower case letters — indicate the following
   (i) Colours - e.g. pk/grn/k = pink fragments in an acid igneous rock with a green matrix.
   (ii) Textural or structural features - e.g. vtk = crystal tuff of acid composition, e.g. pA = porphyric acid rock, e.g. mA = endesed acid rock.
3. As suffixes in progressive order:
   (i) Categorised - e.g. pArf = rhyolite, e.g. Ia = intermediate rock of endesitic composition.
   (ii) Mineralogy - e.g. pArfs = porphyritic (rhyolite) with feldspar phenocrysts, e.g. lat f/b = lithic crystal tuff with feldspar (phenocryst component) and biotite (prominent matrix component); e.g. lat f g = lithic crystal tuff with (major) feldspar crystals and (minor) quartz crystals, e.g. fb mg Arfp/fk = block bunkis inflow banded porphyritic rhyolite with quartz (minor phenocryst component, size range 1mm - 5mm), feldspar (minor phenocryst component), sericite (prominent matrix component), and black specks (minor undifferentiated accessory mineral).

NOTE: This map has been compiled from enlargements of the Tasmanian Lands Department's 1:15840 scale topographic machine plots.

SYMBOLS:

IGNEOUS:
A acid igneous unclassified
Ar rhyolite
I intermediate igneous unclassified
Id dacite
Id dacite
M basic igneous unclassified
Mx basalt
Md dolerite
Gr granite

SEDIMENTARY:
Sah shale
Sstst siltstone
Sast sandstone
Sqtz quartzite
Bcongl conglomerate
Sv volcaniclastic sediment

STRUCTURAL and TEXTURAL:
t tuff unclassified
lt lithic tuff
vt crystal tuff
vtf vitric tuff
fb flow banding
p porphyritic
clvd cleaved
shd sheared
ox oxidised
vns veins
lam laminated
breq brecciated
sch schistose

GRAIN SIZE:
fg fine grained (<1mm)
mg medium grained (1mm - 5mm)
cg coarse grained (5mm - 5cm)

STRUCTURAL:
overlying limit
rubble boundary
interpretative boundary
bedding
joint
cleavage
primary foliation
fault
unconformity

COLOURS:
pk pink
grn green
brn brown
gn green
dk dark
wte white
gry grey
pur purple

SILICATE MINERALOGY:
q quartz
f fk-feldspar
mus muscovite
b biotite
c chlorite
s sericite
cb carbonate
mafics mafics
hb hornblende
sid silicified
ferromag ferromagnesian

SULPHIDE MINERALOGY:
x sulphides
py pyrite
cpy chalcopyrite
gn galena
hm haematite
mag magnetite
gos gossan
rm rimpette

MISCELLANEOUS:
TS 3033 Thin section and rock No.
* 1112 Geochemical analysis and rock No.
Grid traverse
Anomaly centre (approximate)
Old workings
Campsite

GEOLOGICAL INTERPRETATION:

Period No.			
19-1		TERT.	(Macquarie Beds)
19-6		L. ORDO.	Conglomerate (Owen type), sandstones. (Scongl, Sast)
19-50		Id	Andesite
19-87		M	Basic dyke
19-10		uE ?	Granite (Gr)
19-13		€.	Sandstone (Sast)
19-17		€.	Fine grained volcaniclastic sediments. (fg Sv(sst), Sv(Sah),)
19-18		€.	Coarse grained sedimentary breccia (cg S(brec).)
19-19		€.	Porphyritic quartz - feldspar rhyolite lava. (fpqArqf)
19-21		€.	Feldspar - quartz - biotite porphyry (cg pArfqb)
19-24		€.	Rhyolitic vitric pyroclastics. Vitric tuff, vshrd. crystal tuff (vstq, vstqf)
19-28		€.	Rhyolitic crystal pyroclastics. Crystal tuff, crystal lithic tuff (stq, vltqf)
19-32		€.	Rhyolitic lithic pyroclastics. Lithic tuff, lithic crystal tuff, lithic vitric tuff, (cg ltuf, mg ltuf, lstqf)
19-70	PRE	€.	Undifferentiated quartzite, quartz mica schist (Sqtz, fg mm sch fish mus.)

GEOPEKO LIMITED
KING ISLAND GROUP

SCALE: 1:10,000

No. KT27/76-8A

DATE: AUGUST 1978
GEOLOGIST: C.D.S.
DRAWN: J.P.M.
CHECKED: C.D.S.

78-1314

E.L. 27/76
ELLIOTT BAY, TASMANIA
GEOLOGICAL MAP

003

5 cm

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

374 000 E | 375 000 E | 376 000 E | 377 000 E | 378 000 E | 379 000 E | 380 000 E | 381 000 E | 382 000 E

5 250 000 N

5 249 000 N

5 248 000 N

5 247 000 N

5 246 000 N

5 245 000 N

E.L. 27/76 BOUNDARY

600

400

200

LEGEND:

5 Cu ppm
60 Pb ppm
80 Zn ppm

ANALYTICAL METHODS: Cu, Pb and Zn by A.A.S. following conc. HCL leach and HCL/HNO3 leach in latter stages for 1 hour of 0.25g sample.
A.C.S. Laboratories Pty. LTD.

Anomalous Values - Drainage Samples
(colour marked from sample location upstream to next location)

Copper	> 5 ppm	(4·0 % of total population)
Lead	> 65 ppm	(2·0 % of total population)
Zinc	> 55 ppm	(2·0 % of total population)

NOTE:
This map has been compiled from enlargements of the Tasmanian Lands Department's 1:15840 scale topographic machine plots.

5 cm

209205

GEOPEKO LIMITED
KING ISLAND GROUP

78-1317

SCALE: 1:10,000

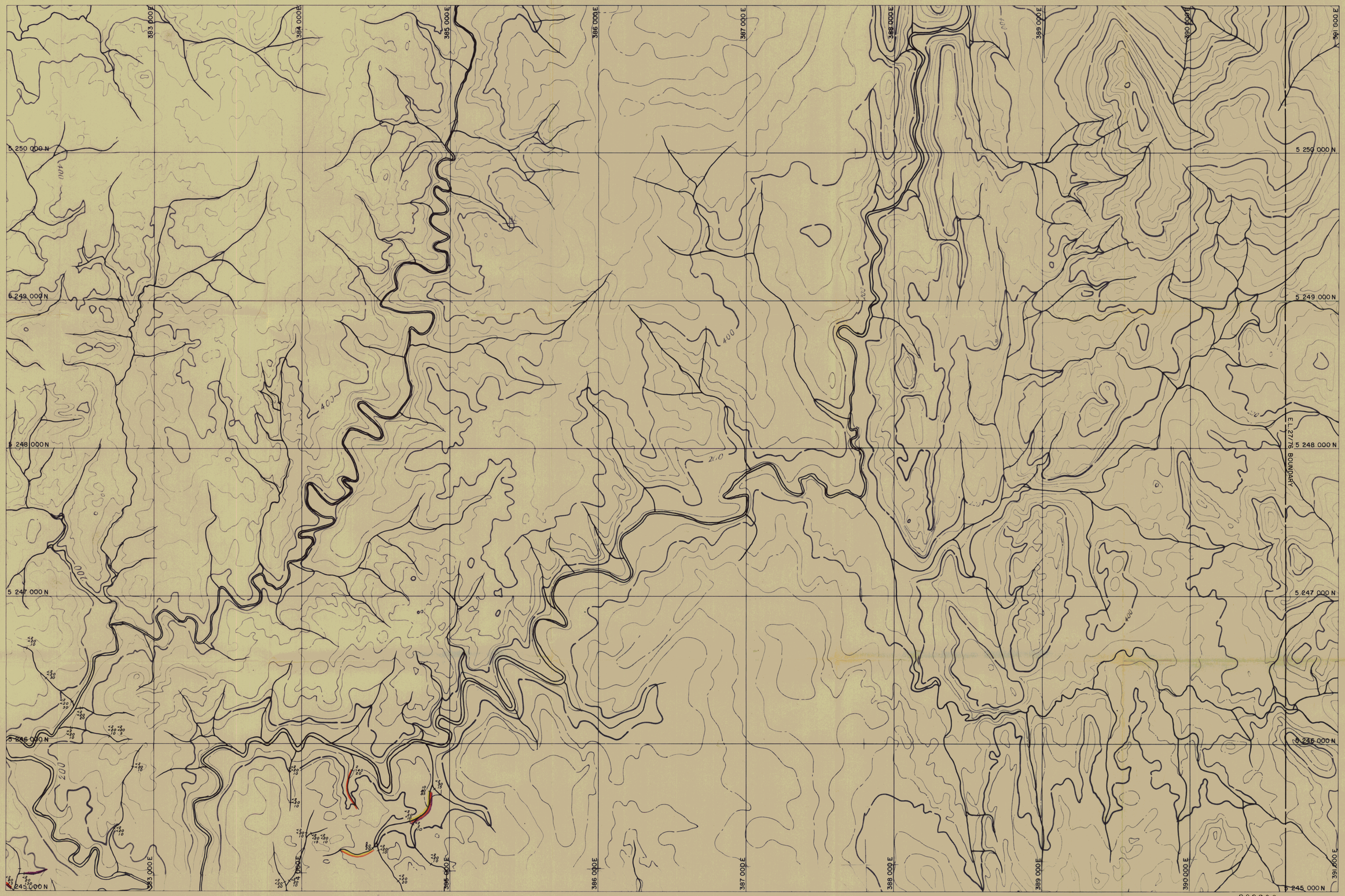
No. KT27/76-5 B

DATE: July 1978
GEOLOGIST: C.D.S.
DRAWN: J.P.M.
CHECKED: C.D.S.

E.L. 27/76
ELLIOTT BAY, TASMANIA
DRAINAGE GEOCHEMICAL RESULTS
COPPER, LEAD and ZINC

004

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



209206

LEGEND:

20	Cu	ppm
50	Pb	ppm
90	Zn	ppm

ANALYTICAL METHODS: Cu, Pb and Zn by AAS following conc HCL leach and HCL/HNO3 leach in latter stages for 1 hour of 0.25g sample.
A.C.S. Laboratories Pty. LTD.

Anomalous Values - Drainage Samples
(colour marked from sample location upstream to next location)

Copper	≥ 5 ppm	(40 % of total population)
Lead	≥ 55 ppm	(2.0 % of total population)
Zinc	≥ 65 ppm	(2.0 % of total population)

NOTE:
This map has been compiled from enlargements of the Tasmanian Lands Department's 1:15840 scale topographic machine plots.

5 cm

GEOPEKO LIMITED 78-1317
KING ISLAND GROUP

SCALE: 1:10,000

No. KT27/76-6B

005

E.L. 27/76
ELLIOTT BAY, TASMANIA
DRAINAGE GEOCHEMICAL RESULTS
COPPER, LEAD and ZINC

DATE: Jan 1978
GEOLOGIST: C.D.S.
DRAWN: J.P.M.
CHECKED: C.M.R.

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

374 000 E | 375 000 E | 376 000 E | 377 000 E | 378 000 E | 379 000 E | 380 000 E | 381 000 E | 382 000 E

5 244 000 N
5 243 000 N
5 242 000 N
5 241 000 N
5 240 000 N
5 239 000 N

209207

LEGEND:

Cu	Pb	Zn
20	20	ppm
60	40	ppm
80	70	ppm

ANALYTICAL METHODS: Cu, Pb and Zn by AAS following conc HCL leach and HCL/HNO3 leach in latter stages for 1 hour of 0·25g sample.

A.C.S. Laboratories Pty. LTD.

Anomalous Values - Drainage Samples
(colour marked from sample location upstream to next location)

Copper	≥	5 ppm	(4·0 % of total population)
Lead	≥	65 ppm	(2·0 % of total population)
Zinc	≥	55 ppm	(2·0 % of total population)

NOTE:
This map has been compiled from enlargements of the Tasmanian Lands Department's 1:15840 scale topographic machine plots.

5 cm

DATE: Jan 1978
GEOLOGIST: C.D.S.
DRAWN: J.P.M.
CHECKED: CAS.

GEOPEKO LIMITED
KING ISLAND GROUP
78-1317

SCALE: 1:10,000

No. KT27/76-7 B

E.L. 27/76 006

ELLIOTT BAY, TASMANIA

DRAINAGE GEOCHEMICAL RESULTS
COPPER, LEAD and ZINC

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

383 000 E
384 000 E
385 000 E
386 000 E
387 000 E
388 000 E
389 000 E
390 000 E
391 000 E

5 244 000 N
5 243 000 N
5 242 000 N
5 241 000 N
5 240 000 N
5 239 000 N

E.L. 27/76 BOUNDARY

209208

LEGEND:

S Cu ppm
60 Pb ppm
60 Zn ppm

ANALYTICAL METHODS: Cu, Pb and Zn by AAS following conc. HCL leach and HCL/HNO3 leach in latter stages for 1 hour of 0·25g sample.
A.C.S. Laboratories Pty. LTD.

Anomalous Values - Drainage Samples :
(colour marked from sample location upstream to next location)

Copper	> 5 ppm	(4·0	% of total population)
Lead	> 65 ppm	(2·0	% of total population)
Zinc	> 55 ppm	(2·0	% of total population)

NOTE:
This map has been compiled from enlargements of the Tasmanian Lands Department's 1:15840 scale topographic machine plots.

5 cm

DATE: Jan 1978
GEOLOGIST: C.D.S
DRAWN: J.P.M.
CHECKED: C.D.S.

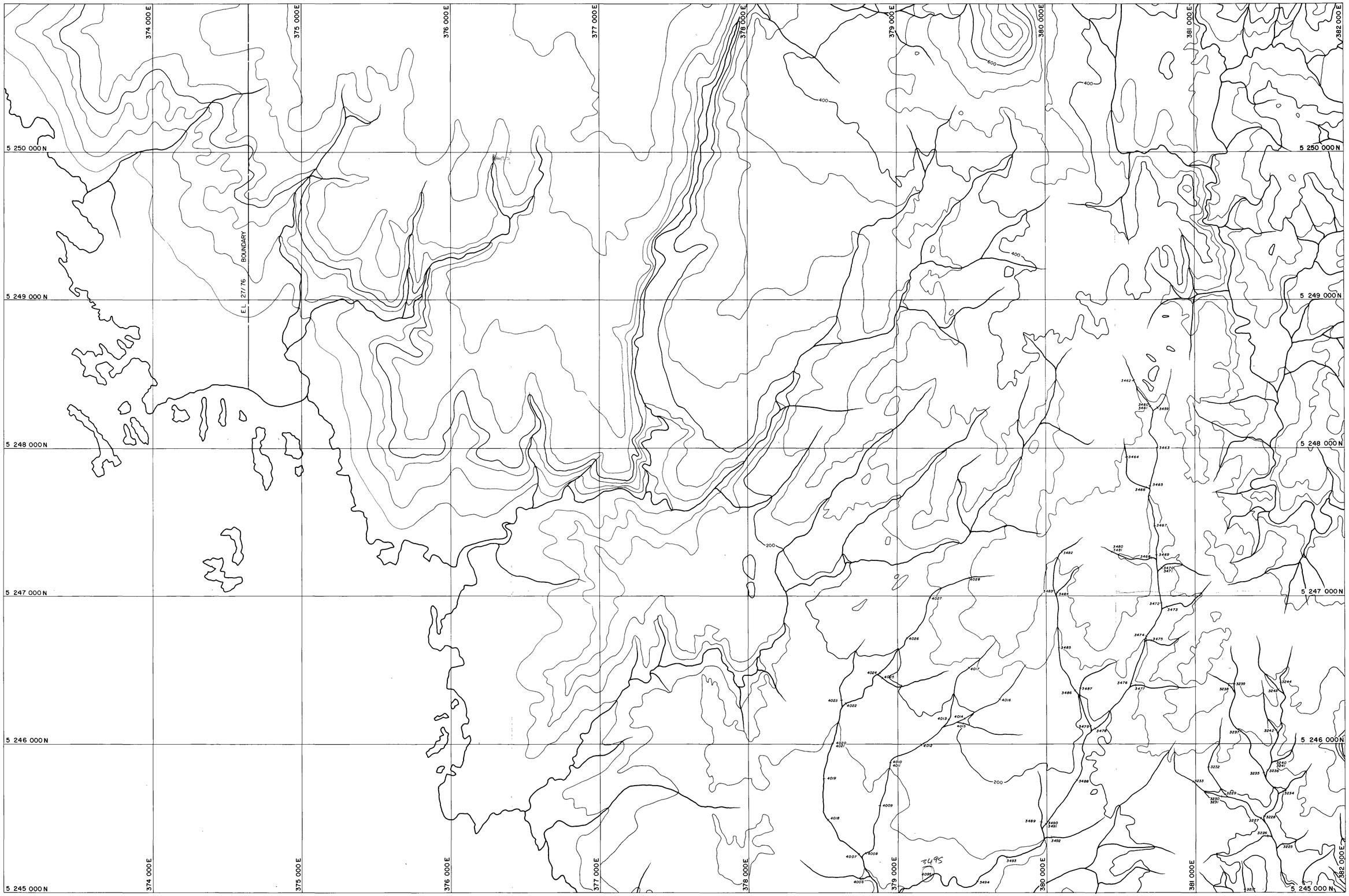
GEOPEKO LIMITED 79-1317.
KING ISLAND GROUP

SCALE: 1:10,000

No. KT27/76-8B

E.L. 27/76 007
ELLIOTT BAY, TASMANIA
DRAINAGE GEOCHEMICAL RESULTS
COPPER, LEAD and ZINC

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



LEGEND:

- 4019 Drainage sample No KD 4019
- 4020 / 4021 Drainage sample No KD 4020 Duplicate drainage sample No KD 4021

NOTE
This map has been compiled from enlargements of the Tasmanian Lands Departments 1:15840 scale topographic machine plots

209209

GEOPEKO LIMITED
KING ISLAND GROUP

78-1317.

SCALE: 1:10,000

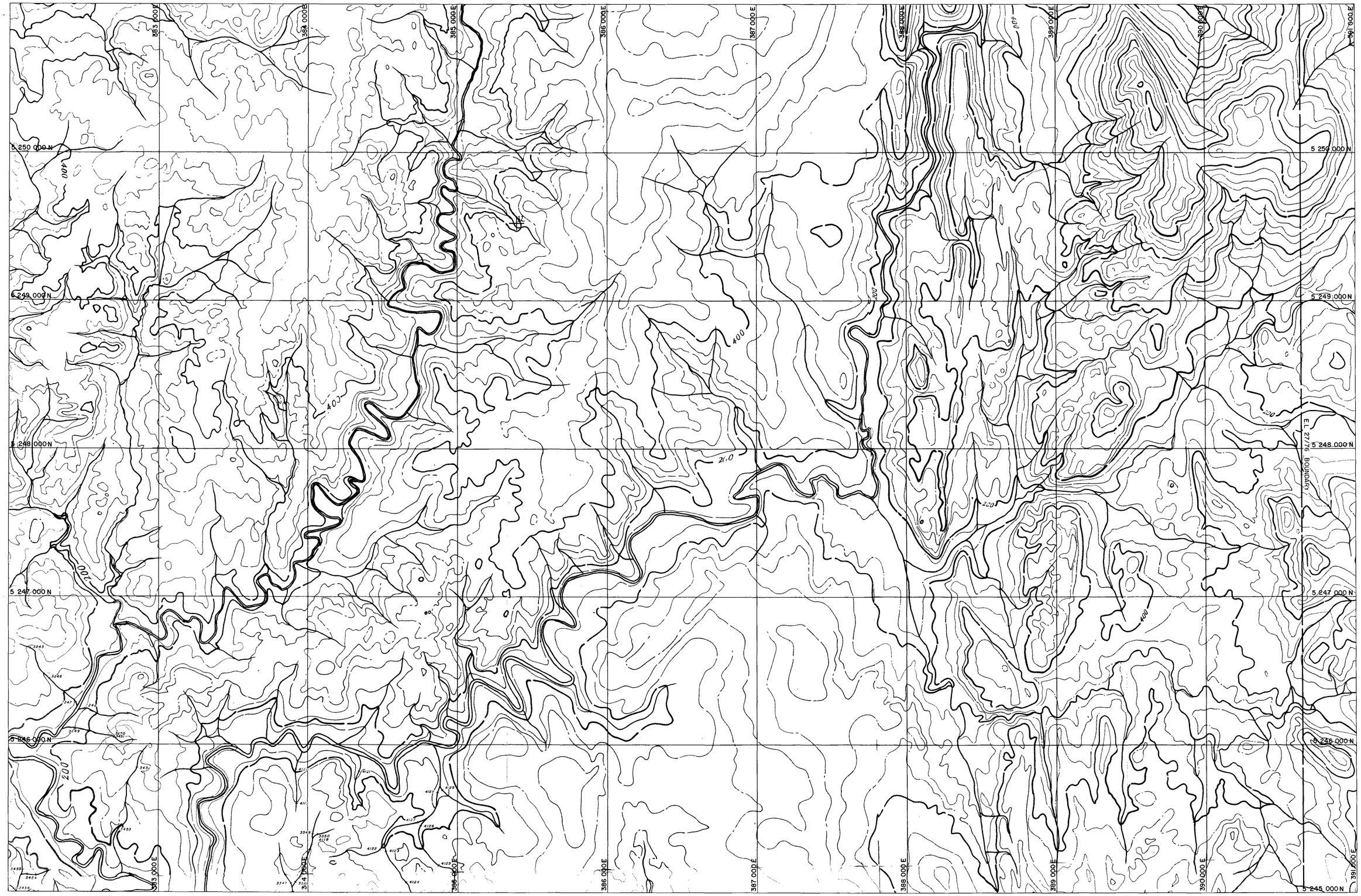
No. KT27/76-5C

E.L. 27/76 008
ELLIOTT BAY, TASMANIA
DRAINAGE SAMPLE LOCATION MAP

5 cm

DATE: Feb 1978
GEOLOGIST: C.D.S.
DRAWN: L.G.B.J.P.M.
CHECKED: C.D.S.

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



209210

LEGEND

—3453 Drainage sample No KD 3453

—3250 / 3451 Drainage sample No. KD 3250 / Duplicate drainage sample No KD 3451

NOTE

This map has been compiled from enlargements of the Tasmanian Lands Department's 1 15840 scale topographic machine plots

GEOPEKO LIMITED
KING ISLAND GROUP

78-1317

SCALE: 1 10,000

No. KT27/76-6 C

E.L. 27/76 009

ELLIOTT BAY, TASMANIA

DRAINAGE SAMPLE LOCATION MAP

6 cm

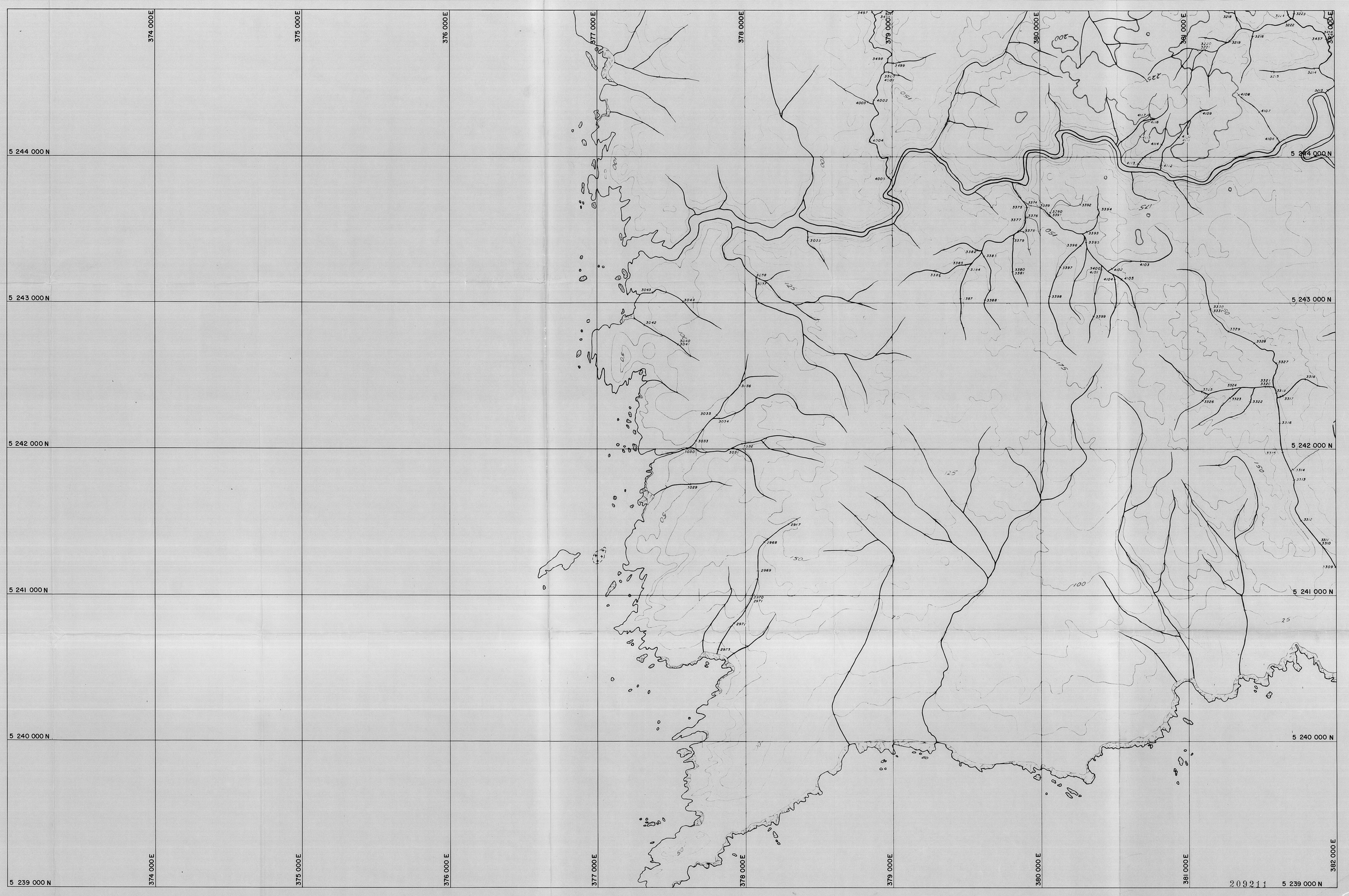
KT27/76-1	KT27/76-2
KT27/76-3	KT27/76-4
KT27/76-5	KT27/76-6
KT27/76-7	KT27/76-8

DATE: Feb 1978

GEOLOGIST: C.D.S

DRAWN: J.P.M.

CHECKED:



209211

LEGEND:

-2972 Drainage sample No. KD2972
-2970 Drainage sample No. KD2970
-2971 Duplicate drainage sample No. 2971

NOTE:
This map has been compiled from enlargements of the Tasmanian Lands Department's 1:15840 scale topographic machine plots.

GEOPEKO LIMITED
KING ISLAND GROUP

48-1317

SCALE: 1:10,000

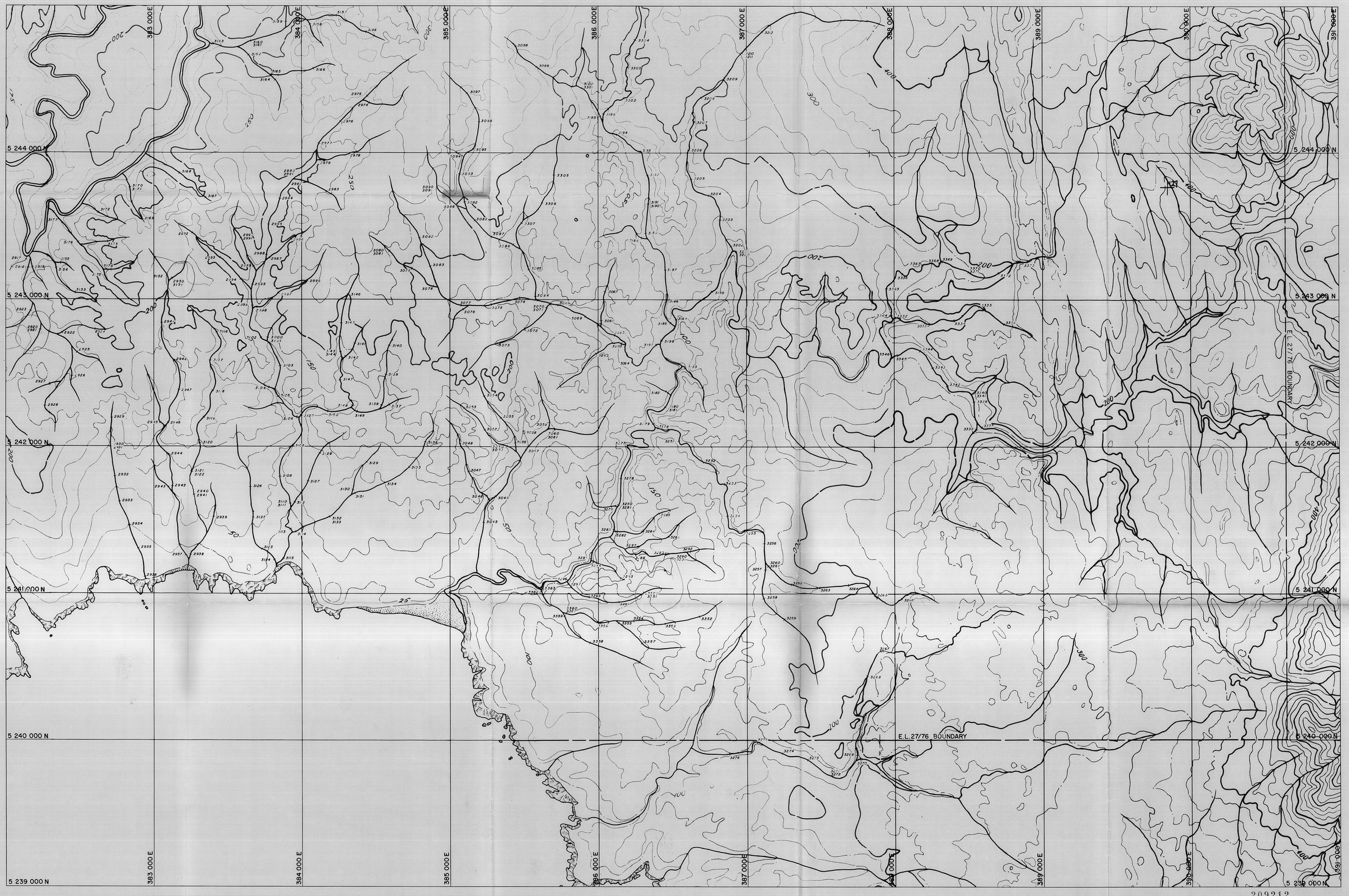
No. KT27/76-7C

E.L. 27/76
010
ELLIOTT BAY, TASMANIA
DRAINAGE SAMPLE LOCATION MAP

DATE: Feb. 1978
GEOLOGIST: C.D.S.
DRAWN: J.P.M.
CHECKED:

5 cm

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



LEGEND:

— 3114 Drainage sample No. KD 3114

— 3132 / 3133 Duplicate drainage sample No. KD 3132 / 3133

NOTE:
This map has been compiled from enlargements of the Tasmanian Lands Department's 1:15840 scale topographic machine plots.

209212

GEOPEKO LIMITED 78-1314

KING ISLAND GROUP

SCALE: 1:10,000

No. KT27/76-8C

DATE: Feb 1978

GEOLOGIST: C.D.S.

DRAWN: J.F.M.

CHECKED:

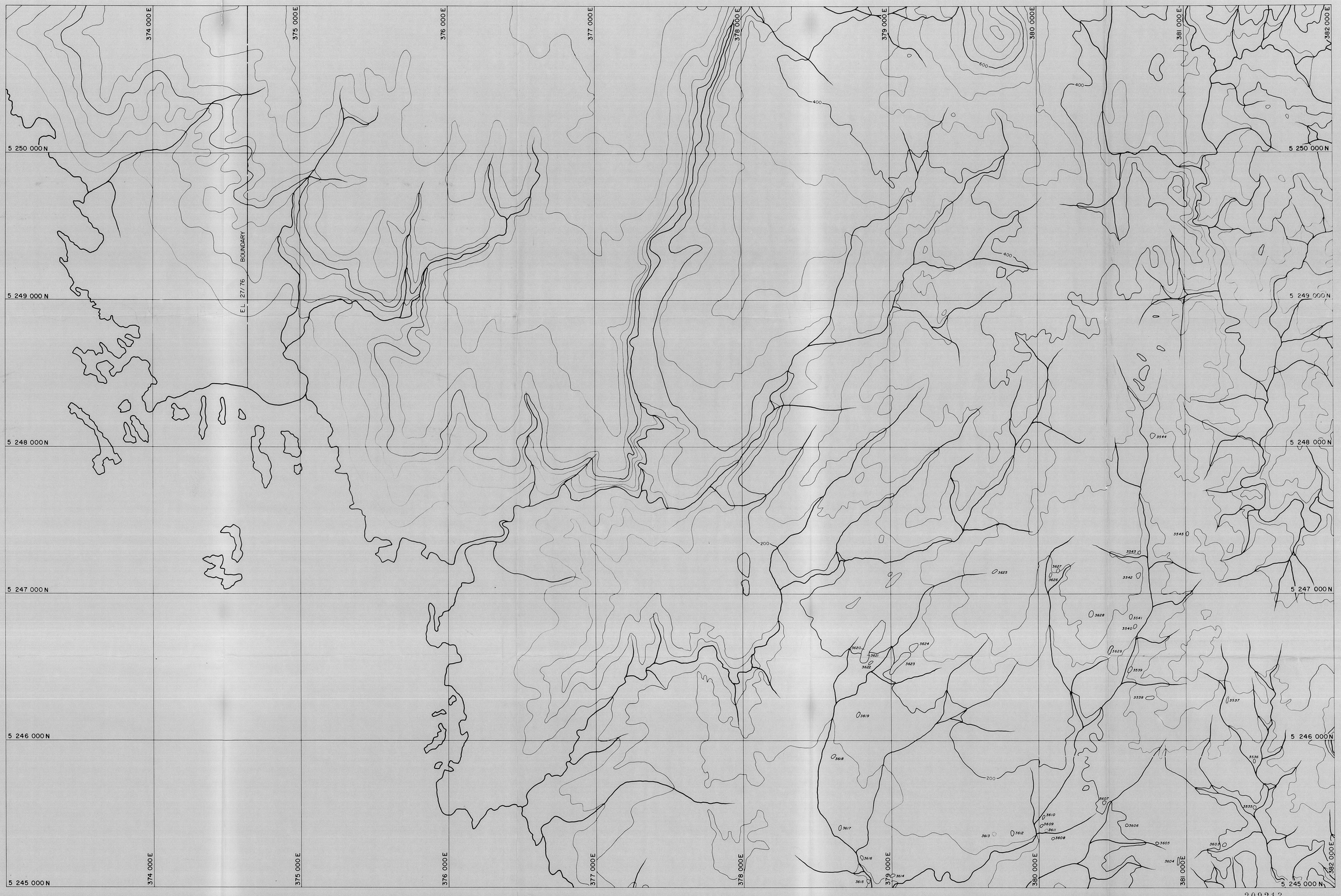
E.L. 27/76 011

ELLIOTT BAY, TASMANIA

DRAINAGE SAMPLE LOCATION MAP

5 cm

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



LEGEND:

○ 3612 Outcrop sample No. KR 3612

◌ 3613 Float sample No. KR 3613

NOTE:
This map has been compiled from enlargements of the Tasmanian Lands Department's 1:15840 scale topographic machine plots.

5 cm

209213

GEOPEKO LIMITED 78-1317

KING ISLAND GROUP

SCALE: 1:10,000

No. KT27/76-5D

DATE: Feb 1978

GEOLOGIST: C.D.S.

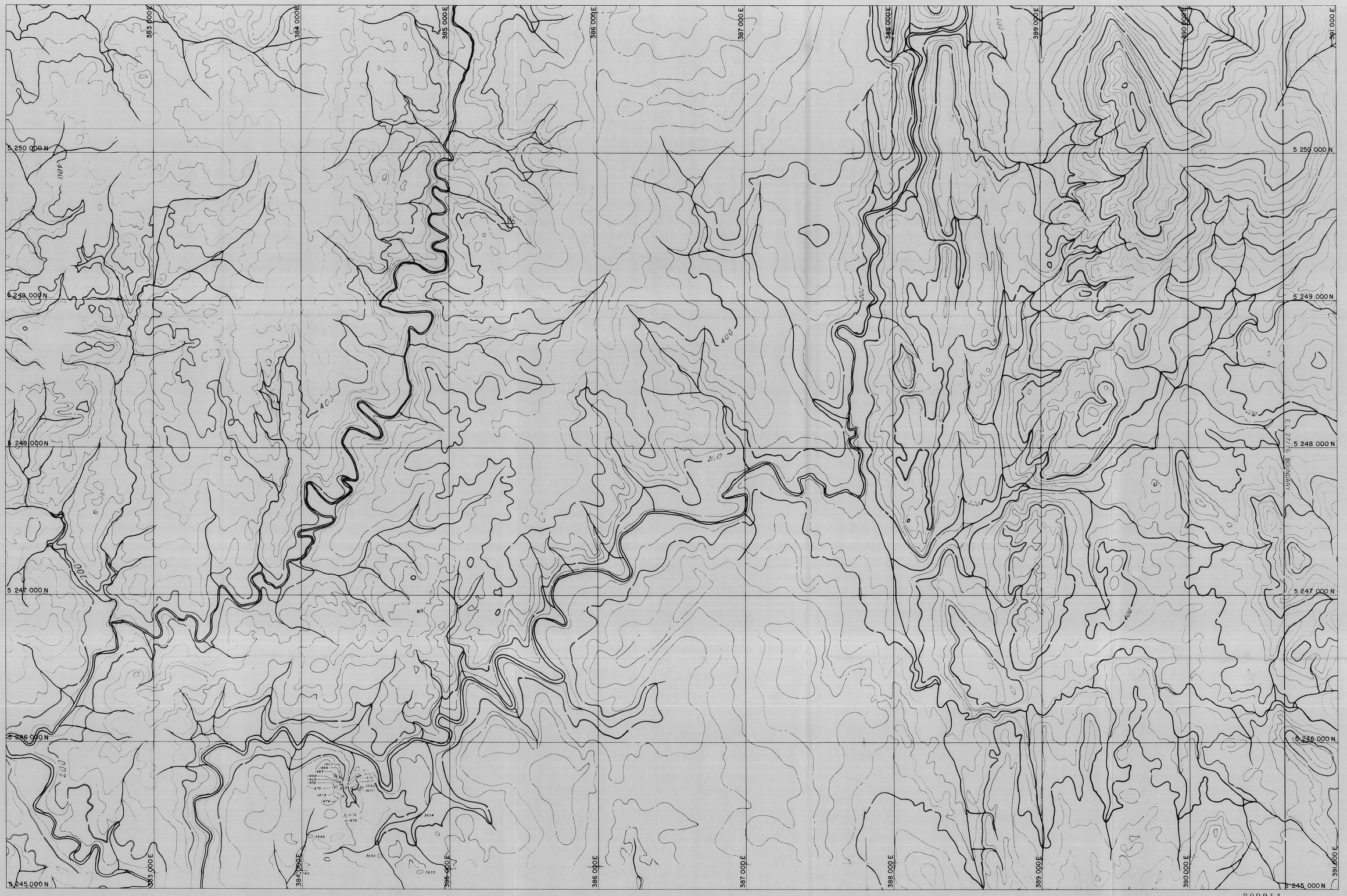
DRAWN: J.P.M.

CHECKED:

012

E.L. 27/76
ELLIOTT BAY, TASMANIA
ROCK SAMPLE LOCATION MAP

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



LEGEND

- ○ 3612 Outcrop sample No. KR 3612
- ◌ 3613 Float sample No. KR 3613

NOTE:
This map has been compiled from enlargements of the Tasmanian Lands Department's 1:15840 scale topographic machine plots

209214

GEOPEKO LIMITED 78-317

KING ISLAND GROUP

SCALE: 1:10,000

No. KT27/76-6D

013

E.L. 27/76
ELLIOTT BAY, TASMANIA
ROCK SAMPLE LOCATION MAP

5 cm

DATE: Feb 1978
GEOLOGIST: C.D.S.
DRAWN: J.P.M.
CHECKED:

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

374 000E | 375 000E | 376 000E | 377 000E | 378 000E | 379 000E | 380 000E | 381 000E | 382 000E

5 244 000 N
5 243 000 N
5 242 000 N
5 241 000 N
5 240 000 N
5 239 000 N

LEGEND:

- 3612 Outcrop sample No. KR 3612
- 3613 Float sample No. KR 3613

NOTE:
This map has been compiled from enlargements of the Tasmanian Lands Department's 1:15840 scale topographic machine plots.

209215

GEOPEKO LIMITED 79-317.
KING ISLAND GROUP

SCALE: 1:10,000

No. KT27/76-7 D

E.L. 27/76 014
ELLIOTT BAY, TASMANIA
ROCK SAMPLE LOCATION MAP

DATE: Feb 1978
GEOLOGIST: C.D.S
DRAWN: J.P.M
CHECKED: C.D.S

5 cm

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

383 000E
384 000E
385 000E
386 000E
387 000E
388 000E
389 000E
390 000E
391 000E

5 244 000 N
5 243 000 N
5 242 000 N
5 241 000 N
5 240 000 N
5 239 000 N

E.L. 27/76 BOUNDARY

LEGEND

○ 3612 Outcrop sample No. KR 3612
□ 3613 Float sample No. KR 3613

NOTE:
This map has been compiled from enlargements of the Tasmanian Lands Department's 1:15 840 scale topographic machine plots

209216
78-1317

GEOPEKO LIMITED
KING ISLAND GROUP

SCALE: 1:10,000

No. KT27/76-8D

DATE: July 1978
GEOLOGIST: C.D.S.
DRAWN: J.P.M.
CHECKED:

015

E.L. 27/76
ELLIOTT BAY, TASMANIA
ROCK SAMPLE LOCATION MAP

5 cm

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

374 000 E | 375 000 E | 376 000 E | 377 000 E | 378 000 E | 379 000 E | 380 000 E | 381 000 E | 382 000 E

5 250 000 N

5 249 000 N

5 248 000 N

5 247 000 N

5 246 000 N

5 245 000 N

E.L. 27/76 BOUNDARY

Sample not submitted

209217

LEGEND:

200 1000 690*

300 ppm Sn Emission Spectrography , original.
1000 ppm Sn Emission Spectrography , duplicate.
690* ppm Sn XRF analysis of original.

ANALYTICAL METHODS:

Sn determined by Emission Spectrography Scheme ES 2.
Sn* determined by XRF

A.C.S. Laboratories Pty LTD.

NOTE:
This map has been compiled from enlargements of the Tasmanian Lands Department's 1:15840 scale topographic machine plots.

5 cm

DATE: June 1978
GEOLOGIST: C.D.S.
DRAWN: J.P.M.
CHECKED: C.D.S.

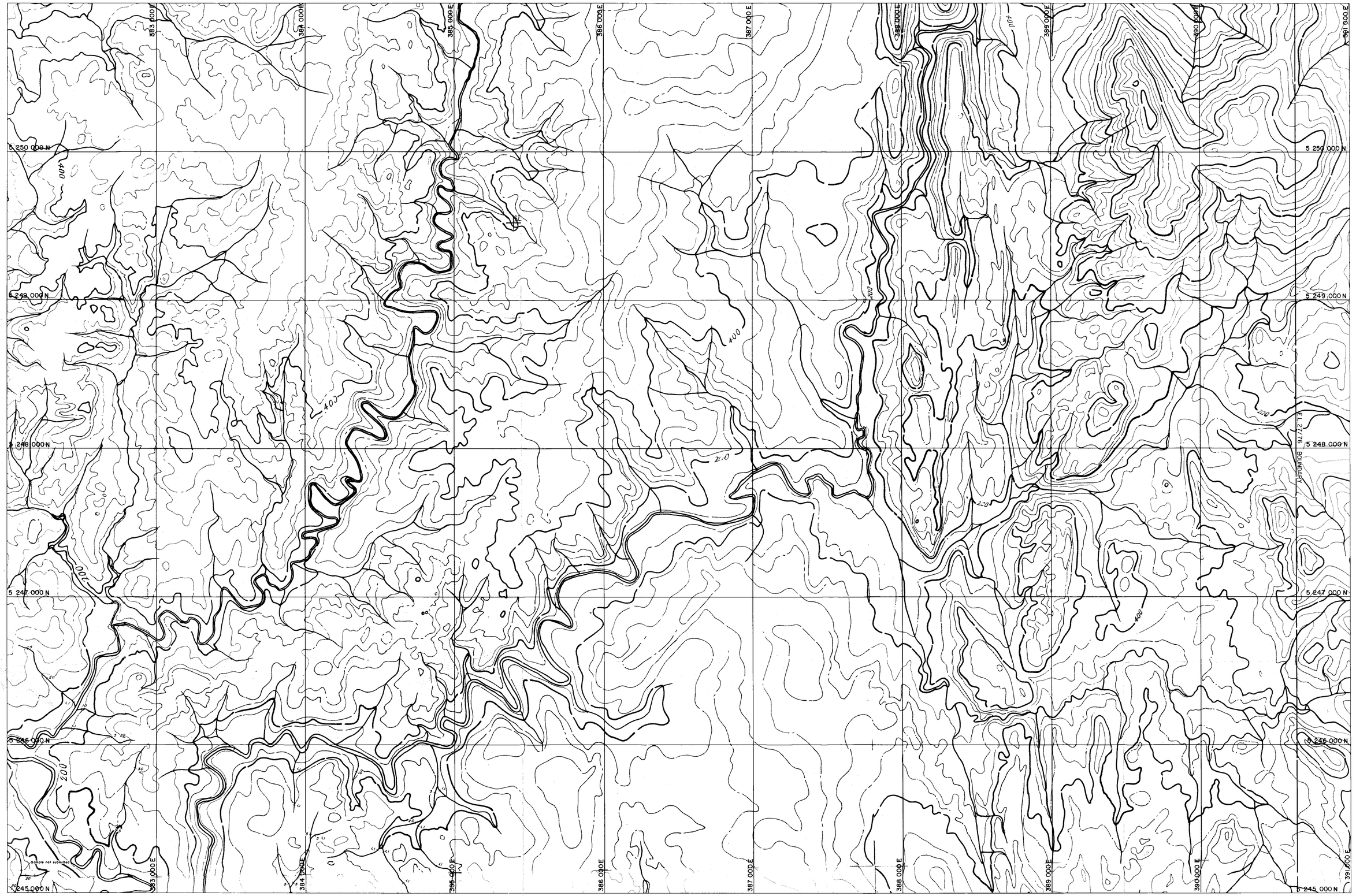
GEOPEKO LIMITED 79-1317
KING ISLAND GROUP

SCALE: 1:10,000

No. KT27/76-5E

E.L. 27/76 016
ELLIOTT BAY, TASMANIA
DRAINAGE GEOCHEMICAL RESULTS
TIN

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



209218

LEGEND:

300 1000 690* 300 ppm Sn Emission Spectrography , original.
1000 ppm Sn Emission Spectrography , duplicate.
690* ppm Sn XRF analysis of original.

ANALYTICAL METHODS.
Sn determined by Emission Spectrography Scheme ES2.
Sn*determined by XRF.

A. C. S. Laboratories Pty LTD

NOTE:
This map has been compiled from enlargements of the Tasmanian Lands Department's 1:15840 scale topographic machine plots

5 cm

DATE: June 1978
GEOLOGIST: C.D.S.
DRAWN: J.P.M.
CHECKED: C.D.S.

GEOPEKO LIMITED 78-137
KING ISLAND GROUP

SCALE: 1: 10,000

No. KT27/76-6 E

E.L. 27/76 017
ELLIOTT BAY, TASMANIA
DRAINAGE GEOCHEMICAL RESULTS
TIN

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

374 000 E | 375 000 E | 376 000 E | 377 000 E | 378 000 E | 379 000 E | 380 000 E | 381 000 E | 382 000 E

5 244 000 N | 5 243 000 N | 5 242 000 N | 5 241 000 N | 5 240 000 N | 5 239 000 N

Insufficient sample in duplicate sample for Emission Spectrography or XRF analysis.

Insufficient sample for XRF analysis.

Original sample damaged insufficient duplicate sample for Emission Spectrography or XRF analysis

LEGEND:

300, 1000, 690* — 300 ppm Sn Emission Spectrography, original. 1000 ppm Sn Emission Spectrography, duplicate. 690* ppm Sn XRF analysis of original.

ANALYTICAL METHODS:

Sn determined by Emission Spectrography Scheme ES2
Sn^{XR} determined by XRF

A.C.S. Laboratories Pty LTD.

NOTE:

This map has been compiled from enlargements of the Tasmanian Lands Departments 1:15840 scale topographic machine plots

5 cm

DATE: June 1978
GEOLOGIST: C.D.S.
DRAWN: J.P.M.
CHECKED: C.M.S.

209219

GEOPEKO LIMITED 78-1317.

KING ISLAND GROUP

SCALE: 1:10,000

No. KT27/76-7 E

018

E.L. 27/76

ELLIOTT BAY, TASMANIA

DRAINAGE GEOCHEMICAL RESULTS

TIN

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

383 000E | 384 000E | 385 000E | 386 000E | 387 000E | 388 000E | 389 000E | 390 000E | 391 000E

5 244 000 N | 5 243 000 N | 5 242 000 N | 5 241 000 N | 5 240 000 N | 5 239 000 N

Insufficient sample for Emission Spectrography or XRF

Insufficient sample for Emission Spectrography or XRF analyses

Insufficient sample for XRF analyses

Sample damaged

E.L. 27/76 BOUNDARY

209220

LEGEND

300 ppm Sn Emission Spectrography, original
300 ppm Sn Emission Spectrography, Duplicate
690 ppm Sn XRF analyses of original

ANALYTICAL METHODS

Sn determined by Emission Spectrography Scheme ES12
Sn determined by XRF

A.C.S. Laboratories Pty LTD

NOTE: This map has been compiled from enlargements of the Tasmanian Lands Department's 1:15840 scale topographic machine plots.

5 cm

GEOPEKO LIMITED 78-1317

KING ISLAND GROUP

SCALE: 1:10,000

No. KT27/76-8 E

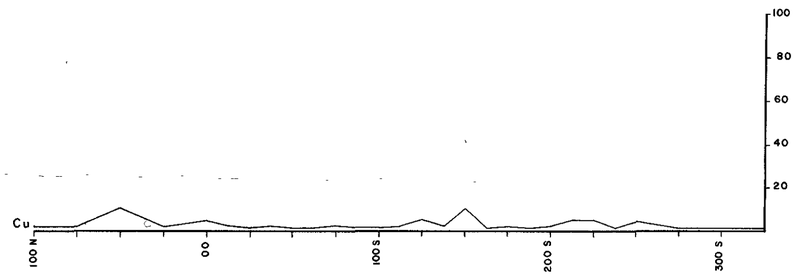
019

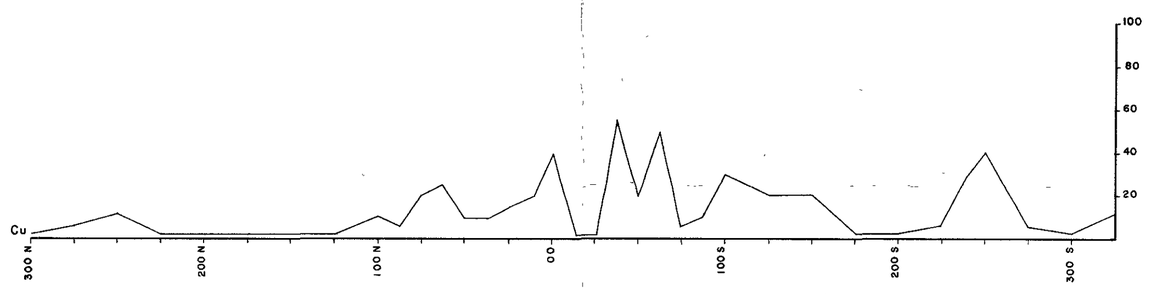
E.L. 27/76
ELLIOTT BAY, TASMANIA
DRAINAGE GEOCHEMICAL RESULTS
TIN

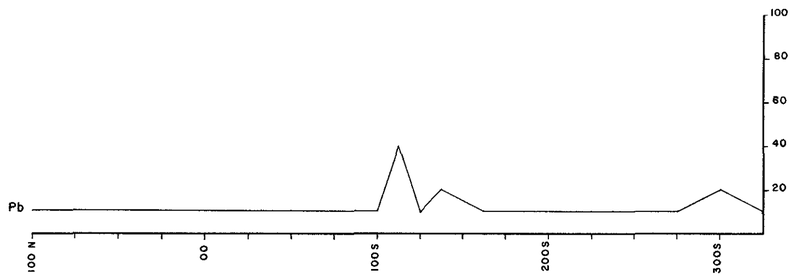
DATE: June 1978
GEOLOGIST: C.D.S.
DRAWN: J.P.M.
CHECKED:

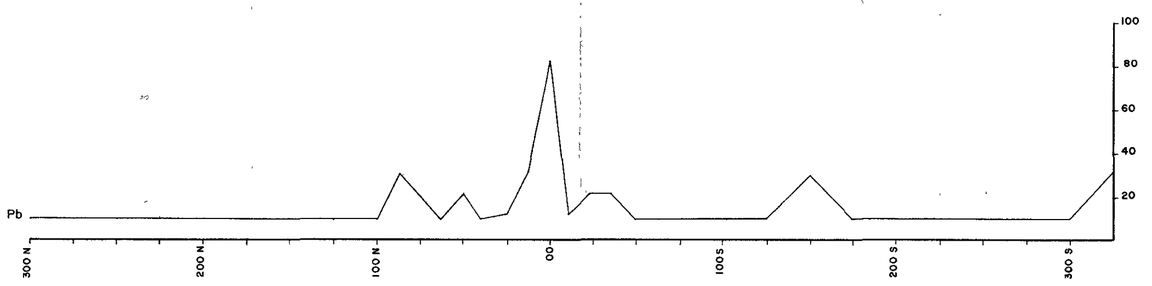
KT27/76-1	KT27/76-2
KT27/76-3	KT27/76-4
KT27/76-5	KT27/76-6
KT27/76-7	KT27/76-8

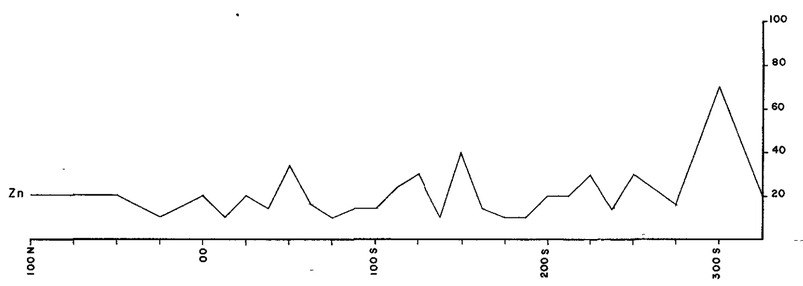
VOYAGER 1



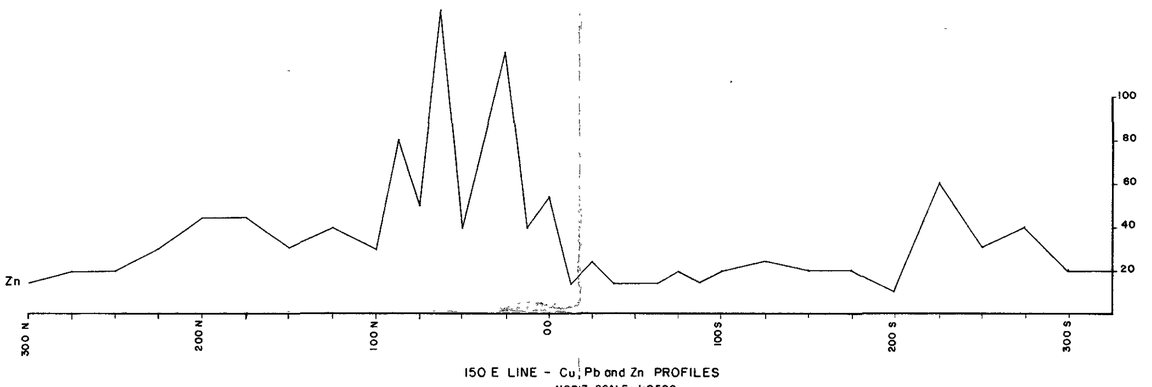






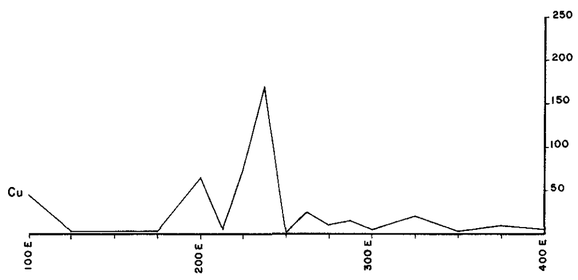


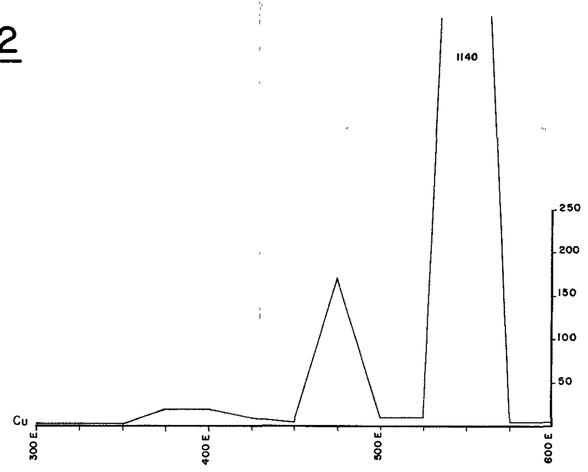
50 E LINE - Cu, Pb and Zn PROFILES
HORIZ SCALE: 1:2500
VERT SCALE 1cm = 20 ppm

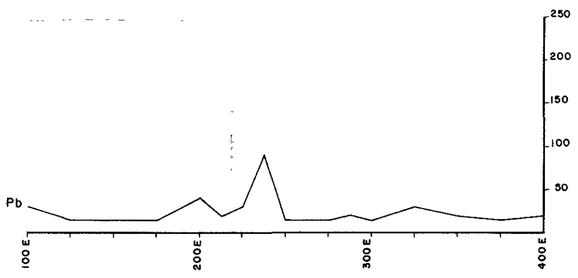


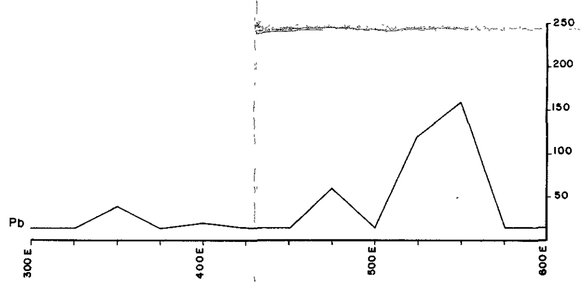
150 E LINE - Cu, Pb and Zn PROFILES
HORIZ SCALE: 1:2500
VERT SCALE 1cm = 20ppm

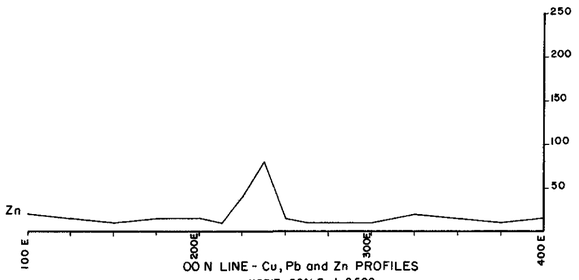
VOYAGER 2



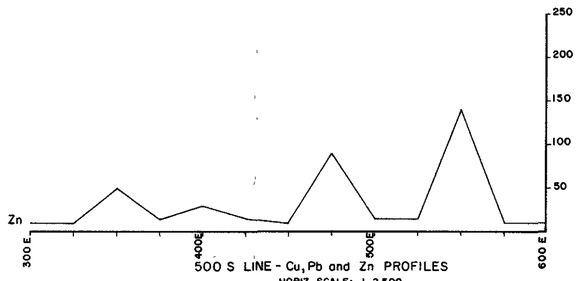








00 N LINE - Cu, Pb and Zn PROFILES
HORIZ SCALE: 1 2500
VERT SCALE 1cm = 50 ppm



500 S LINE - Cu, Pb and Zn PROFILES
HORIZ SCALE: 1 2500
VERT SCALE 1cm = 50 ppm

209221

5 cm

GEOPEKO LIMITED
KING ISLAND GROUP

78-1317.

SCALE 1:2500

No KT 27/76 IG

E.L.27/76 ELLIOTT BAY, TAS.
"C" HORIZON GEOCHEMICAL RESULTS 1976-77
COPPER, LEAD and ZINC PROFILES
VOYAGER 1 and VOYAGER 2

020

DATE MAY '79
GEOLOGIST C D S
DRAWN J P M
TRACED

5243000N

5242000N

5241000N

377000E

378000E

379000E

10800N
10300E

12400N
10000E

Voyager I Mineralized Zone
(Penders Prospect Workings)

dk fg pArqc
dk grn shd lxt qfsch m TS 3412
ple grn clvd pArqf
ple grn fg pArqfc
dk grn fg pA?q pyc 3415*
grn fg pA?q py cpy c 3416*
dk grn fg pA?q py cpy c 3417*
q vns py cpy
dk grn fg vt? c
grn massive c py sid
grn fg pA?q magnetite c
grn fg pA?cpy magnetite 3421*
grn fg pA? sid py

TS 1424* ple grn shd mg pArq s cb

TS 1423* dk grn shd brec p? A? q cbc magnetite py

gra fg fb pArqf oxide s"

LEGEND:

1. For details of abbreviations used for geological interpretations refer to map number KT 27/76-7A

5 cm

209222

GEOPEKO LIMITED 78-1317.
KING ISLAND GROUP
SCALE 1:5000
No KT 27/76 VI-2

E L 27/76 ELLIOTT BAY TASMANIA
VOYAGER I
GEOLOGICAL MAP 021

DATE NOV '78
GEOLOGIST C D S
DRAWN J P M
CHECKED COS

5243000N

5242000N

5241000N

377000E

378000E

379000E

12400N
10000E

10800N
10300E

6600N
10000E

209223

LEGEND

● Power auger
○ Hand auger
Grid position

0 <20 <20 <20 ppm Cu original sample.
<20 <20 ppm Cu repeat and check original sample.
<20 ppm Cu duplicate sample.

ANALYTICAL METHODS:
Cu by AAS following hot conc. HCL and HCL/HNO leach in latter stages for 1 hour of 0·25g sample.

CONTOUR INTERVAL

Pencil No	
19-6	50 - 100 ppm
19-10	100 - 200 ppm
19-15	200 - 400 ppm
19-22	400 - 800 ppm

NOTE
This map has been compiled from enlargements of the Tasmanian Lands Department's 1:15840 scale topographic machine plots.

5 cm

DATE JULY '78
GEOLOGIST C.D.S.
DRAWN J.P.M.
CHECKED C.D.S.

GEOPEKO LIMITED
KING ISLAND GROUP

78-317.

SCALE 1:5000

No. KT 27/76 VI-3

E.L. 27/76 ELLIOTT BAY TASMANIA
VOYAGER I
C-HORIZON GEOCHEMICAL RESULTS
COPPER CONTOURS

022

5243000N

5243000N

5242000N

5242000N

5241000N

5241000N

377000E

378000E

379000E

12400N
10000E

10800N
10300E

9600N
10000E

209224

LEGEND

- Power auger
- Hand auger
- Grid position

40 ppm Pb original sample.
40 30 30 ppm Pb repeat and check original sample.
20 20 ppm Pb duplicate sample.

ANALYTICAL METHODS

Pb by AAS following hot conc. HCL and HCL/HNO3 leach in latter stages for 1 hour of 0.25g sample.

CONTOUR INTERVAL

Pencil No	
19-6	50-100 ppm
19-10	100-200 ppm
19-15	200-400 ppm
19-22	400-800 ppm

5 cm

NOTE

This map has been compiled from enlargements of the Tasmanian Lands Department's 1:15840 scale topographic machine plots

DATE JULY '78
GEOLOGIST C D S
DRAWN J P M
CHECKED C B S

GEOPEKO LIMITED
KING ISLAND GROUP

78-1317

SCALE 1:5000

No KT 27/76 VI-4

E.L 27/76 ELLIOTT BAY TASMANIA
VOYAGER I
C-HORIZON GEOCHEMICAL RESULTS
LEAD CONTOURS 023

5243000N

5242000N

5241000N

377000E

378000E

379000E

12400N
10000E

10800N
10300E

9600N
10000E

LEGEND

- Power auger
- Hand auger
- Grid position

20 ppm Zn original sample
20 20 20 ppm Zn repeat and check original sample
20 ppm Zn duplicate sample

ANALYTICAL METHODS
Zn by AAS following hot conc HCL and HCL-HNO3 leach in after stages for 1 hour of 0.25g sample

CONTOUR INTERVAL
Pencil No
19-6 50-100 ppm
19-10 100-200ppm
19-15 200-400ppm

NOTE
This map has been compiled from enlargements of the Tasmanian Lands Department's 1:5840 scale topographic machine plots

5 cm

DATE JULY '78
GEOLOGIST C D S
DRAWN J P M
CHECKED CDS

GEOPEKO LIMITED
KING ISLAND GROUP
SCALE 1:5000
No KT 27/76-VI-5

E L 27/76 ELLIOTT BAY TASMANIA
VOYAGER I 024
C-HORIZON GEOCHEMICAL RESULTS
ZINC CONTOURS

209225

78-1317.

1484
1485
1486
1487
1483
1482
1481
1480
3305
3304
3303
3302
3295
3306
2027
2028
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2031
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3297
3296
3308
3307
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2026
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3294
3309
3301
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3382
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3402
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3400
3401
1972
3391
3392
3397
3398
3396
3393
3394
3395
1971
1970
3387
3386
3385
3383
3384
3388
3389
3390
5243000N
5242000N
5241000N
377000E
378000E
379000E
12400N
10000E
10800N
10300E
9600N
10000E
209226

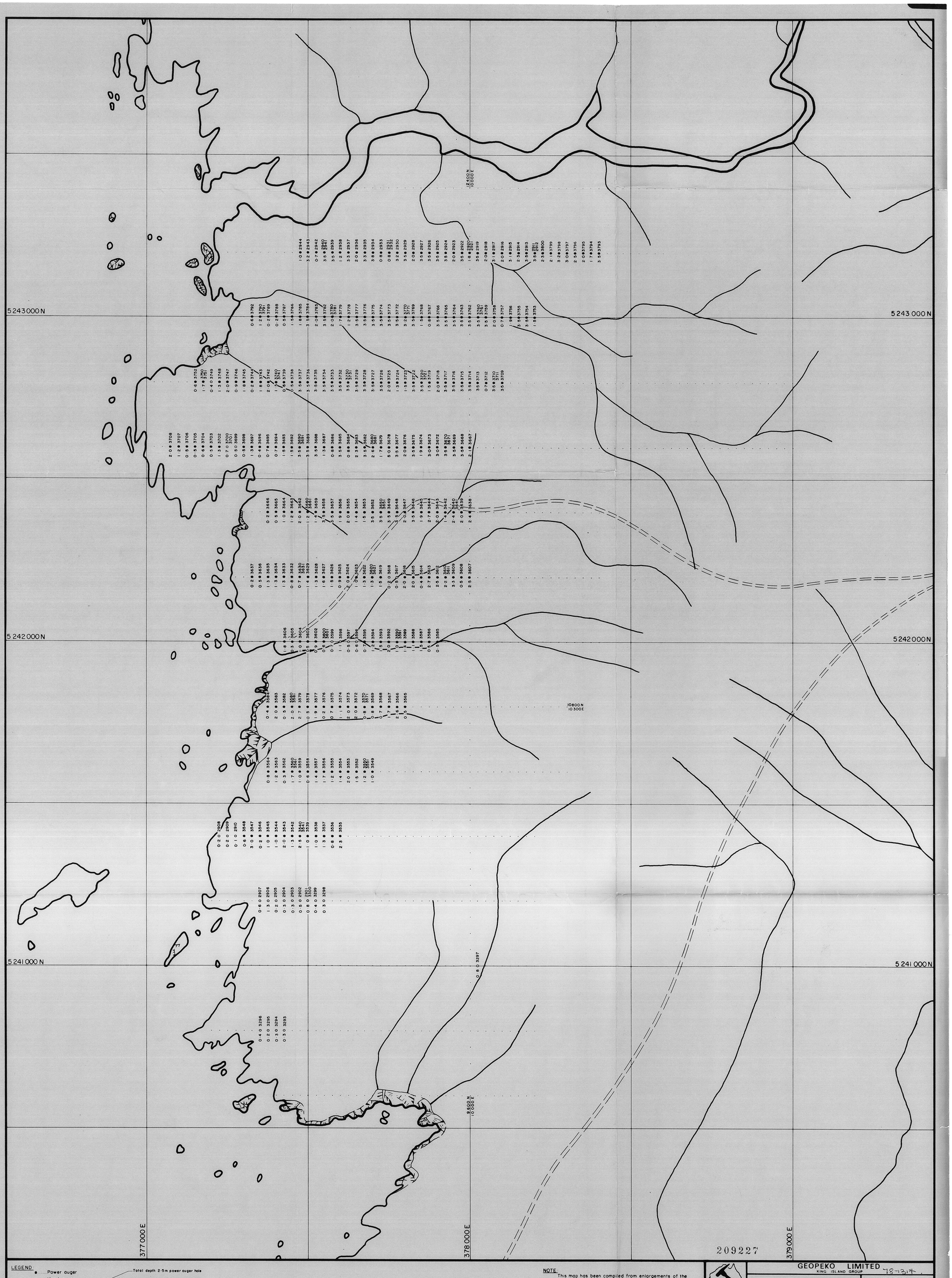
LEGEND
- Power auger
- Hand auger
- Grid position
- 1986 Outcrop sample No. KR 1986

NOTE
This map has been compiled from enlargements of the Tasmanian Lands Department's 1:5840 scale topographic machine plots

5 cm

DATE NOV. 1978
GEOLOGIST C.D.S.
DRAWN J.P.M.

GEOPEKO LIMITED 78-1317.
KING ISLAND GROUP
SCALE 1:5000
No. KT 27/76-VI-6
E.L. 27/76 ELLIOTT BAY TASMANIA
VOYAGER I
025
ROCK SAMPLE LOCATION MAP



LEGEND

- Power auger
- Hand auger
- Grid position

Total depth 2·5m power auger hole

2·5 ● 3540 — Soil sample No KS 3540 original
3541 — Soil sample No KS 3541 duplicate

NOTE

This map has been compiled from enlargements of the Tasmanian Lands Department's 1:15840 scale topographic machine plots.

5 cm

GEOPEKO LIMITED
KING ISLAND GROUP

SCALE 1:5000

No. KT 27/76-VI-7

E.L. 27/76 ELLIOTT BAY TASMANIA
VOYAGER I 026
SOIL SAMPLE LOCATION / AUGER HOLE DEPTHS

DATE AUGUST '78
GEOLOGIST C.D.S
DRAWN J.P.M
CHECKED CAR

209227

5243000N

5242000N

5241000N

377000E

378000E

379000E

18400N
10000E

10800N
10300E

8800N
10600E

209228

LEGEND:

- ●.....Power auger
- o.....Hand auger
- ·.....Grid position

1. For details of abbreviations used for the geological interpretation refer to map number KT 27/76 VI-2
2. ●— indicates insufficient rock chips for petrological identification

NOTE:
This map has been compiled from enlargements of the Tasmanian Lands Department's 1:15840 scale topographic machine plots.

5 cm

DATE: OCT. '78
GEOLOGIST: C.D.S
DRAWN: J.P.M.
CHECKED: CAA.

GEOPEKO LIMITED
KING ISLAND GROUP

SCALE: 1:5000

No. KT 27/76-VI-8

E.L. 27/76 ELLIOTT BAY TASMANIA
VOYAGER I
AUGER HOLE ROCK CHIP GEOLOGICAL MAP

027

5246000N

5 246 000 N

wte/brn mg pArq lim c

75

wte/brn mg pArqf?lim sc (brec.)?

75

wte/ple grn mg pArqf lims

10400 N
9850 E

mottled wte/grn xltq sid

ple vxt

mottled grn/wte xltqfs sid

grn vxt sid

10 200 N
10 300 E

clvd vt sid

Voyager 2 Mineralized Zone

(Lewis River Prospect Workings)

TS 1467 ple grn vxltqfs py

gos qhm lim 1466*

ple grn lxtqf

gos hm q cpy py magnetite 1468*
1469
1470

1471* gos q lim

1473* gos hm q py

ple xt

ple vxt

ple grn vxtqfs 1476*

grn/brn vxtqs sid

ple fg xtqf

ple fg xtq

ple grn fb fg pArqf

grn v?xltc

dk grn/grn vxltc

ple Sv (Saltst)

ple brn vxt

ple grn vx?ltq

ple vxt

ple clvd Sv(Seltst)

ple oxpArfq

grn vxtqf

ple grn vxlt sid

ple vxtq

ple vxt sid

45

ple vxltq sid

ple vtq sid 1477*

wte/ple grn xltq

ple grn xtqf

ox clvd pArq

ple grn vltq sid

ple grn v?lt

ple brn xtq

ple grn shd vt sid

ple brn vt sid

ple vltq

1478* gos q lim hm c

ple vt sid

gos q lim

gos brec q lim

dk grn xltqf

ple grn clvd shd?vxtqf

ple grn v?xtq sid

wte/ple grn vxltqf sid

ox ple grn vx?lt sid

brn xtqf

wte/ple brn fg-mg pArqf?

gos q lim py 1479*

ple vt

ple fg Sv (Sssst)

Sv (Sssst)

wte/grn xltq

grn vxltfqs

ple grn xltfqs

wte/grn xltfqs

ple vxtqf

ple vxtqf sid

75

ple Sv (Ssh)

ple xl?tqf

grn vxltqf sid

ple/grn vltq sid

mottled wte/grn xvl?tqf sid

wte/ple grn clvd fg-mg pArq

dk grn vxtc sid

wte/grn xltqf

ple grn vltq sid

ple grn xltqf

ple grn vxtc vns

TS 3547 ple Sv (Saltst)

70

ple fg Sv (Seltst)

5245000N

5245000N

ple grn vxtqfs

grn vxtqfs

grn xtqfs

ple grn vltqf?

wte/ple grn vltqfs

9400 N
10600 E

wte/grn vxltqf

ple grn Ar?sid

grn clvd fg fb? pArqfs sid

ple grn xtfq

wte/ple grn vlx?tq sid

ple vltq

wte/ple grn fg-mg pArqf

ple clvd Sv (Seltst)

ple grn shd xtfq

ox ple fg pArqs

ple fg pArqfs

ple xtqf mafics

ple vltx?tq sid

ple fg pArq? sid

8800 N
10000 E

OLD WORKINGS

q vns

5244000N

5244000N

45

ple grn clvd fg pArqs sid

grn fg fb? clvd p?Arqf ferromag

3324* grn/wte fg fb? pArqf py?s

3325* ple fg fb pArqf

ple grn/wte fg pArfq sid

clvd fg pArqf

85

brn ox pArq lim

ple grn fg pArqf py 3320*

xvlt

ple xvlt s"

384 000 E

385 000 E

209229

LEGEND:

1 For details of abbreviations used for geological interpretations refer to map number KT 27/76-6A

5 cm

GEOPEKO LIMITED
KING ISLAND GROUP

SCALE 1:5000

No. KT 27/76-V2-2

E.L. 27/76 ELLIOTT BAY, TASMANIA
VOYAGER 2
GEOLOGICAL MAP

78-1317

023

DATE DEC. '78
GEOLOGIST C.D.S.
DRAWN J.P.M.
CHECKED CDS

5246000N

5 246 000 N

5245000N

5245000N

5244000N

5244000N

384000E

385000E

209230

5 cm

LEGEND:

- ●.....Power auger
- o.....Hand auger
- ·.....Grid position

020 — 20 ppm Cu original sample.
20 20 — 20 ppm Cu repeat and check duplicate.
20 ppm Cu duplicate sample.

ANALYTICAL METHODS:

Cu by AAS following hot conc. HCL and HCL/HNO3leach in latter stages for 1 hour of 0·25g sample.

CONTOUR INTERVAL

Pencil No.	
19-6	50 - 100 ppm
19-10	100 - 200 ppm
19-15	200 - 400 ppm
19-22	400 - 800 ppm
19-50	800 - 1600ppm

NOTE:

This map has been compiled from enlargements of the Tasmanian Lands Department's 1:15840 scale topographic machine plots.

DATE: JUNE '78
GEOLOGIST: C.D.S.
DRAWN: J.P.M.
CHECKED: CDS

GEOPEKO LIMITED
KING ISLAND GROUP

SCALE 1:5000

No. KT 27/76-V2-3

E.L. 27/76 ELLIOTT BAY, TASMANIA
VOYAGER 2
C-HORIZON GEOCHEMICAL RESULTS
COPPER CONTOURS

029

78-1317

5246000N

5246000N

5245000N

5245000N

5244000N

5244000N

384000E

385000E

209231

5 cm

LEGEND

- Power auger
- Hand auger
- Grid position

40 ppm Pb original sample.
40 60 60 ppm Pb repeat and check duplicate sample.
40 ppm Pb duplicate sample.

ANALYTICAL METHODS:
Pb by AAS following hot conc. HCL and HCL/HNO3 leach in latter stages for 1 hour of 0.25g sample.

CONTOUR INTERVAL

Recall No.	
19-6	100-200 ppm
19-10	200-400 ppm
19-15	400-800 ppm
19-22	800-1600ppm
19-50	> 1600 ppm

NOTE
This map has been compiled from enlargements of the Tasmanian Lands Department's 1:5840 scale topographic machine plots

DATE JUNE '78
GEOLOGIST C.D.S.
DRAWN J.P.M.
CHECKED C.W.B.

GEOPEKO LIMITED
KING ISLAND GROUP

SCALE 1:5000

No. KT 27/76-V2-4

E.L. 27/76 ELLIOTT BAY, TASMANIA
VOYAGER 2
C-HORIZON GEOCHEMICAL RESULTS
LEAD CONTOURS

030

78-1347

5246000N

5246000N

5245000N

5245000N

5244000N

5244000N

384000E

385000E

10400N 9850E

10400N 10600E

10800N

10 200 E

10 300 E

209232

5 cm

LEGEND

- Power auger
- o Hand auger
- · Grid position

65 ppm Zn original sample.

65/55 60 — 60 ppm Zn repeat and check duplicate sample.

55 ppm Zn duplicate sample.

ANALYTICAL METHODS:

Zn by AAS following hot conc. HCL and HCL/HNO3 leach in latter stages for 1 hour of 0.25g sample.

CONTOUR INTERVAL

Pencil No.	
19-6	100 - 200 ppm
19-10	200 - 400 ppm
19-15	400 - 800 ppm
19-22	800 - 1600 ppm
19-50	> 1600 ppm

NOTE:

This map has been compiled from enlargements of the Tasmanian Lands Department's 1:15840 scale topographic machine plots

DATE JUNE '78
GEOLOGIST C.D.S
DRAWN J.P.M
CHECKED C.D.S

GEOPEKO LIMITED
KING ISLAND GROUP

SCALE 1:5000

No. KT 27/76 V2-5

E.L 27/76 ELLIOTT BAY, TASMANIA
VOYAGER 2
C-HORIZON GEOCHEMICAL RESULTS
ZINC CONTOURS

031

78-1317

5246000N

5 246 000 N

5245000N

5 245 000 N

5244000N

5 244 000 N

384 000 E

385 000 E

10400 N
9850 E

10 200 N
10 300 E

9400 N
10600 E

10000 N
8800 E

1872 1873 1871

2081 2080 2079 2077 2078

2066 2065 2064 2063 2067 2068 3549 2069 2070 2071 1473 1465 1466 1467 1468 1469 1470 1471 1475 1472 1476 2072 2073 3550 3630 1477 2074 2075 2076 3634

1948 1478 2062 2061 2060 2059 1946 1947 1950 2051 2058 3632 2052 1479 1949 2053 2054 2055 2056 2057 3633

3548 3547 3548 3546 1930 1931 1932 1933 1935 1934 1937 1936 1941 1942 1944 1945 1943 1940 1939 1938

1928 1927 1929 1926 1925 1923 1924 1921 1920 1918 1922 1919

1913 1912 1914 1915 1916 1917

3327 3323 3324 3325 3326 3322 3321 3320 3318

209233

5 cm

LEGEND

- Power auger
- o Hand auger
- · Grid position
- ◇ 2052 Outcrop sample No. KR 2052

NOTE

This map has been compiled from enlargements of the Tasmanian Lands Departments 1:15 840 scale topographic machine plots

DATE NOV. 1978
GEOLOGIST C D S
DRAWN J P M
CHECKED

GEOPEKO LIMITED
KING ISLAND GROUP

SCALE 1:5000

No KT 27/76-V2-6

E L 27/76 ELLIOTT BAY, TASMANIA
VOYAGER 2
ROCK SAMPLE LOCATION MAP

032

78-1319.

5246000N

5245000N

5244000N

384000E

385000E

5 246 000 N

5 245 000 N

5 244 000 N

LEGEND

● ..... Power auger

o ..... Hand auger

* ..... Grid position

1·0 ● 3480 — Total depth 1·0m power auger hole

3480 — Soil sample No.KS 3480 original

3481 — Soil sample No.KS 3481 duplicate

NOTE

This map has been compiled from enlargements of the Tasmanian Lands Department's 1:15840 scale topographic machine plots

DATE AUGUST '78

GEOLOGIST C.D.S

DRAWN J.P.M

CHECKED

GEOPEKO LIMITED

KING ISLAND GROUP

SCALE 1:5000

No. KT 27/76 V2-7

E L 27/76 ELLIOTT BAY, TASMANIA

VOYAGER 2

033

SOIL SAMPLE LOCATION / AUGER HOLE DEPTHS

78-1317

209234

5 cm



LEGEND:
- ●.....Power auger
- o.....Hand auger
- +.....Grid position

1. For details of the abbreviations used for the geological interpretations refer to map number KT 27/76 V2-2
2. ●— indicates insufficient rock chips for petrological identification

NOTE:
This map has been compiled from enlargements of the Tasmanian Lands Department's 1:15840 scale topographic machine plots.

209235

GEOPEKO LIMITED
KING ISLAND GROUP

SCALE: 1:5000

No. KT 27/76-V2-8

E.L.27/76 ELLIOTT BAY, TASMANIA
VOYAGER 2

034

AUGER HOLE ROCK CHIP GEOLOGICAL MAP

78-1214

DATE: JAN '79
GEOLOGIST: C.D.S.
DRAWN: J.P.M.
CHECKED: C.D.S.

5 243 000 N

5 242 000 N

5 241 000 N

380 000 E

381 000 E

382 000 E

383 000 E

384 000 E

9 200 N 7 000 E

9 400 N 7 400 E

9 400 N 7 800 E

9 500 E

9 600 E

9 400 N 8 400 E

ple grn xltqf

grn fb? shd xltqfc TS 3475

ple grn shd xltqfsc

grn shd fg-mg pArq sid c

ple grn pArq

ple Sv (Sah)

ple clvd fg pArq sid

ple fg pArqf

dk grn fg p?Arqcs

ple grn fb pArq

ple vx?tsid

mottled fg pArq

ple grn pArq

3341* fg Gr fq

3340* cg Gr fq

ple grn A?sid brec

pArq sid

grn clvd fb? pArqf? py 3339*

Gr

cg Gr fq

gg Gr fq

3336* cg Gr fq magnetite

wte/grn cg Grqfs

dk grn clvd mg pArqsc

wte/pk cg Grfqs

ox brn xt?

mg shd Gr fq magnetite 3335*

fault brec

grn shd A?sid cpy

ple grn A?sid

wte/grn shd cg Grfqs

dk grn Gr fq brec py 3334*

Gr 3333*

ple fg fb pArqfc 3332*

Gr py c 3331

pArq brec cg 1451*

fg fb pArq?

cg Grqf

wte/grn fg fb pArq?c q hm vns

ple pArqfsid

dk grn fg pArq?sid q vns

grn fg shd pArqf? sidc

pArq

wte/grn mg pArqfc

clvd fg pArqc

wte/ple grn clvd xl?f

clvd ox fg pArq

q vns

ple fg pArq

ple Sv (Slfst)

wte pArq

wte/grn fg-mg pArqf

wte/ple grn fg pArqfsid

pArq

q vns

wte/ple grn mg pArq

wte/grn mg pArqcs

ple grn xl?vtq

ple grn xlvtq

grn vtqsids

ple grn vtqsids

wte/grn xtqfc

ple fg pArq

qvns

mottled wte/grn xtqf

wte/grn lxtq

ple grn l?xvtq

wte/pk xtfq sid

xtfq

ple vxtq TS 3479

vx?tqs

wte/pk pArqf

mottled wte grn xtfqc

ox fg pArqf

ple fg pArqf sid

qvns

wte/pk fg pArqfs*

ple grn xl?vtq

ple grn xlvtq

grn vtqsids

grn xtqck TS 3350

grn M

grn/wte p?Arqfsid c

grn shd lxtqsc

pArqf?

ple vt sid matrix

ple (opal) lvt sid

1461*

70

ple vx?t sid 1462*

brn vx?t lim hm 1463*

brn vxtq lim 1464*

ple brn vxt lim vns (ferrogenous staining)

grn lxvtq 1460*

brn p?Arq gos 1459*

xtqf

xt

Camp

wte/pk fg pArqf ferromg

pk/dk grn fg pArqcs

grn lxtqf

ple xtq

ple grn xtq

wte/dk grn shd fg pArqcs

209236

5 cm

LEGEND:

1. For details of abbreviations used for the geological interpretations refer to map number KT 27/76-8A

GEOPEKO LIMITED

KING ISLAND GROUP

SCALE 1:5000

No KT 27/76-V3A-3

EL 27/76 ELLIOTT BAY

TASMANIA 035

VOYAGER 3

GEOLOGICAL MAP

A | B

DATE MAR '79

GEOLOGIST C.D.S

DRAWN J.P.M

CHECKED CMS

48-1317

5243000 N

5242000 N

5241000 N

384000 E

385000 E

386000 E

387000 E

388000 E

LEGEND

1. For details of abbreviations used for geological interpretations refer to map number KT 27/76-8A

Approximate areas containing abundant Scongl float. Consists of rounded/subrounded pre C quartzite pebbles and occasional subangular quartz-schist pebbles.

5 cm

209237

GEOPEKO LIMITED
KING ISLAND GROUP

SCALE 1:5000

No KT 27/76-V38-4

EL 27/76 ELLIOTT BAY
TASMANIA 036
VOYAGER 3
GEOLOGICAL MAP

78-1317

DATE MAR '79
GEOLOGIST C D S
DRAWN J P M

A | B

5 243 000 N

5 242 000 N

5 241 000 N

380 000 E

381 000 E

382 000 E

383 000 E

384 000 E

19 200 N 7 800 E

9 800 N 7 400 E

9 400 N 7 800 E

9 400 N 9 400 E

9 500 E

9 050 E

No sample taken

Camp

209238

5 cm

LEGEND

- Power auger
- Hand auger
- Grid position

170 — 170 ppm Cu original sample.
170 / 160 — 170 ppm Cu repeat and check original sample.
160 — 160 ppm Cu duplicate sample.

ANALYTICAL METHODS:
Cu by AAS following hot conc. HCL and HCL/HNO3 leach in latter stages for 1 hour of 0.25g sample.

CONTOUR INTERVAL

Pencil No.		Pencil No.	
19 - 6	50 - 100 ppm	19 - 22	400 - 800 ppm
19 - 10	100 - 200 ppm	19 - 50	800 - 1600 ppm
19 - 15	200 - 400 ppm	19 - 65	> 1600 ppm

NOTE
This map has been compiled from enlargements of the Tasmanian Lands Department's 1:15840 scale topographic machine plots.

GEOPEKO LIMITED
KING ISLAND GROUP

SCALE 1:5000

No. KT 27/76-V3A-5

E L 27/76 ELLIOTT BAY
TASMANIA 037
VOYAGER 3
C-HORIZON GEOCHEMICAL RESULTS
COPPER CONTOURS

A | B

DATE JUNE '78
GEOLOGIST C.D.S
DRAWN J.P.M.
CHECKED CDS

78 - 1317

5243000 N

5242000 N

5241000 N

384000 E

385000 E

386000 E

387000 E

388000 E

10000 N
13000 E

9600 N
12300 E

209239

5 cm

LEGEND

- Power auger
- Hand auger
- Grid position

170 ppm Cu original sample.
170 / 160 — 170 ppm Cu repeat and check original sample. / 160 ppm Cu duplicate sample.

ANALYTICAL METHODS:
Cu by AAS following hot conc. HCL and HCL/HNO3 leach in latter stages for 1 hour of 0·25g sample.

CONTOUR INTERVAL

Pencil No	
19-6	50 - 100ppm
19-10	100 - 200ppm
19-15	200-400ppm
19-22	400 - 800 ppm
19-50	800 - 1600ppm
19-65	> 1600ppm

NOTE
This map has been compiled from enlargements of the Tasmanian Lands Departments 1 15840 scale topographic machine plots

DATE JUNE '78
GEOLOGIST C D S
DRAWN J P M
CHECKED C D S

GEOPEKO LIMITED
KING ISLAND GROUP

SCALE 1:5000

No KT 27/76-V3B-6

EL 27/76 ELLIOTT BAY
TASMANIA
VOYAGER 3 038
C-HORIZON GEOCHEMICAL RESULTS
COPPER CONTOURS

A | B

78-1317

5243000 N

5242000 N

5241000 N

380000 E

381000 E

382000 E

383000 E

384000 E

9500 E

9400 N 7800 E

Camp

5 cm

209240

LEGEND:

- ● ..... Power auger
- o ..... Hand auger
- · ..... Grid position

- ●100/120 — 100 ppm Pb original sample. 120 ppm Pb repeat and check original sample.
- 100 — 100 ppm Pb duplicate sample.

ANALYTICAL METHODS:

Pb by AAS following hot conc. HCL and HCL/HNO3 leach in latter stages for 1 hour of 0·25g sample.

CONTOUR INTERVAL

Pencil No.		Pencil No.	
19-6	100 - 200 ppm	19-22	800 - 1600 ppm
19-10	200 - 400 ppm	19-50	1600 - 3200 ppm
19-15	400 - 800 ppm	19-65	> 3200 ppm

NOTE:

This map has been compiled from enlargements of the Tasmanian Lands Department's 1:15840 scale topographic machine plots.

DATE JUNE '78
GEOLOGIST C.D.S.
DRAWN J.P.M.
CHECKED C.D.S.

GEOPEKO LIMITED
KING ISLAND GROUP

SCALE 1:5000

No. KT 27/76-V3A-7

EL 27/76 ELLIOTT BAY
TASMANIA 039
VOYAGER 3
C-HORIZON GEOCHEMICAL RESULTS
LEAD CONTOURS

A | B

78 B17.

5243000 N

5242000 N

5241000 N

384000 E

385000 E

386000 E

387000 E

388000 E

9600 N
12300 E

10000 N
13000 E

209241

5 cm

LEGEND:

- Power auger
- Hand auger
- Grid position

0100 120 100 — 100 ppm Pb original sample.
120 ppm Pb repeat and check original sample.
100 ppm Pb duplicate sample.

ANALYTICAL METHODS:
Pb by AAS following hot conc. HCL and HCL/HNO3 leach in latter stages for 1 hour of 0·25g sample.

CONTOUR INTERVAL

Pencil No.		Pencil No.	
19 - 6	100 - 200 ppm	19-22	800 - 1600 ppm
19 - 10	200 - 400 ppm	19-50	1600 - 3200 ppm
19 - 15	400 - 800 ppm	19-65	> 3200 ppm

NOTE.
This map has been compiled from enlargements of the Tasmanian Lands Department's 1:15840 scale topographic machine plots

DATE JUNE '78
GEOLOGIST C D S
DRAWN J P M
CHECKED

GEOPEKO LIMITED
KING ISLAND GROUP

SCALE 1:5000

No KT 27/76-V3B-8

E L 27/76 ELLIOTT BAY
TASMANIA 040
VOYAGER 3
C-HORIZON GEOCHEMICAL RESULTS
LEAD CONTOURS

A B

78-1317.

5 243000 N

5 242000 N

5 241000 N

380000 E

381000 E

382000 E

383000 E

384000 E

9 800 N 7 400 E

9 400 N 7 800 E

9 500 E

9 050 E

9 400 N 9 400 E

No sample taken

Camp

5 cm

209242

LEGEND

- Power auger
- Hand auger
- Grid position

0170 / 180 — 170 ppm Zn original sample. 180 ppm Zn repeat and check original sample.

180 ppm Zn duplicate sample.

ANALYTICAL METHODS:

Zn by AAS following hot conc. HCL and HCL/HNO3 leach in latter stages for 1 hour of 0·25g sample.

CONTOUR INTERVAL

Pencil No.		Pencil No.	
19 - 6	200 - 400 ppm	19 - 22	1600 - 3200 ppm
19 - 10	400 - 800 ppm	19 - 50	3200 - 6400 ppm
19 - 15	800 - 1600 ppm	19 - 65	> 6400 ppm

NOTE:

This map has been compiled from enlargements of the Tasmanian Lands Department's 1:15840 scale topographic machine plots.

DATE JUNE '78
GEOLOGIST C.D.S.
DRAWN J.P.M.
CHECKED CbB

GEOPEKO LIMITED
KING ISLAND GROUP

SCALE 1:5000

No. KT 27/76 V3A-9

EL 27/76 ELLIOTT BAY
TASMANIA 041
VOYAGER 3
C-HORIZON GEOCHEMICAL RESULTS
ZINC CONTOURS

A | B

78-317

5243000 N

5242000 N

5241000 N

384000 E

385000 E

386000 E

387000 E

388000 E

10000 N
13000 E

9600 N
12300 E

209243

5 cm

78-1317.

LEGEND

- Power auger
- Hand auger
- Grid position

170 ppm Zn original sample.
180 ppm Zn repeat and check original sample.
180 ppm Zn duplicate sample.

ANALYTICAL METHODS:
Zn by AAS following hot conc. HCL and HCL/HNO3 leach in latter stages for 1 hour of 0·25g sample.

CONTOUR INTERVAL

Pencil No.		Pencil No.	
19 - 6	200 - 400 ppm	19 - 22	1600 - 3200 ppm
19 - 10	400 - 800 ppm	19 - 50	3200 - 6400 ppm
19 - 15	800 - 1600 ppm	19 - 65	> 6400 ppm

NOTE:
This map has been compiled from enlargements of the Tasmanian Lands Department's 1 : 15840 scale topographic machine plots.

GEOPEKO LIMITED
KING ISLAND GROUP

SCALE : 1:5000

No. KT 27/76-V3B-10

E.L. 27/76 ELLIOTT BAY
TASMANIA
VOYAGER 3 042
C-HORIZON GEOCHEMICAL RESULTS
ZINC CONTOURS

A B

DATE JUNE '78
GEOLOGIST C.D.S.
DRAWN J.P.M.
CHECKED

5243000 N

5242000 N

5241000 N

380000 E

381000 E

382000 E

383000 E

384000 E

9500 E

9050 E

9400 N 7800 E

9400 N 8400 E

9400 N 7400 E

9000 N 7800 E

Comp

209244

5 cm

78-1317 · Vol 2

LEGEND

- Power auger
- Hand auger
- Grid position
- 1906 Outcrop sample No KR 1906
- 1954 Float sample No KR 1954

NOTE

This map has been compiled from enlargements of the Tasmanian Lands Department's 1:15840 scale topographic machine plots

GEOPEKO LIMITED
KING ISLAND GROUP

SCALE 1:5000

No KT 27/76-V3A-11

EL 27/76 ELLIOTT BAY
TASMANIA
VOYAGER 3
ROCK SAMPLE LOCATION MAP

043

A | B

DATE NOV 1978
GEOLOGIST C D S
DRAWN J P M
CHECKED

5243000 N

5242000 N

5241000 N

384000 E

385000 E

386000 E

387000 E

388000 E

10000 N
13000 E

9600 N
12300 E

LEGEND

- Power auger
- Hand auger
- Grid position
- 1906 Outcrop sample No. KR 1906
- 1954 Float sample No. KR 1954

NOTE:
This map has been compiled from enlargements of the Tasmanian Lands Department's 1:15840 scale topographic machine plots

DATE NOV. 1978
GEOLOGIST C.D.S.
DRAWN J.P.M.
CHECKED C.D.S.

GEOPEKO LIMITED
KING ISLAND GROUP

SCALE 1:5000

No. KT 27/76-V3B-12

EL 27/76 ELLIOTT BAY
TASMANIA 044
VOYAGER 3

ROCK SAMPLE LOCATION MAP

A | B

209245

5 cm

78-1317 · W2