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AMDEX MINING LIMITED

TRIAKO MINES N.L., BUKA MINERALS N.L.,
GIPPSLAND MINERALS N.L., KIBUKA MINES PTY. LTD.
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TECHNICAL REPORT

EXPLORATION LICENCE 28/76 - DERBY, TASMANIA.

SIX MONTHLY REPORT FOR PERIOD

22 JUNE 1978 to 21 DECEMBER 1978

DKSG

79-1331

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Investigations Conducted by: Kibuka Mines Pty. Ltd.

Typed by: R. McNicol

Date: 8 January 1979

Distribution: Department of Mines, Hobart, Tas.
Kibuka Mines Pty. Ltd., Sydney, N.S.W.

PROJECT: D 134 Derby E.L. 28/76

1:250,000 Sheet Index No: SK 55-4

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1. INTRODUCTION

1.1 Summary

This report summarises the exploration conducted in E.L. 28/76 during the six monthly period from 22nd June, 1978 up until 22nd December, 1978. Earlier work on the area has been partly reviewed and the regional geology reassessed. Previous proposals for exploration such as dewatering the Valley Lead have had to be altered however an adjacent area, Fraser Flats, has been investigated as a future exploration target. A Magnetic Induced Polarisation Survey was conducted in an adjoining Exploration Licence in the hope of perfecting a regional geophysical tool. The relevance of this work is briefly discussed and future exploration proposals are outlined.

1.2 Locality and Geography

E.L. 28/76 containing the towns of Derby and Branxholm is located in north-East Tasmania. Its position adjacent to additional Exploration Licences held by this Company is shown on the accompanying Location Plan. The Exploration Licence is roughly bisected by the irregular course of the Ringarooma River. The areas to the south of the Ringarooma River are fairly rugged, timbered and with steeply incised valleys; while to the north the area is well cleared farm country with undulating or partly dissected plateau topography. A recently disused rail link crosses the area, most of which is further accessible by both sealed and unsealed roads.

1.3 Tenement Details

E.L. 28/76 of 46 square kilometres area was granted to L.W. Morris of Burnie towards the end of 1976 until 22nd June, 1977. Kibuka Mines and Morris entered into an agreement whereby Kibuka would conduct investigations into the area. The Exploration Licence was renewed on successive six monthly

dates by Kibuka/Amdex Mining on behalf of Mr. Morris. The Licence was transferred from L.W. Morris to Moruka Tin Pty. Ltd. of 115 Collins Street, Hobart from 12th May, 1978 and successive six monthly renewals have been continued by Kibuka.

Various areas within the boundaries of the Exploration Licence are not covered by the Licence where pre-existing mining leases, water reserves, etc., were located. In particular, major omissions from the Exploration Licence are the Arba Hill area north of Branxholm, the Briseis area adjacent Derby, the narrow section along the Ringarooma River east of Derby and an area adjacent Main Creek/Mutual Hill in the eastern section of the Licence.

2. CONCLUSIONS AND RECOMMENDATIONS

2.1 A wide flat area adjacent the Ringarooma River near Derby, Fraser Flats, is selected as a potential exploration/possible dredging target. A program of closely spaced percussion drill holes is necessary to give a preliminary assessment of this area.

2.2 The previously suggested proposal to dewater and mine the Valley Lead is probably not feasible owing to the proximity of the Ringarooma River. Dredging in conjunction with Fraser Flats may be a viable means of mining this material, however the worth of the ground needs to be established by drilling first.

2.3 Other areas of the Exploration Licence should be considered for; gold veins in the Mathinna Beds; alluvial or hard rock tin in or on the granite - granite/Mathinna contact.

3. EXPLORATION

3.1 Early Activity and Previous Exploration

The early activity in the area of the Derby Exploration Licence was intensive. The deep lead mines, active in the earlier part of this century, were the Black Creek/Arba Hill Lead near Branxholm, the Valley Lead towards Derby, the Briseis Mine at Derby and the Main Creek/Mutual Hill Lead east of Derby. Apart from these large operations, of which the Briseis was the largest and most famous there have been numerous other smaller workings in the area. Most of the operations took place when documentation of results and procedures was not compulsory and so detailed records were not kept. Utah collated much of the literature relating to the area (King 1963, Warin and Appleby 1964) and subsequently conducted detailed exploration north of Arba Hill. Their unpublished reports are on open file in the Department of Mines, Tasmania.

3.2 Current Investigations

No drilling was attempted during the six monthly period ended 22nd December, 1978 owing to priorities of drilling ahead of the Pioneer Mine in an adjacent Exploration Licence. The earlier plans to dewater and work the Valley Lead have not been attempted and are of questionable viability. Extensions to the Valley Lead may extend to depths below 40 metres and are in dangerously close proximity to the surface flow of the Ringarooma River. The river shingle in the section also poses difficulties of working but may be handled with a dredging operation provided sufficient reserves could be established in the area. In this regard, the extensions to the Valley Lead may be regarded as an integral part of a larger target area, Fraser Flats currently under investigation.

Fraser Flats (see Drawing No. 134/1) is a wide, flat area within the Exploration Licence, 28/76. The geology and rationale for the selection of

this target for alluvial tin are outlined under the geology section. The area has been mapped and the indications of the economic potential reviewed. A further review of drill hole information in adjoining areas is necessary with a view to initiating drilling activities in about March, 1979. Also 1:2000 topographic sheets have been previously constructed photogrametrically of the Valley, Fraser Flats and Briseis areas. These will serve as base sheets for more detailed exploration activities.

The only other activity relevant to the exploration of this Authority was the trial of a Rapid Reconnaissance Magnetic Induced Polarisation survey in an adjacent area in an attempt to perfect a regional geophysical tool. A relatively short frequency of 3 cycles per second was employed in this method in order to induce and detect a rapid capacitive decay/relative phase shift effect associated with the ilmenite heavy mineral fraction of the alluvial section. A mobile linear dipole electrode/sensor array achieved significant anomalies, and results are only just being evaluated. However from initial observations, the anomalies generated appear to be inconsistently associated with known tin (heavy mineral) occurrence and not reproducible when read from the reverse direction. Assessment of the results will be undertaken when the data is available and improvements may be possible to this method. A viable regional geophysical tool then is not yet available.

3.3 Proposals for Future Exploration

Within the next few months it is planned to collate as much of the drilling and other exploration material relevant to the area as possible. The height differences to the basalt/alluvial sediment contacts will be investigated to provide information on possible faulting in the vicinity of Fraser Flats. A drilling program for alluvial tin in this area is planned to commence in March, 1979. Some investigations of the granites in this area will be made and some consideration will be given to the vein gold

potential of the Mathinna Beds in the area. For continuation of exploration in this Exploration Licence much depends on the success or failure of results in the Fraser Flats area which may hold potential for alluvial tin and possibly gold amenable to a dredging operation.

4. GEOLOGY

4.1 General

The Tertiary, tin bearing alluvial sediments of North-East Tasmania were formed as extensive fill deposits in topographically low areas between granitic source rocks. Much of this alluvial material lies beneath the present Ringarooma and Boobyalla drainage systems and is covered by Kibuka/Amdex Mining exploration licences. The primary lode tin formed in greissen cappings or in pegmatitic veins through the Devonian granite, granodiorite and adamellite plutonic masses. The cassiterite grains resist chemical attack and are concentrated, owing to their high specific gravity in placer deposits known as deep leads, which coincide with the ancients drainage courses. Surface run off, estuarine and coastal processes have also contributed to the distribution of the tin bearing sediments. From the character of the sediments tidal-estuarine processes have had a much larger influence on the distribution of both the tin and the Tertiary sediments than has been recognised previously.

Within the area of the Exploration Licence there are five main rock units relating to successive geological episodes. These are listed in order of decreasing age:

i) The lower Palaeozoic Mathinna Beds, mainly metamorphosed slates and grey wackes - these are located in the north to north-west section of the area;

ii) The lower Devonian Granite masses - these are located over wide areas in southern portions of the Authority and extending diagonally from the south-west to the north-east portions of the area;

iii) The Tertiary alluvial sediments which infill ancient drainage courses that cut an irregular path close to the Granite/ Mathinna contact;

iv) The Tertiary Basalt which overlies much of the area infilled with Tertiary sediments;

v) The Quaternary sediments mainly river shingle deposited by the Ringarooma River where it has re-eroded along the ancient drainage course removing some of the Basalt and exposing Tertiary sediments in places.

4.2 Tin Distribution

The alluvial cassiterite of North-East Tasmania has been eroded from surrounding source rocks and concentrated mechanically by traction currents sporadically throughout the Tertiary sediments. Small amounts of eluvial tin have been won from surface concentrations immediately overlying granite bedrock, but by far the richest concentrations of tin have been won from the 'deep leads' which enter the Tertiary basin.

The leads were first located by prospectors where shallow rich cassiterite deposits occurred in the alluvial valley fill. The leads were mined down slope beneath increasing thicknesses of overburden, and appear to continue as roughly linear entities, for at least some distance into the Tertiary basin. It is common to see fairly pure cassiterite grains concentrated into 3 mm bands. Some cassiterite grains also occur disseminated throughout coarser sediments.

Apart from some irregular surface concentrations, the tin is concentrated almost exclusively at the base of the section. This is attributed to tidal agitation of the alluvial valley fill material and winnowing of the cassiterite into the thin rich basal layers. Thus the sediment laden streams carrying the cassiterite are envisaged as entering the encroaching estuary; heavy cassiterite and coarse fractions are winnowed out and the lighter and finer sediment fractions are transported further.

This model for tin distribution can be applied more readily to the wider area of Tertiary sediments around Pioneer and Endurance towards the North-East of the Exploration Licence. However there is some doubt as to its applicability to the narrow valley fill tin bearing sediments in the area of the Licence.

4.3 Sedimentation Model

The Tertiary sediments of North-East Tasmania comprise coarse quartzose grits and gravels, fine and coarse sands, pebble, cobble and boulder grade conglomerates, with beds of silty clay, clay and occasional peat. The coarser sediments almost always have a matrix of finer, usually clayey material. These sediments are poorly consolidated and are disaggregated fairly easily by the high pressure jet from a monitor pump, however they are firm and compact enough for the features of cross bedding and layering to be plainly recognised (see accompanying photograph).

The alluvial sediments fill a Tertiary Basin with granitic highlands surrounding most of the basin margins, as depicted by Jennings (1976). Coarse conglomerates and similar high energy sediments are commonly located towards the base of the Tertiary section. This indicates that high capacity traction currents scoured the base of the section and must, at one time, have flowed downhill out of the basin, implying that the depositional system is not an enclosed internal drainage area as supposed by Brown (1978).

It is suggested that the expanse of sediments infilling the basin has resulted from the infilling of slowly rising estuarine conditions which have drowned the ancient valley system. The reasons for this proposal are as follows:

- The sediments are moderately widespread and in many cases cover the interfluve areas of the ancient valley margins which is difficult to accomplish in an entirely fluvial situation.

- There are moderately high energy traction current sediments throughout the section that can be explained by estuarine conditions, while there are no laminated fine grained sediments towards the base of the Tertiary section which should, if deposited in an internal drainage lake system, show an overall upward coarsening sequence.

- Estuarine black muds are recognised in the Tertiary section towards the lower reaches of the Boobyalla River but there is not a great height difference between this area of established estuarine influence and those further inland.

- Large scale cross bedding observed toward the basal sections of the face at the Pioneer Mine dips in opposite directions, a situation more readily explained by estuarine-tidal action rather than unidirectional fluvial currents.

- Relatively thick beds of silty clay, which must have been deposited from suspension in a standing water body, are more readily explained in an estuarine fill situation.

- Peat, common in the sequence, would readily be deposited in quiet sections of an estuarine fill but not in an alluvial valley fill situation.

- The occurrences of rich winnowed tin layers towards the base of the section are attributed to tidal agitation of the original alluvial valley fill sediments.

- Workers from the old Endurance deep lead mine report the occurrence of scallop and mussel shells in bedded layers toward the basal sections of the old workings. These reportedly crumbled on touch and contained only the concave/convex halves of the shells.

If marine estuarine influence is accepted for the Tertiary Basin sediments 15 to 20 kilometers north-east of Derby, the extension of this influence

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to the more proximal narrow valley fill areas near Derby must have at least some likelihood. The general model for the Tertiary Basin alluvial sediment is depicted in Drawing No. 136/24.

4.4 Fraser Flats Target Area

i) Location and Access

Fraser Flats (see Drawing No. P 134/1) is a wide, low area some 2 to 3 kilometres west of the town of Derby in North-East Tasmania. It is traversed by several anna branches of of the Ringarooma River. The now water-filled old workings of the Valley Lead enter the Flats in the extreme south of the area. A wide expanse in the north-west of the area is well cleared, firm, and reasonably accessible. Areas adjacent to the river along the east and south-east margin are mostly covered with dense vegetation. Roads run either side of these Flats. The area is privately owned and there is therefore a bonded agreement which must be entered into before initiating activities. A 20 metre dozed track from the western road slope onto the Flats would also be required to gain access.

ii) Geology

The geology of the area is portrayed on the accompanying plan (Drawing No. P 134/1). Granite forms the high country to the south and has been the supply source responsible for the shedding of the alluvial tin into the Tertiary sediments along narrow leads such as the Valley Lead shown on the sheet.

Tertiary alluvial sediments are visible in scarps adjacent to the road and about 10 to 20 metres of these sediments have been removed by the present Ringarooma River from the area over the Flats. Basalt forms the high plateau country to the north and

north-west of the area, and there is also a remnant of basalt overlying Tertiary sediment to the east of the Flats, adjacent to the road to Derby. This basalt outlier abuts a steep granite scarp which indicates that the scarp is related to Tertiary not recent erosional processes. This is portrayed in the accompanying photograph.

There are also some areas of metasediments marginal to the granite bodies in the area. The outcrop of these metasediments on the outskirts of Derby exists; however, the occurrence west of Fraser Flats, as shown on the 1:50 000 Geol. Survey Tasmania Map was examined briefly but not verified. Crop of such basement may have important implications concerning deflection of paleodrainage systems, so this mapping needs checking. The Flats then would consist of Quaternary river shingle, and this would, presumably, overlie the basal sections of the Tertiary alluvial section.

Vital in planning drill programme.

iii) History

There has been no recent Company exploration over the Fraser Flats area, and Utah did not consider it as an exploration target. According to Mr. Ken Davies, there were some old Mines Department holes in the area, and an attempt will be made to locate this information. There was also drilling ahead of the Valley Lead, however, this is only a small segment to the side of the main area of the Flats. The Briseis Tin Co. attempted to mine the river shingle ahead of the Valley Lead workings, however no dredging has been attempted over these Flats and this would be the only viable means of negotiating such material and ground. Mr. David Jennings of the Tasmanian Mines Department reports that their drilling was located to the west of the area of interest, closer to Arba Hill, and that there is surprisingly no drilling recorded over the Flats area.

According to Mr. Jim Ponting, an Amdex employee at South Mt. Cameron, the Dorset Dredging Company intended to drill Fraser

Flats but this proposal never eventuated. It seems likely that much of the Flats have never been tested.

iv) Rationale

Fraser River Flats can be considered as an alluvial tin exploration target for two reasons. Firstly, much of the recent river gravels may contain tin because as the Ringarooma River looses energy over the wide flat area, it would presumably deposit its transported tin lode; secondly, the Tertiary alluvial sediments would exist beneath the river gravel and seeing 10 to 20 metres of this material has already been removed, there may only be a relatively short depth to the rich basal tin concentrate, common in the Tertiary sediments.

The Tertiary sediments exposed in cuttings adjacent to the Flats exhibit the features typical of the whole area and it would be valid to suppose that estuarine tidal currents, operative during the Tertiary, have winnowed and concentrated a rich basal tin layer in this area also.

The steepness of the granite scarp adjacent to the basalt remnant suggests that an active paleodrainage system and possibly a buried deep lead system could feasibly exist in this area. In this regard it is thought that a thick section of Tertiary overburden has already been removed from over the Flats. For example, Tertiary sediments extend in places as high above the Flats area as the site from which the accompanying photograph was taken.

The distribution of this tin, if present, may be in localised narrow rich pockets in similarity to other local areas so close spaced drilling is required. The small rich pockets would sum to give a larger lower grade deposit. The exploration target sought is a medium to low grade large tonnage of alluvial tin amenable to a dredging operation.

Leon K McDonald

KIBUKA MINES PTY. LIMITED.

5 January 1979

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Warin, O.N. and Appleby, W.R., 1964, Tin resources of North-East Tasmania and proposed drilling programme. Unpublished Report, November 1964. Utah Development Company (Department of Mines, Tasmania).

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FIGURE 1

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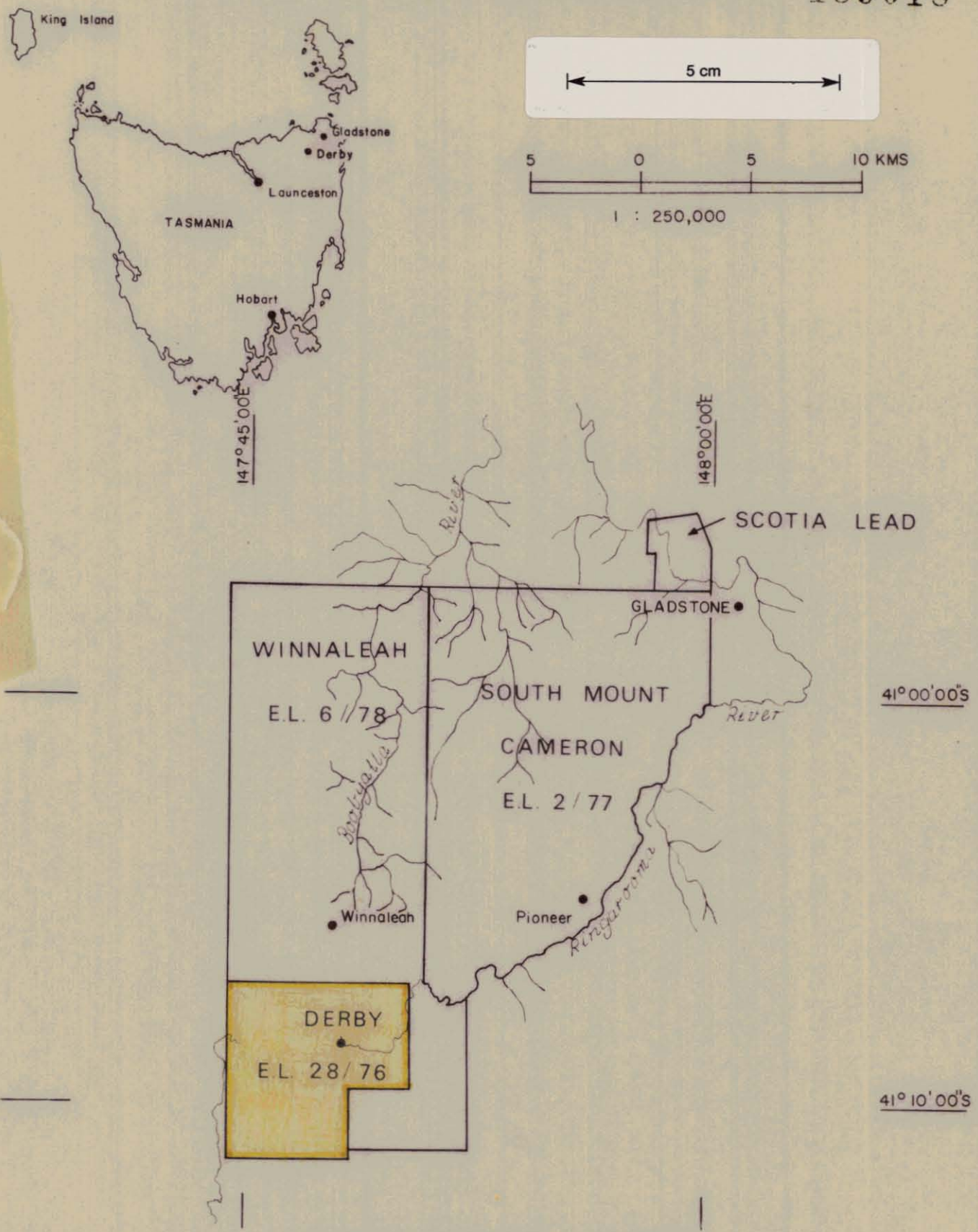

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NORTH - EASTERN TASMANIA LOCATION MAP

SHOWING CURRENT E.L.'S

Fig. 1

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5 64 000 m E

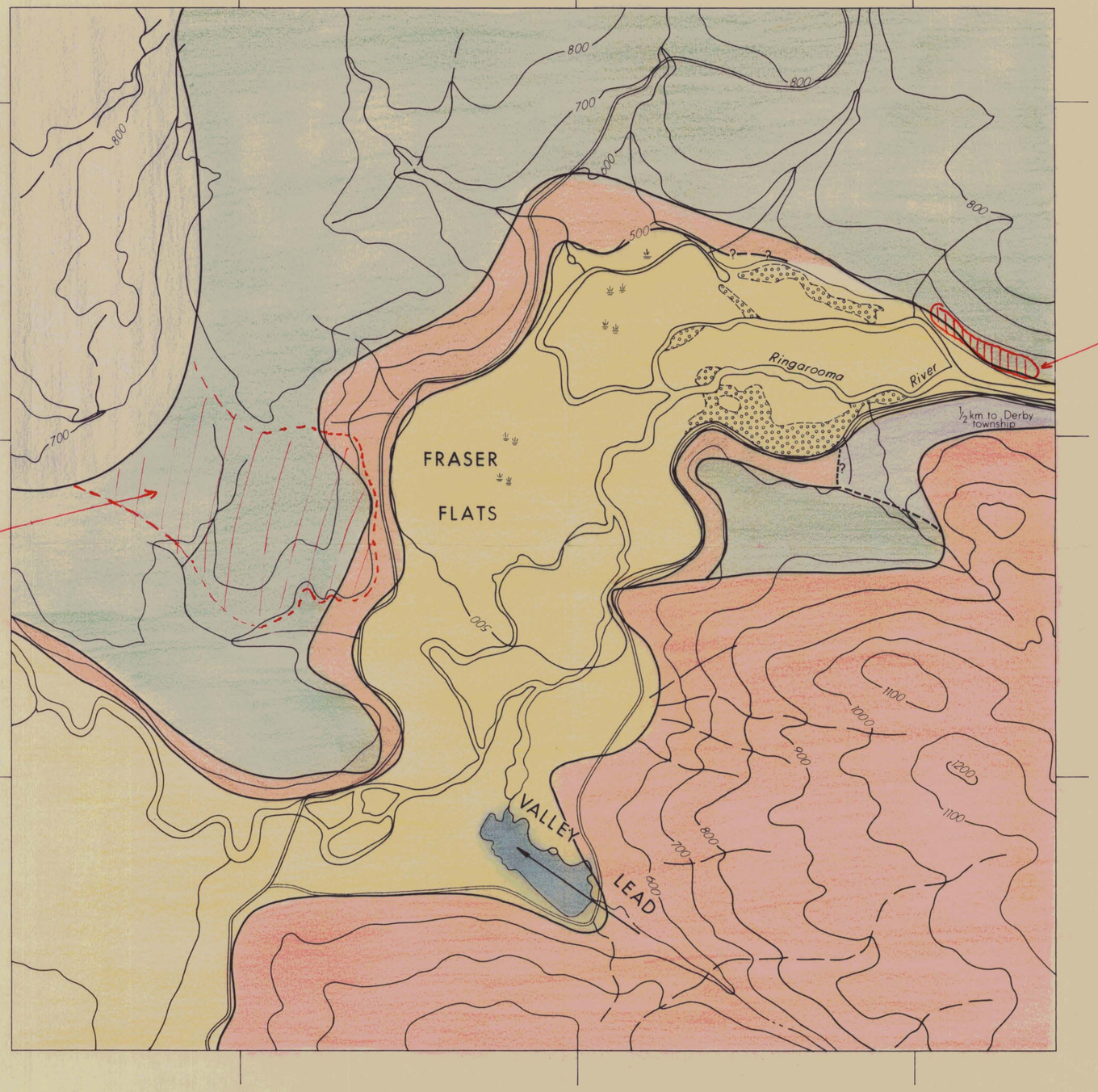
5 65 000 m E

5 66 000 m E

54 46 000 m N

54 45 000 m N

5444 000 m N



5m. on D.o.M. 1:50,000.

5m on D.o.M 1:50,000.

LEGEND

- Quaternary Alluvials
- Basalt
- Tertiary
- Granite
- Mathinna Beds (metasediments)
- Geological boundary
- Road
- River, creek
- Sand
- 600 Topographical contour

5 cm

200 100 0 100 200 300 400 Metres

SCALE 1: 10,000

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FRASER FLATS AREA GEOLOGY

Fig. 2

Author: L. Mc Donald	Date: January, 1979	Dwg. No. D134/1
Drafted by: C.C.	Report No.	Base Plan

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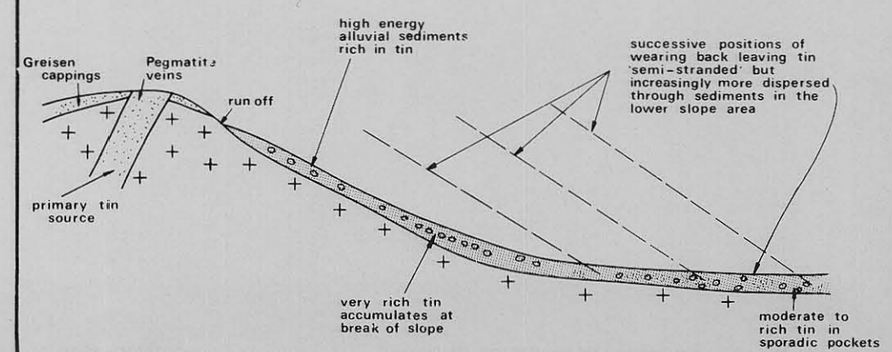
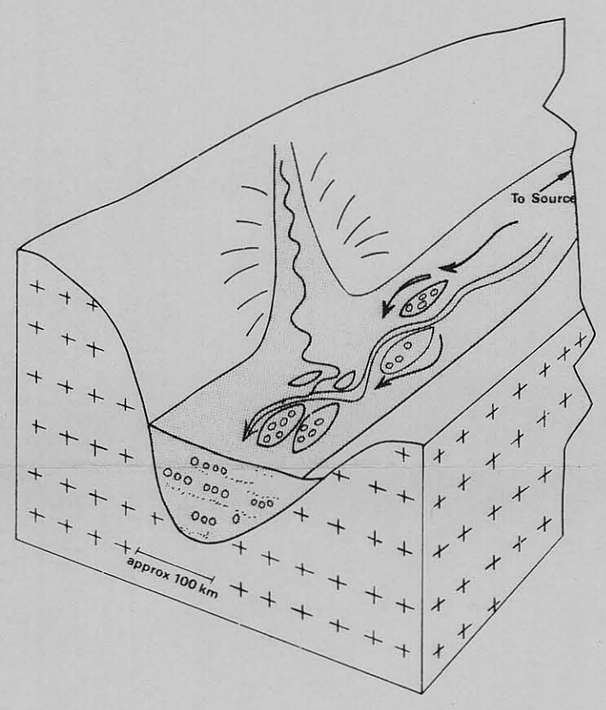
SUCCESSIVE STAGES OF SEDIMENT / TIN DISTRIBUTION IN TERTIARY OF NORTH — EAST TASMANIA — CONCEPTUAL MODEL

1. ALLUVIAL DISTRIBUTION

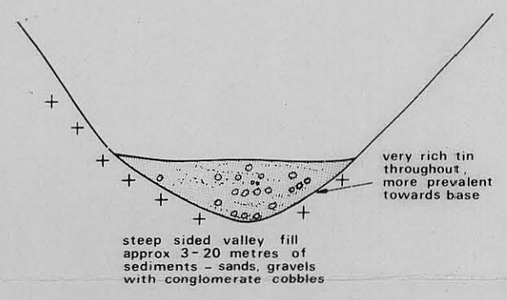
section parallel to flow



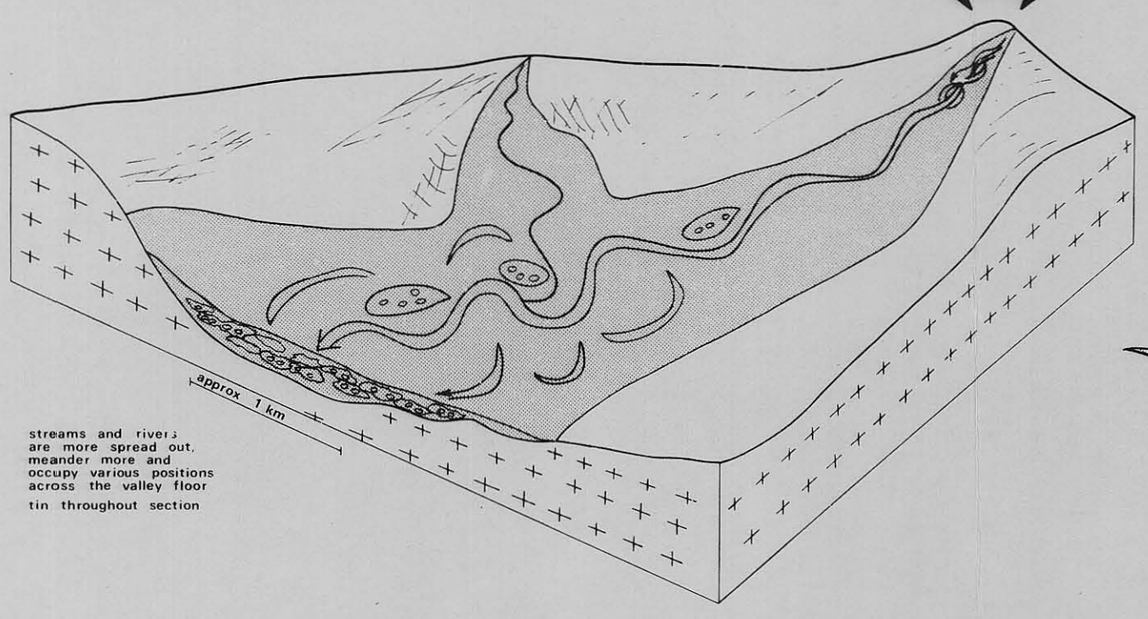
v-shaped valley view



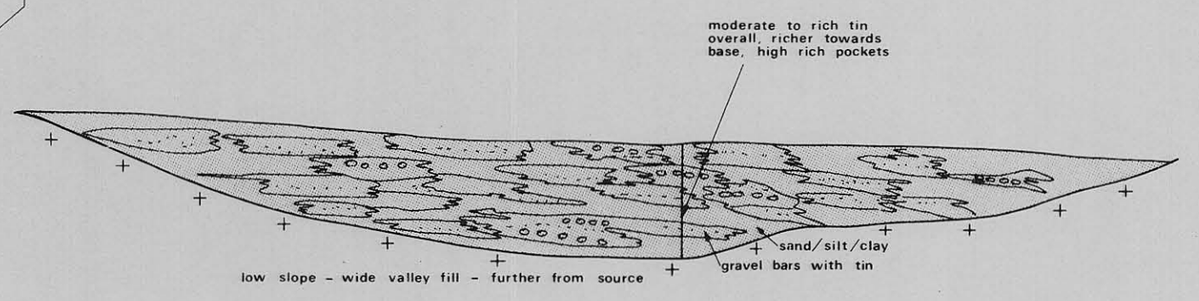
section across flow



wide valley view

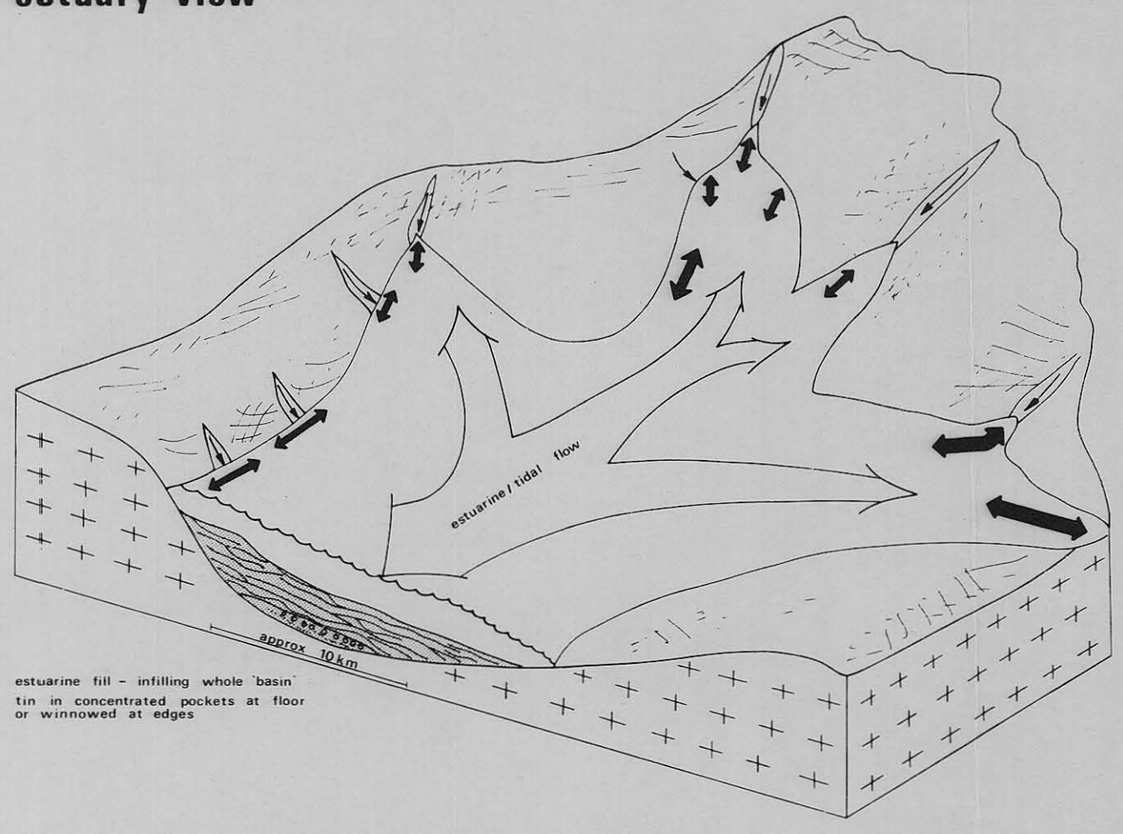


section across flow

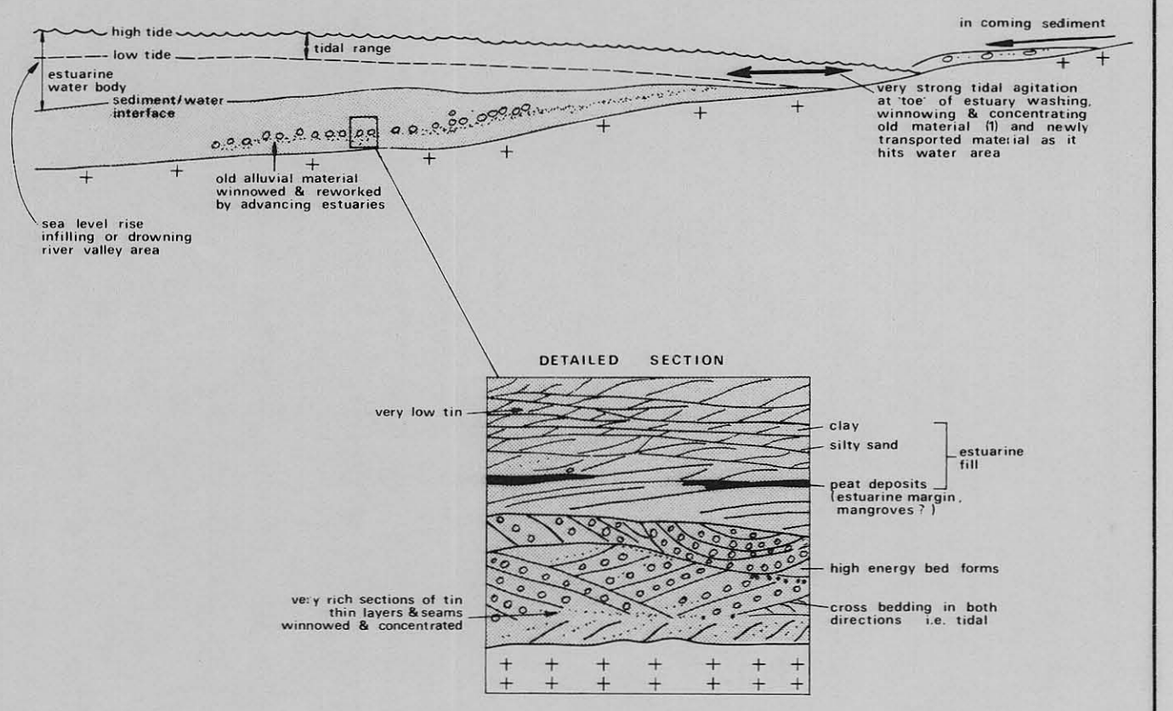


2. RIVER VALLEYS DROWNED BY ESTUARINE CONDITIONS - ALLUVIAL/TIDAL ESTUARINE DISTRIBUTION

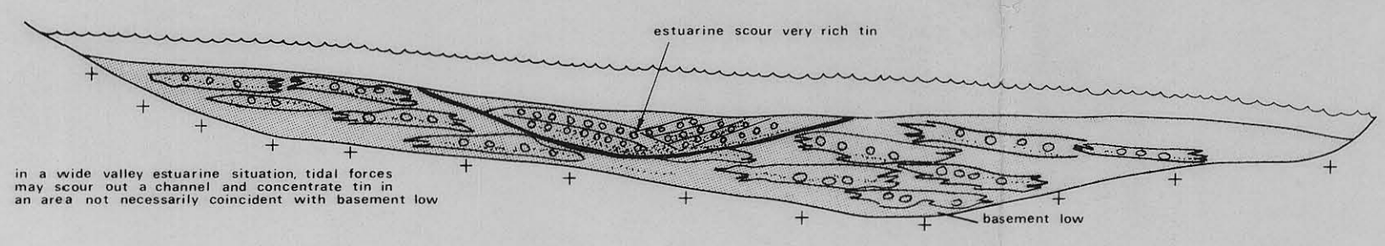
estuary view



parallel section

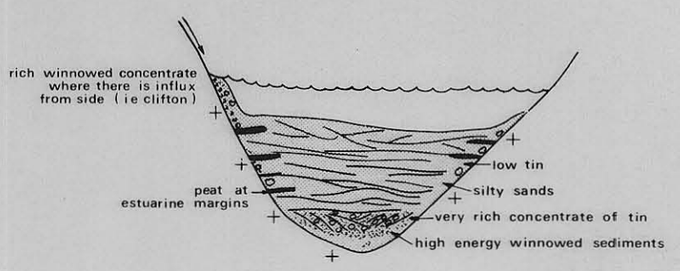


wide valley section

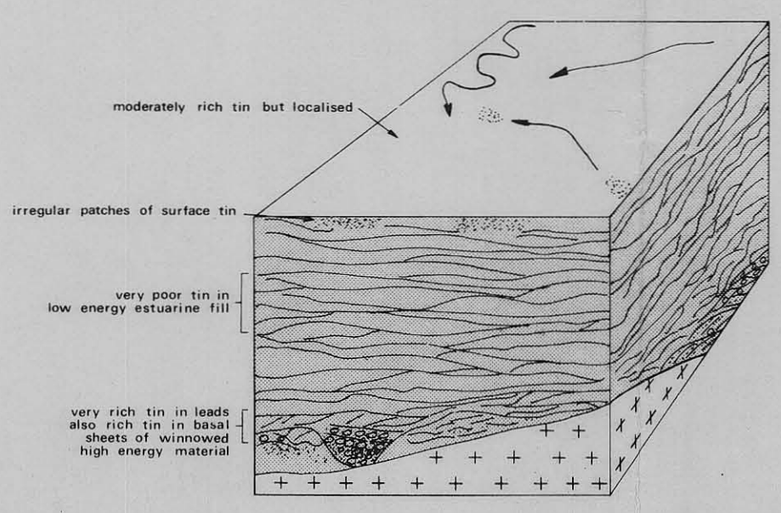


narrow valley (steep sided) section

eg ENDURANCE



3. SEA WITHDRAWS SOME SURFACE DRAINAGE CONCENTRATION



LEGEND

- Tin
- Cobbles
- Granite, Granodiorite, Adamellites (Granite bedrock)
- Sand silt/clay alluvium
- Peat

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Fig 3.

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N.E. TASMANIA TIN EVALUATION	
DATA BY: L. McDONALD	Dwg. No. 136/24
DATE: September, 1978	DRAWN BY: C.C.

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FIGURE 4

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View looking south across Fraser Flats. River flats are in the foreground. Tertiary alluvial sediment extends higher than the vantage point from which the photo was taken. A planar basalt plateau extends from the small cut on the other side of the Flats back to and abutts a granite tree-covered hill scarp in the distance. The granite hill scarp represents a paleoscarp eroded by the Tertiary drainage system.

Large amplitude cross bedding toward the base of the Tertiary alluvial section from Pioneer area. The coarser beds visible are cobble-sized conglomeratic material, other material is coarse clayey sand. The large cross bedding shows dips in alternate directions. The configuration of bed-forms supposes a reasonable water depth in the ancient channel.