KIBUKA MINES N.L.

EXAMINATION

OF

EXPLORATION LICENCES 9/69 AND 13/66,

KING ISLAND, TASMANIA.

Sydney,
Sept. 12, 1972.

K. J. Callow.

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CONCLUSIONS

1. Exploration for skarn scheelite deposits or other mineralisation within Exploration Licence 9/69 is not warranted as their presence is considered very unlikely.

2. Within Exploration Licence 13/66, the portion of the Palaeozoic upper series in contact with the Grassy granodiorite is worth testing for skarn scheelite mineralisation, although the prospects of the necessary limestone beds being present do not appear to be very good.

3. If hand augering is feasible, the preliminary exploration program should cost about $1,000.00.

RECOMMENDATIONS

1. A preliminary exploration program is recommended for Exploration Licence 13/66 to test the Palaeozoic upper series rocks in contact with the Grassy granodiorite for skarn scheelite mineralisation.

The program consists of hand augered holes (if possible) spaced 50 feet apart on lines spaced 1,000 feet apart, as shown in Fig. 4. The holes are to be drilled through the sand to the soil beneath to obtain samples to be analysed for tungsten, molybdenum, tin, lead, zinc and copper.

Further testing depends on the results of the preliminary program.

2. No exploration for skarn scheelite mineralisation or vein type mineralisation is recommended for Exploration Licence 9/69.

INTRODUCTION

On August 18, 1972, Mr. K.J.Callow was commissioned by Mr. E.B.Bell for Kibuka Mines N.L. to examine Exploration Licences 13/66 and 9/69 on King Island, Tasmania, and report on the possibility of mineralisation - particularly schoelite mineralisation - within them.

The Exploration Licences were acquired by Kibuka Mines N.L. from Naracoopa Rutile Ltd. when they successfully bid for this company after its liquidation early in 1972.

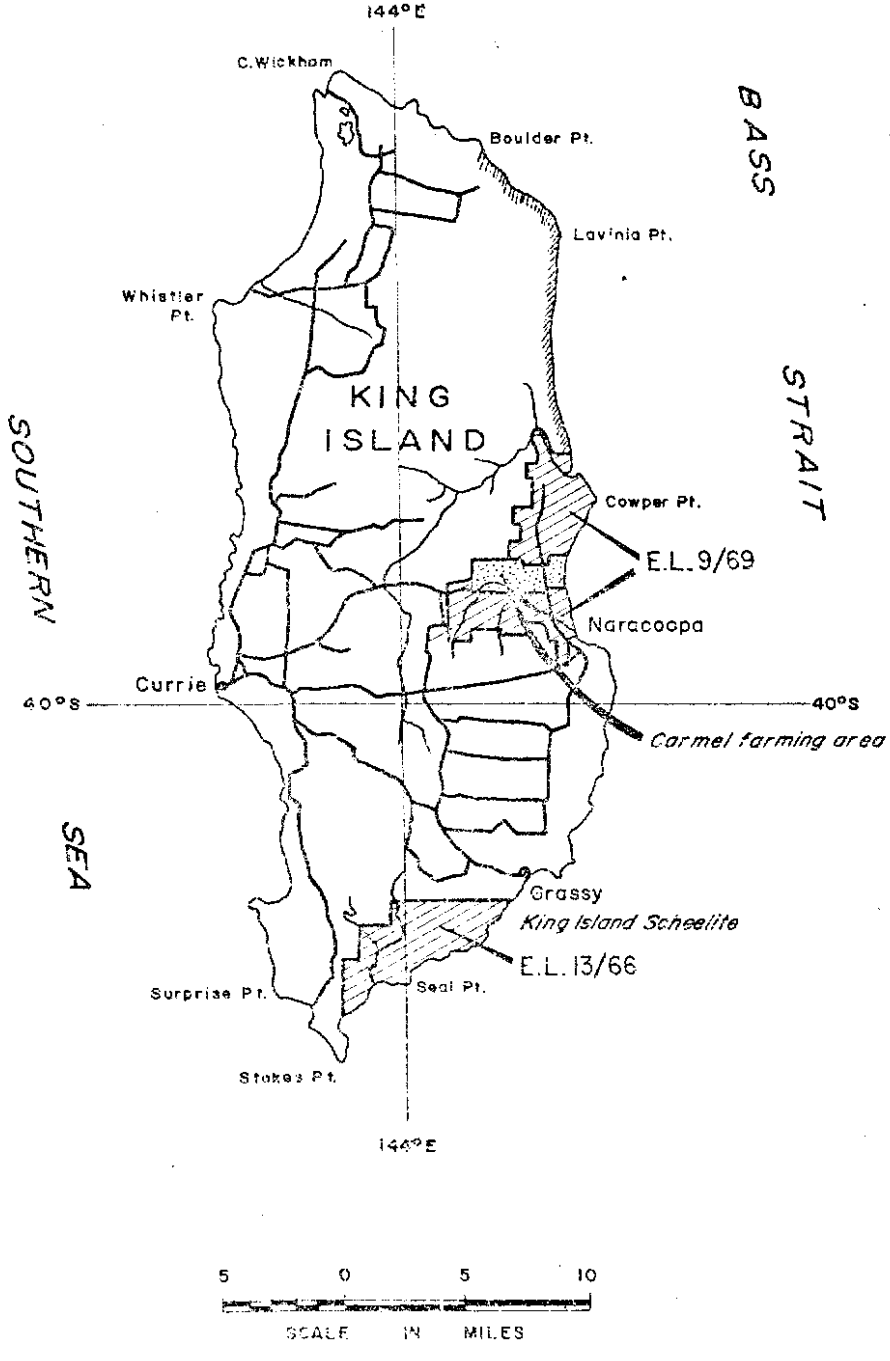
The areas covered by the Licences were reconnaissance mapped by Mr. K.J. Callow in 1954, whilst employed by King Island Scheelite (1947) Ltd. and the three days August 22-24, 1972, spent in their re-examination with Mr. Barry Evans of Kibuka Mines N.L. served to check the previous mapping and add additional data from recent exploration work in the general area.

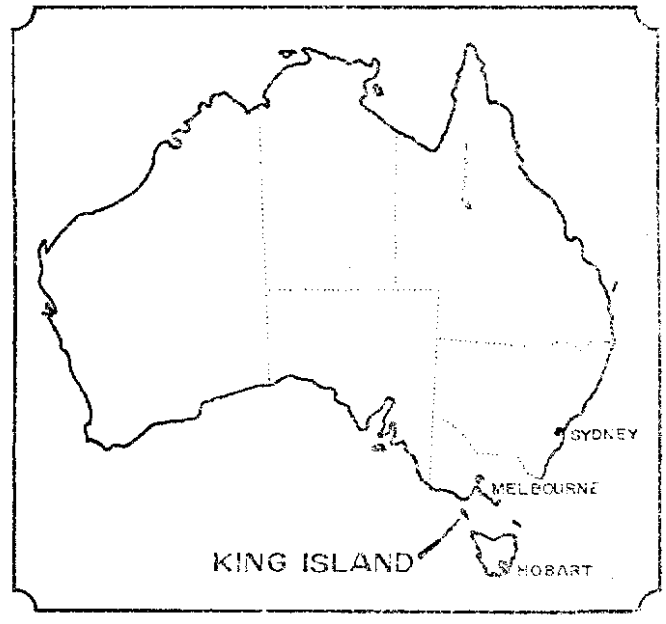
LOCATION

King Island, with latitude 40°S and longitude 144°E, is situated at the Western entrance to Bass Strait, about halfway between the Northwest corner of Tasmania and Cape Otway, Victoria. It has a length of 40 miles in a meridianal direction and a greatest width of 16 miles.

Exploration Licence 9/69, with an area of 15 square miles, covers two separate areas on the central east coast of the Island between the Sea Elephant and Fraser Rivers, plus the strip of beach between highwater mark and low water mark from the mouth of the Sea Elephant River to Boulder Point (Fig.1).

Exploration Licence 13/66, with an area of 15 square miles, covers the south-east corner of the Island.





LOCATION MAP

showing

KING ISLAND AND

EXPLORATION LICENCES 13/66, 9/69

5 cm

FIG. 1

PHYSIOGRAPHY

The Island is of low relief. Mt. Stanley, the highest point on it, rises imperceptibly to an elevation of 700 feet above sea level near the eastern junction of the Loop and Currie-Grassy roads. It is marked by the newly erected micro-wave relay tower.

Around the coast there is ample evidence of the varying Pleistocence sea levels. Along the east coast, north of City of Melbourne Bay, raised shore platforms backed by cliffs occur at varying levels with a few old rock stacks on them. At Grassy, a high level boulder bed is exposed in the open cut with boulders up to 130 feet above sea level. On the west coast there is an offshore shelf.

From the very low depression that extends from Fitzmaurice Bay across to Seal Bay, the southern tip of King Island represents a tied island, as this portion at one time must have been separated from the main island. The depression is marked by lakes and swamps.

Three natural physiographic regions are recognisable - the sand dune, plain and plateau regions. Exploration Licence 9/69 covers sand dune and plains country, whilst Exploration Licence 13/66 covers the southern escarpment of the plateau region, sand dune and low lying marsh country.

GENERAL GEOLOGY

The basement rocks of King Island consist of Precambrian muscovite-quartz schists, and Palaeozoic sediments and volcanic rocks. Granitic rocks of two ages have intruded the above sequences - Devonian potassic granites confined to the west coast of the Island and Carboniferous granodiorite and adamellite confined mainly to the east coast of the Island.

Palaeozoic

The Palaeozoic rocks are confined to the eastern half of the Island, and have a known thickness of about 5,000 feet made up of a lower series consisting of approximately 2,500 feet of interbedded whitish to gray coloured shales, blue-gray shales and fine-grained micaceous sandstones, followed conformably by an upper series of at least 2,500 feet of volcanics with interbedded shales, tillite, limestones and dolomites, mainly near the base of the sequence. At Grassy and Bold Head these limestone and dolomite beds have been contact metamorphosed and metasomatised by intrusive granodiorite and adamellite to form garnet-scheelite skarn orebodies.

The tillite or tilloid horizon, as it is referred to by R.R.Large (1971), forms a very good marker horizon within the sequence. It varies up to 150 feet in thickness, consisting of numerous angular and rounded boulders of bedded limestone up to 2 feet in diameter, set in a calcareous matrix varying from light-grayish to dark chocolate in colour; the matrix being irregularly ferruginised. The horizon is remarkably persistent. It is traceable down the east coast of the Island, from a little south of the mouth of Lancaster creek to one and a half miles south of City of Melbourne Bay, from which point it swings inland and is hidden by sand. Its next appearance is in the Grassy opencut where it lies immediately above the ore beds.

The horizon next outcrops 4 miles south-west of the opencut and is traceable for about $\frac{3}{4}$ of a mile. It is about 2,000 feet from the granodiorite contact and only slightly contact metamorphosed, as the limestone chips and boulders are still fine-grained and bedded with only narrow reaction rims of grossular garnet and diopside. The fine-grained matrix varies from mainly diopside to biotite-actinolite hornfels depending on the degree of ferruginisation prior to contact metamorphism. The southernmost outcrop of the horizon is about 800 feet from the northern boundary of Exploration Licence 13/69.

Precambrian

Carey (1953) p.1108, states that Precambrian strata form the core of Tasmania and outcrops again in parallel strips further west and on King Island. There is evidence of an older (Davey) group and a younger (Carbine) group, probably separated by an unconformity. Lithologically the Precambrian rocks of King Island are best classified as belonging to the Davey group of the Precambrian.

They consist of regionally metamorphosed sediments in the form of various mica schists, muscovite quartzites and quartzites. They are well exposed along the west coast of the Island and on the east coast from Seal Bay to Stokes

Point. Muscovite-staurolite-quartz schists and muscovite-garnet-quartz schists are exposed in the centre of the Island at the Reekara tin and tungsten workings and the Hawkes alluvial tin workings respectively.

The Intrusive Rocks

These consist of amphibolites, various types of granitic rocks, quartz veins and later dolerite and lamprophyric dykes.

Granitic rocks - Two different ages of granite appear to be present on King Island. Potassic granite of possible Devonian age occurs as a narrow belt down the west coast of the Island, whilst individual granodiorite and adamellite masses of Lower Carboniferous age (determined isotopically by McDougall and Leggo (1965)) occur at three localities down the east coast of the Island. The best exposed of these is the granodiorite mass extending from $\frac{1}{4}$ mile south of the opencut at Grassy for a distance of 4 miles down the coast, and for a distance of $2\frac{1}{2}$ miles inland, to form a semicircular stock. Exploration Licence 13/69 covers the southern portion of this mass.

The adamellite associated with the Bold Head scheelite orebody about 2 miles north of the Grassy opencut is poorly exposed over an area measuring a few hundred feet across. The mass has possible dimensions of 7,000 feet by 3,000 feet and could well be a faulted portion of the granoriodite mass south of Grassy.

The other granodiorite mass is poorly exposed in the bed of the Sea Elephant river about $3\frac{1}{4}$ miles from its mouth. It is not possible to determine the size of this mass as only a few isolated outcrops have been observed, but it is very likely that the northern portion of Exploration Licence 9/66 is underlain by granodiorite,

Quartz veins - Narrow quartz veins and areas of quartz float occur at Reekara and the Hawkes alluvial tin workings. Waterhouse (1915) reported that an auriferous quartz vein occurs in the bed of the Sea Elephant river about $1\frac{1}{2}$ miles north of the Pegarah road and that another vein about $3\frac{1}{2}$ miles due north of City of Melbourne Bay carries a little galena and sphalerite.

STRUCTURE

Folding

Folding within the Precambrian and Palaeozoic rocks is of the simple open type. A synclinal axis striking north west passes through Mt. Stanley, with a complementary anticlinal axis about $\frac{1}{2}$ mile east of Grassy. Another anticlinal axis striking about north east passes through Fraser Bluff. The structure north of Fraser Bluff is not known due to lack of exposures.

The central portion of the Mt. Stanley syncline is intruded by the Grassy granodiorite stock with the sediments and volcanics around the margin of the stock dipping into it.

Faulting

Major faulting on both sides of the Island appears to have preceeded the intrusion of granitic rocks and to have continued after the completion of the intrusions. At Grassy a major fault with an east block north movement strikes about north-north-west and has an apparent displacement of about 2 miles. Large (1971) indicates that the Bold Head adamellite has been moved into its present position by this fault as the siltstones in fault contact with it are unmetamorphosed. In the Grassy opencut, faults parallel to the Grassy fault are intruded by aplite dykes and quartz veins, indicating they were formed prior to the intrusion of the granodiorite mass.

THE POSSIBILITY OF MINERALISATION WITHIN EXPLORATION LICENCES 9/69 AND 13/66

Exploration Licence 9/69

Rock exposures within the licence area are very poor, consisting of a few outcrops of thin-bedded shales and fine-grained sandstones in the Fraser river, and a few outcrops of granodiorite in the bed of the Sea Elephant river. Elsewhere it is completely covered with sand.

The possibility of any limestone beds of the Palaeozoic upper series occurring within the aureole of the Sea Elephant granodiorite to form garnet-scheelite skarn orebodies is remote. The suite of heavy minerals contained in the beach sands between the Fraser and Sea Elephant rivers, which is obviously derived from the rocks drained by these rivers, is devoid of calc-minerals such as diopside, enstatite grossular and andradite garnet, indicating that skarn deposits are absent from the area.

The only other possible form of mineralisation appears to be quartz veins, as these are present elsewhere on the Island, carrying small quantities of tin, gold, scheelite, lead and zinc. Prospecting for such veins beneath the sand cover of the Exploration Licence is considered a poor risk, and not worth the high expense that would be involved.

Exploration Licence 13/66

The licence covers part of the Grassy granodiorite where it is in contact with the Palaeozoic upper series containing the stratigraphic horizon considered favourable for the formation of garnet-scheelite orebodies. The tilloid horizon, which is immediately above the garnet-scheelite orebodies exposed in the Grassy opencut, outcrops about 800 feet north of the boundary of the Exploration Licence and can be projected into the area covered by

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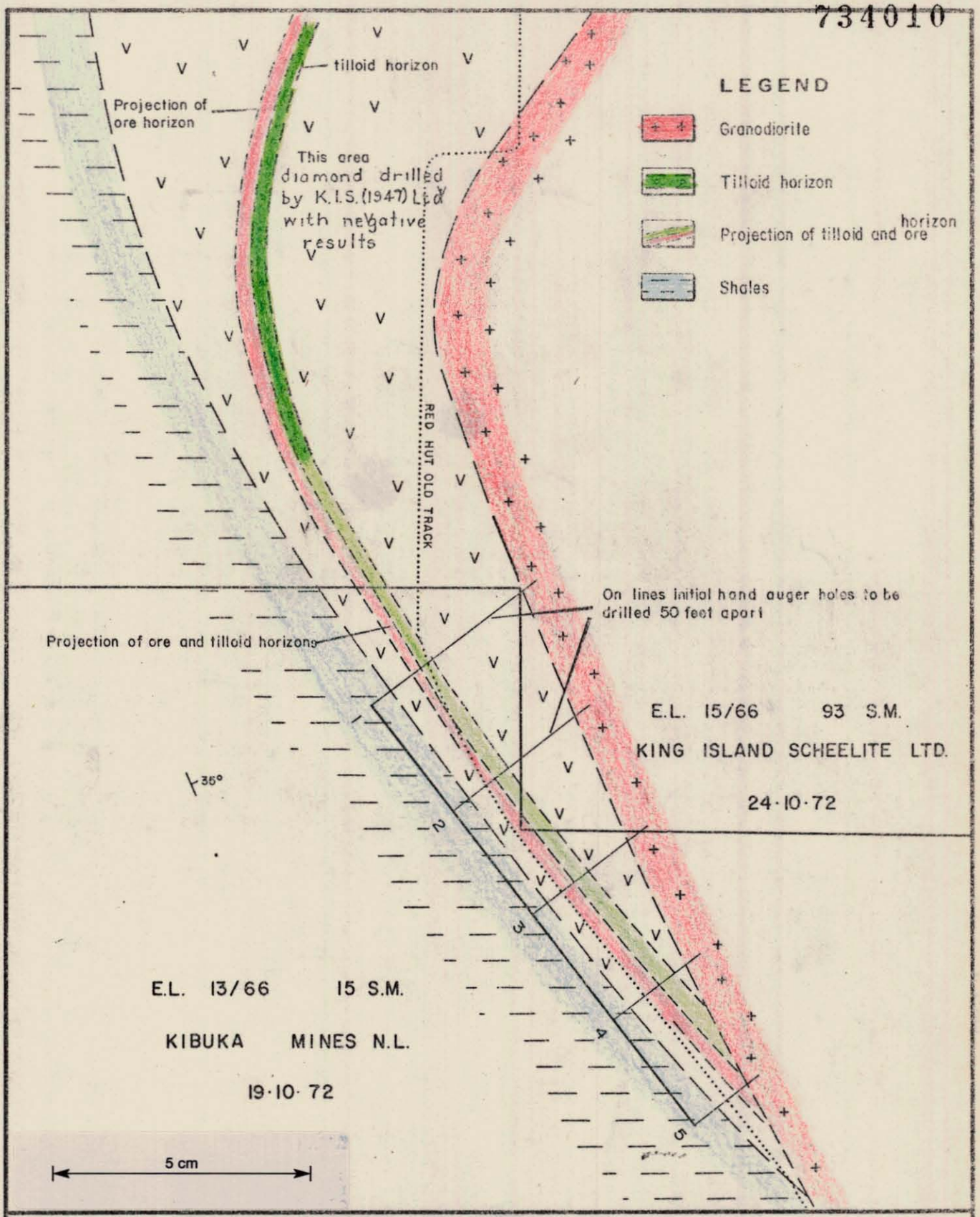

KIBUKA MINES N.L.

PLAN SHOWING LAYOUT OF GRID FOR TESTING POSSIBLE ORE HORIZON

WITHIN E.L. 13/66

SCALE: 1 inch to 1000 feet	DATE: August, 1972	DRAWN: K.J.C.	TRACED: V.	FIG. 4

the Exploration Licence, as shown in Fig. 4.

The rocks of the upper series wedge out against the granodiorite, as further south sediments of the Palaeozoic lower series are in contact with the granodiorite.

Although the favourable horizon immediately north of the Exploration Licence boundary has been diamond drilled by King Island Scheelite (1947) Ltd. with disappointing results, due to the absence of limestone beds from the sequence essential for the formation of garnet-scheelite orebodies, the horizon should be tested within Exploration Licence 13/66, as there is the possibility that the limestone beds could make further along the strike.

Exploration Program

A preliminary program is recommended, consisting of hand auger drill holes 50 feet apart on lines spaced 1,000 feet as shown in Fig. 4. Although exposures in the area are poor, the sand cover does not appear to be deep (possibly less than 10 feet), as there are a number of isolated outcrops of the Palaeozoic rocks through the sand. The hand auger holes need to be taken down to the soil beneath the sand to obtain samples to be analysed for tungsten, molybdenum, copper, lead and zinc. Any samples with tungsten values greater than 2 parts per million should be covered by a closely spaced grid with holes about 25 feet apart to trace any possible continuation of the values. If any areas of interest are discovered, a trench should be bulldozed through the sandcover to expose the rocks of interest to allow more thorough sampling.

Further exploration would depend on the results of the preliminary program.

No other areas of the Exploration Licence appear to be worth prospecting for scheelite mineralisation.

Budget

Hand augering - 2 men for 2 weeks	$400
Transport	50
Air freight on samples	40
Analyses of soil samples	250
	$740

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Large, R.R., 1971. Metasomatism and Scheelite Mineralisation at Bold Head, King Island. Proc. Aust. Inst. Min. Met., No. 238, pp. 31-45.

McDougall, I. and Leggo, P.J., 1965. Isotopic Age Determinations on Granite Rocks from Tasmania. J. Geol. Soc. Aust., 12, pp. 295-333.

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012

3/72

MOUNT COUNCIL

4/68

E.L. 4/68 5 S.M.
J. CURTAIN
11·7·72

REEKARA TIN AND TUNGSTEN WORKINGS

Part of E.L. 4/68

E.L. 15/71 3 S.M.
BASSMIN AUS. P/L
22·9·72

Vertical diamond drill hole in spotted Quartz-muscovite hornfels

Hawkes alluvial tin workings

45°

E.L. 3/72 30 S.M.
BASSMIN AUS. P/L
30·9·72

E.L.9/69 15 S.M.
KIBUKA MINES N.L.
21·11·72

B A S S

S T R A I T

Councellor Island

COWPER POINT

SEA ELEPHANT RIVER

Eldorado Creek

Carmel Farming Area

SEA ELEPHANT BAY

PART OF 4/68

E.L. 9/69

4/68

Heavy mineral beach sand deposit

KIBUKA MINES N.L. PLANT AREA

NARACOOPA

PART OF E.L. 9/69

42°

45°

FRASER JETTY

FRASER BLUFF

E.L. 15/66 93 S.M.

KING ISLAND SCHEELITE LTD.
24·10·72

FRASER RIVER

Lancaster Creek

Pit 4' deep on quartz vein carrying galena + sphalerite

60°

55°

40°

Yarra Creek

CITY OF MELBOURNE BAY

LEGEND

RECENT		Sand
TERTIARY		Limestone
		Basic dykes
CARBONIFEROUS		Granodiorite
CAMBRIAN		Volcanic series including tillite, dolomite, calcareous shales and their contact metamorphic equivalents including garnet-scheelite skarn(Ore).
		Shales, siltstones
PRECAMBRIAN		Muscovite-quartz schist, muscovite-staurolite schist
		Dip and strike of horizontal, inclined and vertical bedding
		Geological boundary observed, inferred
		Fault observed, inferred
		Anticlinal axis
		Synclinal axis
		Roads
		Tracks
		E.L. held by Kibuka Mines N.L.

5 cm

734013

KIBUKA MINES N.L.

72-895

GEOLOGY OF EASTERN PORTION OF KING ISLAND CONTAINING E.L. 9/69

SCALE: 1inch to 1mile	DATE: August, 1972	FIG. 2.
DRAWN: K.J.C.	TRACED: V.	

Compiled by K.J.Callow, 62 Koola Ave., East Killara 2071

013

CITY OF MELBOURNE BAY

BOLD HEAD OREBODY

GRASSY

GRAHAMS ROAD

GRASSY ROAD

LOOP ROAD

RIVER FAULT

MICROWAVE TOWER

GRASSY TOWNSHIP

No.3 FAULT

BOLD HEAD

OPEN CUT GRASSY OREBODY

REEF

HOT

STRAIT

FITZMAURICE BAY

CATARAQUE POINT

PEARSHAPE

E.L. 50/70 12 S.M.

BASSMIN AUS P/L

8-12-72

Area Covered by Fig.4

E.L. 13/66

15 S.M.

SEAL RIVER

MARSH

TRACK

LAKE

KIBUKA MINES N.L.

9-10-72

SEAL BAY

SEAL POINT

SURPRISE POINT

SURPRISE BAY

ROAD

LIGHTHOUSE

STOKES POINT

BASS

LEGEND

RECENT		Sand
		Basic dykes
CARBONIFEROUS.		Granodiorite - Adamellite
DEVONIAN		Potassic granite
CAMBRIAN		Volcanic series including tillite, dolomite, calcareous shales and their contact metamorphic equivalents including garnet-scheelite skarn (Ore)
		Shales, siltstones
PRECAMBRIAN		Quartzites, sandstones
		Muscovite-quartz schist, muscovite-andalusite-garnet hornfels

- Dip and strike of horizontal, inclined and vertical bedding
- Geological boundary observed, inferred
- Fault observed, inferred
- Anticlinal axis
- Synclinal axis
- Roads
- Tracks
- E.L. held by Kibuka Mines N.L.

734014

5 cm

72-895

KIBUKA MINES N.L.

GEOLOGY OF SOUTHERN PORTION OF KING ISLAND CONTAINING E.L. 13/66

SCALE: 1 inch to 1 mile	DATE: August, 1972	FIG. 3.
DRAWN: K.J.C.	TRACED: V	

Compiled by K.J.Callow, 62 Koola Ave., East Killara 2071