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RETENTION LICENCES 8715 & 8723

GREAT NORTHERN PLAINS, TASMANIA

TIN RESOURCE REVIEW, 1993

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RETENTION LICENCES 8715 & 8723,
GREAT NORTHERN PLAINS, TASMANIA.
TIN RESOURCE REVIEW, 1993.

*Other
minerals*

Introduction.

This report is the product of a review of the results of previous work done, in terms of resource assessment, of the alluvial tin deposits in the Great Northern Plains area of NE Tasmania. It considers the definition of the resources and compares them with current tin prices and 2 higher tin prices.

The economic potential of the deposits at present is negligible and the 3 to 5 year potential depends on a substantial real price increase in the value of tin. However, the deposits have value and are currently controlled under one business umbrella. This is important in the possibility of development taking place at some stage. It would be unfortunate to see the ground fragmented - this would mitigate against a necessarily large scale project being contemplated.

Summary of work done.

Hellyer Mining & Exploration P.L. produced a comprehensive report on EL 19/77, CML 42M/76 and ELA 17/82 in 1983. Their 1981 and 1982 drilling results were reworked and extrapolations were made to include the previous drilling.

Resource blocks have been redrafted using an arbitrary 90g and 60g contained Sn cutoff value and ignoring assumed palaeogeographic patterns. This provides a value controlled picture of higher grade zones and the mineralised ground in which they occur. Neither value represents an economically derived cutoff number but they subjectively appear to represent natural thresholds within the suite of results.

US?

The contained metal has been converted to dollar values at current tin prices, double current tin prices and a

figure half way between. This provides a feel for the dollar value tin should reach before contemplating development.

Results.

Resource Size.

Firstly it should be reported that there has been a slight overstatement of the tin resource with the inclusion of overburden tin in the value of the holes. This is certainly the case in Hellyer (1981/82) and the Tasmanian Department of Mines (1977) work. If the deposit was developed no attempt would be made to process the overburden for its contained tin - it should therefore be left out of the assessment. In the Hellyer results this overburden factor is 5% of the total value of the hole in holes with greater than 50 g of tin.

Secondly some of the previous workers have reported results as grams of metallic tin, others as grams of cassiterite. In the accompanying map (ex Hellyer) all results are expressed as grams of metallic tin following the author of that report who converted all results to that format.

In the resource figures presented below overburden tin has been excluded when the amount is known (Hellyer 1981/82 programme). Also due to the patchy distribution of data points simple averages have been used to estimate grade and depth figures. Polygonal or sectional techniques would give a misleading feel for the accuracy of the result.

Fosters Marshes area.

Four 'higher grade' blocks have been defined:-

BLOCK1

average depth m.	g Sn	
18.4	177.9	
6.4m Cu m,	254g cas/cu m,	1625 tons cas.

BLOCK2

average depth m. g Sn

20.75 115.3

3.6m Cu m 165g cas/cu m, 594 tons cas.

BLOCK3

average depth m. g Sn

17.88 136.2

2.8m Cu m 195g cas/cu m, 546 tons cas.

BLOCK4

average depth m. g Sn

16.01 98.0

1.04m cu m 140g cas/cu m, 145 tons cas.

BLOCKS 1 to 4 EXTENDED (60 g Sn contour)

average depth m. g Sn

19 97.2

29m cu m 139 g cas/cu m, 4031 tons cas.

NE of Delta Workings.

BLOCK5

average depth m. g Sn

18.8 99.8

1.2m cu m 143 g cas/cu m, 172 tons cas.

BLOCK 5 EXTENDED (60 g Sn contour)

average depth m.	g Sn
16.3	89.9
7m cu m	128 g cas/cu m, 900 tons cas.

Braithwaites.

BLOCK 6

average depth m.	g Sn
17.1	107.6
3.6m cu m	154g cas/cu m, 554 tons cas.

BLOCK 6 EXTENDED. (60 g Sn Contour)

average depth m.	g Sn
14.3	102.8
7m cu m	147 g cas/cu m, 1029 tons cas.

MacGregors. Complex shape marginal to old workings.

average depth m.	g Sn
16	169.63
1.5m cu m	242 g cas/cu m, 360 tons cas.

Discussion.

With the exception of MacGregors the drill hole density is inadequate to elevate the resource statement confidence above the possible category. MacGregors can be considered a probable resource figure. A 100m square grid of drill holes would be required over the other

blocks to elevate the confidence level of the resource shape and value to the 'probable' category. A further round of closer spaced drilling would still be required to define the deposit sufficiently.

From the existing literature it appears that the Fosters Marsh area and NE of the Delta workings are amenable to dredging. Braithwaites and MacGregors are under higher ground precluding dredge removal of overburden. This significantly affects mining costs with historical figures indicating dredge costs of earth moving being at least 50% of other means.

If a dredge plan could be developed permitting sequential exploitation of the Fosters Marsh higher grade blocks a total of 2910 tons of cassiterite would be available. Additional drilling may establish similar grade corridors linking the blocks which would obviously increase the resource somewhat. If Block 5, NE of the Delta workings could be linked to the Fosters Marsh area then the resource could be lifted to over 3000 tons of cassiterite.

The overburden removal costs for Braithwaites and MacGregors in relation to their potential contained tin probably preclude these areas from being the focus for development of the tin field as a whole. The higher grade blocks have the potential to contribute about 1000 tons of cassiterite. They may be exploitable as an adjunct to an amortised operation described above.

The potential resource can be summarised as follows :-

1) Areas amenable to a dredging operation.

Fosters Marsh

4 higher grade blocks total 13.8 m cu m containing 2910 tons of cassiterite concentrate.

NE of Delta

1 higher grade area with 1.2 m cu m containing 172 tons of concentrate.

Drilling may identify higher grade corridors to link these resources into a sequential dredge path. The potential will then exceed the 15 m cu m containing over 3000 tons of concentrate quoted.

2) Areas not amenable to dredge removal of overburden.

Braithwaites

A higher grade block has possible reserves of 3.6 m cu m containing 554 tons cassiterite.

MacGregors

A complex shaped area peripheral to the old workings has 1.5 m cu m containing 360 tons of concentrate.

Not included.

Apparently gold is a consistent but minor contributor to the recovered concentrate. It would probably add positively to the potential cash flow of a mining operation subject to an inexpensive circuit for its recovery being designed. Santos and Hellyer indicate gold is present at the rate of approximately 2 mg per cu m throughout the mineralised area (1987 ref.). Any future sampling should routinely include gold as a measured product of the concentrate.

Resource Valuation.

The tin content of the mineralised blocks has been converted to dollar values using 3 metal prices. The current price of tin is fluctuating around the US\$ value 4500. At a conversion rate of \$0.67 the A\$ value is \$6700. The resource has been valued at the additional prices of \$9000 and \$13500 Australian looking for a threshold to possible viability.

This values the Blocks as follows expressed in \$/cu m:-

Fosters Marsh.

At A\$/ton Sn	\$6700	\$9000	\$13500
BLOCK 1	\$1.19	\$1.60	\$2.40
BLOCK 2	\$0.77	\$1.04	\$1.56
BLOCK 3	\$0.91	\$1.23	\$1.84
BLOCK 4	\$0.66	\$0.88	\$1.32
BLOCK 1-4 EXTENDED	\$0.65	\$0.88	\$1.31

NE of Delta.

BLOCK 5	\$0.67	\$0.90	\$1.35
BLOCK 5 EXTENDED	\$0.60	\$0.81	\$1.21

Braithwaites.

BLOCK 6	\$0.72	\$0.97	\$1.45
BLOCK 6 EXTENDED	\$0.69	\$0.92	\$1.39

MacGregors.

	\$1.14	\$1.53	\$2.29
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Unless the gold content of the wash is well over that reported its contribution to revenue is unlikely to tip the balance in favour of exploitation at any stage. At a

gold price of \$A540 per ounce, \$0.02 can be added to each cubic metre.

The present tin mining scene.

A search of the Mining Magazine back to and including 1990 for references to tin mining operations reflects the parlous state of the industry. The metal does not rate a mention until as far back as April 1990 - and then only in reference to the closure of Cornish underground tin mining operations due to poor prices. Some useful number did emerge in the search however.

A tailings dredge in the Philippines shifted 6.5m dry tonnes in 22 months at a cost of \$US0.23/t in 1989/90. (M.M. May 1991). In ball park terms this may equate to the rate of operation envisaged for the Great Northern Plains and it may mean dredging costs would be in the order of \$A0.60 to 0.70 per cubic metre in today's terms.

An alluvial gold project in Indonesia quotes exploration grades between 260 and 280 milligrams with volumes of 19 and 8.5 m cu m. (M.M. July 1991). This values the ground at between \$A4.50 and \$A4.85 per cu m.

The biggest alluvial tin producer, Malaysia, has suffered the following reduction in metallic tin output, 1989 32,000 tons, 1990 28,500 tons 1991 20,500 - the proportion produced by the more cost effective dredging techniques has increased as gravel pump production slumped. (Mining Annual Review 1992).

It is thought that Amdex ceased mining at Pioneer (1981) with head grades at or above 200 g concentrate per cu m. Using more costly gravel pump techniques the resource was uneconomic and presumably was inadequate in either tonnage or grade or both to convert to dredging on an anticipated tin price of \$A16500.

The famous Kanieri gold dredge in New Zealand has had a tough time economically processing alluvials with 150 mg gold. Reserves and values converted to \$ are not dissimilar to the Great Northern Plains tin occurrence.

Conclusions.

Without more detailed information on grades of currently profitable tin dredging operations it is difficult to speculate on what may constitute an economically viable target value for the Great Northern Plains deposits.

The 60 g metallic tin per cubic metre cut off used above to define the envelope within which the higher grade blocks occur is clearly too low to be regarded as an economic cut off value - it translates as \$A0.40 rock - in today's terms. It is however valid to use this as an exploration tool in that it identifies the ground within which exploration should take place to define the higher grade resource. Previous resource evaluations have used this technique along with some palaeogeographic interpretations of the tin distribution to identify the potential in the area to be as much as 56.6 m cu m. Most previous workers seem to estimate a resource in the order of 40 m cu m of ground at 100 g Sn per cubic metre as a reasonable basis for conducting economic extrapolations with a view to determining whether further drilling is justified. The results of this review suggests that number is not unreasonable.

In the context of this study the 90 g metallic tin per cubic metre cut off outlines a 'possible' category reserve. This represents a cut off value of \$A0.60 enclosing a resource valued at \$A0.97 per cubic metre.

When it is anticipated that the tin price will increase in real terms to levels at which the possibility of exploiting this resource becomes realistic then pattern drilling, initially at no greater than 100m spacing, should be done. This would target areas defined by the 60g Sn cut off contour. Holes should also be drilled where palaeogeographical interpretations indicate links may exist between the higher grade blocks.

It appears that a sustained value of at least double the present tin price would be needed to resume active investigations of the Great Northern Plains tin resource. However, it merits reiteration that 'subdivision' of the area would reduce the likelihood that exploitation will eventually occur.

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ADDENDUM TO GREAT NORTHERN TIN PLAINS REPORT OCT '93.

In response to your call advising that you no longer hold title to the MacGregors workings.

In my report I incorrectly assumed you would hold title to MacGregors. It is unfortunate that the residual resource left there is no longer under your control. I should therefore comment as follows.

Your Retention Licences certainly cover the principal elements of the dredgable tin resource in the Great Northern Plains as demonstrated by the drilling and reports sighted. However, in anticipation of the economic climate turning in favour of tin you might consider replacing the lost 'up stream' tin resource with aquisition of 'down stream' extensions towards Ringarooma Bay.

The March 1983 Hellyer Mining report includes a Long Section (Fig 13) which extrapolates mineralised intersections near Bowlers Lagoon to a possible sub outcrop beneath sea level. The northern most line of drill holes by Santos holes 69 to 77 include reasonable tin values but they are diluted by thick overburden. The pattern of tin values interpreted on the map accompanying my report indicate the tin bearing wash forms a series of targets trending NNW from Blocks 3, 5 and 6 to Block 1. It is unlikely that the wash does not continue further and it may be accessible in areas of shallow dune cover. (This aspect was pointed out in the March '83 report p. 20).

I made the comment in my October Report that an aid to eventual exploitation of the tin resource in the Great Northern Plains would be consolidation of it under one corporate umbrella. I still hold to this view.

R.W.L. SHAW Nov. 1993

Dr. SHAW

961015

MINERAL HOLDINGS AUSTRALIA PTY. LIMITED

A.C.N. 004 759 853

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TO FAX NO: 004 247 183

DATE: 3rd November, 1993.

ATTENTION: DR SHAW
AT: P.O. BOX 218, DEVONPORT, TAS. 7310

FROM: NEIL M. THOMAS

NUMBER OF PAGES (including this page): 2

**IF ANY PARTS OF THIS TRANSMISSION FAILED OR WERE MISDIRECTED,
PLEASE ADVISE IMMEDIATELY.**

GREAT NORTHERN PLAIN
RL. 8715 AND 8723

Dear Dr Shaw,

You will note the attached "Australian" 3/11/93 article on the compensation of \$2.2 million for relinquishment of a licence on Fraser Island.

Our CML 42M/76, had no such consideration after around \$500,000 had been spent drilling it.

We were given a worthless assurance by the Mines Department that the 2/3 of the mineral lease could still be mined, which as you know would be most unlikely.

I believe you could incorporate our loss of most of CML.42M/76 in your report with the recommendation that a compensating offer, around Bowler's Lagoon be allowed, and our exploration of around \$500,000 be credited against the new area.

Good luck.

Kind Regards,



NEIL THOMAS.

P.S. The G.N.P. could be an attractive area for pivot mining.

Mineral exploration permit angers greens ahead of inquiry

By JAMIE WALKER

THE Federal Government has cleared the way for mineral exploration in the army's Shoalwater Bay training area in central Queensland, undermining an inquiry into the reserve's future.

The move comes just days ahead of the inquiry hearing its first public evidence, and drew claims yesterday from a peak conservation group that the exercise has become a "laughing stock".

The inquiry, headed by former NSW environment and planning commissioner Mr John Woodward, was set up in February to assess land management options for the 520,000ha training area.

Pressure on the Government to allow full-scale mining is mounting, with the Australian Bureau of Agricultural and Resource Economics estimating recently that it has the potential to contribute \$260 million to the economy.

Both the defence force and conservation groups are opposed to such development. The area is the army's premier training range but is also prized by the greens for its wilderness values. It is listed on the register of the National Estate.

Now the Federal Government's environment watchdog, the Environment Protection Agency, has advised Perth businessman Mr Ron

Sheen, chairman of mining company Pivot Mining N/L, is free to begin exploration of about one-fifth of Shoalwater Bay's pristine beachfront.

Written advice received by Mr Sheen on Monday says in part: "On the basis of the information provided, we are now able to approve the first stage of the exploration program."

Mr Sheen told The Australian yesterday that the inquiry was irrelevant to his plans to develop a \$120 million mining and processing venture in Shoalwater Bay and the nearby industrial centre of Gladstone.

He will give evidence at the public hearing beginning in Yeppoon on Monday next week, but said: "The inquiry has nothing to do with me."

A 21-year lease for mineral sand exploration and mining was issued to Queensland's Pivot Group in October 1990 on the decision of Federal Cabinet.

Mr Sheen paid \$350,000 to acquire that lease, and others on Fraser Island, through Pivot Mining N/L. He subsequently received \$22 million for relinquishing the mining rights on Fraser Island ahead of its World Heritage listing.

Mr Sheen said he was "obliged" to begin exploration in Shoalwater Bay to comply with the development condi-

tions imposed by the Government. High intensity aeromagnetic surveying would begin late this year or early in 1994, he said.

Mining giant Geopeko Ltd is also applying for a permit to explore another section of the training area, known as the Clinton Lowlands, while a Japanese-owned company RZM Pty Ltd. plans to mine mineral sands at Byfield, adjoining Shoalwater Bay to the south.

A spokesman for Mr Woodward yesterday played down the development, saying the Pivot Mining lease occupied only a fraction of Shoalwater Bay.

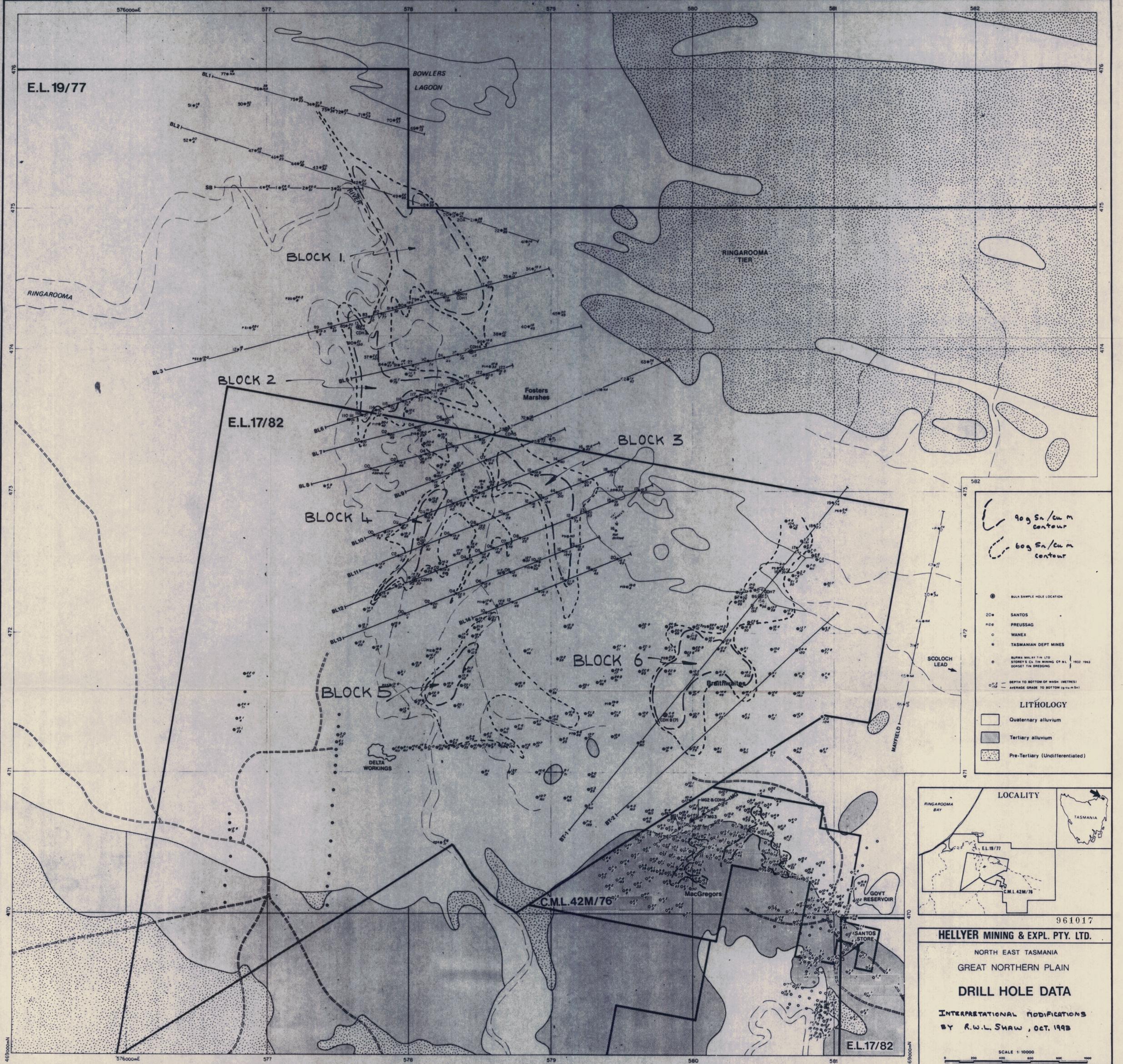
"The inquiry is not just about those leases, our terms of reference are very wide-ranging," he said.

But the co-ordinator of the Queensland Conservation Council, Ms Nicky Hungerford, said the go-ahead given to Mr Sheen effectively preempted Mr Woodward's findings. As the Pivot lease was central to the inquiry.

"It has made a laughing stock of the whole thing," she said.

"What is the point of looking at the conservation values (of Shoalwater Bay) if they are able to go ahead now?"

Feature - Page 7



E.L.19/77

E.L.17/82

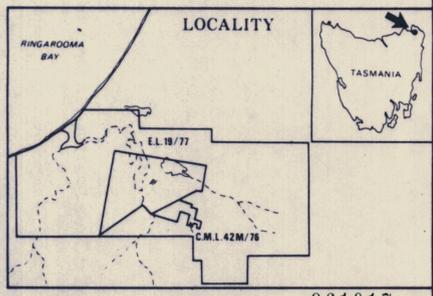
C.M.L.42M/76

E.L.17/82

90g Sn/cu m
contour

60g Sn/cu m
contour

- BULK SAMPLE HOLE LOCATION
 - SANTOS
 - PREUSSAG
 - WANEX
 - TASMANIAN DEPT MINES
 - BURMA MALAY TIN LTD
 - STOREY'S CO. TIN MINING CO. NL 1932-1963
 - DOCKET TIN DRIVING
 - DEPTH TO BOTTOM OF WASH (METRES)
 - AVERAGE GRADE TO BOTTOM (g/cu m Sn)
- LITHOLOGY**
- Quaternary alluvium
 - ▨ Tertiary alluvium
 - ▩ Pre-Tertiary (Undifferentiated)



961017

HELLYER MINING & EXPL. PTY. LTD.

NORTH EAST TASMANIA
GREAT NORTHERN PLAIN

DRILL HOLE DATA

INTERPRETATIONAL MODIFICATIONS
BY R.W.L. SHAW, OCT. 1993

SCALE 1:10000

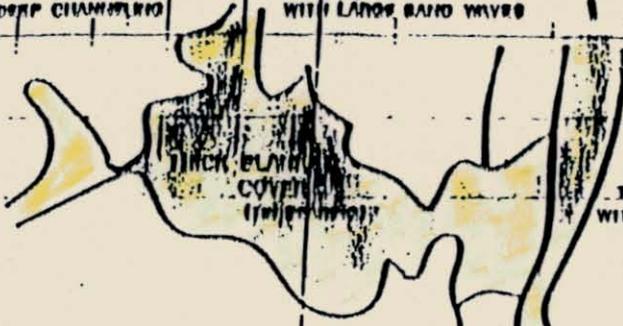
0 200 400 600 800 1000
METRES

FIGURE 2

E.L. 42/80

THICKENING BLANKET COVER WITH DEEP CHANNELLING

VARIABLE BLANKET COVER WITH LARGE SAND WAVES



VARIABLE BLANKET COVER WITH DEEP CHANNELLING

THIN BLANKET COVER

THIN BLANKET COVER WITH SOME CHANNELLING & SAND WAVES

OLD SEDIMENT WEDGES

SEDIMENT

MANY CHANNELS (TIN BEACHES)

5 cm

R I N G A R O O M A B A Y

ANCIENT DEEP LEADS WITH TIN
RUTILE, ZIRCON & MONAZITE,
CELIUM, YTTRIUM AND SAPPHIRES

HEADWATER

E.L. 19/77

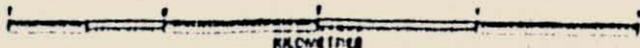
E.L.A. 17/82

93-3515

HELLYER MINING & EXPLORATION PTY LTD
(SUBSIDIARY OF MINERAL HOLDINGS AUSTRALIA PTY LTD)
NORTH EAST TASMANIA

RINGAROOMA BAY PROJECT
GEOLOGY & TREND OF MINERALIZATION

SCALE



961018



000

OCEAN MINING A. G.
EXPLORATION LICENCES
APRIL 1969

KING ISLAND



E.L. 7/65

BASS STRAIT

E.L. 6/65

TASMANIA

0 30
MILES

N

INDIAN OCEAN

Legend



CONCENTRATED
DEEP LEAD

ON + OFFSHORE

RIVERMOUTH

BAY

5 cm