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REF. No:				

CRA EXPLORATION PTY.LIMITED

EL 48/80 - RINGAROOMA BAY , TASMANIA

RELINQUISHMENT REPORT 17TH JANUARY, 1983.

**OPEN FILE**

Author: T.W.Dickson

Date: 15th August, 1983.

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## 1. SUMMARY

EL 48/80 Ringarooma Bay was granted to CRA Exploration Pty.Limited on 17th July, 1981. It covered all available on shore and off shore ground adjacent to the Ringarooma River and was taken to provide a possible trial area for a new method of borehole mining.

A detailed review of all previous exploration however indicated only very limited potential for future exploration and as trials of the borehole mining system on the Mainland had proved unsuccessful, title to the area was allowed to lapse at the next available renewal date.

## 2. INTRODUCTION

Alluvial tin has been worked from a number of areas along the course of the present day Ringarooma River. Mining has been almost continuous on a small scale since the 1870's, but during the past 30 years a number of investigations by a whole host of companies have attempted to examine the potential for large scale exploitation of the area. In almost every case the conclusion reached was that the tonnage and grade available were insufficient to support a large scale dredging operation.

The real potential for the Ringarooma area therefore lay in the possibility of new technological developments. RTZ in Malaya had developed a new method of borehole mining, essentially sluicing from the bottom of boreholes, and as this equipment was in Australia for trials on the Victorian Deep Leads, it was possible the equipment could be used to develop the Ringarooma leads. So far the equipment has proved unsatisfactory for Australian conditions and large scale mining by this method is still a long way in the future.

3. CONCLUSIONS

A detailed literature review indicated only four areas each with only very limited potential within the boundaries of EL 48/80. These were:-

- a) Boobyalla Lead a down stream extension of deep low grade stanniferous wash worked west of Mt. Cameron. The lead is expected to lie at depths greater than 100 metres below the surface.
- b) Bowlers Lagoon a northern extension of Fosters Marsh but grades in this area are expected to be diluted by considerable marine reworking.
- c) The Dune system north of the Ringarooma River.
- d) Offshore portions of the old Ringarooma Valley lead.

Previous testing by various different companies had given no encouragement in any of the above areas and the potential for each area was considered very low.

4. RECOMMENDATION

The potential for locating additional tin reserves was considered very low and as initial tests of the borehole mining technique proved unsatisfactory the area was allowed to lapse at the next renewal date.

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## 5. SUMMARY OF WORK CARRIED OUT

EL 48/80 was pegged on 14th October, 1980 to cover all available onshore and offshore ground adjacent to the Ringarooma River. Title to the 237 Sq.Km. area was granted on 17th July, 1981 with the title to run for 6 months to January 17th 1983. The title was renewed for an additional 12 months but was left to lapse on the due date of 17th January, 1983.

Originally the Licence was taken to provide a possible test area for the Charnbul Mining method. This system was developed by our parent company RTZ for use in the Malayan Tin Fields. It is a method of borehole mining where a sluicing arm and pump system work from the bottom of a drill hole to mine out the basal high grade wash and leave intact the overlying barren sediment. The system was tried in the Victorian Deep Leads but could not cope with large boulders or with wet running sands and was considered unsuitable for Australian conditions.

In the meantime, a CRAE geologist reviewed all previous reports on the Ringarooma area. Clementson (see attached memorandum) concluded that the major areas of deep lead tin lay outside EL 48/80 and that there was only very limited potential for additional reserves within the Licence area.

The areas of potential within EL 48/80 were listed by Clementson as:-

- (1) A possible extension of the old Boobyalla River lead. Evidence for the lead is inconclusive. To the south EL 48/80 the old lead was estimated to contain no more than 9 million cubic yards of low grade material with a depth in excess of 100 metres. Conditions are not likely to improve downstream within EL 47/80.

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- (2) Bowlers Lagoon, to the north of Fosters Marsh where considerable marine reworkings would have resulted in dispersion and dilution of the original alluvial tin.
  - (3) The Dune system north of the Ringarooma River mouth. Area tested by Minsands in 1971 with no encouraging results.
  - (4) Offshore portions of EL 48/80, but work by BHP/Utah and OMAG did not indicate any potentially economic deposits in the shallow waters covered by the EL.

At that stage (December 1981), it was decided that the EL would be dropped at its first six months renewal due on 17th January, 1982. At the last minute however, we were approached by Santos for a Joint Venture proposal whereby they would fund a major exploration programme in return for a 50% interest in the area.

On the basis of that proposal, the licence was renewed for an additional 12 months period. The discussions however were long and protracted and largely because of uncertainties resulting from the listing of the Ringarooma River area in the Register of the National Estate, Santos suspended all exploration in the area. They requested a delay in Joint Venture negotiations and finally withdrew their offer during the latter part of 1982.

As a results no fieldwork was carried out during 1982; In view of our previous interpretation of only very limited potential, CRA Exploration Pty.Limited. notified the Department of Mines that it would allow the title to lapse at the next renewal on 17th January, 1983.

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6. KEYWORDS

Tin, Deep Lead, Literature Research.

1:250 000 Sheet SK55-4 Launceston

7. LIST OF PLANS

TASh 1466 EL 48/80 Ringarooma Bay, Tasmania  
Areas of exploration potential.

8. LIST OF APPENDICES

Appendix I Notes on the Alluvial Tin Potential of  
the Ringarooma Bay Area and CRA Exploration  
P/L. EL 48/80 NE Tasmania.  
Memorandum I.M.Clementson to T.W.Dickson.

Appendix II Notes on Ringarooma Bay, Offshore Tin  
Potential. Memorandum I.M.Clementson to  
T.W.Dickson.

APPENDIX I

NOTES ON THE ALLUVIAL TIN POTENTIAL OF  
THE RINGAROOMA BAY AREA AND CRA EXPLORATION  
P/L. EL 48/80 NE TASMANIA.  
MEMORANDUM I.M.CLEMENTSON TO T.W.DICKSON.

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MEMORANDUM TO: T.W.DICKSON

FROM: I.M.Clementson

Notes on the Alluvial Tin Potential of  
the Ringarooma Bay Area and CRAE EL 48/80  
NE Tasmania.

SUMMARY

Whilst interesting concentrations of tin in alluvial deposits may occur within the Ringarooma Bay area, it is unlikely that there are individual large deposits, or contiguous small deposits, of sufficient size to make a large scale dredging operation viable. For this reason alone the area does not warrant further investigation. In addition all the most prospective ground is outside CRAEs' current EL, this ground being held by Mineral Holdings under EL 19/77 or as leases by numerous individuals or groups.

The economic potential and land tenure situation are not favourable, therefore further expenditure on this area is not warranted.

INTRODUCTION

Alluvial tin has been worked on a small scale from the area north of Mt.Cameron to Ringarooma Bay since it's discovery there in the 1870's. During the last 30 years there have been many investigations into the potential of the area by a variety of companies, including extensive work by RTAE, CRAE and the Tasmanian Mines Department.

These notes are a review of the many reports available on this area, but as very little original data is available for examination, these notes are only personal impressions gained from the reports.

As there are several CRAE reports, the most recent being those of Spratt (1976) and Toh (1978), which adequately describe the geology and previous work, these subjects will not be described in detail.

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The work of Rattigan for RTAE in the late 1950's is amongst the best carried out in the area, it is notable that his findings and conclusions have not been challenged by subsequent workers.

It should be stated that RTAE, CRAE and all other organisations (except Renison 1978) who have evaluated the economic potential for a large scale mining operation have reached unfavourable conclusions. As there is no new information available on this area, and the economics of large scale tin dredging have not changed for the better recently, this report inevitably reaches similar conclusions.

#### LOCATION AND LAND TENURE

The area of interest, frequently referred to as the Great Northern Plains Tinfield is basically the country north west of Gladstone in the broad valleys of the Ringarooma and Boobyalla Rivers. The area is approximately 11km x 5km and is about 140km by road from Launceston. CRAE hold EL 48/80 over portions of this area and an area offshore as outlined on the accompanying plan. The most prospective region however is held as EL 19/77 by Mineral Holdings. Only a few leases are current within the CRAE EL, but numerous leases are being maintained within Mineral Holdings EL, mainly over old workings and the more prospective areas. Private land owners appear to control a significant proportion of the surface rights in the area.

#### GEOLOGY

The alluvial tin deposits are derived from primary cassiterite mineralisation associated with the late Devonian Blue Tier granite batholith. The Ringarooma River and its tributaries drain northwards off this mineralised area and fluvial and marine alluvial deposits were formed in the late Tertiary basins along the lower reaches of this drainage system.

Rattigan (1958) has identified three major Tertiary basins in NE Tasmania which might be expected to have trapped significant quantities of alluvial tin. These are the Boobyalla Basin, the Great Northern Plain Basin and the Mussel Roe Basin. The latter is well to the east of the area now being considered and is not thought to have great potential. The main feature of the Boobyalla Basin is that it contains the ancient Ringarooma River valley. This has never been worked as it appears to be too deep and no significant values have been located within it. The CRAE EL only covers the northern end of this basin.

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The Great Northern Plains Basin, which is unfortunately largely covered by the Mineral Holdings EL, is the most prospective of the three basins. Four types of alluvial deposit are known or interpreted in this basin.

1. Deep leads; principally the Scotia - Lochaber (Scoloch) leads. Apart from their own tin content, these leads have significance as feeders of tin into other environments.
2. Estuarine wash beds where tin has been reworked from old leads and redistributed at fairly shallow depth e.g. Fosters Marshes (?).
3. Marine terraces; reworking of alluvial tin by marine action e.g. Fosters Marshes (?).
4. Valley, terrace and alluvial flat deposit of the current Ringarooma River. Such deposits have been worked by the Dorset Dredge.

#### PREVIOUS RESULTS AND ORE POTENTIAL

This represents only a brief summary of the work conducted, estimated reserves and ore potential of the most prospective areas within the region. The similarity between this summary and that of Toh 1978 is unavoidable in that the same sources were consulted.

#### BOOBYALLA BASIN

1. The buried Ringarooma River valley west of Mt. Cameron has been indicated by seismic profiling (BMR) and by some drilling (BHP and RTAE). The gutter of the valley has never been reached so the low tin value reported from the drilling may not represent the full potential of this deep lead. However, the depth to the gutter is in excess of 100m so, even if gutter grades are high, it would not be a dredgeable deposit. Rattigan (1958) estimated that the lead might contain up to 9 million m<sup>3</sup> of stanniferous sediment.
2. The Shallamar Flats - Monarch Mine area was thought to have potential for up to 20 million m<sup>3</sup> of recoverable ground in an embayment off the ancient Ringarooma River. Rattigan (1958) conducted some scout drilling at the mouth of this embayment but results were inconclusive.

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3. Dugards - Boobyalla Plain; RTAE and Utah have conducted limited drilling in this area. Toh (1978) reports that Utahs drilling indicated up to 23 million  $m^3$  at  $120\text{ gm SnO}_2/m^3$  which would appear to be somewhat optimistic. A volume of 8-10 million  $m^3$  is more reasonable. Even at 23 million  $m^3$  the deposit is isolated and too small to be worked alone.

None of these Boobyalla Basin prospects fall within the current CRAE EL.

GREAT NORTHERN PLAINS BASIN.

1. Fosters Marsh: Toh (1978) believes that this area has the potential for 50-60 million  $m^3$  at an average grade of 140-180  $\text{ gm SnO}_2/m^3$  at dredgeable depths. This estimate is comparable with the known drilling results (Mines Dept., Dorset, Austral, Malay, Wanex) but probably reflects a maximum probable volume. Renison (1978) estimated the potential of this area to be in excess of 100 million cubic yards at depths of less than 45m. This appears to be a very optimistic figure, as Toh (1978) points out, the Fosters Marsh area is probably fairly restricted, being bounded by physical features or areas of very low potential. However, there are a number of possible extensions which might upgrade the potential of Fosters Marsh if in continuity.  
These are -
2. Scoloch Lead: this deep lead, below the junction of the Scotia and Lochaber leads may have drained into the Fosters Marsh area but this has not been proved. There has been extensive testing of the known parts of this lead by the Mines Department, Dorset Dredge, RTAE and BMI. Grades obtained were generally low and erratic whilst the dimensions of the lead were often small.
3. Marsh Creek - Mayfield Flat area to the east of Fosters Marsh has not been extensively tested. The Scoloch lead has been shown to cross this area but is narrow and not of high grade.
4. Ringarooma River and its alluvial flats and terraces south of Fosters Marshes. This prospect has the attraction that it is in continuity with Fosters Marsh. However, work by BMI, Geophoto and Dorset Dredge suggests that the volume of potential is not great, probably less than the 10 million  $m^3$  estimated by Toh (1978). The worked out Dorset Dredge area is the upstream limit for this prospect, although further upstream from Dorset, BMI and Geophoto results show interesting grades but low volumes ( 2 million  $m^3$ ).

5. Bowlers Lagoon, to the north of Fosters Marsh, is not prospective. Considerable marine reworking would probably have resulted in dispersion and dilution of any original alluvial tin in this area. The results of Minsands (1971) investigation support this.

Note that all of the Great Northern Plains prospects, except Bowlers Lagoon, are outside the current CRAE EL 48/80.

#### Other Areas (within CRAE 48/80)

1. Dune system: bounded by Petal Point, Ringarooma Tier and the Ringarooma River mouth. This area was the subject of a cursory examination by Minsands in 1971. The area was hand drilled and no encouraging results obtained. A possibility exists of basalt covered alluvial deposits in the north of the area, but the potential is very low.
2. Off shore portions of EL 48/80. Work conducted by BHP/Utah and OMAG did not indicate any potentially economic deposits in the shallow waters covered by this EL.
3. Of the remainder of the EL, only that portion which covers the northern part of the Boobyalla Basin containing the Ringarooma deep lead is of any interest. But as mentioned, this lead is too deep for exploitation.

#### CONCLUSION

There would not appear to be an area or areas, within the region which have the potential to yield sufficient volume of ore grade sediment to make a large scale operation viable. Assuming that  $>100$  million  $m^3$  of average grade in excess of  $150$  gm  $SnO_2/m^3$  are required for such an operation, this area does not have any economic potential.

The Fosters Marsh area is the only prospect with a significantly encouraging potential volume to warrant further investigations. However, even if the estimated maximum potential of  $60$  million  $m^3$  is proven, the deposit is too small. Exploration to prove this potential and to prospect the possible extensions which might bring the overall volume closer to economic levels, is likely to be very expensive. Reverse circulation drilling would have to be employed and extremely careful sampling would be necessary. As none of the interesting ground is held by CRAE, agreements would have to be reached with the current EL and lease holders.

In view of the lack of economic potential, the land tenure situation and probable cost of exploration, the area does not warrant further investigation.



I.M. CLEMENTSON

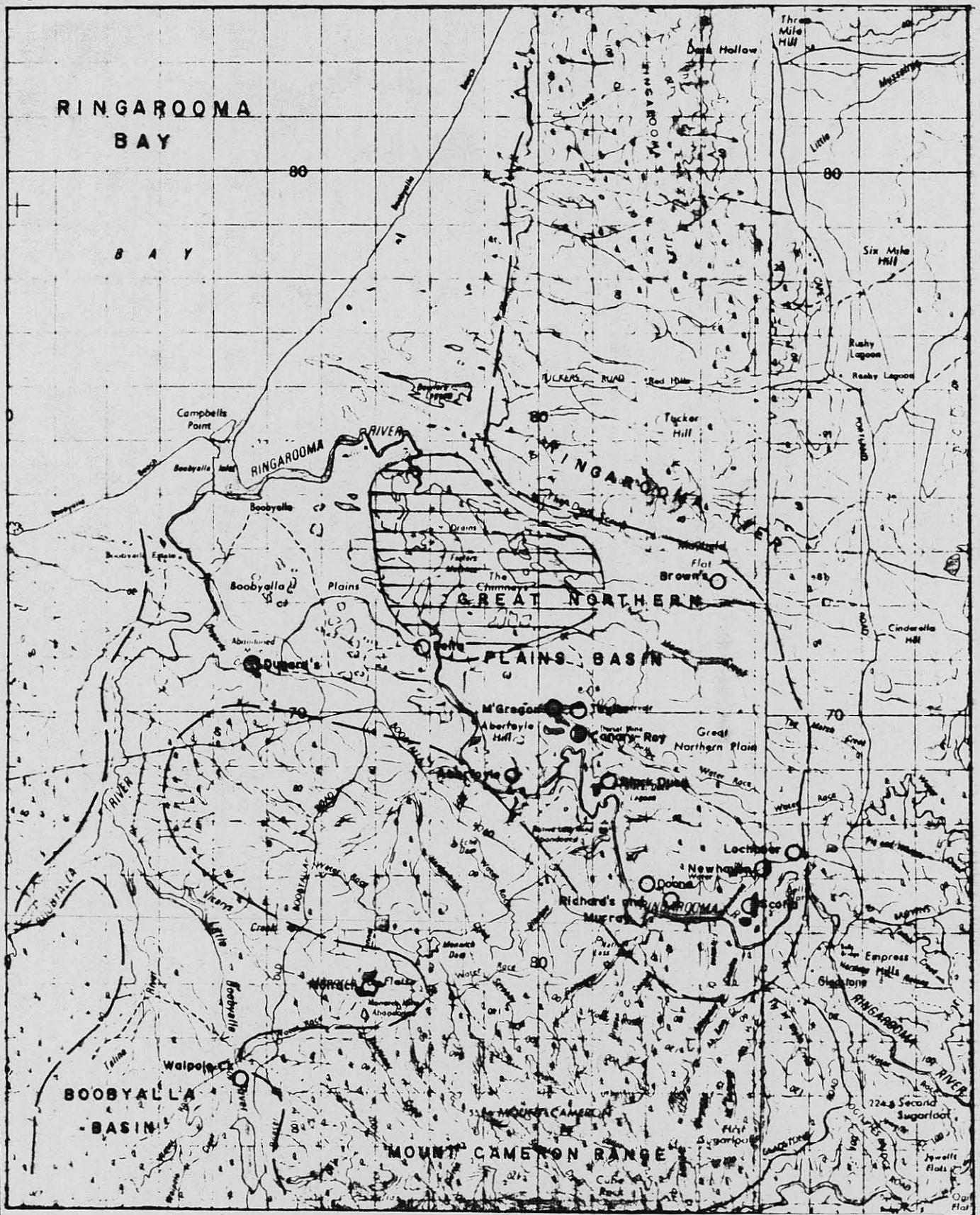
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Scale 1:100,000

5 cm

-  River, lake
-  Intermittent lake
-  Swamp
-  Old workings
-  Potential area for alluvial dredging

ALLUVIAL TIN PROSPECT  
GREAT NORTHERN PLAIN  
N.E. TASMANIA

March 1978 Toh S.C.  
From Topo Sheets 8416, 8516

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-  Drilling - RTAE Scout Drilling
-  Potential Deep Leads (Rattigan)
-  Potential ore bodies for dredging (Toh) (Alluv. and estuarine)
-  Area, not specific, for which reserve estimates have been made (Toh)
-  Potential for extensions of Fosters Marsh.
-  Largely worked out

5 cm

<b>CRA EXPLORATION PTY. LIMITED</b>	
<b>E.L. 48/80 RINGAROOMA BAY TASMANIA AREAS OF EXPLORATION POTENTIAL</b>	
Ref: SK55 - 4	Drawn: R. T.
Scale: 1 : 100 000	Report N°.
Author: I. M. C.	Plan N°. TASH 1466
Date: AUGUST 1983	

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APPENDIX II

NOTES ON RINGAROOMA BAY, OFFSHORE TIN  
POTENTIAL. MEMORANDUM I.M.CLEMENTSON  
TO T.W.DICKSON

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23rd June, 1981.

MEMORANDUM TO: T.W. DICKSON

FROM: I.M. CLEMENTSON

### Notes on Ringarooma Bay, Offshore Tin Potential

#### INTRODUCTION

C.R.A.E. have been approached by Blaxand Seadredge, holders of offshore E.L. 42/80, with an offer to participate in a joint venture to further evaluate known offshore alluvial Sn deposits in Ringarooma Bay. C.R.A.E. hold E.L. 48/80, contiguous with Blaxands' E.L., covering the southern part of Ringarooma Bay off shore and extending from Cape Portland to the Ringarooma- Boobyalla "Great Northern Plains Tin Field" onshore.

#### HISTORY

Ocean Mining A.G. conducted an extensive bathymetric, seismic and drilling survey during 1966-1967 as part of a large investigation into the offshore mineral potential of Tasmania. A total of 138 holes were drilled in Ringarooma Bay, indicating the presence of a drowned valley of the Ringarooma River which contained alluvial Sn deposits. Using a 75 gm Sn/m<sup>3</sup> cut-off, it was estimated that the deposit contained 23 million m<sup>3</sup> of sediment at an average grade of 150 gm Sn/m<sup>3</sup>. In view of the drill hole spacing, the distribution of the mineralised holes and problems of correlation, this was admitted to be a rough estimate only. As no drilling was conducted in water depths >33m, the deposit was not closed-off to the N.W.

A limited programme of drilling in shallow waters (3-18m) along the margin of Ringarooma Bay was conducted by BHP/Utah Development in 1968.

The results were regarded as uninteresting; however, upon re-assessment by a consultant, it was suggested that there were potentially significant concentrations of Sn in the drowned channels of the Ringarooma River and in another area north east of the current mouth of the Ringarooma River.

Blaxand Seadredge, having taken an E.L. over the main deposits outlined by OMAG are attempting to attract partners to fully evaluate the deposit by infill drilling and bulk sampling. Blaxand appear to have accepted OMAG results and interpretation without reservation, and are using these results as the basis of their prospectus.

#### NOTES

1. OMAG drilling is very widely spaced. Their reserve estimate hangs on 15 holes over an area of approximately 11.5 km<sup>2</sup>. The distribution of these holes is irregular, and the validity of correlation between mineralised holes can be questioned.

2. Bathymetry and seismics do indicate a drowned valley which roughly coincides with the outline of the Sn deposits. The gradient of this valley indicates that any alluvial deposit within it would have been deposited by a highly sinuous river; hence the distribution of such a deposit is likely to be irregular. The results of OMAG s' drilling confirm this. To prove the deposit for mining would therefore require a very intensive drilling programme.

3. Blaxand believe that the deposit has been underestimated because: (a) A number of holes stopped in high Sn values but did not reach bottom.

(b) The area of influence of barren holes is disproportionately larger.

The former argument might be applicable if these holes were included in the OMAG reserve estimate. It appears that they were not because they are relatively few in number, sporadically distributed and are overlain by too great thicknesses of low grade sediment.

The second argument could also be said of the influence of the mineralised holes.

4. The deposit is open to the north west where water depths exceed 33m. The potential to increase the volume of the deposit in waters deeper than this is limited by the maximum possible dredging depth of the equipment to be used to mine the deposit.

That depth would probably be about 45m (water plus sediment), therefore limiting any possible extension to between the 32 - 40m bathymetric contours (assuming 5m of sediment to be dredged). Therefore there is probably only the potential for, say, a 50% increase in the volume of the deposit.

5. Reserves: a fairly crude re-evaluation of the OMAG drilling results suggests that their quoted estimate of 23 million m<sup>3</sup> at 150 gm Sn/m<sup>3</sup> is rather optimistic.

Using a cut-off grade of 75gm Sn/m<sup>3</sup> and looking only at the uppermost, hopefully correlateable, zone in each hole, the following results were obtained.

- (a) Maximum inferred reserves, using all holes in the main body of the deposit:-  
21.27 million m<sup>3</sup> at 174 gm Sn/m<sup>3</sup> (87 ppm Sn)  
containing 3725 tonnes Sn.
- (b) Indicated reserves, marginal holes excluded:-  
15.59 million m<sup>3</sup> at 206 gm Sn/m<sup>3</sup> (103 ppm Sn)  
containing 3227 tonnes Sn.
- (c) Probable reserves, all marginal holes excluded and certain holes down graded to prevent possible misrepresentation by these holes:-  
13.90 million m<sup>3</sup> at 202 gm Sn/m<sup>3</sup> (101 ppm Sn)  
containing 2818 tonnes Sn.

6. The influence of by-product Ti, Zr and Au has not been evaluated, but is unlikely to make a significant difference to the viability of the deposit.

7. The OMAG results do not give encouraging indication for the possibility of high grade deep leads. If these exist they would have to be extensive and of very high grade to warrant removal of the low grade cover.

#### CONCLUSION

Blaxands' proposals appear to be unrealistic for several reasons. Their proposed drilling programme, already expensive, would probably be inadequate. Even the maximum inferred reserves would appear to be far too poor, in both size and grade, to justify commissioning a "jumbo" dredge if Asian examples are used as a guideline; and, at the probable reserve of 13.9 million m<sup>3</sup>, the venture should not be considered at all.

The hopes of extending the reserve to a viable economic size (but not necessarily grade) lie in -

- (a) proving an extension to the NW. This might increase the volume by, say, 50%.
- (b) locating other deposits within Ringarooma Bay.
- (c) locating onshore alluvial deposits adjacent to Ringarooma Bay which could be worked in conjunction with the offshore deposit.

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The first possibility is the most encouraging, but even so, it would be unlikely to upgrade the deposit to economic levels ( assuming that an average grade of 300 gm Sn/m<sup>3</sup> and 10,000 tonnes contained Sn are minimum requirements).

The probability of locating further deposits in the Bay would not appear to be great. The OMAG drilling programme was quite extensive and did not indicate any other prospective areas.

The equipment requirements for offshore and onshore dredging are totally different. So, whilst the possibility does exist of locating onshore alluvial deposits, such deposits could not be worked by the same dredge as required to work the offshore deposit. To equip for both environments would not be economically viable.

The offer by Blaxand to enter into a joint venture is not at all attractive. The Ringarooma Bay offshore deposit does not have sufficient economic potential to justify the expenditure proposed.



I. M. CLEMENTSON

Attached:

Reserve estimation and sketch plans.  
Literature search notes.  
Various locality and drill hole plans.  
OMAG drilling results in table and histogram form.

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Re-Estimation, Ocean Mining A.G. Ringarooma Offshore Reserves.

Note.

1. Exercise is an approximation only. Inaccuracies are inherent from scale of plans used, non perfect polygon construction, possible errors in thickness of samples as gauged from copies of O.M.A.G. plans.
2. Cut-off grade taken as 38 ppm Sn (2 oz/yd<sup>3</sup>, 75gm/m<sup>3</sup>)
3. Only holes with above cut-off Sn contents in the upper most horizons which may be correlateable are used.
4. Note that a disproportionately high percentage of the overall deposits hangs on two holes only (103 and 89).
5. S.G of sediments assumed to be 2gm/cc.

TOTAL INFERRED RESERVES (all holes in or adjacent to the main body above cut-off).

21.27 million m<sup>3</sup> at 87 ppm (174 gm/m<sup>3</sup>) = 3725 tonnes Sn.

INDICATED RESERVES (marginal holes excluded).

15.59 million m<sup>3</sup> at 103 ppm (206 gm/m<sup>3</sup>) = 3227 tonnes Sn.

PROBABLE RESERVES (all marginal holes and hole 47 excluded, holes 103 thickness cut by 50%, hole 89 cut by 50%).

13.90 million m<sup>3</sup> at 101 ppm Sn (202 gm/m<sup>3</sup>) = 2818 tonnes Sn.

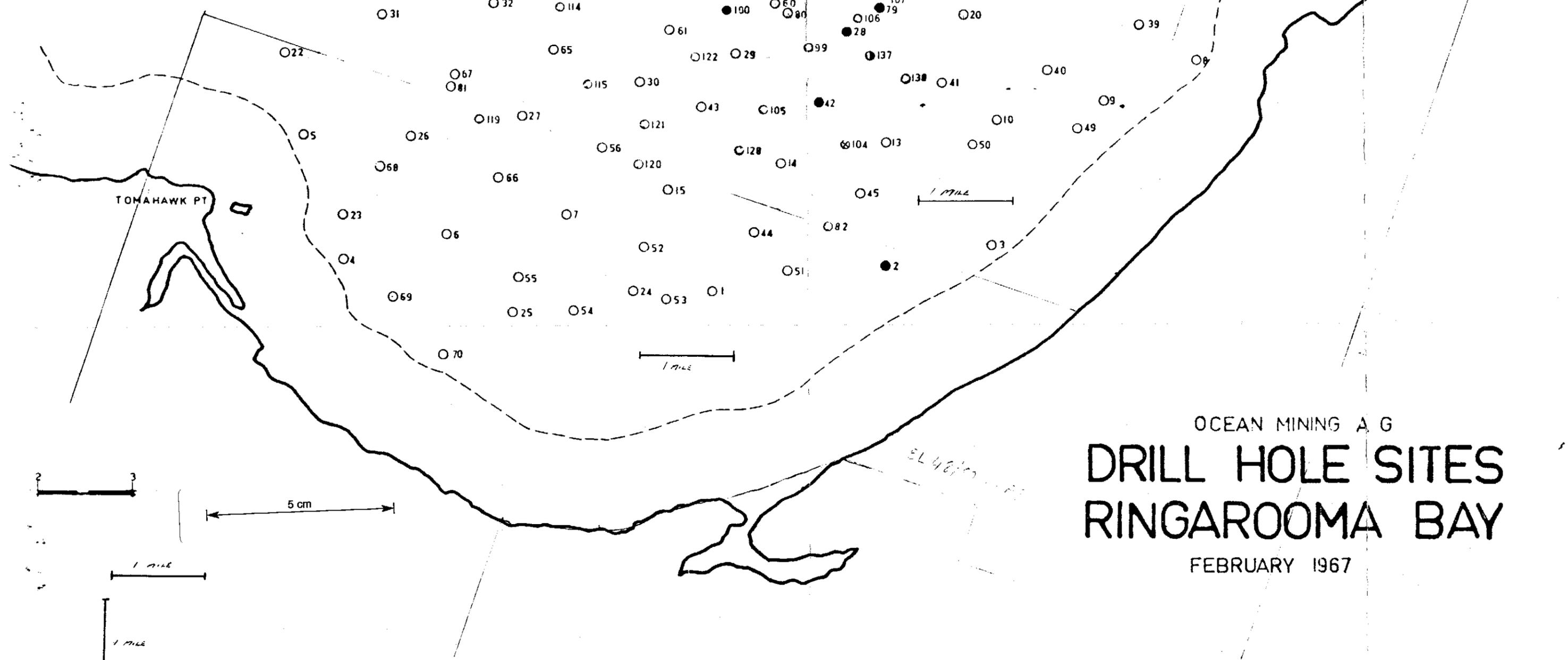
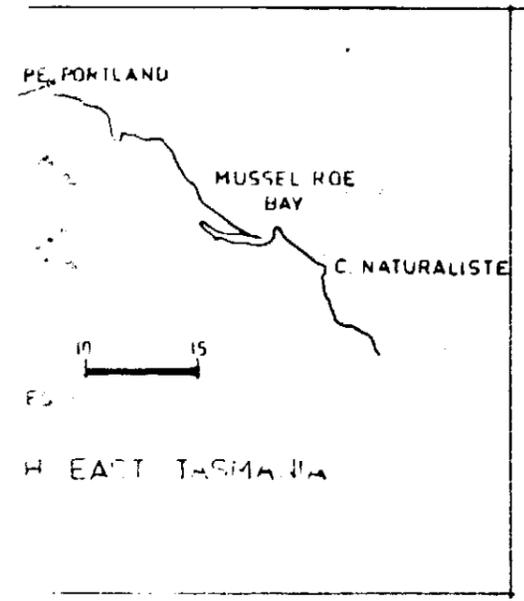
*me*

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<u>HOLE #</u>	<u>Av Sn ppm</u>	<u>Thickness m</u>	<u>Area m<sup>2</sup></u>	<u>Volume m<sup>3</sup></u>	<u>Tonnes</u>	<u>Tonnes Sn</u>
42	61.8	3.05	879534	2682578	5365157	332
28	51.4	1.52	422853	642736	1285473	66
79	109.8	3.35	355196	1189906	2379813	261
48	116.0	1.22	515880	629373	1258747	146
(47	47.0	0.46	938733	431817	863634	40)
36	100.3	2.74	304454	834203	1668407	167
18	83.0	3.66	634279	2321461	4642922	385
71	65.0	1.22	532794	650008	1300017	84
77	111.0	0.61	651193	397227	794455	88
107	75.0	0.91	904905	823463	1646927	123
103	125.7	cut (5.94)	422853	2524432	5048864	634
92	120.0	1.37	507423	695169	1390339	167
89	(207.0) cut	3.96	448224	1774967	3549934	734
76	40.0	0.91	642736	584889	1169779	46
100	58.0	0.76	(800000)	608000	1216000	70
88	43.8	2.90	887991	2575173	5150347	225
19	43.0	0.91	828792	754200	1508401	64
137	40.3	1.83	634279	1160730	2321461	93

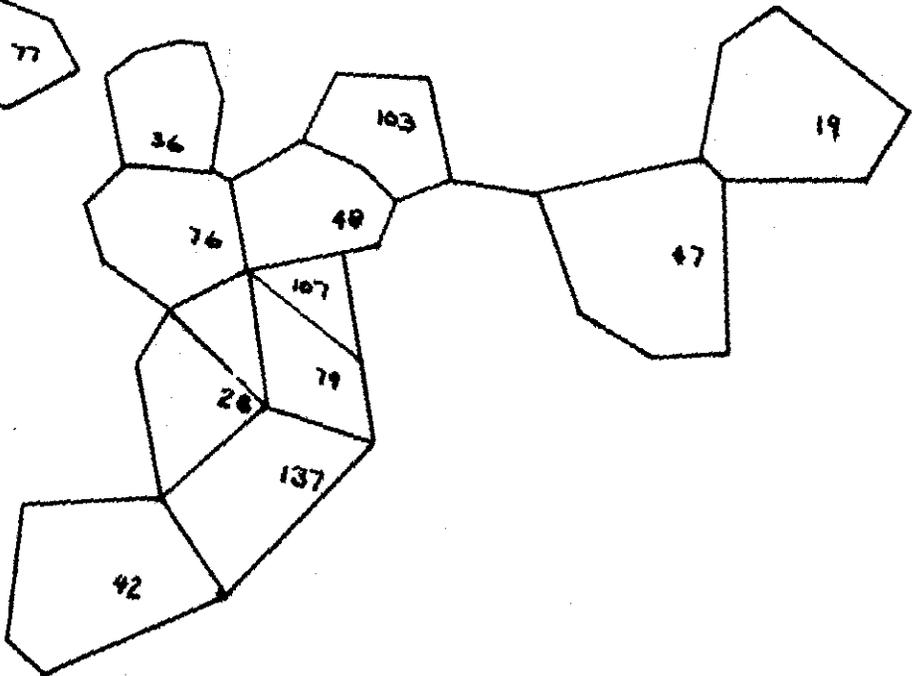
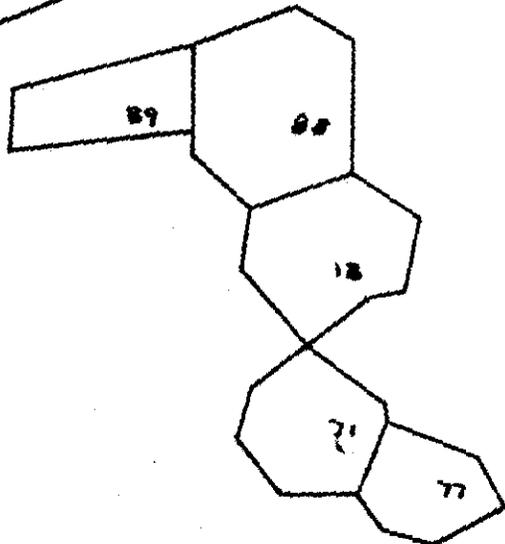
x - marginal  
 o - disproportionately important. Weighting 0.5.

530025



OCEAN MINING A G  
**DRILL HOLE SITES**  
**RINGAROOMA BAY**  
 FEBRUARY 1967

92



026

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