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PREUSSAG

Preussag Australia
Proprietary Limited

PREUSSAG AUSTRALIA PROPRIETARY LIMITED

RINGAROOMA JOINT VENTURE

NORTHERN TASMANIA - AUSTRALIA

ASSESSMENT OF THE PROJECT AREA

AND RECOMMENDATIONS FOR STAGE I

EXPLORATION AND DRILLING

OPEN FILE

W.T. DUNNE
(Consulting Mining Engineer)

Rev. 11-12-78.

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PREUSSAG AUSTRALIA PROPRIETARY LIMITED
RINGAROOMA JOINT VENTURE
NORTHERN TASMANIA - AUSTRALIA
ASSESSMENT OF THE PROJECT AREA
AND RECOMMENDATIONS FOR STAGE I
EXPLORATION AND DRILLING.

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WTD:MMcL.

19th. October, 1978.

The Manager,
Preussag Australia Proprietary Limited,
4th. Floor, 24 - 28 Collins Street,
MELBOURNE.....VICTORIA.....3000.

Dear Sir,

RINGAROOMA RIVER
GREAT NORTHERN PLAIN
BOOBYALLA PLAIN.

I am now in a position to give you my recommendations for a preliminary programme of prospecting for the purpose of forming an opinion on the potential of proving reserves of alluvium in the above area to justify the establishment of an economic dredging operation.

In addition to the large amount of background information on the area you already had available in your office, I have been able, with the assistance of Mr. David Hall, to obtain further useful details on past prospecting by searching the Mines Department records in Hobart. I have also been able to obtain, through personal contact, very full and valuable information on the drilling programme carried out in 1955/56 by Dorset Tin Dredging, chiefly in the Fosters Marshes area of the Great Northern Plain, a programme which was at that time also for the purpose of locating economic dredging reserves.

Finally I was able, together with Mr. Hall, after both having visited and acquainted ourselves with the area, when Mr. Len Brown accompanied us, to spend two days there

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with Mr. D. J. Jennings, the Government Geologist, whose duties cover this area, during which, with the aid of an aerial photograph, we successfully located access routes into the swampy margins of the area not easily ascertained from available maps.

PROSPECTING AUTHORITIES:

The area to which I have confined my attention for consideration of a prospecting programme is covered by Exploration Licence No. 19/1977 held by Mineral Holdings Australia Pty. Ltd. and the Consolidated Lease No. 42M/76 also held by that Company together with Leases Nos. 113M - 118M/70 inclusive.

Exploration Licence No. 19/1977 encompasses S.R.32/70, SR.1975/179 and SR.166/67 which are currently "Exempt from the Mining Act 1929" and therefore subject to special Government permission in respect of prospecting. Rights of entry to the "Exempt" areas, which include a number of small mining leases held by other parties, are essential for the proper investigation for the potential for dredging operations.

Exempt area No. SR.166/67 covers the main part of the Scotia-Lochaber lead. This is a long, narrow but deep channel with reserves proved by the Mines Department amounting to 11 million cubic yards said to average 0.32 lb. 70% SnO₂ per cubic yard. It is not readily suitable for dredging and I have considered only the north western extension outside the 'Exempt' area where it must enter the Great Northern Plain. I understand that it is probable that prospecting rights in SR.166/67 may be awarded to Kibuka Mines who hold mining titles nearby.

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GENERAL NATURE OF THE AREA:

The great Northern Plain east of the Ringarooma River and the Boobyalla Plain west of the Ringarooma River cover the broad coastal basin into which both rivers discharge and which is now completely infilled with sediments with both rivers entering the sea through a common estuary.

A view apparently widely held in the past is that the Ringarooma River flowed through the same channel alignment as the present Boobyalla River, i.e. to the west of the Mt. Cameron Massif and that it was diverted to its present channel to the east of Mt. Cameron by late-Tertiary basalt flows. This concept gave rise to quite considerable effort to seek evidence of the existence in the area of the Boobyalla Plain of a possible "deep lead", similar to those found and mined further up-stream in the Ringarooma Valley. The evidence that emerges, however, from Government drilling is that the large basin in the Ringarooma valley up-stream of the Mt. Cameron Massif, on the margins of which the above-mentioned deep leads occur, took the form of a lake established by the tectonic movement accompanying the upper-Devonian granitic intrusions which gave rise to the Mt. Cameron Massif.

There is geological similarity, however, between the lacustrine basin south of Mt. Cameron and the coastal basin now traversed by the Ringarooma and Boobyalla Rivers, in that both have, in pre-Tertiary times, been deep tectonic depressions which have subsequently been in-filled by Tertiary sediments. However, Government drilling in the southern basin indicates substantially less thickness of Tertiary sediment than recorded in the one deep bore in the coastal basin and seems to support a contention that the inland basin was a normal lake with a high level outlet. The cassiterite in the alluvium has its source in the widespread occurrence of mineralised veins in the Blue Tier batholith the intrusion of which in the upper-Devonian period created the southern inland basin which became the main receptacle for the cassiterite-rich alluvium which subsequently was buried under Tertiary sediments and later still by basalt flows in the western and southern parts of the basin.

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GENERAL NATURE OF THE AREA: (Cont'd.)

The deep leads worked in that area were in fact discovered at the margins of the basin and in the case of the Cascade lead, worked by the Briseis Company, workings extended outwards until overburden of some 300 feet of sediments and 200 feet of basalt made further progress impracticable and uneconomic.

There are much fewer primary sources of cassiterite in the northern part of the batholith formed by the Mt. Cameron Massif so that only minor alluvial concentration can be expected, though their cassiterite content would have been augmented by ore transported downstream from the upper basin by the Ringarooma River. There do not seem to be primary sources of cassiterite capable of giving rise to rich alluvial leads in the northern coastal basin such as occur around the margins of the southern basins.

The Mines Department, using a rotary drill, recorded a depth of 1,000 feet still in Tertiary ⁱⁿ sediments near the southern margins of the coastal basin/which seismic work has indicated the basement to be at a minimum depth of 2,000 feet. Nearby percussion drill holes to a maximum depth of 340 feet failed to locate cassiterite concentrations in the Tertiary sediments intersected.

The much greater depth of the coastal basin and the fact that it was subject to major transgressions of the sea in post-Tertiary time would not have been conducive to the preservation of alluvial concentrations forming at the margins of the basin, such as has occurred in the southern inland basin.

The northern basin for which a block faulting genesis is suggested seems from geophysical evidence to be very steep-sided towards its south-western granite boundary where the above holes are located, with probably gentler slopes on its eastern margins. This may account for the frequency with which relatively shallow basement is recorded in drill holes put down east of the Ringarooma River, though the recognitions are usually unsubstantiated and therefore give rise to doubts as to a true basement rock having been encountered. This applies also to the bottom exposure of weathered

GENERAL NATURE OF THE AREA: (Cont'd.)

volcanic rock near surface in the old Delta Mine for which a possible basalt tongue from a localised vent is suggested for the occurrence and this would fall in line with geophysical evidence that deep basement exists in that section of the basin. A similar type of bedrock is reported in a group of three drill holes just over half a mile north of the Delta Mine and it is possible that a similar explanation can be applied. It is confusing, however, that dolerite is reported in four bore holes about a mile further northwest where deep basement was expected. Unfortunately, there appears to have been no verification of these descriptions.

Typical descriptions of the material in which drill holes west of the Ringarooma River have been stopped include weathered granite, diabase (possibly dolerite which is prevalent east of that area, or alternatively basaltic material), hard shale, hard sandstone (possibly cemented marine or fluviatile grit) and "sticky" wash.

Most of the holes in the Fosters Marshes show a typical "shingle wash" in beds of up to 20 feet in thickness generally between the 40 and 60 feet levels in the holes. As distinct from the area west of the Ringarooma River, there seems to be a general similarity in the bedding in all the holes, the cassiterite content being almost wholly confined to the single layer of shingle wash.

Immediately west of the Ringarooma River, the few percussion drill holes put down appear to show little consistency of bedding other than a fairly constant upper layer of sand. More than one wash horizon was often found but it was the shallower wash beds that contained the better values. Much of this boring was started at levels near the 50 feet contour line as was the Mines Department boring east of the Ringarooma River and it seems possible that the higher wash beds which were laid down, which are revealed in the "terraces" above marsh level and which may have been widespread, have been eroded in the areas where the surface is now at marsh level.

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GENERAL NATURE OF THE AREA: (Cont'd.)

The post-Tertiary alluvials in Fosters Marshes have not been drilled deeper than about 80 feet and yet there is no evidence that these post-Tertiary beds do not extend deeper. The bottom samples are indefinite and rather indicate that the alluvium extends deeper. Further there is some evidence of the possibility of deeper wash in that the depth of bores in the northernmost part of the narrow Scotia-Lochaber Lead, where it must start to spread into the area now occupied by Fosters Marshes, appears to show that the wash in the lead is at a lower level than the wash recorded in the Marshes. This provides good reason for deeper drilling there to investigate the possibility of a further wash bed or beds below the one already recorded.

PAST DRILLING RESULTS :

Of the drilling programmes which can be accepted as having a degree of reliability, the following are chosen for comment :-

1/. Austral Malay Tin - 1935:-

Austral Malay Tin was and is still involved in dredging for cassiterite in Malaysia. It was always staffed with competent personnel and I would have placed a good degree of reliance on their work. A doubt apparently exists, however, in that the field values in this area were heavily reduced following check assays on field concentrates. Further I am not able to interpret the bore plan satisfactorily in relation to the Ringarooma River course and lease boundaries.

The recorded results show bore depths varying from 22 feet to 87 feet, averaging 50 feet. Adjusted values average 0.13 lb. of 70% SnO₂ per cubic yard.

2/. Dorset Tin Dredging (= 1955/56):

This Company was operated by the Commonwealth Government Ministry of Supply. Its one dredge was working in the Ringarooma River valley up-stream from the area under consideration but ceased some years ago on exhausting its accessible reserves.

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 2/. Dorset Tin Dredging - 1955/56: (Cont'd.)

Some years earlier, in the search for further dredging areas, the Company embarked on a well-planned prospecting programme to test the dredging potential of the Ringarooma River flats including the Fosters Marshes. They used a Werf-Conrad Pit Digger with 16" casing and sank a total of 42 holes mostly in the Fosters Marshes area from the Ringarooma River channel eastwards but including 5 holes put down further west in the Boobyalla Plain near the estuary.

Having had access to the Dorset Company correspondence relating to this programme, I am satisfied that it was carried out competently and that the results can be accepted as reliable. In particular, core recovery was excellent, closely approximating the theoretical volume for that pipe size. This factor and the size of sample recovered increase the reliability of the results.

The maximum depth reached was 77.5 feet, probably near the limit of the plant, and most of the holes were in excess of 40 feet, the exceptions being four shallow bores in the estuary area to the west. The average figures recorded were 51 feet depth and 0.133 lb. 70% SnO₂ per cubic yard excluding the above-mentioned holes.

All the bores were stopped at some recognisable horizon. In a few cases it was assumed basement rock, in others a hard cemented grit often called "marine bottom" but many of the holes were stopped in 'sticky' clays often containing wash stones. All these horizons were almost without exception directly overlain by one wash bed containing practically all the cassiterite concentrations and it was evidently accepted that a dredge would not be able to dig or treat the underlying material.

It appears in effect that the boring may not have tested the full depth of the post-Tertiary fluvial-estuarine alluvium and that there is possibility of deeper wash.

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2/. Dorset Tin Dredging - 1955/56: (Cont'd.)

The area covered by this programme generally coincided with that tested by Austral Malay Tin and compared generally in depth and values.

3/. Riotinto Australia Exploration - 1958:

This Company carried out an investigation by drilling of a number of areas within and in the vicinity of the Great Northern Plain and the Boobyalla Plain. In these two areas they concentrated first on the Scotia-Lochaber Lead which lies outside the present area of interest but carried out also a limited amount of drilling in the southern part of the Boobyalla Plain. In this latter area only five shallow hand bore holes were put down and it was reported as "..... probable that the bedrock surface beneath the Boobyalla Plains is undulating and tin deposits could occur on bottom in the depressions. These are likely to be patchy and of small yardage from the knowledge of deposits known in the abandoned workings."

In fairness, this opinion was expressed without the valuable knowledge gained later from seismic work and drilling carried out by the Mines Department.

Except for one unbottomed drill hole to 70 feet in the south of the Great Northern Plain near the McGregor Mine, no attention was given to the potential of this plain which was dismissed as offering "little hope of deposits of moderate and large size with economic grades".

4/. Utah Development - 1966:

This Company carried out an extensive programme of exploration in North Eastern Tasmania in 1966 and included the Boobyalla Plain in the programme. This work also preceded the Government drilling in the area.

Two areas were investigated. The first was the area immediately west of the Ringarooma River, one line stretching north and south from the Delta Mine covering a distance of half a mile without significant results and the other two northerly lines on a level some 20 feet or more above marsh level and reaching almost as far as north of the Boobyalla Inlet. Most of the work was auger drilling in an effort to

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4/. Utah Development - 1956: (Cont'd.)

locate wash channels but ten holes were then bored by percussion drill for sampling purposes, the maximum depth drilled being 104 feet at a location only about half a mile west of the Delta Mine and started probably some 20 feet above marsh level. This hole had no wash recorded below 62 feet.

Only one hole showed a reasonable amount of cassiterite which came from a high wash horizon, the bore being valued at 0.44 lb. Sn per cubic yard (0.63 lb. 70% SnO₂) to a depth of 30 feet only. This wash is not at the levels recorded further east by the Dorset Tin Dredging Programme.

The other parts of the programme in this area were a series of six short lines of auger holes attempting to locate a lead between the two old mines, Dugards and Delta, but without success, and one line of auger holes to the west of the Scotia-Lochaber Lead, which are reported to have bottomed on shale at shallow depths.

5/. Mines Department Drilling Programme - 1967:

A limited area was chosen for test drilling in 1967. It was located in the "Exempt" area north of the McGregor workings. First a line started by Dorset Tin Dredging near the Delta Mine hole, known now as "Line 14", was continued eastwards by the Mines Department. This line became the key to geophysical work carried out by the Mines Department in trying to establish the nature of the underlying Tertiary sediment-filled basin and its southern and eastern limits.

The drilling was extended by a further six short lines of holes immediately north of Line 14 as a result of which a selection was made of some 7.4 million cubic yards averaging 0.25 lbs. 70% SnO₂ per cubic yard. Most of the wash in which this ore was found appears to be unrelated to the wash found in the Dorset Tin Dredging bores in Fosters Marshes a short distance further north. I believe

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5/. Mines Department Drilling Programme - 1967: (Cont'd.)

it is a remnant of higher horizon wash which, as mentioned above, may have been widely distributed in the basin but which now appears to be limited in extent and more suited to open cast working than dredging.

6/. Westralian Nickel Exploration - 1972 :

This Company, by agreement with Dorset Tin Dredging, carried out a programme of drilling to establish a course for the Dorset dredge from its present location into the Great Northern Plain through the McGregor workings. The surface in the area prospected is some 60 - 80 feet above the flood plain. The move was to be dependent on proving adequate reserves for future working. This plan did not materialize but reserves estimated at 2.7 million yards averaging 0.32 lbs. 70% SnO₂ per cubic yard were said to be proven. It was also established that a channel some ten chains wide extended northwestwards into the "Exempt" area with all the bores in that channel said to be unbottomed, the maximum depth being 100 feet.

There is a possibility that this channel may contain a bottom wash but as the surface level at which the drilling was carried out appears to be more than 50 feet above marsh level it is quite possible that it is one of the leads which gave rise to the extensive shingle wash shown in the drill holes in the marshes, probably since worked and reworked under intermittent estuarine or shore-line conditions.

DISTRIBUTION OF MINERALISATION:

Two relatively deep cassiterite-bearing leads can be shown to be entering the Great Northern Plain. One is the McGregor lead referred to above and the extent of its influence on the large area of alluvium in the plain is yet to be established. The other is the extension of the Scotia-Lochaber Lead, proven to be a relatively narrow deposit located to the east outside the area of present concern. However, this lead must also discharge northwestwards into the Great Northern Plain but there is evidence from recent evidently reliable drilling to suggest that the lead widens and that the cassit-erite disperses as it reaches the area of the marshes within

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DISTRIBUTION OF MINERALISATION: (Cont'd.)

the plain. It is certain that this lead must also have had an influence on ore distribution in the plain though again probably masked by repeated reworking of alluvium.

The best host of cassiterite in the plain so far proved appears to be the shingle wash which occurs in varying thicknesses between 40 and 60 feet depth in most of the beds in the Fosters Marshes which takes up a large area in the Great Northern Plain. The cassiterite content of this wash is shown to be variable, though usually in amounts inadequate on its own to suggest economic dredging ground even in this period of high tin prices. The overall nature of the beds overlying the shingle wash is such that they rarely seem to have an ore content which would even justify treating in the event of dredging.

The results of the Utah Development drilling west of the Ringarooma do not suggest a regular extension of this particular shingle bed and if any of the washes shown to exist in the deeper sections of those bores are of comparable nature they do not on present knowledge give promise of adequate ore content to support a dredging operation.

I believe the best remaining potential is if the shingle beds already located are shown to be repeated in similar form below the bottom level of the existing recorded occurrences but with substantially higher ore content and only deeper drilling can prove this.

DRILLING RECOMMENDATIONS:

Mere repetition of the past drilling is unlikely to advance the existing knowledge of the possibility of the existence of rich cassiterite concentrations. I therefore recommend that any programme adopted at this preliminary stage in the area should, in your Company's interest, be directed to attempting to establish :-

- 1/. The nature of the detrital material below known levels but to a maximum of say 150 feet below Fosters Marshes' water level unless ease of drilling and presence of alluvium justifies somewhat deeper exploration.

Also whether the scattered bedrock descriptions in the

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DRILLING RECOMMENDATIONS: (Cont'd.)

- 1/. bores in the Fosters Marshes are justified and at the same time possibly provide further geological knowledge of the extent of the Tertiary basin.
- 2/. The possibility of the Ringarooma River having discharged into the sea east of its present point of discharge with particular attention to the area near Bowlers Lagoon at the north-eastern extremity of the Great Northern Plain with the hope of establishing whether or not a direct point of discharge exists opposite the deep ore-bearing channel indicated by Ocean Mining's off-shore exploration.
- 3/. The presence of cassiterite-bearing wash, in the unbottomed part of the McGregor Lead, if any, such as proved to exist in the Scotia-Lochaber Lead and to investigate its continuity into the basin.
- 4/. The continuing occurrence of wash at depth in the area drilled by Utah Development west of the Ringarooma River.

Although it is essential to test any cassiterite-bearing layer intersected I believe that a preliminary programme should be directed primarily towards establishing reasonable targets for fuller investigation as to their potential for mining by dredging whether on a large or small scale.

PROPOSALS FOR METHOD OF DRILLING:

In order to pursue the rather diverse programme suggested above for closer appreciation of the potential for the area the choice of suitable equipment is limited.

The type of plant used in the past in this area is the cable line type drill usually with 6" casing. This has long been standard for alluvial drilling where hand drilling plant is inadequate. There are records however of difficulty in driving casing in some holes in this area with consequent restrictions on drilling depth. Further this type of drill is not entirely satisfactory for valuation purposes if heavy boulder wash is encountered. Dorset Tin Dredging in their 1955/56 drilling of the Fosters Marshes made successful use of a Werf-Conrad Pit Digger with 16" casing but this plant has a limitation in depth particularly in tight ground because of the difficulty in turning the casing. Also the rate of progress recorded was very slow.

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PROPOSALS FOR METHOD DRILLING: (Cont'd)

The Calweld type Pit Digger can also be satisfactorily applied to drilling and is capable of sinking holes up to 48" in diameter. However, the holes are uncased and therefore this plant is unsatisfactory in ground where loose running sand is known to occur. However, where applicable they can provide an excellent sample which simplifies the matter of valuation.

Rotary drilling has been applied to deep alluvials using drilling mud as a medium both for elevation of the drill cuttings and for stabilising the sides of the uncased holes. This method to my knowledge has succeeded in reaching depths of 160 feet in relatively free alluvium but doubts continue to exist as to the accuracy of valuations.

Contractors with cable line equipment are available, but the time factor is against this method for the exploratory programme envisaged, as an average rate of drilling of only 25 - 30 feet a day could be expected and for the 29 - 30 holes proposed, the programme could extend to about six months.

Reverse circulation drilling using annular casing and a circular bit, with water as the elevating medium, has been suggested, with an internal diameter of the bit and casing of 5 inches. Full core recovery could be expected except where large boulder wash is encountered and a roller rock bit would be used temporarily when necessary. The speed of drilling in normal alluvium would be expected to average about 80 feet per day which is approximately three times the expected rate of cable line drilling.

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Sample recovery would entail dealing with an flow of water and coarse and fine solids from the pipe of up to 150 gallons per minute. It would be proposed to use two launders alternately to collect samples which would not be large but which would have to be dewatered but this does not pose any great difficulty if losses of some suspended material is accepted for this programme.

The estimated basic cost of drilling by this method has been indicated at \$12/per foot by W.L. Sides & Son, Pty. Ltd., whom Mr. Hall and I contacted because of their experience in the area in drilling with cable line rigs for Utah in 1966 and B.M.I. in 1972. Establishment and disestablishment costs, moving time between holes, stand-by time and accomodation are stated as extra to the basic cost.

That basic figure compares with their estimates of \$16/ and \$22 per foot for 6" and 8" cable line drilling respectively, although I have an estimate from another contractor with a cable line rig only of rates less than \$12/ per foot - the time factor is the drawback.

I therefore recommend adopting reverse circulation drilling for the purpose of this programme which will be directed primarily to the location of deeper stanniferous wash beds than so far recorded. The programme could extend to 75 days of which actual drilling may occupy say 60 days.

The size and weight of the plant necessary for such a duty may be a governing factor where movement in low lying areas near swamp margins is concerned, but W.L. Sides and Son know the area and the problems of accessibility to drill sites. However, it will be necessary to make use of a small bulldozer

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PROPOSALS FOR METHOD OF DRILLING: (Cont'd)

for route preparation in obtaining access to all the drill hole sites, especially those in the more inaccessible parts of Fosters Marshes, which I hope prove accessible, and it could also serve to assist in movement of the drilling plant between sites.

For any future drilling for valuation purposes, consideration will have to be given to the nature of the wash horizon in which recoverable cassiterite is shown to occur during the exploratory work. If a substantial proportion of large stones or boulders in excess of say 5" diameter is contained in the wash beds, small diameter drill holes can give serious over-valuations. It would therefore be necessary to drill at least a limited pattern of check holes of the order of +16" diameter as a minimum to establish an accurate figure for the percentage of 5" material in order to gauge a reliable factor to apply to field results recorded by drilling with 5" pipes. Valuation drilling will also require provision to be made to move the drilling equipment through both the swampy and the inundated parts of the area in order to complete an adequate pattern of drill holes.

SUGGESTED DRILLING PROGRAMME:

The attached plan shows on a relatively small scale the area to be investigated. The approximate locations of marshes and ponds, from which I have excluded drilling sites for this preliminary programme, are outlined. The plan shows also the 50 feet and 100 feet contours above sea level, to which the drill collars must be related.

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SUGGESTED DRILLING PROGRAMME: (Cont'd)

The drill hole locations shown have been fixed with reference to the geological maps and an aerial photograph taken in 1964, and although Mr. Hall and I have reached a number of the proposed sites during our visit with the Government Geologist, it may be found necessary to amend some of the sites in the marsh areas. It would even be desirable if some holes could be sited in parts of the marsh area which dry out sufficiently to permit access especially dry parts of the Fosters Marshes for which no previous records of drilling exist.

I would have a preference to drill first in Fosters Marshes area to check the possible influence of the Scotia-Lochaber Lead, especially to ascertain if a lower cassiterite bearing wash exists below that revealed by the Dorset Tin Dredging drilling. However, this must be a matter of judgment at the time of commencement of the programme. If there has been inadequate drying out in the marsh area, drilling could commence of the easily accessible sites west of the Ringarooma River, where, in any case, most of the planned drill sites are close to the margin of Forster Marshes.

Quite long access routes will have to be prepared for a number of the sites and permission will have to be obtained from landowners to upgrade old tracks and to cross fields. However, it should not be necessary to prepare tracks before the commencement of drilling.

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SUGGESTED DRILLING PROGRAMME:(Cont'd)

Also the early drill hole sites can be located in the field by reference to cultural features with survey work also commencing with the drilling. A preliminary reconnaissance prior to the arrival of drilling plant would still be desirable.

SUPERVISION OF DRILLING AND HANDLING OF SAMPLES:

In order to obtain the fullest possible information from the drilling it will be essential to have it supervised in the field by a mining engineer or geologist with experience in alluvial drilling, preferably with a knowledge of alluvial cassiterite.

It will be necessary also to have a second mining engineer or geologist to attend to the many ancilliary duties so as to avoid any hold-up of the programme. Accommodation, supplies, surveys, access routes, general local liaison work and assisting with samples are some of the important duties which cannot be handled by the person supervising the drilling, although the ability to interchange duties would be an advantage. I consider it advisable to concentrate in the field to grades preferably in excess of 60% SnO₂. As the cassiterite in the area appears to be predominantly 90% + 100 mesh from the Dorset Tin Dredging report, this should not be difficult with an experienced tin dresser.

The volume of core recovered from a 5" diameter pipe is likely to be of the order of 1.4 cubic feet per 10 feet section and could cause congestion of samples with rapid drilling and without the use of mechanical aids to concentration.

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SUPERVISION OF DRILLING AND HANDLING OF SAMPLES: (Cont'd)

Therefore I suggest for this preliminary programme, which should be exploratory rather than for detailed valuation that it would be satisfactory to split samples which are predominately clay material for testing in the field and resort to testing of the balance of the material only if significant amounts of cassiterite are recovered. In the case of coarse shingly wash, which appears to contain almost all the ore, handling of the full samples should not be difficult. However, some of the very clayey ground which is likely to be met at depth could cause delays and as past drilling suggests negligible cassiterite in such material, the field treatment could justifiably be restricted to part of the sample only.

Adoption of this practice will obviate the need to provide a mechanical field treatment plant, though this type of plant would be necessary if a detailed programme of drilling for calculation of reserves is later undertaken.

FINAL COMMENTS:

The low-lying parts of the coastal basin are well suited to bucket dredging, whereas the higher level "terrace" deposits and the deep Scotia-Lochabar Lead, which are credited with limited volumes of proven reserves, do not easily lend themselves to working by dredging.

Fosters Marshes and the immediately adjacent areas along the course of the Ringarooma River, which alone cover over three square miles, offer scope for adequate volume of alluvium to support a large dredging operation.

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19th October, 1978

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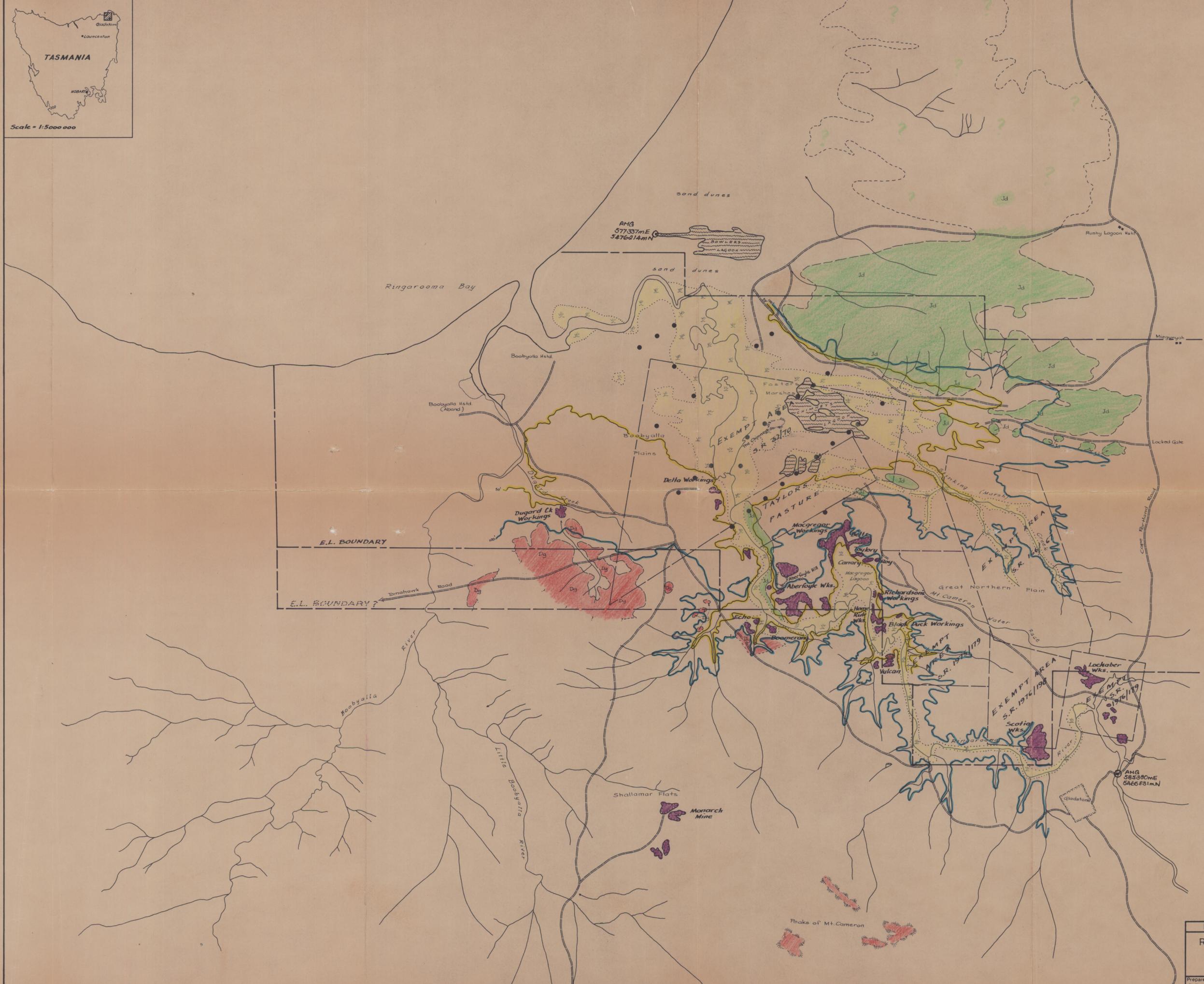
FINAL COMMENTS: (Cont'd)

Past drilling in this particular area indicates fairly widespread cassiterite-bearing alluvium but proving the extent and grade of future selections will entail very detailed drilling. I consider that a potential dredging life of not less than 15 years with an average recoverable grade of the order of 0.30 lbs. 70% SnO₂ per cubic yard should be sought as a basis for economic dredging dependent on the nature of selected areas, the appropriate size of dredging equipment and the tin metal price adopted for studying the feasibility of dredging operation.

The above programme, which is minimal in the context of the coastal basin as a whole, is designed to attempt to locate the areas of best potential as well as to obtain a better understanding of the distribution of the cassiterite bearing alluvium as a guide to the planning of any detailed drilling justified by results.

Yours faithfully,

W.T. Dunne.



● Proposed drill holes.
 AMG REFERENCE POINTS ADDED
 CHAINS 0 40 80
 1:50,000
 5 cm

646021
 78-1368 FIG.
 PREUSSAG AUSTRALIA PTY. LTD.
 RINGAROOMA AREA - NE TAS.
 LOCATION AND GEOLOGY
 020
 Prepared Date Drawn Date
 D.B.H. Oct. '78 A.S.C. Oct. '78
 A1-339



- Proposed drill holes.
- hole with sample no.
- Austral. Malay Tin 1935 including Foster's Bores 1-11 and unnumbered bores.
- △ Tasmanian Mines Dept. deep percussion drill holes (prefixed BH)
- ▽ Tasmanian Mines Dept Line 14 (seismic line)
- Rio Tinto Aust. Expl scout bores (prefixed HB)
- Ulat Development Company auger holes (prefixed A)
- Ulat Development Company sample holes.
- Darset Tin Dredging Boobyalla delta area (6 ch grid)
- /○ Sample depth and tin grade. 16(-)yd (70%Sn)
- (20) Hole depth.

Scale: 1" = 10 chains.

0 5 10

021

RINGAROOMA J.V. - TAS
RINGAROOMA FLOOD PLAIN AREA
PREVIOUS DRILLING