

PRELIMINARY SUMMARY GEOLOGICAL REPORT

OF

BLUE TIER TIN DEPOSITS

Lottah, Tas.

by

J. L. Morton

3rd January 1963

MICROFILMED

Accompanying Report:
Regional Geological and Contour Plan
Sections of the Blue Tier Field

Scale 1" = 40 ch.
Scale 1" = 40 ch.

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SUMMARY

Some 1.4 million tons of ore have been treated from widely spaced localities of the Blue Tier Tin Field at Lottah, in North-eastern Tasmania. Records show that 144,000 tons selectively mined from the Anchor property between 1934 and 1941 yielded a recovery grade of .17% Sn.

The possibility of finding one large body or several smaller contiguous bodies which would yield .17% Sn recovery grade by bulk mining, is extremely remote.

While it is structurally possible to find an adequate number of widely spaced bodies, this would demand a higher grade than hitherto attained. Judging from available data, this could not be expected.

INTRODUCTION.

Attention was first drawn to the Blue Tier Tin Area when tin ore was discovered near George Bay in 1874. This encouraged prospectors to follow-up investigations resulting in the discovery of a rich detrital deposit over the Moon property, which was sluiced and produced tin concentrates at a very profitable rate. A number of sluicing ventures of similar detrital deposits were undertaken by different companies following the Moon discovery. The major of these are: Southern Cross, Lottah, Marie, Planet, Crystal Hill, Australia and Anchor. Alluvial flats were also successfully worked in several creeks. With the depletion of detrital and weathered sections of these deposits, several ventures were undertaken to mine the primary ore, which required blasting, haulage, crushing and treating on tables. In addition to the above, the Summit, Don and Michael mines were major bodies mined for their primary ore.

More than 3000 tons of tin concentrates were recovered from sluicing of detrital and alluvial deposits between 1875 and 1886. This work is accepted as having been exceedingly successful and profitable.

An estimated 6000 tons of tin concentrates were recovered from the primary ores off all mines up until the closing of the Anchor mine by the original company in 1914. The Anchor mine was re-opened in 1934 and worked by a syndicate, later taken over by Tasman Tin N. L., finally by tributers, closing down again in 1942. During this time records show that between 1934 and 1941, 144,469 tons were treated for a recovery of 239.4 tons of metallic tin. This is a recovery grade of .17% Sn. Figures are quoted in various reports showing grades ranging from .13% Sn recovery to .20% Sn recovery; however, these figures are estimated from recovery of tin oxide and some of the records are stated to be incomplete.

The closing of all ventures concerned with mining primary ores has been attributed to the same cause, that is, the grade of ore was too low to provide sufficient profit after paying production and other costs.

At the present time no extensive operations are being carried out in the area. Aberfoyle Tin Development Partnership hold Exploration Licence No. EL7/62 covering the main past-producing mines and major potential ground. This study is being carried out at their request to assess the potential of the area.

Preliminary field inspection was carried out by the writer between 10th and 14th December 1962. Tentative required potential is estimated at 10 million tons of tin ore, with a recoverable grade of not less than .17% metallic tin, estimated to be about .25% head grade.

LOCATION.

Lottah, North-eastern Tasmania, 20 miles West of St. Helens and 81 miles East of Launceston.

ACCESS.

Most convenient access is from Launceston via Tasman Highway, or from St. Helens also via Tasman Highway to within about 4 miles. Good all-weather roads lead from three points on the Tasman Highway to Lottah, and tracks from Lottah lead to most of the mines excepting Australia and Don.

The Tasmanian Government Railway extends to Herrick, which is about 15 miles from Lottah, and is connected with Launceston and Hobart.

WATER.

Adequate water should be able to be developed from local sources.

POWER.

Tasmanian Hydro-electric Power lines within 4 or 5 miles.

TOPOGRAPHY.

Between the Anchor, located at the foot of the Tier and mines on the plateau is a difference in elevation of about 1400 feet. Slopes of the Tier are heavily overgrown and steep valleys and streams make access to the mined areas difficult. The old opencuts are overgrown and are in some cases difficult to locate.

OWNERS.

Aberfoyle Tin Development Partnership controls the major portions of the area through their exploration licence EL7/62.

REGIONAL GEOLOGY.

Most of the area is underlain by granite. There are two phases of granite and these have been assigned the local names of "normal" granite and "tin" granite. An early distinction should be made that "tin" granite is the main host rock for tin orebodies, but does not otherwise contain tin. The orebodies are widely spaced within the "tin" granite, and "tin" granite between orebodies is quite barren. "Normal" granite also acts as a host to tin ore in certain cases but to a far less and unimportant extent compared to "tin" granite.

Tin granite occurs as flat sheets or sills within normal granite. These have been gently folded and orebodies occur associated with the crests and possibly troughs of these folds. Other orebodies occur as veins of griesen in vertical cracks which are probably related to the folding in some way.

A basalt flow occurs to the West of the field, and sediments are in situ forming the capping of Mt. Littlechild. Please refer Locality and Contour Plan, Blue Tier Area, Scale 1" = 40 ch.

STRUCTURAL AND ECONOMIC GEOLOGY.

Tin occurs in the form of cassiterite in veins and lenses of tin granite. Steeply dipping, narrow veins, although of higher grade than other primary ores, consist only a fraction of total ore. Selective mining methods required to extract these bodies would exclude them from large-scale operations unless they were within or joining the major lenses. Their discussion, therefore, will be limited to their structural relationship to the major lenses.

Major ore has been mined from structures locally termed "floor" deposits. Two of these deposits have been studied to some extent in the past and available data provides a clue to their origin and nature. Regional mapping shows tin granite along the Southern edge of the tier to be folded. This can be seen clearer in the section drawn between points A-A. Please refer 1" = 40 ch. Section A-A. The Anchor orebody occurs in association with one of these folds and was recognised by past geologists (with some variation). Plan and sections accompanying D. E. Thomas' report of 1943 show contacts between the two granites (in this case the orebody and normal granite) to have an overall dip of about 10° South, but at the Southern end the dip changes abruptly to 70° South, and at the North-eastern portion is also steeply South. The effect

of this is shown in Section B-B and could be described as a lens formed by the change in pitch of a fold. The fold-crest type of deposit is not uncommon; an example of this at the Lode Hill Mine, China Camp, Queensland, is described in Queensland Geological Survey Publication No. 250.

The attitudes and positions of major lenses - Anchor 10° South, Don flat South, Australia flat South, all on the slopes of the tier, and Summit and Michael both flat situated on the plateau suggest that these bodies were close to a sediment contact (part of which occurs on Mt. Littlechild) before erosion. In other words, the orebodies probably occur in a skin of griesen associated with the pre-erosion contact of granite and sediments, which was folded in a more or less dome shape forming a trap for mineralising solutions. In some cases normal granite occurs between tin granite and the pre-erosion contact and dips flatly over tin granite at a flat angle, mainly notable at the Don Mine. For this reason it could be expected that several orebodies lie under this type of cover, but it would not be likely that ore would occur at any great depth, and would remain close to the pre-erosion contact zone. A finer geological appreciation of these structures would be necessary to predict their possible extensions or repetitions.

The economic geology of the field is one of localised enrichments, the largest of which (Anchor) produced some 1,000,000 tons. Selective mining resulted in a recovered grade of .17% metallic tin; it could therefore be confidently expected that the recoverable grade of any bulk mining would be somewhat below this figure.

CONCLUSION.

The possibility of locating several contiguous bodies of ore which would yield a recovery grade of .17% Sn by bulk mining is extremely remote. While it is structurally possible that widely spaced lenses may occur, this situation would demand a higher grade than hitherto attained. Considering results from the widely spaced workings of the field, this could not reasonably be expected.

There are, however, some aspects of the field which are unknown. None of the large bodies have been completely mined out, due either to excess cover or depth, or both, as in the case of the Anchor. Apart from trenching carried out by the Mt. Lyell Mining and Railway Company, which was intended to prospect mainly for vein type ore and is not suitable for determining characteristics of floor type deposits, there is little data available regarding distribution of values.

If it is decided that further work should be carried out on the field, the programme should be designed to determine these points first:

- (1) Size of known deposits.
- (2) Grade of known deposits.
- (3) Distribution of values in known deposits.

This data cannot be determined from available records, but is necessary to make a reliable assessment of the potential of the field and to formulate a programme of exploration.

The most suitable method of doing this would be to diamond drill the extensions of one or more of the known orebodies. Some surveying and mapping would be required in conjunction with this work.

Such a programme would involve some 3000 feet of diamond drilling and together with geological work would probably cost in the range of £7000 - £8000.

J. L. Morton

Melbourne
3rd January 1963.



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LEGEND

- Tin granite
- Sediments
- Basalt
- 1400
- WELD
- Road
- Track
- Anchor
- Tin Mine
- Town Site
- Boundary EL 7/62
- Elevation contour
- River or creek
- Road
- Track
- Tin Mine
- Town Site
- Boundary EL 7/62

AMG REFERENCE POINTS ADDED

ABERFOYLE TIN DEVELOPMENT PARTNERSHIP

LOCALITY AND CONTOUR PLAN
BLUE TIER AREA
 TASMANIA

007

R.HARE & ASSOCIATES

SCALE: 1 INCH = 40 CHAINS

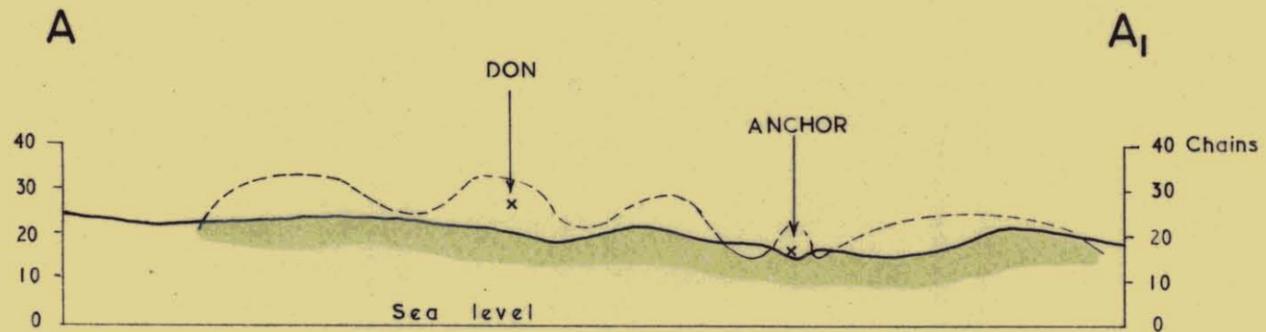
Prepared: J.L.Morton

REVISION

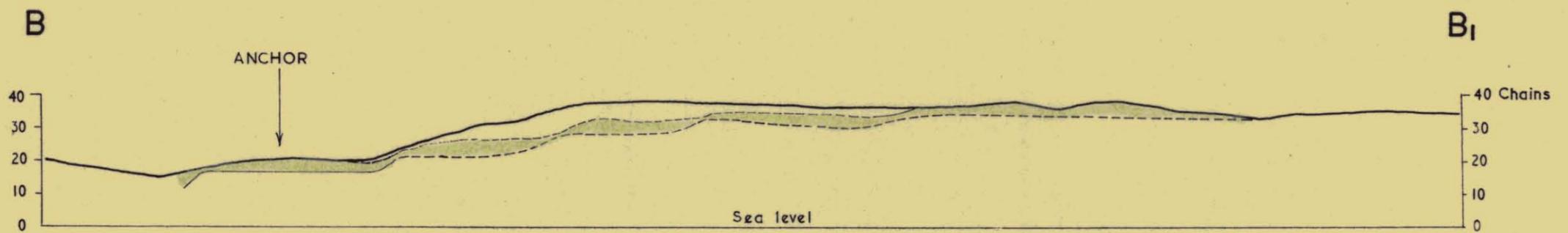
Drawn: B.L.

Date: 11-12-62





SECTION A-A₁
Looking North



SECTION B-B₁
Looking West

LEGEND

- Normal Granite
- Tin Granite

287009

ABERFOYLE TIN DEVELOPMENT PARTNERSHIP

SECTIONS OF
BLUE TIER TIN FIELD

008

R. HARE & ASSOCIATES

SCALE 1 inch = 40 chains

Prepared: J.L. Morton

REVISION

Drawn: I.R.

Date: 4. 1. 63.

