BALFOUR TIN FIELD

NOTES ON A VISIT TO BALFOUR

ON 29th & 30th APRIL 1961

by

J F Gilfillan

5 April 1961

306602 654

Renison Bell,
Tasmania.
5.4.61.

Balfour Tin Field.

Notes on a visit to Balfour on April 29th.-30th., 1961.

Introduction.

At the request of Mr. F. Britton of Britton's Swamp, I was asked by Mr. R. J. Howard, Zeehan, to visit the Balfour Area. The purpose of the visit was to try to ascertain whether the area would be worth prospecting for minerals, in particular alluvial cassiterite; the venture to be financed by a syndicate of Smithton business men. Because of the difficulties of access, the time available on the field was limited. I was accompanied by Mr. Geof. Johns, a prospector of the area; two members of the syndicate and a driver.

History.

L. K. Ward (see refs.) reports that alluvial tin workings were in existance in 1884 but that there was little work done until 1901 when copper was discovered. Even then there was little activity till 1908. By the time of the 1st. World War, the area was dying. Even in 1911, there was only a bullock track: the tram was not completed till later. The lack of communications must have retarded the progress of the area and the closing of the town, together with the First War would have discouraged all but the very hardy.

Ward claims that over 1000 tons of copper ore were exported up to June 1910 from one mine and that several others were stockpiling while awaiting the completion of the tram to Temma Harbour.

He estimates that up to the time of his visit approximately 300 tons of tin ore had been shipped out of the area.

Geology.

A description of the geology and economic geology of the Balfour Area is available in a Report by L.K.Ward - see refs.- and for details, I

would refer you to this. There are a few points, however, worthy of special mention.

1. Ward, p48, claims that the only known exposure in his time of primary tin ore in lodes in the immediate Balfour Area, is on Specimen Hill. The existance of these lodes I can confirm and while they do not appear to be of any economic interest in themselves at the moment, they probably have an important bearing on the local distribution of the alluvial cassiterite. I have seen a similar lode on the south-western slopes of the hill immediately north-east of this, across Tin Creek, which suggests they may be more widespread.

The similarity between the cassiterite in the alluvials and in the flat-lying quartz lodes is very striking and leaves little doubt that much of the cassiterite has been shed locally. Hence the importance of the possibility of the lodes being found over a wide area.

2. The very coarse-grained nature of the cassiterite in the alluvials and the perfection of many crystals also indicates that the material has travelled only a very short distance.

3. Ward, p68, states that the creek beds contain cassiterite at points which are distant from the lodes. Mr. Johns confirms this and suggests a figure of 3 to 4 miles. I cannot confirm this but it is not an unreasonable suggestion.

4. As a result of these narrow quartz-cassiterite lodes on the hills, the alluvials on the creek flats merge with detrital deposits on the hills. I am using the word alluvial to include these which is not strictly correct. It is noteworthy that some of the workings reported - ex Mr. Johns - to have been rich are well above the creek flats.

5. Ward, p68, also remarks on the absence of sulphides in the alluvials. This could be an important point metallurgically, though I think that it may need modification locally as in some dishes I have seen sulphides in small quantities

6. The shallowness of the area is an unusual feature and may have been a factor in the relative neglect of the area in the past. The reason is, of course, that the hill slopes have detrital deposits and the true alluvials in the valleys may in fact be much deeper. On the hills,

the depth of the gravel is rarely seen to be greater than 3', usually less. In some 'gutters' it could be seen to be up to 10 feet or more.

7. The principal alluvial workings are to be found in the valley of Tin Creek where workings have been undertaken intermittantly since about 1890. There are also workings, however, in the creek west of Specimen Hill which runs into Tin Creek north of Mr. John's camp. Ward, p69, reports that cassiterite has been won from Emmett's Creek. I think that this is a small creek running into Tin Creek from the north. To explain this anomaly, Ward suggests that recent earth movements have reversed the flow of the stream and that the cassiterite actually come from Specimen Hill. If there are lodes in this area, however, such a hypothesis is not necessary - see 1.

8. Copper Lodes. It can be accepted that these lodes were extensively tested with such means as were available when the mines were operating. I made no investigation of these at all.

9. Tin Lodes. It has been suggested that the tin bearing lodes may be better in depth. This may be so but I would point out that in the Specimen Hill area, the topographic relief gives a vertical section of about 100 feet and to my knowledge, the lower lodes so far exposed in this area are no more promising than those on top of the hill.

Investigations Made.

1. Copper Lodes. Nil.

2. Tin Lodes. General observations were made with particular regard to the possibility of the alluvial cassiterite being shed from these.

3. Alluvial Cassiterite. I have tried to ascertain four things.

(a) An estimate of the area likely to contain cassiterite.

(b) An estimate of the depth of the wash, gravels, etc., and hence, in conjunction with (a), make a very rough estimate of the order of volume of material which might exist.

(c) Any mineralogical factors which might make easy, or otherwise, the treatment of the material.

(d) Some idea of the order of grade which might be expected.

(a) Ward states that the cassiterite follows down stream for some distance as would be expected. Mr. Johns confirms this but qualifies it by saying that the tin content weakens the further one goes down Tin Creek. On the basis of this, and not on my own observations, I estimate that there could be up to 2 sq. miles favourable for tin bearing alluvials.

(b) In the area I saw, the average depth of the wash, alluvium, and detritus was something in the order of 2 feet. It would be expected that there were deep 'gutters' in places, also that the creek flats may be deeper. It must be borne in mind however that there are quite large areas already worked to bedrock.

(c) This is really outside the scope of this brief report but it is apparent from the very coarse nature of the cassiterite and its apparent relative freedom from sulphides, wolfram, etc., that recovery would not be a very difficult matallurgical problem.

(d) To get some idea of the tin content of the alluvium, I took five samples across the area, along or near the old bullock track. I delibrately chose an area which seemed likely to have the best chances of containing cassiterite because a failure to gain encouragement in such an area would cast considerable suspicion on the rest of the area. These results should not therefore be considered indicative of the whole field.

The accompanying rough sketch - not to scale and drawn from memory - shows the location of these samples. The samples were assayed at Renison Bell by Renison Associated Tin Mines N.L. After drying, the samples were screened to ¼" to eliminate the coarse gravel and any large size composite particles which would not be recoverable by normal gravity methods without expensive treatment. The -¼" particles were then chemically assayed and reported as Tin Metal per cent of the original sample.

Sample No.	R.A.T.M. Assay No.	%Sn.	Sample Weight.
B.1.	1131	0.47	2 lb. 15 ozs.
B.2.	1132	0.24	3 lb. 3 ozs.
B.3.	1133	0.09	4 lb. 5 ozs.
B.4.	1134	0.20	3 lb. 8 ozs.
B.5.	1135	0.15	3 lb. 9 ozs.

Making an assumption that 1 cub. yard of gravel, in situ, weighs 2,500 lb. per cub. yard, a figure that can only be verified by actual determination of samples from the field, these become;

B.1.	11.7 lb Sn/cub. yard	or 15.0 lb. SnO_2/cub. yard.
B.2.	6.0 lb Sn/cub. yard	or 7.7 lb. SnO_2/cub. yard.
B.3.	2.2 lb Sn/cub. yard	or 2.8 lb. SnO_2/cub. yard.
B.4.	5.0 lb Sn/cub. yard	or 6.4 lb. SnO_2/cub. yard.
B.5.	3.7 lb Sn/cub. yard	or 4.7 lb. SnO_2/cub. yard.

Even cutting back B.1. to a lower figure, these results still look attractive. It should be noted that a high assumption of the specific gravity of the gravels would lead to a lowering of these amounts on correction. I am not conversant with the cost structure of alluvial tin mining but these figures are certainly interesting enough to warrent research into the matter and compare very favourably with the grades I have seen quoted. These are generally in the range of -1 lb. SnO_2 per cub. yard.

Conclusions.

It is quite impossible to value a field from a quick glance and five samples. However, using all the above assumptions to give an order of magnitude of what might be expected, or at least hoped for, we have 2 sq. miles of wash about 2 feet deep. This gives the order of 4,000,000 cub. yards. Now 1 ton of SnO_2 concentrate is worth about £600, i.e. 1 lb is worth about 5/4d. At an average of 2lb. SnO_2 per cub. yard, this indicates a figure of £2,000,000 in tin content. I would emphasise that this is pure supposition and I only include it to show why I think more work should be done. I am NOT stating that the area contains this quantity or value of tin.

Recommendations.

1. I consider that on the evidence of the information which has been available to me, the area is worth further investigation with the following objectives; (a) To systematically prospect a small area to confirm, or otherwise, my samples; and to actually establish an ore reserve in terms of yardage and grade of that area.

(b) To check my specific gravity guess as soon as possible so that all assays can be immediately converted to the lb./Cub. yard form. Also checking that my conversions are reasonable and not erroneously high before too much money is spent.

(c) To delineate, subject to (a), the approx. limits of the area to give a better estimate of the area. This will not eliminate 'barren islands' but will give a better figure than mine. It is the size factor which worries me most as it may be that the higher tin values are concentrated into a small area about Specimen Hill.

2. I recommend that you employ a qualified supervisor for the campaign - either full time or on a consulting basis. The Mines Dept. requires that the holder of an S.P.L. demonstrates his ability to prospect the larger area and I doubt if the present set-up would satisfy them.

3. I consider that prospecting of the copper and tin lodes at this stage would be very expensive and is unwarrented.

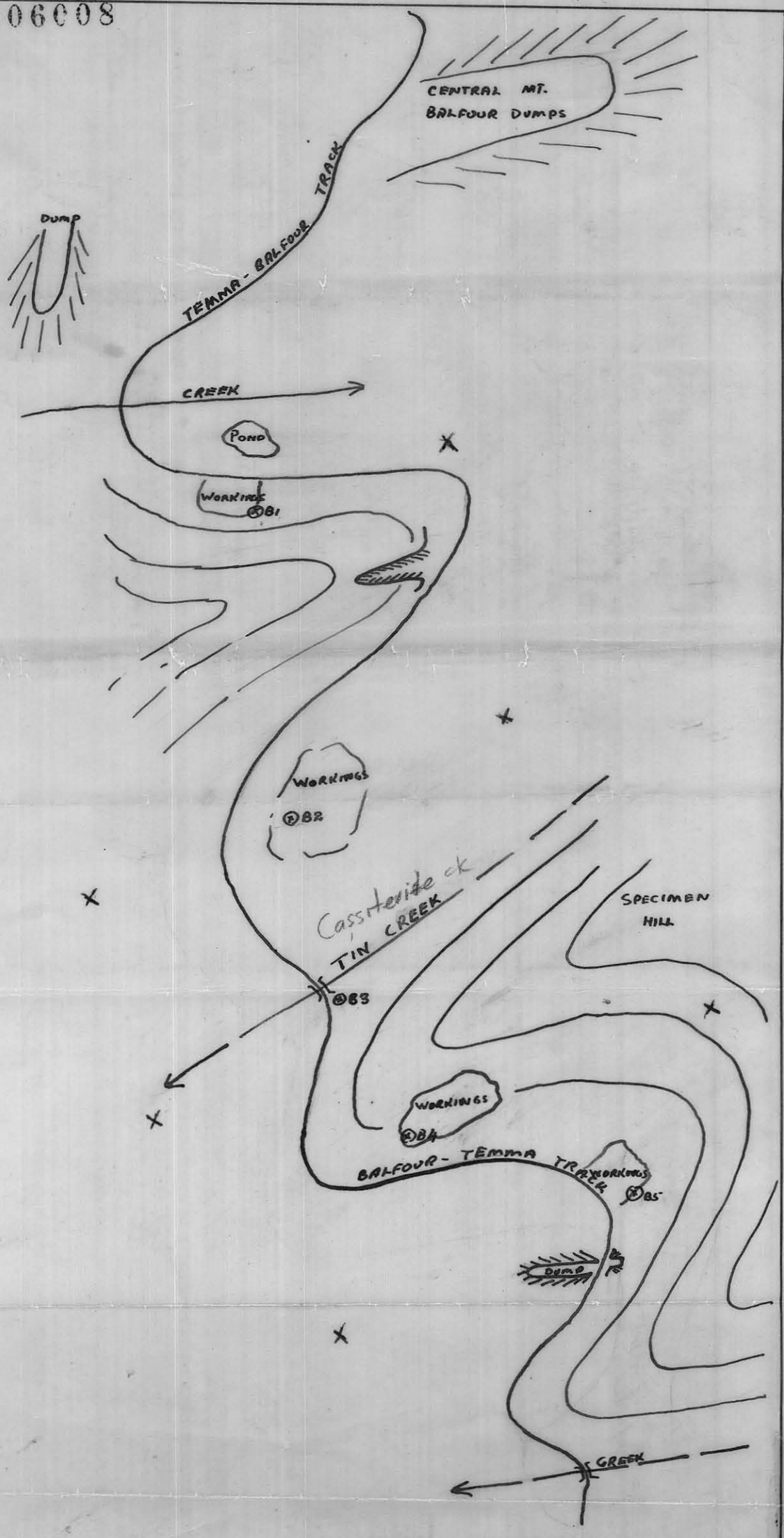
Notes: 1. I have used the word "alluvial" to mean alluvial and detrital.

2. Cassiterite = SnO_2=Tin Ore (Ward)="Tin" (casual usage)= Tin Oxide.

References: Peele R, 1956. Mining Engineers Handbook. John Wiley & Sons.
Ward L.K.1911, The Mt. Balfour Mining Field, Geol Surv. Bull.No10.
Hooper&Black,1953, Mining Methods in Aus. Aus. Inst. Min & Met.

J. F. Gilfillan.(Geologist)
Ass. to General Manager - Mining.
Renison Assoc. Tin Mines N.L.

006 306608



SKETCH OF MT. BALFOUR MINING AREA

APPROX. POSITIONS OF SAMPLES TAKEN 30·4·61.

NOT TO SCALE.