TR6-31-35

THE BALFOUR TIN FIELD

by W. N. MacLeod.

INTRODUCTION

The current favourable market for tin has stimulated a revival of interest in the Balfour mining field. At the request of a syndicate of Smithton business men, a visit was made to the area between June 28th and July 2nd, 1961, in order to make a general assessment of the potential of the field. The area is covered by Special Prospector's Licence 370 of 25 square miles held by the Balfour Mining Syndicate surrounding Lease 3M/60 of 80 acres held by G. A. John, a member of the syndicate.

PREVIOUS INVESTIGATIONS

A comprehensive description of the Balfour mining field has been given by L. K. Ward (1911) who visited the area during the peak period of both copper and tin mining. The field declined rapidly after 1918 and there has been virtually no production of tin for the past thirty years.

The field was visited by Q. J. Henderson (1935) and by D. E. Thomas and Q. J. Henderson (1943). The last report offered little encouragement for the revival of mining as the following extracts reveal:—

> "The youthfulness of the topography militates against the accumulation of large alluvial deposits. The alluvial deposits are practically confined to the valley of Tin Creek and some of its tributaries. The maximum depth of wash is nine to ten feet and it is reported that only the bottom two feet six inches is tin-bearing. Furthermore payable tin wash is confined to narrow gutters in these flats."

Referring to the detrital deposits, upon which the future of the field would appear to depend, Thomas and Henderson stated that:—

> "The total depth of these deposits is very small and generally does not exceed two feet in thickness. Even below the existing races, only isolated areas have been ground-sluiced, thus conclusively proving that only portions of these deposits

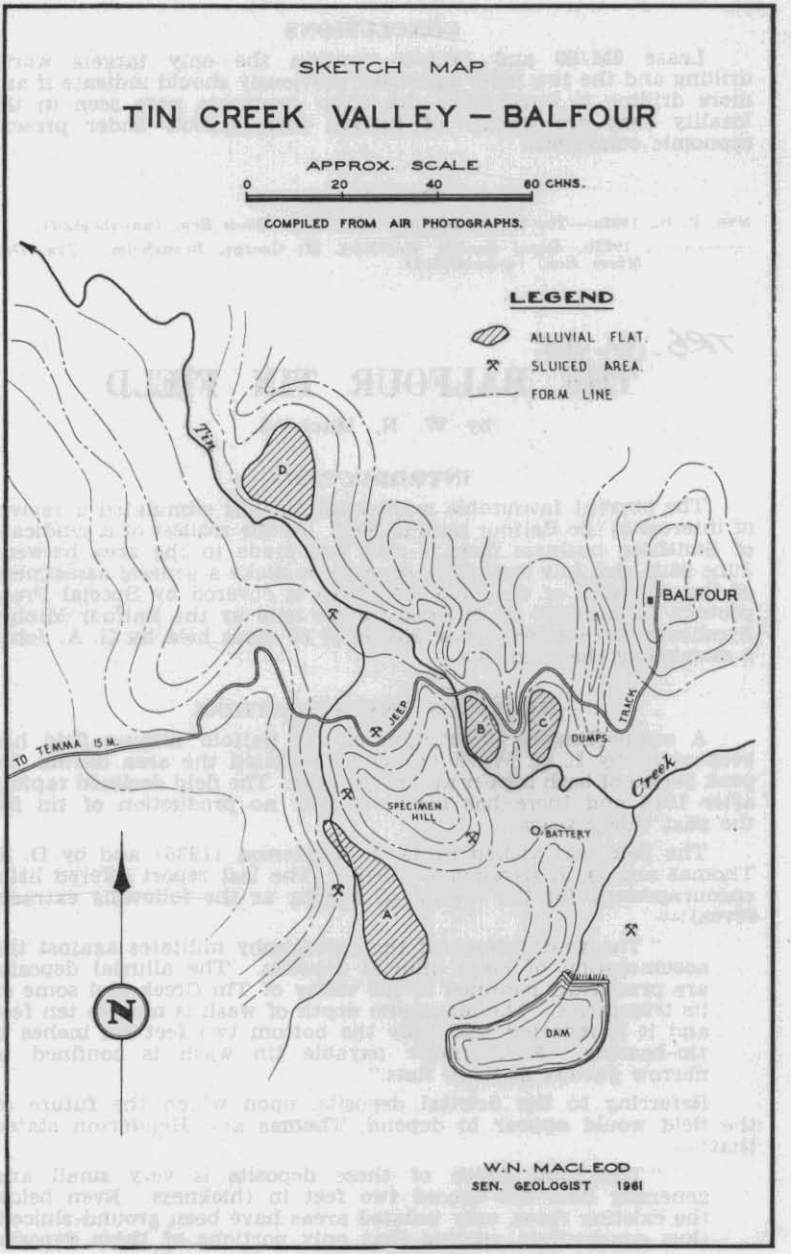
SKETCH MAP
TIN CREEK VALLEY – BALFOUR
APPROX. SCALE
0 20 40 60 CHNS.
COMPILED FROM AIR PHOTOGRAPHS.
LEGEND
ALLUVIAL FLAT.
SLUICED AREA.
FORM LINE
TIN
D
BALFOUR
JEEP
TRACK
B
C
DUMPS
TO TEMMA 15 M.
Creek
SPECIMEN HILL
BATTERY
A
N
DAM
W.N. MACLEOD
SEN. GEOLOGIST 1961

FIGURE 8.

5 cm

could be profitably mined. Above the races, small areas have been worked by sledging or barrowing to the races below. The richer patches mark the outcrops of the rich veins.

"The low average tin content of the detrital deposits and their shallowness, offer no inducement to formulate a scheme for large scale sluicing operations, particularly as water cannot be brought to Specimen Hill at an effective elevation by gravitation."

SUMMARY OF GEOLOGY

The Balfour district is underlain by quartzite and shale of possibly Precambrian age. These are strongly folded on north-westerly trending axial lines and are traversed by tin-bearing quartz veins which, although individually small and impersistent, occur in great numbers and appear to evince no definite pattern of trend or attitude. These veins are most abundant on and around Specimen Hill, and are the source of the alluvial and detrital tin deposits. Exposures of the veins are only to be found in sluiced areas but probably a great number more exist beneath the detrital cover. The small elevated plateau, which was the former site of Balfour township, is underlain by a residual of Tertiary basalt.

THE PRESENT INVESTIGATION

The present investigation had three definite aims. Firstly to study the nature and distribution of the detrital and alluvial deposits. Secondly to gain some idea of the range of tin values in the superficial deposits and thirdly, to delimit by scout prospecting areas of potential value which would merit close sampling for the computation of reserves.

The Detrital and Alluvial Deposits.—As noted by Thomas and Henderson, alluvial deposits are restricted in areal extent and relatively thin. The most promising areas are indicated on the accompanying plan (figure 8) and labelled "A", "B", "C" and "D" respectively.

Flat "A" appears to be one of the most promising areas in the district and merits close sampling. Tin-bearing veins occur in the sluiced area on the western side of the flat and on the flanks of Specimen Hill to the east. There is an ideal dam site at the south-western corner where the creek leaves the hills above the level of the flat. The detrital deposits overlying the low rocky ridges west of the flat carry tin values approaching 2 lb./cu.yd. and similar values occur in the lower south-western flanks of Specimen Hill. It seems a reasonable expectation that good values should occur in the flat itself. The values in the shallow creek alluvium further downstream near the road crossing are very low. The flat could be adequately sampled by about four lines of pits at five chain intervals aligned in an E-W direction, with pits at one chain intervals.

Flats "B" and "C" on the eastern side of Specimen Hill have been pitted but the holes were full of water at the time of inspection and could not be properly sampled. Rich values have been reported in Flat "B" and some locally rich zones, up to 2lb./cu. yd., were noted in areas north of the road.

Flat " D " appears to mark a former course of Tin Creek. From the topography it is inferred that the creek once flowed against the hills to the east and has since shifted its course to the west. This area appears worthy of closer sampling in the expectation of locating a buried lead or gutter beneath the alluvium. Three lines of pits, trending E-W at four chain intervals with pits spaced one chain apart should provide an indication of the value of the ground.

The most extensive detrital deposits occur on the summits and flanks of Specimen Hill. The detritus is between two and three feet thick on the average, although holes as deep as eight feet have been noted. It is usually overlain by about nine inches of peat and contains a high proportion of coarse quartzite fragments. About 20 samples from Specimen Hill were washed in the field and values ranged between 2 lb./cu.yd. to as low as a few ounces.

It is felt that the future of the field largely depends on the tin values in the detrital deposits of Specimen Hill. The entire hill should be sampled on a two chain grid. It is estimated that there are about 50 acres of untouched ground available. Assuming an average depth of two feet six inches for the detritus and tin values averaging 1 lb./cu.yd., the available reserves would amount to about 100 tons of tin. Assays of samples already taken from the eastern side of Specimen Hill average about ½ lb./cu.yd., and abrupt variations are encountered which presumably reflect the irregular distribution of the quartz veins in the hill.

The richest detrital deposits were located on the low ridge between Flats " B " and " C ", east of Specimen Hill. Tin values as high as 6 lb./cu.yd. were recorded over a limited area. Here the detrital deposits are very thin, less than two feet, and the reserves of this higher grade ground are very restricted. It is possible that other such rich areas exist south-east of Specimen Hill and further scout prospecting in this zone is recommended.

The Tin and Wolfram Veins.—The pattern of primary mineralization can be best observed in old workings on the summit of the western spur and the western flanks of Specimen Hill. Most of the tin-bearing veins are less than three inches wide and form an irregular open stockwork. There are local rich segregations of tin and wolfram but the writer is in agreement with earlier observers who considered the mineralization to be too dispersed to be of any economic value. The extremely sporadic nature of the mineralization offers no encouragement for exploration of the veins at depth.

CONCLUSIONS AND RECOMMENDATIONS

From the scout prospecting conducted by the writer, and the assay results available to date, the prospects of restoration of any large scale mining appear to be remote. Rich, but restricted, concentrations certainly remain which could profitably support small scale operations under the present favourable market conditions. Unfortunately, the reserves available within such zones are rather limited.

Advantages of the field are the cleanness of the tin concentrates and the ready washability of the coarse quartzitic detritus. Water supply should present no serious problem. The old dam south of Specimen Hill could be restored at comparatively low cost, or alternatively, smaller dams could be constructed along Tin Creek at a

number of points in the valley. Disadvantages, apart from the remoteness of the area, are the great variations in the tin values to give an average grade of less than 1 lb./cu.yd., and the wide dispersal of these values in a thin veneer of detritus over a hilly area.

The only practicable method of mining the higher ground of Specimen Hill would appear to be by wholesale stripping of the wash by bulldozer and moving it downhill to a level where water could economically be brought to bear.

Recommendations are summarized as follows:—

1. Pitting and sampling of Specimen Hill on a two chain grid.
2. Sampling of Flats "A" and "D" as outlined above.
3. Sampling of Flats "B" and "C" on a one chain grid and similar close sampling of the intervening ridge.
4. Scout prospecting of the area south-east of Specimen Hill.

In the writer's opinion the bulk of the available reserves should be revealed by the above programme, and no accurate assessment of the potential of the field can be made until the results of such sampling are available.

REFERENCES.

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