THE MINERAL RESOURCES OF THE AREA TO BE SERVED BY THE PROPOSED DEVIATION OF THE MOUNT CAMERON WATER RACE.

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1. OBJECT OF REPORT

This report is intended to convey in concise form a summary of our present information in regard to the mineral resources of the area which would be served by the proposed extension of the Mount Cameron Water Race.

The statements contained herein are based on the geological survey carried out by the late W.H. Twelvetrees in 1916 and described in Geological Survey Bulletin No. 25, together with the results of the recent observations made by the writer on the alluvial tin deposits.

2. NATURAL CLASSIFICATION OF THE MINERAL DEPOSITS OF THE AREA AND THEIR RELATIVE IMPORTANCE

To arrive at a correct conclusion as to the potentialities of the area from the mining standpoing it is necessary to classify the various types of deposits and determined the inherent value of each.

There are only three metals developed to any appreciable degree in the area, namely, tin, tungsten and gold.

The deposits of these three metals are in two forms - lodes and alluvial.

(a) LODE DEPOSITS.

(1) TIN

These are not developed to a very great extent. The quartz lodes carrying tin, together with the tin-bearing greissenised zones at the Fly-by-Night, are the most important. Another thin quartz lode carrying rich tin in patches occurs above the Race level up Steep Creek.

The importance of the Fly-by-Night deposits on Daw's section (1998 -M) Lies in the existence of the soft greissenised tin-bearing patches which could be worked by water under sufficient pressure. The proved amount of hard tin-bearing stone requiring battery treatment is so small as at present not to warrant consideration.

(2) TIN AND WOLFRAM

One tin-wolfram lode is known to exist, namely, on Fleming's section (8591-2-M), but the evidence available throughout the field is conclusive that appreciable quantities of wolfram do not occur in this district. The absence of wolfram from the alluvial deposits is significant in this connection.

(3) GOLD

These lodes occur in the vicinity of Gladstone township and are fully described in Bulletin 25.

The experience on these lodes shows that they are very patchy and inconsistent in value and this observation, added to that which shows that this belt is not in association with the granodiorite rock from which the gold deposits of Tasmania are practically derived, indicates that the gold deposits cannot be expected to be very important.

(b) ALLUVIAL DEPOSITS

(1) TIN

Shallow Ground - This type of deposit consists of the surface soil together with from 2 to about 6 feet of detrital or alluvial material carrying tin.

Deep Ground - This consists of from 6 feet upwards of alluvial material which may contain one or more layers carrying tin. Generally the tin is in the bottom layer of wash, but in many cases may be distributed over as much as 6 feet or more of the alluvial.

Both the shallow and deep ground are of value, and these deposits are the most important in the field, and it is from them that the mineral output of the district must be looked for in the future as has been the case in the past.

(2) GOLD

In the alluvial immediately west of the Gladstone township some gold has been found associated with the tin, but the amount does not warrant any consideration in connection with the present proposal.

3. THE GENERAL CHARACTER AND POSITION OF THE ALLUVIAL DEPOSITS IN RELATION TO THE METHOD OF EXPLOITATION

The alluvial deposits, although containing rich patches, may be regarded as being too-low grade to permit of any other method of working, under modern conditions, than either hydraulic sluicing or dredging. The tin content of payable ground ranges upwards from the vicinity of ½ lb. of tin per yard.

The location of the deposits, however, on the slopes of hills and only exceptionally on river flats limits the method of working to that of hydraulic sluicing.

4. THE RELATION OF THE METHOD AND EXTENT OF WORKING TO THE WATER-SUPPLY

The alluvial tin deposits in the area under review are so situated as to have very little water-supply available in their immediate vicinity for their treatment. The catchment area of the creeks above the deposits is small and the rainfall not more than 35 inches. These conditions, combined with the fact that the topography makes dam construction very difficult, have resulted in the position that in only restricte areas has it been possible to work the alluvial deposits by hydraulic sluicing under gravitational pressure. Not only so, but when this has been attempted it has been confined, owing to the low pressure available, to the shallow ground or the very richest deeper ground.

In the case of the old Perdue Mine in the vicinity of Watts' present section water was pumped from the Ringarooma River and sluicing carried out on a considerable scale.

The position then summed up is that it has not been possible to work the greater part of the tin-bearing alluvial deposits in the area under review owing to the absence of a sufficient volume of water under adequate pressure. The experience on the eastern side of the Ringarooma River has been that the availability of the water from the Mt. Cameron Water Race has enabled considerable areas to be worked which otherwise would have lain idle indefinitely.

It may therefore be accepted that the existence of a supply of sufficient water under suitable pressure is a sine qua non to the working of whatever deposits of alluvial tin exist in the area under discussion.

5. THE EFFECT OF THE MANNER OF DISTRIBUTION OF THE TIN ON THE TYPE OF ORGANISATION FOR WORKING THE DEPOSITS

The alluvial tin deposits are characterised by irregularity and discontinuity of occurrence and by great variation in tin contents. These facts make it impossible to lay out surface works sufficiently concentrated to embrace in the operations sufficient ground to warrant the capital expenditure involved.

The result is that better results will undoubtedly be obtained by the exploitation of the deposits by individual miners or by groups of two or three miners working as a party, rather than by the formation of companies large or small. It must be realised in this connection that the average miner will, perhaps unconsciously, work far harder for himself than for a company.

6. THE TYPE OF MINER RESIDENT IN THE FIELD - HIS EQUIPMENT AND CONDITIONS OF WORKING

As the result mainly of the existence for many years past of the Mount Cameron Water Race, there has developed in the Gladstone district a population of miners of a type very valuable to the State. Skilled in the art of hydraulic sluicing the miner has gradually acquired an outfit of pipes, nozzles, etc., which by using the water from the Government Race enables him to efficiently work very low grade alluvial deposits. The result has been a satisfactory monetary benefit to himself and an appreciable augmentation of the tin output of the State.

The alluvial ground on the eastern side of the River has been nearly exhausted, and although still in possession of their equipment, many of these miners, although willing to tackle the ground on the western side, are unable to do so owing to want of water. It is my opinion that these miners, if operating in their own way with the plant already in their possession, will far more efficiently work the type of alluvial ground in the area under discussion than any company. The independence and freedom associated with work under such conditions is regarded by these miners as possessing a definite value and the dominating idea of a basic minimum wage does not exist.

7. THE AREAS CONTAINING ALLUVIAL TIN DEPOSITS

(a) BELOW THE LEVEL OF THE PROPOSED RACE.

(i) Not Served by Existing Race.

A. This area is situated north of the Ringarooma River and south of the proposed branch of the deviation. A very large part of it has been worked by the Purdue Company and others by pumping, and to a lesser extent by storm waters. The general evidence, however, goes to show that in all probability there are appreciable areas of alluvial deposits carrying sufficient tin to induce individual miners or parties to work them.

B. The southerly portion of this area is rather an unknown quantity although some work done years ago has demonstrated the existence of tin-bearing alluvial. The Northerly portion, however, especially that towards the blue area marked, is known to carry good tin-bearing alluvial. This portion of the ground is nearly at the same level as the Gladstone township, but will have at least a 70 feet head from the new race. There is undoubtedly here a valuable area of workable ground at places practically untouched, shallow in portion of it but becoming definitely deep ground in the northern portion at least.

C. In addition to the area thus marked and continuously colored red in the plan herewith two small areas occur to the east which may be best treated of at the same time.

In Daw's area the tin-bearing ground, as previously pointed out, must be considered at present as restricted to the softer greissenised portion of the granite. There exists an appreciable quantity of this material and an appreciable amount of tin could be obtained by sluicing under the 70 feet pressure which would be available from the proposed race.

The remainder of this area marked "C" consists of a considerable amount of shallow ground carrying workable tin values together with a varying and unknown amount of deeper ground. Some of the shallow ground and a portion of the deep ground have been worked but considerable areas still remain. In fact in this area it cannot be said that anything approaching 50 per cent of the tin-bearing ground has been worked. The more thoroughly worked area at the head of the Fly-by-Night Creek has been left blank in the map and is not included as available tin-bearing ground. Lower down the Fly-by-Night Creek, however, there still remains an appreciable amount of tin-bearing alluvial and this is included in the above area.

(ii) Partially Served by Existing Race.

D. The area marked blue in the accompanying map has been in the past and still is being worked from the existing race, the water being brought across the Ringarooma River by means of a privately owned syphon. The deepness of the deposit, however, calls for a greater head and volume

of water than is thus available and the amount of ground still remaining to be worked, which is considerable, could be much more efficiently dealt with if the additional 70 feet head were available which would reult from the proposed deviation.

It may be stated, in fact, that the most southerly portion of this area marked "D" could only be really satisfactorily worked from the proposed deviation of the race.

(b) ABOVE THE PROPOSED RACE.

E. This area is marked by parallel vertical red lines. Its extreme southern end is on the race level, and in fact the dam put in by Watts would be fed by the continuation of the proposed deviation. The whole of the area can only be worked with this water by pumping it.

From the dam northwards there is an alluvial deposit carrying good tin values which extends across the main road to the ground proposed to be worked by Higgs, also by pumping. The area of this patch of alluvial is approximately 50 acres. It is undoubtedly a valuable area to be worked by individual miners if sufficient water is available. It has been well prospected on the southern side of the road.

Watts' area has a maximum height of 150 feet above the Race, while Higgs' ground is 250 feet above the same level.

F. This area lies above the 6-mile peg of the proposed deviation. It contains many existing or old workings but the water rights which represent quite small amounts of water are in the hands of one or two individuals who use it when available to work their own ground. There is undoubtedly ground here which could be worked if more water were available.

(c) BELOW POSSIBLE FUTURE EXTENSIONS OF THE RACE.

G. This area has not been much prospected because no water has been available to treat it. I am of the opinion, however, that the greater part of it contains alluvial tin deposits. It is quite possible, however, that as the granite contact is approached workable deposits will be located.

H. Very little prospecting has been done on this large area because of the absence of water. It is clear, however, that this area does carry valuable tin deposits. One of these, originally known as the "Native Lass" was worked years ago and good values occur in their old ground. The extent of this alluvial on the Native Lass plain is not known but there is every reason to believe that it is considerable.

It should be remembered in this connection that the probability of obtaining good tin values increases as the granite contact is approached. In the area marked "H" there is a valuable area for future prospecting designed to locate deposits which with water available would be workable by individual miners.

(d) ABOVE POSSIBLE FUTURE EXTENSIONS OF THE RACE.

I. At a height of from 20 to 80 feet above the level of a possible future extension beyond the 6-mile there exists

good payable ground, portion of which is held as 5-acre blocks by G.F. Reid. Its exact limits have not been determined but it is certainly of appreciable area and worthy of attention.

8. THE POSITION IN REGARD TO TESTING THE GROUND BY BORING

In order to make anything approaching an accurate determination of the area of ground available and the tin contents thereof, accurate surveys would be needed accompanied by systematic boring. The irregularity of the distribution of the tin, however, would necessitate the placing of the bores at very close intervals. To thus test the whole of the ground would involve a considerable expenditure.

Boring tests have been made on certain properties for companies, but it must be remembered that results discouraging to a company may under the conditions explained above indicate to the individual miner an area of ground justifying his working it for several years.

The expenditure on boring these deposits completely would be so high that the desirability of otherwise approximately estimating the general possibilities of the area is apparent. This estimate the writer feels justified in making after a study of the deposits actually disclosed and taking cognisance of our knowledge of the general conditions of deposition of the tin in the district.

9. THE EFFECT OF THE CONSTRUCTION OF THE PROPOSED DEVIATION

Taking all of the aspects and facts discussed above into consideration, the writer feels justified in stating that in the area to be served by the proposed deviation there exists deposits of tin-bearing alluvial in such quantities as ro keep a considerable number of miners employed for some years. This will only be possible, however, if water is available from the Government Race.

There would thus be assured a continuance of an appreciable output of tin from the Gladstone district which otherwise would seen cease production completely. In addition, there will be assured a definite continuance of the opportunity for a valuable type of miners to apply their labour and plant in the production of tin to the benefit of both themselves and the State. The remaining desireratum, viz., the existence of a sufficient area of tin-bearing alluvial can, in the writer's opinion, be relied upon.

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