

Mines Department,  
Hobart, July 6th, 1931.

Memorandum for

Secretary for Mines,  
HOBART.

In compliance with instructions per your memorandum of the 8th April last, I made an investigation into the question of the advisability or otherwise of providing a State battery to assist the gold mining industry. The localities visited were Warrentinna and Forester, Lyndhurst Gold mining areas, also Alberton and New River Fields.

#### WARRENTINNA-FORESTER DISTRICTS

The Warrentinna and adjacent fields were a scene of activity many years ago when a number of stamper batteries were erected and productive work was in progress on the numerous quartz reefs which occur in these localities. As time went on mining dwindled and finally ceased altogether.

Something in the nature of a revival took place in more recent years at Warrentinna but was not maintained.

All traces of former mining activity have disappeared save for abandoned shaft workings and surface excavations scattered over the fields which now for the greater part is used for pastoral purposes.

A more or less continuous belt of auriferous country extends from a few miles north of Branxholm to Waterhouse near the sea coast roughly a distance of 15 miles. Practically the whole of this belt of country has been extensively prospected in past years and wherever any quantity of gold bearing stone had been opened up crushing plants were erected to treat it. The results achieved were not in any instance satisfactory enough to warrant a continuity of operations.

The chief factors detrimental to economic work are:-

- (1) The smallness of the veins
- (2) The low average gold content

A good deal of information respecting the general and geological features of this belt of country is contained in departmental records, consequently it is not necessary to refer herein to any features relating thereto, other than those directly concerned with its immediate possibilities as a potential gold producer.

The scope of this report is confined solely to that aspect of the fields.

Some few months prior to my recent visit there, towards the end of last month, when discussing the prospects of the field with residents who had been actively associated with mining and prospecting on the field extending over a good number of years were of the opinion that if crushing and dressing appliances were made available to miners to enable them to treat the gold bearing quartz awaiting exploitation that remunerative employment would be found for a number of men by raising quartz for crushing from the various reef occurrences. These men expressed themselves as being convinced

that any proposal having for its object the treatment of ore available, if put into effect would be successful in resuscitating productive gold mining activities in the district.

On my return there towards the end of May last for the purpose of making a special investigation and report in compliance with the direction of the Hon. the Minister for Mines I found a complete reversal of opinion on the part of those prospectors who a short time previously were advocating provision of a Stamper battery. During the intervening period of my visits these prospectors had made further investigations which apparently satisfied them that the prospects offering in the shape of payable reefs were not sufficiently encouraging to warrant the installation of crushing and saving appliances.

The attached copy of a report dated 25/6/31 received from two prospectors in receipt of sustenance allowance speaks for itself. These men live in the district and have been in close association with mining all their lives. They were granted sustenance allowance for a period of two months. The report is the final one received, and can be regarded as a true summary of the position from a prospector's point of view.

These, however, are not the men to whom I referred previously in this report.

Disregarding the opinions expressed by miners and others interested in the possibilities of the field the position as it exists today is that:-

- (1) No development work of any description is in progress on any of the reef deposits.
- (2) All known outcrops of quartz have been tested and abandoned in most cases 50 to 60 years ago.
- (3) The gold bearing reefs are small not exceeding on the average a thickness of 6 inches.
- (4) Facilities for mining are not favourable for cheap work owing to the fact that in the great majority of cases their exploitation would necessitate shaft workings and provision for pumping to keep them drained.
- (5) There are no known reef outcrops that can be regarded as payable under the conditions of working if a crushing and treatment plant was available to deal with them.

#### METALLURGICAL DIFFICULTIES

An important aspect which cannot be disassociated with any proposal to deal with the quartz reefs of these districts is that of treatment for recovery of the gold.

The upper portions of the reefs owing to meteorological agencies, as a rule are well oxidised, rendering any contained gold "free". That is by simple crushing and concentration it can be separated from the gangue. At a comparatively shallow depth from the surface weathering influences have no effect and it will invariably be found that iron and arsenical pyrites are associated with the vein stone as accessory minerals. The gold as a rule is in close association with these minerals rendering their separation a problem calling for special treatment common to practically all gold ores.

Some of the gold may be free but usually the larger proportion is inseparable from the sulphidic component of the ore without special treatment.

Simple battery processes would, therefore, recover only portion of the gold, the remainder according to the character of the ore would be concentrated with the pyrites.

Whether the "free" gold present would be sufficient to pay for mining and concentration costs on treatment or not, it would be decidedly an unsound and uneconomical policy to let the pyrite concentrate run to waste or even stack it for future treatment.

From what knowledge we have of the quality of the stone in the districts a high percentage recovery of the gold it contains would be essential to success, under any conditions or facilities for treatment that may be provided.

A portable stamp battery would not meet the requirements in that respect even if all the gold present was free.

Under the most favourable conditions a high percentage of loss will occur in simple battery and amalgamation practice of gold ore. Supplementary treatment of the sands is necessary involving classification, regrinding and re-concentration is indispensable to ensure a reasonable percentage extraction of gold and finally cyanide treatment of the sand residues.

In the case of a field where rich stone is plentiful and easily mined and the miners can afford to disregard losses, is quite a different question to one that confronts gold mining problems on the fields under review where losses on treatment on the best grade ore available would render operations unprofitable.

It may be asserted by persons interested in the industry that the presence of a battery on the field would stimulate work and encourage miners to give more attention to the known reef occurrences, but the fact must not be ignored that as already stated stamp batteries have been installed in numerous places on this gold belt under conditions of workings which by comparison were more favourable than those prevailing at the present time.

When recently in the district I took samples from a number of reef occurrences and submitted them for assay to the Mines Department Laboratory, Launceston. The results proved that the average grade of stone is considerably below being payable even if operated under most favourable conditions of mining and treatment.

Until more encouraging prospects are apparent, there is nothing to justify provision for a portable or stationary stamp battery for use of miners and others in these districts.

#### ALBERTON-NEW RIVER DISTRICT

In view of the activity being displayed in the Alberton-New River districts in the mining and treatment of stone from various holdings the question of providing facilities for crushing and treatment to assist those engaged in the industry who are without means of treating their ore is worthy of special consideration.

In the Alberton district there are two plants capable of dealing with gold ore.

These are the Ringarooma United Mine plant on the north part of the field and J.A. Sowell's towards the southern part. The former is equipped with concentrating

tables as well as the usual saving appliances whilst the latter is at present dependent upon the amalgamating tables only for recovery of gold.

The Ringarooma United Mine battery has recently treated several lots of stone mined from various claims in the neighbourhood.

Cartage and treatment costs for small lots would necessarily be heavy and impose a severe handicap on productive work.

The number of claims which can produce intermittent small lots of stone are very few but with better facilities for treatment probably more activity would be shown. On the present prospects of the field, however, there is nothing to justify the hope that a marked revival of the industry is likely to eventuate unless developmental work on a comprehensive scale is undertaken.

On the New River Field which is situated several miles northerly by road from Alberton more work of a productive character has been commenced. A number of reefs on parallel formation occur on Krushka Bros. Mine also on Singline's Claim. Trial samples treated at the Ringarooma United Mine battery prove that bulk lots of the ore contained gold in payable quantity.

There is, however, no reserve of stone opened up and the work being carried out is in the nature of developmental operations.

The reefs vary in width up to 20" occurring in the form of lenses of limited extent.

Unless a crushing and dressing plant had been available to those engaged in reef mining they would not have continued their operations, although up to the present a small tonnage only has been sent to the Ringarooma United Mine for treatment.

Regarding the question of providing a portable battery for the Alberton-New River district, there does not appear to be sufficient stone developed to warrant it at present although the prospects are encouraging.

The small parties actively engaged in the production of payable stone are deserving of some help and better facilities for dealing with ore mined from their claims. I consider that it would be more advantageous to assist them in that respect for the time being than to provide a portable battery. If the developments continue along satisfactory lines further consideration could be given to the question of providing a crushing and concentrating plant at a later date.

STATE MINING ENGINEER

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REPORT OF T.B. DUTTON AND R.O. REEVE, SUSTENANCE PROSPECTORS  
WARRENTINA-FORESTER GOLDFIELDS

Dated 25th June, 1931

"Some of the reefs mentioned in the previous report. We have done a good bit more cross cutting and sank deeper on them but they did not improve, then we put in a week in around Warrentina in Mt. Horror district.

I showed Mr. Scott everything I knew of in the gold line and old workings and he took several parcels of stone away with him. I have not heard the results of them.

Three parts of Mt. Horror, the north east side and south east side is slate and sandstone, most of it is heavy scrub and the only thing we saw of any value on that portion is splitting and milling timber. The west side of the Mount is granite stone. We found a few tin specimens on the top of Mt. Horror but owing to the low price of that ore we did not bother much about it as there is a patch of tin ground on the north western fall of the Mount towards the Tomahawk River, but it is no good at the present price as the water would be the draw back.

In the dolly pot we crushed a lot of various samples out of the outcrops of reefs that we passed over but we could get no trace of Gold only iron pyrites, copper pyrites and silver.

As far as I can see on this field there is nothing that I could recommend at all. The Renown reef is the only one worth spending anything on and the Warrentina Gold Field has had a good trial with several Companies and my opinion is they have got all out of it that is worth getting in the gold line, so I do not think that the old prospectors have missed too much on this field.

We tried our best to find something worth while reporting but to our sorrow failed."

(Signed) T.B. Dutton for

T.B. Dutton and  
R.O. Reeve