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BORING CAMPAIGN IN THE GLADSTONE DISTRICT 1953

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The earliest official report on the area in the vicinity of Gladstone, with reference to its tin production, is one by G. Thureau F.G.S. published in the year 1881. There is no doubt that the tin field was known prior to that date for Thureau refers to an output of 1,500 tons of concentrates shipped from the Port of Boobyalla in the year 1880.

In a previous report, written in the year 1946, on the Eddystone Quadrangle, a full list of the reports, both published and unpublished, dealing with the Gladstone district was prepared. It is not proposed to rewrite that list but some references will be made.

The earlier writers, Thureau, Montgomery, Twelvetrees, and Nye have established the trend of the various tin bearing leads of the district, all of which have at times been worked. In the early years of operations the tin was won by ground sluicing assisted at times by water under pressure. The water pressure was low for the operators depended for their water supply on small dams built in the creeks close to the scene of operations. Work was not continuous and depended on the current rainfall.

At a later date some of the higher ground was worked by water supplied by the Empress Company. This water was raised by pumps, driven by a water wheel, from the Ringarooma River to the Empress dam at an altitude of approximately 300 feet above the river. From the dam the water was distributed by race to various sites. This mine operated until the pumping plant and water wheel were destroyed by floods.

The construction of the Mount Cameron Water Race assisted the industry considerably and enabled many operators to work areas below the level of the race. With the exhaustion of these areas the higher ground, known to be tin bearing, could not be worked without mechanical means of pumping.

Steam power was tried by the Star Hill Syndicate but was found to be uneconomic. With the introduction of electric power to the district the same syndicate was able to resume operations and has continued working.

It is worthy of note that in 1906 the General Manager of the Cybele mine recommended to his Directors that a pumping station be erected on the Ringarooma River to deliver water to approximately the same area that is now being worked by the Star Hill Syndicate.

In recent years the introduction of Diesel Engines as the source of power for pumping has assisted the industry by making water available for the treatment of areas far removed from the Mount Cameron Water Race.

In his earlier reports and plans of the district Thureau shows that many prospecting shafts were put down to test areas within the field. It was not until the year 1901 that official recommendations for boring were made. In that year W.H. Twelvetrees suggested that some sixty bores be put down to determine the course and grade of the Mussel Roe lead to the east and north of Gladstone. Although this boring was done in the year 1902 the official records were not published until the publication of Geological Survey Bulletin No. 25 in the year 1916.

Six lines of bores, totaling 87 bores, were completed but few of them showed wash of economic grade. They served however to show the existence of deeper gutters under the surface. The bores varied considerably in depth to a maximum of 114½ feet.

Since the year 1902 several boring campaigns have been carried out on behalf of the Government to further the development of the field. Perhaps the chief campaign was that carried out under the supervision of Mr. H.T. Roach in the years 1916 - 17. During that time some 530 bores were completed the area covered extending from the vicinity of Amber Hill to the Edina and thence to the MacGregor Mine. This campaign was directed more towards the proof of extensions of known leads than to the discovery of new occurrences and served to prolong the productive lines of some of the then existing mines.

In the year 1937 further boring was carried out when 53 bores were completed on the Amber Hill Leases to prove the presence of a narrow lead of tin bearing wash.

An extended boring campaign was carried out during the years 1935-44 on what is known as the Northern Plains. A considerable area was systematically tested to prove the existence of a deep channel of tin bearing gravels.

The foregoing boring has been completed on behalf of the Government but there have been numerous occasions when boring has been carried out by individuals and by companies operating on leases or prospecting areas already held or on areas over which options have existed.

The positions and records of most of the foregoing bores have been shown on a plan prepared to accompany a previous report, written in 1946, on the Eddystone Quadrangle. For purposes of that plan the work was on a small scale but references can be made to the large scale plan from which the composite plan was prepared.

During investigations into the tin potential of several sections of the Gladstone district it became evident that certain areas could be tin bearing and recommendations were made that boring may prove these areas to contain tin bearing wash of an economic grade. Detailed plans of the areas were prepared and a campaign for boring was formulated.

Examination of the producing mines and the old workings of the field made it evident that, almost without exception, the tin bearing leads were narrow, and that any campaign for boring would necessitate the close spacing of the bores. Without this precaution existing leads would be missed.

It was decided, after consultation, that bores would be placed at intervals of one chain along the lines of bores. Should any bore prove wash of an economic grade other lines of bores would be placed four chains distant and that boring on these additional lines be confined to the area in close proximity to the high grade bores of the first line.

Boring was commenced on 28th April and was continued until 8th December. During that time 278 bores were completed for a total footage bored of 5,280 an average of 31 feet per day.

Five separate areas were selected for testing by boring. These were as follows:-

The Mussel Roe River Area

Echo Mine or Hardwick Creek Area

Native Lass Area

Dryden Creek to Alhambra Creek Area

South Mount Cameron Area.

THE MUSSEL ROE RIVER AREA

The first area selected for testing is situated on the Mussel Roe River and extends from a point about a mile north of Brown's Bridge, the river crossing with the Gladstone-Ansons Bay road, to a point about two miles south of the bridge. Some prospecting had already been done on the area and old workings, the Garfield and Cybele Mines, occur just outside its south-western limits.

At the time boring was first recommended there were no operating mines on the area but when boring commenced Messrs. Park, Richardson and Groves were operating in ground ranging to 15 feet in depth and yielding approximately 12 oz. of concentrates p.c.y. Their mine is situated about a quarter of a mile south from the Ansons Bay road.

Boring was commenced on 28th April at a point half a mile south from the Gladstone-Ansons Bay road and 116 chains west from the River. The Mount Cameron Water Race passes the site about 150 yards to the west. The first bore was on flat country, bounded by low ridges to the west and north, which extends easterly for about 12 chains. Bores were spaced at intervals of one chain on a line trending easterly. Rising ground was met between bores 12 and 13. It soon appeared that the line selected would pass through the leases of the operating mine. It was, therefore, decided to move further south. From the high ground at bore 16 the line was taken southerly. At a distance of 10 chains from bore 16 a bore was placed in the middle of another flat area. The line was continued in a southerly direction over a low ridge till a further flat area was met. Bore No. 20 a distance of 23 chains south from bore No. 16 is the starting point of the second section of the easterly line of bores which was continued to and beyond the River.

At a distance of 13 chains from bore No. 20 a creek, trending in a north-easterly direction, crosses the bore line. The side lines of a 10 acres lease cross the bore line between bores 28 and 29 and again between 38 and 39, the southern boundary of the lease being parallel to and half a chain south from the bore line.

Easterly from the eastern boundary of the lease the ground again rises to form a fairly wide ridge, trending northerly, at a height of about 30 feet above the flat. The ridge has a gentle fall to the east till at bores 52 and 54 it falls sharply to Garfield Creek, the level of which is 73 feet below the ridge.

Deep ground was met on the ridge and clays and gravels to a depth of 58½ feet were cut.

In Garfield creek the gravels were tin bearing but were shallow the depth of gravels being 13 feet and the grade of wash 6.5 oz. p.c.y.

To the east of Garfield creek a second comparatively high ridge was crossed rising to a height of 30 feet above the creek. The cross section of this ridge was similar to that of the first one in that chiefly clays and a little gravel were met.

To the east of this ridge the Mussel Roe River flat occurs and extends easterly to the river.

A total of 90 bores were completed on the main line of bores. Until Garfield creek was reached none of the 50 bores then completed had been tin-bearing. At Garfield Creek two bores proved tin-bearing wash. To the east of the creek barren high ground was crossed. At bore No. 61 a distance of 72 chains east from the datum the Mussel Roe River flat was met. This flat is 31 chains in width and terminates at the eastern bank of the river. The flat is heavily timbered with Gums, Wattle and Dogwood and is subject to frequent flooding during the wet season. Some of the floods of the season just past reached depths of four feet but there is evidence that at times the flood waters are much higher.

On the river flat four bores showed grades ranging to 10 oz. p.c.y. and on the higher ground to the east of the river two more bores showed an appreciable grade of tin.

Of the 90 bores completed on this line only eight were tin bearing the maximum grade recorded being 17.7 ozs p.c.y.

As some of the bores on the river flat were tin-bearing it was decided to commence a second line of bores limiting its length to prove only extensions of the tin-bearing wash already shown. The second line of bores was commenced at a point four chains north of Bore No. 82 and within two chains of the eastern bank of the river. From this point the line was continued westerly, across the river, for a distance of 22 chains but there were only two bores which proved tin bearing wash.

A third line of bores was then placed at an interval of four chains south from the original line. The line commenced on the flat country the first bore No. 107 being four chains south from bore No. 65 and succeeding bores being placed to the east to and across the river. Only two of the bores showed tin bearing wash.

The positions of the bores which showed tin bearing wash are not such as to suggest the occurrence of tin bearing leads on the river flat and the grade of concentrate won is too low to be regarded as definitely of an economic grade being only 5.0 oz. p.c.y. with the highest grade one of 10.1 oz. p.c.y.

With close spaced bores there is little possibility of having missed wash of a higher grade and it is felt that further boring would not improve the average grade.

At Garfield Creek two bores in the original line of bores showed tin-bearing wash. It was therefore decided to put additional bores in that area.

Four chains south of the original line of bores

a second line containing six bores spaced at half chain intervals was placed across the creek. Of these six bores two proved tin bearing wash.

Two chains to the north of this line, and two chains south of the original line of bores, four bores were placed on a line crossing the creek. Of these bores two proved tin-bearing wash.

Four chains to the north of the original line of bores a line of five bores crossed the creek and three of them proved tin bearing wash.

From the eastern end of this last line of bores four bores were placed across the creek in a northerly direction. Three of these bores proved tin bearing wash.

Boring in Garfield Creek has shown the presence of tin bearing wash over a length of eleven chains along the creek and over an average width of 1.2 chains.

The grade of the wash proved by these bores varies from 1.9 ozs. p.c.y. to a maximum of 30.7 ozs. p.c.y. with an average grade, calculated to 70% Sn, of 6.6 oz. p.c.y.

The average depth of the ground is 14.4 feet.

In the area proved at Garfield Creek the quantity of concentrates available, calculated to 70% Sn, would be 5.5. tons but there are possibilities of further extending the area by boring, particularly down stream in the creek.

At the head of the creek the old Garfield workings are situated and the Star Hill Syndicate is pperating close to the head of the creek.

The cross section along the bore line shows that the tin bearing gravels are of late Tertiary age for they have been deposited in the bed of a stream cut into the earlier Tertiary clays.

The map prepared in 1946 for a previous report has been revised and brought up to date to be included with this report. On it has been recorded all the information at present available.

To the north of Mount Cameron and extending from the foothills of the Mountain, to and beyond the Ringarooma River, extensive plains occur. On these plains mining operations have been carried on at many points and it has been a general belief that these plains would eventually prove productive of tin.

As a means of testing the area lines of bores were placed on three selected sites as follows:-

(1) Echo Mine or Hardwick Creek Area

(2) Native Lass Area

(3) Drydens Creek to Alhambra Creek Area.

ECHO MINE OR HARDWICK CREEK AREA

The first area to be tested on the plains to the north of Mount Cameron was the flat country in the vicinity of the Echo Mine Workings. When the Echo Mine was operating the results must have been favourable for the Mount Cameron Water Race was extended to supply that mine and others in the district with water.

The old workings show a face of about 15 feet to the granite bottom into which tail races have been cut for an additional eight feet. Prospects taken from the face showed fair results.

Boring was commenced to the south of and within a chain of the edge of the Echo Mine Workings. The first bore was bottomed at a depth of eighteen feet for an average grade of 3.6 oz. p.c.y. A band of hard cemented sand, two feet in thickness, was passed through from 2½ to 4½ feet from the surface and from that depth to the bottom tin was fairly evenly distributed. Below the cement band there is a band of dark brown sand 3½ feet thick. Four feet of white sand with a little clay occurs before passing into a further four feet of white drift and wash.

The bottom two feet of the bore, though containing some wash in the sample, is mainly a white clayey gravel which could be the decomposed granite bottom.

The line of bores was placed on a bearing of 300 degrees and for a distance of eight chains the interval between bores was maintained at one chain. With a falling off in grade the interval between bores was widened to two chains. After completing thirteen bores an additional bore was placed on the low lying flat adjoining Hardwick Creek.

Except for the first two bores, which yielded 3.6 oz. p.c.y., the results were generally disappointing.

Boring was then continued on the backward continuation of the bore line towards Echo Creek with bore No. 15 being one chain to the south east of bore No. 1. It was expected that these bores would at least be equal in grade to Bores Nos. 1 and 2 but results were disappointing.

A second parallel line of bores was placed four chains south of the first line the datum being four chains south of Bore No. 16. To the westward the wash was barren but to the eastward grades of 3 oz. p.c.y. were met.

A northern line of bores through Bore No. 18 showed grades of from five to six ounces p.c.y. but it must be recorded that the tin was here confined to the surface sand and did not persist to depth.

In this area therefore it is to be expected that future prospects are negligible.

As a continuation of this programme boring was continued to the south of the Gladstone-Boobyalla road across Echo Creek. Fifteen bores were put down in this locality but all failed to reveal an economic grade of wash.

Boring in the Echo Mine area has shown that some

tin, doubtfully of an economic grade, occurs in the surface sands near the old workings, and particularly in the persistent layer of brown sand which occurred throughout the area bored. The brown sands vary in thickness from one to nine feet their upper limit being within two feet of the surface. The highest grade did not exceed 6 oz. p.c.y.

The sands are fine in grain size and appear to be sea sands deposited on the underlying barren tertiary sediments.

NATIVE LASS AREA

After boring in the vicinity of the Echo workings a line of bores was placed across the flat country near the Native Lass workings. Some exceptionally high grade wash was tested from the bottom of the old Native Lass workings and good prospects were obtained in the existing face from the wash left near the bottom. It was considered that the flat country may yield wash of a similar grade.

Boring was commenced about a quarter of a mile to the east of the southern limits of the Native Lass workings. The bore line was on a bearing of 90 degrees and succeeding bores were placed towards the east.

Eleven bores were completed on the line easterly to the river flats on the Ringarooma River the surface level falling a total of 48 feet in the eleven chains covered. The bores varied in depth to 14 feet but revealed only clays which contained no wash or coarse gravel.

The continuation of the bore line in a westerly direction towards the Native Lass workings showed some slight improvement in grade but in all cases the grade was not an economic one.

Approaching the old workings the surface level rises appreciably. After crossing the workings the ground level falls sharply and it is evident that the Native Lass deposits occurred as a comparatively high residual ridge of tertiary sediments surrounded by the younger recent deposits resulting from the redistribution of the Tertiary sediments on or near the sea shore.

All the Native Lass workings were narrow with a moderate length in a northerly direction.

DRYDEN CREEK TO ALHAMBRA CREEK AREA

In Dryden Creek mining operations were carried on to work a tin bearing lead of approximately 25 feet in depth. The workings are situated to the south of the Gladstone - Boobyalla road and are about half a mile distant there from. The lead has at all times been a narrow one but the workings extend for more than 1,200 feet in length and would suggest an economic grade of wash. Recent workings, a little to the south of the original ones, have traced the lead for an additional 500 feet to shallow ground varying to ten feet in depth. Returns have shown the wash to be high grade.

A line of bores, on a bearing of 225 degrees, was commenced at a point eleven chains from the workings. The first bore penetrated decomposed granite bottom at a depth of three feet. Bores at first were spaced at two chains interval and depths of 11,10, and 7 feet were obtained. As bore No. 4 showed a trace of tin the interval between bores was closed to one chain and bores 5 to 9 yielded depths of 6,11,9,5 and 6 feet. All the Bores were bottomed on decomposed granite but failed to show wash of an economic grade. Bore No. 9 was placed within five yards of the old workings.

In a north-easterly direction from Bore No. 1 outcrop granite was soon met. Further in a north-easterly direction Sextus Creek occurs as a comparatively narrow gorge within granite walls.

From Bore No. 1, a line was set out on a bearing of 135 degrees. Sextus Creek was crossed and the line was continued for a total distance of 26 chains to an extensive area of flat country extending to the foothills of Mount Cameron.

From the 26 chain point boring was commenced on a line bearing 45 degrees towards Alhambra Creek.

Twenty-four bores were completed on this line between its starting point and Alhambra Creek the last bore being between the Mount Cameron Water Race and the creek at a point 180 feet below the fluming crossing Alhambra Creek. Above the fluming old workings in the creek extend upstream for at least six chains.

The average depth of bores on this line was 13.6 feet with the deepest one being 27 feet. A few of the bores showed a little low grade concentrate but in general only a trace of tin was shown.

Between bores Nos. 21 and 22 old bore pegs were observed. This line of bores was remarked by renewing some of the pegs. Bores numbered from 180 to 193 were located Bore No. 21 of the present series being within 20 feet of Bore No. 190 of the old series. It was reported that the earlier boring was done by the Endurance Tin Mining Company but this could not be readily confirmed by reference to the present manager. It is apparent however that the grade of wash shown by that boring was not such as to warrant development.

The workings in Alhambra Creek are narrow and are confined to the course of the present stream. They are similar in most respects to the workings in Dryden Creek and appear to represent remnants of Tertiary ridges. The younger materials tested by boring have proved barren and it is not to be anticipated that further boring will reveal highergrade material.

SOUTH MOUNT CAMERON

After the boring to the north of Mount Cameron has been completed further boring was carried out in the vicinity of the township of South Mount Cameron. To the west of the township some boring had been done on an area at present held by the Endurance Tin Mining Company but formerly held by Mr. Geo Watt. Fairly extensive workings exist in the bend of Clifton Creek as the result of operations by Watt and others.
To the south of these workings further boring had been

done and it was reported that a false bottom had been met at depths of 40 feet. 70

The positions of three bores where false bottoms were reported, had been indicated on the chart and there was no difficulty in locating two of these bores.

In the first instance bores were put down to check the depths and conditions of the two bores. The check bores were placed about 10 feet from the original ones.

The first bore put down was taken to a depth of 46 feet but from a depth of 10 feet it was almost certain that the material passed through was decomposed granite. As there had been no change in the last 36 feet the bore was stopped.

The depth of the original bore was then tested and found to be 14 feet.

The second bore put down was used as a check on the second of the original bores and was taken to a depth of 23 feet. This was at least four feet into the decomposed granite and the bore was stopped. The original bore at this site had collapsed and without re-boring, its depth could not be checked.

A third bore on the line joining the two original bores and one chain distant from the second one was then started but was finalised at ten feet in decomposed granite.

As the area to the north of this last bore site had previously been tested by boring and the old workings, which are close to Clifton Creek, suggest that mining operations succeeded the boring it was assumed that the northern area was barren of tin.

There is a corner peg close to the first bore put down in this area. It was later determined that this peg was the south-west corner peg of lease No. 69M/39.

From this peg a line of bores was put down in a southerly direction the bores being placed at one chain interval. The earlier bores showed no appreciable depth to the decomposed granite bottom although the seventh bore of the line (No. 10) was carried to a depth of 42 feet of which 35 feet was in the granite bottom. Further to the south there is a rapid deepening of the ground for at Bore No. 13 the depth to bottom was 27 feet and at bore No. 15 a depth of 63 feet was recorded. The last bore of the line No. 16 was not bottomed at a depth of 55 feet.

Although the earlier bores of this line revealed only clays the last four bores penetrated gravels and drifts and the cross section suggests that the greatest depth may not yet have been reached. It has been reported that deep ground occurs between Clifton and Corduroy Creeks and the boring already done has confirmed that report although the limits of the lead have not been defined. It is unfortunate that the material passed through was barren.

CONCLUSIONS

The results of the campaign have been disappointing as far as the determination of areas containing economic grades of tin bearing wash. The only area which may be

regarded as of economic importance is one of limited extent situated in Garfield Creek near its junction with Mussel Roe River. In this area further boring towards the junction may prove additional ground and make it one of some importance. The average grade of 6.6 oz p.c.y. though low, is based on conservative methods of determination and should at least be the recoverable grade.

Although little in the way of tin bearing gravels have been revealed the boring has shown that extensive areas, previously regarded as potentially tin bearing, are barren and should prevent useless expenditure at a future date.

Boring has also shown that the area as a whole has an available supply of underground water for most of the bores were met ones and in many of them the water was under slight pressure.

Accompanying this report are plans and sections showing the nature of the country tested and its position relative to the town of Gladstone.

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