REPORT ON THE TIN DEPOSITS OF A PORTION OF THE GLADSTONE MINING-FIELD

INTRODUCTION -

The particular object of the examination of the Gladstone area was to generally determine the tin-bearing nature of the alluvial deposits and to make a geological survey of that tract of country. A prospecting campaign of the alluvial and detrital deposits was undertaken and test samples were obtained from all available working faces, natural exposures, etc. In some localities it was found necessary to sink prospect holes either by digging or with the aid of a drill auger.

LOCATION AND ACCESS -

The area examined is that part of the Gladstone mining-field immediately west of the township of Gladstone bounded on the north by Ringarooma River; on the west by Hardwick Creek; and on the south by the surveyed line of the proposed extension of the Mt. Cameron Water-race (surveyed by J.B. Scott, State Mining Engineer, 1926). In other words, all the country between the Ringarooma River and the proposed extension of the race which would be commanded by the latter. The road from Gladstone to Boobyalla passes through the district and is suitable for motor traffic.

PHYSIOGRAPHY -

This district is generally of low relief. Gladstone itself is probably the highest point, being in the vicinity of 270 feet above sea level. Drainage is proceeding by means of a number of small creeks running in a general northerly direction to Ringarooma River.

Ringarooma River here may be said to be in that stage of its cycle of erosion termed "old age". Its course is a very sinuous one and it is meandering over its own flood plain depositing large amounts of sediments as it goes. Much of the sediment is collected along its course from alluvial tin mines, the tailings from which are directed into the river.

The south-eastern portion of the area is somewhat hilly rising as it does to the south to form the foothills of Mt. Cameron. The upper reaches of the creeks here are in a youthful stage and are at present cutting their beds down steeply into the underlying rocks. In a number of instances these creeks have reached a more advanced stage, for near their confluence with Ringarooma River they are depositing sediments over their beds, the sediments being mainly derived as tailings from workings.

In the creeks in which no tailings occur, lagoons have formed at the junctions with the main stream, probably owing to the fact that the Ringarooma River has been able to build its bed up above the level of the creeks at these points and so allowed water to back up into the tributaries.

In the western half of the district undulating plains are the main features and the drainage in this part is somewhat indeterminate.

GEOLOGY -

Cambro-Ordovician - Slates, sandstones and quartzites of this system occur over a big percentage of the total area. They are the oldest rocks exposed in this district and at their junction with granite they have been slightly metamorphosed. The observed strikes were in nearly every case a little west of north and the dips almost vertical. No fossils were found in these sediments but on general lithological and structural grounds they have been placed in the Cambro-Ordovician system together with other rocks of the same type in Tasmania.

Devonian - Granite is exposed in the southern and north-western parts of the area and is intrusive into the Cambro-Ordovician strata. South of the district the granite continues to Mt.Cameron and comprises part of the great granite batholith of North Eastern Tasmania. Lithologically the granite varies from fine through medium to coarse grained and in some localities is porphyritic.

With other tin granites of the State these are described to the Devonian Period.

Tertiary - In a number of places in the district, but principally on the more level ground above the steep banks of Ringarooma River in the Western portion, and also between the upper reaches of Ah Kaw and Mt. Cameron Creeks and at the head of Dryden Creek, are deposits of sands, clays, grits and rounded waterworn gravels, the latter being comprised of quartz, slate and quartzite. These are sometimes as much as 30 feet deep, resting either on granite or slate bottom.

In many other places as in the Native Lass workings, on section 10329/M in the name of J. Terry, and in the old workings a few chains north-east of Native Lass Dam etc., there appear deposits made up almost wholly of rounded quartz pebbles. These are always of shallow depth, being seldom more than 1 to 4 feet in thickness.

From the foregoing it is inferred that the whole of this tract of country was, in Tertiary times, covered by more or less enclosed waters which distributed sediments brought down by river and creeks of those times, over the area. Later, after a rise in the coast line, the sediments came under the influence of atmospheric and aqueous agents of denudation. The general effect was that the greater part of the deposits were carried away, leaving only those that are present today.

It is probable that some of the gravels and drift were of river origin and are therefore leads, but it is now hard to distinguish the two types.

In different places in the vicinity it is almost certain that more deep deposits exist, but owing to the flat nature of the surface these are not exposed and it would be necessary to prospect by means of shafts or bore holes to prove their existence.

Recent - Recent deposits of alluvium are in process of formation along the courses of Ringarooma River and the smaller streams where they are approaching maturity. The alluvium in the creeks is mainly composed of quartz and slate pebbles derived as tailings from mining.

In the case of Ringarooma River the alluvium is generally a fine yellow silt brought down the stream. One exception to this may be seen in the old Princess workings on the river bank between Sextus and Princess Creeks. There are exposed beds of typical river wash consisting of sandy silt and waterworn pebbles, the latter being flattened and elongaged oval in shape.

ECONOMIC GEOLOGY -

For the past 30 to 40 years tin mining has been carried on intermittently throughout the district excepting in the south-western portion. The chief sources of supply of cassiterite have been from the deeper Tertiary deposits such as those at the Echo, Vulcan, Home Rule, Native Lass mines and others. Superficial detrital matter on the banks between the streams and also the beds of the creeks themselves have been sluiced for their tin contents.

Only two claims are at present being worked, viz, those on Sections 9511/M J. Watt, Lessee, and 10346/M, L. Watt, Lessee. Both these miners are sluicing under difficulties with storm water obtained from the slopes of Mt. Cameron.

WATER SUPPLY -

In the past when the greatest amount of the deep stanniferous gravels and drifts were worked it would appear that the rainfall was heavier and the vegetation was more abundant than at the present time. This fact would enable more water to be conserved and the supply all round would be greater.

Today it is impossible to carry out hydraulicing to any great extent owing to the water supply being only sufficient for work in approximately two months of the year.

If the proposed extension of the Mt. Cameron Water-race were completed, even as far as the Native Lass Dam, water would be provided for sluicing a good deal of virgin country as well as the deposits in old workings, which, under the present conditions, cannot be worked to any extent.

SAMPLING -

Approximately 65 samples of tin oxide were washed from different parts of the district surveyed, although only 47 of these were retained. The remaining 18 samples showed only traces of cassiterite and were discarded. The prospects conserved were forwarded to the Chief Government Chemist and Assayer for weighing and assaying.

The method of sampling undertaken was, wherever possible, to clean a face, take a representative sample of a section from top to bottom into a prospecting dish, and to then wash the waste matter off with the aid of water and so retain the tin content by means of its greater weight.

The contents of the ground were calculated from the weights and assay results (reported as metallic tin) of the dish concentrates. In converting the contents to tin oxide it was assumed that the percentage of tin in the oxide was 70%. It is realised of course that tin ore can be "dressed" to give in many cases a greater percentage of metallic tin than 70%.

The following tables give details and results of the prospecting undertaken:-

(see next page)

Prospect Number	Description of position	Section	Metallic Tin Lbs. per cub. yard	Tin Oxide lbs. per cub. yard
L.	On section 10346/M, L. Watt, Lessee	1ft. surface soil, 2ft. 6in. sand and grit 1ft. medium sized quartz wash	.787	1.13
2	On section 10346/M, L. Watt, Lessee	2ft. 3in. sand & clay (old tailings) 3ft. 3 in. black sand & quartz grit, 1 ft. 6 in. quartz and slate wash. Slate bottom	4.216	6.02
3	Old deep workings 2 chains south of section 10346/M, L. Watt, Lessee between two southern branches of Dryden Creek	15ft. sand and small rounded quartz grit Granite bottom	.017	.024
4	From old tail race on section 10346/M, L. Watt, Lessee	8ft. in sand and quartz grit, Granite bottom	.036	.052
5	On section 10329/M, J. Terry, Lessee	3ft. consolidated sand & small quartz pebbles 2ft. dark sand with quartz wash, Slate bottom	.587	.93
6	On section 10329/M, J. Terry, Lessee 2 chs. north of No. 5 Prospect	1ft. 3in. sandy surface soil. Slate bottom	.396	.566
7	Taken from Native Lass deep workings about 20 chs. south of junction of Gin Case Ck. with Boobyalla River	15ft. sands, gravels, and quartz wash, Slate bottom	.204	.292
8	Native Lass deep workings	6ft. sands, gravels, and quartz wash. Slate bottom	.084	.120
9	Native Lass deep workings	18ft. sands, gravels, and quartz wash Not on bottom (slate)	.226	.323

Prospect Number	Description of position	Section	Metallic Tin lbs. per Cub. yard.	Tin Oxide lbs. per Cub. yard
10	Native Lass Deep workings	6ft. sands, gravels and quartz wash Slate bottom	.123	.176
11	Most northerly of Native Lass shallow workings about 10 chs. south west of Native Lass deep workings	3ft. quartz wash. Slate bottom	.572	.817
12	Western portion Echo workings, between Hardwick and Echo Creeks	6ft. 3 in. sand, grit & pebbles of quartz & slate (no definite bottom wash) Granite bottom	.462	.661
13	Western portion Echo Workings	4ft. in sand, grit and pebbles of quartz and slate. Granite bottom	.069	.099
14	Western portion of Echo Workings	5ft. in sand, grit and pebbles of quartz & slate. Granite bottom.	.085	.122
15	Western portion of Echo workings	3ft. 6in. in sand grit & pebbles of quartz and slate. Granite bottom	1.951	2.787
16	Eastern portion of Echo workings on east bank of Echo Ck. from western workings	7 ft. from below surface soil to granite bottom through grit, sand & coarse wash in clay. Granite bottom.	.195	.297
17	Eastern portion of Echo workings	4ft. in medium sized quartz and slate wash with sand. Not on bottom (Granite)	.199	.285
18	Eastern portion of Echo workings	6ft. in clay, sand & wash. From below surface soil down to granite bottom	.083	.119

Prospect Number	Description of position	Section	Metallic Tin lbs. per cub. yard.	Tin Oxide lbs. per Cub. yard.
19	Eastern portion of Echo Workings	1ft. 6in. surface soil, 6ft. 6in. in slate & quartz pebbles with clay and sand. Not on bottom (granite)	.134	.192
20	Home Rule workings in Section 1031/M Gladstone Deep Leads Synd. N.L. Lessees	7ft. in sands, gravel & wash. Slate bottom	.523	.748
21	Home Rule workings, 3 chs. south of southern line of 9996/M Gladstone Deep leads Synd. N.L. Lessees	4ft. in sand, grit, clay and wash From surface to slate bottom	.257	.367
22	Home Rule workings. About 2 chains east of No. 21 Prospect	1ft. 3 ins. of surface soil	.131	.187
24	In old deep workings on section 9511/M, J. Watt, Lessee	10 ft. from surface through cemented sand, sand, and quartz grit, Not on bottom (slate)	.163	.233
25	On same section and 1 chain south of No. 24 Prospect	4ft. 6in. in sand, clay, and quartz grit, Starting 2ft. 6 in. below hard surface cement. Not on bottom (slate)	.222	.317
26	In tail race on section 9511/M, J. Watt, Lessee	4ft. in sand and quartz grit. From surface to slate bottom	.431	.616
27	In old Vulcan workings 1½ chain south of section 9820/M, C.L.J. Hayes, Lessee	11ft. in sand, grit and wash. From 2ft.6in. below surface. Not on bottom (slate)	.546	.637

Prospect Number	Description of Position	Section	Metallic Tin lbs. per Cub.yd.	Tin Oxide lbs. per cub. yd.
28	In section 9820/M C.J.L. Hayes, Lessee and 4 chs, N.E. of No. 27 Prospect. Old Vulcan workings	5ft. through sand, grit and gravel wash From surface. Not on bottom (slate)	.479	.685
29	Native Lass shallow workings, south end	1ft. surface soil & grit, 4ft. quartz wash cemented with sandy drift. Slate bottom.	.212	.303
30	Native Lass shallow workings, 4 chs. north of No. 29 Prospect	6ft. 6in. in surface soil and quartz wash. Not on bottom (slate)	.184	.264
31	Native Lass shallow workings, 3 chs. N.N.E. from No. 30 Prospect	6ft. in soil & quartz wash, from surface to slate bottom	.252	.360
32	Native Lass Shallow workings, 2 chs. N. of No. 31 Prospect	6ft. in soil, sand, grit and quartz wash From surface to slate bottom	.791	1.130
33	Native Lass shallow workings, 1 chain north of No. 32 Prospect	7ft. in quartz wash, sand & grit, Slate bottom	.197	.282
34	Native Lass shallow workings, 3 chs. N.E. of No. 33 Prospect	7ft. in sand, gravel & quartz wash, From surface to slate bottom.	1.00	1.43
35	In shallow workings on south side of road to Boobyalla and 4 chains north-east of Native Lass Dam	3 ft. in quartz wash, grit and sand. From surface to slate bottom.	.237	.339
36	In shallow workings 4 chains east of No. 35 Prospect	4ft. 6in. in quartz wash, grit & sand From surface down to hard cement. Not on bottom (slate)	.126	.180

Prospect Number	Description of Position	Section	Metallic Tin lbs. per cub. yd.	Tin Oxide lbs. per cub. yard
37	1½ chain below race survey on west side of Deep Creek.	2ft. 6 in. surface gravel and sand, Granite bottom.	.230	.329
38	On east fall of Deep Ck.about 20 chs. above junction of largest tributary.	1ft. surface sandy soil, bottomed on cement Slate country.	.112	.160
39	In old shallow workings on east slope of Dryden Ck. on north side of Boobyalla Rd.	4ft. 6in. taken from below surface soil cement in blue & red clay sand carrying a few quartz pebbles. Slate bottom.	.322	.460
40	One chain east of No. 39 Prospect	1ft. surface soil, 1ft. 6in. subsoil, Slate bottom	.410	.585
41	4 chs. north of No. 39 Prospect on west slope of Dryden Creek	9in. soil, 2ft. subsoil cement, 1ft. 6in. drift with small quartz pebbles	.127	.181
43	In small eastern branch of Deep Ck. 2 chs. above its junction with the mainstream	3ft. of soil, grit and creek wash	2.563	3.661
44	Near south line of 5572/M (vacant section) Between Alhambra and Mt. Cameron Cks.	2ft. through soil and subsoil down to slate bottom.	.545	.778
45	In small creek running west into Sectus Ck. 3 chs. below junction of Sectus and Dryden Creeks	2ft. 6in. in silt, and creek wash of small quartz pebbles and larger angular slate. Slate bottom	.421	.602

Prospect Number	Description of position	Section	Metallic Tin lbs. per cub. yd.	Tin Oxide lbs. per cub. yd
46	In Sectus Creek, 2 chs. above its junction with Dryden Creek	2ft. in soil, silt and creek wash of small quartz pebbles and larger angular slate	.688	.983
47	On bank of Ringarooma River in old Princess workings, between Sectus and Princess Creeks	2ft. 6in. in river wash consisting of sand, silt and waterworn flat oval pebbles	.098	.140
48	Between Alhambra and Princess Creeks, north of Boobyalla road and about 30 chs. south of river	2ft. waterworn rounded quartz wash in sand and clay. From 2 ft. below surface Not on bottom (slate)	.145	.207
51	In Alhambra Creek, 1½ chain below crossing of race survey	3ft. soil, sand and quartz wash to granite bottom.	1.606	2.294

The average number of lbs. per cubic yard of metallic tin and tin oxide for the 47 samples assayed amount to .498 and .690 respectively, and for the 65 samples taken altogether of which 18 showed only a trace the average would be a little better than .360 metallic tin and .499 tin oxide.

Conclusion

It will be seen from the prospect results that there are many places in the area in which cassiterite is concentrated in payable quantities if a constant supply of water were assured.

Generally it is considered that the ground examined is typically suited for sluicing by the miner working singly in a small way or for parties of two.

There does not appear to be any large deposits of tin oxide on these portions of the district tested and so it is not recommended that there is ground suitable for exploitation by companies.

It was found impossible to test the deep deposits of alluvium along and under Ringarooma River. It is very probable that the latter are stanniferous but a good deal of capital would be necessary to supply the machinery for working these and the venture would therefore be best attempted by a fairly strong company. A prospecting campaign would be necessary to determine if the ground was suitable for economic working.

The tertiary and recent deposits indicated on the plan attached to this report indicate the chief places in which tin ore is likely to be found.

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