

Preliminary Report  
ON

GROOM RIVER ALLUVIAL DEPOSITS OF TIN ORE.

Introduction.

This report deals with the result of an examination of certain properties held by the Groom River Tin Syndicate. In the work of the examination it was thought desirable to check the boring of the Syndicate's Engineer and bore other untested lots for the information of the Syndicate and the Department. The information so obtained forms the basis of calculation of value of the deposits and proves helpful also in the design of plans for the operation of the deposits on a commercial scale.

In the past sporadic attempts have been made to work certain sections of these deposits by ordinary methods of ground sluicing, but such attempts were feredoomed to failure because the methods adopted were not suited to local conditions.

The Properties of Groom River Tin Syndicate

The areas held under lease and freehold extend three miles along the valley of the river and consist of:-

leases -	10064 M	of	20	acres;
	10063 M	of	"	"
	10062 M	of	"	"
	10061 M	of	"	"
	10033 M	of	40	"
	10056 M	of	63	"
	10058 M	of	10	"
	10057 M	of	5	"
Dredging Claim	744	of	20	"

A total of 235 Acres.

Freeholds -	Yost flats of 49 acres.
	Anderson's Farm of 100 acres
	Booth's Farm of 25 "
	Singline's Land of 27 "

A total of 201 Acres

of these areas a small proportion only contains tin-bearing beds of gravel.

The Formation and Nature of the Deposits

Groom River is a youthful stream occupying a V-shaped valley cut deeply into granitic rocks of varying nature and hardness. The variation in the nature of the granitic rocks is responsible for the division of the valley floor into a number of small catchment areas of basins connected one with another through narrow rock-bound gorges. The comparatively hard rock of the gorges

formed erosion - resisting bars upon which the action of the flowing water made little impression. Thus impeded the water spread laterally, gradually curving the basins into their present shapes and accumulating the tin ore-bearing gravels. In the process of gravel accumulation a large number of logs collected and in some parts, Booth's ground for instance, logs form a large proportion of the debris. These logs are now under a deep covering of tailing from the Anchor, Crystal, and Liberator Mines.

As regards the source of the ore it is evident that it was all shed from the upper end of the valley where very large ore-bodies have been exposed and trenched by the action of the river. The waste of the ore-bodies was carried down stream and the tin ore was concentrated in the lower gravels.

In the upper reaches (Anderson's ground) the average depth of alluvium is 10 feet consisting of 5 to 8 feet of sandy clay soil, overlying 6 inches to 1 foot of drift, resting on 3 to 5 feet of coarse gravel. In the lowest section the proportion of large boulders 6 to 15 inches in diameter is about one fifth in bulk, and the pebbles 2 to 6 inches in diameter constitute one quarter of the whole.

In the lower reaches, Yost Bog for instance, a typical section is:

tailing from Anchor mine	10 feet,
sandy clay soil	6 feet,
drift	2 feet,
gravel and sand	3 feet,
resting on the hard granite bottom.	

The tin ore is mostly fine in grain, a considerable proportion being finer than 80-mesh. It is generally of good quality, but a little pleonaste, zircon, and ilmenite is in association.

#### The Tin Ore Value of the Properties -

In order to arrive at an idea of the value of the several properties of the Syndicate a number of bores and shafts were sunk through the alluvial beds to bedrock. The Syndicate sank 39 bores holes and the Department sank 14 holes on Yost's and Booth's farms. The Department checked also the value of the gravels opened in some of the 33 shafts.

Details of the results obtained in the various shafts and bores are shown in the subjoined tables and the positions of these openings are indicated on the accompanying plan.

Dealing with these area tested by bores and shafts the following estimates of quantities and values have been prepared:-

Lot	Cubic yards of tin bearing ground	Tin ore in lbs. per cubic yard.	Average depth of ground in feet.	Tin ore in area
Lease 10062M	47756		19.7	
" 10061M	7260		19.0	
" 10033M	399576		19.3	
Singline's Land	138040		18.8	
Yost's land	576590		19.4	
Booth's "	186340		15.6	
Anderson's Land	286429	1.08	9.5	138
Totals	1,641,991			

It is impossible to base a calculation of the tin in pounds per cubic yard on Singline's, Booth's and Yost's lands on the results obtained from the few check bores sunk during the recent investigation. However, the results convey an idea of the relative values of tailing, soil and gravel. In some cases it will be noticed the results are low, but then it should be remembered that the deep tailing and soil coverings are almost devoid of tin.

Yost Bog.

Bore No. 40  
 Sample No. 3, IO3I, IOI6, and IO37.  
 Depth of bore, 18 feet 8 inches

Thickness of tailing	6 feet 6 inches
" " black loamy soil	1 foot 6 inches
" " drift and gravel	10 feet 8 inches

Weight of concentrate from tailing

" " " soil	0.0029 Oz.
" " " gravel	0.0122 Oz.
	1.247 Oz.

  

Tin content of concentrate 37.5 per cent

Concentrate Retained on 20-mesh screen	0.82 per cent
" " " 40-mesh "	3.67 " "
" passed through 80-mesh "	65.25 " "
" " " 80-mesh "	30.26 " "

The value of the ground tested in this bore is 0.806 lb. per cubic yard of 70 per cent concentrated ore. The screening test shows a large portion of the ore is very fine.

Yost Bog.

Bore No. 41  
 Sample Nos. IO25, IO29, and IOI7  
 Depth of bore 18 feet

Thickness of tailing	6 feet 6 inches
" " soil	4 feet 6 inches
" " gravel	7 feet

Weight of concentrate from tailing

" " " soil	0.0162 Oz.
" " " gravel	0.0052 Oz.
	0.2628 Oz.
	<hr/> 0.2842 Oz.

  

Retained on 40-mesh screen	2.68 per cent
" " 80-mesh "	48.33 per cent
Passed through 80-mesh screen	48.90 per cent
Tin in concentrate	45.35 per cent

This ground contains tin in the proportion of 0.28 lb. per cubic yard.

Yost Bog.

Bore No. 42  
 Sample Nos. IOI8, IO27, and IO2I.  
 Depth of bore 18 feet 3 inches

Thickness of tailing	6 feet 6 inches
" " soil	6 feet
" " gravel	5 feet 9 inches.

Weight of concentrate from tailing

" " " soil	0.0069 Oz.
" " " gravel	0.0211 Oz.
	0.5115 Oz.

Concentrate retained on 20-mesh screen

" " " 40-mesh "	0.34 per cent.
" " " 80-mesh "	8.96 " "
" passed through 80-mesh "	64.48 " "
	26.22 " "

in  
 Tin/concentrate 51.95 per cent.

The value of the ground tested in this bore is 0.76 lb. per cubic yard.

Yost Bog.

Bore No. 43		
Samples Nos.		
Depth of Bore 20 feet 6 inches		
Thickness of tailing		12 feet
" " soil (clay)		6 feet
" " gravel		2 feet 6 inches.
Weight of concentrate from tailing		0.1341 Oz.
" " " " soil		0.02734 Oz.
" " " " gravel		0.2187 Oz.
		<hr/>
		0.3801
Concentrate retained on 80-mesh screen		41.93 per cent
" " passed through " " "		58.07 Per cent
Tin <sup>in</sup> /concentrate		36.66 per cent

The ground tested by this bore contains tin in the proportion of 0.27 per cubic yard.

Yost Bog.

Bore No. 44		
Samples Nos. IO28, IO20, and IO23		
Depth of bore 17 feet 9 inches		
Thickness of tailing		8 feet
" " soil		6 feet 6 inches
" " gravel		3 feet 3 inches
Weight of concentrate from tailing		0.0287 Oz.
" " " " soil		0.0195 "
" " " " gravel		0.1985 "
Tin ore retained on 20-mesh screen		0.88 per cent
" " " " 40-mesh "		5.32 " "
" " " " 80-mesh "		53.28 " "
" " passed through 80-mesh "		40.52 per cent.

The value of the ground tested in this bore is 0.32 lb. per cubic yard.

Yost Bog.

Bore No. 45		
Sample Nos. IO22 and IO36		
Depth of Bore 18 feet		
Thickness of tailing		6.0 feet
" of black sandy clay soil		6.0 feet
" of drift and gravel		6.0 feet
Weight of concentrate from tailing		0.0312 Oz.
" tin ore retained on 80-mesh screen	34.86	per cent
" " passed through 80-mesh "	65.14	per cent
Weight of concentrate from drift and gravel		1.5135 Oz.
retained on 20-mesh screen	0.23	Per cent
" " 40-mesh "	6.29	per cent
" " 80-mesh "	68.29	per cent
passed through 80-mesh screen	25.19	per cent
Tin in tailing concentrate	31.85	per cent
" " gravel "	44.28	" "

The value of this ground is 1.47 lb. per cubic yard of 70 per cent grade tin ore.

Note. In this calculation the whole of the tin ore obtained was taken into account, yet it is evident that very little of the portion that passed through the 80-mesh screen is recoverable in sluicing.

Booth's Land.

Bore No. 46

Sample Nos. IOI4, and IOI5.

Depth of Bore 15 feet

Thickness of Tailing	10 feet	5 feet.
" " drift and gravel		
resting on biotite granite bedrock.		
Weight of Concentrate from tailing retained on 40-mesh screen	0.028 Oz.	
" " 80-mesh "	1.03 per cent	
passed through 80-mesh screen	8.15 per cent	
Weight of concentrate from gravel retained on 20-mesh screen	90.82 per cent	
" " 40-mesh "	1.656 Oz.	
" " 80-mesh "	0.108 per cent	
passed through 80-mesh "	2.98 per cent	
	63.88 per cent	
	33.03 per cent	
Tin in tailing concentrate	52.35 " "	
" " gravel "	48.10 " "	

The value of the ground tested in this bore is 2.10 lb. per cubic yard.

In Booth's Farm area eight bores were sunk only one of which reached bottom. Seven holes, 12 to 17 feet deep, passed through tailing on to logs; It is evident that the wash all over this ground is covered with logs and that the wash or gravel bed is not more than 5 feet thick. The tin ore in the tailing is in very small proportion and so fine that it will be impossible of recovery by ordinary sluicing methods. In fact, it is doubtful whether any attempt should be made to save the little tin ore in the tailing.

Anderson's Block.

Sample No. IOI3

Shaft. No. 28

Depth 95 feet.

Thickness of wash 1.5 feet, overburden 8 feet.

The concentrate represents the tin ore content of one cubic foot only.

Weight of concentrate.	0.296 Oz.
Proportion of tin in concentrate	53.35 per cent
Sizing Test -	
retained on 40-mesh screen	33.33 per cent
" " 80-mesh "	55.95 per cent
Through 80-mesh "	10.72 per cent

Proportion of tin ore of 70 per cent quality is 0.99 lb. per cubic yards.

This shaft exposes only 18 inches of wash yet it is very rich and brings the average to profitable proportion. The wash contains boulders up to 12 inches in diameter.

Anderson's Block.

Sample No. 1026  
Shaft. No. 8  
Depth 10 feet.

Thickness of wash 5 feet, overburden 5 feet.  
The concentrate represents the tin ore content of Three cubic feet of the wash only weight of concentrate. 0.601 Oz.  
Proportion of tin in concentrate 60.25 per cent

Sizing test -

retained on 20-mesh screen	nil	
" " 40-mesh "	24.63	per cent
" " 80-mesh "	63.34	per cent
Through 80-mesh "	12.03	per cent

Proportion of tin ore of 70 per cent quality is 1.4 lb. per cubic yard.

Five feet of clayey overburden, almost barren, rests upon five feet of boulder wash containing boulders up to 15 inches in longest dimension.

Anderson's Block.

Sample No. 1038  
Shaft No. 17  
Depth 10 feet

Thickness of wash 2.5 feet; overburden 7.5 feet. The concentrate represents the tin ore content of two cubic feet of the wash only.

Weight of concentrate 0.6525 Oz.  
Proportion of tin in concentrate 57.10 per cent

Sizing Test -

retained on 20-mesh screen	0.27	per cent
" " 40-mesh "	30.27	" "
" " 80-mesh "	57.83	" "
Through 80-mesh "	11.63	" "

Proportion of tin ore of 70 per cent quality is 0.8 lb. per cubic yard.

The ground exposed in this shaft consists of black loam resting on sandy clay subsoil which overlies fine drift and coarse boulder gravels. Boulders up to 12 inches in diameter are in fairly high proportion.

Anderson's Block

Sample No. 1024  
Shaft No. 4  
Depth 9 feet 6 inches

Thickness of wash 3 feet, overburden 4 feet.

The concentrate represents the tin ore content of 3 cubic feet of wash only.

Weight of concentrate 0.6684  
 Proportion of tin in concentrate 56.35 per cent

## Sizing Test -

retained on 20-mesh screen	2.11	per cent
" " 40-mesh "	33.77	per cent
" " 80-mesh "	49.07	per cent
Through 80-mesh "	15.05	per cent

Proportion of tin ore of 70 per cent quality if 1.9 lb. per cubic yard.

Four feet of sandy clay on seven feet of drift and boulder wash containing stones up to 2 feet in longest dimension. Boulders constitute half the bulk of the materials of the wash.

Anderson's Block

Sample No. IOI2  
 Shaft No. I4  
 Depth 10 feet 0 inches

Thickness of wash 4 feet; overburden 6 feet.  
 The concentrate represents the tin ore content of Three cubic feet of the wash only.

Weight of concentrate 0.432 Oz.  
 Proportion of tin in concentrate 53.75 per cent

## Sizing Test.

retained on 20-mesh screen	1.224	per cent
" " 40-mesh "	22.04	" "
" " 80-mesh "	60.408	" "
Through 80-mesh "	16.328	" "

Proportion of tin ore of 70 per cent quality is 0.9 lb. per cubic yard.

A shallow hole (eight feet deep) exposing 4 feet of barren clayey soil resting on 4 feet of wash.

Anderson's Block

Sample No. IOII  
 Shaft No. 2  
 Depth 12 feet.

Thickness of wash 3 feet; overburden 7 feet.  
 The concentrate represents the tin ore content of two cubic feet of the wash only.

Weight of concentrate 0.292 Oz.  
 Proportion of tin in concentrate 53.45 per cent

## Sizing Test -

retained on 20-mesh screen	nil	
" " 40-mesh "	24.09	per cent
" " 80-mesh "	46.38	" "
passed through 80-mesh "	29.53	" "

Proportion of tin ore of 70 per cent quality is 0.5 lb. per cubic yard.

Seven feet of barren overburden rests on three feet of coarse boulder wash with stones up to 15 inches in diameter.

Summary and Remarks.

The Syndicate holds leases and freeholds over three miles of river flats. These flats are occupied at surface by 8 to 12 feet of tailing from the Anchor Milling plant, which rests upon a black sandy clay soil, which in turn overlies the tin-bearing wash. The tailing and the soil contain a little fine tin ore, the greater part of which will be lost in sluicing. Although the tailing is poor and forms the bulk of the materials its removal will prove of little difficulty, in fact in the process it will assist in the breaking up and removal of the clayey soil.

As regards the upper reaches (Anderson's Block) the tailing cover is absent, but a rather stiff sandy clay, almost barren of tin ore, constitutes half of the bulk of the alluvium. The removal of this sandy clay is not a serious difficulty; a matter of more serious movement is the handling of the heavy boulders which form such a large proportion of the wash.

Some of the ground holes in the detritus fringing the road are very poor, and this part of the holdings is of no commercial value.

It is reported that the river bed is extraordinarily rich, but the report could not be verified.

The areas may be conveniently divided into two mining groups and the deposits in each could be worked at the same time. Generally the conditions for mining and transport are favourable.

A. McI. REID  
DIRECTOR OF MINES.

Mines Department,  
Hobart,  
7th October, 1927.