THE PROGRESS OF

The Mineral Industry

OF

Tasmania

FOR THE

QUARTER ENDING 30TH SEPTEMBER, 1913

Compiled by W. H. WALLACE, Secretary for Mines

By order of the Hon. EDWARD MULCAHY, Minister for Mines

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PROGRESS OF THE

MINERAL INDUSTRY OF TASMANIA

FOR THE QUARTER ENDING 30TH SEPTEMBER, 1913.

Hobart, 17th November, 1913.

THE following table shows, as far as can be ascertained, the quantities and values of metals and minerals raised during the quarter ending 30th September, 1913, as compared with the previous quarter ending 30th June, 1913:—

	During the Quarter ending 30th Sept., 1913.		During the Quarter ending 30th June, 1913.	
	Quantity.	Value.	Quantity.	Value.
		£		£
* Gold won ..... oz.	9487·428	40,300	8299·733	35,255
Silver-lead Ore produced tons	24,922·86	87,469	26,209·39	95,966
† Blister Copper produced ,,	1551	121,850	923	74,113
Copper Ore and Copper produced ..... ,,	38	380	354	2030
Tin Ore produced ..... ,,	1120·73	142,232	897·26	129,835
‡ Coal raised ..... ,,	16,095	7258	16,382	7491
Wolfram Ore produced... ,,	18·4	1942	23·5	2436
Bismuth ..... ,,	1·66	664	1·35	300
Osmiridium .... oz.	197·5	2009	358·7	3070
Shale ..... tons	10	10	10	10
	...	404,114	...	350,506

* Fine gold, including gold contained in blister copper and silver-lead bullion.
† Value of gold contents deducted.
‡ Value at pit's mouth.

GOLD.

During the past quarter 3371 oz. gold were obtained from quartz, 65·85 oz. from alluvial, 2268 oz. by means of the cyanide

and chlorination processes, 2386 oz. from blister copper from the Mt. Lyell Mining and Railway Company Limited, and 1429 oz. from the silver-lead bullion from the Tasmanian Smelting Company's Works, Zeehan, valued at £40,300.

The following table shows the quantities obtained from the various sources on the different fields during the period under review, together with the totals for the corresponding period for 1912, and the previous quarter ending 30th June, 1913:—

	Gold obtained during the Quarter ending 30th Sept., 1913.						Totals corresponding Quarter, 1912.	Totals for Quarter ending 30th June, 1913.
	From Quartz.	Alluvial.	Cyanide & chlorination.	From Blister Copper.	From silver-lead Bullion.	TOTAL.		
	oz.	oz	oz.	oz.	oz.	oz.	oz.	oz.
Beaconsfield	2911	..	2242	...	...	5153	4843	4906
Mathinna & Mangana.	460	...	26	...	...	486	47·4	164·65
Mt. Victoria Warrentinna Mt. Cameron	...	22·25	...	...	...	22·25	93·65	100·95
Lefroy	...	...	...	...	...	...	...	8
Lisle ..... Lilydale..... Golconda ...	...	36·8	...	...	...	36·8	54	26·65
West Coast.	...	6·8	...	2386	1429	3821·8	3874·8	3104
TOTALS	3371	65·85	2268	2386	1429	9519·85	...	...
Totals corresponding Quarter, 1912.....	2624·4	181·45	2266	2315	1526	...	8912·85	...
Totals for Quarter ending 30th June, 1913.....	2435	130·6	2643·65	1664	1437	...	...	8310·25

Value, £40,300; equal to 9487·428 oz. fine gold.

BEACONSFIELD.—The quarter's statistics for the district are as follows:—

	Gold produced.	Men employed.
	oz.	
Tasmania Mine.....	5153	400

Tasmania Mine.—The number of tons of quartz crushed was 13,293, whilst 5153 oz. of gold were obtained (by amalgamation and cyanide process), which makes a total of 1,025,522 tons quartz crushed, and 824,343 oz. of gold obtained since the mine was first started.

LEFROY.—The quarter's statistics are as follows:—

	Gold produced. oz.	Men employed.
Golden Crest	—	7
Others	—	12
Total	—	19

LISLE, GOLCONDA, &c.—From these fields 36·8 oz. of gold have been won. Eighteen men have been employed.

RINGAROOMA.—Eleven ounces were obtained from this district by five men.

Alluvial Gold and Dredging Companies.—Gold has been obtained by the following companies in streaming tin:—

	Standard Gold. oz.
Briseis Co.	—
South Mt. Cameron T.M. Co.	11·25
Total	11·25

MATHINNA AND MANGANA.—The quarter's statistics are as follows:—

Gold produced. oz.	Men.
486	26

WEST COAST.—Mr. Inspector Curtain reports:—

McDowell Prospecting Association, Linda.—Mr. Michael Cunningham, the secretary, reports:—The No. 2, or lowest, adit has been driven 71 feet, making a total of 335 feet, with two men.

Alluvial.—Messrs. Nicholson and Ellison, gold-buyers at Queenstown and Linda, report having purchased 6 oz. 16 dwt. 11 gr., valued at £23 17s. 3d., being the labour of three men.

TIN.

The statistics for this metal for the past quarter are as follows:—

	Ore won. tons.	Value. £	Men employed. Europeans.	Chinese.
Northern and Southern Division	17·61	2083	43	...
North-Eastern Division	470·95	62,237	686	78
Eastern Division	150·25	19,190	402	25
North-Western Division	385·75	47,675	690	...
Western Division	96·17	11,047	200	...
Totals	1120·73	142,232	2021	103

North-Western Division.

The output has been as under:—

	Ore won. tons.	Men employed.
Mt. Bischoff	300	473
Mt. Bischoff Extended	47·5	106
Weir's Bischoff Surprise	6·6	9
Wombat	·75	3
Ringtail	2·75	7
Mt. Cleveland	10	30
Waratah Alluvial	·1	2
Mt. Balfour	18·05	60
Totals	385·75	690

North-Eastern Division.

Pioneer and Gladstone Districts:—

	Tin ore won. tons.	Men employed. Europeans.	Chinese.
Pioneer Tin Mine	128	77	...
Aberroe	4·5	13	...
South Mt. Cameron	29·15	34	...
Garibaldi	...	...	...
Clifton Creek	33·55	30	...
Yee Gee	15·4	8	6
Other Claims	40·85	51	47
Totals	251·45	213	53

Ringarooma District:—

Bell's Hill	3·6	6	...
Other Claims	7·95	33	1
Totals	11·55	39	1

Derby District:—

Briseis Tin Mines	124·45	171	...
Clyde	3·5	6	...
Waverley	2·05	5	...
Other Derby Claims	13·05	68	17
Totals	143·05	250	17

Branxholm District:—

Arba Tin Mine	15·90	51	...
New Ruby Flat	10·50	19	...
Other Claims	6·90	51	7
Totals	33·30	121	7

MOORINA DISTRICT:—

	Tin ore won. tons.	Men employed. Europeans.	Chinese.
Wilberforce Pump Co.	3	5	...
Weld Tin Mine	20·50	15	...
Other Moorina Claims	7·35	28	...
Totals	30·85	48	...
Straits Islands	0·75	15	...
Totals for North-Eastern Division	470·95	686	78

EASTERN DIVISION.

	Tin ore won. tons.	Men employed. Europeans.	Chinese.
Weldborough, Lottah, and Blue Tier Mines.			
Anchor Mine	43·4	141	...
Others	29·75	45	25
Totals	73·15	186	25
St. Helens Mines.			
Pioneer Co.	12·4	10	...
J. C. Macmichael	·45	3	...
C. Miller	·85	4	...
Others	7·55	27	...
Totals	21·25	44	...
Avoca Mines.			
Royal George	36·85	85	...
Gipp's Creek	1·10	8	...
South Esk	3·35	7	...
Foster's	4·25	14	...
Desire Tin Mine	2·	12	...
Story's Creek	2·35	30	...
Rex Hill	1·10	4	...
Brookstead	4·85	12	...
Totals	55·85	172	...
Totals for Eastern Division	150·25	402	25

NORTHERN AND SOUTHERN DIVISION.

	Tin ore won. tons.	Men employed. Europeans.
Shepherd and Murphy Mine	16·34	41
Iris	—	—
	16·34	41

COX'S BIGHT, SOUTH COAST.—During the year 1·27 tons of tin, valued at £191, were raised by two men.

Western Division.

	Tin ore won. tons.	Men employed. Europeans.
Boulder	14·5	25
Renison Bell	44·	51
Montana Tin Syndicate	8·	17
Penzance	6·31	16
Others	23·36	91
Totals	96·17	200

Boulder Tin Mine.—Mr. E. Flight, manager, reports:—During the quarter the erection of additional 10-head of 1000 lb. stamps, with rockbreaker, extra dressing tables, and other accessories, the whole of which is driven by wire rope direct from Pelton shaft, has been completed. This plant is estimated to put through 1000 tons monthly.

Montana Tin Prospecting Syndicate.—Mr. James Duffy, manager, reports:—Operations on this mine during the term have continued to proceed satisfactorily, and there has been no shortage of water; have worked No. 1 face continuously, for a fair return of tin oxide, and have uncovered one or two good formations. Progress has been somewhat hampered by the amount of dead work we have had to do to cope with the overburden in No. 2 face, but now everything is in good working order, and expect handsome returns in the near future. The detritus will average 7 feet. In removing same we are uncovering a massive pyritic body, which should considerably enhance the value of the property. Have had to put on an extra shift in the mill to keep slimes from accumulating. The mill has been running well for a good return of tin oxide, and we have 8 tons of tin on hand, and expect to clean up on the 8th of October for 6 or 7 tons of tin. Have finished bench in bed of creek, which had to be taken out to make room for the two rotary tables we are about to instal. On the whole, things are very much brighter for this coming term than they have been for some time past.

SILVER.

West Coast.—The registered output of silver ore in the Western Division for the quarter ending 30th September, 1913, is given below:—

	Ore.	Tons.	Value.	Men
Zeehan Mines:				
Zeehan-Montana	gossan	127·89	178 } £4825 }	104
Zeehan-Montana	galena	277·84		
Zeehan-Western	,,	35·56	691	14
Zeehan-Queen	,,	72	732	14
Mt. Zeehan (Tas.)	,,	88	1750	12

Zeehan Mines—continued.	Ore.	Tons.	Value.	Men.
Oonah	pyrites	667	416	24
Section 903M	...	4·72	113	3
Florence	...	...	...	2
South Comstock	pyrites	220	96	4
Block 10	galena	16	195	
Tas. Smelting Coy.	„	...	..	...
Queen Extended	„	67·82	967	10
Austral Valley	flux	589	220	6
Queensberry	galena	50	600	5
Dundas Mines:				
Adelaide	iron flux	1055·25	1097	14
Hercules	sulphide	6942	21,503	132
Zeehan-Dundas Blocks	galena	108	2515	30
Comet	iron flux	4400	2690	36
Mount Read	...	...	...	2
Hercules, North	...	...	...	...
Ben Accord	...	...	...	4
Rosebery Mines:				
Tasmanian Copper	sulphide	2925	11,412	17
Primrose	„	2901·6	10,362	34
Metals Extraction Co.	...	...	...	140
Mt. Farrell Mines:				
N. Mt. Farrell	galena	743	8503	86
Sterling Valley	...	...	...	...
North Pieman:				
Chester Mine	pyrites	2075·28	782	37
Mt. Lyell:				
Tasman & Crown Lyell Extd.		...	...	4
Sundries:				
Dunkley Bros.		...	...	148
Tasmanian Smelting Co.		...	...	300
Prospectors, &c.		...	...	35
	Total	23,365·96	£69,647	1217

MT. READ DISTRICT.—*Hercules Mine.*—Mr. C. H. Moxon, manager, reports:—During the term routine stoping of ore has been continuous, the principal extractions being obtained from the "E" ore-body, which is being worked from all the levels. A considerable amount of development work has been done, including the restarting of operations in the bottom, or No. 5, level. The diamond drill plant has been at work since July, and its utility has been amply demonstrated, as it has definitely proved the downward continuation of the main ore-body for a considerable distance below the existing working level.

ROSEBERY.—*Tasmania Copper Mine.*—Mr. George Barker, manager, reports:—Regular deliveries of ore at the rate of 225 tons

per week have been made to the Tasmanian Metals Extraction Works. The lode in our main adit level is 30 feet wide of solid sulphide of good value. No. 6 and 7 levels also show similar ore and width.

Primrose Mine.—Mr. George Barker, manager, reports:—I am pleased to report that a very satisfactory development has taken place in the main adit's south drive. The hanging-wall crosscut has exposed a fine body of sulphide ore 6 feet in width, of good value. Cutting this ore proves that the ore-body is extending south in the bottom level. The stopes in the different levels are showing fine bodies of payable ore.

Tasmanian Smelting Company.—Mr. H. Harris, manager, reports:—Ore bought during the quarter, 10,461 tons, containing 1109 tons lead, 132,712 oz. silver, 1353 oz. gold. Exported 1214 tons bullion, containing 1178 tons lead, 131,465 oz. silver, and 1429 oz. gold.

NORTH-WESTERN DIVISION.

	Tons.	Value.	Men.
Magnet Mine	1377	£15,983	158
Victoria Magnet	...	...	7
	1377	£15,983	165

NORTHERN AND SOUTHERN DIVISION.

	Tons.	Value.	Men.
Round Hill Mine	179·9	£1839	16

COPPER.

Mt. Lyell Mine.—Mr. Robert Sticht, general manager, reports:—Ores and metal-bearing fluxes treated at Reduction Works:—

	Dry Weight.			
	tons.	cwt.	qr.	lb.
Mt. Lyell Mine ore	50,769	13	0	11
North Lyell Mine ore	26,393	9	0	4
Metal-bearing flux from Lyell Tharsis Mine	101	5	3	13
Lyell Comstock Mine Ore	1369	0	1	11
North Lyell flux	71	2	3	17
Purchased ore	88	2	0	2
	78,792	13	1	2

Number of men employed:—

At the Company's		Mt. Lyell Mine	416	
"	"	North Lyell Mine	474	
"	"	Crotty Leases	72	
"	"	Lyell Tharsis Mine	...	
"	"	Lyell Comstock Mine	39	
				1001
"	"	Reduction Works	...	709
Railway Department—		Mt. Lyell Railway	138	
"	"	North Lyell Railway	16	
				154
		Total		1864

Quantity and value of metal produced:—

Blister copper, 1551 tons, containing—	£	s.	d.
Copper, 1532 tons, valued at	£109,269	18	0
Silver, fine, 110,799 oz., valued at	12,580	6	1
Gold, fine, 2386 oz., valued at	10,021	4	0
Total	£131,871	8	1

Mr. Inspector Curtain reports:—

Mt. Lyell Mining and Railway Company's Group.

Mt. Lyell Mine.—Surface and underground work continues satisfactorily at the South Lyell Mine. The "gullet" through the floor of the old stope workings, which will constitute the main gallery and its accessory side wings, nears completion, and the whole made ready for providing increased supplies of pyritic ore wherever required. To facilitate the removal and delivery of mullock for underground filling purposes, the introduction of "scoop shovels" is mentioned in connection with this and the neighbouring North Lyell workings.

North Lyell Mine.—Surface work is chiefly devoted to providing "filling," in connection with which other passes are being brought from the underground workings in order to permit more expeditious delivery. Underground: The various producing stopes are again in commission and providing satisfactory returns for the smelters.

Pump Houses.—In both mines the wooden structures are being replaced with iron and concrete, and made thoroughly uninflammable.

Lyell Comstock Mine.—Prospecting work continues in the five adit levels; in addition to which, connections for general delivery and ventilation purposes are being made with the four top workings.

Reduction Works.—During the period three furnaces have for the best part of the time been in blast, and there is every assurance normal conditions again prevail in this important branch of general operations.

Lake Margaret Hydro-Electric Scheme.—In the immediate vicinity of the lake, beyond checking the daily rainfall and water discharging at the weir, whose aggregate correspond and qualify that previously recorded, viz., 144 inches per annum, or a mean constant overflow of 60 cubic feet per second, little attention is being paid here for the present. Between here and the power station site, however, the scene changes. In connection with the latter, it may be well to state that it is distant about two miles, and situated in the valley some 1100 feet below, with which it is connected by horse and incline-haulage trams, that designate or separate the work into "top" and "bottom" sections. The former is 30-inch gauge, 110 chains in length, most of which is completed, and used to convey the material required for construction puposes towards the intake.

The other, or incline section, is 24 inches, coresponding with the general narrow gauge laid down and used by the company. It is 38 chains in length, within which distance it rises 1020 feet; that also will be the approximate pressure of the "working head" when harnessed and in operation.

This top section, having little pressure to contend against, will be provided with 4-feet stave (wooden) pipes, put together on the works; while duty on the other (bottom) section will be fufilled with a double, if not triplicate, row of 30-inch, reduced to 22 inches, of approved steel piping.

Adjacent to both tramway lines the track is cleared, and work in progress to uniformly grade the ground, so as to receive those different lengths or columns of piping, which, when completed, will practically constitute the whole scheme. This, while easily contemplated, is certainly not so easily accomplished, as the difficulties throughout are numerous, in consequence of the work being necessarily high on the mountain's flank or shoulder, where the country chiefly consists of massive columnar-shaped conglomerate, in places abrutly vertical, and upon whose buttresses ordinate ledges have to be hewn out of the solid rock, in order that the piping may be snugly housed and securely anchored.

To overcome such obstacles electric pneumatic rock-drills, of 7·5 H.P. calibre, assisted by hand steel, are in operation, and have already made marked and steady incursions towards attaining their readily-perceived goal or objective, which, even at this early stage reflects credit on this piece of engineering skill and industry.

After leaving this "top" section a descent is made on the incline tramway by means of wire-rope haulage to the principal power site below, adjacent to which is already installed an 80-horsepower hydro-electric unit that supplies current for working the inclined (hoist) motor and rock drills. The balance of the

work hereabouts is principally directed to levelling the foundations for the power-house, which covers an area of 66 feet by 110 feet, in conjunction with which there are in readiness fitting sheds, smith and carpenters' shops, officers' and workmen's quarters, and an area cleared for more permanent residences; the whole being in direct communication with the general office, both by telephone and 7½ miles of narrow-gauge railway, whose construction forms no small part in the success of this laudatory undertaking.

Mt. Lyell Blocks Copper Mines.—Mr. Robert Ferguson, the mining manager, reports:—There is nothing of importance to report, as only sinking the main shaft is occupying attention. The shaft has been deepened 70 feet during the term, making a total of 1166 feet from the surface, or 45 feet below that of the Mt. Lyell Company's North Lyell shaft at its 1100 feet, or deepest level; 25 men employed.

Guy's Prospecting Syndicate have two men prosecuting a search for copper on the confines of Jenico-street, Queenstown.

Mt. Jukes Prospecting Syndicate.—Mr. James Souter reports:—The intermediate adit has been extended a further distance of 28 feet, in addition to which a blacksmith's shop, 15 feet by 12 feet, has been erected near the drive's mouth. Two men employed.

North Dundas.—Copper-nickel sections, 8 men.

Ring Valley.—Thirty-eight tons fahl-ore, value £380, 16 men.

North-Western Division.

	Tons.	£	Men employed.
Murray's Reward (Balfour)...	...	...	...
Others (Balfour)	...	...	35
Mt. Jasper, Heazlewood	...	...	22
Totals	...	...	57

COAL.

The output this quarter was 16,095 tons, against 16,382 tons the previous quarter. The output of the respective collieries was as follows:—

Colliery.	Tons raised.	Value at mine. £	Men employed.
Cornwall Colliery	5948	2677	60
Mt. Nicholas ,, ...	9470	4262	67
Spreyton ,, ...	301	105	7
York Plains ,, ...	266	172	3
Illamatha ,, ...	70	42	2
Catamaran ,, ...	...	...	...
Mt. Cygnet ,, ...	40	20	2
Totals	16,095	£7258	141

SHALE.

Three men were employed at the Railton-Latrobe shale oil works. Ten tons of shale were obtained, valued at £10.

BISMUTH.

The output of bismuth during the quarter was as follows:—

	Tons.	£	Men.
Shepherd and Murphy Mine	1·66	664	...

WOLFRAM.

The output of wolfram during the quarter was as follows:—

	Tons.	£	Men.
Avoca Mines.....	6·2	682	*
Shepherd and Murphy Mine.....	8·5	850	*
Squib Mine	1·6	160	5
Iris Mine	2·1	250	3
Totals	18·4	1942	8

* Shown in tin returns.

OSMIRIDIUM.

The output of osmiridium during the quarter was as follows:—

	ozs.	£	Men.
Savage River District	197·5	2009	40
Wilson River	...	...	50
	197·5	2009	90

The following return shows the average number of men employed in or about the mines during the quarter ending 30th September, 1913:—

District.	Europeans.	Chinese.	Total.
Northern and Southern	521	...	521
North-Eastern	691	78	769
Eastern	555	25	580
North-Western	1002	...	1002
Western	3339	...	3339
Total	6108	103	6211

Value of mineral output per man:—£65 1s. 3·417d.

Dividends paid by mining companies during the quarter ending 30th September, 1913 :—

	£	s.	d.	£	s.	d.
From Copper Mines :—						
Mt. Lyell Mining & Railway Co. Ltd.	...			...		
From Tin Mines :—						
Mt. Bischoff Tin Mining Co., Reg.....	18,000	0	0			
Pioneer Tin Mining Co. Ltd.	8062	0	0			
Briseis Tin and General Mining Co. Ltd....	13,950	0	0			
Renison Bell Pros. and Mining Co., N.L....	1846	0	0			
				41,858	0	0
From Silver Mines :—						
The Mt. Farrell Mining Co., N.L.	903	0	0			
Quigley's Prospecting Syndicate	120	0	0			
				1023	0	0
From Coal Mines—						
Cornwall Coal Co.....	...			...		
Total.....	...			£42,881	0	0

Appendix I.

Burnie, 9th August, 1913.

Report 8.

Sir,

The following is the report for the month ending 31st July, 1913 :—

General.

The ordinary office routine was carried out at Zeehan, and 11 assays completed. Special visits were made to Beaconsfield and Farrell to inquire into work proposed there. A plan of work was decided on at Beaconsfield, which will be commenced as soon as the preliminaries are settled.

Zeehan Prospecting.

(1) *South Zeehan.*—In this vicinity 2316 feet of trenching have been cut, but apart from three poor formations, which carried specks of galena, with a little pyrite and blende, nothing of value was uncovered.

(2) *North Zeehan (North-east of Dunkley Town).*—Work in this district has been confined mostly to testing the creek beds. Three and one-half miles of rough tracks have been cut, and 704 feet of trenching completed.

(3) *East Zeehan (Five-Mile).*—Eight hundred and twenty-four feet of trenching have been completed without important result.

(4) *West Zeehan (Comstock).*—The tunnel has been driven 50 feet 6 inches on the lode, which looks promising, but is not yet payable.

(5) *South-West Zeehan (Little Henty River District).*—A large mullocky pyrite formation has been trenched across in several places, but the assays gave only a trace of gold.

This country on the north bank of the Little Henty River has now been carefully prospected from the seaboard to the Zeehan area. It has proved the most promising district that has been examined, and deserves further work. In several places water has prevented a conclusive examination of the lodes disclosed, and it may be advisable later on to use a small diamond-drill to prove them further.

PROSPECTING.

On this work only one party was engaged, who proceeded to the D'Aguilar Range to examine a special locality there. Weather conditions, however, proved altogether too bad, and they were withdrawn on the 19th of the month. All the prospecting parties, with the exception of two men engaged on special work at Farrell, have now been withdrawn, and preparations are being made for the work proposed during the coming summer.

PORT DAVEY TRACK.

Work here has proceeded very satisfactorily during the month. The court depot at Albina has now been completed, and the track extended for about six miles down the coast. Point Hibbs will soon be reached, and a depot will be established there, and fodder and provisions brought in in preparation for some difficult country that is known to lie to the south of the point.

WATER CONSERVATION.

The Rolleston work has proceeded steadily. Levels have been taken showing the available fall to be over 600 feet, and compass surveys carried from the intake to the proposed power site. The track from Mt. Read is being repaired, and questions of access and water catchment more closely examined. The figures, so far, are confirming in every way the preliminary estimates.

HARTWELL CONDER, State Mining Engineer.

The Secretary for Mines, Hobart.

State Mining Engineer's Office, Zeehan,
4th September, 1913.

SIR,

The following is the report for the month ending 31st August, 1913:—

GENERAL.

The usual office work was carried on at Zeehan, and 15 assays were completed for the month.

Zeehan Prospecting.

(1) *South Zeehan.*—On Section 306 an old tunnel is being extended to cut the northern continuation of several lodes which were worked in the Montagu Mine. After driving 20 feet, a lode was met and driven on 6 feet south and 3 feet north. It carries about 2 inches of clean galena, and shows indications of improvement as it goes north. Negotiations to let this lode on tribute are now proceeding. Driving the tunnel was continued, 63 feet having been done to date, or a total of 132 feet from the entrance.

On Section 5226, 340 feet of trenching have been done.

(2) *West Zeehan (North Comstock).*—Sixty-six feet of driving have been done on this lode; total, 132 feet 6 inches. The lode, which is a mixture of blende, pyrites, and galena, is of a very patchy nature, and so far has proved too poor for exploitation.

(3) *North-East Zeehan (Dunkley Town).*—About 1 mile of track has been cut, 462 feet of trenching done, several prospecting holes sunk, and a creek bed examined. This locality has proved disappointing. Although the sedimentary rocks are apparently of the same age and character as those of Zeehan, they have not been disturbed to the same extent by intrusions of dykes and masses of igneous rock; hence the conditions for ore-deposition have not been so favourable. The prospecting party has been withdrawn from this district.

(4) *North Zeehan.*—A large mullocky lode has been opened in several places. It proved to be very poor, and occurs in a low and wet position. Altogether 520 feet of trenching have been done.

(5) *Central Zeehan.*—A crosscut has been started and driven 18 feet to date to cut the northern continuation of some of the lodes worked by the Mt. Zeehan Tas. Co. on the Argent Flat.

(6) *Nubeena Tribute.*—The tributors began work on 11th August; they have driven 26 feet south and 7 feet north. For the last 10 feet going south the lode has been poor. Going north the lode carries 6 inches of fairly good seconds. About 1½ tons of firsts have been bagged and several tons of good seconds are ready for jigging.

Prospecting.

One party was engaged on this work at Tullah during the month. Work here was directed chiefly to the valley of the Murchison River. A large magnetite deposit carrying a certain percentage of copper was opened up, but the copper values are low, and under present conditions are not payable. It is proposed to put in repair the pack-track here as far as the old Kitson sections, and to prospect the northern and eastern flanks of Mt. Murchison from this base.

Beaconsfield.

In accordance with the plan of work decided on here a start has been made to repair the Duchess of York tunnel. When this has been done, it is proposed to let a contract to sink from the tunnel and cut the Gladstone lode at as deep a point as proves practicable.

Port Davey Track.

Several small creeks were encountered this month, which required bridging and delayed the advance, but the track is standing well through the bad weather, and the work is being pushed steadily forward.

Water-power.

Work has gone on steadily in regard to the power scheme at Lake Rolleston. The line of the race has been surveyed and measured, the distance proving under 1½ mile. A route of tramway to connect with Messrs. Dunkley's tram from Rosebery was examined, and it is found that about 5 miles of tram through easy open country will give the connection. The results of closer investigation continue to strengthen in every way the original estimates.

HARTWELL CONDER, State Mining Engineer.

Report 10.

State Mining Engineer's Office,
Zeehan, 3rd October, 1913.

Sir,

The following is the report for the month ending 30th September, 1913:—

General.

The usual office work was carried on at Zeehan, and 18 assays were completed for the month.

Zeehan Prospecting.

(1) *South Zeehan* (*Section* 306).—The tunnel has been driven 160 feet for the month, making a total distance of 292 feet. The end is now approaching the area in which the continuation of the old Montagu lodes may be cut. The lode which was intercepted at 90 feet from the tunnel mouth has been let on tribute, but on account of the ventilation will not be worked until the tunnel is completed.

(2) *West Zeehan* (*North Comstock*).—The tunnel has been driven 57 feet, total 187 feet. The lode has been irregular and poor. Work has been suspended in the end, but a cross lode which was cut will be tested.

Kynance.—The crosscut to the pyrities lode has been driven 19 feet 6 inches.

(3) *Central Zeehan* (*No. 2 Argent*).—The crosscut has been driven 93 feet, total 111 feet. At 25 feet a vein of high galena was cut. From that point to 78 feet three other seams, averaging about 1 inch of clean ore, were met with. At 100 feet a vein of gossan 12 inches wide, and assaying 10½ oz. silver, was driven through. All these ore occurrences will receive attention from tributors when the crosscut is finished.

Queen Hill.—A tunnel has been driven 26 feet. About 40 feet more driving is required to cut a lode which shows on the surface.

(4) *Nubeena Tribute.*—Dunn and party have driven the south end 3 feet, the north end 17 feet, put up a rise to 13 feet, and beaten out 21 feet of a leading stope. The north end is barren. There are indications that there is a new make of ore coming in at the south end, and there are six inches of clean galena in the rise. The party are preparing a parcel for sale.

Four tribute parties are now working in this vicinity.

Prospecting.

One party has been engaged on this work at Tullah. The track to the Kitson cage across the Murchison River has been repaired, and a start made to extend it further on the south side of the river. Some prospecting work has been done on the Osborne blocks, and preparatory work commenced for extending a tunnel on the Kitson property.

Port Davey Track.

The track has reached the Hinns River, which flows into the sea on the northern side of Point Hibbs. The depot will be established at the base of Point Hibbs itself, and if possible part of the supplies for work further south will be landed at a small boat harbour sheltered by the Pyramid Rock.

Water Power.

In addition to the steady work of contouring the dam site and bettering the means of communication a flying survey was pushed forward to ascertain what fall would be secured by carrying the water-race on to the Murchison River. The figures require confirming, but it appears that in place of 600 feet, over 1000 feet of fall could be secured by increasing the length of the race from 1½ mile to about 7 miles. This would mean a large increase in the maximum power available, or a corresponding reduction in storage works and dimensions of race if a scheme of smaller capacity seemed advisable. The details will be more fully investigated during the current month.

HARTWELL CONDER, State Mining Engineer.

Appendix II.

REPORT ON THE McLEAN'S FALLS AND SUNRISE DRAINAGE TUNNELS AT ZEEHAN.

The following is a report dealing with the question of drainage on the Zeehan field. Several proposals were considered, but the chief one enquired into was that to drive a tunnel from McLean's Falls, about 4 miles south-west of the town, to drain off the water in the upper levels of the mines around Zeehan.

The question is not so much one of whether or not certain advantages can be secured, but whether the cost of securing them is warranted; and the object has been to collect, as far as possible, the engineering facts, so that some basis may be available to those with whom the provision of the required funds would rest, if the work was undertaken.

Dealing with these features, it was found that the bottom of McLean's Falls is 345 feet below the collar of the New Mt. Zeehan shaft. These heights were taken by the level from the New Mt. Zeehan shaft to the top of the falls; from there to the bottom of the falls the height was taken by aneroid, which was checked carefully with the level during the progress of the work. The result can be relied on within a few feet.

The course of the main tunnel is shown on the Zeehan chart attached. It would start from the falls and connect with the Colonel North shaft; thence to the New Mt. Zeehan shaft, *via* the Florence; thence to the Montana; finally terminating at the Western shaft. Branch tunnels would go off to the other more important mines.

A section is also attached showing the relation of the level of the tunnel to the chief shafts of the field. Allowing 10 feet for tip head and 10 feet per mile fall, the tunnel would come as follows:—

Below the bottom of—

	Feet.
Colonel North shaft (320 feet deep)	215
Spray No. 1 (368 feet deep)	150
Austral Valley (200 feet deep)	125
Florence (198 feet deep)	125
New Mt. Zeehan (124 feet deep)	180
Oonah (450 feet deep)	25
Silver King (240 feet deep)	28
Above the bottom of—	
Montana No. 1 (803 feet deep)	450
Western (1000 feet deep)	580

The fall allowed—10 feet per mile—is steep, but if lessened the tunnel would need to be larger, and there would be danger of sediment depositing.

The distance to be driven would be as follows:—

	Feet.	Feet.
To Colonel North shaft	10,230	
To New Mt. Zeehan, *via* Florence	10,312	
		20,542
		(3 m. 71 chs.)
To Montana		3234
To Western		2112
		25,888
		(4 m. 72 chs.)

Branch drives would be needed to other shafts as follow:—

	Feet.	Feet.
Austral Valley	6402	...
Silver King	3696	
Spray	1320	
Oonah	1980	
		13,398
Total	...	39,286
		(7 m. 35 chs.)

The tunnel could be made the width of ordinary drives at the top, but 10 feet deep and 6 feet wide at the bottom. Passing points would need to be allowed about every 100 yards. The ties for the rails would be 4 feet from the bottom, leaving the water-channel below about 5 feet wide by 3 feet 6 inches deep. This would carry off about 130 Tasmanian head, or 28 million gallons of water per diem, which should be ample.

A compressing plant for rock-drills, and either compressed air or electrical haulage, would be required to handle the trucks. Power from this could be obtained from the falls.

For about 4000 feet the tunnel would penetrate conglomerate; after that should come the ordinary slate country of the Zeehan field.

For a drive of the above dimensions the cost would probably amount to an average of £4 per foot for driving, timbering, and equipping.

This gives the cost of driving as follows:—

	£
To New Mt. Zeehan	82,168
Other connections	74,976
Total	£157,144

Equipment, rails for a tramroad, air-pipes, &c., would require another £10,000; so that the total cost would probably lie between £160,000 and £170,000.

Taking an average progress of 3 feet per day for 300 days in the year, it would require 11 years to reach the Colonel North shaft, 22 years to get to the New Mt. Zeehan, and about 43 to complete the work. These periods could be reduced by working from intermediate shafts, but the cost of this, entailing pumping and equipment for driving only two ends, would be extremely heavy.

When the results that would be secured by this lengthy and costly undertaking are considered, one fact stands out very clearly. Over a considerable area of the country to be tapped, shafts are already down deeper than the level at which the tunnel would come in, while over most of the rest of the area the major portion of the ground above has been worked out. For instance, in the case of the Florence the shaft is down 198 feet, and the tunnel would come only 125 feet below this. It is extremely unlikely that sufficient ore would be discovered between the tunnel and the present workings of the existent mines to warrant the cost of the tunnel, while if the mineowners have to instal pumps to drain their workings below the tunnel level they will be averse to paying also for the use of the tunnel.

One aspect deserves consideration, and that is the prospecting of the country through which the tunnel would advance. This would be of real value, and might easily lead to the disclosures of new lodes, but the chances are discounted heavily—(1) by the probable presence of barren conglomerate for the first 4000 feet; and (2) by the shallow depth of the tunnel as it approaches the central part of the Zeehan field. A depth of 300 feet here does not appear sufficient. To prove the extension downwards of present known lodes a depth of 500 feet would appear to be the minimum, while to test the ground at depth for another zone of enrichment at least 1000 feet would be required.

A point of interest is, whether in the event of sinking below the tunnel level the water in the mines would be intercepted and kept from percolating into the lower levels. This bears directly on an alternative scheme proposed a short time ago by Mr. Hodge, to drive a tunnel from the Sunrise Mine to drain off the surface water. This tunnel would cut the Florence shaft at about 100 feet from the surface, and the new Mt. Zeehan at about 70 feet, and would be 1000 feet long to the Florence shaft. In some instances the water encountered on the Zeehan field may be called local; *i.e.*, it may be derived from soakage close at hand, and not from springs of distant origin; but at the Florence Mine this is certainly not the case. In this mine the rush of water is so strong, and the quantity so much larger than in the neighbouring mines on either side, that it would seem that a definite underground water-channel (the presence of which many eminent geologists believe in) has been tapped. However this may be, neither in this mine nor

in the others, can one hope to intercept at 100 feet more than a small proportion of the water that would be encountered at, say, 300 feet. Surface alteration, as shown by the softer rocks, extends on the Zeehan field to at least 300 feet in depth, and these rocks are porous and permeable. In the case of the Florence, where the water-pump was estimated at 15,000 gallons per minute, this quantity would account for a rainfall of 100 inches per annum over 348 acres. Under 10 acres would embrace all the Florence workings, so that the balance must come in laterally, and not vertically. As the workings drained by the country, an hydraulic gradient would soon be established in the surrounding rock, and the water would miss the upper workings and appear in those below. All the evidence available as to the Florence points to a shallow tunnel here being of very little service, while any scheme of work in the Argent Flat should be most careful of breaking into this deep-lying river. When it is realised that 1500 gallons per minute means over 2,000,000 gallons per diem, or about as much as the Tasmania Mine is now pumping, the magnitude of the danger and difficulty here will be appreciated.

With the deeper tunnel, a larger proportion of the water would be retained, but it is unlikely that sufficient would be intercepted to lessen materially the quantity of water that would require to be pumped from any lower levels. There would, however, be a saving of power in the lesser height, to which the water would require to be raised.

Another point that has been referred to is the advisability of dealing with the surface-water of the Argent Flat. Any scheme that aids in quickly carrying away the surface water cannot fail to be an influence for good, but it would be unwise to expect any big results from, for instance, running a concrete channel along the Argent Flat. Under normal conditions in Tasmania there is a heavy leakage from a water-race when first cut, but if muddy water is passed into the race the crevices silt up, and the leakage is not heavy. In the case of the Argent Flat it is doubtful whether there would be much escape from the water-channel itself. The seepage over the whole flat would certainly amount to far more, while the underground flow would be the main factor in shaft-sinking. When it is realised that the catchment area of the Flat is about 1 square mile, and that a considerable stream is constantly flowing out of it, it becomes clear that the loss by soakage cannot be very severe. It would be advisable to gauge the delivery of this stream before incurring any serious outlay in concrete or other channels.

The above conclusions show that a very large expenditure spread over a long period of time would be required if the drainage tunnel was undertaken, while the result would be so imperfect and incomplete that it could be in no sense regarded as final. If it were decided to attempt some combined scheme for unwatering the field and further testing it at a depth, I consider that a central shaft would be preferable to the tunnel. The cost of

this work would, however, be very heavy, and it should be deferred until cheap power has been provided to deal with the pumping that would be required. The quantity of water encountered in the mines (with the exception of the Florence) is not great. Including the Florence and the 16 other most important shafts the total water horse-power would only amount to about 650, if all were working. This would be equivalent to a demand for about 1000 horse-power. Power can be secured on the West Coast for a capital outlay of about £20, plus an anuual charge of about £8. It seems more reasonable to invest money in a power scheme which would be of permanent value, whatever the mining results that accrued, than in a tunnel scheme, in itself incomplete, and dependent absolutely on the vicissitudes of the mines it serves.

The problem of the Zeehan field is no easy one; the closer the matter is enquired into the clearer it becomes that an enormous amount of work has been done here, both above and below the ground, by engineers as capable as any in Australia, supported by miners and tributors of more than ordinary acumen. Any scheme which proposes to follow after these men and win success from mines which they have closed down must be equipped with more resources than they possessed if it is to have any hope of prevailing. I regard the provision of cheap power as more likely to prove advantageous to Zeehan than any system of tunnelling, and as precedent to any scheme of mining development that may be proposed.

The survey work entailed above was carried out by Mr. J. H. Levings, and I have to thank Mr. John Craze for valuable assistance in some of the estimates.

HARTWELL CONDER, State Mining Engineer.

Zeehan, 7th August, 1913.

JOHN VAIL,
GOVERNMENT PRINTER, TASMANIA