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PRELIMINARY REPORT ON
THURLOW GOLD MINE
EAST THURLOW ISLAND
NANAIMO MINING DIVISION
BRITISH COLUMBIA

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Vancouver, B.C.,
March 28th, 1933.

B. W. W. McDougall,
Consulting Mining Engineer.

Vancouver, B.C.,

March 28th, 1933.

Messrs. H. H. Peters & Co.,
Vancouver, B.C.

Gentlemen:-

In accordance with your instructions I have made an inspection of the Thurlow Gold Mine, situated on East Thurlow Island, Nanaimo Mining Division, B. C. Attached hereto please find my report. I trust that you will find this in order and that it will provide you with the information you require.

W
Yours very truly,

B. W. W. McFarquhar

Consulting Mining Engineer.

THURLOW GOLD MINE
East Thurlow Island, B.C.

INTRODUCTION

The inspection on which this report is based was made on March 20th and 21st, 1933. I was accompanied from Vancouver by Mr. Gordon Brown and he, together with Messrs. J. Morrison and J. W. McDonald of Shoal Bay, accompanied me on the inspection of the property.

The principal points of interest on this property, being situated near sea level, were free of snow. The upper portions of the property, however, were in part snow covered. The inspection was confined to the lower claims of the property on which almost all the development and exploration work has been effected. As will be described in a later paragraph the principal workings include a tunnel, two open cuts and a shaft from the bottom of which about 150 feet of drifting has been done. The shaft was filled with water and could not be examined. One of the cuts was not well exposed for sampling.

The purposes of the inspection were as follows:

1. To determine the general mining merit of the property.
2. To determine whether or not it would be well-advised to institute small-scale production involving relatively small capital expenditure at the outset of possible operations.
3. Assuming that the property was considered to have merit and to warrant the expenditure of capital on some programme of exploration and development, to determine the most economical ways and means of effecting this.

It is understood that complete descriptions of the property and of the general circumstances affecting its exploration and development are already on record. Accordingly this report will refer but briefly to these general circumstances and will deal more completely with descriptions of the accessible mine workings and with recommendations for the more complete exploration of the mineral claims.

CONCLUSIONS

1. The Thurlow Gold property is still in the prospect stage. Such development work as has already been effected has been confined to a small vein area and part of this, because of water, was not available for examination. For reasons which will be given later it is my opinion that the property warrants the expenditure of capital for a carefully-planned exploration and development programme.
2. It is, in my opinion, unwise and premature to assume that the mine may be brought into profitable small-scale production at the outset of an exploration and development campaign. It happens that a certain vein area can be developed quickly and cheaply. This development must be done before information concerning quick production possibilities will be available.
3. The Thurlow Gold property as at present constituted has a length of more than two and one half miles and is believed to include a certain regional fracture zone for its full length. Very little work has been done on any of those claims situated more than one-half mile or less from the beach. It is considered that the back-lying claims of the group well merit careful prospecting and exploration.

PROPERTY

CLAIMS:

The Thurlow Gold Group includes some fifteen claims all of which are locations.

SITUATION:

The property is situated on East Thurlow Island some 125 miles North Westerly from Vancouver. It is on the Easterly side of the island contiguous to Nodales channel and extends from the beach in a North Westerly direction.

TOPOGRAPHY:

Like all the islands in this vicinity East Thurlow is somewhat rugged topographically. There are five mountain peaks having heights of 1,500 feet or upwards,- one reaches an altitude of 2,000 feet. The vegetation is, for the most part, dense and this together with the somewhat heavy overburden which characterizes much of the island impedes prospecting. The principal mine workings on the Thurlow Gold Group are at elevations of from 145 to 230 feet above sea level and not more than 2,000 feet from the beach.

NEIGHBORING PROPERTIES:

On East Thurlow island there are two other claim groups which have attracted some degree of attention,- namely, the White Pine and the Douglas Pine Groups. The Sonora Group is situated on Sonora island at the Easterly side of Nodales channel and about three miles distant from Thurlow Gold. The Alexandria mine, at the entrance to Phillips arm, is about 5 miles distant in a Northerly direction.

ECONOMICS

CLIMATE:

The climate of the coast islands is similar, in essential respects, to that prevailing at Vancouver.

TRANSPORTATION:

Vessels of the Union Steamship fleet provide access and transportation to the islands in this vicinity. The beach at Thurlow Gold is suitable for a float which can be provided for an expenditure estimated at \$400.00. Deep water persists close to the shore and when a proper float has been built vessels will be able to discharge freight on it. The cost of freighting from Vancouver to Thurlow Gold is about \$6.00 per ton.

A straight-line right-of-way has been cleared from the beach a distance of 600 feet and to an altitude of 100 feet. A surface tram operated by a hoist from the upper end could be built for small expense. A road, following a more gentle grade, leads from the beach to the top end of the straight-line grade,- thence continues to the Thurlow Gold camp, shaft and tunnel with but little change in grade. The road is not surfaced and in certain seasons mud will doubtless occasion some difficulty.

There is a Fordson tractor at present on the road near the top of the straight-line grade. It has been stripped of much of its equipment by prowlers. It is equipped with a hoist which fortunately was not stolen. The machine can probably be repaired and put in serviceable condition for a cost of about \$250.00.

WATER:

There are two small streams close to the sites of the tunnel and shaft. There is sufficient and convenient water for domestic, mining and metallurgical requirements.

TIMBER:

There is sufficient timber for all mining and construction purposes.

POWER:

Diesel engines must be used for power. The cheapness of transportation will permit of low-cost power.

GENERAL:

Equipment and supplies of every description are best purchased in Vancouver. There is a general store at Shoal Bay a few miles distant where doubtless a few emergency requirements may be purchased. At the present time there is weekly steamer service to East Thurlow island, - it is believed that a twice-a-week service will be commenced during the summer as has been the case in past years. In any event a gas boat permits of access to other ports of call within two or three hours run of Thurlow Gold.

HISTORY

Reference is made to the B.C. Minister of Mines Reports and to Memoir No. 23 of the Canadian Geological Survey by Dr. J. A. Bancroft, for the early mining history of the district including Thurlow and Sonora islands and the mainland coast in the vicinity of Phillips and Frederick Arms.

Briefly, discoveries of gold-bearing ore were made in the '90's and a mild 'boom' appeared to be getting under way. A great deal of the Easterly part of Thurlow Island was staked and development, on a small scale, was under way at a number of places. Like many other mining districts in the Province, the area was almost completely depopulated in 1898 when the 'stampede' to the Klondyke occurred. It has only been in recent years that mining interest has reverted to the area. Promising developments at the Alexandria Mine on Phillips Arm has doubtless, to a considerable degree, been instrumental in causing this renewal of interest.

GEOLOGY

The coast line geology of the area is given in Memoir No. 23 of the Canadian Geological Survey. The data for this memoir were collected in 1912. Unfortunately there have been no further official geological investigations of this area. Certainly the complete geological mapping of the district would bring to light many interesting features and it seems not improbable that some of these might prove of substantial economic interest.

The area is underlain by granodiorites of the Coast Range batholith. There are numerous roof-pendants and interfoldings of volcanic and sedimentary rocks.

There appear to be at least two more or less parallel zones from two to three miles apart along which fracturing on a regional scale has occurred. These zones strike in a general NW-SE direction. One of these zones crosses the North Easterly side of Sonora island and extends across Cardero channel to the Alexandria and Dorothea Morton Mines. This zone follows the contact of an interfolded remnant of volcanics and sedimentaries with the granodiorites. The other zone is considered to extend from Thurlow Gold on the South East, through White Pine and possible

through to Loughborough Inlet to the North West. This zone appears to be a major fracture line in the granodiorites. It is largely this evidence of continuity of fracturing on something approaching a regional scale, that attracts geological and economic interest to the area.

Granodiorites underlie the lower three claims of the Thurlow Gold Group. Doubtless the same formation underlies most if not all of the upper claims. Along the fracture zone a vein can be seen on a rock bluff at the beach. Here it is in the form of several stringers the largest of which is about one foot in width. At the mine workings about 2,000 feet distant the vein is from 3 to 5 feet in width.

The vein has the appearance of being intrusive in the same sense as a dyke is. There is but little megascopic evidence of replacement. The vein minerals were evidently injected along a major fracture plane following the initial consolidation of the plutonic rocks. Accordingly the vein quartz and accompanying sulphides may be expected to occur in the form of lenses. Certainly some severe post-mineral faulting has occurred. The gangue is chiefly quartz and the sulphide minerals are principally pyrite and minor amounts of pyrrhotite. There are traces of galena and sphalerite.

MINE WORKINGS

At an altitude of about 230 feet a quartz vein showing sulphide mineralization is exposed in an open cut. The maximum width is about 5 feet. It strikes North Westerly and dips at an angle of about 60 degrees to the South West. Near the end of this cut the vein curls sharply to the East and appears to end. A strong post-mineral fault has displaced the North Westerly continuation of this vein. A short distance above the cut there is a line of bluffs which is doubtless due to faulting. Coursing diagonally up the face of the bluffs is a well-defined fault zone a foot or more in width. Further continuity of the vein to the N.W. should be sought on the N.W. side of this fault and to the North East.

Two samples were taken from the open cut. These assayed as follows:

No. 1	Width 4.4'	Ozs. in Gold to the ton	0.10
" 2	" 2.7'	" " " " " "	0.54

At an altitude of about 155 feet or about 75 feet lower than the level of the open cut a tunnel has been driven on the vein. The portal is about 75 feet South Easterly from the outer end of the open cut.

This tunnel exposes the vein for a distance of about 90 feet. At the 90-foot point the lode is displaced by the fault mentioned in the description of the open cut. The tunnel was driven a further distance of some 50 feet and two crosscuts, one some 36 feet Westerly and the other about 48 feet North Easterly, were driven. Judging from the conditions exposed on the surface the mine workings beyond the fault could not be expected to locate the vein.

The vein as exposed in the first 90 feet of the tunnel is considerably disturbed due, largely, to the influence of the fault. The sulphide content appears to be heavier at the bottom of the tunnel than at the top. In a former operation some four feet of the original tunnel bottom was taken up and the ore recovered

was sorted and shipped to the smelter. From the portal to about the 30-foot point the vein matter is badly leached and the original sulphide content has been partly removed. Beyond the 25-foot point the sulphides have suffered much less oxidation. At the 80-foot point a winze about 15 feet deep has been sunk. Samples taken from the tunnel together with their assays are as follows:

<u>No.</u>	<u>Width</u>	<u>Dist. from Portal</u>	<u>Ozs. Gold</u>	<u>Remarks</u>
3	3.3'	6.0'	0.03	Badly Oxidized
4	2.8'	15.0'	0.09	" "
5	5.0'	24.0'	0.43	Partly Oxidized
6	2.2'	30.0'	0.78	Full Width not exposed
7	2.4'	70.0'	0.78	" " " "

The vein between samples Nos. 6 and 7 is continuous though not well exposed for proper sampling.

An open cut has been made on the vein about 160 feet South Easterly from the portal of the tunnel and at an elevation of 150 feet. High gold assays are reported from selected samples taken from this cut. It was not well exposed for proper sampling.

Some 210 feet South Easterly from the tunnel portal a shaft has been sunk on the vein to a depth of about 72 feet. The shaft collar is at an elevation of about 145 feet or about 10 feet lower than the portal of the tunnel. The shaft is filled with water to the collar and so could not be examined. It is reported that about 150 feet of drifting has been done from the shaft bottom. Evidently some faulting was encountered in these workings. It is said that a considerable portion of the drifting is not on the vein.

The distance from the fault in the tunnel to the shaft is about 320 feet and the vein continuity on the surface appears to be indicated throughout this distance at least. It is further believed that continuity persists to the beach, - a distance of nearly 2,000 feet from the shaft collar.

A sample taken from the fines dump at the tunnel portal and representing the screenings from ore sent to the sorting table assayed 0.41 ounces to the ton in gold. It is estimated that there is between 80 and 100 tons of these fines or grizzly undersize.

A sample taken from the sulphides picked at random from the tunnel dump and intended to represent a reasonable average for hand-sorted sulphide ore returned an assay of 2.06 ounces to the ton. Possibly something under 5 tons of this type of ore may remain on the dumps.

A sample of selected sulphides taken from the shaft dump assayed 0.30 ounces gold to the ton.

CAMP

The camp buildings consist of a boarding house, bunk house and office building. All buildings are in a fair state of repair and can be renovated cheaply to serve as satisfactory quarters for a crew of about 10 men.

RECOMMENDATIONS

While it is believed that the fracture zone may persist throughout the entire length of the property and that there may exist re-occurring lenses of auriferous sulphide ores, there is no known reason for expecting that the fracture zone on the back claims will be larger or richer than those which may exist nearer the beach

and in the immediate vicinity of the present workings. It is accordingly recommended that exploration work first be undertaken in the vicinity of the shaft and tunnel. The topography of this portion of the property does not permit of further exploration by tunnels,- the vein must be opened and explored through a shaft. It is useless to attempt exploration work through the shaft without first installing a diesel-driven compressor. Since power must be made available for a three-fold purpose,- drilling, pumping and hoisting, nothing smaller than a 50-horse power engine and a compressor having a capacity of 250 cubic feet of free air per minute at 100 pounds pressure, should be considered. The shaft should be de-watered and exploration continued from the present bottom level of the shaft. Briefly the work to be recommended includes drifting on the vein and thoroughly searching out the zone of fracturing for ore lenses in both directions from the shaft. If this exploration work is successful in locating ore shoots subsequent development will readily fall in line.

The only alternative to the method of exploration above suggested is to employ a crew of men for a season or more exclusively at surface prospecting work. Such work would include trenching and opencutting the vein between the beach at the shaft and searching for the fracture zone and possible ore lenses on the upper side of the fault and across the full length of the upper claims. The latter method would have as its object a more complete delineation of the outcrops, their character and values, for the purpose ultimately if the exploration results warranted, of instituting a more ambitious programme of development.

COSTS

The following figures are compiled for the purpose of indicating the approximate cost of preparing for exploration work and of carrying this forward. They are not necessarily precise but will serve as an approximate guide.

Estimated cost of preparing for commencement of operations,- any programme:

Ship Landing Float,	\$ 400.00
Repairs to Tractor,	250.00
Repairs to Camps,	150.00
Camp Equipment for 10 men,	300.00
Total,	<u>\$ 1,100.00</u>

Estimated cost of providing power mining equipment:

Engine and compressor installed together with tools,
mining equipment and sundries, \$ 3,900.00

(NOTE: These figures based on certain quotations made but quoted equipment is subject to prior sale.)

For an over-all expenditure of about \$2,500.00 per month about 240 feet of underground development should be effected.

A prospecting campaign employing say 7 men and a superintendent would cost at the rate of about \$1,500.00 per month inclusive of moderate overhead, travelling and incidentals.

SUMMARY

The external circumstances affecting mining operations at the Thurlow Gold property are favorable and should commercial ore shoots be opened unusually low costs, commensurate with the scale of operations, will be possible.

So far as is known the ore-bearing veins occur in the form of lenses following the course of a fracture zone in the granodiorites of the Coast Range batholith. Since this fracturing is considered to be regional rather than local in character and extent it is believed that there are possibilities for ore shoots of commercial grade and dimensions. This belief is substantiated, in part, by the finding of outcrop samples from which assay attractively in gold. Moreover such outcrops have been found at intervals over several miles of length.

A possible ore shoot carrying gold content in excess of one-half ounce per ton is indicated below the Thurlow Gold tunnel over a length of more than 50 feet. The present workings permit the exploration and development of a vein area, say 500 feet and upwards in length and 70 feet in depth, at relatively small expense but power-driven mining equipment is essential.

The property is to be considered as a prospect with certain favorable features which, in my opinion, warrant exploration. It is obviously premature to anticipate assured profitable production. As yet the Thurlow Island gold occurrences have been only very superficially investigated. If commercial gold-bearing ore shoots exist anywhere along this fracture zone it is reasonable to expect that they exist on the Thurlow Gold property.

The gold appears to be associated entirely with the sulphides and the ores should be amenable to cheap metallurgy. It is to be expected that a high extraction of gold values can be made by flotation with a relatively coarse grind and yielding a concentrate having a gold content of possibly 3.0 ozs. to the ton or more.

Two alternatives have been suggested concerning exploration work. One of these has as its object an attempt to prove up a comparatively accessible vein area quickly and in the hope that sufficient commercial ore may be made available for small-scale production. The other has as its object an extensive prospecting campaign intended to trace out the fracture zone and possible re-occurring ore lenses across the length of the property and with the ultimate object of eventually, if prospecting meets with success, of initiating a much more ambitious campaign of development.

Respectfully Submitted,


B. W. W. MacDunnell

Consulting Mining Engineer.

Vancouver, B.C.,
March 28th, 1933.