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THE PORTAGE MINE

FOR DAY

WHITTIER, ALASKA

MR 95-3

August 28, 1965

Robert Steiner, P. Geol.

MAPPING - EXAMINATIONS - REPORTS

GEOLOGICAL CONSULTANT:-
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BOOK 2 19
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THE PORTAGE MINE

POE BAY

WHITTIER, ALASKA

August 28, 1965

INTRODUCTION:

The writer examined the property August 27th to 30th, accompanied by F. T. Isherwood and W. Funk. A comprehensive report on the mine has been written by Dr. T. V. Smitheringale, and the reader is referred to this report for a general description. Further information about the area may be obtained from the Geology of the Prince William Sound Region, Alaska, Fred H. Moffitt, Geological Survey Bulletin 989-E, U.S. Department of the Interior, 1954.

No radical changes have taken place since the mine was last operated in 1939. However, economic conditions and general regional development of the area warrant a re-assessment of the potential of the Portage Mine.

GENERAL DESCRIPTION:

Poe Bay is located on the north shore of Passage Canal, about 8 miles easterly of the port of Whittier. Passage Canal is one of the few ice-free bodies of water in this portion of southern Alaska. Thus the port of Whittier is open all year. The Alaska Railway connects Whittier with Anchorage, 62 miles northwesterly. Anchorage has an all-weather international airport, and is the largest centre of population in the region. Supplies for the mine can thus be expedited from Seattle, Washington, either by sea to Whittier, or by air to Anchorage, and then by rail to Whittier.

Access to Poe Bay is by water, from Whittier. Poe Bay is at the mouth of a small river draining the Heth Glacier. This river flows in a gently graded

valley, which rises to 350' above sea level over a distance of about 3.5 miles. The valley begins about .5 miles northerly of Poe Bay, and is separated by a rock ridge, about 150' high, from the bay. Thus the river, draining the valley, falls, through a fairly broad canyon, about 30' to the head of the bay. The bay itself is rather shallow, and an extensive sand flat overlying bedrock, permits access only at high tide. A large-scale earthquake, whose epicentre was approximately 12 miles southeasterly, has caused Passage Canal to sink from 5' to 20'. This has resulted in a slight deepening of Poe Bay. Since this subsidence is still in action the floor of Poe Bay is unstable. Passage Canal forms a protective bulwark against inclement weather, and therefore shelters Poe Bay from heavy seas.

For the purpose of this report the river draining the Seth Glacier, since it is not named on the existing maps, will be referred to as the Seth River. This river begins in a steep-walled cirque, some 1,400' below the Seth Glacier. The recent earthquake sheared off a very large section of the cirque wall under the east edge of the glacier, resulting in a change in outwash water. Most of the water draining from the glacier now flows on the east side of the cirque, rather than as previously down the west side. The mine workings are situated near the west outflow of water.

The Seth valley is a typical U-shaped glacial valley. However, there are no lateral morraines, and the valley walls end abruptly at the fairly flat valley floor. There are some slide areas, but none extend more than a few hundred feet into the valley. The river is at grade, and close to the canyon has agraded to the extent that some timber has been killed, and a small swamp exists over about 1,300' by 5,000' along the westerly edge of the valley. The valley is about 6,000' wide, and retains this width for its entire length. Its grade appears to be about 100' per mile.

GEOLOGICAL DESCRIPTION:

The east wall of the valley is composed of a contact zone between a granodiorite stock and highly metamorphosed sediments. The west side is underlain by sediments, occasionally cut by pegmatite and quartz dykes. The general trend of both the sediments and the granite appears to be about N 10° W. The dykes trend westerly on the west wall, and none exist on the east wall.

Slates, quartzites and greywackes comprise the sediments on the west wall. These change on the east wall to mainly greywackes, shot through by many small quartz veins, whose depositions become more intense as the granite is approached. The recent earthquake, in shearing off the east wall of the cirque, exposed a very large contact zone extending some hundreds of feet easterly of the mine workings. This zone is nearly vertical, with some minor folding, and appears to be at least 500' wide. Field glass observation indicated a series of parallel quartz veins, some of which appeared to be at least 50' wide. The contact zone is exposed for a depth of about 1,300' above the cirque floor, and is covered by about 100' of debris at its bottom.

Access to the mine workings was not possible, due to the hazardous conditions existing at the time of examination. However, the portals appeared open. The mill has apparently been destroyed. Examination indicated that the portals were driven perpendicularly to the contact zone. The drifts were driven along a vein presumed to be some 450' southwesterly of the presently exposed contact zone. Thus it is apparent that the former operators were unaware of a much larger mineralized section some 400' - 500' inwards, into the face of the cirque. The writer cannot describe the contact zone at the mine workings, except by inference derived by examination of debris covering the bottom of the cirque. It is thus inferred that further exploration of the contact zone will most certainly disclose the existence of additional quartz vein systems, capable of carrying gold mineralization.

RECOMMENDATIONS:

The existence of economical quantities of gold had been proven by former operation. The present conditions existing in the area warrant an intensive exploration program, aimed at a substantially greater development of the property than was carried out previously.

It is recommended that a small diamond drilling program be carried out at the base of the cirque. This would explore the recently exposed section of contact zone. The length of the holes cannot be precisely determined, at present, until some surface exploration has been carried out. Since, at the moment, the existing mine workings are inaccessible, they should only be re-

examined, when convenient, as an aid to orienting the structures wherein gold was mined, and correlating these to the contact zone now exposed. It is probable that the mineralization persists to depth. Thus a new drift, at the base of the cirque would be much less expensive than the construction of an access road to the former workings. Prospecting should also be carried out along the contact zone on the east wall of the Seth River valley.

A camp should be set up near the southerly edge of the cirque. This area is flat and well protected from slides and bad weather. It is preferable to set up a camp here, rather than at Poe Bay, because no time would be consumed getting from the Bay to the working area. The camp should not be large, but should be capable of housing a drill crew of four men, a cook, and at least two prospectors and a geologist. Minor supplies could be flown in by helicopter.

An access road can be constructed from Poe Bay quite easily. The general terrain is such that a road driven up the valley will have no more than about 1 ½ grade. The ridge at the head of Poe Bay can be avoided if the road is begun at the west side of the Bay. A D-8 cat should drive a road in in not more than one week, including access from Poe Bay to Seth Valley.

The Bay is shallow for a distance of about 2,000' from shore. Therefore a floating dock of about half this length is recommended. The remainder of the dock can be of piles. The solid portion of the dock should have a grade to shore (bedrock) and the road begun at this point. There is ample area for a storage shed in the flat area behind shoreline. A 15' tide exists at this point. Thus the dock should be flexible enough to allow unloading at low tide. However, barges can be unloaded while at rest on the bottom, and no great difficulties should be encountered. If timber is available economically, the entire dock can be built of logs and planks. It is not recommended that concrete piles be used, due to the continuing subsidence of the Bay floor. However, precast piles could be sunk in place, provided that the solid portion of the dock is flexible enough to withstand such subsidence.

The cost of a preliminary exploration program is thus outlined:

Camp buildings: prefabricated, plywood, about $3,000 for a bunkhouse-cookhouse combination, to house eight men.

Road: $1,000 per mile in the valley;
$1,500 per mile from the beach to the valley.

Bridges: $1,000 each, at least two necessary.

Diamond drilling: $3.50 to $8.00 per foot, 2,000'.

Dock: about $5.00 per lineal foot.

Camp supplies: $5.00 per day per man.

Wages: about $20.00 per day per man.

Camp, road and dock are permanent. Thus these costs would be:

Camp	$ 3,000	
Road: 2.5 miles	2,500	
1.0 miles	1,500	
Bridges: two at $1,000 each	2,000	
Dock: 2,000' at $5.00/foot	10,000	$ 19,000
Diamond drilling: 2,000' at $8.00/foot	$16,000	
Camp supplies: 200 days at $40/day	8,000	
Wages: 4 men (drill crew excepted) 200 days at $20/day/man	16,000	
Supervisory staff, engineering, etc., on consulting basis	6,000	
Moving in charges are not known, but it is estimated that barging in cat and supplies would probably be at least	1,000	$ 51,000

If possible, some ore might be mined. This would necessitate a portable compressor, drills and blasting supplies. Compressor and drills can be leased or rented. These rents would probably be $15 - $20/day for the compressor, and $300/month for two drills. However, if the present workings were to be reactivated, a road would have to be built to the portals from the base of the cirque. This road would be at least 4 miles long, with a 5% grade. Since some rock work is definitely involved, the cost would

be about $2,000 - $2,500 per mile. It is recommended that this program be carried out at a later date.

It is probable that the mining equipment used before may be in working condition. This equipment apparently consisted of several ore cars, rail, compressor, drills and milling machinery. It is not conceivable that all equipment should be unusable, after some 25 years of inactivity. Thus, before any plans are made for mining, this equipment should be examined, repaired if necessary, and any other equipment needed either purchased or leased. However, as stated above, mining should only be carried out after the property has been properly assessed.

DISCUSSION:

The writer is not at liberty to discuss the merits of the former operation, except by inference and assuming historical mention to be true. It is clear, however, that mining was begun without any regard to some preliminary exploration, beyond the discovery of a few minor quartz veins. It is true that the average grade of ore was about 1.5 ounces gold per ton. The veins, as described by Smitheringale, were very small. And, if mined to standard mining widths, would have so been diluted by waste as to make the operation of the mine unprofitable. It is therefore rather unique that the former operators did not carry out exploration in the vicinity of the contact zone. Had this been done the mine would have continued operating, at a profit, until the present time.

Portage Mine is in a somewhat isolated area. Thus even the U.S. Geological Survey has not examined the Seth River valley. Consequently, what mapping has been done shows only a partial picture of the potential. The contact zone, as observed, is large enough to be classed as a separate geological unit. The granitic rocks persist along the east wall of the Seth River valley for some considerable distance beyond that shown, and most certainly beyond the Portage Mine. In other areas, with lesser potential, contact zones of such major proportions, as indicated here, have been examined, explored and developed with greater enthusiasm than that apparently displayed in the Seth River valley. The observer cannot at present state what the economic potential may ultimately be, but, if 1.5 ounces gold were found in 12" of vein, it is reasonable to expect the same or better in veins some 50 times larger.

In the past access to the mine was difficult and costly. Today modern equipment could make this mine into a highly profitable operation. However, at least one season should be spent in exploration. The result of this work would then indicate the most efficient methods whereby the development of the area could be carried out.

The methods of exploration are simple. A good geological mapping program, combined with a limited amount of diamond drilling, and a small underground program could outline a considerable economic potential.

SUMMARY AND CONCLUSION:

The mine is situated close to an all-weather seaport. It is also within reasonable distance of a large centre of population, with an international airport. Although it is, climatically, within reach of the Gulf of Alaska, Prince William Sound, Passage Canal, and the position of the Seth River valley combine to decrease the severity of storms originating in the Gulf.

Initially, the cost of re-activating the mine may be high. But, if an efficient exploration program is conducted during the next summer season, 1967 could be the start of a long and profitable operation of the Portage Mine. The initial cost appears to be about $69,000. Of this about $18,000 would be spent on permanent work. The costs for the next year would be reduced considerably due to the returns from ore shipments. It is suggested that initially some attempt should be made to ship out about 1,000 tons of siliceous grade ore, with no attempt made to mill the ore at the site. Part of this tonnage could be mined during the exploration phase, and the rest during the first year of development. It is, however, not suggested that shipment of ore precede exploration for it.

Were it not for the exposure of the very large contact zone by the recent earthquake, indicating a good potential, the mine would not, according to past performance, be worthy of further consideration as a profitable venture. The contact zone, previously not exposed, shows that more favorable ground exists than was mined in the past.

Respectfully submitted,

Robert Steiner

Robert Steiner, F. Geol.

A section of the middle part of the Seth River valley. The view is to the east. The timber has been killed by continual flooding, due to the aggrading action of the stream. At high water this area would be under about 3' of water.

The ridge, down to about the first vegetation, is granite. The talus slope, and the bluff below it is the contact zone. And below this are the sediments underlying the valley and its westerly wall.

The view is to the south. In the far distance is the ridge immediately north of the beach. The mountain beyond this ridge is on the south shore of Passage Canal.

The rubble in the immediate foreground is the southerly extent of the slide caused when the earthquake sheared off the easterly section of the cirque. This area would be suitable for a campsite. It is obvious that road building would be simple.

The dotted circle indicates the mine portals. To the right (east) is a tongue of the Seth glacier. And at the edge of the picture (arrows) is the contact zone. Access to the portals would have to be up to the slope at the left side of the picture. The portals are some 1,400' above the base of the rock wall. This view is to the north. The sediments occupy most of the section to the left of the large stream flowing down the face of the rock wall. The contact zone should be explored by cuts and trenches at the base of the wall.

The two streams, converging towards a small patch of snow, could be the source of a small hydro-electric plant. A large lake, just over the crest of the ridge, feeds both streams.

Diamond drilling should be carried out between the vertical of stream and the small talus pile to the right. The holes should be horizontal, so as to cross-cut the vein system and the contact zone.

D E C L A R A T I O N

I am a graduate of the University of British Columbia. I have a B.A. degree in geology.

I am a member, in good standing, of the Association of Professional Engineers of Alberta, registered as a Professional Geologist.

I do not hold any interest whatsoever in the property described in this report.

I do not intend to give or express any warranty, and the opinions expressed in this report are my own.

Respectfully submitted,

Robert Steiner

Robert Steiner, B. Geol.

BOOK 2 PAGE 31
Wittier Recording District

The following is a report made by Dr. W. V. Smitheringale, Geologist.

1935

REPORT OF THE PORTAGE MINE
PORTAGE BAY, ALASKA.

As engineer for the Portage Mine Syndicate the writer of this report examined the showings on the Portage claims in May, July, August and October of 1935.

Location: The Portage No. 1 and 2 mineral claims are situated in the Port Wells district, Alaska. The claims are located about 3½ miles from tidewater, on Poe Bay. This Bay is a small indentation along the north side of Portage Bay about six miles from the head of the latter. The elevation of the claims is approximately 1700 feet.

The nearest port of call of regular steamers is Valdez, some eighty miles east of Poe Bay. The Alaska Steamship Company maintains a weekly schedule from Seattle to Valdez. From Valdez power boats are used to Poe Bay. A mail schedule is maintained twice monthly between Valdez and points about Port Wells.

From the beach at Poe Bay a trail connects the workings and camps. This is mainly along a low open valley of easy grade. The last one half to three quarters of a mile are along the side of a small dead glacier and up a steep side hill slope.

Number of claims: Originally there were two claims, the Portage No. 1 and No. 2. These were located in 1928 by D. Vietti and Partners. They held the claims by annual assessment work which consisted of driving a cross-cut tunnel towards the vein. In 1935 an option to purchase these claims was acquired by Capt. John Irving which he later assigned to the Portage Mine Syndicate - a syndicate formed to do the initial development work -. The syndicate now owns an undivided half interest in the claims and an option to purchase the remaining half interest for $25,000 shares in the company, plus $25,000.00, payable

as a ten per cent (10%) royalty on gross production from the mine. No time limit is set for completion of the royalty payments.

In November, 1935, a third claim, Portage No. 3 was staked, recorded and registered in the name of the ~~xxxxxx~~ Portage Mine Syndicate. Now have 5 claims

Transportion:

At present small shipments(freight) are consigned to Valdez and then taken to Poe Bay by scow. For consignments of twenty-five tons (Now 15) (25) or more it is possible to have these transhipped at Cordova to a small ~~fr~~freighter which will deliver the goods at Poe Bay provided proper facilities are available for handling the consignment at its destination.

From Poe Bay to the tunnel, 3½ miles, will be by trail or road. At present a fair trail exists from the beach to the "Glacier" camp at 350 feet elevation. This 2½ miles of trail will need some alteration before any quantity of material can be moved over it conveniently. A short favorable approach will be needed from the valley floor onto the glacier and a suitable winch and cable from the portal of the tunnel down to the glacier. None of these required alterations present any undue difficulty or ~~xxxxx~~ outlay.

TOPOGRAPHY:

In Poe Bay, at low tide, a sand flat extends outward for about one third mile. At high tide scows may be floated to within fifteen (15) feet of the beach cabins.

Across the mouth of the Valley there is a ridge that rises to about 150 ft elevation. The valley floor back of this ridge is some 50 ft below the summit. The valley floor has a gradual rise. The elevation at the toe of the glacier is 350 feet.

The valley is about one half mile or more in width. The sides are very steep. (See photo No. 1.)

Geology: The mineral showings are in the western section of the Port Wells district. This district is underlain by a shale- "graywacke" series which is intruded by stocks and dikes of granitic rocks. Adjacent to these granitic ~~xxx~~ intrusions are quartz veins, some of which carry gold in economic quantities. The veins are associated with the granitic rocks but are later as the vein fissures extend from the shales into the granite. The vein fissures while narrow (one to two feet) are quite persistent.

About one half to three quarters of a mile southeasterly from the showings there is a granitic stock of some considerable size. There are a few small granitic dikes cutting the shales on ~~xxx~~ and adjacent to the property.

The rocks on the property are limey and arenaceous phases of the shale series. Their general strike is N 50° to 70° E and their dip is 65° to 75° N.W.

The shales in the vicinity of the property are well fractured. Many small irregular veins occur but most of those are worthless as a source of gold.

The main showing on the property at present is a vein occurring along a well defined fracture striking N58° to 60° E and dipping 60°N.W. In general it has a slight discordance in attitude to that of the enclosing rocks.

Mineralization:

The vein consists predominently of banded quartz in which are varying amounts of sulphides and free gold, forming from one to two per cent of the whole. The sulphides are pyrrhotite, pyrite, galena and sphalerite. The gold is mostly free, occurring in the quartz and in the sulphides.

Irregular bunches of quartz occur along the hanging wall of the vein in places and short north south spur veins are spaced along the

footwall. These carry low but varying amounts of gold.

On the surface the vein is definitely exposed over a horizontal length of 150 feet. In this distance the vein varies from three inches to three feet in width with an average indicated width of 10 to 12 inches. Talus covers the vein on either end. Underground the vein has been drifted on for thirty feet and exhibits the same characteristics as on the surface. It varies in width from four inches to two feet with an average width of 12 inches. It is cut by a fault which has caused only slight displacement and a general widening of the vein adjacent to it.

Values:

Sixteen samples were taken along the outcrop of the vein. The indicated average of these 1.46 oz. gold per ton over an average width of 9.2 inches. A 25 to 30 ft section near the east end indicates an average of 3 oz. gold per ton with a width of 12 inches. A shipment of 530 lbs of ore from this section yielded 5.83 oz. gold and 1.66 oz. silver per ton.

Underground the average indicated value from eight samples is 0.619oz gold per ton over an average width of 12 inches. About 150 lbs. of vein material was collected underground at random from the broken ore. two samples quartered from this material yield respectively 1.41 oz gold and 1.24 oz. gold per ton.

It is believed that as drifting is continued along the vein the average value will rise to that indicated on the surface. This is suggested by the vary close similarity in character of vein and type of mineralization between the underground and surface exposures. The free gold in the vein is <u>not</u> due to secondary enrichment; it is primary in origin.

The higher assays are calculated in the average because they are integral and important parts of the vein. They are not chance erractic assays. This is borne out by developments and production from other similar veins in the district.

The general relationship of the workings to the outcrop of the vein and its underground intersection is shown on Map 2. The tunnel is 140 ft.

vertically below the outcrop; along the dip of the vein this gives 165 ft of backs. West of the tunnel the backs remain the same or a little less; east of the tunnel the backs increase quickly and at 30 ft east are approximately 215 feet.

It is estimated that there is a possible 2062 tons of ore indicated. This assumes a block of vein 150 ft horizontal by 165 ft deep and one foot wide. Estimating this ore to run one ounce per ton and allowing an 85 % recovery there is indicated 1752.7 oz. At $35.00 gold this gives $61244.50.

The above estimate of possible ore assumes that the vein extends only to the limits of its surface outcrop and only down to the tunnel level. Recommendations are made later for defining the tonnage possibilities.

Climate:

There are no official records of precipitation and temperature changes in this district. It is estimated that the yearly rainfall is in the neighborhood of 70 inches with some 15 feet of total snowfall durin g the winter. The temperatures probably vary between minus 15 degrees to plus 70 degrees. The average winter temperature from October to March is 25° plus,- probably higher than this estimate.

In 1935 the snow was mostly gone from the valley by May and the tunnel was free from snow until early November at least.

Timber:

The timber in this section consists mainly of spruce, hemlock and a variety locally called "alchuck". On sheltered slopes timber line varies between 500 and 1000 feet in elevation.

At the property there is a fair stand on the ridge across the mouth of the valley and along the sides of Poe and Portage Bays. There is likewise a small stand of timber on the valley floor (see photo No. 1). It is estimated that this latter stand will furnish most if not all timber necessary for mining purposes.

For fuel it is estimated that oil will be the most economical.

Water:

There is ample water for domestic purposes. There are two possible water sites. The principal one is at the beach. The ridge across the mouth of the valley causes the river to fall abruptly from the main valley floor to the beach. There is some 85 ft of effective head at this point, requiring about one-quarter mile of pipe line. During low water there is possibly sufficient water to develop some 70 H.P. while during the summer months several times this is available. No guaging has been done so the low estimate is only a rough approximation. This power site would require some 3½ miles of transmission line to the mine workings.

Crossing the outcrop of the vein there is a glacier fed flow of water. This could be collected to give an effective head of 200 feet or more and there would be sufficient for possibly 50 H.P. This supply, however, is variable with the temperatures and is not considered feasible for a reliable source. It will however supply all water necessary for milling purposes.

Milling:

Due to the topography in the vicinity of the showings it is considered best that the mill should be established immediately below the portal of the tunnel., and the excavation made well into the rock. This will allow the roof of the mill to be as near as possible to the natural ground surface and afford as much protection as possible from the snow. The site would be free of snow slides. There is ample facilities for tailing disposal.

The ore appears to be a free milling type, similar to the other working properties in the district. These properties employ stamps with plate amalgamation. After the plates the ore is passed over the tables and a sulphide concentrate is made which runs 4 oz. gold per ton or better.

The two producing properties in the district during 1935 were the Granite mine and the Beddles Bay mine. The present owners of these properties estimate that the past production from these properties has been upwards of $500,000.00 for the Granite Mine and $100,000.00 for the Beddles Bay Mine. (Gold at $20.00). These estimates were given during the conversations with the owners.

Whittier 2 37

General:

There is at present limited accommodation at the beach (see photo 3) The "Glacier" camp near the foot of the glacier will accommodate 6 or 8 men. At present this is a tent camp. It is about three quarters of a mile from the Portal and about one hour's walk.

It is possible to establish camp about one quarter mile from the Portal on a small bench. With a little rock work it will be possible to establish a building site just east of the portal and at the same level.

Due to the steep hillsides snow slides are common during the spring breakup. There is only one that interferes with the approach to the tunnel. Above the vein outcrop the hillside is steep and acts as a gathering ground for snow. The slides off this section pass over the vein fromthe center of the outcrop westward. They pass the portal about 200 feet to the west and then down the slope twelve hundred feet to the glacier surface. The approach to the portal of the tunnel must cross the lower end of this slide. The danger period is over by June and does not recur again until probably December. The maximum danger is during April and May.

Conclusion:

The results of the work during 1935 are favorable and sufficient to warrant the installation of machinery to further the rapid exploration of the vein at depth.