MR-048-02

MR Tozimoran 48-2

REPORT ON PLACER PROPERTY

KNOWN AS THE

TOZIMORAN CREEK KT 48-55

ENGINEER
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YUKON - KOYUKUK DISTRICT

Tozimoran Section:

Tozimoran Creek lies in an unmapped area about 20 miles north and west of Tananaon the Yukon River and is in the Rampart Quadrangle.

External Conditions:

The Tozimoran is about 12 miles long and flows N. 80 degrees E. in a deep, broad valley to its junction with the Tozitna River. Two transportation routes are available for this creek. The usual route is by wagon road which follows Grant Creek to a point about 4 miles north of the Yukon and then by a 16 mile trail passable to pack animals to a temporary camp near the head of Toximoran. The other route is by shallow draft boat up the Tozitna River from the Yukon to the mouth of the Toximoran, a distance reported to be about 40 miles by water but only about 25 miles in an air line. No landing field is available at this creek.

The surrounding country is quite rugged and many of the hills attain an elevation of about 3000 feet. The Ray Mountains to the northeast reach an elevation of 6000 feet, but the Kokrine Hills to the west are considerably lower.

The freeze-up and break-up occur earlier and later, respectively than in the Ophir and Poorman sections, and consequently the operating season is somewhat shorter. The annual precipitation is reported to be greater than that for the Yukon-Tanana region to the south.

Stands of birch, spruce and tamarack of a size suitable for mining and building purposes occur locally in the valley, and

there is an ample supply of small timber for domestic purposes. The summits of the neighboring ridges and hills are above timber line at this latitude which is only about 70 miles south of the Arctic Circle.

The Tozitna River flows a large volume of water and, at the time of the examination, at least 150 miner's inches were running in Tozimoran Creek at a point 3 miles below the head.

History:

It is reported that gold was discovered in this creek about 1908, but no ground rich enough to work was opened at that time. Intermittent prospecting appears to have been carried on with more or less indifferent success, and claims were frequently allowed to lapse and were restaked by other prospectors. Within the past two years the upper creek valley has been taken up by the present owners, and staking downstream by the same parties is still being carried on. The present plan is to cover the creek throughout its length.

Geology:

During the last glacial period ice sheets interfered with the existing drainage system in this area and caused the flooding of many of the creek valleys. The economic effect of this, as regards mining, has been the deposition of from 25 to 75 feet of silt above the gold bearing gravels on the lower Tozimoran Creek. As drainage was re-established, the creek cut into bedrock deeply

so that at present the original paystreak remains locally on benches and elsewhere has been entirely eroded and distributed through the creek gravels.

No positive evidence was found that the creek had been subject to the direct action of the ice, so that the pay streak probably was not destroyed at that time.

Where exposed, the bedrock is schist which carries discontinuous veins and seams of quartz. In general appearance it resembles strongly the Birch creek schist which forms the bedrock of the Fairbanks area, and on this basis it is possible that slate, limestone and quartzite beds may underlie some sections of Tozimoran. The occurrence of greenstone in the gravels indicate that beds or intrusions of this rock are present.

Areas of granite intrusions occur in the general area and probably underlie the schists in the creek. Mineralizing solutions given off by these intrusions were the probable source of the tin, gold and lead found in the creek, but no veins of either tin or gold were noted. The sulfide of lead, galena, was observed at two points.

The exposures of gravel which is medium in size and iron stained, range in thickness from a foot or so to a maximum of 9 feet.

In the upper section of the creek, the bench and creek gravels are overlain by muck, which at one place reaches a thickness of 18 feet. As the thickness of gravel under this muck was 6 feet, the ratio was 3 to 1. The lower section of the creek, in part at least, has a heavy overburden of very fine silt.

The gold, which is fairly coarse and dull yellow in color, and the cassiterite, occur for the most part in a two or three foot section just above and in bedrock, although low values are distributed throughout the entire gravel section, but nothing is known definitely of the grade or distribution of values in the creek gravels.

Development:

Very little development has been accomplished during the history of the creek, and such pits as were put down at various times have caved and are now inaccessible. Several small open cuts on a bench three miles below the head of the creek, and occasional pits over a distance of a further four miles indicate that prospecting results were not especially encouraging. At one cut (referred to in the sampling data as the old cut) about 4000 square feet of bedrock were cleared, but the results were reported to be disappointing. The unusually large amounts of cassiterite present probably contributed to this condition by the clogging of the riffles in the sluice boxes.

Recently, 3000 feet of old ditch have been repaired and a new cut ground sluiced to bed rock on the same bench.

Sampling:

Seven complete samples were taken in the new cut and two samples representative of the gold and tin pay section were taken in the old cut. The individual fractions were rocked and panned, and the gold recovered weighed after amalgamation and acid treatment. The cassiterite recovered from each sample was weighed, and a

composite sample was put through a ¼ inch screen. The two products resulting were weighed and assayed separately for tin and iron to obtain information regarding the possibilities of marketing all the cassiterite as recovered and the feasibility of producing cheaply a smaller tonnage of higher grade material.

The interval between the samples in the new cut was 25 feet, so that a 175 foot section is represented. The two samples in the old cut were taken at convenient points.

The sampling data are set forth in the following table:

Tozimoran Creek Samples (New Cut)

No.	Position With Reference to Bed Rock	Area of Cut Square Feet	Volume of Cut Cubic feet	Gold Ret. Mgms.	Assumed Fineness	Black Tin Ret. Lbs.
2 A	2 to 4	2	4	7		
B	0 to 2	2	4	39		
C	0.5 to 0	2	1	69		
2	0.5 to 4	2	9	115	900	1.0
4 A	1.5 to 4.5	2	6	54		
B	0 to 1.5	2	3	28		
C	1 to 0	2	2	104		
4	1 to 4.5	2	11	286	900	0.5
6 A	2.5 to 5.5	1.5	4.5	4		
B	0 to 2.5	1.5	3.75	232		
C	1 to 0	1.5	1.5	170		
6	1 to 5.5	1.5	9.75	406	900	0.14
8 A	2 to 4.5	1.5	3.75	3		
B	0 to 2	1.5	3	68		
C	1 to 0	1.5	1.5	82		
8	1 to 4.5	1.5	8.25	153	900	0.9

(Cont. Tozimoran Creek Samples) (New Cut)

No.	Position with Reference to Bed Rock	Area of Cut Sq. feet	Volume of Cut Cubic Feet	Gold Ret. Mgms.	Assumed Fineness	Black Tin Ret.Lbs.
10A	1.5 to 4.5	2	6	7		
B	0 to 1.5	2	3	108		
C	-1 to 0	2	2	190		
10	-1 to 4.5	2	11	305	900	0.2
12A	0 to 4	1.5	6	125		
B	-1 to 0	1.5	1.5	335		
12	-1 to 4	1.5	7.5	460	900	4.2
14A	0 to 2.0	2.5	5			
B	-1 to 0	2.5	2.5	6		
14		2.5	7.5	6	900	Trace

Tozimoran Creek Samples (Old Cut)

20A	-0.5 to 2	1.0	2.5	6	900	
22A	-0.5 to 1.5	1.5	3	502	900	

The above data are calculated to values and amounts per cubic yard and per square foot of bedrock, as shown below.

Tozimoran Creek Samples (New Cut)

Sampling Results

Gold Values Per Cubic Yard Dollars	Gold Values Per Square Foot of Bed Rock Dollars	Black Tin Amounts Per Cubic Yard Pounds	Black Tin Amounts Per Square Foot of Bed Rock Pounds	Location Left Limit Bench New Cut
0.35	0.06	3.0	0.5	"
0.70	0.14	1.2	0.3	"
1.12	0.27	0.4	0.1	"
0.50	0.10	2.8	0.6	"
1.66	0.31	15.1	2.8	"
Trace	Trace	Trace	Trace	

Tozimoran Creek Samples (Old Cut)

Sampling Results

Trace	Trace	Left Limit Bench Old Cut
4.52	0.34	"

The samples are too few in number to justify the calculation of the average value of the section, as their principal value lies in showing the range of values, the distribution of values in the gravel and bedrock, and the close relationship between the gold and the black tin.

In the rocking of the samples, clay derived from the decomposition of the bedrock gave some trouble, but it is too small in amount to cause undue interference in sluicing. The cassiterite gave the greatest trouble in handling the samples, but amalgamation easily effected a separation of the gold from the tin.

Conclusion:

The Ophir section contains a probable yardage of gold bearing gravel in the lower sections of the creeks and the adjacent river gravels sufficient to make an attractive dredging proposition from this viewpoint, but the probable grade of the gravels, from 35¢ to 45¢ per cubic yard, and the apparent lack of continuity of the pay streak, indicates that over the life of the operation the property would be but a marginal producer.

The other possibility in this section, the working of the few remaining bench pay streaks and local enrichments, offers a doubtful net profit from very limited operations.

It is not recommended that active work be undertaken in this section at the present time, but developments should be watched.

So little information and data could be obtained on the Poorman section that no definite conclusions can be reached at this time beyond the fact that the cost of providing an ample water

supply would require a considerable yardage of rich gravel to even meet amortization charges on this development. As a rule ground that has been drifted in the past can be dredged at a profit today, providing that the operating factors are suitable for this method of mining. On this basis, Poorman Creek would probably be an attractive prospect if the cost of necessary water could be held within reason. At present, it is inadvisable to consider taking over the property.

Tozimoran Creek, due to the lack of prospecting and development data, can be considered merely a prospect at this time. Gold values on the benches, as shown by sampling, appear attractive but could be duplicated in the other sections examined and under conditions more favorable to lower operating costs.

The assay returns on the placer cassiterite in this creek give, for the material larger than $\frac{1}{4}$", 52.5% tin and 2.90% iron, and for the material less than $\frac{1}{4}$" in size the tin assay is 69.6% and the iron ran 1.94%. The respective weights, expressed as percentages, were 70.2 and 29.8, giving an average result for all the material of 57.6% for the tin and 2.61% for the iron. The iron content, which, if too high, is penalized by the smelter, in this case is contained mainly in the rock particles associated with the cassiterite, and could be reduced to 1.75%, or less, by milling. The 2.61% average, however, would probably be acceptable without penalty. Sulphur, arsenic and copper, the other impurities subject to penalty, were not determined as they do not appear to be present in appreciable amounts.

Tin concentrates assaying 58% tin, or, roughly, 74% cassiterite, can be made from these gravels as a by-product from mining the gold. However, a penalty is usually applied for concentrates running less than 60% tin, which is the usual grade of Bolivian concentrates. Malayan concentrates run considerably higher in tin content, and placer tin from Tin City, Alaska, run better than 70%. It is difficult to see how there would be any market for the Tozimoran Creek tin except at a heavy discount from the market price unless foreign tin supplies were cut off. The cassiterite, then, becomes a liability in that it increases the cost of recovering the gold and, under ordinary conditions, is valueless.

Further work on this creek should not be considered unless a profitable market for tin concentrates of the grade and composition available be assured. Under normal market conditions it is certain that there would not be any profit in shipping tin concentrates from this section.

Respectfully submitted,

Marshfield Hills,
Massachusetts

Livingston Wright

COPY

Anchorage, Alaska
August 28, 1940

Mr. Gus Gelles
Anchorage, Alaska

Dear Sir:

I have completed a brief examination of the mining property held by Messrs. Purkeypile and Weboreis on Moran Creek, 20 miles north of Grant Creek, Alaska, and submit the following report for your information.

Lode tin deposits.

Results of assays of samples from Moran Mountain, thought by Mr. Purkeypile to contain tin, were negative. There is therefore no direct evidence of lode tin in this locality, except as may be inferred from the presence of placer tin on Moran Creek. Tin-bearing veins are characteristically associated with granite. Although there is no trace of granite in the upper basin of Moran Creek, areas of this rock lie a few miles to the southwest and west of this locality, and granite is very probably present at no great depth below Moran Creek. Further prospecting may result in the discovery of tin-bearing lodes, but the scarcity of outcrops makes the search a difficult one.

Placer tin deposits.

A body of tin-bearing gravels about 1,000 feet long and averaging 100 feet wide has been blocked out by a series of open cuts across a low bench on upper Moran Creek. According to Mr. Purkeypile these cuts have averaged about 2 to 3 pounds of cassiterite per square foot of bedrock, as well as 50 cents per square foot in gold. This would indicate a deposit of between 100 and 200 tons of placer tin in sight but as none of the cuts reached the inner limit of the gravel deposits considerably more tin may be present in this bench. The depth of over-burden ranges from about 5 feet along the outer edge of the bench to 20 feet or more at the inner end of the longest cut.

Placer tin has been reported as far down Moran Creek as the mouth of Slate Creek, a distance of 2⅔ miles, but this could not be confirmed in the present investigation as all the old prospects had caved in. One prospect hole 25 feet deep is said to have yielded 7 pounds of tin and $1.65 in gold. Most of the prospecting was done on the low benches, as water prevented the

sinking of open holes in the immediate valley bottom. Consequently nothing is known of the occurrence of placer deposits at the present stream level.

Recommendations.

Development work to date has proven the presence of placer tin and gold in workable quantities and location on a low bench within a few miles of the head of Moran Creek, and there is some evidence that similar deposits of equal or greater value occur several miles downstream. The geologic setting is favorable for the extensive occurrence of both bench and creek deposits. This property is therefore judged to be sufficiently promising to justify an extensive program of prospecting to determine the extent and richness of the deposits. As a drill would be necessary to prospect the creek bottom the entire area could probably best be prospected by drilling, perhaps supplemented by open cuts at favorable places on the benches.

Very truly yours,

Farrell F. Barnes
Geologist, The Alaska Railroad