MR-112-02

DATA IN CONNECTION WITH KENSINGTON MINES COMPANY

INTRODUCTION

The following pages contain reports and data by various engineers and firms on a group of mines in Alaska now consolidated and known as the KENSINGTON MINES COMPANY.

RECAPITULATION AND DEDUCTIONS MADE FROM APPENDED REPORTS

Property

K+ 112-8

Consists of four contiguous mining groups, Seward, Ophir, Northern Belle and Nowell Groups, now consolidated as the Kensington Mines Company, comprising sixty-seven odd claims, or approximately 2100 acres, mostly patented, situated in the Juneau Mining District, 60 miles north of the Treadwell Mines in southeastern Alaska. (For details see maps and reports attached.)

History

In 1891 Berners Bay Mining & Milling Company was organized, with a capital stock of $1,000,000. The company then opened up what is known as the Comet vein and from that was taken approximately $500,000 in very rich quartz. In 1896 the capitalization of this company was increased to $2,500,000 for the purpose of purchasing properties adjacent to the Comet mine, and a large area of ground was covered by purchase and locations. The bonded indebtedness at this time was increased to $500,000, and the additional money was expended in the purchase of mining claims in the vicinity and in the erection of additional reduction works. Large sums were spent on surface equipment, but no intelligent system of development was followed. Dissatisfaction arose between the stock and the bondholders over the wasteful management of the mines. In 1902 litigation was started. The properties were thrown into the hands of a receiver and continued so until the close of the litigation in 1910 (see history litigation attached). The question of ownership between the original stockholders, receiver's certificate holders, and bondholders was finally settled by the U. S. Supreme Court in favor of the bondholders, who purchased the property at a court sale for their claim February, 1910. In 1904-5 receiver's certificates were sold and the Kensington cross-cut run tapping the ledge at depth. During this litigation, which lasted from 1902 to 1910, attempts were made by the principals of the Treadwell Company, Corning of Corning, Alcott & Peer, and various others, to reorganize the company and take over the property. The attempts failed on account of their inability to obtain clear titles or fulfill contracts made. The detailed reports attached were made by these several companies while endeavoring to make the reorganization.

In the spring of 1909 the Appellate Court of San Francisco, sustaining the decision of the lower Federal Court of Alaska, decided that the original bondholders were the rightful owners of the property. After this decision was reached, the bondholders, in conference with their attorney, decided and agreed to reorganize the properties, forming a new company known as the Kensington Mines Company, which would embrace all of the groups, to have a capitalization of $5,000,000 of common stock and $500,000, 7% preferred cumulative redeemable stock.

The bondholders have agreed to sell this preferred stock with a bonus of common stock for the purpose of raising $500,000. This money to be subscribed in two issues of $250,000 each. The first $250,000 subscribed is to be applied as follows: $125,000 of this to pay all the last receiver's indebtedness (already taken care of); $125,000 to repair the present equipment and begin active mining operations on a working basis. As soon as preparations for a larger plant can be made, and the necessary development completed in the mine, the second $250,000 subscribed will be applied to the building of a larger crushing plant.

Type

Three large known low-grade deposits and or more smaller high-grade deposits. The low-grade deposits are of the same type, size and character in ore, formation and values as the Treadwell deposits in the same belt (See U. S. Government Reports, No. 835, and Transactions A. I. M. E., Vol. 35, reports by Corning, Treadwell, Van Furman and others.)

The Small High-Grade Leads

Several thousand tons of ore have been milled from these small leads, one of them alone, known as the Comet Mine, having returned $464,000 in gold, with an average of $10 a ton. This mine was worked out to the level of the present No. 3 cross-cut, and as the property got into litigation at this time, no further work was carried on. These high-grade properties have great merit, but are considered as secondary to the large low-grade deposits. (For complete details in regard to these, see also accompanying reports.).

Abstract of Reports

The following tables are made from the appended reports on the Kensington Mines Company property; show the results obtained on the various important ledges of the group by the several engineers and companies who examined and sampled these groups. These tables also show the average value, ore developed, width and length of these several ledges obtained by averaging the results of the various reports.

TABLE

Kensington Ledge: Kx 112-15

Report by	Width	Length	Depth Dev.	Tons Dev.	Assay Val. per ton gold	Gr. Val. Dev.	Net Val. per ton	Total net Val. Dev.
Tripp.....	50 ft.	200 ft.	800 ft.	400,000	$5.00	$2,000,000	$3.00	$1,200,000
Treadwell.	70 ft.	150 ft.	800 ft.	320,000	4.27	1,360,000	2.00	640,000
Corning...	(Assume above widths)		800 ft.	320,000	4.85	1,550,000	2.00	
George....	60 ft.				6.00			
Smythe....	50 ft.	300 ft.	800 ft.		5.20			
Thane.....	70 ft.	150 ft.	800 ft.	320,000	4.30	1,375,000	2.00	640,000
Average...	60 ft.	200 ft.	800 ft.		4.93		2.00	

Note: This ledge is opened on two sides 10,000 tons milled from the surface and on the 800-ft. level in the Kensington cross-cut there are 600 ft. of cross-cuts and drifts, on the same ore chute. Though the ore body on this level appears to be some smaller than on the surface, the value remains the same.

Eureka Ledge: Kx 112-10

Tripp.....	20 ft.	400 ft.	500 ft.	300,000	7.00	2,100,000	5.00	1,500,000
Treadwell.	20 ft.				4.04			
Corning...	15 ft.				5.00			
George....	15 ft.				8.00			
Thane.....	18 ft.	200 ft.	500 ft.	150,000	6.56	980,000	3.00	450,000
Smythe....	30 ft.	260 ft.			(0.77) (41.00)			
Average...	17 ft.	280 ft.	500 ft.		5.90			

Note: This ledge is opened up on two sides on the surface by a drift and surface cuts, and 500 feet deeper by the Kensington Crosscut, in which latter place the ledge shows a greater width and a better value than was found on the surface.

Johnson Ledge:

George....	75 ft.	1500 ft.	5.00
Treadwell.	50 ft.	840 ft.	4.10
Corning...			5.00
Van Furman	50 ft.	1500 ft.	
Smythe....	100 ft.		3.90
	70 ft.	1280 ft.	4.50

Note: This ledge is only shown on the surface, where there are two surface tunnels driven for prospecting purposes. These croppings, however, can be plainly seen and extend considerably beyond the point sampled. The lowest point of the cropping sampled is 700 feet lower than the highest point sampled. The ledge extends up the mountain side on an angle of 45 degrees.

Comet Ledge:

Report by	Width	Length	Depth Dev.	Tons Dev.	Assay Val. per ton gold	Cr. Val. Dev.	Net Val. per ton	Total net Val. Dev.
George....	4'	400'			$9.50			
Corning...					8.00			
Treadwell.					9.94			
Van Furman	3'	725'			9.03			

Note: There was milled from this ore chute 51,000 odd tons of ore, giving a net return of $464,000, or about $9.00 a ton. It was worked down to the lowest crosscut, which was 470 feet in depth, and was cut off on the north end by a distinct fault. The management did not attempt to pick up the vein beyond the fault, although the ore was mined right up to the fault.

Northern Bell:

George....	4'				10.00			
Treadwell.					8.15			
Van Furman	3'	330'						

Note: There was mined from the surface of the Northern Bell 2,302 tons of ore netting $8.15 a ton. This ledge has not been developed in depth, but is probably a continuation of the Comet beyond the Comet fault.

Other Ledges

Besides these important veins just described, there are several other veins on which surface work has been done and which have probable future value. These are Savage (George $3.00 to $5.00), Bear (George $3.00), Little Nell, Seward (Furman $6.00 to $17.00), Elmira (Furman $3.00 to $6.00), Little Kensington, Yellow Jacket, Chilcat, Ophir (George $2.50 to $10.00).

Ore Developed

	Tons	Gross	Net
Tripp's Report--Kensington.....	400,000	$2,000,000	$1,200,000
Tripp's Report--Eureka.....	300,000	2,100,000	1,500,000
Total.....	700,000	4,100,000	2,700,000

By taking the lowest values and the lowest areas by any sampled we have:

	Tons	Gross Value	Net
Kensington.....	320,000	$1,370,000	$ 736,000
Eureka.....	140,000	560,000	280,000
	460,000	1,930,000	1,016,000

Permanency in Depth

The three large deposits, the Kensington, Eureka and Johnson, are crushed zones in the diorite intrusion, recemented together by quartz, calcite and pyrites of iron, carrying gold, the whole forming the ore body. This is identical in character with the Treadwell deposits in the same belt, the only known deposits of this type.

The Treadwell deposits have been examined by the well known geologists Dawson, Becker, Spencer and Wright, whose reports have been published in the A. M. I. E. Transactions and U. S. Geological Survey Bulletins. They state in conclusion that the deposits are primary and within mining depths no change in value or size should be found over the variations that exist on the strike of the leads. This statement has so far been proven true in these mines to a depth of 1850 feet below sea level, the lowest working levels of the Treadwell Mines.

Spencer & Wright have studied and reported on the Kensington Mines Company group and verify the similarity in the deposits.

It is reasonable and legitimate to expect the same conditions to prevail in these mines as in the Treadwell; the genesis of the ore is the same, and the deposits lie ever 2000 feet above the Treadwell Mines. This view is further borne out by the fact that where the Kensington crosscut tapped the Eureka and Kensington ledges, in the case of the Eureka, 500 feet in depth, the value of the ore and width of lead was higher than on the surface, and the Kensington, which was cut 800 feet in depth showed the same value as on the surface.

The dimensions of this ore body are smaller at this point.

Further in as much as two of these three parallel lodes have been proven in depth, it is reasonable to expect that the third, the Johnson, which is by far the largest of the three, of the same type, and lies on the diorite contact, will show the same results.

See Trans. A. M. I. E., Vol. 34--U. S. Geo. Survey Bulletin, No. 259. See Assay's results on these ledges in appended reports.

Probable Ore

Assume Kensington Tunnel driven to the Johnson Lode will develop on this chute 50x1300x600 feet in depth.....	3,000,000 tons
Assume "Bear Tunnel" driven to the Johnson Lode will develop 50x1300x720 feet.....	3,600,000 "
Total.....	6,600,000 "

For gross value of this ore, see accompanying reports of surface sampling. If values hold in depth, would produce $25,740,000 gross at $3.90 gross (Smythe).

Assume Bear Tunnel completed through the Eureka and Kensington leads; this tunnel would develop, on the Kensington 550,000 tons; Eureka 440,000 tons, over and above that which is at present in sight, or a total of 990,000 tons.

This would add, if values continued down to the Bear Tunnel, another $5,000,000 gross. (See maps.)

Assuming an average value of the several examinations we have as a value per ton of this ore, $4.50 instead of $3.90 per ton, as shown by Smythe, this value per ton would show a gross valuation of the Johnson of..... $29,700,000

On the Kensington and Eureka of $5.30 per ton or gross....	5,300,000
Total gross probable ore.....	35,000,000
Or a net of approximately.....	18,000,000

The above estimate is made to the level of the Bear Tunnel, which taps the veins at an average depth of 1300 feet below the surface. These veins can be further tapped by crosscuts 1200 feet deeper than the above level of the Bear Tunnel. This lowest level would practically double the above estimate.

Present Equipment

The sum of $800,000 has been spent in the purchase and equipment of these properties, consisting of the following:

One 40-stamp mill complete with water power plant and steam auxiliary, 2-3/4 miles of railroad connecting with wharf at the beach, about 5000 feet of aerial and surface tramways, 14,000 feet of drifts, shafts and underground development.

This plant has been idle during the litigation and will need repair before the stamps can be again started.

Proposed Immediate Development

The immediate operative plans are to repair the present building and equipment, railroad, etc., improve the power plant, put in a suitable compressor, connect the mill with the Kensington Crosscut, begin milling on the Eureka and Kensington leads, and at the same time carry out a system of development work, viz: Continuing the present Bear Tunnel until it intersects the Eureka and Kensington leads, drifting and raising on these leads from the Kensington Crosscut, and also cross-cutting beyond the Comet fault, to pick up the Comet vein and preparing these leads, to furnish a mill as now planned of 1000 tons daily capacity.

The exact method of treatment for these large deposits will be worked out in this mill before the new and larger plant is erected, and the present plant will then be used to mill the ore from the small high-grade leads.

Extraction

From the results of various sampling of the Kensington, Eureka and Johnson lodes it is evident that the heads of a large milling plant could be kept at $5.00 per ton gross.

Extractions by milling and vanning, without any attempt to classify cyanide or use any of the common modern metallurgical methods, has shown an extraction of 65 per cent. Principals of the Treadwell Company, who did some of the latest development work, state that the extraction of 90 per cent is possible and practicable, by the combined methods of concentration and cyaniding. (See preliminary tests appended.)

The extraction that can be expected from the start will be an 80 per cent extraction, or a gross return extraction of $4.00.

Working Costs

The following table is taken from the latest Treadwell report:

Note:

Bullion Shipments from Paris or Treadwell Mine

From Beginning of Work to May, 1909

The Paris Mine was owned by Alaska Mill and Mining Company up to June 1, 1890; since that time it has been owned and operated by the Alaska Treadwell Gold Mining Company.

Dates	Tons Crushed	Total Yield	Total Yield per ton	Operating Profits	Operating Cost per ton
1882-1884.....		$ 10,902.86			
Aug., 1885-May, 1890	617,112	2,328,496.11	$3.79	$1,075,000.00	$2.05
Total (Paris Mine).	617,112	2,339,398.97	3.79	1,075,000.00	2.05
1890-1, June to May..	220,686	769,765.80	3.49	418,208.90	1.59
1891-2, June to May..	239,633	707,017.37	2.95	361,980.16	1.44
1892-3, June to May..	237,235	694,658.74	2.94	385,613.79	1.30
1893-4, June to May..	220,043	705,948.03	3.20	429,948.86	1.25
1894-5, June to May..	241,278	626,327.06	2.60	309,534.56	1.31
1895-6, June to May..	263,670	782,829.67	2.97	497,342.22	1.08
1896-7, June to May..	242,027	676,064.88	2.79	376,450.90	1.24
1897-8, June to May..	254,329	586,857.42	2.31	313,075.60	1.20
1898-9, June to May..	250,408	677,655.13	2.71	386,792.34	1.28
1899-1900, June to May	557,960	1,153,367.60	2.07	669,301.20	.86
1900-01, June to May.	457,802	860,736.58	1.88	377,417.34	1.05
1901-02, June to May.	682,893	1,304,720.54	1.91	481,633.94	1.20
1902-03, June to May.	756,325	1,598,963.42	2.11	659,849.77	1.24
1903-04, June to May.	775,150	1,829,508.39	2.36	801,312.24	1.32
1904-05, June to May.	877,170	2,007,842.75	2.29	863,182.60	1.30
1905-06, June to May.	888,411	1,902,454.96	2.14	883,088.67	1.14
1906-07, June to May.	702,953	1,511,671.67	2.15	571,706.68	1.33
1907-08, June to May.	743,097	1,624,145.75	2.18	577,493.47	1.40
1908-09, June to May.	768,628	1,702,627.96	2.21	517,938.99	1.54
Totals and averages	9,996,810	24,062,562.69	2.41	10,956,872.23	1.31

The figures in the above statement, prior to May 31, 1890, were prepared by the late Mr. Hamilton Smith, from a careful analysis of the accounts of the Alaska Mill and Mining Company.

Chlorination Works were closed in February, 1899. Sulphurets now shipped to Tacoma Smelting Company for treatment. *300-stamp mill started May 6, 1899.

The working costs of the Perseverance Mine in this district, equipped with a 100-stamp mill, running eight months of the year, are in a total for the year of 1908, $0.91.

The working costs of the Kensington Mines Company properties will be reduced over the Treadwell costs with same equipment by the costs of hoisting and pumping. This group is and always will be a tunnel proposition.

However, the costs with the small equipment at the start will be greater on account of the fixed charges that have to be taken care of on any mine regardless of size. Considering the conditions it is expected that the working costs of the Berners will not exceed $2.00 per ton with present equipment of 40 stamps and will be reduced as the milling capacity is increased.

Returns

From the foregoing statements we have the following deductions that will undoubtedly be realized:

Gross value of the ore.....	$5.00
Extraction 80 per cent of gross ore...	4.00
Working costs.....	2.00
Net value of the ore.....	2.00

The following returns are to be expected:

Tons per stamp per day 24 hrs.	Tons per stamp year 300 days	Gross value (extraction $4 per stamp)	Net (value $2) per yr. per stamp
4 tons	1200 tons	$4800.00	$2400.00

Net value per year 40 stamps	Net per year 100 stamps	Net per year 250 stamps	Net per year 500 stamps
$96,000.00	$240,000.00	$600,000.00	$1,200,000.00
Interest and redemption--			
$35,000.00	$75,000.00	$75,000.00	$75,000.00
Yearly net--			
$61,000.00	$165,000.00	$525,000.00	$1,125,000.00
Per cent on common stock yearly--			
	3.3%	10.5%	22.5%

Note: **The same working cost is assumed for the increased capacity of the mill as for the 40 stamps. The reduced working cost for 100 stamps should be reduced so as to increase the net to $300,000.00 yearly, and larger mills it should be reduced so as to increase the net by 20 per cent of the amount stated above.

Conclusion

After studying the foregoing recapitulation and checking this from the appended detailed reports and data, the following facts are drawn:

(1) The property has been thoroughly and independently examined and sampled by reliable, well known and competent engineers, whose results check so closely as to absolutely determine the value of the ore.

(2) The value of the deposits have been largely determined by development work, and the present development is of great future value.

(3) The present equipment, while too small for these large deposits, is large enough to begin profitable operations.

(4) The mines are sufficiently developed so that milling can be started as soon as the present plant is repaired.

(5) The several small high-grade deposits have been extensively developed and have shown unusual merit and value.

(6) Only a comparatively small amount of money is needed with which to begin operations.

Final

These mines are sufficiently large and carry sufficient values to insure redemption of preferred stock with interest, and pay good returns on the common stock for a great many years.

(Signed) F. L. MORRIS,
B. L. THANE,
J. R. WHIPPLE,
H. E. PATTERSON,

The following four maps show the results of the Treadwell examination:

Map No. 1 shows the summary of the sampling of the principal ledges, the elevation and geographical relation of one to another.

Map No. 2 shows the assay plan of the Eureka ledge in the Kensington Crosscut, and the Kensington ledge at the 100-foot level.

Map No. 3 shows the assay plan of the Kensington ledge in the Kensington Crosscut on the 800-foot level.

Map No. 4 shows the assay plan of the Johnson.

The following is a list of the Patented and Unpatented Lode Claims, Placer Claims and Mill Sites now owned and controlled by the Kensington Mining Company:

PATENTED CLAIMS - Kx 112-12

1.	Hartford	59
2.	Ophir	37A
3.	Excelsior	48
4.	Northern Belle	43
5.	Savage	39
6.	Northwest	49
7.	Eureka	46
8.	Elmira	42
9.	Esmeralda	47A
10.	Kensington	45
11.	Yellow Jacket	44
12.	Bear	38A
13.	Comet Ext'n.	54A
14.	Seward 2	41
15.	Comet	51
16.	Eclipse	56
17.	Banner	57
18.	Seward	40A
19.	Poor Richard	53
20.	Last Chance	56
21.	Thomas	52A
22.	Cumberland	50A
23.	Snow Flake	55

MILL SITES--PATENTED - Kx 112-10

1.	Ophir	37B
2.	Esmeralda	47B
3.	Bear 2	38B
4.	Comet Ext'n	54B
5.	Seward	40B
6.	Thomas	52B
7.	Cumberland	50B

UNPATENTED CLAIMS - Kx 112-8

1. Bill
2. Bailey
3. Dooley
4. Angle
5. Diamond
6. Bliven
7. Pine
8. Devil Club
9. Cedar
10. Alder
11. Hemlock
12. Spruce
13. Silkirk
14. Chilkat
15. Harvard
16. Rustler
17. North Star
18. Acropolis
19. Alaska Maid
20. Fraction
21. Lucky Boy
22. Little Nell
23. Triangle
24. Savage
25. Bear 2
26. Seward 3
27. Portsmouth
28. American
29. Detroit
30. New York
31. Milwaukee
32. Triangle 2
33. Snow Flake 2

UNPATENTED PLACER CLAIMS

1. Kensington Placer - Kx 112-11

JOHNSON GROUP--PATENTED Kx 112-13

LODE CLAIMS

1. Northern Light
2. Northern Light No. 1
3. Northern Light No. 2

The following table shows the results of the preliminary cyanide tests and also the assays obtained by the engineers during the Treadwell Examination.

Preliminary Cyanide Tests on Berners Bay Mill Tailings By G. Caetani

September 24, 1904.

Strength of Solution v. Extraction. #5 tailings. (4 A. T. tailings + 125cc solution agitated in bottle for 5 hrs. and washed for 12 hrs.)

1. Assay value of pulp, $1.65.

Test #	1	2	3	4	5	6
Strength of Sol.....	0.2%	0.4%	0.6%	0.8%	1%	1.2%
Assay Val. tails.....	$0.72	.51	.41	.41	.41	.70
Val. recovered.....	.93	1.14	1.24	1.24	1.24	.95
Per cent Extraction...	56%	68.8%	75%	75%	75%	57.5%

Extraction versus Consumption on hydraulically classified tailings.

(100 gr. pulp + 100cc of 0.5% K Cy sol. agitated in -2- bottle for 6 hrs. and washed for 12 hrs.)

Tails No. and Value 1--$1.24 3--$1.65 4--$1.85

Hydr. Classf.	Coarse	Fine Sands	Slime	Coarse	Fine Sands	Slime	Coarse	Fine Sands	Slime
Assay val. pulp..	$0.51	0.62	3.51	0.57	0.82	4.03	0.51	0.82	5.38
Assay val. tails.	0.31	0.20	1.45	0.31	0.31	1.14	0.41	0.41	1.45
Val. recovered...	0.20	0.42	2.06	0.26	0.51	2.89	0.10	0.41	3.93
% Extraction.....	39%	68	59	46	62	72	19	50	73
Lbs. K Cy consumed.....	0.8	0.8	2.2	0.6	0.8	2.6	0.6	0.8	2.6
Per ton of ore...	Fine Crushing			Intermediate Crushing			Coarse Crushing		

Remarks: The slimes of the most coarsely crushed ore are the richest. Extraction on sands increases with finer crushing while that of slimes decreases.

Composite sample (of the 6 tailings samples--hydr. class. done by washing).

	%	Assay value	% value
Coarse and fine sand.....	75.4	$0.83	$0.622
Slime.....	24.3	3.94	0.957
Floating slime.....	0.3	2.50	0.007
	100		1.586

Calculated value of composite sample..... 1615

These composite samples were used for tests 4, 5, 6.

4. Extraction versus Consumption. Leaching in Vat. (6 lbs. fine and coarse sand and composite sample - 2000cc of 0.5% KCy Sol.)

Assay value of pulps.....				$0.83
Fine.....	19 hrs.	22	25	42
Assay value of tails.....			$0.21	$ .21
Value recovered.....			.62	.62
% extraction.....			75%	75%
Consumption KCy per ton of ore.....	1.4	1.4	1.47	2.05
Assay value of pulp.....				$3.94

5. (1.4 lbs. slime + 1000cc of 0.48% KCy sol.)

Fine	0h. 45m.	1h. 30 m.	2h. 15m.	3 hr.	3h. 45m.	20h.
Assay value tails.....	$1.14	$1.14	1.03	1.03	0.93	0.62
Value recovered.....	2.80	2.80	2.91	2.91	3.01	3.32
Extract %.....	71%	71	74	74	76.4	84.3
Con. KCy per ton ore..	1.89 lbs.	1.89	2.21	2.36	2.62	3.15

6. Same with 0.25 KCy Sol. (21 lbs. slime + 2000cc 25%KCy Sol.)

Time	15m.	45m.	2h.	4h.	7h.
Assay value tails.....	$1.24	$1.04	$1.04	$1.45	$1.04
Value recovered.....	2.70	2.90	2.90	2.90	
Extract %.....	68.6	73.6	73.6		73.6
Cons. KCy per ton of ore, lbs.....	1.1	1.54	1.87	1.98	2.42

7. Strength of Sol. and Extraction on Composite Slimes. (100 gr. Slime + 100cc KCy agitated in bottle for 8 h. and leached for 12 h. acidity neutralized by caustic soda.)

Assay value of composite sample..... $4.13 equals A.
Calcul. ..... 4.24 equals B.

Strength of Sol., %...	.25	.30	.35	.40	.45	.50	.55	.60
Assay Val. Tails.....	$1.22	1.04	1.10	1.10	1.04	1.10	1.04	.093
Val. recovered.....	2.91	3.09	3.03	3.03	3.09	3.03	3.09	3.21
Extraction, %.....	70.4	75	73.4	75.4	75	73.4	75	77.7

Cons. KCy per ton of ore--Less than 1/2 lb. per ton.

Average results on preceding data.

	Ore	Coarse Sands	Fine Sands	Slimes	Total
% in weight.....	100	39	38	23	100
Assay value.....	$1.615	.59	.87	4.24	
Value per 1 ton ore.....	1.615	.23	.331	9.76	1.54
% on value of ore.....	100	14.25	20.5	60.5	95.25
% Ave. extraction.....	75	45	70	83	
% on value of ore.....	74.5	6.41	14.35	50.2	71-74.5%
Cons. of KCy for acid ore, lbs.	2.05	0.7	0.7	2.0-3.5	of 95.35%

Gd. for neutralized ore--Less than 12 lbs.

Conclusions with coarse crushing:

1. The assay value of coarse sand remains constant.
2. The % value of coarse sand remains constant.
3. The assay value of fine sand increases.
4. The % value of fine sand remains constant.
5. The assay value of slime increases rapidly.
6. The % value of slimes remains constant.

Conclusions KCy tests:

The total extraction is 75%.

The ore is acid and needs 0.6 lbs. lime for coarse sands and 2.74 lbs. for fine slimes.

The addition of lime reduces greatly the consumption of KCy and is absolutely necessary for settling the slimes.

Air is favorable to the extraction both for sands and slimes.

85% of the extraction in the slime is done in the first 2 hrs.

Samples from Johnson Mine, Berners Bay district, Alaska.

No.	Place taken	Width	Description	Assay Val.
1	Above slide rock north side of vein	10'	Iron stained Qu.	$ 2.06
2	10' SW. of No. 1	10'	"	2.83
3	10' SW. of No. 2	10'	"	6.20
4	25' W. uphill from 1	10'	"	1.54
5	12' SW. of above	10'	"	12.00
6	40' W. from No. 4	10'	"	3.87
7	10' S. of above	10'	"	1.27
8	10' S. of above	10'	"	5.90
9	15' W. of No. 7	10'	"	10.50
10	10' S. of above	10'	"	2.83
11	10' S. of above	10'	Stringers Qu. in diorite	10.50
12	10' S. of above	10'	"	0.51
13	18' SW. of No. 9	10'	"	3.97
58	20' W. of No. 13	4'	Across Qu. vein	2.57
59	60' S. of No. 13	8'	"	17.50
60	6' SW. of above	6'	"	6.70
	Average of vein above slide rock			5.86
61	S. of slide rock from 14" Qu. next to dike of quartzite	14"		Tr.
14	S. end of trench U.	10'	Stringers of Qu. in greenstone	0.77
15	10' N. of above	10'	"	0.77
16	10' N. of above	10'	"	4.64
	Average of trench U.			2.06
17	S. end of trench N.	10'	"	2.30
18	10' NE. of above			6.97
	Average of trench N.			4.58
19	S. end of trench A.	10'	Stringers of Qu. in diorite	1.27
20	10' N. of above	10'	Along face of 10" Qu. stringers	56.00
21	10' N. of above	5'	Across face of Qu.	7.74
22	6' from and opposite to No. 21	16'	Sulphurets	41.00
	Average of trench A.			26.50

No.	Place taken	Width	Description	Assay Val.
23	Across face of cut X.	5'	Qu. heavy with sulphurets	$75.00
24	10' S. of above in trench B	10'	Qu.	17.00
25	10' S. of above in trench B	10'	Iron stained diorite	0.77
26	10' S. of above in trench B	10'	"	0.51
32	12' below No. 23	5'	Across Qu. vein	1.80
33	5' S. of above	5'	"	2.06
34	5' S. of above	5'	"	1.54
	Average of trench B			14.10
35	S. end of trench C.	5'	Along Qu. capping	2.83
36	5' N. of above	5'	"	2.30
37	"	5'	"	.25
38	"	5'	"	.25
39	"	5'	"	.25
40	"	10'	"	.51
41	"	10'	"	.25
42	"	10'	"	.25
43	5'	10'	"	1.27
44	5'	10'	"	4.64
45	5'	10'	"	1.03
46	10' E. of No. 32	10'	"	0.77
7	10' E. of above	10'	"	1.03
8	5' SE. of above	10'	"	0.51
9	5' "	10'	"	1.03
50	5' "	10'	"	1.54
1	5' "	10'	"	0.51
2	5' "	10'	"	99.00
3	10' E. of No. 47	10'	"	1.27
4	20' NE. of No. 47	10'	Qu. in face of cut V	0.51
5	5' N. of No. 45	10'	Along Qu. capping	2.57
6	5' N. of above	10'	"	3.10
5	5' "	10'	"	17.50
by 23	5' N. of above	5'	"	0.51
3	5' N. of above	5'	"	0.25
4	5' "	5'	"	0.77
5	5' "	5'	"	Tr.
6	6' NE. of above	5'	"	0.51
7	6' NE. of above	6'	"	0.25
8	5' NE. of No. 36	5'	"	7.73

No.	Place taken	Width	Description	Assay Val.
9	5' NE. of above	5'	Along Qu. capping	8.70
70	5' "	5'	"	3.10
71	5' "	5'	"	3.87
72	5' N. of No. 57	5'	"	3.10
81	8' NE. of No. 63	5'	Greenstone full of Qu. lenses	2.06
82	5' NE. of above	5'	"	0.77
	Average of trench C and vicinity			4.86
73	S. end of trench J.	10'	Diorite	3.35
4	5' N. of above	5'	" + 10" Qu.	3.35
5	"	5'	" + 4" + 6" Qu.	1.54
6	"	5'	" + 2" Qu.	0.51
7	"	5'	" 2" "	0.77
8	"	5'	" 2" "	Tr.
9	"	5'	Qu.	0.51
80	"	5'	"	47.00
3	"	5'	"	1.27
4	"	5'	Diorite + 6" Qu.	0.51
5	"	5'	"	1.03
6	"	5'	"	1.03
7	"	5'	1/4 Diorite, 3/4 Q.	0.51
8	"	5'	Quartz capping	0.77
9	"	5'	"	2.57
90	"	5'	"	2.57
1	"	5'	Diorite with small Qu. stringers	0.77
2	"	5'	"	2.83
	Average of trench J.			3.32
27	N. side of entrance to upper tunnel	5'	Qu. + Diorite	2.06
28	5' west of above	5'	"	2.06
29	"	5'	"	2.06
30	"	5'	Qu. + Diorite + Sulph.	12.40
31	"	5'	"	10.34
99	"	5'	Qu. + Diorite	3.10
100	"	5'	Qu.	1.80
1	"	5'	Qu. + Greenstone	1.54
2	"	5'	"	1.54
3	"	5'	Greenstone	0.25

No.	Place taken	Width	Description	Assay Val.
4	Face of N. branch of tunnel	5'	Greenstone	0.77
5	N. side upper tunnel from branch	10'	"	Tr.
6	10' N. of above	10'	"	1.54
7	"	10'	"	Tr.
8	12' N. of above to face	10'	"	Tr.
9	Back of tunnel opposite 102	5'	Qu. + Greenstone	3.38
10	Cut 40' S. of tunnel	5'	Decomposed Qu.	3.38
11	5' N. of above	5'	"	1.03
2	5' "	5'	Greenstone and Qu. stringers	1.27
3	On surface above No. 30	5'	1/3 Qu., 2/3 altered greenstone	0.77
4	" No. 29	5'	1/4 Qu., 3/4 altered greenstone	1.03
5	" No. 28	5'	1/5 Qu., 4/5 altered greenstone	1.54
6	10' NW. of and opposite to No. 115	5'	3/4 Qu., 1/4 altered greenstone	0.25
117	5' SW. of above	5'	All quartz	Tr.
118	"	5'	"	1.03
119	25' NW. of No. 117	5'	Samples Nos. 119-126	2.57
20	5' S. of above	5'	All from Trench D.	1.54
1	"	5'	Altered greenstone	0.25
2	"	5'	and stringers of	0.51
3	"	5'	Qu. with Strike	0.77
4	"	5'	NW. and SE.	Tr.
5	"	5'		2.06
6	"	5'		1.03
7	"	5'		0.25
8	"	5'		Tr.
	(Between Nose. 125 and 129, 14' Greenstone not sampled.)			
129	5' S. of above	5'	(Altered greenstone in Qu. stringers)	4.64
30	"	5'	"	1.03
1	"	5'	"	3.35
2	"	5'	"	5.68
3	"	5'	"	0.77
4	20' NE. of No. 119	2'	Decomposed quartz	4.64
	Average around upper tunnel			2.00

Samples from Eureka Vein in Kensington Crosscut Tunnel.

No.	Place taken	Width	Description	Assay Val.
K-1	E. side 1250' from entrance	5'	Diorite and Qu. stringers	6.70
K-2	W. " 1258' "	5'	"	0.77
K-3	E. " 1255' "	5'	"	4.38
K-4	W. " 1263' "	5'	"	1.27
K-5	E. " 1260' "	5'	"	8.20
K-6	W. " 1268' "	5'	"	3.10
	Average of 15' F. W. Section			4.07
K-7	E. side 1265' from entrance	5'	"	0.77
K-8	W. " 1273 "	5'	"	0.51
K-9	E. " 1270' "	5'	"	0.51
K-10	W. " 1278' "	5'	"	1.03
K-11	E. " 1275' "	5'	"	0.51
	Average Eureka Vein			2.52
K-12	E. side 1289' from entrance	10'	"	0.77
13	W. " 1290' "	10'	"	0.51
14	W. " 1365' "	$4\frac{1}{2}$'	Qu. dip 30° SW.	0.25
15	E. " 1395' "	8'	Lense of quartz extending only 3' above bottom of crosscut	2.06

Comet City, Alaska, September 16, 1904.

Assay Report

KCy tests on composite sulphurets. August 22, and September 1, inclusive, 1904.

No. of test	Conditions of the composite sulphurets in each test made	Mesh sign.	Heads	Residues	Extraction	Total time of extraction treatment	Ration of total solution to ore	Approx. loss of KCy in S. S. treatment (lbs. KCy to ton of ore)	S. S. No. used and time	S. S. Strength in KCy	W. S. No. used and time	W. S. Strength in KCy	1 water wash lime
I	Natural		$58.91	35.14	40.3	5d. 14h.	3.0	14	5d5	4.7	1½d.	2.4	2h.
II	All thr.	50	58.91	31.01	47.4	5d. 14h.	3.0	14	5d5	2.0	1½d.	2.4	2h.
III	All thr.	100	58.91	41.34	29.8	5d. 14h.	3.0	14	5d5	2.0	1½d.	2.4	2h.
IV	All thr.	100	58.91	49.61	15.8	5d. 14h.	3.0	11	5d5	3.7	1½d.	1.9	2h.
V	All thr.	100	58.91	49.61	15.8	5d. 14h.	3.0	8	5d5	2.8	1½d.	1.4	2h.
VI	All thr.	100	58.91	49.61	15.8	5d. 14h.	3.0	4	5d5	1.9	1½d.	1.0	2h.

These tests were made in beakers. The heavy nature of the material made it settle in a compact mass. so the circulation of solution through it was not good. This may partially account for the low extractions of III, IV, V, VI. It is doubtful if the addition of lime to the sulphurets first before cyaniding would have noticeably decreased the enormous consumption of KCy. These tests indicate that percolation does not seem practicable; possibly very fine grinding with agitation might succeed better.

I still think more favorable conditions, such as cyaniding the tailings wet, at once after they leave the vanners, before the particles of pyrite have a chance to oxidize, would improve the extraction and cut down the KCy loss.

Yours very respectfully,

(Signed) J. H. BATCHELLER.

Comet City, Alaska, September 16, 1904.

Assay Report

Sizing tests on composite tailings of run with fine woven wire screen. August 29-September 1, 1904, inclusive.

Value of composite tails..... $1.65

Sizes produced	Value per ton	% Wt.	Prof. value
On 30 Mesh.....	$0.41	7.7	$0.032
Thr. 30 on 40 Mesh.....	0.62	17.5	0.109
Thr. 40 on 50 Mesh.....	0.41	12.5	0.051
Thr. 50 on 80 Mesh.....	0.83	11.6	0.096
Thr. 80 on 100 Mesh.....	0.62	7.9	0.049
Thr. 100 Mesh.....	3.93	42.1	1.655
		99.3	1.99

Actual value composite tails. by assay..... $1.65

Calculated value of composite tails. (from above)..... 1.99

The KCy tests will be made on these composite tailings as there are only a few ounces left of the sample.

Six more samples of tailings were placed (without crushing or addition of lime or other protective alkali) in leaching bottles with filtering bottoms and treated with strong solutions (S. S.) and weak solutions (W. S.) of KCy--and followed with water wash (W. W.). The residues were then dried and assayed.

Cyanide tests on Composite tailings. Sept. 28, '04.

No. of test	Of head	Of residue	Extraction	Total time of treatment	Ratio of sol. to ore	Loss of KCy in strong sol. (lbs. per ton of ore)	Strength lbs. per ton solution	No. of strong solutions used. S. S.	Time per sol. used	Strength lbs. per ton solution	No. W. S. used	Time per sol. used W. S.	2 W. W. 1 hr. each
I	$1.45	0.21	85.2%	5d.2h.	3½	5.5	4.7	4	1d.	2.4	2	1/2d.	2h.
II	1.45	0.21	85.2%	5d.2h.	3½	4.3	3.7	4	1d.	1.9	2	1/2d.	2h.
III	1.45	0.21	85.2%	5d.2h.	3½	4.1	2.8	4	1d.	1.4	2	1/2d.	2h.
IV	1.45	0.21	85.2%	6d.2h.	4	4.8	2.8	5	1d.	1.4	2	1/2d.	2h.
V	1.45	5.41	71.7%	5d.2h.	3½	3.1	1.9	4	1d.	1.0	2	1/2d.	2h.
VI	1.45	5.41	71.7%	6d.2h.	4	4.1	1.9	5	1d.	1.0	2	1/2d.	2h.

Tests III to V indicate the most satisfactory work in time of treatment, ratio of sol. to ore, loss in cyanide and good extraction. I believe that further experiments along the conditions indicated in III and V with the addition of some lime (or protective alkali) to the ore, will show it possible to greatly reduce the consumption of KCy and ratio of solution to ore, without losing the good extraction.

Comet City, Alaska, September 6, 1904.

Smizing Tests on Composite of Sulphurets to date. August 22-September 1, 1904, inclusive.

Assay of Composite sample — Ag 0.05 oz. per ton, Au $58.91

Name of product	Value	%Weight	% Ave.
On 30 mesh	$29.97	4%	1.199
Thr. 30 on 40 mesh	42.37	10	4.237
Thr. 40 on 50 mesh	46.51	8.1	3.767
Thr. 50 on 80 mesh	48.58	14.0	6.801
Thr. 80 on 100 mesh	49.61	11.4	5.656
Thr. 100 mesh	64.08	51.7	33.129
Value of sulphurets calculated			$54.79
Value of sulphurets by assay			58.91

The sulphurets contain quite an amount of Fe. met., as much as 4% in some cases. This is a most vigorous cyanide. 4 grs. of this iron reduced 100^{cc} of 5 lb. cyanide sol. in six (6) hours to 3.5 lbs.

Comet City, Alaska, September 9, 1904.

Cyanide Tests.

Preliminary work in composite tailings of mill run 8/22-28/04, #5 battery screen.

No soluble acids or alkalies were found. A sample of tailings agitated with an equal weight of cyanide sol. 5 lbs. KCN per ton of water showed a loss of 4.7 lbs. KCy with an extraction of 57.2% in 12 hrs. (Heads $1.45, residue $0.62.)

Another sample of these tailings (value $1.45) was crushed through 80 mesh and agitated in a 20 lb. cyanide solution for 12 hrs.; this gave $0.21 residue or 85.5% extraction.

Comet City, Alaska, September 4, 1904.

Statement of Mill Run.

Aug. 22-Sept. 1, inc.

98 tons ore milled.

Ave. val. of ore (approx.) per ton.....		$ 3.76
Ave. val. tails (approx.) per ton.....		1.40
Est. value of ore milled (98 T.).....		368.48
Actual value of sulphurets saved (7625 lbs.).....	$209.74	
Est. value tails accounted for (94.17 T.).....	131.84	
		341.88
Total amount unaccounted for loss.....		$ 26.90
Unaccounted for loss per ton.....		0.274

Mill run of September 7, 1904, with round hole punched battery screen.

Sulphurets.....	$52.71	$3.93 Tails. $1.24 Ext.....	68.4%
Hand tailings sample tail vanners (215 Rev.) (3-3/4"grade).....		$1.64	58.0%
Hand tailings sample tail vanners (215 Rev.) (5¼" grade).....		2.07	47.3%

This screen was so coarse the sand banked in the sluices and it is feared the tails sample is inaccurate.

Mill run September 8, 1904, with #8 diagonal slot screen.

Sulphurets.....	$60.36	$3.93 Tails. $0.145 Ext.....	63.1%
Hand tailings sample head vanners (200 Rev.) (3-3/4" grade).....		$1.45	63.1%
Hand tailings sample tail vanners (200 Rev.) (5¼" grade).....		1.86	52.7%

The following report was written by C. R. Corning of Olcott & Corning, consulting engineers of New York.

The report was written for the reorganization committee, composed of Gillespie, Fairchild and Corning, who attempted to reorganize the company before the litigation, at that time active, was finished. This reorganization failed for the reason that they were unable to bring all parties concerned into a satisfactory agreement.

This examination was made in part before and finished after the Kensington crosscut was driven.

MEMORANDUM CONCERNING CERTAIN MINING PROPERTIES NEAR BERNERS BAY, ALASKA

The properties herein referred to are held by the Berners Bay Mining & Milling Company, the present legal status of which is described in the report herewith of Mr. R. McM. Gillispie, counsel for the Reorganization Committee.

Location

They are situated on Sherman and Johnson Creeks, the former flowing into Lynn Canal at Seward City, the latter into Berners Bay itself. They lie slightly west of North, 40 miles from Juneau in a direct line three miles or so from tide water at Seward City and 60 miles as the boat has to run from Juneau, whence a weekly or semi-weekly mail steamer is maintained according to the season of the year. The landing facilities at the Company's dock at Seward were formerly good and with proper repairs to the dock could be easily re-established.

Titles and Claims

The properties were discovered and located in the eighties and active operations continued in a wasteful manner until about 1902.

The titles are governed by United States law and have been maintained to date. The ground covered by the company's holdings is approximately 2½ miles in length by over 3/4 of a mile in width, besides the three full Johnson claims, 4500 feet long and 600 feet wide. These locations are shown on the claim map attached hereto, which is the latest available but which fails to show the newly located properties and those re-located.

The Company's claims are enumerated in counsel's report and the complaints in the foreclosure action. Twelve have been renamed as follows. To these are to be added the Johnson claims:

Old Name.	New Name.
Jack	Bin
Cambridge	Bailey
Bradley	Dooley
Syracuse	Angle
Buffalo	Diamond
Brooklyn	Bliven
Albany	Pine
Utica	Devil Club
Rochester	Cedar
Chemung	Alder
Aurora	Hemlock
Niagara	Spruce

Geology

The country rock in which the ore deposits occur is a diorite and the deposits themselves are either fissure veins, as in the case of the Comet, or else belts of shearing or crushing as represented by the deposits at the Kensington, the Eureka and the Johnson.

The values are very largely gold and are recoverable in part by amalgamation and in part in the concentrates, which can be sold to smelters or else cyanided on the ground. The gangue of the ore is quartz--very favorable for above methods of treatment.

Mines and Production and Quality of Ores

On the Company's property there are found known deposits of value, from two of which, prior to 1900, a gross production of something over $530,000 has been secured. The mill records show that slightly over 10,000 tons of Kensington ore was milled which contained on the average $4.85 per ton; in all, some $50,000. About $450,000 was recovered from the ore taken out of the Comet mine; the balance from a few small and unprofitable workings at odd points.

Calculations based on the figures in the mine books, which we believe express the truth as they are fairly well confirmed by sampling on the ground, show the contents of the Kensington ore milled to have been as above, approximately $4.85 per ton. The ore from the Comet averaged in the neighborhood of $8.00 per ton. None of the ore from either the Kensington or the Eureka, where recently opened, has ever been milled. Careful sampling of the Eureka deposit, where it was intersected in the Kensington tunnel, shows a value of close to $5.00 over a width of 15 feet. This figure is based on three independent samplings, two of them by other competent engineers and one of them by Mr. Corning. A close sampling of the Johnson deposit at surface, also by an outsider, averaged up to more than $6.00.

Development Work

Referring to the amount of work done at the various important points we note that so far as the Kensington is concerned there were a few small tunnels at surface which permitted the breaking of the mill ore in open cuts and underground stopes. No work has been done at this point for a number of years.

Meantime the so-called Kensington tunnel, started about 900 feet below these upper workings, has been pushed through to the Kensington lode, which was cut in good strength and of fair value, although perhaps not intersecting the ore chute known as surface. This would have to be sought by further drifting, a part of the proposed development work referred to later.

The Comet mine has been opened by several tunnels and the ore extracted so far as developed. A number of the upper tunnels have fallen in to a considerable extent, but when last visited in 1905 by Mr. Corning the lower tunnel was in excellent condition and whould be most serviceable in future work.

The workings in this property are cut off to the north (see map) by a fault, and very little work has been done beyond that disturbance to rediscover the vein and the ore.

On the Eureka some tunnels were driven and stoping done, but these works are at present largely if not altogether inaccessible. The Kensington tunnel, however, intersected the Eureka deposit some 300 feet below surface with results in the matter of assay values already mentioned.

On the Johnson a small tunnel was driven near the edge of the orebody and into barren country rock. A further small and unimportant tunnel was driven lower down the hill and considerable trenching was effected at the time sampling of the property took place, which is today still practically virgin ground.

Equipment

The important items in the equipment of these various properties when last seen by Mr. Corning in 1905 consisted of a 40-stamp mill and some concentrators, the necessary boarding and bunk-houses, some aerial tramways from the various mines, a good incline from the Bear tunnel, a narrow-gauge railway about four miles in length to the dock at Seward City, and the dock itself, which was then somewhat out of repair but still entirely serviceable for the purposes of docking boats and landing supplies, which, however, has not recently been necessary, as no mining operations have been carried on during the reorganization.

Power

No motive power is needed for any of the tramways, they being actuated simply by the force of gravity. Power requirements of the mill and of the compressor have heretofore been met partly by water power, which is available for a good portion of the year, and partly by steam, for the generating of which coal or wood is used. Incidentally, it may be mentioned that a fall of some 600 feet between the mill and tide water affords good opportunity for the development of sufficient power to meet the requirements of the property for a considerable time to come.

Policy of Future Development

Referring to the policy which it would be well to inaugurate on completion of the reorganization, we would urge operations on the Eureka where cut in the Kensington tunnel, on the Kensington itself, and on the Comet. The Johnson should be left aside for the moment.

The Eureka deposit should be opened by drifts and raises so as to make the ores available for stoping. So soon as this work shows satisfactory results, it would be advisable to drive the Bear tunnel, situated 600 feet lower than the Kensington tunnel, to an intersection with the Eureka vein for the purpose of drifting on the same and opening up the deposit in like manner as in the Kensington tunnel.

At the Kensington deposit proper drifting should be resumed in the Kensington tunnel and one or two short tunnels driven respectively 100 and 200 feet below the old workings in order to open up the croppings and make them speedily available for mining.

At the Comet work should be resumed in the lowest tunnel north of the fault with a view to determining the position of the vein and of the old ore chute thereon.

For the moment we would deem it inadvisable to take any steps towards developing the Johnson, leaving that for a future date when the three first mentioned properties shall have to put the Company's operations on a paying basis.

Estimates on Equipment and Development Work

It is difficult for us to estimate on the sums required excepting in a general way, as we are not informed concerning the state of repair of the equipment now in place except in the case of a few items, but we would consider the following as providing conservatively.

Putting in order or rebuilding dock, road between mines and dock, (new), compressor, bunk-houses at mill, mill proper, bunk-houses at Kensington and Comet tunnel, tramways and pipe lines.....	$35,000
Development work at Eureka lode.....	20,000
Development work at Kensington lode.....	20,000
Development work at Comet lode.....	15,000
Superintendence two years.....	15,000
	$105,000
Aerial tramways.....	20,000
Incidentals and further equipment.....	25,000
	150,000

Assuming that ore of the grade of that of the Kensington will be milled, namely $4.85 per ton, and that the recovery be only 75%, a low result, i. e., $3.65 gross per ton, and that all expenses will be covered by $2 per ton, we calculate on a capacity of 3500 tons a month in the mill at a cost of $7,000 and on a gross return of $12,750 per month, equal to $5,750 net, or say $69,000 per annum for the first full year's milling.

Bond interest would be $15,000, so that for said period net returns of $55,000 would be available.

These funds should be used for adding 40 stamps to the mill, at a cost of $40,000 or less. This would increase the monthly capacity to over 8,000 tons, reduce the cost per ton somewhat and would enable the Company to earn $12,000 a month net, or $140,000 a year. Copper properties producing profits in this way currently sell on the Boston market on an 8% basis, so that an income of $140,000 a year would represent a capitalization of $1,750,000 or over one and one-half times the total contemplated capitalization in preferred stock at par.

Further milling capacity should be added from earnings as the underground development may justify. We should consider a 200-stamp mill at the end of four or five years, crushing 1,000 tons daily, or say 25,000 tons per month, as a reasonable anticipation of results. Net earnings on such equipment may be conservatively estimated at $41,000 a month, or about $500,000 per annum, from which income the total bond issue could be retired and dividends paid on both Preferred and Common Stock within the five years after operations commence. We estimate that milling can be inaugurated not over nine months after operations on the property are started.

It is our opinion that under proper management such rate of production could be maintained for many years, as has been and still is the case at the Treadwell mines, Douglas Island, which have been operating for the past twenty years.

A renewal of operations should contemplate the acquisition by location of additional claims, particularly on the Johnson lode, which would tend to round out and increase the properties owned by the New Company without burdening the same with any great expenditure of money.

We furthermore estimate that it will take three months after work is commenced on the rehabilitation of the properties to get started on actual development work, and further six months' time to open the property sufficiently to permit the steady running of the mill at its full capacity.

It is to be remembered that above calculations are based on the ore milled from the Kensington openings which is the lowest average, $4.85, whereas the Eureka and Johnson assayed $5.00 and the Comet carried $8.00 per ton.

Accompanying this are blue prints showing:

1. The majority of the claims (no new and complete map is procurable).
2. Cross-section through the Kensington and Johnson deposits.
3. Plan and cross-section of Kensington lode.
4. Outline map of Comet workings.
5. Longitudinal section of Comet mine.

Respectfully submitted,

(Signed) OLCOTT & CORNING.

New York, December 10, 1908.

(Original with Endicotts in Boston.)

This report was made by H. T. Tripp Superintendent of the Ebner Gold Mining Company for Mr. Chas. L. Tildon and associates of San Francisco.

It was made after the Kensington cross cut was driven.

Juneau, Alaska, January 27, 1905.

To Those Interested in the Kensington and Eureka Leads, near Seward City, Alaska.

Gentlemen:

On the first day of this year I was at the Kensington Crosscut, ready to commence a sampling of the ore found by that Crosscut, in both the Eureka and Kensington Leads; and further, for the purpose of sizing up the proposition as a whole from a business standpoint. The time of the year being against me for surface exploring, I was compelled to confine myself mostly to underground conditions and indications.

Kensington Lead.

I will assume that there is a general understanding of why and where this Kensington Crosscut has been run, and that the work has been carried on by parties who have had the property under option, during the time of all development work on the Kensington Lead, and that this Crosscut tapped the Kensington Lead at a point practically under the surface workings some 800 feet below where considerable mining has been done on the surface, and as I understand it, about 18,000 tons of ore have been taken from these workings to the mill, and a return value recovered of $5.00 per ton for this amount; and that it is also understood that this Crosscut follows the lead at this point, at right angles to the strike, and crosses through the lead, and that this distance is 80 feet or more, and that at the place where the crosscut has fairly entered into the lead matter, drifts were then started along the line of the lead, this being on the footwal side and that the distance run each way is about 200 feet apart, that there are crosscuts run from these drifts about 100 feet apart, thus making in all, with the main, or center crosscut, five such crosscuts. These crosscuts are in the lead matter and all carry some values; and it is a question whether they are all drifted far enough toward the hanging wall. However that may be, it is not my intention to deal with what I may term outside considerations. I gave this ground a thorough sampling, and found that as we got away from the central crosscut the values got low.

It appears by way of explanation, as though this center has been the vent hole or outlet of some ancient hot spring, and that the ore in this lead has been charged with its values for a reasonable distance each way from this center, and that the better part of this value was along, or near the footwall side. With this understanding, I have waived lines around my map of assay value marks, and find that I have a distance of about 100 feet on each side of the center crosscut, and over 50 feet in the crosscut, and, within this compass there is an averaging

working value of $5.00 a ton, and that within that distance and between the center crosscut and the surface, there are 400,000 tons.

I do not mean to say that there is not ore outside this limit which can not be worked when this block of ground is mined, for I think more than likely there will be treble that amount taken, because there are values running much further and wider than I have considered.

Eureka

It is unfortunate that no work, except where the main crosscut passes through it, has been done on the Eureka lead on this level, but I find this lead much wider than I took samples from. I wanted to be conservative, and stopped long short of where I saw other samplers had been at work, I found, like the Kensington lead, that the best ore was near the footwall side, that the first five feet is exceedingly good, and that recovery values continued out for twenty feet or more. I have made an estimate, on the basis that this lead will continue out 200 feet each way from this crosscut, and it seems to me this is conservative, inasmuch as the cropping on the surface, where work has been done, are over 400 feet on one side of a line perpendicular over this crosscut. This being so, and by shading the values down to a point each way, I find there would be 300,000 tons of ore valued at $7.00 per ton, with something to go on.

Now, we found in the Kensington, above this level, 400,000 tons of ore valued at $5.00 per ton. After paying all expenses, which I estimate at $2.00 per ton, there remains a profit of $1,200,000.

I find that the Eureka lead has 300,000 tons valued at $7.00 per ton, and after paying all working expenses, a profit of $1,500,000 is left. Thus, over and above all working expenses, there is in this estimate, which is made on a conservative basis and from a practical standpoint, $2,700,000.

I find that with a 40-stamp mill the time required to work out this would be over twelve years. In my figures I have allowed for winter expenses exceeding those of summer, and calculating on the handling of the sulphurets. Owing to the character of the ground, which will stand without timbers, and all to be worked down hill, or in other words, the output transported by gravity, and with free power during the greater part of the year, I believe that estimate is not far from correct.

In viewing this proposition it should be remembered that there is a tunnel, called the Bear Tunnel, already driven within a few hundred feet of the Eureka lead, about 720 feet deeper, or below the Kensington crosscut and also that there are several other leads with apparent merit; the last of these is the Johnson lead, which, from all accounts

has very great possibilities in store. It is my idea that the property should be put in shape to work without any more additional expense than is necessary, but that no conservative notions of economy should be entertained whereby necessities would be lacking to start off properly; and, according to my figures, $50,000 is necessary to put the 40-stamp mill in shape, to put in suitable compressors, to stock up with drills, machines, and all necessary machinery and supplies. The Bear Tunnel should be continued to the Eureka and Kensington leads. Drifts, winzes and upraises started and additional stamps put up as required, as estimated ore is opened and life of machinery calculated upon.

Respectfully submitted,

(Signed) H. T. TRIPP.

The following report was made by Mr. H. Van F. Furman in 1909 for the New England Exploration Company, who made the stockholders an offer for the properties which was not accepted. The examination was made before the Kensington Crosscut was driven and the ore bodies developed in depth.

REPORT ON THE PROPERTIES OF THE NOWELL MINING AND MILLING COMPANY, THE NORTHERN BELLE GOLD MINING COMPANY, THE SEWARD GOLD MINING COMPANY, AND THE OPHIR GOLD MINING COMPANY.

By H. VAN F. FURMAN

Denver, Colorado, August 21, 1909.

Benj. B. Lawrence, Esq.,

404 Boston Building, Denver, Colorado.

Dear Sir:

In accordance with your request I have made a personal examination of the properties of the American Gold Mining Company, located at Sheep Creek and Silver Bow Basin; and the properties of the Nowell Mining and Milling Company, the Northern Belle Gold Mining Company, the Seward Gold Mining Company and the Ophir Gold Mining Company, located at Berner's Bay, all in Southeastern Alaska.

I left Denver June 8th, proceeding to San Francisco, where I met Mr. Thomas S. Nowell, and received from him letters of introduction to his sons at Juneau and Berner's Bay. I arrived at Juneau on the afternoon of June 18th, and left there on my return to Denver on the evening of August 2nd. Whilst I was in Alaska I had an opportunity to inspect the properties of the Alaska-Treadwell, etc., Companies and a number of prospects other than those controlled by the Nowell people. These inspections, whilst they have no direct bearing on the Nowell properties, were of interest and value as they have resulted in the acquisition of information which enables me to arrive at conclusions based upon the practice of others.

I herewith submit my report and trust it will receive your approval.

Yours truly,

(Signed) H. Van F. Furman. 218 Boston Building.

REPORT A

THE BERNERS BAY PROPERTIES

Location

These properties are located in the Berners Bay Mining District, Southeastern Alaska, and principally on the Seward City side of the divide; between the Lynn Canal and Berners Bay. Berners Bay is about 60 miles from Juneau by steamer and about 40 miles northwest of Juneau in a direct line. Seward City, located on the beach of the Lynn Canal, is 2-3/4 miles from the 40-stamp mill, operated by the Nowell Companies, by railroad.

The mill is located on Sherman Creek, 2-3/4 miles by railroad from the wharf, at Seward City, at an elevation of 700 feet above the beach. The mines and prospects are all situated in the mountains above the mill to the north, northeast and southeast.

The mountains attain a maximum elevation of about 4,500 feet, and are very rugged and precipitous near their summits. Up to an elevation of about 2,000 feet above sea level there is an abundance of fir and spruce timber, which is frequently of good size, and underbrush in almost tropical abundance, except where snow slides prevail. The country below timber line, and down to the beach is generally covered with moss, fallen timber, underbrush and slide.

These general topographical features, which prevail throughout Southeastern Alaska, render prospecting very difficult.

Transportation

Steam vessels of fair size can land at the Company's wharf at Seward City in good weather; but in order that large vessels may make a landing here, the wharf would have to be extended about 100 feet. When a strong northwest wind is blowing, which is not unusual in the winter months, it is doubtful if any vessel would effect a safe landing. It is probable that by building a breakwater to the north of the present wharf, a safe harbor could be made; however this would be an expensive undertaking.

From the Comet Mine to the mill the ore is transported by a Bleichert wire tram. From the Kensington Mine to the mill ore is transported to the upper terminus of the Bear gravity tram by a wire tram, and thence by a gravity tram. The other properties are reached by trails, which are rough and of but little service for the transportation of ore.

The concentrates are transported from the mill to the wharf at Seward City by a railroad (3 foot gauge) 2-3/4 miles in length. This railroad is built on trestles for most of the distance, a method of construction necessary in order to keep the road open in the winter time on account of the heavy snow fall. The railroad is not in good condition. The rails are old and there are too many sharp curves and switch backs. In fact the road does not appear to have been intelligently laid out or constructed. I am of the opinion that a much better road could be constructed at a cost not to exceed $40,000. Such a road would be somewhat longer than the present line, but, at least, many of the curves, and at least one of the switch backs could be eliminated. The elevation of the mill above the wharf at Seward City is 700 feet. The railroad is equipped with a Porter light locomotive. The railroad cars have a capacity of five tons each, and the locomotive hauls one car at a trip at a speed of about five miles per hour.

I am informed that the freight rate on concentrates by steamer from Seward City to the smelter at Tacoma, Washington, is $5.00 per ton, with a rebate of $2.50 per ton. In the event of a large production, a much better rate could doubtless be secured. I am informed that the Alaska-Treadwell people ship their concentrates from Douglas Island to Tacoma for less than $1.25 per ton, the barges returning laden with coal and supplies. Bullion is shipped by express from Juneau to the U. S. Assay office at Seattle, or the U. S. Mint at San Francisco. The companies own a small steamer, called the Rustler, which makes occasional trips between Juneau and Seward. There are several steamers plying between Juneau and Skagway in the summer season, which stop at Seward upon request.

Labor and Supplies

Miners, trammers, vanner men, etc., are paid $2.50 per day and board. Mill men (amalgamators) generally receive $150.00 per month and board. Where a number of men are employed, the board should not cost the company to exceed seventy-five cents a man per day, as all supplies are quite cheap on account of the water transportation from San Francisco and Seattle. There are no labor unions in the country, and there is apparently no difficulty in obtaining efficient miners.

Smelting Charges

The treatment charges at the Tacoma Smelter are at present $6.00 per ton neutral basis, with an additional charge of ten cents per unit for silica excess, and a corresponding allowance for Iron excess. This makes the average smelting charges on Comet Mine and Kensington Mine concentrates about $5.50 per ton. With better mill work, the percentage of silica in the concentrates could be reduced so that the smelting charges should not exceed $5.00 per ton on the above $6.00 basis.

Climate

All of Southeastern Alaska adjacent to tide water feels the influence of the Japan current, and hence the climate is comparatively mild. The temperature seldom falls below zero in the winter season, and seldom attains a maximum of over 75 degrees in the shade in the summer time. The annual precipitation of moisture is very large, and whilst I have been unable to obtain reliable figures, I should judge it would average fully 100 inches. The summer season is short, not much over three months. However, with proper equipment, there is no difficulty in working throughout the year; in fact, anywhere near the beach the difficulties of working throughout the year are not as great as they are in Colorado, and many parts of the Rocky Mountain Region.

Claims

The claims of the Northern Belle Gold Mining Company are as follows: Northern Belle, Elmira, Kensington, Eureka, Excelsior, Esmeralda, Savage, Yellow Jacket and Bear (U. S. Patents), Triangle, Little Nell, Lucky Boy, Savage No. 2, Bear No. 2, Columbian and Columbian East Extension (Locations).

The claims of the Seward Gold Mining Company are as follows: Snow Flake, Banner, Seward, Seward No. 2, Poor Richard, Comet, Comet Extension, Thomas, Last Chance, Eclipse and Cumberland (U. S. Patents), Seward Extension and Portsmouth (Locations).

The claims of the Nowell Mining and Milling Company are as follows: Emma, Northern Light and Northern Light Extension No. 2 (U. S. Patents applied for); and Eldorado (Location). These claims are known as the Johnson Group, being so called after their original locator. The Company also owns the following locations: Boston, Troy and Bunker Hill.

The claims of the Ophir Gold Mining Company are as follows: Selkirk, Chilcat, Ophir and Hartford (U. S. Patents); Acropolis, Alaska Maid, Fraction Rustler, American, Harvard, Columbian West Estension and North Star (Locations).

Most of these are full claims (1,500 feet by 600 feet) of about 20 acres each, although some are fractional claims.

In addition to the above mining claims, the various companies own five patented mill sites and three other mill sites for which application for U. S. Patents has been made.

Geology

All of the veins which I have examined occur in a granite formation. The granite is generally fine grained, and merges from one variety into another. To the south the country is slate and schists.

Above the Kensington there is a belt of greenstone, and near the summit of the mountain there is probably a dike of porphyry, as I found some porphyry slide and float on the side hill, and in the gulches, but was unable to climb sufficiently high to find this rock in place. The country has been subjected to enormous pressure, and there has been some faulting, there being a well defined fault of considerable magnitude in addition to numerous slight slips exposed in the Comet Mine. The various canyons and gulches are largely the result of glacial action.

The Veins

The veins generally present the same general characteristics. The vein filling is white quartz, which is frequently stained with iron oxide at and near the surface. The quartz frequently carries iron sulphide (pyrite) and occasionally copper pyrites; the unaltered sulphides frequently extending to the surface. In fact, the zone of oxidation does not usually extend to a depth of more than a few feet, although in the Comet Mine free gold is encountered at a depth of about 500 feet below the surface. In the Comet and Ophir Mines the rich quartz frequently contains small crystals of galena. The various veins vary in width from a few inches to upwards of 100 feet. The underground development on the Comet, Ophir and Bear claims shows that the width of the veins is very variable, that is, they frequently widen out to several feet and then pinch to a width of a few inches. For example, the Comet vein in places does not exceed twelve inches in width, whilst in other places it is fully five feet wide. It is difficult, I might say impossible, to form an accurate opinion as to the length of the various veins. There has not been sufficient underground development to settle this question, and owing to the character of the country, the outcrops cannot generally be traced for any considerable distance. However, I have been able to trace some of the quartz veins for over 1,000 feet on the strike, and believe that development would prove their extension for greater distances. For example, the Savage veins, is exposed in the open cut (at least, this appears to be the same vein) in the workings on the Mexican and Horrible claims belonging to other parties. If this is the Savage veins, it is continuous for over 2,000 feet in length.

The Kensington lode differs from the others. It is not, so far as present development shows, a well defined vein, and for want of a better term I will call it a mineralized zone. The mineralized zone is from 30 to 60 feet in width, and contains numerous quartz seams, stringers and veinlets. The quartz, and frequently the country rock between the quartz seams, carries iron pyrites. The gold is associated with this iron pyrites, only a small percentage of the gold being free and susceptible of treatment by amalgamation.

The Ophir vein presents numerous cavities or vag holes lined with quartz crystals, which are frequently off unusual size. I am informed that some very rich free gold quartz has been taken from these vag holes. The quartz as exposed by the croppings, and the underground development varies from 2 to 12 feet in width.

What is known as the Johnson lode, which is exposed on the Northern Light and the Northern Light Extension No. 2 claims, is the most remarkable vein of the district. At the crosscut tunnel the quartz is 60 feet in width. A few hundred feet above, and to the north of the point mentioned the outcrop is over 50 feet in width. Several hundred feet above, and to the north of this point, the outcrop can be seen distinctly, but I did not examine it closely, as the place was practically inaccessible. This deposit has not been developed sufficiently to enable one to judge as to its size and value; however, I believe it will average fully 50 feet in width for a distance on the strike of over 1,500 feet. As to the continuity of the quartz in depth, the highest point at which I could see the outcrop, I should judge to be at least 700 feet above the basin where the lowest workings are situated.

The vein filling is white quartz, more or less stained with iron oxide on the surface, and carrying iron pyrites, the sulphides coming to the surface. The ore is similar in character to the Kensington, the gold being associated with the pyrites, only a small percentage of the gold being free, except in the surface honecombed quartz.

The Comet vein is the only vein which has been developed or worked to any great extent. To the south the vein is cut off by a bed of talcose schist, and to the north the vein is cut off by a fault; the distance between these two points on the 470 foot level is about 725 feet. The extension of the vein beyond these points is not shown by the present development. However, I am inclined to believe that intelligent prospecting will disclose the continuation of the vein beyond the line of fault and to be northwest of the present workings. I am also inclined to believe that the vein extends beyond the bed of talcose schist into the slates to the south.

The vein is virtually stoped out to the level of the No. 3 crosscut tunnel (470 foot level). There was practically no pay ore in sight above this level at the time of the inspection of the property (June, 1900) and I understand that since my visit the mine has been closed for want of pay ore.

The vein carried from 18 inches to 5 feet in width, and will average from $2\frac{1}{2}$ to 3 feet in width.

The vein's filling is white quartz containing free gold (as wire and crystalline gold) and small amounts of sulphides (iron and copper pyrites, galena, and occasionally zinc blend). The gold is quite free, less than 6 per cent of the value being contained in the concentrates. This mine has produced many fine specimens of free gold quartz, small pockets of very rich rock having been encountered from time to time.

The No. 2 Comet vein, which is parallel to and about 75 feet east of the main Comet vein, has been opened at the points in plate attached.

The Seward workings are located on the Seward claim in the saddle above the Comet. The saddle is on the divide between Berners Bay and the Seward City side of the peninsula. It is developed by two open cuts, which were buried in snow at the time of my visit, and a shaft about 60 feet deep. From the bottom of the shaft there is a drift 15 feet in length, which shows a six foot vein of white quartz. The same quartz vein is exposed in the shaft from the surface to the bottom. The quartz contains little or no sulphides, the gold being free. The continuity of this vein on its strike has not been demonstrated for any considerable distance by the present development.

The Eureka workings were buried in snow at the time of my inspection. They are so covered for about ten months in the year, and the property can only be profitably opened and worked by extending the Kensington crosscut tunnel to the intersection of the vein. A little to the northwest of the workings, quartz croppings about 35 feet in width are exposed. These croppings are iron stained, white quartz carrying some iron pyrites.

The little Nell vein outcrops in two or three places above the Kensington workings. These white quartz croppings are 1 to 2 feet in width and are apparently stringers or offshoots from the Kensington.

The Elmira is opened by a tunnel 60 feet in length. At the mouth of the tunnel the white quartz croppings are 5 feet in width.

The Savage vein is exposed by a small open cut located about 450 feet above the Bear tunnel. At this point the quartz is 10 feet in width. What appears to be the same vein is exposed in the workings of the Mexican and Horrible claims.

The Bear vein is exposed in the Bear tunnel and some small stopes which extend to the surface. The vein varies from 1 to 2 feet in width.

I also visited the Esmeralda and Selkirk, but the workings were buried in snow and the surface was covered with snow or moss so that I could not see the veins.

Quartz veins are said to outcrop on a number of the other claims, but as most of the claims were covered with snow at the time of my inspection I did not visit them.

The Ores

Throughout this district the ore is white quartz. Some of the veins carry free gold in more or less defined chutes. In other veins (notably the Johnson and Kensington) the quartz contains sulphides and (principally iron pyrites), the gold being associated with the pyrites, and only a small percentage being free so that it can be recovered by amalgamation. All of the ore is quite free from silver, the amount present being generally less than one ounce per ton.

The ores present no difficulties as to metallurgical treatment wherever they occur in sufficient quantities and value to warrant mining. The ore from some of the veins, notably the Comet, is quite free, and at least 80 per cent of the gold should be saved by amalgamation, with an additional saving in the concentrates. The ore from some of the veins, notably the Kensington and Johnson, carries considerable iron pyrites, with which the gold is intimately associated. These ores contain but little gold which can be recovered by amalgamation, but they are well adapted to concentration.

Samples and Assays

The following table gives the assay results on a number of samples taken by the writer:

Sample No.	Assayer *E. J. N. Ott Ozs. gold per ton	Value per ton	Assayer *J. H. Moyle Ozs. gold per ton	Value per ton	Sample taken from
1	Trace	$___	---	$___	Savage vein. General grab of dump at open cut.
2	0.20	4.00	0.28	5.60	Johnson vein. Across 32 feet exposed in open cut and tunnel.
3	0.20	4.00	0.29	5.80	Johnson vein. General grab sample of ore dump from tunnel.
4.	0.70	14.00	0.75	15.00	Johnson vein. Across outcrop for 20 ft. above and N. of tunnel.
5	12.00	240.00	9.36	187.20	Johnson vein. Selected sample of rich honeycombed quartz and sulphides. Chute exposed in small open cut at same point as No. 4.
6	2.10	42.00	2.04	40.80	Eureka outcrop just N. of tunnel. A cross vein for 6 feet.
7	0.50	10.00	0.59	11.80	Johnson. Sample from 30 sacks of sorted ore from tunnel.
8	0.05	1.00	0.15	3.00	Ophir outcrop above No. 2 tunnel. A cross vein for 5 feet.
9	0.30	6.00	0.53	10.60	Seward shaft. 10' below.
10	0.75	15.00	0.85	17.00	Battery sample of Kensington ore July 1.
11	0.50	10.00	---	---	Battery sample Kensington ore July 2.
12	0.60	12.00	---	---	Pulp sample of Kensington ore July 2.
13	0.12	2.40	---	---	Tailings from vanners treating Kensington ore July 2.

*Mr. Ott is assayer for the Alaska-Treadwell Co.

Mr. Moyle is assayer for the Berners Bay Companies.

The following table presents the results of a few assays which I copied from the assay record of the Company. These assays were made by Mr. Boyle:

Date	Gold Value per ton	Vein	Remarks
8/25/99	$36.00	Johnson	Across creek from tunnel.
8/27/99	21.20	"	Across side tunnel.
6/13/99	6.40	"	General sample of ore from tunnel.
10/10/99	1.00	"	White quartz containing a few small crystals of iron pyrites.
"	5.40	"	Yellowish quartz slightly iron stained.
"	7.00	"	Grab sample at dump at tunnel.
"	18.80	"	Brown sulphide ore.
"	30.40	"	Brown honeycombed quartz.
"	136.00	"	Brown honeycombed quartz and light iron pyrites.
10/2/99	42.80	"	Light iron pyrites.
"	17.60	"	Dark iron pyrites.
7/24/96	1.20	Bear	Free milling quartz from stopes.
"	2.00	"	" " " " "
"	1.60	"	" " " " "
"	2.40	"	" " " " "
"	1.00	"	" " " " "
6/11/96	3.13	"	Battery sample.
6/12/96	2.24	"	" "
6/14/96	3.66	"	" "
9/15/98	47.54	Eureka	Tunnel.
"	38.44	"	Lower face of tunnel.
"	72.34	"	Upper face of tunnel.
"	198.43	"	Selected sample of sulphides from tunnel.
"	161.20	"	Selected sample of sulphides from face of tunnel.
"	3.60	Little Kensington	Average across cut No. 1.
"	7.60	" "	Average across cut No. 2.
"	20.80	" "	Average across cut No. 3.
7/29/98	38.02	" "	20 sacks of sorted ore from Cook House vein.
Aug. 96	3.72	Elmira	Across face of tunnel for 8 feet.
"	6.60	"	Cross face of tunnel for 2 feet.
"	2.27	"	Sample from point furthest south.
8/11/98	70.27	"	Selected sample of white quartz and iron pyrites.
7/8/96	2.52	Savage	Croppings.
"	2.68	"	General grab of dump.

"	5.16	"	White quartz with small galena crystals.
Aug. 96	3.10	Uphir	Face of S. drift S. level.
"	4.38	"	" N " N " vein 3' wd.
"	Trace	"	" N " E " vein 10' wd.
"	0.82	"	" S " N " " 4' wd.
"	4.13	"	N. drift hanging wall streak 1½ ft. wd.
1896	3.30	Northern Belle	40 feet south of discovery.
"	36.38	" "	80 feet south of discovery. Vein 4 ft. wd.
"	85.57	" "	Selected sample of brown quartz.
"	5.37	" "	110 feet south of discovery. Vein 4½ ft. wide.
"	11.57	" "	140 ft. south of discovery. Vein 1½ ft. wide.
"	18.19	" "	60 feet north of discovery. Vein 3 ft. wide.
"	19.01	" "	220 ft. N. of discovery. Vein 3 ft. wd.
"	7.44	" "	170 ft. N. of discovery. Vein 2 ft. wd.
"	12.39	" "	Point furthest N. where vein can be traced.

Mill Run

At the time of my visit to Berners Bay, the mill was treating ore from the Comet and Kensington Mines exclusively.

The following table shows the results of a mill run for 10 stamps for 8 days and 17 hours on Kensington Ore. The stamps crushed an average of about 2 tons each per 24 hours during this run. Total tons crushed 180:

June 1900	Pulp sample Value per ton gold	Concentrates sample value per ton gold	Vannery Tailings value per ton gold	Aut. Tail sample value per ton gold
23.....	$11.20	$92.00	$2.40	$0.80
24.....	10.00	82.00	3.00	1.20
25.....	8.80	92.80	2.20	1.10
26.....	8.60	86.20	2.80	0.80
27.....	10.00	85.60	2.40	1.20
28.....	10.40	100.80	2.60	1.80
29.....	12.40	81.60	3.60	1.60
30.....	11.60	84.00	3.40	1.60
July 1.....	10.00	94.40		
Average.....	$10.33	$88.49	$2.49	$1.12

From this mill run the recovery was as follows, the weights given being dry weights:

Ore milled 360,000 pounds. Gross value $1,859.40.

Concentrates from	Weight lbs.		Assay Value per ton	Gross Value of Concts.
Vanners	25,625		$81.72	$1,047.03
Canvas Plant, 1st Through	9,445		69.60	328.69
Canvas Plant, 2nd Through	1,000	(Estimated)	94.40	47.20
Canvas Plant, 3rd Through	1,000	"	132.80	66.40
Total	37,070			$1,489.32

Percentage of value saved in concentrates, 80.

In addition to the concentrates a small amount of free gold was saved in the battery and on the plates. The amount (I estimate it as less than 10% of the gross value) was so small that I did not make a clean-up.

The following statement presents the results of a mill run for 20 stamps for 20 days and 8 hours on Comet ore. Total ore crushed 1,124 tons, or an average of about 2-3/4 tons per stamp in 24 hours. I was unable to obtain either the weight of concentrates or the value of the bullion produced during this run. This ore is free milling, about 80% of the assay value being recovered in the form of amalgam. The concentrates do not amount to more than 4$\frac{1}{2}$% of the rock crushed.

Date	Average Gold Value of Concentrates	Average Gold Value of Mill Tailings
May 23 to June 29, 1900	$43.14	$0.65

The Production of the Comet Mine

The following table, prepared for me from the books of the Juneau office shows the productions of the Comet Mine. I looked over the mint and smelter returns, and have no reason to doubt the accuracy of the following figures:

Year	Tons of Ore Crushed	Value of Bullion Produced	Value of Concentrates Produced	Total Value
1894	6,300	$ 68,210.63	$4,622.31	$ 72,832.94
1895	10,800	149,201.42	3,150.10	152,351.52
1896	5,915	88,558.52	4,780.28	94,338.80
1897	12,750	84,155.80	2,676.29	86,832.09
1898	3,582	16,248.29	960.11	17,208.40
1899	3,191	25,261.20	2,458.48	28,719.68
1900 to June 30	2,925	10,886.58	1,887.85	12,774.43
Total	51,463	444,522.44	20,535.42	465,057.86

An analysis of these figures shows the average returns each ton of ore milled to have been $9.0367. The recovery in free gold was $8.6377 per ton (95.5% of the total).

Development

The following table presents a summary of the amount of work done on the principal claims. In addition, there are a number of 10 foot prospect holes and cuts on the various other claims.

Claim	Shafts and Winzes feet	Drifts Crosscuts and Tunnels feet	Open Cuts and Stopes Cu. Ft. Approximate	Remarks
Comet.....	520	7,800	600,000	
Kensington.....		740	130,000	
Cumberland.....		80		Crosscut. No vein exposed.
Seward.....	60	30	2,500	
Thomas.....	40			Shows stringers of quartz.
Ophir.....	115	720	500	
Selkirk.....		65		Inaccessible on account
Chilcat.....	50		1,000	Do. of snow.
Harvard.....		50		
Esmeralda.....		60		
Savage.....		220		Tunnel on vein. Now caved and accessible.
Eureka.....		50		Two prospect tunnels, 25'
Bear.....	150	1,860	50,000	each.
Northern Light Ext. No. 2.....		130		
Elmira.....		60		
Total.....	935	11,915	784,000	

Surface Improvements

Railroad:

The surface improvements consist of the railroad from the wharf at Seward City to the Mill, distance 2-3/4 miles, with a grade of 700 feet in this distance, and five switch backs. This road is 36 inch gauge and has too many curves, and switch backs. It is built almost entirely on trestles, a construction which is necessitated by the character of the country, and in order to keep the road open in the winter season when the snow fall is heavy. The rails are light and old (I understand they have been in use by a street railway company in Washington before they were put in place at Berners Bay). The roadbed, including trestles, is in bad condition. The road is equipped with H. K. Porter (Pittsburgh, Pa.) light locomotive. The cars and locomotive are capable of transporting about 5 tons of concentrates from the mill to the wharf at a trip. The road could be rebuilt at a cost not to exceed $40,000, so as to eliminate at least one of the switch backs, a number of the sharp curves, and so as to make it thoroughly practicable and economical road to operate.

Mill:

The mill contains forty 850 pound stamps, and sixteen 4 foot Frue vanners; also a Gates crusher, and automatic feeders for each battery of 5 stamps. The mill building is substantial, and the mill is in good condition for economical work, provided a few changes are made. There is a canvas concentrating plant below the mill, which has recently been erected. The mill and adjacent buildings are illustrated herewith.

At the mill is located office-store-warehouse building, bunk and mess-house, blacksmith shop, retorting and melting room, assay office, and power, and compressor plant.

The office-store and warehouse building is well built, and well arranged for conducting a large business.

The bunk and mess-house will accommodate about 40 men and is well built.

The hospital and building adjacent to it which is arranged for families, would probably accommodate 20 people.

Power Plant:

To the rear and adjoining the mill building there is a well arranged steam power plant, containing two steel boilers of 100 H. P. each, a Union Iron Works Corliss Engine of 250 H. P., a six-drill Union Iron Works Air Compressor, a 20 kilowatt Edison General Electric Company Incandescent Light Generator with switchboard, etc. The mill and office buildings are wired for incandescent lights.

Water Power:

The two flumes and pipe lines are illustrated in Plate 2; No. 1 pipe line, about 1150 feet in length, has a head of 400 feet, and its pipe is 14 and 16 inches in diameter. The No. 2 pipe line is about 1,000 feet in length, has a head of 320 feet and is 10 and 11 inches in diameter. At least 500 H. P., and probably much more, can readily be derived from Sherman Creek for about 5 months in the year. During the winter season the water power fails.

The various Nowell companies virtually control all of the water power on Sherman Creek and its tributaries.

Tramways:

From the mill to the Comet mine there is a wire tram (Bleichert System) about 4,300 feet in length. This tram has a capacity of about 100

tons in ten hours. The guide cables are old, I understand they were second hand cables when installed, hence the small capacity of the tram. Originally this tram was built in a snow slide country, and lasted until the first snow slides destroyed it. The tram as at present located can probably be operated throughout the year.

From the Kensington workings to the terminus of the gravity tram at the Bear tunnel there is a wire tram about 2,300 feet in length, which has a capacity of about 45 tons in ten hours, the two buckets transporting 1,200 pounds at each trip. The buckets discharge into storage bins, whence the ore is drawn off into the gravity train cars, which hold 5,000 pounds each. The gravity tram is about 1,700 feet in length and has a capacity of at least 300 tons per day. It is well constructed and delivers the ore to a chute which carries it by gravity into the mill.

Mine Buildings.

The Comet mine is equipped with a good boarding and bunk house capable of accommodating about 50 men. There is also a terminal tramway station and storage bins at the mouth of the No. 3 cross-cut tunnel. Also a blacksmith shop and dry room. The buildings at the upper Comet workings are now abandoned and some of them have been destroyed by fire.

The Kensington mine is equipped with a good boarding and bunk house capable of accommodating about 20 men; also a blacksmith shop and a terminal and storage bins for the wire tram.

At the mouth of the Kensington cross-cut tunnel there are some small frame buildings capable of accommodating 6 or 8 men.

At the mouth of the Bear tunnel there is a boarding and bunk house which has not been occupied for some time. These buildings have accommodated about 20 men.

On the Northern Belle claim there is a boarding and bunk house capable of accommodating about 25 men. These buildings have not been in use for some time.

At the lower Ophir tunnel there is a small cabin, and there are one or two other cabins on the properties.

Cost of Improvements and Developments.

It is extremely difficult, I might say almost impossible, to make any accurate estimate as to what the actual cost of the various improvements have been. Under the management these properties have been subjected to, the cost has doubtless been excessive. The following is a rough estimate of what in my estimation the various improvements should have cost:

Railroad and wharf	$ 50,000.00
Mill, mill buildings and office buildings	45,000.00
Power plant	13,200.00
Pipe lines	7,000.00
Flumes	7,000.00
Electric plant	700.00
Air pipes	3,000.00
Wire tram lines	18,000.00
Gravity tram	10,000.00
Shafts and winzes @ $12.00 per foot	11,220.00
Drifts, crosscuts and tunnels @ $10.00 average per foot	11,915.00
Boarding and bunk houses	4,000.00
	$181,035.00

I have not included the cost of stopes and open cuts, as these produced ore and their cost should properly be charged to mining expenses.

Conclusions and Recommendations.

First--Management.

A great deal of money has been wasted on these properties by the incompetent management which has prevailed. The construction of railways, tramways, mills and expensive buildings before the mines were developed cannot be condemned too strongly. The result is illustrated by the present condition of the companies. There are a number of expensive plants, and not a single producing mine. If anything is to be done with the view of placing these properties on a paying basis it should be undertaken under entirely new management.

Second--Properties.

At present there are no properties belonging to the various companies enumerated which can be considered as other than prospects. The Comet mine has been a good property, and under intelligent and conservative management should have paid handsome dividends. At present the property is worked out to the level of No. 3 cross-cut tunnel, so far as the vein has been developed on its strike. As I have stated previously, the northerly portion of the vein is cut off by a fault. An endeavor should be made to find the continuation of the vein beyond

the line of fault. I am inclined to believe it will be encountered to the northwest of the present workings; but it is of course impossible to state at what point. The slip has been a considerable one, and I would not be surprised to find the movement has been from 200 to 300 feet. To the southeast the vein passes into a bed of talcose schist, where it pinches out and is apparently lost. An endeavor should be made to find the continuation of the vein either in or beyond this talcose belt. The No. 2 Comet vein has been intersected in a number of places as shown in Plate 7, but it has not been prospected to any extent, probably because the vein is narrow, seldom more than one foot in width, and, so far, has not given good values. However, this vein should be prospected by drifting, especially to the southeast.

As to the development of the Comet vein below the level of the No. 3 cross-cut tunnel, it is practically out of the question to develop the vein at greater depth by running another cross-cut tunnel from the Seward City side of the divide. Such a tunnel would be probably 1000 feet longer than the present lower tunnel, and would intersect the vein at a depth of only about 125 feet below the present 470 foot level. On the Berners Bay side of the divide the Alaska-Indiana Gold Mining Company have a tunnel in about 1000 (?) feet. I have made no actual survey of this ground which would enable me to state the distances accurately. However, from general observation, I am inclined to believe that a cross-cut tunnel could be driven from the face of the present Alaska-Indiana tunnel which would intersect the Seward vein in a distance of about 1200 feet; and the Comet vein in a distance of about 2000 feet. This cross-cut should intersect the Comet vein at a depth of about 600 feet below the level of the No. 3 Comet cross-cut tunnel.

The Comet is a very wet mine, especially during the Summer season. At the time of my visit to the property I should judge there were about 1000 gallongs of water a minute being discharged from the No. 3 tunnel. Most of this is surface water which comes from the melting snow above and finds its way down through the stopes which extend to the surface. A considerable part of this water might be turned off above so that it would not enter the mine workings. In the winter season, I am informed, the mine makes but little water. Hence, it would be possible to develop this mine to a greater depth by sinking from the present 470 feet level, but I am inclined to believe that, when cost of erecting a hoisting and pumping plant and the cost of pumping is considered, it will be found more economical to endeavor to develop the mine by driving the cross-cut tunnel outlined above, which would serve the purpose of a drain tunnel. The past production of the Comet mine would seem to warrant the expenditure of a reasonable sum in order to develop the mine at a greater depth and open up ore reserves. Provided satisfactory arrangements could be made with the Alaska-Indiana Company, and I am inclined to think they could be, the driving of this tunnel should not cost to exceed $12.00 per foot.

As to the development of the Eureka, Northern Belle and Johnson veins, after my careful inspection of the properties I gave this matter considerable attention. I am of the opinion that the most practical and economical method would be to extend the Kensington tunnel to the intersection of the various veins. This tunnel was commenced with the object in view of prospecting the various veins and has been driven as a double-track transportation and drainage tunnel in order to make it the main working tunnel for the various veins as they were intersected. According to the survey, the tunnel will have to be driven about 4050 feet to intersect the Johnson vein at a depth of about 630 feet vertically below the present surface tunnel. With machine drills (there are two Sullivan machine drills at the tunnel and an air pipe from the compressor at the mill to the Kensington tunnel, and beyond the Kensington workings), this tunnel should be driven at a cost not to exceed $20.00 per foot.

For the present the endeavor should be to prospect these properties located on the line of the Kensington tunnel, and possibly to further prospect the Comet vein on the lines outlined above. In the past a great deal of money has been expended in surface workings, which were prosecuted under great disadvantages and were consequently excessively costly.

If the extension of the Kensington tunnel should open good pay ore bodies, mining and milling could be carried on at a cost not to exceed $1.50 to $2.00 per ton by building a gravity tram from the mouth of the tunnel to a modern mill to be located in the vicinity of the present mill. This would also involve the extension of the present water power system, so as to furnish the mines and works with water power for at least six months in the year.

Third--The Mill and Buildings.

The present mill and buildings should answer all present requirements, although a few changes and alterations in the mill would be advisable as long as the mill is running on the present Kensington ore. These changes I suggested and outlined to the mill foreman whilst at the mill.

Fourth--Cost of Proposed Development.

The proper development to prove up the value of the Comet, and also the Kensington, Johnson and other veins on the line of the Kensington tunnel will require the expenditure of about $150,000. It would appear to me that such an expenditure is warranted by the past production of the Comet and the present surface development of the various other veins. Should such development open large ore bodies, a plant to treat from 500 to 1000 tons per day would be advisable.

(Signed) H. VAN F. FURMAN.

The three following reports were made on the separate groups of mines now formed into the Kensington Mines Company by Mr. T. S. George and for Mr. George S. Nowell, one of the defendants in the litigation just finished. Mr. George's examination was made before and after the Kensington Crosscut was driven.

REPORT ON THE PROPERTIES OF THE SEWARD AND OPHIR GOLD MINING COMPANIES.

The properties of the Seward and Ophir Gold Mining Companies are situated about 60 miles northwest of Juneau, in Berners Bay Mining District, Alaska. The Ophir claims are bounded on the east by those of the Northern Belle Co.. The Seward claims adjoin those of the Northern Belle Company on the northwest. They range in elevation from 1200 feet on the Ophir to 2500 feet and over on the Acropolis and North Star, and from 1700 feet on the Comet to 2600 feet on the Seward.

Claims.

The claims of the Seward Gold Mining Co. consist of the following, to wit: Comet, Comet Extension, Snow Flake, Last Chance, Eclipse, Cumberland, Banner, Poor Richard, Seward, Seward 2d (U. S. Patents), Seward 3d and Portsmouth, (Locations) and three patented mill sites at the beach, embracing an area of 11.52 acres. The claims of the Ophir Gold Mining Co. are the Hartford, Ophir, (U. S. Patents), Selkirk, Harvard, Columbia West Ex., American, Fraction, Chilkat, Rustler, Alaska Maid, Acropolis and North Star, (Locations) and the Ophir mill site (U. S. Patent) Embracing an area of five acres.

Seward Veins. - KX 112-8

The principal veins in the Seward group of claims, so far as known, are the Comet, Comet No. 2 and Seward. The Comet is the only vein of the group that has been extensively developed. It is a well defined fissure vein varying from 2 feet to 8 feet in width, averaging fully 4 feet. Its general course or strike is about due north and south, dipping toward the east at an angle of 65 degrees.

The Comet mine has been worked to a depth of 800 feet on the dip of the vein, below the surface, and has produced about $500,000 in bullion, the ore averaging $9.50 per ton. The ore is a white quartz, stained more or less with iron oxide, carrying over 90 per cent of its value in free gold, the remainder being in and recovered from the sulphurets.

The main ore body thus far developed has been stoped out from the surface down to the bottom level, excepting the necessary pillars left for the protection of main thoroughfares, such as winzes, etc. The length of the ore body in the first level below the surface was 100 feet; in the deeper levels it increases to nearly 400 feet. No work

has been done on the vein below the bottom level. At that point the vein is strong, being from two feet to ten feet in width.

Comet No. 2 is a parallel vein about 100 feet to the east or on hanging wall side of the Comet. But a comparatively small amount of work has thus far been done on this vein. A tunnel, starting from the croppings at the surface, has been driven on it a distance of 225 feet showing the vein to be from 1 foot to 3 feet in width in that distance. This tunnel is connected by a crosscut with No. 1 level of the Comet. The vein has also been intersected at a point about 175 feet further south or into the mountain, by a crosscut from No. 2 level. At this point a level has been started on the vein and extended about 20 feet. The ledge here is from 2 feet to 2½ feet wide and very similar in character to the Comet. If developed more extensively and at greater depth it promises well to become as valuable as the Comet.

The Seward vein crops out very boldly at the summit of the mountain, at an elevation of 2600 feet, and down on the Jualin side of the summit a distance of about 750 feet, when it becomes covered with gravel, slide rock and vegetable growth.

On the Comet side of the summit it is traceable from 350 to 400 feet, when, from similar causes, it is again covered over. The development work done on this vein is of a rather limited character, which is largely due to the fact that its surface is inaccessible, for practical operations, during a large portion of the year. The work consists of an open cut at the surface, where the vein is from 10 feet to 12 feet wide, also a shaft sunk on the vein to a depth of 60 feet and a level run on the ledge or vein at the bottom of the shaft about 20 feet. The vein in the shaft and level is from 5 feet to 7 feet wide, and between the open cut and shaft, a distance of about 300 feet, it ranges from 5 feet to 12 feet in width. The ore is much like the Comet, its value being almost entirely in free gold. Samples taken from time to time at different points on the vein, range from $3.00 to $15.00 per ton and upwards.

This is a strong, well-defined fissure vein. Its greater size will permit of its being mined more cheaply, when properly opened, even if its average value should not be quite so high as the Comet. It can be worked advantageously through the Comet mine; in fact, this is the only point, except lower down on the Jualin side, where it can be operated on practical lines. A crosscut from No. 3 level of the Comet mine would intersect this vein 450 feet vertically below the surface, and a crosscut extended from the bottom level would strike it at a point about 1000 feet below the surface. Each of these crosscuts would be about 900 feet long, and in passing through the Poor Richard ground might strike something of value before reaching the Seward vein.

Ophir Veins

The principal veins of the Ophir group are the Hartford, Ophir, Chilkat, Selkirk and Acropolis. The Hartford crops out near the foot of the mountain, at an elevation of 750 feet. It is from 3 feet to 4 feet wide where exposed in an open cut, and has only a small amount of work done on it thus far.

The next in ascending the mountain is the Ophir. This is a strong, well-defined fissure varying from 2 feet to 14 feet in width. It is situated at an elevation of about 1200 feet to 1400 feet. Its values are largely in free gold and vary from $2.50 to $10.00 per ton and upward. The development work consists of 350 feet of drives on the vein and 250 feet of crosscuts, aggregating 600 feet.

The Chilkat occurs at an elevation of about 1700 feet. This vein is from 3 feet to 6 feet wide. It has been uncovered at the surface about 200 feet in length by open cuts. It also has an inclined shaft sunk on it to a depth of about 75 feet. It is a well-defined, promising vein.

The Selkirk occurs at an elevation ranging from 1500 to 2000 feet. In size and character it is very similar to the Chilkat. The development on this vein consists of a tunnel 125 feetlong, and a short crosscut and level on the vein about 75 feet long, aggregating 200 feet of drives.

The Acropolis is a large lode or vein of low-grade ore. Its outcrop is at an elevation of 2500 feet. The ore is pyritic, occurring in a hard greyish quartz, running from $1.00 to $1.50 per ton. This vein has been driven through in the Kensington crosscut tunnel where it is 120 feet wide, but on the Acropolis side it is much wider. These points are about three-quarters of a mile distant. It possesses sufficient merit to warrant further outlay to develop and determine something further as to its value.

General Remarks

The further development of the claims of the Seward Gold Mining Co. should be mainly conducted and carried out through the Comet mine. This mine is connected by an aerial tramway (Bleichert System) 4800 feet long; having a capacity of 100 tons in ten hours, with the 40-stamp mill and narrow gauge railroad, between the beach on the shore of Lynn Canal and mill of the Northern Belle Gold Mining Co., thus placing it in a position to have supplies of every character moved from tidewater to the mine at a minimum cost; also to transport ore, when operating, with the same facility and advantage.

The Comet mine should be developed at greater depth, also to the north and south of the present workings. The object of sinking would be to develop the ore body on from the surface down, at a greater

depth and the development north and south of present workings, to show the continuation of the vein in these directions and developing other ore shoot. If this work can be carried out there is not much reason to doubt but that its record as a bullion producer will be equally as good in the future as it has been in the past.

The question of sinking is one that probably will be attended with some difficulty, as the influx is certain to be heavy, particularly in the early part of the summer season. In view of this it would be desirable, and that difficulty would be overcome, if greater depth could be gained by running a tunnel from the surface. This is impracticable on the Comet side of the summit, but on the Jualin side the conditions are more favorable for that purpose. A tunnel has been driven into the mountain 1200 feet by the Alaska-Indiana Mining Co. to develop a series of claims adjacent to those of this Company. This tunnel is well in toward the Seward vein and is about 750 feet below the Comet bottom level. If suitable arrangements could be made to work through this tunnel or extend a branch from it to the Seward vein and thence to the Comet it might be of great advantage to do so. The great benefit to be derived from this method would be that the Comet vein would be drained down to that level at a much less cost than by installing and operating a large pumping plant and endeavoring to sink with a heavy flow of water to hamper and retard the work. The only apparent disadvantage is that it would require a considerable length of tunnel to operate from the Jualin side, but even that would greatly disappear when it is remembered that the dip of the veins is in that direction, and in the development of the Seward, the crosscuts from the Comet would become an absolute necessity, no matter which method be adopted.

At the Comet mine there is a large substantial building capable of housing, and with cooking facilities and arrangements for seventy-five or more men.

The veins in the Ophir group of claims, up to this time, have received but little attention, and only a small amount of work has been done toward their development. They are of a favorable and promising character and can be worked advantageously through one of the Ophir tunnels, excepting the Hartford, which, being lower at the surface, would have to be developed from some other point.

T. H. GEORGE
Engineer for the Seward and Ophir
Gold Mining Companies.

REPORT ON THE PROPERTY OF THE HOWELL MINING AND MILLING COMPANY

The property of this Company is situated in Berners Bay Mining District and adjoins the Northern Belle property on the west. It consists of nine lode claims and six mill sites. The lode claims are known as the Northern Light, Northern Light Extension No. 1, Northern Light Extension No. 2, Eldorado, Needless, Shaler, Bunker Hill, Boston and Troy. Patents are to be issued on the three first named claims. The El Dorado, Bunker Hill and the three mill sites have been surveyed for U. S. Patents.

The Veins.

The vein or lode known as the Johnson lode is embraced in the four first mentioned claims. It occurs in a contact between hornblende, granite and greenstone. Its outcrop on the surface is very prominent for more than 1500 feet. In width it varies from 75 feet to 125 feet or more, and in value it averages about $5.00 per ton, selected samples running as high as $180.00 per ton. The vein filling is mostly quartz carrying sulphide and iron pyrites. It is a concentrating ore carrying only a small percentage that is free milling.

Situated on the slope of a precipitous mountain where the elevation above sea level ranges from 1300 feet on the Northern Light Extension No. 1 to about 4000 feet on the Eldorado, the claims, embracing the Johnson Lode can be reached for practical operations during a period of rather less than six months each year.

At a point about 300 feet northwesterly of the south end of the Northern Light Extension No. 2 the vein is fully 75 feet wide. At this point a tunnel, known as the King Tunnel, starting near the center of the lode, has been driven across it and fifty feet into the footwall.

A number of samples taken from this and other points with a view of ascertaining the value of the ore shows an average value of about $5.00 per ton.

The Needless and Shaler may be considered spurs from the Johnson Lode. They can be developed advantageously from the workings on the Northern Light Extension No. 2 when these workings have been sufficiently advanced to permit it.

The Boston and Troy are parallel veins, being extensions of the Yellow Jacket and Northern Belle. They vary from 3 feet to 10 feet in width at points where the outcrop is exposed, and are situated on the summit of the divide between Berners Bay and Seward. The surface of the claims, at an elevation varying from 3000 feet to 4000 feet is inacessible for practical and economical operations. Several hundred tons of ore have been milled from the Northern Belle vein, which is a continuation of the Troy on the south end, the value of which ranged from $8.00 to $10.00 per ton, a large percentage of its value being free milling.

The Bunker Hill is an extension of the Kensington claim. But little of that valuable lode crops out at surface, even on the Kensington claim, where it has been developed showing great extent and value. The topographical features will hardly permit of advantageous working from the surface of this claim. Like many others on this and adjacent properties it can best be worked through a tunnel intersecting the vein at some depth below the surface.

General Features

The great extent of the Johnson Lode and the large amount that must be daily mined, when opened, in order to operate at a minimum cost and with the greatest degree of efficiency and success, make the question of proper development one of great importance. The general conditions and features are such as to allow the working of the lode to a great depth by a tunnel driven from the surface. The points of advantage for such tunnel, on account of accessibility and other favorable conditions, are on the Seward side of the divide. The present Kensington crosscut tunnel is well situated for the work of developing the property, also for the delivery of ore to a convenient point for transportation by a gravity tramway to the milling plant. It will intersect the Johnson Lode 600 feet vertically below the King tunnel and about 1400 feet below the highest point of the surface croppings. It will be about 4300 feet long, 1710 feet of which have already been driven.

The Boston and Troy veins, which will be intersected at a depth of about 1200 feet below the surface, can also be advantageously worked through this tunnel.

The natural facilities for economical working are excellent. Within a radius of about ten miles there are large streams affording ample water to meet the requirements of a plant of almost any capacity. The power from this source of supply can be utilized by means of electric transmission and would obviate almost entirely the costly item of fuel. Under such circumstances it should follow as a natural result that the expense of mining and milling would be reduced to the lowest point

practicable with efficiency. It may be stated in this connection that the entire cost of mining and milling of the Alaska-Treadwell Co., whose operations are on a large scale, does not exceed $1.30 per ton.

The cost of operating the Johnson mine ought not to be much if any in excess of that of the Alaska-Treadwell. In several points the cost of production should be materially less, as there would be no hoisting or pumping and comparatively little fuel to swell the expense account.

On the other hand, the cost of transportation, both of supplies from the landing point, at tidewater, to the works, and sulphurets from the mill to the leading station at the same point would be greater. This item of increase, however, would be small and the difference would be much more than overcome by the almost entire elimination of fuel for generating power. The cost of shipping and treatment of sulphurets would also be greater, as nearly the entire value of the output would be in the sulphurets, whilst nearly one-half of the value of the Alaska-Treadwell output is obtained from free-milling ore.

On a basis of a daily output of 500 tons the entire cost of operation of the Johnson Mine should be about the following, viz:

Mining and Milling.....	$1.00 per ton
Freight and treatment of sulphurets.....	.60 per ton
Incidentals, covering renewals, repairs, etc.	.15 per ton
Total cost of operating.....	$1.75 per ton

Making due allowance for the usual loss in the operation of milling the recovery value should not fall below $3.50 per ton, leaving a margin of $1.75 per ton.

When the development of the property has been sufficiently advanced to permit of operating on a large scale the items covering the entire expense, as shown above, will be found to have been made on a liberal basis, and the actual cost of operating should be found to be rather less than otherwise.

When intersected by the Kensington tunnel the Boston and Troy veins can be worked economically. As these veins are much smaller than the Johnson a close estimate of the cost of working them can hardly be made at this time. The cost per ton will be somewhat greater; on the other hand, the average value of the ore, as shown by the results already obtained, should be greater.

Recommendations

The Kensington tunnel, now being driven to intersect and through which to work the Eureka, Kensington and other veins of the Northern Belle Co., should be continued through this property.

On the Northern Light No. 2 claim the tunnel known as the Johnson tunnel, started on the vein at a point 200 feet below the King tunnel and at the south end line of this claim, should be driven through the entire length of the claim, a distance of 1500 feet, and beyond. At regular distances or proper points crosscuts should be run across the width of the lode, also raises be put up at convenient points for ventilation purposes, blocking out ground, etc. This would not only be valuable development work but would establish the value of the lode at a great depth below the surface. If undertaken at this time the greater part of this work could be accomplished by the time the Kensington tunnel had reached the lode. It would then only be necessary to establish connections between the Johnson and Kensington tunnels, the vertical distance between the two tunnels being 350 feet, in order to be in a position to commence mining and milling operations on the scale outlined above.

T. H. GEORGE,
Mining Engineer, U. S. Deputy Mineral Surveyor.

(This report was made after the Kensington Crosscut was driven and the ore struck in depth).

REPORT ON THE PROPERTIES OF THE NORTHERN BELLE GOLD MINING COMPANY

The property of this Company is situated at Seward, in Berners Bay Mining District, Alaska, about 60 miles northwest of Juneau. It is on the east shore of Lynn Canal, the central part of it being back in a direct line about two miles from tidewater. The property consists of seventeen lode claims, for ten of which U. S. Patents have been granted, three mill sites, which are also patented, and other improvements hereinafter described. The patented claims are the Bear, Savage, Eureka, Kensington, Excelsior, Emeralda, Northwest, Northern Belle, Yellow Jacket and Elmira. The unpatented claims are the Bear Extension, Savage Extension, Lucky Boy, Little Nell, Triangle, Columbian and Columbian East Extension.

The Bear Mine is 575 feet above the Company's mill and 1275 feet above tidewater. It is connected with the mill by a substantial, well constructed double track gravity railroad, 1750 feet long, which has a capacity, with present equipment of 2½-ton cars, of 250 tons per day of ten hours. The capacity of this road can be more than doubled or raised to 1000 tons per day or more by simply increasing the size of cars and running rope. The running gear, consisting of a sheave 6½ feet diameter with two band brakes for same and guide wheels for "tail rope" and foundations for same, are of sufficient strength for that purpose.

The terminal at the head of the road is a substantial frame building, 50x25 feet, with ore bin having a capacity of 300 tons.

The Bear Crosscut Tunnel is 1020 feet in length. The Bear Ledge was intersected at a point 453 feet in from its mouth, 220 feet below the surface at the mouth of No. 1 level. This ledge varies in size from 2 feet to 8 feet, averaging about 3½ feet in width. Several thousand tons of ore have been extracted from this vein, yielding by mill returns about $5.00 per ton, the assay value of which was about $3.50 per ton. About 50 per cent of the value of the ore is free milling, the remaining portion being sulphurets, requires to be concentrated and subjected to other treatment for releasing the gold. There are three levels driven on this vein aggregating 1050 feet in length. The vein has a dip of 68 degrees.

Following in regular order, the next ledge is the Savage, the outcrop of which can be readily traced for a distance of over 3000 feet. This is a strong, well-defined ledge, varying in width from 3 to 12 feet. It is about 500 feet vertically above the Bear Crosscut Tunnel.

From several very thorough samplings its value has been found to run from $3.00 to $5.00 per ton. Where it has been sunk on it has a dip of 50 degrees. It should be intersected in the Bear Crosscut Tunnel in driving the same about 100 feet further. A small amount of development work only has been done on this claim.

The next in regular order is the "blind ledge" on the Lucky Boy ground, discovered in the Kensington Crosscut Tunnel, about 400 feet in from its mouth. This is a strong, well-defined ledge or lode of low-grade ore. It was not seen, as its name indicates, on the surface, except, it may be, at a point about a mile or more distant. It is a pyritic ore, in a very hard greyish quartz. Though running low in value where driven through by the tunnel, its value is very uniform throughout its entire width of 120 feet. From several samples it shows a value varying from $1.00 to $1.25 per ton. Although not known to exist prior to running the Kensington Tunnel, if developed, it promises from its favorable character and great size to become a valuable part of the property.

The Kensington Crosscut Tunnel is 720 feet above the Bear Tunnel and 780 feet below No. 1 tunnel level on the Kensington Lode. It was projected primarily for the purpose of working the Eureka, Kensington and Johnson Lodes, and incidentally the Northern Belle, Yellow Jacket and other ledges. It has been driven 1710 feet, is 8 feet wide, 7½ feet high, with a ditch in the bottom 24x15 inches for drainage purposes, and is sufficiently large for a double track to permit and facilitate a large output from the lodes mentioned in connection herewith. Branches will be driven from it on the Eureka, Kensington, Johnson and other lodes. The tunnel can be driven at the rate of 200 feet per month. It can be run on contract at a price not exceeding $12.00 per tunning foot, the contractors furnishing all supplies, except timbers, tracking and cars, drilling machines and compressed air.

The Kensington is a very large lode or body of ore. It occurs between diorite and greenstone, in a silicious, hornblendic rock. It is a concentrating ore, the value being in the sulphides and pyrites, carrying only a small percentage of free gold. From several thousand tons mined and milled, the values have ranged from $4.00 to $12.00 per ton, averaging from $5.00 to $6.00 per ton.

No. 1 tunnel level has been driven on the lode from the surface 225 feet, and at the face is 125 feet in vertical depth below it. The greater part of the ore mined and milled has been taken from this level, and openings made therefrom. The remaining portion being taken from other openings made from the surface above this level. Several tons of crude ore have been shipped from time to time, the net value of which was over $195.00 per ton.

Nothing in the nature of a wall, except on what is termed the footwall side, has yet been found. At a point in the level, about 125 feet from the entrance, a crosscut 75 feet across the lode failed to show the hanging wall; in fact, there is every reason to believe that the lode is much wider than that, as the widest stope is over 80 feet in width.

The tunnel to the west and on the same level as No. 1 tunnel (see map) was driven to facilitate operations during the winter months. It is 150 feet in length and connects with the main level 85 feet in from the entrance of same. At the mouth of this tunnel an excavation in solid rock 40x25 feet was made for tramway terminal building and ore bin, which are connected by an aerial tram 3000 feet long with the gravity railroad running from the Bear Tunnel to the mill. The ore from the mine is run over the aerial tram to the gravity railroad, thence to the mill. Its daily capacity is 150 tons.

In order to operate this mine systematically and to the greatest advantage, it must be connected with the Kensington Crosscut Tunnel so as to permit of a very much larger output, and a better means for the transportation of ore than is possible over a wire tram, the capacity of which is limited.

The opening of the mine through this tunnel will afford other facilities and advantages for working, among which are the following, viz; a very much better base for operation which will be free from the dangers of slides common to most mountainous countries in the winter season; the handling of the output of ore with the minimum amount of labor, and consequently at a smaller cost; the development of the mine at greater depths; the accessibility of the works at all seasons, etc., etc.

The Little Nell is a fractional claim, about 1000 feet in length. The ledge is from 8 to 12 feet wide and is evidently a spur from the Kensington Lode. It can be worked from crosscuts from the Kensington level.

The Eureka, at the surface, has the appearance of a very promising lode. In character it is rather similar to the Kensington, carrying its value mostly in sulphides. It has rather better walls, particularly on the footwall side, and is more silicious. This vein or lode was intersected by the Kensington Tunnel, at a point 1235 feet in, 500 feet vertically below the surface, and 300 feet in a northwesterly direction beyond the point where it is traceable in that direction at the surface. There driven through in the tunnel the lode is 26 feet wide and is well mineralized across its entire width. Samples taken with a view of getting an average value of the lode, vary from $10.00 to $15.00 per ton; selected samples running as high as $250.00 per ton. The outcrop showing greatest value is at the extreme southeast point, where it is about 500 feet in that direction from the tunnel and 350 feet vertically above the same. This would indicate an ore body of great extent.

The Northern Belle Ledge varies from 3 to 10 feet in width. It can be traced on the surface a distance of over 1500 feet. The ore is largely free milling. Several hundred tons of ore taken from this ledge gave a value of from $5.00 to $10.00 per ton. A comparatively small amount of development work has been done on this claim. When intersected by the Kensington Crosscut Tunnel, through which it can be worked economically and advantageously, it will become a valuable part of the property.

The Yellow Jacket is about 3 feet in width. Not much is known as to its value or worth, as there has been only a small amount of development work done on the claim. A large part of its surface is inaccessible for practical conditions.

The Elmira is an extension of the Northern Belle and carries the same favorable features and characteristics as the latter. A small amount of work only has been done on this claim.

A large part of the surface of the Esmeralda, Excelsior and Northwest Claims is inaccessible. These claims can be reached and worked systematically and advantageously by crosscuts from one or more of the Kensington levels into the Little Nell ground and beyond to these claims. (See map.)

The surface improvements and personal property consist of a 40-stamp mill, enclosed in a substantial frame building 75x100 feet, complete with self-feeders, amalgamating plates, vanners, a large Gates' rock breaker, running gear, etc.

An engine room 80x40 feet, with a 250 H. P. engine, a 3-drill air compressor, a 75 H. P. dynamo and lighting plant complete.

Two large boilers in a suitable frame building, with the necessary feed pumps and attachments.

A substantial frame building for coal bunkers, capacity 1000 tons.

An assay office, with complete outfit for all classes of work.

Suitable retort and melting room.

Blacksmith shop and tools.

Machine shop, with lathe, drills, taps, dies, etc.

Suitable and commodious warehouses, tool houses, offices, etc.

Boarding house with outfit, and sleeping houses for 150 men.

Superintendent's residence, a large two-story tenement house, and a suitable and commodious building for hospital and residence.

Two and three-fourths miles of railroads, 36-inch gauge, running from mill to tidewater, with two locomotives, two flat cars and two box cars.

A wharf 480 feet long, 20 feet wide, with a "T" at the outer end 60x80 feet, the face being 60 feet.

The mill, air compressor, lighting plant, etc., can be run by water power for a period of eight or nine months in each year. All the water rights in the principal creeks within a radius of about two miles have been secured and are held exclusively by this Company. The water in Sherman Creek and upper tributaries is carried by a flume 4000 feet long to a large penstock, thence by a pipe line 12 inches in diameter at the upper end and 11 inches at the lower end to a 6-foot Pelton wheel at the mill. This pipe line is 1400 feet long, having an efficient head of 400 feet.

The waters from Ophir Creek, West Ophir Creek and tributaries are conveyed by a flume 9000 feet long to a large penstock, thence by a pipe line 13000 feet in length, 16 inches diameter at the upper end and 14 inches diameter at the lower end, to a 6-foot Pelton wheel at the engine room.

This line, which has an efficient head of 320 feet, supplies power to run the air compressor, lighting plant, etc.

At Endicott River, on the opposite side of Lynn Canal, about eight or nine miles distant, there is a large flow of water at the lowest stage in winter that will afford ample power for a large works. In the month of March, 1898, the writer found by actual measurement, a flow of over 30,000 cubic feet of water per minute. This could be made available for power purposes by the installation of an electric plant and transmitting power across the canal, a distance of 4½ miles, by submarine cable, thence to the works by suitable wire overhead.

T. H. GEORGE,
Mining Engineer, Northern Belle Gold Mining Co.,
U. S. Deputy Mineral Surveyor.

This estimate was made for Geo. H. Lowell, who was negotiating with the defendants in the suit just finished, and who endeavored to re-organize the company.

Estimates

These estimates have been made up in order to give an approximate idea merely of the result that may be expected. As a matter of fact, it is believed that active operations will materially reduce the amount of time and expense accounts herein allowed, and that the gross and net returns will be materially increased.

PRESENT CONDITION OF THE BERNERS BAY MINING & MILLING COMPANY

Receivership indebtedness, about.....	$450,000.00
First mortgage bonds, face value.....	500,000.00

In case a re-organization of this Company can be effected it is proposed to issue about $800,000 of first preferred stock at par value for cash, of which about $550,000 will be put into the treasury and the balance devoted to the purchase of receiver's certificates held partly by persons who need the money and cannot afford to take stock in exchange therefor, and partly with persons with whom we do not care to be associated. Second preferred stock will be issued to take up the receiver's certificates not purchased for cash. Third preferred stock for $500,000 par value will be issued to retire the first mortgage bonds by an exchange of third preferred stock at par for the bonds at face value. Common stock will be issued for $15,000,000.

In case a re-organization on the above lines cannot be effected it is proposed to purchase the properties of this Company and its allied companies at a sale by order of the court, or under foreclosure proceedings, after which purchase capital to the amount of $500,000 to $550,000 will be devoted to developing and equipping these properties on a large producing basis.

The Johnson mines will be purchased and deeded to the Company free of all incumbrances, the purchase price for the same to be paid in common stock to be issued outright to the owners of said Johnson mines.

The combining of the properties controlled by the Berners Bay Mining & Milling Company with the Johnson mines will place under one management a group of properties of great magnitude which, provided the business is well managed, the lodes properly developed, will be capable of enormous net earning capacity.

A list of the present improvements at present existing on the property, taken from the report of T. A. George, M. E.

One stamp mill of 40 stamps, enclosed in a substantial frame building, 75x100 feet, complete with self-feeders, amalgamating plates, vanners, a large Gates rock breaker, running gear, etc.

An engine room 60x40 feet, with a 250 H. P. engine (Corliss), a 3-drill air compressor, a 75 H. P. Dynamo and lighting plant complete.

Two large boilers in a suitable frame building, with necessary feed pumps and attachments.

A substantial frame building for coal bunkers, capacity 1000 tons.

An assay office with complete outfit for all classes of work.

Suitable retort and melting room.

Blacksmith shop and tools.

Machine shop, with lathe, drills, taps, dies, etc.

Suitable and commodious warehouses, tool houses, office, etc. (The office has since been burned.)

Boarding houses with outfit, and sleeping houses for 150 men.

Superintendent's residence, a large 2-story tenement house and a suitable and commodious building for hospital and residence.

Two and three-fourths miles of railroad, 36-inch gauge, running from mill to tidewater, with two locomotives, two flat cars and two box cars. (Railroad must be rebuilt).

A wharf 480 feet long, 20 feet wide, with a T at the outer end 60x80 feet, the face being 60 feet. (The outer end of the wharf has been carried away, owing to neglect properly to repair the same.)

The mill, air compressor, lighting plant, etc., can be run by water power for a period of 8 or 9 months in each year. All the water rights in the principal creeks within a radius of about two miles have been secured and are held exclusively by this Company. The water in Sherman Creek and upper tributaries is carried by a flume 4000 feet long to a large penstock, thence by a pipe line 16 inches in diameter at the upper end and 12 inches at the lower end to a 6-foot Pelton wheel at the mill. This pipe line is 1400 feet long, having an efficient head of 400 feet.

The water from Ophir Creek, West Ophir Creek and tributaries are conveyed by a flume 9000 feet long to a large penstock, thence by a pipe line 1300 feet in length, 18 inches in diameter at the upper end and 14 inches diameter at the lower end, to a 6-foot Pelton wheel at the engine room. This line has an efficient head of 320 feet, and supplies power to run the air compressor, lighting plant, etc. (Repairs will probably be necessary on the flumes.)

Allowance for water power has been made for six months only per year. The average number of months per year that water power will be available will without doubt be eight months, and in favorable winter seasons the water power will be partially available during the remaining months of the year.

As the plant is increased and more power needed, power to any amount will be had from the large stream some four or five miles distant from the wharf, which water power can be developed to deliver an ample supply of electrical power to meet all future needs, whereby the cost of power per ton of ore reduced will be reduced to the lowest possible rate.

Estimated Cost of Wharf

400 piles 75 feet long, each at $7.50	$3,000.00
2600 linear feet of 10x12 stringers, at $15 per M.	390.00
3200 linear feet of 4x12 stringers, at $15 per M.	195.00
90 M. of 3 inch plank, at $15 per m. (wharf covering)	1,350.00
One ton of spikes and iron, at $.08 per lb.	160.00
35 M. of lumber for coal pocket, at $15 per M.	525.00
10 M. lumber for building 40x20 feet	150.00
15 M. of lumber for building for concentrates	225.00
One ton of nails, bolts, and iron at $.08 per lb.	160.00
Hire of pile-driver and labor (estimated)	6,000.00
	$12,155.00

Estimated Cost of Railroad

4,753 piles 20 feet average length, at $1.40	$6,653.00
31,680 linear ft. 10x12, equals 317 M., at $15 per M.	4,755.00
7,920 linear feet 10x12 stringers, 80 M. at $15	1,200.00
Ties, 4x4 in. x 5 ft., 32 M. at $15 per M.	480.00
50 M. plank, 3x8 in., at $15 per M.	750.00
185 tons of 35 lb. rails, at $50 per ton	9,250.00
3 tons of spikes, bolts, etc. (estimated), at $.08 per lb.	480.00
3 tons fish-plates, bolts, etc. (estimated), at $.08 per lb.	480.00
Cost of pile-driver installed on flat car	2,000.00
5 men for 120 days at $3.50 per day	2,100.00
5 men for 120 days at $3.00 per day	1,800.00
15 lumpers for 120 days at $2.50 per day	4,500.00
	$34,430.00
Amount allowed for cost of wharf and railroad	$55,000.00
Estimated cost of same	40,585.00
Difference to go and come on	5,415.00

Estimated Cost of Pile-driver

One double cylinder hoisting engine, No. 28, manufactured by the American Hoist & Derrick Company	$ 950.00
One pile-driver hammer, 3500 lbs., at $.03 per lb.	105.00
500 ft. of extra flexible crucible steel wire rope, 5/8 inch diameter at $91.16 per thousand feet	46.00
Derrick fittings--head block and extra parts	50.00
Freight St. Paul to Comet, 8 tons (estimated)	300.00
Two M. timber for derrick, at $15 per M.	30.00
500 lbs. bolts and iron work for derrick, at $.08	40.00
Labor erecting derrick (agent's figure)	100.00
Labor installing hoisting engine on flat car	100.00
	$1,721.00
Amount allowed for cost of pile-driver installed	$2,000.00
Estimated cost of same	1,721.00
Difference to come and go on	$ 279.00

Estimated Expense Account for Running the 40-Stamp Mill.

Cost of Mining and Milling.

Mining.

Daily Expense Account.

One foreman at $6.00	$ 6.00	
27 machine drill men (9 drills) at $3.50	94.50	
15 laborers for handling broken ore in mine	52.50	
8 tramway men at $3.50	28.00	
One blacksmith at $5.00	5.00	
One blacksmith's helper at $3.50	3.50	
Powder, fuses, steel, etc., at $.30 per ton	52.50	$242.00

Milling.

Daily Expense Account.

One foreman at $6.00	$ 6.00	
Two rock-breaker men at $3.50	7.00	
Two battery men at $4.00	8.00	
Two concentrator men at $3.50	7.00	
Two compressor men (engineers) at $5.00	10.00	
Two firemen, 180 days at $7.00 equals 360 days at	3.50	
Two laborers at $3.50	7.00	
One machinist at $5.00	5.00	$ 53.50

Coal. 3 tons at $5 for 181 days equals 300 days at	24.00	
Smelter and freight charges on concentrates.....	50.00	
50% of office and railroad expense account.....	18.00	92.00
Mill supplies at $.0714 per ton.....	12.50	12.50
Total daily expense of mining and milling 175 tons.....		$400.00

An average of $2.365 per ton at 5075 tons per month.
The above estimate is figured on a basis of 175 tons per day.

The list of assays hereto attached states the value per ton of about ten thousand tons of ore taken from the upper workings of the Kensington mine at Berners Bay, Alaska, and owned by the Berners Bay Mining & Milling Co.

This said ten thousand tons of ore was treated at the 40 stamp mill of the company and the milling operations extended over a period of more than six months, i.e., from June 16th, 1900, to December 30th, 1900, inclusive.

Each daily result represents the value per ton of the ore milled during the whole 24 hours of the respective day and was computed from samples taken every 15 minutes from the lower ends of the copper plates, after amalgamation.

(Signed) WILLIS E. NOWELL,
Superintendent.

Average per ton, $5.139.

The above average of $5.139 is arrived at after deducting the item of $232.00 per ton for crude ore on Oct. 5, 1900.

Daily capacity of the present 40 stamp mill with the addition of another rock-breaker.....	175 tons
Monthly capacity at 29 days per month.....	5,075 tons
Average assay value per ton.....	$ 5.139
Average value recovered, 85% of average assay value.....	$ 4.368
Gross receipts per month of 29 days from 5075 tons at $4.36 per ton.....	22,127.00
Expense per month of mining and milling, 30 days at $400.00 per day.....	12,000.00
Net profits per month of 40 stamp mill.....	10,127.00
Average net profits per day at 29 days per month.....	349.20
Daily average net profits allowed herein.....	300.00
Monthly average of net profits allowed herein, 29 days at $300.00 per day.....	8,700.00
Difference between the actual net profits per month and the amount herein allowed.....	1,427.00
Actual average value recovered per ton.....	4.368
Estimated cost per ton of mining and milling 5075 tons per month.....	2.365
Actual amount per ton that should be recovered.....	2.003
Actual amount per ton allowed as recovered herein.....	1.715
Difference per ton between the amount actually recovered and the amount allowed herein as recovered.....	.288

Or twenty-eight cents (28 cts.) per ton to go and come on.

The foregoing statement applies to the present 40 stamp mill only. With the completion of the 200 stamps the ratio of expense and net profits will change, giving a higher rate of net profit per ton when operating 200 stamps than when operating but 40 stamps. Thirty (30) days per month are allowed herein for expense account. Twenty-nine (29) days per month are allowed herein for income account.

Assay Value of Pulp Samples from Kensington Mine
after amalgamation.
Gold figured at $20.00.

1900		Gold Value	1900		Gold Value
June 16,	Pulp.....	$6.60	Aug. 1,	Pulp.....	$ 4.80
17,	"	4.40	2,	"	4.00
23,	"	11.20	6,	"	3.60
24,	"	10.00	7,	"	5.20
25,	"	8.80	8,	"	2.20
26,	"	8.60	9,	"	2.40
27,	"	10.00	10,	"	2.40
28,	"	10.40	11,	"	2.50
29,	"	12.40	12,	"	2.80
30,	"	11.60	13,	"	2.20
July 1,	"	10.00	14,	"	4.00
2,	"	10.40	15,	"	4.20
3,	"	7.60	16,	"	2.40
12,	"	10.00	17,	"	3.20
13,	"	4.00	18,	"	3.00
14,	"	4.80	19,	"	2.40
15,	"	5.00	20,	"	3.00
16,	"	3.40	Oct.27,	"	3.00
17,	"	4.00	28,	"	3.00
18,	"	5.00	29,	"	3.20
19,	"	5.60	30,	"	3.20
20,	"	5.60	31,	"	3.40
21,	"	8.00	Nov. 1,	"	4.00
22,	"	6.00	2,	"	3.20
23,	"	5.20	3,	"	4.00
24,	"	3.60	4,	"	5.40
25,	"	7.80	5,	"	4.00
26,	"	4.80	6,	"	3.60
27,	"	4.00	7,	"	3.40
28,	"	4.20	11,	"	3.20
29,	"	5.20	13,	"	3.20
30,	"	4.20	12,	"	3.00
31,	"	4.00	14,	"	4.00
			15,	"	4.00

1900		Gold Value	1900		Gold Value
Nov. 16,	Pulp.....	$ 3.60	Dec. 16,	Pulp.....	$10.00
17,	"	3.00	17,	"	4.60
18,	"	2.40	18,	"	4.80
19,	"	2.20	19,	"	5.20
20,	"	2.40	20,	"	4.80
21,	"	5.00	21,	"	4.40
Dec. 6,	"	4.80	22,	"	5.60
7,	"	6.00	23,	"	2.20
8,	"	4.50	24,	"	3.60
11,	"	5.20	26,	"	4.80
12,	"	4.80	27,	"	6.00
13,	"	5.20	28,	"	3.60
14,	"	4.00	29,	"	4.40
15,	"	6.00	30,	"	4.20

(Signed) JOHN H. MOYLE,
Assayer.

Development Work Contemplated.

Tunnels.

No. 1.	Kensington cross-cut to Johnson lode.....	2475 feet
No. 2.	Bear tunnel to Kensington lode.....	2100 feet
No. 3.	Bear tunnel, Kensington lode to Johnson lode.....	2625 feet
	Total.....	7200 feet

Estimated cost of the above tunnels, not including cost of power, at $15.00 per foot..... $108,000

Time needed to complete the above tunnels at 8 feet per day:

No. 1. July 1st, 1908, to May 10th, 1909..... 10-1/3 months
No. 2. July 1st, 1908, to April 1st, 1909..... 8-3/4 months
No. 3. July 1st, 1910, to June 1st, 1911..... 11 months

The foregoing distances are taken from blue-print drawn to scale and there will be some variations between them and the actual distances run.

Development Work Contemplated.

Upraises.

Measurements given are vertical.

Kensington lode.

No. 1. From Kensington cross-cut to stopes..... 787 feet
No. 2. From Bear tunnel to Kensington cross-cut..... 700 feet

Eureka lode.

No. 3. From Kensington cross-cut to surface..... 487 feet
No. 4. From Bear tunnel to Kensington cross-cut..... 700 feet

Johnson lode.

No. 5. From Kensington cross-cut to Johnson tunnel..... 600 feet
No. 6. From Bear tunnel to Kensington cross-cut..... 700 feet
Total..... 2974 feet

The above figures are taken from blue-print drawn to scale and there will be some variation between them and the actual distances run.

Estimated cost per foot of upraises, not including power $ 25.00

Total cost of 3974 feet at $25.00 per foot..... $99,350.00

Time needed to complete the above upraises at 4 feet per day:
No. 1. July 1st, 1908, to January 31st, 1909..... 7 months
No. 2. April 1st, 1909, to October 1st, 1909..... 6 months
No. 3. July 1st, 1908, to November 1st, 1908..... 4 months
No. 4. January 1st, 1909, to July 1st, 1909..... 6 months
No. 5. May 10th, 1909, to November 10th, 1909..... 5 months
No. 6. June 1st, 1911, to December 1st, 1911..... 6 months

The foregoing dates are estimated conditioned upon beginning active operations on July 1st, 1908. In case active operations are begun later than July 1st, 1908, the respective dates must be postponed by an equal amount of time as occurs between July 1st, 1908, and the date upon which active operations are actually begun.

The foregoing estimates of the cost of upraises are based upon running them through non-productive country rock. Mr. T. H. George expresses the opinion that these upraises will be made on the lodes themselves, in pay ore, and that the bullion derived from the ore thereby taken out will, at the least, pay for the cost of running some of the upraises herein estimated. The aggregate cost of such "dead-work" will thereby be materially decreased.

In case this running in ore of some of the upraises proves to be advisable, the sum of $60,850 should be deducted from the estimated cost of upraises, whereby the total charge against upraises will be reduced to $38,500, in place of $99,350.00 as above given.

Should it be found to be advisable to run these upraises Nos. 1, 2, 3 and 4, in ore, there is no reason why the upraises Nos. 5 and 6, on the Johnson lode, should not also run in ore, since the dip of the Johnson lode is about the same as that of the Eureka lode and of the Kensington lode, wherefrom it will be seen that in case it is decided by the engineer to run all of these six upraises in ore, the total sum of $99,350.00 herein charged up thereto will be available for other work.

Average backs of ore on dip of lodes upwards from Bear tunnel level on following lodes:

Eureka	1387 feet
Kensington	1650 feet
Northern Belle	1800 feet
Little Kensington	1700 feet
Johnson lode, to shaft 300 feet above tunnel	1725 feet

Computed tons of ore to Bear tunnel level for a distance of 200 feet each way, allowing 13 cubic feet per ton.

	Tons
Eureka, 1387 x 30 x 400 divided by 13 equals	1,280,307
Kensington, 1650 x 80 x 400 divided by 13 equals	4,061,538
Northern Belle, 1800 x 4 x 400 divided by 13 equals	221,538
Little Kensington, 1700 x 4 x 400 divided by 13 equals	209,230
Johnson Lode, 1725 x 150 x 400 divided by 13 equals	7,961,538
Total number of tons to Bear tunnel level	13,734,151
Value of 13,734,151 tons at $2.00 net profit	$27,468,302

Twelve years and eleven months supply at the rate of 3,000 tons per day and 304 days in the year.

The distance of 400 feet has been arbitrarily taken simply for the reason that the present developments have proceeded that far, i. e., 200 feet on each side of the tunnel in the Kensington lode. Some of these lodes have been traced on the surface for thousands of feet and there is reason to presume that ore bodies in paying values extend for hundreds of feet on each side of the tunnel.

The following estimates of the cost of production of the Berners Bay mines is based upon the total cost of operating and construction charges as shown in the report of the Alaska-Treadwell mine for the year ending May 31st, 1903.

Mr. Tripp has stated to the writer that after our mines have been opened up on the several lodes and a large reduction plant is in operation, we can mine and mill the ores at Berners Bay at a cost not to exceed that of the Alaska-Treadwell mine.

The main bodies of ore at Berners Bay are so extensive that mining operations can be carried on at the minimum cost per ton of ore mined. The altitude of our mines above tide-water permits of mining without the expense of hoisting the ore or pumping water. The broken ore will fall from the stopes by gravitation through ore gates into ore cars and after being run out of the mine in ore cars operated by electrical power and dumped on to the grizzlies, it will continue onwards and downwards, falling from the ore breakers into ore bins and thence to the batteries without handling, by the simplest and cheapest of known methods. Our water supply for power is ample for at least six months and possibly for eight months or more in the year. In some past years the mill has been run by water power during parts of the winter months, but this is unusual and cannot be looked for as a regular thing. Instead of being obliged to pump water out of the mines, the water that does find its way through the ledges down into the tunnels can be turned into pipes or flumes and will assist in generating power, thereby becoming a source of revenue instead of entailing expense. The present supply of water will continue to be utilized at the present water power plant, whence it will be turned into pipes or flumes to be utilized again at the main power plant, which is to be located at tide-water under a head of 500 to 700 feet. The location of the main power plant at tide-water makes available a larger amount of water and gives a very high head or pressure, and at the same time avoids the transportation of coal up the railroad when the plant is operated by electrical power generated at the beach by steam power during the winter months. The transportation of the less bulky supplies for mine, mill, store and boarding houses from the wharf to the plant will be effected quickly and cheaply by means of the little railroad which can be operated at minimum cost after the installation of electric traction. A charge of one cent per ton of ore mined at 1000 tons per day will net the sum of $3540 per annum, which sum should be ample for operating the railroad, since it will be operated not constantly but at intervals only. A charge of three cents per ton of ore mined, or at the rate of $10,620 per annum, has been herein allowed for the railroad expense account. The charges for hoisting ore, pumping water, and for horses and feed at the Treadwell mine aggregate the sum of $20,656.39 or $.0273 per ton as against the charge herein made of $.03 per ton for transportation. We can land supplies, merchandise and coal at our wharf at Berners Bay at the same rates per ton at which they can be landed at Douglas Island. We can buy in the same markets for cash and at the same prices. We can command the same labor supply and can

hire at the same rates for wages. The Treadwell store earns a large annual profit. We can earn at our store the same proportionate profit, but no account has herein been taken of such item.

When the above conditions are considered in connection with the extent of the ore bodies--the Eureka at least 30 feet wide, the Kensington from 60 to 120 feet wide, and the Johnson lode ranging from 150 to 300 feet in width, it will be readily perceived that mining operations can be carried on at an exceptionally low rate per ton of ore mined and milled. The ores yielded from the smaller veins carrying higher values will be used to raise the general average of net values recovered, and the revenues of the company will be thereby materially increased. But the calculations herein made are based solely on the values we are justified in expecting to recover from the lower grade ores taken from the above named lodes or zones of ore.

The cost of operating at the Treadwell mine has been used as a standard for the simple reason that the conditions existing at the Treadwell mine more closely approximate the conditions existing at Berners Bay than at any other property known to us. Freight rates are the same, prices for coal and merchandise are the same, wages are the same, and for all practical purposes of mining the ore bodies are co-extensive. In some respects we are subject to less favorable conditions. In other respects we possess advantages over the Treadwell mine. Each and every mining proposition must, of course, rest upon its individual merits. Success or failire is controlled by the cost of production of each unit of value. We have used the Treadwell figures merely to show what expert advice has assured us we can likewise do, and for the further purpose of providing a starting point or standard of cost of production. By the addition of liberal allowances for contingencies possible, but not probable, under conditions almost entirely similar we are able to secure a safe basis of computation for the guidance of the investor. The following figures are based upon an output of 1000 tons per day of 24 hours.

Cost of Mining on a Basis of 1000 Tons per Day.

	Per ton	Per 1000 tons
Labor less hoisting, pumping and stablemen.....	.4621	$462.10
Mdse. less charges for horses and feed.....	.0534	53.40
Iron and steel.....	.0359	35.90
Foundry.....	.0018	1.80
Powder.....	.2365	236.50
Steam power ($91.25 per day).....	.0912	91.20
Sundries.....	.0180	18.00
P. H. expense account at $10,820 per annum.....	.0300	30.00
Daily expense of mining 1000 tons.....	.9289	928.90

Cost of Milling on a Basis of 1000 Tons per Day

Labor	.0833	83.30
Merchandise	.0222	22.20
Iron and steel	.0214	21.40
Foundry	.0055	5.50
Steam ($19,753.20 per annum)	.0558	55.80
Repair	.0070	7.00
Car	.0005	.50
Sundries	.0039	3.90
Electric light, etc	.0018	1.80
Daily expense of milling 1000 tons	.2014	201.40

Note.--The items for horses, feed and stablemen charged up to mining account in the report of the Alaska-Treadwell Company have been proportionately deducted from this account owing to the fact that at Berners Bay there will be no need to employ horses. In lieu of charges for horses we have allowed a large expense account for railroad maintenance. The items charged against hoisting and pumping at the Treadwell mine are also deducted since at Berners Bay it will not be necessary to pump water out of the mine, or to hoist a pound of ore.

Sundry Accounts.

	Per ton	Per 1000 tons
Sulphuret expense	$.2500	$250.00
General expense account, bookkeeper, watchman, etc	.0300	30.00
Main office expense, rent, bookkeeper, etc	.0100	10.00
Taxes, etc.	.0020	2.00
Consulting engineer, $5,000 per annum	.0150	15.00
Superintendent and assistant, $7,000 per annum	.0200	20.00
General manager, $5,000 per annum	.0150	15.00
Bullion charges	.0096	9.60
Construction charges	.0454	45.40
	$.3970	$397.00
Total mining charges	.9289	928.90
Total milling charges	.2014	201.40
Total sundry accounts	.3970	397.00
	1.5273	1,527.30
Plus 10% for contingencies--$54,066 per annum	.1527	152.73
To make even money--$24,764 per annum	.06997	69.97
Total operating and construction charges	1.75	1,750.00

The above increase of $.2227 per ton allowed for operating and construction charges amounts to $78,838.80 per annum on a basis of 1000 tons per day output, which taken with the $50,000 per annum charged up to development and general construction and expense accounts will give a total of total of $154,838.80 per annum in excess of the total charges for a like tonnage at the Treadwell mine for operating and construction accounts. On a basis of 2000 tons per day the excess would amount to $317,677.60 per annum and on a 3000 ton daily basis it would amount to $476,507.40 per annum. This would seem to be a safe margin to provide against contingencies.

(COPY)

New York City, December 28th, 1905.

George L. Howell, Esq.,
8 Beacon St., Boston, Mass.

Dear Sir:

I have carefully examined your statement in relation to starting the mines of the Berners Bay Mining & Milling Co., and also the "Johnson Mine," situated in Southeastern Alaska.

Your estimate of the cost for "development work contemplated" whilst liberal, conforms closely to actual costs and there is no question but that the work outlined can be carried on at the figure mentioned therein. I may state that "upraises 1, 2, 3 and 4, aggregating in round numbers 1450 feet in length, will be in ore their entire lengths, and that the value of the output from these points will exceed the cost of doing the work. It is, of course, development work, but not "dead work" like that of running crosscuts.

Your estimate of the value of the ore in the Eureka, Kensington, Johnson and other lodes is fully borne out by the record of the present forty stamp mill, and the samplings from time to time of several competent mining engineers.

Your estimates, also, for equipment, for building railroad, wharf and other work, seem to have been made with much care, but, at the same time, will be found ample for the work mentioned and merits my concurrence.

Altogether, your statement may be regarded as practical and comprehensive, yet on conservative lines. With a capital such as you contemplate, you will be in a position to carry out the work in a practical and economical manner, and success will be assured.

Yours truly,

(Signed) T. H. GEORGE,
Mining Engineer.

Cash available for operating..... $550,000

Expenditures and Receipts from July 1st to December 31st, 1908.

1908

July 1st. By cash balance.....		$550,000
Repairing present 40 stamp mill, adding one new rock-breaker and new concentrators.....	$15,000	
Rebuilding wharves and buildings thereon.....	18,000	
Cost of thirty-drill compressor, complete.....	16,622	
General incidental repairs.....	10,000	
New railroad construction account.....	40,000	
General construction and expense account.....	10,000	
	$106,622	106,622
Dec. 31. By cash balance.....		$443,378

The foregoing six months of time are absolutely non-productive. It is possible and probable that the present 40 stamp mill can and will be started in three or four months from the time actual operations are begun, but we have preferred to be on the safe side and, for that reason, we have made no allowance during the foregoing six months for possible earnings to be derived from the present reduction plant. As a matter of fact, we have allowed for eight months of active operations before taking into account the earning capacity of the present plant. In view of the fact that Messrs. George, Tripp and Thane, all agree that these properties can in one year be put on a 1000 ton daily basis, it will be seen that we are well within bounds in allowing for eight months of development before we count upon starting the present 40 stamp mill, the capacity of which will not exceed 200 tons per day.

Expenditures and Receipts for 1909

1909

Jan. 1st. By cash balance.....		$443,378
Tunnel No. 1. 1440 feet at $15.....	$21,600	
Tunnel No. 2. 1440 feet at $15.....	21,600	
Upraise No. 1. 720 feet at $25.....	18,000	
Upraise No. 3. 487 feet at $25 (completed)....	12,175	
Other development work.....	10,000	
General construction and expense account.....	5,000	
	$88,375	
June 30. Net profits of present 40 stamp mill to date, 4 mos. at $8,700 per mo.....	34,800	
	$53,575	53,575

June 30.	By cash balance.....		$389,803
July 1st.	By cash balance.....		$389,803
	Tunnel No. 1. 1035 feet at $15 (Completed).....	$15,525	
	Tunnel No. 21. 660 feet at $15 (Completed).....	9,900	
	Upraise No. 1. 67 feet at $25 (Completed).....	1,675	
	Upraise No. 2. 360 feet at $25.....	9,000	
	Upraise No. 4. 700 feet at $25 (Completed).....	17,500	
	Upraise No. 5. 200 feet at $25.....	5,000	
	Other development work.....	10,000	
	General construction and expense account.....	15,000	
		$83,600	
Dec. 31.	Net profits of present 40 stamp mill to date, 6 months at $8,700 per month.....	52,200	
		$31,400	31,400
Dec. 31.	By cash balance.....		$358,403

Expenditures and Receipts for 1910 to June 30.

1910			
Jan. 1st.	By cash balance.....		$358,403
	Upraise No. 2. 340 feet at $25 (Completed).....	$ 8,500	
	Upraise No. 5. 400 feet at $25 (Completed).....	10,000	
	Other development work, 6 mos. at $5,000.....	30,000	
	General construction and expense account.....	20,000	
	Estimated cost of 200 stamp mill, complete with electric power plant, ready to run.....	250,000	
		$318,500	
June 30.	Net profits of present stamp mill to date, 6 months at $8,700 per month.....	52,200	
		$266,300	266,300
June 30.	By cash balance.....		$ 92,103

It is to be observed that between January 1st, 1909, and June 30th, 1910, the large amount of 3274 linear feet of upraises at $25 per foot are allowed for, the cost of which, at the above rate, will be $81,850. Mr. George states that some, if not all, of these upraises will be made in ore on the lodes, and that the returns from the ore will materially lessen the cost of the same. Every dollar saved in driving these upraises will increase the cash balance remaining in the treasury by just so much over the balance herein shown of $92,103.

(COPY)

ALLIS-CHALMERS COMPANY.
State Mutual Bldg.,
Boston, Mass.

November 26, 1906.

Mr. G. M. Nowell,
6 Beacon St., Boston, Mass.

Dear Sir:

Referring to your inquiry for an approximate price on a 200 stamp mill complete with power, we take pleasure in quoting you price of $151,300.00 for the necessary machinery to make up such a plant, f.o.b. cars Chicago. These figures cover a plant complete, consisting of crushing plant having a capacity of 100 tons per hour reducing the ore to ½ inch size, conveyors from the crushers to the storage bins at the stamp batteries, stamp mill comprising 200 stamps of latest improved design, in all detail of best material throughout and arranged for concrete foundations, also including feeders, ore bin gates, copper table 16 ft. 0 in. long, amalgam traps, shafting, belting, etc. It also includes 80 Frue Vanners complete with shafting, clean-up room equipment for collecting and cleaning the amalgam from the mill, equipment for power plant, consisting of water-wheel and alternating current generator of sufficient size to develop the necessary power to operate the above mill under 400 ft. head. This price also includes the motors, required to drive this mill divided up into units of suitable horsepower to suit the arrangement of the machinery. Also the necessary switchboard, transformers, etc. The approximate shipping weight of this plant complete is 868 tons. As the freight rate from Chicago to Seattle, Wash., is $1.54 per cwt. or $30.80 per ton, the total freight rate on this machinery as listed above would be $26,734.00. In case you should not desire to purchase the Frue Vanners we would say that we have figured these in at an approximate price of $35,000.00 f.o.b. cars Chicago. Approximate weight of same being 320,000 lbs. These figures were included in the amount given above.

We trust that these figures will be sufficient for your purpose until you can give us a little more definite knowledge of your location and just what you wish to install. The price quoted does not include any wiring or pipe line for water-wheel as our information at hand is not complete enough for us to give you these figures. We would be pleased to furnish you with any further information which you may desire.

Yours truly,

ALLIS-CHALMERS COMPANY,

CLM-AC

(Signed) C. L. Miller,
Sales Agent.

General Offices
246 Clinton St.
Milwaukee, Wis.

ALLIS-CHALMERS COMPANY

Cable Address
"Founders"

State Mutual Bldg.
Boston, Mass.

December 3, 1906.

Mr. G. M. Nowell,
6 Beacon St.,
Boston, Mass.

Dear Sir:

Referring to our quotation of November 26 on a 200 stamp mill, wish to say that this estimate was based on stamps of 1250 lbs.

An engine and boiler plant to operate this mill, consisting of cross compound, condensing Corliss engine and water-tube boilers, would cost approximately twenty-six thousand dollars ($26,000.00) f.o.b. factory. The approximate weight, 215,000 lbs.

We would advise the use of the water tube boilers for powers of this size and steam pressure, rather than the tubular boiler; however, should you decide to use a tubular boiler, deduct approximately $3,000.00 from the above price.

Yours truly,

ALLIS-CHALMERS COMPANY,

OLM-AW

(Signed) O. L. Miller,
Sales Agent.

(COPY)

General Offices:
246 Clinton St.
Milwaukee, Wis.

ALLIS-CHALMERS COMPANY

State Mutual Bldg.,
Boston, Mass.

Cable Address
"Founders"

November 26, 1907.

Mr. G. M. Nowell,
8 Beacon St., Boston.

Dear Sir:

We take pleasure in confirming our telephone conversation of this morning in which we quoted you prices on the following Gyratory Rock Breakers.

1--No. 5 Style "K" Gyratory Rock Breaker, complete with all necessary fittings, wrenches, etc., as illustrated on pages 3, 4 and 5 of Catalogue No. 131. Price $1440.00, f.o.b. cars Chicago. Weight 32,225 lbs.

1--No. 6 Style "K" Gyratory Rock Breaker, complete with all necessary fittings, wrenches, etc., $1902.00 f.o.b. cars Chicago. Weight 47,050 lbs.

1--No. 7½ "K" Gyratory Rock Breaker, complete with all necessary fittings, wrenches, etc., $2671.00 f.o.b. cars Chicago. Weight 68,100 lbs.

Yours truly,

ALLIS-CHALMERS COMPANY.

OLM-AC

(Signed) O. L. Miller,
Sales Agent.

Condition of the Company June 30, 1910.

Cash paid in operating.....	$550,000	
Net earnings of present 40 stamps.....	139,200	
	$689,200	$689,200

Expenditures.

General repairs.....	$ 25,000	
Development work.....	200,475	
General construction and expense account.....	105,000	
Equipment.....	266,622	
	$597,097	597,097
By cash balance.....		$ 92,103

New railroad from wharf to mill completed.

Present 40 stamp mill with a daily capacity of 175 tons, which can be operated should the consulting engineer so advise.

New 200 stamp mill with a daily capacity of 1000 tons, installed and ready to run.

New wharf and buildings for the storage of coal and goods.

Electric power plant located at tide-water.

Two gravity trams from mine to mills.

Store, warehouse, boarding-houses, office and other buildings.

Tunnels and upraises completed, 7849 feet. (70% of the whole).

Fifty thousand dollars ($50,000) expended in other development work, being equal to 3333 feet at $15 per foot.

Several million tons of ore in sight.

Yearly net earning capacity of new 200 stamp mill, 354 days--354,000 tons at $2.00 per ton net profit..... $708,000
Yearly net earning capacity of present 40 stamp mill, 354 days at 175 tons--61,950 tons at $1,715 net profit of which no account will be further taken..... $106,244
By cash balance..... $ 92,103

Expenditures and Receipts from July 1 to December 31, 1910

1910			
July 1st.	By cash balance.....		$ 92,103
Dec. 31st.	Net profit of 200 stamps to date, 177 days at 1000 tons per day--177,000 tons at $2.00 per ton net.	$354,000	354,000
			$446,103
	Development work, 6 months at $5,000 each.....	30,000	
	General construction and expense account.....	50,000	
		$80,000	80,000
Dec. 31.	By cash balance.....		$366,103

According to this prospectus the first stamp mill of 200 stamps will start running on July 1st, 1910, or exactly two years from the beginning of active operations. Messrs. George, Tripp and Thane, all competent mining experts, with personal knowledge of these properties, have stated to the writer that in one year's time these mines can be developed

to a capacity of 1000 tons of ore output per day. We have figured on a crushing capacity of 1000 tons per day for each 200 stamps, and we have allowed two years in which to develop the mines to that capacity. We, therefore, feel justified in believing that our estimate of two years will be materially diminished and that in actual practice it will be found that eighteen months, or even less, will be ample time, and that it will be possible to start the 200-stamp mill not later than January, 1910, or even earlier.

Expenditures and Receipts for 1911

1911			
Jan. 1.	By cash balance		$366,103
	Tunnel No. 3, 1440 feet at $15	$ 21,600	
	Other development work, 6 months at $5,000	30,000	
	General construction and expense account	25,000	
June 30.	Eight months' interest to date on $1,500,000 preferred stock	157,500	
		$234,100	234,100
			$132,003
June 30.	Net profits of 200 stamps to date, 177 days at 1000 tons per day, equals 177,000 tons, at $2.00 per ton net	$354,000	354,000
			$486,003
July 1.	By cash balance		$486,003
	Tunnel No. 3, 1185 feet at $15	$ 17,775	
	By preferred stock redeemed	150,000	
	General construction and expense account	50,000	
	Development work, 6 months at $5,000 each	30,000	
		$247,775	247,775
			$238,228
Dec. 31.	Net profits of 200 stamps to date, 177 days at 1,000 tons per day, equals 177,000 tons, at $2.00 per ton net	$354,000	354,000
Dec. 31.	By cash balance		592,228

Expenditures and Receipts for 1912.

1912			
Jan. 1.	By cash balance.....		$592,228
	Upraise No. 6, 700 feet at $25 (completed)....$	17,500	
	Interest to date on $1,350,000 preferred stock	47,250	
	By preferred stock redeemed.....	100,000	
	Development work, 6 months at $5,000 each.....	30,000	
	General construction and expense account.....	50,000	
June 30.	Estimated cost of 200-stamp mill, with electric power plant, ready to run.....	250,000	
		$494,750	494,750
			$ 97,478
June 30.	Net profits of 200 stamps to date, 177 days at 1000 tons per day, equals 177,000 tons, at $2.00 per ton net.....	$354,000	354,000
June 30.	By cash balance.....		$451,478

Condition of the Company June 30, 1912

Cash paid for operating.....	$550,000	
Net earnings of 40-stamp mill to June 30, 1910.....	139,200	
Net earnings of 200-stamp mill to date.....	1,416,000	
	$2,105,200	$2,105,200

Expenditures

Repairs.....	$ 25,000	
Development work.....	377,350	
General construction and expense account.....	280,000	
Equipment.....	516,622	
Interest paid on preferred stock.....	204,750	
First preferred stock redeemed.....	250,000	
Cash balance.....	451,478	
	$2,105,200	$2,105,200

Four hundred (400) stamps with a daily capacity of 2000 tons.
Electric power plant located at tidewater.
Electric power generated by water power six to eight months in the year.
Reduction plant run by electricity.
Railroad and mine equipped with electric traction.
New wharf with all necessary buildings for the storage of merchandise and freight.
Mine, buildings and streets lighted by electricity.
All necessary buildings erected.
Proper sanitary arrangements for the whole camp.
Pure water supply and fire apparatus under high pressure.
Telephone connection to all parts of the mine and plant.
Main tunnels and upraises completed, 11,174 linear feet.
Other development work to the amount of $170,000, equals 11,333 feet at $15.00.
Yearly net earning capacity of 400 stamps, $1,416,000.
Liabilities in preferred stock, $1,250,000.

Expenditures and Receipts.

July 1 to December 31, 1912.

1912			
July 1.	By cash balance.....		$451,478
July 1.	Interest to date on $1,250,000 preferred stock.....	$ 43,750	
July 1.	By preferred stock redeemed.....	250,000	
	Development work, 6 months at $5,000 each.....	30,000	
	General construction and expense account.....	50,000	
		$373,750	373,750
			$ 77,728
Dec. 31.	Net profits of 400 stamps to date, 177 days at 2000 tons per day, equals 354,000 tons, at $2.00 per ton net.....	$708,000	708,000
Dec. 31.	By cash balance.....		$785,728

Expenditures and Receipts

1913			
Jan. 1.	By cash balance.....		$785,728
Jan. 1.	Interest to date on $1,000,000 preferred stock.....	$ 35,000	
	By preferred stock redeemed.....	500,000	
Jan. 1.	Development work, 6 months at $5,000 each.	30,000	
	General construction and expense account.....	50,000	
		$615,000	615,000
			$170,728
June 30.	Net profits of 400 stamps to date, 177 days at 2000 tons per day, equals 354,000 tons, at $2.00 per ton net.....	$708,000	708,000
June 30.	By cash balance.....		$878,728
July 1.	By cash balance.....		$878,728
July 1.	Interest to date on $500,000 preferred stock.....	$ 17,500	
	By preferred stock redeemed.....	150,000	
	Development work, 6 months at $5,000 each.....	30,000	
	General construction and expense account.....	50,000	
July 1.	By 2% divident on common stock.....	300,000	
		$547,500	547,500
			$331,228
Dec. 31.	Net profits of 400 stamps to date, 177 days at 2000 tons per day, equals 354,000 tons, at $2.00 per ton net.....	$708,000	708,000
Dec. 31.	By cash balance.....		$1,039,228

Expenditures and Receipts

From January 1, 1914, to June 30, 1914.

Jan. 1. By cash balance			$1,039,228
Jan. 1. Interest to date on $350,000 preferred stock	$ 12,250		
Jan. 1. By preferred stock redeemed	150,000		
Jan. 1. By 3% divident on common stock	450,000		
Development work, 6 months at $5,000 each	30,000		
General construction and expense account	50,000		
June 30. Estimated cost of 200 stamps with electric power plant, ready to run	250,000		
	$942,250	942,250	
		$ 96,978	
June 30. Net profits of 400 stamps to date, 177 days at 2000 tons per day, equals 354,000 tons, at $2.00 per ton net	$708,000	708,000	
June 30. By cash balance		$ 804,978	

Condition of the Company June 30, 1914

Net earning capacity of 600-stamp mill per annum, 354 days at 3000 tons per day, at $2.00 per ton net.		$2,124,000
By dividends at the rate of 15% per annum on common stock	$1,500,000	
By annual cash balance for treasury, reserve and depreciation account	624,000	
	$2,124,000	$2,124,000
By cash paid in for operating	$ 550,000	
Net earnings to June 30, 1914	4,387,200	
	$4,937,200	$4,937,200

Expenditures

Repairs in general	$ 25,000	
Development work	497,350	
General construction and expense account	480,000	
Equipment	766,622	
Interest paid on preferred stock	313, 250	
Preferred stock redeemed	1,300,000	
Dividends paid on common stock	750,000	
	$4,132,222	
1914		
June 30. Cash balance	804,978	
	$4,937,200	$4,937,200
June 30. Balance	$ 804,978	
Liabilities, preferred stock	200,000	
June 30. Net cash balance	$ 604,978	" 604,978

Condition of the Plant on June 30, 1914.

Six hundred (600) stamps with a daily capacity of 300 tons.
Stamps and all other machinery operated by electrical power.
Railroad and mine equipped with electric traction.
Electric power plant located at tidewater.
Water power available for at least six months in the year.
Plant, mine, buildings, and streets lighted with electricity.
Proper sanitary arrangements for the whole camp.
Pure water supply and fire apparatus working under high pressure.
Telephone connection to all parts of the property.
New wharf and the necessary buildings for storing merchandise and freight.
Main tunnels and upraises completed, 11,174 linear feet.
Extra development work to the value of $290,000, equaling 19,333 feet of levels and crosscuts, at $15.00 per foot.
Estimated value of machinery, buildings, and other equipment, $750,000 to $1,000,000.
Over 13,000,000 tons of ore in sight.
Value of ore in sight, at $2.00 per ton net, $27,465,226.
Twelve years' and eleven months' supply at 3000 tons per day.
Liabilities, none.
Yearly net earning capacity, $2,124,000.

The foregoing dates are estimated conditioned upon beginning active operations on July 1, 1908. In case active operations are begun later than July 1, 1908, the respective dates must be postponed by an equal amount of time as occurs between July 1, 1908, and the date upon which active operations are actually begun.

The foregoing estimates of the cost of upraises are based upon running them through non-productive country rock. Mr. T. H. George expresses the opinion that these upraises will be made on the lodes themselves, in pay ore, and that the bullion derived from the ore thereby taken out, will at the least, pay for the cost of running some of the upraises herein estimated. The aggregate cost of such "dead-work" will thereby be materially decreased.

In case this running in ore of some of the upraises proves to be advisable, the sum of $66,850 should be deducted from the estimated cost of upraises, whereby the total charge against upraises will be reduced to $32,500 in place of $99,350 as above given.

Should it be found to be advisable to run these upraises Nos. 1, 2, 3 and 4, in ore, there is no reason why the upraises Nos. 5 and 6, on the Johnson lode should not also run in ore, since the dip of the Johnson lode is about the same as that of the Eureka lode and of the Kensington lode, wherefrom it will be seen that in case it is decided by the engineer to run all of these six upraises in ore, the total sum of $99,350 herein charged up thereto will be available for other work.

Average assay value per ton, Kensington ore.....	$5.139
Average value per ton recovered, 85% of assay value per ton....	4.368
Total operating and construction charges per ton.....	1.75
Average value that should be recovered, net profit.....	2.618
Average value per ton net profit allowed herein.....	2.00
Difference between the average net profit per ton that should be recovered and that allowed.....	.618
Amount per ton previously allowed for contingencies.....	.2227
Total amount per ton amount allowed for contingencies.....	.8407

The present daily duty per stamp of 1050 lbs. each at the Treadwell mine is about 6 tons. The Allis-Chalmers estimate submitted herewith provides for stamps weighing 1250 lbs. each, which with finer reduction in the rock breakers should maintain a daily duty in excess of 6 tons. But a 6-ton daily duty is a safe basis upon which to predicate results. The tonnage of a 200-stamp mill would therefore be increased by 20 per cent over the 1000 daily basis previously allowed with practically no increase in the total daily milling charges. A 20 per cent increase in milling capacity at the same rate of charges for milling cost and at the same net profit of $2.00 per ton will increase the net earnings of 200 stamps per annum to $849,000; of 400 stamps per annum to $1,698,000; of 800 stamps to, per annum, $2,547,000.

A net profit of more than $2.00 per ton is confidently anticipated, but we prefer to base our calculations upon a net profit of $2.00 per ton as being safe and satisfactory.

The following report of examination was made by Henry Lloyd Smyths in company with Mr. Weld of Boston for a Col. Thomas E. Hurley, President of the Mines Securities Corporation. At an early date in the history of the Mine and before the Kensington Crosscut was driven and the properties developed in depth.

Rotch Building, Jarvis Street,

Cambridge, Mass.

Col. Thomas J. Hurley,
President Mines Securities Corporation,
Mills Building, New York.

Sir:

In July of this year and again in September I visited southeastern Alaska, and examined on behalf of the Mines Securities Corporation certain mining locations situated on the east side of the Lynn Canal, about 60 miles by water northwest of Juneau, and a few miles inland from Seward City, the nearest landing. I now beg to submit the following statement of my observations and conclusions.

The claims in question constitute two adjacent groups belonging respectively to the Northern Belle Mining Company and the Nowell Mining & Milling Co. A third contiguous group, which contains the Comet Mine, although under the same general ownership, is not included in the proposition which you now have under consideration. In Appendix A will be found a list of the claims embraced in these two groups.

The Northern Belle group contains the Kensington ore body and will be referred to in this report as the Kensington group. The Nowell Mining & Milling Company's claims cover the Johnson lode and will be referred to by that name.

These are the only lodes or ore bodies of importance known to exist on the two properties.

The general results of the investigation may be summed up as follows:

1. The developments on the Kensington show the existence of an ore body about 13,500 square feet or 1500 square yards in horizontal section. The extreme dimensions of this ore body are from 60 to 120 feet in width from east to west, and 180 feet long from north to south. The limit of profitable ore has probably been reached at the north end, but may not have been reached at the south end.

The ore body has no definite walls, and so far as known does not occupy a definite lode. It can be traced on the surface for a short distance only.

Whether it goes down vertically or pitches to the north, south, east or west is not known.

2. From this orebody about 10,000 tons of ore, in round numbers, have been mined and milled. Much of this ore was broken at the surface, while more than half of it came from less than 30 feet, and practically all of it from less than 80 feet below the surface.

3. The average assay value of the 10,000 tons milled, as nearly as can be determined from the unsatisfactory records of the Northern Belle Company, was $5.19 a ton. The probable correctness of this figure is supported by the fact that the average assay value of my samples is $5.21 a ton. Of this 26 cents a ton was recovered on the plates, and $3.24 a ton in the form of concentrates, 20 tons of wet ore making one ton of dry concentrates. The percentage of extraction was therefore 67.5%; that is to say, two-thirds of the value of the ore was saved and one-third lost.

4. Only 5% of the values recovered were saved by amalgamation; the remaining 95% was for the most part contained in the sulphide concentrates.

Our experiments have shown, first, that it is difficult to avoid sliming these sulphides and, secondly, that the finer sulphide particles are very much richer than the coarser particles. In carefully crushing panned sulphides to pass an 18-mesh screen, 20% of the product was unavoidably broken finer than 80-mesh, and this 20% carried nearly half of the total value of the sulphides. The unusually high value of the finer sizes makes it, in my opinion, practically impossible to save a very high percentage in the mill. Wet crushing rolls instead of stamps, with careful sizing for each type of machine, and the recrushing of tailings, would undoubtedly give a higher extraction than that realized in the present gold mill; but at the best I should not expect an extraction under working conditions higher than 80%.

5. The Kensington ore body outcrops above timber line at an elevation of 2800 feet above the sea on a precipitous and bare mountain side swept by snowslides, and is inacessible for more than half the year. In these high latitudes the climatic conditions change rapidly with change of elevation. At 2800 feet they are of Arctic severity. For these reasons the general plan of development adopted and partially carried out by the Northern Belle Company, namely, by driving a crosscut tunnel to the ore body, starting in ground protected from snowslides, is the only feasible plan. If the Kensington crosscut tunnel were turned at the present breast and run straight for the Kensington workings, it would reach a point about 750 feet vertically under them in 600 or 700 feet.

6. The future of the Kensington of course depends on the size and value of the ore body in depth, and is perhaps characteristic of the former management that relatively but little money was devoted to the determination of these fundamental questions. With regard to the first, viz.: the size of the orebody--there is no good reason to believe that it will be materially larger in depth than it is in the present workings near the surface.

On the other hand, with regard to the tenor of the ore, there can be little doubt that it will diminish with depth, and perhaps seriously.

The geological conditions here are such as always produce enrichment not far below the surface. And in fact the samples indicate an actual diminution in value between the stope and the main level. It is quite impossible to predict how far this diminution will go, and at what depth it will cease. A reduction of 25% to 50%, or even more, in 750 feet would not be surprising. If it reaches 50%, the orebody would hardly pay to mine and mill.

7. The first step in the development of this property is therefore to find out what there is in it, and the best way to do this is to drive the Kensington crosscut tunnel on to the Kensington ore body. It must not be forgotten that it may be a difficult and costly undertaking to find this orebody on the tunnel level. It has no walls, nor is it contained within any easily recognizable locus. Absolutely nothing is known as to its pitch, either as regards amount or direction. If its pitch is as low as 45 degrees it may be found on tunnel level anywhere on a circle of 1500 feet diameter.

8. If the orebody should be found in the tunnel and above of undiminished size, and value, it undoubtedly could be made to yield a profit by the investment of a large amount of capital in development, in the erection of a new mill and power plant, and in a tramway from mine to mill. An orebody of the same horizontal dimensions as the Kensington on the main level--1500 square yards--and 750 feet high would contain 750,000 tons. It would require the expenditure of $150,000 in development work and equipment to open it for the production of 400 or 500 tons a day. A tramway and suitable mill to handle and treat such a tonnage of rock as tough as the Kensington would cost in the neighborhood of $250,000. To mine and mill such an ore in a body of the assumed size would cost at least $2.50 a ton.

9. My opinion of the Kensington as a commercial proposition can be summed up in a few words. If it were presented to me as an original proposition, without a past, I should regard the investment of the money necessary to find the ore body on the level of the crosscut tunnel--say $20,000 to $30,000--in return for a strong controlling interest, as a fair mining venture. Under the existing conditions I cannot recommend your company to take this property on any essentially different terms. There is nothing in this property worth paying cash for. All that the owners have to offer is the privilege of exploring for a body of ore, that at the best will be of low grade and will require a heavy expenditure to successfully exploit. I do not think the chances of a fortunate issue are sufficiently good to warrant the payment of any money, directly or indirectly, for the privilege of doing this work.

With regard to the Johnson lode the facts and conclusions are as follows:

1. The lode is closely connected with a well marked line of faulting. It is exposed for a length of about 1000 feet, and a vertical height of nearly 800 feet. Twenty-one samples taken by myself from various points, mainly on the surface, give an average value of about $3.90 a ton.

2. The outcrop of the lode is found on a precipitous mountain side, having a slope of 42 degrees for nearly 1000 feet in height. The altitude of the outcrop ranges from about 2300 feet to 3100 feet above the sea; and it is accessible for about four months in the year.

3. The Johnson lode cannot be developed or mined continuously except by a crosscut tunnel, driven from the Lynn Canal side of the mountain. If the Kensington tunnel were pushed on, it would reach a point under the croppings of the Johnson lode at a distance of about 3600 feet from the present breast or about 3000 feet from a point under the Kensington.

4. The chances are that this lode, when opened in depth, will be somewhat leaner than the Kensington. The vein matter is heavily charged with pyrite in many places, and probably would make as high a percentage of concentrates as the Kensington.

5. Owing to the short season available for work on the outcrop, the exploration of this lode would be a slow and expensive undertaking. The surface showing is not sufficient to warrant an enterprise so costly as the driving of a crosscut tunnel 3600 feet long for exploring purposes.

6. I cannot recommend the exploration of the Johnson as a venture separate from the exploration of the Kensington.

A detailed account of the observations on which the foregoing conclusions are bases will be found below:

Topography

The more important lodes on the Kensington and Johnson properties are found at considerable altitudes above timber line on the western and southern sides of a high mountain ridge which forms the eastern wall of the Lynn Canal, and, on the south, falls away gradually to sea level, forming the peninsula between Lynn Canal and Berners Bay. The higher peaks of this ridge attain altitudes of nearly 6000 feet above the sea within two miles of the shore of Lynn Canal. The upper rocky slopes of these mountains are especially precipitous, and inclinations exceeding 40 degrees for heights of 1000 to 2000 feet are not uncommon. These upper slopes are so constantly swept by snowslides that it is impossible to maintain an artificial structure on them. This

fact has a most important bearing on the development and exploitation of the Kensington and Johnson lodes. It makes it necessary to adopt a plan of development that will bring the ore out to the surface, for transportation to the mill below, at a point protected from snowslides by a heavy growth of timber.

Timber line may be placed at a rough average height of 2500 feet above the sea, although over large areas below this elevation the timber has been swept away or its growth prevented by slides.

The winter snowfall is very heavy. Snow lies in sheltered spots and in the basins and gorges of the higher mountains throughout the year. Many of the higher peaks also are ice covered, although in the immediate vicinity of the Kensington and Johnson lodes no glaciers come down as low as 3300 feet.

The principal stream of the district is a mountain torrent called Sherman Creek, which forms the southern boundary of the Kensington group. It rises west of the backbone of the peninsula and flows west for nearly three miles, through a gorge carved out of soft slates, into Lynn Canal. This creek during the summer carries a large volume of water, collected from the southwest slopes of snow mountains. Spuhr Creek, north of Sherman Creek, and like it flowing into Lynn Canal, is also a large summer stream. The water rights in both creeks are owned by the Northern Belle and Nowell companies.

Geology

In the general district in which the Kensington and Johnson properties are situated three principal varieties of rock are encountered, namely, sedimentary slates, diorites with granitic phases, and black or dark green, fine grained, eruptive rocks, which are probably of volcanic origin. The slates occur along the beach and in the relatively low foothills along Lynn Canal and Berners Bay, extending for no great height up the mountain sides. The diorites form an intermediate belt higher than the slates on the west and south slopes of the mountains, while the more elevated regions above 2500 to 3000 feet are composed of greenstone.

Slates. The slates have no known economic importance. None of the lodes of the Kensington or Johnson groups are in or near these rocks.

Diorites. North of the slates, and covering the greater part of the Kensington and Johnson groups, is an area of diorite. The contact of this rock with the slates was not found, but it probably lies some distance--400 or 500 feet--north of Sherman Creek.

The diorite is generally coarse grained, particularly that which encloses the Kensington and part of the Johnson lodes. But lower down in the Bear crosscut tunnel, which cannot be far north of the contact between diorite and slate, the rock is noticeably fine grained.

The diorites are the most important rocks in this district, for the reason that all the known veins and lodes of any importance, except part of the Johnson lode, occur within them.

Greenstones or Volcanics. These rocks occur north and west of the diorite mass and form the higher peaks of the range. The contact between the diorite and greenstones is visible in many places, and in all cases shows evidence of faulting. Adjoining the diorite is a zone of brecciated or schistose greenstones, the structure of which is clearly a fault product. In the northwestern portions of the Kensington property, this contact follows very roughly the contours of the mountain on the side towards Lynn Canal. A short distance northeast of the Kensington crosscut tunnel, however, the contact line turns at right angles towards the northeast and mounts rapidly in crossing the divide to the Johnson property. The contact wherever seen has a steep or vertical dip.

The greenstones enclose several lodes. A large part of the Johnson lies within this rock. The Little Nell, an undeveloped quartz vein north of the Kensington, occurs in the greenstone about 20 feet from the contact with the diorite. Other lodes are said to occur in it in higher and practically inaccessible regions of the mountains.

Other Eruptive Rocks. In addition to these main rock masses other varieties of eruptive rocks occur. In the Kensington openings, and also in the Kensington crosscut tunnel, the coarse diorite is cut by dikes of darker colored, fine grained, basic rock. Also, near the Northern Belle tunnel small dikes of aplite occur in the diorite.

The Lodes

The Kensington group contains three veins or ore bodies on which a considerable amount of work has been done, and a fourth which has been supposed to be of promise, but about which little is known. These are the Bear, Savage, Kensington and Eureka.

The Bear Vein. This vein outcrops on the west side of the mountain at a height of about 1500 feet above the sea. Its strike is northwest and southeast, magnetic; its dip towards the northeast at an angle of about 65 degrees. The vein has been opened by a crosscut tunnel, the mouth of which is about 575 feet above the mill, with which it is connected by a gravity tram about a third of a mile in length. The tunnel taps the vein 430 feet from its mouth, and has been continued

490 feet farther, or to a total distance of 950 feet to the breast. Above the tunnel level the vein has been stoped practically to the surface for a length of 250 to 300 feet, most of the ground removed lying west of the line of the tunnel. Two intermediate levels were opened above tunnel level and driven to daylight on the vein.

As shown in the old workings, as far as I examined them, the vein consists of solid white quartz carrying a little pyrite near the foot wall, and with crushed and silicified diorite on the hanging. At tunnel level the vein is in places two feet wide. In the west drift it pinches to a narrow gouge for about 50 feet, but in the breast has again widened to eight inches.

The books of the Northern Belle Company show that from this vein there have been mined and milled 4900 tons of ore in 1895, and 685 tons in 1897, or a total of 5585 tons. What this ore contained or yielded it is impossible to say. The books and reports of the company to which Mr. Weld and myself had access are in such condition that no safe conclusions on these points can be drawn. Mr. T. H. George, the Company's engineer, states that the assay value of the ore milled was about $3.50 a ton, and that the yield in the mill, on the plates and in concentrates, was about $3.00 a ton. The concentrates are said to have been of low grade--carrying not more than $35 a ton. These figures are probably not understated, but we found it impossible to verify them.

There can be no doubt, however, that under the conditions now prevailing in Alaska and likely to prevail for many years to come, it is entirely out of the question to mine and mill a quartz vein two or three feet thick for any sum approaching $3.00 a ton. The Bear vein, therefore, cannot be regarded as an asset, and should under no circumstances be carried to the credit side in estimating the value of this property.

The Savage Vein. The Savage vein is practically parallel with the Bear and outcrops about 450 feet north and some 300 feet above it. At the time of my visit this vein was visible on Kensington ground only in a small open cut, probably at the point of discovery on the Savage claim. But on the adjoining Mexican and Horrible claims, which belong to other owners, the vein has been quite extensively opened. It has been traced along the strike for a distance of half a mile.

At the Mexican Discovery tunnel the vein consists of discolored quartz about 5 feet wide, striking northwest and dipping northeast 62 degrees. Narrow streaks near the foot and hanging are quite heavily mineralized with pyrite. A sample taken by myself across the vein at this point carried at the rate of 51 cents a ton in gold.

At the Mexican Main tunnel the vein is opened by a crosscut through the foot about 135 feet long, and by drifts on the vein northwest 90 feet and southwest 12 feet in length. In the breast of the northwest drift, the vein is about 6½ feet wide, and consists for the most part of coarsely crystalline milky quartz, here and there stained with iron oxide. Narrow streaks near the foot and hanging walls carry coarse-grained pyrite.

A sample taken across the vein in the breast of the northern drift yielded at the rate of 51 cents a ton in gold.

On the Horrible claim the Savage vein has been most extensively opened. A tunnel has been driven on the vein for more than 400 feet, and for the first 200 feet from the mouth of this tunnel the vein matter has been beaten out above the tunnel level in places nearly to the surface.

In the ground opened the vein is seen to be a very strong one, averaging probably about 4 feet in thickness, varying between a maximum of 8 feet and stringers a few inches wide. In the breast of the tunnel, more than 400 feet from the surface, the vein consists of a foot wall stringer well mineralized about 8 inches wide, separated from the main vein by pyritiferrous diorite. The main or hanging wall branch is 30 inches wide.

A sample taken across both stringers and representing a width of 38 inches carried gold at the rate of $1.54 to the ton.

It is evident from the cessation of work on these claims that nothing of value was found in the Savage vein. There is no reason to believe that it is any better in Kensington ground.

The Eureka Lode

The Eureka lode outcrops about halfway between the mouth of the Kensington crosscut tunnel and the workings of the Kensington mine, or at an altitude of about 2300 feet above the sea. The lode, as far as discolored, consists of two nearly parallel veins about 30 feet apart with connecting stringers; the foot wall vein may be traced for upwards of 260 feet, while the hanging wall vein is exposed or opened for a distance of about 100 feet along the strike. The strike is northwest and southeast, the dip of the foot wall vein being about 40 degrees towards the northeast. The two veins consist of white and rusty quartz with bunches and streaks of partly altered sulphides. Each vein is about 2 feet in thickness. Samples taken by Mr. Perin from these veins yielded as follows:

Hanging wall vein, 36 inches thick.....	$ .77 a ton
Hanging wall vein, 24 inches thick.....	1.13 a ton
Foot wall vein, 24 inches thick.....	41.34 a ton
Foot wall vein, 24 inches thick.....	6.20 a ton
*Foot wall vein.....	5.17 a ton

*This sample was taken by Mr. Weld.

The diorite between the veins is only slightly mineralized, and carries no values.

The Eureka has possible importance and probably will be intersected by the Kensington crosscut at no great distance from the breast.

The Kensington Lode

This lode is the most important and most extensively opened on the property. More than 10,000 tons of ore were mined and milled from the Kensington ore body in the years 1898 to 1900, inclusive. The lode outcrops at an altitude of about 2800 feet above the sea on the steep and bare southwestern slope of the mountain. The outcrop is inconspicuous, and consists of fractured, sheared and somewhat altered diorite intersected by quartz seams; all more or less rusty with iron oxide. Even these faint indications of mineralization are not traceable far. Down hill on the south side they are soon lost under an accumulation of slide; up the hill indubitable evidences of mineralization cease within 400 feet below the contact of diorite and greenstone is reached.

The development on this lode consists (1) of an open pit, roughly 60x40 feet in area by 10 feet deep, the long dimension running east and west magnetic; (2) below the open pit on the main level, a large breast stope 100x50 feet in area, from which the ore has been taken from 8 to 12 feet in height, the back being held by four or five pillars; (3) two nearly parallel drifts, about 50 feet apart, running northwest from this stope, the western drift being 120 feet and the eastern about 40 feet in length; (4) an upper stope 50x60 feet in area by 20 feet in height, lying nearly over the block of ground between the two drifts and about 13 feet above the main level; and (5) two shallow holes or winzes below tunnel level.

The upper stope is holed through to the surface and is also connected with the main level by six mills, and one-man way. The open pit is connected with the main level by three raises, through which the broken ore was milled.

There is now standing above the upper stope a back of from 20 to 40 feet of solid ground. Over the northwest drift at the breast there is a back 100 feet in height.

In addition to the above openings a crosscut tunnel on the main level comes into the orebody through the country rock on the west side, and the breast stope is also directly connected with the surface at its south end.

The map of the workings indicates that the orebody, while irregular in shape, is elongated in a north and south direction. Underground study, while showing that the ore has no easily recognizable

physical limits or walls, nevertheless strongly confirms this impression. The reason for this is that the orebody is traversed by a system of important fractures running from N. 4 degrees to 12 degrees W. and dipping east at angles ranging from 50 degrees to 80 degrees. Several fractures of this system are found in the upper stope; and two very important ones occur on the main level. One of these crosses the western drift obliquely, and the other follows the eastern drift. In addition to the fractures above described a few belonging to an intersecting system running between N. 10 degrees to 20 degrees E. have been noted. All these fractures are strongly marked with gouges and crushed and slickensided rock. In certain cases the shear zone is two feet or more in width.

Without question these main fractures stand in close relation to the mineralization, because the values are generally near them, yet they do not limit it; that is to say, in no case do they constitute walls or boundaries to the ore.

The Kensington ore consists of diorite intersected by quartz veins, usually small, which carry gold-bearing pyrite. Besides quartz the small veins often contain a brown or pinkish carbonate which contains manganese. The diorite between the quartz seams is also impregnated with pyrite, often in minute dust-like particles. While the impregnated country rock and the quartz veins which intersect it are inseparable and together constitute the Kensington ore, it cannot be doubted that much the greater part of the value of the ore is contained in the pyrite of the quartz seams and not in that disseminated through the rock. Mr. C. M. Weld carried out some experiments at my instance which prove this.

In these experiments selected pyrite was collected from the bunches in the larger quartz seams from all parts of the mine; after crushing and removing as much gangue material as possible by panning, the remaining sulphides assayed from $78 to $147 to the ton. Next, mineralized diorite was selected from all parts of the mine, that being chosen which carried pyrite but no visible quartz. This rock was crushed to pass an 18-mesh screen and as clean sulphides as possible obtained from it in the pan. These carried only $17 to the ton, or not more than a fifth of the value of the pyrite from the quartz veins.

The quartz seams referred to which carry the greater part of the values are the filling of fractures in the diorite; fractures less conspicuous than the master fractures already described, but much more numerous. A certain regularity and system in the attitude of these seams is also observable.

The thicker seams strike between northeast and northwest, and are generally characterized by low angles of dip either towards the north or south. The thickness of these seams varies from a small fraction of

an inch to a foot. They often carry heavy bunches of pyrite. These thicker and low-dipping quartz seams in many instances originate in the master fractures already described. I believe the irregular and nearly horizontal fractures which they occupy have been produced by faulting on the master fractures.

Besides these seams there are numerous others more steeply dipping which serve to connect the horizontal seams.

The spacing of the quartz seams is extremely variable. This manner of occurrence is best illustrated by the drawings below:

Three Drawings

The question of the content of the Kensington orebody in gold is of fundamental importance. In order to answer this question all records and books in the company's possession that could be obtained were carefully examined. For the most important single year, namely, 1900, I personally examined the books. The records for 1898 and 1899 were unobtainable at the time of my visits, and the figures for these years are the result of Mr. Weld's subsequent work. The results are given in full in appendix B, and are summarized below:

In 1900, 5790 tons of Kensington ore were milled. From this ore an average of 26 cents a ton in gold bullion were recovered from the plates. Daily assays (in the case of 5227.7 tons) of the pulp which passed the plates gave an average of $5.09. The assay value of the ore may therefore be taken as $5.37.

The records also show that during this year 279 tons of dry concentrates were made (or 1 ton of concentrates to about 21 tons of ore), the assay value of which was a little below $53 a ton.

Taking Mr. Weld's figures as correct, the results for the whole period during which the ore was mined and milled do not differ materially from these.

These figures show that 10,342 tons in all were mined and sent to the mill from 1898 to 1900 inclusive, and this tonnage agrees very fairly with the volume of ground removed from the mine. The assay value of this ore, including the bullion recovered, was $5.19. The percentage of concentrates was 5.08, and the percentage of recovery in bullion and concentrates was about 67.5. These 10,000 tons all came from the surface or within 100 feet of it.

In order to obtain independent evidence as to the values, I took a series of 25 samples, weighing from 200 to 300 lbs. each, from various parts of the mine, the positions and assay values of which are

given in Appendix C. After cutting down, they were sent to Mr. E. J. N. Ott, of the Treadwell Mine, for determination.

Omitting one sample of exceptional value, taken from a shallow hole below the main level, and which was not intended to be representative, the other 25 samples had an average gold content of $5.21, which agrees sufficiently closely with the assay value of the 10,342 tons milled.

We may therefore regard it as fairly well established that the Kensington orebody within a distance varying from nothing to 100 feet of the surface has had an average value of about $5.20 a ton.

The distribution of values is as follows:

The fourteen samples of ore from the stope averaged ..... $7.85 a ton
The eleven samples of ore from the drifts averaged..... 1.85 a ton

Although too much weight should not be given to so small a number of samples, there seems, nevertheless, to be a well marked diminution of values with depth. The sulphides everywhere throughout the workings show evidence of change, but the change is less marked the deeper one gets under cover. In the drifts on the main level the practically only visible alteration consists in the darkening and softening of the pyrite.

The conditions are favorable in this case for the concentration of gold in the upper portion of the deposit. The region is near the sea and has a very heavy rainfall; therefore relatively large amounts of chlorides are probably present in the surface waters. The quartz stringers of the orebody carry in places considerable amounts of carbonate of manganese. This mineral, as well as the pyrite of the orebody, is undergoing oxidation in the surface zone.

One of the products of the alteration of pyrite is free sulphuric acid, which with the reagents already named, will evolve chlorine, a vigorous solvent of gold. It is well known that such conditions generally result in the formation of an enriched zone not far below the surface, and I think it practically certain that the Kensington workings are situated in such a zone. It is to be expected, therefore, that the values will diminish with depth. If my view is correct such diminution has already begun, 100 feet below the surface. How far down they will continue to diminish and what will be the value of the ore when stable conditions are attained it is impossible to say. I do not think a reduction of 50% would be at all improbable.

An important feature of the Kensington pyrite is the readiness with which it slimes, and the unusual richness of the fines. Some experiments carried out by Mr. Weld, at my instance, have established

these facts, and have thrown light on the cause of the heavy losses sustained in milling this ore. These experiments were as follows:

Pyrite was selected from various parts of the stope, the aim being to get it as free from gangue as possible. It was broken to pass an 18-mesh screen and panned; after drying, the concentrates were divided into three classes by running them over 40 and 80-mesh screens. Silica and gold were determined for each class. A similar experiment was carried out with pyrite selected from the main level drifts.

The results were as follows:

Pyrite from the Stope

Mesh	% of whole	SiO2	Average	Av. for 100% pyrite
18-40	40%	6%	$73.00 per ton	$ 78.73 per ton
40-80	40%	19%	81.00 per ton	100.00 per ton
below 80	20%	23%	264.00 per ton	342.86 per ton

Pyrite from the Drifts

18-40	40%	3.5%	142.00 per ton	147.15 per ton
40-80	40%	9.5%	188.00 per ton	207.73 per ton
below 80	20%	13.5%	589.00 per ton	680.92 per ton

In the first case the product below 80-mesh, although only about 1/5 of the whole in quantity, carried 47% of the gold. In the second case it carried 49% of the gold. The fines (below 80-mesh) were carefully examined for free gold, but none was found.

Qualitative tests of the fine concentrates show that they contain neither copper, tellurium arsenic nor bismuth. The pyrite is apparently exceptionally pure.

On treating the fines with nitric acid and examining the washed residue under the microscope, a large number of very minute crystalline particles of gold appear. These particles in many cases have a dull surface. A few have side or corner rubbed bright.

These experiments go to show that the heavy losses in milling the Kensington ore are due neither to the presence of friable copper minerals enclosing gold nor of gold tellurides, but to the existence of the gold in an extremely fine state of division in the metallic state, locked up in the pyrite. The very great enrichment of the fines is perhaps due to the fact that the gold particles are mainly placed on or near the surfaces of the pyrite grains.

It would seem difficult or impossible to make a high saving on such material. A mill with wet crushing rolls followed by roughing tables, careful sizing and distribution to machines adapted to the work, with recrushing of tailings, would probably save 80% of the assay value of the ore. The work done in the present mill, which resulted in the saving of 67.5% of the values, was by no means as bad as has been claimed.

The Johnson Lode

The Nowell Mining and Milling Company's claims, so far as known, include but one lode of possible importance, namely, the Johnson. This lode outcrops on a steep mountain side, the lowest point of exposure being 2300 feet above the sea. The altitude of the highest outcrop I reached and sampled was about 3100 feet, but it is said that other exposures occur still higher.

The lode strikes a few degrees north of west, and is exposed on the surface for about 1000 feet in length. It crosses the contact of diorite and greenstone, about half the prominent outcrops lying on each side of this contact. The lode occurs for the most part on the south side of a line of faulting, along which the diorite-greenstone contact and a later dike have been displaced. Along this fault, and especially on its south side, occurs a broad and very irregular mineralized zone, consisting of sheared country rock with quartz stringers and veins, many of which strike northwest or obliquely to the direction of the fault. The result is that the lode has one strong wall, namely, the fault.

The mineralization, consisting in the alteration of the country rock with the introduction of quartz and pyrite, is very far from being uniform. Four or five areas, tributary to the fault and lying within 200 feet of it, are well mineralized, but they are separated from each other by visibly barren ground of still greater extent. The mineralized areas in some cases are 100 feet wide.

But little work has been done on the lode. The King tunnel, at an altitude of 2580 feet, has been driven in 64 feet somewhat south of west or markedly oblique to the trend of the fault. Thirty feet north of the King tunnel is a small cut almost on the line of fault. At 2300 feet altitude another small cut about on the fault line is known as the Johnson tunnel. During the present summer Mr. Weld cut a number of trenches across the lode, exposing fresh surfaces above the level of the King tunnel.

A small amount of the Johnson ore is said to have been milled several years ago, but no record of the result was obtained.

In the case of a lode so wide and so irregular both in shape and in mineralization, it is futile to attempt to forecast the value of the ore by sampling, except within wide limits. Nevertheless, I took a series of 21 samples from the King tunnel upward in the mineralized areas. The evidently barren parts of the lode I passed over, sampling those parts only which seemed likely to carry values.

The average of my samples, therefore, by no means represents an average for the whole lode, but only an average of the better portions--that is to say, of ground that might be mined separately if the conditions warranted.

The result of this sampling is shown in Appendix C. The general average value is about $3.90 a ton.

The Johnson ore is very like the Kensington. The only recognizable metallic mineral is pyrite, which occurs especially in bunches associated with quartz. It seems likely that the percentage of concentrates will be as high in the Johnson as in the Kensington ore. The final quarterings from three large samples taken in the King tunnel were broken to pass an 18-mesh screen, and panned, yielding 9.5% of concentrates carrying 31% silica.

The partially altered pyrite of the Johnson carries very high values, as is shown by sample 3352, which assayed $162.00 a ton.

As already stated, too much weight should not be given to the samples. They show, however, that the Johnson lode is unquestionably of low grade, probably lower than the Kensington, although it contains some very rich bunches of ground.

As to the quantity of ore in the Johnson nothing can be said until the lode is opened by longer tunnels at several points, and the question of its character in depth settled. The surface exposures are certainly large and in places attractive.

Yours truly,

(Signed) HENRY LLOYD SMYTHE.

Oct. 16, 1902.

APPENDIX "A"

List of Claims of the Northern Belle Mining Company and of the Nowell Mining and Milling Company.

Northern Belle Mining Company.

Patented Claims	Unpatented Claims
Northern Belle	Little Nell
Yellow Jacket	Lucky Boy
Elmira	Triangle
Eureka	Savage Extension
Kensington	Bear Extension
Esmeralda	Columbian
Excelsior	Columbian East Extension
Northwest	
Savage	
Bear	
Twin Mill Sites	

Nowell Mining and Milling Company.

Northern Light	Emma
Northern Light Extension	Eldorado
Emma Light Extension No. 2	Needles
	Bunker Hill
	Boston
	Troy

APPENDIX "B"

Northern Belle Gold Mining Company
Comet City, Alaska.
Kensington Mine.
1898

Receipts:

Bullion	$ 1,100.91	
Concentrates	6,310.61*	
*Net.		$ 7,411.53

Expense:

Operating	$14,327.30	
*Development	4,586.32	
Property	10,000.32	
*Includes $421.98 for Bear Mine.		$28,913.94

Mill Run:

Tonnage..... 3,362
No. of days..... July 28 Oct. 14
Aug. 15 Nov. 5
Sept. 3
58 days

Further mill records missing.

Bullion:

Free gold recovered.....$ 0.33 per ton

Pulp off plates:

Total value (from daily assays).....$13,766.34
Average value..... 4.09 per ton
Total average value of ore..... 4.42 per ton

Concentrates: (Dry weights)

Vanners.....174.645 tons
Canvas plant.... 7.000 (7,393 tons by W.E.M.'s records)
Total.....181.645
Per cent of ore. 5.40
Average gold content..... 2.327
Average silver content..... 2.584 oz.
Average SiO2 content.....24.57 %
Average Fe content.....31.09 oz.
Average cost of treatment (neutral basis).....$5.35

Crude Ore: (Dry weights)

Total weight..... 2.696
Average gold content..... 9.139 oz.
Average silver content..... 0.533 oz.
Average SiO2 content.....25.18 %
Average Fe content.....34.72 %
Average cost of treatment (neutral basis).....$5.05

1899

Receipts:

Bullion.....$ -----
Concentrates..... 3,271.11*
*Net. $ 3,271.11

Expense:

Operating	$ 8,827.75
Developing	5,397.87
Property	2,328.45
	$16,554.07

Mill Run:

Tonnage	1190	
No. of days		Oct. 27
		Nov. 29
		Dec. 3
		59 days
No. of hours, one stamp		13,204
Tonnage per stamp per hour		0.0901
Tonnage per stamp per 24 hours		2.162

Bullion:

None

Pulp off plates:

Total value for 1130.46 tons (from daily assays)	$7,498.58
Average value per ton	6.63
Total average value of ore	6.63

Concentrates: (Dry weights)

Vanners.....59.736 tons
Canvas plant..... 5.000 tons (5,819 tons by M.E.M.'s records)
Total.....64.736 tons

Per cent of ore	5.44
Average gold content	4.106 oz.
Average silver content	4.395 oz.
Average SiO2 content	30.05 %
Average Fe content	34.98 %
Average cost of treatment (neutral basis)	$5.51

Crude ore: (Dry weights)

Total weight	2.062 tons
Average gold content	8.10 oz.
Average silver content	0.90 oz.
Average SiO2 content	24.30 %
Average Fe content	34.30 %
Average cost of treatment (neutral basis)	$5.00

1900

Receipts:

Bullion	$ 1,899.62
Concentrates	16,955.70*
*Net.	$18,555.32

Expense:

Operating	$23,635.12
Developing	10,528.01
Property	899.00
	$35,062.13

Mill Run:

Tonnage.....5790 (5586 by M.E.M.'s monthly reports)
No. of days..... June 8 Oct. 28
July 23 Nov. 17
Aug. 28 Dec. 22
Sept. 23
149 days

Total No. of hours, one stamp	58,050
Tonnage per stamp per hour	0.0982
Tonnage per stamp per 24 hours	2.309

Bullion:

Free gold recovered..... $ 0.28 per ton

Pulp off plates:

Total value for 5227.69 tons (from daily assays)	$26,615.63
Average value	5.09 per ton
Total average value of ore	5.37

Concentrates: (Dry weights)

Vanners	245.736 tons
Canvas plant	33.542 tons
Total	279.278 tons
Per cent of ore	4.82
Average gold content	3.612 oz.
Average silver content	3.725 oz.
Average SiO2 content	31.02 %
Average Fe content	27.31 %
Average cost of treatment (neutral basis)	$6.37

Shipment of July 20th was estimated at 60,000 lbs., as smelter's return was missing. The return has since been obtained and shows a shipment of a little over 55,000 lbs. The total then will be 279.025 tons, and the per cent of the ore 4.82.

Crude Ore: (Dry weights)

Total weight	4.684 tons
Average gold content	11.36 oz.
Average silver content	0.60 oz.
Average SiO2 content	24.20 %
Average Fe content	37.00 %
Average cost of treatment (neutral basis)	$4.72

RECAPITULATION

Receipts:

Bullion	$ 2,700.53
Concentrates	26,537.32*
	$29,237.85

*Net

Expense:

Operating	$46,790.17
Development	20,506.20
Property	13,233.77
	$80,530.14

Mill Run:

Tonnage	10,342
No. of days	266
No. of hours, one stamp ('99 and 1900)	71,254
Tonnage per stamp per hr. ('99 and 1900)	0.0951
Tonnage per stamp 24 hrs. ('99 and 1900)	2.262

Bullion:

Free gold recovered	$0.261

Pulp off plates:

Total value for 9720.15 tons (from daily assays)	
Average value for 9720.15 tons	$4.920 per ton
Total average of ore	$5.187

Concentrates: (Dry weights).

Vanners	480,117 tons
Canvas plant	45,542
Total	525,659

Average gold content	2.697 oz.
Average silver content	1.819 oz.
Average SiO2 content	28.67 %
Average Fe content	29.55 %
Average cost of treatment (neutral basis)	$5.91

Crude Ore: (Dry weights).

Total weight	9.442
Average gold content	10.014
Average silver content	0.646
Average SiO2 content	24.49 %
Average Fe content	35.75 %
Average cost of treatment (neutral basis)	$4.87

APPENDIX "C"

Table Showing the Location, Width and Value of Samples from the Kensington and Johnson Groups, Alaska

No.	Vein	Place	Width	Value per ton
2700	Savage	Mexican Claim, Discovery Tunnel	5 ft.	$ .51
2701	"	Horrible Claim	3 ft. 2 in.	1.54
2703	Kensington	Mill No. 1		22.00
2702	Savage	Mexican Claim, Breast of W. drift	6 ft. 6 in.	.51
2704	Kensington	Mill No. 2		7.23
2705	"	" 3		8.20
2706	"	" 5		2.83
2707	"	" 9		5.42
2708	"	" 6		2.30
2709	"	" 8		3.60
2710	"	" 4		3.10
2711	"	" 7		8.20
2712	"	West Drift, breast	5 ft.	3.35
2713	"	" " 10 ft. S. breast	10' long 8' high	.77
2714	"	" " 20 ft. S. "	10' long 8' high	.25
2715	"	" " 30 ft. S. "	10' long 8' high	2.06
2716	"	" " 40 ft. S. "	10' long 8' high	7.74
2717	"	" " 50 ft. S. "	10' long 8' high	1.54
2718	"	" " 60 ft. S. "	10' long 8' high	.25
2719	"	East Drift, breast	5 ft. long	1.03
2720	"	" " S. of breast	10' long 8' high	2.06
2725	"	" " S. of breast	10' long 8' high	.77
2727	"	" " S. of breast	10' long 8' high	.51
2721	"	Stope, northwest end	14 ft. wide	8.70
2722	"	" east side, northwest room	12 ft. long	33.00
2723	"	" north end	12 ft. long	2.30
2724	"	" northeast end	10 ft. long	11.26
2726	"	" Northern crosscut	10 ft. long	1.80
2728	"	Larger winze	Selected	44.50
5001	"	Smaller winze	10x6 ft.	.25
2734	Eureka	Hanging wall vein	3 ft.	.77
2735	"	Foot wall vein	2 ft.	41.34
2736	"	Hanging wall vein	2 ft.	1.03
2737	"	Footwall vein	2 ft.	6.20
2729	Johnson	King Tunnel, selected sulphides		16.00
2730	"	King Tunnel	8 ft.	4.60
2731	"	" "	3 ft.	1.03
2732	"	" "	14 ft.	6.20
2733	"	Cut north of King Tunnel		2.83
2738	"	1st cut above King Tunnel	11 ft.	3.00
2739	"	" " " " "	15 ft.	3.00
2740	"	" " " " "	18 ft.	2.00
2741	"	" " " " "	6 ft.	8.00

No.	Vein	Place	Width	Value per ton
2742	Johnson	2nd cut above King Tunnel	19 ft.	1.25
2743	"	" " " " "	22 ft.	2.25
2744	"	" " " " "	10 ft.	1.25
2746	"	7th cut above King Tunnel	6 ft.	1.00
2747	"	" " " " "	11 ft.	.25
2748	"	" " " " "	22 ft.	4.25
2749	"	" " " " "	9 ft.	3.25
2750	"	" " " " "	9 ft.	19.00
3351	"	" " " " "	8.5 ft.	21.00
3352	"	Hole 20 ft. above 7th cut	Selected sulphides	162.00
3353	"	9th cut above King Tunnel	6 ft.	1.00
3354	"	" " " " "	Selected sulphides	29.00
3355	"	10th cut above King Tunnel	7 ft.	1.75
3356	"	10th cut above King Tunnel, quartz vein	4 ft.	26.00
3357	"	11th cut	14 ft.	1.25