MR Chandalar 31-1

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REPORT ON THE PROPERTY OF THE CHANDALAR GOLD COMPANY

Chandalar Precinct, Beaver P. O. Alaska, January, 1925.

By G. L. THOMPSON

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The property of this Company is situated about 120 miles to the Northwest from the village of Beaver, on the Yukon River, and about 250 miles from Fairbanks, Alaska. It lies in the foot-hills of the Endicott Range which forms the Yukon Arctic divide, and at an elevation above sea level of from 2500 to 5500 feet.

Lode Claims

The lode claims now of record in the name of the Chandalar Gold Company are, the Little Squaw, Big Squaw, Sine, Cosine, Cosine Fraction, Crystal and Crystal No. 2, which compose the Little Squaw Group, and are located on the divide between B ig and Little Squaw Creeks. KA 31-16

Also the Duplex Group, consisting of the Duplex, Triplex and Quadruplex claims, situated likewise on the ridge between Big and Little Squaw Creeks and to the north of and paralell to the Little Squaw Group.

In addition to these is the Star Group, containing the Star, Morning Star, Evening Star and Star Fraction, located on the divide between Big Squaw Creek and Big Creek. KA 31-16

The Mikado Group, with the exception of a three quarter interest in the Tobin Claim, was formerly owned by the Company, but were relocated in July, 1923, and again in December, 1924, in the name of one Solomon Smith. The group contains the Mikado, Little Mikado and Tobin Claims and is situated at the upper end of the East fork of Tobin Creek. KA 31-17

The Eneveloe Group, also formerly owned by the Company, but relocated on the above dates in the name of Solomon Smith, consists of the Eneveloe, Bonanza and Golden Eagle claims and is situated on the ridge between Big and Little Squaw Creeks, to the South of the Little Squaw Group. KA 31-16

Placer Claims

The Company also located in 1924, six placer claims on Big Creek, Nos. 13, 14, 15, 19, 20 and 21 below upper Discovery. Also the Crystal Placer Claim in Crystal Gulch, a tributary of Little Squaw Creek. KA 31-22 KA 31-18

Two Mill-Sites are of record in the name of the Company, the Little Squaw and the Cosine mill sites. They are situated on Little Squaw Creek, at about the edge of timber line.

Owing to the extreme isolation and other somewhat unusual conditions connected with this property, details of a nature not commonly included will be given in this report in order that it may be as complete as possible, and that a record may be had of the information obtained at considerable expense during this examination.

Transportation

Roads and trails. Access to the property from Beaver, on the Yukon River, is had by means of a road from that point to Caro on the main Chandalar River, a distance of 75 miles. Owing to the surface being covered with from one to two feet of snow at the time of my visit I was unable to see its nature along the road. I am advised, however, that 1500# can, in summer, be hauled by a two horse team over this road from Beaver to Caro without much difficulty. Relief cabins, some built and occupied as stables, occur along this road. Hauling by horses during the winter is possible, over good sled roads, if kept broken, but the present small requirements of the Chandalar are taken care of by dog teams. The only person living along the road from Beaver to the Little Squaw at the present time is Charles De Bien, who conducts a road house at Caro.

From Caro to Little Squaw, a trail is used which is a pack horse trail in summer and a horse or dog sled trail during the winter months. This distance is 48 miles.

The trail from Fairbanks to B eaver, beginning at Olnas, a station on the Government Railroad, is distinctly a winter trail only, and is impassible for horses for any industrial purpose at any other time. Near Beaver, in winter, this trail crosses the Yukon Flats, and one travels for a number of miles over frozen lakes, sloughs and streams. I am told that this section, in summer, is difficult to travel even by men on foot. So far as I am able to learn, no horses have ever been used on this trail in winter, but on a part of it, the Alaska Road Commission have, in summer, used horses in packing a limited quantity of supplies from Olnas to their road crews at work when the trail was cut through. No one lives along this trail between Olnas, 21 miles from Fairbanks, and Beaver. No bridges have been built, excepting a few near Beaver, and there are no cables with trolleys crossing any of the streams. On the other hand bridges have been constructed over the smaller creeks on the Beaver-Caro trail, but for heavy freighting, as with catarpillar tractors, it would be necessary to rebuild or strengthen some of them.

There is a cable crossing the Chandalar River at Caro, but none on this trail at the Middle Fork of the Chandalar River.

As stated, transportation in winter at the present time, between Beaver and Little Squaw is confined to dog teams. The standard rate for that distance is 15¢ per pound, dry freight and 18¢ per pound for perishable articles. A quotation was received from Chas. Schultz of Beaver, of 12¢ per pound, Beaver to Little Squaw Mill site, in quantities of 10 tons or over, and 15¢ per pound for weights under that amount. Schultz would use horses for freighting, and owns the only horses in the District, a total of eight head.

Tractors. Quotation on a 5 ton Best caterpillar tractor was furnished me by Frank McCafferty, agent for the C. L. Best Tractor Co., in Fairbanks. The price, quoted December 26th, 1924, on this machine, equipped as the "Snow Special" including lights, cab and stationery drive pulley attachment, was $4400.00 F. O. B. Seattle. Freight to Fairbanks was quoted by Mr. McCafferty at $75.00. Bob sleds cost approximately $150.00 each F. O. B. Fairbanks, and wagon trailers, for possible summer use, were quoted at $600.00 each F. O. B. Fairbanks. The wagon trailers quoted were furnished with three foot wheels and 6 inch tires. The wheel diameter should be increased to not less than four feet and the width of tire to 10 or 12 inches.

It would appear that the use of such a tractor with bob sled equipment, in winter would be the most practicable manner in which to move freight, if the tonnage warranted the initial expense.

All supplies and material necessary for a year should be delivered at Beaver before the close of navigation so as to permit freighting to the mines during the winter. No stock of food and supplies in appreciable quantity is kept in the store at Beaver, for the reason that the amount necessary for local use only is purchased each season. Arrangements can be made with Frank Yasuda, store-keeper, to handle food and other usual supplies for the Company on a 10% basis. This would include transfer and warehousing until desired.

Freight Rates. Rates have been quoted over both of the two available routes: From Seattle to Skagway, over the White Pass Ry. from Skagway to White Horse and down the Yukon River to Beaver. Also from Seattle to Seward, over the Alaska Railroad from Seward to Nenana, down the Tanana River to the Yukon and up the Yukon River to Beaver.

Seattle to Beaver per ton.

		Alaska R.R.	White Pass.
Gasoline, dissel and lubricating oils,	LCL	79.80	93.00
Same	CL	68.00	
Mining machinery and hardware	LCL	55.00	77.00
Food staples, 2 classes	LCL	72.80	77.00
		87.80	93.00
Same	CL	58.00	

Alaska Railroad rates include all transfer charges from Nenana to Beaver, and it will be noted that rates over this route are the cheaper.

River Boats. During the summer of 1924, a White Pass boat left Dawson, Y. T. for Nenana, on the first and fifteenth of each month. Nenana is a station on the Alaska Railroad also situated on the Tanana river, a tributary of the Yukon River. This service gave Beaver two down river and two up river calls per month. It is probable that the same or a similar schedule will be effective during the season of 1925. No. U. S. Government boats cover the Yukon River above the mouth of the Tanana.

Air Planes. The possibility of airplane service between Fairbanks and the Little Squaw has been suggested and a statement made that a landing field would be necessary at the latter point. It would seem to the writer that such a field is unnecessary for the reason that Squaw Lake, about 1½ miles distant from the Little Squaw Mill camp offers an excellent spot for the landing of airplanes, equipped with pontoons during the summer months

and with skis during the winter. At the time of my visit to this lake, on Jan. 29th, 1925, it offered a perfectly smooth surface of snow over the ice, and as the lake is about three miles long by 1½ miles wide, ample space is available.

I am informed by officials of a Fairbanks airplane company in the transportation business, that they intend to have a new machine available for use in this district during the coming season, with a passenger capacity of 6 persons, exclusive of the pilot, or a freight carrying capacity of 1000 to 1200 pounds. No rate for freight has been quoted. This machine is to be equipped so that either wheels, pontoons, or skis can be used as desired, and will be so constructed as to permit winter operation.

The cost for passenger fares has been and is expect to remain $1.00 per mile for the distance the passenger is carried, and this manner of traveling to or from isolated points is without doubt the most economical, even when the difference in the required time is not taken into consideration.

Postal and telegraphic communication. During the summer of 1924 mail was received at Beaver, by White Pass boats from Nenana on the Alaska Railroad, twice each month, approximately the 12th and 24th. During the winter mail reaches Beaver once each month, being dispatched from Nenana, thru Fairbanks, thence to Circle by horse stage weekly. From Circle to Fort Yukon twice each month by dog team and from Fort Yukon to Beaver, also by dog team once each month. The time required for a letter to reach Beaver from Nenana or Fairbanks, necessarily depends upon the date it reaches Circle and Fort Yukon and the connections made at those points.

A powerful wireless station operated by the Signal Corps of the U. S. Army is located at Fort Yukon. Messages addressed to Beaver are delivered by the mail carrier from Fort Yukon on his monthly trip in Winter, and arrive at Beaver about the 18th, 3 days after the mail carrier leaves Fort Yukon.

From Beaver to Little Squaw both mail and messages are carried by any responsible person who may be making the trip. At the time of my visit the mail for Little Squaw and Big Creek which arrived at Beaver Dec. 18th had not yet been received. I arrived at Little Squaw Jan. 18th and at Big Creek Jan. 27th. The mail left Beaver early in January.

Climatic conditions. The ice on the creeks and lakes, I am reliably informed, breaks up each Spring about the 15th of May and the thawing of snow and ice continues, with a drainage of the resulting water, until the 10th to the 15th of June and by July 1st, the roads and trails are in a fair condition. The snowfall is not excessive.

At the Little Squaw, its depth, Jan. 29th, 1925, was 14 inches. The greater storms occur in February and March. The deepest snow noted on the entire trip from Fairbanks to the Little Sqaw and return, was about half way between Fairbanks and Beaver, where a depth of 2½ feet was found. The depth of ice formed on the streams and lakes varies with the degree of exposure, current, &c. If cold weather occures before much snow has fallen greater thickness of ice obtains than when a blanket of snow protects the surface. Ice on Big Squaw Lake on Jan. 28th, 1925, was about 20" thick. Prospectors living at Little Squaw state that the present winter snow fall is much heavier than usual.

Some of the streams, including the Chandalar River, which at Caro is 300 feet wide, freeze to the bottom on the riffles. Where this occurs the water in the stream above breaks thru and flows over the top of the ice. This condition is known as an "overflow". Repetition of these overflows and consequent freezing build up "glaciers" often filling a stream full of ice level with its banks and causing the main curring to find new channels. At times the water in these overflows on top of old ice, reaches a depth of two or three feet or more. The smaller streams, if not carrying sufficient water to keep them open, freeze solidly their entire length and depth.

Temperatures at the Little Squaw in winter are more moderate than at lower elevations. A marked difference was noted between the Little Squaw Mines and the Little Squaw Mills, only slightly more than two miles distant, but the former at an elevation of 1806 feet above the latter. The lowest temperature recorded at the Little Squaw Mill during my visit was minus 42 degrees F.

Temperatures.

Date	Time	Place	Weather	Degrees F.
Jan. 1	2 PM	Snowshoe Cabin	Snow and cold	- 1
2	9 AM	Bluff Cabin	Cloudy	- 0
3	8 AM	"	Snow and wind	-12
4	9 AM	Moose John Cabin	"	-10
5	8 AM	Tent. Victoria Cr.	"	- 4
6	7 AM	Victoria Cabin	Clear	-36
7	7 AM	"	"	-26
8	8 AM	Rat Cabin	Partly Cloudy	-12
9	8 AM	Beaver	Clear	-23
10	8 AM	"	"	-40
11	9 AM	"	"	-36
12	8 AM	"	Slight snow	-20
13	6 AM	"	Partly Cloudy	-28
13	8 PM	24 Mile Cabin	Clear	-50
14	6 PM	46 Mile Cabin	Wind	-10
15	8 PM	Caro	Snow and wind	- 4
16	9 PM	Flat Cr. Cabin	Clear	-34
16	9 AM	Caro	"	-13
17	7 AM	Grave Cr. Cabin	"	-36
18	8 AM	"	Partly Cloudy	-31
19	8 AM	Little Squaw Mill	Clear	-37
20	7 AM	Little Squaw Mill	Clear	-39
21	8 AM	"	"	-39
22	8 AM	"	"	-42
23	8 AM	"	"	-39
24	7 AM	"	"	-36
25	7 AM	"	"	-28
26	8 AM	"	"	-27
27	8 AM	"	"	-26
28	6 PM	Big Creek		-16
29	8 AM	Big Squaw Lake	Partly Cloudy	-24
30	8 PM	Grave Cr. Cabin	"	-37
31	5 AM	Grave Cr. Cabin	"	-47
31	8 AM	"	"	-47
31	5 PM	Caro	"	-48

Date	Time	Place	Weather	Degrees F.
Feb. 1	9 AM	Caro	Clear	-58
2	6 AM	Caro	Wind	-40
3	8 AM	Mile 46 Stable	Cloudy	-12
3	7 PM	Mile 46 Stable	Snow and Wind	-14
4	8 AM	Mile 46 Stable	Clear	-40
4	9 PM	Beaver	Clear	-34
5	8 AM	Beaver	Clear	-45
6	7 AM	Beaver	Snow	-38
7	7 AM	Beaver	Partly clear	-34
8	8 PM	Mile 17 Cabin	Partly clear	-27
9	8 AM	Mile 17 Cabin	Clear	-46
9	9 PM	Mile 34 Cabin	Clear	-52
10	9 AM	Mile 34 Cabin	Clear	-34
11	6 AM	Victoria Cabin	Snow	-18
11	8 PM	Moose John Cabin	Snow and wind	- 0
12	8 PM	Fossil Cabin	Wind Clear	- 7
13	7 PM	Bluff Cabin	Partly Cloudy	- 7
14	8 PM	Snowshoe Cabin	Clear	- 1
15	8 PM	Fox	Clear wind	- 6
16	M	Fairbanks	Clear	- 9

I am unable from personal knowledge of the district to comment on the summers. I am informed that the "break up" occurs as stated, about May 15th, and the "freeze up" about October 15th, and that the summers are warm and pleasant. By some persons I am told that mosquitoes are plentiful and by others that the period is short in which they are active. I note, however that mosquito tents are a necessary part of the equipment of those who travel or live in the district during the summer. It is said that other insects are also common to the country, black flies, gnats, &c., their propogation probably made favorable by the large number of swamps and sloughs and stagnant water.

At Caro on Feb. 1st, 1925, the sun at 12 M reached a height of 3 degrees 50 minutes from the horizontal. The short winter and long summer days are well known.

Food supplies. The usual mining camp food supplies can, when in stock, be obtained at the store of Frank Yasuda, at Beaver, or can be shipped in from Seattle or Fairbanks during the season of open navigation. Some Beaver prices are given, based upon Yasuda's quotations the current cost of freight to Little Squaw added.

Flour per bbl.	$ 50.00
Swift's premium bacon per lb.	.70
Swift's premium ham per lb.	.60
Butter 48# c/s 60# gross,	40.00
Eggs fresh c/s 53# gross,	24.25
Rolled oats 90# bag	24.50
Condensed milk, 60#	24.50
Potatoes, per ton,	560.00
Sugar per 100#	28.00

Fresh meat for camp use can be obtained from the herds of caribou in the vicinity of the mine at the expense of shooting them and caring for the meat. Winter meat is killed about the middle of September and is very palatable. Moose are common and furnish a portion of the meat supply. The superintendent at the property advises that the one time when he had to purchase meat the price was 25¢ per pound for caribou and 30¢ per pound for moose. He also states that in the summer grayling and whitefish are obtainable in most of the lakes and streams.

Water Power. An investigation was begun of a proposed hydro-electric power site in the canyon of the Chandalar River about 60 to 8 miles below Chandalar Lake, but when it was learned that this project was located about 20 miles from the mine, that there are only rapids and no abrupt falls in the Chandalar River at any point, and that the proposed development at the site indicated required a dam of considerable size, the investigation was dropped and no personal examination made. Likewise, a site at the lower end of Chandalar Lake, located some years ago by a former General Manager for the Company, was not considered for the reason that this site for development necessitates the construction of a dam across the river immediately below the lake, which dam would be approximately 700 feet in length. In both these projects, the development of power would require the installation of turbines, due to the low heads available, As stated these two sites were not visited by the writer, and the statements above made are based upon information furnished by Supt. Patterson and confirmed by numerous persons in the district.

Two other proposed sites were examined, one on Lake Creek which flows out of Big Squaw Lake into the North Fork of the Chandalar River. This site is about 6 miles distant from the Little Squaw Mill, and requires a pipe line of not less than a mile in length in order to obtain an approximate head of 160 feet. It has no dam site.

A surface pipe line, even of a short length, is considered by the writer to be impracticable in a country subject to extremes of temperature as low as those obtaining in the Chandalar.

The other site examined is situated on Grave Creek, a tributary of the Middle Fork of the Chandalar River and about 11 miles from the Little Squaw Mill. It is located in a canyon and requires a dam, the construction of which and the installation of the necessary machines would necessitate the expenditure of a sum of money not warranted by the present development of the District. It is however, the most feasable of any of the sites suggested or even possibly available. Barometer readings indicate a difference in elevation between the damsite on this creek and a point 1.5 miles above, of 204 feet. No abrupt falls which permit the cheapest development of water power, exist on any of the streams in the Chandalar District.

Lumber: The timber in the interior of Alaska generally, is quite small and little of it fit for lumber. There are however, along some of the streams small bunches of comparatively large spruce trees, some of which are 18 to 24 inches in diamater at the base, in areas protected from the wind and probably in deeper or richer soil. There are also among the usual small timber occasional trees 14 or more inches in diamater at the base but usually of little height. Most of the trees are one foot and less diameter at the base. No quantity of sufficient size for lumber

were seen in the vicinity of the Little Squaw Mill. Some good timber is said to be located at the mouth of Rock Creek, a tributary of the Middle Fork of the Chandalar below Grave Creek and about 14 miles from the mill. A limited amount can be obtained on Slate Creek and an un-named creek next West about 6 and 5 miles respectively from the mill. On the latter two creeks, the larger trees would have to be selected for the purpose required.

Practically all the timber is spruce, with some birch and willow. Lumber used in the district at present time, for sluice boxes, cabin floors, &c., is whip sawed by hand and costs at the saw between $200. and $300. per thousand feet board measure.

Fuel

Wood. Wood is the only fuel used in the Chandalar. The Little Squaw mill is sutuated at timber line and such timber as may have once stood in its vicinity has largely been cut, leaving only widely scattered trees. A usual method of preparing the green wood for fuel is to fall and trim the trees, cut them into 16 foot lengths, and "ross" the bark. That is, the bark is peeled with an axe on the top and two sidesand piled on stumps to dry. It is left for a year or more if possible, before using. Another method of drying wood fuel, is to burn during a dry season, the moss covering the surface of an area to be cut. The latter method has the advantage of requiring less time for drying, but the tree surfaces are burned to charcoal and some men object to handling it on that account.

Carlson and Buckley, operating a placer property on the Little Squaw Creek about one third mile above the Little Squaw Mill, obtain the wood used in their small plant about 2½ to 3 miles to the North below the mill. They state that it costs them $20.00 per cord in 16 foot lengths at their boiler house and is called "pole" wood.

Shaw & Nicholson operating a similar plant on Big Creek, haul their wood fuel 13 miles by a Cleveland Tractor, a small machine of Catarpillar type weighing 3800 pounds. Their wood, they inform me costs them $45.00 per cord, also in 16 foot lengths, delivered at their plant.

Some 70 cords of wood are piled at the inactive placer property known as the "Smith Camp" on Little Squaw Creek about a mile above the mill. This wood, together with that of Carlson and Buckley, and Shaw and Nicholson, all in 16 foot lengths, will average approximately seven inches in diamater at the butt and four inches at the small end. I was unable to learn the cost of the wood at the Smith camp as no one now in the district could supply the information.

Bids for wood delivered in 16 foot lengths at the Little Squaw mill and mine were received from Charles Schultz of Beaver. His bid for deliveries at the mill was $20.00 per cord, including piling. A standard cord of wood 3 inches inches in diamater contains 45% voids. A standard cord of wood 6 inches in diamater and over, contains 30% voids. It is estimated that it will require not less than three cords of the 16 foot wood to make two standard cords, when cut into four foot lengths and piled. On this basis, one and one half cords of the 16 foot wood will be necessary to make one standard 4 x 4 x 8 foot cord and based on Schultz's bid will cost at the mill $30.00 per standard cord. In addition to this the cost of cutting into short lengths and repiling, including the splitting of the larger pieces will cost not less than $4.00 per cord or a total cost of $34.00 per standard cord ready for the fire box.

No wood of greater length than 2½ feet can be used in the 30 H.P. boiler now at the Little Squaw mill.

Schultz's bid on wood for delivery at the Little Squaw Mill was the only reliable one obtained. His bid for mine deliveries, after a wagon or two horse road has been built, is $38.00 per 16 foot cord. In this connection it may be stated that the expense for feed for two horses in the Chandalar, together with the wages and board of one teamster, totals $30.00 per day.

Dissel Oil and Gasoline. The estimated Seattle price on dissel oil of 27 degree test is 5½¢ per gallon, or $55.00 per 100 gallon drum. A drum weighs filled, drum included about 1000 pounds, equal to 200 gallons per ton. Calculated on the quotation of Charles Schultz for freighting in 10 ton lots or over at $240.00 per ton, and including freight from Seattle to Beaver at $68.00 per ton in car lots, the cost at Little Squaw mill would be $2.09 per gallon. There is a Standard Oil Co. station at Seward and it is probable that oil supplies may be obtained at that point cheaper than from Seattle. A difference of 17¢ per gallon in favor of Seward is indivated by the respective freight rates to Beaver.

A 50 H.P. Fairbanks-Morse deisel oil engine would drive a 150 cu. ft. air compressor, the 4 stamp mill and crusher, also a small dynamo for mill and camp lighting. This engine would require not less than 2.5 gallons deisel oil per hour or 60 gallons per 24 hour day. However, the use of one engine for driving both the mill and compressor is impracticable unless the mill were moved up Little Squaw Creek to a point directly below the mine, the question of mill water requires solution, also an added cost will obtain for wood, deisel oil or any other supplies to be freighted to the mill, due to the 900 feet additional elevation above its present location.

Two 25 H.P. Fairbanks-Morse engines could be used. One at the mill and one at the mine, but this would require a duplication of engineers, and added fuel consumption.

Cordwood for use in the 30 H.P. vertical tube boiler now in the mill building is estimated at 2 standard cords or three cords of the 16 foot wood as cut in the district. Obviously, an air compressor could not be used in connection with this boiler when installed for mill drive.

The cost of gasoline delivered at the Little Squaw mill in 100 gallon drums under conditions similar to the above would be $2.40 per gal.

Labor

Boarding House Expense. Wages in this district are given below, and in addition board is furnished without expense to employees. The cost for board is said to average $4.00 per man per day. This information was given me by H. J. Patterson and confirmed by others in the district.

Miners	$6.00	Blacksmith	$7.00
Cooks	7.00	Laborers	6.00
Engineers	8.00	Tractor driv.	8.00

Mill men would expect a wage equal to that of engineers.

There are at present in the district within a radius of 15 miles from the Little Squaw mill a total of 11 men. Four on Big and Little Squaw Creeks, four on Big Creek, and two on Trilby Creek, and one on Baby Creek, all placer miners engaged in prospecting with the exception of five who are operating three placers. See "Placer Claims" in this report. No men other than trappers or natives, with two or three exceptions, are to be found nearer than Fairbanks, Fort Yukon or in the Koyukuk region.

Little Squaw Mill Camp

This camp consists of three cabins, a cache and a stable, all in good condition. The mill building, unnecessarily large for the equipment expected to be installed, is in a bad state of repair, not strongly constructed, and will require dismantling and rebuilding before it should be used.

The building has been shifted at various points by action of frosts and the building up of glacier ice from the spring adjoining. A mortar block, if installed at the present site of the building, would likewise be moved and the can shaft bearings probably thrown out of line, causing difficulty in operation. The 30 H.P. boiler and the 20 h.p. engine, both installed require resetting, having been badly disturbed by frost. A new location in dry, or at least frozen, ground should be found and the building re-erected. From an examination of the two mill sites belonging to the Company, it is improbable that a point can be found on either of them where bedrock is sufficiently close to the surface to permit the setting of the mortar block on it. It is apparent that this building was placed at its present location in order to make easily accessible for mill use the water from the spring referred to. This spring does not usually freeze, there being open water, I am told, at most times. At the date of my visit, Jan. 18th to 29th, 1925, the temperature of the water in the small creek flowing from the spring, 30 feet from the mill and near the Spring, was plus 33.5 degrees F. This reading was taken during a somewhat extended cold period and immediately after a day during which the atmospheric temperature reached a point -42 degrees F.

The mill building is constructed of logs, somewhat small but in good condition, and dry. If the building is rebuilt and the size properly reduced to fit the equipment, the 3 stamp mill discarded as it should be, sufficient logs would be available to complete the building, with the possible exception of timbers for crusher, orebin foundation, &c.

Mill Assay Office and Equipment.

One of the log cabins at the mill camp was built for use as an assay office and is amply sufficient for that purpose. The assay equipment with the possible exception of the furnaces, is of no value for accurate work and is incomplete. No chemicals to speak of in usable condition remain and the balances are not suitable for the work intended.

Little Squaw Mine.

The tunnels of the Little Squaw Mine are situated approximately in the center of the Little Squaw Claim, located on the top of the ridge

separating Big and Little Squaw Creeks. The elevation of No. 1, or the main tunnel above the Little Squaw mill and timber line is 1806 feet.

The vein, occurring in what is known as the Birch Creek schists, has an East-West strike, paralell with the bedding planes of the schist and dips 63 degrees to the South. No. 1 tunnel, 192 feet in length, has been driven on the vein for a distance of 92 feet. From that point to the face of the tunnel, the latter has followed the footwall of the vein, leaving it, for most part, intact. A winze has been sunk 56 feet deep at a point 140 feet from the portal and at 160 feet from the portal a raise has been driven 67 feet up to the broken surface rock but not thru to the surface, a distance of less than ten feet remaining.

Near the face of the tunnel the vein is displaced by a fault bearing N. 49 W. and having on the tunnel level a dip of 76 degrees to the Southwest. I am informed that this fault is visible on the surface, and that the vein has been found on the surface beyond it, but owing to the quantity of snow I was unable to verify this statement.

On the tunnel level the vein has an average width of 3.6 feet, but in the raise is apparently wider, narrowing in the winze as may be noted on the map accompanying this report. The first 30 feet of the tunnel is timbered and could not be inspected or sampled. In the remaining 62 feet to the point where the tunnel leaves the vein and proceeds in the footwall, two distinctly different characters of quartz are to be seen. On the footwall, banded or ribbon quartz occurs averaging 16 inches or more in width, and the remainder of the vein towards the hanging wall is composed of a hard, coarsely crystalline, dense quartz. Between the bottom of the raise and the fault at the face of the tunnel, some 4 to 9 inches of banded quartz also occurs and at one point just beyond the raise toward the face, an excellent speciment of banded quartz containing free gold was obtained.

The raise has been driven in the footwall and up to the time of my visit the vein in the raise had not been broken into. The vein dip in the raise is regular but at 27 feet below the tunnel in the winze, the vein flattens to 53 degrees at 33 feet, 43 degrees at 45 feet and at the bottom of the winze is 58 degrees, somewhat near its regular dip. Folding stresses in the schist at these points have caused ruptures across the bedding planes and these openings have been filled with quartz forming stringers from the main vein. The winze also follows the footwall for half its depth until the narrowing and breaking up of the vein into stringers permitted easy removal of the quartz to the hanging wall.

At the time of my arrival at the mine, there was about five feet of loose, broken rock in the bottom of the winze which had not been removed. I had this taken out and found that the vein in the extreme bottom consisted of 10 inches of solid arsenopyrite and 10 inches of quartz, separated by an equal width of schist. See an accompanying map.

In the main tunnel, between where it leaves the vein, and the face only two or three crosscuts to the hanging wall had been made. I had, at various places, sufficient drill holes put in and blasted to break thru to the hanging wall in order to permit examination and to make moil samples. The vein in this section is now exposed for most part in nine places. Additional samples to those taken in the raise and winze were contemplated, but a shortage of blacksmith coal for sharpening drill steel prevented.

Charcoal was tried for that purpose, but with little success.

Sampling

Upon reaching the mine, most of the surface of the underground openings were covered with a thick coating of frost and ice. This was removed as much as possible before sampling. Samples were taken by moil on a clean canvas of ample size, dumped into a tin box, and sacked. In the following list of assays, those letters succeeding the sample number indicate by whom taken. All moil samples were taken by the writer and are distinguished by the Letter "T". The others are sludge samples or drill cuttings from holes drilled thru the vein at right angles to its dip and the men drilling the holes are indicated by the respective letters.

The assays were made Feb. 20th, 1925, by Paul Hopkins, analytical Chemist and Mineralogist of the U. S. Bureau of Mines, at Fairbanks, Alaska. All samples were passed thru a 100 mesh screen and where metallics were found they were indicated by the letter "M". Silver contents, while not requested, were also given by Mr. Hopkins.

A s s a y s.

Tunnel Samples

No.	Dist. from Portal	Width FW	Width HW	Width Vein		Ozs. Au.	Ozs. Ag.	Total Ozs. Au.	Total Ozs. Ag.	Description
1T	30.6			3.0		.32	.05			Includes banded quartz on footwall. Tunnel not to hanging wall. Sample 1 to 5 inc.
					m	.71	.10	1.03	.15	
2T	34.3			3.4		.20	.04			Banded quartz on footwall and in center. Balance coarse hard quartz
					m	.45	.07	.65	.11	
3T	39.1			4.6		.66	.15			Same No. 2. Vugs on hanging wall side filled with large well formed crystals of quartz
					m	.19	.03	.85	.18	
4T	44.0			4.6		.30	.06			Same except only 16" banded quartz on footwall
					m	.09	.02	.39	.08	
A5T	49.0	1.3				2.12	.50			
					m	2.74	.43	4.86	.93	BANDED QUARTZ ONLY
B5T	49.0		2.2			.02	tr	.02	tr	Coarse blocky quartz on hanging wall very hard.

TUNNEL SAMPLES

No.	Dist. from Portal	Width FW	Width HW	Width Vein		ozs. au.	ozs. ag.	Total ozs. au.	Total ozs. ag.	Description
6T	54.0			5.0		.52	.20			
					m	.02		.54	.20	Banded quartz on footwall.
A7T	59.1	1.3				.58	.20			
					m	.50	.07	1.08	.27	Same as A5
B7T	59.1		3.0			.02	tr	.02	tr	Same as B5
A8T	64.1	1.0				4.02	1.0			
					m	2.37	.38	6.39	1.38	Banded quartz
B8T	64.1		2.9			.06	.02			
					m	.09	.02	.15	.04	Coarse hard quartz.
A9T	69.0	1.5				1.52	.30			
					m	2.82	.44	4.34	.74	banded quartz
B9T	69.0		2.1			.02	tr	.02	tr	Coarse hard quartz.
10T	74.2			3.0		.92	.30			
					m	1.36	.21	2.28	.51	1.5' banded quartz on footwall. 1.4' hard dense quartz on hanging wall.
A11T	79.3	1.5				1.42	.40			
					m	3.95	.58	5.37	.98	Banded quartz
B11T	79.3		1.3			.01	tr	.01	tr	Coarse blocky quartz
12T	84.1			3.4		.46	.10			
					m	.48	.07	.90	.17	2' banded quartz on footwall. 1.4 coarse quartz on hanging wall.
13T	89.0			3.5		.28	.10			
					m	.42	.07	.70	.17	8" banded quartz on footwall. 2.7 coarse hard quartz on hanging wall.
14T	92.0			3.6		.14	.08			
					m	.21	.04	.35	.12	Occasional band for about 2.4' balance sample hard quartz.
A15T	101.2			3.7		.26	.15			
					m	.07	.02	.33	.17	Friable white qutz. on footwall coarse hard qtz on hang.wall.

No.	Dist. from Portal	Width FW	Width HW	Vein		ozs. au.	ozs. ag.	Total ozs. au.	Total ozs. ag.	Description
B15W	101.2			.9		.01	tr	.01	tr	Sludge from drill hole from S and of sample A15T to hanging wall.
A16T	109.5			4.0		.06	.10			Vein badly shattered.
					m	.04	.01	.10	.11	qtz.reconsolidated giving brecciated appearance for 3' on footwall. Some large quartz crystals up to 2" dia. in silicious matrix, which is sometimes oxidized.
B16W	109.5			.8		tr	tr	tr	tr	Sludge from drill hole to complete Sample A16T
17T	124.6			3.7		.02	tr	.02	tr	Occasional small bunch of arsenopyrite on footwall side of vein.
19T	142.5			4.8		.04	tr	.04	tr	Softer quartz somewhat shattered. No sulphides.
A20T	153.0			2.4		.01	tr	.01	tr	White barren appearing quartz on footwall side.
B20N	153.0			1.2		.02	tr	.02	tr	Sludge from drill hole to complete A20T
21T	158.5			3.2		.18	.03			
					m	.18	.03	.36	.08	9" banded quartz on footwall balance is coarse hard qtz.
22NW	173.			2.0		.12	.10	.12	.10	Sludge from drill hole across vein. Was afterward blasted exposing 8 to 12" banded qutz. on footwall.
23T	186.4			1.9		.04	tr	.04	tr	Across hard white qtz. at fault.
A26T	132.5			1.9		.05	tr			
					m	.02	tr	.07	tr	4" banded quartz on footwall balance hard white quartz.
B26T	132.5			2.0		.04	tr	.04	tr	Sludge from drill hole to complete Sample A26T.

Raise Samples

No.	Dist. from Portal	Width of Vein	Assays ozs. au.	ozs. ag.	Total ozs. au.	ozs. ag.	Description
A27T	22.0 up	1.9	.42	.15			
			m .28	.05	.70	.20	Qtz. slightly exidized a few specks sulphide on footwall.
B27W	22.0 up	2.6	.04	tr	.04	tr	Sludge from drill hole to complete Sample A27T
28BP	54.0 up	3.3	2.34	.45			
			M 5.08	.67	7.42	1.12	Sludge from drill hole partly across vein. Not thru to hanging wall.

Winze Samples

18C	18.5 down	1.7	1.06	.35			
			m 2.51	.32	3.57	.67	Sludge from drill hole.
24T	bottom	.8	.22	.10	.22	.10	8' hanging wall streak solid arsenopyrite.
25T	Bottom	.8	.03	tr	.03	tr	9' quartz on footwall.

With one exception, no free gold was removed from any of these samples before assaying. One very small piece of free gold was seen in sample No. 10T and while being examined, was accidently dropped and could not be recovered. All other samples were assayed precisely as they were taken from the mine.

It will be apparent from these samples that practically the entire gold content of the vein is confined to the streak of banded quartz on the footwall, and that the hard, solid quartz constituting the remainder of the vein contains no appreciable values. The bands in this footwall portion are separated by very thin seams of arsenopyrite, altered and more or less decomposed, probably little of the iron remaining. It is well known that arsenical ores are among the most difficult to amalgamate, the arsenic fouling the mercury and amalgam and sliming the plates.

Referring again to the banded quartz on the footwall. This footwall shoot begins in the tunnel somewhere in the timbered portion near the portal. The first 30 feet beyond the timbers toward the face averages 16 inches in width and 4.34 ounces Au. The next 30 feet extending to the offset where the tunnel was begun in the footwall, the values are less, declining to .35 ounces Au. at the offset. At this point, the width of the bands are greater and the banded quartz constitutes 2.4 feet of a total width of 3.6 feet.

From the offset in as far as the raise, a distance of 70 feet, in no part of the vein, either in the footwall or hanging wall side did samples assay more than .10 ounces Au., with the exception of A15T, taken in the footwall next the offset in the tunnel, and which assays .33 ounces Au. This section, on the tunnel level, may be said to be barren.

What may be called a second footwall shoot occurs between the foot of the raise and the fault. The banded quartz at this point varies in width from 4 to 9 inches.

Sample A27T from the raise indicates values in the footwall as B27W taken in the hanging wall side at the same point assayed only .04 ounces Au.

The origin of the gold in certain quartz veins in the district, to which the Little Squaw vein is similar, is due, in the opinion of Maddren, U. S. Geological Survey, Bull. 532 to their connection "in zones of contact alteration surrounding or connecting bodies of dioritic intrusive rocks." The surface in the vicinity of the Little Squaw Mine does not appear to have been subjected to glaciation. Many of the higher elevations are capped with dikes or ridges of intrusive rocks and erosion has worn away the softer schists, leaving the intrusives exposed in relief.

Tunnels Nos. 2 and 3.

These tunnels are situated directly East of and below No. 1 tunnel. No. 2 is 25 feet long and No. 3 11 feet. No vein is exposed in No. 3 tunnel and No. 2 had caved so that the face could not be examined. Supt. Patterson, however, advises me that the vein had not been located by this work.

The superintendent also informed me that an outcrop of quartz occurs on Crystal No. 2, the most Easterly claim in the Little Squaw Group, that only a small amount of surface work had been done, and that it would be impossible to see it on account of snow. I therefore did not attempt to examine it. It lies at an elevation of 2900 feet above the Little Squaw mill building.

Eneveloe and Duplex Groups. KT 31-16

These groups were not visited because of snow preventing a surface examination. No underground work has been done on either of them.

Mikado Group KT 31-12

This group lies at the head of the East Fork of Tobin Creek which flows into Chandalar Lake and the portal of the tunnel on the Tobin Claim of the group is situated at an elevation of 2350 feet above the Little Squaw Mill, but over a much higher summit separating Big Squaw and Tobin Creeks. There is a cabin of small dimensions at the tunnel. Eleven years ago a shaft was sunk for a depth of 104 feet on a quartz vein outcropping on the hillside North of the Creek. I am informed by Frank Yasuda of Beaver, one of the owners at the time this work was done, that the shaft was not timbered, being in frozen ground, and that it has long since caved from surface thawing in the summers. He informs me that this shaft followed the vein on its dip

for a distance of 42 feet and from that point to the bottom the vein and shaft were vertical, the bucket used in sinking not touching the walls when being raised and lowered. A tunnel has since been driven 456 feet in length in an effort to cut the vein about 200 feet in elevation below the shaft. No vein was encountered by this tunnel. No surface examination was possible at the time of my visit because of snow. A small amount of placer mining was done some years since in the Creek below the Mikado Group but none of the claims have been recently operated.

Schultz Group.

This property lies on the extreme top of the ridge between Little Squaw and Big Creeks, at an elevation of 2550 feet above Little Squaw mill, and is the property of Chas. Schultz of Beaver. The surface was snow covered and could not be examined. The underground work as I was informed by Schultz consists of a shaft 60 feet in depth and a drift of 80 feet on the vein. The shaft was filled with ice and has not been opened for several years.

Schultz could not give me any information as the value of the ore in this vein, said to be five feet in width.

Roberts Group.

The claims owned by Joseph Roberts of Beaver lie near the head of Big Squaw Creek. A vein outcrops at right angles to the ridge, in strike practically parallel with the Eneveloe Outcrop. Barometer readings at the outcrop and at the tunnel below indicated a difference in elevation of 80 feet. No vein was found in the tunnel, and its width could not be ascertained on the surface at the time of my visit.

Placers

The placer claims located on Big Creek in 1924 for the Company are situated 3 to 5 miles below the camp of Nicholson & Shaw who are operating on Claim No. 5 below upper discovery. The value of these claims can be determined only by considerable prospecting. For use in thawing ground in this connection, cordwood costing $45.00 per cord has prevented much activity. Shaw and Nicholson inform me that the ground they are now working will average $1.50 per square foot of bedrock for the thickness of the pay streak.

D. A. Murphy, Recorder and U. S. Commissioner lives 14 miles below upper discovery, on Big Creek.

Bedrock on No. 5 below Upper Discovery is 19 feet below the surface.

John Rasmussen is preparing to sink a shaft to bedrock a short distance above the Shaw & Nicholson shaft.

Placers on Little Squaw Creek

Carlson & Buckley have sunk a shaft on claim No. 1 below Discovery and are now crosscutting their pay streak. This crosscut on Jan. 29, 1925 was in 30 feet and was still in pay gravel. They claim to have values averaging $1.50 per sq. ft. of bedrock, which, at this point, is 165 feet from the surface. They are using a steam hoist, the only one in operation in the district.

Jos. Wilks is taking out pay dirt on No. 4 above Discovery. He says the amount of gravel available is small and I did not learn its value. He is working alone. Bedrock is about 30 feet deep.

Oscar Otterson has sunk a shaft single handed for a distance of 65 feet, on a claim not far from the Little Squaw mill. He has not reached bedrock at that depth.

When I left the camp Otterson had gone to assist Newton who is prospecting on Trilby Creek, a tributary of the Middle Fork of the Chandalar. Newton also owns some hydraulic ground on Big Creek a short distance above the Shaw & Nicholson operation. This ground he operates in the Summer.

Anderson, a placer miner, is prospecting on Baby Creek which flows into the Chandalar River above Chandalar Lake a short distance.

This constitutes the present placer activity in the entire district. No quartz prospecting or mining is being done.

Powder

Powder at the Little Squaw Mine under present freighting conditions costs about $720.00 per ton.

Mill Machinery.

An estimated weight of 17½ tons of mill machinery is now at Beaver, about 6600 pounds at Caro, 2000 pounds at Flat Creek stable, a building used as a relief cabin 17 miles from Caro, and at two points along the trail between Flat Creek and Grave Creek are a few boxes discharged from loads to lighten them when enroute to the mine. This machinery, some of the smaller parts in boxes, has been lying in the weather for fourteen years. However, it is in remarkably good condition, considering the time it has been exposed, and is not seriously damaged by rust.

REPORT ON THE PROPERTY OF THE CHANDALAR GOLD COMPANY

Chandalar Precinct, Beaver P. O. Alaska, January, 1925.

By G. L. THOMPSON

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The property of this Company is situated about 120 miles to the Northwest from the village of Beaver, on the Yukon River, and about 250 miles from Fairbanks, Alaska. It lies in the foot-hills of the Endicott Range which forms the Yukon Arctic divide, and at an elevation above sea level of from 2500 to 5500 feet.

Lode Claims

The lode claims now of record in the name of the Chandalar Gold Company are, the Little Squaw, Big Squaw, Sine, Cosine, Cosine Fraction, Crystal and Crystal No. 2, which compose the Little Squaw Group, and are located on the divide between B ig and Little Squaw Creeks.

Also the Duplex Group, consisting of the Duplex, Triplex and Quadruplex claims, situated likewise on the ridge between Big and Little Squaw Creeks and to the north of and parallel to the Little Squaw Group.

In addition to these is the Star Group, containing the Star, Morning Star, Evening Star and Star Fraction, located on the divide between Big Squaw Creek and Big Creek.

The Mikado Group, with the exception of a three quarter interest in the Tobin Claim, was formerly owned by the Company, but were relocated in July, 1923, and again in December, 1924, in the name of one Solomon Smith. The group contains the Mikado, Little Mikado and Tobin Claims and is situated at the upper end of the East fork of Tobin Creek.

The Eneveloe Group, also formerly owned by the Company, but relocated on the above dates in the name of Solomon Smith, consists of the Eneveloe, Bonanza and Golden Eagle claims and is situated on the ridge between Big and Little Squaw Creeks, to the South of the Little Squaw Group.

Placer Claims

The Company also located in 1924, six placer claims on Big Creek, Nos. 13, 14, 15, 19, 20 and 21 below upper Discovery. Also the Crystal Placer Claim in Crystal Gulch, a tributary of Little Squaw Creek.

Two Mill-Sites are of record in the name of the Company, the Little Squaw and the Cosine mill sites. They are situated on Little Squaw Creek, at about the edge of timber line.

Owing to the extreme isolation and other somewhat unusual conditions connected with this property, details of a nature not commonly included will be given in this report in order that it may be as complete as possible, and that a record may be had of the information obtained at considerable expense during this examination.

Transportation

Roads and trails. Access to the property from Beaver, on the Yukon River, is had by means of a road from that point to Caro on the main Chandalar River, a distance of 75 miles. Owing to the surface being covered with from one to two feet of snow at the time of my visit I was unable to see its nature along the road. I am advised, however, that 1500# can, in summer, be hauled by a two horse team over this road from Beaver to Caro without much difficulty. Relief cabins, some built and occupied as stables, occur along this road. Hauling by horses during the winter is possible, over good sled roads, if kept broken, but the present small requirements of the Chandalar are taken care of by dog teams. The only person living along the road from Beaver to the Little Squaw at the present time is Charles De Bien, who conducts a road house at Caro.

From Caro to Little Squaw, a trail is used which is a pack horse trail in summer and a horse or dog sled trail during the winter months. This distance is 48 miles.

The trail from Fairbanks to B eaver, beginning at Olnas, a station on the Government Railroad, is distinctly a winter trail only, and is impassible for horses for any industrial purpose at any other time. Near Beaver, in winter, this trail crosses the Yukon Flats, and one travels for a number of miles over frozen lakes, sloughs and streams. I am told that this section, in summer, is difficult to travel even by men on foot. So far as I am able to learn, no horses have ever been used on this trail in winter, but on a part of it, the Alaska Road Commission have, in summer, used horses in packing a limited quantity of supplies from Olnas to their road crews at work when the trail was out through. No one lives along this trail between Olnas, 21 miles from Fairbanks, and Beaver. No bridges have been built, excepting a few near Beaver, and there are no cables with trolleys crossing any of the streams. On the other hand bridges have been constructed over the smaller creeks on the Beaver-Caro trail, but for heavy freighting, as with caterpillar tractors, it would be necessary to rebuild or strengthen some of them.

There is a cable crossing the Chandalar River at Caro, but none on this trail at the Middle Fork of the Chandalar River.

As stated, transportation in winter at the present time, between Beaver and Little Squaw is confined to dog teams. The standard rate for that distance is 15¢ per pound, dry freight and 18¢ per pound for perishable articles. A quotation was received from Chas. Schultz of Beaver, of 12¢ per pound, Beaver to Little Squaw Mill site, in quantities of 10 tons or over, and 15¢ per pound for weights under that amount. Schultz would use horses for freighting, and owns the only horses in the District, a total of eight head.

Tractors. Quotation on a 5 ton Best catarpillar tractor was furnished me by Frank McCafferty, agent for the C. L. Best Tractor Co., in Fairbanks. The price, quoted December 26th, 1924, on this machine, equipped as the "Snow Special" including lights, cab and stationery drive pulley attachment, was $4400.00 F. O. B. Seattle. Freight to Fairbanks was quoted by Mr. McCafferty at $75.00. Bob sleds cost approximately $150.00 each F. O. B. Fairbanks, and wagon trailers, for possible summer use, were quoted at $600.00 each F. O. B. Fairbanks. The wagon trailers quoted were furnished with three foot wheels and 6 inch tires. The wheel diameter should be increased to not less than four feet and the width of tire to 10 or 12 inches.

It would appear that the use of such a tractor with bob sled equipment, in winter would be the most practicable manner in which to move freight, if the tonnage warranted the initial expense.

All supplies and material necessary for a year should be delivered at Beaver before the close of navigation so as to permit freighting to the mines during the winter. No stock of food and supplies in appreciable quantity is kept in the store at Beaver, for the reason that the amount necessary for local use only is purchased each season. Arrangements can be made with Frank Yasuda, store-keeper, to handle food and other usual supplies for the Company on a 10% basis. This would include transfer and warehousing until desired.

Freight Rates. Rates have been quoted over both of the two available routes: From Seattle to Skagway, over the White Pass Ry. from Skagway to White Horse and down the Yukon River to Beaver. Also from Seattle to Seward, over the Alaska Railroad from Seward to Nenana, down the Tanana River to the Yukon and up the Yukon River to Beaver.

Seattle to Beaver per ton.

		Alaska R.R.	White Pass.
Gasoline, dissel and lubricating oils,	LCL	79.80	93.00
Same	CL	68.00	
Mining machinery and hardware	LCL	55.00	77.00
Food staples, 2 classes	LCL	72.80	77.00
		87.80	93.00
Same	CL	58.00	

Alaska Railroad rates include all transfer charges from Nenana to Beaver, and it will be noted that rates over this route are the cheaper.

River Boats. During the summer of 1924, a White Pass boat left Dawson, Y. T. for Nenana, on the first and fifteenth of each month. Nenana is a station on the Alaska Railroad also situated on the Tanana river, a tributary of the Yukon River. This service gave Beaver two down river and two up river calls per month. It is probable that the same or a similar schedule will be effective during the season of 1925. No. U. S. Government boats cover the Yukon River above the mouth of the Tanana.

Air Planes. The possibility of airplane service between Fairbanks and the Little Squaw has been suggested and a statement made that a landing field would be necessary at the latter point. It would seem to the writer that such a field is unnecessary for the reason that Squaw Lake, about 1⅛ miles distant from the Little Squaw Mill camp offers an excellent spot for the landing of airplanes, equipped with pontoons during the summer months

and with skis during the winter. At the time of my visit to this lake, on Jan. 29th, 1925, it offered a perfectly smooth surface of snow over the ice, and as the lake is about three miles long by 1½ miles wide, ample space is available.

I am informed by officials of a Fairbanks airplane company in the transportation business, that they intend to have a new machine available for use in this district during the coming season, with a passenger capacity of 6 persons, exclusive of the pilot, or a freight carrying capacity of 1000 to 1200 pounds. No rate for freight has been quoted. This machine is to be equipped so that either wheels, pontoons, or skis can be used as desired, and will be so constructed as to permit winter operation.

The cost for passenger fares has been and is expect to remain $1.00 per mile for the distance the passenger is carried, and this manner of traveling to or from isolated points is without doubt the most economical, even when the difference in the required time is not taken into consideration.

Postal and telegraphic communication. During the summer of 1924 mail was received at Beaver, by White Pass boats from Nenana on the Alaska Railroad, twice each month, approximately the 12th and 24th. During the winter mail reaches Beaver once each month, being dispatched from Nenana, thru Fairbanks, thence to Circle by horse stage weekly. From Circle to Fort Yukon twice each month by dog team and from Fort Yukon to Beaver, also by dog team once each month. The time required for a letter to reach Beaver from Nenana or Fairbanks, necessarily depends upon the date it reaches Circle and Fort Yukon and the connections made at those points.

A powerful wireless station operated by the Signal Corps of the U. S. Army is located at Fort Yukon. Messages addressed to Beaver are delivered by the mail carrier from Fort Yukon on his monthly trip in Winter, and arrive at Beaver about the 18th, 3 days after the mail carrier leaves Fort Yukon.

From Beaver to Little Squaw both mail and messages are carried by any responsible person who may be making the trip. At the time of my visit the mail for Little Squaw and Big Creek which arrived at Beaver Dec. 18th had not yet been received. I arrived at Little Squaw Jan. 18th and at Big Creek Jan. 27th. The mail left Beaver early in January.

Climatic conditions. The ice on the creeks and lakes, I am reliably informed, breaks up each Spring about the 15th of May and the thawing of snow and ice continues, with a drainage of the resulting water, until the 10th to the 15th of June and by July 1st, the roads and trails are in a fair condition. The snowfall is not excessive.

At the Little Squaw, its depth, Jan. 29th, 1925, was 14 inches. The greater storms occur in February and March. The deepest snow noted on the entire trip from Fairbanks to the Little Sqaw and return, was about half way between Fairbanks and Beaver, where a depth of 2½ feet was found. The depth of ice formed on the streams and lakes varies with the degree of exposure, current, &c. If cold weather occures before much snow has fallen greater thickness of ice obtains than when a blanket of snow protects the surface. Ice on Big Squaw Lake on Jan. 28th, 1925, was about 20" thick. Prospectors living at Little Squaw state that the present winter snow fall is much heavier than usual.

Some of the streams, including the Chandalar River, which at Caro is 300 feet wide, freeze to the bottom on the riffles. Where this occurs the water in the stream above breaks thru and flows over the top of the ice. This condition is known as an "overflow". Repetition of these overflows and consequent freezing build up "glaciers" often filling a stream full of ice level with its banks and causing the main curring to find new channels. At times the water in these overflows on top of old ice, reaches a depth of two or three feet or more. The smaller streams, if not carrying sufficient water to keep them open, freeze solidly their entire length and depth.

Temperatures at the Little Squaw in winter are more moderate than at lower elevations. A marked difference was noted between the Little Squaw Mines and the Little Squaw Mills, only slightly more than two miles distant, but the former at an elevation of 1806 feet above the latter. The lowest temperature recorded at the Little Squaw Mill during my visit was minus 42 degrees F.

Temperatures.

Date	Time	Place	Weather	Degrees F.
Jan. 1	2 PM	Snowshoe Cabin	Snow and cold	- 1
2	9 AM	Bluff Cabin	Cloudy	- 0
3	8 AM	"	Snow and wind	-12
4	9 AM	Moose John Cabin	"	-10
5	8 AM	Tent. Victoria Cr.	"	- 4
6	7 AM	Victoria Cabin	Clear	-36
7	7 AM	"	"	-26
8	8 AM	Rat Cabin	Partly Cloudy	-12
9	8 AM	Beaver	Clear	-23
10	8 AM	"	"	-40
11	9 AM	"	"	-36
12	8 AM	"	Slight snow	-20
13	6 AM	"	Partly Cloudy	-28
13	8 PM	24 Mile Cabin	Clear	-50
14	6 PM	46 Mile Cabin	Wind	-10
15	8 PM	Caro	Snow and wind	- 4
16	9 PM	Flat Cr. Cabin	Clear	-34
16	9 AM	Caro	"	-13
17	7 AM	Grave Cr. Cabin	"	-36
18	8 AM	"	Partly Cloudy	-31
19	8 AM	Little Squaw Mill	Clear	-37
20	7 AM	Little Squaw Mill	Clear	-39
21	8 AM	"	"	-39
22	8 AM	"	"	-42
23	8 AM	"	"	-39
24	7 AM	"	"	-36
25	7 AM	"	"	-28
26	8 AM	"	"	-27
27	8 AM	"	"	-26
28	6 PM	Big Creek		-16
29	8 AM	Big Squaw Lake	Partly Cloudy	-24
30	8 PM	Grave Cr. Cabin	"	-37
31	5 AM	Grave Cr. Cabin	"	-47
31	8 AM	"	"	-47
31	5 PM	Caro	"	-48

Date	Time	Place	Weather	Degrees F.
Feb. 1	9 AM	Caro	Clear	-58
2	6 AM	Caro	Wind	-40
3	8 AM	Mile 46 Stable	Cloudy	-12
3	7 PM	Mile 46 Stable	Snow and Wind	-14
4	8 AM	Mile 46 Stable	Clear	-40
4	9 PM	Beaver	Clear	-34
5	8 AM	Beaver	Clear	-45
6	7 AM	Beaver	Snow	-38
7	7 AM	Beaver	Partly clear	-34
8	8 PM	Mile 17 Cabin	Partly clear	-27
9	8 AM	Mile 17 Cabin	Clear	-46
9	9 PM	Mile 34 Cabin	Clear	-52
10	9 AM	Mile 34 Cabin	Clear	-34
11	6 AM	Victoria Cabin	Snow	-18
11	8 PM	Moose John Cabin	Snow and wind	- 0
12	8 PM	Fossil Cabin	Wind Clear	- 7
13	7 PM	Bluff Cabin	Partly Cloudy	- 7
14	8 PM	Snowshoe Cabin	Clear	- 1
15	8 PM	Fox	Clear wind	- 6
16	M	Fairbanks	Clear	- 9

I am unable from personal knowledge of the district to comment on the summers. I am informed that the "break up" occurs as stated, about May 15th, and the "freeze up" about October 15th, and that the summers are warm and pleasant. By some persons I am told that mosquitoes are plentiful and by others that the period is short in which they are active. I note, however that mosquito tents are a necessary part of the equipment of those who travel or live in the district during the summer. It is said that other insects are also common to the country, black flies, gnats, &c., their propogation probably made favorable by the large number of swamps and sloughs and stagnant water.

At Caro on Feb. 1st, 1925, the sun at 12 M reached a height of 3 degrees 50 minutes from the horizontal. The short winter and long summer days are well known.

Food supplies. The usual mining camp food supplies can, when in stock, be obtained at the store of Frank Yasuda, at Beaver, or can be shipped in from Seattle or Fairbanks during the season of open navigation. Some Beaver prices are given, based upon Yasuda's quotations the current cost of freight to Little Squaw added.

Flour per bbl.	$ 50.00
Swift's premium bacon per lb.	.70
Swift's premium ham per lb.	.60
Butter 48# c/s 60# gross,	40.00
Eggs fresh c/s 53# gross,	24.25
Rolled oats 90# bag	24.50
Condensed milk, 60#	24.50
Potatoes, per ton,	560.00
Sugar per 100#	28.00

Fresh meat for camp use can be obtained from the herds of caribou in the vicinity of the mine at the expense of shooting them and caring for the meat. Winter meat is killed about the middle of September and is very palatable. Moose are common and furnish a portion of the meat supply. The superintendent at the property advises that the one time when he had to purchase meat the price was 25¢ per pound for caribou and 30¢ per pound for moose. He also states that in the summer grayling and whitefish are obtainable in most of the lakes and streams.

Water Power. An investigation was begun of a proposed hydro-electric power site in the canyon of the Chandalar River about 60 to 8 miles below Chandalar Lake, but when it was learned that this project was located about 20 miles from the mine, that there are only rapids and no abrupt falls in the Chandalar River at any point, and that the proposed development at the site indicated required a dam of considerable size, the investigation was dropped and no personal examination made. Likewise, a site at the lower end of Chandalar Lake, located some years ago by a former General Manager for the Company, was not considered for the reason that this site for development necessitates the construction of a dam across the river immediately below the lake, which dam would be approximately 700 feet in length. In both these projects, the development of power would require the installation of turbines, due to the low heads available, As stated these two sites were not visited by the writer, and the statements above made are based upon information furnished by Supt. Patterson and confirmed by numerous persons in the district.

Two other proposed sites were examined, one on Lake Creek which flows out of Big Squaw Lake into the North Fork of the Chandalar River. This site is about 6 miles distant from the Little Squaw Mill, and requires a pipe line of not less than a mile in length in order to obtain an approximate head of 150 feet. It has no dam site.

A surface pipe line, even of a short length, is considered by the writer to be impracticable in a country subject to extremes of temperature as low as those obtaining in the Chandalar.

The other site examined is situated on Grave Creek, a tributary of the Middle Fork of the Chandalar River and about 11 miles from the Little Squaw Mill. It is located in a canyon and requires a dam, the construction of which and the installation of the necessary machines would necessitate the expenditure of a sum of money not warranted by the present development of the District. It is however, the most feasable of any of the sites suggested or even possibly available. Barometer readings indicate a difference in elevation between the damsite on this creek and a point 1.5 miles above, of 204 feet. No abrupt falls which permit the cheapest development of water power, exist on any of the streams in the Chandalar District.

Lumber: The timber in the interior of Alaska generally, is quite small and little of it fit for lumber. There are however, along some of the streams small bunches of comparatively large spruce trees, some of which are 18 to 24 inches in diamater at the base, in areas protected from the wind and probably in deeper or richer soil. There are also among the usual small timber occasional trees 14 or more inches in diamater at the base but usually of little height, Most of the trees are one foot and less diameter at the base. No quantity of sufficient size for lumber

were seen in the vicinity of the Little Squaw Mill. Some good timber is said to be located at the mouth of Rock Creek, a tributary of the Middle Fork of the Chandalar below Grave Creek and about 14 miles from the mill. A limited amount can be obtained on Slate Creek and an un-named creek next West about 6 and 5 miles respectively from the mill. On the latter two creeks, the larger trees would have to beselected for the purpose required.

Practically all the timber is spruce, with some birch and willow. Lumber used in the district at present time, for sluice boxes, cabin floors, &c., is whip sawed by hand and costs at the saw between $200. and $300. per thousand feet board measure.

Fuel

Wood. Wood is the only fuel used in the Chandalar. The Little Squaw mill is situated at timber line and such timber as may have once stood in its vicinity has largely been cut, leaving only widely scattered trees. A usual method of preparing the green wood for fuel is to fall and trim the trees, cut them into 16 foot lengths, and "ross" the bark. That is, the bark is peeled with an axe on the top and two sidesand piled on stumps to dry. It is left for a year or more if possible, before using. Another method of drying wood fuel, is to burn during a dry season, the moss covering the surface of an area to be cut. The latter method has the advantage of requiring less time for drying, but the tree surfaces are burned to charcoal and some men object to handling it on that account.

Carlson and Buckley, operating a placer property on the Little Squaw Creek about one third mile above the Little Squaw Mill, obtain the wood used in their small plant about 2⅔ to 3 miles to the North below the mill. They state that it costs them $20.00 per cord in 16 foot lengths at their boiler house and is called "pole" wood.

Shaw & Nicholson operating a similar plant on Big Creek, haul their wood fuel 13 miles by a Cleveland Tractor, a small machine of Caterpillar type weighing 3800 pounds. Their wood, they inform me costs them $45.00 per cord, also in 16 foot lengths, delivered at their plant.

Some 70 cords of wood are piled at the inactive placer property known as the "Smith Camp" on Little Squaw Creek about a mile above the mill. This wood, together with that of Carlson and Buckley, and Shaw and Nicholson, all in 16 foot lengths, will average approximately seven inches in diameter at the butt and four inches at the small end. I was unable to learn the cost of the wood at the Smith camp as no one now in the district could supply the information.

Bids for wood delivered in 16 foot lengths at the Little Squaw mill and mine were received from Charles Schultz of Beaver. His bid for deliveries at the mill was $20.00 per cord, including piling. A standard cord of wood 3 inches inches in diameter contains 45% voids. A standard cord of wood 6 inches in diameter and over, contains 30% voids. It is estimated that it will require not less than three cords of the 16 foot wood to make two standard cords, when cut into four foot lengths and piled. On this basis, one and one half cords of the 16 foot wood will be necessary to make one standard 4 x 4 x 8 foot cord and based on Schultz's bid will cost at the mill $30.00 per standard cord. In addition to this the cost of cutting into short lengths and repiling, &ncluding the splitting of the larger pieces will cost not less than $4.00 per cord or a total cost of $34.00 per standard cord ready for the fire box.

No wood of greater length than 2½ feet can be used in the 30 H.P. boiler now at the Little Squaw mill.

Schultz's bid on wood for delivery at the Little Squaw Mill was the only reliable one obtained. His bid for mine deliveries, after a wagon or two horse road has been built, is $38.00 per 16 foot cord. In this connection it may be stated that the expense for feed for two horses in the Chandalar, together with the wages and board of one teamster, totals $30.00 per day.

Dissel Oil and Gasoline. The estimated Seattle price on dissel oil of 27 degree test is 5½¢ per gallon, or $55.00 per 100 gallon drum. A drum weighs filled, drum included about 1000 pounds, equal to 200 gallons per ton. Calculated on the quotation of Charles Schultz for freighting in 10 ton lots or over at $240.00 per ton, and including freight from Seattle to Beaver at $68.00 per ton in car lots, the cost at Little Squaw mill would be $2.09 per gallon. There is a Standard Oil Co. station at Seward and it is probable that oil supplies may be obtained at that point cheaper than from Seattle. A difference of 17¢ per gallon in favor of Seward is indivated by the respective freight rates to Beaver.

A 50 H.P. Fairbanks-Morse deisel oil engine would drive a 150 cu. ft. air compressor, the 4 stamp mill and crusher, also a small dynamo for mill and camp lighting. This engine would require not less than 2.5 gallons deisel oil per hour or 60 gallons per 24 hour day. However, the use of one engine for driving both the mill and compressor is impracticable unless the mill were moved up Little Squaw Creek to a point directly below the mine, the question of mill water requires solution, also an added cost will obtain for wood, deisel oil or any other supplies to be freighted to the mill, due to the 900 feet additional elevation above its present location.

Two 25 H.P. Fairbanks-Morse engines could be used. One at the mill and one at the mine, but this would require a duplication of engineers, and added fuel consumption.

Cordwood for use in the 30 H.P. vertical tube boiler now in the mill building is estimated at 2 standard cords or three cords of the 16 foot wood as cut in the district. Obviously, an air compressor could not be used in connection with this boiler when installed for mill drive.

The cost of gasoline delivered at the Little Squaw mill in 100 gallon drums under conditions similar to the above would be $2.40 per gal.

L a b o r

Boarding House Expense. Wages in this district are given below, and in addition board is furnished without expense to employees. The cost for board is said to average $4.00 per man per day. This information was given me by H. J. Patterson and confirmed by others in the district.

Miners	$6.00	Blacksmith	$7.00
Cooks	7.00	Laborers	6.00
Engineers	8.00	Tractor driv.	8.00

Mill men would expect a wage equal to that of engineers.

There are at present in the district within a radius of 15 miles from the Little Squaw mill a total of 11 men. Four on Big and Little Squaw Creeks, four on Big Creek, and two on Trilby Creek, and one on Baby Creek, all placer miners engaged in prospecting with the exception of five who are operating three placers. See "Placer Claims" in this report. No men other than trappers or natives, with two or three exceptions, are to be found nearer than Fairbanks, Fort Yukon or in the Koyukuk region.

Little Squaw Mill Camp

This camp consists of three cabins, a cache and a stable, all in good condition. The mill building, unnecessarily large for the equipment expected to be installed, is in a bad state of repair, not strongly constructed, and will require dismantling and rebuilding before it should be used.

The building has been shifted at various points by action of frosts and the building up of glacier ice from the spring adjoining. A mortar block, if installed at the present site of the building, would likewise be moved and the can shaft bearings probably thrown out of line, causing difficulty in operation. The 30 H.P. boiler and the 20 h.p. engine, both installed require resetting, having been badly disturbed by frost. A new location in dry, or at least frozen, ground should be found and the building re-erected. From an examination of the two mill sites belonging to the Company, it is improbable that a point can be found on either of them where bedrock is sufficiently close to the surface to permit the setting of the mortar block on it. It is apparent that this building was placed at its present location in order to make easily accessible for mill use the water from the spring referred to. This spring does not usually freeze, there being open water, I am told, at most times. At the date of my visit, Jan. 18th to 29th, 1925, the temperature of the water in the small creek flowing from the spring, 30 feet from the mill and near the Spring, was plus 33.5 degrees F. This reading was taken during a somewhat extended cold period and immediately after a day during which the atmospheric temperature reached a point -42 degrees F.

The mill building is constructed of logs, somewhat small but in good condition, and dry. If the building is rebuilt and the size properly reduced to fit the equipment, the 3 stamp mill discarded as it should be, sufficient logs would be available to complete the building, with the possible exception of timbers for crusher, orebin foundation, &c.

Mill Assay Office and Equipment.

One of the log cabins at the mill camp was built for use as an assay office and is amply sufficient for that purpose. The assay equipment with the possible exception of the furnaces, is of no value for accurate work and is incomplete. No chemicals to speak of in usable condition remain and the balances are not suitable for the work intended.

Little Squaw Mine.

The tunnels of the Little Squaw Mine are situated approximately in the center of the Little Squaw Claim, located on the top of the ridge

separating Big and Little Squaw Creeks. The elevation of No. 1, or the main tunnel above the Little Squaw mill and timber line is 1806 feet.

The vein, occurring in what is known as the Birch Creek schists, has an East-West strike, paralell with the bedding planes of the schist and dips 63 degrees to the South. No. 1 tunnel, 192 feet in length, has been driven on the vein for a distance of 92 feet. From that point to the face of the tunnel, the latter has followed the footwall of the vein, leaving it, for most part, intact. A winze has been sunk 55 feet deep at a point 140 feet from the portal and at 160 feet from the portal a raise has been driven 67 feet up to the broken surface rock but not thru to the surface, a distance of less than ten feet remaining.

Near the face of the tunnel the vein is displaced by a fault bearing N. 49 W. and having on the tunnel level a dip of 76 degrees to the Southwest. I am informed that this fault is visible on the surface, and that the vein has been found on the surface beyond it, but owing to the quantity of snow I was unable to verify this statement.

On the tunnel level the vein has an average width of 3.6 feet, but in the raise is apparently wider, narrowing in the winze as may be noted on the map accompanying this report. The first 30 feet of the tunnel is timbered and could not be inspected or sampled. In the remaining 62 feet to the point where the tunnel leaves the vein and proceeds in the footwall, two distinctly different characters of quartz are to be seen. On the footwall, banded or ribbon quartz occurs averaging 16 inches or more in width, and the remainder of the vein towards the hanging wall is composed of a hard, coarsely crystalline, dense quartz. Between the bottom of the raise and the fault at the face of the tunnel, some 4 to 9 inches of banded quartz also occurs and at one point just beyond the raise toward the face, an excellent specimant of banded quartz containing free gold was obtained.

The raise has been driven in the footwall and up to the time of my visit the vein in the raise had not been broken into. The vein dip in the raise is regular but at 27 feet below the tunnel in the winze, the vein flattens to 53 degrees at 33 feet, 43 degrees at 45 feet and at the bottom of the winze is 58 degrees, somewhat near its regular dip. Folding stresses in the schist at these points have caused ruptures across the bedding planes and these openings have been filled with quartz forming stringers from the main vein. The winze also follows the footwall for half its depth until the narrowing and breaking up of the vein into stringers permitted easy removal of the quartz to the hanging wall.

At the time of my arrival at the mine, there was about five feet of loose, broken rock in the bottom of the winze which had not been removed. I had this taken out and found that the vein in the extreme bottom consisted of 10 inches of solid arsenopyrite and 10 inches of quartz, separated by an equal width of schist. See an accompanying map.

In the main tunnel, between where it leaves the vein, and the face only two or three crosscuts to the hanging wall had been made. I had, at various places, sufficient drill holes put in and blasted to break thru to the hanging wall in order to permit examination and to make moil samples. The vein in this section is now exposed for most part in nine places. Additional samples to those taken in the raise and winze were contemplated, but a shortage of blacksmith coal for sharpening drill steel prevented.

Charcoal was tried for that purpose, but with little success.

Sampling

Upon reaching the mine, most of the surface of the underground openings were covered with a thick coating of frost and ice. This was removed as much as possible before sampling. Samples were taken by moil on a clean canvas of ample size, dumped into a tin box, and sacked. In the following list of assays, those letters succeeding the sample number indicate by whom taken. All moil samples were taken by the writer and are distinguished by the letter "T". The others are sludge samples or drill cuttings from holes drilled thru the vein at right angles to its dip and the men drilling the holes are indicated by the respective letters.

The assays were made Feb. 20th, 1925, by Paul Hopkins, analytical Chemist and Mineralogist of the U. S. Bureau of Mines, at Fairbanks, Alaska. All samples were passed thru a 100 mesh screen and where metallics were found they were indicated by the letter "M". Silver contents, while not requested, were also given by Mr. Hopkins.

A s s a y s.

Tunnel Samples

No.	Dist. from Portal	Width FW	Width HW	Width Vein		Ozs. Au.	Ozs. Ag.	Total Ozs. Au.	Total Ozs. Ag.	Description
1T	30.5			3.0		.32	.05			Includes banded quartz on footwall. Tunnel not to henging wall. Sample 1 to 5 inc.
					m	.71	.10	1.03	.15	
2T	34.3			3.4		.20	.04			Banded quartz on footwall and in canter. Balance coarse hard quartz
					m	.45	.07	.65	.11	
3T	39.1			4.6		.66	.15			Same No. 2. Vugs on hanging wall side filled with large well formed crystals of quartz
					m	.19	.03	.86	.18	
4T	44.0			4.6		.30	.06			Same except only 16" banded quartz on footwall
					m	.09	.02	.39	.08	
A5T	49.0	1.3				2.12	.50			BANDED QUARTZ ONLY
					m	2.74	.43	4.86	.93	
B5T	49.0		2.2			.02	tr	.02	tr	Coarse blocky quartz on hanging wall very hard.

TUNNEL SAMPLES

No.	Dist. from Portal	Width FW	Width HW	Vein		ozs. au.	ozs. ag.	Total ozs. au.	Total ozs. ag.	Description
6T	54.0			5.0		.52	.20			
					m	.02		.54	.20	Banded quartz on footwall.
A7T	59.1	1.3				.58	.20			
					m	.50	.07	1.08	.27	Same as A5
B7T	59.1		3.0			.02	tr	.02	tr	Same as B5
A8T	64.1	1.0				4.02	1.0			
					m	2.37	.38	6.39	1.38	Banded quartz
B8T	64.1		2.9			.06	.02			
					m	.09	.02	.15	.04	Coarse hard quartz.
A9T	69.0	1.5				1.52	.30			
					m	2.82	.44	4.34	.74	banded quartz
B9T	69.0		2.1			.02	tr	.02	tr	Coarse hard quartz.
10T	74.2			3.0		.92	.30			
					m	1.36	.21	2.28	.51	1.5' banded quartz on footwall. 1.4' hard dense quartz on hanging wall.
A11T	79.3	1.5				1.42	.40			
					m	3.95	.58	5.37	.98	Banded quartz
B11T	79.3		1.3			.01	tr	.01	tr	Coarse blocky quartz
12T	84.1			3.4		.46	.10			
					m	.48	.07	.90	.17	2' banded quartz on footwall. 1.4 coarse quartz on hanging wall.
13T	89.0			3.5		.28	.10			
					m	.42	.07	.70	.17	8" banded quartz on footwall. 2.7 coarse hard quartz on hanging wall.
14T	92.0			3.6		.14	.08			
					m	.21	.04	.35	.12	Occasional band for about 2.4' balance sample hard quartz.
A15T	101.2			3.7		.28	.15			
					m	.07	.02	.33	.17	Friable white qutz. on footwall coarse hard qtz on hang.wall.

No.	Dist. from Portal	Width FW	Width HW	Vein		ozs. au.	ozs. ag.	Total ozs. au.	Total ozs. ag.	Description
B15W	101.2			.9		.01	tr	.01	tr	Sludge from drill hole from S end of sample A15T to hanging wall.
A16T	109.5			4.0		.06	.10			Vein badly shattered.
					m	.04	.01	.10	.11	qtz.reconsolidated giving brecciated appearance for 3' on footwall. Some large quartz crystals up to 2" dia. in silicious matrix, which is sometimes oxidized.
B16W	109.5			.8		tr	tr	tr	tr	Sludge from drill hole to complete Sample A16T
17T	124.8			3.7		.02	tr	.02	tr	Occasional small bunch of arsenopyrite on footwall side of vein.
19T	142.5			4.8		.04	tr	.04	tr	Softer quartz somewhat shattered. No sulphides.
A20T	153.0			2.4		.01	tr	.01	tr	White barren appearing quartz on footwall side.
B20N	153.0			1.2		.02	tr	.02	tr	Sludge from drill hole to complete A20T
21T	158.5			3.2		.18	.03			
					m	.18	.03	.36	.08	9" banded quartz on footwall balance is coarse hard qtz.
22NW	173.			2.0		.12	.10	.12	.10	Sludge from drill hole across vein. Was afterward blasted exposing 8 to 12" banded qutz. on footwall.
23T	186.4			1.9		.04	tr	.04	tr	Across hard white qtz. at fault.
A26T	132.5			1.9		.05	tr			
					m	.02	tr	.07	tr	4" banded quartz on footwall balance hard white quartz.
B26T	132.5			2.0		.04	tr	.04	tr	Sludge from drill hole to complete Sample A26T.

Raise Samples

No.	Dist. from Portal	Width of Vein		Assays ozs. au.	ozs. ag.	Total ozs. au.	ozs. ag.	Description
A27T	22.0 up	1.9		.42	.15			
			m	.28	.05	.70	.20	Qtz. slightly exidized a few specks sulphide on footwall.
B27W	22.0 up	2.6		.04	tr	.04	tr	Sludge from drill hole to complete Sample A27T
28BP	54.0 up	3.3		2.34	.45			
			M	5.08	.67	7.42	1.12	Sludge from drill hole partly across vein. Not thru to hanging wall.

Winze Samples

18C	18.5 down	1.7		1.06	.35			
			m	2.51	.32	3.57	.67	Sludge from drill hole.
24T	bottom	.8		.22	.10	.22	.10	8' hanging wall streak solid arsenopyrite.
25T	Bottom	.8		.03	tr	.03	tr	9' quartz on footwall.

With one exception, no free gold was removed from any of these samples before assaying. One very small piece of free gold was seen in sample No. 10T and while being examined, was accidently dropped and could not be recovered. All other samples were assayed precisely as they were taken from the mine.

It will be apparent from these samples that practically the entire gold content of the vein is confined to the streak of banded quartz on the footwall, and that the hard, solid quartz constituting the remainder of the vein contains no appreciable values. The bands in this footwall portion are separated by very thin seams of arsenopyrite, altered and more or less decomposed, probably little of the iron remaining. It is well known that arsenical ores are among the most difficult to amalgamate, the arsenic fouling the mercury and amalgam and sliming the plates.

Referring again to the banded quartz on the footwall. This footwall shoot begins in the tunnel somewhere in the timbered portion near the portal. The first 30 feet beyond the timbers toward the face averages 16 inches in width and 4.34 ounces Au. The next 30 feet extending to the offset where the tunnel was begun in the footwall, the values are less, declining to .35 ounces Au. at the offset. At this point, the width of the bends are greater and the banded quartz constitutes 2.4 feet of a total width of 3.6 feet.

From the offset in as far as the raise, a distance of 70 feet, in no part of the vein, either in the footwall or hanging wall side did samples assay more than .10 ounces Au., with the exception of A15T, taken in the footwall next the offset in the tunnel, and which assays .33 ounces Au. This section, on the tunnel level, may be said to be barren.

What may be called a second footwall shoot occurs between the foot of the raise and the fault. The banded quartz at this point varies in width from 4 to 9 inches.

Sample A27T from the raise indicates values in the footwall as B27W taken in the hanging wall side at the same point assayed only .04 ounces Au.

The origin of the gold in certain quartz veins in the district, to which the Little Squaw vein is similar, is due, in the opinion of Maddren, U. S. Geological Survey, Bull. 532 to their connection "in zones of contact alteration surrounding or connecting bodies of dioritic intrusive rocks." The surface in the vicinity of the Little Squaw Mine does not appear to have been subjected to glaciation. Many of the higher elevations are capped with dikes or ridges of intrusive rocks and erosion has worn away the softer schists, leaving the intrusives exposed in relief.

Tunnels Nos. 2 and 3.

These tunnels are situated directly East of and below No. 1 tunnel. No. 2 is 25 feet long and No. 3 11 feet. No vein is exposed in No. 3 tunnel and No. 2 had caved so that the face could not be examined. Supt. Patterson, however, advises me that the vein had not been located by this work.

The superintendent also informed me that an outcrop of quartz occurs on Crystal No. 2, the most Easterly claim in the Little Squaw Group, that only a small amount of surface work had been done, and that it would be impossible to see it on account of snow. I therefore did not attempt to examine it. It lies at an elevation of 2900 feet above the Little Squaw mill building.

Eneveloe and Duplex Groups.

These groups were not visited because of snow preventing a surface examination. No underground work has been done on either of them.

Mikado Group

This group lies at the head of the East Fork of Tobin Creek which flows into Chandalar Lake and the portal of the tunnel on the Tobin Claim of the group is situated at an elevation of 2350 feet above the Little Squaw Mill, but over a much higher summit separating Big Squaw and Tobin Creeks. There is a cabin of small dimensions at the tunnel. Eleven years ago a shaft was sunk for a depth of 104 feet on a quartz vein outcropping on the hillside North of the Creek. I am informed by Frank Yasuda of Beaver, one of the owners at the time this work was done, that the shaft was not timbered, being in frozen ground, and that it has long since caved from surface thawing in the summers. He informs me that this shaft followed the vein on its dip

for a distance of 42 feet and from that point to the bottom the vein and shaft were vertical, the bucket used in sinking not touching the walls when being raised and lowered. A tunnel has since been driven 456 feet in length in an effort to cut the vein about 200 feet in elevation below the shaft. No vein was encountered by this tunnel. No surface examination was possible at the time of my visit because of snow. A small amount of placer mining was done some years since in the Creek below the Mikado Group but none of the claims have been recently operated.

Schultz Group.

This property lies on the extreme top of the ridge between Little Squaw and Big Creeks, at an elevation of 2550 feet above Little Squaw mill, and is the property of Chas. Schultz of Beaver. The surface was snow covered and could not be examined. The underground work as I was informed by Schultz consists of a shaft 50 feet in depth and a drift of 80 feet on the vein. The shaft was filled with ice and has not been opened for several years.

Schultz could not give me any information as the value of the ore in this vein, said to be five feet in width.

Roberts Group.

The claims owned by Joseph Roberts of Beaver lie near the head of Big Squaw Creek. A vein outcrops at right angles to the ridge, in strike practically parallel with the Eneveloe Outcrop. Barometer readings at the outcrop and at the tunnel below indicated a difference in elevation of 80 feet. No vein was found in the tunnel, and its width could not be ascertained on the surface at the time of my visit.

Placers

The placer claims located on Big Creek in 1924 for the Company are situated 3 to 6 miles below the camp of Nicholson & Shaw who are operating on Claim No. 5 below upper discovery. The value of these claims can be determined only by considerable prospecting. For use in thawing ground in this connection, cordwood costing $45.00 per cord has prevented much activity. Shaw and Nicholson inform me that the ground they are now working will average $1.50 per square foot of bedrock for the thickness of the pay streak.

D. A. Murphy, Recorder and U. S. Commissioner lives 14 miles below upper discovery, on Big Creek.

Bedrock on No. 5 below Upper Discovery is 19 feet below the surface.

John Rasmussen is preparing to sink a shaft to bedrock a short distance above the Shaw & Nicholson shaft.

Placers on Little Squaw Creek

Carlson & Buckley have sunk a shaft on claim No. 1 below Discovery and are now crosscutting their pay streak. This crosscut on Jan. 29, 1926 was in 30 feet and was still in pay gravel. They claim to have values averaging $1.50 per sq. ft. of bedrock, which, at this point, is 165 feet from the surface. They are using a steam hoist, the only one in operation in the district.

Jos. Wilks is taking out pay dirt on No. 4 above Discovery. He says the amount of gravel available is small and I did not learn its value. He is working alone. Bedrock is about 30 feet deep.

Oscar Otterson has sunk a shaft single handed for a distance of 65 feet, on a claim not far from the Little Squaw mill. He has not reached bedrock at that depth.

When I left the camp Otterson had gone to assist Newton who is prospecting on Trilby Creek, a tributary of the Middle Fork of the Chandalar. Newton also owns some hydraulic ground on Big Creek a short distance above the Shaw & Nicholson operation. This ground he operates in the Summer.

Anderson, a placer miner, is prospecting on Baby Creek which flows into the Chandalar River above Chandalar Lake a short distance.

This constitutes the present placer activity in the entire district. No quartz prospecting or mining is being done.

Powder

Powder at the Little Squaw Mine under present freighting conditions costs about $720.00 per ton.

Mill Machinery.

An estimated weight of 17½ tons of mill machinery is now at Beaver, about 6600 pounds at Caro, 2000 pounds at Flat Creek stable, a building used as a relief cabin 17 miles from Caro, and at two points along the trail between Flat Creek and Grave Creek are a few boxes discharged from loads to lighten them when enroute to the mine. This machinery, some of the smaller parts in boxes, has been lying in the weather for fourteen years. However, it is in remarkably good condition, considering the time it has been exposed, and is not seriously damaged by rust.