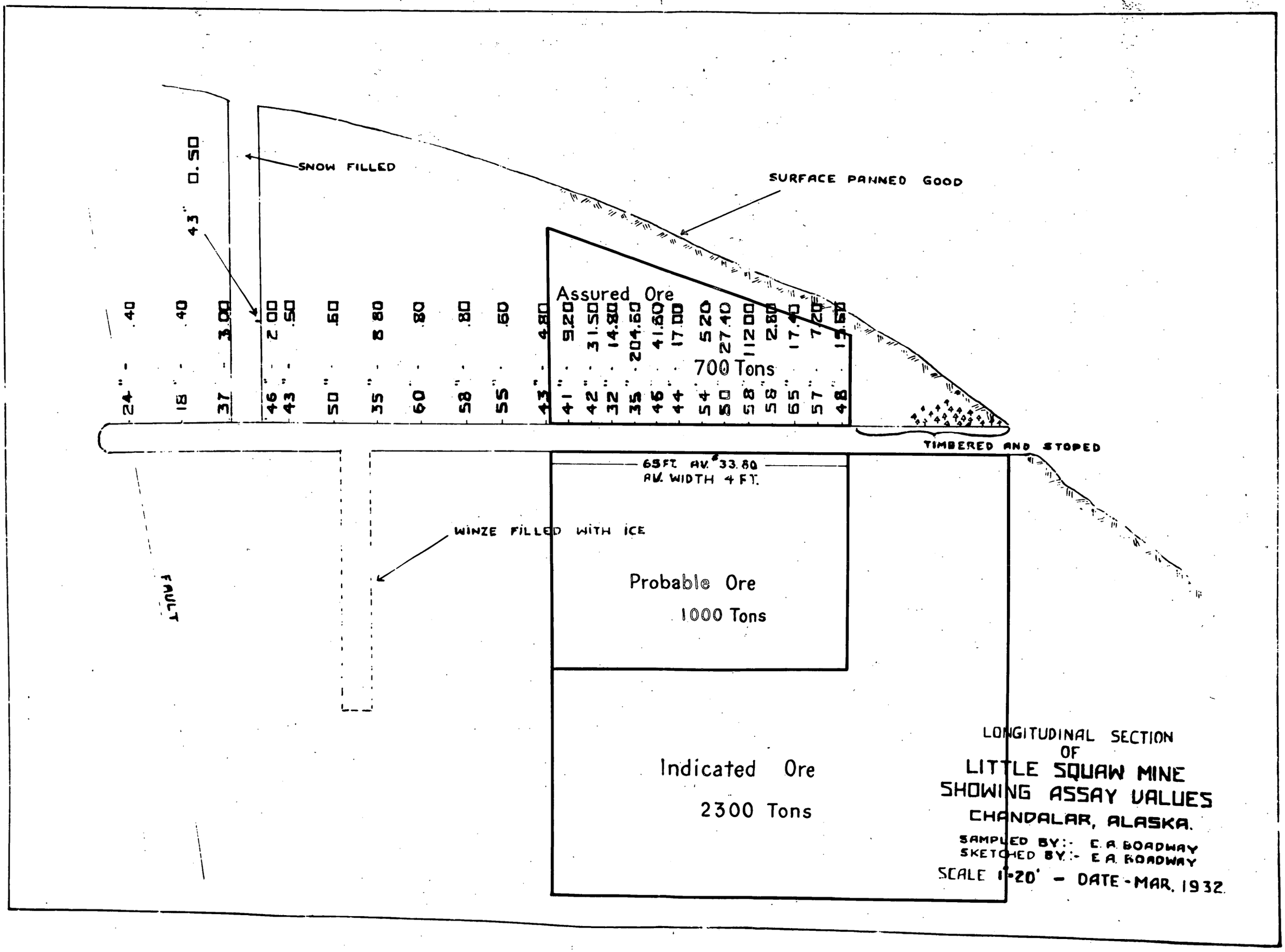
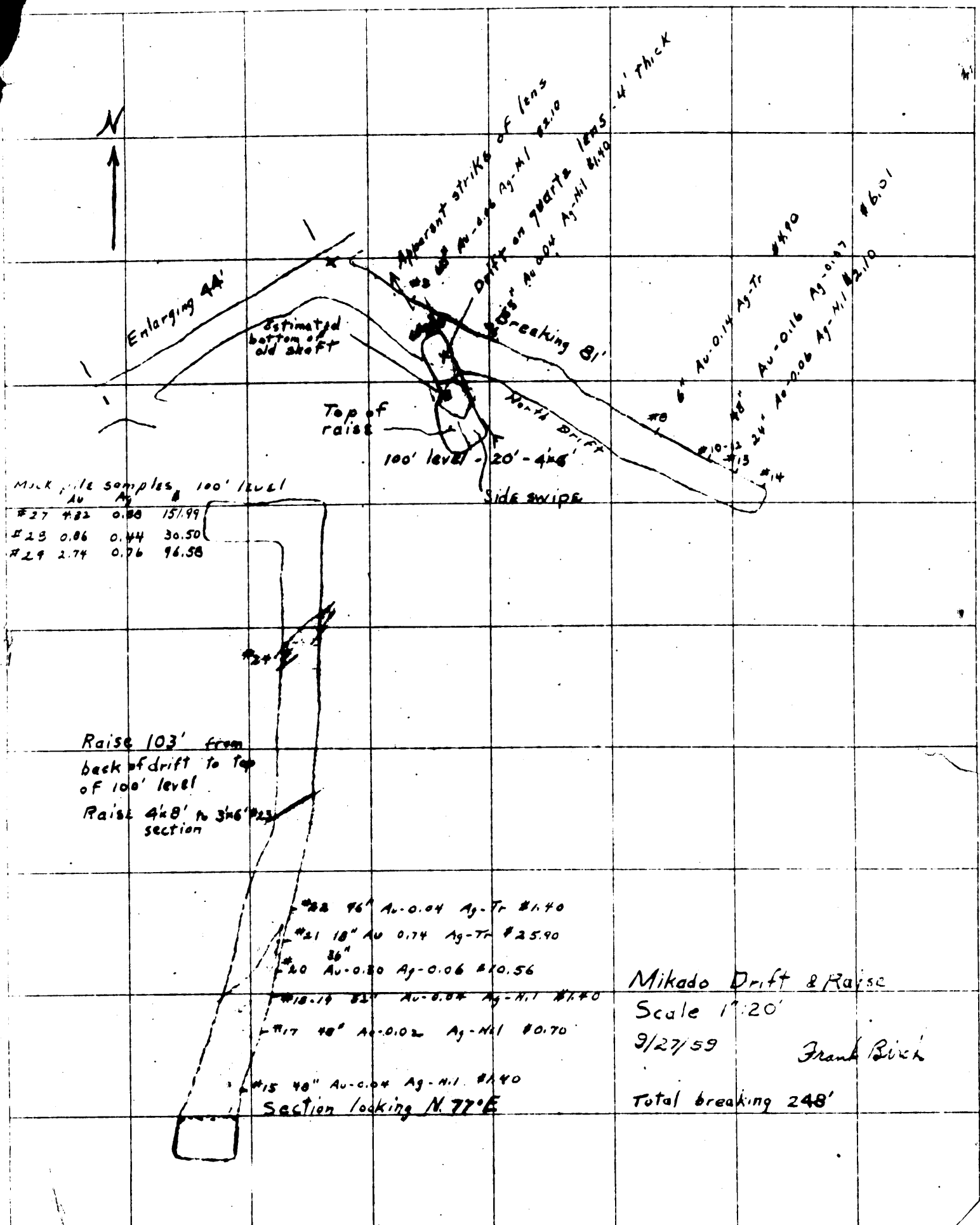

SNOW FILLED
43" 0.50
SURFACE PANNED GOOD
24" - .40
18" - .40
37 - 3.00
46" 2.00
43" .50
50" .50
35" 8.80
60" .80
58" .80
55" .60
43" 4.80
41" 9.20
42" 31.50
32" 14.80
35" 204.50
46" 41.60
44" 17.00
54" 5.20
50" 27.40
58" 112.00
58" 2.80
65" 17.40
57" 7.20
48" 15.60
Assured Ore
700 Tons
TIMBERED AND STOPED
65FT AV. 33.80
AV. WIDTH 4 FT.
WINZE FILLED WITH ICE
FAULT
Probable Ore
1000 Tons
Indicated Ore
2300 Tons
LONGITUDINAL SECTION
OF
LITTLE SQUAW MINE
SHOWING ASSAY VALUES
CHANDALAR, ALASKA.
SAMPLED BY:- E.A. BOADWAY
SKETCHED BY:- E.A. BOADWAY
SCALE 1"=20' - DATE - MAR. 1932.

31



J. A. Gendron Co., Spokane
"ALBANENE" No. 1066 K&E

New York, N. Y.
May 25, 1933.

Mr. W. E. Wade, Vice-President and Consulting Engineer,
Idaho-Alaska Corporation,
120 Broadway,
New York City.

Dear Sir:

The examination of the Mikado mine in the Chandalar district of Alaska was undertaken during the past winter at your request, and a copy of the report on this property is attached.

Arriving in Fairbanks on January 10th, contacts with merchants were made and after several days delay, due to extremely cold weather, a flight was made to Beaver. Two miners were hired and a dog-team with driver engaged to freight our equipment from Little Squaw Creek to the Mikado claims. This dog-team, owned by Tourec Newman of Beaver, departed on the 19th of January, accompanied by the two miners. Returning by plane to Fairbanks, further supplies were purchased and after sufficient time had elapsed for the dog-team to reach Little Squaw Creek, a flight was made with the Wein Airways to Chandalar Lake.

Three months were required to reopen the Mikado shaft, and during this period monthly trips with mail and supplies were made by the Wein Airways. All available dry wood was purchased and hauled by dog-team to the Mikado claims. A boiler, stove, and miscellaneous equipment were brought over from Little Squaw and the quarters made habitable. Mr. Ellis Anderson, a prospector, was most hospitable and housed us until our quarters were made comfortable.

The sampling of the shaft was completed on the morning of April 24th, and the return flight to Beaver and Fairbanks made on April 25th. This flight was the last this spring to be made out of Fairbanks on skis., and while it would have been possible to return to Chandalar Lake the next day, it would have been extremely hazardous or impossible thereafter.

May 25, 1933.

On the return trip to New York, a stop was made at Juneau, Alaska, to determine the amount of assistance probably obtainable from the Government for future road construction in the Chanialar district.

The return journey was completed on May 22nd.

Respectfully Submitted,

E. A. Broadway

E. A. BROADWAY

INDEX

	Page
SUMMARY and CONCLUSIONS	1
RECOMMENDATIONS	2
CLAIMS	3
LOCATION	3
TOPOGRAPHY	3
CLIMATE	4
TRANSPORTATION	4
EQUIPMENT	6
TIMBER	6
WATER SUPPLY	7
LABOR	7
GEOLOGY	7
HISTORY	10
PLACER PRODUCTION	11
DESCRIPTION OF LITTLE SQUAW	11
SAMPLING LITTLE SQUAW VEIN - 1932	12
ASSAY RESULTS	14
DESCRIPTION OF MIKADO VEIN	16
SAMPLING MIKADO VEIN	17
MIKADO ASSAYS	18
TABULATION MIKADO ASSAYS	20

I N D E X (Cont'd)

	Page
BONANZA VEIN	22
STAR GROUP	22
BONULTR VEIN	22
TONNAGE ESTIMATES	23
AMALGAMATION TESTS	24
MILLSITES	25
TRANSPORTATION OF ORE	25
POWER	26
ESTIMATED OPERATING COSTS	26
CAPITAL REQUIREMENTS and SCHEDULE	27
OPERATING PROFITS	28
APPENDIX	30

R E P O R T

-on-

MIKADO and LITTLE SQUAW VEINS

Chandalar, Alaska

****

SUMMARY and CONCLUSIONS

The ore exposed in the Mikado shaft and in the Little Squaw tunnel is of a grade that could be profitably mined if found in sufficient quantities to operate a mill upon a moderate daily tonnage (i.e. 100-200 tons per day), and further work on these deposits is advisable.

The limits of the ore exposed have not been determined and no tonnage estimate can be made, but all evidence obtainable during the winter season, and from Government reports and individual statements, indicates the zones in which the ore occurs to be continuous for considerable distances.

The present high cost of freighting to this district could be greatly reduced, and government assistance is assured when justified by active development.

Sufficient timber for fuel and construction purposes for many years stands in the valley, and a power site capable of developing all the power necessary is reported fifteen miles west of the Mikado claims.

The climate does not impose any foreseen difficulties on daily mining and milling operations throughout the year if seasonal preparations are made.

RECOMMENDATIONS

That $75,000 be expended between July, 1933, and April, 1934, in underground exploration and development work on the Mikado and Little Squaw veins. A minor portion of this sum should be expended in examining the surface of this district prior to large expenditures for underground work.

That this exploration and development be instituted during the month of June in order that the seasonal preparations that are necessary for carrying on the work throughout the winter may be made.

That this exploration be undertaken immediately by hand and carried on until fall trail conditions permit the installation of light machine equipment.

That a preliminary survey be made of the power site and the boat channel of the Chandalar River during the coming summer season.

CLAIMS

Three groups of claims, all of which are patented or are in process of patenting, are held under option by the Engineers Exploration Syndicate. They are the Little Squaw group of nine contiguous end-to-end claims; the Bonanza group of six claims, and the Mikado group of three claims. A mill site claim, the Spring Creek millsite, held under option, is also in process of patenting.

LOCATION

These claims are situated at an elevation of approximately 3500 feet, near the crest of the mountains, in the western part of the Little Squaw area. This area in the Chandalar mining district is approximately eighty miles north of the Yukon River in latitude 67° 35' North and longitude 148° 15' West and is 200 miles north of Fairbanks, Alaska.

TOPOGRAPHY

The immediate district is mountainous, with deep-cut narrow valleys and precipitous knife-like crests on the ridges. Drainage is very rapid and the north fork of the Chandalar River is practically unnavigable. The valleys of the north fork and of Graves Creek have been broadened by glaciation and are used as routes for overland travel. The average elevation of the ridge crests is slightly over five thousand feet and the valley floors are from two to three thousand feet lower. The relief decreases rapidly towards the Yukon

River flats to the south.

CLIMATE

The average temperature of the three winter months is 15° F. Blizzards are frequent on the mountains and the winters are severe. The precipitation is light, being from 11 to 12 inches in normal years. Sled freighting is possible from November 5 to May 1. Mining operations could be carried on throughout the year but seasonal preparation is absolutely necessary.

TRANSPORTATION

All overland traffic to this district now enters through the village of Beaver on the Yukon River. River transportation to Beaver is limited to semi-monthly trips during the summer season from May 15 to September 15. Supplies from Seattle to Beaver may be shipped via Seward and Fairbanks, Alaska, or via Skagway and Whitehorse, Yukon Territory. The present rates are less via the Whitehorse route and the rates per ton to Beaver on this route, including all handling charges, are: General supplies $80; Explosives $141; Groceries $87; Machinery $51.

At present, the only overland method of transportation from Beaver to the Little Squaw area is by dog team. The rates for this distance of 125 miles are 15 cents a pound to Little Squaw Creek and 17 cents a pound to the Mikado claims, with an additional charge of 2 cents a pound for perishables. There is a well cut road suitable for winter tractor travel and spring and fall crawler trailer travel between

Beaver and Little Squaw. The construction of 10 miles of road down the Chandalar River from Cairo to the head of navigation would shorten the overland haul to the Little Squaw area to a distance of 62 miles. Inhabitants of the country report that a small amount of blasting in the channel of the river would permit shallow draft boats to proceed an additional 80 miles up the middle fork of the river during high water, within 12 miles of the Spring Creek millsite. This could not be verified at the time of the author's visit in the winter season.

No government appropriation has been made for the construction of new roads in North Alaska during the year of 1933 but a sum of $4,000 is available for the repair and maintenance of the Beaver to Little Squaw road. Government assistance has been assured when the possible future tonnage to the district warrants.

The cost of transporting supplies by tractor throughout Alaska, as determined over a period of years by the Alaska Road Commission, varies from $0.66 to $1.32 per ton mile. These figures include maintenance, depreciation, and a portion of the general overhead. For the conditions existing in the Chandalar district, a cost of $0.90 per ton mile for tractor freighting is a conservative estimate.

Freighting is carried on throughout ten months of the year by existing airplane services and the present rate is 15 cents per pound from Fairbanks to lakes in the Little Squaw area, and 10 cents per pound from Beaver to these lakes. A lake suitable for

landing is located within three miles of the Spring Creek millsite and four miles from the Mikado claims.

EQUIPMENT

A new Allis-Chalmers four-stamp mill complete with engine and boiler is stored in transit at a distance of approximately ten miles from the Spring Creek millsite. A three-stamp mill without amalgamating plates or crusher is now on the millsite. The total equipment is capable of milling 15 tons a day, but the operation of this equipment would not be profitable.

Housing facilities to accommodate ten men at the Spring Creek millsite have been erected. There are blacksmith shops and cabins that are suitable for three men each at both the Little Squaw and Mikado tunnels.

TIMBER

The valleys below an elevation of 5,000 feet support a fair growth of timber, principally spruce. At and within a distance of a few miles of Spring Creek there is an abundant supply of timber suitable for all fuel, building and mining and milling purposes, and in sufficient quantity to last for many years. Wood, in sixteen feet lengths, delivered to the Spring Creek millsite, or at Chandalar Lake, by dog-teams now costs $10.00 a cord. Delivered to Little Squaw or Mikado mining claims the cost is now much greater, but under operating conditions, when ore is being transported to the mill, this cost would not be greatly increased. Two cords of this spruce are equivalent to one ton of good coal.

WATER SUPPLY

A perennial spring at the Spring Creek millsite at the end of the present road 5 miles from the Mikado claims has a winter flow estimated to be 140 gallons per minute at 40° F. This supply could be supplemented in normal years by diverting the water of Little Squaw Creek a distance of approximately 2500 feet.

No underground or surface winter flow of water sufficient to meet milling requirements could be located on Robin Creek, nearer than Chandalar Lake, a distance of 11 miles.

LABOR

The local supply of labor is limited and it is both necessary and desirable to import labor from outside of the district. A scale of wages below that now demanded for intermittent labor could be established. The present scale is $10.00 a day or $5.00 and board.

GEOLOGY

The formations in the Little Squaw area have been referred to the early Paleozoic period, with the slightly older lithologically classed Birch Creek schist underlying them to the south. To the north, the Paleozoic is covered by Silurian crystalline limestone and dolomites.

These early Paleozoic rocks, comprising the major portion of the Chandalar District, consist principally of schists and phyllites. These schists vary from quartzose and arenaceous to graphitic, and in the vicinity of granitic intrusions biotite schist

with garnet is developed. Associated with these schists are bodies of diorite, granitic schist, greenstones and greenstone schists. These Paleozoic intrusives entered at various times throughout the period of regional metamorphism and they are found in all gradations from unaltered to schistose.

The early Paleozoic rocks are highly deformed and in places show intense crenulation and shearing. The structural trend of the formation is from northeast to southwest and the long axis of the granitic dikes and laccolith-like granitic bodies tend to conform to this trend.

Zones of faulting are indicated on the ridges near Crystal Peak and Caribou Gulch and at the head of Saint Mary's Creek. The faulting strikes at an acute angle to the structural trend and to the plane of schistosity. Gold-bearing quartz veins up to six feet in width are reported in many places along these and similar zones. Quartz in fissures following the cleavage planes is also found, but in the valleys and tributary valleys of Lake Tolim and Graves Creek (Little Squaw area) the quartz filling is principally in the fault zones cutting across the plane of schistosity.

There are lithological similarities between the rocks of the gold producing areas of the Seward peninsulas and the Tanana regions and those of the Chandalar region, but absolute correlation has not been established.

Sufficiently detailed work to determine the source of the quartz veins has never been done. The presence of monzonite

and rutile in the placer concentrates indicates the possibility of a genetic connection between the gold-bearing quartz vein and an acid granitic rock. The probable source of the gold-bearing solutions was from a granitic rock tentatively classed as a diorite, many boulders of which were found in the bed of Little Squaw and Tobin Creeks well above the line of glaciation.

Several isolated lenses of quartz are known and many stringers having no definite trend are found throughout the area, but the principal gold-bearing quartz outcrops are distributed along four east-west lines. This distribution, coupled with evidence of step-faulting indicated on the ridges, suggests a zone of shearing along which mineralizing solutions have deposited quartz that is in places gold bearing.

Along the Little Squaw zone of faulting there have been at least three periods of movement and two periods of deposition. The first faulting opened courses and cavities through and into which much barren quartz was deposited. The second movement, indicated as nearly horizontal, reopened the footwall of the Little Squaw vein and a second quartz was deposited. The deposition of gold and sulphides (Pyrite, arsenopyrite) was contemporaneous with this second deposition of quartz. After the close of this period, another movement re-fractured the quartz and a typical "banded" or "ribbon" appearance was developed. Occasional cavities are found with quartz crystals protruding into them, but these cavities are more often filled with a bluish sulpharous deposit.

Two periods of deposition with subsequent minor faulting are evident in the Mikado vein. It is probable that the mineral-bearing solutions emanating from an acidic mass entered and filled cavities along a reopened shear zone late in the period of regional metamorphism.

HISTORY

Twenty years ago a placer miner named Carter, using funds taken from the placer mines of this district, sank the Mikado shaft to a depth of 104 feet. Upon the favorable assays obtained from the quartz exposed in the shaft and upon the advice of a "practical" miner, the shaft was abandoned and a tunnel was driven to intersect the vein 200 feet below the outcrop. This tunnel was driven 460 feet and intersected a crushed zone at 417 feet from the portal that extended to 453 feet. Short drifts were driven for a total distance of 66 feet on the walls of this zone. As the grade of quartz encountered on the tunnel level was much below that found in the shaft, the work was abandoned and the antimbered shaft permitted to cave. William Salzer later acquired the property along with other properties in this district, and in 1930 extended the Mikado tunnel an additional 50 feet.

The history of the driving of the tunnel raise and winze on the Little Squaw vein is an intermittent one similar to the Mikado except that a small tonnage was milled that produced about $30.00 per ton.

PLACER PRODUCTION

The recorded production of gold from the Little Squaw area between 1906 and 1923 was $295,000. Of this amount $155,000 was extracted in the last three years of this period by a small company operating during the winter season on a claim on Little Squaw Creek. The placer gold recovered was confined to relatively small "pay streaks". On Tobin Creek, "shot" gold has been found for a distance of two miles below the Mikado claims and is also found in St. Mary's Creek below an outcrop on the strike of the Mikado vein three-quarters of a mile east of the shaft.

DESCRIPTION OF LITTLE SQUAW

The Little Squaw vein, dipping 75° to the south and striking N. 75° E. has a proven length of nearly two hundred feet and a proven depth of over one hundred and thirty feet. It cuts across the plane of schistosity which strikes N. 5° W. and dips 15° E. Erosion has removed the eastward extension of the vein at the tunnel level and a minor fault cuts it off at the face of the tunnel two hundred feet to the west. A 75-foot raise to the surface and a 60-foot winze have been driven. The continuation of the vein on the surface beyond the minor fault is reported, the displacement being about fifty feet. Very little gouge is found in this fault, which strikes N 45° W. and dips 80° E. Imperfect striations indicate the movement of the western block have been to the south at a dip of 12°.

Tunnels driven through the surface debris at levels

70 to 114 feet below the portal of the tunnel described have not encountered the vein. These tunnels were apparently started without allowing for the dip of the vein and appear to be situated too far to the north.

The values in the Little Squaw vein are contained principally in a one-foot band in the foot-wall portion of the vein. The values accompany sulphides and the foot-wall part of the vein has a banded or "ribbon" appearance. Much coarse wire gold is found in this foot-wall section. Occasional seams of sulphides are found extending from the foot-wall to the centre of the vein. Wherever these seams extend out from the high-grade foot-wall streak, the fractured quartz of the vein has been recemented with quartz and is vitreous and massive.

An ore shoot extends from near the portal of the tunnel (where it has been truncated by erosion) west for a distance of 65 feet, where a barren zone is encountered. The vein is strongest where truncated. Occasional foot-wall streaks of "ribbon ore" from one inch to six inches thick are found on the foot-wall sections of the vein beyond the end of the ore shoot, but are not of sufficient extent to be mineable. The vein at the fault in the face of the tunnel is two feet wide and contains no visible sulphides.

The winze is completely filled with ice and the raise closed at the top by snow and loose debris.

SAMPLING LITTLE SQUAW VEIN - 1932

Channel samples were taken across the back of the

tunnel over full width of the vein. These samples were cut at five-foot intervals where sulphides were visible and at ten-foot intervals elsewhere. The channels were cut from the foot-wall gouge to the hanging wall rock and one sample was made from each cut. These samples averaged approximately two pounds per running foot of channel. Occasional check samples and blank samples were cut and all samples were sealed and placed under lock.

Samples were crushed to minus 1/4 inch and quartered over a large Jones riffle. One portion was kept and assayed by Mr. Paul Hopkins of Fairbanks. The other portion was ground to minus 30 and the pulp rolled and quartered over a Jones riffle. Sets of this pulp were forwarded to Black & Deason of Salt Lake, and Dr. John Banks of New York. The results obtained from the different assayers varied greatly and Dr. Banks reground to minus 100 mesh and assayed the rejects of his pulps and obtained appreciable differences from his original assays. Dr. Banks attributes the differences to the presence of minor amounts of tellurides and much coarse wire gold. It is probable that the original sample should have been ground to minus 100 mesh before the initial quartering.

ASSAY RESULTS

Sample No.	Width Inches	Value @ Gold Hopkins	B & D	Av. Banks	Average	Remarks
1	----	69.96	77.60	---	73.80	Grab sample of 100 sq. ft. of surface of Mikado dump
2	34	0.40	0.80	---	0.60	N.wall 15 ft. from face Mikado X-cut
3	39	4.00	4.80	---	4.40	S. wall 90 ft. from face Mikado X-cut
4	—	6.40	0.80	1.60	2.90	Dump sample Woodchuck
5	48	12.50	22.60	11.60	15.60	End timber L. Squaw tunnel
6	57	7.60	3.60	10.60	7.20	5-ft. West #5
7	65	15.70	22.20	13.60	17.40	" " " #6
8	58	3.10	2.00	3.40	2.80	" " " #7
9	58	92.30	123.40	120.00	112.00	" " " #8
10	60	25.20	32.20	24.80	27.40	" " " #9
11	54	1.30	3.60	10.80	5.20	" " " #10
12	44	18.50	17.20	15.60	17.00	" " " #11
13	48	34.80	52.40	37.20	42.60	" " " #12
14	35	158.50	237.20	218.00	304.60	" " " #13
15	32	9.50	18.40	16.60	14.80	" " " #14
16	42	29.60	45.40	19.60	31.50	" " " #15
17	41	7.40	13.00	7.40	9.20	" " " #16
18	43	6.00	4.60	3.80	4.80	" " " #17
19	55	0.80	1.00	----	----	10 ft. West #18
20	—	0.50	0.40	----	----	Blank from schist
21	58	0.80	1.00	----	----	10 ft. West #19
22	60	0.90	0.60	----	----	" " " #21
23	35	9.40	8.20	----	----	" " " #22
24	50	0.50	0.60	----	----	" " " #23
25	42	0.50	0.40	----	----	" " " #24
26	46	3.80	0.20	----	----	5 ft. West #25
27	37	8.80	1.80	1.60	4.10	" " " #26
28	54	—	15.60	--	15.60	Recut #11
29	43	—	3.00	--	3.00	Recut #18
30	24	0.50	0.40	--	0.40	22 ft. West #27
31	37	--	0.20	—	0.20	Recut #27
32	18	0.50	0.20	--	0.40	11 ft. West #27
33	18	—	0.20	--	0.20	Recut #32
34	48	—	10.40	--	10.40	Recut #5
35	--	--	0.20	--	0.20	Blank schist
36	64	0.30	0.20	—	0.20	Bonanza pit collar neither wall reached
37	36	0.30	0.20	--	0.20	H.W.part #26
38	18	8.60	32.20	20.80	20.50	F.W. " #26 High grade struck
39	48	0.50	1.20	—	0.80	Raise 20 ft. above drift

The average of all assays is plotted on accompanying sketch. A weighted average shows the truncated ore shoot extending for 65 feet west from the portal, and averaging $33.80 a ton over a width of 4 feet. In computing this weighted average, the high values were included because of the presence of much coarse gold along the exposed ore shoot. Panning shows these values to be concentrated in the foot-wall half of the vein and panning of the surface breccia indicates the extension of the ore shoot to the surface. (See assay plan).

DESCRIPTION OF MIKADO VEIN

The Mikado vein as exposed in the shaft and tunnel consists of lenses of auriferous quartz in a gouge filled fault. This fault in places resembles a shear zone, striking magnetic East and West and dipping nearly vertical. In the shaft the quartz is concentrated on the North or hanging wall side of this zone.

No cross-cuts from the shaft toward the foot wall have been driven, and as holes drilled in several places intersected additional quartz in both the foot wall and hanging wall of the shaft, parallel lenses may be expected. On the tunnel level the quartz is concentrated on the foot wall of the zone which at this level is 36 feet wide.

The maximum width of the lenses in the shaft is 4-1/2 feet with a maximum depth of 50 feet (See section sketch). These lenses and the fault cut across the strike and dip of the schistosity

of the country rock at an acute angle.

Two ages of auriferous quartz are found with the younger quartz appearing near and at the bottom of the shaft. The older quartz is shattered in places, while the younger quartz, although showing minor faulting in and parallel to the vein, is hard and breaks clean from the enclosing rocks and gouge. Adjacent to the older quartz the gouge in places carries appreciable values in gold.

Pyrite and arsenopyrite are abundant, and panning gave a concentrate of these minerals varying from one to five per cent of the total by volume. These minerals are somewhat disseminated throughout the older quartz but are arranged in zones in the younger quartz, giving it a banded appearance.

The oxidized zone in this district is very shallow, and in the shaft extends to a depth of about 50 feet but is not pronounced below a depth of 25 feet.

Only one surface pit or trench could be located under winter conditions but the statements of several men and quotations from government reports are that several pits and outcrops showing auriferous vein material have been cut or found extending over a length of 3,000 feet along this East-West zone.

Quoting A. S. MacDren in the U. S. Geological Bulletin 5532, published in 1913:

> "On the Tobin, Little Mikado and Mikado claims of the Mikado group, the quartz has been exposed by open cuts in six places over a distance of 3,000 feet, and in all of these the quartz near the surface contains rich values in gold. **********

"----a shaft has been sunk on the vein to a depth of about 100 feet. The average thickness of this vein is about 4 feet ----. It is reported that the average assays from the quartz removed in sinking this shaft give $112 to the ton."

Brunton surveys place the bottom of the shaft as approximately 100 feet above the tunnel level and on the north wall of this crushed zone.

The conclusion drawn from the examination of the vein and fault as exposed in the Mikado workings and from the best reports and information obtainable is that the lenses may be expected to be repeated at unknown intervals for a considerable length and depth along this east-west zone.

SAMPLING MIKADO VEIN

The Mikado shaft was reopened by thawing down through the debris filling along the west end of the former shaft. Sufficient dry fuel for thawing out the entire cross section of the caved shaft could not be obtained and consequently the vein on the east end of the former shaft was exposed only at irregular intervals.

Channel samples containing approximately 2 pounds per running foot of sample were cut at 5 foot intervals down the west side of the shaft and on the east side of the shaft wherever exposed. Occasional blank samples and check samples were taken. All samples were sealed and placed under lock and key, but the locked container remained accessible to all men employed. At several points in the

shaft, the hanging and foot wall were drilled and blasted, and the additional quartz exposed was sampled. A surface pit was located approximately 200 feet southwest of the shaft and open fires used to thaw it to a depth of 3 feet. A six foot disintegrated vein was exposed and channel sampled. Channel samples were cut on the quartz lenses, showing in the drifts on the tunnel level.

MIKADO ASSAYS

All original samples were delivered to Mr. Hopkins at the Alaska School of Mines where they were ground to minus 20 mesh before making the initial quartering. The portion of the pulp saved was ground to minus 60 mesh, and 3 pulp samples cut from it. One of these was screened and assayed by Mr. Hopkins and the metallics gathered on the screen were assayed separately and the results combined. Another set of these pulp samples along with several check samples was expressed to and assayed by Black & Deason of Salt Lake City. A third set was stored in Fairbanks.

In both the Little Squaw samples that were assayed in 1932 and in the Mikado samples, the average of the assays reported by Black & Deason averaged materially higher than those reported by Hopkins. In all computations the average of the results of the two assayers was used, but the author is inclined to give greater weight to the assays of Black & Deason, as they are commercial assayers and their work for a period of years as referee assayers has been satisfactory to interests with whom the author has been associated.

The results as plotted on the accompanying assay plan show an ore shoot in the Mikado shaft which, when eliminating 90% of the extremely high assay of $6, averages $49.50 per ton. The average width for this section is 38 inches and extends from a depth of 10-1/2 to 64-1/2 feet. The continuation of this section for the next twelve feet of depth to 76-1/2 feet averages $19.00 over an average width of 43 inches. From a depth of 69 feet to 87 feet, a lense of vein material constitutes the hanging wall of the shaft and nine samples taken at the upper and lower portions of this lens averaged $37.00 per ton. A four-foot cross-cut into the hanging wall at the bottom of the shaft (depth 93 feet) exposes a vein averaging 16 inches wide. Two channel samples cut across this vein assayed $79. and $439. and a 75-lb. bulk sample assayed $178. a ton. A sample of the quartz on the surface of the dump, roughly representing the last material removed from the shaft, assayed $133. a ton.

At the intersection of the tunnel and the crushed zone, assays of samples taken across the quartz concentrated on the south wall of the zone average $1.00 per ton. Eight feet east of this point, on the back of the drift driven along this wall, the back averaged $10.60 over a width of 76 inches and the face 8 feet east assayed $5.60. The highest assay on the tunnel level was $56. over a width of 6 inches in this south drift.

A 47-foot drift on the north or hanging wall of this zone intersected no appreciable amount of quartz, and the face assayed only $0.40.

The samples taken from the surface pit assayed $0.80 over a width of 2 feet. This pit is not on the line of the strike of the vein exposed in the shaft. This relation is shown on the surface plan accompanying this report.

The conclusions drawn from the sampling of the Mikado claims is that ore of minable widths and values but of unknown length and depth is present, and that the Mikado tunnel has intersected the vein at a comparatively lean section of the tunnel horizon.

TABULATION MIKADO ASSAYS

Sample No.	Value $ Ton Gold Hopkins	B & D	Average	Width Inches	Remarks
1		138.20		—	Surface of shaft dump
2	38.58	42.80	39.19	18	Shaft -see sketch for location
3	33.49	35.20	34.34	15	"
4	19.12	15.20	17.16	20	"
5	11.95	12.00	11.98	13	"
6	344.76	332.20	338.48	11	" reduced in computation to 33.85
7	2.86	3.40	3.13	15	"
8	10.92	10.80	10.86	20	"
9	22.72	29.60	26.16	10	"
10	81.50	92.40	86.95	24	"
11	58.04	70.20	64.12	13	"
12	.00	.00	0.50		Blank schist
13	87.93	105.40	96.67	28	Shaft
14	1.83	1.60	1.72	15	"
15	27.44	29.40	28.42	28	"
16	51.30	58.80	55.55	[illegible]	Out just above #15
17	12.26	14.60	13.43	8	Shaft
18	98.16	101.40	98.88	30	"
19	79.24	84.40	81.82	8	"
20	95.60	112.60	104.05	40	"
21	32.32	39.80	36.06	26	"
22	40.55	44.60	42.57	53	"
23	88.10	101.40	94.75	54	"
24	10.49	11.20	10.84	18	"
25	45.04	41.20	43.12	56	"
26	18.78	28.20	23.49	28	"
27	11.89	13.80	12.84	2	"
28	15.15	15.80	15.38	25	"

Sample No.	Value $ Ton Gold Hopkins	B & D	Average	Width Inches	Remarks
29	5.26	6.80	6.03	22	Shaft
30	0.23	0.40	0.32	19	"
31	26.24	24.20	25.22	15	"
32	1.26	1.40	1.32	6	Tunnel
33	7.78	7.00	7.39	16	Shaft
34	7.46	8.00	7.73	11	"
35	12.86	13.80	13.33	44	"
36	59.87	62.80	61.34	12	"
37	142.20	145.60	142.90	14	"
38	0.46	0.40	0.43	32	Tunnel level
39	1.32	1.00	1.16	40	"
40	1.32	1.20	1.26	36	"
41	1.84	1.60	1.72	34	Shaft
42	2.95	3.00	2.97	30	"
43	0.43	0.40	0.42	24	"
44	0.00	0.20	0.10	9	"
45	0.43	0.40	0.42	10	"
46	15.98	13.60	19.79	18	Tunnel level
47	5.59	5.60	5.65	46	"
48	12.52	16.40	14.46	13	"
49	59.84	51.40	55.62	8	"
50	6.12	5.00	5.56	30	"
51	0.83	0.40	0.61	43	"
52	0.26	0.60	0.43	30	"
53	20.52	22.40	21.46	40	Shaft
54	88.36	69.20	78.78	17	"
55	17.29	21.20	19.25	19	"
56	438.98	478.80	458.89	15	"
57	174.12	182.20	178.16	Bulk	"
59	14.58	16.80	15.19	28	"
60		5.00			Rough cut above #59
62	1.26	1.40	1.33	32	Surface pit
63	0.43	0.40	0.41	36	"
64		1.40		36	Check on 62
65		1.00			Blank schist
66		0.80			"
66-A	35.24	40.00	37.62	36	Shaft
67	16.12	19.00	17.56	8	"
68	0.23	0.60	0.41	14	"
69	31.39	35.20	33.30	14	"

NOTE: Gold was taken at $20 per ounce in computing these values.

BONANZA VEIN

The Bonanza vein is 4,000 feet south of the Little Squaw vein, as shown on the accompanying map. No extensive work has been done on this vein, but seven to ten foot widths of quartz are reported exposed by widely separated trenches and pits over a length of 2,000 feet. One pit was found on the east end of the Woodchuck claim and the vein was sampled at the collar. No mineralization was evident, but neither the foot-wall nor the hanging wall was sampled as they were completely covered by frozen overburden. The six feet sampled assayed only $0.30, but the bottom of this pit is reported to be in the footwall of the vein. The dump indicates this to be true as a grab sample of the dump assayed $3.00. Float was traced for 150 feet west along this wind-swept ridge, but deep snows prevented the location and examination of the other pits. High-grade float was found in Robbins Gulch below the Enevelos claims, and it is reported that rich surface placer was found in the creek below the Jupiter claim.

STAR GROUP

This group is described by Irving McReed, a U. S. Minerals Surveyor, as one of the most promising in the district. Deep snow prevented any examination of these claims.

SCHULTZ VEIN

This vein is obtainable by option under favorable terms. It was completely snow covered but is reported by several men as exposed for over a hundred feet in length and averaging three and

one-half feet wide. A 57-foot shaft, a short tunnel and two trenches, all showing free gold, have been opened along this vein. The vein narrows to four inches to the west and has not been found beyond this point. Specimens reported to have been taken from surface trenches carry considerable visible gold. This vein is located on the ridge at the head of Little Squaw Creek. Other veins are reported by inhabitants but have never been prospected.

TONNAGE ESTIMATES

Of the various groups of claims only the Little Squaw group has open workings suitable for making an estimate of probable ore.

The continuation of the Little Squaw ore shoot through from the tunnel to the surface was verified by panning talus and float on the surface directly above the shoot. This block of ore is termed "assured ore".

I believe that there is reasonable assurance that this shoot will extend to a depth of fifty feet below the tunnel level; this is termed "probable ore". As there is no information regarding the depth to which "ore shoots" extend in this district, no estimate is made of the "possible ore". Instead of predicting or limiting the "possible ore", a block called "indicated ore" is shown and it has been limited to a depth of 100 ft. below the tunnel level, and a block to a similar depth below that portion of the vein reported stoped near the portal. The assumption is made that the "probable ore" and the "indicated ore" will be of a grade similar to that exposed.

Assured ore	700 tons	
Probable ore	1000 "	
Indicated ore	2300 "	
Possible ore		No knowledge of extent of ore shoots in this district
	4000 tons at $33.00	

The total value of this tonnage at $33.00 a ton is $132,000.

No tonnage estimate can be made for the Mikado vein from the information now available, but geologically the conditions appear favorable.

AMALGAMATION TESTS

Amalgamation tests were run by Mr. Hopkins at the Alaska School of Mines on both ages of quartz of the Mikado vein. Tests on a composite sample, taken from the rejects of samples cut in the older quartz, gave an extraction of 78% when ground to minus sixty mesh.

The extraction on a portion of the bulk sample taken from the younger quartz in the bottom of the Mikado shaft was 77% at minus twenty mesh and 89% at minus sixty mesh.

In both cases where the sample was ground to minus sixty mesh, the tailings assayed over $18. Two amalgamation tests run on the quartz from the Little Squaw vein, which contained much visible gold gave an average extraction of 90%.

The 15-ton stamp mill now stored in transit is not satisfactory for the treatment of these ores. Economical grinding to the fineness indicated as necessary cannot be accomplished in this mill.

These tests indicate the advisability of further tests

of finer grinding and additional treatment beyond the simple amalgamation first considered as suitable for the ore of this district.

MILLSITES

The Spring Creek Millsite, now being patented, is situated in the Graves Creek valley five miles northeast of the Mikado claims and two and three-quarter miles northeast of the Little Squaw claim. This millsite was located on a perennial spring that was estimated to have a winter flow of 140 gallons per minute at 40° F. It is probable that this flow could be supplemented by diverting the flow of Little Squaw Creek half a mile east of the millsite. This millsite is at an elevation 1000 feet lower than the Little Squaw tunnel and 1300 feet lower than the Mikado tunnel.

TRANSPORTATION OF ORE

An aerial tramway is proposed to convey materials and ore between the Mikado and Little Squaw veins, and the Spring Creek millsite. The line of this proposed tramway will cross the Bonanza vein and pass near the Star and Schultz veins and with a small additional investment might be used to service these latter properties.

In conjunction with the Leschen Company's staff, the cost of the complete installation of the suggested aerial tramway capable of handling ten tons per hour, has been estimated to be $110,000. The power required is estimated to be 25 H.P. and the operating cost is estimated to be $0.15 per ton mile.

POWER

A flow of water and drop sufficient to develop at least 1,000 H.P. is reported to exist a few miles below the outlet of Chandalar Lake on the Chandalar River. From observing this section under winter conditions from an aeroplane and from government reports, it is the author's opinion that this information is correct, but that it should be verified at the first opportunity.

This power site is 15 miles from the Mikado claims and 20 miles from the Spring Creek millsite.

The cost of the complete installation of the generating plant, transmission line and substation equipment for a 700 H.P. plant is estimated to be $250,000.

ESTIMATED OPERATING COSTS

Many factors that would influence the cost of operating in this district are not accurately determinable with the information now available. The following costs have been estimated by making what was considered due allowance for these undeterminable factors.

The following costs have been estimated on a basis of 200 tons per day. These costs do not include depreciation and capital charges.

Development	$2.50
Mining	7.00
Tramming (cable way)	0.75
Milling	2.50
General Expense	0.75
Total	13.50

CAPITAL REQUIREMENTS and SCHEDULE

The following schedule and capital requirements are made subject to revision as conditions in the field indicate as advisable, especially so if not undertaken at the seasons suggested.

Underground (some surface) Exploration

June 15	$4,000
July 15	6,000
Aug. 15	9,000
Sept. 15	8,000
Oct. 15	8,000
Nov. 15	6,000
Dec. 15	6,000
Jan. 15	6,000
Feb. 15	6,000
Mar. 15	8,000
Apr. 15	10,000
Total	$75,000

Being guided by conditions as found in the field, the progressive expenditure of the sum recommended under the supervision of a competent engineer should block out sufficient ore and provide sufficient geological and other information to determine the most profitable scale of mining and milling the veins on these properties.

Throughout the following summer, the transmission line, power house, mill and tramway equipment would be purchased and transported to the head of navigation; the foundations for these units and living quarters should be prepared. All equipment should be transported to the properties and erected as soon as road construction or the advent of fall conditions permit.

Capital Summary:

Exploration and Development (1933-34)	$100,000
Aerial Tramway	130,000
Hydroelectric installation (750 HP)	175,000
Transmission lines and substations	75,000
200-ton Mill	200,000
Mining equipment	15,000
Roads, tractors, & misc. equipment	35,000
Camps and equipment	25,000
Additional development 1934-5	40,000
Contingencies	25,000
Total	$820,000

The schedule of expenditures necessary to cover these phases of the work cannot be accurately determined at this time, but it is probable that approximately $50,000 per month would be needed from May to October 1934, and $25,000 per month from November to February 1935, inclusive. The remaining $160,000 should be available in March and April of 1935.

This program would be considerably shortened by the expected cooperation of the Territorial government in providing suitable summer roads in this district or by using airplanes for freighting at a slight increase in the estimated costs.

OPERATING PROFITS

Although no appreciable tonnage has been blocked out, the sections sampled indicate the possibility that millheads might be maintained at $30.00 a ton.

If the proposed underground exploration and development work blocks out and indicates sufficient tonnage to operate on a 200-ton per day basis, the maintenance of $30 millheads would provide an estimated profit of $16.50 per ton, or a daily profit of

$3300. Of this amount, 15% of the net operating profits derived from ore from the Mikado would be applied under the option to the total purchase price of $300,000 until the $300,000 is fully paid.

From the net operating profits derived from ores from the Bonanza and Little Squaw ores 10% must be applied to retiring the mortgage against the Little Squaw mine of $147,005. Fifty per cent (50%) of the net operating profits go direct to the Engineers Exploration Syndicate, or assignees, for management of the property, and the remaining 40% to the Chandalar Gold Mines, Incorporated. Under the options held, the Engineers Exploration Syndicate, or assignees, will own 50% of the stock of the Chandalar Gold Mines as soon as the sum of $150,000 has been expended on the development and equipping of the properties of the Chandalar Gold Mines, Incorporated. This sum of $150,000 will be spent in the schedule outlined before the properties are producing, and the Engineers or assignees will then be entitled to 70% of the net profits from the Little Squaw mine, and 75% of the net profits after the mortgage is retired.

APPENDIX

The conclusions drawn in the letter part of this report under the headings of "TRANSPORTATION OF GAS", "POWER", "ESTIMATED OPERATING COSTS", "CAPITAL REQUIREMENTS and SCHEDULE", and "OPERATING PROFITS" are based upon insufficient data to warrant their being interpreted as definitely obtainable.

The subjects discussed under these headings are included for the specific purpose of pointing out the possibilities of the district and the probable capital expenditures necessary to obtain these possibilities, if warranted by the initial underground exploration.

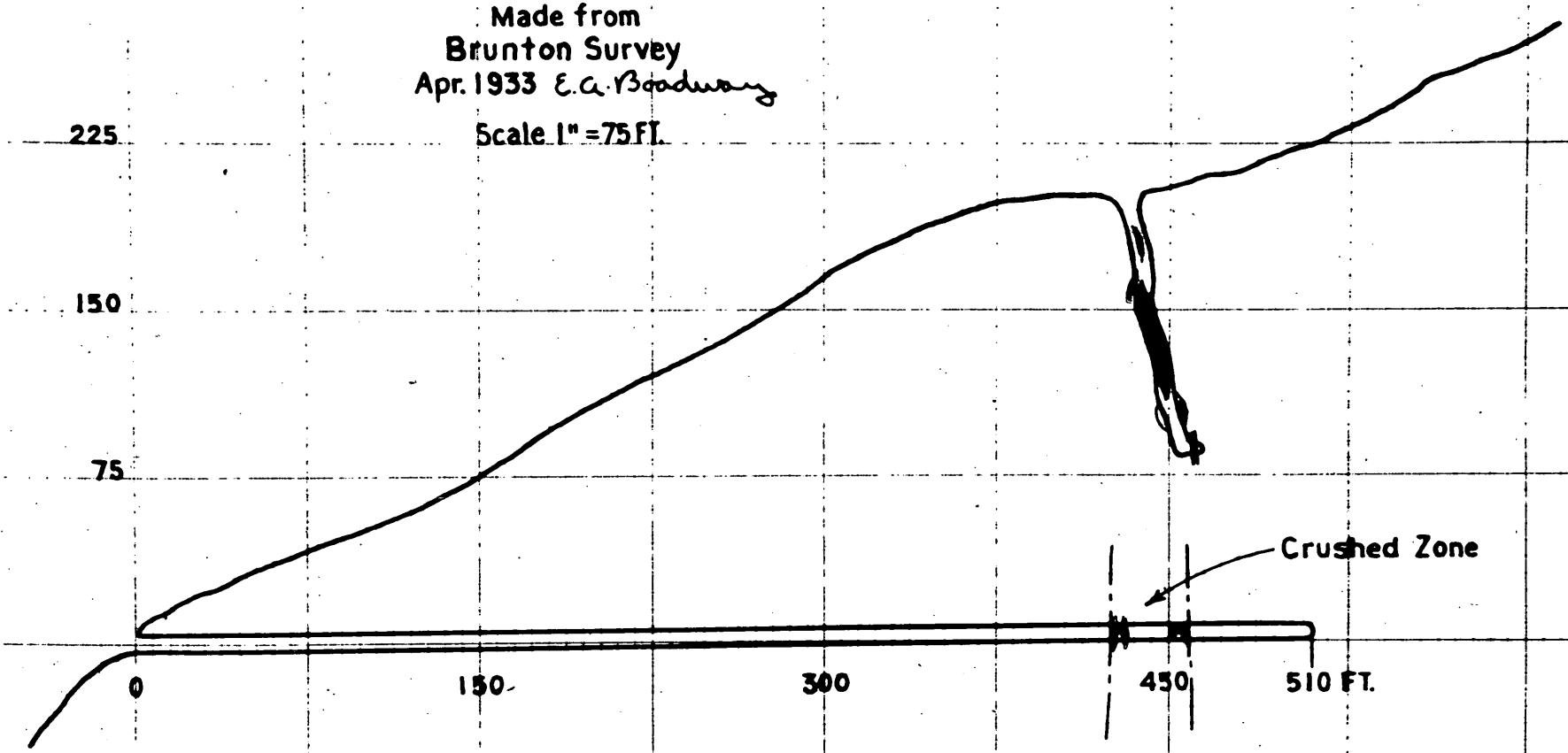
E. G. Bordinas

SECTION

MIKADO VEIN, SHAFT AND TUNNEL

Made from
Brunton Survey
Apr. 1933 E.A. Boadway

Scale 1" = 75 FT.

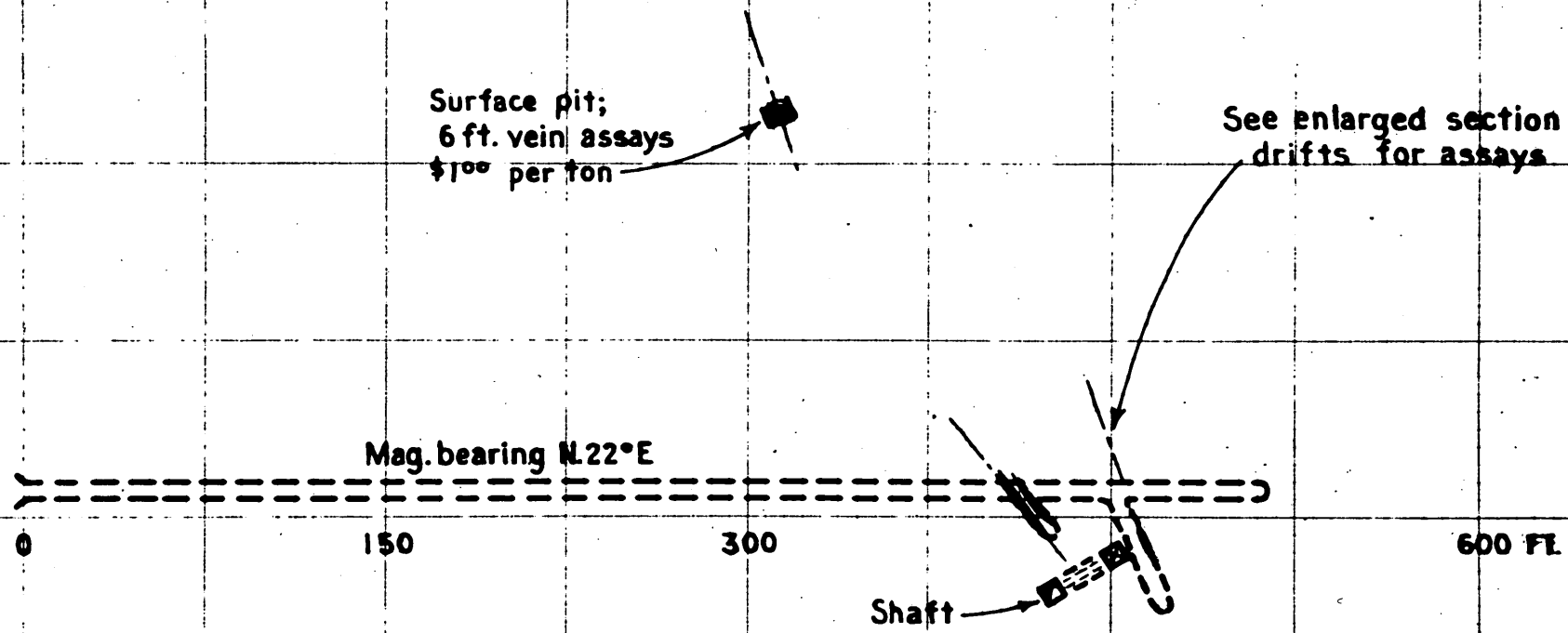


LEGEND :-

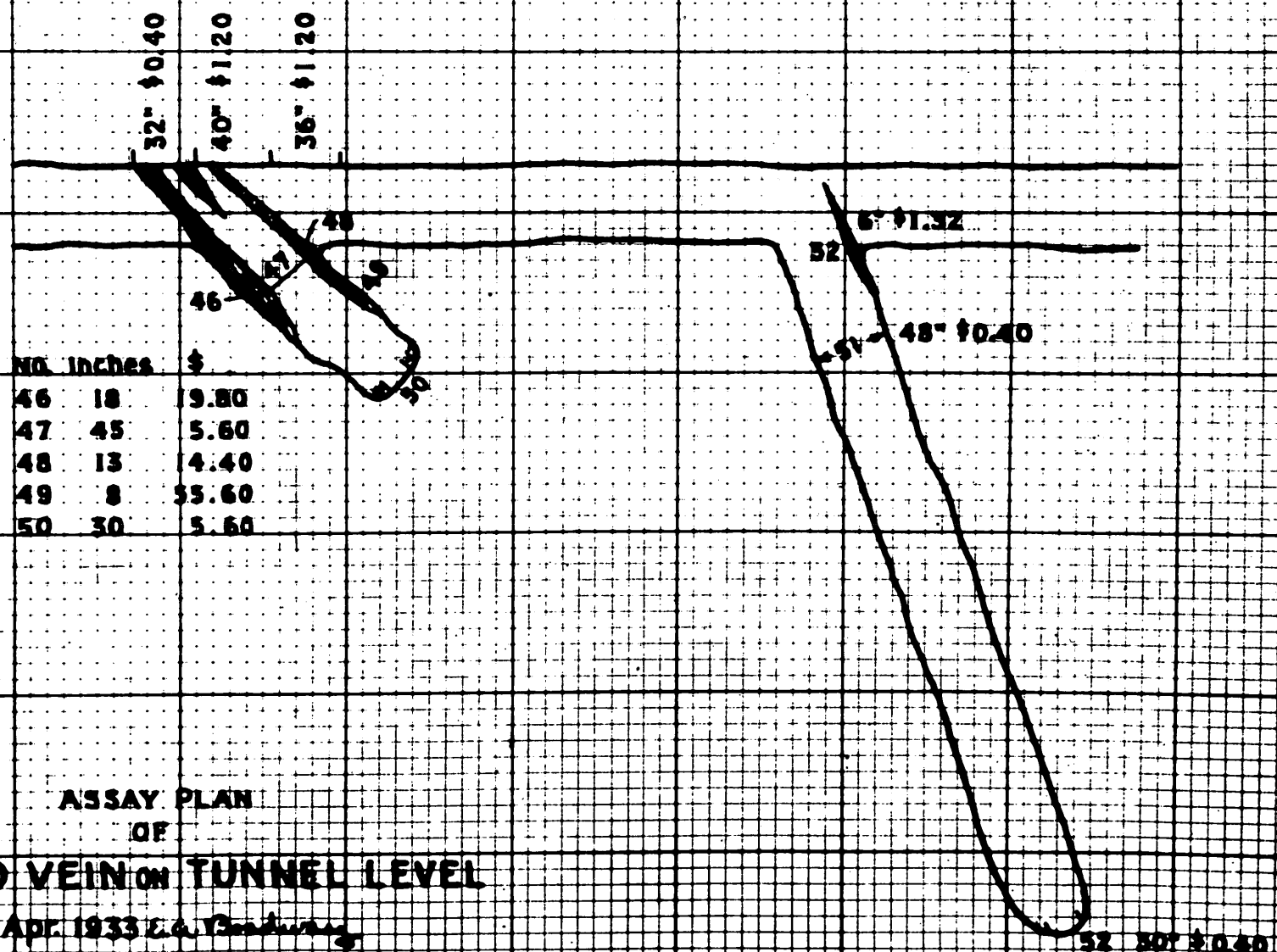
Quartz

Fault

Note:- This section is perpendicular to the strike of the vein.



PLAN OF
MIKADO SURFACE
AND
UNDERGROUND WORKS
From Brunton Survey
Apr. 1933 E.C. Broadway
Scale 1" = 75 FT.



No.	Inches	$
46	18	19.80
47	45	5.60
48	13	14.40
49	8	35.60
50	30	5.60

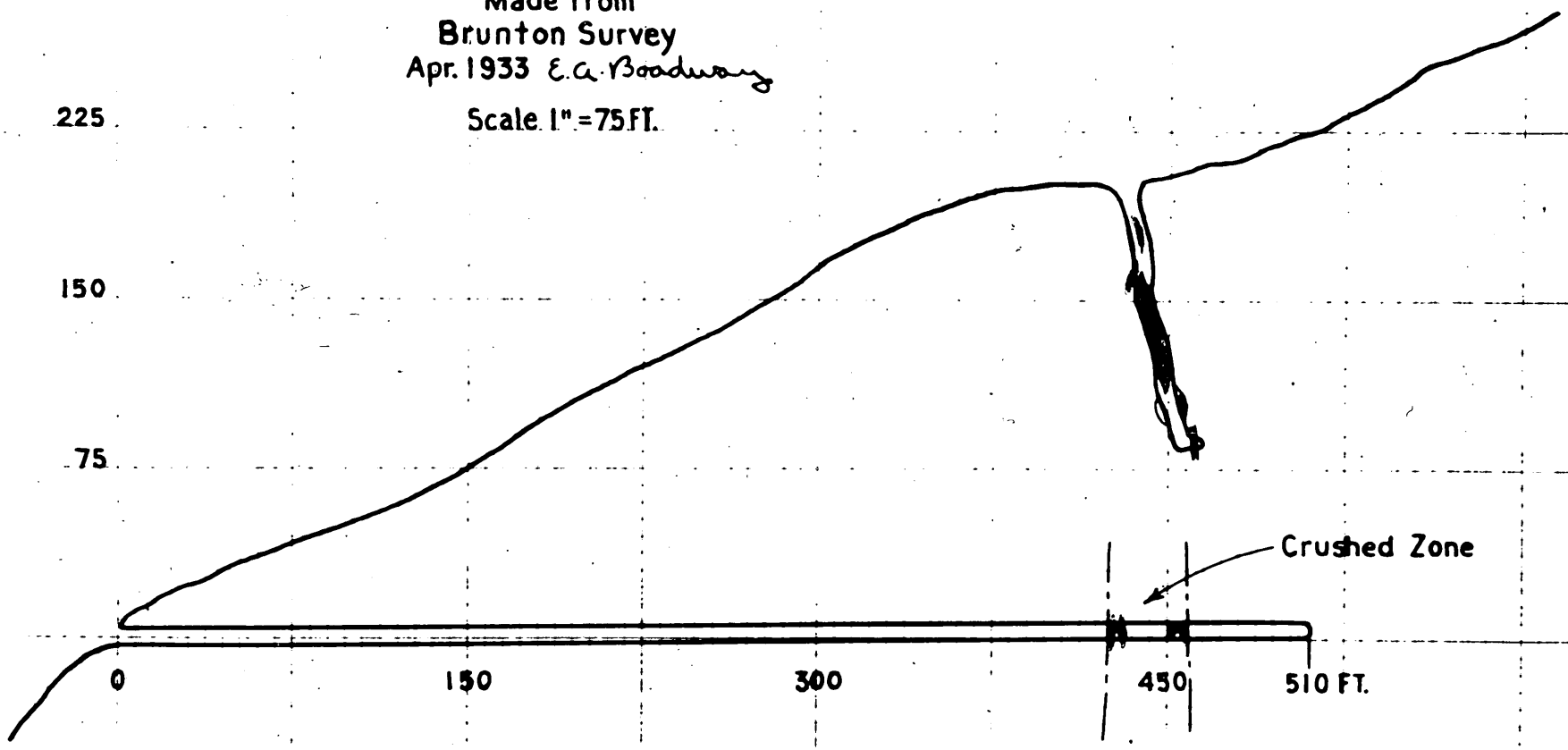
ASSAY PLAN
OF
MIKADO VEIN ON TUNNEL LEVEL
Apr. 1933 E.A. Gardiner
Scale 1" = 10 FT.

SECTION

MIKADO VEIN, SHAFT AND TUNNEL

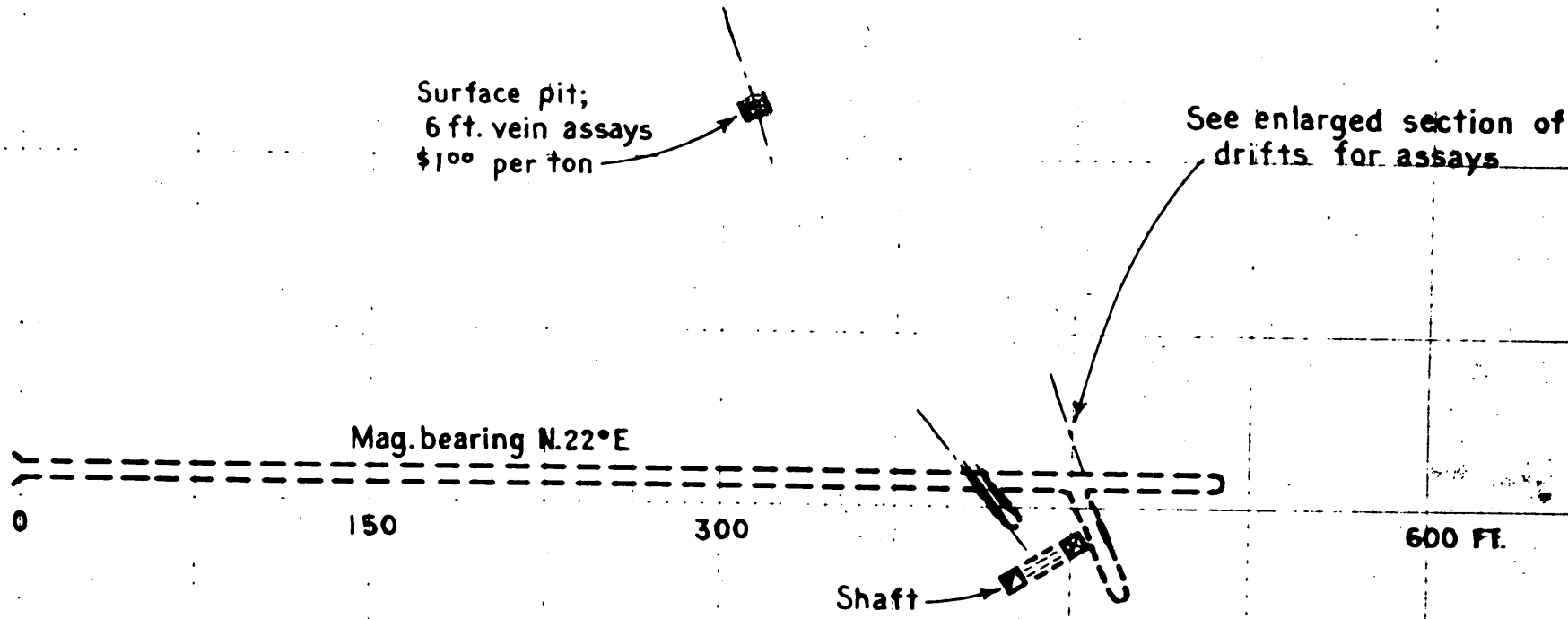
Made from
Brunton Survey
Apr. 1933 E.A. Boadway

Scale 1" = 75 FT.

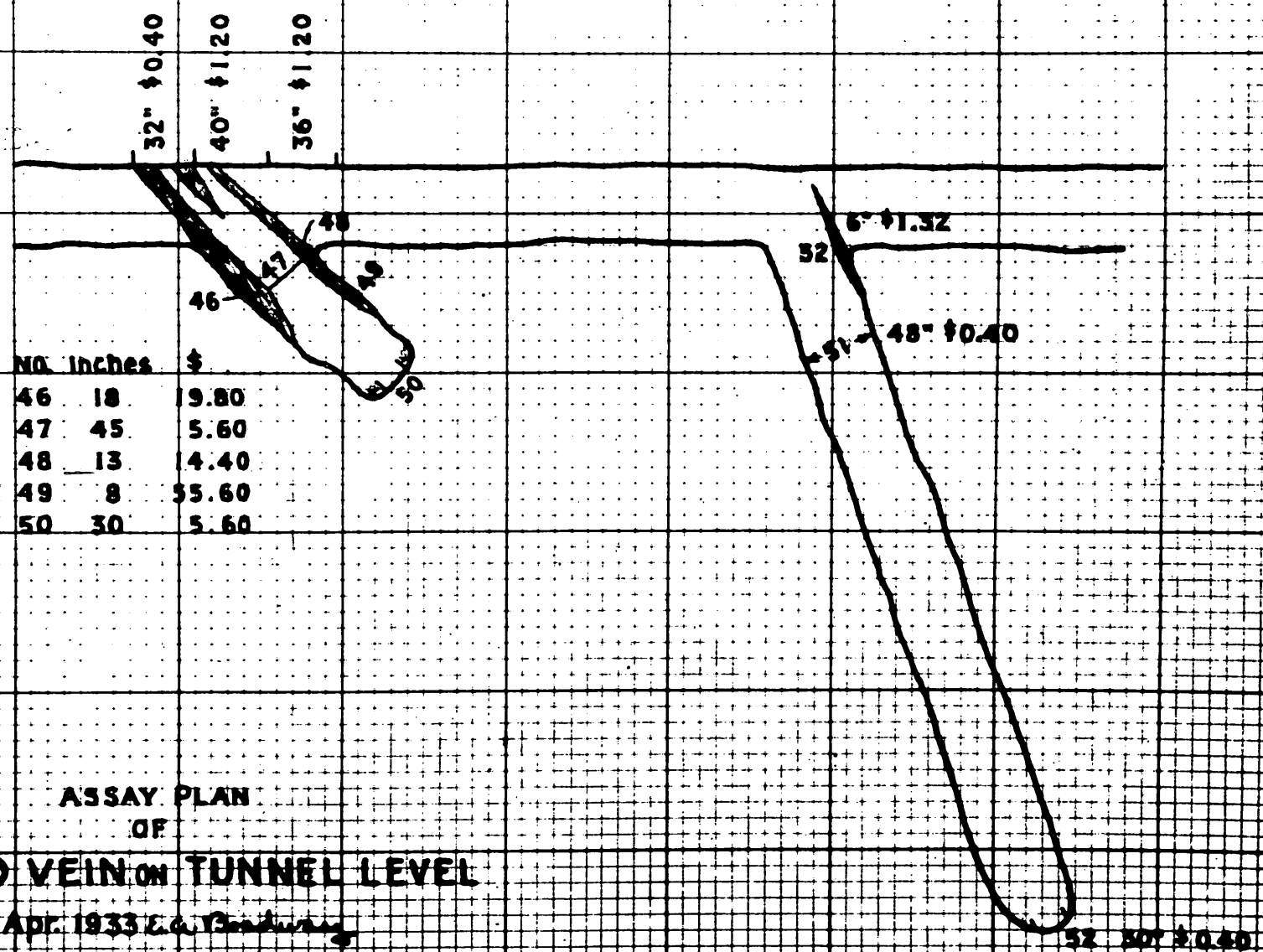


LEGEND :-
Quartz
Fault

Note:- This section is perpendicular to the strike of the vein.

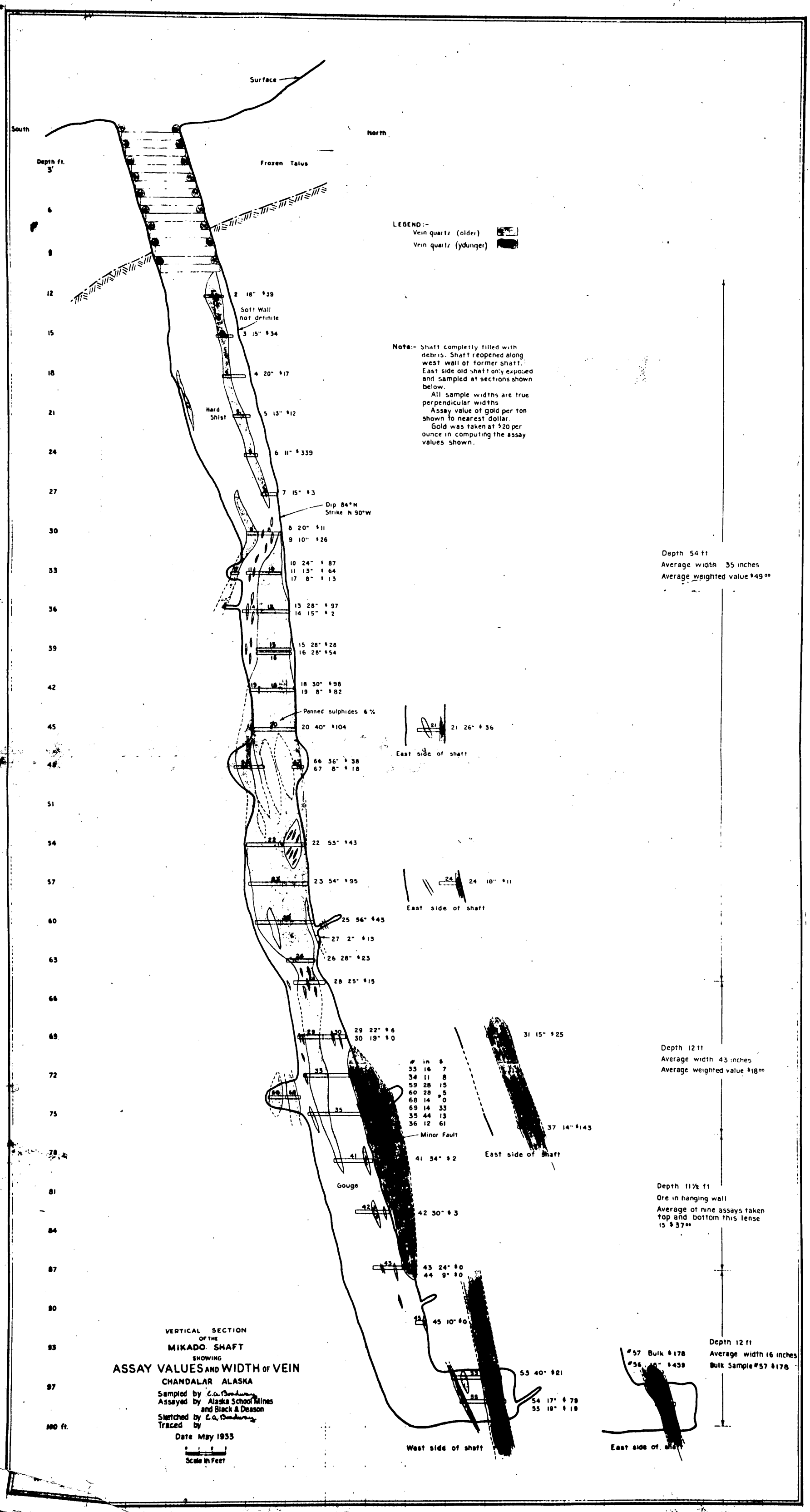


PLAN OF
MIKADO SURFACE
AND
UNDERGROUND WORKS
From Brunton Survey
Apr. 1933 E.A. Broadway
Scale 1" = 75 FT.



NO.	inches	$
46	18	19.80
47	45	5.60
48	13	14.40
49	8	35.60
50	30	5.60

ASSAY PLAN
OF
MIKADO VEIN ON TUNNEL LEVEL
Apr. 1933 E.A. Vandenberg
Scale 1" = 10 FT.


Surface
South
North
Depth ft.
Frozen Talus
LEGEND:-
Vein quartz (older)
Vein quartz (younger)
Note:- Shaft completly filled with debris. Shaft reopened along west wall of former shaft. East side old shaft only exposed and sampled at sections shown below.
All sample widths are true perpendicular widths
Assay value of gold per ton shown to nearest dollar.
Gold was taken at $20 per ounce in computing the assay values shown.
Soft Wall not definite
Hard Shist
Dip 84° N
Strike N 90° W
Panned sulphides 6%
East side of shaft
Minor Fault
Gouge
West side of shaft
Depth 54 ft
Average width 35 inches
Average weighted value $49.00
Depth 12 ft
Average width 43 inches
Average weighted value $18.00
Depth 11½ ft
Ore in hanging wall
Average of nine assays taken top and bottom this lense is $37.00
Depth 12 ft
Average width 16 inches
Bulk Sample #57 $178
VERTICAL SECTION OF THE MIKADO SHAFT SHOWING
ASSAY VALUES AND WIDTH OF VEIN
CHANDALAR ALASKA
Sampled by C.A. Bradway
Assayed by Alaska School Mines and Black & Deason
Sketched by C.A. Bradway
Traced by
Date May 1933
Scale in Feet

Abstracts of Chandalar lode reports.

March - 1909

Bedrock - micaceous and siliceous schists; strata striking roughly E-W, in what appears to be large anticline. Schists cut by intrusive diabases which show on tops of ridges and appear to be E-W dikelike bodies.

In schists and generally parallel to intrusives are quartz veins cutting bedding planes and dipping from 70° to vertically.

Little Squaw group strikes W. 15° So. from summit between Little Squaw and Little McLellan Creeks to west bank of Big Squaw Creek. Principal outcrop on Little Squaw extends east from point 200' from west end line of Little Squaw Claim for 300' on surface. Outcrop covered on both ends by talus but are continuous in outcrops. Schist here dips 8 degrees North and strikes E-W. Vein strikes E. 15 degrees N. and dips 82° S. cutting bedding planes at right angles. At tunnel vein lies about 50' N. of large intrusion which it appears to encounter 780' west of entrance of tunnel. Similar chute uncovered on strike on south side of this intrusion and traced on Sina, Big Squaw and West End claims.= Believes intrusion may be later than veins.

From data obtained to that time footwall band has average of from 3 to 4½' wide. Hanging wall band consists of hard massive quartz and has angular cleavage. On footwall occurs talcose streak, hanging wall having free cleavage. Chute at widest point is 8' wide, narrowest, at portal, is 3½'. At 45' depth at face 64' in tunnel vein is 4½' wide. Estimates 80% of gold to be free, remainder in sulfides. Estimates $259,208. ore in sight 428' x 45' x 45' x $41.87 (at 14 cubic feet per ton).

33 pounds of picked ore from upper crosscut gave 2.03 oz. Au. Expects vein to continue west to intersection with dyke, a distance of 350' from westerly crosscut (uppermost - 428' west of portal) - it being traceable by float to that point. In every opening so far made vein is well defined.

Sina, Big Squaw, and West End Claims - vein uncovered at several points. On Big Squaw in face of bluff and near creek level (about 700' lower than tunnel) 8' outcrop, same general character as in tunnel, picked samples assayed [illegible].

Cosine Fraction and Crystal - Cosine largely covered. Crystal uncovered near summit and traced for 125'. At lowest point 10' shaft on vein, below that float uncovered by prospect holes for 100' downhill. Crosscut made 50' above shaft. These openings show vein averaging 8' in width, composed of two bands as in Little Squaw. One which appears to be ribboned in 14" to 18" thickness. 9 samples in free Au from $250 to $850. Other band is hard massive quartz and assays from $11 to $21. No average working values obtained.

Triplex and Quadruplex - apparently northernmost vein which is outcropping between Little and Big Squaw creeks (?). Contains scattered galena.

Parabola - 3½' vein similar to Little Squaw (location?)

Evening Star, Morning Star, Star Fraction - on west extension of [illegible] claims crossing Upper Disc., Big Cr. (claims now known as Indiana and [illegible]), then known as Golden Eagle vein and later as American Eagle. At creek level Golden Eagle is 16' in width with 4' band running from $20 to $[illegible] per ton in free Au. Vein traced on each of the Star claims and is from 5' to 11' in width. Crosscuts made on each claim and samples found which show free Au, the [illegible] having same character as Golden King. Vein on Star Claims found at from [illegible] above creek.

No. 1 above Disc. on Little Squaw - in [illegible] surface gravels [illegible] per day per man but too many boulders.

Patterson - 1923

In Little squaw winze vein pinched to 12", including 6" of arsenopyrite on hanging wall, a horse of country rock 2' thick, and small quartz stringer on footwall. Next round down not mucked out, but miner who passed out from gas, reported vein had widened to 4' thick with little arsenopyrite.

Surface - Trench exposes vein on surface for 100' west from portal. At 100' west vein is 5½' wide, composed of shattered quartz. Fine ore shows good prospect by panning. 100' further west (200' west of portal) is open cut 7' x 10' x 6' deep from which Carter said he mortared $35. out of 41 pounds of rock. Patterson did find vein in this cut to be 6' x 6½' wide, with two or three feet of ribbon ore on footwall, in which much free Au was visible. 30' farther west (at 230') Patterson picked up vein but did not locate the walls. Then man opened it to 10' x 10' x 10'. Vein 7' wide, Patterson estimated from panning and grinding tests that ore will run $150 to $200 across full width. Vein faulted here. Dug several trenches to west finding no vein. About 100' west of last cut (at 330') and 100' south picked up qtz outcrop which may have been south faulted segment of vein.

Patterson had man make open cut 220' down hill to east of portal. Cut was 10' wide, 28' wide and 18' deep on west end. Found fissure but very little ore. Walls seem to be well defined and with same strike and dip as main tunnel. Called this 200' level (or #3 tunnel). Drove open cut 20' and tunnel 19' on vein. Fissure from 6" to 12" wide fairly filled with crushed country rock in places, other places with badly leached, oxidized ore. (According to Boadway and others all lower tunnel adits were begun too far north to encounter main vein.)

Also started open cuts on 300' and 400' levels. Ore road crosses strike of vein near 400' level. Suggests considerable work at 400' level as heavy showing of good float found there.

Advocated that Tunnel #3 on 200' level be driven 430' along the vein to fault zone.

Tunnel #2 is prospect tunnel driven 30' from 120' down hill from portal or 160' level. At breast of tunnel vein is 18" to 2' wide and seemed to be well mineralized; showed free Au by panning crushed ore.

Tunnel #1 was driven 100' on vein, with ore and gouge breaking free of walls. Vein at 100' shows 18" to 2' of ribbon ore, and from 2' to 3' of white quartz. All ore that has been milled, and that is still on dump is from this part of tunnel. Last 58' of Tunnel #1 was driven in foot wall, except at 130' where small crosscut was driven through vein to hanging wall. At winze station was partly cut in vein, part in country rock. Patterson made no tests of ore in tunnel except in crosscut at 130' where fine ore mined from floor showed good prospect in fine and coarse Au.

3 small piles of ore on dump, about 10 to 30 tons each. Pile at south side of entrance to tunnel should mill $50 to $70 per ton. North pile is coarse ribbon ore and does not pan as well. Third pile is mainly white quartz, considered waste, but expected to assay over $20 per ton. Tests of mill tailings showed considerable quicksilver which when burned left much au.

Heese - 1924

Little Squaw - assay map made but not in our files. Estimates 2000 tons of ore developed at $40. (at present prices about $140,000). based on assumption that ore in first 71' of tunnel has no commercial value and that from that point to face of tunnel (fault) and from tunnel level to surface will yield $40 per ton.

Tramline would be 10,889 feet long to Little squaw millsite.

Enevelos Group - more or less continuous outcrop for a thousand feet terminates in immense quartz exposure shown in photo (not available)

Mikado Group - 456' tunnel is 195' below collar of shaft - has not yet been driven to intersection of vein. Mikado vein outcrops for more than ½ mile. Tunnel should not have to be driven more than 45' further assuming vein dips 80° to northeast.

Little Squaw - No. 1 tunnel driven on and alongside vein for 191' at which point vein has been faulted, suffering horizontal displacement of 65'. Assays given but map not available. No. 2 tunnel = 69' below No. 1. No. 3 tunnel - 114' below No. 1. Vein dips S. at 65° - no account taken for dip in starting tunnels.

Thompson - 1925

Little Squaw Vein - E-W strike ("parallel with bedding planes of schist" - not true, probably confused shearing planes) dips S. 63°. No. 1 tunnel 192' long - on vein for 92' - followed footwall for remainder of distance. 1806' above Little Squaw Mill. Winze sunk 55' deep about 140' from portal. Raise 67' to 10' from surface at 160' in tunnel. Near face of tunnel vein displaced by fault bearing No. 49° W and dipping 76° to southwest at tunnel level. Fault and displaced vein visible on surface according to reports not verified because of snow. Vein averages - 3.6' wide in tunnel. Wider in raise and narrower in winze. First 30' of tunnel timbered and not sampled. In remaining 62' two distinctly different types of quartz - on footwall ribbon quartz averaging plus 16", remainder of quartz is hard, coarsely crystalline dense quartz. Between raise and fault, 4" to 9" of banded quartz, just west of raise excellent specimen containing free Au was obtained. Raise driven in footwall - dip regular. In winze at 27' below tunnel, vein flattens to 53° at 33' to 43', at 45' and to bottom dip is 58°. Winze follows footwall for half its depth until narrowing of vein and breaking into stringers where quartz was removed to hanging wall. At bottom of winze vein consisted of 10" of arsenopyrite and 10" of quartz separated by 10" of schist. In tunnel beyond point where it was on vein, nine places were broken through to hanging wall to inspect vein before Thompson left. First 30' of vein beyond timbers, banded quartz averages 16" thick and 4.34 oz. Au. Next 30' extending to offset where tunnel is in footwall, values are less declining to .35 oz. Au at offset. Here banded quartz 2.4' of 3.6' vein. From offset to raise 70', vein considered barren by Thompson - number of samples, six, from crosscuts, footwall to hanging wall. What may be called second footwall sheet occurs between foot of raise, and fault. Banded quartz here varies from 4" to 9" thick.

Tunnels No. 2 and 3 - directly east of and below No. 1. No. 2 is 25' long and No. 3 is 11' long. No vein exposed in No. 3 tunnel. No. 2 caved. Patterson said vein not located.

On Crystal No. 2, 2900' above Little Squaw Mill Patterson said quartz outcrop occurs.

Mikado Group - Tunnel portal is 2350' above Little Squaw Mill. Yasuda said shaft follows vein on dip for 42' and from there to bottom of vein and shaft were vertical. Tunnel driven 456' had not encountered vein.

Schultz Group - at 2550' elevation above Little Squaw Mill. Schultz said shaft was 50' deep and drift 80' on vein. Said vein was 5' wide.

Roberts Group - outcrop 80' above tunnel. No vein found in tunnel. Tunnel about 25 feet short of projected vein

McK. Reed - 1932?

Little Squaw area - 100 sq. mi. between latitudes 67° 30'N. and 67° 35'N.
longitudes 148° 05'W. and 148° 25'W.
Plane of schistosity where observed on Little Squaw and Big Cr. pitches (dips?) at very flat angle to the south.

Elevation Carlsens's cabin 2300'. Pass between Big and Little Squaw Cr. 4455'.

Little Squaw Lode - 185' adit, 160' to raise 75' to surface
135' to winze
- dip about 80° S. flattens to 60° in winze, and back to 80
- vein narrows where dip flattens and widens below.

1929 report - largely on placer
1927 report - Lit. Squaw, general strike of vein N. 80 to 85° W. - believes lead on Cosine Lode Cl. is part of Eneveloe Lead.

Bonanza, Golden Eagle and Eneveloe expose yellow Fe stained vein about 5' thick. Adit on W. end of Eneveloe and crosscuts on Golden Eagle and Bonanza. Vein about E-W and dip 70° N. Woodchuck - E-W and Vertical. Star - crosscuts (2) on E. end of Star #3 and 15' shaft on east end of Star #2. 40' shaft on American Eagle (Big Creek). Veins E-W and approximately vertical.

Boscway - 1932 (Gold at $20).

Little Squaw Vein - N. 75° E., 75° S. with proven length of 200 Feet and depth of over 120'. Cuts plane of schistosity which strikes N. 5° W. and dips 15° E. Fault displaces vein at face 200' N. of portal - displacement of about 50' on surface. Fault strikes N. 45° W. and dips 50° E. 75' raise to surface and 60' winze. (Believes fault striations indicate movement of western block to be to N. at dip of 12°).

Tunnel #2 on 70' level and #3 at 114' below portal of main tunnel did not encounter vein - appear to have been started without allowing for dip and are situated too far N. as shown in Sketch #2.

Ore shoot extends from near portal where truncated by erosion west for distance of 65'. Vein is strongest where truncated. Footwall streaks of "ribbon ore" from 1" to 6" thick are found on footwall section of vein beyond ore shoot but not of sufficient extent to be minable. Vein at fault in face of tunnel is 2' wide and contains no visible sulfides. Winze filled with ice. Raise closed at top by snow.

Sampling - Samples cut across back over full width of tunnel at 5' intervals where sulfides were visible - at 10' intervals elsewhere - were assayed by three independent assayers and results averaged. Weighted average shows truncated ore shoot extending for 65' west from portal and averaging $32.00 (59.15) a ton over a width of 4 feet. Estimates 4000 tons Assured, Probable, and Indicated ore with an "Possible" ore estimate as there is no knowledge of ore shoots in district, or $152,000 ($236,000). Amalgamation tests - average extraction 70%. Estimates operating costs at $20/ton under existing high cost of transportation.

Location plan of Little Squaw tunnels and projected position of vein at Tunnel No. 3 - North of Tunnel No. 2 is projected vein in 114' (main tunnel level.

Boadway - 1933 (Gold at $20)

For Little Squaw see Boadway 1932 report.

Bracco Vein - as exposed in shaft and tunnel consists of lenses of auriferous quartz in a gouge filled fault. Fault resembles shear zone in places, striking magnetic East and West and dipping nearly vertical. In shaft the quartz is concentrated on the N. or hanging wall side of zone.

No crosscuts from shaft towards footwall have been driven. Holes drilled in several places intersected additional quartz in both footwall and hanging wall of the shaft and parallel lenses may be expected. On tunnel level quartz is encountered on footwall of zone which at this level is 36' wide. Maximum width of lenses in shaft is 4½ feet with maximum depth of 50'. Lenses are fault cut across strike and dip of schist parts of country rock at an acute angle. Pyrite and arsenopyrite vary from one to five % by volume. Two ages of quartz - younger is harder - adjacent to older quartz gouge carried gold. Younger quartz is banded. Oxidized zone in district is very shallow and extends to about 50' in shaft but is not pronounced below 25'.

Magnetometer surveys place bottom of shaft at approximately 100' above tunnel level and on north wall of crushed zone. Exists lenses to be repeated for considerable length and depth along this E-W zone.

Sampling - Channel samples with about 2 pounds per running foot were cut at intervals of 3' on west side of shaft and on cross cuts from shaft wherever exposed. Results show ore shoots in Bracco shaft which, on eliminating 90% of extremely high assay averaged $47.50 ($86) per ton. Average width for this section is 25" and extends from depth of 10½ to 64½'. Continuation of this section for next 12' to 76½' averages $17 ($30.60) over an average width of 42". From 69' to 77' a lense of vein material consisting hanging wall and the samples averages $37 ($64.75). A four foot crosscut into hanging wall at bottom of shaft (99') exposes vein averaging 16" wide. Two channel samples assayed $77 ($138.25) and $43 ($77.50). The bulk sample assayed $175 ($315.50). Sample on dump roughly representative of last material removed from shaft averaged $138. ($241.50).

West of intersection of tunnel and crushed zone (see map) face of drift averaged $10.62 ($18.55). Highest assay on tunnel level was $51 ($89) over width of 6'.

Bracco Vein - The [illegible] widths reported exposed by visual, separated trenches over length of [illegible]. High grade float found in Robins Outlet.

Silver Queen - described by Irving Kane Reed as one of most promising in district.

Schultz Vein - (Dowell) brief description.

Estimates preliminary exploration expenditure of $75,000, then $620,000 for full scale operation with 200 ton mill.

McKee - 1939

Recommendations (expenditure of $43,000)

(1) Little Squaw Vein - deepen winze 10' and drift east on vein 200'. Surface trench west of fault.

(2) Mikado Vein - raise 110' from tunnel level to bottom of shaft and drift on vein 100'. Expose and sample veins in trenches No. 2 and No. 6.

(3) Eneveloe Vein - Tunnel 30' on vein outcrop.

$25. per foot contract for underground work.

Little Squaw Lode - vein dips 75° S, and strikes N. 86° E. proven length of 320' (210' east of fault and 110' west of fault) and proven depth of 110 feet. Outcrop at elevation of 3900'.

Surface - vein can be followed from portal west up mountain for 210' where it is faulted south 87 feet. Four trenches 48', 65', 82', and 110' west of fault. Vein west of fault strong - 40" wide in most westerly trench. Trenching done through 6' of talus - to west heavy layer of talus occurs frozen within a few feet of surface. Below tunnel level, east down mountain (average slope 35°) talus and rock broken by frost action covers surface for several feet. Trenching during examination failed to reach bedrock or locate vein. Two adits 70' and 114' below adit level penetrated bedrock for few feet. They are located 26 feet and 50 feet north of location of vein as projected from known dip and strike.

Adit level - adit 192' long, raise 78' to surface and winze 53' from adit level. Vein 8' wide maximum and 25" minimum. As exposed on surface average width is 4'. Adit follows vein for 90' and continues in footwall country rock for 102'. At 192', face, vein is cut off by fault.

Winze - Follows footwall of vein (at 75° S) for 30'. Vein flattens at 30' to 30° S. consisting of number of quartz stringers. From 49' to 57' (bottom) winze is on vein again and vein dips 75° S widening out again. At bottom of winze 13" and 20" quartz veins separated by 17' of schist. In bottom of winze 12" massive arsenopyrite is concentrated on hanging wall - footwall not clearly defined. False full of ice was not cleaned out.

Sampling Summary - Weighted average of surface and adit level samples with high assays cut to twice average is $50.15. Average width sampled is 25.00". Tonnage above adit level is 1500 tons - gross value of $71,500. Tonnage from surface to depth of 20' below adit level is 2000 tons gross value $108,000. For each foot of depth below adit level there is 34.3 tons - $1630./foot. Over 30" for length of 210' weighted average of surface samples east of fault is $54.01 - of adit level samples is $54.20 over average width of 20.16 inches for length of 195'.

Mikado - Boadway's sampling of shaft showed number of shoots from surface to bottom of shaft (depth 104') averaging better than $50.00 per ton across average width of 35" with best values at bottom of shaft. Lower values obtained from tunnel level.

Surface - the six trenches referred to in U.S.G.S. Bull. No. 532, 1913, were located by quartz dumps (trenches No. 2, 3A, 3, 4, 5 and 8) and appear to have been more in form of adits through surface debris. "Vein exposed by 6 cuts over 3000' and in all of these quartz near surface gives rich values in gold". U.S. G.S.Bull. No. 532. Quartz float estimated to make up over 1% of surface rock on hillside between trenches No. 3 and No. 2, and Tobin Creek, a length of 950'. Quartz is in evidence in continuous, regular form as indicated on map, below trenches and up hill above Trench No. 5. Bulieses float marks strike of veins and that number of parallel veins 2' to 5' thick occur en echelon. Trench No. 4,5,and 6 indicate dip of veins to be 60° S. Strike of veins appears to be about No. 65° to 70° W.

Shaft - shaft collared about 10' below surface at bottom of large pit, through talus [illegible] Sample from dump apparently representative of last material

removed from shaft consists of about 5# of banded, ribbon quartz picked at random over 100 sq. ft. mineralized chiefly with fine pyrite, some arsenopyrite, and gold visible under a glass. Sample assayed $649.95.

Tunnel - Tunnel was over half full of ice for its length, 496'. Ice removed. Near end of tunnel are 2 short drifts - 37 feet and 33 feet respectively. Drifts strike N. 81° W. and N. 65°W. Tunnel level located 100' below bottom of shaft and 42' west of shaft collar. Both drifts are in what appears to be a crushed, sheared, fault zone over 50' wide. Only definite markers in this zone are south wall and quartz stringers - one following south wall for drift length, one across tunnel back and into S. drift for 8 feet, and then striking out of drift at angle of few degrees.

Drifting - 22 feet drinting done by hand in south drift. Work indicates that vein structure has flat rake to the east. Present bottom of shaft is 27' east of tunnel - projected to tunnel level it would be 17' E. of tunnel. If vein structure in shaft rakes east as indicated in tunnel, downward continuation of the part of vein in bottom of shaft would be 83' to east at tunnel level. Mineralization consists chiefly of pyrite and arsenopyrite.

Summit - tunnel 42' long, shaft 41' deep and drift to W. from bottom of shaft 62' long. Three surface trenches on Summit Cl. and three on adjoining Rex claim on the same vein. All workings located at irregular intervals over 800 feet.

Tunnel Sampling - from portal west first 25' is timbered and lagged. Next 15 feet shows number of quartz stringers on the back separated by narrow bands of schist. Channel samples cut across this section at 5' intervals gave mediocre results. In tunnel face 30" of quartz indicate possibility of ore shoot coming in. Surface trench 50' west of tunnel face did not reach bedrock but showed much very high grade float.

Drift sampling - bottom of shaft. At bottom of shaft there is a short crosscut 11 feet long to the north. From here a drift, average width 30", follows quartz stringer for 62'. Quartz averages 16" wide. Face of drift in ice said to continue for another 20'. Vein channel sampled every five feet with mediocre results. Three samples 25' apart at 260', 285', and 310' west of western limit of underground workings showed 64" - $81.20; 40" - $14.70; 74" - $19.00. Three samples on partially exposed Rex Vein showed mediocre results.

As a result of erratic sampling results - option was dropped on Summit Vein. However, a 600' ore shoot is indicated by surface cuts.

Emerald Claim - Boadway reported occurrence of high grade float in Robbins Gulch. Bull. No. 532 reported occurrence of high grade ore in three trenches on claim. Natives say rock slide obliterated two trenches. Quartz dump marks location of the 3rd trench, at elevation of about 300' below top of saddle between two peaks. Slope of hill where the dump occurs is about 45°. Trenching here exposed banded quartz vein about 10" wide. 17" channel sample including 7" wall rock assayed $107.80. Sample of dump area quartz, area 50' square, assayed $154.45. Recommends expenditure of $1,000 for 30' of drifting, and further exploration of vein if warranted.

Fallsgreen and Northern Light Claims - Two samples showed low values. 34" - $4.20; 6" - $11.20. This property warrants further exploration. Sampling records filed with company.

Newton property (American Eagle) - now indicate and Tonopah - U.S.G.S. Bull. 532 and placer miners report 15' quartz vein crossing Big Creek. Shaft timbered and lagged to bottom. Quartz visible through 2" of water in bottom of shaft across full ' width. Representative sample of dump quartz assayed $11.20. Quartz showing - mineralization assayed $2.80. Pile of quartz near creek, apparently from surface trench across vein shows considerable visible gold. Recommends continued work.

Other showings - Many in area between Squaw Lake and Chandalar Lake. Some high erratic values obtained from Star and Woodchuck Claims but no ore shoots outlined (sampling records filed with company).

Claim staking - One adjoining Tobin and Little Mikado to south. One claim on each side of Little Squaw Claim. One 1500' north of Little Squaw on parallel

quartz vein (probably Grubstake) where quartz assayed $8.40.

Transportation - largely outdated, to the area.
In the area - High divide with steep slopes lies between Little Squaw and Mikado. Ore indications at present do not justify road construction or tram-way between properties. Proposes that Little Squaw, including Enevelos and Pallagren and the Mikado, including the Summit, Big Creek and Star veins be developed and the ore milled as independent undertakings. Freight for Little Squaw would be landed on Squaw Lake. For Mikado on Chandalar Lakes.

From Squaw Lake to Little Squaw Mine is about 3½ miles, fairly even gradient, maximum 15%. Year round tractor road from lake, airport, and millsite to within 3/4 mile of Little Squaw adit, and thence a 4 feet trail along the hillside. Estimates that using tractor and grader $1500. will widen the last 3/4 mile for all year tractor heavy freighting of supplies to mine and ore to millsite.

Lake Chandalar to Mikado Mine is about 9 miles up Tobin Creek. Estimates that $2000 will complete road for year round service between Chandalar Lake and the Mikado Mine. At present time freight can be handled over this route by tractor while ground is frozen, maximum 15% grade. Low pass between Tobin and Big Creeks. Freight for and ore from Summit and Big Creek veins can be handled by tractor via this pass. Wide flat valley over which freighting by tractor can be done during frozen season connects Squaw Lake and Chandalar Lakes - 13 miles.

Timber and wood - ample available for fuel, buildings, and mining and milling purposes within few miles of both lakes.

Labor - partnership or contract work preferable to wages.

Costs - see report for detailed cost estimates

Milling and millsites - Discusses amalgamation tests etc. For year-round milling of Little Squaw ore, mill should be located 2 miles from mine where year round supply of water is available. (For salvage purposes mill should be set up on creek just below Little Squaw vein where there is sufficient water for 3 to 4 months of milling and no transportation of ore would be necessary).

For year round milling or ore from Mikado Vein mill should be located at Chandalar Lake (9 miles). For salvage purposes mill could be setup in creek bottom one mile away where there is sufficient water for 3 to 4 months.

Notes on Chandalar Lodes not described in reports, and recommendations.

Drumlummon Vein - N. 75° W., 50°S. Vein averages 8' thick exposed for about 150'. Free Au picked from vein in pits, arsenopyrite sparse in qtz. Regular channel sample not taken - neither well exposed. Chip samples assayed very low. About 5' vein outcrops 1000' SE of Drumlummon along strike, sample by Buckley assayed $4.80 ac. to O'Keefe.
Another vein, 2' thick, exposed on cliff about 300' N. of Drumlummon.

Outlaw - much float, no outcrop, no gold observed, apparently E-W vein.

Golden Vale - no outcrop now visible. Ac. to O'Keefe rich float was found here. So. 30°W. of Drumlummon outcrop.

Big Mick - barren quartz outcrop probably 6' thick - few sulfides.

Pioneer - North ab. 1000' from X1 Pk, in saddle due E. from Little Squaw Float in pit carries sulfides with much fine Au. Vein not found in place until later. Saddle trends N. 65° W heading towards Grubstake No. 1 and Prospector.

10/2/46 3 float samples Au-1.45 oz. $51.80
10/30/46. After vein was found in place Denny O'Keefe sent in two sacks of rock supposed to be roughly representative of mineralized outcrop material. Au - 2.89 $102.48
Au - 7.54 266.26
Pioneer Extension - no outcrop, E. of Pioneer on Little McLellan slope.

Little Johnny - 1st claim N. of Pioneer and adjoining it. Outcrop 10' thick, mostly barren quartz carrying small amounts of Pbs. Picked sample of qtz with Pbs and FeOx stain - Au Tr Ag - 1.00 oz.

Matchless - vein and claim N. of Little Johnny. Barren looking qtz outcrop about 8' thick with sparse Pbs and pyrite.

Jackpot - vein opened about 20' in adit. Aver. 18" across. N. 80°E., 80°S. 15" sample across face 18' from portal Au - 0.[illegible] $2.40. 20" sample across face Au - 0.33 $11.55. Free Au visible in some specimens but vein appears smaller and weaker than others.

Grubstake - Nearly 1000' N. of Jackpot. Free Au, fine to coarse, visible in specimens taken from face. Ac. to O'Keefe one pc. of qtz. with a lump of Au as large as the end of a finger, was from the Grubstake vein. Ab. 20' tunnel on 20" vein. Drift on vein strikes N. 75°E. from Gold Gulch right limit ab. 100' below mtn. top. Other outcrops below and to N. of Grubstake carry pyrite and arsenopyrite.
Extending E. across divide to Little Squaw Cr. are outcrops on Grubstake No. 1 claim including the Trail Tunnel N. along trail from Little Squaw vein. Trail Tunnel ab. 20' long striking W. on S. dipping vein ab. 2½' thick. Vein contains some Sa. 30" sample assayed Au -0.02 $0.70.

Prospector Vein - ab. 1/3 mi. of Grubstake in saddle between Gold Gulch and Little Squaw Cr. Ab. 3' thick, N. 75° W., sparse spots of Ag bearing Pbs, arsenopyrite, and pyrite in white qtz.

St. Marys - outs St. Marys Cr. on Discovery Placer Claim. Vein about 5' thick, vertical, and striking S. 80° E. No gold visible in rusty outcrop in creek. St. Marys Cr. placer very rich below this outcrop - gold may have come from Mikado-Star zone.

Indiana and Tonopah claims - cross Upper Disc. Placer Claim, Big Cr. Shallow shaft and dump where E-W vein crosses creek. Qtz. bearing free Au, arsenopyrite, pyrite on dump though dump thoroughly higraded in past. Vein was very thick where shaft was sunk.

McLellan Lode - Vein about 3' to 4' thick, only about 6' of outcrop exposed. Does not look well mineralized. Qtz with chlorite, chist, and FeOx stain.

Capitola Lode - middle Tobin Cr. out of best mineralized area on L.L. of creek ab. Anderson cabin. 3 pcs. of qtz with some scorodite and arsenopyrite Au - 0.02 $0.70.

Little Kiska Lode - vein staked by Adney on stibnite float between Mikado-Star groups and Summit group.

Second Chance (Last Chance?) Restaked 1958 as Chandalar Lode Overlapping Enevelos from West. - Robbins Gulch, west of Enevelos. Channel sample from 2' of S. wall of ab. 6' vein Au - 1.64 $67.40. Vein here at least 6 feet thick, phenomenally rich samples can be taken from outcrop.

Rex and Summit Claims - samples from outcrops of Summit vein. Several pits on Summit Vein on Rex Claim west of west end line of Summit Claim were in 1946 largely sloughed, though shallow. Mineralized qtz float and gouge was present in dump material.

Rex Disc. Pit - ab. 3' wide, 25' long from Summit-Rex boundary westward. Neither wall of vein exposed. Vein said to be 5 or 6 feet thick. Sample across 5' from cleaned bottom of trench, crushed scorodite stained qtz, gouge, gray schist. Neither wall of zone exposed Au - 0.04 $1.40.
45' sample. Neither wall exposed
Au - 0.03 $1.05.

Summit
A46-341C Loc. Dump at pit ab. 150' E. of Rex Claim border
Descr. Rough average of dump material (see sketch)
Assay Au - 0.53 $18.55.

A46-341F Loc. Outcrop from pit at 341 C
Descr. Heavily scorodite and FeOx stained Qtz specimen
Disp. Assay Au - 2.58 $90.30

Sample from small ore bin near upper adit E. of 341C. Qtz crushed to ab. 3/4 in. and taken to represent rough average of ore in bin. Au - 2.90 $101.50.

Summit
(contd.)

A46/342A Loc. Outcrop ab. 40' E. of 341 C and 75' W. of upper tunnel portal.
Descr. 10" rotted gray schist, crushed white qtz, and scorodite stained qtz on N. side of vein
Assay Au - 10/57 oz. $369.95

A46-342B Loc. Continuation to S. across vein from 342A
Descr. Sample across 2' of FeOx stained Qtz
Assay ?Au - 0.18 $6.30

342A and B combined - 34" $153./ton

Upper tunnel less than 45' long, ice filled. Vein said to have averaged 4' to 5' thick, 7 tons milled yielded a little over $700. to prospectors Wurtz & Duggan. Shaft several hundred feet east of 342A & B ice filled. Lower tunnel, near shaft, but possibly on different qtz lens, still open.

A46-342C Loc. From dump below lower tunnel.
Descr. Fine Qtz particles picked from all parts of dump
Assay Au - 0.90 $31.50

A46-343A Loc. From dump at shaft. Cabin built on dump.
Descr. Qtz from shaft picked up at random around dump.
Assay Au - 0.44 $15.40

A46-343B Loc. Outcrop near 342 A & B
Descr. Heavily scorodite stained Qtz specimen from N. side of vein.
Assay Au - 9.04 $316.40

Sample. Loc. Lower tunnel on vein which may be S. of main Summit vein.
Descr. Across 4½' of sparsely mineralized qtz and schist on back 50' from portal. Neither wall of zone exposed. Au - 0.16 $5.60.

Woodchuck Vein - over 6' thick, very small proportion of Sa. Steep E-W vein mainly white qtz, no free Au observed, walls of vein not seen in shallow sluffed shaft (see Sulzer notes)

Golden Eagle Cl.- Pit on Qtz float does not expose vein (see Sulzer notes)

Jupiter Cl. - trench and open adit on wide qtz vein. Adit ab. 20' long N. 75° W. No free Au but vein appeared fairly well mineralized with Sa and scorodite.

First Chance - (partly restaked as Chandelar Lode) Strong vein exposed between Enevelce and Jupiter. Some free Au found in float near vein.

Second Chance - (Last Chance?) (Partly restaked as Chandelar Lode) Pit on wide vein. Tunnel below did not hit vein. Vein E-W, S. dipping. 3' quartz, 1½' schist, 2' plus qtz showing in pit. Entire zone not exposed. Abundant coarse free Au visible in outcrop and on dump. Sample across 2' of 6' plus zone Au - 2.26 $79.10. Bulk sample along rich band in vein Au 49.98 $1749.30

Enevelope - qtz outcrop abt. 18' thick near West end Enevelope Lode.

Bonanza - Small vein, sometimes called Bonanza vein, parallels Enevelope few feet away covered with talus and slow, said to be very rich. Running slope at hd. of (Rockline) Gulch on Enevelope pieces of float (Roberts ?) bearing free Au, often in center of small PbS and ZnS, were picked up and later used as specimens. See Sulzer notes and later reports.

Cosine Lode - not visited, qtz. visible from Stoner's Last Chance vein. Sulzer notes show high Au obviously from picked highgrade.

Star #3 - at E. end from pit on S. dipping E-W vein over 5' thick. Chip sample assays Au - [illegible] $6.40 Very high Au sample taken from one of Star outcrops picker sample, indicates Au mineral as sulfide content was small.
About 500' W. of above pit is another on 3' outcrop of poorly mineralized looking qtz.

Mikado Sh. - outcrop at extreme hd. of St. Marys Gr. on divide to Tobin. Short caved adit. E-W steep dipping vein?. Heavily mineralized qtz on dump. Some free Au visible and few PbS in qtz. Grab sample of small qtz particles from dump Au - 3.47 $121.35.

American Eagle (see Indicate & Turquoise) - now Indicate Sh. upper Big Gr. Shallow shaft on vein said to have been over 20' wide with spectaculer free Au specimens said to have been taken from vein near walls in early days. Big Gr. is overall operations very high below vein (also later above).

Shamrock Lode - 1500' S. of Summit Cabin. 4' vein exposed at one outcrop, Ss but no free Au observed.

Little Mikado - at Little Mikado and Tobin shaft - rough average of qtz on shaft dump Au - 3.[illegible] $[illegible]
Free Au not visible in qtz on dump.

Crystal Claim - pits on very large vein sparsely mineralized with Ss, at least 7' thick, no free Au seen. Old Sulzer file notes show spectacular assays, obviously from picked specimens. Other large qtz outcrops in notches on divide between [illegible] Lellan and Little Squaw Creeks, south from Crystal Lode to the E. Star Claim. Tunnel on the Eward extension of the summit zone.

Recommendations

Little Squaw Vein

With available D-8 or TD-18 bulldozers strip east of tunnel portal, where possible, to locate vein. Near old 114 foot level portal strip to south and if vein or vein zone can be found drift 350 feet west to explore vein.

Build road proposed by McKee to Little Squaw Mine.

Enevelee Vein

Strip with bulldozer to locate trenches described by U.S.G.S. as showing high grade ore. Tunnel on vein outcrop near west end of Enevelee claim. Later strip other vein outcrop areas on the six claims of the Bonanza Group (which includes the Enevelee Claim).

Mikado Vein

De-ice Mikado tunnel. Raise 100 - 118 feet from tunnel level to bottom of shaft and drift on vein 100 feet. Where vein outcrops near surface are accessible to bulldozer strip old trench areas to uncover and sample veins.

Complete road to Chandalar Lake or to best supply landing.

If above work indicates desirability, acquire, if possible on reasonable terms, Last Chance and First Chance Claims staked as Chandalar Lode adjoining Enevelee Cl. on west, (Work should begin there.), Summit Group, Indicate and Tonopah, and other more promising veins. Stake any claims necessary to prevent nuisance staking as soon in program as it seems that it should be done.

Depending on results of above work follow one of McKee milling plans for small scale program.

Diamond drilling some of the veins at an appropriate stage of the work would be the quickest way of determining the possibility of blocking out large scale tonnages for a moderately large mill.

MIKADO 1960 - FRANK BIRCH

ORE RESERVE ESTIMATED:

Ore indicated by work on the 100' level is divided into three adjacent zones of 5', 10', and 15' mining widths.

SE 30' of ore chute, outlined by the original Mikado shaft (100' vertically) and the 100' level drift, assuming 100' vertical extent of ore body, 30' long and 5' wide. Values from Boadway's 1933 report are used for upper 66' of this block. Lower 34' taken from values in drift. Boadway's shaft 5' wide @ $47 for 66'.

1,250 tons @ $48 per ton = $ 60,000

Middle block, including #1 x-cut rse, extending to #2 rse.
Bulk samples used in determining grade of section thru #1 rse, and cutting samples used at #2 rse - Bulk sample average of drift used in determining value of drift section. Block 50' long, 100' vertically, and 15' wide:

6,250 tons @ $78 per ton = $ 488,000

End block, extending NW from #2 rse thru #3 rse.
Samples from drill cuttings in both raises used in estimating this 50' long, 100' high, and 10' wide block.

4,160 tons @ $81 per ton = $ 337,000

TOTAL 11,660 tons @ $76 per ton = $ 885,000

100' Level Drift:

Bulk samples - 80' of 5'x 7'- $62 per ton.

Chip samples 15" width - 80' - $360 per ton; or 5' at $90 per ton.

100' level, #1 x-cut rse:

Bulk samples for 10' horiz. width = $31.39 per ton
Chip sample for same 10' = 88.00 per ton

Weighted average from bulk sample across 17'
horiz.width projected to drift level, including drift: $40 per ton

Weighted average of chip samples across same section 55 per ton

100' level #2 rse:

Drill cutting samples for 10' width projected to drift level - $143 per ton

Chip samples for same area higher in value, but the total value is indeterminate due to loss of one sample in shipping.

100' level Highgrade raise:

64 tons in stockpile, total raise muck broken, average $150 per ton
Top 20' of rse. chip samples show average 16" qts averaging $557 per ton
Next 25' shows average 10" qts & gouge averaging $15.85 per ton

This raise shows vertical continuity of values found in #2 x-cut rse, but was not used in reserve estimate, since it does not show cut-off widths of ore zone.

100' level #3 rse.

From drill cuttings: 10' horiz. width projected to
drift level averages - $18.50 per ton.

From chip samples, same 7' width shows $69 per ton, or graduated to include 3' of waste, its 10' wide @ $48 per ton

This discrepancy probably largely due to the fact that the high-grade qtz had already shown up at the end of the previous unsampled round, before cuttings were taken, so a good part of this highgrade material did not get into the cuttings. The lower value is used in my estimates.

ORE RESERVES ON 100' level using chip samples:

Drift - $90/ton - 5' widths 450

#1 rse $88/ton - 10' width 880

1330 ÷ 15 = $88.67

#2 rse (from drill cuttings no chips available) 143 - 10' wide 1430

Drift 90 - 5' wide 450

1880 ÷ 15 = 125.00

213.67 ÷ 2 = $106.83 per ton

Middle Block - 6,250 tons @ $106.83 - - - - - - - - - $666,000

Shaft Block - $47 for 66' = 3100
$90 for 34' = 3060

6160 ÷ 100' = $61.60 per ton

1250 tons @ $61.60 - - - - - - - - - $ 77,000

End Blocks:
#3 Rse Chip samples show 10' width @ $48
#2 Rse chip samples show 10' @ 143

$191 ÷ 2 = $95.50 average

4160 tons @ $95.50 per ton - - - - - - - - - - -
$398,000

TOTAL 11,660 tons @ $98 - - - - - - - - - - - - - - $1,141,000

1,141,000
[illegible]
2,[illegible] ÷ 2 $1,013,000 average of two estimates

11,[illegible] tons @ $87

ka
f Natural Resources
f Mines
d Minerals

Form M-1-8-60—5M

Assay Office ..... April 26, 1961
Date ..... College

REPORT OF ASSAY

On samples received from ..... Little Squaw Mining Co.

Address ..... Chandalar, Alaska

Assay No.	Sample Marked	OUNCES PER TON		Value per Ton	Percentage of
		GOLD	SILVER		
26055	131	trace	nil		
26056	132	1.58	trace	$55.30	
26057	133	0.02	nil	0.70	

Assayer.

SAMPLES FROM DRIFT ON SUB-LEBEL

1960

Date	Cars	Total	Sample No.	Description	
July 27	10	10	1	Drift on sub-level	Sidewiping, plugging bottom for chute, etc. at top of shaft. Scoop from each car, mixed, quartered for sample.
28	14	24	"	"	
29	6	30	"	"	
30	20	50	"	"	
Aug. 5	14	64	"	"	
16	8	72	"	"	
18	19	91	2	" 0' -6'	5' x 7' 100'
18	17	108	3	" 6' - 12'	Sublevel drift West
19	13	121	4	" 12' - 18'	
20	15	136	5	" 18' - 24'	
22	17	153	6	" 24' - 30'	
23	18	171	7	" 30' - 36'	
24	13	184	8	" 36' - 42'	
25	15	199	9	" 42' - 48'	
26	13	212	10	" 48' -54'	
27	15	waste	11	" 54' - 60'	
29	14	"	12	" 60' - 66'	
30	13	"	13	" 66' - 72'	
31	15	"	14	" 72' - 78'	
Sept. 1	14	"	15	" 78' - 84'	
2	11	"	16	" 84' - 90'	
5	9	"	17	" 90' - 96'	
6	12	"	18	" 96' - 102'	

SAMPLES FROM RAISES ON SUB-LEBEL

7	21	"	19	#1 ft. wall raise	0' - 6'
8	6	218	20	"	6' - 14'

SAMPLES FROM RAISES ON SUB-LEVEL con't.

Date	Cars	Total	Sample No.	Description
10	6	224	21	#1 ft. wall raise 14' - 22')
14	Drill cuttings		22	#2 ft. wall raise 4' -x 12')
14	"		23	#1 ft. wall raise 22' - 30') Avg. of
16	"		24	#1 ft. wall raise 30' - 38')cuttings from all
17	"		25	#2 ft. wall raise 12' - 20')drill holes
17	"		26	" 20' - 28')in ea. round
17	7	231	27	#1 & #2 ft. wall raises) mixed correlate with samples) indiscrim- 24, 25, 26) inately
21	4	235	27	")
23	Drill cuttings		28	#1 ft. wall raise 38' - 46'
23	"		29	#2 ft. wall raise 26' - 34'
24	18	253	30	#1 & #2 ft. wall raises
24	drill cuttings		31	#2 ft. wall raise 34' - 42'
26	"		32	#1 ft. wal raise 46' - 54'
27	"		33	#2 ft. wall raise 42' - 50'
Oct. 10	"		34	#1 ft. wall raise 54' - 60'
10	"		35	#2 ft. wall raise 50' - 57'
11	"		36	#3 ft. wall raise 28' - 35'
17	"		37	#2 ft. wall raise 64' - 71'

Samples from Raises & Cross cut on Sub-level

18	drill cuttings	253	38	#1 ft. wall raise 60' - 67'
19	"		39	#3 ft. wall raise 32' - 39'
20	"		40	#2 ft. wall raise 70' - 77'
20	"		41	#3 ft. wall raise 39' - 46'
21	"		42	#3 ft. wall raise 46' - 53'
24	Grab sample		43	#3 ft. wall raise 52' - 59'

Samples from Raises & Cross cut on Sub-level cont'd

Date	Cars	Total	Sample No.	Description
24	Drill cuttings		44	#3 ft. wall raise 58' - 65'
28	"		45	S. E. cross cut 0' - 5'
31	"		46	" 5' - 7'
Nov. 1	15	268	47	Raise on qtz. lens 0' - 15'
4	7	275	48	S. E. cross cut 0' - 7'
7	13	288	49	" 7' - 12'
7	drill cuttings		50	" 7' - 12'
8	10	298	51	" 12' - 17'
9	9	307	52	Raise on qtz. lens 15' - 22'
10	10	317	53	" 22' - 30'
10	10	327	54	" 30' - 38'
10	10	337	55	" 38' - 46'
11	10	347	56	" 46' - 54'
11	Grab sample		57	S. E. cross cut 12' - 18'
11	Drill cuttings		58	" 18' - 24'

Samples from drifts on main levels

14	waste	59	S. W. drift 0' - 5'
15	"	60	N. E. drift 0' - 8'
16	"	61	S. W. drift 5' - 9'
18	"	62	N. E. drift 14' - 20'
18	"	63	S. W. drift 9' - 15'
21	"	-	S. W. drift 15' - 21'
22	"	-	S. W. drift 21' - 27'
23	"	64	S. W. drift. 27' - 33'
24	"	65	Ft. wall raise 6' - 14'
24	"	66	[illegible] wall raise [illegible]
25	drill cuttings	67	[illegible] 14' - [illegible]
26	"	68	" [illegible]

CHANNEL AND OTHER SAMPLING

Sample #	Level	Location	Description
69	Main	Hanging wall raise	30'-38'
70	100'	X-cut	3' Qtz & gouge
71	100'	"	3' " "
72	100'	High rse	5' below face East end 12" footwall qtz strike S 37 E Dip 74° NE
73	100'	"	5' " " Qtz in hanging wall - 18" No distinct limits
74	100'	"	10' " " East End 12" Qtz on footwall Strike S 37 E Dip 74° N.
75	100'	"	15' " " East End 30" Qtz. " " "
76	100'	"	20' " " 8" hard mineralized qtz in hangwall N 50 W 74°N
77	100'	High rse	20' " " 18' crushed qtz & gouge adjacent to above on footwall. Same dip & strike. East end
78	100'	" "	25' " " 4" hard mineralized qtz - west end N. 50°W 84°N dip rse section 3 x 5
89	100'	" "	30' from face 3' of gouge - no qtz
80	100'	" "	35' " " 4' qtz in E end West end blank Dip 68°N rse Section 3 x 5
81	100'	" "	40' from face 2" - 4" qtz in E end West end blank Dip 47°N rse Section 3 x 5
82	100'	High rse	45' from face 2" - 4" good qtz in East end Dip 57°N West end blank rse Section 3x3
83	100'	#2 rse	6' qtz (measured along raise) white & crushed in middle, oxidized 1' on each edge
84	100'	#2 rse	30" qtz with some gouge along bottom of raise
85	100'	#2 rse	3' qtz
86	100'	#2 rse	18" Qtz coming up from bottom, pinches out in back
87	200'	SW drift	Drill cuttings 39' - 47' ft.wl. rse. Qtz & schist zone S 40°E 65° N dip
88	100'	Drift	5' west of sta. #10 30" of qtz
89	100'	"	10' west of sta. #10 36" qtz
90	100'	"	15' west of sta. #10 30" qtz

Sample #	Level	Location	Description
91	100'	Drift	20' west of Sta. #10 10"qtz
92	100'	"	25' West of Sta. #10 7" qtz. N 47°W 76° N Dip
93	100'	"	30' West of Sta. #10 30 Qtz
94	100'	"	35' West of Sta. #10 2" Qtz - (skip 8" gouge) + 12" qtz
95	100'	"	37' - 41' W. of 10. 6" - 18" qtz on footwall side Dip 78° to South (App. shear) strike N.80° W
96			
97	100'	"	45' West of Sta. #10 11" qtz toward bottom, coming up on hanging wall side. Dip 45°N. Strike N. 60°W
98	100'	"	Same as # 97, but in the back - 24" qtz
99	100'	"	50' W. of 10 5" qtz at Sta. #14 N. 60°W 74°N Dip
100	100'	"	55' W. of 10 8" qtz N 60°W 74°N Dip
101	100	"	60' W. of 10 12" qtz " "
102	100'	"	65' W/ of 10 6" qtz N 47°W 72° N Dip
103	100'	"	80' W of 10 8" qtz in footwall N 70°W 90° dip (vert.) no apparent continuity
104	100'	"	30" qtz in back at Sta. 10
105	100'	"	12" qtz 5' E. of 10 — N 65 E 72° N Dip
106	100'	"	12" qtz 10' E. of 10
107	100'	"	8" qtz & gouge (chalky qtz) in E face, 14' E of 10
108	100'	#3 ft wl rse	~~#3-ft-wl-rse~~ 32' from face 6" qtz in E side and back S 23 E 80° N dip
109	100'	#3 ft wlm	~~#3-ft-wl~~ 32' - 34' from face Qtz & gouge bearing as # 108
110	100'	"	36 - 40' from face 2" qtz stringer -turning into 108 & 9 45° N Dip N 38° W
111	100'	"	41 - 42" from face 12" qtz S 40 E 88° N Dip
112	100'	#1 Ft. wl rse	3' - 5' from face crushed partially oxidized qtz N 50° W 80° N Dip
113	100'	#1 Ft. wl rse	5' - 8' from face (W rib) (extendate 8' from face on East rib) continuation of sample 112 total qtz width 4-5 feet. leying on footwall

Sample #	Level	Location	Description
114	100'	#1 Ft Wl rse	3" - 6" Qtz comes into rse from bottom 25' from face, pinches out in rse 15' from face, dips N 60°, strike N 45°W
115	100'	"	34 - 37' from face Wide, crushed, white qtz, some mineralization
116	100'	"	37 - 40' -continuation of qtz in # 114, Dip 80°N & strike N 27° W on upper contact
117	100'	"	40 - 43' continuation of qtz in # 114
118	100'	"	43 - 46' " " " " Dip 80°N and strike N 27° W. onlower hanging wall contact
119	100'	"	46 - 49' Qts. and gouge in ribs - appears to lay with raise, running into qtz in Nos. 115-119
120	100'	"	49 - 52' from face Qtz and gouge from bottom up. Seems to stop at back of raise.
121	100'	#1 Ft wl rse	52 - 56' from face. Hard mineralized qtz, coming up from bottom, appears to stop at back. N. 88°Dip N 40°W
122	100'	#1 Ft. wl rse	58 - 59' from face. 12" qtz N 87°Dip N 45° W strike
123	100'	#1 Hang.Wl Rse	8' from bottom of rse. 12" qtz. N. 60°Dip N 50 W Stk
124	200'	S.E Heading of N drift following hanging wall.	4" qtz. 71° N dip at Sta. # 19 to +4'
125	200'	S E end hanging wall drift, #19 Sta. + 10'	5' Qtz and gouge from hanging wall down.
126	200'	Sta. 19 + 15'	5' Qtz & gouge from hanging wall down.
127	200'	Sta. 19 + 15'	6" qtz on hanging wall
128	200'	Sta. 19 + 20'	5' qtz & gouge
129	200	Sta. 19 + 25.5	4' qtz. &gouge in face
130	200'	Sta. 19 + 10' to 20'	3"-4" stringer in Hanging Dip 60° SW S 55°E
131	200'	Ft Wl drift	4.5' qtz 22' from face 90° Dip Strike N 70° W
132	200'	Ft wl drift Ft wl raise	4.5' qtz N. 70° W S 78° Dip 6 - 10.5' from face
133	200'	Cuttings from Ft wl drift	Hg Wl rse 47' - 55'

State of Alaska
Department of Natural Resources

Division of Mines and Minerals

Form M-1-5-60-25M

Assay Office College

Date Oct. 21 1960

REPORT OF ASSAY

On samples received from Little Squaw Mining Co.

Address Chandalar, Alaska

Assay No.	Sample Marked	OUNCES PER TON		Value per Ton	Percentage of	
		GOLD	SILVER			
25821	22	5.66	1.40	$199.36	#2 Footwall raise drill cuttings	4'-12'
25822	23	0.02	nil	0.70	#1 Ftwall "	22'-30'
25823	24	0.02	nil	0.70	#1 Ftwall raise "	30'-38'
25824	25	1.50	0.40	52.86	#2 Ftwall raise "	12'-20'
25825	26	5.00	1.38	176.24	#2 Ftwall raise "	20'-28'
25826	27	0.82	0.26	28.93	#1 and #2 Ftwall raises (24,25,26)	11 cars
25827	28	0.02	trace	0.70	#1 Ftwall raise (drill cuttings)	38'-46'
25828	29	0.36	0.16	12.74	#2 Ftwall rse " "	26'-34'
25829	30	1.36	0.20	47.78	#1 + #2 Ftwl rse	18 cars
25830	31	0.02	nil	0.70	#2 Ftwall rse (drill cuttings)	34'-42'

#1 Footwall raise muck was put over dump as waste - 20 tons

About 100 assays to come

Assayer.

State of Alaska
Department of Natural Resources

Division of Mines and Minerals

Form M-1-6-60—3M

Assay Office College

Date Oct 13 1960

REPORT OF ASSAY

On samples received from Little Squaw Mining Co.

Address Chandalar, Alaska

Assay No.	Sample Marked	OUNCES PER TON GOLD	OUNCES PER TON SILVER	Value per Ton	Percentage of
25777	#1	1.08	0.28	$38.05	Average of 72 cars. Enlarging top of shaft
25778	#2	0.12	trace	4.20	5'x7' subsurface drift 0'-6'. 19 cars
25779	#3	0.76	0.20	26.78	" 6'-12' 17 cars
25780	#4	0.70	0.14	24.62	12'-18' 18 cars
25781	#5	3.32	0.78	116.90	18'-24' 15 cars
25782	#6	3.06	0.62	107.66	24'-30' 17 cars
25783	#7	2.48	0.52	87.27	30'-36' 18 cars
25784	#8	4.14	0.86	145.67	36'-42' 13 cars
25785	#9	3.60	0.58	126.52	42'-48' 15 cars
25786	#10	1.34	0.34	47.21	48'-54' 13 cars
25787	#11	0.40	0.10	14.09	- Waste - 54'-60' 15 cars
25788	#12	0.78	trace	27.30	60'-66' 14 cars
25789	#13	0.06	trace	2.10	66'-72' 18 cars
25790	#14	trace	trace		72'-78' 14 cars
25791	#15	0.82	0.18	28.86	- " - 78'-84' 11 cars
25792	#16	0.06	1.01	3.00	84'-90' 9 cars
25793	#17	0.02	trace	0.70	90'-96' 12 cars
25794	#18	0.02	trace	0.70	96'-102' 21 cars
25795	#19	0.06	trace	2.10	#1 footwall rock (waste) 0-6' 6 cars
25796	#20	0.58	0.16	20.44	6'-14' 6 cars
25797	#21	1.20	0.38	42.34	14'-22'

Mineralization in samples #8 and 9 is given below.
Mineralization consists of pyrite and arsenopyrite with some sphalerite and trace amounts of galena. Most of the gold is free-milling, but some of it occurs intimately associated with the pyrite and arsenopyrite mineralization. Trace amounts of copper (0.001%) also occur in the samples.

Ed Hoak just told me you had another group of samples on the way.

Assayer.

State of Alaska
Department of Natural Resources

Division of Mines and Minerals

M 1-5-59—3M

Assay Office Callage

Date Dec 27 1[illegible]

REPORT OF ASSAY

On samples received from Little Squaw Mining Co.

Address 309-310 Radio Central Building, Spokane, Wash 1

Assay No.	Sample Marked	OUNCES PER TON GOLD	OUNCES PER TON SILVER	Value per Ton	Percentage of
					From sublevel raises
25872	32	trace	trace		#1 Footwall Rse 46'-54' Drill cuttings
25873	33	0.12	trace	$4.20	#2 " " 42'-50' " "
25874	34	0.02	0.22	0.90	#1 " " 54'-60' " "
25875	35	0.02	trace	0.70	#2 " " 50'-57' " "
25876	36	1.02	0.18	35.86	#3 " " 28'-35' " "
25877	37	0.06	trace	2.10	#2 " " 64'-71' " "
25878	38	0.04	0.40	1.76	#1 " " 60'-67' " "
25879	39	0.16	0.08	5.60	#3 " " 32'-39' " "
25880	40	0.54	trace	18.90	#2 " " 70'-77' " "
25881	41	trace	trace		#3 " " 39'-46' " "
25882	42	nil	nil		#3 " " 46'-53' " "
25883	43	trace	trace		#3 " " 53'-59' Grab sample
25884	44	trace	trace		#3 " " 58'-65' Drill cuttings
25885	45	trace	trace		SE crosscut 0'-5' " "
25886	46	trace	trace		" " 5'-7' " "
25887	47	6.76	1.68	238.20	Raise on qtz lens 0'-15' 15 cars
25888	48	0.32	trace	11.20	SE crosscut 0'-7' 7 cars
25889	49	0.08	trace	2.80	" " 7'-12' 12 cars
25890	50	0.02	nil	0.70	" " 7'-12' Drill cuttings
25891	51	0.02	trace	0.70	" " 12'-17' 10 cars
25892	52	0.48	0.22	17.00	Raise on qtz lens 15'-22' 9 cars
25893	53	4.06	0.98	142.98	" " " 22'-30' 10 cars
25894	54	5.08	1.52	203.67	" " " 30'-38' 10 cars
25895	55	1.90	0.38	66.64	" " " 38'-46' 10 cars
25896	56	4.98	1.02	175.22	" " " 46'-54' 10 cars
25897	57	0.02	trace	0.70	SE crosscut 12'-18' Grab sample
25898	58	0.02	trace	0.70	" " 18'-24' Drill cuttings
25899	59	0.02	trace	0.70	SW Drift - waste 0'-5'
25900	60	0.02	trace	0.70	NE Drift - " 0'-8'
25901	61	0.12	trace	4.20	SW Drift - " 5'-9'
25902	62	0.02	trace	0.70	NE " " 14'-20'
25903	63	0.04	0.06	1.46	SW Drift " 9'-15'
25904	64	trace	trace		SW Drift " 27'-33'
25905	65	0.18	0.08	6.38	Footwall raise " 6'-14'
25906	66	trace	trace		Hanging wall rse " 6'-14' Drill cuttings
25907	67	trace	0.14	0.12	" " " " 14'-22'
25908	68	trace	trace		Hanging wall rse " 22'-30' Drill cuttings
25909	69	0.02	trace	0.70	[illegible] cut [illegible] Chip
25910	70	0.20	trace	7.00	[illegible]
	—	—	—	—	SW Drift - waste 18'-21'
	—	—	—	—	" " " 21'-27'

State of Alaska
Department of Natural Resources

Division of Mines and Minerals

Form M-1-5-50—5M

Assay Office Cola.

Date Dec 2,

REPORT OF ASSAY

On samples received from Little Squaw Mining Co.

Address 309-310 Radio Central Building, Spokane, Washington

Assay No.	Sample Marked	OUNCES PER TON GOLD	OUNCES PER TON SILVER	Value per Ton	Percentage of
25911	71	0.32	trace	$11.20	100' x-cut 8' gtz w gouge (chip sample)
25912	72	36.28	7.22	1,273.90	High grade raise 40' below face - 12" gtz (")
25913	73	3.48	0.46	122.20	" " " -5' below face 18" gtz (chip)
25914	74	42.00	8.00	1,477.20	" " " -10' " " 12" gtz (")
25915	75	15.20	4.40	535.96	" " " -15' " " 3' gtz (")
25916	76	1.46	0.32	51.38	" " " -20' " " 8" " (")
25917	77	4.62	1.60	162.60	" " " 20' " " 18" " (")
25918	78	0.62	0.20	21.18	" " " 25' " " 4" gtz (")
25919	79	0.48	0.32	17.09	" " " 30' " " 3' gouge (")
25920	80	0.22	trace	7.70	High grade raise (35') 4" gtz (")
25921	81	0.58	0.24	20.79	" " " -40' below face 3" " (chip)
25922	82	0.16	0.10	5.82	" " " -45' " " 3" " (")
25923	83	0.52	0.10	18.52	#2 rse - 6' gtz (see map) (")
25924	84	0.02	trace	0.70	#2 rse - 30" gtz w gouge (") (")
					#2 rse - 3' gtz (") (chip)
This assayed * No sample #85 is with this group.					
25925	86	18.14	3.80	673.32	#2 rse - 18" gtz (see map) (chip)
25926	87	0.02	trace	0.70	SW drift - final rse - 34'-48' (Drill cuttings)
25927	88	9.60	2.24	338.02	100' level - S'ly of Sta. #10 - 30" gtz chip sample
25928	89	2.40	1.24	85.12	" -10' W. - 36" gtz " "
25929	90	2.36	0.70	83.23	" 15' W. - 30" gtz " "
25930	91	2.26	0.46	79.51	" 20' W. - 10" gtz " "
25931	92	0.48	0.14	16.98	25' W. 7" gtz " "
25932	93	1.28	0.44	45.20	" 30' W 3" " " "
25933	94	0.14	0.12	5.02	35' W of Sta. #10 - 12" gtz " "
25934	95	0.16	0.18	5.76	37'-41' W. of #10 - 6'-18" gtz " "
25935	96	0.10	0.10	3.86	
25936	97	0.02	0.22	0.90	10" gtz. chip sample
25937	98	[illegible]	15.46	2,174.60	see map 24" gtz
25938	99	[illegible]	[illegible]	1,522.20	100' level - 50' W. of #10 - 5' gtz chip sample
25939	100	[illegible]	6.12	841.31	" " 55' W. 8" gtz " "
25940	101	[illegible]	2.90	442.21	" " 60' W. 12" " " "
25941	102	[illegible]	1.56	212.20	" " 65' W. 6" " " "
25942	103	0.02	trace	0.70	" " 70' W. 8" gtz " "
25943	104	[illegible]	0.84	125.36	" " Sta. #10 - 30" gtz " "
25944	105	[illegible]	0.76	125.18	" " 5' E. of Sta. #10 " " " " gtz - Chip sample
25945	106	0.90	trace	31.50	" " 10' E. " " " - 42" " " "
25946	107	0.02	trace	0.70	" " 14' E. " Sta. #10 - 8" " " "
25947	108	[illegible]	2.14	[illegible]	cg final rse - 32' from face - 6" gtz " "
25948	109	0.04	trace	1.40	" -32'-34' " " gtz w gouge " "
25949	110	0.02	trace	0.70	" 36'-40' " " -2" gtz
25950	111	[illegible]	3.86	[illegible]	" 41'-42' -12" gtz " "

Assayer.

Department of Natural Resources

Division of Mines and Minerals

Form M-1 5-59—3M

Assay Office Colle

Date Dec 27

REPORT OF ASSAY

On samples received from Little Squaw Mining Co.

Address 309 Radio Central Bldg. Spokane, Wash.

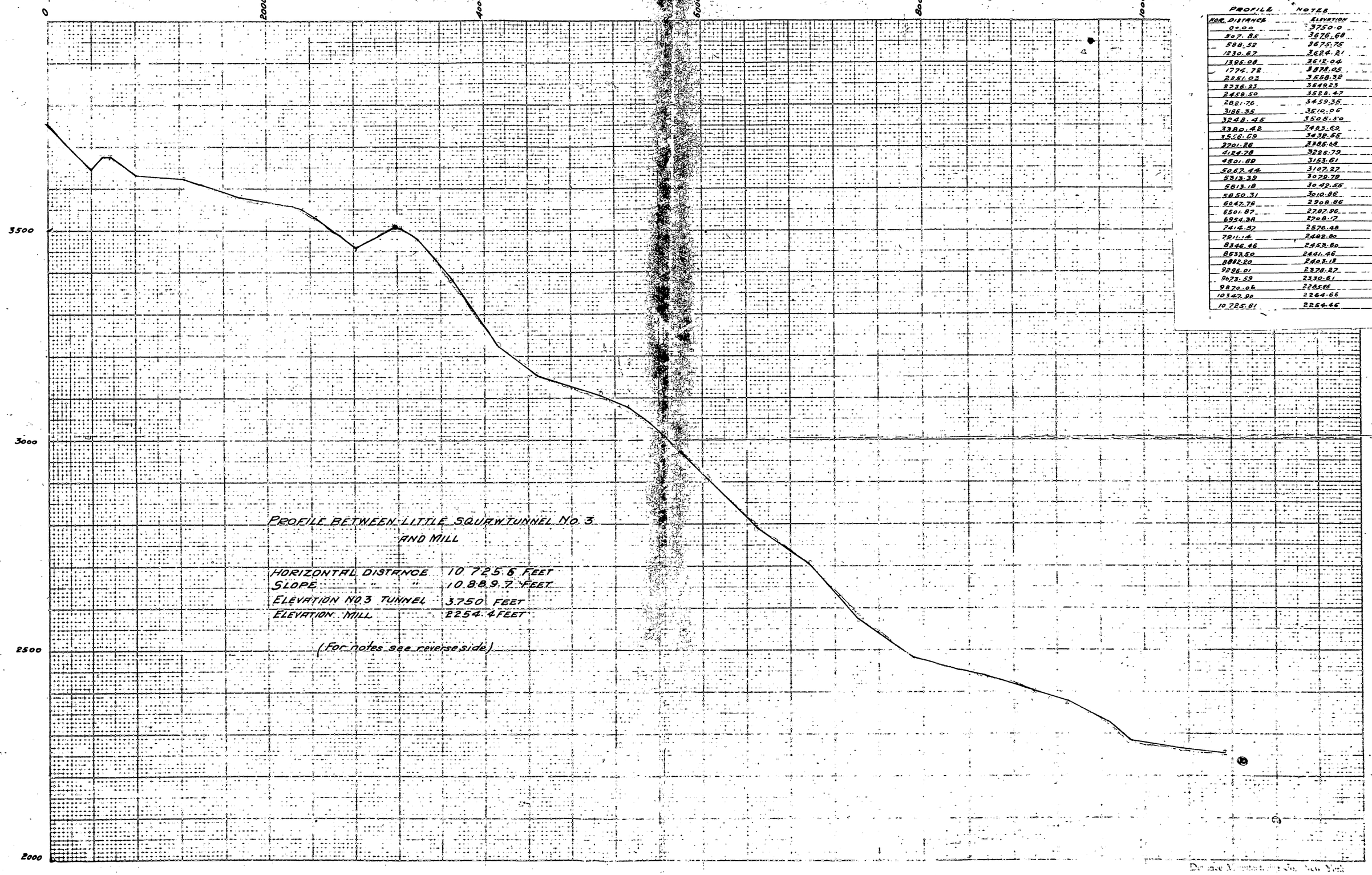
Assay No.	Sample Marked	OUNCES PER TON GOLD	OUNCES PER TON SILVER	Value per Ton	Percentage of
25951	112	0.02	trace	$0.70	#1 Ftwl rse - 3'-5' from face - chip sample
25952	113	0.02	trace	0.70	" -5'-8' " " "
25953	115	0.02	trace	0.70	" 34'-37' " " - qtz
* Not assayed	* No sample #114 is with this group.				#1 Ftwl rse - 3"-6" qtz - 3'-5' nice
25954	116	0.02	trace	0.70	" (cont. from 37' to 40' - qtz
25955	117	nil	nil		" 40'-43' qtz
25956	118	0.02	0.16	0.84	" 43'-46' qtz
25957	119	8.50	2.36	299.62	" 46'-49' qtz & gouge
25958	120	1.20	0.30	42.27	" 49'-52' from face - qtz & gouge
25959	121	2.44	0.30	85.67	#1 Ftwl rse - 52'-56' - qtz Chip sample
25960	122	1.08	0.38	38.14	" 58'-59' - 12" qtz
25961	123	0.02	trace	0.70	#1 Hanging Wl RSE - 8'-9' - 12" qtz
25962	124	0.02	trace	0.70	SE hdng - N. Drift - 4" qtz
25963	125	0.02	trace	0.70	SE heading - N. Drift - #19 Sta
25964	126	trace	trace		Sta. 19 + 15'
25965	127	0.02	trace	0.70	Sta. 19 + 15' - 6" qtz
25966	128	0.02	trace	0.70	Sta. 19+20' - 5' qtz & gouge
25967	129	0.02	trace	0.70	Sta. 19 + 28.5 - 4' qtz & gouge
25968	130	trace	trace		Sta. 19 + 10' to 20' - 3'-4' stringer
	131				200 Lvl Ftwl Drift - 22' from face -
200 Level	132 Ftwl Drift - Ftwl rse -			—	8 - 10.5' from face - 45' qtz
" "	133 " " -			—	47' - 55' (Drill cuttings

I haven't turned the samples over to Ed Beak as yet, as there is the possibility you may want some rechecked — in which case I'll make a fresh split of the sample. I'll turn them over to Ed as soon as I hear from you.

#85, #114, and #131-133 were lost enroute. It is hoped that they will be found as samples which should be approaching ore zone at upper end of 200 level footwall raise are included.

Howard Stevens

Assayer.



PROFILE BETWEEN LITTLE SQUAW TUNNEL No. 3
AND MILL

HORIZONTAL DISTANCE	10 725.6 FEET
SLOPE " "	10 889.7 FEET
ELEVATION No 3 TUNNEL	3750 FEET
ELEVATION MILL	2254.4 FEET

(For notes see reverse side)

PROFILE NOTES

HOR. DISTANCE	ELEVATION
0.00	3750.0
307.85	3676.68
588.59	3675.75
1230.67	3624.21
1395.08	3612.04
1774.72	3578.05
2051.03	3558.38
2336.23	3549.23
2458.50	3528.47
2821.76	3459.35
3186.35	3510.06
3248.46	3505.50
3380.42	3493.69
3576.09	3438.55
3701.26	3386.68
4124.78	3226.79
4501.89	3153.61
5067.44	3107.27
5313.39	3079.79
5613.18	3042.56
5850.31	3010.86
6047.76	2908.86
6501.87	2787.96
6954.39	2728.17
7414.57	2576.48
7911.14	2482.80
8346.46	2458.80
8537.50	2441.46
8882.20	2408.13
9286.01	2378.27
9673.59	2330.61
9870.06	2285.85
10347.98	2264.66
10 725.61	2254.46

Dennis Montgomery Co. New York

TAKEN FROM DEPARTMENT OF THE INTERIOR U.S.G.S. BULLETIN 532 - THE KOYUKUK-CHANDALAR REGION ALASKA by A. G. MADDREN

CHANDALAR DISTRICT

General Features.

At present mining operations in the Chandalar Valley are confined to a rather small area whose central part is situated about 6 miles east of the upper end of Chandalar Lake. (See Pl. 1, in pocket.) On the west this area is bounded by the north-south portion of the Chandalar Valley, on the north by a wide east-west valley now drained by Lake and Grave creeks, on the east by the headwaters of McClennan and Big Creeks, and on the south by Tobin Creek. As thus limited the area is about 10 miles in extent from north to south and the same from east to west and embraces about 100 square miles.

The chief features of this area are a rugged mountain mass, whose peaks are from 5,000 to 6,000 feet above sea level, and whose slopes are steep and deeply dissected by gulch valleys. The streams of these gulches are Big Creek and its tributary headwater stream St. Marys, Tobin Creek, Boulder Creek, Big and Little Squaw creeks, and Big and Little McClennan creeks. They flow from the mountains in various directions and have concentrated along their courses more or less placer gold which is without doubt derived from the mineralized country rock into which the gulches have been eroded.

In a broad sense the Chandalar district may be considered an easterly continuation of the Koyukuk district. The same country rocks occur in both in the sections where gold has been found, their kinds, condition, and general stratigraphic relations being similar throughout a belt some 10 to 20 miles wide that extends from southwest to northeast across the region. The auriferous mineralization in the particular mountain mass here under consideration appears to have been associated with intrusive rocks, which at this locality are mostly diorites. There are apparently several of these intrusive masses, and they seem to be more or less accordant with the general strike, from southwest to northeast, of the country rocks which they cut. There are evidences of quartz mineralization in the schistose country rock about the borders of the intrusive masses. Several of these quartz bodies are 4 to 6 feet or more wide in their thickest parts and are known to have a more or less connected linear extent of several thousand feet. The directions of these lode zones do not appear to conform to the structural trends of the country rock, but rather to lie across the strike at large discordant angles. In general they extend from east to west.

In addition to the larger quartz-lode zones there are a number of small lenses scattered about in apparently a disconnected manner and a considerable number of veinlets at some localities. In general the quartz appears to be best developed around the borders of the larger dioritic intrusive masses, and while there are dikelike bodies of the same intrusive rock extending out from the larger masses the quartz mineralization does not appear to accompany these to any extent.

Quartz Lodes.

Recent prospecting appears to reveal four principal quartz-lode zones, which extend across this mountain mass with general east-west trends in more or less connected form. It is thought that these are practically continuous zones of fractures in the bedrock, but that the deposition of vein quartz, at least of quartz carrying gold, is not necessarily continuous along their whole extent

but appears to occur more in the form of sheetlike bodies. There is evidence that these zones have suffered shearing movements since some of the quartz was deposited along them, and it may be that the quartz is more or less cut off or squeezed out in places; also that the quartz was never deposited in a vein of more than a few inches thickness at other places. In some parts of these zones the fractured walls of country rock lie against each other, with practically no vein quartz deposited between their slickensided surfaces. In the larger bodies the quartz has been considerably crushed and recrystallized, which seems to indicate that considerable of the quartz was deposited before the latest shearing movements occurred.

The southernmost of these zones of more or less quartz-filled fractures extends across the upper part of Tabin Creek basin. The principal claims located in this basin are known as the Mikado group. To the east, in the valley of upper Big Creek, there is a body of gold-bearing quartz in the bed of the creek on Discovery placer claim, and a group of lode claims have been located along its westward trend, which extends toward the Mikado group in upper Tabin Creek basin. It is thought that these two groups of lode claims are along the same general mineralized zone, and that this zone may be continuous from the valley of Big Creek to the upper basin of Tabin Creek, a linear extent of 3 miles or more. Where shafts have been sunk along the quartz veins in Big and Tabin valleys it is found that they stand nearly vertical, their dip being 80° N.

On the Tabin, Little Mikado, and Mikado claims of the Mikado group the quartz has been exposed by open cuts in six places over a distance of 3,000 feet, and in all of these the quartz near the surface contains rich values in gold. Considerable development work has been done on the Little Mikado claim of this group. At about 20 feet from its west end line a shaft has been sunk on the vein to a depth of about 100 feet. The average thickness of this vein is about 4 feet, although there are some contractions and expansions along it. At a depth of 100 feet it is 3 feet 10 inches wide. It is reported that average assays from the quartz removed in sinking this shaft give $112 to the ton. In 1912 a tunnel was run on this claim to tap the vein upon which the shaft has been sunk. It is estimated that this tunnel will meet the vein in a distance of about 456 feet, at a depth of about 209 feet below the mouth of the shaft, which has already been sunk 100 feet. This tunnel is 4 by 6½ feet in cross section, and in September, 1912, had been driven 130 feet. Three men will continue it throughout the winter of 1912-13 under a contract which pays them about $8 for their labor.

Another zone of quartz mineralization lies about 2 miles north of the Mikado group. Three principal groups of claims are located along this zone. From west to east they are named the Kelly, Enevelos, and Summit groups. The Kelly group is situated on the southwest headwaters of Big Squaw Creek and the Enevelos group extends along the divide between Big Creek and Little Squaw Creek. The veins along this zone dip about 65°S.

A tunnel on a line separating First Chance and Last Chance claims of the Enevelos group has been driven 165 feet, to a point where its face is 125 feet below the surface. It is expected that this tunnel will tap a quartz vein about 200 feet from its mouth. On the Last Chance claim there is a surface outcrop of quartz which is reported to assay $198 to the ton. On the Woodchuck claim, which extends to the east from the Last Chance, a tunnel entrance has been opened on a vein of quartz that has a width of about 4 feet between well-defined walls. On the Enevelos claim, which lies north of the Woodchuck claim, another body of quartz about 6 feet wide which carries considerable free gold has been prospected by three open pits.

On the Summit claim a shaft 54 feet deep has been sunk, and a tunnel has been run 72 feet along the vein. A sample from 5 feet of ore in the tunnel at a depth of 34 feet is reported to have assayed $54 to the ton. In the tunnel the vein was found to be from 1½ to 2 feet wide, and one rich lens of ore was found. The vein on this claimhas been uncovered in four other places by shallow openings.

A third zone of quartz mineralization extends across the valley of Little Squaw Creek about three-fourths of a mile north of the Enavelon group. As in that group, the dip of the vein is about 65° S. The principal claim, the Little Squaw, has a tunnel 87 feet long driven along the vein, reaching at its face a depth of 35 feet. About 50 tons of good ore are on the dump of this tunnel. Some of this ore has been run through a small stamp mill that has been erected near the mouth of Little Squaw Valley. It is reported that this ore assays $60 to the ton and that $38 to the ton of free gold was recovered on the plates of the stamp mill. A road has been built up the west side of Little Squaw Valley from this mill site to the Little Squaw claim.

A fourth group of lode claims is located on a zone of quartz outcrops about a mile north of the Little Squaw group. They extend across the west slope of the valley of Little Squaw Creek. Tunnels have been started on two of these claims.

The veins of the four belts of mineralization that have been located in this district are composed essentially of quartz, and so far as they have been developed appear to be chiefly of the fissure-vein type, although their form and extent as well-defined continuous quartz bodies has not been conclusively demonstrated by the small amount of underground work done on them up to 1913. Further developments along the strike of the quartz bodies may show the veins in some parts of the fracture zones to be more like the kind termed stringer veins. This would not be surprising from the evidence of sheared displacements shown by the nature of the quartz that makes up the larger bodies which has been opened. However, so far as observed, the ore bodies are essentially fissure veins or sheets rather than stringer lodes.

A large part of the quartz is much crushed and recrystallized. Most of it is white in appearance, and composed of masses of interfering grains, without many cavities, into which crystalline prisms project. This massive quartz, however, has been much fractured into sheets, which, in general, lie parallel to the vein walls and each other. These sheets vary from an eighth of an inch up to several inches in thickness, and many of the thicker ones are broken into tablet-like pieces by cross fractures. Between the thicker sheets some of the thinner ones taper to knifelike edges, and many thin, small lenses of quartz occur along the fractures. Most of the fracture seams between the thin sheets and lenses of quartz would not be noticeable to the unaided eye if it were not for the presence of films of dark sulphides which are deposited along the fractures. In addition to the deformational sheeting of the quartz, which is apparently due primarily to shearing movements, there is some depositional banding present in the veins. These bands are fillings of quartz from 1 to 3 inches thick, which show quite perfect interlocking crystals along the centers of individual sheets. The evidence seems to indicate that they have been deposited along sheared fractures, whose faces have been sprung apart to the width of a few inches, instead of being closely appressed and slickensided by the shearing movements. None of these depositional seams appear to have been filled with the sulphide ores instead of quartz, although they are all open fractures in the older crushed and recrystallized quartz, which contains a considerable amount of gold-bearing sulphides.

This seems to indicate that much of the shearing has occurred since the sulphide minerals were first introduced. Many of the sheared faces of crushed and recrystallized quartz sheets show slickensided coatings or thin seams of sulphides.

The two most abundant gold bearing sulphides appear to be sphalerite (zinc sulphide) and arsenopyrite (arsenical iron sulphide or mispickel). There are minor amounts of galena (lead sulphide) and stibnite (antimony sulphide), together with a little pyrite and chalcopyrite. All these sulphides are rather intimately associated with one another throughout the crushed, recrystallized, and sheared quartz. These minerals occur both as small aggregates and blotches scattered through the more massive tablets of the recrystallized quartz sheets and as films and thin bands along the fractures between the sheets, especially between the thinner sheets. Free gold in flakes and specks may be observed mixed with the sulphides and scattered about in the quartz. Neither the sulphide mineral aggregates or the free gold appears to occur in solid forms or chunks of large size.

Within about 75 feet of the surface the ore is chiefly oxidized and the gold is probably for the most part free. Probably below the depth of 100 feet the ores will be found in a less oxidized condition.

The arsenical pyrite (mispickel) will probably be found to carry the highest values in gold, but the sphalerite (zinc blende or blackjack) will probably be more indicative of silver. Until thorough mill tests of the ore are made it will be impossible to state the gold tenor of the average ore. Probably one-third of the sulphide concentrates in a mill run of much of the ore will be sphalerite (zinc sulphide), with arsenopyrite and galena second and third in abundance. The sulphides sphalerite and galena generally tend more to silver than arsenopyrite or pyrite.

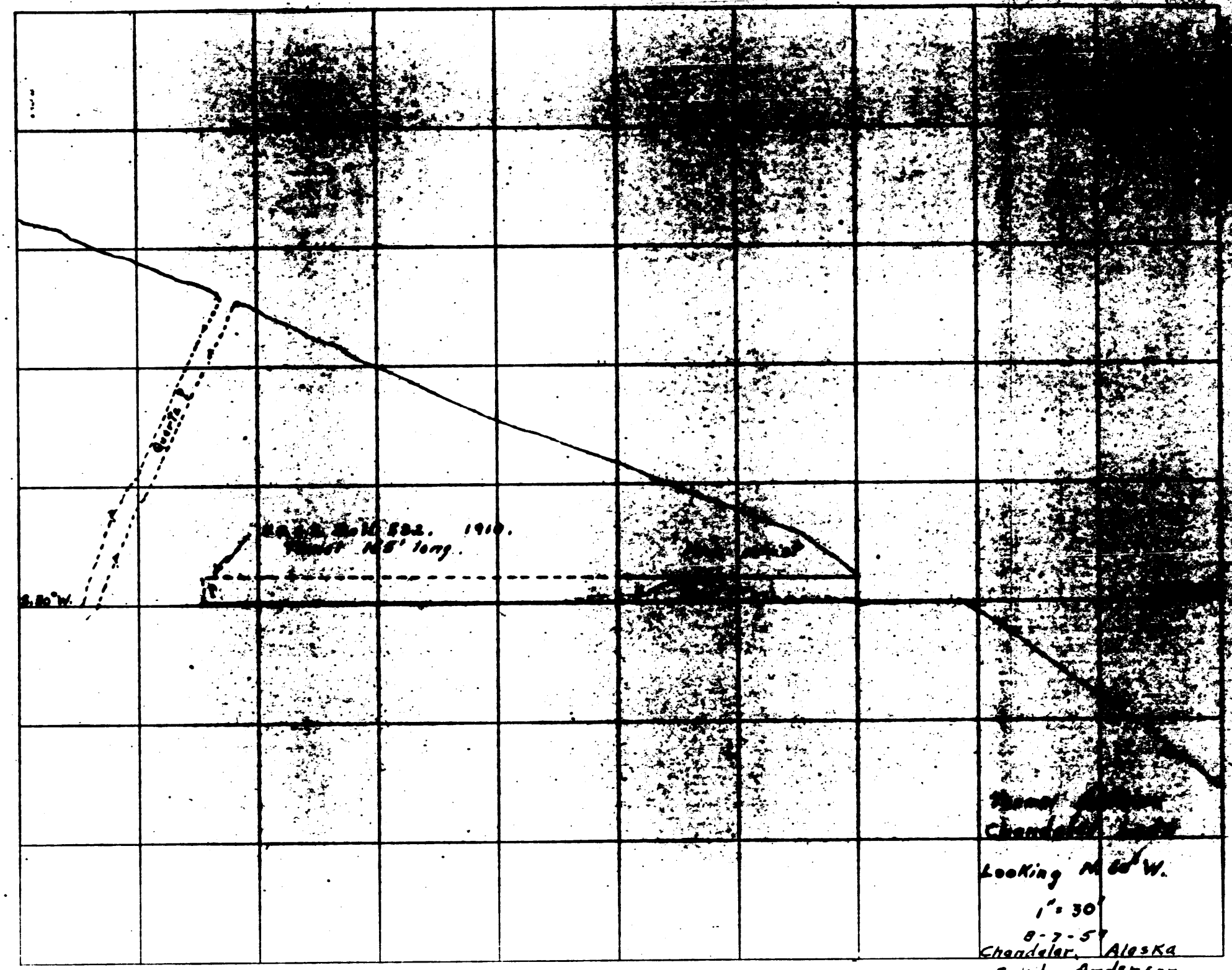
There seems to be little doubt that the most promise for the future of the Chandalar district is in its quartz lodes, but it requires a much larger initial investment of capital to develop lode deposits than placers, especially in a region as remote as this, where even rich shallow placers that require very little capital or machinery do not always yield adequate returns under present commercial conditions.

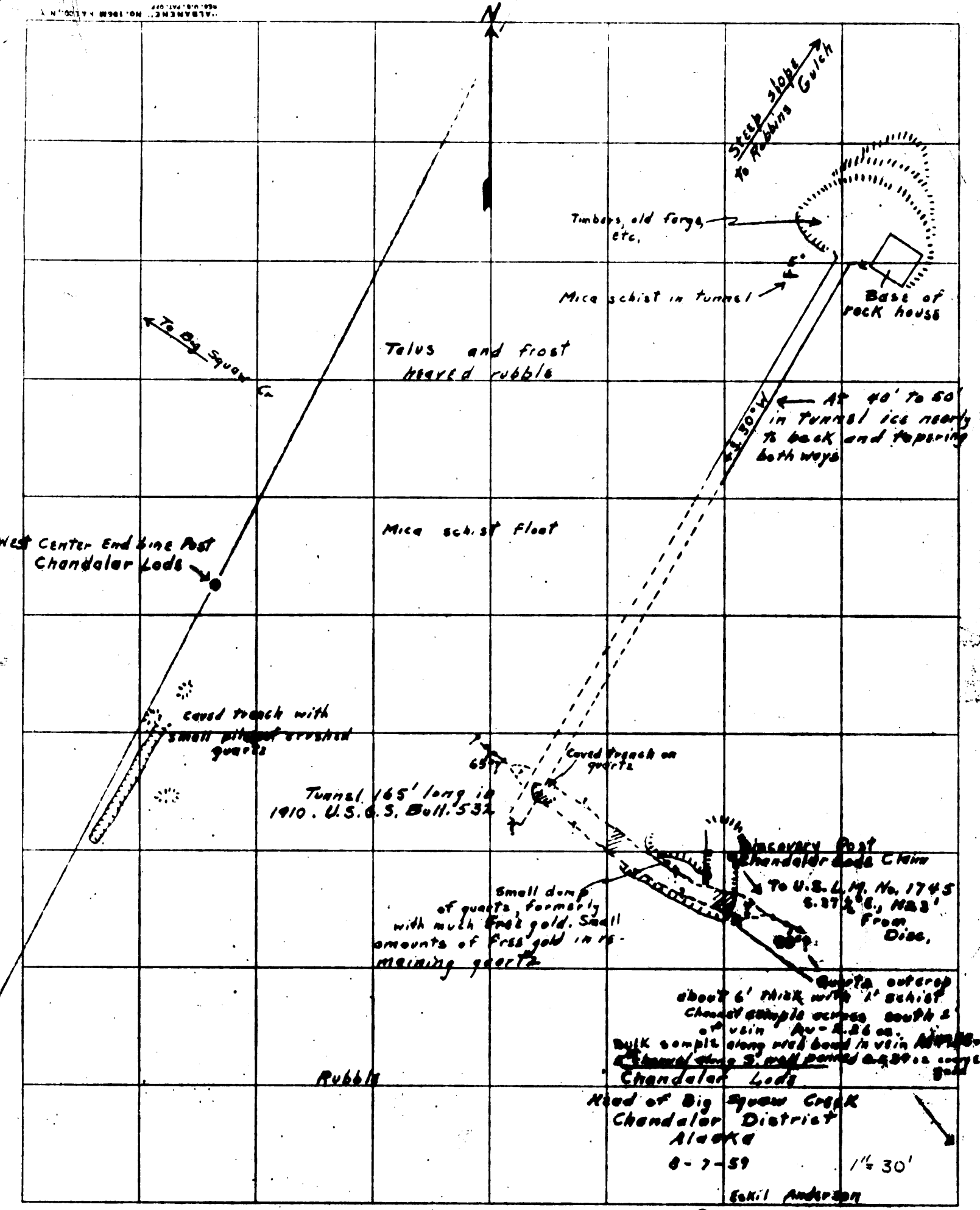
The Alaska Road Commission has taken steps to relieve the situation to some extent by laying out a winter sled trail from the settlement of Beaver, on the Yukon, over which supplies and machinery may be transported with greater facility than in the past. During the winter of 1909-10 a small prospecting stamp mill was hauled to Discovery claim on Big Creek, and an attempt was made to mine a quartz lode prospect on that claim, but this appears to have been discontinued. This mill has since been used for testing the ore from a vein on Squaw Creek.

Placers.

The placer gold in the gulches is without doubt derived from the erosion of the weathered vein material, and the fact that the placer gravels are not very rich, although they evidently represent the concentration of gold from the disintegration of a great thickness of country rock during a long period of erosion in a locality which does not appear to have been glaciated, may be used as evidence that the gold-quartz veins contain only small amounts of gold. This, however, is not borne out by assays of the ore, for some remarkably rich gold quartz has been found in the prospects that have been opened.

There has been a little placer mining in the Chandalar district in the last 10 years, but the value of the total production does not exceed $60,000. Most of this gold has been taken from the head of Big Creek and from St. Marys Gulch. It is reported that in 1911 a shaft was sunk on Cracked Creek to a depth of 286 feet and one on Mammoth Creek to a depth of 172 feet, but that no workable placers were found.


Quartz
1910.
Looking N 60° W.
1" = 30'
8-7-57
Chandalar, Alaska
Eskil Anderson


N
Steep slope to Robbins Gulch
Timbers, old forge, etc.
Mica schist in tunnel
Base of rock house
To Big Squaw Cr.
Talus and frost heaved rubble
At 40' to 50' in tunnel ice nearly to back and tapering both ways
Mica schist float
West Center End Line Post Chandalar Lode
Caved trench with small pile of crushed quartz
Caved trench on quartz
Tunnel 165' long in 1910. U.S.G.S. Bull. 532
Discovery Post Chandalar Lode Claim
To U.S.L.M. No. 1745
Small dump of quartz, formerly with much free gold. Small amounts of free gold in remaining quartz
From Disc.
Quartz outcrop about 6' thick with 1' schist
Chandalar Lode
Rubble
Head of Big Squaw Creek
Chandalar District
Alaska
8-7-59
1" = 30'
Eskil Anderson

[illegible] mineralized zone 7 mi. long by 2 1/2 mi. wide, examined in July, 1945-6 by Dennis O'Keefe and Ebert Anderson (Marked 'float' where vein in place has not been found) (x - vein on patented claim)
Average vein widths about 3' at exposures - eliminating 20', 18', and 12' outcrops

Free Au visible at outcrops	Sulfides Pan Au	Sulfide Bearing (unpanned)	Barren quartz	Total
LITTLE SQUAW GROUP 1 - Little Squaw (x) - 250' x 125' 1 - Cosine (x) (Marsh 1909) 1 - Crystal (x) (Marsh 1909)		1 - Grubstake #1 1 - Grubstake #2 1 - Prospector 1 - Lone Lead 1 - Outlaw 1 - Emerald 1 - Big Mick 1 - Little Johnny 1 - Matchless		
ENEVELOE GROUP 1 - Eneveloe (x) - U.S.G.S. - 3 pits on 6' vein. Also in Robbins Gulch 1 - Chandalar Lode (old First and Last Chance) 1 - Summit - 5 outcrops 1200' vertically 250' Woodchuck ( ) Jupiter (x) Golden Eagle (x) Bonanza (x)	1 - Shamrock 1 - Hillside	1 - Wildcat 1 - Eastern Star		
STAR GROUP 1 - Star #1 (x) 1 - Star #2 (x) 1 - Star #3 (x) Indicate & Tonopah				
MIKADO GROUP 1 - Little Mikado (x) Tobin (x) Mikado (x) outcrops - ~2000'				
OTHER VEINS Jackpot, Grubstake, Drumlumman, Pioneer	1 - Golden Vale	1 - Capitola (float) 1 - Little Kiska (Antimony float)	1 - St. Mary's 1 - ½ mi. S. of Crystal in notch 1 - Little McLellan About 10 large barren outcrops not listed	

THE GALIGHER COMPANY

ESTABLISHED 1901

CABLE ADDRESS
GALSAL

TELEPHONE
ELgin 9-0781

548-568 WEST EIGHTH SOUTH STREET
P. O. BOX 200
SALT LAKE CITY 10, UTAH
U. S. A.

February 10, 1961

Little Squaw Mining Company
Suite 309-312 Radio Central Bldg.
Spokane 4, Washington

Attention: Mr. Eskil Anderson

Dear Mr. Anderson:

Yesterday we passed on to Pat Ray some preliminary results that we obtained in test work on your Little Squaw ore. The head assay of the material ran 1.7[illegible] oz. of gold; no silver was reported. We attempted to amalgamate the material at minus 20 mesh. The results of this test were negative. Very little gold was picked up by the mercury amalgam.

In the test that we cyanided the material, excellent results were achieved. We had tails in the range of 0.030 to 0.040 gold. This means that approximately 97% of the gold contained in the sample was extracted. We ran one float test and achieved a tail of .0060. Again, this is an excellent recovery.

At present, we are conducting additional cyanide tests to determine the optimum mesh of grind and time necessary. It is our feeling at this time that probably the best approach to the problem on a plant scale would be by straight cyanidation.

We are not familiar with the exact location of your property; however, we imagine it is quite a ways inland in the Yukon and, therefore, the shipping of products to and from same would present a problem. While the results of our float test are encouraging, and possibly it would be somewhat cheaper as regards initial investment to build a float plant as versus a cyanide plant, we believe that the additional price that you would get for your gold from the mint as versus gold that will be contained in a float concentrate that would have to be shipped to a smelter plus the fact that you would be only shipping a small volume of gold per month on a cyanide plant as versus large quantities of float concentrate to smelters, that all economics indicate cyanidation to be the answer.

THE GALIGHER COMPANY

It is possible that we could float a concentrate and then cyanide [illegible]. However, this will require additional lab work. Inasmuch as our [illegible] tests require at least two or three days for completion, we [illegible] that it will be approximately another [illegible] days to 2 weeks in [illegible] the case.

We do not believe that we [illegible] the deposit and [illegible] in under our estimated fee, [illegible] I [illegible] that, if you are serious [illegible] plant construction, it would be our recommendation that once [illegible] completed that you retain [illegible] take a study of the necessary [illegible] required as well as providing you with a complete flowsheet [illegible] and etc. We anticipate having two engineers return to our company in approximately four weeks, and at that time, we will be in a position to [illegible] the latter study.

The [illegible] certainly doesn't present any extraordinary problems [illegible] metallurgical recovery. It is merely a question of planning down [illegible] such as the grind and optimum time for lixiviation and, probably [illegible] plant were to be constructed, the problem of grind appears to [illegible] factor involved.

We sincerely thank you for allowing us to assist you with this [illegible] assure you of our continued interest in your behalf.

Sincerely,

THE GALIGHER COMPANY

Tom H. Lee,
Metallurgist

THL/[illegible]

SUMMARY AND CONCLUSIONS

This examination failed to outline sufficient ore to justify the expenditure of installing a power driven mining plant. No new work done

Continuance of exploration by hand work, following this examination, was impracticable at the time, due to the necessity of studying results, estimating costs, and an irregularity found in the title of the Mikado property.

Sufficient ore is outlined in the Little Squaw vein to warrant further development by hand work and thus determine whether to install a power driven mining plant or take out the available ore on a salvage basis by utilizing milling equipment now at the property.

Underground exploration on the Mikado property is warranted, based on Mr. Boadway's sampling results of the Mikado shaft and on the information obtained during this examination.

The main factor affecting exploration and mining is the high transportation costs. Seasonal arrangements for transportation to and in the area are necessary.

The original plan of milling ore from all the veins at a central mill is not practical. The veins may be divided into two groups, the Little Squaw group, north of a high divide, and the Mikado group, south of this divide.

While sufficient evidence is not available to arrive at definite conclusions, the general impression was obtained that the ore sections of the quartz veins are lenticular and development costs between shoots will be high. This is also true of a large number of quartz mines in the Fairbanks area having similar geology. On the other hand, the country rock in the Chandalar area is more competent and gold quartz veins are closer spaced and more numerous than in the Fairbanks area, where there are several profitable operations with 10 and 15 ton mills. The high grade nature of the ore and the economy of tunnel

mining leads to the conclusion that profitable operations, commensurate with the risk involved, may be expected in the Chandalar area.

In addition to the Quartz Lodes, the area examined has two placer bets that have splendid profit possibilities. The placer bets do not appear to be big enough to warrant an independent operation, but could be economically proven and developed with a small capital outlay in conjunction with quartz operations in the area.

The area of favorable geology, as outlined by the U.S.G.S. map accompanying 1923 report by J. B. Mertie, is a large one. Information obtained during this examination, details of which are filed with the Company, lead to the conclusion that the area has some intriguing prospecting possibilities. Prospecting in the area is warranted only in conjunction with actual operations.

RECOMMENDATIONS

That $13,000.00 be expended between February and June, 1940, on underground development, including minor surface work on the Little Squaw, Mikado and Kneveles veins.

That the work be done by hand work and consist of the following:

(1) Little Squaw vein: Deepen winze 10 ft. and drift east on the vein, 200 ft. Surface trench west of fault.

(2) Mikado vein: Raise 100 ft. from the tunnel level to the bottom of the shaft and drift on the vein 100 ft.

(3) Kneveloe vein: Tunnel 30 ft. on the vein outcrop.

That supplies, explosives, etc. for this work be purchased in Fairbanks and flown to Squaw Lake for the Little Squaw and Kneveloe veins and Chandalar Lake for the Mikado vein.

That this work be done by contract ($25.00 per foot).

That Manuel Mello, placer miner, Chandalar, and C. L. Carlsen,

U. S. Commissioner, Chandalar, be given the contract for this work, if suitable price arrangements can be made.

That during this work a complete check-up be made of the milling plant now in the area.

That provision be made for a further capital outlay of $30,000.00 following the completion of this program, for equipment and supplies required for mining and milling operations.

That supplies and equipment for mining operations be purchased and transported to the properties prior to the break-up.

That steps be taken to have the record of title of the Mikado group conform with the title as set out in lease agreement.

That Clause Fifth, Paragraph Two, of Lease Agreement on the Mikado Group be amended. This clause now reads: "Work said mining claims steadily and continuously". Amended clause to provide for 200 ft. of underground development within twelve months' time and mining and milling to commence if as and when all ore developed at the Little Squaw Mine has been milled and the same mill is thus made available for milling the Mikado ore.

That Clause Seventh be amended. This Clause now provides for the payment of $200.00 per month until such time as royalty payments commence. Amend this clause to provide for the payment of $500.00 immediately and no further payments except royalty payments as set out in lease agreement.

REPORT OF EXAMINATION OF

LODE PROPERTIES IN THE CHANDALAR AREA, ALASKA

1938

The Chandalar Area, Alaska, lies between Meridian 147° and 150° west longitude and between parallel 37° and 68° north latitude.

This report deals with an examination made during July, August and September, 1939, of gold lode occurrences within this area in the vicinity of Little Squaw, Big Squaw, Tobin and Big Creeks, and lying between Squaw Lake (Ogburn Lake) and Chandalar Lake. As thus limited, the area examined is about 10 miles in extent from north to south and 4 miles from east to west. The examination was undertaken as a result of:

1. Report by Mr. E. A. Boadway of his sampling of the two principal showings in the area during the winter months of 1932 and 1933 (vis. Little Squaw and Mikado veins):

2. Report by U.S.G.S. Bulletin #532 - 1913, by A. G. Madren, which describes four parallel quartz lode zones in the area.

From the information contained in these two reports the examination was undertaken with the following objects:

1. Outline ore occurrences on surface and in present underground workings sufficiently to lay out a mining development program and carry on continuous operations with the object of milling ore from the various known ore occurrences at a central mill;

2. Examine and acquire other favourable showings in the area;

3. Obtain sufficient information on economic factors (transportation, labor, power, timber, fuel, etc.), to estimate operating costs.

The examination was carried out between July 11th and September 17th, 1939, during which time 600 man days' work was performed, consisting of surface trenching, de-icing, retimbering and logging old workings, drifting 22 feet, surveying, mapping and prospecting. 230 samples were taken, including five bulk samples for mill tests. Four claims were acquired by staking. The major portion of the work was concentrated on the Little Squaw, Mikado and Summit properties.

Geology, topography, nature of ore occurrences, mineralization, placer production, etc. are dealt with rather fully in the following reports:

1. U.S.G.S. Bulletin No. 532 - 1913, by A. G. Madren
2. U.S.G.S. Bulletin No. 778E - 1925, by J. B. Merte, Jr.,
3. E. A. Boadway Report - 1932-1933, examination

Copies of these three reports are on the Company's files.

This report is therefore confined to a description and discussion of the veins and outcrops sampled and economic factors relative to the carrying out of mining operations on the veins examined and sampled.

All gold values referred to herein are calculated on a basis of gold at $35.00 per oz.

All surveys were made by Brunton compass and triped; elevations by altimeter and taken from contour maps by Irving Reed U.S.M.S.

LITTLE SQUAW LODE

(See Maps and Photographs herewith)

The Little Squaw property consists of nine patented claims, held under lease agreement with Chandalar Gold Mines Inc. (William Sulzer). (See Survey Plats for location)

The Little Squaw vein dips 75° S, and strikes N. 86° E, and has a proven length of 320 feet (210 feet East of fault and 110 ft. West of fault) and a proven depth of 110 feet. It outcrops at an elevation of 3800 ft. on the divide between Little Squaw and Big Squaw Creeks.

Surface -

The vein can be followed from above an adit portal west up the mountain for 210 ft. to where it appears to be faulted South 87 ft. During examination, four trenches were put down 48 ft., 65 ft., 82 ft., and 110 ft. respectively, West of the fault (total length 110 ft.). The vein west of the fault is strong for this length and in the most westerly trench is 40" wide. This trenching was done through 6 ft. of talus, requiring lagging in places. Water from thawing made sampling difficult. Continuing west a heavy layer of talus occurs frozen within a few feet of the surface. Trenching this material in the summer months is impracticable.

Below the tunnel level, east down the mountain (average slope 35°) talus and rock broken up by frost action covers the surface for several feet. Trenching during examination failed to reach bedrock or locate the vein. Timbering and lagging are necessary to trench through the surface debris on the side hills. Evidence is in sight of considerable surface work having been done, including two adits both timbered through the talus and both penetrating bedrock for a few feet at elevations of 70 feet and 114 feet below the adit level. The two adits were apparently located at points re-

quiring the shortest distance to get under the high grade section rather than being located to follow the vein. They are located 26 ft. and 50 ft. north of the location of the vein as projected from the known dip from surface to the bottom of the winze. The surface trenching below the adit level also does not allow for the dip of the vein.

Adit Level -

The vein has been explored by an adit for 192 ft., a raise 78 ft. to surface and by a winze from the adit level for 55 ft. The maximum and minimum widths of the vein are 8 ft. and 25 inches. The general average width of the vein as exposed on surface and in the adit levels is about 4 ft. between well defined walls from which the vein breaks clean. The vein material is quartz. The gold values are concentrated along the footwall in banded, ribbon, vitreous quartz, varying in width from a few inches up to 33 inches. The remainder of the vein is massive, white quartz, readily distinguishable from the ore quartz. From samples Nos. 29 to 37, in addition to the banded ore quartz, considerable scorodite (arsenic oxide) occurs in bands up to 15 inches wide.

Starting at the Portal the adit level follows the vein west for 90 feet, and then continues in the country rock along the footwall of the vein for 102 ft. Eight crosscuts at fairly even intervals, approx. 10 ft., exposes the vein in this latter section. At 192 ft. west of the portal the vein is cut off by a fault. No work has been done underground beyond this fault.

Winze -

The winze, from the adit level, follows the footwall of the vein and maintains the same dip as above for 30 ft. Here, 30 ft., below the cellar, the vein flattens out, dips 30°S. and the vein itself appears to consist of a number of quartz stringers. From 49 ft. deep to the bottom, (8 ft.), the winze is on the vein and it again assumes the same dip as above the adit level and the vein

widens out again. At the bottom of the winze two quartz stringers show widths of 13 ins. and 20 ins., separated by 17 ins. of schist. Mineralization in the bottom of the winze consists of 12 inches of massive arsenopyrite concentrated on the hanging wall. The footwall is not clearly defined.

The Raise from the adit level to the surface is full of ice and was not cleaned out for examination.

The accompanying map shows the location and results of sampling.

SAMPLING -

Back channel samples were cut where possible. These averaged better than 2 lb. per running foot and all cuttings were included. Channel samples averaging about 2 lbs. per running foot were cut from the floor of the adit where back sampling not practical and from the bottom of the surface trenches. These samples were washed and no fines included where clean surfaces not available. Occasional check samples were cut and blank samples included. All samples except three check samples and five mill test bulk samples were assayed at the University of Alaska. Rejects are available.

SURFACE -

Surface samples No. 1 to No. 9 inclusive are channel samples cut from the floor of surface trenches, washed and no fines included where clean surfaces not available. One sample was taken from the banded footwall section and another from the continuation across the barren section of the vein.

Adit Level -

Samples No. 10 to No. 15 inclusive are channel samples cut from the floor of the adit level at 5 ft. intervals. These samples were washed and no fines included where fresh surfaces not available.

The next 16 ft. to the west was not sampled on account of loose rock and lagging. Banded, ribbon ore quartz of equal dimensions and similar appearance to the high grade section that continues to the west may be seen along the footwall above the lagging of this section.

Samples No. 16 to 28 inclusive are channel samples cut from the tunnel back at approximately 5 ft. intervals.

Samples No. 29 to No. 38 inclusive are channel samples cut from the back of crosscuts through the vein, except sample No. 29, which is an average of two samples, - one cut from the crosscut back and one from the crosscut floor, immediately below. On the accompanying sketch assay results of the banded footwall ore section of the vein are shown separate to the assay results of the Barrée Section of the vein.

Five channel samples not shown on the accompanying sketch were cut from the back of holes blasted into the footwall immediately adjacent to high grade sections of the vein. Assay results were nil for all of these samples.

Winze -

Sampling of the winze from collar to depth of 41 ft. was done by drilling six holes (see sketch) with 7/8" drill steel into the vein and catching the cuttings (Samples No. 38 to 42). From 41 ft. below the collar to the bottom of the winze the vein was channel sampled (Samples No. 43 to 52 inc.)

Assay results from the winze (see accompanying map) show erratic values averaging below ore grade. The fact that the winze is sunk on a section of the vein that gave "nil" results on the adit level and the unsatisfactory method of sampling accounts for this discrepancy.

Bulk Samples - Mill Test -

Three Bulk Samples - 20 lbs. each, were taken from the locations marked "A", "B", and "C".

Sample "A" is representative of the banded, ribbon ore, from the footwall. This sample is representative of the mineralization that occurs in the adit level from the portal west to Sample No. 28 (90 ft.)

Sample "B" - Considerable scorodite (arsenic oxide) occurs with the banded ore quartz, particularly on the adit level between samples No. 29 to 38. In this section bands up to 15 inches wide of massive scorodite occur along the

banded ore. ~~Roasting~~ Roasting and panning of this material showed that at least some of it carried considerable gold. Visible gold was observed in a few pieces of the massive mineral. Sample "B" consists entirely of this material.

Sample "C" - From footage 41 in the winze to the bottom, a band 6" to 12" wide of massive arsenopyrite, is exposed along the hanging wall. Sample "C" consists entirely of this material.

SUMMARY OF SAMPLING RESULTS

LITTLE SQUAW

The weighted average of surface samples East of the fault is $54.01 over average width of 30 inches - length 210 ft.

The weighted average of adit level samples is $54.20 over average width of 20.16 inches - length 195 ft.

The weighted average of surface and adit level samples with high assays cut to twice the average grade is $50.15. Average width is 25.00 inches.

The tonnage above the adit level is 1500 tons, having a gross value of $71,500.00, or a cut grade value of $68,150.00

The tonnage from the surface to a depth of 20 ft. below the adit level is 2,000 tons, having a gross value of $108,000.00, or a cut grade value of $100,000.00.

For each foot of depth below adit level there is 34.3 tons - $1,850.00 per feet (Cut grade $1,750.00 per foot).

SAMPLING RESULTS COMPILED

SURFACE

Sample	Width	Slope	Location Distance	Grade
1.	48"	44 ft.	West of adit portal	$ 81.58
2.	30"	56 "	" " Sample No. 1	37.10
3.	18"	50 "	" " Sample No. 2	5.25 #
4.	22"	40 "	" " Sample No. 3	59.00 #
5.	34"	28 "	" " Sample No. 4	49.70 #

#These samples washed and no fines included.

Total Length from portal to Sample No. 5 ..... 218 ft.
Length sampled..... 175 ft.
Average width of vein..... 4 ft. (approx.)
Average width of Samples..... 30 inches
Average grade (30" wide)..... $54.01

The first 55 ft. West of the fault was not sampled, due to loose rock and talus and the impracticability of trenching this section in the summer months. Four trenches in the next 55 ft. assayed - $4.20 - 10", $17.30 - 8", $3.25 - 14", Nil - 40" (Samples No. 6 to 9 inclusive). These are indicative results only due to the nature of sampling.

ADIT LEVEL

(Compiled in 4 sections)

No. 1 Section

Sample	Width	Location	Grade
10.	16"	7½ ft. East of portal on floor	$10.50 #
11.	12"	2½ ft. " " " " "	10.85 #
12.	23"	2½ ft. West " " " "	7.35 #
13.	21"	7½ ft. " " " " "	11.90 #
14.	17"	12½ ft. " " " " "	8.60 #
15.	24"	17½ ft. " " " " "	38.35 #

Length of Section No. 1..... 25 ft.
Average width of samples..... 18.85"
Average grade (18.8" width)..... $15.13

- These samples washed and no fines included.

No. 2 Section

Sample	Width	Location	Grade
16.	57"	34.4' W. of portal, Back samples	$ 68.25
17.	38"	5.5' " " Sample No. 16	18.30
18.	42"	n8.5' " " Sample No. 17	33.60
19.	17"	3.5' " " Sample No. 18	357.68
20.	13"	3.5' " " Sample No. 19	101.15
21.	14"	5 ' " " Sample No. 20.	147.35
22.	19"	5 ' " " Sample No. 21	213.90
23.	17"	5 ' " " Sample No. 22	276.40
24.	15"	5 ' " " Sample No. 23	113.95
25.	17"	5 ' " " Sample No. 24	64.50
26.	24"	5 ' " " Sample No. 25	88.55
27.	27"	5 ' " " Sample No. 26	9.80
28.	12"	5.6' " " Sample No. 27	133.95
29.	28"	10 ' " " Sample No. 28 (#1 crosscut)	62.84

Length sampled..... 67.6 ft.
Average width of samples..... 24.28 "
Average grade (24'28")..... $96.41
Average Grade (high samples cut to twice average$82.81

No. 3 Section

Sample	Width	Location	Grade
30.	35"	No. 2 crosscut 109.5' W. of portal	$ 8.10
31.	12"	No. 3 " 122.6' " " "	11.55
32.	15"	No. 4 " 153.8' " " "	30.80

Length sampled..... 24.3 ft.
Average width..... 20.33"
Average grade..... $14.25

No. 4 Section

Sample	Width	Location	Grade
31. 33	30"	No. 5 crosscut 141.3' W. of portal ab/raise	Nil
32. 34	9"	No. 6 crosscut 153.8' " " " " "	$ 9.80
33. 35	21"	East side of raise " " " " "	1.40
34. 36	9"	West " " " " " " " "	171.15
35. 37	9"	No. 7 crosscut 175.8' " " " " "	32.55
36. 38	25"	No. 8 " 188.8' " " " " "	4.55

Length sampled..... 47.5'
Average width..... 17.16"
Average Grade..... 19.95

Average Grade of samples Nos. 34, 35 and 36..... $45.04
Average Grade this section high assay cut to twice average..... 28.21
Length of this section..... 25 ft.
Average width..... 14.33
Average cut grade No. 4 Section (47.5')..... 12.97

RECOMMENDATIONS -

That the winze be deepened 10 ft. to assure being below the roll of the vein and 200 ft. of drifting done East on the vein from the bottom of the winze. This work should cost about $25.00 per foot.

That this work be started by the first of March, 1940.

That the work be done by hand work on a partnership or contract basis.

That Manuel Mello, placer miner, Chandalar, and C.L. Carlson, U. S. Commissioner, Chandalar be given the contract if suitable price arrangements can be made.

That surface trenching west of the fault be carried out before the end of May, 1940.

MIKADO

(See Maps and Photographs herewith)

The Mikado property consists of three patented claims — Tobin, Little Mikado and Mikado (see survey plat), held under lease agreement with William Sulzer.

The information on which examination of this property was undertaken was: (1) The results obtained by Mr. Boadway from sampling of the shaft and tunnel on the Little Mikado claims. Mr. Boadway's sampling of the shaft showed a number of shoots from the surface to the bottom of the shaft (depth 104') averaging better than $80.00 per ton across an average width of 35". The best values appear to be at the bottom of the shaft. Lower values were obtained from the tunnel leve. (2) Description of the surface in U.S.G.S. Bulletin No. 532 by A. G. Madren, - "On the Tobin, Little Mikado and Mikaod claims of the Mikado Group, the quartz has been exposed by open cuts in six pieces over a distance of 3,000 feet and in all of these the quartz near the surface contains rich values in gold." "A shaft has been sunk on the vein to a depth of about 100 Ft. The average thickness of this vein is about 4 ft. - It is reported that the average assays from the quartz removed in sinking this shaft give $112.00 to the ton.

Surface -

Examination on the surface of this property for definite information is difficult due to a heavy layer of talus and rock broken up by frost action, frozen to within a few feet of the surface. Surface trenching attempted during examination failed to reach bedrock on account of surface water and sloughing. Surface trenching is impracticable during the summer months.

The six trenches referred to in U.S.G.S. Bulletin No. 532, 1913, were located by quartz dumps, (Trenches Nos. 2, 3-A, 3,4,5 and 6 (see accompanying map). These trenches appear to have been more in the form of adits through surface debris.

All have sloughed in and would require timbering to trench in the summer months. Trenching exposed the vein in place in Trench No. 4. This trench was channel sampled and about 4 lb. dump samples were taken from the dumps of other trenches. Assay results as follows:

Sample No.	Trench No.	Value	Description
4	No. 2	$ 6.30	Representative of mineralized part of quartz on dump. Arseno-pyrite sparlingly disseminated.
15-A	No. 3-A	2.80	Representative of mineralized part of quartz on dump. Arseno-pyrite scorodite sparingly disseminated.
22-A	No. 3	3.50	Representative of mineralized part of quartz on dump, some mineralized schist included.
40-A & 40-B	No. 4	Trace	Channel across vein 46" including 10" schist wall rock. Selected sample of mineralization (scorodite) assayed $14.70
	No. 5	Not sampled	
1	No. 6	135.45	Representative of mineralization from quartz dump over area 50 sq.ft.

Down the slopes below the trenches and up the hill above trench No. 2, quartz is in evidence in continuous, regular form as indicated on accompanying map. From this and other evidence it is though that the float marks the strike of the veins, although not indicating their length due to the slope of the hill. The amount of quartz float in evidence is estimated from observation to make up over 1% of the surface rock on the side hill between trenches No. 3 and No. 2, and Tobin Creek, a length of 950 feet. No visible gold was found in this quartz float but arsenopyrite is sparingly disseminated throughout most of it.

From the meager evidence available on surface the general impression is obtained that a number of parallel quartz lenses occur in ehhalon. The size of the float suggests vein widths of 2' to 5'. From evidence in trench No. 4 and from the vein walls as exposed in trenches Nos. 5 and 6, the dip of the vein appears to be about 60° to the South. Both of these deductions are based on inconclusive evidence.

Shaft -

The shaft is collared about 10 ft. below the surface at the bottom of a large pit, through talus. It is full of ice and it was impracticable to attempt to clean it out from the surface in the summer months. No information was obtained on the values in the shaft apart from a sample taken from the dump that appears to represent the last material removed from the shaft.

This sample consists of about 5 lbs. of banded, ribbon quartz, picked at random over 100 sq. ft. mineralized chiefly with fine pyrite, some arsenopyrite and, under strong glass, fine particles believed to be gold. This sample assayed $649.95.

Tunnel -

The tunnel was over one-half full of ice for its length, 496 ft. This was removed. Near the end of the tunnel there are two short drifts, - 37 ft. and 33 ft. respectively, - identified as south and north drifts, - (See accompanying Map). The drifts strike N 81° W. and N 68° W. respectively. The tunnel level is located 100 ft. below the bottom of the shaft and 42 ft. west of the shaft collar. Both drifts are in what appears to be a crushed, sheared fault zone over 50 ft. wide.

The only definite markers in this zone are the south wall of the fault zone and three quartz stringers, - one following the south wall for the drift length, one across the tunnel back and into the south drift, for 8 ft. and then striking out of the drift at an angle of a few degrees (see accompanying map). The third occurs across the tunnel back into the North drift for 4 ft. and then strikes out of the drift at an angle of a few degrees (see accompanying map).

Drifting -

In an attempt to obtain further information 22 feet of drifting was carried out by hand in the south drift. This work was done at this location as the south wall of the zone is the most definite marker, more quartz is

showing and it is from this section that Mr. Boadway obtained the best values. The information obtained is negligible apart from indicating that the vein structure has a flat rake to the east (35° approx.) and approximate costs of powder per foot of advance.

No information was obtained on the dip of the shaft. Taking Mr. Boadway's map as a guide, the present bottom of the shaft is located 27 ft. east of the tunnel (See accompanying map) and by projecting the same dip to the tunnel level, it would be located 17 ft. east of the tunnel.

If the vein structure in the shaft rakes to the east as indicated in the tunnel, then downward continuation of the part of the vein in the bottom of the shaft would be 83 ft. to the east at the tunnel level.

Mineralization consists chiefly of pyrite and minor amounts of arsenopyrite. Results of sampling are shown on the accompanying map. The higher values in samples Nos. 66-A, 67, 80-A and 68-A are accounted for by a 3" band of quartz (50% mineral) along the footwall of the quartz stringer sampled. A grab sample of this material taken by Mr. K. J. Springer assayed $23.80.

Bulk Samples - Mill Test

Two Bulk Mill Test samples - 20 lbs. each - were taken from the locations marked "D" and "E" on the accompanying sketch.

Sample "D" - Consists of banded quartz from the dump, Little Mikado shaft, believed to be the last material removed from the shaft.

Sample "E" - Representative of the pyrite quartz mineralization containing the values on the tunnel level.

RECOMMENDATIONS -

That 110 ft. of raising connecting the tunnel level with the bottom of the shaft be done by hand work and 100 ft. of drifting on the vein at or near the bottom of the shaft.

That this work be started by March 1st, 1940.

That the work be done by hand work on a partnership or contract basis.

That Manuel Mello, placer miner, Chandalar, and C.L. Carlson, U.S. Commissioner, Chandalar, be given the contract if suitable price arrangements can be made.

That the veins in trenches Nos. 2 and 6 be exposed for sampling and examination before the end of May, 1940.

That steps be taken to have the record of title of the Mikado group conform with the title as set out in lease agreement.

That the lease agreement be amended so that continuous work is not required.

SUMMIT PROPERTY

(See accompanying Maps)

The Summit property consists of two claims owned jointly by C.L. Carlson, Chandalar, Alaska, and William Schultz, Beaver, Alaska. An examining option with no cash payments was obtained on this property.

See accompanying maps for location of workings and sampling.

Workings consist of a tunnel 42 ft. long, shaft 41 ft. deep, drift at the bottom of shaft 62 ft. long and 3 surface trenches, Nos. 1, 2 and 3. In addition, there are three trenches, on strike of the zone, on the adjoining Rex claim, owned by Dennis O'Keefe, Chandalar, Alaska. All these workings are located at irregular intervals over a length of 800 ft. and indicate more or less continuous quartz veining for this length.

Tunnel Sampling -

From the portal west the first 25 ft. of the tunnel is timbered and lagged. The next 15 ft. to the face shows a number of quartz stringers on the back separated by narrow bands of schist. Channel samples cut across this section at 5 ft. intervals gave the following results:

Sample No.	Width		Grade	Description (See accompanying maps)
15-A)	14"			
15-B)	28"	$8.40		
15-C)	18"	10.40		
	60"		$7.07	Face
?	30"		17.35	Face (Best Section)
16-A)	9"			
16-B)	25"			
16-C)	9"			
16-D)	21"	$7.35		
	64"		$ 3.35	Back - 5' East of Sample #15)
17-A)	23"			
17-B)	25"			
17-C)	21"	$4.90		
17-D)	17"			
	86"		$ 2.27	Back - 5' East of Sample #16)
18-A	30"		1.75	Back - 5' East of Sample #17)

In the tunnel face the quartz stringer carrying values is 30" wide. Values obtained here indicate the possibility of an ore shoot coming in. An attempt was made to put a surface trench down on strike about 50 ft. west of the tunnel face. This trench failed to reach bedrock but revealed considerably very high high grade float.

Drift Sampling - Bottom of Shaft

At the bottom of the shaft there is a short crosscut 11 ft. long to the north. From here a drift, average width 30", follows a quartz stringer for 62 ft. The quartz averages 16 inches wide along a well defined wall showing 3 inches of gouge. The face of the drift is ice and it is stated by the owners to continue for another 20 ft. Channel samples cut on both walls of the crosscut at the bottom of the shaft gave nil results.

Channel samples cut across the drift back at regular 5 ft. intervals gave the following results for the quartz stringer. Adjacent schist assayed nil.

Sample No.	Width	Value	Location & Description (See sampling records)
44-F	23"	$6.30	East end of drift (E. Wall of crosscut.)
28	27"	3.15	6 ft. W. of Sample No. 44
29	14"	3.15	5 ft. " " " " 28
48-A	13"	4.20	5 ft. " " " " 29
49-A	13"	4.20	5 ft. " " " " 48-A
50-A	10"	4.90	5 ft. " " " " 49-A
90-A	12"	3.50	5 ft. " " " " 50-A
91-A	10"	4.20	5 ft. " " " " 90-A
92-A	10"	4.90	5 ft. " " " " 91-A
93-A	12"	4.55	5 ft. " " " " 92-A
94-A	14"	9.80	5 ft. " " " " 93-A
95-A	17"	1.40	5 ft. " " " " 94-A
96-A	36"	4.90	5 ft. " " " " 95-A

The best values obtained were from three surface trenches 25 ft. apart, located 280 ft., 285 ft., and 310 ft. respectively west of the western limit of underground workings. Channel samples, no fines included, gave the following results:

Sample	Trench No.	Width	Value	Location & Description (See sampling records)
(41-A	1	30"	$78.00	SW wall rock 25" quartz, banded slightly oxidized.
(41-B	1	34"	84.00	Continuation sample 41-A, all quartz, banded, slightly oxidized.
89-A	2	40"	14.70	25 ft. west, sample #41-A, quartz banded, slightly oxidized.
41-A		18"	32.90	25 ft. west sample No. 69-A
41-B		31"	2.80	Banded quartz, slightly oxidized.
41-C	3	25"	5.00	and 12" rock wall

Channel samples from 2 trenches on strike on the adjoining Rex Claim 236 ft., 252 ft., and 332 ft. respectively west of Trench No. 3, above, assayed as follows: (The trenches were partly filled with water and the vein only partially exposed.)

20-A	4	30"	8.40	Oxidized, quartz
(21-A		18"	4.20	" "
(21-B	5	23"	1.72	" "
	6	Not sampled		

As a result of the erratic and indefinite nature of sampling results, a payment of $200.00 due Nov. 15th, 1939, on the option was not made and the option has lapsed.

RECOMMENDATIONS -

If any further program of work is carried on in the area this property warrants further investigation. While the main work during this examination concentrated on underground workings did not show ore grade values, surface trenches and assay results indicate good possibilities of an ore shoot between

the present tunnel face and the top of the hill(west) - a length of 600 ft. This section should be surface trenched and sampled, at regular intervals in the spring or fall, while the frost is still in the ground. It is thought that no difficulty will be had in obtaining a satisfactory deal with the owners.

In conjunction with any future program of work in the area, it is estimated that the sum of $500.00 would do the surface work and sampling necessary to complete examination.

ENEVELOE CLAIM

A claim of the Bonanza Group held under lease agreement with Chandalar Mines (William Sulzer) - See Survey Plat.

Mr. Beadway and others reported the occurrence of high grade float in Robbins Gulch, down the mountain below the Enevelce claim. U.S.G.S. Bulletin No. 532 reported the occurrence of high grade in three trenches on the claim. Natives of the area state that a rock slide obliterated two of the trenches.

A quartz dump marks the location of the third trench, at an elevation of about 300 ft. below the top of the saddle between two peaks. The slope of the hill where the dump occurs is about 45°. Trenching here during examination exposed a banded ribbon quartz vein about 10" wide. Further surface trenching was impracticable. A channel sample 17" wide cut across the vein including 7" wall rock assayed $107.80. A sample representative of the quartz on the dump, area, 50 ft. square, assayed $154.35.

RECOMMENDATIONS -

In conjunction with any further program of work in the area an adit should be driven on this vein to further explore it. It is estimated that $1,000.00 should complete the initial work, including 30 ft. of drifting.

PALASOREN AND NORTHERN LIGHT CLAIMS

See Progress Report and accompanying sketch, dated July 30th, 1939, for particulars of ownership, description and location of property and samples taken.

Of the samples taken, only two showed values, both from Trench No. 2 - Sample No. 16, width 34 inches, $4.20, and Sample No. 17, width 6 inches, $11.20.

An option agreement on this property arranged with the owners was not completed on receipt of assay results.

This property warrants further surface exploration. This work will probably be carried out by the owners. It is thought that no difficulty will be had in making a satisfactory deal if desired, at a later date.

NEWTON PROPERTY (BIG CREEK)

Owned by Newton Estate (Frank Yusida, Beaver, Alaska, administrator).

U.S.G.S. Bulletin No. 332, and placer miners in the area report the occurrence of a quartz vein (15 ft. wide) crossing the bed of the Big Creek on this property. A shaft about 15 ft. deep located about 50 ft. east of the creek has been sunk on the vein. The shaft is timbered and lagged to the bottom. Quartz can be seen through 2 ft. of water in the bottom of the shaft across the full shaft width (5 ft.) A representative sample of the quartz from the shaft dump sparingly mineralized with arsenopyrite and pyrite assayed $11.20. A sample of fresh quartz from this dump showing no mineralization assayed $2.80.

A pile of quartz near the creek, apparently from a surface trench, across the vein, contains considerable visible gold. An attempt, during this examination, to sluice the loose rock and tailings in the creek failed to expose the vein on account of work being done late in the summer when the volume of water was limited. This work should be completed and, subject to results, the vein explored by deepening present shaft and drifting. Heavy talus prevented tracing the vein on the surface.

It is thought that no difficulty will be had in making a satisfactory deal on this property at a later date.

Other Showings -

A great number of trenches, pits and short adits have been completed on various showings between Squaw Lake and Chandalar Lake. These are all marked by quartz dumps that may be seen on the slopes from the tops of surrounding hills. These were examined and sampled or panned. Some high, erratic values were obtained from the Star and Woodchuck veins, but no ore shoots outlined. (See sampling records filed with the company for description and location of samples taken.)

Staking -

Four claims were staked and recorded on behalf of Lake Chandalar Gold Mines Limited, during this examination. One adjoining the Tobin and Little Mikado claims on the south. The portal of the tunnel on the Mikado property is 10 ft. outside the claim boundary. The claim was staked to avoid any nuisance value staking by other persons. Two claims were staked, one on each side of and adjoining the Little Squaw claim for the same reason and one claim was staked about 1500 ft. N. of the Little Squaw claim on a quartz vein parallel to the Little Squaw vein. A sample of the mineralized quartz exposed assayed $8.40.

TRANSPORTATION

(See tariffs and quoted rates filed with this report)

To carry out the program recommended in this report, transportation is dealt with under two headings: (1) To the Area; (2) In the Area. Under the heading "To the Area" a general outline of transportation means and possibilities are discussed. Only facilities of established companies now available are considered in estimating costs of the program recommended herein. Under the heading "In the Area" deductions are made from reconnaissance trips made on foot during examination over all routes to be used and some experience gained by freighting done by tractor in the area during this examination.

To the Area -

At the present time freight reaches the Chandalar area by two routes (1) From Seattle to Fairbanks via the Alaska Steamship Lines and Alaska Railway, thence from Fairbanks to Chandalar by air (approx. 200 miles) via Wein Alaska Airlines, who maintain monthly mail service and have quoted a rate of 10¢ per lb. Fairbanks to Squaw or Chandalar Lakes, when load for Tri Motor Ford available (3,000) lbs. and 12 cents per lb. for smaller quantities. This is a year-round service. (2) From Seattle to Skagway, Alaska, via Alaska Steamship Lines, thence Skagway to Beaver, located on the Yukon River about 90 miles south of Chandalar via the White Pass and Yukon Railway and Yukon River Service, thence Beaver to Chandalar (90 miles) by plane. Wein Airlines have quoted a rate of 8 cents per lb. from Beaver. This is a summer season route. There is also a winter road (Government road) from Beaver to Chandalar over which considerably heavy freight (including the three stamp mill now at Chandalar) was handled in the early days by horses and dogs. In November, 1937, two men transported a 40 h.p. caterpillar, hauling one ton of fuel oil over this route in six days. The men report that the bridges are out, making it necessary to detour on some heavy grades and preventing the hauling of larger loads. Insofar as the

recommendations and costs estimated in this report are concerned the only use to be made of this road is for taking in a Caterpillar tractor under its own power.

A study of freight tariffs shows that Fairbanks is the best place to purchase all supplies, explosives, tools, etc., in less than carload lots for the initial program of work. There is ample supply to fill all requirements available at Fairbanks. Cost of a few items at Fairbanks are:

Gasoline:	30 cents Imperial Gallon, drum lots,
Powder 80%:	11.25 per case - (20 case lots)
Blacksmith Coal:	3.37 per 100 (1,000 lb. lots)
Flour:	6.00 " "
Sugar:	8.50 " "

On completion of the first stage of exploration, Mining Machinery and Milling Equipment required can be shipped from Seattle to Beaver during the summer months at a freight rate of $56.00 per ton and transported by plane from Beaver to Chandalar for $169.00 per ton. A tractor can be taken into Chandalar from Fairbanks under its own power up to the middle of May or in the fall after breeze-up. If development results warrant heavy freight shipments, consideration can be given to repairing the bridges on the tractor road with Government assistance and freight transported from Beaver to Chandalar by tractor during freeze-up. It is thought, however, that apart from the units weighing over 4,000 lbs. the Alaska Airplane companies will successfully compete with winter road tractor freighting costs.

<u>In the Area</u> -

A high divide with steep mountain slopes lies between the Little Squaw and Little Mikado mines. Ore indications at present do not justify the cost of tractor road construction between the two properties or consideration of the construction of a tramway.

It is proposed that the Little Squaw vein, including the Knevelee and Palasgren and the Mikado vein including the Summit, Big Creek and Star veins be developed and the ore milled as independent undertakings.

When the veins examined are divided into these two groups, no transportation problems or costly road construction are involved.

As thus divided, freight for the Little Squaw Mine would be landed on Squaw Lake or the present airport. For the Mikado mine, landings would be made on Chandalar Lake.

From Squaw Lake to the Little Squaw Mine is about 3-1/2 miles, fairly even gradient, maximum 15%. There is a year-round tractor road from the Lake, airport and millsite to within 3/4 mile of the Little Squaw adit, and thence a four-foot trail along the hill-side. It is estimated that, by using a tractor and grader $1500.00 will widen the road this last three-quarters of a mile for all-year tractor heavy freighting of supplies to the mine, and ore to the millsite.

From Lake Chandalar to the Mikado mine is about 9 miles up Tobin Creek. All freight taken into the Mikado Mine for its early development, and present freight for Mr. Anderson, placer miner, located six miles up Tobin Creek, is taken in over this route by dog team while the ground is frozen. Two reconnaissance trips were made on foot, over this route, during this examination. It is estimated that $2,000.00 will complete a road for year-round service between Chandalar Lake and the Mikado Mine. At the present time freight can be handled over this route by tractor while the ground is frozen, fairly even gradient, maximum 15%. A low pass lies between Tobin and Big Creeks. Freight for and ore from the Summit and Big Creek veins can now be hauled by tractor via this pass.

A wide, flat valley, over which heavy freighting by tractor can now be done during the frozen season, connects Squaw Lake and Chandalar Lake, a distance of 13 miles.

Manuel Mello, placer operator, on Little Squaw Creek has a 40 H.P. deisel caterpillar, equipped with power take-off pulley. This tractor was used during this examination between Squaw Lake and the base Camp - 2½ miles, at a cost of $25.00 per day, plus fuel oil ($10.00 per day). This tractor is available and could be used for initial freighting, and as a stand-by unit. At the present time, all heavy freight should be moved before the frost leaves the surface.

Timber and Wood -

The Squaw Lake and Chandalar Lake valleys support a fair growth of timber, principally spruce. There is ample available for all fuel, buildings and mining and milling purposes within a few miles of both lakes. At the present time, C. L. Carlson, U. S. Commissioner, Chandalar, has fifty cords of wood located on Tobin Creek, about six miles from the Mikado Mine, available at $10.00 per cord. He also has two sets of building logs, suitable for two buildings, 16 x 20 ft. each, located on Tobin Creek one mile from the Mikado Mine, available for $50.00. There are also available several cords of dry wood near Squaw Lake at $10.00 per cord.

Labor -

There is ample labor available in Fairbanks. Careful selection is necessary. Partnership or contract work is preferable to wages. The present rate of pay is $6.00 per day, and board, in Chandalar.

Power -

Consideration of the development of the water power site referred to in Report by Mr. Boadway is not justified at the present time.

COSTS

Powder consumption per foot of advance for 22 ft. of drifting, 4' x 6½' drift, done during this examination on the Mikado tunnel level, was slightly less than 4 lbs. per foot. The rock broken was of average hardness to the work recommended in this report. 7 holes, deepest 3', broke 2½ ft. from the face. Average rate of advance for crew of three men was 15" per day (8 hours). This includes packing supplies three miles, repairing buildings and packing wood. The men worked by the day with supervision one day per week. It is estimated that a crew of three men on a partnership or contract basis, will advance an average of 18" to 24" per day for the 450' of work recommended herein. Cost of food supplies, including luxuries, Fairbanks prices, for 600 man days' work for the examination was $685.54.

Estimate of costs to complete 450 ft. of underground exploration by hand work, crew of 6 men, including supervision, by utilizing tools, steel, blacksmith outfits, camps and equipment now available is:

Little Squaw	
Deepening Winze	10'
Drifting East on vein from bottom of winze	200'
Mikado	
Raising from tunnel level to bottom of shaft	110'
Drifting on vein	100'
Emerelee	
Drifting on vein	30'
	450'

450 ft. underground work @ $25.00 per ft.	$ 11,250.00
Extra cost setting up camp and blacksmith outfit Enevelos and freighting supplies	250.00
Extra cost repair buildings Little Squaw and Mikado	300.00
Extra cost surface trench Little Squaw West of fault	250.00
Extra cost taking ice out of Little Squaw raise and Mikado shaft for ventilation, including labor and material for collaring against water.	950.00
	$ 13,000.00

ITEMIZED COST ESTIMATE 450 FEET UNDERGROUND WORK AND SURFACE WORK, PROPOSED

Six Men, including supervision.

	Fairbanks Price	Weight Lbs.	On Hand at Chandalar
Powder (1800 lbs.) 36 cases (60%)	$ 405.00	2160 packed	2 cases
Fuses - 85 rolls	75.00	65	12 rolls
Caps - 20 boxes	50.00	20	5 boxes
Steel 7/6" - 200 ft.	50.00	450	300 ft.
Coal (1500 lbs.)	50.00	1500	—
Radio — sending	250.00	75	—
Food - 950 man days	1,000.00	4500 ~~8770~~ lbs.	
Frt. Fairbanks to Squaw Lake and Chandalar Lake; 8770 lbs.	800.00		
Frt. Squaw Lake to Little Squaw Mine	180.00		
5 Cord Wood, including freight to Little Squaw Mine	125.00		1 cord wood
Freight Lake Chandalar to Little Mikado Mine, including 5 cords wood and Carlson's building camp	400.00		1/4 cord wood
Six men, Fairbanks to Chandalar and return @ $72.00	432.00		
Five men, 160 days' work, 750 days @ $6.00	4,500.00		
Supervision, six months	1,800.00		
Travelling expenses	800.00		
General, including office supplies, sample bags and freight on samples	503.00		
Extra labour for trenching, repair camps, etc.	1,500.00		
	$ 13,000.00		

Milling and Millsites

Amalgamation tests have not as yet been carried out on the three bulk samples from the Little Squaw vein and the two bulk samples from the Mikado vein, taken during this examination.

Mr. Bendway reports the following results from amalgamation tests of samples taken by him:

Mikado Vein	Recovery by Amalgamation
Composite sample taken from rejects of samples cut in older quartz, (Mikado shaft) ground to minus 60 mesh.	76%
Sample of younger quartz from bottom of Mikado shaft at minus 20 mesh	77%
at minus 60 mesh	89%
Little Squaw Vein	
Two amalgamation tests on quartz containing considerable visible gold averaged	90%

Amalgamation tests of samples taken during this examination will provide the information necessary to design the most suitable mill. The size of the mill can be determined following completion of the development work recommended herein.

For year-round milling of ore from the Little Squaw vein, the mill should be located 2 miles from the mine, at the springcreek millsite (See Survey Plat). There is ample water available at this location. It is estimated that an expenditure of $1500.00 would complete the road between the mine and millsite for year round service. (For salvage purposes the mill would be set up adjacent to the creek bottom down hill directly below the Little Squaw vein. There is sufficient water here to mill during the summer (3 to 4 months) and no transportation of ore would be necessary.

For year-round milling of ore from the Mikado vein the mill should be located at Chandalar Lake (9 miles from the mine). It is estimated that an expenditure of $2,000.00 would complete a road between the mine and mill-site for year-round service. For salvage purposes the mill could be set up in the creek bottom, one mile from the Mikado vein. There is sufficient water here to mill during the summer (3 to 4 months).

Taxes -

The following Tax Acts are in effect in Alaska:

1. Income Tax Act:
   Payable
   (a) 3% of gross production less $20,000. exemption, less royalties paid.

   (b) Up to $100,000. net profit - 1-3/4%
   100,000. to 150,000. " 3%
   150,000. to 250,000. " 4%
   250,000. to 300,000. " 5%

2. Unemployment Insurance Tax Act: 3% of payroll payable by operator. This Tax does not apply when crew of 8 or less are employed.

3. Social Security Tax Act: 2% of payroll payable, 1% by employer and 1% deductible from employees' wages.

4. Hospitalization Tax Act: $2.50 per man per month. Deductible from employees' wages.

Capital Outlay - Following completion of initial work recommended herein.

On the basis of a salvage proposition by hand work of the 2,000 tons of ore now outlined in the Little Squaw vein, the total cost to mine and mill the ore estimated to be $54,000.00 requiring a capital outlay of $20,000.00, the remaining $34,000.00 could be paid out of production.

On the basis of favourable ore development from the underground work recommended in this report it is estimated that an additional capital outlay of $18,000.00 would be necessary to install a 315 air compressor and specially designed mill to treat the ore, and an additional $3.00 per ton should be added to mining costs to cover further development work.

Capital Outlay Itemized (On Salvage Basis) -

34 h.p. Tractor Deisel (Ingersoll Rand) equipped with grade builder, starter and lights and power take off complete at Chandalar	$ 6,500.00	
Spare Parts.	500.00	
Fuel Oil, Greases, for Transportation and road building	1,200.00	
To complete Airport, standard size - Government expenditure		$1,000.00
Building at Mine, including conveying system from adit to mill	2,000.00	
Set up Mill now at property in Creek bed, directly below Little Squaw vein	3,000.00	
Mining and Milling 2,000 tons @ $22.00 per ton	44,000.00	
	$ 57,200.00	
Less: Resale value of Tractor	3,200.00	
	$ 54,000.00	

The estimate of $22.00 per ton for mining and milling does not allow for further development and is made up as follows:

Timber per ton	.50
Explosives	1.00
Steel, Coal & Misc.	.50
Fuel	.15
Labour	5.10
Mining Costs	7.25

Mining Costs	7.25
Transportation of ore	.50
Milling including power	9.00
Blacksmithing	.75
Supervision	2.00
General	.50
Extra Labour	1.25
Insurance against accident	.50
Head office	.25
	22.00

The cost estimates under the last heading in this report, Capital Outlay, are based upon insufficient data to warrant their being interpreted as definitely obtainable.

This estimate is included for the purpose of showing the probable costs and is based chiefly on costs of other small mines operating in Alaska.

Documents, Files, Drawings, etc. filed with this report:

1. Five sample books containing stubs of all samples taken.
2. Field Book - C. W. McKee.
3. Field Book - L. J. Lohse
4. Journal containing account for each employee showing record of time, bank statement, Tractor rent, etc., and personal expenses.

Files:

1. Invoices and Vouchers
2. Typed list of all samples taken showing number, description and location, and assay results.
3. Original copies of assay reports.
4. Correspondence file.

5. Freight rates and costs.

6. Machinery, Millsites, Chandalar area.

7. Big Creek Flader property including Map.

Maps:

Original Drawing - Little Squaw Adit Level

" " " " Profile of Surface

" " " " Adit

" " Summit Property - Profile and Plan

" " Mikado Tunnel Level

" " " Surface Plan

" " Level Survey Airport

" " Reconnaissance trip Mikado Mine to Chandalar Lake.

Survey Plats Little Squaw group 9 claims

" " Bonanza " 6 "

" " Mikado " 3 "

" " Springcreek, St. Marys and Tobin Creek Millsites.

Contour Map Chandalar area by Irving Reed, U.S.M.S.

Map Showing Geology Chandalar area by J. B. Mertie, U.S.G.S.

Reports:

U.S.G.S. - 1923 - Chandalar Area by J. B. Mertie

U.S.G.S. - 1931 - Lode Deposits of the Fairbanks District

Documents:

Abstracts - Little Squaw Group - 9 claims

" Bonanza " - 6 claims

" Mikado " - 3 claims

" Star " - 3 claims

" Summit " - 2 claims

Copies of option agreements on the Summit group

Copies of option agreements on the Palasgren group

Copies of option agreements on the Rex claims

Record of staking and bills of sale for the four claims staked.

Agreements with employees.

3 copies Alaska Mining Laws.

1 copy Alaska Mining Inspector Act

1 copy Alaska operation of coal mines.

1 copy Alaska Compensation Act.

1 copy Outline Social Security Board

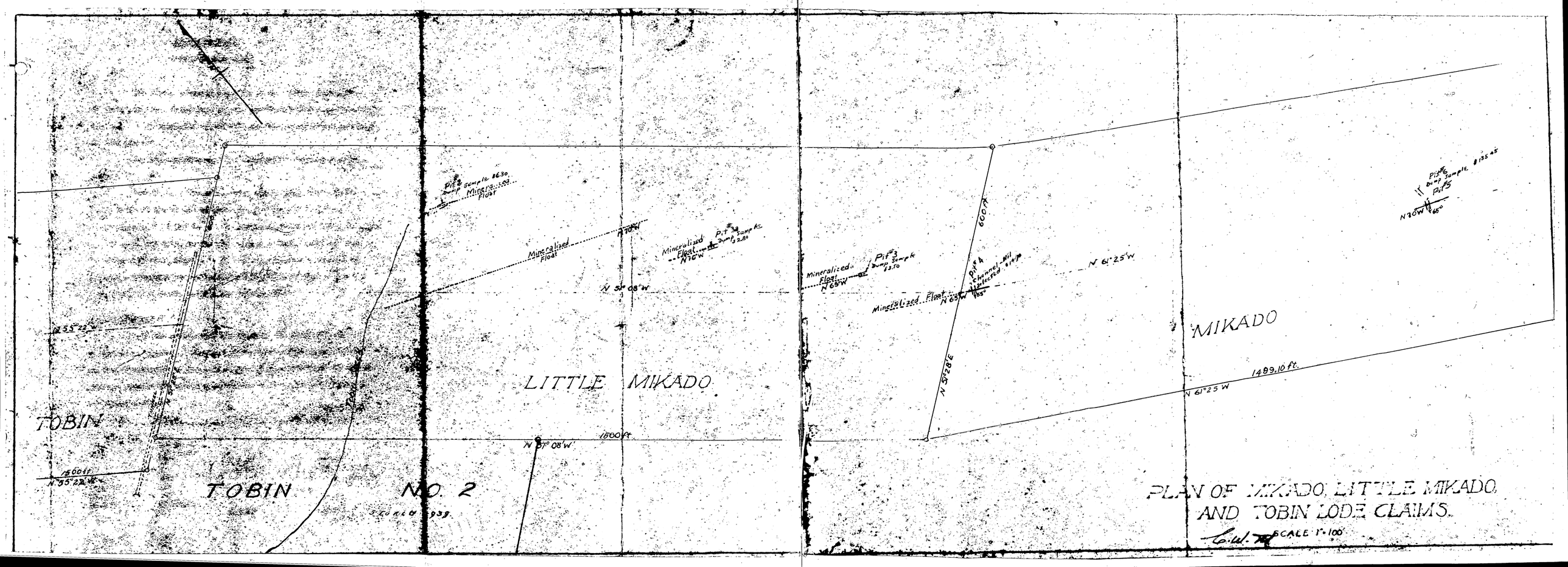
Income Tax return forms.

For mapping purposes, the identification numbers of samples from the Little Squaw Mine have been altered as follows: (All other sample numbers conform with original records).

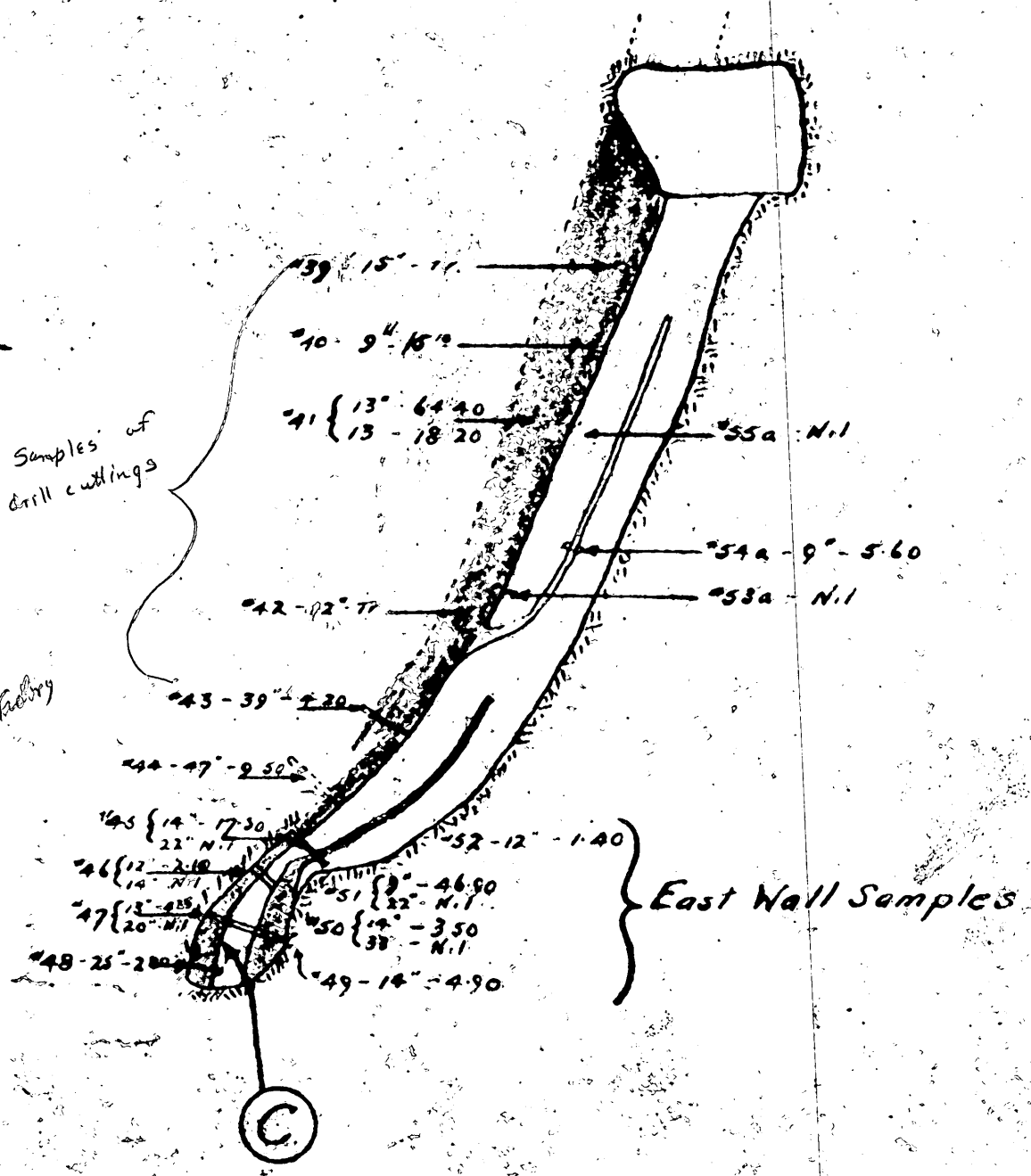
Mapping No.	Original Record No.
1	27a
2	72a
3	40
4	7a
5	38
6	32a
7	9a
8	11a
9	24a
10	34a
11	33a
12	52
13	97a
14	98a

Mapping No.	Original Record No.
15	99a
16	1a
17	8a
18	2a
19	29a
20	33a
21	36a
22	23a
23	4a
24	28a
25	5a
26	3a
27	6a
28	10a
29	62a & 49
30	41
31	44
32	46
33	106a
34	35a
35	64a
36	61a
37	54a
38	60a
39	51a
40	52a
41	35a and b
42	63a

Mapping No.	Original Record No.
43	69a
44	71a
45	73 a and b
46	74a and b
47	100a and b
48	101a
49	102a
50	103a and b
51	104a and b
52	105a


Pit 2
Dump Sample #630.
Mineralized Float
Mineralized Float
N 70 W
Pit 1
Dump Sample #288
Mineralized Float
N 76 W
N 55° 08' W
N 55° 22' W
LITTLE MIKADO
TOBIN
1800 ft
N 37° 08' W
1800 ft
N 55° 22' W
TOBIN NO. 2
Mineralized Float
N 65 W
Pit 3
Dump Sample #370
Mineralized Float
N 65 W
Pit 4
Channel Mineralized Strip
600 ft
N 61° 25' W
N 51° 28' E
MIKADO
1489.10 ft.
N 61° 25 W
Pit 6
Dump Sample #135.85
Pit 5
N 20 W
65°
PLAN OF MIKADO, LITTLE MIKADO
AND TOBIN LODE CLAIMS.
SCALE 1" = 100'

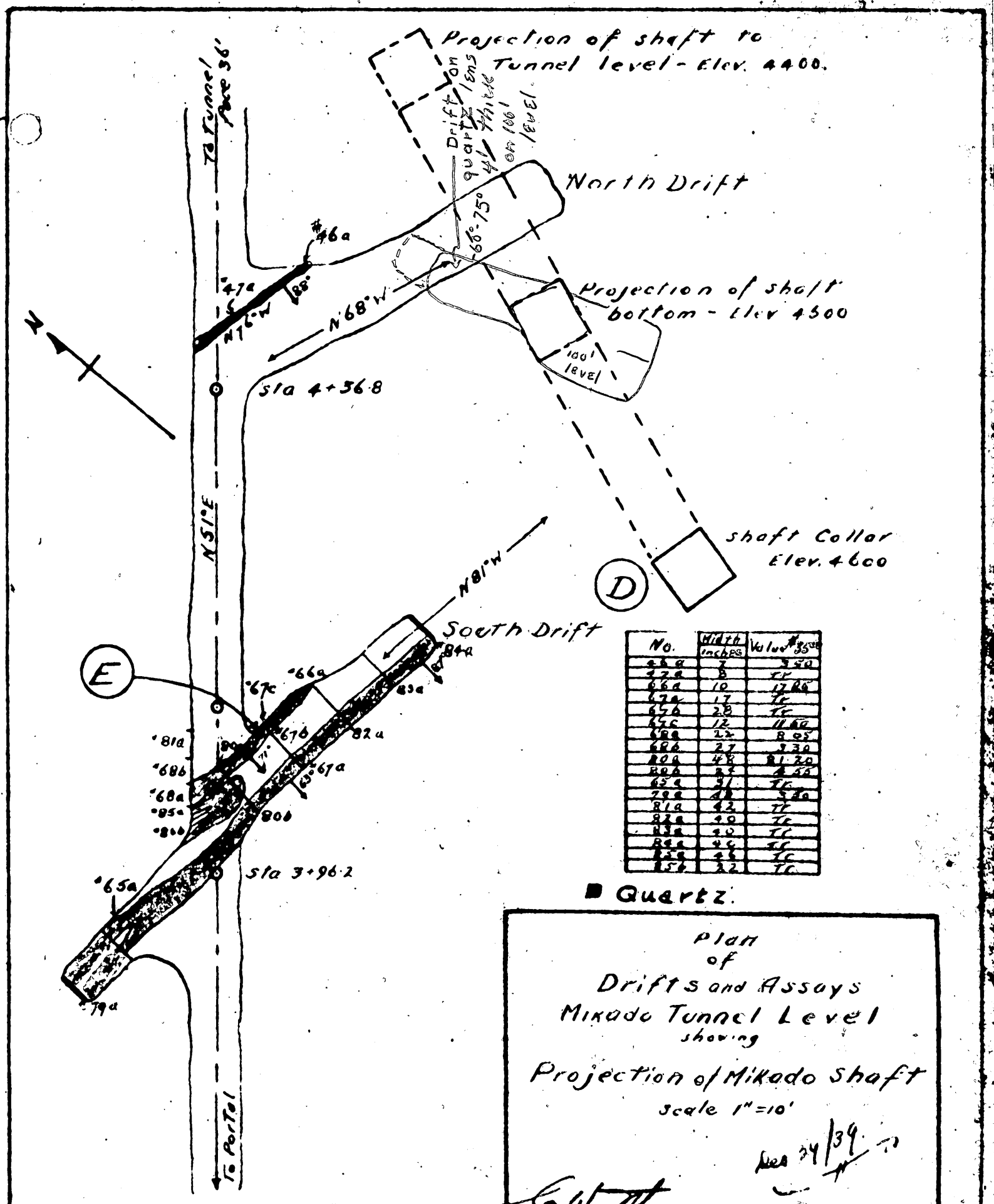
Sectional View Little Squaw Winze
— Looking west —



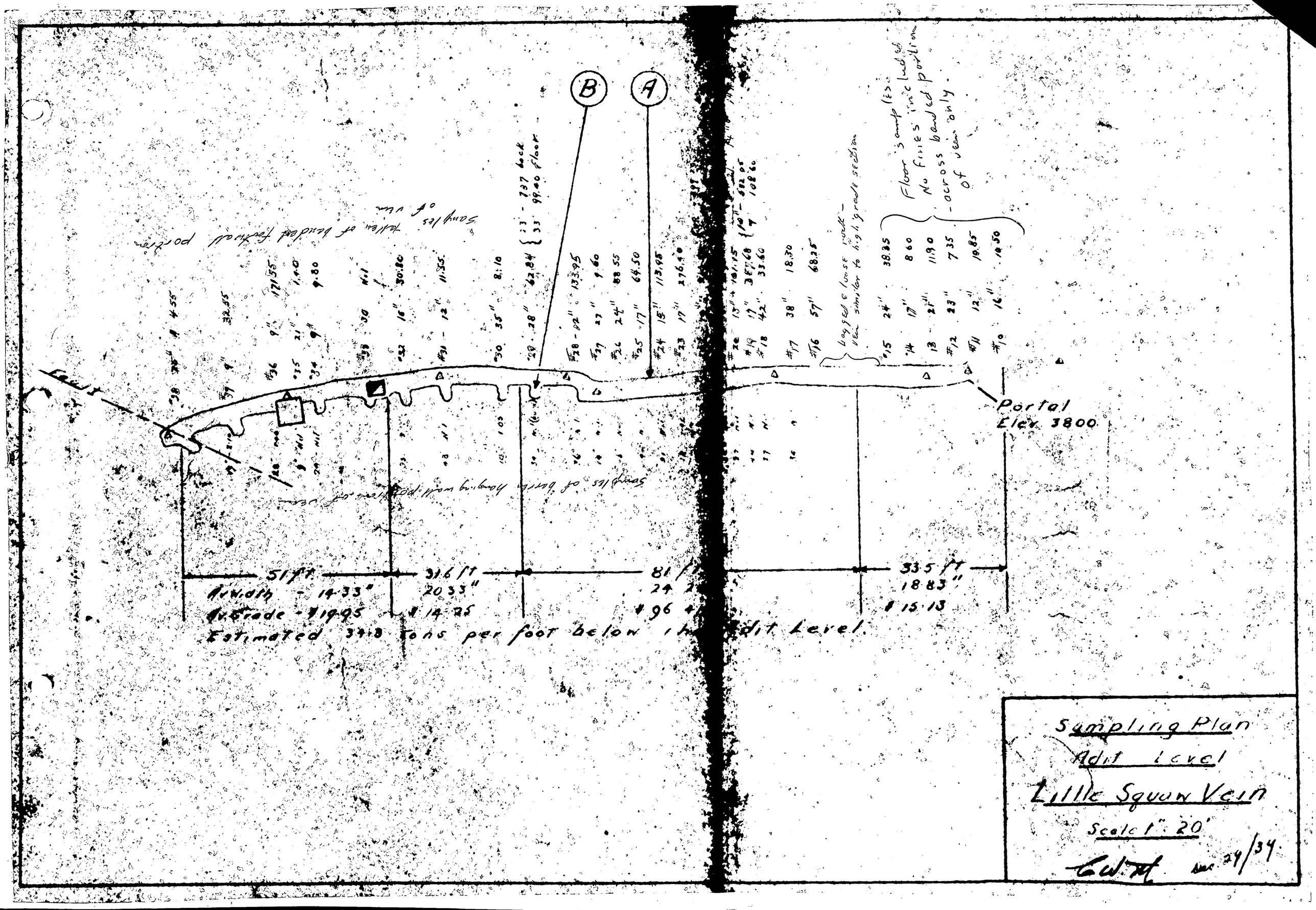
■ Quartz

Scale 1" = 10'

C.W.M. Dec. 29/39.



No.	Width inches	Value $ per ton
46a	7	3.50
47a	8	TC
66a	10	17.80
67a	17	TC
67b	28	TC
67c	12	11.60
68a	22	8.05
68b	27	3.30
80a	48	81.20
80b	34	8.50
65a	31	TC
79a	48	5.40
81a	42	TC
82a	40	TC
83a	40	TC
84a	44	TC
85a	45	TC
86b	32	TC


B
A
Portal
Elev. 3800
Samples of Blocked Footwall position
Samples of vein
Floor samples include No. fines, including position across banded vein only.
Layered & loose rock — like similar to high grade section
51 ft
316 ft
81 ft
335 ft
Estimated 3.4.8 tons per foot below the adit level.
Sampling Plan
Adit Level
Little Squaw Vein
Scale 1" = 20'

FIELD NOTES

by

C. W. McKEE

Page:

1. Preliminary letter July 7, 1939

2. Preliminary reports - leased properties and Summit July 18, 1939

16. Rock Samples - identification July 25, 1939

17. Preliminary report - Pallas Gren and Northern Light July 30, 1939

22. Progress reports - Aug. 5, 1939 with Little Squaw and Mikado Plans and Summit Profile

31. Summary with two Mikado profiles

[illegible]. Letter - S[illegible] 4, [illegible]

Fairbanks, Alaska
Nordale Hotel
July 7, 1939

Lake Chandalar Gold Mines, Ltd.
1207 67 Yonge Street
Toronto, Canada

Dear Sirs:

This letter is not a complete report on undertakings and events to date, but rather a number of details which you will probably be interested in receiving.

Enclosed herewith is a map of Alaska. I arrived in Fairbanks Tuesday afternoon last and have spent the past three days in ordering supplies, equipment, hiring a crew and obtaining general information on the area. I am now organized for two months' work and the first load of freight is going in this afternoon. I will be leaving for Chandalar tomorrow.

Labor:

I interviewed Mr. Crawford, General Manager of United States Smelting and Refining Company in Fairbanks, and received his complete cooperation. I obtained considerable information in connection with wages, working conditions, etc. Upon his recommendation, Mr. L. J. Lohse, graduate in mining from the University of Alaska, was hired as my assistant. He is being paid a salary of $200 per month plus board and transportation. This is the standard salary for junior engineers in this area. There is considerable labor available; however, high rates of pay for labor prevail. The Government has what is known as the Territorial Employment Agency which acts as a clearing house for labor. They list, check and investigate all applications for work and undertake the hiring for companies operating in outlying points. I am told by mining people using the service that they give excellent results. Mr.

Crawford also recommended this service as the best means of obtaining a crew. With the assistance of this employment agency I have hired five men for stripping and trenching operations at $6.00 per day plus Board and transporation, and one blacksmith at $7.00 per day plus board and transportation. Wish a crew of eight men or less we are not subject to the 3% unemployment tax. Therefore, I propose to carry on on this basis until such time as something is definitely known about the property.

Transportation:

There are five companies doing local flying out of Fairbanks; however, only one (Wien Alaska Airlines) has a ship with any substantial freighting capacity on floats. It is a Fairchild 71 and carries about one thousand pounds pay load. The cost of transportation is $72 per man return and 12¢ per pound for freight. I could not get this rate reduced for our immediate flying, but should we have any flying whereskis or wheels can be used by repairing the landing field at Chandalar then this rate can be materially reduced. Wien Alaska Airlines make two regular trips per month with mail to Chandalar and during this season have averaged three trips a month. With the flying we will give them they should service us weekly.

Supplies:

All our supplies have been purchased from the Northern Commercial Company, the largest wholesalers and retailers in Alaska. They carry a complete line, and the prices range from 10% to 25% higher than Seattle prices. Dynamite by the case is $14.75 and in twenty-case lots it is $12.75. Gas is 30¢ per gallon in drum lots. Gas can be delivered in Fairbanks in quantity at 25¢ per gallon.

Machinery:

Carrington & Jones carry a fairly complete line of tractors, pumps, drills, parts, gas, oil, etc., and are agents for Ingersoll-Rand, International Harvester, etc.

Without having seen the ground and from information obtained here, it seems to me that we will need a portable compressor, Model 105 Ingersoll-Rand. There is a tractor which the airplane pilot reports in good working condition now available at Chandalar. Gas and oil hauled in over the winter road from Beaver are available. A portable compressor can be ordered from here by wire and delivered at Fairbanks in less than ten days. I will know more about this after a few weeks on the ground. Crawford, of the U. S. S. & R., suggested that I purchase one immediately, as there is a shortage of them in the country and there would be no difficulty in reselling.

Legal:

Upon the recommendation of the bank, Crawford and others, Hon. Charles E. Taylor, of the law firm of Albrecht and Taylor, has been retained to handle our work. I discussed the various points contained in the memorandum prepared by Holden Murdock with him and it appears that all matters can be handled quite easily by correspondence between Mr. Taylor and our solicitors in Toronto, and he is proceeding to do this. Mr. Taylor considered it essential that we register in Alaska immediately and that an agent be appointed. I therefore wired you today requesting a copy of the articles of association and a letter from the company appointing Mr. Taylor as our agent in Alaska. Mr. Taylor has assured me that it is o.k. for us to proceed immediately with our work.

Bank:

The bank here charged one-half of one per cent discount on our draft - in other words, $25.00 on the $5,000 draft. In sending further money be sure and buy American funds in Toronto as the discount there is much less than here. I would like you to send as soon as possible $5,000 draft to the First National Bank of Fairbanks, marked to be deposited to my account as I will be in the field when it arrives. The name of the president and manager of the bank is Edw. H. Stroecker.

Assays:

Arrangements have been made with the University of Alaska at Fairbanks to do our assaying. I have purchased three locked sacks and the Wien Alaska Airlines will transport them from Chandalar to the University. While the assay results will not be accepted as final, they will furnish a quick guide for our exploration work. One of the professors from the University is going to visit the Chandalar area in about a month's time.

Freighting:

From information received, it seems to me that should we have any heavy shipments of machinery, supplies, etc., to make, they should be shipped to Beaver from Seattle and taken in over the winter road by tractor. At the present time there is supposed to be a good summer road from Beaver to Caro. Should developments this summer result in indications suggesting heavier work, then I will walk from Chandalar to Beaver and size up the whole transportation situation over this route.

General:

There are several small, hardrock mines operating near Fairbanks in the Birch Creek Schists. I expect to go out this afternoon to visit the McCarthy mine operated by U. S. S. & R. I spent considerable time with Warren Woodward, manager of the McCarthy Mine, and obtained considerable valuable information from him on the nature of ore occurrences, mining methods, etc., in the Birch Creek Schists. From the information received it appears that the ore is very spotty, erratic and high grade. He figures that it is necessary to do about three times as much exploratory work as is necessary in the ordinary mine. In one drift they ran 800 feet through barren vein material and then opened up 200 tons of high grade ore that paid for all the work and gave them 100% profit. In any case, they are operating on quite a nice profit basis. While we are supposed to be in the Birch Creek Schists at the Chandalar Area, there are two features which seem to me to stand out in our favor: First, our ore occurs off the nose of diorite intrusions which are lacking in the Fairbanks Area, and second, our veins strike across the schistosity of the

formation which is also lacking in the Fairbanks area. I will know more about this, however, after a few weeks' work.

A number of quartz properties have been brought to my attention in the vicinity of Fairbanks. I plan on looking at some of them this fall when I return from Chandalar. There are very few hardrock men in the area and there is a general agreement between the engineers and some of the professors at the University that quartz lode deposits have been somewhat overlooked, due to the heavy initial expenditures required as compared with the initial expenditures for placer operations, and there is apparently considerable potential placer ground still available.

This letter has been dictated somewhat at random for the purpose of acquainting you with some of the general information in connection with our operation. I will send you detailed information from time to time as it is obtained.

Yours truly,

s/ C. W. McKee

cwm:dd
enc 1
airmail

P.S. 1 Address mail to me at Fairbanks, in care of Wien Alaska Airlines, P O Box 649, Fairbanks, Alaska.

PSS 2 In connection with the air compressor, I just had dinner with the Alaska manager of Carrington and Jones and he has wired today for two portable air compressors to have in stock here, so there will be one available if we require one later on.

Chandalar, Alaska,
c/o Wein Airlines Ltd.
Fairbanks, Alaska
July 18th, 1939

Lake Chandalar Gold Mines Ltd.,
67 Yonge St. , Toronto

Dear Sirs:

After being tied up in Fairbanks for three days on account poor flying weather, we finally arrived on Squaw Lake July 11th, with a complete outfit and crew. If you keep the enclosed contour map before you, it will be easier to follow the locations referred to in this letter.

A new 4DR tractor owned by Manuel Mello, placer operator on Little Squaw Creek, transported our supplies and equipment, two and one half miles, up the valley, over a good tractor road, where a base camp has been established, use being made of Mr. Mello's well equipped camp. Cost of tractor $25.00 per day.

While camps were being prepared a day was spent with Mr. C. L. Carlson, Commissioner, Recorder and Postmaster, Chandalar, reading over the record books containing all recorded transactions in connection with properties held under lease by the Company. It appears to me that the patent titles of the various properties held by the Company are in order and as represented in the lease agreements.

There are four buildings in fairly good condition at the main camp of the Chandalar Gold Mines, located at the springcreek Millsite, about one mile N. down the hill from our present base camp. The buildings are partially equipped. There is also a number of tools, parts of mill equipment, Radio poles wired for Government Station, etc, at the millsite. The landing field lies adjacent to the millsite. The surface of the field is in good condition for landing but is only about 700 ft. long. The field could be extended at a small cost.

Preliminary investigation was first made of the Little Squaw mine and work started thereon. A descriptive report on preliminary investigation of the Little Squaw mine is being mailed this date under separate cover.

Preliminary investigation was next made of the Bonanza group of six claims, and a program of initial work outlined is now underway. Descriptive report on preliminary investigation of the Bonanza group is being mailed this date under separate cover.

The Summit Claim owned by Mr. C. L. Carlson, was also examined during the Bonanza group investigation. Descriptive Report of preliminary examination of this property is being mailed this date under separate cover. Next to the Mikado and Little Squaw this showing is the most important so far seen in the area. An option and lease agreement, similar to the lease with Sulzer is being prepared for execution by Mr. Carlson.

Preliminary investigation was next made of the Mikado group. Initial work laid out is now underway. Descriptive Report, preliminary investigation on this group is being mailed this date under separate cover.

Lake Chandalar Gold Mines, Ltd.

Twenty four samples have been taken from various locations and are going out tomorrow for assay.

The following is a brief outline of some of the placer operations in the area that may be of importance in locating lode quartz.

On TOBIN CREEK, Mr. Anderson has been prospecting for years taking out grub stake money each year by winter drifting operations. He reports that during the last three years he has located and worked rich ground, $5.00 to the foot, about one mile down the creek from the Little Mikado mine. The gold is undoubtedly derived from the proximity of the Little Mikado mine. In this creek the gold is all very fine with occasional nuggets, the largest being $3.00.

On LITTLE SQUAW CREEK, Manuel Mello and his two sons employ a crew of 6 to 10 men in winter drifting operations. Nuggets up to ten ounces have been recovered. Mr. Mello reports the location of quartz stringers on bed rock in the basin of Little Squaw Creek carrying considerable visable gold. The bed rock of this creek is about 1000 feet below the tunnel level of the Little Squaw mine and about 2000 feet below the surface of the Summit claim.

ON BIG SQUAW CREEK, it is reported that a very high grade section has been worked near the head of the creek below the Jupiter claim and considerable high grade float is reported to have been found in Robins Gulch below the Eneveloe claim. During the first preliminary checkup, I personally located several pieces of high grade float in this gulch.

BIG CREEK drains the area covered by the Summit claim and is joined by St. Marys Creek which drains the supposed easterly extension of the Mikado Group. Evidence is in sight on this creek of substantial operations and Amero showed me several $2 to $5 nuggets. Most of the gold recovered is fine gold and it is estimated that $150,000 has been taken out of Big Creek. Mr. Amero states that he was present when a quartz vein was exposed crossing the bed of Big Creek, having a width of 25 feet and showing considerable visable gold along one wall. This vein could not be seen at the present time and it is covered with tailings. Arrangements are being made to have Mr. Amero sluice the vein bare a little later in the season. A shaft located along the stike about 50 feet east of the creek, depth 15 feet, shows solid quartz over its full width and is well mineralized with arsenopyrite and pyrite. Two samples have been taken from the shaft dump. Refer to U. S. G. S. Bulletin 532, 1912, second paragraph under QUARTZ LODES, copy of which is in the office, Toronto, for the relationship between this showing and the Mikado Group. The bed of Big Creek where this vein occurs is 1200 feet below a point on the Mikado claim where visable gold occurs, 800 feet below the Little Mikado shaft outcrop and 1300 feet below the Summit claim outcrop. A quartz claim covering the vein in Big Creek is owned by the Newton Estate, Frank Yasuda of Beaver, Alaska administrator. It is understood no difficulty would be had in making a satisfactory deal for this claim.

Weather conditions have been ideal for working, warm, dry and 24 hours of daylight. We have a crew of husky, young, willing workers.

Yours very truly,

s/ C. W. McKee

Chandalar, Alaska
c/o Wien Airlines Ltd.
Fairbanks, Alaska
July 18, 1939

Lake Chandalar Gold Mines, Ltd.
67 Yonge St. Toronto

PRELIMINARY REPORT

Little Squaw Mine

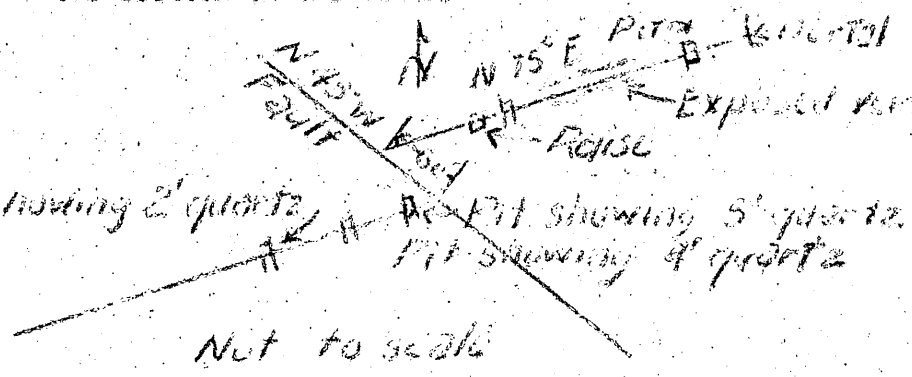
Preliminary invesitgation was made of the Little Squaw mine the day of arrival, an initial program of work laid out and started the following day. Refer to Boadway map and discription of Little Squaw workings as a basis of guidance in reading this report.

Location and Accessibility: Located about one mile south of the base camp. Refer to contour map by Irving Reed, being mailed this date. The trail to the mine has a fairly even gradient, maximum of 20 per cent.

Cabin: A habitable cabin equipped for 2 men including blacksmith outfit, and tools for stripping and trenching is erected near the tunnel portal.

Tunnel: About 2 to 4 feet of ice on floor in tunnel, three and one half to five feet of clearance between ice and back from portal to raise. The raise and winze are full of ice. Considerable gold, small specks and nuggets may be seen in the tunnel back along the foot wall and extending out from the footwall into the vein in places for three feet.

Surface: A strong shattered quartz vein, 4 ft. to 8 ft. in width is exposed on the surface extending from above the end of tunnel timbering, west up the hill, continuous a distance of about 200 ft. to where it is cut off by the fault shown on Boadway's map. The vein was located west of the fault about 60 ft. along the strike slip and has been exposed during the past week by three trenches for a length of about 70 ft. The last trench up the hill shows 2 ft. of heavily mineralized, banded quartz, similar in appearance to the ore section in the tunnel.



NOT TO SCALE

Sampling: Six channel samples, 3 lbs per running foot, have been cut, at 10 ft. intervals from the tunnel back and are going out tomorrow for assay. It is the plan to cut deep wide channels at 3 ft. intervals before the season ends.

Proposed work: Continue surface trenching W. of the fault and E. down the hill below the tunnel and prospect for parallel veins. Towards the end of the season after cleaning up the work

Little Squaw Mine.

on the more distant properties it is the plan to remove the ice from the winze.

The vein on the Little Squaw, as on other gold veins in the area is heavily mineralized with arsenopyrite; where visible gold occurs it appears that the sulphides have weathered out leaving the gold exposed.

s/ C. W. McKee

July 18, 1939

Chandalar, Alaska
c/o Wien Airlines Ltd.
Fairbanks, Alaska
July 18, 1939

Lake Chandalar Gold Mines, Ltd.,
67 Yonge St. Toronto

DESCRIPTIVE REPORT — PRELIMINARY INVESTIGATION

Little Mikado Group

Location and Accessibility: Lies along the head of Tobin Creek and extends east over a high ridge and down towards St. Marys Creek. The property is reached by pack trail from the Summit claim and is about 4 miles southwest of the base camp. Mr. Carlson states that most of the equipment and etc. at the mine was freighted from Chandalar Lake up the basin of Tobin Creek and that a tractor could be used over this route in the winter time. I propose to walk over this route later.

Buildings: One cabin in bad condition partially equipped for two men. Also some tools. Cabin is now being repaired, supplies, tools, and etc. have been packed in and two men are now engaged in trenching.

Shaft: Full of ice. Quartz on dump mineralized with pyrite, arsenopyrite and very fine visible gold.

Tunnel: Partly filled with ice, possible to get in to face. Some of the timbering near portal has moved and needs replacing. Steel mine car in good condition with wooden rails having steel cleated faces.

Veins and Trenches: Refer to sketch. The six trenches containing rich values in gold over a length of 3000 feet, referred to in U.S.G.S. BULL. 532, copy of which is in the Toronto office, were located. While all of the trenches were caved in and no quartz could be seen in place, considerable quartz is in evidence on the dumps. The quartz in all the trenches is mineralized with arsenopyrite, pyrite, and some zinc blende and galena. Visible gold was seen on the dump of trenches Nos. 4 and 6. The evidence observed from preliminary examination suggests lenses of quartz at widely separated intervals lying along the north wall of a major east-west sheared fault zone. Quartz also appears to occur in fractures running off from the fault zone at an angle. At this stage the above theory is only conjectural based on meager evidence provided from the six trenches and the position of quartz float.

Structure: There appears to be a major sheared fault zone extending east of the shaft over the summit and down into St. Marys Creek. Refer to second paragraph under QUARTZ LODES in U.S.G.S Bull. 532. This is most evident on the side hill from the summit down to St. Marys Creek. Widths up to 75 feet show signs of intense shearing. M st of the quartz float lies along the north wall of the fault zone and at an angle from the shearing.

Little Mikado Group

Structure cont.

Surface prospecting along this zone will be extremely difficult. Heavy layers of talus occurs, frozen from a few feet beneath the surface. Preliminary investigation which consisted of a single traverse from the shaft to St. Marys Creek gave no evidence of any regular vein system.

Proposed work: The head of Tobin Creek is dry and it is thought that bed rock will be found a few feet from the surface where the creek cuts across the zone. It is estimated that it will take two men two weeks to put down this trench. Trench No. 1 is considerably off strike of the zone and an attempt may be made to reach bed rock west of the shaft. Careful prospecting, sampling and mapping will be carried out along the entire zone. From preliminary investigation of the surface and from Boadway's sampling results of the shaft, the best method of attack of the property would seem to be to drift east and west from the present tunnel, raising through to the present shaft for ventilation. Drifting should follow the north wall with crosscuts or drill holes at close intervals. The length of the ore shoot and the amount of dead work between shoots are questions to be determined.

Recommendation: If it is decided to proceed, following results of our initial work, with a program of underground exploration on the property it would seem advisable to ship on the last boat out of Skagway, Sept. 4 the necessary supplies, oil and mining machinery from Seattle to Beaver via the White Pass and Yukon route. In this way one year's time would be saved in the development of the property. The supplies could be stored with Frank Yasuda, storekeeper at Beaver, and transported either by plane or tractor this coming winter to Lake Chandalar and thence up Big and Tobin Creeks by tractor to the property. This recommendation and the previous paragraph suggesting an underground program of exploration may seem premature. They are made here solely for the purpose of pointing out the seasonal time factor should it be decided to go ahead.

s/ C. W. McKee

July 18, 1939

Chandalar Alaska
c/o Wien Airlines, Ltd.
Fairbanks, Alaska

Lake Chandalar Gold Mines Ltd.
67 Yonge St., Toronto

DESCRIPTIVE REPORT — PRELIMINARY INVESTIGATION

SUmmit Lode Claim

Location: Marked in red ink on contour map drawn by Irving Reed, copy of which is being mailed this same date.

Owners: C. W. Schultz, Beaver, Alaska, and C. L. Carlson, U. S. Commissioner and Postmaster, Chandalar, own the claim jointly. Mr. Carlson has power of attorney to deal as he may decide. He is agreeable to giving the company an option and lease agreement, along similar lines to the deal with Sulzer, on the Summit claim and also on four additional claims held by him. An agreement is being prepared for execution by Mr. Carlson within the next few days.

Reports: Boadway's Report refers to the summit claim as the Schultz vein. Bulletin 532 page 113, U.S.G.S. copy of which is in the Office, Toronto, describes the workings at the mine at the time the report was written.

Description: Refer to attached sketch.

SHAFT: Equipped with windless, cable and bucket. Necessary to remove about three tons of ice before sampling.

DRIFT: Full of ice. Mr. Carlson states that the vein is strong for the full drift length, showing four ft. of quartz in the face, and that five samples taken at fifteen foot intervals averaged $150 per ton. He states that no person other than he and his partner Schultz has sampled the drift.

TUNNEL: Timbered and lagged in places, dry and open to the face. Quartz vein extends from the portal to the face varying in width from one and one-half feet to four feet in the face.

VEIN: Strikes S. 70 degrees W. Dip, slightly N. Exposed along the strike at two places, 300 ft. and 360 ft. W. of tunnel portal. Surface of vein sluiced off to depth of about ten feet in attempt to recover gold from talus by placer operation using surface rain water. This part of vein now covered with tailings.

STRUCTURE: From preliminary examination the vein appears to lie along the south or foot wall of a fault which resembles a shear zone in places. The fault or shear zone appears to have major dimensions both laterally and horizontally. The country rock is a mica schist.

Proposed Work: It is proposed to remove the ice from the shaft and drift, examine, sample and probably take out a few rounds from the drift face. The tunnel to be cleaned out fresh face blasted, back and face sampled. An attempt will be made to expose the vein on the surface at intervals for sampling purposes. The vein appears to have been located by several pits, now caved, along the strike west onto the adjoining claim owned by a local Prospector, who is agreeable to giving the company an option. The vein on the Jupiter Claim appears to lie along the same general line of weakness as the summit vein.

SAMPLING: During the preliminary examination five samples were taken. Two from the tunnel back, one from the tunnel face, and one from each of the quartz vein exposures along the strike. These samples are going out today and we should have assay results for guidance in about a week or ten days.

CABIN: A small cabin equipped to accommodate two men is erected on the property including blacksmith outfit and trenching tools.

NOTE: Considerable visible gold was seen on the various dumps.

July 18, 1939

s/ C. W. McKee

Chandalar Alaska,
c/o Wien Airlines Ltd.
Fairbanks, Alaska

Lake Chandalar Gold Mines Ltd.
67 Yonge St. Toronto

DESCRIPTIVE REPORT — Preliminary Investigation

Bonanza Group - Six Claims

PROPERTY: Consists of Jupiter, Eneveloe, Bonanza, Woodchuck, Gold Eagle and Venus Quartz Claims.

LOCATION: This group lie along the Summit above the head waters of Little Squaw Creek, about two miles south of the base camp and is reached over a well worn trail that follows the side hill up the valley, with a fairly even gradient. Refer to Contour Map. A round trip from the base camp to the summit with a 50 lb. pack is made in two hours and one half.

A preliminary check up has been made of a number of quartz outcrops on this group and an initial program of work outlined. Little can be seen at most of these claims except the direction of the veins and at some of them the widths and mineralization. Brief description of some of the showings follow.

JUPITER LODE CLAIM

TUNNEL: Located on side hill, N. and above the head waters of Big Squaw Creek. 13 ft. from portal to face, timbered, lagged and dry. The tunnel follows a well defined hangin g wall, which shows signs of considerable movement.

VEIN: The vein appears to be strong. Strike south 65 degrees W. Dip 70 degrees N., and is exposed in the tunnel face over a width of 40 inches. Full width of vein not seen due to lagging on footwall side. Mineralized with considerable Arsenopyrite, some pyrite and scattered galena. Typical gold quartz of the area. Two samples have been taken, one across the face, 40 inches, and one from the dump representing the mineralization.

Proposed Work: Take down lagging, square face and sample from hanging wall to footwall. Endeavor to trace vein by surface trenches.

COMMENT: The vein has the same general appearance as the Summit vein and is roughly along the same line of strike. It is reliably reported that considerable placer gold has been taken from the bed of Big Squaw Cr. at the base of the hill below the vein.

EVEVELOE LODE CLAIM

At the top of the hill above the Jupiter claim, three shallow trenches, along a length of 60 ft. expose a quartz vein about 4 ft. wide, mineralized with arsenopyrite. Visible gold was seen on the dump. Several pieces of float showing considerable coarse gold were picked up on the western end of the claim down the slope towards Robbins Gulch. No definite vein was seen.

BONANZA GROUP -- Six Claims

ENEVELOE LODE CLAIM continued.

Proposed Work: Clean out trenches, Sample, endeavor to extend vein by surface trenching. Prospect to locate source of high grade float found.

BONANZA LODE CLAIM

SHAFT: Ice filled, reported to be 12 feet deep.

Vein: Appears to be about 6 ft. wide, mineralized with arsenopyrite, visible gold was seen in the rock on the dump. Considerable float, some of which appears to outline veins appears along the ridge to the west of the shaft.

Proposed Work: Clean off vein around shaft and sample. Prospect and surface trench along strike and float outcrops

WOODCHUCK - VENUS - GOLD EAGLE

Several openings with quartz dumps were seen in the distance on the side hills, on these claims, but have not as yet been examined.

Arrangements have been made to use Mr. Carlson's cabin, now equipped at the top of the hill on the Summit Claim. Supplies have been packed to the top of the hill. Two men are at present cleaning out trenches preparatory to sampling. Further work is planned in conjunction with the investigation of the Summit Claim.

C. W. McKee

July 18, 1939

Chandalar Alaska,
Via Wien Airlines
Fairbanks, Alaska
July 25, 1939

Lake Chandalar Gold Mines, Ltd
67 Yonge St.
Toronto, Canada

ROCK SAMPLES — CHANDALAR AREA — IDENTIFICATION

No. 1, No. 1a, No. 1b, No. 1c, No. 1d	from back Little Squaw Tunnel.
No. 2, No. 2a, No, 2b	from surface pit, 30 ft. East of raise, Little Squaw. Pit No. 2
No. 3	From shaft dump, Little Mikado, Looks like last material removed from shaft. Note the very fine gold under strong glass, in this rock.
No. 3a	From dump trench No. 6, marked No. 3, survey map, Mikado claim. This is 2500 ft. on strike E. of the Little Mikado shaft.
No. 4.	From surface trench, Summit claim.
No. 5	Gold recovered from one pan surface pit, Little Squaw, W. of Fault
No. 6	Four gold nuggets from Big Creek recovered from base of hill below Summit claim.

C. W. McKee

Chandalar Alaska
Via Wien Airlines Ltd
Fairbanks, Alaska
July 30, 1939

Lake Chandalar Gold Mines, Ltd.
67 Yonge St. Toronto

Descriptive Report -- Preliminary Investigation
on
Palsagren and Northern Light Lode Claims.

PROPERTY : Two adjoining claims, approx. 40 acres, recorded on the 15th day of
LOCATION : August 1932, Vol. I, pages 517-518.
ASSESSABILITY; Located near the head of Nugget Gulch, on the divide between Lake Creek and Little M'Lellan Creek. Refer to Sketch attached. Reached by foot path from base camp about one mile East. Supplies and equipment could be transported by tractor from Squaw Lake to the property.

OWNERS: Recorded owners are:
C. L. Carlson, Chandalar - - - - - One third interest
Dennis O'Keefe, Chandalar - - - - One third interest
Cornelius Buckley, Seattle - - - - Five Eighteenths interest
Frank O'Farrell, Fairbanks - - - - One Eighteenth interest

DEAL: Carlson and O'Keefe have agreed on a deal as follows. They assure me that no difficulty will be had in getting Buckley and O'Farrell to sign the agreement. The agreement is made between the above parties and Boadway, who will hold the claims for and on behalf of the Company for the time being.

In consideration of One Dollar etc. they grant a 20 year lease and option. We are to examine the claims by Nov. 15, 1939, and do the representation work from year to year. We also must spend $10,000 per year in the Chandalar Area, first year commencing July 15, 1940. 15 per cent net profits payable to owners. Total price $150,000.00. Other terms similar to Sulzer agreement. We may quit at any time.

DESCRIPTION: Refer to attached sketch.
Strong quartz vein exposed by three trenches along length of about 140 ft. Strike about E. W. Dip appears to be South.
Trench No. 1: Exposes quartz vein, 72 inches wide, broken, iron stained, oxidized quartz, disseminated black sulphides. Sample No. 15 was cut across full vein width. Trench No. 2 Quartz vein appears to be 6 ft to 8 ft. wide, foot wall not exposed. Three feet width extending from hanging wall side, fresh, banded and well mineralized with black sulphides. Several fine specks visible gold occur in place in this trench.
Samples No. 16 1nd 17 were cut across 34 inches and 8 inches respectively from hanging wall side.
8 inches--Banded quartz well mineralized black sulphides.
26 inches -- Minor banding, disseminated black sulphides.

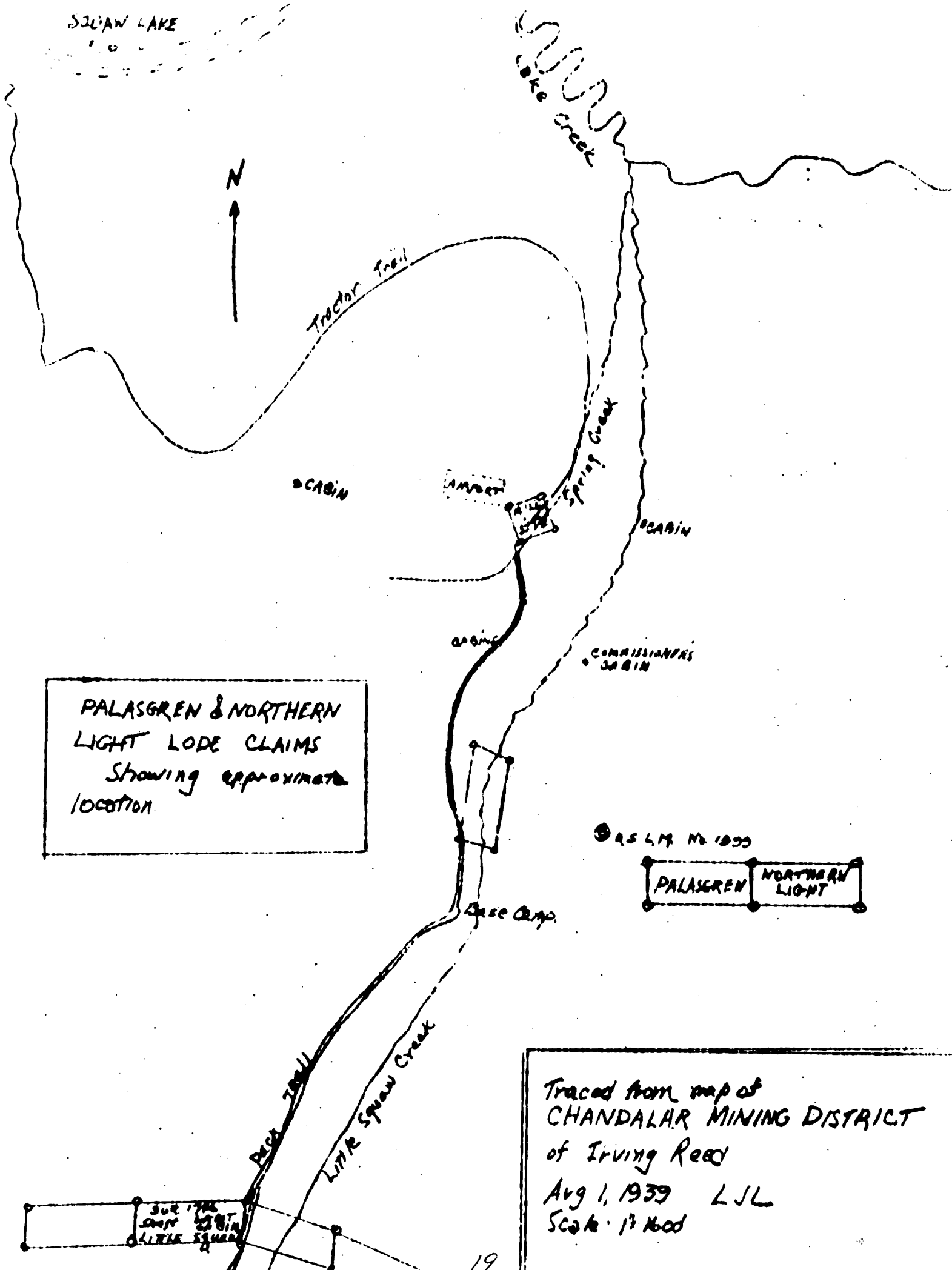
Trench No. 3. Exposes quartz vein along strike for about 30 ft., width 10' to 15 ft. All ironstained, oxidized and rotten. Black sulphides disseminated. Sample No. 18 was cut across 55 inches from footwall side.

A parallel vein is exposed by one trench about 240 ft. to the south, showing a width of 26 inches. Sample No. 19 was cut across full width.

The Creek Bed in Nugget Gulch runs about N. S. to the west of above trenches, and contains considerable quartz float. Visible gold was seen in some of the float. From evidence seen following this creek bed up the valley south of the above trenches and from the location and distribution of other float seen on the hillside, at least two other parallel veins are indicated up the side hill to the south of the trenched vein.

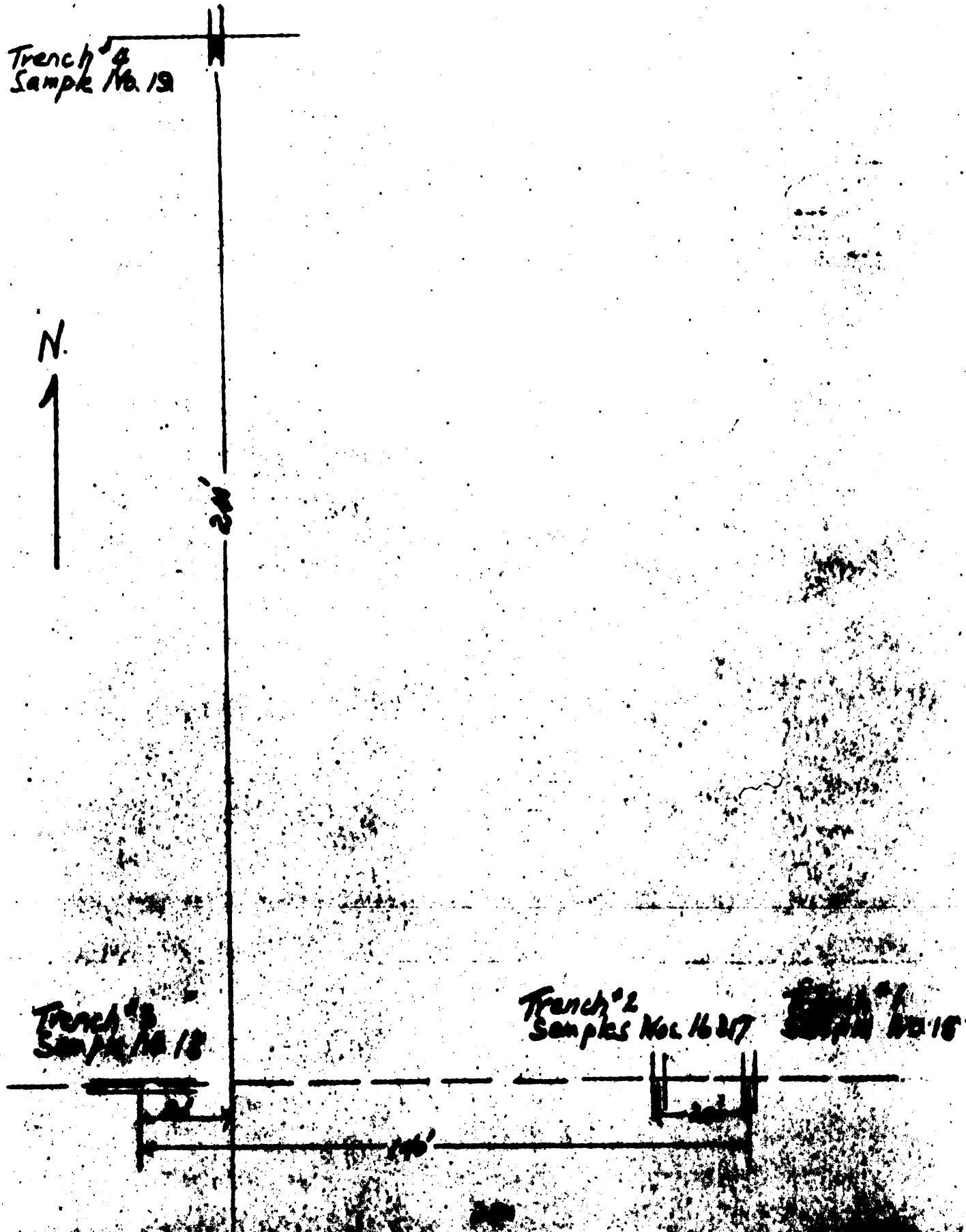
PROPOSED WORK: Work on this property is being left until the latter part of the season as it can be worked from the base camp when weather conditions are uncertain. It is proposed to clean out the trenches, exposing both walls and sample. Panning will also be carried out along the oxidized zone. Some prospecting on indicated parallel veins.

C. W. McKee


SQUAW LAKE
Lake Creek
N
Tractor Trail
Spring Creek
CABIN
CABIN
CABIN
COMMISSIONER'S CABIN
PALASGREN & NORTHERN LIGHT LODE CLAIMS
Showing approximate location
PALASGREN
NORTHERN LIGHT
Base Camp
Little Squaw Creek
Traced from map of
CHANDALAR MINING DISTRICT
of Irving Reed
Aug 1, 1939 LJL
Scale: 1" = 600'

PALASGREN & NORTHERN LIGHT CLAIMS

SCALE: 1" = 30'



Sent to:

Pioneer Gold Mines of B. C. Ltd.
Concourse Bldg., 100 Adelaide St. W. Toronto

Arthur Cockshutt, Esq.
106 Chiltern Hill Road, Toronto

August 3, 1939

Frank V. C. Hewett, Eq.
16 Plymbridge Crescent, York Mills, Ont.

G.F.H.Long, Esq.
Pacific Bldg., Vancouver, B. C.

Dear sirs:

We enclose herewith for your information, copy of a letter from Mr. C. W. McKee, dated July 18, 1939, together with preliminary reports by him on the Little Mikado, the Bonanza, and the Little Squaw and Summit groups of claims.

Yours very truly,

LAKE CHANDALAR GOLD MINES LIMITED

Secretary-Treasurer

HJM:C

encls.

Chandalar Alaska
Via Wien Airlines
August 5, 1939

Lake Chandalar Gold Mines Ltd.
67 Yonge St.
Toronto, Ont.

Dear sirs:

Under separate cover I am mailing you this date:

1. Progress report on Little Squaw Mine
2. Progress report on Little Mikado Mine
3. Progress report on examination Summit and East Star group.
4. Report on preliminary investigation, Palasgren and Northern Light Group
5. U. S. Land Surveyor's maps of the Little Squaw, Bonanza and Mikado groups and the St. Mary's Gulch and Tobin Creek Millsites, showing location of workings, pits, trenches, etc. (now in map folder).
6. I am also sending via air express, box of samples, addressed to E. A. Boadway, c/o Mrs. Hensel, 1363 Ontario Ave. Niagara Falls, New York. It was thought that there might be some difficulty at customs if the samples were shipped direct to Toronto. Attached hereto list of samples being shipped.

During the past three weeks prospecting and exploration have gone ahead in normal manner. About 400 lbs. of samples have been cut.

ESTIMATED COSTS:

It is estimated that Eighty Five Hundred Dollars $8500.00 will cover the costs of the present program up to Sept. 15th. This does not include Head Office expenditures, my salary and personal expenses. The results of our work up to Sept. 15th should provide sufficient information to determine plans for the next stage of exploration.

In order that we may have the benefit of all the results of the year's work and due to the high cost of transporting wood, logs and lumber at this time of year, necessary to prepare camps for winter operations, and due to the high freight rate, 12¢ per pound, for flying in supplies at this time of year it is considered advisable to discontinue operations before freeze up and to start again early next spring as explained in following paragraph on transportation.

FREIGHT for next year's operations:

Ship from Seattle to Fairbanks next March. Freight costs about $50.00 per ton. Fly from Fairbanks to Chandalar. There are five companies doing local flying out of Fairbanks with several large planes capable of handling up to two tons on skiis. It is thought that no difficulty will be had in obtaining a rate of 5¢ per lb.

For Little Mikado Mine: Land freight on Lake Chandalar. Erect a store house at the mouth of Tobin Creek. Arrange to have tractor that is here haul freight up Tobin Creek to the mine before break-up next spring. Arrangements can be made with local labor to get out a number of logs after the first of the year at the mouth of Tobin Creek, Carlson already has about 50 cords of wood cut and building logs for two large buildings. A portable saw mill that can be run from the tractor that is here should be shipped in, lumber sawed, and hauled together with wood, by tractor up Tobin Creek to the mine before break-up.

Wood and Lumber should also be hauled to the Summit mine before Breakup via TobinCreek, Big Creek pass and up Big Creek.

For the Little Squaw Mine and Palasgren, Northern Light group: Land freight at Squaw Lake and have it hauled and stored at the Spring Creek Millsite.

FREIGHTING when established:

When freight requirements can be determined in advance ship during the summer months from Seattle to Skagway and from Skagway to Beaver over the White Pass and Yukon route.

Freight costs Seattle to Beaver are:

Machinery - $56.00 per ton.
Class A Frt. 69.00 per ton. Carload lots.
Wharfage and handling charges Seattle and Beaver $3.05 per ton.=

Freight can be shipped from New York to Beaver via the Panama Canal for $54.00 per ton including wharfage and handling charges.

BEAVER TO CHANDALAR: Approx 100 miles..

A standard size landing field at Beaver and the Yukon River for Pontoon and skiis permit take offs with maximum load capacity. There is also a winter tractor road from Beaver to Chandalar with cabins about every 10 miles, over which a 4DR tractor came in last winter with about 1500 lbs of oil and gas. The driver of the tractor states that it took 6 days to make the trip and that several bridges need repairing before handling heavy loads. It is understood that the Government will repair the road and bridges should we decide to go ahead.

C. W. McKee

August 5, 1939.

Chandalar Alaska
Via Wien Airlines
August 4, 1939

PROGRESS REPORT - LITTLE SQUAW CLAIM

During the past three weeks exploration has consisted of surface trenching, removing ice from tunnel, retimbering and lagging tunnel, and sampling. Three men are engaged in this work. Attached hereto is a sketch in plan and profileof the Little Squaw mine.

VEIN: The vein has been exposed west of the fault for 95 feet and all trenches have been sampled, results not yet received. No sign of weakness has occurred and trenching is being continued. There is absolutely no evidence of the vein on the surface until encountered in the pits which are sunk about six feet through talus. An occasional small piece of quartz float is found in this talus.

The vein has not yet been located down the hill below the tunnel level. Complex faulting and folding occurs and it is thought that by cleaning the ice out of the winze a key may be found for depth exploration. This work is being started within the next week.

TUNNEL: Sampling of the tunnel at five foot intervals is about completed and assay results have been received for the first six samples taken at 10 foot intervals. Results are as follows:

57	inches	at	$68.25
63	"	"	20.45
58	"	"	6.20
45	"	"	105.40
31	"	"	35.30
41	"	"	6.45

Considerable visible gold was seen along the channel of one sample and was omitted from the sample. It is thought that some minor salting of the samples with loose rock from the barren side of the vein may have occurred in the first sampling. Recuts, as checks, are being made.

A number of holes have been blasted in the footwall along the vein for sampling purposes. Quartz stringers and mineralized schist have been exposed.

C. W. McKee

Chandalar, Alaska
Via Wien Airlines
August 4, 1939

PROGRESS REPORT - - MIKADO GROUP - - TOBIN CREEK

During the past three weeks exploration work has consisted of surface work, retimbering tunnel and removing ice from tunnel. Three men are engaged in this work.

Attached hereto is a sketch in plan and profile of the section adjacent to the Little Mikado shaft.
TRENCH A is a cross trench about 50 feet long located 105 feet west of the shaft along the assumed strike of the zone. About six inches is removed from the bottom of the trench each day and then allowed to stand until the ground thaws. Bed rock has not yet been reached.

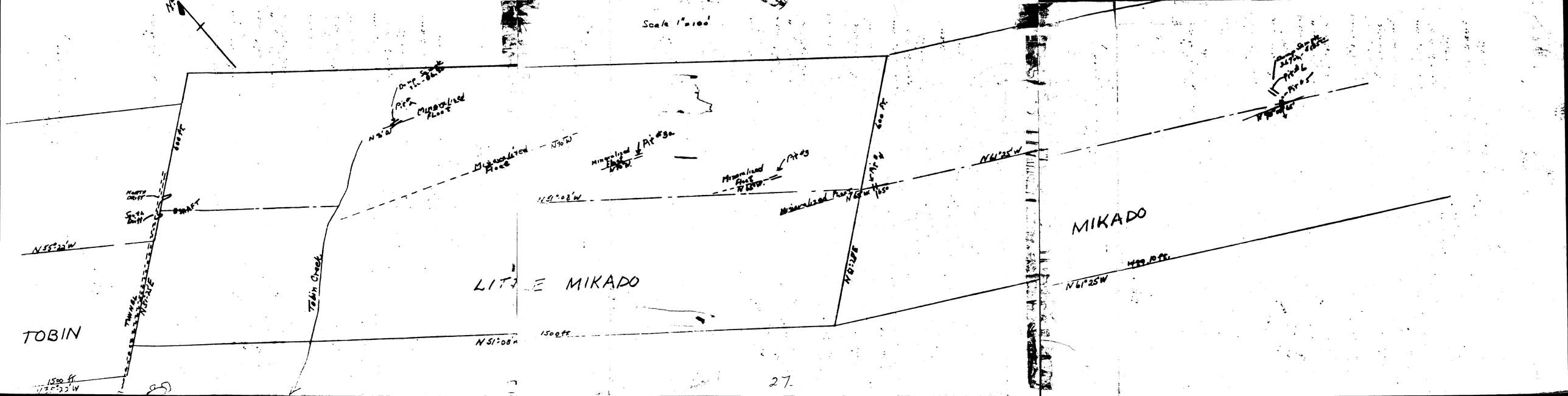
TRENCH B is a cross trench about 50 feet long located in the bed of Tobin Creek 370 feet east of the shaft along the assumed strike of zone. Surface waters following rains are being used to sluice out the trench. Bed rock has not yet been reached.

PANNING: Systematic panning at regular measured intervals was tried both east and west of the shaft. Fifty holes were dug about 2 feet deep at 10 foot intervals over a 20 foot width along the assumed strike and a pan of the fines panned. No colors were obtained and this work has been discontinued as the talus that now lies over the assumed strike of the zone is probably from much higher up the hill.

TUNNEL: The tunnel entrance has been retimbered and lagged where necessary. Ice has been removed for over 200 feet and it is estimated that within ten days the ice will be removed from the walls and it will be possible to take the mine car in to the face. There is evidence in the creek bed below the mine of intrusive rocks and it is thought that upon thorough examination of the tunnel, which represents a 500 foot cross-section, some geologic key may be found for guidance in further exploration work. Some acid rock on the dump, reported here to be the last removed from the shaft, is possibly intrusive and is heavily mineralized with pyrite. It is planned to do some probing by hand from the tunnel level when it is cleaned out.

SAMPLE RESULTS: During preliminary examination one sample only was taken, assay results received. This sample was taken from dump of trench No. 6, Mikado claim (Refer to sketch sent last mail and to survey maps being sent this mail for location). This trench is located about 2500 feet east of the Mikado shaft and along the assumed strike of zone. Sample consisted of quartz mineralized with pyrite, arsenopyrite, odd speck of sphalerite and galena, and assayed 3.87 oz. Au., $135.75. The dumps of trenches Nos. 2,3,4 and 5 have been sampled, results not yet received. All of these trenches have caved and filled with talus; they are being cleaned out for sampling.

C. W. McKee


Scale 1"=100'
TOBIN
LITTLE MIKADO
MIKADO
Tobin Creek
Pit #3
Pit #3a
Pit #6
Pit #5
Mineralized Floor
600 Ft
1500 Ft
N 55°22'W
N 61°25'W
N 51°08'W
N 10°W
N 2°W
N 61°25W
1500 Ft
N 73°22'W

Chandalar, Alaska
August 5, 1939
Wien Airlines

PROGRESS REPORT - EXAMINATION OF SUMMIT AND EAST STAR LODE CLAIMS.

DEAL: Twenty year lease, examining option until Nov. 15, 1939. Pay $200.00 by Nov. 15, 1939. July 15, 1940 to July 15, 1941, spend $2400.00 on exploration, may be spent in any one month. Pay the owners, Carlson and Schultz, $100.00 per month starting July 15, 1940 until payments start from net profits. Fifteen per cent net payable to Carlson and Schultz. Total price, $150,000.00

During preliminary checkup 5 samples were taken and results have been received. Refer to sketch sent out week report dated July 18, 1939. Results of the samples are:

Trench No. 1	width	48	inches	0.44	oz. Au.	$15.40
Trench No. 2	"	44	"	0.54	" "	18.90
Tunnel Face	"	36	"	0.51	" "	17.85
Tunnel back	"	58	"	0.12	" "	4.20
Tunnel back	"	28	"	0.16	" "	5.60

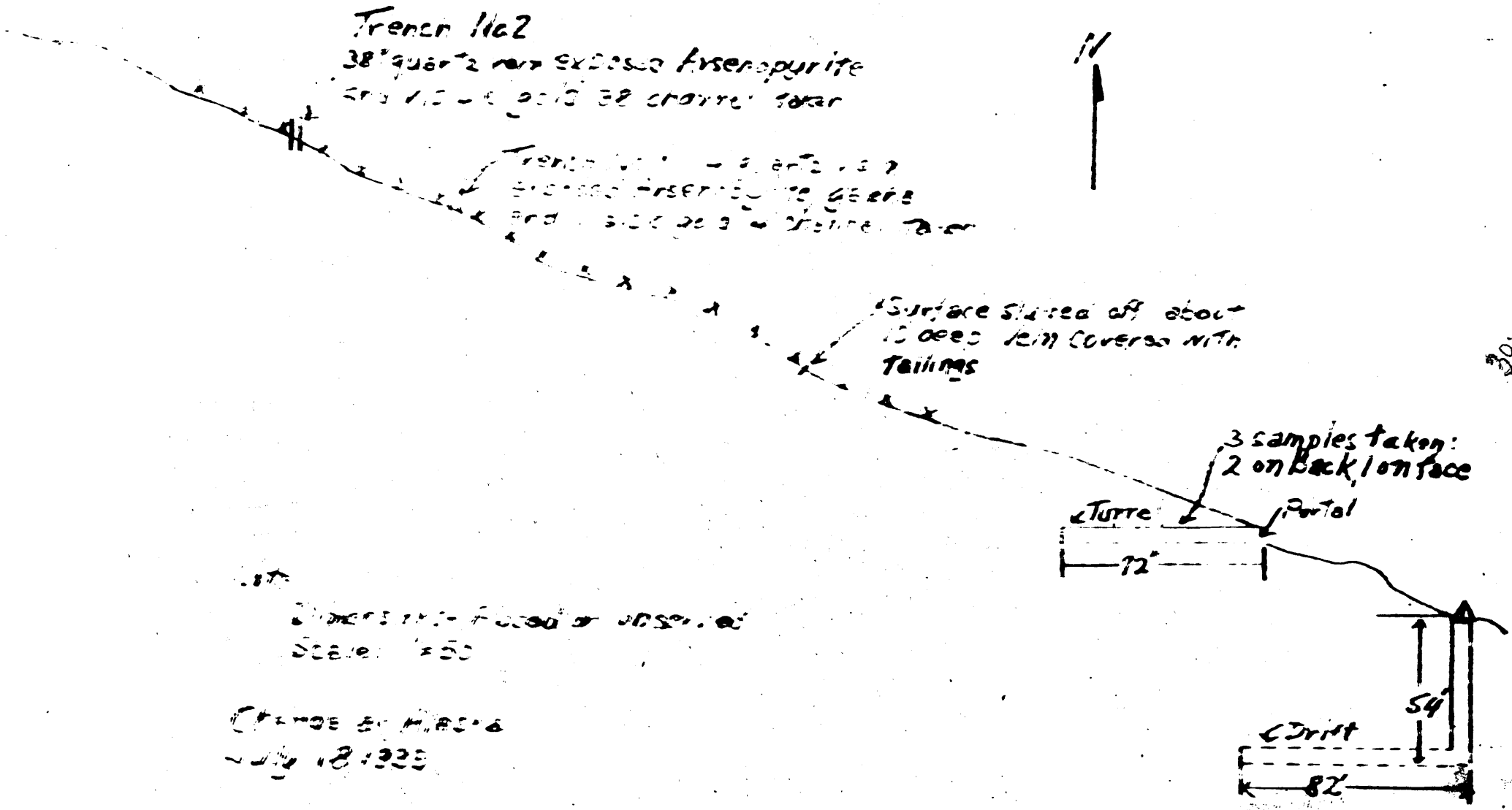
Good tailings have been obtained from panning over a length of 800 feet and high grade visible gold occurs at several places along the vein. Three trenches located 330, 346, and 420 feet respectively west of Trench No. 2 (refer to sketch sent out July 18, 1939), show the continuation of the vein and good tailing obtained from panning these 3 trenches. These three trenches are over 200 feet higher than the tunnel level.

TUNNEL: Cleaned out and completely sampled. A trench starting at the north side of the portal and extended into the wall rock of the footwall side exposed a series of quartz stringers over a 5 foot width parallel to the main vein. Good tailing was obtained in panning this material.

SHAFT: Cleaned out and sampled at the bottom. Ice now being removed from drift for sampling purposes. Two men are engaged on this property.

C. W. McKee

PROFILE OF
SUMMIT LODE CLAIM
Referred to in Bloomer's report as Schultz Veix
Referred to in USGS Bull #532, Page 113 as Summit Claim



Scale 1" = 50

July 18, 1933

July 18, 1933

Chandalar, Alaska
August 22, 1939

Mr. K. J. Springer
1207 Montreal Trust Building
67 Yonge St.
Toronto, Canada

Dear Karl:

No doubt you will be anxious to receive some detailed information and opinions on the various properties we are working on and on the area in general. In the progress reports sent out addressed to the company I merely tried to give a general description of the various properties and the work underway. Delay in sending out detailed information has been caused from a desire to have more complete information before attempting to arrive at conclusions. There is a lot of ground to cover and it is all hard traveling. This, together with the fact that considerable preliminary work is required, the delay in receiving assay results, and the fact that it is a new area with unfamiliar conditions eliminated the possibility of any quick size-up and opinion. We have found what appears to be important information from the standpoints of geology, structure, and ore, but I hesitate to write any interpretation in report form until all the information on this year's work is available. I will, however, try to give you a better idea in this letter of the results and plans with the understanding, of course, that all assumptions and deductions herein are subject to change when final results are obtained and further information is available.

In general, we have found Boadway's report to be accurate in detail and our efforts are being concentrated in an effort to extend the information contained in Boadway's report. Work is being concentrated on the Little Squaw, Mikado, and Summit (Carlson's option) properties, as these three properties have been developed the most and seem to provide the best place to obtain general information on the nature of deposits in the area. High-grade has been

Karl J. Springer
August 22, 1939

found on other properties, none of which, however, have been explored beyond the occasional surface trench, pit or short tunnel entrance. Considerable work will be necessary to demonstrate their importance. On these showings we are confining our efforts to surface trenching to obtain fresh surface for sampling, panning and mapping.

The size of our crew is limited to the accommodation available. At the Mikado three men are working. A fourth man can stay over night by sleeping on the floor, but even this space is limited. The nearest timber, even tent poles, is five miles distance. At the Summit two men are working and in adition to the small cabin for two men we have erected a tent for sleeping quarters for two extra men and for storage. At the Little Squaw three men are working and they live at the base camp, one mile distant, where ample accommodation is available. We also have a cook, blacksmith and assistant engineer.

At the Little Squaw property in addition to checking Boadway's results we have:

1. Extended the vein about 100 feet (still strong) west beyond the fault. Some high-grade has been seen in the pits, and panning shows good tails in places.

2. Two greenstone dikes (andesite?) cut the schist, one on each side of and roughly parallel to the vein and a few hundred feet distant. The importance of these dikes has not as yet been definitely determined. It is noticeable, however, throughout the area that wherever gold is found greenstone dikes, grading from the acid phase to the more basic dioritic phase, occur. On complete mapping, and after obtaining further information, these dikes may prove to be the source of and control of the ore and a valuable guide for further work. On the present known dip of the Little Squaw vein one of these dikes will become the hanging wall at a few hundred feet depth. We hope to do some work along the contact before snow flies.

Mr. K. J. Springer
August 22, 1939

3. The most important result seems to be an assay made on about ten pounds of massive arsenopyrite (results 2.84 ounces Au per ton). There is quite a pile of this material on the dump and Carlson states that it came from the bottom of the Little Squaw winze. This is confirmed in a report by Government geologist J. B. Mertie, who was in the winze in 1923. In his report he states:

> "At the sixty foot level in the winze the dip of the vein changes to about sixty degrees and the vein itself consists of several quartz stringers with much arsenopyrite, but some later work in the winze, after the writer's visit, is said to have shown the vein widening out again."

A Mr. Murphy, who lives in Chandalar and who helped do the work, claims that the vein is strong in the bottom of the winze, showing considerable massive arsenopyrite. Three men started yesterday to remove the ice from the winze and after this is completed (about ten days) and examination and survey made we will be able to properly locate and start another tunnel entrance at about 100 feet below the present tunnel level. This method seems better than attempting to find the downward extension of the vein by surface trenching, due to the heavy talus and the variable dip of the vein. There has been considerable "gophering" down the hill below the tunnel level in an attempt to find the vein. Practically all of this work does not seem to allow for the dip of the vein. I have been somewhat disturbed at not being able to locate the vein below the tunnel level, but very little work has been done and I can see no reason as yet for thinking the vein does not continue to deeper levels.

On the Summit claim the ice has been removed from the tunnel, shaft, and shaft drift, and sampled at five-foot intervals. Some exceptionally high grade ore occurs along the strike of this vein. Just what the average will be will not be known until we receive our assay results. No glaciation has occurred at the Summit, so practically all of the vein is in place, and it looks like good testing ground.

Mr. K. J. Springer
August 22, 1939

I am enclosing two sketches on the Mikado property. One will give you an idea of the vein system as exposed by float and some trenching, and the second shows the drifts on the tunnel level and the position of the shaft on surface as determined by our survey and the position of the bottom of the shaft determined from Boadway's map. Brunton Compass Survey is unsatisfactory for this work. We located a 5 degree error in Boadway's tunnel survey and our Brunton shows the same error. We have located a transit in working order and are surveying and mapping the exact location of the tunnel drifts and shaft. Examination of the tunnel walls shows the typical greenstone intrusives (diorite?). The most definite market in the tunnel seems to be the south wall of the south drift which is a greenstone intrusive dike. It will be noted that the veins in the tunnel all dip to the south, whereas the veins in the shaft dip to the north. We have started drifting by hand, following the south wall of the south drift, and hope to make 30 to 50 feet within the next month. There has certainly been dynamic action and strong mineralization on the Mikado property, and it seems to me that the most practical way to find out how close the ore lenses occur is by underground drifting and cross-cutting.

The blacksmith that I took in with me when first going into the field took sick and it was necessary for him to return to Fairbanks. The plane is expected in tomorrow and I plan to go to Fairbanks to get a blacksmith, order further supplies, and to have the Option and Lease Agreement on the Summit property signed up by Schultz at Beaver. Wein Airlines tell me that we will be perfectly safe in working until October first, so I plan to carry on with at least the drifting in the Mikado Tunnel until this date. Buildings on the properties are not suitable for winter or cold weather work, and as we are 3 to 6 miles above the timber line, and it is practically impossible to get timber up at this time of the year, we will close down on October first.

Mr. Ray J. Barber, Dean of Mining at the University of Alaska, was a visitor to the camp and spent three days with us. Primarily, he was in the field checking over

Mr. K. J. Springer
August 22, 1939

some placer properties on Tobin Creek for Fairbanks interests. He is regarded as one of the best placer authorities in Alaska and if the company decides to go ahead in the Chandalar area it seems to me that they would be well advised to combine placer work with their quartz operation and in this regard Dean Barber could be consulted. There appear to be two placer bets in the camp worthy of attention - one on Big Creek, and one on Tobin Creek. We will have no difficulty in obtaining suitable options on both these properties. Initially, they each appear to be $5,000 drilling bets. I have obtained considerable information on the placer possibilities which I think will be sufficient to arrive at a decision.

In addition to the placer, there are certainly some prospecting possibilities in the area. I have some very definite information on two areas about 40 and 60 miles, respectively, from our present operations, which certainly warrants attention. I have no one in the crew that I feel disposed to send to these areas and while I would like to go myself, I hesitate to run away from the scene of our present operation where there is so much to be done and we know that gold occurs.

In general, I find myself at a loss to arrive at any conclusive opinions as yet on the quartz possibilities. There are certainly a lot of very high-grade sections. How consistent or how often these sections occur is something that only further work can tell. We have spent a great deal of our time to date in removing ice and cleaning out old workings and have just now reached a point where we are starting to obtain definite information, and I expect before fall we will have obtained sufficient to permit arrival at an intelligent opinion and the laying out of a program of work for further exploration.

I am rather optimistic on the whole picture, but would certainly be glad to see you, and probably Boadway, here for a couple of weeks. I think there is sufficient to warrant your making a trip in here, and I certainly hope that you are able to do so. We have everything in pretty good shape now for an examination.

Mr. K. J. Springer
August 22, 1939

I am enclosing some photos which will give you a general idea of the country.

1. and 2. Lake Chandalar.

3. Tobin Creek Valley, 2 miles below Mikado mine. Anderson's placer operation.

4. C. L. Carlson, postmaster, U. S. Commissioner, and cook, Lake Chandalar Gold Mines, Ltd.

5. "Blue Room" of the Summit Hotel, Summit claim.

6. Looking south from Summit claim down Big Creek Valley. Considerable placer in this creek.

7. Looking south from our base camp. Little Squaw Mine marked "1" and Summit marked "2".

8. Looking north from Summit, Little Squaw Mine marked "1"; base camp "2"; Squaw Creek "3".

9. Yours truly and L. J. Lohse, assistant engineer.

In the last progress report sent out to you it was estimated that $8500 would cover our field expenses without allowing for head office's expenditures, my salary, or personal expenses. This was on a basis of closing down on September 15. This figure will have to be raised somewhat now that we have decided to work until October 1 and carry on drifting operations on the Mikado property. I have had to purchase further supplies, dynamite, fuses, etc., and employ another blacksmith. I will be able to keep our expenditures within the $10,000 that has already been deposited to my account at Fairbanks.

Yours truly,

C. W. McKEE

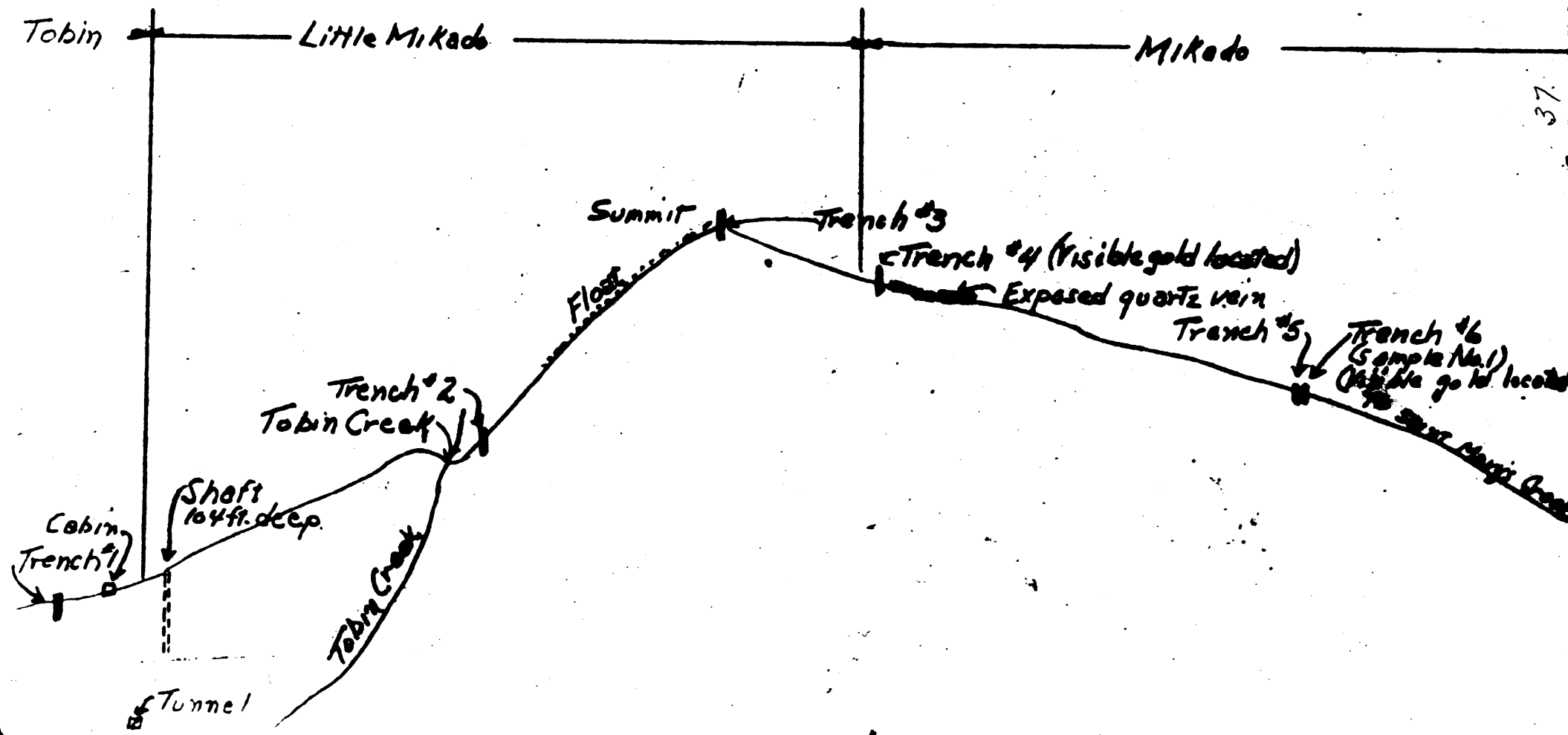
CWJcK:DD
Encs 11
airmail

PROFILE FROM LITTLE MIKADO SHAFT-EAST

SCALE: 1" = 300' HORIZ., 150' VERT.

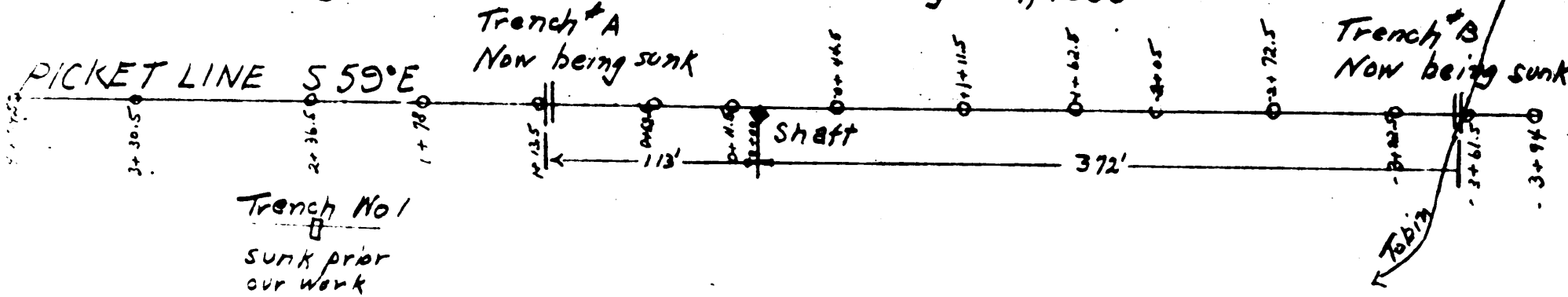
Measurements taken from contour map by Irving Reed and observation.

Chandalar, Alaska
July 18, 1939



PLAN OF LITTLE MIKADO PICKET LINE

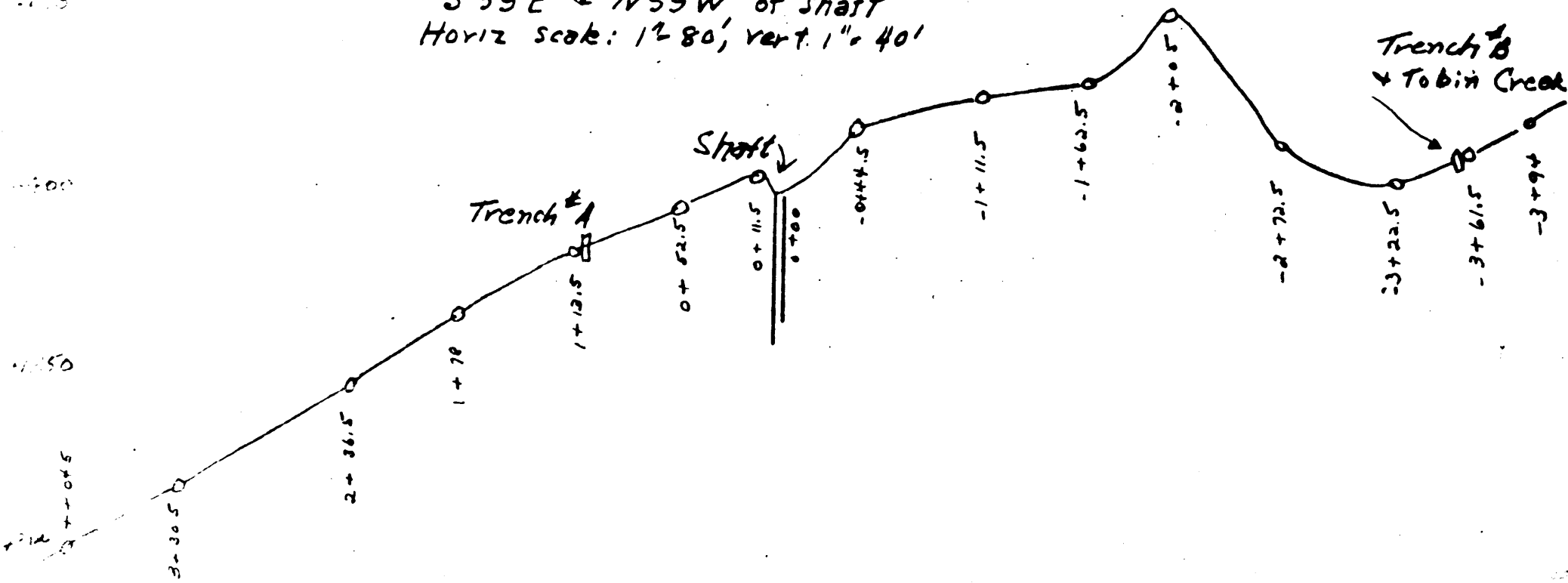
Strike S 59°E · Assumed strike of zone determined from strike of 47' drifting tunnel level along north or hanging wall Boadway's maps. Scale: 1" = 80' July 24, 1939



PROFILE OF LITTLE MIKADO PICKET LINE

S 59°E & N59°W of shaft

Horiz scale: 1" = 80', vert. 1" = 40'



Chandalar, Alaska
Sept. 4, 1939

Lake Chandalar Gold Mines Ltd,
67 Yonge St.
Toronto, Ontario

Dear sirs:

Enclosed herewith lists showing the number and the location and description of samples taken to date, also results received to date. The Assayer at the U. of A. is mailing you direct duplicate copy of assay results. You will be able to locate the Little Squaw samples on the sketches already mailed, also the Summit and Palasgren sampling. I am enclosing sketch of the Mikado tunnel drift showing location of samples cut to date.

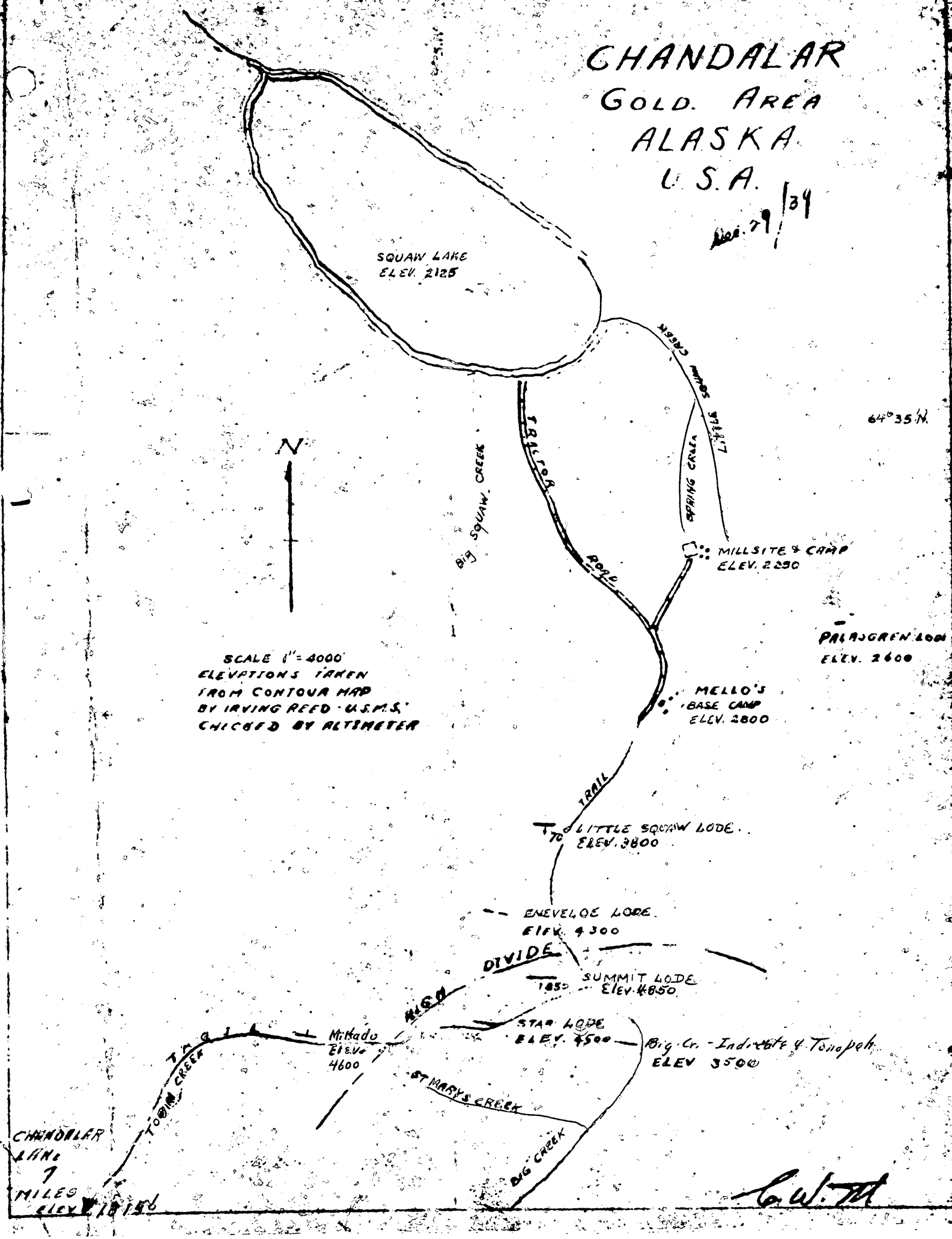
On the Mikado, drifting in the south drift on two faces east and west has advanced about 21 ft., a little better than 1 ft. per day is being made. In the west face the quartz has widened to the full drift width. This work will be carried on until we close down.

On the Little Squaw, ice has been removed from the winze for 45 ft. The winze follows down along the footwall of the vein. Sampling is being done at five foot intervals by drilling holes into the vein. From the portal west the tunnel follows the vein for 92 feet, and then continues along the footwall of the vein with cross-cuts across the vein at 10 ft. intervals. I am enclosing map in longitudinal section showing sampling data to date. A vein has been located and staked, parallel to and about 1500 feet distant to the north of the Little Squaw vein. Similar mineralization and vein quartz occurs to that in the Little Squaw vein. No visible gold has been found in the vein.

We have about one week's work yet on the Little Squaw, completing winze, sampling and probably staking. There is about 5 days work yet on the Summit and Bonanza claims, sampling. This will clean up our program apart from sampling of the Little Mikado tunnel drifts.

Yours very truly,

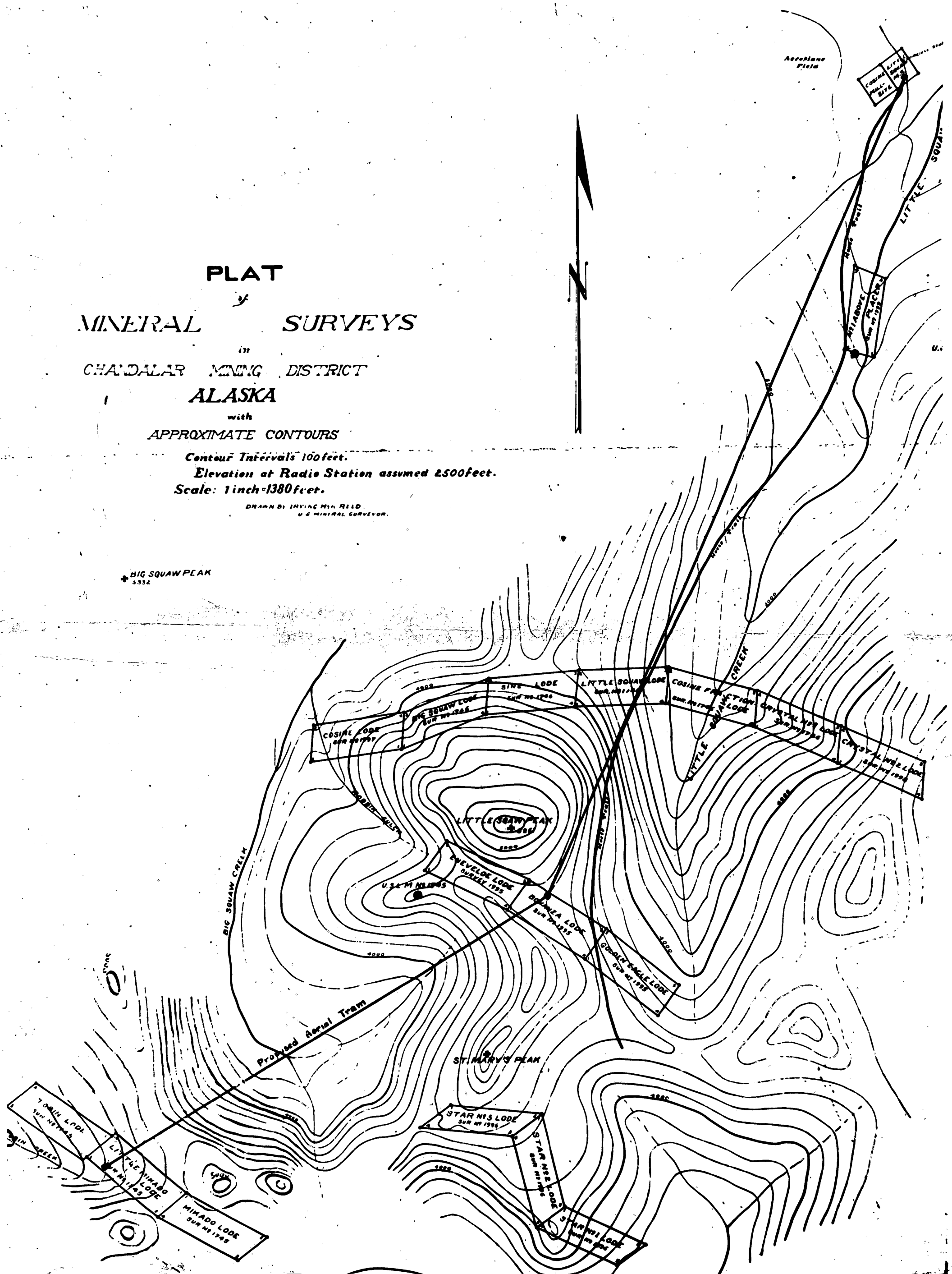
C. W. McKEE

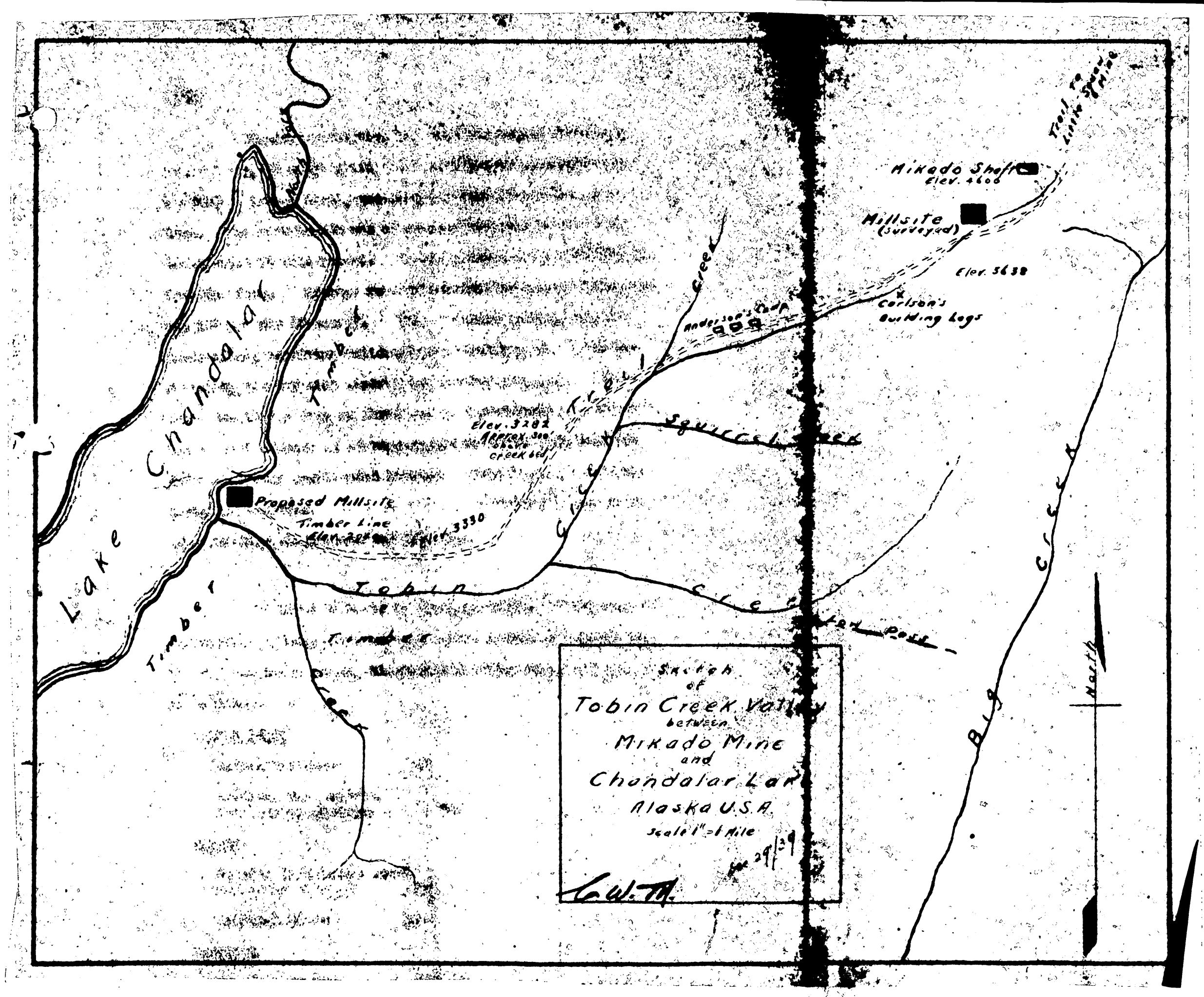

CHANDALAR
GOLD AREA
ALASKA
U.S.A.
Dec. 29/39
SQUAW LAKE
ELEV. 2125
SQUAW CREEK
TRAIL
SPRING CREEK
64°35'N.
N
BIG SQUAW CREEK
TRAIL
ROAD
MILLSITE & CAMP
ELEV. 2290
PALASGREN LODE
ELEV. 2600
SCALE 1" = 4000'
ELEVATIONS TAKEN
FROM CONTOUR MAP
BY IRVING REED - U.S.M.S.
CHECKED BY ALTIMETER
MELLO'S
BASE CAMP
ELEV. 2800
TRAIL
TO LITTLE SQUAW LODE
ELEV. 3800
ENEVELOE LODE
ELEV. 4300
DIVIDE
SUMMIT LODE
ELEV. 4850
HIGH
STAR LODE
ELEV. 4500
Big Cr. - Indicate & Tonopah
ELEV 3500
Mikado
Elev.
4600
TRAIL
TOBIN CREEK
ST MARYS CREEK
BIG CREEK
CHANDLER
LAKE
7
MILES
ELEV. 1815

PLAT
of
MINERAL SURVEYS
in
CHANDALAR MINING DISTRICT
ALASKA
with
APPROXIMATE CONTOURS

Contour Intervals 100 feet.
Elevation at Radio Station assumed 2500 feet.
Scale: 1 inch = 1380 feet.

DRAWN BY IRVING MIN. FIELD
U.S. MINERAL SURVEYOR.




Trail to Little Stone Mine
Mikado Shaft
Elev. 4600
Millsite
(surveyed)
Elev. 3638
Carlson's
Building Logs
Anderson's Cabin
Creek
Squirrel Creek
Elev. 3282
Approx. 300'
above
creek bed
Proposed Millsite
Timber Line
Elev. 3330
Lake Chandalar
Tobin Creek
Timber Creek
Big Creek
North
Sketch
of
Tobin Creek Valley
between
Mikado Mine
and
Chandalar Lake
Alaska U.S.A.
Scale 1" = 1 Mile
Dec 29/39
L.W.M.

Questions in re Stage I Work and Approval of Stage II Work

1. Were trenches "excavated approximately normal to the vein strike, cutting to bed rock, so as to expose the vein and make it available for sampling", as required by par. 2 of Stage I Description of the Work?

2. Were assayed samples taken from "the veins exposed in the dozer trenches", as required by par. 3 of Stage I Description of the Work?

3. Has the requirement (par. 4 of Stage I Description of the Work) that "the assay results of all trench sampling shall be adequately shown on maps or sketches" accompanying the Operator's monthly report been fulfilled?

4. Has a determination been made that the /Mikado/ vein is "gold bearing to a significant degree", as set forth in par. 1 (as amended) of Stage I Description of the Work?

5. Have "favorable results" been obtained under Stage I /Mikado/ work, a prerequisite for approval of Stage II /Mikado/ work according to par. 1 (as amended) of Exhibit A?

Operator states:

(a) In September narrative, that none of the Mikado trenches "had been taken down through decomposed bedrock and sheared material to fresh solid bedrock or quartz. * * * No solid quartz masses or solid bedrock was encountered. As a result the sampling probably will not be representative until next July when the trenches are expected to be taken down to solid material, * * * and proper sampling completed".

(b) In July-September narrative, "Accompanying maps show location of trenches * * *, with report of sampling done of the incompleted trenches on the Mikado. Early freeze-up prevented completion of any of the trenches".

(c) In sampling report, "The above samples taken from incompleted trenches on the Mikado Claims were not taken to determine the value of underlying rock in place, but to illustrate the

continuity of mineralization and strength of structure in this area" and samples are stated as being taken in "frozen zone of crushed quartz and gouge", "in deep, frozen overburden", "frozen muck", etc., from "muck not yet to bedrock" or "overburden not yet completely removed".

MacLaren states:

(a) In January 31 memorandum, "The assay of samples taken from the trenches are, with two exceptions, not too encouraging at this stage of the surface work".

(b) In same memorandum, "The contemplated approval [of Stage II work] is based on the indicated improvement in grade in those trenches where deeper sampling has shown an increase of values over shallower samples of the same structure and the grades of underground samples submitted with the application".

Number of samples:

Operator claimed air-freight on	51
Reports of Assay cover	47
Operator's sampling report identifies	33
Operator's map shows	17

Bulldozing hours:

	Roads	Trenches	
	D-8	D-8	TD-18
Kimball's Oct. 5 memo	620	600	290
MMR Form 61, July & Sept.	358	590	290
Operator's Sept. narrative	--- 958 ---		290
Contract Maximums	0	1200	500

Bulldozing costs:

(1) Operator's September narrative states "in our modest request for government participation in this exploration program the dozer hours spent in gaining access to the trenching sites from camp were assumed an integral part of this program".

(2) MacLaren's January 31 memorandum states "If an amendment is necessary for the acceptance of this [access roads] cost, which is due entirely to the difficult terrain, it is recommended that such an amendment be prepared".

(3) Application of May 8, 1961, requests 1500 hrs. D-8 dozing @ $25/hr. and 750 hrs. TD-18 dozing @ $21.50/hr., total $53,625.00, including some work on Knavelee and Star Groups and possibly $1500.00 "or less" for road work.

(4) Application also states that "Survey and mapping, sampling and assaying, * * * blasting and clearing out of trenches and all other rock work would be done by Little Squaw Mining Company as a part of this job and at its own expense".

(5) MacLaren's Sept. 28, 1961, report on proposed project states "The trenching is estimated to require 1,200 hours of D-8 work at $25.00 per hour and 500 hours of TD-18 work at $21.50 per hour".

(6) Applicant's Oct. 24, 1961, letter states "The relative cost to the government is small. The actual costs of bulldozer work will exceed our estimate considerably * * * ".

(7) Applicant's Dec. 7, 1961, letter revises application and requests surface trenching of 1200 hrs. D-8 dozing @ $25/hr. and 500 hrs. TD-18 dozing @ $21.50/hr., total $40,750.00, and details estimated actual costs totalling $45,333.00.

(8) Applicant's Dec. 7, 1961, letter further states "We believe actual costs will exceed twice these amounts. Our request is for government participation at rates of $25.00 per hour for D-8s, $21.50 per hour for TD-18s, * * * ".

(9) Contract dated Jan. 25, 1962, provides that trenching work shall not exceed 1,200 hours with D-8 and 500 hours with TD-18 and that Government will not contribute to allowable actual costs in excess of $25/hr. and $21.50/hr., respectively, or a total of $40,750.

Vouchers submitted:

(1) On May 25, 1962, claim for $17,878.68 as costs during March and April of "mobilization, supplies, equipment, personnel".

(2) On September 18, 1962, claim for $58,412.48 (far in excess of allowable costs for completion of all Stage I work) as costs for April through August.

(3) On November 14, 1962, claim for $20,268.15 for trenching and sampling from July 31 through August 31.

(4) On January 25, 1963, claim for $8,950.00 for 358 hours of D-8 dozing @ $25/hr. on access roads; but documentation (as certified true and correct "to the best of my knowledge" by Karl W. Jasper) indicates claimed actual costs of $9,641.38 for access road work in July, mapping and "attempted sampling" Sept. 1 to 11, and repairing equipment Sept. 3 to 27.

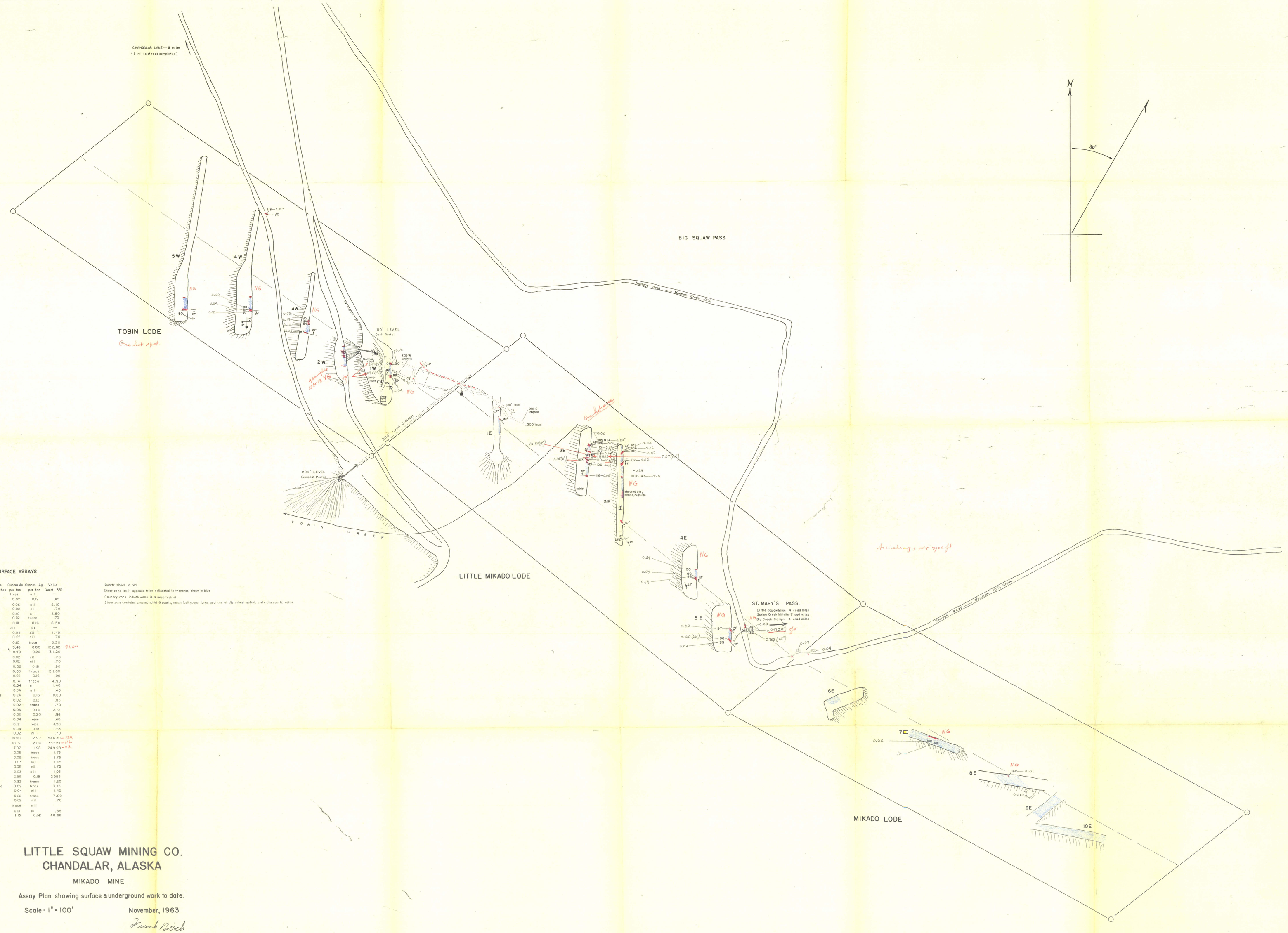
(5) A September-November claim for costs of Stage II work.
Note: Contract requires submission of monthly vouchers, progress reports, narratives, maps, etc.

Vouchers paid:

(a) On Dec. 21, 1962, $9,454.24 as 50% of $18,908.48 (the allowable portion of $20,268.15 claimed).

(b) On Feb. 1, 1963, $41.18 as 50% of $82.37 (re-claimed portion of $20,268.15 claim).

EDTalbert/sms
2-7-63



1963 SURFACE ASSAYS

Sample Number	Sample Width, inches	Ounces Au per ton	Ounces Ag per ton	Value (Au at $35)
80	60	trace	nil	—
81	60	0.02	0.02	.85
82	60	0.06	nil	2.10
83	12	0.02	nil	.70
84	48	0.10	nil	3.50
85	60	0.02	trace	.70
86	12	0.18	0.16	6.50
87	48	nil	nil	—
88	24	0.04	nil	1.40
89	60	0.02	nil	.70
90	36	0.10	trace	3.50
91	24	3.48	0.80	122.82 — 81.04
92	30	0.90	0.20	31.26
93	60	0.02	nil	.70
94	60	0.02	nil	.70
95	36	0.02	0.16	.90
96	60	0.60	trace	21.00
97	36	0.02	0.16	.90
98	48	0.14	trace	4.90
99	36	0.04	nil	1.40
100	36	0.04	nil	1.40
101	Picked	0.24	0.16	8.60
102	24	0.02	0.02	.85
103	36	0.02	trace	.70
104	24	0.06	0.14	2.10
105	36	0.02	0.20	.96
106	24	0.04	trace	1.40
107	6	0.12	trace	4.20
108	36	0.04	0.18	1.63
109	12	0.02	nil	.70
110	8	15.50	2.97	546.30 — 139.
111	12	10.23	2.09	357.23 — 116.
112	12	7.07	1.98	249.98 — 73.
113	12	0.05	trace	1.75
114	4	0.05	trace	1.75
115	60	0.03	nil	1.05
116	60	0.05	nil	1.75
118	24	0.03	nil	1.05
119	24	0.85	0.18	29.98
120	36	0.32	trace	11.20
121	Picked	0.09	trace	3.15
122	30	0.04	nil	1.40
147	8	0.20	trace	7.00
160	36	0.02	nil	.70
161	12	trace	nil	—
162	24	0.01	nil	.35
163	6	1.15	0.32	40.66

Quartz shown in red

Shear zone as it appears to be delineated in trenches, shown in blue

Country rock in both walls is a mica-schist

Shear zone contains crushed schist & quartz, much fault gouge, large sections of disturbed schist, and many quartz veins

LITTLE SQUAW MINING CO.
CHANDALAR, ALASKA

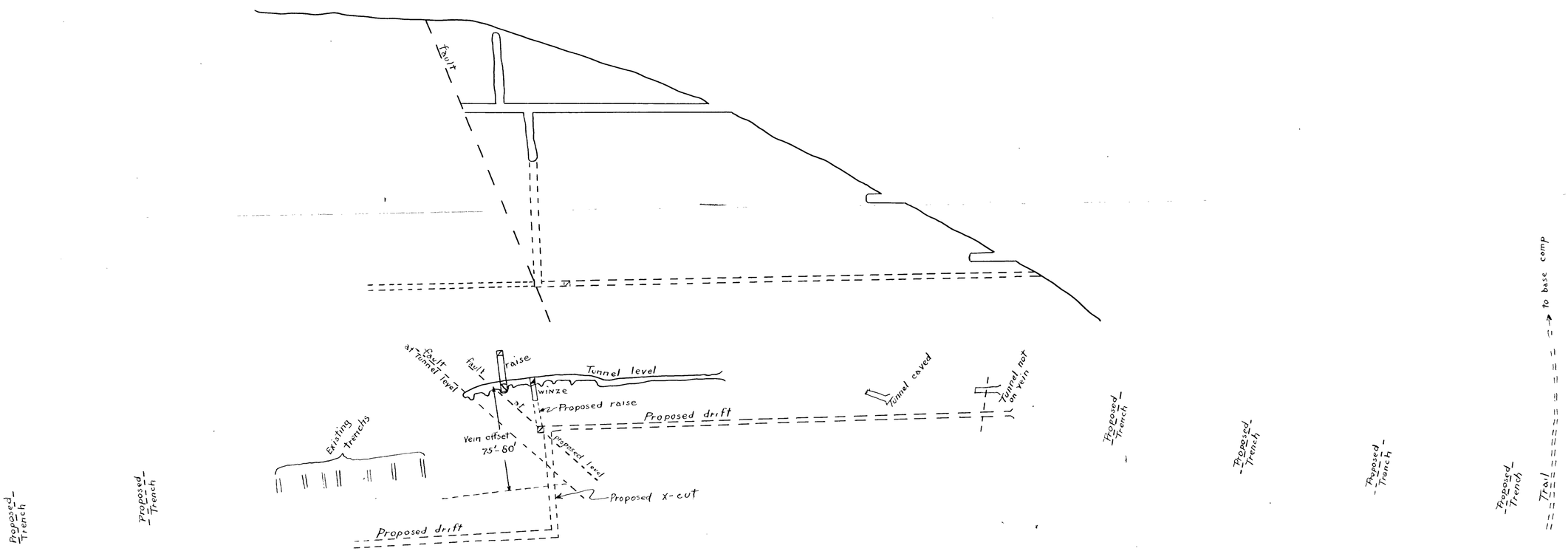
MIKADO MINE

Assay Plan showing surface & underground work to date.

Scale: 1" = 100'

November, 1963

Frank Birch

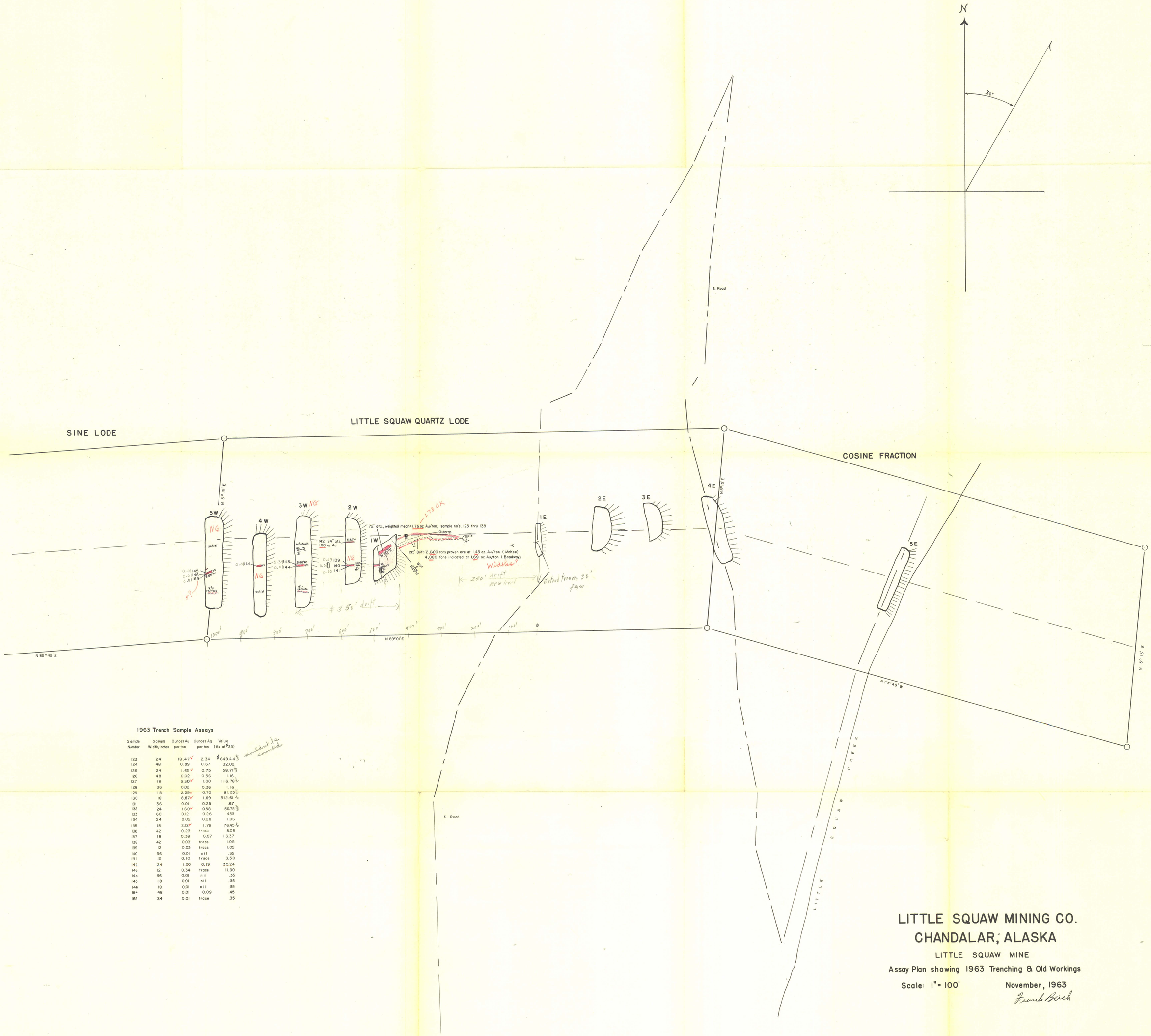


Note: Basic data compiled from Company maps

Plan and Section
Existing and Proposed Surface and Underground Workings
Little Squaw Mine
Little Squaw Mining Company
Fairbanks Precinct Alaska

60 40 20 0 60 feet

November 1961
Plate 2



1963 Trench Sample Assays

Sample Number	Sample Width, inches	Ounces Au per ton	Ounces Ag per ton	Value (Au at $35)
123	24	18.47	2.34	$649.44
124	48	0.89	0.67	32.02
125	24	1.65	0.75	58.71
126	48	0.02	0.36	1.16
127	18	3.30	1.00	116.78
128	36	0.02	0.36	1.16
129	18	2.29	0.70	81.05
130	18	8.87	1.69	312.61
131	36	0.01	0.25	.67
132	24	1.60	0.58	56.75
133	60	0.12	0.26	4.53
134	24	0.02	0.28	1.06
135	18	2.12	1.76	76.45
136	42	0.23	trace	8.05
137	18	0.38	0.07	13.37
138	42	0.03	trace	1.05
139	12	0.03	trace	1.05
140	36	0.01	nil	.35
141	12	0.10	trace	3.50
142	24	1.00	0.19	35.24
143	12	0.34	trace	11.90
144	36	0.01	nil	.35
145	18	0.01	nil	.35
146	18	0.01	nil	.35
164	48	0.01	0.09	.45
165	24	0.01	trace	.35

should not be counted

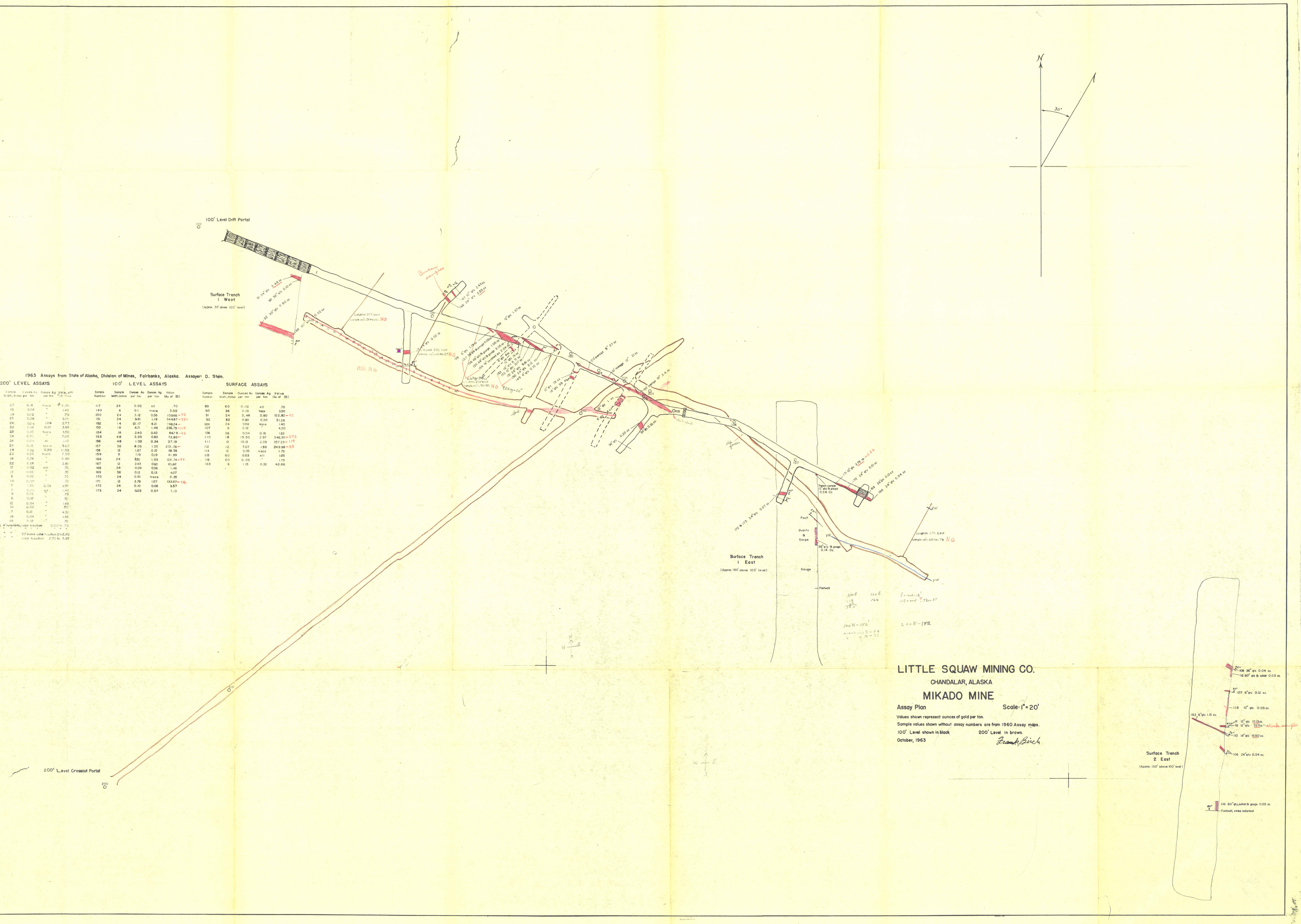
LITTLE SQUAW MINING CO.
CHANDALAR, ALASKA

LITTLE SQUAW MINE

Assay Plan showing 1963 Trenching & Old Workings

Scale: 1" = 100' November, 1963

Frank Birch



1963 Assays from State of Alaska, Division of Mines, Fairbanks, Alaska. Assayer: D. Stein.

200' LEVEL ASSAYS

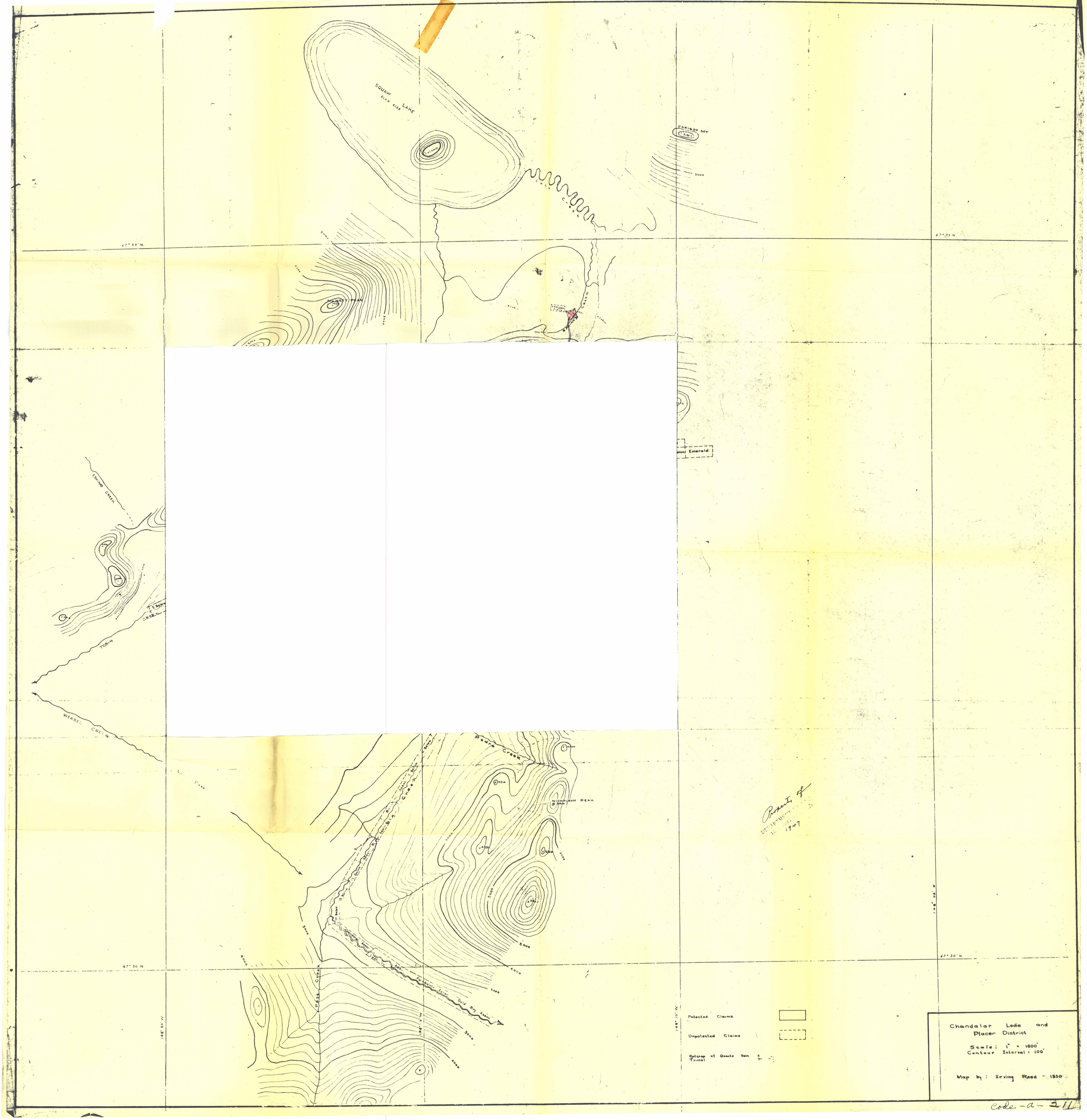
Sample Number	Sample Width, Inches	Ounces Au per ton	Ounces Ag per ton	Value, $ per ton (Au at 35)
1	20	0.16	trace	5.60
2	18	0.06	"	2.10
3	18	0.02	"	.70
4	23	0.06	"	2.10
5	26	0.24	1.04	2.73
6	22	0.10	0.10	3.63
7	23	0.10	trace	3.50
8	24	0.20	"	7.00
9	26	0.04	nil	1.40
10	26	0.16	trace	5.60
11	18	0.32	0.30	11.59
12	22	0.20	trace	7.00
13	18	0.08	"	2.80
14	22	0.08	"	2.80
15	12	0.02	nil	.70
16	13	0.02	"	.70
17	6	0.02	"	.70
18	10	0.02	"	.70
19	7	1.26	0.08	9.50
20	7	0.04	nil	1.40
21	5	0.02	"	.70
22	6	0.02	"	.70
23	12	0.04	"	1.40
24	10	0.02	"	.70
25	7	0.12	"	4.20
26	18	0.04	"	1.40
27	16	0.02	"	.70
28 thru 42	4 inch vertically, collar to bottom			0.00 to .70
43 thru 57	" "	" "		" "
58 thru 65	" "	30' sleeve collar to bottom		0.70 to 2.80
66 thru 79	" "	collar to bottom		0.70 to 3.50

100' LEVEL ASSAYS

Sample Number	Sample Width, Inches	Ounces Au per ton	Ounces Ag per ton	Value (Au at 35)
117	24	0.02	nil	.70
149	4	0.1	trace	3.50
150	24	3.12	0.26	109.66 — 73
151	24	9.81	1.19	344.87 — 230
152	14	21.17	4.21	746.24 —
153	18	6.71	1.48	236.75 — 115
154	18	2.40	0.62	84.79 — 42
155	48	2.05	0.83	72.80 —
156	48	1.05	0.34	37.19
157	36	6.06	1.30	213.76 —
158	12	1.67	0.10	58.56
159	6	1.19	0.19	41.89
166	24	3.55	1.95	126.74 — 59
167	12	2.43	0.60	85.82
168	24	0.04	0.06	1.46
169	36	0.12	0.13	4.27
170	24	0.01	trace	0.35
171	12	3.78	1.07	133.67 — 44
172	24	0.10	0.06	3.57
173	24	0.03	0.07	1.13

SURFACE ASSAYS

Sample Number	Sample Width, Inches	Ounces Au per ton	Ounces Ag per ton	Value (Au at 35)
89	60	0.02	nil	.70
90	36	0.10	trace	3.50
91	24	3.48	0.60	122.82 — 92
92	30	0.90	0.20	31.26
106	24	0.04	trace	1.40
107	6	0.12	"	4.20
108	36	0.04	0.18	1.63
110	18	15.50	2.97	546.30 — 273
111	12	10.13	2.09	357.23 — 179
112	12	7.07	1.59	249.96 — 83
113	12	0.05	trace	1.75
115	60	0.03	nil	1.05
116	60	0.05	"	1.75
163	6	1.15	0.32	40.66


SQUAW LAKE
ELEV 6135
ISLAND
CARIBOU MT
4180
3000
67° 35' N.
67° 35' N.
BARNETT PEAK
ESHHAO CREEK
TOBIN
WEASEL CREEK
Emerald
Pedro Creek
NICHOLSON PEAK
Big Creek
Bess Creek
Gold Bay Assess.
67° 30' N.
67° 30' N.
148° 20' W
148° 10' W
148° 00' W
Patented Claims
Unpatented Claims
Outcrop of Quartz Vein Tunnel
Chandalar Lode and Placer District
Scale: 1" = 1600'
Contour Interval = 100'
Map by: Irving Reed - 1950

Code -a- 3 11

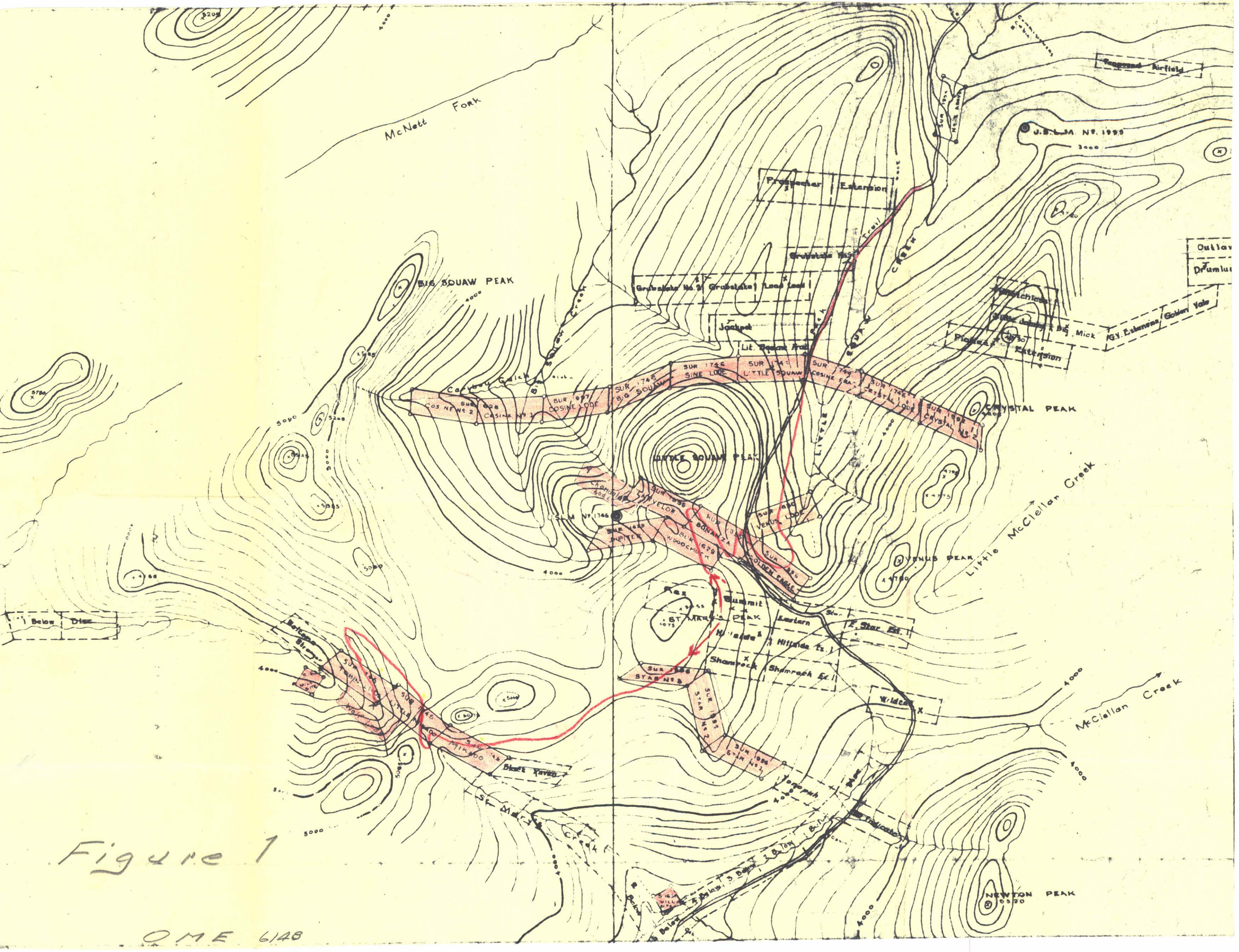


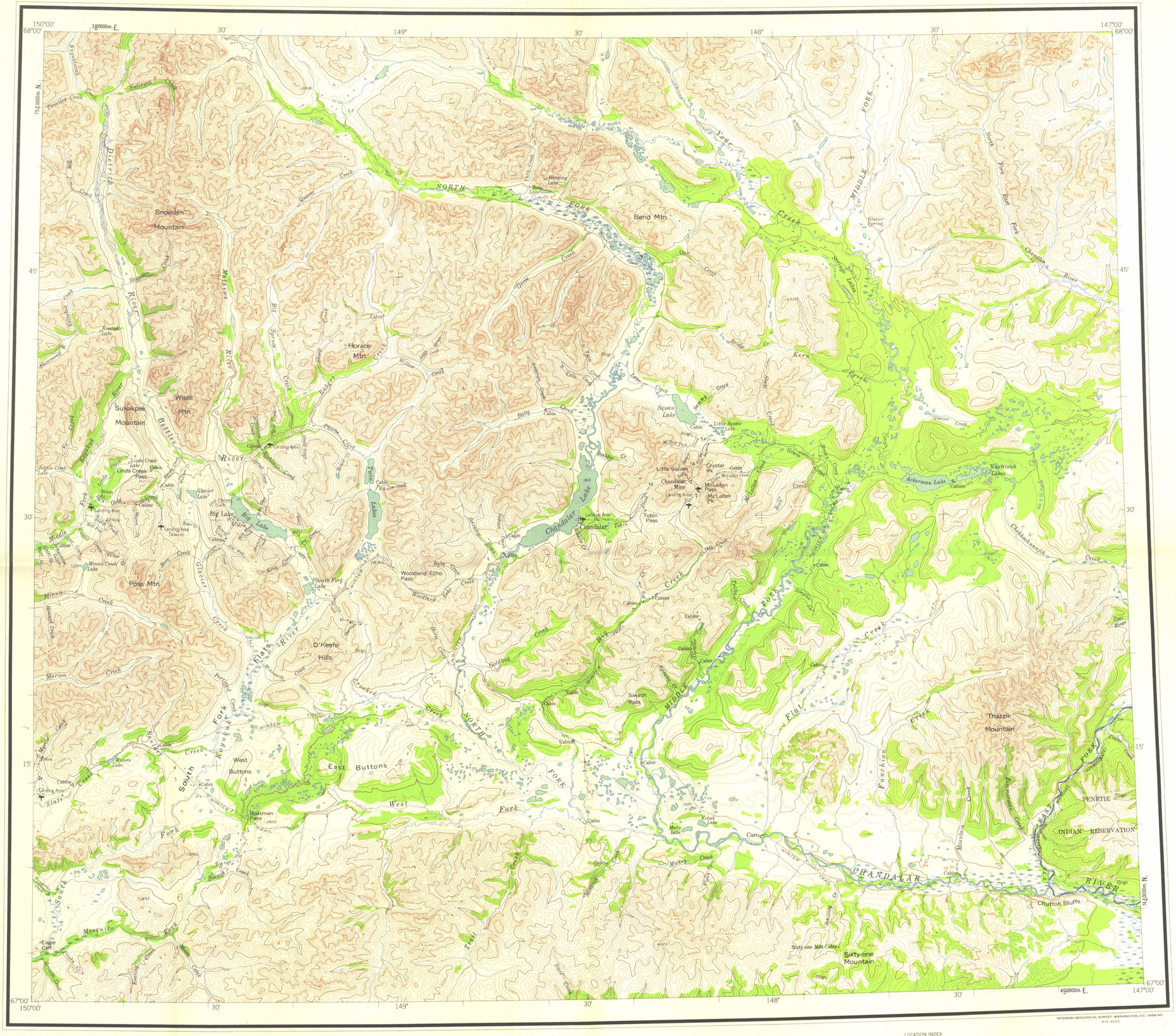
Figure 1

OME 6148

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

CHANDALAR

ALASKA
TOPOGRAPHIC SERIES
FOURTH JUDICIAL DIVISION



INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D.C.—1958—NS
M E 4638

MAPPED, EDITED, AND PUBLISHED BY THE GEOLOGICAL SURVEY

CONTROL BY USGS

TOPOGRAPHY FROM AERIAL PHOTOGRAPHS BY PHOTOGRAMMETRIC METHODS 1957
AERIAL PHOTOGRAPHS TAKEN 1955, FIELD ANNOTATED 1956
MAP NOT FIELD CHECKED

UNIVERSAL TRANSVERSE MERCATOR PROJECTION
1927 NORTH AMERICAN DATUM
10,000-METER UNIVERSAL TRANSVERSE MERCATOR GRID TICKS,
ZONE 6, SHOWN IN BLUE

UNCHECKED ELEVATIONS ARE SHOWN IN BROWN AND BLUE

SCALE 1:250 000

5 0 5 10 15 20 25 MILES

5 0 5 10 15 20 25 KILOMETERS

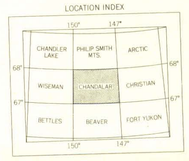
CONTOUR INTERVAL 200 FEET
DATUM IS MEAN SEA LEVEL

1958 MAGNETIC DECLINATION AT SOUTH EDGE OF SHEET VARIES FROM 28°30' TO 30°30' EAST

THIS MAP IS AVAILABLE IN BOTH SHADED RELIEF AND CONTOUR EDITIONS

FOR SALE BY U.S. GEOLOGICAL SURVEY
FAIRBANKS, ALASKA DENVER 2, COLORADO WASHINGTON 25, D.C.
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

LOCATION INDEX

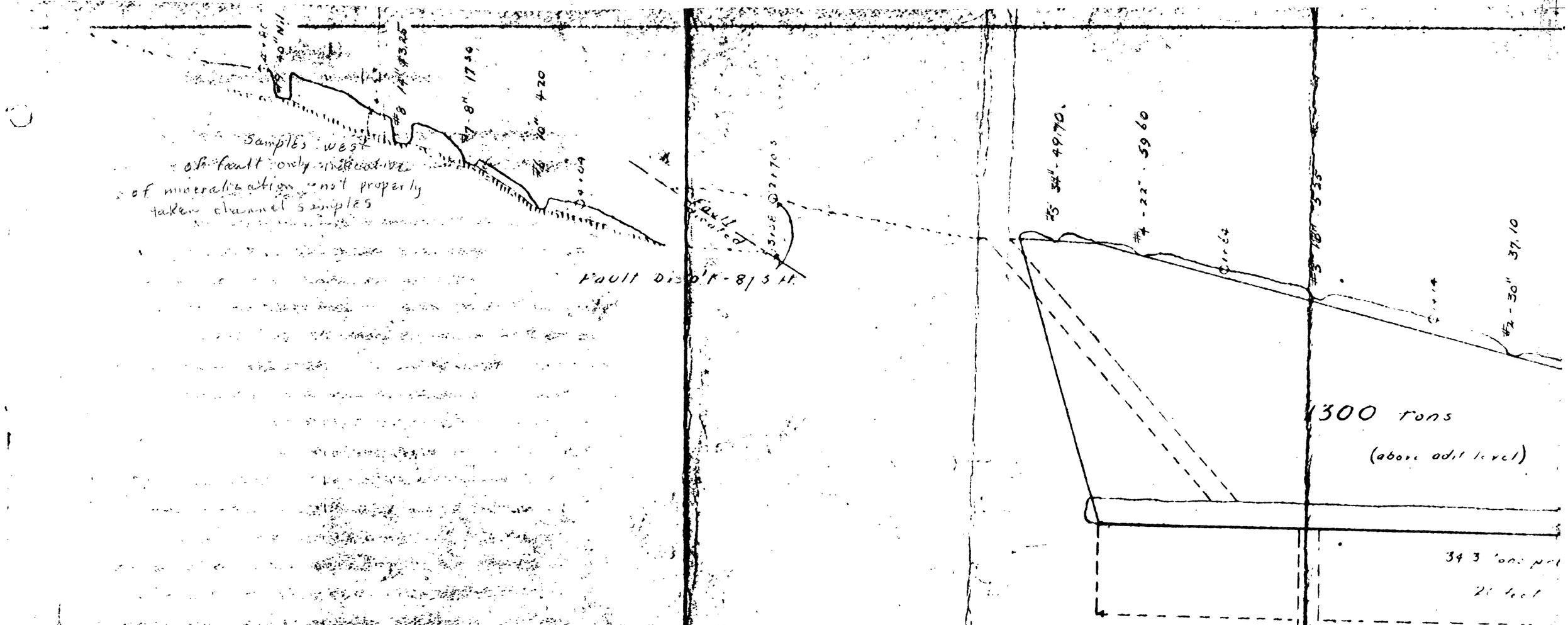


ROAD CLASSIFICATION

TRAILS. . . . . .

CHANDALAR, ALASKA
N6700—W14700/60X180

1956



Weighted Average Surface Samples (east of fault) $ 54.01

Average Width 30 Inches

Length 210 Feet

Weighted Average Adit Level Samples $ 54.20

Average Width 20.16"

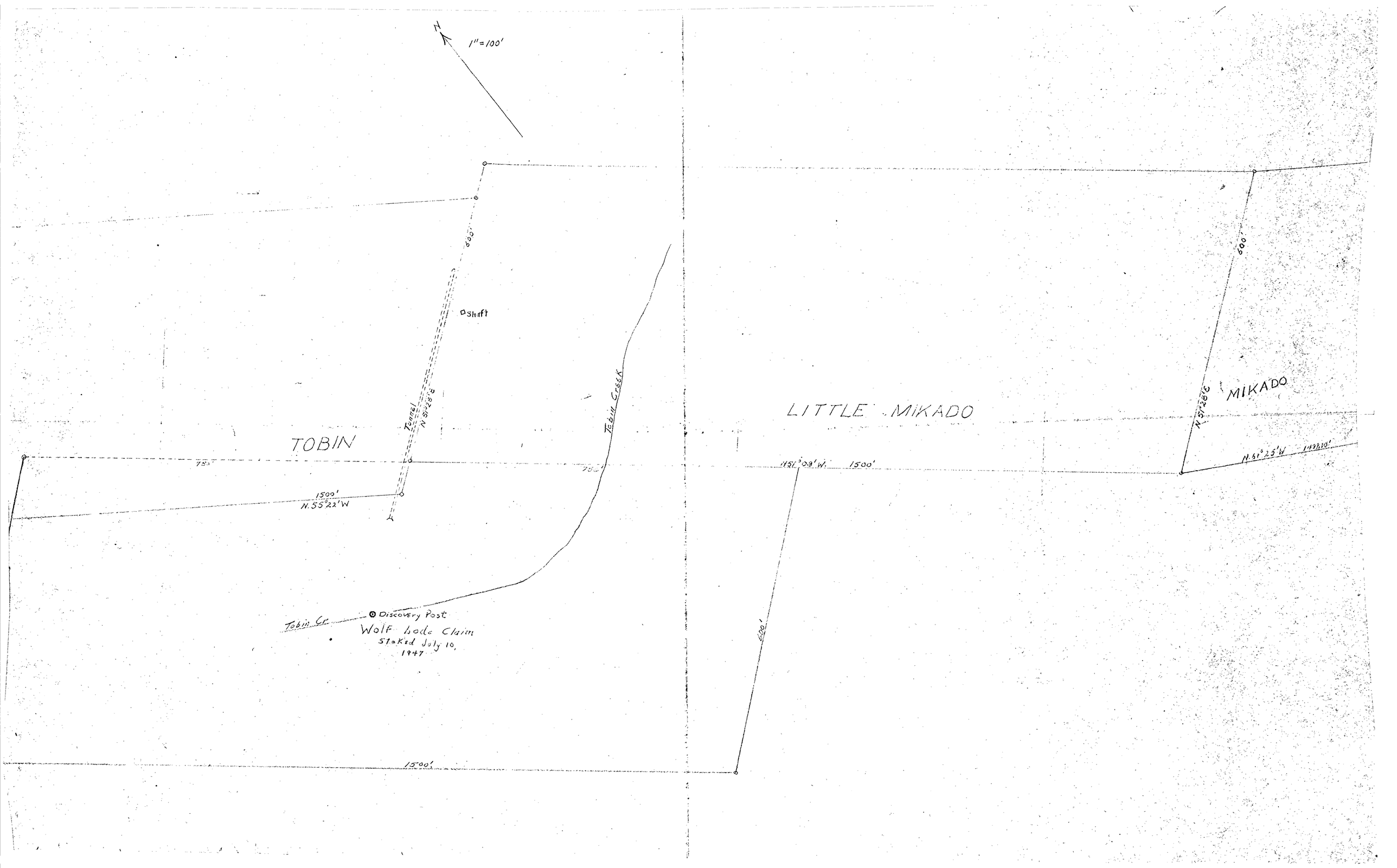
Length 195'

Weighted Average Surface & Adit Level (high assays cut to reduce the average) $ 50.15

Average Width 25.08"

Ore

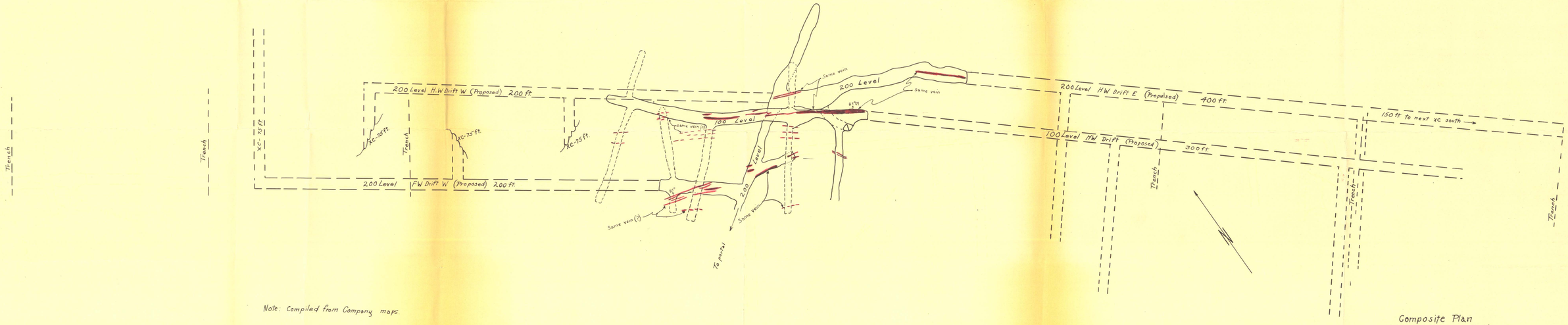
Outlined between Surface & 20 feet below Adit Level — 2006 Tons


N
1" = 100'
600'
Shaft
Tunnel
N 51°28'E
Tobin Creek
TOBIN
750'
750'
1500'
N.55°22'W
Tobin Cr
Discovery Post
Wolf Lode Claim
Staked July 10,
1947
1500'
LITTLE MIKADO
N.51°08'W. 1500'
600'
600'
MIKADO
N.51°28'E
N.51°25'W 1499.10'

U.S. Department of the Interior

Office of Minerals Exploration
Examination Report

OME-6148



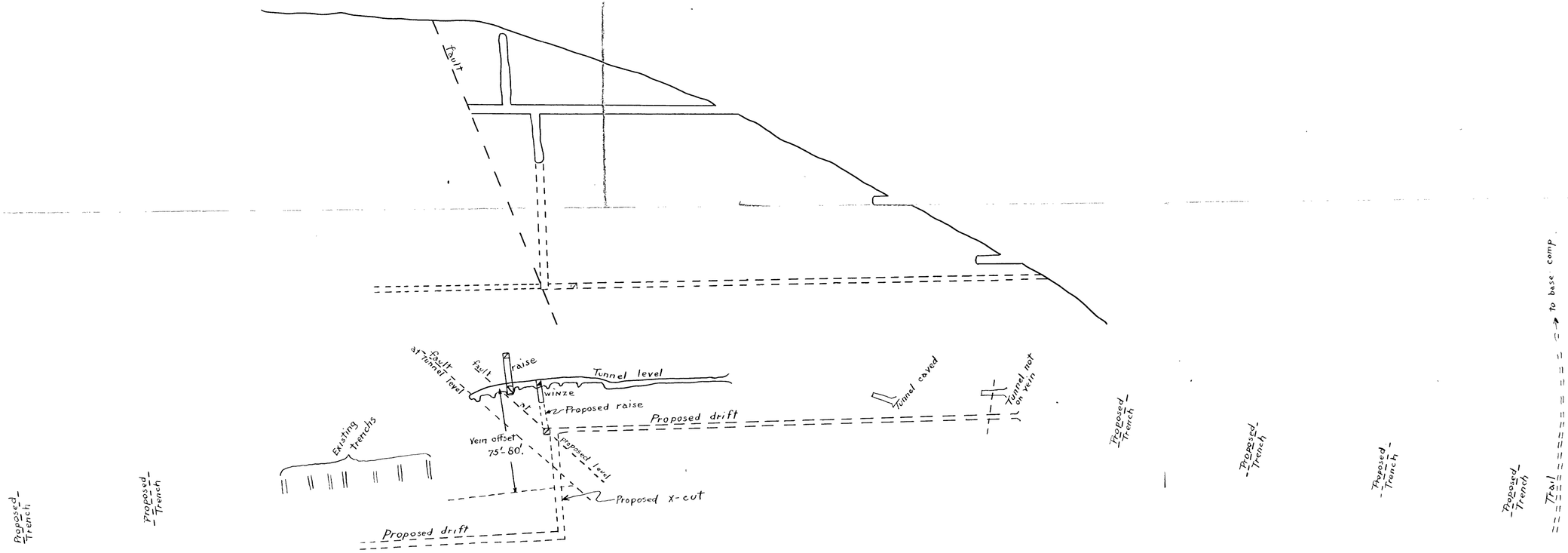
Note: Compiled from Company maps.

Composite Plan
100 and 200 Level Workings
Little Mikado Mine
Little Squaw Mining Company
Fairbanks Precinct Alaska

20 10 0 20 feet

November 1961
Plate I

Reg. I memo 12/19/61 OME-6148



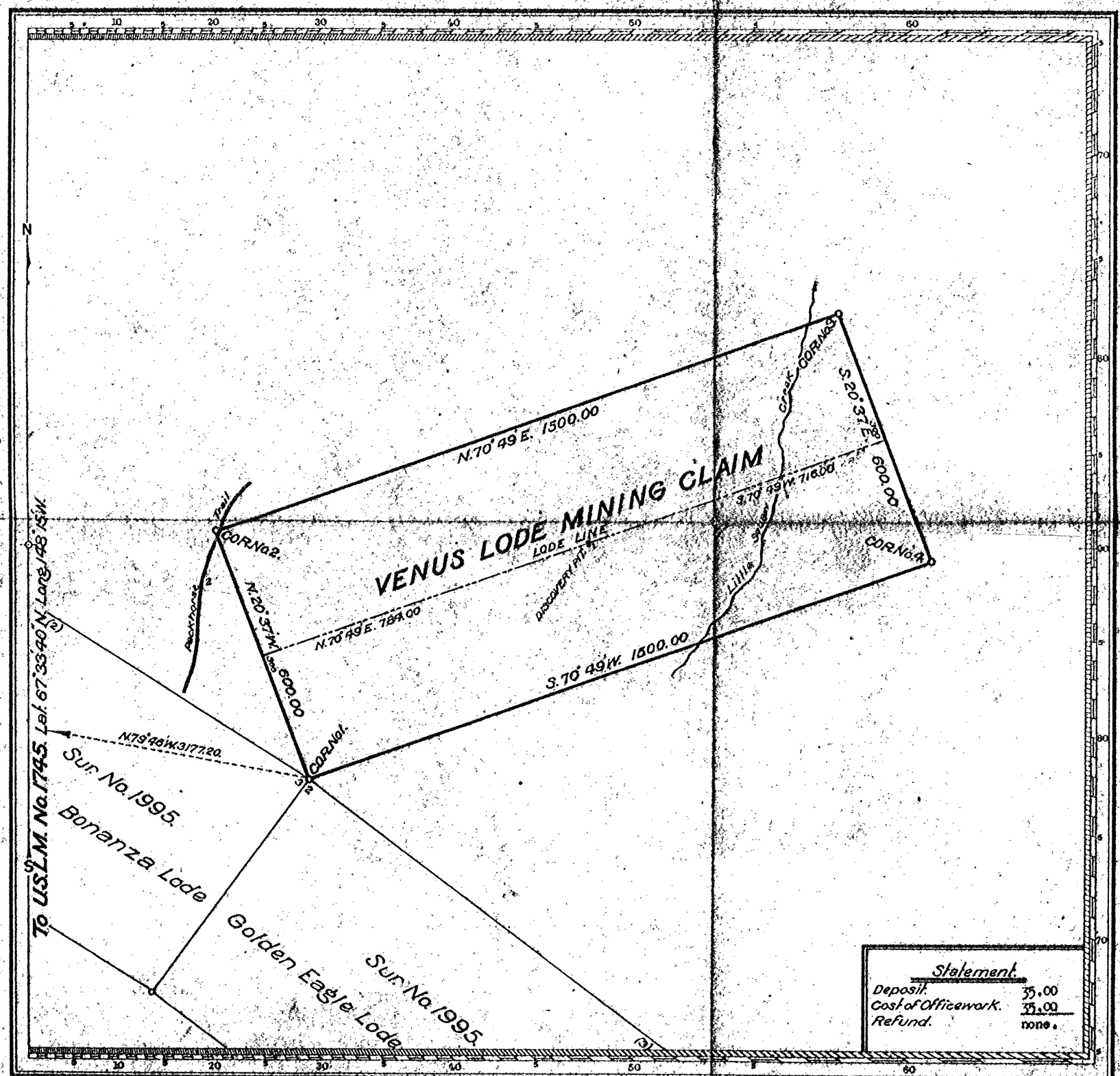
Note: Basic data compiled from Company maps

Plan and Section
Existing and Proposed Surface and Underground Workings
Little Squaw Mine
Little Squaw Mining Company
Fairbanks Precinct Alaska

60 40 20 0 60 feet

November 1961
Plate 2

(4-675)



Statement.	
Deposit.	35.00
Cost of Officework.	35.00
Refund.	none.

Mineral Survey No. 1630.

Fairbanks Land District.

PLAT

OF THE CLAIM OF

Chandalar Gold Mines Inc.

KNOWN AS THE

VENUS LODE MINING CLAIM

IN Chandalar MINING DISTRICT,
Territory of Alaska.

Containing an Area of 20.655 Acres

Scale of 200 Feet to the inch.

Variation 33° 30' E.

SURVEYED July 29-30, 1930 BY

Irving McK. Read U.S. Mineral Surveyor

The Original Field Notes of the Survey of the Mining Claim from which this plat has been made under my direction, have been examined and approved, and are on file in this Office; and I hereby certify that they furnish such an accurate description of said Mining Claim as will, if incorporated into a patent, serve fully to identify the premises, and that such reference is made therein to natural objects or permanent monuments as will perpetuate and fix the locus thereof.

I further certify that Five Hundred Dollars worth of labor has been expended or improvements made upon, or for the benefit of, each location embraced in said mining claim by claimant Chandalar Gold Mines Inc. *on its grantors and that said improvements consist of*

Discovery Pit
Packhorse Trail

Total Value $46.00

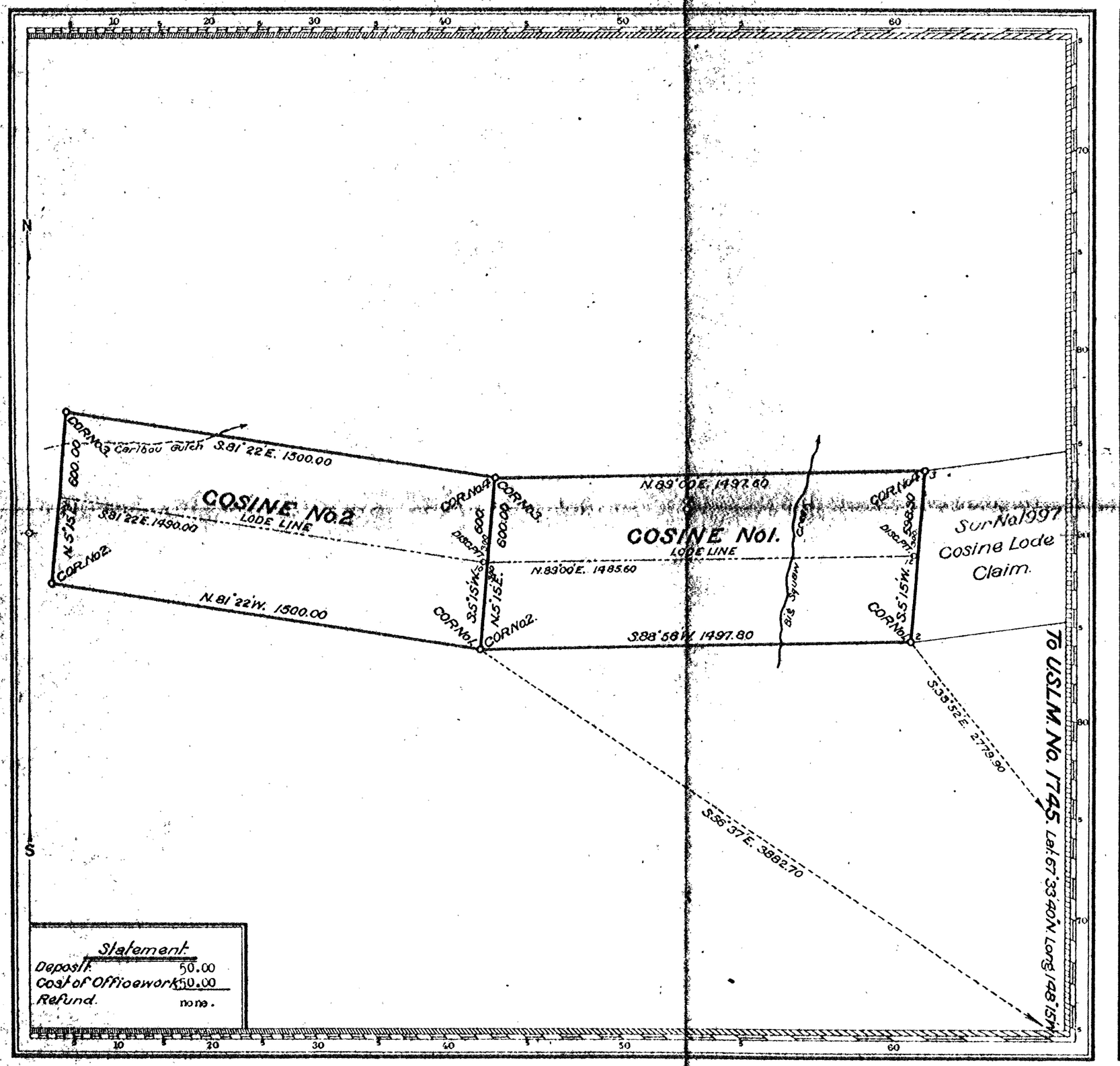
that the location of said improvements is correctly shown upon this plat, and that no portion of said labor or improvements has been included in the estimate of expenditures upon any other claim.

And I further certify that this is a correct plat of said Mining Claim made in conformity with said original field notes of the survey thereof, and the same is hereby approved.

Public Survey Office
Juneau, Alaska.
August 18, 1931.

E. O. Pierson
Industrial Engineer
In Charge

(4-675)



Mineral Survey No. 1628.

Fairbanks Land District.

PLAT

OF THE CLAIM OF

Chandalar Gold Mines Inc.

KNOWN AS THE

COSINE No1 and

COSINE No.2

IN Chandalar MINING DISTRICT,

Territory of Alaska.

Containing an Area of 41.101 Acres.

Scale of 300 Feet to the inch.

Variation 33°30'-33°45'E.

SURVEYED August 3-4, 1930. BY

Irving McK. Reed, U.S. Mineral Surveyor,

The Original Field Notes of the Survey of the Mining Claim from which this plat has been made under my direction, have been examined and approved, and are on file in this Office, and I hereby certify that they furnish such an accurate description of said Mining Claim as will, if incorporated into a patent, serve fully to identify the premises, and that such reference is made therein to natural objects or permanent monuments as will perpetuate and fix the bounds thereof.

I further certify that Five Hundred Dollars worth of labor has been expended or improvements made upon, or for the benefit of each location embraced in said mining claim by claimant Chandalar Gold Mines Inc. *or its grantors and that said improvements consist of* 2 Discovery Pits

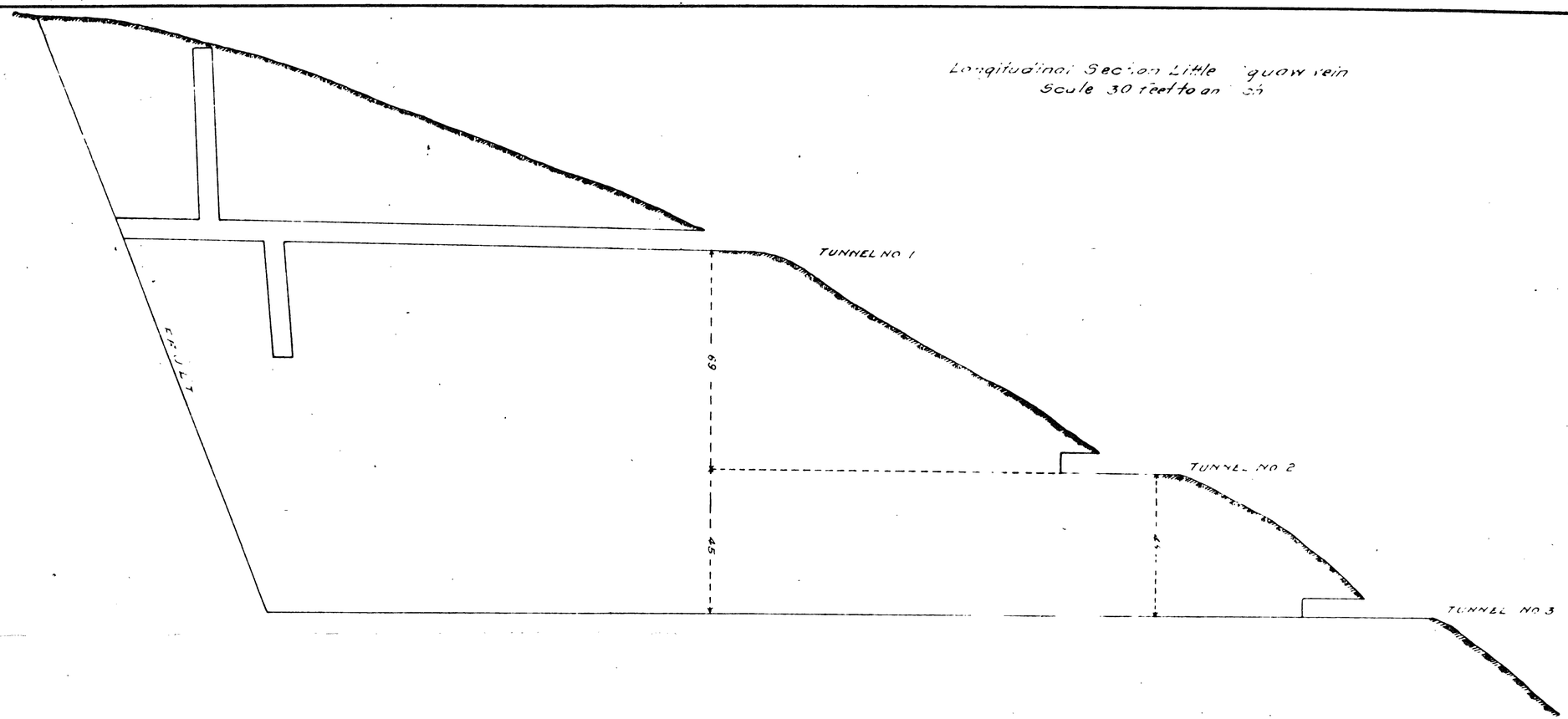
Total Value $20.00

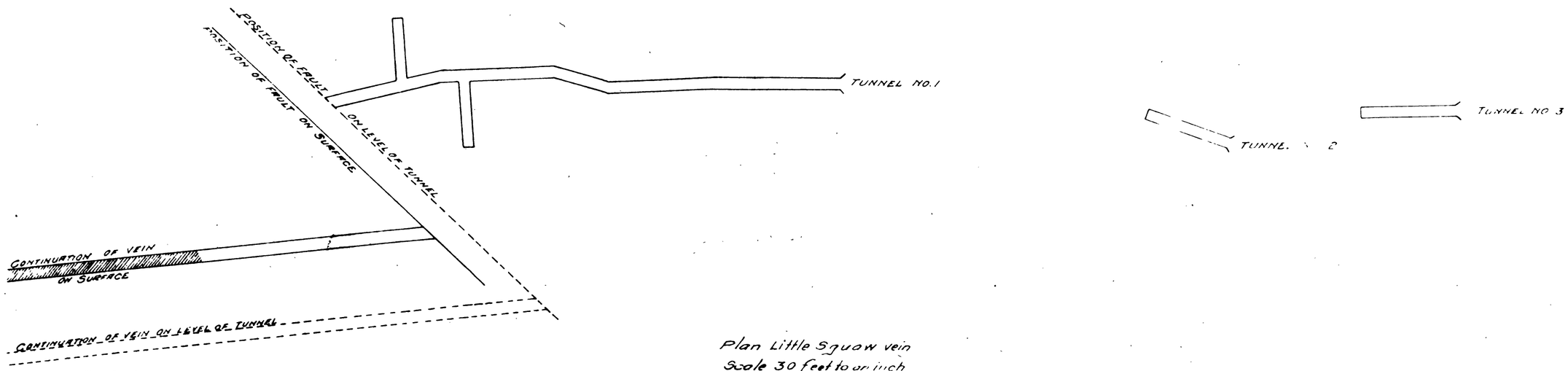
that the location of said improvements is correctly shown upon this plat, and that no portion of said labor or improvements has been included in the estimate of expenditures upon any other claim.

And I further certify that this is a correct plat of said Mining Claim made in conformity with said original field notes of the survey thereof, and the same is hereby approved.

Public Survey Office
Juneau, Alaska.
August 15, 1931.

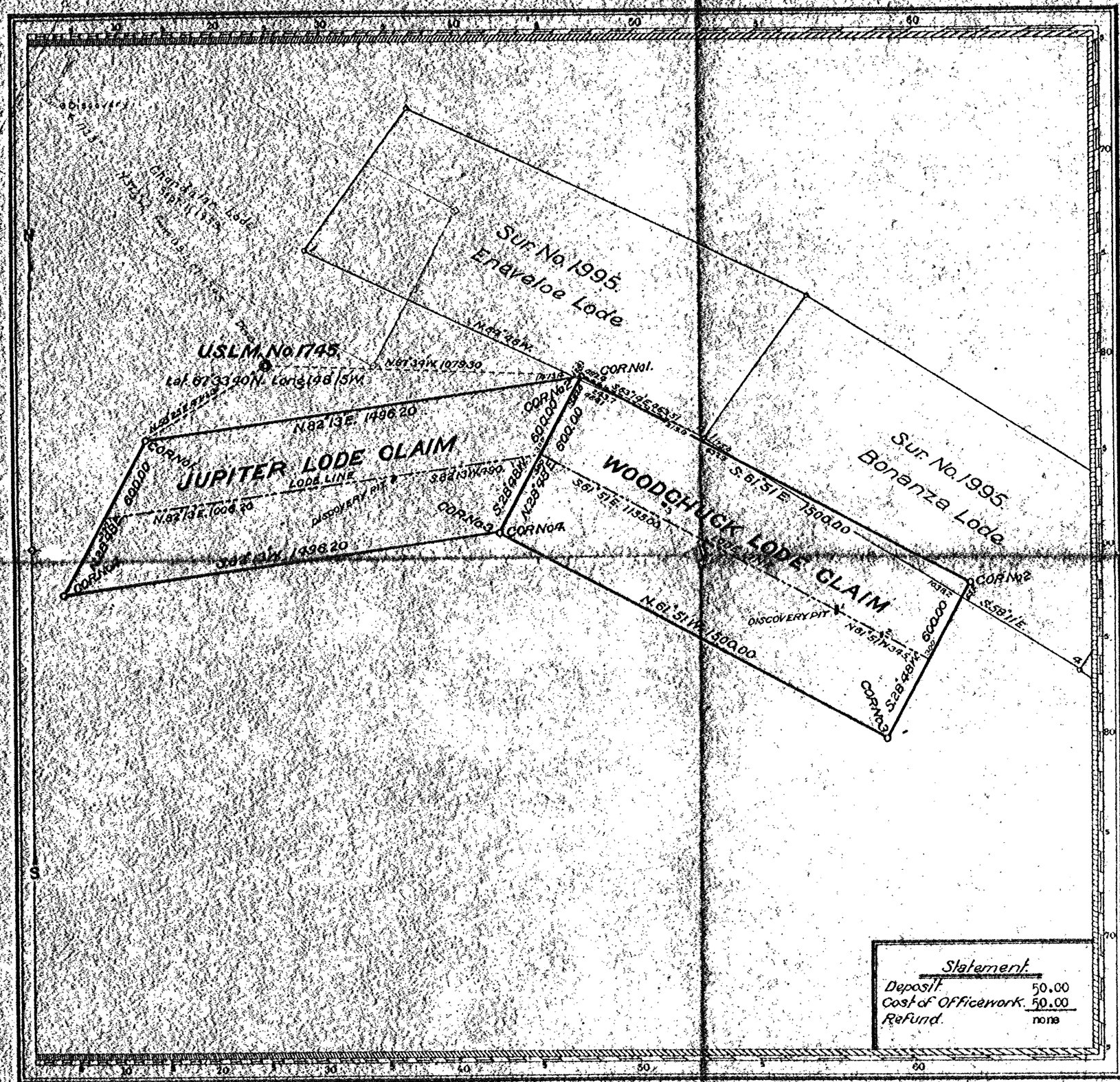
C. G. Sherwin
Cadastral Engineer in Charge.





Plan Little Squaw vein
Scale 30 feet to an inch

(4-675)



Statement.	
Deposit.	50.00
Cost of Officework.	50.00
Refund.	none

Mineral Survey No. 1629.

Fairbanks Land District.

PLAT

OF THE CLAIM OF

Chandalar Gold Mines Inc.

KNOWN AS THE

JUPITER AND WOODCHUCK LODE CLAIMS

IN Chandalar MINING DISTRICT,
Territory of Alaska

Containing an Area of 37.209 Acres.
Scale of 300 Feet to the inch.
Variation 34°30' E.

SURVEYED July 30 – August 1, 1930 BY

Irving McK. Read U.S. Mineral Surveyor

The Original Field Notes of the Survey of the Mining Claim, from which this plat has been made under my direction, have been examined and approved, and are on file in this Office, and I hereby certify that they furnish such an accurate description of said Mining Claim as will, if incorporated into a patent, serve fully to identify the premises, and that such reference is made therein to natural objects or permanent monuments as will perpetuate and fix the locus thereof.

I further certify that Five Hundred Dollars worth of labor has been expended or improvements made by or for the benefit of each location embraced in said mining claim by claimant

Chandalar Gold Mines Inc. or its grantors and

that said improvements consist of

4 Pits

Total Value $870.00

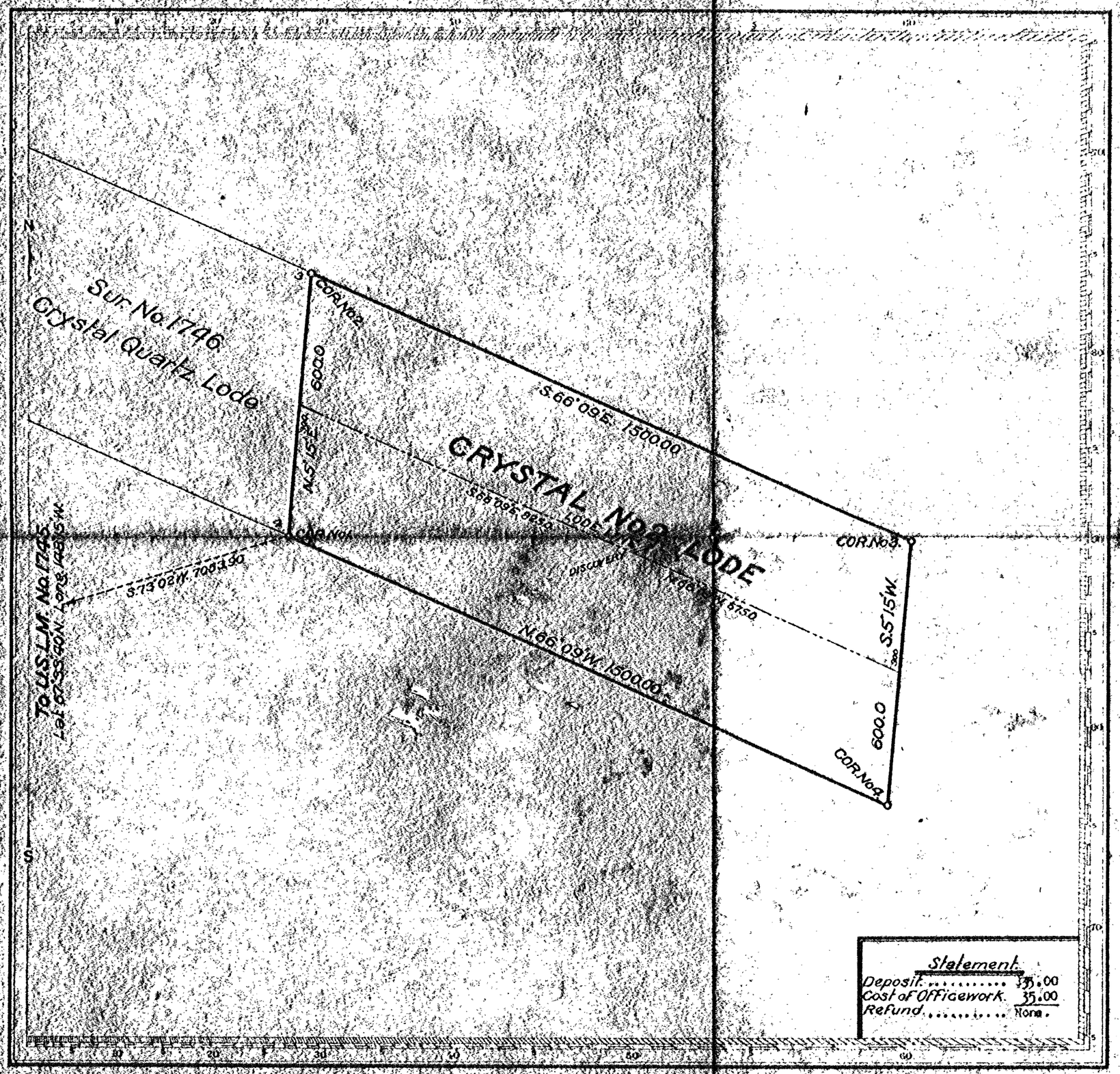
that the location of said improvements is correctly shown upon this plat, and that no portion of said labor or improvements has been included in the estimate of expenditures upon any other claim.

And I further certify that this is a correct plat of said Mining Claim made in conformity with said original field notes of the survey thereof, and the same is hereby approved.

Public Survey Office
Juneau, Alaska.
August 17, 1931.

C. C. Cheney
Cadastral Engineer in Charge
For Alaska.

(4-675)



Claim Located _____ 19_____

Mineral Survey No. 1998.

Lot No. _____

FAIRBANKS Land District.

PLAT

OF THE CLAIM OF

CHANDALAR GOLD MINES INC.

KNOWN AS THE

CRYSTAL NO. 2 LODE

IN CHANDALAR MINING DISTRICT,

TERRITORY OF ALASKA

Containing an Area of 19.582 Acres.

Scale of 200 Feet to the Inch.

Variation 33°45' - 34°15' E.

SURVEYED September 14, 1927 19_____

Irving McK. Reed U.S. Deputy Mineral Surveyor

The Original Field Notes of the Survey of the Mining Claim of CHANDALAR GOLD MINES INC. known as the CRYSTAL NO. 2 LODE

from which this plat has been made under my direction, have been examined and approved, and are on file in this Office, and I hereby certify that they furnish such an accurate description of said Mining Claim as will, if incorporated into a patent, serve fully to identify the premises, and that such reference is made therein to natural objects or permanent monuments as will perpetuate and fix the locus thereof.

I further certify that Five Hundred Dollars worth of labor has been expended or improvements made upon said Mining Claim by claimant _____ or _____ its _____ grantors and that said improvements consist of

1 Cut, Value $600.00

that the location of said improvements is correctly shown upon this plat, and that no portion of said labor or improvements has been included in the estimate of expenditures upon any other claim.

And I further certify that this is a correct plat of said Mining Claim made in conformity with said original field notes of the survey thereof, and the same is hereby approved.

Public Survey Office

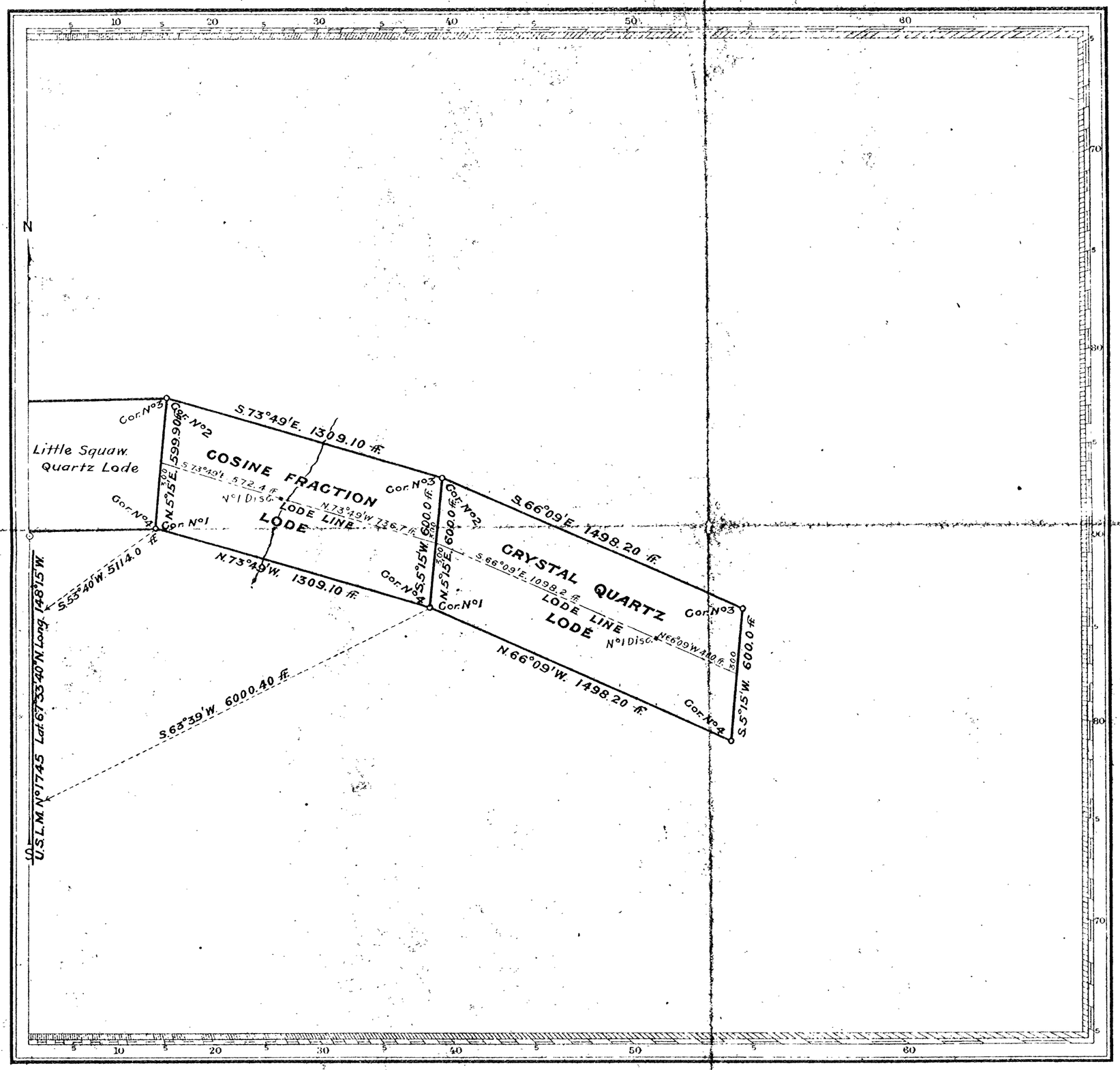
Juneau, Alaska

March 3, 1928

C. C. Cunningham

Cadastral Engineer in Charge.

(4-675)



Section B

Claim Located _____ 19__

Mineral Survey No. 1746

~~Lot No.~~ _____ Land District.

PLAT

OF THE CLAIM OF

KNOWN AS THE

IN _____ *MINING DISTRICT,*

COUNTY,

Containing an Area of _____ *Acres.*

Scale of _____ *Feet to the inch.*

Variation _____

SURVEYED _____ *19* ____ *BY*

_____,

U.S. Deputy Mineral Surveyor;

The Original Field Notes of the Survey of the Mining Claim of

known as the _____

from which this plat has been made under my direction, have been examined and approved, and are on file in this Office, and I hereby certify that they furnish such an accurate description of said Mining Claim as will, if incorporated into a patent, serve fully to identify the premises, and that such reference is made therein to natural objects or permanent monuments as will perpetuate and fix the locus thereof.

I further certify that Five Hundred Dollars worth of labor has been expended or improvements made upon said Mining Claim by claimant _____ *or* _____ *grantors and that said improvements consist of* _____

that the location of said improvements is correctly shown upon this plat, and that no portion of said labor or improvements has been included in the estimate of expenditures upon any other claim.

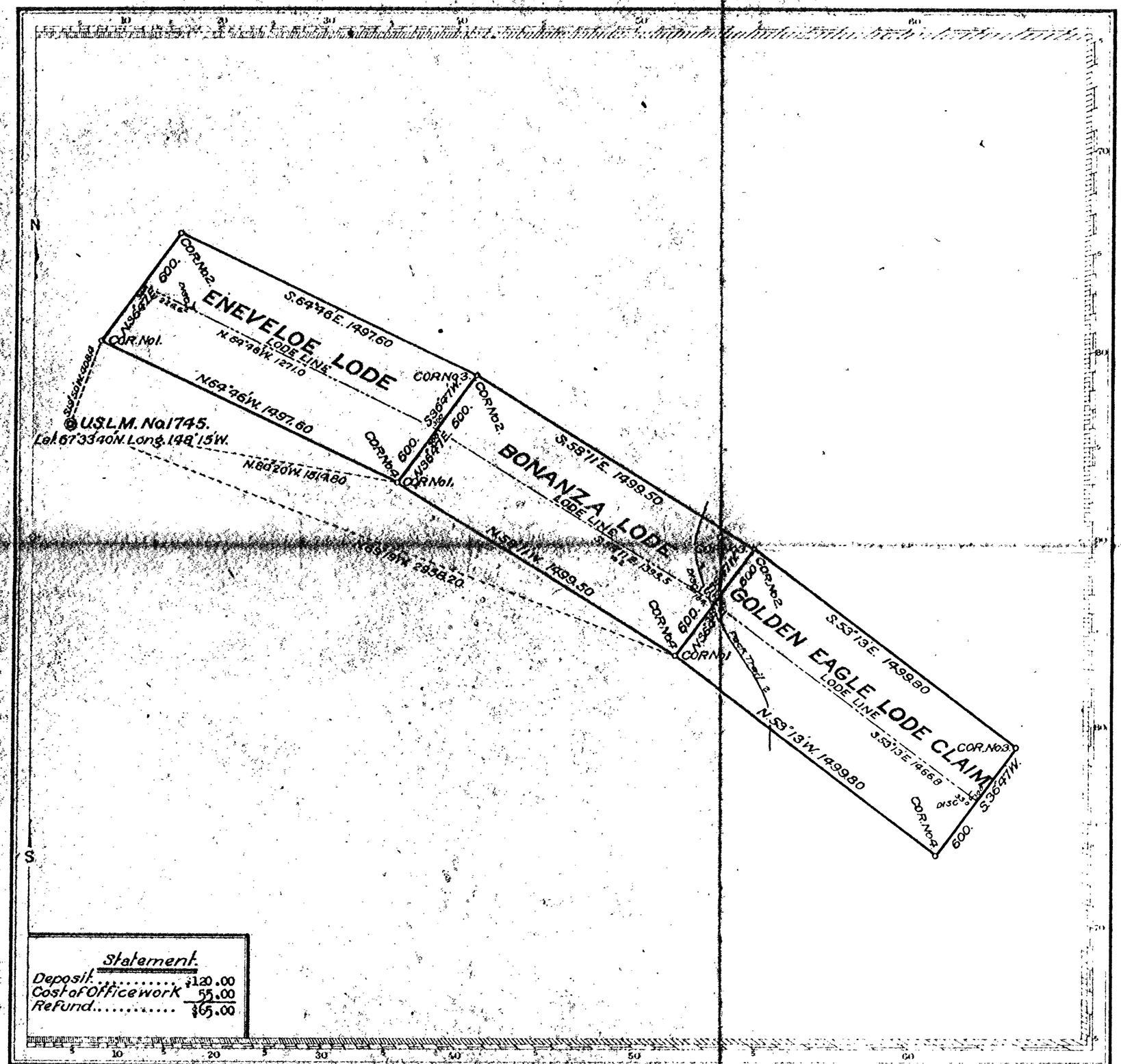
And I further certify that this is a correct plat of said Mining Claim made in conformity with said original field notes of the survey thereof, and the same is hereby approved.

U.S. Surveyor General's Office

U.S. Surveyor General for _____

19

(4-675)



Statement.

Deposit	$120.00
Cost of Office work	55.00
Refund	$65.00

Claim Located *19*

Mineral Survey No. **1995.**

Lot No. ...

CHANDALAR Land District.

PLAT

OF THE CLAIM OF

CHANDALAR GOLD MINES INC.

KNOWN AS THE

GOLDEN EAGLE LODE CLAIM, BONANZA LODE, ENEVELOE LODE

IN CHANDALAR *MINING DISTRICT,*

TERRITORY OF ALASKA

Containing an Area of 61.446 *Acres.*

Scale of 400 *Feet to the inch.*

Variation 33°30'-34°45'E.

SURVEYED September 16 - 18 *1927* *BY*

Irving McK. Reed *U.S. Deputy Mineral Surveyor.*

The Original Field Notes of the Survey of the Mining Claim of

CHANDALAR GOLD MINES INC.

known as the Golden Eagle Lode Claim, Bonanza Lode, Eneveloe Lode

from which this plat has been made under my direction, have been examined and approved, and are on file in this Office, and I hereby certify that they furnish such an accurate description of said Mining Claim as will, if incorporated into a patent, serve fully to identify the premises, and that such reference is made therein to natural objects or permanent monuments as will perpetuate and fix the locus thereof.

I further certify that Five Hundred Dollars worth of labor has been expended or improvements made upon said Mining Claim by claimant ... *or* its *grantors and that said improvements consist of* ...

1 Pit, 1 Pack Horse Trail, 3 Cuts, 2 Common Improvements, Total Value $5000.00

that the location of said improvements is correctly shown upon this plat, and that no portion of said labor or improvements has been included in the estimate of expenditures upon any other claim.

And I further certify that this is a correct plat of said Mining Claim made in conformity with said original field notes of the survey thereof, and the same is hereby approved.

Public Survey Office

Juneau, Alaska

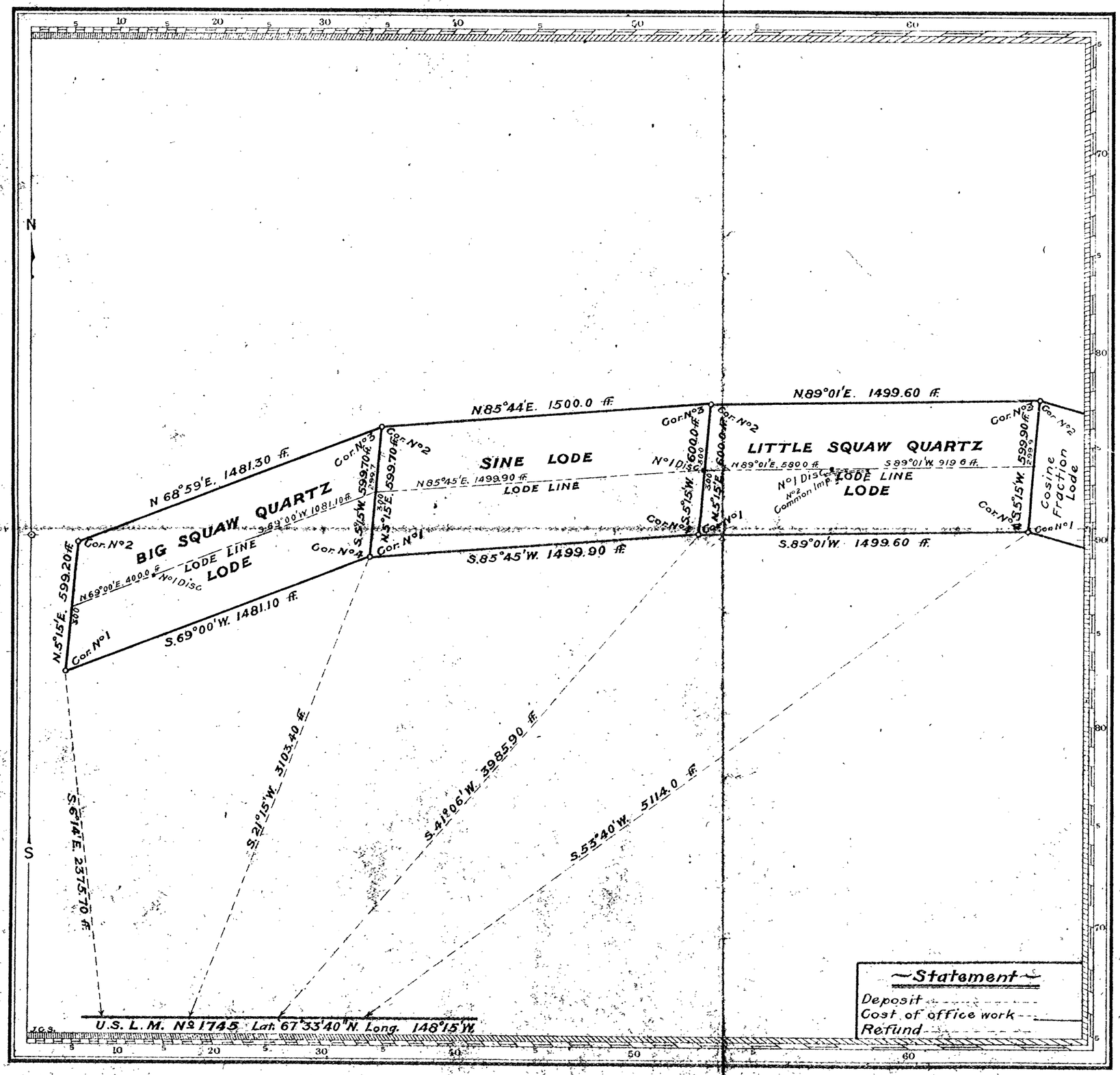
March 2, 1928

C. H. Cummins

Cadastral Engineer in Charge.

(4-675)

Section A



Claim Located June 8, 1908 - July 26, 1909.

Mineral Survey No. 1746

LOT No.

FAIRBANKS Land District.

PLAT

OF THE CLAIM OF

CHANDALAR GOLD COMPANY

KNOWN AS THE

LITTLE SQUAW QUARTZ, BIG SQUAW QUARTZ, SINE, COSINE FRACTION, AND CRYSTAL QUARTZ LODES,

IN CHANDALAR *MINING DISTRICT,*

TERRITORY OF ALASKA,

Containing an Area of 96.215 *Acres.*

Scale of 400 *feet to the inch.*

Variation 34°15'E.

SURVEYED August 20 - 30, 1924, *BY*

WM. A. HESSE,

U.S. Deputy Mineral Surveyor

The Original Field Notes of the Survey of the Mining Claim of CHANDALAR GOLD COMPANY *known as the* LITTLE SQUAW QUARTZ, BIG SQUAW QUARTZ, SINE, COSINE FRACTION, AND CRYSTAL QUARTZ LODES,

from which this plat has been made under my direction, have been examined and approved, and are on file in this Office, and I hereby certify that they furnish such an accurate description of said Mining Claim as will, if incorporated into a patent, serve fully to identify the premises, and that such reference is made therein to natural objects or permanent monuments as will perpetuate and fix the locus thereof.

I further certify that Five Hundred Dollars worth of labor has been expended or improvements made upon said Mining Claim by claimant ____ *or* its *grantors and that said improvements consist of* Five discoveries and one tunnel, Value, $9,625.00,

that the location of said improvements is correctly shown upon this plat, and that no portion of said labor or improvements has been included in the estimate of expenditures upon any other claim.

And I further certify that this is a correct plat of said Mining Claim made in conformity with said original field notes of the survey thereof, and the same is hereby approved.

U.S. Surveyor General's Office,

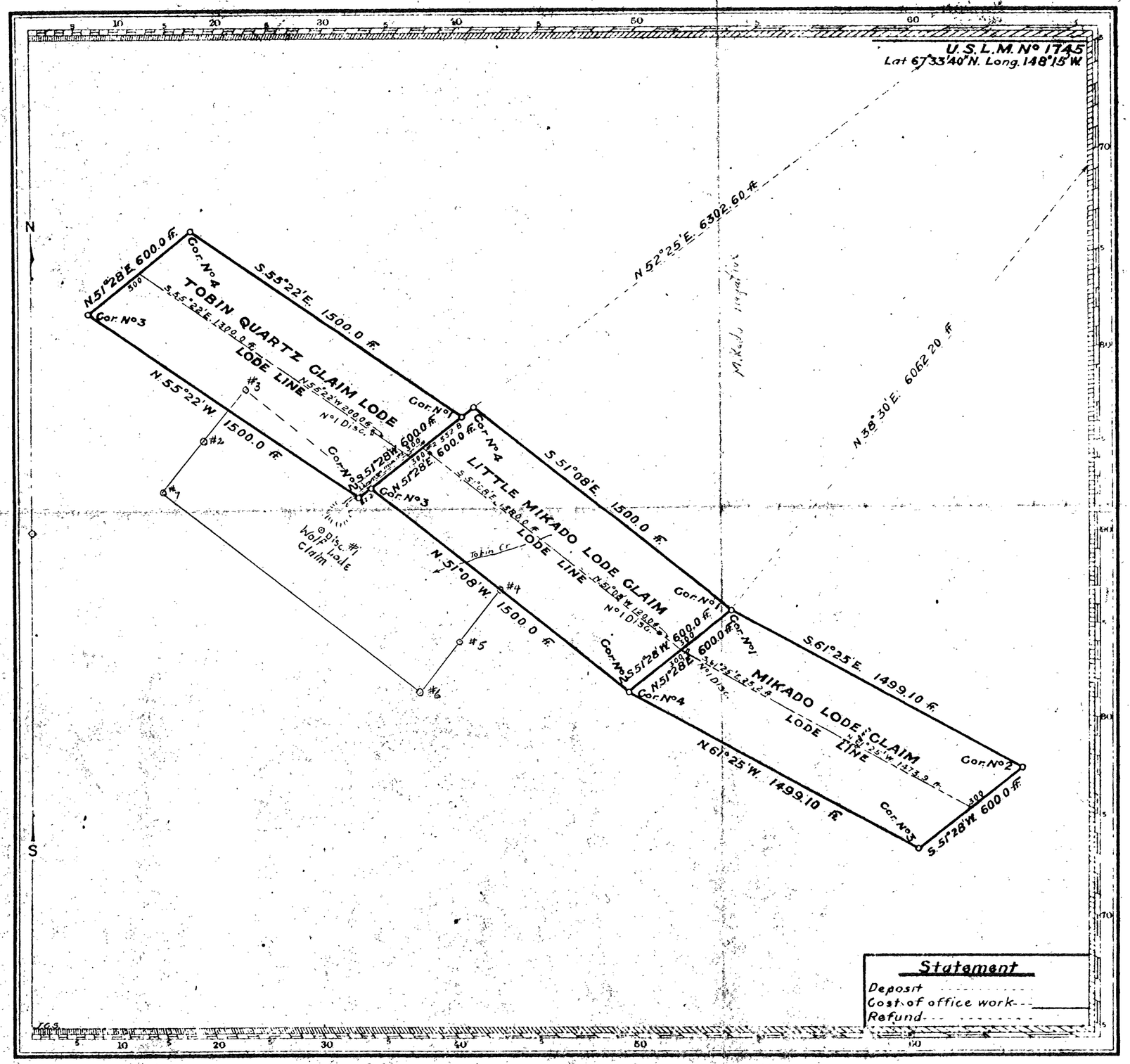
Juneau, Alaska,

November 11, 1924.

Earl Chesle

U.S. Surveyor General for Alaska.

(4-675)



Claim Located July 6 - 9, 1909.

Mineral Survey No. 1745

Lot No.

FAIRBANKS Land District.

PLAT

OF THE CLAIM OF

SOLOMON SMITH

KNOWN AS THE

TOBIN QUARTZ CLAIM LODE, MIKADO LODE CLAIM, AND LITTLE MIKADO LODE CLAIM,

IN FAIRBANKS *MINING DISTRICT,* TERRITORY OF ALASKA,

Containing an Area of 58.964 *Acres.*

Scale of 400 *Feet to the inch.*

Variation 34°15' E.

SURVEYED August 13 - 19, 1924, *BY*

WM. A. HESSE

U.S. Deputy Mineral Surveyor.

The Original Field Notes of the Survey of the Mining Claim of SOLOMON SMITH

known as the TOBIN QUARTZ CLAIM LODE, MIKADO LODE CLAIM, AND LITTLE MIKADO LODE CLAIM.

from which this plat has been made under my direction, have been examined and approved, and are on file in this Office, and I hereby certify that they furnish such an accurate description of said Mining Claim as will, if incorporated into a patent, serve fully to identify the premises, and that such reference is made therein to natural objects or permanent monuments as will perpetuate and fix the locus thereof.

I further certify that Five Hundred Dollars worth of labor has been expended or improvements made upon said Mining Claim by claimant ____ *or* its *grantors and that said improvements consist of* Three discoveries, one shaft, two cuts and one tunnel,

Value, $19,300.00.

that the location of said improvements is correctly shown upon this plat, and that no portion of said labor or improvements has been included in the estimate of expenditures upon any other claim;

And I further certify that this is a correct plat of said Mining Claim made in conformity with said original field notes of the survey thereof, and the same is hereby approved.

U.S. Surveyor General's Office

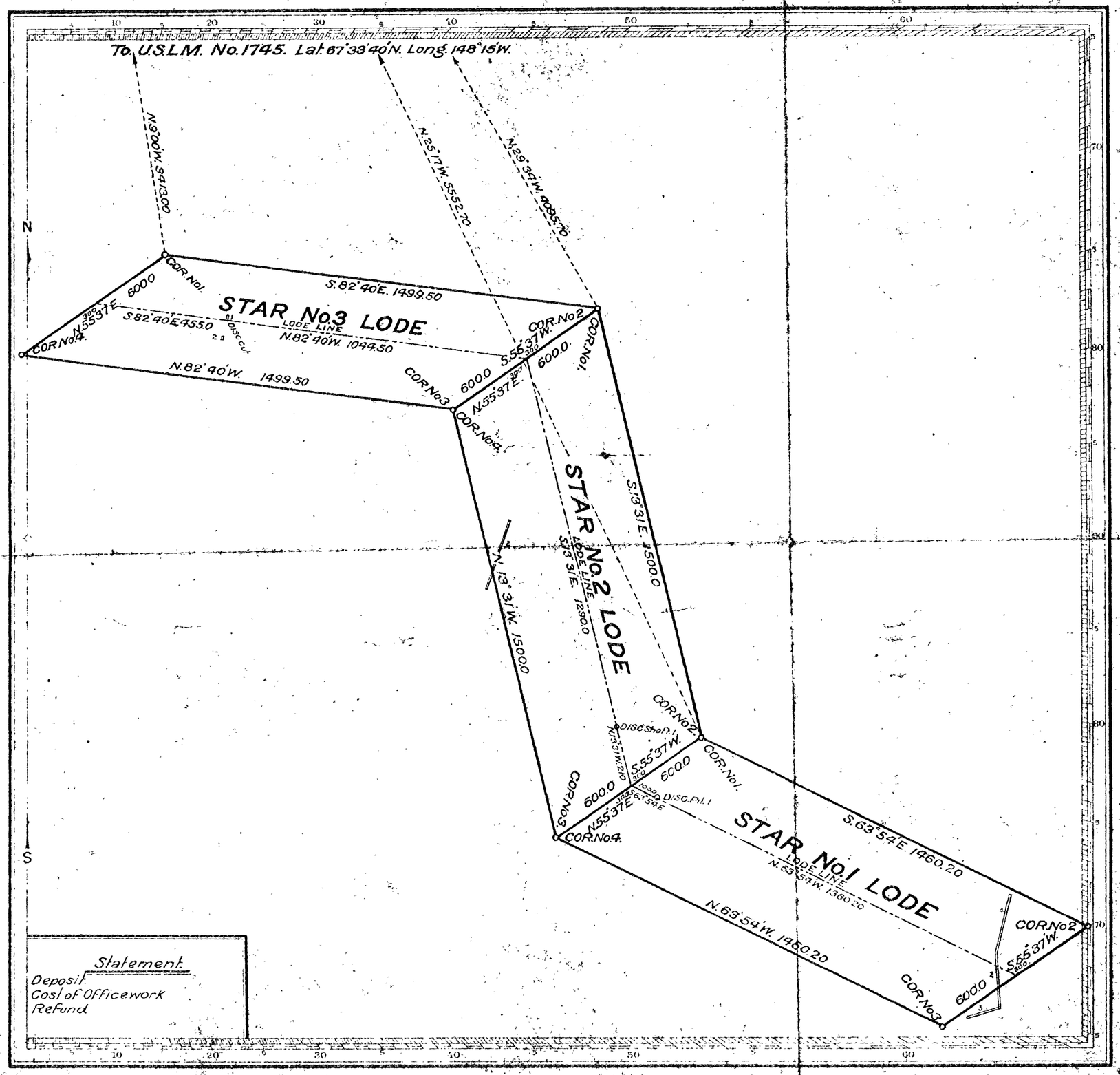
Juneau, Alaska,

November 11, 1924

U.S. Surveyor General for

Alaska.

(4-675)



Claim Located 1996. 19

Mineral Survey No.

LOT No.

FAIRBANKS Land District.

PLAT

OF THE CLAIM OF

CHANDALAR GOLD MINES, INC.

KNOWN AS THE

STAR NO. 1 LODE, STAR NO. 2 LODE, STAR NO. 3 LODE

IN CHANDALAR *MINING DISTRICT,*

TERRITORY OF ALASKA

Containing an Area of 50.553 *Acres.*

Scale of 300 *Feet to the inch.*

Variation 31°04' - 33°50'E.

SURVEYED September 18 - 20 1927 *BY*

IRVING McK. REED *U.S. Deputy Mineral Surveyor,*

The Original Field Notes of the Survey of the Mining Claim of CHANDALAR GOLD MINES, INC. *known as the* STAR NO. 1 LODE, STAR NO. 2 LODE, STAR NO. 3 LODE

from which this plat has been made under my direction, have been examined and approved, and are on file in this Office, and I hereby certify that they furnish such an accurate description of said Mining Claim as will, if incorporated into a patent, serve fully to identify the premises, and that such reference is made therein to natural objects or permanent monuments as will perpetuate and fix the locus thereof.

I further certify that Five Hundred Dollars worth of labor has been expended or improvements made upon said Mining Claim by claimant or its *grantors and that said improvements consist of* 1 pit, 1 shaft, 6 open cuts. Total Value $3620.00

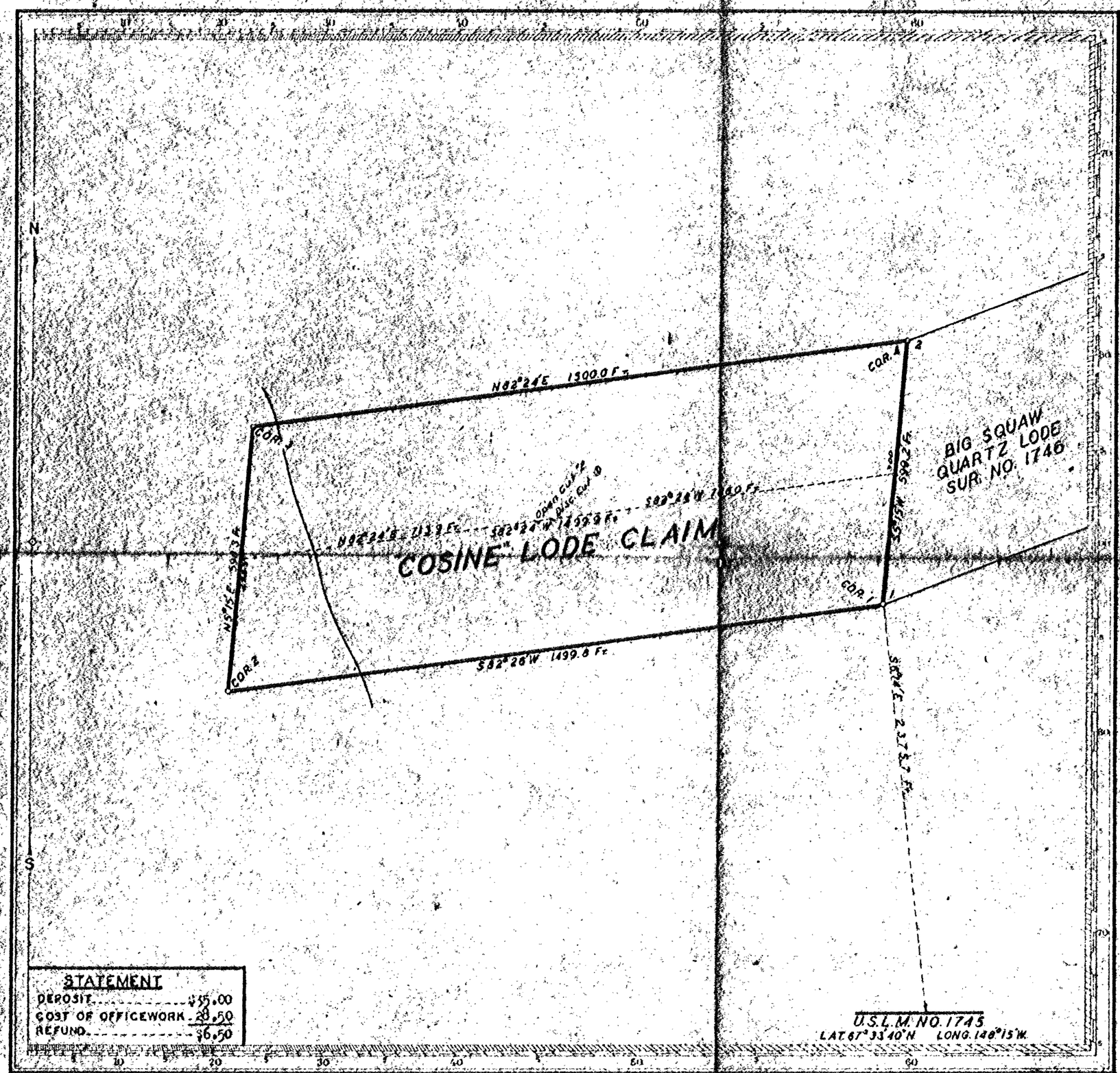
that the location of said improvements is correctly shown upon this plat, and that no portion of said labor or improvements has been included in the estimate of expenditures upon any other claim.

And I further certify that this is a correct plat of said Mining Claim made in conformity with said original field notes of the survey thereof, and the same is hereby approved.

Public Survey Office
Juneau, Alaska
February 14th 1928

C. C. Ruth
U. S. Cadastral Engr.
in charge

(4-675)



Claim Lode(s)

Mineral Survey No. 1997

Lot No.

FAIRBANKS Land District

PLAT

OF THE CLAIM OF

CHANDALAR GOLD MINES LTD.

KNOWN AS THE

COSINE LODE CLAIM

LY. Chandalar MINING DISTRICT,

Territory of Alaska

Containing an Area of 20.102 Acres

Scale of 200 Feet to the inch.

Variation 33°30' E. to 34°15' E.

SURVEYED September 15, 1927 BY

Irving Lore Reed U.S. Deputy Mineral Surveyor

The Original Field Notes of the Survey of the Mining Claim of Chandalar Gold Mines Ltd.

known as the Cosine Lode Claim

Have been examined and approved, and are on file in this office, and I hereby certify that the description, showing the location of said Mining Claim as well as the original plat, serve fully to identify the premises, and that such reference is made therein to natural objects or permanent monuments as will perpetuate and fix the lines thereof.

I further certify that Five Hundred Dollars worth of labor has been expended or improvements made upon said Mining Claim, by claimant or its grantors and that said improvements consist of

2 open cuttings

Value $60.00

that the location of said improvements is correctly shown upon this plat, and that no portion of said labor or improvements has been included in the estimate of expenditures upon any other claim.

And I further certify that this is a correct plat of said Mining Claim made in conformity with said original field notes of the survey thereof, and the same is hereby approved.

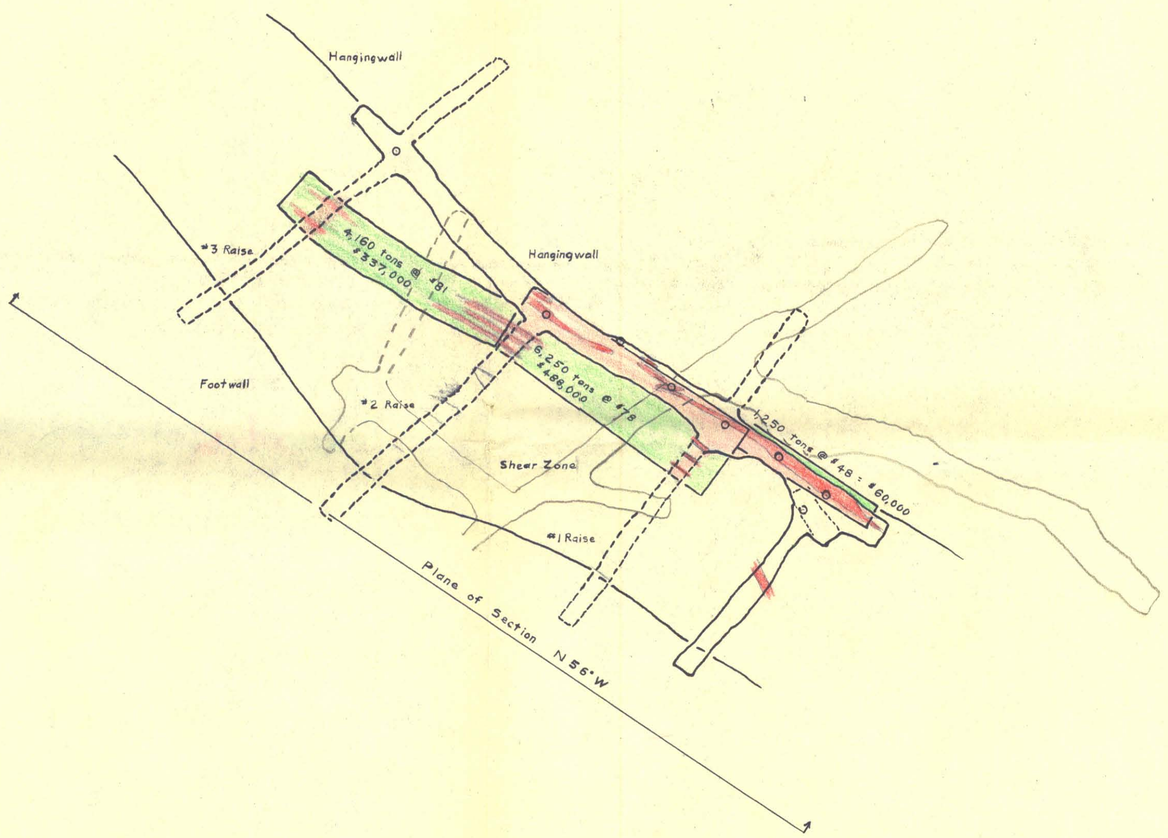
Public Survey Office

Juneau, Alaska

March 14 1928

C. E. Martin

Cadastral Engineer in Charge.

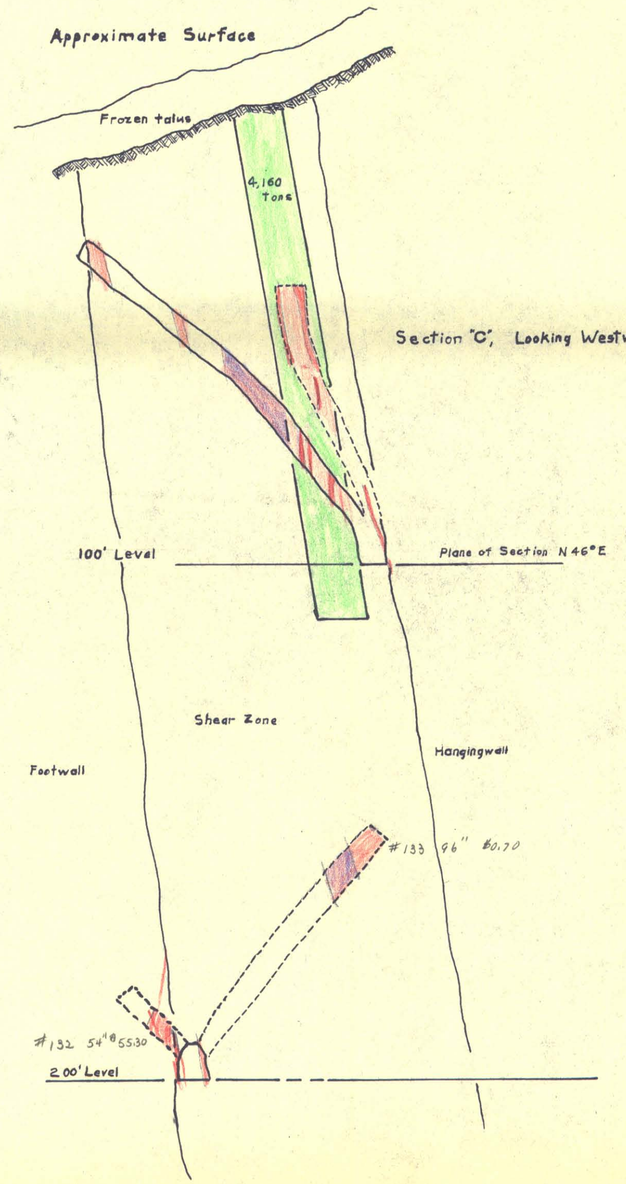


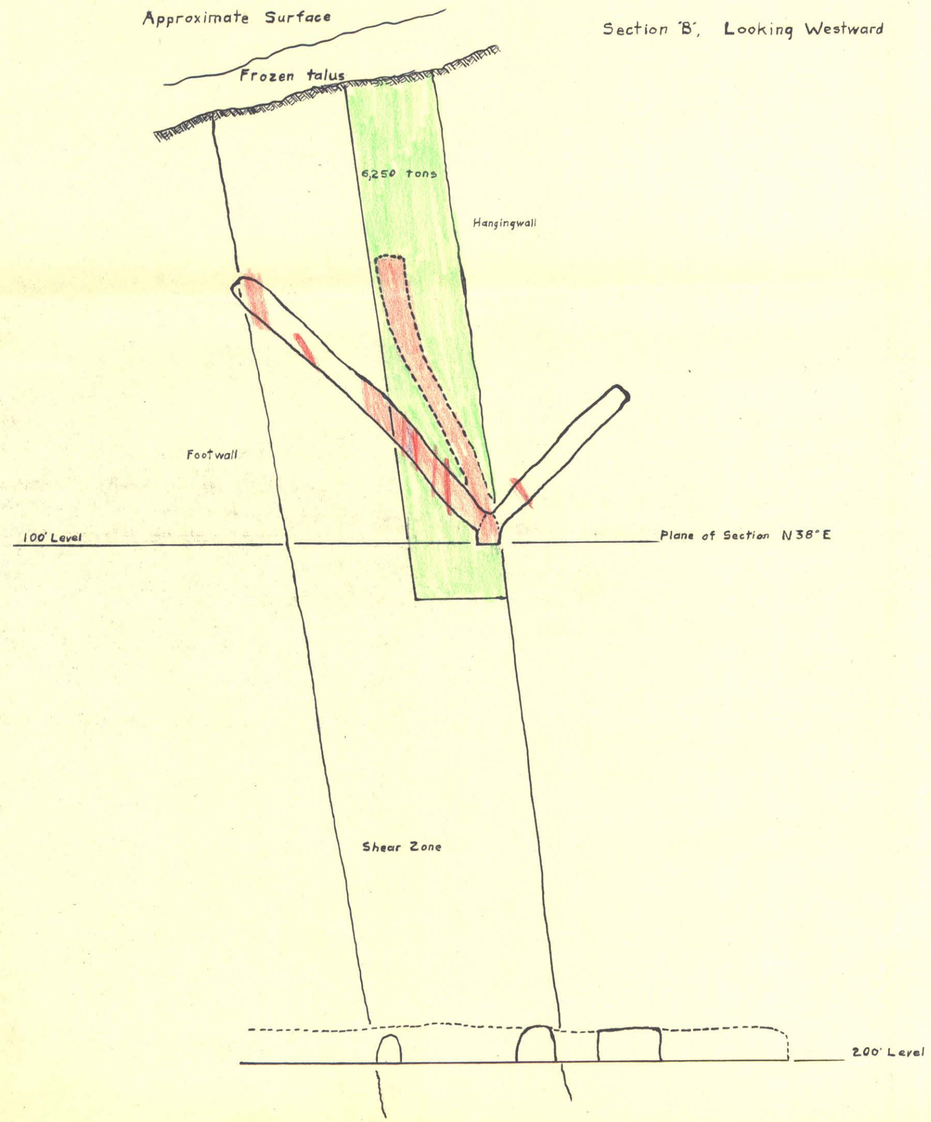
MIKADO MINE
CHANDALAR, ALASKA
Plan of 100' Level showing Indicated Ore Blocks

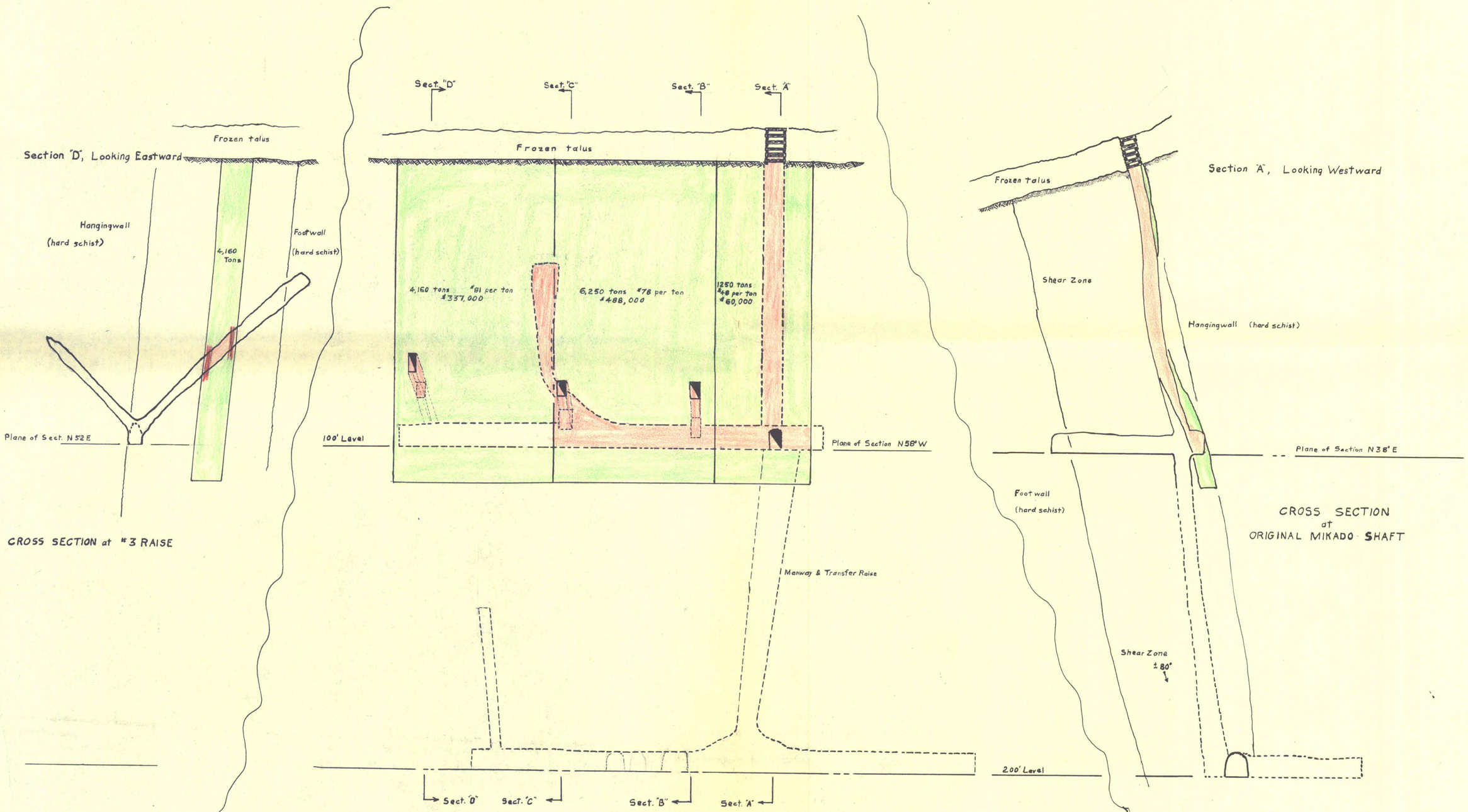
Scale: 1" = 20' Jan., 1961 By: F.E. Birch

MIKADO MINE
CHANDALAR, ALASKA
Cross Sections of Ore Blocks

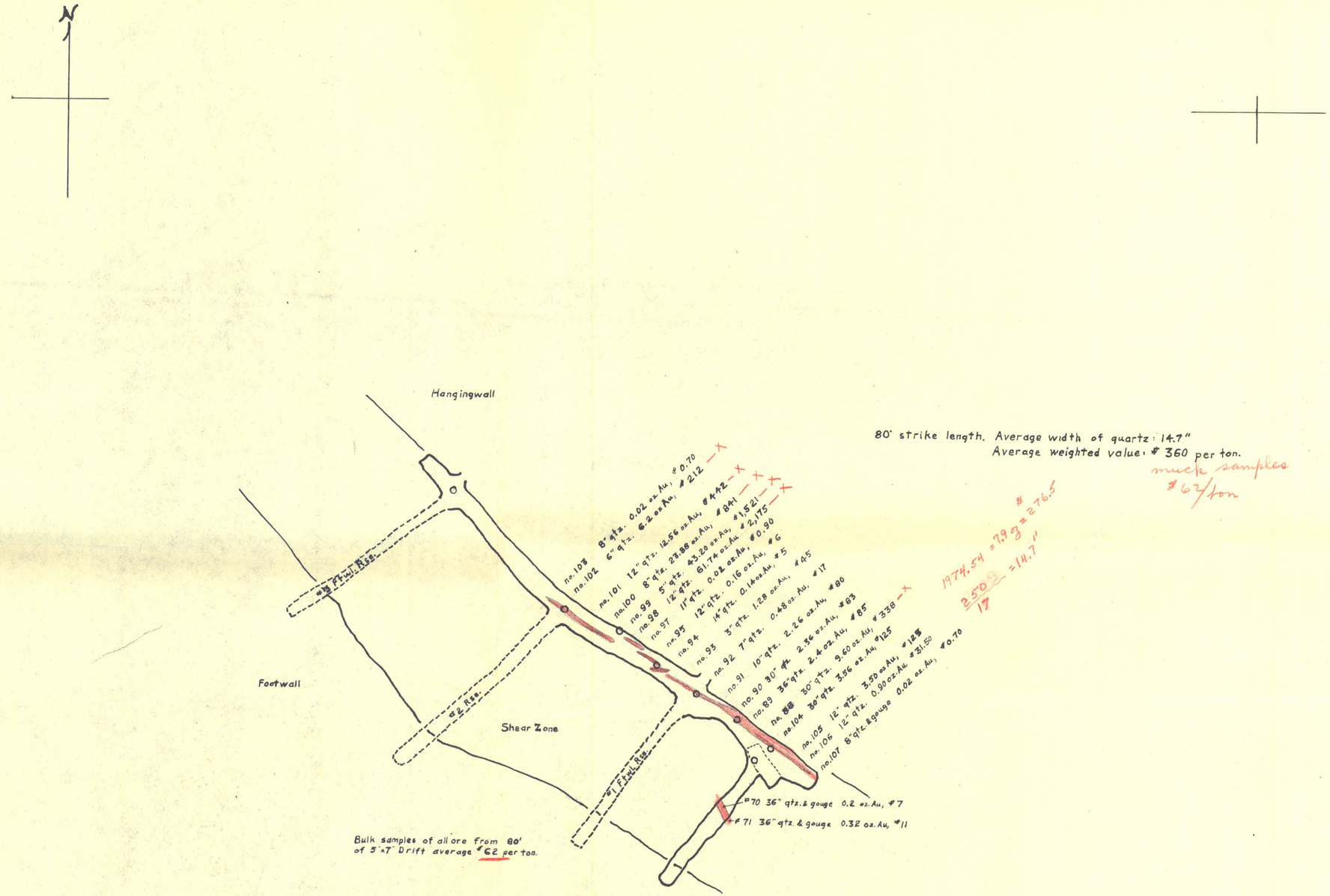
Scale: 1" = 20' Jan., 1961 By: J.E. Birch





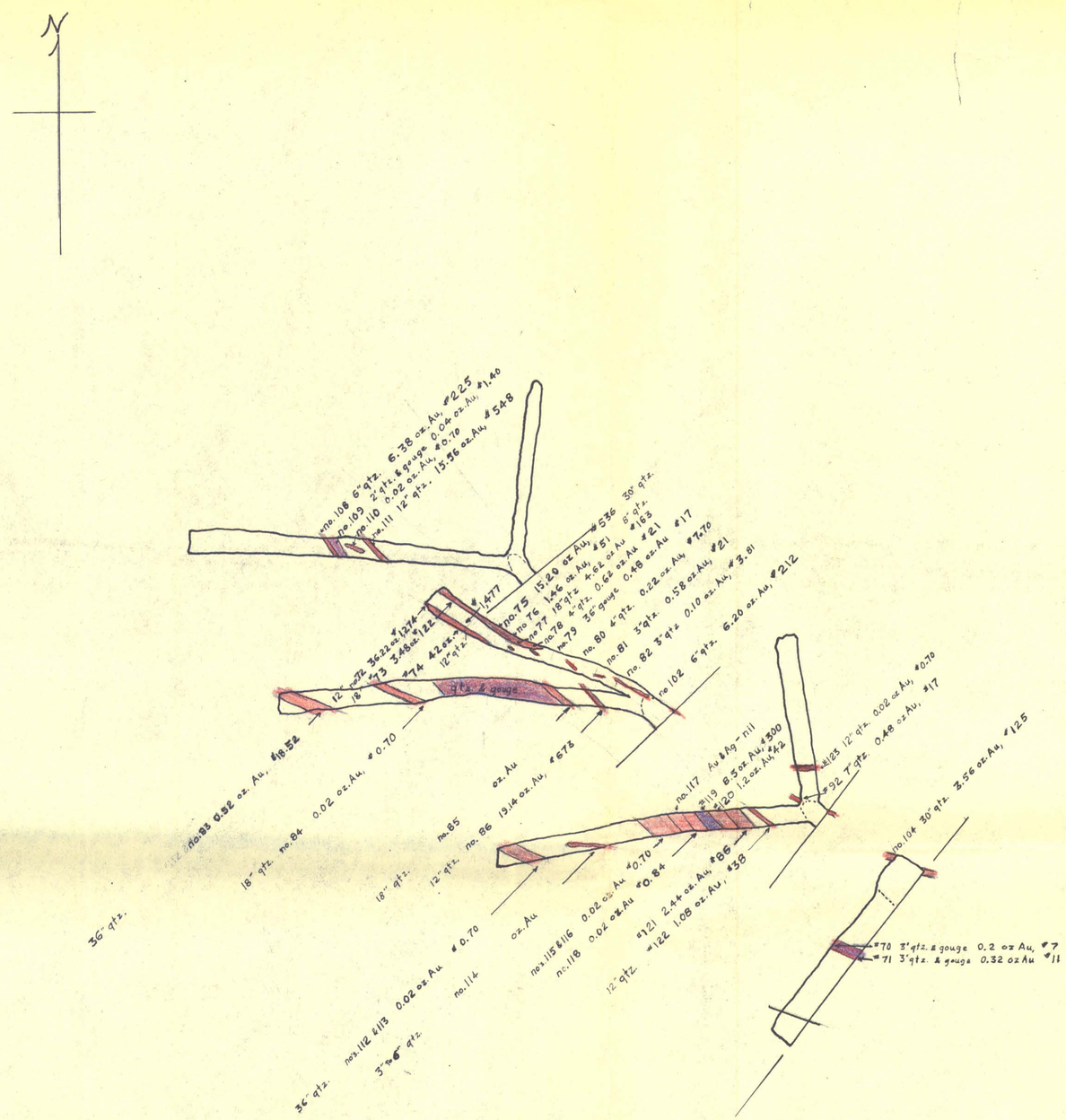


MIKADO MINE
CHANDALAR, ALASKA
Vertical Longitudinal Projection of 100' & 200' Levels showing Indicated Ore
viewed looking Northward
Scale: 1" = 20' Jan., 1961 By: Frank Birch



MIKADO MINE
CHANDALAR, ALASKA
Plan of 100' Level

Scale: 1" = 20' Dec., 1960
By: Frank Birch



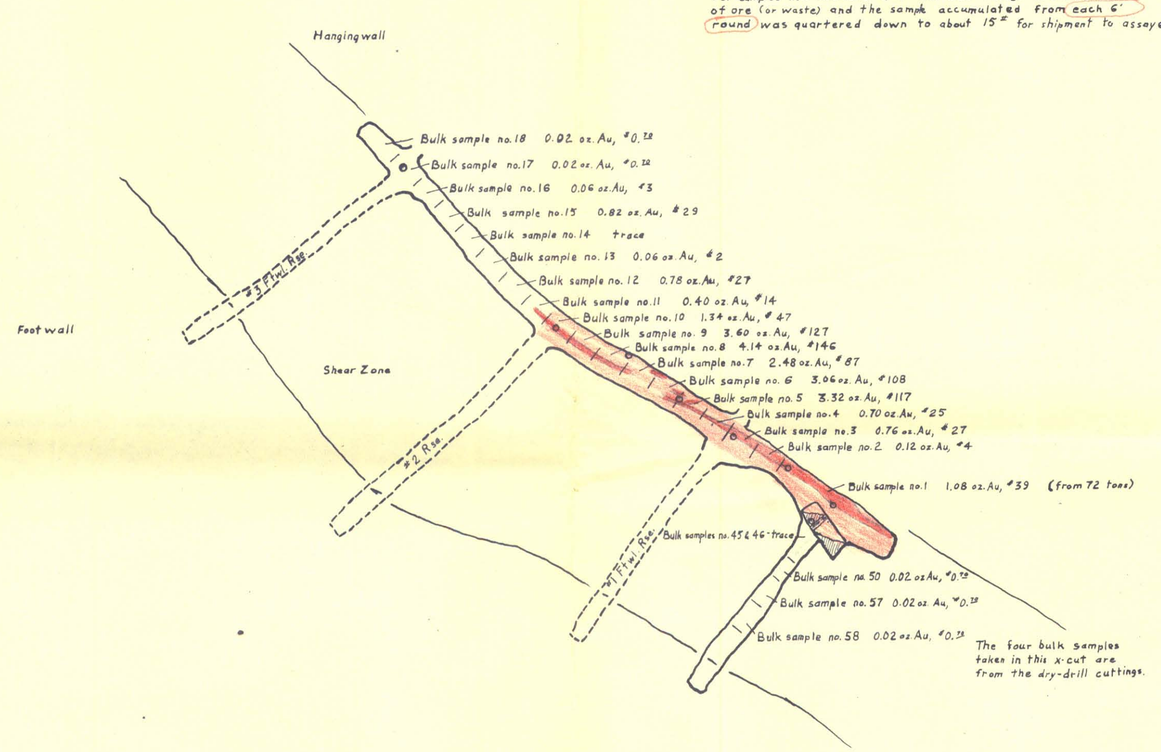
Chip samples cover areas shown in red.

MIKADO MINE
CHANDALAR, ALASKA
100' Level Cross Sections

Scale: 1" = 20'

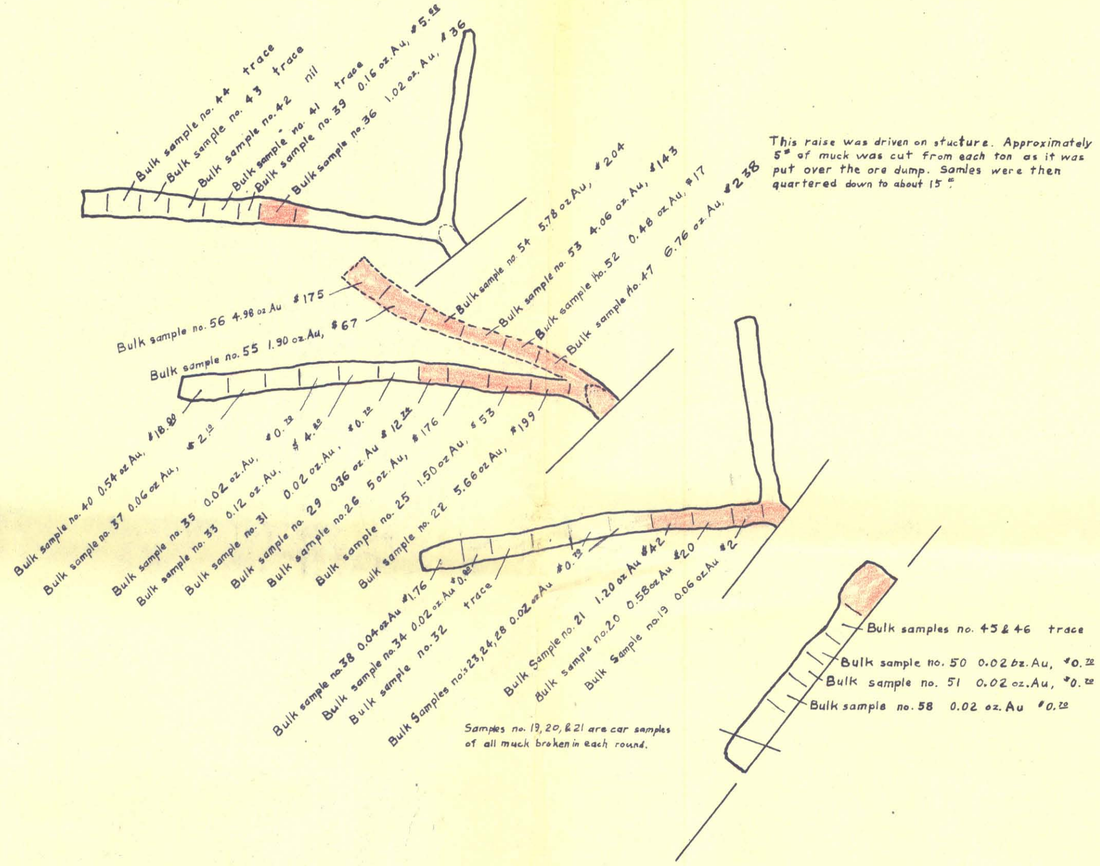
December, 1960
By: J. E. Buck

For samples no.1 thru no.18 a 5# cut was taken from each ton of ore (or waste) and the sample accumulated from each 6' round was quartered down to about 15# for shipment to assayer.



MIKADO MINE
CHANDALAR, ALASKA
Plan of 100' Level

Scale: 1" = 20'
December, 1960 By: Frank Bird



This raise was driven on stucture. Approximately 5" of muck was cut from each ton as it was put over the ore dump. Samles were then quartered down to about 15".

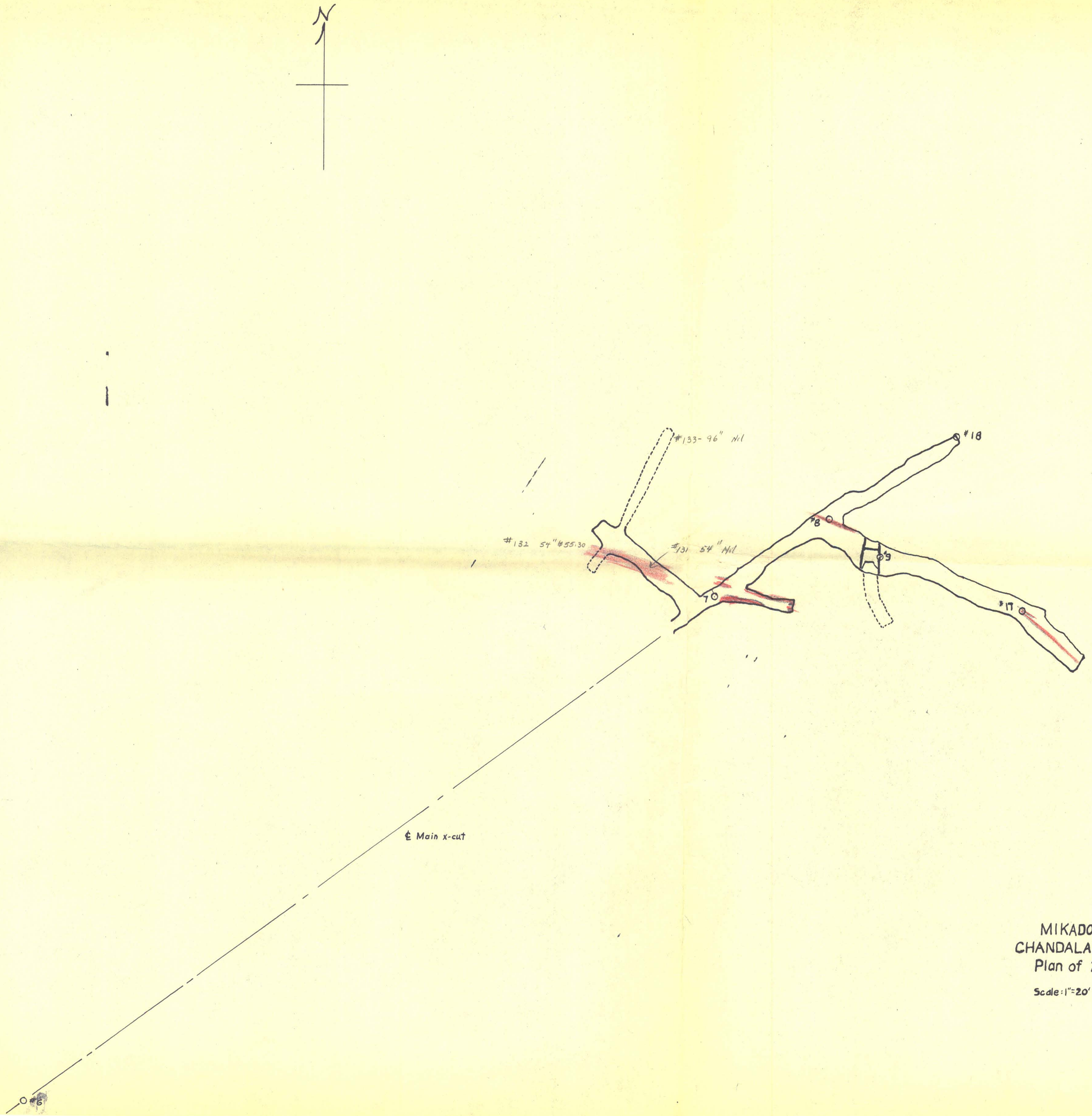
Samples in the x-cut raises were taken from the mixture of dry-drill cuttings from the 14 to 18 holes drilled per round.

Samples no. 19, 20, & 21 are car samples of all muck broken in each round.

MIKADO MINE
CHANDALAR, ALASKA
100' Level Vertical X-Sections

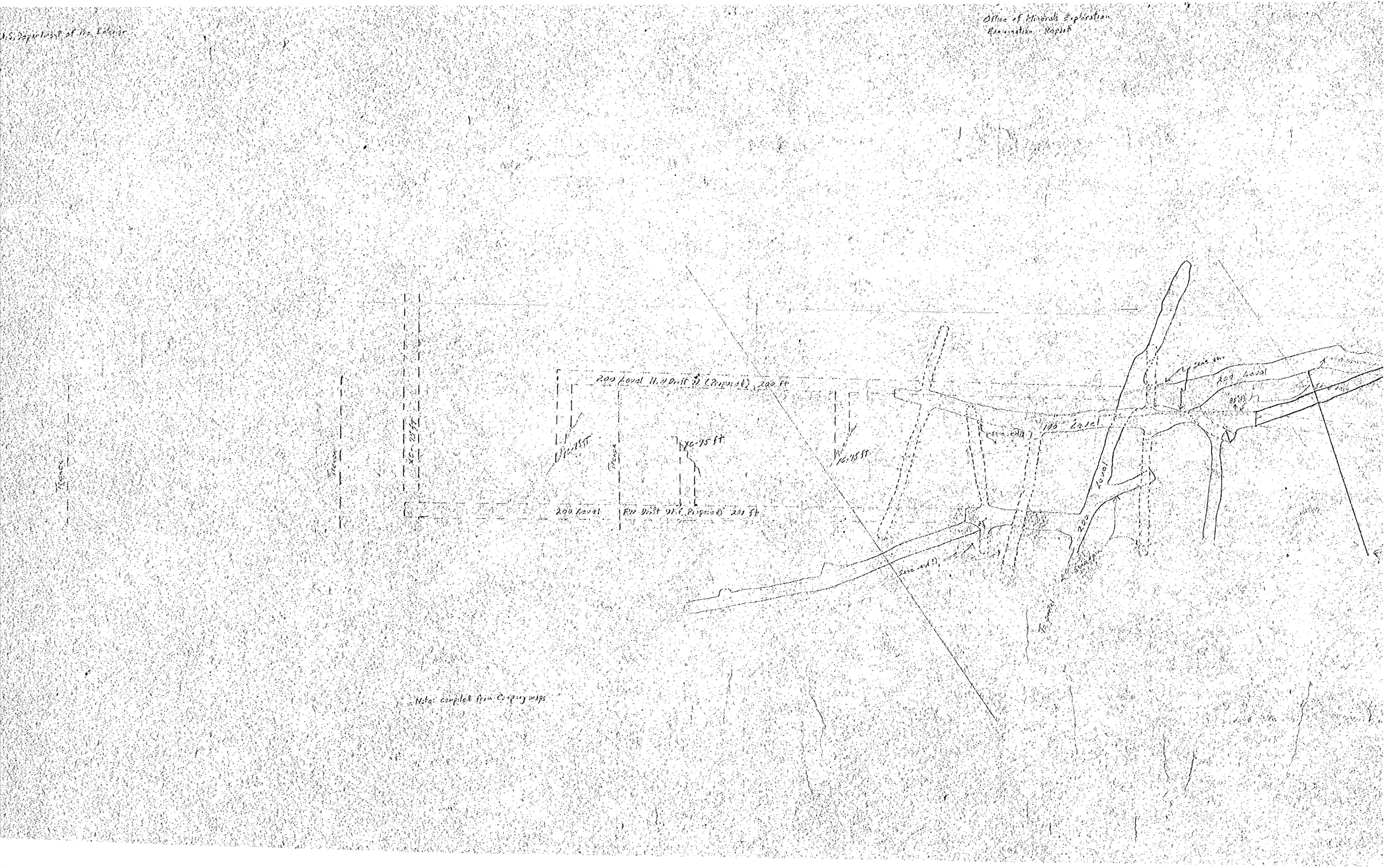
Scale: 1" = 20'

December, 1960
By: F. E. Birch



MIKADO MINE
CHANDALAR, ALASKA
Plan of 200' Level

Scale: 1"=20' December, 1960
By: J.S. Birch

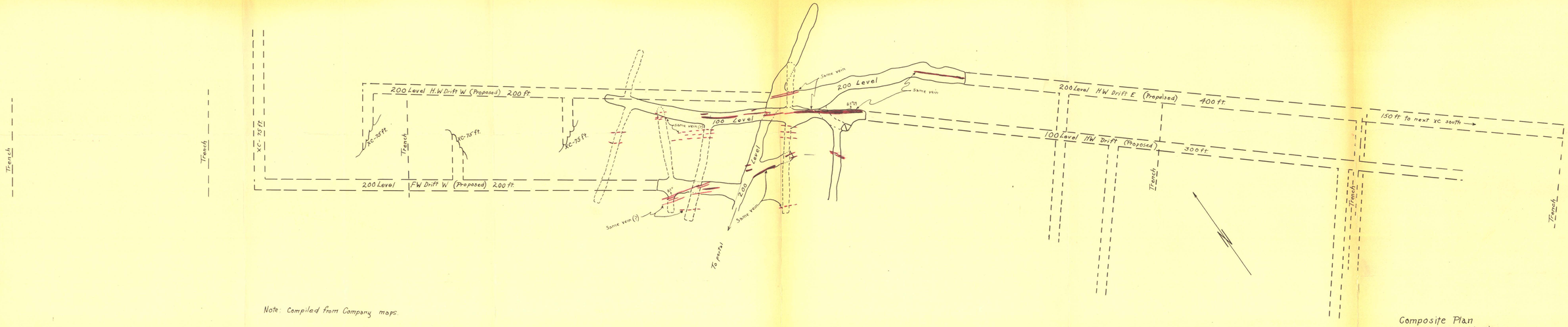


Note: compiled from Company maps

U.S. Department of the Interior

Office of Minerals Exploration
Examination Report

OME-6148



Note: Compiled from Company maps.

Composite Plan
100 and 200 Level Workings
Little Mikado Mine
Little Squaw Mining Company
Fairbanks Precinct Alaska

20 10 0 20 feet

November 1961
Plate 1

R. Timms 12/19/61

OME-6148