

1930

REPORT ON THE LITTLE SQUAW AREA OF THE CHANDALAR MINING DISTRICT

NOTED

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LOCATION AND EXTENT

The Little Squaw Area of the Chandalar Mining District is in an isolated group of mountains of about 100 square miles in extent between latitudes 67°30'N. and 67°35'N. and longitudes 148°05'W. and 148°25'W. It lies about 80 miles directly north of the town of Beaver on the Yukon River and probably constitutes the most northerly mining camp in the world.

PREVIOUS DESCRIPTIONS

This area has been previously described in U.S.G.S. Bulletin No. 532 by A. G. Maddren and in Bulletin No. 773, pages 215 to 263, by J. B. Mertie.

RELIEF AND DRAINAGE

The Little Squaw Area is bounded on the west by the low, broad valley of the North Fork of the Chandalar, which is really the Chandalar River proper. Directly to the west, occupying the floor of this valley is Chandalar Lake, about 8 miles long and 1½ miles wide. On the east the area is bounded by the valley of the Middle Fork of the Chandalar River which lies parallel to that of the North Fork and is very similar in its characteristics, with no such large lake, however, occupying the valley floor. The area is bounded on the north by a low glacier-cut valley which runs about S.60°E. from the North Fork, at least as far as the East Fork of the Chandalar River. For the sake of brevity this valley will be

called Glacier Valley. The area is bounded on the south by another low-lying valley approximately parallel to Glacier Valley on the north and at present occupied by lower Tobin Creek, Squirrel Creek and the middle part of Big Creek. The North Fork above Chandalar Lake is a very sluggish stream, winding through many sloughs, the valley showing every evidence of having been occupied by a large glacier. Below the lake the river continues of the same nature for five or six miles, then runs over bedrock in a series of rapids for about 1/2 mile. These rapids probably constituted a fall at one time, the lake being at a higher level.

The valley of the Middle Fork, as said before, is very similar to that of the North Fork. The stream in its upper valley is very sluggish. But a short distance below Dictator Creek it runs over bedrock in a series of riffles. So far as could be seen, this same parallelism holds good for the East Fork of the Chandalar River.

Glacier Valley drains both to the North Fork through Lake Creek and to the Middle Fork through Grave Creek. The divide between these two drainages is almost imperceptible. The floor of the valley is occupied by many large lakes and old morainal deposits, the same general characteristics continuing to the eastward as far as could be seen. The valley lying to the south of the area is not so well-defined but constitutes more of a swale or narrowed lowland lying east and west between higher uplands. Big Creek running south into this swale turns sharply to the southeast for several miles and then breaks to the south again and back southwest so as to occupy a valley almost directly south of the one in which it originally headed. Squirrel Creek drains the swale to the northwest into Tobin Creek which occupies it then as far as the

North Fork.

The mountains in this area all range around about five thousand feet in altitude, the equality of elevation in their summits suggesting an old land surface. The streams that have cut into this mountain mass have an extremely steep gradient and are running ~~2~~ in narrow, V-shaped valleys. They drain outward in all directions from the central part of the area although the biggest peak surveyed lies in the southeast part.

#### COMMUNICATION AND TRANSPORTATION

The Alaska Road Commission has cut a wagon road 74 miles from Beaver on the Yukon River to Caro on the Chandalar. From Caro there is a trail 48 miles long up Big Squaw Creek and over the divide to Little Squaw. The wagon road can be used in late fall and early winter for hauling but it is too wet in summer for general use. From the mouth of St. Mary's Creek to Spring Creek at Little Squaw, the trail is about 8 ft. wide and though very steep, could be used by pack horses.

Most of the freighting is done by dogteams in winter. Freight rates are 8 cents a pound from Beaver to Caro by horse team and 7 cents a pound from Caro to Little Squaw by dogteam. Both rates are for winter haul.

At Little Squaw Creek there is a landing field for airplanes. This field lies at an altitude of about 2300 ft. It is so small and at such a high altitude that little freight could be taken in by airplane and landed on it. Squaw Lake could be used by Amphibian planes if such were brought in to Fairbanks for the interior Alaskan trade. The distance from Fairbanks by airplane is about 180 miles. The rates are \$200 one way for a single

passenger, and \$150 apiece for more than one passenger. In 1926 a radio station was established at Little Squaw by the U. S. Signal Corps. This was however abandoned in 1928. Although there is a post office at Little Squaw, there is no mail service into the district. There is no means of communication with the district except by occasional dogteam in winter or by airplane or foot travel in summer.

#### SETTLEMENT AND POPULATION

The main point of supply to the Little Squaw Area is the town of Beaver on the Yukon River. Most of the miners in the district winter here, freighting in their supplies in spring and fall. Beaver has a rather fluctuating population of probably 150 souls, most of them native Eskimos.

At Caro on the Chandalar River there is a roadhouse run by a whiteman and his native wife. Also a few natives winter at this place.

In the district proper there are at present not more than nine white men at any time. Four of these are employed by the Chandalar Gold Mines on quartz development work. The others are engaged in prospecting and mining on their own account.

#### GEOLOGY.

The country rock of this area is a very hard mica schist. This schist in places is crossed <sup>by</sup> with dikes of greenstone, pebbles of which are very numerous in the gravels of some of the creeks. The plane of schistosity, where observed on Big and Little Squaw Creeks, pitched<sup>s</sup> at a very flat angle to the south and the schist weathers by a system of joint planes into long rectangular or pointed slabs. The Little Squaw area apparently has been a part of a system of uplands bordering on a northwest-southeast drainage

system. This drainage system evidently ran through what is now the valley of Lake Creek and Grave Creek or Glacier Valley. Whether this system drained to the southeast or out to the northwest at one time is problematical. However, the <sup>impression</sup> ~~feeling~~ is given in looking over the country that the whole of the northern area of the Koyukuk range had been tilted to the south. The decrease in the relief as one goes towards the southeast would seem to indicate that the original drainage had been towards the southeast from the Chandalar District. It would seem that the main divide or height of land had been during the <sup>Tertiary</sup> ~~Tertiary~~ from the Baby Mountains and the headwaters of the South Fork of the Koyukuk westward. The drainage was towards the north and south from this point. The drainage in the Little Squaw area was mainly to the southeast. Before the Quaternary this drainage has been changed and accentuated in the Little Squaw Area by a tilting of the whole of this part of Alaska to the south, placing the divide further to the north at the present summit of the Arctic Mountains or Brooks Range.

The valley which is now occupied by Chandalar Lake and that part of the North Fork of the Chandalar down to the rapids, originally flowed north into the stream flowing to the southeast in Glacier Valley. Big Creek drained to the northwest through Squirrel Creek and Tobin Creek into the above northward flowing part of the North Fork valley and eventually to Glacier Valley.

During the Quaternary, Glacier Valley was filled with ice. The ice cut through the low pass where the rapids of the Chandalar River are at present and established a new drainage system directly south. At the same time the retreat of the ice and the morainal material blocked the old drainagesystem through Glacier Valley. This last probably also happened in the Middle Fork

valley, though not so plainly marked as in the North Fork valley because of the earlier retreat of the ice from Middle Fork valley and also because the divide to the south here was probably lower. The bedrock channel where the rapids of the North Fork now stand was probably 100 to 150 ft. higher than at the present time. The lake thus formed after the retreat of the ice is gradually being filled in by sediments which also filled in the lower end of all creeks bordering on the lake. This would account for the great silt filling of lower Tobin Creek and the great depths to bedrock on Eskimo Creek. Afterwards the North Fork cut down the rapids barrier so low that it began to drain the original Chandalar Lake and cause the creeks to incise themselves into and re-work the silt filling. This action is continuing and will finally completely drain the lake.

#### PLACER MINING

The first gold in this area was discovered by Thomas G. Carter, Frank Yasuda and Charles McNett in 1905 on No. 1 Above Discovery on Little Squaw Creek. The known gold-bearing creeks that have been prospected or mined in the district are: Big Squaw Creek, Little Squaw Creek, St. Mary's Creek, Big Creek and Tobin Creek. Of these, the main producers have been Little Squaw Creek, St. Mary's Creek, Big Creek and Big Squaw Creek in order of importance as named. K-31-18

#### Little Squaw Creek K-31-17

The geology of Little Squaw Creek has been fully described by Dr. J. B. Mertie on pages 254 to 259 in U.S.G.S. Bulletin No. 773. However, one of the puzzling factors in the geology of this creek is the distribution of the gold in the post glacial channel from Claim No. 3 Above downstream. This will be brought out more

fully in discussion of lodes on the creek. The gradient of this creek is from about 4455 ft. elevation on the divide between Little Squaw and Big Creek to 2300 ft. on the creek bed just opposite Commissioner Carlson's cabin. The creek has been mined from Discovery Claim to the upper end of No. 4 Above. The depth to bedrock on the upper part of the creek is about 25 ft. On No. 1 Above Discovery the depth to bedrock in the bed of the present creek is about 102 ft. On the lower end of Discovery Claim the depth to bedrock in the bed of the creek is about 130 ft. At the present time no one is mining on the creek with the exception of Manuel Mello on the upper end of No. 2 Above, who is re-running some tailings in order to make room for a winter dump in the winter of 1932-1933. Values on the creek have run in places to as high as \$10 a square foot. The richest part was on claims No. 2 and No. 3 Above, the pay rapidly decreasing above and below this point. There is probably no chance of finding more pay on the creek.

#### Big Squaw Creek

No one at present is mining on this creek nor has been for several years. It has been mined from about 500 ft. below the southwest corner of the Jupiter Lode to the mouth of Robin Gulch. There was very little gravel in the creek bed in this section, just above Robbin Gulch the creek running on bedrock for over 300 ft. However a narrow cut was mined in the creek bed where there was sufficient low gradient to hold the gravel and such gold as there was. On Lower Big Squaw Creek several shafts have been started but have always been drowned out as the ground is unfrozen at depth. On Gold Gulch, a small right limit tributary below Little Squaw Peak, two shafts have been sunk near the mouth to bedrock. No results were obtained from these shafts.

St. Mary's Creek

This creek was the second largest producer in the Little Squaw Area. It is a small right limit tributary joining Big Creek about 2 miles from its head. This creek has been entirely mined out and no one is at present working on it. It was extremely rich when first mined, running as high as \$8 per square foot. The ground was very shallow, especially in the upper part, averaging not over 6 ft. deep. The pay streak was very narrow, averaging about 10 ft. wide.

Big Creek 14311

Big Creek has been mined and prospected from Upper Discovery about 1 mile above the mouth of Pedro Creek to 8 Below Upper Discovery. At Upper Discovery Arthur Newton, who owns Discovery and No. 1 Below, has been mining for many years by shovelling-in and ground sluicing with a splash dam. The ground here averages about 12 ft. deep and ran about \$1200 to the box-length or \$8 a sq. ft. At present the ground is worked out and Newton is doing no work on it this year. Unless water can be secured so that he can re-work it by hydraulicking or some other cheaper method, he is through.

On Claim No. 5 Below Upper Discovery O. J. Nicholson, who owns No. 3 Below, No. 4 Below and No. 5 Below, has been working since 1922. The ground is around 20 to 22 ft. deep and has been worked mainly by drifting. It is only partly frozen and great difficulty is encountered in drifting it. He did not work in the summer of 1930 but expects to get in lumber and build a ditch in the summer of 1931 so as to open the ground up by hydraulic methods. Below Nicholson there is a little pay on No. 6 and No. 7 Below but it rapidly diminishes and is lost on No. 8 Below Upper Discovery. One of the great difficulties of working on Big Creek is its high altitude and the difficulty of getting supplies and timber to it.



Timber has to be hauled 12 miles by dogteam from lower Big Creek to Nicholson's mine.

Tobin Creek 31-24

Ellis Anderson has been prospecting by himself on Tobin Creek for several years. To my notion Tobin Creek has the best chance for making a new producer in the Chandalar District of any other creek so far seen. About 1/2 mile below the lower end or southwest corner of the Tobin lode, Anderson put in a cross cut of 4 or 5 shafts. These ranged from 30 to 40 ft. deep. There was no pay in this cross cut and only a little fine gold found. About 3/4 mile below this cross cut he is at present making another cross cut. The first shaft has been sunk 60 ft. to bedrock but without results. About 3/4 mile below the mouth of Woodchuck, William Hesse and associates sank a line of holes across the valley of Tobin Creek. The first 3 holes sunk on the left limit, were spaced 100 feet apart and were only 15 ft. deep. The next hole spaced 100 ft. farther towards the right limit, was 50 ft. deep. The next hole, spaced 250 ft. more towards the right limit was 170 ft. deep. In none of these holes nor in the one finished hole of Anderson's last cross cut, was pay struck, only fine gold being found as a prospect in any hole. About 1/4 mile up Woodchuck Creek from the mouth and on the left limit a hole was sunk 80 ft. deep without reaching bedrock. Very good prospects are claimed to have been found in this hole though it was never finished because of lack of supplies. It is apparent from the map that Woodchuck Creek is the main creek and really the head of Tobin Creek. Woodchuck crosses the general east-west systems of small veins in the country rock and is more likely to have gold bearing gravels in it than upper Tobin Creek. Anderson has demonstrated that in all probability

upper Tobin Creek does not carry pay. If the line of holes on Tobin Creek below Woodchuck were continued further towards the right limit, there would be a very good chance of getting pay. This cross-cut should by all means be finished by the prospectors in the district. Where the prospect was found on Woodchuck, a line of holes should be put down to bedrock as it is possible that in this place or below it, there may be a pay streak. Whether it would be sufficiently rich or not to pay to mine in this district is of course problematical.

#### Big McClellan and Little McClellan Creeks

Good prospects have been reported in early days on these creeks though it is very peculiar if this is so that no further prospecting has been done on them by the miners of the district.

#### Dictator Creek

14-31-25

This creek is a right limit tributary of the Middle Fork of the Chandalar River and rather out of the area under consideration. Chris Olson prospected on this creek for several years. He sank a shaft 190 ft. deep by himself but was drowned out before reaching bedrock in the spring of 1930 and all his work came to nothing.

#### Agitator, Trilby and Rock Creeks

Encouraging prospects have been found in these creeks in early days but no mining has been done nor is anyone at present prospecting on them.

#### Middle Fork River

In early days about 1/2 mile above the mouth of Trilby Creek, coarse gold up to \$6 or \$7 a day was picked up on bedrock outcropping in the stream bed. No further work has been done at this place.

Slate Creek, Our Creek and Bridge Creek

The first is a northern tributary of Grave Creek. The second is a large creek near Bend Mountain. The third is a large left limit tributary of North Fork River. Very encouraging prospects were found on the first two in early days. Prospects have been reported also in 1926 on Bridge Creek.

LODE MINING

Lode mining in the Big Squaw Area is still confined to prospecting. The largest holder in this area is the Chandalar Gold Mines Inc. Their holdings are at present surveyed for patent or patented, and consist of:

A string of lode claims running from Crystal Peak on the divide between Little McClellan Creek and Little Squaw Creek to Caribou Gulch on Big Squaw Creek; 6 claims lying south of Little Squaw Peak on the divide between the heads of Big Squaw Creek and Little Squaw Creek; 3 claims lying south of St. Mary's Peak and north of St. Mary's Creek; and 3 claims at the head of Tobin Creek and St. Mary's Creek. They also hold 3 mill sites on Spring Creek, Big Creek and Tobin Creek respectively.

On the Little Squaw Lode claim just west of the trail on Little Squaw Creek, an adit has been driven into the mountain for 185 feet. At 160 ft. from the portal a raise was put in 75 ft. to the surface and at 135 ft. from the portal a winze was sunk 60 ft. The vein apparently is about 4 ft. wide. The dip is about 80° to the south and in the winze flattens to 60° and then swings back to 80° again. The vein narrows in the winze where the dip flattens to 60° and then widens again below. Enclosed is

~~As~~ an assay map of this adit furnished by the company. In it the average values will be seen to run around \$80 a ton. Sampling done by an engineer during the summer of 1930 averaged about \$16 a ton. A mill run at the Spring Creek millsite with a 2-stamp mill, since dismantled, is said to have averaged a recovery of \$22 a ton for the 27 tons run.

Apparently there were two periods of mineralization in this vein. On the south side of the vein there is a small streak along the hanging wall from 4 to 8 inches wide which carries very high values. The values in the rest of the vein apparently are rather low-grade. The first mineralization evidently carried very low values. Subsequent opening up of the vein ~~lead~~ to a mineralization carrying much higher values. As seen by the assay map the vein is faulted at the end of the adit. This part of the adit was filled with ice so that it was impossible to enter it beyond the raise, therefore the fault could not be examined. It is said that the drag indicated that the movement had been from the end of the adit to the northwest along the fault. However, this is purely conjectural as no engineer has been able to verify the above statement. There is on the surface a barren vein to the southeast of the locus of the end of the adit which may be the continuation of the Little Squaw vein. If so the secondary mineralization occurred after the faulting and the lack of prospects in Gold Gulch can be accounted for. However, only exploratory work will bring this out. The company in the winter of 1930-1931, is supposed to go 100 ft. below the adit and try to pick up the vein on the surface by an open cross-cut.

All the other work done on this long string of claims is in the nature of pits and small cross-cuts which do not show

anything that can be of use in estimating the value or nature of the lead, if such it is.

At 3/16 About 3/4 mile along the trail south of this last group of claims known as the Little Squaw-Big Squaw Group, is what is known as the Eneveloe-Venus group. This group lies just south of Little Squaw Peak on the divide between the heads of Big Squaw and Little Squaw Creeks. The work on this group of claims consists of small pits and cross-cuts which, with <sup>one</sup> ~~one~~ exception, have no material use for determining the nature or value of any vein or lead.

The above exception is on Woodchuck claim just southeast of a small eminence at the northwest corner. Here a distinct vein has been uncovered about 3 ft. wide and with very clearly defined walls. This vein is traceable about 100 ft. on the surface. No work has been done on it whatsoever except this one small cross-cut. No values are known.

At 3/16 About 3/4 mile south of the Eneveloe-Venus group is the Star group of claims lying just south of St. Mary's Peak. A few cross-cuts and pits have been made on Star. No. 3 Lode and on No. 1 Lode. On Star No. 2 Lode a 10-foot shaft was sunk in quartz near the southeast boundary line.

At 3/12 About 1 ~~and~~ 1/2 miles directly west of the Star group of claims is the Tobin-Mikado group. A shaft on the Little Mikado Lode at its western end was sunk 100 ft. This shaft is filled with water and impossible to get down in. Just below the southeast corner of the Tobin Lode an adit has been run north into the mountain for about 450 ft. This adit is supposed to come out directly under the shaft aforesaid. However, from compass observations, it looks as though it would end a little to the west of the shaft. It

is claimed that this adit need only be run 40 ft. more to intersect the vein. The company has let a contract to finish this adit ~~in~~ ~~at~~ 50 feet further into the mountain.

On Little Squaw Creek about 3/4 mile north of the Little Squaw-Big Squaw group of claims of the Chandalar Gold Mines, is an old abandoned adit in a quartz lead. It is said that this lead was more or less barren and would not pay to work.

On Robbin Gulch about 500 ft. below the western end of the Eneveloe Lode, a man named Robbin ran an adit south into the divide between Robbin Gulch and the head of Big Squaw Creek. This adit was filled full of ice and could not be entered. However, it is understood that <sup>it</sup> ~~he~~ did not <sup>recall</sup> ~~strike~~ the lode which outcrops on the mountainside a little above the adit. After <sup>Robbin's</sup> ~~his~~ death no one finished the work and it has been entirely abandoned.

On the divide between the head of Little Squaw Creek and Big Creek and just south of the Golden Eagle Lode, Charles Schulz owns 2 lode claims. Just west of the trail he has put in a small shaft and run several cross cuts. This shaft is understood to have been about 60 ft. deep, the lead pinching out in the bottom. The lead was followed by open-cutting to the westward up the hill towards St. Mary's Peak. It pinched out in this direction also. About 1/4 mile east of the trail and on the Little Squaw Creek slope, Schulz ran an adit to the south towards Big Squaw Creek, attempting to pick up the lead. This attempt was not successful.

East from ~~2~~ the Star No. 1 Lode towards a small gulch coming in on the left limit of Big Creek, Arthur Newton owns 2 lode claims. In the bed of Big Creek on ~~through~~ <sup>the</sup> American Eagle Lode the lead was picked up in the course of placer mining

operations and a shaft 40 ft. deep <sup>was</sup> sunk thereon. The 2-stamp mill which was subsequently moved to Spring Creek on the Little Squaw Creek side of the divide, was erected at this place and a test mill-run made of the ore. This mill-run proved that the ore was too low-grade to pay under present conditions although Newton claims that not over 30 per cent of the gold was recovered. Attempts to pick<sup>up</sup>/this lead to the westward near the Star No. 1 Lode by open-cuts have proved unsuccessful. South of the Star No. 1 Lode and overlooking Big Creek on the right limit various trenches and pits have been made on the hillside showing outcroppings of quartz. On St. Mary's Peak to the north of the Star Group and towards the Eneveloe-Venus Group many pits and cross-cuts have been made in various quartz outcroppings. None of these evidently showed enough values to warrant further work.

There apparently are in this part of the Little Squaw District several parallel east-west zones of movement in the country rock. One of these would be about 3/4 mile north of the Little Squaw-Big Squaw group of claims. Another is on the Little Squaw group of claims running from just south of Crystal Peak to Gold Gulch. Another lies through Caribou Gulch, Robin Gulch, the head of Little Squaw Creek to just north of Venus Peak. Another lies south of Venus Peak and on the head of Big Squaw Creek. Another apparently lies along the head of Tobin Creek and the left limit of St. Mary's Creek, crossing Big Creek to the north of Newton Peak. These zones of movement in the rock seem to be in the nature of lines of weakness along which the rock has moved from an east-west thrust. This movement opened up in these zones small cavities and gash veins which have been filled with quartz. Movements have taken place at several different times leading to different periods of

quartz filling and mineralization as exemplified in the Little Squaw Lode. It is not to be looked for that any large continuous lead or one of any depth will be found in this area on account of the nature of this movement. The long line of claims of the Little Squaw-Big Squaw Group between Caribou Gulch and Crystal Peak does not represent a continuous lead. It only represents small gash veins found here and there along a zone of movement in the country rock. The opening up of ~~some~~<sup>some</sup> of these gash veins by means of open-cuts and pits, has given the resemblance to a continuous vein. No continuity between these veins can be found. The bend in this line of claims to the south is not a bend along a zone of movement but represents a crossing from one zone to another. This observation also holds good for all the other veins examined in the Little Squaw Area.

This type of vein will explain the peculiar nature of the placers on ~~the~~ Little Squaw Creek. If the creek cut in the course of eroding its bed, small gash veins, the gold would be localized in certain streaks. Therefore in the post-glacial channel of Little Squaw Creek on and below Claim No. 3 Above, the pay streak indicates the time in the life of the creek when it cut and eroded out a very rich gash vein in its bed. The gravels above and below this pay streak would therefore be barren as no gold would be brought down by the creek during the time that these gravels were deposited. This local nature of the gold leads also would account for the barren creeks which are apparently on a direct line to be crossed by a lead and which would thereby be thought to be very rich. It will well be seen that the richness of the placers on this account would be very erratic in the Little Squaw Area. Unless these gash veins prove to be very numerous and extensive enough so



that the country rock can be mined with them, it is not to be looked for that any large gold quartz mine will ever develop in the Little Squaw Area.

#### SOURCE OF MINERALIZATION

Numerous pebbles and cobbles of a light-colored granitic rock (judged in the field to be a biotite granite) examined on upper Tobin and Big Creeks, would suggest that the mineralization was due to an intrusion of this rock somewhere along the divide between these two creeks. This intrusion was not seen in place. No cobbles or pebbles of granitic rock were found on any of the other creeks examined.

*See map file  
for sample locations  
Big Creek  
R.S.*

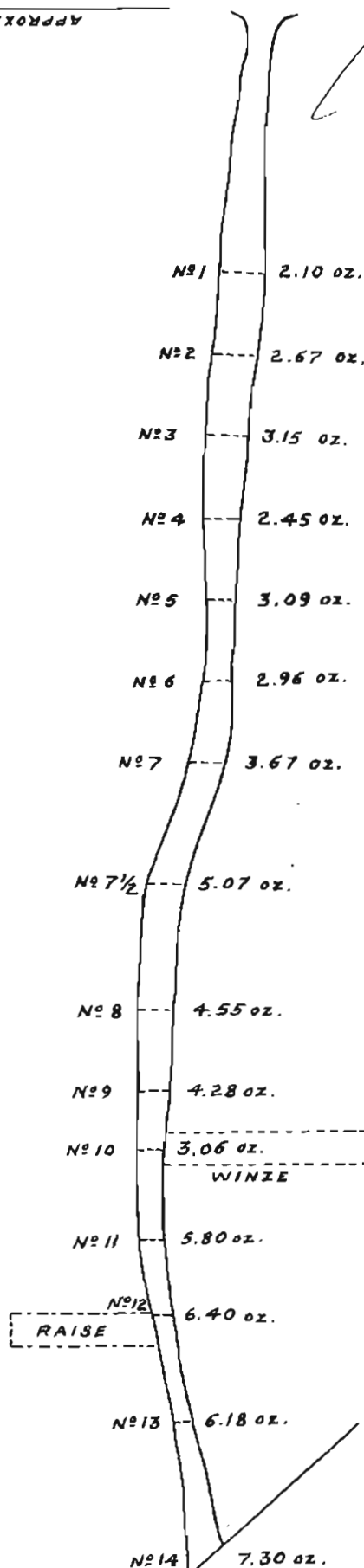
U.S. GEOLOGICAL SURVEY  
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UNEAU, ALASKA

APPROX. NORTH

SCALE: 200 FT. = 1 IN.



ASSAY MAP OF LITTLE SQUAW MINE ADIT

FURNISHED BY CHANDALAR GOLD MINES, INC.  
ENGINEER UNKNOWN

*Handwritten notes:*  
200 ft. = 1 in.  
Photo 100 ft. = 1 in.