-01

UNITED STATES

DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

The Nuka Bay Mining District.
~~Kenai~~ Precinct.

Examined by J.G. Shepard.
Sept. 1925.

Head of Nuka Bay

The Nuka Bay Mining District embraces the country adjacent to the shores of Nuka Bay, an indentation of the southwestern coast of Kenai Penninsula. It is reached by gas boat from Seward, the nearest town.

Country rocks consist of alternating beds of slate and graywhacke. Broad granitic dykes are prevalent. Numerous quartz veins occur both in the slate and the graywhacke. The veins in the slate are smaller and of a higher gold ~~tenure~~ than those of the graywhacke tenor.

None of the veins examined were of a richness to justify any great amount of enthusiasm. Surface enrichment is present in nearly all cases throughout the oxidized zone, which in some instances reaches a depth of 30 feet.

Nuka River and Mountain.

Prospectors in this District consistently fool themselves, regarding the value of their ores, by using the panning method of value determination. Near the surface, considerable free gold is present, which settles in the fracture planes and gouge seams. In panning a sample no care is taken to wash the sediments from the solid rock. Thus the sample is salted and leads the prospector to believe that his rock is far richer than it really is.

The slate offers the best opportunity for finds of a commercial nature. Only one prospect was seen in the graywacke which would warrent developing, It is not likely that the District will ever be an important producer, although small tonnages of commercial ore will probably be worked from time to time.

UNITED STATES

DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

The Alaska Hills Mining Co.
Nuka Bay.
Kenai Precinct. K+104-28

Examined by J. G. Shepard.
Sept. 1925.

The property of the Alaska Hills Mining Co. is situated on the east bank of the Nuka River, 2 miles above the mouth.

Surface equipment consists of a small water power installation, substantial camp buildings, and a small milling plant connected to the mine workings by a jigback aerial tramway.

Milling plant.

Milling plant consists of a small jaw crusher, worthington ball mill, drag classifier, amalgam plates, and concentrating table. Assaying equipment is also installed in the mill. Capacity is 40 tons per 24 hours.

Country rock is black slate. Quartz veins cut the bedding planes. The mine workings are on one of these veins. A x-cut adit was driven which cut the vein at a point 200 feet distant from the portal. At this point the vein was 6 inches in width and a sample taken at the floor assayed $ 1.80 per ton. The vein was drifted on for a distance of 50 feet, where a fault was encountered. At this point the vein had widened to 30 inches. Depth was 100 feet below the surface. A raise was driven in the oreshoot from the adit level to the surface. The body of ore developed was 50 feet long, 100 feet high, 6 inches wide on the portal side, widening to 30 inches at the fault, which maintained its pitch from the adit to the surface. It is not likely that the block of ground would have an average value of better than $ 15.00 per ton.

Showing Tunnel Portal and line of Tramway.

The Mine was poorly worked, no attention had been given to either chutes or manways. Not to exceed 500 tons of ore remained to be mined, of the block of ground developed, on the Ist. of September.

Drifting was in progress, along the fault plane, in the hope of picking up the extention of the vein. Bunches of drag quartz in the sheared material would indicate that this is quite possible. There are three other quartz veins of the same character, carrying a moderate amount of gold, within a distance of 350 feet of the present workings. Under a comprehensive, conservative management, a considerable tonnage of commercial ore might be developed from these veins. At present , all mining is done by hand drilling.

The management of this property has been very inefficient. Nothing was known as to the value of the ore milled. The value of the tailings was an unknown quantity. Attotal lack of knowlege of the principals of mill operation was displayed. Mining was poorly done. In short it has been an operation such as might be expected, of men who had no conception of current mining practice.

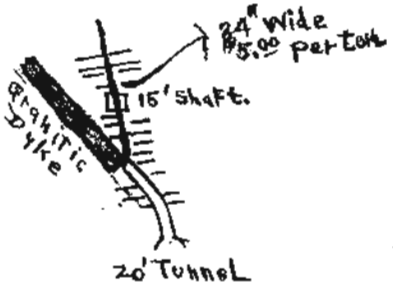
A systematic sampling of the tailings pond returned an average value of $ 3.75 per ton in gold and silver. Using this ~~value~~ as a basis and estimating an 80 percent mill recovery, the head value of the ore milled could not have exceeded $ I5.00 per ton.

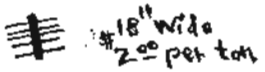
Under a skilled superintendence, ore of a $ I5.00 value can be made to pay a profit. Hap-hazzard operation, such as been carried on in the past is bound to be a failure.

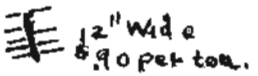
Alaska Hills Mining Co.
Nuka Bay
Kenai Precinct

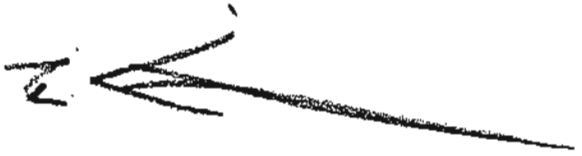
sketch by
J. Q. Shepard
Sept 1st 1925.

Scale 1" = 40'

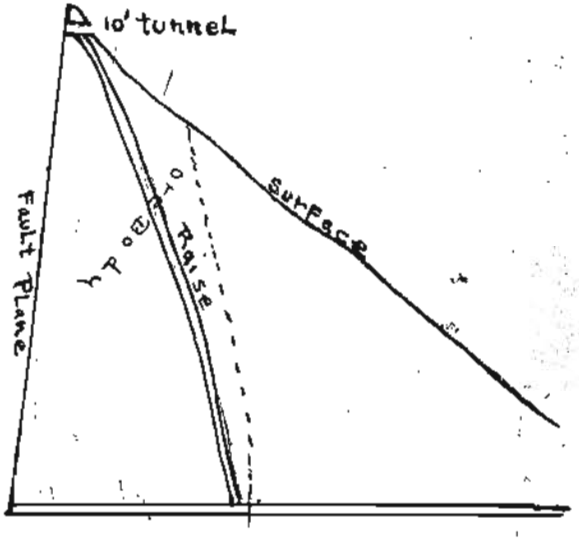


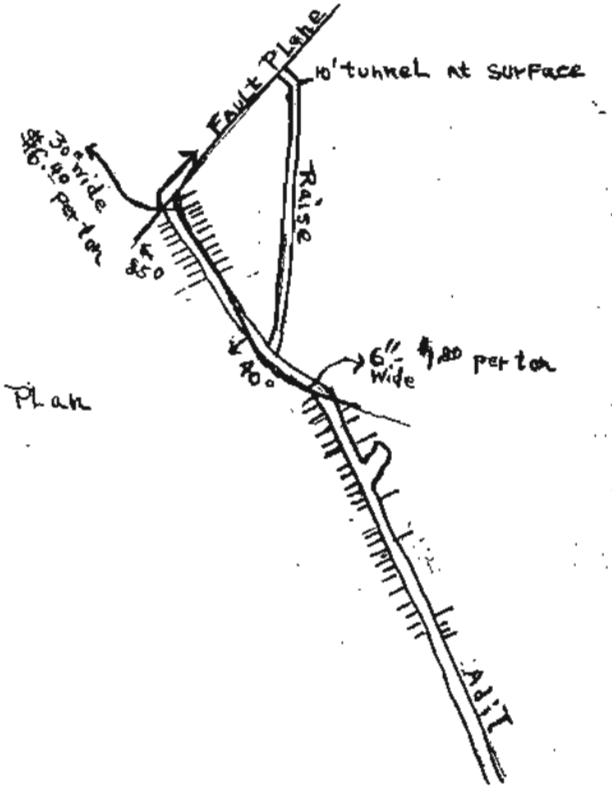




Vertical Section




Plan



UNITED STATES

DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

The Lang Prospect.
Nuka Bay.
Kenai Precinct.

K104-36

Examined by J. G. Shepard.
Sept. 1925.

The Lang Prospect is situated at tide water, two miles from the head of Nuka Bay, on the west shore. Two quartz veins with a north - south Mag. strike mount the hillside. 14 feet of country rock seperate these veins. Both veins have tunnels 10 feet long driven on them. No. 1 or the lower vein is 2 feet wide at the breast and sampled $ 9.20 per ton in gold and silver. No. 2 vein or the upper one is 2½ feet wide at the breast and returned $ 11.20 per ton in gold and silver. These values are by far the best obtained from any veins in the graywhacke, which were examined and the showings are worth further investigation.

Upper vein exposure.

Lower tunnel and quartz exposure.

UNITED STATES

DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

The Burman Prospect.
Nuka Bay .
Kenai Precinct.

J. C. Shepard.
Sept. 1925.

Nothing has been done at the Burman Prospect since it was visited and sampled by H. H. Townsend in 1924. The reported discovery of a galena deposit on the summit of the mountain seems to be a myth as Burman was unable to find it at the time of this visit. The country is unfavorable for the deposition of lead in any commercial quantity and its presence would be very unlikely.

UNITED STATES

DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Rasness and Gillespie Prospect
Nuka Bay
Kenai Precinct.

Examined by J.G. Shepard.
Sept.1925.

A small amount of work has been done on the Rasness - Gillespie prospect since the visit of H.H. Townsend in 1924. This work consists mostly of surface trenching. Nothing of any importance was discovered however. Several samples were taken on scattered surface showings. None of the samples returned values which could be any way considered of commercial value. What small values have been found are surface concentrations caused by the decomposition of quartz stringers.

It is not likely that the prospect will ever prove of commercial value.

UNITED STATES

DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

The Homestake and Anchor Group.
Nuka Bay.
Kenai Precinct.

Very little was done on this group of claims after the visit of H. H. Townsend in 1924. A 15 foot tunnel was driven on a pyrite stringer 8 inches in width. A picked specimen of solid pyrite from this tunnel returned a value of $ 11.20 per ton. Unless showings of a far better nature than those so far discovered are found, the property does not warrent further investigation.

Between Alaska Hills & Nuka Bay - groups on trail.

UNITED STATES

DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

The Hatcher Prospect. 38
Nuka Bay.
Kenai Precinct. KX104-39

Examined By J.G.Shepard.
Sept. 1925.

Nothing has been done at the Hatcher property since the visit of H.H.Townsend in 1924.

A sample from the face of the tunnel returned $ 1.20 in gold and silver. It is not likely that any rich oreshoots would occur in this vein.

UNITED STATES

DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

The Kasnek - Smith Prospect.
Nuka Bay.
Kenai Precinct. KH 104-37

Examined by J. G. Shepard.
Sept. 1925.

The Kasnek - Smith Prospect, known as the Butter clam Group, is located on the west shore of the north arm of Nuka Bay. Showings consist of quartz stringers in Graywhacke. A tunnel 20 feet long has been driven on one of these stringers. At the breast the vein is 1 foot wide and assays $ 1.60 per ton in gold and silver. At an elevation 100 feet higher, the vein outcrops 3 feet wide. A sample across this outcrop assayed $ 1.40 per ton in gold and silver.

The prospect does not seem to warrent further investigation.

Near Moss Point

(Charles Frank
Property of Pilgrim ?)

UNITED STATES

DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

The Babcock and Downey Prospect.

Nuka Bay.
Kenai Precinct.

KX 104-2

Examined by J. G. Shepard.
Sept. 1925.

The Babcock and Downey prospect is located on the west hillside of the valley at the head of ~~the north arm of Nuka Bay~~ Surprise Bay - See Progress report [illegible]. A trail from the beach leads to the prospect, a distance of a mile.

The prospect is a small quartz fissure 6 inches wide at the discovery point, striking Mag. North and south. It is ~~traveble~~ traceable for some distance and in places attains a width of 18 inches. A sample across the outcrop at point of discovery returned $ 7.60 in gold and silver.

The owners have ordered an Ellis chili ball mill and a small earial tramway for installation this fall. It is extremely doubtful if ore of a sufficiently rich gold ~~tenure~~ tenor will be found to make an installation of this sort profitable. Certainly at this time, the expenditure is not warranted.

One half mile from the beach is a quartz exposure in the graywhacke. The quartz is 18 feet wide and an assay sample tacken across the deposite yeilded $ 1.30 in gold and silver. Considerable Arsenopyrite is present.

UNITED STATES

DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

The Nuka Claims. ( Harrington )
Nuka Bay.
Kenai Precinct.

Examined by J. G. Shepard.
Sept. 1925.

Very little development was done on the Nuka group of claims since they were visited and sampled by H. H. Townsend in 1924. A small amount of work was done on a new discovery to the south east of the previous workings.

This discovery is a quartz vein striking mag N. 70 E. and dipping 80 degrees ~~west.~~ A tunnel 20 feet in length has been driven on it. At the breast the vein is 4 inches wide and shows no values. 200 feet south west of the tunnel the vein has been open cut. At this point 2½ feet of mixed quartz and slate with a strong iron oxide stain is exposed. This was reported to be rich ground, but a sample taken across the width of the exposure returned only $ 1.20 per ton in gold and silver.

The owners are planning the installation of a small mill dyring the winter of 1925. There is not sufficient ore of a rich value in sight to warrent this expenditure.

Blair Prospect.
Nuka Bay.
Kenai Precinct. KX104-31

Examined by J.G.Shepard.
U.S.Geological Survey.
Sept. 1925.

Red line shows approximate location of vein.

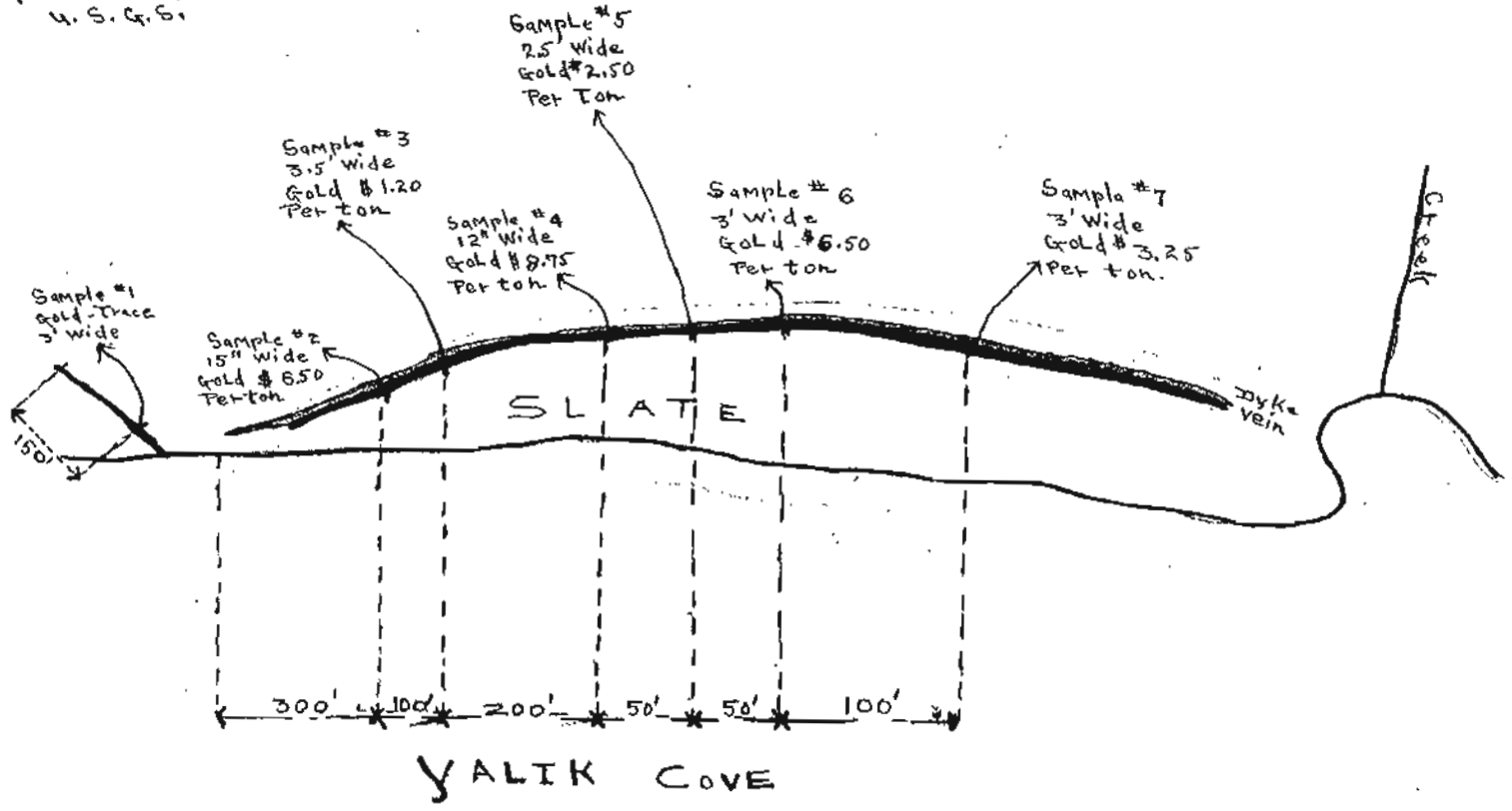
The Blair prospect is located near the shore of Yalik Cove, an arm of Nuka Bay.The general strike of the vein is East-West, and nowhere along the stripped portion is it more than 300 feet distant from the beach. The maximum elevation above sea level does not exceed 100 feet.

The vein consists of white quartz and is stripped at intervals for a distance of some 1500 feet. The dip is steeply to the south. Wdths vary from 1 to 4 feet of solid vein, and in places a stock work of stringers, interspersed with dike rock make the entire width 6 and 7 feet across. Through out its entire length the vein is associated with a granitic dyke of the type which is prevalent throughout the Nuka Bay section. Numerous cross stringers and feeders were observed. The country rock is black slate of an ore bearing type. Ore minerals observed were free gold, galena, zinc, and pyrite. The predominant valuable mineral is the free gold.

The results of seven samples taken along the vein at intervals, while not carrying bonanza values, are sufficiently encouraging, in veiw of the rock structures,to warrent a further examination of the prospect.

Same as Peter Sather of Pilgrim

Sketch
OF
Blair Prospect
Nuka Bay
No Scale
By J.Q. Shepard
U.S.G.S.



U. S. GEOLOGICAL SURVEY
RECEIVED
JAN 19 1932
511.60
ERP 1931
NOTED
FEB 15 1932

# Precinct of Nuka Bay.

## Introduction.

The purpose of this report is to describe the mineral resources of the mineral precinct of Nuka Bay; especially that portion which has attracted attention by recent mineral developments. In July 1931, an examination of mines, prospects, and a general reconnaissance of the shoreline outcrops was made. Data thus obtained is incorporated in this report.

## Previous Reports.

The only previous reported geological survey of this section was made by U. S. Grant and D. F. Higgins in 1909 as a part of their reconnaissance of the shore line of Kenai Peninsula from Cape Puget at the western entrance of Prince William Sound to Nubble Point, on the southeastern shore of Kachemak Bay, Cook Inlet.[a]

## Geography.

Nuka Bay lies on the south front of Kenai Peninsula, about midway between Resurrection Bay and Cook Inlet and is the largest embayment along the peninsula between those two localities. The main body of the bay, 6 miles in width, is formed by Nuka Island on the west and the Pye Islands on the east. The north end of the bay is divided into fiords known as East Arm which heads in Mc Carty Glacier and West Arm, which branches into Beauty Bay on the northwest and North Arm on the north. The greatest length of the bay, including North Arm, is 20 miles. The area covered by this report lies roughly between latitude 59° 20' and 59°40' north, and longitude 150° 20' and 150° 45' west. It represents an area of about 345 square miles with dimensions of 15 miles east-west and 23 miles north-south.( See vicinity map accompanying this report)

The region is one of bold relief. Rising abruptly from the water's edge, the mountains reach an altitude of 2,000 to 3,500 feet.

a. Geology and Mineral Resources of Kenai Peninsula, Alaska, 1915: U. S. Geol. Survey Bull. 587, pp.209-238.

Storm Mountain 3,775 feet and Mt. Diablo 3,550 feet are the highest named peaks of the region. The shore line is rough with a few sandy beaches where a boat could be beached between tides. Good anchorage is found in numerous coves for small power boats. Deep water permits large steamships approaching within a few yards of the shore in many parts of the bay. The bay is well charted by the Coast Geodetic Survey. In general the shore line represents a region which has been recently subjected to glacier action combined with a drowned coast. The hard highly resistant rocks,( slate and graywacke) tend to hold the typical alpine glacier topography. Many glaciers are still found existing in the region; most being valley glaciers branching from the ice field which cloaks the main portion of the Kenai Mountains between Katchemak and Resurrection bays. Yalik and Mc Carty glaciers are tide water glaciers emptying into Nuka Island Passage and East Arm respectively.

Nuka River emptying into Beauty Bay is the largest stream of the region. It has a total length of 5½ miles, receives its water from 5 small glaciers and during the warm days of summer,floods its banks, destroying the once thick stand of timber which occupies the valley floor. Many small torrents, not of glacier origin, travel short distances to debouche into the sea.

Climate.

The Nuka Bay Province lies within the North Temperate Zone of the North Pacific Coast. The climate is distinctly temperate with a heavy annual precipitation of less than 100 inches. Records at Seward and Seldovia, which are the nearest communities to Nuka Bay and about the same distances on either side of it, show the following;

Mean Monthly Temperature.

Seldovia. 1921, 1923.

| Year. | Jan. | Feb. | Mar. | April. | May. | June. | July. | Aug. | Sept. | Oct. | Nov. | Dec. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1921 | 17.4 | 22.1 | 32.7 | 34.8 | --- | 52.0 | --- | --- | --- | --- | --- | --- |
| 1923 | 25.1 | 30.5 | 30.7 | 36.4 | 43.8 | --- | --- | --- | --- | --- | --- | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | | | | | | |

Mean Monthly Temperature.

Seward, 1908 to 1931, Inclusive.

| Jan. | Feb. | March. | April. | May. | June. | July. | Aug. | Sept. | Oct. | Nov. | Dec. | Ann. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21.8 | 26.8 | 30.9 | 37.6 | 44.7 | 49.5 | 55.4 | 54.1 | 48.7 | 39.9 | 31.1 | 25.1 | |

Mean Monthly Precipitation.

Seldovia, 1918, 1919, 1920, 1921,1923.

| | | | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.46 | 4.93 | 1.61 | 2.44 | 0.47 | 0.94 | 1.71 | 3.07 | 8.67 | 5.22 | 2.83 | 6.42 | 41.75 |

Seward, 1908-1931 Inclusive

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.98 | 4.78 | 3.43 | 4.01 | 2.81 | 2.25 | 2.96 | 5.84 | 9.75 | 10.59 | 7.10 | 7.20 | 64.70 |

Mean Monthly Snowfall.

Seldovia, 1918, 1919, 1920,1921,1923.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30.1 | 31.3 | 12.2 | 11.2 | T. | 0.00 | 0.0 | 0.0 | 0.0 | 0.3 | 15.0 | 35.3 | 135.4 |

Seward, 1908 - 1931 Inclusive.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21.0 | 21.0 | 10.0 | 9.2 | T | 0.0 | 0.0 | 0.0 | T. | 1.5 | 4.7 | 19.2 | 86.6 |

The equivalent records of Nuka Bay would perhaps approximate an average of Seldovia and Seward. Uniformly moderate temperatures, heavy rainfall, although less than localities southeast from Seward, and a moderate snowfall are characteristic of this region. Great care must be exercised in this region as in all the coastel sections of Alaska, in the location of camp sites,roads and trails as well as mine workings, to avoid the menace of snow-slides. Buildings must be made sufficiently strong to retain the weight of heavy wet snow which accumulates on the roofs.

Timber and Vegetation.

Spruce is the most abundant tree found in this region. Spruce trees are found covering the mountains from high tide level, to a maximum of 1,000 feet in elevation. The largest and best stands of timber are found along the valleys extending back from tide water. The finest timber noted in the region is along the valley of Nuka River at the head of Beauty Bay. Other fine timber was noted at the heads of Surprise Bay, Quartz Bay, Yalik Bay and North Arm. Trees growing to a height of over 100 feet and with a diameter of three feet at the

base are not uncommon in these localities.

Alder and willows are found on the slopes from sea level to over 1,000 feet in elevation. Grasses are plentiful along the lower slopes. It is however a region in which horses cannot be used except along the lower valleys. Travel in the mountains must necessarily be on foot.

Animal Life.

Black bears, and squirrels were the only land animals noted in the district. Hair seals are not uncommon in the waters. Salmon, herring, and other fish are seasonally plentiful. Clams are found in the sands of a few beaches.

Transportation.

All points along the shores of Nuka Bay where miners or prospectors are living are served by Peter Sather, fox farmer of Nuka Island, with monthly gas boat. Special trips of the same boat are made by arrangement. The Steamer Starr of the San Juan Fish Co. will make special trips into the bay from regular runs to Kodiak Island. The larger freight and passenger boats of the Pacific Coast Steamship Co. will deliver freight in quantity or load freight at Nuka Bay. Scows are necessary for unloading or loading if the larger boats are used. The passenger fare from Seward to Nuka Bay is $ 15.00 on the regular trips. As a regular quantity freight service from Seattle has not been inaugurated, rates are not known but it is believed they would be very little different from the regular rates from Seattle to Seward or return. The distance by boat between Seward and Surprise Bay is about 78 miles.

Seward is the commercial and supply point for Nuka Bay. A bank hotels, restaurants, and merchandise stores are available. Seward is the tide water terminus of the Alaska Railroad, connecting with the Interior of Alaska, and a regular port of call for the two steamship companies operating along the coast of Alaska from Seattle.

Power Available.

There are many streams in this region with sufficient volume and head for power for small mining operations during about 9 months of the

year and a number of streams run the full 12 months. At the head of North Arm there is a cataract which falls about 900 feet and although not visited by the writer is said to have a large volume. Water power is available within 2 miles of almost any point in the region. Of the present mines which were operating in 1931, 2 were using water wheels to operate their mills and one was using a small gasoline engine although there was sufficient water within 200 yards of that plant to operate it also.

## Geology.

The predominating rocks of the region are a series of slates and graywackes considerably folded, tilted, and faulted [redacted], and in places highly silicified. These rocks have been described by Grant and Higgins and also by Johnson in describing the Sunrise Group. They are dark in color ranging from black to dark gray. They vary in hardness from soft, easily carved slates to hard highly siliceous quartzites, exhibiting little bedding structure or other visible indication of their sedimentary nature. These fine grained siliceous rocks are often mistaken for intrusive rocks and only a microscopic analysis will determine their sedimentary origin. These beds of slate and graywacke are generally thicker than those observed in the Prince William Sound region, having generally a thickness of several hundred feet. They show unconformable contacts in several localities. One such was noted on the north west side of Surprise Bay near the head of the bay and several hundred feet up the slope. Another was seen on the east side of Surprise Bay about 1½ miles from the entrance to Palisade Lagoon, just north of a small stream entering the bay. This unconformity distinguished by an 8 foot bed of conglomerate, standing almost on end, and between a bed of slate on the west and graywacke on the east. The slate cleavage strikes N. 25° E. dipping 80° E. The conglomerate grades from a coarse conglomerate, with pieces as large as 24 inches in length against the slate contact, to a slaty structure on the graywacke contact.

The sediments are generally steeply pitching. On Iron Creek near the head of Beauty Bay they were noted dipping 43° E. On Surprise

Bay they dip from 60° to80°E. while on Yalik Bay they dip from 52° to 60° W. Their strike is northernly, varying from N. 48° E. to N. 30° W.

It is in these tilted sediments that the principal mineralizations occur as in the graywackes and slates in other parts of Kenai Peninsula and in the Prince William Sound region. They are generally accepted as of late Paleozoic or Mesozoic age.

Intrusive Rocks.

Grant states " The intrusive igneous rocks of the district include both acidic and basic types. A few small masses of granite are intruded into the highly folded graywacke and slate of the eastern coast of Kenai Peninsula and two large granite masses are intruded into the same formatiom on the southern coast of the peninsula.----- The other large granite mass makes up the Pye Islands and the peninsula immediately north of them. Small dikes of granitoid rocks cut the various slate formations and are especially abundant near the southern end of the peninsula."

About 350 feet north of the main vein of the Alaska Hills Mines Corp. property a dike is said to outcrop, striking in a northwesternly direction. This dike is stated to be over 20 feet in width. About 2¼ miles northernly from Moss Point at the mouth of North Arm and 1,100 feet from the camp of Rosness and Larson, a light colored dike shows on the shore bluff, cutting the graywacke in a direction of N. 30° W. and dipping 68°W. The dike is highly siliceous, hard and massive. It shows a small amount of pyrite distributed throughout its full width. A picked piece showing perhaps a little larger proportion of sulphides than an average, when submitted to Paul Hopkins, Anal.chemist, U. S. Bureau of Mines, reported; 01887 North Arm No. 30. " The above sample is an igneous rook consisting of quartz, felspar, and amphibole. It contains a small amount of pyrite, less than one percent." The same sample submitted for assay gave; gold, 0.02 oz., silver 0.10 oz. per ton. or a value of $ 0.43 per ton. Two other dikes are reported as showing on the same shore farther north. They are said to be about 8 feet in width. The dike described above can be traced for over 1,500 feet up over the mountain

towards Nuka River Valley. This may possibly be the same dike that is just north of the Alaska Hills property.

About 2½ miles southwest from the Kesnoff and Smith camp on the east shore of North Arm, a dike shows on the rocky shore cutting the graywacke and extending out under the water in a northwesternly direction. This might be the same dike described above. It is light colored, softer then the dike across the arm because of a lesser quartz content, and breaks up blocky along the beach. Some sulphides were noted in this dike. The dike is about 18 feet in width.

About 400 feet from the mouthof Quartz Bay on the north shore, a small light colored dike shows cutting the dark slates in a direction of N. 15° W. dipping 75° W. This dike is probably 90 percent quartz with a small amount of orthoclase, and calcite, with a few crystals of pyrite.

Farther up the shore at a point about 800 feet from the torrential stream entering the bay at its northeast corner, another dike shows cutting the slate bluff. This light colored acidic dike is split just at high tide level. The branches show 4 feet and a few inches respectively in width and enclose about 30 inches of slate. The slate along the contact and enclosed between the branches, shows little contact change.

A dike, probably the continuation of the latter one described above, shows outcropping on the south side of Quartz Bay at a point near its head. The dike has a direction of N.70° W. and stands vertical. It cuts the graywacke country rock across the cleavage at an angle of 70°. The dike is partly obscured but is probably at least 20 feet in width. It is light colored and highly siliceous, very similar to those previously described.

On the south side of Yalik Bay, ¼ mile from its head, a small light pinkish colored dike was noted which has a direction slightly east of north. This dike is 4 feet in width and stands vertical.

About 3,500 feet east of the above point, a tunnel driven in a southwesternly direction, cuts a small dike 4 inches thick, strik-

ing N. 58° W. and dipping 80° S. A small seam of quartz 2 inches thick lies on the north side of this small dike. About 9 feet south of this dike, another branch of intrusive shows for 15 feet along the tunnel with a quartz vein on its southern contact, parallelling it. These dikes and veins are in slate.

There are in all probability a number of other similar dikes cutting the slates and graywackes of this region. It is to be noted that they all strike in a general north-south direction parallelling in general the axis of the folding of the sediments. The sediments show little or no alteration effect along these contacts in the hand specimens examined. The large granitic mass composing the Pye Islands lies to the south of the area described which contains the above dikes.

Veins, Prospects and Mines.

A vein described by Grant is here quoted; " a broken quartz vein in slates---- near the south point of the first ridge west of the west side of McCarty Glacier about 300 yards from the ice as it was in July, 1909, ---- 4 to 5 feet wide, striking with the schistocity of the surrounding rock, about north and south and dipping steeply west. Numerous bands of shattered quartz and partings of slaty chloritic material are in the vein, indicating deformation of the rock since the vein was formed. Small amounts of pyrite and considerable rusty stain may be seen at the surface."

A considerable number of veins were noted by the writer, exposed on the cliffs and bluffs along the shore line of Nuka Bay and its many branches. A number of unlocated veins were visited and examined by the writer. In addition nearly all veins being held by location were examined. From this examination and study the following facts are noted; The veins are generously distributed throughout the area, occurring both in the slates and graywackes, close to the intrusive dikes and at considerable distances from them. They are found at and below sea level and at elevations greater than 1,200 feet. They are noted occurring in the following types; Lenticular veins lying in the slaty cleavage of the country rock, Gash veins cutting the cleavage

and as fissure veins of indefinite length cutting across the cleavage of the slates and into the graywacke. One vein was noted in contact with an acidic dike rock. One vein was noted following the approximate contact of a hard massive graywacke with a dark slate. In at least two localities, veins were noted crossing or intersecting. As in most mining sections containing gold bearing quartz veins, the veins are considerably faulted although to date insufficient work has been done on the veins of Nuka Bay to portray the fault system of these veins. The veins range in width from less than an inch to over 10 feet. Their filling varies from white crystalline quartz, with metallic sulphides, to massive vitreous hard quartz with no sulphides, to white milky quartz containing considerable slate or graywacke breccia, and to sheared zones in the sediments showing a little quartz in the form of stringers filling the crevasses. Some veins are frozen to the wall rock while others show a distinct parting of gouge on one or both walls.

The minerals occurring in these veins are listed according to their abundance as noted; Quartz, calcite, arsenopyrite, sphalerite, pyrite, galena, pyrrhotite, chalcopyrite, gold, silver and in one instance a trace of nickle was detected by Hopkins.

A portion of the gold in the veins of Nuka Bay occurs free; but a larger portion is contained with the metallic sulphides. Just what this ratio is, is not known. Undoubtedly there will be still less free gold in the ores when mined below the surface outcrops where the veins are enriched by reprecipitation of gold and of gold mechanically deposited. These veins, as in other localities, are much richer at their surface outcrops, than they are at depth, although to date, no depth of over 100 feet has been reached.

In treating these ores, either a combination of amalgamation and concentration, cyanidation, or concentration by flotation will be necessary. The location of most of these veins either on or close to tide water involves no great problem of shipping concentrates. During the past season several shipments of high grade ore and concentrates were made from the district.

Surprise Bay.

Frank Skinner Property. KX104-39

In a small cove on the east side of Surprise Bay about a mile south of the narrows, at the entrance of Palisade Lagoon, a vein outcrops on the rocky slope at sea level. The vein strikes N. 81° E. and dips 51° S. It shows strong and regular containing considerable gouge, fractured graywacke and quartz. A tunnel has been driven on the vein a distance of 42 feet, at an elevation of a few feet above high tide. In the face of the tunnel there is about 12 inches of vein filling with very little quatrz. The quartz has about disappeared leaving only the fissure with gouge and brecciated wall rock. The walls are blocky graywacke, which at this location, shows a distinct blocky cleavage. Numerous quartz stringers ~~are extending off~~ extend from the tunnel into the graywacke in a southeasterly direction. The bedding of the graywacke has a strike of N. 3° E. There is a cleavage also plainly visible in the graywacke which has a direction N. 57° W. and a dip of 80° S. Samples from this vein are said to have returned values of $ 38.90 and $ 18.00 per ton.

Sonny Fox Mining Company. KX104-2

The Sonny Fox Mining Co., better known as the Babcock and Downey property, consisting of the Sonny Fox, Sonny Fox No. 1 to No. 5 claims inclusive, is situated approximately 1 mile north of the head of Palisade Lagoon in the ampitheater shaped valley at the head of Surprise Bay. The original discovery on the Sonny Fox Claim, opened up a vein which averaged 12 inches in width ranging between 3 and 36 inches. This vein strikes in an easternly direction. The vein was not visited by the writer. It is opened by a lower tunnel 60 feet in length and an upper tunnel about 40 feet higher, which is 40 feet in length. A raise connects the two tunnels. An Ellis Mill was installed and a small production resulted.

A second vein located about 1,200 feet south from the Sonny Fox vein and on the Sonny Fox No. 3 claim outcrops along the hillside. Several opencuts and one short tunnel have traced this vein for several hundred feet. The vein has a strike of N. 10° E. with a dip of 65° W.

The vein has a width of over 6 feet of solid, white, crystalline, quartz along the west side with a number of parallel stringers of white quartz, through the slate for a width of over 5 feet on the east side, where examined in the face of a short tunnel at an elevation of 206 feet. Both walls are a dark slate. The hanging wall of the vein is sharply defined with a small amount of gouge along the contact. The footwall is not clearly defined and is only distinguished by the gradual disappearance of the quartz stringers. Samples from this vein are said to have returned values of from $8.60 to $ 40.00 per ton.

About 20 feet south from this short tunnel, a third vein shows striking S. 75° E. and dipping 73° N. This vein and the latter described above are undoubtedly intersecting although the intersection is not exposed. The latter vein shows a width of from 2 to 4 feet of iron-stained quartz in a 60 foot tunnel driven from an elevation of 206 feet. In the face of this tunnel a fault, striking N. 30° W. and dipping 75° E., has cut off the vein. The vein is said to show some fair values.

A short distance south of the latter vein and on the Sonny Fox No. 4 claim is the Lady Luck Vein upon which the principal mining was being done in July 1931. The first mining on this vein was from an openout 65 feet in length on the outcrop where first discovered and several hundred tons of ore extracted. This ore carried very good values. A tunnel was driven a few feet lower on the vein at an elevation 190 feet and is in about 100 feet. At a point 40 feet from the mouth of this tunnel a split in the vein occurs. One branch has a strike of east and the other N. 45° E. A second tunnel about 40 feet lower in elevation was in about 230 feet on July 25, 1931. This tunnel is the main working tunnel and stoping was being carried up between this level and the upper tunnel on the northeast branch of the vein. A crosscut was being driven north to intersect the other branch but had some distance still to go. The vein in the opencut shows from 3 to 4 feet of white crystalline quartz containing considerable arsenopyrite with small amounts of galena, sphalerite, and some free coarse gold. Under the microscope calcite and amphiboles or similar silicates are present in

small amounts. The vein shows from a few inches to 4 feet wide in the lower tunnel. A number of minor faults show in the lower tunnel which have a southeasterly direction offsetting the vein each time to the south.

About 800 feet in a southeasterly direction from the Babcock and Downey camp and at an elevation of 106 feet, a large vein shows outcropping on the hillside. This vein contains a considerable amount of pyrite and arsenopyrite. The quartz appears to ~~lay~~ lie in a number of parallel bands with a cleavage between. Some graywacke breccia is also present. A sample taken across 22 feet of this outcrop, and probably representing its full width, showed only a trace of gold and silver.

An 800-foot, graded and trestled track connects the lower tunnel of the Lady Luck Vein with an ore bin at the head of a two-bucket gravity aerial tram, ~~using~~ equipped with 500-pound bottom-dump buckets. This short tram delivers into the mill ore bin.

The mill is a No. 1 Denver Quartz-mill operating at a speed of 35 R.P.M. with a capacity of 7 tons per 22 hours. Two amalgamation plates 3 feet by 6 feet and 4 feet by 8 feet, respectively, are used. The tailings are treated on a Gibson concentrating table driven by a small gasoline-engine. The table tailings are impounded. The crusher and mill are operated by a 45-inch water wheel under a head of about 40 feet. A 25-H.P. gasoline engine is available for emergency power. The mill is at an elevation of about 35 feet.

The concentrates are shipped to the Tacoma Smelter and have a value of about $128.00 per ton. An analysis of the concentrates show the following:

| | | | |
|---|---|---|---|
| Al2O3 | 5.9 % | Lead | 0.2 % |
| Insoluble | 1.3 | Zinc | 1.3 |
| SiO2 | 55.8 | Arsenic | 6.11 |
| Sulphur | 4.9 | Iron | 11.3 |

Camp buildings consist of a log mess house, a log bunk house, two tent residences, and a log compressor house and blacksmith shop. The compressor is an Ingersol-Rand gasoline portable type.

The Sonny Fox Mining Co. is owned by Thomas Babcock, D. W. Downey, and Charles Tecklenburg. The property has produced about 1,000 tons of ore to Aug.1, 1931 which has averaged about $ 25.00 per ton.

Johnston and Degan Property. 124104-2

A group of claims held by Fred Johnston and Michael Degan consists of the Grubstake No. 1 and No. 2, and the Lost Boy claims on the Quartz Bay side of the ridge between Surprise and Quartz bays, and the Grubstake Extension No. 1 and No. 2 claims on the Surprise Bay side. The claims on the Quartz Bay side were not examined by the writer because of the unusual depth of snow remaining late in the season. The Lost Boy Vein , at the head of Quartz Bay, is said to have a northernly strike and to average 4 feet in width.

The Grubstake Extension No. 1 and No. 2 claims are on the Surprise Bay side of the ridge directly above the head of the bay where it narrows down at the entrance of Palisade Lagoon. At an elevation of 370 feet 2 small veins, 36 inches apart, show outcropping in the small gulch leading back from the bay. They strike N. 54° W. and dip 86° N. The northernly vein is 2 inches in width while the southernly one is 8 inches wide. The walls are graywacke. Conglomerate boulders with graywacke pebbles show in the gulch just north of this outcrop, and for several hundred feet higher up. The veins are filled with white quartz showing no sulphide mineralization.

At an elevation of about 810 feet in the same gulch a vein of white quartz outcrops above the slide. The strike as near as could be determined, from the small amount of outcrop, visible through a snow drift, is N. 82° W. The vein shows over 3 feet wide of white quartz containing no visible sulphides.

Just below this outcrop a small gulch branches off in a northeasternly direction. About 200 feet back from the mouth of this gulch a vein outcrops at an elevation of 908 feet. This vein is about 4 feet wide at this point. It contains white quartz with some graywacke bre-

ccia. The vein strikes S. 36° E. and dips 85° S. Both walls are graywacke. No sulphide mineralization was visible but the surface outcrop is considerably oxidized.

Following up along the gulch a vein shows about 12 inches in width with a strike of N. 25° E. About 35 feet from the previous vein another cross vein on the east side shows with a strike of S. 35° E. and a dip of 80° N. This latter vein has a width of 36 inches of quartz containing some galena, arsenopyrite, and pyrite. This outcrop is at an elevation of about 914 feet. Another vein shows farther north, at an elevation of 1,002 feet, parallelling the latter cross vein and on the same side of the through vein. This vein is about 2 feet in width and contains considerable sulphides. Here the quartz is banded into a number of parallel stringers with graywacke bands alternating. At about the same elevation but in the bottom of the watercourse the northeastern striking vein is about 40 inches in width, of crystalline quartz containing considerable sulphides. The vein here strikes N. 62° E. and dips 61° S. About 70 feet higher in elevation and farther north, slate shows on the hanging wall of the through vein. The through vein is apparantly continuous but the southeasterly striking veins do not cross it, extending only against it, two from the east and one from the west. A sample from the through vein at an elevation of 1,000 feet, across 28 inches, returned: gold 0.98 oz. and silver 1.0 oz.

Development work on these claims consist of a number of surface trenches and trails built to the veins. A cabin is located at the head of Quartz Bay near a cataract which enters the bay on the northeast corner. This stream is a splendid available power for mining. A power line could be carried over the ridge to the Surprise Bay side. The saddle between the bays is 1,216 feet elevation.

Charles Goyne Property. 104.3

Charles Goyne has two claims, the Surprise and Bear claims on the mountain-side sloping back from the west side of Surprise Bay. This property lies just south of the Johnston and Degan property.

At an elevation of 147 feet a tunnel is driven in a westernly

direction. For 41 feet the tunnel is in a hard, fine grained, graywacke. At this point it encounters a vein which showed in the face, 57 inches in width. This was 51 feet in the tunnel July, 16, 1931. The vein has a strike of S. 80° W. and dips 83° S. The hanging wall side shows 9 inches of fractured, white, crystalline quartz with a thin seam of gouge along the hanging wall contact with the hard graywacke. On the footwall side there was about 48 inches of banded parallel quartz stringers cutting the hard slate. A sample across the 9 inches of quartz assayed: gold 3.68 oz. silver 1.89 oz. per ton. A sample across the 48 inches of banded quarts stringers and slate assayed: gold 0.12 oz., silver o.20 oz. per ton.

This vein shows along the contact of the slate and graywacke for several hundred feet up the mountain-side. At an elevation of 276 feet the vein has a width of 17 inches of quartz. A sample across the vein at this point by Mr. Goyne assayed: $ 11.00 per ton. At an elevation of 330 feet the vein cuts into the graywacke, showing about 4 feet of graywacke between it and the slate. It has here formed into a number of parallel bands of quartz and graywacke with one large band of graywacke 30 inches thick. A parallel vein shows 24 feet south at this point. This parallel vein is traced for some distance up the mountain. It lies wholly within the graywacke. At this point it shows 48 inches in width of massive quartz containing considerable slaty breccia, although both walls are hard graywacke. No sulphide mineralization is visible in this outcrop. Higher up on the same vein some galena shows. At an elevation of 548 feet quartz shows in the north vein over 2 feet wide, strongly mineralized with arsenopyrite, galena, and free visible gold. A picked specimen showing only quartz and galena to ascertain which sulphide was most directly associated with the gold assayed; gold 5.29 oz., silver 5.20 oz. per ton. a specimen containing only visible quartz and arsenopyrite assayed, gold o.11 oz., silver 0.30 oz. per ton.

The south vein shows 26 inches wide south of this point and is

said to carry values of from 3.00 to 5.00 dollars per ton.

The general strike of these veins is N. 85° W. and that appears to be the direction of the contact between the slate and graywacke; but the slate cleavage varies from N. 5° E. to N. 34° E. with a dip of 80° W.

A shipment of several tons of sorted ore from the north vein to the Tacoma Smelter in September 1931 returned:

| | | | |
|---|---|---|---|
| Gold | 4.10 oz. at | $ 19.50 | $ 79.95 |
| Silver | 1.72 | .27¾ | .34 |
| Arsenic | 5.6 units | .25 | |
| Sulphur | .24 | | |
| Total payment per ton | | $ 80.92 | |

Quartz Bay Veins.

On Quartz Bay a number of veins were noted outcropping along the shore. These carry small amounts of pyrite. A sample taken from one of these outcropping on the south side of the bay about 50 feet west of the light colored dike described previously, and 6 inches in width, assayed gold 0.02 oz., silver 0.10 oz. per ton. A sample taken from a second vein or series of stringers outcropping on a bluff on the south side of the bay about ½ mile west of the head of the bay, representing a width of about 5 feet, assayed gold 0.01 oz., silver 0.30 oz. per ton. The point where the latter was sampled is mineralized for over 12 feet in width.

Peter Sather Property. KX104-31 formerly Al. Blair prospect. See Shepards 1925 report

On the south side of Yalik Bay, about 2 miles from its mouth and just east of the stream which enters it at that point, Peter Sather has a group of 7 claims, the Rolph No. 1 to No. 7 inclusive. The Rolph No. 1 vein outcrops on the beach, extending out under the water and up into the rocky bluff. It shows along the shore for about 50 feet varying in thickness from a few inches to 42 inches of white crystalline quartz containing pyrite, sphalerite, chalcopyrite, and galena. A trace of nickle was detected in one sample from this vein. This vein strikes S. 57° E. dipping 85° E. The walls are slate the cleavage of

which strikes N. 7° E. and dips 66° W. A tunnel driven from a point 20 feet east of the outcrop on the beach in a direction of S. 17° W. intersects the vein 24 feet in. The vein there is 6 inches wide of white quartz containing some sulphide mineralization. The tunnel has been driven on past this vein for 27 feet where it intersects a second vein. The tunnel cuts into the second vein but not through it, so the width is not known. It shows about 6 feet wide in one surface exposure higher up, not seen by the writer. The quartz is a dull white color containing little mineralization. A sample taken across the 24 inches cut into by the tunnel returned a trace of gold and silver.

A sample across 42 inches of the outcrop of the first vein assayed, gold 0.80 oz., silver 1.40 oz. per ton.

About 700 feet west of the above tunnel and on the Rolph No. 3 claim a tunnel has been driven southwesternly for 60 feet. The tunnel is at an elevation of about 20 feet above the sea. It is driven to crosscut a vein which outcrops on the surface above . In the face of the tunnel the vein is encountered but not crossed, so that its width is not known. The north or footwall of the vein strikes N. 21° W. and dips 73° W. 30 inches of dull white quartz shows in the face of the tunnel containing considerable slate breccia, but showing no sulphide mineralization. Some calcite stringers show in the brecciated material. The footwall rock is a light gray intrusive which shows in the tunnel for 15 feet. The slate shows for 9 feet and another narrow tongue of the same intrusive rock cuts across the tunnel in a direction of N.58° W. and dipping 80° S. Along the footwall side of the tongue is about 2 inches of quartz. The intrusive varies in width from 4 inches on the east wall of the tunnel to 18 inches on the west wall. The slate cleavage strikes N. 10° E. and dips 52° W. A sample of the portion of the vein showing in the face of the tunnel assayed a trace of gold and silver.

A frame house is located on a point in the heavy timber about 450 feet west of the latter tunnel. A small cove with a slate bottom makes a fair anchorage for a small power boat.

Veins on North Side of Yalik Bay.

Near the mouth of Yalik Bay on the north side is a small rocky bay. Along the west side of this bay are a number of quartz veins and stringers outcropping on the rocky bluff. These veins strike N. 30° W. and dip steeply to the west. They vary in width from a fraction of an inch to 4 feet. A considerable pyrite mineralization was noted in these veins. The predominating rocks are black slates which strike slightly west of north. A grab sample taken from several of these veins shawed a trace of gold and silver.

West Arm.

Frank Lang Property. Kx 104-36

On the west shore of West Arm, directly west from Beautiful Island, at the mouth of Quartz Bay, the Frank Lang property is located. There is no beach close to this property so it is necessary to land directly on the rocky shore.

About 10 feet above high tide a tunnel has been driven on a vein outcropping in a small gulch. The direction of the tunnel which is also the strike of the vein is S. 45° W. The vein dips 44° ~~S.~~ N. (See Townsend & also photos by Shepard) The vein is a well defined fissure filled with white quartz containing considerable graywacke breccia. Arsenopyrite is the only sulphide observed in the quartz. The vein varies from 6 to 24 inches in width along the full length of the tunnel which is 88 feet. The walls are slaty graywacke with a cleavage striking S. 30° E. A crosscut in the graywacke has been driven for 39 feet in a direction of N. 33° W. from a point 27 feet in the tunnel. A sample taken from a pile of vein quartz at the mouth of the tunnel, of about 8 tons, assayed; gold 0.38 oz., silver 0.30 oz. per ton.

A log cabin is situated on the hillside above the tunnel. A frame house is built on a leveled dump at the portal of the tunnel.

Beauty Bay.

Earl Mount Property. Kx 104-27

This property owned by Earl Mount of Seward is reached by a trail

about 1 mile in length from the northwest corner of Beauty Bay, which follows up Ferrum Creek ( Iron Creek) for ½ mile, then up a small gulch to its head at an elevation of about 215 feet. The camp is just over this low divide on the Ferrum Creek side at an elevation of 194 feet.

The property consists of the Little Creek No. 1 and No. 2 claims. south of Ferrum Creek and extending over the hill towards Beauty Bay. This property located originally by Eric Burman and H. Carlson has 4 veins uncovered on the two claims.

The first vein known as Vein A. has a 50 foot tunnel driven on it at an elevation of 229 feet. The vein strikes N. 87°E. and dips 52° N. It shows in the tunnel from 10 to 24 inches of solid, white, crystalline quartz containing considerable arsenopyrite, some sphalerite and a trace of copper and lead. A grab sample sample taken from various points along the vein in this tunnel assayed gold 0.01 oz., silver 0.10 oz. per ton. A number of opencuts on this vein along the hillside a above the tunnel expose the vein for several hundred feet.

About 200 feet south of the "A" Vein is "D" Vein. This vein strikes S. 82° E. and dips 85° N. It shows in one cut from 6 to 10 inches in width of coarsely crystalline quartz which pans considerable coarse free gold.

"C" Vein is about 45 feet north of "D" Vein. It strikes S. 85° E. and stands almost vertical. It shows a width of from 3 to 6 feet of white crystalline quartz containing considerable sulphides. Galena is present when the ores carry the best values. The vein quartz contains some graywacke breccia. Several cuts have been dug this vein. One of them has a shaft down 15 feet in the end of the cut. Near the west end of this cut free gold is visible in the quartz along the south wall.

B. Vein lies between and parallel to A. Vein. It has 3 opencuts on it higher up the hill; which show a vein similar A Vein and is said carry some values.

The Alaska Hills Mines Corporation. K+104-28

The Alaska Hills Mines Corporation camp is situated about 2 miles

north of Beauty Bay, on the east side of Nuka River Valley, at an elevation of about 40 feet. A narrow Territorial road , built by the Alaska Road Comission, connects the mine camp with the beach. 2 log bunk houses and a frame mill building constitute the camp. A log residence and a stable were destroyed in1930 by a snow slide. The mine is situated about 1,000 feet from the mill at an elevation of 494 feet.

The principal mining has been on a vein originally discovered in 1918 by Frank Case and Otis Harrington. In 1923 Frank Skeen relocated the vein and it was transferred to the Alaska Hills Mines Corporation.

The property consists of the Paystreak No. 1 and No 2, Paystreak Extension, Paystreak Fraction, and Fairweather claims. Development work consists of an upper tunnel 125 feet in length driven at an elevation of 569 feet. A main tunnel 75 feet lower in elevation which connects with the mill by aerial tram,550 feet in length, and a lower tunnel 165 feet in length and 125 feet lower in elevation. A tunnel was driven in for 35 feet on the vein at the same elevation as the main tunnel in1931. The lower tunnel has not encountered the vein but is believed to be close as several gold bearing stringers were encountered in the last few feet of the tunnel. The vein above the the upper tunnel has been worked to the surface and was not accessable for examination. The main tunnel, about 550 feet in length encounters the vein at about 118 feet in. The vein there shows about 6 inches in width, has a strike of East and dips 55° N. The vein quartz is white, and crystalline containing considerable sulphides. At a distance of 170 feet in the tunnel a fault, striking N.5° E. cuts off the vein. The tunnel has been driven ahead and the vein was encountered 155 feet beyond and stoped back for about 50 feet and up to the upper tunnel. The wall rock is graywacke for the greater part of the tunnel until about the last 60 feet where it is slate. The vein pinches out into a number of quartz stringers and ends as soon as it encounters the slate. A winze 40 feet in depth has been sunk from the tunnel. The winze was filled with water and inaccessable for examination. The mine workings develop a large amount of water.

About 350 feet north from the above vein is a tunnel 75 feet in length on a quartz vein reported as parallelling it, which has a width of from 6 to 20 inches, and containing good valued. This vein is known as the "Ehmswiler Vein." Another vein is reported 75 feet north of the Ehmswiler Vein and two other veins between the Alaska Hills and Ehmswiler veins.

During the summer of 1931, 3 men were mining the decomposed slide rock from below the outcrop of the Alaska Hills Vein which carried sufficient values to pay the operations. 267½ tons of this material was milled during the season. A tunnel was driven into the vein for 35 feet after the mining operations in the slide uncovered the lead on the surface at the main tunnel level.

The mine plant consists of an Ingersol-Rand gasoline portable compressor, with a 25 ton ore bin, and 2 bucket gravity aerial tram, 1,000 feet in length connecting with the mill. The milling plant consists of a 35 ton ore bin at the tram terminal, a 7 by 10 inch Union Iron Works jaw crusher, a 10 ton capacity fine ore bin, a 4 by 4 foot Worthington Ball Mill with amalgamator in closed circut with a belt drag classifier and a Deister sand table; all operated by a 66 inch Pelton wheel using a double nozzle under ahead of 94 feet through a 16 inch wooden pipe 900 feet in length.

In ordinary milling operations the table concentrates assay from $ 107.00 to $ 112.00 per ton. The tailings average about $ 2.85 per ton. The property has a past production of over $ 40,000.00. J. H. Rice of Anchorage is President and E. W. Barnet is Secretary and Treasurer of the corporation.

Nuka Bay Mines Company. K+104-30

The Nuka Bay Mines Company's property consists of the Nooka, Nooka Extension and the Nooka No. 1 claims situated on the mountain about a mile northeast of the head of Beauty Bay. The property is reached by travelling along the road to the Alaska Hills property for about ¾ mile to where the Nuka Bay Mines Company has a log cabin

store house. From there a trail leads up the mountain for 3,400 feet to the upper camp at an elevation of 1,200 feet.

A vein which outcrops above the camp at an elevation of 1,470 feet was not accessable for examination due to the heavy snow drifts still remaining. The vein is said to strike easternly and to dip steeply. A shallow shaft has been sunk on this vein and a few tons of ore milled. The vein can be traced down the mountain for over 100 feet. About 320 feet down hill at an elevation of 1,235 feet a second vein is exposed in a cut. This vein, 12 inches in width, has a strike of N. 83° W. and dips 85° N. The vein is the characteristic white crystalline quartz of the district, containing some graywacke breccia and small amounts of pyrite. A sample of a small pile of quartz from this vein alongside of the cut assayed: gold 0.02 oz., silver 0.10 oz. per ton.

The vein is cut off in the east end of the cut by a fault striking N. 13° E. and dipping 75° W. It is believed that the extension of this vein lies to the southeast. The vein shows outcropping for 180 feet down hill to the west. The wall rock of the vein is graywacke but slate shows east of the fault, moved into position alongside of the graywacke. About 260 feet west of this cut another vein outcrops at an elevation of 1,180 feet with a strike of N. 61° E. and a dip of 85° S. This quartz shows from a few inches to over 3 feet in width of white crystalline quartz containing much graywacke breccia. No work has been done on this outcrop or any samples taken from it.

At elevation of 1,144 feet and in front of the outcrop described above a tunnel has been driven in almost 400 feet. This tunnel is in graywacke the whole distance. It starts with a direction of ~~S.~~ N. 83° E ~~W.~~ E. and in the face has a direction of S. 5° W. Except near the portal of the tunnel, where the quartz outcropping above the tunnel is cut, no vein has been encountered in this tunnel.

The camp consists of a small gasoline driven Gibson mill, which when visited, was almost all covered by snow drifts. A lot of 24 tons of ore from the upper shaft is said to have milled 27 ounces of retort.

Mrs. E. B. Weybrecht, and Cal. M. Brosius of Seward are the principle owners of this property.

North Arm.

Charles Frank Property. KX 104-37

The Charles Frank property is situated on the west side of North Arm, about 1¾ miles northeast from Moss Point. About 50 feet above sea level, on the steep hillside, a body of quartz containing arsenopyrite, and pyrite shows outcropping in a direction of N. 60° E. A few feet from the west end of this quartz it bends towards the west, bulges out to a width of 5 feet and ends. About 4 feet north of the end of this quartz another body of quartz, 20 inches in width, outcrops. This quartz strikes N. 60° W. disappearing into the mountain under the vegetation. The wall rock of the latter and also the north wall of the first lense is slate, the cleavage of which strikes N. 40° E. dipping 75° W. The south wall of the first lense is a dense siliceous graywacke.

About 40 feet lower in elevation a crosscut tunnel has been driven in a direction of N. 50° W. for a distance of 60 feet. From the end of the tunnel a drift has been run 8 feet to the southwest and one 43 feet to the northeast following a quartz vein which strikes about N. 52° E. and dips 79° N. varying in width from 8 inches on the southwest drift to 14 inches in the northeast drift. Slate shows on both walls of the tunnel and on both walls of the drift along the vein. The strike of the slate is N. 7° W. in the southwest drift and N. 20° E. in the northeast drift. It dips 70° W. A cabin is situated on the bluff about 100 feet above the sea and 100 yards southwest from the tunnel.

Rosness and Larson Property. KX 104-33

About 1,400 feet northeast from the Charles Frank tunnel, at a small sheltered cove with a graveled beach, is situated the camp of the Rosness and Larson property. A group of claims covering several veins found outcropping, is held by Albert Rosness, Frank Larson, and Josie Ehmswiler. A small mill was installed on this property in 1931 and the first production of gold from North Arm resulted.

A vein outcrops on the beach, just above tide level, in the southwest corner of the cove. It was necessary to build a bulkhead to keep the waves , during hough weather, from washing into the workings of this vein. It strikes in a northwesternly direction and probably dips steeply. Very little could be seen of the vein when visited as it was covered with gravel except for a small space where the decomposed surface was being mined and hoisted into the mill ore bin by means of a trolly and windlass. The outcrop as seen consisted of several feet of crumbly, iron-stained, decomposed quartz. A sample taken across 45 inches of this assayed; gold 0.64 oz., silver 0.40 oz. per ton.

About 30 feet south of this outcrop a large number of quartz stringers outcrop on the slaty graywacke bluff. A tunnel has been driven into the bluff for 28 feet in a direction of S. 13° E. Near the end of the tunnel a winze has been sunk to a depth of 27 feet. This winze was full of water when visited. The cleavage of the slate strikes S. 34° E. and dips from 70° to 80° W. so that the tunnel does not follow them but cuts across diagonally. The quartz stringers vary in width from ½ to 6 inches and are lenticular in shape. A sample across the face of the tunnel over a width of 8 feet 8 inches assayed: gold 0.08 oz., silver 0.30 oz. per ton.

About 350 feet southeasternly from this tunnel, across a low ridge, on the main shore of North Arm, several quartz stringers show outcropping. They strike N. 45° W. and dip 63° S. About 50 feet south from the above outcrops several other small veinlets are outcropping in a slaty graywacke parallel with the cleavage. These veinlets vary in width from ½ to 6 inches. Part of this exposure was covered. The total width covers at least 8 feet. These quartz stringers and veinlets are said to show some values in gold. They are probably the extension of the quartz mineralization shown in the tunnel and winze on the other side of the ridge.

At an elevation of 107 feet, and 250 feet northwest from the lower tunnel, a tunnel is in 20 feet on a white crystalline quartz vein

which strikes west and dips 80° S. This vein shows 30 inches of quartz at the portal of the tunnel and 6 inches wide at the face. The quartz contains some sulphides and is said to carry fair values. About 70 feet north of this tunnel at an elevation of 120 feet an opencut shows 10 feet of brecciated graywacke containing many parallel stringers of quartz. The strike of these stringers is N. 58° W. and dip is 80° S.

Below this cut and a few feet above high tide a tunnel was in 105 feet in a direction of N. 61° W. but had not encountered the mineralization showing above. In the tunnel the walls are dark slaty graywacke striking N. 48° E. and dipping 60° W.

About 100 yards northeast of the camp a number of small quartz veins are outcropping on the rocky bluff. The wall rock is graywacke. These veins are composed of the characteristic white crystalline quartz No sulphides were noted in these veins.

A short distance beyond the above veins is the 39 foot acidic dike described earlier in this report and from which a picked specimen containing a small amount of pyrite assayed $0.43 per ton.

The Rosness and Larson plant consists of a small Ellis mill driven by a gasoline engine. The mill has a capacity of about 4 tons per 24 hours. Other buildings are a small frame residence and 2 tents. Two men were working on this property when visited in July 1931.

Robert Hatcher Properties. KK 104-38

Robert Hatcher has several groups of claims under location along the east side of North Arm south of Pilot Bay.

The Utopia group consists of the Utopia No. 1 and No. 2 and the North Gold claims, situated on the east side of North Arm about 1 mile south of Pilot Harbor. The Utopia Vein outcrops on the hillside about 800 feet east of the shore and has been traced for several hundred feet up over the mountain onto the North Gold claim, which extends over the ridge onto the Quartz Bay slope. At an elevation of 64 feet a a tunnel, in 20 feet, July 18, 1931, was being driven on this vein. The vein strikes S. 75° E. and dips 85° S. It shows a width in the tunnel

of 5 inches of porus, white, crystalline quartz containing no visible sulphides. About 25 feet above the tunnel the vein outcrops with a width of 30 inches. Both walls of this vein where examined are massive, hard graywacke.

About 4,000 feet north of the Utopia Vein a tunnel has been driven 30 feet into a vein which outcrops on the rocky shore. The surface outcrop showing in the roof of the tunnel, has 4 feet of massive quartz on the north or hanging wall side and 3 feet of graywacke in the middle with 4 feet of fractured graywacke cemented with quartz stringers on the footwall side. The vein strikes N. 77° E. and dips 70° N. Arsenopyrite and pyrite are plentiful along the hanging wall quartz portion of the vein. At a point about 15 feet in the tunnel slate appears cutting across the tunnel and cutting off the vein. This possibly is a fault displacement of the vein but there is little evidence of a fault plane or gouge present. A picked piece of the quartz from the outcrop of this vein just over the tunnel showed pyrite, arsenopyrite, traces of galena, sphalerite and chalcopyrite present. The same piece assayed: gold 0.01 oz., silver 0.20 oz. per ton.

About 1,300 feet north from the above vein, a third vein outcrops on the rocky shore, striking S. 85° E., dipping 85° S. and 6 feet wide of massive white quartz. This vein is on the Sea Level No. 1 Claim. At an elevation of 10 feet a tunnel has been driven in a few feet. The walls are hard massive graywacke. About 85 feet in elevation above this tunnel, a second tunnel 60 feet in length, follows the vein, which averages 2 feet in width of the same white, solid quartz. The vein is traced up over the mountain for 600 feet. At 170 feet elevation the the vein shows 4 feet in width and contains some free visible gold. An assay of $ 20.00 is said to have been obtained from the vein at this point.

Mr. Hatcher's cabin is situated at the mouth of a stream entering North Arm about 3,200 feet north of the Utopia Vein.

Kesnoff and Smith Vein.

About 1 mile southwest of the Utopia Vein Alec Kesnoff and Jack

Smith have driven a tunnel 26 feet on a quartz vein, which averages 5 feet in width, of hard, white quartz showing a few specks of pyrite. This vein strikes N. 85° E. and dips vertical. The property is abandoned.

Other Veins of North Arm.

A number of other veins were noted outcropping along the shores of the arm. About 3,000 feet northwest from the Kesnoff and Smith vein a brownish stained outcrop occurring in slate was examined. This mineralization is over 10 feet in width and shows on a rocky bluff above the water's edge. A grab sample of broken material from these quartz quartz stringers in slate assayed; gold 0.08 oz., silver 0.30 oz. per ton.

Beauty Bay.

KX104-40

It is reported that Frank Skinner discovered two veins late in 1931, in Shelter Cove. They are reported as being about 20 feet apart, one 12 inches in width and the other 4 feet in width. An assay of $51.00 is reported from the smaller vein.

Very Respectfully Submitted,

Earl R. Pilgrim

Earl R, Pilgrim

Fairbanks, Alaska.
Dec. 29, 1931

Record of Petrographic Examination, Nuka Bay Rocks.

By Paul Hopkins and Earl R. Pilgrim,

1. L. piece graywacke, from Babcock and Downey, hanging wall Lady Luck Vein. KX104.2

Mostly chlorite with small amounts of quartz with some fine grained calcite.

2. 2 pieces graywacke from Quartz Bay.

Hornblend in considerable quantity also considerable felspar, slight amount of quartz.in first piece.

In second piece mostly felspar, with slight amount of amphiboles, and quartz.( less than 5 %)

3. 1 piece of graywacke from Quartz Bay.

About 25% quartz with remainder felspar fragments, possibly some chlorite.

4. Light colored dike from North Arm near Rosness and Larson camp.

Orthoclase with small amount of quartz, few crystals amphibole.

5. Dike rock from Peter Sather Tunnel No. 2. (west tunnel)

Practically all felspar( plagioclase) with considerable calcite.

6. Graywacke from Peter Sather Tunnel No. 2.,same as above.

Felspar.

7. Graywacke from south shore Surprise Bay.

Altered felspar or chlorite with 5 to 10% quartz, small amount of amphiboles.

8. Piece graywacke from south shore Surprise Bay near Frank Skinner Tunnel.

Over 30 % quartz, remainder plagioclase. KX104.3

9. Wall rock from footwall Charles Goyne Tunnel.

Quartz 20 %, dark amphiboles.

10. Graywacke from Peter Sather Tunnel No. 1.

Felspar, quartz, some calcite, possibly nephlite.

11. Graywacke from Charles Goyne Tunnel, footwall side of vein. KX104.3

Less than 10 % quartz, no hornblend, some amphibole.

12. Dike on North Arm, east shore.

Quartz 20 %, orthoclase, amphibole, pyrite.

13. Conglomerate from west side of Surprise Bay.

Pebbles are slate, matrix shows amphibole and chlorite.

14. Graywacke from North shore of Palisade Lagoon close to Narrows.

Augite, quartz, andesine.