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TERRITORY OF ALASKA

DEPARTMENT OF MINES

COLLEGE, ALASKA

June 3, 1953

ITINERARY REPORT

TO: Phil R. Holdsworth, Commissioner of Mines

FROM: Robert H. Saunders, Associate Mining Engineer

SUBJECT: Field trip made by Martin W. Jasper and Robert H. Saunders, Associate Mining Engineers, from May 15 to May 22, 1953 to visit some recently discovered nickel prospects in the Yukon Territory.

In the summer of 1951 an important nickel discovery was made on Quill Creek near Burwash Landing in the Yukon Territory. Since then, there has been continual prospecting in the region, and it has been proven that the nickel mineraligation occurs as far west as the White River, about 20 miles from the Alaska-Canada border. This field trip was made to study the mineralogy and geology of the known prospects and to determine if there is any probability that the mineralization extends across the border into Alaska.

May 15: R. H. Saunders left Fairbanks at 8 a.m. and traveled by Alaska Coachways to Tok Junction, arriving at Tok at 4 p.m. M. W. Jasper left Anchorage about 8 a.m. and traveled by private car to Tok Junction, arriving at Tok at 5 p.m. We continued together from Tok Junction to Scottie Creek by private car, arriving at Scottie Creek at 10:45 p.m.

May 16: We left Scottie Creek at 9 a.m. and arrived at Koidern, Y. T. at 11:15 a.m. In the afternoon we walked to the Prospectors Airways drill site on the White River and returned to the camp at Koidern.

At Koidern, Prospectors Airways has a camp on the highway and another camp at the drill site, three-and-one-half miles from the highway. There is a road to the upper camp, but it is passable to four-wheel-drive-vehicles only.

Mr. Finn Campbell, geologist for Prospectors Airways, described the nickel deposit as a number of pods and lenses of chalcopyrite and pyrrhotite occurring in a shattered zone in silicified volcanic tuff. At the drill camp, Mr. Ronald Baker, drill foreman, showed us the cliff along the White River where the discovery was made. The outcrop is in a vertical cliff at the river's edge, and it is accessible only in the winter when the river is frozen. The strike and dip of the deposit are not definitely known, but the strike appears to be about N-70°-W, and the dip appears to be vertical.

In the two camps there were about 30 men; those not engaged in the drilling were brushing out claim lines. The company was in the process of organizing the men into two-man prospecting parties: one prospector and one geologist in each party. The prospectors are paid $300 per month, and they retain a ten per cent interest in each claim they stake. The geologists are either students or recent graduates; their main job is to write reports on the areas prospected.

May 17: During the day we made a reconnaisance along the west side of the White River. In the evening we left Koidern at 9 p.m. and arrived at Joe's Airport Lodge at Mile 1095 at 11:15 p.m.

On the west side of the White River we found zones of chalcopyrite-pyrrhotite mineralization. The largest of these was about six feet wide. Although we tested numerous specimens for nickel, we were unable to get a positive test on any of them. Prospectors Airways has not yet found any nickel on the west side of the river. The rocks on the west side are of the same general age and type as those on the east side, but the individual beds have not been correlated.

Fig. I. View looking down the White River from the vicinity of the nickel outcrop.

Shortly after we returned to Koidern, Mr. E. O. Chisholm, chief geologist for Prospectors Airways, arrived in camp;

we had an interesting and informative discussion with him in the evening. In 1952 Mr. Chisholm made a trip up Beaver Creek into the Ptarmigan Lake area on the Alaskan side of the border. He found no nickel on the trip, but he did find a chalcopyrite-magnetite deposit on Dry Creek about ten miles from the border.

Mr. Ronald Price of the Hudson Bay Mining and Smelting Co. had told Mr. Chisholm in Whitehorse to tell us to contact the proprietor of Joe's Airport Lodge and have him arrange transportation for us to the Hudson Bay Mining and Smelting Co. camp on Quill Creek.

May 18: We left Joe's Airport Lodge at 1 p.m. and arrived at the Hudson Bay Mining and Smelting Co. camp on Quill Creek at 3 p.m. Transportation was by Hudson Bay Mining and Smelting Co. Jeep. The trail to the camp is about nine miles long; it leaves the Alaska Highway about 18 miles northwest of Joe's Airport Lodge and goes up the valley of Quill Creek; it is passable to four-wheel-drive vehicles only.

Mr. Hal MacKenzie is the foreman in charge of the camp, and Mr. Ray Freberg is the geologist. At the time of our visit there were three diamond drills in operation, and there were two more on the property to be put into operation soon. An adit was being started to intersect the ore-body below the No. 1 showing. The equipment on hand for driving the adit included a portable compressor, Gardner-Denver mucking machine, two ore-cars, and a supply of steel rails.

The ground is blocky and much casing is required in the drill holes. The high cost per foot of drilling under such conditions has added to the desirability of going underground.

At the No. 1 showing, solid sulfides are exposed over a width of 20 ft, and there is also an unknown width of mineralized wallrock. The exposure is in the steep wall of a gulley on the north side of a ridge about 500 ft high. The gulley runs down the side of the ridge almost due north. The ore-body cuts across the gulley, and its strike has been estimated to be between east-west and southeast-northwest; it dips into the hill at about 45°. The ore is at the contact between fine-grained peridotite and a light green rock which Mr. Freberg referred to as a fine-grained quartzite, but it appears to be the same as the rock along the White River which Mr. Campbell referred to as a silicified volcanic tuff. The diamond drills now in use are near the ridge-top; vertical holes are being drilled to intersect the ore-body a few hundred feet down the dip from the No. 1 showing. Two piston pumps are used to pump water for the drills from a stream about 400 ft in elevation below the drill sites. The camp is about 4150 ft above sea level, and the drill sites are about 500 ft above the camp.

Besides nickel and copper the ore contains cobalt, gold, silver, platinum, and palladium. The ore is considered to be a "nickeliferous pyrrhotite"; pentlandite has not been definitely identified. The outcrop at the No. 1 showing has been known for several years, but it was considered to be a low-grade copper prospect until it was first tested for nickel in 1951.

May 19: We traveled by Jeep and on foot to two more showings on property held by the Hudson Bay Mining and Smelting Co.

We first visited the No. 3 showing which is the prospect shown on the accompanying map on the east side of Quill Creek. There, a zone of solid sulfides one-and-one-half feet wide is exposed for about 20 ft along the strike in a gulley wall. The ore occurs along the contact between peridotite and the fine-grained green rock. Some specimens of the ore gave a good positive test when treated with dimethylglyoxime.

The second showing we visited was on the largest eastern tributary of Quill Creek. Azurite and malachite are disseminated through a basic igneous rock in a zone about 20 ft wide. Rock is exposed on both sides of the gulley, but the mineralized zone has been found on only one side. No primary minerals were visible in the rock. This showing is probably a different type of mineralization from the others; it is not shown on the accompanying map.

Fig. II. Hudson Bay Mining and Smelting Co. camp.

May 20: We traveled on foot to the Prospectors Airways property on Arch Creek and returned to the Hudson Bay Mining and Smelting Co. camp.

Prospectors Airways had just begun to establish a summer camp on Arch Creek. There were only two men in the camp and neither of them knew the location of the showing. We spent most of the day searching in the area. M. W. Jasper found a nimeralized zone in which there were sulfides disseminated through peridotite, but the material gave a negative nickel test. In the vicinity there were the same general rock types that are found near the showings on the Hudson Bay Mining and Smelting Co. holdings.

May 21: We traveled by Jeep from the Hudson Bay Mining and Smelting Co. camp to Joe's Airport Lodge. From the lodge we drove to Burwash Landing to try to locate Mr. James MacDonald, mining engineer from Seattle, who was reported to be outfitting there for a prospecting trip up the White River into Alaska, but he was not there at the time. We returned th the lodge for lunch; at 1 p.m. we left and traveled to Tok Lodge, arriving at 8 p.m. M. W. Jasper continued southward by private car.

May 22: R. H. Saunders left Tok Lodge at 2:30 p.m. via Alaska Coachways and arrived at Fairbanks at 9 p.m.

The accompanying map shows the locations of the nickel prospects visited. Prospectors Airways holds the prospect on the White River and the one on Arch Creek. Hudson Bay Mining and Smelting Co. (through its subsidiary, Hudson Bay Exploration and Development Co.) holds 10 to 12 miles of property along the apparent strike of the three prospects near Quill Creek. The No. 2 showing on the Hudson Bay Mining and Smelting Co. property is the westernmost of the three Quill Creek showings. We did not visit this showing because it was covered by ice at the time. There is a high mountain ridge between the No. 1 showing and the No. 2 showing.

Two other companies, Conwest and Falconbridge, were reported to be holding property in the area, but they apparently were not actively prospecting at the time.

Prospectors Airways owns and operates their own diamond drill, but the drilling for the Hudson Bay Mining and Smelting Co. is done under contract by the Midwest Diamond Drilling Co. Drill runners on Quill Creek are paid $1.59 per hour; they work 12 hours per day, and there is no time-and-one-half pay for overtime.

Both companies have hired a number of young geologists, recent graduates and students, for rather extensive programs of mapping and reconnaisance work. The geology of the Kluane Ranges between Quill Creek and the White River has not been mapped, but the Geological Survey of Canada will have a party working there this summer.

Both companies have magnetometers at their camps, but neither seems to have used them very much yet. Mr. Chisholm of Prospectors Airways told us that magnetic anomolies could be detected over the deposits, and his company plans to do some magnetometer work this summer. They also plan to try some selfpotential electrical methods and some geo-chemical prospecting. The Hudson Bay Mining and Smelting Co. is using an electro-magnetic method which they have found to be successful in the Canadian Shield. The equipment is called the "loop-frame" apparatus; it is manufactured by the Boliden Mining Co. of Sweden.

All the nickel prospects are in the same general types of rock. On Quill Creek the peridotites seem to occur in a series of sills. The ore deposits are at or very near the contact between peridotite and a fine-grained, greenish-colored rock. Some of the peridotite has sulfides disseminated through it.

A major fault, known as the Shakwak fault, runs the length of the Shakwak Valley. The movement on the fault was mostly vertical, and the southwest side is the downthrown side. According to the Geological Survey of Canada, the rocks on the southwest side of the fault are of Carboniferous to Cretaceous age, and those on the northeast side of the fault are of pre-Cambrian age, excluding intrusives. All of the known prospects are on the southwest side of the fault and from one to four miles from it. The fault may have provided structural control for the mineralization.

On the Alaskan side, the steep northern flank of the Nutzotin Mountains is almost in line with the Shakwak fault. Along this northern flank, the U. S. Geological Survey has mapped a contact between Paleozoic or older rocks on the northeast and Mesozoic rocks on the southwest. In USGS Bulletin 933-B, Fred H. Moffitt states that a fault is indicated here, but its presence has not been fully established.

It has been reported to M. W. Jasper that a packer, Harry Boyce, found some nickeliferous pyrrhotite float along the Chisana River during the past two years.

If the mineralization extends into Alaska, it is most likely in the northern part of the Nutzotin Mountains. The rocks in this region are of the same general geologic age as the host rocks on the Canadian side, and there is good indication of favorable structure. The reported occurrence of nickeliferous float on the Chisana River makes that part of the region particularly favorable. The region could probably be most easily reached by going from the Alaska Highway up the east side of the Chisana River or up Snag Creek. There is a possibility that pack horses might be available for the trip.

Respectfully submitted,

Robert H. Saunders

Robert H. Saunders
Associate Mining Engineer

cc: Anchorage office

141°-00'

140°-00'

62°-00'

Scottie Creek

Snag Creek

Beaver Creek

WHITE RIVER

CHISANA RIVER

NUTZOTIN MOUNTAINS

ALASKA HIGHWAY

SHAKWAK FAULT

DONJEK RIVER

KLUANE RIVER

KLUANE LAKE

Arch Ck.

Quill Ck.

CANADA
ALASKA

SCALE : 1" = 8 Miles

⊛ - Nickel prospect.

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SKETCH MAP
Kluane-White River Area

Adapted from maps by the Geol. Surv. of Canada and the U.S. Geol. Surv.
R.Saunders - 1953