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STATE OF ALASKA
DIVISION OF MINES AND MINERALS

REPORT ON THE EMERICK WEST DELTA NICKEL PROSPECT,
MT. HAYES QUADRANGLE

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ABSTRACT

The Emerick West Delta prospect is in the Alaska Range near the central part of the Mt. Hayes quadrangle on the west side of Delta River. At the prospect, a nickel-bearing intrusive rock of unknown width crops out in several places for a distance of 5700 feet along the side of a gorge. Nine samples of the nickel-bearing rock assayed 0.17 to 0.57 per cent nickel and 0.11 to 0.32 per cent copper. One sample from an 18-inch-wide lens of metallic sulfides cutting across the nickel-bearing rock assayed 2.01 per cent nickel and 0.61 per cent copper. The mineralization is similar to that at the Emerick prospect, which is on the east side of Delta River a few miles east and north of the Emerick West Delta prospect.

INTRODUCTION

The Emerick West Delta nickel prospect is owned by the Bee Mining Company, Box 951, Delta Junction, Alaska. Owners of the Bee Mining Company are Mr. and Mrs. Rollie Emerick and Mr. Irving Blakefield, all of Delta Junction. The prospect was examined June 25, 27, and 29, 1962. On June 25 the party visiting the prospect included Charles F. Herbert, Irving Blakefield, and Rollie Emerick; Mr. Herbert was not a member of the party on the other two days.

Another nickel prospect owned by Rollie Emerick on the east side of the Richardson Highway a few miles east and north of the West Delta prospect has been described in a Division of Mines and Minerals report entitled REPORT ON THE EMERICKS NICKEL PROSPECT, MT. HAYES QUADRANGLE, November, 1961, by Robert H. Saunders.

LOCATION AND ACCESSIBILITY

The West Delta prospect is in the Alaska Range near the central part of the Mt. Hayes quadrangle at $63^{\circ} 20'$ N latitude and $145^{\circ} 48'$ W longitude. It is on the west side of Delta River less than one mile from the Richardson Highway. Plate 1 is a map of the vicinity.

The floor of the Delta River valley is a floodplain, which, in the vicinity of the prospect, is a mile wide. The river is braided throughout most of its course, and the river channels change from year to year. When this examination was made, the river, where it flows by the prospect, was confined to a single channel on the east side of the floodplain adjacent to the highway. Near the prospect the flood-

plain lies at 2500 feet altitude; from its east side, Rainbow Mountain rises to 6000 feet. At the west side of the floodplain, a steep bank rises 400 feet to an eastward-sloping terrace. The terrace extends four miles along the river and a mile westward to the base of a mountain chain that is a minor part of the Alaska Range. Four miles west of the river, this chain of mountains reaches 6000 feet altitude. Ice fields and glaciers in the higher parts of the mountains feed streams that are tributaries to Delta River. Four unnamed tributaries that flow eastward from the mountains have cut deep gorges through the eastward-sloping terrace. The prospect lies along the north side of the lower or eastern part of one of these gorges. On the Delta River floodplain, the stream that emerges from this gorge separates, and some of its branches flow northward as far as a mile before emptying into the river.

To reach the prospect, it is necessary to cross Delta River by boat and to ford one or more of the stream branches that flow northward on the Delta River floodplain. Fording the stream branches is not difficult at a low water stage but would be difficult or impossible during periods of exceptionally high water. Delta River is swift and silt-laden. Numerous boulders, outcrops, and shallow riffles make crossing the river in a boat somewhat hazardous.

PROPERTY AND OWNERSHIP

The prospect is covered by 20 lode claims staked in the name of the Bee Mining Company and recorded in the State Magistrate's office at Fairbanks. The claims are staked with their long axes north-south,

parallel to some of the structures within the mineralized zone. The zone itself appears to strike nearly parallel to the line of outcrops, approximately east-west. For the present, the claims probably should be left as they are, but, after more is learned about the nature of the prospect, amending the locations may become desirable. Perhaps the main mineralized zone between extreme outcrops could be covered by four claims staked end-to-end with their long axes east-west.

GEOLOGY

The geology of the region has been described in U. S. Geological Survey Professional Paper 41, GEOLOGY OF THE CENTRAL COPPER RIVER REGION, ALASKA, by W. C. Mendenhall (1905); in U. S. Geological Survey Bulletin 498, HEADWATER REGIONS OF GOLKANA AND SUSITNA RIVERS, ALASKA, by Fred H. Moffit (1912); and in U. S. Geological Survey Bulletin 989-D, GEOLOGY OF THE EASTERN PART OF THE ALASKA RANGE AND ADJACENT AREA, by Fred H. Moffit (1954).

The rocks in the area are sedimentary and extrusive rocks of Devonian to Permian age and intrusive rocks of Devonian to Triassic age. The sedimentary rocks include argillite, sandy or tuffaceous beds, limy grit or conglomerate, sandstone, quartzite, volcanic breccia, and limy tuff. The igneous rocks are basic lava flows and related intrusives; they predominate over the sedimentary rocks.

The nickel-bearing rock at the prospect is a dark green intrusive, probably peridotite. The best exposures of this rock are in the bluff where the valley of the tributary stream joins the valley of Delta River. Immediately underlying the peridotite (?) is a

lighter colored intrusive rock, probably diorite. The contact between these two rocks is uneven; fingers of the lighter colored rock extend upward into the overlying nickel-bearing rock. This contact is well exposed from the bluff 1500 feet westward, where it disappears under a talus slope.

The eastward-sloping terrace west of the Delta River floodplain is covered with glacial till. Cobbles and boulders of various rock types can be found in the till, however, because they could have been transported long distances, such cobbles and boulders are of little value as indicators of rock types in the immediate area.

MINERAL DEPOSITS

Plate II shows the outlines of areas in which the nickel-bearing rock crops out. The line of outcrops trends N 70° W, and the strike of the nickeliferous rock appears to approximate this. The distance between outer extremities of the outcrops is 5700 feet. The north contact of the nickeliferous rock is not exposed in any of the outcrops, therefore the total width of mineralized rock is not known.

Nickel apparently is present in metallic sulfides, which are disseminated throughout the peridotite (?). In most specimens, the sulfides are visible to the naked eye, but in some they cannot be distinguished without the use of a hand lens. During the examination a small lens of metallic sulfides cutting across the nickeliferous rock was uncovered. The sulfides comprising the lens are pyrite, pyrrhotite, and chalcopyrite. The lens appears to be similar to

eight of nine lenses found at the Emerick prospect on the east side of Delta River and described in the 1961 report.

SAMPLES AND ASSAYS

Twelve samples were taken during the examination; they were assayed by Donald Stein, assayer for the Division of Mines and Minerals at College, Alaska. Table I shows the assay results, and Plate II shows where the samples were taken.

Sample 20 was taken from the face of the bluff shown in Fig. 2 by cutting chips at intervals of 5 feet along the entire face, a distance of 100 feet. The chips were cut 4 to 5 feet above the toe of the bluff.

Samples 21, 22, and 23 were cut from the same place as sample 20, but chips were cut at intervals of 3 feet, and the samples were taken end-to-end. Sample 21 came from the easternmost 20 feet of the face; sample 22 came from 35 feet near the center of the face; and sample 23 came from the remaining 45 feet at the west end of the face.

Sample 24 consisted of chips broken at random from large pieces of talus in the talus slope shown on Plate II. At this place the contact between the nickel-bearing rock and the underlying rock is well up on the wall of the gorge. The talus consists mostly of pieces of the nickel-bearing rock.

Sample 25 was taken at 2900 feet altitude from the top of a small ridge, which, at the time of the examination, protruded through snow that still partly filled the gulch. The ridge probably is composed of rock in place, however, it is partly covered by rubble,

soil, and vegetation as shown in Fig. 4. The sample was made up of rock fragments picked at random from the ridge. A few pieces of mica schist were noted in the rubble; these most likely had come from the glacial till that covers much of the surrounding area. The ridge probably is not within the mineralized zone.

Sample 26 was taken from 200 feet east of where sample 25 was taken on a similar ridge protruding through the snow. The sample consisted of chips broken from a well exposed outcrop that measures 30 feet along the crest of the ridge. The sample was tested for platinum, but none was detected.

Sample 27 was taken from an outcrop of dark green igneous rock 1400 feet north of the line of outcrops of mineralized rock.

Samples 28 and 29 were taken end-to-end across an outcrop on the wall of the gorge. The wall slopes 35 degrees, and the outcrop is 75 feet wide measured on the 35-degree slope. Sample 28 was taken from the northern or upper 25 feet of outcrop, and sample 29 was taken from the southern or lower 50 feet of outcrop. North of the outcrop, the mineralized zone continues an unknown distance under the glacial till.

Sample 30 consisted of fragments chipped at random from the outcrops along the top of the bluff.

Sample 31 was cut across a sulfide lens exposed in a small hand-dug pit. The lens lies within the peridotite (?); it dips vertically and strikes north-south. It is 18 inches wide where the sample was cut, and it was exposed along a strike-length of four feet.

SUMMARY

The samples indicate that the large body of nickeliferous rock is too low-grade to be minable. The small lens of metallic sulfides (from which sample 31 was taken) was found during the examination. The lens was not readily discernible, and the finding of it could be termed an "accidental discovery". Most of the outcrops are of such nature that other similar lenses, if present, would not likely be found without careful searching and some digging. The geological similarity between this prospect and the Emerick prospect is a favorable indication that more sulfide lenses are present.

Table I. Results of Assays

Sample Number	Per Cent		Remarks
	Nickel	Copper	
20	0.20	0.11	
21	0.17	0.17	
22	0.19	0.13	
23	0.26	0.30	
24	0.21	0.25	
25	.03	0.11	Outside of mineralized zone.
26	0.57	0.23	Platinum - Nil.
27	0.02	0.11	Outside of mineralized zone.
28	0.29	0.21	
29	0.46	0.32	
30	0.29	0.32	
31	2.01	0.61	

Widths represented by most of these samples are not known. See text for dimensions of outcrops and descriptions of sampling methods.