R. I. 4110 August 1947

UNITED STATES
DEPARTMENT OF THE INTERIOR
J. A. KRUG, SECRETARY

BUREAU OF MINES
THOS. H. MILLER, ACTING DIRECTOR

REPORT OF INVESTIGATIONS

WARD COPPER DEPOSIT, SEWARD PENINSULA, ALASKA

BY

W. S. WRIGHT

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By. W. S. Wright[2]

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INTRODUCTION

The Ward copper deposit was brought to the attention of the Bureau of Mines in September 1943 by John J. Knob, 217 E. Penn Street, Long Beach, N. Y. At that time all Bureau of Mines work on Seward Peninsula was being directed to the exploration of deposits of tin, a metal high on the strategic list. It was not until September 1946 that the Bureau could make a preliminary examination of the Ward prospect.

ACKNOWLEDGMENTS

In its program of investigation of mineral deposits, the Bureau of Mines has as its primary objective the more effective utilization of our mineral resources to the end that they make the greatest possible contribution to national security and economy. It is the policy of the Bureau to publish the facts developed by each project as soon as practicable after its conclusion. The Mining Branch, Lowell B. Moon, chief, conducts preliminary examinations, performs the actual investigative work, and prepares the final report. The Metallurgical Branch, Oliver C. Ralston, chief, analyzes samples and performs beneficiation tests.

Acknowledgment is extended to Robert S. Sanford, acting chief of the Alaska division, under whose supervision all exploratory work of the Territory is conducted.

1/ The Bureau of Mines will welcome reprinting of this paper, provided the following footnote acknowledgment is used: "Reprinted from Bureau of Mines Report of Investigations 4110."

2/ Mining engineer, Bureau of Mines, Juneau, Alaska.

LOCATION AND ACCESSIBILITY

The Ward copper deposit is near the head of the South Fork of Serpentine River, between Quartz and Bismark Creeks, 3-1/2 miles northwest of Kougarok Mountain on Seward Peninsula, Alaska. Its location at 65° 46' north latitude and 165° 12' west longitude is shown on figure 1.

Trinity airfield is situated 12 miles east of the deposit, near the confluence of Washington and Macklin Creeks, tributaries of Kougarck River. In summer considerable placer mining is done on Washington Creek and Kougarok River. Supplies and equipment needed during the operating season are air-freighted from Nome, 90 miles southwest of Trinity.

Some winter freighting by tractor and sled is done between this area and Shishmaref Inlet, 35 miles northwest. Freight could also be transported by scows from Teller to Salt Lake and hauled overland by tractor the remaining 36 miles. It is a like distance to the Seward Peninsula Railway terminal at Shelton. There are no roads in this area, and, because of the marshy condition, only tractors, usually of the wide-tread type, are used for cross-country hauling.

PHYSICAL FEATURES AND CLIMATE

The Ward claims cover a broad, gentle slope northwest of Kougarok Mountain. Drainage to the west forms the headwaters of Quartz Creek, a northward flowing stream tributary to Serpentine River, The east side of the area is drained by Bismark Creek, a small branch of Quartz Creek. The area is distinguishable from other parts of the immediate vicinity by two prominent knobs, or pinnacles, formed by resistant limestone. United States Land Monument 1306 is on the more northerly knob, as shown on figure 2; the other is about 1,600 feet southeast of the monument.

No arborescent vegetation is found in this part of Seward Peninsula. The northern slopes of Kougarok Mountain are mostly barren, though moss and lichen, characteristic growth of the Arctic tundra, appear in patches between Bismark and Quartz Creeks.

Climatic conditions are sub-Arctic. Records kept at Nome for many years show an annual mean temperature of 25.7° F. Winters are severe and temperatures of -40° F. are not uncommon. The annual average precipitation at Nome is 17.82 inches.

HISTORY AND PRODUCTION

The first claim locations were made on July 25, 1904. Approximately a year later, Moffit3/ examined the prospect and reported as follows:

> On the Arctic slope southeast of Shishmaref Inlet, ten men were prospecting on Dick Creek, a tributary of Serpentine River.

3/ Moffit, F. H., Gold Mining on Seward Peninsula: U. S. Geol. Survey Bull. 284, 1906, p. 139.

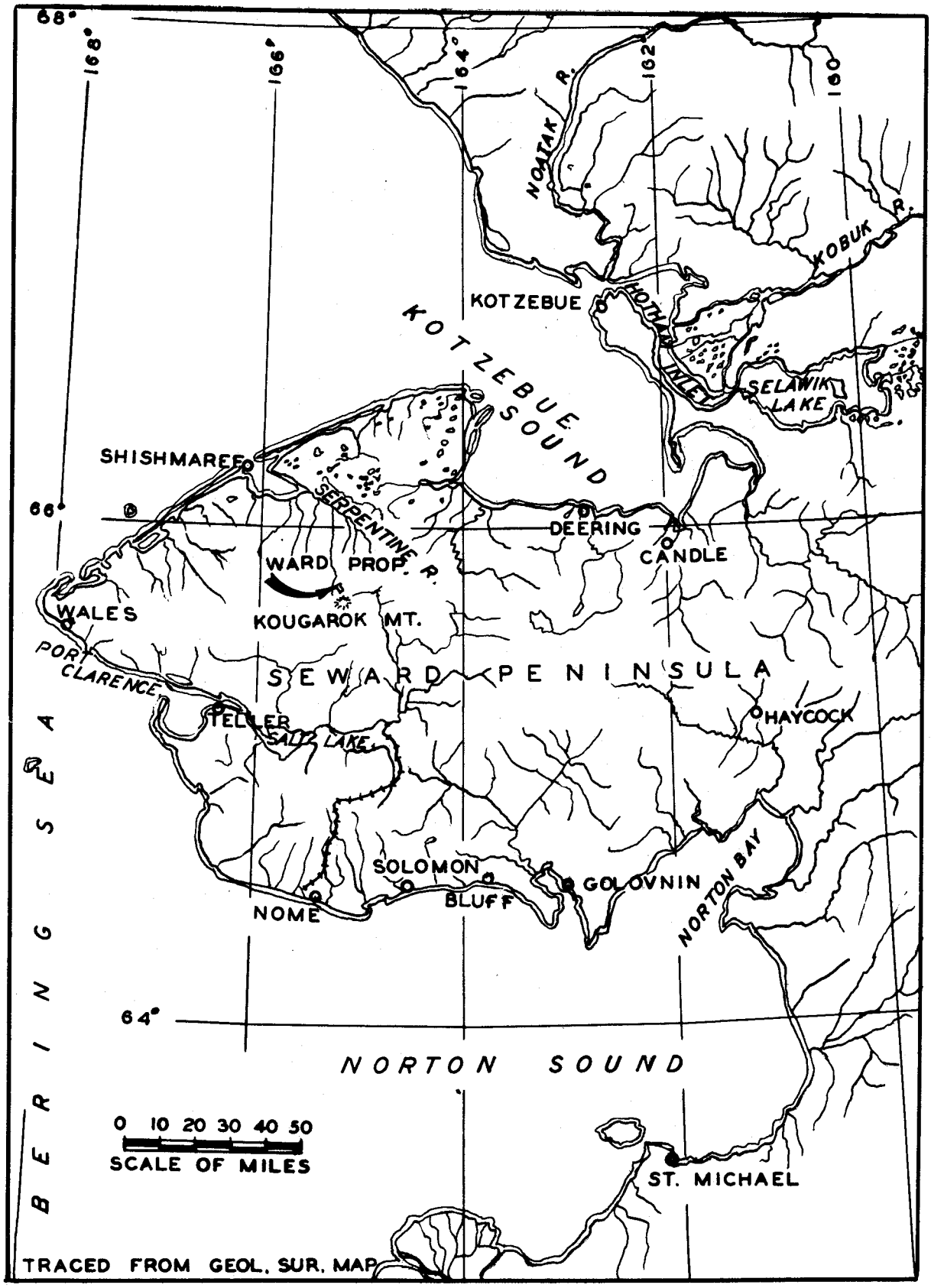

FIG. 1 INDEX MAP SHOWING LOCATION WARD PR.

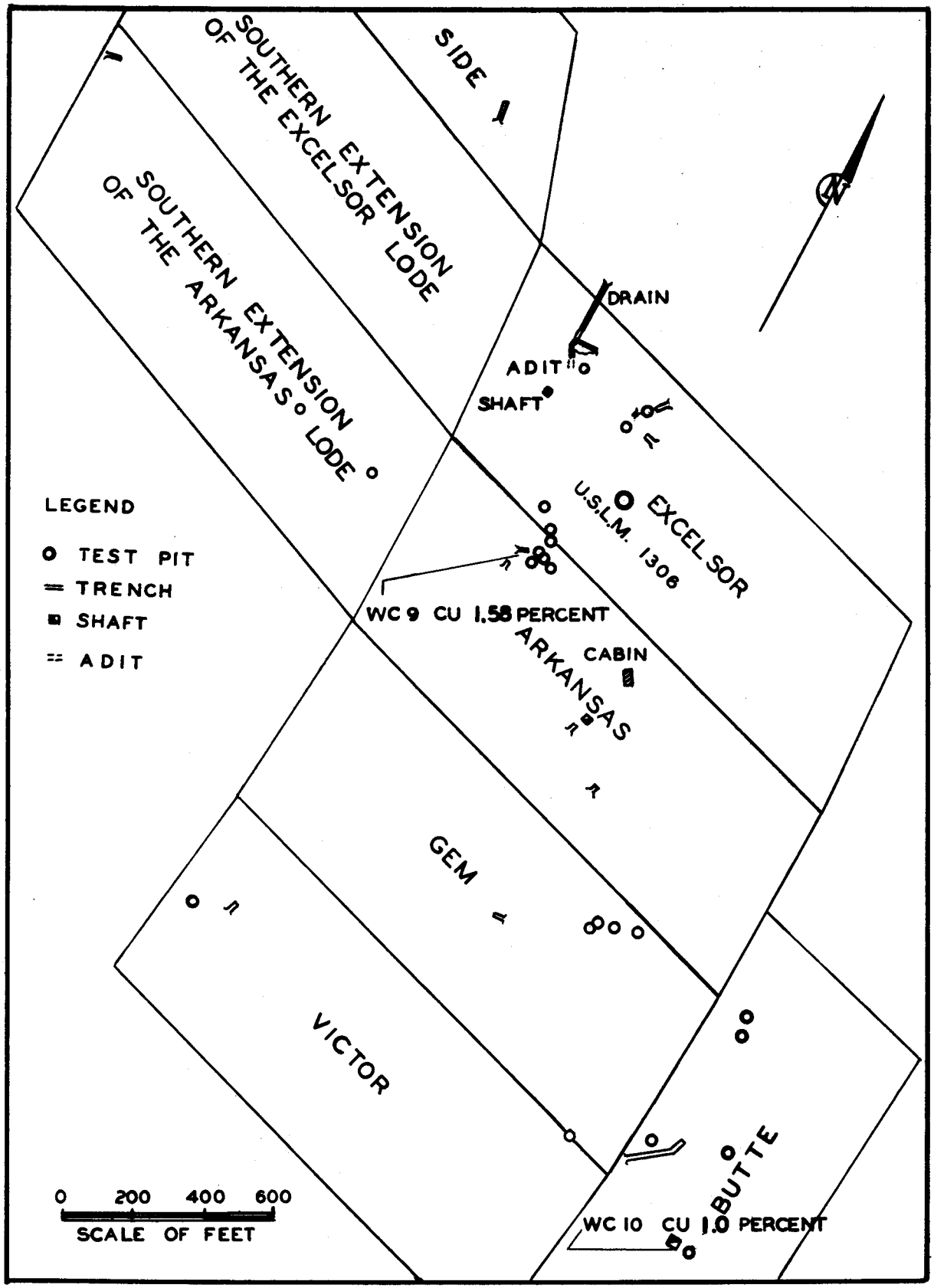

FIG. 2 CLAIM MAP~ WARD COPPER

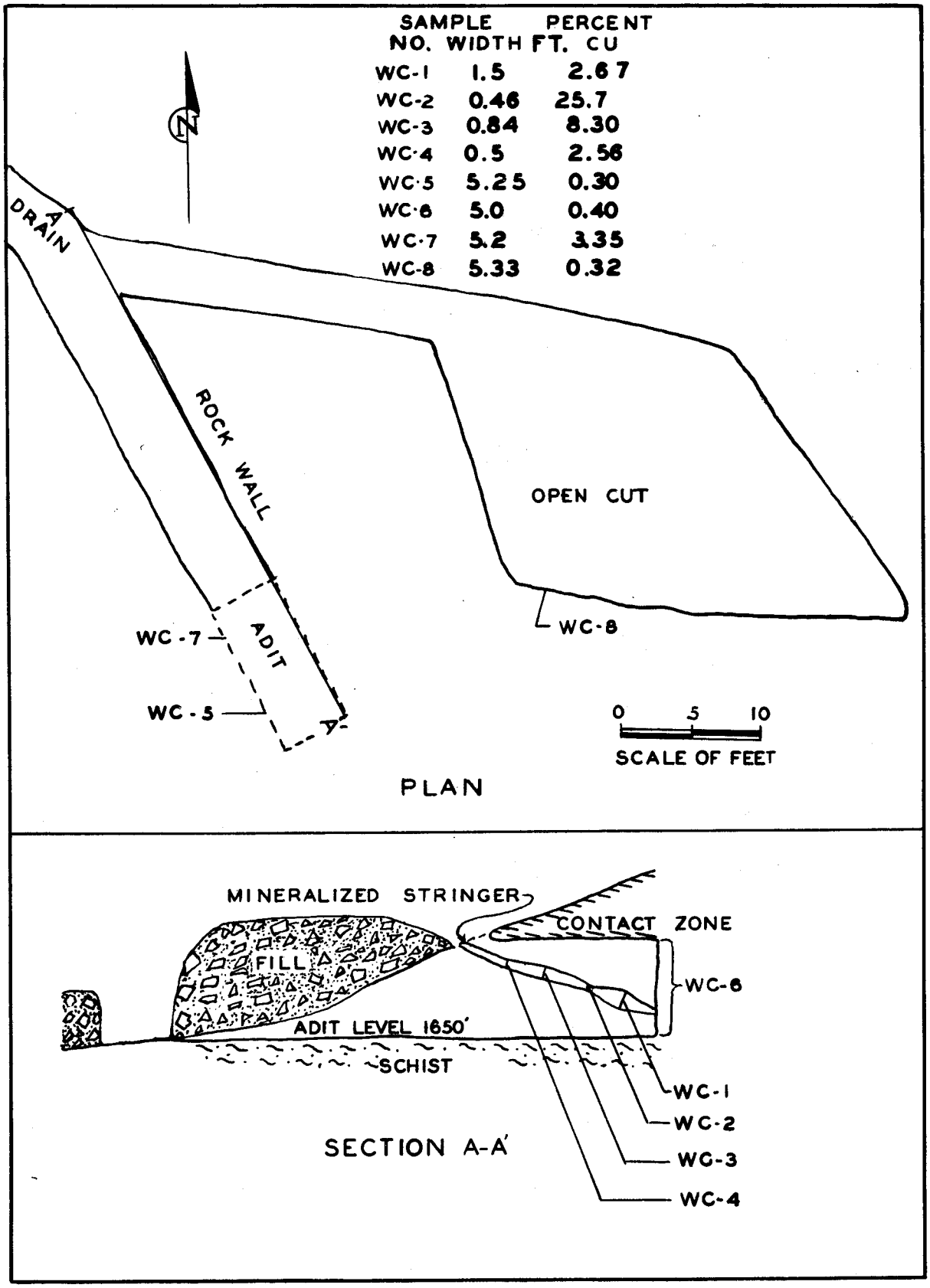

FIG.3 ADIT AND OPEN CUT AT WARD COPPER

A copper prospect also has been discovered in this region. It is located near the head of South Fork of Serpentine River, between Quartz and Bismark Creeks. The copper occurs as carbonates, chiefly malachite with some azurite, with quartz, at a contact of limestone overlying gray mica-schist. A shaft 25 feet deep has been sunk above the vein, which dips to the northwest, but it must be carried down 20 or 25 feet farther before reaching the ore. An incline 20 feet long was also driven in the vein, whose thickness is said to be from 6 to 21 inches, and 10 to 21 tons of ore were taken out, which will be sledded to Teller this winter (1905-6).

A report4/ by the Geological Survey shows that the deposit yielded a small amount of copper in 1906 and 1907, and small shipments of ore were again made in 1913 and 1916, as follows:

Year	Tons	Copper content, percent	Value
1906	8	41	$1,200.00
1907	8	41	1,200.00
1913	14	30.34	1,400.00
1916	9.473	-	981.12
			4,781.12

Eight claims, known as Excelsor, Arkansas, Gem, Victor, Butte, Southern Extension of the Excelsor Lode, Southern Extension of the Arkansas Lode, and Side, with a combined area of 152,013 acres, were surveyed in July 1921 and, upon application of the Ward Copper Co., were incorporated into a mineral land patent designated as Survey 1306 of the Port Clarence mining district.

No mining or development work has been done since 1916.

GENERAL GEOLOGY

Rocks of the region consist principally of gray mica-schist and thin-bedded limestone.

The schists are metamorphic rocks of complex origin and are made up largely of biotite, graphite, chlorite, quartz, and calcite. It is impossible to determine the attitude of the schist, as the only structural planes are cleavage.

Limestone appears to overlie the schist unconformably, though in the area of the Ward copper deposit there is evidence of considerable silification at the contact. A very large part of the surface occupied by the Ward claim appears to coincide with the schist-limestone contact, and quartz appears in great abundance. The limestone is thin-bedded and dips 10 to 15 degrees northwest.

4/ Brooks, Alfred H., and others, Mineral Resources of Alaska: U. S. Geol. Survey Bull. 662, 1916, p. 440.

CHARACTER OF ORE

Iron and copper carbonates, mostly in the form of surface coating and fillings of interstitial rock seams, have been exposed in several places over an area 2,600 feet long by 1,200 feet wide. Malachite and azurite are found associated with limonite, quartz, and calcite and nearly always occur at the schist-limestone contact. The only occurrence of the minerals in sufficient abundance to represent commercial ore is along a 5- to 12-inch stringer in the adit, which was probably the source of much of the ore shipped earlier. The material along the walls and face of the adit indicates a grade of ore considerably lower than that recorded in the shipments, and it is quite evident that considerable breaking and sorting was necessary to produce 30- to 41-percent copper ore. Small piles of "fines" near several of the old workings bear evidence of sorting.

The iron and copper carbonates occur as replacement minerals in a zone of silicified limestone at or near the contact, but there is little evidence that mineralization follows downward into the schist. The deepest working is probably the discovery shaft on the Butte claim. The shaft is now caved and filled, but dump rock believed to come from the bottom is mostly barren schist. Likewise, no copper minerals are found in the unaltered limestone above the contact.

SAMPLING AND ASSAYING

Eight 1- by 6-inch channel samples were collected from the adit and adjacent open cut near the northwest corner of the Excelsor claim. Sample locations and analyses are shown on figure 3.

Two grab samples were collected, one from dump material beside the trench near the north side line of the Arkansas claim and the other from the discovery shaft dump on the Butte claim. The locations and analyses of these samples are shown on figure 2. The ten samples were assayed for gold and silver. All samples contained less than 0.005 ounce per ton gold and a trace of silver.