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RECONNAISSANCE OF THE GOLD-BEARING QUARTZ VEINS IN THE TIBBS CREEK AREA, GOODPASTER RIVER, BIG DELTA QUADRANGLE, CENTRAL ALASKA

by Bruce I. Thomas

* open-file report

UNITED STATES DEPARTMENT OF THE INTERIOR

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ILLUSTRATIONS

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ABSTRACT

Gold-bearing quartz veins at Tibbs Creek, Goodpaster River, about 54 miles N 60° E of Delta Junction, Central Alaska, were examined by the Bureau of Mines to determine the production potential and extent of the metalliferous lode area. The reconnaissance work was about 50 percent complete and an appraisal of the area on the basis of accumulated data would be misleading.

Time allotted for work in the area was curtailed by inclement weather and mechanical mishap to the helicopter. Work was confined to sampling of pits and trenches. Underground workings at the Blue Lead, Blue Lead Extension, Grizzly Bear, and Grey Lead are iced but cursory inspection reveals they would be safe for entry after removal of ice barriers.

Bureau of Mines records show a scant 150 tons of ore, averaging 0.88 ounce of gold per ton, was produced from the Blue Lead, Blue Lead Extension, and Grizzly Bear. The amount of subsurface mining in this remote area is not explained by the surficial sampling and related work that was completed during the reconnaissance. Continuance of surface sampling and removal of ice barriers for entry underground to permit mapping and sampling is recommended.

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INTRODUCTION

Reconnaissance of the gold-bearing quartz veins at Tibbs Creek, Goodpaster River, Big Delta quadrangle, Central Alaska (Fig. 1), was made during August 23-26, 1964, using intermittent helicopter support. The work was about half completed because inclement weather and a mishap to the helicopter curtailed the allotted time in the area. The purpose of the reconnaissance was to determine the extent of the metalliferous lode-bearing area and to form a concept of the production potential of the deposits from surficial spot sampling and inspection of underground workings. Work was confined to the inspection of old prospect pits and trenches. Underground workings are partially iced and it was not possible to prepare them for entry in the time allotted to the area.

LOCATION AND ACCESSIBILITY

Tibbs Creek is in the Goodpaster River region about 50 miles N 60° E of Delta Junction at latitude 64°28' N and longitude 144°15' W (Fig. 2). Fairbanks, the supply center and transportation hub of Central Alaska is about 110 miles N 73° W of Tibbs Creek.

An airstrip on Tibbs Creek provides access to the area by small fixedwing aircraft. The strip is about 1,500 feet long and 100 feet wide and is partially overgrown with willow and alder shoots, and in places is washed from flooding by Tibbs Creek. Without maintenance, the strip becomes progressively more hazardous for aircraft. During

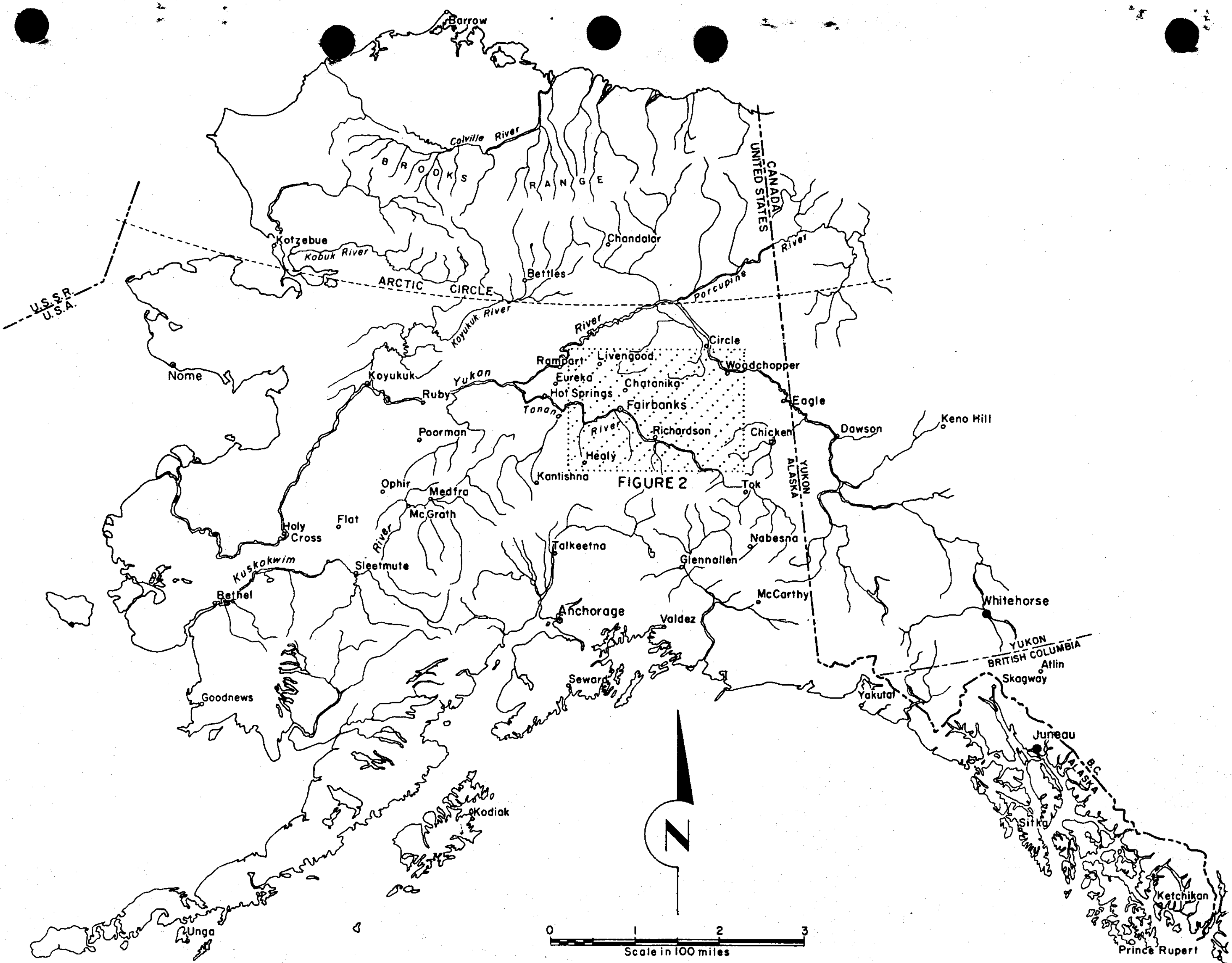

FIGURE 1.- Index map of Alaska

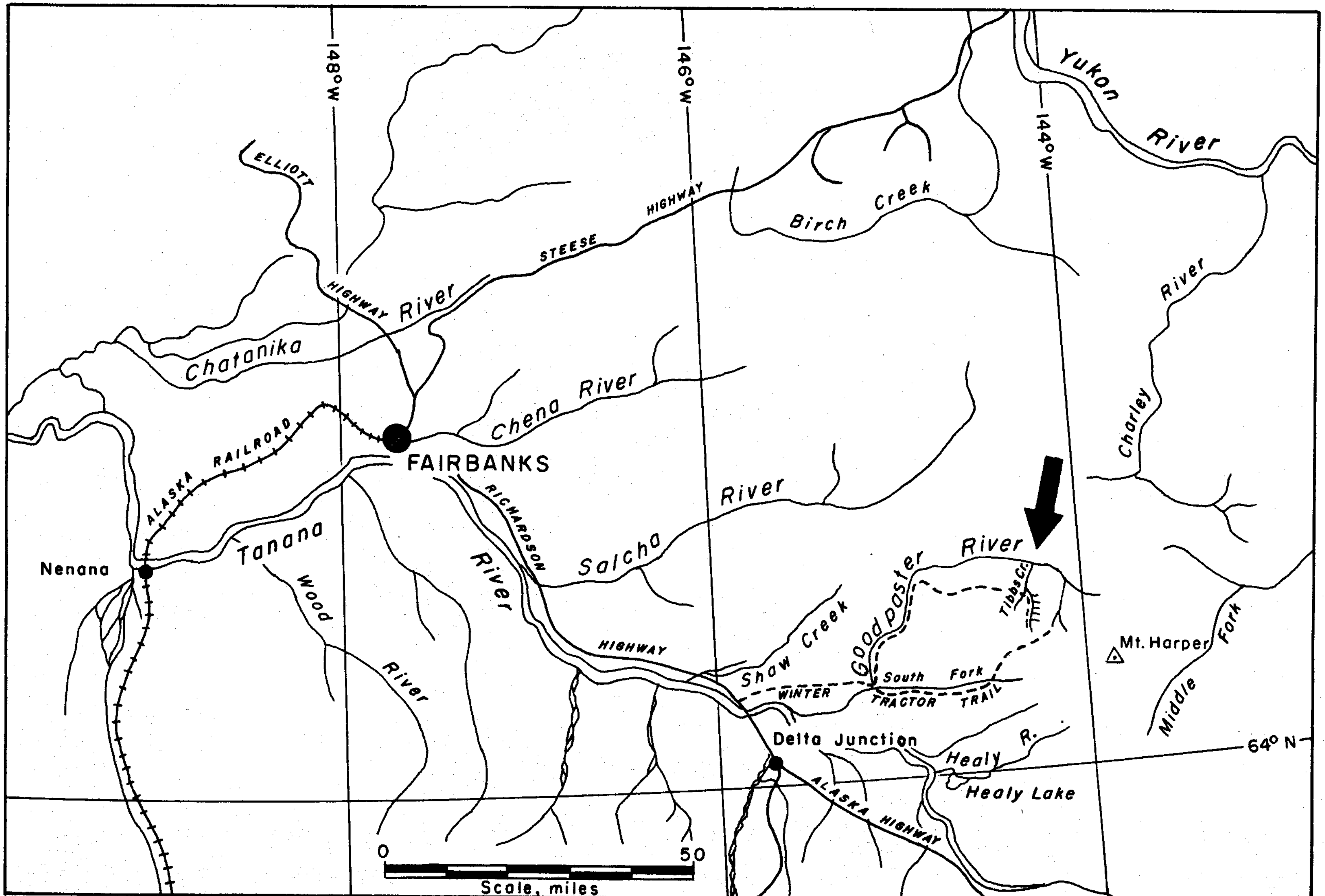

FIGURE 2.- Tibbs Creek Area, Goodpaster River

winter months portions of the strip are covered by overflow ice which adds to the danger of winter landing on skis.

The Tibbs Creek area is reached overland in winter by tractor-trail. The tractor-trail starts near Mile 285 on the Richardson Highway and follows a circuitous route for 65 miles to Tibbs Creek (Fig. 2). At the confluence of Liscum Slough and the Goodpaster River the trail branches; one route follows the Goodpaster River and the other follows the South Fork. By either route Tibbs Creek is only 65 miles from the Richardson Highway. The main Goodpaster River route is usually preferable because the pass at the head of Central Creek is less precipitous than the pass at Divide Creek on the South Fork.

PHYSICAL FEATURES AND CLIMATE

The Tibbs Creek area is a small segment about 4 miles square, of the Yukon-Tanana upland, and is amidst rounded hills that are drained by the Goodpaster River basin. The local physical features are typical of the topography along the north flank of the Tanana River valley and is characteristic of much of the Yukon-Tanana upland with its rounded hills and flat-topped ridges. The most prominent landmark is Black Mountain at the head of Tibbs Creek in the southeastern corner of the area. Black Mountain has a plateau like top with an altitude of 5,080 feet and is about midway along a flat-topped ridge that trends about 12 miles in a northerly direction.

The eastern tributaries of the headwaters of Tibbs Creek cut into the northern segment of the ridge (Fig. 3) and outline the Tibbs Creek area. The tributaries, designated from north to south, as Granite, Wolverine, Antimony, Johnson, and King Creeks, are practically parallel streams in "V" shaped valleys that are separated by flat-topped ridges to form a distinctive local physiographic feature. The headwaters of the "V" shaped valleys terminate in steep faces against the ridge.

Most of the area is above timberline. The ridges are covered with loose rubble and bedrock exposures are sparse except along precipitous slopes. At widely separated places along crestlines there are small truncated pinnacle-like bedrock exposures.

Willow, alder, and thickets of brush grow along the headwaters of stream courses. Moss covers most of the lowlands and extends along Tibbs Creek valley. Between Wolverine Creek and King Creek spruce trees are suitable for mine timber and cabin logs.

The climate is typical sub-Arctic with long cold winters and relatively short summers. Precipitation is probably more than in the lowlands of the Tanana River valley. Rain showers are frequent in summer and snow is three to four feet in depth by mid-winter. The wind blows most of the time and violent wind storms are frequent during winter months.

HISTORY AND PRODUCTION

The discovery of placer gold on Michigan Creek, a tributary to the South Fork, caused the first stampede to the Goodpaster River region in 1915. Some placer mining resulted from the stampede but the deposits were too low grade and mining activity soon ended. The Goodpaster River region did not attract much attention again until the early 1930's when gold-bearing quartz veins were discovered in the Tibbs Creek area by William Hirshberger and Lawrence Johnson. Hirshberger and Johnson staked the Blue Lead and shortly thereafter other claims were staked by Walter Johnson, Lou Colbert, William McCann, Victor Anderson, and William Eisenmenger.

About 1935, Jack McCord of Fairbanks consolidated some of the holdings at Tibbs Creek and was instrumental in getting the American Smelting and Refining Company to undertake the first underground exploration in the area. In the fall of 1936, the American Smelting and Refining Company set up camp on Summit Creek and by mid-winter completed preparations for drifting on the Blue Lead. The exploration work was terminated some time late in 1937 and shortly thereafter C. W. Tibbett of Fairbanks acquired the lease holdings of American Smelting and Refining Company. Tibbett installed a 50-ton mill, using amalgamation plates and table concentration for recovery, at the Blue Lead, and operated intermittently for almost 1-1/2 years and then closed down in the fall of 1939. Between the years 1939 and 1941 Goodpaster Exploration drove about 1,300 feet of drift, cross-cut, and raises in the Gray Lead and then terminated their work because of World War II and the attendant increasing operating costs. This was the last underground exploration in the area.

Bureau of Mines records show a total production from the Tibbs Creek area as 132 ounces of gold and 25 ounces of silver from an estimated 150 tons.

GENERAL GEOLOGY

The general geology of the Tibbs Creek area has not been determined in detail. Mertie[1/] of the Geological Survey designates the predominant rocks of the area as granite and quartz diorite of Mesozoic age. Reconnaissance shows granite, gneissic schist, and augen gneiss are probably the same meta-igneous intrusives designated as the Pelly gneiss[2/] that is associated with Birch Creek schist. Mertie dates the Birch Creek schist as pre-Cambrian age. The northern segment of the long north-south trending ridge where Black Mountain is located appears to be predominately granite. About midway between the crest of the ridge and Tibbs Creek granite abutts augen gneiss and gneissic schist to form a meandering contact extending northward from upper

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1/ Mertie, J.B., Jr. The Tanana-Yukon Region, Alaska. U.S. Geol. Survey Bull. 872, 1937, Plate 1.

2/ work cited in footnote 1, pages 51 and 52.

Tibbs Creek to Granite Creek (Fig. 3). In places monzonite occurs in both granite and gneiss but surficial reconnaissance does not indicate it to be widespread. Monzonite probably invades granite and metamorphic rocks in the form of small localized plutons.

Underground workings at the Gray Lead show intense faulting and shearing along the contact of granite and gneissic schist. The shear zone at the Gray Lead is expressed on the surface by a pronounced saddle-like depression across the spur that separates King Creek and upper Tibbs Creek. Granite and gneissic rocks are found on both sides of similar saddles developed across other spurs separating westward flowing tributaries of Tibbs Creek. This characteristic surface expression indicates that a persistent shear zone defines the contact of granite and metamorphic rocks.

DESCRIPTION OF DEPOSITS

The lode deposits of the Tibbs Creek area are essentially gold-bearing quartz veins; sulfide veins appear to be insignificant in number and importance. In general free gold occurs in quartz containing pyrite, arseno-pyrite, and/or stibnite. Underground exploration indicates that the gold content of the veins decreases with an appreciable increase in sulfides notably arsenopyrite. Veins pinch and swell and range in width from a few inches to about eight feet, but widths of two to three feet appear to be more common than widths near eight feet. Most veins are in shear zones in granite or in the shear zone along the contact of granite and gneiss or gneissic schist. In places both premineral and postmineral faults parallel vein structure; numerous small transverse faults offset veins a few inches to several feet.

In the southern part of the area arsenopyrite is the predominant sulfide. At the surface the veins are usually stained by hydrous ferrous arsenate and iron oxide. The staining usually indicates an appreciable free gold content. At the Blue Lead, and elsewhere in the northern part of the area, quartz with minute grains of stibnite and possible jamesonite indicate a high free gold content. The thinly disseminated antimony sulfide gives quartz a distinct blue cast.

Summarily, veins strike N 15°- 20° E and dip 60°-70° NW. Underground exploration seems to indicate that payshoots are small with a possible slight rake to the south. Strike faults disrupt continuity of the veins.

FIELD WORK AND SAMPLE RESULTS

Reconnaissance of the Tibbs Creek area was shortened by inclement weather and delays caused by mechanical problems with the helicopter. Work was confined to surficial investigation of pits and trenches. Many pits and trenches are caved therefore most sampling was confined to dumps and spoil piles. Underground workings are iced but cursory inspection indicates they would be safe after removing ice barriers.

However, time did not permit making access for complete underground entry. Underground workings are at the Blue Lead, Blue Lead Extension, Grizzly Bear, and Gray Lead (Fig. 3). Some ore was milled from the Blue Lead, Blue Lead Extension, and the Grizzly Bear.

Twenty-five samples were collected from the northern section of the area. Sample locations and tabulated results with descriptions of individual samples are shown on Figures 3, 4, and 5. Surficial investigations do not confirm reports of strong sulfide veins in the area. The vein on the ridge between Granite and Wolverine Creeks (Fig. 4) identified by samples 585 and 585A is composed of stibnite and quartz, and marks the only location where appreciable sulfide mineralization was observed.

Petrographic analysis of a grab sample of table concentrate from the mill at the Blue Lead, sample 578, figure 3, shows the following mineral constituents arranged in decreasing order of abundance: Pyrite, quartz, arsenopyrite, stibnite, goethite, muscovite, and sericite, biotite, covellite, and digenite. The concentrate is stored outside of the mill building and is cemented with iron oxide. The cementing material is probably derived from the oxidation of pyrite, arsenopyrite, and metallic iron.

CONCLUSIONS AND RECOMMENDATIONS

With the exception of one anomalously high gold assay, sample 571, figure 5, results of surficial sampling do not appear to justify the amount of underground workings in the remote area. However, the production records, despite the obviously scant 150 tons shows a recovery of 0.88 ounces of gold per ton from underground. To appraise the gold potential of the area in the reconnaissance conducted thus far would be misleading. It is recommended that surface sampling be continued into the southern section of the area, and ice barriers be removed from underground workings to permit mapping and sampling of the veins at the Blue Lead, Blue Lead Extension, Grizzly Bear, and Gray Lead.