Public-data File 86-18

PROSPECT EXAMINATION OF THE GOLDEN EAGLE LODE-GOLD PROSPECT NEAR PORCUPINE, SKAGWAY B-4 QUADRANGLE, ALASKA

By

T.K. Bundtzen and K.H. Clautice

Alaska Division of
Geological and Geophysical Surveys

March 1986

THIS REPORT HAS NOT BEEN REVIEWED FOR
TECHNICAL CONTENT (EXCEPT AS NOTED IN
TEXT) OR FOR CONFORMITY TO THE
EDITORIAL STANDARDS OF DGGS.

794 University Avenue, Basement
Fairbanks, Alaska 99709

CONTENTS

FIGURES

TABLE

INTRODUCTION

On June 25, 1985, the authors examined the Golden Eagle lode gold deposit near the head of McKinley Creek, tributary of Porcupine Creek near the old mining camp of Porcupine, Southeastern Alaska. The prospect examination was conducted as part of a cooperative study of the Haines subdistrict of the Juneau mining district by the U.S. Bureau of Mines (USBM) and Alaska Division of Geological and Geophysical Surveys (DGGS). A geologic sketch map, assay information, and suggestions for further work are herein presented. The authors wish to thank mining claim owner James P. McLaughlin, W.G. Gilbert (DGGS), J.P. Still (USBM), and R.B. Forbes (DGGS) for their assistance during the investigation.

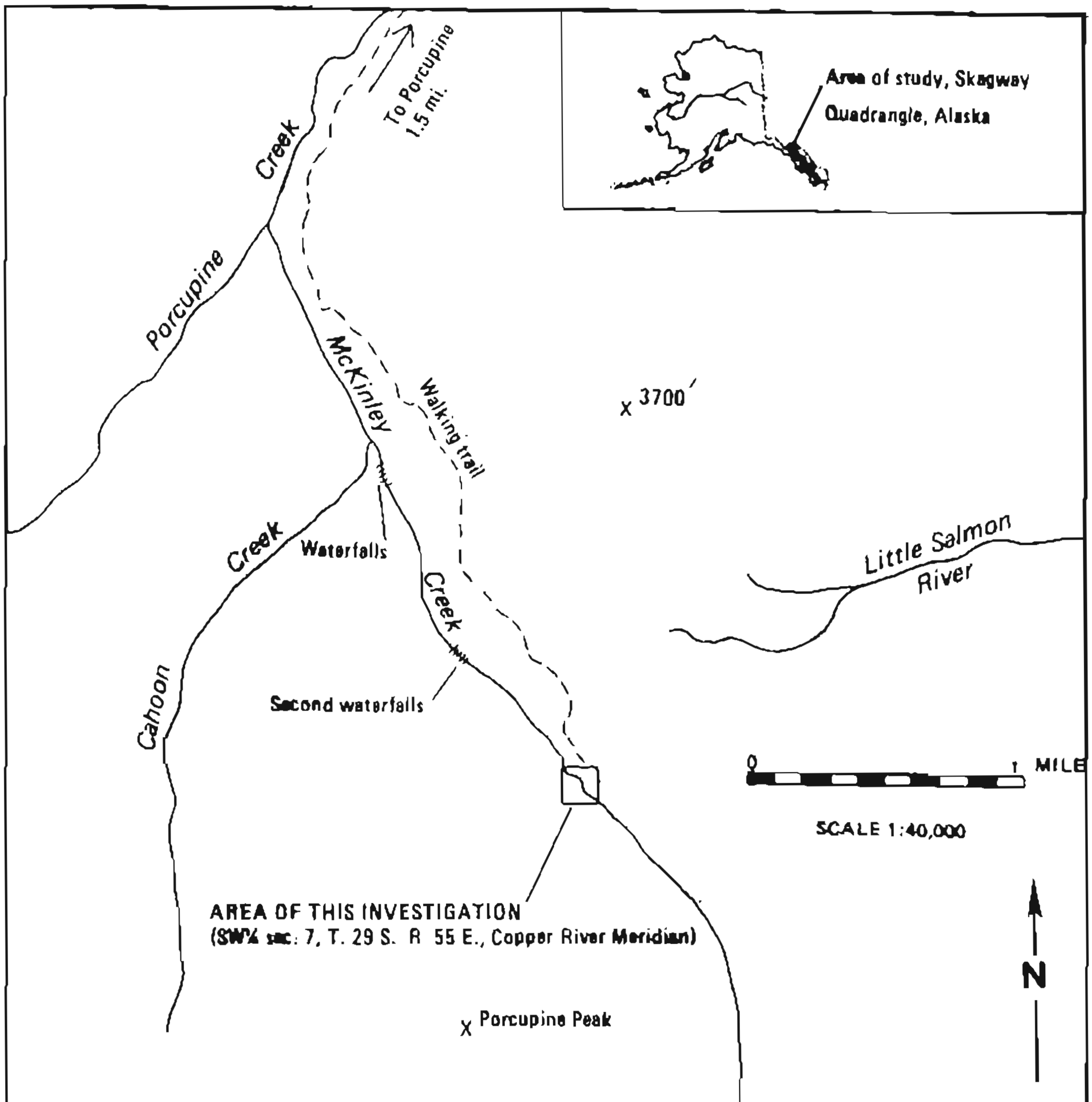
GEOGRAPHY

The study area is part of the 225 mi^2 Porcupine mining district originally described by Eakin (1919) and Beatty (1937). The district has a recorded production of approximately 80,000 oz from 1898 to the present (Smith, 1933; Robinson and Bundtzen, 1979). The old mining town of Porcupine near the mouth of Porcupine Creek, is located about 35 mi west-northwest of the port of Haines, Alaska, and is accessible by a state-maintained logging and mining road (9 mi long) from Mile 32 of the Haines to Haines Junction Highway. The Golden Eagle Lode, discovered and staked by James P. McLaughlin several years ago, is located 3.5 mi upstream from the mouth of Porcupine Creek, and is accessed by a fairly good walking trail along the right limit of Porcupine and McKinley Creeks about 100 to 200 ft above their canyon floors. The lode crops out on the western limit of McKinley Creek at an elevation of 1,820 ft, SW¼ sec. 7, T. 29 S., R. 55 E., Copper River Meridian, Skagway B-4 Quadrangle, Alaska (fig. 1).

The area is characterized by steep, glacially carved mountains and broad U-shaped valleys. Relief ranges from 500 ft at the town of Porcupine to 5,400-ft-high Porcupine Peak. Rapid, post-glacial downcutting has incised steep, bedrock-walled canyons in the valleys of McKinley, Cahoon, and Porcupine Creeks and several water falls are present in all three drainages. Traversing in the vegetated canyon areas can be hazardous.

GEOLOGY OF THE PROSPECT

The area is underlain by dark-gray slate, metasandstone, metasiltstone, and minor carbonate of the Porcupine Slate (Eakin, 1915). This rock unit is now considered by Redman and others (1985) to have an age range of Devonian to Pennsylvanian on the basis of faunal collections in marble from Porcupine and Glacier Creeks. Above the Porcupine Slate are interbedded sediments, volcaniclastics, and pillow basalt now thought to be Triassic in age (Ken Dawson, Geological Survey of Canada, personal commun., 1985). The rim of a 15 mi^2 Mesozoic granodiorite pluton is exposed at the head of McKinley Creek, approximately 1.5 mi from the Golden Eagle Lode. The study area lies about 1 mi north of the axis of a major east-west trending anticline, a structure responsible for the general distribution of layered rocks in the study area.



Topography from USGS Skagway B-4 Quadrangle.

Figure 1. Location map showing Golden Eagle Prospect, Skagway Quadrangle, Southeast Alaska.

The Porcupine Slate, in the vicinity of the Golden Eagle and associated lodes, consists of dark-gray, pyrite-rich, micaceous, carbonaceous slate to phyllite; medium-gray, micaceous metasiltstone; and slightly foliated, coarse-pebble metasandstone (fig. 2). Tan to brown, medium-grained, micaceous silica-carbonate bands or beds 3 to 15 ft thick crosscut or occur parallel to the foliation exhibited in slate and metasiltstone units. The massive nature, local crosscutting relationships, igneous-like porphyritic textures, and presence of mariposite(?) led the authors to conclude in the field that silica-carbonate units were altered mafic dikes intruded into the rock section. However, microscopic examination of two thin sections cut from samples collected by the authors and R.B. Forbes show relict quartz-carbonate grains of possible detrital (i.e. sedimentary) origin, suggesting that some of the silica carbonate exposures are calcareous metaclastic beds. In most silica-carbonate samples a protolith could not be determined; hence, the question of whether the silica-carbonate units in figure 2 are altered dikes or metasandstone is unresolved at this time.

The Golden Eagle deposit is a crosscutting, quartz-pyrite-pyrrhotite-sphalerite fissure vein intruding an 11- to 15-ft-wide, tan silica-carbonate dike. On the west limit of McKinley Creek (fig. 2) the fissure vein ranges from 3 to 27 in. thick, trends N. 35°-65° W., and dips steeply northeast to vertical. The hanging wall of the vein, at or near creek level, contains a highly gossanous 3.5-ft-long by 0.5- to 1-ft-wide wedge of bronze-colored pyrite, pyrrhotite, and minor sphalerite. Much of the original sulfide content has been oxidized away leaving a prominent cavity or 'vug' composed of euhedral quartz crystals, ferricrete gossan, and local concentrations of very fine-grained free gold. Of note is the occurrence of sulfur spheres and masses up to 2-in. diam. that apparently envelope masses of sulfide grains, particularly sphalerite. Such phenomena is believed to be the result of oxidation of the sulfide zone, although sulfur products from parent sphalerite grains are considered unusual. Higher on the vein, smaller pods of massive to disseminated pyrite, pyrrhotite, and minor sphalerite are also localized along the hanging wall. Overall the vein is largely barren of sulfides so that an average sulfide content is about 5 to 8 percent. Small veinlets of quartz also occur on both sides of the silica-carbonate bed as well as along its contact with enclosing slate.

At least two phases of silica injection are apparent in the vein: 1) an earlier, white, highly fractured vein quartz that composes 80 percent of the total fissure filling, and 2) a brown to tan, iron-stained, euhedrally crystalline, vug-quartz accompanied by interlocking sulfide species previously described.

Table 1 presents assay results of chip-channel sampling taken up the exposed face of the Golden Eagle vein (fig. 2). The values range from nil to 3.8 oz/ton gold and nil to 1.3 oz/ton silver. The weighted average of six samples taken along 14 ft of exposed vein is 0.653 oz/ton gold, 0.227 oz/ton silver, 0.45 percent zinc, and traces of copper, lead, and cobalt; this however includes a very high-grade sample from the vicinity of the vug at creek level. The high-grade sample, a 14 in. chip-channel, contains about 70-percent sulfide, mainly pyrite, and a 30-percent mixture of quartz, ferricrete gossan, and quartz crystal debris. Free gold grains in the 150-

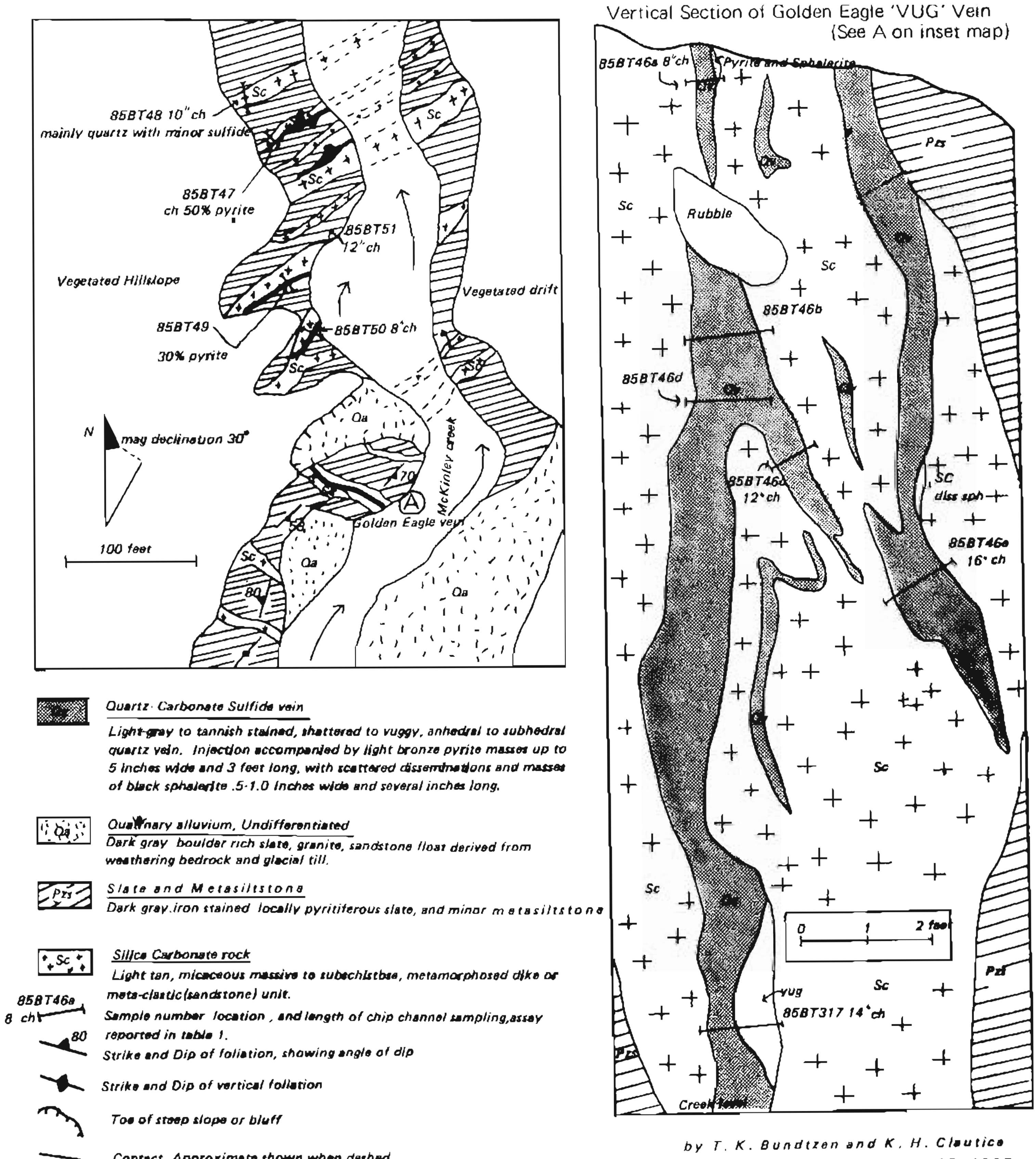


Figure 2. Geologic sketch of Golden Eagle zinc-gold prospect, McKinley Creek, Skagway B-4 Quadrangle.

Table 1. Analytical results of chip-channel and grab samples, Golden Eagle Prospect, Porcupine mining district, Alaska.*

Sample no.	Cu (ppm)	Pb (ppm)	Zn (ppm)	Ag (ppm)	Co (ppm)	Au (ppb)	Remarks
84BT317	31	20	475	46.2	108	129,950	14" chip-channel 70% sulfide (pyrite and pyrrhotite) in vuggy quartz vein; euhedral quartz in vugs.
85BT46A	27	26	975	0.2	22	5	8" chip-channel, sphalerite, tight quartz vein with gossan.
85BT46B	4	8	190	0.4	8	2,480	6" chip-channel, pyrite-rich quartz vein with minor vugs.
85BT46C	2	13	97	ND	7	780	12" chip-channel, pyrite-rich quartz vein with gossan.
85BT46D	4	18	42	ND	6	1,185	14" chip-channel, pyrite-rich tight quartz vein.
85BT46E	3	13	915	ND	8	25	16" chip-channel, sphalerite, quartz vein with slate xenoliths.
85BT47	5	20	720	7.4	60	75,550	Grab sample, quartz vein in dike, 50% pyrite and pyrrhotite.
85BT48	2	11	28	ND	4	840	Grab sample, quartz vein, 30% sulfide, mainly pyrite.
85BT49	8	20	480	0.3	18	1,265	Grab sample, quartz vein, 20% sulfide with minor sphalerite.
85BT50	12	12	165	ND	19	140	Grab sample, quartz vein marbled through 6' wide silica-carbonate unit.
85BT51	8	8	715	2.3	28	7,070	6" grab sample, quartz vein, 10% sulfide with minor sphalerite.

*Analyses by Bondar-Clegg, Inc., Lakewood, Colorado 80228.

to 200-mesh range were won by panning the oxidized, pyrite-rich material in the floor of the vug. Additionally, one polished section from material taken from this section of the vein shows finely crystalline masses of free gold occluded in the pyrite. Hence, the existing evidence suggests that the last phase of silica injection carried sulfide-bound gold into the system. Approximately 8.15 mg recovered from residual material in the pyrite at the vug site (84BT317a) yielded a gold fineness of 780 with 219 silver and 1 undetermined. Effectively silver is the only impurity present in the gold bullion.

The surface area of the vein exposed in the creek bluff is about 9.5 ft^2. The bluff in which the vein is exposed is heavily vegetated, and exposures of the vein were not found beyond the face. The vein should project in a northwest direction 30 ft to the opposite limit of the bluff that intersects a downstream meander of McKinley Creek. Assuming vein continuity for this distance, 285 ft^3, or about 24 short tons[1], of potential mineralized rock with an average grade of 0.65 oz/ton gold exists above the creek level. Because fissure veins can pinch and swell, and our gold assays are erratic, these assumptions are speculative. The fissure probably extends some distance laterally in both directions from the discovery exposures and down dip below the level of the creek. However, this would have to be confirmed by subsurface investigations.

Further downstream from the Golden Eagle Lode, several similar mineral occurrences were examined and assayed (fig. 2, table 1). All five sites sampled are quartz-pyrite-pyrrhotite veins cutting the contact between silica carbonate and slate. Here, the veins parallel northeast-trending foliation or bedding of enclosing host rocks, in contrast to the northwest-trending vein orientation of the Golden Eagle Lode. These veins contain 5- to 65-percent total sulfide and are 1 to 6 in. thick, with sulfides generally localized along the vein hanging walls. The average assay value of five grab samples taken over a width of 125 ft of stockwork-like veins in the creek cut is 0.495 oz/ton gold, 0.043 percent zinc, and traces of cobalt, copper, and lead. It is emphasized that the analyses are not representative grades of individual veins or the width of the mineralized area. The average gold tenor is somewhat similar to that reported from chip-channel efforts at the Golden Eagle vein. J.P. Still (USBM; personal commun., 1985) has obtained similar assay values in the prospect area; he has also found massive sphalerite veins up to 4 in. wide in association with similar fissure vein systems further downstream below the mineralized exposures shown in figure 2. We found minor pod-like masses of sphalerite less than 1 in. thick in sulfide-rich fissures, but no massive sphalerite veins.

SUGGESTIONS FOR FURTHER WORK

Individual mineralized fissure veins examined in this study have limited tonnage potential. Because most are less than 12 in. thick, a high average gold tenor would have to be maintained to successfully exploit them along strike and offset expensively high waste:ore ratios. However, limited areas such as the 'vug' section at the Golden Eagle Lode contain locally exception-

[1] 12 ft^3 of quartz ore = 1 short ton.

al examples of free gold, sulfides, and euhedral quartz crystals. Such a sample found by property owner, Jim McLaughlin, was recently sold to a Juneau business as a high-quality, free gold-bearing, 'museum quality' mineral specimen suitable for display. The 'vug' portion of the Golden Eagle deposit probably contains additional specimens of this type.

The larger area of 'stockwork-like' fissure veins exposed in the creek cuts may represent a bulk-tonnage, gold-silver-zinc exploration target. However, this area needs additional bulk-style channel sampling along the creek exposures and along projected lateral extensions up the hill slopes to determine economic viability.

REFERENCES CITED

Beatty, W.B., 1937, Geology of the placer deposits of Porcupine, Alaska: Pullman, University of Washington unpublished Mining Engineering and Geology B.S. thesis, 97 p.

Eakin, H.M., 1919, The Porcupine gold placer district, Alaska: U.S. Geological Survey Bulletin 699, 29 p.

Redman, E.R., Gilbert, W.G., Jones, B.K., Rosenkrans, D., and Hickok, B.D., 1985, Preliminary bedrock geologic map of the Skagway B-4 Quadrangle, Alaska: Alaska Division of Geological and Geophysical Surveys Report of Investigation 85-6, scale 1:63,360.

Robinson, M.S., and Bundtzen, T.K., 1979, Historic gold production in Alaska---a minisummary: Alaska Division of Geological and Geophysical Surveys Mines and Geology Bulletin, v. 28, no. 3, p. 1-4.

Smith, P.S., 1933, Past placer gold production from Alaska: U.S. Geological Survey Bulletin 857, 19 p.