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STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES & MINERALS
BOX 1391
JUNEAU

PROPERTY EXAMINATION REPORT

ELECTROMAGNETIC SURVEY J & J CLAIMS KETCHIKAN QUADRANGLE

By Miro Mihelich
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SUMMARY

Samples of arsenopyrite containing 11.76 ounces of gold per ton, value $411.60, prompted an examination of the J & J Claims near Ketchikan on July 18, 1960. Auriferous arsenopyrite occurs as a minor fracture filling on a argillite-granite contact exposed in the bed of a small creek at only one location. A dense mature forest cover of spruce and hemlock and soil overburden obscure the argillite-granite contact elsewhere on the claims. Purpose of the electromagnetic survey was to determine the possible occurrence and locii of massive lenses of arsenopyrite on or near the contact, strike N 30°-35° W, which traverses the J & J Claims.

An area 1500 feet along the strike of the contact and 600 feet transverse to the strike was surveyed by stadia and 105 stations established. Because of communication equipment failure and time limitations, only 64 stations covering a distance of approximately 1000 feet along the strike of the contact was surveyed by electromagnetic methods using a Sharpe SE-100 electromagnetic unit from August 13-22, 1960.

Anomalies indicative of the presence of massive sulfides occur along the general strike of the argillite-granite contact as well as in areas north and south of the contact. The nature of the anomalies show the sulfides to occur as disseminations as well as massive lenses in a zone from 120 to 200 feet wide along the contact. The most definitive anomaly is immediately northeast of the contact where it is exposed in the creek.

Exploration by diamond drilling of the anomalous areas shown on Figure 2 is recommended. Further study and delineation of the argillite-granite contact zone for a distance of 3 to 5 miles northwest of the J & J Claims by electromagnetic methods may disclose important gold-bearing arsenopyrite deposits. The area studied by this examination was too restricted to determine the northern limits of the granitoid intrusive; Brooks in 1902, mapped the general area as argillites and limestones. The northern contact of the granitoid intrusive may reveal similar mineralogic associations and structures to those investigated on the J & J Claims.

LOCATION AND ACCESSIBILITY

The J & J Claims are practically in the city limits of Ketchikan on Revillagegido Island. (See Figure 1). The claims may be reached by driving 1.4 miles west from Ketchikan City Hall on Tongass Avenue, to Carlanna Lake Road; thence about one-half mile on Carlanna Lake Road, Baranoff Avenue, and Buren Road. The south boundary of the claims is about 500 feet by unimproved trail from the end of Buren Road. The claims are on the southwest side of a mountain and range in elevation from 300 to about 800 feet.

PROPERTY AND OWNERSHIP

Mr. Jerry Bailey of Ketchikan staked three claims, the J & J, J & J No. 1, and J & J No. 2 in the belief that the area was open to mineral location. However, the survey completed shows the claims to be on patented land, U. S. Survey 1587, owned by Mr. Earl Smith. There are no major improvements or structures on the claims. An excellent forest of mature spruce and hemlock is on the claims.

GEOLOGY

The general geology of the area studied has been described by C. W. Wright in USGS Bulletin 347, Ketchikan and Wrangell Mining Districts, 1908, page 151. Lack of exposures and only very minor prospecting during 1900 to 1910 are the basis for the following description:

> "The country rock consists of siliceous and argillaceous schists striking northwest intruded by large granitoid dikes, usually parallel to the formation and ranging in composition from syenites to gabbros. The veins generally occur within these intrusives..... There are two sets of veins, an older set containing chiefly pyrite and pyrrhotite striking north-south with dip 45° W; a second and later set striking N 20° to 35° W and usually dipping 50° SW, characterized by arsenopyrite, abundant free gold and occasional particles of tetradymite (Bi_2Te_2S)....."

Auriferous arsenopyrite samples have been submitted to the Division of Mines Assay Office at Ketchikan from locales three miles northwest of the J & J Claims. The area encompassed by this examination is too restricted to determine the northern limits of the granitoid intrusive; however, Brooks in 1902, mapped the general area as argillites and limestones. Determination and study of the northern contact of the

granitoid intrusive may reveal mineralogic associations and structures similar to those investigated on the J & J Claims.

ELECTROMAGNETIC SURVEY

This electromagnetic survey was made possible by the cooperation of the U. S. Bureau of Mines who kindly loaned the Alaska Division of Mines and Minerals their Sharpe SE 100 Electromagnetic Survey Unit. Thanks is also due the City of Ketchikan who supplied the transit for surveying and the U. S. Coast Guard who furnished the "walkie-talkies". Mr. Jerry Bailey also cooperated fully in the survey by his labors and the use of a car.

Prior to an electromagnetic survey utilizing inductive methods, it is necessary to establish stationing such that profiles are surveyed at right angles to the general strike of the formations or possible ore structures. This was accomplished by establishing roughly parallel profile lines at 300-foot intervals normal to the strike of the contact. (See Figure 2). For a distance of 100 feet on each side of the contact on the profile lines, stations were at 25-foot intervals; elsewhere, stations were at either 50 or 100-foot intervals. Brush cutting and surveying required the major expenditure of effort and time in completing the electromagnetic survey.

The electromagnetic method has been one of the fundamental methods of geophysics for years. It is based on inducing a current in a conductor, usually sulfides, and measuring the resultant of the induced magnetic field by a search coil. The Sharpe SE 100 vertical coil transmitter produces an audio frequency of 1000 cycles per second with transmitter coil current of 13 to 15 amps at 700 volts. The search coil has

an amplifier and clinometer mounted on a rigid staff and by tilting it from side to side, the direction and inclination of the resultant of the induced magnetic field is measured when the vertical coil is beamed at the station occupied.

RESULTS OF THE ELECTROMAGNETIC SURVEY

Anomalies indicative of the presence of massive sulfides occur along the general strike of the argillite-granite contact as well as in areas north and south of the contact. (See Figure 2). Although it is theoretically possible to calculate the shape and probable depth of the sulfides responsible for the anomalies, insufficient data concerning the resistivity of the host rocks and overburden make such a calculation of dubious value at this time. Should interest in the area justify it, an index curve from which the shape and location of the conducter can be determined will be constructed. Line 3 / 06 was surveyed during a severe electrical storm which may account in measure for the broad null points recorded on this line.

The nature of the anomalies show the sulfides to occur as disseminations as well as massive lenses in a zone from 120 to 200 feet wide along the contact. The most definitive anomaly is immediately northeast of the contact where it is exposed in the creek on line 0 / 00.

Two anomalies at stations 300 and 200 are found on lines 3 / 06 and 9 / 07 respectively. Their general trend coincides with a strongly rust and iron stained granitic soil exposed by a trench on claim J & J No. 2.

The inability to complete the electromagnetic survey of lines 0-100 and line 12 / 12 was because the "walkie-talkie" used to communicate

direction of the vertical coil between transmitter and receiver failed to perform because of poor batteries. Arrangements had been made to assure no difficulty in communication during the electromagnetic survey, however, time limitation precluded completion of the work when fully charged batteries were unobtainable.

RECOMMENDATIONS

1. Exploration by diamond drilling of the anomalous areas shown on Figure 2 is recommended.

2. Based on results and correlation of the diamond drill exploration, further delineation and study of the argillite-granite contact zone for a distance of 3 to 5 miles northwest of the J & J Claims may disclose important bodies of auriferous arsenopyrite.

3. The northern limits of the granitoid intrusive on the J & J Claims should be further investigated. This investigation may reveal similar mineralogic associations and structures to those on the J & J Claims.

Miro Mihelich
Mining Engineer
Division of Mines and Minerals

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