REPORT ON MOOSE CREEK COPPER CLAIMS -KX 85-62 & 85-

INTRODUCTION

The writer was commissioned to examine and report on a large pyritic vein at the head of Moose Creek in the Matanuska Region, late in the fall of 1918. Snow had fallen before the examination could be made, and very incomplete data was obtained; however, the evidence of an extraordinarily large body of sulfides was so strong, that a second trip was made in August 1919. The following description has been written from notes obtained on both expeditions.

GEOGRAPHY

The Moose Creek Copper Claims are located near the head of Moose Creek, a tributary of Matanuska River which flows into Cook Inlet on the southern coast of Alaska. They extend from the Moose Creek side over the summit of the most southerly extension of the Talkeetna Mountains and into the drainage of the Little Susitna River.

They are approached from Anchorage, the nearest important town, by the Matanuska Coal Fields branch of the Government railroad, which diverges from the main line at Matanuska Junction. The claims are about 12 miles from Moose Creek Station. A wagon road follows the creek for about six miles to Baxter's Coal Mine, and from here a horse trail leads to the claims.

OWNERSHIP AND HISTORY

There are two groups of claims in the property under discussion, one of four claims held by J. H. McCallie, George Staman, L. B. Lillwal, J. B. Dimond and William Ray, and another group of seven claims adjoining

and owned by Peter Murray, Dan Sloan, J. H. McCallie, J. B. Dimond and William Ray. The claims were located in 1914 and 1915, and were visited in those years by a representative of the American Smelting and Refining Company, who made various offers to bond the prospects, which, however, did not meet with the approval of all parties concerned and were rejected.

TOPOGRAPHY

The elevation at Moose Creek Station is 500 feet, and at Baxter's Mine, five miles by most direct route, the elevation is 900 feet, which difference is equal to a grade of 1.5 per cent. At the canyon, five miles above Baxter's Mine, the elevation is 1750 feet, and at the foot of the gulch on Moose Creek, below the claims, the elevation is about 2300 feet. The outcrop of vein near head of gulch is 3500 feet, and the summit 4800 feet. The angle of slope up the mountain for the first half mile is 15 degrees, and for the remaining distance to the lower end of outcrop 30 degrees. From here to the summit the angle of slope is about 65 degrees.

GEOLOGY AND MINERALOGY

The Talkeetna Mountains are formed of a great granite mass, which has been assigned by Page and Knoph of the U.S. Geological Survey to the early Mesozoic. Within this broad classification are many border and local facies, of which the quartz-diorite of the Willow Creek area is perhaps the best known. Toward the southern border of the quartz-diorite area the rocks have an gneissoid texture, which is thought by Capps to represent an older granitic mass, that has been metamorphosed, together with a schistose area in the south-western quarter of the Willow Creek Quadrangle, which is probably the oldest formation in the district,

and has been provisionally assigned to the paleozic. South of the schistose and gneissoid rocks the mountains are flanked by tertiary sediments of eocene age, derived largely through erosion from the higher central masses of the granitic area. These sediment lie conformibly upon the granitic rocks, and the contact is not to be construed as an intrusion into sedimentaries.

A sweeping survey of the Willow Creek area and the lower Matanuska Region to the southeast reveals the existence of two great faults parallel to each other, and striking approximately north 75 degrees east. The most southerly fault forms a scarp, determining the southern extension of the Talkeetna Mountains. The second fault occurs about five miles northwest of the first, and is closely parallel to it. It forms in the Willow Creek District the dividing line between the typical quartz diorite and the gneissoid granites and diorites. About midway between these two faults and parallel to them occurs a wide shear vein, which is visible from a distance of several miles as a prominent red band. The rocks adjacent to this zone are banded gneissic granites with variable textures, and exhibiting in hand specimens a rough parallelism of constituent minerals. They appear to have undergone profound cataclastic metamorphism. Minerals recognizable in hand specimens are quartz, feldspar (variety not determined), and horn blend. Silica appears to be both residual and secondary.

The vein is a wide band, varying from 50 to 100 feet, and plainly visible for about 7000 feet on its strike, which is about 75 degrees east. Its dip is 80 degrees southeast. The red color is due to oxide of iron. Sulphides of iron, copper, and zinc are found at a shallow depth. They are massive, certainly primary, and replace the

minerals of the gneissic granite in varying degrees. The vein does not appear to have any well-defined walls, but metalization gradually decreases with distances from the vein. In only one place has any work been done on this vein (see sketch) and here an irregular cut 25 feet diagonally on the vein shows a massive sulphide body, composed of pyrrhotite, pyrite, chalcopyrite and sphalerite. A sample across this cut as accurately as could be obtained assayed 0.9 per cent copper, .06 gold, and .24 ounce silver per ton.

A selected sample assayed 5.6 per cent copper, .20 ounces fold, and .50 ounce silver. Other samples taken by the owners of the property and submitted to me for assay gave the following values:

	Au. oz. per ton	Ag. oz. per ton	Cu%
No. 1	0.08	0.50	5.60
No. 2	0.08	0.20	2.00
No. 3	0.04	0.22	1.80
No. 4	0.04	0.22	2.20
No. 5	0.06	0.14	1.50
No. 6	0.04	0.20	Trace
No. 7	0.12	0.28	Trace

The following assays are from samples taken by myself:

	Au. oz. per ton	Ag. oz. per ton	Cu%
No. 8	0.06	0.24	4.20
No. 9	0.04	0.20	0.36
No. 10	0.12	0.30	0.00
No. 11	0.10	0.40	5.00

Sample No. 8 was a selected specimen of phrrhotite and chalcopyrite; No. 9 was clean pyrite with no visible chalcopyrite; No. 10 oxidised capping, with no sulphide; No. 11 selected specimen of pyrrhotite and chalcopyrite. All these samples were taken at the open cut on North-western claim.

A section of the ore, cut and polished at the labratory of the U.S. Geological Survey, shows pyrite, pyrrhotite, chalcopyrite and sphalerite. Nuclei of the original constituent minerals plainly reveal the metasomatic origin of the ore. Pyrite appears as the oldest sulphide, followed by pyrrhotite and chalcopyrite, which is replacing the pyrite plainly and the pyrrhotite less evidently. On the Nogul claim a natural section shows the vein terminating before reaching the surface. This is interpreted as indicating the extreme upper limit of metalisation, and it is certain that the later stages of metalization would not be as strongly represented here as at a lower horizon where the period of metalization continued longer, due to a greater temperature, pressure and proximity to the source of the metalizing solutions. From these premises it follows that chalcopyritisation has probably proceeded farther at a greater depths and consequently that higher copper values may be expected to appear on exploration. In this connection it should be noted that sampling has been entirely inadequate, being confined to a shallow open cut on a vein outcropping for nearly 7000 feet.

DEVELOPMENT

In addition to the open cut mentioned there is an adit 30 feet long in the pyritized granite on the south side of vein, which however does not cut the massive sulphide body, and is of no use in determining the value of the property.

It appears advisable to the writer to explore the ore body with diamond drills. This would economically define the boundaries of the ore bodies and permit their values to be ascertained by assaying the cores and sludge. Development could then proceed on the basis of size, values, and location of ore bodies.

There is a probability that a railroad spur will be built from Matanuska branch of the government railroad at Moose Creek Station, extending to Baxter's coal mine, a distance of 6 miles. This would leave but 6 miles of railroad to construct to reach the property. From Moose Creek Station to Baxter's coal mine the grade is equal to 1.5 per cent, and from Baxter's coal mine to the prospect grade would be from 2½ to 4 per cent. In the event that the projected spur is not built to Baxter's coal mine, there would be but a total of 12 miles of railroad to construct from Moose Creek Station to the property. Photograph No. 3 accompanying this report shows the upper part of the valley through which the railroad would have to be built. The lower valley from the extreme background of the picture, near the canyon, to Moose Creek Station is across glacial terraces and benches of morainal material and wooded with spruce and birch, which would furnish ample timber for all mining purposes.

POWER AND FUEL

Moose Creek has its principal source in numerous small remnantal glaciers at the heads of the small tributaries in its headward basin. It flows through a canyon about two miles below the copper prospect. Its flow at the canyon in August was estimated at from 3000 to 4000 cubic feet per minute. A dam could be built to impound considerable reserve water for the slack season, December to March. Little Susitna River and the Upper Matanuska River might also be utilized to generate power. It seems highly probable, however, that the power question would be solved by the utilization of coal, which occurs in large quantity in the Matanuska valley, the nearest occurrence being Baxter's mine, only 6 miles from the copper claims.

In addition to the burning of coal to generate power, it can also be used for smelting purposes; that from Eska and Chickaloon beds furnishing a good grade of coke.

Note: See bulletin "Results of various tests on Matanuska Coals from Alaska at Pacific Northwestern Station, Bureau of Mines 1916." by George Watkins Evans.

SUMMARY

The essential facts in the case in hand are the existence of a large pyritic body, carrying copper and gold in appreciable amounts under geological conditions, which indicate a persistence of the ore body and increase of copper content with depth. The topographic conditions are such as to permit ascertainment of values by drilling and development of the ore bodies by an adit more than 2000 feet below the outcrop of vein.

Transportation problems are simple and the proximity to a railroad and to the coal fields of the Matanuska Valley indicate cheap and ready power and an abundant supply of coke for metallurgical use.

The development of the country adjacent to the Government railroad through the Alaskan range may be expected to follow hard upon its completion, and the writer has knowledge of splendid prospects of smelting ores in the Broad Pass region, having made two trips of exploration into that region in 1918. Ores containing lime, iron, and silica will undoubtedly be available for fluxing in the event that a smelter should be constructed to reduce the ores from the Moose Creek property.

CONCLUSION

Consideration of the foregoing data leads to the conclusion that the Moose Creek Copper claims constitute an exceptionally desirable prospect.

The success of a well known mining and smelting enterprise in the northwest, working in similar ores containing an average of two and one-quarter per cent copper and less than fifty cents per ton in precious metals, is sufficient warrant for the investigation of such well situated and meritorious prospect as the one under discussion.

The writer unhesitatingly recommends the Moose Creek properties for investigation and exploration with a view to creating a mining and smelting enterprise compatible with modern conditions.

(Signed) F. LeRoi Thurmond

Sept. 5, 1919