MR-195-02

MR 195-2

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MEMORANDUM

ON

MOLYBDENITE DEPOSITS

IN

ALASKA.

KX 117-33 The most important known deposit of molybdenite in Alaska occurs on the patented claims owned by the Treadwell Gold Mining Co. that are situated at Shakan on Prince of Wales Island.

A description of this deposit, copied from U. S. Geol. Sur. Bull. No. 714, is attached hereto.

Notations on other published references to molybdenite deposits and occurrences are contained in U. S. Geol. Sur. Bull. No. 692, Mineral Resources of Alaska, 1917, p. 23; and in Bull. No. 800, Geology and Mineral Deposits of Southeastern Alaska, p. 329. Both of these bulletins are out of print and no longer obtainable but they may be consulted at the larger public libraries or libraries of large educational institutions.

Besides the deposits referred to in the above publications several occurrences are known that have not been visited or described by representatives of the U. S. Geological Survey. These include the following:

KX 76-45 1. Moose Johnson prospect near Chulitna: - Molybdenite occurs in large, pure flakes, apparently not associated with other metallic minerals in granitic rocks, at a prospect on Portage Creek, a tributary of Susitna River about 10 or 12 miles easterly from Chulitna

Station on The Alaska Railroad. This property belongs to Moose Johnson of Chulitna. The extent of the deposit is not known but specimens of the material show the mineral to possess a high degree of purity, and to occur liberally in such specimens.

K46-32 2. Two molybdenite deposits that are referred to by the owners as the "upper" and "lower" showings, occur on a property that has been located by Gus Conrad and John Hodjucovich on Ptarmigan Creek, a tributary of the Dry Delta River, in the Mt. Hayes district west of the Richardson Highway.

In hand specimens the molybdenite is shown to occur in quartz veins in diorite as patches and as disseminated fine particles, which impart a bluish tinge to the quartz. In specimens from the "upper" showing very thin fractures in the quartz carry minor amounts of fine pyrite crystals.

The extent of these deposits is not known.

K478-11 3. Rock Creek Prospect:- Molybdenite occurs in very pure coarse flakes and patches in a persistent pegmatite dike 5 feet in width, that traverses a belt of dark mica schist near the head of Rock Creek, a tributary of Batzulnetas Creek in the upper Copper River valley. The mineral also occurs in disseminated form in the adjoining schists. Associated metallic minerals include magnetite and pyrite.

Surface showings reveal five small areas of mineralization, but no continuous body that appears to be of commercial grade.

This property, which has been held by L. DeWitt and associates of Slana Road House, Nabesna Road, was recently held under

option by the Kennecott Copper Corp., who abandoned the property in 1939 after having driven a tunnel 150 feet in length underneath the surface showings. Molybdenite mineralization was reported to be practically absent at the depth of the tunnel.

KA 114-145 4. Baker Island Deposit: - Molybdenite is reported to occur in association with gold-bearing pyrite in an extensive system of quartz stringers at the junction of intersecting shear zones in granitic rocks in the general vicinity of their contact with argillites and schistose lavas at Port San Antonio on Baker Island, which lies off the West Coast of Prince of Wales Island in Southeastern Alaska.

The property on which the deposit occurs was located sometime prior to 1930 by J. G. Galvin and associates who organized the San Antonio Metals Company. A limited amount of surface trenching has been done on the ground and in 1932 four diamond drill holes ranging in depth from 170 to 380 feet were driven by Lynch Brothers of Seattle on the gold-molybdenite deposit.

Molybdenite was found to occur in association with auriferous pyrite. The small veins and stringers in which the mineralization occurs appear at the surface to be of uneven distribution and the mineralization itself also appears to be sparse and of irregular occurrence. Channel sampling of the deposit is therefore impractical.

The results of the diamond drilling are not known although gold values of about $3.00 per ton have been reported.

For several years annual assessment work only has been done on those claims of the group that cover the better ore showings.

At various places within and along the borders of the Coast Range batholith from Portland Canal to Skagway numerous occurrences of molybdenite are known but no deposits of sufficient size have been developed to the point of being of significance commercially.

From time to time attention has been drawn to deposits that occur a few miles north of Skagway near the line of the White Pass Railroad, but there is no published report on them and apparently no active development work has been done upon them.

Extract from

U. S. GEOLOGICAL SURVEY BULLETIN No. 714

KK 117-33 Shakan Molybdenite Lode Page 118

A molybdenite lode was opened in 1917 by the Alaska Treadwell Mining Co., and development work has continued to the present time, although no ore has yet been shipped. This lode is about three-fourths of a mile south of Shakan, at an elevation of 600 feet, at the north end of Prince of Wales Island, on the east side of a small stream that enters Shakan Bay.

The country rock consists of tuffaceous sediments intruded by diorite. The lode is in diorite, which varies somewhat in character and composition but in general is composed of zonally grown plagioclase feldspar, ranging from albite on the rims to bytownite in the centers of the crystals, and with an average composition perhaps of andesine; a small amount of orthoclase; considerable hornblende; and biotite, augite, iron oxides, and apatite. Being composed essentially of plagioclase feldspar and hornblende, this rock is classed as a hornblende diorite. Pegmatite is present in dikes and veins cutting the diorite and is in fact related genetically to the molybdenite in the lode. The pegmatite is composed essentially of orthoclase feldspar and quartz, with accessory sphene and small amounts of secondary sericite, chlorite, and epidote.

The vein at its maximum is 6 feet thick, with a strong, clean-breaking hanging wall and an indistinct footwall. It varies considerably in strike and dip, as is shown by the crookedness of the main tunnel which follows the vein. The average strike is about N. 70° W. and the dip ranges from 10° to 25° S. Considerable faulting is apparent, particularly along the hanging wall, where in places the vein matter for 6 inches or more has been reduced to a fault gouge. Some of the best of the ore has been taken from this zone along the hanging wall. The gangue of the vein is partly quartz and partly pegmatitic material, and these two appear to grade into one another, indicating that at least a part of the quartz is of primary origin. The sulphide minerals in the gangue include molybdenite, pyrite, pyrrhotite, and chalcopyrite. The molybdenite is in some places scattered through the quartz and pegmatite and in others more or less concentrated, particularly in the gouge zone. Pyrite and chalcopyrite are distributed throughout the gangue, but pyrrhotite is most often found in pockets or kidneys. The paragenesis of the sulphide minerals has not been deciphered.

A tunnel, now driven 360 feet, is the main underground development work. At 250 and 300 feet from the portal cross faults were met, the first striking N. 10° E. and the second N. 10° W., with offsets at both places. The molybdenite content of the vein

becomes very low beyond the 300-foot point in the tunnel, and at this point the direction of the tunnel was changed to one somewhat south of the strike on the working hypothesis that the true vein at the 300-foot point has been replaced through faulting by a barren quartz vein. It is equally possible, however, that a molybdenite ore shoot in the vein has been terminated by the fault, and that the vein exposed beyond the fault is a barren zone of the same vein. In this event, further drifting on the vein or sinking an inclined shaft down the dip will afford the greater chance of discovering ore.

A tramway has been constructed from the portal of the tunnel across the small stream above mentioned and down the opposite side of the valley to tidewater. A small dock has also been built. All mining has so far been done by hand, but in September, 1919, a compressor plant was at the dock awaiting installation. Six men, working in two shifts, were at work at the time of the writer's visit.

TERRITORY OF ALASKA,
DEPARTMENT OF MINES
MEMORANDUM FOR THE PRESS

FOR RELEASE AUGUST 1, 1938.

KA 114-117

THE OCCURRENCE OF CHROMITE IN THE KETCHIKAN DISTRICT, ALASKA.

An interesting result of field investigations recently conducted in the Ketchikan mining precinct by the Territorial Department of Mines is the discovery of the occurrence of the mineral chromite on Cleveland Peninsula.

The discovery was made by J. C. Roehm, associate engineer of the Department of Mines, who has been engaged for the past two months in examining mining properties and assisting prospectors in the Ketchikan region.

The locality where the chromite was found is along the summit of the divide that separates Vixen Inlet from Union Bay, which are indentations from Ernest Sound on the north coast of Cleveland Peninsula. The principal observed occurrences of the mineral are on and adjacent to the summit of Mt. Burnett, otherwise known locally as Red Mountain, and on the ridge that extends westerly from it toward Union Bay. By reason of its pronounced reddish color, and the absence of vegetation upon it, Mt. Burnett forms a conspicuous landmark.

Investigation and mapping of this mountain mass disclosed that it consists of a central core of dunite and pyroxenite surrounded by alternating bands of other ultra-basic rocks that include hornblendite, gabbro and pyroxenite, all of which have been intruded into a broad belt of altered sedimentary rocks. Many black basic dikes penetrate the schists adjacent to their contacts with the intrusives.

An oval mass of dunite approximately 2 miles long and 1½ miles wide embraces the summit and flanks of Mt. Burnett. Within this area chromite occurs in the form of irregular bunches, small masses, and as a crystalline constituent of the rock. Although the chromite is associated with magnetite at some of the occurrences it is of a very pure quality at others.

Another oval mass about 2 miles long and one mile wide occupies the summit of the high ridge that extends westerly from Mt. Burnett. It lies about 3 miles distant from the first described mass. Within this second mass the dunite occurs intermixed with pyroxenite and the composition of the rocks is less uniform. Also,

more magnetite is here associated with the chromite and large bunches of pure magnetite were observed. It is sometimes difficult to distinguish chromite from magnetite in the field. The surest method is by use of a magnet.

Much prospecting and development work will be required to determine the commercial value of these deposits. Even the proper sampling of the best deposits observed will require considerable time and expense.

Should commercially valuable bodies of chromite be proven the area is a favorable one for mining operations, as it is within 2 or 3 miles of deep water transportation. The mineral occurrences are at elevations ranging from 1,500 to 2,400 feet above sea level. A limited water power could be developed on the river that empties into the head of Vixen Inlet, and which flows within one mile of the principal chromite showings. This river issues from a lake more than a mile in length whose elevation is about 160 feet above sea level and whose outlet is within 2 miles of salt water. The river has a fall of 30 feet within less than one-half mile from its outlet.

The mineral chromite is used principally in metallurgical processes; especially in the manufacture of stainless steels of which it is the rust-preventing component. Although the United States is the largest consumer of chromite, it is one of the smallest producers. Large quantities of chromite ores are imported by this country. In 1936 the principal sources of supply, named in the order of their importance were: Africa, Oceania (New South Wales), Cuba, Greece, and Turkey. Probably the largest known deposits of chromite ores in the United States are situated in California and Montana. Other known deposits in Alaska are situated at Port Chatham and the nearby Red Mountain on the southerly tip of Kenai Peninsula (#); and at Red Bluff Bay on the east coast of Baranof Island.

KK 164 E

During the World War approximately 20,000 tons of chromite ore was mined and shipped from the deposits at Port Chatham. Since that time the properties have been idle.

KK 116 E

The name of Red Bluff Bay is derived from reddish color of the weathered ultra-basic rocks of dunite and serpentine types of which the conspicuous promontory that forms the north shore of the entrance to the bay is composed. These rocks contain scattered oc-

(#) Described in U.S.Geol. Survey Bull. No. 742, Chromite of Kenai Peninsula, Alaska, by A. C. Gill.

ourrences of high-grade chromite, but the mineral has not yet been found there in bodies of commercial size.

The current prices paid for chromite c.i.f. Atlantic coast ports range from $18 to $25 per long ton (2140 pounds) for ores that contain from 43 to 49 per cent chromic oxide (Cr_2O_3).

Further interest attaches to the mass of ultra-basic rocks found in the vicinity of Mt. Burnett on Cleveland Peninsula by reason of the similarity that exists in their composition and nature of occurrence to the platinum-bearing rocks of the Red Mountain area at Goodnews Bay.

Sampling and Assays

During the interval spent in obtaining the geology of Mt. Burnett and vicinity very little attention was given to sampling the central portion of the dunite masses which contained the disseminated chromite deposits. No massive bodies of chromite, other than minor segregations, were seen. However, sizable float pieces up to two feet in length and eighteen inches in diameter were noted. Later reports were to the effect that small lenses were observed on the north side of Mt. Burnett ranging up to thirty feet in length and from two to three feet in width. These were reported found after the examinations.

Several pounds of chromite pieces were, however, collected during the various trips. These were pieces of high-grade chromite mixed with various pieces of lower grade containing magnetite and ilmenite. From these a sample was taken for assay to arrive at an average figure of chromium content. This sample, No. 441, consisting of ten pounds of chromium ore gave a chromium content of 17.72 per cent. The sample was assayed at Territorial Assay Office at Ketchikan.

From the various samples representing the types of ore found on Mt. Burnett and the mountains north, four different types were sent to Territorial Assay Office at Fairbanks to determine the chromium and iron content and the presence of platinum minerals. Of these samples the following results were obtained:

	Type	Percentages	
		Chromium	Iron
Sample 558	No. 1	7.0	10.6
" 559	" 2	25.8	20.2
" 560	" 3	17.4	41.8
" 561	" 4	was found to be nearly pure magnetite	

Samples 560 and 561, which were assayed for platinum, were found lacking.

Sample No. 559, with the content of 25.8 per cent chromium

has a chromium oxide (Cr_2O_3) content of 37.7 per cent. This is the only sample that is near a commercial ore - however, the iron content is rather high.

Commercial assays could possibly be obtained from picked pieces from selected areas. However, these would not represent any massive ore bodies. Further prospecting for ore bodies may, however, reveal commercial bodies.