

Summary of Scheelite Deposits

019819 A

British Columbia

1. Molly B - 50 feet in elevation on the east bank of the Bear river opposite Stewart, B.C. A contact deposit, containing scheelite, molybdenite and pyrite in a bed of metamorphosed impure limestone. An area of about 620 square feet, averaging 3 to 6 feet in width is exposed. Grade of scheelite per cent.

2. Louise and Dot - 400 feet in elevation on the west side of the Bear river, $4\frac{1}{2}$ miles north of Stewart, B.C. A contact deposit of scheelite in beds and lenses of metamorphosed limestone. Very small quantity exposed and grade low, per cent or less.

3. Little Pat, Badland, and Hogback. A number of narrow quartz veins cutting the quartz diorite and quartz porphyry of a belt of dikes. Elevation 1000 feet to 1400 feet on the northeast slope of Bitter Creek valley at its mouth. Mineralization, quartz, pyrite, chalcopyrite and scheelite throughout, locally molybdenite, sphalerite, galena, tetrahedrite and cosalite(?). Quantity exposed very small and grade low, to per cent

4. Silverado Mine, lower workings - 1750 feet in elevation on the north fork of Portland creek, $1\frac{1}{2}$ miles southeast of Stewart B.C. A network of quartz veins in a 6 foot shear zone, locally containing scheelite. Grade very low

Scheelite has also been reported from a property owned by Nick Nickolas and Mike Koris, at an elevation of about 2000 feet on the west side of Georgia river about 5 miles from its mouth. Examination of samples from this property failed to show the presence of scheelite. Dr. Mandy reports that the samples sent to him contained very small amounts of what may be scheelite.

Scheelite was reported from a deposit of molybdenite about 2 miles west of Meziadin lake. This deposit occurs on the east

19

edge of a granite stock near the contact with the Nass river slates. The showings are situated to the north of the Meziadin lake trail and at elevations of from 60 to 2000 or 3000 feet above it. Small veins and stringers of molybdenite are present. Some fluorescent material, thought to be scheelite, was reported, but the examination of samples by Dr. Mandy failed to bring to light the presence of scheelite.

Alaska

W. A. Matthews
12th Jan, 1943.

~~CONFIDENTIAL~~
1943

Ed T

TUNGSTEN IN THE PORTLAND CANAL AREA

Scheelite has been discovered at twelve localities in the Portland Canal area to date, eight of these in Alaskan territory and four in British Columbia. Of these only one, the Riverside, has produced any quantity of scheelite, and only two others, the Mountain View and the Molly B, at the present time show any promise of production.

The Alaskan deposits have been the subject of a rather detailed study by a party of the United States Geological Survey under Mr Frank Byers and a summary of their findings is given below:

All the scheelite found to date occurs in quartz veins which strike northwest and dip at moderate to steep angles to the northeast. These veins vary from a few inches to several feet in thickness; they may be continuous, lenticular, or branching or, locally, a network of quartz stringers. In them are shoots or pockets of scheelite-bearing vein matter which may be rich enough to constitute milling ore or may be too low grade for profitable concentration; all parts of the veins, however, do not carry scheelite. All the veins occur in the 'Texas Creek batholith' (Buddington, U.S.G.S. Bull 807 - Hyder and vicinity) or, as is the case at the Riverside, in an elongated inclusion or roof pendant within this batholith. The older sediments and volcanics of the Hazelton group and the younger 'Hyder quartz monzonite' are barren of scheelite-bearing veins. Buddington regards the Texas creek batholith as the source of the mineral deposits of this area.

The mines of the area show a distinct zoning, of which the scheelite-bearing deposits occur in the lowest zone, one which extends more or less horizontally across the valley bottoms. Above the scheelite zone is a zone of base-metal sulphide deposits in which scheelite may occur but not in commercial quantities.

103P252

The mineral tetrahedrite is regarded as the indicator of this zone.

The scheelite-bearing deposits, in addition to falling within the lowest zone, or the lower part of the ~~massive~~ ~~zone~~ 'tetrahedrite zone', are, with one exception situated within an elliptical area 2 miles in length and 1 mile in width, trending northwest and southeast. The one exception, ^{or} the Engineer group, is situated 6 miles to the northwest of this area, but still along the trend of its major axis.

The important deposits of scheelite occur below an elevation of 750 to 800 feet, that is, in the lowest zone as described above. These consist of quartz veins containing pyrite, barite and scheelite. No other minerals contemporaneous with the scheelite have been found. The scheelite-bearing veins may, however, be followed or cut by veins of a later period of mineralization, consisting of barren quartz, or of quartz and sulphides, notably galena, sphalerite, tetrahedrite, chalcopyrite, pyrite and pyrrhotite, with some calcite, minerals all characteristic of the next higher base-metal sulphide zone. In this later mineralization some low-grade scheelite-bearing patches may be found and it has been postulated that these have been derived by solution and reprecipitation of the earlier scheelite. The deposits in this zone are the Riverside (Lindeborg vein) and the lower part of the Mountain View (Fish Creek No. 2 vein).

For a thousand feet or more above the productive zone, that is an elevation of 750 feet to 2000 feet or even more, scheelite may be found sparingly distributed through quartz-sulphide veins, but in no case does it occur in sufficient quantity to offer hope of commercial recovery. In this zone tetrahedrite is

found in the same veins with the scheelite and the presence of the former mineral is regarded as an unfavourable omen for any tungsten production. The deposits in this zone included the upper part of the Mountain View, the Monarch, the Last Chance vein of the Olympia Extension, and the veins in No. 5 tunnel of the Olympia claim and the No 3. tunnel of the Starboard claim, the Hyder Butte and the Engineer.

The wall rock may have some influence on the deposition of scheelite. In the Riverside mine, the vein follows a shear, not in granodiorite, but in highly metamorphosed rock of the Hazelton series, and it has been suggested that the additional calcium in this rock aids in the precipitation of scheelite from tungstic acid or similar material in the vein solutions whereas the calcium-poor granodiorite would be much less favourable. In the Mountain View deposit, however, the vein cuts granodiorite and no such inclusions of wall rock are to be found.

Summary of deposits ~~103PH6~~ ^{NO 1} ~~104B~~ ⁰⁷³

Riverside - On this property are three veins, the ~~Heis~~ ^{Leis} and Lindeberg striking north degrees west and dipping to the northeast, and the Cross vein striking north and south across the other two. Of these veins, only the Lindeberg ~~xxx~~ contains scheelite ore; in the other two scheelite occurs only as rare grains. "The Lindeberg vein is a locally mineralized quartz vein in a narrow band of crumpled injection schist included in the Texas Cree~~x~~ granodiorite. The schist band, which is 50 feet wide at the portal of the Lindeberg adit, constitutes a weak zone along which movements have taken place, and the vein is in a shear zone. The vein in part of its length crosses the

foliation of the schist at a slight angle and strikes about ~~N~~ N. 60° W."(Buddington, Bull 807, page 80). The vein has been traced for a total distance of feet underground, and feet on the surface; in this distance it ranges in elevation from feet on the northwest ~~and~~ to feet on the southeast. The vein varies from 1 to 5 feet in thickness.

As is customary in the vein deposits, scheelite-bearing quartz occurs only in shoots or pockets, and the ~~amount~~^{quantity} sufficiently high in grade to constitute milling ore is small. The amount of ore, ranging in grade from 1 to 2 per cent, blocked out at the present time is measurable in tens of tons, another 50 tons may be regarded as probable. A larger tonnage of submarginal ore (grade 1 per cent or less) may be expected, 2000 tons probable and perhaps 5000 tons possible.

~~103P045~~
 Mountain View.- At the Mountain View mine, scheelite occurs in the Fish Creek No. 2 vein, now known as the Grey Copper vein. This deposit is situated about 1½ miles southeast of the Riverside mine and at an elevation of 700 to 1000 feet. The vein, which strikes north 50 degrees west and dips 40 degrees northeast, is exposed ~~for 500 feet~~ over a horizontal distance of 500 feet and a vertical distance of 350 feet, in which distance it varies from 1 to 3 feet in width. The grade ~~is xxx~~ of scheelite-bearing material is low, rarely over 1 per cent, and the deposit can be regarded as only submarginal.

~~103P015~~ NO!
 Monarch - The Monarch claims are situated above and to the east of the Riverside mine. Scheelite has been reported from a vein striking north 55 degrees west and dipping 75 degrees to the northeast, situated at an elevation of 2400 feet, ¾ mile east of the Riverside mine. On this property several tons

of material averaging WO_3 2 per cent is exposed in a drift 50 feet long.

← Olympia Extension - The Olympia Extension claim is situated about $\frac{1}{2}$ mile south of the Monarch. On it is exposed a quartz vein striking north 60 degrees west and dipping 45 to 50 degrees to the northeast and ranging in width from 1 to 10 feet. It lies at an elevation of feet and has been traced for 600 feet. The grade of scheelite-bearing material is 0.1 per cent or less.

Olympia - Scheelite-bearing material is exposed in No. 5 tunnel of the Olympia claim, about 1500 feet south of the Olympia extension and at an elevation of 1900 feet. ^{The vein strikes North 50 degrees west and dips 45 to 50 degrees to the northeast.} A part of the vein some 20 feet long and 3 inches wide carries coarse scheelite. The grade is about 1 per cent.

Starboard - Scheelite-bearing material is exposed in No. 3 tunnel of the Starboard claim which is situated about 300 feet ^{southwest} west of the Olympia occurrence. The vein strikes north 60 degrees west and dips at 65 degrees to the northeast. In it a body 10 feet long and 3 ~~feet~~ inches wide carries coarse scheelite. The grade in this body is about 1 per cent.

Hyder Butte - The Hyder Butte is situated at an elevation of In it a quartz vein strikes and dips

Scheelite is rare and of only mineralogical interest.

Engineer - ^{IN ALASKA NEAR FERGUSON GLACIER (WEST FORK - TEXAS CRACK)} The Engineer group is situated about $\frac{3}{4}$ mile southeast of the ~~longmaxif~~ snout of Ferguson glacier, or about 6 miles northwest of the Riverside mine, and at an elevation of 4000 feet. The vein strikes north 30 to 40 degrees west and dips at 60 to 75 degrees to the northeast. The occurrence of scheelite in this vein is of only mineralogical interest.

103P103

Marmot
Engineers
NOV

The British Columbian deposits differ in a number of respects from those in Alaska. Two of the four deposits, the Molly B and the Dot and Louise, ^{103P252} are replacements in lime-silicate rocks rather than vein deposits. Three of the deposits, the Molly B, the Dot and Louise and the lower workings of the Silverado ^{lie} on the projection of the elliptical area, described above, but the fourth is situated far off its trend. The scheelite of the British Columbia is, in general, much finer grained than ~~those~~ ^{that} of the important Alaskan deposits, and ~~unlike the Alaskan~~ is frequently associated with molybdenite and powellite. The deposits appear to be related to the Hyder Quartz monzonite, ^{and in one case to the belt of quartz-diorite dikes crossing Bear R. 9 miles north of Stewart.} rather than the Texas Creek granodiorite which apparently does not enter British Columbia.

The British Columbian deposits do, however, show the same tendency to zoning as the Alaskan deposits. The most important occurrence of scheelite, the Molly B, ^{103P085} is situated at an elevation of less than 100 feet above sea level; the Dot and Louise lies at an elevation of 400 feet; and the two other occurrences, both ^{too small or} too low grade to be of commercial interest, and both containing locally some tetrahedrite and base-metal sulfides are at elevations of 1000 to 1300 feet and 1750 feet respectively.

The two contact deposits are situated in metamorphosed impure limestones of the lower part of the Bear River formation within 1000 feet or less of ~~the contact~~ a granite body. The volcanic rocks of the upper part of the Bear River formation and the argillites of the Bitter Creek formation are apparently unfavourable for replacement. Prospecting for scheelite, for the time being at least, should be confined to the contacts of plutonic rocks with the lower part of the Bear River formation, where such contacts occur at low elevations. Though the vein deposits on the British Columbian side have not as yet proved of commercial interest, prospecting in old workings might well be justified.

55-129

103P/13W

Jan. 12/43,
W. Matthews
No. 6.

LOUISE and DOT, Stewart, B. C.

Two claims, the Louise and the Dot, have been recently (August 1942) staked on a small scheelite showing by Mr. Arthur Cameron of Stewart, B. C. They are situated on the steep, lower slopes of the west wall of the Bear River valley, about $4\frac{1}{2}$ miles north of Stewart, B. C.

The workings consist only of one old open cut and 20 or 30 feet below it, a recent small excavation, at an elevation of 400 feet above sea-level, or slightly more than 300 feet above the floor of the Bear River valley. They are approached by a foot-trail, brushed out along the river-flats, leading for $1\frac{3}{4}$ miles from the road bridge across the Bear river. If the property shows promise of production, a cable bridge could readily and cheaply be erected across the Bear River at this point to the road on the east side. The cuts are in a small draw sloping steeply (35 to 50 degrees) to the southeast, amid a number of cliffs and thickly wooded hillside.

The rocks exposed in the cuttings and on the adjacent cliffs consist of metamorphosed sediments, probably originally tuffs and clastics, some of which were distinctly calcareous and have been altered to an impure diopside-garnet-epidote rock. The lime-silicate beds and the enclosing mica schists strike north and south and dip from 25 to 40 degrees to the west. A large body of granite, presumably part of the 'Hyder quartz monzonite (Buddington, U.S.G.S. Bull. 807) is first exposed about 150 feet southeast of and 150 feet

below the workings. Its northern contact strikes south-westerly from this point diagonally up the hillside. Some faulting is in evidence; a prominent fault striking north and south and dipping 60 degrees to the west apparently passes through both open cuts, and has on its eastern side a number of other, probably related, faults, striking north and south and dipping at various angles, one at 35 degrees west, another at 65 degrees east.

As already mentioned, locally in the succession of bedded rocks, there is a stratum of more or less impure lime-silicate rock. One of these, 2 to 6 feet in thickness, was traced at intervals for a distance of 150 feet northeast across the hillside as far as the main fault described above, to a point about 30 or 40 feet above the higher cut. It was found to be rather sparingly mineralized with scheelite at its northeastern end. In the vicinity of the cuts, there are a number of lenses of rather pure lime-silicate rock, lenses up to $1\frac{1}{2}$ and 2 feet in thickness but rarely more than 3 feet in length. These were found to contain small amounts of material fluorescing white to yellow. Assays on grab samples of higher grade material gave WO_3 0.04 and 0.27 percent. At one or two points in the lime-silicate lenses there is some coarse grained calcite, possibly a relic of the original limestone. In the upper cut is exposed a quartz-wollastonite vein, badly faulted.

It contained no scheelite. The origin of the wollastonite, which was intimately associated with the quartz in the vein, is not clear, but it may be derived from the metamorphism of an old quartz-calcite vein. Garnet was observed at one point in another quartz vein.

The low grade and small size of these scheelite-bearing lenses give scant hope of any scheelite production. The occurrences however, give some encouragement that in the vicinity other bodies of higher grade and larger size may be found.

W. H. Matthews
12th Jan, 1943