TORBRIT SILVER MINES LIMITED (Non-personal Liability)

GEOLOGICAL REPORT ON THE NUTTLUDE LAKE PROPERTY

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1046/9W

This property consists of seventeen claims comprised of the following inclusive groups: KLASTLINE, 1-8; KAKIDDI, 1-5; SKYLINE, 1-4. Nuttlude Lake is thirty miles S 65° E of the village of Telegraph Creek, B.C. while the property itself (Latitude 57°43'N Longitude 130°30'W) is one and one-half miles west of the lakes' western extremity.

Respectfully submitted by

G.R. Kent

Supervision by

R.W. Burton

Compilation dates: June 10-July 12, 1957 July 28-September 12, 1957.

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STATEMENT OF GEOLOGICAL COSTS ON NUTTLUDE LAKE CLAIMS BRITISH COLUMBIA - 1957

Salaries & Wages	\$4,168.74		
Grub & Supplies	1,028.97		
Board (Hotel, meals, etc.)	144.46		
Air Transportation, men & supplies	1,685.18		
Rail " " "	38.30		
Taxis (Vehicles hired with driver)	43.90		
Assays	152.90		
Maps, Prints, Photos	87.06		
Telegrams & Long Distance	54.09		
Miscellaneous	109.30		
	\$7,512.90		

CERTIFIED CORRECT

Asst. Secretary-Treasurer

January 14, 1958.

Chalcopyrite is also found in the numerous secondary fractures of an outcrop located 2750' N and 80' west of the box canyon base line, some secondary carbonates are also in evidence.

Massive pyhrrotite and chalcopyrite were observed over widths of only one half inch at the intrusive contact of one felsite dyke, near the confluence of the Hawk Creek and box canyon streams. The mineralization here appears to be of a different generation and contains the only pyhrrotite identified during the entire examination.

CONCLUSION

The seventeen mineral claims encompass all of the mineral occurrences which were observed during the summer's exploration activity with the exception of that which is contained in the acid intrusives surrounding the property. The many occurrences, their relatively high values and the geologic conditions are attractive, however, their remote locale is a major adversity. It is suggested that the claims either all or in part, should be retained until the area becomes more easily accessible or until such a time as more favorable economic conditions exist.

It is understood by the writer that preliminary work has already commenced towards the completion of a road to connect Dease Lake and Stewart, B.C. Such a road would pass within approximately fifteen miles of the property and would greatly enhance the prospects for further exploration.

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(d) Iron Pyrite

(e) Chalcopyrite

(f) Soft metallic material tentatively identified as silver. Strangely enough, an X-ray pattern of this material indicated silver flouride. It was found to be in small fractures which traverse both the quartz and the calcite and appears to be the last mineral to form.

NUMBER 2

- (a) Galena
- (b) Sphalerite
- (c) Quartz
- (d) Pyrite
- (e) Arsenopyrite

NON MINERALIZED VEINS

These veins, in most cases, contain only calcite and quartz with perhaps a little pyrite, while others, theoretically speaking, are not true veins but represent highly silicified fractures similar to the barren portions of the mineralized veins. They are exceedingly narrow, dip predominantly west and owing to their highly scattered, irregular nature are considered to be of little economic importance.

OTHER MINERALIZATION

The monzonitic stocks to the south east and south west of the claim group contain minor amounts of chalcopyrite and the secondary carbonates while the easterly one contains as well Molybdenum in minute quantities.

ADDITIONAL MINERALIZATION

Five widely separate samples were taken over narrow widths and their assay results are recorded on the enclosed 100 scale plan of the box canyon. In the majority of cases one sample was sufficient owing to the relatively short length of each vein.

Sample number 3 represents the only mineralized portion of an otherwise barren vein.

Samples 4 and 5 are taken from a vein that could represent an even further continuation of vein number 5, however, trenching between the two exposures was all but impossible under the existing conditions. The mineralization was also somewhat different, exhibiting coarse crystals of galena and a fine "needle like" silvery-white mineral believed to be arsenous, while quartz and calcite predominate.

IDENTIFICATION OF TWO POLISHED SECTIONS

The specimen used in the identification of these sections was taken at random from the main or number four showing which in all other cases revealed the presence of some gold, however, in this case no gold was recognized. A subsequent chemical assay of the remaining chips proved the non existence of gold in this particular specimen; nevertheless the results are interesting from a mineralogical viewpoint.

NUMBER 1

- (a) Pale brown calcite
- (b) White quartz
- (c) Fine grained silver white arsenopyrite in crystalline aggregates as well as in small euhedral crystals.

One sample assayed: Tr - Au, 0.16 oz/ton Ag, 0.20% Pb.

VEIN NUMBER - 7: (See 400 Scale Plan) Located in the adjoining easterly canyon, in the north west portion of claim number 5 of the Klastline group.

The vein attitude, N 20° W and dip 80° W departs somewhat from the general trend, however, it contains essentially the same type of mineralization. It has a length of 70', as exposed, disappearing under considerable overburden to the north and terminating on the hanging wall side of a strong south westerly trending fault.

The mineralization is massive with some evidence of banding: pyrite, arsenopyrite, sphalerite and galena with occasional quartz calcite gangue.

Eight samples assayed: 2.29 oz/ton Au, 3.20 oz/ton Ag, 1.72% Pb. VEIN NUMBER - 8: (See 100 Scale Plan) Located in the most eastern outcrop of Hawk Creek and possibly associated with the strong south west trending fault mentioned in the description of vein number seven. This vein also strikes N 20° W and dips 40° west.

The mineralization exhibits well developed banding with a high concentration of arsenopyrite. The outcrop and vein length does not exceed four feet as it is covered with large boulders and considerable debris. Trenching along the strike and at higher elevations failed to reveal its continuation.

> One sample assayed: 2.04 oz/ton Au, 5.24 oz/ton Ag, 5.00% Pb, 4.90% Zn, 9.0% As.

The many samples taken from the vein and enclosing wall rocks proved the gold and silver to be confined to the vein itself. The mineralization is predominantly massive being composed of fine grained galena, sphalerite, arsenopyrite, pyrite and occasionally chalcopyrite. There was some evidence of increasing gangue at the lower elevations, however it constitutes only a minor percentage of the exposed vein. None of the precious metals or minerals of these metals were recognized in hand specimens, or by panning.

Thirty nine samples of true vein averaged 0.81 oz/ton Au, 1.75 oz/ton Ag, 1.8% Pb. Zinc and copper determinations were made on only a few samples but are estimated at 2.0 and 0.3 percent respectively.

VEIN NUMBER - 5:

(See 20 Scale Plan) Located 2300' N and 235' W of the box canyon base line could be an offset portion of the main or number four vein. It strikes roughly the same, varies in dip from $45 - 70^{\circ}$ west and in width from 0.1 to 1.5 feet. The vein was traced for a total length of 215 feet, 55 feet being a natural exposure.

The nature of the mineralization is all but identical with that of vein number five with eight samples averaging: 1.30 oz/ton Au, 2.42 oz/ton Ag, 1.29% Pb.

VEIN NUMBER - 6:

(See 100 Scale Plan) Located 1100' N on the box canyon base line. This vein dips 85° W, is 1.5' wide and continues in length for seven feet. It is interesting for two reasons: first, that it contains a large quantity of arsenopyrite and pyrite but shows only a trace of gold; secondly, that it represents one of only two mineral occurrences on the east side of the base line fault. This latter feature as opposed to the numerous veins west of the fault. It is also terminated by the box canyon fault to the south and disappears under heavy overburden to the north. The recognizable sulphide minerals are the same as in vein number 1 only present in larger quantities.

Four samples averaged 0.18 oz/ton Au, 0.78 oz/ton Ag, 0.49% Pb. Two samples averaged 1.73% Zn.

VEIN NUMBER - 3: (See 100 Scale Plan) Located 875' N on the box canyon base line, is 15' long, 2.2' wide and dips 75° W. It is terminated by a vertical fault on the north and disappears under overburden to the south. This vein contains considerably more pyrite and arsenopyrite, than the previous two veins.

One sample assayed 0.36 oz/ton Au, 1.20 oz/ton Ag, 0.51% Pb, 1.5% Zn.

VEIN NUMBER - 4:

(See 20 Scale Plan) This vein is located 1900 - 2300' N and approximately 150' W of the box canyon base line and varies in elevation from 4510 to 4855 feet. It constitutes the main mineralized vein encountered having a length of 450' and varying width of 0 - 2.5 feet. It is a vein which varies in dip from 40 - 80° W and in places pinches out to a mere fracture. Where it has been shielded from the elements it protrudes as much as one foot above the host rock surface, in other places the effect has produced considerable decomposition of the foot and hanging walls. Often this poorly consolidated oxidized material is the only evidence of the vein continuation.

The south east extremity of the vein terminates against a strong fault which dips north at 45° and strikes roughly east west. At this point it appears to be dragged, however two narrow stringers carry on through the fault. Other minor faults displace the vein for distances up to five feet. For purposes of clarification "mineralized veins" refers to those which are completely or predominantly metalliferous and "non-mineralized veins" refers to those which are completely or predominantly non-metalliferous including in some instances highly silicified fracture continuations. <u>MINERALIZED VEINS:</u> All of these veins are terminated in at least one direction by faults on which they appear to be dragged, however, their offset counterparts, if they exist, were never located. This observation suggests the faulting to be pre-mineralization and that the mineralizing solutions were channeled along these avenues of weakness, concentrated and finally retained in their present undisplaced positions.

The minerals in evidence are the sulphides: pyrite, arsenopyrite, chalcopyrite, sphalerite and galena while the minor non-metallic gangue constituents are quartz and calcite.

The mineralized veins are designated 1 - 8 on the accompanying maps, all strike approximately N 40° W with the exception of numbers 7 & 8 which strike N 20° W.

VEIN NUMBER - 1:

(See 100 Scale Plan) Located 700' north on the box canyon base line, is 15' long, dips 60° W and averages 0.83' in width. It pinches out in a non-mineralized fracture to the N.W. while its other extremity appears to be dragged on a strong vertical fault of the box canyon base line. The vein is composed chiefly of gangue minerals with coarsely crystaline, sphalerite, galena, pyrite and arsenopyrite.

> Four samples averaged .19 oz/ton Au, 1.19 oz/ton Ag, 0.43% Pb. Three samples averaged 1.37% Zn.

VEIN NUMBER - 2: (See 100 Scale Plan) Located 725' N on the box canyon base line, is 75' long, 1.4' wide, and varies in dip from 70 - 50° E. The marked unconformity between the Mesozoic sediments and Tertiary or Pre-Tertiary volcanic sedimentary series represents a period of erosion attested by carbonaceous matter and the presence of mantle rock of Mesozoic age. The contact itself dips from twenty to seventy degrees north.

FAULTING AND FRACTURING

Faulting and fracturing appear to be of major importance as it is these lines of weakness that provided for the entrance of the mineralizing solutions.

The majority of the faulting appears to be pre-mineralization and in only one or two cases does it appear to have post mineralization importance. Many of the faults appear to have little or no displacements while gangue and slickensides are indicative of movement in others. In most cases shearing accompanies the faults and major fractures.

Fracture cleavage in the Mesozoic sediments is most prevalent striking S 80° W and N 40° W with the dip being south in both cases. There exists another complex system of minute, closely spaced, irregularly orientated fractures having minute displacements. These latter fractures occasionally contain pyrite and along with the disseminated, pyritized nature of the argillites yield considerable oxidation products.

ECONOMIC CONSIDERATIONS

The observed mineralization is restricted to fissure vein occurrences in the Mesozoic sediments, they are of a dilation type with two distinct differences of mineralization. The distinction although perhaps more apparent than real serves as the division for the following explanations and observations characteristic of the individual veins.

QUATERNARY VOLCANICS.

<u>BASALTS:</u> These lavas occur on the north easterly portion of the mapped area and due to their almost horizontal position form the existing plateaux of the mapped area and together with rhyolitic flows, of the general area. The basalts are olivine bearing and contain a few well rounded vesicles and feldspar phenocrysts. In addition they exhibit well developed columnar structure.

GEOLOGIC STRUCTURE.

The general areal structure appears to be a broad anticline and syncline plunging gently to the west, the crest of the anticline having been eroded away and subsequently covered by emplacement of Tertiary or Pre-Tertiary sediments and volcanics.

A series of monoclinal folds represents the connecting limb while Hawk Creek itself represents the synclinal axes.

Monzonitic stocks which occur to the south west, south east and north east of the claim group could account for all of the mapped intrusions, the intermediate to basic dykes being derivitives of what appears to be a basic fringe of the south westerly intrusive. The mapped intrusions all trend north east and are quite probably derived from this same stock. One or two narrow dykes trend north west and appear to owe their origin to the south easterly intrusive. AGGLOMERATE: A very thick band of agglomerate occurs between the flows mentioned above and contains from small to exceedingly large angular to sub-rounded fragments of flow, tuff and vesicular volcanic material.

SEDIMENTS.

Most of the TERTIARY or PRE-TERTIARY sediments were observed in the westerly canyon and could not be traced to the east.

<u>LIMESTONES:</u> A chalky white to brown crinoidal limestone of considerable thickness and a thinner series of impure, dark colored limestones trend roughly parallel to the Mesozoic contact and dip gently north. The impure limestone is the oldest and occurs in thin beds near the base of the Tertiary series. <u>ARCILLITE:</u> These sediments occur over narrow widths between the impure and crinoidal limestones. They are thinly bedded, dark green to black in color and dip gently north as do the limestones. <u>CONGLOMERATE:</u> The identification of this particular sediment is somewhat obscure as it occurs in only a few outcrops which are not disimilar to other rock typec mentioned. The peculiar spheroidal weathering of the feldspar porphry and the highly weathered nature of the Mesozoic mantle rock serve to complicate the situation. In any case the supposed conglomerate does not show any signs of bedding nor has it any great variety of constituents. INTRUSIVE FELSITE: These intrusions are narrow dykes with fine grained aphanitic matrixes and some biotite phenocrysts. They are of intermediate composition and are exposed mainly at the confluence of the Hawk Creek and box canyon streams. Only two very narrow dykes in the easterly canyon represent their continuations in this direction. <u>LAMPROPHYRE:</u> Two small and separate outcrops enclosing these black, fine grained, sugary textured dykes were observed but not recorded owing to the narrow widths of the dykes and the inability of tracing their lateral continuities. They strike roughly N 10° E and dip 50° west being enclosed by Mesozoic argillite.

<u>MONZONITE</u>: These acid intrusives consist of a series of closely spaced dykes which trend N 35° E and dip 70° west. They owe their origin to an apparently small monzonitic stock located in Hawk Creek and on strike with the mapped exposures.

TERTIARY or PRE-TERTIARY

<u>VOLCANICS and SEDIMENTS</u>: A thorough investigation of this series was not warranted from a mineralogical viewpoint hence the general grouping of the entire series on the enclosed maps.

VOLCANICS

<u>TUFFS and FLOWS:</u> These volcanics are dacitic to andesitic in composition and are unaltered and fresh looking with the exception of one flow occurring near and at the contact of the older Mesozoic argillites. This particular dacite is highly schistoze and contains some altered feldspar phenocrysts. A porphrytic feldspar flow occurs near the upper contact of the Quaternary basalts and exhibits a peculiar spheroidal weathering.

GEOLOGICAL CONDITIONS

STRATIGRAPHY:

The oldest rock exposed is Mesozoic in age and consists almost entirely of fine to coarsely bedded argillite. These sediments are exposed in the Hawk Creek valley of the claim group and extend vertically to elevations as high as 5200 feet. The sediments are intruded by biotite felsite dykes of intermediate composition and by acid monzonite of Mesozoic age.

There exists a series of younger rocks overlying the Mesozoic sediments on the north and separated by a marked unconformity trending roughly N 60° E. This series consists of volcanic igneous and pyroclastic rocks, namely: flows, tuffs, and agglomerates with interbedded limestones and one or two instances of argillacious and conglomeratic sediments.

The youngest rocks are flows of basaltic composition and presumedly Quaternary age. They are exposed on the northwest portion of the claim group and their contact with the Tertiary or Pre-Tertiary series is covered with overburden.

PETROGRAPHY

<u>MESOZOIC ARGILLITE</u>: For the most part these sediments are horizontal to gently dipping and fine to coarsely bedded. They contain widely disseminated pyrite mineralization, the surficial oxidation of which has left a thin veneer of oxidation products masking the exposed rock to a high degree. In one or two instances these argillites contain large angular peridotite fragments which are of undetermined origin. In 79 days of field work between June 10th and September 12th there were eight days on which the rainfall was too heavy to allow mapping or prospecting. According to F.A. Kerr (Geological Survey of Canada - Memoir 245) "Prospecting can be begun early in May and continued until the middle of October."

Scope of this Report:

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As noted formerly, the seventeen claims of this group were staked in the winter, and when they were surveyed it was found that many of the claims were not of full size. Prior to staking it was known that the region above 6,000 feet consisted of young volcanic rocks of no immediate interest, and the region adjoining the lake shore was covered with heavy overburden. Consequently the area for study was reduced to approximately 660 acres, lying between elevations 3,900 feet and 6,100 feet.

Aerial photographs covering the western end of Nuttlude Lake and extending westward to Mount Edziza were enlarged and used as a guide in identifying physical features in the preliminary reconnaissance. Detailed mapping was controlled from established stations of known elevation, from which Brunton and tape surveys were interconnected.

Rocks and minerals not readily identified in the field were sent out for classification. Over two hundred assay determinations were made on vein samples in the assay office of Torbrit Silver Mines Ltd. Two polished sections of vein material were examined in a laboratory of the Ontario Dept. of Mines.

General Surface Features:

Nuttlude Lake has an area of two square miles and it lies in a broad glaciated valley between the Spectrum Range on the west and the Klastline Range on the east. The lake elevation is 2,500 feet, and from this horizon the terrain rises to a maximum elevation of 9,140 feet at the summit of Mount Edziza, seven miles west of the lake. This peak is the most prominent physical feature in a mountaineous area where neighboring peaks rise to over 6,000 feet.

A restangular, trellised drainage pattern predominates, and drainage is to the north, south and east of the mapped area joining the system which embraces the upper reaches of the Stikine River. Fast-flowing mountain streams have cut deep gullies and canyons, giving rise to precipitous slopes on which avalanches are prevalent in winter and spring. On these steep slopes the run-off in the spring is rapid and only the larger streams flow throughout the summer. Snow persists in the bottom of canyons until August.

The claim group and immediate vicinity are heavily forested with conifers to an elevation of 4,000 feet, thinning out above and giving way to meadow lands ranging to 6,000 feet. Cottonwood, willow and alder are abundant along the lake shore.

No climatological records cover this immediate area, and no regular temperature or precipitation readings were recorded in the course of this work. However, it is known that winter temperatures at the lake drop below minus 10°F, and a maximum summer temperature of 90°F was recorded in August.

Introduction:

In the late fall of 1956 Torbrit Silver Mines Ltd. was advised of the discovery of outcrops containing sulphides, one and one half miles west of Nuttlude Lake, B.C.

Early in 1957 seventeen mineral claims were staked, covering the area. At the time of the staking winter weather did not permit any further work but in June 1957 a base camp was established on the west shore of Nuttlude Lake from which mapping, sampling and other work was done towards the preparation of this report.

Access to Prospect:

There are no roads or trails connecting Nuttlude Lake and vicinity with Telegraph Creek or any other settlement. The old Telegraph Creek trail (from Hazelton to Telegraph Creek) passes too far to the west to be of any value in reaching the lake. At present the lake is accessible only by aircraft which are available on a charter basis from either Watson Lake, Y.T. or Atlin, B.C. While this work was undertaken it was possible to charter an aircraft from Telegraph Creek to Nuttlude Lake, and the craft being small enough was also used to land on some of the smaller lakes in the vicinity. Watson Lake, Y.T. is on the Vancouver-Whitehorse route of Canadian Pacific Airlines, and there are daily flights both northbound and southbound from Watson Lake, which is 175 miles north-east of Nuttlude Lake.

From the western extremity of Nuttlude Lake to the claims there is a good trail which was made by the prospecting party.

MAPS ENCLOSED

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(see folder on reverse cover)

H / GEOLOGICAL PLAN OF BOX CANYON -Scale 1 inch to 100 feet. H 2 CLAIM NUMBER FOUR "KLASTLINE GROUP" - SAMPLING PLAN Scale 1 inch to 20 feet. H 3 GEOLOGICAL PLAN (BASED ON AIR PHOTOGRAPH) Scale 1 inch to 400 feet.







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