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82K/4E&W - MINERAL POTENTIAL OF AREA SERVED  
by the "MILLIE MACK ROAD"

In the given map area there are 8 located properties that have been worked on at some time. They are listed below with their corresponding mineralization.

1. Shakespeare, Skylark, (Mountain Meadow Group)  
-a fractured quartz vein bearing galena, sphalerite, argentite, chalcopyrite, pyrite, and pyrrhotite cuts biotite granite.
2. Promestora  
-quartz vein, in part crushed and broken, containing pyrite and pyrrhotite in slates and altered slates.
3. Ora Granda  
-an unsuccessful attempt was made to try and find an extension of the Promestora vein.
4. Hardy (Golden Eagle)  
-mineralized quartz vein containing very low gold values.
5. Millie Mack  
-fragments of quartz vein, containing galena, tetrahedrite, sphalerite, and arsenopyrite, in graphitic slate.
6. Chieftain  
-tetrahedrite, argentiferous galena, and iron sulphides in a shattered and crushed quartz vein in quartzite and slate.
7. Caribou Ace, Caribou Queen  
-quartz veins carrying some gold values.
8. Poorman  
-crushed zone of graphitic slate carrying argentiferous galena and sphalerite.

There have also been other small quartz veins showing low gold values found in the area, however, most were abandoned after one summer's work. The same can be said for most of those properties just outside the map area which have been looked at more recently.

Of the 8 properties mentioned above only 5 are in a position to be affected by the "Millie Mack Road": the Hardy, Caribou Ace, and Poorman on which no further mineralization was found after 1930; the Chieftain which was looked at in 1955 and then abandoned when no new ore was found; and the Millie Mack which has been worked on for the last 6 or so years.

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Production for the area is as follows:

Millie Mack (1899-1924, 1960, 1969)

-340 Tons: 299 oz. Au, 20,921 oz. Ag, 43,450 lb. Pb, 1,013 lb. Zn.

Chieftain (1934, 1955)

-8 Tons: 5 oz. Au, 460 oz. Ag, 245 lb. Pb, 199 lb. Zn.

Within this area, the Millie Mack would appear to be the most promising property, however, according to the attached geology map it lies within a klippe of graphitic slate separated <sup>from</sup> by the underlying andesite by a planar fault surface. Both rock types are members of the Slocan Group.

With the exception of one reference in GEM 1969 concerning the uncovering of a complex network of quartz veins in black argillite, every other reference to the property describes mineralization in broken quartz veins and quartz vein fragments.

The greatest mineral potential would involve the original in place vein system and since this, according to the present mapping, would not be in the immediate area, the possibility for a high potential deposit would be limited.

Looking at the property descriptions in general, however, the graphitic slates and argillites of the Slocan Group apparently present a good potential for finding Ag, Pb, Zn and possibly Au in quartz veins in this area.

Therefore, although the lithologic setting is apparently good and the production figures show a high grade of silver in the ore on the Millie Mack property, there is no geologic evidence to support the outlining of good ore reserves within the property itself and only one possibility of finding mineralization in the Slocan Group rocks-between Mineral Creek and Big Gulch Creek. However, since certain descriptions refer to slates and argillites which do not appear on the geologic map there is a possibility that more detailed mapping in this area may indicate a better mineral potential.

Judy  
Wmsby  
Research Officer  
Resource Data JAW

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82K/3E  
MINE EXAMINATIONS  
REPORTS  
APPRAISALS  
CONSULTATIONS  
MANAGEMENT

708 BANK OF NOVA SCOTIA BUILDING  
VANCOUVER 2, B.C.

May 30th, 1957,

The Star Mines Limited,  
Vancouver, B.C.;

Dear Sirs:

As instructed by you I have prepared a report on your Star Group of Mineral Claims which is situated in the Slocan region of British Columbia. The report is presented herewith; I trust it will provide you the information you require.

Yours very truly

*B.W.W. Mc Dougall* P. Eng.  
Consulting Mining Engineer.

PROPERTY FILE

REPORT ON  
THE STAR GROUP OF MINERAL CLAIMS  
SLOCAN MINING CAMP  
AINSWORTH MINING DIVISION  
BRITISH COLUMBIA

708 Bank of Nova Scotia Bldg.,  
Vancouver, B.C.,  
May 30th, 1957

B. W. V. McDougall, P. Eng.,  
Consulting Mining Engineer.

PROPERTY FILE

THE STAR GROUP OF MINERAL CLAIMS  
AINSWORTH MINING DIVISION, BRITISH COLUMBIA

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FOREWORD

The Star Group of Mineral Claims is a re-staking of a claim Group formerly known as the T. & T.. The individual claims of this Group were Crown-Granted and are described as follows: Hera, Lot 2438; Pluto Frac. Lot 2441; Haba, Lot 2439; and Oppollo, Lot 2440. The aggregate area of these four claims was 185.85 acres. Their locations are shown on the Mineral Reference maps of the area a copy of which accompanies this report. Due to the non-payment of accruing Provincial taxes the claims were recently thrown open for re-staking and the area has since been acquired as newly-staked locations by Mr. A. L. Borup of Vancouver. These locations will constitute the principal Mineral Lands assets, or Mining Properties of a Company to be known as The Star Mines Limited.

While the original Crown-Granted claims are shown on the Mineral Reference maps of the area the site is about one mile to the north of the north boundary of the Canadian Geological Survey map No. 273 A and no mention of these claims, which are known to have important mineral occurrences, is made in the descriptions of the mining properties of the Camp in C.G.S. Memoirs and Summary Reports.

The writer has not examined the T. and T., or more correctly, the Star Group, but he has traversed areas in its close vicinity. On several occasions he has examined other properties in the general neighborhood. Also, during the past twenty-five years, he has examined properties in many parts of the Slooan region and has conducted operations on numbers of properties. The available information concerning this property has come partly from conversations with people who had personal knowledge of the claims and

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were acquainted with its earlier owners and, particularly, from details given in a written report by one of the original owners.

PROPERTY

MINERAL CLAIMS: The Mineral claims comprising the Star Group are as follows:

Star No. 1,

Star No. 2,

Star No. 3,

Star No. 4,

Star No. 5,

Star No. 6.

All these six mineral claims are locations which are staked to cover the T. and T. Group as previously mentioned.

OWNERSHIP: I am informed that all claims are, or will be, owned outright by The Star Mines Limited; also, that other claims which may subsequently be obtained by staking in the vicinity, will likewise be the property of the Company.

SITUATION: The mineral claims of the property are contiguous and are situated nearly midway between the Slooan and Kootenay lakes and about two and one-half miles north northwesterly from the one-time mining settlement of Metallack. This is the site of the once-famous Whitewater Mine and it is near the most northerly point of the great 'pass' or valley which cuts across the Selkirk mountains between the Slooan and Kootenay lakes. The claims are in the extreme northerly section of the Slooan region, in the Ainsworth Mining Division and about two miles easterly from the summit of the high divide which separates the Ainsworth from the Slooan Mining Division in this region. The take-off point leading to the property, from the Kaslo to New Denver highway is almost midway between these two towns.

B.W.J.

NEIGHBORING PROPERTIES: Mining properties within a 3-mile radius of the Star Group which have been operated more or less extensively during the past 60 years include the Whitewater, Wellington, Charleston, Colorado, Keystone and certain claims in the London Hill region. The most important of these is the Whitewater Mine which has operated more or less continuously for many years and has a production record of about \$4,000,000. It has been worked through a vertical interval of about 1,100 feet - from the outcrops at 4,500 to the valley-level adit at 3,400 feet. There are fourteen levels and extensively-stopped vein areas. The workings have revealed much useful information concerning the structural and ore-body geology of this section of the Camp and, in a way, provide something of a pattern for the anticipated behaviour of ore-bearing veins in this general neighborhood.

TOPOGRAPHY: The Selkirk mountains, in the West Kootenay area, trend northwesterly and certain of its land masses attain something approaching topographic entities. The Slocan Mining Camp is in that region between the Kootenay and Slocan lakes in the general vicinity of the 50th parallel of north latitude. Two creeks - Kaslo creek draining southeasterly to the Kootenay lake at Kaslo and Seaton creek, draining southwesterly to Slocan lake at New Denver, have carved out great valleys which cut across the Selkirks in an approximate east-west direction - a direction normal to the trend of the range. Southerly from this great trench, bounded by Slocan lake and valley on the west and the Kootenay lake on the east the 'Sandon' segment of these mountains continues some 35 miles southerly to where the west arm of the Kootenay lake and the valley of the Kootenay river cut another great gap across these mountains. Northerly from the Kaslo - Seaton trench the Lardeau section of the range begins and this segment continues northwesterly some fifty miles to where it is again crossed in a general east - west direction by the northeasterly end of the Upper Arrow lake and the valley of

The Star Group of Mineral Claims.

Incomappleux River.

Referring to GCS Map 273 A, (Sandon Sheet), it will be observed that the valleys of Kaslo and Seaton creeks which flow outwards from Fish and Bear lakes, constitute the outstanding topographic feature of the area - particularly that portion of it which lies within a few miles of the trench. Numerous side creeks flow in to the master valleys and, in turn, countless side creeks add to the topographic confusion. Valley carving by stream erosion has taken place, largely, during the Tertiary era. Also - the entire region has been heavily glaciated and remnants of former ice fields are still to be seen at the higher horizons.

Above the 6,000-ft horizon the topography is typically alpine in character - hanging valleys, talus-strewn slopes, mountain pools and shattered peaks and high ridges occur in many places above timberline. The altitude of Kootenay lake to the east is about 1,740 feet and that of Slocan lake to the west is given as 1,756 feet. The high point in the Kaslo - Seaton creek valley, near the Wellington Mine turn-off, is about 3,500 feet above sea level. The higher ridges and peaks on both sides of the master valleys attain altitudes up to upwards of 8,000 feet.

Though a region of extreme topographic relief and grandly picturesque from innumerable viewpoints transport routes have, at one time or another been provided to some of the most remote and difficult parts of the area. The master valleys, together with the many tributary valleys and gulches have provided approach avenues to virtually all the places of known mineral interest in the Camp.

For more graphic representations of the general topography of the area reference is made to photographs accompanying this report and to those accompanying Dominion and Provincial Reports on this well-known Camp.

*B. W. [unclear]*



Topographically the mineral claims of the Star Group are situated on and near the summit of the ridge directly above, or north of, Retallack. The mountain slopes above the highway across some of the claims of the Wellington property are relatively even being, in fact, steeper across the lower slopes than at the higher horizons. Altitudes on the Star claims probably approach 7,000 feet. The vein outcrops occur at about 6,300 feet and the site for the planned adit entry is at about the 6,000-ft horizon. The terrain below this site slopes more or less uniformly down to the south, towards the valley at Retallack, the southerly exposure assuring the locality release from winter snows reasonably early in the year. There are no unusual obstacles to extending the Wellington Mine road to the chosen operating site on the Star Group property. It might be noted that, throughout the past 60 years or more, many millions of dollars of high grade silver lead ores has been mined, shipped and marketed from mining properties in the Slocan situated at or above the 6,000-ft. horizon - and using horse-drawn transport and hand-mining methods.

North and east of the claims the terrain falls away a few hundred feet to a hazy valley near the head of Quitwater creek - thence it rises to higher and more rugged regions beyond. Much of the property is very rugged - cliffs and talus slopes, with very minor clumps of balsam, characterize much of the terrain. A fair idea of the rugged nature of the locality may be had from a study of the original Crown Grant survey plat of the T. & T. Group, a copy of which accompanies this report. Topography has herein been discussed in some considerable detail since a reasonable understanding of this circumstance factor might otherwise be misinterpreted to the undeserved disadvantage of this mining property.

#### ECONOMICS

##### CLIMATE:

The climate is similar to that prevailing throughout the

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Selkirk mountain regions generally. At the higher altitudes, such as obtain on these claims, the winters are rigorous and snow, on the level, may build up to depths of ten feet or more. Blizzards may frequently occur and there are periods, usually of brief duration, during which sub-zero temperatures prevail. Effective outside work of such nature as prospecting, open-cutting, diamond drilling, construction and road-building can usually be carried forward from early June until mid-October or later. Many Slooan mining properties, more or less similarly situated in respect to altitude, have been successfully operated throughout the winters even during the days of horse-drawn transport. If adequate preparations have been made in proper appreciation of winter conditions winter operations need not prove particularly difficult or unduly expensive. The New Denver - Kaslo highway is kept open to motor traffic during winters and mine roads can usually be kept cleared for truck transport by maintaining a bulldozer or snowplough at the top or mine end clearing the road in a down-hill direction after severe storms.

TIMBER: There is little if any timber of commercial consequence on the claims. There is some tree growth however and probably sufficient for most sorts of mining requirements. Lumber and milled timber is available from mills near New Denver and Kaslo.

POWER: Hydro-electric power was developed on Whitewater creek and used in mining and milling operations there. The installation is still intact. There have been other small hydro installations in the district. It is reasonably certain that power requirements at Star Mines will most economically be provided by diesel-powered equipment. Numerous mining properties throughout this and similarly-situated areas in the West Kootenay district have been and are powered by oil-burning engines.

ACCESS & TRANSPORTATION: Bear and Fish lakes are at about the summit of the divide in the great east - west pass or valley connecting the Slooan and

Kootenay lakes. From this divide, as previously mentioned, Kaslo creek valley extends southeasterly to Kootenay lake at Kaslo and Seaton creek extends southwesterly to Slooan lake at New Denver. A third deeply cut valley, that of Carpenter creek, extends southeasterly to and beyond Sandon. These are the 'master' valleys of the area - extending from them is the network of tributary valleys which drain to the main stream courses. The trunk streams, Kaslo, Seaton and Carpenter creeks provide right-of-ways for a branch line of the Canadian Pacific Railway which extends from Nakusp on the Upper Arrow lake to Kaslo on the Kootenay lake, and for the Provincial highway which parallels the rail lines over much of the territory. This railway gave access to the heart of the Camp. Supplemented by tug and barge service from Nakusp to West Robson on the Lower Arrow lake - and Kaslo to Proctor on the Kootenay lake - as well as from Roseberry and New Denver to Slooan City on Slooan lake, rail service was provided extending from the C.P.R. mainline at Revelstoke to the West Arm of the Kootenay lake and the Kettle Valley railway branch at Proctor, Nelson and South Slooan. Practically all this rail and barge route system is now paralleled by good highways and the railway service, as of 1957, is to be discontinued. The only portion of the former rail transport system which will remain will be the tug and barge service, handling railway cars, between Kaslo and the Kettle Valley line at Proctor.

Two good highways extend into the area from Nelson, Trail and other points on the southerly link of the Trans-Canada highway. One leaves the Trans-Canada at South Slooan, some 15 miles west of Nelson, follows the Slooan river valley to Slooan City and thence northerly and westerly to New Denver, Roseberry and on the Nakusp on the east shore of the Upper Arrow lake. The second route leads off from Nelson, follows the north side of

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the west arm of the Kootenay lake to Balfour thence northerly following the west shore of Kootenay lake through Ainsworth to Kaslo. As already mentioned the Kaslo - New Denver road gives access to the central parts of the Elcom Mining Camp.

Some highway distances are given as follows:

Nelson to Kaslo: -----	45 Miles
Nelson to New Denver: -----	65 "
New Denver to Retallack: -----	14 "
Kaslo to Retallack: -----	17 "
New Denver to Kaslo: -----	31 "
Kaslo to Trail: (Smelter): -----	90 "
New Denver to Trail: -----	86 "
Kaslo-New Denver highway to Star Mine, (Estimated): -----	4½ "

Heavy c/l inbound freight, as, for instance, machinery, may be trucked in to the operations site from freight cars delivered at Kaslo. Outgoing ore or concentrate shipments may be sent from Kaslo in freight cars else trucked directly to Trail either by way of Kaslo or New Denver. LCL freight services, from coastal points, are available by trucking concerns.

From a point near the former settlement of Retallack a road has been extended northerly, up the mountain side, to the Wellington camp and mine workings. The estimated distance from the Wellington Mines camp to the Star Mines camp and plant site is 2½ miles. The terrain over which it is planned to extend the road grade to Star Mines is reasonably uniform as to grade. The estimated cost of re-conditioning the existing road to Wellington Mines and extending it on to the Star site is \$7,500.00,- the time required should not exceed 30 days. The Wellington road turn-off is

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at an altitude of about 3,500 feet and the Wellington Mine terminus is at about the 5,000-ft. horizon. The average road grade required to provide vehicle transport to Star Mines site should not exceed 8%. It is believed that most of the road construction work can be effected by bulldozing and that very little rock work will be required.

**GENERAL:** The two towns, New Denver and Kaslo, have the customary merchandising and other establishments in such communities. They have daily postal and bus services to and from Nelson which town is the principal supply center for much of the West Kootenay country. Telephone services can be made available to 'outside' points from Retallack if and when desired. Operations in the Slocan region have been proceeding more or less continuously for more than 60 years and whatever servicing the mining operations require have, at one time or another, been provided and can probably be restored without extraordinary expense or difficulty. Numerous properties in the area situated at altitudes of 6,000 or higher have operated successfully and continuously for years with only horse-drawn transport. If and when adequate arrangements are provided at Star Mines operations during winters need occasion little added difficulty or expense.

#### HISTORY

As has already been mentioned the original four claims of the property, Hera, Pluto Fr., Heba and Oppollo, are situated about one mile to the north of the north boundary of the C.G.S. map. There are two of these, one described as Catalogue No. 1667 issued in 1916 to accompany C.G.S. Summary Report by G. W. Drysdale and the other being designated as C.G.S. Map 273 A, (Sandon Sheet), issued in 1932. Though of different scales both of these maps cover precisely the same areas. Descriptions of properties in the C.G.S. Memoirs and Summary Reports are confined to properties which lie within the map area.

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The Mineral Reference Map of the Slooan and Ainsworth Mining Divisions show the claims as being situated in the Ainsworth Mining Division about two miles easterly from the high divide which forms the boundary between the two Mining Divisions. In respect to the history of these claims, however, the only mention of them to be found in the Minister of Mines Reports for B. C. is in reference to their Crown-Granting. In the Report for 1899 it is stated that the claims Hera and Heba were Crown Granted by M. A. Bucket and C. D. McKenzie in May of 1899 and that the Oppollo and Flute Fraction were Crown Granted by M. A. Bucket in April and May of 1899. The claims were staked in 1895. This indicates that the mineral discoveries on the claims were made in the early days of the Camp. It would seem that the only work effected on the property was that which was done prior to the Crown Grant surveys.

Some knowledge of and appreciation for the background history of the Slooan Mining Camp and of the people who were prominent in the fast-moving events of more than half a century ago is needed for an understanding of the history of the property. More or less intimately associated with Slooan mining was the well-known mining engineer, Mr. W. J. Tretheway. In the earlier days of the Slooan and other West Kootenay mining Camps Mr. Tretheway maintained a consulting office in Vancouver and numbered among his clients were such notables as Sir Charles Hibbard Tupper and his English mining associates, Mr. Horne-Payne and others. For a time he maintained a branch office in the bustling town of Kaslo and this office was in charge of C. D. McKenzie in whom Mr. Tretheway had every confidence as to his ability, good judgement and integrity. According to the fragments of information sifting down from earlier days, the four claims were located by a prospector by name of M. A. Bucket. They were later purchased, at least in part, by C. D. McKenzie and the two would appear to have co-operated in the Crown-Granting procedure

C. D. McKenzie

in 1899. In the late '90s and early years of the 20th century the entire West Kootenay region, including the Sloan Camp, lost most of its active mining population - first to the Klondike Gold Rush and, a little later, to the Cobalt stampede.

Mr. Trethewey who died in 1936 was well known to many now living as one of the outstanding engineers of his time. Following the First World War he became associated with numbers of important Ontario mining organizations among which Ventures Ltd., Gunner Gold and Paymaster are mentioned. Though he returned to the Sloan in the late '20s and early '30s he was then in ill health. He still retained G. D. McKenzie's report on the T. and F. Group. The writer is without knowledge of the four claims of this Group during the long time interval since the turn of the century. Title was, however, maintained by the payment of the Mineral Lands Tax during all this time.

After Mr. Trethewey's death in 1936 the claims were thrown open for lease and purchase. They were acquired by Mr. Paul Thygesen in 1938. Mr. Thygesen was an old-time friend of Mr. Trethewey. In their conversations Mr. Trethewey had told of his former mining scout, G. D. McKenzie and the undeveloped mineral claims near the head of Whitewater creek. Also he gave to Mr. Thygesen a copy of McKenzie's original report on these claims. Though entirely without experience in mines or mining, well remembering Mr. Trethewey's conversations regarding the claims, Mr. Thygesen acquired the claims, as already described, when they were released. The writer has had the foregoing information, personally, from talks with Mr. Thygesen. The copy of McKenzie's report provides the best description of the mineral showings on the four claims that is available at the present time.

Detailed descriptions of the Slocan region, its geology, its mining properties, and many other features are given in Summary Reports and Memoirs by the Canadian Geological Survey and in Reports by the British Columbia Department of Mines from the early '90s down to the present. Particular reference is made to the publications listed as follows:

C.G.S. Memoir 173, (1934) by Dr. C. E. Cairnes,

C.G.S. Memoir 181, (1935) by Dr. C. E. Cairnes,

Minister of Mines for B.C.,-

Bulletin 22 (1945), by Dr. W. S. Hedley, B.C. Dept. of Mines,

Bulletin 29 (1952), by Dr. W. S. Hedley, B.C. Dept. of Mines.

Complete bibliographies are given in some of these publications. Attention is called to the many excellent photographs contained in the publications listed.

#### GEOLOGY

GENERAL: The availability of excellent Official publications makes it quite unnecessary to include any save general geological descriptions in this report.

Very briefly - the Slocan region is underlain by a series of slates, argillites, limestones, quartzites and tuffaceous sediments all of Triassic age which, collectively, are known as the Slocan Series. This rock series has been extensively intruded by granodiorites and associated variants of the Nelson batholith - also by numerous sills and dykes, which though younger than the main batholithic masses, are considered to be related to them. The intrusives are believed to be Jurassic or Jura-Cretaceous in age. The ore occurrences are related to the end phases of the intrusive activity. The rock members of the Slocan Series have been folded, faulted and otherwise drastically deformed and the deep-seated granitic intrusives have been laid

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bare, in places to great depths, by the processes of erosion. Mineralization, generally, probably closely followed the up-warping of the West Coast mountains and the up-thrusting, mangling and other deformations of the pre-existing sedimentary formations, on a grand scale, provided the innumerable channels which were later followed by the agencies of mineralization.

LOCAL: Referring to C.G.S. Map No. 273 A (Sandon Sheet), on which the approximate situation of the Star Mineral Claim Group is shown as being about one mile north of the north boundary of the map and practically on the west longitude line of  $117^{\circ} 10'$ , it will be seen that the property is not far from the contact between the Kaslo Volcanics, which are principally andesites and dacites, with the Slovan Series which has already been described. This contact is described by Dr. Cairnes as a disconformity. This means that though the physical character of the formations changes abruptly at the contact line the dips and strikes of both formations are conformable. At the contact there is a layer of a characteristic variety of conglomerate which is in part built up from Kaslo Volcanics detritus. The general strike of both formations is NW -SE and the dips range from  $45^{\circ}$  to  $90^{\circ}$  southwesterly.

It will be noted from C. D. McKenzie's report which is quoted in full on subsequent pages, that the rocks on the Star Group in which the veins occur are described as - "-----The country rock in which these fissures exist is an unaltered slate quartzite." This is interpreted to mean that the host rocks in which the veins occur are of the Slovan Series. No mention is made of granitic intrusives in the vicinity - though the occurrence of such may be suspected.

#### MINERAL SHOWINGS AND EXPLORATORY WORK

The only intimate description of the property and of the work which was effected on it, which is known to the writer, is contained in the report by C. D. McKenzie who, at that time, (1899), was an agent of mining

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scout in the employ of Mr. Tretheway. The ability and integrity of Mr. McKenzie has been vouched for by Mr. Tretheway as has been indicated in former pages. The report, presumably, was a private one to Mr. Tretheway. Considering the secrecy with such vital value-information was guarded and the reasonably obvious conclusion that Mr. Tretheway intended to investigate the matter further when it might become more convenient for him to do so, it is easy to understand that no unnecessary publicity was then given to the McKenzie report. The report is here quoted in full:

"A STATEMENT OF FACTS AND INFORMATION  
CONCERNING THE T. & T. GROUP OF  
GROWN-GRANTED MINERAL CLAIMS"

"This mining property is situated in the White Water basin of the Slocan mining Division of West Kootenay, B.C., which is the centre of the great argentiferous belt of that region.

The Group consists of the Hera, Pluto Fraction, Heba and Oppollo mineral claims. The area of claims is 51.65, 32.41, 51.65 and 50.14 acres, respectively, making a total of 185.85 acres.

Contained within the limits of the Heba claim are three separate and distinct veins of silver ore which traverse the course of the mountain range and also within the limits of the adjoining claims in an easterly and westerly direction. These veins are as strongly defined and regular as can be, being traceable on the surface for upwards of a mile. The country rock in which these fissures exist is an unaltered slate quartzite, while the material of the veins where silver does not actually exist is of an entirely different nature, being quartz and spathic iron in various stages of decomposition. All the veins are identical in their surface character throughout their entire length.

Up to the present time, work of development has been conducted

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within the limits of the Heba claim. On this location the vein lying furthest north has been explored principally with opencuts which show, between clearly and strongly defined walls, 16 to 18 inches of ore, sternbergite and galena, principally the former which assays as high as 1,600 ounces of silver to the ton. The vein furthest south is of an average width of about four feet at the surface and while it resembles the others in all respects, has not been so fully developed.

The center or main lead, which is situated midway and about 150 to 200 feet from the two veins just described, has been systematically and extensively developed at the principal ore showing. From commencement of this work to the lowest developed level, 65 feet, the values have improved steadily in quality and quantity until there is at present exposed 28 inches of pay ore; 15 inches being galena intermixed with gray copper, sternbergite and chloride of silver and 10 inches of carbonates.

The galena assays from 91 ounces silver and 76% lead to 223 ounces of silver and 74% lead per ton. The sternbergite gives from 125 ounces to 2,244 ounces of silver and as high as 6% copper per ton. The carbonates vary in value from 35 to 120 ounces of silver per ton. The greater the depth attained by development in the vein, it is particularly noticeable that the ore improves in grade, yet from a few feet below the surface a shipment of about  $\frac{1}{2}$  of a ton sent to Pilot Bay smelter gave a net value of 96 ounces of silver and 76% lead per ton. The regularity of this ore chute is assured from the fact that at a point about 375 feet east of the shaft there is 6 inches of clean galena ore showing on the surface, while at intermediate points ore can be obtained in spite of the fact that the ledge is 'capped' and considerably modified by the country rock. As to the other ore chutes, as is customary in regularly defined precious metal deposits, they occur at intervals along the course of the vein.

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Situated as it is on the south side of a mountain range (the summit of which is 6,000 feet above sea level) this property affords exceptional opportunities for development by tunnel, owing to the steepness of the hillside. The mine has arrived at a condition value which calls for an outlay of at least \$10,000, to be expended in driving a cross-cut tunnel 700 feet long which will tap all three veins at a 225 foot level. The completion of this tunnel will admit of all three ledges being worked on a horizontal basis and give enough depth to work the orebodies for several years with 6 faces to work on. The balance of the amount not needed on tunnel work is necessary for construction of cook, bunk and storage houses and ore bins and in fixing trail from mine to railroad and for implements.

The property is a little more than 2 miles from Kaslo-Slocan railroad at a point 17 miles from Kaslo city.

Within sight of the mine are shipping mines such as the White-Water, Wellington, Burska (supposed to be one of the Heba veins  $1\frac{1}{2}$  miles east) which in a short time has shipped 250 tons of ore and has half of that amount stored, Lucky Jim, R. E. Lee, Payne, Washington and London, all valuable properties, while there are undeveloped claims in almost every direction."

Dated at Kaslo, B.C.,

March 15th, 1899,

(Signed) G. D. McKenzie

To those who have knowledge of the Slocan Mining Camp this report is very informative. There is, indeed, little lacking except, perhaps, modernity. Most of the production history of the region has occurred since the report was written. The 'rush' to the Klondike and the 'stampede' to Cobalt took place soon afterwards. Obviously the contents of the report never did become common knowledge. During the decades that followed many of the opencuts sloughed in, the location of the shaft, long since filled with water, was forgotten and the trail leading in became overgrown and lost.

G.D.M.

But throughout all these years there were some who retained knowledge of the details recorded in McKenzie's report.

Little additional comment is needed in explanation of the information given in this old report. The high-grade silver minerals mentioned, sternbergite, chloride of silver and gray copper, would suggest that still other silver minerals probably occur. Sternbergite is a mineral of silver, iron and sulphur in which the silver content is about 30%; chloride of silver is the mineral cerargyrite which contains 75% of silver; The gray copper minerals tennantite and tetrahedrite contain no silver but are very often closely associated with proustite, stephanite and other compounds of arsenic and/or antimony with silver and sulphur. Such minerals typically occur in the higher horizons of most of the Slocan ore-bearing veins. The vein descriptions given in the report could apply almost equally well to dozens of other veins which occur in the wide-spaced Slocan Series rocks in the area from which veins many thousands of tons of ore carrying some millions of ounces of silver and pounds of lime have been won.

CONCENTRATING VALUES

Numbers of assays are given in McKennie's report - perhaps the most representative of these is that of the 3/4 ton of hand-sorted sulphides sent to the Pilot Bay smelter on the east side of Kootenay lake, as a test shipment. This, according to the report, averaged 96 ozs/t silver and 7 1/2% lead.

Differing types of lode material taken from the ore dump at the 65-foot shaft and submitted for assay by Mr. E. L. Borup at J. R. Williams & Son, Provincial Assayers, Vancouver, are quoted as follows:

<u>Sample No.</u>	<u>ozs/t Ag</u>	<u>% Pb</u>	<u>% Zn</u>
1	157.62	59.14	

*E.L.B.*

Sample No.	ozs/t Ag	% Pb	% Zn
2	172.64	57.00	
3	4.16		60.20
4	65.84	39.40	10.00

Such information as is at present available apparently indicates that the ore of these Star Group claims is generally similar in respect to the high silver content, to those of many other well-known Glocan veins. It might be added that the high silver values, as has been instanced at numerous places throughout the Camp, may be expected to extend to important depths.

#### RE DEVELOPMENT PROCEDURE

Plans are now being studied looking to the preliminary development of the Star Group veins. The procedure is, basically, simple: the choice of methods, at the beginning, is between diamond drilling and driving a cross-cut adit to intersect all three veins at an approximate average depth of about 300 feet below the outcrops. To attempt development, or even exploration, by diamond drilling would, it is believed, be extremely, if not entirely, ineffective and would really double the initial expenditure needed, besides doubling the time required to obtain the necessary positive vein information at depth.

Accordingly it has been planned to repair the Wellington Mine road which leads off towards the Star Group from the New Denver - Kaslo road from a point near Fish Lake - and to continue this road an estimated distance of 2½ miles to an adit site on the Star Group property at approximately the 6,000-foot horizon and about 300 feet below the vein outcrops. Having chosen and prepared such site the necessary buildings would be provided and an adit driven in a northerly direction an estimated distance of 1,000 feet to intersect all three veins which are believed to occur within a belt or zone not more than 400 feet in width. This work would be effected under contract arrangement and the crew would commute back and forth from living quarters in the

valley below or even in New Denver or Kaslo. The cost and nuisance of providing and operating a boarding house and living quarters on the property, during the exploration period, would thus be avoided. Having given much thought and consideration to this matter, the writer is in firm agreement that the plan outlined above is the proper procedure and, when completed, will prove to have been much more conclusive and economical than such procedure preceded by diamond drilling.

CONCERNING COSTS

The cost of effecting the preliminary stage of development, more or less as suggested in preceding paragraphs is estimated approximately as follows:

Repairs to Wellington Mines road and extension of it to working site on Star Group at approximate altitude of 5,000 feet: -----	\$ 7,500
Preparation of adit site - construction of buildings including compressor building, tool house, garage for tractor and four-wheel-drive equipment, powder magazine and emergency (Temporary) living quarters etc.:-----	7,500
Machinery including compressor, drills, drill steel, medium bulldozer, four-wheel-drive track or jeep, tools etc.:-----	35,000
Adit driving, - 1,000 feet @ \$35.00 per foot:-----	35,000
Administration, legal, accounting & engineering costs,:-----	5,000
Total,-----	\$ 90,000

It is thus indicated that the job will require a minimum of \$100,000 up to the point of determining the existence and ore-bearing character of the veins at the adit horizon. It is understood, of course, that, for the most part, the machinery and mechanical requirements will, so far as reasonably possible, be purchased second hand.

CONCLUSION

I believe that this Star Mineral Claim Group well warrants exploration and development of the general nature suggested in preceding paragraphs and that this proposed mining venture is properly to be considered as a very promising speculation. While the information on which my opinions are based is largely that given in the McLenzie report, I have personal knowledge of Mr. Tretheway's personal interest in the Sloan region during the late '20s. Also - at different times during past years I have heard of the T. & T. Claims. It is to be recalled that these claims were tightly held until release in 1938 at which time they were acquired by Mr. Thygesen as promptly as possible. I believe that the greatest economy in extending the recommended adit to the projected position of the three veins, approximately 500 feet below their outcrops, can only be achieved by well-planned and continuous effort from the commencement to the completion of the initial program.

Respectfully submitted

May 30th, 1957,

708 Bank of Nova Scotia Bldg.,

Vancouver, B.C..

*B. D. D. McLaughlin* P. Eng.,  
Consulting Mining Engineer.



FRED J. HEMSWORTH  
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CREDIT FONCIER BLDG.  
850 WEST HASTINGS STREET  
VANCOUVER 1, B.C.

March 18, 1963.

President & Directors,  
Blue Star Mines Ltd.,  
613-837 W. Hastings St.,  
Vancouver 1, B. C.

Dear Sirs:

As requested, the following is a resume of the progress of the Matheson crosscut toward the intersection with the Wellington vein.

At the start of the present program, the Matheson crosscut was slashed-out and prepared for advance. On September 2, 1962, the crosscut, as measured by the writer, was 990 feet from the portal to the face.

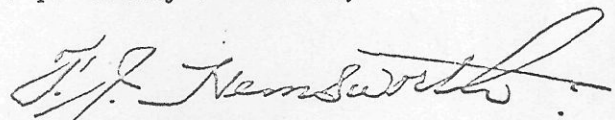
On March 7, 1963, the face of the crosscut had been advanced 540 feet, and measured 1,530 feet from the portal.

On March 16, 1963, a report from the mine gave the footage at 1,568 feet from the portal.

Estimating an average dip of the Wellington Lode of 60 degrees to the south, the vein structure should be intersected at 1,700 feet from the portal, and about 310 feet below the Wellington No.2 Level.

The work is being carried out in an efficient manner, and I consider the exploration as a good geological bet.

Respectfully submitted,



F. J. Hemsworth, P.Eng.