

Consulting Geologists
519 - 602 WEST HASTINGS STREET
VANCOUVER 2, B. C.

82KNW095

004002

February 22, 1972.

Board of Directors,
Burdos Mines Ltd. (N.P.L.)
515-602 West Hastings Street,
Vancouver 2, B.C.

COMPILATION REPORT
on the
TROUT LAKE PROPERTY
of
BURDOS MINES LTD. (NPL)

Dear Sirs:

The following is a compilation report pertaining to work
carried out on the Trout Lake group of claims during the
past two years.

PROPERTY

The property consists of 35 located mineral claims and fractions and Mineral Lease M219 which is comprised of six crown-granted claims. They are as follows:

<u>CLAIM NAME</u>	<u>RECORD NUMBER</u>	<u>EXPIRY DATE</u>
Fi 1 - 24 incl.	8809 - 32 incl.	April 30, 1974
Trout 1 - 4 incl.	6889 - 92 incl.	May 19, 1974
Trout 6	6884	May 19, 1974
Trout 8	6896	May 19, 1974
B.B. 1 - 2	8807 - 08	May 2, 1974
TR 1 - 2 Fractions	9573 - 74	Nov. 6, 1974
American	12575 82K/11W	Nov. 6, 1974.

Mineral Lease M 219 - Slocan Mining Division

<u>CROWN GRANTS</u>	<u>LOT NUMBER</u>	<u>EXPIRY DATE</u>
Butte No. 1. Fraction	L 14176	April 29, 1974
Butte No. 2 Fraction	L 14177	April 29, 1974
Bonanza King	L 14178	April 29, 1974
Gallant Boy	L 14179	April 29, 1974
Harlock	L 14180	April 29, 1974
Butte	L 14902	April 29, 1974

OWNERSHIP

The claims are owned by Burdos Mines Ltd. (N.P.L.) of Vancouver, British Columbia.

LOCATION (50°117°N.E.)

The south end of the property is located approximately 3,000 feet north of the Village of Gerrard, British Columbia, on the south east end of Trout Lake in the Selkirk Mountain Range of southeastern British Columbia. Gerrard is fifty miles south-east of Revelstoke via the newly constructed Arrowhead Highway, which is paved, the Galena Bay ferry crossing and gravel roads. Alternatively, Gerrard may be reached by 90 miles of paved highway north from the City of Nelson, British Columbia.

ACCESS

The mine access road is located approximately one mile north-west of Gerrard and is about 12 miles long with several switch backs.

WATER

There is a sufficient water available for all phases of exploration and development, mining, milling and domestic use.

TRANSPORTATION

Railroad facilities exist in both Revelstoke and Nelson. The smelter in Trail is about 50 miles south of Nelson, British Columbia.

CLIMATE

Winters are fairly long with heavy snows whereas the summer months are warm and rainfall moderate.

PHYSIOGRAPHY AND TOPOGRAPHY

The area is one of rugged mountains and high relief with elevations reaching 9200 feet with a relief of about 6,800 feet.

Timber line is about 6500 feet elevation above which are many precipitous cliffs and peaks.

The area is traversed by youthful stream valleys and fast-flowing mountain streams.

At the higher elevations cirques and hanging valleys occur along with some alpine glaciers.

HISTORY

The first recorded prospecting in the Lardeau District was about 1890 and by 1900 most of the principal mineral occurrences

were discovered. After 1907 most mining activity had ceased. Some work was carried out during 1914 and 1927 and 1952 and access to the area has been improved considerably in recent years.

There are three mineralized belts in the Lardeau District, namely, the west, central and eastern belts. The three zones parallel the general northwest trend of rock formations and structure. There has not been any report of mineralization found between the belts. The Burdos Mines Ltd. (N.P.L.) property lies in the central belt; the most productive area of the district. The Silver Cup, Triune, Nettie L., Spider, Oyster-Criterion and True Fissure claims accounted for most of the production.

The deposits on these claims are veins and lodes containing galena, sphalerite, freibergite, pyrite and chalcopyrite. Initially the properties were worked for their silver content which ranged up to 150 ounces per ton.

PRESENT WORK

During 1969 Burdos Mines Ltd. (N.P.L.) carried out a limited programme of road building, stripping, prospecting and sampling. A log cabin was constructed at the 6500 foot level. In the brief 1970 field season which remained after access roads were put in, a plane-table survey, topographic and geological mapping were

undertaken over a limited portion of the property. The plane-table and topographic surveys were undertaken by Geotronics Surveys Ltd. while the geological mapping was done by Mr. E.P. Sheppard. P.Eng., and the writer. Due to adverse weather conditions the exploration programme was terminated near the end of September. In addition to the above work, a limited reconnaissance geochemical survey was carried out in November, 1970 over the Fi 3-6, 8, 10-14, 21-23 mineral claims. The method used was the Holman which gives readings in terms of milliliters of indicator. Readings of 4 ml. or greater are considered anomalous. Two anomalies were detected and are both 600 to 700 feet long with readings as high as 8 ml. The test was made for copper because of its association with the lead-zinc mineralization.

During the 1971 field season work consisted of additional road building, repairs to existing roads, trenching and prospecting, geophysical reconnaissance survey, and geological mapping.

The trenching was confined to portal areas in an attempt to re-open them. This met with little success as the old portals continued to slough-in. The two adits which were partially cleaned were examined by the writer in a cursory manner as the walls and backs of the cross-cuts were in poor state of deterioration.

The VLF electromagnetic reconnaissance survey did not encounter any anomalous areas and is probably not a workable tool as an aid to locating lead-zinc.

GENERAL GEOLOGY

The following description of the general geology of the Lardeau-Trout Lake area is taken from Bulletin No 45, British Columbia Department of Mines and Petroleum Resources by James T. Fyles and G.E.P. Eastwood (1962):

The oldest rocks are found in the northeastern part of the map area. They strike northwest and are complexly folded into tight and isoclinal synclines and anticlines with low plunge. The folds produce a cumulative dip to the southwest and regionally the stratigraphic top is to the southwest. Rocks of the Hamill Group, which outcrop at the head of Gainer Creek, include white quartzite overlain by micaceous quartzite and phyllite containing minor limestone in the upper part. The rocks above the white Quartzite are divided into two formations which total more than 3000 feet thick.

The Hamill Group is overlain by massive grey limestone of the Badshot Formation, which forms the prominent peaks of Badshot and Mohican Mountains. The limestone is several hundred feet thick."

The Badshot formation is succeeded by a thick sequence of phyllites containing a few beds of limestone. These rocks make up the Index formation, the oldest in the Lardeau Group. Parts of the Index formation are repeated several times by isoclinal folds in a belt 2 1/2 miles wide, southwest of Badshot and Mohican Mountains. The rocks are greatly deformed, and correlation of rock units from one fold to the next is hampered by the deformation and by the fact that sedimentary facies appear to change across the strike. The exact stratigraphic relationship between the Index and the Badshot formations is not entirely certain, but the Index is the younger. Anticlines within the Index expose a limestone

called the Lade Peak formation beneath the Index phyllites that probably is equivalent to the Badshot formation. Green phyllitic volcanic rock a few hundred feet thick forms the uppermost member of the Index formation and is conformably overlain by the Triune formation

The Triune formation consists of dark-grey thin-bedded cherty slates and argillites. It is overlain by a lighter-grey, somewhat coarser-grained quartzite named the Ajax formation. The Ajax quartzite in turn is overlain by a dark-grey to black siliceous argillite and phyllite named the Sharon Creek formation. These three formations constitute a distinctive stratigraphic succession a few thousand feet thick. The Ajax quartzite is a particularly useful marker.

Volcanic rocks of the Jowett formation conformably overlie the Sharon Creek formation in the northeastern part of the map area. The Jowett formation includes a few thousand feet of mafic volcanic rocks with a predominance of amygdaloids and pillow lavas near the base and pyroclastic rocks towards the top

The Jowett formation is overlain by a thick succession of grey and green grits, and phyllites known as the Broadview formation. The formation occurs between the Jowett formation and the Cup Creek fault zone in the northeastern part of the area and between the Sharon Creek formation and Trout Lake on the southwestern limb of the Silver cup anticline. Very few distinctive lithologic

units are found within the formation, and only a general stratigraphic sequence is recognized.

Between the Cup Creek fault and the Trout Lake-Lardeau Valley, the uppermost part of the Index formation and rocks stratigraphically above it are exposed. They lie on a major anticline, the Silvercup anticline, the axis of which is nearly parallel to the Cup Creek fault and no more than a few thousand feet southwest of it. The axial plane of the anticline dips steeply to the northeast and the axis plunges at a low angle to the northwest. The Triune formation and, near the southeast edge of the map area, the underlying Index formation are exposed in the core of the anticline, and the Ajax, Sharon Creek, and Broadview formations are repeated on the limbs. The Jowett formation is not found on the Silvercup anticline.

The Broadview formation is overlain by the Milford group on the northeast side of the Lardeau Valley. It is uncertain from evidence within the Ferguson area whether the contact between the Broadview at the top of the Lardeau group and the Milford group is one of conformity or disconformity. The Milford group consists of grey and black argillite and slate and grey, pink, or green chert. Argillaceous limestone near the base contains Mississippian fossils.

Little is known of the structure and stratigraphy of the southwestern part of the map area because the structure is exceedingly complex and large areas contain only scattered outcrops. The Milford group

is followed to the southwest by black slates and argillites with minor bands of carbonaceous limestone along the Lardeau Valley, and these rocks are succeeded to the southwest by monotonous grey and black grits and phyllites. White crystalline dolomite and limestone underlain by phyllitic green pillow lavas lie southwest of the grits and phyllites and constitute the only traceable markers in the southwestern part of the area. They are isoclinally folded about axes plunging 20 to 40 degrees to the northwest and are followed to the southwest by grey and black argillite. Rocks in the southwestern part of the map area cannot be correlated directly with any rocks northeast of the Lardeau valley. It is possible that some of them belong to the upper Lardeau or Milford groups, but it may be that they are younger than the Milford "

Several intrusive rocks of varying sizes occur in the area. The dioritic rocks are generally massive, medium to coarse grained, and light to dark green or greenish-grey and take the form of small stocks or dykes. The acidic Kuskanax batholith lies to the southwest.

There are several faults in the area, the main one which is called the Cup Creek fault zone. The zone strikes northwest parallel to the structural trend, dips 75 to 80 degrees to the northeast and separates the Silver Cup anticline and the Finkle Creek syncline to the northeast.

LOCAL GEOLOGY

The claims are underlain by rocks of the Lardeau group namely, the Broadview, Sharon Creek, Ajax, Triune and Index formation. Most exposures reveal thinly bedded phyllite and argillite. An altered dioritic dyke also occurs. The general strike of the rocks is northwesterly with a dip of approximately 45° to the northeast with some minor flexures. The beds appear to form part of the western limb of the Silver Cup anticline.

Many large discontinuous masses of white quartz occur on Silver Cup Ridge and appear to fill tension fractures.

Early descriptions of the prospects on the claims by Gunning mention quartz veins which are conformable to the bedding, are up to two feet wide, and carry galena, pyrite, freibergite, minor sphalerite and chalcocopyrite. Some of the veins were noted to be at right angles or larger angles to the attitudes of the enclosing sediments.

MINERAL DEPOSITS

All of the underground workings on the claims are caved at the portal and are inaccessible. The descriptions of the mineral occurrences are taken from Annual Reports of the Minister of Mines of British Columbia

Lanax:

The Lanax workings are located on F19 mineral claim and the Minister of Mines Report for 1905 states that an 80-foot tunnel was driv

Blue Grouse:

The Blue Grouse showing is located on Fi 9 mineral claim near the Lanax tunnel and in the Minister of Mines Report (1905) it is stated that "a tunnel was driven on the lead for a distance of 100 feet."

Butte, Bonanza King, Gallant Boy, Harloch, Butte Fraction No. 1 and Butte Fraction No. 2.

The showings are located on the crown granted mineral claims which comprise the Mineral Lease M 219 and are described in the Minister of Mines Report for 1924 and in Memoir 161 "Lardeau Map Area, British Columbia" by H.C. Gunning (1929).

"This property, consisting of the Butte, Bonanza King, Gallant Boy, Harloch, Butte Fraction No. 1 and Butte Fraction No. 2, owned by J.G. Jenkins, of Gerrard, is situated in the Bonanza basin at the head of the Middle fork of Haskins Creek, just over the divide from American Creek, which flows westerly into Trout Lake a little above Gerrard, from which place the property is distant about six miles by Trail. The elevation of the summit crossed by the trail is 7,400 feet and the elevation of the cabin in Bonanza basin is 6,800 feet.

The formation is composed of schists containing bands of limestone and quartzite, the strike of the rocks being north-westerly, with steep dips to the north-east. There are several veins on the claims, some of them fissure-veins and others veins conforming to the stratification of the enclosing rocks. The ore is

chiefly galena, with associated zinc-blende and iron pyrites, the latter mineral containing appreciable gold values. Clean zinc ore occurs in places and at other points the mineralization consists of lead, zinc, and iron sulphides disseminated through the gangue, which is quartz and altered country-rock. A streak of grey copper in quartz occurs on the Butte Fraction No. 2 claim.

The workings, consisting of short tunnels and open-cuts, are scattered over a considerable area and some surveying would be required to show the relations between the different showings. Briefly, it may be said that there are several small showings of ore of shipping grade in the fissure-veins and some showings of undertermined width of ore of milling grade in the bedded deposits.

Further work is required before any definite opinion can be formed as to the character and continuity of the deposits, but the following samples taken by the writer give some idea of the values obtainable."

	Gold oz/t	Silver oz/t	Lead oz/t	Zinc oz/t
6-inch pay-streak on foot-wall on Butte claim (fissure-vein)	0.46	4.0	8.0	10.0
6-inch pay-streak on hanging-wall same cut	0.32	50.0	64.0	nil
Sacked carbonates from hanging-wall streak, same cut	1.24	22.5	24.0	0.5
Grab sample from milling-ore in formation lead just east of above open-cut	0.02	18.0	26.0	12.0
6-inch pay-streak quartz and grey copper in open-cut on Butte Frac. No. 2	0.06	116.0	nil	0.5
Zinc ore from "Red Fissure" on Butte claim	0.04	0.8	nil	37.0

"The Butte, Bonanza King, Gallant Boy, Harloch, Butte fractions No. 1 and No. 2 mineral claims compose the Butte group. In 1926 they were bought by R.H. Graves of Kaslo, the original owner being the late J.C. Jenkins of Gerrard. The group is on the southeast side of Bonanza basin, opposite the Bonanza group at an elevation of 6,700 feet. The old workings consist of two short adits, a shallow shaft, and numerous open cuts. In 1927, the Lardeau Gold-Silver Mining Company, organized by Mr. Graves to operate the property, erected a serviceable cabin in the basin just below the workings.

Black slates or carbonaceous schists, light to dark green chlorite schists, and thin bands of crystalline limestone are exposed on the

claims. They strike north 40 degrees west and dip about 70 degrees northeast. A large dyke of grey rock spotted green by altered hornblende crystals, appears in a small gulch immediately southwest of the upper adit. It follows the strike of the neighbouring sediments and is probably a continuation of the greenstone dyke which appears at the Silver Cup mine and continues southeast across Brown and Ottawa creeks. It is greatly altered to chlorite and calcite. Originally it perhaps approached a diorite in composition. Numerous open-cuts have exposed a series of quartz veins. Most of them are true fissure veins cutting the bedding of the sediments at large angles. The most easterly open-cuts show a banded vein, striking north 60 degrees east, dipping 60 degrees southeast, up to 8 inches wide. and composed of quartz, pyrite, arsenopyrite, sphalerite, and galena. An old shaft on the same lead is flooded. These showings merit a little more development work. Two hundred feet southwest of the shaft is another open-cut on what may be a continuation of the same vein. The vein is about 8 inches wide and cuts across from slates on the west through a few limestone bands to chlorite schist on the east. Small amounts of pyrite and sphalerite occur in the vein, but in several places, particularly in bands of limestone, narrow bodies of galena and sphalerite with some pyrite, chalcopyrite, and grey copper replace the rocks along the bedding. In these cases the sulphides are almost devoid of gangue.

The upper adit has been driven 20 feet on a large quartz vein, slightly mineralized with pyrite and zinc blende and following a strong fault. A bedded quartz vein is exposed in a small cut a few feet west of the portal. Numerous other open-cuts expose quartz veins, several of which are more or less mineralized, but sufficient surface work has not been done to prove the continuity of individual veins.

On the whole, the veins vary from mere stringers to a width of 2 feet and are mineralized rather irregularly with pyrite, arsenopyrite, sphalerite, and galena. Small amounts of chalcopyrite are present and some grey copper, the latter generally associated with the galena in microscopic quantities. The possibility of replacement extending along the bedding, particularly in the limestone, should not be neglected. Microscopic examination of the limestone shows it to be a siliceous marble, containing about 25 per cent quartz. Bands of chlorite and sulphides follow the bedding, accounting for the dark colour. Assays quoted by the provincial resident mining engineer indicate that the gold is associated with the pyrite and arsenopyrite and that good silver values may be expected where much grey copper is present."

A sample was cut from the hanging wall of a vein on the Butte claim on July 21, 1969 by D. Mark which ran 40.8 oz Ag and 0.51 % Pb across 30 inches.

200 feet below the above vein another working was sampled across 8 inches which assayed 0.44 oz Ag and 1.39 % Pb.

The Gallant Boy #1 adit was examined by the writer over its short distance. The drift was along a bedding vein which intersected a cross vein at a sharp angle. The veins are banded with sulphides and are up to two feet wide. The bedding vein strikes 020° and dips -50° N.E. The cross vein strikes 040° and dips -50° NE whereas the beds strike 140° and dip -50° NE.

Gallant Boy #2, 3 and 4 adits are all caved at the portal. #2 adit was driven 20 feet below #1 to intersect the veins exposed in #1 adit. #3 adit was driven along a bedding vein whereas #4 was driven at 295° along a graphitic shear. The bedding strikes 295° and dips at -45° NE.

Between Gallant Boy #4 and #5 adits jointing was noted to occur in conjugated sets, one set parallel to the strike of the beds and one at right angles to the dip and along the dip direction. Several horizontal faults with negligible displacements occur between the adits.

Gallant Boy #5 adit is not caved and was examined and mapped by the writer. The zone drifted on was a graphite shear with minor occurrences of malachite and azurite stain. No sulphide minerals were observed. A large portion of the drift was coated with calcite precipitated from ground waters, the source, a limestone member

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687-2922

CERTIFICATE

I, Thomas R. Tough, of the City of Vancouver, in the Province of British Columbia, do hereby certify:

That I am a Consulting Geologist and an associate with T.R. Tough & Associates Ltd. with offices at 519, 602 West Hastings Street, Vancouver 2, B.C.

I further certify that:

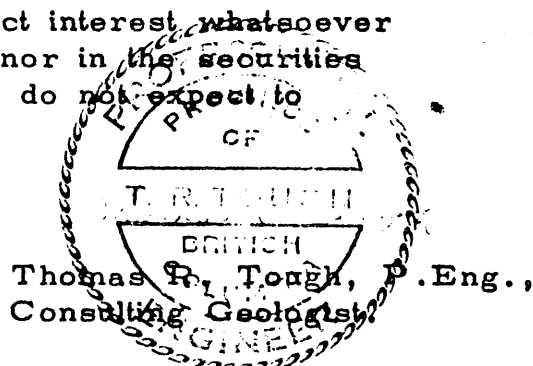
I am a graduate of the University of British Columbia (1965) and hold a B.Sc. degree in Geology.

I have been practising my profession for the past six years and have been active in the mining industry for the past thirteen years.

I am registered with the Association of Professional Engineers of British Columbia.

The information for the accompanying report is based on personal examinations of the property during the field season of 1970 and 1971, and from the results of work performed on the property under my direct supervision.

I have no direct interest or indirect interest whatsoever in the property described herein, nor in the securities of Burdos Mines Ltd. (NPL) and do not expect to receive any interest therein.



February 22, 1972
Vancouver, B.C.

above the drift.

EXPLORATION PROGRAM

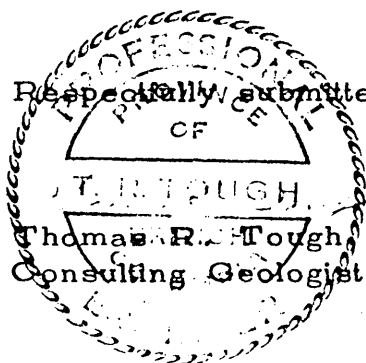
Soil sampling should be completed over the entire Fi claims utilizing the hot acid extraction method. In conjunction with the soil sampling a D8 or D9 bulldozer equipped with a ripper would be used to trench in the area of the 5 adits uncovered during the trenching operations in the 1971 field season. The use of a larger bulldozer would prove to be more successful in trenching to bedrock, thus exposing possible mineralized zones which were drifted ore initially. Pursuant to uncovering mineralization from the trenching, a limited amount of diamond drilling should be carried out to test the zones at depth.

ESTIMATE OF COSTS OF EXPLORATION PROGRAM

Geochemical Survey 20 line miles - 600 samples @ \$5/sample	\$ 3,000.00
Bulldozer trenching	5,000.00
Diamond Drilling 1000 ft @ \$15/ft	15,000.00
Engineering & Supervision	1,500.00
Contingencies	<u>2,500.00</u>
	\$ 27,000.00

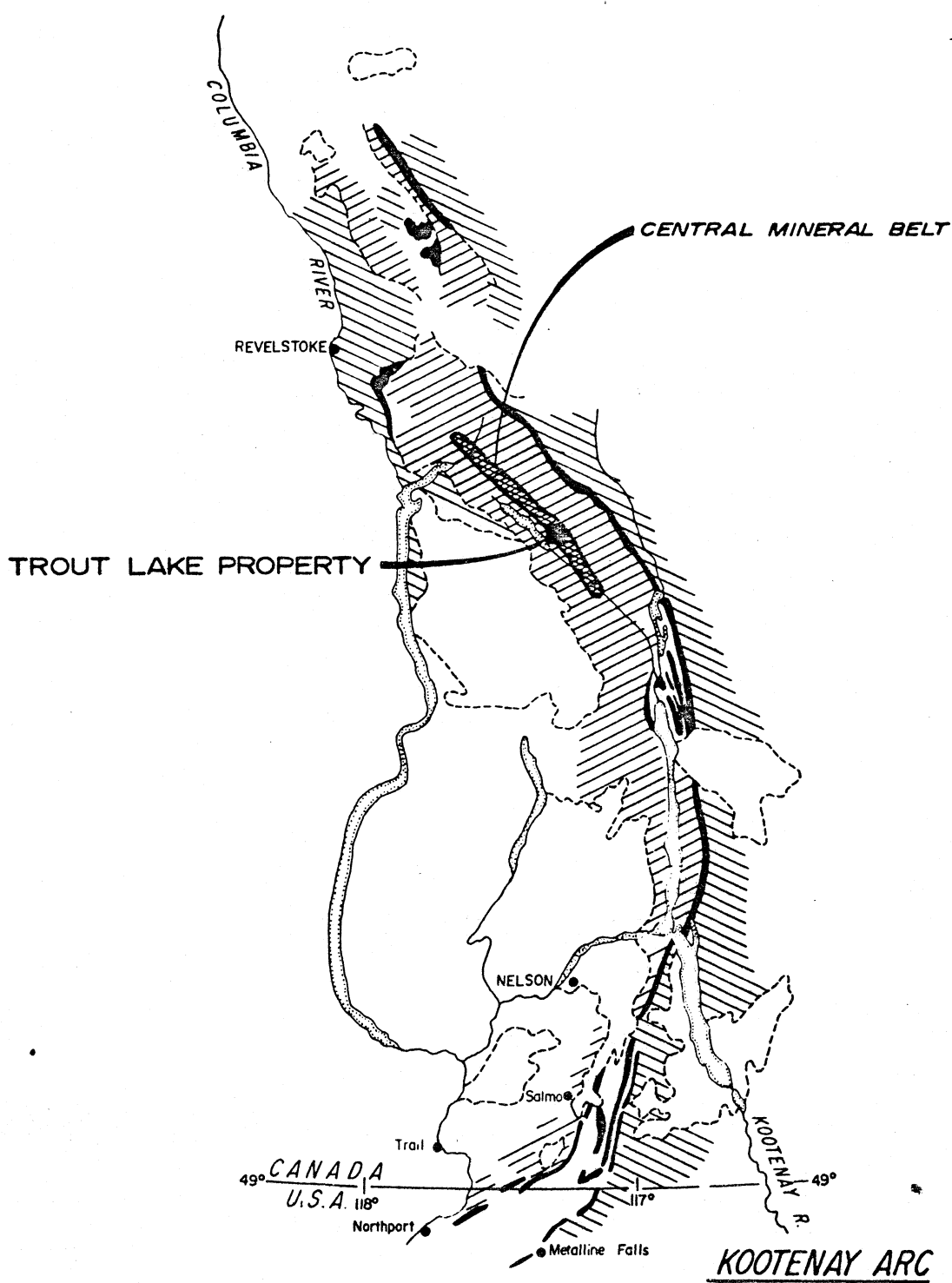
It is estimated that the above recommended program should take approximately 2 months to complete.

Respectfully submitted,







P. Eng.

February 22, 1972
Vancouver, B.C.



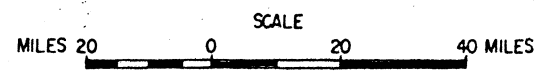
LEGEND

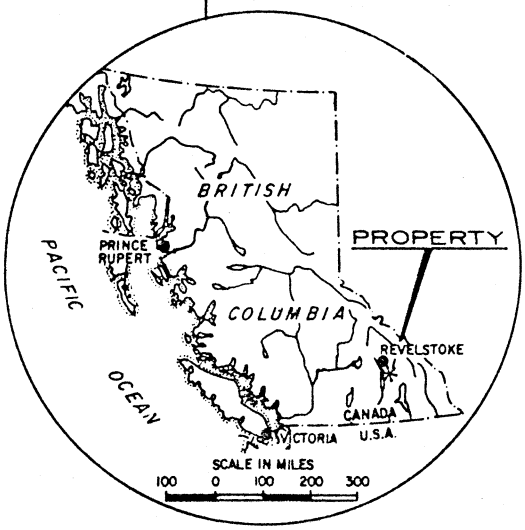
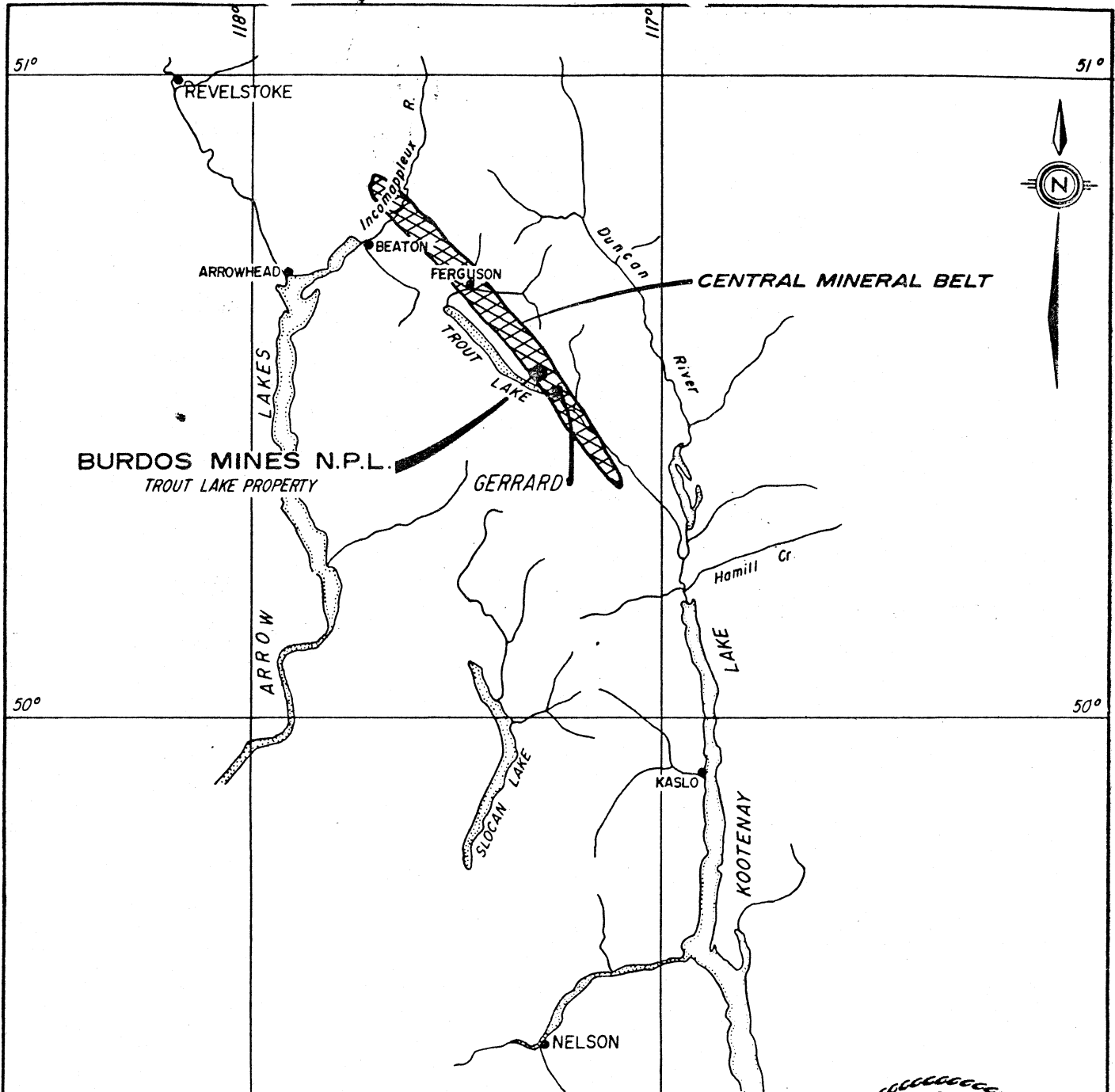
-  Granite
-  Post-Reeves
-  Reeves - Badshot
-  Pre-Reeves



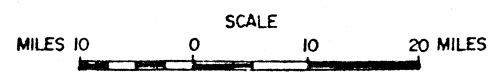
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BURDOS MINES LTD. (N.P.L.)
TROUT LAKE PROPERTY

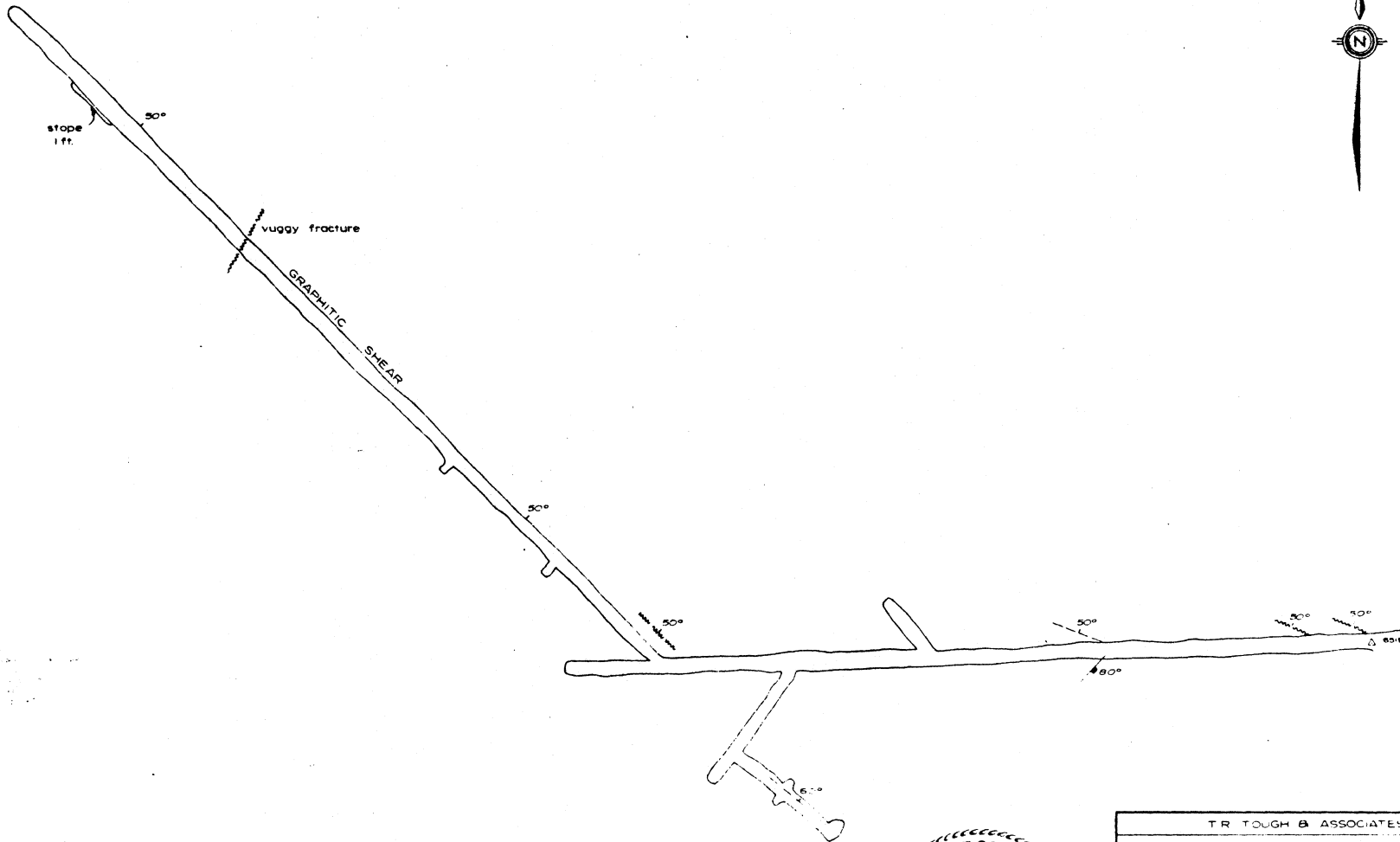
REGIONAL GEOLOGY





T.R. TOUGH & ASSOCIATES LTD.
BURDOS MINES LTD. (N.P.L.)
TROUT LAKE PROPERTY
LOCATION MAP





SYMBOLS

- BEDDING STRIKE AND DIP
- JOINT
- QUARTZ VEIN
- SHEARING



T. R. TOUGH & ASSOCIATES LTD.	
BURDOS MINES LTD. (N. PL.)	
GEOLOGICAL PLAN	
GALLANT BOY ADIT No. 5	
TROUT LAKE B.C.	
DRAWN BY: T. R. TOUGH	
SCALE: 1" = 40 FEET	MARCH, 1972

X
T. R. TOUGH & ASSOCIATES LTD.

CONSULTING GEOLOGISTS
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82K/11W
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GEOLOGICAL REPORT

on

TROUT LAKE PROPERTY

of

BURDOS MINES LTD (N. P. L.)

Revelstoke and Slocan Mining Division

"LARDEAU AREA"

PROPERTY FILE

January 26, 1971

Thomas R. Tough, P. Eng.,
Consulting Geologist

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MAPS

LOCATION MAP.....	1" = 150 miles
PROPERTY MAP.....	1" = 1500 feet
GEOLOGICAL SKETCH MAP.....	1" = 1/2 mile
GEOLOGICAL PLAN (Gallant Boy Adit #5).....	1" = 40 feet
SURFACE PLAN OF GEOLOGY.....	1" = 100 feet
GEOCHEMICAL.....	1" = 330 feet

SUMMARY

Burdos Mines Ltd (N.P.L.) owns 35 mineral claims and fractions and Mineral Lease M219 which consists of six crown-granted claims. The property is located in the "Lardeau" silver-lead district of south-eastern British Columbia. The claims lie between the elevations of 4500 and 8200 feet in the rugged Selkirk Mountain Range about 3000 feet immediately north of Gerrard, British Columbia, on the south shore of Trout Lake. The claims lie in both the Revelstoke and Slocan Mining Divisions and are accessible by road.

Railroad facilities are available in both Revelstoke and Nelson, British Columbia, 50 and 90 miles respectively from the property. The smelter in Trail, B.C. is approximately 50 miles southwest of Nelson.

Heavy snow is common during the winter months and the summer has moderate temperatures and rainfall.

Elevations in the mountains reach 9200 feet with a relief of 6800 feet.

Timberline is about 6500 feet elevation and there is sufficient timber and water for all phases of exploration and development.

The most productive veins of the Central Mineral Belt of the Lardeau camp are relatively short, narrow, 1 to 2 feet wide, and carry high-grade silver-lead-zinc-copper values. The minerals present are of freibergite, galena, sphalerite and lesser chalcopyrite. Most veins

are conformable to the bedding present in the metamorphosed Pre-Cambrian schists, phyllites, slates, quartzites and limestones of the Lardeau group. Some veins cut the bedding at rather steep angles.

The Lardeau camp was first prospected in 1890 and the prospects have been worked intermittently over the years.

Important mineral controlling structures are the Silver Cup anticline, Silver Cup fault and a diorite dyke. These structures are parallel, trend northwest and should extend through the Burdos Mines Ltd (N. P. L.) property. Eighty-five per cent of the Lardeau camp production was related to those structures.

The depth persistence of ore-shoots at the Silver Cup Mine was up to 1200 feet.

Several mineral occurrences are located on the Burdos Mines Ltd (N. P. L.) property, but they have not been fully assessed at present day metal prices.

Most portals of the underground workings have caved.

Due to a short field season during 1970 only portions of previously recommended programs were carried out consisting of road building, geological mapping, topographic survey, limited renovation to some of the portals, and a reconnaissance geochemical survey over a portion of the claims at lower elevations.

CONCLUSIONS

Old published reports indicate that some of the properties of the Central Mineral Belt, which had records of production or mineralization with grades comparable to samples from the property of Burdos Mines Ltd (N. P. L.) did develop into mining situations with diligent work. Such endeavours by Burdos Mines Ltd (N. P. L.) may develop economic deposits of gold-silver-lead-zinc mineralization.

The presence of limestone reported on the property may have provided the environment which would produce replacement sulphide mineralization. Wherever veins may cut or parallel the limestone replacement bodies may occur.

The major structures that localize mineralization in other areas of the Central Mineral Belt should be on the Burdos Mines Ltd (N. P. L.) property.

Some consideration should be made by the company to acquire additional properties in the area.

RECOMMENDATIONS

It is recommended that geological mapping and sampling of all known mineral occurrences be undertaken in conjunction with soil sampling bulldozer stripping and trenching, road repair and diamond drilling.

It is also recommended that Burdos Mines Ltd (N. P. L.) allocate the sum of \$40,000.00 to implement and execute the recommended exploration and development programme.

Upon the completion and success of the recommended programmes
a study of the results should be made and further work
recommended.

Respectfully submitted,

Thomas R. Tough, P. Eng.
Consulting Geologist

INTRODUCTION

The following report is based on information compiled from the writer's personal experiences gained through examinations of properties in the general area of the property of Burdos Mines Ltd (N. P. L.), from various government geological reports and from a report written by M. D. Kierans, P. Eng., for Burdos Mines Ltd (N. P. L.) dated January 14, 1969.

The property was visited by the writer on September 10 and 11, 1970 and an examination was made of all accessible workings, both surface and underground. A fairly heavy snowfall hampered a thorough investigation of the surface workings.

The purpose of the study was to assess the potential of developing economic deposits of silver, lead and zinc mineralization on the property.

PROPERTY

The property consists of 35 located mineral claims and fractions and Mineral Lease M219 which is comprised of six crown-granted claims. They are as follows:

<u>Claim Name</u>	<u>Record Number</u>	<u>Expiry Date</u>
Fi 1 - 24 incl.	8809 - 32 incl.	April 30, 1972
Trout 1 - 4 incl.	6889 - 92 incl.	May 19, 1972
Trout 6	6884	May 19, 1972
Trout 8	6896	May 19, 1972
B.B. 1 - 2	8807 - 08	May 2, 1972
TR 1 - 2 Fractions	9573 - 74	Nov. 6, 1971
American	12575	Nov. 6 1972

Mineral Lease M 219 - Slocan Mining Division

<u>Crown Grants</u>	<u>Lot Number</u>	<u>Expiry Date</u>
Butte No. 1 Fraction	L 14176	April 29, 1972
Butte No. 2 Fraction	L 14177	April 29, 1972
Bonanza King	L 14178	April 29, 1972
Gallant Boy	L 14179	April 29, 1972
Harlock	L 14180	April 29, 1972
Butte	L 14902	April 29, 1972

OWNERSHIP

The claims are owned by Burdos Mines Ltd (N.P.L.) of Vancouver, British Columbia.

LOCATION (50° 117° N. E.)

The south end of the property is located approximately 3,000 feet north of the Village of Gerrard, British Columbia, on the south east end of Trout Lake in the Selkirk Mountain Range of southeastern British Columbia. Gerrard is fifty miles southeast of Revelstoke via

the newly constructed Arrowhead Highway, which paved, the Galena Bay ferry crossing and gravel roads. Alternatively, Gerrard may be reached by 90 miles of paved highway north from the City of Nelson, British Columbia.

The mine access road is located approximately one mile northwest of Gerrard and is about 12 miles long with several switch backs.

There is sufficient water available for all phases of exploration and development, mining, milling and domestic use.

Railroad facilities exist in both Revelstoke and Nelson. The smelter in Trail is about 50 miles south of Nelson, British Columbia.

Winters are fairly long with heavy snows whereas the summer months are warm and rainfall moderate.

The area is one of rugged mountains and high relief with elevations reaching 9200 feet with a relief of about 6,800 feet.

Timber line is about 6500 feet elevation above which are many precipitous cliffs and peaks.

The area is traversed by youthful stream valleys and fast-flowing mountain streams.

At the higher elevations cirques and hanging valleys occur along with some alpine glaciers.

HISTORY

The first recorded prospecting in the Lardeau District was about 1890 and by 1900 most of the principal mineral occurrences were discovered. After 1907 most mining activity had ceased. Some work was carried out during 1914, 1927 and 1952 and access to the area has been improved considerably in recent years.

There are three mineralized belts in the Lardeau District, namely, the west, central and eastern belts. The three zones parallel the general northwest trend of rock formations and structure. There has not been any report of mineralization found between the belts. The Burdos Mines Ltd (N. P. L.) property lies in the central belt; the most productive area of the district. The Silver Cup, Triune, Nettie L., Spider, Oyster-Criterion and True Fissure claims accounted for most of the production.

The deposits on these claims are veins and lodes containing galena, sphalerite, freibergite, pyrite and chalcopyrite. Initially the properties were worked for their silver content which ranged up to 150 ounces per ton.

PRESENT WORK

During 1969 Burdos Mines Ltd (N. P. L.) carried out a limited programme of road building, stripping, prospecting and sampling. A log cabin was constructed at the 6500 foot level. In the brief 1970 field season which remained after access roads were put in, a plane-table survey, topographic and geological mapping were undertaken over a limited portion of the property. The plane-table and topographic surveys were undertaken by Geotronics Surveys

Ltd while the geological mapping was done by Mr. . Sheppard, P. Eng., and the writer. Due to adverse weather conditions the exploration programme was terminated near the end of September. In addition to the above work, a limited reconnaissance geochemical survey was carried out in November, 1970 over the Fi 3-6, 8, 10-14 21-23 mineral claims. The method used was the Holman which gives readings in terms of milliliters of indicator. Readings of 4 ml or greater are considered anomalous. Two anomalies were detected and are both 600 to 700 feet long with readings as high as 8 ml. The test was made for copper because of its association with the lead-zinc mineralization.

GENERAL GEOLOGY

The following description of the general geology of the Lardeau-Trout Lake area is taken from Bulletin No. 45, British Columbia Department of Mines and Petroleum Resources by James T. Fyles and G. E. P. Eastwood (1962):

"The oldest rocks are found in the northeastern part of the map area. They strike northwest and are complexly folded into tight and isoclinal synclines and anticlines with low plunge. The folds produce a cumulative dip to the southwest and regionally the stratigraphic top is to the southwest. Rocks of the Hamill Group, which outcrop at the head of Gainer Creek, include white quartzite overlain by micaceous quartzite and phyllite containing minor limestone in the upper part. The rocks above the white quartzite are divided into two formations which total more than 3000 feet thick.

The Hamill Group is overlain by massive grey limestone of the Badshot Formation, which forms the prominent peaks of Badshot and Mohican Mountains. The limestone is several hundred feet thick.

The Badshot formation is succeeded by a thick sequence of phyllites containing a few beds of limestone. These rocks make up the Index formation, the oldest in the Lardeau Group. Parts of the Index formation are repeated several times by isoclinal folds in a belt 2 1/2 miles wide, southwest of Badshot and Mohican Mountains. The rocks are greatly deformed, and correlation of rock units from one fold to the next is hampered by the deformation and by the fact that sedimentary facies appear to change across the strike. The exact stratigraphic relationship between the Index and the Badshot formations is not entirely certain, but the Index is the younger. Anticlines within the Index expose a limestone called the Lade Peak formation beneath the Index phyllites that probably is equivalent to the Badshot formation. Green phyllitic volcanic rock a few hundred feet thick forms the uppermost member of the Index formation and is conformably overlain by the Triune formation.

The Triune formation consists of dark-grey thin-bedded cherty slates and argillites. It is overlain by a lighter-grey, somewhat coarser-grained quartzite named the Ajax formation. The Ajax quartzite in turn is overlain by a dark-grey to black siliceous argillite and phyllite named the Sharon Creek formation. These three formations constitute a distinctive stratigraphic succession a few thousand feet thick. The Ajax quartzite is a particularly useful marker.

Volcanic rocks of the Jowett formation conformably overlie the Sharon Creek formation in the northeastern part of the map area. The Jowett formation includes a few thousand feet of mafic volcanic rocks with a predominance of amygdaloids and pillow lavas near the base and pyroclastic rocks towards the top.

The Jowett formation is overlain by a thick succession of grey and green grits, and phyllites known as the Broadview formation. The formation occurs between the Jowett formation and the Cup Creek fault zone in the northeastern part of the area and between the Sharon Creek formation and Trout Lake on the southwestern limb of the Silvercup anticline. Very few distinctive lithologic units are found within the formation, and only a general stratigraphic sequence is recognized.

Between the Cup Creek fault and the Trout Lake-Lardeau Valley, the uppermost part of the Index formation and rocks stratigraphically above it are exposed. They lie on a major anticline, the Silvercup anticline, the axis of which is nearly parallel to the Cup Creek fault and no more than a few thousand feet southwest of it. The axial plane of the anticline dips steeply to the northeast and the axis plunges at a low angle to the northwest. The Triune formation and, near the southeast edge of the map area, the underlying Index formation are exposed in the core of the anticline, and the Ajax, Sharon Creek, and Broadview formations are repeated on the limbs. The Jowett formation is not found on the Silvercup anticline.

The Broadview formation is overlain by the Milford group on the northeast side of the Lardeau Valley. It is uncertain from evidence within the Ferguson area whether the contact between the Broadview at the top of the Lardeau group and the Milford group is one of conformity or disconformity. The Milford group consists of grey and black argillite and slate and grey, pink, or green chert. Argillaceous limestone near the base contains Mississippian fossils.

Little is known of the structure and stratigraphy of the southwestern part of the map area because the structure is exceedingly complex and large areas contain only scattered outcrops. The Milford group is followed to the southwest by black slates and argillites with minor bands of carbonaceous limestone along the Lardeau Valley, and these rocks are succeeded to the southwest by monotonous grey and black grits and phyllites. White crystalline dolomite and limestone underlain by phyllitic green pillow lavas lie southwest of the grits and phyllites and constitute the only traceable markers in the southwestern part of the area. They are isoclinally folded about axes plunging 20 to 40 degrees to the northwest and are followed to the southwest by grey and black argillite. Rocks in the southwestern part of the map area cannot be correlated directly with any rocks northeast of the Lardeau valley. It is possible that some of them belong to the upper Lardeau or Milford groups, but it may be that they are younger than the Milford."

Several intrusive rocks of varying sizes occur in the area. The dioritic rocks are generally massive, medium to coarse grained, and light to dark green or greenish-grey and take the form of small stocks or dykes. The acidic Kuskanax batholith lies to the southwest.

There are several faults in the area, the main one which is called the Cup Creek fault zone. The zone strikes northwest parallel to the structural trend, dips 75 to 80 degrees to the northeast and separates the Silver Cup anticline and the Finkle Creek syncline to the northeast.

LOCAL GEOLOGY

The claims are underlain by rocks of the Lardeau group namely, the Broadview, Sharon Creek, Ajax, Truine and Index formation. Most

exposures reveal thinly bedded phyllite and argillite. An altered dioritic dyke also occurs. The general strike of the rocks is northwesterly with a dip of approximately 45° to the northeast with some minor flexures. The beds appear to form part of the western limb of the Silver Cup anticline.

Many large discontinuous masses of white quartz occur on Silver Cup Ridge and appear to fill tension fractures.

Early descriptions of the prospects on the claims by Gunning mention quartz veins which are conformable to the bedding, are up to two feet wide, and carry galena, pyrite, freibergite, minor sphalerite and chalcopryrite. Some of the veins were noted to be at right angles or larger angles to the attitudes of the enclosing sediments.

MINERAL DEPOSITS

All of the underground workings on the claims are caved at the portal and are inaccessible. The descriptions of the mineral occurrences are taken from Annual Reports of the Minister of Mines of British Columbia.

Lanax:

The Lanax workings are located on Fi 9 mineral claim and the Minister of Mines Report for 1905 states that an 80-foot tunnel was driven.

Blue Grouse:

The Blue Grouse showing is located on Fi 9 mineral claim near the Lanax tunnel and in the Minister of Mines Report (1905) it is stated that "a tunnel was driven on the lead for a distance of 100 feet."

Butte, Bonanza King, Gallant Boy, Harloch, Butte Fraction No 1
and Butte Fraction No 2:

The showings are located on the crown granted mineral claims which comprise the Mineral Lease M 219 and are described in the Minister of Mines Report for 1924 and in Memoir 161 "Lardeau Map Area, British Columbia" by H. C. Gunning (1929).

"This property, consisting of the Butte, Bonanza King, Gallant Boy, Harloch, Butte Fraction No 1 and Butte Fraction No 2, owned by J. G. Jenkins, of Gerrard, is situated in the Bonanza basin at the head of the Middle fork of Haskins Creek, just over the divide from American Creek, which flows westerly into Trout Lake a little above Gerrard, from which place the property is distant about six miles by Trail. The elevation of the summit crossed by the trail is 7,400 feet and the elevation of the cabin in Bonanza basin is 6,800 feet.

The formation is composed of schists containing bands of limestone and quartzite, the strike of the rocks being north-westerly, with steep dips to the north-east. There are several veins on the claims, some of them fissure-veins and others veins conforming to the stratification of the enclosing rocks. The ore is chiefly galena, with associated zinc-blende and iron pyrites, the latter mineral containing appreciable gold values. Clean zinc ore occurs in places and at other points the mineralization consists of lead, zinc, and iron sulphides disseminated through the gangue, which is quartz and altered country-rock. A streak of grey copper in quartz occurs on the Butte Fraction No. 2 claim.

The workings, consisting of short tunnels and open-cuts, are scattered over a considerable area and some surveying would be

required to show the relations between the different showings. Briefly, it may be said that there are several small showings of ore of shipping grade in the fissure-veins and some showings of undetermined width of ore of milling grade in the bedded deposits.

Further work is required before any definite opinion can be formed as to the character and continuity of the deposits, but the following samples taken by the writer give some idea of the values obtainable."

	Gold	Silver	Lead	Zinc
	oz/t	oz/t	oz/t	oz/t
6-inch pay-streak on foot-wall on Butte claim (fissure-vein).....	0.46	4.0	8.0	10.0
6-inch pay-streak on hanging-wall, same cut.....	0.32	50.0	64.0	nil
Sacked carbonates from hanging-wall streak, same cut.....	1.24	22.5	24.0	0.5
Grab sample from milling-ore in formation lead just east of above open-cut.....	0.02	18.0	26.0	12.0
6-inch pay-streak quartz and grey copper in open-cut on Butte Frac. No. 2.....	0.06	116.0	nil	0.5
Zinc ore from "Red Fissure" on Butte claim.....	0.04	0.8	nil	37.0

"The Butte, Bonanza King, Gallant Boy, Harloch, Butte fractions No. 1 and No. 2 mineral claims compose the Butte group. In 1926 they were bought by R.H. Graves of Kaslo, the original owner being the late J. C. Jenkins of Gerrard. The group is on the southeast side of Bonanza basin, opposite the Bonanza group, at an elevation of 6,700 feet. The old workings consist of two short adits, a shallow shaft, and numerous open cuts. In 1927, the Lardeau Gold-Silver Mining Company, organized by Mr. Graves to operate the property, erected a serviceable cabin in the basin just below the workings.

Black slates or carbonaceous schists, light to dark green chlorite schists, and thin bands of crystalline limestone are exposed on the claims. They strike north 40 degrees west and dip about 70 degrees northeast. A large dyke of grey rock spotted green by altered hornblende crystals, appears in a small gulch immediately southwest of the upper adit. It follows the strike of the neighbouring sediments and is probably a continuation of the greenstone dyke which appears at the Silver Cup mine and continues southeast across Brown and Ottawa creeks. It is greatly altered to chlorite and calcite.

Originally it perhaps approached a diorite in composition. Numerous open-cuts have exposed a series of quartz veins. Most of them are true fissure veins cutting the bedding of the sediments at large angles. The most easterly open-cuts show a banded vein, striking north 60 degrees east, dipping 60 degrees southeast, up to 8 inches wide, and composed of quartz, pyrite, arsenopyrite, sphalerite, and galena. An old shaft on the same lead is flooded. These showings merit a little more development work. Two hundred feet southwest of the shaft is another open-cut on what may be a continuation of the same vein. The vein is about 8 inches wide and cuts across from slates on the west through a few limestone bands to chlorite schist on the east. Small amounts of pyrite and sphalerite occur in the vein, but in several places, particularly in bands of limestone, narrow bodies of

galena and sphalerite with some pyrite, chalcopyrite, and grey copper replace the rocks along the bedding. In these cases the sulphides are almost devoid of gangue.

The upper adit has been driven 20 feet on a large quartz vein, slightly mineralized with pyrite and zinc blende and following a strong fault. A bedded quartz vein is exposed in a small cut a few feet west of the portal. Numerous other open-cuts expose quartz veins, several of which are more or less mineralized, but sufficient surface work has not been done to prove the continuity of individual veins.

On the whole, the veins vary from mere stringers to a width of 2 feet and are mineralized rather irregularly with pyrite, arsenopyrite, sphalerite, and galena. Small amounts of chalcopyrite are present and some grey copper, the latter generally associated with the galena in microscopic quantities. The possibility of replacement extending along the bedding, particularly in the limestone, should not be neglected. Microscopic examination of the limestone shows it to be a siliceous marble, containing about 25 per cent quartz. Bands of chlorite and sulphides follow the bedding, accounting for the dark colour. Assays quoted by the provincial resident mining engineer indicate that the gold is associated with the pyrite and arsenopyrite and that good silver values may be expected where much grey copper is present. "

A sample was cut from the hanging wall of a vein on the Butte claim on July 21, 1969 by D. Mark which ran 40.8 oz Ag and 0.51% Pb across 30 inches.

200 feet below the above vein another working was sampled across 8 inches which assayed 0.44 oz Au, 6.90 oz Ag and 1.39% Pb.

The Gallant Boy #1 adit was examined by the writer over its short distance. The drift was along a bedding vein which intersected a cross vein at a sharp angle. The veins are banded with sulphides and are up to two feet wide. The bedding vein strikes 020° and dips -50° NE. The cross vein strikes 040° and dips -50° NE whereas the beds strike 140° and dip -50° NE.

Gallant Boy #2, 3 and 4 adits are all caved at the portal. #2 adit was driven 20 feet below #1 to intersect the veins exposed in #1 adit. #3 adit was driven along a bedding vein whereas #4 was driven at 295° along a graphitic shear. The bedding strikes 295° and dips at -45° NE.

Between Gallant Boy #4 and #5 adits jointing was noted to occur in conjugated sets, one set parallel to the strike of the beds and one at right angles to the dip and along the dip direction. Several horizontal faults with negligible displacements occur between the adits.

Gallant Boy #5 adit is not caved and was examined and mapped by the writer. The zone drifted on was a graphite shear with minor occurrences of malachite and azurite stain. No sulphide minerals were observed. A large portion of the drift was coated with calcite precipitated from ground waters, the source, a limestone member above the drift.

EXPLORATION AND DEVELOPMENT PROGRAM

Of primary importance is that the entire claim group be mapped geologically using the planetable method.

Wherever possible a bulldozer should be utilized to reopen caved

portals to allow access for mapping and sampling. Old trenches and cuts should be cleared out, enlarged, mapped and sampled.

All located mineral showings should be sampled and mapped both on surface and underground.

Systematic soil sampling should be carried out over the claims located below timberline namely the Fi 1-24 and BB 1-2 claims. The survey should be contracted and samples taken every 200 feet. The survey will cover approximately 20 line miles.

The existing roads will have to be repaired and rendered passable by four-wheel drive vehicles.

Diamond drilling should be undertaken to test continuity of the stronger veins and to test such veins at depth.

Estimate of Costs of Exploration and Development Programs:

Geological mapping	\$ 4,000.00
Geochemical Survey 20 line miles - 600 samples	
@ \$5/sample	3,000.00
Road repairs	1,500.00
Stripping and Trenching	5,000.00
Diamond Drilling 1000 ft @ \$15/ft.	15,000.00

Assaying	1,500.00
Engineering and supervision	3,000.00
Travel and Living Expenses	2,000.00
Contingencies	5,000.00
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	\$40,000.00

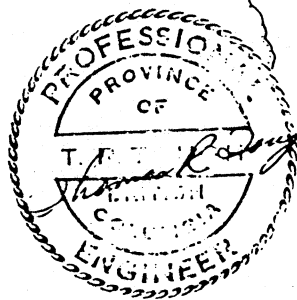
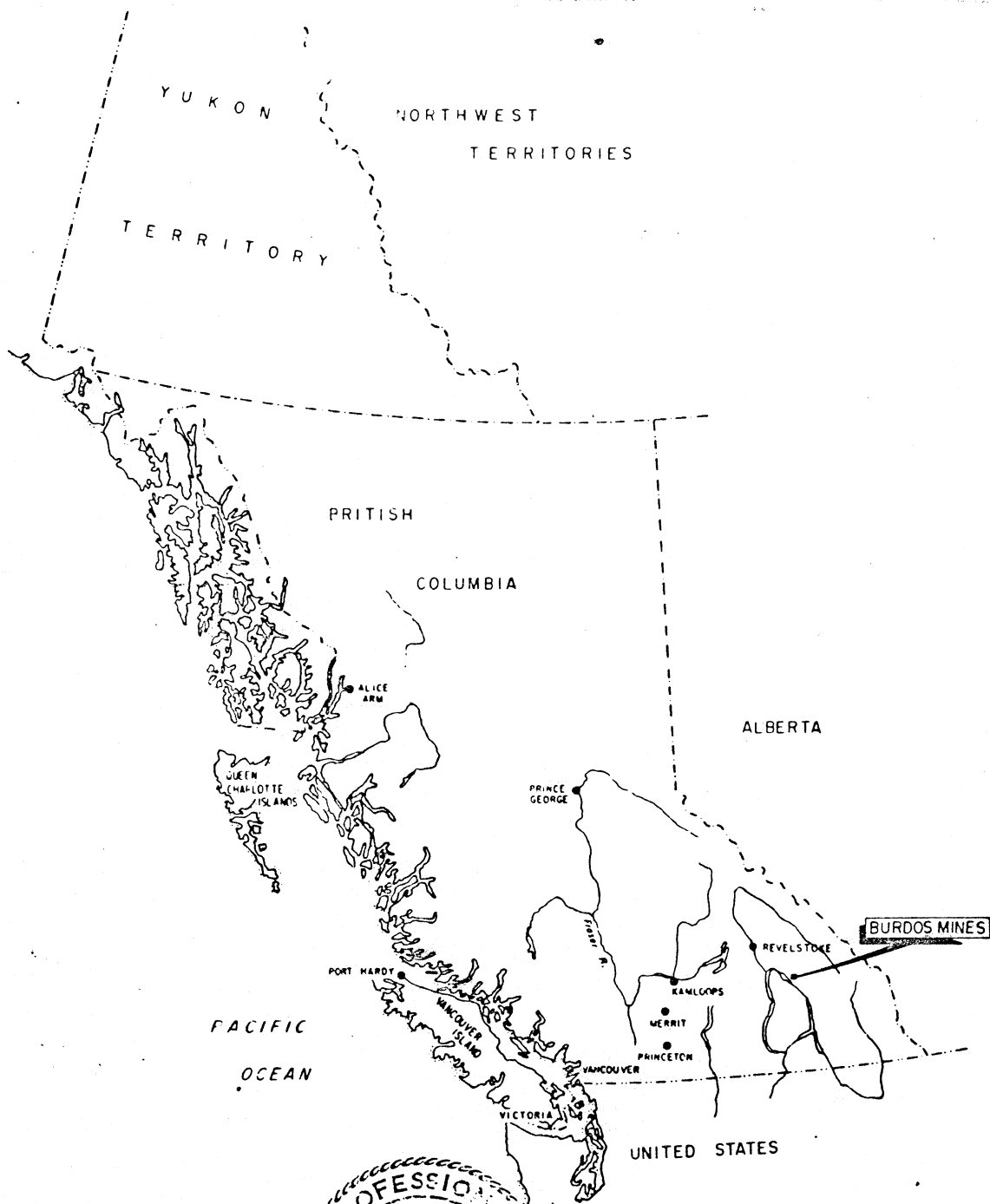
It is estimated that the above recommended programs should take approximately 4 months to complete.

Respectfully submitted,

Thomas R. Tough, P. Eng.
Consulting Geologist

REFERENCES

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2. Fyles, J. T. and Eastwood, G. E. P. (1962); "Geology of the Ferguson Area" Bulletin No. 45, Department of Mines and Petroleum Resources of Province of B. C.
3. Annual Reports, Minister of Mines, B. C. 1895 - 1967.
4. G. C. S. Annual and Summary Reports 1900-1908
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6. N. G. Cornish, P. Eng., Report on Examination of Trout Lake Claims of Burdos Mines Ltd (N. P. L.) August, 1969.
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LOCATION MAP

1" = 150 MI