TREASURE MOUNTAIN COPPER

Omineca Mining Division

British Columbia

020864

Donald D. Fraser

Report on

PROPERTY of ZENDA EXPLORATIONS, LTD.

in

Zymoetz River Area

Omineca Mining Division

BRITISH COLUMBIA

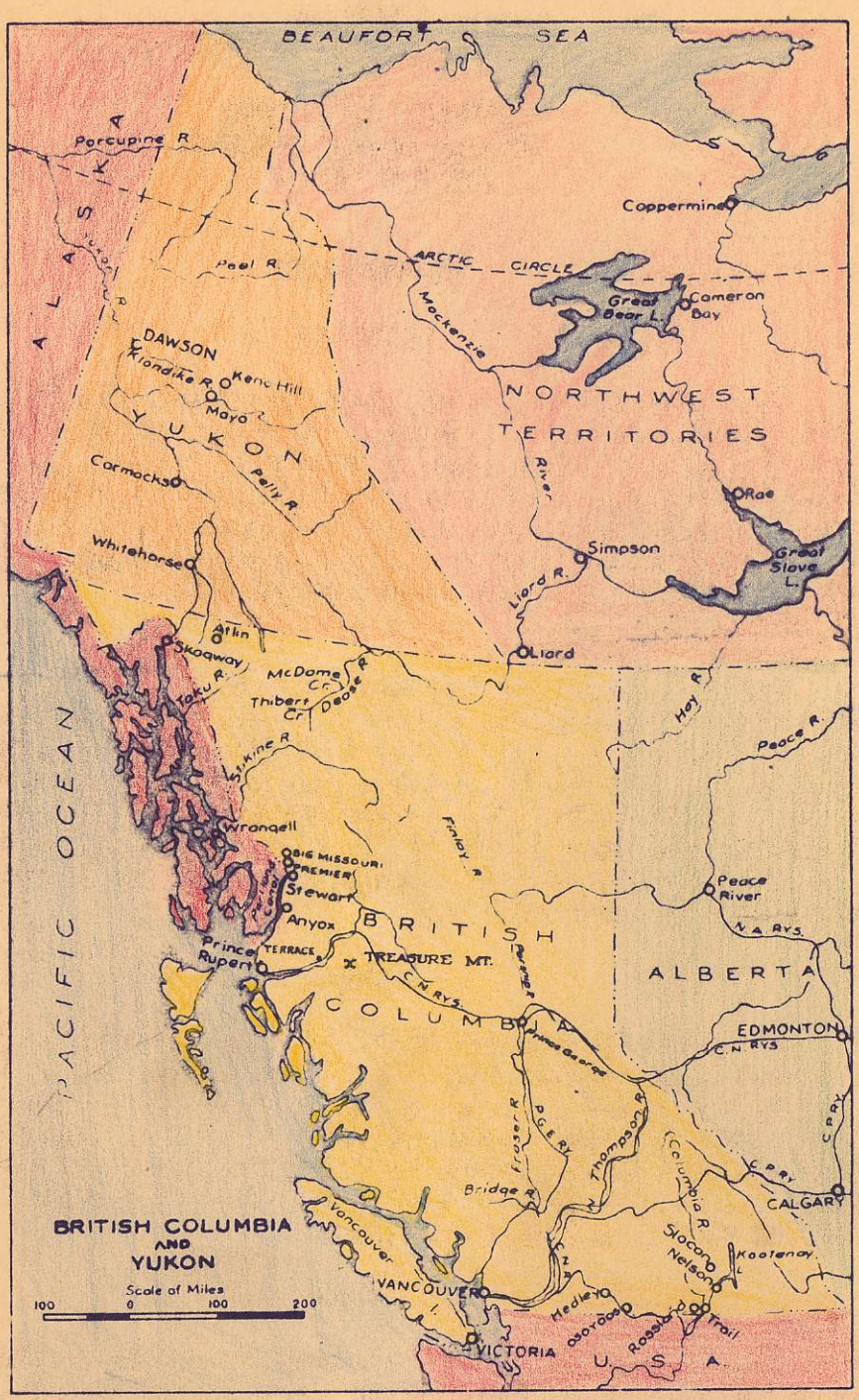
by

Donald D. Fraser

CONTENTS

MAPS AND PHOTOGRAPHS

- - -


BEAUFORT SEA
ALASKA
Porcupine R.
Coppermine
ARCTIC CIRCLE
Peel R.
Great Bear L.
Cameron Bay
Mackenzie
DAWSON
Klondike R.
Keno Hill
Mayo
YUKON
NORTHWEST TERRITORIES
Carmacks
Pelly R.
River
Rae
Whitehorse
Simpson
Great Slave L.
Liard R.
Atlin
Skagway
Liard
McDame Cr.
Thibert Cr.
Dease R.
Taku R.
Hay R.
Peace R.
Stikine R.
Wrangell
Finlay R.
BIG MISSOURI
PREMIER
Stewart
Anyox
Peace River
N.A. RYS.
BRITISH
TERRACE
TREASURE MT.
Prince Rupert
C.N. RYS.
ALBERTA
COLUMBIA
Fraser R.
EDMONTON
C.N. RYS
P.G.E. RY.
Thompson R.
Columbia R.
C.P. RY.
C.R.R.Y.
Bridge R.
CALGARY
Vancouver
Slocan
Nelson
Kootenay
VANCOUVER
Medley
Oroville
Rossland
Trail
VICTORIA
U. S. A.
PACIFIC OCEAN
BRITISH COLUMBIA
AND
YUKON
Scale of Miles
100 0 100 200

Report on
PROPERTY of ZENDA EXPLORATIONS,LTD.
in
ZYMOETZ RIVER AREA
Omineca Mining Division
British Columbia

INTRODUCTION

Location

This property is located about 20 miles south-east of Terrace, British Columbia, a village along the Canadian National Railways, some 90 miles east of Prince Rupert. It lies on Treasure Mountain, sometimes called Kleanza Mountain, along the Kleanza Creek-Zymoetz River divide, in the major bend of the Zymoetz River. The area is situated between longitudes 128° CO' and 128° 20' west and about 5 miles south of latitude 54° 40' north.

The area may be reached by a road that leaves the highway at Copper River, 5 miles east of Terrace, and follows up the east side of the Zymoetz River. The old trail to Telkwa is then taken up the river for 7 miles to the mouth of Salmon Creek, up which a branch trail 4 miles long leads to the lower end of the property. The road extend for 14 miles to the old Dardenelles mine and is passable with a jeep. The trail needs repair before horses can be taken over it.

Property

The property consists of 24 contiguous mineral claims that are held by location. They are called Chalco 1 to 8, Bornite 1 to 8, and Copper 1 to 8. As shown on the accompanying map, they extend for over 2 miles northeasterly along the Kleanza Creek-Zymoetz River divide, southerly from Treasure Mountain. These claims were located last spring and are recorded in the name of the Zenda Explorations,Ltd.

History

Prospecting in this general area was active immediately prior to and during World War 1. With the low copper prices that prevailed after the war, interest in the area decreased, and all holdings were allowed to lapse. Little or no work has been done on these claims since 1917.

The work done on these deposits was, except for a couple of short tunnels, limited to surface trenching and investigation of natural exposures. Except for work done on the old Northwest group, now the Chalco group, all exploration was carried out above timberline, where slides and talus have covered the old workings.

View up Lower Zymoetz River valley.

Physical Features

The area is characterized by high mountain peaks and deeply incised valleys, typical of the eastern border of the Coast Range. The mountain slopes are generally steep below 4000 feet elevation, gently sloping along a surface of Tertiary erosion from 4000 to 5000 feet, and steep above 5000 feet.

That part of the district lying east of the Skeena River and West of the upper reaches of the Zymoetz River is high country deeply dissected by westerly-flowing tributaries of the Skeena River. A large cirque has been eroded at the head of Kleanza Creek, and the valley below the cirque eroded to a low elevation. At the head of Kleanza Creek, a pass, under 3000 feet elevation, extends to the Zymoetz River valley. The south fork of Kleanza Creek rises in a pass at 4200 feet, and the highest peak along the divide rises to over 5000 feet between the two passes. Treasure Mountain lies directly south of the higher pass, and from it Bell Creek flows easterly and Salmon Creek southerly into the Zymoetz River. Scrub timber, mainly mountain balsam and juniper, grow in scattered clumps to an elevation of about 4200 feet. Rock outcrops are numerous above 4000 feet, with bare rock and long talus slopes occurring at higher elevations. At lower elevations, stands of red and yellow cedar and hemlock are plentiful and undergrowth is heavy. Precipitation in this area is heavy, and the streams swell to many times their natural size during periods of heavy rainfall.

Bibliography

The following references record all pertinent data available on these deposits:

Brewer, W.H.; Minister of Mines Report, 1914, page 118.

Galloway, J.D.; " " " " , 1917, " 96.

" " ; " " " " , 1920, " 83.

Hanson, G.; Geol. Survey of Canada, Summery Report, 1925, Part A, page 114.

Kindle, E.D.; Geol. Survey of Canada, Memoir 212, page 15.

- - -

GEOLOGY

Stratigraphy

A short distance south of the Lower Symoetz River, batholithic rocks form extensive outcrops that contain minor areas of pendant rocks. Easterly, through the Zymoetz River area, outcrops of batholithic rocks become progressively fewer, and Mesozoic volcanics and sediments predominate. The oldest rocks in this area are Triassic sediments that outcrop near intrusives close to the range. Tertiary formations are lacking and may have been removed by erosion, as have a great thickness of Cretaceous rocks.

Triassic

The oldest rocks occur in three small outcrop areas, flanking a large tongue of batholithic rocks along the right limit of the Lower Zymoetz River valley. They include beds of white crystalline limestone up to 20 feet thick, associated with cherty quartzite, slate, argillite, and conglomerate. They underlie volcanic rocks of the Hazelton group and have been assigned to the Triassic from the contained fossils.

Jurassic

The rocks directly overlying the Triassic series are known as the Hazelton group. They correlated with similar rocks that extend for many miles along the eastern flank of the Coast Range. Volcanics and sediments, occuring in zones that vary in both thickness and horizon with the locality, make up this group.

Lower Jurassic

The lowest member of the group, which lies directly above the Triassic sediments, consists of a thick series of andesite and andesite porphyry flows, with local areas of tuff and breccia and occasional interbeds of argillite and chert. It outcrops extensively in the Zymoetz River area and extends through a vertical range of over 6000 feet. The nature of the contact with Triassic rocks has not been established in this area.

Upper Jurassic

The upper division of the group consists entirely of sediments, and transition from the volcanics is abrupt. They comprise well-bedded tuffs, sandstone, argillite,

quartzite, greywacke, slate, and conglomerate, all of terrestrial origin. The series is thick and extensive, but it does not occur in the Zymoetz River area.

Coast Range Intrusives

Intrusives associated with the Coast Range batholiths outcrop at numerous localities in this area. Long tongues of granodiorite and quartz diorite extend northeasterly across the Lower Zymoetz River. A large stock of granodiorite and quartz porphyry outcrops at the head of Kleanza Creek, while diorite and gabbro stocks cut the volcanics at the head of Chimdemash and Legate Creeks. Another area of these intrusives crosses the Skeena River at the mouth of Legate Creek.

Dykes, varying in composition from quartz diorite to lamprophyre, intrude the Hazelton group and the batholiths. They generally have vertical attitudes, average from 2 to 20 feet wide, and seldom exceed one-half mile in length. Many dykes occur along Kleanza Creek and in areas more northerly, where mineralized veins occasionally follow them. Many of these dykes are believed to represent the closing phase of the Coast Range intrusions and, locally, probably are of late Jurassic age. Some of the dykes may have been associated with the later intrusives mentioned below.

Lower Cretaceous

Conformably overlying the Upper Jurassic sediments is a series of terrestrial sediments, known as the Skeena formation. Contained fossils have established it to be of Lower Cretaceous age. It consists of argillite, sandstone, and conglomerate, with occasional coal seams. The formation is essentially a valley deposit and, in this district, does not occur above an elevation of 4000 feet. A small remanent of the formation, containing coal seams, lies on the left limit of the Zymoetz River, south of Limonite Creek, where it rests directly on volcanics of the Hazelton group. It occurs more extensively in areas to the north and east.

Upper Cretaceous Intrusives

Numerous outcrops of intrusives, similar in composition to the Coast Range intrusives, occur easterly from the range. They occur as stocks and also batholiths of considerable size. Numerous dykes are related to them, and both intrude the Skeena formation. A batholith of this age occurs directly east of this property near the head of Limonite Creek.

Structure

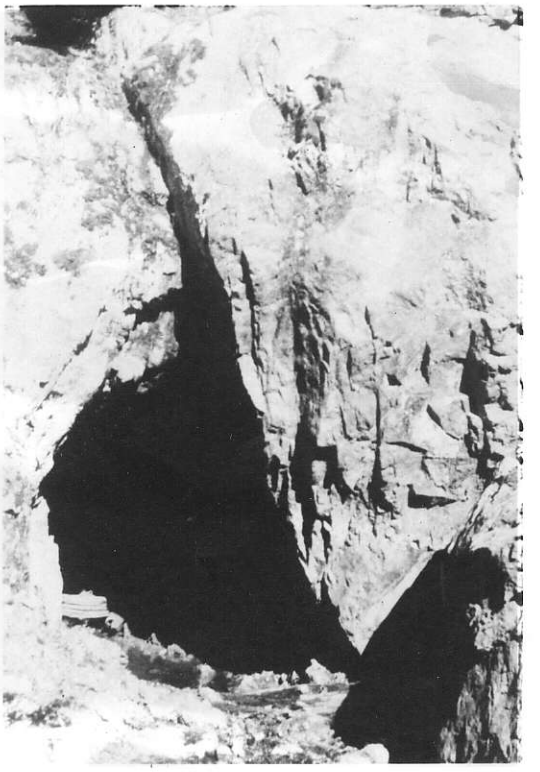
Between the Skeena River and the Kleanza Creek-Zymoetz River divide the volcanic flows strike north of west, and dips of from 50° north to 50° south indicate folding. Easterly from the divide, in the Zymoetz River valley, outcrops strike N40°E and dip northwesterly. West of the divide, folding appears gentle and interrupted by minor faulting only. A zone of faulting, upwards to a mile wide, strikes northeasterly along the divide, which dips vertically in some instances and southeasterly about 65° in others. This faulting has developed several shear zones 30 to 40 feet wide and is believed to be regional, rather than local, in extent. At the south end of the divide, a wide shear zone strikes north to west of north with dips to the east. This fault pattern might have resulted from differential elevation of the general area, which was at a maximum west of the divide, or by subsequent subsidence of the area to the east. In either case, the results would be similar.

Mineralization

In the area lying between the Skeena and Zymoetz Rivers mineralization is directly related to the Coast Range intrusions, with copper the dominant metal. Copper carbonates are common and both cuprite and native copper have been reported, but these oxidization products extend to a very shallow depth. The deposits along the Kleanza Creek-Zymoetz River divide contain bornite and chalcocite only. West and north of the divide, bornite, chalcocite, and chalcopyrite occur singly or in combination. Chalcopyrite, frequently associated with pyrite, is more common at the lower elevations, but chalcocite has been reported as low as 500 feet above sea level. With a few exceptions, the known deposits in this area contain low gold and silver values.

- - -

West end of outcrop on Chalco group.



Tunnel on Chalco group.

OUTCROPS

Investigation of outcrops on the property was confined this year to the Chalco group, and results obtained are described below. Description of outcrops on the Bornite and Copper groups are taken from engineer's reports listed in the bibliography.

Chalco Group

This group is located over the area formerly held in the Northwest group. It lies directly east of Salmon Creek, extending northeasterly from about 3500 feet to 4500 feet above sea level. On the lower part of this group timber is large, but higher than Chalco 3 and 4 claims, it is stunted and sparse.

The one known outcrop on this group lies near the intersection of Chalco 1,2,3, and 4 claims. It occurs as a rock bluff at the terminus of a ridge along the right limit of a steep draw that extends southerly to a branch of Salmon Creek. The bluff rises some 25 feet from the draw to a timbered ridge that merges into the generally rising surface to the north and east. To the west the surface drops steeply to the branch of Salmon Creek, and to the east it is flanked by a narrow bench, which merges into the hillside to the north and along which a small amount of water flows into the draw close to the outcrop. Ruins of an old cabin lie on the bench a short distance from the outcrop.

Considerable work has been done at the outcrop, consisting mainly of blasting down the face of the bluff. An ore dump, estimated to contain about 250 tons, lies at the base of the outcrop, and a tunnel, about 20 feet long has been run into the bluff from a level some 4 feet below the top of the dump. A composite sample of the dump was taken at 5-foot intervals across the width at several horizons. It assayed:

Silver, 1.3 oz.; Copper, 3.9%

The outcrop is composed of hard grey andesite, which is traversed by numerous fractures dipping steeply easterly. Silicification of this fractured zone is general, but quartz-filled fractures are not visible in the face of the bluff, although thin incrustations of quartz occur along numerous fractures. In the tunnel, the fractures were observed to undulate from about N10°W to N10°E, with the dip approaching 75° easterly. The face of the bluff is about 85 feet long at right angles to the fractures. It is mineralized across a total width

of 72 feet from overburden to the east to a well-defined shear to the west. This shear dips about 45° easterly, but the strike is not evident. It shows little crushing and no development of gouge but is evidenced by broken rock across a width of about one inch. The eastern limit of mineralization is obscured by overburden.

Copper carbonates occur in some quantity near the eastern edge of the outcrop, where the rock is broken to a greater extent than elsewhere, but, otherwise, they occur sparingly. Chalcocite and bornite occur along the steeply dipping fracture planes and also disseminated in the rock between fractures, with no major variation in mineral content visible in various parts of the outcrop. A horse of slightly fractured andesite, 22 feet wide, separates the outcrop into an eastern zone of mineralization, 24 feet wide, and a western zone 26 feet wide. The outcrop was divided into five sections for sampling, in which each mineralized zone was divided into two equal widths. These samples assayed:

1.	East 12 ft. E.Zone	Silver, 0.9 oz.;	Copper, 2.9%
2.	West 12 ft. "	" , 1.2 " ;	" , 4.1%
3.	Horse 22 ft.	" , Tr. " ;	" , 0.1%
4.	East 13 ft. W.Zone	" , 1.1 " ;	" , 3.2%
5.	West 13 ft. "	" , 0.4 " ;	" , 1.2%

In the 1914 Minister of Mines Report, Brewer reported this outcrop to be mineralized across a width of 70 feet, from which a sample of the most highly mineralized section assayed:

16.5 feet - Gold, trace; Silver, 1.0 oz; Copper, 3.8%

Brewer also reported that he traced this showing uphill "for some considerable distance" to snowline, where conditions similar to the lower outcrop prevailed.

Bornite Group

This group includes the area formerly contained in the Montana group. The old workings were all found to be filled with broken rock and were not opened this year. The following data on mineralization in this group are available from engineer's reports listed in the bibliography.

A shear zone in volcanics, near 4400 feet elevation, strikes N20°E and stands vertically. Silicification extends into the zone from one wall, and bornite-chalcocite mineralization occurs irregularly across the full width of the zone and is maximum across 8 to 10 feet, where silicification is greatest.

A sample from an opencut on the zone assayed:

20 feet - Gold, trace; silver, 1.2 oz.; copper, 1.1%
8 feet - " " ; " 2.0 " ; " 2.5%

Another shear zone, 30 to 40 feet wide, outcrops for 300 to 400 feet on a sloping bluff. Bornite and chalcocite, with some specularite, is disseminated across the zone, with ore-grade mineralization across a few feet. Near the foot of the bluff, fractures 3 to 6 inches wide, are mineralized with chalcocite, bornite, and calcite that were estimated to run 20% to 40% copper. An acid dyke cuts the formations near the lower end of the outcrop.

Similar replacement mineralization is reported along a shattered fault, 6 to 8 feet wide, that strikes eastward and dips vertically. It is visible for 400 feet and said to be traceable for 1500 feet.

Again, a quartz vein in volcanic rocks, 6 to 36 inches wide, is reported to be exposed for 250 feet, between elevations 4800 and 5000 feet. It strikes north of west and dips southwest. At the lower end, the vein splits into three small quartz-calcite stringers spaced across a width of 6 feet, below which talus covers the surface. A cut across the vein near the upper end assayed:

28 inches - Gold, trace; silver, 0.58 oz.; copper, 1.18%

Copper Group

This group is practically a relocation of the old Wells group. Here also the old workings were filled with talus, and no new work undertaken. The following data are taken from reports listed in the bibliography.

A 35-foot shear zone in volcanics, mineralized with chalcocite and bornite, is reported to outcrop at 4400 feet elevation and to have been traced through a vertical and horizontal distance of 1000 feet. Neither strike or dip is reported. A sample of a section of the zone, containing 5 fractures, having a combined width of one foot, assayed:

Gold, 0.06 oz.; silver, 6.0 oz.; copper, 13.7%

A second sample taken across the same zone several hundred feet higher than the first sample, assayed:

23.5 feet - Gold, trace; silver, 0.6 oz.; copper, 0.8%

In 1917, an engineer reported three mineral deposits on the property. First, a shear zone, striking N65°E and dipping 65° south,

contains fractures, ½ to 2 inches wide, mineralized with calcite, bornite, and chalcocite, and disseminated mineral between fractures. A sample taken in a short tunnel on the zone at elevation 4650 feet assayed:

4 feet - Gold, trace; silver, 2.3 oz.; copper, 9.5%

Another shear zone near the top of the mountain, 30 feet wide, strikes N30°E. It is mineralized similar to the first zone. A sample across part of the shear assayed:

10 feet - Gold, trace; silver, 0.45 oz.; copper, 0.5%

A third similar zone is exposed in a bluff at elevation 4800 feet. Good mineralization occurs across 10 feet and scattered across another 10 feet. A sample across the richer section assayed:

10 feet - Gold, trace; silver, 3 oz.; copper, 4.2%

A shear zone, 3 to 5 feet wide, is reported to contain stringers mineralized with quartz, calcite, bornite, and chalcocite. It strikes east-southeast, with a parallel zone over 6 feet wide, occurring some distance away, containing quartz, calcite, chalcocite, and cuprite. A sample across part of this zone assayed:

3 feet - Gold, trace; silver, 0.6 oz.; copper, 9.5%

At 4650 feet a vertical 7-inch vein strikes north and contains altered, epidotized andesite, mineralized with bornite and chalcocite. A representative sample assayed:

Gold, trace; silver, 0.5 oz.; copper, 3.48%

- - -

DISCUSSION AND CONCLUSIONS

The deposits considered in this report warrant thorough investigation, for the available information indicates the presence of orebodies of considerable size. Such a conclusion is evident from a listing of the number and sizes of the reported occurrences alone, and it is supported by consideration of the character of the deposits and factors related to their formation. The following discussion outlines reasons supporting this conclusion.

Structure

Details on folding in this area are few, but in control of ore deposition, such structure appears to be subordinate to faulting. The faulted area that strikes northeasterly across the Bornite and Copper groups appears to be over a mile wide and contains several wide shear zones. It should be noted that they parallel the Skeena and Upper Zymoetz-Clore River valleys, which probably are also lines of faulting. Also parallel is the elongated Jura-Cretaceous intrusive lying between the Skeena and Zymoetz Rivers, as well as the Upper Cretaceous intrusive east of the Zymoetz River. It therefore seems probable that the northeasterly alignment of structures in this area had its inception prior to the emplacement of the Jura-Cretaceous intrusives. Northeasterly faulting, as occurs on the Bornite and Copper groups, is probably regional in extent and may be expected to be deep-seated and to have exerted major control on ore deposition. Northwesterly faulting in this locality appears to be much more limited in extent.

Movement along this faulted zone appears to have been large. It is evidenced by Triassic rocks outcropping above 4000 feet west of the zone, and overlying Jurassic volcanics occurring under 2000 feet in the Zymoetz River valley to the east. It may be argued that this deformation took place, at least in part, in the late Jurassic or early Cretaceous, for, in the Zymoetz River Valley, the Skeena formation lies directly on Lower Jurassic volcanics from which Uppper Jurassic sediments had been eroded.

ORIGIN OF DEPOSITS

The peculiarities of these deposits are the occurrence of chalcocite and the absence of chalcopyrite and pyrite. Such mineralization is obtained in thoroughly altered secondary deposits, and an argument can be made in support of secondary origin. These deposits, however, contain much disseminated mineral, which occurs

irregularly in the rock and without visible connection with fracturing. The rock is very hard and contains a minimum of porosity. Metasomatic action rather than secondary deposition is very definitely indicated. Furthermore, neither covellite or sooty chalcocite have been recognized, so that primary mineralization is tentatively inferred. This conclusion is strengthened by the presence of primary chalcocite in deposits a few miles distant.

Depth of Mineralization

As the deposits are held to be primary, mineralization is directly related to and was derived from underlying intrusives. These intrusives could be phases of the Coast Range batholiths or of the Upper Cretaceous intrusives. Neither outcrop within the property, so are assumed to be covered by a considerable thickness of volcanics. Mineralization may be anticipated, therefore, to extend to the same considerable depth.

Size of Orebodies

It is notable that deformation of the volcanics was accomplished by extensive shearing and fracturing, which developed a minimum of crushing, thus providing easy access to circulating mineralizing solutions. The 30 to 40-foot shear zones reported on the Bornite and Copper groups and the 72-foot zone on the Chalco group provide wide openings for circulation. The amount of mineral reported in these deposits indicates that they were fed from a well-nourished source, so where structure is favorable for localization of deposition, orebodies of considerable size are anticipated. The complicated fault pattern, as indicated by the variation in strike of the various veins and shears reported, promise numerous intersections with probable local enlargement of orebodies.

- - -

RECOMMENDATIONS

Initial development of this property might well be directed to investigation of the outcrop on the Chalco group. Mineralization there is strong and, with a width of 72 feet, lateral and vertical extensions will develop tonnage with a minimum of effort. An adit entry, that will quickly gain "backs" is available, from which mining of the zones outcropping higher on the mountain may be practical. Surface trenching along the strike of this outcrop should be a primary effort, and southerly extension as well as northerly should be investigated. A program of diamond drilling along this deposit should be considered simultaneously with surface work.

Surface trenching on the Bornite and Copper groups is recommended, and it should be undertaken at such a rate as available funds permit.

A contour map of the claim area should be prepared at an early stage of the work, and all geological data available plotted on it. This is most important for the intelligent interpretation of both surface and subsurface conditions and necessary for planning development.

The trail upriver from the Dardenelles mine requires repair, and as soon as plans can be made, an application should go to the Mines Department in Victoria for financial aid in this regard. A grant of up to one half the cost of this work may be expected. This application should be made before the first of May. When a road up the river is justified, the Celanese Company, which holds a timber management license along the river, will be interested in sharing the cost.

Permanent shelter for workmen should be provided at an early date. Low-lying clouds and heavy precipitation make for much inclement weather, which detracts from efficient work, unless relief is available.

Donald D. Fraser.

Vancouver, B.C.
October 10,1955.

TREASURE MOUNTAIN
Omineca Mining Division
British Columbia

ASSAY SHEET

Computed prices - copper at 30¢/lb., silver at 90¢/oz.

Year	Sampler	Deposit	Width	%Cu	oz.Ag	Value
Chalco Group						
1955	Fraser	E½ E.Zone	12'	2.9	0.9	$18.21
"	"	W½ "	12'	4.1	1.2	25.68
"	"	E½ W.Zone	13'	3.2	1.1	20.19
"	"	W½ "	13'	1.2	0.4	7.56
"	"	Horse	22'	0.1	Tr.	-
"	"	Dump	250T.	3.9	1.3	24.57
1914	Brewer	E.Limit	16½'	3.8	1.0	23.70
Bornite Group						
1917	Galloway	A.Vein	20'	1.1	1.9	8.31
"	"	"	8'	2.5	2.0	16.80
1936	Kindle	B.Vein	28"	1.18	0.58	7.60
Copper Group						
1917	Galloway	Tunnel	4'	9.5	2.3	59.07
"	"	3.Vein	10'	0.5	0.45	3.40
"	"	2.Vein	10'	4.2	3.0	27.90
1925	Hanson	Zone	4'	9.5	2.3	59.07
1936	Kindle	Zone	3'	0.08	0.06	-
"	"	Vein	7"	3.48	0.50	21.33

- - -

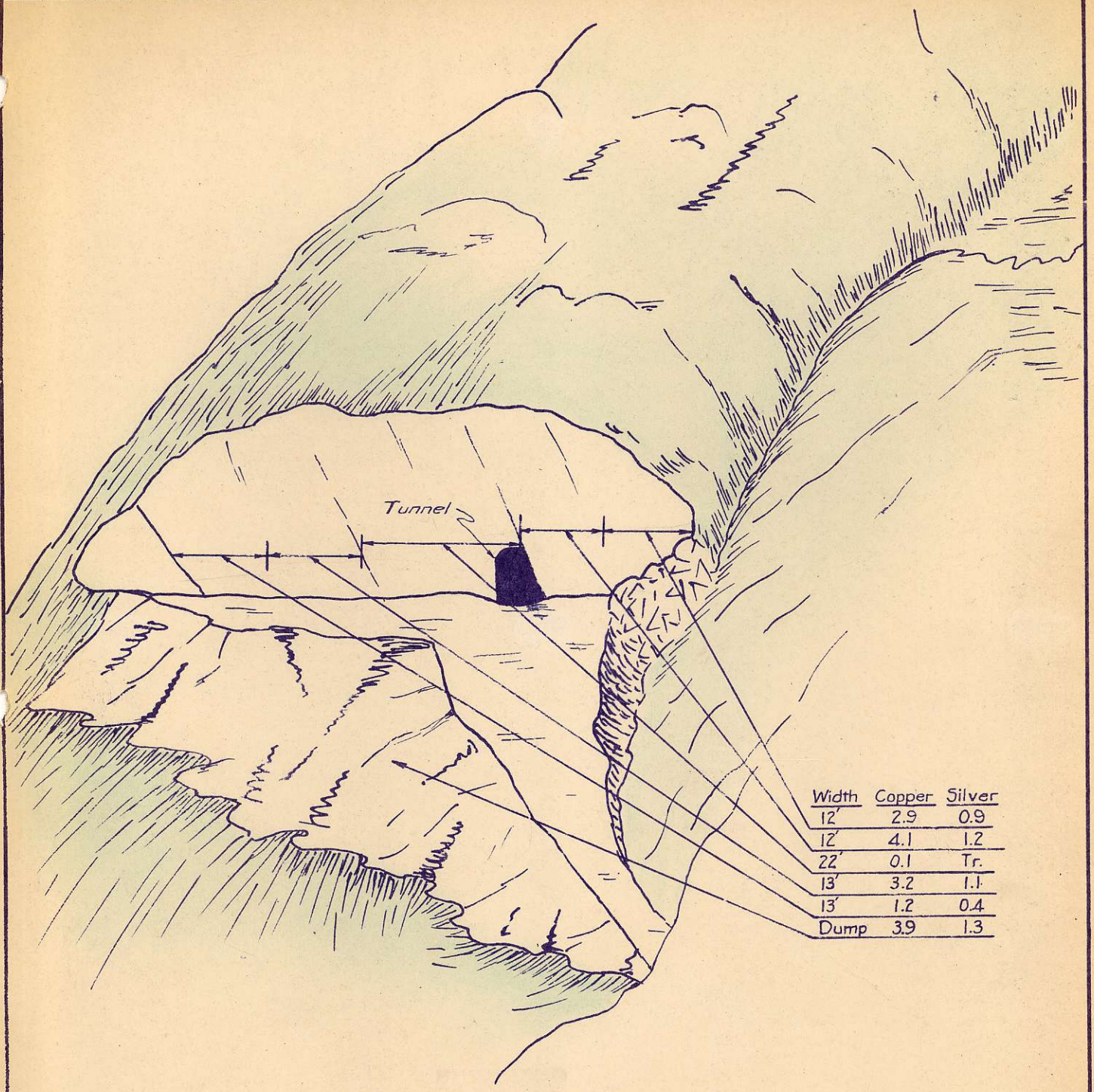
Equalized averages of 1955 sampling of the face of outcrop in Chalco group, less horse:

50 ft. 2.82% Cu 0.89 oz. Ag $17.72

Equalized average of same, including horse:

72 ft. 2.00% Cu 0.62 oz. Ag. $12.55

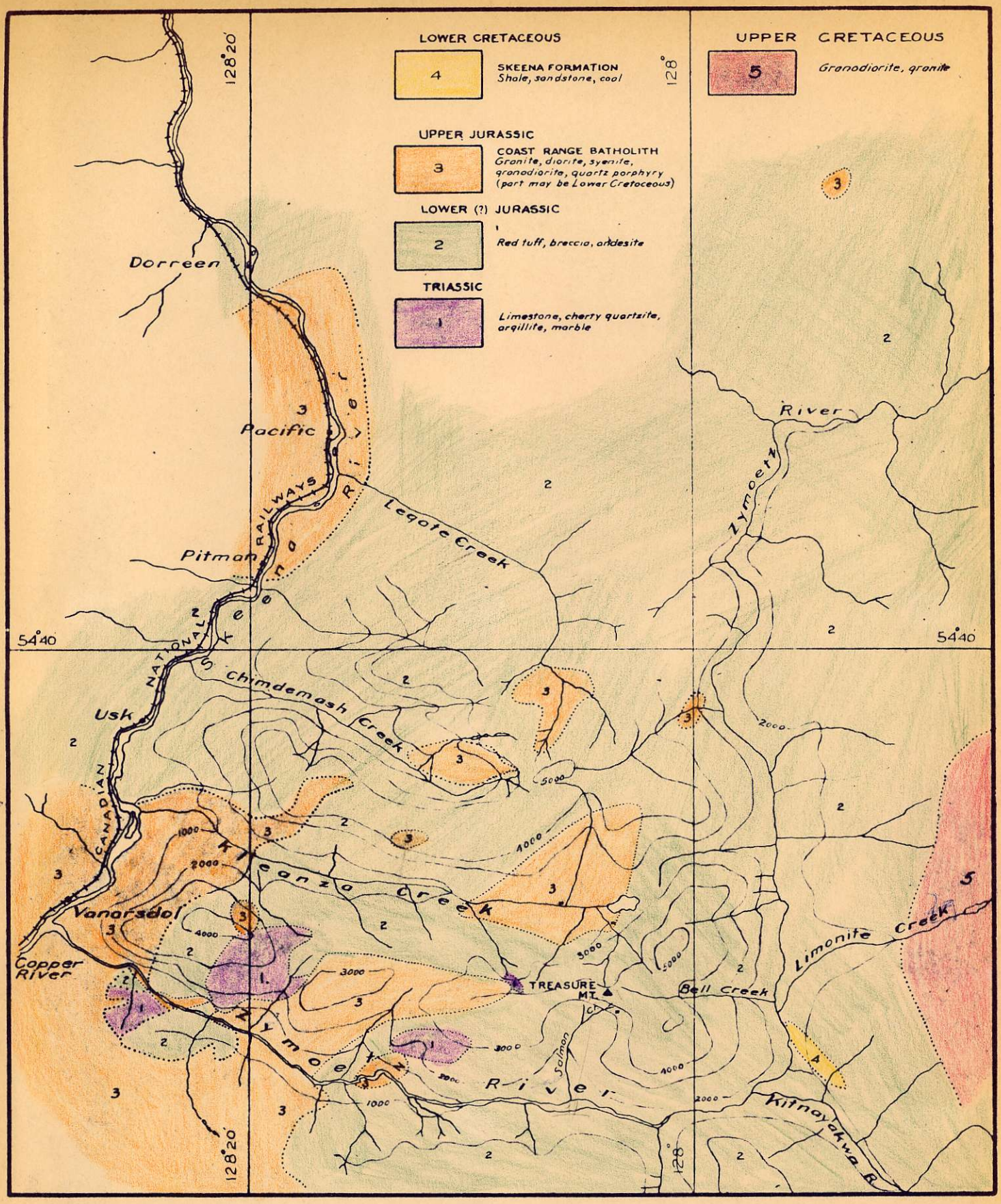
- - -



Width	Copper	Silver
12'	2.9	0.9
12'	4.1	1.2
22'	0.1	Tr.
13'	3.2	1.1
13'	1.2	0.4
Dump	3.9	1.3

SKETCH
OF
OUTCROP ON CHALCO GROUP
ZYMOETZ RIVER AREA
BRITISH COLUMBIA

To accompany report by D.D.Fraser October 1955.



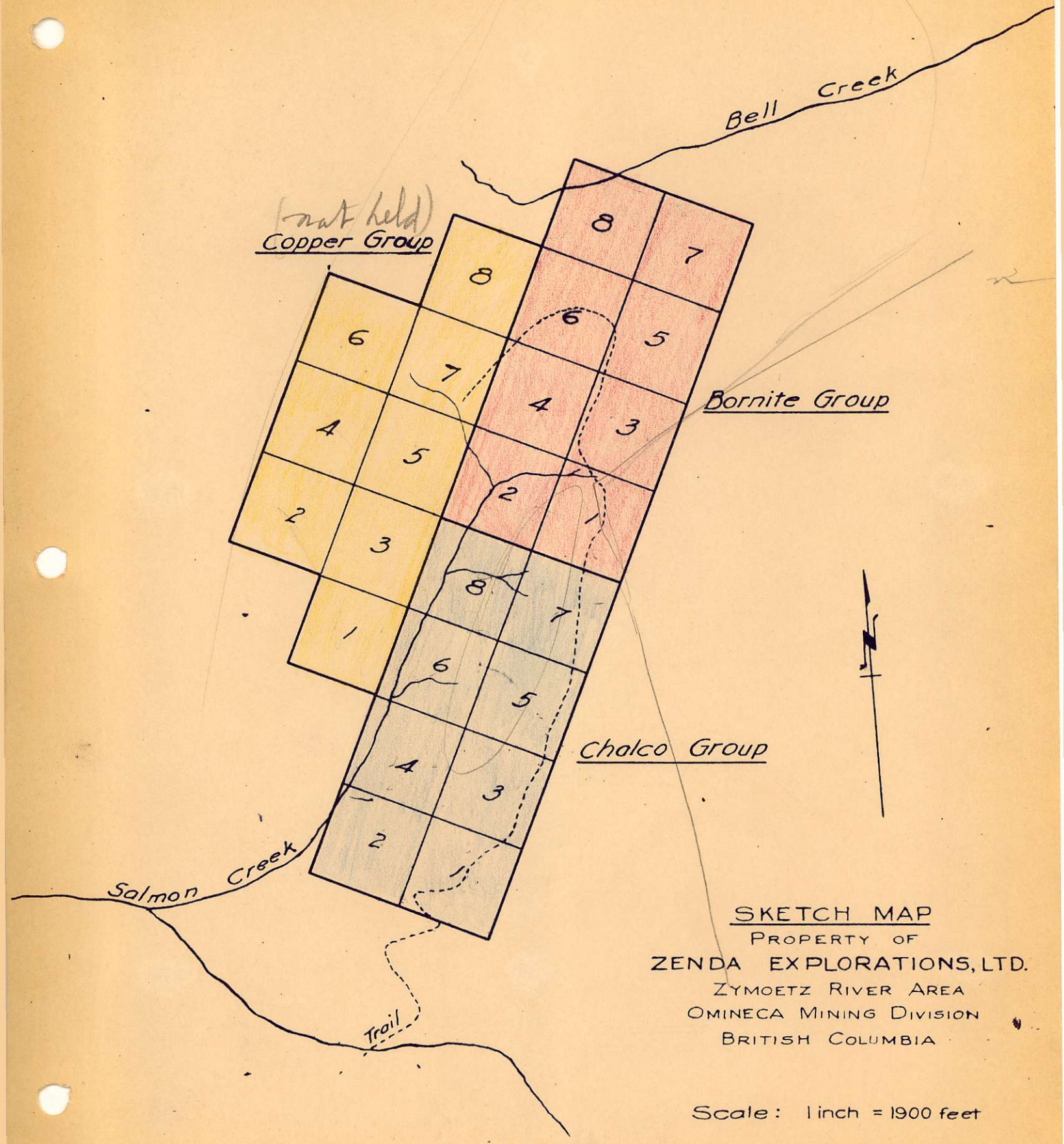
ZYMOETZ RIVER AREA

BRITISH COLUMBIA

Scale, 1 inch to 4 Miles

4 3 2 1 0 4 8 12

Copy from Summ Rep Part A 1925



SKETCH MAP

PROPERTY OF

ZENDA EXPLORATIONS, LTD.

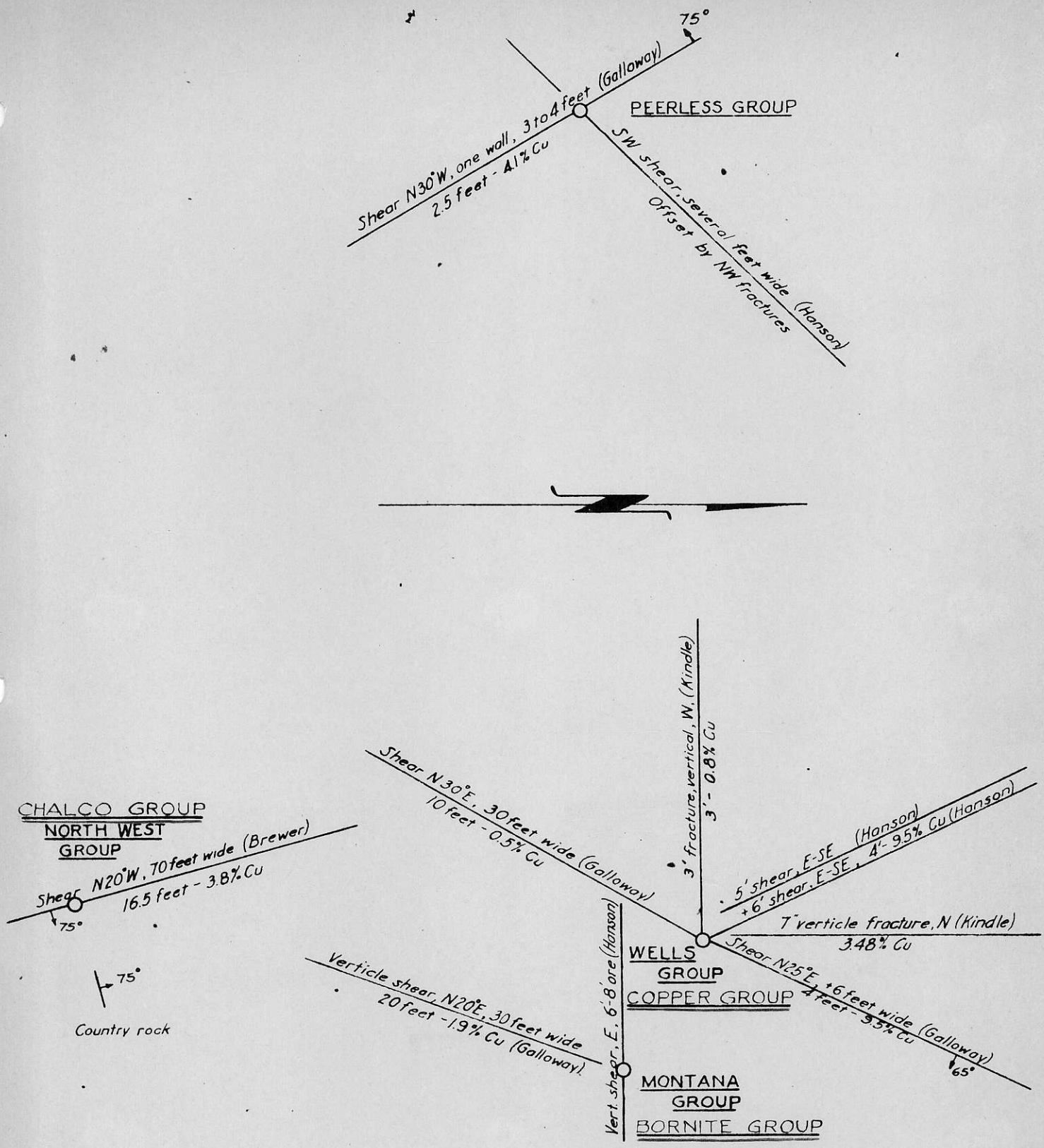
ZYMOETZ RIVER AREA

OMINECA MINING DIVISION

BRITISH COLUMBIA

Scale: 1 inch = 1900 feet

D.D. Fraser - Oct 1952



TREASURE MT.

The four groups of mineral claims above are shown in relative location as given by W.M. Brewer's map in Minister of Mines Report, 1914. Only such mineralized fracturing is here shown as can be plotted from recorded data. Many other occurrences are reported, but data is not complete enough to plot.

To accompany report by D.D. Fraser February 1955