REPORT ON
GEOLOGICAL RECONNAISSANCE
SOUTH CARIBOO - P.N. 123
1972

N.T.S.: 92-H,I,O,P; 93-H

Vancouver, B.C.
March 1973

S. H. Pilcher

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S. Pilcher
B. Calder
M. McClaren

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FIGURES:

I. INTRODUCTION

For the past three field seasons the South Cariboo project has been concerned with detailed reconnaissance in areas of favourable intrusive rock situated to the north of the southern B.C. "copper belt." Map sheets covered include Bonaparte River, Taseko Lake, and Quesnel Lake. One of the main advantages in working here is the fact that most of the ground is open and it is possible to work relatively freely, unhindered by other exploration companies. However, because of a lack of favourable indications in these areas, it is felt that further work here is not warranted. Future work will therefore have to be concentrated on the Ashcroft and Hope map sheets, areas which are extensively staked and in which the possibility of finding open ground in favourable areas is extremely unlikely. This work will therefore involve mostly property examinations, detailed mapping, study of the general character of the known mineralization, and possible property options.

A total of five men were employed during the 1972 field season. The areas covered and properties examined are indicated on the index map (Figure 1).

Figure 1

Index Map
of
AREAS AND PROPERTIES
EXAMINED
May-Oct. 1972

SOUTH CARIBOO - P.N. 123

MURPHY LAKE - P.N. 165

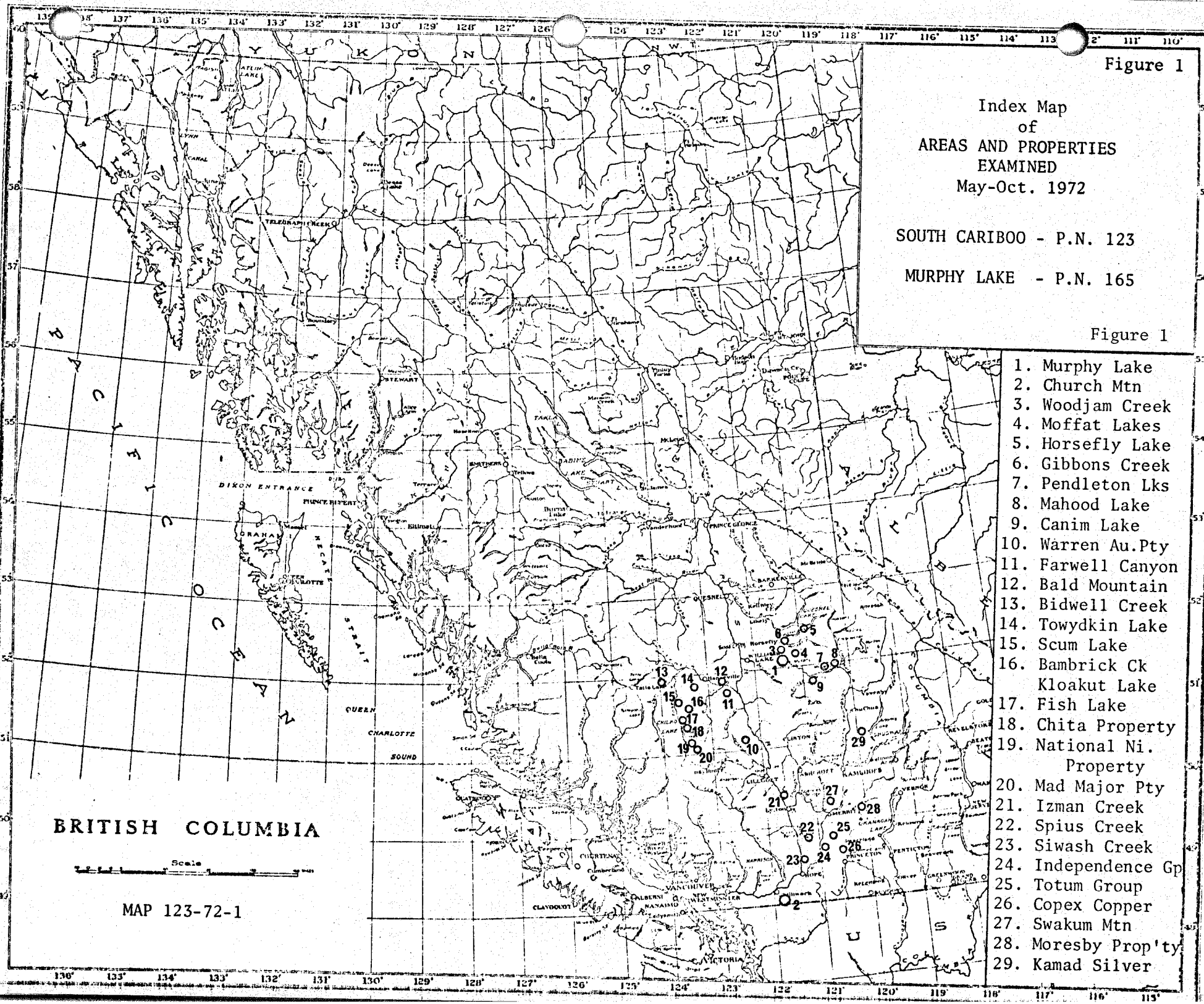


Figure 1

II. RECONNAISSANCE AND PROPERTY EXAMINATIONS

Taseko Lake Map Sheet 92/0
(Numbers 10-20, Index Map)

A. General Discussion

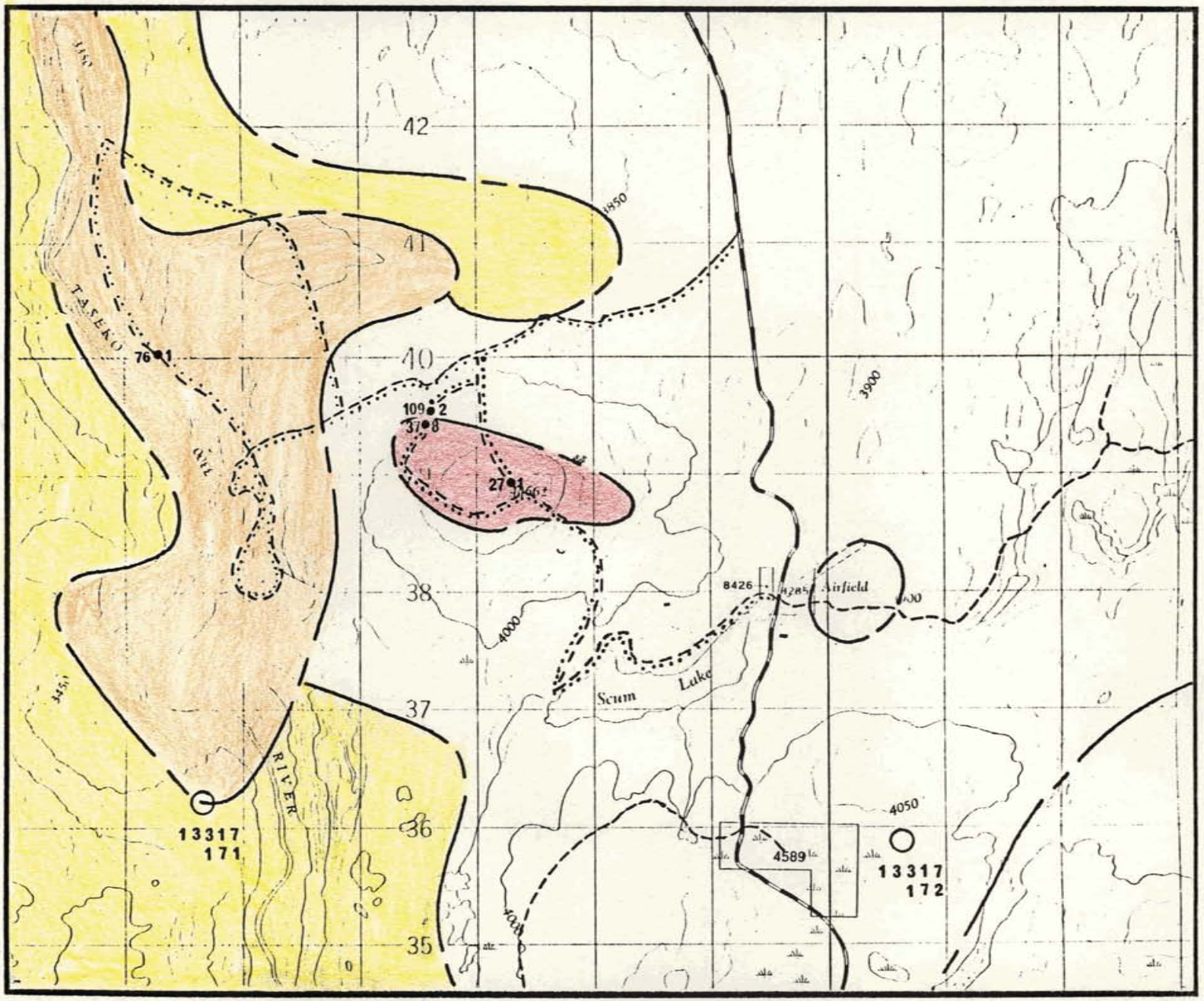
This work was a continuation of that started during the previous field season. Within the area Lower Jurassic granite, quartz monzonite, and diorite intrude volcanic and sedimentary rocks of probable Triassic age and are exposed through windows of late Tertiary volcanics. Pre-Miocene sills and stocks of felsite, feldspar porphyry, and andesite are also widespread in the area (Figure 2). These intrusives and their contacts were systematically examined and prospected and associated silts and soils collected. Glacial drift was found to be widespread and the best exposures occur on ridge summits and in river and creek channels.

B. Scum Lake Area (15). McClaren

This property, located 1.5 miles northwest of Scum Lake (Figure 3), was recently worked on by Cyprus Exploration. They had completed a magnetometer, I.P., and drilling program on a block of 110 claims (K claims) held by a Mr. K. W. Livingston. Work done on the property consists of a minimum of 25 line miles of I.P. and magnetometer survey and 5,300 feet of diamond drilling. From examination of the area and data obtained from company records it is concluded that initial work commenced on the property in 1971 and that follow-up drilling was carried out in 1972. Drilling was completed by July 31, 1972.

The area of interest is underlain by a Tertiary (Pre-Miocene) felsite plug. The plug is bounded on the west by a Lower Jurassic(?) quartz diorite intrusive and volcano-clastic rocks of probable Cretaceous age. The textures (porphyritic with felsitic groundmass) and associated extrusive rocks indicate a hypabyssal mode of emplacement.

Figure 3



MAP REF. No.: 123-72-7

N.T.S.: 92 O/13E

Legend

- Tertiary Volcanics
- Pre-Miocene Felsite and Porphyry
- Mesozoic Granodiorite, Diorite, & Quartz Diorite
- Traverse
- cu⊕mo Silt Sample (Values in ppm)

FALCONBRIDGE NICKEL MINES LTD.

PROPERTY: Scum Lake

LOCATION: Taseko Lake Map Sheet

TYPE OF MAP: Geology Recce

BASED ON: GSC Map 29-1963

DATE OF WORK: July 1972

DATE: Feb. 1973

DRAWN BY:

SCALE: 1:50,000

Cyprus drilled 10 holes, 6 of which are located in a 1600' x 4000' area surrounding the topographic height of land in that area (Figure 4). The depths penetrated by the holes vary from 150' to 950' and the dip of the holes was directed to a general central area. The diamond drill record for holes 8 and 9 was obtained and is outlined in the appendix.

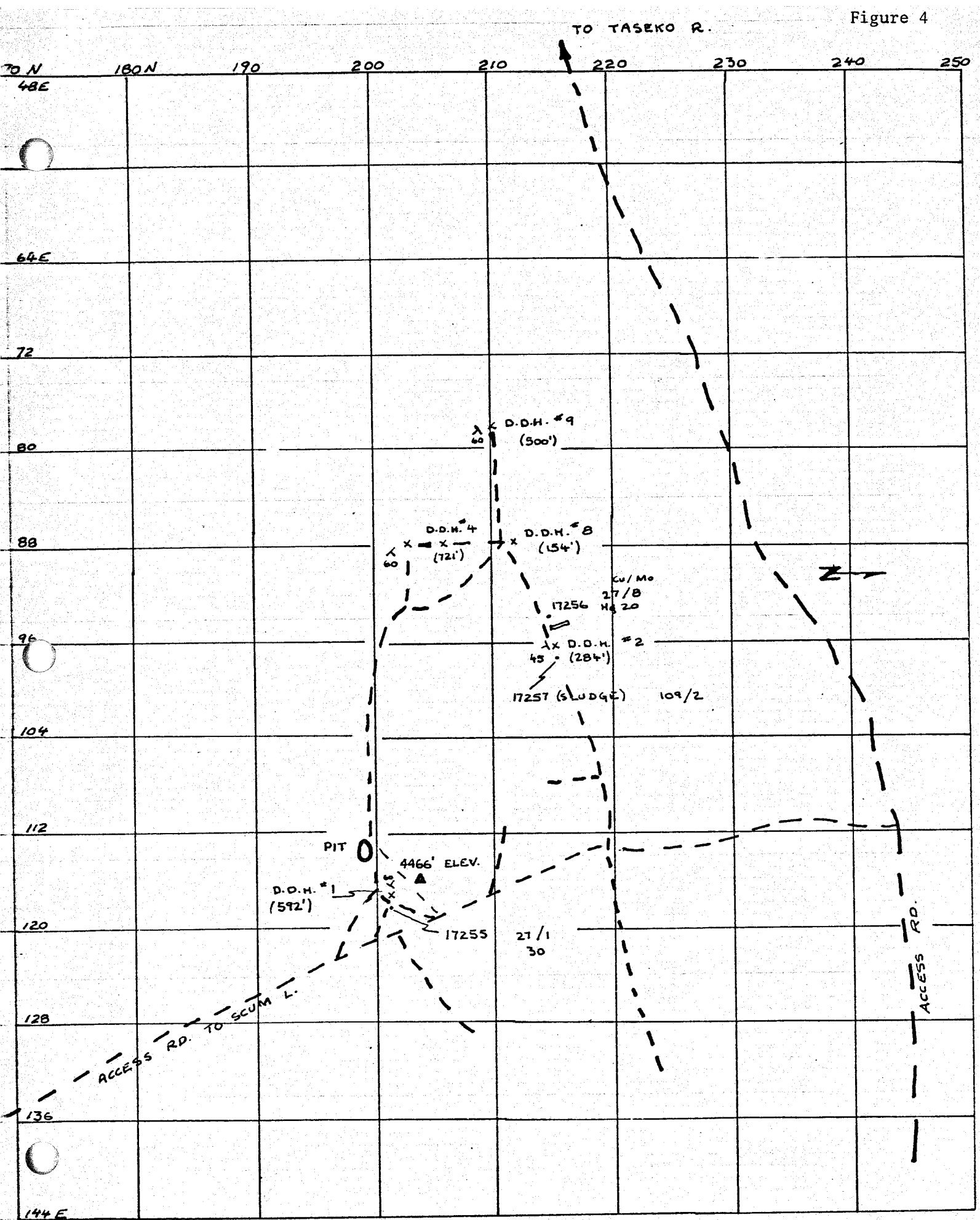
The presence of an intrusive breccia is of particular note. The breccia is composed of a heterogeneous mixture of angular to rounded siliceous fragments in a clastic matrix of comminuted rock flour. An intrusive breccia suggests the presence of fault or shatter zone structures. An examination of air photograph lineaments shows a well-developed northwesterly fault system intersected by a less prominent northeasterly system of lineaments. It is probable that emplacement of this intrusive was controlled by a major N50^{o}W fault system and also influenced by a weaker N40^{o}E lineament.

Examination of core indicates the presence of a zone of oxidation and supergene enrichment overlying the primary mineralization. Near the surface pyrite and limonite are present and are accompanied by fracture fillings of gypsum. Below the oxide zone chalcocite occurs as thin coatings on pyrite and as fine disseminations. The chalcocite first makes an appearance at 100 feet in hole #8 and extends to a depth of up to 300 feet (as in hole #6). The primary mineralization lies below the chalcocite "blanket" at depths greater than 300 feet (e.g. hole #9 - 323', hole #6 - 392').

The grade of the mineralization drilled is generally quite low. Within the chalcocite zone values would appear to seldom exceed 0.1% Cu. In hole #8 a section from 126' to 139' averaged 0.35% Cu.

Geochemical results were generally quite low and it would appear that geophysical methods would be the only way in which targets could be selected in this highly leached rock.

Figure 4



SCALE: 1" = 200'

CYPRUS EXPLORATION
SCUM LAKE PROPERTY

C. Fish Lake Area (17). McClaren

The Fish Lake property is located approximately 7 miles north of the northern end of Lower Taseko Lake and approximately 3 miles west of the Taseko River. Claims in the area had been held by National Trust Co. Ltd. who optioned them to Nittetsu Mining Co. Ltd. Work conducted on these claims included an I.P. survey, trenching, and diamond drilling (Assessment Report 2483-2702). These claims were subsequently allowed to lapse and have been re-staked this year by Quintana Minerals.

The property is underlain by Upper Cretaceous or Paleocene diorite and dioritic feldspar porphyry that intrude Cretaceous andesites and argillites(?) (Figure 5). The intrusions are strongly fractured and altered with areas of intense argillic alteration and associated pyritization. Pyrite, chalcopyrite, magnetite, and pyrrhotite occur as disseminations and along fracture planes.

The best copper mineralization observed is associated with some felsic dikes which are exposed in a series of northeast-trending trenches. The dikes contain disseminated chalcopyrite with values of up to 0.05% copper.

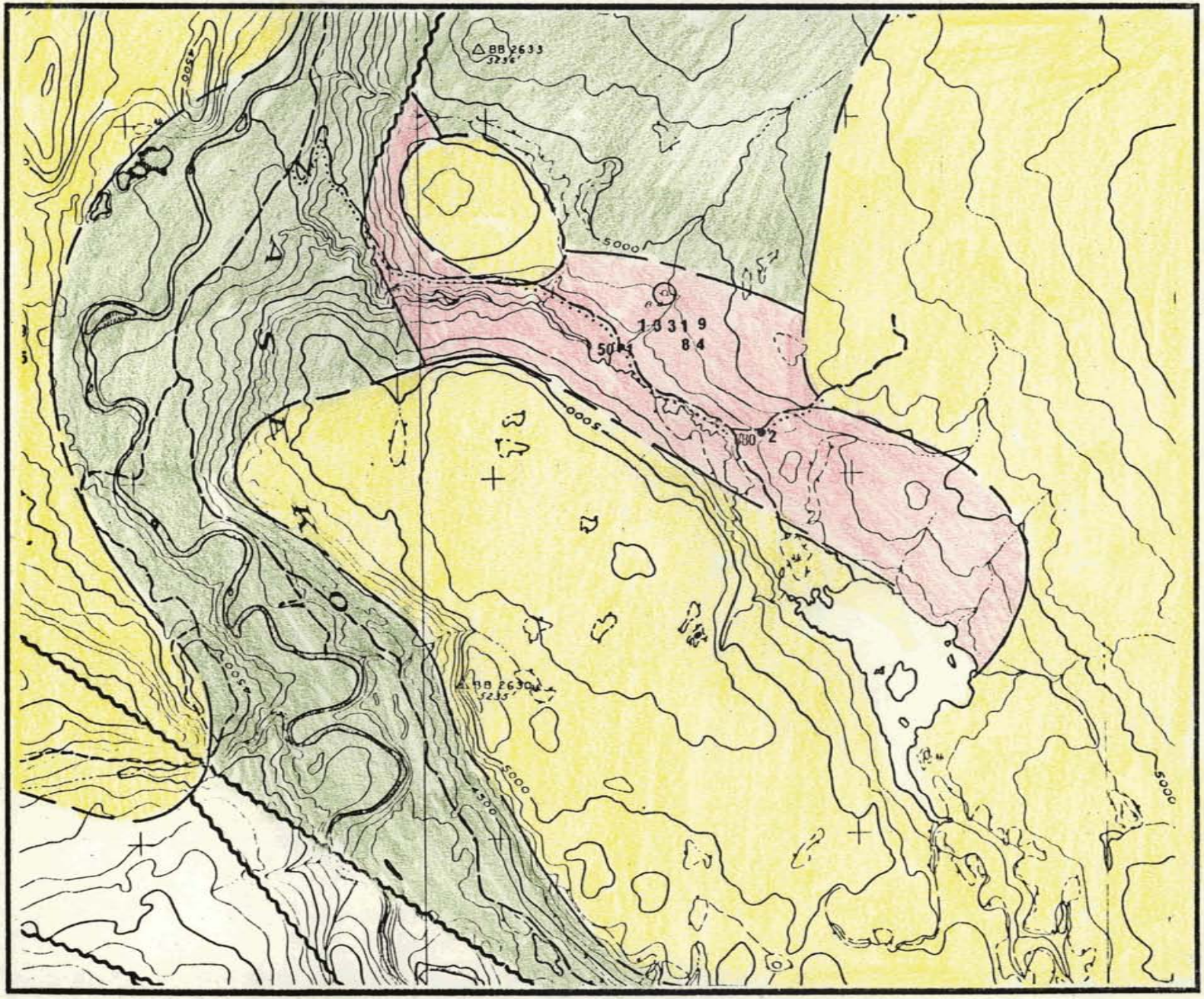
This area has been thoroughly tested by I.P. and drilling in an attempt to explore the extent and intensity of the mineralization exposed in the trenches. Drilling results indicate sub-ore grade mineralization (Assessment Report 2702).

D. Farwell Canyon Area (11). McClaren

The area examined is located approximately 8 miles due south of Riske Creek and is bordered on the north by the Chilcotin River, on the west by Farwell Creek, and on the east and south by McEwen Creek.

The area is underlain by an unmapped stock of hornblende diorite, granodiorite, and granite that covers an area of approximately 10 square miles (Figure 6). The intrusives are of probable

Figure 5



MAP REF. No.: 123-72-8

N.T.S.: 92 O/5E

Tertiary Volcanics

Cretaceous Sedi-ments & Volcanics

Cretaceous Diorite, Granodiorite, Porphyry

..... Traverse

CU 90 Silt Sample (Values in ppm)

FALCONBRIDGE NICKEL MINES LTD.

PROPERTY: Fish Lake

LOCATION: Taseko Lake Map Sheet

TYPE OF MAP: Geology Recce

BASED ON: GSC Map 29-1963

DATE OF WORK: July 1972

DATE: Feb. 1973

DRAWN BY:

SCALE: 1:50,000

Lower Jurassic age and intrude and are bounded to the south and north by volcano-clastic sediments of Triassic age. Cherts and gabbroic rocks of the Cache Creek Group occur on the eastern margin of the stock where they are intensely deformed.

The Triassic rocks exhibit metasomatic alteration near the intrusive contact and this alteration varies from moderate to intense epidotization, weak silicification and in some areas strong chloritization accompanied by calcite and hematite. Only traces of chalcopyrite were noted in the altered rock.

The intrusive rocks are fresh, coarse-grained granodiorites to hornblende diorites. In Farwell Canyon the granodiorite is in contact with altered volcanic rock and here the intrusive is pyritized and cut by calcite-epidote veinlets. Minor malachite staining was noted only with the altered volcanics.

Approximately 7 miles southeast of Farwell Canyon and 1 mile south of the Chilcotin River, two trenches expose highly sheared and altered acid intrusive rocks. The alteration consists primarily of talc concentrated along N90^{O}W shears. Some minor chalcopyrite, malachite, and azurite were noted along these shears.

Geochemical reconnaissance of the area yielded only background values except for one anomalous soil sample taken adjacent to a N65^{O}W shear zone in pyritized and chloritized volcanic rocks. No copper minerals were noted here.

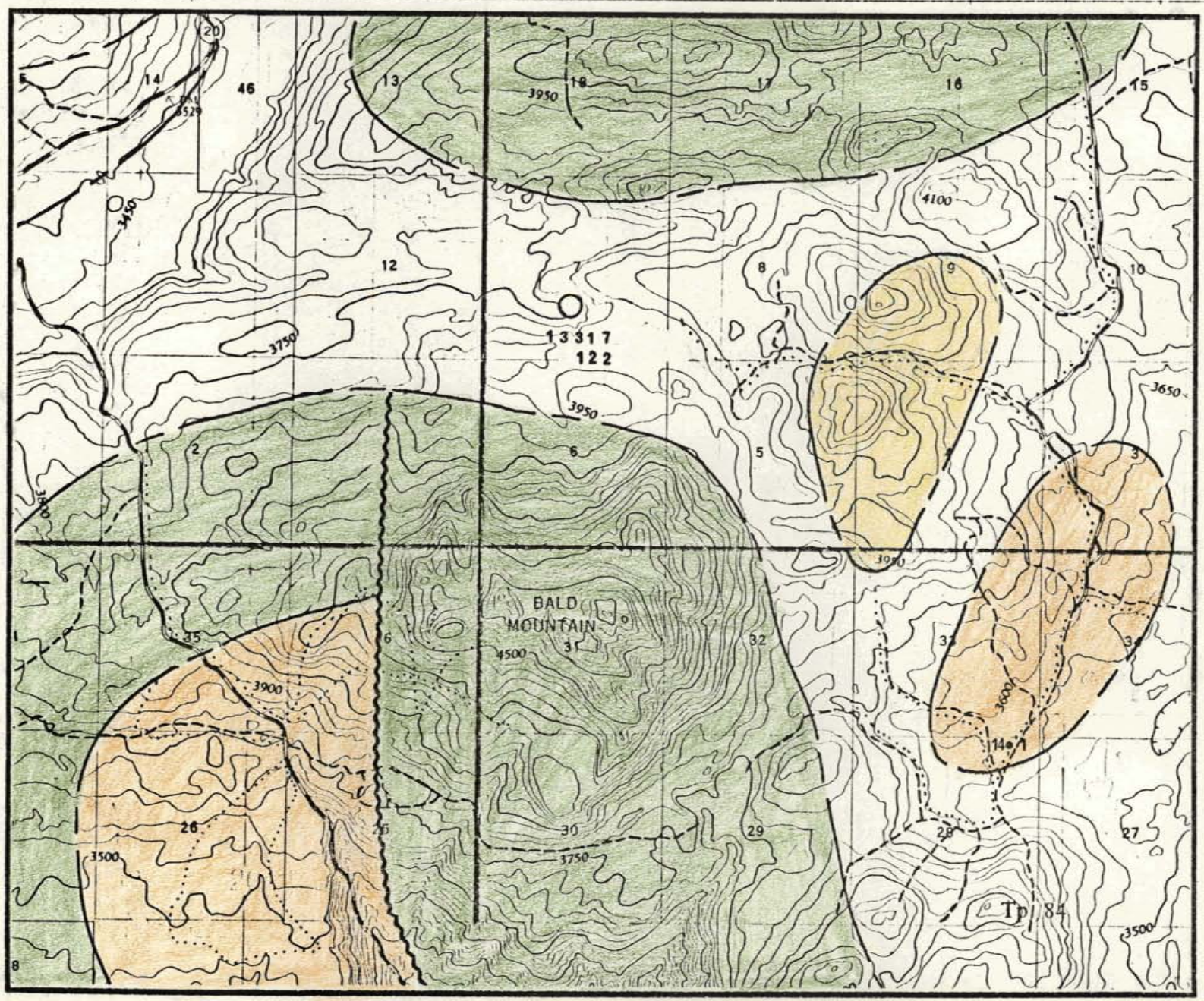
E. Bald Mountain Area (12). McClaren

The area lies approximately 8 miles southwest of Riske Ck. Two stocks of Lower Jurassic hornblende-biotite diorite were examined (Figure 7) but no mineralization of significance was discovered.

F. Bambrick Creek & Kloakut Lake Areas (16). McClaren

Map 29-1963 indicates a stock of felsite and quartz porphyry occurring about 10 miles southwest of Big Creek. Very little

Figure 7



MAP REF. No.: 123-72-10

N.T.S.: 92 O/15E

Legend

- Pre-Miocene Volcanics
- Mesozoic Granodiorite, Quartz Diorite & Diorite
- Triassic Limestone, Basalt and Sediments
- ..... Traverse
- cu•mo Silt Sample (Values in ppm)

FALCONBRIDGE NICKEL MINES LTD.

PROPERTY: Bald Mtn.

LOCATION: Taseko Lake Map Sheet

TYPE OF MAP: Geology Recce

BASED ON: GSC Map 29-1963

DATE OF WORK: July 1972

DATE: Feb. 1973

DRAWN BY:

SCALE: 1:50,000

outcrop is seen here and results of geochemical and magnetometer surveys by Tri-Con Exploration over the stock failed to establish any anomalous areas.

Another stock, located 1 mile southeast of Kloakut Lake (Figure 8), is indicated on Map 29-1963. The area here is flat to gently rolling and only 1 outcrop of a fresh, coarse-grained granodiorite was found. Geochemical reconnaissance failed to indicate any anomalous areas.

G. Towydkin Lake (14). McClaren

A Lower Jurassic(?) intrusive which outcrops 2 miles south of Towydkin Lake was examined. It was found to be a fine-grained biotite diorite overlain by Lower Cretaceous conglomerates. No mineralization was found.

H. Bidwell Creek (13). McClaren

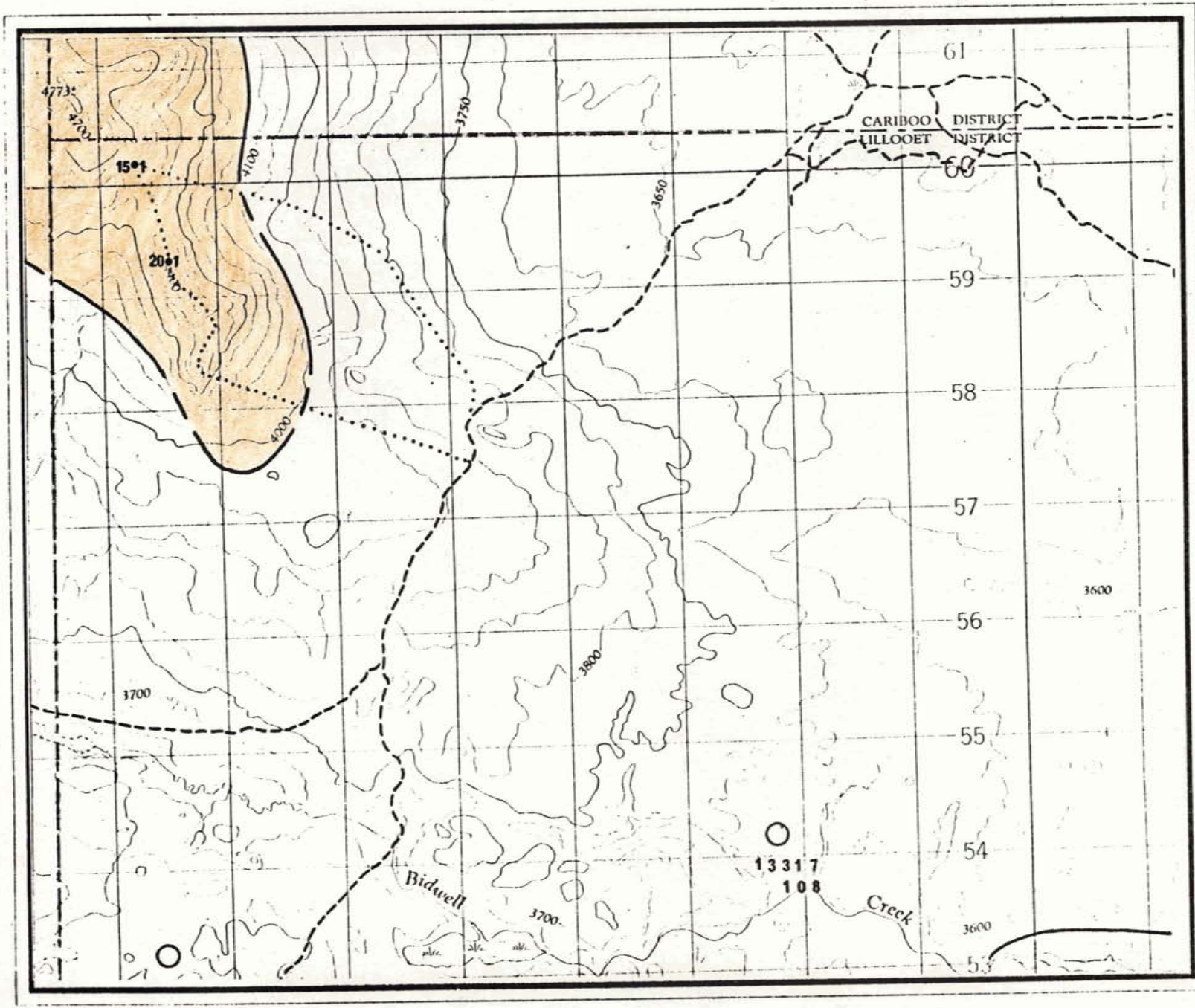
A Lower Jurassic intrusive is located in the northwest corner of the Taseko Lake Map Sheet (Figure 9). It was found that the southern portion of the area mapped as intrusive was actually andesitic volcanic rock of unknown age. The northern portion of the area indicated contains medium-grained, biotite-hornblende quartz monzonite. The intrusive is unaltered and contains no visible mineralization.

I. Chita Property (18). Pilcher

This property, located 1.5 miles east of Lower Taseko Lake, was originally staked by Phelps Dodge and was later re-staked and drilled by Bethlehem Copper. At the time of examination the ground was open.

The area lies near the southwest part of a large stock of Upper Cretaceous - Lower Tertiary diorite and granodiorite adjacent to its contact with Lower Cretaceous argillite. The most conspicuous

Figure 9



MAP REF. No.: 123-72-12

N.T.S.: 92 O/13W

Legend

Mesozoic Pink Biotite Granite, Quartz Monzonite, Monzonite

Traverse

Cu 80 Silt Sample (Values in ppm)

FALCONBRIDGE NICKEL MINES LTD.

PROPERTY: Bidwell Creek

LOCATION: Taseko Lake Map Sheet

TYPE OF MAP: Geology Recce

BASED ON: GSC Map 29-1963

DATE OF WORK: July 1972

DATE: Feb. 1973

DRAWN BY:

SCALE: 1:50,000

feature of the property is the intense gossan which covers an area of nearly 1 square mile (Figure 10).

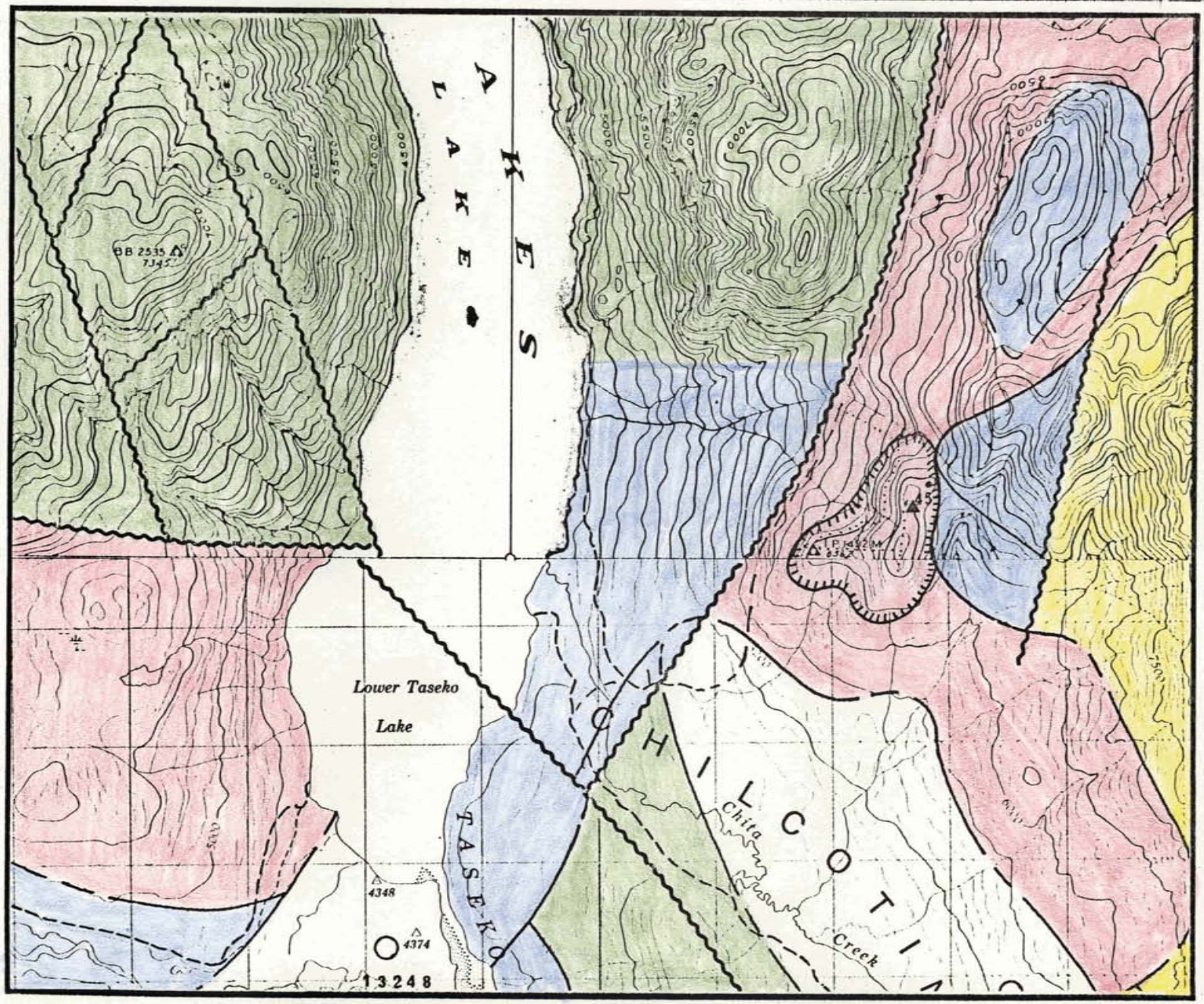
The intrusive here is generally a coarse-grained quartz-feldspar-biotite porphyry, though a fine-grained porphyry persists in certain areas. Over the southern half of the property the intrusive interfingers with bands and irregular zones of altered argillite and hornfels, probably indicating the roof zone of the intrusive.

The porphyry is altered in varying degrees throughout. In the northern area, where alteration is least intense, the mafics are completely chloritized. Here minor pyrite and pyrrhotite occur along fractures and as disseminations. These sulfides are 50-100% altered to limonite. Within this area and near the height of land as indicated in Figure 10, is a small zone of intrusive breccia. This breccia consists of porphyry fragments of all sizes cemented by a later fine-grained quartz-feldspar matrix. The breccia is gradational to unfractured porphyry. The matrix contains minor chalcopyrite and minor to moderate pyrite, both as disseminations and as rims around fragments.

Towards the southern part of the property the mineralization and alteration become more intense. The porphyry is heavily sericitized and argillized. Limonite staining here is particularly heavy, both in the altered porphyry and in the included blocks of argillite. These rocks are highly fractured and contain pyrite (mostly altered to limonite) as fracture fillings and as disseminations. No chalcopyrite was observed here. Bethlehem had drilled at least 4 percussion holes in this area and evidently the copper values obtained were very low to nil.

Based on rock type, fracturing, and alteration this property is extremely attractive. However it, like other mineralized stocks in this general area, is characterized by an abundance of pyrite and a paucity of copper sulfides.

Figure 10



MAP REF. No.: 123-72-13
N.T.S.: 92 O/4E, 5E

Legend

- Tertiary or Cretaceous Granodiorite, diorite, feldspar porphyry
- Tertiary Volcanics or Cretaceous
- Cretaceous Volcanics
- Cretaceous Sediments
- Outline of Gossan
- ▲ Mineralized Intrusive Breccia
- ..... Traverse

FALCONBRIDGE NICKEL MINES LTD.

PROPERTY: Chita Property
LOCATION: Taseko Lake Map Sheet
TYPE OF MAP: Geology Recce
BASED ON: GSC Map 29-1963
DATE OF WORK: Aug. 1972
DATE: Feb. 1973
DRAWN BY:

SCALE: 1:50,000

J. Mad Major Property (20). Pilcher

This property, located approximately 16 miles southeast of the southern end of Taseko Lake, is within a large mass of Cretaceous or younger diorite to granodiorite (Figure 11). The ground had recently been dropped by Asarco who had done trenching and diamond drilling.

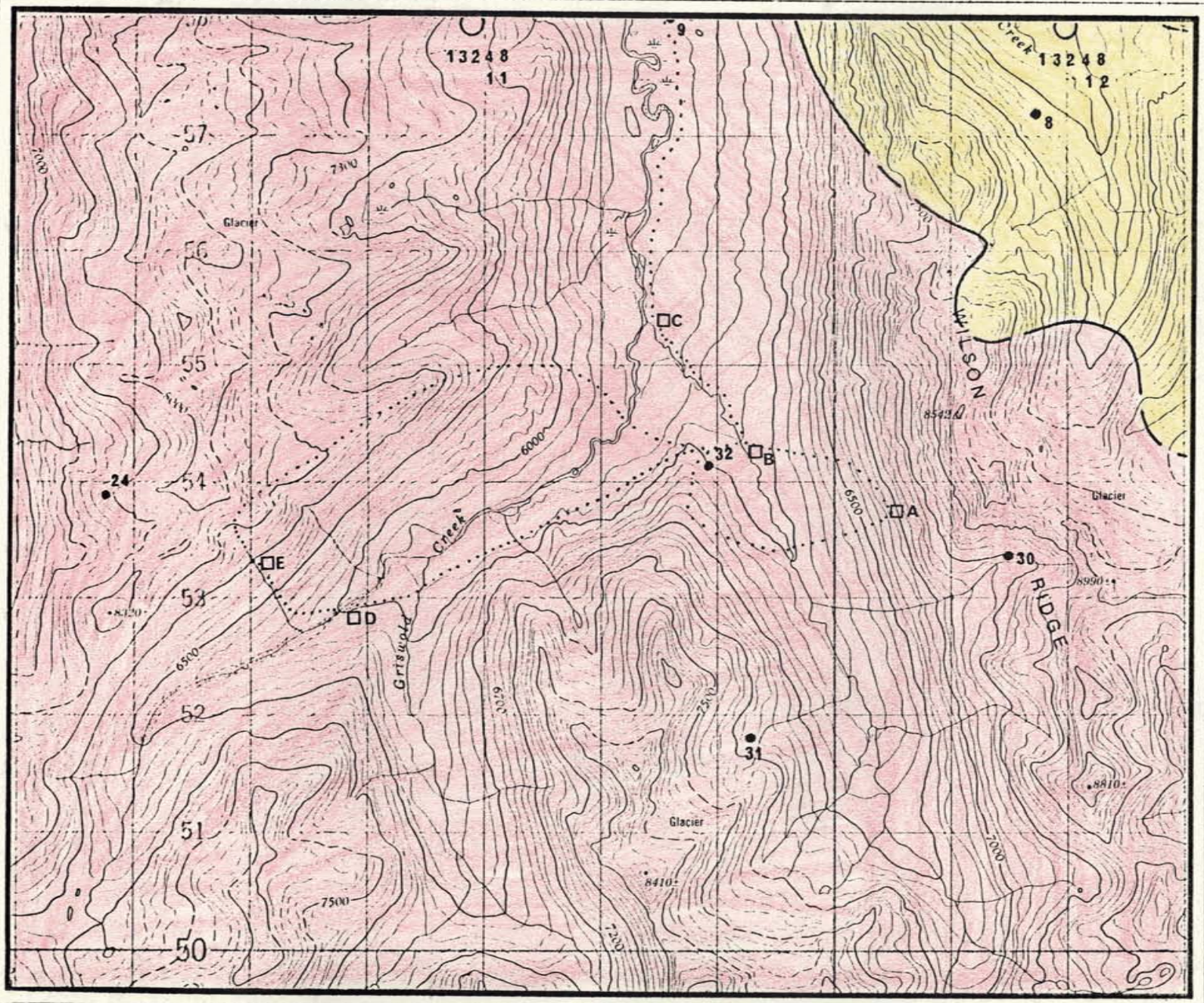
One showing, located at traverse station H (Figure 11), consists of a weakly mineralized zone, in coarse-grained granodiorite, measuring about 100 x 100 feet. Within this zone is one well-developed set of tight fractures trending N65°E and dipping 43° to the south. These average 5-6 per foot and contain minor limonite, pyrite, chalcopyrite, molybdenite, and magnetite. Though the fracturing is relatively strong the mineralization is weak. The rock is relatively fresh except immediately adjacent to the fractures. Outcrops in surrounding areas are barren and the mineralization is therefore too restricted to be of interest. Two holes diamond drilled here cut the mineralized fractures at acute angles. Their attitudes are as follows:

#1. 115° at 70° dip.
#2. 55° at 70° dip.

Core from 5 holes is stored at a camp near this showing. None of this core contains sufficient quantities of sulfide to be of interest.

Weak but persistent mineralization is exposed for about 1 mile along the banks of the river between points B and C. The rock here is a coarse-grained granodiorite cut by 2 sets of fractures. One set carries quartz in veinlets up to ½ inch in thickness. The other set consists of tight hairline fractures carrying minor pyrite, chalcopyrite, and molybdenite. Limonite staining is present throughout the section. It is probable that the Taseko River here follows a fault and the mineralization may be related to that structure and perhaps to its intersection with another fault paralleling Griswold Creek. Asarco attempted to trench this area but they were generally unsuccessful in reaching bedrock. A possibility exists for exten-

Figure 11



MAP REF. No.: 123-72-14

N.T.S.: 92 O/3W

Legend

- Cretaceous or Tertiary Granodiorite & diorite
- Cretaceous Volcanics
- □A Traverse Station

FALCONBRIDGE NICKEL MINES LTD.

PROPERTY: Mad Major

LOCATION: Taseko Lake Map Sheet

TYPE OF MAP: Geology Recce

BASED ON: GSC Map 29-1963

DATE OF WORK: Sept. 1972

DATE: Feb. 1973

DRAWN BY:

SCALE: 1:50,000

sions of the mineralized zone into covered areas both to the east and to the west of the creek. This could best be determined with I.P. However, based on what is exposed here and in surrounding areas, it is extremely unlikely that anything but trace amounts of copper are present, even though pyrite may be abundant.

In the valley west of Griswold Creek, at stations D and E, small gossans are present. At both these localities heavy concentrations of pyrite occur as disseminations in quartz porphyry and quartz-feldspar porphyry dikes which cut the coarse-grained granodiorite. No copper minerals were observed. These dikes trend generally northerly.

Time did not permit further work in this area. The most effective way to work here is with helicopter, as most of the area is above tree line and gossans are readily apparent. Most of these no doubt have previously been examined.

K. Warren Property (10). Pilcher .

This gold property was examined only for general interest and information. It is located just west of the Fraser River near the headwaters of Stirrup Creek and just south of Watson Bar Creek.

Warren has done a considerable amount of trenching along ridge tops and has exposed a series of quartz-feldspar dikes cutting argillites and poorly-sorted wackes. Both the porphyry and sediments exhibit intense but patchy sericitization and iron staining. This alteration shows no obvious pattern but it does generally occur along the porphyry-sediment contact. At several localities narrow seams of stibnite are present within the altered zones. Quartz veins reported from this property were not seen.

Warren has drilled 8-10 percussion holes, most of which are in the sedimentary rock in the vicinity of porphyry.

Ashcroft Map Sheet (92/I)

(Numbers 21, 27, 28, - Index Map)

A. Izman Creek (21). McClaren

The Izman Creek - Botany Mountain area was selected as an area to be examined because of the presence of copper mineralization associated with intrusive rocks of the area and the recorded presence of hydrothermal alteration (McTaggart, Memoir 262, p.90).

The area under consideration lies approximately 10 miles north of Lytton on the east side of the Fraser River. Topography ranges from 2500' along the Fraser Canyon to 6600' at Botanie Mountain.

Most of the ground here is held by Syntana Exploration. Except for a very minor amount of trenching these people have done very little work on the property.

The area is underlain by the Mount Lytton batholith, a Coast Intrusion of Lower Cretaceous or earlier age. Field evidence suggests that this intrusive is nearly contemporaneous with the Guichon batholith which is Lower Jurassic in age (McTaggart, Memoir 262, p.81). The rocks are mainly granodiorite and quartz diorite, but include some older gabbro and related basic rocks.

Several intrusive rock types crop out in the area examined (Figure 12). The unit mapped as granodiorite varies from a medium-grained biotite granodiorite to a coarse-grained biotite granite. This rock is moderately altered with biotite partly replaced by chlorite and moderate saussuritization of feldspar.

The diorite is a magnetite-rich highly foliated rock, some of which occurs as inclusions in the granodiorite. It is therefore older than the granodiorite and may represent a border phase of the main intrusive mass.

The other rock unit mapped is a highly silicified and sericitized intrusive(?) rock containing moderate amounts of dissemi-

nated pyrite. The rock contains conspicuous blue or blue-gray quartz grains which are crowded with needle-like inclusions of rutile. McTaggart (G.S.C. Memoir 252, p.90) suggests that these are the result of hydrothermal alteration of dioritic rocks. Rutile has also been noted by Gower in areas of silicification such as the Iona Zone at Bethlehem where it imparts a rosy colouration to an otherwise white siliceous zone.

Weak copper mineralization is present in the vicinity of station A. Trace amounts of pyrite and chalcopyrite occur along fractures and in quartz veinlets throughout a zone several hundred feet long. The rock here exhibits a patchy alteration in which chlorite, epidote, and sericite are developed. This mineralization is too weak and of too limited extent to be of interest.

Skarn mineralization in diorite (station B) is well developed over an area one-half mile in length by one-quarter mile in width. Within this zone garnet, magnetite, and minor chalcopyrite are present in the dioritic rocks. There is also a minor development of vertical quartz veins here which carry trace amounts of chalcopyrite. The veins trend N50^{O}W. This deposit has no economic significance.

Though the mineralization exposed on this property is weak, the general geologic setting is of interest. If the ground were to come open, a geochemical soil survey over covered areas might be considered.

B. Swakum Mountain (27). Pilcher

Several old prospects were examined in this area of Nicola Group rocks located about 10 miles north of Merritt. The main purpose of the examination was to determine whether or not detailed prospecting of the area might be worthwhile.

The southernmost showings, probably a part of the old Thelma claims, consist of several pits, adits, and one inclined shaft situated along a strike length of several thousand feet, following a

north-south striking limestone-volcanic contact zone. Dump material indicates the mineralization to be mostly pyrite with lesser amounts of sphalerite and galena, all of which occur in quartz veins and stringers.

Approximately 1 mile to the north and apparently along the same contact zone are several large open cuts belonging to the Last Chance group. Massive garnet is exposed here in volcanic rocks in sections of up to 10 feet in thickness. The garnet carries minor pyrite and traces of chalcopyrite. During the war the government drilled this property for tungsten.

This area is very favourably situated geologically, it being within Nicola volcanic rocks located between the Guichon and Central Nicola batholiths. Sulfide-bearing quartz veins and skarn-type mineralization have been noted and the area therefore does have potential for disseminated type copper occurrences. Time permitting, this area will be examined in detail during 1973 and following the Princeton work.

C. Moresby Mines' L and M Group (28). Pilcher

This property, located in gently rolling ranchland, is situated approximately 2 miles east of Minnie Lake and about 20 miles southeast of Merritt. Moresby has done some blasting of outcrops and a small soil geochemistry survey on their 24-claim group.

The only known showings are on a north-facing slope several hundred feet south of Wasco Creek. Within an area of approximately 200' x 300' are several small outcrops of medium-grained granodiorite containing weak copper mineralization. Chalcopyrite and bornite occur here mostly as widely scattered clots and flecks along tight, dry hairline fractures. A few narrow quartz veins containing trace amounts of chalcopyrite are also present. There is little or no associated alteration. The majority of the mineralized fractures strike east-west, roughly parallel to the creek.

The few outcrops immediately adjacent to the mineralized zone are barren or contain only trace amounts of copper. Uphill to the south, outcrop is plentiful but barren. North towards the creek and beyond, topography is flat and there is no outcrop.

The exposed mineralization is too weak and of too limited extent to be of interest. The only possibility is in the covered area to the north where the east-west trending creek could indicate a larger structure parallel to the weakly mineralized fractures south of it. The property is not worth taking on option just to test this possibility.

Seymour Arm Map Sheet (82/M)

(Number 29 - Index Map)

Kamad Silver Property (29). Pilcher

Formerly known as the Homestake, this property, which is located 18 miles east of Barrier and 3 miles west of Adams Lake, has a sporadic production record dating back to 1892. That year approximately 20 tons of ore were shipped, averaging 79 oz. silver per ton. During the period 1926-27 approximately 2770 tons were produced. This material assayed 80 oz. silver, 3% lead, and 8% zinc per ton.

Kamad acquired the property in 1968. Since that time they have drilled some 20 diamond drill holes and done approximately 800 feet of underground development. At the present time underground workings total approximately 2000 feet.

The property is underlain by rocks of the Shushwap Metamorphic complex. In this area these can best be described as talcose quartz-mica schists and quartz-feldspar gneisses. Foliation generally strikes northwest and dips 20-25^{o} to the northeast.

Mineralization consists of bands, streaks, and disseminations of pyrite, galena, sphalerite, tetrahedrite, and chalcopyrite. Barite is also present as stringers and thick lenses, generally

intergrown with quartz. The sulfides occur in the barite masses but the better grade material seems to be in the schists immediately adjacent to the barite.

Kamad has delineated what appears to be 3 separate flat-dipping mineralized zones which generally parallel the schistosity. These assay up to 30% $BaSO_4$, 16 oz. silver, 3% lead, 6% zinc, and 0.6% copper over thicknesses of up to 25 feet. Due to a lack of proper surface and underground geologic maps, to the erratic nature of the mineralization, to a lack of proper compilation of data, and to questions regarding the purity and marketability of the barite, a considerable amount of time would be necessary to properly evaluate this property. There is no doubt that it does have potential for a small operation, however the flat-lying nature of the mineralized zones presents a major obstacle to any possible profitable operation.

Two independent consultants in 1970 listed probable reserves of 284,000 tons grading 0.02 oz. gold, 11.21 oz. silver, 2.45% lead, 3.49% zinc, 0.49% copper, and 21.04% $BaSO_4$. Total reserves could be as high as several million tons but these are far from being proven.

At the time of examination Kamad was looking for a buyer for the property. They were talking about a price based on some 3 million tons of ore which by a stretch of the imagination might barely be classed as possible.

Hope Map Sheet (92/H)

(Numbers 22-26 - Index Map)

A. Spius Creek (22). Pilcher

This is a porphyry copper prospect located near the headwaters of Spius Creek about 12 miles east of Boston Bar. Owners of the property are Slim Powney and Jack Knott, both of Penticton.

The property is within the Eagle granodiorite which in this area is cut by a dike of biotite monzonite which is exposed over a strike length of 3000 feet. Associated with the monzonite are various small dikes of aplite and pegmatite. In some areas near the contact the granodiorite is brecciated and flooded by pegmatite.

The monzonite, some of which is porphyritic, is weakly altered throughout and does contain scattered clots of pyrite. The main locus of mineralization, however, is along the contacts. Here both the monzonite and the granodiorite contain pervasive sericitic alteration accompanied by minor pyrite with traces of chalcopyrite and molybdenite. Quartz veining is also a common feature of the contact areas.

The altered and mineralized zones are up to several hundred feet wide. The sulfides here are mostly controlled by northeast-trending fractures which roughly parallel the contacts. The most intense alteration and mineralization is associated with a major shear zone, also trending northeast.

In 1968 Orequest optioned this property and at that time did 1000 feet of percussion drilling in 5 holes. These were mostly drilled on geochemical anomalies. Assays of this material averaged .05 - .12% copper.

Murray Mines drilled 2000 feet in 1969. Values obtained at this time averaged .03 - 0.1% copper.

Arrow Inter-America Corporation mapped the property and did an I.P. survey in 1970.

Orequest again took the property in 1971 and drilled the I.P. anomalies outlined by Arrow's survey. At this time they did 2300 feet of percussion drilling in 7 holes. The material drilled contained weak pyrite mineralization.

This property has been thoroughly prospected and drilled and is of no further interest.

B. Siwash Creek Area (23). McClaren

The Siwash Creek and Anderson River areas were selected as an exploration target after initial helicopter reconnaissance of the area by J. McDougall disclosed a feldspar porphyry occurrence at the junction of the north and east forks of Siwash Creek. The presence of gold mineralization on the Martel Gold Mines' property was the incentive for a closer examination of the area.

The area under consideration lies on the east side of the Fraser River, approximately five miles northeast from Yale (Figure 13). The topography ranges from 3000' to 6400' along the Fraser Canyon to 6400' at Anderson River Mountain.

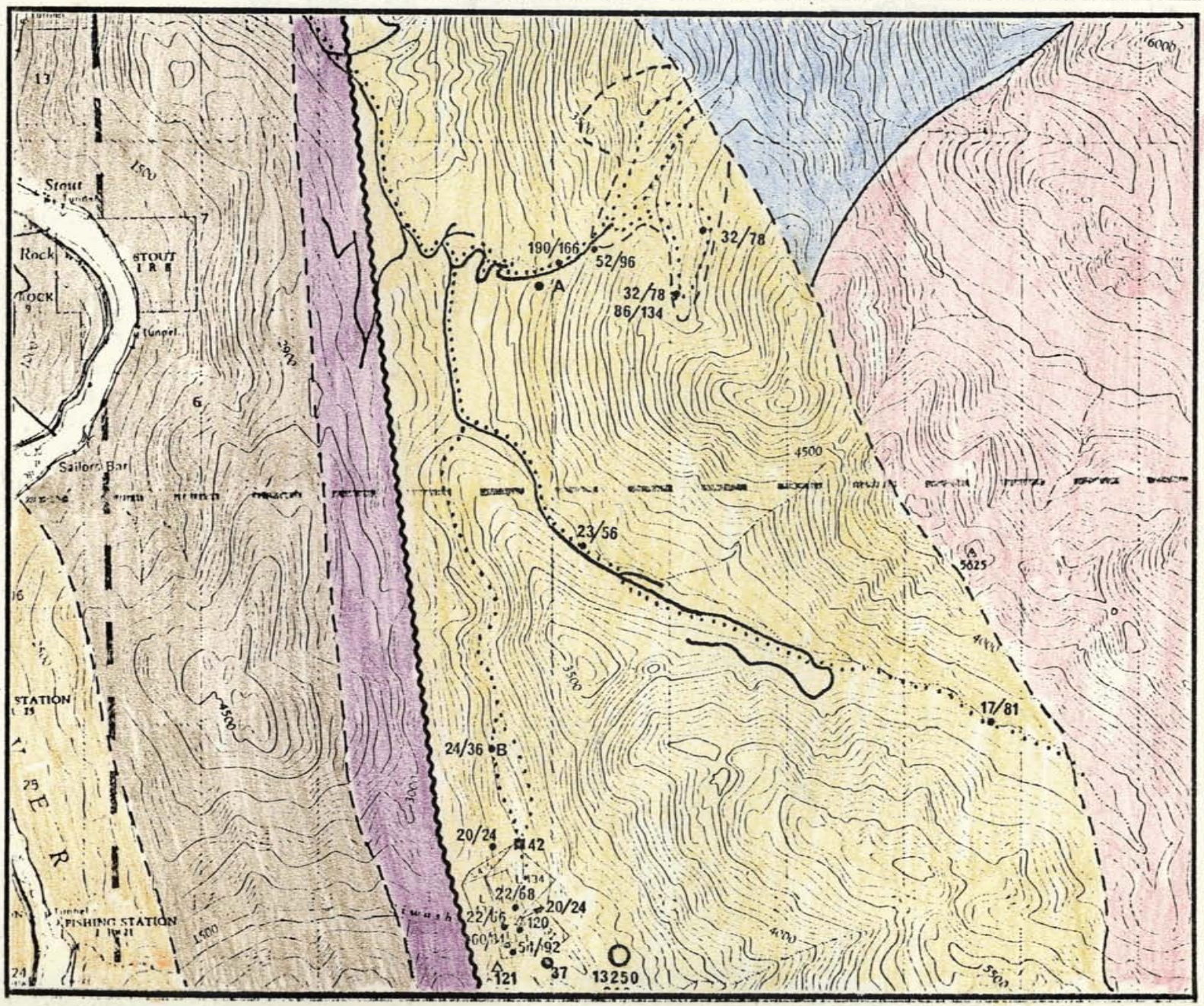
The eastern portion of the area is underlain by sedimentary pelitic rocks and volcanic sandstones of the Ladner Group of Lower and Middle Jurassic age. Intruding these rocks is the Needle Peak Pluton dated as Miocene age (39 m.y. : determinations by Geological Survey of Canada). The intrusive rocks range from granite to quartz diorite and have a hornfelsic contact with the sedimentary rocks of the Ladner Group.

Two days were spent in the area collecting silt samples and appraising the geology. The areas examined are outlined on the accompanying map (Figure 13).

Station A

Brownish-black hornfelsic rocks are foliated and sheared and cut by pyritized quartz stringers. Hornfels constituents include andalusite, biotite and pyrrhotite, suggesting that original rocks were K-poor, Al-rich shales gone to hornblende hornfels facies of contact metamorphism. These rocks occur adjacent to granitic rocks which range in composition from granites to biotite quartz monzonites. The granitic rocks are medium- to coarse-grained and unaltered; cut by K-feldspar-quartz stringers and aplite-pegmatite veins. A biotite quartz diorite was also noted in dikes cutting the granites.

Figure 13



MAP REF. No.: 123-72-16

N.T.S.: 92-H/11W

LEGEND

- MIOCENE granodiorite, qtz. diorite
- EARLY TERTIARY/ LATE CRETACEOUS foliated granodiorite qtz. diorite
- LOWER CRETACEOUS- JACKASS MTN. GP. sandstone, pelite, conglomerate
- LOWER & MIDDLE JURASSIC-LADNER GP. - pelite, volcanic sandstone
- DEVONIAN, CARB. & PERMIAN HOZAMEEN GP. - pelite, chert, basic volcanic rock.
- Unknown Age. Serpentinite, serpentinized peridotite.

..... Traverse

cu•zn Silt Sample (Values in ppm.)

FALCONBRIDGE NICKEL MINES LTD.

PROPERTY: Siwash Creek- Anderson River Mtn.

LOCATION: Hope Map Sheet

TYPE OF MAP: Geology Recce.

BASED ON: GSC Map 12-1969

DATE OF WORK: Aug. & Sept. 1972.

DATE: February 1973

DRAWN BY:

SCALE: 1:50,000

Station B

A metamorphic assemblage of amphibole (diopside) and calcite with minor pyrite. These rocks are cut by barren quartz-carbonate stringers.

The anomalous values obtained for both Cu and Zn at the junction of the north and eastern fork of Siwash Creek were to be expected as they are located at the old Martel gold mine workings which are the source for the values. The anomalous values obtained from the northerly traverse can only be partially explained. The sample collected near station A was taken adjacent to quartz stringers that cut the hornfelsic rocks. These stringers were noted to contain both pyrite and chalcopyrite in minor amounts and would be the source for the anomalous copper value obtained. The other samples obtained from the creek draining the intrusive yielded consistently high zinc values and may indicate polymetallic mineralization in their source area and follow-up work is recommended.

Follow-up Work. Calder

Follow-up investigation was conducted on the Siwash Creek area after several anomalous zinc values were obtained. In the first area studied, in the northerly creek adjacent to Siwash Creek, an unaltered coarse-grained orthoclase porphyritic biotite granite occurs (part of the Needle Peak intrusive). K-feldspar crystals up to one inch in length give the porphyritic appearance. Very small (2-3 inches wide) aplitic dikes cut the granite at various localities. To the west, locally contorted argillites often cut by small acidic dikes are in contact with the intrusive.

Further investigation of the area west of the Anderson River Mountain where the anomalous zinc values were obtained produced no significant mineralization. An altered fine-grained biotite granodiorite was encountered in which the biotite(?) had been completely altered to limonite with accompanying fine-grained pyrite cubes. Along with very minor chalcopyrite, the pyrite occurs as disseminations and fracture fillings within the granodiorite. Also

seen cutting the intrusive were numerous small barren quartz veins. In contact with this altered granodiorite was a much fresher biotite granodiorite with the original biotite and no pyrite cubes. Again in contact with the intrusives were argillites, locally metamorphosed along the contact to an andalusite-cordierite hornfels. Although a small quartz vein with arsenopyrite and pyrite was found, no other mineralization was discovered in the area.

C. Independence (24). Pilcher

This property, located in the Coquihalla about 15 miles northeast of Hope, was examined only for general interest. Fort Reliance Minerals has held this ground for years and at the time of examination a crew was just leaving, presumably having done assessment work of some type.

In the area of the showings the rock is a well-altered quartz-feldspar-biotite porphyry. In the vicinity of an old adit this rock is well-mineralized with pyrite and chalcopyrite. Examination of outcrop and dump material indicates that these sulfides occur in quartz veins, as fracture fillings, as disseminations, and as massive clots up to a foot in diameter. The quartz veins and fractures trend northwest and north-south.

Several shafts are distributed along a line extending for approximately 400 feet to the south of the portal. These contain dump material similar to that at the portal. The adit is supposed to be approximately 900 feet in length.

Based on surface exposure the main mineralized zone appears to be quite narrow - perhaps 100-200 feet and to extend along strike for about 600 feet. The zone is surrounded by a halo of barren pyrite. Beyond this is barren porphyry. The porphyry itself intrudes a coarse-grained gneissic granodiorite.

Bethlehem optioned the property several years ago and at that time opened the adit, did an I.P. survey, and drilled several holes.

Unless the exposed mineralized zone broadens at depth, there is not enough tonnage here to be of any interest. This possibility was no doubt investigated by Bethlehem.

D. Totum Group (25). Pilcher

This is an old group of claims recently re-staked by Mr. Terry Doubt of Princeton. The property is located in the Tulameen area about 7 miles northwest of the north end of Otter Lake.

The showings consist of very weak skarn-type mineralization located along a contact between Nicola Group volcanic rocks and a small stock mapped as Coast Intrusion. The skarn minerals include magnetite, epidote, and traces of chalcopyrite. These are exposed in several pits and trenches for approximately 200 feet along the contact. The intrusive and volcanic rocks immediately surrounding the showings are barren.

These showings are of no particular interest other than indicating that the general area should be looked at in more detail. Some prospecting will be done in this region in 1973.

E. Jura Claims, Cop-Ex Mining Corp. Ltd. (26). McClaren

The Cop-Ex claim group is located approximately 7 miles north of Princeton on Christian Creek and covers ground both north and south of Jura. Access is by road from Princeton.

Exploration activity is presently being carried out on the Elk 3 and 4 claims, where both percussion and diamond drilling are in progress. The initial target which prompted exploration activity in the Jura area was an aeromagnetic discovered by Kennco Explorations in 1962. Follow-up by Kennco Explorations included the staking of claims in the southeast portion of the area now held by Cop-Ex.

In 1966 Amax Explorations conducted an aeromagnetic survey over the Princeton area which produced an anomaly over the ground covered by Cop-Ex claims. An agreement was made by Amax and Cop-Ex

Mining Corporation Limited such that ground follow-up could be carried out by Amax. Follow-up work consisted of I.P., magnetometer and soil geochemistry surveys under the direction of Mr. Peter Fox.

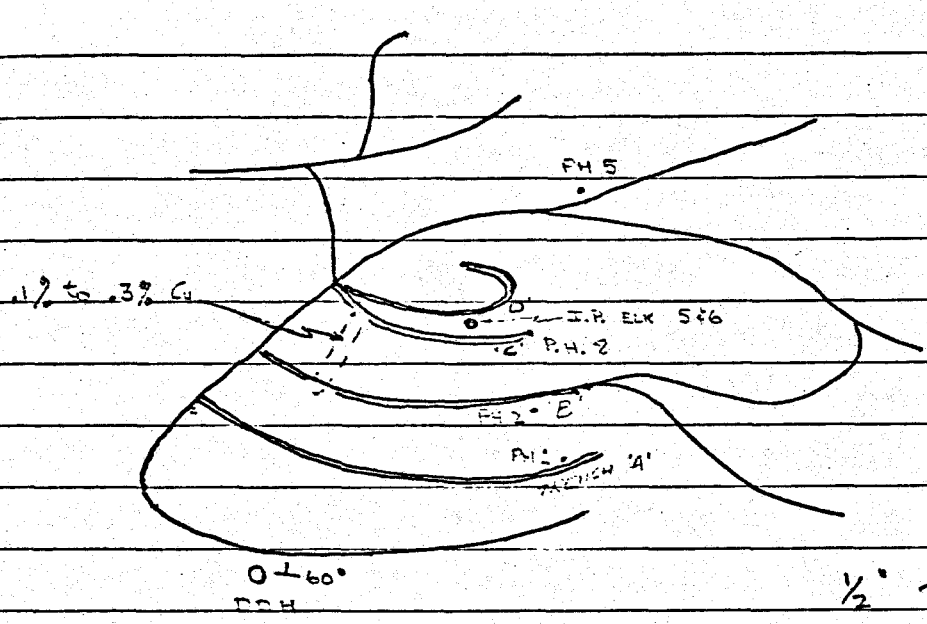
The anomalous areas delineated by I.P. and soil geochemistry have been and are now being tested by trenching, percussion drilling and diamond drilling under the direction of Mr. Gerhard Von Rosen of Cop-Ex Mining Corporation Limited. At present, twenty percussion and two diamond drill holes have been completed.

The working area (Elk 3 and 4) is underlain by volcanic rocks of the Nicola Group. The Nicola rocks are massive andesitic lavas and fragmentals which have been altered to epidote, calcite, chlorite(?) and magnetite. Sulfide mineralization has taken place after most of this alteration and accompanies a magnetite, pink feldspar, epidote, calcite alteration that has been developed on a conjugate fracture system.

The Nicola volcanics have been well fractured and are cut by numerous faults. The faults are northwesterly-trending and west-dipping. There is a distinct conjugate fracture set: N45W/NE and N40E/SW. The N45W fractures are the most prominent and it is along this set that sulfide mineralization is best developed.

The northeastern portion of the claim block is occupied by a biotite diorite to monzonite intrusive which is cut by aplite veins which contain minor pyrite. The Nicola volcanic-intrusive contact was not seen. Chalcopyrite and magnetite occur either together or separately as very sparse disseminations and fine seams in the altered Nicola volcanic rocks. A moderate degree of oxidation has produced malachite, azurite, limonites and gypsum. The best mineralization exposed in the trenches (Figure 14) is localized in an area of pink feldspar alteration. This area of mineralization has a N65W trend and varies in width from trench to trench. In trench "C" the mineralization is 20 ft. in width and contains 0.3% Cu (visual estimation), while in trench "B" the mineralization is 10 ft. in width and contains 0.1% Cu (visual estimation). The mineralization did not

SKETCH MAP OF WORKING AREA



Jura Claims
Princeton, B.C.

Report - August 21, 1972
- M. McClaren

Fig. 14

appear in trench "A" or "B". The mineralization is characterized by quartz veinlets up to ¼" in width and density of 1 ft. with magnetite and chalcopyrite irregularly dispersed throughout the veinlets. It is at the southern end of this zone where the present diamond drill set-up is located, presumably to try to intersect this mineralized area at depth. This mineralized area is localized and is contained within a 1600' x 1000' area outlined by an I.P. anomaly. This anomalous area has an overall low Cu content (.005% and less) as expressed by surface exposures.

The alteration and the proximity to intrusive rocks support the classification of this deposit as pyrometasomatic.

Assays from core results have been reported by Mr. Von Rosen to range from 0.1% to 1% Cu, and the location of these results and their extent would be required to evaluate this property. Core and core assays were withheld and will be shown to persons with permission obtained from the president of the company, Mr. John Wishart, located at the following address:

Cop-Ex Mining Corporation Limited
25th Floor
700 West Georgia Street
Vancouver 1, B.C.
(P.O. Box 10054, Pacific Centre)

Cop-Ex is looking for a share option whereby a major company will hold 50% of the shares and Cop-Ex the remaining 50%. These shares would be bought out of the company's treasury in order to finance the project.

Quesnel Lake Map Sheet (93/H)

(Numbers 3-6, Index Map)

A. Woodjam Creek (3). Calder

An attempt was made to reach the Woodjam Creek property but the access road to the showing was not found. Therefore an investigation of nearby outcrops of the same intrusive was conducted (Figure 16). The intrusive is an unaltered fine- to medium-grained hornblende granodiorite to quartz monzonite. No mineralization was seen. The claims on this property are still in good standing.

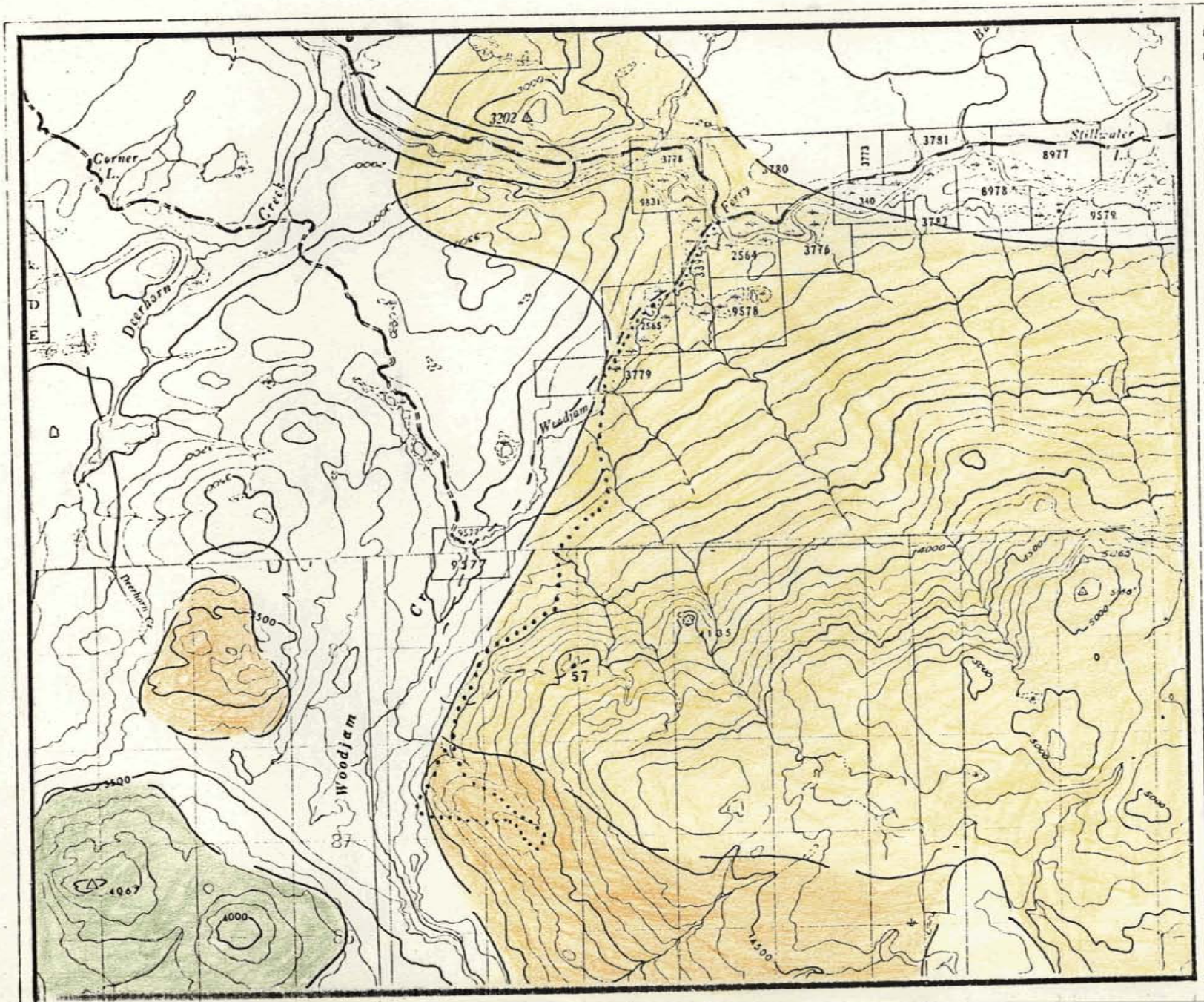
B. Moffat Lakes (4). Calder

Moffat Lakes are situated approximately 12 miles northeast of the Bory claims (Murphy Lake). Because of the nearness to these claims and to Boss Mountain, a careful investigation consisting of regional mapping and prospecting was conducted in the area. Extensions of units mapped previously as part of the work around the Bory claims, plus new intrusives to the north, were discovered.

To the south of Moffat Lakes, an unaltered medium-grained, sugary-textured hornblende-biotite quartz monzonite occurs (Figure 17). It is undoubtedly an extension of the same quartz monzonite that outcrops to the south and along the shore of Murphy Lake. The intrusive is usually equigranular (medium grained), however some outcrops do display coarse K-feldspar phenocrysts up to one inch in length. This feature is very prominent at Station BC-72-14. At several outcrops, small aplite dikes and K-feldspar pegmatites were found cutting the intrusive.

To the west of the quartz monzonite and still south of Moffat Creek, an unaltered medium-grained hornblende-biotite granodiorite is encountered. Again, this intrusive is an extension of the granodiorite mapped previously and referred to then as the medium-grained granodiorite (see Plate No.2, Murphy Lake, 1970). At Station

Figure 16



MAP REF. No.: 123-72-17

N.T.S.: 93-A/3 & A/6

LEGEND

MIOCENE basaltic flows

JURASSIC/CRETACEOUS hornblende-biotite & biotite qtz monz. & granodiorite

UPPER TRIASSIC green andesitic volcanic rocks.

Traverse

FALCONBRIDGE NICKEL MINES LTD.

PROPERTY: WOODJAM CREEK

LOCATION: Quesnel Lk Map Sheet.

TYPE OF MAP: Geology Recce.

BASED ON: G.S.C. Map 3-1961

DATE OF WORK: Sept. 1972

DATE: February 1973

DRAWN BY:

SCALE: 1:63,000

BC-72-20, a small latite porphyry has intruded the granodiorite. The dark-pink porphyry consists of a mainly K-feldspar matrix with phenocrysts of fine-grained hornblende and medium-grained plagioclase. However, as in all the outcrops south of Moffat Creek, no mineralization was encountered.

To the north of Moffat Lakes, three distinct intrusions occur. Approximately four miles north of the west end of Moffat Lakes, a slightly altered fine- to medium-grained hornblende diorite occurs. Alteration consists of epidotization as small stringers, chloritization, plus some feldspar alteration. A couple of minor, intensely-epidotized faults and a few small aplitic dikes were noted cutting the diorite. The odd speck of disseminated chalcopyrite and pyrite were found in the diorite at station BC-72-15. About one mile south of this station, two flagged lines were observed. Along one line float of hornblende diorite containing some minor disseminated and fracture filled chalcopyrite and pyrite was found. However, no claim line was encountered.

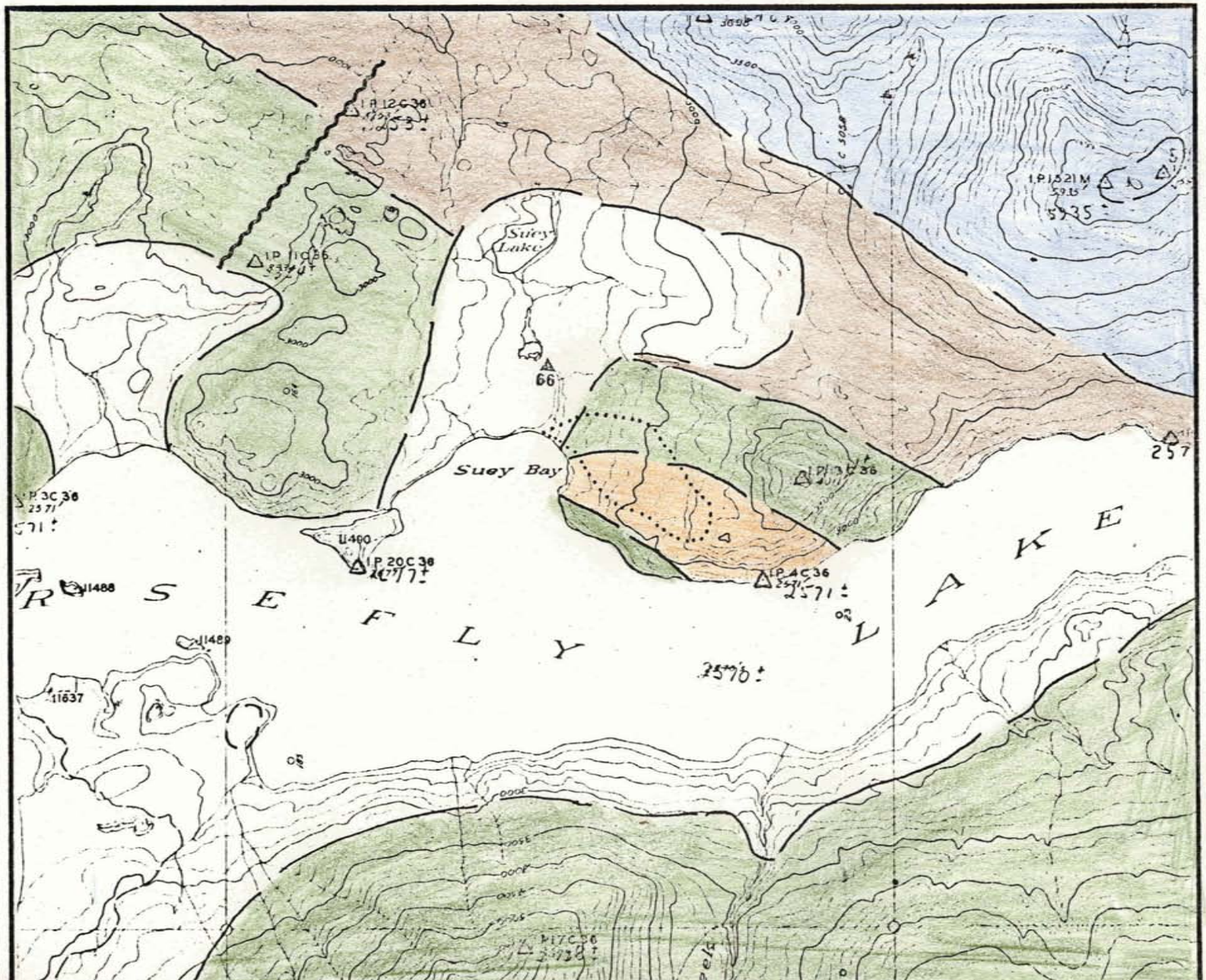
Two miles directly north of Moffat Lakes a fine- to medium-grained hornblende granodiorite occurs. This intrusive may be an equivalent to the medium-grained granodiorite to the southwest. The granodiorite is mainly unaltered but does have localized areas of pyrite-filled fractures with associated epidote and chlorite. Several thin (4-6" wide), barren quartz veins cut the intrusive at various localities.

To the northeast of the lakes, a slightly foliated medium-grained diorite to quartz diorite outcrops. The intrusive is mainly unaltered but does contain very minor epidote in thin fractures plus minor chloritization and feldspar alteration. Several specks of disseminated pyrite were seen.

C. Horsefly Lake (5). Calder

A very small intrusive on the north shore of the eastern end of Horsefly Lake (Figure 18) was investigated. The intrusive

Figure 18



MAP REF. No.: 123-72-19

N.T.S.: 93-A/7W

LEGEND

- JURASSIC/CRETACEOUS hornblende diorite
- TRIASSIC/JURASSIC - green andesitic tuff, agglomerate, breccia.
- LOWER CAMBRIAN OR LATER SNOWSHOE FM. - brown & grey qtz. - mica schist, quartzite.
- LOWER CAMBRIAN OR LATER MIDAS FM. - black argillite, phyllite, schist.
- ····· Traverse

FALCONBRIDGE NICKEL MINES LTD.

PROPERTY: SUEY BAY

LOCATION: Quesnel Lake Map Sheet

TYPE OF MAP: Geology Recce.

BASED ON: G.S.C. Map 1-1963

DATE OF WORK: Sept. 1972

DATE: February 1973

DRAWN BY:

SCALE: 1:32,000

is a slightly altered fine- to medium-grained hornblende diorite. The alteration includes epidote stringers and slight saussuritization, while mineralization in the form of minor pyrite as disseminations and fracture fillings was found. No other mineralization noted.

D. Gibbons Creek (6). Calder

Gibbons Creek is 6 miles east-northeast of Horsefly and has a G.S.C.-mapped diorite outcropping along it. Therefore, investigation of this intrusive and associated properties was carried out. The property was held by Helicon Explorations Limited in 1966 and subsequently optioned to Magnum Consolidated Mining Co. Ltd. in 1967. Apparently it was re-staked by Silver Standard in 1969 and work done in 1969 and 1970. A central core of claims, approximately 40 in number, are still held and cover the main showings.

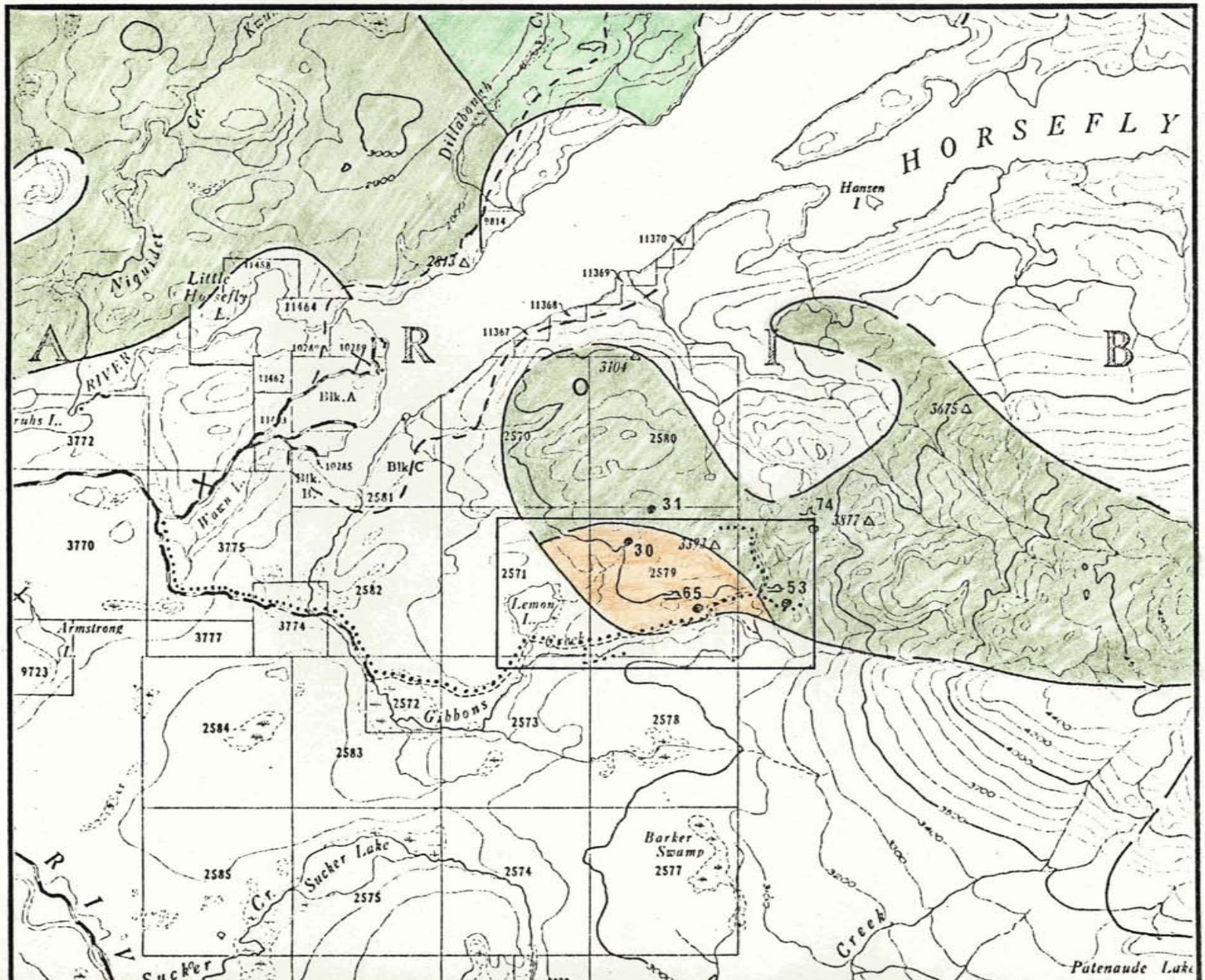
Two areas have major work completed on them. Area Number One (station 1-9-4) has extensive trenching criss-crossing the locality (Figure 19 and 20). The area is a basic volcanic-diorite contact zone with associated feldspathic dikes and stringers. Chalcopyrite and malachite occur in a few of these small dikes, mostly near the creek, with magnetite also found in the dikes and as disseminations in the volcanics. However, the mineralization is very sparse and alteration mainly confined to saussuritization.

Area Number Two (station 3-9-4) is further to the east and consists of much trenching and several percussion drill holes. Also, one area of about 100 feet by 150 feet has been completely cleaned off to bedrock, with a blasted trench (2-3 feet deep) bisecting the area. Chalcopyrite, pyrite and malachite occur in a fine-grained diorite. Feldspathic veining is again quite prevalent.

Throughout the rest of the property, trenches and percussion drill holes are found. However, the trenches are usually void of any promising mineralization.

Sludge samples were taken of three of the percussion drill holes on the property. The first hole was labelled on the post in

Figure 19



MAP REF. No.: 123-72-20
N.T.S.: 93-A/16

LEGEND

- JURASSIC/CRETACEOUS hornblende - biotite diorite
- TRIASSIC/JURASSIC - green andesitic tuff, agglomerate, breccia
- MIDDLE/UPPER JURASSIC dark green pyroxene-bearing andesitic agglomerate; breccia & flows.
- ..... Traverse

FALCONBRIDGE NICKEL MINES LTD.

PROPERTY: GIBBONS CREEK
LOCATION: Quesnel Lake Map Sheet
TYPE OF MAP: Geology Recce.
BASED ON: G.S.C. Map 3-1961
DATE OF WORK: Sept. 1972
DATE: February 1973
DRAWN BY:

SCALE: 1:50,000

the drill hole and called PDH #24 and was drilled to a depth of 200 feet. The other two were arbitrarily called PDH #2 and #3. The assay results were as follows:

PDH #24	113 ppm Cu.
PDH #2	164 ppm Cu.
PDH #3	250 ppm Cu.

PDH #3 is situated directly below the cleared showing (Area #2) which has disseminated chalcopyrite and malachite staining. Therefore it has probably been contaminated by washings from the cleared area and is not a true reflection of the rock actually drilled.

Although Area #2 appears promising, it seems as if sufficient work has been done on the property to outline the extent of mineralization and, since no work was done on the property this summer, it doesn't warrant any further investigation.

Bonaparte River Map Sheet (92/P)

(Numbers 7-9, Index Map)

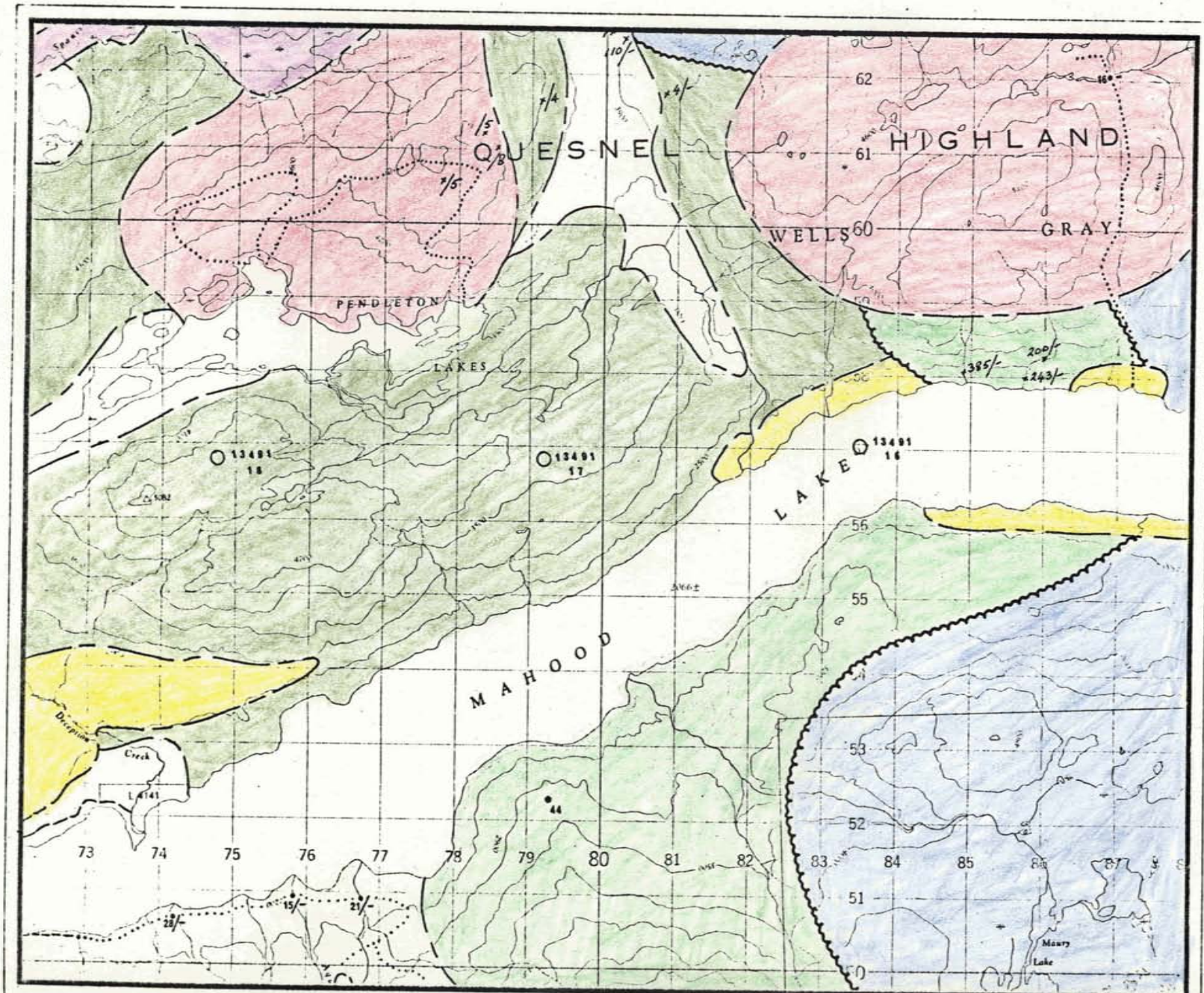
A. Mahood and Pendleton Lakes (7,8). Calder

Mahood and Pendleton Lakes are situated in the Wells Gray Provincial Park. Permission was received to prospect an area that included two Cretaceous intrusives.

The intrusive north of the eastern end of Mahood Lake is an unaltered equigranular, medium-grained biotite granodiorite (Figure 21). No mineralization was noted. The intrusive is very consistent in composition, grain size and freshness and is not worth further exploration.

The Pendleton Lakes are 3 miles north of Mahood Lake and are bound on the north by a mostly unaltered finer- to medium-grained biotite-hornblende granodiorite to diorite. On the eastern contact, xenoliths of Nicola volcanics up to several feet in length are found

Figure 21



MAP REF. No.: 123-72-22
N.T.S.: 92-P/16

- PLIOCENE-RECENT basalt flows
- MIOCENE-PLIOCENE, plateau lava & olivine basalt
- CRETACEOUS(?) granodiorite, quartz monzonite
- UPPER TRIASSIC Nicola volcanics
- UPPER TRIASSIC FENNELL FM. pillow lavas, greenstone
- LOWER CAMBRIAN SNOWSHOE FM. qtz. - mica schist, quartzite, phyllite

..... Traverse

Cu 80 Silt Sample (Values in ppm.)

FALCONBRIDGE NICKEL MINES LTD.

PROPERTY: MAHOOD LAKE - PENDLETON LAKES

LOCATION: Bonaparte Lk Map Sht

TYPE OF MAP: Geology Recce.

BASED ON: GSC Map 1278A

DATE OF WORK: Sept. 1972

DATE: February 1973

DRAWN BY:

SCALE: 1:78,000

within the intrusive. Most of the blocks are unaltered but several were found to have taken on a gneissic texture. Barren quartz veins and aplite dikes cut the intrusive at various localities. No mineralization was observed.

B. Canim Lake (9). Calder

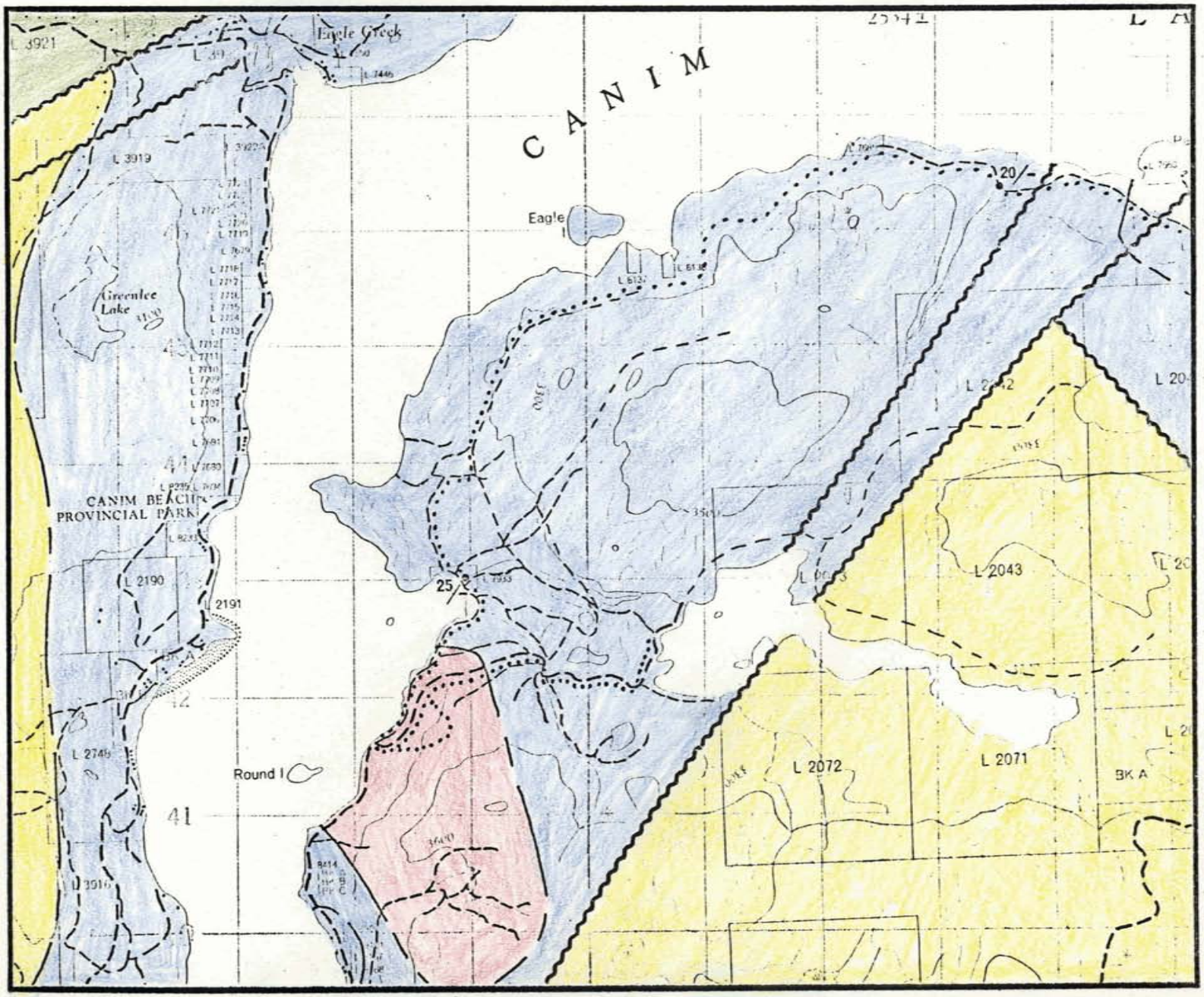
A small intrusive on the southwest shore of Canim Lake was investigated and found to be a slightly altered hornblende quartz monzonite (Figure 22). Alteration consisted of epidote stringers, chloritization of hornblende and saussuritization of feldspars. Some local fracturing and shearing is prominent but the only mineralization was minor disseminated magnetite.

S. H. Pilcher

S. H. Pilcher

Vancouver, B.C.
March 1973

Figure 22



MAP REF. No.: 123-72-23
N.T.S.: 92-P/15

LEGEND

- EOCENE SKULL HILL FM. dacite, trachyte, basalt.
- CRETACEOUS(?) biotite, granodiorite & qtz monzonite.
- LOWER JURASSIC andesitic arenite, siltstone, breccia.
- UPPER TRIASSIC Nicola volcanics - augite andesite flows & breccia, tuff.
- ..... Traverse
- cu•mo Silt Sample (Values in ppm)

FALCONBRIDGE NICKEL MINES LTD.

PROPERTY: CANIM LAKE
LOCATION: Bonaparte Lake Map Sheet
TYPE OF MAP: Geology Recce.
BASED ON: G.S.C. Map 1278A
DATE OF WORK: Sept. 1972
DATE: February 1973
DRAWN BY:

SCALE: 1:50,000

APPENDIX A

APPENDIX A

SCUM LAKE - DIAMOND DRILL RECORD

Holes #8 and #9

Hole No.: 479-72-8

Commenced: July 18, 1972 9:00 p.m.

Finished: July 20, 1972

Purpose of Hole: To test frequency effect at depth.

Location: North: 212+00 Elevation: 4075'
East: 88+00 Dip: -90°

17-98' Feldspar Andesite Porphyry
- Oxidized, limonitized, argillized.
- Rock has been highly weathered, altered and reduced to clay minerals after feldspars. Pre-existing pyrite appears as limonite in fracture fillings. Rock composition ranges from almost 90% clay minerals with secondary limonite to the reverse situation.

17-87.5' Argillic section of feldspar porphyry reduced to clay minerals with secondary limonite. 90:10

87.5-98' Argillic section mostly limonite with secondary clay minerals. 80:20 Suggests replacement of pre-existing massive pyrite mineralization.

98-126' Grey-green andesite porphyry and andesite porphyry breccia.

The andesites are weak to moderately fractured and brecciated. Pyrite occurs as fracture fillings on fracture surfaces. Some gypsum with or without accompanying chlorite serves as fracture fillings.

Pyrite 1-2%

100-110' Fine- to medium-grained grey-green andesite porphyry. Pyrite occurs as hairline fracture fillings. Minor epidote alteration; interstitial magnetite present.

Pyrite 1-2%

110-126' Fine- to medium-grained dark-grey-green andesite porphyry. Pyritization, brecciation and porphyry texture increase with depth as compared to 100'-110' section. Black sooty mineral occasionally occurs with pyrite mineralization.

Pyrite 2-4%

126-154' Feldspar Porphyry

Rock is generally medium-grained, moderately argillized with feldspar phenocrysts altering to cream-coloured clay composition minerals.

Biotite and hornblende and chlorite phenocrysts are also prevelant. Matrix appears siliceous. Pyrite occurs as disseminations throughout the porphyry in a fairly consistent proportion (2-4%). A black disseminated sulfide mineral also occurs throughout this section and appears to be chalcocite. The chalcocite occurs less frequently and in less abundance than pyrite (.5 - 1%). In certain instances the brecciated rock surfaces have been cemented with secondary $CaCo_3$ and silica.

Cu .035% Pyrite 2%

126-130' Moderately altered feldspar porphyry.

Cu .035% Pyrite 2%

130-133' Feldspar porphyry less altered to fresh.

Cu .035% Pyrite 2%

133-136' Moderately altered feldspar porphyry.

Cu .035% Pyrite 2%

136-139' Moderately altered feldspar porphyry. Gougy pulverized zone. Black sulfide seam - hairline to ¼".

Cu .035% Pyrite 3-5%

139-153.5'	Moderately fresh feldspar porphyry. Minor shear surface hematite. Cu .01% Pyrite 2%
153.5-154'	Fresh feldspar biotite porphyry. Pyrite 2%

==========

HOLE #9

0-20'	Overburden
20-52'	Highly leached oxidized zone. - Rock is reduced to sand and clay - very friable. - Material is highly oxidized - limonite stain throughout.
52-73'	Highly fractured and black, fine-grained, blue-grey andesite (porphyry). Limonite prevalent on fracture survaces replacing pre-existing pyrite. Chlorite is present on some fracture surfaces. - Extent of limonite weathering products: minor pyrite.
73-88'	Andesite - minor pyrite present.
88-93.5'	Minor pyrite: epidote and $CaCO_3$ in fractures.
93.5-12.5'	Andesite Porphyry - Pyrite and gypsum on shear surfaces. - No weathering products.
121.5-130'	Fine-grained, dense, purplish meanocratic volcanic. - Brecciated. - Silicified replacement of andesite porphyry. - Chlorite and pyrite on fractures.
130-146'	- Brecciated and altered andesite porphyry.
146-151.5'	- Light coloured quartz - feldspar porphyry. - Disseminated pyrite 5-8%.
151.5'	- Dark (purplish) silicified andesite porphyry.

175-183.5 - Quartz - feldspar porphyry.
- Disseminated pyrite 2-5%.

183.5-216' - Greyish-green to purplish andesite porphyry.
- Highly silicified, porphyry texture almost destroyed.
- Gradation into quartz - feldspar porphyry intrusive.
- Fracturing minor to moderate.
- Silica; chlorite and pyrite as fracture fillings.
- Pyrite 2-4%.

216-220' - Quartz-feldspar porphyry.
- Some hematite in fractures.
- Dissem. and fracture filling pyrite 5-10%.

220-269' - Silica flooding and alteration of volc. andesites.
- Quartz; epidote and hematite on fractures.

269-280.6' - Silicified fine-grained andesite.
- Moderate fracturing, Pyrite 2-6%.
At 275.5 - 276.3 - Volcanics highly altered by vug and fracture filling of $CaCO_3$.
Py - 10-20%.
- Minor chalcopyrite .1%, and chalcocite .2%.

RESUME OF DDH DATA

Hole #9 20-52' Argillic zone
52-121.5' Andesite (porphyry)

Gypsum 93-121
121.5-146' Brecc. and porph.
146-220' Quartz feldspar porph.
220-288' Andesite

Hole #8 17-98' Argillic zone(andesite porphyry)

Gypsum 98-126' And. porph. and And. porphyry Breccia
126-154' Feldspar porphyry.

LEGEND

CENOZOIC

PLEISTOCENE AND RECENT

18 Till, gravel, sand, clay, and silt

TERTIARY

UPPER MIOCENE AND (?) YOUNGER

17 Olivine basalt, andesite, and related tuffs and breccias

MIDDLE OR UPPER MIOCENE

16 Buff to grey siltstone, diatomite, clay and silty sand; coarse reddish brown conglomerate; minor ash beds

PRE-MIOCENE (MAINLY)

15 Stile and stocks of felsite, feldspar porphyry, and andesite; probably related to 14 and (?) 17

PRE-MIOCENE

14 Grey, reddish brown, greenish grey, and mauve andesite, dacite, and basalt, minor cream-coloured to white rhyolite

CRETACEOUS OR TERTIARY

UPPER CRETACEOUS OR PALEOCENE

13 13a, fine-grained to medium-grained quartz monzonite and granite; 13b, coarse-grained grey diorite, medium-grained hornblende granodiorite and diorite, feldspar porphyry and feldspathic rocks similar to 13

12 Massive, fine-grained green to grey-green andesite and basalt; minor related pyroclastic rocks, greywacke, and shale

CRETACEOUS AND/OR TERTIARY

UPPER CRETACEOUS AND/OR YOUNGER

11 Non-foliated coarse-grained biotite granite and quartz diorite

10 Greenish granodiorite and diorite with indistinct to prominent gneissosity; many granite and aplite dykes; large inclusions locally abundant

CRETACEOUS

UPPER CRETACEOUS

9 Mainly coarse-grained, friable, grey and grey-green greywacke interbedded with grey to mauve shale and conglomerate with abundant granitic pebbles

LOWER AND UPPER CRETACEOUS

8 Mainly variecoloured andesitic pyroclastic rocks interealated in places with grey, greenish grey, and mauve massive or porphyritic flows; 8a, interbedded with shale and conglomerate similar to 7

LOWER CRETACEOUS

7 Interbedded grey to black shale and grey to green greywacke; coarse greywacke and conglomerate near top of section; minor dark grey argillaceous limestone

MESOZOIC

JURASSIC AND CRETACEOUS

UPPER JURASSIC AND LOWER CRETACEOUS

ELDORADO GROUP

6 Massive to thinly bedded argillaceous and tuffaceous beds in part dense and flinty, grey and green greywacke and shale; minor thin beds of conglomerate

JURASSIC

MIDDLE AND (?) UPPER JURASSIC

TAYLOR GROUP

5 Buff to green greywacke, light grey shale, and pebble conglomerate; massive boulder conglomerate

LOWER JURASSIC (?) OR OLDER

4 4A. Pink biotite granite, quartz monzonite, and monzonite
4B. Gneissic granodiorite, diorite, and quartz diorite; includes minor metamorphosed volcanic rocks (?)

LOWER JURASSIC

3 Black, dark grey argillite, green argillaceous tuff; minor limy argillite, greywacke

TRIASSIC

MIDDLE OR UPPER TRIASSIC

2 Limestone, basalt, and related tuffs and breccias; argillite greywacke, conglomerate; 2a, massive limestone

PALAEOZOIC

PERMIAN AND (?) OLDER

CACHE CREEK GROUP

1 Limestone, chert, argillite, greywacke; minor basalt and conglomerate; 1a, massive limestone

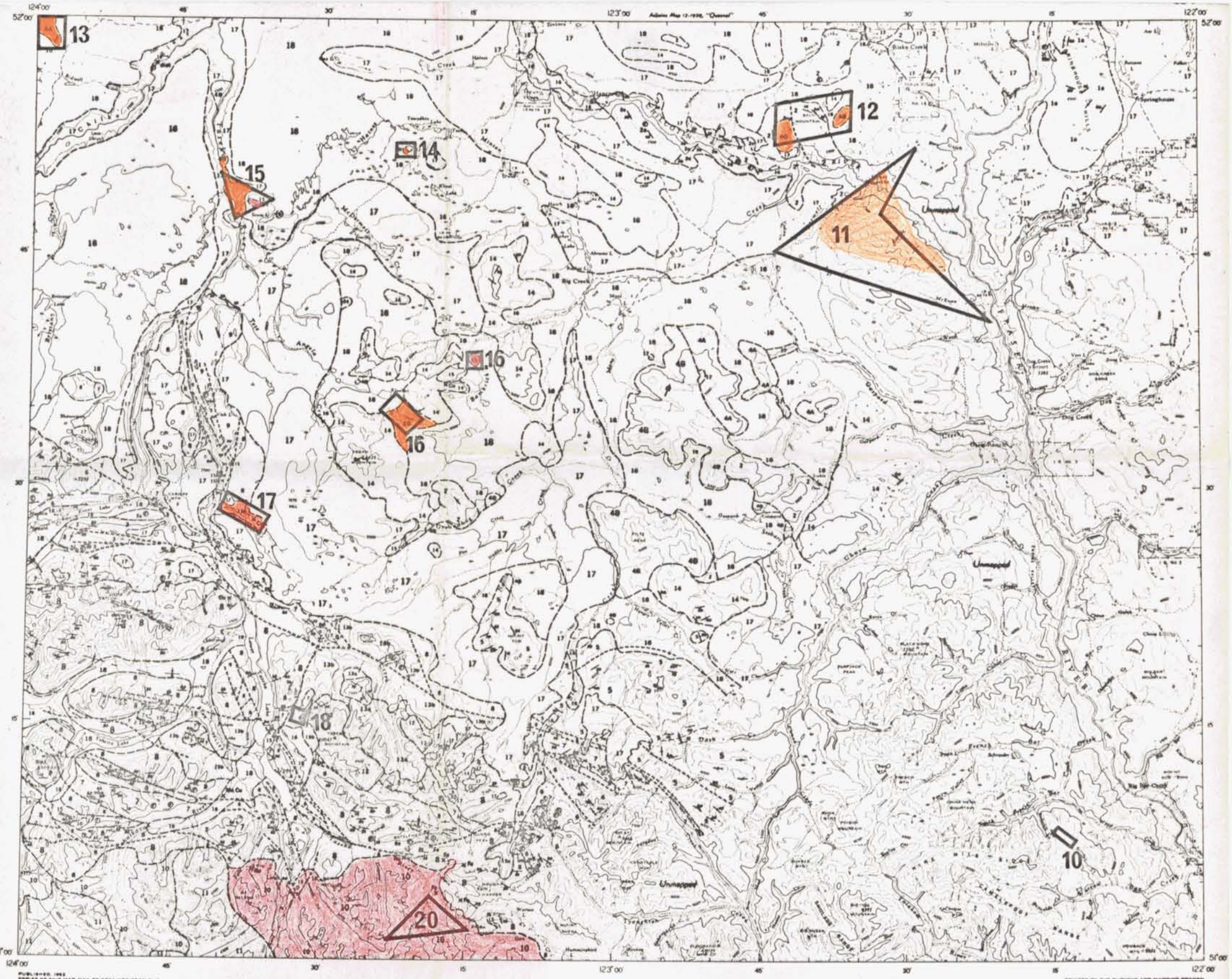
Geological boundary (defined, approximate or assumed)
Limit of geological mapping
Bedding (inclined, vertical, overturned)
Fault (defined, approximate, assumed)
Anticline (defined, approximate)
Syncline (defined, approximate)
Glacial striae
Fossil locality
Mineral occurrence

MINERAL SYMBOLS

Copper	Cu	Molybdenum	Mo
Iron	Fe	Manganese	Mn
Gold	Au	Diatomite	diat

Geology by H. W. Tipper 1961-62

Cartography by the Geological Survey of Canada, 1962



PUBLISHED, 1963
COPIES OF THIS MAP MAY BE OBTAINED FROM THE DIRECTOR, GEOLOGICAL SURVEY OF CANADA, OTTAWA

PRINTED BY THE SURVEYS AND MAPPING BRANCH

INDEX MAP

MAP 29-1963

GEOLOGY

TASEKO LAKES

BRITISH COLUMBIA

Scale:

Miles

Base-map by the Surveys and Mapping Branch, 1956

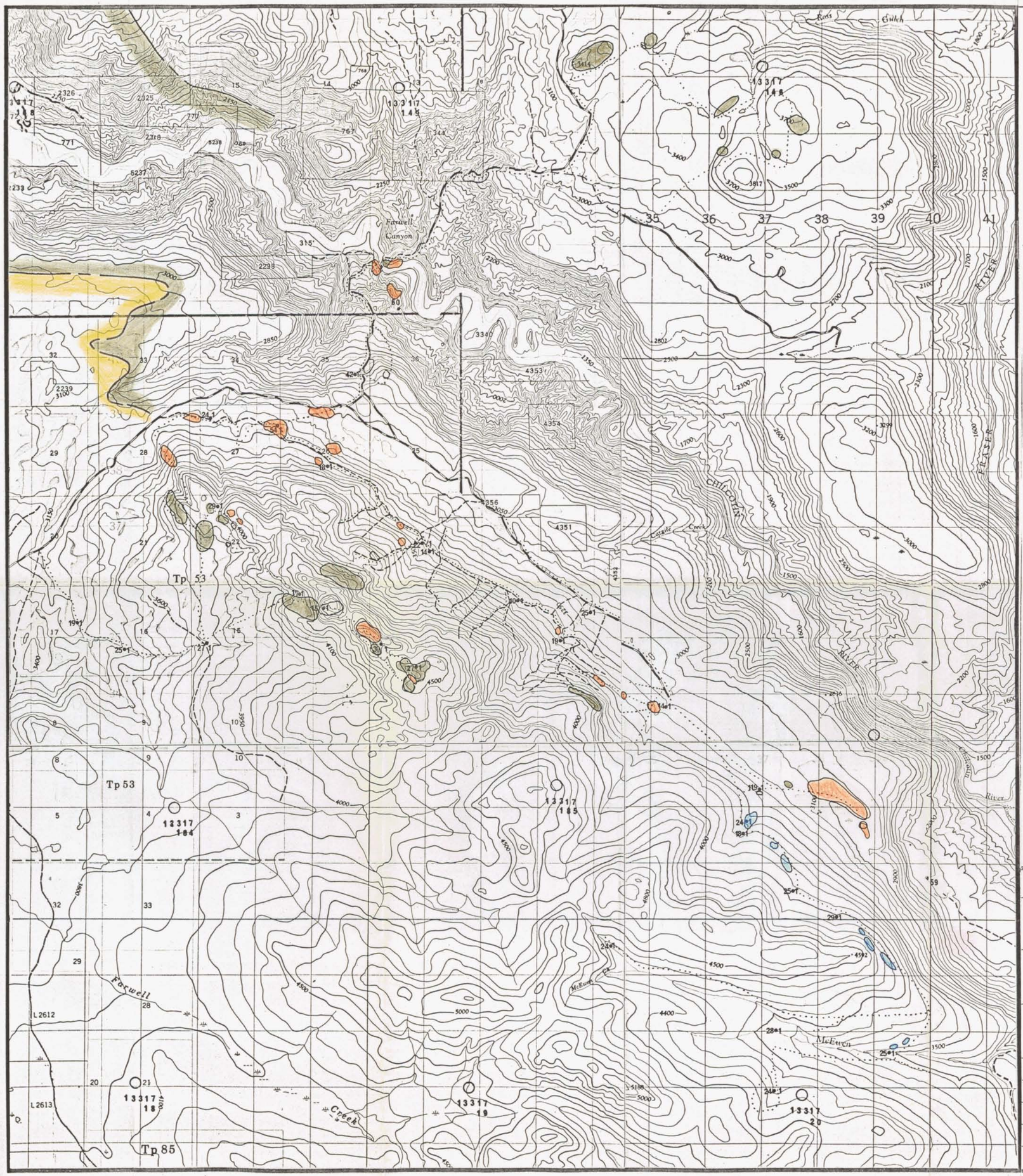
Mean magnetic declination, 24° 45' East, decreasing 3.3' annually. Readings vary from 24° 15' E in the SE corner to 25° 06' E in the NW corner of the map-area

LEGEND

Road, all weather
Other roads
Trail
District boundary
Indian Reserve boundary
Post office
Airport or airfield
Intermittent stream
Marsh
Glacier
Contours (interval 500 feet)
Height in feet above mean sea-level

Fig. 2

MAP REF. NO.:
N.T.S.:



LEGEND

- Tertiary volcanic rocks.
- Mesozoic granodiorite, quartz diorite, diorite.
- Triassic limestone, basalt & sediments.
- Permian Cache Creek group.
- ..... Traverse.
- cu●mo Silt sample (values in p.p.m.)

SCALE: 1:50,000

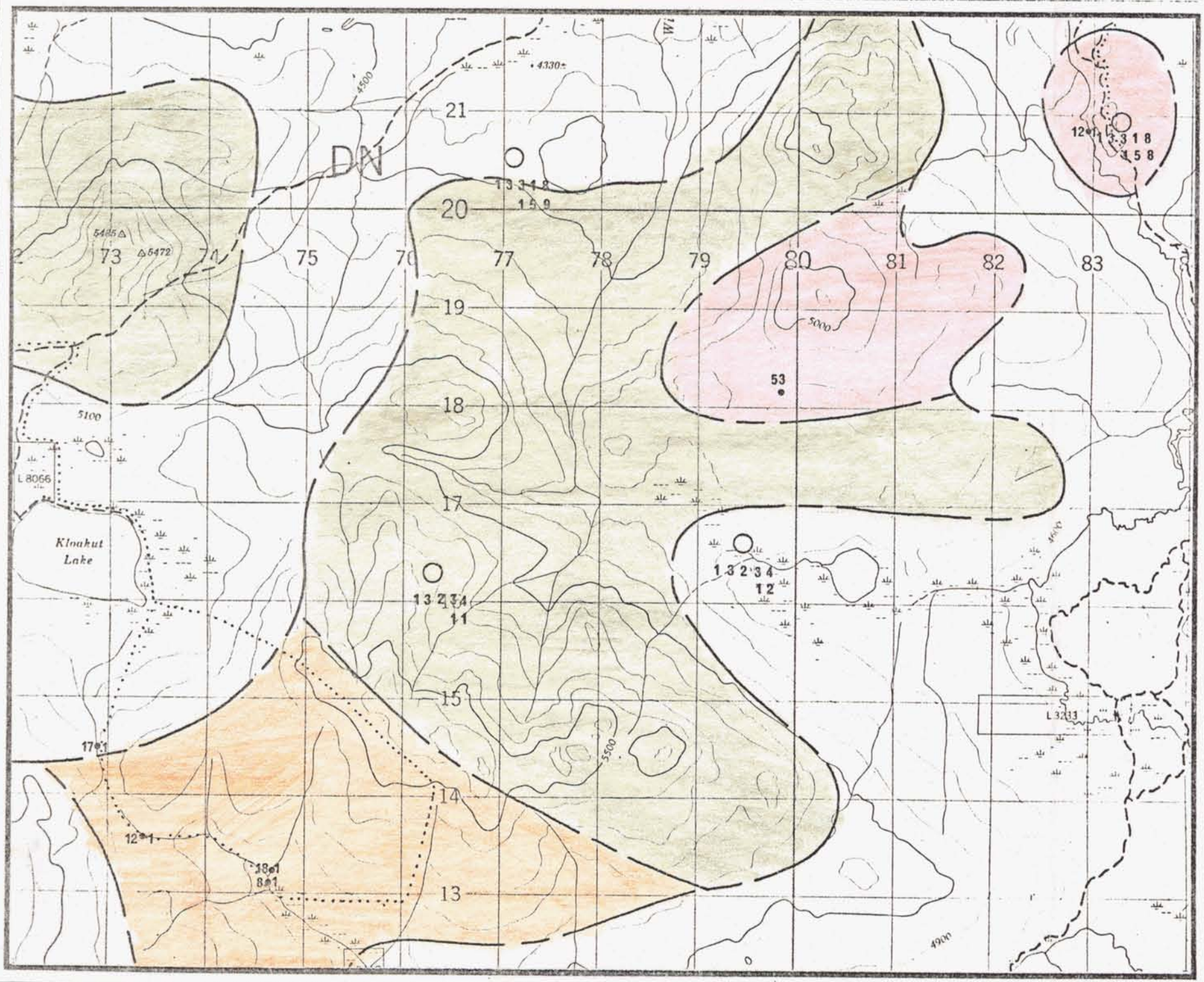
FALCONBRIDGE NICKEL MINES LIMITED		
PROPERTY: FARWELL CANYON		
LOCATION: Taseko Lake Map Sheet		
TYPE OF MAP: GEOLOGY RECONNAISSANCE		
WORKING PLACE:		
BASED ON: G.S.C. map		
DATE OF WORK: July 1972	MAP REF. NO.: 123-72-9	FIG. NO.: 6
DRAWN BY:		
DATE: Feb. 1973	N.T.S. NO.: 92·O 9/W 10/E 15/E 16/W	

BGIL - 3363 D - P.N.

Figure 8

MAP REF. No.: 123-72-11

N.T.S.: 92 O/11W



Legend

- Pre-Miocene Felsite, Feldspar Porphyry
- Pre-Miocene Volcanics
- Mesozoic Granodiorite, Quartz Diorite, Diorite
- ..... Traverse
- cuomo Silt Sample (Values in ppm)

FALCONBRIDGE NICKEL MINES LTD.

PROPERTY: Bambrick Creek and Kloakut Lake

LOCATION: Taseko Lake Map Sheet

TYPE OF MAP: Geology Recce

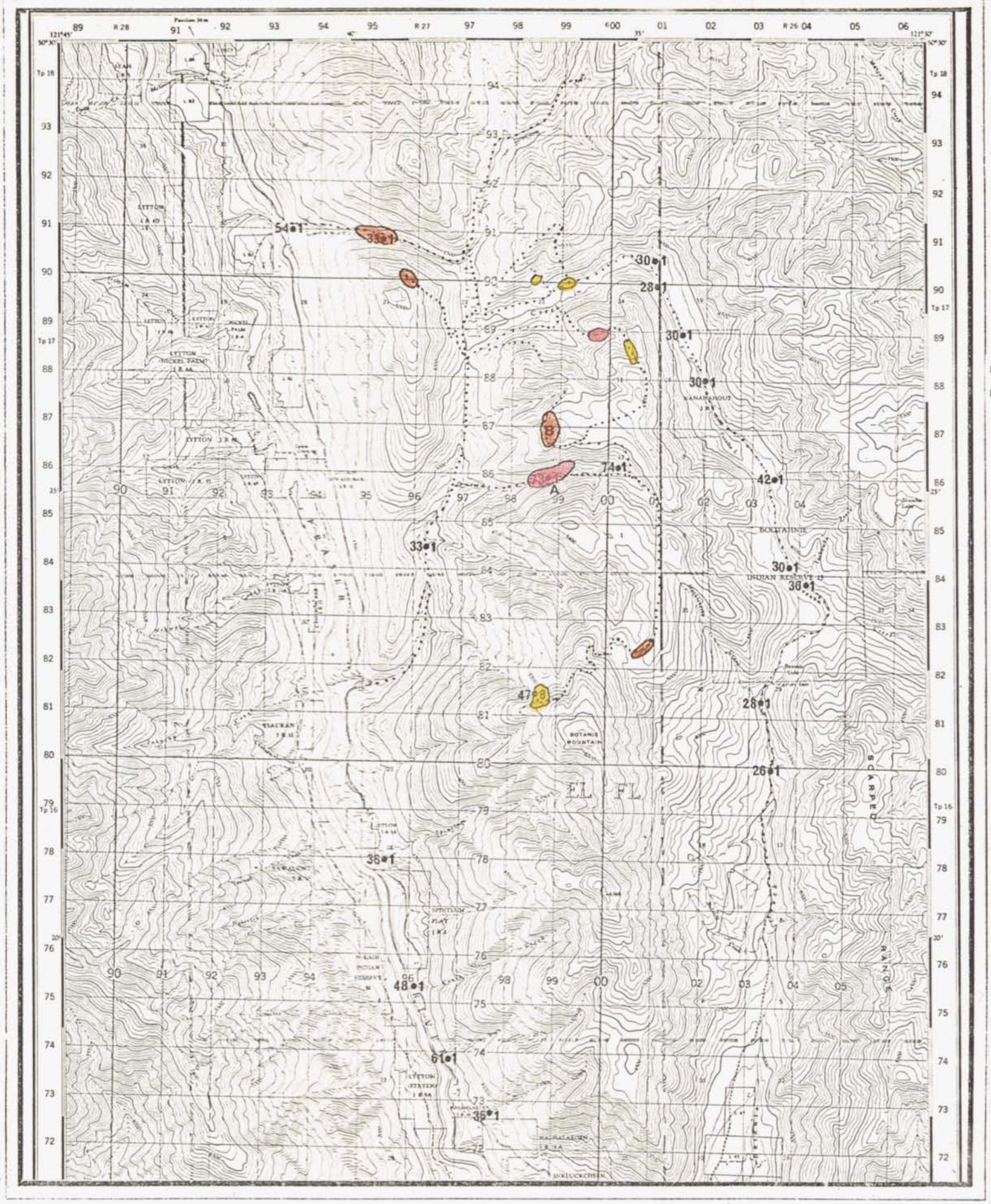
BASED ON: GSC Map 29-1963

DATE OF WORK: July 1972

DATE: Feb. 1973

DRAWN BY:

SCALE: 1:50,000



MAP REF. No.: 123-72-15

N.T.S.: 92-I-5/E

Fig. 12

Legend

- Biotite Granodiorite
- Diorite
- Silicified and Sericitized Intrusive
- ····· Traverse
- cu•mo Silt Sample (Values in ppm.)

FALCONBRIDGE NICKEL MINES LTD.

PROPERTY: Syntana Mines

LOCATION: Izman Creek

TYPE OF MAP: Geology Recce.

BASED ON:

DATE OF WORK: Sept. 1972

DATE: February 1973

DRAWN BY:

SCALE: 1:100,000

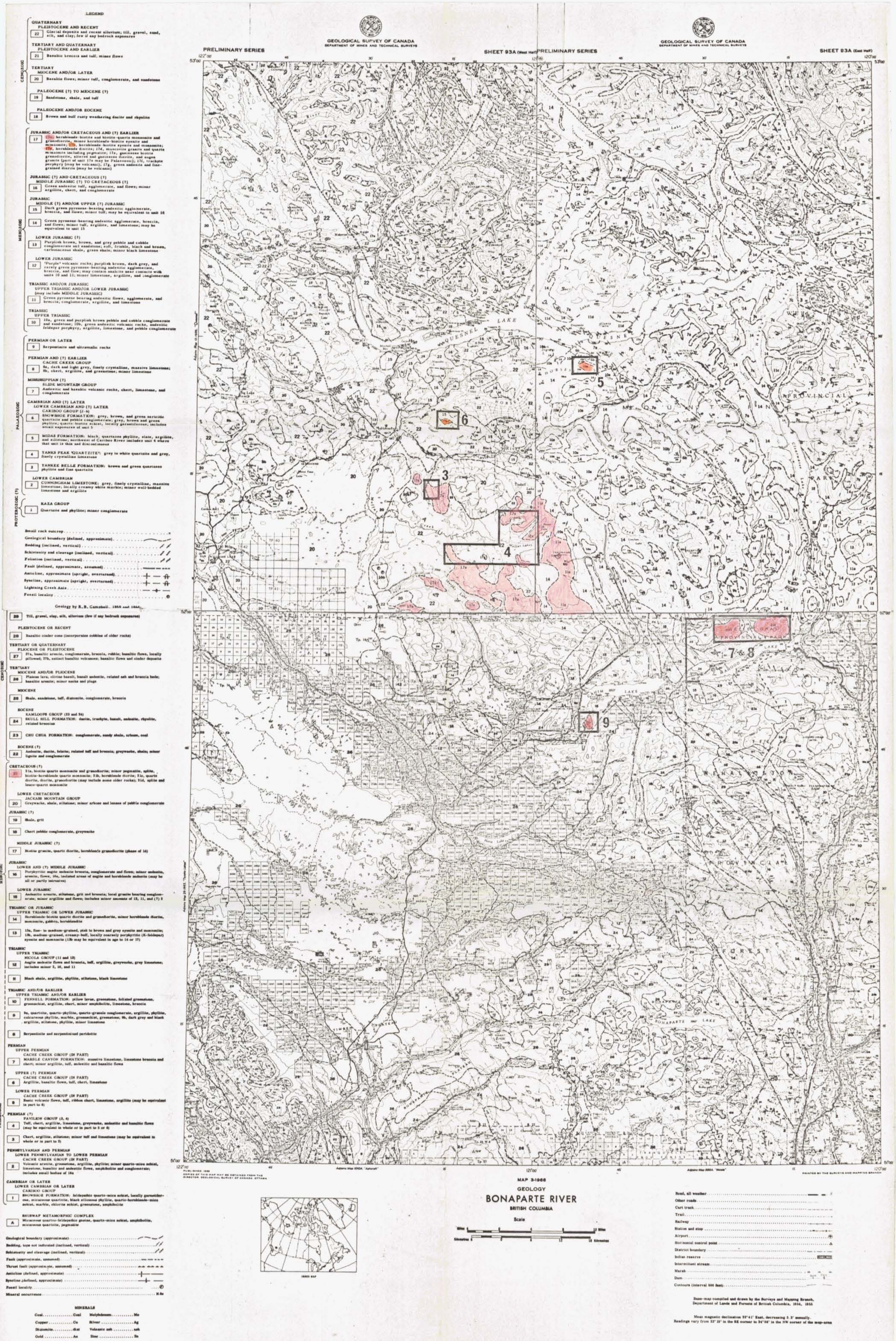
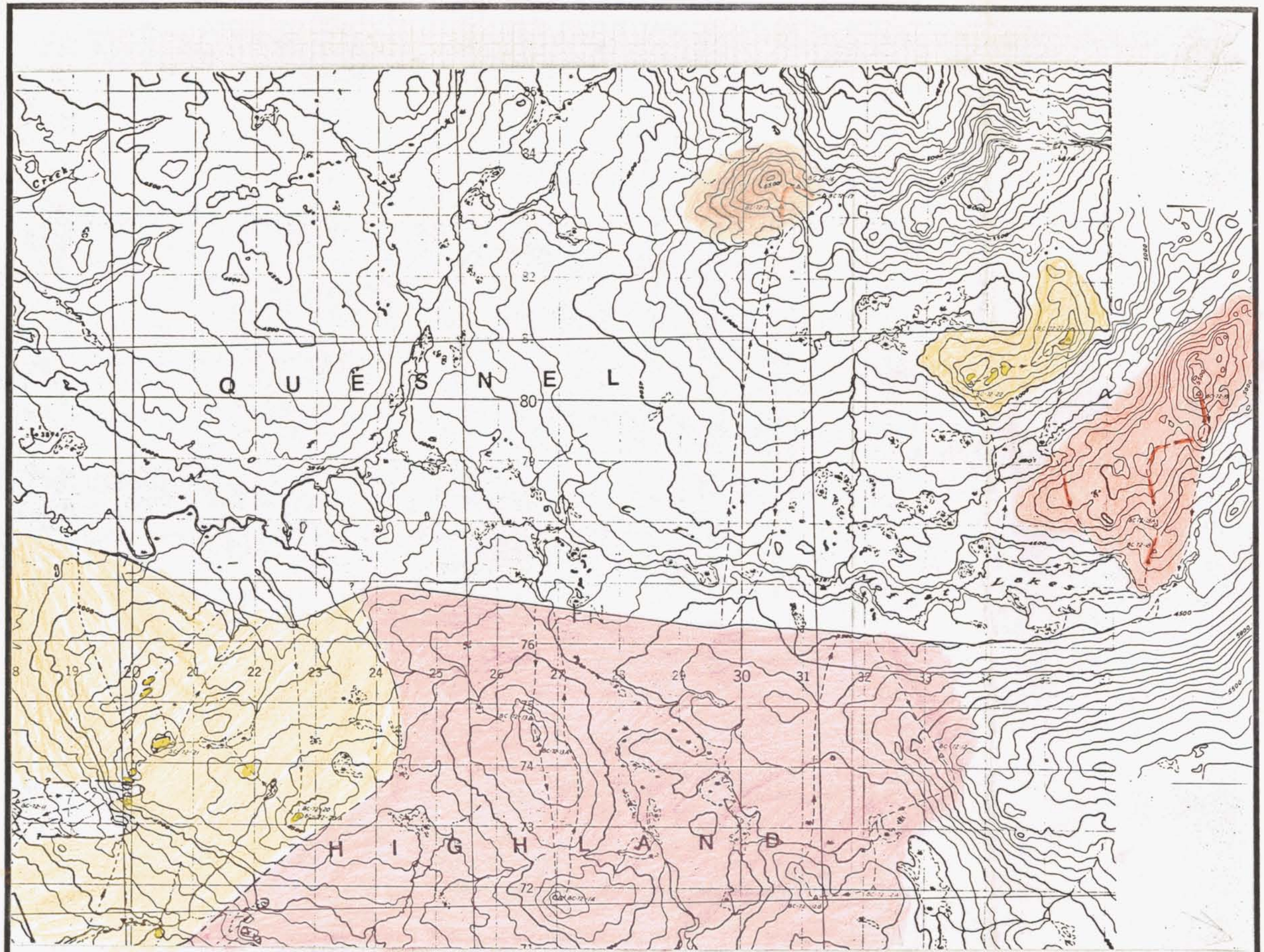

LEGEND
QUATERNARY
PLEISTOCENE AND RECENT
22 Glacial deposits and recent alluvium; till, gravel, sand, silt, and clay; few if any bedrock exposures
TERTIARY AND QUATERNARY
PLEISTOCENE AND EARLIER
21 Basaltic breccia and tuff, minor flows
TERTIARY
MIOCENE AND/OR LATER
20 Basaltic flows; minor tuff, conglomerate, and sandstone
PALEOCENE (?) TO MIOCENE (?)
19 Sandstone, shale, and tuff
PALEOCENE AND/OR EOCENE
18 Brown and buff rusty weathering dacite and rhyolite
CENOZOIC
JURASSIC AND/OR CRETACEOUS AND (?) EARLIER
17 17a, hornblende-biotite and biotite-quartz monzonite and granodiorite, minor hornblende-biotite syenite and monzonite; 17b, hornblende-biotite syenite and monzonite; 17c, hornblende diorite; 17d, muscovite granite and quartz monzonite including pegmatite; 17e, gneissose biotite granodiorite, altered and gneissose diorite, and augen granite (part of unit 17e may be Palaeozoic); 17f, trachyte porphyry (may be volcanic); 17g, green andesite and fine-grained diorite (may be volcanic)
JURASSIC (?) AND CRETACEOUS (?)
MIDDLE JURASSIC (?) TO CRETACEOUS (?)
16 Green andesitic tuff, agglomerate, and flows; minor argillite, chert, and conglomerate
JURASSIC
MIDDLE (?) AND/OR UPPER (?) JURASSIC
15 Dark green pyroxene-bearing andesitic agglomerate, breccia, and flows; minor tuff; may be equivalent to unit 14
14 Green pyroxene-bearing andesitic agglomerate, breccia, and flows; minor tuff, argillite, and limestone; may be equivalent to unit 15
LOWER JURASSIC (?)
13 Purplish brown, brown, and grey pebble and cobble conglomerate and sandstone; soft, friable, black and brown, carbonaceous shale, green shale; minor black limestone
LOWER JURASSIC
12 'Purple' volcanic rocks; purplish brown, dark grey, and rarely green pyroxene-bearing andesitic agglomerate, breccia, and flow; may contain analcite near contacts with units 10 and 11; minor limestone, argillite, and conglomerate
TRIASSIC AND/OR JURASSIC
UPPER TRIASSIC AND/OR LOWER JURASSIC
(may include MIDDLE JURASSIC)
11 Green pyroxene bearing andesitic flows, agglomerate, and breccia; conglomerate, argillite, and limestone
TRIASSIC
UPPER TRIASSIC
10 10a, green and purplish brown pebble and cobble conglomerate and sandstone; 10b, green andesitic volcanic rocks, andesitic feldspar porphyry, argillite, limestone, and pebble conglomerate
MESOZOIC
PERMIAN OR LATER
9 Serpentinite and ultramafic rocks
PERMIAN AND (?) EARLIER
CACHE CREEK GROUP
8 8a, dark and light grey, finely crystalline, massive limestone; 8b, chert, argillite, and greenstone; minor limestone
MISSISSIPPIAN (?)
SLIDE MOUNTAIN GROUP
7 Andesitic and basaltic volcanic rocks, chert, limestone, and conglomerate
CAMBRIAN AND (?) LATER
LOWER CAMBRIAN AND (?) LATER
CARIBOO GROUP (2-6)
6 SNOWSHOE FORMATION: grey, brown, and green sericitic quartzite and pebble conglomerate; grey, brown and green phyllite; quartz-biotite schist, locally garnetiferous; includes small exposures of unit 5
5 MIDAS FORMATION: black, quartzose phyllite, slate, argillite, and siltstone; northwest of Cariboo River includes unit 4 where that unit is thin and discontinuous
4 YANKS PEAK 'QUARTZITE': grey to white quartzite and grey, finely crystalline limestone
3 YANKEE BELLE FORMATION: brown and green quartzose phyllite and fine quartzite
LOWER CAMBRIAN
2 CUNNINGHAM LIMESTONE: grey, finely crystalline, massive limestone; locally creamy white marble; minor well-bedded limestone and argillite
PALAEOZOIC
KAZA GROUP
1 Quartzite and phyllite; minor conglomerate
PROTEROZOIC (?)
Small rock outcrop
Geological boundary (defined, approximate)
Bedding (inclined, vertical)
Schistosity and cleavage (inclined, vertical)
Foliation (inclined, vertical)
Fault (defined, approximate, assumed)
Anticline, approximate (upright, overturned)
Syncline, approximate (upright, overturned)
Lightning Creek Axis
Fossil locality
Geology by R. B. Campbell, 1959 and 1960
GEOLOGICAL SURVEY OF CANADA
DEPARTMENT OF MINES AND TECHNICAL SURVEYS
PRELIMINARY SERIES
SHEET 93A (West Half)
SHEET 93A (East Half)
QUESNEL LAKE
HORSEFLY
CARIBOO
MOUNTAINS
PROVINCIAL PARK
WELLS GRAY PROVINCIAL PARK
CANIM LAKE
NEHALLISTON
PROVINCIAL FOREST
BONAPARTE LAKE
Mitchell Lake
3
4
5
6
7 & 8
9
29 Till, gravel, clay, silt, alluvium (few if any bedrock exposures)
PLEISTOCENE OR RECENT
28 Basaltic cinder cone (incorporates cobbles of older rocks)
TERTIARY OR QUATERNARY
PLIOCENE OR PLEISTOCENE
27 27a, basaltic arenite, conglomerate, breccia, rubble; basaltic flows, locally pillowed; 27b, extinct basaltic volcanoes; basaltic flows and cinder deposits
TERTIARY
MIOCENE AND/OR PLIOCENE
26 Plateau lava; olivine basalt, basalt andesite, related ash and breccia beds; basaltic arenite; minor necks and plugs
MIOCENE
25 Shale, sandstone, tuff, diatomite, conglomerate, breccia
EOCENE
KAMLOOPS GROUP (23 and 24)
24 SKULL HILL FORMATION: dacite, trachyte, basalt, andesite, rhyolite, related breccias
23 CHU CHUA FORMATION: conglomerate, sandy shale, arkose, coal
EOCENE (?)
22 Andesite, dacite, felsite; related tuff and breccia; greywacke, shale; minor lignite and conglomerate
CENOZOIC
CRETACEOUS (?)
21 21a, biotite quartz monzonite and granodiorite; minor pegmatite, aplite, biotite-hornblende quartz monzonite; 21b, hornblende diorite; 21c, quartz diorite, diorite, granodiorite (may include some older rocks); 21d, aplite and leuco-quartz monzonite
LOWER CRETACEOUS
JACKASS MOUNTAIN GROUP
20 Greywacke, shale, siltstone; minor arkose and lenses of pebble conglomerate
JURASSIC (?)
19 Shale, grit
18 Chert pebble conglomerate, greywacke
MIDDLE JURASSIC (?)
17 Biotite granite, quartz diorite, hornblende granodiorite (phase of 14)
JURASSIC
LOWER AND (?) MIDDLE JURASSIC
16 Porphyritic augite andesite breccia, conglomerate and flows; minor andesitic arenite, flows, 16a, isolated areas of augite and hornblende andesite (may be all or partly intrusive)
LOWER JURASSIC
15 Andesitic arenite, siltstone, grit and breccia; local granite bearing conglomerate; minor argillite and flows; includes minor amounts of 12, 11, and (?) 2
TRIASSIC OR JURASSIC
UPPER TRIASSIC OR LOWER JURASSIC
14 Hornblende-biotite quartz diorite and granodiorite, minor hornblende diorite, monzonite, gabbro, hornblendite
13 13a, fine- to medium-grained, pink to brown and grey syenite and monzonite; 13b, medium-grained, creamy-buff, locally coarsely porphyritic (K-feldspar) syenite and monzonite (13b may be equivalent in age to 14 or 17)
TRIASSIC
UPPER TRIASSIC
NICOLA GROUP (11 and 12)
12 Augite andesite flows and breccia, tuff, argillite, greywacke, grey limestone; includes minor 2, 10, and 11
11 Black shale, argillite, phyllite, siltstone, black limestone
TRIASSIC AND/OR EARLIER
UPPER TRIASSIC AND/OR EARLIER
10 FENNELL FORMATION: pillow lavas, greenstone, foliated greenstone, greenschist, argillite, chert, minor amphibolite, limestone, breccia
9 9a, quartzite, quartz-phyllite, quartz-granule conglomerate, argillite, phyllite, calcareous phyllite, marble, greenschist, greenstone; 9b, dark grey and black argillite, siltstone, phyllite, minor limestone
8 Serpentinite and serpentinized peridotite
PERMIAN
UPPER PERMIAN
CACHE CREEK GROUP (IN PART)
7 MARBLE CANYON FORMATION: massive limestone, limestone breccia and chert; minor argillite, tuff, andesitic and basaltic flows
UPPER (?) PERMIAN
CACHE CREEK GROUP (IN PART)
6 Argillite, basaltic flows, tuff, chert, limestone
LOWER PERMIAN
CACHE CREEK GROUP (IN PART)
5 Basic volcanic flows, tuff, ribbon chert, limestone, argillite (may be equivalent in part to 6)
PERMIAN (?)
PAVILION GROUP (3, 4)
4 Tuff, chert, argillite, limestone, greywacke, andesitic and basaltic flows (may be equivalent in whole or in part to 5 or 6)
3 Chert, argillite, siltstone; minor tuff and limestone (may be equivalent in whole or in part to 5)
PENNSYLVANIAN AND PERMIAN
LOWER PENNSYLVANIAN TO LOWER PERMIAN
CACHE CREEK GROUP (IN PART)
2 Volcanic arenite, greenstone, argillite, phyllite; minor quartz-mica schist, limestone, basaltic and andesitic flows, amphibolite and conglomerate; includes small bodies of 14a
CAMBRIAN OR LATER
LOWER CAMBRIAN OR LATER
CARIBOO GROUP
1 SNOWSHOE FORMATION: feldspathic quartz-mica schist, locally garnetiferous, micaceous quartzite, black siliceous phyllite, quartz-hornblende-mica schist, marble, chlorite schist, greenstone, amphibolite
SHUSWAP METAMORPHIC COMPLEX
A Micaceous quartzo-feldspathic gneiss, quartz-mica schist, amphibolite, micaceous quartzite, pegmatite
Geological boundary (approximate)
Bedding, tops not indicated (inclined, vertical)
Schistosity and cleavage (inclined, vertical)
Fault (approximate, assumed)
Thrust fault (approximate, assumed)
Anticline (defined, approximate)
Syncline (defined, approximate)
Fossil locality
Mineral occurrence
MINERALS
Coal ... Coal
Copper ... Cu
Diatomite ... diat
Gold ... Au
Lead ... Pb
Molybdenum ... Mo
Silver ... Ag
Volcanic ash ... ash
Zinc ... Zn
Geology by R. B. Campbell and H. W. Tipper, 1964, 1965
Geological cartography by the Geological Survey of Canada, 1966
PUBLISHED 1966
COPIES OF THIS MAP MAY BE OBTAINED FROM THE DIRECTOR, GEOLOGICAL SURVEY OF CANADA, OTTAWA
MAP 3-1966
GEOLOGY
BONAPARTE RIVER
BRITISH COLUMBIA
Scale
Miles
12 Miles
Kilometres
18 Kilometres
PRINTED BY THE SURVEYS AND MAPPING BRANCH
Road, all weather
Other roads
Cart track
Trail
Railway
Station and stop
Airport
Horizontal control point
District boundary
Indian reserve
Intermittent stream
Marsh
Dam
Contours (interval 500 feet)
Base-map compiled and drawn by the Surveys and Mapping Branch, Department of Lands and Forests of British Columbia, 1954, 1955
Mean magnetic declination 23°41' East, decreasing 3.3' annually.
Readings vary from 23°19' in the SE corner to 24°06' in the NW corner of the map-area
Fig.15

Fig. 17

MAP REF. No.: 123-72-18

N.T.S.: 93-A



LEGEND

- Fine grained granodiorite.
- Medium grained granodiorite.
- Quartz monzonite.
- Slightly foliated quartz diorite - diorite.
- Traverse.
- Traverse station.

FALCONBRIDGE NICKEL MINES LTD.

PROPERTY: MOFFAT LAKES

LOCATION: 93A/2W-3E

TYPE OF MAP: GEOLOGY RECONNAISSANCE

BASED ON: Traverse mapping.

DATE OF WORK: August 1972

DATE: Feb. 1973

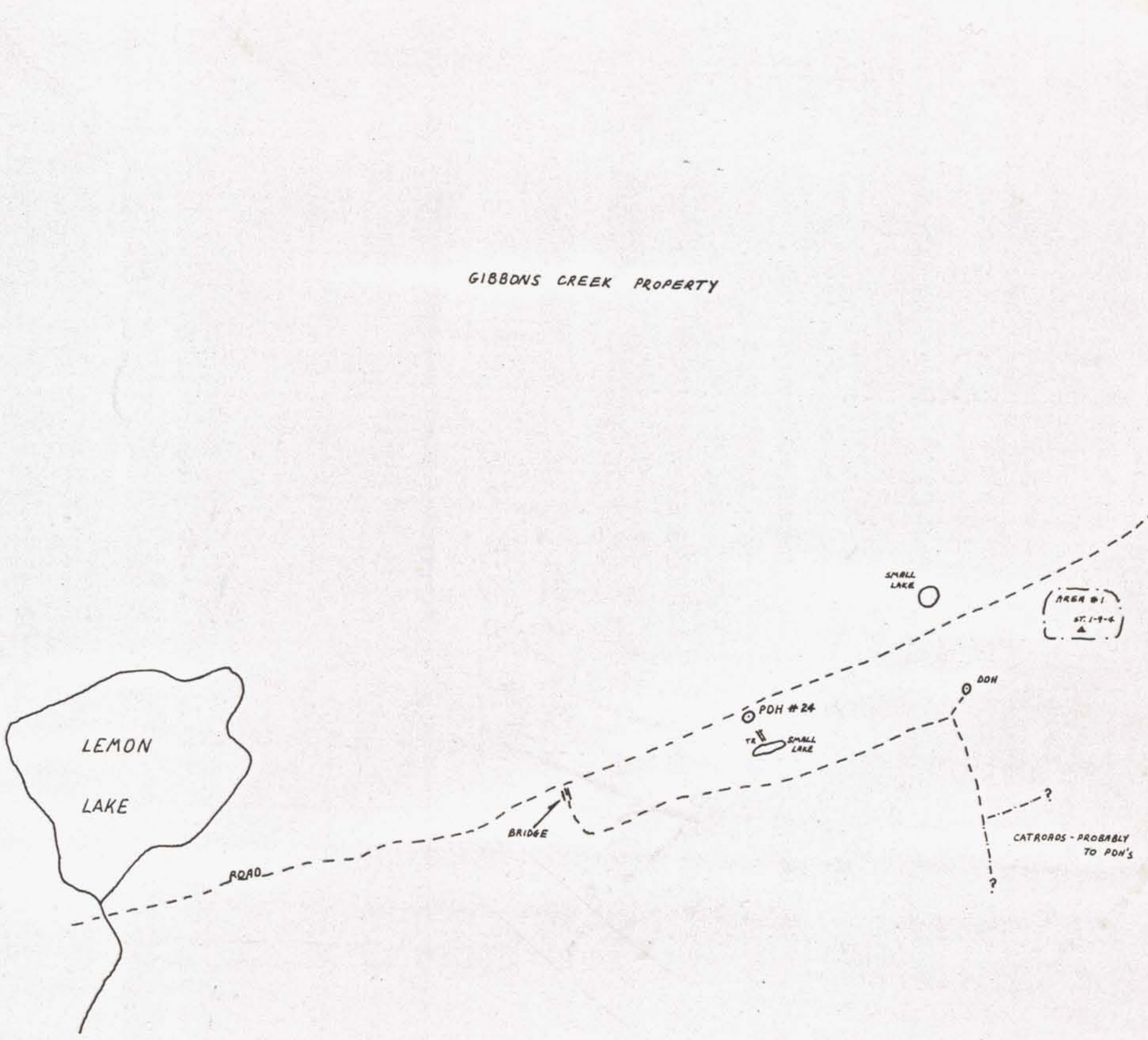
DRAWN BY:

0 1 2 3

SCALE: 1 INCH TO 1 MILE

BCIL - 2547 - F.N.M.

GIBBONS CREEK PROPERTY



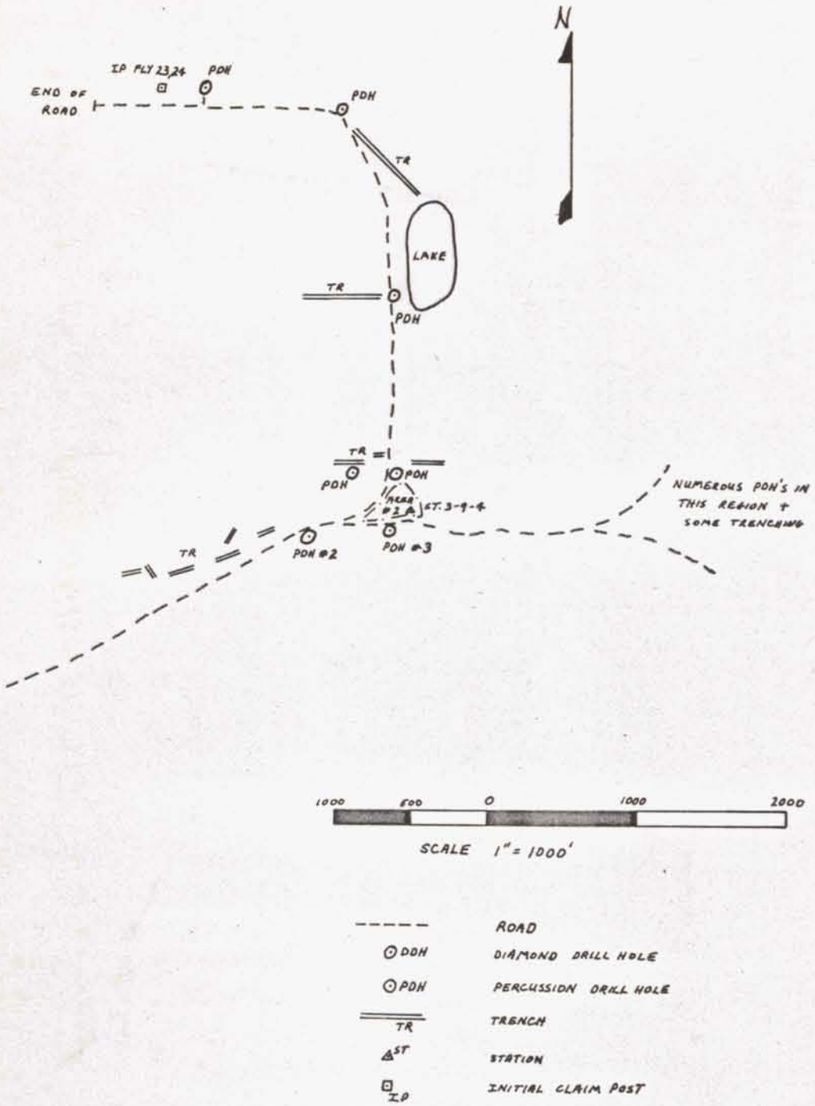


Fig. 20