8343

GEOPHYSICAL SURVEY
AND
GEOLOGICAL AND GEOCHEMICAL EVALUATION

HIXON CREEK GOLD PROJECT
CARIBOO MINING DIVISION
BRITISH COLUMBIA
122°31'W, 53°27'N

prepared for
GOLDEN RULE RESOURCES LTD.
CALGARY, ALBERTA

by
Michael St.C. Fox
TAIGA CONSULTANTS LTD.
CALGARY, ALBERTA

SEPTEMBER 8, 1980

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STATEMENT OF QUALIFICATIONS

I, Michael St.Clair Fox, do hereby certify that:

1. I am a practising professional geologist with an office at #301, 1300 - 8th Street S.W., Calgary, Alberta;

2. I am a graduate of the University of British Columbia with a B.Sc. in Geology (1974) and that I have been practising my profession since that date;

3. I am a member in good standing of the Association of Professional Engineers, Geologists and Geophysicists of Alberta;

4. I have personally worked on the claims and supervised exploration work carried out there.

Respectfully submitted,

1980

Michael St.Clair Fox, P.Geol.

SUMMARY

The Hixon Creek gold prospect is a 1,250-hectare property situated on Hixon Creek approximately 54 km south of Prince George, British Columbia.

Placer and lode gold deposits along Hixon Creek have been known at least since the 1860's. The lode deposits were worked intermittently from the 1860's to the 1930's, with several hundred feet of underground development having been completed on the property. Past production has been quite limited, totalling only a few hundred tons, but has demonstrated the presence of economic grades of gold mineralization. Placer production has continued sporadically to the present day.

Economic gold values are associated with a zone of shearing, quartz veining, and carbonatization in a greenstone formation, adjacent to a greenstone-schist contact. Significant potential exists for the development of a low-grade, large-tonnage precious metals deposit in the greenstone.

This report describes a 14.9 line km ground magnetic survey carried out on the property in 1980, and evaluates previous work and the geologic potential of the property. Further systematic exploration is recommended, to proceed in two phases. The first phase is to consist of additional detailed, grid-controlled ground magnetic surveying and geochemical soil sampling along the greenstone formation, to be followed by a second phase of diamond drilling, contingent upon sufficiently encouraging results from the first phase.

INTRODUCTION

Property, Location, and Access

The Hixon Creek gold prospect presently consists of one 4-unit, one 6-unit, and two 20-unit mineral claims (modified grid staking), and six 2-post mineral claims. The centre of the property is located at the approximate geographic coordinates 122°30'30" West longitude and 53°26'30" North latitude (Figures 1 and 2). The property is situated approximately 54 km south-southeasterly from Prince George, British Columbia, and 4 km easterly from the town of Hixon. A well-maintained logging road crosses the southern part of the property and connects it with B.C. Highway 97, at a point about 10 km to the west. An alternate maintained route crosses the central part of the property, connects with the logging road, and joins Highway 97 at the settlement of Hixon.

Ownership

The above-described mineral claims are presently owned by and registered in the name of Golden Rule Resources Ltd. of Calgary, Alberta. Ownership is subject to certain conditions of an option agreement currently in force on some of the claims. The claims are described more specifically as follows:

Claim Name	No. of Units	Tag Number	Record Number	Assessment Due Date
HQ	4	15604	856(9)	Sept. 25, 1980
HQ 2	20	15601	969(4)	April 9, 1981
HQ 3	6	15605	970(4)	April 9, 1981
HQ 4	20	48053		July 25, 1981
Hixon Quartz 1			61413	Dec. 16, 1980
Hixon Quartz 2			61414	Dec. 16, 1980
Hixon Quartz 3			821(9)	Sept. 1, 1980
Hixon Quartz 4			822(9)	Sept. 1, 1980
Hixon Quartz 5			823(9)	Sept. 1, 1980
Hixon Quartz 6			824(9)	Sept. 1, 1980

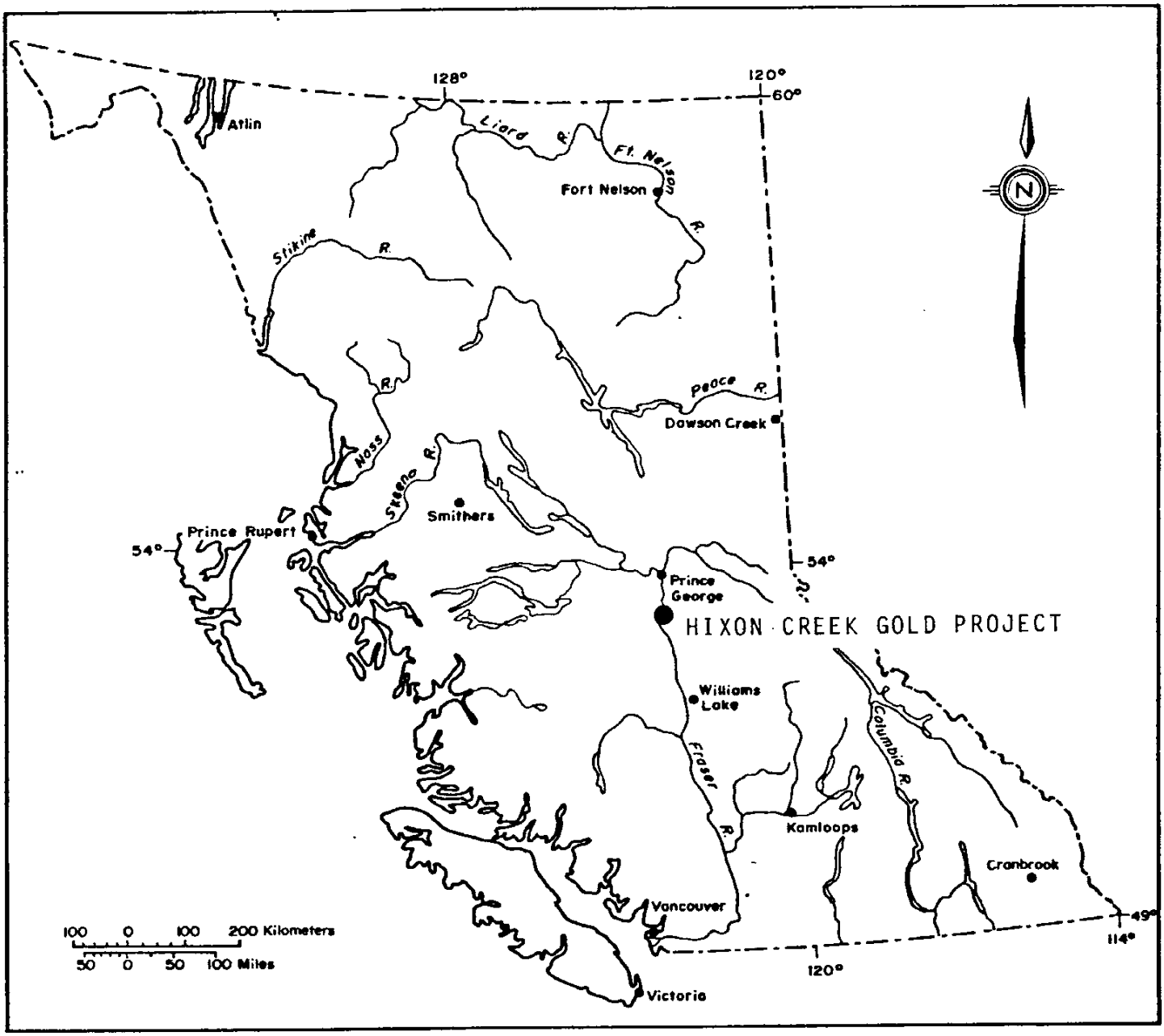


FIGURE 1. General location map.

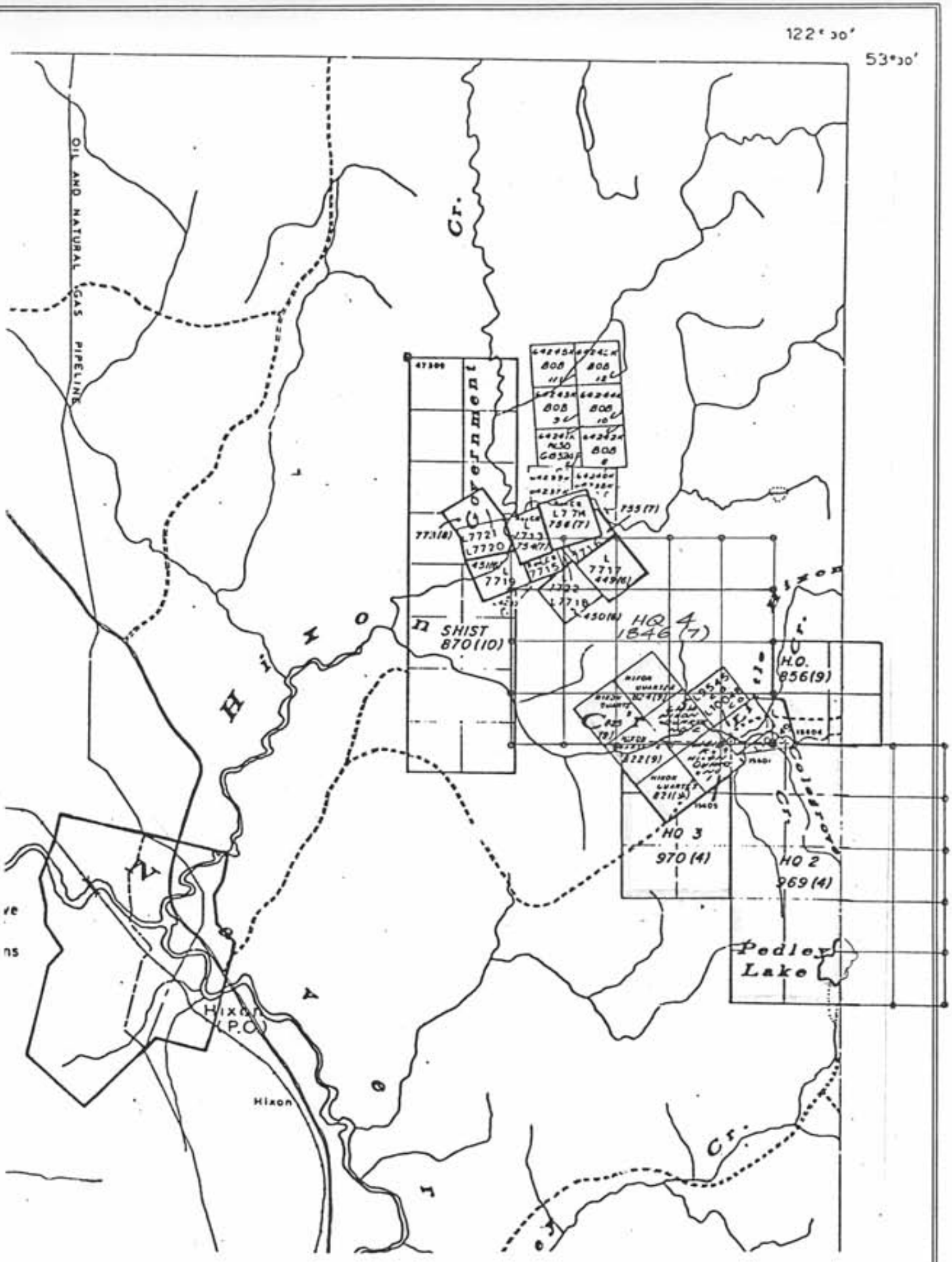


FIG. 2
SCALE: 1:50,000

Property Location
Hixon Property

The claim group totals 1,250 hectares in area and is situated entirely within the Cariboo Mining Division.

History

Placer and lode gold deposits have been known at Hixon Creek at least since the 1860's. Placer production has continued sporadically from then until the present day, but lode mining has a less consistent history of development.

In the 1870's, a company known as Quesnelle Quartz Mining Co. Ltd. was incorporated and subsequently carried out most of the presently existing underground development. This company erected a stamp mill on the property and was reported to have milled 239 tons of ore averaging slightly more than 1 oz. of gold per ton. Operations ceased in the 1880's and the property lay dormant until 1918, when a new adit of about 100' in length was driven. This option lapsed and the property again lay dormant until 1929 when Cariboo Lode Mines Ltd. rehabilitated the old adits, but were unsuccessful in their attempts to unwater the three shafts sunk in the late 1800's. In 1933 and 1934, the Quesnelle Quartz Mining Co. Ltd. (a reorganization of the original company bearing the same name) unwatered the shafts, permitting examination of the underground workings for the first time in half a century. A new adit was started, in 1933, on the opposite side of the creek from the main shaft. Additional headings, rasies, and winzes were driven from the existing workings. This work is described in the Minister of Mines Annual Reports for 1935, 1936, and 1937, but no plans of the workings are available to the writer. From that time until the early 1970's, the property again lay dormant until Bethlehem Copper Corp. Ltd. carried out semi-reconnaissance surface exploration over a large area surrounding the original workings.

Physiography

The property is located within the Interior Plateau physiographic subdivision of British Columbia, characterized by low, rolling, flat-

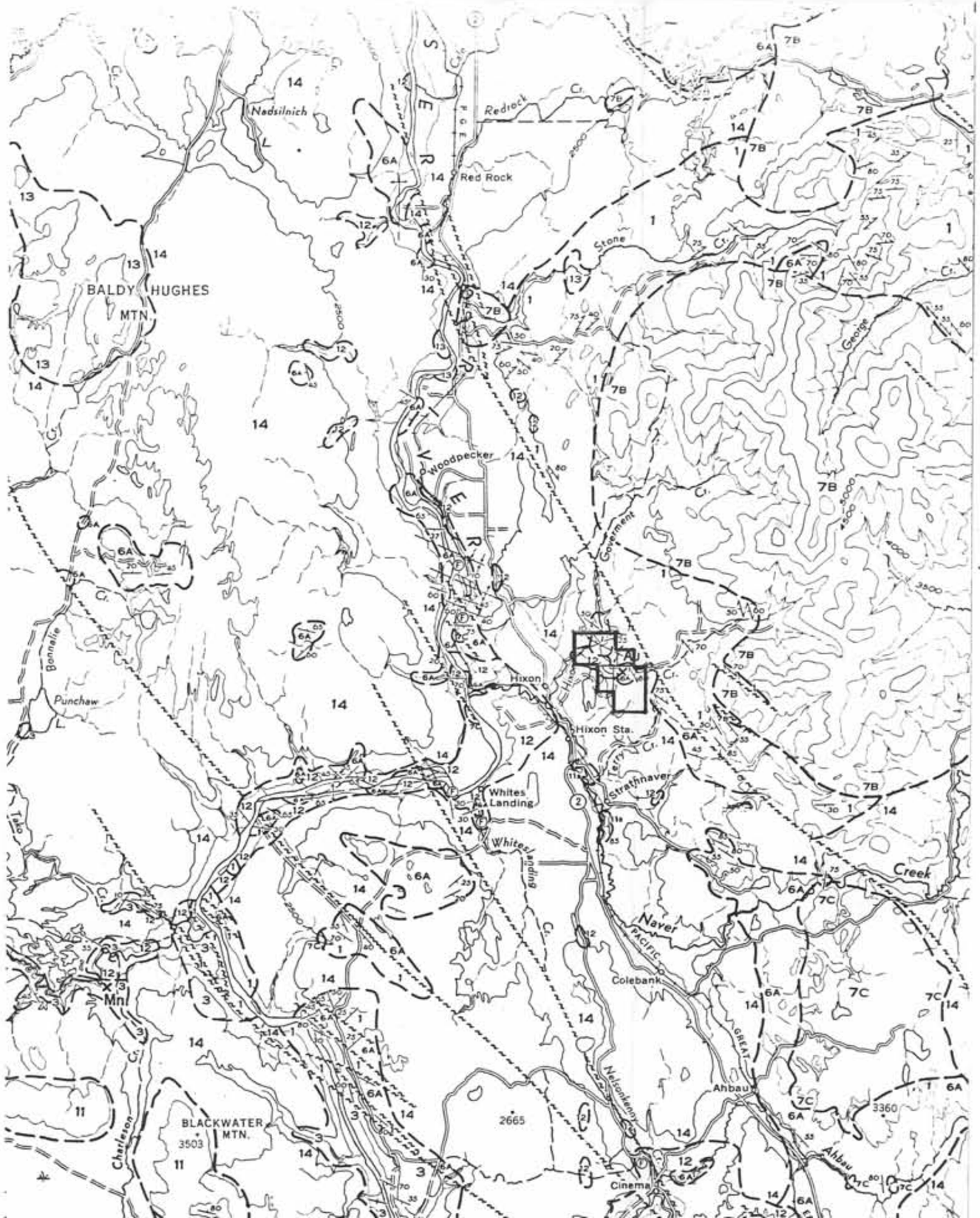
topped or gently rounded hills, wide valleys, and thick glacial deposits. Topographic relief on the claims is moderate, about 500' (152 m), and elevations range from approximately 2250' (686 m) to 2750' (838 m) ASL. This drumlinoid terrain was produced by a northerly moving ice sheet with a consequent north-south orientation of drumlinoid ridges.

A thick immature coniferous growth is present over most of the claims area. A few park-like stands of pine grow in restricted areas along well-drained ridge crests, but dense undergrowth and windfall predominates over the rest of the property.

REGIONAL GEOLOGY

Bedrock exposures in the map-area occur infrequently due to the low-lying terrain, and as a result, the geology of the area is not well known. The property is situated over an intensely faulted zone that characterizes the boundary between the Omineca Crystalline Belt and Intermontane Belt geologic provinces (Figure 3). A short distance east of the property, a Lower Paleozoic section of quartzite, phyllite, argillite, and minor limestone has been domed over a large Lower Jurassic boss composed of quartz monzonite, monzonite, and granitic phases. Just east of the Hixon gold property, the Lower Paleozoic metamorphic rocks are in fault contact with Upper Triassic(?) greenstones, related tuffs and breccias, argillite, greywacke, and minor conglomerate and limestone. These rocks are the host rocks for gold mineralization at the property. Unconformably overlying the Triassic rocks is a Miocene formation consisting of conglomerate, sandstone, mudstone, and lignite. It is surmised that the Tertiary rocks are the source of gold in the placer deposits in the immediate area. Although the extensive Pleistocene deposits preclude detailed surface geological mapping, the Triassic rocks are known to have a northwesterly regional strike and are tightly folded and in places overturned to the northeast. (Tipper, 1961)

FIG. 3.
1 : 253,440



LEGEND

CENOZOIC

QUATERNARY
PLEISTOCENE AND RECENT

14 Till, gravel, sand, clay, and silt

TERTIARY
MIOCENE AND/OR LATER
ENDAKO GROUP

13 Basalt, andesite, related tuff and breccia

MIOCENE (?)

12 Conglomerate, sandstone, mudstone, lignite, and diatomite

PALEOCENE (?) TO OLIGOCENE

11 Andesite, basalt, breccia, and tuff; 11a, minor sediments

10 Rhyolite, dacite, trachyte, related tuff and breccia; minor sediments

9 Andesite, basalt, breccia, and tuff; minor rhyolite

MESOZOIC

JURASSIC
MIDDLE JURASSIC
HAZELTON GROUP (in part)

8 Green to dark grey andesite and basalt, related pyroclastic rocks, chert-pebble conglomerate, argillite, and greywacke

LOWER JURASSIC AND (?) LATER

7 7A. TOPLEY INTRUSIONS: granodiorite, quartz diorite, diorite, biotite granite
7B. Quartz monzonite, monzonite, and granite; minor diorite
7C. Granodiorite, diorite, granite, minor gabbro

TRIASSIC AND JURASSIC
UPPER TRIASSIC (?) AND LOWER JURASSIC (?)

6 6A. Eastern group: argillite, greywacke, green, grey, black, purple andesite and basalt and related tuffs and breccias; minor conglomerate and limestone
6B. Western group: chert-pebble conglomerate, red, brown, and black shale, greywacke; minor purple to green andesite

TRIASSIC
POST-PERMIAN, PRE-UPPER TRIASSIC (?)

5 Serpentinized peridotite, serpentinite

PALAEOZOIC

PENNSYLVANIAN (?) AND PERMIAN
CACHE CREEK GROUP

3 4 3. Black to dark grey ribbon chert, black argillite
4. Green to black basic volcanic rocks, grey limestone; minor argillite and chert; 4a, mainly grey limestone

MISSISSIPPIAN (?)
SLIDE MOUNTAIN GROUP

2 Grey and buff chert, argillite, basalt and related pyroclastic rocks; 2a, diabase

CAMBRIAN AND/OR LATER
LOWER CAMBRIAN AND/OR LATER
CARIBOO GROUP

1 Grey micaceous quartzite, black to dark grey phyllite and argillite; minor grey limestone

PROPERTY GEOLOGY

As previously stated, bedrock exposures are rare as a consequence of the low relief and thick Pleistocene deposits. Previous mapping carried out in 1971, when the property was under option to Bethlehem Copper Corp. Ltd., indicated that outcrops constitute less than 0.5% of the property area. Geological mapping carried out at that time by D. C. Miller, P.Eng., outlined a few scattered outcrops of greenstone near the north end of Pedley Lake, fewer than half a dozen small outcrops of phyllite and sericite schist approximately 1 km west of the confluence of Hixon and Little Hixon Creeks, and two small outcrops of biotite-muscovite-feldspar-quartz schist approximately 2 km north of Pedley Lake (Figure 4). Foliations in the greenstone range from 310^{o} to 335^{o} Azimuthal, and dips are 50^{o} to 80^{o} NE, similar to the regional strike and dip. Attitudes in the schists are similar. Miller also mapped a number of exposures of intrusive rocks approximately 3 km westerly from the exposures of phyllite and sericite schist. The intrusive exposures are outside of the limits of the present claim group.

In 1933 and 1934, personnel of the British Columbia Department of Mines mapped the old underground workings which were at that time dewatered and reopened. It was determined that the greenstones were in contact with quartz-sericite schists along a highly sheared and hydrothermally altered zone. The greenstones were seen to be highly carbonatized adjacent to the contact; this zone of carbonate alteration is represented by a friable, orange-brown weathering, kaolinized zone at surface. The distribution of precious metals values is closely related to this zone.

Although the greenstones on the property have been mapped as Upper Triassic and Lower Jurassic in age (i.e., correlative with the Nicola-Takla Groups), no associated sediments or diagnostic fossil assemblages are found within the greenstones on the property. The degree of metamorphism of the greenstones and intimately associated schists is atypical of the Nicola-Takla Groups and more closely resembles rocks found within

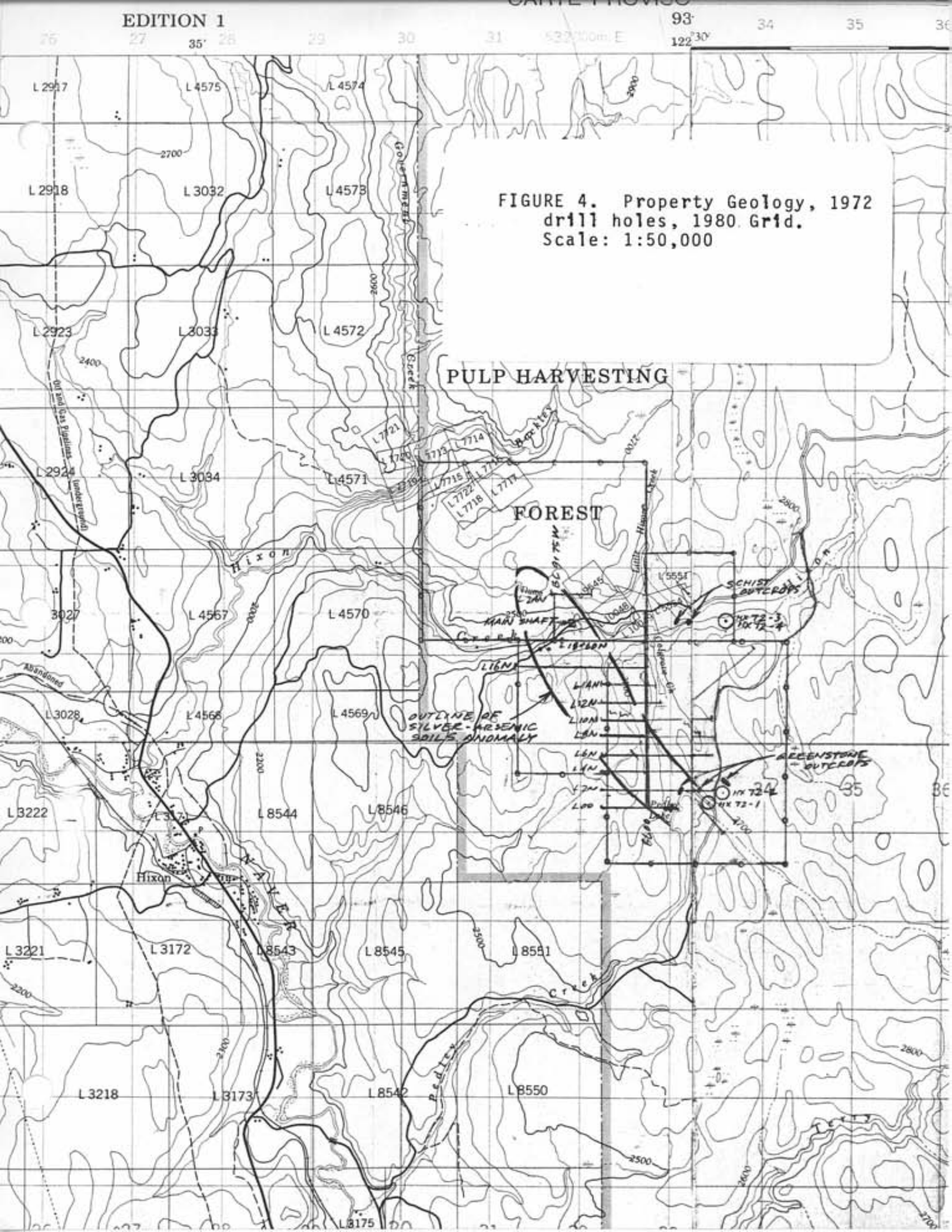
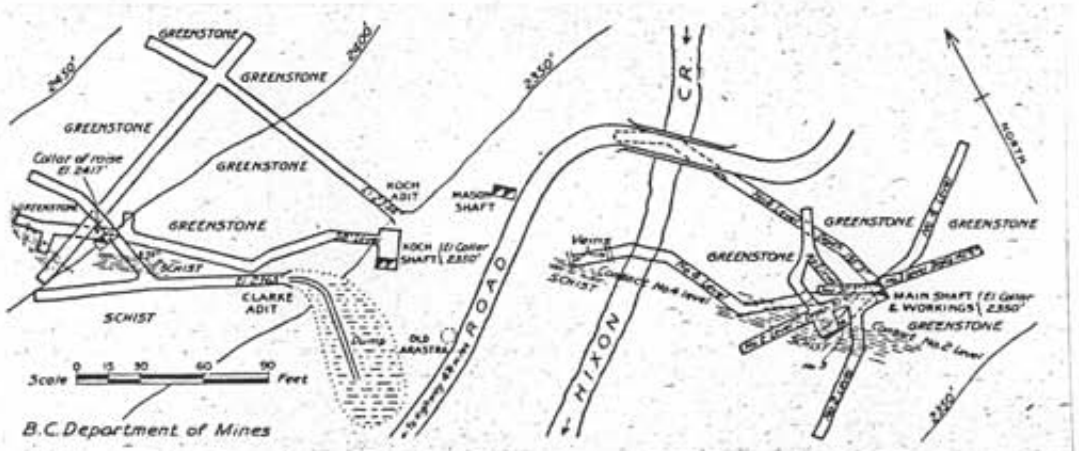


FIGURE 4. Property Geology, 1972 drill holes, 1980 Grid. Scale: 1:50,000

the Omineca Crystalline Belt. Similar rocks found in the extreme south-western corner of the adjacent McBride map-area (see GSC Map 1356A) are also problematical in their relationship to metamorphosed Upper Proterozoic and Lower Paleozoic rocks of the Omineca Crystalline Belt on the east and relatively unmetamorphosed Mesozoic arc-type volcanic and sedimentary rocks on the west.

ECONOMIC GEOLOGY / PREVIOUS WORK

Placer gold on Hixon Creek and its tributaries has been known since the days of the Cariboo gold rush. The earliest records of lode prospecting in the area are incomplete, but it is thought to date back to the 1860's or 1870's (Galloway, 1932, p.47). In a report to the Minister of Mines, dated 1878, John Bowron, Gold Commissioner for the Cariboo District, stated that six men had been employed by the Quesnelle Quartz Mining Co. Ltd. on Hixon Creek from which property they had taken out ore of "a higher grade than any yet found in the district" (MMAR, 1878, p.374). In the Minister of Mines Annual Report for 1919, work carried out on the ground in 1918 was described as being mainly rehabilitation of old workings which were then reported to consist of three shafts and an adit, all caved. At that time, a small ore dump was present beside the ruins of an old stamp mill. This work met with little success although a new adit was driven for a distance of about 100'. In 1929, the property once again received short-lived attention from Cariboo Lode Mining Ltd., who cleared the old adits. The main shaft and related workings were finally dewatered in 1933 by the Quesnelle Quartz Mining Co. Ltd. (a reorganization of the company that had first carried out work on the prospect half a century before), and examined by personnel of the British Columbia Department of Mines. It was found that the old workings were located at a greenstone-schist contact that has a northwesterly strike (N 42^{o} W) and a steep northeasterly dip. The greenstone along the contact is hydrothermally altered to carbonate, quartz, a green chloritic mineral (probably mariposite), and an unidentified chocolate-colored iron silicate mineral. Along the northwesterly striking, sheared contact, a network of discontinuous northeasterly striking quartz veins are developed in the greenstone. Pyrite, chalcopyrite, galena, sphalerite, arsenopyrite, molybdenite, native gold, and native silver occur both in the veins and in the greenstone. Sampling carried out in the 1930's indicated erratic values in the quartz veins, although it was suggested that "...a considerable width of vein and country rock (greenstone) in the vicinity of the contact (might) constitute commercial ore." (MMAR, 1935, p.C4). The results of the sampling carried out in 1934 and a plan of the old workings are shown in Figure 5 (from MMAR, 1935, p.C3).



Quesnelle Quartz Mining Co. Plan of Workings as in 1934.

FIG. 5.

The above workings are located on the Hixon Quartz 1 and 2 two-post mineral claims. The "Main Shaft" is collared at a point approximately 30 m west of the presently existing bridge across Hixon Creek. Thus, neither the known mineralized greenstone contact nor any of the old workings are situated on the three Crown grants which do not constitute part of the property described in this report (see Figure 2). When the property was examined in August 1980, only the position of the main shaft was determined, since the other workings are too badly caved and overgrown to be located with any degree of certainty.

The veins along the greenstone-schist contact range from hairline fractures to as much as 6' in width. The veins nearly all terminate abruptly at the contact with the schist, and extend only a limited distance into the greenstone away from the contact. It is tempting to conclude that the veins are tensional structures along a major fault which follows the greenstone-schist contact. However, the northeasterly strikes and steep dips of the veins would be more easily reconciled with east-west or north-south directed faulting and it may be that there are other as yet unrecognized structural controls of auriferous mineralization.

GEOPHYSICS

Prior to the 1980 property work, existing geophysical coverage of the property was restricted to government aeromagnetic surveying. A portion of GSC Map 1548 is shown in Figure 6 with the boundaries of the present claim group outlined. The northwesterly trending magnetic 'high' that crosses the property is the magnetic expression of the greenstone formation.

Reconnaissance ground magnetic surveying was carried out to outline the contacts of this zone. Line spacings used were 200 metres, with readings being taken at 25-m intervals along the grid lines. The grid was laid out to cover the area between the old workings and the greenstone outcrops mapped near Pedley Lake. The results of the survey indicate that the greenstone formation is continuous across the property between those two points, and is open along strike at both ends of the grid. Several faulted offsets are also apparent. Profiles of the magnetic data do not indicate a consistent northeasterly dip along the strike length of the formation. The structure appears to be fairly complex, with the greenstone formation bifurcating at the southern end of the property. Folding, changes in dip, changes in hte thickness of the formation along strike or laterally, or faulting may all be factors in the magnetic expression of the formation. These possibilities should be investigated by additional more detailed ground magnetic surveying.

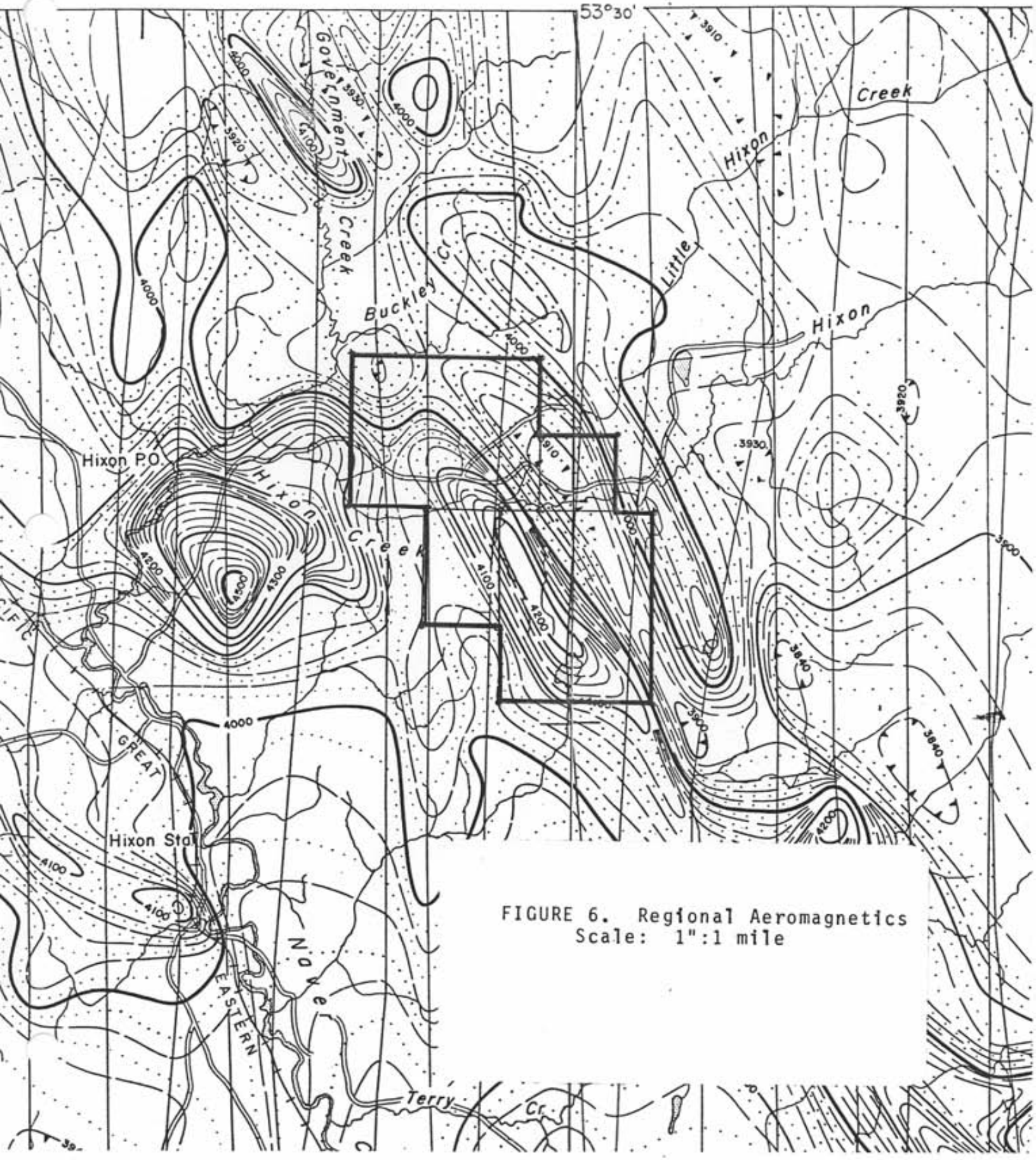


FIGURE 6. Regional Aeromagnetics
Scale: 1":1 mile

GEOCHEMISTRY

In 1971, grid-controlled geochemical sampling was carried out by personnel of Bethlehem Copper Corp. Ltd. A total of 579 samples were collected at intervals of 500' along lines nominally spaced 600' apart. The samples were analyzed for As, Ag, and Au. Significant anomalous zones are shown in Figure 4. In this writer's opinion, there were two major faults in the above described survey:

1. Cross lines were run parallel to regional strike and the known trend of mineralization along the greenstone-schist contact.
2. Sample intervals (500') and line spacings (nominally 600') were inappropriately large for a precious metals exploration program.

Notwithstanding the above, the survey was successful in outlining several broad northerly trending zones, anomalous in As and Ag. The anomalous zones parallel the regional glacial trend but no discussion of the possible relationship between glaciation and geochemical dispersion was included with the Bethlehem report. It is the opinion of this writer that the northerly trend of the anomalous zones is the result of northerly directed glacial dispersion, in the drumlinoid terrain, of anomalous zones associated with the northwesterly trending greenstones. Detailed soil geochemistry at maximum sample intervals of 25 m and maximum line spacings of 100 m would undoubtedly be useful in refining and interpreting the presently known anomalous trends. Field mapping of glacial features would be an essential adjunct to the above work.

DIAMOND DRILLING

Subsequent to the geochemical sampling and geological mapping carried out in 1971, Bethlehem Copper Corp. Ltd. carried out a diamond drilling program on the Hixon property in 1972. Four holes were drilled with collar locations shown in Figure 4. The results of drilling and drill hole data are summarized below:

Drill Hole	Bearing	Dip	Depth	Intersections	
HX-72-1	S54°W	-60°	511'	0- 94	overburden
				94-511	greenstone
HX-72-2	N49°E	-60°	501'	0- 60	overburden
				60-501	greenstone (tuffs, flows, breccias)
HX-72-3	S4°E	-60°	300'	0- 50	overburden
				50-300	conglomerate
HX-72-4	N4°W	-60°	160'	0- 30	overburden
				30-165	conglomerate

The drill holes do not appear to have been collared to intersect specific targets, but rather to investigate poorly defined zones of high Au values in soils. In this regard, drilling was carried out prematurely. It is considered, by this writer, that well-defined drill targets could be established by detailed ground magnetic surveying and detailed soil sampling over greenstone contacts defined by the ground magnetics. The greenstones show a strong response on the existing government aeromagnetic survey of the area, yet Bethlehem made no apparent attempt to use ground geophysics to position the drill holes to intersect the greenstone contact. It should be borne in mind that, even with well-defined ground magnetics and properly detailed and interpreted geochemical results, adequate drill hole investigation of the potentially mineralized contact will still be a difficult proposition. On the basis of information presently available to the writer, it appears that the northwesterly trending, northeasterly dipping greenstone-schist contact would be most appropriately investigated by northerly or southerly inclined drill holes collared east of the contact. Although a southwesterly inclination would be the ideal orientation of drill holes for locating the contact, it would unfortunately be subparallel

to the northeast-trending fracture zones assumed to be localized along the greenstone-schist contact. Northerly or southerly inclined holes should intersect northwesterly trending regional structures and northeasterly trending mineralized structures at angles amenable to the economic and geologic evaluation of the contact zone.

CONCLUSIONS AND RECOMMENDATIONS

Limited production of gold ores from a mineralized greenstone-schist contact on the property took place in the late decades of the last century. Economic grades are associated with disseminated sulphides in carbonatized greenstone and sparse sulphides in northeasterly striking quartz-filled shears of limited strike length which occur in the greenstone adjacent to the greenstone-schist contact. Aeromagnetic data, ground magnetic data, and presently available geological information indicate that the greenstone belt trends northwesterly across the property. The quartz veins may be tensional features related to shearing along the greenstone-schist contact. Previous sampling of the quartz veins has indicated that gold values in them are erratic. However, the greenstone host and the vein zones taken together have significant potential for the development of a large-tonnage, low-grade precious metals deposit (ref. to previous rock chip sampling in 1930's).

Previous work on the property includes several hundred feet of underground development carried out in the 1860's, -70's, and -80's, in 1918, in 1929, and in the early to mid-1930's. Grid controlled geochemical sampling and geological mapping were carried out on the property in 1971, followed by diamond drilling in 1972. Grid orientation, sampling interval, and line spacings of the 1971 work are considered by this writer to be inappropriate for a meaningful geochemical investigation of the mineralized zone, although some weak anomalous trends were outlined that show a spatial relationship to the greenstone formation. Diamond drilling was carried out prematurely, without the benefit of detailed geochemical and geophysical surveys, and was predictably unsuccessful in evaluating the greenstone zone.

The property presently affords considerable encouragement for more systematic exploration. Further work is recommended, to proceed in two phases. The first phase of work should consist of tightly controlled ground magnetic surveying to outline the greenstone formation and any important structures on the property. Detailed geochemical soil sampling along the margins of the greenstone formation should be carried out at the same time. Cross-lines on the grid should be oriented northeast-southwest. Samples and magnetic readings should be taken at 25-m intervals along grid

lines not more than 100 m apart. The interpretation of geochemical results should be made with due consideration being given to any possible relationship of the results to local glacial features. Contingent upon the success of this phase of exploration, diamond drilling should be carried out.

STATEMENT OF EXPENDITURES

CLAIMS: HIXON QUARTZ 1, 2, 3, 4, 5, 6
HQ, HQ 2, HQ 3, HQ 4

TIME: July 16-Sept. 18, 1980

PRE-FIELD PREPARATION					$ 225.00
FIELD PROGRAM					
Personnel					
Project Geologist	Field	July 17-23	7 days @ $240	1,680.00	
	Office	July 25	1 day @ $150	150.00	
		Aug. 1-5	3½days @ $150	525.00	
		Sep. 18	1 day @ $150	150.00	2,505.00
Prospector	Field	July 17-25	9 days @ $145		1,305.00
Geophysical Operator		July 17-25	9 days @ $145		1,160.00
Camp & Accommodation					
Food	24 field man days @ $17/man day			408.00	
Camp Equipment	24 field man days @ $ 4/man day			96.00	504.00
Equipment Rentals					
3/4-ton 4x4 truck	9 days @ $35/day			315.00	
Scintrex MP-2 magnetometer	7 days @ $20/day			140.00	455.00
Travel Expenses					
includes mobilization and demobilization July 16-Sept. 2, 1980					910.64 *
Disposable Materials & Supplies					
Flagging, hip-chain thread, notebooks, etc.					92.33
Miscellaneous					
Telephone, Freight, Courier					72.10 *
* **Service Charge** on all third-party invoices, 10% x 982.74					98.27
POST-FIELD COMPILATION					
Maps, reproductions, drafting, secretarial				412.50	
Report writing				700.00	1,112.50
			TOTAL EXPENDITURES		$ 8,439.84

REFERENCES

B.C. Department of Mines
Assessment Report 3484

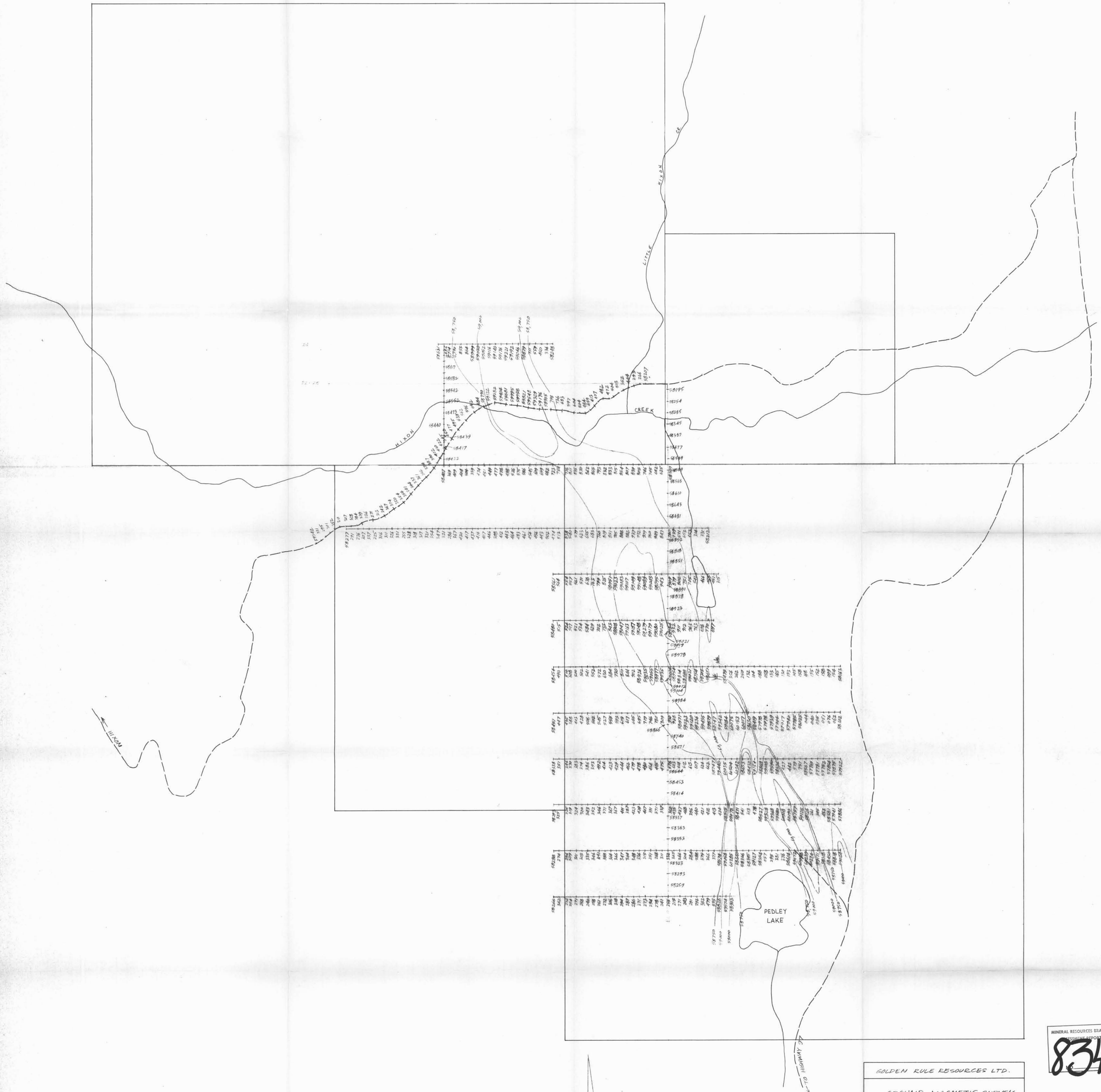
B.C. Minister of Mines Annual Reports

1918	p. 128 K
1919	p. 189
1930	p. A161
1933	p. 119
1934	p. C19
1935	p. C2, G44
1936	p. C38
1937	p. C33
1939	p. 108

Geological Survey of Canada
- Bowman, 1888, Summary Report for 1888, p.48C
- Reinecke, 1920, GSC Memoir 118, p.105
- Tipper, 1960, GSC Map 49-1960

Bethlehem Copper Corp. Ltd.; drill report

Galloway, John D., 1932:
Lode Gold Deposits of British Columbia
(B.C. Dept. of Mines Bulletin No. 1)


LITTLE HIXON CR
HIXON CREEK
HIXON
PEDLEY LAKE
TO HIGHWAY 97
0 100 200 300 400 500 METERS
SCALE : 1:5,000
INSTRUMENT : SCINTREX MPS-2
CONTOUR INTERVALS : 58750, 59000, AND 60000 NANOTESLAS
GOLDEN RULE RESOURCES LTD.
GROUND MAGNETIC SURVEY
HIXON CREEK GOLD PROJECT
NTS 93 G-7E AND 93-G-8W
DATE SEPT, 1980
SCALE 1:5,000
MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
8343