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Report on the H and Horace Claims on Criss Creek in the Kamloops Mining Division, B.C.

M. McClaren

H. Visagie

March 18, 1975.

OPTION TERMS

YEAR 1	$4000 CashPayment
	$20000 Work Commitment
YEAR 2	$9000 Cash Payment
	$40000 Work Commitment
YEAR 3	$20000 Cash Payment
	$100,000 Work Commitment

Net Smelter Return 10%

At agreement of optioners and optionees a buy-out of N.S.R. can be made.

Advancement on Net Proceeds

Deductible from future net proceeds, $50,000 per year and adjustable with the cost of living index.

Perimeter Clause

Both parties are committed that any ground staked within 3000' of the outer boundary of the claims is subject to the terms of agreement.

Claim Status

If the claims are returned to the owners they will be returned with 1 year good standing.

Information

All information will be handed over to the optionees at the expiry of the option.

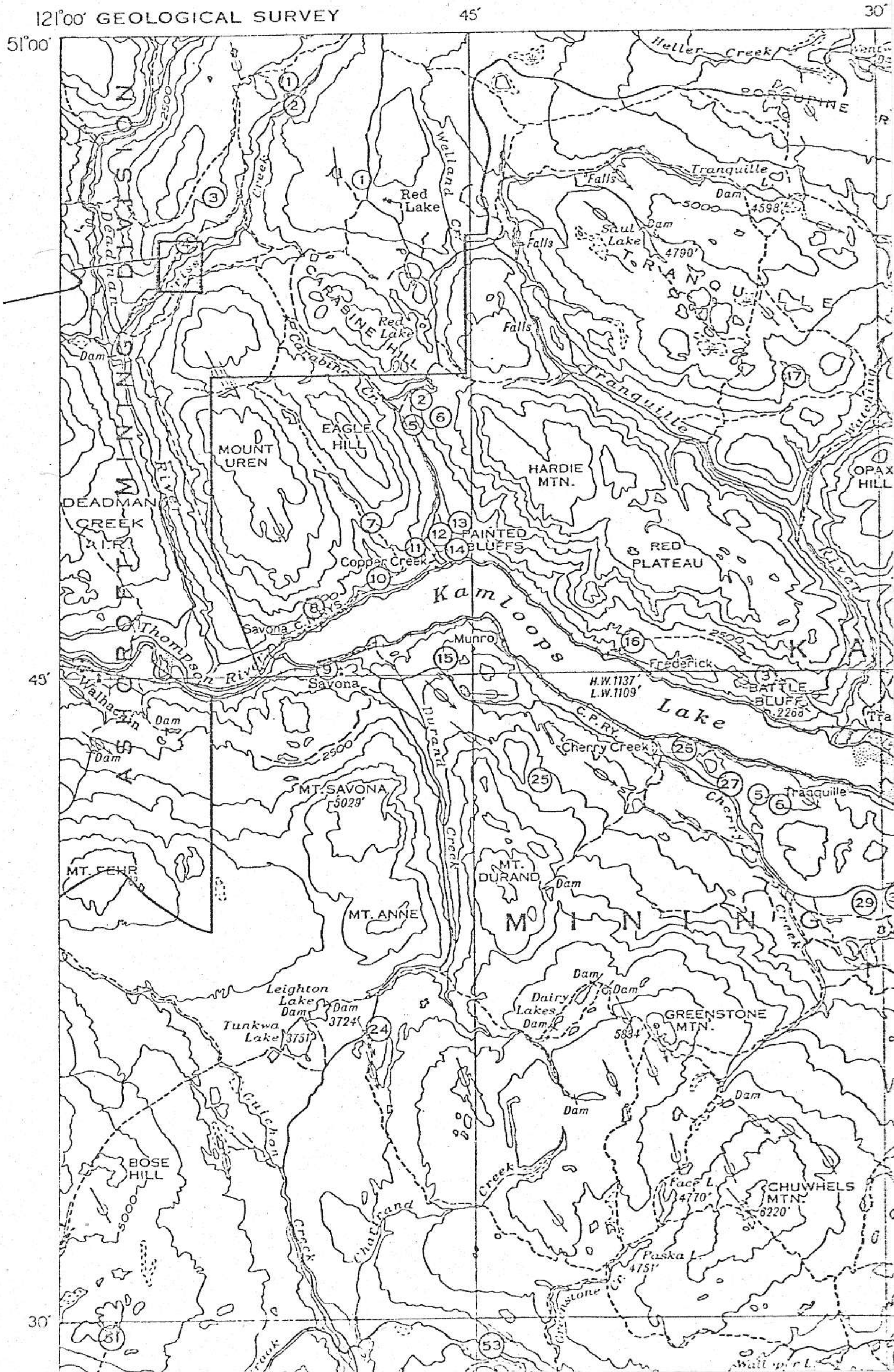
CANA

DEPARTMENT OF MINE

MINES AND GEO

BUREAU OF GEOLOGY

H AND HORACE CLAIMS



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SUMMARY

The H and Horace claims are situated on Criss Creek in the Kamloops Mining Division of British Columbia.

The claims cover andesites, tuffs, limestones and cherts of the Upper Triassic Nicola group. Extensive areas of these lithologic units have been altered to minerals of a propylitic alteration assemblage. Sulphide minerals found on the claims consist of pyrite, cinnabar, realgar, stibnite and tetrahedrite. These minerals are found in fracture-fill and replacement veins. The environment of deposition of the mineralization is epithermal.

There is a widespread silver geochemical anomaly and a weak gold geochemical anomaly on the H and Horace claims. It is suggested that these anomalies may be geochemical halos peripheral to and above a stockwork-replacement deposit consisting of a large volume of low grade fracture-filling and disseminated precious metal mineralization.

A program of geological mapping and chip sampling is recommended.

INTRODUCTION

This report is of the H and HORACE groups of mineral claims held by M. McClaren and H. Visagie, in the Kamloops Mining Division of B.C.

This report is based on the results of a program of geochemical soil sampling carried out by Manny Consultants during the months of July, August and September, 1972 and reconnaissance carried out by the owners during the months of November, 1974 and March, 1975.

PROPERTY

The property lies in the Kamloops Mining Division, B.C. and consists of a block of 20 claim units.

The H group overlies the Horace 1 - 4 mineral claims. The H claim consisting of 20 units was staked by H. Visagie in March, 1975 and the Horace claim group was staked in November, 1974 by M. McClaren.

The claims are recorded at the office of the Mining Recorder in Kamloops.

CLAIM	TAG NOS.	DATE LOCATED	REMARKS
Horace #1	440014 M	December 14,1974	M. McClaren
Horace #2	440015 M	December 14,1974	M. McClaren
Horace #3	440016 M	December 14,1974	M. McClaren
Horace #4	440017 M	December 14,1974	M. McClaren
H	07193	March 1,1975	H. Visagie
	20 units	to March 3,1975	

LOCATION AND ACCESS

The claims are located on Criss Creek at 120° 55' west longitude, 50° 54' north latitude, some 30 miles northwest of Kamloops, B.C. and approximately 10 miles north of Savona and the west end of Kamloops Lake. The identification post for 1N of the H claim is located approximately 300 feet northwest of the 10 mile marker on the Criss Creek road. The Legal Corner Post is about 100' north of Criss Creek and 1640' due south of the identification post 1 N.

Access from Kamloops, B.C. is via some 30 miles west on the Trans Canada Highway to Deadman River Road, some 3 miles west of Savona, then some 8 miles north on an all weather road to the Criss Creek road, then 2 miles northeast to the mile 10 marker on the north bank of the road. Other access roads are found on the southern portion of the property.

TOPOGRAPHY AND CLIMATE

The general claim area comprises of rolling summits and a deep valley cut by Criss Creek. The maximum relief on the property is approximately 3500 feet while the minimum relief on the property is approximately 2100 feet in Criss Creek Valley. The hills are generally rounded and lack the rugged character of the mountains farther west and south.

The region is situated within the dry belt of British Columbia and rainfall in the lower valleys is between 10 and 11 inches a year. Rainfall on the upper slopes is greater than the figure given and there is a change in vegetation to increased forest growth on the upper slopes.

HISTORY

Mineral claims were staked in the Criss Creek area as early as 1896. The Spey mineral claims were staked to cover some cinnabar showings and were worked between the years 1897 and 1900. During those years desultory prospecting and surface work was done.

The area was restaked in 1929 by the Mercury Mining Syndicate of Vancouver, B.C. Between the years 1929 and 1938 some short adits were driven by the owners. The claims were examined by Mr. P.B. Freeland in 1933 and described in the B.C. Minister of Mines Report for 1933. Some samples taken from the workings and sent to the Mines Branch at Ottawa contained as high as 8.22 oz/ton in silver.

In 1972 the area was staked by Andex Mines Ltd. During the months of July, August and September, 1972 an exploration program was carried out by Manny Consultants for Andex Mines Ltd. This program consisted of geological mapping, geochemical soil sampling (tests for Cu, Au, Ag, Pb and Zn) and one test drill hole to 100 feet. The geochemical survey returned higher than normal silver assays.

In 1974 and 1975 the Horace and H claims were staked to cover the area of anomalously high silver geochemical results.

GENERAL GEOLOGY

The area lies on a belt of Upper Triassic rocks of the Nicola group. The series is eugeosynclinal and consists largely of volcanic rocks, tuff, some sedimentary rocks of volcanic origin, and limestone deposited during periods of volcanic quiescence. The Nicola group rocks are covered extensively by later vocanic rocks of the Kamloops group in an area northwest of the property. The Kamloops group is of Miocene age and consists mainly of rhyolites, andesites and basalts associated with tuffs and breccias. "The volcanic rocks are chiefly dense, fine-grained, basaltic lavas. They exhibit a wide range of colours and are intercalated with considerable thicknesses of breccias and agglomerate". (Cockfield 1961).

The area exhibits numerous widely fractured shear zones striking in many directions but chiefly north-east and southwest.

ECONOMIC GEOLOGY

(a) POSSIBILITIES

The type of deposit sought after in this area is that of a silver - gold, stockwork-replacement deposit of a large volume of low grade fracture-filling and disseminated precious metal mineralization. This type of deposit is essentially similar to the disseminated replacement type of precious metal deposits found in Nevada but have structures more typical of epithermal deposits. Replacement veining as well as fracture-fill veining constitute the environment of emplacement of mineralization.

The replacement veining is typified by indistinct contact with the wall rock with much silicification and ankeritization of the wall rock in the vein zone. The fracture-fill veining is characterized by distinct contacts between vein and wall-rock and mineralization occurring in crustified runs.

(b) MINERALIZATION

Pyrite, realgar, cinnabar, stibnite and tetrahedrite is the predominant sulphide assemblage.

Pyrite is found as fine disseminations in altered host rock and as irregular masses in a quartz filled vein-breccia.

Realgar occurs as fine particles along with minor cinnabar, in a quartz filled vein-breccia and as small masses in dolomite.

Cinnabar is observed as occurring in fine disseminations in altered host rock; as particles in siliceous breccias; and as thin films coating dolomite.

Stibnite is found as acicular crystals in thin ($\frac{1}{4}$" to $\frac{1}{2}$") quartz veinlets associated with very minor amounts of realgar.

Tetrahedrite is observed as blebs in dolomite-quartz veins and veinlets.

The gangue minerals consist primarily of quartz and dolomite with minor amounts of opaline silica and chalcedony.

(c) <u>ALTERATION</u>

Wall-rock alteration in the area is both widespread and conspicuous. Among the principal alteration products are dolomite, chlorite, epidote, silica and pyrite. The zeolite, natrolite is found as open space fillings in a breccia zone and may be more widely distributed than has been noted.

There are numerous large areas of carbonatization and such areas of alteration represent either areas of intense fracturing or areas in which alteration beginning in fissures has been relatively widespread.

The propylitic alteration assemblage and subtypes of the propylitic alteration assemblage are recognized in the field by the rusty brown weathering character of these rocks. These areas are denoted on Plate 2 by the symbol <u>R</u>.

(d) <u>CLASSIFICATION</u>

The features that are common to epithermal deposits have been noted on the H and Horace claims. These features are listed below.

(1) Widespread "propylitization" of host rocks, with the formation of chlorite, epidote, carbonates and disseminated pyrite.

(2) Vein formation accompanied by tectonic movements causing earlier vein matter to be torn open and the openings filled by later vein minerals.

(3) The vein texture is diagnostic, exhibiting crustified or colloform banding, drusy cavities, or a breccia of altered rock fragments cemented by vein matter.

(4) The sulphides, stibnite, cinnabar and realgar are characteristic of low temperature deposition.

The co-existence of the mineral assemblage stibnite-realgar-cinnabar is uncommon in the Western Cordilleran. This assemblage has been noted at the Carlin and Getchell mines in Nevada. Deposits with this sulphide assemblage may be a gradational form between the typical epithermal deposits that are characterized by relatively rapid deposition and telescoping because of steep thermal gradients, and a still feebler telethermal deposit type characterized by liesurely deposition in a cooler environment.

GEOLOGY OF THE CLAIM GROUPS

The property is cut by several northeasterly trending faults. Direct observation of northeasterly trending shear zones on the ground confirmed these trends.

Several different lithologies underlie the property. The major portion of the property is underlain by andesites of the Nicola group. The andesites vary from a light grey-green to a medium grey. Their texture varies from fine to medium grained with some phases having hornblende phenocrysts up to ¼" in length. Dacite dykes are found cutting the andesites at serval exposures on the Criss Creek road.

At approximately the 2250' elevation in the Criss Creek valley, an outcrop in the north side of the river consists of a series of bedded rocks that included, progressing northerly, from drift and gravel, fifty feet of ankeritized chert-limestone breccia containing fragments of chert and limestone; ten feet of fine grained tuff; ten feet of coarse grained tuff; ten feet of laminated black to grey, crystalline limestone; fifty feet of massive fine grained tuff; then into drift and gravel. These beds strike north 60 degrees east and dip 35 degrees north-westward.

In the northwestern corner of the H claim are outcrops of basalt flows of the Kamloops group. The basalt is generally medium to dark grey brown and the texture varies from fine to medium grained. Some of the basalt is amygduloidal and displays well developed columnar jointing.

Plate 2 shows the outcrop distribution on the H and Horace claims as mapped by Pat Nolan of Manny Consultants.

TABLE 1--Results of the 1972 Soil Surveys Conducted at Criss Creek

Element	Number of Samples Assayed	Ranges of Values	Number of Possibly Anomalous Values
Cu I	37	22-175 ppm	6 greater than 69 ppm
II	526	14-209 ppm	36 above 80 ppm
Ag I	37	.3-1.3 ppm	10 above 1 ppm
II	526	.3-19 ppm	184 above 4 ppm
Au I	37	30-120 ppb	6 above 80 ppb
II	unknown	30-240 ppb	figures not available
Zn I	not sampled		
II	approximately 330	12-182 ppm	66 above 80 ppm
Pb I	not sampled		
II	unknown	Results were considered negligible	

element I results of the preliminary geochemical survey
II results of the main geochemical suvey

The above results are taken from a report prepared by E. Amendolagine for Andex Mines. This report is on file in Victoria, B.C. as an assessment report.

All the above geochemical analysis was done by the professional assayers at "Core Laboratories Ltd." in Vancouver, B.C.

GEOCHEMISTRY

In the summer of 1972, Andex Mines Ltd. undertook two separate geochemical soil sampling programs on their claim group situated on Criss Creek. The first preliminary survey covered a very small area and the samples were analysed for copper, gold and silver. The second survey covered most of the forty claim block and the samples were analysed for silver, gold, copper, lead and zinc.

The preliminary survey consisted of 37 soil samples taken at 100 foot intervals along three parallel north-south lines. The sample locations are plotted on Plate 1. The samples were collected at a depth of 6-inches and then put into plastic bags. They were then shipped to Core Laboratories in Vancouver for analysis. The samples were prepared by taking a 5 mg. sample, digesting it in Aqua Regia, and by the use of Atomic Absorption, copper and silver values were determined. Gold was extracted by the MIDK. Silver and copper were measured in ppm and gold was measured ppb.

The main geochemical survey consisted of 526 soil samples taken at 200 foot intervals along 6 thirteen thousand foot north-south line and 6 three thousand foot east-west lines. The lines were put in by pace and compass and the sample locations flagged. The samples were collected at a depth of 18 inches and put into plastic bags. Analysis of the samples was by the same techniques used in the preliminary survey. Silver, copper, lead and zinc content of the soils was tested for in the second geochemical survey.

The results of the geochemical surveys are plotted on Plate 1 and a summary of the results is found on Table 1. The results show silver to be highly anomalous. A fire assay of four soil samples was made by Andex Mines Ltd. and a visible silver bead was produced in each case. Gold values are assumed to be weakly anomalous. Base metal values are low with the exception of several small localized anomalies.

(A) SILVER GEOCHEMISTRY

Normal silver background value in the area is taken to be in the .3 to 1.9 ppm range. Weakly anomalous silver values range from 2 to 4 ppm and values above 4 ppm silver are considered to be strongly anomalous. Silver values were found to range from .3 ppm to 19 ppm. A review of the literature supports the assertion that the H and Horace Claims have highly anomalous silver values (Boyle 1968, Cornwall et al 1967).

There is a discrepency in the results of the preliminary geochemical survey and the main geochemical survey (see Table 1 and Plate 1). This discrepency can be related to the soil horizon sampled. The preliminary survey sampled the soil at a depth of 6 inches while the main survey sampled the soil at a depth of 18 inches. In the preliminary survey, sampling probably occurred in the B horizon while in the main survey the sampling occurred in the C horizon. The C horizon usually contains higher silver values relative to the B horizon (Archer and Main 1971. Boyle 1968). Consequently, the lower values of the preliminary survey reflect the difference in the silver content of the B and C soil horizons.

(B) GOLD GEOCHEMISTRY

The preliminary geochemical survey tested 37 samples for their gold content. Six of these samples returned values greater than 80 ppb gold. These values are assumed to be weakly anomalous. A review of the literature supports this assumption (Cornwall et al. 1967, Polikarpochkin and Kitaev, 1971.) and it appears that values between 70 and 200 ppb gold represent weak gold anomalies. Values over 200 ppb gold would represent strong gold anomalies.

Andex Mines Ltd. reported that gold values obtained from the main geochemical survey were negligible with the exception of one value of 240 ppb. No mention is made of the number of samples analysed for their gold content. Consequently, without the results of the main geochemical survey it is impossible to determine the extent of the gold geochemical anomaly determined in the preliminary survey.

(C) COPPER, LEAD AND ZINC GEOCHEMISTRY

The base metals, in general, did not give any strong geochemical response. A few weak anomalies exist for copper and zinc while lead did not give any response at all. From these geochemical results it can be concluded that no major concentrations of these elements is indicated.

TABLE 2--Elemental Concentrations in the Halos of Epithermal Deposits

Deposit-	Belaya Gora	Onokhivsky	Baleisky	Comstock	Tonopah	Silver Reef
Element						
Au	.0045 .01-1 10-200	.001-.003 .01-1 10-1000	.001 .01-1 10-3000	.005 .05-.15 10-30	.005 .05-3.8 10-1500	.005 .05-.35 10-70
Ag	.01 .1-10 10-1000	.05 .1-1 10-20	.01 .1-50 10-1000	.1 1-10 10-100	.05 .1-4 2-100	.5 1-14 2-30
Hg	.08 .1-3 5-300	.01 .1-1 10-100	.01 .1-3 10-300	.1 .1-3 1-30	.02-.06 .3-1 10-30	.02-.2 .3-2 10-200
As	1.5 500 10-300	1.5 3000 100-2000	2 10-10000 10-5000			
Sb	.26 500 100-1000	.26 100 100-2000	.1 2-1000 20-10000			
Pb	5 30-300 6-60	10 30-100 3-10	10-30 30-500 3-50			
Cu	5 30-100 6-20	5 30-300 6-50	10-30 30-500 3-50			
Zn	60 1000 to 20	60 300 to 5	40 200-1000 5-25			

element — background value in ppm
contents in halo in ppm
coefficient of concentration

Note: Values for Belaya Gora, Onokhivsky, and Baleisky are by V.V.Polikarpochkin and N.A.Kitaev
Values for Comstock, Tonopah, and Silver Reef obtained from artical by H.R.Cornwall, H.W.Larkin, H.M.Nakagawa, and H.K.Stager

RESEARCH

Endogenous epithermal mineral deposits with a precious metal content characteristically show a zonal relationship of the elemental species that were present in the hydrothermal system. Of particular interest to the exploration geologist is the use of "indicator" elements in the search for blind orebodies. In the epithermal precious metal deposits, arsenic, antimony, mercury and copper have proved useful in the search for blind orebodies. Polikarpochkin and Kitaev have demonstrated the usefulness of these "indicator" elements and have elaborated on the zonation of several elements found in three epithermal precious metal deposits in the U.S.S.R.

The authors show that in areas periperal to and above the zone of greatest gold-silver mineralization halos of arsenic, antimony, mercury and copper exist (referred to as supra-ore halos). These halos project above the gold-silver mineralization for some 200 to 300 metres. Gold and silver, however, are restricted in their vertical projection above the precious metal orebodies.

Table 2 shows the elemental concentrations in the halos of six epithermal precious metal deposits. The data was taken from papers by Polikarpochkin and Kitaev, 1971 and Cornwall el al., 1967.

The greatest concentrations from the background to the halo areas occur with the elements antimony and arsenic. Gold, silver and mercury have moderate to strong concentration ratios. Lead, copper and zinc have a low concentration coefficient, which maximizes in the order of tens above background.

The following is an excerpt from the paper by Polikarpochkin and

Kitaev describing the characteristics of endogenous halos of epithermal gold-bearing deposits.

"The distribution of gold and its associated elements in the orebodies and halos show a distinct zonation in both the horizontal and vertical directions. Vertically, the localization to the maximum gold and silver ooncentrations are similar but silver exhibits a lower concentration gradient causing the Ag/Au ratio to increase above and below the site of maximum mineralization and also adjacent to the ore body. The zones of maximum mineralization are distinguished by a minimal value for Ag/Au ratio. The highest arsenic concentrations are at the upper end of the orebodies, where marked wide halos prevail. Antimony is similarly distributed in halos syngenetic with the gold mineralization. Higher still in the supra-ore zone, increased copper contents prevail, but the halo of this element is local, and the contents fall to background below the upper end of the arsenic halo. There is a trace of mercury at all levels, with a minimum concentration, and minimal Hg/Au ratios in the zone of optimal gold mineralization, Upward and downward from this zone, the concentration of mercury and the Hg/Au ratio increase. The upper parts of the supra-ore halos contain a high arsenic and mercury concentration, compared with a minimal one for gold and silver. The supra-ore halos of arsenic and mercury concentrations can be traced some 200 to 300 metres above the zone of productive mineralization."

"The zonation described above is also repeated in the horizontal plane which suggest that the depositional zoning formed during one stage, comtemporaneous with the gold mineralization. This zoning is characterized by a lower Ag/Au ratio within the orebodies and concentrations of most of the elements associated with gold in regions of maximum mineralization. Only the highest antimony concentrations fail to present this picture, mainly because the stibnite mineralization is later than the gold mineralization. However, the poorly developed antimony halos formed contemporaneously with the gold mineralization follow the zonal pattern faithfully."

The authors conclude their paper with the following summary.

"Prospecting for blind orebodies can be guided by the elemental composition of the halos and the nature of the change in concentration of the elements with depth. If the halos exhibit high concentrations of only arsenic, mercury and antimony without high concentrations of gold and silver, this indicates one is high above the zone of optimal gold mineralization. Copper concentrations in the halos decrease markedly as one approaches this zone of optimal mineralization. The presence of high contents of gold-silver indicates a near approach to the zone of maximal mineralization, especially when a decrease in the Ag/Au ratio is apparent. The vertical interval over which these elemental variations are manifested is equivalent to the vertical range of the supra-ore halos and is approximately 200 - 300 metres. A decrease in the content of gold and silver with depth and an increase in the Ag/Au ratio means that the zone of optimal mineralization is higher than the level of sampling or the deposit has been eroded."

CONCLUSIONS

(1) The mineralization found on the H and Horace claims was deposited in an epithermal environment.

(2) The large silver geochemical anomaly and the weak gold geochemical anomaly suggest the existence of an epithermal silver-gold deposit.

(3) The extent of the silver anomaly and the associated alteration may indicate the presence of a large volume of economic mineralization.

(4) If a silver-gold epithermal deposit exists at Criss Creek and if the zoning described by Polikarpochkin and Kitaev is applicable to the area then the following interpretation of the data may be made.

(a) The mineralogy, widespread alteration, the extensive silver anomaly and associated weak base metal anomalies express an association characteristic of areas peripheral to and above any precious metal deposit (supra-ore halo).

(b) The widespread silver geochemical anomaly suggests nearness to the best mineralized zone.

RECOMMENDATIONS

(1) An accurate geologic and alteration map should be compiled.

(2) A chip sampling survey should be undertaken and the samples analysed for their gold and silver content.

(3) The ratio of silver to gold should be plotted and if the results are positive a drilling program should be conducted in the areas of the lowest Ag/Au ratios.

REFERENCES

Amendolagine, E.: Department of Mines and Petroleum Resources Assesment Report No. 4305; (1972)

Archer, A.R., Main, C.A.: Casino, Yukon - A Geochemical Discovery of an Unglaciated Arizona-Type Porphyry. Geochemical Exploration, Special Volume II, C.I.M. (1971)

Boyle, R.W.: The Geochemistry of Silver and its Deposits, G.S.C. Bulletin 160 (1968)

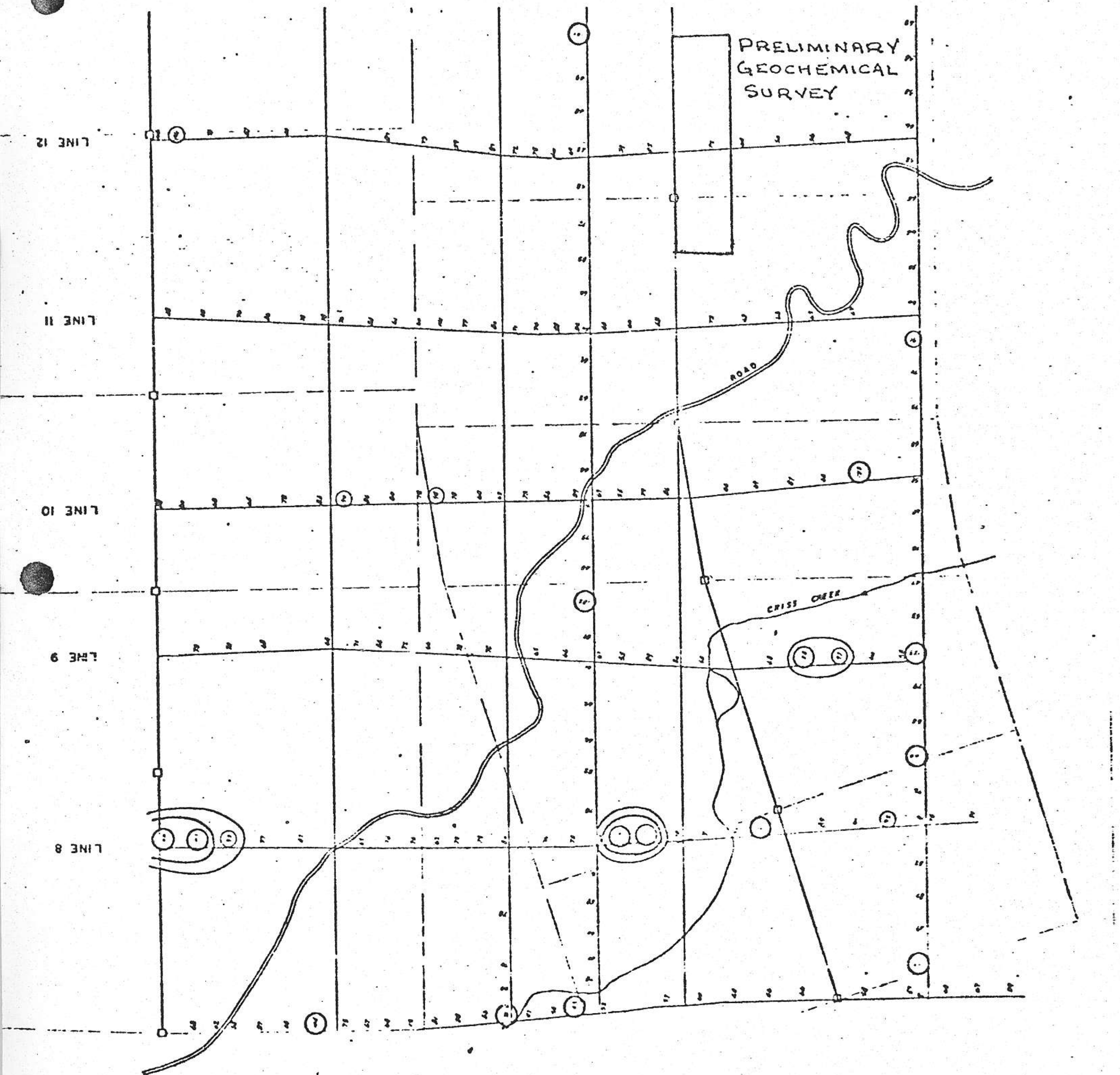
Cockfield, W.E.: Geology and Mineral Deposits of Nicola Map-Area, British Columbia, G.S.C. Memoir 249 (1961)

Cornwall, H.R., Larkin, H.W., Nakagawa, H.M., and Stager, H.K.: Silver and Mercury Geochemical Anomalies in the Comstock, Tonopah and Silver Reef Districts, Nevada-Utah. U.S.G.S. Prof. Paper 575-B, B10 - B20, (1967)

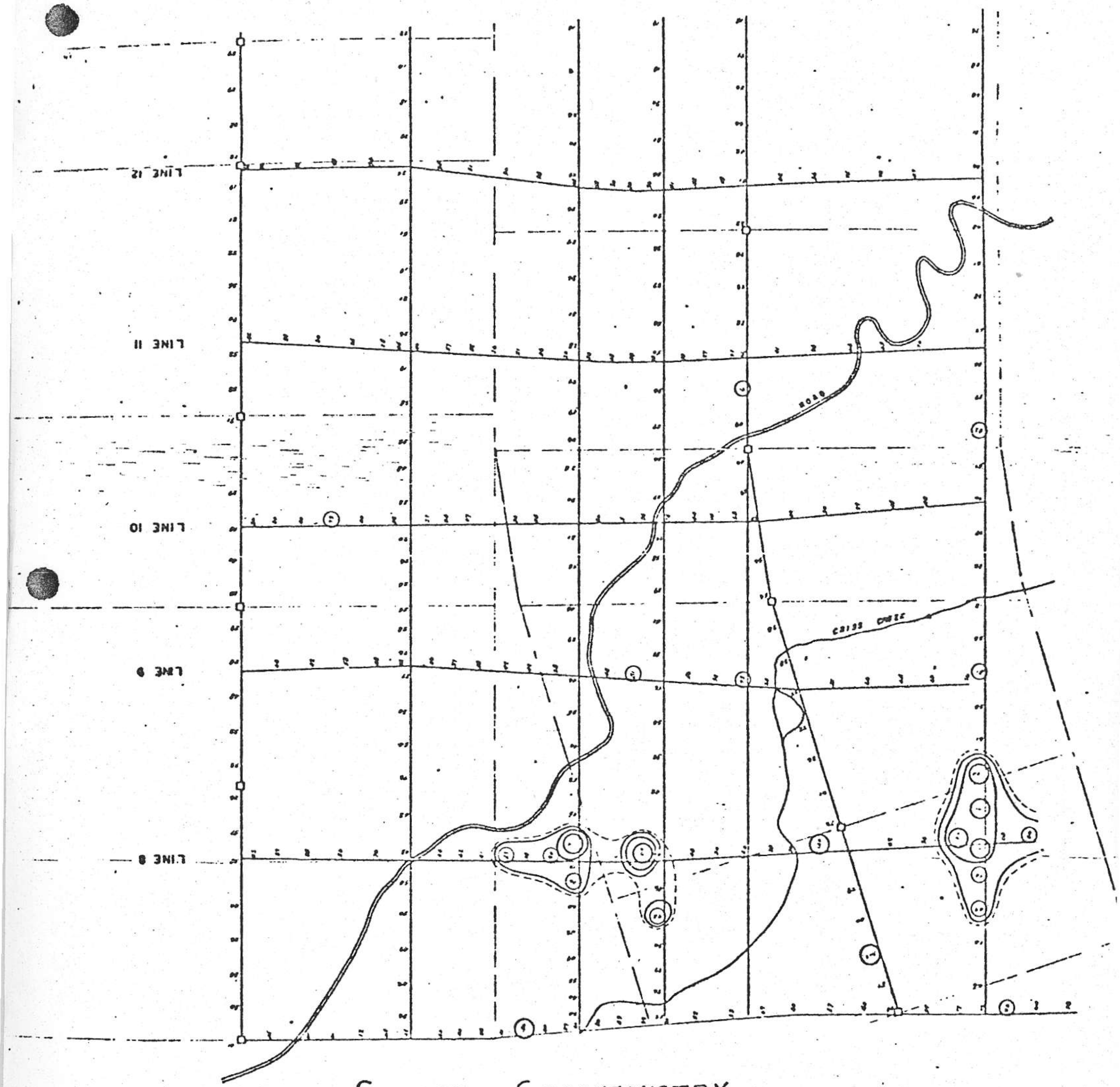
Freeland, P.B.: Minister of Mines Annual Report, 182-183, (1933)

Joraleman, P.: Geology of the Getchell Mine, Economic Geology, (May 1951)

Polikarpochkin, L.N., and Kitaev, N.A.: Endogenic Halos of Epithermal Gold - Bearing Deposits, Geochemical Exploration, Special Volume II, C.I.M. (1971)



ZINC GEOCHEMISTRY



COPPER GEOCHEMISTRY

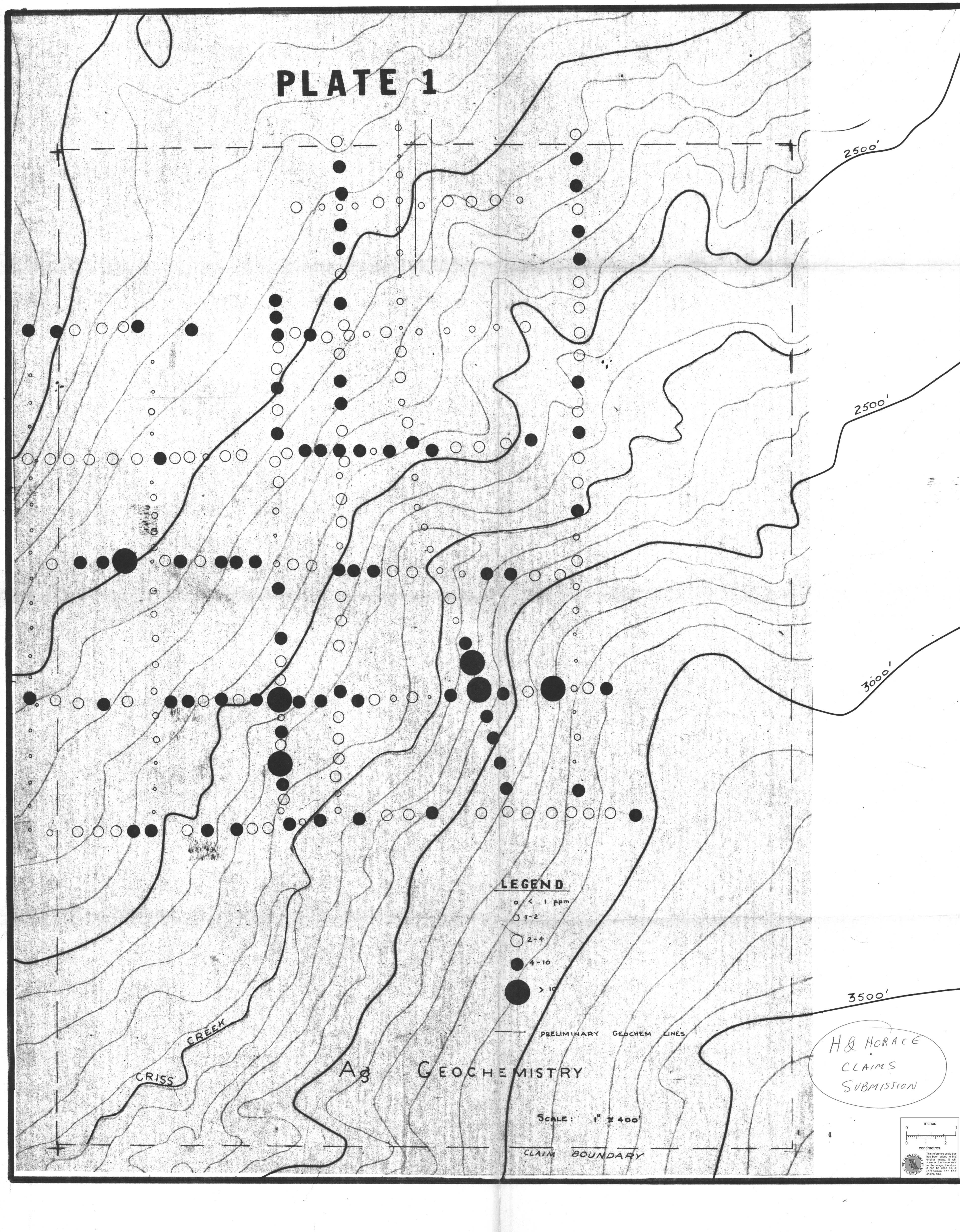


PLATE 1
2500'
2500'
3000'
3500'
LEGEND
< 1 ppm
1-2
2-4
4-10
> 10
PRELIMINARY GEOCHEM LINES
CRISS CREEK
Ag GEOCHEMISTRY
SCALE: 1" = 400'
CLAIM BOUNDARY
H & HORACE CLAIMS SUBMISSION
inches
centimetres

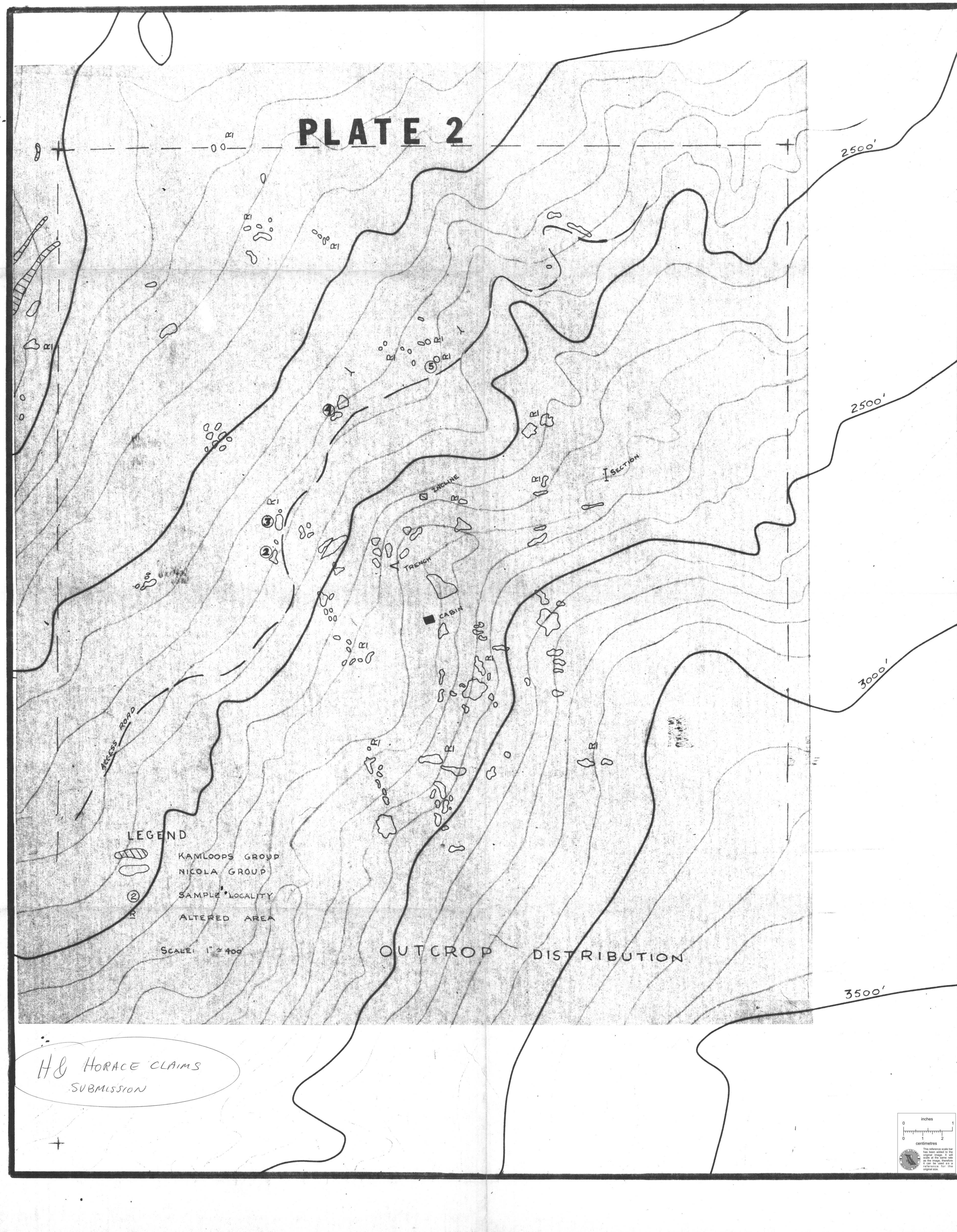


PLATE 2
2500'
2500'
3000'
3500'
ACCESS ROAD
INCLINE
TRENCH
CABIN
SECTION
LEGEND
KAMLOOPS GROUP
NICOLA GROUP
SAMPLE LOCALITY
ALTERED AREA
SCALE: 1" = 400'
OUTCROP DISTRIBUTION
H& HORACE CLAIMS
SUBMISSION
inches
centimetres