1983-05-05

840893

PROPERTY EXAMINATION REPORT
MOW CLAIMS
MOWICH LAKE, DEADMAN RIVER
Kamloops M.D. B. C.
92P/2W
120°53' 51°02'N

Date Examined - April 5, 1983

INTRODUCTION

Michael Dickens, prospector from Savona, B.C., had reported finding good grade copper mineralization in Nicola volcanics on his Deadman River claims. He also reported the occurrence of the Na amphibole riebeckite which is a known associate of precious metal environments. Riebeckite is also found in high pressure-low temperature metamorphicssuch as the glaucophane-lawsonite-schist facies. New unpublished data on Cordilleran structures suggests a major fault - the Pinchi - may lie considerably further to the east than previously indicated (H. Tipper, personal comm). It appears that the Dickens' ground straddles this fault.

This is an interesting situation in early stages of development that could blossom into a major area of interest through modest expenditures.

The property is recommended for acquisition subject to availability of new opportunity funds and a satisfactory working agreement. Several of our competitors have examined the property recently and apparently have shown a strong interest.

Initial programs would be aimed at defining drilling targets through geological, geochemical and geophysical surveys. Drilling would be part of the second year's program.

REGIONAL GEOLOGY

(1) 50 km long window of U. Triassic Nicola Group volcanics extend along Deadman River valley.

(2) U. Triassic terrain E and W is capped by Tertiary sediments and plateau lava.

(3) The U. Triassic terrain in the northern Cordillera is extremely favourable for gold and base metal deposits. Favourable rocks include Nicola, Takla, Vancouver Group (Vancouver Island, Queen Charlottes), Mush Lake Group, Y.T., Nicolai Greenstone and Chitistone limestone of Kennecott Alaska fame.

(4) Recent rethinking on the Pinchi fault suggests the structure may lie along Deadman River - considerably further E than previously thought. Possible location includes (1) along the entire valley of Deadman River or (2) along Deadman River to Mowich Lake then south eastward across Criss Creek and along Carabine Creek. Evidence considered include Hg

showing and lithological evidence for major fault at Deadman River (Howard Tipper, Jim Monger personal comm.)

(5) A belt of Cretaceous to Tertiary granite plugs located in Carabine Creek and extending at least as far as Criss Creek probably were emplaced along a major fault such as the apparent Pinchi fault extension.

(6) Mercury anomalies in the regional silt sampling of sheet 92P feature prominent anomalies in the area of the MOW claims. This is also on trend with the earlier mentioned Carabine Creek belt of granitic intrusions. There are unconfirmed reports of intrusive near Mowich Lake.

(7) Au, Ag, Hg are associated with the Carabine Creek intrusions.

(8) Broad areas of Tertiary volcanics on the plateaus either side of Deadman River offer good gold potential in proximity to areas of calc alkaline intrusions or volcanic centres where these are associated with major structures.

(9) Regional precious metal tracers include Au, Ag, Hg, mariposite and riebeckite. Riebeckite is spatially associated with fluorine, Pb-Zn

(10) The nearest former producer to the MOWICH claims is the Vidette Mine (15 km north along Deadman River). Production from 1933 until closure in 1940 was 30,000 oz Au and 50,000 oz As from 60,000 tons of ore. Production came from the Tenford vein which averaged 15 inches in width. This ore is believed assocated with a fault structure extending along Deadman River.

PROPERTY

(1) Two possible deposit types considered:

A. U. Triassic alkaline porphyry Cu-Au (open pit target).

B. Tertiary lode gold (underground or open pit target).

POTENTIAL FOR A (STOP 2-9)

(1) Alkaline to subalkaline augite andesite flows contain feldspar and chalcopyrite amygdales (Littlejohn), in small exposures within a 70 x 70 m area. The mineralized area is located on a strong NW aeromagnetic trend formed by lows adjacent to a prominent high likely caused by an unroofed intrusion. Chip samples contain up to 1.28% and 135 ppb Au over 1 m or 0.72% Cu and 300 ppb Au over 2 m in another outcrop about 10 m away. In the highest copper sample the bulk of the copper is in the form of supergene minerals such as azurite, malachite, cuprite and native copper (minor). The second sample is essentially all hypogene sulphides but may include a little supergene chalcocite. Hand picked specimens collected at the sites of the above Cu-Au samples contain 5.15% Cu and 110 ppb Au and 2.80% Cu and 25 ppb Au. There appears to be little direct relationship between the copper and the gold.

(2) The hypogene mineralization is open space filling (amygdales and fractures).

(3) The attitude of the mineralized rocks cannot be determined from the scant outcrops. The mineralization is open in all directions.

(4) Geochemical tracers that may be of use here in addition to the major metals of interest are Ag, Sb and As.

POTENTIAL FOR B (STOP 9-11)

(1) A NW trending ridge forms a conspicuous topographic feature traversing the main trend of valley glaciation which is assumed to be from north to south parallel with Deadman River. This ridge is several hundred metres in length and about 100 m wide. The sides of the ridge are extremely steep on the north side, particularly, leading one to suspect the presence of a fault escarpment or the presence of a highly resistent formation.

(2) The ridge is underlain by silicified and carbonitized andesite of apparent alkaline composition. If the andesite were truly alkaline in composition (based on only one rock sample) then it would be probable that this environment is unfavourable to Buchanan-style epithermal gold deposits. In the absence of definitive information it is assumed that this is a Cretaceous-Tertiary feature because of its location on the NW Carabine Creek intrusive trend and the indicated mercury silt anomalies in the general Mowich Lake area. Mercury is, of course, an associate of the Carabine Creek intrusions. The apparent alkaline composition is difficult to explain. Alkaline andesite is more of an Upper Triassic Nicola feature than a Tertiary one.

(3) Traces of chalcopyrite and pyrite occur in fractures. One rock chip sample (STOP 11) contains 885 ppm Cu, 0.4 ppm Ag, 45 ppm As, 28 ppm Sb, 1280 ppm Ba and 5400 ppb Hg. All of these values are well above the local background. The gold content is very low at 5 ppb.

(4) Mariposite, a chromium bearing sericite, is widespread. Petrographic work reveals moderately high zeolite content in two samples (12% and 18%).

(5) Low pH alteration (Buchanan) such as illite and kaolinite were specifically sought after in the petrographic work carried out but these were found to be present in only small amounts.

(6) Calcite and zeolite are prominent alteration facies in the Buchanan model. The presence of some low pH alteration is encouraging. Buchanan claims that a very nearly 1:1 relationship exists between epithermal gold deposits in volcanics and low pH alteration.

OTHER AREAS OF MINERALIZATION

(1) Mono-lithological breccia consisting of augite porphyry (Nicola) is exposed on the west side of Deadman River at STOP 1. This material contains clots of malachite and minor native copper. It seems to be rather poorly indurated material for Nicola volcanics. Initial impressions were that it may be some sort of a slump deposit. The material is indicated to have been sheared after the deposition of the mineralization. It would be worth while to study this material and its distribution. If it is a slump deposit, such as talus, it may give us a clue about the possible occurrence of Afton type deposits in the area. At Afton it is believed that Tertiary supergene native copper resulted from circulation of surface waters containing copper down through a fracture zone perched on the edge of a cliff in a horst and graban structural setting. Apparently native copper formed as a result of reduction of hypogene sulphides by the action of ground water. In time the graben located adjacent to the deposit became filled with sediments and Tertiary volcanics which effectively shielded the deposit against glacial erosion thereby preserving it.

(2) Andesitic rocks (possibly also diorite) containing quartz carbonate veins with galena occur as float at STOP 15 on Deadman River. The angular character of the boulders suggest a local source. Intense chloritization of the mafic minerals is evident.

(3) Riebeckite occurs in great abundance as feathery aggregates in large angular boulders of fine grained quartz rich volcanic rock at STOP 14 on the east bank of Deadman River. About half of the rock is plagioclase and a third is quartz. There is no appreciable feldspar present. This is probably a dacitic volcanic. Gordon White of B.C. Ministry of Mines has advised us that the riebeckite was confirmed by X-ray.

R. U. BRUASET

References

Buchanan, Larry T., Precious metal Deposits Associated with Volcanic Environments in the Southwest (same publication as Rytuba).

Littlejohn, A.L., Petrographic report dated April 14, 1983. Vancouver Petrographics.

Rytuba, James T., Relation of Calderas to Ore Deposits in Western U.S. Relations of Tectonics to Ore Deposits in Southern Cordillera, Editors Dickenson, W.R. and Payne, W.D., Arizona Geological Society Digest, volume XIV 1981.

Vancouver Petrographics Ltd.

JAMES VINNELL, Manager
JOHN G. PAYNE, Ph. D. Geologist

P.O. BOX 39
8887 NASH STREET
FORT LANGLEY, B.C.
VOX 1JO

PHONE (604) 888-1323

Report for: Ragnar Bruaset,
Chevron Standard Ltd.,
Minerals Staff,
901 Marine Building,
355 Burrard Street,
Vancouver, B.C.
V6C 2G8

Invoice 3851

April 14, 1983

Samples: STOP#2, STOP#7, STOP#9, STOP#10, STOP#11A, STOP#11E, STOP#14, STOP#15.

Summary:

STOP#2 and STOP#7 are similar andesites. They have been regionally metamorphosed to the greenschist facies - chlorite and tremolite have formed. Late calcite veinlets, associated with chalcopyrite, are present in STOP#2. STOP#7 contains amygdales filled with plagioclase. Some of these have a core of chalcopyrite; small grains of chalcopyrite also occur in the rest of the rock. Although no veining was seen, comparison with STOP#2 suggests that the chalcopyrite was introduced after solidification.

STOP#9 and STOP#10 are similar rocks. They are highly altered volcanic rocks consisting mainly of carbonates and zeolite. Minor green sericite (+ mariposite), possibly mixed with clay, is present. Traces of chalcopyrite are present associated with the carbonate.

STOP #11A is an altered andesite consisting mainly of plagioclase with no mafics. Calcite veining has altered the rock. Small amounts of illite are present between the plagioclase laths. Calcite appears later. While the presence of illite indicates a low pH environment there is probably not enough to define an alteration cap above an epigenitic deposit.

STOP#11E is a carbonate vein in altered andesite (same as #11A). It contains small grains of chalcopyrite, bornite and magnetite. Traces of chalcocite and hematite are also present.

STOP #15 is a highly altered mafic igneous rock. Alteration minerals are chlorite, serpentine and later calcite, in veins and pervasively.

STOP #14 is a soda trachyte consisting of albitic plagioclase, quartz and riebeckite. It is unaltered.

A. L. Littlejohn

A. L. Littlejohn, M.Sc.

STOP #2 Andesite

This is a medium to fine grained volcanic rock with a few small phenocrysts of amphibole. It has been weakly metamorphosed, probably regionally, with the formation of chlorite and tremolite. Thin veinlets of calcite, associated with chalcopyrite, cut the rock. Minerals are:

plagioclase	53%
tremolitic amphibole	20
chlorite	16
hematite + magnetite	5
calcite	4
Fe-Ti oxide	2
chalcopyrite	minor
epidote	trace
K-spar	trace

Plagioclase forms laths about 0.3mm in size which are crowded together with smaller shapeless interlocking grains. There is a rounded patch about 1.5mm in size which consists of more rounded plagioclase grains about 0.4mm in size with sutured grain margins. Small grains of epidote occur within this patch.

Tremolitic amphibole forms ragged, bladed grains about 0.2mm in size which are intergrown with the plagioclase. It is pale green in colour and was probably originally hornblende. Small patches of chlorite occur within the amphibole. There are a few subidiomorphic phenocrysts of amphibole up to 1mm in size scattered about the rock. These also contain patches of chlorite; some are largely chloritised.

Chlorite forms small ragged patches up to 0.2mm in size between the plagioclase laths as well as in the amphibole. It is colourles in thin section.

Iron oxides form ragged, subrounded grains up to 0.1mm in size which are scattered throughout the rock between the plagioclase grains. Most of the grains are hematite but many of the larger ones consist of a mixture of hematite and magnetite, the latter mineral forming a core to the grain. Fe-Ti oxides (hematitsed rutile??) form smaller grains disseminated throughout the rock around the amphibole and chlorite.

Calcite forms veinlets up to 0.3mm in width. Very fine grained hematite occurs in the wider veinlets. The narrower ones are discontinuous and form a widely spaced network. Extremely thin (0.002mm) stringers of chalcopyrite occur in some of the thinner calcite veinlets. Patches of calcite also occur replacing plagioclase. These rarely exceed 0.2mm in size. The chloritised phenocrysts of amphibole also contain patches of calcite.

Chalcopyrite also forms subrounded to shapeless grains up to 0.6mm in size which are intergrown with the plagioclase. They sometimes occur around the phenocrysts. These grains have no direct connection to the veinlets although there is probably a genetic association.

K-spar forms a narrow rim along the edges of the wider calcite veinlets. In places in occurs partly within the calcite.

STOP #7 Andesite

This is a medium to fine grained volcanic rock containing small patches of plagioclase,oftn with a chalcopyrite core. It has been weakly metamorphosed, probably regionally,with the formation of chlorite and tremolitic amphibole. By analogy with sample STOP #2 the chalcopyrite probably formed after metamorphism. Minerals are:

plagioclase	53%	
tremolite	23	
chlorite	18	
Fe-Ti oxide	4	
chalcopyrite	2	(+ trace of chalcocite)
epidote	trace	
goethite	minor	

Plagioclase forms subhedral laths about 0.2mm in size which are intergrown with smaller shapeless grains. It also occurs in shapeless patches 1 - 3mm in size which consist of ragged interlocking lath-like grains with sutured grain margins. These are about 0.4mm in size. Narrow vein-like patches of plagioclase also occur. The patche patches form about 8% of the rock.

Many of the plagioclase patches contain a core of chalcopyrite which forms shapeless grains up to 1mm in size. These have a narrow rim of chalcocite and goethite. A few small grains of chalcopyrite are almost completely altered to goethite. Some of the grains contain small inclusions of epidote.

Tremolite forms ragged bladed grains about 0.1mm in size which are intergrown with the plagioclase laths. It is pale green in colour and contains small patches of chlorite. It was probably a hornblende before metamorphism.

Chlorite forms shapeless interstitial patches about 0.2mm or less in size which occur between the plagioclase and amphibole grains. There are a few rounded patches up to 3mm in size which consist of a mass of chlorite flakes about 0.05mm in size. These patches may have been amphibole phenocrysts. The chlorite is colourless in thin section.

Fe-Ti oxide forms rounded grains about 0.01mm in size which are disseminated throughout the rock and tend to occur around the chloritisd amphibole.

STOP #9 Altered (carbonate) volcanic(?) rock

This rock consists largely of calcite which has been introduced along veinlets and has permeated the whole rock. Patches of the original rock have been altered to a mass of zeolite. There is a suggestion in places that the original rock was volcanic - some patches have a lath-like outline reminiscent of plagioclase. Minerals are:

calcite	84%
zeolite	12
quartz	4
sericite	minor
rutile	trace
hematite	trace
goethite	trace
chalcopyrite	3 grains

Calcite forms elongated grains up to 0.6mm in size which grow across the veinlets These grade into patches of finer grained calcite mixed with the rest of the rock.

Quartz forms rounded to subidiomorphic grains about 0.2mm in size which occur mixed with the calcite at the edges of the veinlets and patches. Some of the larger grains are strained.

The material between the crbonate veinlets and patches consists largely of a zeolite (species unidentifiable without X-ray diffraction). The mineral forms masses of feathery interlocking grains about 0.05mm in size with a few coarser patches. In places radial aggregates occur. Some patches of fine grains suggest replacement of plagioclase. Calcite forms small diffuse patches of fine grains within the zeolite masses.

Sericite forms ragged patches about 0.1 to 0.4mm in size which occur at the edges of the calcite patches and is oftn partly intergrown with the calcite. Grain size is less than 0.005mm. Some patches of calcite have a narrow rim of sericite. This is the greenish mineral ("mariposite") in the hand specimen. [According to Deer,Howie and Zussmann,mariposite is a variety of muscovite rich in Cr_2O_3; it is indistinguishable optically or by X-rays from muscovite,only a chemical analysis can identify it. It is sometimes green in thin section but most of the "mariposite" that I have seen is colourless in thin section,as is the sericite in this rock]

Rutile forms rounded grains about 0.05mm in size which are associated with the sericite patches.

Goethite forms subcubic grains about 0.1mm in size which occur within the calcite of the zeolite. It is an alteration of another mineral,perhaps magnetite.

Hematite forms extremely fine grains less than 0.005mm in size which occur in clusters within the calcite,often along the cleavages. A few grains of chalcopyrite occur in one calcite associated with the hematite.

↑ Upper Buchanan

STOP #10 Carbonate-zeolite rock (altered volcanic?)

This consists largely of patches and veins of carbonates (calcite and siderite) which are replacing a groundmass of zeolite (species unidentifiable without X-ray diffraction). Perhaps the original rock was volcanic but all traces have been obscured. Minerals are:

calcite	53%
siderite	20
zeolite	18
sericite	7
rutile	trace
hematite	trace
chalcopyrite	trace
quartz	2

Calcite forms shapeless interlocking grains of variable size up to 2mm which occur in veinlets and patches. Finer grains form diffuse patches mixed with the zeolite. The siderite has formed later than the calcite, occuring around the edges of the veinlets and patches. It sometimes forms small rounded patches by itself. Formation of the siderite has resulted in the carbonate patches being interconnected. (The siderite is probably not a pure end-member but it has higher relief than the calcite and is brownish in colour).

Quartz forms rounded grains about 0.1mm in size which occur at the edges of the calcite veinlets, partly intergrown with the calcite.

The groundmass of the rock consists of a zeolite which forms shapeless interlocking grains about 0.1mm in size. In places it forms radiating aggregates about 0.2mm in size.

Sericite forms a thin rim around the carbonate patches and veinlets. This grades into ragged, diffuse patches within the zeolite mass. Grain size is extremely small (less than 0.005mm) and it may be mixed with clay (illite??).

Rutile forms rounded grains about 0.05mm in size which are associated with the sericite.

Hematite forms rounded grains less than 0.01mm in size which occur in clusters within the calcite, often along the cleavage. In a few places it is associated with chalcopyrite.

STOP #11E Carbonate vein with copper sulphides

This consists of fine grained calcite with small patches of copper sulphides. Minerals are:

calcite	97%
chalcopyrite	2
bornite	1
magnetite	minor
hematite	minor
goethite	minor
chalcocite	trace

The calcite forms a mass of extremely fine grains which are matted together. It is dusty with fine grained iron oxides. Thin gash veins of clear calcite cut the finer grained mass. These are up to 0.3mm thick but usually much less. Within the fine grained mass there are also clear patches which are spherulitic in shape. These occur in clusters and are about 0.3mm in size.

Clusters of chalcopyrite, bornite and magnetite occur within the fine grained calcite. The grains are rather shapeless and range in size from 0.004 to 0.2mm in size. Chalcopyrite and bornite are often intergrown. Grain size of the bornite tends to be smaller than the chalcopyrite. These minerals are concentrated around or within the clear spherulitic calcite.

Hematite forms small ragged grains associated with the gash veins. It is partly or completely altered to goethite. Some of the magnetites are also altered to goethite.

Supergene enrichment

Chalcocite forms a narrow rim around the chalcopyrite and bornite. A few of the smaller grains have been completely altered to chalcocite.

STOP #11A Altered (carbonate) andesite

This is a medium grained volcanic rock consisting mainly of plagioclase; it has been highly altered by carbonate veinlets. Minerals are:

plagioclase	56%
calcite	32
goethite	4
rutile	2
illite	4
quartz	2

Plagioclase forms ragged, subhedral laths from 0.1 to 0.5mm in size. They are randomly oriented and interlocked. A few small shapeless interstitial patches of plagioclase occur between the laths. There are a few rounded phenocrysts about 1mm in size. The laths are weakly zoned.

Calcite occurs in subparallel veins from 1 to 3mm thick, forming subrounded interlocking grains up to 1mm in size. Much thinner veinlets also cut the rock and these grade into small diffuse patches up to 0.4mm in size which are replacing the plagioclase

Quartz forms subrounded grains about 0.2mm in size which are intergrown with calcite in the thicker veins. A few thin veinlets of quartz with minor calcite are aslo present.

Illite forms small flakes about 0.005mm in size which occur in patches about 0.2mm in size between plagioclase laths. It is intergrown with kaolinite in places. A few extremely thin stringers cut through the plagioclase grains. Some of the patches are partly surrounded by calcite.

Rutile forms rounded grains about 0.07mm in size which are disseminated throughout the rock. Many of the grains are partly replaced by goethite. Goethite itself forms extremely small grains disseminated between the plagioclase laths. It is probably oxidised hematite.

STOP #14 Soda trachyte implies low quartz (< 10%)
implies Ksnar > 2/3 of total feldspar

This is a fine grained volcanic rock with scattered small phenocrysts of plagioclase and quartz;bright blue riebeckite forms small feathery aggregates. Minerals are:

plagioclase	54%	groundmass
	5	phenocryst
quartz	24	groundmass
	2	phenocryst
riebeckite	11	
phlogopite	4	
sphene	minor	
apatite	trace	
calcite	trace	
hematite	trace	

Plagioclase (An_8 - optical determination) forms laths from 0.05 to 0.2mm in size which are crowded together with an intergrowth of quartz and plagioclase between them. The quartz tends to be intergrown with the edges of the plagioclase laths. The quartz grains are shapeless and tend to be partly intergrown with the edges of the plagioclase laths. There are a few plagioclase grains which are graphically intergrown with quartz. Quartz also forms in discontinuous stringers about 0.1mm thick which grade into the groundmass. In one of these there is calcite intergrown with the quartz. These stringers are probably deuteric in origin.

Plagioclase phenocrysts form squat subhedral grains up to 1.5mm in size. A few larger aggregates containing several interlocking grains are present. Scattered sericite flakes occur in some of the phenocrysts. The composition could not be determined due to lack of twinning. Quartz phenocrysts are rounded and up to 0.4mm in size.

Riebeckite forms extremely thin acicular grains which form rounded feathery masses up to 0.8mm in size.Individual grains cannot be distinguished exept at the edges of the aggregates. The aggregates are intergrown with the groundmass and sometimes occur at the edges of both the quartz and plagioclase phenocrysts. There is a vein-like patch of riebeckite at the edge of the section.

Sphene forms rounded grains about 0.1mm in size which are scattered about the groundmass. Aggregates and vein-like patches of smaller grains occur around the riebeckite. Fine specks of hematite occur at the edges of these. A few small rounded grains of apatite occur around the sphene aggregates.

Phlogopite forms small flakes less than 0.05mm in size which are disseminated through the groundmass around the plagioclase laths. It often forms aggregates of a few flakes.

STOP #15 Altered (calcite, chlorite, serpentine) mafic igneous rock

This is a medium grained rock which originally consisted of idiomorphic hornblende grains crowded in an unknown matrix. It could have been a porphyritic volcanic rock (andesite) or perhaps a diorite. It has been completely altered. The hornblende has altered to a chlorite and the groundmass has altered to a fine grained mixture of serpentine? and clays? Later calcite veining has resulted in calcite permeating the rock and replacing much of the groundmass and the chloritised hornblende. Minerals, excluding the vein, are:

calcite	40%
altered hornblende	38%
altered groundmass	20
quartz	2
Fe-Ti oxide	minor
rutile	trace
magnetite	trace
spinel (chromite?)	trace

The altered hornblende forms idiomorphic grains from 0.3 to 1.3mm in size, averaging about 0.5mm. They have been pseudomorphically replaced by a light buff coloured chlorite forming scaley aggregates of fine grains.

The groundmass consists of patches of very fine fibrous grains which in places are intergrown with a fine grained clay-like mineral with low relief and birefringence (clay?). Much of this mineral has been replaced by calcite and it occurs in minor amounts. In places there are rounded patches of serpentine with a crystal outline - these may have been pyroxene or olivine.

Calcite forms ragged, rounded, interconnected patches averaging about 0.4mm in size which have replaced much of the groundmass. Diffuse patches of very fine grained calcite occur within the altered hornblende. Quartz is sometimes associated with calcite, especially close to the calcite vein where it is concentrated at the edge. The calcite vein grades into the rest of the rock.

Very fine grained opaque Fe-Ti oxides are disseminated around the edges of the calc calcite patches throughout the rock. One or two rounded rutile grains about 0.05mm in size are associated with these.

Magnetite appears to be an original constituent. It forms subrounded grains about 0.1mm in size which are scattered about the altered groundmass. It is cracked and clays have formed within these.

Spinel forms octahedral grains about 0.05mm in size which occur in clusters of a few grains; smaller ones are rounded. They occur within the serpentine patches.

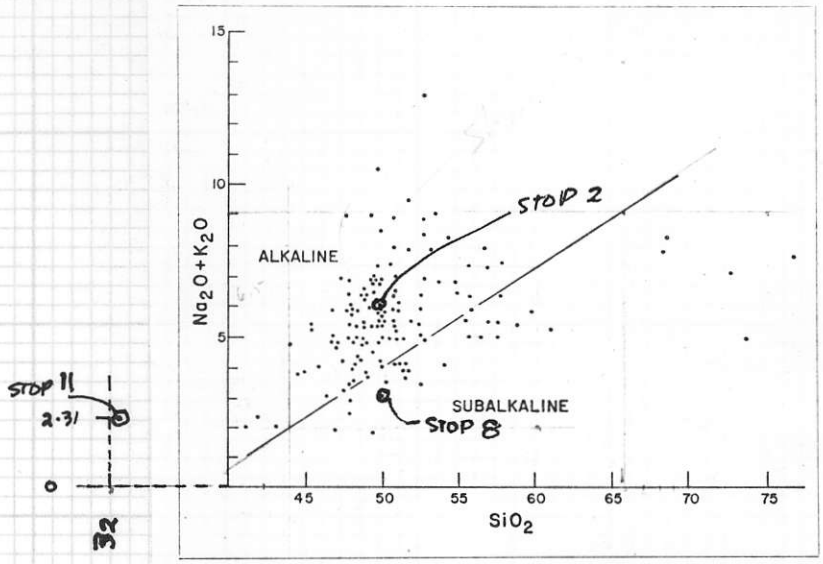

FIGURE 2 — Alkalis-silica plot for volcanic rocks of the Quesnel Trough (wt. %). After Fox CIM Special Vol 15 p361

Plot of "MOW" claim rock geochem. values
Ref. Chemex Certificates A9310891 -001 -A, B

92P

CHEMEX LABS LTD.

212 BROOKSBANK AVE.
NORTH VANCOUVER, B.C.
CANADA V7J 2C1

TELEPHONE: (604) 984-0221
TELEX: 043-52597

• ANALYTICAL CHEMISTS • GEOCHEMISTS • REGISTERED ASSAYERS

CERTIFICATE OF ASSAY

Major element Analyses

TO : CHEVRON STANDARD LIMITED
MINERALS STAFF
#901 - 355 BURRARD ST.
VANCOUVER, B.C.
V6C 2G8

ATTN: RAGNAR, B.

CERT. # : A8310891-001-E
INVOICE # : I8310891
DATE : 21-APR-83
P.O. # : NONE

Sample description	Prep code	Na2O (WRA) %	K2O (WRA) %	LOI (WRA) %	P2O5 (XRF) %		
STOP # 2	214	4.21	1.84	5.72	0.32	--	--
STOP # 8	214	2.05	0.96	4.87	0.16	--	--
STOP # 11	214	0.23	2.08	24.87	0.12	--	--

High Loss on ignition is due to high carbonate content (35-40% not uncommon.

Registered Assayer, Province of British Columbia

CHEMEX LABS LTD.

212 BROOKSBANK AVE.
NORTH VANCOUVER, B.C.
CANADA V7J 2C1

TELEPHONE: (604) 984-0221
TELEX: 043-52597

• ANALYTICAL CHEMISTS • GEOCHEMISTS • REGISTERED ASSAYERS

CERTIFICATE OF ASSAY

TO : CHEVRON STANDARD LIMITED
MINERALS STAFF
#901 - 355 BURRARD ST.
VANCOUVER, B.C.
V6C 2G8

ATTN: RAGNAR, B.

CERT. # : A8310891-001-A
INVOICE # : I8310891
DATE : 21-APR-83
P.O. # : NONE

Sample description	Prep code	SiO2 (WRA) %	Al2O3 (WRA) %	Fe2O3 (WRA) %	TiO2 (WRA) %	MgO (WRA) %	CaO (WRA) %
STOP # 2	214	48.78	14.72	9.81	0.90	7.93	4.82
STOP # 8	214	50.06	8.59	7.61	0.49	15.53	8.47
STOP # 11	214	32.43	6.42	9.12	0.30	14.91	7.98

Registered Assayer, Province of British Columbia

CHEMEX LABS LTD.

212 BROOKSBANK AVE.
NORTH VANCOUVER, B.C.
CANADA V7J 2C1

TELEPHONE: (604) 984-0221
TELEX: 043-52597

• ANALYTICAL CHEMISTS • GEOCHEMISTS • REGISTERED ASSAYERS

CERTIFICATE OF ANALYSIS

TO : CHEVRON STANDARD LIMITED
MINERALS STAFF
#901 - 355 BURRARD ST.
VANCOUVER, B.C.
V6C 2G8

Rock Samples

ATTN: RAGNAR, B.

CERT. # : A8310890-001-A
INVOICE # : I8310890
DATE : 13-APR-83
P.O. # : NONE

Now #1 AMER M.C.s 92P/2

Sample description	Prep code	Cu ppm	Mo ppm	Pb ppm	Zn ppm	Ag ppm	W ppm
STOP # 2 Fresh only primary Cu	205	825	1	1	35	0.1	1
almost entirely oxide copper + carbonate copper STOP # 3	205	1930	1	1	32	0.1	1
STOP # (5) Actually Residual soil sampled to see if any fm enrichment.	205	3750	1	5	64	0.1	1
STOP # 8	205	58	2	1	33	0.1	1
STOP # 9	205	14	1	1	95	0.1	3
STOP # 11	205	885	2	1	82	0.4	2
STOP # 13	205	50	2	1	80	0.1	1
STOP # 14	205	16	1	19	40	0.1	1

Certified by Hartwig Sichler

CHEMEX LABS LTD.

212 BROOKSBANK AVE.
NORTH VANCOUVER, B.C.
CANADA V7J 2C1

TELEPHONE: (604) 984-0221
TELEX: 043-52597

• ANALYTICAL CHEMISTS • GEOCHEMISTS • REGISTERED ASSAYERS

CERTIFICATE OF ANALYSIS

TO : CHEVRON STANDARD LIMITED
MINERALS STAFF
#901 - 355 BURRARD ST.
VANCOUVER, B.C.
V6C 2G8

Rock Samples

ATTN: RAGNAR, B.

CERT. # : A8310890-001-B
INVOICE # : I8310890
DATE : 13-APR-83
P.O. # : NONE

MOW #1, MER M.C. 92 P/2

Sample description	Prep code	Au FA+AA ppb	AS ppm	Hg ppb	F ppm	Sb ppm	Ba ppm
STOP # 2	205	<5	4.0	30	210	0.1	1040
STOP # 3	205	<5	4.0	30	240	0.1	900
STOP # 5	205	(<5) expected Au enrichment	7.0	20	200	0.8	720
STOP # 8	205	<5	11.0	40	130	0.1	420
STOP # 9	205	<5	5.0	30	130	0.1	20
STOP # 11	205	<5	45.0	5400	160	28.0	1280
STOP # 13	205	<5	16.0	80	220	9.6	640
STOP # 14	205	5	2.0	90	50	1.0	200

Certified by ..... Hartwig Bichler

CHEMEX LABS LTD.

212 BROOKSBANK AVE.
NORTH VANCOUVER, B.C.
CANADA V7J 2C1

TELEPHONE: (604) 984-0221
TELEX: 043-52597

• ANALYTICAL CHEMISTS • GEOCHEMISTS • REGISTERED ASSAYERS

CERTIFICATE OF ASSAY

TO : CHEVRON STANDARD LIMITED
MINERALS STAFF
#901 - 355 BURRARD ST.
VANCOUVER, B.C.
V6C 2G8

Rocks, misc

CERT. # : A8310892-001-A
INVOICE # : I8310892
DATE : 13-APR-83
P.O. # : NONE

ATTN: RAGNAR, B.

MOW #1 M.C.

Sample description	Prep code	Cu %					
STOP # 6 Chip Sample over 1m.	208	1.28	--	--	--	--	--
STOP # 7 Chip Sample over 2m	208	0.72	--	--	--	--	--
STOP # 6 H.G.	208	5.15	--	--	--	--	--
STOP # 7 H.G.	208	2.80	--	--	--	--	--

"Samples" taken by M. Dickens April 5/83
actually hand picked material R.L.B.

Very heavy supergene minerals such as azurite malachite native copper (minor) cuprite.

Registered Assayer, Province of British Columbia

CHEMEX LABS LTD.

212 BROOKSBANK AVE.
NORTH VANCOUVER, B.C.
CANADA V7J 2C1

TELEPHONE: (604) 984-0221
TELEX: 043-52597

• ANALYTICAL CHEMISTS • GEOCHEMISTS • REGISTERED ASSAYERS

CERTIFICATE OF ANALYSIS

TO : CHEVRON STANDARD LIMITED
MINERALS STAFF
#901 - 355 BURRARD ST.
VANCOUVER, B.C.
V6C 2G8

Rock Samples

CERT. # : A8310892-001-B
INVOICE # : I8310892
DATE : 13-APR-83
P.O. # : NONE

ATTN: RAGNAR, B.

MOW #1

Sample description	Prep code	AS ppm	Hg ppb	F ppm	Sb ppm	Ba ppm	
STOP # 6	208	30.0	20	200	3.6	280	--
STOP # 7	208	7.0	20	210	1.0	280	--
STOP # 6 H.G.	208	22.0	30	130	0.8	340	--
STOP # 7 H.G.	208	11.0	20	140	2.0	180	--

Samples taken by M. Dickens April 5/83

Certified by ..Hart Bichler...

CHEMEX LABS LTD.

212 BROOKSBANK AVE.
NORTH VANCOUVER, B.C.
CANADA V7J 2C1

TELEPHONE: (604) 984-0221
TELEX: 043-52597

• ANALYTICAL CHEMISTS • GEOCHEMISTS • REGISTERED ASSAYERS

CERTIFICATE OF ANALYSIS

TO : CHEVRON STANDARD LIMITED
MINERALS STAFF
#901 - 355 BURRARD ST. Rock Samples
VANCOUVER, B.C.
V6C 2G8

ATTN: RAGNAR, B.

CERT. # : A8310892-001-A
INVOICE # : I8310892
DATE : 13-APR-83
P.O. # : NONE

now #1 M.C.

Sample description	Prep code	Mo ppm	Pb ppm	Zn ppm	Ag ppm	W ppm	Au FA+AA ppb
STOP # 6	208	5	1	63	2.7	1	135
primary cu * STOP # 7	208	14	3	31	3.7	1	300
STOP # 6 H.G.	208	13	1	36	3.1	1	110
STOP # 7 H.G.	208	36	1	32	6.7	1	25

"Samples" taken by M. Dickens April 5/83
actually specimen

* amygdaloidal cpy

CTA MEMBER CANADIAN TESTING ASSOCIATION

Certified by ..... Hart Bichler

CHEMEX LABS LTD.

212 BROOKSBANK AVE.
NORTH VANCOUVER, B.C.
CANADA V7J 2C1

TELEPHONE: (604) 984-0221
TELEX: 043-52597

• ANALYTICAL CHEMISTS • GEOCHEMISTS • REGISTERED ASSAYERS

CERTIFICATE OF ANALYSIS

TO : CHEVRON STANDARD LIMITED
MINERALS STAFF
#901 - 355 BURRARD ST.
VANCOUVER, B.C.
V6C 2G8

Soil samples

ATTN: RAGNAR, B.

CERT. # : A8310889-001-A
INVOICE # : I8310889
DATE : 13-APR-83
P.O. # : NONE

MOW #1 & MER M.C's 92P/2

Sample description	Prep code	Cu ppm	Mo ppm	Pb ppm	Zn ppm	Ag ppm	W ppm
SSM # 1	201	120	1	1	68	0.1	2
SSM # 2	201	14	1	1	77	0.1	1
SSM # 3	201	58	1	1	62	0.1	1
SSM # 4	201	215	1	1	68	0.1	1
SSM # 5	201	>10000	6	1	87	0.1	1
SSM # 6	201	295	3	4	73	0.1	1
SSM # 7	201	98	2	2	108	0.2	1

Certified by Stan Sicker

CHEMEX LABS LTD.

212 BROOKSBANK AVE.
NORTH VANCOUVER, B.C.
CANADA V7J 2C1

TELEPHONE: (604) 984-0221
TELEX: 043-52597

• ANALYTICAL CHEMISTS • GEOCHEMISTS • REGISTERED ASSAYERS

CERTIFICATE OF ANALYSIS

Soil Samples

TO : CHEVRON STANDARD LIMITED
MINERALS STAFF
#901 - 355 BURRARD ST.
VANCOUVER, B.C.
V6C 2G8

ATTN: RAGNAR, B.

CERT. # : A8310889-001-B
INVOICE # : I8310889
DATE : 13-APR-83
P.O. # : NONE

MOW#1 ~ MER MCS 92P/2

Sample description	Prep code	Au FA+AA ppb	AS ppm	Hg ppb	F ppm	Sb ppm	Ba ppm
SSM # 1	201	<5	10.0	40	230	0.1	580
SSM # 2	201	10	9.0	30	410	0.1	500
SSM # 3	201	5	6.0	20	260	0.1	460
SSM # 4	201	25	4.0	30	250	0.1	480
SSM # 5	201	35	15.0	30	240	0.1	620
SSM # 6	201	5	45.0	280	340	12.6	620
SSM # 7	201	35	73.0	100	440	7.8	1340

Certified by ..Hartt Bichler...

MOW Claims

Rocks

	Au ppb	Ba ppm	Cu ppm (gen)	Mo	Pb	Zn	Ag ppm	As ppm	W	Hg ppb	F	Sb ppm	
STOP 2	<5	1040	825	1	1	35	.1	4.0	1	30	210	.1	barren rock
3	<5	900	1930	1	1	32	.1	4.0	1	30	240	.1	oxidized
5	<5	720	3750	1	5	64	.1	7.0	1	20	200	.8	Residual soil
6	135	280	1.28%	5	1	63	2.7	30	1	20	200	3.6	rock chip 1 m
7	300	280	0.72%	14	3	31	3.7	7	1	20	210	1.0	rock chip 2 m
8	<5	420	58	2	1	33	.1	11	1	40	130	.1	
9	<5	20	14	1	1	95	.1	5	3	30	130	.1	
11	<5	1280	885	2	1	82	.4	45	2	5400	160	28	in pit
13	<5	640	50	2	1	80	.1	16	1	80	220	19.6	1 m of Andesite ~25% of Dead.
14	5	200	16	1	19	40	.1	2	1	90	50	1.0	At rhyolite
Prospectors samples 6 High grade	110	340	5.15%	13	1	36	3.1	22	1	30	130	0.8	at STOP 6
7 High grade	25	180	2.80%	36	1	32	6.7	11	1	20	140	2.0	at stop 7

* yet to come Au

3 whole rock

SOILS	Au ppb	Ba	Cu	Mo	Pb	Zn	Ag	As	W	Hg ppb	Sb 0.1	
SSM. #1	<5	580	120	1	1	68	0.1	10	~~2~~	40	0.1	
#2	(10)	500	14	1	1	77	0.1	9	~~1~~	30	0.1	
#3	(5)	460	58	1	1	62	0.1	6	1	20	0.1	
#4	(25)	480	215	1	1	68	0.1	4	1	30	0.1	
#5	(35)	620	10,000	6	1	87	0.1	15	1	30	0.1	
#6	(5)	620	295	3	4	73	0.1	45	~~1~~	280	12.6	same location as STOP 11 by Deadman Cr.
#7	(35)	1340	98	2	2	100	0.2	73	1	100	7.8	

Note Geochem handbook: Sb in soil at Keno Hill — not influenced by mineralization contained 1-3 ppm Sb — average ≈ 1 ppm.

Sb in andesitic rocks in Japan ≈ 0.2 ppm

CHEMEX LABS LTD.

212 BROOKSBANK AVE.
NORTH VANCOUVER, B.C.
CANADA V7J 2C1

TELEPHONE: (604) 984-0221
TELEX: 043-52597

• ANALYTICAL CHEMISTS • GEOCHEMISTS • REGISTERED ASSAYERS

CERTIFICATE OF ANALYSIS

TO : CHEVRON CANADA RESOURCES LTD.
MINERALS STAFF
#901 - 355 BURRARD ST.
VANCOUVER, B.C.
V6C 2G8

ATTN: R. U. BRUASET

CERT. # : A8311376-001-A
INVOICE # : I8311376
DATE : 25-MAY-83
P.O. # : NONE
MISCELLANEOUS

Sample description	Prep code	Cu ppm	Ag ppm	Au FA+AA ppb			
2' FROM SURFACE	201	3550	3.2	10	--	--	--

Certified by Hart Bichler

LCP

MOW #1 (2 Oct)

Relocation of MOWICH 1
Located by M. Dickens

MOWICH LAKE

DEADMAN CR.

Topography

STOP 1 Clots of malachite, azurite in Nicola Volcanics (Augite porph) Post mineral shearing

STOP 13
S.S.M7
STOP 12
Andesite

Andesite (alkaline)

STOP 11
S.S.M6
STOP 10
STOP 9

Zone of old trenches with strong silicification carbonitization minor low pH alteration, abundant mariposite quartz and carbonate veins
Minor py+cpy in fractures.

Ample → W. for drilling purposes → W

Cu showing
STOPS 2-8
S.S. M1-5
- Alkaline and subalkaline Nicola augite porphyry.
- Hypogene sulphides as amygdales, heavy supergene Cu minerals azurite, malachite, ~~native~~ and/or chalcocopper, ~~bornite~~

STOP 14 Rhyolite
~~Rhyolite~~ bearing boulders; probably close to source

STOP 15
Andesite boulders with quartz veins + galena.

1:10,000

0 500 m

MOW #1 claim.
Deadman ~~River~~ River

92P/2

To Mowich L. / Deadman Cr.

Drift covered for 150m +

Oxide Zone

Note: No stop #4

N

Steep hillside; drainage direction as shown by arrows

Primary zone

STOP #5
Residual soil developed on deeply weathered andesite

Heavy azurite, malachite, chrysocolla

S.S.M#5

STOP #6

S.S.M#4

Rock chip 0.72% Cu / 2m Rock chip sample

STOP #7

1.28% Cu / 1m Rock Chip

135 PPB Au

Heavy primary cpy also some pyrite sulphides, rock have amygdaloidal or possibly fragmental. Little evidence of structures controlling cpy such as veins, fractures

Location reference: Approx. 800 m @ 315° to the southend of Mowich Lake at mouth of Deadman Creek

Rejuvenated Valley forms lineament

Drift covered

augite porphyry

STOP #8

Rock chip

Tmxam

TO STOP #9 etc

Rock geochem: $Na_2O + K_2O = 3.01\%$
$SiO_2 = 50.06\%$
∴ Subalkaline (Mac Donald line)

Oxide Zone

STOP #3

1.0m

S.S.M#3

Chip sample of oxidized andesite (augite porphyry) (azurite) malachite, (chrysocolla) (N. Cu)
Minor tetrahedrite noted
This could be part of oxide zone on top of a major deposit.

S.S.M#2

Legend

STOP #

Small outcrop of Nicola andesite (augite porphyry and amygdaloidal basalt/andesite) generally exposed in hand dug prospecting pits.

Fracture

Rock sample (chips)

Soil sample

--- traverse line

Oxide Zone

0 10 20 m

Oxide ZONE

S.S.M#1

STOP #2
Weakly amygdaloidal
Traces of malachite

Tm

Rock geochem: $Na_2O + K_2O = 6.05\%$
$SiO_2 = 48.78\%$
∴ Alkaline (Mac Donald line, 1968)
Ref: Chemex Report A8310391-001-B 21 April/83.

Claim: MOW #1 92P/2