



Province of
British Columbia

Ministry of
Energy, Mines and
Petroleum Resources

MEMORANDUM

B.C. GEOLOGICAL
SURVEY BRANCH

#159 - 800 Hornby Street, Vancouver, B.C. V6Z 2C5

Telephone 660-2708

FAX 660-2653

November 1, 1989

To: Ted Faulkner
District Geologist
Prince George

885716

From: Tom Schroeter, P.Eng
Senior Regional Geologist
Vancouver

Re: MT. MILLIGAN Property

I have enlisted Mark Rebagliati as a co-author for a write-up on the Mt. Milligan proerty to be submitted next spring for Exploration Part B. Vic has agreed to also participate by providing a regional/exploration perspective re-alkaline porphyry Cu-Au deposits with emphasis on this new favourable belt and with specific reference to Mt. Milligan. I understand that you are preparing a 'regional overview' of the area (belt) north of Fort St. James to be published in Fieldwork 1989. I look forward to seeing the product. If you feel you have something specific to contribute to this separate report on Mt. Milligan, I invite you to participate as another co-author. If you don't think you have anything specific or that you don't want to participate, I still welcome any comments from you.

J. Balci, Secretary

For Tom Schroeter

cc V. Preto
R. Smyth
B. McMillan



Tom

MAR 11 1989

ARCS: 440-01

TO: W.R. SMYTH

JRS

March 13, 1989

RE: VISIT TO Mt. Milligan (Phil-Heidi Claims) PROPERTY MARCH
8TH AND 9TH

MT. MILLIGAN

On March 8th & 9th I visited the Mt. Milligan Cu-Au property of Lincoln Resources Inc. in the company of E.L. Faulkner. C.M. Rebagliati, consulting geologist is in charge of the project and he kindly toured us around and discussed property geology with us.

Lincoln currently have 3 drills working around the clock. Two are occupied in 100 M step out drilling on the "66 zone" (Au) while the third is testing the western flank of the MBX monzonite stock. Approximately 40- men are in camp. The company has spent \$1.3M since November 1/88, and are currently in the middle of another 1.1M program.

GEOLOGY

- The Mt. Milligan property is clearly a very large alkalic porphyry system in Takla volcanics. Two K-Ar samples have been submitted by T. Schroeter and results should be available soon. They should give ages of \pm 90 m.a. Mineralization occurs within and around a modest sized (< 1km diameter) "stock" of porphyritic monzonite.
- Drilling to date has been almost exclusively in the surrounding volcanics and therefore little is known about the amount of mineralization in the "stock" and on the continuity and exact shape/size of this body.
- The volcanic rocks consist roughly of 50% pyroxene porphyry flows, 30% lapilli turfs and breccias and 20% finer grained massive and bedded tuffs. This is not a very proximal assemblage. As well, the drill sections show only 10-15% intrusives mostly in the form of pre- or intra-mineral dykes and sills. The volcanics dip moderately to the east and appear to be right-side-up. No folding has been detected.
- There is no sign of molybdenite, very little quartz veining, and no sign of any supergene alteration.

.../2

- Hydrothermal alteration of the volcanic and intrusive rocks includes potassic alteration (biotite and K-spar) closer to the stock, and prophylic alteration farther out. In the southern part of the "66 Zone" potassic alteration appears again, suggesting the presence of another stock to the south or at depth.
- Albite-epidote alteration, usually widespread in other alkalic systems, and earlier than potassic, appears to be limited to zones of fracturing and to be later than potassic alteration at Mt. Milligan.

GENERAL COMMENTS

- The company is doing a very good job of core logging, understanding of rocks, alteration etc. mostly because of the energy and experience of the consultant, Mark Rebagliati. They have, however, done only a limited amount of petrography and chemical study due to the intensity and urgency of the program, and likely will not do much in the future.
- Drilling so far has been widely spaced (100 m) and amounts to roughly 50,000 ft.. This has undoubtedly contributed to an oversimplified picture of the system. Fill-in drilling will have to be done probably at 30 m centers, implying at least 150,000 ft. In all probability difficulties and complexities will surface then, and the current picture of a large open pit might change. We might end up with one or more smaller pits..... or no pits at all....or a very major deposit if everything pans out.
- Whatever will happen, this remains a major alkalic Cu-Au System in an area still relatively poorly known and in which a number of other similar deposits are found, such as Windy, Tas, Col, Takla Rainbow etc.

RECOMMENDATIONS

- G.S.B. should do a study on this property this summer because:
 - In excess of 50,000 ft of core are available.
 - Not much is known about the deposit and the exploration community could significantly benefit from a study by us

• From the point of view of understanding the deposit better in broader perspective, several questions need to be answered such as:

1. Are the volcanics "average" Takla or a special K-rich site?

2. Are the intrusives on Mt. Milligan, 3 miles to the north, genetically related? What is the petrogenesis?.

3. Can even a rough comparison/ contrast be made with other systems in the Omineca/Quesnel/Nicola belts?

- Ideally a geologist with considerable prophyry experience should do this job, and Andre' Panteleyev would be the natural choice.
- If this is not possible, the District Geologist could do the job with my direct input and co-operation, and the interaction of Mark Rebagliati. The output could be a paper for Geological Fieldwork 1989 or, at the latest, Exploration Part B, co-authored by Ted Faulkner, Mark and myself. The job could probably be done with 3 weeks in the field and 4-6 weeks study and write-up time.

I would appreciate your reaction/comments to this report.



V.A. Preto
Manager
District Geology and
Coal Resources

VAP/bb

cc: W.J. McMillan
T.G. Shroeter
E.L. Faulkner



Province of
British Columbia

Age Dating
Ministry of
Energy, Mines and
Petroleum Resources

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Telephone: (604) 660-2708 Fax: (604) 660-2653

January 24, 1989.

Dr. Bill McMillan
Ministry of Energy, Mines
and Petroleum Resources
Mineral Deposits and Regional Mapping
Parliament Buildings
Victoria, B.C.
V7V 1X4

Dear Dr. McMillan:

Re: K-Ar AGE DATING - MT. MILLIGAN PORPHYRY Cu-Au PROPERTY

Enclosed are three (3) samples for possible age dating. As discussed over the telephone, I would very much appreciate your assistance in 'streamlining' this request. As you are keenly aware, the Mt. Milligan property represents a significant new discovery, significantly a porphyry! There are virtually no age dates regionally and other recent discoveries (eg. Tas) will also require age determinations.

I believe the Geological Survey Branch can make a significant contribution to the genesis and further understanding of porphyry systems in this much bypassed part of the Province. Providing a quick age date(s) would make an excellent start.

If at all possible it would be very timely if one date could be obtained by April 5th, THE DATE OF THE GAC-MDD porphyry Cu-Au Workshop in Vancouver.

I would appreciate your opinion of the thin sections of all 3 samples; furthermore, I would ask that you proceed if determination look possible. Ideally I would hope for determinations from TGS-89-1 and TGS-89-3.

Please let me know what STOB I will need to use.

Thanks for your assistance.

Yours sincerely,

Tom Schroeter
Senior Regional Geologist

cc. R. Smyth

Encls.

SEPARATION APPROVED _____
DATE _____

10-3: GEOCHRONOLOGY REQUEST FORM

Submitted by: TOM SCHROETER
K/Ar Zircon _____ Other _____

MI 93N194

Sample Number ~~88~~ TGS-89-1 ~~89~~
Lab Number ~~88~~ same ~~89~~

Location Lat 55°07' Long 124°02' NTS 93N/01E
UTM Zone 10 Easting 6108819 Northing 434101

Kind of Sample Hand specimen _____ Drill core Other _____

Rock Type PORPHYRITIC MONZONITE

Rock Unit/Formation/Group TAKLA GROUP ANDESITIC PYROCLASTICS

Mineral to be separated (specify if whole rock) Biotite or whole rock

Geologic Age Estimated Early Cretaceous - 110 to 125 Ma?

Comments Naver Intrusion?
MT. MILLIGAN (Phil, Heidi) property
DOH-88-53-70m
Note: Monzonite is ^{weakly} mineralized (py/cpy)

Collected by Mark Rebagliati -> Tom Schroeter

Dated by _____

Listed by _____
Name/Institution

SEPARATION APPROVED _____
DATE _____

10-3: GEOCHRONOLOGY REQUEST FORM

Submitted by: TOM SCHROETER
K/Ar Zircon _____ Other _____

MI 93N 194

Sample Number TGS-89-2
Lab Number same

Location Lat 55°07' Long 124°02' NTS 93N/01E
UTM Zone 10 Easting 6108819 Northing 434101

Kind of Sample Hand specimen _____ Drill core Other _____

Rock Type PORPHYRITIC LATITE DYKE (MONZONITIC?)

Rock Unit/Formation/Group TAKLA GROUP ANDESITIC PYROCLASTICS

Mineral to be separated (specify if whole rock) Biotite? → Whole Rock

Geologic Age Estimated Early Cretaceous - 110 to 125 Ma

Comments Naver Intrusions?

Mt. MILLIGAN (Phil, Heidi) property
DDH-88-26-18 m

Note: Rock has abundant disseminated sulphides
(i may only be able to try whole rock?)

Collected by Mark Rebagliati → Tom Schroeter

Dated by _____

Listed by _____
Name/Institution

SEPARATION APPROVED _____

DATE _____

10-3: GEOCHRONOLOGY REQUEST FORM

Submitted by: TOM SCHROETER
K/Ar Zircon _____ Other _____

MI 93N194

Sample Number TGS-89-3
Lab Number same

Location Lat 53° 07' Long 124° 02' NTS 93N 101E
UTM Zone 10 Easting 6108819 Northing 434101

Kind of Sample Hand specimen _____ Drill core Other _____

Rock Type HORNFELS - altered volcanic

Rock Unit/Formation/Group TAKLA GROUP andesitic volcanic

Mineral to be separated (specify if whole rock) Whole Rock - fr. gr. matte of secondary biotite

Geologic Age Estimated Early Cretaceous 110 to 125 Ma

Comments Naver Intrusions?
Mt. MILLIGAN (Phil, Heidi) property
DDH- 88-25-90m

Collected by Mark Rebagliati -> Tom Schroeter

Dated by _____

Listed by _____

Name/Institution