

**REPORT**

**on the**

**Thor 3 and Thor 4  
Mineral Claims**

**Ketchan Creek Area  
Similkameen Mining Division, British Columbia**

**Latitude 49° 45' 30" N., Longitude 120° 32' 45" W.  
NTS map sheet 92H/15E**

**by**

**James W. McLeod, P.Geo.**

**on behalf of**

**Gary Brown**

**November 1, 2002  
Delta, British Columbia  
GEOLOGICAL SURVEY BRANCH  
ASSESSMENT REPORT**

**26,964**

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## SUMMARY

The Thor 3 and Thor 4 mineral claims described in this report are located immediately west of the south-end of Missezula Lake in the Similkameen Mining Division, southern British Columbia, Canada.

The property is underlain by rock units of the Upper Triassic Nicola Group. The Nicola Group is regionally subdivided into three N-S trending belts: the Central Belt, the Eastern Belt and the Western Belt from oldest to youngest. The depositional time frame of the three belts are not contemporaneous, but traverse portions of the Upper Triassic and Lower Jurassic periods. The Thor 3 and Thor 4 mineral claims cover an area underlain by the Central Belt that is seen to host many of the alkalic igneous porphyry and volcanic skarn copper-gold-platinum group elements (PGE) occurrences and deposits. In addition to an excellent geological setting, the property lies in or very near strong structurally effected zones and numerous known mineral occurrences.

The current emphasis on reconnaissance magnetometer ground surveying and prospecting is to cover large areas. This method should at some stage be augmented with rock and soil geochemistry, testing for multi-elements including precious metals.

The magnetometer survey may define underlying rock-type features and relative, localized variations of intensity may indicate alteration, mineralization and/or dyke concentrations.

The program used in this survey and outlined above should be expanded over the entire property.

The recommended program is expected to take approximately one month to complete at an estimated cost of \$ 40,000.

## **INTRODUCTION**

The reconnaissance magnetometer and prospecting fieldwork initiated during this survey is thought to be an effective method by which to cover this and other localized areas of interest.

The program was carried-out during the period May 15-24, 2002, under the writers' supervision.

This report is being prepared at the request of Gary Brown of North Vancouver, BC.

## **LOCATION AND ACCESS**

The claim area may be located on NTS map sheet, 92H/15E at latitude 49° 45' 30" north and longitude 120° 32' 45" west. The property is situated approximately 21 km. south southeast of the Village of Aspen Grove, B.C. immediately west of the south-end of Missezula Lake. The property lies in the Similkameen Mining Division, British Columbia, Canada.

Access to the mineral claims is gained by traveling 26 km. south southeast of Aspen Grove, B.C. on Provincial Highway 5 to the Hornet Lake cut-off and then east and north for 6 km. on the Ketchan Creek road to the Thor 3 mineral claim. A due east traverse for 2 km. along the south boundary claim line of the Thor 3 and Thor 4 mineral claims takes you to the common N-S boundary of the mineral claims (see Figure 2). A further 1 km. traverse to the Thor 4 - 2E post is the 0+00 – Baseline of the survey grid.

## **TOPOGRAPHICAL AND PHYSICAL ENVIRONMENT**

The mineral claims lie within the specific Thompson plateau area of the larger Interior plateau region. The physiographic setting of the area is defined as the Dry Interior and/or Sub-Alpine belt, depending on the local elevation. The property covers low, rounded mountainous terrain as a well defined, north-south trending hill approximately 3 km. long and 2 km. wide. This feature has relative relief of about 250 metres (800 feet).



THOR 3 and THOR 4  
 Mineral Claims  
 Location Map  
 Ketchikan Lake Area  
 Similkameen M.D. B.C.

0 180 360 Km

NOV/02	JWH	92H/15E	FIG. 1
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Patches of coniferous and deciduous trees interspersed with open range areas cover the property. The elevations of the claim area range from 1,360 metres (4,150 feet) to 1,525 metres (5,000 feet).

The general area experiences approximately 90 cm. (35") of precipitation annually, of which 25-30% often occurs as a snow equivalent. The winter weather is generally moderately cold. The summer weather could be described as variable, but most often dry and fairly hot.

## **PROPERTY AND OWNERSHIP**

The property is located in the Similkameen Mining Division of British Columbia, Canada at latitude 49° 45' 30" north and longitude 120° 32' 45" west. It is comprised of two west-east contiguous, 4-post, 4X5 unit mineral claims with a total of 40 units (see Figure 2). The claims are listed as follows:

<u>Name</u>	<u>Tenure No.</u>	<u>Units</u>	<u>Anniversary Date</u>
Thor 3	389010	20	August 4
Thor 4	389011	<u>20</u>	August 3
	Total	40 units	

The mineral claims have not undergone a legal survey, but the writer has examined the legal corner post and other intermediate posts and they appeared to be in the recorded location. The mineral claims total an area of approximately 900 hectares or 2,224 acres.

The above listed mineral claims are owned by Mr. Gary Brown of North Vancouver, British Columbia.

## **HISTORY**

Lode gold was discovered in the Hedley area in 1894. By 1904, the Nickel Plate Mine, in the Hedley Camp was producing for the first of three extended periods, the latest of which ended during the 1990's after successful mining by Mascot Gold Mines (Corona Corporation).

The large copper-gold-platinum group elements (PGE), alkalic porphyries of the Copper Mountain area were first discovered in 1884, but not staked until 1892 and did not actually reach production until

676000

678000

Missegularz Lake

5517000

Nicola M.D.

Similkameen M.D.

Ketchikan Creek

Thor 4

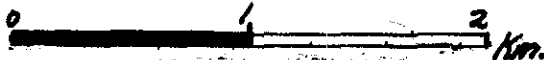
Thor 3

5513000



Thor 3 & Thor 4 Mineral Claims

Claims Map  
Ketchikan Lake Area  
Similkameen M.D. B.C.



Nov/12

JWW

9241/5E

FIG. 2

1925 when Copper Mountain was brought on stream by the Granby Consolidated Mining, Smelting and Power Company. The mines at Copper Mountain operated between 1925-1930 and 1937-1957 producing 31.5 million tons of ore grading better than 1% copper. The latest episode of this area's production began in 1972 by the Newmont Mining Corporation on the west side of the Similkameen River at the adjacent Ingerbelle volcanic skarn deposit. Newmont later consolidated the Copper Mountain and Ingerbelle operations and were active under the name, Princeton Mining Corporation until 1996 as the Similco Operation.

The Aspen Grove Copper Camp began its' extended period of mineral exploration activity about 1900 to 1930, but rendered disappointing results. It wasn't until the realization during the late 1950's that large tonnage (100 million tons plus), low grade (0.50% primary copper) deposits could be exploited economically in British Columbia, i.e. Bethlehem Copper Corporation in the Highland Valley. Also a number of larger tonnage, higher grade copper situations were displaying exciting economics, i.e. Craigmont Mines at Merritt, BC, the Phoenix Copper Camp in the Greenwood-Grand Forks area, BC and the beginning of the third extended period of production in 1972 at Copper Mountain, Princeton, BC.

The local mining companies and junior mineral exploration companies soon developed geological models around indicated clusters of mineral occurrences (and types) and tied-in with the development of field geochemistry kits and later relatively inexpensive multi-element analyses, the game was on. The 1960-70's saw a revitalized mining industry and the new discoveries started to come. Ingerbelle, the volcanic skarn satellite of the Copper Mountain porphyries and Afton, the copper-gold porphyry at Kamloops, BC fueled worldwide interest in what was happening in British Columbia.

When the United States of America first lifted the restriction on their citizens directly owning gold as an investment and then un-pegging, the fix on the price of gold in 1973 further excitement and interest was aroused in the porphyry-belts.



The Princeton-Merritt-Kamloops corridor or synonymously, the southern portion of the Nicola Group volcanic belt and its' coeval intrusions became a very desirable exploration area. The Thor mineral claims lie within this belt and the aforementioned reasons explain the ongoing interest in the area.

## **REGIONAL GEOLOGY**

The writer offers a geological synopsis as follows of an area previously described by many other parties (see References) outlining the geological setting which is used in the description of the current work program, as well as their geological model of the occurrence of the copper-gold-PGE mineralization described herein.

The history of the underlying rocks in this area is thought to be representative of a northwest-southeast trending island arc depositional environment that is cut by steeply dipping north-south faults. The predominant lithology are the oldest rock units that have been assigned to the Nicola Group of Upper Triassic to Lower Jurassic age. The Nicola Group (Nicola), in this general area has evolved into three distinct, adjacent, elongate (structurally controlled), volcano(igneous)-sedimentary assemblages or belts which are not considered to be of strictly contemporaneous age. These belts are defined as follows: the Central Belt is the oldest while the Eastern Belt is next oldest. Both are thought to be locally derived and are of alkalic (some calc-alkaline) composition. The youngest, Western Belt of the Nicola Group does not appear to be strictly, locally derived and are mainly of calc-alkaline composition.

The composition of the Nicola (the three belts) from oldest to youngest are described as follows:

- a) Central Belt – subaerial and submarine assemblages; pyroxene and plagioclase abundant andesitic to basaltic flows, breccia, conglomerate and lahar deposits; coeval intrusives mainly diorite and lesser syenite.
- b) Eastern Belt – submarine volcano-sedimentary units, lahars, basaltic flows and high-level syenitic stocks.

- c) Western Belt – flow and pyroclastic rocks ranging in composition from andesite to rhyolite and interbedded limestone, volcanic conglomerate and sandstone (fossiliferous).

The Nicola and its' equivalents form an elongated belt of eugeosynclinal rocks which are observed from near the 49<sup>th</sup> parallel, trending northward for over 240 kilometres (150 miles) and possibly beyond to northern British Columbia and the Yukon Territory for a possible total distance of 1,300 km (800 miles). The width of the Nicola locally approaches 50 km (30 miles) in places and is often bound on its' east margin by Jurassic or later intrusives and volcanics and on the west by Jurassic/Tertiary aged intrusives and Carboniferous to Tertiary volcanics.

The next oldest rocks in the general area are non-correlated sediments thought to be of Lower Jurassic to Lower Cretaceous age.

The next youngest units are variable units of igneous and sedimentary rocks assigned to the Kingsvale Group of Lower Cretaceous age.

The next youngest units are a variety of well-rounded, boulder conglomerates of post Lower Cretaceous age.

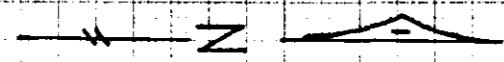
The next youngest rocks observed in the general area are the more acidic, calc-alkaline intrusive rocks which are seen to range in composition from granite through quartz diorite, these units have been assigned an Upper Cretaceous or Lower Tertiary age.

The youngest rocks observed in the general area are those of the Princeton Group, assigned a Tertiary age and comprised of a lower volcanic unit of andesite or basalt and an upper sedimentary unit composed of shale, sandstone, conglomerate which are sometimes seen to contain economic occurrences of coal. The lower Princeton Group volcanics have been observed, in places to lie unconformably over portions of the Upper Triassic aged Copper Mountain intrusions that are thought to be coeval with the Nicola volcanic rocks of the area.

The Nicola is found in places to have been cut by small stocks and dykes of ages varying from late Triassic into the Tertiary.

THOR 3

THOR 4

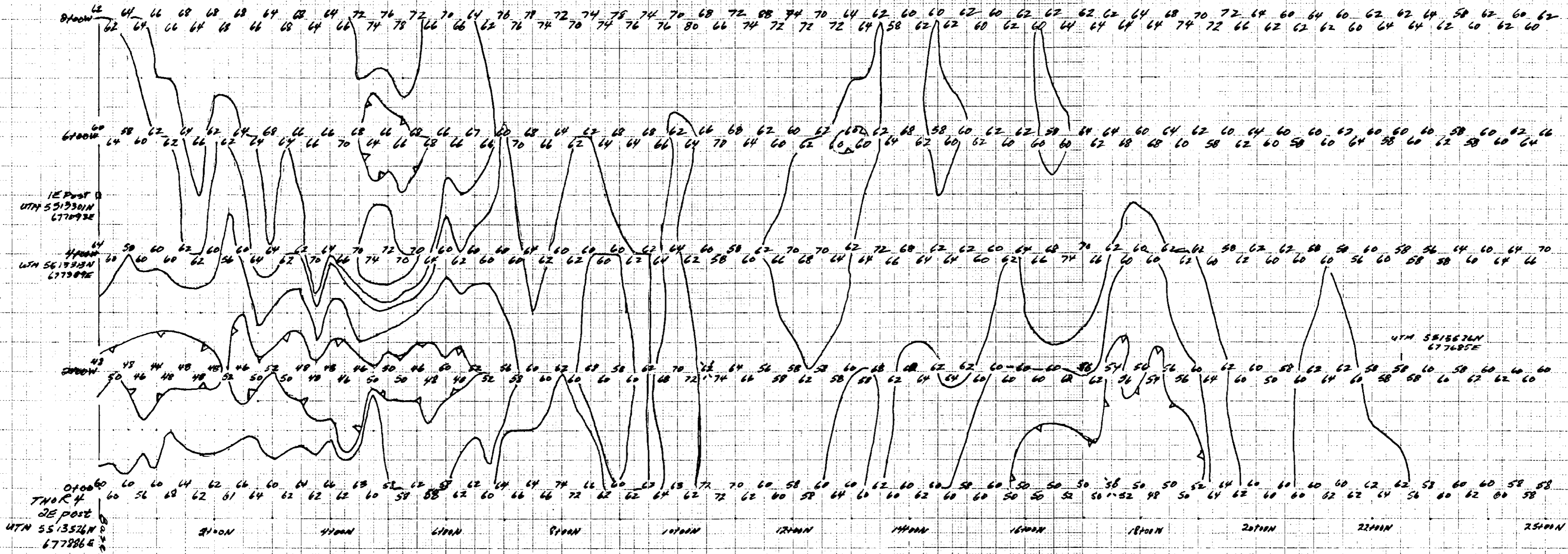
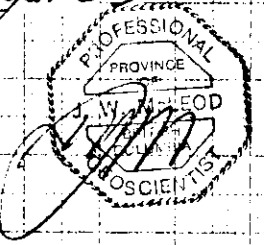
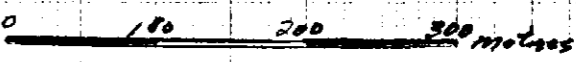


Legend  
⊖ - Magnetic "Low"  
⋆ - Rock exposure

Thor 3 and Thor 4  
Mineral Claims  
Relative Residual  
Magnetic Map

Ketchikan Lake Area  
Sinalkameen H.D. B.C.

Nov 107  
JWM  
92415E  
Figure 3



26964 ①

The general area has also experienced widespread faulting which display an east-west and northeasterly trend that in turn have sometimes been cut by younger northerly trending faults. For example in the Copper Mountain-Ingerbelle Mine area, in the southern portion of the Nicola, the western boundary of the Copper Mountain Stock is truncated by the north trending, west dipping "Boundary Fault". East of the Boundary Fault, faulting is generally east-west, northwesterly and northeasterly. The connection, if there is one between the Boundary Fault on the south and the sub-parallel Allison and Summers Creek (Kentucky-Alleyne) Fault(s) on the northside of the Town of Princeton, BC is masked by the large Tertiary aged Princeton Basin. These faults may have effected the ore control which poses the possibility of much younger hydrothermal sources of mineralization, possibly Tertiary?

Within the major southeastern lobe of the Nicola Group some 39 km. east-southeast of Princeton, B.C. occurs the famous lode gold mines of the Hedley area. These deposits are found to occur within metamorphosed limestone units (skarns) of the Nicola near diorite-gabbro intrusive contacts.

## **LOCAL GEOLOGY**

The property area being discussed in this report is described as being underlain by interlayered flows and volcanoclastics that have been assigned to the Central Belt of the Nicola Group.

No mineralization and/or significant alteration have yet been found on the grid area, but the report of copper mineralization near the headwaters of Allison Creek (in the vicinity of Ketchan Creek) was reported as far back as 1973 when "widespread alteration as epidote accompanying magnetite, pyrite and traces of chalcopyrite". In an adjoining area, intense alteration as sericite, silicification, biotitization and kaolinization of feldspars is found over a large area. Pyrite and galena were recognized in one location as was the occurrence of chalcocite. Mineralization and alteration of fractured (brecciated) volcanics and their coeval intrusives as porphyry-type (alkalic) copper occurrences are being sought.

## **PREVIOUS WORK PROGRAMS**

The area covered by the present mineral claim previously underwent some prospecting and grid-controlled soil and rock geochemistry during the periods 1973-74 for Bronson Mines Ltd. and 1985-88 on behalf of Vanco Explorations Limited of Toronto, Ontario. Some of these areas underwent hand trenching or bulldozer trenching.

## **CURRENT WORK PROGRAM**

The present fieldwork program was conducted on the Thor 4 mineral claim for the claim group of Thor 3 and Thor 4.

The work program consisted of grid installation with line-spacing of 200 metres and station interval of 25 metres (see Figure 3). The grid began at the Thor 4 - 2E post and consisted of lines 0+00, 2+00W, 4+00W, 6+00W and 8+00W and all lines went north for 2,500 metres. The grid contains global positioning system (GPS) checks (see Figure 3). The magnetometer traverses intermittently closed-loops to check for diurnal variations in the data. The grid area also underwent prospecting and recording of GPS locations of grid and sample site features. The magnetometer used for the survey was a Scintrex fluxgate-type, model MF-1.

The reconnaissance magnetometer and prospecting are an effective method for covering large areas.

## **CONCLUSIONS**

The present reconnaissance magnetometer program appears to be useful in delineating features which could be related to bedrock characteristics including alteration patterns indicating structural characteristic that may be related to mineralization. The method could be augmented with reconnaissance soil and/or rock geochemistry, but it would slow down the progress of the program.

## RECOMMENDATIONS

The current exploration method in use seems to be effective for covering large areas expediently.

The present method should be maintained and encountered areas of interest should be surveyed in more detail by both geophysical and geochemical methods. The strong, coincidently anomalous areas encountered would undergo trenching and ultimately drilling to further expose their merits. As an initial follow-up, the anomalous areas or trends should undergo a detailed magnetometer survey with the grid configuration of 25 metres x 25 metres, with a coincident base recorder survey. VLF-EM (electromagnetic) surveying for conductive patterns and self potential (SP) for oxidation responses of possible underlying sulphide zones. Auger sampling of underlying residual soil and/or rock particles followed-up with multi-element analyses of the samples including gold. Any anomalous copper-gold should be checked for PGE.

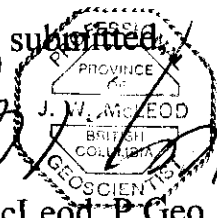
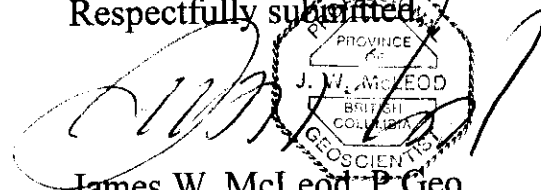
The recommended reconnaissance (current-type) program is expected to take one month to complete.

## COST ESTIMATE

Geologist and supervision	\$ 6,000
Grid installation- 200m. X 25m. with GPS control and prospecting over entire claim group	7,000
Magnetometer survey completion over the property	6,000
Localized follow-up surveys	9,000

Camp and board	6,000
Transportation rentals and fuel	2,250
Analyses and assays	1,000
Reports and maps	1,000
Contingency	<u>1,750</u>
Total	\$ 40,000

Respectfully submitted,



J. W. McLEOD  
BRITISH COLUMBIA  
GEOSCIENTIST

James W. McLeod, P. Geo.

**STATEMENT OF COSTS**

<b>Geology and supervision</b>	<b>\$ 500</b>
<b>Grid installation and prospecting</b>	<b>1,700</b>
<b>Magnetometer survey</b>	<b>1,250</b>
<b>Transportation (4X4) including mileage &amp; fuel</b>	<b>450</b>
<b>Camp and board</b>	<b><u>350</u></b>
	<b>Total</b>
	<b>\$ 4,250</b>



**CERTIFICATE**

I, JAMES W. McLEOD, of the Municipality of Delta, Province of British Columbia, hereby certify as follows:

I am a Consulting Geologist with an office at #203 - 1318 56<sup>th</sup> Street, Delta, B.C., V4L 2A4.

I am a Professional Geoscientist registered in the Province of British Columbia and a Fellow of the Geological Association of Canada.

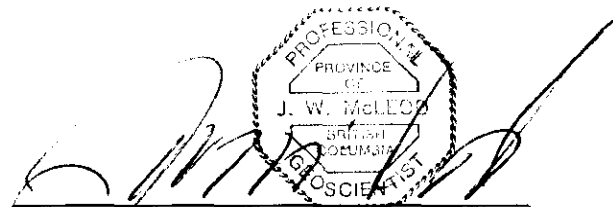
I graduated with a degree of Bachelor of Science, Major Geology, from the University of British Columbia in 1969.

I have practiced my profession since 1969.

I have no beneficial interest nor otherwise in the mineral claims that are the topic of this report.

The above report is based on personal field experience gained by the myself in the specific and general area at various times during the past 33 years, the latest being in 2002.

DATED at Delta, Province of British Columbia this 1st day of November 2002.



James W. McLeod, P. Geo.  
Consulting Geologist

## REFERENCES

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