

GM 69271

PROPERTY EVALUATION AND RECOMMANDATIONS FOR THE KREIGHOFF PROPERTY

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Énergie et Ressources
naturelles

Québec 

PROPERTY EVALUATION

&

RECOMMENDATIONS

for the

KREIGHOFF PROPERTY

KREIGHOFF TOWNSHIP, P.Q.

for

PIERCE MOUNTAIN RESOURCES LTD.
6th Floor, 535 Howe St.
Vancouver, B.C.

BY

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NOVEMBER 20, 1990

GM 69271

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APPENDIX I: CLAIMS LIST AND EXPIRY DATES.

ILLUSTRATIONS (In Appendix):

Fig.1: GENERAL QUEBEC LOCATION MAP & 1:250,000 LOCATION MAP.

Fig.2: CLAIM MAP (Scale 1:50,000).

Fig.3: STRATIGRAPHIC COLUMN.

Fig.4: GEOPHYSICAL/GEOCHEMICAL ANOMALIES.
PLUS PROPOSED DIAMOND DRILLING LOCATIONS.

(i)

SUMMARY

Pierce Mountain Resources Ltd. has optioned the Kreighoff mineral property, a 140 contiguous block of claims, located in Kreighoff Township, Quebec, from Battlefor resources Ltd. Access to, and throughout the claim block is excellent. The claims are located in proximity to several auriferous and base metals mines and prospects which occur within a geological setting similar to that encountered within the Kreighoff property.

A great deal of exploration work was carried out on the property in late 1986 and early 1987, including extensive geological mapping, aerial geophysics (EM & magnetics), ground VLF-EM, magnetics, surface soil sampling, overburden drilling and basal till sampling (geochemistry), plus a modicum of diamond drilling. However, the drill targets were spotted strictly on the basis of the geological mapping, which had defined several surface showings containing zinc mineralization. When the geophysical and geochemical data were later assembled, it became evident that the property embraced several very strong and untested geophysical anomalies as long as 4,000 metres. Several anomalies consist of coincident VLF-EM, magnetic highs, which could be the geophysical expression of massive pyrrhotite-bearing sulphide zones. An incomplete program of basal till sampling for gold and base metals also resulted in defining a strong correlation of anomalous gold values over at least one of the conductors.

A single diamond drill hole in one of the long, strong conductors intersected a one-foot section of massive pyrite, pyrrhotite mineralization containing six percent zinc and 0.3% copper.

No exploration has been undertaken on the property since early 1987, due to lack of funding. While further geochemistry and geophysical programs might be undertaken, in light of the excellent, untested targets presently outlined, it is considered that diamond drilling of the many targets would be the most appropriate approach at this time. For this reason, a 23-hole, 6,900 lineal ft. (2100 lineal metre) diamond drill program is recommended, at a cost of \$150,000 to test the highly-regarded anomalies encountered to date.

I INTRODUCTION

At the request of Mr. Jon George, of Pierce Mountain Resources Ltd., a property evaluation report and recommendations for work are herein prepared for the Kreighoff Property, Kreighoff Township, Quebec. The Kreighoff property, consisting of 140 contiguous claims, has been optioned by PIERCE MOUNTAIN RESOURCES LTD. from BATTLEFORD RESOURCES LTD.

II LOCATION & ACCESS

The property is located 104 km west of the mining town of Chibougamau, 40 km north-east of the town of Desmaraisville, and 2 km south of Lac Inconnu.

The north-western corner of the property is cut by paved highway # 113, which links the towns of Val d'Or and Chibougamau. A network of north-south and east-west logging roads provide easy access to the entire property.

III HISTORY

The following summary of previous work done on the property is based on the reports and maps provided to the author through PIERCE MOUNTAIN RESOURCES LTD. and BATTLEFORD RESOURCES LTD.

The Kreighoff Property was first mapped by Gilbert in 1955. The most recent revision of the Ministry of Natural Resources compilation map (MER 32 G / 13, 102, 202) dates from 1983.

In the fall of 1986, compilation work and geological mapping were undertaken by Mr. Yves Sanschagrín, geologist, on behalf of NRD MINING LTD. Sanschagrín outlined several potential mineral-bearing horizons within the property boundary, and which will be discussed in a later section.

In October, 1986, Aerodat Ltd. carried out an airborne (in-pu) geophysical survey (magnetometer, electromagnetic, and VLF) covering the entire property.

In November, 1986 a surface geochemical survey over selected portions of the property was conducted.

Line cutting and ground geophysics (magnetometer, VLF electromagnetic, and Maxmin electromagnetic) surveys were carried out in January and February, 1987.

As much of the overburden was fairly deep, an overburden drilling program was conducted in February, 1987, with geochemical sampling/assaying of the basal till conducted in February and March of 1987.

A total of thirteen diamond drill holes were drilled in early 1987, and many more were planned. However, these were not drilled due to lack of funds, and the closure of the 1986/87 flow-through funding season.

IV PROPERTY

The property consists of 140 contiguous claims, comprising an area of approximately 2,240 hectares of land, located almost entirely within Kreighoff township, P.Q. PIERCE MOUNTAIN RESOURCES LTD. holds the option from BATTLEFORD RESOURCES LTD., to the entire block of claims (See Fig. 2). The licence numbers, claim numbers, and apparent expiration dates of these are tabulated in Appendix I.

The author takes no responsibility as to the ownership or status of these claims.

Assessment credits on the property apparently presently stand at \$48,779.69. Annual assessment work required per claim per year is \$500.00, while rental amounts to \$20.00 per year per claim.

V REGIONAL GEOLOGY

The Kreighoff Township is underlain by Precambrian rocks of the Superior province. The formations in the area may be subdivided into two groups (See Fig. 3), (Allard and Gobeil 1984):

a) The Opemisca group, comprised of sedimentary rocks with interbanded potassic flows

b) The Roy group, comprised of the Bordeleau, Blondeau and Gilman formations, dominated by pyroclastic rocks, felsic to mafic flows, and tuffs. A stratigraphic column depicting these sequences is illustrated in Figure 3.

Several granitic to tonalitic intrusive complexes intrude the Archean rocks in the area and may play a role in the remobilization of the sulfides.

Two phases of deformation affected the area. One has a north-south direction and is cut by a series of north-east faults. The second phase consist of isoclinal folding of east-west direction (Guha and Chown, 1984)

The mineral occurences found in the Chibougamau-Chapais mining district consist mainly of vein-type deposits associated with faults (Gobeil and Racicat, 1984), and very few stratiform-type deposits.

VI LOCAL GEOLOGY

The rocks on the property belong to the Blondeau formation of the Roy group. They consist predominantly of pyroclastic metavolcanics, crystal tuffs, epiclastic sediments and mafic flows, intruded by the Bourbeau gabbroic sill of the Cumming complex. Stratiform sulfide-rich lenses are known to occur in proximity to the intrusive body. To the north of the sill, the property is comprised of argillites, silts, graphitic argillites, greywackes, sandstones and mafic flows. South of the intrusive, intermediate to mafic metavolcanic rocks dominate the Kreighoff property (Sanchagrin, 1986).

The property has sustained many phases of deformation. The general orientation of the rocks is now S60 E, with near vertical dips. An east-west syclinal axis crosses the west-central portion of the claim group. The schistosity generally parallels the stratigraphy (Sanchagrin, 1986). However, a second schistosity has been noted in the northern portion of the property. Southwest trending faults were noted or inferred (Aerodat, 1986) in various places on the property and may play a role in the distribution of the mineral occurences.

The Kreighoff property is located in proximity to several auriferous and base metal mines or occurances. These mineral deposits occur in a similar setting to that of the Kreighoff property:

1. The Cooke Mine (Au) of Chapais, occurs within cherty felsic volcaniclastic rocks of the Blondeau formation at the contact with the gabbroic intrusive rocks of the Bourbeau sill. The mineralization consists of pyrrhotite, chalcopyrite, sphalerite, pyrite, tetrahedrite and galena. The alteration pattern associated with the deposit is characteristic of volcanogenic origin. A base metal showing immediately south-west of the property occurs within a similar setting (Belanger et al., 1984).

2. The Bibis Yukon showing (Mathieu, 1986) is located south-west of the property boundary on the Waswanipi Indian Reserve, with mineralization consisting of chalcopyrite and sphalerite

within a 2300 foot long sheared pyroclastic band some 0.9 to 2.7 metres (3 to 9 feet) wide. It is believed to be syngenetic, of volcano-exhalite origin, remobilized during the Bourbeau sill intrusion. A grab sample apparently taken from this showing yielded 2.75% Cu, 7.21% Zn, 161 (?) oz Ag/ton, and 0.05 oz Au/ton.

3. The Desmaraisville Lac Shortt Mine (Au), is a stratiform-type deposit hosted by volcano-sedimentary rocks. It is associated with an exhalite phase following carbonated, alkaline hydrothermal activities, as well as with the later intrusive phase (Cormier et al, 1984). This deposit occurs in a setting similar to that observed on the Kreighoff property.

VII SIGNIFICANCE OF PROGRAMS CONDUCTED IN 1986/87

Due to the tight constraints brought about by flow-through funding time-limit restrictions, the entire program conducted in the fall and winter of 1986-87 was too compressed. Third and fourth-phase projects were conducted before results from first and second phase projects could be fully evaluated. This may have resulted in many areas of high-potential not being diamond drilled.

The surface geochemical program was spotty. The diamond drilling was based only upon the results of this, and the airborne geophysical survey.

Due to the considerable overburden in most areas of the property, the surface geochemistry results showed anomalies only where the overburden was very shallow. Recognizing this, NRD MINING LTD. embarked on a program of overburden drilling with basal till sampling, plus a follow-up program of line cutting and ground geophysical surveys to compliment the airborne (in-pit) surveys. However, the diamond drilling had to be conducted before the later geochemical and geophysical results were available.

The basal till sampling program, although very incomplete, showed this method to be most appropriate for the areas of deep overburden. Much of the basal till sampling was carried out in areas away from the geophysical anomalies, and thus the geophysical anomalies, to a large extent, were missed.

This is not a criticism of the planning of NRD MINING LTD., or the value of flow-through funding, but of the fact that the closing dates for the work could not be extended. The 1986/87 program has outlined several coincidental geophysical/geochemical anomalies warranting diamond drilling.

1986/87 DIAMOND DRILL PROGRAM

Some 13 diamond drill holes were drilled on this large property in the winter of 1986/87. The drilling was done on the basis of the mineral showings found in the geological mapping program of October, 1986. The best diamond drill hole intersection consisted of a 0.3 metre band of massive sulphides (pyrite and pyrrhotite), plus zinc (6%), and copper (0.3%). This intersection is very significant, as it was cut on a ground EM conductor (although at the time of drilling, the conductor was not yet known to exist).

VIII ASSESSMENT OF ANOMALIES

D-2, d-2 ZONE:

The ground geophysical survey shows coincident VLF and EM conductors for the a length of some 4,000 meters (d-2, D-2 zone) (see Figure 3). Not a single diamond drill hole has been drilled into this conductor. At two locations along its length, the VLF-EM conductors are coincident with a strong total-field ground magnetic anomaly, and at one of the showings, a probable fault. The magnetometer readings are very significant, as they may indicate the presence of heavy pyrrhotite mineralization (which often accompanies base and precious metals). Three diamond drill holes are recommended for this structure. The east target, at station 22+00W, 6+00N and which encompasses VLF, EM, and magnetic anomalies and a probable cross-fault, warrants two diamond drill holes. Station 17+00E, 1+00S, embraces VLF, EM, and a magnet anomaly, and warrants one drill hole.

A ground EM conductor some 200 metres south of, and parallel to the previously-noted d-2/D-2 conductor ("O"-zone), also has an indicated length of some 4,000 metres, and warrants at least five diamond drill holes. The single diamond drill hole drilled on this massive sulfide structure cut the significant intersection of 6% Zn and 0.3% Cu over a width of 0.3 metres. As this could represent the tail-end of an orebody, three additional diamond drill holes are required here; one on each side, approximately 30 metres from the intersection, and one down-dip from the intersection.

Figure 3 also shows an easterly-striking in-pit conductor of some 2,000 metres in length, located approximately parallel to, and 800 metres north of the d-2 conductor (zone II). In four out of five lines of basal till sampling, anomalous gold values were encountered over, or immediately to the south of this conductor. A single diamond drill hole was drilled on the

conductor, as it happens, on the only line which did not later show anomalous gold values in the basal till. Pyrite and pyrrhotite were encountered, which is encouraging, but the zone was barren of gold at the point of intersection. A relatively short, but strong magnetic anomaly parallels this, and is located some 100 metres to the north of it. Four additional holes are warranted here, in order to intersect: a strong in-pot conductor close to a basal till gold anomaly; a weak in-pot conductor close to a basal till gold anomaly; the strong magnetic high; and the in-pot conductor close to the gold anomaly.

Zone h-H consists of coincident VLF-EM conductors some 700 metres long and up to 150 metres wide. Neither diamond drilling, nor basal till sampling over this geophysical anomaly has been done. This could represent a mineral body of major dimensions.

Zone number VII, an in-pot conductor located near the south-west boundary of the claim group, has an indicated length of some 1,000 metres. A single diamond drill hole has been drilled into it, some 200 metres west of a major cross-fault. However, a second hole is recommended to the east and immediately adjacent to the cross-fault, where the in-pot conductor is the strongest.

Zone "L" consists of coincident VLF-EM anomalies, and warrants at least one hole within its entire 1,000 metre length. A second hole is warranted on a magnetic anomaly immediately on strike, and to the east of this zone.

Zone VIII consists of many in-pot conductors with some included magnetic highs. Four holes are recommended for this zone.

IX CONCLUSIONS & RECOMMENDATIONS

The Kreighoff property is geographically situated in an area well suited for the concentration of mineral deposits. To date, some five zinc showings have been mapped within the property limits and two additional showings have been documented immediately south of the claim group.

From case histories described under "Local Geology", it is indicated that there is a direct association between mineral occurrences and the Proterozoic intrusive sills within the Blondeau formation. The presence of this sill across the central part of the property may have played a role in the mobilization of sulfide-bearing hydrothermal fluids.

Several airborne (in-pot) anomalies (II, VII, VIII), as well as ground VLF (d-2, h, 1, 0), and electromagnetic (D-2, H, L)

conductors remain unexplored or unexplained to date.

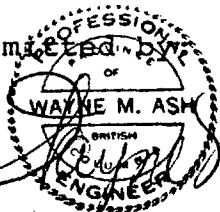
In the light of encouraging gold anomalies encountered in the basal till sampling program, and their coincidence with certain of the geophysical anomalies, further exploration work on the Kreighoff property is warranted, and recommended. Exploration work has reached a stage where diamond drilling is the most appropriate program required.

In all, a minimum of twenty diamond drill holes are required. An additional three drill holes should be planned for, as there is a good likelihood of encountering encouraging mineralization.

X COST ESTIMATE

| | |
|--|------------------|
| DIAMOND DRILLING: 23 Holes @ 300 ft., @ \$18/ft..... | \$124,200 |
| SUPERVISION: 35 Days @ \$300/day..... | 10,500 |
| ASSAYING: 300 Samples (Au, Pb, Cu, Zn, Ag) @ \$17..... | 5,100 |
| OTHER: Truck rental (Incl. Insurance)..... | 1,200 |
| Fuel..... | 400 |
| Lodging: 35 days @ \$40..... | 1,400 |
| Food: 35 days @ \$30..... | 1,000 |
| Report: 10 days @ \$270..... | 2,700 |
| Misc. (Contingencies)..... | <u>3,500</u> |
| <u>TOTAL FOR PROGRAM.....</u> | <u>\$150,000</u> |

Submitted by



 Wayne M. Ash, P. Eng.

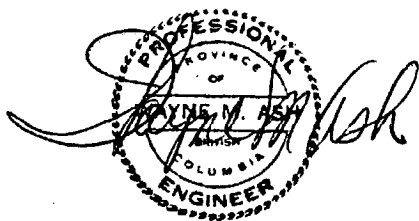
Wayne M. Ash, P. Eng.
October 20, 1990

XI CERTIFICATE OF QUALIFICATIONS

I, Wayne M. Ash, P. Eng., of 401 - 543 Granville St., Vancouver, B.C. do hereby certify that:

1. I am a graduate of Haileybury School of Mines (1965), and of Michigan Technological University, (B.Sc. Mining Engineering, 1969).
2. I am a Registered Professional Engineer with the Association of Professional Engineers of British Columbia (1971).
3. I have been directly involved in the minerals industry for 30 years.
4. This report is based upon my understanding of the project, based upon evaluation of the reports available to me at the time of writing, and upon my past experience in mineral exploration in Northwestern Quebec.
5. I do not have, nor do I expect to receive, either directly or indirectly, any interest in the properties or securities of Battleford Resources Ltd., or in Pierce Mountain Resources Ltd.
6. This report, or excerpts from it, may be used by Pierce Mountain Resources Ltd. for any legitimate corporate purposes, so long as the excerpts used do not detract from the meaning or purpose of this report, as set out in the whole.

Dated at Vancouver, B.C., this 20th day of November, 1990.

A circular professional seal for Wayne M. Ash, a Registered Professional Engineer in the Province of British Columbia. The seal features the text "PROFESSIONAL ENGINEER" around the perimeter, "PROVINCE OF BRITISH COLUMBIA" in the center, and "WAYNE M. ASH" in the middle. A handwritten signature of Wayne M. Ash is written over the seal.

Wayne M. Ash, P. Eng.

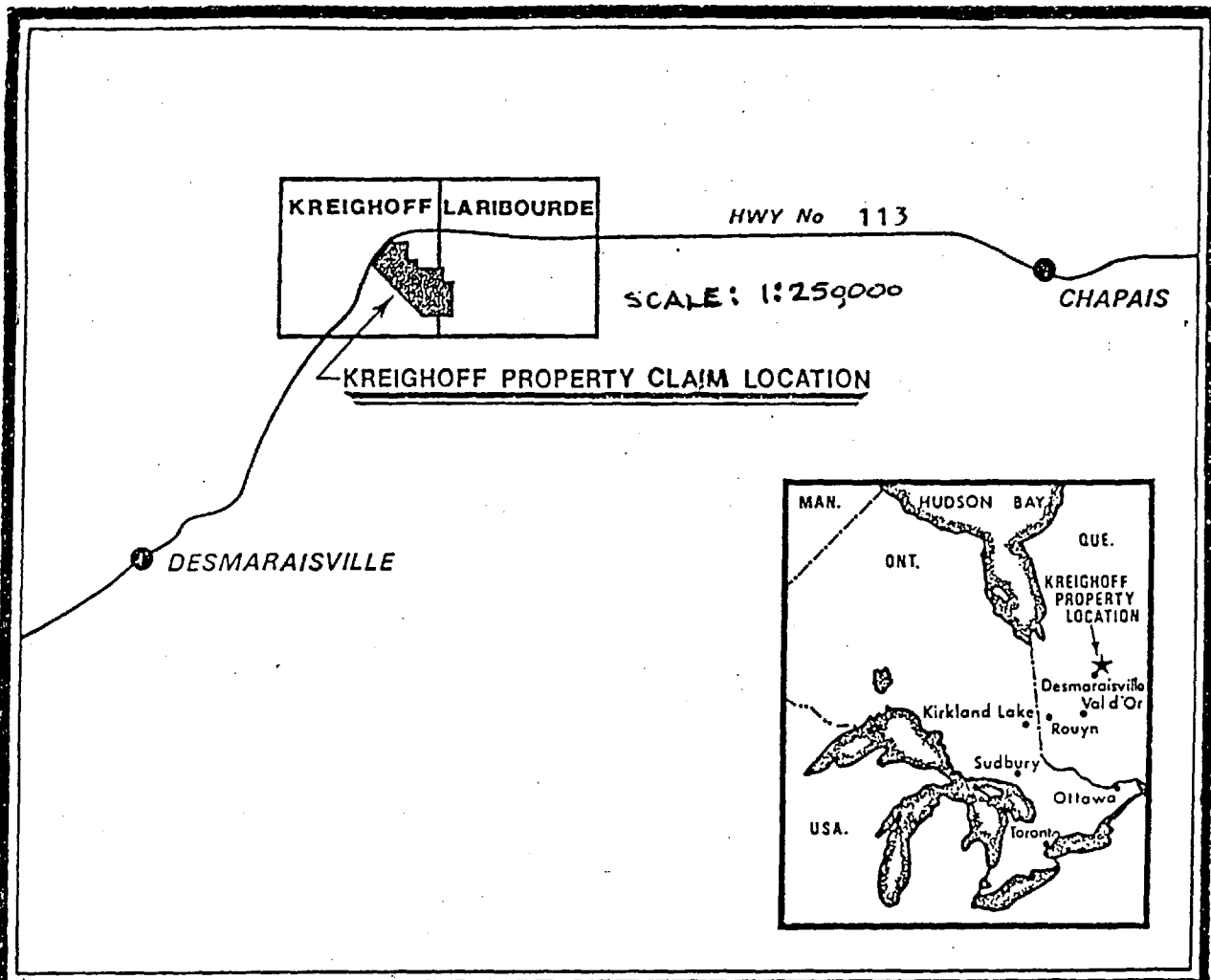
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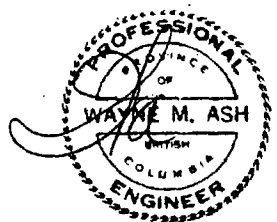
APPENDIX I

MINERAL CLAIM STATUS
KREIGHOFF PROPERTY
 Kreighoff Township, Quebec

| <u>LICENCE NUMBER</u> | <u>CLAIM NUMBERS</u> | <u>AREA (HECTARES)</u> | <u>EXPIRY DATE</u> |
|---------------------------|--------------------------|----------------------------|------------------------|
| 449560 | 1 to 5 | 80 | May 29, 1991 |
| 449561 | 1 to 5 | 80 | May 30, 1991 |
| 449562 | 1 to 5 | 80 | May 31, 1991 |
| 449563 | 1 to 5 | 80 | May 31, 1991 |
| 449634 | 1 to 5 | 80 | May 29, 1991 |
| 449635 | 1 to 5 | 80 | May 29, 1991 |
| 449636 | 1 to 5 | 80 | May 30, 1991 |
| 449637 | 1 to 5 | 80 | May 31, 1991 |
| 449884 | 1 to 5 | 80 | May 31, 1991 |
| 449885 | 1 to 5 | 80 | May 31, 1991 |
| 449886 | 1 to 5 | 80 | June 1, 1991 |
| 449888 | 1 to 5 | 80 | May 29, 1991 |
| 449889 | 1 to 5 | 80 | May 29, 1991 |
| 449890 | 1 to 5 | 80 | May 30, 1991 |
| 449891 | 1 to 5 | 80 | May 31, 1991 |
| 449902 | 1 to 5 | 80 | May 29, 1991 |
| 449903 | 1 to 5 | 80 | May 30, 1991 |
| 449904 | 1 to 5 | 80 | May 31, 1991 |
| 449905 | 1 to 5 | 80 | June 1, 1991 |
| 449908 | 1 to 5 | 80 | May 29, 1991 |
| 449909 | 1 to 5 | 80 | May 29, 1991 |
| 449910 | 1 to 5 | 80 | May 30, 1991 |
| 449911 | 1 to 5 | 80 | May 31, 1991 |
| 449948 | 1 to 5 | 80 | May 29, 1991 |
| 449950 | 1 to 5 | 80 | May 29, 1991 |
| 449952 | 1 to 5 | 80 | May 30, 1991 |
| 451510 | 1 to 5 | 80 | June 2, 1991 |
| 451511 | 1 to 5 | 80 | June 1, 1991 |



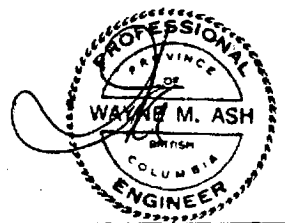
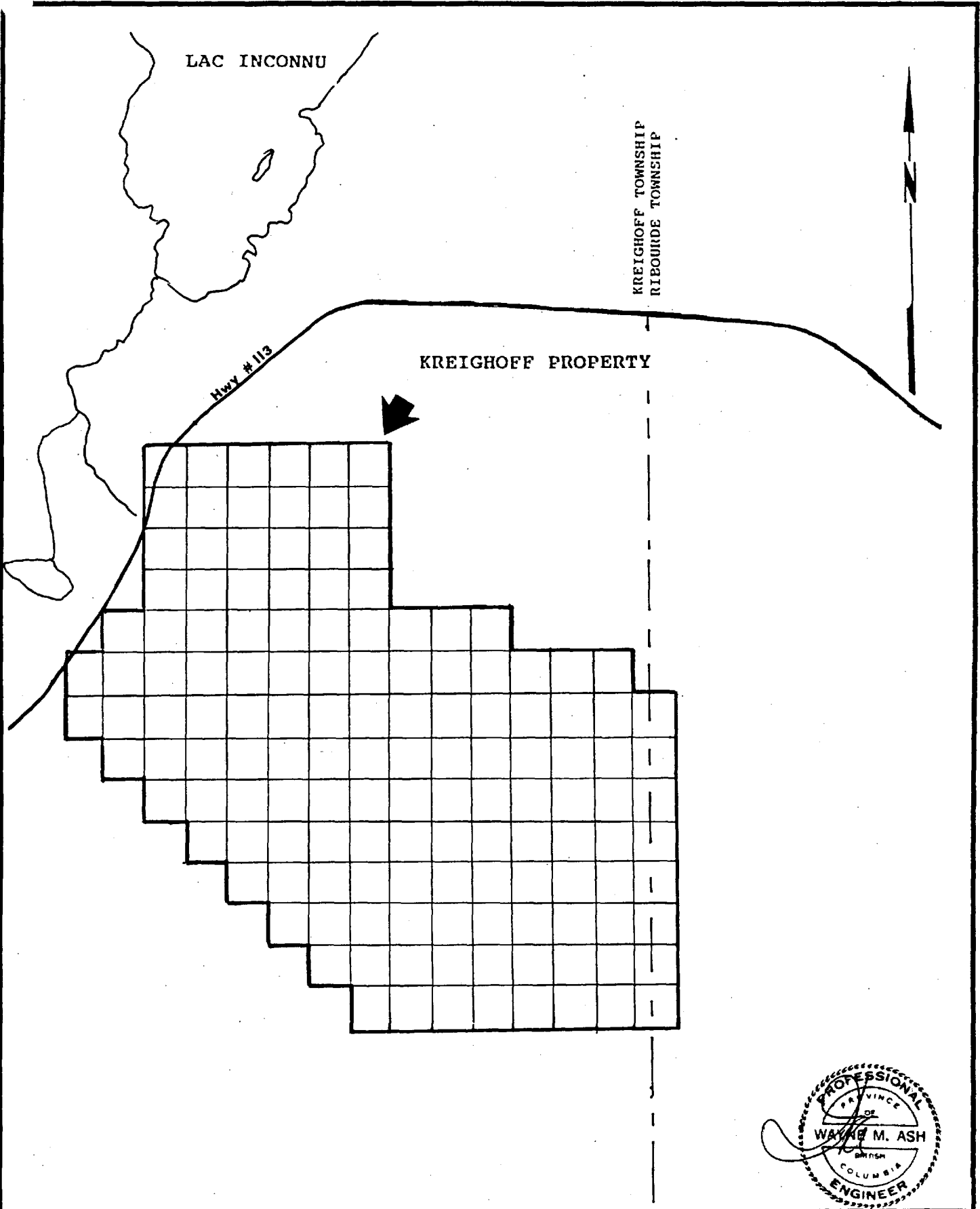
PROPERTY LOCATION MAP



ASH & ASSOCIATES CONSULTING LTD.
 401-543 Granville Street, Vancouver, B.C.
 V6C 1X8: Ph: (604) 682-5211

Client **PIERCE MOUNTAIN RESOURCES LTD.**

| | |
|------------|----------|
| SCALE: | |
| DATE | FIG. |
| NOV. 17/90 | 1 |

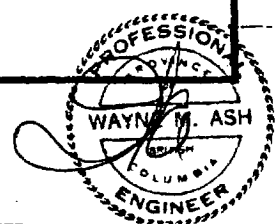
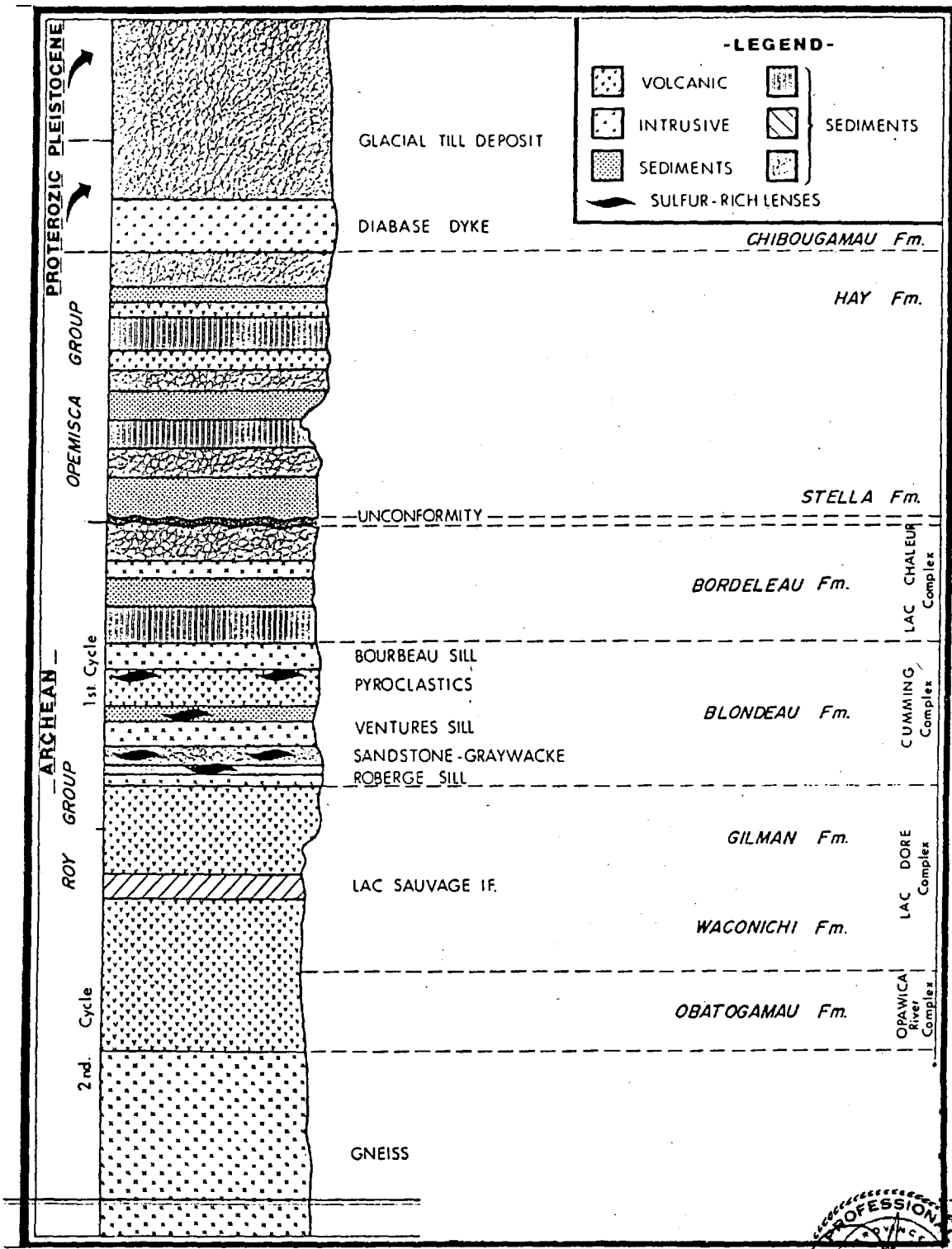


ASH & ASSOCIATES CONSULTING LTD.
 401-543 Granville Street, Vancouver, B.C.
 V6C 1X8: Ph: (604) 682-5211

Client PIERCE MOUNTAIN RESOURCES LTD.

CLAIMS MAP

| | |
|-----------------|------|
| SCALE: 1:50,000 | |
| DATE | FIG. |
| NOV. 17/90 | 2 |



ASH & ASSOCIATES CONSULTING LTD.
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- STRATIGRAPHIC COLUMN -
KRIEGHOFF Project

SCALE: NONE
 DATE NOV. 17/90
 FIG. 3