



Ministry of Energy & Mines  
 Energy & Minerals Division  
 Geological Survey Branch

ASSESSMENT REPORT  
 TITLE PAGE AND SUMMARY

TITLE OF REPORT [type of survey(s)]	TOTAL COST
Assessment Report, Eaglet Property	\$9,557
AUTHOR(S) Zdenek D. Hora, M.Sc., P. Geo.	SIGNATURE(S) <i>[Signature]</i>

NOTICE OF WORK PERMIT NUMBER(S)/DATE(S) N/A (July-Dec.) YEAR OF WORK 2007

STATEMENT OF WORK - CASH PAYMENT EVENT NUMBER(S)/DATE(S) \_\_\_\_\_

PROPERTY NAME Exploration & Development Work

PROPERTY NAME Eaglet Property

CLAIM NAME(S) (on which work was done) Q Claims, Tenure 401809  
QE Claims, Tenure 550469  
Q South, Tenure 550512 Q East R, Tenure 550514

COMMODITIES SOUGHT Fluorite, molybdenum, silver

GENERAL INVENTORY MINFILE NUMBER(S), IF KNOWN 093A 046

MINING DIVISION Cariboo NTS 093A/10W

LATITUDE 52 ° 33 ' \_\_\_\_\_ \* LONGITUDE 121 ° 00 ' \_\_\_\_\_ \* (at centre of work)

OWNER(S)  
 1) Freeport Resources Inc. 2) \_\_\_\_\_

MAILING ADDRESS  
8711 Elsmore Road  
Richmond, B.C. V7C 2A4

OPERATOR(S) [who paid for the work]  
 1) same as above 2) \_\_\_\_\_

MAILING ADDRESS  
same as above

PROPERTY GEOLOGY KEYWORDS (lithology, age, stratigraphy, structure, alteration, mineralization, size and attitude):  
Quesnel Gneiss, Fluorspar, Pb-Zn-Ag, Molybdenite, potassic alteration

REFERENCES TO PREVIOUS ASSESSMENT WORK AND ASSESSMENT REPORT NUMBERS 05639 (1975),  
09515 (1981), 23594 (1994), (2005)

(OVER)

TYPE OF WORK IN THIS REPORT	EXTENT OF WORK (IN METRIC UNITS)	ON WHICH CLAIMS	PROJECT COSTS APPORTIONED (incl. support)
GEOLOGICAL (scale, area)		401809,550469,550512,550514	\$7040
Ground, mapping _____			
Photo interpretation _____		401809,550469,550512,550514	\$895
GEOPHYSICAL (line-kilometres)			
Ground			
Magnetic _____			
Electromagnetic _____			
Induced Polarization _____			
Radiometric _____			
Seismic _____			
Other _____			
Airborne _____			
GEOCHEMICAL			
(number of samples analysed for ...)			
Soil _____			
Silt _____			
Rock _____			
Other _____			
DRILLING			
(total metres; number of holes, size)			
Core _____			
Non-core _____			
RELATED TECHNICAL			
Sampling/assaying _____			
Petrographic _____			
Mineralographic _____			
Metallurgic _____			
PROSPECTING (scale, area) _____			
PREPARATORY/PHYSICAL			
Line/grid (kilometres) _____			
Topographic/Photogrammetric		401809,550469,550512,550514	\$1625
(scale, area) _____			
Legal surveys (scale, area) _____			
Road, local access (kilometres)/trail _____			
Trench (metres) _____			
Underground dev. (metres) _____			
Other _____			
		TOTAL COST	\$9557

**ASSESSMENT REPORT  
EAGLET PROPERTY**

Geological Report

**BC Geological Survey  
Assessment Report  
29879**

**Q CLAIMS** (Eaglet Property)  
Tenure Numbers 401809, 550469  
550512, 550514

**Cariboo Mining Division**

**N.T.S Map Area 93A-10W**  
Latitude 52°33' north; Longitude 121°00' west

Minfile Number **093A 046**

**For:**

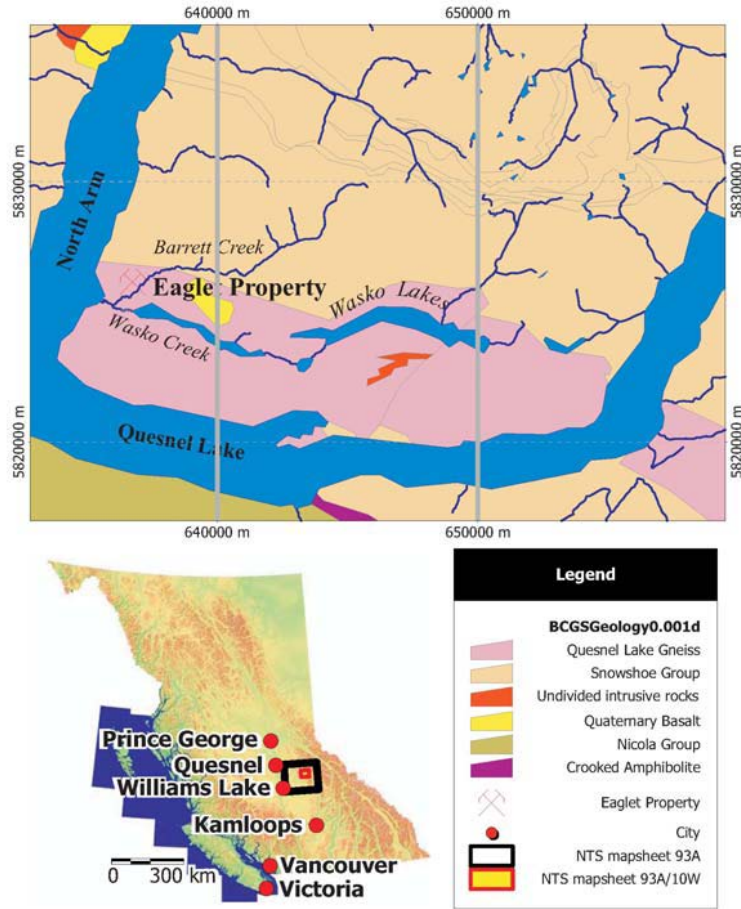
**FREEMPORT RESOURCES INC.**  
8711 Elsmore Road  
Richmond, B.C. V7C 2A4

**By:**

**Zdenek D. Hora, M.Sc., P.Geo.**  
**Brenda Clark, B.A., B.Arch., MAIBC**

January 21, 2008

Figure 1. Property Location Map



View of Eaglet from Quesnel Lake, 1980's (Eaglet Mines photo)



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B	BCGS Geological Field work 2007, Paper 2008-1 Eaglet Property Revisited: Fluorite-Molybdenite Porphyry-Like Hydrothermal System, East-Central British Columbia (NTS 093A/10W) by Z.D. Hora, A. Langrová and E. Pivec

## 1.0 Introduction

The purpose of this report is to summarize work performed in 2007 at the Q claims, which overlay the previous workings by Eaglet Mines, originally evaluated largely as a fluor spar deposit. This work consisted of a short property visit in August 2007, where the claims were entirely traversed by helicopter, with on-site review of historical drill core, and the muck piles of Adit 1 and 2. In addition, GPS coordinates were taken at key points to commence a database in order to translate the paper records of the historical work into a digital 3-dimensional model for a greater understanding of the deposit. Mineralogical and petrographic work was undertaken on select samples from the property. In addition, high resolution digital imagery was secured and a schematic fracture diagram prepared. Analytical work on pulp samples collected from the site is ongoing and will be summarized in a separate report. Current findings suggest the property is prospective for a potential molybdenum porphyry-like deposit.

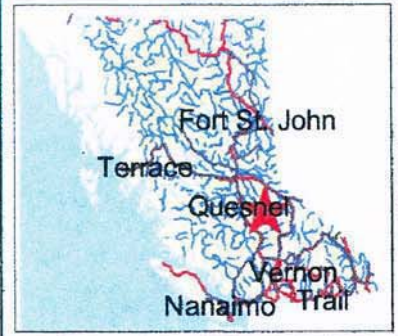
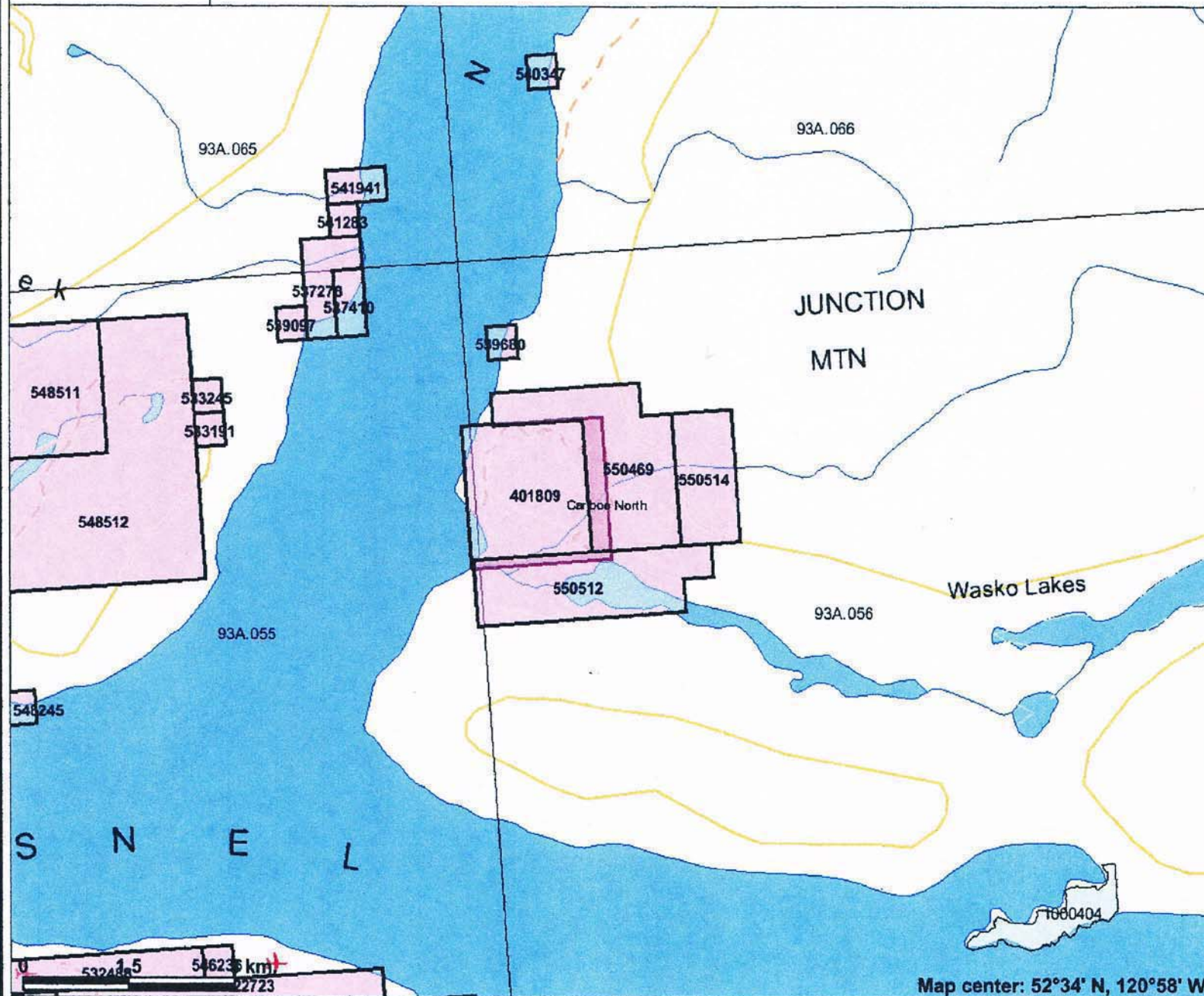
The Q Claims are located in the Cariboo region of central B.C. They are accessed by road from William's Lake through Horsefly to the south shore of Quesnel Lake, and then by boat to the site. In recent times, logging roads from Likely have been extended and it is believed that construction of one small bridge at the head of the north arm of Quesnel Lake would result in road access to the claims.

Fluorite showings on the Eaglet site have been known since 1947. Extensive exploration took place at the property from 1965 to 1967, and again between 1973 and 1984. This work outlined mineralization over an area of approximately 1500 by 900 metres.

During the course of exploration to 1984, a total of 126 surface drill holes measuring 19,687 metres were completed. In addition, two adits, No. 1 of 292 metres and No. 2 of 373 metres, were driven to test the mineralization underground. Nine flat holes totalling 1,525 metres were drilled from No. 1 Adit.

In spite of early suggestions of similarity to porphyry mineralization systems, it is believed that fluorite and silver were consistently the primary focus in all collected

# Q Claims 1:50,000



## Legend

- Indian Reserves
- National Parks
- Parks
- Mineral Tenures (Mineral - MTO)
- Mineral Claim
- Mineral Lease
- Reserves (Mineral - MTO Sites)
- Placer Claim Designation
- Placer Lease Designation
- No Staking Reserve
- Conditional Reserve
- Release Required Reserve
- Surface Restriction
- Recreation Area
- Others
- Mining Division (MTO)
- BCGS Grid
- Contours (1:250K)
- Contour - Index
- Contour - Intermediate
- Area of Exclusion
- Area of Indefinite Contours
- Annotation (1:250K)
- Transportation - Points (1:250K)
- Airfield
- Anchorage - Seaplane
- Ferry Route
- Heliport
- Seaplane Base
- Air Field
- Airport
- Air Feature - Condition Unknown
- Airport Abandoned



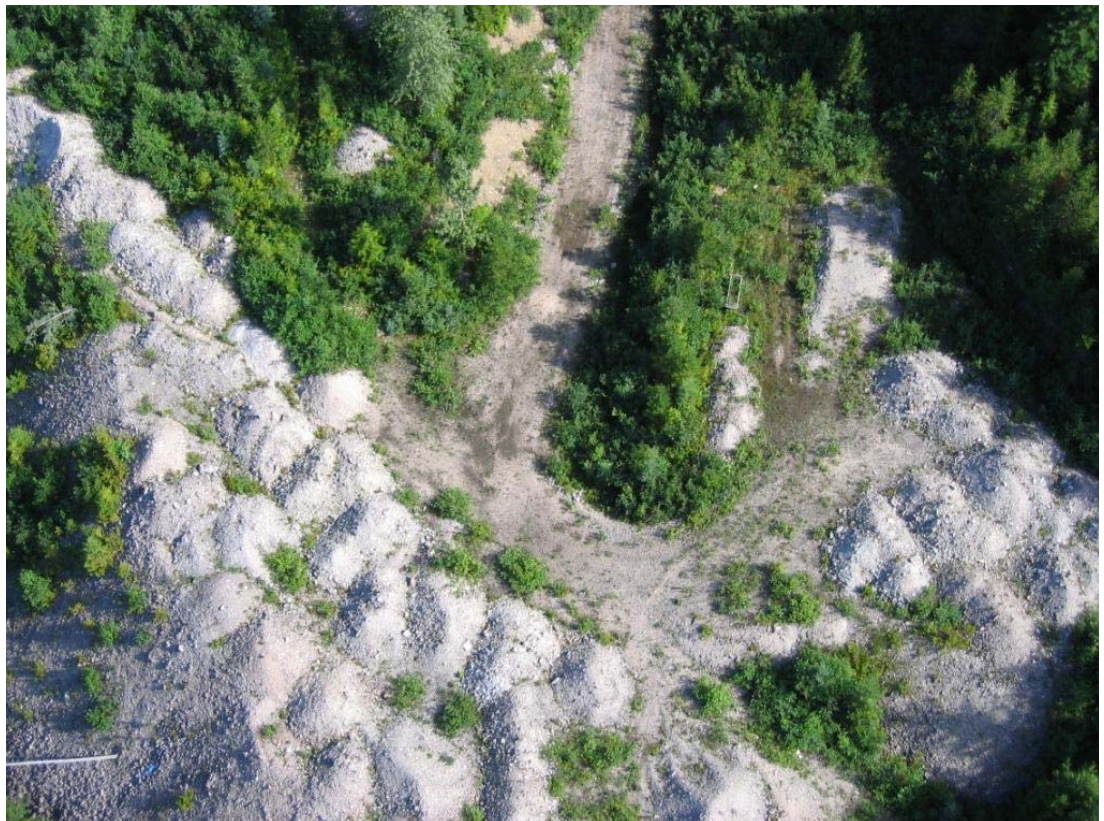
Scale: 1:85,071

Map center: 52°34' N, 120°58' W

This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.



*View from Quesnel Lake over claims to Adit 1, Adit 2 and Barrett Creek canyon*



*Adit 2 muck piles*



samples and assaying for other minerals with economic potential was either very limited or not recorded. It is known from review of unpublished Eaglet Mines data that a commercial grade molybdenum concentrate was prepared from ore from Adit #2 in 1984. Molybdenite was previously unknown at this property and commercial concentrations were encountered rather unexpectedly during the driving of Adit #2.

The property was partly abandoned in 1991, and entirely in 1997. It was restaked in 1994 and then again in 2003 by Freeport Resources Inc. Three new blocks flanking the existing claims were staked in January, 2007, given encouraging assay results from Adit 2 pulp samples. All costs claimed in this Assessment Report represent new previously unreported results, paid for exclusively by Freeport Resources Inc.

## **2.0 History**

The Barrett Creek canyon fluorite showings were staked in 1947 by H Forster of Kamloops. A few scattered shallow trenches were dug in 1965. The following year, Canex Aerial Exploration Ltd, later Placer Development Ltd., optioned the property and conducted trenching, geochemical soil sampling and percussion drilling. The option was cancelled in 1967.

In 1973, Eaglet Mines Limited commenced an exploration program which continued until 1984. In 1985, Eaglet Mines hired Dr. Peter Read to undertake a structural study of the deposit to understand better the distribution of mineralized zones. After completing the fieldwork, the analyses of collected data did not proceed and work remained uncompleted.

Eaglet Mines filed three assessment reports during this period - No. 5639 dated September 26<sup>th</sup>, 1975, No. 9515 dated April 22, 1981, and No. 10,447 dated May 4, 1982. After that time, commodity prices underwent significant changes. From 1984 to 1985, international fluorspar prices decreased almost 50% from US\$ 130-210/metric tonne to US\$ 72-115/metric tonne. Between 1980 and 1983, molybdenum prices decreased from US \$25/kilogram to below US \$10/kilogram. Some claims lapsed in 1990 and 1991, with the remainder in 1997.



*View over claims from northeast, over Wasko Lake to north arm of Quesnel Lake*



*View from Q claims over Wasko Lake to northeast*

The property was first staked by Freeport Resources Inc. from May to July 1994 to cover the exposed fluorite zones. The claims were resurveyed in April 2003, with a digital GPS to more accurately record the claim boundaries. The Q East, South, and East R blocks were staked in January 2007.

Current claim holdings are as follows:

Tenure number	Claim name	Date recorded	Owner
401809	Q	April 11, 2003	Freeport Resources Inc.
550469	Q East	Jan. 27, 2007	Freeport Resources Inc.
550512	Q South	Jan. 28, 2007	Freeport Resources Inc.
550514	Q East R	Jan. 28, 2007	Freeport Resources Inc.

Since Eaglet Mines abandoned the property, work by Freeport Resources Inc. has been limited in scope. In 1994, a property visit was conducted from September 15 to 17, including selective mapping and sampling of Adit Number 2, by geologist, John Ball.

Physical work at the site has included rehabilitation of the access road, drill core and core racks, and the chip shed storage, as well as shoring the entry portal of Adit #2.

Two years later, geologists Leo King and Virginia Kuran also visited the site and sampled number 2 Adit, conducted geological surveying, located existing drill hole collars and platforms, and examined and sampled drill core.

Freeport has since collected all the pulp samples from the 1983-1985 drilling programs and driving of Adit 2, which were still stored on the site. These samples were sent for ICP 31 and 34 elements analyses. The majority of the drill holes were also assayed for fluorine, in order to calculate  $\text{CaF}_2$ . Some of the Adit 2 samples were also assayed for fluorine. Final results for Adit 2 are being compiled, and will be included in a separate analytical report.

### 3.0 Geology

The mineralization is hosted by Quesnel Lake orthogneiss of Late Devonian to Early Mississippian age near the contact with Late Proterozoic Snowshoe Group metasedimentary rocks (see Figure 3 next page). Some of the mineralization is also found in Snowshoe Group rocks.

The contact of the orthogneiss with metasediments is well exposed in Barrett Creek canyon which crosses the mineralized zone from north-east to south-west. In this outcrop, the intrusive contact where granitic gneiss crosscuts metasediments is clearly visible, with large blocks of metasediments included within the orthogneiss near its margins.

Fluorite occurs as disseminated grains, thin fracture fillings, irregular veins up to 10 centimeters thick and replacement bodies and pots within the gneiss. The mineralization seems to be intimately associated with the late aplitic dikes intruding the orthogneiss body. Small quantities of galena, sphalerite, chalcopyrite, pyrite and locally molybdenite grains are common visible accessories with fluorite mineralization. Celestite was identified in several drill holes and as irregular veins in Adit No.2. ICP analytical results indicate widespread distribution of the celestite throughout the deposit. Earlier reported scheelite and wolframite have not been confirmed. Widespread presence of a salmon pink feldspar in the fluorite mineralized area resembles potassic alteration dominated by K-feldspar commonly associated with porphyry Cu-Mo deposits. Gypsum as a joint filling was identified by Peter Read during the relogging of drill core as well when mapping Adit #2.

The age of muscovite collected by Peter Read from the mineralized zone suggests an age of 127 $\pm$ 4 Ma, with the generally considered less accurate fission track dating of fluorite from the claims suggesting an age of 104.6 $\pm$ 6 Ma. Both cases indicate an Upper Cretaceous age. The important B.C. porphyry molybdenum properties of Endako, Boss Mountain and MAC are also Upper Cretaceous in age.

Figure 3. Geology Map (Hora et al.2008)

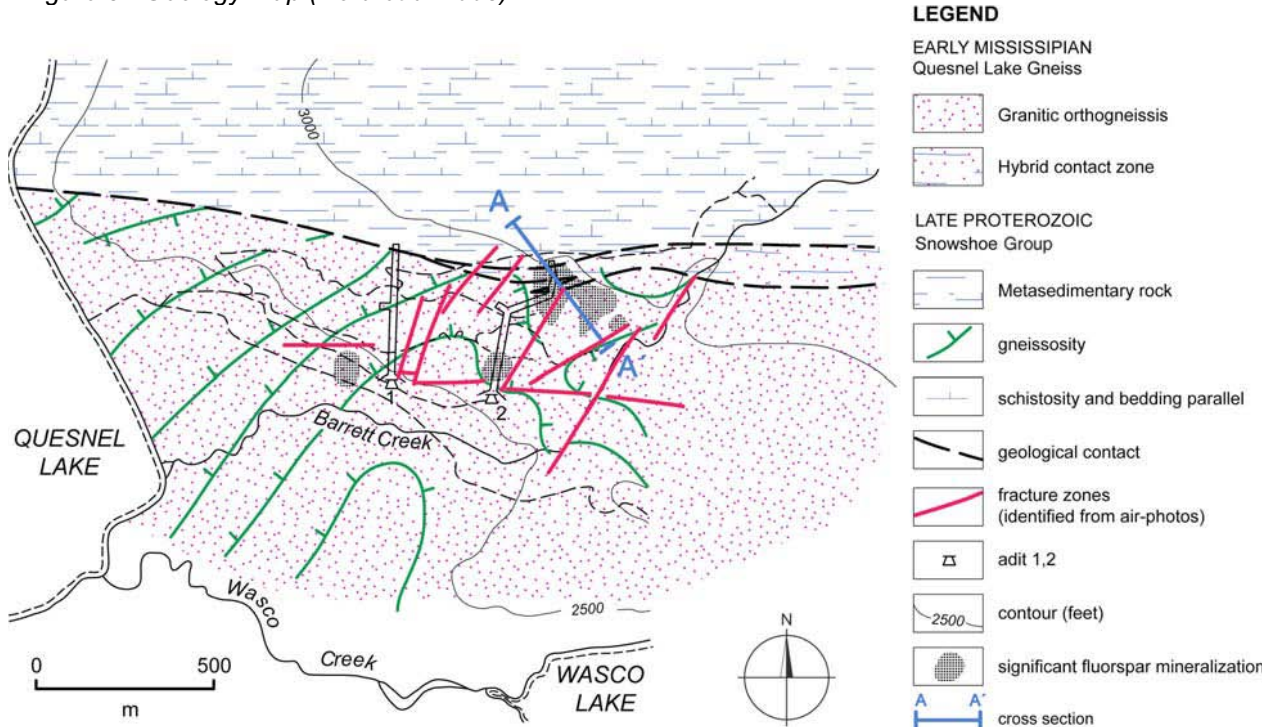


Figure 5. Linear features (fracture pattern) interpreted on air photos



Figure 5. Section A-A (Hora et al.2008, reinterpreted after Eaglet Mines, 1989)

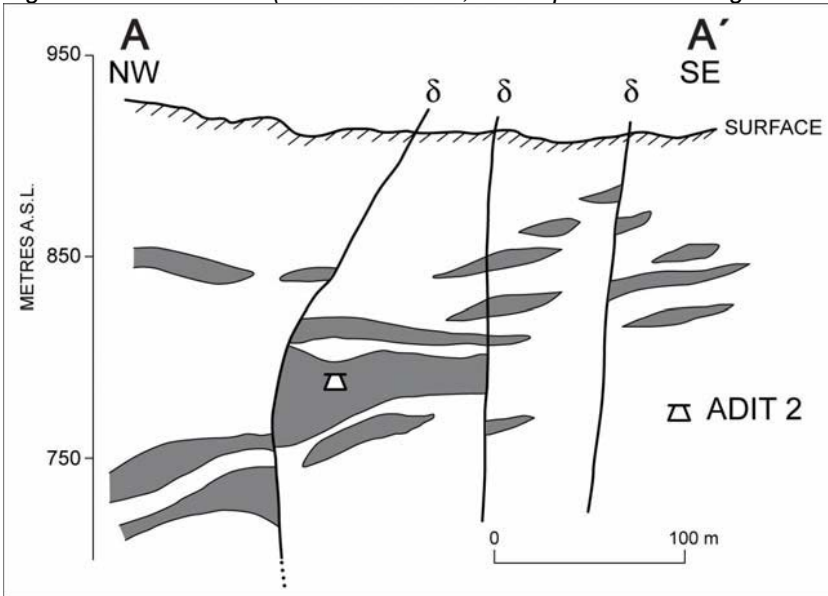
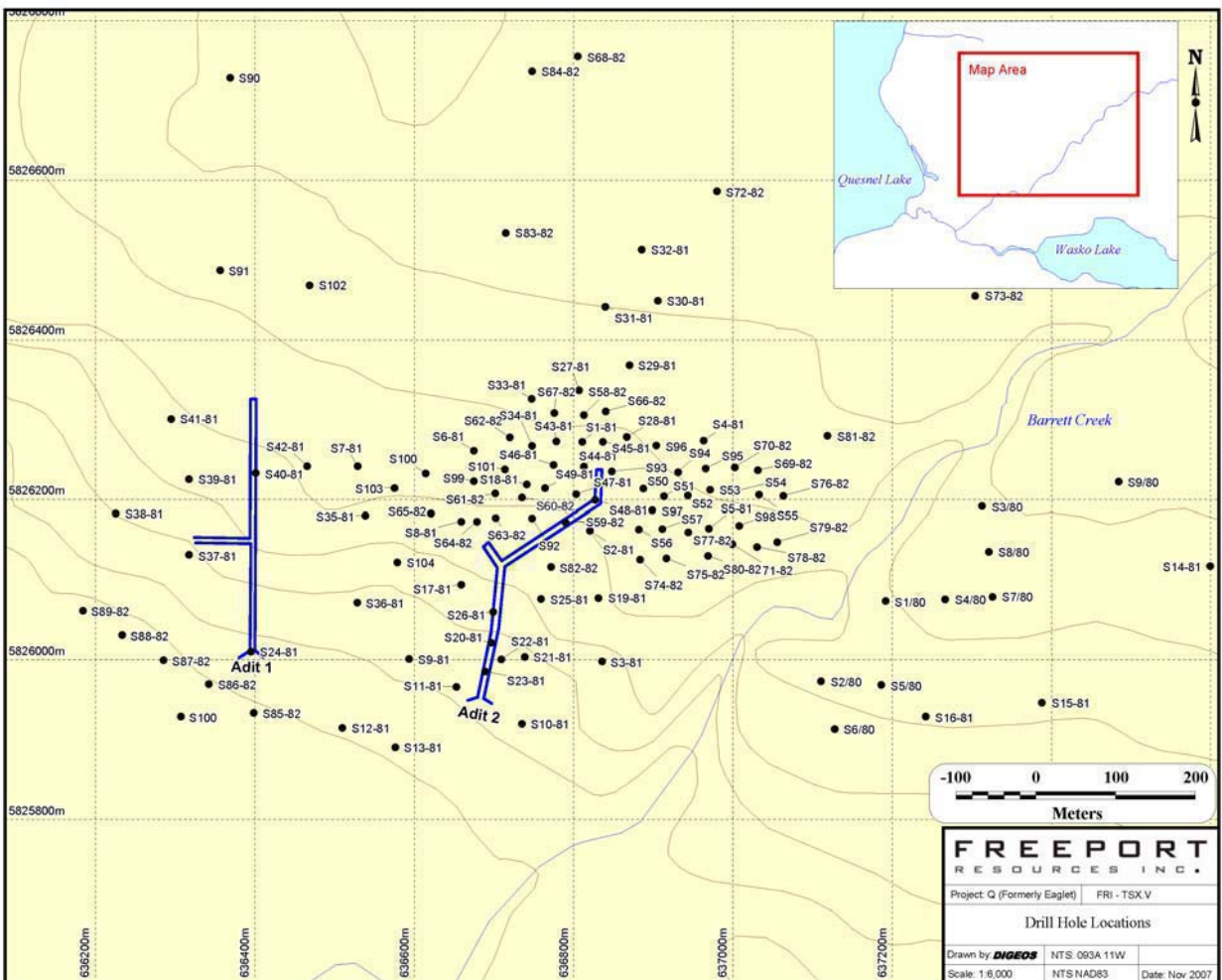


Figure 6. Drill Hole Location Map



The preliminary conclusions of the structural study indicate that mineralized zones are folded by late, broad open upright folds and locally truncated by faulting (P.Read, personal communication, 1989).

A recent review of high resolution air photo imagery confirms a concentration of faulting patterns in the vicinity of Adit 2, near the contact between granitic orthogneisses and metasedimentary rocks. This zone is located in an area of significant fluor spar mineralization at the northeast end of Adit 2, as seen in the geology map, section A-A, and the air photo interpretation diagram, respectively figures 3-5.

#### **4.0 Exploration**

Two adits and in total 135 diamond drill holes were completed by previous owners in the course of exploring the property. To process core samples and those from channel sampling from the adit walls, a small laboratory was built on the site. In the lab, the core was split, crushed and ground by laboratory standards. The resulting pulps were shipped for assays to the Kamloops Research & Assay Laboratory Ltd.

A variety of pulp samples were stored inside the lab shed in several cardboard boxes. These include 189 samples processed from the 1983 drill program (DDH 83 to DDH104), as well as 11 boxes of pulp samples from the ribs and rounds of Adit 2. The pulps were stored in small paper bags with approximately 200 grams of ground sample each, preserved in excellent condition.

A shed housing chip samples from most drill holes and the adits is also located on site. Freeport has commenced analysis of these samples. Results will be summarized in a later analytical report.

The available data from previously filed assessment reports is very incomplete and a considerable amount of the information generated by the work remains unavailable. From the 1975 program of 9 drill holes, no logs were filed and only some samples were analyzed for CaF<sub>2</sub> only (Assessment Report 5639). The seven underground drill holes completed in 1980 are not documented at all. In 1981, the company drilled forty vertical

drill holes. Only 7 (S1 to S8) have reported logs and CaF<sub>2</sub> and Ag assay results (Assessment Report 9515). Drill holes completed during 1982 and 1983 season have available information on CaF<sub>2</sub> and Ag assay results, but drill hole logs have been reported for nine holes only (S41 to S49). In total, 54 drill holes (S50 to S104) are lacking any core description from geological staff. There is no historical assay data available from Adits #1 and #2, and no Mo data is available in spite of the fact that parts of Adit 2 were driven to outline a Mo mineralized zone and a processing test to produce a commercial grade molybdenum concentrate was carried out in the Kamloops laboratory.

## **5.0 Geochemical Analyses**

In order to obtain a better idea about distribution of other minerals present in the deposit and to help to interpret the deposit type, Freeport Resources Inc. collected hundreds of preserved pulp samples from the on-site lab, and sealed them in plastic bags for longer term storage. A number of representative split drill core samples were also collected for analysis. The pulps and core samples were then sent to several commercial laboratories for ICP 31 and 34 elements analyses, REE, gold fire assays and whole rock analyses. The labs include Assayers Canada (Min-En Labs), ACME Analytical Laboratories Ltd., and Chemex Laboratory in Vancouver. Many of the samples were later analyzed for fluorine to correlate the ICP data with the main exploration target. Current work is focussed on a compilation of all of these results, in particular, those from Adit 2. Some of these findings were included in the June 2005 assessment report. The compilation of all the results, including those from Adit 2, will be the subject of a later report.

## **6.0 Drill Hole Logs**

Sixty drill holes were logged in 1984 and 1985 by structural geologist Dr. Peter Read, but his work was never completed. These logs were purchased by Freeport Resources, reviewed and compiled into a comprehensive digital database for further work and



analysis. The drill hole logs, included in the 2005 Assessment Report, provide an extensive list and description of veins, as well as rock alteration encountered in the core. Lithologies are described in detail in most of the logs.

From review of the previously unfinished drill core logs, fluorite mineralization seems to be associated with late, mostly unfoliated white and pink aplite sills intruding the Quesnel lake orthogneiss and the schists of the Snowshoe Group. Fluorite mineralization forms sheet-like zones up to 30 meters thick with grade ranging from a few percent to 43%  $\text{CaF}_2$ . The best zone of fluorite mineralization is located at the contact between the Snowshoe schist and the orthogneiss and forms a sheet that extends for approximately 100 m east-west and approximately 150 m north-south including the northern arm of Adit #2. Its western boundary coincides with the western arm of Adit #2. The mineralized zone is intercepted in drill holes at depths between 100 to 150 m and is up to 30 m thick with grade of ~10%  $\text{CaF}_2$ . This zone seems to taper out outside of the area mentioned above. Other thinner fluorite zones are intercepted in drill holes below and above the main one. A three dimensional map of the mineralized zones intercepted in drill holes would help to visualize the spatial distribution, the grade and volume of the fluorite mineralization.

Several different types of veins were encountered in drill core. In general, veins are more numerous and more varied at depth than at the top of the holes. The main veins seen in drill holes are variant of the following: Quartz  $\pm$  pyrite  $\pm$  calcite  $\pm$  fluorite veins; fluorite  $\pm$  pyroxene  $\pm$  K-feldspar  $\pm$  quartz  $\pm$  pyrite veins; kaolinite veins; gypsum  $\pm$  calcite veins; quartz veins; quartz  $\pm$  Kfeldspar  $\pm$  pyrite veins. Molybdenite, galena and sphalerite are sometimes seen in some veins, mostly associated with fluorite. In spite of high strontium values identified by ICP analyses, no celestite has been mentioned in these logs. The white, fine-grained nature of this mineral may have been confused with calcite or fluorite.

Slight to moderate, rarely intense, alteration of the host rock is also common in the drill core. The alteration minerals mentioned include K-feldspar, biotite, sericite, muscovite, gypsum, pyroxene, chlorite, and possible clay. Epidote is seldom mentioned as either

vein component or rock alteration. It is unknown at this time if the alteration minerals form halos or zones of different intensity and type of alteration as is often seen in porphyry copper and molybdenum systems (i.e. propylitic, argillic, phyllic and potassic alteration zones). It would be interesting to study the spatial distribution of the alteration minerals and vein types encountered in the drill cores to determine whether they show similarity with any porphyry copper and molybdenum deposit model.

## **8.0 Conclusions and recommendations**

As previously reported, high values of strontium in all samples indicate the presence of celestite disseminated throughout the whole area mineralized with fluor spar. Potassium is considerably higher than sodium in most of the samples, which points to potentially widespread potassium alteration.

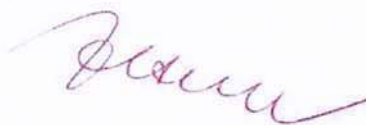
Molybdenum values are elevated in many samples, but independently of fluorine, strontium, lead, copper and zinc. Barium values are less than one tenth of strontium content. Dark purple fluorite is enriched in the thorium and light REE relative to the green and colorless varieties. About 25% of molybdenum ICP values are between 0.001% and 0.02%.

Samples collected from Adit 2 driven into the same general area of mineralization have Mo values considerably higher – out of 562 samples over 15% of results are between 0.01% up to 0.114% Mo. Such a difference leads one to question whether larger volume samples collected from the adit walls during work on the adit present more representative results than a sample of BQ core.

Since the previous assessment report was filed in June 2005, available data from published and unpublished sources has been used to establish the most probable deposit type for mineralization at the Q claims. The mineral target has been identified as molybdenum, especially given encouraging results from samples from Adit #2. An exploration program is being developed with the deposit model in mind, and may include optional use of geophysics to identify areas of high fracture frequency.

A three-dimensional diagram of alteration and mineralization intercepted in drill holes and adits has been commenced to further exploration efforts at this property. The summary of a 2007 study published in Geological Fieldwork 2007 interprets the Eaglet mineralization as a replacement product of the interaction of alkali sodium and successive potassium-bearing fluids with a consolidated orthogneiss series with metasedimentary intercalations. This process, followed by hydrothermal activity contributing quartz, molybdenite, fluorite, carbonates and celestite with few minor minerals is considered to be an aureole of a differentiated granitic body at depth. The Cretaceous age (by dating of mica and of fluorite) is within the range of stocks and dikes with Mo mineralization in the Quesnel and Kootenay Terrane elsewhere. The large area covered by this aureole indicates a potentially significant size of this subsurface intrusion. The distribution of fluorspar and celestite is mainly controlled by mechanical properties of more brittle host rocks susceptible to fracturing and percolation by hydrothermal fluids. Presence of molybdenite has been observed mostly along schistosity and in quartz filled veinlets. The suspected faults interpreted from air photos are most probably conduits for hydrothermal fluids as well as playing part in the physical force for the fracturing of physically susceptible environment. Therefore, more detailed interpretation of linear features from air photos has been warranted.

Respectfully submitted,



Z.D. Hora, M.Sc., P. Geo.  
Victoria, B.C.  
January 21, 2008



## 9.0 References

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- Taggart, L.P. (1984): Eaglet Mines Limited, Quesnel Lake Fluorspar Project, Horsefly, British Columbia. Preliminary Feasibility Study; Kilborn Engineering (B.C.) Ltd., Volumes I and II.

## 9.0 Statement of qualifications

I, Zdenek D. Hora, M.Sc., P.Geo., of Victoria, British Columbia, do hereby certify that:

I am a Consulting Geologist and since 1975, a Registered Professional Geoscientist in British Columbia and previously in Alberta, residing at 3657 Doncaster Drive, Victoria, B.C., V8P 3W8.

I graduated from Charles University of Prague, Czechoslovakia with a M.Sc. Degree in geology in 1958. Since graduation, I have been continuously practicing my profession in Europe and overseas, and since 1971 in Canada, namely in Quebec, Alberta, the N.W.T. and British Columbia. My work has largely been focussed on the geology, exploration and evaluation of industrial minerals deposits. From 1978 to 1984, I was the Industrial Minerals Specialist for the British Columbia Ministry of Energy, Mines and Petroleum Resources. From 1984 to 1999, I acted as the Program Manager for industrial minerals inventory and market studies in the province. Since my retirement in 1999, I am consulting in the field of industrial minerals – property assessment and evaluation, tenure aspect of industrial minerals in B.C. and its historical development, aggregate prospecting and deposit models for a wide range of industrial minerals. My professional activities included teaching industrial minerals courses (i.e. University of Victoria – Economic Geology; B.C. Ministry of Energy, Mines and Petroleum Resources, B.C. and Yukon Chamber of Mines, and Geological Association of Canada – Courses for Prospectors). I have previously served as Chairman of the Industrial Minerals Division of the Canadian Institute of Mining, Metallurgy and Petroleum (CIM), and was the organizer and Co-Chairman of the 27<sup>th</sup> FORUM on Geology of Industrial Minerals and several other symposiums dealing with industrial minerals. From 1995 to 2000, I was part of the CIM Standing Committee on Reserve Definitions representing the CIM Industrial Minerals Division. I am presently a Consulting Geologist and have been so since June, 1999. As a result of my experience and qualifications, I am a Qualified Person as defined in N.P. 43-101.

This report is based on several property visits between 1979 and 2007, published and unpublished reports filed with the B.C. Ministry of Energy and Mines and information provided to me by Freeport Resources Inc.

I have not received, nor do I expect to receive any interest, directly or indirectly, in the properties or securities of Freeport Resources Inc. or any affiliate. I am independent of Freeport Resources Inc. in accordance with the application of Section 1.5 of National Instrument 43-101. I consent to use of this report by the company in submissions for any Regulatory requirements and development opportunities. I am not aware of any material fact or material change which is not reflected in this report. I have read National Instrument 43-101, Form 43-101F1 and this report has been prepared in compliance with NI 43-101 and Form 43-101F1.

Dated in Victoria, B.C., January 21, 2008.

Z.D.Hora, M.Sc., P.Geo.



DATE	INVOICE #	SUPPLIER	COST	GST	TOTAL
<b>GEOLOGICAL FEES</b>					
ZDHora MSc	ZDHora MSc	1.6 days @ \$500	\$800	\$0	\$800
ZDHora MSc			<b>\$800</b>	<b>\$0</b>	<b>\$800</b>
<b>FIELD EXPENSES &amp; SUPPLIES</b>					
Fri, July 27, 2007	85116	Overlander Motor Inn (hotel Jul27-28) 2 rooms @ \$90/night, plus meals for 3	\$400	\$21	\$421
Sat, July 28, 2007		Oliver St. Bar & Grill	\$8	\$1	\$8
			<b>\$408</b>	<b>\$21</b>	<b>\$430</b>
<b>TRANSPORTATION</b>					
Fri, July 27, 2007	LAZIAA	Tango Air -Zdenek Hora (Victoria-YWL)	\$248	\$7	\$255
Fri, July 27, 2007	LAZIAA	Tango Air -Edvin Pivec (Victoria-YWL)	\$248	\$7	\$255
Fri, July 27, 2007	FCNMRA	Central Mountain Air - B Clark (YVR-YWL)	\$198	\$12	\$210
Sun, July 29, 2007	620116	Pacific Coastal Air - Z. Hora (YWL-Victoria)	\$232	\$14	\$246
Sun, July 29, 2007	620116	Pacific Coastal Air - E. Pivec (YWL-Victoria)	\$232	\$14	\$246
Sun, July 29, 2007	620112	Pacific Coastal Air - B Clark (YWL-YVR)	\$164	\$10	\$175
			<b>\$1,321</b>	<b>\$64</b>	<b>\$1,385</b>
Sun, July 29, 2007	61912320	National car rental/gas: 2 days @ \$40 (partial, remainder to another project)	<b>\$120</b>	<b>\$8</b>	<b>\$128</b>
Sat, July 28, 2007	50562	Arduini Helicopters Ltd 3.1 hrs. @ \$950/hr. = \$2945 353l @ \$1.1/l = \$388.30	<b>\$3,333</b>	<b>\$200</b>	<b>\$3,533</b>
<b>MAPS/AIR PHOTOS</b>					
<b>Air photos</b>					
Jan.8, 2008	23226	Base Map Online, 6@\$18.50+shipping	\$144	\$7	\$150
Jan.20, 2008	23535	Base Map Online store, 10@\$9.00+tax	\$95	\$5	\$100
			<b>\$239</b>	<b>\$12</b>	<b>\$251</b>
Digital Maps:					
Oct.28, 2007	502	Digeos Spatial Solutions Inc. Digeos (7.7 hrs. @ \$75/hr.)	\$575	\$81	\$656
Oct.30.2007	514	Digeos (3 hrs. @ \$75/hr.)	\$225	\$32	\$257
Dec.12,2007	532	Digeos (6 hrs. @ \$75/hr.)	\$450	\$63	\$513
			<b>\$1,250</b>	<b>\$175</b>	<b>\$1,425</b>
			<b>\$7,352</b>	<b>\$472</b>	<b>\$7,824</b>
		<b>pac \$2,205.51</b>			
		<b>EXPENDITURES \$9,557</b>			
				subm. fee	
		Q: 401809	3200	160	3360
		Q EAST: 550469	2672	268	2940
		Q EAST R: 550514	1258	126	1384
		Q SOUTH: 550512	2359	236	2595
			<b>9489</b>	<b>790</b>	<b>10278</b>

## APPENDIX A

## ITEMIZED COST STATEMENT

<b>2007 Q PROJECT EXPLORATION COST SUMMARY</b>			
Q Claims (Eaglet), submitted January 2008			
<b>1. Consulting Services:</b>			
Dan Hora, Geologist			
	1.6 days @ \$500	\$ 800	\$ 800
<b>2. Maps and Air Photos:</b>			
	Air Photos (6@\$18.50, 10@\$9 plus tax/shipping)	\$239	
	Digital Map/data base compilation (16.7hrs@\$75/hr.)	\$1,250	\$1,394
<b>3. Field Expenses</b> (Logistic support for Eaglet deposit scientific study)			
	Accommodation/food/supplies (2 rooms @ \$90/night, July 27-28, plus meals)	\$408	\$408
<b>Transportation:</b>			
	Car rental/gas (2 days @ \$40/day plus taxes/gas)	\$120	
	Airfare (2 Victoria-WL round-trip, 1 Vancouver-WL round-trip)	\$1,321	
	Arduini Helicopters Ltd (3.1 hrs @ \$950, 353L@\$1.1/L)	\$3,333	
		\$4,775	\$4,775
	<b>SUB-TOTAL</b>		\$ 7,352
	<b>TOTAL EXPENDITURES</b>		\$ 7,352
	<b>PAC account (&lt;30% total)</b>		\$ 2,206
			\$ 9,557

Note: Analytical results and expenses to be included in a separate report

APPENDIX B

**BCGS GEOLOGICAL FIELD WORK 2007, PAPER 2008-1:**

Eaglet Property Revisited: Fluorite-Molybdenite Porphyry-Like  
Hydrothermal System, East-Central British Columbia (NTS 093A/10W)  
by Z.D. Hora, A. Langrová and E. Pivec



# Eaglet Property Revisited: Fluorite-Molybdenite Porphyry-Like Hydrothermal System, East-Central British Columbia (NTS 093A/10W)

by Z.D. Hora<sup>1</sup>, A. Langrová<sup>2</sup> and E. Pivec<sup>3</sup>

**KEYWORDS:** Eaglet deposit, MINFILE 093A 046, fluorite, fluorspar, celestite, celestine, molybdenite, potassic alteration, pyrochlore, niobium

## INTRODUCTION

The Eaglet property is located on the northern side of Quesnel Lake, 2.5 km east of the North Arm (Fig 1) in NTS area 093A/10W. The identified mineralized zones are located north of Wasko Creek and west of Barrett Creek. Freeport Resources Inc. of Vancouver has owned the property since 1994 when they restaked it as the 'Q claims'.

Exploration of the Eaglet deposit began in 1946 with the discovery of fluorite in Barrett Creek canyon. The property was briefly examined by Canex Aerial Exploration in 1966. Between 1971 and 1985, Eaglet Mines Ltd. conducted a systematic program of trenching and diamond-drilling, and developed two adits.

Exploration activities ceased at Eaglet when international fluorspar prices suddenly dropped from US\$130–210/tonne in 1984 to US\$72–115 in 1985, following a fall in molybdenum prices from US\$25/kilogram in 1980 to below US\$10 in 1983. Fluorspar and fluorite are synonymous terms, with fluorite used more in scientific terminology and fluorspar being a rather technical term in industrial applications.

Given the current strength of commodity prices, with fluorspar at US\$180–280/tonne (*Industrial Minerals*, No. 481, October 2007) and molybdenum at US\$32.75–34.00/lb of Mo oxide (*The Northern Miner*, November 26–December 2, 2007), an update to the public-domain geoscience knowledge of the Eaglet deposit was warranted.

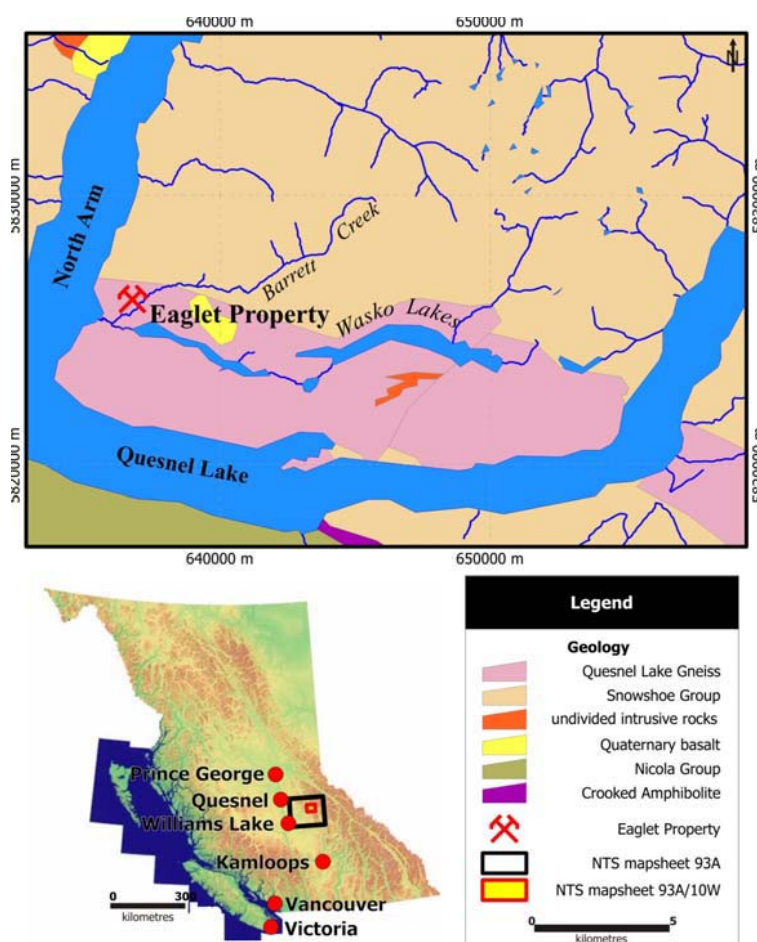


Figure 1. Location of study area, east of the North Arm of Quesnel Lake.

## EXPLORATION OVERVIEW

Mineralization discovered in Barrett Creek canyon was disseminated fluorite and minor celestite, pyrite, galena, sphalerite and molybdenite. In a 1966 report, J.M. McCammon described the discovery zone hostrocks as quartz-feldspar-mica gneiss injected with pegmatite, aplite and granitic rock.

Exploration between 1971 and 1985 included 126 surface diamond-drill holes totalling 19 687 m, together with 9 underground horizontal diamond-drill holes (from adit 1) totalling 1525 m (Fig 2). In addition, two adits, no 1 of 292 m and no 2 of 373 m were driven to test the mineraliza-

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tion underground (Fig 3, 4). This program covered an area 1500 m long and 900 m wide on a south-facing forested slope between elevations of 760 and 915 m. Unfortunately, only a small part of the exploration work was documented and is publicly available in Assessment Reports 5639, 9515 and 10447 filed by Eaglet Mines Ltd. The only geochemical data available from the exploration campaign are incomplete CaF<sub>2</sub> assays for 120 of drillholes, 9 of which also have Ag values. The presence of molybdenite has been only briefly mentioned in the *George Cross Newsletter* (1983) and *The Northern Miner* (1984). According to internal Eaglet Mines Ltd. reports, a “good quality fluorspar concentrate” and a saleable MoS<sub>2</sub> concentrate were obtained in pilot tests by Kamloops Research and Assay Laboratory Ltd. In 1985, Eaglet Mines Ltd. contracted Peter Read to map adit 2 and relog the on-site core with the objective of conducting a structural analysis of the deposit. Unfortunately, the project was not completed, although 60 manuscript drillcore logs and a map of adit 2 were purchased by Freeport Resources Inc. (Hora, 2005). Preliminary conclusions of this incomplete structural study indicate that the Eaglet mineral zones are folded by late, broad, open upright folds and are locally truncated by faults (P. Read, pers. comm., in Pell, 1992).

When Freeport took control of the deposit in 1994, a variety of pulp samples were stored inside a shed on the property. These included 189 samples from the 1983 diamond-drilling program (holes 83 to 104) and 632 samples of ‘ribs’ and ‘rounds’ from adit 2. The diamond-drill hole samples were sent by Freeport for reanalysis of 31 elements by inductively coupled plasma – mass spectrometry (ICP-MS) and CaF<sub>2</sub> by wet chemistry (Hora, 2005), and the samples from adit 2 for 34 elements by ICP-MS. In 2005, Freeport also tested samples containing visible molybdenite, collected from the adit 2 muck piles (Fig 5) to document processing suitability of this mineralization type (B. Clark, pers comm, 2005).

## GEOLOGICAL SETTING

The Eaglet deposit is located within Early Mississippian Quesnel Lake granitic orthogneiss (Okulitch, 1985) at its contact with Late Proterozoic biotite-garnet metapelite of the Snowshoe Group (Struik, 1983). Along its structurally modified intrusive northern contact are abundant xenoliths of garnet-biotite metapelite and garnet amphibolite. The deposit area is covered by a continuous blanket of overburden, which varies in thickness from 1.2 to 33.2 m (averaging 11.3 m), as documented from 63 drillhole logs (Hora, 2005). However, contact relationships exposed in the Barrett Creek canyon show an easterly strike and shallow northerly dip (Pell, 1992).

Orthogneiss composition ranges from diorite to granite to syenite (Ferri et al., 1999). The U-Pb zircon geochronometry indicates an age between 375 and 335 Ma (Mortensen et al., 1987). Eaglet mineralization is within the East Quesnel Lake gneiss facies (Fig 4, 6, 7). This facies displays I-type attributes with indications of some assimilation of continental material. Most geochemical characteristics of the East facies point to magma genesis within an arc setting, but its origins are not fully understood (Ferri et al., 1999). Some authors have argued that characteristics of at least parts of the East Quesnel Lake gneiss are consistent with a within-plate or anorogenic setting (Montgomery and Ross, 1989).



Figure 2. Eaglet core storage facility in 2007.

Any geochemical discrimination of Quesnel Lake gneiss near the Eaglet deposit must consider the affects of alteration. The salmon pink colour of gneiss blocks found on muck piles from adits 1 and 2 and in most of the drillcore points to widespread potassic alteration and major-element mobility. In particular, any tectonic discrimination based upon the highly mobile large-ion lithophile elements, such as K, Rb, Sr and Ba, is suspect.

## PETROGRAPHY, MINERALOGY AND CHEMISTRY

Mineralogy was investigated using optical microscopy, X-ray powder diffractometry and electron microprobe microanalytical techniques at the Institute of Geology, Academy of Sciences of the Czech Republic in Prague. Unless specifically noted, analytical data and tables are part of this study.

### *Microanalytical and X-Ray Diffraction Methods*

Microanalytical analyses were made on polished sections with a CAMECA SX-100 electron microprobe using the wavelength dispersive technique. The beam diameter was 2µm with an accelerating potential of 15 kV. A beam current of 10 nA was measured on a Faraday cup. A counting time of 10 s was used for all elements. The standards employed were synthetic SiO<sub>2</sub>, TiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, Fe<sub>2</sub>O<sub>3</sub> and MgO, and natural jadeite, leucite, apatite, diopside, spinel and barite. The data were reduced using the  $\Phi(\rho z)$  Merlet correction.

Mineral phases were also identified by X-ray powder diffraction (XRD), using a Phillips X’Pert APD that employs CuK $\alpha$  radiation and graphite monochromator. Scanning speed was set to 1°/min, generator voltage to 40 kV and current to 40 mA.

The ICP-MS analytical results were provided by Vancouver laboratories Min En Labs, Assayers Canada and ACME Analytical Laboratories Ltd.

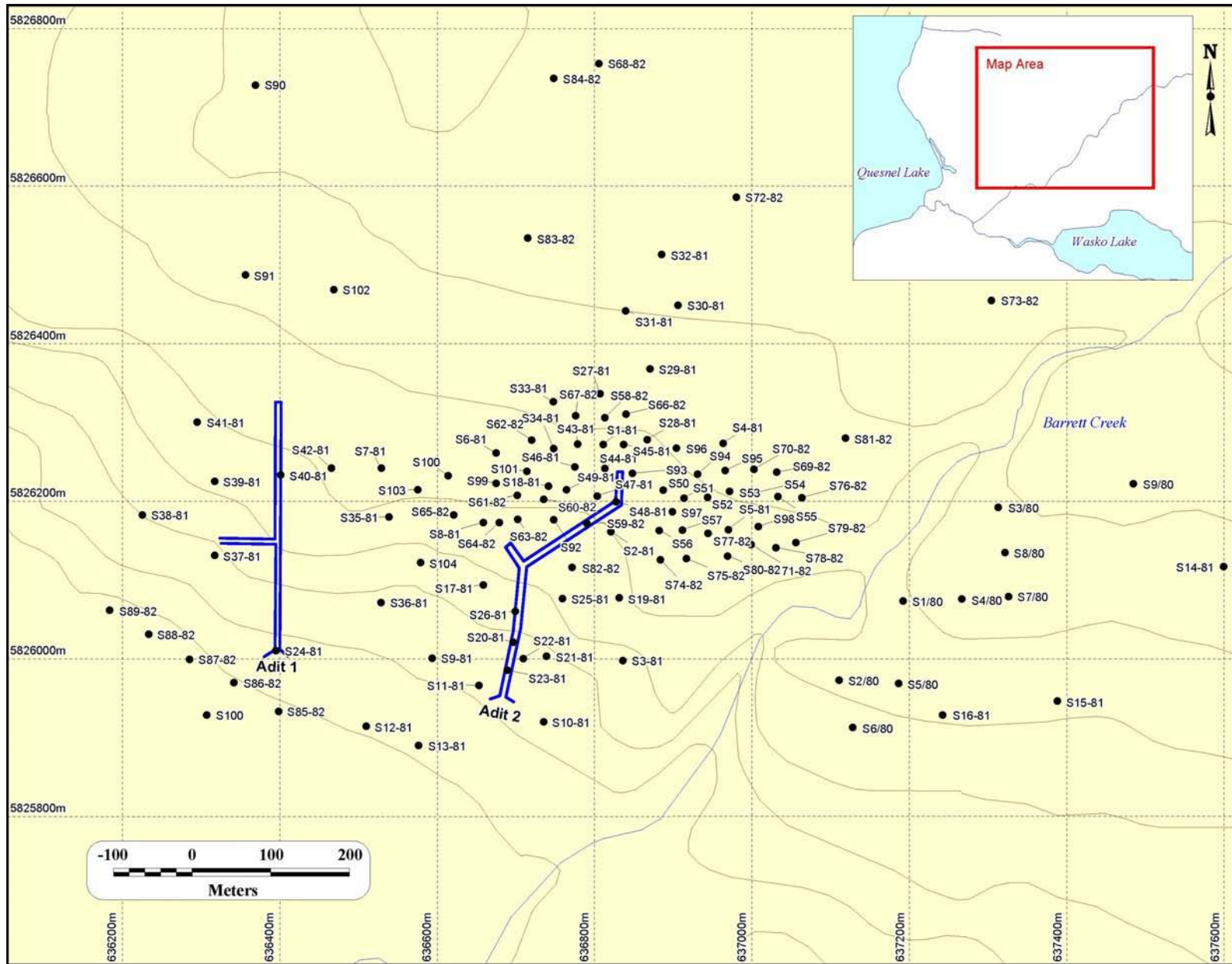


Figure 3. Locations of vertical diamond-drill holes and adits 1 and 2 on the Eaglet property.

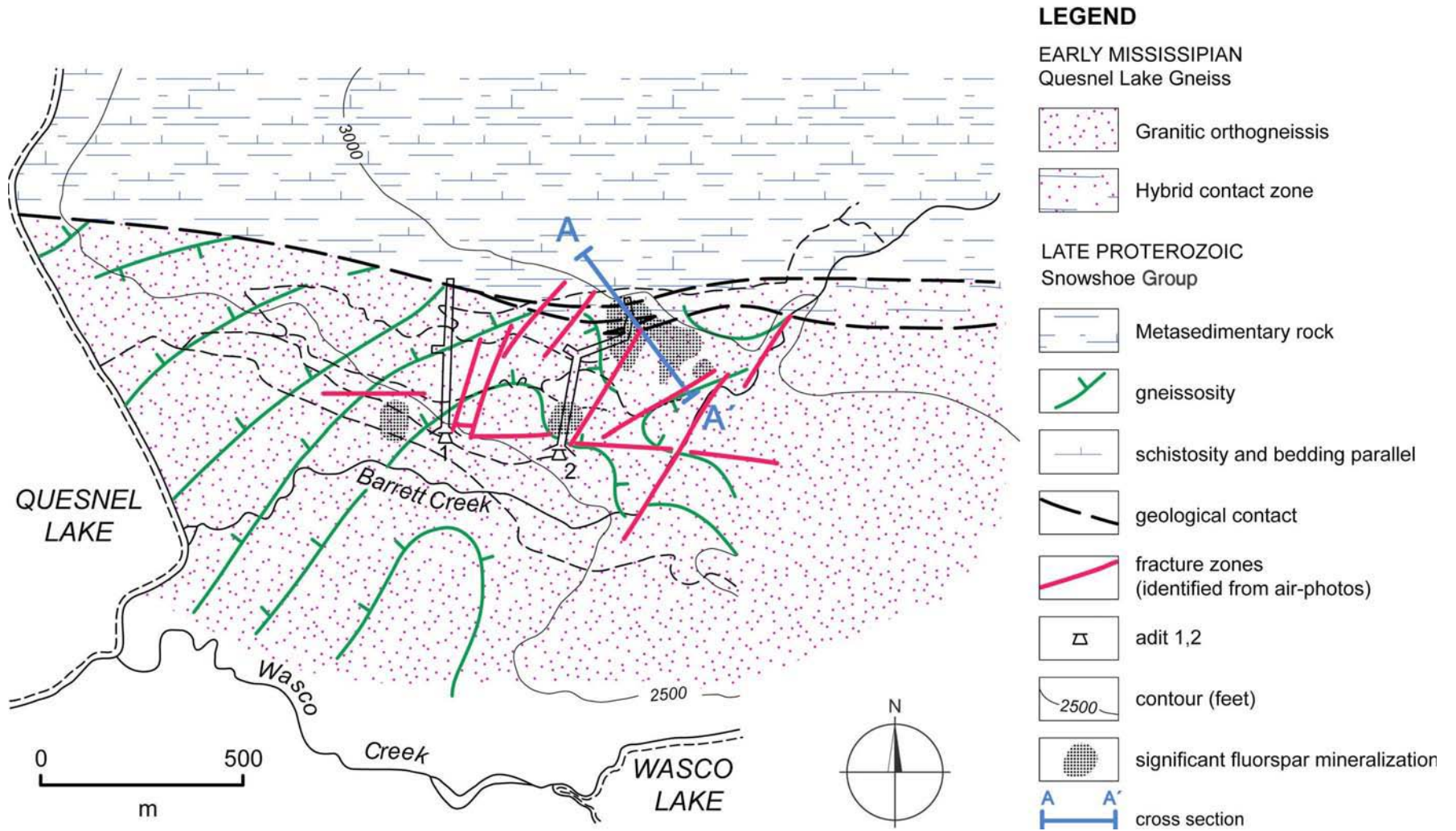


Figure 4. Geology of the property area (modified after Pell, 1992), with faults identified from airphotos.



Figure 5. Aerial view of muck piles from adit 2 as they appeared in 2007.

## Petrography

The dominant rock types are salmon pink and light grey gneisses, locally displaying a yellow overprint (Fig 7). They are fine to medium grained and composed of a sucrosic mixture of K-feldspar, albite, quartz and kaolinite group minerals. The rocks are frequently so heavily altered and recrystallized that their gneissic fabric is partially or entirely obscured. Samples of the Quesnel Lake gneiss collected in 2007 present a broader range of rock types than previously recognized: alkaline pyroxenite to leucogranite, aplite and gradations into metapelitic xenoliths.

Mineralogy includes potentially economic minerals fluorite, molybdenite and celestite; dominant rock-forming minerals microcline, albite and quartz; and accessory minerals rutile, pyrite, zircon, sphene, fluorapatite, magnetite and pyrochlore. Secondary minerals resulting from low-temperature hydrothermal alteration are siderite, disseminated very fine grained hematite, calcite, dickite, nakrite, kaolinite 1T with 1Md, and fluorapophyllite.

Figures 8 to 11 document three main stages of physical and chemical changes affecting the orthogneiss:

- 1) Following silicification and regional metamorphism, the rocks were subjected to albitization and then K-feldspar alteration (microcline) and silicification.
- 2) Introduction of sulphide minerals ( $\text{MoS}_2$ , PbS and ZnS) may have occurred next, then addition of fluorine and deposition of the oldest generation of fluorite.

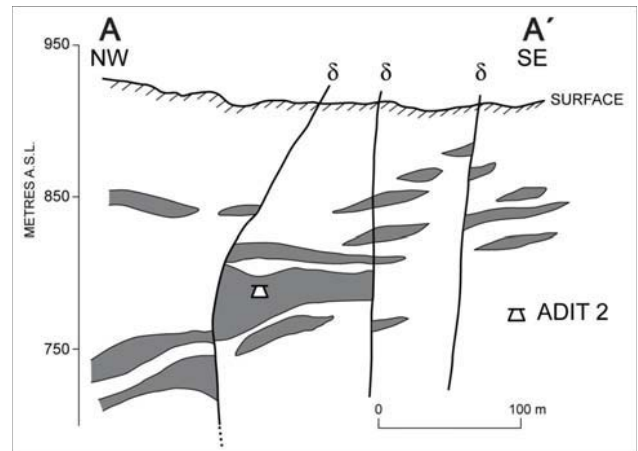


Figure 6. Northwest-southeast section across the mineralized zone, constructed using data projected from drillholes 33, 67, 58, 1, 45, 93, 50, 51, 57, 77 and 80 (adapted from Ball and Boggaram, 1985). Faults ( $\delta$ ) interpreted from airphotos.

- 3) A period of cataclasis ensued, followed by carbonate alteration and addition of multiple generations of fluorite and celestite. Growth of these minerals was accompanied by the alteration products kaolinite, sericite, chlorite and zeolite minerals. Secondary fluorapophyllite was identified by XRD analysis.

Demonstrating that some minerals are remnants of an original protolith is difficult. Only in a few thin sections are the outlines of the original minerals visible where they have been replaced by microcline and their boundaries enhanced by the presence of quartz (Fig 9d). Identification of residual minerals incorporated from the original protolith is less ambiguous (Fig 8b, 10c, 10d). The chemical composition of dominant minerals, identified by XRD as microcline and low albite, is consistent in the samples analyzed (Fig 12; Table 1). Therefore, we interpret these minerals as a product of the same large-scale replacement process. The intensity of feldspar alteration makes distinctions between original rock types uncertain.

A mica sample recovered from aplitic granite intersected in drillhole 43-81 provided an age of  $127 \pm 4$  Ma



Figure 7. Sample of East Quesnel Lake gneiss showing pervasive alteration, adit 2.

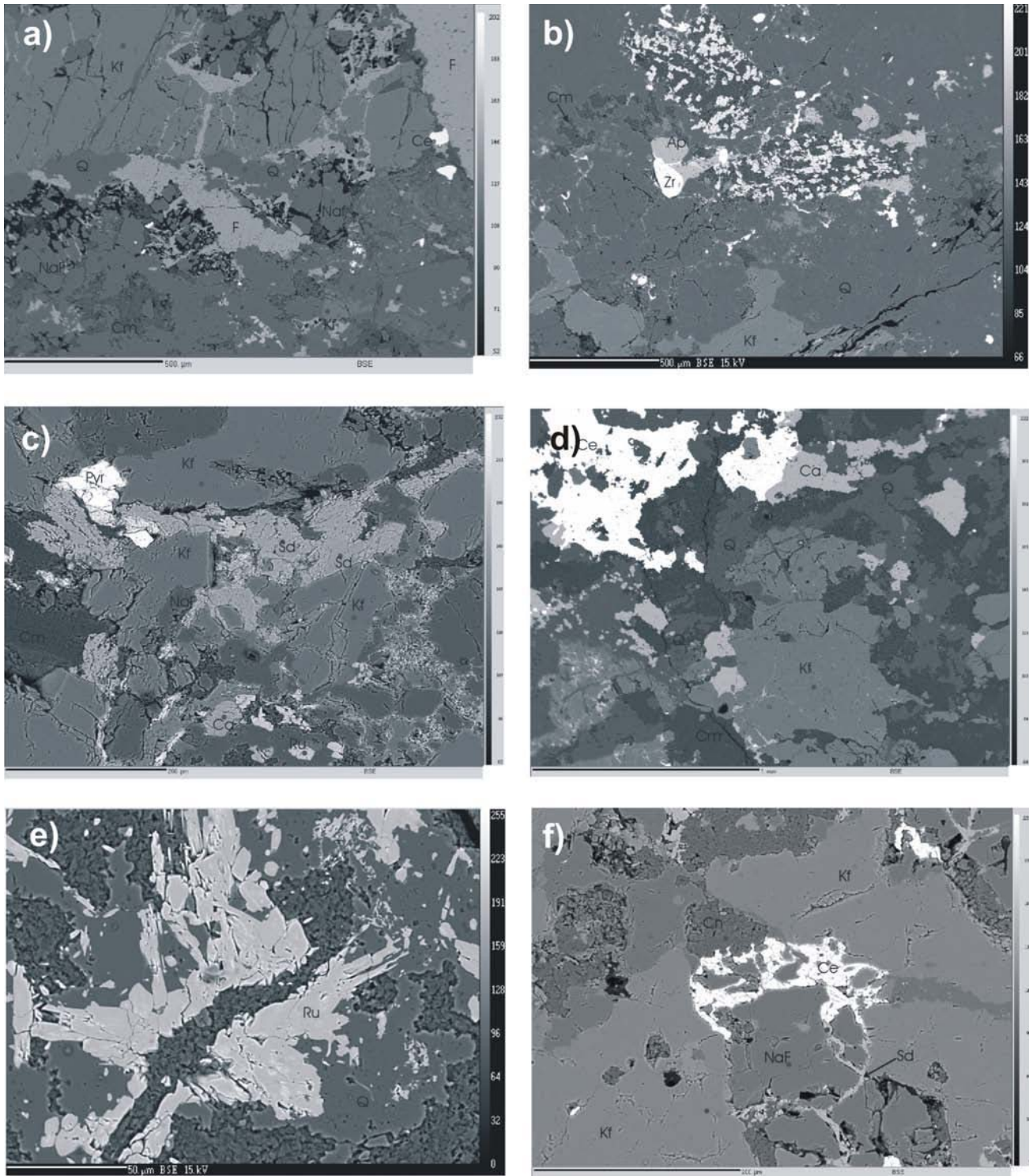


Figure 8. Scanning electron microscope (SEM) photomicrographs showing a) brecciated microcline (Kf) replacing albite (NaF), with fractures in microcline filled by quartz (Q) and fluorite (F); youngest minerals are celestite (Cs) and a clay mineral of the kaolinite group (Cm); b) hydrothermal quartz (Q) replacing microcline (Kf) and enclosing apatite (Ap) and zircon (Zr) with, to the right and up from them, original titanium mineral crystals altered to a mixture of rutile and clay mineral; c) cataclasis of microcline (Kf), which is replacing albite (NaF); intergranular space is filled by siderite (Sd) with pyrite (Pyr) grains; albite contains disseminated grains of calcite (Ca); d) microcline (Kf) cut by microveinlets of quartz (Q) and calcite (Ca); the calcite is partly engulfed by celestite, perhaps indicating replacement of calcite by celestite; in this sample, extensive mats of kaolinite (Cm; type IT) indicate advanced alteration; e) rutile crystals (Ru) enclosed by quartz (Q), with kaolinite (type IT) penetrating both; f) microcline (Kf) replacing albite (NaF), and celestite (Ce), siderite (Sd) and a clay mineral of the kaolinite group (Cn) replacing both feldspars along fractures and grain boundaries.

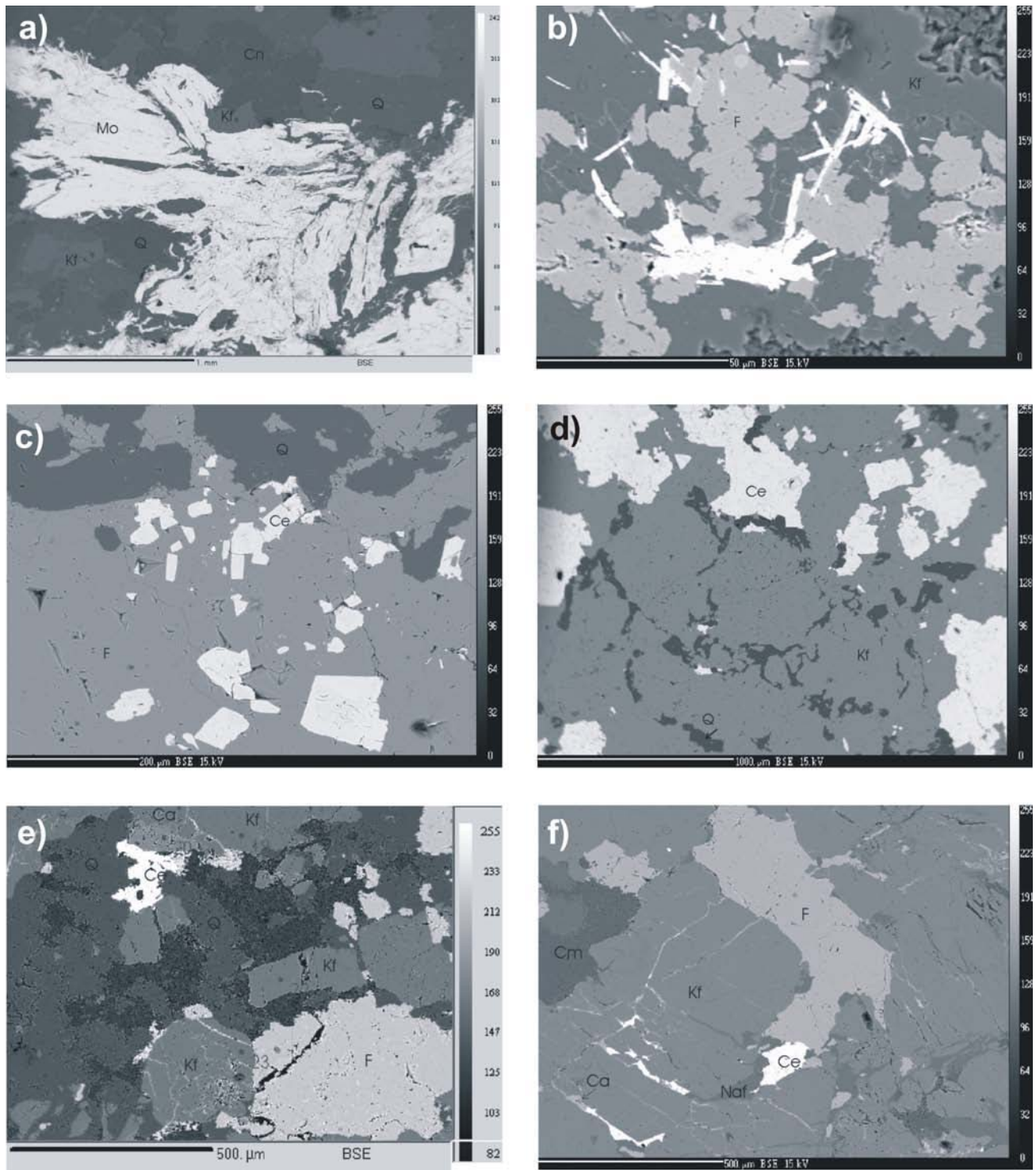


Figure 9. Scanning electron microscope (SEM) photomicrographs showing a) hydrothermal quartz (Q) with an aggregate of molybdenite (Mo) flakes; K-feldspar enclosed in quartz is structurally disordered and is probably a remnant of the original rock; the rock is highly altered, with nacrite present in addition to kaolinite (Cn); b) crystal aggregates of fluorite (F) formed at the expense of K-feldspar (Kf); elongate, prismatic, highly charged (bright) mineral replacing fluorite is an unidentified mineral with high Y, Ce, La and Nd, probably a carbonate related to bastnaesite; c) idiomorphic celestite (Ce) formed at the expense of fluorite (F) and quartz (Q); d) microcline (Kf) replacing the original rock-forming minerals; patchy quartz (Q) outlines the boundaries of replaced minerals and celestite (Cs) replaces both microcline and quartz; e) a highly clay-altered rock specimen, with the oldest mineral being microcline (Kf) and later minerals, in order of paragenesis, being quartz (Q), fluorite (F) and celestite (Ce), all of them replaced by a dark-coloured clay mineral (Cm); f) cataclastic microcline (Kf) replacing albite (Naf), with both being replaced by calcite (Ca), fluorite (F), celestite (Ce) and a clay mineral (probably kaolinite).

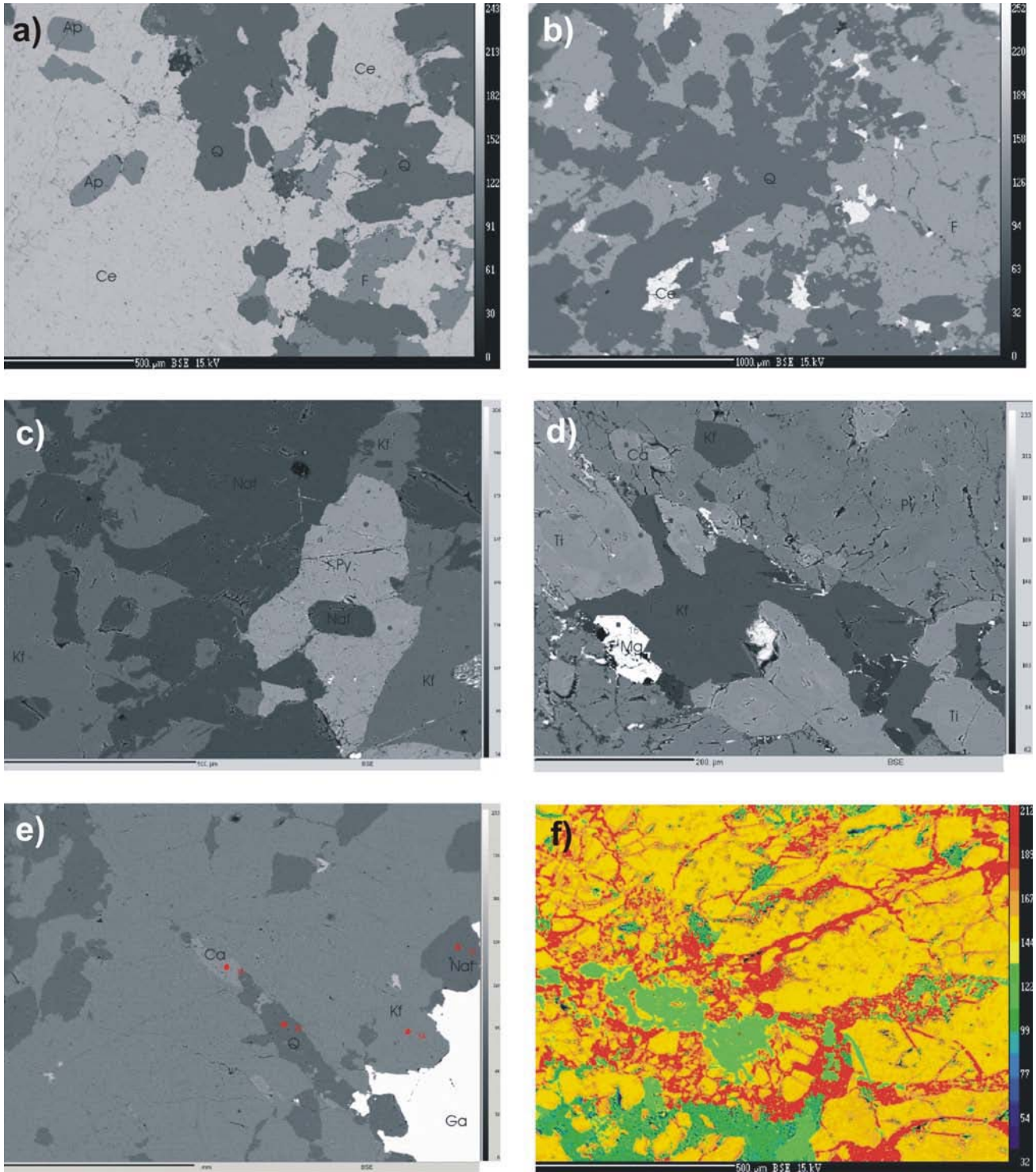


Figure 10. Scanning electron microscope (SEM) photomicrographs showing a) remnants of quartz (Q) and fluorite (F) within celestite (Ce), with apatite (Ap) grains being the only residual minerals from the original protolith; b) quartz (Q) being replaced by fluorite (F), with celestite (Ce) replacing both; c) that the protolith in this sample was probably an alkaline intrusive, as indicated by remnants of original pyroxene (Py) of aegirine-augite composition; albite (Naf) grain is enclosed by the pyroxene and both are replaced by microcline (Kf); d) the same protolith as in 10c; aegirine-augite is associated with magnetite (Mg), sphene (Ti) and calcite (Ca), and late microcline replaces all igneous minerals; e) a quartz (Q) – calcite(Ca) vein with galena (Ga), the galena replacing both microcline (Kf) and albite (Naf); f) colour-enhanced element mapping in a backscatter photomicrograph; microcline is yellow, fluorite is red, siderite is pale green and kaolinite is dark green.



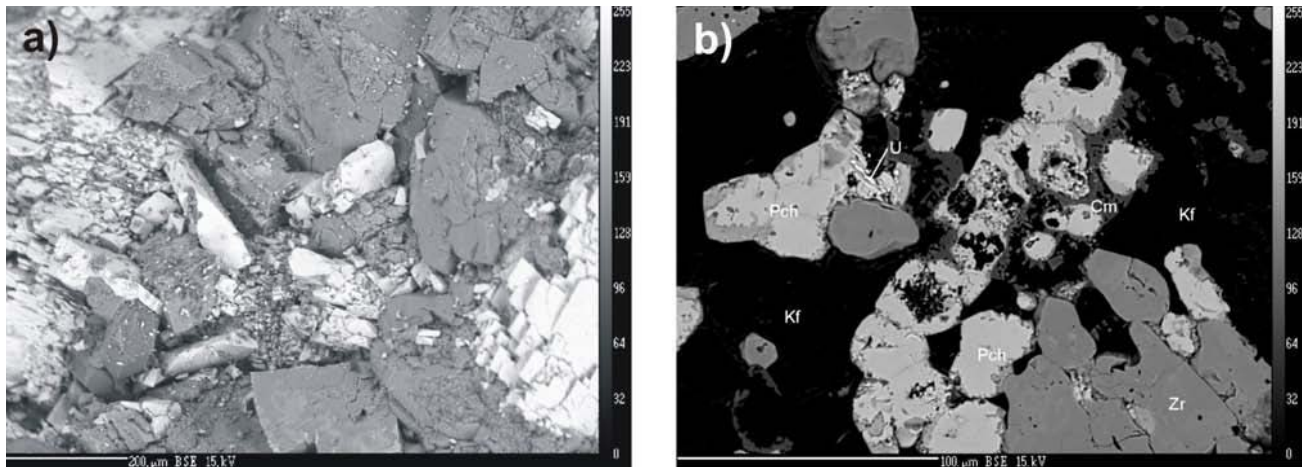


Figure 11. Scanning electron microscope (SEM) photomicrograph showing a) celestite crystals in vugs of carbonate-altered rock; b) aggregates of pyrochlore (Pch) crystals and zircon (Zr) grains enclosed in microcline (Kf) matrix, with the margins of both microcline and pyrochlore corroded and replaced by kaolinite (Cm); bright white inclusions in the pyrochlore are probably uraninite (U).

(Pell, 1992), which is within the range of Cretaceous stocks and dikes with Mo mineralization in the Quesnel and Kootenay terranes elsewhere. A less reliable fission-track date on fluorite from adit 1 suggests an age of formation of 104.6 Ma (Pell, 1992), which is within the same general range.

Alkali feldspars are the dominant minerals of the hostrocks on the Eaglet property. Microcline in anhedral grains with evidence of cataclasis (Fig 8a, 10f) makes up almost 50% of the rocks. It often shows undulatory extinction. Preserved silica rims on original mineral components commonly outline the grain boundaries within the original protolith (Fig 9d). The X-ray diffraction diagrams of microcline confirm its ordered structural state close to the pure theoretical composition. Chemical composition corresponds with very high purity  $KAlSi_3O_8$  (orthoclase (Or)); Fig 12; Table 1), with only low content of the albite (Ab; max. 4.7%) and celsian (Ca;  $BaAl_2Si_2O_8$ ; max. 0.5%) components.

Albite in samples from the Eaglet property is intergrown with quartz, the second most abundant mineral. Petrographic identification of low albite based on polysynthetic and carlsbad-albite twinning was confirmed by XRD. The crystallization of albite preceded formation of microcline (Fig 8c, 8f). Chemical composition (Table 1; Fig 12) corresponds to very pure albite (Ab;  $NaAlSi_3O_8$ ), with only 1.3% Or component and a negligible (0.4%) An content.

Chondrite-normalized rare earth element (REE) abundance patterns for all four samples analyzed are enriched in light rare earth elements (LREE). The LREE pattern is marked by a high  $La/Sm_N$  ratio (up to ~180, average ~140), while the content of heavy rare earth elements (HREE) is low but variable ( $Gd/Lu_N = \sim 1$  on average). All of the analyzed samples have distinctly positive Eu anomalies (Fig 13; Table 2). The samples selected for REE analysis are from mineralized zones high in Sr (>10 000 ppm).

Quartz is present in several mineral associations and several generations that are texturally indistinguishable from each other. The dominant is quartz of hydrothermal origin (Fig 14). Other typical products of low-temperature hydrothermal alteration are siderite (Fig 8c), calcite

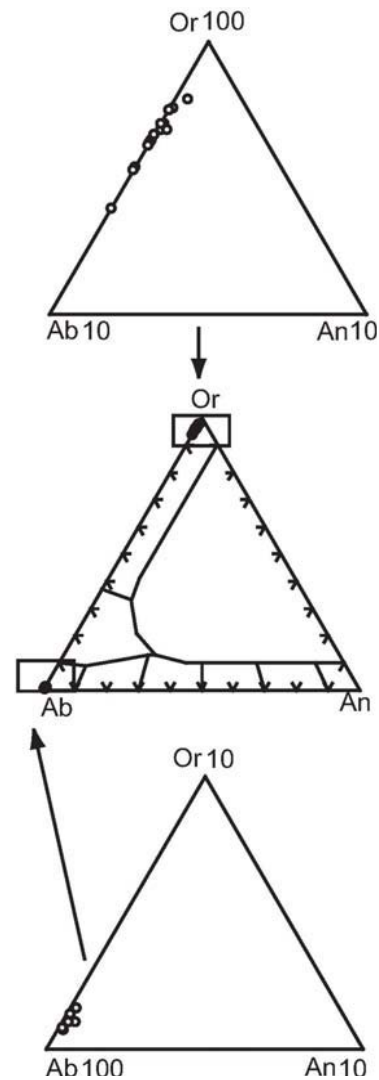


Figure 12. Feldspar minerals from the Eaglet property plotted on an orthoclase-albite-anorthite ternary diagram with expanded orthoclase and albite apices.

**TABLE 1. GEOCHEMISTRY OF TYPICAL ROCK-FORMING MINERALS IN EAST QUESNEL LAKE GNEISS FROM THE EAGLET PROPERTY.**

	Microcline			Albite			Quartz			Sphene		Rutile
SiO <sub>2</sub>	64.09	64.49	64.88	68.88	68.33	68.36	98.62	98.80	99.77	30.61	30.22	0.41
TiO <sub>2</sub>	0.00	0.01	0.04	0.00	0.06	0.01	0.66	0.80	0.03	31.56	33.71	89.16
Al <sub>2</sub> O <sub>3</sub>	17.78	18.29	18.06	19.07	19.34	19.66	0.00	0.00	0.92	1.73	1.19	0.00
Cr <sub>2</sub> O <sub>3</sub>	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.01	0.00	0.01	0.00	0.00
MnO	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.12	0.00	0.13	0.26	0.00
FeO	0.23	0.13	0.15	0.16	0.65	0.22	0.00	0.00	0.00	2.01	1.59	2.31
MgO	0.00	0.00	0.00	0.04	0.03	0.00	0.03	0.02	0.00	0.00	0.31	0.00
CaO	0.01	0.01	0.00	0.09	0.04	0.06	0.00	0.03	0.03	26.45	27.13	0.18
BaO	0.23	0.13	0.06	0.00	0.10	0.00	0.04	0.01	0.00	0.00	0.00	0.00
Na <sub>2</sub> O	0.41	0.54	0.70	11.57	11.73	11.73	0.00	0.00	0.04	0.00	0.31	0.00
K <sub>2</sub> O	16.65	16.54	16.37	0.17	0.12	0.16	0.00	0.02	0.06	0.04	0.01	0.05
Total	99.42	100.14	100.26	100.00	100.39	100.20	99.41	99.81	99.85	92.54	94.46	92.11

	Magnetite		Aegirine-augite		Siderite		Calcite		Kaolinite		Muscovite	
SiO <sub>2</sub>	1.18	0.06	52.49	51.83	1.11	0.15	0.28	0.03	47.95	45.46	45.33	45.9
TiO <sub>2</sub>	0.11	0.01	0.04	0.05	0.00	0.00	0.01	0.00	0.03	0.16	0.20	0.23
Al <sub>2</sub> O <sub>3</sub>	1.07	0.00	1.58	0.95	0.57	0.11	0.00	0.00	37.85	32.77	33.43	33.28
Cr <sub>2</sub> O <sub>3</sub>	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.04	0.04
MnO	0.00	0.04	2.75	1.77	0.79	1.03	0.15	0.51	0.07	0.13	0.06	0.14
FeO	83.04	89.28	16.08	23.12	50.3	50.44	0.16	1.73	0.19	5.17	5.16	5.12
MgO	0.12	0.00	5.92	4.31	5.05	4.31	0.00	0.04	0.07	0.55	0.44	0.47
CaO	0.45	0.05	14.15	10.91	1.66	1.83	54.48	54.34	0.00	0.00	0.01	0.00
BaO	0.04	0.00	0.02	0.00	0.00	0.00	0.00	0.02	0.00	0.12	0.02	0.00
Na <sub>2</sub> O	0.08	0.00	5.92	7.79	0.09	0.22	0.17	0.03	0.03	0.35	0.34	0.32
K <sub>2</sub> O	0.04	0.00	0.01	0.02	0.06	0.01	0.02	0.03	0.00	10.54	10.55	10.38
Total	86.16	89.43	99.13	99.47	59.63	58.13	55.26	56.74	86.19	95.26	95.58	95.89

(Fig 9f) and clay minerals of the kaolinite group: kaolinite, dickite and nacrite (Fig 8a, 8d, 9a, 9e, 11b).

Magnetite is the most common accessory mineral, forming euhedral to anhedral crystals (Fig 10d). The Fe<sub>3</sub>O<sub>4</sub> component (87.9–99.0%) is dominant over the ilmenite (Mg<sub>2</sub>TiO<sub>4</sub>) admixture (up to 10.2%). The geikielite (MgTiO<sub>3</sub>) component is minor (up to 1.3%).

Muscovite is another common accessory in rocks on the Eaglet property (Table 1). Its volume is variable, locally

reaching several percent. A genetically important accessory is zinnwaldite, found in centimetre-wide greisen veinlets. Its presence was confirmed by XRD.

Other common accessory minerals are rutile (Fig 8b, 8e), sphene (Table 1; Fig 8b, 8e, 10d), fluorapatite (Fig 8b, 10a), pyrite (Fig 8c) and pyrochlore. Pyrochlore commonly occurs as individual grains and crystal aggregates (Fig 11b; Table 3). Pyrochlore, present locally in amounts up to several volume percent, is found in association with microcline, zircon, pyrite and clay minerals of the kaolinite group. Accessory zircon (Fig 8b, 11b), sphalerite and galena (Fig 10e) are rare.

Irregular zones of dark bands within altered East Quesnel Lake gneiss are highly altered amphibolite, garnet amphibolite and pyroxene-bearing rock. Aegirine-augite can enclose euhedral albite crystals and is found in association with microcline, albite, calcite, sphene and magnetite (Fig 10c, 10d, 15; Table 1).

### Economic Minerals

Until now, Eaglet had been considered a fluorspar property. In outcrops along Barrett Creek, fluorite showings have been described as disseminated grains, veinlets and scattered veins up to 15 cm thick, and as pods and irregular masses 15 to 20 cm wide (McCammon, 1966). Fluorspar mineralization also crops out in sparse exposures for a distance of 400 m westward from Barrett Creek canyon and again on the lakeshore, 1600 m further west. After an initial search for massive veins was unsuccessful, exploration work targeted lower grade feldspathic zones with fluorite impregnations and a stockwork character (Fig 6,

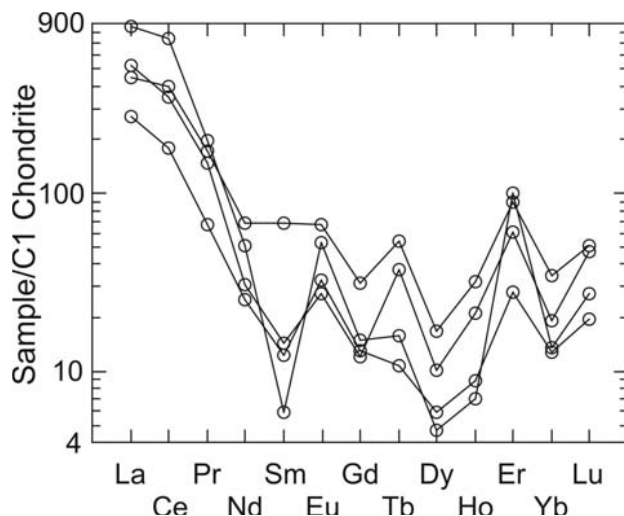


Figure 13. Chondrite-normalized rare earth element pattern of East Quesnel Lake gneiss, Eaglet property.

TABLE 2. RARE EARTH ELEMENT ANALYSES OF EAST QUESNEL LAKE GNEISS HIGHLY ALTERED ZONE, EAGLET PROPERTY. ANALYSES BY ACME ANALYTICAL LABORATORIES LTD.

Sample	Y (ppm)	La (ppm)	Ce (ppm)	Pr (ppm)	Nd (ppm)	Sm (ppm)	Eu (ppm)	Gd (ppm)	Tb (ppm)	Dy (ppm)	Ho (ppm)	Er (ppm)	Tm (ppm)	Yb (ppm)	Lu (ppm)
B 110303	26.3	124.5	212.1	14.0	14.5	2.2	1.6	2.5	1.4	2.6	1.2	10.1		3.3	1.2
B 110313	4.8	45.2	79.9	5.7	5.5	1.6	0.5	1.3	1.0			4.3		0.6	0.3
B 110315	26.4	11.0	22.0	0.5	4.9		0.4	1.3	0.3		0.6			1.4	0.3
B 110316	7.9	41.2	73.8	4.4	7.2	1.6	0.6	1.5	0.6			4.4		0.8	0.2
B 110320	44.5	105.1	243.3	16.3	31.6	10.4	3.9	6.5	2.0	4.3	1.8	14.9		5.9	1.3
S92-502	18.4	35.8	62.5	4.4	5.7		1.2	2.2	0.2			0.8		1.5	0.3
S93-520	21.7	37.3	54.8	5.0	4.6		1.3	2.3				1.3		1.8	0.5
S97-562	27.7	206.3	449.4	18.8	24.0	0.9	3.1	3.1	0.6	1.2	0.4	16.5	0.3	2.3	0.7
S98-585	22.1	103.1	173.4	10.2	12.6		1.5	2.1				2.2		1.9	0.5
S102-854	23.1	64.5	109.5	6.4	11.8	1.9	1.9	2.7	0.4	1.5	0.5	4.6		2.2	0.5

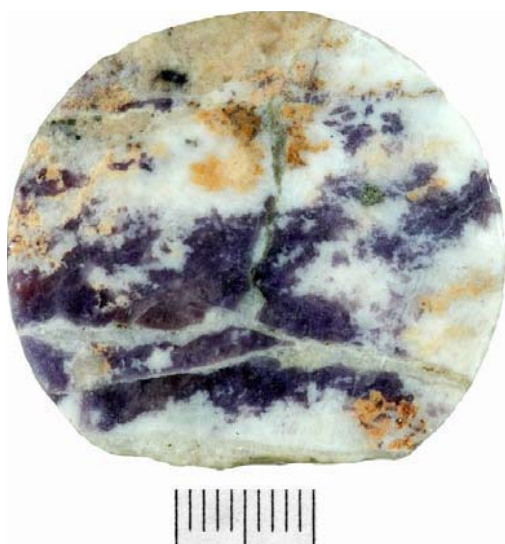


Figure 14. Sample of 'BQ' drillcore showing an early generation of fluorite (Fl) fractured and cemented by quartz (Qtz).

TABLE 3. ANALYSES OF PYROCHLORE, EAGLET PROPERTY.

	QL A6	QL A6	QL C10	QL C10
ThO <sub>2</sub>			0.36	0.31
TiO <sub>2</sub>	8.73	8.49	8.59	8.74
ZrO <sub>2</sub>			0.00	
Nb <sub>2</sub> O <sub>5</sub>	55.53	56.01	56.18	57.52
Ta <sub>2</sub> O <sub>5</sub>	1.28	1.25	1.19	1.25
U <sub>2</sub> O <sub>5</sub>	15.42	15.85	15.45	15.59
Ce <sub>2</sub> O <sub>3</sub>			0.00	
La <sub>2</sub> O <sub>3</sub>			0.00	
MnO	0.36	0.06	0.16	0.26
FeO	1.98	2.48	3.14	2.08
CaO	6.58	5.67	3.69	5.34
Total	89.88	89.81	89.04	91.11

14, 16). Late discovery of molybdenite in adit 2 has not been followed up by work to outline its distribution within the deposit. In 2007, the authors also found molybdenite in a rock pile outside adit 1. Molybdenite is frequently but randomly present along slickenside and gneissosity planes as

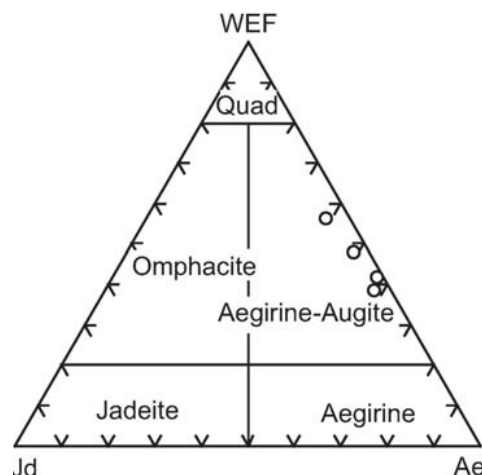


Figure 15. Pyroxene from East Quesnel Lake gneiss on the Eaglet property plotted on wollastonite/enstatite/ferrosilite (WEF) – jadeite (Jd) – aegirine/acmite (Ac) diagram (after Morimoto, 1988).



Figure 16. Mineralized breccia in adit 2 of the Eaglet property, showing patchy purple fluorite, flesh-coloured veins of K-feldspar, white celestite and blue-grey silicified zones.

groups of flakes several centimetres in size (Fig 17). Molybdenite also occurs within quartz veinlets and as grains within crosscutting veinlets of fluorite (Fig 9a). The X-ray diffraction analysis of a laboratory-scale concentration test sample identified two forms of MoS<sub>2</sub>, the 3R and 2H, in rel-



Figure 17. Sample of coarse-grained molybdenite from adit 2, Eaglet property.

atively similar amounts (Table 4). The widespread presence of celestite in the deposit is unusual. It is commonly found with fluorite and calcite (Fig 11a) and, in some samples, celestite is more common than fluorite (Fig 9c, 9f, 10a). It replaces both fluorite and calcite (Fig 8d, 10f, 18).

The chemical composition of fluorite and celestite, as determined by electrode microprobe microanalysis, is shown in Table 5. Fluorite is very pure, with only 0.25% SrO, irrespective of which of several generations of fluorite is analyzed. The dark purple colour definitely represents a very early fluorite phase. Celestite exhibits zoning of Sr, with an increase from grain centres to the rims (Ba content decreases). Impurities in molybdenite within the mineral phases analyzed by microprobe are below the detection limits of the instrument.

The widespread association of fluorite with feldspar-altered zones at the Eaglet property may suggest a magmatic source for the fluorine component. Specialized magmas with elevated fluorine are usually 'dry', and fluorine migrates from the protolith into the melt only at higher temperatures in the late stages of protolith melting. It may accumulate in the residual melt, lowering the temperature of the

**TABLE 4. MINERAL COMPOSITION OF MOLYBDENITE CONCENTRATE, EAGLET PROPERTY. ANALYSES BY THE MINERAL LAB, INC.**

Mineral name	Chemical formula	Approx. wt %
Molybdenite <sup>(1)</sup>	MoS <sub>2</sub>	33
Molybdenite <sup>(2)</sup>	MoS <sub>2</sub>	22
Quartz	SiO <sub>2</sub>	10
Fluorite	CaF <sub>2</sub>	<5
Calcite	CaCO <sub>3</sub>	<5
K-feldspar	KAlSi <sub>3</sub> O <sub>8</sub>	<5
Talc	Mg <sub>3</sub> Si <sub>4</sub> O <sub>10</sub> (OH) <sub>2</sub>	<10
Kaolinite	Al <sub>2</sub> Si <sub>2</sub> O <sub>5</sub> (OH) <sub>4</sub>	<10
Pyrophyllite	Al <sub>2</sub> Si <sub>4</sub> O <sub>10</sub> (OH) <sub>2</sub>	<5?
Sepiolite	Mg <sub>4</sub> Si <sub>6</sub> O <sub>15</sub> (OH) <sub>2</sub> ·6H <sub>2</sub> O	<10?
Unidentified'	?	<5

<sup>(1)</sup> '3R' type; also called 'rhombohedral type'

<sup>(2)</sup> '2H' type; also called 'hexagonal type'



Figure 18. Typical fluorite (FI) – celestite (ClS) – quartz (Qtz) mineralization from adit 2, Eaglet property. Sample is 5 cm across.

granite solidus to 600–650°C and gradually developing into postmagmatic fluids. Exsolved fluorine-rich fluids may migrate along steep fracture systems into overlying rocks. In a favourable environment, such as a cataclastically deformed feldspathic host, the fluids may react with the host and result in fluorite flooding. A similar process has been described from tin-bearing metallogenic provinces (Tischendorf and Förster, 1990, 1994; Štemprok, 1993).

Mineralized zones at Eaglet can attain thicknesses of up to 30 m (Fig 6). Past exploration efforts at Eaglet have

**TABLE 5. CHEMICAL COMPOSITION OF FLUORITE AND CELESTITE, EAGLET PROPERTY.**

	Fluorite				
	gr	v	v	gr	v
SiO <sub>2</sub>	0.03	0.01	0.01	0.00	0.01
Al <sub>2</sub> O <sub>3</sub>	0.01	0.00	0.00	0.00	0.00
MnO	0.00	0.02	0.06	0.00	0.00
FeO	0.02	0.03	0.01	0.00	0.00
CaO	52.30	51.34	51.61	52.95	51.81
BaO	0.00	0.00	0.01	0.00	0.00
SrO	0.17	0.25	0.02	0.23	0.01
SO <sub>4</sub>	0.00	0.00	0.00	0.00	0.01
F	47.67	47.19	47.40	48.06	47.14
ThO <sub>2</sub>	0.01	0.02	0.06		
Total	100.24	99.02	99.24	101.33	98.98

Abbreviations: gr, individual grains; v, fluorite in veinlets >1 mm

	Celestite				
	gr	gr	lgr core	lgr rim	lgr core
MnO	0.00	0.00	0.06	0.05	0.00
FeO	0.07	0.02	0.07	0.01	0.01
CaO	1.21	1.13	0.05	0.12	0.17
BaO	6.36	6.59	2.75	8.57	3.96
SrO	48.81	48.16	54.08	48.11	51.97
Ce <sub>2</sub> O <sub>3</sub>	0.38	0.27	0.26	0.22	0.23
F	0.06	0.00	0.00	0.01	0.00
SO <sub>4</sub>	43.42	43.17	43.58	42.41	42.98
Total	100.44	99.36	100.86	99.50	99.35

Abbreviations: gr, small grain <1mm; lgr, larger grain >1 mm

outlined eight such zones, four of them described as 'main zones' (Ball and Boggaram, 1985). The special association of higher grade fluorite accumulations with feldspathic zones should not be considered a genetic affiliation (Pivec, 1973). The source of Sr is disputable; however, it is most likely the result of late to postmagmatic fluids penetrating the Snowshoe Group. Such enrichment is not common, but it has been described at other localities, such as the Beauvoir granite in France (Raimbault and Azencott, 1987) and the Ghost Lake batholith in Ontario (Breaks and Moore, 1992). Five more fissure celestite localities in Canada have been listed by Dawson (1985).

## Discussion

A large number of ICP-MS analytical results from drillcore and adit 2 samples can be used to demonstrate element associations (or lack thereof) at Eaglet (Hora, 2005). Some previous reports, such as Ball and Boggaram (1985), mentioned the presence of scheelite and wolframite in the deposit. This was not confirmed by our study, and tungsten is practically absent in all laboratory results. However, under UV light, some varieties of apatite, which is very common at the property, have fluorescence similar to that of scheelite, and the two can easily be confused. Tin is also impoverished within the analytical dataset. Lithium is frequently slightly elevated (in the low tens of ppm range). The widespread presence of Sr, frequently in quantities over 1%, is surprising. Only a small set of five samples was analyzed for Nb; all of them had concentrations ranging from tens of ppm to 857 ppm. Lead and zinc are usually elevated in the same samples, mainly in the tens of ppm and only occasionally in the hundreds of ppm (Hora, 2005).

Approximately 25% of samples collected from 13 drillcores from the 1983 exploration program have Mo concentrations ranging from the high tens of ppm to 270 ppm. The high values were found in samples from drillholes 93, 11, 96, 99, 102 and 103 (Hora, 2005). Samples collected from the walls and roof of adit 2, which was driven into the same general area of mineralization, have considerably higher Mo values: more than 15% of 562 samples contain between 100 ppm and 1143 ppm Mo. In particular, adit sections from 240 to 297 m and from 324 to 369 m have consistently high Mo values within this range (B. Clark, pers comm, 2007). Such a difference leads to the question of whether a large volume of samples from 'ribs' and 'rounds', collected during the driving of the adit, gives a more representative result than a sample of 'BQ' drillcore.

There are similarities in mineralogy and geochemistry, such as the presence of potassic alteration, fluorspar, molybdenite, celestite and REE minerals, between the Eaglet property and the well-known Rexpar property (MINFILE 082M 007; Pell, 1992). The presence of pyrochlore with fluorite in a granitic host is also known from the Upper Cretaceous Horseshoe batholith, south of Golden (Reesor, 1973).

## SUMMARY

Mineralization at the Eaglet property is interpreted as the product of two superimposed hydrothermal events. Early, pervasive, alkalic feldspar alteration was the product of an alkali sodium and successive potassium-bearing hydrothermal event. These fluids may have originated from a deep-seated, well-differentiated intrusive body. They in-

vaded structurally prepared East Quesnel Lake orthogneiss, perhaps focused on the north flank of the local structural culmination. Extensive feldspar alteration embrittled the gneissic host rocks. Subsequent deformation of the East Quesnel Lake gneiss resulted in brittle dilatancy within the feldspar alteration zones (versus more ductile, unaltered quartz-rich gneiss), thereby forming zones susceptible to percolation by hydrothermal fluids (Fig 6). Successive hydrothermal activity contributed quartz, molybdenite, fluorite, carbonate minerals, and celestite and other accessory minerals, such as a prismatic REE carbonate mineral (Fig 9b). They are interpreted as products of thermal-metamorphic alteration above a differentiated Early Cretaceous granitic body. The large area covered by this aureole indicates a potentially significant size for this unexposed intrusion. The high differentiation of such a deep source is also indicated by several lamprophyre and feldspar porphyry dikes reported from adit 1 (Ball and Boggaram, 1985). Our identification of greisen veinlets with zinnwaldite also suggests a deeper source of alkaline elements. The suspected faults, interpreted from airphotos (Fig 4, 6), are likely premineral faults with postmineral activity proposed to explain the distribution of mineralized zones intersected by drilling, as well as the conduits for hydrothermal fluids and local displacement.

Eaglet Mines Ltd. reported an outlined resource of 24 Mt with an average grade of 11.5% CaF<sub>2</sub>, including 2 Mt grading 15% CaF<sub>2</sub> (Ball and Boggaram, 1985). An estimate of the Mo resource has not yet been attempted.

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