005186 Property File

Waterloo (QEM)
082N 028

Geological Reconnaissance Report

on the

QEM Mineral Claims

in the

Fort Steele Mining Division

Lat: 51° 09' 28"N
Long: 116° 21' 23"W

for

Mr. S. Jaffer
~~952 Como Lake Ave.~~ 894 GLENAYRE DR.
Coquitlam, B.C.
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by

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Date: Aug 9, 1990

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INTRODUCTION

The QEM claim of 20 units was staked in August 1987 for Mohawk Oil Co. Ltd. An option has been obtained by Mr.S.Jaffer of Coquitlam, B.C.

The property covers the eastern margin of the "Ice River Complex", and sediments of Cambrian age. The latter has a base metal prospect called the "Waterloo". (MI 082N 028). An assessment report 3433 by Cominco in 1971 indicates that the property has Uranium, (0.07%) and consequently is now "designated". This means that before any further work can be done on the property that a baseline survey for Uranium and Thorium must be done.

Two major economic targets exist. One is a Sodalite zone mapped by Currie, (1947) which is 1763 feet long, 82 feet wide, and has a topographic expression of 1100 feet. A second zone, not visited on this trip, is 574 feet long, 82 feet wide, and at least 175 feet in depth. (Ref Fig 1 Sodalite Occurrences) The tonnages involved indicate that this is the largest Sodalite deposit available for development in western North America.

The second major target is a large area of Nepheline Syenite. It is 33362 feet long, 2460 feet wide and has a Topographic expression of 1500 feet. (Ref Fig 2 Nepheline Syenite Occurrences) If this material is suitable for the ceramic and glass industry there is enough tonnage to capture the western North American market as well as the Pacific Rim market. Allan, (1914) also suggests that it would be an excellent building stone.

The logistics of the deposit are good. There is a logging road to within 6 km of the property. The rail head at Golden also gives this property an advantage over other smaller deposits in British Columbia.

PURPOSE OF THE REPORT

This report has two purposes. One is for the application for a road. It is believed that a definite target is required. With the discovery of a Sodalite outcrop at the 6500 ft. elevation by Mr Jaffer this requirement has been met.

The second requirement is for assessment work to be done before August 28, 1990. This reconnaissance provides new information on the Waterloo prospect and the Sodalite outcrop discovery.

ACCESS

Helicopter flight time is approximately 45 min. from Golden. A new logging road up Moose Creek comes to within 6 km of the property. An old prospecting trail dating back to the early 1900's is present following the creek. It would however be unsuitable for a road location as some of it goes through swamps.

GENERAL GEOLOGY

The Ice River Complex (an alkaline intrusion) forms an S - shaped body approximately 18 km in length with an area of 29 km^2, emplaced into gently dipping Cambrian and Ordovician shales and carbonates.

The older layered mafic units, semi-concordant, are feldspar free and range from jacupirangite through melanite ijolite to melanite urtite. A plug of carbonatite forms the latest phase. A younger cross cutting zoned dyke consists of marginal melanocratic nepheline syenite grading to a central sodalite syenite. The dyke suite cutting the country rocks display the same bimodal character as the main intrusion. One of them is sodalite and nepheline and another is a biotite lamprophyre. The age of this complex is roughly 245 m.y. ago. (Currie, 1974)

PROPERTY GEOLOGY

The QEM property is on the eastern edge of the Ice River Complex and contains all the rock types mentioned under general geology except the carbonatite.

Of particular interest is a vertical Sodalite dyke bearing N24° E on the north side of Buttress Mountain. A long boulder train of this material has been known for some time but now an outcrop has been found confirming Currie's map. He indicates that the width is 25 to 50 m. The smaller value is used in our calculations. The new outcrop is on a bearing of N6° E from Buttress Peak at the 1982 m elevation. (6500 feet).

A small vein of Sodalite was also seen cutting the sediments at about the 1951 m elevation. (6400 feet).

The sediments were only examined briefly at the Waterloo showing and will be described further on in the report.

Mineralogy

The Nepheline Syenite on the scree slope is of medium grain with approximately 10% mafics, practically all augite.

The specific gravity of the massive Sodalite was determined to be 2.5. Pure Sodalite has a specific gravity of 2.3. The difference is due to nepheline which has a specific gravity of 2.5 - 2.6. The tonnage factor for a specific gravity of 2.5 is 14.5 cubic feet per long ton. A small amount of chlorite and phlogophite is present in some of the Sodalite. Under fluoresence a small amount of Zircon was noted. The beautiful azure blue of the sodalite is actually enhanced if a little white nepheline is present to act as a contrast.

WATERLOO PROSPECT

MI 082N 028
A.S.R. 3433

Lat: 51° 10' 10" N
Long: 116° 22' 53" W
Elevation: 2164.6m (7100 ft)

The geology was first described by Allan (1914, p.225). He describes the sedimentary beds as having a strike of N15°E and dip of 42° W.

> "The ore body, so far as the very limited exposure showed, varies in width from 3 to 6 feet and forms a more or less continuous band, conformable with the bedding of the sediments.
>
> It has the general appearance of a "blanket deposit". At the mouth of the uppermost tunnel, the mineralized zone has a maximum width of 6 feet and lies directly under a sheet of mica porphyry, a fine-grained, black rock, with a fine-grained groundmass and phenocrysts of biotite, some of which are 1 1/2 inches in diameter. Microscopically this rock is an ouachitite.
>
> The ore minerals are sphalerite, galena, chalcopyrite, pyrrhotite, arsenopyrite, and pyrite. The gangue minerals are calcite and some quartz sparsely disseminated through the ore.
>
> .....
>
> In the lower exposure, which may be slightly lower in horizon then the upper exposure and also slightly farther away from the mica porphyry dyke, the ore is principally pyrrhotite and chalcopyrite, with a very small percentage of galena or sphalerite. Pyrite in the well crystallized form is absent wherever pyrrhotite and chalcopyrite are found. These two minerals are found in irregular patches, of practically pure material.

In one specimen some of the limestone of the country rock remained attached and the limestone was thoroughly impregnated with pyrrhotite grains and some chalcopyrite. This probably represents the primary stage of replacement of the country rock. there is, however, in this specimen an extremely sharp contact between a patch of pure chalcopyrite and pyrrhotite and the impregnated country rock. There are also some very small grains of pyrite in the country rock."

This same geology is repeated by Webber (March 30, 1971) and again in A.S.R 3433 (Sept 17,1971).

Unfortunately in the last report in a chip sample from the upper tunnel uranium is reported at 0.02% . The massive sulphides assayed 0.07% U_3O_8. The showing is therefore "designated". A 1 km circle has been drawn around the deposit on the claim map. Before any work can be done in this area a baseline study must be done for uranium and thorium on a 10 m grid.

Assays:

A.S.R. 3433	Chip Sample
	Ag 0.22 oz/T
	Pb 0.40%
	Zn 0.35%
	U_3O_8 0.02%
	Massive Sulphide
	U_3O_8 0.07%

Allan (1914,p.229)

Pb 3.69%
Zn 16.10%
Cu 1.59%
Fe 27.3%
Ag 2.9 oz/T
Au 0.05 oz/T

1990 OBSERVATIONS AT THE WATERLOO SHOWING

The upper tunnel is filled with water and was not entered. It has a bearing of N30°E. The HW sediments are thin bedded, phyllitic shales with a bearing of N50°W - 72° SW. Above the tunnel thin bedded limestones and dolomite have a bearing of N42°E - 39° SE. At the entrance of the tunnel there is a fault with a bearing of N80° W - 72° S. A few meters east of this is a 1 m lamprophyre dyke with a bearing of N15° E - 65° NW.

The contact between the shales and upper thin bedded limestones and dolomites was not observed due to the scree. It is possible that the mineralization seen has been remobilized from a larger syngenetic deposit. The age of upper Cambrian for the limestones suggests an environment similar to the large Pb-Zn mine at Metaline Falls, Washington. (Addie, 1970). There is enough soil developed that a soil sampling program may be useful.

A VLF-EM test was made at the upper tunnel using Seattle, Washington (NLK 24.8 KHZ). A clear null was obtained but no cross over was obtained over the mineral zone.

From the difference of the bearing between the sediments and the lamprophyre we suspect that the latter is cross cutting. The pyrite in the lamprophyre may confirm remobilization from a syngenetic source.

It is critical to get an age dating on the galena with the hope of getting a Cambrian age. This would change the picture from an epithermal deposit to a remobilized syngenetic deposit which would have some tonnage potential. If so, further work would be warranted regardless of the Uranium designation. Samples were taken for this purpose but will not be available for this report.

SODALITE TONNAGE CALCULATIONS

The following figures are estimates of the mineralization available. The term "ore" is not used as the markets have not been determined.

Zone 1	Length	1763 feet
	Width	82 feet
	Depth	1100 feet
	Cuft	79,511,300
	Factor	14.5
	Long Tons	5,483,538
Zone 2	Length	574 feet
	Width	82 feet
	Depth	175 feet
	Cuft	13,084,904
	Factor	14.5
	Long Tons	902,407

Note: Zone 1 used a depth based on the topographic relief.

Zone 2 used a depth equal to half the horizontal length.

In both cases a much higher tonnage could be obtained by drilling.

The width remains to be proven by trenching.

ECONOMICS OF SODALITE

The 1982-1983 cataloge from Wards Natural Science, Ltd. sells Sodalite at $10.15 Can per 1/2 Kg. This would equal $11.16 per pound. Their present source is Ontario.

Lapidary stores in Vancouver sell Sodalite at approximately $3./lb. The market is small and undeveloped.

Mr. Jaffer intends to market the Sodalite as tiles and special purpose aggregate. It is anticipated that a considerable market exists for these two items. This would be the beginning of a new industry for the Golden area of B.C.

Chemical Analysis of Sodalite

	1.	2.
SiO_2	54.6	37.52
TiO_{22}	0.12	
Al_2O_3	20.8	31.38
Fe_2O_3	3.1	
FeO	0.4	
MnO	0.07	
MgO	0.1	
CaO	0.7	0.35
Na_2O	11.5	19.12
K_2O	5.3	0.78
H_2O	0.8	
CO_2	0.7	
P_2O_5	0.02	
Cl	1.1	6.91

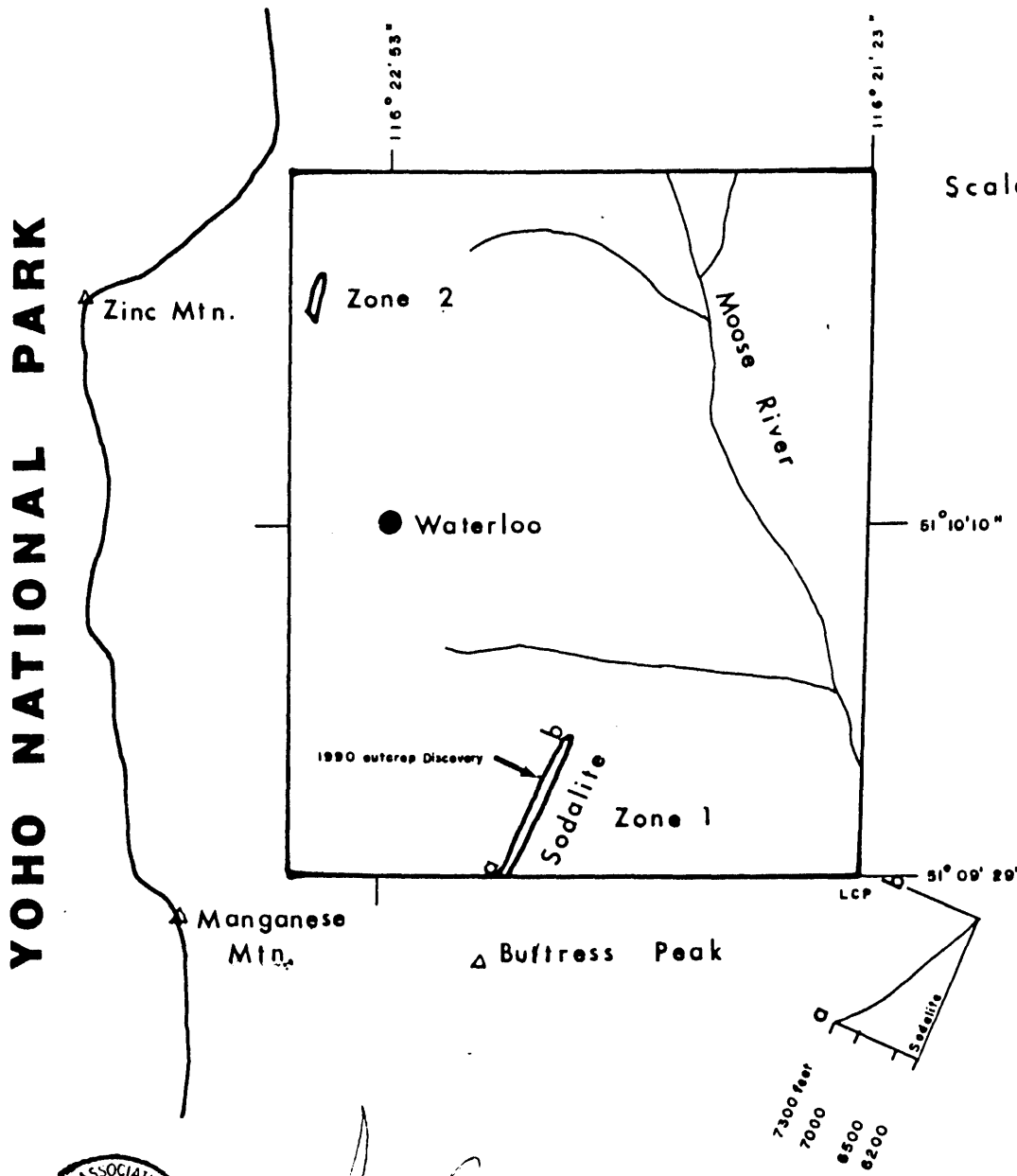
Trace Element %	
Ni	NF
Cr	<0.0010
Co	NF
Sr	0.038
Ba	0.028
Zr	0.033
Nb	0.014
Y	NF
La	NF
Ce	NF
Nd	NF

1. Currie, K.L., The Geology and Petrology of the Ice River Complex, Bulletin 245 p.43. (Sodalite-nepheline Syenite)

2. Allan, John A, Geology of Field Map-Area Geological Survey, Memoir 55, p.164 (Sodalite)

FIG 1

QEM Claim



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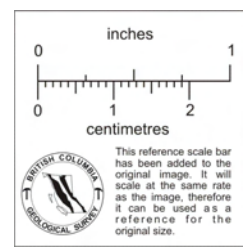


GEOLOGICAL ASSOCIATION OF CANADA
George G. Addie
FELLOW

GEOLOGY after K.L. Currie (1975)

GEORGE G. ADDIE P.Eng
Aug. 9, 1990

NEPHELINE SYENITE TONNAGE CALCULATIONS

Zone 1	Length	3362 feet
	Width	2460 feet
	Depth	750 feet
	Cuft	6,202,890,000
	Factor	14.5
	Long Tons	427,785,517
Zone1	Length	1640 feet
	Width	410 feet
	Depth	820 feet
	Cuft	55,136,800
	Factor	14.5
	Long Tons	3,802,538

Note: In Zone 1 the cross section of the vertical relief has been used. (Ref. Fig 2)

In Zone 2 half the length is used for the depth calculation.

Because of the nature of the deposit (a vertical vent) the depth potential is very great. This can only be proven by drilling.

ECONOMICS OF NEPHELINE SYENITE

It is not only the chemical qualities that determine the market value but also the physical properties such as brightness.

McVey (1988), in "A Study of Markets for British Columbia's Nepheline Syenite and Feldspathic Minerals" makes the following comments:

"The only North American source, and the major world source of nepheline syenite, is in Ontario where one company produces approximately 500,000 tons per year. The major North American sources of feldspar are in the eastern United States, with North Carolina accounting for 70% of total production of about 700,000 tons per year. Other North American production occurs in some other eastern states, southern California and Mexico.

Feldspar and nepheline syenite are freight sensitive, with freight from eastern suppliers to western cosumers significantly exceeding the f.o.b. cost of the material at the producing plant. For example, the price of nepheline syenite is between US$21-$30, per ton f.o.b. Ontario and freight to western provinces or states is about US$70.00 per ton.

Therefore, a producer of feldspar or nepheline syenite in British Columbia would enjoy a freight advantage in western markets over eastern producers of both materials and also over southern California or Mexican suppliers of feldspar.

The regional market area consisting of Western Provinces, Pacific Norhtwest States and Northern California consumes approximately 25,000 short tons per year of nepheline syenite, all of which is derived from Ontario. A British Columbian source should attain the overwhelmingly largest share of this tonnage.

Depending on the technical characteristics of the deposit, establishment of freight rates and effective sales and marketing procedures, markets of 25,000 tons per year to over 100,000 tons per year are potentially attainable."

CHEMICAL ANALYSIS OF NEPHELINE SYENITE

Ice River		Trident Mtn	-100 Mesh
SO_2	53.42%	55.59-63.7	62.0
Al_2O_3	21.04	20.73-24.69	18.5
Fe_2O_3	1.74	0.17-0.59	0.10
FeO	2.83		
MgO	0.61		
CaO	2.88	0.56-1.20	0.95
Na_2O	7.80	8.16-8.39	5.63
K_2O	7.48	3.12-8.22	8.31
H_2O-	0.04		
H_2O+	0.76		
CO_2	0.43		
TiO_2	0.60		
P_2O_5	0.10		
MnO	0.07		
Cl	0.10		
SO_3	0.06		
S	tr.		

Spg. 2.609

1. Allan, John A, Geology of the Field Map-Area. Memoir 55, Geological Survey, p136.

2. White, G.V., Feldspar and Nepheline Syenite Potential in B.C., in Geological Fieldwork 1988, Ministry of Energy Mines and Petroleum Resources, Paper 1989-1, Trident Mountain, (Minfile 082M173), p.486

3. " " Analysis of nonmagnetic concentrate at -100 mesh.

Note: Trident Mountain is considered to have a good potential to produce commercial grade nepheline syenite.

Building Stone Potential:

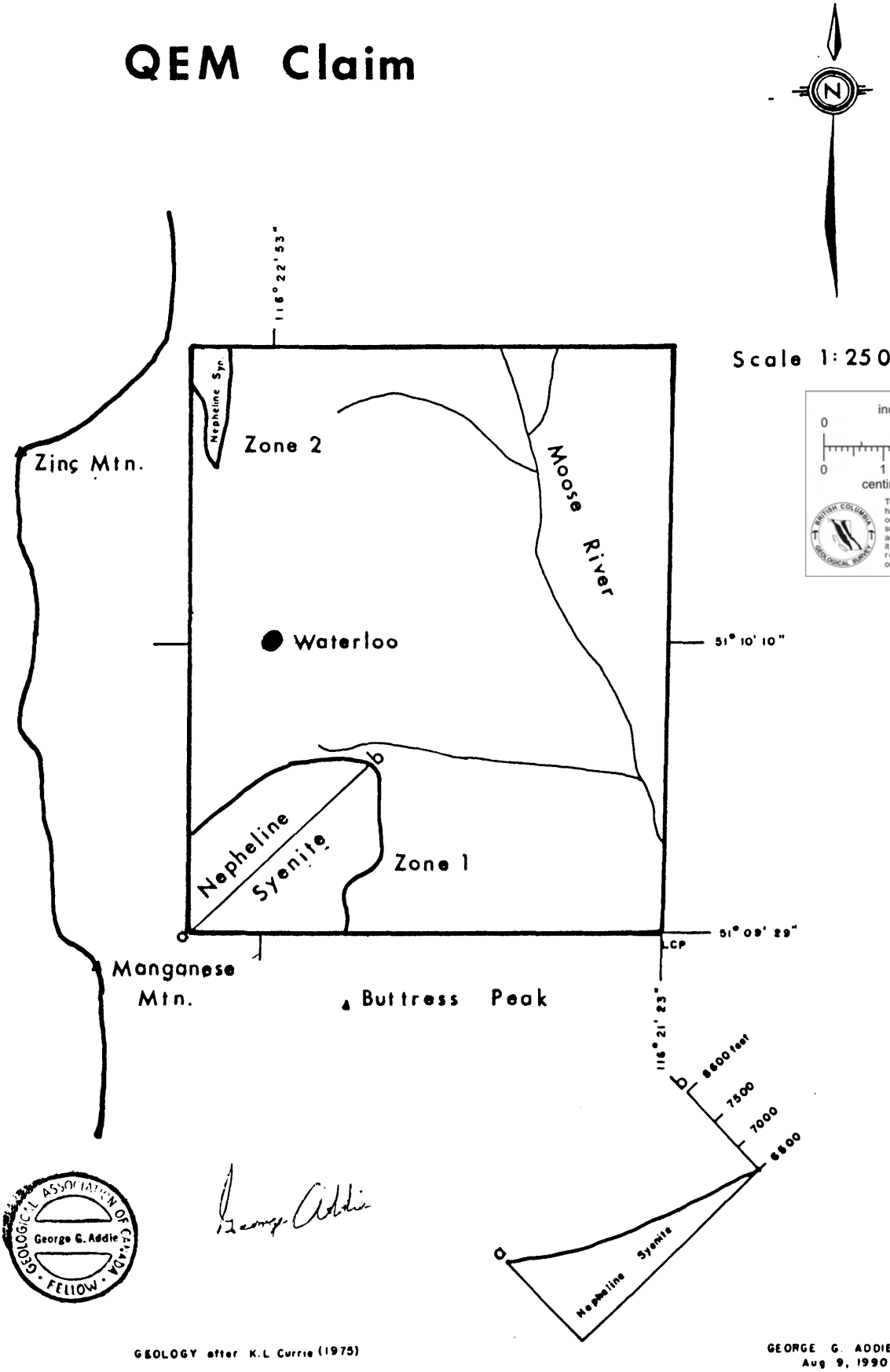
Allan, (1914, p.242) " The normal syenite which is completely free from fractures, would make a good stone, either for building or ornamental purposes."

"As this is the only large mass of igneous rock of value for building purposes in the vicinity of the main line of the Canadian Pacific railway in the Rocky mountains, a market for the material would soon be established, either in Calgary and eastwards, or if of suitable quality, it might be profitably shipped to Vancouver and the Pacific Coast."

The rail head at Golden probably gives this deposit superior logistics over any other deposit in British Columbia.

FIG 2

QEM Claim



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CONCLUSIONS

1. A significant Sodalite deposit exists on the QEM claim which may be in the order of 5 million tons. This remains to be proven.

2. A significant Nepheline Syenite deposit exists on the QEM claim which may be in the order of 428 million tons. This also remains to be proven.

3. There is the possibility that the Waterloo Pb-Zn showing is a remobilized syngenetic deposit. This should be investigated by age dating of the lead.

RECOMMENDATIONS

1. Without a six (6) km road to the claim the potential of the area cannot be evaluated. A new road application should be made immediately.

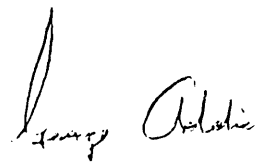
2. The outcrop of Sodalite at the 1982 m elevation (6500 feet) must be trenched to determine the width of the zone. The minimum length of this trench would be 50 m (164 feet).

3. A whole rock analysis is needed for the Nepheline Syenite. A separate analysis is also needed for the mafics removed by magnetic separation. A gravity concentrate of the mafics should also be tried. The mafics should also be assayed for the rare earth elements as well as Uranium and Thorium..

4. Tests should be made on both rock types to determine the suitability for building stone.

5. The sample from the Waterloo dump should be assayed for Au, Ag, Pb, Zn, Cu, Cd, U_3O_8, and Th. Should the uranium be below 0.05% an application should be made to have the showing removed from the "designated" list.

6. Market studies should be made for tiles and aggregate made from Sodalite.



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Webber, G.L., (1971) Assessment Report 3433, Area Study of the Waterloo Claim Group and The Waterloo Prospect on Moose Creek West of the Yoho and Kootenay Park Boundaries., Cominco Ltd., Western District.

White, G.V, (1988) Feldspar and Nepheline Potential in British Columbia, in, Geological Fieldwork 1988, B.C. Energy, Mines and Petroleum Resources, Paper 1989 -1, p.486.

STATEMENT OF QUALIFICATIONS

I, GEORGE G. ADDIE P.ENG., do hereby certify:

1. That I am a Professional Engineer of the Province of British Columbia residing at 604 3rd Street, Nelson, B.C., V1L 2P9.

2. That I am a graduate of Mount Allison University of Sackville, New Brunswick, and Washington State University, Pullman, Washington, having obtained a Science Degree in Geology from each university.

3. That I have practiced my profession in Geology since 1959 for Rio Algom Mines Ltd. (Elliot Lake), Bralorne Pioneer Gold Mines, B.C., Phoenix Copper Mines Ltd., B.C., Cominco Ltd., Kimberley, B.C., Pend Oreille Mines Ltd., Metaline falls, Washington State, Reeves MacDonald Mine, Remac, B.C.

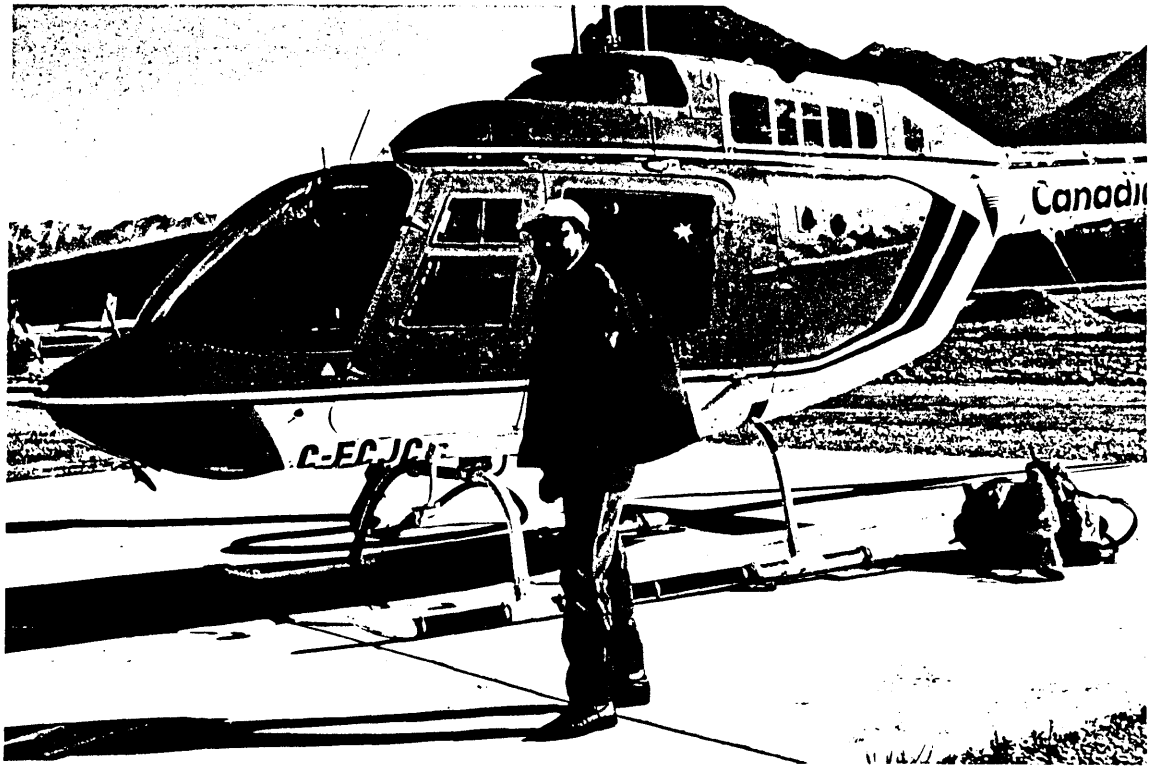
4. That I have served as a Professional Geologist for J.C.Sproule and Associates of Calgary, Alberta, and Addie Consultants Ltd., formerly of Calgary, Alberta.

5. That for fifteen years I was with the B.C. Department of Energy, Mines and Petroleum Resources as the District Geologist at Nelson, B.C., and that I am now retired from that position.

6. That I am a Fellow in good standing of the Geological Association of Canada.

Dated at Nelson, British Columbia on the 9th day of August 1990

George G. Addie P.Eng.



MR. S. JAFFER

OKANAGAN HELICOPTERS LTD
(DON McTIGHE)

VIEW OF ZINC MOUNTAIN FROM MOOSE CREEK

SODALITE OURCROP AT 6500 FT. ELEVATION

SODALITE BOULDER

THIN BEDDED LINESTONE AND DOLOMITE
AT THE WATERLOO PROSPECT