3433

COMINCO LTD.

EXPLORATION WESTERN DISTRICT

AREA STUDY

OF

THE WATERLOO CLAIM GROUP

and

THE WATERLOO PROSPECT

ON MOOSE CREEK

WEST OF THE

YOHO and KOOTENAY PARK BOUNDARIES

REPORT BY

G.L. WEBBER and B.E. MacKEAN

Under the Supervision of

A.G. STIRLING, P. ENG.

The Waterloo Claim Group

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Summary:

The Waterloo prospect is a lead-zinc prospect which was located in the early 1900's.

It is situated in the Upper Cambrian Ottertail formation, which lies east of the Ice River Alkaline Intrusive. The sedimentary series in this part of the Rocky Mountain system have been regionally metamorphosed. In the area of the prospect the rocks consist of a dark thin-bedded, siliceous limestone. The mineralization varies in width from 3 to 6 feet and form a continuous band conformable with the bedding of the sediments, and lies directly above a minette sill.

This property is now owned by Purcell Development of Brisco, B.C. and consists of 16 mineral claims, recorded in Golden, B.C. as the Waterloo Group.

Location and Access:

Lat.: 51° 10' Long.: 116° 22' N.T.S. 82N/1 W

Moose Creek is a tributary of the Beaverfoot River, and lies outside the Yoho National Park, on the southwest side.

Access to the area is by Ice River or Wells Lake roads. The Ice River road extends from the Banff-Golden Highway at the horseshoe bend east of Leanchoil, up the Beaverfoot valley for 25 miles, to near the confluence of Moose Creek.

The Wells Lake road can be entered in the Kootenay National Park at Kootenay Crossing on Highway 93, thence 20 miles of fire road to within three miles of the confluence of Moose Creek.

History:

The original Waterloo claims were located in the early 1900's, at which time two tunnels were driven for a total of about 275'. No additional development work has been done on this property in the last 67 years.

Cont'd....

In June 1953, and 1954, W.H. Patmore and Walker of Vancouver, located claims on niobium-bearing mineralization near the head of Moose Creek. During the same period, other claims were recorded by J.R. Ashdown of Kamloops; R.C. Macdonald and E. Livingston of Vancouver; and J.S. Adamson and R. Renn of Calgary. The only claims that this report is concerned with are the 16 claims of the Waterloo Group, owned by Purcell Development of Brisco, B.C., a private company, owned and operated by E.A. Wilder, W.C. Jones and W. Wolfenden, all of the Brisco area.

Sedimentary Geology:

The Moose Creek area is underlain by the Upper Cambrian Ottertail formation. This formation consists essentially of beds of massive medium blue-gray magnesian limestone. It is over 1,600' thick. Only two fossils have been found in it, and these are Upper Cambrian in age. Above the Ottertail formation is a thick conformable series of thin-bedded cherts, cherty and dolomitic limestones, siliceous and calcareous shales of the Goodsir formation. This formation is over 6,000' thick. Several species of fossils in the lowest beds of this formation were found by J.A. Allan.

On lithological evidence, and from the fauna represented, J.A. Allan, G.S.C., places the Upper Cambrian and Ordovician boundary between the Goodsir and Ottertail formations.

Igneous Geology:

The Ice River Alkaline intrusive is exposed on the west boundary of the Waterloo Group. It is irregular in outline, and is irregular in its relation to the surrounding sediments. J.A. Allan considered this complex to be an asymetrical laccolith with a probable stock-like feeder which connects this chamber with a much larger reservoir beneath. This reservoir has not been exposed by erosion. The surrounding sediments have been lifted to a certain degree by the pressure behind the magma.

The petrology of the rock types has been subdivided into three groups according to mineralogical composition. The first group

Cont'd....

includes the leucocratic types which make up the larger part of the complex. Nephelite syenite is the most important member, and at the same time the more highly alkaline. With it are included many minor types, all variation facies of the nephelite syenite.

The second group (exposed on the west boundary of the Waterloo Group) is comprised of ijolites, uritites, and other varieties that are essentially mesocratic, but varying towards both leucocratic and melanocratic varieties.

It is a characteristic feature that the rocks vary both in appearance and in mineralogical composition, sometimes within a few feet.

A good deposit of sodalite, which has been concentrated along the roof of the laccolith, is exposed on the west boundary of the Waterloo Group.

The third group, jacupirangite, which consists of pyroxene, magnetite, ilmenite, scharlomite, and sphene are the essential minerals.

Metamorphism: (Exomorphic)

The external effects of the intrusive is much greater than the internal, but in either case metamorphism is not of extreme intensity. The magmas has had a greater effect on the argillaceous beds of the Goodsir formation than on the limestone and magnesion limestone of the Ottertail formation. Some of a large variety of rocks found in the contacts are: calcite, diopside, garnet, epidote, tremolite, wollastonite, sphene, biotite, muscovite, aegirite, feldspar, nephelite, sodalite, cancrinite, quartz, etc.

Regional Metamorphism:

The sedimentary series in the Moose Creek part of the Rocky Mountain system have been regionally metamorphosed. The chief orogenic disturbance which caused this occurred since or toward the close of the period of intrusion.

Cont'd....

The igneous rocks show little or no effect from these movements, because it has acted as a resistant "nodule" in the sedimentary rocks so that the latter have become crumpled, highly cleaved and sheared about the laccolithic body. The sheared sediments, though very highly cleaved, do not show the presence of many secondary minerals.

The effect of the regional alteration is probably best seen in the Ottertail limestone. It is recrystallized to some degree in almost every part of the formation. Some layers are saccharoidal in their general texture, while other more impure bands contain recrystallized actinolite or tremolite. In the thinly-bedded limestones the harder layers have been broken into angular fragments, while the matrix has been partly or wholly recrystallized to calcite or dolomite. This alteration is so widespread, reaching beyond the limits of the laccolith, that it is now believed to have been close to regional metamorphism.

WATERLOO PROSPECT

(Located on the Waterloo Group)

Location:

The Waterloo prospect is located near the head of Moose Creek on the west side of the valley. It is on the east slope of Zinc Mountain. The workings are situated at an elevation of 7200' near timber line.

Geology and Character of the Deposit:

As the slope of the mountain is thickly covered with talus from Zinc Mountain slope, the only exposure on which the deposit could be studied was at the mouth of the workings, which is poorly exposed, and in the upper adit. The rocks consist of dark thin-bedded, siliceous limestone, dense in texture, which strike N 18° E and dip from 40° to 45° W.

Cont'd....

The beds are overlain by calcareous limestone, corresponding to the limestones which is traceable to the upper end of the Moose Creek valley, and forms the floor of the sill-like projection of the laccolithic mass. The base of the igneous mass is about 500 feet in elevation above the exposed portion of the mineralized exposure.

The mineralization varies in width from three to six feet, and forms a continuous band, conformable with the bedding of the sediments, and lies directly above a sill of minette.

Mineralization:

The mineralization consists of sphalerite, galena, chalcopyrite, pyrrhotite, arsenopyrite, and pyrite, and an unidentified uranium mineral. The gangue minerals are calcite and some quartz disseminated throughout the bed of mineralization.

The writer was unable to examine the lower tunnel because of snow and caved ground. The sulphide mineralization on the dump consisted principally of pyrrhotite, some chalcopyrite, and a very small percentage of galena and sphalerite.

Assays:

Chip samples from the mineralized zone of the upper tunnel were found to contain: (averages only)

Ag	0.22%	Zn	0.35%
Pb	0.40%	U_3O_8	0.02%

Samples obtained from the massive sulphides of this deposit were found to contain 0.07% U_3O_8.

Origin:

It is highly speculative to say that the solutions were probably very hot, and directly connected with another chamber of

Cont'd....

igneous material similar to the one exposed on the footwall of this deposit. The sediments have been impregnated and replaced by mineralizing solutions, the mineral being deposited separately to a certain extent.

Development:

The old workings are at an elevation of 7200'. The development consists of two tunnels driven along the general strike of the sediments. The upper tunnel is 40' long and the lower tunnel (caved) was reported to be 250' long.

G.L. Webber,
Exploration Technician.

GLW/ld
September 17th 1971

Assay Certificate

Date March 8, 19 71

Cominco Ltd., Trail, B.C.

Description KIMBERLEY SPECIALS	Lot	% U_3O_8
G.L.W. Special (W71-1)	2701	.07
Waterloo anticline		

Serial No. 1013

Supervisor G.J. Mitchell Jr.

211-9020

Assay Certificate

Date August 2, 19 71

Cominco Ltd., Trail, B.C.

Description KIMBERLEY SPECIALS	Lot	% U_3O_8
G.L. Webber Special	2641	.02
	2642	.02

Serial No. 3143

Supervisor gw / G.J. Mitchell

211-9020

Assay Certificate

Cominco

Kimberley, B. C., JULY 16 19 71

Description	Lot	Moisture %	Gold Ozs.	Silver Ozs.	Copper Wet %	Lead Wet %	Zinc Wet %	Iron Wet %	Sulphur %	Insol. %	Alumina %	Lime %	Mag. %	Bone Phosph. %	%	%	%	
GLW SPECIALS																		
2641				.35		.60	.40											
2642				.10		.19	.30											

Official Serial No. 4811 Assayer Chief Assayer K. White

2013—N.D.N.

STATEMENT OF EXPENDITURES - 1971

Direct Expenditures

Geological Survey:

G.L. WEBBER, Exploration Technician, 7 man days @ $50./day during the period July 4th to 11th 1971, including truck transportation and expenses	$ 350.
B.E. MacKEAN, Geologist, 7 man days @ $60./day during the period July 4th to 11th 1971	420.
Bow Helicopter, Golden, B.C. Flight report Q 179 Flight report Q 170 Time: 2.95 hrs. @ 160./hour	440.
Assays: (Cominco Lab.) Silver, lead, zinc and uranium	33.
T O T A L	$ 1,243.

Endorsed by: R.C. Ratcliffe
Accountant, Kimberley Operations

This is EXHIBIT "A" to the Statutory Declaration of G.L. WEBBER, declared before me this 20th day of September, A.D., 1971.

CANADA)
PROVINCE OF BRITISH COLUMBIA)
TO WIT:)

STATUTORY DECLARATION RELATING TO EXPENDITURES ON A GEOLOGICAL SURVEY OF THE WATERLOO GROUP OF CLAIMS IN THE GOLDEN MINING DIVISION

I, G.L. WEBBER, Geological Technician, of the City of Kimberley, in the Province of British Columbia,

DO SOLEMNLY DECLARE:

1) That I am the person who prepared this geological report as a result of surveys carried out on certain mineral claims by Cominco Ltd., as agent for the owners of the said claims.

2) That copies of the said report are being filed with the Mining Recorder at Golden.

3) That attached hereto and marked with a letter "A" upon which I have signed my name at the time of declaring hereof, is a statement of expenditures incurred in connection with the geological survey of the said claims.

AND I MAKE this solemn declaration conscientiously believing it to be true and knowing it is the same force and effect as if made under oath and by virtue of the Canadian Evidence Act.

DECLARED before me at KIMBERLEY, in Province of British Columbia, this 20TH day of September, A.D., 1971.

G.L. Webber

J. C. Ratcliffe
A Commissioner for taking affidavits for British Columbia

Cominco Ltd./P.O. Box 2000/Kimberley, British Columbia, Canada/Tel. (604) 427-3595

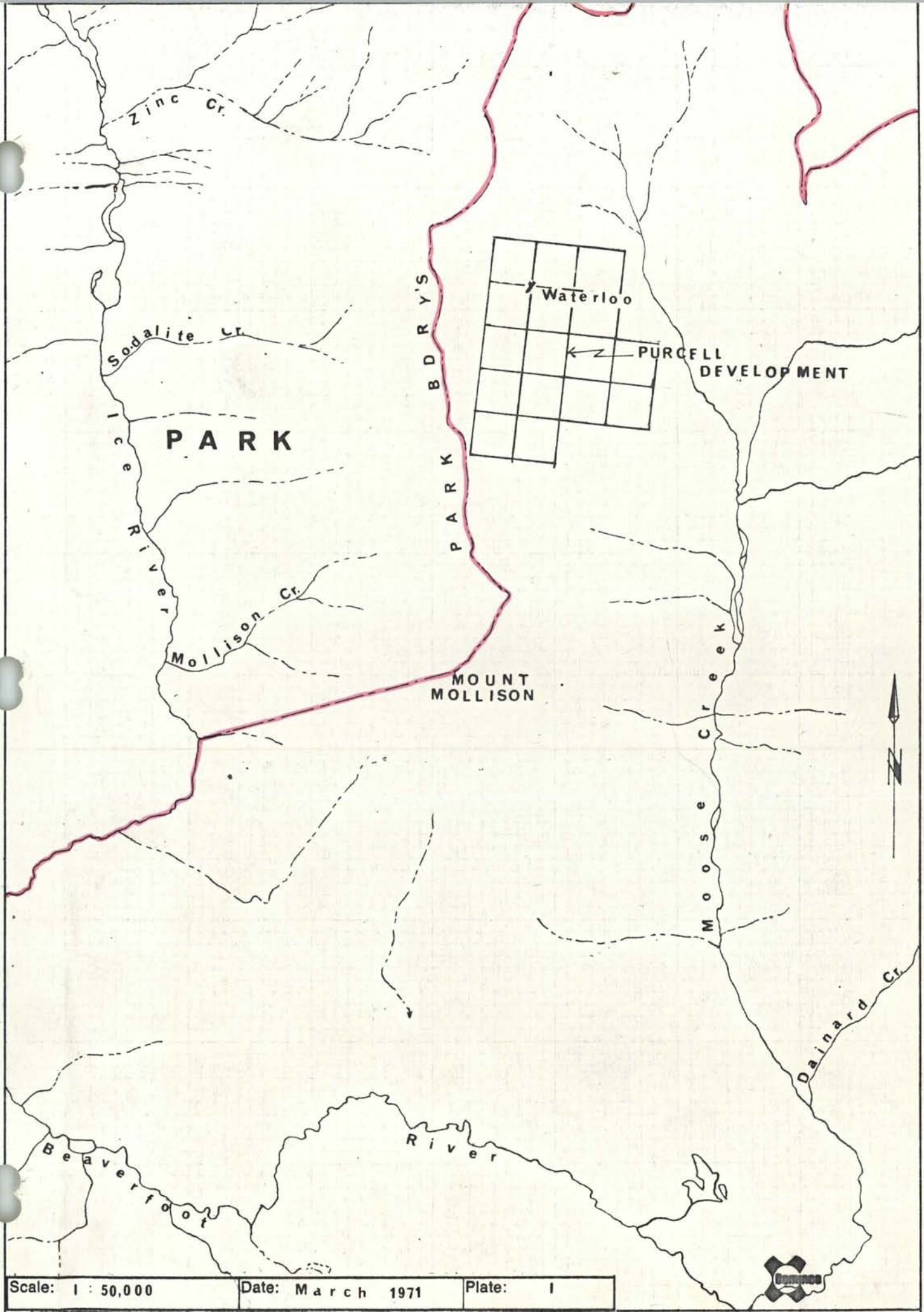
Cominco

STATEMENT OF QUALIFICATIONS

G.L. WEBBER was responsible for conducting the geological survey described herein. Webber is a Geological Technician, and has been employed in geological exploration work for more than ten years. I consider him a competent and experienced Geological Technician.

A.G. Stirling, P.Eng.

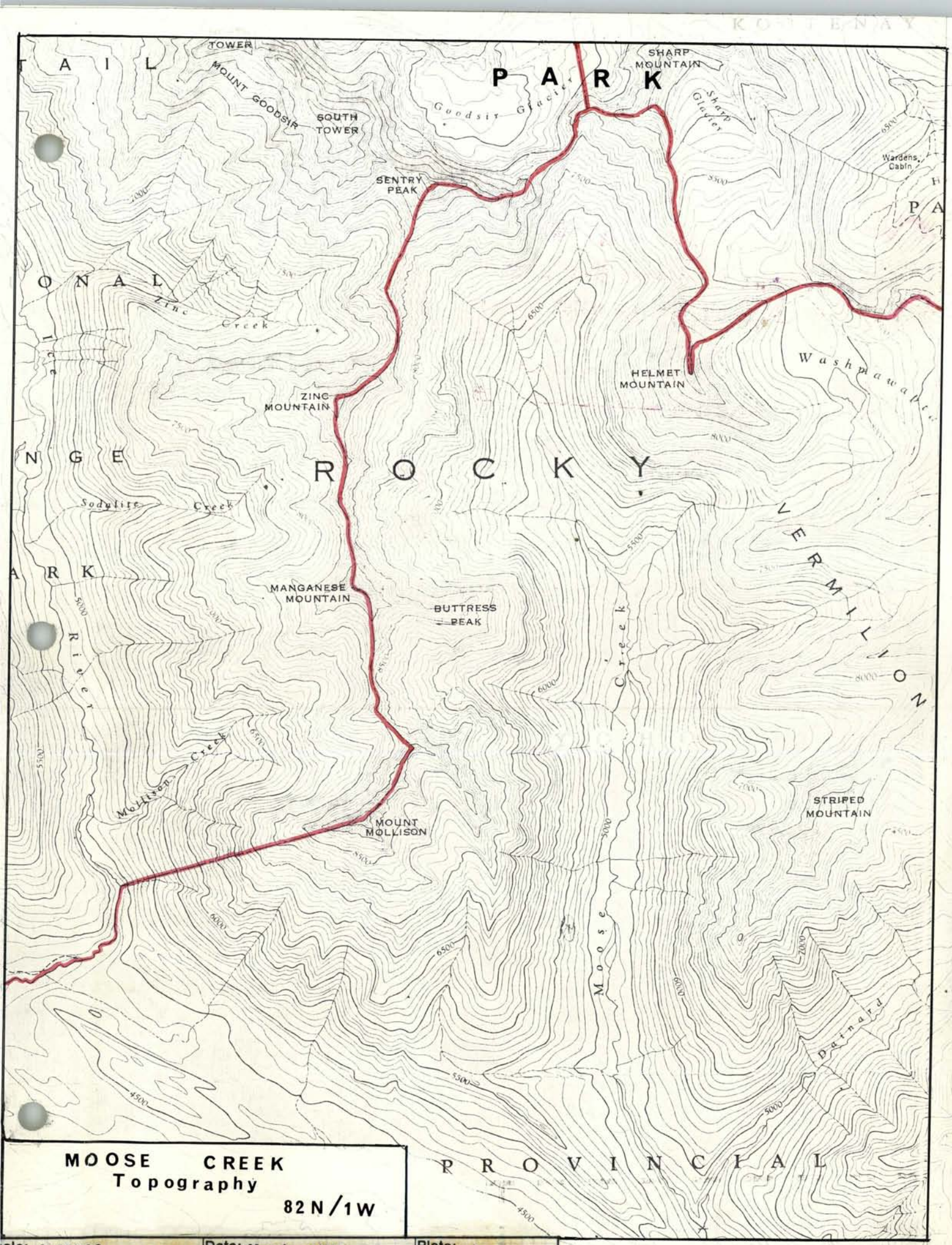
September 17th 1971



Scale: 1 : 50,000	Date: March 1971	Plate: 1
Drawn by: G L W	Traced by:	

MOOSE RIVER AREA

82 N/1 W



MOOSE CREEK
Topography
82 N/1W

Scale: 1:50,000	Date: March 1971	Plate: 3

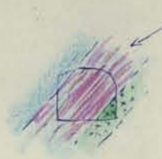
STRATIGRAPHIC SAMPLES TAKEN FROM THE BACK OF THE DRIFT
SAMPLES WERE CONED AND QUARTERED

No 1 Cert. No. 2641 Ag. 0.35 oz; Pb 0.60%; Zn. 0.40%; U_3O_8 0.02%.

No 2 Cert. No 2642 Ag. 0.10 oz; Pb 0.19%; Zn. 0.30%; U_3O_8 0.02%

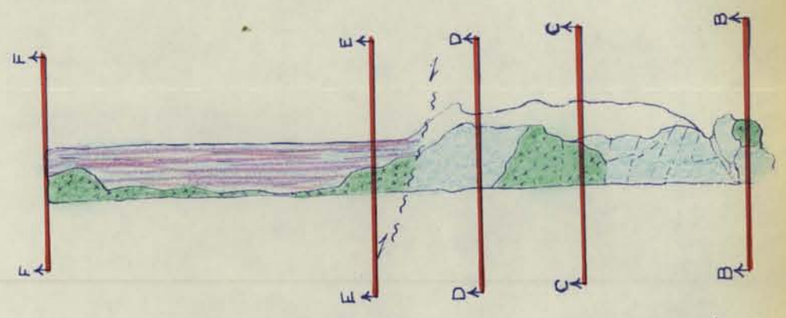
Massive sulphides contains 0.07 % U_3O_8 (Cert. No 1013)

SECTION F-F



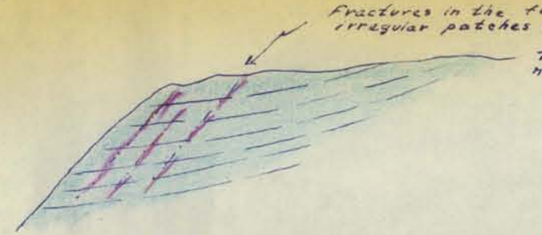
Five foot mineralized sedimentary unit paralling the hanging wall of the minette dyke. This stratiform unit contains ± 20% Fe. mainly in the form of pyrrhotite

SECTION E-E



SECTION A-A

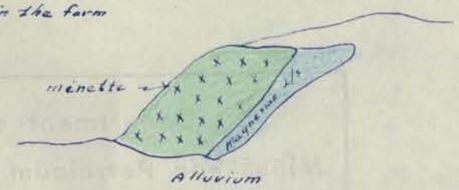
Scale: 1" = 15'



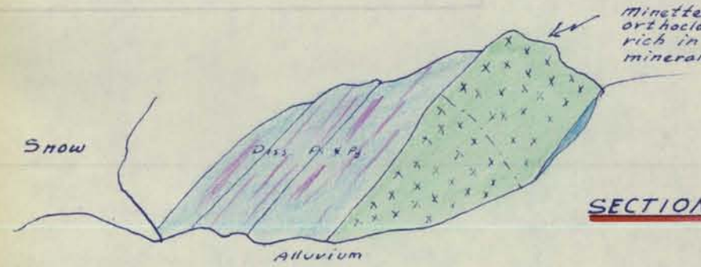
Fractures in the foot-wall sediments contain some irregular patches of P. Py. with Pb. & Zn.

The sediments are mainly leached magnesian limestones

SECTION D-D



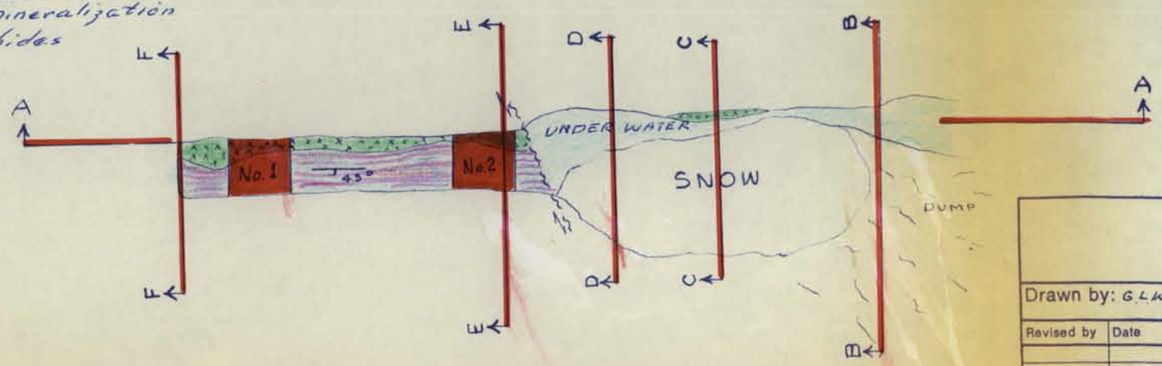
SECTION C-C



SECTION B-B

SKETCH OF SECTIONS B, C & D

Pb. Zn Mineralization
Fe. Sulphides



DRIFT PLAN & SECTION A-A

Scale: 1" = 15'

Cominco

Drawn by: G.L.W.		Traced by:	
Revised by	Date	Revised by	Date

WATERLOO PROSPECT

UPPER DRIFT

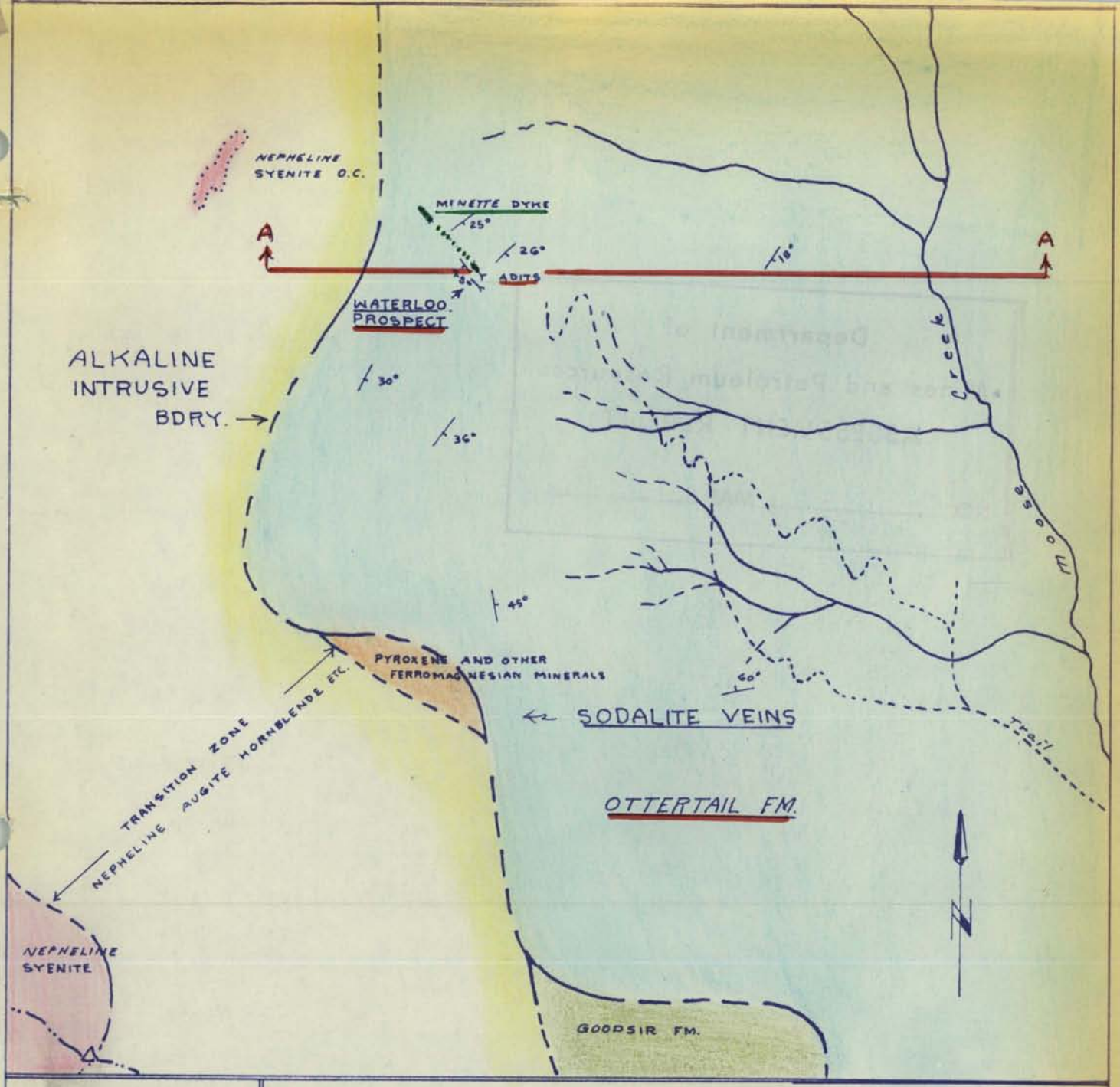
82N/1W

Scale:

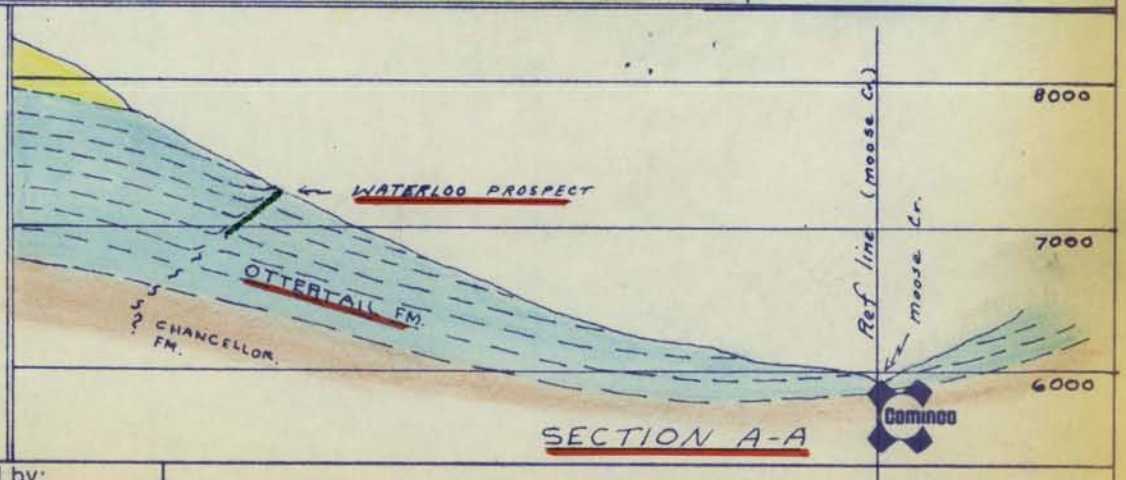
Date: DEC 17, 1971

Plate:

210-0620



BOUNDARYS
- DEFINED
- APPROXIMATE
- ASSUMED
- MINETTE DYKE



SECTION A-A

Drawn by: G L Webber		Traced by:	
Revised by	Date	Revised by	Date

GEOLOGY PLAN & SECTION
THE WATERLOO & RIVER CLAIMS

82N/1W

Scale: 1" = 1320'

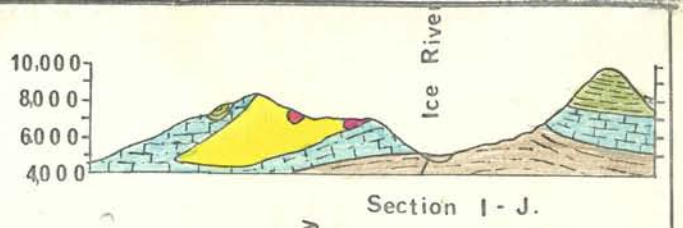
Date: DEC. 16 1971

Plate:

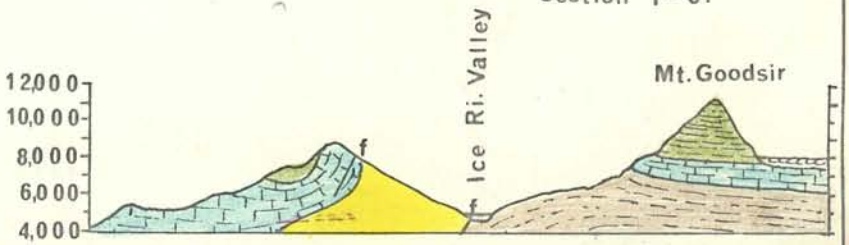
LEGEND

- Nephelite Syenite
- Iolite & Urtite
- Jacupirangite
- Goodsir Fm. } Ordovician
- Ottertail Fm.
- Chancellor Fm. } Upper Cambrian
- Chancellor Fm. (sheared zone)

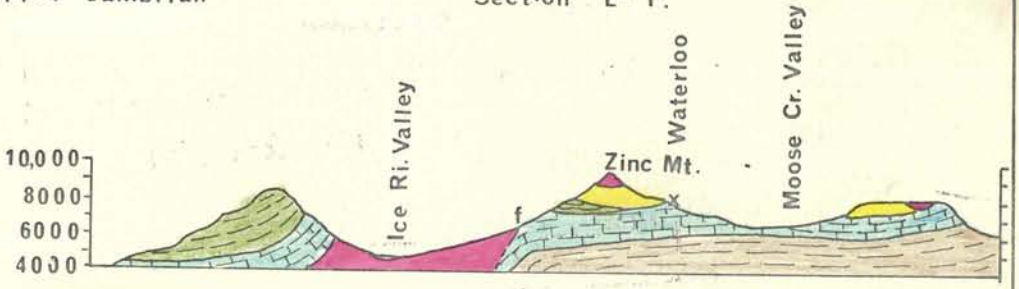
f = Fault



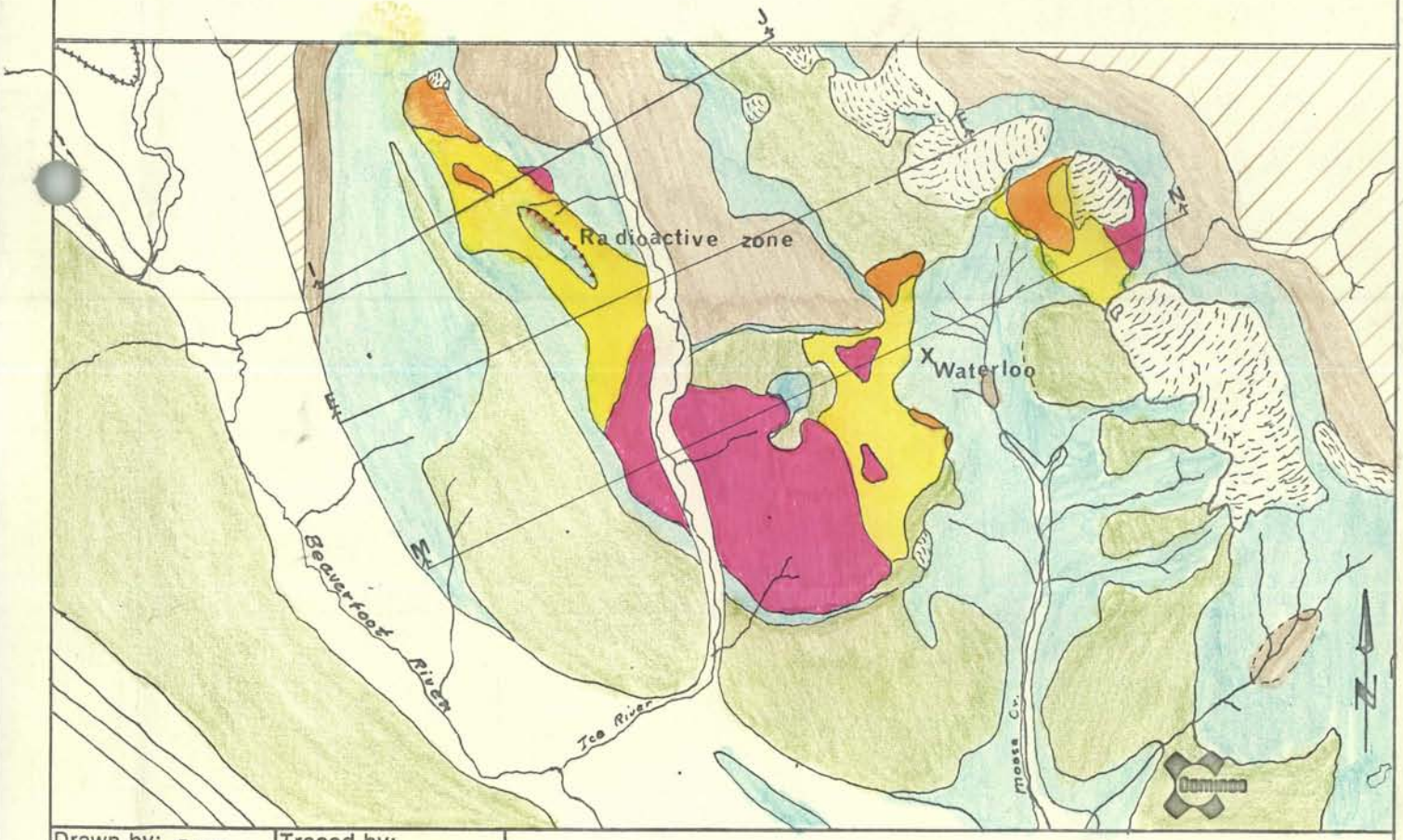
Section I - J.



Section E - F.



Section M - N.



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Revised by	Date	Revised by	Date

RIVER GEOLOGY & SECTIONS

82N/1W

J. A. ALLAN

Scale: 1:126,720 | Date: March 1971 | Plate: 2

BCIL 2187C

210-0610