MOUNTAINEER MINES LTD. - PAN OCEAN OIL LTD.

JOINT VENTURE

GEOLOGICAL AND GEOCHEMICAL REPORT

ON THE

ELK 1-90 MINERAL CLAIMS

N.T.S. 106-C-14

64°53'N 133°20'W

YUKON TERRITORY

by

D. Yeager - Geologist

C. Ikona - P.Eng.

January, 1979

090424

This report has been examined by the Geological Evaluation Unit and is recommended to the Commissioner to be considered as representation work in the amount of $ 1000.00 22/2/79

Resident Geologist or
~~Resident Mining Engineer~~

Considered as representation work under Section 53 (4) Yukon Quartz Mining Act.

B. R. BAXTER
Supervising Mining Recorder

Commissioner of Yukon Territory

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APPENDICES

1.0 INTRODUCTION

The ELK 1-90 mineral claims were staked on November 21, 1976 by the Mountaineer Mines Ltd. - Pan Ocean Oil Ltd. joint venture to cover favourable geologic targets in the Quartet/ Fairchild uranium belt.

During the period June 9 to June 21, 1977, a geological geochemical, and prospecting evaluation of the property was carried out by Pamicon Developments Ltd. under the field supervision of R. Darney.

During the period August 22,1978 to September 22, 1978, a follow-up geochemical program was done.

2.0 LIST OF CLAIMS

Claim Name	Staking Date	Recording Date	Grant No.
ELK 23-36	November 21, 1976	November 25, 1976	YA14501-14514
ELK 51-64	November 21, 1976	November 25, 1976	YA14529-14542
ELK 79-90	November 21, 1976	November 25, 1976	YA14557-14568

3.0 LOCATION AND ACCESS

The ELK claims are located on NTS sheet 106-C-14, approximately 117 miles northeast of the community of Mayo in the northeastern Yukon Territory. Approximate co-ordinates of the claim group are $64^{o}53'$ N. latitude, $133^{o}20'$W longitude.

Access to the property is by wheel equipped, fixed wing aircraft from Mayo to the Dolores Creek airstrip, a distance of 120 miles, then by helicopter or on foot the 3 miles southwest to the property.

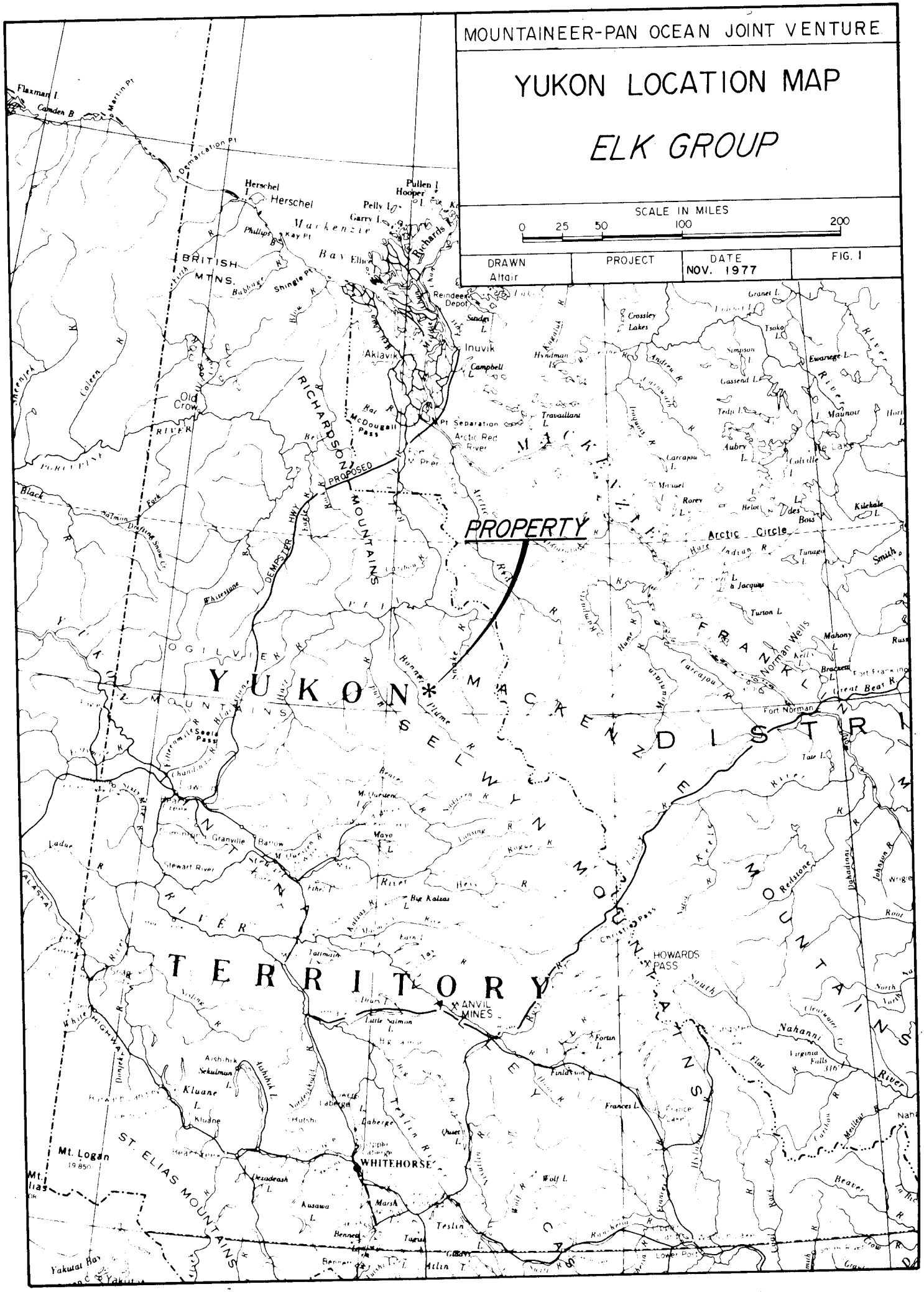
MOUNTAINEER-PAN OCEAN JOINT VENTURE

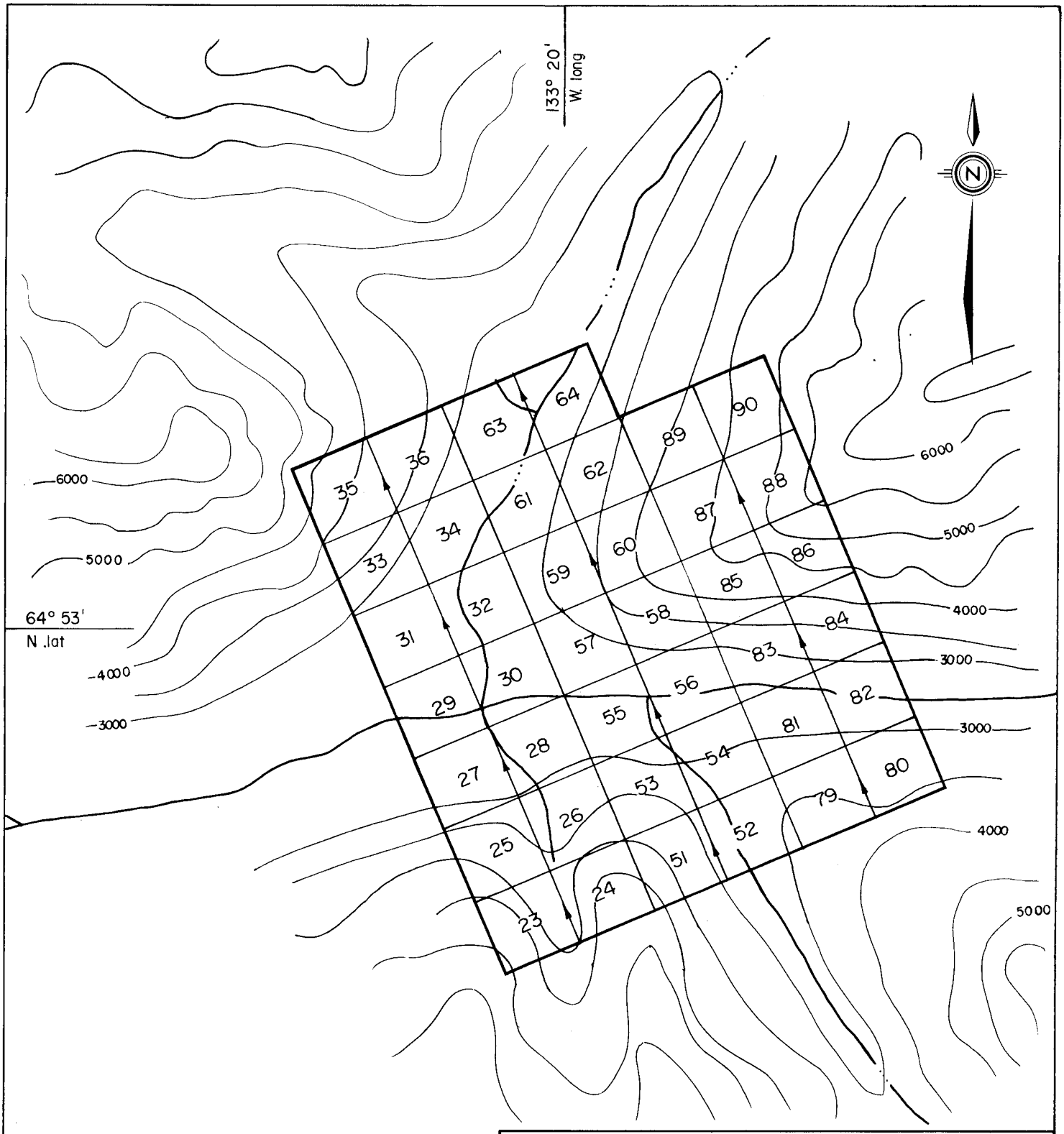
YUKON LOCATION MAP

ELK GROUP

SCALE IN MILES
0 25 50 100 200

DRAWN	PROJECT	DATE	FIG. 1
Altair		NOV. 1977	





MOUNTAINEER-PAN OCEAN JOINT VENTURE

ELK MINERAL CLAIMS
DOLORES CREEK AREA
CLAIMS MAP

NTS 106 C 14
YUKON TERRITORY

0 1/4 1/2 MILES 1 1 1/2

0 0.5 1 1.5 2.0 2.5
KILOMETRES

PAMICON DEVELOPMENTS LIMITED

DRAWN:	PROJECT:	DATE:	FIGURE:
Altair	Fairchild	Jan., 1979	2

Both helicopter and fixed wing aircraft as well as full expediting services are available in Mayo.

4.0 TOPOGRAPHY AND VEGETATION

Elevations on the property range from 3,000 to 6,500 feet A.S.L. and topography is extreme in most of the area. Exposure is good at higher elevations, however approximately 50% of the ground is covered by talus and overburden.

Vegetation consists of black spruce and willow thickets at low elevations giving way to dwarf birch, grasses, and moss at about the 3,000 foot level.

5.0 REGIONAL GEOLOGY

The Quartet-Fairchild region lies in the Wernecke Mountains of the north eastern Yukon Territory. In the general area, the Werneckes consists of local ranges which include the Rackla Range, Bonnet Plume Range and Knorr Range. Topography is normally moderate to rugged with elevations ranging from 2,000 to 6,500 feet. The major river valleys are broad, timbered and extensively overburden covered, while most mountain slopes present greater than 60% outcrop above the 4,000 foot level.

The entire area has been mapped by the Geological Survey of Canada and three spearate publications are presented. The following memoir and open file reports give 1" = 4 miles geological coverage of the Nash Creek, Nadaleen River, Wind River and Snake River map areas.

(1) Geology of Nash Creek, Larsen Creek and Dawson Map-Area, Yukon Territory by L.H. Green 1972 (Memoir 364).

(2) Open File 205 (Geology of Nadaleen River and Bonnet Plume Lake Map sheets by S. Blusson) 1975.

(3) Open File 279 (Geology of Snake River and Wind River sheets by D.K. Norris) 1975.

In the Quartet-Fairchild-Gillespie Lakes region Helikian rocks are exposed over an area of some 1,500 sq. miles in a roughly circular fashion centered near Longitude 134°00'W and Latitude 65°00'N.

These rocks have been described as Units 1 & 2 by L. Green on the Nash Creek Sheet.

Recent G.S.C. stratigraphic work by Bell and Delaney (1976) has redesignated Units 1a, 1 and 2 (Green 1972) as Units A, B, and C respectively. The unit designations as established by Bell and Delaney will be used in this report.

Unit A whose base is not exposed, is composed of a thick succession of moderately metamorphosed fine grained clastic sediments with interbedded carbonates. The overlying Unit B consists of thinly interbedded slates and argillites with occasional quartzite beds.

Unit C, which conformably overlies the uppermost slate-quartzite section of Unit B, consists mainly of thickly bedded orange weathering dolomites. The base of the unit is marked by a series of transitional beds of alternating buff weathering dolomites and interbedded slates and quartzites.

4 ..

Erratically distributed throughout the Proterozoic metasediments are irregularly shaped breccia bodies. The breccia zones vary from tens of feet to several thousand feet in size and appear as cross cutting pipe-like features at all levels in the stratigraphic column. Several varieties exist, but all exhibit an assortment of angular clasts derived from rock types common to the area. Hornfels margins observed at several localities indicate an intrusive origin.

A common association with many of the breccia bodies are zones of veining or locally pervasive feldspar alteration seen as internal features within the breccias or in host rocks adjacent to them.

The alteration zones are pink in colour due to either K-spar or strong hematization and in some instances contain varying amounts of specularite, chalcopyrite and minor uranium mineralization.

5.1 Structure

Two major periods of deformation have taken place within the Wernecke Mountain region. During the first period or Racklan Orogeny, the Proterozoic rocks of Units A, B, and C underwent intense folding and faulting. Folds are tight to isoclinal with the development of strong axial plane cleavage and commonly an almost vertical foliation.

A major unconformity of Lower Hadrynian age forms the upper contact of Unit C. In many localities, erosion

beneath this unconformity has resulted in the complete removal of Unit C and the strong angular relationship between the relatively flat lying Cambrian and younger rocks directly overlying Units A and B is apparent.

Further unconformities near the Upper Hadrynian, Lower Cambrian and Upper Cambrian margins leave Devonian carbonates directly over the Helikian section.

The second period of deformation, which involves both Paleozoic and Proterozoic strata, is weak compared to the first. This is particularily evident in the younger Carbonate sections to the west and southwest where deformation consists mainly of broad open folding and minor overthrusting.

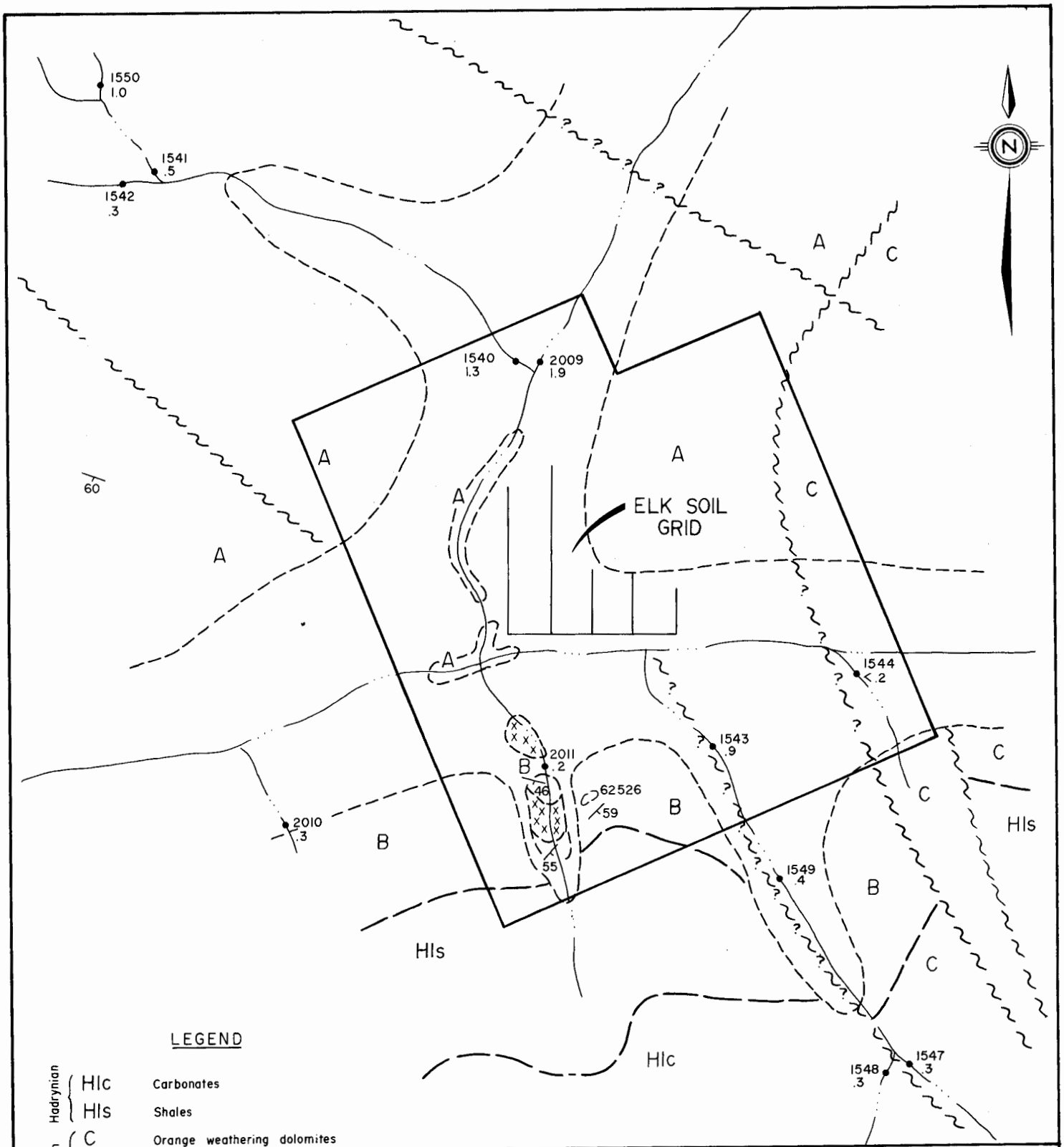
6.0 PROPERTY GEOLOGY

6.1 Introduction

No detailed geologic mapping was done on the ELK claims, however, 1:250,000 mapping has been done by the Geological Survey of Canada (Blusson, 1975) and 1:50,000 reconnaissance mapping was done by Pamicon Developments Ltd. in the claims area. A compilation of this work is presented in Figure 3 of this report at a scale of 1 inch to 1/2 mile.

6.2 Lithology

The lowermost rocks exposed on the property are Proterozoic sediments and metasediments thought to be Helikian in age. These have been subdivided in Figure 3 to units A, B, and C. The Unit A rocks on the ELK claims are made up mainly of



LEGEND

Hadrynian	Hlc	Carbonates
	Hls	Shales
Helikian	C	Orange weathering dolomites
	B	Argillites and shales
	A	Siltstones and carbonates
	(xx)	Diatreme breccia
		Geologic contact
		Fault
		Outcrop limit
	59	Bedding attitude
	1547 .3	Water sample number Value in parts per billion uranium

MOUNTAINEER-PAN OCEAN JOINT VENTURE

ELK MINERAL CLAIMS
PRELIMINARY GEOLOGICAL MAP
NTS 106 C 14

YUKON TERRITORY

MILES: 0, 1/4, 1/2, 1 1/2

KILOMETRES: 0, 0.5, 1, 1.5, 2.0, 2.5

PAMICON DEVELOPMENTS LIMITED

DRAWN	PROJECT	DATE	FIGURE
Altair	Fairchild	Jan., 1979	3

brown to grey weathering siltstones, dolomitic siltstones, and silty dolomites. The Unit B rocks consist of thickly to massively bedded, dark brown to grey argillites. Unit C is mainly orange weathering dolomites. Overlying the Proterozoic section, in the southern part of the property, is a thick sequence of Hadrynian sediments. These are subdivided into a lower shale unit, consisting of dark brown to black shales with interbedded siltstones; and an upper carbonate unit containing orange and grey weathering banded dolomites with occasional minor limestone interbeds.

Several breccia bodies were encountered on the claims. These are made up of clasts of grey to pink weathering siltstones ranging in size from microscopic to greater than 40 mm. suspended in a matrix of dolomite and/or specular hematite.

6.3 Structure and Stratigraphy

The Unit A siltstones and dolomites are the oldest rocks present on the property. They are usually overlain conformably by the Unit B slates and argillites exposed in the southern part of the claims, however, in the case of the ELK group, a fault contact is suspected to pass in an east-westerly direction through the deep, overburden covered, Dolores Creek valley.

The Hadrynian shales and carbonates exposed in the southern part of the property lie unconformably on the Helikian rocks.

7 ..

Faulting is the most obvious structural feature in the area. Most of the faults trend in a northwesterly direction and appear to be of a high angle block faulting style. The relative ages of the fault structures on the property are uncertain as insufficient detailed mapping has been done to determine the age relationships.

6.4 Mineralization

The only mineralized showing found on the property occurs in a small breccia body at the 4,000 foot elevation level in the south central portion of the claims. Chalcopyrite and brannerite occur finely disseminated throughout a metasomatized siltstone/dolomite breccia.

The small pipe-like body is roughly elliptical in shape, measuring approximately 50 feet by 150 feet in size. The breccia body is both lithologically and mineralogically zoned. It occurs in a massively bedded, dark brown to grey weathering argillite in which chloritic alteration was noted for a distance of 50 to 60 feet away from the body itself. The outer rim of the pipe appears to be a shatter zone as up to 6 inch fragments of both the main pipe material and the surrounding host rock occur together in a coarse breccia zone. The main body of the pipe is a very finely crystalline reddish brown weathering metasomatite having an almost syenitic texture. A likely model of emplacement involves the brecciation of a dolomitic siltstone to very small particles, accompanied by albitization of the siltstone and remobilization of the dolomite to form the present crystalline

texture.

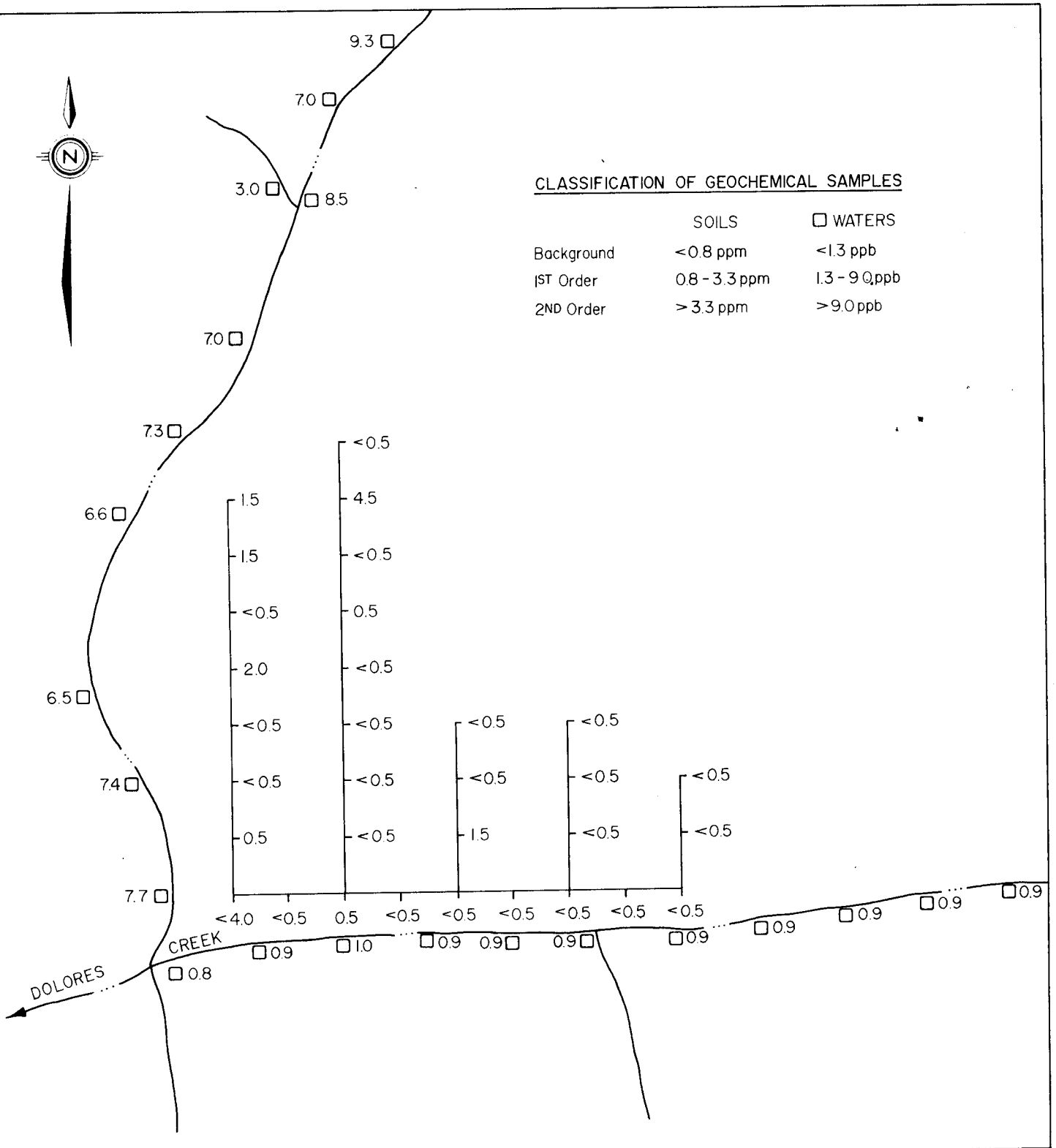
The breccia pipe exhibits above background radioactivity near the outer rim, which increases to a level 5 to 6 times background in the central core. In this central core, measuring approximately 10 feet by 10 feet, chalcopyrite and brannerite occur finely and evenly disseminated throughout the rock. Chip sample number 62526 from an area approximately 2 feet by 3 feet exhibiting the highest radioactivity assayed 0.38% Cu and 0.012% U_3O_8.

7.0 GEOCHEMISTRY

The geochemical program on the ELK claims(1977) consisted of reconnaissance water sampling of all the drainages in the claims area. Sample locations and values are presented in Figure 3 of this report. Samples were collected in numbered, acid cleansed, plastic sample bottles and sent for analysis to Chemex Lab. Ltd. in North Vancouver, B.C. Upon receipt at Chemex the samples were analysed for uranium using standard fluorometric procedures. Complete descriptions of analysis procedures are included in Appendix II.

Twelve water samples were collected during the survey. Values ranged from less than 0.2 to 1.9 parts per billion uranium. A statistical analysis of results of a regional water sampling program carried out by Pamicon Developments Ltd. in the area indicates that samples 1549, 1543, 1540 and 2009 exhibiting values of 0.4, 0.9, 1.3 and 1.9 ppb respectively can all be considered anomalous.

9 ..



CLASSIFICATION OF GEOCHEMICAL SAMPLES

	SOILS	☐ WATERS
Background	<0.8 ppm	<1.3 ppb
1ST Order	0.8 - 3.3 ppm	1.3 - 9.0 ppb
2ND Order	>3.3 ppm	>9.0 ppb

MOUNTAINEER-PAN OCEAN JOINT VENTURE

ELK MINERAL CLAIMS
DOLORES CREEK AREA
URANIUM IN SOILS & STREAMS
NTS 106 C 14
YUKON TERRITORY
FEET

0 1000 2000 3000

PAMICON DEVELOPMENTS LIMITED

DRAWN:	PROJECT:	DATE:	FIGURE:
Altair	Fairchild	Jan., 1979	4

Twenty-one water samples and thirty-two soil samples were collected during the 1978 program (See Figure 4). With the exception of one second order anomalous value of 9.3 parts per billion uranium, all the samples collected from the southerly flowing branch of Dolores Creek range from 6.5 to 8.5 parts per billion uranium and are therefore first order anomalous. The westerly flowing branch exhibited low background values.

Soil sample values ranged from less than detection limits (0.5 parts per million uranium) to 4.5 parts per million uranium. One anomalous area was indicated in the northwest corner of the grid measuring 400 feet by 800 feet and open in two directions.

8.0 DISCUSSION AND CONCLUSIONS

Although the size and grade of the mineralized showing in the ELK breccia pipe appear to be subeconomic, it is felt that the encouraging water sample results indicate a need for further work in the area of the ELK claims. The area is considered promising for several reasons. The degree of faulting in the region is extreme, thus providing suitable channelways and traps for uranium mobilization and deposition. The number of breccia bodies encountered during the brief geologic investigation indicates that many more are likely to exist under the overburden covered parts of the property. Uranium mineralization is thought to be associated with the basal Hadrynian unconformity on several properties in the Dolores Creek area (RAM, PTERD); this same unconformity exists on the ELK

claims and may help to provide a suitable geological environment for uranium deposition.

The follow-up geochemical program has indicated anamolous levels of uranium in both streams and soils on the property. It is felt that a careful geologic evaluation of the property as well as a detailed geochemical study in some areas is required.

9.0 RECOMMENDATIONS

It is recommended that the ELK claims be held on assessment credits and that geologic mapping be carried out on a scale of approximately 1:10,000. Silt, soil, and water sampling should be conducted in areas selected in the field during the mapping program.

Respectfully submitted,

David A. Yeager

D. A. Yeager - Geologist

C. K. Ikona - P. Eng.

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CHEMEX LABS LTD.

• ANALYTICAL CHEMISTS • GEOCHEMISTS • REGISTERED ASSAYERS

CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 46239

TO: Pamicon Developments Ltd.,
208 - 850 W. Hastings St.,
Vancouver, B.C.
V6B 1P1

INVOICE NO. 28600

RECEIVED Oct. 11/78

ANALYSED Oct. 17/78

ATTN:

WATERS

SAMPLE NO. :	PPB U
BG 5650	9.3
5651	7.0
5652	3.0
5653	8.5
5654	7.0
5655	7.3
5656	6.6
5657	6.5
5658	7.4
BG 5659	7.7
ND 110 ELK	0.9
111	0.9
112	0.9
113	0.9
114	0.9
115	0.9
116	0.9
117	0.9
118	1.0
119	0.9
120	0.8

CTA MEMBER CANADIAN TESTING ASSOCIATION

CERTIFIED BY: H. P. Thiel

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CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 46237

INVOICE NO. 28597

RECEIVED Oct. 11/78

ANALYSED Oct. 16/78

TO: Pamicon Developments Ltd.,
208 - 850 W. Hastings St.,
Vancouver, B.C.

ATTN:

SAMPLE NO. :	PPM Uranium
E 1	< 4.0
2	0.5
3	< 0.5
4	< 0.5
5	2.0
6	< 0.5
7	1.5
8	1.5
10	< 0.5
11	0.5
12	< 0.5
13	< 0.5
14	< 0.5
15	< 0.5
16	0.5
E 17	< 0.5
Std.	19

Note: Less than 4 detection limit due to fluorescence quenching caused by high concentration of the interfering metals.

CTA MEMBER CANADIAN TESTING ASSOCIATION

CERTIFIED BY: .....

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AREA CODE: 604
TELEX: 043-52597

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TO: Pamicon Developments Ltd.,
208 - 85Q W. Hastings
Vancouver, B.C.

INVOICE NO. 28597

RECEIVED Oct. 11/78

ATTN:

ANALYSED Oct. 16/78

SAMPLE NO. :	PPM Uranium
E 18	4.5
19	< 0.5
20	< 0.5
21	< 0.5
22	1.5
23	< 0.5
24	< 0.5
25	< 0.5
26	< 0.5
27	< 0.5
28	< 0.5
29	< 0.5
30	< 0.5
31	< 0.5
32	< 0.5
E 33	< 0.5
Fair B	
0+80N 0+40W	1.5

CTA MEMBER CANADIAN TESTING ASSOCIATION

CERTIFIED BY: .....