



GEOLOGICAL AND GEOCHEMICAL REPORT  
ON THE BOZO 13-16 MINERAL CLAIMS,  
CABIN CREEK AREA, YUKON TERRITORY

WATSON LAKE MINING DISTRICT  
NTS 105B-9W

LATITUDE  $60^{\circ}37'48''N$

LONGITUDE  $130^{\circ}22'30''W$

BASED ON WORK COMPLETED BETWEEN  
AUGUST 15 AND SEPTEMBER 1, 1986

for

CENTRAL ELECTRICITY GENERATING BOARD  
EXPLORATION (CANADA) LIMITED

by

A. T. Turner, B.Sc., P.Geol.

June 24, 1987



09 17 36

*A. T. Turner*

This report has been examined by  
the Geological Evaluation Unit  
under Section 53 (4) Yukon Quartz  
Mining Act and is allowed as  
representative work in the amount  
of \$ 2000.00 .

*for* *D. Edmund*  
Regional Manager, Exploration and  
Geological Services for Commissioner  
of Yukon Territory.

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## 1.0 INTRODUCTION

Ground radiometric prospecting and geological mapping was concentrated in the Cabin Creek Stock to follow up a radioactive occurrence discovered during the 1985 field season. This discovery resulted in the staking of twelve mineral claims (Bozo 1-12), detailed grid mapping, soil sampling, ground radiometric and magnetic surveys. An examination of the area of interest, designated Grid #1, revealed anomalous radiometric readings (up to 18,000 cps) within two intersecting clay altered structural zones. The analyses of grab samples collected from these alteration zones ranged from 70.8 ppm to 5,650.0 ppm  $U_3O_8$ . Due to the paucity of rock exposure in this area, the alteration zones could only be traced along a strike length of 50 m. Mineralogical studies carried out on the radioactive grab samples indicated the presence of both uranophane and pitchblende.

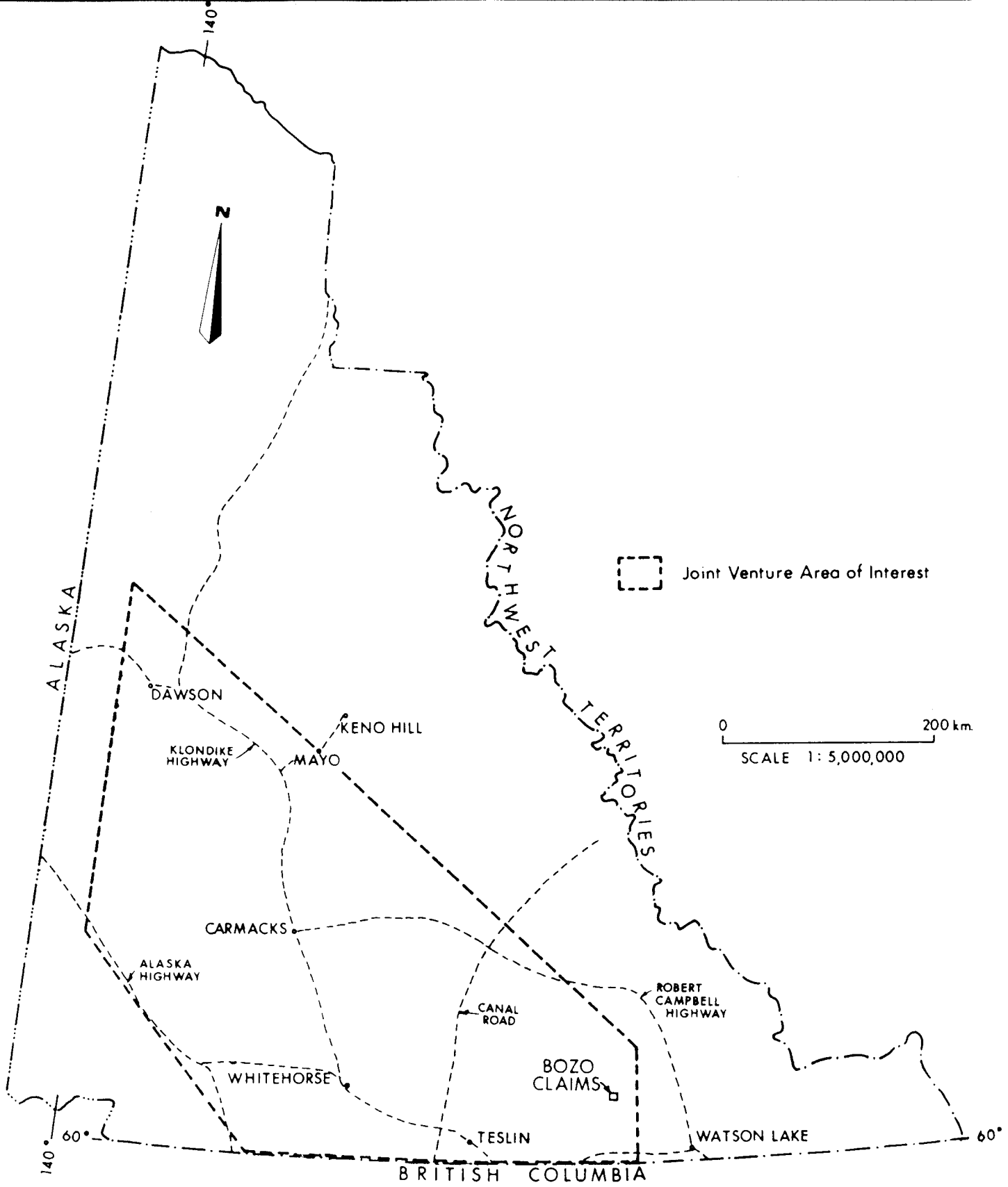
During 1986, investigations were concentrated outside the Bozo 1-12 claims but within the Cabin Creek stock. Detailed ground radiometric prospecting to the north of the claims along an  $030^{\circ}$  trending airphoto structural lineament, which passes through the Grid #1 alteration zones, identified additional radioactive occurrences within altered zones. These poorly exposed occurrences are scattered along a north-south trending ridge within an area 900 m by 250 m. Individual zones are less than 1 m wide and have been traced intermittently over distances of up to 125 m. Maximum radiometric readings were 2,700 cps over a background of approximately 550 cps. The analytical results from several grab samples ranged from 8.5 ppm to 1,485.0 ppm  $U_3O_8$ . Four additional claims (Bozo 13-16) were staked to cover the occurrences.

This report documents geochemical and geological studies carried out over Bozo 13-16 claims between August 15 and September 1, 1986.

## 2.0 LOCATION AND ACCESS

The Cabin Creek stock is situated 100 km northwest of Watson Lake. The closest settlement is Rancheria, approximately 60 km to the south-southwest on kilometre 1183 of the Alaska Highway (see Figure 1).

A winter road extends from the Alaska Highway north to the Liard River-Cabin Creek junction and passes to within 10 km of the eastern edge of the batholith. A fixed wing airstrip is situated just south of the Liard River - Cabin Creek junction. This airstrip was utilized by previous exploration companies during placer gold mining operations on Cabin Creek.



 Joint Venture Area of Interest

0 200 km  
SCALE 1: 5,000,000

<b>CEGB EXPLORATION (CANADA) LTD.</b>		
GENERAL LOCATION AND INFRASTRUCTURE YUKON TERRITORY		
DATE	AUTHOR	FIGURE
June '87	A.T.T.	1

During the 1986 season, the field crew was mobilized from Watson Lake to the Liard River-Cabin Creek junction utilizing a float-equipped fixed wing aircraft chartered from Watson Lake Flying Services. Personnel and equipment were then transported by helicopter to a camp site just north of the Bozo Claims on a tributary of Cabin Creek.

### 3.0 REGIONAL GEOLOGY

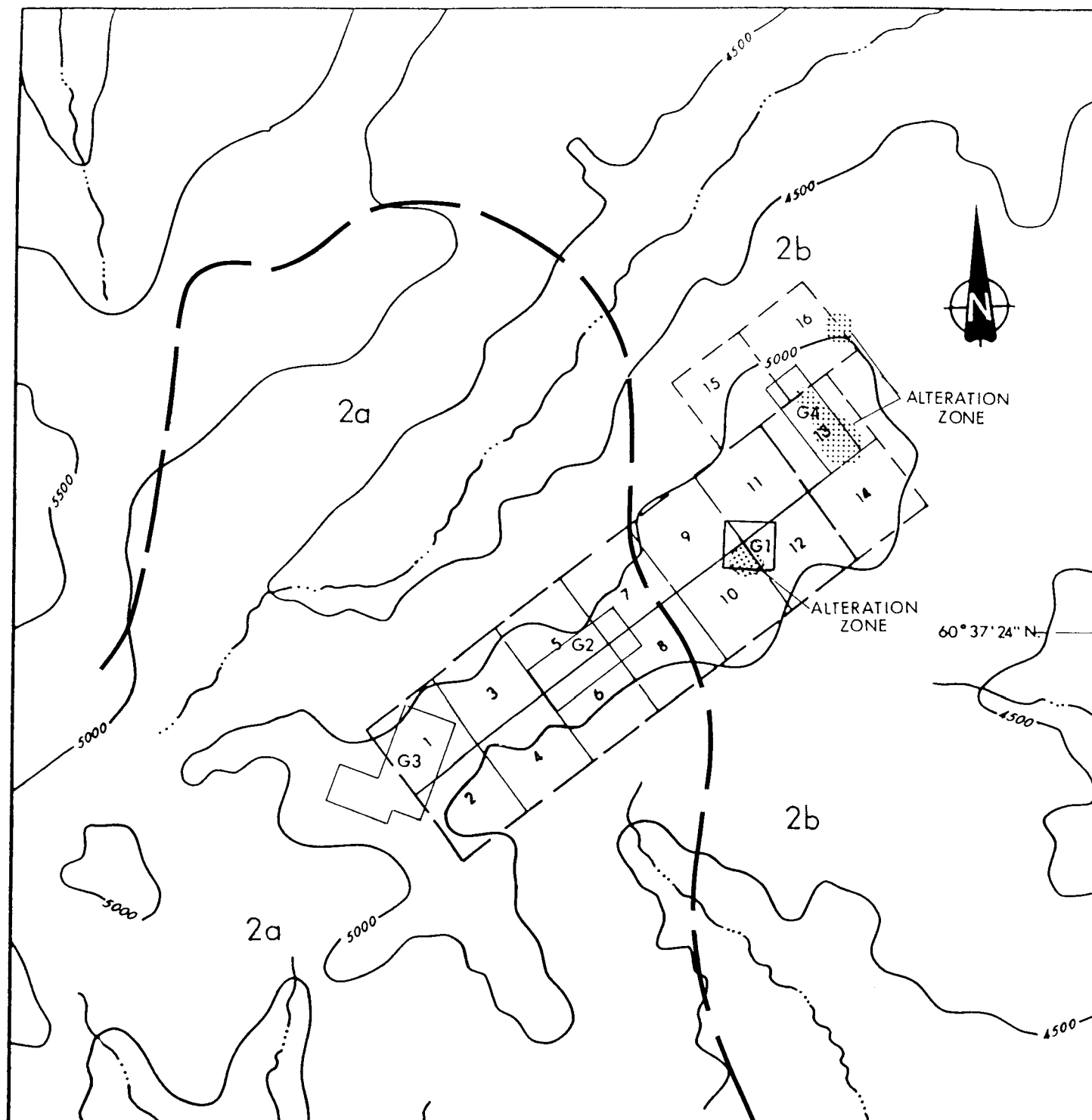
Geological mapping of the Wolf Lake map sheet was carried out by Poole of the Geological Survey of Canada during the early 1950's at a scale of 1:250,000 (see Map 1). This work delineated the boundaries of Cretaceous intrusions designated the Cassiar (Unit 15) and Seagull (Unit 16) batholiths and related stocks. These units intrude:




- late Proterozoic to Mississippian miogeosynclinal sedimentary rocks (Cassiar Platform)
- a thick intensely sheared sequence of Carboniferous clastic, carbonate and intrusive rocks (Yukon Cataclastic Complex).

### 4.0 LOCAL GEOLOGY AND STRUCTURE



Mapping by CEGBE during 1985 and 1986 identified two major phases of the intrusive (Figure 2, Map 2). Unit 2A is a very coarse grained porphyritic biotite quartz monzonite which corresponds to a pronounced horseshoe shaped magnetic expression on the regional aeromagnetic maps. This unit displays an average radiometric background of 550 cps and contains numerous magnetic, biotite rich segregations. These biotite rich zones are commonly radioactive (up to 3600 cps) but have low uranium to thorium radiometric ratios (less than 3/1), possibly indicating the presence of uranothorite associated with the biotite. A second phase, Unit 2B, consists of an equigranular, fine to medium grained, biotite quartz monzonite which is largely exposed within the central and western portions of the stock. Muscovite and radioactive alteration zones have been observed only within the central portion of the stock. The radiometric background of Unit 2B is about 500 cps.

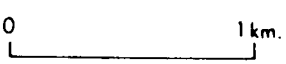
The surrounding country rocks consist of quartz feldspar biotite muscovite schist, quartzite and minor limestone. Garnet pyroxene skarns are developed in the steeply dipping limestone unit just west of the stock. Molybdenite, galena and scheelite have been observed in the skarns. The radiometric backgrounds of the lower Cambrian lithologies are generally 300 - 350 cps.




-  GRID NUMBER
-  CLAIM NUMBER
-  GEOLOGICAL BOUNDARY

GEOLOGICAL LEGEND

- JURASSIC and/or CRETACEOUS
-  Megacrystic biotite quartz monzonite
  -  Biotite-muscovite quartz monzonite, mainly equigranular



 CEGB EXPLORATION (CANADA) LTD.		
BOZO CLAIMS COMPILATION		
SCALE	AUTHOR	DATE
1" = 1/2 mile	T.T.	June '87
NTS	DRAWN BY	FIGURE 2
	J.S.	

4500  
130° 24' 18" W  
4000

Subvertical, randomly oriented aplite to pegmatite dykes and vuggy to massive quartz veins have been observed cutting both the intrusive and metasedimentary lithologies. No enhanced radioactivity has been noted in these rocks.

Prominent  $045^{\circ}$  and  $170^{\circ}$  trending airphoto lineaments are probably related to the dextral strike-slip movement along the Tintina Fault. A primary foliation direction within the stock ranges from  $030^{\circ}$  to  $060^{\circ}$ .

## 5.0 PREVIOUS EXPLORATION

In 1979 Eldorado Nuclear Ltd. staked 139 claims (Elle property) to cover six airborne radiometric anomalies within the Cabin Creek Stock. Follow-up ground prospecting located anomalous radioactivity (greater than 10,000 cps - Scintrex BGS 1SL) within a megaporphyritic phase of the coarse grained biotite quartz monzonite (Pare, 1980). Grab samples from trenches yielded analyses of up to 2000 ppm U and 390 ppm Th. These claims lapsed in 1982.

Between 1979 and 1982, three large claims blocks were staked along the margins of the stock by Serem Ltd. (170 claims, Cabin property), Hudson Bay Exploration Ltd. (40 claims - Todd property) and Regional Resources Ltd. (50 claims - Tung property). The exploration target was scheelite and powellite bearing garnet pyroxene skarns where assays of up to 0.52%  $WO_3$  were reported.

Reconnaissance prospecting by CEGBE in 1985 identified anomalous radioactivity associated with megaporphyritic pods (Grid 3 - 25,800 cps), biotite rich segregations (Grid 2 - 3600 cps) and linear kaolinized zones (Grid 1 - 10,000 cps) within the intrusive (Figure 2). The highest assay was 2.1% total  $U_3O_8$  from a grab sample collected from the Eldorado trench (Grid 3). This sample was described as a coarse grained granite with anomalous radioactivity due to the presence of kobeite  $((Y, U)(Ti, Nb)_2(O, OH)_6)$ . The anomalous radioactivity appeared to be very restricted in dimensions and of little economic interest. The most interesting area consisted of two intersecting linear clay altered zones (Grid 1) where rock sample analyses ranged from 70.8 ppm to 5650.0 ppm  $U_3O_8$ . Petrographic and SEM studies of mineralized samples from this area identified the rocks as being medium grained clay altered quartz monzonite with thorium-free pitchblende, brannerite and uranium-rare earth minerals. Although some characteristics of the classical intrusive related uranium deposit were not recognized, there appeared to be some potential for intragranitic vein uranium deposits within unexplored areas of the intrusive.

## 6.0 LAND STATUS

Bozo claims 13-16 were staked and recorded on August 14, 1986. Identification tags for these claims were issued by the Mining Recorder and will be affixed to the appropriate claim posts during the 1987 field season.

## 7.0 1986 EXPLORATION PROGRAM AND RESULTS

Initial work commenced on August 15 and was completed on September 1. The following personnel participated in the project:

1. Terry Turner - Project Geologist  
27 Rundleson Way NE  
Calgary, AB, T1Y 3H7
2. Tom Bojczyszyn - Geologist  
231 - 18 Avenue NE  
Calgary, AB, T2E 1N3

Detailed prospecting immediately north of Grid 1 on the Bozo 1-12 claims and within the regional magnetic low encountered several poorly exposed weakly radioactive, linear, clay altered zones. These zones are similar to the radioactive occurrences found on Grid 1. Individual zones are less than 1 m wide and were traced intermittently over a distance of 100 m within an area 900 m by 250 m (Grid 4).

In the southern portion of the grid area, the predominant strike direction of the individual alteration zones is  $124^{\circ}$  whereas to the north the most persistent trend is  $030^{\circ}$ . Spot radiometric readings range from 525 cps to almost 2500 cps. Enhanced radiometric readings are generally found within the southern portion of the mineralized area. Uranium to thorium radiometric ratios range from 3:1 to 11:1.

A total of 18 grab samples were collected from weakly radioactive clay altered zones within Grid 4. Sample results and descriptions are shown in Table 1. Radiometric readings at outcrops and of samples collected (bag counts) are generally correlatable with analytical results. Both total (multi acid) and leachable (single acid attack) uranium analyses were performed on the samples. Leachable uranium results are generally 10% to 15% lower than the total uranium results. The highest uranium results were recorded in sample number TRO-87 (1509.0 ppm total  $U_3O_8$  and 1485.0 ppm leachable  $U_3O_8$ ). This sample site also showed the highest radiometrics with total count readings of up to 2490 cps.

The rock samples collected from alteration zones are typically medium grained, slightly porphyritic and buff to

TABLE 1  
LITHOGEOCHEMICAL SUMMARY  
CABIN CREEK AREA

Sample No.	Radiometrics (cps)				Bag	Analyses (ppm)		Description
	TCl	TUK	TU	T		U <sub>3</sub> O <sub>8</sub> (Total)	U <sub>3</sub> O <sub>8</sub> (L)	
86TRO-81	2025	52	27	3	800/450	283.0	235.8	Fine to medium grained porphyritic quartz monzonite, limonite rims around bleached, kaolinized feldspar phenocrysts (up to 0.6 cm), black quartz from 0.1 cm to 0.5 cm in diameter, 5% fine grained muscovite and and sericite.
86TRO-82	2700	65	35	3	850/440	424.4	377.3	Medium grained porphyritic intrusive, phenocrysts 1 cm black quartz and 2 cm altered feldspar phenocrysts, groundmass is light grey and smoky quartz and cream colored sericite-kaolinite (altered feldspars), 5% muscovite.
86TRO-83	2320	56	31	3.3	910/470	188.6	165.1	Fine to medium grained, muscovite <5% in groundmass, light grey to dark smoky quartz.
86TRO-84	1090	27	12	2.7	630/510	495.2	448.0	Porphyritic quartz monzonite, phenocrysts up to 4 cm in medium grained groundmass, feldspar phenocrysts are only slightly altered compared to groundmass of kaolinite and muscovite.
86TRO-85	1560	36	21	3.5	600/530	63.7	61.3	Fine to medium grained, slightly porphyritic, white kaolinized feldspars, fractured black anhedral quartz, heavily oxidized with medium greenish brown solution rims around feldspars.
86TRO-86	1150	29	14	2.9	620/550	75.5	68.4	Altered intrusive, fine to coarse grained black quartz, limonite, bleached and kaolinized feldspars, medium grained, cream colored.

Sample No.	Radiometrics (cps)					Analyses (ppm)		Description
	TCl	TUK	TU	T	Bag	U <sub>3</sub> O <sub>8</sub> (Total)	U <sub>3</sub> O <sub>8</sub> (L)	
86TRO-87	2490	54	28	3.5	1680/500	1509.0	1485.0	Fine to coarse grained intensely altered intrusive, <10% muscovite, kaolinized feldspar up to 1 cm and dark smoky quartz up to 0.5 cm, anhedral.
86TRO-88	1360	34	14	3.5	720/490	179.2	165.1	Altered medium grained intrusive, dark smoky and light grey quartz 10%, muscovite 5%, oxidized, limonite banding, light cream colored with grey spots with rusty orange solution banding.
86TRO-89	750	25	13	3	510/480	44.8	37.7	Medium to coarse grained, white spotted rusty orange altered intrusive, feldspars completely altered to kaolinite, dark grey smoky quartz grains up to 0.5 cm, light grey and dark grey fine grained quartz and muscovite in groundmass.
86TRO-90	920	30	15	4	575/560	15.3	9.7	Fine to coarse grained porphyritic quartz monzonite, relatively fresh feldspar phenocrysts to 3 cm, groundmass feldspars are kaolinized, with biotite, limonite rims and both light grey and smoky quartz.
86TRO-91	784	30	16	3	850/770	13.4	8.5	Friable, weathered medium grained intrusive 10-15% grey quartz, muscovite 15%, oxidized.
86TRO-92	969	40	20	5	590/580	40.1	28.3	Altered medium grained intrusive, feldspars are slightly kaolinized and altered to a pale green clay, limonite bands, minor manganese stains, fractured.
86TRO-93	1321	45	25	5	590/450	99.0	82.5	Intensely altered intrusive, medium grained, porphyritic, fractured black quartz phenocrysts up to 0.5 cm feldspars vary from partly altered to completely altered to kaolinite and sericite, weak limonites.

Sample No.	Radiometrics (cps)				Bag	Analyses (ppm)		Description
	TCl	TUK	TU	T		U <sub>3</sub> O <sub>8</sub> (Total)	U <sub>3</sub> O <sub>8</sub> (L)	
86TRO-94	1450	54	27	4	710/650	106.1	103.7	Weathered and altered cream colored intrusive, limonites, dark grey quartz up to 1 cm.
86TRO-95	1125	31	21	5	575/485	63.7	54.2	Medium grained porphyritic quartz monzonite, alteration of feldspars varies from intense to weak, limonite rims, anhedral black quartz, subhedral feldspar phenocrysts to 1.5 cm, fine muscovite <5%.
86TRO-96	2030	-	-	-	600/100	1486.0	1415.0	Fine grained, white pebbly clay, groundmass is sericite, muscovite and kaolinite, black and smoky quartz, oxidized.
86TRO-97	2050	54	27	4	1050/570	188.6	188.6	Rusty, cream colored altered rock, medium to coarse grained, bleached and totally kaolinized quartz monzonite, fine muscovite, limonite and clay groundmass, light grey and black fine and coarse grained quartz.
86TRO-98	2670				175/100	103.8	99.0	Weathered and altered medium grained porphyritic quartz monzonite, clay altered feldspar phenocrysts up to 2 cm, fine grained muscovite clay and quartz in matrix, limonitized.

medium brown in colour with creamy white spots (kaolinized feldspars). Quartz grains visually comprise 10% to 35% of the rock and may be light to dark smoky grey in colour. Samples are generally kaolinized and dark brown limonite stains rim feldspar grains and fractures. One exception is sample number TRO-96 which is essentially a fine grained white pebbly clay. This sample was collected from the bottom of a 30 cm deep trench where surface radiometric readings exceeded 2000 cps. The second highest analytical results, 1486.0 ppm total and 1415.0 ppm leachable  $U_3O_8$ , were recorded from this sample site.

#### 8.0 CONCLUSIONS AND RECOMMENDATIONS

Additional occurrences of uranium mineralization associated with hydrothermally altered zones within the Cabin Creek Stock demonstrate the potential of the area for intragranitic uranium vein type deposits. The following program is recommended for 1987.

- Mineralogical studies should be carried out over selected samples in an attempt to compare the results with classical intrusive related deposits.
- Soil sampling and Track Etch surveys should be carried out in overburden covered and recessive areas immediately to the west of the radioactive occurrences to identify additional target areas.

#### 9.0 1986 EXPENDITURES

Expenditures for the 1986 program on the Bozo 13-16 claims are \$3,732.00 and are tabulated below:

<u>Code #</u>	<u>Description</u>	<u>Cost</u>
C102	Geology, office labour	650.00
C104	Geology, field labour	700.00
C105	Geology, supplies	147.00
C106	Board & lodging	65.00
C113	Helicopter transport	1,200.00
C120	Contractors (1 geologist)	700.00
D108	Magnetics, equipment rental	90.00
E116	Rock assays	<u>180.00</u>
	Total:	<u>\$3,732.00</u>

10.0 REFERENCES

- Amukun, S.E., McPherson, R., Turner, A.T.  
1985: Year-end Report, 1985, Uranium Exploration Program,  
Yukon Territory for CEGB Exploration (Canada) Ltd.
- Geological Survey of Canada  
1986: Open File Report 563, Wolf Lake Map Sheet, NTS 105 B.
- Pare, D.  
1980: Report on the 1979 Field Program, Mich 1-224 Claims,  
Watson Lake Mining District, Eldorado Nuclear Limited

11.0 STATEMENT OF QUALIFICATIONS

I, Arthur Terry Turner, do hereby certify that:

- I am presently residing at 27 Rundleson Way, NE, Calgary, Alberta, T1Y 3H7
- I am a member of the Association of Professional Engineers, Geologists and Geophysicists of Alberta
- I have been actively involved in mineral exploration in Canada, Australia and New Guinea since 1966
- I supervised and participated in the 1986 exploration program on the Bozo 13-16 mineral claims.

APPENDIX I

Analytical Procedures and Results

## ASSAY ANALYSIS of URANIUM

### Procedure I - Fluorescence (up to 5% $U_3O_8$ )

The sample (1.0000 gm.) is digested in 8N Nitric acid to almost dryness. The solution is made up to volume and an aliquot is transferred to a volumetric flask. To this is added aluminum nitrate and ethyl acetate and the mixture shaken.

After the layers have separated, an aliquot of ethyl acetate is transferred to a clean platinum dish and evaporated off. The fluoride flux is added to the dish and the flux is melted for three minutes. After cooling, the fluorescence of the disc formed is compared with a series of freshly prepared standards using a Jarrell-Ash Fluorimeter.

### Procedure II - Volumetric (greater than 5% $U_3O_8$ )

The sample is decomposed in a mixture of nitric, hydrochloric, perchloric, hydrofluoric and sulphuric acids and evaporated to dryness. The salts are dissolved in dilute sulphuric acid; iron and other interfering elements are separated from uranium by chloroform extraction of their cupferron complexes. Uranium VI is reduced to the tetravalent state with titanous sulphate. The uranium IV is subsequently reoxidized to uranium VI with ferric sulphate and is determined by titrating the resulting iron II with potassium dichromate.

Note: Precision volumetric apparatus is used throughout both assay procedures.



4200B - 10 STREET N.E.  
CALGARY, ALBERTA  
T2E 6K3

PHONE: (403) 250-1901  
13-NOV-86  
PAGE: 1 OF 4  
COPY: 1 OF 2

AUTHORITY: P. COOPER

C.E.G.E. EXPLORATION LTD.  
700, 635 - 8 AVENUE S.W.  
CALGARY, ALBERTA T2P 3M3

PROJECT: 8101

WORK ORDER: 9066D-86

ATTN: T. TURNER

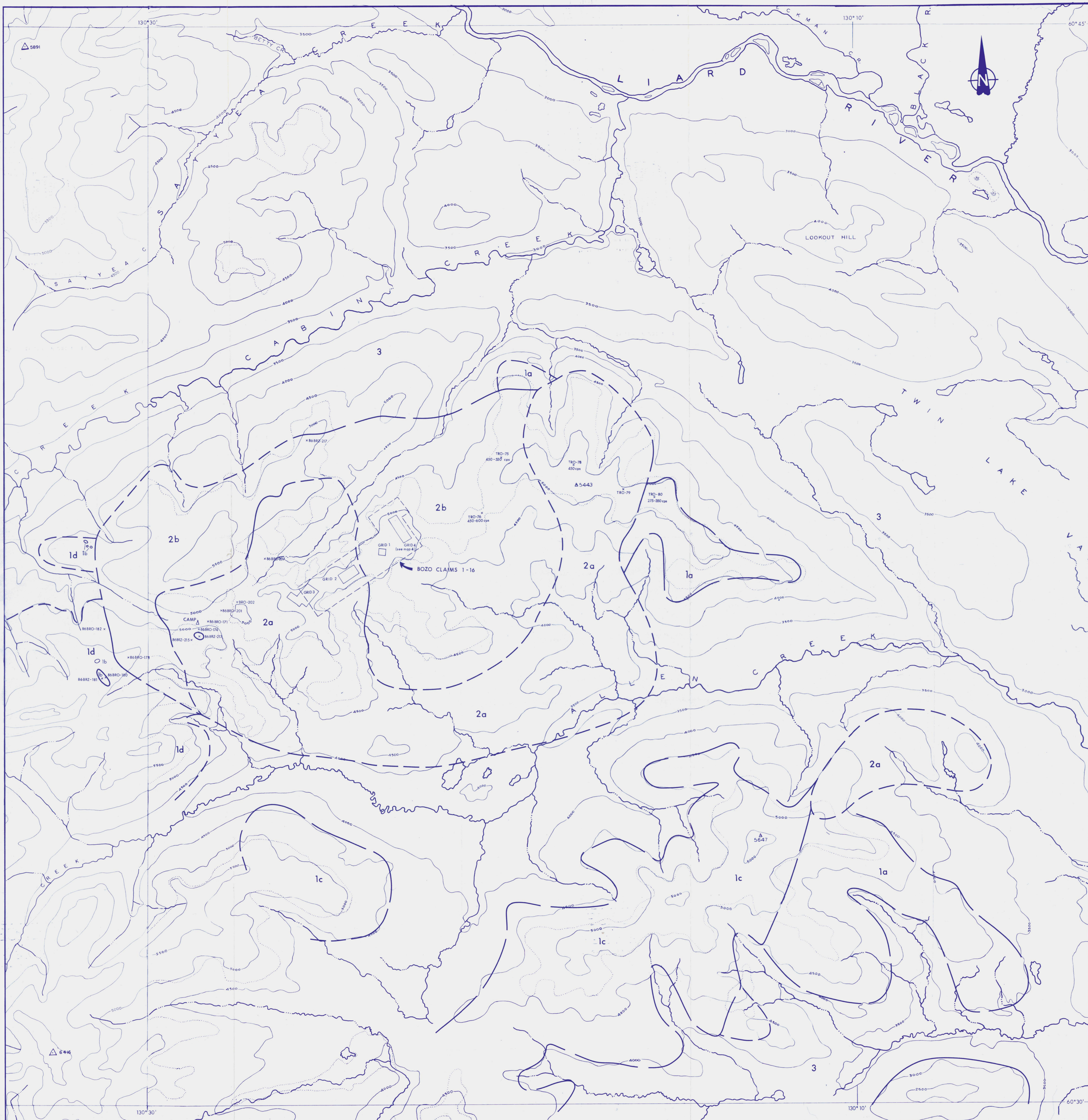
\*\*\* FINAL REPORT \*\*\*

**GEOCHEMICAL LABORATORY REPORT**

SAMPLE TYPE: ROCK

SAMPLE NUMBER	TOTAL U308 PPM	U308 PPM
86TRO: 81	283.0	235.8
86TRO: 82	424.4	377.3
86TRO: 83	165.1	165.1
86TRO: 84	495.2	448.0
86TRO: 85	63.7	61.3
86TRO: 86	75.5	68.4
86TRO: 87	1509.0	1485.0
86TRO: 88	179.2	165.1
86TRO: 89	44.8	37.7
86TRO: 90	15.3	9.7
86TRO: 91	13.4	8.5
86TRO: 92	40.1	28.3
86TRO: 93	99.0	82.5
86TRO: 94	106.1	103.7
86TRO: 95	63.7	54.2
86TRO: 96	1486.0	1415.0
86TRO: 97	188.6	188.6
86TRO: 98	103.8	99.0

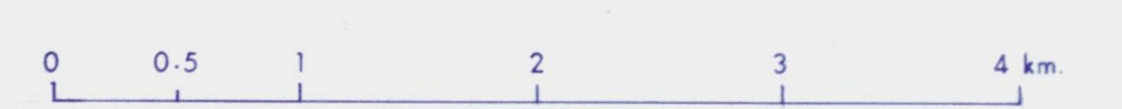




**LEGEND**

- QUATERNARY
  - 3 Glacial till
- JURASSIC and/or CRETACEOUS
  - 2a Megacrystic biotite quartz monzonite
  - 2b Biotite/Muscovite quartz monzonite, mainly equigranular
- CAMBRIAN and (?) EARLIER
  - 1a Biotite schist, quartzite
  - 1b Marble, skarn
  - 1c Biotite schist and quartzite with sills, dykes and irregular bodies of pegmatite
  - 1d Biotite schist, gneiss
- Geological Boundary
- x 450cp Radiometric Reading (EDA Spectrometer)
- \*TRC-80 Representative rock sample

NOTE: Regional Geology after Poole, 1955 modified by C.E.G.B.E.

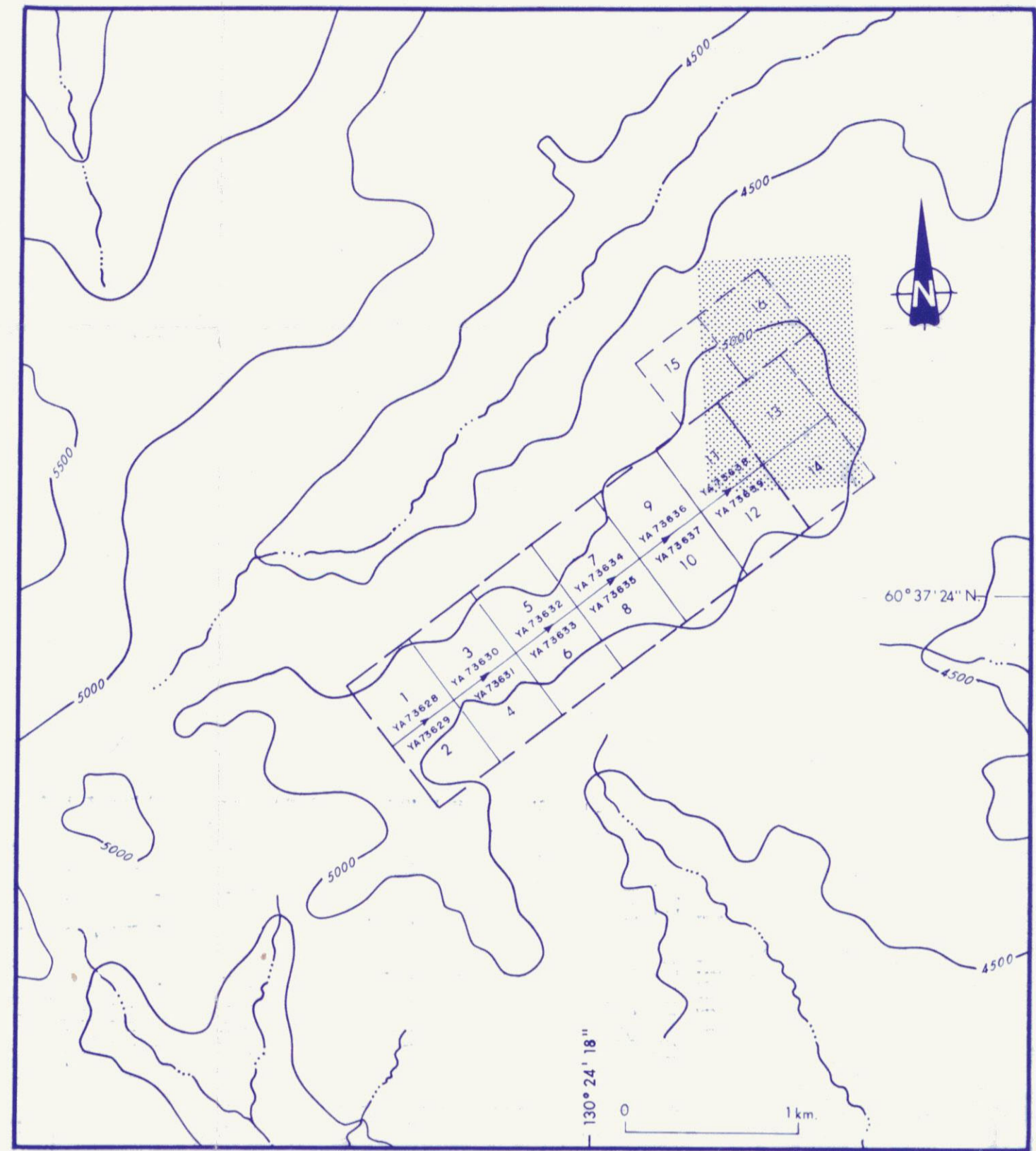


**CEGB EXPLORATION (CANADA) LTD.**  
 1986 URANIUM EXPLORATION PROGRAM

**GEOLOGY** (1977)

**CABIN CREEK AREA  
 YUKON TERRITORY**

SCALE: 1:31,180	AUTHOR: A.T.T.	DATE: October, 1986
NTS: 105 B 9&10	DRAWN BY: B.M.	MAP: 2



LOCATION MAP

LEGEND

- 1 Equigranular biotite quartz monzonite  
occasional k-feldspar megacrysts
- SYMBOLS**
- Grassy Plain
- Topographic Depression
- Swamp
- Altered Outcrop
- Scattered Outcrop
- 86 TRC-2, F-188.6, 165.1 Rock Sample Location, Outcrop, Frost Heave, Flot, (total U<sub>3</sub>O<sub>8</sub> ppm, leachable U<sub>3</sub>O<sub>8</sub> ppm)
- Quartz Vein
- Altered Intrusive
- Trend of Altered Zone or Quartz Vein
- Joints
- Foliation
- Fault
- Claim Post
- 2700 cps Radiometric Readings (EDA 400)
- 86 TRC-285 Soil Sample Location ppm U<sub>3</sub>O<sub>8</sub>
- 600 cps/0.0 Ground Radiometric Reading cps



**CEGB EXPLORATION (CANADA) LTD.**

1986 URANIUM EXPLORATION PROGRAM

GEOLOGY - GRID # 4  
BOZO CLAIMS 13-16  
CABIN CREEK AREA  
YUKON TERRITORY

SCALE 1:1000	AUTHOR T.T.	DATE October, 1986
NTS 105 B/9	DRAWN BY B.M.	MAP 3

091786