

# MAR 19710009: ANDREW LAKE

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ECONOMIC MINERALS  
FILE REPORT No.  
U-AF-108(1)

REPORT OF WORK

*Confidential until  
July 31, 1972*

QUARTZ MINERAL EXPLORATION PERMIT #158

HUDSON'S BAY OIL AND GAS COMPANY LIMITED

by: E. C. Burgan

September, 1971

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PLATE 2	Ground Radiometric Plan	1" = 1/4 mi.
PLATE 3	Emanometry	1" = 400'

## INTRODUCTION

During June and part of July 1971, HBOG conducted reconnaissance radiometric and geological traverses over outcrop areas within the Permit. In addition, emanometric surveying was completed in a "sand-plain" area lying immediately south and southwest of the south end of Andrew Lake. A crew of six persons were utilized in this work, and field supervision was delegated to Mr. G. Ian Hall, a graduate geologist (B.Sc.).

## PROPERTY

Quartz Mineral Exploration Permit #158 comprises approximately 7,840 acres situated in the NE corner of Alberta. Individual land parcels are listed in the Permit "Schedule" (Alberta Department File Reference No. 147332).

## GEOLOGY

Where investigated the Permit area is largely underlain by leucocratic granite, foliated granite, granite gneiss and pegmatite. These rocks are compositionally very uniform and vary in most part only in texture and structure. Pegmatites are widespread but are generally small to very small in dimension, grading laterally into the granites. Granitic rocks grade indiscriminately from undeformed granite into sheared and foliated granites, into good banded granite gneiss. Very locally, small exposures of amphibolite or metasedimentary rock were noted (see Plate 1).

The Permit area was carefully mapped by J. D. Godfrey, and the reader is asked to refer to his comprehensive reports for more detailed geological descriptions of the rocks in the area (see Research Council of Alberta, Preliminary Reports No.'s 58-4 and 61-2).

### GEOPHYSICS

#### Gamma Scintillometric & Spectrometric Surveys

The survey was conducted in reconnaissance fashion over out-cropping areas of Quartz Mineral Permit #158 during June and July, 1971 (see Plate 2).

Field Procedure: The area was surveyed along compass lines in a predominantly E-W direction, as shown on the accompanying plan. Out-cropping areas were checked thoroughly.

The " $T^0$ " (total count) intensity in counts per second were read continuously with periodic readings recorded. Values are plotted on Plate 2. Anomalies of more than a 3x background were checked for U:Th:K ratio by separately recording counts above 1.3, 1.6 and 2.5 MeV ( $T_1$ ,  $T_2$ ,  $T_3$  readings respectively). Stability of the spectrometers and levels of discrimination  $T_1$ ,  $T_2$ ,  $T_3$  were checked prior to and after each working day by reading at a base station and using a thorium standard. The survey was conducted by two spectrometers; " $T^0$ " readings of one of them, No. 569-11, were about 7x lower, but consistent during the whole survey. This was confirmed by daily background

check. As this was a result of a shift in lower energy threshold for "T<sup>0</sup>", the higher energy T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> readings were about the same for both instruments; anomaly to background ratio for "T<sup>0</sup>", was the same for both instruments. Readings taken by different instruments are shown clearly on the accompanying plan.

Results & Conclusions: A total of 40.5 line miles were surveyed. Normal background (in terms of Instrument No. 569-01) vary from about 11,000 CPM to 20,000 CPM with higher values over pink granites. Several point anomalies more than 100,000 CPM, of U, U/Th and Th composition over a few square feet area were detected over pegmatitic facies. This is typical for the Andrew Lake region. No significant U-anomaly was found.

No readily detectable economic U-mineralization is likely to exist in the surveyed area.

Instrumentation: McPhar's gamma spectrometer TV-5, No. 569-11 and No. 569-01.

Sensitivity: Approximately 2 PPM equivalent U

Calibration: Using standard Th source

#### Emanometry

In order to search for possible economic U-mineralization in areas covered by beach sands to the north and NW of Carrot Lake radioactive zone, a highly sensitive and deep penetrating method, an emanometric survey,

was conducted over this area. The overburden in this region is believed to be generally less than 50 feet, comprised mostly of beach sands resting directly on the bedrock, and largely without any impermeable clayish sediments. In such favorable overburden conditions, this technique works "directly" up to about 50 feet, and considering secondary chemical dispersion, probably well in excess of 100 feet.

The survey was conducted by J. Panenka (geophysicist) and three helpers on June 27 & 28, 1971 (see Plate 3).

Field Procedure: The survey was conducted along 400-foot-spaced flagged lines from cut and picketed base lines running N-S. Readings were taken at 50-foot intervals. Soil gas samples were taken from hand-driven holes about 3 feet deep and 2/3 inches in diameter. Approximately 8 litres of air were pumped from each hole, and at every tenth station instrumental background was read using equal amounts of atmospheric air. Contamination exceeding 1 Eman was not tolerated. At each station "total" concentration of radioactive emanation, Radon<sup>222</sup> + Thoron<sup>220</sup>, was recorded. When "total" concentration exceeded approximately 2x background, a repeated reading was taken with a two minute delay, so as to separate, in time domain, Rn<sup>222</sup> from Th<sup>220</sup>.

Results & Conclusions: A total of 895 stations were read, or 8.6 miles of profiles. Background values varied from 4-15 Emans, predominantly (> 60%) of Th<sup>220</sup> composition; this value is quite typical of shallow sandy

sediments. Occasional higher values up to 26 Emans proved to be of mostly  $\text{Tn}^{220}$  (> 60%). No  $\text{Rn}^{222}$  anomalies were detected.

Interpretation of the survey results indicate that there is no evidence of U-mineralization in the surveyed area.

Instrumentation:

Emanometer: Scintrex ETR-1

Sensitivity - 1 Eman or approx. 0.1 PPM of U  
in Equilibrium

Calibration - Done by Scintrex Ltd. 3 days prior  
to the survey

Personnel: Operator J. Panenka (geophysicist) and 3 helpers

COSTS

The field program was aircraft supported, and a tent camp-site was situated at the S end of Andrew Lake. No major billings are thought to be outstanding at this time, and the total cost of this season's work as of the end of July is \$14,498 (including all salaries, transportation, aircraft and camp maintenance).

CONCLUSIONS & RECOMMENDATIONS

The radiometric, emanometric and geological surveys conducted on Permit #158 during the 1971 field season did not delineate any area worthy



of further exploration. Some local radiometric "highs" were determined to be local in extent and resultant of minor increases in Th and U as basic rock forming minerals in granites or pegmatites.

In the light of present information, additional work cannot be recommended.

Signed:



E. C. Burgan  
Prof. Eng. B.C.

QUARTZ MINERAL EXPLORATION PERMIT No. 158

(74M/16)

HUDSON'S BAY OIL & GAS COMPANY LIMITED,  
320-7th AVENUE S.W.,  
CALGARY 2, ALBERTA

DATE OF ISSUE - JULY 31, 1970  
AREA - 7,840 ACRES

TP. 125

TP. 124

TP. 123

R. 2

R. 1 W. 4 M.

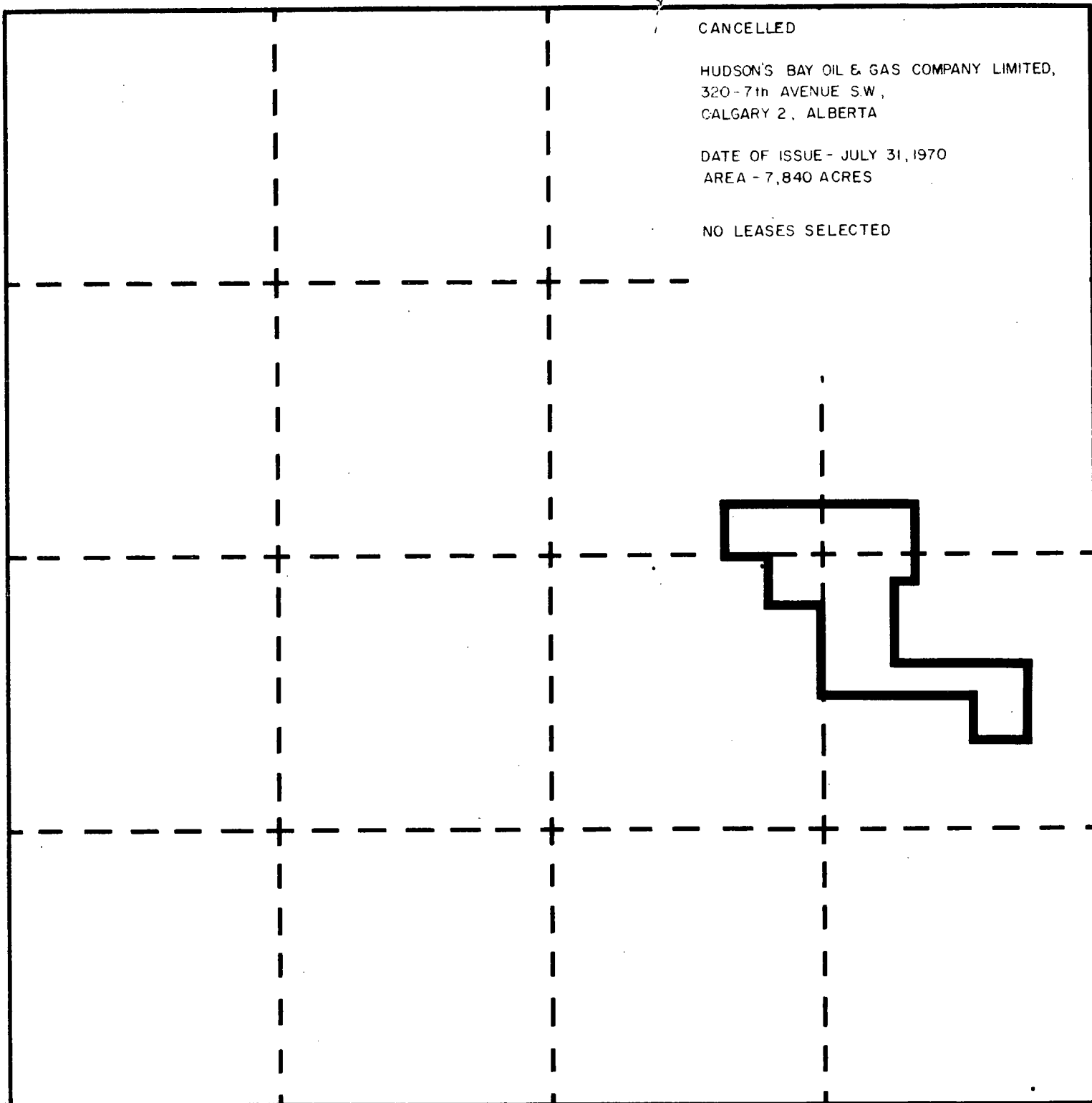
# QUARTZ MINERAL EXPLORATION PERMIT No. 158

CANCELLED

HUDSON'S BAY OIL & GAS COMPANY LIMITED,  
320-7th AVENUE S.W.,  
CALGARY 2, ALBERTA

DATE OF ISSUE - JULY 31, 1970  
AREA - 7,840 ACRES

NO LEASES SELECTED



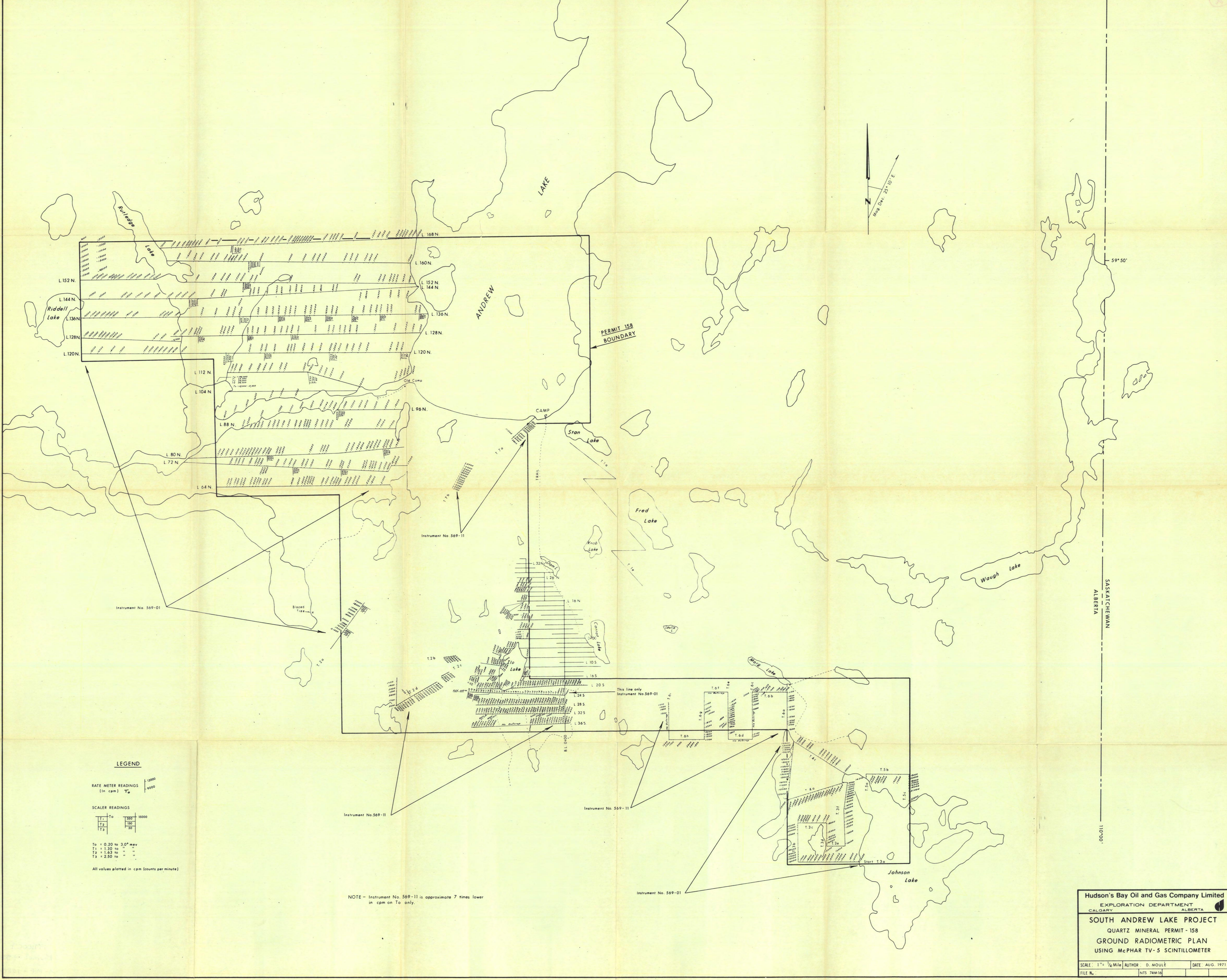
TP. 125

TP. 124

TP. 123

R. 2

R. 1 W. 4 M.



**LEGEND**

RATE METER READINGS  
(in cpm)  $T_0$

SCALER READINGS

T1	To	1500	15000
T2		150	
T3		50	

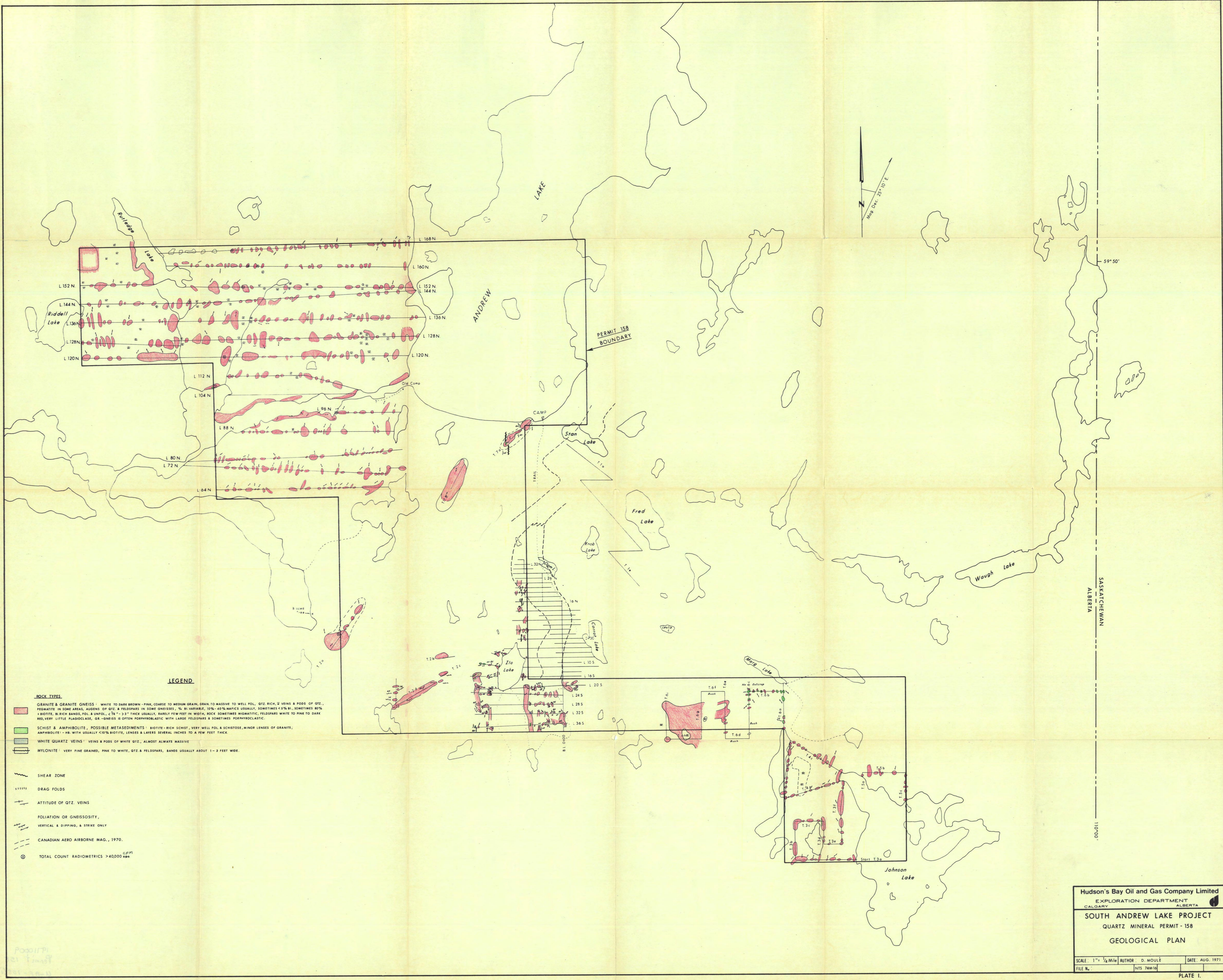
To = 0.20 to 3.0<sup>+</sup> mev  
 T1 = 1.30 " "  
 T2 = 1.63 " "  
 T3 = 2.50 " "

All values plotted in cpm (counts per minute)

NOTE - Instrument No. 569-11 is approximate 7 times lower in cpm on T<sub>0</sub> only.

Hudson's Bay Oil and Gas Company Limited  
 EXPLORATION DEPARTMENT ALBERTA  
 CALGARY  
**SOUTH ANDREW LAKE PROJECT**  
 QUARTZ MINERAL PERMIT - 158  
 GROUND RADIOMETRIC PLAN  
 USING McPHAR TV-5 SCINTILLOMETER

SCALE: 1" = 1/4 Mile AUTHOR: D. MOULÉ DATE: AUG. 1971  
 FILE No. NTS 74M14



**LEGEND**

- ROCK TYPES**
- GRANITE & GRANITE GNEISS: WHITE TO DARK BROWN - PINK, COARSE TO MEDIUM GRAIN, GRAN TO MASSIVE TO WELL FOL. QTZ. RICH, 2 VEINS & PODS OF QTZ., PEGMATITE IN SOME AREAS, AUGENS OF QTZ. & FELDSPARS IN SOME GNEISSES, % BI. VARIABLE, 10% - 40% MAFICS USUALLY, SOMETIMES <5% BI., SOMETIMES 80% BIOTITE, BI. RICH BANDS, FOL. & UNFOL. C. 3/4" - 2" THICK USUALLY, RARELY FEW FEET IN WIDTH, ROCK SOMETIMES MIDMATIC, FELDSPARS WHITE TO PINK TO DARK RED, VERY LITTLE PLAGIOCLASE, GR. - GNEISS IS OFTEN PORPHYROBLASTIC WITH LARGE FELDSPARS & SOMETIMES PORPHYROCLASTIC.
  - SCHIST & AMPHIBOLITE, POSSIBLE METASEDIMENTS: BIOTITE - RICH SCHIST, VERY WELL FOL. & SCHISTOSE, MINOR LENSES OF GRANITE, AMPHIBOLITE - HB. WITH USUALLY <10% BIOTITE, LENSES & LAYERS SEVERAL INCHES TO A FEW FEET THICK.
  - WHITE QUARTZ VEINS: VEINS & PODS OF WHITE QTZ., ALMOST ALWAYS MASSIVE.
  - MYLONITE: VERY FINE GRAINED, PINK TO WHITE, QTZ. & FELDSPARS, BANDS USUALLY ABOUT 1 - 3 FEET WIDE.
- SHEAR ZONE
- DRAG FOLDS
- ATTITUDE OF QTZ. VEINS
- FOLIATION OR GNEISSOSITY, VERTICAL & DIPPING, & STRIKE ONLY
- CANADIAN AERO AIRBORNE MAG., 1970.
- TOTAL COUNT RADIOMETRICS >40,000 c.p.m.

Hudson's Bay Oil and Gas Company Limited  
 EXPLORATION DEPARTMENT  
 CALGARY ALBERTA

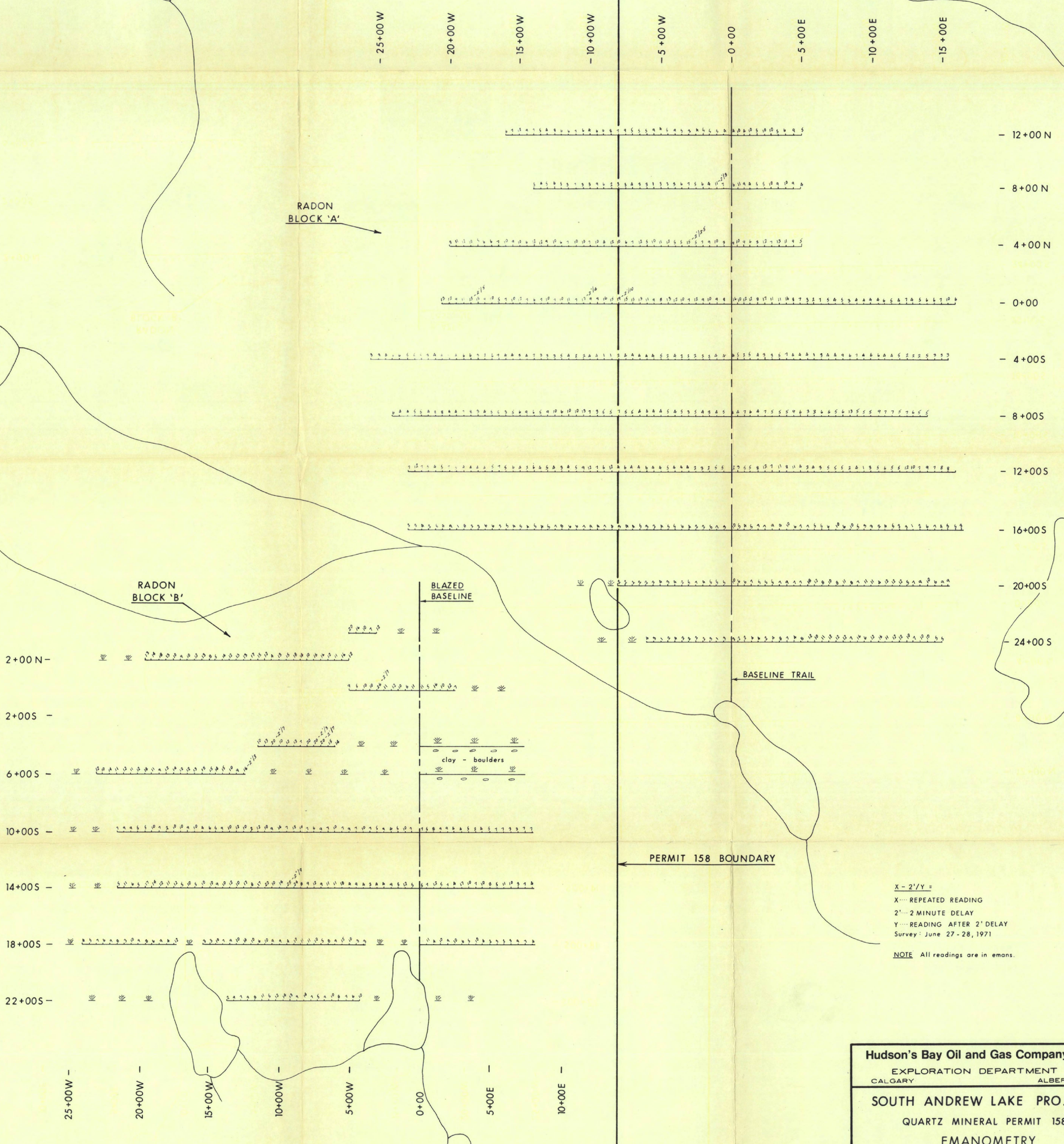
**SOUTH ANDREW LAKE PROJECT**  
 QUARTZ MINERAL PERMIT - 158

**GEOLOGICAL PLAN**

SCALE: 1" = 1/4 Mile AUTHOR: D. MOULÉ DATE: AUG. 1971  
 FILE No.: NTS 74M-14

PLATE 1  
 19710009

ANDREW LAKE



RADON BLOCK 'A'

RADON BLOCK 'B'

BLAZED BASELINE

BASELINE TRAIL

PERMIT 158 BOUNDARY

clay - boulders

X - 2'/Y =  
 X --- REPEATED READING  
 2' --- 2 MINUTE DELAY  
 Y --- READING AFTER 2' DELAY  
 Survey: June 27-28, 1971

NOTE All readings are in emans.

<b>Hudson's Bay Oil and Gas Company Limited</b> EXPLORATION DEPARTMENT CALGARY ALBERTA		
<b>SOUTH ANDREW LAKE PROJECT</b> QUARTZ MINERAL PERMIT 158 EMANOMETRY BLOCKS 'A' & 'B'		
SCALE: 1"=400 Ft.	AUTHOR: J. PANENKA	DATE: JULY, 1971
FILE No:	NTS 74-M-16	