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REPORT OF WORK

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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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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 outcropping 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. Outcropping areas were checked thoroughly.

The "T₀" (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 (T₁, T₂, T₃ readings respectively). Stability of the spectrometers and levels of discrimination T₁, T₂, T₃ 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; "T₀" 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°", the higher energy T₁, T₂, T₃ readings were about the same for both instruments; anomaly to background ratio for "T°", 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\(^{222}\) + Thoron\(^{220}\), 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\(^{222}\) from
Th\(^{220}\).

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\(^{220}\) composition; this value is quite typical of shallow sandy
sediments. Occasional higher values up to 26 Emans proved to be of mostly Tn\textsuperscript{220} (\textgreater 60\%). No Rn\textsuperscript{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

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
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