

# MAR 19690040: MARGUERITE RIVER

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19690040

ECONOMIC MINERALS  
FILE REPORT No.  
U-AF-074(2)  
U-AF-075(2)

REPORT ON AIRBORNE RADIOACTIVE  
SPECTROMETER SURVEY  
PERMIT NUMBERS 117 and 118  
MARGUERITE RIVER AREA, ALBERTA  
ON BEHALF OF  
RADEX MINERALS LTD

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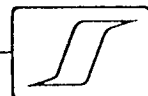
November 1969

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Radex Minerals Limited  
Scale: 1" = 1320'

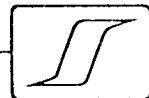


## SUMMARY

During September and October 1969, Seigel Associates Limited executed an airborne radioactive spectrometer survey over Permit Numbers 117 and 118, in the Marguerite River area, Alberta on behalf of Radex Mineral Ltd.

A total of 1230 line miles covering an area of approximately 147 square miles were surveyed.

Nine distinct anomalous zones and a large number of isolated individual anomalies were indicated by the present survey. Uranium indications were few and generally low in amplitude although the thorium response was strong in places.



REPORT ON AIRBORNE RADIOACTIVE  
SPECTROMETER SURVEY  
PERMITS NUMBERS 117 and 118  
MARGUERITE RIVER AREA, ALBERTA  
ON BEHALF OF  
RADEX MINERALS LTD.

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INTRODUCTION

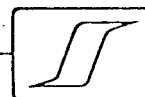
During the period September 18th to 20th, 1969, an airborne radioactive spectrometer survey was undertaken over Permits Numbers 117 and 118 in the Marguerite River area, Alberta by Seigel Associates Limited on behalf of Radex Minerals Ltd. One thousand, two hundred and thirty line miles were flown over the Permit area.

Figure 1 (NTS Map 74E, scale 1"=8 miles) gives the location of the permits.

The purpose of the survey was to map the distribution of radioactive material within the permit area and distinguish between potassium, uranium and thorium sources.

SURVEY EQUIPMENT, PROCEDURES AND STATISTICS

The spectrometer survey assembly used in the present survey consists of four sodium iodide thallium activated Harshaw crystals each 5" in diameter and 4" thick. The crystals are housed in an environmentally controlled and thermally isolated detector probe. Each of the crystals is coupled to a 5" magnetically shielded photo multiplier tube whose output is fed into a four channel gamma ray spectrometer manufactured by Scintrex Limited.



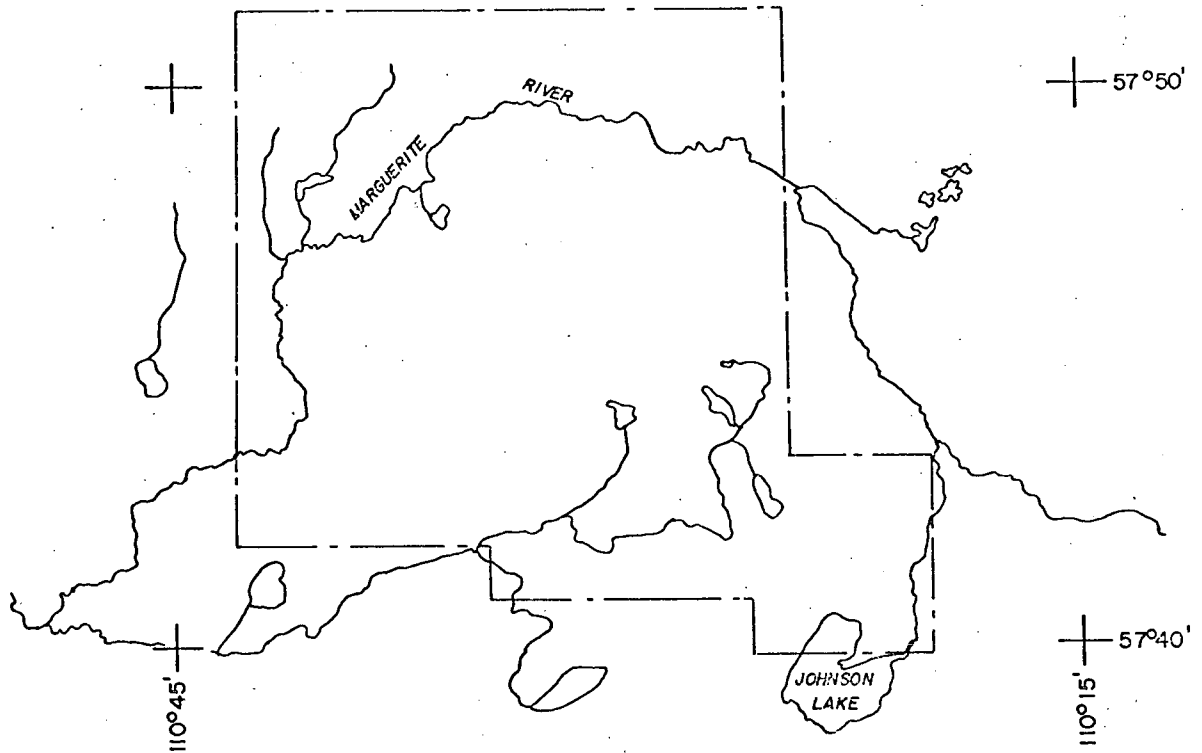


FIGURE 1

LOCATION MAP

RADEX MINERALS LIMITED

MARGUERITE RIVER AREA

ALBERTA

AIRBORNE GEOPHYSICAL SURVEYS

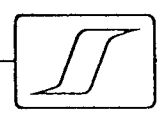
SCALE : 1 : 250,000

This spectrometer accepts only gamma energies falling above a fixed threshold in each of the four channels. By appropriate proportioning in the analogue computer circuit (based upon equilibrium within the radioactive series) the spectrometer readout is indicative of the kind of radioactive material present on the ground. Four discrete pieces of information -- Broadband, Potassium -40, Uranium and Thorium -- can be simultaneously observed. This information is recorded in analogue form on a six channel hot pen recorder manufactured by MFE, Massachusetts.

Photographs of the ground were taken using a Vinten Mark 3, 16 mm positioning camera, with sufficient frequency of exposure to give a complete record of the aircraft's flight path. A Scintrex IV-1 solid state intervalometer provided regularly spaced timing plause which drove the camera exposure mechanism and also produced synchronous fiducial marks on the side pen of the MFE recorder. Thus due to the synchronization of the geophysical traces and positioning camera, it was possible to relate the geophysical responses to their correct ground location.

The altitude of the aircraft, accurate to  $\pm 10$  feet, was recorded permanently on one channel of the MFE recorder using a Bonzer radio altimeter (Model TRN-70) operating at 1600 MHz.

The spectrometer, camera, altimeter and intervalometer were installed in a twin engine Beech Baron. The air crew consisted of pilot, navigator and equipment operator. Navigation was by visual contact using



mosaics on the scale of 1"=1/2 mile. The aircraft was flown along the proposed lines at an altitude of some 150' to 250' and at an average air speed of 160 mph. Survey lines were flown north-south at a nominal 660' line interval.

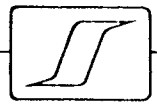
PRESENTATION OF DATA

The results of the airborne survey are presented on Plates 1, 2, 3, and 4, on the scale of 1" = 1320'. The plates were prepared using, as a base, the photomosaics of the survey area. Flight lines, permit boundaries and fiducial numbers are shown on this plan. The four channel radioactive spectrometer results are plotted with each anomaly being identified by its peak location and maximum width along with the numerical presentation of the counts recorded on each of the four channels, namely, net thorium counts, net uranium counts, net potassium-40 counts, as well as broadband counts. All values are in counts per second above local background.

The original geophysical traces are on the following scales:

MFE recorder (from top to bottom of chart)

1st channel	-----	
2nd channel	Altimeter channel	Logarithmic
3rd channel	Thorium channel	2 cps/mm
4th channel	Uranium channel	6 cps/mm
5th channel	Potassium channel	6 cps/mm
6th channel	Broadband channel	20 cps/mm





DISCUSSION OF RESULTS

Nine distinct regions of anomalous radioactivity were observed in the area as well as a number of isolated anomalies on one line only.

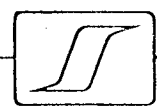
Zone 1: Zone 1 occurs on lines 19-25. It strikes about NE-SW and is about 5300' long. <sup>1615m</sup> The individual anomalies making up the zone have half widths ranging from 400' - 900'. <sup>122 274</sup> Of the seven anomalies in the zone only one shows a response in the uranium channel, ( 12 c. p. s. anomaly C line 21). Ground work would be required to evaluate its significance.

Zone 2: This small zone is composed of only two anomalies on lines 29 and 30, separated by 600' and with half widths of approximately 1000'. <sup>182 304.8</sup> Anomaly A on line 30 gave 18 c. p. s. on the uranium channel, the highest observed during the course of the present survey, no uranium activity was observed on line 29. Possibly of some residual interest.

Zone 3: Zone 3 strikes NW-SE for about 2500' on lines 35-38 inclusive. It shows thorium and potassium responses only. The broadband response is comparatively high. Unlikely to be significant.

Zone 4: Zone 4 (lines 44, 45, 46) also displays weak thorium and potassium activity over a zone striking NW-SE. The half widths vary from 400' to 1000'. Probably not significant.

Zone 5: Zone 5 strikes NE for approximately 2800'. The anomalies on lines 51, 52 and 53, show only weak thorium and potassium. A weak uranium indication (9 c. p. s.) occurs on line 50. Half widths decrease from 1000' (anomaly 50A) to 400' (53A). Of doubtful significance.



Zone 6: Zone 6 shows radioactivity on two lines only, 56 and 57.

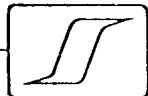
Two peaks occur on line 56, anomaly B shows a weak uranium response (9 c. p. s.) over a half width of 600'.

Zone 7: The anomalies on lines 61, 62 and 63, have been tentatively linked as one zone although the existence of two or more bands striking NE-SW is possible. The uranium response (anomaly B line 62 and anomaly C line 63) is too weak to be positively distinguished against the background. The width of the zone broadens to the east, from 400', anomaly A line 61, to an overall width of about 4000', anomalies A, B, and C on line 63. The thorium response is moderate (15 to 25 cps) but the broadband response of the north-western most band of anomalies is strong (62A, 62B, and 61A). In this region the survey altitude was comparatively high.

Zone 8: Consists of anomalies 65B and 66A. Shows very weak response. The zone is only properly visible in the broadband channel. Probably not significant.

Zone 9: This is a distinct broadband anomaly (about 300 c. p. s.) with very weak thorium and potassium activity. The zone strikes NW-SE with half-widths generally ranging from 500' to 600'.

Isolated anomalies are indicated throughout. Only two, C and D on line 62, display any uranium response and these may be a continuation of zone 6. The remaining individual anomalies show no uranium and only weak thorium (less than 15 c. p. s.) and potassium radioactivity.



The amplitude of the individual peak response of a given occurrence is related to its percent potassium, uranium and thorium respectively, its surface area of exposure to the airborne detector system, the elevation of the aircraft above the ground and its airspeed. Thus, any one recorded anomaly in this present survey could be caused by a high grade concentration over a limited size area, or alternatively, lower grade concentration over a larger area. Only ground investigations can resolve the actual significance of each individual anomaly.

In a ground follow-up program, priority should be given to those anomalies exhibiting the highest peak values. Detailed investigation should be made of areas where anomalous trends occur. Isolated individual anomalies have often been found, on ground investigation, to have been caused by interesting concentrations of radioactive mineralization and should not be neglected. It is not possible to give 100% coverage over the entire area surveyed and between individual flight traverses, there is a sizeable area which, as yet has not been effectively surveyed and which should be investigated in the vicinity of each radioactive occurrence found to be of interest on the ground.

Respectfully submitted,

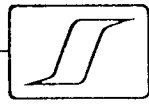
[Redacted Signature]

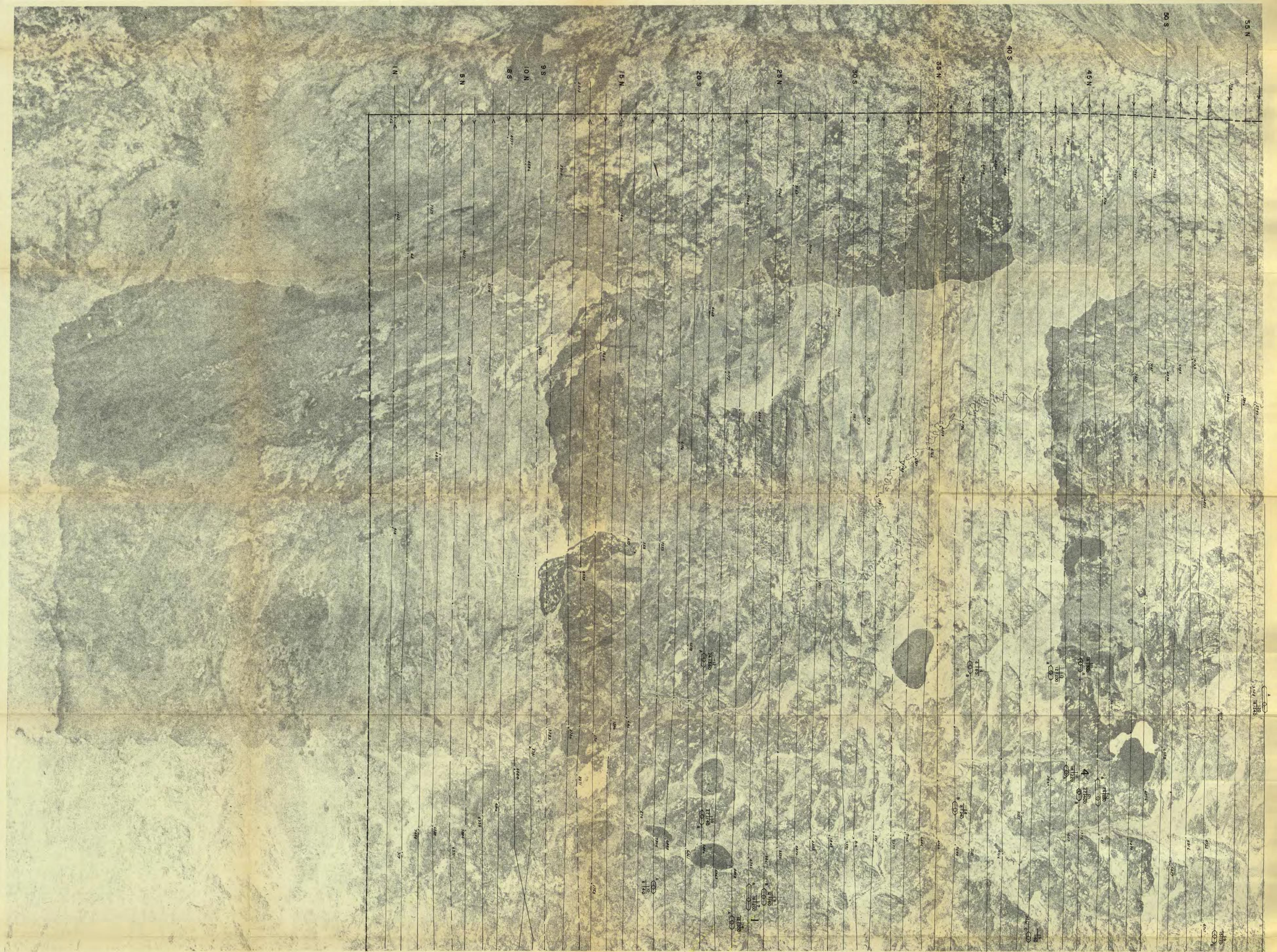
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[Redacted Signature]

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Consulting Geophysicist.

TORONTO, Ontario.  
November 1969





**RADIOMETRIC ANOMALY PLAN**

**LEGEND:**

- 34W ← FLIGHT LINE NUMBER, DIRECTION AND NUMBERED CONTROL POINT
- ANOMALY DISTRIBUTION:
  - URANIUM → 2017
  - THORIUM → 2017
  - POTASSIUM → 9180
  - BROAD BAND → 9180
- VALUES IN COUNTS PER SECOND ABOVE BACKGROUND
- ANOMALY EXTENT (HALF-WIDTH) AND PEAK LOCATION

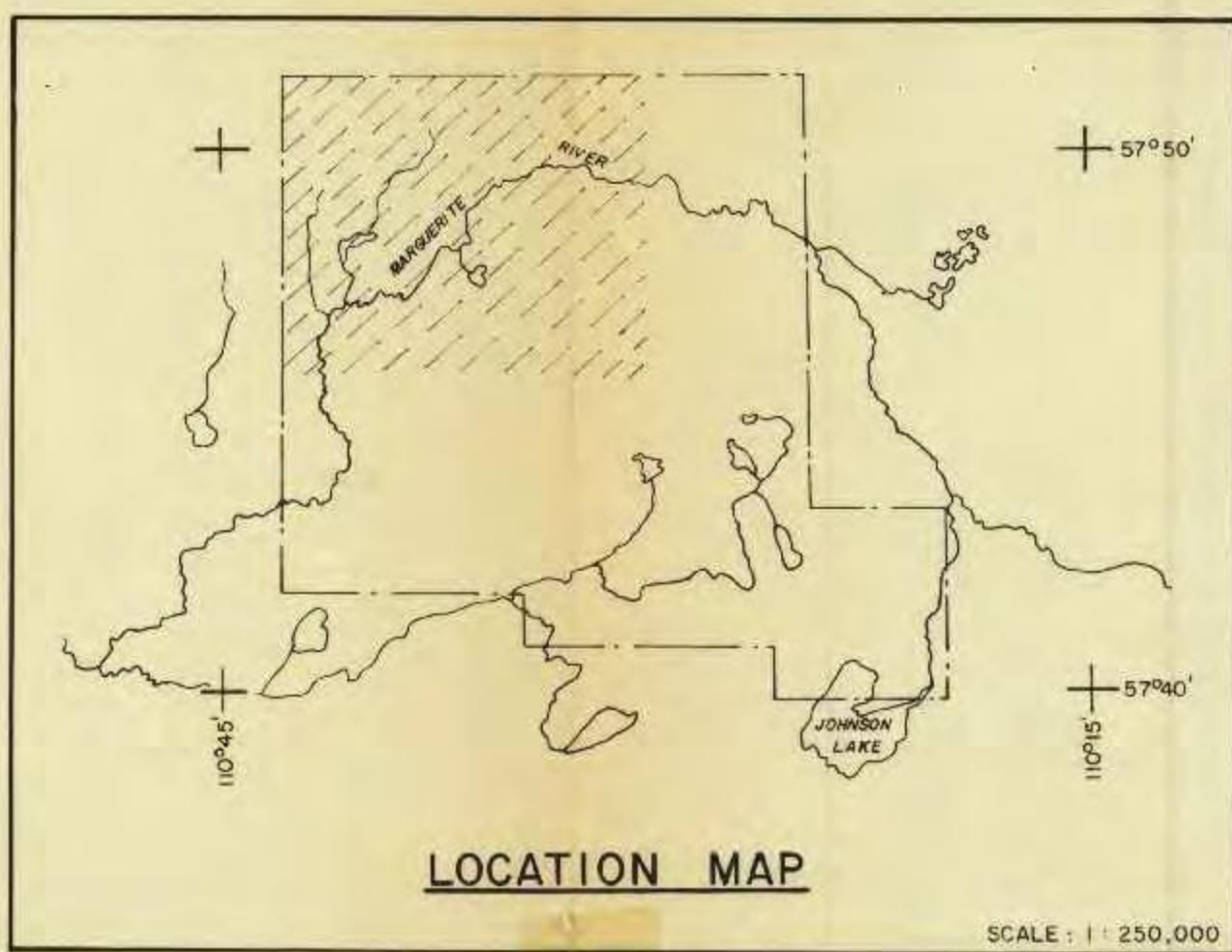


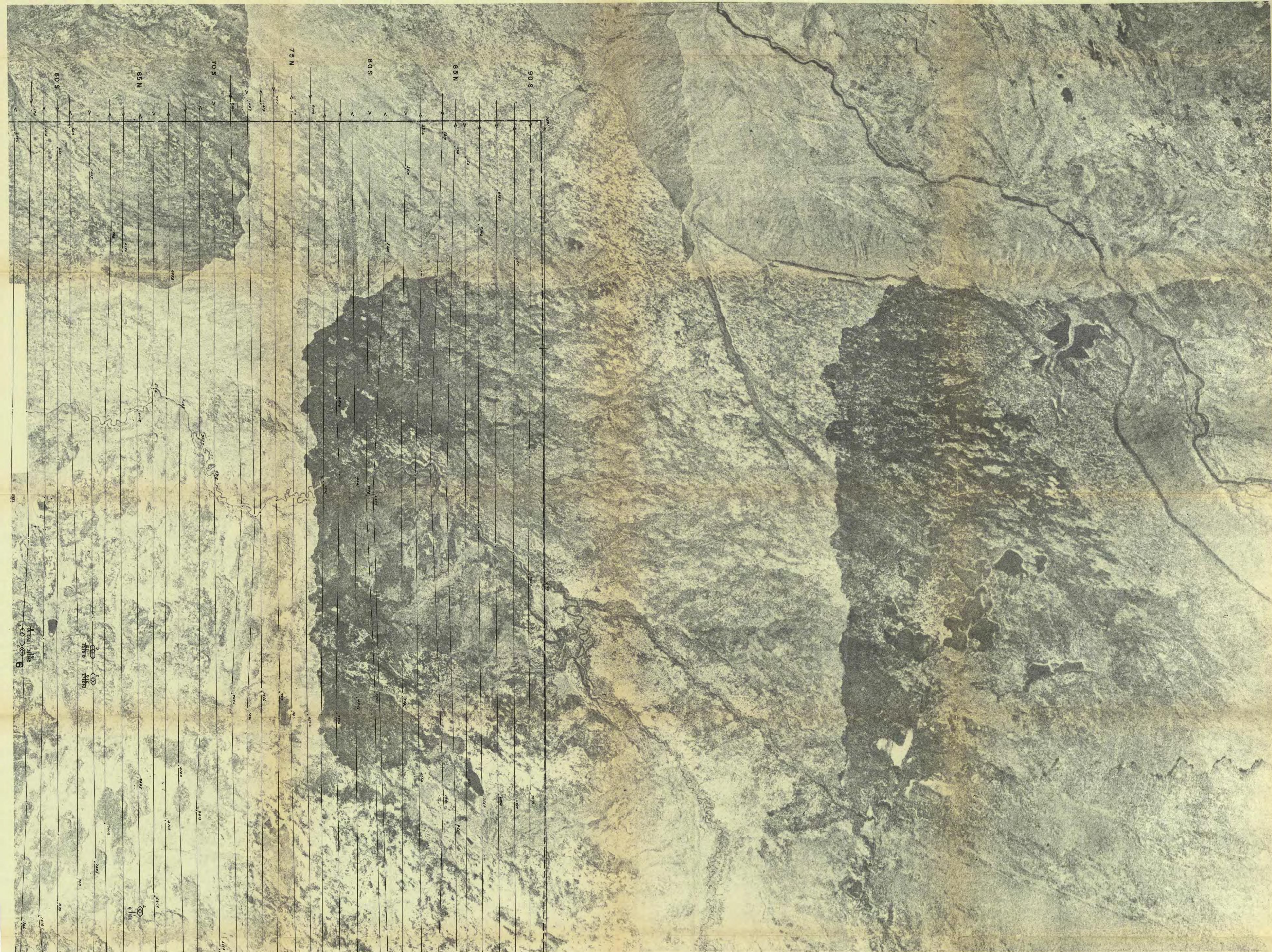
PLATE I  
**RADEX MINERALS LIMITED**  
 PERMITS 117 & 118  
 MARGUERITE RIVER AREA, ALBERTA  
**AIRBORNE GEOPHYSICAL SURVEY**

SCALE: 1" = 1320'

SURVEY BY SEIGEL ASSOCIATES LIMITED  
 FLOWN AND COMPILED SEPT. - OCT. 1969

FLIGHT ALTITUDE ≈ 200'  
 FLIGHT LINE SPACING ≈ 660'





**RADIOMETRIC ANOMALY PLAN**

**LEGEND:**

- 34W ← ———— FLIGHT LINE NUMBER, DIRECTION AND NUMBERED CONTROL POINT
- ANOMALY DISTRIBUTION:
  - URANIUM ———— THORIUM
  - POTASSIUM ———— BROAD BAND
- VALUES IN COUNTS PER SECOND ABOVE BACKGROUND
- ———— ANOMALY EXTENT (HALF-WIDTH) AND PEAK LOCATION

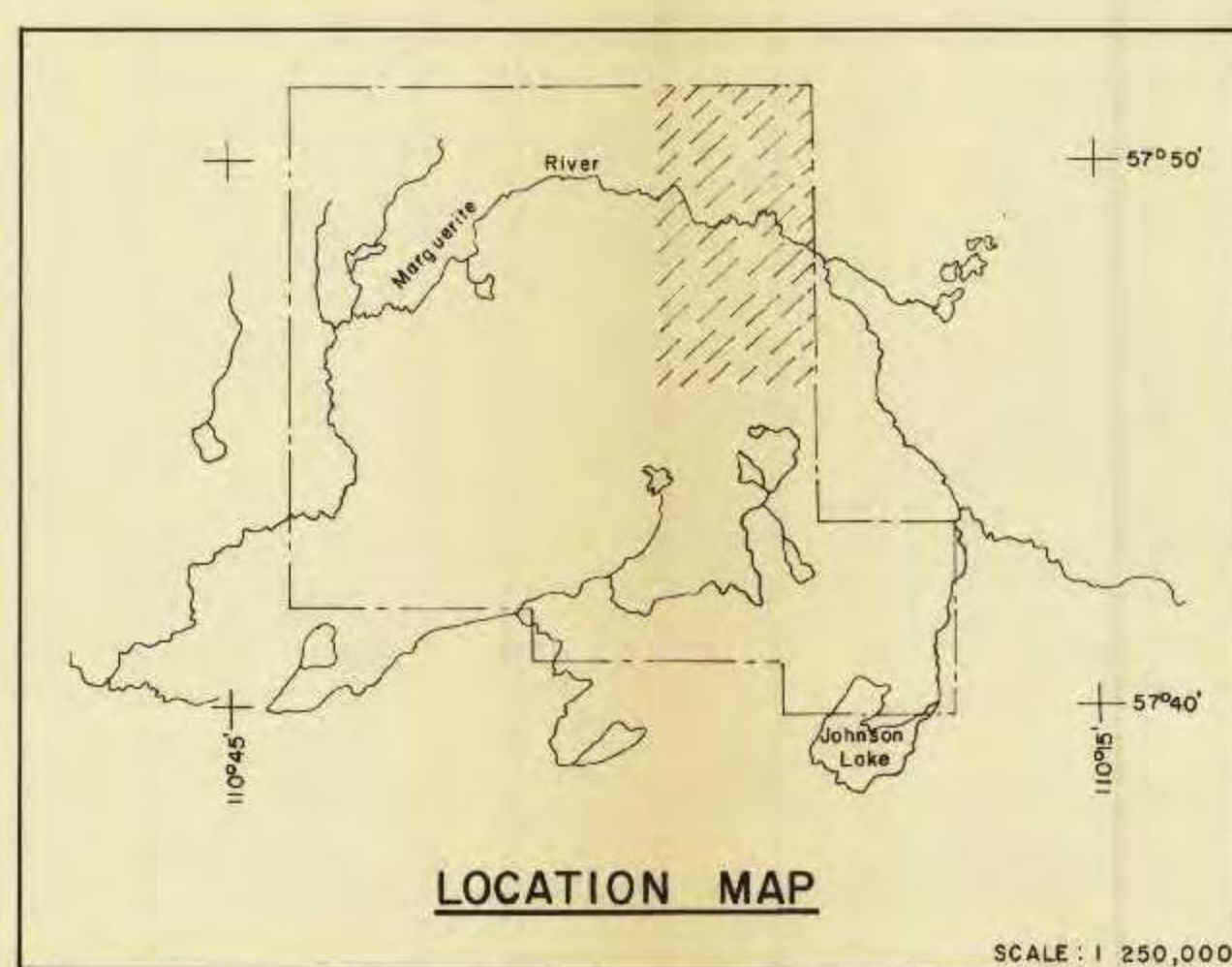
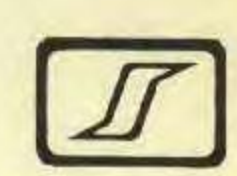
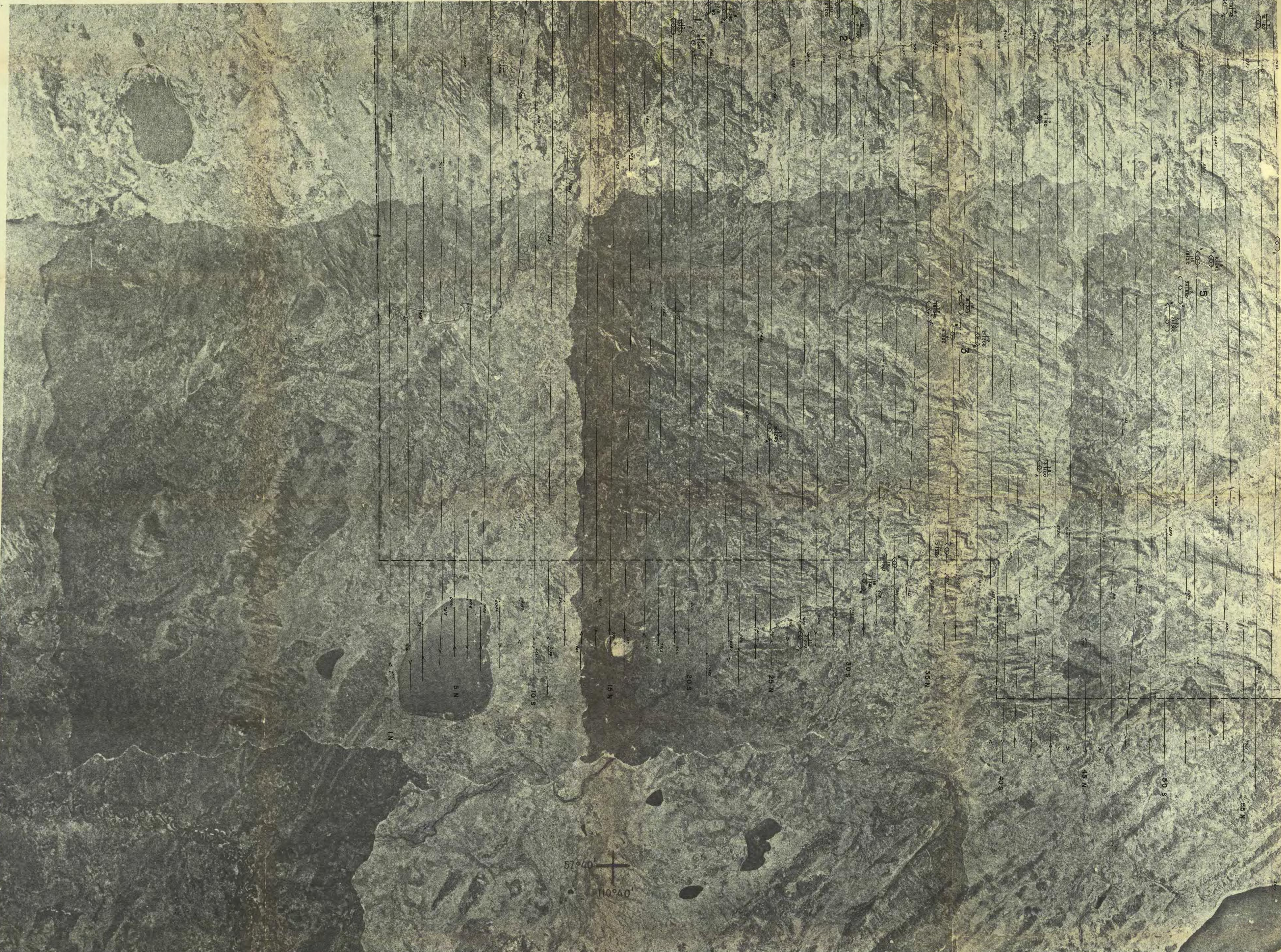


PLATE 2  
**RADEX MINERALS LIMITED**  
 PERMITS 117 & 118  
 MARGUERITE RIVER AREA, ALBERTA  
**AIRBORNE GEOPHYSICAL SURVEY**

SCALE: 1" = 1320'  
 SURVEY BY SEIGEL ASSOCIATES LIMITED  
 FLOWN AND COMPILED SEPT. - OCT. 1969  
 FLIGHT ALTITUDE ≈ 200'  
 FLIGHT LINE SPACING ≈ 660'





**RADIOMETRIC ANOMALY PLAN**

**LEGEND:**  
 34W ← 302 FLIGHT LINE NUMBER, DIRECTION AND NUMBERED CONTROL POINT  
 ANOMALY DISTRIBUTION:  
 URANIUM → 201 ← THORIUM  
 POTASSIUM → 100 ← BROAD BAND  
 VALUES IN COUNTS PER SECOND ABOVE BACKGROUND  
 ○ ANOMALY EXTENT (HALF-WIDTH) AND PEAK LOCATION

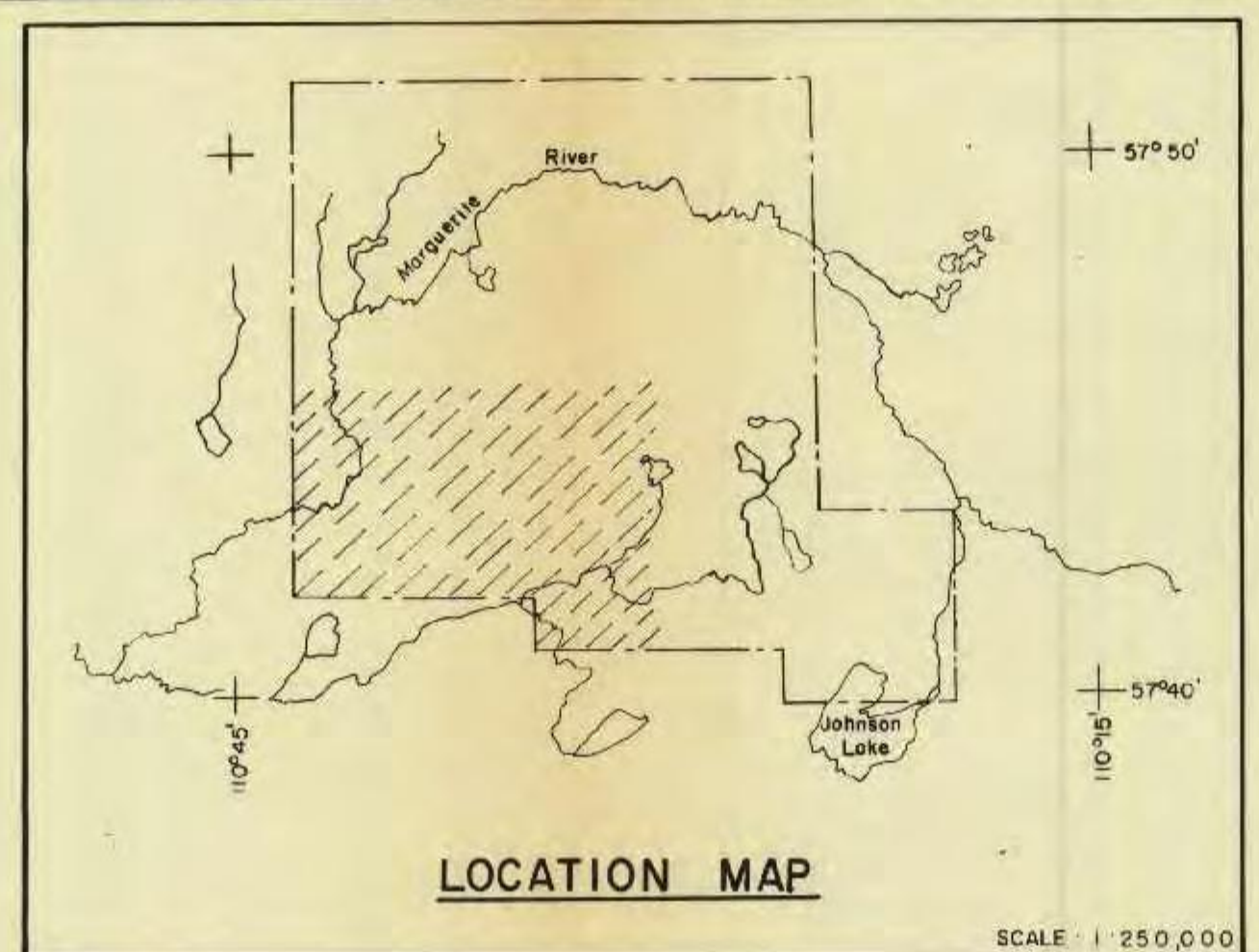
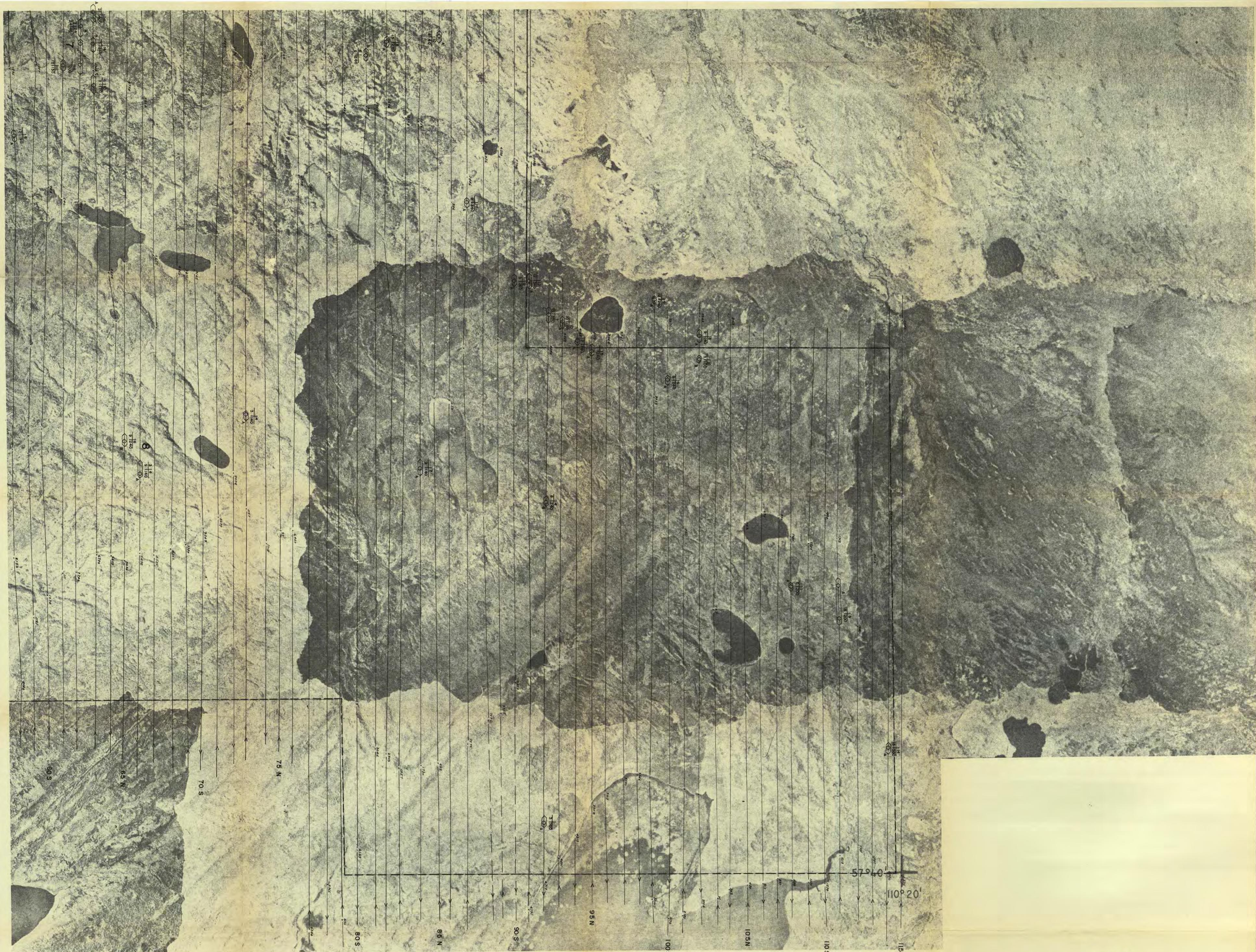


PLATE 3

**RADEX MINERALS LIMITED**  
 PERMITS 117 & 118  
 MARGUERITE RIVER AREA, ALBERTA  
**AIRBORNE GEOPHYSICAL SURVEY**

SCALE: 1" = 1320'  
 SURVEY BY SEIGEL ASSOCIATES LIMITED  
 FLOWN AND COMPILED SEPT. - OCT. 1969  
 FLIGHT ALTITUDE ≈ 200'  
 FLIGHT LINE SPACING ≈ 660'

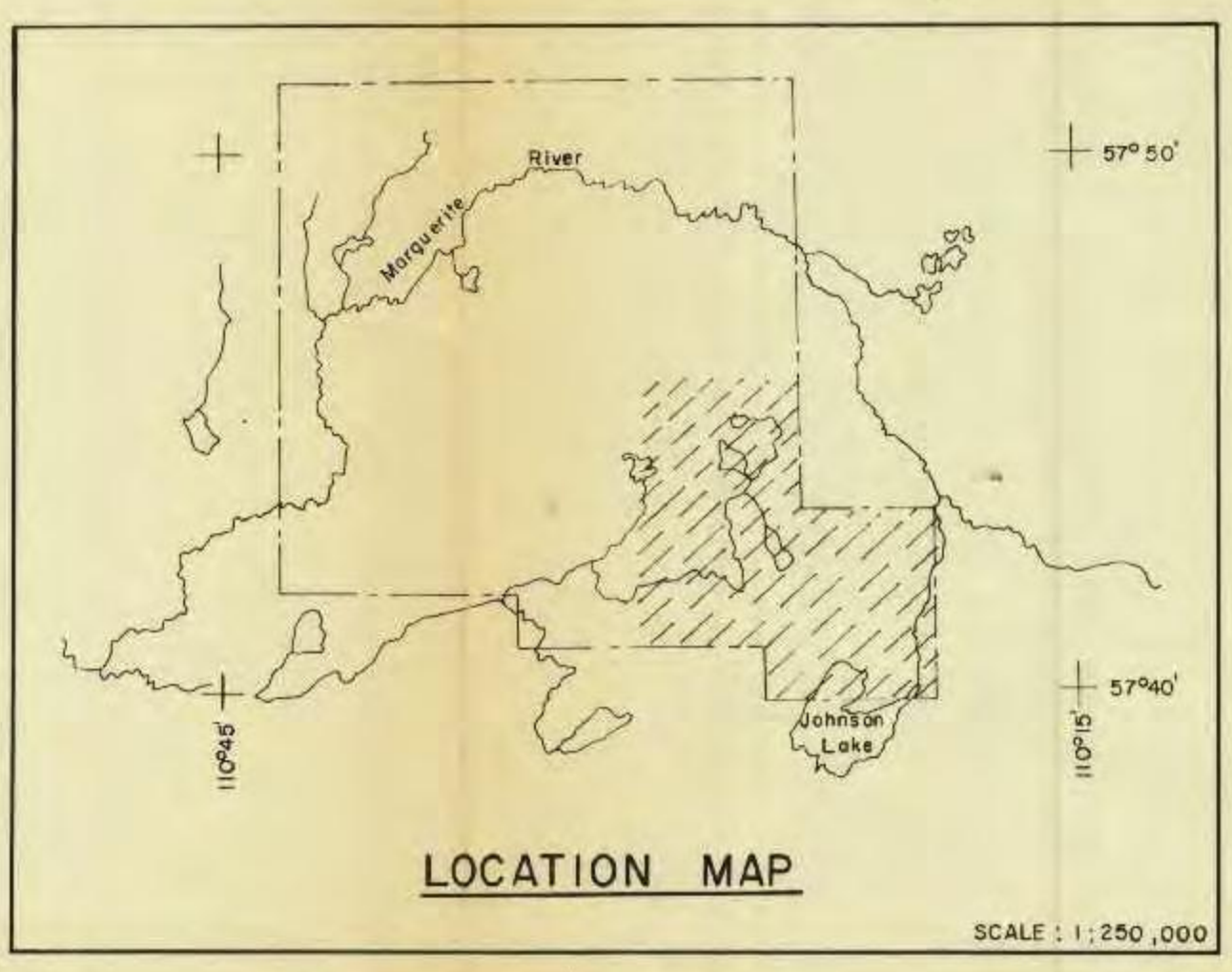




**RADIOMETRIC ANOMALY PLAN**

**LEGEND:**

- 34W ← FLIGHT LINE NUMBER, DIRECTION AND NUMBERED CONTROL POINT
- ANOMALY DISTRIBUTION:
  - URANIUM
  - POTASSIUM
  - BROAD BAND
- VALUES IN COUNTS PER SECOND ABOVE BACKGROUND
- ANOMALY EXTENT (HALF-WIDTH) AND PEAK LOCATION



**LOCATION MAP**

SCALE: 1:250,000

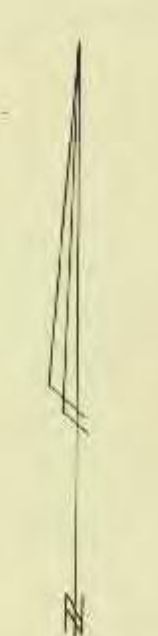


PLATE 4  
**RADDEX MINERALS LIMITED**  
 PERMITS 117 & 118  
 MARGUERITE RIVER AREA, ALBERTA  
**AIRBORNE GEOPHYSICAL SURVEY**

SCALE: 1" = 1320'

SURVEY BY SEIGEL ASSOCIATES LIMITED  
 FLOWN AND COMPILED SEPT. - OCT. 1969

FLIGHT ALTITUDE ≈ 200'  
 FLIGHT LINE SPACING ≈ 660'

