

# GM 60916

GEOLOGICAL ASSESSMENT REPORT ON THE LAC BIENVILLE CLAIM BLOCKS, LAC BIENVILLE AREA

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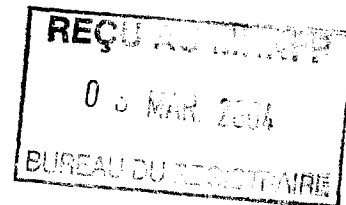
**GEOLOGICAL ASSESSMENT REPORT  
ON THE LAC BIENVILLE CLAIM BLOCKS  
LAC BIENVILLE AREA  
CHIBOUGAMAU MINING DISTRICT  
NORTHERN QUEBEC**

**For**

**INTERACTIVE ENTERPRISES INC**  
1150-355 Burrard St  
Vancouver, B.C.  
V6C 2G8

MRNFP-GÉOINFORMATION 2004

**GM 60916**



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**February 2004**

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## **1.0 INTRODUCTION**

This report was prepared to provide an exploration approach to assess the potential of finding a primary source of diamonds in the subject properties and to make recommendations and a budget proposal for future exploration work.

The information, opinions, and recommendations in this report are based upon research of published geological and geochemical information, also from regional work conducted and published by Ministère des Ressources naturelles, Quebec.

The author has not physically visited the properties that are the subject of this report due to the early stage nature of the property.

## **2.0 DISCLAIMER**

This report also examines the diamond potential of northern Quebec and directly relates and compares all fundamental geological factors that the subject properties enjoy to the fundamental geological factors that apply to the northern Quebec region. The writer did not discuss or interpret any current available diamond results for the reason that the properties have never been explored or tested for diamond potential.

Individual chapters were extracted or improved by comments from external individuals who are acknowledged in each chapter.

## **3.0 LOCATIONS, ACCESS, AND PHYSIOGRAPHY** (Figure 1)

Lac Bienville properties consist of 10 claim groups, all located in the Lac Bienville area, approximately 65-85 kilometers south of Lac Bienville and approximately 200 to 255 kilometers directly north of the newly discovered Renard kimberlitic bodies. The subject claim blocks are located in map sheet area 33I/ 1, 4, 7, 8, 9, and 10 in northern Quebec.

Access to all claim groups is by float /ski-equipped fixed-wing aircraft from a base near Hydro Quebec's site at LG-4 (Figure #1), approximately 70-125 kilometers southwest of the claim groups. Main highway access is located only a few kilometers from claim blocks # 1 and # 2 at the southeast corner of map sheet area 33I.

All claim groups occur within relatively flat, extensively glaciated terrain. Topography is dominated by 65 % wooded area and 35 % lakes in almost flat terrain. Elevation on most groups ranges from 400 to 500 meters.



The most effective time to conduct surface exploration work is between June and September. However, ground and airborne geophysical surveys can be conducted all year around.

**4.0 PROPERTY DESCRIPTION (Figure 2)**

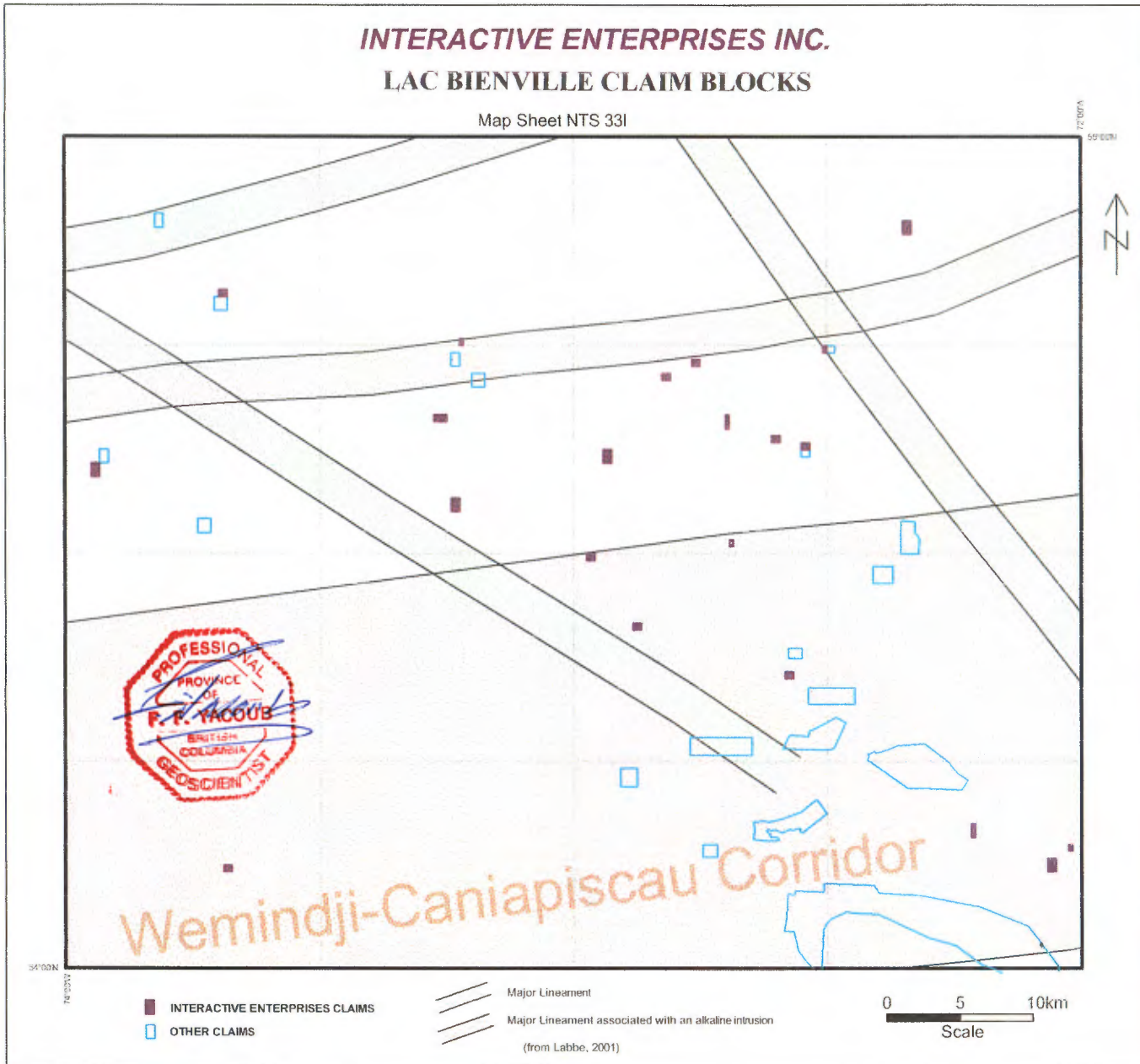
The Lac Beinville group of claims consists of 10 noncontiguous claim groups totaling 31 claims located in the Lac Bienville area in northern Quebec. A total of 24 claims owned by Mr. Richard Nesbitt of Vancouver, B.C. and 7 claims owned by Mr. Fayz Yacoub of Surrey B.C. All claims are in the process of being transferred to Interactive Enterprises Inc.

**Pertinent claim data is as follows:**

Title	Range	Column	Surface Area (ha)	Group #	Expiry Date
CDC1091225	0015	0053	50.55	1	2004 05 06
CDC1091226	0015	0054	50.55	1	2004 05 06
CDC1091227	0016	0053	50.54	1	2004 05 06
CDC1091228	0016	0054	50.54	1	2004 05 06
CDC1091229	0018	0058	50.52	2	2004 05 06
CDC1091223	0015	0038	50.51	3	2004 05 06
CDC1091224	0015	0039	50.51	3	2004 05 06
CDC1091197	0013	0051	50.25	4	2004 05 06
CDC1091198	0013	0052	50.25	4	2004 05 06
CDC1091199	0020	0015	50.17	5	2004 05 06
CDC1091200	0020	0016	50.17	5	2004 05 06
CDC1090103	0014	0008	49.93	6	2004 05 02
CDC1090104	0014	0009	49.93	6	2004 05 02
CDC1090105	0015	0008	49.92	6	2004 05 02
CDC1090106	0015	0009	49.92	6	2004 05 02
CDC1090107	0016	0055	49.92	9	2004 05 02
CDC1090108	0016	0056	49.92	9	2004 05 02
CDC1090111	0019	0037	49.88	7	2004 05 02
CDC1090112	0020	0037	49.87	7	2004 05 02
CDC1090117	0030	0060	49.77	10	2004 05 02
CDC1091186	0012	0007	49.93	8	2004 05 06
CDC1091187	0012	0008	49.93	8	2004 05 06
CDC1091188	0013	0007	49.92	8	2004 05 06
CDC1091189	0013	0008	49.92	8	2004 05 06
CDC1089924	0030	0001	49.77	10	2004 05 01
CDC1089925	0030	0002	49.77	10	2004 05 01

**INTERACTIVE ENTERPRISES INC.  
LAC BIENVILLE CLAIM BLOCKS**

Map Sheet NTS 331



**Figure # 2**

Title	Range	Column	Surface Area (ha)	Group #	Expiry Date
CDC1106044	0029	0001	49.78	10	2204 12 12
CDC1089637	0015	0055	49.93	9	2004 04 30
CDC1089638	0015	0056	49.93	9	2004 04 30
CDC1121262	0015	0057	49.93	9	2005 04 06
CDC1121263	0016	0057	49.92	9	2005 04 06

- The total area of the Claim Groups combined is 15.03 square kilometers, 1502.57 hectares, or 3696.32 acres.

## 5.0 GEOLOGICAL SETTING

### 5.1 ARCHEAN CRATONS OF THE CANADIAN SHIELD (Figure 3)

After J.A. Percival

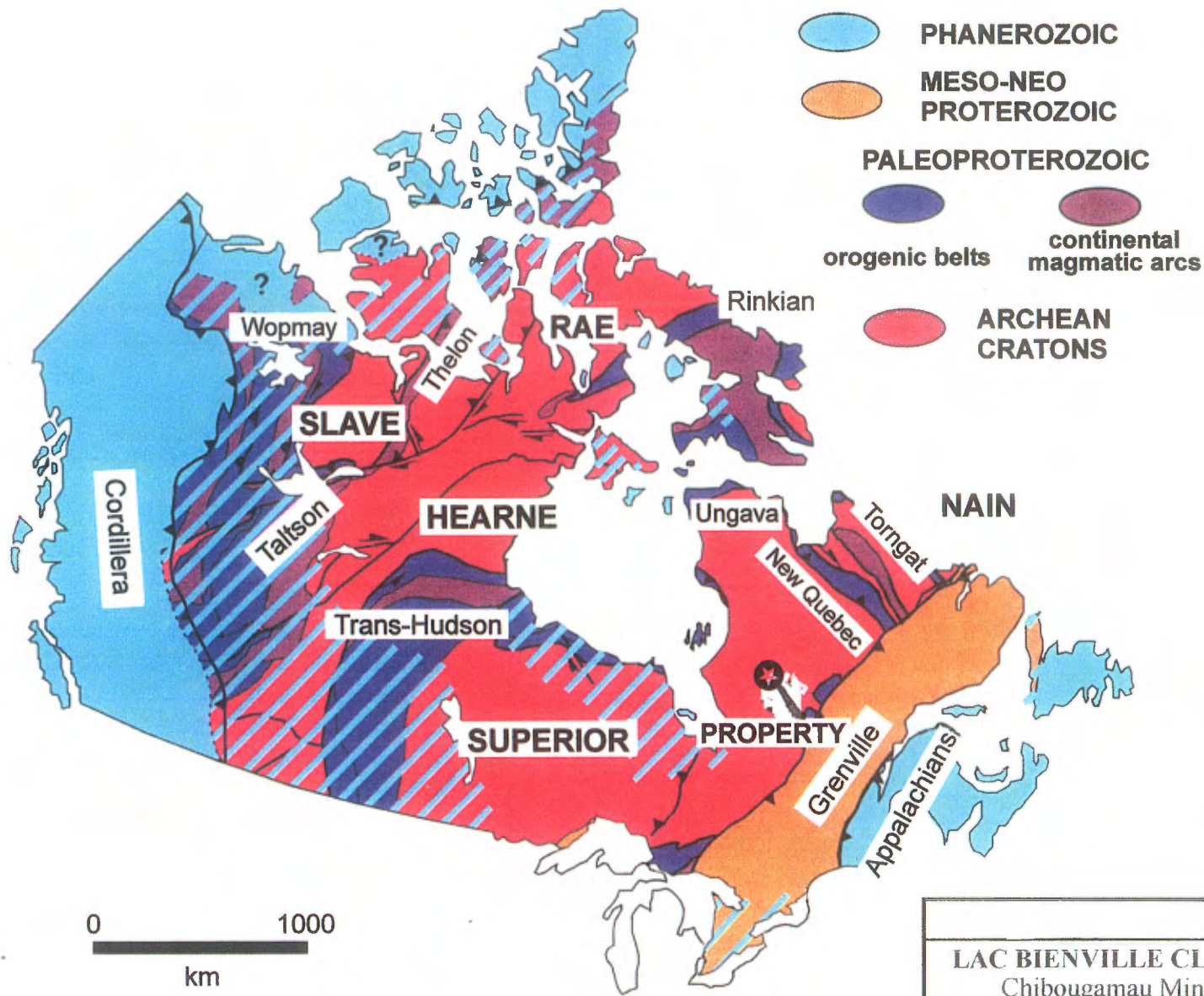
Cratons are blocks of continental crust that have not been significantly reworked since their formation. In the Canadian Shield three main cratons are of Archean age, the Superior, Slave, and Nain. The craton consists of several distinct lithotectonic sub-province types: granite-greenstone, meta-sedimentary gneiss, high-grade gneiss, and plutonic complexes. Several deformation episodes have been recognized in most parts of the Superior Province, related to multiple accretionary events and late dextral transpression (Percival and Williams, 1989; Card, 1990; Williams et al., 1992).

### 5.2 REGIONAL GEOLOGY (Figure 3 & 4)

The Northern Quebec region in which the subject properties are located is underlain by the Archean age Superior craton.

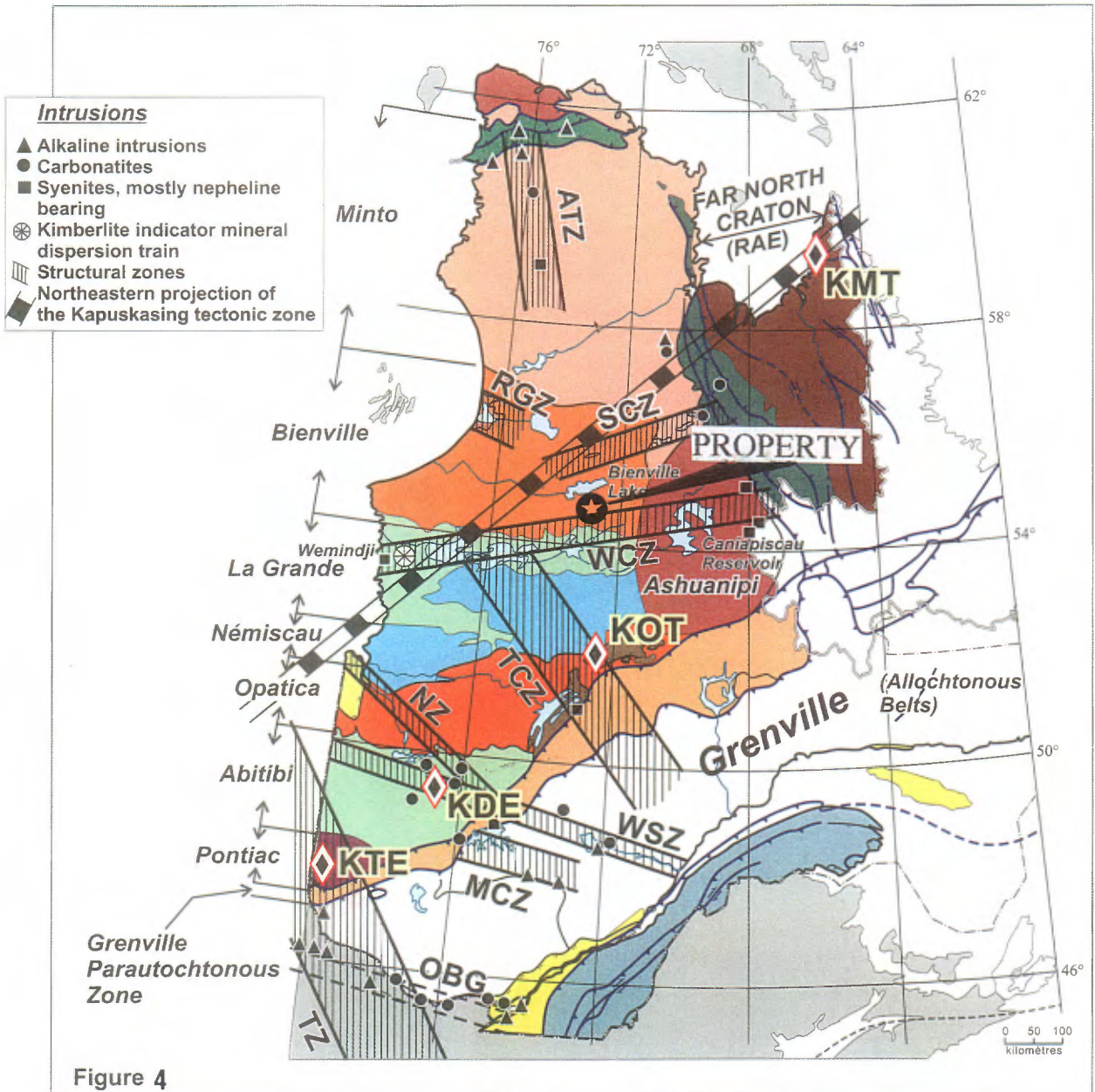
The Superior basement lithologies consist of gneiss, migmatite, and metavolcanic rocks and metasedimentary fold belts as well as granite. All geological units are thought to be of Archean age.

Multistage deformation accompanied by amphibolite grade metamorphism has affected all units in the area. In the western part of the region, the general structural trend is east-west and is considered to represent Archean basement rocks. In the north-central part of the region the structural and magnetic trends are northwesterly, they are considered to be sedimentary basin filled with meta-sediments and meta-volcanics that lie disconformably on the Archean units.



Precambrian tectonic elements of the North American craton in Canada, modified after Hoffman (1988, 1989 and Ross et al. (1995).

**LAC BIENVILLE CLAIM BLOCKS**  
 Chibougamau Mining District  
 NTS: 331  
**ARCHEAN CRATONS OF THE CANADIAN SHIELD**  
 Figure # 3



**Figure 4** Tectonic sub-divisions of Quebec (Hocq, 1994) with the location of large-scale brittle fault zones and alkaline intrusions. Structural zones: ATZ: Allemand-Tasiat Zone, RGZ: Richmond Gulf Zone, SCZ: Saindon-Cambrian Zone, WCZ: Wemindji-Caniapiscau Zone, TCZ: Témiscamie-Corvette Zone, NZ: Nottaway Zone, WSZ: Waswanipi-Saguenay Zone, MCZ: Mégiscane-Chasseur Zone, TZ: Temiscamingue Zone, OBG: Ottawa-Bonnechere Graben. Kimberlite Fields: Torngat (KMT); Otish (KOT); Desmaraisville (KDE); Témiscamingue (KTE).

Unconsolidated glacial material was deposited during various ice advances in the Pleistocene period. The northern Quebec region is extensively covered with glacial material of various forms.

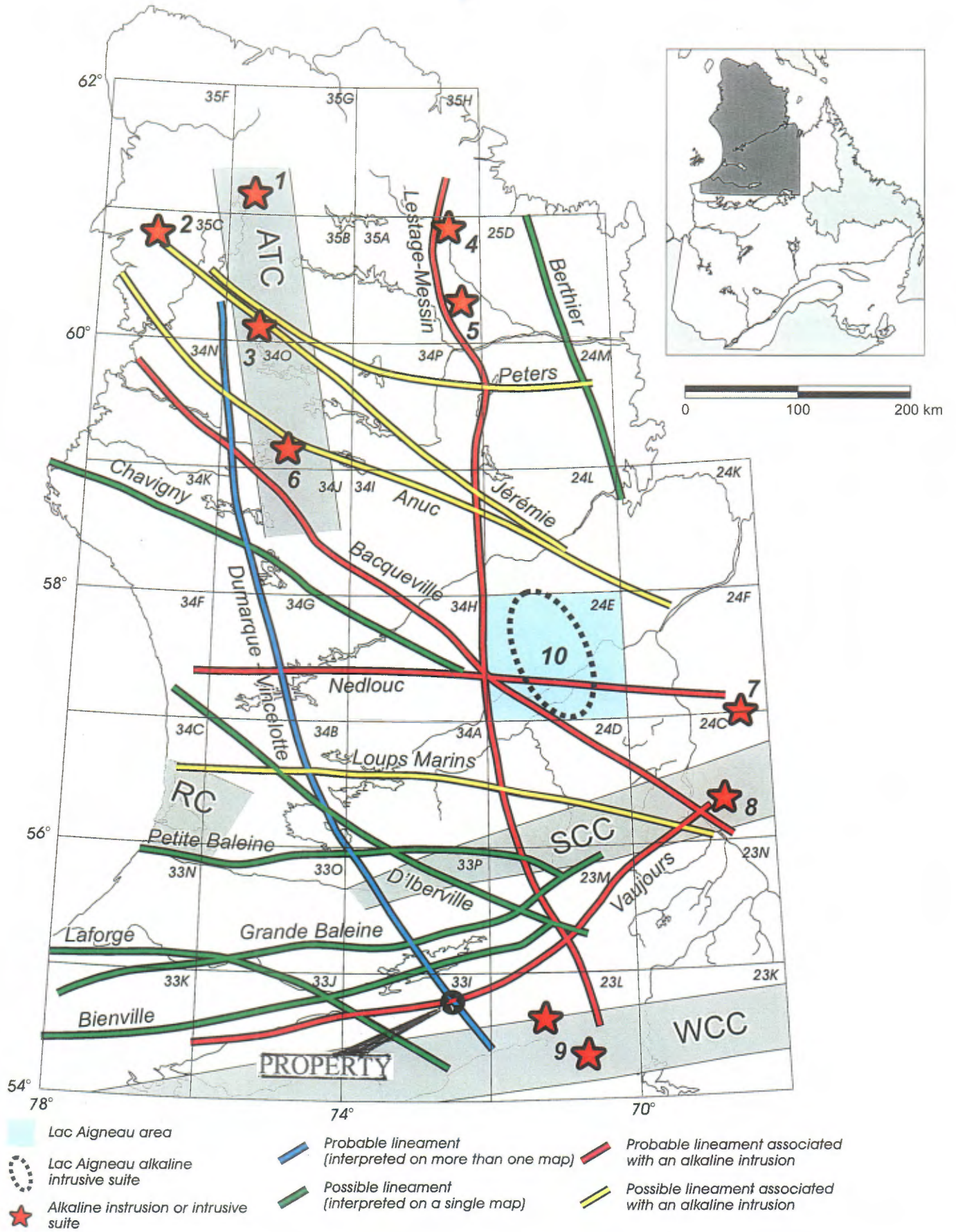
Relevant information concerning kimberlite occurrences in Northern Quebec compiled by Moorhead F. A (1999) indicated large linear and brittle structural zones that probably have a relatively deep expression in the crust and are, at least locally permeable to alkaline magmatism. Kimberlite occurrences are frequently located in Archean cratons along large lineaments or fault zones and are associated with alkaline intrusive suites such as carbonatite, ultramafic lamprophyre, and nepheline syenite. These major lineaments are believed to be crustal scale features that provide passageways for ascending kimberlite magmas (Figure 5).

## **6.0 THE SUPERIOR PROVINCE KIMBERLITES**

The superior province is one of the largest Archean cratons in the world, half of which is located in Quebec. It has long been established that economic diamondiferous kimberlites are concentrated within these cratons (Cliford, 1966). So far, 56 pipes and numerous dykes and kimberlitic bodies, distributed in 5 distinct fields (Missisa, Attawapiskat, Temiscamingue, Desmaraisville and Otish) have been discovered. The number of discovered kimberlitic bodies is quite small when compared to the 250 pipes identified so far in the much smaller Slave Province (Roger Clement, quoted in Macqueen, 1998) or the 2000 occurrences identified in South Africa (Guney, 1989).

In Quebec, the three-kimberlite fields of the Superior Province (Temiscamingue, Desmaraisville and Otish) are located south of the 52<sup>nd</sup> parallel. This portion of the Superior represents only 25% of the total area in Quebec. Although only eight Kimberlite bodies were discovered lately by Ashton mining in Otish Mountains area north of 52<sup>nd</sup> parallel, it is not unreasonable to suggest that the remaining 75% of the Superior Province in Quebec is likely to host more kimberlites (Moorhead 2000).

In many cases, kimberlites found in Archean cratons are located along lineaments or fault zones; some kimberlite fields are situated at the intersection of cross-structures with the main lineament or fault zone (white et al., 1995).



**FIGURE 5** - Interpreted crustal lineaments and location of principal alkaline intrusions. ATC = Allemand-Tasiat Corridor, RC = Richmond Corridor, SCC = Saindon-Cambrien Corridor, WCC = Wemindji-Caniapiscau Corridor. Alkaline intrusions are numbered as in Table 1.

## 7.0 THE KIMBERLITES DISCOVERY POTENTIAL OF LAC BIENVILLE AREA

(Figure 6)

In 2001 a regional survey esker sampling was conducted by the Ministère des Ressources naturelles, Québec around the area of Lac Beinville, map sheet area 33 P in northern Québec. Heavy mineral concentration, paramagnetic separation, and microscopic identification were carried out on 33 esker sediment samples.

Two chromium microilmenite grains were identified within the area of Lac Beinville. Since chromium microilmenite is one of the most characteristic minerals of kimberlites and since glacial and sediments in northern Québec are characterized by very short dispersal trains of kimberlite indicator minerals as well as a very low background counts (Michael Parent, Marc Beaumier, 2002), this finding is considered significant for diamond exploration programs in the region.

The two-picroilmenite grains were found in separate samples (01-PLA-524 and 01-PLA-543) located at the Southwest and the Northeast corners of the map sheet area 33 P. Their magnesium and chromium contents (see table 1) are typical of mantel-derived ilmenites (Mitchell, 1986); only Archean rocks have been mapped in the vicinity of the sapling areas.

Table 1 Microprobe analysis of two picroilmenite grains found in esker sediments of the Lac Beinville map area (NTS 33P). The results are expressed as percentages.

Sample	East	North	SiO <sub>2</sub>	TiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	Cr <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>	Na <sub>2</sub> O <sub>3</sub>	MgO	CaO	MnO	FeO	ZnO	Na <sub>2</sub> O	Tot
01PLA524	581872	6126258	0.03	48.23	0.52	0.94	24.41	0.23	9.92	N/d	0.24	15.54	0.03	0.03	100.11
01PLA543	671207	6192416	0.07	48.15	0.53	0.68	25.36	0.19	9.54	N/d	0.27	16.44	0.02	0.06	101.28

A reconnaissance survey of the regional glacial movements was also carried out by the Ministère des Ressources naturelles, Québec during the summer of 2001. The latest and the most dominant ice-flow direction are almost westward-trending 260°.

The kimberlite indicator minerals of the Lac Beinville region are found 300 kilometers or more north of the Otish Mountains (Renard discovery area), suggesting different diamond source rocks and good possibilities exist to locate new diamondiferous source rock within the area of Lac Beinville. The kimberlitic indicator minerals also confirm the high potential of the region for diamond exploration.

# Lac Bienville - 33 P

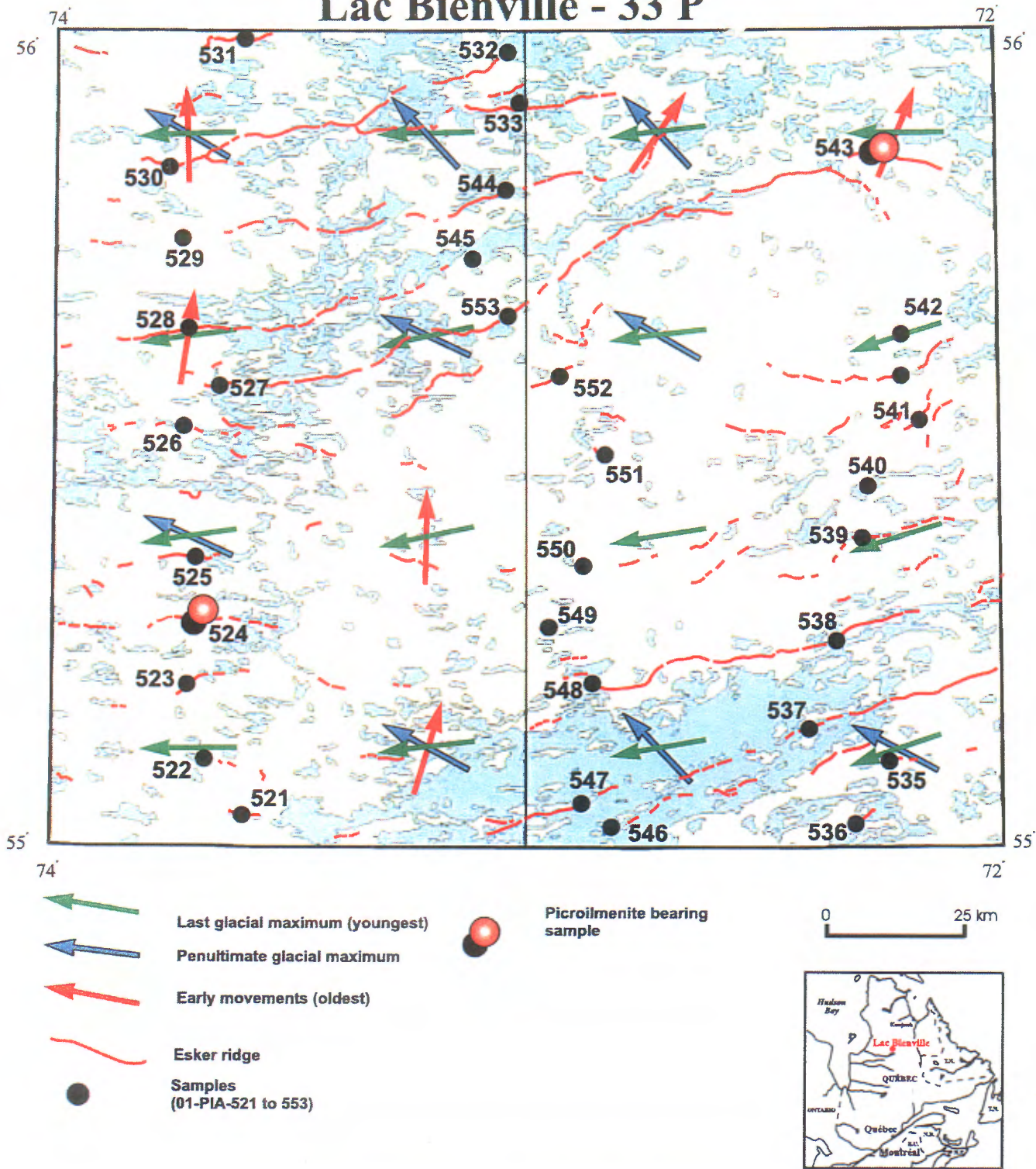


FIGURE 1 - Location of kimberlite indicator minerals (#524 and #543) in the esker sample suite from the Lac Bienville area. Ice-flow successions and esker ridges are also shown.

## 8.0 GEOPHYSICAL REVIEW OF THE CLAIM BLOCKS

The flat-lying sedimentary rocks through which the kimberlites have come to the surface have a much lower magnetism than the kimberlites themselves. For this reason, the change in magnetism over the kimberlites produces strong, clearly visible anomalies. The regional airborne geophysical survey shows **an exceptional, strong circular magnetic anomaly over several areas of the claim blocks**. The magnetic anomalies show clear magnetic contrast with the host rocks and are considered a strong sign for possible kimberlitic volcanism activities in the area of the claim blocks.

The writer completed a review on the regional magnetic data prepared by the geological survey of Quebec on the subject claim blocks in order to evaluate areas of magnetic anomalies that may warrant follow-up work. The regional total magnetic maps (1:50,000 scale) show the following magnetic patterns:

### **Claim Block # 1**

NTS: 33I/1

(Figure 7)

Claim block #1 was originally staked based on a semi-circular strong magnetic anomaly centered on the claim area. The magnetic anomaly covers approximately 60% of the property area. The anomaly is magnetic high, roughly 1200 meters in diameter.

### **Claim Block # 2**

NTS: 33I/1

(Figure 7)

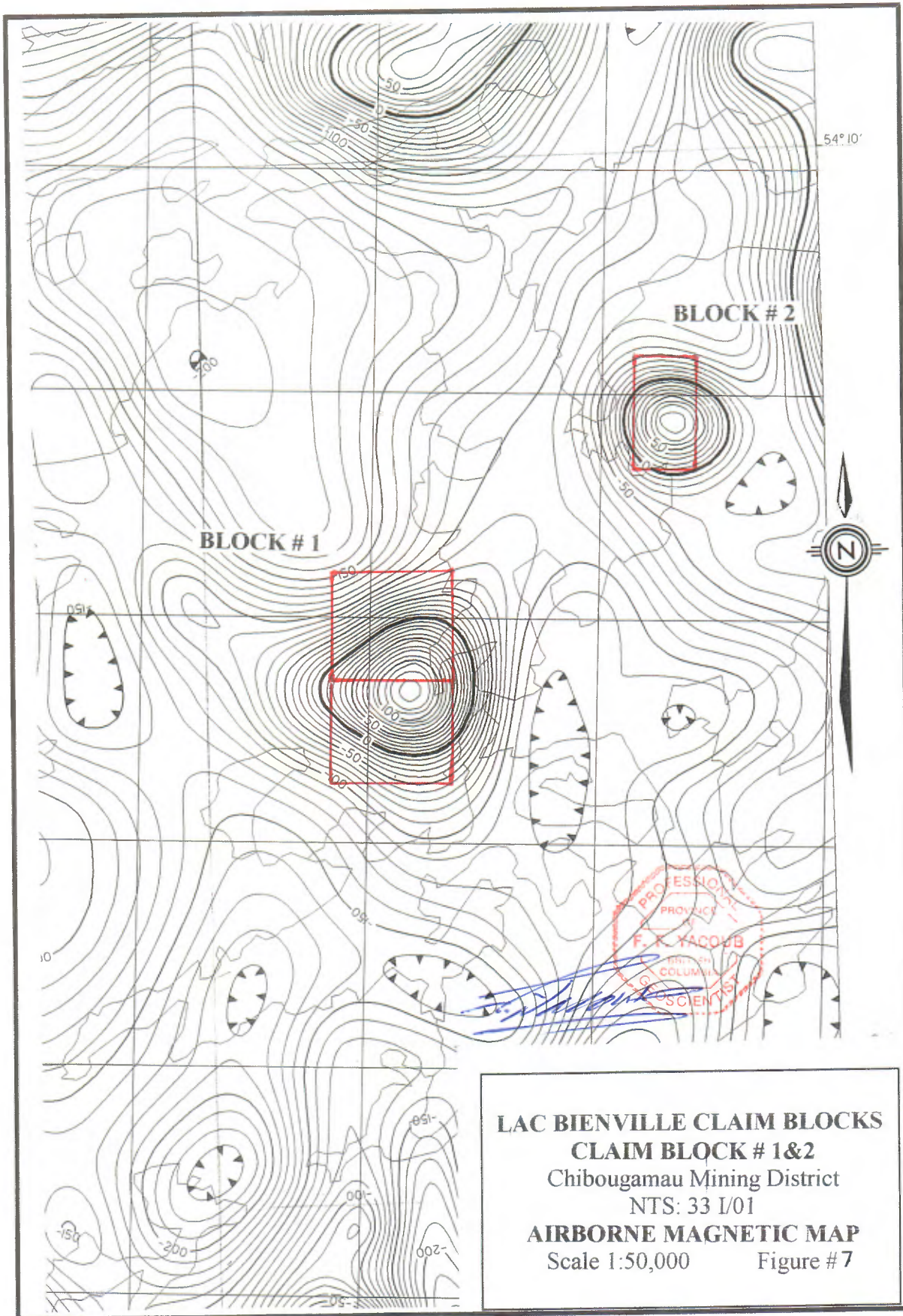
Claim block # 2 is located two kilometers northeast of claim block #1. The area of the claim covers approximately 70% of circular magnetic anomaly roughly centered on the property. It is high magnetic anomaly approximately 750 meters in diameter.

### **Claim Block # 3**

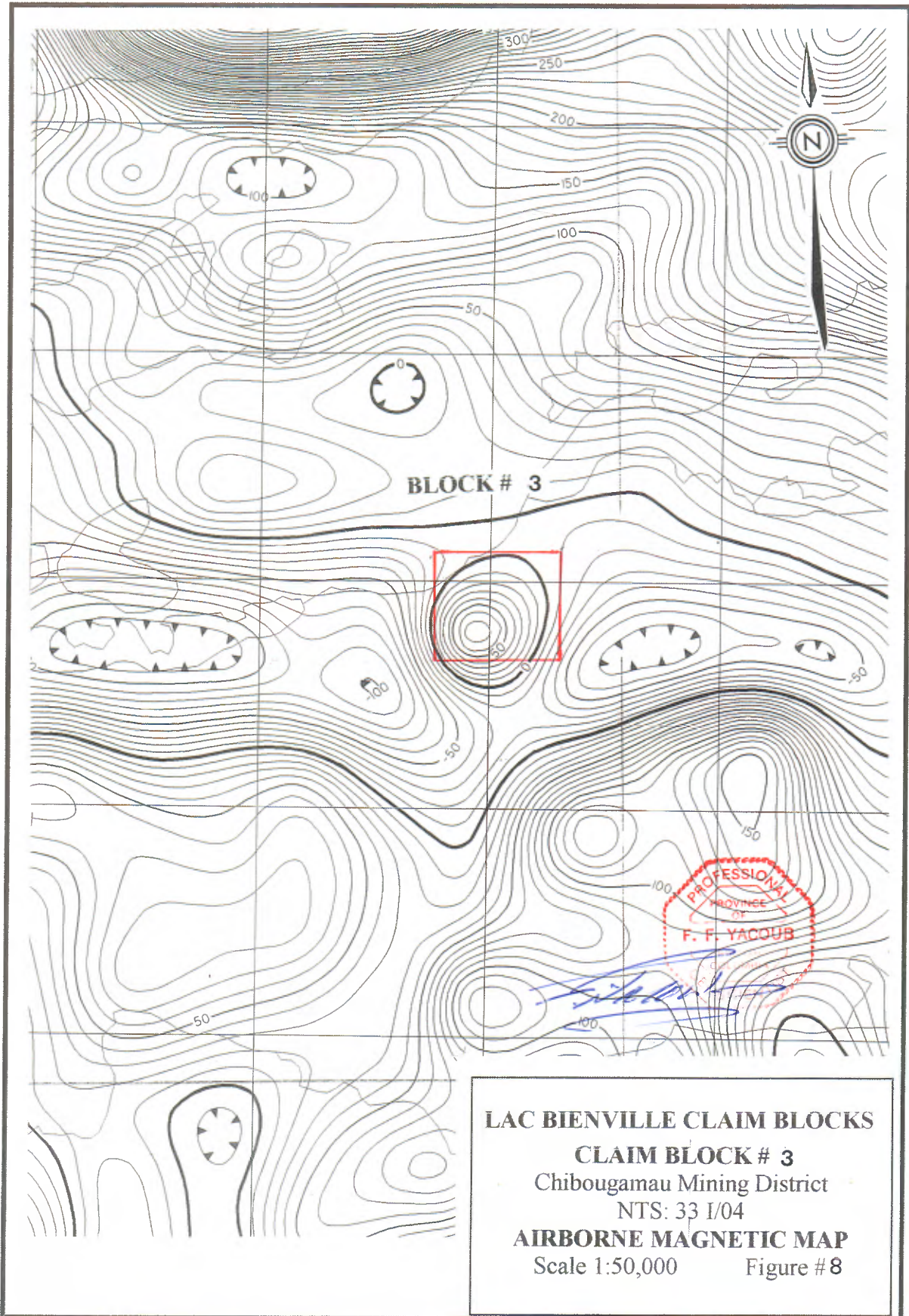
NTS: 33I/4

(Figure 8)

The area of claim block # 3 covers a moderate magnetic anomaly. The anomaly is abruptly truncating another east west trending magnetic low that may represent near surface structure and should be carefully prospected and studied closely within the area of the claim block.



**LAC BIENVILLE CLAIM BLOCKS**  
**CLAIM BLOCK # 1&2**  
Chibougamau Mining District  
NTS: 33 I/01  
**AIRBORNE MAGNETIC MAP**  
Scale 1:50,000      Figure # 7



**LAC BIENVILLE CLAIM BLOCKS**

**CLAIM BLOCK # 3**

Chibougamau Mining District

NTS: 33 1/4

**AIRBORNE MAGNETIC MAP**

Scale 1:50,000

Figure # 8

**Claim Block # 4**

(Figure 9)

NTS: 33I/7

Claim block # 4 is centered on a strong semi-circular magnetic high, approximately 1.5 kilometers in diameter. The claim area represents a narrow, near surface magnetic anomaly in a geological environment of low magnetic background.

**Claim Block # 5**

(Figure 10)

NTS: 33I/7

Claim block # 5 is centered on a strong semi-circular magnetic high similar to the area of block # 4. The strength of the anomaly is more significant than the area of block # 4 and shows a clear magnetic contrast with the surrounding geological environment that has several circular to semi-circular low magnetic anomalies.

**Claim Block # 6**

(Figure 11)

NTS: 33I/10

The area of the claim block covers a circular, moderately low magnetic anomaly approximately 750 meters in diameters in geological environment of a low magnetic background.

**Claim Block # 7**

(Figure 12)

NTS: 33I/10

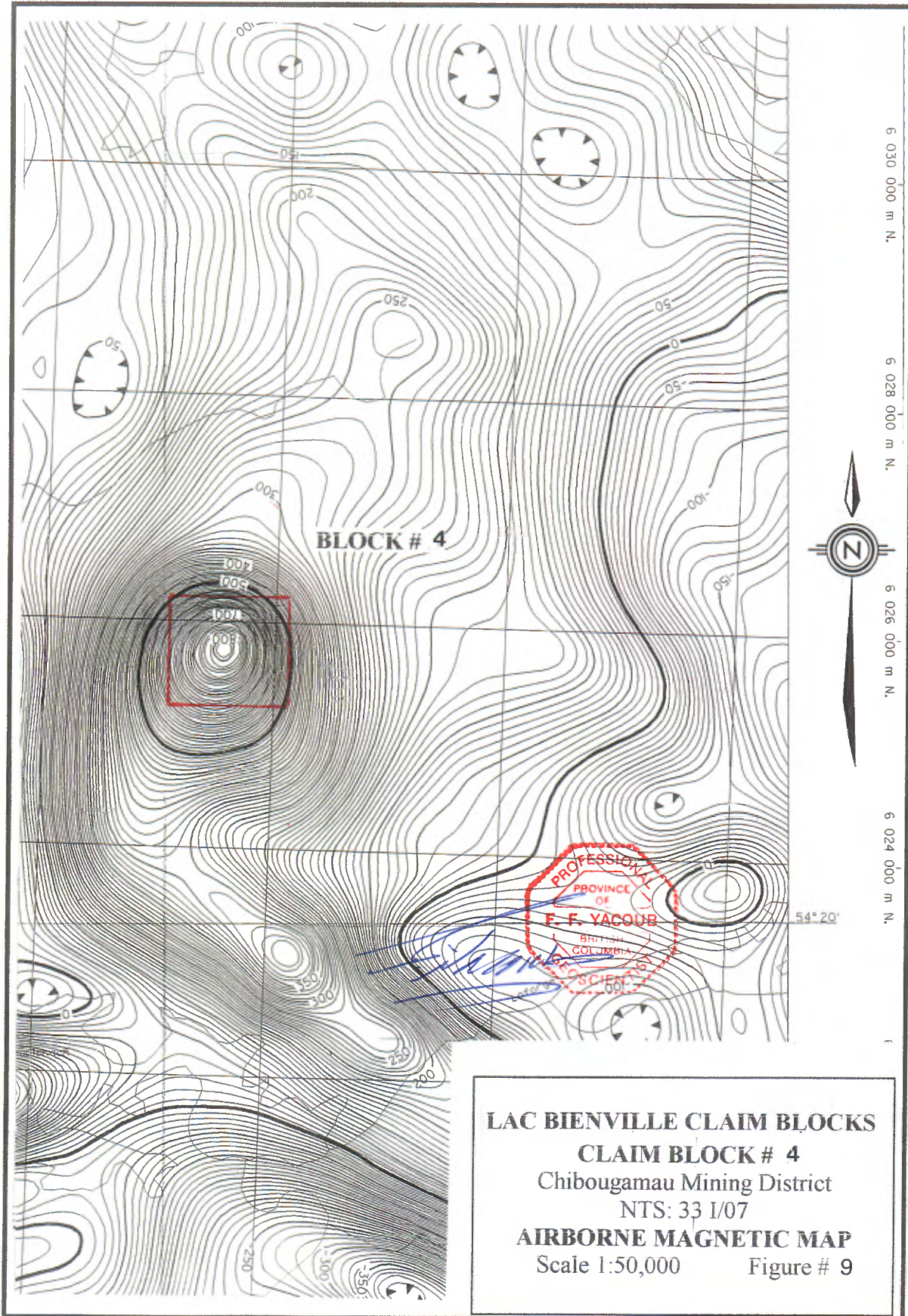
Claim block # 7 consist of two claims. The area of the claim was staked for its magnetic anomaly. The anomaly is magnetic high, approximately one kilometer in diameter and shows clear magnetic contrast with the host rocks. The claim area covers approximately 60% of the anomaly.

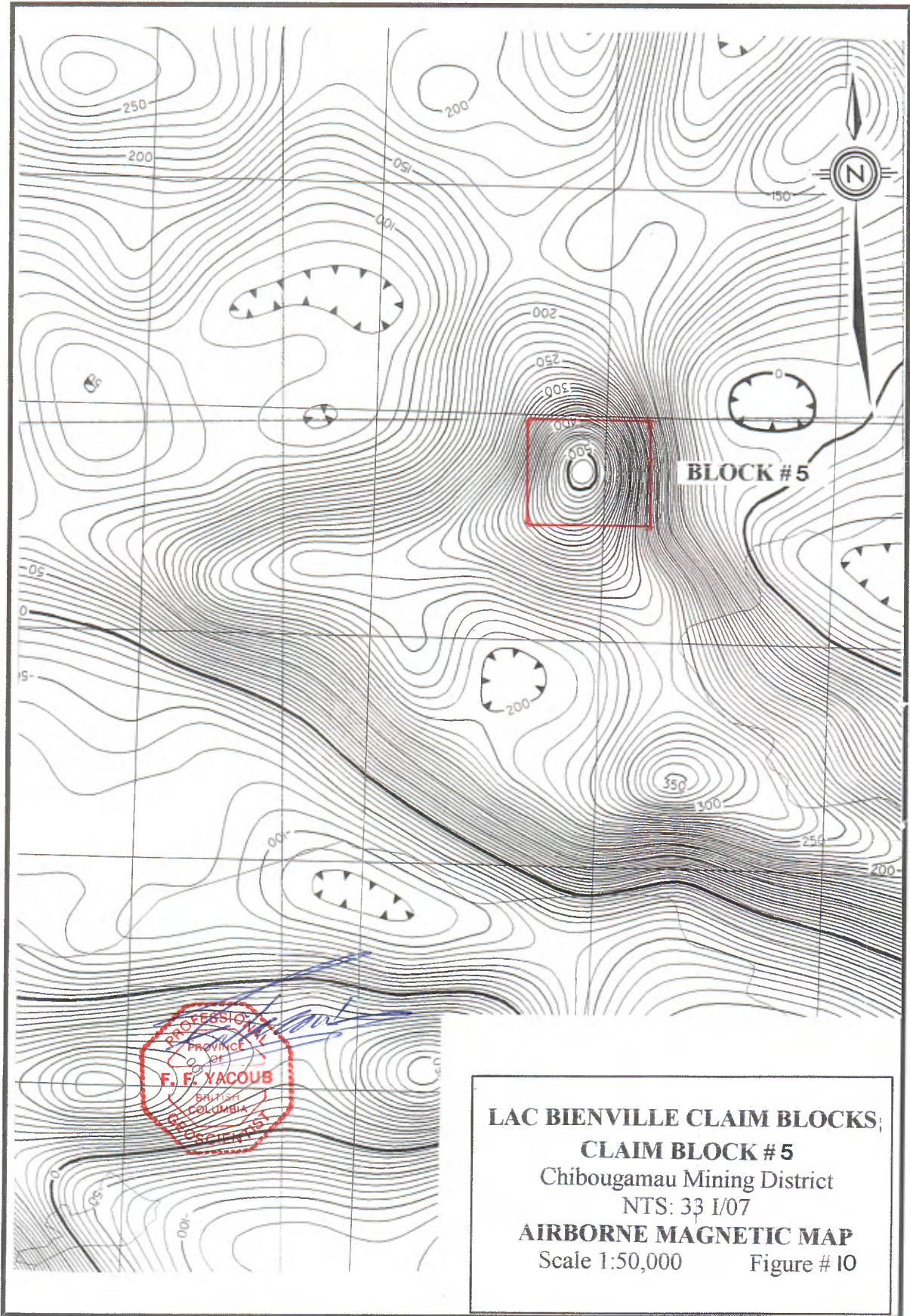
**Claim Block # 8**

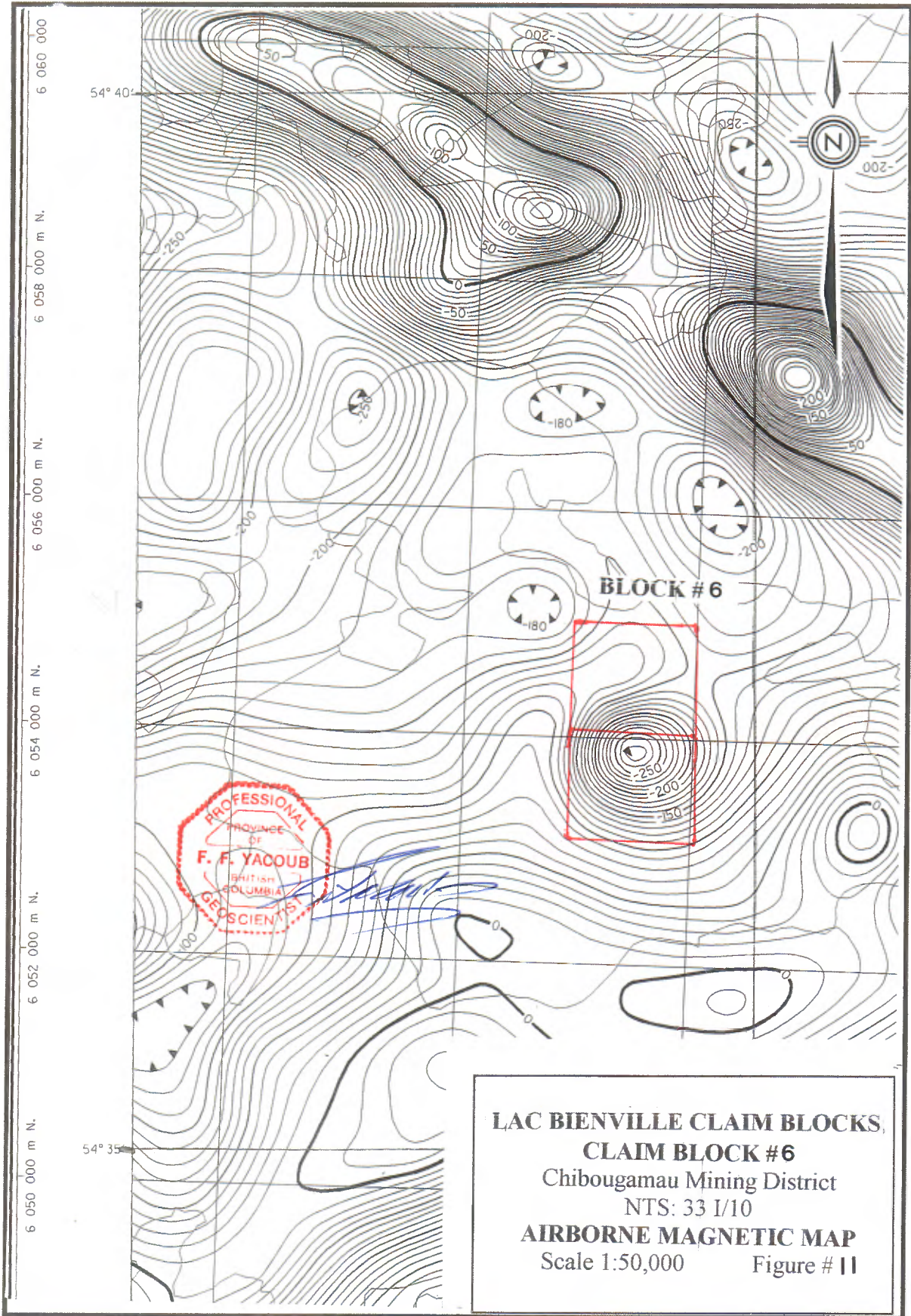
(Figure 13)

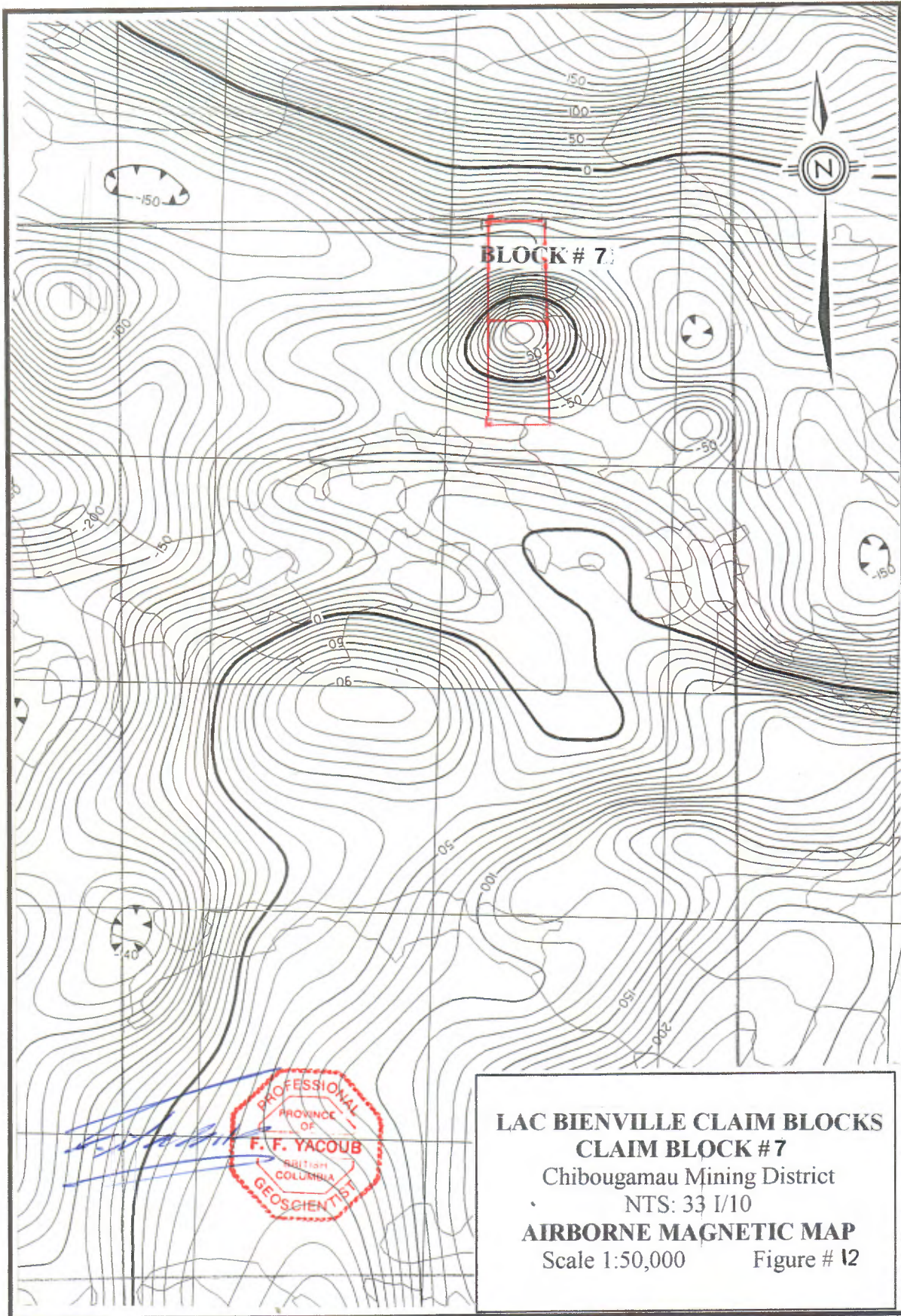
NTS: 33I/12

A prominent northeast-southwest trending, narrow near surface magnetic anomaly, extends from the northeast corner to the southwest corner of the figure 13. The anomaly is abruptly truncated by another circular magnetic high approximately 750 meters in diameter and a small magnetic low about 300 hundred by 100 meters in diameter.









**Claim Block # 9**

(Figure 14&15)

NTS: 33I/10

The regional airborne geophysical survey shows an exceptional, strong circular magnetic anomaly over the area of the claim block. It is high magnetic anomaly, approximately one kilometer in diameter and shows clear magnetic contrast with the host rocks. The anomaly is considered a strong sign of kimberlitic volcanism in the area of the property (see Figure 14). An exceptional surface expression of a large semi-circular lagoon is located at the center of the magnetic anomaly that stands out as another strong possibility for kimberlitic volcanism.

Claim block # 9 is located just north the Wemindji-Caniapiscau structural corridor.

**Claim Block # 10**

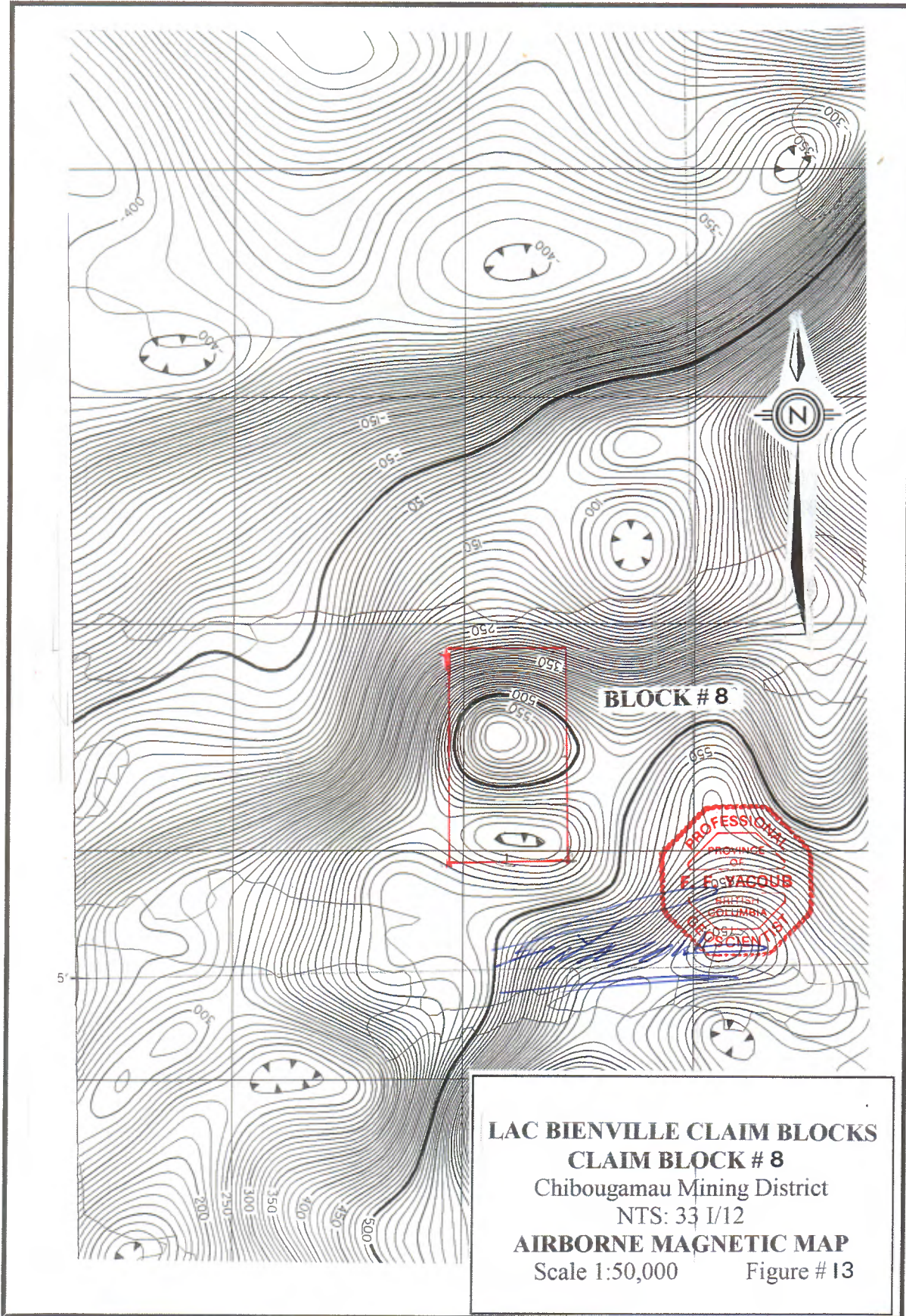
(Figure # 16&17)

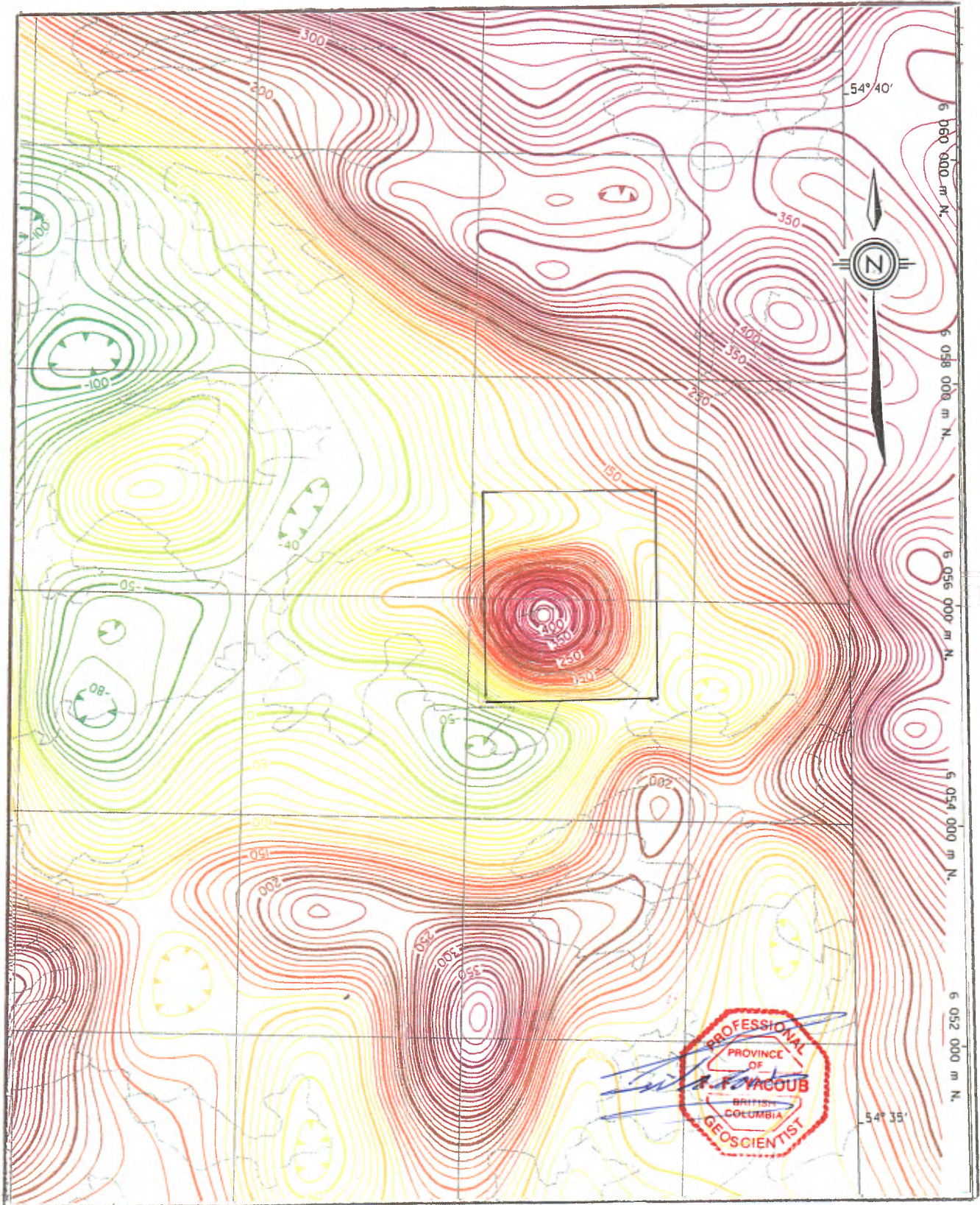
NTS: 33I/9

The regional airborne geophysical survey by Ministère des Ressources naturelles, Quebec shows a strong circular magnetic anomaly over the central part of the claim block. It is a low magnetic anomaly that shows clear magnetic contrast with the host rocks. An exceptional surface expression of a large semi-circular lagoon is located at the center of the magnetic anomaly and stands out as another strong possibility for kimberlitic activity.

The claim block is located in an interesting area since it lies just south of an intersection between two major deep seated crustal lineaments; one is associated with alkaline intrusions which is considered most favorable in the search for kimberlitic magma (see Figure # 2).

**The above two anomalies of claim blocks # 9 and # 10 warrant further ground geological and geophysical investigation.**





**LAC BIENVILLE CLAIM BLOCKS**

**CLAIM BLOCK # 9**

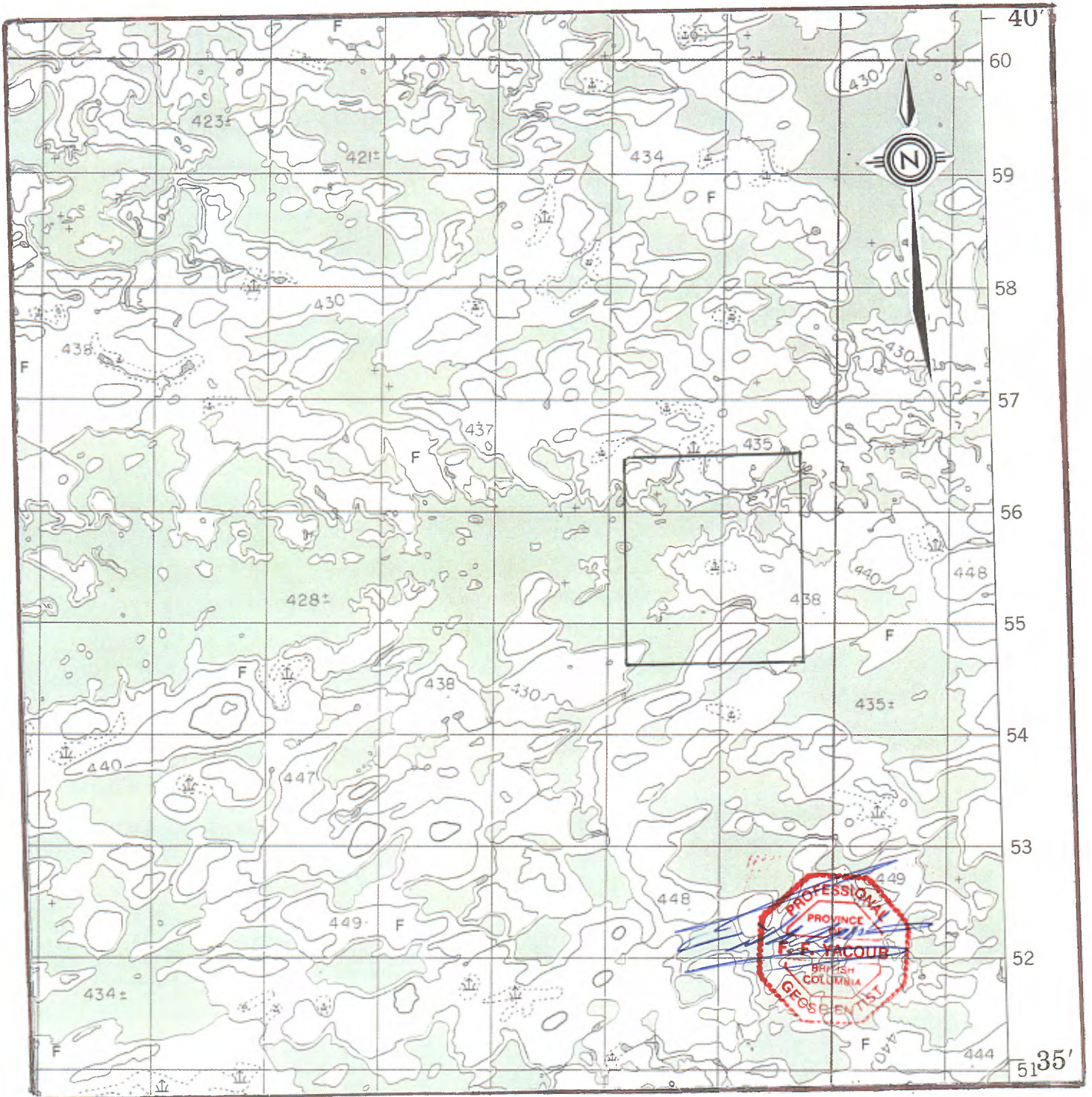
Chibougamau Mining District

NTS: 331/10

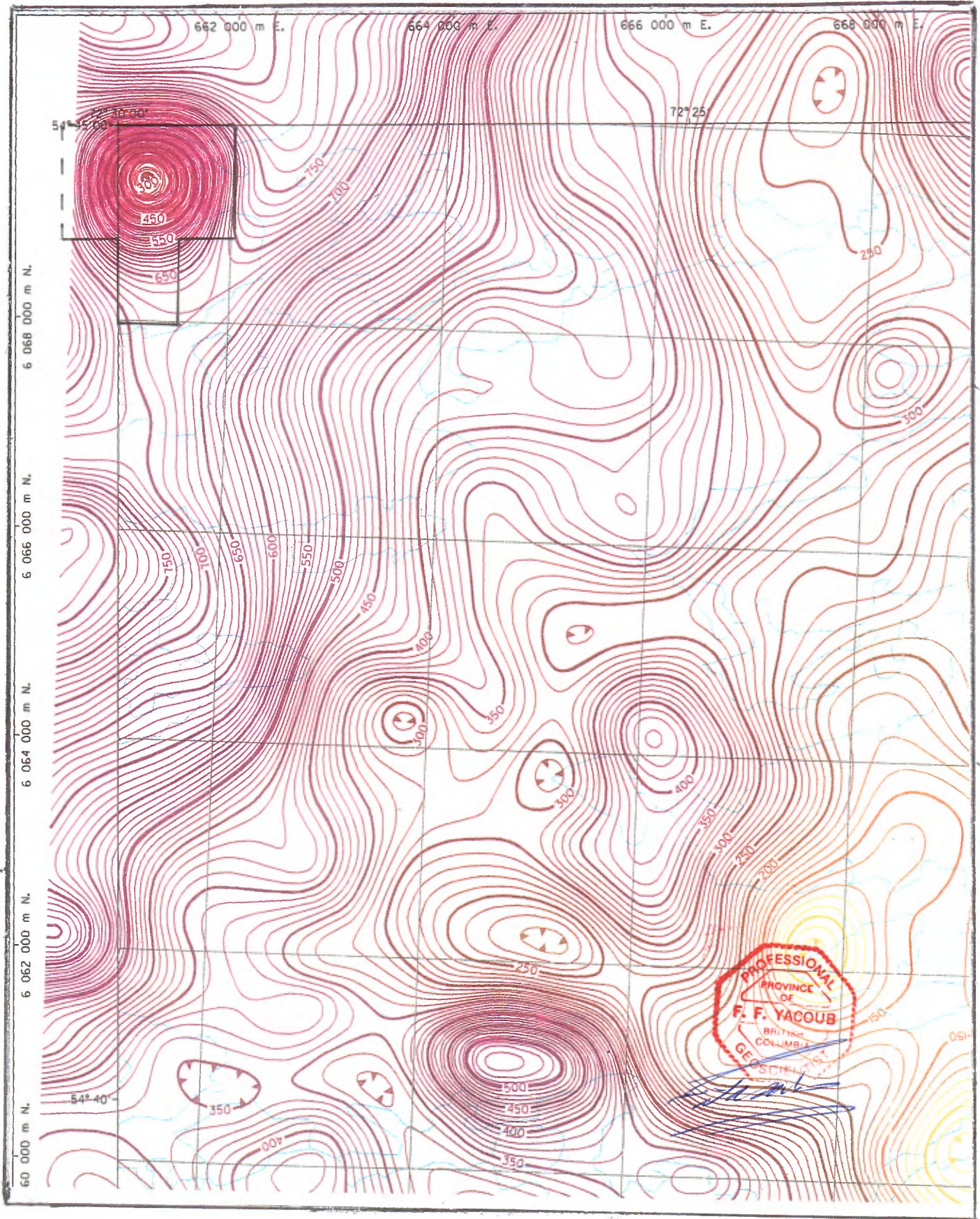
**AIRBORNE MAGNETIC MAP**

SCALE 1:50,000

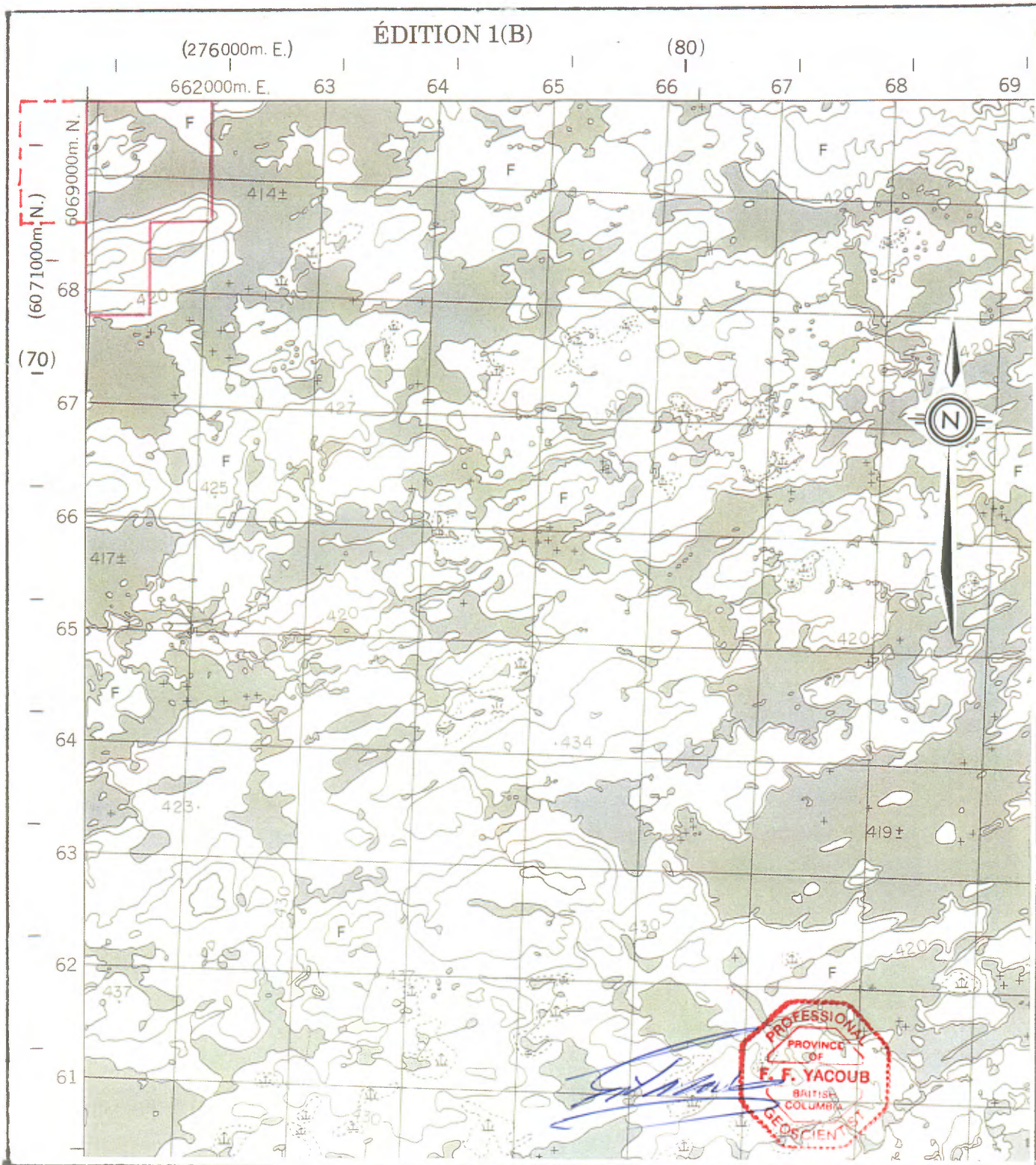
Figure # 14



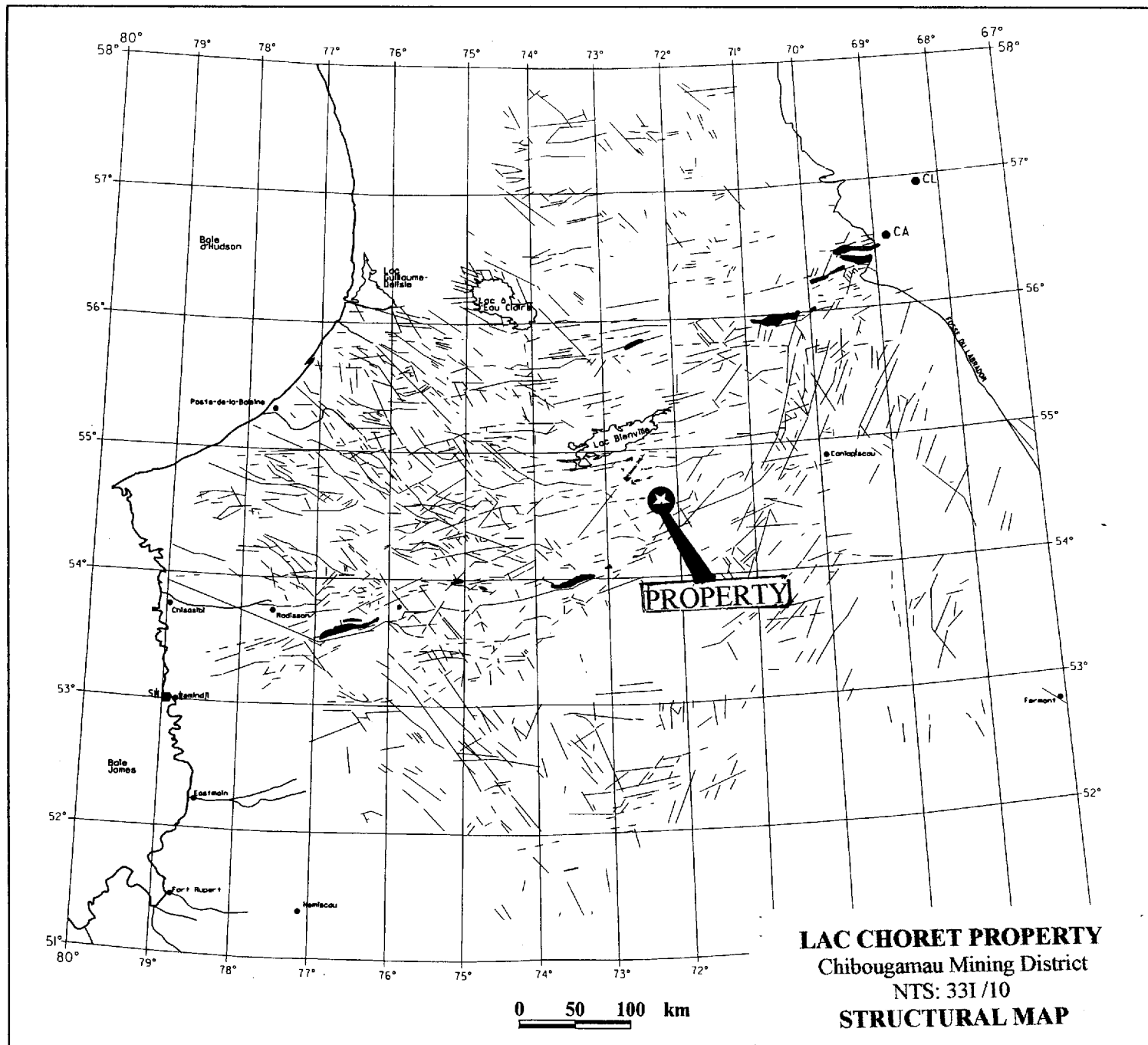
**LAC BIENVILLE CLAIM BLOCKS**  
**CLAIM BLOCK # 9**  
Chibougamau Mining District  
NTS: 33I/10  
**TOPOGRAPHIC CLAIM MAP**  
SCALE 1:50,000  
Figure # 15



**BIENVILLE LAC CLAIM BLOCKS**  
**CLAIM BLOCK #10**  
Chibougamau Mining District  
NTS: 33 I/09  
**AIRBORNE MAGNETIC MAP**  
Scale 1:50,000      Figure #16



**BIENVILLE LAC CLAIM BLOCKS**  
**CLAIM BLOCK #10**  
 Chibougamau Mining District  
 NTS: 33 I/09  
**TOPOGRAPHIC CLAIM MAP**  
 Scale 1:50,000      Figure #17



**Figure 6** Carte de linéaments pour la région Moyen-Nord du Québec, d'après Portella (1980).  
CA : Carbonatite du lac Castignon, CL : Carbonatite du lac Le Moyne. Les bassins de la

## 8.0 THE KIMBERLITES DISCOVERY POTENTIAL OF THE CLAIM BLOCKS

The northern portion of the Superior Province in Quebec represents an attractive area for diamond exploration. Three parameters should be considered in assessing the diamond potential in the region. These parameters are:

- Major crustal lineaments
- Local structural control
- Signs of kimberlitic volcanism

- The area of the claim blocks is underlain by **Archean Cratonic rocks**, which are considered the most favorable setting for diamond-bearing kimberlites.
- The area of the claim blocks is located in an interesting area since it lies between two major deep-seated structural zones; **Wemindji-Caniapiscau structural corridor and Saindon-cambrian zone**
- Claim blocks #1, #2, #3, #4, and #5 are located within the **Wemindji-Caniapiscau structural corridor**.
- In addition to the major crustal lineaments most of the claim blocks enjoy the presence of a **network of local brittle faults** (see Fig 18) that represent a superficial porosity and may control the position of individual kimberlite pipes.
- The regional airborne geophysical survey shows **exceptional, strong circular magnetic anomalies over all claim blocks**. The magnetic anomalies range between 750 meters and 1500 meters in diameter and show clear magnetic contrast with the host rocks. The anomalies are considered a strong sign of kimberlitic activities in the area of the claim blocks.
- **A surface expression of a large semi-circular lagoon** located in the center of the magnetic anomalies of claim block 9 and 10 stands out as another strong possibility that the magnetic anomaly may represent kimberlitic volcanism.
- All subject claim blocks have never been tested for indicator minerals and diamond potential.
- A main Highway is located only a few kilometers away from several claim blocks.

## 8.0 RECOMMENDATIONS

An aggressive first phase exploration program should be initiated on the subject claim blocks in the search for diamondiferous kimberlitic bodies within the Archean rocks of the Lac Bienville area. The first phase program should consist of:

- 1) A till (heavy minerals) sampling program over the area of each claim block for initial indicator mineral investigation. All sample sites should be carefully selected and a specialist laboratory should carry out sample processing since recovery and recognition of diamonds and indicator minerals depends entirely upon processing and observation techniques. As many indicators and diamonds are not super heavy, great caution must be used to not lose these minerals during the concentration process.
- 2) Surface geology and prospecting over all areas of interest. Special attention should be paid to any local structure, circular bodies, dykes, and magnetic features.


Results from the first phase will have a good impact on deciding priorities for the following work program.

## PROPOSED BUDGET

### Phase 1: Project Geologist, two prospectors, 10 days of till sampling and prospecting:

Mob/Demob	\$6,000	
Field crew	8,000	
Field costs	6,500	
Helicopter support	16,000	
Lab analysis	10,000	
Data compilation and Report	4,000	
	<hr/>	
	50,500	
Administration, Consulting & Supervision @ 10%	5,050	
	Subtotal	55,550
GST @ 7%		3,888.5
	<b>TOTAL</b>	<b>59,438.5</b>
	<b>APPROX</b>	<b>60,000</b>

Respectfully submitted

  
Fayz Yacoub P. Geo., F.G.A.C.

Dated February 26, 2004

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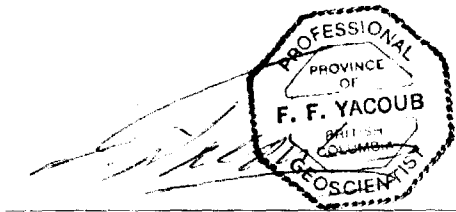
## CERTIFICATE OF QUALIFICATIONS

I, FAYZ F. YACOUB, of 6498-128B Street, Surrey, British Columbia, V3W 9P4, do hereby declare that:

- 1) I am a graduate geologist with a bachelor degree from Assuit University, Egypt (B.Sc., 1967), and a diploma in Mining Exploration Geology from the International Institute for Aerial Survey and Earth Sciences (I.T.C.), Holland (Diploma 1978).
- 2) I am a fellow in good standing with the Geological Association of Canada (Membership # 5490)
- 3) I am a professional geologist and a member of the Association of the professional Engineers and Geoscientists of British Columbia (Registration No. 20390).
- 4) I have actively pursued my career as a geologist for the past twenty-two years;

The information, opinion, and recommendations in this report (The Lac Bienville claim blocks) are based on research of published geological and geochemical information, also from regional work conducted and published by Ministère des Ressources naturelles, Quebec.

- 5) I am the recipient of 25,000 shares of Interactive Enterprises Inc.
- 6) I have never been on the site of the subject claim block.



Fayz Yacoub, P. Geo., F.G.A.C.

Dated February 26, 2004