

# NI 43-101 Compliant Technical Report

## **Dalquier Nickel-PGE Property**

Dalquier-Figuery-Landrienne  
Townships

Abitibi Region, Quebec,  
NTS 32C06 & 32C03

Submitted to

**9248-7792 Québec Inc.**

Prepared by:

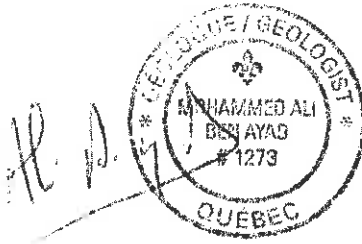
**M. Ali BEN AYAD, Ph.D.**

OGQ Member # 1273  
Montreal, August 8, 2013

## DATE AND SIGNATURE PAGE

This report is effective as of the 8 August, 2013

Original signed in Montreal, the 8<sup>th</sup> August 2013, by



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**Mohammed Ali BEN AYAD, Ph.D.**

**OGQ # 1273**

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## 1. SUMMARY

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In September 2011, a first 43-101 Technical Report (TR) has been realized on demand of Mr. Glenn Griesbach and Mr. Stephane Leblanc, principal holders of the mineral licenses that comprise the Dalquier Property (60 claims, Block 1 to 6), by Mr. M. Ali Ben Ayad, Ph.D, independent consultants and Qualified Person (QP) for the purpose of Regulation 43-101.

This report constitute a second 43-101 TR realized on this property by the same author on demand of Mr. Stéphan Leblanc, owner of 9248-7792 Québec Inc. and responsible for the claims, on a part of the ancient Dalquier Property (Ancient Block 1, 2, 3 and 6).

The following technical report (herein after "the Report"), prepared in accordance with Canadian National Instrument 43-101 ("NI 43-101", summarizes current knowledge of the geology of the property, including mineralization, and the historical work carried out on the property.

The Dalquier Property is located in the south-east part of the Abitibi Greenstone Belt of the Superior Province of the Canadian Shield. More precisely, it is located about 8 km east of the town of Amos (for the farthest claim block) and 55 km northeast of the city of Val d'Or. The Abitibi Sub-province, the largest greenstone belt of the Superior Province, is well known for its important volcanogenic massive sulphide deposits, orogenic lode gold deposits and porphyry-type deposits.

The property, consisting of **59 claims totalling 2411.65 hectares**, lies mainly in Figuery and Landrienne Townships, with a few of the claims in Dalquier Township. Mining titles information, obtained from the MRNFQ show that **exploration expenses around 71,000.00 \$** must be carried out before November 2014 in order to renew the mineral licenses for an additional two years.

Geologically, the property area is part of the south-east segment of the Abitibi Greenstone Belt where a mafic, locally felsic, volcanic package is oriented on the regional NW-SE to E-W trend. Plutonic bodies in the region are diverse in age, in size and in composition, and include granitic to granodioritic plutons, and granitic to gabbroic and ultramafic sills and dykes.

In the volcanic package of the Amos area, besides the Landrienne Group and the Figuery Group defined regionally at the scale of the south-east of the Abitibi greenstone Belt, three other stratigraphic units regionally separated from each other by major structural contacts, characterise this area, have been defined and correspond, from south to north, as the overlying the Figuery Group (andesites, locally pillowed, rhyolites, and felsic tuffs), to the Amos Group (pillowed basaltic flows, felsic flows and tuff), the Lac Arthur group (andesite and rhyolite) and the La Morandière Group (pillowed basaltic flows).

All these volcanic groups constitute the inverse flank of the north-east trending Amos mega-anticline, where bedding and schistosity dip generally steeply to the north and face often to south. The lower part of the Amos Group, part of this inverse flank, is characterized by the presence of two large ultramafic sills, one about 25 km west of Amos and known as Dumont Sill and the second in the same stratigraphic level, which concerns the Dalquier property, is the Southeast Amos Sill.

The Dumont Sill, which constitute a geological Ni-Cu deposit model for the region is poorly exposed over a strike length of 6.5 km and dipping 60° to 70° to the northeast. Its comprises a lower ultramafic zone which averages 450 m in true thickness and an upper mafic zone about 250 m thick. The ultramafic zone is subdivided into the lower peridotite, dunite and upper peridotite subzones, underlying a gabbro zone. The world-class Dumont Nickel Deposit (nickel-cu & PGE deposit) is associated to this ultramafic sill in the Amos Group. This deposit has been estimated (all categories of resources, NI-43101 compliant as of August 16, 2010) at: 1,451,000 (000 tons) at 0.25% Ni + minor Cu.,

Two types of mineralization are present in the Dumont deposit:

- Disseminated sulphides (magmatic sulphides) which are restricted to the lower peridotite and dunite subzones,
- Contact type nickel-copper-PGE mineralization, confirmed by drilling, which corresponds to pluri-decimetric semi-massive pyrrhotite, at the contact between the Dumont intrusive and volcanic footwall. This contact-related mineralization appears to be restricted in extent.

In the Dalquier Property, the differentiated ultramafic to mafic tabular structures, constituting the southeast trending Amos Sill, are injected sub-parallel to the primary "metavolcanic" structures, particularly in a specific narrow felsic tuff (locally cherty-tuff).

Five cycles of intrusions have been recognized in this Amos sill complex and the scheme of the succession of the different lithofacies keeps quite the same in every cycle. Thus, from the base upwards, we have the succession of "dunite – wehrlite – clinopyroxenite - gabbro" that we find in most of the cycles.

Very few exploration works (geological mapping, geophysical surveys "mag & EM") has been done on the area of the ultramafic sill (UMS) and generally their exploration objectives were essentially for gold, volcanogenic massive sulphides or asbestos fibre as the alteration product of the UMS. Diamond drill holes appear to be totally absent in this part of the Dalquier Property, and the few drillholes which crosscut the UMS are located west of this Block and basically in the east, in Range 10 of Landrienne, north of the property (Block 1 Landrienne, Range 9).

Thus, west of Block 1 of the property, a drillhole (F1-97-03, GM56441) has revealed, in addition to the fine mineralization in the UMS (less than 1% pyrite), mineralization consisting of 2-3% of pyrite and chalcopyrite and with a best value of 330 ppb Au, 5.2 ppm Ag and 7240 ppm Cu in the lower contact of the UMS with the underlying andesite.

Further to the east, north of Block 1, north of Landrienne side (Range 10), 4 drillholes were drilled in 1971 by Wrightbar Mines Limited ( Hole WL-1 to WL- 4) which crosscut almost the entire UMS in this sector. They reveal the UMS with its different ultramafic lithofacies, different kinds of alteration (carbonation, serpentinization) and dissemination of fine sulphides (pyrite,

pyrrhotite and chalcopyrite). These drillholes seem to be the only ones for which samples have been analyzed for Ni. No PGE analyses are known in this sector of the Property.

As an example, results of one of these mineralized drillholes ( Hole WL-1, GM27436) are as follows: ):

**0.207 % Ni over 70 feet, from 300 to 370 feet**

**0.199 % Ni over 70 feet, from 820 to 890 feet**

The three others drillholes, localize the presence of sulphides (dissiminated in the sill and in it lower contact with the volcanics) with highly anomalous values of Ni varying from 0.05% Ni to, locally 0.24% Ni. One of them gave also interesting averages values, such as Hole LW- 2 (GM27436):

**0.175% Ni over 137.5 feet, from 37.5 TO 175.0 feet**

**0.170% Ni over 85.0 feet, from 865.0 to 950.0 feet**

All these occasional short drillholes that crosscut the UMS close to Block 1 of the property (Figury and Landrienne). In addition to the presence of sulphides (pyrite, pyrrhotite and chalcopyrite), disseminated in the UMS and in it lower contact with volcanics where sulphide can locally be massive, they show a lateral variation of Ni inside the sulphide zones with a spatial association of an alteration-like serpentinization and talc-carbonate zones.

The SE Amos Ultramafic Sill presents, like the Dumont Nickel Deposit, all the characteristics of an intrusive ultramafic Ni-Cu category (Eckstrand.O.R., 1984), and remains highly potential for the discovery of economic Ni-Cu and PGE mineralization, particularly if we consider the large volume of the SE Amos Sill to explore.

An estimated cost of the **recommended exploration program** on the Dalquier Property is presented in this report for an amount of **\$ 393,859.00**

## **2. INTRODUCTION**

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### **2.1 Introduction**

The Dalquier Property is a Nickel-Copper-PGE exploration project located in the south-east part of the Abitibi Greenstone Belt of the Superior Province of the Canadian Shield. This Property is, more precisely, located about 8 km east of the town of Amos and 55 km northeast of the city of Val d'Or.

### **2.2 Scope of Work principal**

In September 2011, a first 43-101 Technical Report (TR) has been realized on demand of Mr. Glenn Griesbach and Mr. Stéphane Leblanc, holders of the mineral licenses that comprise the entire Dalquier Property (60 claims, Block 1 to 6). They requested Mr. M. Ali Ben Ayad, Ph.D, independent consultants and Qualified Person (QP) for the purpose of Regulation 43-101, to publish a NI 43-101 compliant Technical Report on the Dalquier Property.

This report constitutes a second 43-101 TR realized by the same author on demand of Mr. Stéphane Leblanc, owner of 9248-7792 Québec Inc. and responsible of the claims, on a part of the ancient Dalquier Property (Ancient Block 1, 2, 3 and 6).

The following technical report (herein after "the Report"), prepared in accordance with Canadian National Instrument 43-101 ("NI 43-101", summarizes current knowledge of the geology of the property, including mineralization, and the historical work carried out on the property.

### **2.3 Sources of Information**

All the data used to prepare this report are based on the assessment files (GM) existing on the E- Sigeom EXAMIN website at the "Ministère des Ressources Naturelles et de la Faune (MRNF. Web site: [www.mrn.gouv.qc.ca](http://www.mrn.gouv.qc.ca)) of Québec.

## 2.4 Term of references

Unless otherwise stated:

- All units of measurement used in this technical report are metric;
- Base metal values (nickel, copper and cobalt) are reported in weight percentage (“%”) or parts per million (“ppm”);
- Precious metal values are reported in grams per tonne (“g/t”) or ppm;
- Other references to geochemical analysis are reported in ppm or parts per billion (“ppb”) as reported by the originating laboratories.

Maps coordinates are in UTM, NAD83, zone 17 & 18.

## 2.4 Field Validation Work

All the data were compiled by the author from the “Ministère des Ressources naturelles et de la Faune” (MRNF. Web site: [www.mrn.gouv.qc.ca](http://www.mrn.gouv.qc.ca)).

The author visited the property between the 10 and the 15 October 2011.

## 3. RELIANCE ON OTHER EXPERTS

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The current status of the Dalquier Property is available on the website of the “Ministère des Ressources naturelles et de la Faune ». The author did not personally look online to verify the information or the legal status of the property, including the rights to own, explore and extract ore from the site.

The author is not aware of the existence of any claims on the property due to financial grievances such as bankruptcy, mortgage, debts, liabilities or other.

This report has been prepared by Mr. M. Ali Ben Ayad, Ph.D. The author is a Qualified and Independent Person as defined by Regulation NI 43-101.

The present report is based on the past assessment files (GM) available on the E-Sigeom EXAMINE website of the Ministère des Ressources Naturelles et de la Faune (MRNF. Web site: [www.mrn.gouv.qc.ca](http://www.mrn.gouv.qc.ca)). This report is a synthesis of historical work done on the property.

The author did not carry out any independent exploration work, sampling and/or drilling work as it is not in the scope of this assessment report.

#### **4. PROPERTY DESCRIPTION AND LOCATION**

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##### **4.1 Property location**

Geologically, the property is located in the Archean greenstone belt of northwest Quebec (Canada). The Dalquier Property is located about 55 kilometers northwest of the town of Val d'Or and at 8 kilometers east of the town of Amos (Fig.1).

##### **4.2 Historical acquisition of the claims**

The ancient 60 claims that comprise the Dalquier Property were held by Mr. Glenn Griesbach, Mr. Stéphane Leblanc and Mr. W. Lambertz. Mr. Griesbach, who was responsible for the claims, is familiar with the Abitibi region, mineral exploration and mining in Abitibi, having worked as a geologist with a number of exploration and mining companies in the region in the late 1980s and early 1990s. The region of "Amos-Barraute-Senneterre" has always been of particular interest to Mrs. G. Griesbach and S. Leblanc and so several years ago they began to build a portfolio of mineral licenses in the region. The Dalquier Property is one of the results of his diligent effort to acquire, by staking, the right to explore some of the most prospective ground in the region.

The actual Dalquier Property, which object of this report, is also constitute by 59 claims, owned by the same owners cited above, but reorganized in a Ni-Cu-PGE objective. Mr. Stephane Leblanc is the responsible of the property claims.

##### **4.3 Property Description and subdivisions**

The Dalquier Property (actual), consisting of 59 claims in two blocks totalling 2,429 hectares, lies mainly in Figuery and Landrienne townships, with a few of the





claims in Dalquier Township (Fig.2). The Harricana River lies between the claims groups:

#### **4.3.1 Block 1:**

The property consists in part, of the larger Block 1 representing more than 90 % of the property area and lies within Figuery and Landrienne townships: Range 9, Range 10 for Figuery and Range 9 for Landrienne.

The UTM WGS 84 center coordinates of block 1 is given below:

**Block 1: E 720747m N 5382217m**

The East Harricana group with the major claims Block, called Block 1, the West Harricana claims block, called Block 2 (Figure 1).

#### **4.3.2 Block 2**

West of the Harricana River and north of block 1, we have the block 2 (Fig 3).

The center coordinates of block 2 is given below:

**Block 2: E 715067m N 5389990m**

### **4.2 Mining title's Status**

The Dalquier Property is comprised of 59 mineral claims in 2 blocks totalling 2,429 hectares. The table below provide the details of the mining titles for the property, blocks 1 and 2, and give the details concerning each claim (location, surface area, owner, etc.) and encumbrances for each claim.

The Dalquier Property covers a surface area of **2,412 hectares** and needs exploration expenditures for the renewal of these claims for a total of around **\$71,000.00**. All these data have been obtained from the MRNFQ.

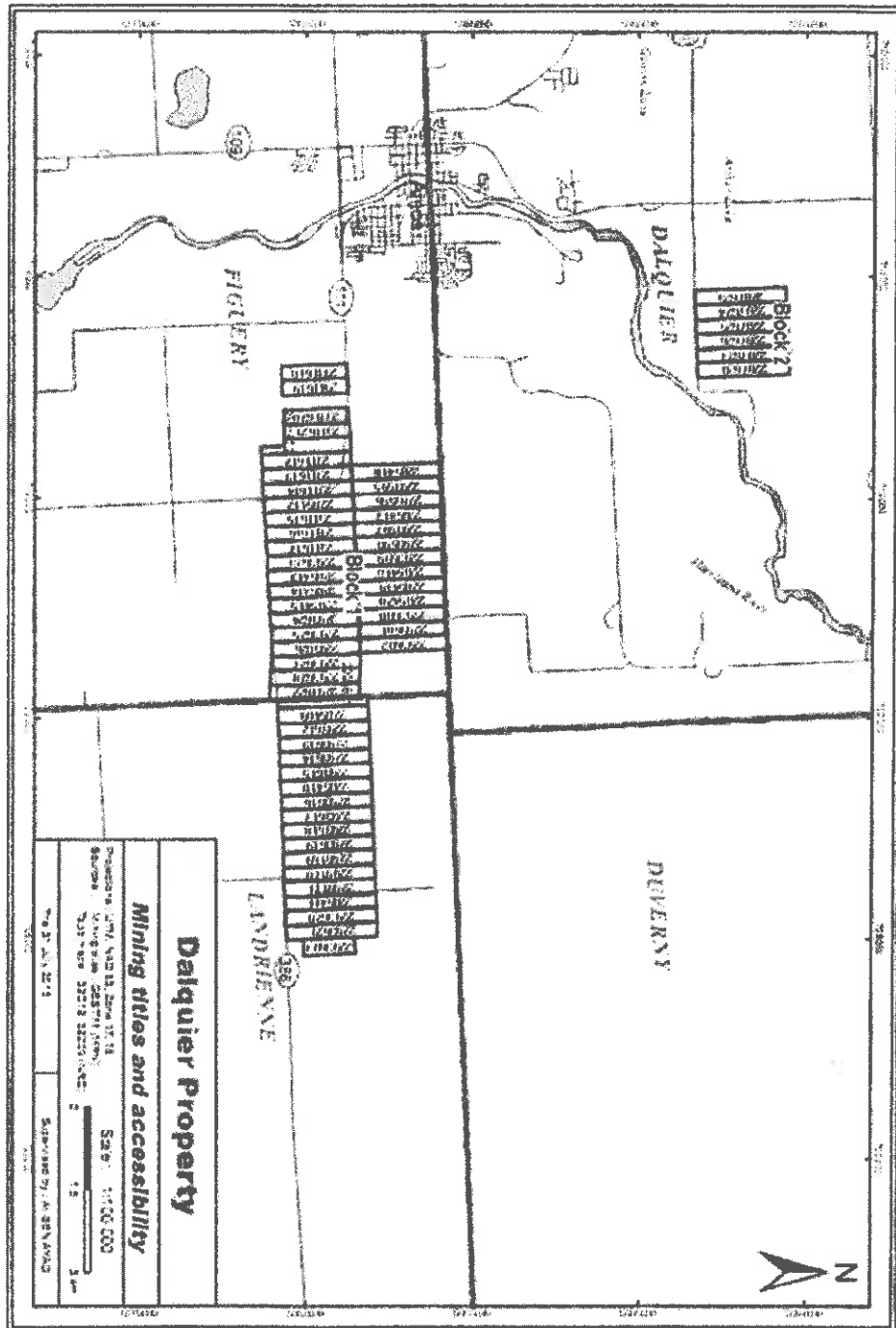


Figure 2. Mining titles map and accessibility.

SNRC	Township	CELL IDENTITY Range-Lot	CLAIM NUMBER CDC "X"	EXPIRYDATE	Expl. Exp. Req. for renewal (\$)	AREA (Ha.)	Owner & responsible name	%owner
32D09	FIGUERY	CF100 R 0009 0049 0	2311613	4/11/2014	1200.00	42.26	9248-7792 Québec Inc.	60.0%
32D09	FIGUERY	CF100 R 0009 0050 0	2311614	4/11/2014	1200.00	42.21	9248-7792 Québec Inc.	60.0%
32D09	FIGUERY	CF100 R 0009 0052 0	2311615	4/11/2014	1200.00	42.14	9248-7792 Québec Inc.	60.0%
32D09	FIGUERY	CF100 R 0009 0053 0	2311616	4/11/2014	1200.00	42.09	9248-7792 Québec Inc.	60.0%
32D09	FIGUERY	CF100 R 0009 0054 0	2311617	4/11/2014	1200.00	42.06	9248-7792 Québec Inc.	60.0%
32D09	FIGUERY	CF100 R 0009 0042 1	2311618	4/11/2014	1200.00	30.95	9248-7792 Québec Inc.	60.0%
32D09	FIGUERY	CF100 R 0009 0043 1	2311619	4/11/2014	1200.00	31.02	9248-7792 Québec Inc.	60.0%
32D09	FIGUERY	CF100 R 0009 0045 1	2311620	4/11/2014	1200.00	31.16	9248-7792 Québec Inc.	60.0%
32D09	FIGUERY	CF100 R 0009 0046 1	2311621	4/11/2014	1200.00	31.23	9248-7792 Québec Inc.	60.0%
32D09	FIGUERY	CF100 R 0009 0047 1	2311622	4/11/2014	1200.00	36.59	9248-7792 Québec Inc.	60.0%
32D09	FIGUERY	CF100 R 0009 0048 0	2311612	4/11/2014	1200.00	42.29	9248-7792 Québec Inc.	60.0%
32D09	DALQUIER	CD040 R 0004 0033 0	2287623	4/11/2014	1200.00	42.76	9248-7792 Québec Inc.	60.0%
32D09	DALQUIER	CD040 R 0004 0034 0	2287624	4/11/2014	1200.00	42.81	9248-7792 Québec Inc.	60.0%
32D09	DALQUIER	CD040 R 0004 0035 0	2287625	4/11/2014	1200.00	42.87	9248-7792 Québec Inc.	60.0%
32D09	DALQUIER	CD040 R 0004 0036 0	2287626	4/11/2014	1200.00	42.92	9248-7792 Québec Inc.	60.0%
32D09	DALQUIER	CD040 R 0004 0037 0	2287627	4/11/2014	1200.00	42.98	9248-7792 Québec Inc.	60.0%
32D09	DALQUIER	CD040 R 0004 0038 0	2287628	4/11/2014	1200.00	43.03	9248-7792 Québec Inc.	60.0%
32C12	Cel. 30" X 30"	32C12 X 0007 0008 1	2293603	4/11/2014	1200.00	27.33	9248-7792 Québec Inc.	20.4%
32D09	FIGUERY	CF100 R 0010 0050 0	2293595	4/11/2014	1200.00	41.99	9248-7792 Québec Inc.	19.8%
32D09	FIGUERY	CF100 R 0010 0051 0	2293596	4/11/2014	1200.00	41.92	9248-7792 Québec Inc.	19.8%
32D09	FIGUERY	CF100 R 0010 0053 0	2293597	4/11/2014	1200.00	41.79	9248-7792 Québec Inc.	19.8%
32D09	FIGUERY	CF100 R 0010 0054 0	2293598	4/11/2014	1200.00	41.72	9248-7792 Québec Inc.	19.8%
32D09	FIGUERY	CF100 R 0010 0055 0	2293599	4/11/2014	1200.00	41.65	9248-7792 Québec Inc.	19.8%
32D09	FIGUERY	CF100 R 0010 0059 0	2293600	4/11/2014	1200.00	41.37	9248-7792 Québec Inc.	19.8%
32D09	FIGUERY	CF100 R 0010 0060 0	2293601	4/11/2014	1200.00	41.31	9248-7792 Québec Inc.	19.8%
32D09	FIGUERY	CF100 R 0010 0061 0	2293602	4/11/2014	1200.00	41.24	9248-7792 Québec Inc.	19.8%
32C12	LANDRIENNE	CL215 R 0009 0001 0	2293611	4/12/2014	1200.00	25.28	9248-7792 Québec Inc.	0.204
32C12	LANDRIENNE	CL215 R 0009 0003 0	2293612	4/11/2014	1200.00	42.59	9248-7792 Québec Inc.	20.4%
32C12	LANDRIENNE	CL215 R 0009 0004 0	2293613	4/11/2014	1200.00	42.61	9248-7792 Québec Inc.	20.4%
32C12	LANDRIENNE	CL215 R 0009 0005 0	2293614	4/11/2014	1200.00	42.63	9248-7792 Québec Inc.	20.4%
32C12	LANDRIENNE	CL215 R 0009 0006 0	2293615	4/11/2014	1200.00	42.65	9248-7792 Québec Inc.	20.4%
32C12	LANDRIENNE	CL215 R 0009 0008 0	2293616	4/11/2014	1200.00	42.68	9248-7792 Québec Inc.	20.4%
32C12	LANDRIENNE	CL215 R 0009 0009 0	2293617	4/11/2014	1200.00	42.70	9248-7792 Québec Inc.	20.4%
32C12	LANDRIENNE	CL215 R 0009 0010 0	2293618	4/11/2014	1200.00	42.72	9248-7792 Québec Inc.	20.4%
32C12	LANDRIENNE	CL215 R 0009 0011 0	2293619	4/11/2014	1200.00	42.74	9248-7792 Québec Inc.	20.4%
32C12	LANDRIENNE	CL215 R 0009 0016 0	2293620	4/11/2014	1200.00	42.84	9248-7792 Québec Inc.	20.4%
32C12	LANDRIENNE	CL215 R 0009 0017 0	2293621	4/11/2014	1200.00	42.84	9248-7792 Québec Inc.	20.4%
32C12	FIGUERY	CF100 R 0009 0064 0	2293622	4/11/2014	1200.00	42.63	9248-7792 Québec Inc.	20.4%
32D09	FIGUERY	CF100 R 0009 0055 0	2293623	4/11/2014	1200.00	42.01	9248-7792 Québec Inc.	20.4%
32D09	FIGUERY	CF100 R 0009 0059 0	2293624	4/11/2014	1200.00	41.84	9248-7792 Québec Inc.	20.4%
32D09	FIGUERY	CF100 R 0009 0060 0	2293625	4/11/2014	1200.00	41.83	9248-7792 Québec Inc.	20.4%
32D09	FIGUERY	CF100 R 0009 0061 0	2293626	4/11/2014	1200.00	41.89	9248-7792 Québec Inc.	20.4%
32D09	FIGUERY	CF100 R 0009 0062 0	2293627	4/11/2014	1200.00	42.31	9248-7792 Québec Inc.	20.4%
32C12	LANDRIENNE	CL215 R 0009 0002 0	2285409	4/11/2014	1200.00	42.57	9248-7792 Québec Inc.	19.8%
32C12	LANDRIENNE	CL215 R 0009 0007 0	2285410	4/11/2014	1200.00	42.67	9248-7792 Québec Inc.	19.8%
32C12	LANDRIENNE	CL215 R 0009 0015 0	2285411	4/11/2014	1200.00	42.82	9248-7792 Québec Inc.	19.8%
32D09	FIGUERY	CF100 R 0009 0051 0	2285412	4/11/2014	1200.00	42.18	9248-7792 Québec Inc.	19.8%
32D09	FIGUERY	CF100 R 0009 0056 0	2285413	4/11/2014	1200.00	41.98	9248-7792 Québec Inc.	19.8%
32D09	FIGUERY	CF100 R 0009 0057 0	2285414	4/11/2014	1200.00	41.94	9248-7792 Québec Inc.	19.8%
32D09	FIGUERY	CF100 R 0009 0058 0	2285415	4/11/2014	1200.00	41.90	9248-7792 Québec Inc.	19.8%
32D09	FIGUERY	CF100 R 0010 0049 0	2285416	4/11/2014	1200.00	42.06	9248-7792 Québec Inc.	19.8%
32D09	FIGUERY	CF100 R 0010 0052 0	2285417	4/11/2014	1200.00	41.85	9248-7792 Québec Inc.	19.8%
32D09	FIGUERY	CF100 R 0010 0056 0	2285418	4/11/2014	1200.00	41.58	9248-7792 Québec Inc.	19.8%
32D09	FIGUERY	CF100 R 0010 0057 0	2285419	4/11/2014	1200.00	41.51	9248-7792 Québec Inc.	19.8%
32D09	FIGUERY	CF100 R 0010 0058 0	2285420	4/11/2014	1200.00	41.44	9248-7792 Québec Inc.	19.8%
32C12	LANDRIENNE	CL215 R 0009 0013 0	2299170	4/11/2014	1200.00	42.78	9248-7792 Québec Inc.	19.8%
32C12	LANDRIENNE	CL215 R 0009 0014 0	2299171	4/11/2014	1200.00	42.80	9248-7792 Québec Inc.	19.8%
32C12	LANDRIENNE	CL215 R 0009 0012 0	2299169	4/11/2014	1200.00	42.76	9248-7792 Québec Inc.	19.8%
32D09	FIGUERY	CF100 R 0009 0063 0	2293628	4/11/2014	1200.00	42.33	9248-7792 Québec Inc.	20.4%

Table 1: Mining titles status and encumbrances

## **5. ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY**

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### **5.1 Accessibility**

The property is located approximately 8 km east of Amos, 55 km northwest of the mining city of Val d'Or via Highway 111 and approximately 100 km northeast of the industrial and mining city of Rouyn-Noranda via highways 117 and 107 (Fig.1 & Fig.2).

### **5.2 Climate and Physiography**

The climate is temperate with warm summers, cold winters, and a low average precipitation. Summer temperatures average 25° C during the day and there is relatively little precipitation (200 to 500 mm). Winters are cold, with temperatures averaging -15° C in January and February, where it can get as low as -35°C for periods of a few days to a few weeks at a time. Lake ice remains until roughly the end of April. Exploration is possible throughout the year; however this can require the use of snow removal equipment to keep access roads open.

The regional topography is typical of the glaciated Canadian Shield in that low ridges of rock, gravel or sand interrupted by areas of muskeg along drainages. The physiography is generally a fairly flat region and consists of swampy bush and small trees. Drainage varies from poor to good depending on topography.

### **5.3 Local Resources and Infrastructure**

The closest center for the area is the city of Amos with a population of about 13000. The city of Val-d'Or (population approximately 35000), is about 60 minutes' drive from the Dalquier Property (55 from Val d'Or). The city of Rouyn-Noranda (population 40.000) is approximately 110 km distant.

The Canadian National Railway (CNR) crosses the property just north of Highway 111.

With its proximity the town of Amos offers good logistical support (groceries, hardware, banks,, hotels and motels, etc.), with a small hospital (with emergency services) and necessary provincial government services.

Amos has a municipal airport but scheduled flights from major centers land at the airports of Val d'Or and Rouyn-Noranda.

The region has an experienced, skilled and innovative workforce, considering the many exploration, development, contracting and engineering companies carrying out activities in the region. In addition, a variety of provincial government ministries maintain full service offices. Both the regional school board and technical colleges offer many industry-focused courses that ensure an educated workforce.

## **6. HISTORY OF EXPLORATION WORK**

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In the Val d'Or mining district, which encompasses the Dalquier Property, gold was discovered in the beginning of the 20th century, with the first active mine (the Lamaque Mine) entering production in 1933.

In the Amos area, exploration appears to have also begun around 1930 ( Jay Copper in 1924). The carrying out of the regional magnetic and EM surveys by the Geological Survey of Canada in 1947 boosted exploration activity. At that time serious exploration began (prospecting, geological mapping, aerial and ground geophysical surveys and drilling) in the area..

All the information below has been obtained from public assessment files kept by the "Ministère des Ressources Naturelles et de la Faune". These are available on the web site ([www.mrn.gouv.qc.ca](http://www.mrn.gouv.qc.ca)).

### **8.1. Blocks 1 of Dalquier Property**

#### **Figury Township**

**1947-1949:** Prospecting and geological mapping in Range 10 and Dalquier Range 4, by *Paramount Mining Co. GM 234 N - 234 H - 235*

- 1963-1966:** Ground geophysics surveys (EM & Mag), mapping and 1 DDH by *AMOS SYNDICATE*, in Range 9. **GM 14283-1 - GM 14283-2; GM 4283 - 16014**
- 1963:** DDH (1) by “*Colonisation, Mir*”. **GM 14981**
- 1965:** Ground geophysics surveys (EM & Mag), in Range 10 by *Kidd Mining Co.* **GM 16262**
- 1966:** Geophysical ground surveys (Mag & EM profiles), geological mapping and 3 DDH, by *Canadian Johns-Mainville Co Ltd*, Range 10. **GM 18048**
- 1966:** Diamond Drilling logs and geological sections by *Union Carbide Expl Ltd*, Range 9. **GM 19453**
- 1972-1973:** Ground geophysics surveys (EM & Mag), followed by two drillholes in Range 9 by *Mattagami Lake Mines Ltd.* **GM 28019 – 28971-28634.**
- 1974:** Geophysical reports by *SOQUEM* on EM, gravity and I.P. surveys covering parts of Range 9 and 10. **GM 29792-29758**
- 1975 - 76:** Ground geophysics surveys (Mag & EM) in range 9 & 10, by *UMEX Inc.* **GM 32169 – 31408**
- Ground geophysics surveys (Mag-EM) and DDH location, by *LABRADOR EXPLORATION LTD*, in Range 9 & X. **GM 30716 - 30717**
- 1978:** Ground geophysical survey (VEM) to confirm an input anomaly by *SEREM*, in R IX, Lot 60-64. **GM 34385**
- 1984:** Geological mapping, geophysical surveys (ground gradiometry, Mag & VLF) by *Noranda Exploration Ltd*, Range 9 – X. **GM 41662**
- Prospection and mapping by *Noranda Exploration (Claims Cosette)* Range 10 and IX. **GM 41680**
- 1984:** DDH and samples analysis by “*Claim Leclerc*”. **GM 42415**
- 1998:** Ground Geophysics (Mag & VLF) and diamond Drillholes by *Claims Hamel* in Range 10. **GM 56441**
- 2008:** Regional computer compilation using multiple Ni deposits characteristics with “*CARDS*” software for the identification of Ni deposits potential area at the scale of The Abitibi greenstone belt. By *Diagnos.* **GM 63895**

### Landrienne Township

- 1947:** Geological mapping by *Paramount Mining Co.* in Range 9. **GM 234 - 237**

Geological mapping by *KOULOMIZE & Co* in Range VI - X. **GM 12805**

- 1962:** Detail mapping and magnetic surveys followed by six drillholes by *Canadian Johns Marville Co.* **GM 11979 – 15080 – 18048 - 18474.**
- 1963-66** Geological mapping and 2 DDH, by *Canadian Johns-Mainville Co Ltd*, Range 9. **GM 15080**
- 1965:** Ground geophysics surveys (EM & Mag), in Range 10 by *Kidd Mining Co.* **GM 16262**
- 1966:** Geophysical ground surveys (Mag & EM profiles), geological mapping and 3 DDH, by *Canadian Johns-Mainville Co Ltd*, Range 10. **GM 18048**
- 1966-1967:** Ten drillholes in Range 9 by *Union Carbide Ltd.* **GM 19453. 21556.**
- 1971-1972:** Four holes drilled by *Wright bar Ltd* in Range 10. **GM 27436.**  
Geological mapping and trenching followed by nine drillholes in Ranges IX and X by *SOQUEM.* **GM 27656 – 27659-.**
- Magnetic and EM surveys by *Noranda Exploration* followed by one drill hole. **GM 27538 - 27539.**
- 1976:** Magnetic and EM surveys followed by one drill hole in Range 9 by *Umex Ltd.* **GM 28985 – 31632 – 31633 – 31789 – 31790 - 32687.**
- 1983:** Soil geochemistry, Range 9, by *Minerai lac Ltd.* **GM48288**
- 1984:** Geological mapping, geophysical surveys (ground gradiometry, Mag & VLF) by *Noranda Exploration Ltd*, Range 9 – 10. **GM 41662**
- Prospection and mapping by *Noranda Exploration* east Range 10 and IX. **GM 41680**
- 1984-85:** Geophysical surveys (Mag & EM / EM&VLF) and DDH recommendations, Range 9, Lot 55 - 62 by *Geo-Exploration Services.* **GM42065; GM41063**
- 1988:** Geophysical surveys (Mag & Max Min), prospection and geochemical sampling (soil and rocks), Geological and geochemical report, Barraute Property by *MINES BHP-UTAH Ltee*, Range 9. **GM 48288**
- 1989:** Diamonds drillholes and sampling analyses by *MINES BHP-UTAH Ltee*, Range 9. **GM 48843**
- 2008:** Regional computer compilation using multiple Ni deposits characteristics with "CARDS" software for the identification of Ni deposits potential area at the scale of The Abitibi greenstone belt. By *Diagnos.* **GM 63895**

#### 8.4 Block 2 of Dalquier Property

Block 2 is located in the north part of the Amos area, about 10 kilometers north of the city of Amos, in Range IV, lots 33-38 inclusive, west of the Harricana River.

Considering the few GM reports available that cover the 6 lots of this small block, little work seems to have been carried out here. A list of the GM reports in the immediate vicinity of Block 6 is given below.

- 1947: Geological survey by "*Paramount Mining and develop. Syndicate*". GM 00243 F; GM 234 J.
- 1974: Ground geophysical surveys (EM & Gravity) by "*Claims Gauthier & New Jersey Zinc Expl Co Ltd*". GM 30554
- 1985: Geological survey of the Property by "*Claims Gauthier*". GM 43461
- 1986: Geophysical Survey (Mag & VLF) partially on the Property by "*Exploration Mon-Dor Inc*". GM 43462

## 7. GEOLOGICAL SETTING AND MINERALIZATION

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### 7.1 Regional geology

The Dalquier Property is located in the east part of the Abitibi Greenstone Belt of the Canadian Shield's Superior Province.

Abitibi region consists mostly of NW-SE to E-W striking volcanic and sedimentary rocks of Archean age. Plutonic bodies are diverse in size and composition, and include granitic to granodioritic plutons, and granitic to gabbroic and ultramafic sills and dykes.

The volcanic rocks are mainly of mafic composition although ultramafic, intermediate and felsic types are also present. The abundance of pillowed and non-vesicular lavas, together with the flyschoid character of much of the sedimentary component, demonstrates the prevalence of deep submarine conditions. However, the occurrence of some fluvial sedimentary rocks and airfall tuffs attest to occasional local non-marine conditions.



The supracrustal rocks were deformed and intruded by granitic stocks and batholiths during the Kenoran event about 2,680 to 2,700 million years (Ma) ago. Folding along generally east-trending axes has commonly produced isoclinal structures. Regional metamorphism is predominantly greenschist and prehnite-pumpellyite facies except in the contact aureoles of the Kenoran granites where amphibolite grade is usually attained. The amphibolite facies metamorphism also occurs in the sedimentary rocks of the Pontiac Group.

The Abitibi Sub-province, the largest greenstone belt of the Superior Province, is well-known for its important volcanogenic massive sulphides and orogenic lode gold deposits. These Archean terranes enclose also a multitude of showing and small deposits of nickel associated to mafic-ultramafic sills and/or dykes and molybdenum (Mo) associated with differentiated post-kinematic intrusions (monzonite to monzogranite with Pegmatites).

The eastern Abitibi Sub-province "The Amos area" where is located the Dalquier property (Fig.3), encloses favourable lithologies and structures to discover base metal deposit and gold deposits. This area is also known by the presence of nickel showing associated with ultramafic sills. A world-class deposit of Nickel, the Dumont Ni deposit (1,451,000.000 tons at 0.25% Ni + minor Cu), is located in an ultramafic sill, about 30 Km west of the property.

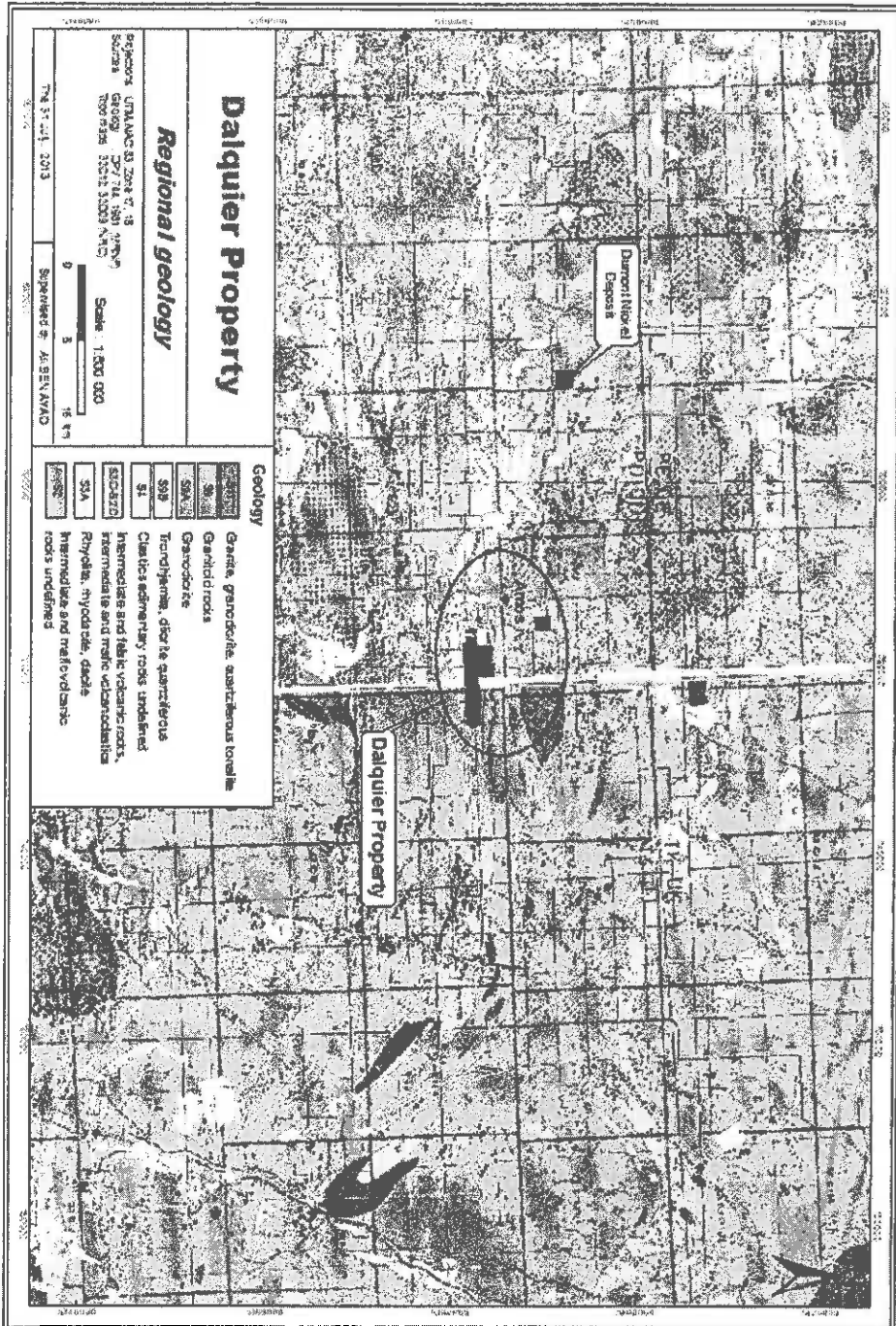


Figure 3. Regional geology of Dalquier Property. (Geological map of MRNFQ, 1981)

## 7.2 Local geology:

At the scale of the eastern Abitibi greenstone belt, the rocks of the Amos area (metavolcanics) are located within the northern flank of “La Motte-Vassan Anticline” (Imreh, 1982) and considered as a part of the Kinojevis Group. The Kinojevis Group is defined as a sequence of iron tholeiitic rocks. It is stratigraphically located under the Blake River Group.

At a smaller scale, the rocks in the Amos area (metavolcanics) are located within the southern flank of “NE Amos mega-anticline”.

### 7.2.1 Lithology and stratigraphy

Imreh defines three lithological groups in the south of the Amos area; from south to north they are:

- **Landrienne Formation:** Chloritic basaltic massive flows, locally magnetic, pillowed and brecciated, with the presence of lenticular rhyolitic lava flows. Porphyritic intrusives are common and appear to be comagmatic with the volcanic pile.
  
- **Figury group, subdivided into:**
  - **Lower Figury:** Lava flows and breccias flows of mafic metavolcanics and tholeiitic metandesites; volcanogenic epiclastic deposits; tuff and chemical precipitations; locally ultramafic - mafic differentiated sills.
  - **Upper Figury:** Flow breccias and lava flows, mostly andesitic, rarely dacitic and basaltic; tuffaceous episode with chemical precipitation.
  
- **Lower Amos group:** Mostly pillowed basaltic flows; ultramafics-mafics differentiated sills.

More recent geological work (GM B9524; Labbé, 1994, 1999) in the area of Amos reconsider the historical lithostratigraphic subdivisions concerning their Continuity.

The author, based on lithological and lithogeochemical criteria, defines six stratigraphical units regionally separated from one another by major structural contacts (Fig. 5). Thus, from north to south: Béarn group (pillowed baltic flow), Lac Arthur group (andesite and rhyolite), La Morandière group (pillowed basaltic flow), Amos group (pillowed basaltic flow), Figuery group (andesites and rhyolite) and Landrienne group (pillowed basaltic flow).

This volcanic succession is interpreted, following a geochemical study of all the volcanics mentioned above, as beginning by a first phase of calco-alkaline (Figuery Group) volcanism in an immature arc environment, followed by a rifting and a second phase of transitional volcanism (Lac Arthur Group).

All these units are regionally oriented E-W on the regional trend of deformation and shows isoclinal structures of folding.

In our case, The Dalquier property is essentially located in Figuery and Amos Groups except for Block 2 (north claim) which is located in the "Lac Arthur Formation".

The "Lac Arthur Formation", which represents the major part of the "Dalquier group", consists mostly of andesitic and minor basaltic flows, generally metric pillowed flows, with some felsic volcanic like rhyolitic (Jonpol Rhyolite, which contains some massif sulphide lens) and dacitic flows. (Labbé, 1995, 1999).

## **7.2.2 Structures**

### **A. Schistosity and folding**

Regionally, in the area of Amos Township, all the structures and microstructures are generally oriented along the regional E-W trend. Rock units dip generally steeply to the north, however, locally they commonly dip sub-vertically to the south.

The schistosity, generally highly developed in some geological units (Figuery), can also be discreet in other units (north of the McArthur Formation)..

However, this schistosity intensifies approaching the deformation corridors, the inverse faults and the axial plane of folds.

Folds can be observed at different scales depending on the lithology. At a regional scale (Amos area), 4 megastructures have been identified by Webber et al (1964) and redefined (Fig.6) by Labbé (1982). From North to south, is the the Soma anticline and the supposed "Duvernoy syncline" affecting the Mac Arthur Group lithologies, the anticline of "Rivière Chevalier" (Amos anticline of Webber) affecting the "Figuery Group" lithologies and the syncline of "Ruisseau Brisson" limited in the south by an overthrust fault on the Landrienne Group.

#### **B. Regional structures and stratigraphic consequences**

It is important to notice that as far as stratigraphy is concerned, until the structural problems are resolved , no serious stratigraphic organization can be established, especially concerning the units (formations and groups) defined (Webber et al,1964; Imreh, 1982; Labbé, 1995, 1999) north of the Figuery Group (Amos Group, Lac Arthur Formation, La Morandière and more to the north).

The anticline mega-structure northeast of Amos is shown in all the existing maps of the MRNFQ (32C12, 32D09, Map of 1982, MRNFQ) and its axis plane is located around the Suma Anticline defined by Webber (Figure 3&4).

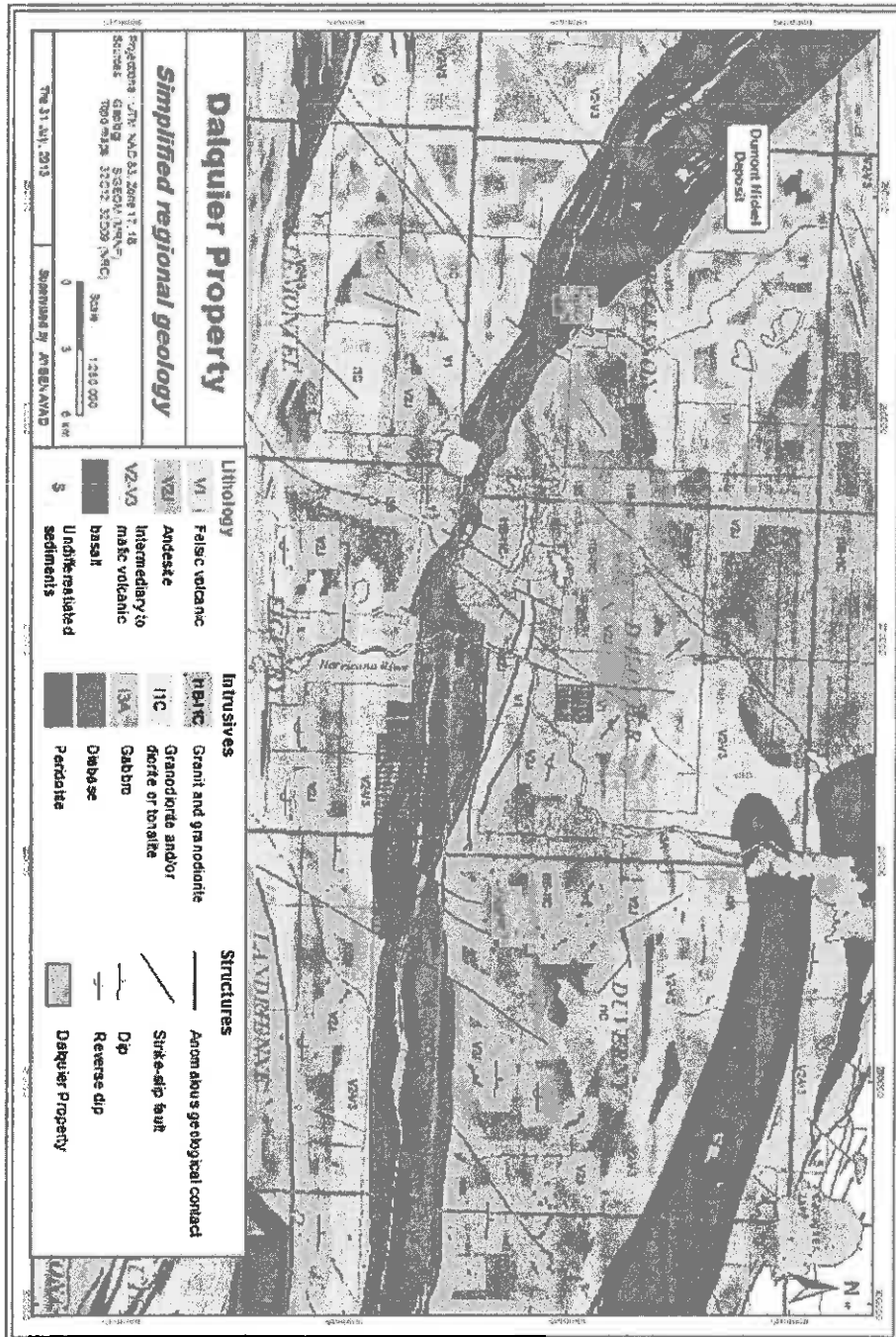


Figure 4. Regional geology of Dalquier Property. (Geological map of MRNFQ, 2007)

Regionally, south of this axial plane, the schistosity and/or stratification-schistosity, generally highly developed in some lithologies, is oriented along the regional E-W trend and dips steeply to the north. The majority of the professional geological papers in this area of Amos, south of the axial plane, report "a steep northerly dip and facing south". This structural configuration is typical of an inverse flank, we are regionally south of the axial plane of NE Amos mega-anticline, if we accept an anticline for this mega-structure. Thus, considering the "drag folds of the megastructure of Amos", which have been described by different authors and mapped by Labbé (1995,1999), from south to north, Amos group and Mc Arthur Group come out approaching the heart of the anticline mega-structure of NE Amos. In this scheme, if we suppose that there are no "nappe structures" (overtured structures) the Amos Group and Lac Arthur Group have to be more historical than the Figuery Group, which is contradiction with the interpretation concerning the stratigraphic position of the Amos Group accepted until now, in Imreh's work of 1982.

More recently, Labbé (1999) made some Zircon geochronological studies done on the Jonpol Rhyolite of the Lac Arthur Formation which gives an age of  $2714 \pm 3$  My. The Lac Arthur Formation corresponds to a volcanic cycle not yet identified in the Abitibi Greenstone Belt and possibly identified (Labbé, 1999) in the Ontario part of this greenstone belt (Hunter Mine Group).

This structural problem has numerous exploration consequences at a regional scale considering the metallogenic repartition of different deposits in different groups and formations and associated volcanism types in the Abitibi greenstone belt (Imreh, 1982).





**C: Deformation corridors**

Three deformation corridors of regional scale (Labbé, 1995), characterized by an intense schistosity, crosscut the Amos area and generally underline the contact between the different groups mentioned above (Fig.6). Thus, from North to south we have:

Jonpol Corridor: located NE and W of Amos Town, this corridor separates the Lac Arthur Formation from the Amos Group. Its width can reach 2 kilometres but the extension seems to be limited (located between two intrusives).

Bolduc Corridor: This regional deformation corridor, which constitutes the contact between the Amos Group and the Figuery Group, is located east of the town of Amos and develops more to the east in Barraute and west Senneterre townships.

Abcourt Corridor: Located in the contact between the Figuery Group to the north and the Landrienne Group to the south, this corridor is about 1 to 2 km with highly deformed rocks and has a regional E-W extension.

In addition to these Deformation Zones, the geological map of the area of Amos (MRNFQ 1982, Labbé, 1995) shows sinistral faults (brittle deformation), generally oriented NE-SW to NNE-SSW, of different scales which seem also to control the hydrographical system of this region.



### 7.2.3 Intrusive rocks:

Plutonic bodies in the Abitibi region are diverse in size and composition, and include granitic to granodioritic plutons, granitic to gabbroic and ultramafic sills and dykes. Volcanic and intrusive rocks (sills and dykes) have generally been metamorphosed to greenschist facies except in the vicinity of large intrusives where rocks are usually of amphibolite' facies (Imreh, 1982).

At the scale of The meridional Abitibi greenstone belt, different authors (Leduc, Sans Chagrin and Imreh) recognize the presence of two kinds of intrusives:

- Syn-kinematic to tardi-kinematic calc-alkaline intrusions characterized by the presence of hornblende and the lack of garnet ( Preissac, LaCorne batholiths),
- Post-kinematic intrusions (Lamothe and Preissac batholiths) composed of biotite diorite, biotite grano-diorite and adamellite (quartz monzonite and monzonitic granite included) where pegmatitic dykes with spodumene (Mo) are frequent.

Numerous diabase dykes, post Kenoran orogenesis, with a Proterozoic Age, crosscut at a direction of 030° to 045° N all the lithologies described above.

In the goal of this report, we have to remind the generation of intrusive thus “the ante-kinematic intrusive” which took place before the Kenoran orogenesis.

Anti-kinematic intrusives: Numerous sills and dykes, granitic, gabbroic and ultramafics, occur throughout the volcanic rocks and they are generally parallel to the WNW regional structural trend. In this category we can also add some synvolcanic felsic intrusive like Trecesson and Duvernoy intrusions (Labbé, 1999). These non-differentiated intrusions, mafic to ultramafic in composition, correspond to porphyries, lamprophyres, gabbros and peridotites (Imreh, 1982; Hébert, 1992; Labbé 1994).

### **7.2.4 Intrusive rocks in the area of the property**

In the immediate environment of the property, six plutons are known (Fig.5) and correspond to Villemontel intrusive, Amos intrusive, Trécesson intrusive, Berry intrusive, Duvernoy intrusive and Claverny intrusive. Most of these intrusions, post to syn-kinematic, correspond to granodiorite and granite, locally diorite and monzodiorite.

Besides these post-kinematic intrusives, anti-kinematic mafic to ultramafic sills and dykes are known in the area of the property and will be discussed later.

### **7.3 Property Geology**

Geographically, The Harricana River subdivides the property into two claims groups (Fig.7):

- East Harricana Group with one major claims block called Block 1,
- West Harricana with a small block claims, called Block 2,

Geologically, the blocks 1 is located in the Figuery and Amos groups. Block 2 is located in the McArthur group further to the north.

#### **7.3.1 Block 1**

Block 1 represents about 90% of the property with 53 lots. This block, which is straddling Figuery Township (Range 9 & 10) and Landrienne Township (Range 9), is also straddling geologically part of the Figuery Group to the south limit of the property and the Amos group to the north (Fig.5 & 7).

The Property Block 1, particularly the Figuery part, is characterized by a lack of outcrops, particularly in the south part where most of the geological interpretations are done by the projection of lateral data, by geophysical anomalies and by drill holes data. Nevertheless, the ultramafic sills, for their relative hardness, come out from lots 21 to 64, Range 10 of Figuery township and in the north limit of Landrienne Township in Range 9 from lot 1 to lot 45 (Hébert, 1982).

According to Labbé (1995), the synthetic structural map (Fig.6) shows the presence of a major regional tectonic contact (overthrust fault) in the south limit of the Block 1 Property (Figury Township Range 9), separating the Amos Group from the Figury Group in south ( Bolduc Corridor). This contact continues to the east and reappears in the east part of the property Block 1 (Landrienne Township, Range 9).

North of this contact, the property lies at the base of Amos Group lithologies, mainly andesites, rhyolite and dacite lava, alternating with felsic tuff, the whole locally intruded by some intrusives like gabbro and pyroxenite (GM27538, GM21556, GM 19453). This zone shows the presence of multiple graphitic horizons, mainly mineralized in pyrite and pyrrhotite.

In the north-west part of Block 1 (Figury Range 10), the presence of an ultramafic sill complex (UMS) is known, identified in this area by geophysics (magnetics) and correspond to the continuity of the UMS outcrops in the east of this block. These sill continue towards the east in Landrienne Township (Range 10), just north of Block 1(Range 10, Landrienne Township).

Two others sills, recognized by drillholes have been crosscut in lots 2 to 7 in Landrienne Range 10. north of the principal sill's complex, but their position has not been established precisely (Hébert, 1982).

#### **A. Geology of Lower part of Amos Group and the ultramafic sills**

As part of a MRNQ project ("Liothostratigraphie et métallogénie prévisionnelle des volcanites de l'Abitibi Est"), detailed mapping of the area of the ultramafic sill (UMS) was carried out by Hébert in summer 1980.

The Amos group, where the UMS is located in the lower part (lower Amos Group ), is limited to the south by the Figury Group, essentially the upper Figury (Imreh, 1982). The lower Amos Group is constituted, in this area, by mafic to intermediate "metavolcanic" rocks, locally felsic, and intercalations of fine tuff and/or crystal tuff.



Differentiated ultramafic to mafic tabular structures, constituting the UMS, are injected sub-parallel to the primary "metavolcanic" structures, particularly in a specific narrow felsic tuff.

The volcanics south of the main basic intrusion are generally massive, quite highly sheared and contorted (Bolduc Corridor), with minor pyrrhotite sulphide mineralization, the disseminations becoming more concentrated toward the peridotite-volcanic contact.

The volcanics north of the main intrusive are moderately pillowed, but the pillows were so highly sheared (Jonpol Corridor) and altered that dip and strike determinations were not possible (GM 12776).

### **B. The Ultramafic Sill complex**

The differentiated Amos sill complex, with a maximum of 500 m in thickness, has a length of 15 km recognized regionally by outcrops, drillholes and geophysics.

Some authors (Serem, 1978; GM 34385) who worked near the UMS report the existence of narrow layers of felsic tuffs and cherts that contain veinlets of chalcopyrite and malachite centimeters in thickness and a few centimeters in length.

The lower contact of the UMS is regionally (Hébert, 1982) emphasized by a thin banded tuff layer, locally metamorphosed and recrystallized with amphibole, chlorite, epidote and oligoclase. This intrusive contact shows an angle inferior to 15° with the tuff layer. Furthermore, the lower part of the UMS (dunite) is locally brecciated over three meters in width with angular elements of dunite of about 30 cm in a schistose serpentine matrix.

Hébert (1982) recognize five cycles of intrusions in this sill complex and the scheme of the succession of the different lithofacies keeps quite the same in every cycle. Thus, from the base upwards, we have the succession of "dunite-wehrlite-clinopyroxenite-gabbro" that we find in all the cycles except cycle 3.

This third cycle is anomalous due to the presence of the sequence "dunite-gabbro-clinopyroxenite-wehrlite". A hypothesis of tectonic movement has been proposed by Mr. Hébert (1982) to explain this anomalous cycle.

**C. Brief description of the different lithofacies in a cycle of the UMS complex (Hébert, 1982)**

**Dunite:** Dunite represent about 50% of every cycle of the UMS. Granulometry, from bottom to top, varies from fine (less than 1mm) to coarse (4 mm). The fine dunite is massive and highly magnetic; the coarse dunite is characterized by bedding (millimetric to pluri-centimetric chromite layers alternating with decimetric layers of olivine, "dunite") and a magmatic foliation highly developed. All these facies are totally serpentinized.

The dunite is locally deformed with the appearance of of brucite in fracture planes. In this tectonized facies we can also find small veins of chrysotile in different type of fractures and microfractures (schistosity and joints).

**Wehrlite:** Overlying the dunite, the wehrlite appear gradually by a progressive enrichment in clinopyroxene (5-15%). This massive rock rich in chromite (diopside rich in chromite), shows a multitude of olivine inclusions in diopside, totally serpentinized. Magnetism is less strong than in dunite.

**Clinopyroxenite:** The passage from wehrlite to clinopyroxenite is gradual and where magnetite disappears due to the lack of olivine.

**Gabbro:** The transformation from clinopyroxenite to a gabbro remains also gradual by the enrichment in plagioclases. The gabbro can be bedded (alternation of fine layers of plagioclases and pyroxenes) and/or foliated. Depending of the profile, the gabbro width varies from 12 m to 280 m.

The gabbro shows some differences (colour, granulometry, recrystalizations of the amphiboles) depending in which cycle and which profile we are.

All these ultramafic complex lithofacies are affected but the regional Kénoran metamorphism given the following paragenesis (Hébert, 1982):

- Host rocks (metavolcanics): Chlorite-albite-epidote-quartz  
(±±hornblende)  
Ultramafic sills:



- Dunite: Serpentine + magnetite ± chlorite ± talc ± carbonate ± amphibole
- Wehrlite : Serpentine + chlorite + magnetite ± amphibole ± talc ± carbonate
- Clinopyroxenite : trémolite + actinote + chlorite + magnetite
- Gabbro : Brown hornblende + chlorite + epidote + albite ± leucoxene ± garnet ± carbonate±

### 7.3. 2 Block 2 geology

In Block 2 outcrops occur mainly in the north part of the property (Fig.6&7). This consists mainly of intermediate lava striking west-northwest with a steep northerly dip and facing south (GM00234F; GM43461).

Considering the regional geology discussed below, this block is located in the “Lac Arthur Formation”, south of the axial plane of the NE Amos megastructure, so always in the inverse flank.

Following a brief mapping of this property (GM43461), volcanic lithological units, mafic to intermediary in composition have been distinguished in this block. They correspond to andesitic and minor basaltic flows, generally pillowed, with some felsic volcanics such as dacitic flows. The mafic and felsic flows are generally pillowed, with pyrite in their borders. A crystal tuff unit with a width of more than 350 m occupies the south of the property.

### 7.4 Mineralization

The Dalquier Property, as defined below, consists of two claims blocks for a total of 59 claims. Considering the geological and metallogenic environment of the 2 blocks, a regrouping is done for those presenting similar geological and metallogenic characteristics.

Therefore, we will discuss Block 1 located in the Amos Group and in the Figuery Group and finally Block 2 in the north located in the Lac Arthur Formation.

The Dalquier Property is an early stage exploration project, the known mineralization is essentially that discovered by historical exploration prospecting and drilling.

We will first describe the exploration results of historical work of each block for gold and massive sulphides (Zn, Pb and Cu). Ni-Cu exploration work and potential, for its strong relation with the ultramafic and mafic sills, will be described separately.

#### **7.4.1 Gold and Base metals exploration works on the Dalquier Property**

In comparison to the north region of Amos (Amos mine, and further the north) little exploration work has been carried out in this area, generally based on the reconnaissance of airborne INPUT anomalies. Hence, after brief mapping, geophysical surveys such as magnetics, VLF and/or Maxmin EM, short diamond drilling (60 m to 150 m) was proposed for the recognition of the ground geophysical anomaly, and enables to "explain" the different EM conductor.

##### **7.4.1.1 Block 1**

Block 1, Range 9 Figuery and Landrienne townships, covers the lower part of the Amos Group and locally encloses the contact with the Figuery Group (Bolduc Corridor).

Block 1, Range 10 Figuery cover the ultramafic sill and its hanging wall and footwall.

In the Landrienne Township part of Block 1 the recognized conductors correspond generally to a pluri-decimetric to pluri-metric graphitic horizon, generally mineralized in pyrite and/or pyrrhotite (0.5% to 30% sulphides, locally massive and/or banded sulphide). This "graphitic" horizon is sometimes described like (or associated with?) siltstones, cherty black fine sediments sometimes showing the presence of quartz-carbonate stringers or hematite stringers (GM21556). A chloritization and sericitization is noted in some drillholes, affecting the "graphitic horizon" in its hanging wall and footwall (GM19453). The altered (chloritization

and epidotization) hanging wall and footwall may contain finely disseminated pyrite.

The host rock of this graphitic horizon corresponds to mafic basaltic flows, locally pillowed interlayers with andesitic or felsic tuffs, locally with dacites or rhyolites and cherts. Fine sediments, essentially siltstones and rarely carbonates, have been observed in drillholes.

Block 1, Figuery Range 10, cover partially the Ultramafic Sill (UMS) of the Amos Group. The volcanics south of the main ultramafic intrusion are generally massive, quit highly sheared and contorted (Bolduc Corridor), with minor pyrrhotite sulphide mineralization, the disseminations becoming more concentrated toward the peridotite-volcanic contact. North of the main intrusive, the volcanic, highly deformed (Corridor Jonpol Corridor), are moderately pillowed and altered with pyrite disseminations (GM 12776).

Nickel-copper exploration works will be described later.

#### **7.4.1.2 Block 2**

This block lies on a mafic to intermediary volcanic lithological unit (GM43461), corresponding to an andesitic and minor basaltic flow, generally pillowed, with some felsic and dacitic volcanicic flows. The mafic and felsic flows are generally pillowed, with pyrite in the pillow borders. A crystal tuff unit, with a width of more than 350 m, occupies the south part of the property.

In this block, the two known mineralized (1% chalcopyrite and pyrite) quartz veins, located in a crystal tuff unit (Lot 38), are oriented N40°E with a width of 50 cm. One of them (east vein) can be followed discontinuously for about 70 m (GM 43462).

Besides these showings, Block 2 is surrounded by interesting showings:

- NW of Block 2 (Range V, Lots 18-19), presence of the "Mondor Zone" with 5.1 g/T over 1.8 m, 4.5 g/T over 1,8 m and 2,2 % Zn.
- NE of Block 2 (Range VI, Lot 52) discovery (Raymor Resources & Co) of

mineralization in graphitic silicified and sericitized shear zone drillhole: zone with 2.4 g/T on 30 m and 2.9 g/T on 19.8 m.

#### **7.4.2 Nickel-Copper and PGE mineralization in the Dalquier Property**

Nickel-Copper and PGE concentrations are strongly associated with ultramafic and mafic rocks which are stratigraphically located in the lower sequences of the Amos Group.

In the Dalquier Property, the most important UMS is known in Block 1 Figuery Township, Range 10 and Landrienne Township range 9 (Fig.7). This part of the property covers the lower sequences of the Amos group which encloses the UMS for about 15 kilometers in an east-west direction. This property block 1 covers the principal UMS, in east-west, on about 3 km (Lot 49 to 61 inclusive). Two other smaller UMS are known by drillholes, north of the principal, in the Range 10 of Figuery Township (Labbé, 1982).

Very little exploration (geological mapping, geophysical surveys "magnetics & EM") has been done over the area of the UMS and generally their objectives were essentially to explore for gold, volcanogenic massive sulphides or asbestos fiber (the latter as an alteration product of the UMS).

Drillholes appear to be entirely absent in this part of the Dalquier Property, and the few drillholes which crosscut the UMS are localized (Fig.8) west of this block and basically in the east, in Range 10 of Landrienne, north of the property (Block 1 Landrienne, Range 9).

Thus, west of Block 1 of the property (Fig.8), following a geophysical survey (VLF), a DDH has been realized to rest the VLF anomaly axis. This drillhole (F1-97-03, GM56441) localized in the lower contact of the UMS with the underlying andesite, the presence of mineralization (disseminated or in the matrix of breccias) of pyrite and chalcopyrite (2-3% py-cpy) in a narrow highly altered (quartz, carbonates, feldspars and chlorite) and sheared felsic tuff horizon. Fine

disseminated pyrite (less than 1%) is present locally in the UMS crosscut by this drillhole.

The best values obtained in this drillhole are between 84.1m and 86.0m (**1.8 m apparent width**) with **330 ppb Au, 5.2 ppm Ag and 7240 ppm Cu.**

A second drillhole done in 1998, next to the first described above, recognized the same geology and mineralization without any economic values (GM 57204).

Further to the east, north of Block 1, Landrienne part (Range 9), four holes were drilled in 1971 by Wrightbar Mines Limited, thus holes WL-1 to WL- 4 which crosscut the UMS in this sector. They recognise the UMS with its different ultramafic lithofacies, different kinds of alteration (carbonation, serpentinization) and dissemination of fine sulphides (pyrite, pyrrhotite and chalcopyrite).

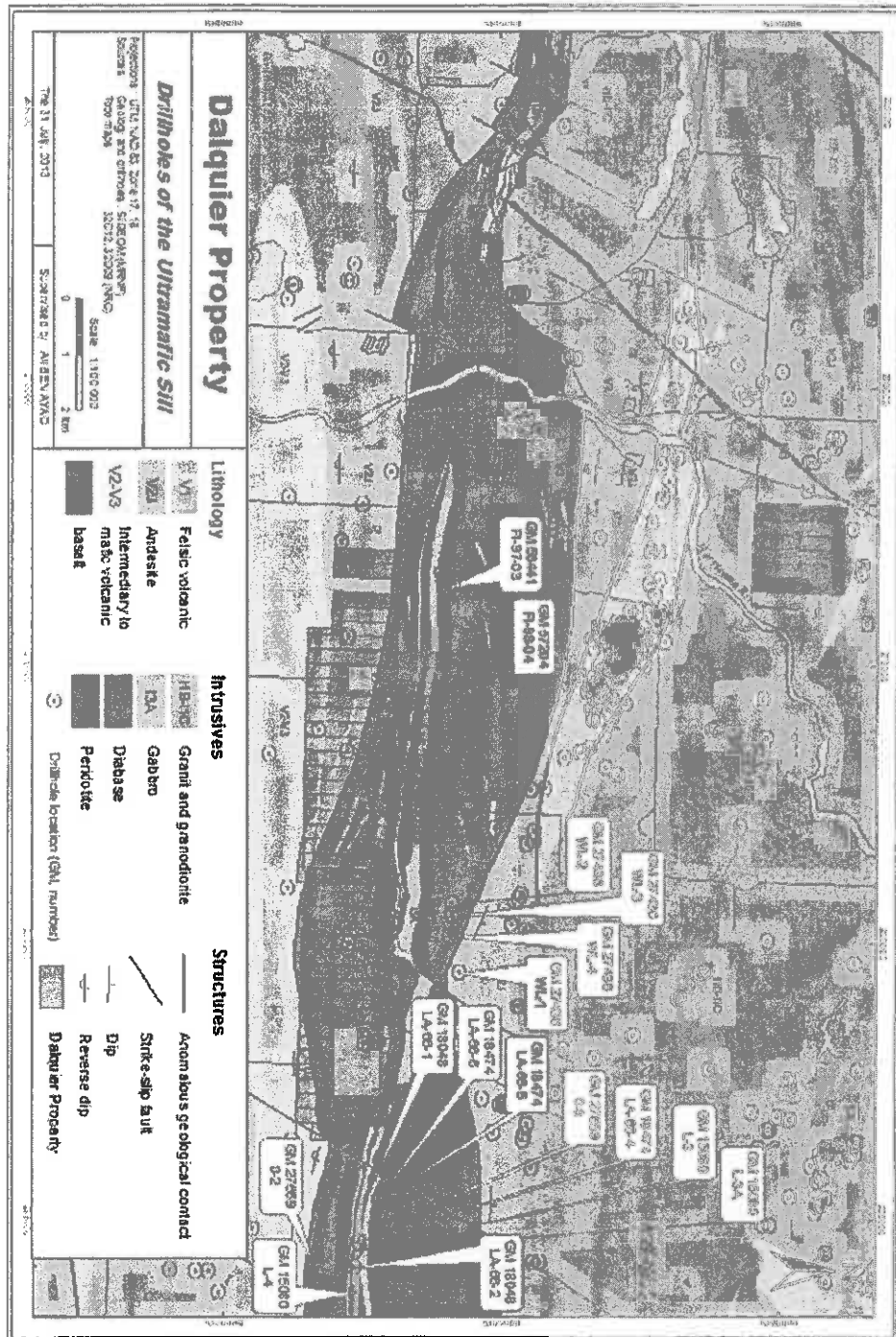


Figure 8. Drillholes North of the Ultramafic Sill.

As an interesting example, we provide the results of one of them (Hole WL-1, GM27436).

**Hole WL-1:**      *Location: Landrienne Township. Lot 7. Range 10.  
Line 63-W. Station 17450N.  
Claim No. 2. Certificate 312210.*

**Description:**      0.0\_23.0 Casing.

**23.0-170.0**      Massive medium-grained grey to dark grey gabbro. Scattered in-light colored feldspathic stringers. **Little chalcopyrite and pyrite** in places.  
72.5-76.0 **Scattered fine-grained chalcopyrite**

**170.0-953.0** Dark grey coarse-grained massive peridotite-pyroxenite. Much Magnetite.  
170.0-180.0 **Disseminated fine-grained chalcopyrite and pyrrhotite and pyrite.**  
A few sulphides threads.  
180.0-450.0 Scattered **very fine-grained sulphides** with much magnetite.  
Slightly serpentinized.  
230.0-500.0 Fractured and contains numerous dark green serpentinized threads. 40 -50 - No mud.  
**Platy sulphides** along slip planes in places.  
323.0-450.0 **Disseminated very fine-grained sulphides** with much magnetite.  
342.0 - " carbonate stringer at 70°. **Pyrite and chalcopyrite.**  
450.0-650.0 **Disseminated very fine-grained sulphides**  
*A little more than previous.*  
Much magnetite.  
Setter serpentinization.  
500.0-530.0 highly fractured. 45°-60°  
530.0-585.0 Moderately fractured. 45°-60°  
with numerous dark green serpentinized threads. No mud.  
585.0-650.0 Scattered chloritic serpentinized stringers. 45 - 65 . to 1".

**650.0-935.0** Fair magnetite.  
Magnetite content diminishes slightly. Peridotite, massive.  
**Disseminated very fine-grained sulphides.** Scattered dark serpentine threads with magnetite.  
736.0-742.0 Scattered low angle serpentinized stringers.  
790.0-843.0 Scattered asbestos threads, 45°, and stringers 1/32 to 1/8" Cross fibers.  
843.0-872.0 Well fractured, 45°-60°.  
872.0-875.0 Very fine-grained and magnetic.  
875.0-893.0 Scattered asbestos threads and string-ers, 60°-70°, 1/32" to 1/8w.  
875.0-953.0 Peridotite contains fair magnetite, and is well erpentinized.

935.0-953.0 **Disseminated fine-grained sulphides.**  
*A little botter than before.*

**953.0— 976.5** Medium-grained grey massive gabbro.  
974.0-976.5 Very fine-grained.

976.5- 988.0 Dark grey rhyolitic tuffs.  
**Well mineralized with coarse pyrite aggregates and threads.**  
**Very little pyrrhotite.**

988.0-1004.0 Light gray coarse-grained acidic flows and tuffs.  
 Little fine  
 grained sulphides in places.

End of hole

81 core sample have been taken from 72.5 feet to 988.0 feet (end of hole) for Ni assays by the Bourlamaque assay office reg'd. The results are summarized in average as follows (**GM27436**):

Drillhole WL-1:

0.207 % Ni over 70 feet, from 300 to 370 feet

0.199 % Ni over 70 feet, from 820 to 890 feet

For the three other holes drilled west of the first one (Fig. 8):

Drillhole LW-2: Drilled furthest to the west, in Lot 2, Range 10 Landrienne Township, shows some important lateral variation by the abundance of the gabbro facies and a the presence of basic dykes in UMS. Fine mineralisation of pyrite-pyrrhotite and chalcopyrite keep present with a different amount but in general less abundant than in holehole LW-1 described above. The length of the hole is 950 feet with the same collar angle than hole LW-1, thus 60°, to south.

31 core samples have been taken from 37.5 feet to 950.0 feet (end of hole) for Ni assays by the Bourlamaque assay office reg'd. The results are summarized, in average, as follows (**GM27436**):

Averages:

0.175 % Ni over 137.5 feet, from 37.5 to 175.0 feet

0.170% Ni over 85.0 feet, from 865.0 to 950.0 feet

Drill hole LW-3: Drilled east of the hole LW-2, in Lot 3, Range 10 Landrienne Township, with a 60° azimuth at collar, has a depth of 502 feet. This drill hole recognized an important volume of peridotite, locally tectonized (faults) with abundant sulphides including disseminated pyrite-pyrrhotite and less chalcopyrite. The end of the hole at 502 feet is in peridotite with disseminated sulphides.

38 core samples were taken from the interval 150 feet to 502.0 feet (end of hole) and assayed for nickel by Bourlamaque assay office reg'd. The results has not been summarized. Values of nickel vary from 0.05% Ni to, locally 0.24% Ni.



Drill hole LW-4: Drilled east of holehole LW-3, in Lot 4, Range 10 Landrienne Township, south azimuth and --55° dip at collar, has a depth of 550 feet. This drillhole recognized the gabbro lithofacies until 217 feet depth until it-penetrated an altered carbonatized talcose peridotite with a fair concentration of magnetite, and a coarse grained grey peridotite at 262-501 feet depth, and a gabbro contact at 501 feet. The end of hole stayed in the gabbro lithofacies at 550 feet, with a mafic dyke from 543 to 548 feet depth. Few sulphides have been described in this hole and the 28 core samples taken from 220 to 500 feet gave weak Ni values varying from 0.03% Ni to 0.16% Ni.

East of this zone, close to the property, there are other drillholes (Fig.8) which crosscut the UMS, thus:

**Drillhole LA-66-4 (GM18747)**, located further to the east, NE of the limit of the entire Block 1 Property, crosscut the UMS recognizing the presence of disseminated pyrrhotite and chalcopyrite in the 10 meters of the andesitic and rhyolitic footwall with a graphitic narrow horizon with dissemination of pyrite, intercalated in this volcanic.

Drillhole LA-66-1 (GM18048), drilled west of the LA-66-4, crosscut all the UMS without any trace of sulphide.

**Drillhole LA-66-2 (GM18048)**, drilled further to the east of LA-66-1, and east the drillhole LA-66-4 (GM18747) described above, recognize the presence of sulphide dissemination of pyrite, pyrrhotite and chalcopyrite in the footwall of the UMF composed of carbonitized rhyolite and diorite with disseminations of pyrite and chalcopyrite over several meters, and finished in andesitic lava with minor pyrite disseminations.

**Drillhole LA-66-03** recognizes the presence of sulphide in the bottom of the peridotite moderately magnetic with disseminations of pyrite, minor pyrrhotite overlying a highly carbonatized peridotite with disseminations of pyrrhotite and chalcopyrite and also a **bronze stellated** mineral forming star like crystals (nickel mineral?), followed by a fault zone in peridotite and finally a gabbro at the end of the hole.

No nickel or PGE samples analyses have been done, for these drillholes, on these sulphides spatially associated to the UMS and its contact with the volcanic.

Following this brief description of all these occasional short drillholes that crosscut the UMS close to the Block 1 property (Figury and Landrienne), we can conclude the following concerning the UMS of southeast Amos:

- Presence of disseminated sulphides such as pyrite, pyrrhotite and chalcopyrite in some lithofacies of this ultramafic sill,
- Presence of sulphides (disseminations, small massive lenses and stockwork) in the basal contact of the UMS, generally tectonized, and in the host rock (tuff and/or felsic and mafic lava flow) ,
- Presence of alteration such as serpentinization and talc-carbonates spatially associated with mineralized zones,
- Presence of nickel mineralization in non-negligible quantities and grades, locally sub-economic, whenever the UMS rock containing visible sulphide mineralization has been analysed for nickel,
- Existence of a lateral variation considering the abundance and absence of sulphides,
- Existence of a nickel evolution in the sulphide zones.

All these data will be discussed later in the chapter interpretation and conclusions.

## **8. DEPOSIT TYPE**

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Considering the position of the Dalquier Property within the Abitibi Greenstone Belt and the presence of the Ultramafic sill, three major kinds of deposits may be found:

- Orogenic gold quartz-veins
- Nickel, chromite and PGE deposits

### **8.1 Orogenic Gold Deposits (gold-bearing quartz $\pm$ carbonate veins in volcanic rocks and plutonic rocks)**

Archean orogenic gold deposits are generally defined as structurally controlled vein or shear margin deposits emplaced epigenetically in all lithologies occurring in volcano-plutonic belts of Archean Age (Lamothe et al., 2006, Groves et al., 1998). These concentrations of gold are the result of relatively homogeneous hydrothermal fluid flows of variable origin, including metamorphic devolatilization, felsic plutonism and mantle fluids (Lamothe et al., 2006, Hagemann and Cassidy, 2000).

The Amos region has a high potential for gold. In Duverny Township, east of Dalquier Township, numerous gold showings have been discovered (Fig.10), such as Duvay (reserves estimated at 40,000 tons at 1.7 g/t Au), Fontana (reserves estimated to 968,000 tons at 5.47 g/t Au) and Standard Gold (reserves estimated to 435,453 tons at 6.17 g/t Au).

These deposits are all associated with highly carbonatized (ankerite) alteration zones, and are spatially associated with the NW-SE shear zones.

More to the west, in Dalquier Township (Labbé, 1995), two other gold showings are known. The Chib-Kayrand occurrence is located in Range VI (lots 12 and 13) near the eastern edge of the Trécesson Pluton. A selected sample of the main vein of the occurrence (Goldstar vein) gave 88 g/t Au (deposit file 032D/09-22, MRNQ). SE in the andesites of the Lake Arthur Formation a sample of a quartz

vein in the Mondor Black occurrence gave a result of 57g/t Au. These two occurrences are associated with an approximately N130° shear-direction.

The great majority of gold showing and deposits of the Amos region are spatially associated to regional NW-SE dextral shear zones except the Duvay deposit that seems to expose a particular kinematic (Labbé, 1999).

## **8. 2 Nickel, Copper and PGE deposits**

The magmatic nickel, copper and platinum group deposits are subdivided into two major subgroups, thus the “*ultramafic-associated nickel, copper*” and the “*gabbroid-associated nickel, copper, and platinum group elements*” (O.R. Ekstrand, 1984).

### **1. Ultramafic associated nickel copper deposits**

The host rock is subdivided into three major types:

- Volcanic Peridotite Nickel
- Intrusive Dunite Nickel
- Intrusive Ultramafic Nickel-Copper

The known economic nickel deposit associated with the ultramafic intrusion (Dumont Nickel deposit) relates to the Intrusive Ultramafic Ni-Cu category, for which the general geological and metallogenic criteria are as follows:

#### **A. Geological setting**

*Intrusive Ultramafic Nickel-Copper*: Proterozoic mafic volcanic belts, Archean greenstone belts.

#### **B. Host rocks or mineralized rocks**

*Intrusive Ultramafic Nickel-Copper*: Ultramafic intrusive lenses, less magnesian than Volcanic Peridotite Nickel and Intrusive Dunite Nickel, adjacent metasedimentary and metavolcanic rocks.

#### **C. Form of deposits, distribution of ore minerals**

Intrusive Ultramafic Nickel-Copper Ores may comprise either 1) rich segregations at margins (basal contacts were interpretable) of ultramafic lenses, as at Agnew, Pipe and Manibridge; or 2) conformable internal zones of disseminated sulphides, **as at Dumont** and Mt. Keith.

Remobilization of sulphides into veins, breccia matrices, and disseminations in fault zones and wall rocks is common.

#### D. Genetic model

Partial melting of the mantle is considered to have produced highly magnesian liquid (>20% Mg in Archean komatiitic host rock's subtypes "Volcanic Peridotite Nickel" and "Intrusive Dunite Nickel"). In the case of deposits containing rich basal concentrations of nickel sulphide, the liquid apparently became saturated with respect to sulphur prior to, or at an early stage of crystallization. The resulting immiscible nickeliferous sulphide droplets became segregated by flow and gravitational settling, and gave rise to rich basal sulphide concentrations in the ultramafic flows and sills. In the case of deposits consisting of internal zones of disseminated sulphide, sulphur saturation was apparently reached at a later stage of crystallization, probably in situ within the ultramafic flows and sills.

The apparent high degree of mantle melting that gave rise to komatiitic rocks and their nickel ores seems to have been most common in Archean times, but also occurred in the Aphebien (Thompson).

Subtype "Intrusive Ultramafic Nickel-Copper" is presumed to be of similar genesis but involved liquid that were less magnesian.

#### 8.4 Application to the Amos Region

At the scale of the Amos region there is one important known nickel deposit, associated with ultramafic and mafic sills in two superposed different lithological formations (Fig.10), thus:

- The world class Nickel-PGE-Cu deposit "**Dumont Nickel Deposit**" associated with an ultramafic sill in the Amos Group, estimated (All categories reserves,

NI 43101 of August 16, 2010) at: **1,451,000 (000 tons) at 0.25% Ni + minor Cu.**

- A small deposit of Nickel-Copper associated with gabbroic sills in the Lac Arthur Formation, thus the **“Wendell Nickel-Copper deposit”** discovered in the mid 1940's (GM39791; GM14320) estimated to contain **65,000 tons at 0.68% Cu and 0.31% Ni.**

The following brief description of the Dumont Ni-PGE-Cu deposit remains the best models to rely on for the exploration of Ni-PGE-Cu in the Ultramafic Sill south east of the town of Amos where the Dalquier Property is located.

#### **8.4 .1 Dumont Nickel Deposit**

Located within the Amos Group , the Dumont Sill (NI 43-101, September 2010) is poorly exposed over a strike length of 6.5 km and dips 60° to 70° to the northeast and comprises a lower ultramafic zone which averages 450 m in true thickness and an upper mafic zone about 250 m thick. The ultramafic zone is subdivided into the lower peridotite, dunite and upper peridotite subzones. The lower and upper peridotite subzones are olivine-chromite cumulates with variable amounts of intercumulus clinopyroxene. The dunite subzone is an extreme olivine adcumulate containing very small amounts of intercumulus chromite and clinopyroxene. Cumulus sulphide occurs in certain parts of the dunite subzone and also locally in the lower peridotite.

The mafic zone comprises three subzones which are, from the base upwards, the clinopyroxenite, the gabbro and the quartz gabbro. The clinopyroxenite subzone is an extreme clinopyroxene adcumulate at its base but grades into clinopyroxene + plagioclase cumulate rocks in the overlying gabbro subzone. The quartz gabbro subzone includes both plagioclase + clinopyroxene cumulates and noncumulate gabbros that contain modal and normative quartz. Olivine and chromite are restricted to the ultramafic zone whereas plagioclase occurs only in the mafic zone.

The parent magma of the intrusion is inferred to have been a peridotitic komatiite liquid containing about 27.5% MgO and carrying about 12.5% olivine (93% forsterite) in suspension. The lower peridotite subzone represents the accumulation of these phenocrysts and variable proportions of trapped intercumulus liquid. The cumulus chromite in the lower peridotite may also have been carried into the magma chamber in suspension or may have crystallized during settling of the olivine subzone but do not extend over the entire strike length of the sill.

The ultramafic rocks are pervasively serpentinized and serpentinization is overprinted by talc-carbonate alteration in places along the basal contact of the sill.

The sill was faulted and tilted into a steeply inclined attitude during the Kenoran event but no penetrative deformational fabric is evident, and the effects of regional metamorphism are minimal

Magmatic sulphides are restricted to the lower peridotite and dunite subzones; although in the former they represent mainly a post cumulus phase. In the dunite subzone, olivine and sulphide are present in approximately their "cotectic" proportions and molten sulphide was apparently a cumulus phase. Three olivine-sulphide cumulate layers occur within the dunite subzone but do not extend over the entire strike length of the sill. The middle layer has the highest average nickel grade (0.50%) and is the most laterally extensive, persisting over a strike of 2,400 m with an average true thickness of 24 m. A higher-grade zone within the middle layer averages 0.71% nickel over a strike length of 730 m and has a true thickness of 14 m (Duke, 1986).

#### **A. Dumont Ni-PGE mineralization:**

Two types of mineralization have been identified historically within the Dumont Sill, the primary large low-grade to medium-grade disseminated nickel deposit (Duke, 1986), and the contact type nickel-copper-platinum group elements (PGE) occurrence discovered in 1987 (Oswald, 1987). Drilling by Royal Nickel has also

identified discontinuous PGE mineralization associated with disseminated sulphide at lithological contacts in the layered intrusion and within the dunite.

### **A.1. Disseminated Nickel mineralization**

Nickel bearing sulphides and a nickel-iron alloy are enriched within three distinct layers of the dunite subzone, the upper layer, the middle layer, and the lower layer, and are broadly disseminated throughout the dunite and lower peridotite subzones. In thinner parts of the dunite subzone, fewer than three enriched layers may be present. Nickel mineralization continues at lower grades between the enriched layers.

#### **A.1.1. Nickel Mineralogy**

Disseminated nickel mineralization is characterized by disseminated blebs of pentlandite ((Ni,Fe)<sub>9</sub>S<sub>8</sub>), heazlewoodite (Ni<sub>3</sub>S<sub>2</sub>), and the ferro-nickel alloy, awaruite (Ni<sub>2.5</sub>Fe), occurring in various proportions throughout the sill. Millerite (NiS) is also present in lesser amounts near host rock contact zones.

### **A.2. Contact-type Nickel-Copper-PGE mineralization**

Contact-type Nickel-Copper-PGE mineralization is confirmed by drilling (Lewis and San Martin, NI 43-101, August, 2010). Drilling by Royal Nickel has confirmed the occurrence and grade of the historically identified mineralization at the basal contact at the eastern end of the Dumont sill. Drill hole 08-RN-71 intersected 0.8 m of semi-massive pyrrhotite grading 0.99% nickel, 0.19% copper, 0.3 g/t platinum, 1.0 g/t palladium and 0.07 g/t gold at the contact between the Dumont intrusive and volcanic footwall. This contact-related mineralization appears to be restricted in extent.

Royal Nickel has drilled several holes through the footwall of the Dumont intrusion, to test weak, vertical-axis Time Domain Electromagnetic (VTEM) anomalies. The holes intersected barren pyrrhotite-pyrite mineralization in the footwall volcanics in proximity to the contact and no nickel-bearing sulphides were found.



### **A.3. Other types of PGE mineralization**

Royal Nickel's drilling has further delineated three anomalous PGE horizons other than the basal contact type described above. In 2008, a PGE horizon associated with the pyroxenite layer, overlying the upper peridotite, was identified. This zone varies in thickness from 1.5 to 22.0 m with grades ranging from 0.01 to 0.16% nickel, 0.08 to 0.39 g/t platinum, and 0.04 to 0.34 g/t palladium. The second PGE horizon, which lies under the main sulphide body, was previously identified during research on the historical drilling (Brüggmann, 1990). This zone ranges from 0.4 to 34.5 m thick with grades ranging from 0.18 to 1.37% nickel, 0.01 to 0.76 g/t platinum, and 0.01 to 0.14 g/t palladium. The remaining PGE horizon was discovered by Royal Nickel in 2008 and is located approximately 100 m below the lowest sulphide body near the dunite contact with the lower peridotite. This horizon is ranges from 1.0 to 139.5 m thick with grades ranging from 0.09 to 0.49% nickel, 0.003 to 0.84 g/t platinum, and 0.03 to 1.86 g/t palladium. These horizons are generally observed to be continuous along strike and dip where drilling is present.

## **9. EXPLORATION**

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No exploration work has been carried out on the property by the current mineral lic

## **10. DRILLING**

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No exploration or definition drilling has been carried out on the property by the current mineral license owners

## **11. SAMPLE PREPARATION, ANALYSES AND SECURITY**

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No sampling has been carried out on the property by the license owner.

## **12. DATA VERIFICATION**

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The author, M. Ali Ben Ayad, PhD., verify the available data such as the past statutory works and the mining titles status.

**13. MINERAL PROCESSING AND METALLURGICAL TESTING**

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The Dalquier Property is an early stage property; thus no gold processing or metallurgical test work was done.

**14. MINERAL RESSOURCES ESTIMATE**

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The Dalquier Property is an early stage property; thus no Mineral resource estimate was done.

**15. MINERAL RESERVE ESTIMATES**

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The property is not an advanced stage exploration property, there is no mineral resource defined.

**16. MINING METHODS**

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N/A

**17. RECOVERY METHOD**

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N/A

**18. PROJECT INFRASTRUCTURE**

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N/A

**19. MARKETS STUDIES AND CONTRATCTS**

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N/A

**20. ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT**

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N/A

**21. Capital and operating coast**

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N/A

**22. ECONOMIC ANALYSIS**

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N/A

**23. ADJACENT PROPERTIES**

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Block 1 of the Dalquier Property, which constitute more than 90% of the area of the Property, lies over an Ultramafic Sill in the lower part of the Amos Group (Fig.10) which is the host, in another equivalent Ultramafic Sill, of the world class Dumont Nickel-Cu and PGE deposit.

Numerous gold and base metals occurrences (Figure 9 & Table 2), including a number of good exploration prospects and deposits with known reserves, are spatially associated with the Lac Arthur group and its intrusive, ( Block 2).

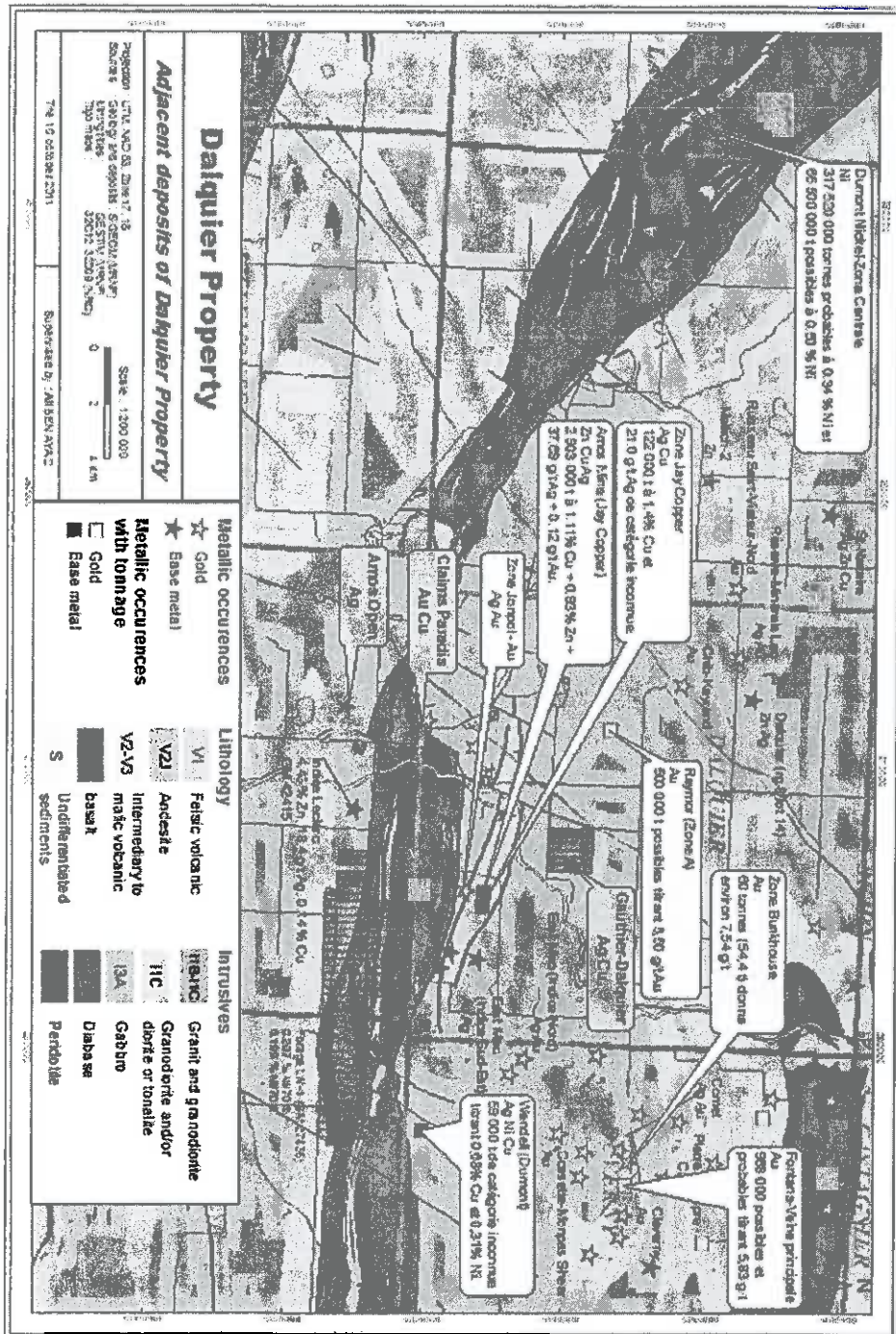


Figure 9. Adjacent deposits of Dalquier Property.

Deposit Name	Dumont Ni-Cu & PGE Deposit	Wendell Ag-Cu-Ni Showing	Jay Copper zone	Annis Mine Ag-Zn-Cu-Au Mine	Raymor Zone A Au	Chibikayrand Au	Fontana Main Qz vein (Au)	Bukhouse Au
Resources / best values	1,451,000,000 t At 0.25 %Ni	59,000 t at 0.68 % Cu & 0.312 % Ni	172,000 t at 1.4% Cu & 21 g/t Ag	2,903,000 t 1.11% Cu; 37,69 g/t, 0.12 g/t Au	500,000 t at 5 % Ag	Showing, representative value of 8.9 g/t	968,000 t at 5.83 g/t	Bank sample At 7.54/t Au
Typology	Intrusive ultramafic Ni-Cu ore	Layed intrusive Ni-Cu	Primary min. MSV Remobilized Shear & 112 veins	Primary min. MSV Remob. Shear/ Quartz veins	Shear zone, fault	QV in Girard and Shear 7	Shear zone with different QV	Vein in Francorite
Morphology	Disseminated & Contact mineralization	Contact- Min MS lenses and disseminations	Quartz veining & dissemination	Dissemination & Qz veins	Dissemination & Fine quartz-veins in breccia	Dissemination in Q-V	Sheared Qz Veins with sulfides disseminations	Tension quartz vein related strike slip fault
Principal element	Ni and NiG	Ag, Cu, Ni	Cu, Ag	Zn, Cu & Au (Pb, Au)	Au (Ag, Zn)	Au (Ag, Cu)	Au (Zn, Cu)	Au
Geology		?	Altered tuff & Quartz veining	Altered tuff & Quartz veining	Quartz carbonates	Quartz, feldspar	Quartz & carbonates	Quartz
Mineralization	Pentlandite, Heulandite, Ferro-nickel alloy, etc.	Chalcopryite, pyrite, pyrite & pentlandite	Pyrite, Chalcopryite, Sphalerite & Pyrite (Native silver)	Sphalerite, chalcopryite, Pyrite, Po	Pyrite, Pyrrhotite, chalcopryite, sphalerite, Galena	Native gold, chalcopryite, pyrite & sphalerite, Sphalerite	Pyrite, sphalerite & chalcopryite Native gold	Sphalerite Pyrite Native gold
Alteration	Serpentinization ?	Epithermal	Serpentinization Carbonization	Chloritization, sericitization	Sericitization, silicification & Carbonization	Epithermal	Silicification & carbonization	Carbonization
Host rock	Ultramafic sill and contact /volcanics	Gabbro sill and volcanics	Felsic volcanic & feldic tuff	Felsic volcanic & feldic tuff	Breccia schistes interlayered in volcanics	Granite-Diabase andesite	Syn-volcanic Francorite highly altered	Syn-volcanic Francorite
References	M143-101 September 2010	GMR447 DV 85-08 Northern Min 1983-12-15	GMS2074 ET 98-04	GMS2074	GMS1776 GMR762 GMR355	ET 98-04	ET 98-04	RG 109

Table 2: Geological characteristics of Dalquier adjacent deposits

## **24. OTHER RELEVANT DATA and INFORMATION**

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There is no additional public information other than what has been used to write this report.

## **25. INTERPRETATIONS AND CONCLUSIONS**

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As part of the creation of this Technical Report for the Dalquier Property, the resume and analysis of all the exploration work realized on this property allows to highlight the interesting potential of the different blocks constituting the property for Gold (Au), base metals (Zn, Ag, Cu), and particularly for Ni-Cu & PGE.

### **25.1 Base metals potential:**

This concern Block 1 located over rocks of the Figuery Group, in the north flank of the "Rivière Chevalier" anticline (Amos anticline according to Webber & al). A base metals showing (Zn, Ag & Cu) recognized by a drillhole which gave interesting values (4.3% Zn and anomalous Ag-Cu) in a sequence of felsic tuffs and lapilli-tuffs overlying an intermediate to mafic volcanic sequence (dacite, andesite). This repetitive sequence characterizes all the Figuery group and is known (Labbé, 1999) for its good potential for base metals as is attested by the historical Abcourt mine ( 5 M tons at 3% Zn and 18,4 g/T Ag) located to the east. Localized in the same stratigraphic horizon, thus upper Figuery Group, the Abcourt Mine shows a very close mineralization paragenesis.

Another felsic to intermediate tuff horizon, in the property (Block I, Figuery Range 10), locally about 20 m in width, accompanied by a metric chert layer, highlights the basal contact of the UMS regionally, over more than 15 km, and corresponds to a volcanic hiatus in the andesitic Amos Group volcanics. This tuff horizon could be potential for base metals if we consider that the recognized sulphides are independent of an eventual ultramafic sill mineralization in which case will also have potential for other elements such as nickel and PGE.

Considering the extensive exploration work carried out over the area of the property in the goal of VMS discoveries using the geophysical surveys anomalies,

aerial surveys (INPUT EM anomalies) or on ground (VLF, MaxMin EM), accompanied by geological mapping and finally drillholes, we suggest first a compilation of all these data with a field control for the different maps. Depending of the results of this compilation, further exploration work can be proposed if necessary.

## 25.2 Gold potential of the Property:

This concerns the Block 2 located in the Lac Arthur Formation.

Regionally, gold showings and/or deposits seems to be (Labbé, 1999) spatially associated with the intrusive, thus the Amos-Trécesson, and Duverny intrusives (Figure 9 & table 2) locally in tension quartz-veins and generally associated to NW-SE shear zones in contact with these intrusives, in the surrounding mafic intrusives (gabbro) or in the volcanics. Alteration correspond generally to a silicification-carbonation and/or épidotitization. The paragenesis of the mineralization corresponds to the common association "pyrite-chalcopryrite-sphalerite" and gold can be associated to pyrite and/or native gold.

According to Labbé (1999), the first major control seems to be the NW-SE linear structures, corresponding to the dextral shear zones host of the majority of the gold deposits of the Amos region. A spatial and probably genetic relation with the intrusive is also confirmed by the presence of sheelite in some gold deposits of the area (eg., Chib Kayrand deposit).

All the deposits discovered since the beginning of the 20<sup>th</sup> century, in spite of their respectable grades, have limited volumes, discouraging any mining of these structures. Nevertheless, considering the multitude of showings and small deposits in the area, the presence of "ante-tectonic" and "syn-tectonic" intrusives in a relative high degree of deformation environment of the rocks (eg., isoclinal folding, ductile-brittle shearing and faulting), new traps able to accumulate economic gold concentrations have to be found in this promising region. For this, one must keep exploring a relative important volume which supposes a good number of claims.

Blocks 2, despite its strategic position in the region, needs a better geological compilation enclosing all the area with adjacent properties.

### 25.3 Ni-Cu & PGE potential of the Property:

Following The description of the Dumont Ni-Cu & PGE deposit, nickel and copper mineralization is strongly associated to sulphides, and two types of Ni-Cu (PGE) mineralization have been identified historically within the Dumont sill:

- The primary large low-grade to medium-grade disseminated nickel deposit, enriched within three distinct layers of the dunite subzone, the upper layer, the middle layer, and the lower layer, and are broadly disseminated throughout the dunite and lower peridotite subzones.

The contact type nickel-copper-platinum group elements (PGE), corresponding generally to massive to semi-massive sulphides (pyrrhotite) mineralization which appears to be restricted in extent.

- PGE mineralization, beside its association with the Ni-Cu contact type, has also been identified as associated with disseminated sulphides at lithological contacts in the layered intrusion (PGE horizon associated with the pyroxenite layer, overlying the upper peridotite; PGE horizon, which lies under the main sulphide body near the dunite contact with the lower peridotite) and within the dunite.

Finally, it is also known, for this type of mineralization, that remobilization of sulphides into veins, breccia matrix, and disseminations in fault zones and wall rocks is common.

The southeast Amos Ultramafic Sill (UMS of the property) has strong similarities with the Dumont Sill concerning its litho-stratigraphic position and its magmatic differentiation (fractional crystallization allowing the different lithofacies characterizing these Ultramafic sills).



Nevertheless, the Dumont Sill appears to correspond first to one cycle of crystallization which allowed the concentric organization “Lower peridotite – Dunite - Upper Peridotite” in a vertical section, underlying a gabbro facies. Does this geometry suggest the gabbro as a second cycle? In every instance, in the SE Amos Sill, 5 cycles have been defined (Hébert, 1982) and it's will be interesting to compare this west part of the sill with the rest, at least 13 km more to the east. (Fig 11)

An eventual lateral evolution of the cycles or any internal organization of the SE Amos UMS could help to predict the vertical evolution of this sill who extends laterally about 15 km.

Considering:

- The high geological similarities, mentioned above, of the SE Amos UMS with the Dumont Sill,
- The presence of sulphides in the shallow drillholes which crosscut the sill in the west and east limits of the property,
- The presence of nickel mineralization in the sulphide zones with interesting values,

We have all the reasons to suppose a high potential of the Amos SE Sill for Ni-Cu & PGE mineralization, for the contact mineralization type and for a disseminated mineralization type, at least in one of the 5 cycles defined in this voluminous sill.

It is important to notice that a computer geological compilation (**GM 63895**) to highlight Ni project deposits realized by DIAGNOS ([WWW.diagnos.ca](http://www.diagnos.ca)) who develop CARD (Computer Aided resources Detection System), compilation software, applying the known signatures of nickel deposits in NTS regions 32C and 32D, identified the Amos Nickel Project. CARDS highlighted a significant zone of 90% probability of fostering the discovery of Nickel mineralization. Their targets

lie along an approximately 20 km long, east-west trending peridotite and gabbro layered sill, corresponding to the south east Amos sill.

## **26. RECOMMENDATIONS**

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### **26.1. Recommendations for NI-Cu & PGE mineralization**

In the objective to concretize the high potential for Ni-Cu & PGE mineralization of the southeast Amos Sill, which can be considered to be “virgin” ground in terms of exploration, we propose the following:

- Realization of a compilation of all the existent data, including geophysics (EM and magnetics), aerial and ground surveys realized by different companies in this sector,
- Re-interpretation, in the objective of the creation of geological sections, of all the drillholes mentioned above which crosscut the UMS in the area of the property and even elsewhere along the regional 15 km of extent of the UMS,
- Geo-structural mapping of the Block I, Figuery part (Range 10, lots 41 to 61 inclusive) at the scale of 1:5 000 for a lithofacies mapping of the principal ultramafic sill, based on a tight grid (100 m spacing of the lines with stations at 25 meters, for example).
- At the same time than mapping, a prospecting programme should be performed including trenching when necessary.
- Depending on the geophysics compilation results, realization of a magnetometer ground survey to help to delimit the UMS, particularly in the west on the Figuery Block 1 (lack of outcrops),
- Geophysical ground survey test on a known “disseminated mineralization” zone and “contact mineralization” zone (LW-1 drillhole zone for example), using different geophysical methods of high resolution. This test has to be conducted by a qualified and experienced geophysist. The VTEM (Vertical axis Time Domain Electromagnetic), used by Dumont exploration staff, seems to be very effective to localize the contact mineralization in such geological environment. A collaboration with the exploration department of the Dumont Mine (future) could be very useful considering their exploration experience with the same type of mineralization in the same geological environment
- Realization of a first phase exploration drillholes on the basis of the geological

compilation of existing data and geophysics results.

- Depending of the result of these first phase of drilling, elaboration of a second phase of drilling more consistent.

## **26.2. Recommendations for base metals and gold mineralization**

Considering the numerous small exploration programs realized on the property in the goal of VMS and/or gold discoveries using the geophysical surveys anomalies, aeriels surveys (Input EM anomalies) or on ground (VLF, maxMin), accompanied by geological mapping and finally drillholes, we suggest first a compilation of all these data with a field control for the different maps. Depending of the result of this compilation, complementary exploration works can be proposed if necessary. The table below gives an estimate for this compilation work and particularly the exploration work to do for Ni-Cu & PGE mineralization concerning Block 1 on Figuery Range 10.

Work Phases	DESCRIPTION OF PROPOSED WORK	UNIT QUANTITY (Km, meters or	UNIT COST (\$)	ROW COST (\$)
<b>PHASE 1</b>				
<i>Compilation and re-interpretation of all existing geological and geophysical data concerning the property (Block 1 for Ni-Cu-PGE and Blocks 2 for gold)</i>				
	(Data Mag-VLF & EM) data processing + inter	50	100	\$5,000.00
	Purchase of digital files from the MRNFQ			\$1,000.00
<i>Prospecting and geological mapping</i>				
	Line cutting	40	550	\$22,000.00
	2 geologists	25	450	\$22,500.00
	Manual and mechanical stripping			\$ 5,000.00
	Channel sampling & laboratory assays	50	50	\$ 2,500.00
<i>Geophysical surveys</i>				
	Combined ground magnetic/VLF survey	50	260	\$13,000.00
	Ground geophysical survey (VTEM ?)	40	800	\$32,000.00
	Compilation of new and historical data/targeting	10	1000	\$10,000.00
	<b>Total</b>			<b>\$113,500.00</b>
	Contingencies 15%			\$17,500.00
	<b>TOT. PHASE 1</b>			<b>\$ 130,500.00</b>
<b>PHASE 2</b>				
	Exploration drilling	1500	150	\$225 000.00
	Data interpretation by a senior geologist	5	800	\$4 000.00
	Contingencies 15%			\$34 350.00
	<b>TOT. PHASE 2</b>			<b>\$ 263,350.00</b>
	<b>GRAND TOTAL</b>			<b>\$393,850.00</b>

Geophysics including Mob-Demobilization  
Drilling including cost of geologist, technicien & assays  
Blocks 2 is concerned only by a compilation at this stage.

**Table 3: Exploration budget proposed**

**27. REFERENCES****27.1. Regional references**

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**27.2 REFERENCES OF THE ASSESSMENT FILES (GM)****Block I: Figury Township:**

GM 63895 - **REPORT ON THE AMOS NICKEL PROJECT.** 2008, Par D'AMOURS, I. 22 pages.

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### Block 2, Dalquier Township

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GM 00234-J - **REPORT ON WEST SEAFORTH OPTION, PROPERTY NO 4.** 1947, Par KEATING, B J. 1 page. 1 microfiche.



**28. Certificate of Qualification:**

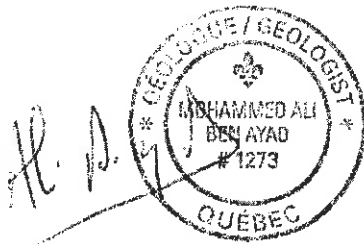
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**Mohammed Ali Ben Ayad, PhD, MBA, do hereby certify that:**

- I, a professional geoscientist with a PhD degree from the University of Toulouse III of France (1987) and an MBA of the University of Sherbrooke, Québec, Canada (2002), am a consulting geologist since 1997. Since 2006; I am an associate geologist with P.J. Lafleur Géo-Conseil Inc. Since 2007 I'm also an associate geologist with Watts, Griffis & McQuat.
- I have been a member of the APGGQ (Association Professionnel des Géologues et Géophysiciens du Québec) before the recent creation of the OGQ (Ordre des Géologues du Québec) where my membership number is 1273. I have been a member of AMBAQ (Association des MBA du Québec) in 2002-2003.
- I have more than 25 years of experience in the mining industry, as a mine geologist; senior mine exploration geologist and senior exploration geologist in different geological environments for different precious, semi-precious metals and base metals companies.
- I have been involved in different mineral and mining projects at various stage of development in North Africa since 1987, in Abitibi Greenstone Belt (Québec, Canada) since 1992; in West Africa since 1996 and recently in the establishment of the 43 101 Technical report for different companies having projects around the world (West Africa; North and South America and Southeast Asia).
- I have read the definition of "Qualified Person" set out in Regulation National Instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in Regulation 43-101) and past relevant work experience, I fulfil the requirements to be a "qualified person" for the purpose of Regulation 43-101.
- I am responsible for the preparation of the report titled "NI 43-101 Technical Report on the Dalquier Property dated on August, 8<sup>th</sup>, 2013. I have been on the property the 5<sup>th</sup> and 6<sup>th</sup> November 2010.
- I never had any prior involvement with the property that is the subject of the Technical Report,
- I am independent of the issuer (Claims Griesbach) applying all of the tests in Section 1.4 of Regulation 43-101.
- No disclosure of information relating to permitting, legal, title, action and related issues were verified in this mission. I have relied on information provided to me by Mr. Glenn Griesbach.

- I am not aware of any material fact or material change with respect to the subject matter of the Technical Report that is not reflected in the Technical Report, the omission to disclosure which makes the Technical Report misleading.
- I consent to the filling of the technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files or their websites accessible by the public, of the Technical Report.
- As of the date of this certificate, to the best of my knowledge, information and belief, the Technical report contains all scientific and technical information that is required to be disclosed to make the technical Report not misleading.
- All the data used to prepare this report are based on the past assessment files (GM) existing, at this date of report signature, on the E-Sigeom EXAMIN engine research at the "Ministère des Ressources Naturelles et de la Faune du Québec" (MRNF. Web site:[www.mrn.gouv.qc.ca](http://www.mrn.gouv.qc.ca)).

Prepared in Montreal, this 8<sup>th</sup> of August, 2013:



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