

Chapter 1

Base and precious metals

1A

1A - Northern Superior Province (including the eastern part of the Opatica Subprovince), <i>Serge Perreault</i>	3
Opatica Subprovince.....	3
Paleoproterozoic Sedimentary Sequences	3
Sediment-Hosted Uranium	3
Diamond	3
Opportunities for Exploration	4
1B - James Bay Region, Central Superior Province (Opatica, Opinaca, Nemiscau, and La Grande Subprovinces), <i>Patrick Houle</i>	7
Frotet-Evans Area.....	7
Eastmain Area.....	7
La Grande Area.....	9
Opportunities for Exploration	9
1C - Southern Superior Province (Abitibi and Pontiac Subprovinces), <i>Pierre Doucet</i>/<i>James Moorhead, Suzanne Côté</i>	15
Introduction	15
Casa Berardi – Matagami Area.....	15
Lebel-sur-Quévillon – Desmaraisville Area.....	15
Chibougamau Area.....	16
Normétal – La Sarre – Amos Area	16
Rouyn-Noranda – Cadillac Area	16
Malartic – Senneterre – Val-d’Or Area	17
Témiscamingue Region	19
Opportunities for Exploration	19
1D - New Québec and Torngat Orogens, Southeast Churchill Province (Core Zone), and Ungava Orogen, <i>Abdelali Moukhsil</i>	33
Introduction	33
New Québec Orogen	33
Torngat Orogen and Southeast Churchill Province (core zone).....	33
Ungava Orogen	33
Opportunities for Exploration	34
1E - Grenville Province, <i>Serge Perreault, Abdelali Moukhsil</i>.....	39
Introduction	39
Western Grenville Province.....	39
Eastern Grenville Province	41
Opportunities for Exploration	42
1F - St. Lawrence Platform and Appalachians, <i>Serge Lachance</i>	47
Introduction	47
Exploration Projects	47
Opportunities for Exploration	49

Northern Superior Province (including the eastern part of the Opatica Subprovince)

Serge Perreault

The Ungava region (Nunavik) covers a vast surface area of about 350,000 km². Although relatively underexplored, this region offers a very promising mineral potential.

From 1998 to 2003, **Géologie Québec** completed 22 geological surveys within the scope of the Far North Project. In 2005, **Géologie Québec** continued its geological synthesis of the extensive territory covered by this program (Leclair *et al.*, 2005). In 2005, with the exception of a few technical studies and compilation work, only four exploration projects were active in the field (Table 1A-1). The latter focused on the search for diamond, uranium, and gold. The following sections describe the most significant exploration projects conducted in 2005 in the Minto and Opatica (eastern part) subprovinces.

Opatica Subprovince

The Opatica Subprovince comprises Archean metavolcano-sedimentary sequences and plutonic suites located between the Abitibi Subprovince to the south and the Opinaca and Ashuanipi subprovinces to the north (Hocq, 1994; Lamothe *et al.*, 1998; note that this Subprovince is not represented on the figure 1A-1, see the figure 1B-1 and 1E-1 for the localization of the projects). The eastern part of the Opatica Subprovince is formed of the Brûlis Group, a basaltic to intermediate volcanic assemblage metamorphosed to the upper amphibolite facies, as well as hornblende-biotite granodiorite, hornblende monzogranite, and leucocratic biotite and locally hornblende-bearing tonalite (Lamothe *et al.*, 1988).

In the Lac Courcy area, gold showings (Courcy 1 and Courcy 2; Thériault *et al.*, 1998) associated with iron formations and mafic and felsic volcanic rocks of the Soucy and Soulard formations in the Brûlis Group were previously reported by Géologie Québec. In 2004, **SOQUEM INC.** reported the following results from samples collected in trenches on several gold showings: 91 g/t Au and 7.3 g/t Ag (DL-02), 3.3 g/t Au (Courcy 2), 4.8 g/t Au, 6 g/t Ag, and 0.25% Zn (Souche), and 2.53 g/t Au (SL-12). A channel sample from showing SL-29 yielded assays of 10.75 g/t Au over 1 m. These gold occurrences are associated with volcanogenic massive sulphides. In 2005, **SOQUEM INC.** (project 9, Figure 1A-1) continued its prospecting and mapping surveys. The company also carried out prospecting work as well as a Mag-EM survey in the Lac Vallard area (project 8, Figure 1A-1).

Paleoproterozoic Sedimentary Sequences

Paleoproterozoic continental sediments form autochthonous outliers which may be correlated with those of the Sakami Formation in the James Bay region and the Chakonipau Formation in the New Québec Orogen (Clark and Wares, 2004). These sedimentary outliers are preserved in half-grabens within the Saindon-Cambrien tectonic zone. They contain continental-type detrital rocks, comprising a lower unit from 1 to 100 m thick of mudstone, siltite, and green or red conglomerate, overlain by an upper km-scale unit of subarkosic and arkosic sandstone (Clark and Wares, 2004).

Sediment-Hosted Uranium

Outliers of Paleoproterozoic detrital rocks overlying the Archean basement of the Superior Province host uranium mineralization. The most significant occurrences are conformable and hosted in greenish argillaceous sediments located near the Archean/Proterozoic unconformity (Clark and Wares, 2004). The uranium mineralization occurs in sedimentary formations indicating reducing conditions at the base of the Sakami Formation. These mineralized zones are also associated with the presence of synsedimentary faults. The uranium mineralization is essentially composed of pitchblende. Most known showings of this type are associated with the Lac Gayot outlier (Sakami Formation).

In 2005, **Strathmore Minerals Corporation** (project 2, Figure 1A-1; Table 1A-1) conducted exploration work and geological mapping on its Dieter Lake property (Gayot outlier), in order to validate previous data acquired by other companies between 1976 and 1981 and build a new geochemistry database complementing historical data, to identify new geochemical targets and to define subsequent drill targets. Mineral resources for the Lac Gayot deposit are estimated at 50 Mt at 0.1% U₃O₈, or 10 to 15 Mt at 0.25% U₃O₈ (Fearless One; Marcoux, 1981; deposit file).

Diamond

Moorhead *et al.* (2000) stressed the importance of major brittle structural zones, locally defined by late faults, aeromagnetic lineaments, remote-sensing lineaments, and graben-type sedimentary basins, as controlling factors for the emplacement of alkaline and kimberlitic magmatism. Several major crustal lineaments transect the Bienville, Minto, and Ashuanipi subprovinces (Labbé, 2000; Labbé and Lamothe, 2001), including the Saindon-Cambrien corridor, the Allemand-Tasiat structural zone, and the Richmond Gulf structural zone (Moorhead *et al.*, 2000).

1A

In 2005, diamond exploration activities mainly consisted of reconnaissance surveys performed by **Ashton Mining of Canada Inc.** and **SOQUEM INC.** in the Lac Bienville area (project 1, Figure 1A-1).

the Far North. For example on the Kogaluk property, **Virginia Gold Mines Inc.** and **SOQUEM INC.** reported grades of up to 60 g/t Au in grab sample, 2.85 g/t Au over 4.1 m in channel sample, and of 2.20 g/t Au over 27.9 m in drillhole, including high-grade zones at 9.89 g/t Au over 2.1 m and 14.24 g/t Au over 1.5 m.

Opportunities for Exploration

Given the current economic context, with gold prices reaching historical highs and mineral exploration financing as promising as ever, it may be of interest to know that many greenstone belts in the Minto Subprovince host promising gold occurrences, namely associated with iron formations in

With the sharp rise in uranium prices, uranium exploration is reaching levels unheard of since the mid-1980s. In this regard, the various outliers of Sakami Formation, which represent the remains of a former Paleoproterozoic sedimentary basin overlying the Archean basement of the Minto Subprovince, are undoubtedly worth a closer look.

Proterozoic

- Volcano-sedimentary sequences of Paleoproterozoic basins.

Archean

- Volcano-sedimentary greenstone belts.
- Opinaca:** Volcano-sedimentary sequences and plutonic rocks.
- La Grande:** Volcano-sedimentary sequences and plutonic rocks.
- Ashuanipi:** Charnockitic and granitic plutonic complexes with metamorphosed volcano-sedimentary belts at the granulite facies.
- Bienville:** Tonalitic and granitic plutonic complexes, with enderbite and charnockite; locally with volcano-sedimentary belts.
- Lepelle:** Granitic and charnockitic plutonic complexes.
- Utsalik:** Granitic and charnockitic plutonic complexes with rare volcano-sedimentary belts.
- Douglas Harbour:** Granitic and charnockitic plutonic complexes with volcano-sedimentary belts.
- Goudalie:** Tonalitic and charnockitic plutonic complexes, diatexites, volcano-sedimentary belts.
- Qualluviartuuq:** Volcano-sedimentary belts, tonalitic and granodiorite plutonic complexes.
- Lac Minto:** Volcano-sedimentary belts, tonalitic and charnockitic plutonic complexes, diatexites, granodiorite.
- Tikkerutuk:** Sedimentary belts, tonalitic and charnockitic plutonic complexes, diatexites, granodiorite.
- Inukjuaq:** Volcano-sedimentary belts of 3.8 to 3.0 Ga, tonalitic and charnockitic plutonic complexes.

Mineralization types

- Au in iron formations
- Volcanogenic Cu-Zn-Au-Ag
- Au in shear zones
- Porphyric Cu-Au-Ag-Mo
- Ni-Cu-PGE's in komatiites
- Cu in veins
- Rare Earths
- Uranium
- Ni-Cu-PGE's in mafic and ultramafic intrusions
- Iron
- Pb-Zn

- Mine

Figure 1A-1. Legend of exploration projects in the northern Superior Province for 2005.

1A

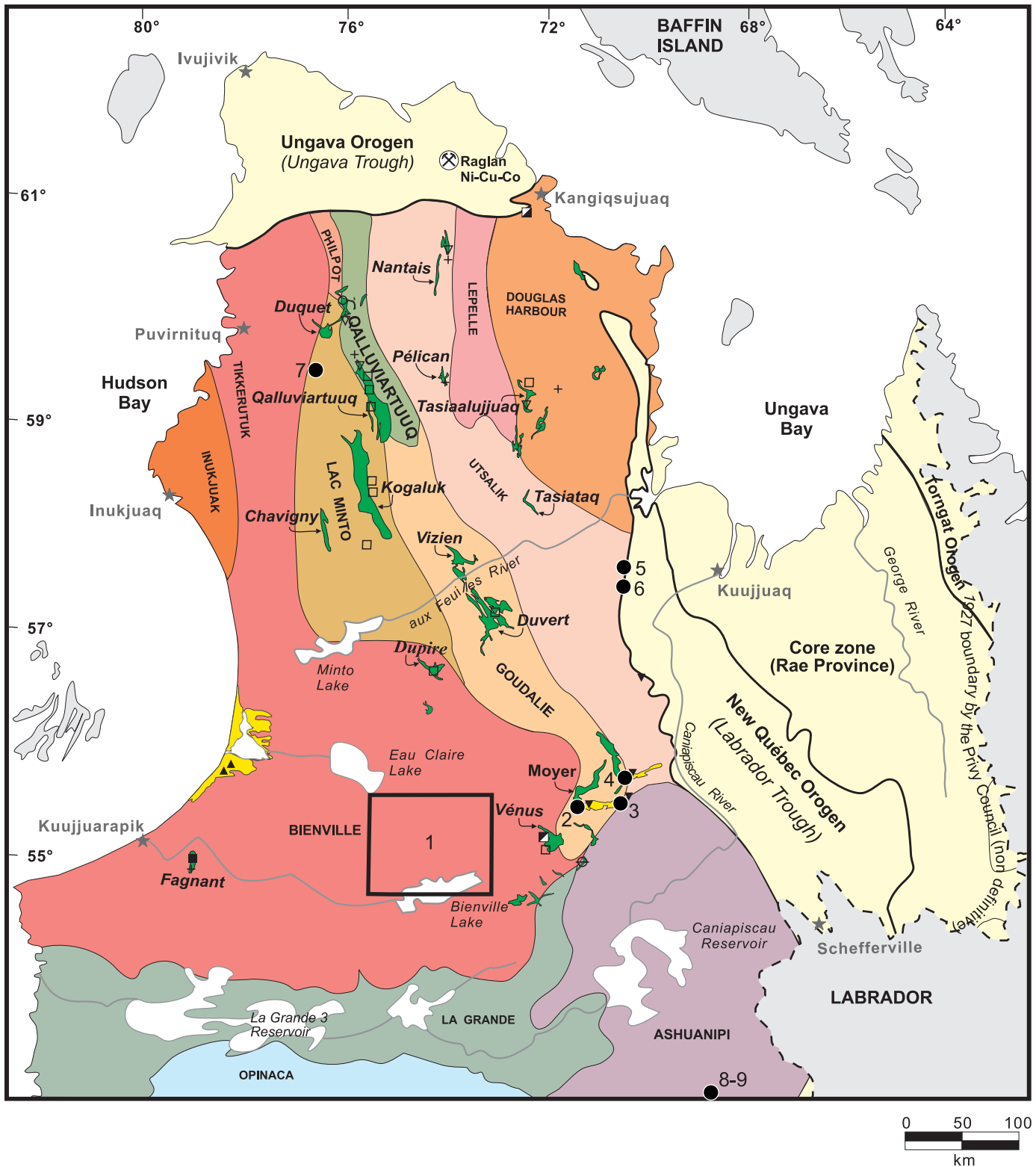


Figure 1A-1. Exploration projects in the northern Superior Province for 2005. Projects 8 and 9 are located outside of this map; see figure 1E-1 (page 43) for their location.

TABLEAU 1A-1 - Exploration projects in the northern part of the Superior Province for 2005 (see figure 1A-1).

Nos.	NTS	COMPANIES	PROJECTS	SUBSTANCES	WORKS ⁽¹⁾
1	33 P	SOQUEM INC. / Ashton Mining of Canada Inc.	Ungava	Diamond	G, Gc(t), GpMa(A), GpMa(G)
2	23 M/15, 16	Strathmore Minerals Corporation	Dieter Lake	U	G, Gc(l), Gc(ro), GpEm(A), S
3	24 C/04	Waseco Resources Inc.	Pons Lake	U	TE
4	24 C/04	Waseco Resources Inc.	Fenster Lake	U	TE
5	24 L/01	URANOR Inc.	Chioak	U	TE
6	24 E/16	URANOR Inc.	Adelaide	U	TE
7	34 O/12, 13	Canadian Royalties Inc.	Kogaluk	Ni-Cu-Co	TE
8	23 C/14	SOQUEM INC.	Lac Vallard	Au-Ag	GpEm(A), GpMa (A), Pr
9	23 C/10	SOQUEM INC.	Courcy	Au-Ag	G, Pr

1 = See abbreviation list in appendix II.