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St. Lawrence Platform and Appalachians

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Introduction

The St. Lawrence Platform and Appalachians include all parts of Québec mostly located south of the St. Lawrence River (Figure 1F-1). The geological setting of this part of Québec, to the south of the Canadian Shield, mainly consists of Paleozoic rocks subdivided into two geological provinces: the St. Lawrence Platform, which overlies the Grenvillian basement along an erosional unconformity, and the Appalachians to the southeast. The boundary between the two provinces is marked by Logan's Line (LL). In Québec, each of these two provinces is subdivided into major tectono-stratigraphic domains. In the St. Lawrence Platform, from northwest to southeast, we find the following Cambrian to Silurian domains: the Autochthonous Domain and the Parautochthonous Domain. The Appalachian Orogen, also from northwest to southeast, is divided into four domains: the Cambrian-Ordovician Humber and Dunnage zones, separated by the Baie Verte-Brompton Line (BVBL), the Silurian-Devonian Gaspé Belt, and the Permo-Carboniferous Magdalen Basin.

This area hosts two mineral collecting operations on outstanding mineralogical sites. Located a few kilometres northeast of Bonsecours in the Estrie region, **Mines Cristal Québec** extracts, since 1990, quartz crystals of all sizes from numerous druses occurring in quartz veins intercalated in the Sutton Schists. In Lemieux Township south of the Parc national de la Gaspésie, **Mine d'Agates du Mont Lyall Inc.** manages a site where collectors can find exceptional agates and geodes, in a rhyolite flow intercalated in the York River Formation (Gaspé Sandstones).

In terms of exploration activities in the St. Lawrence Platform and Appalachians, 20 exploration projects were brought to our attention in 2005, compared to 18 projects in 2004. The total number of metres drilled in 2005 amounted to 3,063, compared to 6,700 m in 2004.

To provide a clearer framework in which to discuss exploration projects, the St. Lawrence Platform and Appalachians were divided into three segments: the southwestern segment, which includes the Montréal and Chaudière-Appalaches regions (10 projects and 417 m drilled), the central segment comprising the Bas-Saint-Laurent region (1 project and 350 m drilled), and the northeastern segment, which includes the Gaspésie and Îles-de-la-Madeleine regions (9 projects and 2,296 m drilled).

Exploration Projects

SOUTHWESTERN SEGMENT (MONTRÉAL AND CHAUDIÈRE-APPALACHES REGIONS)

In a press release dated November 30, 2005, **Niocan Inc.** (project 4, Figure 1F-1) announced it had commissioned Golder and Associates to reassess hydrology studies conducted thus far and to propose a plan of action to address concerns brought up by the Ministère du Développement durable, de l'Environnement et des Parcs du Québec (MDDEP). At the end of 2005, **Niocan Inc.** was still waiting for the MDDEP to issue the certificate of authorization required to continue development work on its project to operate a niobium mine and processing plant in the Oka carbonatite Complex (lower Cretaceous) near Montréal, in the Lac-des-Deux-Montagnes seigniory. The niobium ore deposit contains proven and probable reserves in the S-60 and HWM-2 ore zones estimated at 13.3 Mt grading 0.63% Nb_2O_5.

The St-André property (project 1, Figure 1F-1), held by **H. Solis**, **G. Gravel**, **M. Bezeau** and **J. Huet**, is underlain by rocks of the Saint-André carbonatite complex (lower Cretaceous) in Argenteuil Township and the Lac-des-Deux-Montagnes seigniory. This carbonatite complex was identified in the 1960s and at the time, was namely explored (**SOQUEM INC.**, 1969) for its niobium potential. Since 2004, the four partners are investigating the diamond, niobium, rare earth elements, and gold potential of the property. Exploration work carried out to date has revealed new evidence for polymetallic hydrothermal occurrences associated with alkaline intrusions, and has led to the recovery of microdiamonds associated with alkaline breccias in the regolith overlying the carbonatite complex.

The discovery in 2003 of a series of quartz boulders with native gold prompted prospectors **R. Mainville** and **T. Burnham** to pursue their exploration efforts on the Timrod property (project 6, Figure 1F-1) in the Saint-François seigniory. In 2004, a trench was excavated, then in 2005, glacial till samples were collected and processed to recover and examine gold grains. In late December 2005, **R. Mainville** and **T. Burnham** signed an agreement with **Fancamp Exploration Ltd**, whereby the latter may continue exploration on the Timrod property. The well-developed stockwork of quartz veins and veinlets is hosted in an acidic tuff in contact with a graphitic argillite typical of the Beauceville Formation (middle Ordovician). Located directly up-ice of gold placers in Saint-Simon-les-Mines, the Timrod gold showing may represent one of the sources of these placer deposits.

Ressources Tectonic Inc. is focussing on the potential for Cu-Zn volcanogenic massive sulphide (VMS) deposits in mafic volcanic rocks (metabasalts and chlorite-epidote schists) of the Clinton Formation (Silurian) in Clinton (project 2, Figure 1F-1) and Marston (project 5, Figure 1F-1) townships, as well as

in the volcano-sedimentary sequence of the Ascot Complex (lower to middle Ordovician), in Weedon Township (project 9, Figure 1F-1). A detailed magnetometer survey conducted on the Weedon property helped trace the ore-bearing horizon at the former Weedon mine over a strike length of 800 m to the south of the latter.

In a press release dated June 20, 2005, **Lithic Resources Ltd** announced it had signed an agreement to acquire a 100% interest in the Stoke Mountain Cu-Zn-Ag property, located in Stoke, Dudswell, and Westbury townships, about 20 km northeast of Sherbrooke in the Estrie region. The company intends to perform, over a period of 4 years starting in 2006, a wide range of exploration work in the Ascot Complex (lower to middle Ordovician) in order to assess the potential for Cu-Zn-Pb-Au-Ag volcanogenic massive sulphide (VMS) deposits. Drill results from previous work defined two mineralized zones (Phelps Dodge, 1997-1999): the first intercept contained disseminated chalcopyrite and stringers and graded 6.34% Cu and 27.3 ppm Ag over 5.1 m, whereas the second contained 0.35 m of stratiform massive sulphides with barite grading 2.4% Zn, 2.5% Pb, 52.6 g/t Ag, and 850 ppb Au.

The Sainte-Cécile project (project 10, Figure 1F-1) held by **Ressources Appalaches Inc.** includes the Sainte-Cécile and Galloway molybdenum properties, both bordering the Mont Sainte-Cécile and Mont Saint-Sébastien granitic massif (Devonian), north of Lac Mégantic in the Estrie region. Best results from 16 boreholes drilled by Labrador Mining Exploration in 1964 on the Sainte-Cécile property (deposit file 21E10/0015) were 0.06% Mo over 6 m. The Galloway property (deposit file 21E10/1000) hosts a molybdenite showing (1% MoS_2) and a km-scale molybdenum anomaly in stream sediments.

CENTRAL SEGMENT (BAS-SAINT-LAURENT REGION)

On the Sainte-Marguerite property in La Vérendrye and Casupscull townships (project 11, Figure 1F-1), **Puma Exploration Inc.** confirmed in drillhole the presence and continuity, over respective lengths of 35 and 70 m, of two mineralized zones consisting of subhorizontal gold-bearing quartz veins in the Fraser 3 zone. Best results to date on these zones, which remain open along strike, range from 1.6 g/t Au over 0.3 m (F05-11) to 40.8 g/t Au over 0.2 m (F05-08). These lode gold occurrences are hosted in lower Devonian volcano-sedimentary rocks along the southern limb of the Sainte-Florence fault, more specifically in Sainte-Marguerite basalts and mafic tuffs and sedimentary rocks of the Fortin Group.

NORTHEASTERN SEGMENT (GASPÉSIE AND ÎLES-DE-LA-MADELEINE REGIONS)

For the fifth consecutive year, **Ressources Appalaches Inc.** was very active in the Gaspésie region, with four exploration projects. In August 2005, the company signed an agreement with **Scorpio Mining Corp.** to acquire a 51% interest in the Lac Arsenault property (project 20, Figure 1F-1) in Weir and Honorat townships. This property is characterized by the presence of mineralized breccias and at least 5 distinct gold-bearing veins (Baker, Mercereau and Mercereau Extension, Marleau, Line 4W, and Greek). These gold zones were emplaced in Ordovician greywackes and siltstones of the Arseneault Formation (Honorat Group). Since August 2005, **Ressources Appalaches Inc.** has demonstrated, on surface and in drillhole, the continuity of the Baker gold-bearing quartz vein over a strike length of 80 m and to a vertical depth of 90 m (7.4 g/t Au and 74.3 g/t Ag over 0.5 m in drillhole F05-28).

Drillholes completed thus far by **Ressources Appalaches Inc.** on the Mont-de-l'Aigle copper property (project 13, Figure 1F-1) in the northern part of the Lemieux Dome (Lemieux Township) have demonstrated the presence of iron oxide-copper-gold (IOCG)-type mineralization, in veins and breccias with hematite, magnetite, pyrite, chalcopyrite, and quartz, over mineralized thicknesses reaching 60 m and grades on the order of 0.2% Cu. These copper-bearing zones are hosted in subhorizontal sedimentary and volcanic (mafic and felsic) sequences (lower Devonian) of the Upper Gaspé Limestones (Forillon, Shiphead, Indian Cove formations) and the Gaspé Sandstones (York Lake, York River formations). Two other projects headed by **Ressources Appalaches Inc.** focussed on the gold potential of the Robidoux and Saint-Benoît properties (projects 19 and 16, Figure 1F-1).

At the end of 2005, **Threegold Resources Inc.** signed an agreement with prospector V. Arsenault, in order to acquire a 100% interest in the Vital property (project 14, Figure 1F-1) located in the southern part of the Lemieux Dome (Lemieux Township). This subcircular antiformal structure, inferred to be caused by one or more important intrusions, consists of a central part of Silurian-Devonian sandstones, siltstones, and limestones of the Saint-Léon Formation (Chaleurs Group), bordered by sedimentary (mudstones, sandstones, and limestones) and volcanic (basalts, rhyolites, mafic and felsic tuffs) rocks of the lower Devonian Upper Gaspé Limestones and Gaspé Sandstones. A recent metallogenic study released by the Ministère des Ressources naturelles et de la Faune (Pilote, 2005) suggests the possibility of copper deposits at depth, as well as gold deposits along the periphery. These two settings will be the main targets for the 2006 exploration program.

Prospectors **R. Lelièvre** and **M. Boudreau** (project 17, Figure 1F-1) observed, 5 km north of Grande-Rivière in Percé Township, sedimentary redbed copper occurrences (chalcocite, malachite) as well as copper-bearing (chalcocite, malachite, chalcopyrite) quartz veins. These copper showings, mainly hosted in calcareous to non-calcareous and occasionally dolomitic mudrocks of the Pabos Formation (Ordovician), are generally associated with structures trending N60° and N340°. Grab samples yielded grades reaching 1.75% Cu and 7.1 ppm Ag.

Prospectors **R. Lelièvre** and **M. Boudreau** also worked on two other projects, in partnership with the **Fonds régional d'assistance à la prospection minière Gaspésie-Îles-de-**

la-Madeleine (FRAPMGÎM). The Cannes-de-Roches–Barachois property (project 18, Figure 1F-1) near Percé hosts two main showings, namely the Beattie showing (8.75% Pb) and the Cannes-de-Roches showing (5.24% Zn), as well as other types of occurrences: Pb-Zn sedimentary redbeds, semi-massive sulphides (pyrite, sphalerite, galena ± chalcopyrite ± bornite) in carbon-rich, pyrite-rich reducing layers (quartzitic sandstone), and copper (chalcopyrite, malachite, bornite) in felsic volcanic pebbles. On the BBL-32 property (project 12, Figure 1F-1), basic prospecting led to the discovery of a well-developed stockwork of quartz-carbonate-chlorite veins with local chalcopyrite, malachite, and bornite (up to 1.08% Cu).

Opportunities for Exploration

BASE METALS AND PRECIOUS METALS

Over the past two decades, exploration efforts have demonstrated the mineral potential of sedimentary settings in the Appalachians, namely for redbed copper deposits and for Carlin-type gold in limestones. **Ressources Appalaches Inc.** and **SOQUEM INC.** explored the Paleozoic sedimentary basin in the Bas-Saint-Laurent region, more specifically in NTS sheets 22C/02 and 21N/15. Their work on the Transfiguration and Squatec properties, southwest of Rimouski, led to the discovery of stratiform Cu-Ag±Pb±Zn occurrences typical of sedimentary redbed copper deposits. Mineralized zones consist of disseminated chalcopyrite and minor chalcocite, with grades ranging from 0.1 to 15% Cu. On a regional scale, they occur in reducing facies composed of grey and green conglomerates and grey quartzitic sandstones overlying the base of the Silurian Robitaille Formation in the Connecticut Valley-Gaspé Synclinorium.

In north-central Gaspésie, more specifically in Boisbuisson Township west of the Devonian McGerrigle granitic Pluton (NTS 22G/01 and 22H/04), the **FRAPMGÎM** performed exploration work on its property, which includes the minesite of former copper producer **Les Mines Madeleine Ltée**. They confirmed the presence of copper-silver occurrences, also related to sedimentary redbed copper deposits. The mineralized zones, grading up to 4.8% Cu and 31 g/t Ag, are disseminated in green sandstones overlying mafic volcanic and volcaniclastic rocks at the top of the Cambrian volcano-sedimentary sequence of the Des Pics unit in the Québec Supergroup. In this area in 1981, **Les Mines Madeleine Ltée** had estimated, based on drill data, mineral resources at 400,000 tonnes at a grade of 0.25% Cu.

DIVEX, a group of earth scientists united in a research network to diversify mineral exploration in Québec, is taking a closer look at known gold showings in sedimentary settings near the Grand Pabos–Ristigouche fault in the southern Gaspésie region. In studying the geological setting of these occurrences and particularly the Saint-André-de-Restigouche gold-stibnite showing in Ristigouche Township (NTS 22B/02), **DIVEX** has identified several features typical of Carlin-type gold deposits. These results outline the potential for Carlin-type gold deposits in Ordovician and Silurian limestones of the Matapédia Group.

In eastern Gaspésie, more specifically in York, Fortin, Baillargeon, and Galt townships (NTS 22A/09, 10, and 15), the **FRAPMGÎM** completed a study on hydrocarbons and Pb-Zn±Ag occurrences in cherty and dolomitic limestones, dolomites, and dolomitic breccias along the Troisième Lac fault. The study confirms that Pb-Zn occurrences are Mississippi Valley-type (MVT) and that, in this area, lower Devonian carbonate rocks of the Indian Cove Formation in the Upper Gaspé Limestones, as well as those of the York Lake Formation in the overlying Gaspé Sandstones, offer a strong potential for this type of ore deposit.

To date, Paleozoic sedimentary and volcanic assemblages in north-central Gaspésie (NTS 22A/11 to 14, B/09 and 16, G/01, H/04) were explored for copper deposits similar to those formerly mined by **Gaspé Copper** (a division of **Noranda Inc.**) in Murdochville, namely: porphyry-type deposits (Copper Mountain), skarns (zones B and C), marble-hosted replacement massive sulphides (mantos) (zone E), as well as distal polymetallic vein deposits.

However, based on the presence of favourable metallogenic settings (Lachance and Pilote, 2003; Pilote, 2002; Doyon, 1995, 1996; Bellehumeur and Valiquette, 1993; Wares, 1988; Stevens, 1983), the north-central Gaspésie region also represents a first-order regional target in the search for: 1) replacement-type (skarns and massive sulphides) Zn-Pb-Ag deposits in limestones, 2) epithermal gold deposits in and around rhyolitic volcanic centres (particularly in Mont Lyall and Mont Tuzo rhyolites peripheral to the Lemieux Dome), 3) SEDEX-type Pb-Zn-Ag-barite deposits associated with manganese-enriched zones in calcareous shales with bentonite beds indicating volcanism coeval with sedimentation in the Upper Gaspé Limestones, 4) volcanogenic massive sulphide (VMS) Zn-Pb-Cu deposits or Besshi-type Cu-Zn deposits, and 5) along the southern margin of the Lemieux Dome, disseminated Pb-Zn deposits in quartzofeldspathic sandstones of the lower Devonian York River Formation.

Recent exploration campaigns led by **Ressources Appalaches Inc.** on its Mont-de-l'Aigle property and geoscience studies conducted by the **Ministère des Ressources naturelles et de la Faune (MRNF)** in the Lac Sainte-Anne area (22B/16-200-0102) confirm the presence of hematite-magnetite-chalcopyrite-quartz-dolomite veins and hydrothermal breccias, particularly in the northern part of the Lemieux Dome. These Paleozoic Appalachian occurrences correspond to iron oxide-copper-gold (IOCG)-type deposits, with a gold component that remains, for the moment, poorly developed.

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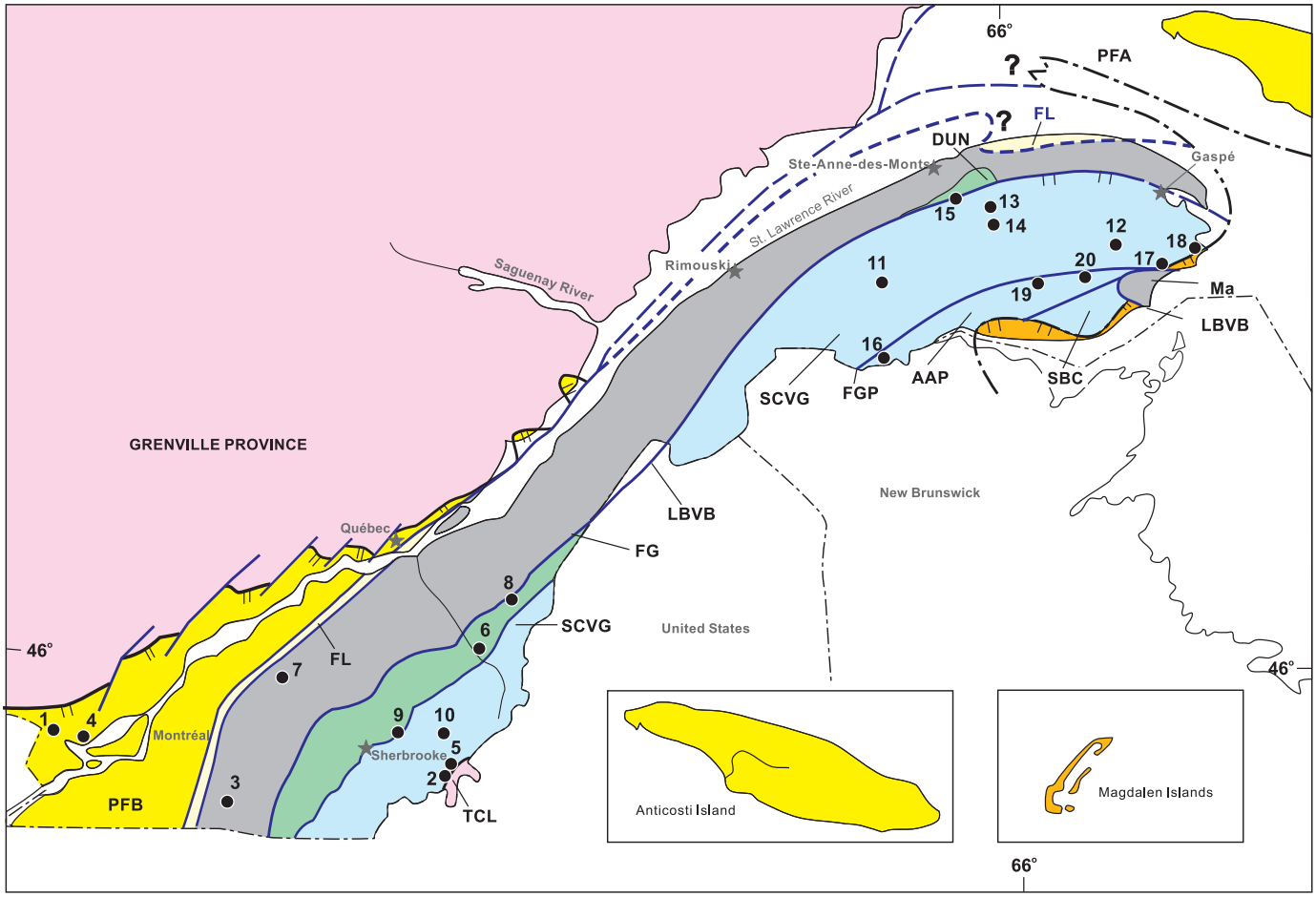

Figure 1F-1. Exploration projects over the St. Lawrence Platform and the Appalachians for 2005.

TABLE 1F-1 - Exploration projects over the St.Lawrence Platform and the Appalachians for 2005 (see figure 1F-1).

Nos.	TOWNSHIPS (SEIGNIORIES)	NTS	COMPANIES / PROSPECTORS	PROJECTS	SUBSTANCES	WORKS [1]
Southwestern Segment (Montréal and Chaudière-Appalaches regions)						
1	Argenteuil (Lacs-des-Deux-Montagnes)	31 G/09	H. Solis / G. Gravel / M. Bezeau / J. Huet	St-André Prospect	Diamond-Nb-REE	G, GpMa(G), Gs(r), Rsi, S
2	Clinton	21 E/07	Ressources Tectonic Inc.	Clinton F	Cu-Zn	G, Gp
3	Dunham, Farnham	31 H/02	K. E. Heusser	Karl Heusser	Au	D(11:417)
4	**(Lac-des-Deux-Montagnes)**	**31 G/09**	**Niocan Inc.**	**Niobium/Oka**	**Nb**	**Env.**
5	Marston	21 E/07	Ressources Tectonic Inc.	Clinton A	Cu-Zn	G
6	(Saint-François)	21 L/02	R. Mainville / T. Burnham	Timrod	Au	Gs(t), Pr, S
7	Simpson	31 H/16	D. Cyr	Drummond	Au-Cu	Pr
8	Ware, Langevin, Roux	21 L/08, 09	Explorateurs-Innovateurs de Québec Inc.	Appalaches	Cu-Ni-Au-Ag-Pb-Zn	GpEm(G), Gs(r), Pr, S
9	Weedon, Lingwick	21 E/11	Ressources Tectonic Inc.	Weedon	Cu-Zn-Au	GpMa(G), Pr
10	Whitton, Gayhurst	21 E/10	Ressources Appalaches Inc.	Sainte-Cécile	Mo	G, Pr
Central Segment (Bas-Saint-Laurent region)						
11	La Vérendrye, Casupscull	22 B/06, 07	Exploration Puma Inc.	Sainte-Marguerite	Au	D(12:350)
Northeastern Segment (Gaspésie and Îles-de-la-Madeleine regions)						
12	Gaspésie	22 A	R. Lelièvre / M. Boudreau / FRAPMGÎM	BBL 32	Au-Ag-Cu-Pb-Zn	Gs(r), Pr, S
13	Lemieux	22 B/16	Ressources Appalaches Inc.	Mont de l'Aigle	Cu-Au	D(3:576)
14	Lemieux	22 B/16	Ressources Threegold Inc.	Vital	Cu-Au	TE
15	Lemieux, Courcelette	22 B/16	2419-1538 Québec Inc.	Lapidaire	Gaspéite	S, T
16	Matapédia	21 O/14	Ressources Appalaches Inc.	Saint-Benoît	Au-Cu	Pr, T
17	Percé	22 A/08	R. Lelièvre / M. Boudreau	Lits rouges cuprifères de Grande-Rivière	Cu	Gs(r), Pr, S
18	Percé, Malbaie	22 A/09	R. Lelièvre / M. Boudreau / FRAPMGÎM	Cannes-de-Roches - Barachois	Zn-Pb-Cu-Ag-Au-Ni-Co-Pt-Pd-Cr-U-V	Gs(r), Pr, S
19	Robidoux	22 A/05, 06	Ressources Appalaches Inc.	Robidoux	Au-Cu	TE
20	Weir, Honorat	22 A/05	Ressources Appalaches Inc.	Lac Arsenault	Au-Ag-Cu-Zn-Pb	D(28:1720), T

1 = See the legend of abbreviations and the signification of italic and bold type in the appendix II.

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