Québec New World Class Mineral Deposits within Archean Superior Province (Canadian Shield)
The Éléonore Gold Deposit, Québec: History of Discovery (1996-2004)

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Former project generator for Virginia Gold Mines (1995-2009)

Éléonore fact sheet
(according to Goldcorp ltd. website 2012)

Average ore grade: 7.56 g/t Au
Opening planned for 2014
Plant production: ≥ 7,000 tonnes per day
Average 600,000 ounces of gold production per year over an approximate 15-year mine life = ≥ 9 Moz (280 t)
(will be Canada largest underground gold mine)
Life-of-mine cash costs are expected to be below $400 per ounce
$1.4 billion: total capital cost to full production

Source: Goldcorp 2012 website
Éléonore project:
Sold in 2006 by Virginia Gold Mines ltd. to Goldcorp

That’ll be US $420 million please

Meanwhile, at the North Pole:
Darn, I’ll have to come up with a new gift idea again!

Ian Jelfer
PDG Assets
DT Hoffman
Éléonore

Source: The Northern Miner
The challenge faced in 1996 when Virginia Gold Mines launched Opinaca reservoir greenfield exploration project.
As presented by Gema Olivo segunda feira a tarde, known Canadian Archean orogenic gold deposits occur within or immediately adjacent to greenstone belts commonly in spatial association with crustal-scale fault zones that mark major lithological boundaries.

Depositions of unconformable fluvial-alluvial sediments is another characteristic of orogenic gold environments that has been used as an exploration guide in the Abitibi.
The challenge faced in 1996 when Virginia Gold Mines launched Opinaca reservoir greenfield exploration project.

But what to do where no major crustal-scale faults have been delineated except Proterozoic ones?

Regional metamorphic contrast to delineate crustal-scale structure

Metamorphic Gradient:
A Regional-Scale Area Selection Criterion for Gold in the
Northeastern Superior Province, Eastern Canadian Shield

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Orogenic Lode Gold

~ 10 to 100 m
How to delineate metamorphic domains in unchartered terranes?

A GIS database of all orogenic gold occurrences of the Eastern Superior Province, including the Abitibi, and metamorphic isograds were collated from existing literature and field observations.
How to delineate metamorphic domains in unchartered terranes?

Then a metamorphic 3D pseudo-surface was generated
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A metamorphic map was generated and gradients calculated.
Results were significant

Statistical robustness
ROC curve (Receiving Operating Characteristic, Hanley 1989, Van Schalkwyk, 2001)

At 99% confidence, 48% of known orogenic gold deposits occur in the favorable belts delineated up to 10 km off north-facing maximum metamorphic gradients.

Results were significant

The favourable belts thus defined occupy just 10% of the Abitibi greenstone belt

Thus, for a first pass, craton scale exploration program, this area selection criterion appeared to be exceptional.
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This is how the Éléonore area was selected for a greenfield exploration project which resulted in a major gold discovery in 2004.
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That day (June 22 2004) results were received for TR-04-39

90 g/t Au

This is how the Éléonore area was selected for a greenfield exploration project which resulted in a major gold discovery in 2004

PDAC 2005 Prospectors of the year award
The Roberto Deposit comprises of numerous sub-parallel gold bearing lenses hosted by poly-deformed sedimentary rocks, usually a thinly bedded greywacke. The gold mineralization is found within stockworks of quartz-tourmaline-arsenopyrite veins and veinlets contained within microcline (potassic alteration) and brown tourmaline replacement zones.
Schematic temperature versus time path for metamorphic rocks (above) and variation in water contents (below). During heating, rocks lose water due to dehydration (D). Dehydration will continue in rocks that do not intersect melting reactions (hatched region) until the peak of metamorphism (P). In rocks that melt (M), the melts represent a sink for fluids until crystallization (C) occurs and the fluids are exsolved. During retrogression, rehydration (R) is possible if fluids remain within or are introduced into the terrane.

The critical metamorphic zone for Éléonore type gold deposition

Muscovite -> Kfelspar

+ Migmatite front

S: sillimanite
M: muscovite
K: K feldspar
Éléonore metamorphic setting according to Goldcorp 2012 website

Upper Amphibolite to granulite facies metaturbidites

The Éléonore property is located within the contact zone between the La Grande and Opinaca sub-provinces. The host rocks of the Roberto Deposit consist in aluminous meta-sediments and conglomerates. The sedimentary rocks evolve into pegmatite-bearing paragneiss to the north, the east and the west, suggesting a steep metamorphic gradient.
Manuel-Claude AZM-ER-G JV INEX
Apple-Matamec Éléonore
Dago
Upper amphibolite to granulite facies metaturbidites
Greenschist to mid-amphibolite
Upper amphibolite to granulite facies metaturbidites
Lower to Mid-amphibolite metaturbidites

Drilling on Opinaca Reservoir
April 2005
En juin 2001, quand Jean-François Ouellette et Michel Gauthier ont posé leur hydravion dans une baie du réservoir Opinaca, au cœur de la Baie-James, les deux prospecteurs d'or, fervents amateurs de Brassens, ont fait honneur à la tradition française voulant que l'on donne des noms de femmes aux veines et filons trouvés par les géologues. Excités par leurs observations de terrain, ils ont baptisé le site «Éléonore». «Nous nous sommes trompés, c’aurait du être Léonor.»

L'actualité, printemps 2007
Obrigado