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Secondary Environment Geochemical Maps: Favorable Zones and Exploration Targets

Daniel Lamothe and Patrice Roy
Géologie Québec

A new mineral potential assessment has been carried out based on secondary environment geochemical data from MRNF regional surveys stored in the SIGEOM database.

After analysis and spatial integration of the data, a first group of maps was presented at Québec Exploration 2009 (November 23 to 26, 2009, in Québec). This initial assessment identified 2,054 favorable zones for 11 mineral elements (Table 1), which were posted on the MRNF website. Of these zones, 1,373 are unstaked targets corresponding to secondary environment geochemical anomalies.

Element	Favorable Zones in the Secondary Environment				Unstaked Targets			
	Lake	Stream	Till	Soil	Lake	Stream	Till	Soil
Ag	104	57	5	13	79	36	0	8
As	156	136	0	0	118	77	0	0
Au	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Co	115	48	0	0	109	37	0	0
Cu	115	102	25	43	94	54	12	10
Li	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Mo	212	26	0	0	174	19	0	0
Ni	130	62	0	0	97	50	0	0
U	167	38	0	0	86	25	0	0
Y	211	41	0	0	177	29	0	0
Zn	131	49	25	43	36	12	12	22
Total	1341	559	55	99	970	339	24	40
Grand Total	2 054				1 373			

A second group of anomalies, enhanced to eliminate background geochemical "noise" from certain metals of interest, will be presented at PDAC 2010 (March 7 to 10, 2010, in Toronto). The targets will be unveiled simultaneously on the MRNF website in Google Earth format and in GESTIM.

Data Processing Method for First Group of Geochemical Maps and Targets

The first group of secondary environment geochemical maps was produced for 11 metallic substances (Ag, As, Au, Co, Cu, Li, Mo, Ni, U, Y, and Zn). In addition to data from previous years, the database includes over 50,000 ICP-MS results from new surveys and re-analyses conducted by MRNF in 2008–2009. These maps are available in ArcGIS, ASCII, or PDF. To make them easier to read, they have also been incorporated into the Google Earth module.

The maps were produced using the ModelBuilder module in ArcGIS, which made it possible to automate the spatial analysis and integration steps. The procedure extracts samples from different survey types (lakes, streams, till, or soil) separately

and interpolates the raw values and their percentile equivalents for selected elements by the natural neighbor method. A distance buffer, based on the element's estimated mobility and type of sample is then applied. The interpolated raw values are recalculated into natural log values. The resulting image of Québec is sequentially divided into 25 portions corresponding to distinct geological environments. Québec is first divided into five geological provinces (Appalachians, St. Lawrence Lowlands, Churchill, Grenville, and Superior). Then Churchill is subdivided into four sub-provinces, Superior into 13 sub-provinces, and Grenville into six lithological assemblages. Thus, the populations of values from each portion are broken down into 25 classes using the natural breaks method and then recombined at the end of the process. Ultimately, three maps are generated for each element: a map of raw values, a second map showing six percentile classes (0, 50, 75, 95, 97.5, and 100), and a third map of the 25 classes divided by natural breaks.

For all elements except gold and lithium, an analysis of the spatial association between classes of natural breaks and mineralized deposits containing these elements established clear spatial associations of known deposits of these substances with higher value natural break classes. These well defined classes were used to create secondary environment favorability zones in Shapefile that can be viewed in GESTIM. The unstaked portions of these zones, as of October 31, 2009, represent targets, which are also available in Shapefile format in GM 64290 ([Table 1](#)). All of these zones are available in Google Earth format.

Data Processing Method for Second Group of Leveled Maps and Targets

Work at CONSOREM on lake sediments shows that in contrast to gold, arsenic, and uranium, base metals (Ni, Cu, Pb, Zn) require signal enhancement (Trépanier, 2009). The second data processing phase involves a database of 5,948 isolated targets delineated by the enhancement method developed by Sylvain Trépanier at CONSOREM, which uses the residual values from a multiple spatial regression (except for pure zinc). The data is processed using a database of 90,844 lake sediment samples leveled by the author for 18 elements (Al, Ba, Ca, Ce, Co, Cr, Cu, Fe, K, La, Mg, Mn, Ni, P, Ti, U, V, and Zn). The leveling is based on a group of 43,336 samples re-analyzed for 53 elements by ICP-MS in 2008–2009. The target database is made up of the following element groups: (see [Table 2](#)):

1. One group of five elements associated with pure deposits (Cu, La, Ni, U, Zn)
2. One group of two elements (Cu, Zn) associated with volcanogenic massive sulphide (VMS) deposits
3. One group of two elements (Ni, Cu) associated with magmatic Ni-Cu deposits
4. One group of three elements (Cu, La, U) associated with iron oxide deposits enriched with Cu-U-Rare earth elements

The predictability of the proposed target groups was tested in each case by the weights-of-evidence method (*W of E*), which determines the effectiveness of the approach used.

Table 2: Lake Sediment Targets by Multiple Spatial Regression

Type of Deposit												Total
Pure Elements					VMS		Magmatic Ni-Cu		Cu-U-REE (IOCG)			
Cu	La	Ni	U	Zn	Cu	Zn	Ni	Cu	Cu	La	U	
498	286	297	516	909	493	412	459	408	568	527	575	5 948

Publications

The first group of geochemical maps and favorable zones was published in GM 64290 and is available in the MRNF's e-SIGEOM-Examine databank:

http://sigeom.mrnf.gouv.qc.ca/signet/classes/I1102_index?l=f&entt=LG

The favorable zones are also available in Google Earth format on our website:

<http://www.mrnf.gouv.qc.ca/publications/mines/zones-favorables.zip>

Remember, a sneak preview of the second group of targets will be posted in Google Earth format on our website and in GESTIM on March 7, 2010, as part of PDAC 2010. The maps leveled for the 18 elements listed above as well as the targets will be available in digital format and PDF in the document EP 2010-01, slated for publication in April 2010.

References

Trépanier, S. 2009. Rehaussement des anomalies géochimiques dans les levés régionaux de sédiments de lac : exemples du Québec et du Labrador, Résumé des conférences et des photoprésentations, Ministère des Ressources naturelles et de la Faune, Québec, DV 2009-05, 74 pages.

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Steps in the Mining Development Process and Oversight Measures: The Example of Uranium

The opening of a new mine is a big event! Before getting to this stage, numerous steps must be completed, sometimes taking six to ten years. These steps, summarized in the following table, happen according to a complex decision-making process based on geological, mining, metallurgical, economic, financial, environmental, and social criteria. A project that successfully negotiates all these steps and actually leads to a mine opening is an exception.



Mining is also subject to economic and social constraints that can change the viability of the project once it is underway and cause premature closing.

Setting up a mine involves three main phases: exploration, development, and mining. Each of these phases draws on specific specialists, research techniques, and investors, poses its own challenges, and involves various risks and chances of success.

The exploration phase starts with the investigation of vast territories, the identification of anomalies, the discovery of promising indicators, and the characterization of a mineral deposit. Studies intensify during the development stage to make sure that the deposit can be worked profitably while respecting the environment and the local population. With luck, and after many years of work, construction and working of the mine can start. When the deposit is mined out, the mine tailing accumulation area and mining site are rehabilitated in a manner that is acceptable for the environment and the local population.

A highly controlled industry

Like all businesses, mining companies must comply with a series of acts and regulations which control their operations and aim to protect both the environment and the health and safety of the workers and the public. From this flows a whole raft of permits and authorizations that must be obtained. Throughout the process, numerous municipal, regional, provincial, and federal bodies must be informed, give their opinion or permission, and issue authorizations and permits for the project to advance, step by step. Mechanisms for consulting local populations and aboriginal groups are also in place and apply according to the stage of the project,

its size, and the scale of its impacts. These consultations are conducted according to established, transparent protocols. The location of the project (e.g., in an urban community; on public or agricultural land, on land covered by agreements, or in a northern environment) also influences the laws and regulations that apply.

The number, importance, and complexity of the authorizations reflect the type of work and the actual and anticipated impacts. The main regulations are based on the *Mining Act*, the *Forest Act* (MRNF), the *Environment Quality Act*, Directive 019 for the mining industry (MDDEP), the *Metal Mining Effluent Regulations* (MMER), and the *Act respecting occupational health and safety* (AROHH).

Uranium

When it comes to regulations, controls, and consultations, uranium is a prime example. All uranium mining and processing projects must comply with the acts and regulations that apply to all mining projects, but they are also subject to very strict control by the Canadian Nuclear Safety Commission (CNSC).

The CNSC is the sole authority responsible for regulating the use of nuclear energy and materials under the *Nuclear Safety and Control Act* (NSCA). It regulates to preserve the health, safety, and security of Canadians, protect the environment, and comply with Canada's international commitments on the peaceful use of nuclear energy. Since the mining of uranium, a naturally radioactive element, aims at producing nuclear energy, the mining company must apply to the CNSC for a nuclear activity permit.

The CNSC Tribunal is independent and is the only entity that can issue a nuclear activity permit. Its employees (over 800) examine applications in light of regulatory requirements, make recommendations to the Commission, and oversee the enforcement of the regulations and permit conditions imposed by the Commission. They monitor mining sites and inspect them frequently.

Exploration

The CNSC specifies that prospecting and exploration for uranium come under provincial jurisdiction and considers that these activities do not pose a threat to health or the environment.

Exploration companies must comply with the laws and regulations that govern the exploration of any mineral substance, including uranium. A number of exploration companies voluntarily adhere to Environmental Excellence in Exploration (E3 Mining), a group overseen by the Prospectors and Developers Association of Canada (PDAC). They apply the guidelines set out in the e3plus guide, particularly those that concern protection of the environment and workers. In the case of uranium, the guide is based on best practices in Saskatchewan (the biggest uranium producer in the world), Canada, and around the world.

Development

The extraction and refining of uranium are strictly regulated in Canada. As soon as a uranium exploration project reaches the development stage when radioactive material may be extracted or a mineralized zone accessed, the company must submit a permit application to CNSC before starting work. The company must also apply for all other required authorizations.

The CNSC oversees and coordinates the activities of a number of federal and provincial committees and agencies throughout this process. An important part of the process involves an environmental and social impact assessment and the holding of public hearings, often jointly with other bodies. All documents submitted to the CNSC as well as the Commission's activities are released, and the public is invited to participate in the hearings.

The CNSC has the power to approve or reject a project. The nuclear activities permit is valid for a period of only two to five years. The permit application process must be repeated from the beginning, and the company must prove that it is in compliance with all regulations and CNSC requirements and that it possesses the necessary financial guarantees to rehabilitate all sites affected by its mining operations. No uranium mining can take place without CNSC authorization.

Mining and rehabilitation

Once all the authorizations and permits have been obtained and the CNSC gives the go-ahead, the mining project can move on to the mining phase.

The company must comply at all times, throughout the mining phase and long after the complete rehabilitation of all affected sites, with orders issued by the CNSC and all other bodies.

CNSC provides ongoing oversight and carries out frequent inspections. The CNSC can withdraw a mining permit at any time if the terms have not be respected or for any other cause that may endanger the environment, workers, or the population. At the end of the life of a mine, the CNSC oversees site restoration and rehabilitation. If all activities are up to standard, the CNSC issues its approval and subsequently continues to monitor the site.

In conclusion

From exploration to final site rehabilitation, mining companies (exploration companies and producers) must comply with the acts and regulations in force and are increasingly subject to a highly controlled process that is more respectful of the environment and worker health and safety, and in harmony with community values with respect to sustainable development and collective social responsibility. In the case of uranium, this process includes strict measures to protect workers and the environment for future generations.

Whenever uranium ore extraction is involved, the CNSC is the oversight body with the authority to grant, under strict conditions, a nuclear activity permit following an exhaustive review of the technical file, environmental and social impact studies, and public hearings. The company is monitored by the CNSC throughout the life of the mine and long after it has closed.

For more information

- [*Act respecting occupational health and safety*](#)
- [*Canadian Nuclear Safety Commission*](#)
- [*Directive 019 on the mining industry*](#)
- [*Environment Quality Act*](#) (In French)
- [*Forest Act*](#)
- [*Mining Act*](#)
- [*Metal Mining Effluent Regulations*](#)
- [*Nuclear Safety and Control Act*](#)
- [*Regulations Amending the Metal Mining Effluent Regulations*](#)

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Québec Exploration 2009

Marked by Record Attendance and a Unifying Theme!

The results are in and the Québec Exploration organizing committee is delighted to declare the 2009 edition a resounding success—over 2,200 people attended, almost **160** exhibitors presented their products and services, and over **60** speakers shared their knowledge, points of view, and new developments in geological research and mineral exploration in Québec.

Given the gloomy economic situation in early 2009, the organizing committee had expected fewer attendees at the 7th edition of Québec Exploration. Contrary to all expectations, attendance actually increased by 10% compared to last year, hitting a new record.

The convention's popularity, which is a clear reflection of the industry's vitality, also stems from the quality and diversity of its program, particularly with respect to gold, uranium, and industrial mineral exploration. The session on mining investment and the outlook for 2010 was as popular as always, and the innovative session on sustainable development was very successful. Participants were also able to appreciate the wealth of new data on minerals in Québec thanks to some fifty photographic presentations displayed on posters and giant screens, the work of geologists from Géologie Québec and their partners. The recent rise in a number of base and precious metal prices generated great enthusiasm on the part of the exhibitors who came to do business at Québec Exploration.

Open House

For the third consecutive year, the organizing committee put together an open house for students and the general public. This third edition was by far the most successful, with a program specially designed for this clientele, including popularized scientific exhibits, workshops, lectures, a contest, and door prizes. The theme, *The Oldest Rock in the World is in Québec* piqued the curiosity of both the public and journalists, who turned out in force to view rock samples unique in the world.

Over 300 students and 250 members of the general public made this the most successful open house yet.

Invitation to the 2010 Edition

The results of Québec Exploration 2009 are barely in and the organizing committee is already sketching the broad outlines of the program for Québec

Exploration 2010. To start off the new decade, the 8th edition of Québec Exploration will boast an original program and new features for exhibitors.

Set aside November 22 to 25, 2010, for a brand new Québec Exploration!

<http://www.quebecexploration.qc.ca/english/home.asp>

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Delegation of Sand and Gravel Mining Management to RCMs

Encouraging territorial development and growth

Roch Gaudreau, Director
Direction des titres miniers et des systèmes

In fall 2008, the Québec cabinet authorized the Minister of Municipal Affairs and Regions and the Minister of Natural Resources and Wildlife to sign and make public an agreement negotiated with Fédération québécoise des municipalités (FQM) and Union des municipalités du Québec (UMQ). One of the goals of the agreement was to transfer management of sand and gravel mining on public land to the regional county municipalities (RCMs). In June 2009, cabinet adopted an order-in-council on the decentralization of sand and gravel mining management.

Under the agreement in principle, the ministers must:

- Draft an implementation plan and start transferring powers and responsibilities while taking into account constraints such as resource availability
- Provide RCMs with the available data, guides, standards, and procedures they require to assume the responsibilities delegated to them, as well as models for producing MRNF reports and information requests on decentralized activities

The sand- and gravel-related powers and responsibilities assigned to the RCMs are as follows:

- Granting, renewing, revoking, and registering sand and gravel mining permits and leases in the Register of Real and Immovable Mining Rights, and obtaining authorization certificates as per section 22 of the Québec Environment Quality Act
- Inspecting and overseeing the mining of these substances, collecting rent and royalties, and restoring sand and gravel pits.

Every year, MRNF handles over 2,700 leases and authorizations for sand and gravel mining. The royalties and lease income generated across Québec each year add up to more than \$3.2 million. Most of this amount comes from RCMs located in Nord-du-Québec, Côte-Nord, Abitibi-Témiscamingue, and Saguenay-Lac-Saint-Jean.

In November and December of 2009, the Saguenay-Lac-Saint-Jean RCM signed a memorandum of understanding for a transfer of responsibilities effective April 1, 2010. Staff at Direction des titres miniers et des systèmes have spent the past months actively preparing for the management transfer to the RCMs. They have put together materials such as a guide and other documentation in addition to planning training sessions. A series of workshops will be held for designated Saguenay-Lac-Saint-Jean RCM staff between the months of February and June, 2010.

Several other administrative regions are also interested in this management delegation initiative. New agreements with other RCMs will likely be signed over the course of 2010.

By delegating new responsibilities to the RCMs, the Québec government is helping to

- Boost regional autonomy and prosperity, and provide high-quality living conditions for their residents.
- Enhance the role of RCMs within their territories and provide them with

- new tools for providing more services to the public.
- Enable citizens to directly seek out services offered by their RCMs.
 - Permit sand and gravel pit operators to benefit from the knowledge of RCM staff.

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Bill 79: An Act to Amend the Mining Act

Innovative Measures to Facilitate the Shift to Sustainable Mining

Hélène Giroux and Jocelyn Boucher
Direction générale de la gestion du milieu minier

In June 2009, the Québec government released its very first Québec Mineral Strategy, *Preparing for the Future of Québec's Mineral Sector*. This strategy proposes concrete measures, including some that will lead to new practices for both the mining industry and Ministère des Ressources naturelles et de la Faune (MRNF) and that require legislative and regulatory amendments.

Serge Simard, Minister for Natural Resources and Wildlife, tabled a bill amending the *Mining Act* in the National Assembly on December 2, 2009. The purpose of the bill is to implement the priority actions set out in the Québec Mineral Strategy, particularly those regarding environmentally friendly mining development, development of the mineral potential in the regions, and economic development with a view to creating wealth for Quebecers.

The proposed amendments to the Mining Act revolve around three sustainable development dimensions and aim to:

- stimulate mineral exploration on mining claims,
- guarantee the costs of restoring mining sites,
- advance geoscientific knowledge of Québec, and
- clarify surface mineral substance rights on private lands.

The following are the main **amendments with regard to the economic dimension** aimed at spurring exploration work on claims:

- It will no longer be possible to make a payment in lieu of carrying out mineral exploration, except during the claim's first period of validity.
- The area of land to which work credits may be applied to renew other claims is reduced.
- It will no longer be possible to use credits for exploration work conducted under a mining lease or concession to renew a claim.
- The period during which work credits may be carried over is limited to ten years.

The following are the proposed **amendments with regard to the environmental dimension**, which concern both mining and exploration:

- Coverage of the estimated costs set out in the mining site restoration plan will be increased from 70% to 100%, and the scope of the financial guarantee will be extended to include more than just the mine tailing accumulation areas, geotechnical stabilization of soils, securing of openings and surface pillars, construction of a water treatment plant, and the restoration of roads. The schedule for submitting the financial guarantee will be changed in order to speed up payment. A three-year moratorium will be applied to mining activities already underway, after which the financial guarantee must be paid in full within a maximum of five years.
- A financial guarantee corresponding to 100% of the cost of the work will be required for exploration sites covered by section 108 of the *Regulation respecting mineral substances other than petroleum, natural gas and brine*. A certificate of authorization from Ministère du Développement durable, de l'Environnement et des Parcs (MDDEP) will also be required for these sites. The scope of the guarantee will be extended to all work, including the exploration camps, if necessary, rather than just the mine tailing accumulation areas.

- A penalty equal to 10% of the financial guarantee will be applied if the latter is not paid by the deadline.
- Anyone holding a mining right who does not remove all property and mineral substances extracted from the site once the right expires will be subject to a penalty.
- The requirements for obtaining a release certificate after the rehabilitation and restoration work is completed will be tightened. Approval from MDDEP will be required.
- The rehabilitation and restoration work carried out on the mine tailing accumulation areas will be protected.

The following are the proposed **amendments with regard to the social dimension**, which aim to reconcile various land uses:

- It will be possible to take other land uses into account, e.g., regional planning, to prohibit mining on the land or set aside the land for government use in order to minimize conflicts of use.
- It will be possible to refuse or revoke leases to mine surface mineral substances for reasons of public interest.
- It will be possible to refuse to grant a mining lease for sand and gravel where land use is an issue.
- Anyone applying for a mining lease, except for surface mineral substances other than peat, will be required to hold a public consultation and to submit a restoration plan before the consultation.
- Anyone applying for a claim will be required to declare uranium exploration and discovery.
- Claim holders will be required to inform the landowner and tenants that a claim has been staked on their private property.
- Eskers with drinking water potential will be protected by having them declared off-limits for mining or set aside for the government.

Other measures are also proposed in Bill 79:

- Transmission of reports on all mineral exploration work carried out according to the exploration credits claimed under the *Mining Duties Act* (R.S.Q., c. D-15)
- Surface mineral substance concessions to land owners
- Review of all penalty provisions
- Setting of fees for processing files
- Revoking of unnecessary provisions

Bill 79 will be discussed in parliamentary committee in the coming weeks.

The text of Bill 79 is available at the following address:

<http://www.assnat.qc.ca/en/travaux-parlementaires/projets-loi/projets-loi-39-1.html>

Summary of Québec Mineral Strategy

The Québec Mineral Strategy is based on three core elements:

- Creating wealth and preparing for the future of Québec's mineral sector
- Ensuring environmentally friendly mineral development
- Fostering integrated, community-related mineral development

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PDAC 2010

Québec Promotes its Mineral Potential and Invites Participants to Explore the Future

Once again this year, MRNF's mining section will be well represented at the 2010 edition of PDAC, the Prospectors and Developers Association of Canada's international convention, trade show, and investors exchange. PDAC is the biggest mineral exploration event in North America.

Québec will have the third biggest stand of the 1,000 exhibitors attending the trade show. A team of generalists and specialists will be on hand to discuss new mineral exploration targets, available support for the industry, tax incentives, everything pertaining to mining restoration, and many other topical subjects.

Conference-goers will be able to search our databases, get the latest information, and even acquire mining titles using our computerized systems.

On the program: a special session on the Abitibi geological region

Géologie Québec is delighted to be part of the geoscience conference program. A special session on the Abitibi geological region will be held in the morning on Tuesday, March 9. This special session, chaired by Phil Thurston (Laurentian University, Sudbury) and Sylvain Lacroix (Géologie Québec, MRNF, Val-d'Or), will feature seven lectures on local and regional assessments of known base metal (copper, zinc, and nickel) mineralization in the vast and rich Abitibi geological belt. Jean Goutier and François Leclerc, geologists with Bureau de l'exploration géologique du Québec, will give two talks presenting new developments stemming from the geological work carried out over the last five years by a large network of geoscience partners (Géologie Québec, Ontario Geological Survey, Geological Survey of Canada), university researchers, and the mining industry under the TGI-3 program (Targeted Geoscience Initiative, Abitibi Project), and the Copper Plan.

For program details on the special session on the Abitibi geological region, go to:

<http://www.pdac.ca/pdac/conv/2010/pdf/2010-convention-brochure.pdf>.

A Sneak Preview of Two New Geophysical Surveys

At PDAC, Géologie Québec, in cooperation with the Geological Survey of Canada (GEM Program) and the Newfoundland and Labrador Geological Survey, will unveil two new aerial geological surveys east of Schefferville. The surveys, which were coordinated by the Geological Survey of Canada under the GEM Program (Geomapping for Energy and Minerals), cover 25 NTSC maps in the Lac Ramusio (NTSC 13L05, L12, L13, 13M04, M05, 23I08, I09, I16, 23P01, and P08) and Lac Attikamagen sectors (NTSC 23I05, I12, I13, 23J07 to J10, 23J15, J16, 23O01, O02, O07, O08, 23P04, and P05) located east and west, respectively, of the recently published aeromagnetic survey (DP 2009-04). The new surveys include magnetic and spectrometric data collected at a flight altitude of 90 m along lines 200 m apart.

The data will be published simultaneously by the three government partners:

- The Geological Survey of Canada - Open File 6532
- Ministère des Ressources naturelles et de la Faune - DP 2010-07
- Newfoundland and Labrador - Open File LAB1536

Tangible Presence of Direction générale du développement de l'industrie minérale

Direction générale du développement de l'industrie minérale will also attend the PDAC this year to present its support program for mining companies. The program

provides assistance in obtaining the permits, certificates, and rights required for carrying out mining ventures in Québec—from the exploration, development, and mining stages right through to mine restoration—in keeping with sustainable development objectives.

Showcasing our Partners in the Mining Industry

To showcase its partners in the Québec mining industry, MRNF will share its stand with its long standing partners in prospecting, geoscience research, and exploration.

Drop by and see us at the PDAC! The coffee's on us!

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Mining Highlights in Québec

A revampe report for a more complete picture of the industry

James Moorhead, Patrice Roy and Pierre Doucet
Géologie Québec

The annual *Report on Mineral Exploration Activities in Québec* has gotten a facelift! From now on, it will be called *Annual Report on Mining Activities in Québec* and will present a more complete overview of the mining industry. The new report will discuss all aspects of the industry, from claim designation to mining site rehabilitation. In addition to the usual sections on Géologie Québec's geoscience work and mineral exploration, the report will also contain the following chapters:

Mining highlights : a summary of the highlights and main subjects covered in the report.

Mining regime : new developments and basic principles of mining taxation and the mining rights regime, notably Bill 79, *An Act to amend the Mining Act*.

Land protection: protected areas and limits on mining activities

Mining: a detailed overview of mineral development and mining projects

Mine rehabilitation : an overview of rehabilitated mining and exploration sites

These new chapters will supplement those found in previous versions of the report:

- A summary of mineral exploration and development highlights.
- An overview and description of various exploration projects (diamonds, base and precious metals) by geological province and administrative region.
- A description of architectural stone, industrial mineral, industrial stone, and peat mining and exploration projects.
- A description of Géologie Québec's geoscience projects.
- The location of producing mines and architectural stone quarries in Québec.

The annual report is available free-of-charge in PDF on the MRNF website:

<http://www.mrnf.gouv.qc.ca/english/mines/publications/publications-report.jsp>

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