



GUIDE FOR THE PREPARATION
OF A SCOPING AND MARKET STUDY
FOR PROCESSING IN QUÉBEC

Production

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Guide for the preparation of a scoping and market study for processing in Québec

A scoping and market study for processing in Québec is required for all projects for which a mining lease must be obtained or renewed, and for mining concessions.

October 2015

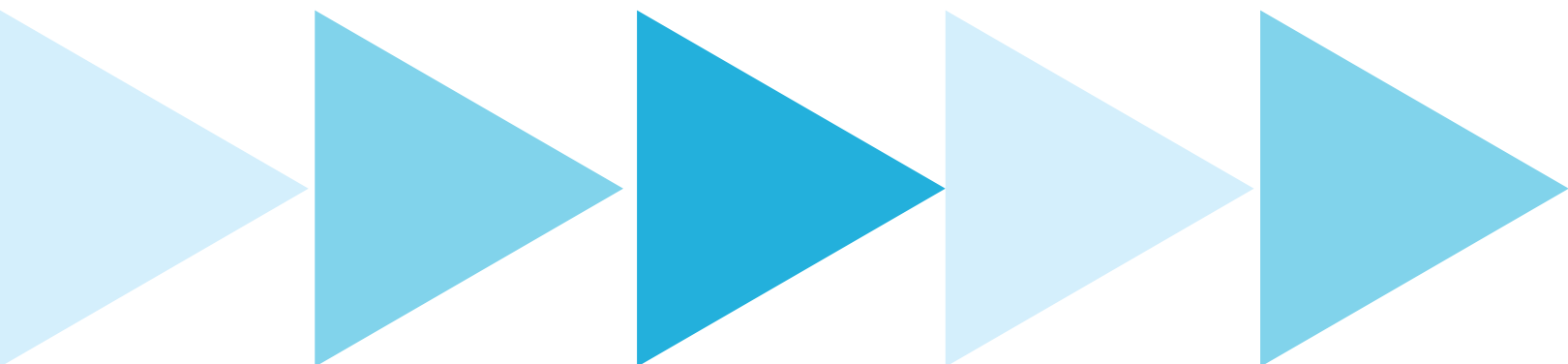




Photo: Mining industry human resources council

Preamble

The Mining Act (chapter M-13.1) was amended in December 2013 and now includes new conditions for the granting and the renewal of mining leases that also apply to mining concessions. Among other things, the lease application must be accompanied by a scoping and market study for processing the mined substance in Québec. The study must be presented in the form of a single document, and must contain the elements described in this Guide. It will be considered acceptable if it meets the requirements and complies with the instructions set out in this Guide. Appendix 3 contains an overview of the study content.

The *Ministère de l'Énergie et des Ressources naturelles* (MERN) does not require companies to include the figures, process diagrams and detailed production timeframes used to calculate the information presented in the study, but it does reserve the right to request these details if necessary.

The study submitted with the first lease application can be re-submitted with additional applications, provided its content and conclusions are still pertinent. The MERN may request additional information at any time. A study must also be submitted when a mining lease is renewed. The same requirements apply to mining concessions.

Under section 215 of the Mining Act, all documents obtained from holders of mining rights for the purposes of the Mining Act, including the study, are public. Accordingly, while promoters must provide the MERN with a document that meets all the requirements of this Guide, they must bear in mind that the information will be published. It is therefore up to them to make sure the details they provide will not be prejudicial to their company or harm its ability to compete.

Readers should be familiar with the relevant sections of the Mining Act, which may be found in Appendix 1 to this Guide.

The Mining Act and its associated regulations can be consulted by clicking on the following link:

www.mern.gouv.qc.ca/lois/lois-mines.jsp

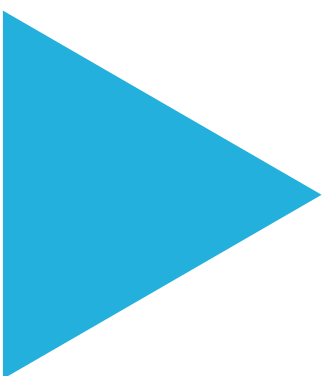




Photo: Minalliance

Ore treatment and primary processing

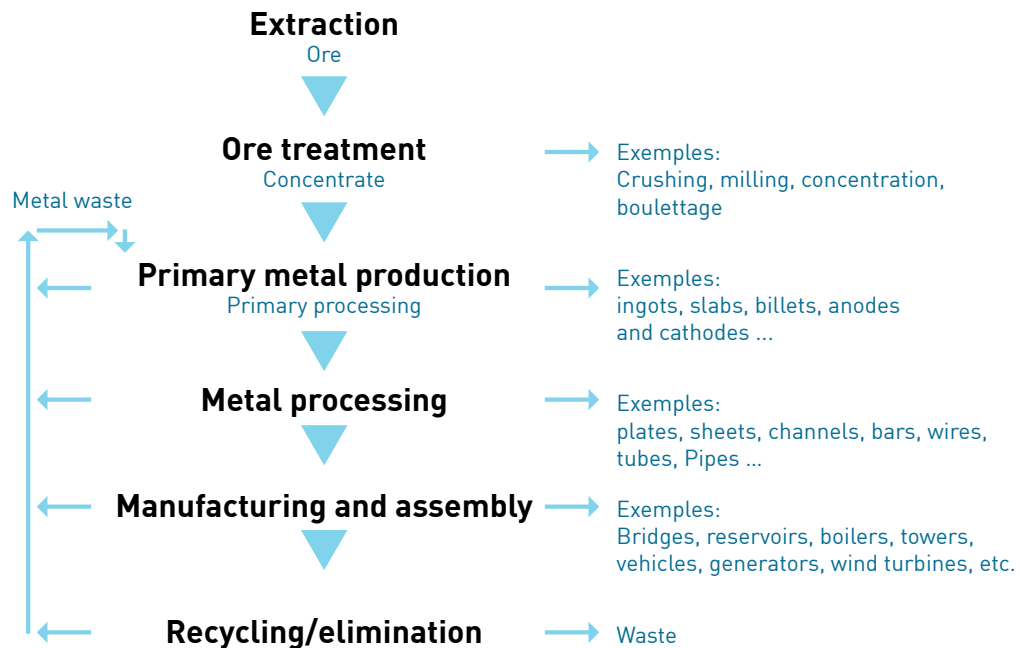
Ore treatment

Most mining companies treat their ore in Québec. The ore that is mined is then subjected to physicochemical treatment in order to obtain a concentrate. This is known as ore treatment. The substance remains in mineral form throughout treatment, the aim of which is to concentrate the substance of value by removing as much gangue¹ as possible. Ore treatment is not considered to be “processing”.

Primary processing

Primary ore processing takes the substance from mineral form to raw metal. This process – the production of primary metal – can be divided into several steps. Primary metal is not a finished product, but must be re-processed. Again, re-processing may take place in several steps. The following diagram illustrates the main steps in processing, from ore extraction to finished product. Table 1 on the next page provides examples of some common types of primary processing that could take place in Québec.

FIGURE 1 – METAL PROCESSING



Note: The above process illustrates the path from ore to finished metal product. The notion of recycling has been included because it is an intrinsic part of the metal industry. Metal waste generated at each step is put back into the process that generated it. The same applies to products that have reached the end of their useful life. Anything that is recyclable is recycled. The rest is treated as garbage, for elimination.

1 - Gangue: the worthless portion of an ore vein.

TABLE 1 – EXAMPLE OF MINERAL SUBSTANCES THAT COULD BE PROCESSED IN QUÉBEC

Substances	Primary processing products
Apatite*	Fertilizer
Clay*	Alumina
Copper	Copper cathodes
Iron	Steel billets or bars, steel powder, metal pellets or briquets (direct reduced iron, hot briquetted iron), pig iron, iron powders
Lithium*	Lithium hydroxide, lithium carbonate
Magnesium	Pure magnesium bars, magnesium oxides and salts (sulfates, chlorides)
Nickel	Ferronickel, very pure nickel metal
Niobium	Ferroniobium, niobium oxide (see Appendix 2 for a more detailed example)
Gold and silver	Gold and silver bricks, refined gold ingots, refined silver ingots
Rare earths	Rare earth elements in different chemical forms (oxides, carbonates, phosphates, etc.)
Titane	Slag, titanium pigments (titanium dioxide), cast iron, steel
Titanium	Zinc ingots

* Mineral substances that are not yet mined in Québec but for which there are projects at the deposit appraisal phase.

The scoping and market study

A scoping and market study is the first step in assessing a processing or development project² for the main substance extracted by a mine. It considers the current status of the market, and also examines the competition, plus any problems issues or opportunities, the project’s location, the mined substance, the production process, the economic and financial aspects of the project, and any existing or potential markets.

This type of study is intended to provide estimates only (level of accuracy $\pm 50\%$), to help with decision-making, and is not required to give accurate data. However, the data on which it is based must be reasonably up-to-date.

Ultimately, the study identifies and explores segments of the processing market in which a processing or development project could be implemented for a mineral substance mined in Québec. Appendix 2 presents the example of niobium mined in Québec.

Engineering consultants or specialist marketing or market survey firms are all capable of carrying out a scoping and market study. However, if the study is produced by a member of a professional order, such as the *Ordre des ingénieurs du Québec* or the *Ordre des comptables professionnels agréés*, the fact of signing the study entails responsibility on the part of the signatory.

Briefly, a scoping and market study constitutes the preliminary phase of a project, and helps in understanding the market and identifying opportunities for growth in light of the sector’s economic context, in order to reduce the strategic risk when making decisions.

Its goal

The scoping and market study allows the Government to see whether or not it would be possible to process the mined substance in Québec, and to understand the promoter’s intentions in this respect.

² Some mineral substances (including industrial metals) cannot be processed in the technical sense of the term. In this case, an additional step is required to add value – for example, cutting and polishing diamonds, producing spheroidal graphite, etc. In the case of precious metals, processing possibilities are limited and they cannot in fact, structurally speaking, be processed in Québec. In these cases, promoters are still required to produce a study, but its scope is extremely limited.

Its scope

To identify business opportunities, it is important to start by considering world economic and technological trends. The next step is to identify which of the potential products is the most promising. A distinction must be drawn between the technological aspect of the project and its financial viability, in order to show its promise based on real figures. Information must be obtained from primary sources (surveys, interviews with potential customers), and can also be obtained from secondary sources (statistics, existing market surveys). All this information is then analyzed. The end goal of the study is to collect the data needed to make informed operational decisions regarding the relevance of a processing or development project.

The study must present the types of processing that would be possible, based on the characteristics of the ore. However, it should focus mainly on the processed product for which the conditions appear to be most favourable.

It must also examine different scenarios. The authors should be able to provide an idea of the investments required, along with a preliminary financial analysis. They should also give preliminary construction and operating cost estimates, as well as a preliminary estimate of the potential financial outcome. The following diagram situates the study with respect to the subsequent steps in the evaluation of a primary processing project.



Its content

The scoping and market study must clearly identify the strategic issues, advantages and limitations of processing the mineral substance mined in Québec. The elements mentioned in this section are therefore those that are likely to become issues for any future processing project.

A list of the information required can be found in Appendix 3 of the Guide.

Market

The promoter must provide a brief description of the market, review existing research findings (available market analyses and statistics for both supply and demand), examine the value of sales in the sector in the last three years, provide growth estimates and give an estimate of market size.

The promoter must also provide a summary profile of the target customer group: the products it currently uses, the demand for new or replacement products, the price buyers are willing to pay, and how the product could be marketed.

This section can contain both primary data (e.g. data based on survey responses or taken from interviews with potential customers) and secondary data (e.g. sector-based statistics).

It should provide answers to the following questions:

- > What are the main elements that influence demand?
- > Where is it situated, geographically speaking?
- > What are the short, medium and longer term prospects for growth?
- > What are the factors that influence growth of demand?
- > Are there any existing substitute products for this demand?
- > What impact does the current supply/demand situation have on prices?
- > How have prices evolved over the last ten years?
- > With regard to the supply/demand prospects described earlier, how are prices likely to change in the short, medium and longer terms?
- > At what price level does the project become viable?

- > At what critical concentrate volume level does the project become viable?
- > Is the amount of concentrate produced sufficient to support construction of a processing plant, or would an outside supply source be needed in addition?

Competition

The promoter must also provide a profile of other suppliers and potential competitors.

This involves estimating their market shares and examining changes in supply. Some sectors have “entry barriers”: for example, very high starting capital requirements or regulations preventing market access. Where this is the case, the promoter must analyze the impact of these barriers and propose a strategy to address them (e.g. forming a strategic alliance).

This section should provide answers to the following questions:

- > What is the current level of production for this market?
- > What are the short, medium and longer term prospects?
- > Are there any plans for expansion or construction of new facilities that may affect the supply in the short, medium and longer terms?
- > Where are the main producers located?
- > Which of the existing producers are the market leaders? What are their market shares?
- > Which of them are considered potential direct competitors?
- > Will strategic partnerships be needed? If so, what are they?

Investment and financing

The promoter must provide information on the investment and financing required, and on the need for financial assistance or a Government contribution.

This section should provide answers to the following questions:

- > What level of investment does the promoter feel is required for this type of project?
- > Are there any financing constraints?
- > Would Government aid or a Government contribution allow the project to go ahead?

Location

The promoter must identify the potential locations in Québec for a project of this type, and state whether they are in competition with other locations outside Québec. In this case, the following questions should be answered:

- > What are the potential locations in Québec?
- > Are they able to compete with other potential sites outside Québec?

Supplies

The promoter must state its supply needs, in particular for strategic inputs, and its energy needs:

- > Is the supply chain secure?
- > What strategic inputs are required, and can they be obtained in Québec?
- > What are the energy supply needs (electricity, natural gas)?
- > Is energy a strategic issue?

Other elements

If possible, the promoter must state its labour and training needs.

It must also state whether or not road, rail or maritime infrastructures are required, and at what cost (estimated).

It must identify any research and development needs, especially for pilot projects, in particular if a new process or new technology will be required.

It must also identify its service and subcontracting needs and list the consulting or engineering firms whose expertise is required.

Depending on the location of the project, and the anticipated inputs and processes, the promoter must also identify any environmental and social acceptability issues that may arise.

Its conclusions

The study must analyze the information collected and then take a stance concerning the possibility of processing the mineral substance in Québec.

In the conclusion, to ensure that the study is acceptable, the company must clearly state its intentions with respect to processing its ore concentrate in Québec. The conclusion must take one of the following two stances:

- A. The study shows that there is potential for processing the ore in Québec.
 - Describe the main elements justifying this conclusion.
 - Describe the next steps required in order to collect the data needed to refine the information in the study and add other relevant elements (e.g. preliminary economic study, pre-feasibility study, feasibility study).
- B. The study shows that there is no potential for processing.
 - Describe the main elements justifying this conclusion.
 - Explain how processing may become viable.
 - List the prerequisites for processing in Québec.

If neither of these conclusions is present, the study will not be accepted.

For information

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Wednesday: 10:00 a.m. to midday, 1:00 p.m. to 4:30 p.m.



MINING ACT (CHAPTER M-13.1)

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101. The Minister shall grant a lease in respect of all or part of a parcel of land that is subject to one or more claims if the claim holder establishes the existence of indicators of the presence of a workable deposit, meets the conditions and pays the annual rental prescribed by regulation.

The lease cannot be granted before the rehabilitation and restoration plan is approved in accordance with this Act, and the certificate of authorization mentioned in section 22, 31.5, 164 or 201 of the Environment Quality Act (chapter Q-2) has been issued.

Despite the second paragraph, the Minister may grant a lease if the time needed to obtain the certificate of authorization is unreasonable.

The Minister shall make public the rehabilitation and restoration plan as submitted to the Minister for approval and register it in the public register of real and immovable mining rights for public information and consultation purposes as part of the environmental impact assessment and review procedure provided for in the Environment Quality Act.

An application for a mining lease must be accompanied by a survey of the parcel of land involved, unless it has already been entirely surveyed, a report describing the nature, extent and probable value of the deposit, certified by an engineer or a geologist who meets the qualification requirements determined by regulation, and a project feasibility study as well as a scoping and market study as regards processing in Québec.

At the Minister's request, the holder of the mining right shall provide the Minister with any document and information relating to the mining project.

The Minister may subject the mining lease to conditions designed to avoid conflicts with other uses of the territory.

101.0.2. When granting a lease, the Government may, on reasonable grounds, require that the economic spinoffs within Québec of mining the mineral resources authorized under the lease be maximized.

104. The term of a mining lease is 20 years.

The Minister shall renew the lease, by mere notice, for a period of 10 years, not more than three times, provided the lessee

(1) applies therefor before the sixtieth day preceding the expiry of the lease or, failing that, within 60 days preceding the expiry of the lease on payment of an additional amount prescribed by regulation;

(2) has submitted a report establishing that he has performed mining operations for at least two years in the last 10 years of the lease;

(2.1) has provided the Minister with a scoping and market study as regards processing in Québec;

(3) has paid the annual rental prescribed by regulation;

(4) has complied with this Act, the Mining Tax Act (chapter I-0.4) and the regulations throughout the previous term of the lease;

(5) has complied with any other renewal requirement prescribed by regulation.

Notwithstanding the foregoing, after the third renewal of the lease, the Minister may grant five-year extensions.

118.1. Before beginning mining operations and every 20 years after they begin, a grantee shall send the Minister a scoping and market study as regards processing in Québec.

119. Before mining operations begin, and 20 years after they begin, the Government may, on reasonable grounds, require the maximization of the economic spinoffs within Québec of mining the mineral resources authorized under the mining concession.

215. The documents and information obtained by the Minister from holders of mining rights for the purposes of this Act are public. The Minister makes such documents and information public in the manner the Minister sees fit.

However, the work reports required under section 72 involving amounts beyond the allowances that may be claimed under the Mining Tax Act (chapter I-0.4) remain confidential for five years after the date of the work.

The following are made public once a year for each mining lease, mining concession and lease to mine surface mineral substances:

- (1) the quantity and value of the ore extracted during the previous year;
- (2) the royalties paid during the previous year; and
- (3) the overall contributions paid by the holder.

The following are also made public:

- (1) the rehabilitation and restoration plan approved by the Minister; and
- (2) the total amount of the financial guarantee required.

However, the data contained in an agreement entered into between a holder of a mining lease or a mining concession and a community with respect to the contributions or benefits the community receives is not made public and may only be used for statistical purposes.

This section applies subject to the restrictions on rights of access prescribed by section 28 of the Act respecting Access to documents held by public bodies and the Protection of personal information (chapter A-2.1).

ACT TO AMEND THE MINING ACT (2013, CHAPTER 32)

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126. The grantee of a mining concession who has begun mining exploration work on 10 December 2013 must send the Minister a scoping and market study as regards processing in Québec within 3 years after that date, and subsequently every 20 years.

PRIMARY PROCESSING OF NIOBIUM

Niobium is mined in Brazil and Québec. Ore extraction and treatment and ferroniobium production all take place on the same site. Ferroniobium is used mainly as a component in highly reinforced steel.

The trend towards stronger, lighter and less expansive products has emerged in the last 20 years, and continues to intensify. The demand for these types of steel comes mainly from the construction industry (structural steel), the automobile industry, and the petroleum and gas industries (pipelines).

The demand for ferroniobium depends on the demand for steel and on the amount of ferroniobium used to produce the steel. The average amount used globally is 55g/tonne of steel. However, quantities vary considerably from one country to the next.

Asia, Europe and North America are the largest consumers of ferroniobium.

INDUSTRIAL MINERALS

Unlike their metal counterparts, most industrial minerals are not chemically treated.

In the case of industrial minerals, the scoping study usually includes an additional step to provided added value, such as cutting and polishing of diamonds or the production of spheroidal graphite.



Photo: Stornoway diamonds

APPENDIX 3

LIST OF INFORMATION REQUIRED IN THE SCOPING AND MARKET STUDY.

Description of the company

- Contact information
- General description of the company
- Structure and management team (organization chart)
- Number of employees
- Type of company (private or public)
- Main shareholders
- Capitalization
- History
- Location of head office, mines and plants in Québec and elsewhere in the world
- Nature of operations (products and production levels)
- Partnerships/Economic agreements (e.g. off take agreement)
- Facilities and infrastructures

Description of mining project

- Location of the project
- Substances mined
- Past and future investments
- Anticipated life of the mine
- Mine operating method, ore treatment and annual production
- Infrastructures required for the project

Processing market and prospects

Supply

- Potential processed products from the mined substance
- The current supply and economic prospects for primary processing products
- Current world production level
- World prospects in the short, medium and longer terms
- Description of the main producers, their production capacity and the locations of each of their production units
- From the list of main producers, the market leaders and their market shares
- The names of companies that may potentially be direct competitors
- Expansion plans or proposed new constructions that may affect the supply in the short, medium or longer term
- Level of market integration

Demand

- Current demand and future prospects for the market
- Main elements influencing the demand
- Geographic location of target market
- Demand growth prospects in the short, medium and longer term
- Factors influencing growth of the demand
- Availability of substitute products and their impacts on demand

Prices

- Impacts of the current supply/demand situation on prices
- Evolution of prices in the last ten years
- Potential price changes in the short, medium and longer terms
- Viability of processing (threshold price, production)
- How prices are set

Competitive benefits, constraints and strategic issues

- Investment and financing
- Promoter's estimate of investment required for processing
- Financing constraints
- Financial package
- Critical concentrate volume (critical production threshold required for processing)
- Strategic partnerships (existing or required)
- Potential sites for processing in Québec and elsewhere
- Energy supply needs (electricity, natural gas) and strategic issues
- Supply chain, essential strategic inputs and inputs available in Québec
- Labour and training needs
- Road, rail and maritime infrastructures to be built
- Process development and pilot project needs
- Social and environmental issues

The firm's stance with regard to processing in Québec

- The study shows potential for concentrate processing in Québec.
- The study shows that there is no potential for or benefits from processing in Québec
- Main elements justifying the conclusion
- Prerequisites for processing in Québec

The conclusion should include a clear statement of the lease applicant's intentions regarding ore concentrate processing in Québec.



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