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CANADIENNE DES  
PROSPECTEURS ET  
ENTREPRENEURS

February 16, 2024

**To: Hon. Jonathan Wilkinson  
House of Commons  
Ottawa, Ontario,  
Canada  
K1A 0A6**

**Re: Let's Talk Critical Minerals – Consulting on Canada's Critical Mineral List Criteria**

**BY ELECTRONIC MAIL**

Dear Minister Wilkinson,

The Prospectors and Developers Association of Canada (“PDAC”), on behalf of our 7,000+ individual and corporate members, is the voice of Canada’s mineral exploration and development sector. Following launch of the ‘Let’s Talk Canada’s Critical Minerals list and methodology’ consultation, we value the opportunity to offer feedback from our members and industry. Below we respond to consultation questions and provide insight from observations made over the last three years of the Critical Minerals List (or “*List*”) being applied in various policies and strategies within Canada and abroad.

### **Frequency and nature of changes to Canada’s critical minerals list**

Canada’s Critical Minerals Strategy has recognized that transitioning to a low emission future represents a generational opportunity. One year on from the Strategy’s release, demand projections for minerals essential to this transition have only grown, while little change has been observed in domestic capacity to supply new sources of critical mineral production or processing.

In this context of lagging supply, key international agreements such as the Canada / US Joint Action Plan, the UAE Consensus and Canada’s various bilateral partnerships highlighted in the Strategy, are largely dependent on considerable increases in mining capacity. Therefore, any changes to the List or incentives that exist to support Canada’s strategy should primarily be made with the understanding that mineral development is not just an opportunity for Canada: it is a responsibility.

Building the critical minerals value chain is, indeed, critical, both in consideration of the economic development it will facilitate and of Canada’s position in the global mining ecosystem. Timely action on critical minerals can still cement Canada as a leader in the green and tech transitions—but taking proactive steps to boost a socially and environmentally responsible domestic supply is crucial in reducing our and our allies’ reliance on minerals of uncertain provenance, and immediate action is needed to meet our national objectives.

The idea that “if everything is critical, nothing is critical” is an important one, but concerns regarding the inclusion of too many minerals on Canada’s list must be balanced by consideration of the scale of the potential to be unlocked. While worry about the misappropriation of critical minerals incentives in more developed mineral markets is understandable, these risks pale in



comparison to the damage that could be caused by prioritizing the List's continued refinement over concrete action. In this spirit, any changes to the criteria should be future-looking, aiming to minimize the impact of short-term fluctuations in supply, demand and commodity price on capacity-building activities as the List itself evolves.

## **Do you agree with the criteria?**

The first three criteria are relevant and comprehensive, providing valuable clarification to the original metrics for criticality. However, the prescriptive nature of the two newly disclosed mandatory criteria, considering threatened supply and reasonable likelihood of production, may constrain critical mineral supply chain development in the future.

Determining whether there is potential to produce a mineral in the “near- to medium-term” is no small feat; in fact, simply defining this timeframe is a challenge. Understanding that a “long-term” scale in mining projects could refer to decades or longer, as is the case with the management of tailings, the idea of the medium-term is nebulous and challenging to convey to those outside the industry. For investors who may be using the criteria to understand the critical minerals landscape in Canada, for example, this terminology may cause confusion in the absence of context on mining's average project timelines.

The provided details on criterion five also appear to disproportionately value the end stages of the supply chain, notably the export of end products, with little consideration of the role of exploration in building a robust critical minerals landscape. Requiring that “minerals must be capable of being economically shipped to relevant markets” to be deemed critical would be a logical step to be taken if assessing a robust, self-sufficient critical minerals supply chain. That is not reflective of Canada's position today, where we still lack a granular understanding of the mineral potential to be extracted from various deposits and regions. Rather than focusing on production potential, the current state of our critical minerals value chain requires emphasis to be placed on discovery.

In addition to an urgent need for increased exploration activities, domestic processing and refining capability must be significantly developed if all minerals currently deemed critical are to meet the proposed criteria. Building this capacity alongside research and development of new processing and recycling technologies will take time and must be prioritized. Otherwise, we risk placing too much focus on currently-viable projects and it is probable that it will be too late to switch gears by the time new valorization technologies are discovered—likely outside of Canada.

Beyond traditional commodities like copper and nickel, our critical minerals value chain is still in its infancy. It will be most impactful to the objectives of the Strategy if the List is considered a tool to build critical minerals capacity, with the understanding that these are not yet fully formed markets. Rather than focusing on the economics of the critical minerals value chain, which already present a rather significant barrier to growth in the open market, a leader in mining and clean technology such as Canada should prioritize the development of technologies and projects that will move that needle.

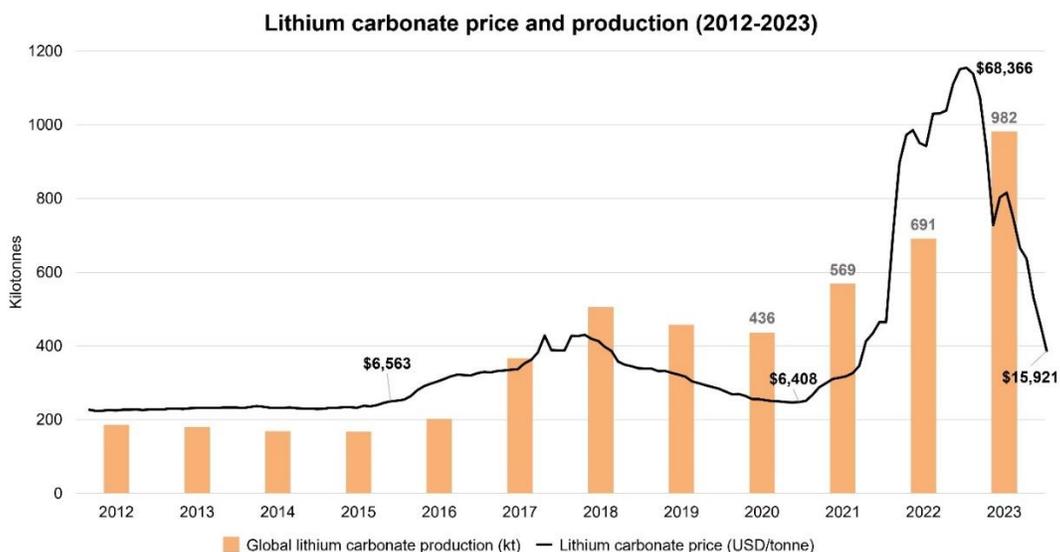
For example, Canada's critical mineral list does not include silicon, a common inclusion in our partners' lists—including the EU, the UK, and Australia—as it is a key component in

semiconductor manufacturing. While Canada has significant silica reserves, refining the raw material into saleable silicon is an energy-intensive process, and it is unlikely that any silicon refinery could establish operations in Canada using current technologies. Yet if this rationale is used to keep silicon off our critical minerals list, there will be little incentive to conduct exploratory studies or other research into new processing technologies. Granting criticality to minerals like silicon poses few risks, but could bring enormous rewards, in this case the potential to develop Canada’s semiconductor industry.

An opposite example is that of rare earth elements (REEs): while valuable advances in REE extraction have been made in recent years, current projects primarily aim to produce intermediate rare earth oxides, meaning that Canada’s capacity to export REEs “processed into usable forms that are required as inputs for technologies” is likely still decades away. This example is not intended to be a case against REEs, but rather an illustration of the List’s impacts: if Canada becomes a refined REE producer in the proposed 25-year “near to medium-term” timeline, this success will have been a direct result of rare earth elements’ inclusion on the List from its first iteration. In consideration of the global benefits that would stem from Canada developing reliable production of semiconductor and threatened battery materials, minerals in this category should be granted the same opportunity as REEs.

Overall, the emphasis on economic viability represents a departure from the objectives of the original Strategy, and may conflict with the other necessary criterion, threatened supply. The factors that threaten a mineral’s supply, supply chain disruptions, geopolitical considerations, or material price fluctuations, can shift far more rapidly than a mineral’s production potential. Lithium has exemplified this dynamic over the last few years with a spike in prices (more than 400% in 2021 alone) leading to a complimentary spike in marginal production coming online outside of Canada and subsequently causing a price collapse (see Figure 1).

Figure 1: Lithium carbonate production and price changes over time



Sources: S&P, Statista, PDAC analysis



The simplest way to safeguard Canada's mineral supply, and that of our partners, from such disruptions is to holistically develop the critical minerals ecosystem, from exploration through to production. Further raising the bar for criticality will only hinder the building of this capacity, a process which will be challenging even under the most favourable economic conditions.

### **Are all criteria needed?**

While the five criteria allow for a comprehensive definition of a critical mineral, it is unclear that the addition of both mandatory criteria will be valuable in refining the List and may in fact impose unnecessary constraints on the development of Canada's critical minerals capacity. Modifying the relationship between the criteria such that a mineral would need to meet two or three of the five to be considered for inclusion on the List may be an effective way to avoid the pitfalls presented by the two mandatory criteria.

This approach would establish a clear baseline for a mineral's criticality while providing more flexibility in the List determination methodology through criteria ranking by Natural Resources Canada. Limiting the prescriptive elements of the criteria would also aid in clarifying to industry and the public that the List is intended to be a guiding document for government initiatives, rather than a set determination of minerals to be prioritized. Providing the accompanying criteria ranking would increase understanding of the tiering system previously introduced through the Strategy, and clearly classifying minerals based on priority criteria may further aid in establishing consistent tier lists across government departments and critical minerals incentives.

### **Would any additional criteria be useful?**

The criteria as proposed are clear in their requirements of a critical mineral, and additional criteria would not enhance that definition.

Beyond these criteria, an addition to be considered is the development of a critical processing or critical materials list. Building on the principles behind Quebec's Critical and Strategic Minerals Plan and the European Union's Critical Raw Materials Act, the differentiation of critical minerals needing exploration-stage incentives from critical materials or intermediate products dependent on processing innovation may allow for a shorter, more impactful Critical Minerals List while ensuring that government incentives effectively target each stage of the mineral value chain.

The above examples outlining Canada's REE and silicon processing capacity can also be used to demonstrate the potential impact of a Critical Processing List: while silica is more abundant than REEs, both minerals face the same bottleneck in domestic processing constraints. Focusing incentives later in the value chain, with particular emphasis on government-backed research and development, would provide an opportunity to bring these minerals to market far sooner than otherwise possible. Another example is that of aluminium: while its criticality as a final product is undeniable, its status on the List under the proposed criteria may be questioned as Canada lacks meaningful bauxite deposits, let alone production. In this case, a separation between processing criticality and geological criticality would eliminate confusion around List eligibility while ensuring that aluminium operations continue to benefit from processing incentives.



This separation could also strengthen the late-stage value chain for minerals not currently included on the List, such as high-purity iron ore, a recent addition to Quebec’s provincial list. As in the case of aluminium, the exploration and mining ecosystem for iron ore is well-established, particularly in the remote Labrador Trough, which is home to some of the highest-grade iron ore in the world. This product is sought out globally for green steel initiatives as well as defense and medical applications, where it cannot be substituted for more conventional iron ore products. While the applications of high-purity iron ore are both critical and technologically advanced, processing and pelletizing the mineral is an intensive process that has seen little innovation in recent years. In fact, many waste products from mining in the Labrador Trough still contain more, purer iron ore than primary ores in other jurisdictions, but are not adequately valorized due to capacity and technology constraints—effectively leaving money and resources on the table. Acknowledging the criticality of saleable high-purity iron ore products would drive investment in research and development that can establish Canada as a leader in green steel, while strengthening relationships with the United States and other steelmaking partners.

This logic can also be applied to zinc, nickel, and copper, all of which benefit from a robust exploration-to-mining value chain but have suffered from lack of processing innovation in the past two decades, leading to reduced production, brain drain, and loss of social relevance—none of which can be afforded as we look to build Canada’s critical minerals value chain. Overall, the distinction between a processing or materials list and the Critical Minerals List could ensure that the latter retains a clear definition and focus on capacity-building for mineral extraction, particularly in terms of geoscience and exploration incentives, while closing gaps in processing research and development.

### **Are there specific methodologies that would be more useful to determine criticality?**

The determination of criticality should be supported by geological modeling and other public geoscience data to appropriately consider Canada’s geological potential. Clearly understanding what we have the capacity to produce, including more granular quantification of Canada’s mineral reserves and resources and comparison of these data to projected demand, is essential to effectively scope critical minerals incentives.

Geological modeling should be further supported by analysis of Canada’s mining infrastructure, from roads, railways, and ports to processing plants and brownfield mine sites, which can be utilized to reduce the social and environmental impact of increasing critical minerals capacity. Better understanding Canada’s mining legacy is essential if we are to become and remain a leader in the global transition toward a low-carbon economy, and repurposing or restoring historical projects is an important step in that direction.

In the absence of a comprehensive assessment of Canada’s geological potential and existing infrastructure, the criteria should ensure that both mineral exploration and public geoscience are not hindered but rather emphasized.



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## Final comments

While the List is a useful compass to direct future-focused funding, its development should first consider the urgent need to build Canada's critical minerals value chain from the ground up. Progress to this end has been slow since the publication of the Strategy one year ago and of the original list nearly three years ago, yet the same cannot be said of some of Canada's biggest competitors for the critical mineral opportunity. Though clear, comprehensive criteria for the List's development are certainly important, it is crucial that they incentivize rather than hinder activities like exploration and the development of new processing and recycling technologies, which, while essential to the development of the critical minerals value chain, are often less appealing to market investors.

It is also important to consider that projects developed around minerals currently on the List which may not meet the updated criteria have not had a meaningful period of time to benefit from existing funding mechanisms like the Critical Minerals Exploration Tax Credit or the newly launched Critical Minerals Infrastructure Fund. Barring significant, scientifically backed changes to the availability of a mineral, removals from the List should be avoided until sufficient time has elapsed to demonstrate the impact of inclusion.

Overall, the current state of Canada's critical minerals value chain should be the primary consideration in the retooling of the criteria. With the understanding that the development of this capacity is and will continue to be an enormous undertaking, we must be careful to orient critical minerals initiatives around the bigger picture, emphasizing exploration, public geoscience, and skills and infrastructure development across the value chain, rather than the possibility of other mineral producers eking out minor benefits from policies with much greater impacts.