Request for Proposals
Understanding Physical Disturbance of Mineral Exploration and Mining in Canada

Introduction

Canada's geological endowment is one of our primary competitive advantages over other countries. For many decades, Canada has been a world leader in the discovery, production and processing of the minerals and metals needed for the products we use in our everyday lives. Mining also has a significant connection to the move to a lower carbon future. The products produced through mining are vital to the technologies needed to reduce carbon emissions. Everything from electric cars to solar panels and wind turbines depend on the products of mining.

There is, however, a general lack of awareness and understanding of the physical disturbance of mineral exploration and mining projects, as well as the remediation efforts at the conclusion of these projects. In part, this is due to the fact that scientific data / information around this issue does not exist. This information gap has led to assumptions and misinformation about the mineral sector. In particular, in the absence of an accurate understanding of exploration and mining-related activities and associated degree of physical disturbance, the total area of disturbance is being over-estimated by using the sum of mineral leases and assuming that all land leased for exploration is disturbed.

The Prospectors & Developers Association of Canada (PDAC) and the Mining Association of Canada (MAC) are interested in working with a respected consultant or academic to better understand the extent of physical disturbance / impacts of mineral exploration and mining activities across a variety of Canadian ecosystems in which mineral industry activity occurs.

Objectives

The objective of this project is to develop an independent, verifiable estimate of the physical footprint of mineral exploration and mining activities in Canada as a means of providing clear, scientific information to improve understanding of the sector. The data will be used to accurately inform decision-makers and other stakeholders about the degree of disturbance. The data will also be of value in conducting regional environmental impact assessments, providing accurate information on the listing of species on federal and provincial species at risk lists.

To achieve this objective, the outcomes of this project will be:

1) Develop a scientifically robust method to estimate the physical disturbance associated with mineral exploration and mining activities in Canada, taking temporary disturbance into consideration.
2) Develop a scientifically robust overview of disturbance caused by various mineral exploration and mining activities in a variety of Canadian biogeographic regions (e.g., boreal forest, arctic).
3) Publish the research in a reputable journal, or journals.

Data Sources

- Natural Resources Canada - Canadian Forest Service data sets on deforestation which includes a "mining" attribute.

- PDAC overview of the stages of exploration.
- Provincial and Territorial departments responsible for mineral exploration and mining which have data regarding the total surface area staked and other additional relevant information. This could be compared to the total land mass of the specific jurisdiction.
- MAC and PDAC member companies.
- MAC and PDAC publications.
- MAC's inventory of Google Maps of most Canadian metal mines.
- Methodologies used to calculate physical disturbance as a result of other industrial activities (e.g. oil and gas extraction).
- Other sources identified by the selected service provider.

Quantifying Disturbances

Disturbances would be mapped using accepted methods to estimate forest cover or similar delineations. For instance, delineations are based on actual physical or ecological boundaries not assumed buffered zones. For example, a helipad cut would be mapped to its square edge boundary, and the estimated disturbed area would not include an assumed buffer associated with helicopter noise.

Scope

- All stages of mineral exploration and mining – basic exploration, advanced exploration, mine construction and operation, and closure and remediation of exploration sites and mine sites.
- Metal, coal and diamond:
    - Roads directly attributable to developed or closed mines or exploration projects up to 100 km unless a longer distance can be directly shown to be attributable.
    - All other infrastructure directly attributable to the mine or exploration activity.
- *Exclusions for this research: Pipelines, oil and gas, sand and gravel quarries, and seismic activity related to oil and gas seismic lines.*

Project Outline

The project will cover six main components:

1. The development of a scientifically robust method to estimate the area of physical disturbance associated with mineral exploration and mining activities in Canada, including definitions of when rehabilitation is complete. (Note: Recognizing that there are varying degrees of rehabilitation, experts within MAC and PDAC's memberships will provide guidance based on current exploration and mining practices to inform the development of definitions.)
2. An overview of activities at each stage of the mineral development sequence, including closure and reclamation.
3. Summary of types of disturbance (e.g. temporary disturbance, long-term disturbance, permanent disturbance) across the mineral development sequence (e.g. disturbance in exploration, construction and operations and closure, including permanent disturbance).
4. Quantification of total area of current disturbance, including a comparison of surface area staked by jurisdiction to actual disturbance.
5. Identification of closure and reclamation policies in each jurisdiction for mineral exploration and mining activities.
6. Case studies to illustrate 3 and 4 above.

Optional component: if feasible, case studies showing a comparison of the physical disturbance of mineral exploration and mining to the scale of disturbance as a result of other activities (e.g. urban development), where disturbance footprint is known.

Note: MAC and PDAC are interested in building on this study in the future to continue to enhance understanding of the mineral exploration and mining sectors' physical disturbance footprint, impacts on wildlife and opportunities to minimize disturbance and optimize reclamation efforts. To ensure that the outputs of this study are useful for MAC, PDAC and other interested parties, the format of collected data and how the data will be tabulated, disaggregated and presented must be identified at the onset of the project.

Tasks, Deliverables, Milestones and Schedule
MAC and PDAC will work with the selected service provider to agree on an appropriate work plan and timeline for this project.

Upon completion of the project, all supporting research (raw data, calculations, GIS and spatial files, etc.) will be shared with MAC and PDAC.

Deadline for Proposals
Please send proposals to either Tara Shea (MAC) or Luka Stevanovic (PDAC) by close of business on **October 31, 2019.**

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About MAC
The Mining Association of Canada is the national organization for the Canadian mining industry. Its members account for most of Canada's production of base and precious metals, uranium, diamonds, metallurgical coal, mined oil sands and industrial minerals and are actively engaged in mineral exploration, mining, smelting, refining and semi-fabrication. Please visit www.mining.ca.

About PDAC
PDAC is the leading voice of the mineral exploration and development community. With over 8,000 members around the world, PDAC's work centres on supporting a competitive, responsible mineral sector. PDAC is known worldwide for its annual PDAC Convention—the premier international event for the industry—that has attracted over 25,000 people from 135 countries in recent years and will next be held March 1-4, 2020 in Toronto. Please visit www.pdac.ca.