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Comment on the James Bay Lithium Mine Project

Introduction

The University of Waterloo's Environmental Assessment Review Society has completed its evaluation of the James Bay Lithium Mine Project (#80141) proposed by Galaxy Lithium (Canada) Inc. It is our opinion that the project proposal should be approved under certain conditions that we have listed below. We acknowledge the implications of mining projects but also understand the potential for lithium to fuel a greener Canadian economy.

Biophysical Impacts

The environmental impacts of arsenic can be devastating to not only people drinking from contaminated waterways but also to aquatic, avian, and terrestrial species inhabiting the area. As proposed currently, the James Bay Lithium Mine project would result in the creation of an arsenic contaminated pit and mining effluents. More specifically, the arsenic concentrations would range from 0.20 to 0.23 mg/L until approximately 60 years after cessation of operations, nearly 3 to 4 times the lifespan of the operation itself. These concentrations exceed federal regulations and would deteriorate the quality of the surrounding ecosystems for decades to centuries, posing risks to species inhabiting the area which have not been accounted for by the proponent. We believe that Galaxy Lithium (Canada) Inc. (now Allkem after a merger) should first acknowledge the imminent risk associated with this project. Secondly, we believe that Allkem. should implement mitigation measures to ensure that the arsenic contamination will not persist in the surrounding area following the closure of the mining operation if they hope to continue this project. There are currently technically and economically feasible procedures in Canada that have been used to treat arsenic-laden pit water, such as neutralization and precipitation with a hydroxide directly into the pit. We recommend using scrubbers, electrostatic precipitators, and baghouses in smelters to combat the air pollution caused during roasting and smelting. We also recommend using ferric reagents to precipitate and absorb dissolved arsenic species into disposable iron compounds. Moreover, we recommend using adsorbents like iron oxides, clay liners, or activated charcoal filters to filter out aqueous arsenic species.

We would also like to request that Allkem define the levels of other deleterious metals (i.e. Fe_2O_3) that may be present within the external waste dilution. Another concern we have is that the project was originally set to begin operations in 2022, but this projected start date has since been delayed. Hence, we encourage Allkem to

consider shortening the mine life of the project rather than extending the proposed end date. This is because the effects of the project may become magnified over time due to the increasing degradation of the planet since the project was initially proposed. Furthermore, we encourage Allkem to conduct drill work to ensure they can minimize environmental damage as they have not done so since receiving ownership of the project. Another cause for concern is that recent forest fires (in 2005, 2009 and 2013) have significantly affected the plant group structure and composition in the project area to the point where the short- and long-term development of existing stands could be disrupted. Thus, we recommend avoiding the disturbance of these plants to allow for their regeneration.

Socio-Economic Impacts

As any project occurring in traditional lands, we must protect the well-being of the individuals who are in purview of these lands. In the case of this Project, it is the Cree Nation of Eastmain which is home to approximately 833 residents. There are three traplines (RE2, VC33, VC35) located near the mining site and can affect hunting, fishing and gathering activities. While the tallymen express their desire to protect their livelihood, they recognize the financial benefits that the mines can bring to the community. In order to increase the possibility of forming partnerships between the mining company and the Eastmain community, we propose a third-party mediator that can serve as a liaison between the two parties. The mediator should be knowledgeable of the Cree community and their values so they can be suited to convey and advise the company of the community's concerns. On the other hand, Allkem should train the mediator about the operational nature of the project in order for them to communicate and relay the technicalities of the project back to the community.

Québec is a highly attractive investment destination for lithium production due to its supportive resource development sector, access to skilled labor and its proximity to the emerging European and North America's electrical vehicle markets. Lithium is a vital commodity in the making of electric vehicles. We recognize the effort of the Québec Government to increase the availability of battery metals to create economic opportunities that are environmentally conscious. Mining is a necessary practice to maintain the well-being of Canadians and humans worldwide, but certain conditions must be in place in order for the emerging green market industry to remain green. Before defining these conditions, it is important to understand the nomenclature behind mineral exploration. In mineral exploration, *Mineral Resources* are subdivided, in order of increasing geological confidence, into ***inferred***, ***indicated***, and ***measured*** categories. A ***Measured*** Mineral Resource has a higher level of confidence than that applying to either an ***Indicated*** Mineral Resource or an ***Inferred*** Mineral Resource. It may be converted to a ***Proven*** Mineral Reserve or to a ***Probable*** Mineral Reserve.

Mineral Reserves are subdivided in order of increasing confidence into ***Probable*** Mineral Reserves and ***Proven*** Mineral Mineral Reserves. In other words, the economic viability of a mine is critically dependent on the type of classification given to it. In the case of the James Bay mines, only an ***Indicated*** Mineral Resource is available (Ibarra-Gutiérrez et al., 2021). This classification contextualizes the short- and long-term conditions necessary for the James Bay mines going forward. Firstly, Allkem must provide a ***Measured*** Mineral Resource upon additional exploration in order to acquire evidence for further decision-making. Secondly, Allkem must convert the ***Measured*** Mineral Resource to a ***Proven*** Mineral Reserve or to a ***Probable*** Mineral Reserve in order to justify the continuity of the Project. Lastly, Allkem has a duty to consult to the Cree community upon new discoveries to ensure their continued consent on the Project.

Conclusion

Investing in alternative energy resources such as lithium is a step in the right direction to a greener economy. We conclude that the James Bay Lithium Mine project should be approved by the Minister under certain conditions. Allkem must implement appropriate measures for mitigating arsenic contamination, carry out additional drill work for characterizing economic viability, and define baseline levels of relevant deleterious metals used in the mining process. Allkem must refrain from extending mine life in order to preserve the sustainability of the operation by implementing mitigation measures at the appropriate time. In addition, a third-party mediator must be present in consultations and public hearings in order to relay the concerns of the Cree community as well as convey mining technicalities effectively.

About Us

The University of Waterloo's Environmental Assessment Review Society (UW EARS) is a student-run Waterloo Undergraduate Student Association (WUSA) club. We represent students passionate about environmental assessment and its role as a pathway for sustainable development in Canada. We work collaboratively across faculties to review current high-profile assessments and environmental/social justice projects to submit formal comments during commenting periods based on our expertise in assessment and related fields. Our greater goal is to foster the next generation of assessment practitioners while contributing to the assessment field and raising awareness of evolving assessment practices in Canada. Comments are developed in consultation with students from the University of Waterloo but do not represent the official stance of the University on the project.