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Testimony on Proposed Legislation Concerning Mining and Possible Amendments to the Maine Metallic Mineral Mining Act

By Pete Didisheim, Advocacy Director
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Senator Brenner, Representative Gramlich, and members of the Environment and Natural Resources Committee. My name is Pete Didisheim, and I am the advocacy director for the Natural Resources Council of Maine (NRCM). NRCM is Maine's largest environmental advocacy group with more than 25,000 members and supporters.

NRCM worked closely with the Department of Environmental Protection (DEP) and this committee in developing the 2017 Metallic Mineral Mining Law ('Mining Law") and its associated rules. Based on that experience and having reviewed the bills before the Committee, as well as available literature about spodumene and rare earth deposits in Maine, our advice today is a simple one: we urge you to proceed with caution.

There is a lot that we do not know about the ore deposits that have spurred a flurry of media attention and public interest here in Maine. We know very little about the full range of materials that exist in these deposits and whether they have the potential to cause acid mine drainage, basic mine drainage, or toxic metal leachate that could violate Maine's water quality standards.

We have seen no plans that explain how or where these ore bodies would be processed at scale. And we know essentially nothing about possible ore transportation plans, site remediation plans, or whether the deposits in Maine are even economically viable compared with other spodumene deposits or other technologies for lithium production.

Any path forward should be guided by a "no regrets" policy, and this means digging into the details about these ore deposits, about the possible environmental impacts of various processing techniques, and the potential liabilities for neighboring communities and Maine taxpayers.

The world is riddled with mining operations that have gone awry. We do not want rushed legislation today to result in contaminated waters, stigmatized communities, and a trail of clean-up challenges in the future.

NRCM is not categorically opposed to amending Maine's Mining Law. In fact, our testimony includes amendments for the purpose of advancing conversations about spodumene mining. But we firmly believe that the critical safeguards for the environment and Maine taxpayers that are key features of Maine's Mining Law must be kept intact.

We fully recognize the important role that lithium plays in electric vehicles and other clean energy technologies. But we also recognize that there is a lot that we don't know. Maine has no experience with spodumene mining, so we all are still pretty low on this learning curve.

That said, NRCM believes that, of the many and diverse bills before you today, LD 1363 comes closest to striking a defensible path forward. We appreciate the work that the DEP and the bill sponsor have put into this legislation. NRCM opposes LD 1433 and LD 1476, which would remove spodumene mining from being regulated by the Mining Law. And we are not taking a position on the other bills at this time.

LD 1363 would allow the restriction on open-pit mining in Maine's Mining Law to be lifted if, and only if, a proposed mining operation would only generate mine waste that does not have the potential to create acid mine drainage, basic mine drainage, or toxic metal leachate in amounts that would violate water quality standards. We support this general approach for three primary reasons:

First, the bill applies statewide to any metal or metalloid element, and not just to one particular deposit of spodumene (the mineral from which lithium is obtained) in Newry. This statewide approach makes sense.

Second, it puts the appropriate burden of proof on the mining operator to provide data showing that the deposit does not co-occur with deposits of reactive, acid-generating ores, or materials that are otherwise dangerous because of high levels of heavy metals or uranium, for example.

Third, this approach keeps intact all of the other safeguards in Maine's Mining Law that protect Maine's environment and taxpayers from a legion of possible risks associated with mining extraction and processing activities. These safeguards include:

- No use of tailings impoundments and a requirement to use dry stack tailings management;
- A ban on mines requiring perpetual treatment;
- A requirement not to contaminate groundwater beyond 100 feet from a mining operation; and
- A requirement that a mining operation provide sufficient funding up front to the State to cover a worst-case mining disaster (refundable after successful closure).

Many recent press articles have contained claims that mining spodumene is just like mining granite, but this is highly misleading.

The major difference between granite and spodumene mining is that with granite mining, granite is the end-product. But spodumene must undergo considerable processing, or beneficiation, to produce purified spodumene concentrates that are useful to make the raw materials, such as lithium hydroxide, for batteries. This beneficiation process creates high volumes of waste, called tailings. Because there is no way to manage this liquid waste properly, the Mining Law requires drying the tailings and stacking them. This requirement needs to stay in place for spodumene. LD 1363 does that.

Beneficiation involves grinding the ore and running it through a series of processing tanks containing surfactants, which can be highly toxic. Air is bubbled up through the tanks, and spodumene concentrate floats to the surface. The concentrate is removed for further processing, and the tailings, which make up the vast majority of the ore, sink to the bottom of these tanks.

In Australia, the country with the largest spodumene industry, mining companies discharge these tailings to impoundments, which have a risk of catastrophic failure. Examples of recent catastrophic tailings dam failures include the Mount Polley Mine in British Columbia and the Samarco Mine in Brazil. The Legislature should not make any amendments to Maine's mining law that would allow tailings impoundments. LD 1363 would keep the prohibition on tailings impoundments in existing law in place. It

would also maintain the other protections that are relevant to spodumene mining and processing as mentioned above. LD 1476 and LD 1433 would exempt spodumene mining ***and processing*** from all provisions of the Mining Law, including the ban on tailings impoundments, which is why we oppose these two bills.

Unlike granite mining, Maine has no experience with large-scale open-pit spodumene mining, which is why state law should require deposit owners to characterize their deposits thoroughly before allowing them to use open-pit mining techniques. For example, we know from the very limited public data about the Newry deposit that there is some galena, or lead sulfide, present in the ore. This is an acid-generating mineral and has the potential to leach lead. We are uncertain if galena is present at levels that are dangerous, but the only way to know would be through detailed characterization of the deposit. This has not happened in Newry.

There is also an additional step in the manufacture of battery materials from spodumene concentrate that involves treatment of the concentrate with acid at high temperatures. Like beneficiation using chemical flotation, this process also uses large amounts of energy and chemicals. The Legislature should decide whether Maine's current environmental laws and rules are adequate to regulate this process, with which our state has no experience. I mention lithium processing because it is a critical component of turning any spodumene concentrate into a form that is useful for products such as electric vehicle batteries.

Let me now turn to our proposed amendments, which we would be glad to describe in more detail for the work session:

> **Sec 2.** Our suggested language would clarify that spodumene is a metal that would be regulated under the 2017 Maine Mineral Mining Law and that the Legislature could specifically identify other metals to come under the Mining Law in the future. Spodumene mining is not treated like quarrying in Australia, but is regulated as metal mining. This language conforms with that approach.
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> **Sec. 3.** Our suggested language would clarify that exempting limestone beneficiation for cement does not include chemical flotation of limestone. We do not believe that chemical flotation of limestone occurs in Maine, but the Department needs to be more specific about what sort of exemption it is proposing, or this language could potentially allow future tailings impoundments for limestone beneficiation waste and set a precedent for allowing tailings impoundments more broadly.
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> **Sec. 4.** Our suggested language is intended to clarify that independent rock crushing and sorting facilities in Maine would not be regulated under the Mining Law. Such operations could receive, crush, and sort material that is not acid generating or hazardous in other ways, as long as the operation is covered as specified. The original bill language could be read to suggest that any open-pit mine operation that uses an off-site crusher would be exempt from monitoring as would any processing facilities at the mine. We do not believe this was the intent of the sponsor or the Department. The proposed amendment tries to close a loophole that we do not believe was intended.

Sec. 5. Our suggested language would clarify the intention of the bill that an open-pit mine is not allowed if the ore and waste materials are reactive (acid generating or base generating), or if they have the potential to leach heavy metals at levels that would violate water quality criteria or other water quality standards other than those for sedimentation or turbidity. In other words, the ore/waste can only be Group C waste as defined in Chapter 200 section 2(XX)

XX. **Group C Waste.** "Group C waste" means a mine waste that does not have the potential to violate water quality standards other than sedimentation or turbidity.

Our suggested language also requires the DEP to develop rules about what constitutes sufficient characterization of an ore body to determine whether a waste is "Group C" and what the best practices are for open-pit mining of such ore deposits.

Sec. 6. Our suggested language would limit the size of an allowed open pit to 10 acres at any one time, not 100 acres, consistent with title 38 section 490-D(8)(a). The amendment also would make clear that DEP rules would be major substantive and require "contemporaneous reclamation", meaning that remediation would occur in stages. Remediation would need to occur on mined-out pits prior to moving on to new areas. It also clarifies that the rulemaking the DEP is calling for is major substantive.

Finally, as it discusses the bills before the Committee, we urge you to consider these additional factors regarding mining for lithium for batteries:

1. **Diverse sources for lithium:** There are two major sources of battery lithium: brine deposits and spodumene deposits. Spodumene mining is significantly more chemical and energy intensive than obtaining lithium from brine deposits. An emerging technology for extracting lithium from brine, called Direct Lithium Extraction allows removal of lithium salts from brine without evaporation of the brines and the impacts this can cause to groundwater supplies. Although it is not at commercial scale yet, there is every reason to believe that it will get there.

2. **Current sources of lithium:** The vast majority of the world's lithium, about 80%, comes from Australia and Chile.[1] Although China processes lithium from many other places and makes a large share of lithium-ion batteries, it produces far less lithium than either Australia or Chile. Because both Chile and Australia are close U.S. allies with free trade agreements, their lithium would be treated as equivalent to domestic lithium under the Inflation Reduction Act.

3. **Many U.S. lithium sources:** The U.S. has many possible domestic lithium sources, including brine deposits. The Nature Conservancy produced an extensive report looking at 72 sites in the U.S. Among its conclusions are: 1) the U.S. has enough lithium in the ground or in brine to supply the world for 100 years at current levels of consumption (even though consumption is increasing, this is still a high volume of lithium); and 2) the U.S. should focus on developing brine resources using Direct Lithium Extraction rather than on spodumene mining. We urge the Committee to review this report.[2]

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[1] Accessed at https://www.statista.com/statistics/677245/distribution-of-world-lithium-production-by-country/.
[2] Accessed at https://www.scienceforconservation.org/assets/downloads/Lithium_Report_FINAL.pdf.

4. **Future lithium needs:** Long-term predictions of lithium demand may or may not be correct, and efficient use and recycling of lithium will lower demand. The Climate and Community Project has written a recent report on this that we also urge the Committee to review.[3]

5. **Lithium market:** The price of lithium is likely to fluctuate dramatically as prices for other commodities do. Prices for lithium carbonate (a key raw material for batteries) have dropped about 30% this year and supply is now outpacing demand.[4]

These factors suggest that the Legislature can give the Department the time it needs to develop rules that would allow for safer regulation of future spodumene mining in Maine.

Thank you for the opportunity to testify.

[3] Accessible at https://www.climateandcommunity.org/_files/ugd/d6378b_b03de6e6b0e14eb0a2f6b608abe9f93d.pdf.

[4] Accessed at https://www.reuters.com/markets/commodities/lithium-price-slide-deepens-china-battery-giant-bets-cheaper-inputs-2023-02-28/.

NRCM Proposed Amendments to LD 1363 (in red)

An Act to Support Extraction of Common Minerals by Amending the Maine Metallic Mineral Mining Act

Be it enacted by the People of the State of Maine as follows:

Sec. 1. 38 MRSA §490-MM, sub-§3-A is enacted to read:

3-A. Cement. "Cement" means any of various calcined mixtures of clay and limestone, which can be mixed with water and used as an ingredient in making mortar or concrete.

Sec. 2. 38 MRSA §490-MM, sub-§8, as enacted by PL 2011, c. 653, §23 and affected by §33, is amended to read:

8. Metallic mineral. "Metallic mineral" means any mineral, ore or excavated material ~~to be excavated from the natural deposits on or in the earth for its metallic mineral content to be used for commercial or industrial purposes. "Metallic mineral" does not include thorium or uranium~~ that has metal or a metalloid element as its economically valuable constituent, regardless of the chemical end product of the metal or metalloid element. For the purposes of clarification, spodumene is a metallic mineral. The Legislature may further clarify additional minerals as metallic minerals as the need arises.

Sec. 3. 38 MRSA §490-MM, sub-§11, as enacted by PL 2011, c. 653, §23 and affected by §33, is amended to read:

11. Mining. "Mining," "mining operation" or "mining activity" means activities, facilities or processes necessary for the extraction or removal of metallic minerals or overburden or for the preparation, washing, cleaning or other treatment of metallic minerals and includes the bulk sampling, advanced exploration, extraction or beneficiation of metallic minerals as well as waste storage and other stockpiles and reclamation activities, but does not include exploration. "Mining," "mining operation" or "mining activity" does not include calcium carbonate or limestone extraction or beneficiation to produce cement, provided that the limestone beneficiation does not involve chemical flotation.

Sec. 4. 38 MRSA §490-OO, sub-§4, ¶D, as amended by PL 2017, c. 142, §7, is further amended by amending the first blocked paragraph to read:

In determining compliance with this standard, the department shall require groundwater monitoring consistent with the standards established pursuant to section 490-QQ, subsection 3., ~~except that facilities that crush and mechanically sort material excavated from an open-pit mining operation that has a permit in good standing under this article are exempt from the requirements of section 490-QQ as long as the crushing, sorting, storage, loading and unloading of the material takes place in a building or shelter that prevents rain, snow, snowmelt, ice melt and runoff from commingling with the material.~~ However, nothing in this section is intended to regulate independently owned rock crushing and sorting facilities that are not part of a mining operation. Such facilities may accept metallic mineral ore from an open-pit mining operation with a permit in good standing under this article for crushing and sorting without performing groundwater monitoring pursuant to section 490-QQ as long as the crushing, sorting, storage, loading