Direct Lease Requests
Keweenaw Land Association - Baraga County

- Map
- Parcel Classification Report

Keweenaw Land Association - Baraga, Dickinson, Iron, and Marquette Counties

- Map
- Parcel Classification Report


DIRECT METALLIC MINERAL LEASE REQUESTS
The Keweenaw Land Association has requested metallic minerals leases from the State of Michigan for 120 acres in Baraga County, and for an additional 2,601.57 acres, more or less, within L'Anse Township, Baraga County; Breen, Felch, Norway, Sagola, Waucedah and West Branch townships, Dickinson County; Bates and Crystal Falls townships, Iron County; and Humboldt and Wells townships, Marquette County.
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APPLICANT CONCERNS

Is Keweenaw Land Association (KLA) a qualified applicant?

We ask that the State of Michigan review Keweenaw Land Association’s financial viability, and reassess whether the applicant’s financial assurances remain adequate to protect public trust resources.

KLA has undergone radical changes which leave its viability in question: capitalization and cash flow have been greatly reduced due to liquidation of all of Keweenaw Land Association’s timberland assets. In the most recent reporting period, KLA cut staff and reduced operating expenses (including insurance) but still operated at “net loss” and disclosed alarming facts about its ability to generate income in the future. During the sale of its timberlands, KLA severed and retained the underlying mineral properties. The potential value of minerals, however, is significantly different from that of productive timberlands.

According to KLA: “The Company maintains a Letter of Credit with Associated Bank, N.A. in the amount of $30,000 in relation to our state mineral leases.” What financial assurance does this “letter of credit” offer, exactly? When was the letter of credit issued? The State of Michigan requires that applicants for metallic mineral leases meet certain insurance coverage obligations: “Lessee is required to provide Lessor with a certificate of insurance evidencing minimum policy limits of $1 million per occurrence and $2 million general aggregate limit. If providing an umbrella or excess liability insurance, the minimum limit is $5 million (...) The companies issuing such policies are also required to furnish to Lessor written notice thirty days prior to cancellation, termination, or other change of any such insurance.” In light of cost-cutting moves by KLA that include staff and insurance, the State of Michigan should reconsider KLA’s existing Certificates of Insurance.

Moving forward, the State of Michigan needs to independently verify whether Keweenaw Land Association possesses the operational capacity to conduct any exploration on the requested lease properties, in light of KLA’s recent corporate statements and activities. There are good reasons to be suspicious about KLA’s qualifications.

● “Keweenaw Land Association, Limited, headquartered in Ironwood, Michigan, previously operated as a forest products and land management company owning substantial subsurface mineral rights. Following the December 27, 2021, sale of (ALL) its timberland assets, Keweenaw’s business will be focused on its mineral assets.”

● “These activities include marketing a specific exploration property to advance partner paid exploration, identifying other areas of interest in our mineral portfolio, and participating in discussions on complementary business opportunities that could add value to Keweenaw’s minerals.”

In December 2021, KLA’s business was “forest products and land management” but the forest lands were sold, resulting in massive windfall payouts to shareholders. Although KLA declared itself to be “focused” on mineral assets as of 2022, this does not make it an exploration company. It may be “marketing” a portfolio of properties and “participating in conversations”, but KLA is not conducting exploration or mining activities. A mining company, by definition, operates mines; a mining company conducts exploration, extraction, processing and production of ore. KLA pursues none of these activities. KLA

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3 KLA’s Semi Annual Report for the Period Ended June 30, 2022
refers to geophysical surveys which were conducted in 2020, and drill cores that were analyzed, but it appears that KLA contracted the work to another company.

Nevertheless, KLA’s corporate profile on Reuters\(^4\) has been changed to read “Keweenaw Land Association, Limited is a subsurface mineral mining company.” That statement seemed misleading or fraudulent, given their lack of mining activities. “It is involved in” mineral exploration and mineral asset management. It acts as a mineral lessor, mineral royalty holder, and commercial property lessor.” Being “involved in” and “acting as” are passive phrases, designed to skirt the question of KLA’s corporate activities. At best, KLA appears to be a holding company, not a mineral exploration company. In their Reuter’s business profile, KLA positions itself as the “mineral lessor” – in much the same way that the State of Michigan defines itself as the “Lessor” in metallic mineral lease regulations. Again, these roles and responsibilities are different. KLA’s current goal seems to be the capture of state mineral leases, in order to control them, and re-market the mineral packages to “partners” who might have the capacity to conduct exploration work. The State of Michigan should avoid the risks and complexities of this scenario, and lease only to qualified applicants.

What is the applicant’s capacity to undertake “exploration”?

KLA is in no position to assume the financial obligations of exploration (field work, office, equipment, staff or insurance). According to their most recent report:

“The following RISK FACTORS have been updated from our Annual Report: Our ability to generate cash revenues is limited and dependent to a substantial extent on the Copperwood Project. The Company (KLA) currently generates negative cash-flow. Most of our revenue from continuing operations is generated as lease revenue from a single customer, Highland Copper Company, Inc., whose going-concern value is directly connected to progressing the Copperwood project from its current development status to the next phase which is construction. The Company is not involved in planning, design, implementation or management of the Copperwood project. In addition to the lease revenue, we are passive owners of an uncertain future royalty stream. Highland Copper has failed to meet operational milestones according to its forecasts, including the publication of an updated feasibility study which was expected in June of 2022. It is uncertain when, if ever, we can expect to receive this royalty stream. Moreover, should Highland Copper experience financial difficulties, including but not limited to bankruptcy, they may no longer be able to provide us with lease revenue, and we may not efficiently, if ever, find reliable replacement customers for this customer. All of this can materially and adversely affect our business.”

KLA’s newly revised RISK statement raises serious concerns about the applicant’s ability to undertake any new exploration activity. Have KLA’s remote employees finished exploring their 425,000 acres of newly-severed mineral properties? What exploration activities have taken place on the State of Michigan metallic mineral leases leased by KLA in 2020?

Keweenaw Land Association asserts that their recent mineral lease request aims to consolidate control for “potential project generation”: “Keweenaw will look for further opportunities to consolidate mineral tenure over prospective areas across our mineral ownership, which may include both State of Michigan and private minerals.”\(^5\) The requested leases under review today, however, appear to include dispersed fragments, and parcels well outside of their known ownership or previous leasing activities, including the parcels in Baraga County.

\(^4\) Keweenaw Land Association profile: https://www.reuters.com/markets/companies/KEWL.PK

\(^5\) KLA Press Release, October 27, 2022: Keweenaw Provides Copperwood and Mineral Project Updates; Announces Austerity Measures.
In our previous comments on KLA mineral leases, we suggested that the State of Michigan ought to conduct its own review of geological literature, in order to produce an informed “likelihood” review as to the presence of potential metallic resources and critical minerals on state-owned lands, and then either (A) price metallic mineral leases accordingly, or (B) offer future leases by auction, to secure more competitive lease prices.

As it stands now, “$3 an acre” for mineral leases with known or high potential for metal deposits is outrageously low. We urge the State of Michigan DNR Minerals Management office to take a more rigorous and conservative view when leasing non-renewable metallic minerals with “high demand”:

Pursuant to Part 5, Section 502, Paragraph 3, of the NREPA, the DNR is responsible for managing State-owned lands and mineral resources to ensure protection and enhancement of the public trust and may enter into contracts for the taking of metallic minerals from State-owned lands. As provided under the Michigan Administrative Code R299.4001 – R299.4007, “Leasing State-owned Metallic Mineral Rights,” the DNR is authorized to enter into metallic mineral leases through public auction (open oral or sealed bid) or direct leasing. Upon receipt of a direct lease application, the DNR may instead choose to enter into the lease through public auction if it is determined to be in the best interest of the State.

But the DNR’s process of allowing nomination of metallic mineral leases serves only a handful of self-interested corporations seeking to control substantial blocks of public mineral rights. The rights of the public, and the wellbeing of public trust resources like lakes, wetlands and wild rivers which may be found at the surface, are substantially ignored in this process.

State metallic mineral leases may also be greatly undervalued, in the self-nomination process. As KLA stated in their recent press release:

To further enhance the value of the project, Keweenaw has leased 3,330 acres of State of Michigan minerals located adjacent to its project generation asset in Dickinson County, Michigan- essentially filling in and complementing Keweenaw’s checkerboard ownership in the area and providing a larger, contiguous land package for this project. State leases can be held for up to 20 years and renewed upon expiration. Keweenaw also has under lease 4,315 acres of State of Michigan minerals in Gogebic County, Michigan. These leases increase the number of mineral acres that Keweenaw directly owns or controls to 436,434 acres. Keweenaw will look for further opportunities to consolidate mineral tenure over prospective areas across our mineral ownership, which may include both State of Michigan and private minerals. The lease cost for these two land packages is $3 per acre or $22,935 annually.\(^6\)

Keweenaw Land Association is not a qualified exploration company; rather, KLA aims to control mineral resources, creating marketable “project” packages for others to explore (and fund exploration). KLA still needs investors, and third-party exploration companies to conduct this field work.

Regarding the previously granted metallic mineral leases (totalling 3330 acres) in Dickinson County, and new lease nominations, KLA states that they have:

“been actively marketing this package to potential partners. However, a partnership has not yet emerged. Management observes and anticipates the following headwinds in bringing this project to fruition:

\(^{6}\) KLA Press Release, October 27, 2022: [Keweenaw Provides Copperwood and Mineral Project Updates; Announces Austerity Measures](https://example.com).

January 2023 Public Comments, Mining Action Group to Michigan DNR - KLA Metallic Mineral Lease Request p. 5 of 41
• Mineral commodity prices have cooled from their highs earlier in the year across base metals and precious metals alike.
• Near-term market uncertainty is causing a pullback from investing in greenfield projects preferring to focus on producing assets.
• A stronger dollar and inflationary factors have also reduced the amount of investment in new mineral projects.” 7

Without “partners,” KLA is not a qualified Lessee, not a working interest owner, as it is unable to fund exploration activities.

As a result of headwinds and setbacks at the nearby Copperwood project, Keweenaw Land Association “is implementing several austerity measures including the planned closure of its corporate headquarters located in Ironwood, Michigan by the end of October 2022 and a move to a remote work environment. The Company has streamlined its business overhead cost structure over the first three quarters of 2022 and these savings combined with the office closure will save approximately $215,000 over the next twelve months.” 8 According to KLA’s Semi Annual Report dated June 30, 2022, “During the six months ended June 30, 2022, the Company recorded an income tax benefit of $134,471 associated with its net operating loss to be used against future earnings.” KLA also noted “Severance and benefit costs relate to workforce reductions that occurred at the end of 2021 and in the first half of 2022”, a six-month loss of ($157,951). KLA “historically earned the majority of its net income from the sale of logs harvested from its forestlands, and from the sale of selected real estate parcels.” 9 These income streams are gone.

Online corporate profiles suggest KLA has no more than 4 employees: one is the CEO, and one is the secretary. Does the State of Michigan still believe KLA is a “qualified” exploration company? Will KLA’s two employees conduct mineral exploration while working from home? Is KLA still a qualified party if it is in austerity mode, with negative cash flow? According to the State of Michigan, DNR Office Of Minerals Management - Leasing State-Owned Metallic Mineral Rights Administrative Code, R 299.4001 Definitions:

(f) “Lessee” means the working interest owner of a lease as shown in the records of the department as the person or entity responsible for the lease.
and
(l) “Qualified party” means an individual of the age of majority or a co-partnership, corporation, or other legal entity qualified to do business in the state of Michigan.

R 299.4001 R 299.4006 Awarding of leases:

Rule 6. (1) Lessor approval is required before any lease may be issued. Approval may be withheld for good and sufficient reasons. (…) 
(3) Before a lease is executed for any state lands, the successful bidder or proposed direct lessee shall file a performance bond acceptable to the lessor, unless waived by the lessor. The amount of performance bond, maximum acreage covered, and when and how the bond may be drawn upon must be specified by the lessor.

7 KLA Press Release, October 27, 2022: Keweenaw Provides Copperwood and Mineral Project Updates; Announces Austerity Measures.
8 KLA Press Release, October 27, 2022: Keweenaw Provides Copperwood and Mineral Project Updates; Announces Austerity Measures.
In light of KLA’s poor financial position, past performance bonds need to be reviewed and new leases to the applicant should be avoided.

KLA’s 2022 Semi-Annual report states: “Future semi-annual reports will focus more on current operations which are very minimal currently in relation to the company’s mineral leases and mineral activities. As we noted at the annual meeting, a replay of which can be found here, we plan to reset expectations regarding the future of the business with the understanding that we will continue to cut costs, be open to opportunities, and are planning for the long term, especially as copper continues to underperform and there have been no significant updates in relation to our main asset at Copperwood.\textsuperscript{10}

Slides from KLA’s July 2022 Annual Shareholder Meeting\textsuperscript{11} reinforce our serious concerns about the applicant’s viability:

The State of Michigan is not obligated to grant additional “direct metallic mineral leases” to an applicant, and should reject a lease applicant who’s corporate viability is in question. The DNR readily acknowledged in a January 26th press release that Michigan’s state-owned metallic mineral resources are highly sought after, and that there is “renewed interest in some known reserves… a return to past prospects and in exploring for new metal ore deposits that may contain copper, as well as other metals or critical minerals. Currently, the main demand … is for electronics and in lithium-ion batteries.”\textsuperscript{12}

Obviously, KLA will not be the only potential suitor seeking to control Upper Michigan’s copper, nonferrous metals and critical minerals. According to the State of Michigan’s outdated overview document Mining in Michigan: A focus on nonferrous mineral extraction: “Michigan has seen an increase in mining interest for nonferrous minerals. This shift is due to new technology and higher metal prices. Currently, there are multiple exploration efforts underway in the Upper Peninsula.” The same document asserts that for successful “Exploration and Advanced Exploration,” mining companies need to build trusting, transparent relationships with environmental, community, and tribal stakeholders. Obviously, KLA has not read the handbook:


\textsuperscript{11} https://keweenaw.com/wp-content/uploads/2022/07/Annual-Shareholder-Meeting-Presentation-Audio.mp4

\textsuperscript{12} Michigan Department of Natural Resources Daily Digest Bulletin, Jan. 26, 2023
"Community and Tribal Involvement Companies who plan to make the major investments required for successful development of mining operations should work in advance with tribal and local communities to align their interest and plans. Although the formal permitting process requires opportunities for public comment, the most successful engagement of local and regional stakeholders begins well before formal permitting activities start. Those invested in mining development include tribal and local leaders, environmental groups and authorities, cultural advocates, and neighbors. Active and voluntary engagement, combined with information exchange, build a wider understanding of the environmental, economic, and social impacts of proposed investments. This will provide the best potential for avoiding issues that can lead to major permitting and project delays."
The Baraga County 120 acre lease request falls within an area of extensive wetlands and surface waters, including the Sturgeon River. This section of the Sturgeon River is a Wild & Scenic Study River.

The proposed lease lands comprising KLA’s 120 acre lease request are within a large block of public land that is part of the Baraga State Forest. They include part of a tributary to the Sturgeon River, which is a Wild and Scenic study river. Under the latest definition of “Waters of the United States”\textsuperscript{13} the Sturgeon River is a traditional “navigable water”, making this permanent tributary and its adjacent wetlands “Waters of the United States”, protected by the Clean Water Act. These waters are therefore subject to federal “water quality standards, permitting to address discharges of pollutants, including discharges of dredged or fill material, processes to address impaired waters, oil spill prevention, preparedness and response programs, and Tribal and State water quality certification programs.”

If this land is leased for mineral exploration, roads and drill pads will add to the fragmentation of forest and wetland habitats in the region, and increase the risk of water pollution from drilling activities. Habitat fragmentation is a major factor contributing to habitat loss, soil erosion, loss of native biodiversity and the introduction of invasive plants and invertebrates. And if the land is ever mined, the impacts to the surrounding land and water will be orders of magnitude greater.

The parcel classification reviews for the three (approximately) 40-acre parcels comprising the first lease request are all listed as “Threatened or Endangered Species Habitat, Best Management Practices.” Does this mean that these parcels are potential habitat for one or more rare species, or (additionally) that these parcels are known to support populations of one or more rare species? If so it seems surprising that the DNR would consider leasing these parcels for mineral exploration and potential mining activity. Section 324.36502 of Michigan law ("Duties of department.") states that “The department shall perform those acts necessary for the conservation, protection, restoration, and propagation of endangered and threatened species of fish, wildlife, and plants in cooperation with the federal government, pursuant to the endangered species act of 1973, Public Law 93-205, 87 Stat. 884, and with rules promulgated by the secretary of the interior under that act.” It seems to us that preventing avoidable disturbance to rare species and their habitats (by not leasing the land and water that supports them) would fall under this “duty of the department.”

Cumulative Impacts to Natural Resources

Days after this 120-acre lease request, KLA requested mineral leases to several parcels adjacent or very near this lease request (see map above). What are the potential "cumulative impacts" of metallic mineral exploration in this wetland-rich area? What considerations have been given to the expanding footprint of the proposed mineral lease area?

A map of Keweenaw Land Association’s Mineral Rights Ownership (2017) suggests that some of the metallic mineral leases being sought in Baraga County are not aligned with existing KLA mineral ownership (contradicting KLA’s claim that their goal is “consolidation”). This includes the parcels nominated in the Baraga State Forest and in proximity to the Sturgeon River.

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14 Section 324.36502, Stats. [Link](http://www.legislature.mi.gov/(S(m2qawbiu5axg4rgnzjudhnx3))/mileg.aspx?page=getObject&objectName=mcl-324-36502&highlight=endangered%20AND%20species)

Baraga, Marquette, Iron and Dickinson Counties: 2,601.57 acre Lease Request

In Iron County, several of the requested parcels appear to be for state minerals under private land (see map above). These include the three 40s in the middle of this map, and the 40 on the right:

![Map of Iron County with highlighted parcels](image)

According to the [https://colligogis.com/web/](https://colligogis.com/web/) website, the surface owners of these parcels are:

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Has KLA or the DNR informed these landowners that the minerals under their land are about to be leased for mineral exploration? The Mineral Lease nomination process requires the applicant company
to notify private landowners who would be impacted by nominations, but has the State of Michigan verified that landowners have been notified?

In the above map showing Marquette & Dickinson Counties (upper center area), a cluster of mineral lease requests in the area of Floodwood Rd. will impact lowland conifer wetlands in the Gwinn State Forest and Crystal Falls State Forest areas, and intersect with Schwartz Creek, a tributary of the Escanaba watershed. The single parcel (lower center of the map) will impact a mixed conifer swamp and the North Branch of the Ford River. The mineral lease requests located east of Degroot Rd (lower right area of the map) impact a large forested wetland complex identified in MiWaters as the Headwaters of the North Branch of the Ford River.
MiWaters: detail of wetlands in the vicinity of Floodwater Road and Schwartz Creek.

MiWaters: detail of wetlands along the North Branch of the Ford River.
MiWaters: detail of wetlands in the vicinity of DeGroot Road, Headwaters of the North Branch of the Ford River.
In the above map of Southern Dickinson County (lower right corner), nominated metallic mineral leases will impact significant wetlands in the “Bergen Rd” area. Note that the road is actually identified as Bergen Backwater Road in MiWaters. The Sturgeon River flows nearby, just to the west of the parcels; these backwaters appear to be tributary wetlands. Nominated leases along the “Norway Truck Trail” vicinity will impact both Fern Creek and Black Creek, and a related conifer swamp wetland complex. Fern Creek is a tributary of Pine Creek. All of them are tributaries of the Sturgeon River.
For a full explanation of concerns over KLA’s mineral lease targets in the Dickinson County area, please refer to the detailed comments we submitted in 2020, in response to metallic mineral lease requests made by Keweenaw Land Association. Our concerns remain unchanged, and we never received a response from the DNR regarding these comments. Our previous comments (July 30, 2020) are attached at the end of this document under Appendix.

16 https://docs.google.com/document/d/1AiXBFrVEnhLBXp109NcSiZPI-EaA75MzQiWYmGk8
PROCESS CONCERNS

In July of 2020, we submitted detailed comments regarding 1,438.88 acres of direct metallic mineral leases sought by Keweenaw Land Association, including our own summary of the geological literature for this area, and asking for the mineral leasing process to be reformed:

We specifically ask the DNR to secure a Mineral Remoteness Report by a qualified independent geologist, in order to determine the nature, extent and potential value of specific metallic mineral resources targeted by this specific lease request. Our own review of the geological literature suggests the nominated parcels hold “Critical Minerals” (as defined in the 2018 Executive Order), including rare earth elements, and polymetallic sulfide deposits of volcanogenic origin, similar to the Eagle orebody in Marquette County. Without greater transparency and expert knowledge, it is impossible to evaluate the proposed trade-off between potential profits (not mentioned in the DNR’s parcel review) and predictable environmental risks.

Our previous comments regarding Keweenaw Land Association and their interest in metallic minerals remain relevant, but unanswered, so we are re-submitting our original comments along these new comments (July 30, 2020 and January 28, 2023). See the Appendix. Our previous comments addressed legacy mining contamination in the Groveland Mine area, summarized the geological context, raised concerns about valuable metals and rare minerals identified in the “Felch Trough” area, and discussed potential impacts to wetlands and trout streams located at the surface of nominated metallic mineral lease parcels.

Once again, we are requesting Process Reforms:

- Public meetings should be scheduled prior to all significant metallic mineral lease requests (for example, whenever lease requests are greater than 320 acres).
- For the benefit and education of all citizens, DNR Minerals Management staff should argue the merits of their leasing recommendations in a public forum; a panel of Natural Resource staff should represent the concerns of other divisions (wildlife, forestry, fisheries). Public presentation should use maps, MNFI data, NWI data and satellite images to convey the merits of the proposed lease in terms of pros and cons, with DNR staff of different divisions (rather than the public) called upon to advocate for the protection of biological diversity, fragile ecological areas such as wetlands, threatened and endangered species, and other renewable natural resources known to be threatened by metallic mineral mining.
- The DNR’s proposed lease classifications are inadequate to protect wetlands from the hazards of metallic mineral exploration and mining.
- We would recommend a parcel classification of “non-development” wherever sensitive wetland complexes are present on the surface.
- We recommend that Stipulation 15 be applied to mineral leases in areas where wetlands are present on the surface - a protective stipulation limiting surface disturbance to a single drilling site. This stipulation was previously included in leasing decisions that could impact headwaters and fragile wetland ecosystems: “To limit surface disturbance, any wells to be drilled on the leased premises shall be drilled from a single surface area that is acceptable to and approved by the Lessor.”
- We recommend that DNR Leasing Decisions require a “Mineral Likelihood” review, to be completed by an independent geologist prior to the Classification Review and the Public Comment. This information, shared with the public, would be critical in guiding the conservative and wise management of non-renewable minerals in Michigan’s Upper Peninsula, where the State may own previously undiscovered deposits of nonferrous metals and/or “strategic minerals” of critical value to national security.
In the case of metallic mineral lease requests related to the “Felch Trough” formation, the potential environmental risk of exploration and extraction remains unclear, as the area may contain deposits of critical minerals, volcanic massive sulfides and radioactive material.

CONCLUSIONS

Restatement of environmental concerns:

- The nominated mineral lease parcels will impact hundreds of acres of wetlands, streams and rivers, including headwater wetlands and “Top Quality Coldwater Aquatic Riverine Resources.”
- Granting these lease requests will lead to more forest fragmentation, loss of habitat (including for one or more rare and endangered species, apparently), soil erosion, loss of native biodiversity and the introduction of invasive species.
- Granting these mineral lease requests will risk degradation of groundwater and surface waters.
- Several of the requested mineral lease parcels are under private land.

Restatement of concerns about Keweenaw Land Association:

- Keweenaw Land Association (KLA) appears to be an unqualified applicant.
- KLA does not appear to conduct mineral exploration; rather, it is a mineral rights and royalties holding company and seeks to profit by “controlling” mineral interests and finding partners who may be able to conduct and bankroll exploration activities.
- KLA’s surface properties (timberlands) have all been liquidated in the past 13 months, resulting in a drastic change in the company’s capital valuation, staffing, operational viability and function.
- As of 2022, KLA’s ability to “generate cash revenues is limited and dependent to a substantial extent on the Copperwood Project” (which has not progressed).
- As of 2022, KLA “generates negative cash-flow.”
- The applicant’s circumstances are uncertain: KLA is in austerity mode.
- KLA’s office is closed and the workforce reduced (to save on overhead, benefits and insurance); remaining employees are working “remotely.”
- The State of Michigan is advised to scrutinize KLA’s existing financial assurances and insurance instruments, in order to safeguard public trust resources.
- **New metallic mineral leases should not be granted to this applicant.**
APPENDIX - Previously Submitted Comments

Comments of the Mining Action Group, previously submitted to the DNR on July 30, 2020 regarding metallic mineral lease requests by Keweenaw Land Association.

Submitted: July 30, 2020

Written Comments RE: “Direct Development Metallic Minerals Leases” in Dickinson County, Michigan, requested by Keweenaw Land Association

Michigan DNR Minerals Management  DNR-Minerals@michigan.gov
Director Daniel Eichinger, Michigan DNR  DNR-Director@michigan.gov
Iron County Watershed Coalition  ironcountywatershedcoalition@gmail.com

Direct Lease Request

KLA Company Direct Lease Public Notice

“Keweenaw Land Association, Limited, of Ironwood, Michigan, has requested direct development metallic mineral leases from the state of Michigan for Department of Natural Resources (DNR) metallic mineral rights located within Sagola Township, Dickinson County, containing a total of 1,436.88 acres, more or less, further described as:

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Before any leasing decision is made in this matter (“Direct Development Metallic Minerals Lease Requests by Keweenaw Land Association” in Dickinson County), we urge the State of Michigan Department of Natural Resources to undertake a more rigorous review of nominated parcels. Additional information must be provided to the public.

The DNR's metallic mineral leasing process must be modified in order to provide the public with a clear-eyed assessment of legacy environmental damages at the adjacent Groveland Mine Zone — a sprawling industrial mining complex with unmet remediation needs, transferred to State ownership by the previous mine owners, making it the responsibility of Michigan taxpayers. A more thorough assessment must be completed before any additional metallic mining is pursued in the lease nomination area, which is known to geologists as the “Felch Trough.” According to the parcel classification review, the environmental risks include impacts to Threatened & Endangered species (bat hibernaculums), cold water trout streams (upper tributaries and wetland headwaters of the Sturgeon River watershed); and possible impacts to a known archaeological site.

How is the public expected to weigh these risks? Against what suggested benefits? What are the specific risks to private surface owners? What are the risks to treaty-protected natural resources? Stipulation codes such as "Best Management Practices" are insufficiently protective.

We specifically ask the DNR to secure a Mineral Remoteness Report by a qualified independent geologist, in order to determine the nature, extent and potential value of specific metallic mineral resources targeted by this specific lease request. Our own review of the geological literature suggests the nominated parcels hold “Critical Minerals” (as defined in the 2018 Executive Order), including rare earth elements, and polymetallic sulfide deposits of volcanogenic origin, similar to the Eagle orebody in Marquette County. Without greater transparency and expert knowledge, it is impossible to evaluate the proposed trade-off between potential profits (not mentioned in the DNR’s parcel review) and predictable environmental risks.

Reviewing the files provided by the DNR pertaining to KLA's lease request, we find no evidence that the Michigan DNR can fulfill its responsibility to “manage state-owned minerals in a manner that protects and enhances the lands for current and future generations.” The Superior Watershed Partnership and the DNR Natural Resources Trust Fund are currently working to protect a significant downstream section of the wild Sturgeon River for public recreation, safe from potential mining threats — even as the DNR's Minerals office is reviewing a significant new metallic minerals lease in the Sturgeon River headwaters!

In order to protect and enhance minerals for current and future generations, the State must learn to deny some lease requests. Most importantly, the DNR must face the past — more than a century of devastating metallic mining impacts at the proposed lease location — before weighing the cost of cumulative environmental impacts. Environmental impacts are dependent upon the types of metallic minerals to be targeted. The DNR, and the public, must proceed with greater caution and expert knowledge before trading away clean air and water, critical habitat and other natural resources for another century of metallic mineral exploration, mining, and environmental degradation.

Lacking a transparent, cohesive assessment, we urge the DNR to deny the “Direct Development Metallic Mineral” lease request (Keweenaw Land Association) seeking state-owned mineral lands in Dickinson County. We appreciate your consideration.

Submitted by Kathleen Heideman on behalf of —
Mining Action Group of the Upper Peninsula Environmental Coalition
Carl Lindquist, Executive Director, Superior Watershed Partnership
Jon Magnuson, Cedar Tree Institute
Interfaith Great Lakes Water Stewards
Chauncey Moran, Chairman, Yellow Dog Watershed Preserve
STATEMENT OF INTEREST

“We abuse land because we regard it as a commodity belonging to us.”
- Aldo Leopold

We are submitting our comments on behalf of environmental groups and residents who are concerned about the environmental impacts of metallic mineral exploration, sulfide mining, and resource extraction. After review, we have concluded that granting these Direct Development Metallic Mineral Lease requests would negatively impact the environment – including headwater wetlands and coldwater streams feeding the Sturgeon River. On behalf of our collective members and supporters, and on behalf of the U.P. watersheds we seek to protect, we urge you to deny the metallic mineral leases sought by Keweenaw Land Association.

SITE LOCATION

The nominated parcels are located in Dickinson County, Randville Michigan (Sagola Township), in the immediate vicinity of an abandoned mine site, Groveland Mine. After a century producing economic quantities of iron and manganese, via both underground and open pit mining, the Groveland site produced a barren minescape which has lingered, decades after the end of metallic mining. A recent newspaper article summarized the environment as follows:

“FELCH TOWNSHIP — It’s a place where trees no longer seem willing to cover the legacy of clawing out iron from the land. With little other long-term value, the Michigan Department of Natural Resources has suggested the Groveland Mine in Dickinson County, now a brownfield site, be used to produce something new: solar power.”

The waste of the Groveland mine site also contains asbestiform minerals; several types of asbestos are found in tailings and rock piles. Rock quarries in the surrounding area also produced commercial stone (dolomite).

The nominated parcels lie southwest and northeast of Randville, on M-95, due west of the old Groveland Mine complex. The nominated parcels include headwater wetlands, ponds, coldwater trout streams (Tom Kings Creek, an
uppermost tributary of the West Branch of the Sturgeon River), and critical habitat for Threatened and Endangered Species (bat hibernacula).

KEWEENAW LAND ASSOCIATION (KLA)

“Keweenaw owns and manages a total of 183,432 surface acres with 167,630 acres located in the Upper Peninsula of Michigan and 15,802 acres located in northern Wisconsin. The Company also owns and manages a total of 401,793 acres of both severed and attached mineral rights located entirely in the UP of Michigan.” Of this, 400,000 acres were acquired via a federal government land grant, following the Civil War.

In light of KLA’s massive mineral rights ownership in the U.P., the company’s desire to control additional state-owned mineral rights should be examined scrupulously. It is most unfortunate that the Michigan DNR fails to conduct a thorough geological review of their own metallic mineral properties, prior to receiving lease nominations such as this one.

The DNR nomination process allows resource extraction companies (like Keweenaw Land Association) to grab the steering wheel, acquiring state-owned mineral rights for a pittance, while avoiding the competitive bidding process.

We find no consideration of the likelihood for extraction/development, no consideration of the impacts to private surface owners, no consideration of risk, and no consideration of the serious threats to cultural and natural resources posed by exploration and metallic mining.

17 https://keweenaw.com/company-profile-history/
NOTE: KLA already owns surface acreage in the Felch Trough area, in the immediate location of the nominated parcels: 39 and 20 acres (two small purple boxes, left side of image) near the intersection of highways M-95 and 69. KLA also controls a significant area south of Felch (right side of image).

HYDROLOGICAL CONTEXT - “STURGEON RIVER WATERSHED”

Targeted parcels are found in the West Branch of the Sturgeon River watershed (Menominee Hydrological Unit). The requested mineral leases would impact wetlands and coldwater trout streams feeding the Sturgeon River watershed. Parts of the watershed, immediately downstream of the lease area, are seriously impaired by historical mine pollution.

“Pine Creek and the West Branch of the Sturgeon River are designated trout streams (MIDNR 2016), and lower Pine Creek is an assessed coldwater fisheries stream. In spite of the protected area status, stream designations, and past mining, only limited information is available on potential contaminants and water quality in this zone. Reports indicate that uraninite and asbestos minerals occurred at the (Groveland) mine (USEPA 1994, USGS 2005). Several reaches near the mine are listed as impaired for mercury in fish tissue and for PCBs in the water column (MIDEQ 2016b). A Michigan DNR study in 2010 indicated that selenium was not at level of concern in four water samples and in two sediment samples (MIDNR 2010). On the other hand, a 2007 macroinvertebrate study that sampled in the West Branch of the Sturgeon River near the mine demonstrated a relatively low community score (Kohlhepp et al. 2008).”

Many of the requested mineral lease parcels are predominantly or entirely covered by wetlands, or bisected by a coldwater trout stream:

LEGACY CONTAMINATION - “GROVELAND MINE ZONE”

According to a report by the Great Lakes Indian Fish and Wildlife Commission, the area (referred to as the “Groveland Mine Zone”) has lowered water quality, contaminated with TDS, mercury,

“The Groveland Mine, located in the Lake Superior Ojibwe 1842 Treaty-Ceded Territory in Dickinson County, was an open-pit iron mine that operated between the 1960's and 1980. Our results from near the Groveland Mine indicated that:

- the headwaters in or near tailings in the Pine Creek watershed were relatively high in characteristics including specific conductance, temperature, sulfate, manganese, iron, and barium;
- the site below the final “South Pond” dam was relatively high in characteristics including specific conductance, bromide, manganese, iron, phosphorus, and arsenic, and low in dissolved oxygen and pH; and
- The West Branch of the Sturgeon River downstream of the reach nearest the Groveland waste rock was greater in specific conductance, pH, and sulfate than were upstream measurements.

- The Groveland Mine appeared to continue to influence Pine Creek headwaters and possibly the West Branch of the Sturgeon River more than 30 years after the mine ceased production. Limited historical data suggested that certain anion concentrations may have decreased since early years of the mine operation in the 1970's at the “South Pond” dam site (SC106) and the Pine Creek downstream site (SC102), but anion concentrations were greater in 2016 than in 1971 at the West Branch of the Sturgeon River downstream site (SC109). Based on our results and other work, we recommend additional sampling to assess sediment and groundwater contamination, sampling for asbestiform minerals, PCB’s, and total and methylmercury, and sampling at additional potentially contaminated sites around the Groveland Mine.”

In the GLIFWC sampling of the Groveland Mine Zone, Cardiff and Coleman report:

“This suggests that the mine tailings and waste rock are sources of constituents of potential concern such as fluoride, sulfate, manganese, iron, arsenic, and barium (...) sulfate, fluoride, manganese, iron, and arsenic are harmful at high concentration to aquatic life, and some also represent risks to human health. In addition, barium can reduce plant and invertebrate growth and effects in humans include cardiovascular problems (ATSDR 2007, Lamb et al. 2013).

In some cases, such as the stream in the tailings (SC242), it is likely that constituents are related to mine tailings. In other cases, additional analysis may be necessary. The REE pattern and cluster analysis suggested similarities between the tailings stream (SC242) and the “Island Pond” south stream (SC115). It is unclear, however, if tailings entered “Island Pond,” or if there is a groundwater influence, or influence of rock exposed during construction of the reservoir. The decrease in trace metal concentrations further downstream of tailings was also an indication of mine influence on those constituents, but the higher levels of iron and manganese below the “South Pond” dam may also reflect the redox state of the dam seepage water or dam construction materials. The difference in range of values of specific conductance and anion concentrations between the reference and downstream sites suggested that the mining influence increased specific conductance, fluoride, chloride, sulfate and bromide in the Pine Creek watershed and increased specific conductance, sulfate, and nitrate in the West Branch of the Sturgeon River. The cluster analysis also suggested reference sites were distinguishable based on specific conductance, chloride, and sulfate measurements. The presence of bromide and moderately high sulfate concentrations at the tailings stream sites (SC112, SC242), the “Island Pond” south stream site (SC115),
and the "South Pond" dam site (SC106) were also indicative of taconite tailings influence (Kelly et al. 2014). We did not have enough trace metals samples, however, to establish correlations between those measures and trace elements. Other processes may have influenced waters in the stream from "Island Pond" and the waters below the "South Pond" dam. The sample at the "South Pond" dam site could include a contribution of suspended, not dissolved elements because TSS was greater at that site and the bottom iron precipitate was flaky. In addition, we did not thoroughly sample along the length of the West Branch of the Sturgeon River and it is possible that Tom Kings Creek or agricultural inputs may have influenced water characteristics in the river at the downstream sites.

Temporal trends could have provided an indication of mining influence, but we did not find pre-mining data for the sites we sampled in this zone. The temporal patterns that we did observe suggest that certain anions may have decreased since early years of the mine operation in the 1970’s at the “South Pond” dam site (SC106) and the Pine Creek downstream site (SC102), but anion concentrations were greater in 2016 than in 1971 at the West Branch of the Sturgeon River downstream site (SC109).

Our results share some similarities with other water quality studies from this zone. An extensive study of macroinvertebrates in 2007 measured a relatively low index score for a West Branch of the Sturgeon River site (SC109; Kohlhepp et al. 2008), and our study found relatively high specific conductance and sulfate at that site. Similar to a MI DNR study (2010), we did not find concentrations of selenium above 1 μg/l. We also did not find uranium greater than 1 μg/l in this zone even though uraninite was present in some rocks in the mine zone (Heinrich & Robinson 2004). It is possible that the vast ponds built for the mine have greatly diluted some constituents of concern and that impacts of the mining on land cover are now more notable than impacts on concentrations of constituents in surface waters. Other surface water sites that we did not sample near the Groveland Mine, however, may be more contaminated with those or other elements.

Indeed, our study does not represent a complete analysis of the waters of the Groveland Mine zone, but rather a snapshot identifying contaminants, potential sources, and extent of contamination over a short time period in select reaches. Additional sampling should assess temporal and hydrological variation, groundwater contamination, partitioning of constituents, sediment contamination, biological sampling, and concentrations of constituents that we did not sample for. It would be particularly important to sample for total and methylmercury, PCB’s, and asbestiform mineral fibers. The DEQ listed several reaches in this zone as impaired because of mercury in fish and PCBs in the water column (MIDEQ 2016b). The DEQ changed the TMDL scheduled date for those from 2014 to 2022 (MIDEQ 2014b, 2016b), and sampling could help delineate the contamination problem. Asbestiform mineral fibers, including tremolite, actinolite, and cummingtonite, are an additional concern because they occurred in gangue rocks of the Groveland Mine zone (USEPA 1994; USGS 2005) and we did not sample for those in this study.

Water sampling by GLIFWC also determined:
- Sulfate and nitrate in the West Branch of the Sturgeon River were greater at the sites downstream of the reach closest to the Groveland waste rock.
- Rare Earth Element (REE) concentrations are elevated (compared with Republic and Grant mine sites). Groveland sites “had greater concentrations of europium” and “were also relatively high in lanthanum.”
- “Sulfate was greater than the Minnesota wild rice criterion in the downstream section of the West Branch of the Sturgeon River” (sampling sites SC109-110, located immediately east of the KLA nominated parcels).

Because the nominated mineral parcels are adjacent to the Groveland Mine Zone, it is important that the DNR’s lease review process should consider legacy mining contamination in this area, per GLIFWC’s (2015-2016 Water Sampling) conclusions:

“Information was previously lacking for several contaminants for most of our sites, and recent information was lacking for others. In addition to anion concentrations of concern (…) barium was of concern in the Groveland Mine zone, and uranium was of concern in the Republic Mine zone. This study...”
suggests that mine-related contamination remains extensive and incompletely remediated. Such contamination has implications for treaty rights, as deterioration of water quality and fish habitat may reduce fish available for harvest and the suitability of fish for consumption.”

HISTORICAL MINING CONTEXT

“Groveland Mine - In the region of the West Branch of the Sturgeon River in the Lake Superior Ojibwe 1842 Treaty-ceded Territory (Dickinson County, Michigan), the M.A. Hanna Company operated the Groveland Mine and pellet plant for taconite production between the 1960’s and 1980 (Reynolds & Dawson 2011). The open pit operation generated piles of waste rock just south of the West Branch of the Sturgeon River and large water reservoirs and tailings and settling basins in the headwaters of Pine Creek. The company eventually turned over a large part of the Groveland Mine land to the Michigan Department of Natural Resources and the site became the Groveland Recreation Area, which is part of the Copper Country State Forest.”  

According to a 1901 report on Mineral Statistics (“STATE OF MICHIGAN, 1901 BY JAMES RUSSEL COMMISSIONER OF MINERAL STATISTICS), “The (Groveland Mine) ore is a fine blue hematite, of bessemer grade, but is badly mixed with greenstone.”

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GEOLOGICAL CONTEXT

ARCHEAN ROCK

Geologically, the nominated parcels align with the “Felch Trough” (Groveland Mine also lies within Felch Trough). Historically, the Groveland extracted ore (iron and manganese) from the Vulcan Iron formation, a sedimentary pocket of the Felch, but observed that the ferrous orebody was cut by north-south aligned dikes of diabase (volcanic rock). The Felch Trough is a relatively narrow feature within a highly metamorphosed geological context, and certainly contains far more than the commodity metals targeted by historic mining operations. The oldest strata include Archean age basement rock. “The Felch and Calumet troughs (fig. 2) are elongate east-trending belts of Early Proterozoic sedimentary and minor volcanic rocks that unconformably overlie or are in fault contact with Archean basement rocks.”

KIMBERLITE

At least one “Kimberlite Pipe” has been identified in the Felch formation, near the town of Felch ( “The discovery of a kimberlite pipe in Iron County in 1971 prompted the first organized diamond exploration in the state. More than 20 kimberlites have been discovered since 1971, and these post-Ordovician intrusions follow a general northwest trend through Iron, Dickinson, and Menominee Counties from Crystal Falls to Hermansville. Many kimberlites in Northern Michigan contain diamonds, while some appear to be barren (...) (S. M. Carlson, personal communication, 1995).”

MAGNETIC ANOMALIES

While past efforts focused on finding ferrous orebodies, it appears the underlying layers of the Felch Trough may be a corollary of Eagle deposit, where volcanic dikes and other intrusions intersect near-surface with Michigamme Slate and other younger geologies. Anomalies identified by past magnetic surveys may have missed volcanic orebodies, interpreting them as indications of magnetic iron orebodies.
According to Klasner and Sims report, “The Felch and Calumet troughs area of northern Michigan is part of the Penokean fold-thrust belt of the continental foreland of the Superior craton. The area lies immediately north of the Niagara fault zone, the north-verging suture between the continental foreland and the Early Proterozoic Wisconsin magmatic terranes to the south. Accretion of the magmatic terranes to the continental margin ~1,850 Ma produced south-verging backthrusting and backfolding in this region involving both Archean basement and Early Proterozoic supracrustal strata.”

**POTENTIAL FOR VMS DEPOSITS**

Comparisons have been made between the Baraga area, which hosts volcanic massive sulfide (VMS) deposits, and the Felch Trough: “The northern domain, in the northern part of the Baraga basin (fig. 1), consists of a foreland-basin thrust belt in which deformation was largely thin skinned (Klasner and others, 1991); that is, it involved mainly Early Proterozoic supracrustal rocks, with apparently minor deformation of Archean basement rocks. The southern domain, which includes the study area and the Archean outliers in the Baraga basin just north of the study area, consists of a basement arch in which deformation was primarily thick skinned, that is, it involved both Early Proterozoic supracrustal rocks and Archean basement.”

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23 [https://pdfs.semanticscholar.org/8044/c05588ec1aad860f1880c373604b2c82bf2.pdf](https://pdfs.semanticscholar.org/8044/c05588ec1aad860f1880c373604b2c82bf2.pdf)

24 [https://pdfs.semanticscholar.org/8044/c05588ec1aad860f1880c373604b2c82bf2.pdf](https://pdfs.semanticscholar.org/8044/c05588ec1aad860f1880c373604b2c82bf2.pdf)
The Felch Trough is a complicated feature, addressed by a number of geological reports. The conclusions tend to be somewhat obfuscated, with references to proprietary drill sites, vague maps, and unnamed quarry sites.

UPEC Mining Action Group Map, combining a diagram by Klasner and Sims diagram showing extent of the Felch Trough, overlain by 2020 KLA Metallic Mineral Lease nominations, revealing a precise correlation between the KLA lease nominations currently under DNR review, and the boundaries of the Felch Trough.

A close review of the geological literature suggests that the KLA-nominated leases have targeted a site known to contain critical metals, with real potential for rare earth elements and metallic sulfide orebodies. The KLA lease requests target a subsection of the Felch Trough geology identified by Klasner and Sims as “Xme”: “Within the area of figure 2, the Menominee Group comprises the Vulcan Iron formation and the underlying schistose rocks of the Felch Formation (combined as unit Xme) and two major volcanic units, the Badwater Greenstone and the Hemlock Formation. Chemical data (K.J. Schulz, oral commun., 1990) indicate that the Badwater and Hemlock are probably correlative.

Additional key geological findings:

“Because of the absence of exposures, structures within the green schist are practically unknown. Drilling reveals a crinkled highly schistose to slaty rock. Correlation of magnetic highs with green schist is based mainly on a drill hole in sec. 25, T. 43 N., R. 31 W., that disclosed strongly magnetic schist. The trend of the belt has been established by magnetometer surveys.”

An early aeromagnetic survey of Dickinson County confirmed strong aeromagnetic anomalies over the Felch and other sedimentary troughs. Felch Trough anomalies indicate the presence of metavolcanic geology with dikes and other intrusions:

![Felch Trough anomalies](image)

Felch Trough was described in the Geology of Central Dickinson County. “The main structure is a complex syncline, here referred to as the Randville syncline, which is marked by canoe-shaped patches of infolded Vulcan iron-formation that extend from sec. 5, T. 41 N., R. 30 W., into sec. 36, T. 42 N., R. 30 W. Southwest of sec. 5, magnetic anomalies, plus a few outcrops and one drill hole, indicate that the Felch formation is present in a broad syncline in which the schist is repeated in close folds.”

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26 [https://pubs.usgs.gov/gp/0115/plate-1.pdf](https://pubs.usgs.gov/gp/0115/plate-1.pdf)
“In the area north of Iron Mountain along the line east of Felch (Felch trough) a much more complex pattern of ages has emerged. The geologic evidence is that the pegmatites and granites intrude all the sedimentary rocks in the area and that these in turn overlie the gray gneiss and the older granite gneiss. The sedimentary rocks have also been metamorphosed presumably at the time of emplacement of the pegmatites and granites. The age pattern of the minerals from the metamorphosed sediments indicates a time of metamorphism 1600 million years or more ago, but it is seen that the K-A ages are uniformly less than this. This pattern may be interpreted most simply by the following sequence of events: (a) intrusion of granites and pegmatites and metamorphism of sedimentary rocks in Dickinson County at, say, 1800 million years; (b) subsequent metamorphism of rocks west and south of the Felch trough at 1400 million years. If this pattern of ages is really the result of two relatively simple periods of mineral formation, the ages at site 11 have considerable significance in establishing the stability of minerals in the environment in which minerals are formed. The pegmatite clearly intrudes the gneiss. The 2500 million-year Pb-Pb age of the zircon from the gneiss is evidence that the gneiss is really a very ancient rock. The biotite ages of the gneiss seem to be due to minerals formed at least 300 million years after the pegmatite intrusion. Thus the geologic event that formed the biotite in the gneiss was relatively ineffective in altering the age pattern of the pegmatic muscovite and feldspar. At site 15 it is again shown that the age pattern of muscovite is somewhat more resistant to alteration than that of biotite in the same environment. It is this fact that makes it difficult to state with certainty that the granites in Iron County are not contemporaneous with the pegmatites in Dickinson County, since only biotites have been analyzed in the Iron County granites.”

POTENTIAL MINERALS

The following metals, minerals and rare earth elements are present within the nominated parcels:

- **Anorthite** - Found in contact metamorphosed limestones and basic volcanic rocks. *Dickinson County: Groveland mine, near Randville in metagabbro with magnetite and augite (Hawke, 1976). Hawke (1976) also reports “flesh-red cleavable masses of anorthite are found with quartz, mica, and hornblende in pegmatite dikes, etc. of Randville.”

- **Asbestiform minerals** - Groveland orebody includes “tremolite, actinolite, and cummingtonite.”

According to the EPA, “Mill tailings samples taken by EPA during the development of Clean Water Act effluent limitation guidelines (U.S. EPA 1982) noted the trace amounts of several toxic metals in raw mill tailings (…) these metals included antimony, arsenic, beryllium, cadmium, chromium, copper, lead, nickel, selenium, silver, and zinc. In some instances (Silver Bay, Minnesota and Groveland Mine, Michigan), amphibole minerals with fibrous characteristics may be a constituent in the tailings.” Tremolite, generally in blades and plates about a quarter of an inch long, is present throughout. It is clearly related to original compositional differences in the rock; the purer layers of the dolomite may contain only a few widely scattered crystals, whereas other layers, generally much thinner, may consist of 75 percent tremolite.

- **Monazite** - There is evidence that Goodrich Quartz, known to contain monazite (Thorium), is found in the Felch Trough.

- **Sulfides** - “The dolomite of the Felch trough, and of the Calumet mine farther south, has been strongly metamorphosed, in contrast to that of the northern area…” and the Felch Trough (Groveland Mine) includes *crystals of garnets* (sulfide/pyrites) in layers of grunerite (asbestos).

- **Uraninite** - Also known as pitchblende, uraninite is a radioactive mineral and the most important ore of uranium. “Dickinson County: 1. North edge of Felch Trough: Uraninite (“pitchblende”)-carbonate mineralization occurs as open-space fillings in the hanging wall and, less extensively, in the footwall of an east-west brittle fault in the Gene Lake Gneiss complex (Archean) (Lehman, 1987). This fault parallels and locally cuts an older mylonitic fault that is parallel with the dominant axis of the Felch Trough. (...) 2. Groveland mine: Uranium mineralization (probably uraninite) occurs along an unconformity between Cambrian sandstone and Proterozoic schist (metadiabase) exposed in the Groveland mine in the Felch Trough (Schick, 1996). UPDATE - Dickinson County: 1. Near Randville, abandoned pegmatite quarry near...”
center of N ½ NW ¾ section 26, T42N, R30W: As small (~0.7 mm) cubo-octahedral crystals recovered from heavy mineral concentrate.33

- **Uranium** - “Central Dickinson County has been widely prospected for uranium, but with little or no success. In a number of places, joints in granite contain thin, widely separated patches of a yellow-brown radioactive material, but careful investigation has shown that the amount of uranium is quantitatively far too small to be possibly considered of economic importance. (...) Many observers have noted that most of the granites of the region yield readings on a Geiger counter of two to three times normal background...”34

### PRESENCE OF “CRITICAL MINERALS”

Executive Order 13817, “A Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals” (82 FR 60835, December 26, 2017), addressed the United States’ dependency on vulnerable limited and foreign supply chains of mineral commodities that are vital to the Nation’s security and economic prosperity. The Executive Order directed the Secretary of the Interior, in coordination with the Department of Defense and in consultation with other executive branch agencies, to produce a list of (...) “35 minerals or mineral material groups deemed critical under the definition provided in the Executive Order: *Aluminum* (bauxite), antimony, *arsenic*, barite, *beryllium*, bismuth, cesium, chromium, cobalt, fluorspar, gallium, germanium, graphite (natural), hafnium, helium, indium, lithium, magnesium, manganese, niobium, platinum group metals, potash, the *rare earth elements group*, rhenium, rubidium, scandium, strontium, tantalum, tellurium, tin, titanium, tungsten, *uranium*, vanadium, and zirconium.”35

In reviewing the federal Critical Minerals list (included above), we have highlighted items identified or inferred from mineral reports in the immediate geological area of the KLA-nominated metallic mineral lease parcels.

While “rare earth elements” are common in the earth’s crust, they are rarely found in economically viable deposits. Economic viability depends on the market, as well as the availability of infrastructure for extracting, transporting, recovering and refining (...) “extraction is complicated by the fact that in the ground, such elements are jumbled together with many other minerals in different concentrations. The raw ores go through a first round of processing to produce concentrates, which head to another facility where high-purity rare earth elements are isolated. Such facilities perform complex chemical processes that most commonly involve a procedure called solvent extraction, in which the dissolved materials go through hundreds of liquid-containing chambers that separate individual elements or compounds—steps that may be repeated hundreds or even thousands of times. Once purified, they can be processed into oxides, phosphors, metals, alloys and magnets that take advantage of these elements’ unique magnetic, luminescent or electrochemical properties. The strong and lightweight nature of rare earth magnets, metals and alloys have made them especially valuable in high-tech products.”36

“Beyond existing mines, companies that dig for other resources might start extracting rare earth elements from deposits of different materials (...) and radioactive material mixed in with ores could end up being positive: If thorium-based nuclear plants prove viable, expanded thorium mining would also turn up usable rare earth minerals.”37

“Some industries that rely on rare earth elements are going outside the box and looking for ways to bypass mining entirely (...because rare earth mining has) significant environmental impacts that can threaten human health in the absence of strict regulation. The presence of radioactive thorium in some ore is one example. In addition, some mining and separation processes involve chemicals that produce toxic wastewater. All of these dangerous byproducts require scrupulous storage and disposal.”38

33 [https://museum.mtu.edu/pdfs/URANITE.pdf](https://museum.mtu.edu/pdfs/URANITE.pdf)
36 [https://www.sciencemag.org/content/357/6345/2063](https://www.sciencemag.org/content/357/6345/2063)
37 [https://www.sciencemag.org/content/357/6345/2063](https://www.sciencemag.org/content/357/6345/2063)
38 [https://www.sciencemag.org/content/357/6345/2063](https://www.sciencemag.org/content/357/6345/2063)
Presence of Rare Elements Raises Significant Environmental Concerns

Previous surveys of the Southern Complex of Marquette County have identified the presence of Thorium, Uranium and Rare Earth Element (REE) metals:

- Rare Earth Elements are not truly rare, but "because of their geochemical properties, rare-earth elements are typically dispersed and not often found concentrated as rare-earth minerals in economically exploitable ore deposits."
- Thorium has been identified in the Goodrich Quartz formation (which is found in Felch Trough): "Abnormal radioactivity in specimens of Goodrich quartzite on rock dumps at the Old Volunteer and Old Maitland mines near Palmer, Marquette County, Mich., was detected in 1951 by Robert Reed, geologist working for L. P. Barrett, U. S. Atomic Energy Commission contractor. Analyses of the rock indicated that most of the radioactivity was caused by thorium. The locality was brought to the attention of the writer during an examination of radioactive materials in northern Michigan in August 1952, and subsequent chemical and spectrographic analyses of the samples indicated that the Goodrich quartzite contains locally as much as 0.37 percent thorium and O.X percent each of Ce, La, Nd, Y..." (** Ce, La, Nd and Y are Rare Earth Elements).  
  - Thorium is associated with massive sulfide deposits like Eagle Mine. The Superior Watershed Partnership's Community Environmental Monitoring Program has an air monitoring station in Big Bay, which detected Thorium and Uranium emissions 9 miles away from Eagle Mine.  
  - Deposits of REE and uranium are now mined from extremely low grade ore: “only Canada has a significant amount of (Uranium) ore above 1 percent — up to about 20 percent of the country’s total reserves. In Australia, approximately 90 percent of uranium has a grade of less than 0.06 percent. Much of Kazakhstan’s ore is less than 0.1 percent.”  
  - Historic geological work identified thorium and uranium in the Central U.P. region.
  - The extraction of uranium/REE ore produces enormous quantities of waste rock, vastly increasing environmental impacts.
  - Special environmental hazards include radioactive waste rock and tailings, groundwater contamination.
  - Michigan has no special mining law for rare earths; REE ores would be considered “nonferrous” metals.

LIKELIHOOD OF METALLIC MINERAL DEVELOPMENT

The DNR's Mineral Management office provides no information whatsoever related to likelihood of development (ie, economic feasibility, or a mineral remoteness report). After reviewing geological literature, we conclude that the KLA-nominated parcels contain unusual metals including “rare earth” elements and “critical minerals” with an extremely high likelihood for development.

Several factors, combined, increase the likelihood of development:

- The Michigan DNR intends to convert the abandoned Groveland Mine site from an “unproductive” state-owned “brownfield” into a solar farm: “He described the property, covered with discarded iron ore tailings from the mine, as otherwise “unproductive,” inhospitable to past attempts to grow trees for timber (...) First opened in the 1800s, the Groveland Mine once produced 2 million tons of iron pellets a year, going from underground to open pit mine about halfway through the last century. It employed 500 before being shut down in 1981, with the state taking ownership in the mid-1990s.”
- Nominated parcels are adjacent to the area's main highway (M-95).
- Parcel classifications note the presence of powerline right of ways.

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The main stem line of the American Transmission Company runs through the nominated parcels: “the (Groveland) site is close to existing transmission lines and a relay station.”\(^{42}\) Identified on ATC’s maps as “Nordic”, this major relay station is also adjacent to the nominated parcels (only 650 feet from a KLA-nominated parcel). This alignment strongly suggests that KLA is planning for a mining operation’s electrical needs.

- The Escanaba and Lake Superior Railroad line, previously owned by Hanna Mining Company (which owned and operated the Groveland Mine) connects the nominated lease area with Ontonagan, Escanaba, and Republic. The railroad actually runs though one of the nominated parcels.
- The presence of a rail line makes it possible for a future orebody to be connected with mine brownfields (White Pine Mine, Republic Mine) which represent potential milling and waste storage options.
- The Humboldt Mill is located just 44 miles north, making the site closer to Humboldt than the Eagle Mine.

The economic viability of any project, regardless of the orebody, must take into consideration transportation routes, shipping options, power infrastructure, access to potential off-site processing, and alternative options for mine waste storage.

Combined, these factors greatly increase the economic viability of any new orebody found in the Felch Trough.

**WETLAND IMPACTS**

Stipulation #49 Inadequate to Protect Wetlands from Metallic Mineral Exploration

Stipulation #49 (“Best Management Practices) is applied a dozen times in the Parcel Classification review. It is not clear how Stipulation #49 would actually be applied to protect wetland-dominated parcels from mineral exploration activities. It is our experience that mineral exploration in such an area will be conducted under a permissive “General Permit” with limited opportunity for public input.

According to a study by the US Fish and Wildlife Service, Michigan’s historic wetland loss exceeds 5.6 million acres.\(^{43}\) The State’s own estimate for total wetlands loss is considerably lower – approximately 4 million acres of wetlands since European settlement. Barb Avers, a wetland specialist with the Michigan Department of Natural Resources (DNR), stated that “more than 50 percent of Michigan’s historic wetland base has been lost, and the rate of wetland loss in key waterfowl landscapes exceeds 90 percent.”\(^{44}\)

Michigan’s wetland losses continue. According to a 2014 report from the Michigan Department of Environmental Quality, another 41,000 acres of wetlands were lost between 1978 and 2005 – more than 1,000 acres per year on average during this period. These figures do not include wetlands that continue to exist but are impaired by contamination and invasive species. Clearly, the rate of wetland loss is of critical environmental concern.

**Wetlands are critical ecosystems providing countless benefits, including water filtration, climate change resilience, carbon sequestration, erosion and flood control, and essential habitat for a diverse array of species.**

According to the Michigan DNR\(^ {45}\):

- Wetlands play a critical role in managing Michigan’s water-based resources, providing flood storage, groundwater recharge, wildlife habitat, pollution treatment, erosion control and nutrient uptake.
- Wetlands are a significant factor in the health and existence of Michigan’s other natural resources, such as inland lakes, groundwater, fisheries, wildlife and the Great Lakes.

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\(^{43}\) https://www.aswm.org/ndf_lib/state_summaries/michigan_state_wetland_program_summary_083115.pdf

\(^{44}\) [http://www.michigan.gov/dnr/0,4570,7-153-10366-457822--RSS,00.html](http://www.michigan.gov/dnr/0,4570,7-153-10366-457822--RSS,00.html)

Wetlands are vital to Michigan’s wildlife as well. Acre for acre, they produce more wildlife and plants than any other Michigan habitat type.

About 25 percent of mammals, 50 percent of birds, nearly all reptiles, and every amphibian in Michigan live within wetlands (...) and more than a third of threatened and endangered species live only in wetlands.

“Michigan has NO NET LOSS GOALS in both regulation and as a statewide administrative approach. Michigan’s State Wetland Conservation Plan outlines both short- and long-term goals for the achievement of no net loss of wetlands. Long-term objectives, with no specific time frame, include the restoration of 500,000 acres (ten percent of historic losses). In addition, Administrative rules for the Wetland Protection Part of the Natural Resources and Environmental Protection Act (NREPA) state that, “An applicant shall provide mitigation to assure that, upon completion, there will be no net loss of wetlands.” (See R 281.925 (7)).”

Reasonable and Foreseeable Environmental Impacts

The DNR’s approach to Minerals Leasing disregards the agency’s responsibility for Natural Resource protection, as the system does not calculate reasonable and foreseeable environmental impacts of granting a mineral lease – the demonstrated risks and impacts of metallic mineral exploration. “The DNR is responsible only for the leasing of state-owned mineral rights. The Michigan Department of Environment, Great Lakes, and Energy is responsible for all permits and regulations for the act of extracting the minerals from the land.” – statement on the DNR Mineral Management webpage.

The DNR promises that all necessary permits will be handled by DEGLE when a company (later) applies for permits necessary to proceed to the next step of resource development. Exploration permits are the regulatory responsibility of DEGLE, under Part 625 and Part 303 (if exploration activities will take place in wetlands). But are the wetland resources protected in this process? Are treaty resources protected? Is the public trust protected? The DNR cannot sidestep their core responsibility, the wise management of public resources for current and future generations.

PROBLEMS WITH PUBLIC NOTICE

The DNR’s “Public Notice” stated that “a detailed map can be found on our mineral lease nomination map page” with a link provided to http://www.dnr.state.mi.us/spatialdatalibrary/pdf_maps/mineral_lease_information/Dickinson_lease_information.pdf

The DNR failed, however, to provide a clear map showing the nominated parcels, as was done in the past. Instead, the public was directed to download an enormous map covering all lease information for Dickinson County. “Clicking on the Map Link will return a visual map of the chosen county displaying Department of Natural Resources ownership, most recent parcel classifications, active State mineral lease numbers, producing and plugged well locations, and well permit numbers.” This map link (PDF) repeatedly failed to load or download, resulting in persistent “404 Not Found” errors.

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47 https://www.michigan.gov/dnr/0,4570,7-350-78136_79239---,00.html

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Some reviewers were unable to download the PDF. The DNR-linked website is flagged as “NOT SECURE” by browsers. Others were able to download the map but described it as “a big file, slowing down my machine. No legend or key on map colors. The nominated areas are scattered around the county.”

Clearly, much confusion could have been avoided if the DNR Minerals Management office provided a custom map showing specific mineral lease nominations, rather than a mineral lease data dump of all information for an entire county.

The DNR Minerals Management office was notified of the potential file problem immediately (June 30th), but failed to respond.

DNR’s Primary Statutory Obligation: to Protect and Conserve the Natural Resources of the State

In accordance with NREPA Act 451 of 1994, 324.503 Duties of department; powers and jurisdiction; purchase of surface rights; limitations; record; strategic plan; managed public land strategy; volunteers; granting concessions; lease and sale of land; reservation of mineral rights; sale of economic share of royalty interests; definitions. Sec. 503.

First and foremost, “(1) The department shall protect and conserve the natural resources of this state; provide and develop facilities for outdoor recreation; prevent the destruction of timber and other forest growth by fire or otherwise; promote the reforestation of forestlands belonging to this state; prevent and guard against the pollution of lakes and streams within this state and enforce all laws provided for that purpose with all authority granted by law; and foster and encourage the protection and propagation of game and fish.”
Sec. 503 eventually goes on to mention authorities for economic decisions such as mineral leasing and concessions, but the clear primary mandate of Sec. 503 is that natural resources are to be protected prior to economic considerations, which are detailed later.

The Department of Natural Resources’ first duty is to “protect and conserve the natural resources of this state” and this specifically includes the prevention of harm, and a further charge to “prevent and guard against the pollution of lakes and streams.”

For the DNR to act as a wise steward and watchdog requires a clear-eyed understanding of the value of Michigan’s natural resources, and a complete understanding of site-specific resources, and proposal-specific risks to those resources. In order to “prevent and guard against” pollution of lakes and streams, the Department must assess the legacy impacts of mining pollution, especially the unique factors (such as a century of mining, mine waste storage, and damages to wetlands and streams).

The Department’s charge is to “prevent and guard against” — this mandate cannot be shunted off into the future, nor resolved with nebulous promises made by Minerals Management staff that additional “environmental permits” would be required before exploration and drilling can take place on leased lands. The DNR’s decision to lease minerals must meet the primary statutory obligation of protection and conservation. Michigan’s current approach to metallic minerals management, in which resource management decisions are driven by the whims of private corporations, is not conservative. Metallic minerals are non-renewable resources. Where natural resources are non-renewable, the principle of conservation is especially critical. The DNR’s duty to protect Michigan’s natural resources must drive its decision-making. Where there is doubt, the DNR must conserve; the clear obligation is to “prevent and guard against” harms and degradations to the State’s natural resources.

Fundamental Process Reforms Needed

Mineral leasing decisions are short-term non-renewable economic decisions which may seriously threaten the long-term goals of renewable natural resources. **Public meetings should be scheduled prior to all significant metallic mineral lease requests** (for example, whenever lease requests are greater than 320 acres). For the benefit and education of all citizens, Minerals Management staff should argue the merits of their leasing recommendations in a public forum; a panel of Natural Resource staff should represent the concerns of other divisions (wildlife, forestry, fisheries). This public presentation should use maps, MNFI data, NWI data and satellite images to convey the merits of the proposed lease in terms of pros and cons, with DNR staff (rather than the public) called upon to advocate for the protection of biological diversity, fragile ecological areas such as wetlands, threatened and endangered species, and other renewable natural resources known to be threatened by metallic mineral mining.

The DNR’s proposed lease classifications are inadequate to protect wetlands from the hazards of metallic mineral exploration and mining. Given the presence of sensitive wetlands in the metallic mineral lease nomination area — we must ask the State of Michigan to deny the requested mineral leases.

Greater protections are needed for mineral leases where wetlands are impacted:

- We would recommend a parcel classification of “non-development” wherever sensitive wetland complexes are present on the surface.
- Once again, we recommend that **Stipulation 15** be applied to mineral leases in areas where wetlands are present on the surface - a protective stipulation limiting surface disturbance to a single drilling site. This stipulation was previously included in leasing decisions that could impact headwaters and fragile wetland ecosystems: “To limit surface disturbance, any wells to be drilled on the leased premises shall be drilled from a single surface area that is acceptable to and approved by the Lessor.”
- We recommend that DNR Leasing Decisions require a “Mineral Likelihood” review, to be completed by an independent geologist prior to the Classification Review and the Public Comment. This information, shared with the public, would be critical in guiding the wise management of non-renewable minerals in
Michigan’s Upper Peninsula, where the State may own previously undiscovered deposits of nonferrous metals and/or “strategic minerals” of critical value to national security.

- In the case of KLA’s lease request near Randville (“Felch Trough” formation), the potential environmental risk of mineral extraction resources remains “unknown.” Our own review of geological literature suggests that the State of Michigan would be making an extremely uninformed decision.

Once again, we are left wondering whether the DNR Minerals Management office belongs in the DNR.

The DNR’s Mineral Management office failed to demonstrate that these direct development lease requests are compatible with their mission to protect and conserve non-renewable mineral resources for current and future generations. Specifically, we find the proposed lease nominations suffer from a lack of transparency. The nominated parcels contain sensitive headwater wetlands, coldwater streams, critical habitat, and (likely) an archaeological site. The nominated minerals also impact private surface ownership.

After conducting a geological literature review, we believe the recommended lease classifications and stipulations are inadequate to protect Michigan’s natural resources from the real hazards of metallic mineral exploration and mining. No effort has been made by the DNR Minerals office to educate the public, in terms of the geology, which types of metallic minerals are targeted, and their potential value, or the environmental risks.

We urge the State of Michigan to reexamine their approach to minerals management in order to align the classification review process with the agency’s mission of resource management, and in order to fully protect Michigan’s natural resources, non-renewable resources, treaty-protected resources, and the public trust.