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KSM BRIEFER #1: MINE PROPOSAL BASICS AND CONCERNS

The Kerr-Sulphurets-Mitchell (KSM) project is a gigantic proposed open-pit and underground gold-copper-silver mine complex targeting a site amidst rugged and remote coastal mountains of northwestern British Columbia (B.C.). It is slated for headwaters of the Bell-Irving tributary of the Nass River in B.C. and the transboundary Unuk River, which flows into Misty Fjords National Monument near the southern end of Southeast Alaska's panhandle. The site is about 18 miles from the B.C.- Alaska border and Ketchikan Alaska is some 90 miles downstream of the proposed mine site. Seabridge Gold, Inc., a junior mining company, currently holds full interest in the KSM project and is seeking investment partners.

The physical size of the KSM project is projected to cover over 160 square miles, the size of a large city. Its open pit would be one of the deepest ever attempted anywhere, over twice as deep as New York's Empire State Building is tall.

The Unuk River is typically the fourth largest producer of Chinook Salmon in Southeast Alaska. It is also a major producer of eulachon, which are of significant cultural importance to the Indigenous people of the region. The Nass ranks close to the top of Canada's salmon producing systems. While the Nass watershed is completely within B.C., it is important to recognize that it also contributes significantly to Alaskan fish harvest numbers and is cooperatively managed under the Pacific Salmon Treaty.

The KSM proposal aims to develop a massive low-grade sulfide deposit with high potential for acid mine drainage and heavy metal pollution. Development of low-grade mineral deposits requires high production volumes to achieve the necessary economies of scale. KSM is considered a world-class mineral deposit, not because of the ore grade (either gold or copper) but because of its total size.

As currently proposed, KSM calls for over two billion tons of sulfide-rich, acid-generating tailings to be submerged under water within a five and a half mile long tailings impoundment**.** The tailings disposal impoundment's dam, as envisioned, would be six times taller and could hold twenty-eight times more waste than the tailings dam that failed catastrophically at the Mount Polley mine in B.C.'s Fraser River headwaters in 2014 In addition to tailings, over two billion tons of overburden including potentially acid-producing waste rock along with toxic mine waste water are also to be stored in facilities within the upper watershed of the Unuk River.

Water treatment for KSM, at an unprecedented scale and likely in perpetuity, would be incredibly challenging to implement. The project calls for the largest and most complex water management and water treatment systems ever proposed for any mine project anywhere in the world.

Selenium is a toxic element of particular concern with the KSM proposal. While the proposed technology specifically for selenium removal in water treatment has been demonstrated to be effective, it has not yet been proven at anything approaching the scale needed for this mine's

operation. Given that the KSM site is extremely wet and steep with high seismic activity, the danger of a tailings dam failure or leaks from a toxic waste rock or water impoundment are very real and the clean-up would be difficult, if not impossible.

The KSM tailings, waste rock and water management facilities would have to remain intact and hold, not just for our time but for centuries to come. Any contamination, whether chronic or acute, of either of the Unuk or Nass Rivers, would be disastrous for downstream communities and likely irreparable for many years to come if at all. Although the KSM environmental review provided risk assessments that predicted a low probability of failures, it is highly likely that during the mine's operating life mishaps and unforeseen problems will happen. No large industrial operations operate flawlessly. The question is the degree of the problems that arise and the ability to respond quickly and effectively, as well as who will be accountable and pay for such responses or even sustain necessary water treatment for generations to come.

Because of the extreme conditions to which a KSM mine would be subjected, problems must be anticipated. Given that the KSM project's primary target mineral is gold, a material not critical for the transition to a low carbon future, requiring risky massive open-pit excavations and the production of massive amounts of potentially acid generating waste, opposition to KSM, especially downstream, is extensive.

Lower Unuk River (USGS Alaska Science Center)

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KSM BRIEFER #2: GOLD IS THE PRIORITY

The gigantic Kerr-Sulphurets-Mitchell (KSM) project being advanced by Seabridge Gold, Inc. (Seabridge), a Toronto-based junior exploration company, is a proposed low-grade open pit and underground gold-silver-copper mine.

If developed, KSM would be one of the world's largest gold-copper mines. While this mine, as with other mines, will produce copper and other metals along with gold, make no mistake, the KSM Project's primary target metal is gold. The proposal has always been promoted as a gold mine and is described by Seabridge Gold, Inc. as "One of the world's largest undeveloped gold-copper projects measured by reserves." However, Seabridge has recently been referencing the mine's principal metal of importance as copper and is now calling the project a proposed "copper-gold mine." Seabridge Gold, Inc. appears to have first spotlighted KSM's copper aspect (rather than gold) in a May 29, 2023 letter to Alaska's U.S. congressional representative extolling the "virtues" of the KSM Project.

To be clear, while it is now very much in vogue for the mining industry to tout its products as critical for addressing climate change, KSM has never really been about helping the world transition to a low-carbon future. In fact, based on the most recent mine plan, the KSM project is drifting even further away from a critical minerals source (copper) than what was presented in earlier mine plans. The most recent KSM project's plan proposes to actually reduce copper production by 28% and increase gold production by 22% from what was proposed in the previous plan for the first 33-years of the proposed 52-year life of mine.

Given the projected increased length of time before KSM's most copper-rich deposits would be mined, Seabridge's recent attempts to redefine the KSM project from a gold mine into a source for providing critical green energy minerals rings hollow. The delay and reduction in copper production also appears to refute Seabridge Gold's claim in its *2020 Inaugural Sustainability Report* that "the transition to a green economy will require large amounts of responsibly produced copper and we believe that Seabridge is uniquely positioned to contribute meaningfully to this supply" (p. 66).

It is also interesting to note that the actual emphasis on copper production is not planned until after the gold-rich deposits are mined-out. Which will likely not happen for at least four decades in the future regardless of how quickly Seabridge can sell its mine plan to a major mining company, if that even happens at all. This is hardly a strong indication to believe that Seabridge

Gold, Inc. has a genuine intention of prioritizing the development of the KSM Project into a meaningful contributor to the world's supply of copper at any time soon.

So, do we really need another low-grade open-pit gold mine? In a further feeble attempt to justify development of this massive gold mine, Seabridge Gold points out in its *2022 Sustainability Report* that gold also plays a role in the green transition (p. 12).

While this is marginally true, gold is not a critical material that necessitates additional mining. There are already sufficient above ground gold reserves to supply plenty of the metal for the green transition and globally. Only about eight percent of gold demand is used for technology while the rest of the annual gold production is driven by jewelry and investment demand. It is also interesting to note that the United States actually curtailed gold mining during WWII because it was not considered critical to the war effort. Considering that we are now on a virtual "war footing" in our fight against anthropogenic climate change, reusing and recycling gold rather than digging more out of the ground would seem to be a much more environmentally and economically sound method for aiding the transition to a low-carbon future as opposed to developing giant gold mines in major salmon producing watersheds.

The construction and operation of a massive low-grade gold-copper mine in the headwaters of two renown salmon systems – the Unuk and Nass – that are of profound economic and cultural importance to downstream communities and that will also require intensive water treatment for centuries to come seems to be an extremely risky and unnecessary endeavor at best.

Mitchell Creek below the KSM mine site (Bo Meredith, Alaska Department of Fish and Game)


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KSM BRIEFER #3: A MINE OR A TOXIC WASTE GENERATOR?

The proposed Kerr-Sulphurets-Mitchell (KSM) is a northwest British Columbia gold-copper-silver mine project owned by Seabridge Gold Inc. It targets a massive low-grade sulfide ore deposit that lies within the headwaters of the Bell-Irving tributary of the Nass River and the Unuk River which flows into the Misty Fjords National Monument near the southern end of the Alexander Archipelago of Southeast Alaska. It has been described by Seabridge Gold as "One of the world's largest undeveloped gold-copper projects measured by reserves."

Development of low-grade mineral deposits requires high production volumes to achieve the necessary economies of scale. This necessitates the generation of vast quantities of tailings and waste rock to produce economically viable amounts of metals. Although we have touched on some of the issues and potential problems with the KSM project, particularly regarding waste storage and water treatment in KSM Briefers #1 and #2 (Briefers), the magnitude of the proposed waste production compared to the potential total relatively small amount of actual metal produced needs further elaboration.

To be clear, the KSM project is, of course, not just about waste. If developed, it would certainly produce valuable amounts of copper and gold in addition to some silver and molybdenum. But it is the small amount of this metal, compared to waste, that makes KSM so striking.

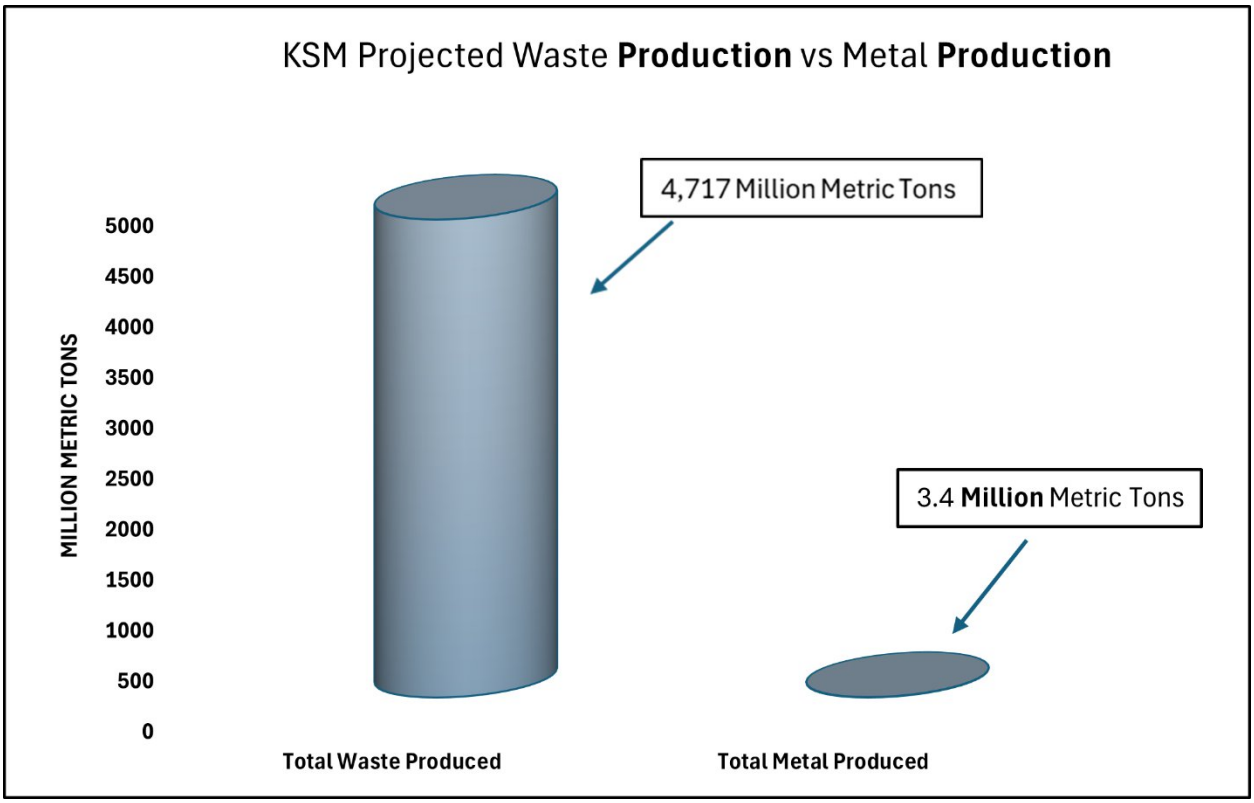
Because most of the high-grade gold and copper deposits around the world have already been mined and played out, the majority of the massive open-pit gold-copper mines in operation today are mining low-grade deposits. Nevada open-pit gold mines generally average around three grams per metric ton (0.1 oz/t), and the largest U.S. copper mines have ore grades ranging from about 0.4% to 0.6% copper.

However, most of the KSM project's estimated metal ore grades are expected to be even lower (and more waste producing) than what is being mined in other parts of North America and the world. The latest KSM mine plan is projecting the average ore grades over the first 33-year open-pit life of mine to be only 0.023 ounces per metric ton for gold (0.65 g/t) and 0.14% for copper (Mine Plan). These ore grades would make KSM one of the lowest grade mines in the world. The amount of waste that will be produced at these low ore grades is enormous. For every troy ounce of gold projected to be produced at the mine nearly forty-nine metric tons of toxic tailings waste will also be produced during the processing stage.

Moreover, before the ore can be accessed and processed the overburden soil, rock and other materials that lie above the valuable ore deposit must be removed or "stripped" off the surface to access the desired resource. The "strip ratio," or the amount of overburden by weight that must be removed in proportion to the actual ore for the KSM project is projected to be 1.06 times the weight of the targeted ore itself. So, the total actual waste generated to produce one ounce of gold will be approximately one hundred metric tons.

What this would mean in everyday terms is that to produce enough gold at the KSM mine to create one gold wedding band, which on average contains one-third ounce of gold, will necessitate the additional production of over twenty-five tons of potentially toxic overburden and process tailings waste.

Although Seabridge Gold, Inc. has always promoted the KSM Project as a gold mine, more copper is actually projected to be produced than gold. That said, the primary impetus for the KSM Project is gold. For the sake of accuracy and to give a true picture of just how wasteful this mine could be, it is important to look at the total amount of all the metal Seabridge Gold, Inc., estimates will be produced compared to the total waste generated. Again, according to the latest KSM mine plan, the total projected amount of gold, copper, silver, and molybdenum produced will be approximately 3.4 million metric tons, but the amount of tailings and overburden waste produced will be approximately 4,700 million (4.7 billion) metric tons. This is equal to approximately 1,400 tons of waste generated for every one ton of metal produced.



All the waste will be stored at the mine site. As currently proposed, about 2.3 billion tons of sulfide-rich, acid-generating tailings will be submerged under water within a proposed 9 km long tailings dump located in the upper reaches of the Nass River watershed. As planned, the tailings management facility will be constructed in three cells that will require four earthen dams, the tallest of which will be higher and wider than Hoover Dam. The tailings facility will be six times taller and could hold twenty-eight times more waste than the tailings dam that failed at the Mount Polley mine in B.C.'s Fraser River headwaters in 2014.

The overburden waste rock will be stored in both a rock storage facility and back filled into played out open pits. The storage "facility" is not a manufactured area constructed for storing waste rock generated by the mining operation but rather is merely a portion of the Mitchell Creek valley that will be used as waste rock dump that will essentially fill in the valley. A portion of the waste rock will also be backfilled into the Sulphurets Pit. The Mitchell rock storage facility will contain approximately 1.58 billion tons of rock and cover approximately 1,100 acres. Seventy-one percent of waste rock is projected to be potentially acid generating, and another 15% uncertain. It should be noted that wastewater from the storage facility will be diverted into a water storage facility and require treatment to remove heavy metals and other toxic substances virtually forever. However, any leakage of untreated water from the rock storage facility will end up in the Unuk River.

This low projected rate of metal produced at that level of waste production and the very real possibility of contaminated wastewater entering the Unuk River or Ness River systems should beg the question of why such a massive, wasteful, and potentially very environmentally damaging project should be permitted at all in such an environmentally sensitive area. Unfortunately, the KSM mine is just one of several wasteful mines targeting the watersheds of the transboundary rivers flowing out of British Columbia into Southeast Alaska.

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KSM BRIEFER #4: SUBSTANTIALLY STARTED?

On July 26, 2024, KSM Mining ULC, a wholly owned subsidiary of Seabridge Gold, Inc. received its "substantially started" determination from the British Columbia (B.C.) Environmental Assessment Office (EAO) for its Kerr-Sulphurets-Mitchell (KSM) project. KSM is a huge proposed open-pit and underground gold-copper-silver mine targeting coastal mountains of northwestern B.C., within the headwaters of both the Nass River, which lies entirely within B.C., and the transboundary Unuk River which flows into Southeast Alaska near Ketchikan.

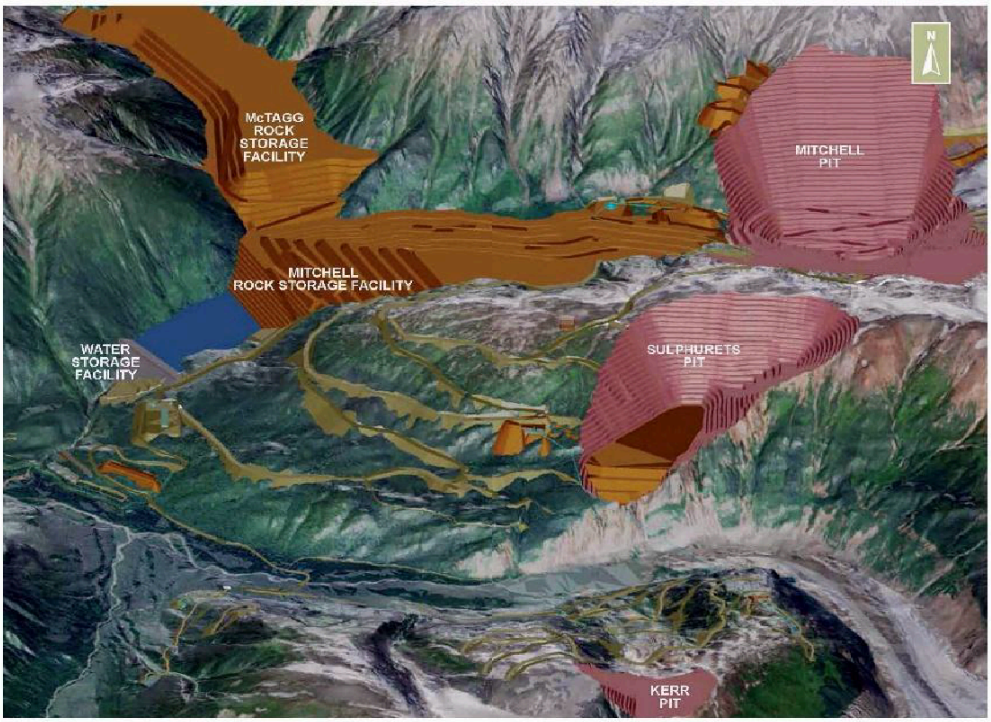
Why does this matter? According to B.C. regulations, an Environmental Assessment Certificate is the key overarching permit required for a reviewable development project to go forward. With the Certificate comes a stipulation that the project must be "substantially started" within ten years, with an opportunity for a one-time five-year extension. The rationale behind the 10-year stipulation is that environmental analyses and the studies on which they are based should be relatively current. If a project is not launched in a reasonably timely way, environmental reviews, and the studies on which they are based, should be revisited to consider changing circumstances, new data, evolving environmental concerns, etc.

However, if a project is deemed "substantially started" by the specified deadline, the Environmental Assessment Certificate remains in effect for the life of the project, be it many years or even many decades further on. Substantially started determinations pose significant environmental risk to downstream communities by fixing Environmental Assessment Certificates and project approvals in time, regardless of climate change, new scientific information, cumulative impacts, or significant regulatory reforms. For KSM, because of this determination, its Certificate now has essentially permanent status.

This means that all environmental impact analyses that are the basis of the Environmental Assessment Certificate for one of the world's largest proposed mines are now virtually locked in place. Data and studies informing the Environmental Impact Study and the Certificate approval for KSM, some already sixteen years old, are now, unfortunately, good indefinitely. These studies also took place before the disastrous Mount Polley tailings dam failure and before revamped provincial mine review processes were implemented. With climate change and fast melting glaciers (and evolving implications for salmon and other species), KSM's remote setting is in dramatic flux, an on the ground reality that can now be all but ignored by B.C. mining regulators. The supreme irony here is that B.C.'s KSM substantially started determination upends the very basis on which the policy was implemented in the first place!

B.C.'s Environmental Assessment Office Substantial Start Determination Policy sets benchmarks in a Certified Project Description (CPD) to guide decision making. Amazingly, according to B.C.'s *Analysis of a Substantially Started Determination Request* for the KSM project, "Of the 32 physical components identified in the CPD, KSM has completed construction of one permanent component…"

KSM Project Mine Site Layout during Operation Phase



Application for an Environmental Assessment Certificate/Environmental Impact Statement for the KSM Project

The decision also appears contrary to a B.C. Court of Appeal's ruling providing guidance on the meaning of "substantially started" which states: "… proponents may fail to commence a project through no fault of their own. While we might sympathize with a proponent that has tried its best but failed to make a substantial start on a project, it does not change the fact that the statutory test has not been met." In other words, the test is about on the ground progress as opposed to external factors. Regardless, B.C. made clear that part of its substantially started rationale for KSM is the fact that Seabridge, like most other mining companies, is seeking investment partners for its project.

This decision was about as rubber-stamp as it gets and calls into question if B.C.'s "substantially started" policy has any relevance to mine development and oversight. The reality is the KSM mine is not yet close to getting started.

What really matters here is whether or not B.C. is giving the KSM proposal the rigorous, thorough environmental review it warrants. This substantially started determination suggests there is reason for concern in this regard. With high stakes for salmon runs, biodiversity, and the interests of downstream communities closely tied to the Unuk and Nass watersheds, B.C.'s substantially started gift to Seabridge is nothing short of a travesty.

The Skeena Wild Conservation Trust and the Southeast Alaska Indigenous Transboundary Commission (SEITC) filed a joint legal challenge, arguing the decision was unreasonable and should be reviewed. Additionally, the Tsetsaut Skii km Lax Ha Nation has also filed a legal challenge, focusing on inadequate consultation. The challenges are ongoing.

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KSM Briefer #5: Unprecedented Water Quality Challenges

The Kerr-Sulphurets-Mitchell (KSM) project, owned by Seabridge Gold Inc., is a large-scale gold-copper-silver mine proposed for northwest British Columbia. Targeting a massive low-grade sulfide ore deposit, the mine is situated within the headwaters of the Bell-Irving tributary of the Nass River and the Unuk River, which ultimately flows into the Misty Fjords National Monument in Southeast Alaska. Seabridge Gold has described KSM as one of the world's largest undeveloped gold-copper projects measured by reserves.

KSM will require ongoing, potentially perpetual, water treatment measures. According to page 100 of the June 2014, KSM Project Assessment Report the mine will implement "the largest and most complex water management and water treatment system ever proposed for a British Columbia mine project," presenting significant challenges for implementation. The proposed water treatment throughput of up to 119,000 gallons per minute and a mean rate of 34,870 gallons per minute is unprecedented within the context of mining wastewater management.

The technology chosen for selenium removal has been successful at smaller mines, but it remains unproven at the scale necessary for the KSM operation. Seabridge's plan, approved by both British Columbia and Canadian Federal agencies, stipulates that the full-scale water treatment facility, including fully operational selenium treatment, will not be in place until five years after the mine begins full operations and selenium treatment is not even proposed at all for the Processing and Tailing Management Area. This decision seems arbitrary, based on the unrealistic and simplistic assumption that selenium toxicity won't be a problem requiring attention until after five years, and appears more influenced by mine site accessibility and infrastructure development needs than by concerns over toxic wastewater discharge into headwaters of the Unuk and Nass Rivers. There is no guarantee that the proposed selenium treatment system will function as planned, resulting in the release of higher selenium concentrations into the Unuk River watershed than projected. This five-year delay in selenium treatment also raises the question of *what happens and what solutions will be implemented should the pre-operational surface water selenium input be higher than projected?* Unfortunately, this question has been asked repeatedly by multiple U.S. and Canadian organizations without ever receiving a satisfactory answer.

During operations, water from the storage facility will be exposed to acid-mine drainage, particularly from rock storage facilities. This water, influenced by runoff from Mitchell Creek, will require treatment to remove high concentrations of metals such as copper, iron, cadmium, aluminum, and selenium before being released back into Mitchell Creek.

Seabridge asserts that all contact water from the mine site, including open pits, rock storage facilities, roads, and infrastructure will be directed to the water storage facility on Mitchell Creek via diversion tunnels and ditches. The proposed water storage facility dam will be 540 feet high and 2,100 feet wide. The company claims that polluted water will remain onsite and not enter rivers; however, uncertainties about groundwater connectivity remain unaddressed, and corrective measures are not proposed if predictions prove incorrect.

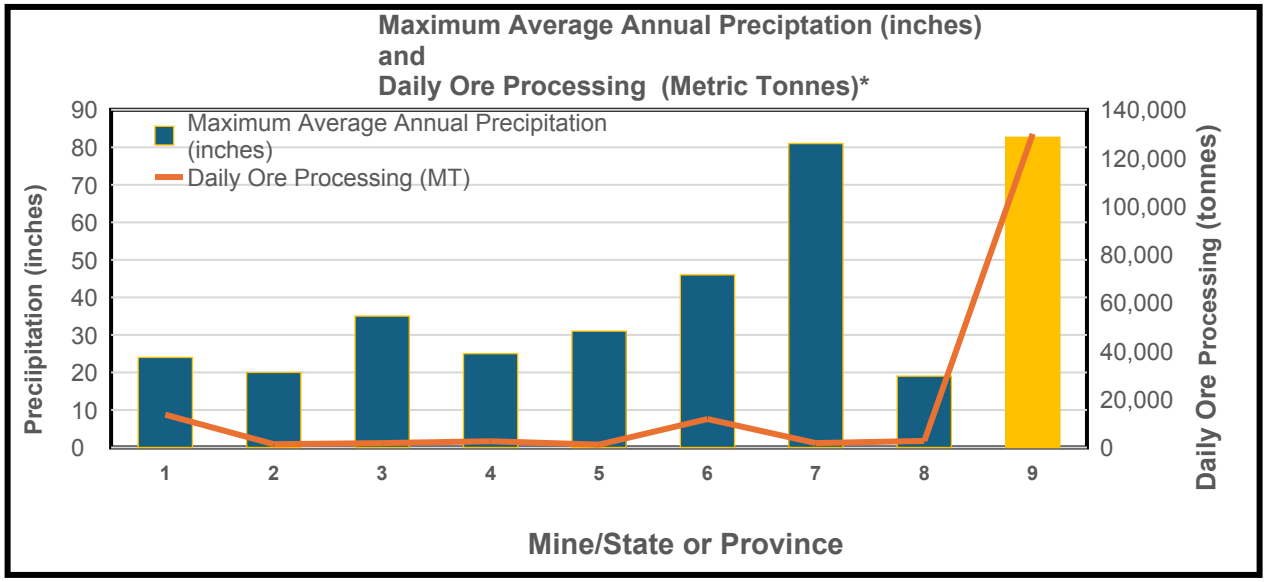
It is highly probable that, during the mine's operational life, mistakes, unforeseen shortcomings, or accidents will occur. No large industrial operation, mining or otherwise, operates without incident. The crucial factors are the severity of issues that arise and the ability to respond effectively. Given the remote setting and extreme environmental conditions at KSM, problems must be anticipated.

Treated water from the rock storage facility's water treatment system will flow into the Unuk River and eventually reach Burroughs Bay, Alaska. According to Seabridge, the facility will have irreversible impacts on these receiving water bodies. Forecasts indicate that concentrations of iron, copper, cadmium, and aluminum may exceed freshwater life guidelines by 500-fold or more, with residual effects lasting over 50 years. Remediation to baseline conditions is not expected to be feasible due to continuous loading, making these increased metal concentrations "irreversible."[1]

Even with Seabridge's stated ability to collect and treat all contact water, their own assessments predict that some pollutant concentrations will remain elevated in Sulphurets Creek and the Unuk River throughout the mine's lifespan, including after closure. Selenium concentrations may more than double the British Columbia guideline for aquatic life in Sulphurets Creek and rise above baseline levels downstream in the Unuk River.

Even if mitigation measures work as planned, a scenario not realized at nearly two-thirds of mines[2], the KSM project is expected to increase concentrations of selenium, aluminum, mercury, nitrate, and sulphate. These pollutants, individually or combined, could have various sub-lethal effects on fish populations.

The recently published *Modern Mine Study*, a review of eight U.S. mines located in seven different states prepared by Northeastern Minnesotans for Wilderness, reveals that all have caused downstream surface water degradation, and seven have negatively affected groundwater. According to the Study, at least six mines have exceeded water quality criteria or standards, and seven have surpassed permit limits. In six cases, actual water quality outcomes were significantly worse than predicted. Acid generation potential was underestimated at two sites, accurately assessed at two, and undetermined at four due to insufficient data. Four mines underestimated the potential for non-acid generating rock to leach constituents under neutral pH conditions. Additionally, six mines underpredicted the volume of water requiring treatment or discharge. The amount of ore processed daily at all the mines examined in the Study is less than 11% of the proposed daily ore processing amount for the KSM mine and the average annual precipitation is nearly double the precipitation in all except the Kensington mine in Alaska.



[1] Seabridge Gold, Inc. Application for an Environmental Assessment Certificate/Environmental Impact Statement, Ch.12, p. 77
[2] Kuipers, et. Al. *Comparison of Predicted and Actual Water Quality at Hardrock Mines: The reliability of predictions in Environmental Impact Statements. https://earthworks.org/wp-content/uploads/2021/09/ComparisonsReportFinal.pdf*

*Data from the Study and KSM environmental assessment reports.

The British Columbia Ministers of the Environment, Energy and Mines issued *Reasons for Ministers' Decision* when approving the KSM mines Environmental Assessment Certificate. The minister's opinion contained the language *"that no significant adverse effects are likely to occur"* during the construction, operation, and closure of the mine. Unfortunately, this is boilerplate language that appears in most, if not all *Reasons for Ministers' Decision* granting Environmental Assessment Certificates for modern British Columbia mines[3]. Given that most mines globally seldom meet expected water quality standards, the minister's decision appears overly optimistic or even irresponsible. Even with abundant foreknowledge that the minister's statement is rarely, if ever, true, it appears that Provincial ministries responsible for mine approvals in British Columbia routinely deny this reality. This systemic denial seems to be their standard practice.

Water discharged from the tailings facility is expected to degrade water quality in Treaty and Teigen Creeks, which are important for salmon spawning and rearing and contribute to the overall Nass River salmon production. Seabridge states that discharge from the tailings facility will meet water quality standards only after initial dilution by the receiving creek water within one hundred meters downstream of the seepage dam on South Teigen Creek and within one hundred meters of the discharge point into Treaty Creek. Nevertheless, selenium and other pollutant levels are expected to exceed baseline levels in Treaty and Teigen Creeks at various times throughout the project's life.

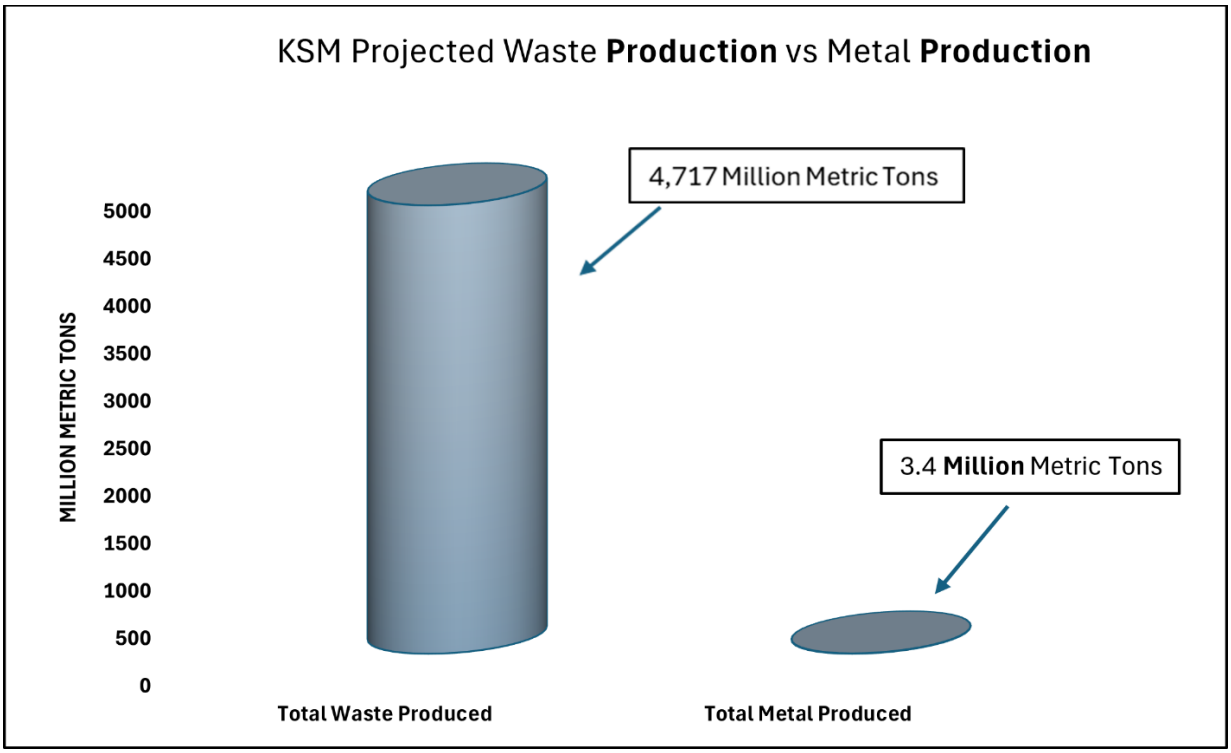
Annual dry sludge production from water treatment is projected at 74,550 tons, with a 52-year total approaching 3.9 million tons. Seabridge plans to store this highly toxic sludge in landfills at the rock storage facility for over two hundred years. The stability of the rock storage facility thus becomes even more critical, as the sludge is more concentrated and hazardous than waste rock or tailings. The requirement of monitoring water quality of wastewater entering the receiving environment for "over 200 years" is vague: it is unclear how long sludge must be securely contained and whether Seabridge has the resources and plans to ensure safe containment over centuries. It is also doubtful if perpetual water treatment is planned for selenium treatment due to conflicting statements in different KSM environmental assessment documents.

Water treatment for both the rock and tailings storage facilities will need to continue not only during mine operations but also post-closure, until discharge quality meets targets—a period projected to be 250 years. Due to numerous uncertainties and a lack of precedent, accurate predictions beyond 250 years are not possible, and it is likely that water treatment will be needed for much longer.

After mine closure, untreated water from the rock storage facility is expected to be of poor quality, containing acid mine wastes or toxins such as copper, lead, aluminum, cadmium, and selenium, and will continue to be released into the Unuk River for more than 50 years. While concentrations may be lower than during operations, untreated discharges could remain hazardous to downstream water quality and fisheries far beyond Seabridge's planned 250-year post-closure monitoring period.

The commitment to over 250 years of monitoring and post-closure activities is dubius and uncertain at best. Seabridge may no longer exist by then and changing environmental, financial, or political circumstances would jeopardize this promise.

[3] This language also appears in the *KSM (Kerr-Sulphurets-Mitchell) Project July 2014 Comprehensive Study Report* prepared by the Canadian Environmental Assessment Agency (Now named Impact Assessment Agency)


KSM Projected Waste **Production** vs Metal **Production**
MILLION METRIC TONS
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
4,717 Million Metric Tons
3.4 **Million** Metric Tons
Total Waste Produced
Total Metal Produced

RIVERS WITHOUT BORDERS
TRANSBOUNDARY WATERSHED CONSERVATION

April 28, 2026

Doug Vincent-Lang
Commissioner, Alaska Department of Fish and Game
1255 West 8th St.
Juneau, Alaska 99801

Via email: dfg.commissioner@alaska.gov

Dear Commissioner Vincent-Lang,

Rivers Without Borders is a nonprofit conservation organization working in both Canada and the U.S. to raise awareness of the outstanding ecological values of the British Columbia–Alaska transboundary watersheds and promoting ecosystem-based stewardship throughout Southeast Alaska to sustain those values.

Extensive industrial gold-copper mines are operating, being "revitalized" or are in the early planning and permitting stages in British Columbia within the watersheds of all Southeast Alaska transboundary rivers. As you know, these rivers are either subject to specific salmon harvest sharing arrangements between Alaska and Canada, as part of the Pacific Salmon Treaty (PST), or play an integral part in the coastwide abundance-based Chinook salmon harvest provisions of the PST. Notably, the Kerr-Sulphurets-Mitchell (KSM) Mine - ranked as one of the largest mine projects in the world - is being planned on the summit of the coast range east of Ketchikan. This mine will impact the upper watersheds of the transboundary Unuk River and the non-transboundary Nass River system; both of which play integral parts in the PST.

We are unaware of any Canadian federal or British Columbia environmental assessments approving transboundary mining projects that explicitly address PST Attachment E: Habitat and Restoration provisions or the proposed projects impacts on stock abundance or PST harvest-sharing arrangements. A recent example that prompted this letter is the Decision Statement issued by Canadian Minister of Environment, Julie Dabrusin, which granted approval for the Eskay Creek Project within the Unuk River watershed.[1] Although paragraph six of the Decision Statement acknowledges the likelihood of significant detrimental environmental impacts from the Eskay Creek Project, Minister Dabrusin justified her approval as being "in the public interest." Unfortunately, this interpretation of "public interest" appears to exclude the downstream, Southeast Alaska-based salmon fishing interests that operate under the harvest provisions and directives of the PST.

We believe that overlooking PST provisions in the assessment of transboundary mining projects is a significant omission that must be addressed. Greater scrutiny and formal input from the Pacific Salmon Commission (PSC) are needed. The scale of potential mining-related habitat degradation and associated environmental harm could be catastrophic, possibly irreparable, and far exceed any negative impacts resulting from fishing activities. Mining impacts may include but are not limited to acute or chronic heavy metal contamination, persistent acid mine drainage, tailings or waste rock dam failures, and catastrophic

[1] https://iaac-aeic.gc.ca/050/documents/p82839/164703E.pdf

landslides. These could cause immediate or long-term harm to PST fisheries and could extend to shellfish, groundfish, and even Gulf of Alaska fisheries.

We respectfully ask that, as Alaskan PSC Commissioner, you encourage the Commission to add transboundary mining discussions to PSC annual meetings. The PSC could at least provide a briefing to the parties on habitat matters, which they appear to commit to in the PST Attachment E at *2(b) periodically review and discuss information on the habitat of naturally spawning stocks subject to this Treaty … any non-fishing factors that affect the safe passage or survival of salmon*. If concerned about how a project might impact fish and habitat, the PSC could share a unified statement to that affect with government officials. This could also help provide important, factual information about salmon under the PSC's jurisdiction for stakeholders who may wish to provide public comments.

To resolve these issues, we suggest arranging formal presentations to the Transboundary Panel, joint meetings with relevant committees, or during plenary sessions at the PSC annual meetings. These would allow for comments to be submitted to the Canadian Impact Assessment Agency and BC Environmental Assessment Office. The only known "organized" discussions on transboundary mining we are aware of is a briefing to the Transboundary Panel members over ten years ago, and an update that followed and was held off campus during a treaty negotiating session.

As a retired Petersburg-based ADFG commercial fisheries biologist and a former member of the PSC Transboundary Technical Committee, the Chinook Technical Committee, and the Transboundary Panel, I understand and appreciate the Commission's existing workload, time constraints, and possible reluctance to take on additional responsibilities. Nevertheless, the ongoing and prospective mining projects in the transboundary river drainages represent a serious and ongoing threat to the health and sustainability of fisheries resources in these river systems.

Thank you for considering our concerns and recommendations. We recognize that what we are asking represents a significant addition to the PSC process. However, we believe these steps are necessary to protect the interests of stakeholders in Alaska who stand to lose the most from adverse mine-related impacts that could devastate their economic and cultural wellbeing.

Sincerely,

Brian Lynch

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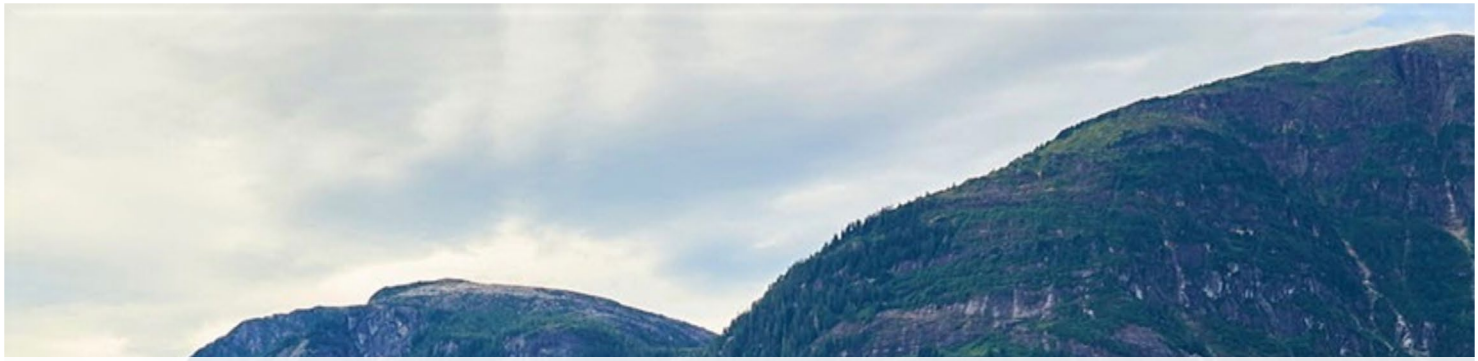


MASSIVE PROPOSED KSM MINE THREATENS ALASKA – BRITISH COLUMBIA SALMON RIVERS

Fall 2021 (Updated August 2023)

RIVERS WITHOUT BORDERS
TRANSBOUNDARY WATERSHED CONSERVATION

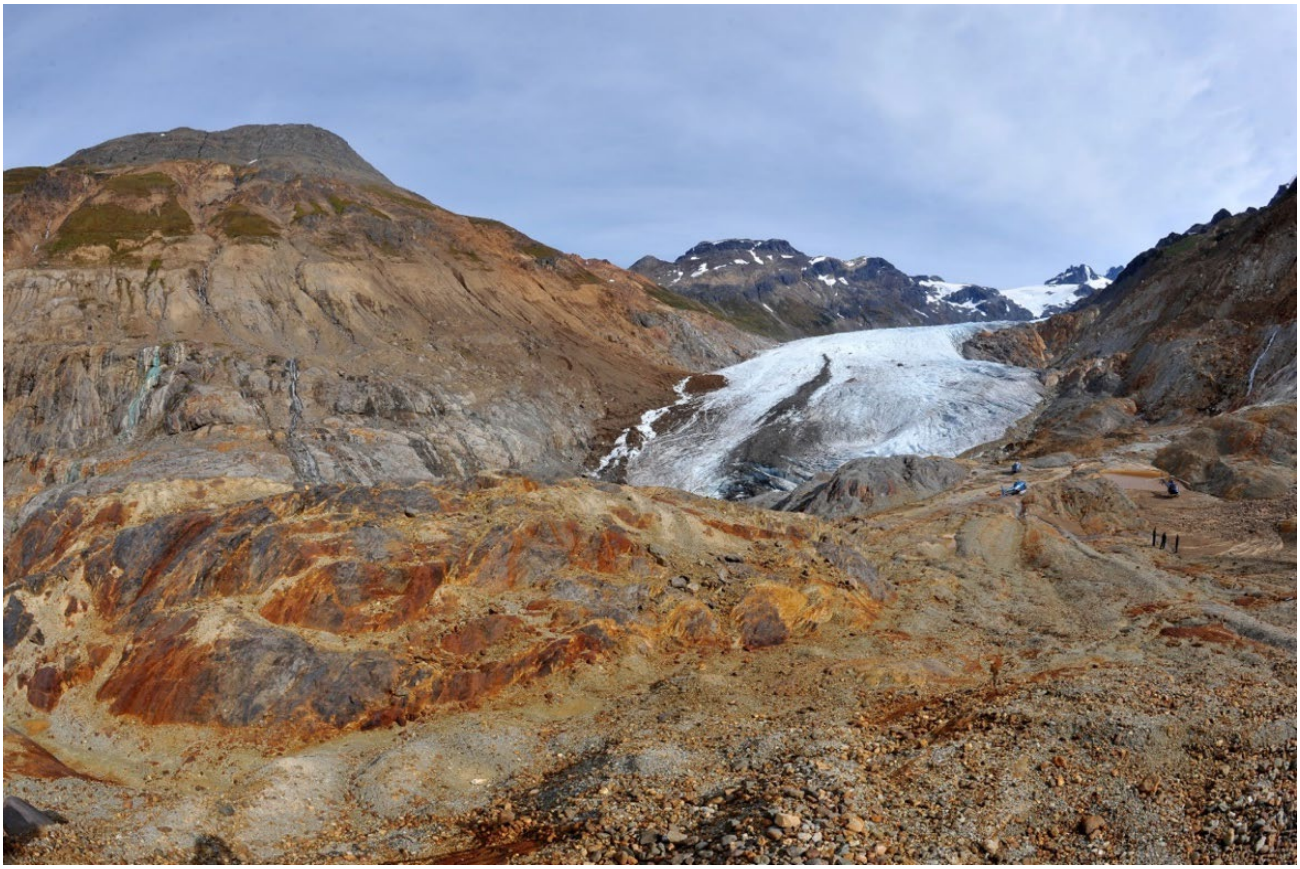
Misty Fjords National Monument, downstream from the proposed KSM mine. Photo: Aubrie Pick for Lonely Planet

PROJECT DESCRIPTION

Kerr-Sulphurets-Mitchell (KSM) is a giant proposed open-pit and underground copper-gold-silver mine. Located in the remote and rugged coastal mountains of northwestern British Columbia (B.C.), it lies near the headwaters of the Bell-Irving tributary of the Nass River and the Unuk River, which flow into the Misty Fjords National Monument near the southern end of the Alexander Archipelago of Southeast Alaska. The site is approximately 65 km north of Stewart, B.C. and within 30 km of the B.C.-Alaska border. Ketchikan Alaska is about 150 km downstream of the proposed mine site. Seabridge Gold currently holds 100% interest in the KSM project.

The Unuk River is historically the fourth largest producer of Chinook Salmon in Southeast Alaska.[1] It is also a major producer of eulachon, which are of significant cultural importance to the Indigenous people of the region.[2] The Nass is the third largest salmon producing river in B.C. and supports significant commercial, sport, and traditional fishing. The Bell-Irving is a major tributary to the Nass, supports significant sport fisheries, and contributes to the overall run of Nass fish.[3] While the Nass River watershed lies completely within British Columbia, it is important to recognize that the Nass contributes significant numbers of fish to Alaska fishermen and is cooperatively managed under the Pacific Salmon Treaty.[4]

If developed, KSM would be one of the world's largest gold-copper mines, processing approximately 2.15 billion tons of ore. It is described by Seabridge Gold as "One of the world's largest undeveloped gold-copper projects measured by reserves." Seabridge's latest estimates of proven and probable reserves are 38.8 million ounces of gold, 10.2 billion pounds of copper, 183 million ounces of silver and 207 million pounds of molybdenum.[5]



Looking East toward the Iron Cap Deposit (Seabridge Gold)

The KSM Project is a low-grade massive sulfide deposit, with high potential for acid mine drainage and heavy metal pollution. Development of low-grade mineral deposits requires high production volumes to achieve the necessary economies of scale. The latest estimate of the Project's cost is US $5.5 billion.[6] KSM is considered a world-class mineral deposit, not because of ore grade (for either copper or gold) but because of the total ore amount. The company's copper grade in mineral resources (indicated and inferred) is only approximately 10% of the

lowest grade in the top ten copper mines in the world. For example, the KSM copper ore grade is only 0.18% while the Antas Mine in Brazil has a copper ore grade of 2.5%. Even the Iron Cap underground deposit, which has the highest grades within the KSM project, is still only approximately 0.25% copper ore grade. The low ore grade is one reason that KSM's economics are shaky at best, and the associated high cost and extensive waste pose a significant cause for concern.

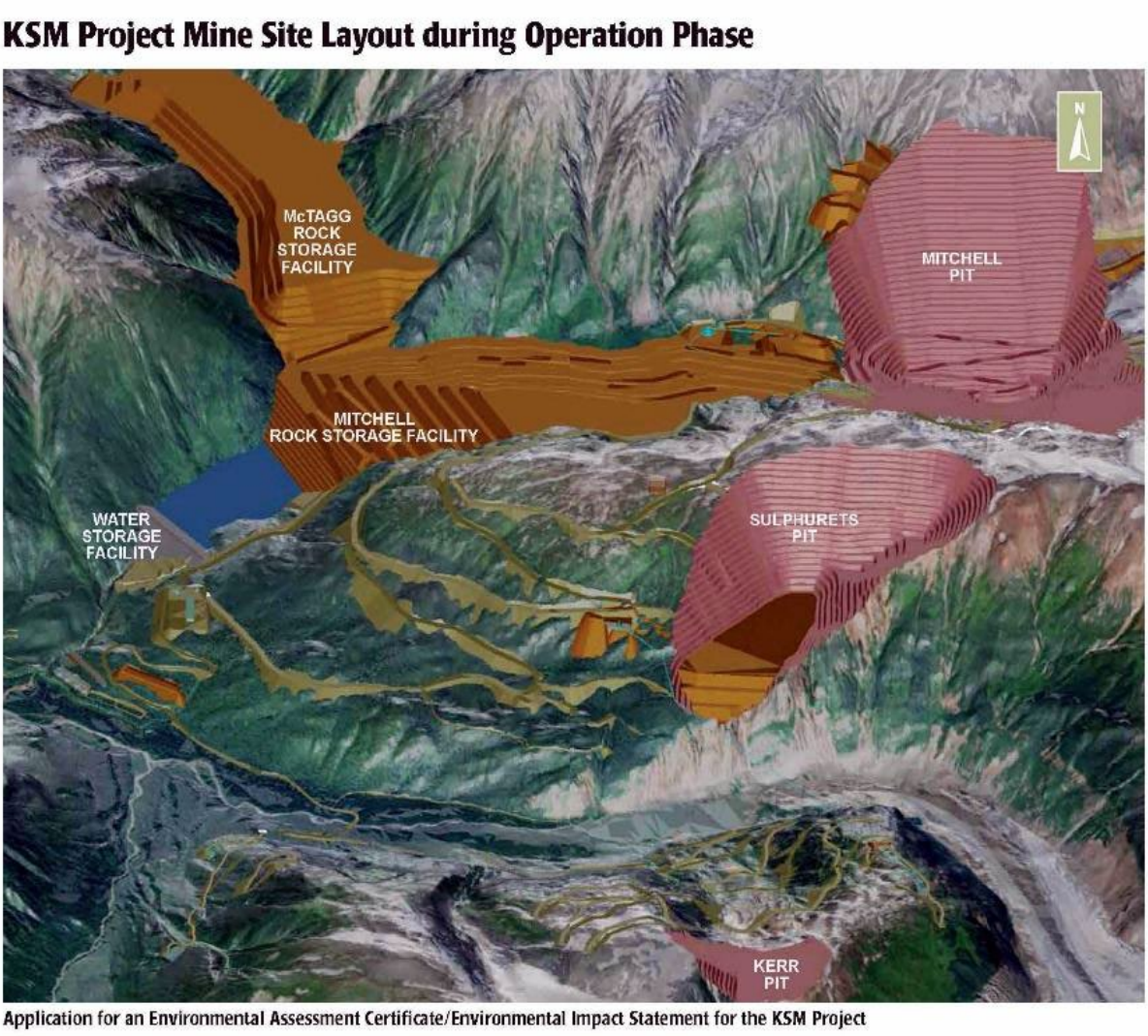
The mine is expected to process up to 180,000 tons of ore per day over a mine life of 52 years[7]**.** The potential projected waste rock from the open pit portions of the mine resulting from this level of production is estimated by Seabridge to be over 2.5 billion tons and is based on the mine's measured and indicated mineral resources.[8,9] However, based on the projected ore tonnage and strip ratios[a] provided in the KSM Environmental Impact Statement and Pre-Feasibility Study documents,[10,11] the actual amount of waste rock produced in the open pits is likely to be over 4 billion tons. If the inferred resources are also included in the calculation, the open pit waste rock produced could exceed five billion tons[b]. The waste rock produced in the underground portion of the KSM project has not been provided here because that waste is proposed to be backfilled into the mine after the metal ore has been removed. If the underground waste rock is included in the total, the KSM project could generate waste rock exceeding six billion tons. Of the total waste rock by weight, 71% is projected to be potentially acid generating, and another 15% uncertain.

The mine is also expected to produce an estimated 2.3 billion tons of acid-generating tailings. Waste rock is the overburden removed to access the ore while tailings are the materials left over after the process of separating out metals from the ore.

The KSM project is made up of 117 separate claims and includes four major mineralized zones, identified as the Mitchell, Kerr, Sulphurets, and Iron Cap deposits. The Mitchell pit would be among the deepest mine pits, if not the deepest, in the world. The deposit developments are planned as a combination of open pit and underground mines. The Sulphurets zone is purely open pit, the Mitchell and Deep Kerr zones are combinations of open pit and underground mines, and the Iron Cap deposit is purely underground. The initial mine plan assumed that during the first 33 years of mine life the majority of ore would be derived first from open pit mines and the Iron Cap deposit would be the last deposit of four to be mined**.**[12] However, recent drilling has shown the Iron Cap zone ore grade and size to be increasing. As a result, this zone could possibly be the first to be developed.

The mineral deposits are bounded to the north, east, and south by glaciers and ice fields. Seabridge has suggested that receding glaciers could allow an expansion of the KSM project. The nearby Brucejack mine recently announced a 40% expansion. As far as we know there has been no analysis of the possible impacts of these expansions.

[a] The strip ratio is the ratio of waste rock to metal ore.
[b] Mineral resources are classified as to their level of geological knowledge and confidence with measured resources at the highest level and inferred at the lowest level.



KSM Project Layout During Operation Phase (Seabridge Gold)

ABOUT SEABRIDGE GOLD

Founded in 1999, Seabridge Gold is a Toronto-based publicly traded junior gold exploration company. Its business strategy is to evaluate, acquire, explore, and develop gold deposits in a rising gold price market, then sell or partner on assets ready for production. Seabridge plans to obtain certificates and permits for KSM, and then sell the project to a major mining company. On October 1, 2018, the Assistant Deputy Minister of the Environmental Assessment Office gave consent to transfer the Certificate for the Project from Seabridge to KSM Mining Unlimited Liability Company, a wholly owned subsidiary, and amended the KSM Environmental Certificate.

ENVIRONMENTAL STUDIES COMPLETED AND PERMITS RECEIVED

The B.C. government issued its approval of the mine and an Environmental Assessment Certificate in July 2014. This was done under the old and widely criticized B.C. Environmental Assessment Act, which was revised in 2018. An Environmental Assessment Certificate can be extended for a one-time 5-year period before a "substantially started" determination associated with the construction of a project must be received from the B.C. Provincial Government. The Province granted this extension in March 2019.

Canada's federal government issued its Comprehensive Study Report in July 2014 and approved the mine in December 2014. As was the case under the B.C. Environmental Assessment Act, this study was done under the flawed previous Canadian federal Environmental Assessment Act, which was revised in 2018. In doing so, Canada rejected calls for a "Panel Review" of the mine project from many individuals and organizations in Canada and Alaska along with the State of Alaska, Alaska's congressional delegation, state legislators, Alaska municipal governments, Indigenous leaders, fishing organizations, and tourism operators.[13] Canadian mine proposals that pose significant risks, like KSM, can be subject to the independent, expert scrutiny of a Panel Review—the highest level of environmental review under Canadian law. For example, a Panel Review was established for the New Prosperity Mine, located in South Central B.C., due to concerns about water quality, fish and fish habitat, grizzly bears and Aboriginal rights and title. The issues with KSM are similar, but KSM is twice the size of New Prosperity with potential international impacts.

Both the B.C. and Canadian federal approvals came prior to the January 30, 2015, Mount Polley Review Panel's report. The report found that unless significant changes are made in the way B.C. tailings dams are designed and maintained, more failures like the summer 2014 Mount Polley mine disaster can be expected. The report's principal recommendation calls for an end to outdated "hundred-year-old" wet tailings storage, which KSM will use, and conversion to "dry stack" tailings systems. KSM's watered tailings dump flies in the face of the Mount Polley Expert Panel, which wrote, "Mount Polley has shown the intrinsic hazards associated with dual-purpose impoundments storing both water and tailings."

B.C. issued an approval under the International River Improvements Act for the construction, operation and maintenance of a water storage facility and ancillary water works in the Unuk River watershed in November 2016. Amendments to Schedule 2 of the Metal Mining Effluent Regulations were also granted in June 2017 for use of South Teigen Creek and North Treaty Creek (both located in the Nass/Bell-Irving watershed) for the disposal of mine wastes. Numerous additional permits will be required for the actual mine construction and operations.

THREATS TO SALMON AND WATER QUALITY IN B.C. AND ALASKA

The footprint of the permitted KSM project encompasses an area of approximately 128,300 acres. The project sits within the headwaters of two salmon-bearing watersheds: the Unuk River, which flows out of B.C. into Alaska, and the Nass River system that flows solely through B.C.

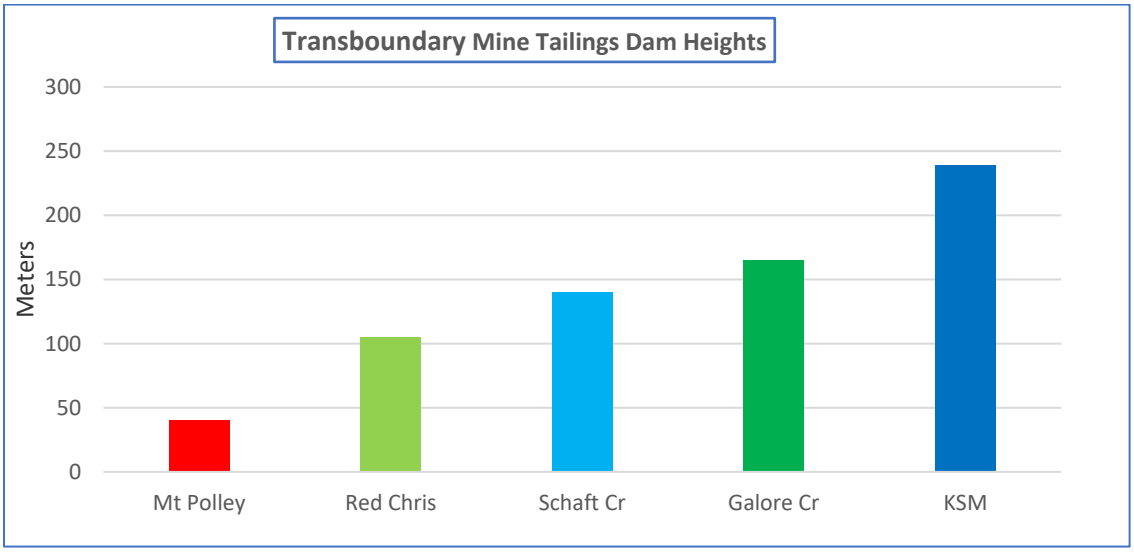
Given that these rivers flow through two different countries, the project would have impacts on both sides of the U.S.-Canada border throughout the southern transboundary region. Acid mine drainage and dissolved metals contamination will be long-term concerns.

Lower Unuk River (USGS Alaska Science Center)

Tailings Management Facility

The proposed process plant site and tailings management facility will be located between Teigen and Treaty Creeks, which support high fish values and drain into the Bell-Irving River, a Nass River tributary that provides spawning and other habitat for Chinook, Coho and Sockeye Salmon, Steelhead, Rainbow and Bull Trout, Dolly Varden char and Mountain Whitefish. The tailings management facility will be constructed in three cells that will require four earthen dams. The tallest dam will be nearly 790 feet high and 4600 feet long; taller and wider than Hoover Dam.[14]

As currently proposed, about 2.3 billion tons of sulfide-rich, acid-generating tailings will be submerged under water within a proposed 9 km long tailings dump.[15] The facility is six times taller and could hold 28 times more waste than the tailings dam that failed at the Mount Polley mine in B.C.'s Fraser River headwaters.[16] Given that the KSM site is extremely wet and steep with high seismic activity, the danger of a tailings dam failure or leaks from a toxic tailings impoundment are very real and the clean-up would be difficult, if not impossible. A KSM tailings management facility would have to remain intact and hold, not just for our time but for centuries to come.



The potential environmental consequences could be catastrophic. A tailings management facility failure or acute or chronic mine-related contamination could negatively impact downstream fisheries, as well as the thousands of families in B.C. and Alaska that are dependent on these resources. Since this will be an acid generating mine, such a failure would be far more lethal to salmon and likely have more long-term negative consequences than the Mt. Polley disaster.[c]

The Bell-Irving River supports world-class salmon and steelhead angling and contributes to the overall productivity of the Nass system. The Nass River is B.C.'s third largest salmon producing river and produces fish that are caught by both Canadians and Alaskans. Under provisions of the Pacific Salmon Treaty, a harvest sharing agreement for Nass River sockeye exists between Alaska and Canada. The impacts of contamination or a tailings management facility failure on the Nass River watershed could affect both B.C. and U.S. residents. Any failure of the KSM tailings management facility or chronic mine contamination could severely impact commercial Sockeye fisheries on both sides of the border.

[c] Although the KSM Environmental Assessment Certificate was granted prior to the Mt. Polley disaster, the use of watered tailings technology approved for KSM is contrary to one of the main recommendations of the January 30, 2015 *Independent Expert Engineering Investigation and Review Panel Report On Mount Polley Tailings Storage Facility Breach.*

The Mount Polley disaster showed that there are no insurance policies, bonds or funds that will compensate those harmed by a mining disaster. Nor are companies required to post a bond for cleanup of a disaster; the bonds only cover the normal mine reclamation process. Although Seabridge does have liability estimates, the company has not released them.[17]

Waste Rock Storage Facility

Waste rock will be stored in areas referred to as rock storage facilities. These storage "facilities" are not man-made areas constructed for storing waste rock generated by the mining operation but rather are merely portions of the Mitchell Creek and McTagg Creek valleys that will be used as waste rock dumps that will essentially fill in both valleys. A portion of the waste rock will also be backfilled into the Sulphurets Pit. The Mitchell rock storage facility will contain approximately 1.58 billion tons of rock and cover approximately 1,100 acres. The McTagg rock storage facility will hold 0.76 billion tons of waste rock and will cover about 617 acres.[18] Seventy one percent of waste rock is projected to be potentially acid generating, and another 15% uncertain.

Water Storage Facility and Water Treatment Systems

KSM will require unprecedented water treatment, likely in perpetuity. The mine will use "the largest and most complex water management and water treatment system ever proposed for a B.C. mine project, [which] will be very challenging to implement"[19]. The technology for selenium removal is not yet proven at the scale needed for mine operation.[20]

Seabridge claims all contact water from the mine site areas (open pits, rock storage facilities, roads, and infrastructure) will be directed to the water storage facility on Mitchell Creek through a series of diversion tunnels and ditches.[21] The dam here will be 540 feet high and 2,100 feet wide. Seabridge says polluted water will remain on site and will not get into the rivers but does not address the uncertainty of groundwater connectivity, nor are corrective measures proposed if this prediction is wrong. It is highly likely that during the mine's operating life, mistakes and unforeseen shortcomings or accidents will result. No large industrial operation, whether in the mining sector or not, operates flawlessly. The question is the degree of the problems that arise and the ability to respond quickly and effectively. Given the extreme conditions to which a KSM mine would be subjected, problems must be anticipated.

During mine operations water from the water storage facility will be subjected to acid-mine drainage, particularly from the rock storage facilities, which will be exposed to runoff from Mitchell and McTagg Creeks. This water will need to be treated to remove highly concentrated metals such as copper, iron, cadmium, aluminum, and selenium before being released back into Mitchell Creek.

The treated water from the proposed water treatment facility associated with the rock storage facility will flow downstream into the Unuk River and eventually into Burroughs Bay, Alaska. According to Seabridge, the facility will have irreversible impacts on the receiving water bodies:[22]

> "Concentrations of iron, copper, cadmium, and aluminum are forecast to exceed guidelines for freshwater life by 500-fold or more…. The duration of the residual effect will be greater than 50 years … Remediation to baseline conditions is not expected to be feasible due to ... continuous loading."

Therefore, the forecast increased metals concentrations are considered to be "irreversible" to baseline conditions.

Mouth of the Unuk River (Bo Meredith, Alaska Department of Fish and Game)

When operating, the water treatment facility will need to treat up to 119,000 gallons of water per minute, a treatment throughput rate that has never been attempted at any other mine anywhere in the world.[23] The proposed mean treatment rate is 34,870 gallons per minute. The B.C. Environmental Assessment Office says the treatment system is unproven at operational scale and "should be considered an uncertainty"[24]. However, Seabridge's plan approved by both B.C. and Canada is to not test the full-scale water treatment facility with fully operational selenium treatment until the mine has been operating for five years.[25]

Regardless of Seabridge's ability to collect and treat all mine site contact water, the company's own assessment predicts that concentrations of some pollutants will remain elevated in Sulphurets Creek and the Unuk River throughout KSM's lifespan, including after closure. Selenium concentrations are predicted to increase in Sulphurets Creek possibly to more than double the B.C. water quality guideline for aquatic life (2 ppb) and to rise above baseline levels in the Unuk River downstream to Alaska.[26]

Even if Seabridge's mitigation measures work as planned, a situation that does not occur at 64% of mines,[27] the KSM project is expected to increase concentrations of not only selenium, but

aluminum, mercury, nitrate, and sulphate as well.[28] Such concentrations, either alone or in combination, could have a variety of sub-lethal effects on fish.[29]

Water discharged from the tailings facility is expected to degrade water quality in Treaty and Teigen Creeks, both of which provide important spawning and rearing habitat and contribute to the Nass River's overall salmon production.[30]

Seabridge says the discharge from the tailings facility will meet water quality standards only after initial dilution by receiving creek water within 100 meters downstream of the seepage dam on South Teigen Creek and within 100 meters of the discharge point of the tailings management facility pipeline into Treaty Creek during operation, closure, and post-closure phases of the Project.[31] Seabridge also expects that the levels of selenium and other pollutants will rise above baseline levels in Treaty and Teigen Creeks at various times over the life of the project.[32]

Water treatment for both the rock storage facility and tailings storage facility will need to operate not only for the life of mine operations, but also for a period after mine closure "until discharge quality meets targets"—projected to be 250 years. The KSM assessments could not make any accurate predictions beyond 250 years due to the numerous uncertainties and lack of mine post-closure precedent of that duration. In fact, it is likely water treatment will be needed for a much longer period.

It is highly likely that untreated water from the rock storage facility after mine closure will be of poor quality, containing acid mine wastes or toxins such as copper, lead, aluminum, cadmium and selenium, and will continue to be released into, and remain persistent in the Unuk River, for greater than 50 years and is considered "far-future".[33] While these post-closure metal concentrations may be lower than during the mine operations, the untreated discharges could remain dangerous to downstream water quality and fisheries long past Seabridge's plans for 250 year post-closure monitoring.

The commitment to 250 plus years of monitoring, and other post-closure activities seems questionable given that Seabridge will likely be long-gone and environmental, financial and/or political changes could render the commitment meaningless.

Annual dry sludge production from water treatment is predicted to be 74,550 tons, for a 52-year total of almost 3.9 million tons. Seabridge plans to store this sludge in landfills constructed on top of the rock storage facility "for over 200 years." This makes the stability of the rock storage facility even more critical than if they were just storing waste rock or tailings as this sludge is highly concentrated and toxic. The standard of "over 200 years" is extremely vague. For how long must the sludge be securely contained? Does Seabridge have the plans and funding to ensure this in the likely event that access, and monitoring would be needed for many centuries?

Mine Dam Failures

Tailings dam failures are not as rare as some may believe. One 2012 peer-reviewed study of currently operating copper mines in the U.S. found that 28% experienced partial or full tailings dam failure.[34] The Mount Polley Review Panel in 2015 concluded that unless significant changes

are made to the way tailings dams in B.C. are designed, built, and managed, failures will happen again to the tune of two dam failures on average every ten years. The Panel wrote:

> *"Tailings dams are complex systems that have evolved over the years. They are also unforgiving systems, in terms of the number of things that have to go right. Their reliability is contingent on consistently flawless execution in planning, in subsurface investigation, in analysis and design, in construction quality, in operational diligence, in monitoring, in regulatory actions, and in risk management at every level. All of these activities are subject to human error."*

A dam failure at KSM could cause dramatically worse damage than Mount Polley due to the presence of acid-generating tailings and toxic heavy metals. As the Panel noted: *"although the tailings released at Mount Polley were not highly reactive, it is sobering to contemplate the chemical effects had they been."*

In 2013 Seabridge contracted a dam failure analysis for both the water storage facility on the Unuk River side, and the tailings management facility on the Nass River side. After conducting a dam failure modeling exercise, Seabridge Gold concluded that—among many other consequences—a failure of the Southeast Dam would flood Highway 37 along the Bell-Irving and Nass Rivers along with existing and proposed infrastructure. Main dam failure has the potential to send a 20-to-36-foot flood wave toward the confluence of the Bell-Irving and Nass Rivers. Based on size and storage capacity, the Canadian Dam Association guidelines assigned three of the four proposed dams (including the Southeast Dam) a failure consequence classification of "Extreme."[35]

While Seabridge's dam failure modeling did address the effects on communities and acknowledged that the safety of communities and infrastructure residing within the flood impact area is of critical concern, Seabridge did not consider the effects of massive flooding on river habitat health and salmon mortality.

Acid Mine Drainage, Toxic Heavy Metals and Salmon

Acid mine drainage increases the concentrations of toxic metals in water. While there is a great deal of scientific information available that describes the concentrations of metals that are acutely or immediately toxic to aquatic life, information is now emerging about the disturbing sub-lethal or chronic effects (negative impacts that do not cause direct death) from extremely low metal concentrations, sometimes below water quality standards.

SkeenaWild Conservation Trust undertook an extensive review of existing scientific studies. and compared the results to the metal contaminants Seabridge Gold Inc. proposes to release into the Unuk watershed.[36] The report shows the KSM mine would release metals into the Unuk watershed that would exceed levels known to have serious impacts on salmon. The review's author, Michael Price, concluded that *"Salmon and trout exposed to these concentrations have shown habitat avoidance, impaired olfaction (smell), migratory disruption, impaired predator response, reduced growth and swim speed, increased stress, impaired reproduction, and death.*"

Recent studies have shown that the presumed effect concentrations are not fixed but are dependent upon other water quality factors such as hardness, pH, and dissolved organic carbon.[37] Additionally, studies on the effects of multiple metal discharges on fish and aquatic food chains are limited but show complex chemical interactions that can be difficult to predict. Concentrations of elements comprising mixtures will vary in space and time and cause higher rates of mortality in fish than expected for each element alone. For example, interactions between copper and zinc can be more than additive, with mixtures of the two metals causing higher rates of mortality in fish than expected based on each element alone.[38]

Confluence of Sulfurets Creek and the Unuk River (Bo Meredith, Alaska Department of Fish and Game)

Selenium

Selenium is found in metal sulfide ores and is a common waste product from mines. While trace amounts of selenium are necessary for cellular function in many organisms, in higher concentrations it is an environmental contaminant. It has been known for some time that selenium pollution is a worldwide phenomenon and the threat of widespread impacts to aquatic life is significant. Selenium is bio-accumulated in aquatic habitats, which can result in higher concentrations in organisms than the surrounding water.[39] According to a 2004 article in the journal Ecotoxicology and Environmental Safety "*…selenium may pose the most serious long-term risk to aquatic habitats and fishery resources [and] once selenium contamination begins, a cascade of bioaccumulation events is set into motion which makes meaningful intervention nearly impossible."*[40]

Fish affected by selenium may experience reduced respiration, degeneration of liver tissue, swelling around the heart, damaged egg follicles in ovaries, cataracts, and accumulation of fluid in the body cavity and head. Selenium often causes a malformed fish fetus which will likely have

problems with feeding and respiration. Distortion of the fins or spine is also common. Adult fish may appear healthy despite their inability to produce viable offspring.

B.C.'s water quality guidelines recommend selenium levels not exceed 2 ppb and drinking water not exceed 10 ppb. In the U.S., the Environmental Protection Agency's guidelines set safe limits for aquatic life at 3.1 ppb in riverine environments (1.5 ppb in still water).

Seabridge is required to operate a full-scale selenium ion-exchange treatment plant at a throughput of five hundred liters per second by year five of mine operation to treat water seepage from the Mitchell and McTagg waste rock storage facilities.[41] The first full-scale ion-exchange selenium treatment plant was commissioned and became operational at the Kemess Mine in north-central B.C. in late fall of 2020. While the treatment plant successfully completed its Performance Test and did reduce the selenium concentration in the input water to below the Canadian water quality standard of 2 ppb, the plant was constructed to treat water volumes of approximately seventy-five liters per second or only 15% of that planned for KSM (Personal communication, David Kratochvil, BQE Water). It is not clear at this time how the KSM mine operations and the receiving environment in the Unuk River watershed will be affected if this selenium treatment plan is not successful operating at that high rate of throughput. Due to the Covid-19 pandemic, the Kemess mine has since been demobilized and placed in care and maintenance for an unknown period.

There is currently severe ongoing selenium pollution of the Elk River originating from Teck Resources' coal mines in B.C.'s Elk River valley. The Elk River is a transboundary river that flows from B.C. into Montana. Measurements taken throughout the Elk River watershed downstream of the mines have found selenium levels in excess of twenty times B.C.'s water quality guidelines, while selenium levels found upstream of the mines are within those guidelines.[42] Attempts by Teck to treat the mine effluent water and stem the selenium pollution after spending hundreds of million dollars over the past several years have failed.

POST CLOSURE COSTS AND ISSUES

KSM's closure costs are estimated at $132 million.[43] It is estimated that post-closure water treatment for 200 years will cost $5.4 billion.[44] These costs do not include replacement costs which would be expected to occur over the life of the water treatment plant including replacement of moving parts (every 10 years), stationary parts (every 20 years) and plant itself (every 50 years), for example.[45]

However, since B.C. does not require mining companies to post a full bond up front, Seabridge proposes to only post a bond of CA $900 million (US $688 million), only 16% of the estimated costs for mine closure and long-term water treatment.[46] Seabridge proposes to post the rest of the needed funds throughout the 52-year life of the mine.[47,48] A financial security based on a 2.5% discount rate consistent with B.C. guidance would be approximately $1.3 billion."

If Seabridge goes bankrupt or is otherwise unable to pay its bills then reclamation, cleanup and long-term monitoring and maintenance will either become a taxpayer responsibility or will not

be done. A similar situation is currently happening with the Tulsequah Chief mine in the Taku watershed. The Mount Polley disaster showed that there are no insurance policies, bonds or funds that will compensate those harmed by a mining disaster. Additionally, companies are not required to post a bond for cleanup of a disaster; the bonds only cover the normal mine reclamation process. Although Seabridge does have liability estimates, they have not been released.[49] To ensure it is able to pay the full costs of its operations, Seabridge should be required to post a bond sufficient to cover mine closure, long term water treatment and other needs and should provide some type of financial security to cover unexpected events and compensation for those affected.

As part of the environmental assessment Seabridge analyzed alternatives to the proposed mine plan.[50,51] However, this was not used to determine closure and reclamation plans. A more comprehensive assessment should have been conducted and that analysis should have been used to decide closure and reclamation plans. Mine closure and post-closure costs seem to have been deemed as less important than up-front costs in the tailings facility alternatives assessment.

Mitchell Creek below the KSM mine site (Bo Meredith, Alaska Department of Fish and Game)

INADEQUATE RISK ASSESSMENT

The Environmental Assessment process looks at risk as line items, each with a predicted rate of failure and degree of damage. No single action is rated as a significant risk but there are hundreds of 'likely to probable" risks. A much more meaningful and informative risk analysis would be to model the multiplicity of risks rather than the risk of singular isolated events. As it

stands, the risk analysis does not take into consideration cascading failures, the probability of which increases with the size and complexity of the operation. A correct risk assessment would consider and factor in all the subsystems and risk factors and examine the cumulative risk of all the systems that must work together for the mine operations to function correctly.

ROADS, POWERLINES AND WILDLIFE

The proposed KSM project will lead to the construction of new roads through prime grizzly bear and mountain goat habitats, including an access road extending from the Eskay Creek Road, and a bridge across the Unuk River. On Highway 37, about forty trucks per day, year-round and in all weather, will transport concentrate from the mill to the deep-water port at Stewart, B.C. This high industrial usage on a wild and remote road system will likely result in multiple accidents and collisions with animals and potentially cause spills and the contamination of soil, groundwater, and surface water. Roads are also known to disrupt wildlife movements between connecting habitats and populations. Road corridors can become barriers, blocking, or selectively filtering important population movements.

According to the KSM Comprehensive Study Report, in addition to mine and access road construction and operation, a 287-kilovolt electrical power transmission line connected to the Northwest Transmission Line will also be required for mining operations. Power lines can directly and indirectly negatively impact wildlife populations and their survival, reproduction, movements, and migrations. Direct impacts can result in mortalities from collisions, while indirect mortalities can result from processes that are altered by the presence of powerline infrastructure.

CUMULATIVE IMPACTS

As a result of climate change, receding glaciers are opening up even greater area for mineral exploration in the Alaska-B.C. transboundary region. Although there are currently only two fully operational metals mines within this area (Brucejack and Red Chris) exploration has greatly increased in recent years. While it is true that a minority of mineral exploration results in actual mine development, it is vital that the potential cumulative impacts of the current and projected level of exploration and development be assessed. Currently, cumulative effects are only analyzed on a project-by-project basis. There is no broader analysis of the effects of numerous development projects across the broad landscape of the transboundary region. Cumulative impact analysis would hopefully reveal and prevent negative effects on downstream aquatic and terrestrial resources and communities that may not be readily apparent through environmental assessment of individual mines.

DOWNSTREAM CONCERNS AND OPPOSITION

Since downstream residents of both Alaska and B.C. first learned of the KSM proposal about a decade ago, concerns about the mine's effects on water quality, fish, and livelihoods have been

growing. Many questions and concerns that were raised by Ketchikan residents at an October 2011 public meeting remain unanswered.[52] Numerous letters of concern and resolutions opposing KSM have been written by:[53]

- Alaska and B.C. tribal governments including Central Council of Tlingit and Haida Indian Tribes of Alaska, Wrangell Cooperative Association, Alaska Native Brotherhood and Alaska Native Sisterhood, National Congress of American Indians, Alaska Federation of Natives, Ketchikan Indian Community, Metlakatla Indian Community, Organized Village of Kake and the Gitanyow Hereditary Chiefs;
- Alaska legislators;
- The Alaska Congressional delegation;
- Local governments including Ketchikan, Sitka, Petersburg, Port Alexander, Wrangell, Kupreanof and Southeast Conference of Mayors; and
- Commercial and sport fishing and tourism businesses and organizations.

ENVIRONMENTAL ASSESSMENTS PROVIDE NO GUARANTEES

Mining companies and mine permitting agencies view risk in terms of "likely" outcomes. These outcomes are repeatedly encapsulated in a statement found in most, if not every mine environmental assessment certificate that "the Project is not likely to cause significant adverse environmental effects." Although those outcomes are generally considered to be definitive or factual, they are not. Conclusions presented in environmental assessments for mine projects are not provable outcomes but are merely projections or probabilities of future events. These do little to alleviate concerns about future irreparable environmental damage.

This viewpoint is succinctly reinforced in a quote by Seabridge Gold's Senior Vice President, Environmental Affairs, Mr. R. Brent Murphy in a July 21, 2017, letter to the DeSmog Blog editor:

> *"In closing, it is important to emphasize that Seabridge will fully meet the standards set by the Canadian and Provincial governments to ensure the structural and chemical stability of the project's water and tailings management systems. Therefore, KSM will be able to operate without harming the environment, including the major watersheds in which we will operate."*

While this statement is presented as fact, it is not. It is only an opinion and optimistic prediction of future outcomes because the proposed KSM mine is not yet in operation.

Numerous technical issues and concerns with the proposed KSM project have been outlined within this paper. These are issues and concerns that present potential and reasonably credible threats from the project to the aquatic resources of both the Nass River system in B.C. and the Unuk River flowing into Alaska. These concerns exist in spite of, and in some cases because of, the numerous environmental studies completed and permits granted by both Canadian and B.C. environmental assessment agencies. Importantly, these assessments were done under old and seriously flawed environmental assessment acts which were revised in 2018.

Regardless of the conclusions derived through environmental assessment of any mine project, the companies and regulatory agencies cannot guarantee that no heavy metal pollution of the transboundary river systems will result from these projects. While absolute guarantees of no pollution are not possible, thorough, and financially guaranteed mitigation and remediation plans are possible. Financially guaranteed mitigation plans along with financial assurances to make downstream residents whole should significant pollution occur must be a part of any mine environmental assessment. And that is exactly what is needed and exactly why the proposed "world class" KSM project as now planned is a "world class" threat to downstream wellbeing.

Looking West along the Mitchell and Sulphurets Creek valleys (Seabridge Gold)

Environmental Assessment Updates

On October 3, 2018, KSM Mining, ULC applied for an extension of KSM's Environmental Assessment Certificate (Certificate). Section 32(4) of the Environmental Assessment Act (2018; EAA) states the B.C. Environmental Assessment Office may extend the deadline specified in the Certificate, on one occasion only, for not more than 5 years. On March 21, 2019, the deadline specified in the Certificate was extended to July 29, 2024, and the KSM Project must be substantially started by July 29, 2024.[54]

On August 6, 2020, KSM Mining, ULC applied to the B.C. Environmental Assessment Office for an Extension of KSM Project's Environmental Assessment Certificate #M14-01 due to the Impact of the COVID-19 pandemic. [55] The application requested "*at least a two-year variance under Section 46 of the Environmental Assessment Act (2018; EAA) in light of COVID-19 and the state of emergency."*

A 14-day public comment period in relation to the Second Extension Request was held from November 19 through December 3, 2020. The purpose of the public comment was to seek feedback on the information presented by the Seabridge Gold/KSM Mining ULC in its Second Extension Request including how the effects of the global COVID-19 pandemic have affected its ability to meet the deadline in the Certificate.

Several U.S. and Canadian environmental organizations, Southeast Alaska tribal organizations and Canadian First Nations, and commercial fishing organizations submitted letters of opposition to this request. Opposition was based on the flawed and meritless reasoning put forth in the application having to do with capital market disruptions and a depressed copper market, COVID-19 imposed safety requirements that limit their field operations, COVID-19 induced slowdown of permitting efforts and subsequent COVID-19 waves that will further exacerbate the above-mentioned points. In the four years since it was updated in 2016, the KSM economic assessment has apparently generated little interest from the investment community. It seems unlikely that a two-year or longer Certificate extension at this time will result in a more positive investment climate given the project's recent economic profile regardless of any effects from the COVID-19 emergency.

Although objections to the Certificate extension focused specifically on the flawed justifications contained in the Application, the KSM mine proposal itself is based on an inadequate and now outdated Environmental Assessment review. KSM warrants much more stringent international review than what the Environmental Assessment process provided. Granting the requested variance and extending the Certificate beyond the initial one-time only 5-year extension based on the questionable Environmental Assessment review would be irresponsible. No variance beyond the Certificate expiration date of July 29, 2024 should be granted and if, at that time, KSM Mining ULC believes that the KSM Project is a viable project, a new Environmental Assessment should be required.

CONCLUDING THOUGHTS

The KSM Project has been described as one of the largest undeveloped gold projects in the world measured by reserves. While this may be true, according to Seabridge Gold's own documents, the initial capital expenditure to develop the mine is estimated to be between US $5 billion and US $6 billion, which, under any circumstances, is an enormous investment in a mine located in a remote and difficult location to access. However, some recent occurrences may have made the KSM project more attractive to a major mining company. The initial project plan proposed mining under an existing glacier. However, due to climate warming, the glaciers in the KSM project area are receding at a more rapid rate than expected which may eliminate the under-glacier mining. In addition, Seabridge Gold and junior explorer Eskay Mining have agreed to share the US $10 million construction bill for the first stage of an access road to the KSM gold-silver-copper project in B.C. Both of these particulars will likely reduce the KSM mine development costs and make the project a more attractive investment proposal (see Addendum).

Seabridge Gold, as well as Canadian mine regulatory agencies, continue to claim that Alaskan's concerns about downstream impacts are not justified because the KSM proposal received approvals under the B.C. and Canadian environmental assessment processes. However, the Mount Polley mine, which had a massive tailings dam failure in August 2014, also had such approvals as did the B.C. coal mines in the Elk/Kootenay area that continue to pollute the Elk River downstream in Montana with selenium. And, although a mine closure and remediation

plan are finally being developed for the Tulsequah Chief mine, that mine has continued to discharge acid mine drainage into the Taku River watershed as it has for decades.

Although the KSM environmental review provided risk assessments that predicted low probability of failures, it is highly likely that during the mine's operating life mistakes and unforeseen shortcomings will result. No large industrial operations operate flawlessly. The question is the degree of the problems that arise and the ability to respond quickly and effectively. The risk analysis did not say there would be no failures, nor did the assessment provide for any funds for compensating downstream interests harmed by mine-related pollution.

Seabridge Gold has also consistently claimed that Alaska concerns were dealt with during the mine's environmental assessment process. However, Alaskans have also consistently and strongly disagreed that their concerns were adequately addressed within that process. Comments from fishermen, fishing businesses, tourism operators, tribes, local governments, State of Alaska, and members of Congress focused on the need for KSM to undergo a more thorough and rigorous assessment known as a Panel Review, yet that review process was denied by Canada.

While Seabridge and Provincial and Canadian Federal governments may believe the mine assessment processes are sufficiently thorough to protect downstream interests, the actual track record is something altogether different. The plans and permits may predict adequate protections and safeguards, but even the KSM assessment could not make any accurate predictions beyond 250 years due to the numerous uncertainties and lack of precedent. Yet, the closed mine would remain dangerous to downstream water quality and fisheries centuries beyond the operating life of the mine or Seabridge's plans for post-closure monitoring for 250 years.

Assertions about the KSM project that everything will be fine and that no significant adverse environmental effects are expected are more reminiscent of motivated reasoning than realistic analysis and historical realities. Given the complexity, size, and unproven nature of the KSM proposal it is likely that, sometime in its lifespan human error, extreme weather conditions, glaciers, or unforeseen factors will result in significant detrimental environmental effects. When that happens paperwork approvals and unproven assertions will be meaningless.

ACKNOWLEDGEMENTS

We want to thank Greg Knox, Skeena Wild, Guy Archibald, and the Southeast Alaska Conservation Council for providing a great deal of data and information on the KSM mine, water treatment and contaminant toxicology found throughout this paper.

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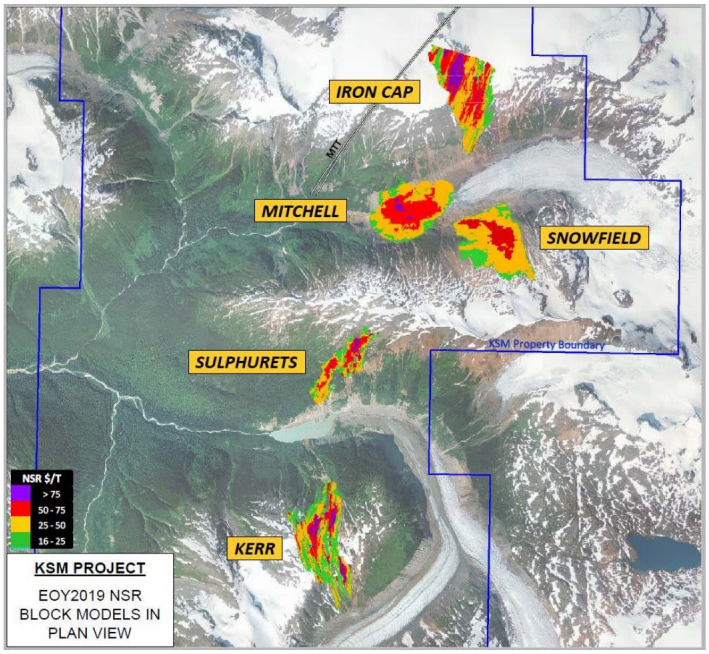
ADDENDUM
August 2023

On December 17, 2020 Seabridge Gold announced that it had officially acquired the Snowfield Property from Pretivm Resources Inc. According to Seabridge Gold, Snowfield will be integrated into the KSM property and sits in the same valley just east of the KSM Mitchell deposit. The Snowfield property will add approximately twenty-seven km^2 to the existing KSM Project footprint (our estimate).[56] This property had been part of the currently operational Brucejack underground mine located approximately 10 km south of the proposed KSM project (see map below).

According to Seabridge Gold press releases, the Snowfield property will be mined initially via open pit "prior to any underground block-cave mining" with the ore being blended with Mitchell production.[57] This would fundamentally mean another open pit mine in the headwaters of the Unuk River with additional mine tailings to be placed in the proposed KSM Tailings Management Facility in the Nass River watershed and additional waste rock being placed in the Rock Storage Facility in the Unuk River watershed. Haul roads through the Snowfield property have already been approved and so Seabridge could potentially initiate KSM mine production first in the Snowfield deposit. A new Preliminary Feasibility Study (PFS) will need to be completed prior to that decision and data yet needs to be generated to complete a new PFS.[58]

Although the Snowfield property was purchased from the Pretivm Resourses Brucejack project, it is interesting to note that it was recently announced that the Brucejack,mine has been purchased by Newcrest Mining, Australia's largest gold producer and 70% owner of the Red Chris mine located in the upper Stikine River watershed.[59] We currently have no knowledge of what, if any, impact this may have on further development of the KSM project but we will continue to provide updates as they occur (see below).

The KSM Property



(Seabridge Gold)

On August 8, 2022, Seabridge Gold filed *KSM (Kerr-Sulphurets-Mitchell) Prefeasibility Study and Preliminary Economic Assessment*, NI 43-101 Technical Report (PFS) on Sedar.com (https://www.sedar.com/GetFile.do?lang=EN&docClass=24&issuerNo=00007531&issuerType=03&projectNo=03417745&docId=5255807). The mine plan presented in the 2022 PFS is significantly different than that presented in the 2016 PFS. With the acquisition of the Snowfield Property (now called the East Mitchell deposit) as described in the earlier Addendum, the mine plan has shifted to an all open-pit project developing the Sulphurets, Mitchell and East Mitchell deposits in the first 33 years of the projected 53-year total life of mine (LOM). Under the 2022 plan only the higher gold grade Sulpherets, Mitchell and East Mitchell (Snowfield) deposits will be initially developed and will focus on gold production. According to a June 28, 2022 Seabridge Press Release, ***"The mine plan is specifically designed for mining highest gold grade first to facilitate a quick capital investment payback."***[60]

The addition of the East Mitchell deposit into the KSM project mine plan will considerably increase the physical size of the KSM project. However, the magnitude of the proposed mine size is not large enough to trigger a formal public review under the provisions of the B.C. Environmental Act, Reviewable Project Regulations (RPR). According to the RPR Part 3-Mine Projects, Section 10(1)(b), in order to initiate a public review of a mineral mine project, the modification to the disturbance of an area of land that was not previously permitted for disturbance must be "***…at least 50% of the area of land that was previously permitted for disturbance at the existing project."***. In the case of KSM, the addition of the East Mitchell pit will result in an approximately 10% increase in the project's physical size. This provision of The Act seems woefully insufficient in this case, given the depth and obvious impact the East Mitchell pit will have within the KSM project and surrounding area.

Rivers Without Borders submitted comments in October, 2018 during review and update of the RPR, to the B.C. Minister of Environment and Climate Change Strategy requesting that any metal mining projects within the watersheds of the transboundary rivers be subject to review per the RPR regardless of their mineral extraction volume or surface area disturbance. Given the economic, subsistence, and cultural importance of these rivers to not only B.C./Canada but to the US/Alaska and the fact that all mines in the transboundary region are acid generating, any potential harm to these river systems should be avoided and therefore such projects, regardless of size, need to be subject to the full B.C. EAO environmental assessment process. Unfortunately, that recommendation has not been implemented.

Major Differences Between The 2016 And 2022 Prefeasibility Study Mine Plans

- Under the 2022 mine plan only the higher gold grade Sulphurets, Mitchell and East Mitchell (Snowfield) deposits will be developed;
    - All developments will be open pit. Iron Cap is the only proposed purely underground block cave development within the KSM project;
    - The 2022 Preliminary Economic Analysis mine plan proposes to develop the copper rich Kerr and Iron Cap deposits after 33 years when the 2022 PFS mine plan is completed.
- The physical size of the KSM project will increase from approximately 150 mi^2 to approximately 164 mi^2 or roughly the size of the city of Detroit, Michigan;

- Open pit development: The 2022 PFS mine plan will include the addition of the East Mitchell pit which, along with the Mitchell pit will be one of three of the deepest in the world and over twice as deep as the Empire State Building is tall;
- The proposed mill throughput will increase by 50% from 130,000 tonnes (metric tons) per day to 195,000 tonnes per day. This level of mill throughput would make KSM the second or third largest mine in the world by tonnes of ore mined.
- The 33-year project will still produce approximately 4.5 billion tonnes of total waste which includes both tailings and waste rock at a 1:1 strip ratio.
    - The McTagg Rock Storage Facility (RSF) will be eliminated, and waste rock mined from the Sulphurets, East Mitchell and Mitchell pit will be placed in the Mitchell RSF until the Mitchell pit is mined out by Year 25. Final waste from East Mitchell will be backfilled into the mined-out Mitchell pit from Year 25 onward along with some waste re-handled from the Mitchell RSF;
    - Although the elimination of the McTagg RSF in the 2022 mine plan is a positive change, the total waste produced during the 53-year total LOM will be greater than what was estimated to be produced in the 2016 mine plan. However, waste rock from the Kerr deposit will be backfilled into mine-out pits and waste rock from the Iron Cap underground mine will be backfilled into the mined-out underground and open-pit workings.

Life Of Mine (LOM) Grade and Production Comparison Between The 2016 and 2022 PFS Mine Plans

	2016 PFS[61]	**2022 PFS[62]**	
Gold grade	.55 g/t	.64 g/t	
Copper grade	.21%	.14%	
Silver grade	2.6 g/t	2.2 g/t	
Molybdenum grade	42.6 ppm	76 ppm	
		Increase/Decrease	
Gold production	38.8 MOz	47.7 MOz	+22%
Copper production	10,155 Mlb	7,320 Mlb	-28%
Silver production	183 MOz	160 MOz	-12.6%
Molybdenum production	207 Mlb	385 Mlb	+86%

Significance of the new mine plan

The 2022 PFS mine plan has greatly reduced the copper production as compared to that presented in the 2016 PFS mine plan. The 2022 PFS proposes mining only 25% of the KSM copper resource inventory. While KSM has always been a project targeting gold, the 2022 PFS focuses on that and is summarized in Seabridge's June 28 and August 3, 2022 Press Releases[63]. **"*The 2022 PFS results released herein propose mining only 25% of the KSM resource inventory and do not include material from the copper-rich Kerr and Iron Cap deposits. An analysis of a stand-alone development of these deposits will be included as a Preliminary Economic Assessment forming a separate part of the NI 43-101…*"**

These statements in Seabridge Gold's press releases actually contradict statements in the *KSM Inaugural Sustainability Report 2020-Q3* (The Report)[64]. The 2022 KSM PFS minimizes the green economy portions of The Report essentially by reducing copper production while increasing production on the higher gold grades added from the East Mitchell deposit. According to the Seabridge June 28, 2022 Press Release ***"The mine plan is specifically designed for mining highest gold grade first to facilitate a quick capital investment payback."*** As also stated on pages seven and 66 of The Report, respectively, ***"As the world transitions to a green economy, our copper reserves and resources will provide a supply of much-needed responsible copper to enable this shift.",*** and ***"The transition to a green economy will require large amounts of responsibly produced copper and we believe that Seabridge is uniquely positioned to contribute meaningfully to this supply. Our multi-generational KSM Project with a projected 59-year mine life includes 17.6 billion pounds of permitted, measured, and indicated copper resources - the result is that Seabridge currently holds more copper per share than any copper company."*** It is interesting that this development is planned after the gold-rich deposits are mined-out which will likely be nearly four decades in the future regardless of how quickly Seabridge can sell the 2022 mine plan, if it happens at all.

Given the projected length of time before KSM's copper-rich deposits would be mined, Seabridge's recent attempts to transform the proposed KSM project from a gold mine, which is how it has always been presented, into a source for providing critical green energy minerals rings hollow. Based on the most recent mine plan, KSM is being moved even further away from a critical minerals source than what was presented in earlier mine plans. It is also interesting to note that in a May 29, 2023 letter to Alaska Representative Mary Peltola[65], Seabridge, for the first time that we know of, referred to KSM as a "copper, gold, silver and molybdenum mine", rather than "one of the world's largest undeveloped gold-copper projects measured by reserves." Copper has never been of primary importance for Seabridge in the development of KSM until recently. That importance is a bit questionable given the dissimilar descriptions of the KSM project transmitted to Alaskan politicians from that given on Seabridge's website[66].

Gold is definitely not a mineral critical for the global progress toward a low-carbon future Globally, only approximately 8% of gold is used for technology while the rest of the annual gold production is driven by jewelry and investment demand.[68] It is also interesting to note that the United States actually curtailed gold mining during WWII because it was not considered critical to the war effort[69] and KSM is first and foremost a gold mine, regardless of Seabridge's statements to the contrary.

Seabridge Gold, Inc. has gone to great lengths to portray KSM as a multi-generational project designed for long-term environmental and social sustainability. They extol their use of "sustainable innovation in the unprecedented on-site water treatment and management systems to enable KSM to exceed the best practices in those areas."[70] They also never hesitate to point out that the Province of British Columbia recognized in their Environmental Assessment that "the KSM Project will not result in significant adverse effects." Which is a curiously definitive statement for a mining project that is not yet operational. If Seabridge truly stands behind their positivity that the KSM project will be environmentally benign then we encourage them to contract a third-party assessment, such as Initiative for Responsible Mining Assurance (IRMA) for a full audit to verify that they will develop a truly environmentally and socially responsible

mining project. Per IRMA's website, "IRMA offers true independent assessment against a comprehensive standard for all mined materials that provides 'one-stop coverage' of the full range of issues related to the impacts of industrial-scale mines."[71]

ADDENDUM ENDNOTES

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