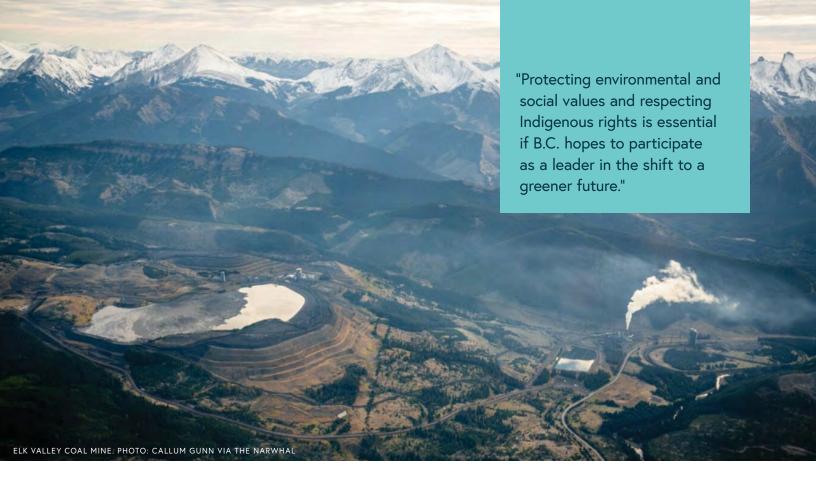


B.C.'s top polluting and risky mines



Introduction

Increasingly, British Columbia's mining regulators are promoting the province as a responsible jurisdiction for mining investment. As we transition to a low carbon future, supply chains and investors are demanding better mining practices for sourced materials. Indeed, protecting environmental and social values and respecting Indigenous rights is essential if B.C. hopes to participate as a leader in the shift to a greener future.

However, risky mines and mine proposals still litter the province (such as those displayed on this map), and important policy recommendations to improve the safety of B.C.'s mining industry have yet to be fully implemented.³ The province has legacy mines with ongoing water pollution issues and insufficient reclamation funding to clean up when closed. Some, such as Britannia mine, have seen action, though it cost taxpayers \$46 million plus an additional annual bill of over \$3 million for water treatment in perpetuity.⁴ A lot of contaminating, or potentially contaminating, mines have yet to be addressed, with little information on when or if they will be.⁵ British Columbia's *Mineral Tenure Act* has changed little since the 1850s gold rush era and continues to be a source of conflict between various land users. Taseko Mines Ltd.'s

New Prosperity mine, for example, embroiled the Tŝilhqot'in Nation in over a decade of lawsuits (that they ultimately won, though negotiations surrounding the project continue).⁶ British Columbia has enacted the United Nations Declaration on the Rights of Indigenous Peoples,⁷ but has yet to update its mineral staking law to require Indigenous consent.

Reforms to B.C. mining laws are needed,⁸ as are stronger monitoring and enforcement.⁹ Problematic mines threaten local environments and communities across B.C., but they are usually operating within the regulations of governing B.C. bodies, such the Ministry of Energy, Mines and Low Carbon Innovation, the Ministry of Environment and Climate Change Strategy, and the Environmental Assessment Office. By permitting these risks and pollution issues to continue, these regulators put the mining industry in B.C. itself at risk as more and more purchasers around the world shift to socially and environmentally responsible sourcing.¹⁰

The following list highlights the top 12 polluting or otherwise risky mines in B.C. in 2021. They were selected based on their proven or probable impacts to sensitive environments and species, violation of Indigenous rights, unsafe management of tailings waste and/or water contamination, inadequate reclamation funding, and/or non-compliance with environmental permits. In all cases, solutions exist that could improve the safety of the mines and/or industry to prevent these problems from recurring. If these solutions are pursued, many of these sites could be removed from this list in future years, and B.C. could come closer to leading as a responsible jurisdiction for mining.

This report was researched and written by Adrienne Berchtold, MSc (SkeenaWild Conservation Trust), and edited by Nikki Skuce (Northern Confluence Initiative) and Greg Knox (SkeenaWild).



Elk Valley Coal

Mine type: Coal; Open-pit

Owner: Teck Resources Ltd.

Location: A few km East of Elkford, Sparwood, and Fernie

Receiving watershed: Elk River (part of Columbia River watershed)

At the five coal mines owned and operated by Teck Resources in the Elk River Valley, selenium—an element that is toxic to humans and animals beyond very small doses—has been leaching from waste rock and severely polluting surrounding waterways for decades. Selenium concentrations in mine site water are at times so elevated it is considered Hazardous Waste.11 The resulting sky-high concentrations in nearby rivers make the water unsafe for human consumption,12 and have caused physical deformities and death among westslope cutthroat trout,13 a species of concern that recently showed a population crash of 93% downstream of the mines.14 Water treatment attempts have failed multiple times,15 once killing at least 45 fish,16 as the search for commercially viable selenium treatments continues.¹⁷ The problem's magnitude is such that the environmental impacts have crossed the border into Montana,18 Teck has been convicted at least four times related to its Elk Valley pollution,19 and long-term management for hundreds of years is now required—the current goal of which is only to stabilize selenium concentrations in the environment, not decrease them.20 Despite these alarming facts, Teck has been permitted four expansions to its Elk Valley operations in the last eight years and is currently applying for another.21 Additionally, the company has over half a billion dollars in estimated reclamation costs for which it has not provided financial security.²² Teck should be required to fully fund its reclamation liability and demonstrate effective, long-term selenium treatment solutions before any new mines or mine expansions are permitted in the Elk Valley.



Gibraltar

Mine type: Base metal; Open-pit

Owner: Taseko Mines Ltd.

Location: 60 km North of Williams Lake

Receiving watershed: Fraser River

Taseko's Gibraltar mine is the fourth largest open-pit mine in North America. Gibraltar began operating in 1972, before Environmental Assessment (EA) legislation existed.²³ It has since undergone significant expansions,²⁴ none of which received an EA either. Two major expansions were also permitted without an update of the mine's reclamation cost estimate.25 Now, Gibraltar's current clean-up estimate is out of date by nearly a decade, and its reclamation bond of \$50 million is wholly inadequate for a mine of its size (comparatively, nearly \$270 million is held for another large B.C. mine, Highland Valley Copper).²⁶ Additionally concerning is the mine's overall water surplus. As recently as March 2021, the nearly 40 billion litres of water stored in its tailings storage facility are taking up flood storage capacity,27 creating a risk of the dam overtopping under heavy precipitation and causing extreme negative consequences.²⁸ Excess contaminated site water is also discharged, untreated, into the Fraser River at a rate of 24 million L/day.29 Resulting downstream nitrite, sulphate, and molybdenum pollution³⁰ could be placing the Fraser River's already declining salmon runs and endangered white sturgeon at even greater risk. This discharge has received fierce Indigenous opposition, facing a legal challenge by the Xat'sull Nation when initially permitted in 2006, and now by the Tŝilhqot'in Nation,³¹ who were forced to close salmon fisheries in their territory in 2020.32 Water management solutions (e.g., passive water treatment) that have the consent of affected Indigenous groups are needed at Gibraltar, as is updated and fully funded reclamation security.



Copper Mountain

Mine type: Base metal; Open-pit

Owner: Copper Mountain Mining Corp.

Location: 20 km South of Princeton

Receiving watershed: Similkameen River (part of Columbia River watershed)

The Similkameen River eventually drains to the Columbia River in Washington, home to coho salmon, sockeye salmon, steelhead, and endangered chinook salmon.33 Copper Mountain mine straddles the Similkameen, with open pits, waste rock dumps, and a large wet tailings storage facility with a 155 m tall dam³⁴ all in very close proximity to the river. The mine—which never received an Environmental Assessment (EA) — has a steady history of causing damage to fish-bearing waters, including a tailings spill in 2014 they failed to properly clean up.35 Currently, many mine components leak contaminated water, containing elevated sulphate and suspended solids,36 directly into the Similkameen, where local Indigenous communities now feel unsafe accessing traditional foods.³⁷ The tailings dam leak is significant, with an average flow of 54 L/sec, or over 4.6 million L/day.³⁸ Copper Mountain has failed to get these discharges under control, despite recent orders from B.C. regulators.³⁹ Now, Copper Mountain is planning to expand operations, thereby increasing contaminated water discharge by nearly four times to a rate of 200 L/sec.40 Not only that, the expansion would increase the tailings dam height by 65% to a staggering 255 m⁴¹—taller than Vancouver's highest building.⁴² The potential consequences of a dam failure at Copper Mountain as it stands now are already considered extreme;43 a dam failure after expansion could annihilate stretches of the Similkameen River and send devastating pollution far downstream. Copper Mountain's proposed expansion should, at minimum, receive an EA, and regulators should consider denying future authorizations given the mine's poor compliance track record.



Willow Creek/Brule/ Wolverine

Mine type: Coal; Open-pit

Owner: Conuma Coal Resources Ltd.

Location: Southwest of Chetwynd and North of Tumbler Ridge

Receiving watershed: Pine River (part of Peace River watershed)

Conuma Coal's three coal mines sit in a row running straight through the critical habitat of highly endangered Central Mountain caribou. Here, one herd is locally extirpated, and scientists believe the remaining herds, with a total population of only about 220, are unlikely to persist under current conditions.⁴⁴ The ultimate cause of caribou's severe decline is habitat alteration, of which these mines (and other coal mines in the region) are known to be key drivers.⁴⁵ Wolverine mine just received an expansion approval,⁴⁶ which will obstruct caribou recovery efforts, such as the Saulteau and West Moberly First Nations' costly maternal penning project.⁴⁷ The Conuma coal mines also have a serious selenium problem. At Brule mine, selenium in receiving creeks is up to 30x greater than B.C.'s recommended limit to protect aquatic life, exceeds human drinking water standards, and accumulates in local fish tissues.⁴⁸ Despite their known environmental risks, these mines were

permitted for development based on financial (e.g., corporate taxes) and economic (e.g., job creation) benefits promised by the proponents. However, a recent analysis demonstrated that they have vastly underperformed on all those promises.⁴⁹ Even worse, their development—and the ensuing ecological damage—was subsidized by taxpayer money.⁵⁰ Solutions related to these issues include: deeming critical Central Mountain



caribou habitat a "no-go" zone where mine expansions and new mine approvals are halted, and performing rigorous economic assessment during mine permitting, with post-approval tracking of projects' economic impact.





Mount Polley

Mine type: Base metal; Open-pit

Owner: Imperial Metals Corp.

Location: 56 km Northeast of Williams Lake

Receiving watershed: Quesnel Lake (part of Fraser River watershed)

Mount Polley is the site of the most significant environmental mining disaster in Canadian history, in which a tailings dam collapse released 24 billion litres of tailings and contaminated water into surrounding salmon habitat. Ongoing risks from this incident remain high: metal-laden tailings deposited at the bottom of Quesnel Lake may impair the lake's function as important sockeye salmon nursery habitat for years to come,⁵¹ post-spill remediation efforts of Hazeltine Creek are failing to support growth,52 zero spill-related charges or fines have been laid by provincial or federal governments against the mine's owner, Imperial Metals,53 and urgent expert recommendations to prevent future tailings dam failures—such as to "eliminate surface water from [tailings] impoundment[s]"54—have not been fully adopted by the B.C. government⁵⁵ and continue to be ignored at mines across the province. Adding to the environmental risks, Mount Polley is currently permitted to discharge up to 52 million L/day of contaminated wastewater directly to Quesnel Lake⁵⁶ (an act Imperial Metals neglects to offer alternatives to, despite ongoing community appeals⁵⁷), and has on multiple occasions broken compliance with its water quality requirements. 58 Bad actors need to be held accountable for the damage they cause — Imperial Metals can, and should, be charged under the Fisheries Act. Mount Polley's effluent discharge permits also should be changed to require that a less ecologically valuable waterbody closer to the mine receives its discharges. Lastly, B.C.'s reclamation guidelines and regulations need to be amended to require that B.C. mines put tailings safety first.59





Shasta-Baker

- Mine type: Precious metal; Underground and open-pit
- Owner: Sable Resources Ltd./TDG Gold Corp.
- Location: 275 km North of Smithers
- Receiving watershed: Toodoggone River (part of Peace River watershed)

Shasta-Baker mine has caused concern amongst the Takla First Nation, whose remote territory contains it, for decades. 60 This small gold mine is emblematic of the pervasive negligence often paid toward past-producing mines where ore reserves are not yet depleted, so owners hold off on full closure. Since being placed under care and maintenance in 2012 by thenowner Sable Resources (the mine very recently changed hands to TDG Gold⁶¹), Shasta-Baker has had an abysmal environmental compliance record. Several environmental management plans (e.g., for controlling cyanide contamination) have been overdue since 2012, and basic surface and groundwater monitoring has not been conducted in most years.⁶² Comprehensive environmental monitoring, which was required to begin in 2012 on a 3-year cycle, has also never been performed.⁶³ Finally, only after this site was profiled in the Auditor General's scathing review of B.C.'s mining oversight, 64 financial penalties were issued for Shasta-Baker's non-compliances. 65 However, stricter enforcement needs to start earlier and not lapse when mines go into care and maintenance. Still unresolved are the risks posed by the mine's tailings storage facilities (TSFs) that contain potentially acid-generating material66 and seep into the groundwater.⁶⁷ This is exacerbated by high-risk upstream dam construction,68 and insufficient information collected to determine the dams' stability.⁶⁹ Regulators have expressed concern about a future "environmental incident" at the mine,7° and inspecting engineers have recommended the TSFs be closed⁷¹—this would align with expert recommendations that B.C. retire at least 60 TSFs across the province to get on the path toward zero tailings failures.72



CLOSED + ABANDONED MINES

Tulsequah Chief

Mine type: Base metal; Underground

Owner: Abandoned

Location: 100 km South of Atlin

Receiving watershed: Taku River

Tulsequah Chief mine operated from 1951–1957, a relatively short time compared to the over 60 years it has been polluting the Tulsequah River.⁷³ The mine leaks untreated acid mine drainage at an estimated rate of 1 million L/day⁷⁴ that is elevated in cadmium, copper, lead, and zinc⁷⁵—all of which are known to harm fish.⁷⁶ The mine is only 10 km upstream of the Taku River, Southeast Alaska's top salmon-producer. However, the closest the site has come to clean-up was a water treatment plant that its most recent owner, Chieftain Metals Ltd., operated for 9 months before shutting down due to high operating costs.⁷⁷ As of 2016, Chieftain Metals has declared bankruptcy, and the question of who will perform and pay for Tulsequah Chief's remediation is a multi-million dollar question.⁷⁸ Reclamation costs are estimated at \$48 million upfront, plus at least \$38.5 million over the next 100 years;⁷⁹ however, only \$0.7 million is secured in reclamation bonds.⁸⁰ The province has thus far

been reluctant to clean-up the site⁸¹ or hold a previous owner,⁸² like Teck Resources, accountable for it. It is likely that a large portion of the price tag for Tulsequah Chief clean-up could fall to taxpayers. Tulsequah Chief mine demonstrates why B.C. regulators must make the polluter pay by requiring upfront, full reclamation bonding from mine owners. An additional, industry-levied disaster or reclamation fund could also address legacy site issues across the province.⁸³





Yellow Giant



Owner: Abandoned

Location: Banks Island
(100 km South of Prince Rupert)

Receiving watershed: Hecate Strait (Pacific Ocean)

Yellow Giant mine, previously owned by Banks Island Gold Ltd., released an estimated 240,000 L of tailings and contaminated water into creeks, lakes, ponds, and wetlands on Banks Island.84 These intentional spills affected important traditional sites for the Gitxaala First Nation, where fish, seaweed, and mussels are harvested⁸⁵—impacts that could have been prevented were it not for lax regulatory oversight. Yellow Giant did not receive an Environmental Assessment (EA) because the owners ensured the project was under the production threshold that would have triggered an EA (by only 2,000 tonnes/year⁸⁶). Early opposition of the project from the Gitxaala was also disregarded when regulators issued permits for the mine to begin operating in 2014.87 Lastly, zero mine inspections occurred post-permit issuance for 15 months, and only then a site visit was performed because a mine employee blew the whistle on the mine's negligent practices.88 Yellow Giant has since been shut down, and 35 federal and provincial pollution charges have been laid.89 Banks Island Gold declared bankruptcy in 2016, so the province has had to take responsibility for clean-up. As recently as 2017, inspectors found that the mine disturbed 60% more land than its permit allowed, and still has multiple leaks of metal-laden water, including one—which drains to a wetland and then to the marine environment—that is acutely toxic to fish.90 To prevent this from happening again, governments must perform EAs on all mines, regulating ministries must tighten up their inspection and reclamation bonding regimes, and Indigenous concerns must be heeded. Support for Indigenous Guardians would also help ensure regular mine monitoring.91

UNCONTROLLED DISCHARGE OF SEEPAGE AND SLUDGE FROM THE SEEPAGE POND TO

THE ENVIRONMENT. PHOTO: PROVINCE OF BRITISH COLUMBIA



CLOSED + ABANDONED MINES

Bell/Granisle

Mine type: Base metal; Open-pit

Owner: Glencore Canada Corp.

Location: 8–16 km North of Granisle

Receiving watershed: Babine Lake (part of the Skeena River watershed)

Glencore's closed Bell and Granisle copper mines sit on Babine Lake, the largest sockeye salmon nursery lake in Canada and producer of 95% of the Skeena watershed's sockeye.92 At first glance, these mines appear as examples of "reclamation done right." They are in compliance with environmental permits, have installed water treatment equipment, and regularly perform government-approved monitoring programs.93 However, a recent investigation revealed unexamined risks still exist at these mines, calling into question many of the province's regulatory standards. The mines' permitted effluent discharges — which go directly into Babine Lake — have copper concentrations up to 20x higher than B.C.'s guideline to protect aquatic life and over 200x greater than science-based thresholds for sublethal negative effects to salmon.⁹⁴ Their aquatic monitoring program is also scientifically weak: sampling replication is too low (e.g., only one water sample per year is taken at each site in the lake area receiving water treatment plant discharge), and some receiving areas are not sampled at all.95 Still, clear links are evident between the mines and elevated metals in Babine Lake water, sediment, and fish—some of which could be causing chronic negative effects.96 Whether the mines are harming sockeye or not is unclear because, despite sockeye salmon's value and sensitivity, Glencore is not required to monitor them. These mines show the bar needs to be raised on reclamation and environmental monitoring in B.C.: permit requirements for mine discharge quality must be protective of sensitive species, like salmon, and required monitoring must be science-based, rigorous, and focused on vulnerable and/or highvalue species.





Anyox

Mine type: Base metal; Underground

Owner: Anyox Hydro Electric Corp.

Location: 60 km South of Stewart

Receiving watershed: Observatory Inlet (Pacific Ocean)

Anyox copper mine and on-site smelter operated from 1914–1936,97 long before environmental regulation of mining in B.C. existed.98 During this time, it was one of the top ore producers and employers on the province's coast. It was also a top polluter. Records suggest that smelter waste was deposited directly into the ocean, 99 and that the site's sulphur fumes were so strong they produced acid rain that killed off all the vegetation for a 20-30 km radius.100 Today, there is little to no government information available regarding the state of the mine. However, historian and tourist accounts indicate that the mine, abandoned by its original owners (Granby Consolidated Mining Co.), has never been properly closed or reclaimed. The property, now owned by private investors who want to develop it for hydro-electricity,101 has seen some natural re-vegetation; however, the mine is still collecting acid drainage and leaking it into crab, salmon, and seal habitat in Observatory Inlet.102 The scale of the acid drainage problem and any other ongoing environmental impacts at Anyox is unknown, at least to the public, as is whether plans to remediate exist. This site—at its peak, one of the largest polluting mines in the country—needs monitoring, clear steps to closure and remediation, and transparent public accounting of that process. Additionally, there are over a thousand closed mines in the province,103 many of them from a time when closure-planning was essentially non-existent. The province needs a comprehensive, industry-wide strategy for closing and cleaning up these old mines.



PROPOSED MINES

KSM

Mine type: Base and precious metal; Underground and open-pit

Owner: Seabridge Gold Inc.

■ Location: 65 km Northwest of Stewart

Receiving watershed: Unuk River and Nass River

Seabridge Gold's KSM mine is the largest undeveloped copper/gold project globally (and it keeps growing¹⁰⁴). The project, which received Environmental Assessment approval in 2014,105 is so big that it spans—and threatens—two major, salmon-producing watersheds. Acid generation and elevated selenium are predicted in the mine's impacted water,106 which will be discharged to the Unuk watershed, a transboundary system that contains salmon stocks of concern in Alaska.107 To minimize damage, active water treatment will be required for over 200 years, costing billions of dollars;108 however, there is currently no proven operational-scale technology for treating selenium.109 Even with treatment, selenium is still expected to rise downstream.110 The other risk is KSM's massive proposed tailings storage facility (TSF), which will destroy sensitive fish habitat just by being built,111 and will sit atop the Nass River, one of B.C.'s top salmon-producing systems. The TSF will contain a jaw-dropping 2.3 billion tonnes of water-covered tailings, 28x more than the failed Mount Polley TSF.¹¹² Provincial regulators must take a great deal more caution before approving mines that propose perpetual water treatment and/or wet tailings storage, especially at a large scale. Though KSM has been approved, regulators can still require that the mine—with consultation and consent of affected Indigenous groups, including Alaskan tribes be redesigned for greater safety. This would include: primarily underground mining, non-degradation standards for discharge water quality, full reclamation bonding, and dry closure of the TSF.



PROPOSED MINES

Giant Copper ("Donut Hole")

Mine type: Base and precious metal;
Open-pit

Owner: Imperial Metals Corp.

Location: 37 km Southeast of Hope

Receiving watershed: Skagit River (part of Puget Sound watershed)

Completely surrounded by protected parks sits the "Donut Hole", a 2,500-hectare plot that was excluded during park creation due to pre-existing mineral tenures now owned by Imperial Metals¹¹³ (owner of Mount Polley mine, also on this list). Located near the Skagit River headwaters, mining here (plus the accompanying fragmentation of surrounding protected lands) could impact highly vulnerable species and ecosystems, such as bull trout, grizzly bears, northern spotted owls, old growth forests, and chinook salmon—an essential food species of endangered southern resident killer whales.¹¹⁴ Imperial wants to begin major exploration of its Giant Copper project in the Donut Hole,115 which will open the door to full mine development. Opposition to Giant Copper has been voiced by over 200 organizations, government officials, and affected Indigenous groups¹¹⁶—with whom Imperial has not consulted because Indigenous engagement is not legally required at this stage.¹¹⁷ The government-created Skagit Environmental Endowment Commission is also trying to buy back the tenures, but Imperial has resisted naming a price,118 or is asking too much. All of this is evidence that B.C.'s mineral tenure laws allow industrial development to take precedence over conservation, public interest, and Indigenous rights. Mining should be banned in the Donut Hole (as logging is¹¹⁹), and Imperial Metals should begin restoring its public image by relinquishing the Giant Copper tenures, allowing full conservation of the Skagit headwaters. Additionally, the B.C. Mineral Tenure Act must be amended to require Indigenous consent before staking claims, and to create mechanisms for retiring tenures when they conflict with other important land uses.



Conclusion

Mining plays an important role in many B.C. communities, and produces materials necessary for the global shift from fossil fuels to renewable energy. However, mining can also cause irreversible damage to local environments and human health, impose massive financial liabilities on taxpayers, and violate Indigenous rights—as the mines in this list have or are at risk of doing. We need to both invest more in mineral efficiency and recycling, and ensure mining is done right in B.C., in a way that protects environmental, social, and cultural values. Legal reform and enhanced enforcement and industry oversight are urgently needed.

There are solutions. Below are recommendations to improve mine safety in B.C. (and globally):

- B.C. Mining Law Reform Network developed a <u>comprehensive list of</u>
 recommendations for shifting to more responsible mining in B.C., endorsed
 by nearly 30 local, provincial and national organizations from a wide
 range of sectors, including citizen and community groups, First Nations,
 academics, and social justice and environmental organizations.
- The First Nations Energy and Mining Council has three reports with recommendations for B.C. on reducing risks related to safety, mine disasters, and non-remediation.

- SkeenaWild Conservation Trust developed a <u>report on responsible mining</u> <u>in B.C.</u>, including essential principles, recommended practices and technologies, and a checklist to assess mines and identify ways they can improve.
- "Safety First: Guidelines for Responsible Mine Tailings Management" was endorsed by over 140 NGOs and technical experts. There are 16 recommendations in this report to improve tailings safety.
- The B.C. Auditor General's "<u>Audit on Compliance and Enforcement in the Mining Sector</u>" includes several recommendations that have yet to be implemented, including a strong financial assurance regime.
- The Mount Polley Expert Panel Report includes several recommendations
 that have yet to be implemented, including cutting B.C.'s tailings storage
 facilities inventory in half and using best available technologies for new
 tailings facilities.
- The International Responsible Mining Assurance (IRMA) is a voluntary standard developed by a multi-stakeholder committee. While a strong regulatory regime is needed, IRMA provides independent third-party verification to metal mine sites.

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