



TROUBLED WATERS

HOW MINE WASTE DUMPING IS POISONING
OUR OCEANS, RIVERS, AND LAKES





PHOTO: EARTHWORKS

EXECUTIVE SUMMARY

ABOVE: Mine tailings at Barrick Gold's Porgera mine in Papua New Guinea.

MINING COMPANIES are dumping more than 180 million tonnes of hazardous mine waste each year into rivers, lakes, and oceans worldwide, threatening vital bodies of water with toxic heavy metals and other chemicals poisonous to humans and wildlife. The amount of mine waste dumped annually is 1.5 times as much as all the municipal waste dumped in U.S. landfills in 2009.¹

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Mine processing wastes, also known as tailings, can contain as many as three dozen dangerous chemicals including arsenic, lead, mercury and processing chemicals such as petroleum byproducts, acids and cyanide.² Waste rock, the extra rock that does not contain significant amounts of ore, can also generate acid and toxic contamination. The dumping of mine

tailings and waste rock pollutes waters around the world, threatening the drinking water, food supply and health of communities as well as aquatic life and ecosystems.

An investigation by Earthworks and MiningWatch Canada has identified the world's waters that are suffering the greatest harm or

TABLE 1. WATER BODIES IMPERILED BY CURRENT OR PROPOSED TAILINGS DUMPING, SELECTED EXAMPLES

BODY OF WATER	MINES AND LOCATION	TYPE OF ORE	TYPE OF DUMPING	COMPANY OR COMPANIES RESPONSIBLE
Basamuk (Astrolabe) Bay, Bismarck Sea	Ramu Nickel and Yandera mines, Papua New Guinea	nickel-cobalt; copper-gold	Marine (proposed)	Metallurgical Construction Corp., Highlands Pacific (Ramu); Marengo Mining (Yandera)
Norwegian Fjords	Kirkenes, Kvannevan, Stjernøya, Hustadmarmor, Skaland, Engebøfjellet, & Repparfjorden	iron, industrial minerals, titanium, copper	Marine (proposed & actual)	Northern Iron Ltd., LNS AS, Sibelco Nordic, Omya Group, Nordic Mining, Nussir
Canadian lakes	Across Canada	gold, nickel, copper, copper-gold, copper-zinc, iron, diamonds	Lakes (proposed & actual)	Agnico-Eagle, BHP Billiton, Cleveland Cliffs, Crowflight Minerals, De Beers, Goldcorp, Taseko Mines, Imperial Metals, Jolu Central Gold, Marathon PGM, Mitsubishi Metals, Newmont, Rio Tinto, Teck, Tyhee NWT, Vale, Xstrata
Senunu Bay	Batu Hijau mine, Indonesia	copper-gold	Marine	Newmont Mining, Sumitomo Mining
Luise Harbor	Lihir mine, Papua New Guinea	gold	Marine	Newcrest Mining
Pigiput Bay	Simberi mine, Papua New Guinea	gold	Marine	Allied Gold
Black Sea	Cayeli Bakir, Turkey	copper-zinc	Marine	Inmet Mining
Otomina and Ajkwa Rivers, Arafura Sea	Grasberg mine, West Papua	copper-gold	River	Freeport McMorRan, Rio Tinto
Porgera River, Fly River system	Porgera mine, Papua New Guinea	gold	River	Barrick Gold
Ok Tedi River, Fly River system	Ok Tedi mine, Papua New Guinea	copper-gold	River	Ok Tedi Mining Ltd.
Auga River	Tolukuma mine, Papua New Guinea	copper-gold	River	Petromin Holdings
Lower Slate Lake	Kensington mine, USA	gold	Lake	Coeur D'Alene Mines Corp.



PHOTO: DAMIAN BAKER

are at greatest risk from dumping of mine waste. **(See Table 1.)** Based on a review of government reports, news media accounts and more than 100 peer-reviewed scientific articles, we have catalogued the wide range of damage and hazards to ecosystems, wildlife and human health caused by tailings dumping into natural water bodies. We have also identified the leading multinational companies that continue to use this irresponsible practice. **(See Table 2.)**

Our investigation found that of the world's largest mining companies, only one – BHP Billiton of Melbourne, Australia, and London, UK – has adopted policies against dumping in rivers and oceans, and none have policies against dumping in lakes.³ (Previously, two other companies – Falconbridge, now part of

Xstrata, and WMC, now part of BHP Billiton – had adopted similar policies.) Many of these companies are also guilty of an unjust double standard: they dump toxic mine tailings in waters around the world even though the nations where many are chartered have prohibited or restricted the practice. At least half of the members of the International Council on Mining and Metals – a network of 20 mining and metals companies formed in 2001 “to address the core sustainable development challenges faced by the industry” – currently dump tailings into bodies of water or have plans to do so.⁴

In a world where climate change, ocean acidification, overfishing and recurring

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ABOVE: Panguna mine, Bougainville, Papua New Guinea.

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tragedies like the Gulf of Mexico oil spill are already disrupting water and food supplies, polluting the world’s waters with mine tailings is unconscionable – and the damage it causes is largely irreversible. No feasible technology exists to remove and treat mine tailings from oceans; even partial cleanup of tailings dumped into rivers or lakes is prohibitively expensive. There is but one workable solution: *Mining companies must stop dumping into natural bodies of water.*

In some cases, safer waste management options exist: putting dry waste in lined and covered landfills (a process called dry stacking) and putting tailings back into the pits and tunnels the ore came from (called backfilling). In other cases, even land-based tailings disposal is too risky. Some places where companies want to dump tailings are simply inappropriate for mining and should be *no-go zones*. The protection of such areas must be coupled with more efficient use of metals and support for sustainable development and livelihoods that do not endanger communities’ health and safety.

A number of nations have adopted prohibitions or restrictions on dumping mine tailings in natural bodies of water. Nations with some restrictions on dumping – including the United States, Canada and Australia – are home to major mining companies that use practices internationally that they wouldn’t be allowed to use at home. Even these national regulations, however, are being eroded by amendments, exemptions, and loopholes that have allowed destructive dumping in lakes and streams.

Non-governmental initiatives to promote responsible mining by corporations can play an important role in helping close regulatory loopholes. Civil society organizations working to encourage more responsible mining are calling on mining companies to end water-based tailings dumping, as are consumers and retailers of mined products such as jewelry and electronics. In turn, the mining industry as a whole must share our collective responsibility to protect water and aquatic ecosystems by pledging not to dump mine wastes in Earth’s most precious resource: water.

TABLE 2. MINING CORPORATIONS THAT DUMP TAILINGS INTO NATURAL WATER BODIES

COMPANY	HEADQUARTERS	MAJOR LOCATION(S) OF DUMPING
Barrick Gold	Toronto, Canada	Fly River, Papua New Guinea
BHP Billiton	Melbourne, Australia / London, UK	Long Lake, Northwest Territories, Canada
Freeport McMoRan	Phoenix, USA	Ajka River, West Papua
Goldcorp Inc.	Vancouver, Canada	Crazy Wind Pond, Ontario, Canada; King Richard Creek, British Columbia, Canada (proposed).
Newcrest Mining	Melbourne, Australia	Luise Harbor, Papua New Guinea; Koro Sea, Fiji (proposed)
Newmont Mining	Denver, USA	Senunu Bay, Indonesia; Tail Lake, Nunavut, Canada (proposed), Cerro Minas Conga lakes, Peru (waste rock, proposed)
Rio Tinto	London, UK / Melbourne, Australia	Ajka River, West Papua; Wabush Lake, Labrador, Canada; Cassidaigne Canyon, Mediterranean Sea
Teck	Vancouver, Canada	Trout Pond, Newfoundland and Labrador, Canada; Garrow Lake (closed), Northwest Territories, Canada
Xstrata	Zug, Switzerland	Moose Lake, Ontario, Canada; Lake Watson, Quebec, Canada
Vale	Rio de Janeiro, Brazil	Sandy Pond, Newfoundland and Labrador, Canada, Meatbird Lake, Ontario; Thompson Lakes, Manitoba, Canada

Note: This is not a comprehensive list of companies or sites.