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Potential effects on groundwater from the re-flooded mine

At the end of mining, groundwater would no longer be pumped from the mine, allowing the mine workings and backfilled stopes to re-saturate as the mine re-floods and the groundwater table recovers. The groundwater table recovery would occur over a period of several years. During mining, localized groundwater flow would be directed inward toward the mine. Therefore, during this period there would be no potential for contaminants to migrate out of the mine. After groundwater recovery, however, the groundwater flow system would be similar to pre-mining groundwater flow, and outward flow gradients from the re-flooded mine would occur.

Both the Department and company are concerned about the potential for the re-flooded mine to affect groundwater quality in the bedrock around the mine. Some pollutants would remain in the underground mine from mining operations due to oxidation during the period of mine pumping.

In order to demonstrate compliance with groundwater quality standards, the company plans to develop a groundwater flow model to evaluate flow paths in and around the re-flooded mine. This information will be presented in a *re-flooded mine management plan* that the company will prepare to assure protection of the bedrock groundwater quality around the re-flooded mine at the end of the mining. The plan is scheduled for completion by late summer. We expect the plan to include elements identifying pollutant source minimization, contaminant containment, and water quality monitoring.

In the plan, the company could consider a series of actions to minimize the amount of pollutants in the mine both before and during the re-flooding process. The activities include the installation of high efficiency oxygen barriers in passageways to reduce mineral oxidation, the removal of spilled ore and waste rock from the mine workings, flushing of exposed surfaces at the end of mining, and high volume extraction of water from the mine workings following the re-flooding process to flush out readily accessible contaminants. In addition, areas of oxidized backfill could be removed.

Irrevocable trust

Effective February 2000, section NR 132.085, Wisconsin Administrative Code, was created, establishing the irrevocable trust agreement requirement for a company applying for a mining permit. Under this requirement, the company must propose an irrevocable trust agreement pertaining to financial responsibility in the event of environmental contamination and implementation of certain types of preventive measures. The owner of a mining site must establish the irrevocable trust fund prior to the start of mining. The trust fund would continue perpetually after mining operations have ended. The trust does not replace an owner's liability under other provisions of law, but is intended to serve as a backup source of funding.

Trust fund requirements would be based on costs associated with certain reasonably anticipated preventive measures, as well as remedial actions related to unanticipated spills, releases from mining and mining waste facilities, and replacement of damaged water supplies. The final amount of the fund and the final schedule of payments would be determined at the Master Hearing following input from all parties. The fund would be structured such that after the period of scheduled deposits by the operator, it would be self-sustaining and adequate to finance necessary preventative and remedial actions forever. The Department would review the fund every five years for adequacy and adjust it if necessary.

The trust would be maintained by a public agency, bank or financial institution in Wisconsin, and it would be a perpetual trust. Only the Department of Natural Resources could authorize payments from the trust for preventive measures to avoid adverse environmental consequences or for remediation measures at the project site. The amount deposited in the fund by Nicolet Minerals Company would apply only to the Crandon project.

Project schedule

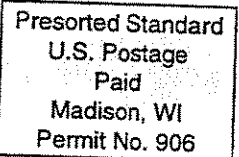
Department staff had planned on releasing the draft Environmental Impact Statement on the proposed mine by the end of this calendar year. However, project changes including the revised grouting plan and the re-flooded mine management plan proposed by the company will necessitate additional review time by Department staff and its consultants. As a result, the release date for the draft Environmental Impact Statement will be delayed. When we receive the company's plans later this summer, we will develop a new schedule for completing our project review and releasing the draft Environmental Impact Statement.

For additional information on the Department's review of the proposed Crandon mine, contact:

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Circulate petition against cyanide in mining

from outside the U.S. : CYANIDE in MINING

Background on Cyanide in Mining -
 ☉ in Wisconsin ☉ Inside the U.S.

- Citizens Say No to a Gold Mine in Greece
- Czechs ban cyanide in mining
- Examples of recent cyanide-related mine accidents
- Cyanide mining is efficient but a hazard to the environment
- Vital Statistics: Cyanide - Gold's Killing Companion
- A History Of Accidents
- Spill in Hungary: "Dead in the Water" & "Cyanide tarnishes gold & Inquiry waters muddied"
- EU Releases Report on Cyanide Disaster , Dec. 15, 2000
- Case Study, 1998: Truck Spills Cyanide in Kyrgyzstan

← Ban Cyanide at Crandon Mine



CITIZENS SAY NO TO A GOLD MINE IN GREECE

Mineral Policy Center
 Site Report from Olympias, Greece
 By Dr. Robert Moran, Ph.D.
 April 18, 2001

Preface

Dr. Robert Moran, is a geochemical and hydrogeological consultant with more than 29 years experience in the mining sector. Dr. Moran is currently in Greece, at the invitation of citizens in Olympias, to provide technical and scientific support.

Mineral Policy Center (MPC) is a non-profit research and advocacy organization dedicated to protecting communities and the environment from the impacts of mining.

MPC has published this paper in order to provide Dr. Moran's observations on the situation unfolding in Olympias, Greece. Community leaders in Olympias are seeking to protect their environment and way of life from the impacts of a proposed industrial-scale gold mine, one that would use cyanide to process the ore.

The background information was provided by MPC. The opinions expressed in the body of the site report are those of the author.

Background

Last week a Greek court, the Council of State, ruled against a gold mine proposed by TVX Gold Inc. of Canada due to the mine's environmental risks. The mining company proposed to use cyanide to process low-grade gold ore. According to press reports, the nation's highest administrative court ruled 20-7 that risks from cyanide processing of gold outweighs the potential economic benefits. The court's decision has not yet been published, but observers expect that it will be made official in the near future.

For several years, community leaders near the proposed mine, 40 miles east of Thessaloniki, Greece, have fought the development of the gold mine. They are concerned that cyanide spills and pollution from heavy metals such as arsenic could impact water resources and agriculture. Concerned citizens organized a months-long blockade of the mine site. They argued before the Council of State that the cyanide used in the gold processing and the arsenic created as a byproduct would endanger the environment.

Yesterday, the Wall Street Journal reported that, in response to the court's ruling, workers at a Greek subsidiary of TVX Gold Inc. blocked a road leading to the village of Lerissos. According to the report, supporters of the mine project threatened to "crush" opponents of the project. In a statement they claimed, "We are determined to crush... anyone who dares, from now on, to be an obstacle in the realization of this investment."

Gold mines using the cyanide extraction process have had a number of devastating environmental spills in recent years including in Colorado (USA), Kyrgyzstan, Guyana, and Romania. The spill in Romania devastated a 250-mile stretch of the Danube River in Europe. Public outcry over the impacts of cyanide process gold mines has led to growing citizen pressure to ban the technology. In Montana in the United States, the process is banned at all new mines and mine expansions. In the Czech Republic, in the aftermath of the spill in Romania, the legislature passed a similar cyanide ban.

In a recent Issue Paper published by Mineral Policy Center ("*More Cyanide Uncertainties, Lessons from the Baia Mare, Romania Spill*"), Water Quality and Politics, MPC Issue Paper #3, Dr. Robert Moran described the risks associated with the cyanide process and documents many of the scientific and technical uncertainties.

In that paper, Dr. Moran, who has worked directly with the community leaders in Greece and is currently in the country, expressed concerns regarding the lack of adequate information, regulation, and testing of mines that use cyanide. In referring to forms of cyanide and related compounds in water he stated, "many aspects of the geochemical behavior and toxicity of such complex mixtures are poorly known."

In the view of MPC, more and more communities will reject mines that use cyanide extraction technology. Communities will reject them for the same reason that the Greek Council of State did, for the same reasons that the citizens of Montana did: cyanide process mines are too great a threat to water resources, fish, and the livelihoods of those who live and work near these mines. This remains true whether the mine is in Montana, Greece, or Kyrgyzstan.

MPC's Issue Paper, "*More Cyanide Uncertainties, Lessons from the Baia Mare, Romania Spill*"), Water Quality and Politics, MPC Issue Paper #3, is available at <http://www.mineralpolicy.org>.

Observations from Olympias, Greece Last week the highest court in Greece ruled in favor of local citizens who are opposed to the operation of a proposed gold mine and mill at the town of Olympias in northern Greece. The citizens argued that the project would create lasting environmental impacts due to the production of toxic wastes, and that the existing facilities were never adequately permitted.

The Olympias mine is owned by TVX Hellas SA, a subsidiary of the Canadian mining company, TVX Gold Inc.

This ruling has dealt a serious blow to what was to be the largest investment of foreign private funds in Greece in the last 50 years. Numerous Greek business sources have described this decision as an economic disaster, saying that it will drive away international investors, and that Greece will remain an economic backwater. The situation, however, may also be seen as a progressive move by the Greek courts, one intended to encourage parts of the economy to modernize. Clearly the Greek courts have become aware that, wherever economies are predominantly dependent on mining, they have the characteristics of developing countries—even in the U.S.

The TVX mining situation is also a microcosm of many aspects of "globalization," and its environmental consequences—the kind politicians and international financial institutions such as the World Bank prefer to avoid discussing publicly.

North American observers may need to be reminded that Greece only became a full economic member of the European Union in January 2001. Also, one glance at a map reveals that Greece is totally separated from the other EU member countries by the northern Balkans. It has the lowest per capita income and lowest labor costs of all the EU countries. In the past, many of the costs of operating a mine were subsidized by the State, yet no taxes were, or are, paid to the local or regional governments.

Ground and surface waters in parts of the Olympias area have already been contaminated by past mining

activities some of which started 2500 years ago. Tailings wastes from the nearby Stratoni site, now also operated by TVX, used to be dumped directly into the sea. Commercial fishing near Stratoni is prohibited for a distance of one nautical mile from the shore. The existing tailings impoundments at both TVX operations are unlined. Local ores contain very high sulfide concentrations, often in the form of arsenic-rich pyrite, which means that the dangers of acid drainage are real.

Despite these conditions, little water quality data is available. Does an environmental problem exist? If citizens wish to answer this question, they must pay to collect and analyze their own samples. As is usual in mining matters, the legal and environmental complaints in Olympias were pushed forward through the efforts of private citizens, essentially unassisted by government authorities.

Fresh water is scarce in most of the coastal areas, and mining will compete for and degrade the quality of this already scarce resource. Hence, many of the folk of this agriculturally rich area want to break the cycle of pollution and economic reliance on mining. Future resource conflicts are likely to center on water supply issues rather than the need for mining.

But the government and TVX have chosen to keep the public in the dark about the mine's potential impacts on water supply and quality. The citizens opposed to the Olympias operations claim that few studies with any valid data or substance have been made public. I have not been shown any studies that would be useful in quantifying baseline water quality or the chemical contents of the tailings, for example. Such studies may have been performed, but they have not been made available to the general public. Thus, it is not possible to truly evaluate the baseline situation. Is this how a mining company is allowed to operate in TVX's home country, Canada, or in the other EU countries?

Months prior to the recent court decision, the Ministry of Environment and Public Works ruled that TVX should be fined 12 billion drachmas, or about \$31.6 million for not having construction permits for the tailings impoundments in Olympias and an active mine site at Stratoni. However, these fines have not yet been enforced. Why? For this most sensitive environmental task, enforcement falls to the regional planning department in Arnea, a town of between 3,000 and 5,000 inhabitants, in the mountains about 75 km southeast of Thessaloniki.

Consider the situation of this regional planning department. It has four technical staff responsible for issuing construction permits, primarily for homes and other buildings. Most have been trained as architects. Here they are required to approve permits for tailings impoundments. Note that they do not normally conduct independent inspections of any construction. None of the staff has specific training in any mining disciplines, and certainly not in mine facilities construction or mining chemical matters. They are aware that these wastes contain metals, but they have no information or experience that would allow them to know that the wastes contain high concentrations of arsenic, copper, lead, cadmium, manganese, zinc, sulfate, and probably cyanide decomposition products, as a minimum. Importantly, the budget does not include any funds to provide legal support for staff activities.

This department has never confronted such an enforcement situation, related to a mine site, before. It's nothing like construction of an apartment or home. Their superiors in Thessaloniki, the second largest city in Greece, have informed the department that approval must come from Athens. However, months ago they were directed by the judge and the head of the Ministry to enforce the fines. If they do, they may be sued by TVX-Hellas. Of course, the planning department has no routine legal support. So, they are forced to delay.

It has been raining off and on near Olympias for days. What would happen if an earthquake were to occur on top of these wet conditions? Is it too perverse to imagine such a scenario in a region where some of the local towns were leveled by earthquakes as recently as 1932? The metal-laden tailings would be released into the nearby rivers and towns. Who would be held legally responsible? The Arnea regional planning department, of course! While Greek law requires that construction permits be obtained, the regional planning department never required that TVX obtain the permits, because their superiors didn't request that they be required. Thus, these operations have technically been illegal.

On top of everything else, the department has also received implied threats of violence if the fines are imposed.

Most of the TVX workers have just been told they are to be laid-off. They have been told that citizen-activists are the cause. Conveniently, the environmental practices of their company are neglected. So, today they have blocked the roads leading into and out of the towns where their citizen opponents live. They threaten to maintain these blockades into the summer when the tourists would normally arrive. It appears, once again, that local citizens are being presented with a simple black and white choice: accept this huge foreign-financed project, the few jobs it will create, and the inevitable long-term environmental impacts, or be considered unfriendly to foreign investment and "unmodern."

Dr. Robert Moran
18 April 2001
Olympia, Greece

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CZECHS BAN CYANIDE IN MINING

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Move Comes Months After Deadly Cyanide Spill Killed All Aquatic Life in 250-mile Stretch of Danube River

(August 11, 2000) - The Czech Senate on Wednesday voted to ban the use of cyanide heap leach technology in mining. The ban comes in the wake of the deadly cyanide spill in Romania in late January that was considered to be the world's worst ecological disaster since the Chernobyl nuclear meltdown. In that spill, 3.5 million cubic feet of mine waste contaminated with cyanide and heavy metals was released into a tributary of the Danube River from a gold mine operated by Australia's Esmeralda Exploration. That disaster killed all aquatic life in a 250-mile stretch of the Danube.

Cyanide heap leach technology is the standard technology of the gold mining industry. It involves the spraying of cyanide-laced solution over ore heaps. Cyanide acts as an agent to separate the rock from gold.

There are dozens of active gold mines in the U.S. that use the cyanide heap leach process. There are hundreds more abandoned mines in the U.S. that used the process and continue to emit high levels of pollution.

The problem prompted the citizens of Montana to pass an initiative banning the process at new mines. Citizens in several other states including Colorado and Wisconsin are considering such initiatives. Internationally, citizen opposition has blocked this mining technique in the Pergamon region of Turkey. [Note: a similar ban is being considered in the Australian state of New South Wales--site of the 2000 Summer Olympics--ed.]

"This action should be a wake-up call for the industry," said Mineral Policy Center President Stephen D'Esposito. "The public's allergy to cyanide used in gold mines will continue to spread until mining companies demonstrate that they can mine responsibly, in a manner that protects our rivers and our ecosystems."

The Czech Senate's cyanide-ban clause has made it through several steps of the legislative process and can not be affected any more.

Mineral Policy Center Protecting Communities and the Environment



EXAMPLES OF RECENT CYANIDE-RELATED MINE ACCIDENTS
From Cyanide Uncertainties, 1998, Mineral Policy Center

(Outside the U.S.)

Kyrgyzstan: On May 20, 1998, a truck transporting cyanide to the Kumtor mine in Kyrgyzstan, Central Asia, plunged off a bridge, spilling almost two tons of sodium cyanide (1,762 kilograms) into local surface waters.

Guyana: In 1995, more than 860 million gallons of cyanide-laden tailings were released into a major river in Guyana, South America, when a dam collapsed at Cambior mining company's Omai gold mine.

Spain: A dam at the Los Frailes zinc mine in southern Spain ruptured in April 1998, releasing an estimated 1.3 billion gallons of acid, metal-laden tailings into a major river and over adjacent farm lands. While news reports of the associated massive fish kill did not mention cyanide or related compounds in the wastes, their presence seems likely given the metals extracted at this site.

Romania, January 15, 2000 Some additional statistics about the Aural gold mine, Baia Mare, Romania: The BBC has reported that as much as 650 tons of dead fish had been pulled from the Tisza and Danube rivers and that many tons more were expected to be found on the bottom of them. Future risks to the rivers remain due to the large amount of other toxic heavy metals that likely spilled with the cyanide. Biologists are estimating that at least 5 years is needed to restock fish there, and 10-20 years for most river life to return. The upper Tisza was one of Europe's cleanest rivers and was home to at least 20 species of protected fish. Rare Osprey, river otters, fox, many other birds, mammals and wildlife are known to have died from ingesting poisoned fish.

Romania, January 19, 2001

InfoBeat - Cyanide eyed in Romania fish deaths

Bucharest, Romania (AP) - Thousands of dead fish were found floating Thursday in a river in northeastern Romania which had high levels of cyanide, private television Pro-TV reported. The incident was reported on the Siret River near Lespezi, a town about 210 miles northeast of Bucharest. Authorities found cyanide 130 times the accepted levels in a tributary of the Siret, the private news agency Mediafax reported. Locals were warned not to eat the fish. Two girls were hospitalized with food poisoning after eating the fish.

"It is an imminent danger to public health," said Nicolae Ivanciu, a county official. There were conflicting reports on where the cyanide came from.

A cyanide spill last year near Baia Mare in northwestern Romania discharged 130,000 cubic yards of cyanide-tainted water from a gold mine reservoir into river systems in Romania, Hungary and Yugoslavia. The incident has been described as Europe's worst river pollution disaster in a decade.

BBC: <http://www.bbc.co.uk/worldservice/>

Sources available on request. Contact Dave Blouin, Mining Impact Coalition, 608-233-8455, or email, burroak15@aol.com



Cyanide mining is efficient but a hazard to the environment

Some places don't control mine wastes properly, experts say. That may have been true in Romania's recent spill.

By Mark Jaffe
Philadelphia Inquirer, Feb. 15, 2000

Cyanide has been a boon to the mining industry, but a bane to the environment, not only in Eastern Europe - where a spill of cyanide at a Romanian gold mine last week devastated aquatic life in the Tisza and Danube rivers - but in South America and the United States, too.

Cyanide is a naturally occurring and extraordinarily toxic substance. It is the active ingredient in the pellet dropped into prison gas chambers. Its chemistry also makes it highly efficient in separating gold from ore.

"It is so efficient that it has enabled mining companies to go back to old, played-out mines," said Stephen D'Esposito, an analyst with the Mineral Policy Center, a Washington-based environmental group that monitors mining. "With cyanide you can efficiently extract very small amounts of gold from a large volume of ore," D'Esposito explained.

Cyanide has been used to extract gold from crushed rock for more than 100 years. Modern methods that mix cyanide compounds in a water-based solution can recover nearly 100 percent of the gold, making it profitable for mining companies to process lower-grade ores.

In the last decade, cyanide mining technology spread around the world. In the United States, more than 100 million pounds of cyanide are used annually in mining, causing problems in Colorado and Idaho. Two years ago, after a series of small cyanide spills, residents in Montana voted to ban cyanide mining in the state. Elsewhere, though, cyanide mining is growing. Miners use either sodium cyanide or potassium cyanide. Potassium cyanide is used in gas chambers.

"The problem is that in some places there simply aren't adequate environmental controls or attention to best engineering practices," said an official at the U.S. Environmental Protection Agency.

Esmeralda Exploration, an Australian mining company, was using cyanide at the Aural mining smelter in Baia Mare, Romania. A waste pool dike at the facility apparently broke, sending cyanide wastes into streams that flow into the Tisza River, a tributary of the Danube.

"The problem is that we don't know whether that waste pool really met industry standards," said D'Esposito.

The Romanian incident is not unique. In 1998, a truck carrying cyanide to the Kumtor Mine in Kyrgyzstan spilled two tons of the chemical into the Barskaun River. There was a massive fish kill and two reported human deaths. The tourist trade in the nearby hot-spring-fed Lake Issyk-Kul also was hurt. The mining company in this incident was a major Canadian firm Cameco Corp.

In 1995, Guyana suffered a major cyanide spill - more than 825 million gallons - that polluted a 50-mile stretch of the Essequibo River. The cyanide escaped from a waste pond at the Omai Gold Mines Ltd. The pond leaked for five days. The Omai mine was owned by Cambior Inc., a Canadian company, and Golden Star Resources Ltd., a subsidiary of Denver-based Invesco PLC.

"What we see happening," one U.S. official said, "is money being raised on the international markets for these ventures and then a quick hit going in to get some gold."

Under the best technology, much of the cyanide is recaptured. Remaining wastes, including cyanide traces and heavy metals such as arsenic, nickel and lead - all of which are toxic - are supposed to be stored in secure waste ponds.

"Those ponds are supposed to be able to withstand heavy rains and snows," said D'Esposito. "Apparently that was the problem in Romania."

But even in the United States, which has tougher environmental rules, cyanide mining is a problem. The abandoned Summitville Mine, in Summitville, Colo., was found to be leaking cyanide into the Alamosa River, and the EPA has spent \$170 million over eight years to clean up the site.

In Idaho, the U.S. Forest Service is taking emergency action to stop cyanide from leaking out of waste ponds at the Heleca Mining Co.'s Grouse Creek Mine. The cyanide was leaking into Jordan Creek, which the Forest Service said was a critical habitat for chinook salmon.

While its immediate impacts are severe, cyanide's effects dissipate quickly once pollution is stopped.

"It does not hang around like DDT, PCBs or oil," said Richard Horowitz, a senior biologist with the Philadelphia Academy of Natural Sciences.

While it might kill fish and bottom-dwelling animals such as worms and snails, cyanide does not build up in the food chain. It either becomes a gas or is broken down by microbes.

"Once it is gone from a flowing river," Horowitz said, "you can anticipate fish and other life coming back very soon."



A History Of Accidents

(Outside the U.S.)

** Ten miners were killed when a disused slime dam at the Harmony mine in South Africa, operated by Randgold, burst its banks and buried a housing complex in cyanide-laced mud in February 1994.*

** More than 3.2 billion litres of cyanide-laden tailings were released into Essequibo river in Guyana when a dam collapsed at the Omai gold mine in August 1995. Studies by the Pan American Health Organization have shown that all aquatic life in the 4 kilometer long creek that runs from the mine to the Essequibo has been killed.*

** On May 20, 1998, a truck transporting cyanide to the Kumtor mine in Kyrgyzstan plunged off a bridge spilling 1762 kilograms of sodium cyanide into local surface waters. Local people have reported at least 4 deaths that may have resulted from the spill. Hundreds of people also checked into local hospitals complaining of health problems following the spill.*

** In April 1998 a dam at the Los Frailes zinc mine in southern Spain ruptured and released an estimated 1.3 billion gallons of acid, metal-laden tailings into a major river and over adjacent farmlands. While news reports of the associated massive fish kill did not mention cyanide or related compounds in the wastes, their presence seems likely given the metals extracted at this site.*

** On March 21, 2000, the Australian mining company Dome Resources contaminated an important water system in the Papua New Guinea rainforest. While flying from the capital Port Moresby to the Tolukuma mine, a Dome helicopter dropped a crate containing one tonne of sodium cyanide pellets the most concentrated form of cyanide into*

the rainforest.

Update on Australian cyanide ban campaign in New South Wales (1/27/01):

Here in New South Wales, the NSW Greens have submitted a Bill to parliament and it awaits discussion which will occur sometime in the next 3-9 months. It is highly highly unlikely that this Bill will pass given who is currently holding the power in the government, so we are happy for the discussion period to be held off as long as possible so that we can keep lobbying and use this as leverage to raise more awareness about gold mining.

Meanwhile, we're about to do a push to move the campaign into the international sphere by asking folks around the world to take it up.

For the Earth, Ruth Rosenhek.

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Globalization and the 2000 cyanide disaster

Dead in the Water

by Donella H. Meadows
February 14, 2000

Here's a story of the global economy at its worst and maybe also at its best.

Early this month a cry of alarm came over email from my friend Zoltan Lontay in Hungary. The Hungarian news had just announced an enormous fish kill in the Szamos river on that country's eastern border. A wave of cyanide was moving down the Szamos and into the Tisza, Hungary's second largest river. No one knew what had happened, but there was talk of a mine, operated by an Australian company, across the border in Romania – a mine that uses cyanide.

Zoltan's message went out to a discussion list of over 100 friends all over the world. Replies bounced back, a guess that it must be a gold mine using cyanide heap leach technology, reports of similar disasters in other parts of the world. Philip Sutton in Australia said he would find out which Australian mining companies operate in Romania.

By February 8, Zoltan had more information. It was indeed a gold mine, of the modern sort that allows even very dilute gold deposits to be extracted from tons of rock economically. The rock is dug, crushed, and piled in heaps, through which cyanide drips to leach out the gold. The tricky part is what then to do with the cyanide. In Romania it

was dumped into an above-ground pool held by an earth dam.

Zoltan wrote:

Though the poison in the pool was enough to kill a million people, the authorities neglected to keep it inspected. On January 30 the dam collapsed. Within half a day cyanide concentrations in the Szamos reached 150-300 times the safe level. Life in the river was exterminated, from fish to plankton.

Several hundred thousand people live in the danger zone. No drinking, fishing, or water extraction from the river or from wells along the river is allowed. The city of Szolnok on River Tisza is distributing bottled water, five liters per family per day. Food industries and paper mills have shut down.

For more than 24 hours the polluting company did not report the incident. People in Romania learned about it only from the Hungarian media. A fine of \$160 was imposed on the company for late reporting. Eight days after the spill a similar spill occurred in the same region. The Romanian authorities again did not warn Hungary, and they have not withdrawn the operating licenses of the mining companies.

Direct economic damage is several hundred million dollars. No one knows how long cyanide in the mud will poison the river and neighboring wells and soils. It is shocking to see on television local people standing along the dead river and mourning it.

The following day Philip Sutton passed on news from the Mineral Policy Institute, an Australian nonprofit that keeps its eye on the mining industry. The offending company's name is Esmeralda. It did not post a bond against environmental damage. The cyanide pond sat in the middle of a Romanian town, 50 yards from an apartment block. The dam broke because rain and snow had filled the pond beyond capacity.

Geoff Evans, director of the Mineral Policy Institute, said, "This adds to the legacy of environmental disasters by Australian mining companies. Serious accidents like this are an inevitable and tragic consequence of using cyanide for gold extraction."

The word "inevitable" leaped out at me. The favorite word of globalization enthusiasts. Free trade, the global economy, it's all inevitable. Don't try to stand in the way of the train; your only choice is to get on and ride.

That "inevitability" claim stops both thought and action. Economics is not physics, it doesn't operate by laws we can't revoke. An economy is a human invention designed to serve human purposes. It is probably inevitable that there will be spills from huge open pools of cyanide. It is not inevitable that companies from one country be allowed to mishandle deadly chemicals in another country and spill them into a third country. Not inevitable, unless we believe it is and do nothing to prevent it.

Free trade enthusiasts never define what this "inevitable" globalization actually means to them. I gather that it means something like the freedom for anyone to go anywhere and do anything that makes money without interference from the locals. I don't suppose anyone actually wants a planetary pollution free-for-all. But you can see why Hungarians -- and New Guineans and other people who have had to live with cyanide and other kinds of spills -- might come to believe that, whatever is intended, what globalization really means is carelessness, unaccountability, greed, and destruction.

Of course, it was a global information system that allowed my group to pass along news of this disaster way ahead of the media. The WTO protesters in Seattle organized through the global Internet. Romanians learned about the poison on their border through Hungarian media. Some aspects of globalization are not only inevitable but desirable, while others are neither acceptable nor necessary. It isn't really hard to figure out which is which.

Donella H. Meadows is director of the Sustainability Institute and an adjunct professor of environmental studies at Dartmouth College.

Cyanide tarnishes gold

FINANCIAL TIMES

by Virginia Marsh

July 18, 2000

One thousand two hundred and forty tonnes is a lot of fish. Yet that is the quantity the Hungarian authorities estimate died in the river Tisza after the cyanide spill in January at the Aurul gold mine near Baia Mare, just across the border in Romania. Last week, the Hungarian government lodged a claim for A\$179m (£69.6m) of damages against Esmeralda, a tiny Western Australian company that operated the Aurul mine. Whatever the results of that action, the cyanide spill could prove something of a watershed for the world's gold mining industry.

The Esmeralda disaster attracted blanket media coverage across the world, causing great embarrassment to the mining industry. It was followed within weeks by another accident, when Dome Resources, an Australian company, accidentally dropped a tonne of highly concentrated cyanide in the Papua New Guinean jungle.

This has re-opened two of the industry's most intractable debates - over the use of cyanide in mining, and the duties that mining companies owe to the developing countries in which they operate.

Sodium cyanide has been used since the 1890s, the height of the gold rush, in the Australian state of Victoria, to "leach" gold particles from ore.

Many gold-containing ores are made up of fine gold particles locked within other minerals. It is usually both too expensive and technically difficult to extract the metal in commercial quantities from these ores using purely physical mining methods.

Cyanide is used to dissolve the gold, which is extracted by crushing, gravity separation and other physical techniques. After more than a century of research, cyanide remains the preferred reagent for extracting gold using leaching.

But cyanide is highly toxic. Controlling it means either covering up the waste ponds where it is stored, or diluting the wastes to perhaps a tenth the strength of the mixture that is used when processing the ore. One of the problems at Baia Mare was that cyanide levels in the waste were still at process strength. When a tailings dam collapsed, hundreds of thousands of tonnes of cyanide-laced water flooded into the Tisza.

As a cyanide-related mining disaster, the incident is without parallel, certainly in Australia and North America, two of the world's three largest gold-mining regions (the other is South Africa).

According to Australia's Department of Environment, cyanide has not been responsible for any fatalities in the local mining industry. Tom Farrell, an environmental consultant at the Australasian Institute of Mining and Metallurgy who has 25 years experience, says he is not even aware of any cyanide-contaminated water having escaped untreated from a mining plant or tailings dam in Australia.

Apart from public concern about plants using cyanide, the main environmental issue within Australia, he says, has been the poisoning of birds and other animals that have drunk from contaminated tailings dams.

But that in itself is cause for concern, according to many. The discovery that cyanide-laced water was responsible for the death of probably thousands of birds at the Northparkes mine in New South Wales in the mid-1990s, has held up government approval for further development of that plant or of other planned mining projects involving cyanide within the state.

The problem at Northparkes appears to have been put right. But Mr Farrell says the Esmeralda incident will perpetuate the idea in the public mind that cyanide is a serious, perhaps the most serious, environmental issue that the Australian gold mining industry faces.

The trouble is that there are few alternatives. Many Australian mining companies have been increasing spending on research and development, including in the environmental area. Newcrest, one of the larger local gold mining companies, for example, has increased its annual R&D spend by 40 per cent over the past four years. Even so the industry - out of favour with equity markets and under greater pressure than many to improve returns - has not spent enough investigating alternatives.

One approach uses polymers with ion-exchange capabilities to Hoover up cyanide ions from mine waste - or tailings -

before the chemical even leaves the processing plant and finds its way into a slurry. According to Bill Jay, who heads Orotek, which markets the technology, there has been a lot more interest in the cyanide recovery technology since the accident in Romania.

This approach comes from work at Monash University in Victoria, to which Mr Jay is affiliated. Professor John Cushion and others at the university are also investigating several methods using chlorine and polyurethane foam.

However, Mr Jay, a former senior research fellow in Prof Cushion's department, says these techniques are still years from the point when they might replace the cyanide method.

A third technique is bio-mining - the use of acid-eating bacteria that dissolve gold as cyanide does, but are far less toxic. But neither is this economical enough to be widely used.

Although the industry has no new techniques to introduce, it can use cyanide more safely around the world. Within Australia, mining companies have for decades been goaded into adopting better environmental practices by the green lobby and are subject to stringent government regulations. After a number of disasters abroad, they are now under growing pressure to adopt the same standards required at home when working elsewhere - even if local law does not demand it.

"Companies know they can't get away with doing one thing in Australia and another somewhere else," says Greg Barns, chief executive of the Australian Gold Council, an industry association.

Broken Hill Proprietary, one of Australia's largest mining groups, is high on environmentalists' list of worst offenders, because of its Ok Tedi mine in Papua New Guinea. However, the company is now at the forefront of attempts to establish global industry standards.

The "global mining initiative" would bind companies around the world to a broad set of principles and best practice that they would undertake to follow at every mine, no matter where.

The initiative, which would also address social and economic issues, is being championed by Paul Anderson, the American who has shaken up BHP since becoming chief executive two years ago.

Among other things, Mr Anderson has come clean about Ok Tedi, admitting it has had dire environmental and social consequences, and is working with the Papua New Guinean government on a plan to close it down. The project has devastated the surrounding river system, because of the waste dumped into it - an incident over which BHP was successfully sued by local groups in the mid-1990s.

The global initiative was already under way before Esmeralda's disaster in Romania, but industry followers say the accident has given the scheme impetus. The challenge is to get the hundreds of small exploration companies and mining service companies to sign up too. Many are, like Esmeralda, loss-making and employ just a few staff.

"The larger groups, many of which are increasingly outsourcing to the smaller companies, should be able to use their leverage with these operators to impose higher standards," says a senior mining executive. "There is a realisation that accidents like Esmeralda's are hugely damaging to us all, not just to the companies involved, and that we have to work harder as an industry to prevent such accidents from occurring."

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Inquiry waters muddied

FINANCIAL TIMES
by Gillian O'Connor
July 18, 2000

The United Nations report on the disaster at the Aurul gold mine near Baia Mare concluded that the mine spill, which polluted 2,000km of rivers in Romania, Hungary and Yugoslavia, was partly due to inherent faults in the design of the mine dam meant to contain the cyanide-rich waste.

"The breach in the retention dam was probably caused by a combination of inherent design deficiencies in the process, unforeseen operating conditions and bad weather," it said. The report, published just before Easter, also criticised the company and local Romanian authorities for their "rudimentary" preparations and procedures for coping with emergencies. It took 10 hours for the local Baia Mare environment agency to inform the local waters authority of the spill.

And the report commented on the lack of any monitoring system to spot a disaster in the making. Baia Mare is only the latest in a series of mining spills. The table, listing some of the more important recent ones, covers incidents in Papua New Guinea, South Africa, Guyana, the Philippines, Spain and Kyrgyzstan.

Many relate to gold mines, and involve cyanide. But the Los Frailes spill in Spain came from a lead-zinc mine, and the Philippines one from a copper mine.

Many involve cracks or breaks in waste dams, but the Kyrgyzstan spill occurred when a truck carrying cyanide crashed into a river.

Finding out exactly what went wrong and why, even in relatively recent disasters, is not easy. All the parties involved have their own interests to protect, and claims, counterclaims and denials muddy the issues.

In the immediate aftermath of Baia Mare, Esmeralda, the Australian company operating the project, said that the incident had been grossly exaggerated, that there was no evidence to connect the contamination with the dam overflow, and that the overflow was attributable to the wet snowy weather, not a structural failure. And even now there are marked discrepancies between pollution reports from the Romanian and the Hungarian scientists.

At Marcopper in the Philippines the company asked the court to dismiss charges against its executives, saying that the waste spill - after an earthquake - was an act of God for which no one could be held liable.

Any attempt to pin down common causes for incidents where the events are disputed must be speculative.

The use of cyanide and the effectiveness of waste dams are obvious issues. But the attitudes of some mining companies and governments may also be relevant.

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See MineWire, Vol. 3, No. 5 for a related story on the Aural mine spill, entitled "Hungary files mine spill claim", at http://www.mineralpolicy.org/files/MineWire_v3n5.pdf.

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EU Releases Report on Cyanide Disaster

International Mining Environment Groups Call for Strict Oversight of Mining Operations

Dec. 15, 2000
Mineral Policy Center
- Friends of the Earth,

Hungary - Mineral Policy

Institute Contact: Chris Cervini, 202.887.1872 x207
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The European Union today released a report on the Esmeralda cyanide mining disaster which devastated a huge swath of the Danube river system earlier this year.

The spill, which was called Europe's worst environmental disaster since Chernobyl, has forced the European Union to look at implementing strict legislation to control the operations of foreign mining companies.

Today, Friends of the Earth in Hungary, Mineral Policy Center in the United States, and Mineral Policy Institute in Australia call for mining operations to be controlled by proper international standards wherever the companies are operating and not just in the European Union.

Such standards should deal with:

- *The need to regulate mining companies by strong international regulations*
- *The ineffectiveness of voluntary regulation*
- *The long term pollution problems created by mining*
- *Protection of sensitive ecosystems and protected areas*
- *Bans on inherently destructive practices such as riverine and ocean waste disposal*
- *Compensation for those directly affected by mining disasters*
- *Creation of baseline mechanisms that identify parties financially liable for cleanup when disasters occur*

This past January, Australian miner Esmeralda spilled 3.5 million cubic feet of cyanide contaminated and heavy metal-laden waste water into Romanian rivers. The pollution flowed through Hungary to Yugoslavia and on into the Danube, killing all aquatic life in a 250-mile stretch of the river system.

The spill was one in a long series of disasters associated with the modern mining industry, including a devastating 1995 tailings dam break at the Omai gold mine in Guyana and a cyanide and heavy metals leak at the Summitville gold mine in Colorado in the early '90s.

"The public's cyanide allergy is a response to the industry's poor track record of cyanide spills and polluted ecosystems," said Mineral Policy Center's president, Stephen D'Esposito. "It will continue to spread until regulators establish international standards and mining companies follow them."

"Australian, Canadian, U.S. and British mining companies have poor track records when it comes to protecting the public and the environment from mining's impacts," said Geoff Evans, director of the Mineral Policy Institute in Australia. "Mining companies need to be held accountable and international standards need to be put in place to prevent future catastrophes."

Everyday practices of international mining companies are also causing massive environmental and social damage. These companies routinely dump waste directly into rivers and oceans, and destroy farmland with acid drainage that leaks off mine sites and into river systems. What has resulted from such practices are farming communities that can no longer work their land and river communities devastated by waterways choked with mine waste.

"The concerns of impacted people in Hungary are raised, but the silence about the ongoing impact on local population around the mine site is a serious issue which is not addressed," said Jozsef Feiler from Friends of the Earth Hungary. "The poor record of the Romanian authorities goes hand in hand with the cynical and negligent approach of the Australian company using double standards. Practices continue in Eastern Europe that would not be allowed in Australia." Feiler concluded.

"Today, we call for an end to what amounts to an environmental double standard," MPC's D'Esposito reaffirmed. "There has to be an international effort to protect developing countries from mining practices that would not be allowed where these companies have their headquarters -- The U.S., Australia, Canada or Britain."

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CASE STUDY, 1998: TRUCK SPILLS CYANIDE IN KYRGYZSTAN, CENTRAL ASIA

On May 20, 1998, a truck transporting cyanide to the Kumtor gold mine in Kyrgyzstan plunged off a bridge, spilling about 1,762 kilograms (kg) of sodium cyanide into a river upstream of several villages. (The material that spilled was a concentrated form of cyanide and not cyanide-bearing tailings or heap leach waters...)

Within days after the spill, hundreds of local residents sought treatment at medical clinics. According to a report by the Russian Federation Ministry of Defense, at least one human death was related to the cyanide spill. The mining company and some officials of the Kyrgyz government, which holds a majority ownership in the mine, have argued that few if any significant impacts have occurred to any living organisms or the overall environment, as a result of the spill.

According to Dr. Owen Mathre, a former research chemist for E.I. DuPont, the dissolution of approximately 1,800 kg (about 2 tons) of solid sodium cyanide under these conditions would probably require several hours to complete. Since the pre-spill pH of the river was likely less than 9.0, most of the dissolved cyanide would have formed HCN, a toxic gas that would have escaped into the air. Within a few hours of the accident, sodium hypochlorite was applied to areas near the spill site to break down the cyanide. Application of this chemical, however, would likely result in the formation of cyanate and cyanogen chloride—cyanide-related compounds that are toxic to aquatic organisms. Cyanogen chloride is a heavy gas that could have traveled significant distances from the spill, and has been known to cause throat and eye irritation in mine workers. Therefore this compound, together with the presence of gaseous ammonia, may have contributed to some of the medical complaints of the local citizens.

Water samples collected about 20 meters from the spill site (presumably downstream) within hours of the accident contained up to 79.5 mg/L of free cyanide, which was the only cyanide form reported. However, since standard cyanide analytical techniques fail to detect several forms of cyanide and cyanide-related compounds, the concentrations reported would not include cyanide from many of the stronger metal-cyanide complexes, nor would they include the toxic cyanide breakdown products in cyanates, thiocyanates, cyanogen, and cyanogen chloride, or indications of ammonia or chloramine concentrations. All of these compounds could have formed following the spill, and all are toxic to aquatic organisms. Furthermore, it is unclear that any of the early samples were collected prior to the application of the sodium hypochlorite.

Thus, available data from the cyanide spill in Kyrgyzstan provides an incomplete picture of the toxic forms of cyanide potentially present at the spill site.

from Mineral Policy Center
MPC Issue Paper No. 1
Cyanide Uncertainties:
Observations on the Chemistry, Toxicity, and
Fate of Cyanide in Mining-Related Waters
Robert Moran, Ph.D., 1998
<http://www20.org/mirrors/www.zpok.hu/cyanide/balamare/docs/cyanideuncertain.htm>

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Ban Cyanide at Crandon Mine
Background on Cyanide in Mining - in Wisconsin Inside the U.S.
MTN Content Page

<http://www.alpha CDC.com/treaty/cyanide3.html>



EXAMPLES OF RECENT CYANIDE-RELATED MINE ACCIDENTS

From Cyanide Uncertainties, 1998, Mineral Policy Center

(Inside the U.S.)

Colorado, U.S.A.: *In Colorado, spills of cyanide and other contaminants from the Summitville gold mine, owned by Galactic Resources Ltd, contributed to severe environmental problems on a 17-mile stretch of the Alamosa River. The mine was opened in 1986, and abandoned in 1992. It is now a federal Superfund site. Estimated total cleanup costs range from \$170-200 million.*

Montana, U.S.A.: *Pegasus Corporation recently closed the Zortman-Landusky gold mine in Montana. Opened in 1979, it was the first large-scale cyanide heap leach mine in the United States. The mine experienced repeated leaks and discharges of cyanide solution throughout its operating life, resulting in wildlife deaths and severe contamination of streams and groundwater.*

In 1998, Montana voters passed Initiative 137, which banned cyanide heap and vat leaching of metallic ores. The Montana Dept. of Environmental Quality reported that between 1982 and 1998 there were 62 spills or leaks of cyanide, some of which killed fish and wildlife. Montana voters approved the ban by a 52 - 48% vote. Legal challenges have failed to overturn the ban.

Nevada, U.S.A.: *Following the failure of a leach pad structure in 1997, the Gold Quarry mine in Nevada released about 245,000 gallons of cyanide-laden waste into two local creeks. In 1989 and 1990, a series of eight cyanide leaks occurred at Echo Bay Company's McCoy/Cove gold mine in Nevada, releasing a total of almost 900 pounds of cyanide into the environment.*

South Dakota, U.S.A.: *On May 29, 1998, six to seven tons of cyanide-laced tailings spilled from the Homestake Mine into Whitewood Creek in the Black Hills of South Dakota, resulting in a substantial fish kill. It is likely to be years before the stream fully recovers.*

BBC: <http://www.bbc.co.uk/worldservice/>

Sources available on request. Contact Dave Blouin, Mining Impact Coalition, 608-233-8455, or email, burroak13@aol.com



VITAL STATISTICS: Cyanide - Gold's Killing Companion

Cyanide is the most popular chemical used by mining corporations to extract gold from ore, despite the fact that leaks or spills of this chemical are extremely toxic to fish, plant life and human beings. In recent years communities in Montana and Turkey have successfully challenged this deadly practice, setting standards for the rest of the world.

The term "cyanide" refers to numerous compounds, both natural and human-made, having the chemical group CN, that is, one atom of carbon and one atom of nitrogen. Hydrogen cyanide is a colorless gas or liquid with a faint, bitter almond odor. Sodium cyanide (the processing chemical which mining companies use) is a colorless solid with a slight odor of bitter almonds.

In 1994 there were 36 companies operating 44 hydrogen cyanide production facilities with a total production capacity of over one billion kilograms in the United States, Western Europe and Japan. DuPont is the dominant world producer with about 38% of total capacity, either totally or partially owned; no other producer has above a 7% world capacity share.

Cyanide combines with up to 97% of gold, including particles of gold that are too small to be seen by the naked eye, making it one of the most efficient process chemicals for the extraction of the metal. The most popular technology that utilizes this chemical property, cyanide leaching, has gained wide use since the 1960s, after it was promoted by the United States Bureau of Mines to replace the older mercury amalgamation processes.

Cyanide leaching involves spraying a sodium cyanide solution (at 250 to 500 parts per million) on finely ground ore or on old waste rock, known as tailings. The gold forms a water-soluble chemical compound with the cyanide called a "pregnant solution" which is then run over activated carbon to extract the gold. The cyanide waste that is left over is supposed to be stored in lined and covered ponds to prevent contact with local animals and birds. Some companies process the ore in vats allowing the cyanide to be recycled, but most operations store the waste cyanide in ponds with plastic liners that break easily, allowing the solution to contaminate the ground water.

Popular concern over this technique has focused on the lethal impact of cyanide. A teaspoonful of two-percent solution of cyanide can kill a human adult. Cyanide blocks the absorption of oxygen by cells, causing the victim to effectively "suffocate." Human exposure to high levels of cyanide for a short period harms the central nervous system, respiratory system, and cardiovascular system. Short-term exposure to high levels of cyanide (110 parts per million) can cause coma and/or death within 30 minutes to 1 hour.

Cyanide impacts fish at far lower concentrations. Concentrations as low as five micrograms per liter have been found to inhibit fish reproduction, and adverse impacts have been reported at levels of ten micrograms per liter. This toxicity increases with any reduction in dissolved oxygen below 100%, and increases three-fold with a 12 degree celsius decrease in temperature.

What the mining companies say ...

Mining and regulatory documents often state that cyanide in water rapidly breaks down in the presence of sunlight and oxygen, into largely harmless substances such as carbon dioxide and nitrate. They also insist there have been no reported cases of human death from cyanide spills. Also scientific studies show that cyanide swallowed by fish will not "bio-accumulate" which means it does not pose a risk to anyone who eats the fish.

... and what mining companies don't tell you

Although cyanide solution eventually breaks down in the presence of sunlight and air at pH neutral conditions, it will not do so when it seeps underground, under cloudy or rainy conditions such as are seen in tropical countries, or during winter in cold countries when lakes or streams may have snow and ice cover and temperatures are reduced. If the cyanide solution is slightly acidic, it can turn into cyanide gas, which is extremely toxic. Furthermore, if the solution is alkaline the cyanide does not break down.

Robert Moran, a geo-chemical expert, has found cyanide-contaminated sediments at a cobalt-nickel mine in Missouri that contained many milligrams per kilogram of total cyanide more than 25 years after all processing had ceased. Samples of bricks, concrete, plaster and mortar from buildings at the Auschwitz-Birkenau concentration camps collected about 45 years after all use of cyanide ceased still showed detectable concentrations of cyanide, presumably as iron cyanides.

Most importantly, not all of the cyanide used in mineral processing breaks down quickly into largely harmless substances. Many of the breakdown compounds, are still toxic to aquatic organisms, and may persist in the environment for significant periods of time. Some of these toxic breakdown forms include the free cyanides, metal-cyanide complexes, organic-cyanide compounds, cyanogen chloride, cyanates, thiocyanates, chloramines, and ammonia.

Of these, cyanate is the main form of cyanide resulting from most cyanide decomposition processes employed at

mineral process sites. Cyanate may persist in water for significant, but undefined periods of time. Ammonia, another breakdown product, is considered to be about as toxic to fish as cyanide. Some data indicate that the combined effect of ammonia and cyanide is greater than would be assumed on the basis of their individual toxicities. Thiocyanates cause "sudden death syndrome" in trout, partly as a response to stress, and because, unlike free cyanides, thiocyanate is accumulated. Other breakdown chemicals like cyanogen chloride may be more toxic to fish than free cyanides.

Official Standards

The current United States Environmental Protection Agency (EPA) water quality criterion for cyanide, set in 1986, is 5.2 micrograms per liter (µg/L) for freshwater aquatic life, and 1.0 (µg/L) for marine aquatic life and wildlife (1986). Yet no criteria exist for other toxic cyanide-related compounds, including cyanate, thiocyanate, cyanogen chloride and the metal-cyanide complexes.

Cyanide levels in the workplace are regulated by the United States Occupational Safety and Health Administration (OSHA). OSHA has a legally enforceable exposure limit of 5 milligrams of cyanide per cubic centimeter of air (mg/cm³) for cyanide and 11 mg/cm³ (or 10 ppm) hydrogen cyanide in air for an 8-hour workday, 40-hour workweek. The United States National Institute for Occupational Safety and Health (NIOSH), however, recommends that employee exposure to hydrogen cyanide and cyanide salts should not be more than 5 mg/m³ in air for a 10-minute sampling period.

Two Communities Fight Back

The community of Bergama, Turkey, was the first to win a legal ban on cyanide. In May 1997 the highest Turkish administrative court overturned approval given by the Department of Environment for the proposed Eurogold project after a rally by 10,000 local people with 1,000 tractors occupied the mine site. The judgment was based on the Turkish Constitution and its guarantee of a healthy and intact environment. The court found that a cyanide-based mining technology was at odds with these constitutional rights.

And voters in the north-western state of Montana approved a ballot measure on November 3, 1998 banning the use of cyanide to extract gold. The community decided to take this initiative after years of suffering dozens of toxic leaks from local mines. For example, the indigenous Assiniboine and Gros Ventre peoples had to battle for years in court to force Pegasus, a Canadian gold mining company, to clean up cyanide waste on the Fort Belknap reservation in the Little Rocky Mountains of Montana. Although the community won the lawsuit in 1996 the company declared bankruptcy the following year thwarting clean-up efforts.

US-based mining company Canyon Resources has filed a lawsuit against the state of Montana in an attempt to recover what it claims will be US\$600 million in lost revenue because of a recent ban on the use of cyanide in gold mining. The suit will also challenge Initiative 137 passed by voters into state law in 1998. The initiative prohibits any new open-pit gold or silver mine from using cyanide to process ore. Head of Canyon Resources, Dick DeVoto said that his company will not contest the constitutionality of the initiative, but will concede that the company was wrongly deprived of the value of its mining property because of the ban.

According to DeVoto, talk among the mining industry indicates that the cyanide ban has put Montana off limits to the mining industry.

(Associated Press, February 9, 2000)

SOURCES: "Cyanide - Gold's Killing Companion", by Project Underground, October 1999; "CRANDON PROPOSAL--CYANIDE ISSUES", by Dave Blouin, Mining Impact Coalition, February 2000.

Project Underground

Supporting communities threatened by the mining and oil industries 1916A Martin Luther King Jr Way, Berkeley, CA 94703

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A History Of Accidents

(Inside the U.S.)

* Cyanide and heavy metal leaks from the Summitville gold mine killed all aquatic life along a 27 kilometer stretch of the Alamosa river in the San Juan mountains of southwestern Colorado by the time the mine was shut down in December 1992. The total clean-up costs have exceeded US\$150 million.

* Over 11,000 fish were killed along an 80 kilometer stretch of the Lynches River by a similar cyanide spill from the Brewer gold mine in South Carolina in 1992.

* Failure of a leach pad structure at the Gold Quarry mine in Nevada released about 1 million liters of cyanide-laden wastes into two creeks in 1997.

* On May 29, 1998 6 to 7 tons of cyanide-laden tailings spilled into Whitewood Creek in the Black Hills of South Dakota, from the Homestake Mine, resulting in a substantial fish kill.

* On May 29, 1998, six to seven tons of cyanide-laced tailings spilled from the Homestake Mine into Whitewood Creek in the Black Hills of South Dakota, USA resulting in a substantial fish kill. It is likely to be years before the stream fully recovers.

* April 5, 2001

Cyanide - Truck Driver Charged

By Tim Velder
Northern Hills Bureau
Rapid City Journal, SD
http://www.rapidcityjournal.com/display/inn_news/news01.txt

A trucker is facing a drunken-driving charge* after his truck full of cyanide ended up on its side early Thursday in a ditch off U.S. Highway 85 southwest of Lead. The load of 5,235 gallons of 30 percent sodium-cyanide solution was bound for the Wharf Resources gold and silver mine near Lead. State and local officials emphasized that none of the cyanide had leaked.

Sometime Friday, officials from a cyanide-making plant in Nevada will supervise pumping the cyanide from the wrecked truck to another truck. During the transfer, the highway will be closed between Cheyenne Crossing in South Dakota and Four Corners in Wyoming. The area will reopen to traffic after the scene is cleared.

The accident scene is two miles inside the South Dakota border, 22 miles from Lead and 34 miles from Spearfish.

According to South Dakota Highway Patrolman Tony Melaragno, truck driver Menno Derijk, 42, Winnemucca, Nev., said he lost control of the rig about 5 a.m. while trying to avoid a deer on the highway.

The South Dakota Highway Patrol, Lead Fire Department and Wyoming Highway Patrol from Newcastle were dispatched to the scene. Safety teams from Wharf Resources and a state natural-resources engineer from Rapid City also responded.

Melaragno's investigation indicated that Derijk had a blood-alcohol level above the legal limit for commercial drivers, which is .04 percent of alcohol. The limit is stricter than the .10 percent of alcohol for other drivers in South Dakota. Derijk was taken Thursday morning to the Lawrence County Jail. Melaragno said damage estimates to the truck were incomplete because of the snow cover.

Lead Fire Chief Ray Bubb said the 1985 Freightliner's 5-inch-thick, double-walled tank was not punctured and that

none of the valves was leaking. Cyanide is considered a hazardous material because of its toxic properties. "He couldn't have picked a better place to wreck," Bubb said. The tanker slid on the road and plopped into a ditch filled with softened snow, which cushioned the truck's fall. Other areas along the highway are rocky with steep ravines, which could have breached the tank.

Bubb said heavy fog initially made it difficult to size up the risks from a safe distance. Coded placards are placed on hazardous-materials trucks to alert officials to what is on board. However, with 30-yard visibility, officers had to get close to read the placard.

Because the truck was not leaking, fears of deadly cyanide gas were alleviated, Bubb said. "While serious in nature, due to the exact circumstances involved here, no one needs to be concerned about this taking any lives or damaging the environment," he said.

State Department of Environment and Natural Resources officials in Pierre said the Rapid City field-office worker was assessing potential dangers for area homes. However, the area is remote and lacks creeks and ponds. No evacuations were announced Thursday.

Bubb, Lead Fire Capt. Chuck Carter and Transwood Trucking Co. representative David Nahnsen monitored the scene from about a quarter-mile away. Traffic was allowed to continue through the area, although orange road-construction signs were placed on both sides of the wreck area to warn drivers.

DENR spokeswoman Kim McIntosh said officials from cyanide-manufacturer Cyanco of Winnemucca were en route by plane to oversee handling of the truck and its chemical load. She said South Dakota does not require special permits for mines or its suppliers to transport cyanide.

Black Hills gold mines have used cyanide to extract gold from crushed rock since the early 1900s. Development of open-pit gold and silver mining has increased area cyanide use since 1982, but McIntosh and Wharf general manager John Begeman said they did not know of another traffic incident involving a cyanide shipment in that time.

- Sodium cyanide is a white, crystalline compound. Begeman said the Wharf mine in 1989 switched from cyanide-briquette shipments because premixed solutions are considered safer to handle. [Note: Crandon project would use briquettes]

The more than 5,000 gallons of solution contains about 15,000 pounds of cyanide, which will provide about a week's worth of processing for gold and silver, he said.

You may call reporter Tim Velder at 642-8822, Ext. 17, or send e-mail to him at tim.velder@rapidcityjournal.com.

(*--Thank goodness we have no drunk drivers in Wisconsin!)



From: "Mineral Policy Center"

mcc@mineralpolicy.org

Mining Exposed as Top Toxic Polluter in U.S. Yet New Senate Legislation Would Block Stronger Environmental Mining Rules

May 11, 2000

Contact:

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Washington, D.C., - According to the EPA press office, at 2 pm today the Environmental Protection Agency (EPA) will release its Toxics Release Inventory (TRI) report. The report will reveal that the hardrock mining industry releases more toxics than any other industry in the U.S. The report details the specific pollutants released which include mercury, arsenic, lead and cyanide.

This marks the first year TRI data will be available for the hardrock mining industry. (Hardrock minerals are nonfuel minerals such as gold, silver and copper.) For years, the hardrock mining industry successfully fought efforts to require its submission of toxic release data along with other industries. But in 1997, the EPA, under pressure from Mineral Policy Center and other environmental organizations, required the mining industry to report. This year's TRI will cover 1998 releases.

The new report reveals:

- In 1998 Nevada mines released approximately 1.3 billion pounds of toxic pollutants. One Nevada mine reported releasing over 80,000 pounds of mercury, with over 9000 pounds of mercury released directly into the air.
- The Cyprus Miami copper mine in Arizona released twice as much toxic waste (123 million pounds) as all of the waste released in New York State (60 million pounds).
- Nevada topped the polluter list, eclipsing Texas, due to toxic releases from the mining industry.
- Mining eclipsed the chemical manufacturing industry as the nation's top polluter.
- In 1997 the chemical manufacturing industry reported 797.5 million pounds of toxic releases nationwide. In 1998, in just one state, Nevada, mining reported approximately 1.3 billion pounds of toxic waste.

Yet even as this new information is released by the EPA, mining industry advocates in the Senate attached an anti-environmental rider to this year's Department of Agriculture spending bill. The rider would block new environmental mining rules. If unimpeded by this rider, these rules would reduce toxic mining pollution, and ensure that mining operators, not the taxpayer, pay the billions of dollars required to clean up toxic mine sites.

The Toxics Release Inventory was created in 1986 by the Emergency Planning and Community Right to Know Act (EPCRA) to provide citizens with vital information about toxic pollution in their communities.

"For over a decade the industry has hid behind a reporting exemption, now we know what we've long suspected, the mining industry is the nation's biggest toxic polluter," said Stephen D'Esposito, President of Mineral Policy Center. "With this information, pressure will build for the industry to clean up its act. This is a wakeup call for an industry that for too long has escaped public scrutiny."

"The facts speak for themselves. The industry is releasing massive amounts of mercury into Nevada's air, it releases cyanide into our nations rivers and streams. And yet rather than respond to these facts, some in the Senate continue to listen to mining industry lobbyists," added Alan Septoff, MPC's reform campaign director. "Industry lobbyists are pushing for an exemption from current limits on toxic mine waste dumping on our public lands. This data shows that Congress should enforce existing waste dumping limits, not grant a toxic waste exemption."

Contact MPC for a full analysis of TRI data. Also MPC can arrange interviews with issue experts and community leaders who live near many of the worst polluting mines. Additionally, photographs of mine waste are available.

Mineral Policy Center (MPC) works to protect communities and the environment from the impacts of irresponsible mining in the U.S. and worldwide.

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THIS IS AN INCREDIBLE STORY about a cyanide emergency at a closed "state-of-the-art" mine in Idaho, which operated at the same time as the Ladysmith mine. The federal government wants to release the cyanide gradually into the Salmon River to avoid a catastrophic collapse of the toxic waste pond dam. We should showcase this "model" Grouse Creek mine in our campaign to prevent cyanide use at the Crandon mine.....



POISON IN SALMON COUNTRY: Emergency Action Ordered for Removal of Cyanide Lake in Idaho

By Paul Koberstein

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STANLEY, Idaho - Federal officials say they will issue an emergency order forcing a gold mining company to remove a lake of cyanide that is contaminating salmon habitat in Idaho, Cascadia Times has learned. The lake is perched on a bench almost directly above the Yankee Fork of Idaho's famous Salmon River, at the edge of the Frank Church-River of No Return Wilderness.

The Salmon River and its tributaries are key to the Northwest's billion-dollar salmon restoration effort. Once home to some of the most abundant salmon runs of any tributary in the Columbia Basin, its fish have been decimated since the construction of federal dams on the Columbia and Snake. Proposals to remove four dams on the Lower Snake would restore more fish by far to the Salmon than any other river. But federal officials worry that the cyanide spilling into the Salmon's headwaters is making survival all the more difficult for endangered salmon, steelhead and bull trout.

The government intends to move quickly on removing the 65-acre lake, which contains 500 million gallons of cyanide-laced wastewater, plus 4.3 million tons of tailings - all from the defunct Grouse Creek open-pit gold mine. Cyanide has been detected in ground or surface water near the mine almost continuously since it opened in 1994. But the government's biggest fear now is that eventually the lake could overflow in a major storm, sending torrents of poison down a mountainside into the Yankee Fork, potentially killing all living things for many miles. The dam holding back the lake could also become unstable because of earthquakes, bad weather or leaks.

"We have a problem on our hands," said Helen Hillman of the National Oceanic and Atmospheric Administration in Seattle, in response to a Cascadia Times inquiry. NOAA is involved because it manages Idaho's salmon under the Endangered Species Act.

"If we don't do something about it, it could get worse," Hillman said. "The amazing thing was this mine was permitted in the first place. Eventually it would overflow, and you would have highly toxic water flowing right into the Yankee Fork. It would kill everything in the Yankee Fork for miles."

One federal official likened the situation to a Romanian gold mine spill that devastated 300 miles of the Danube and its tributaries. The top of a dam broke and released an estimated 100,000 cubic meters of cyanide-laced wastewater within 11 hours. Now, in Idaho, with every heavy spring rain, agencies and conservationists watching the cyanide lake at Grouse Creek worry that a similar disaster could happen in Idaho.

"We are facing a tradeoff between the low level of damage from cyanide release, and the potential for a catastrophic spill," said Nick Iuliano, a National Marine Fisheries Service biologist who has reviewed cleanup plans. "In Romania we had the same kind of situation. A tailings impoundment didn't fail - it overflowed. There was a massive fish kill. If this mine at Grouse Creek would fail, that would be pretty catastrophic. I honestly don't know what the potential would be to fail. It is leaking, and it seems unlikely they are going to be able to control that leak."

However, the government's plan for removing the lake is risky, too. They plan to drain all of the contaminated water from the lake, treat it, and then dump it directly into the Yankee Fork. Given the high levels of contamination, the EPA believes that removing all the pollution from the water may not be possible at any price within Hecla's ability to

**Montana's Open Pit, Cyanide Leach
Gold Mines:
WATER, PROPERTY
AND TAXPAYERS AT RISK**

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ABSTRACT

Cyanide leach mining has resulted in substantial adverse impacts to Montana's natural environment. Millions of gallons of cyanide have been released into Montana's soil, surface and groundwater resources. This report demonstrates that despite state laws regulating mining activities, cyanide leach mines consistently release cyanide into Montana's natural environment, resulting in contaminated community drinking water supplies, polluted groundwater wells, a reduction in private property values, and livestock and wildlife fatalities.

The number of cyanide spills has diminished in recent years because many Montana mines have closed due to declining gold prices or the depletion of the mine's ore body. Zortman/Landusky and Beal Mountain closed in 1997. Kendall closed in 1996. That is not to say, however, that these mines are no longer impacting the environment or neighboring landowners. Heavy metal contamination and/or acid mine drainage will continue to be a long term problem at the Kendall and Zortman/Landusky mines as is described in the mine profiles on the following pages.

The cyanide leach process was developed to make very low grade ore deposits (i.e., ore deposits with very low concentrations of gold) economical to mine. At the proposed McDonald Gold Project, the ratio of the volume of earth moved to gold produced will be 98 million to 1. The excavation of rock and its exposure to air and water may produce acid mine drainage and/or heavy metal contamination. This report documents the frequency and extent of these two additional problems. It also documents the inability of the mining industry or the state to prevent these occurrences or their ability to protect state water resources and adjacent private properties once they do occur.

Cyanide releases at gold mines in Montana - partial list

1982-1998

Date	Mine	Occurrence
1998	Golden Sunlight	Cyanide spill due to leak in the liner system. Cyanide detected in groundwater wells at levels between 30 and 39 ppm (150 times state human health standards). The mining company did not notify the agency of the spill until a month and a half after it occurred. The company did not have pumpback wells on site to address the spill.
	Basin Creek	Nearby stream contaminated by improper "land application." Cyanide measured at levels that exceed state water quality standards.
1997	Basin Creek	Nearby stream contaminated by improper "land application." Cyanide measured at levels that exceed state water quality standards.
1996	Beal Mountain	1,200-2,500 gallons of cyanide were spilled at the processing plant.
1995	Kendall	Cyanide spill occurred due to torn pond liner.
	-New Gold Mine	40,000 gallons of cyanide spilled into Golconda Creek. The State determined that biological damage occurred in 3 miles of the stream. The concentration of cyanide in surface waters was above the acute level of impact for aquatic organisms.
	Golden Sunlight	Possible small leak in east reclaim basin. Low level cyanide measured at three groundwater sample sites.
	- New Gold Mine	A cyanide spill occurred due to a pond overflow. The cyanide solution traveled 200 feet before submerging. A notice of noncompliance and an \$8,000 penalty were issued against New Gold for 11 days of documented cyanide releases.
1994	Golden Sunlight	Cyanide solution leaked from spare tailing line. Forty pounds of cyanide were contained in the discharge. A notice of noncompliance was issued against the company for failure to notify the state of the spill and conduct immediate clean-up.
	Kendall	Cyanide leaked from holding pond due to liner tear.
1993	Zortman/Landusky	The State issued notice of noncompliance for cyanide contamination due to improperly installed liner and underliner failure. Inspection reports indicate that between 5,000 and 10,000 gallons of cyanide solution were released and entered the fractured bedrock aquifer. Groundwater monitoring wells revealed cyanide at levels exceeding human health standards.
	Golden Sunlight	Cyanide solution from tailings impoundment leached into groundwater and surfaced as seeps which flowed into an intermittent drainage below. Cyanide concentrations ranging up to 45 ppm total cyanide (204 times human health standards).
	Basin Creek	A leak in the liner system at the toe of the process pond caused up to 130,000 gallons of solution to be released over 3 days. Monitoring well revealed 52.3 ppm cyanide.
1992	Beal Mountain	Cyanide seeped through holes in the pond liner system and contaminated natural springs. Cyanide continued to be detected in the spring for 6 months. Beal Mountain's 1988, 1989 and 1991 monitoring reports were not submitted until 1992. A notice of noncompliance was issued against the company for failing to report the cyanide leak.
	Blue Range	An estimated 1,200 gallons of cyanide solution spilled when a hose was left on. A notice of noncompliance was issued against the company for failure to enact the approved spill plan, and failure to comply with state laws which prohibit "the placement of wastes in a location where they are likely to cause pollution of state waters."
	Kendall	2,400-3,000 gallons of solution spilled due to a ruptured pipe. Cyanide solution left the mine permit boundary.
1991	Kendall	Emergency land application of process water killed surrounding trees.

Cyanide releases at gold mines in Montana - continued

Date	Mine	Occurrence
1991	Kendall	Cyanide leaked through tear in the liner system caused by improper bulldozer operation.
	Zortman/Landusky	An agency memo states that "cyanide is widely distributed in groundwater below the leach pad. Nine wells showed cyanide in 1991.
	Golden Sunlight	60 pounds of cyanide spilled due to tailings line leak causing soil contamination.
	Blue Range	Clogged pipeline caused cyanide spill.
1990	Blue Range	4,650 tons of mine tailings were placed in an abandoned gypsum mine. The tailings contaminated area drinking water aquifer with cyanide. The tailings seepage collection system not installed, and no one questioned at the site knew if such a pump existed on-site.
1989	Basin Creek	Cyanide solution ran from process station down road and off into woods.
	Basin Creek	DSL issued a notice of noncompliance against Basin Creek for violating its operating permit by allowing cyanide laden material to be distributed off a lined and bermed area. The company was fined \$2860 for 11 days of violation.
1988	Golden Sunlight	A pipeline leak occurred sometime between March 31 and April 5 before it was discovered by the company. Approximately 15,000 gallons of mine waste flowed from the emergency spillway of the secondary dam down the drainage about 100 yards.
	Zortman/Landusky	High rains were followed by cyanide concentrations exceeding human health standards at a surface water station in Ruby Gulch. BLM reports in 1990 show that cyanide contamination in Ruby Gulch continued for a two year period.
	Zortman/Landusky	Cyanide was detected in groundwater monitoring wells. The cyanide spill occurred due to a tear in the liner system.
	Montana Tunnels	Cyanide solution spilled causing groundwater contamination.
1987	Zortman/Landusky	Cyanide spill caused by hole in liner system: groundwater contaminated
	Zortman/Landusky	A Ruby Gulch surface monitoring site yielded trace cyanide caused by two dripping process lines. In 1988 cyanide levels increased to 0.2 ppm (ten times state surface water quality standards).
	Montana Tunnels	116 million gallons of cyanide solution seeped from tailings basin. Three months after the spill, cyanide levels in groundwater monitoring wells had reached as high as 1.06 ppm (5 times human health standards). The company installed a system of pumpback wells to intercept the contaminated groundwater for long-term control.
	Zortman/Landusky	Cyanide spill occurred due to dripping process lines: surface water contaminated.
	Golden Sunlight	A pipe fitting split and discharged approximately 2,000 gallons of cyanide solution.
	Basin Creek	Cyanide spill occurred because a solution valve was left open. Groundwater contamination resulted.
1985	Zortman/Landusky	Storm event caused mining company to land apply process water on 17 acres of land. Tree kills resulted.
	Triad Mine	The State took legal action against Triad Mining, alleging that the mine placed pollutants in locations where they were likely to pollute state waters, and where they did pollute state waters. Agency personnel observed process waters overflowing from the leach pad into an unlined catchment area. Total cyanide in groundwater was measured at 0.15 ppm.

Cyanide releases at gold mines in Montana - continued

Date	Mine	Occurrence
1983	Golden Maple	Cyanide leak occurred with one stock watering spring and one domestic well affected. Two cows killed from drinking contaminated water.
	Zortman/Landusky	1,000-1,200 gallons of cyanide solution spilled due to a ruptured pipe.
	Zortman/Landusky	Leach pad suffered mass movement causing the liner system to be ripped. Cyanide was detected below the dike in Ruby Gulch. One month later a 50 x 100 foot containment pond was built to capture further leakage.
	Golden Sunlight	19 million gallons of cyanide solution leaked when a tailings impoundment failed. The resulting groundwater contamination affected the Jefferson River alluvium. Four domestic wells and a well at the veterinary clinic were contaminated. Pegasus Gold was sued by the neighboring landowners. The company eventually bought out the landowners.
	Zortman/Landusky	Approximately 1,000 gallons of cyanide solution spilled into Alder Gulch due to pipeline failure.
	Zortman/Landusky	200 gallons of cyanide solution spilled from the leach pad. 50 gallons puddled on the ground.
	Zortman/Landusky	A leak in the pond liner was discovered after cyanide contamination was identified in the nearest monitoring well.
1982	Zortman/Landusky	Ruptured pipe caused 1,200 gallons of cyanide to be spilled.
	Zortman/Landusky	50,000 gallons spilled into Alder Gulch contaminating Zortman's community water supply. Pegasus Gold was required to replace the drinking water source. The State issued a \$15,000 fine against the company.
	Zortman/Landusky	75 gallons of cyanide solution spilled.
	Zortman/Landusky	300 gallons of cyanide solution was spilled when the top of a leach pad froze and cyanide flowed over the top onto the ground.
	Zortman/Landusky	4 pounds of cyanide spilled, contaminating groundwater.
	Zortman/Landusky	780 gallon leak occurred in the gold recovery system. Soil Contamination resulted.
	Zortman/Landusky	Bighorn sheep found dead at cyanide ponds.