

A Cyanide Story: Are We Doing Enough to Prevent Cyanide Spills?

By Doug Hadfield

It's the stuff of legend. For many, the word "cyanide" conjures images of [mass suicides](#), [illegal fishing in the Philippines](#) and the [murder of Rasputin](#). Pretty nefarious matters.

But [hydrogen cyanide](#) is a valuable and arguably indispensable industrial chemical, particularly in gold mining.

Some 13% of all man-made cyanide is used to [assist in removing gold](#) and silver from low-grade ore; the rest is used to manufacture a wide range of products, from cosmetics to fire retardant and much else besides.

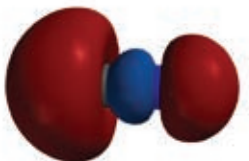
Intense media scrutiny of cyanide spills within the past decade has ensured that it is in mining that cyanide has found its modern infamy. But with the advent of the [International Cyanide Management Code \(ICMC\)](#), and a growing list of voluntary signatories, many questions remain unanswered. To wit: Will the measures that the ICMC stipulates make a difference?

The most infamous cyanide spill in recent memory occurred early on the evening of [January 30, 2000](#), in Romania. There was a break in a dam encircling a tailings pond filled with mining byproducts at the Baia Mare mine in northwest Romania, near the border between Ukraine and Hungary. The cause of the spill is not known, although investigators suspect that a combination of rapidly melting snow and poorly designed containment facilities created ideal conditions for a disaster.

Whatever the case, the results were all too clear: 50 to 100 tonnes of cyanide and heavy metals spilled over the dam in a toxic brew of more than 100,000 cubic meters.

The deadly flow poured into the Sasa river, and for the next four weeks traveled through the Lapus, Somes, Tisza and Daube rivers, before reaching the Black Sea.

Hundreds of kilometers of river water were contaminated; water supply



The cyanide ion, CN⁻

to 24 municipalities was interrupted. In Hungary alone, more than 1,250 tonnes of fish died.

Baia Mare brought international attention to the problem of cyanide in the resource sector, but it was by no means an isolated event.

Dr Terry Mudder, an internationally recognized expert on environmental science and engineering, and a founding member of [www.cyantists.org](#), has assembled data pertaining to environmental incidents in the mining industry over the past 50 years. Mudder and colleague Mike Botz found that 12 out of 67 environmental incidents occurred as a result of cyanide, or about three incidents per decade globally.

Other groups put the number much higher. For example, Rainforest Information Center and the Goldbusters Coalition, which publish an online

resource called [Cyanide Incidents](#) report 34 incidents since 1997, or about 3 incidents per year. The disparity with Dr Mudder's figures is perhaps cause for alarm.

There are, however, obvious differences between the two lists. Rainforest Information Center includes incidents at which no environmental damage was reported, whereas Dr Mudder's list reported only spills of "meaningful" proportions with "impacts on the order of several thousand meters cubed.

Compare such an incident with the first entry on [Rainforest Information Center's](#) report:

"DECEMBER, 2006 Alaska: Cyanide was found seeping this winter from a hillside next to the dam that holds back waste from Alaska's largest gold mine, the Fort Knox Mine near Fairbanks."

The news report from which this entry was generated downplays the spill to the status of irrelevance. The article, [found in Anchorage Daily News](#), concluded, "Tests show the lethal chemical didn't escape from site".

One cyanide industry spokesperson, who spoke on condition of anonymity, argues that NGO's like [Oxfam](#) and Rainforest Information Centre, are pushing an agenda that has zero tolerance for gold mining.

"Between you and I, there is an issue often with what NGOs report and it is difficult to get verification. The NGOs tend to mention anything even very small incidents. I know for a fact some of the descriptions of these incidents are incorrect," the source told me.

Whatever the number of incidents, it is obvious that disasters like Baia Mare have galvanized public opinion in favor of greater control of the use of cyanide.

"Baia Mare prompted an international outcry for establishment of a code for management of cyanide," said Mudder. "Through a [United Nations Environmental Program \(UNEP\)](#)

sponsored forum involving many stakeholders, the International Cyanide Management Institute (ICMI) was eventually formed along with a specific code for management of cyanide at gold mining operations.”

The code, which took nearly two years to develop, is formally called the “International Cyanide Management Code For the Manufacture, Transport, and Use of Cyanide In the Production of Gold” (ICMC). It is a voluntary measure; its development and maintenance are funded by mining companies.

Every three years, signatories to the ICMC must have all projects that utilize the cyanide process audited by an independent, third-party professional who meets the ICMI’s criteria for auditors. A company that does not have these operations audited within this timeframe loses its signatory status.

Once at the site, the auditor has a [thorough mandate](#). Nine categories pertaining to the use of cyanide are covered, including production, storage and handling, transportation, operations, decommissioning, worker safety, emergency response, training and dialogue with the public.

Once an audit is complete, a Summary Audit Report is posted at the Cyanide Code [website](#). The reports are a virtual blueprint of the uses and transportation of cyanide on any given project. Even the trucking companies involved in transporting the cyanide must be certified signatories to the code. Prior to 2002, no such provisions existed.

Dr Mudder, who was also involved with the UNEP group who wrote the code, believes its implementation has thus far been a success.

“The Cyanide Code has been in place now for several years and during that time there has not been a major environmental incident at a gold mining operation,” he told me.

On the other hand, since the ICMC was ratified in 2002, just fifteen gold producers have become signatories. According to Mudder, this number is misleading because these fifteen represent more than 50% of the global production of gold.

“Most of the major gold mining companies have become signatories to the Cyanide Code and have either already

or are in the process of certifying their individual operations,” Mudder told me.

Mudder believes that had the Cyanide Code been in place in 2000, and had the Baia Mare mine been certified, the massive spill in Romania likely would not have occurred.

“Essentially, all of the incidents that occurred in the past were preventable had the operations been certified under the Cyanide Code and followed its [Principles and Standards of Practice](#),” Mudder said.

It is true that no major incidents have occurred since the code was ratified; however not everyone agrees on the reason for this.

In an email to MiningandMoney.com, [Vice President of the International Cyanide Management Institute](#) (ICMI) Norm Greenwald noted, “It is impossible to say whether [the reduction in spills] is due to the Code, society’s growing environmental awareness, or simple good fortune.

Also, [John Carrington](#), ex-Vice Chairman and Chief Operating Officer of [Barrick Gold Corp.](#), conceded that “As an industry, we realize that no Code or set of practices can guarantee that incidents cannot or will not occur.”

For the ICMI, this could be a [Catch-22](#): The ultimate success or failure of the code lies in its ability to prevent catastrophes like [Baia Mare](#). If, as Carrington suggests, spills cannot be prevented, it’s likely that public pressure to end cyanide use – at least in mining – will grow. Already, cyanide use is banned in Montana, the Czech Republic and Costa Rica. Several other nations, including the EU, severely restrict its use.

Moreover, it’s not just the major spills that cause public consternation – 21 of the 34 [spills listed by the Rainforest Information Centre](#) occurred after 2002. Although most were of questionable significance, each new incident sends a gaggle of NGOs – not to mention the communities effected – into paroxysms of I-told-you-sos.

One signatory to the ICMC is [Golden Star Resources](#) (TSX: GSC, AMEX: GSS), a company exploring and mining in developing regions of Africa and South America.

Ironically, just months after signing on to the ICMC in January 2006, Golden

Star reported a second cyanide spill at its Bogoso mine in Ghana (the first occurred in 2004).

“The spillage was located within minutes and the pipe shut down within an estimated 30 minutes of the leak starting,” a press release from the company stated. Golden Star reported that a total of five to eight cubic meters of tailings had “sprayed” out of the tailings impoundment.

The village of Dumase reported numerous illnesses and a number of fish killed in the Aprepre River as a result of the spill. Since neither the company nor the Ghanaian government performed any empirical tests on the affected ecosystem, the actual extent of the harm done has never been established. One Oxfam spokesperson did tell me that “if you referred to [the river] as a stream it would not be inaccurate.”

In spite of this, the spill landed the company in court with the village of Dumase, which is seeking compensation for the spills. The plaintiffs argue that Golden Star acted negligently and have demanded that the company commission health investigations.

A number of NGOs and mining critics were quick to point out that Golden Star was a signatory of the code when the spill occurred. [MiningWatch Canada](#) published a [statement](#) from Oxfam, WACAM, FiAN, EARTHWORKS and itself that argued, “The Cyanide Code is meaningless if a company with a bad track record of cyanide management, such as Golden Star Resources, is not immediately and thoroughly audited.”

However, Vice President of ICMI Norm Greenwald explained that, while unfortunate, the spill at the Bogoso mine occurred during the three-year interim period between Golden Star becoming a signatory to the code and the required audit of its projects.

“While there can be no reasonable expectation that an operation would be in compliance with the Code prior to its initial certification audit, ICMI does require notification from signatory companies of any significant cyanide incident occurring at their operations regardless of whether or not they have yet been certified,” Greenwald said. “When the operation undergoes its certification audit (due by March of next year), the auditor will

evaluate whether the facility has implemented the procedures necessary to prevent a reoccurrence.”

In other words, any cyanide mishaps that occur prior to Golden Star’s certification audit next March do fall within the purview of the ICMC, but the significance of that purview prior to the audit is for the record only.

From the outset, the authors of the cyanide code were aware of the need to attract a majority of junior producers – not just majors – to sign on and make the changes necessary to prevent further spills.

ICMI had to adopt a “kid gloves” approach to attracting juniors, so as not to scare them off with prohibitive expectations and costs. The minutes from a 2001 United Nations Environmental Program (UNEP) meeting (which later formed the ICMI) conceded, “...there were concerns that to impose a heavy auditing burden whether in terms of quantity of work or cost would drive smaller and developing country companies away from the Code. If the Code is to attract them it must assist and encourage them to improve their management, not impose untenable burdens.”

Golden Star’s [VP of Sustainability](#), Dr. Mark Thorpe, was reluctant to put a dollar amount on the costs incurred so far by the company to get “up to code”, but said much of the work “would have been required anyway.”

“As part of ICMC implementation, we have improved our cyanide storage, mixing and handling facilities,” said Thorpe. “It should be noted that although we take legal possession of our cyanide only when it is delivered to the mine, we take a proactive approach in training the communities along the transportation route. At the Bogoso processing plant, we have moved from receiving cyanide in bags to the direct delivery of cyanide in tanks, so eliminating a lot of waste generation and the need to directly handle cyanide at the site.”

From what Thorpe says, it appears that the costs of implementing the code’s principals and practices are substantial, but not necessarily prohibitive.

Greenwald told me that ICMI is actively trying to attract smaller gold producers to the code. “...We have recently been in contact with at least three

additional companies with production in the 100,000 to 200,000 ounce per year range that we expect will soon become signatories,” he said.

Meanwhile, existing signatories continue along the process to certification. In January this year, Golden Star completed a “pre-audit evaluation” of its mines with a third-party cyanide consultant. Although the company has until March next year to complete its final audits, Thorpe says the company will carry out certification audits in 2008.

Once audited, Golden Star can become ICMI-certified with either of two grades: In Full Compliance or In Substantial Compliance (these are published online at www.cyanidecode.com).

With a Substantial Compliance grade, a project is granted temporary certification – the company must develop a Corrective Action Plan and become fully compliant within one year of the audit date.

A third grade, Not in Compliance, requires that the company address and rectify all shortcomings found by the auditor prior to the expiration of the three year period.

To date, none of the [signatory mining companies](#) has received a “Not in Compliance” grade. Only one, South Africa’s [AngloGold Ashanti](#), received the lesser grade of “In Substantial Compliance”, because the company was purchasing cyanide from a manufacturer that was not yet fully compliant. The issue has since been resolved.

As more gold producers around the world sign on and implement the ICMC standards and practices of cyanide management, a picture of greater organization emerges. However, time will tell if the code is enough, or if other involuntary measures are required to prevent catastrophes like Baia Mare in Romania.

If the ICMC is a code whose time has come, it has taken a great deal of time and work to build and get the necessary stakeholders on board. The code is now six years old and has fifteen signatories comprising 50% of the world’s gold production. To the gold industry and the authors of the code, this is – as Dr Mudder says – “a major accomplishment and a first of its kind for the international mining industry.”

Greenwald pointed out that the ICMI has received support from a number of public and private groups, including the G8, International Finance Corporation and the World Bank.

Meanwhile, communities like Dumase in Ghana and other spill sites will be conscious of their water for a while to come. ■

Doug Hadfield writes for [Mining and Money.com](#), a web site about sustainable mining and renewable energy.

Links and References

- [Anchorage Daily News article](#)
- [AngloGold Ashanti](#)
- [Baia Mare](#)
- [Baia Mare incident - January 30, 2000](#)
- [Baia Mare Spill](#)
- [Barrick Gold Corp.](#)
- [Catch-22](#)
- [Cyanide and Science](#)
- [Cyanide Code Governance](#)
- [Cyanide Code Principles](#)
- [Cyanide Code website](#)
- [Cyanide Code: Auditor Mandate](#)
- [Golden Star Resources](#)
- [Hydrogen Cyanide](#)
- [Illegal fishing in the Philippines](#)
- [International Cyanide Management Code](#)
- [John Carrington](#)
- [Mass Suicides](#)
- [Mining and Money.com](#)
- [MiningWatch Canada](#)
- [Murder of Rasputin](#)
- [Oxfam](#)
- [Rainforest Information Center](#)
- [Recent Cyanide Spills](#)
- [Spills Listed by the Rainforest Information Centre](#)
- [Statement from Oxfam](#)
- [United Nations Environmental Program](#)
- [Uses of Cyanide](#)

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