

East/West Letter  
ENVIRONMENT & Health Observer

Okno Group's periodic review of policy issues in the environmental and health-care sectors of the east-European region.

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Romanian Cyanide Spill Underlines Difficulties with Environmental Protection

## All That Glitters

A dam breach at a Romanian gold mine at the end of January 2000 sent huge quantities of cyanide-laden waste water into rivers which feed the Danube. The spill, which began during the night of 30 January, released 100,000 cubic meters of waste water and sludge into the Lapus River near Baia Mare in north-central Romania. According to a UN team of experts called in to review the incident, the overflow released between 50 and 100 metric tons of cyanide, as well as a variety of heavy metals, into surface waters. The spill, its immediate environmental effects, and re-primations over the incident have highlighted some of the difficulties inherent in protecting the region's environment. In particular, the incident underlines the need to transform formal rules, procedures, and regulatory bodies into effective ones.

### *The cyanide plume*

The breach was caused by heavy rains and warmer weather which melted an already thick layer of snow on the uncovered waste pond. Over 1.5 inches of rain fell in Baia Mare on 27 January, which, combined with the melting snow, overwhelmed the dam made of solid mine waste. The wastewater flowed into the Lapus river, which joins the Somes (Szamos) river in northwestern Romania before crossing the Hungarian border and merging with the Tisza river, Hungary's second largest. Measurements taken at the Hungarian border as the contaminants passed by recorded a concentration of 32.5 milligrams of cyanide per liter, over 300 times the safe limit.

Warnings from the Romanian authorities allowed cities and towns along the rivers to protect their water supplies from contamination, but many, including the 80,000 residents of Szolnok in central Hungary, had to go without water for many days. No warnings could protect the aquatic life along the rivers, however: nearly all life in the Somes/Szamos was wiped out, and the cyanide took a tremendous toll on fish in the Tisza river. Hungarian authorities estimated that over 1200 tons of commercially valuable fish were killed by the pollution, inflicting significant damage on the local fishing industry.

Aurul SA, the Romanian-Australian joint venture company operating the mine, managed to stop most of the flow within hours and chemically treated the water which continued to leak; the company was able to completely seal the dam by 2 February. The cyanide plume lost strength as it headed south, measuring 3.7 mg/l as it approached Szeged in southern Hungary and 1.5 mg/l as the Tisza entered Yugoslavia—still fifteen times the 0.1 mg/l limit two weeks after the accident. Yugoslav authorities reported large amounts of dead fish coming down the river from Hungary, but saw no major fish kills once the Tisza joined the Danube. According to the UN report, the plume was still measurable at the Danube delta on the Black Sea, 2000 km from the mine and four weeks after the accident.

### *International finger-pointing*

While the Romanian government promised compensation to Hungary not long after

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Inside: *By the Numbers — Environment*

SOx emissions time-series data from the east European region

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the accident, tensions between the countries increased when officials of the mining company Aurul blamed the fish kills on cold weather. The plant's operations manager said he had been told that "fish always die at this time of year," and blamed the deaths on low oxygen content and ice. Hungarian foreign minister Janos Martonyi called the company's contentions "immoral and indecent." The fact that most of the Romanian half of Aurul was owned by the state mining company Remin also added fuel to contentions that environmental protection was a low priority for the Romanian government. Even though warnings did get out, environmentalists in both countries criticized Romanian officials for a sluggish response to the crisis; even the UN report noted an unexplained ten-hour delay between the time local environmental protection authorities learned of the spill and when they alerted the local water authority. The fact that Romanian tests of cyanide concentrations persistently came up lower than later Hungarian ones also lacks a clear explanation.

early September. Lawyers representing the Hungarian government said that they were seeking compensation first from Esmeralda because it was the project manager.

The Aurul mining operation was allowed to restart in June for a safety assessment (and to reduce toxic buildup in another waste pond). Though the company and Romanian officials insisted that the operations were now safe, Hungarian environmental authorities remained unconvinced. Both Hungarian and Romanian officials did praise their new level of cooperation, and the Romanian government pledged to enforce their environmental regulations strictly on all mining operations. Aurul promised to introduce new equipment by the end of the year that would allow them to use much lower amounts of cyanide, but Esmeralda's financial difficulties leave such investments in doubt.

## Misfortune and bad design

The irony of the spill at the Aurul plant was that the operation itself was intended to remove a major environmental hazard in heavily-polluted Baia Mare. As the UN report

Danube River basin and accident sites



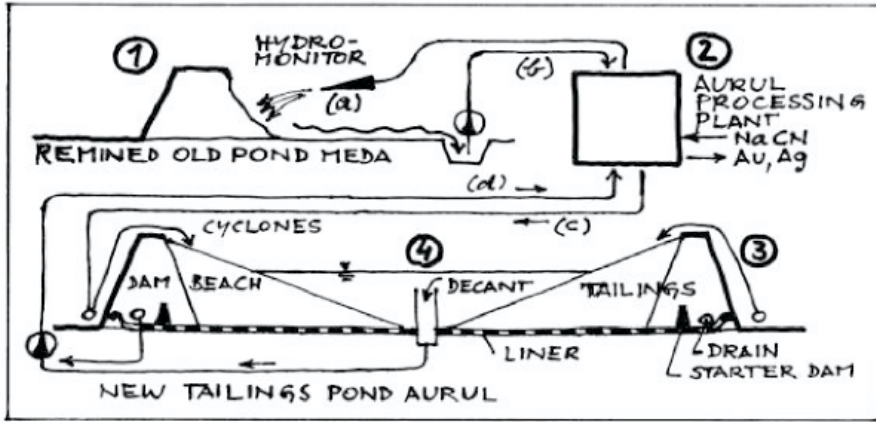
The Australian partner, Esmeralda Explorations, Ltd., placed itself into voluntary receivership in the wake of the accident. Like many similar small exploration companies operating around the world, the firm had a small number of employees and was not profitable. The Hungarian government, pursuing its claim for \$107 million in damages from the company, was allowed to become a formal creditor of Esmeralda in a creditors' meeting in

explains, the Aurul JV won an international tender to clean up existing hazardous tailings ponds that existed side by side with residential areas. Their plan was to remove mine waste from 30-year-old leaking, unlined ponds, process it to recover small amounts of remaining precious metals, and relocate the solid wastes to new, lined, tailings ponds farther from developed areas. The recovery operation used high

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 concentrations of cyanide compounds to leach out the precious metals, an efficient technology not available when the original mines were in operation. (Similar technology is in use

**Schematic diagram of the Aurul processing system**



Courtesy UNEP/OCHA report

around the world, though not without controversy.) Processed tailings settled out at the new pond (and solid materials were used to build up the dam around the pond) while the cyanide-laden decant water was recycled to the plant in a “closed loop” of piping traversing the town.

The Aurul plant complied with all Romanian environmental requirements, from an impact assessment completed in 1993 to the more than 15 permits required to begin operations; after seven years of obtaining clearance, the plant opened in May 1999. Despite all the precautions, the January spill polluted thousands of kilometers of rivers in Romania and Hungary. As the UN report lays out in copious detail, the spill was the result of bad weather pushing a flawed design past its limits. To begin with, the strategy of “construction by operation” made the new pond vulnerable: solid processed tailings were separated out and used to enlarge the dam around the pond, but be-

cause so much water was used to move tailings from the old pond in a slurry, there was always too high a proportion of water to dam material. Rain and snow on both the old and new ponds added to the water burden. Moreover, since the pond was built on an incline, water collected at one end—dramatically slowing evaporation. Finally, there was no relief path for this “closed loop” system (such as a secondary dam around the pond), and thus no way to relieve the pressure from added rain and snow. So while the weather that particular winter may have been extreme—Romania had its worst floods in 30 years that spring—the UN team concluded that those conditions were foreseeable and that the design of the pond provided little margin for error.

**A lax attitude**

During her visit to the affected area, EU environment commissioner Margot Wallstrom used the occasion to criticize applicant nations which seem not to be taking environmental regulation seriously. She singled out Poland and the Czech Republic as “countries who have been less interested in showing ... that they are really concerned about the environment.” Both environmentalists and policy analysts note a general lack of concern about the environment on the part of both governments and most citizens. For instance, despite the apparent rigor of the permitting process for the Aurul plant, the company was allowed to classify itself as a facility of “regular” importance that did not require any ongoing monitoring or contingency planning. The UN report described the emergency response procedures of both the company and local government as “rudimentary,” particularly in light of the large amounts of highly toxic substances used near residential areas.

The EU-sponsored Baia Mare Task Force said, in its year-end final report on the incident, that it had “grave reservations” about the adequacy of regulatory oversight during the planning and construction of the Aurul and similar projects. The task force reported that it was “difficult for [them]... to discern where exactly the responsibility for the overall safety of the facility lay.” Romanian authorities say that they have made significant progress in tightening their regulatory system in the aftermath of the accident.

Some local residents mobilized against the company after the spill, but most of the populace seem so accustomed to extremely high levels

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**The Aurul dam, with hydrocyclones and the ‘beach’**



Courtesy USEPA, from BMTF report

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of pollution that Aurul's operations brought little reaction. Residents of a village next to the Aurul pond were concerned mostly with whether land contaminated by the spill could still be farmed, according to the Financial Times; residents' most common complaint was that the pollution in the area kept their vegetables from growing. Against this background, governments in the east European region have little incentive to move aggressively on environmental protection, especially if it endangers local jobs or potential foreign investment.

#### *International action*

The Baia Mare spill, with its widespread effects, may have shaken some of that complacency. During her visit to the area, Ms Wallstrom pledged EU help to compile a list of similar 'hotspots' in the region; she also promised to close loopholes in current EU regulations—which do not cover mining operations—and to strengthen rules making polluters liable for environmental damage. Other EU officials hoped that the incident would sharpen interest in environmental matters in Hungary and Romania:

"It's obvious that the environment didn't have a top priority" in those two nations, an EU official said. Observers noted that the disaster may strengthen the EU's resolve to stand firm when candidate members ask for delays on environmental compliance.

Following Ms Wallstrom's invitation, the governments of Hungary, Romania, Slovakia and Ukraine signed an agreement in mid-March to identify potential pollution sources

within their borders, to cooperate to reduce the risk of further incidents, and to jointly seek funding for preventive measures. The first result of that agreement, a report put out in August in cooperation with the International Commission for the Protection of the Danube River (ICPDR), contained an inventory of potentially hazardous sites in the Tisza watershed. That project and other work was being coordinated by the EU's Baia Mare Task Force, which also pressed the EU to strengthen and consolidate its Union- and national-level regulations of mining and ore processing.

#### *Accidents continue*

As if to underline the seriousness of the situation, another mine spill occurred in the same region of Romania just six weeks after Baia Mare. Heavy rains and snow melt broke a dam at the state-owned Baia Borsa mine, sending over 20,000 tons of waste laden with heavy metals into tributaries of the Tisza. The zinc and lead ores in the waste raised levels of the pollutants in Romanian rivers to many times the safe levels. The metals were not expected to travel far downstream, however, but instead would settle into river bottoms where they would remain an environmental problem.

The Baia Mare spill is also adding to pressure on mining companies to take greater precautions in their operations outside the developed world. Just weeks after the failure at the Aurul plant, another Australian mining firm accidentally dropped a metric ton of concentrated cyanide in the jungle of Papua New Guinea as it was being transported to a gold mine there. Other recent spills, tailings pond failures, and other problems have put a spotlight on the industry. Prospects for change seem dim, however, since alternatives to the cyanide process are experimental and expensive, and only the largest mining companies have the financial resources to invest in such new technologies.

*E&H*

**View from top of main dam at Baia Borsa, showing overflow sediments**



Courtesy USEPA, from BMTF report

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The United Nations report on the Baia Mare spill is available from the UNEP web site at <http://mineralresourcesforum.unep.ch/BaiaMare/index.htm>.

Reports from the EU's 'Baia Mare Task Force' as well as the text of the regional inventory of high-risk sites in the Tisza watershed are available from the EU Environment Directorate's Enlargement web site at

<http://www.europa.eu.int/comm/environment/enlarg/home.htm>.

These and other environmental links in the region can be found on Okno's web site,

<http://www.okno.com>.

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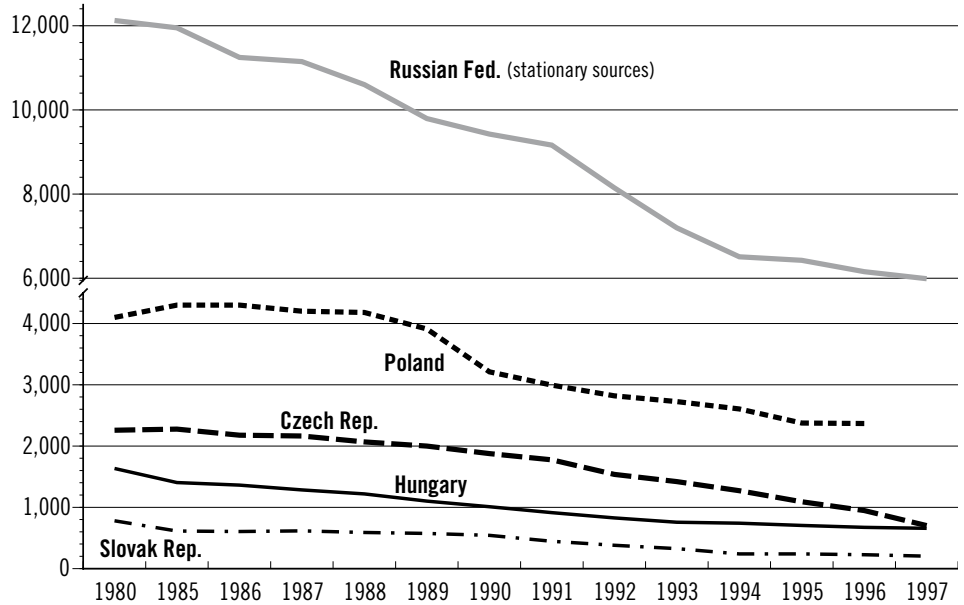
# By the Numbers:

## SO<sub>x</sub> emissions in the east European region

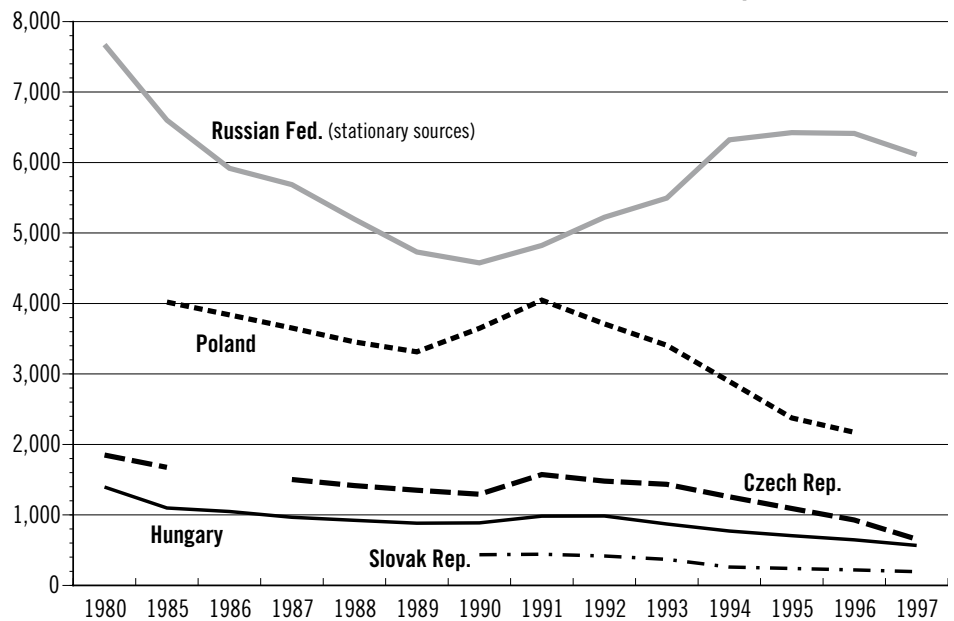
Source: *OECD Environmental Data Compendium, 1999*

As with all data from the region, these figures should be interpreted with care.

### SO<sub>x</sub> emissions, 1000 metric tons



### SO<sub>x</sub> emissions, relative to industrial production



This chart indicates emissions for a given level of industrial production, using an industrial production index with its base set in 1995. The adjustment is intended to correct for the dramatic economic contraction faced by all these countries during the early and mid-1990s.

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