GREENPEACE
Southeast Asia

BACKGROUNDER

INDUSTRIAL POLLUTION IN PASIG RIVER

A few years ago, the Government of the Philippines acknowledged that the Pasig River is "biologically inactive." The first signs of deterioration of river quality began appearing as early as the 1930s when fish migration to and from Laguna Lake began to diminish. Through the years, there was a marked decline in bathing and washing activities. By the 1980s, the country's most important waterway was transformed into a national symbol of pollution.

Assisted by DANIDA (the Danish aid agency), the Philippines government undertook to clean up the river. The Action Plan on Pasig River Rehabilitation Program rightly identified the major sources of pollution as domestic effluents, industrial wastewater and solid waste (garbage). The contribution to the pollution load by the various sources was estimated at 45 percent each for domestic effluents and industrial wastewater.

Unfortunately though, the pollution studies assessed the health of the river mainly on the basis of one parameter – Biological Oxygen Demand (BOD). BOD is a measure of the quantity of oxygen depleted by decaying organic matter in the water. While this is an important indicator of the health of water systems, it is inadequate as an index to total pollution in the river. Because BOD only accounts for decaying organic matter, it tells us little about the presence and effects of persistent toxins including metals (metals do not degrade in the environment) and long-lived organic poisons.

This limited assessment led to the development of an action plan that focused mainly on domestic effluents, particularly those draining from the houses of the impoverished communities living alongside the River. The Action Plan drafted by the River Rehabilitation Secretariat identifies 315 industries located around the River as major water polluters. The August 1991 feasibility study for river rehabilitation admits that "electroplating industries and some chemical processing plants are likely to generate significant amounts of wastes contaminated with heavy metals and other toxic components."

However, the action plan does precious little to prevent industries from polluting. Even the few steps that are being taken to address industrial pollution (such as effluent treatment plants) are ill-advised and rely on end-of-pipe treatment technologies that will do little to save the river.

GREENPEACE ANALYSES

In September 1999, Greenpeace collected wastewater and sediment samples from and around the effluent outlets of two factories – Chemphil and Republic Asahi. The samples were analyzed at the Greenpeace Research Laboratories at the University of Exeter, UK. The findings vindicate Greenpeace's hypothesis that the Pasig River environment is being steadily loaded with non-degradable and poorly degradable toxic substances.

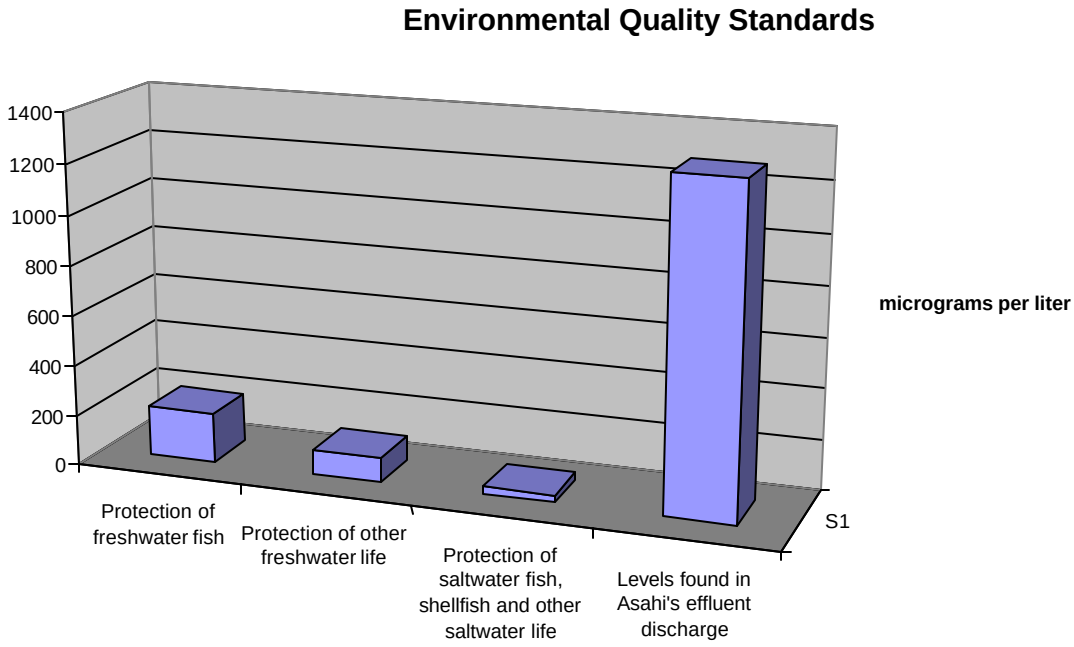
Republic Asahi (Glass Factory)
The sample of treated wastewater collected from Asahi was found to be severely contaminated with Nickel. This finding is particularly noteworthy considering that Republic Asahi has long been heralded for its efficient wastewater treatment plant. It also clearly debunks the myth that effluent treatment plants are efficient destroyers of pollution. Indeed, the levels of lead and copper too were higher than the acceptable levels set in the Australia New Zealand environmental standards (ANZECC).

The nickel in the sample most likely originates from the nickel alloys that are used as ingredients in the manufacture of speciality glass (e.g. nickel-aluminum films, nickel borosilicate glass)

At 1290 micrograms per liter, the levels of Nickel were at least 8 times higher than levels prescribed as tolerable by the ANZECC. The Philippines does not have any standards for Nickel levels in wastewater.

Whereas metallic Nickel and its alloys are listed as possible human carcinogens by the International Agency for Research on Cancer (1998)[1], certain nickel compounds (e.g. oxides, carbonates, acetates etc) are listed by the US Department of Health and Human Services as "Reasonably Anticipated to be Human Carcinogens." (USPHS 1998)[2]

Given the limits recommended by various agencies, it is very likely that Asahi's discharge endangers aquatic life in the Pasig River. The Water Research Center in the UK recommends the Environment Quality Standards for Nickel shown in chart.



Chemphil

Chemphil is listed as a producer of a number of chemicals that may be used as feedstock in the manufacture of surfactants, soaps and detergents. This plant discharges its effluent through a dedicated channel that drains into the river. Sediment samples collected from the channel contained relatively high levels of copper and manganese, and to a certain extent lead, nickel and zinc.

Chemphil Effluent Channel Sediment

METAL	Uncontaminated Background mg/kg	ANZECC Aquatic ecosystm protection levels for sediment ISQG Low - ISQG High mg/kg (dry wt)	Sediment from open channel mg/kg (dry wt)
Copper	10-50	65-270	160
Lead	20-30	50 -220	70
Manganese	N/A	N/A	2450
Zinc	<100	200 -410	530

Exposure to high levels of copper or long-term elevated exposure can be harmful. Oral exposure to high levels can cause vomiting, diarrhoea, stomach cramps and nausea.[3] In addition to these effects, developmental and reproductive damage, following exposure to high levels of copper, has been seen in animals. However, no such effects have been reported in humans.[4] A considerable number of specie is sensitive to dissolved concentrations as low as 1-10 microgram per liter. Another study of species diversity in benthic communities from Norwegian fjords, led to the conclusion that the most sensitive animals were missing from sites where sediment copper levels exceeded 200 mg/kg.

CONCLUSIONS AND DEMANDS

The pollution of Pasig River by industrial sources is significant but neglected. Even though Government documents talk about toxic waste minimization and prevention, virtually nothing has been done to prevent the loading of the River waters by metals or persistent organics.

The Philippines Effluent Regulations do not even have standards for many important and toxic metals and organic compounds. Wherever standards do exist, they tend to do more to legalize pollution than to actually protect the environment and the health of life.

Going by the analyses results of the treated industrial wastewater being discharged into the Pasig River, it is clear that end-of-pipe effluent treatment plants don't work. It is an established fact that effluent treatment plants of the kind that are installed at Republic Asahi are incapable of neutralizing all toxics. Metals and persistent organics in particular are at best relocated from the liquid medium to the bottom sludge of the effluent treatment plants. At worst, they escape the treatment and end up polluting the river as is demonstrated by the presence of high levels of nickel in the wastewater from Asahi.

Government plans to clean up the Pasig River underemphasize the role of industries as a source of pollution in the river. Also, because the action plans rely primarily on Biological Oxygen Demand as an index of pollution, this .
does not solve the potential and long-term problem of toxic chemical build-up in the river.

Communities and citizens are totally unaware about the kinds of pollutants discharged by industries. This ignorance prevents them from playing an active role in assisting regulatory authorities to ensure that industrial operations do not endanger the environment. Internationally, community right-to-know legislation has been crucial to the functioning of communities in an effective watchdog role.

It is in this context that Greenpeace places the following demands in front of the Government:

1. Conduct a comprehensive study into the pollution of the Pasig River by metals and organic pollutants (including persistent organic pollutants) as a result of polluting industrial practices.

2. End-of-pipe pollution control methods should be replaced by pollution elimination at source. The pending Clean Water Act must be quickly enacted with strong language mandating zero toxic discharge into waterways, guaranteeing communities right-to-know and emphasizing Clean Production and Pollution Prevention.

3. All potentially polluting industries should be inspected to ensure that they do not discharge polluted waters into the Pasig River.

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[1] IARC (1998). Nickel and certain nickel compounds. In: IARC monographs on the evaluation of the carcinogenic risk of chemicals to humans. Chemicals, industrial processes and industries associated with cancer in humans. IARC monographs. Vol. 1-29

[2] USPHS (1998). 8th Report on Carcinogens 1998 Summary.

[3] USPHS (1997). Toxicological Profile for Copper on CD-ROM. Agency for Toxic Substances and Disease Registry. US Public Health Service.

[4] USPHS (1997). Toxicological Profile for Copper on CD-ROM. Agency for Toxic Substances and Disease Registry. US Public Health Service.