



NEWS BY DFDL

## WATER POLLUTION BANGKOK

*While taking a ferry up the Chao Phraya River or riding a canal boat to avoid street traffic, you may notice that the quality of Bangkok's waterways leaves much to be desired. Drinking the water would be foolhardy, and merely having it splash on your shirt cuff creates a challenge that only the best dry cleaner can overcome.*

The quality of Thailand's waterways is governed by a cluster of legislation that addresses water pollution from multiple angles. The Enhancement and Conservation of National Environmental Quality Act BE 2535 (1992) regulates the sources of wastewater, such as factories, that dump directly into the public waterways or the environment, by prescribing specific effluent standards. This Act and its related Ministerial Notifications detail the types

of factory businesses that must treat their wastewater and sets limits for a list of harmful metals, toxins, and other chemicals to ensure that their wastewater is not harmful to the environment.

The Factories Act BE 2535 (1992) also restricts the concentration levels of chemicals and metal pollutants in wastewater being dumped into the environment. In addition, under Section 69 of the Act, the owner or possessor of the source of pollution has the duty to install an on-site facility for wastewater treatment or waste disposal, as determined by the relevant pollution control official. An "Environmental Fund" has been established, whose monies come from a tax on gasoline, which is designated for, among other things, investment and operation of wastewater treatment

plants and waste disposal facilities by local administrations or state enterprises. Moneys from this fund can also be allocated as loans to private persons in the event that they have a legal duty to install an on-site facility for wastewater treatment.

The Navigation in Thai Waterways Act (as amended in 1992) and the Public Cleanliness and Orderliness Act BE 2535 (1992), both prohibit the dumping of refuse into rivers, canals, and other waterways. The Public Health Act regulates the nuisance activities related to water pollution such as odor, chemical fumes, and the wastewater discharge systems of buildings, factories or animal feedlots that cause harmful health effects. This Act was also passed in 1992, which was a year in which a military coup took place. The



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appointed Prime Minister, Anand Panyarashun, initiated a number of progressive environmental protection laws almost immediately upon entering office.

The regulators of water pollution are the Pollution Control Department (PCD) and the Department of Industrial Works (DIW). The PCD is responsible for the management of overall water quality and for the control of wastewater discharge. Wastes from industries are controlled by the DIW under the Ministry of Industry. Wastes from agriculture are controlled by agencies under the Ministry of Agriculture and Cooperatives. The local governments control domestic waste.

There are five principal sources of organic wastewater discharged into Bangkok's waterways according to the Global Water Partnership, who released a National Consultation Report on Thailand:

- domestic sewage and wastewater which finds its way to the canals and eventually to the river
- direct discharge by people living along the banks of the river (wastewater from houses/restaurants)
- industries which discharge directly or indirectly into the river
- solid wastes and other wastes thrown into rivers and canals
- agricultural wastes

International standards for monitoring the quality of water test for five different factors. They are:

- Dissolved Oxygen (DO): how much oxygen is available in the water for aquatic organisms (a high DO level is good)
- Biochemical Oxygen Demand (BOD): the amount of oxygen consumed by bacteria while decomposing organisms in water (a high BOD is bad)
- Total Coliform Bacteria (TCB): level of bacterial contamination from human waste
- Fecal Coliform Bacteria (FCB): level of contamination likely to harbor bacteria that cause digestive diseases
- Total Ammonia (NH<sub>3</sub>): the amount of nitrogen in the form of ammonia (a high level is bad)

According to the 2011 Thailand State of Pollution Report compiled by the PCD, around 70 percent of tested areas in the lower Chao Phraya met national standards for DO and BOD whereas only slightly over 50 percent of tests met national standards for NH<sub>3</sub>. However, the most surprising statistics were for TCB (46 percent of tests passed) and FCB (29 percent of tests passed). These are the two tests that measure the amount of human waste and bacteria that cause gastrointestinal illnesses in the water. The raw data shows that the Chao Phraya

averaged 24,000 mpn/100ml in TCB tests and 7,900 mpn/100ml in FCB tests.

As a comparison, the US Environmental Protection Agency set contamination standards well below those levels, finding that water above the thresholds of 2,300 mpn/100ml (TCB) and 400 mpn/100ml (FCB) were associated with gastrointestinal illnesses; the actual "safe" standards imposed by the EPA are considerably lower than these. This means that the amount of fecal matter and accompanying harmful bacteria in the Chao Phraya River is over 10 times higher than the threshold that the US EPA has determined causes digestive illnesses. Perhaps inadvertently ingesting Chao Phraya River water on a water taxi commute is a health risk approaching that of getting on the back of a motorbike taxi during rush hour.

The main cause of deteriorated water quality, according to the PCD, is untreated municipal wastewater being drained directly into public waterways. In fact, 90% of all wastewater nationwide, including residential sewage and industrial discharge, flows directly into public waterways untreated according to the Report. Commercial and industrial expansion, combined with exponential population growth and a rural migration to Bangkok, has resulted in an accumu-





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lation of water pollution that has overwhelmed nature, leaving it unable to cope. Although the state of Bangkok's waterways is better than when most of the environmental legislation was first introduced, their quality still falls well short of what is appropriate for the great city through

which they run.

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