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Sydney's Cooks River an "open sewer"

New research identifies raw sewage as the source of more than a dozen chemicals in major waterway, including human pharmaceuticals, anticonvulsants and cosmetics

October 24, 2011.

One of Sydney's major urban waterways – the Cooks River – is at times an "open sewer" carrying effluent containing pharmaceuticals and other chemicals, researchers have found, sparking calls for urgent action to clean it up.

The river, which flows through inner western suburbs of Campsie, Canterbury, Earlwood and Marrickville, before discharging into Botany Bay, has long displayed evidence of bacterial contamination. But now researchers from the University of New South Wales have pinpointed raw sewage as the culprit, by identifying the exact chemicals being transferred from the toilet to the river.

Testing initiated by UNSW's Water Research Centre (WRC) senior lecturer Dr Stuart Khan found high concentrations of a wide range of chemicals in the Cooks River, including paracetamol and ibuprofen, as well as insect repellents such as DEET and cosmetic parabens. All are either excreted from the body into toilets or are washed off in the shower -- and all wind up in the sewerage system.

The levels of the chemicals found were on a par with raw sewage. While low levels of such substances do routinely enter the environment via sewage treatment plants, no such treatment facility exists on the Cooks River.

"The results show that these chemicals are being transferred directly from the sewers into the river," Dr Khan said. "The highest loads were detected following heavy rainfall when the sewers are designed to overflow into the stormwater system, which flows to the river. However, even during extended dry weather, high concentrations persist, indicating that the aging sewers are leaking into the river."

Student Philippe Laou, collected more than 50 samples over two months with the vast majority testing positive to a range of chemicals (see table below).

Dr Khan said: "The high concentration of chemicals suggests there is very little dilution and the Cooks River at times is really an open sewer running through Sydney. I would strongly discourage anyone swimming in the river under any weather conditions."

The Water Quality Co-ordinator for local community group the Cooks River Valley Association, Gayle Adams, said she hoped the study would highlight the poor state of the river and the need for a rehabilitation plan.

"It's clear that urgent works are required to identify and fix the leaking sewers that are contributing to this problem. However, in the long term, the practice of allowing sewers to overflow into the stormwater system must also come to an end. Our community and our local environment deserve better than this".

The project was funded by UNSW, with in-kind support from the Cooks River Valley Association. Dr Khan, who lives in the area, often cycles around the Cooks River.

List of most commonly detected chemicals in Cooks River:

Chemical	Source/use
Caffeine	From beverages including tea and coffee
DEET	Active ingredient of insect repellents
Bisphenol A	Industrial chemical known to leach from some plastics including pipes
Triclosan	Antibacterial included in some soaps and hand-washes
Paracetamol	Analgesic pharmaceutical
TCEP	Industrial chemical
Salicylic acid	A break-down product of the analgesic pharmaceutical Aspirin
Ibuprofen	Analgesic pharmaceutical
Primidone	Anticonvulsant pharmaceutical
Carbamazepine	Anticonvulsant pharmaceutical
Naproxen	Analgesic pharmaceutical
Polyparaben	Ingredient in many cosmetics
Diclofenac	Analgesic pharmaceutical
Octylphenol	Breakdown product of some industrial surfactants
Gemfibrozil	Blood-lipid regulating pharmaceutical
Atrazine	Pesticide

Source: UNSW Water Research Centre, Dr Stuart Khan

Media contacts

Dr Stuart Khan, senior lecturer, UNSW Water Research Centre | 02 9385 5070 | 0414 398 293 | s.khan@unsw.edu.au

Mr Philippe Laou, international practicum student, UNSW Water Research Centre | philippe.laou@gmail.com

Ms Gayle Adams, water quality co-ordinator, Cooks River Valley Association | 02 9569 5996 | 0404 196 988 | gayle.adams1@bigpond.com | <http://www.crva.org.au>

Alexander Symonds, UNSW Media Unit | 02 9385 1933 | 0431 947 956 | symonds.alexander@gmail.com