ISSUE 4
NOVEMBER 2015

community conversations connecting

Wellington Water

Absolutely Positively Wellington City Council
Me Heke Ki Pōneke

Wellington City ICMP NEWS

An Integrated Catchment Management Plan (ICMP) is a plan for the sustainable management of fresh and coastal water and ecosystems.

In this issue

We discuss stormwater contaminants, where they come from and how we can all help reduce them.

Stormwater contaminants

In dense city environments like the Lambton Harbour catchment, large open spaces are gone, replaced by roads, pavements and buildings. This change in landscape from bush clad hills to densly populated city has radically altered stormwater quantity and quality.

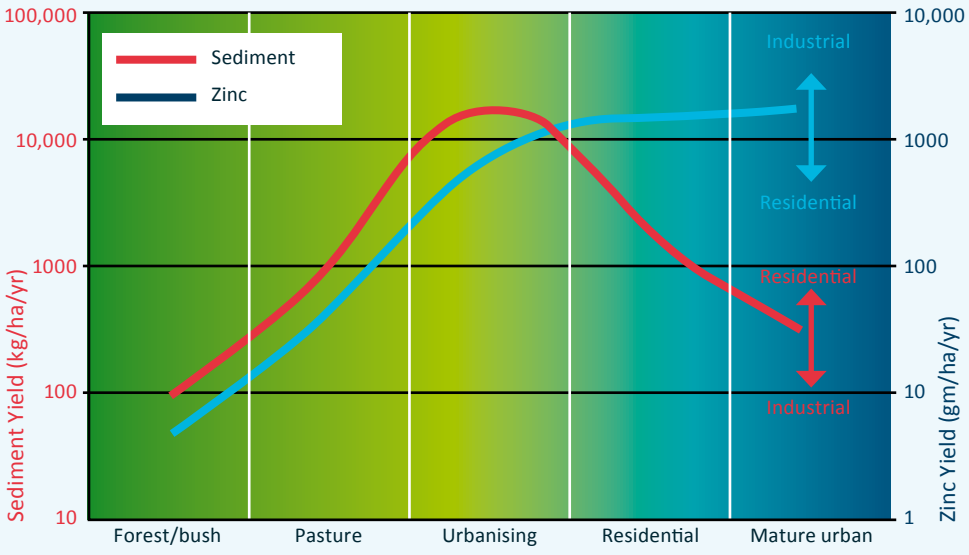
When we think of pollution, most of us think of things like oil spills, toxic chemicals or other big pollution incidents. While occasionally these happen, they are not the only cause of stormwater contamination.

Land use impacts on stormwater discharges

As rainfall runs off over roads and roofs it picks up sediment, petrochemicals and metals like zinc, copper or lead and carries them through the stormwater network to the nearest stream or beach. These contaminants, especially heavy metals, can build up over time in ever-increasing concentrations.

The graph to the right shows how sediment and zinc yields change as cities become more intensively developed.

How sediment and pollutant loads change over time as land use changes



Reference: Urban runoff databook: a manual for the preliminary evaluation of urban stormwater impacts on water quality.

Point and nonpoint source pollution

Pollution sources can be categorised into two areas: point source and nonpoint source. An example of point source contamination would be discharge from an industrial site or a faulty or overloaded wastewater pump station. Nonpoint source pollution is caused by rainfall moving over and through the ground. As the runoff moves, it picks up and carries away natural and man-made pollutants, finally depositing them into streams, coastal and ground waters. Nonpoint source pollution is the main cause of water quality problems. The effects of nonpoint source pollutants may not always be fully assessed, however we know that these pollutants have a harmful effect on recreation, fisheries, drinking water and wildlife.

Where do they come from?

Research suggests that most of the zinc in our stormwater comes from unpainted or badly maintained galvanised iron roofs. In industrial areas there are often large areas of unpainted roofing resulting in more than 95% of the zinc in stormwater coming from roof runoff. While runoff from heavily used roads also contains zinc and other contaminants, it is a smaller proportion of the total load entering our harbours.

Copper: the main sources of copper contamination is from motor vehicles (copper is found in brake pads) and copper roofing, guttering and downpipes which are becoming popular on new buildings.

Lead: major sources of lead contamination include lead in paint, gasoline, water distribution systems, food and lead used in hobby activities. In the 1970s lead was removed from gasoline but old sources are still contributing to contamination in some places.

Oil and grease: motor vehicles drip oil and grease onto roads and parking areas. Total Petroleum Hydrocarbons - (TPH) and Polycyclic Aromatic Hydrocarbons (PAHs) are indicators of such contamination, and recent research has identified car parking areas as being highly polluted surfaces.

Sediments: stream bank erosion, exposed soils and poorly controlled construction activities can contribute to high sediment loads in urban streams and coastal waters.

Bacteria: sources of bacteria in urban stormwater runoff include aging and overloaded wastewater networks as well as pet and bird droppings.

Annual contaminant loads

Chemical contaminant concentrations in Wellington's urban areas are comparable with those in other parts of the world. Copper (Cu) and zinc (Zn) are some of the widespread contaminants of concern, while Polycyclic Aromatic Hydrocarbons (PAH), Dichloro-Diphenyl-Trichloroethane (DDT – pesticide), PolyChlorinated Biphenyl (PCB, commonly used as coolant material) and lead (Pb) may also be of concern in some places, mainly as a result of historical activities. Zn, Cu, Pb, PAH and DDT are all contaminants of concern in Wellington's harbour due to elevated concentrations in sediments.

Nonpoint sources can include:

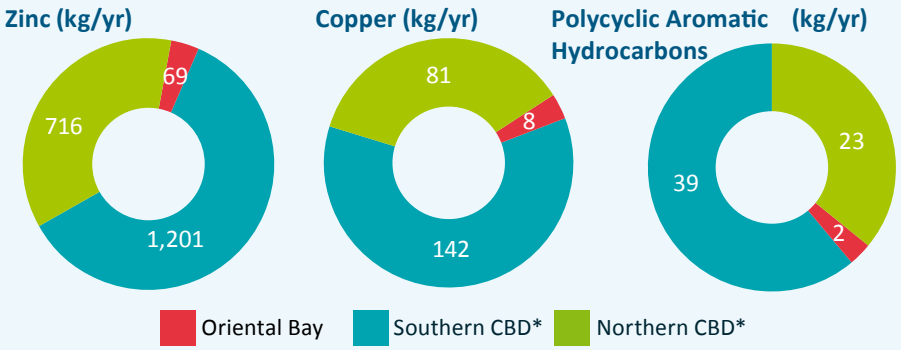
Oil and grease from motor vehicles.

Sediment from eroding stream banks and exposed soils.

Bacteria from leaky wastewater pipes and animals.

Illegal disposal of any waste product into the stormwater system.

Estimated contaminant loads of Zn, Cu and PAH from each catchment:



The amount of contaminants from each sub catchment are moderate, and typical of a well-developed high density urban area. However, the Lambton Harbour catchment contributes to more contaminants per unit area than other catchment areas, reflecting more intensive land use and traffic densities. The contaminant concentrations in sediments immediately around stormwater outfalls are likely to have moderate to high adverse effects on harbour ecology (GWRC 2008, 2013).

* Southern CBD sub-catchments are Newtown, Tory, Te Aro, Taranaki and Harris. Northern CBD sub-catchments are Warring Taylor, Bowen, Glenmore, Aitken, Tinakori and Aotea North.

Wellington's harbour marine sediment quality investigations (GWRC 2008, 2013) reported that DDT, PAH, Pb, mercury (Hg), Cu and Zn concentrations in sediment samples are exceeding the acceptable levels. However, currently there are no reported stormwater contaminants of Pb, DDT and Hg being discharged to produce such levels of contamination. Stormwater may have carried high loads of these substances as a result of the past activities such as:

- Pb from use in petrol
- DDT and Hg from excessive use
- discharges from industries before they were connected to the sanitary system
- spillage during port loading/off-loading activities
- leaching of heavy metals from antifouling paints and treated timber.

Modern day urban stormwater has much lower concentrations of Pb and PAH. Cu and Zn are now the contaminants of concern in terms of adverse effects in fresh and coastal waters.

This information will help us work out where removing contaminants is likely to be most needed and cost-effective.

How does this affect our ICMPs?

A mix of source control and treatment are likely to be used to help reduce the amount of contaminants in our estuaries. Source control means reducing contaminants at their source, for example by encouraging the use of building products that generate less zinc. Treatment involves removing contaminants from stormwater run-off areas like roads, where contaminants build up as a result of normal use.

What we are doing to improve water quality:

- Culvert inspection programmes and maintenance
- Sump cleaning
- Road sweeping
- Outfall inspection
- Critical drain inspection
- Stormwater pit cleaning
- Microbiological monitoring at major outfalls
- Beach water quality monitoring
- Environmental sediment control mangement during construction
- Trade waste management plan
- Education awareness plans

Did you know that...

the first 25 mm of rain (approximately) carries the most stormwater pollutant into our waterways?

stormwater runoff is a major pollution problem in most urban cities in the world?

Lambton Harbour catchment has 10 sediment collecting grit pits within the stormwater network to remove larger particles. Major pits are checked annually, and cleaned as required.

4,000 sumps exist within the Lambton Harbour stormwater network. 250 sumps are cleaned every three months and approximately 1,000 are cleaned annually.

10 grit collecting traps in the wastewater network.

Community groups also work hard to keep our beaches and coastal areas clean.

What can you do to reduce stormwater pollution?

Wellington City owns and operates the public stormwater network, while residents and building owners are responsible for managing their private stormwater systems – that is, the pipes that convey stormwater from your property into the public system.

This makes us all responsible for managing stormwater quality.

Stormwater contaminants come from two main sources – everyday activities (like run-off from cars and buildings); and illegal and accidental spills that cause pollutants to get into the stormwater system. You can help with both.

Source control

We can all help minimise contaminants in stormwater:

- paint your galvanised roof with a low-zinc paint and keep it in good condition.
- for new buildings, think about using products that will have less long term impact on our environment – avoid sources of copper and zinc.
- maintain your car to help reduce exhaust emissions and oil leaks that end up on the road and parking areas and get washed into the stormwater system.
- wash your car on the grass so dirt and detergent soak into the soil. Or - take it to your local carwash.
- take your rubbish home or put it in a public bin, keeping our streams and beaches free of unsightly litter.
- dispose of household chemicals like oil, paint and garden chemicals (hazardous chemicals, batteries etc) by using the free service at the Southern Landfill.

Remember - anything that goes down the stormwater system ends up in our streams, groundwater, harbours and beaches

ONLY RAIN GOES DOWN THE DRAIN!

How can you help stop stormwater pollution:

- If you come across a stormwater pollution problem, contact Wellington City Council with details of where the leak can be found - (04) 499 4444 or contact Greater Wellington Regional Council's environment hotline - 0800 496 734

For further information click on the links below:

businessstoppollution.pdf

youstoppollution.pdf

In our next edition we will be discussing monitoring and investigation work.

For more information or to contact us:
visit **wellingtonwater.co.nz** or phone **04 912 4400**

Document Number: **ICMP NEWS - 4**
Date: **NOVEMBER 2015**