

## Monitoring the health of the Bay

The granting of the consent for the wastewater treatment plant (WWTP) was based on the compliance with 62 conditions in order to avoid, remedy or mitigate any effect to the environment whether it be to the land, air and sea from the activity. The Wastewater Technical Advisory Group (WTAG) was established as part of the consent having the responsibility for initiating a study of, and monitoring, the Biological Trickling Filter (BTF) plant to assess how well the WWTP is working and to provide advice and peer review for the Wastewater Alternative Use and Disposal Programme. As part of the consent, the establishment of the Turanganui A Kiwa Water Quality Enhancement Project was required as a vehicle for integrated research, monitoring, planning and specific projects that aim to improve the mauri (life force) and the water quality of Turanganui A Kiwa.

### Specific projects to address these include:

- A comparison of farmland water catchments to assess the effects of conservation planting and catchment management practices on water quality.
- A biodiversity study of the Taruheru, Turanganui, Waipaoa rivers and the Waikanae Stream to establish the health of the tidal areas of these waterways.
- Monitoring the presence of enterococci and coliform bacteria in juvenile green-lipped mussels which have been placed in several locations attached to ropes in the bay.

Under the monitoring required of the BTF, a profile of emerging organic contaminants within the influent and treated effluent will assess treatment performance of the BTF. Testing also includes DNA analysis to determine exactly what happens to the effluent in the BTF treatment process and exactly what compounds are digested and changed.

### Filter Feeders

Bill and Ian Ruru of Maumahara Education are developing a monitoring programme that uses kaimoana as natural biological indicators of health. Last year mussel lines were brought from the West Coast of the North Island and placed in several locations within the



Bill Ruru with a line of green-tipped mussels to be placed in the bay.

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# From the editor's desk...

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What a difference we have had in weather this season. Wet, humid and unpredictable. The endless summer that freedom campers long for did not come and bodies are left a bit pale. On the bright side, the grass is green, farmers are doing well, and the water tanks are full.

We haven't seen nothing yet... According to a report by the Intergovernmental Panel on Climate Change (IPCC), a confirmed increase in extreme weather events, and other climate change impacts are going to affect coastal centres, including Gisborne. The report states that there is high confidence that these extreme events will have greater impacts on sectors directly reliant on weather and climate. Since the East Coast relies much on our agriculture and horticulture industries, it may be that we have unknown times ahead.

This issue of CQ contains a range of articles from different environmental aspects including pest management, current and future land use and monitoring of the wastewater treatment plant. It has been 10 years since the Jody F Millenium grounded so I have done a recap of the 18 day event.

Back in the office, the conservation section has been trucking along, business as usual. A crack down on Forestry activities have meant some enforcement action has been taken. Trevor Freeman went to Canada to look at oil and gas exploration activities, which included fracking (fracturing oil bearing rock strata at depth). The purpose of the trip was to upskill a staff member about new approaches to oil and gas exploration so they can offer impartial, well informed advice to councilors and decision makers on resource consent applications.

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bay and port area. The mussels can help assess water quality because they are filter feeders and any traces of contamination will show in their gut. Samples will be tested for trace chemicals and the presence of human faecal indicators, bacteria and viruses specific to the human gut. Faecal coliforms come from many sources, including farm run-off and wildlife.

Ian Ruru is providing an opportunity for students to get involved in the project through the Diploma of Iwi Marine and Freshwater studies offered through Te Wananga O Aotearoa. Students will be collecting samples within the catchments and reporting back to the WTAG group.

The biodiversity study of the rivers has produced some interesting findings. The shellfish population samples found in the Taruheru river are a bit of a mystery. It is unknown why there are only live Turangi (Cockles) on one side of the river and only live Pipi on the other. Only dead shells are found in the red areas of the map as shown across the page.

To make things even more interesting, John Mackay of the Gisborne business nature Diagnostics and Research Ltd has been setting up the process for sequencing DNA found in the mussel gut to provide evidence of where the contamination is coming from whether it be human or animal. The tests will become more specific where the use of DNA will determine the species of animal DNA present, i.e sheep and cattle. At the moment this process is still in the preliminary stages of testing in order to create best practices for the process. Identifying the source of contamination is vital to proving whether treatments in the WWTP process are successful in eliminating human waste entering the bay from the outfall.

Organic contaminants entering the WWTP can also be at high volumes. Antibiotics, anti-ulcer and anti-cancer compounds can be at high levels and testing is proposed that will look at the amount of contaminants received at the WWTP and the amount that still exists once the waste has gone through the BTF. Contaminants also reach the WWTP from industrial



Three Rivers Brainteaser - Why are there only live Turangi (Cockles) on one side of the Taruheru river and only live Pipi on the other side? Ian Ruru is offering a chocolate fish for the most convincing answer. Please email to [nicki@gdc.govt.nz](mailto:nicki@gdc.govt.nz)

discharge which also has the potential to put high volumes of micro-organisms into the process.

disposal include using the solid waste as fertiliser on land through irrigation fields, which is planned to be trialed in the near future. 🌱

Currently, weekly samples are collected before and after the wastewater goes through the Biological Trickling Filter. The flow rate, the amount of enterococci and other contaminants are sampled. So far a clear reduction in contaminants has been shown indicating the BTf is working.

#### Alternative use and disposal

Information gathering on alternative use and disposal of waste from the treatment plant is underway. At the moment tonnes of solid waste are trucked out of the district on a weekly basis which not only moves the problem elsewhere but also has an impact on the carbon footprint of the process. Other possible ways of



Elevated view of the WWTP on Banks Street.