

## Welcome to this edition of the Water Supply newsletter

We have made significant progress towards our preferred water supply solution, with the release of a NIWA report on the ecological impact of our proposed groundwater river recharge scheme (see article).

The NIWA report will be part of a package of assessments that is being brought together to support Council's resource consent application.

The other reports will include a cultural impact assessment and the results of drilling investigations currently under way in the Waimea Aquifer in Waikanae (see story in this newsletter). Results from the latter will be used to update the groundwater modelling undertaken last year.

The reports will go to Council next June prior to the lodging of a resource consent application with Greater Wellington.

Yours sincerely,



**Jenny Rowan, QSO JP**

Mayor Kāpiti Coast District



*Dave Pratt from Richardson Drilling*

## Promising results from water bores

Investigation drilling for the district's groundwater river recharge scheme has yielded some promising results as work continues to secure the district's water supply.

Our drilling contractor, Richardsons, has completed testing on the third bore, which is located in Greendale Drive. This bore has been drilled to a depth of 90 metres where bedrock was reached. Pumping tests have been done on a water bearing layer near the base of the bore, and additional tests have been carried out on a layer at around 60 metres deep. The results are looking promising and indicate a potential flow of 20-30 litres per second. To put this in perspective, we are looking for a total combined flow rate of 120 litres per second.

This promising test bore follows the completion of two earlier test bores in the Greenhill Road area. The first of these did not yield water but did provide valuable information about the underlying geology. The second did find water, also flowing at around 20-30 litres per second. Drilling at the fourth test bores has just commenced on Kensington Drive.

The most suitable test site will be chosen as the location of the first new production well (Stage 1), which is expected to be drilled in about April next year. Once this work is completed all the available data will be fed into a groundwater model of the aquifers in the Waikanae area to confirm the sustainability of the groundwater river recharge scheme.

Council will then make a decision on seeking resource consents for the new production bore and the river recharge scheme itself.

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## Contacting the Water Project Team

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# Kāpiti Coast Water Supply



*our water is precious  
he tāonga te wai*



October 2011



# our water is precious - he tāonga te wai

## NIWA Conclusions Welcomed

The Water Supply Project has achieved a major milestone with the completion of investigations into the ecological effects of the proposed River Recharge with Groundwater scheme.

The scheme will see groundwater pumped into the river below the water treatment plant to increase Waikanae River flows and therefore meet minimum flow requirements. This will enable us to increase our water take from the Waikanae River to meet our peak demand in periods of drought.

In order for the scheme to proceed, we had to investigate any changes in water chemistry and potential effects of these changes on the river's ecology.

Led by NIWA's Dr. Alastair Suren, the investigation team built baffles along the river to produce two channels – one a monitoring channel which contained regular river flow, the other one being the experimental channel which contained 70% groundwater and 30% river water. This balance was chosen to reflect conditions of a 1 in 50 year low flow period, based on demand for the estimated population in the year 2060.



NIWA scientist Braden Crocker and Janine Wech monitoring fish survival and growth

The goal was to monitor 3 populations – invertebrates, fish and algae - before and after groundwater addition. The experiment lasted 8 weeks – from February to April this year. The length of the experiment replicated the longest period river recharge will be required in the scenario of a 50 year drought in the year 2060.

In spite of a few complications, in particular a couple of flood events which caused damage to baffles and removed some algae from rocks in the channel, Dr Suren and his team were able to complete the experiment successfully.

The Waikanae River has a diverse fauna, dominated by mayfly, midge, caddisfly and beetles. The comparison of the two channels showed that these invertebrate communities differed little between channels over time, with an overall assessment that the river recharge scheme would not affect invertebrate communities.

In terms of fish, the experiment looked at three species: eels, inanga, redfin bullies - all common in the river. The fish were placed in cages in channels and monitored for survival and growth. Fish density increased in both channels over time.

No differences in fish lengths were detected and it was also noted that fish were not moving away from groundwater in the experimental channel. In fact, there were no differences in growth rates or survival of fish even in 100% groundwater in aquarium trials. Again, the overall assessment was that the river recharge scheme had no adverse effects on fish.

Finally, algae: it was found that algae growth in the experimental channel was normal for summer. It was found that populations in the experimental channel were similar on large rocks in the main river outside the experimental channel, and also they were similar on large rocks downstream at SH1 which were not subject to groundwater flow.



Baffles creating two channels along the river

While the experiments on algae observed some algal changes, these were considered part of a natural succession during summer low flow and warm temperatures. Overall, it was concluded that the river recharge scheme was unlikely to cause proliferations of algae.

The findings were peer reviewed and the methodology considered to be very robust. The only potential difference of opinion was the cause of the algae results. The peer reviewer considered nutrients in the groundwater could cause increased algal growth rates, but accepted that the NIWA explanation was possible. Annual monitoring was recommended as a way of managing the uncertainty over the cause of the algal growth.

The results as a whole were highly satisfactory. It has been shown that the river recharge scheme is very unlikely to have any adverse ecological effects.