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MARCH / APRIL 2016 | ISSUE 193

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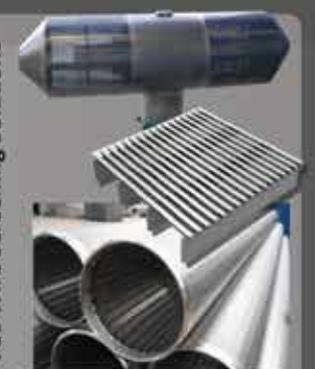
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ISSN 1179-2949 (Print)
 ISSN 2382-1906 (Online)

water

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The official journal of Water New Zealand – New Zealand's only water environment periodical. Established in 1958, Water New Zealand is a non-profit organisation.



Why charity starts in the workplace

Brent Manning, President, Water New Zealand.

“Job applicants in our sector are seeking a lot more than simply the best pay and employment conditions.”

As Engineering Manager of around 40 staff for a medium sized rural-provincial council, I have regular exposure to recruitment processes. Through that exposure, I get to review applications and CVs for engineering and technical staff on an occasional basis. What I have observed over recent years, particularly from younger and graduate engineers is what I will call an altruistic flavour to job applications. That is to say, job applicants in our sector are seeking a lot more than simply the best pay and employment conditions for themselves.

They may want more flexible working arrangements (doesn't everyone?), and want to contribute to the local community and environment so they look for employers with a good track record in this regard. It is notable that some employers allow their staff “community days” for staff to commit time to worthy community projects, or to assist sectors of the community.

In my own employer's case, we regularly hold multi days for local and charitable causes, we enter teams in regional fundraising events and we promote health and well-being for staff and their families through internal training to give but a few examples.

The point here is that our future staff are being more discerning and using greater due diligence before choosing where they would like to work. In the same way that we, as employers thoroughly check out an applicant's work history and record, when they apply for a role, don't be surprised to find the applicant has already checked you out – and your organisation's reputation. This can be advantageous to those employers whose companies are recognised as being ‘great places to work’. I think it means that it matters what we as managers and leaders in our workplaces do and encourage, even on our weekends or after hours – and that we model what we expect from our teams.

Water Challenge

To this end, your Water New Zealand Board has this year committed to entering and participating in the Oxfam Water Challenge. Oxfam New Zealand is a not-for-profit entity, which, as part

of Oxfam International, seeks to mobilise the power of people to end poverty.

The organisation works with local partners and communities to promote basic human rights for people in the Pacific and South East Asia. They help people to access safe water and sanitation and to build a sustainable livelihood, to provide education for their children, to live free from violence, and to have a voice so they can hold the powerful to account, and they provide emergency assistance in a crisis.

Here, Oxfam holds a Water Challenge Day each year with the aim in 2016 being to raise the money needed to fund a vital Water, Sanitation and Hygiene education (WASH) project in Papua New Guinea – and we are well on our way to achieving our chosen fundraising target. As part of our team fundraising, we jointly cycled/walked and jogged 100 kilometres of the Waikato River Trail on a single Saturday back in January. While I thank and acknowledge my Board team mates

(and their family members) on their respective strenuous efforts and stamina on that day, we are also extremely grateful to all those who have donated and sponsored us to date. I was impressed to see some of the major dollar contributions were from our own Water New Zealand staff so I'll put that down as evidence of the effects I

described above in action.

Thanks again to all of our donors, and we are looking forward, along with the 16 other teams no doubt, to the actual challenge day on 20 February. We wish all of our competing organisations' team entries the best, remembering the main goal is to raise at least \$50,000 so that people in Papua New Guinea can get better water and sanitation facilities. That's pretty altruistic and fits entirely within our sphere as water engineers and practitioners, and of course is entirely appropriate for Water New Zealand as both a sponsor and participant.

If you want to know more about the Oxfam Water Challenge or our team efforts to date go to www.oxfam.org.nz/fundraise/water-nz where you can also add your sponsorship if you wish (until 21 March). **WENZ**

Brent Manning, Water New Zealand President.



Journey's End: Water New Zealand Board team members on completion of 100 kilometres of the Waikato River Trail.



WATER NEW ZEALAND'S ANNUAL CONFERENCE & EXPO 19-21 OCTOBER 2016, ROTORUA

The Annual Conference & Expo will again be an industry gathering not to be missed. It remains the largest and most broad-ranging conference of its kind held in New Zealand.

The annual conference provides the water industry and, in particular, association members a chance to gather together for three days to catch up with old friends and colleagues, discuss the latest developments and technologies, and debate the issues at the forefront of our sector. It is also a chance to meet new members of the industry and view new tools and technology in the largest water and wastewater trade exhibition in New Zealand.

We look forward to seeing you in Rotorua. Mark the following dates in your diary.

Key Dates:

Friday 15 April	Call for Abstracts CLOSES
Wednesday 29 June	Registration OPENS
Tuesday 19 July	Earlybird Registration CLOSES

Conference Theme

'Pathways to Excellence' is the theme of this year's conference. Demographically, the country faces a number of challenges. While some of our regions are facing significant growth, others have reducing populations, an increasing number of residents on fixed incomes, and aging assets. How then, do we ensure adequate service delivery at an affordable price? Our total population is less than many cities, but it is spread out, meaning that economies of scale can be difficult to achieve. How then can we all get on that pathway to excellence? How best can a larger centre assist a smaller one, and how big, or small, is best?

The conference will explore innovative ways to mitigate the range of challenges we face.

Exhibition

Expo sites open 9 March.

Held for the duration of the conference, the exhibition gives delegates and trade visitors the opportunity to meet with leading equipment manufacturers and service providers and see state-of-the-art equipment, technology and services. Over 100 companies take part and the exhibition sites at this event are extremely popular.

To view further information and to book a site visit www.waternz.org.nz.

Sponsorship Opportunities

Sponsorship opportunities are available to any member of Water New Zealand wishing to maximise their involvement at the Water New Zealand Annual Conference and Expo. There are a range of sponsorship opportunities available to suit all budgets, with benefits of investment dependent on the level of sponsorship commitment and the type of package.

Call for Abstracts – Closes 15 April

The call for abstracts opened on 15 March and will be of interest to the full spectrum of the water industry and can cover a range of topics. The call for abstracts closes on Friday 15 April. To submit a paper visit www.waternz.org.nz.

Poster Summaries

Poster presentations are always a popular component of the Annual Conference. Visit www.waternz.org.nz for more information and to submit your poster summary online.

If you have any queries regarding the conference, please contact Hannah Smith, Water New Zealand on +64 4 495 0897 or email Hannah at hannah.smith@waternz.org.nz.

WATER NEW ZEALAND CONFERENCES

Modelling Symposium 2016

16 – 17 March
West Plaza Hotel, Wellington
For further information, visit www.waternz.org.nz or contact Amy Aldrich amy.aldrich@waternz.org.nz

Stormwater Conference 2016

18 – 19 May, Nelson
For further information, visit www.waternz.org.nz or contact Amy Aldrich amy.aldrich@waternz.org.nz

Annual Conference & Expo 2016 – ‘Pathways to Excellence’

19 – 21 October, Rotorua Event Centre, Rotorua
For more information, visit www.waternz.org.nz or contact Hannah Smith hannah.smith@waternz.org.nz

OTHER CONFERENCES

NZLTC Annual Conference 2016

16 – 18 March, Gisborne
nzltc.wordpress.com/nzltc-annual-conference

Industrial Waters NZ Conference (NZTIWF)

19 – 22 April, Christchurch
confer.co.nz/industrialwaters

WIOG

4 – 6 May, Auckland
www.wiog.org.nz

Australian Water Association Conference ‘Ozwater 2016’

9 – 13 May, Melbourne, Australia
www.awa.asn.au

IPWEA

22 – 25 June, Auckland
conferenceteam.co.nz/ipweanz2016

Singapore Water Week

10 – 14 July, Singapore
www.siww.com.sg

PWWA

Week of 12 September
Port Vila, Vanuatu

WEFTEC

24 – 28 September
New Orleans, USA
weftec.org

IWA Congress

8 – 16 October
Brisbane, Australia
iwa-network.org/event/world-water-congress-exhibition-2016/

You can view upcoming conferences and events through the News & Events / National Calendar section of our website www.waternz.org.nz.



REMINDER

The Trade & Industrial Waste Forum is on in Christchurch from 20th – 22nd April 2016.

The Forum brings together the Waste Producers, Utilities Providers, Regulators and Industry Suppliers and gives you the opportunity have your say!

REGISTRATION - <http://confer.co.nz/industrialwaters/registration/>

The Full Registration Fee includes attendance at all sessions including the Pre-Conference Workshops, Welcome Function and Field Trips.

Pre-Conference Workshops: 1.00 – 5.00pm, Tuesday 19 April

ACCOMMODATION - We're making things simple for you, you can book your accommodation at the Conference Hotel at the time of registration.

FLIGHTS - For those needing flights, check out www.airnewzealand.co.nz now for bargains.

TWO REPORTS - The theme of the conference is “Infrastructure before Intensification” and papers include latest developments in waste water treatment, research, compliance, instrumentation, trade waste treatment, laboratory analysis, training, testing and ‘kiwi ingenuity’ in the waste water industry.

CONFERENCE PROGRAMME - Keynote speakers include economist Shamubeel Eaqub on Water and the Economy. A full list of speakers can be found at <http://confer.co.nz/industrialwaters/speakers/>

SPONSORSHIP - for those interested in being a supporting partner of Conference 2016, contact the Conference Secretariat for more information: industrialwaters@confer.co.nz.

Science spend to help enhance water resilience

Innovative, resilient land and water use is one of the key themes of a new multimillion-dollar science initiative launched in Wellington at the end of January.

Enhancing New Zealand's primary sector economic contributions while improving our environment is the aim of the newest National Science Challenge, Our Land and Water – Toitū te Whenua, Toiora te Wai launched by Science and Innovation Minister Steven Joyce. Hosted by AgResearch, it brings together researchers from all seven crown research institutes and four universities. Funding for the Challenge amounts to nearly \$100 million over 10 years supported by additional co-funding of up to \$130 million from the crown research institutes.

Interim board chair Paul Reynolds hailed the launch as "truly auspicious". Given that the primary sectors underpin the country's economy, he says "it has never been more urgent to provide research solutions that enhance productivity whilst maintaining and improving the environmental values on which farming, as well as society, depend".

The four main research themes are: innovative, resilient land and water use; collaborative capacity; greater value in global markets; and operating

at the nexus. The challenge, says Reynolds, has been influenced by and will build on the good work already done by the Land and Water Forum. "We have close links with several of the other Challenges, in particular Biological Heritage which focuses on our native biodiversity, biosecurity, and resilience to harmful organisms. Together we will be working to accelerate science for the betterment of our land and water and the next generation."

The first two official Challenge appointments are Ken Taylor as permanent Challenge Director and Richard McDowell as Chief Scientist. Currently the Director of the Science Group at Environment Canterbury, Ken Taylor chairs a reference group of the Land and Water Forum, and is described as being "ideally placed" to lead the Challenge.

Richard McDowell has been the Interim Chief Scientist, and is a Principal Scientist at AgResearch and Professor of Soil and Water Quality at Lincoln University. His special interest in providing options and tools to mitigate water quality contamination while maintaining profitable primary production enterprises "will be invaluable to the Challenge", says Paul Reynolds. Announcements on the first projects funded by the Challenge are expected in May.

Rising Tide – networking event

Water New Zealand's Rising Tide would like to invite members to attend the very popular, relaxed and enjoyable annual speed networking event on Thursday 7 April from 5.30pm-7.30pm. Students, new recruits, experienced professionals and industry leaders all have

the opportunity to meet and network with each other. Water New Zealand will provide a policy update, followed by the speed networking event. For more information visit the Water New Zealand events page. <http://www.waternz.org.nz/events>





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Stormwater conference – registrations open



Early-bird registration and corporate packages are now available for the 2016 Stormwater Conference. Register by 31 March to receive discounted early-bird rates.

The 2016 venue is Rutherford Hotel, Nelson and this year's conference theme is "Resilient Stormwater Systems" in recognition of recent significant damaging rainfall events across New Zealand and the effect this has had on infrastructure and communities. It will be held from Wednesday 18 May to Friday 20 May.

It's the second time this event has been held in the South Island and site tours on Friday around Nelson and to Havelock, Richmond and Mapua will provide an opportunity to view some local examples of stormwater projects.

The conference committee has put together a programme of keynote speakers, technical papers and networking functions which should appeal to anyone interested in stormwater.

The preliminary programme and further information on the social functions and site visits can be viewed on the Conference website www.stormwaterconference.co.nz.

Keynote Speakers

Dr Deirdre Hart, University of Canterbury *Redefining Stormwater System Resilience In A Multi-hazard Environment*

Deirdre is a multi-disciplinary scientist specialising in coastal settlement related research, including earthquake, flood, sea level rise and tsunami hazards.



Along with lifelines engineering specialist Dr Sonia Giovanazzi, she is currently co-leading a team of local and international researchers examining the multi-hazard effects of the Canterbury Earthquake Sequence. This team includes experts in lifelines engineering, geomorphology and oceanography from the USA, Korea, Italy and Japan. Other current projects include work with a team of National Institute of Water and Atmospheric Research (NIWA) and Department of Conservation experts

to develop a 'New Zealand hydrosystem classification for management purposes'.

Deirdre is regularly asked to provide science advice and comment to central and local government, media, port companies and the Parliamentary Commissioner for the Environment on issues relating to flooding, sea level rise and water resource management, beaches and harbours. She is passionate about the dissemination of science for building more resilient urban and rural environments. Deirdre is also former chair of the New Zealand Coastal Society.

Jim Sinner, Cawthron Institute *Challenges in Collaborative Planning*

Jim Sinner is a senior scientist in the coastal and freshwater research group at the Cawthron Institute in Nelson.



With a background in economics, political science and public policy, he works across multiple disciplines, integrating information and insights from biophysical and social science to address environmental management challenges.

His main areas of work are freshwater and coastal management and marine biosecurity. He has also worked on climate change policy, trade policy and fisheries management. A current research focus is on how "value" is perceived, measured and then used in freshwater management, including through collaborative processes.

Sponsorship and Trade Exhibition Opportunities

The Stormwater Conference is a prime opportunity to promote your organisation through sponsorship and trade exhibition. If your company is interested in developing or enhancing business relationships in the stormwater industry, then an exhibition or sponsorship at the 2016 stormwater conference is a great opportunity.

For full details on the sponsorship and exhibition opportunities available email waternz@gavenues.co.nz or visit www.stormwaterconference.org.nz.

Welcome to the first issue of WATER for 2016.

WATER is published five times a year, and we welcome contributions of technical and general news items across the spectrum of the water and wastes industry on the following areas:

Policy and legislation • Water quality
Demand management • Wastewater • Project news • Modelling • Stormwater • International Training • Trade waste • Industry news and Technical topics/papers

The next issue of WATER will be published in May; the themes are Stormwater; Flood Management and Data Management. For editorial contribution, contact Vicki Jayne: E: vicki@contrafed.co.nz. For all advertising, contact Noeline Strange on P: +64 9 528 8009; M: 027 207 6511; E: n.strange@extra.co.nz

The deadline for the May issue of WATER is Tuesday 15 April.

To view the themes for 2016 visit www.waternz.org.nz.

Backflow Group at Plumbing Conference

Water New Zealand's Backflow Group is teaming up with the organisers of the New Zealand Plumbing Conference 2016 to bring you a day relating to Backflow as part of this conference. If you are interested in attending, this event is being held on Wednesday 6 April at Novotel Lakeside in Rotorua from 9am to 4pm.

The programme is as follows:

- 9am:** Welcome and introduction, Backflow, what is it and why we should care.
- 9.15am:** Installation of backflow prevention devices, "the right way", and failures in compliance – "common mistakes being made".
- 10am:** Morning tea.
- 10.30am:** Legal obligations in regards to Backflow prevention – "inside and outside the boundary".
- 12pm:** Lunch.
- 1pm:** Your Backflow Prevention Programme – what it should look like and where to get help.
- 2pm:** Backflow philosophy – "time to change our way of thinking".
- 3pm:** Afternoon tea.
- 3.30pm:** Question time, ownership or verifiable – what's best.

Visit the NZ Plumbing Conference website for further information and to register: <https://forumpoint2.eventsair.com/QuickEventWebsitePortal/nzpc16/nzpc16/ExtraContent/ContentPage>
OR tinyurl.com/BackflowPrevention

Hurunui irrigation project clears legal hurdles

Work on a major irrigation scheme in North Canterbury is back on track following a favourable High Court decision that cleared the path for consents to be granted in late December.

"We now have the base consents needed to go forward," says Hurunui Water Project (HWP) CEO Alex Adams.

But there is still much to be done before work can start on the planned storage along the upper Waitohei River that would provide irrigation to a 58,500 hectare "command area" centred around the Hawarden and Waikari townships.

HWP now has to go back to its farmer shareholders to consult with them in light of changes introduced in the updated National Policy Statement for Freshwater Management 2014.

"Assumptions previously used have changed over the three to four year period that HWP has been seeking consents. So that [consultation] work has to be done early

before we work on defining the project to the point where we have a workable scheme for the first stage – because it will be staged and the nutrient limitations in our consents must be complied with."

HWP first applied for consents to take, store and use water in the Hurunui catchment in North Canterbury in 2009. Following consultation with environmental, recreational and local interest groups, revised consents were applied for in 2011 and granted in August 2013. Subsequent appeals by Amuri Irrigation and Ngai Tahu were heard in the Environment Court whose decision was then appealed by HWP and Environment Canterbury. The High Court allowed their appeals after a hearing in late October.

"So we are now looking at a reasonably different scheme to that originally applied for which means there is a lot of work to do to restart," says Adams.

The need to review and revise has pushed back the date of actual water delivery for

drought-affected farmers in the area to 2018 or beyond.

"Farmers wish they had it now," says Adams, "but in reality, it will take until the end of this year to get the scheme laid out and key parameters established so we can seek funding to go forward into the construction phase. It's really unlikely we can have any water before 2018 and it could be even later."

Become a Water New Zealand Member TODAY!

Start engaging now with other members of the water industry. Keep up to date with the latest news, events and trends plus get access to event discounts, industry policies and information, and much more.

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Next Steps for Freshwater

Penalties for stock pollution, requirements on local councils to ensure efficient water allocation and pollution controls, plus greater iwi involvement in freshwater management are amongst measures proposed in the Government's recently released consultation document *Next Steps for Fresh Water*.

Launched by Environment Minister Nick Smith and Primary Industries Minister Nathan Guy at last month's BlueGreens Forum in Tekapo, the paper contains 23 initiatives for improving the quality and management of freshwater resources. Specific proposals include a programme to progressively exclude stock from water bodies as early as July 2017 (for pigs and for dairy cattle on a milking platform) but extending to 2025 or 2030 for dairy support, beef and deer. Farmers whose animals end up in unfenced waterways could be fined up to \$2000.

Other proposals relate to how councils deal with both water allocation and discharge including the use of technical efficiency standards and mechanisms for allocating water to the highest value end use. In recognition that effective implementation of freshwater management will require councils to spend more on science, monitoring and enforcement, the Government also proposes to increase councils' ability to recover cost from water users for such services.

The document suggests better protection for coastal lakes and lagoons and it is proposed that the Macroinvertebrate Community Index be made the mandatory method of monitoring ecosystem health in all freshwater systems.

Iwi will get a bigger say in freshwater management via proposals that recognise their rights and interests and involve iwi in decision making about fresh water in their rohe (region). Councils will be required to engage with iwi in their planning processes around freshwater and the Government will

amend the Resource Management Act to provide for a new rohe-based agreement between iwi and councils for natural resource management.

Also proposed are changes to Water Conservation Order (WCO) applications both to involve iwi and to require that WCO applications consider any planning processes already underway. There is provision for the Minister for the Environment to delay a WCO application if it conflicts with a regional planning process.

The proposals have already attracted criticism for not moving faster on stock containment measures and for undermining Water Conservation Orders which currently offer the highest form of protection for this country's rivers.

Submissions to the consultation document close at 5pm on Friday 22 April. Both the Next Steps document and submission form can be downloaded from Ministry for the Environment website at www.mfe.govt.nz.

Local Government welcomes freshwater initiatives

Local Government New Zealand president Lawrence Yule has welcomed the release of the discussion paper as a useful addition to the important debate on freshwater management.

"The quality of our freshwater is a vital issue for all our communities," he says. "Regional and unitary councils are already investing heavily in working with their communities to manage water quality.

"We are pleased to see the paper promoting further discussion and input on key issues around water quality and usage such as defining freshwater management units, infrastructure exemptions, stock exclusion from waterways and Water Conservation Orders."

He emphasised the important of a collaborative approach and noted that many councils are already working with iwi to develop their water plans.

Clean water campaigners seek action on quality "crisis"

The quality of our waterways has reached crisis proportions – and they need stronger legal protection, say campaigners who have just spent a month touring the country documenting water quality issues.

The Choose Clean Water Tour travelled down the east coast of both islands, then up the west. Along the way, they spoke to a wide range of people to discover what is polluting our streams, lakes and rivers and what people are doing to help restore them.

Spokesperson Marnie Prickett said reaction to their tour has been "overwhelmingly positive" and they are on target to collect 10,000 signatures on a petition that is pushing for more ambitious water standards.

"Our message is that the first step to improving water quality is to have strong legislation to protect rivers and lakes."

While pollution is becoming more evident, people see little being done about declining water standards in their particular locality.

"The reaction from people in terms of what is happening to the quality of their freshwater is one of desperation and distress as they watch places that they love being destroyed before their eyes."

It is, she says, a growing disaster that will have a negative impact on both economic and social wellbeing. A recent government stocktake found

that around two thirds of sites monitored were unsafe for recreational contact – and the Choose Clean group has put a human face to such statistics via a series of short films.

"Many of the people we've met have seen what is lost – their children can no longer swim in the local river, fish are harder to find, lakes are changing colour because of algal blooms..."

The group, which has backing from the Tourism Export Council, intends presenting its petition to parliament early this year. It wants the "bottom line" standards under the Government's National Policy Statement on Freshwater Management (which include a requirement for regional councils to manage freshwater bodies so people's health is safeguarded when wading or boating) to be beefed up. Waterways should, they say, be suitable for swimming.

"We will be going to a Parliamentary Select Committee to convey the gravity of what we face – and the frustration. I think they need to hear from the younger generation – to look ahead and see we are walking into a very challenging future.

"If we don't have healthy water in New Zealand – what do we have? Sick people and an unprofitable economy."

People wanting to support the group's petition can go to www.choosecleanwater.org.nz.



Choose Clean campaigners Marnie Prickett and Kyleisha Foote at Foxton Loop in Horowhenua (signs like these are common all over New Zealand).



Tapping in to water news

World Water Day

It's World Water Day this month. March 22 is the day that UN-Water has declared as an opportunity to celebrate, show support and get inspired to take action on a big development challenge: Ensuring availability and sustainable management of water and sanitation. This year, the theme 'water and jobs' highlights how enough quantity and quality of water can change people's jobs and lives and aims to create recognition for those working with water and the need to transition to decent jobs. World Water Day 2016 is coordinated by the International Labour Organisation on behalf of UN-Water.

Whakatane's fluoride flip-flop

First it was out – making dentists shout; then it was in, making them grin. After voting to discontinue putting fluoride in the area's water supply in late January, Whakatane District Council last month changed its mind and reversed its earlier decision.

Fluoride Free New Zealand laments a 'golden opportunity' lost – citing research showing that fluoride does not protect against tooth decay but that Council support for a targeted dental health programme based on Scotland's *Childsmile* would have done.

However, a local pro-fluoride dentist said he was overjoyed that the original decision had been overturned. Meanwhile Whakatane Mayor Tony Bonne reckons this is not the sort of decision local councils should have to make.

Local Government New Zealand agrees – and is lobbying the government to have such decisions taken out of local council hands.

Water Conservation Order ruled out of order

Hawkes Bay Regional Council is opposing moves by a group of environment, recreation groups and iwi to protect the Ngaruroro and Clive Rivers with a Water Conservation Order.

Late last year, the group applied to the Minister for the Environment Nick Smith to have the WCO declared because of the rivers' "truly outstanding values". The Ngaruroro is valued highly by outdoor recreationists for fishing, whitewater kayaking, rafting and jet boating challenges. However the Council has written to the Environment Minister opposing the WCO application. HBRC's Group Manager Strategic Development James Palmer says the WCO application will "duplicate effort" already being undertaken through its "TANK" plan change process which incorporates the Tutaekuri, Ahuriri, Ngaruroro and Karamu catchments.

It's not the intention to protect the rivers' outstanding values that is opposed but the timing of the application which includes areas already being included in what is an "integrated and holistic" planning process.

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Finalists named for Innovation Award

For the second time, IrrigationNZ has shortlisted four finalists for its Aqualinc-sponsored 'Innovation in Irrigation Award' which will be presented at the organisation's biennial conference in early April.

New technologies, products, practices or community collaborations that reflect innovation within the irrigation sector are the focus of the award, which is only presented every second year.

IrrigationNZ CEO Andrew Curtis says the external judging panel had struggled to keep the shortlist to the normal three, so four finalists have been chosen this year.

They include: Next Farm's smart control systems for grid irrigation; Lindsay Corporation's new pivot control; Carrfields Irrigation's Hydrofix irrigator stabiliser system; and Central Plains Water for its environmental innovations and management of its stage one development.

The highly prestigious award – which comes with a cash prize of \$2500 – will be announced at IrrigationNZ's conference dinner in Oamaru on Wednesday 6 April. Full details of each finalist will be included in IrrigationNZ's quarterly magazine due out next month.

Next Farm's smart control system for fixed grid irrigation is an integrated farm sensor technology and cloud-based dashboard that allows farmers to operate, manage and understand their farm resources from a computer or mobile device. The product utilises a fixed grid irrigation system associated with a digital "mesh network" connecting all parts of the system through radio frequency and GPS.

Lindsay Corporation's pivot control is compatible with almost any brand of pivot. By retrofitting an existing centre pivot irrigator with one of these

controls, farmers are able to access Lindsay Corporation's FieldNET web and mobile app capabilities, which include real-time alerts and status updates.

Unlike other remote controllers, Lindsay's pivot control is mounted at the pivot point for in-field control.

Carrfields' Hydrofix irrigator stabiliser system consists of a series of inflatable water tanks connected to pulley and counterweight systems along the length of an irrigator. On arrival of a major wind event, the turn of a tap fills the tanks with water and lowers them to the ground to secure the irrigator at the centre of each span.

Central Plains Water won both the Champion Canterbury Infrastructure/Trade (medium/large category) and The Press Supreme Awards at the Champion Canterbury Business Awards last year. Through integrated farm management, groundwater replacement, "best practice" irrigation application and Lake Coleridge storage and aquifer recharge, the scheme will assist the area to achieve environmental improvements.

Andrew Curtis says the line-up of finalists – ranging from technology-based innovations to scheme initiatives – demonstrates the ongoing investment in innovation within the sector.

"Irrigators and their support industries are constantly improving on what we do on-farm and how we do it. We're expecting widespread interest in the finalists as previous winners of the award have gone on to sell their concepts internationally and take on leadership roles within the industry," he says.

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"We Can" network launched

Water New Zealand is supporting a new special interest group with a particular focus on community education and delivery of water demand programmes – the Water Efficiency and Conservation Network (We Can).

We Can aims to create a support network and sounding board for professionals that often work in some isolation, geographically, or are the only staff members in their organisation working on water efficiency. The network will focus on improving desired programme outcomes by skill sharing and by sharing practical experience in behaviour change and communication strategies. It would like to work towards further encouraging the use of technology in reducing water consumption. Meetings will be a flexible mix of electronic and personal contact and will start this month.

If you work predominantly in a people-focused role, communicating or engaging with the community on water efficiency and conservation projects, research or programmes, please get in touch. You will be kept updated and will be contributing to the latest developments and events in water efficiency and conservation. All members must be current financial members of Water New Zealand.

To register your interest, please email:
amy.aldrich@waternz.org.nz.



WE CAN
Water Efficiency & Conservation Network
WATER NEW ZEALAND

A STRONG VOICE for wise water management



Vijesh Chandra

Stormwater engineer and newly appointed Water New Zealand Board member Vijesh Chandra says the organisation has a major leadership role to play in the sector.

"I think there is a big gap in industry leadership of rural water and the natural environment. My vision is for Water New Zealand to provide leadership across the whole spectrum of water in both urban and rural environments including rivers and wetlands and this includes the associated impacts on the natural environment.

"So many wetlands have been cleared for farming over the past century resulting in a huge loss in biodiversity. With constructed wetlands being recommended as a key solution in the 4th Land and Water Forum Report and tourism now our biggest revenue earner – connecting economic gains to investment in the natural environment – there will be an increased focus on integrated catchment management planning.

"That's where Water New Zealand can provide leadership and work in partnership with other key organisations such as DOC and the National Wetland Trust of NZ."

One example of providing a "strong voice for the wise use and management of water" would be influencing central government to embrace the recommendations of the 4th Land and Water Reform report, he says.

Suva-born and educated at Auckland's Lynfield College, Vijesh was fascinated with construction projects from an early age and saw engineering as a "glamour" career.

"It had the 'wow' factor – designing tall buildings, bridges, large dams – who would not want to be an engineer."

Vijesh completed a Bachelor of Civil Engineering at Canterbury University before moving back to Auckland. He has since chalked up 25 years' experience in local government infrastructure management including working for Auckland City, City Design, Opus and GHD

where he is currently championing Livable Cities and Communities. Major projects in which he has been involved include the Britomart Transport Centre and Viaduct Basin.

"I was involved with the planning, modelling and design of major stormwater diversions through the Auckland Central and downtown areas at an estimated cost of over \$20 million."

During the 1990s, he was able to utilise numerous new methods in designing drainage systems and describes this as "an exciting time – trying out various new construction techniques on my projects".

In the past 10 years, he says, technological advancements in modelling and GIS software have made a huge difference to the level of understanding of hydrological and hydraulic process in catchments "giving us more confidence in making decisions to manage catchments".

The downside is that the outcomes of most catchment studies prepared more than a decade ago are "not applicable any more". Efforts to improve outcomes for stormwater receiving environments have also largely missed the mark. Despite good intentions, he says there has been "little positive change" in the past 25 years.

Another interesting observation he makes is that projects now have a higher cost attached to them "due to a very risk-averse and high-compliance culture that the industry has imposed upon itself".

In addition to this, he says the availability of good, broadly skilled engineers is on the decline and believes a competitive market that leads to reduced investment in training could be a significant contributing factor.

He cites working in a competitive environment as one of the challenges in his current role. "Staying on top of the game is challenging but it keeps you at the cutting edge, always looking for more innovative

solutions and new ways of adding more value to the services we provide to our clients."

The most rewarding aspect of his work, he says, is the pro-bono activities. Vijesh has provided his services to IPENZ as Practice Area Assessor for over 10 years. He is also a Trustee of the National Wetland Trust of NZ and has just stepped down as chair of the stormwater group committee of Water New Zealand.

He says there are major issues ahead for stormwater management in the face of climate warming.

"Our conveyance systems will not be able to cope with extreme weather events. More needs to be done to understand the capacity of the stormwater systems within catchments."

Those systems, he adds, include rivers, wetlands, coastal estuaries and the biodiversity that comes with it.

"There is no doubt that the industry is aware of what is needed to start understanding the issues around the changing weather patterns but there is a lack of action to develop integrated catchment management plans which consider the management of all catchment issues.

"I have yet to see a complete integrated catchment management plan here. Most are limited in one or more ways due to a perceived lack of coordination, ownership and leadership. I would love to be proven wrong. So here is the challenge for local authorities to come up with the first completed working integrated catchment management plan."

His own challenge over the term of his office is to realise his vision for Water New Zealand's future – leadership across both urban and rural water and a strong voice for wise water management. The organisation will be developing a new strategy in the next few months – "that's the starting point for me to promote my vision". **WNZ**

COLLABORATION

is key for water resource management



Water New Zealand's new Board member Colin Crampton would like to see a lot more joined-up thinking when it comes to managing the country's water resources.

"New Zealanders have the right to expect us to deliver services for better value," says Colin, who is the chief executive of Wellington Water.

"We can do that in the water sector by working together, to help each other build systems and processes, to develop a common framework of service and performance.

"We're not currently doing that with water because of its disaggregated structure. Why should people experience different levels of service across the country? What should those levels be? And where are the opportunities to tie things together a bit better?"

"We want to deliver consistency. If everybody is working to the same framework, that will lift

the overall productivity of water services management, increase trust that we're working on the right things, and result in better outcomes for our communities."

Colin has been co-opted onto the Water New Zealand Board to help drive increased collaboration across the sector, and to see this improvement reflected in the contribution of the three waters to the economy.

"Smaller utilities will find doing business more and more challenging. We need to all work together to see water management as a whole of New Zealand thing."

"I feel passionate about this and think Water New Zealand can be an effective facilitator for water utility collaboration. If we are successful, then I would expect us to be delivering whole-of-New Zealand solutions early in 2017."

He points to the metadata project as an early milestone that will bring the sector closer together.

Colin says he would also like to see more recognition of the value to the economy as a whole that the sector provides.

"People see water as something that just happens or as a series of projects. But it plays an integral part in supporting the whole economy."

He is particularly aware of the need to invest in resilient water systems so the local economy continues to operate after a damaging natural event.

"A city can't work without water. How quickly we can get supplies up and running after an event will very much depend on the work we do beforehand."

That need is valid for all parts of the country, he says, and is another area where the sector needs to work on collaborating: with other infrastructure agencies as well as with local and central government.

Colin learned the value of such collaboration during his time at the NZ Transport Agency, where he worked on

many large State Highway projects and the rebuild of Christchurch infrastructure. After 20 years with the NZTA, he was appointed chief executive of Capacity Infrastructure Services in November 2013, aged 51. Capacity merged with the regional council's water supply group to form Wellington Water in 2014.

"I moved into water management because I wanted to try a chief executive role. I felt very lucky to have trained under [NZTA chief executive] Geoff Dangerfield who prepared me for a CE role. I decided I wanted to stay in infrastructure and wanted to be in Wellington – so it was a good fit.

"I also liked it because I am interested in water conservation and water quality and the business was under considerable change."

Nelson born and educated, Colin studied at Canterbury University where he graduated with a BE Civil. He found he enjoyed the people side of work more than engineering detail, however, and gained a business diploma from Deakin University to support a move into management.

It is the people aspect of his current role that he enjoys the most. "The most rewarding part is leading the team. I really enjoy working with the team to set direction and build a culture of high performance. We are on our way towards this.

"It's also to ensure Wellington Water is a fun place to work."

Colin notes the most challenging aspect of the new business is its multiple ownership model. Wellington Water is jointly owned by its five client councils, Wellington City, Hutt City, Porirua City, Upper Hutt City and Greater Wellington Regional.

"We have to work all the relationships very carefully and ensure there is always great trust in what we do. The more there is trust, the more we can achieve. Maintaining trust is a never-ending job." **WNZ**



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Matt Ewen

Engineering business innovation

Business owner, innovator, entrepreneur and exporter: at just 31, Matt Ewen's career trajectory may be stellar but his feet are firmly on the ground. The 2015 Water New Zealand Young Water Professional of the Year talks to **Vicki Jayne**.

According to a careers questionnaire he completed at school, Matt Ewen was clearly destined to be an engineer – but he also realised he had a passion for business. Now, at just 31, the majority owner of Filtec is already firmly straddling both worlds.

Since making the step change from employee to co-owner via a management buyout in 2012, he has overseen rapid growth in the company's size, product offerings and market reach. With a strong R&D focus, Filtec (a specialist in water/wastewater treatment) has pioneered new products, taken on more staff, moved into bigger premises and started making inroads in offshore markets.

In June last year, Matt bought out his business partner and is now majority shareholder and managing director of a company with more than 50 employees that can boast a solid domestic workload and growing offshore presence.

Inevitably such rapid growth has involved the odd speed wobble. But, perhaps like any good engineer, Matt is designing in the sort of structural resilience needed to underpin future growth.

“After doubling in size over the past three years, we're now working on the systems and processes that will allow us to become the larger organisation we want to be,” he says.

So far, he notes wryly, it has been an “interesting” path. It's certainly been fast-paced.

Growing up on an Auckland lifestyle block, Matt always had a practical bent and a high school careers councillor helped provide the logical direction for his skills.

“I did an online careers survey which basically concluded that I perfectly fitted the criteria for an engineer and that was it. I set the subjects up, enrolled in uni and did a four-year mechanical engineering degree.”

But Matt also took into account his entrepreneurial bent and in his final year began a postgraduate diploma in business administration at night school.

“It gave me quite a unique sort of perspective on the engineering world – looking at it from a business perspective as well. It's important for where I'm sitting now – looking after Filtec and helping it grow.”

He honed his skills first at high-tech manufacturer Buckley Systems and then



F&P Healthcare before taking a role at Filtec – attracted by the fact it was a smaller company that offered more opportunity to exercise his business skills as well as his engineering nous.

His first challenge was developing a membrane pilot plant in Dunedin. The water filtration technology involved had been around since the 1980s but at that time had only recently evolved to the point where it was financially feasible for municipal water treatment, explains Matt.

“I was in my early 20s and looking after two projects worth a total of \$3.5 million. It was a good challenge and something I really enjoyed, so I gave it my all.”

By 2010, he’d grabbed the opportunity to buy a small shareholding in the company – “a big step for me”. A bigger one was to come just two years later when the company was put up for sale. Today, he owns 90 percent of Filtec with the remainder in the hands of long-time shareholder, Wellington manager Craig Freeman who Matt describes as a “real rock” to the business.

The past three years have been very full on.

“I was pretty green to begin with. If I knew then what I now know, I could have saved a lot of the problems we had in the first year,” Matt admits.

With a keen focus on innovation and no shortage of ideas, he is already enjoying the taste of business success. Every dollar made has been invested back into the business – building its fabrication and project management capability as a design and build contractor, its skill base and research capacity. But he has also been busy shoring up a steep learning curve with a solid framework of business know-how and investing in his own leadership skill to help make the leap from project engineer to company manager.

“What I needed was leadership and business administration skills. I understood the water treatment process very well – the engineering side, how to project manage and build plant. But when you have 50 people, you can’t be providing all those skills to the business – you need people you can trust to have the same or better skills in those areas.”

And while his business diploma provided some financial basics, the reality of running a business demanded much more.

“Coming from engineering to owning and running the business, you are very naïve. Suddenly the bank is talking to you about a whole pile of acronyms you know nothing about and you can’t seem ignorant in that position because they are trusting you with their funds. So financial competency was something I really needed to get a good handle on fast.”

What helped most, he says, was getting involved with business accelerator organisation, The Icehouse. Matt enrolled in its owner-manager programme which not only rounded out the skills he needed but provided a peer group he could bounce ideas off.

“This role can feel like a lonely place to be at times. There are many issues you can’t talk to staff about – and they’re not exactly good topics for social situations either. But when you have a roomful of 15 people in much the same position – then you can go for it. So it was a great forum. The organisation provided some great facilitators but the majority of the value was in the network it provided.”

The value of sharing knowledge also prompted him to put



together a local group of manufacturing business owners who meet regularly to discuss topical business issues.

“One of the things I’ve really discovered is a collaborative management style. At owner operator level, when making big decisions for the company, you can need to seek the opinion of the management team or board – because 90 percent of the time when you do that, you get a better result than if you sat down and made a decision on your own.”

The Icehouse also helped him formalise the company’s governance structure.

“I knew I wanted and needed a board – some experience to help with the challenges ahead. So I brought on the former CEO of TruTest Des Scott and he has been brilliant. I can’t speak highly enough of the effort he’s put in in terms of mentoring me personally and the business.”

Carol Campbell, a former Ernst & Young partner brings a strong financial footing to the board and the third member is Craig Freeman.

“The board has really given me stability in situations where I’m up against the wall and don’t know what the answer is – I can call on them. It’s been brilliant.”

As well as strengthening the business structure, Matt has introduced more structure to underpin areas such as innovation. With no shortage of new ideas, he has already created and launched four key products.

“We commercialised those in quite a short space of time because R&D is perceived as an overhead that’s not producing revenue so you tend to skimp on it unless you have a real strategy. We have been working with the Callaghan Institute and NZTE and are going to get a PhD student into the business. We’ve got a long list of projects we’d like to kick off but will just concentrate on a few of those to begin with.”

Those already commercialised have been finding markets not just in New Zealand but, increasingly, offshore. Filtec’s Automatic Valveless Gravity filters (AVGs) have, for instance, proved popular in developing countries.

“We’ve had success with them in the Pacific and were looking to Southeast Asia so NZTE did some research for us and suggested the Philippines.”

He went over, “found the company most like us” to partner with and now has a contract for regular supply of the units for

the next five years. “That’s a good start and hopefully we will develop other markets in Asia.”

The company has also picked up significant projects in Australia and anticipates having fulltime project engineers based Australia in the next six months.

The company is now taking a more team-based approach to innovation.

“Our team is out there in water plants every day and they need to identify what are the pain points for asset managers and owners of water treatment infrastructure and bring that back to the office so we can develop solutions that will help reduce operating cost and unnecessary call outs.”

The company’s mission statement is “making water safer where it matters most” – and that’s where its efforts are focused. It also has a clear set of business goals based around three things, says Matt.

First – as a business we need to be profitable, meet strategic goals and objectives and give our team a rewarding career path. Second is to give back to organisations that are in the industry it operates in – including Water New Zealand. One of his many commitments is being on Water New Zealand’s Rising Tide committee. Filtec is also a principal sponsor of Pacific Water & Wastes Association (PWWA), and involved in OzWater. Plus, the company employs a new graduate every year and takes on apprentices regularly – “We’re bringing young people into the business and training them up, I strongly believe this is what the industry needs.”

Incidentally, Filtec has a strong commitment to creating a great working environment for its team and he’s happy a recent third party assessment scored a satisfaction rating of 80 percent.

“Industry best practice is about 85 percent and the average is about 63-65 percent – so we’re reasonably happy with that.”

The third company goal is to give back to the community – a commitment that currently includes significant sponsorship of the Westpac Rescue Helicopter and donations to Ronald McDonald House, Oxfam Water Challenge and the Special Children’s Christmas Parties.

Looking back over a hectic three years, Matt has inevitably had some challenging moments.

“It’s been fun but there have been times when I’ve felt the business is consuming me – that I have no balance and am not keeping my head above water.”

That’s starting to change. The company is working through a lean principles process christened “project streamline” that has clear objectives and timelines – all tacked on the walls of what’s known as “the strategy room”.

To avoid future speed wobbles, growth has been deliberately scaled back while the company gets all its strategy and process ducks lined up.

Being awarded Young Water Professional of the Year at last year’s Water New Zealand conference was, says Matt, welcome recognition of what he’s achieved so far. “I guess you don’t often get told you’ve done a good job. I want to thank CH2M Beca for sponsoring this award which is a great contribution towards promoting the industry to the next generation of young water professionals.”

“I love seeing people’s career progression and seeing them enthusiastic about the business and the industry.”

He says that one point of difference he’s brought into the business is that Filtec is now a total solutions provider.

“We can design a plant, build it inclusive of process guarantees and, at completion of the build, we can service the equipment in that plant to ensure it remains in its intended operational state.”

For him personally, the business is getting to a point where it’s both more enjoyable and more manageable. At the end of last year, he even took some time off to get married on Waiheke Island and enjoy an overseas honeymoon.

Asked what he enjoys most about business, his answer is instant: success.

“I love seeing people’s career progression and seeing them enthusiastic about the business and the industry. Internally, success is about having staff engaged and motivated; outside it’s seeing satisfied clients who enjoy the benefits of the solutions that we provide to the industry.

“Of course, there is financial success but if that was what I cared about, I would have scaled back and drawn dividends out of the business. So far, I haven’t drawn a cent out because I get much more of a kick out of building a successful organisation than I do a dividend.” **WNZ**

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Freshwater fair play

It's all about
apportionment

Apportionment, not ownership, is at the core of the current vigorous debate over management of the freshwater resource. **Hugh de Lacy** and **Vicki Jayne** examine the issues.

There once seemed so much freshwater in this country that drowning in it was called 'the New Zealand disease'.

The disease is still with us, and so is the freshwater, but what was in over-abundance is now in short supply – or, rather, there are now so many demands on the finite freshwater resource that some system of apportionment is becoming necessary, even inevitable.

Such a system should not be practically difficult to implement: there are endless examples of systems to apportion a scarce resource – it's what business and government are all about.

The political implementation of such a system is the difficult part, of course, with every applicant for a portion of the commodity scrambling for priority over everyone else.

Systems of apportionment almost invariably involve setting a price for the scarce resource, with those needing the most paying the most.

Such a system implies some form of ownership of the natural resource – land, minerals, fish and oil, for examples – in the first place, and in democratic countries that ownership lies with the people, as represented by their elected government.

From that basis of implied public ownership, apportionment can be systematised, with parts of the resource turned over to private ownership in exchange for, usually, money.

Such apportionments become necessary not only when there is competition for the resource, but also when it is being degraded or diminished by existing forms of usage.

In the latter cases, apportionment takes the form of fines, or compulsion to rehabilitate, being imposed on the user/polluter.

The underlying principle is that the Crown, as the ultimate

owner, should be reimbursed for use or abuse of the natural resource in question.

That might seem obvious enough for resources like the coal in the ground or the fish in the sea, and there is no conceivable reason why it cannot be applied equally well to water – even air.

In fact such apportionment is long established in the New Zealand jurisdiction as quotas for the taking of fish from the nation's seawater estate, while fines are routinely imposed for polluting the air.

Both are most certainly owned by the people, the Crown, which has – and routinely exercises – the power to control their usage in the public interest. It's only when competition arises for the use of natural resources that apportionment becomes necessary, inescapable.

This is the situation that now applies to freshwater, which in the early years of this country's development seemed as infinite as the air.

Nowadays the competing users of freshwater are legion – boaties, fishers, tourists, holiday-makers, farmers wanting to irrigate, power companies wanting to generate electricity – and the need for some form of apportionment is overdue, though that reality has yet to take hold.

There is, inevitably, resistance to changing the status quo which has allowed primary producers, for example, to dip into the freshwater resource for nothing, and effectively export it for their personal profit in such forms as meat, milk and wool.

That being the case, the first step in establishing an apportionment system to suit freshwater is to separate the requirements of the people at large, as represented by the Crown, from those wanting to use it for private gain.

The second step is to ensure that the requirements of the people take precedence over those of the private sector.

The uses put to the resource by the public at large range from water to service their households and businesses, to water to swim and fish in, and since the people own the resource they should logically not be charged for it.

And generally they're not: those water charges you get in your rates bill are not for the water itself, which is free, but for the cost of treating and distributing it.

With not-for-profit users thus defined, and their access to the resource both free and protected, it becomes possible to assess the cost to the wider system of the taking of water for private profit, and to apportion those costs accordingly.

Two profit-making enterprises affecting freshwater are hydro-electric generation and farm irrigation, the former borrowing the water to run through penstocks, the latter removing volumes of it entirely and applying it to the soil elsewhere.

It stands to reason then that because hydro-electric dams interrupt the natural flow of the rivers, and because farmers are taking the water in bulk for irrigation, they should both be paying a royalty for it.

Neither does.

Instead, all the freshwater borrowed by Contact Energy and the partly-privatised state-owned generators, and all the water taken by farmers from the rivers for irrigation, is effectively a cost to the state and to the people not being reimbursed.

The current debate about freshwater is shifting from the non-issue of ownership of the resource to its fair allocation – as well as to the long-term sustainability of what is a public resource. There is also the real issue of making those who profit from it, pay for it.

Freshwater's future – the iwi role

The management and use of this country's freshwater is of particular interest for iwi whose historic relationship with their 'wai' and their role as kaitiaki or guardians is increasingly being recognised at both regional and national levels.

Recent Waitangi Tribunal settlements, for example, have included the recognition of iwi rights in relation to the Waikato and Whanganui Rivers. And late last year, the Gisborne District Council entered into what's been described as a "trail-blazing" partnership with Ngati Porou which means they will share decision making over land and water use in the Waiapu catchment.

This Joint Management Agreement is the first time section 36B of the Resource Management Act has been used – giving regional councils the ability to jointly manage natural resources with an iwi authority. A Waiapu Catchment Plan for managing freshwater will be co-developed under this agreement.

It could be a sign of things to come in light of proposed changes to the Resource Management Act which include requirements for councils to invite iwi to discuss, agree and record ways in which the tangata whenua, through iwi authorities, can take part in the preparations of policy statements or plans.

It's a move welcomed by the Freshwater Iwi Leaders Group (comprising leaders of Ngai Tahu, Whanganui, Waikato-Tainui, Te Arawa and Tuwharetoa) which was formed in 2007

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to advance the interests of all iwi in relation to fresh water through direct engagement with the Crown.

Its view is that “our wai is an inseparable part of our whakapapa and our identity and is a fundamental part of what drives our very existence”.

Speaking at last year’s Water New Zealand conference, keynote speaker and Freshwater ILG spokesman Rahui Papa said this engagement is about “knowing we have set rules and limits to ensure the quality and quantity of wai is sufficiently high to protect [its] spiritual wellbeing and allow us to undertake our cultural practice. It also means being able to fairly share in the economic benefits of the use of our wai.”

That means taking a long-term perspective on water allocation and use.

“Water is a valuable economic resource and our relative abundance of freshwater in New Zealand is an important competitive advantage for our economy not just now but in 100-200 years’ time. The challenge is ensuring we use and manage this valuable resource sustainably.”

He notes that outcomes have to take into account both the environment and the economy.

“Setting limits is a critical step in freshwater management – it’s not just about industry values and uses. Setting limits means identifying how much is available for use – the allocatable quantum – and ensuring it is used as efficiently as possible is important for everyone.

“Let’s be honest, water quality is declining and we all need to act now. The continuous supply of freshwater is seen as fundamental to the sustainable social, environmental, cultural and economic development of iwi. But for change to be truly made, we need to look beyond our waterways as being thought of as just a commodity, beyond its market value alone or its contribution to GDP.

“Our waterways are integral to our existence...the quicker we recognise this, then the quicker we will find solutions to ensure future generations will enjoy the same or better benefits than we do today.”

The Fourth Report of the Land and Water Forum released last November makes three recommendations in relation to recognising iwi rights and interests in freshwater. The first

(in brief) puts the main responsibility for reaching agreement on how to recognise iwi rights and interests in water with the Crown and iwi – including agreed allocable quantum and discharge allowances.

The second is how about how these agreements can be given effect through local government – including reserving for iwi “unallocated portions of allocable quantum and discharge allowances in under-allocated catchments”. The third outlines a broad range of mechanisms that should be considered for giving effect to agreements between the Crown and iwi.

Natural Resources: the co-governance model

As debate continues to hot up around who “owns” controls and manages this country’s natural resources, the Office of the Auditor-General (OAG) has released a new report examining effective approaches to shared governance.

Principles for co-governing natural resources outlines topline thinking behind some of the best ways to co-govern and, to a lesser extent, manage environmental initiatives.

Throughout the country, a growing number of iwi hapu, community groups and local authorities are working together to monitor, protect and enhance the health of the environment.

In Canterbury, the Te Waihora Co-Governance Agreement focuses on the health of Te Waihora (Lake Ellesmere) and surrounding catchments. The largest lake in Canterbury and an important link in the chain of coastal lagoons and estuaries along the South Island’s east coast, Te Waihora has suffered from declining water quality due to changes in land use and the clearing of wetlands. The Te Waihora co-governance group comprises representatives from Canterbury Regional Council and Selwyn District Council alongside the chairperson and members of Te Runanga o Ngai Tahu.

The OAG report cautions public entities to be careful not to make “unrealistic demands” straight away and to help build capability among the co-governors.

While there are few surprises in the five main principles that the OAG outlines in its report, as many people involved in co-governance can testify, these ideas are easier said than done.

The full report can be downloaded from www.oag.govt.nz. [WZN](#)





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Waitaki's Green Growth

Irrigation has already transformed the Waitaki valley in northeast Otago and more expansion is underway. **Vicki Jayne** profiles one of the major players – North Otago Irrigation.

The impact of irrigation on North Otago's landscape is evident. Irrigators stalk the hills and valleys like giant stick insects, once tawny landscapes now sport a green glow and areas that previously favoured sheep now offer lush grazing for dairy cows.

This transformation comes courtesy of water sourced from the mighty Waitaki. The country's fourth largest river in terms of flow, it has proved a reliable provider – even during challenging drought conditions such as the 2014-15 summer.

That reliability has been supporting hydro-electric activity since the 1930s – and the three dams on the river were an obvious start point for rural irrigation in the area. Downstream of the dams, there is still sufficient flow to reliably support several irrigation schemes – the newest of which is North Otago Irrigation Company (NOIC).

One of five shareholders in the Waitaki Irrigators Collective (see box page 22), NOIC is now in its 10th year of operation – and in expansion mode.

Officially opened in October 2006, it is a piped and pumped scheme which already delivers pressurised water to some 100 shareholders with more due to come on stream when its planned “second stage” is completed later this year. Extending the company's existing 30,000 hectare “command area” further to the south and east, it will bring an extra 25,000 hectares into the scheme.

It is a major undertaking, with a budget estimated at around \$57 million. This includes an upgrade of existing facilities – including expansion of the original head pond to triple its capacity, the installation of massive new 2.8MW pumps and 114 kilometres worth of pipes.



As with stage one of the scheme (which cost around \$75.3 million), the expansion is being funded through share issues, bank funding and a loan from the Waitaki District Council.

NOIC operates as a limited liability company that is shareholder owned and operated on a community cooperative philosophy. Shares are issued to landowners who are in a position to take advantage of the irrigation and after issuing a prospectus for its expansion in October 2014, the company was able to close it successfully subscribed by the end of that year.

Since then, it has signed a \$48 million contract with McConnell Dowell and expansion work started in mid-2015. It wasn't all plain sailing – in fact, the company quite quickly ran into a potentially explosive situation when the contractors started laying a new foundation to support the installation of new motors at the company's Black Point Road pumping station.

As company chief executive Robyn Wells reported:

“We were surprised by the discovery of unexploded ordinance in [the pump shed] which appeared to have been left undisturbed since 2006” when the first pumps were installed.

“This really was what we call a ‘black swan’ event – something that we could not have imagined happening.”

The stabilised form of gelignite was found last July and while it delayed pump installation – and tested the company's Crisis Management Plan (CMP) – it hasn't altered the scheme's completion date, she says.

“We are grateful that through a rigorous and inclusive process, we now have a clear pump station building and a more robust CMP.”

When installed, the original 2.3MW pumps were reputed to be the largest in the Southern Hemisphere. The new 2.8MW version weighs in at 24 tonnes and when it kicks into life early this year, it will suck up power at a rate equivalent to around 800 homes.

The completed expansion will altogether include four



Expansion of the original head pond to triple its capacity.



North Otago's landscape now offers lush grazing for dairy cows



114 kilometres of pipes to be installed.

WAITAKI IRRIGATORS COLLECTIVE

Formed in 2010 with the key objective of protecting shareholders' existing water rights, the Waitaki Irrigators Collective (WIC) represents over 580 irrigators. Together, their irrigable command area is more than 75,000 hectares across North Otago and South Canterbury – representing around 12 percent of this country's irrigated land.

WIC shareholders include the five major regional schemes and a society of individual irrigators that take water from Lake Waitaki,

the Lower Waitaki River (or its tributaries or connected groundwater) and use that water to irrigate land downstream of the Waitaki Dam.

The five members are:

1. Morven, Glenavy, Ikawai Irrigation Company which irrigates over 20,000 hectares on the north bank of the Waitaki River.
2. North Otago Irrigation Company.
3. Kurow-Dunroon Irrigation Company which has a siphon intake structure attached to

the Waitaki Dam, on Lake Waitaki.

4. Lower Waitaki Irrigation Company – a community irrigation scheme which irrigates over 20,000 hectares on the Waitaki plains to the northwest of Oamaru.
5. The Maerewhenua District Water Resource Company – a small community irrigation scheme with a command area around the Dunroon and Maerewhenua areas on the South Bank of the Waitaki River.

additional pumps and when fully operational, the company will be able to take up 100 percent of its consented maximum take of 8220 litres per second.

Existing investment in irrigation infrastructure has already had an impact on the area. A report commissioned by the Waitaki Irrigators' Collective in 2014 found that irrigation schemes in the Kurow-Dunroon area had pumped an estimated \$77 million into the area's economy. That study covered just 8000 hectares of irrigated land.

In a submission to the Canterbury Regional Council in June last year, Wells pointed out some of the regional benefits of NOIC's irrigation scheme as derived from a study using comparative census data from 2006 to 2013. This included a \$48 million boost to the area's GDP and employment contribution of 274 jobs.

In the same period, land use had undergone significant intensification. From usage that consisted of 52 percent sheep, 21 percent dairy, 12 percent dairy support and 25 percent arable, deer and beef, it had, in 2013 changed to a proportional use comprising just nine percent sheep, 69 percent dairy, nine percent dairy support and 12 percent arable, deer and beef.

Social indicators revealed by the census include a growing population with a higher proportion of both working-age people and families plus increased building consent activity.

A NOIC-commissioned report looking at the economic benefits of its expansion – both one-off during construction and ongoing – estimated a boost in local economic output of \$104 million a year, a 5.8 percent lift in employment and an addition of \$16 million a year to household income. Most people in the area recognise the economic benefits of the scheme, says Wells, though there are concerns around river flow levels, the management of nutrients and controlling run-off. The scheme, she says, does address environmental issues.

"Every irrigated farm has to have a plan dealing with irrigation, effluent, soil, nutrients and riparian management. Audits and ever-increasing standards provide a classic continuous improvement loop. The evolving technology of irrigation allows farmers to measure, monitor and control their operations on the basis of rich data."

In last year's Environmental Farm Plan audits, 85 percent of farmers graded three and above (on a scale of one to five) which was up from the previous year's 74 percent. The company has set up a water quality sampling regime to assess quality of water in creeks and streams against Regional Plan parameters. It also employs a fulltime environment manager, says Wells.

She believes North Otago has the potential to become a centre of innovation that will drive positive outcomes for everyone in the region. **WNZ**

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Measuring success

The Kapiti Coast experience

Installing water meters for Kapiti Coast residents has proved a successful exercise. **Martyn Cole**, Waste and Wastewater Asset Manager with the KC District Council, explains why.

Kapiti Coast residents are now 18 months into paying for their water via approximately 23,000 water meters installed throughout the district. The process has already led to positive and measurable changes.

Water use reduction

Residents are doing a great job of using less water since they stopped paying one fixed charge under the old system and started paying a volumetric charge (for the amount of water used), along with a lower fixed charge. In fact, peak day consumption has decreased by about 26 percent and we've even passed our target of less than 490 litres per person per day – that's not bad going. Reducing our peak day water use means we can extend the life of our existing water supply systems and delay any future upgrades to increase supply capacity. Delaying this expenditure means significant cost savings.

When water meters were installed, they detected hundreds of leaks on private pipes around the district. Fixing these has meant millions of litres of water are no longer being wasted. Meters enable people to see how much water they're using and it now has a value, which has contributed to the decrease in consumption.

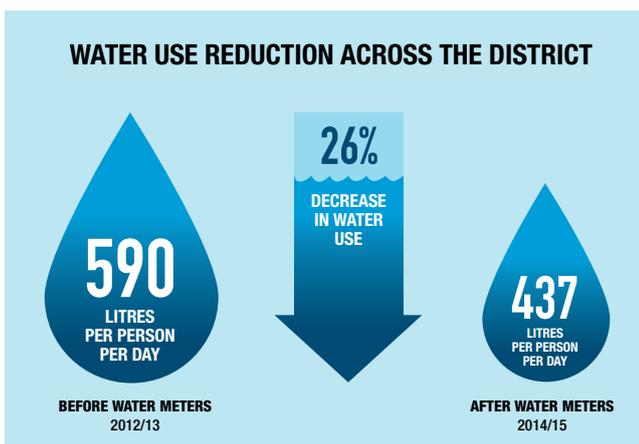
In April last year, when data showed the amount of water going into Paekakariki's water supply was steadily increasing, officers went to investigate. A huge leak was discovered in a water connection, wasting about 430,000 litres of water daily. The leak was promptly fixed and water use for the area has dropped back to normal.

The reduction in water use was an expected result, as this is what's happened in other areas of New Zealand and parts of the world where water meters have been introduced. Less demand for water will help in our growing district, which will require more water as our population increases.

Water charges

In 2011, the Charging Regime Advisory Group (CRAG) was set up and tasked with developing a charging structure for water which could be applied to both residential and non-residential properties using treated water supply.

The group is made up of representatives from iwi, low-income households, the Chamber of Commerce, landlords/tenants, Greypower, Older Persons' Council and elected members.



COST OF WATER: 2014/15

HOW COSTS ARE RECOVERED

HOW MUCH WE PAY: 2014/15

\$7.95
MILLION

TOTAL COST OF PROVIDING WATER SERVICES TO THE COMMUNITY



50% OF COSTS RECOVERED THROUGH A FIXED CHARGE FOR PROPERTIES

\$188.50/yr
FIXED CHARGE



50% OF COSTS RECOVERED THROUGH A VOLUMETRIC CHARGE FOR WATER USED

\$0.95/m³
VOLUMETRIC CHARGE

Water charges, based on the 50/50 recommendation, for the first financial year of the new charging scheme.

It considered seven different charging models that were tested against a range of household sizes and non-residential users. After evaluating the options, CRAG recommended the current structure (50 percent fixed charge/50 percent volumetric charge) as the most fair and equitable for Kapiti residents.

Among the discarded options were:

- a fixed charge for supply, combined with a set allocation

of water and a volumetric charge for water used on top of the allocation – this was viewed as unfair on low water users and too complex to administer;

- a charge based wholly on volumes of water used – this was considered to be unfair on high water users, while also lacking revenue stability; and
- a fixed charge for supply, with stepped charges for usage

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The new charging scheme is a fairer way of allocating costs. It ensures those who use less water, such as small households, are not subsidising those who use more. In fact an estimated two thirds of households are paying less than they would have under the old charge.

– this was discarded for not being simple enough, plus too difficult and costly to administer.

Charges have gone up this financial year (2015/16) due to the increasing costs associated with providing a treated water supply to the district. Residents are now paying \$190 for the fixed charge and 99 cents per cubic metre for the volumetric charge. Crag reconvened at the end of January to look at the future charging structure.

Trial readings and water invoicing

Before the new charging scheme started in July 2014, there were two trial water meter readings for all residents in the district. The trial readings gave people:

- the chance to see how much water they were using and what they would pay for it under the new charging scheme;

- time to check for leaks and get them fixed; and
- the chance to look at ways they could reduce water use before the new scheme started.

The trial reads also allowed us to run all the systems and processes required for volumetric charging together, and calculate water use and costs for all metered properties across the district.

During this period, we were able to determine who had high water use in the district. Council staff visited more than 670 property owners, whose readings showed they were using more than 2000 litres of water per day, and talked to them about ways they could use water more economically (as well as helping them check for leaks).

With the scheme now up and running, residents are sent quarterly water invoices. We can't read all our water meters at once. To make meter reading and invoicing as efficient as possible, invoices are staggered with a third sent out each month.

Financial assistance

Council has put in place several ways to assist people with water charges.

Water rates remissions: Large families in financial hardship can apply for a remission on their water rates of up to \$120



Main pic: Waikanae River which supplies most of the Kapiti District. Above top: Showing a resident what one cubic metre of water looks like before volumetric charging. Above: Installing a large water meter – July 2014.

per year. The total annual budget for water rates remissions is \$50,000. To be granted a remission, a property owner or tenant must have more than three dependants (18 years or younger) living at the property and receive a Working for Families tax credit.

Credits for water loss from leaks: In the first year of the new scheme, more than 200 people who fixed leaks on their properties applied for credits on their water bills (for the estimated cost of water lost from leaks). People can still apply for credits if they have their leaks fixed promptly once discovered.

Cost of fixing leaks: There is up to \$300 available per household for ratepayers in financial hardship who have had to pay to get a leak fixed. There is a total of \$25,000 per year available for these grants.

Not-for-profit: Council is not operating a profit-making system out of the new water charging scheme. If water charges ended up being surplus to water supply costs at the end of any financial year, the surplus money would stay in the water account.

No water restrictions

Water meters mean we don't expect to need water restrictions in Kapiti this summer. Before the installation of water meters

in the district, we used restrictions to reduce demand for water when needed. As a direct result of water metering, we have taken over one million cubic metres less water from the Waikanae River this year than in past years, so we don't need restrictions to reduce demand.

Success story

So, how is the new charging scheme working out since it began in July 2014? It has been very successful and that is based on several factors.

1. A community group provided the basis for our charging structure.
2. Trial readings gave people the chance to understand their water use, think about how they could use water more wisely if needed and act to fix leaks.
3. Our demand for water has decreased and this means we can keep our costs down as much as possible.
4. Council assists those in financial hardship and helps educate the whole community on how to reduce water use and fix leaks.
5. The Charging Regime Advisory Group is taking another look at where we are and will again set the way forward for water charges in the future. **WNZ**

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MEASURE manage and save

Why meters are gaining momentum

It's a trusted truism that what you don't measure is much harder to manage – that's proving very much the case for water metering as DataCol's **Bruce Franks** explains.

How many of us would think of driving a vehicle on the open road without the aid of a speedometer? Would we weigh up the risk of exceeding the speed limit versus a hefty speeding fine, or would we prefer to know how fast we are travelling and keep our money in the bank account?

It's the same with water usage rules and metering.

While water appears to be 'free' and plentiful for some consent holders, others may be forced to go without. Recently introduced regulations aim to bring fairness into the use of water by stipulating measurement and monitoring of a valuable resource. As the age old saying says – "you cannot manage what you don't measure".

The clear benefits are around having accurate soil and climatic data in real time and therefore being able to apply the right amount of water to the right environment at the right time – removing the guesswork.

It's like having the speedometer visible in the vehicle. By knowing the quantity of water used and when, a consent holder can plan their water usage with greater accuracy than prior to having measurement. This means if a season is predicted to be dry, a consent holder can compare weather data and water usages from previous seasons to formulate a plan that enables smarter irrigation and water to be available throughout the irrigation period.

Another benefit is around the management of Farm Dairy Effluent (FDE). In having accurate data measurements for applied water and soil temperature and moisture, then the application of FDE can be optimised to mitigate the risks of effluent leaching into the waterways.

Why the growth in metering?

A sizable increase in irrigation activity over the past few decades inevitably led to over-allocation in some areas – and it proved next to impossible for regulatory authorities to make any meaningful assumptions as to how much water was actually being used.

Then, when new applications were made for water, it became impossible to know whether they should or shouldn't

allow the new water rights.

This was addressed when the Resource Management (Measurement and Reporting of Water Takes) Regulations 2010 came into effect on 10 November 2010.

Prior to regulation, it was believed that around one third of all water takes were monitored. This meant that while some consent holders were taking water within their limits, others may have been exceeding their allocation and potentially reducing the availability for other stakeholders to take water. Others may not have been using any at all.

The regulations stipulated a staged approach to metering and monitoring over a period of six years for water consent holders. Takes with 20 litres/second or more required monitoring by November 2012, 10-20 litres/second by November 2014 and 5-10 litres/second by November 2016.

What are the advantages?

At the beginning of the process, there was resistance from some farmers around implementing water meters and monitoring. However, over time, the benefits have become obvious with many consent holders now embracing the practice.

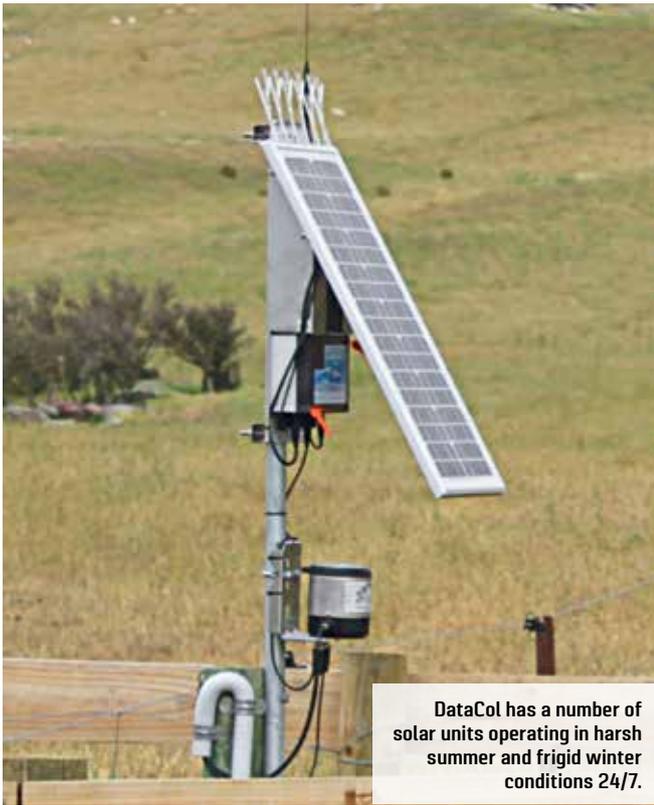
Compliance is one benefit – but consent holders have discovered others.

For instance, the ability to view the volume of water being consumed against their consent is a considerable benefit. Regular monitoring, (which can range from 15 minutes to two to three hours) enables intelligent decisions to be made around water extraction – within the consent conditions.

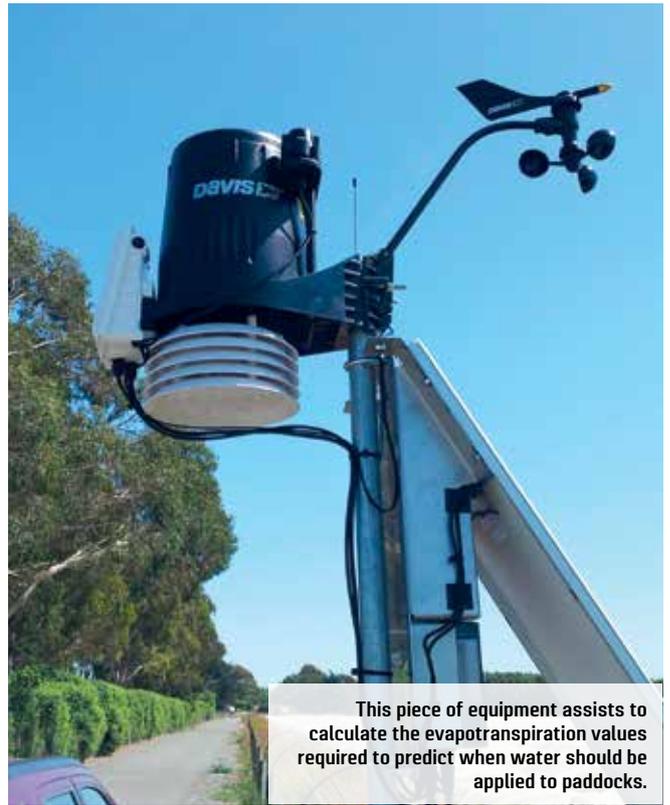
Failing to keep within these can potentially result in Regional Council officers undertaking investigations and, in the worst case, loss of consent.

In some seasons, underground aquifers are fully charged over the winter season – but during the 2015 winter period, aquifers in the Canterbury region, for instance, didn't top up. This left some farmers facing an irrigation season with restrictions in place from day one.

Regional Authorities have an important role in water management and allocation. With accurate data, Councils can



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make more informed decisions around water allocation when water is scarce – and fairer decisions in terms of allocation increase. By knowing exactly what is used, and where, Councils can work with consent holders to ensure water is used equally and fairly.

Using good intelligence

With the ‘base’ water measurement technology implemented, the next question is often around timing: ‘when do I start irrigating?’ While this involves a number of factors, the decision is largely affected by time of season, soil temperature and moisture levels. Consent holders have worked out that if their water is being monitored, then additional information about soil moisture and temperature, rainfall, evapotranspiration, effluent pond monitoring, and energy efficiency makes good sense. By having the basic infrastructure in place, the step up to additional information is relatively minor.

This additional sensor information gives consent holders the ability to quantify what is happening on their farm and can help them make accurate decisions around when to start irrigating and how much to apply.

Another benefit is the ability to capture accurate data records for future farming seasons. Quantifiable data and environmental knowledge from previous years helps farmers make more informed decisions as to future water usage. This allows valuable water to be used in a way that enables good pasture growth and provides for any sudden dry weather conditions.

In addition, if the property is sold, a farmer can prove to a prospective buyer the volume of water required to make the farm viable. Anecdotal evidence has suggested that some farms have failed to achieve a higher price merely due to either insufficient water records or none at all.

As well as having visibility around water usage, in some regions, Councils are bringing in Farm Environmental Plans (FEPs). These require a number of inputs to demonstrate the effect a farm is having on the environment – nitrate leaching being a prime example. In having a number of sensors monitoring key variables, farmers can prove to any investigating

body that they have followed the rules and can demonstrate good business practices that meet FEP requirements.

What do the systems measure and how?

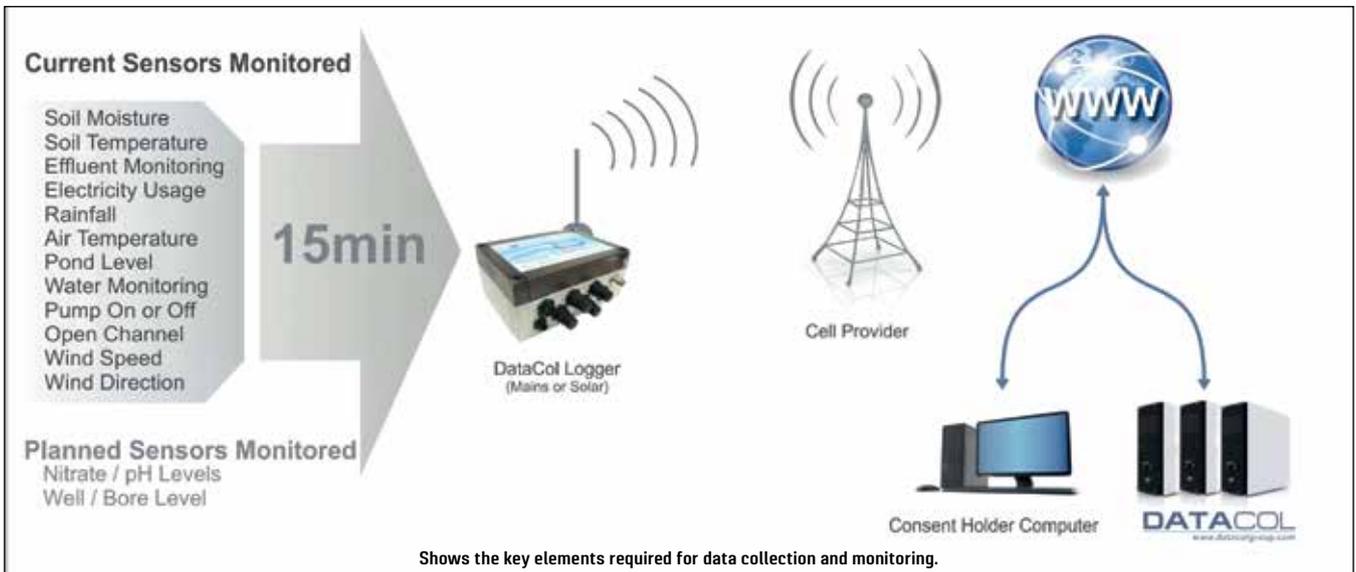
There are generally three key parts for the measurement and reporting of water takes.

1. A water meter that is installed at or near the point of water take (usually specified in a water consent). This can take the form of an inline water meter, or an insertion meter, or a clamp-on ultrasonic meter. The meter is configured to provide usage information to a data-logger and can be set to provide a range of data counts. For most water consents, water meters are generally set to one pulse equal to one cubic

At the beginning of the process, there was resistance from some farmers around implementing water meters and monitoring. However, over time, the benefits have become obvious.

metre of water. In some cases where greater granularity is required, the count can be set as low as one pulse equal to one cubic litre.

2. A data logger which collects pulse/signal data from the meter and transmits collected data via a radio mesh or cellular network to a specialist data collection and management company. Usually the data logger will have a number of ports for digital, analogue and pulse data.
3. The collected data is managed and monitored by a specialist company. The data will more than likely be published to a password-protected website where consent holders should be able to view all their collected data in one place. In addition, the service should monitor water usage against consent conditions and in cases where there is a



breach, quickly notify the consent holder so they can take remedial action.

The diagram on the previous page shows the key components.

What are the advantages to farmers?

Knowing when to start and how much to irrigate is a good example of the benefits derived from monitoring water use and soil conditions. This can often save a large amount of water and delay when the irrigation starts and bring forward when it finishes each season. Adding electricity measurement from the pump motor and overlaying this information with water usage can quickly determine if the pump is operating efficiently. High volume irrigators spend tens of thousands of dollars each month on power so any savings go straight to the bottom line.

Measurement not only keeps a consent holder on the right side of the law but also provides empirical data when negotiating with regulatory authorities for increased water allocation as it can be proven that the water is being applied in the most optimal manner.

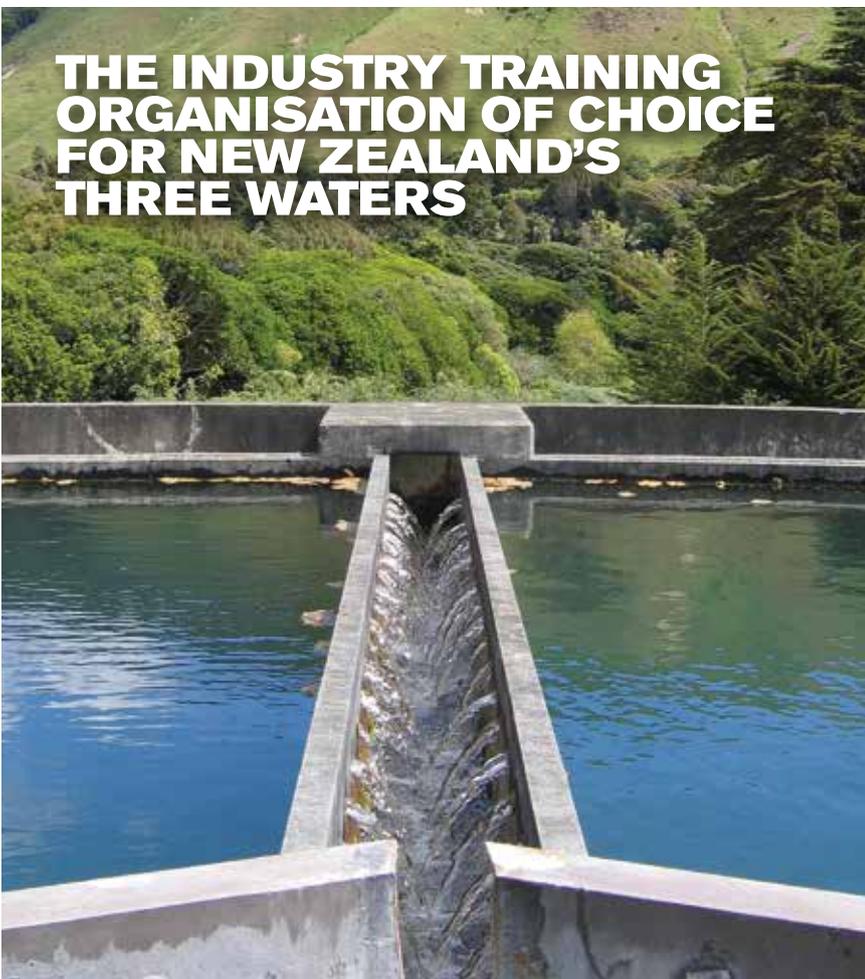
In our experience, most farmers strive to do the right thing. But in some cases without knowing what the 'right' thing is, it is hard to meet regulatory obligations. In having a monitored system for water and other farm inputs, farmers can start making decisions that can reduce input costs and reduce the harmful effects on the environment.

The future

Water metering is the first step in managing farm inputs towards a sustainable and profitable future for farming. The next steps are to integrate and monitor data from multiple sensors – including unmanned aerial vehicles (drones). Measurement of moisture at a micro level can lead to lower input costs and potentially reduce the introduction of harmful elements to the environment.

Another step is large scale water storage which is growing rapidly in momentum. This will lead to water ordering and trading which are seen as the next areas for growth. These tools will enable schemes and consent holders to trade water between themselves. Farmers who require more water for a short period will be able to access this from others who can spare or share their allocation at that particular time. This offers the ability to rethink the way we have traditionally thought about water rights and encourages a value to be placed upon water. The result is greater collaboration, fairer use of water – more for all while consuming less.

We also see many irrigation companies embracing a side use of metering technology – the ability to tie smart drives/variable speed drives for irrigation pumping to the flow rates measured by the meters. This allows greater control of the pumping output to both ensure the consent parameters are not exceeded but also for optimal irrigation and energy efficiency. **WNZ**



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Taking a chance on the weather

**When it comes to long-term weather forecasting, chaos is a constant
– as Brett Mullan, Principal Scientist Climate, NIWA, explains.**

NIWA released its seasonal outlook for February-April 2016 at the beginning of February. The forecast indicated that the seasonal rainfall in the east of the North Island was equally likely to be near normal or below normal for that region. So, why might you be experiencing a downpour in Gisborne today?

Weather chaos

Small changes make a big difference to our weather, climate and atmospheric circulation.

It's "chaotic" which means tiny changes can result in completely different behaviour. This is sometimes known as the "butterfly effect".

Numerical weather prediction is based on a set of coupled differential equations – known as the dynamical equations of motion – that encapsulate basic physical properties such as conservation of energy, conservation of angular momentum and conservation of water (which can be evaporated from the ocean, moved about by the winds and then possibly deposited on the slopes of the Southern Alps).

While in theory this set of equations

may suggest the weather is predictable, in practice the forecasts quickly become random due to the growth of small errors in the initial observations or in the numerical solutions.

The growth of small errors is a fundamental property of the type of mathematical equation that describes atmospheric motion, and would apply even if all the terms like evaporation, rainfall or friction could be formulated exactly. Numerical round-off is all that is needed to kick a forecast off-track, a result discovered serendipitously by Professor Edward Lorenz of the Massachusetts Institute of Technology in the early 1960s. Some years later, the very computer that Lorenz used, the size of a metal desk, was still quietly rusting away in the corner of an MIT office shared by a young soon-to-be-Dr Mullan.

Such randomness limits everyday weather prediction to about 10 to 14 days at most, before the predicted intensity, location and timing of weather systems bear no relation to what is subsequently observed. Smaller scale weather events, like afternoon convective showers, have much shorter

predictability times. Conversely, the enormous thermal inertia of the ocean increases the predictability of fluctuations involving the ocean such as the El Niño-Southern Oscillation (ENSO).

Anomalies in ocean surface temperature can persist for several months, and influence the uptake of moisture and trajectories of air masses passing over them. ENSO temperature anomalies have two additional advantages: the persistence is longer because of feedbacks between the ocean and atmosphere changes that drive the Oscillation to one of its two extremes (El Niño versus La Niña) and 'hold' it there for up to six months and more.

The other advantage is that the tropics is a special place of the Earth for influencing weather elsewhere. Tropical circulation changes generate long-range wavelike fluctuations in the atmosphere that can influence weather at remote locations – what are termed "teleconnections".

One of the consequences of warmer than normal sea surface temperatures in the tropical Pacific under El Niño

is to export some of the atmosphere's angular momentum to higher latitudes and strengthen the jet streams in both hemispheres. The jet stream locations can also shift from their normal position to some degree. For New Zealand, El Niño periods lead to more frequent or stronger westerlies, and this in turn has the obvious effect on the country's west-east rainfall gradient.

Unfortunately, superimposed on this ENSO signal, there is always chaos to contend with. It is like trying to predict the path of a large beach ball bouncing down a rocky hillside, while it is intermittently nudged to the left or right. The slope of the hill, and the direction of the nudging, provides a predictable component, with the random noise dependent on which rocks are hit on the way down the hill.

How do we forecast?

Seasonal outlooks are prepared using both statistical and dynamical

approaches. The statistics route takes advantage of observed relationships in past weather and climate: how does New Zealand rainfall vary with the state of El Niño or with the temperature anomaly or gradients in the Tasman Sea?

One problem with this approach is that past relationships may no longer hold true as the climate changes under global warming. The dynamical equations remain valid regardless of the mean state of the climate, and, as computer technology improves, dynamical seasonal forecasts are becoming the standard approach.

At NIWA, each month the forecast team gets together by teleconference (climate scientists and weather forecasters from Auckland and Wellington, and hydrologists from Christchurch), and mull over the latest guidance from about a dozen different models, a mix of statistical and dynamical. This gives the forecasters



Dr Brett Mullan is a Principal Scientist at NIWA, and is manager of the Climate Variability Group on the Wellington campus, with more than 25 years' experience in the areas of seasonal climate forecasting and climate change science. He is a former member of the Royal Society of New Zealand Climate Committee, a former President of the Meteorological Society of New Zealand, and the lead author of the 2008 and 2016 climate change guidance manuals for local government prepared by NIWA for the Ministry for the Environment.


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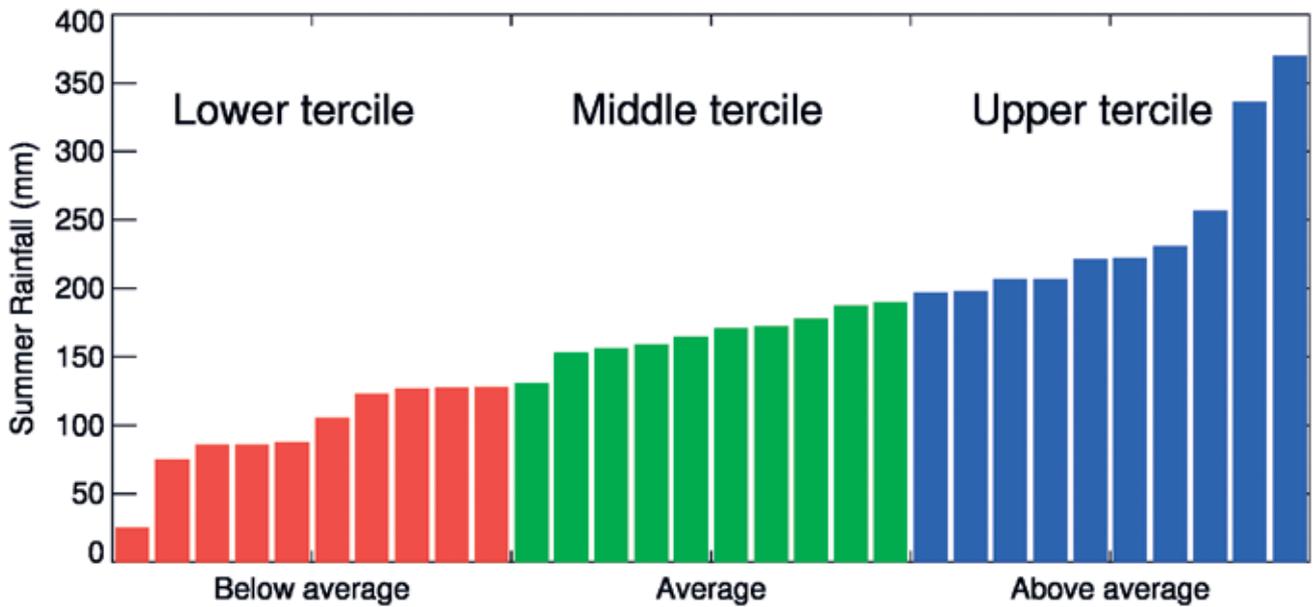
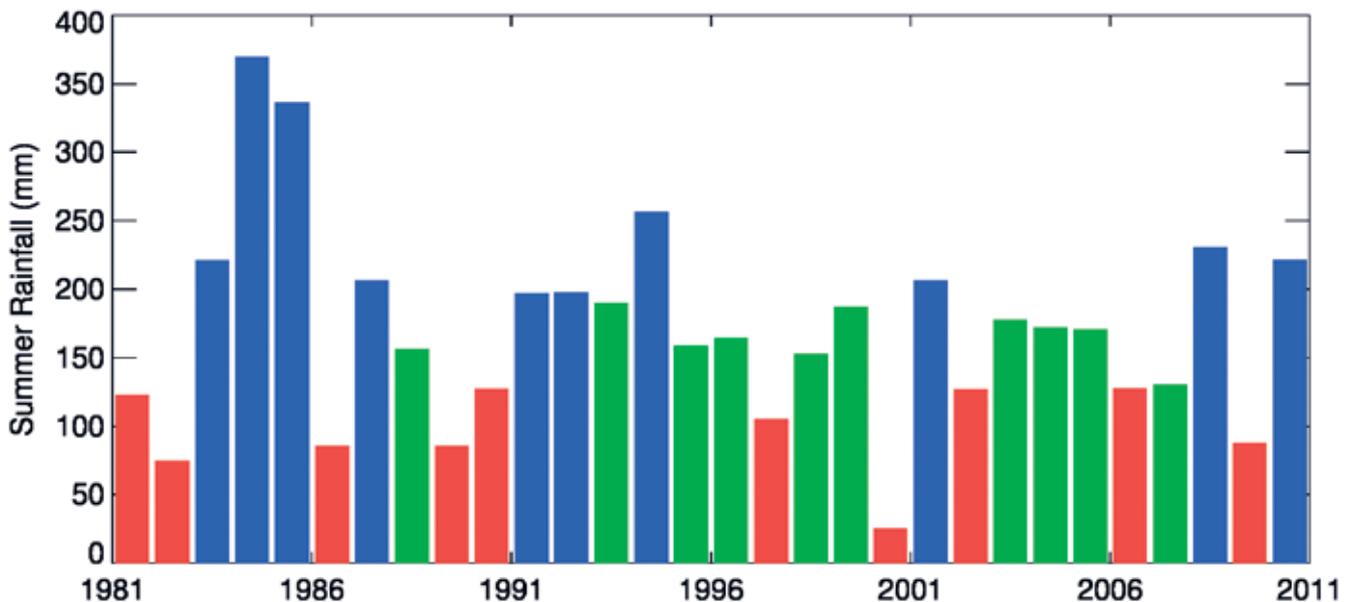


Figure: Summer rainfall total (mm) at Sevenoaks climate site in Marlborough. The top panel shows the seasons ranked from driest to wettest, with colour-coding for the three terciles. The bottom panel shows the observed sequence of dry (red), normal (green) and wet (blue) summers at this location.



a sample of predictions, known in the trade as an “ensemble”, which can take some account of the chaotic evolution of the weather over the coming three months ahead.

Some of the individual models, of the dozen or so, are themselves explicit ensembles. For example, at the European Centre for Medium-Range Weather Forecasts (ECMWF) in England, every month an ensemble of 51 global forecasts are made for the following seven months. Each forecast starts from a very slightly different initial analysis of the global weather patterns, all of them consistent with

the observations and their associated uncertainties.

Current research at NIWA is aimed at assessing how well the different forecast models do, and how best to combine the different results. If one model is forecasting an outcome quite different from the majority of models, then the outlier will be given less credibility. If one model has been performing much better than the other, then it is reasonable to give its forecast greater weight. Of course, deciding how well a model is performing, when the forecasts are expressed as probabilities, is not trivial.

The power of three

At NIWA, the climate forecasts are expressed as the probabilities of terciles – that is, one of three possible outcomes: below normal, near normal, and above normal. The Figure shows an example of how this works in the case of a rainfall forecast.

We take a climatological 30-year period, and rank the seasonal rainfall totals from lowest to highest. The 10 lowest rainfalls form the lower tercile of “below normal”, the next 10 the middle tercile of “near normal”, and the highest 10 the upper tercile of “above normal”. Corresponding rainfall

forecasts from a model ensemble are then collated, and the hit rate within each tercile is accumulated. The NIWA teleconference discussion will then modify this tercile distribution; at present, this is done qualitatively while a statistical scheme is worked on for weighting the various forecast models in an optimal fashion.

We might end up with a forecast rainfall distribution, for example, of 40:40:20, for the below normal: near normal: above normal terciles respectively. Here are some bullet points on interpreting the terciles; the NIWA website provides more.

- Remember that terciles are being used, so all terciles have a climatological expectation of approximately 33 percent. Compare the forecast probabilities against climatology.
- Because the climate outlooks are based on probabilities, it is best to plan for a range of possible outcomes.

- Any management decision should not be based solely on the climate outlook, as there will be a range of other relevant factors. Ideally, a cost-benefit analysis will weigh up the losses or gains of alternative options.
- The outlooks do not always indicate a high probability of dry or wet conditions. A 'flat' distribution (eg, 30:40:30) suggests the forecasters are not very confident in the outcome.
- It may be helpful to look at the least likely outcome. Using the 40:40:20 example above, the forecasters are most confident that rainfall will not be in the above normal range (20 percent versus 33 percent).

Long-term outlook

What is the long-term outlook for the rest of 2016? At present a very strong El Niño event dominates the tropical Pacific. The forecast models predict the tropical forcing (and other factors)

to lead to a more persistent westerly weather pattern over New Zealand, and thus an increased chance of drier than normal conditions on the east coasts.

The current event is past its peak, and conditions in the Pacific are expected to return to normal by early winter. So a winter 2016 forecast will not be able to rely on ENSO relationships, but closer to the beginning of June, there may be other anomalies in the climate patterns to give us some guidance.

In the latter half of 2016, some of the ENSO forecast models (NIWA monitors 14 of them) are predicting a transition to La Niña conditions in the Pacific. If this happens, and there is about a 50:50 split between models predicting La Niña versus neutral (neither La Niña nor El Niño), then a warmer than normal spring is likely for New Zealand, with increased rainfall in north-eastern parts of the country. [WNZ](#)

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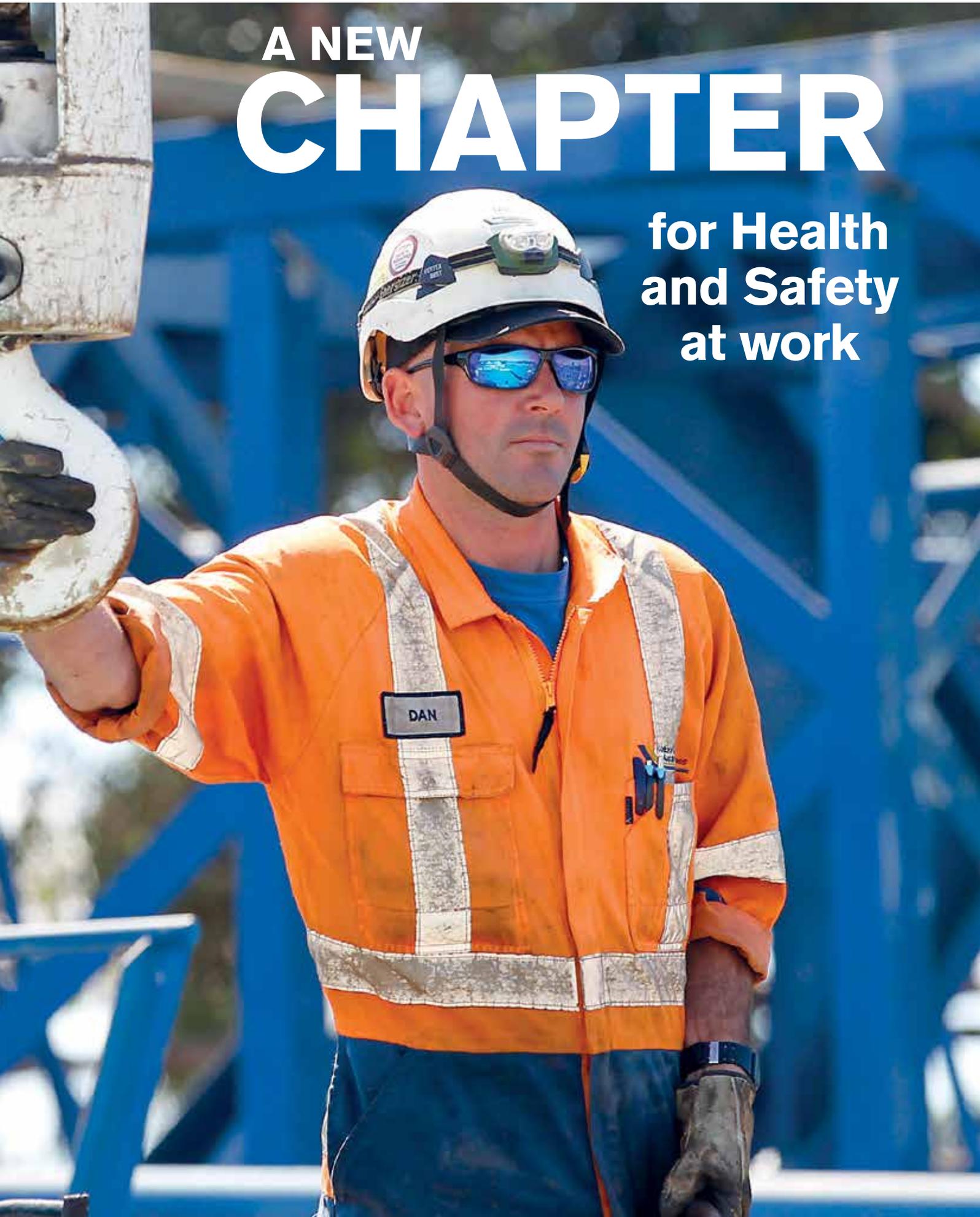
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A NEW CHAPTER

for Health
and Safety
at work





Next month, the Health and Safety at Work Act will come into force bringing new responsibilities for everyone in the workplace. WorkSafe New Zealand Sector Engagement Manager **Bryce Fleury** explains what this means in practice.

In international terms, New Zealand's work health and safety record is extremely poor; twice as bad as Australia's. Here, on average, 50 to 60 people per year die on the job, one in 10 is harmed and more than 600 die from work-related diseases – all coming at a cost of \$3.5 billion per year to the country's economy. And that doesn't take into account the social and psychological costs on the friends, family and co-workers of those people hurt or killed on the job.

The Government has set the target of reducing these deaths and serious injuries by at least 25 percent by 2020. The Health and Safety at Work Act is a significant part of helping achieve this goal. When it comes into force on April 4, it will introduce some important, positive concepts to help bring about a much needed health and safety culture change in this country.

The new law is a great opportunity for organisations to review their health and safety practices and culture and, if needed, revise how they manage critical risks that could cause illness, injury or even death.

Who is responsible for health and safety?

The short answer is everyone – from the boardroom to the frontline – but with clear levels of responsibility.

The Act introduces some new concepts. The first is the PCBU (Person Conducting a Business or Undertaking). Despite its name, this term captures almost every type of business entity, from large companies to sole traders. It will have the primary duty of care – 'as far as is reasonably practicable' – to ensure the health and safety of its workers and anyone affected by its work. It is responsible for managing risks, either by eliminating them or, if that's not possible, minimising them. The Act recognises that each business is best placed to know what it should do to keep workers safe. 'Reasonably practicable' means the business is only responsible for what it can control.

Emphasising the need for strong health and safety leadership, the Act also brings new responsibilities for company 'officers' – directors, board members, chief executives and partners – who will be responsible for health and safety due diligence.

Practically speaking, this means ensuring their business has the right policies, procedures, equipment and resources to manage and monitor risks. This complements, but is not the same as, the PCBU's primary duty of care. Officers are not responsible for

ensuring the health and safety of workers but for ensuring the PCBU has the right processes in place to meet its health and safety duties.

'Workers' are all people carrying out work in any capacity for an organisation even if they aren't directly employed by it, for example, the employees of subcontractors. Workers themselves must also take reasonable care for their own and others' health and safety.

Finally, there are 'other people at a workplace'. These include visitors, customers and the public. They also have duties to ensure their own safety, that their actions do not cause harm to others and that they follow any health and safety instructions given by the PCBU.

Working together

The new law has a significant focus on cooperation and collaboration. Where the work of two or more organisations overlaps, for example on a work site or through a contracting chain, they must work together to fulfil their duties of care. For example, in the construction of a large wastewater treatment plant the client, head contractor, subcontractors and consulting engineers are just some of the likely PCBUs whose duties will overlap for some health and safety matters. These businesses cannot pass on or outsource this responsibility to another business in the contracting chain. Under the new law these organisations must work together to keep people safe, making sure that everyone knows who is taking the lead on each matter.

The law focuses on *how* we work more than where we work. Involving workers in health and safety matters is a strong component of the Act. For example, for Water New Zealand members, common risks might include driving in variable terrain, handling hazardous (including organic) substances, working heavy machinery and, of course, working around stormwater catchments, oxidation ponds, drains etc.

The people doing the driving, handling, working etc are best placed to identify the risks in their work and the equipment, training or behaviours required to minimise them.

All PCBUs will need to engage with their workers and to have good worker participation processes.

The law focuses on *how* we work more than where we work. Involving workers in health and safety matters is a strong component of the Act.

Worker participation practices are not set in stone in the Act; they could range from toolkit talks to health and safety committees, depending on the size and nature of a business (compare the health and safety risks of a small resource management consultancy with those of a large geotechnical engineering company).

Have you heard the one about...

As with any new legislation, the Health and Safety at Work Act has sparked plenty of conversation including speculation, myths and misinformation around supposed health and safety costs, responsibilities, enforcement and penalties.

One myth is that the Act will prompt masses of extra paperwork and compliance costs. This doesn't have to be the case. Paperwork does not equal managing risk and managing risk does not equal paperwork. You only need documentation if it's the best way to minimise critical risks. The most important thing is to talk to your employees about how to work safely. That said, putting things in writing is a useful tool for formalising health and safety management practices and to communicate these consistently, especially for large, widespread organisations.

People are also worried about the Courts handing out increased penalties and prison sentences if someone gets hurt. Hefty fines and imprisonment are only imposed by the Courts in extreme circumstances where health and safety obligations are recklessly or persistently not met.

WorkSafe is not trying to catch people out or pounce on small oversights with minimal consequences; it is tackling areas where significant numbers of workplace serious harms and deaths occur. Prosecution is seen as a last resort not a first step and is not a decision taken lightly. While WorkSafe has an enforcement function, it is committed to engaging and educating as well.

Be prepared

What can businesses do now to get prepared?

Leaders, step up and be accountable. If you are an officer, you will be responsible for due diligence, ensuring your

One myth is that the Act will prompt masses of extra paperwork and compliance costs. This doesn't have to be the case.

organisation meets its obligations. This involves:

- keeping up-to-date with work health and safety matters;
- knowing the nature of your organisation's operations and the associated risks; and
- assessing the resources and processes to manage these risks.

In the same way that you will always be assessing things like finances and resourcing, health and safety should be treated as a fundamental part of running a business. For this you need:

- Leadership – people know what you expect;
- Systems and processes – people know what to do;
- Capability – people know how to do it; and
- Practices – everyone sees safety as a priority and does what is expected.

Identify and manage your risks. Remember, it's not just safety, health is also at stake. It's about doing what is 'reasonably practicable' given the level of risk, the chance of an incident happening and how much control an organisation has in managing it.

Culture change. Make health and safety a part of your organisation's culture. The question is not "Do I have a liability?", but "How do I improve health and safety?" Get all staff thinking this way...and get them involved – not just because it's the law but because they can help you. Workers can see what's happening on the ground and can work with employers to improve health and safety. First and foremost, people need to think and talk about workplace health and safety.

There are those who still see health and safety as just another compliance chore, but a strong commitment to a healthy workplace can deliver you better staff retention and engagement, higher productivity, greater client commitment and a significant return on investment. Everyone who goes to work deserves to come home healthy and safe.

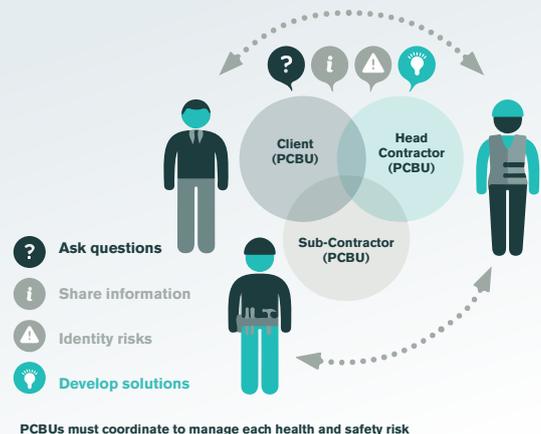
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COMMUNICATION AND ACTION

An important feature of the Health and Safety at Work Act is that when the work of two or more PCBUs overlap, they must work together to fulfil their duties of care. They must do this for each specific health and safety risk where the PCBUs' work coincides (it's not a blanket duty across all work). For example:

On a large construction project, all workers and visitors must sign in when entering the site. After discussions between all the PCBUs, one - probably the head contractor - will put the sign-in procedures in place and communicate them to all parties.

The work of a sub-contractor when it is using a crane to install plant will affect others onsite. The sub-contractor is best placed to ensure their workers operate the crane safely and to secure the area around their work. The head contractor may be in the best position to sequence work so that other workers don't need to access the area during that time; and to communicate this to all parties. Each takes responsibility for the things they can most control and influence. Together, through communication and cooperation, they can develop safe working procedures.



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Combating Corrosion

How best to protect key assets

In the ongoing battle against corrosion, there are options to extend the life of key water assets – as **Corrie Cook** reports.

Dealing with aging facilities, constant pressure on maintenance budgets and a reducing public tolerance for asset failure are real challenges for infrastructure and asset owners.

Asset owners typically expect a 100-150 year design life from water management facilities, when design codes are most commonly for a 40-60 year lifespan. To extend the design life to be closer to an owner's expectation, durability design and management strategies are increasingly important.

Paul Vince, Material Science Manager at South Australia Water Corporation (SA Water), knows this only too well. "Corrosion is a thief," he says. "More and more water-based events are affecting all types of assets and there is more UV exposure on coatings. This inevitably means increased inspection cycles and careful design."

SA Water has responsibility for 700 concrete water storage tanks, many dating from the 1920s, and is now using Remotely Operated Vehicles (ROV) submersibles and drones in its efforts to spot the beginnings of corrosion. For every tank whose life they can extend for 12 months, the facility calculates it is saving up to A\$1 million a year, per tank.

Vince was speaking at the asset management forum at the Australasian Corrosion Association's (ACA) recent Corrosion & Prevention conference in Adelaide. The ACA is a not-for-profit membership association established in 1955 which

aims to reduce the impact of corrosion. It provides an expert knowledge base and disseminates information on corrosion and its control through training, seminars, conferences, publications and other activities across New Zealand and Australia.

"New water tank design doesn't include guttering nowadays, which means water can pond at the base of the tank and depending on the surrounding soils, can accelerate concrete corrosion," he explains.

Concrete sewers are also subject to corrosion from chlorides, sulphates, thermal cracking, and other challenges that pipes carrying organic waste need to withstand.

Exhumed sewer pipes are often found to be very thin at the crown, where acidic condensates formed by microbial action on hydrogen sulphides have eaten into the concrete. In extreme cases, this can result in complete loss of the pipe wall.

"Acidic and high sulphate conditions are very bad for concrete," explains Jonathan Morris, a senior asset management consultant. "A slime layer forms below the surface level of the wastewater, which houses bacteria that convert sulphates into hydrogen sulphide. When the hydrogen sulphide escapes from the water, it can be converted into sulphates in the above-water slime layers, which are converted into powerful acids by other bacteria."

Efforts to slow corrosion onset include careful design,

specifying a concrete mix that includes fly ash, slag, silica fume or metakaolin, curing it appropriately and applying a protective surface coating.

Protecting steel water pipes from corrosion

As a material, stainless steel has great appeal for the water and wastewater industries. It doesn't need special coatings to make it corrosion resistant, it's very versatile in that design modifications are easily made on site, and it can often be cost competitive. Even bad welds can be cut out and re-done on site.

Choosing the wrong grade of stainless steel for an application, joining it to an incompatible metal, or creating tight crevices on its surface will all shorten its life, and therefore the life of the asset, says Morris. The standard grades in water management assets are type 304 and 316 which can provide "acceptable" performance, he says. "Although," he warns, "higher corrosion resistant grades should be used for more demanding applications."

For example, chlorination is the most common way to disinfect water in both potable and wastewater streams, but can promote corrosion in more conventional stainless steels.

"Research suggests there are few problems when chlorine is injected into the process stream and good mixing occurs. However, corrosion can occur when there has been long term, excessive dosing and where the concentrated chlorine has been injected against the metal wall," says international metallurgy expert Carol Powell.

When moist hydrogen sulphide and chlorides are present in closed wastewater systems like pipes, there's a risk of localised pitting and crevice corrosion for 304 and 316 grades. When condensates include dissolved sulphur dioxide such as in geothermal applications, the increased acidity means higher corrosion resistant grades are recommended such as austenitic (eg, 904L) or duplex (eg, 2205) grades.

"Duplex stainless steels are roughly twice as strong as austenitic stainless steels and also have better resistance to localised corrosion," explains Les Boulton of the Nickel Institute. They contain more chromium (19-32 percent) and molybdenum (up to five percent) and lower nickel percentages

than austenitic stainless steels, which means wall thickness and weight can be reduced. There is now a hyper-duplex grade (2707) that performs well in extremely high temperatures such as those found in geothermal power plants.

A clean metal surface naturally passivates itself when exposed to air or aerated water conditions. This is the most corrosion-resistant state of any stainless steel.

"Corrosion, if it occurs, is usually found at crevices, but this can be avoided by correct grade selection for the chlorides present in the waters; guidelines are available to assist with this," says Powell. "Attention to detail during fabrication including the use of good welding and inspection procedures can help, because inferior welding and/or a poor surface finish can also encourage corrosion."

She points out that when raw water is used for hydrostatic testing of stainless steel pipelines and storage tanks, that are then left to stand for a number of weeks, there is a risk that inappropriate bacteria can colonise the asset, and microbiologically influenced corrosion (MIC) can begin. This is usually found where welds have not been cleaned of heat tint. Once this is removed, corrosion resistance is greatly improved.

"It's very important to drain and dry stainless steel systems after hydrotesting if the equipment is not going back into service immediately," said Powell. "If this is not possible, regular flushing of the system should limit potential MIC problems. Ideally potable waters, steam condensates where available, or filtered waters should be used for hydrotesting rather than raw waters."

The ACA is offering a number of seminars and training courses in New Zealand throughout the year. These include "Protecting infrastructure and assets against corrosion" in Auckland on 19 May, and "Corrosion in the oil and gas industries" in New Plymouth on 4 August. ACA's Corrosion & Prevention 2016 conference will be held in Auckland between 13-16 November bringing together researchers and practitioners from around the world who combat corrosion every day.

For further information on these and more, go to www.corrosion.com.au. [WNZ](#)



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IMPLEMENTING SMART WATER METERING AT JURAGRUPPE

This is an edited version of a paper presented at the Water New Zealand Conference. The full paper can be found at www.water.org.nz

Michael Welzel, Direct Control Limited

INTRODUCTION

The Juragruppe, with a staff of eleven employees, is a public corporation founded in 1978. The association has five communities in its membership. This is a typical structure for rural areas in Germany.

The aim of the Juragruppe is to provide a quantitative and high-quality drinking water supply for all members of the association. The total investment since 1982 amounts to more than 60 million Euros.

The overall length of the supply network today is approximately 186 km (without residential service lines). This includes 10 construction and soil containers, 39 water delivery bays and approximately 850 hydrants.

The estimated 23,500 residents, with more than 7000 house connections, are supplied with drinking water. The annual consumption is about 1.2 million cubic meters.

The Juragruppe extracts 100 percent natural protected groundwater from underground aquifers. There is no water

treatment in place. The drinking water contains no chemical additives and comes clean and fresh directly out of the deep wells in the protected local areas.

In 1995, Juragruppe introduced a SCADA system to monitor and control the main water supply grid (which is still in place). In 2012, Juragruppe decided to change the old metering structure for their residential and commercial customers. The existing mechanical meters were replaced by wireless readable ultrasonic meters.

The new generation of meters makes it possible to minimise water loss by identifying leaks far quicker than with the old system. The remote system enables the Juragruppe to detect burst pipes via the meters in their delivery manholes. Previously, the detection of excess consumption of this nature would have meant a search in the area surrounding the manhole. The ability to read the daily consumption from the new meters enables Juragruppe to determine whether a leak has occurred somewhere on the mains network or within a residential or commercial property. This means enormous labour and water savings.

GENERAL ASPECTS

Extreme weather conditions, pollution or overpopulation – the causes of water stress are numerous and diverse; and the need for conservation of water globally attracts still more political attention. The situation becomes all the more critical as the

ABSTRACT

The Juragruppe supplies around 24,000 inhabitants with drinking water within an area stretching over 80km and with over 7000 connections. The company undertakes installation, maintenance, meter readings and the rectification of most damage scenarios.

The Juragruppe water association, based in Southern Germany, has chosen ultrasonic water meters which can be read wirelessly.

Purpose: To increase efficiency, reach a higher level of customer satisfaction, simplification of administrative work and to detect any water loss more quickly.

This paper outlines the significant differences between the costly and labour-intensive method of reading the meters in the past and the new installation of remotely readable meters as a “Mobile Drive By” solution in combination with stationary data concentrators as an Automatic Meter Reading (“AMR”) installation.

It also describes the operational process, by reading the

meters from a car using Google maps with visual and acoustical confirmation for the driver on a standard Android smart phone, the data transmission to a fixed installed data concentrator, the cloud based connection to the central server and the administration of the collected data.

The paper describes the ultrasonic principle and the communication method of the water meters. It considers specific requirements for New Zealand and Australia regarding compliances as far as they are different from Europe. Finally, the paper identifies the Return On Investment aspects and other benefits for the Juragruppe water company and their customers.

KEYWORDS

Wireless Water Meters, Ultrasonic Water Meters, Wireless M-Bus Standard, Advanced Metering Infrastructure, Drive-By-Meter Reading, Automatic Meter Reading.

water supply problem is interwoven with environmental, development and security issues.

And the problem cannot be said to be limited to economically undeveloped regions. High living standards seem to entail high water consumption, as is clearly illustrated by the fact that it takes 1000-3000 liters of water to produce just one kilogram of rice and 13,000 to 15,000 liters to produce one kilogram of grain-fed beef (Ref: The International Fund for Agricultural Development.)

Given the very different drivers such as water intensive agriculture, urbanisation and tourism, practically no country will be left untouched by the water crisis. Even in less challenged areas in mid and northern Europe or here in New Zealand, water costs for domestic use are now almost as much as household energy costs. Hence consumer awareness is growing, and people are demanding fair billing and a high degree of professionalism and efficiency from their water supplier.

PRICING WATER

The aggravating water crisis brings about an increasing political focus on water metering. China has adopted a “one household one water meter” policy; and the European Commission has identified water tariffs and compulsory metering as one of the key challenges to move towards a water saving economy.

Recognising pricing as an efficient incentive for saving water, measuring water consumption on a household level is required. The number of water-meters worldwide is well over 900 million in 2010 and the number of households worldwide is close to 1.9 billion (ABS Energy Research).

Approximately 80 million water meters are delivered annually, equaling a 6.6 percent growth rate predominantly driven by China (IMS Research).

Obviously, water metering is perceived to be an effective means of obtaining water efficiency information which is only natural when considering the water meter’s important role as a cash register – a cash register that serves not only to secure the revenue of water suppliers and thereby the possibility of investing in water saving technologies, but also to visualise the water consumption in terms of capital. Pricing the water consumption correctly is a great opportunity for the water supplier to educate its consumers into being more “usage aware” customers.

AUTOMATIC METER READING (AMR)

There is a growing need for automatic reading of water meters as a rationalisation of an otherwise expensive and bothersome part of managing a water utility. In addition, AMR allows the water utility to control the frequency of the meter reads and conveys a fuller overview of the consumption pattern.

Electronic water meters have a variety of capabilities in terms of automatic meter reading, be it integration into a radio mesh network or wireless reading by means of hand-held devices or concentrators. Smart meters, concentrators and gateways form an Advanced Metering Infrastructure.

Please refer to the original unabridged paper for details of the system.

CONCLUSIONS

Residential smart water metering is acknowledged as an important means to manage water stress. The meters will play an essential role providing water utilities with a wealth of information, helping to reduce water losses, increase efficiency, ensuring correct bills are issued, providing a professional customer service and maintaining a robust distribution network.

Smart water meters are becoming increasingly competitive with traditional mechanical meters, particularly when considering the life cycle costs and the benefits gained from automatic meter reading and leak detection.

REDUCING WATER LOSSES

The heart of the installed water-meters is the ultrasonic measuring principle, which secures high accuracy throughout a long product life because the ultrasonic meter is without movable parts in the pipe.

Even a slight imprecision in the measuring method will add up to large amounts of water when multiplied over a large number of meters. Therefore, high accuracy of each water meter is essential for capturing the total water demand. The meter starts measuring at a water flow as low as 2 litres per hour, and the flow sensor is subjected to a thorough OIML R49 type-approval testing with the purpose of ensuring a long term, stable and reliable water meter. It requires a measurement method with a high accuracy to determine the losses in a network. Juragruppe has an actual loss of 3%. The losses before the introduction of the new water meters were 12%.

COST BENEFIT ANALYSIS

In assessing their options in metering technology, Juragruppe completed an in-depth cost-benefit analysis of mechanical versus static water meters. The costs for installation for either meter type are the same; the main difference in costs for the two metering types lies in the initial purchase cost versus recurring operating costs. Static smart meters have a higher initial cost, but the benefits of this advanced technology more than compensate for the initial cost because operational costs are significantly reduced.

Despite a higher initial price per water meter, Juragruppe saves money in the long run. The savings are primarily obtained through lower administration/labour costs, more accurate collection of data and earlier detection of leaks (minimising water losses), and longer lifetime of the static water meters compared to mechanical meters.

DRIVE-BY AND AUTOMATIC METER READING

The new static water meters are read via drive-by or online via a stationary concentrator; the utility does not have to rely on the consumer to properly read the meter or disturb them to obtain the consumption data. This means that when Juragruppe wants to obtain consumption information, they simply drive by the home and the meter information is automatically collected and transferred to the billing software. The meters read by the stationary concentrator are available permanently in a daily or hourly cycle if necessary.

The previous method of reading the meters was characterised as an enormously costly and labour-intensive process. Unfortunately, residents were often not at home, making it necessary for Juragruppe employees to make numerous attempts to read the meter. A trial which allowed the customers to submit their water consumption online or by post failed.

Following installation of the remotely readable meters, Juragruppe employees are able to quickly and efficiently read all the meters by driving past the premises or receive the data from the concentrators, because the consumption data is transmitted wirelessly. Not only does this save Juragruppe time but also significant costs.

This process also improves customer convenience, as they are no longer disturbed by meter readers.

By submitting consumption and operating data in high resolution and at frequent intervals, the new water meters will

support Juragruppe in its digitalisation process.

In addition to obtaining consumption data in a timely manner, the data obtained is much more detailed than that previously available. Because information such as leaks, bursts, highest and lowest flow rates are also collected, Juragruppe can understand consumers' water usage habits and better prepare for future water demands.

In addition to obtaining consumption data in a timely manner, the data obtained is much more detailed than that previously available. Because information such as leaks, bursts, highest and lowest flow rates are also collected, Juragruppe can understand consumers' water usage habits and better prepare for future water demands.

ACKNOWLEDGEMENTS

We wish to acknowledge and thank Juragruppe Germany and Kamstrup Denmark for their continued support. **WNZ**

DATA DATA EVERYWHERE AND NOT A DIGIT DROPPED

The Waikato District Council Experience

This paper by Abby Gordon, Water Compliance Officer, Waikato District Council was presented at the Water New Zealand conference. A full version can be found at www.water.org.nz

ABSTRACT

This paper outlines the Waikato District Council experience in modernising the collection and management of data for operations and compliance reporting. Like it or not, data (and in particular good quality data) is driving the water industry. Data requirements are on the increase: to prove compliance, to prove performance, to plan for the future and to reduce risk. It has now got to the point where a small rural council like Waikato District Council will typically handle in excess of 30,000 points of manual data points and tens of millions of SCADA data points each year. This data comes from various different agencies and needs to be reported to numerous different stakeholders, so it is no longer acceptable to rely on human-based systems and simple spreadsheets to manage operations and compliance.

Every consent and every standard has evolving rules for analysis and a responsible operator needs to deploy a system that caters for this. Add greater sophistication in analytical methods and handling of time-series data from SCADA systems, and the traditional methods for data management are becoming swamped, inefficient and ineffectual as a management tool.

When looking to the future of data management, Waikato District Council (WDC) posed the following basic questions: what data is needed, where is that data coming from, where does it need to go to, what is the quality of the

data, what is the chain of custody for that data, how is that data managed, what happens to legacy data, what systems are needed for today's data and how to make provision for future data requirements? An outline of how the Waikato District Council addressed these questions and arrived at a cloud-based system is mapped in this paper.

A case study of a simple aerated pond-based wastewater treatment plant is presented, including operations and compliance reporting that involves SCADA data from two agencies (one internal and one external), one lab, and site personnel, complete with internal and external reporting structures.

CONCLUSIONS

WDC identified that the older status quo of data management practices foster risk, uncertainty, and generally impede the ability to effectively deliver water and wastewater services. Implementing a modern technological system will support Council to deliver a reduced level of uncertainty in its service delivery while at the same time increasing the effectiveness of its resources. By adopting a structured approach of defining outcomes along with a cloud based Operations and Compliance data system, Council will deliver on greater value to Waikato District ratepayers. **WNZ**

BIG DRY

hits Papua New Guinea hard

Changing weather patterns are hitting Pacific Islanders hard. Water New Zealand supports Oxfam in its work to improve water supply and sanitation in Papua New Guinea.

Across the Pacific, as many as 4.7 million people face hunger, poverty and disease due to El Niño related droughts, erratic rains and frosts.

Papua New Guinea, Vanuatu, Fiji, the Solomon Islands, Samoa and Tonga are experiencing worsening drought, while central Pacific countries like Kiribati and Tuvalu will likely see intense rain causing flooding, and higher sea levels. The last major El Niño in 1997-1998 caused severe drought and major crop losses in the Pacific. This year's El Niño is expected to be even more severe.

Papua New Guinea is currently the country worst hit by

El Niño in the Pacific. Rainfall has been below average for almost a year. This has led to drought conditions that together with frost in the highlands have destroyed crops and livestock. An estimated 2.4 million people may be affected, with a projected 1.9 million of these in the highlands.

Communities relying heavily on farming are suffering severe food shortages. Some communities say their food supplies will last two to three months; others say only a month.

With many rivers and creeks drying up, villagers are forced to use alternative water sources, compromising hygiene practices and causing diarrhoea, dysentery and typhoid. Women now



Paku Dick: "The dry season destroyed everything."



Oxfam is distributing jerry cans so families can store water.



Children are becoming malnourished because crops are failing..

have to walk even further to get water and schools are open only half the day in response to the heat and lack of water.

“We used to eat two to three times a day. But now because of the dry season, we are eating just once a day.”

Margaret Thomas is a mother of four children living in Danbagl, a village nestled in a valley overshadowed by Mt Wilhelm, Papua New Guinea’s highest mountain. She grows sweet potatoes to earn money and helps her family maintain their onion crop, which they started with the support of Oxfam several years ago. But now the family is once again struggling to put food on the table.

WHAT IS EL NIÑO?

A super-charged weather phenomenon, El Niño is the name given to a periodic heating of the eastern tropical Pacific, which alters weather patterns globally. This year could be the worst ever recorded, with record-high global temperatures, droughts and erratic rains devastating parts of Africa, the Pacific, Asia, the Caribbean and Central and South America.

“In the past, the other dry seasons were quite difficult, but not as difficult as now,” Margaret says. “Today’s dry season is worse because all the vegetables in the gardens – especially the sweet potatoes – are being destroyed by the insects. It’s not like before.”

Paku Dick, a woman farmer from nearby Kafetugu village, says her crops have been totally destroyed this season. “Now there is nothing left: the pests have eaten up all the seeds, the leaves are dried out by the sun, there is very little rain and there is nothing we can do,” she says. “The dry season destroyed everything.”

For many, mealtime now consists of a few small pieces of boiled vegetables or wild foods once a day.

“When my children are hungry they go to the bush and collect fruits to eat and it makes me sad they are hungry,” Margaret says. “Sometimes the fruits are not really ready to eat but then they’re hungry, so they have to eat it. Then later, they get worms in their tummy; they get sick.

“They are missing two to three days off school due to lack of food ... If they go to school without [eating], they will faint.”

In the nearby village of Tugumpaso, local Oxfam staff identified three cases of infant malnutrition. Smiley Jacob, the young mother of nine-month-old Grace, says the drought has destroyed her garden, leaving her with nothing to feed

her child. Grace is severely underweight, with her upper arm measuring just 11cm – about 5cm less than it should be for a child of her age.

Oxfam staff supervised Smiley and Grace’s visits to the local health centre and will continue to work with villages on improving nutrition. But Smiley feels there is little hope for her baby.

“When she was five months, I realised she began to lose weight,” she says. “I went to the local pastor to pray for her. It was all I could do. We have very little food.”

Oxfam has been working in Papua New Guinea since 1991 and has formed deep, enduring relationships with many of the communities since. In addition to our long-term development work, we have been assessing conditions in drought-affected areas, establishing the needs of communities, and working with other agencies on plans to help the most vulnerable prepare for what lies ahead.

Through its local partners, Oxfam is distributing jerry cans for water storage and water purification tablets and soap, which helps prevent the spread of diseases. We are also working in health centres to construct new rainwater catchments, connect centres to existing gravity fed systems and repair broken pipework.

Oxfam is also reaching out to around 4000 households (28,000 people) with agricultural advice on how to cope with the drought and training courses for drought adaptation have begun.

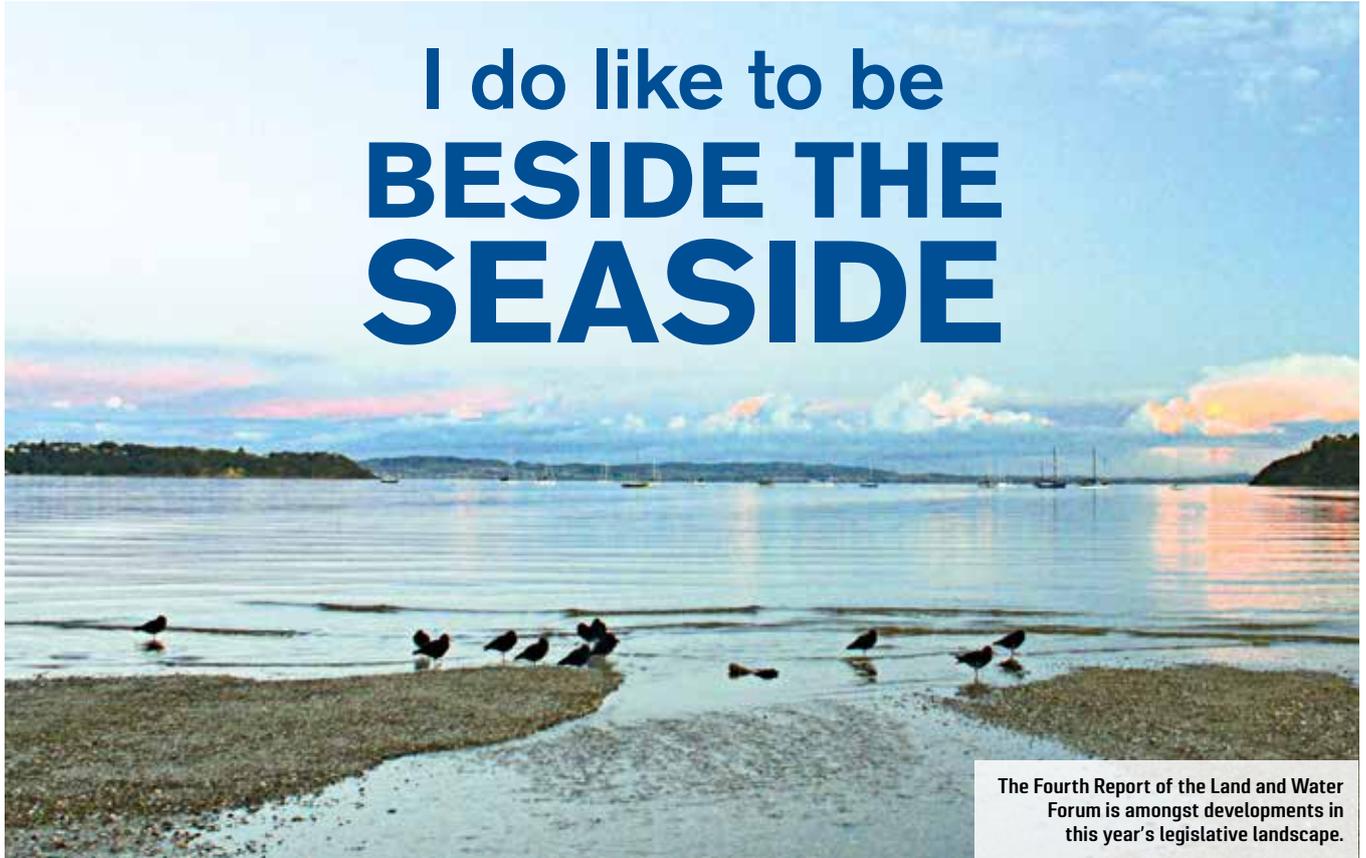
“Before Oxfam came, many people in the community were sick and they died,” says Margaret Kondango, also from Danbagl village. “But now [Oxfam] is here, because they provided toilets and water and how to be hygienic, less people have gone to the hospital.

“I am very, very happy for Oxfam coming here. In our traditional custom, when we’re happy, we scream. I want to scream but we’re in a closed room! So I just want to say that I’m very thankful that they’ve sent this training.”

El Niño will see millions of poor and vulnerable people pushed even deeper into poverty. Take action to save lives at www.oxfam.org.nz/elniño. **WNZ**

- *The Water New Zealand Board walked, jogged and cycled the 111 kilometre long Waikato River Trail in mid-January over their summer break as their main fundraising event to raise funds for the Oxfam Water Challenge for charity in February 2016. The main purpose is to raise funds for improved sanitation in Papua New Guinea. See page 2.*

I do like to be BESIDE THE SEASIDE



The Fourth Report of the Land and Water Forum is amongst developments in this year's legislative landscape.



By **Helen Atkins**, partner, **Vicki Morrison-Shaw**, senior associate; and **Phoebe Mason**, solicitor – Atkins Holm Majurey

We are writing this article at a time when most of New Zealand is traditionally at the beach and enjoying long hot summer days – interspersed by a few summer storms – this is New Zealand after all! By the time this article goes to print, those long summer days may feel like a distant memory as everyone is immersed in what is set to be a very busy year.

Legislative reform is back on the agenda with the Resource Legislation Amendment Bill having been introduced at the end of last year and changes for local government signalled. Further changes are also likely in these sectors once the Government has had the time to consider the recommendations in the Fourth Report of the Land and Water Forum which was issued in November 2015.

In this article, we provide a brief outline of these developments and summarise a couple of water cases from last year which considered water take activity status and water permitting issues.

RESOURCE LEGISLATION AMENDMENT BILL

On 26 November 2015, the Minister for the Environment Nick Smith announced the introduction of the Resource Legislation Amendment Bill 2015 (the Bill). The purpose of the Bill is to create a resource management system that achieves the sustainable management of natural and physical resources in an efficient and equitable way.

To this end, the Bill makes amendments to the Resource Management Act 1991 (RMA) as well as five other Acts, namely the:

- Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 (EEZ Act);
- Environmental Protection Authority Act 2011;
- Conservation Act 1987;
- Reserves Act 1977; and
- Public Works Act 1981 (PWA).

What the Bill proposes

The Bill makes changes in eight key areas:

- national direction;
- plan-making;
- consenting;
- courts and appeals;
- process alignment;
- process improvement;
- the EEZ Act; and
- the PWA.

The changes, while not insubstantial, are not the wide-reaching overhaul of the RMA previously proposed by the Government. The changes will however have tangible effects on planning, consenting and land development processes and should assist in increasing Māori participation in these processes.

While we do not have the space in this article to detail all of the changes, it is worth providing a brief overview of some of the more significant changes in the areas of national direction, plan-making and consenting.

National direction

The Bill seeks to provide stronger national direction in the RMA in a number of ways.

- The processes for developing National Policy Statements and National Environmental Standards are sharpened to address current limitations on the [joint] development of these tools and to broaden what they can provide for.
- A new regulation-making power is introduced, effectively to avoid unnecessary and unreasonable restrictions on land. This power includes the ability to permit specified land uses, and to prohibit and remove plan provisions that duplicate or are contrary to other legislation.
- A new matter of national importance, "the management of significant risks from natural hazards", is proposed to ensure that such risks are considered in planning and consenting processes.

Plan-making

There are two main categories of changes to plan-making – those relating to planning templates and those relating to planning processes.

In terms of planning templates, national planning templates are proposed. The templates aim to improve consistency between plans and policies, make them easier to use, and reduce their complexity and ambiguity. The structure and format of plans will be the same across the country.

In terms of planning processes, the Government has recognised that one process does not fit all and has introduced two new "planning tracks" for Councils – the streamlined planning process and the collaborative planning process.

The streamlined process provides more flexibility in terms of both the process and timeframes and effectively allows a bespoke approach to address specific local issues and conditions. The collaborative planning process aims to encourage greater front-end public engagement to produce plans that better reflect community values and reduce the risk of subsequent litigation. Different interests are encouraged to work together on finding resource planning solutions and, as a consequence, participants have more input and buy-in to the plan.

Other proposed changes to planning processes include:

- limiting notification to only those people who are directly affected (when it is easy to identify who will be affected);
- requiring Councils to seek Ministerial approval for any extension of the two-year time limit for plans; and
- a new requirement to invite iwi to form an iwi participation arrangement that will establish the engagement expectations when consulting during the early stages of the Schedule 1 plan making processes.

Consenting

The Bill narrows the parties that must be consulted on a resource consent application to those directly affected. It gives Councils discretion to not require resource consent for minor issues. For simple resource consent applications, a 10-day fast-track application is proposed. Clarification is provided around the scope of conditions that can be imposed, and a new regulation-making power is introduced which will require Councils to have fixed fees for standard consents. This is in order to give certainty around costs to those seeking such consents.

Next steps

The Bill has been referred to the Local Government and Environment Select Committee for consideration. Public submissions close on 14 March 2016, and the Select Committee Report is due by 3 June 2016. Expectations at this stage are that the Bill will pass into law by the end of 2016.

PROPOSED LOCAL GOVERNMENT CHANGES

On 3 November 2015, Local Government Minister Paula Bennett announced that the Government intended to introduce legislation in early 2016 to allow councils to transfer functions and responsibilities between Regional Councils and Territorial Authorities in order to improve the way that Councils provide their services and manage infrastructure.

While at the time of writing the Bill has not yet been introduced, the 27 October 2015 Cabinet paper (Paper) provides further details of the reasons for the changes and what the Government hopes to achieve.¹ The Paper notes that super-city reorganisation proposals have failed to deliver change (or indeed even get off the ground) outside of Auckland and that change is necessary to lift local government performance and ensure local government structures are fit for the future.

The Paper proposes three steps to effect this change:²

- policy options and legislative amendments to provide a broader range of structures and more incentives for change;
- encouraging Councils to critically review their structures; and
- supporting the Local Government Commission to become a proactive broker for change.

Key areas of focus will be moving towards more effective delivery structures for Council services and infrastructure – particularly water and transport.

A report back to Cabinet is due in February 2016 and a Bill is expected to be introduced in April 2016.

FOURTH REPORT OF THE LAND AND WATER FORUM

On 27 November 2015, the Land and Water Forum released its Fourth Report. The report addresses:³

- how to maximise the economic benefits of freshwater, while managing water within the quality and quantity limits set out in the National Policy Statement for Freshwater Management (NPS-FM);
- the transition from the current water management regime to a new one;
- tools and approaches to assist the Crown to explore iwi rights and interests in the freshwater sphere; and
- regulatory requirements for stock exclusion from streams.

The report contains some 60 recommendations regarding actions that the Government or councils should take. These include:

- that the Government should complete the implementation of the recommendations from the Forum's three previous reports (Recommendation 1);

1. Local Government Cabinet Paper, 27 October 2015. A copy of the Paper is available from: www.dia.govt.nz/diawebsite/NSF/wpg_URL/Resource-material-Dur-Policy-Advice-Areas-Local-Government-Policy?OpenDocument#future

2. Local Government Cabinet Paper, 27 October 2015, at paragraph [2].

3. Land and Water Forum, 2015, *The Fourth Report of the Land and Water Forum, November 2015, Foreword*. A copy of the Report is available from: www.landandwater.org.nz/

- that Councils be required to produce a two-yearly report card to iwi and their communities on progress (Recommendation 10);
- a national stock exclusion regulation for cattle (dairy/beef), deer and pigs from waterways (Recommendation 29);
- 10-year lapse periods for long-term water infrastructure projects (Recommendation 48); and
- that the Government provide additional funding and improve the science and information base needed to manage within limits (Recommendation 60).

Next steps

The Forum's next task is to review the implementation of the NPS-FM and further populate the National Objectives Framework to strengthen the limit setting framework. A report on these matters is expected by September 2016.

The Forum's final task (at least at this stage) is to review the overall changes to water policy and its implementation, to comment on the lessons learned and any further work required to improve water management. A report on these aspects is due by December 2017.

RECENT CASES

Rangitata Diversion Race Management Limited v Canterbury Regional Council [2015] NZHC 2174

This case was interesting as it considered (amongst other matters) whether there was any legal bar to using controlled activity status for

the taking and use of water for hydro-electricity generation and for regionally significant infrastructure. Determining this issue involved the Court considering the interplay between sections 77A and 123 of the RMA. The High Court found that there was no such legal bar essentially because:

- there were no express restrictions on the use of controlled activity status for such purposes and if Parliament had intended such a broad qualification it could be expected to be explicit, and not by way of implication;
- it would be illogical for there to be an impediment on controlled activity status but not on permitted activity status;
- activity status categorisations would be reviewed as part of the 10-year plan reviews; and
- such a bar was not supported by the express words of the RMA, the internal context of the RMA, by external materials or by a cross check with the RMA's purpose.

The appeals were allowed and the matter was referred back to the Council for reconsideration in accordance with some procedural directions made by the Court.

Hampton v Canterbury Regional Council [2015] NZCA 509

This case is of interest as it considers a number of tricky issues including: the transfer of water permits; the nature of water permits and whether they constitute a property right; as well as the principle of non-derogation of grant as it applies to water consents.

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The appellant, Simon Hampton, held a water permit which allowed him to take water to irrigate Robert Hampton's land. However, because Simon and Robert were unable to agree on the terms of such irrigation, Robert applied to the Council for his own water permit. The Council determined an additional water take could not be granted as water in the catchment was already over-allocated but that a secondary water right could be.

The Council therefore granted Robert a permit to take water to the extent that Simon's right to take water to irrigate Robert's land was not being used. Simon brought an appeal challenging the validity of such a grant and argued (amongst other matters) that Robert's permit interfered with his property rights (specifically his right to sell his own water permit), and amounted to a derogation of the rights associated with his water permit.

Both the High Court and the Court of Appeal dismissed the appeal. In coming to its decision the Court of Appeal noted that:⁴

- the conditions of Simon's consent required that the water taken be used only for the irrigation of Robert's land;
- Simon had agreed to that limitation (in order to cement an earlier arrangement he had to transfer part of his allocation to another party);
- Simon had no "right" to transfer the permit and a consent to do so would be required under both s 136(2)(b) and 127(1) of the Act;
- it is unrealistic to suggest that Simon had a legitimate expectation that he would be able to transfer the permit as such an expectation

was contrary to the condition of consent he sought and procured when his consent was granted;

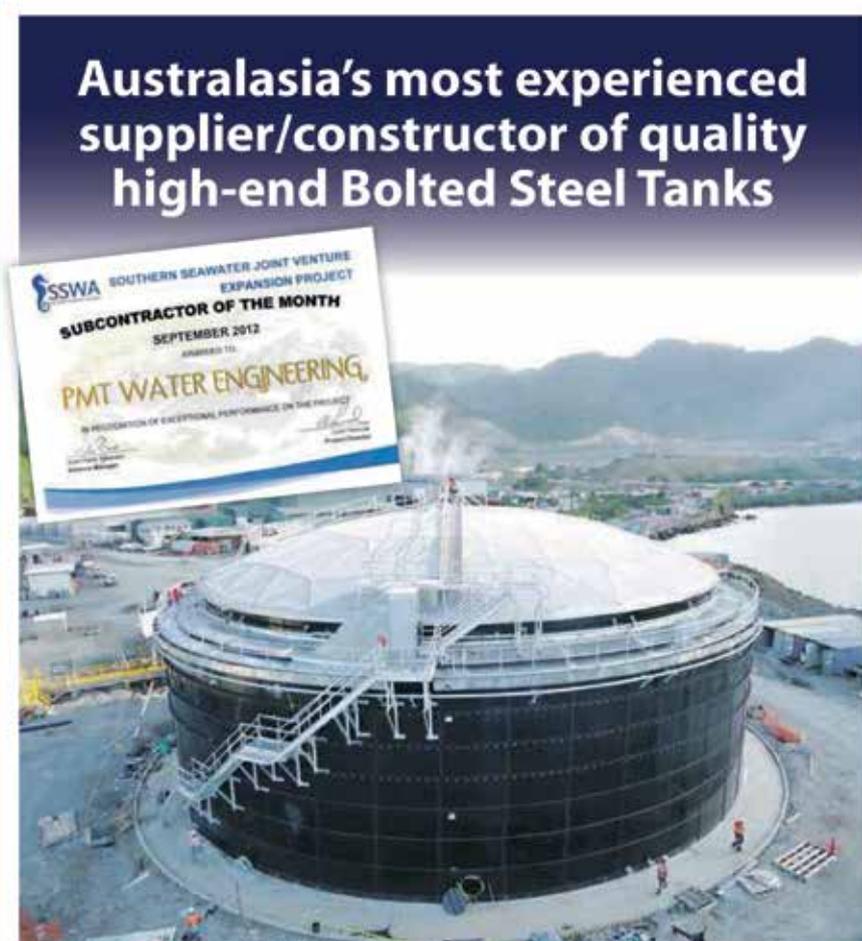
- a water permit does not create a right to property – the right is simply the right to carry out the activity under the RMA (here a water take);
- section 122(1) of the RMA confirms that a resource consent is neither real nor personal property and while the RMA does confer certain property-like rights (limited right to charge and transfer in certain circumstances), these are limited in scope and extent as set out in the RMA;
- the market value of a water permit must reflect the constraints the Act imposes – particularly in relation to alienation; and
- where a resource is fully allocated obtaining a consent is likely to be difficult and the limited (ie, secondary) basis on which Robert's consent was granted reflected that.

The Court ultimately found that:

"[110] ...we can see no basis to hold that the grant of [Robert's consent] affected Simon, still less defeated any right he had legitimately arising under the Act. His inability to charge Robert for water taken under [Robert's consent] and used to irrigate Robert's land is not an issue of resource management significance or concern." **WNZ**

4. Refer paragraphs [79], [80], [87], [99], [106], [107], and [109].

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Humes partners with Stormwater 360

New Zealand's expert manufacturer and supplier of concrete pipe and infrastructure products, Humes, is now an agent for Stormwater360 products, enabling wider distribution of Stormwater360's award-winning stormwater management solutions throughout New Zealand.

Through the new partnership, Humes will manufacture and distribute Stormwater360's range of products nationwide through Humes' network of 26 regional sales centres. These products will also remain available from Stormwater360 directly.

Humes National Sales Manager, Justin Clarke, said the company, which is the key pipeline systems supplier to New Zealand's infrastructure market, has looked to Stormwater360 to strengthen its stormwater offerings.

"We can now offer our customers a complete site solution, a one-stop-shop, where they

can purchase the pipes, fittings and accessories required for their site, as well as the best range of stormwater treatment products available in New Zealand," he said.

Stormwater360 is New Zealand's leading supplier of stormwater management solutions. Its co-founder and director Greg Yeoman says: "We are pleased to be able to offer customers the convenience of purchasing Stormwater360 products through their local Humes branch, using their trade accounts. We'll continue to provide technical support for our products and our technical engineers will continue to carry out any design checks and liaise with customers to ensure they have the best solution for their site."

Yeoman said Stormwater360's move to increase its nationwide presence was prompted by the introduction of the National Policy Statement for Freshwater Management, which mandates improved management of stormwater runoff.

"The Freshwater Policy Statement says we



Jellyfish filter will be made to order and sold by Humes through the agency arrangement.

must maintain or enhance the waterways as we grow and develop our land, so there is a need nationwide to consider the effects of stormwater runoff. This partnership with Humes is a positive step in that it enables two established, quality-focused companies to leverage their independent strengths and work together to reduce stormwater pollution." **WNZ**

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DEALING WITH GRITTY ISSUES

Smith & Loveless general manager for sales and marketing, Joe Gill, explains how baffle developments for forced vortex grit removal augment performance and design flexibility.

In today's sewage treatment plants, vortex grit chamber systems dominate the landscape, and for good reason: they capably protect downstream processes and equipment from abrasion or poor performance from reduced capacity.

Forced hydraulic vortex systems like the Smith & Loveless PISTA® Grit Removal System are most commonly specified not only for industry-leading grit removal efficiencies, but the decades of product performance and system development over time.

Forced hydraulic systems are not settling devices like virtually all other grit systems. Instead, the chamber geometry regulates and optimises flow velocities to generate a true forced hydraulic vortex path that effectively removes grit. To accomplish this hydraulic action, the systems combine a specifically inclined inlet flume, circular chamber with a flat-floor upper chamber (unlike conventional sloped-floors vortex systems) and lower collection hopper, an effluent trough that emanates 270° or 360° from the inlet and, depending on the design flows, patented integral baffle arrangements.

Recent Smith & Loveless developments in forced vortex chamber technology provide for the finest of grit removal and the industry standard 95 percent removal efficiency for grit particles sized down to 105 microns (140 mesh). The driving force, literally, is the integral V-FORCE BAFFLE™, which ensures the proper velocity and extended flow path around the entire 360° to sweep the entering grit along the chamber flat floor and into a centre core opening to the lower collection hopper.

The nearby centre rotating paddles above the opening serve to lift and separate lighter organic material in the centre (enabling it to continue downstream) while the heavier grit particles retreat to the lower hopper. No additional downstream control devices are required to keep the velocity in the preferred range during both peak and minimum flows as the system possesses a 10:1 turndown.

This year, Smith & Loveless is introducing two new integrated baffle and forced vortex technologies that address other varied needs for sewage treatment plants with the PISTA® Vio™ and the OPTIFLOW 270™ Baffle System.

The PISTA® Vio™ offers the flexibility of the



This underwater image demonstrates the forced hydraulic action of the PISTA® Vio™ and how it sweeps grit along the flat floor and enables capture of 95 percent of particles down to 105 microns (140 mesh).

inlet and outlet channels at any variable angle up to the full 360° of the circular chamber, offering simple installation into existing sites or an efficient footprint for new sites. An innovative hydraulically forced ring and tunnel system still creates the vortex flow path necessary to provide industry-leading 95 percent grit removal down to 105 microns (140 mesh) while allowing additional layouts beyond the typical 360° or 270° arrangements.

The new OPTIFLOW 270™ Baffle System addresses the numerous 270° vortex grit chambers that were installed throughout New Zealand and Australia and elsewhere in previous generations. As the name implies, the OPTIFLOW 270 can be a simple retrofit into those systems in order to augment removal efficiency. Vortex grit removal systems designed to meet previously lower standards can be upgraded to remove 95 percent of grit down to 150 microns (100 mesh) with the retrofit. This baffle is available not only for flat-floor vortex chambers but as a conversion system for sloped and cone-shaped chambers. Likewise it can be installed for new systems requiring 270° layouts.

In Dallas, Texas, the OPTIFLOW 270 Baffle System was retrofitted for extensive testing and potential augmentation of the existing

plant's inlet work. The Southside Wastewater Treatment Plant is one of two such plants operated by the city's water utility department. The plant processes up to 56,800 cubic metres per day from four Model 30.0 Smith & Loveless PISTA 270 Grit Chambers that have been in operation for the past 17 years.

Following the installation of the OPTIFLOW 270 Baffles, testing was performed to measure the grit size classification, and efficiency testing on two of the PISTA 270 Grit Chambers. The city's technical staff along with engineering consulting firms CP&Y and Garver agreed with the testing, which is being used to inform for future improvements.

Sampling was performed on Grit Chamber #3 with the OPTIFLOW 270 Baffle. As the test data summary table below demonstrates, virtually 95 percent of all grit particles down to 100 microns were removed and nearly 90 percent of all grit was removed for a system that was originally designed in 1988 to meet significantly lower totals (95 percent for 300 micron particles, 85 percent for 210 micron particles, and 65 percent for 150 micron particles). And all of this was achieved with the simple OPTIFLOW 270 Baffle retrofit, which can be applied to most 270° grit chamber vortex layouts from any brand. **WZN**

GRIT REMOVAL TEST DATA – Dallas, Texas – February 25-March 2, 2015

Size		Influent (g)	Effluent (g)	Cumulative Efficiency (%)
Mesh	Microns			
50	300	336.62	9.48	97.18
70	212	79.67	11.71	94.91
100	150	80.16	21.50	91.40
Residual	0	35.23	12.32	89.65
Total		531.68	55.01	89.65

To learn more, consultants and end-users can contact Joe Gill at S&L NZ Ltd at (09) 488-6701 email: jgill@sandlnz.co.nz to request drawings, design information and pricing.

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DATACOL ACQUIRES WATERMETRICS

Two key water management companies in Canterbury are now operating under the same umbrella following DataCol’s purchase of Watermetrics late last year.

Watermetrics has been operating in rural water data collection and management for a decade and, with its strong alliance to a major rural retail cooperative, quickly became one of the most well known brands in the Canterbury rural sector. Originating from the utilities sector, DataCol’s strong data collection and management processes had prompted requests for it to enter the water measuring sector but the company initially struggled with customer acceptance.

Over time that changed and DataCol established itself as a solid data collection and consent monitoring service – but it needed to achieve greater scale in what has been a fairly fragmented market.

One option was to follow the acquisition path, says DataCol Group CEO Bruce Franks.

“When Watermetrics owners approached DataCol to gauge interest in the business, the answer was ‘yes’ with DataCol taking over the assets of the business last October.”

With the combined market share, DataCol/Watermetrics is now the dominant provider of consent monitoring data in Canterbury and potentially the South Island, says Bruce.

“As the new owner, DataCol are now committed to investing in platform improvements and providing additional services to Watermetrics customers.”

One example of this is the service offered by ReGen which predicts when and how much water needs to be applied to a piece of land. Using DataCol equipment to capture and measure a number of environmental inputs, this service can potentially reduce water usage, reduce electricity costs and potentially reduce nitrate leaching.

Another significant advantage, says Bruce, is that Watermetrics customers now have access to DataCol’s widely experienced in-house IT team who will be applying their skill sets to solving data problems that might arise. Already the team has invested considerable effort in improving the data quality.

“Also, DataCol will be improving customer service, data collection and management processes. The benefit of this is that with the equipment platform, consent holders will be able to add additional sensors and data collection points to meet upcoming FEP requirements.”

As to the future, Bruce believes the collection of water data is merely the start of the data collection for farmers and consent holders. With infrastructure in place to collect and monitor data, it is relatively easy to add other sensors to assist consent holders manage their businesses.

“With on-farm revenue subject to international pressures, farmers today have to work out how to do more at lower cost. By investing in sensors to monitor and provide timely data to the consent manager and other farm stakeholders, costs can be reduced.

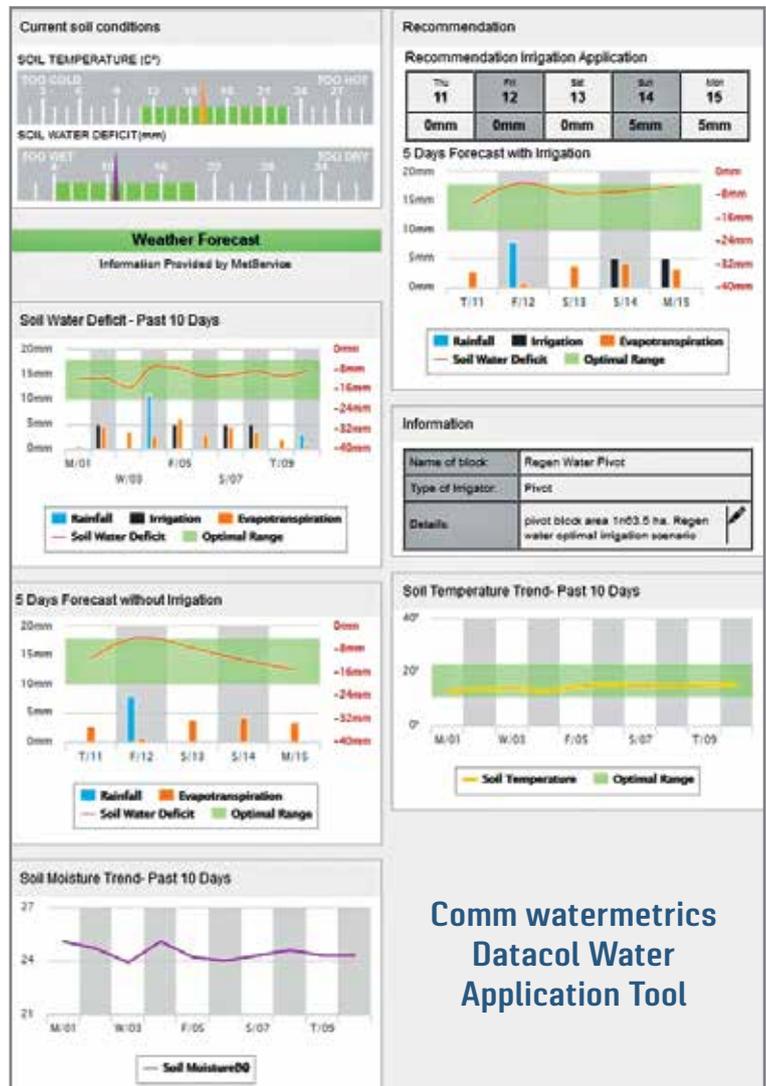
“One example of this is monitoring the electricity used when irrigation pumps are turned on. By overlaying electricity and water pumped, a farmer can potentially

have visibility to the efficiency of the motor. If there are obvious differences in the consumption curves, [electricity and water], then there could be an issue with the water pump – potentially damaged impellers, blockages or a motor nearing the end of its useful economic life.”

Another issue facing farmers in some regions (especially Cantabrians) is the requirement to undertake a Farm Environment Plan. This requires monitoring of the farm operation and, in some instances, monitoring of inputs other than water.

“These could cover effluent pond levels, soil moisture, soil temperature, amount of water applied to certain areas of the farm, how much effluent applied and when and where. Farm Environment Plans are becoming an important tool to manage a farm and can potentially be used to improve productivity.

“The bigger picture is about providing visible information to the farmer that enables them to make intelligent decisions around the farm. This is a journey we will be offering to farmers who can see the value in having useful and timely information that is easy to understand and act upon. We believe that the benefits will not only drive farm costs down, but can enhance and protect the environment.” **WNZ**





Simon Warren

HARRISON GRIERSON APPOINTS INTERNATIONAL WATER EXPERT

Harrison Grierson, a leading New Zealand owned engineering and design consultancy, has appointed international water expert Simon Warren to a key role in the company – as Water Resources and Networks Manager.

Simon has extensive experience in the water sector including five years at Watercare Services where he was the Group Manager, Infrastructure New Development. He was previously with Auckland City Council in senior roles.

Simon's United Kingdom experience includes consulting to the Water Research Centre (a leading research and consultancy expertise provider to water industries worldwide). He audited the Northern Ireland Water Services 30-year Water Resources Strategy and identified the cost-effective actions needed to achieve compliance with UK regulatory standards of performance and industry best practice.

He was also Supply Demand Manager for Anglian Water Services, which is geographically the largest of the UK water companies serving more than five million customers daily.

Simon is based in Harrison Grierson's Auckland office where he leads a team of water and wastewater specialists. **WNZ**

SUN POWER FOR WATER PUMP

A solar water pump system that helps bring water to stock in remote hill country is proving a winner for the firm in Hawke's Bay that invented it.

Isaacs Pumping and Electrical developed the technology with support from Callaghan Innovation and after initial publicity, the firm's two directors, Shane Heaton and Gavin Streeter are finding it hard to keep up with demand.

"It's going really well – it's proved a feasible option and replacement for petrol pumps and safety wise, that's been welcomed," says Shane.

The e-Pump is a standalone, fully automatic solar pumping system which pumps both clean and dirty water efficiently and sustainably. It's already proved a game changer for local farmers and is attracting overseas interest, says Shane.

The pumps come in three models and are built to withstand the harshest environments. They have no ongoing power or fuel costs and eliminate regular checks for maintenance and refuelling. Shane and Gavin are now working on developing a larger model that they hope to have on the market next year. **WNZ**

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