BEFORE THE HEARINGS PANEL

IN THE MATTER **of hearings on submissions concerning the Proposed One Plan notified by the Manawatu-Wanganui Regional Council**

SECTION 42A REPORT OF MR GREG JOHN CARLYON ON BEHALF OF HORIZONS REGIONAL COUNCIL

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1. INTRODUCTION

Qualifications and experience

1. My full name is Greg John Carlyon. I have worked full-time in the field of natural resource management for 20 years. This has included the leadership and preparation of statutory plans under the Resource Management Act 1991, and Conservation Act 1987. I have also led a large number of statutory processes in relation to statutory plans and resource consents under those same processes.

2. I held the position of Policy Manager with Horizons during the critical start-up phase of the One Plan project. I have subsequently become Group Manager – Regional Planning and Regulatory, and now have overall responsibility for the Policy, Science, Consents and Compliance teams. The development and implementation of the One Plan is a key strategic priority for our organisation and is managed from within my group.

3. I led the organisational change, structural re-organisational and delivery programmes for many of the programmes that support the Proposed One Plan being heard before this Hearing Panel.

4. I have worked extensively with the regional community at agency, group and individual level on the issues raised within the Proposed One Plan, and in particular those that deal with water quality matters. I am aware that there is a great deal of interest in these matters at the regional and national level.

5. I am familiar with the regional water resource from the professional, consumptive and recreational perspective.

6. I am comfortable giving this evidence to the Hearing Panel consistent with the Environment Court's practice note 'Expert Witnesses – Code of Conduct'.

Scope of evidence

7. My evidence is designed to provide organisational context and justification for the directions taken and methods/approaches adopted in managing the Region's water resource and rivers - as presented in the Proposed One Plan (POP).

8. Accordingly, my evidence does not contain much in the way of technical information or data, as it is to be read in conjunction with the expert witness reports that follow.

9. My evidence is presented in three parts:

   i. **Setting the Scene:** a general introductory section that sets the scene very briefly regarding the region's water resources and their importance, their value to our community and significance in the regional economy.

   ii. **Water Chapter Key Theme Summaries:** a section split into three parts – one for each of the key sections of the POP Water Chapter, ie. water quantity, water quality and activities in the beds of rivers. Each of these sections briefly details the current state of the resource, the existing management approach, the successes/challenges with the existing approach, and concludes with what new approaches are proposed in the POP to address these challenges. **Regional case studies** are used to help illustrate the sorts of circumstances that have shaped our thinking when preparing the Water Chapter and proposed management approaches.

   iii. **The Big Picture:** a final summary of key points raised in this evidence.

2. SETTING THE SCENE – WATER RESOURCES IN THE MANAWATU-WANGANUI REGION

Water and Us – A River Region

10. Like most floodplain dwellers, we have a strong historical connection to the rivers of our Region. They shape the land and the boundaries of 'our place', and in pre- and early European settler times were the major arterial routes for navigating the central North Island interior.

11. Māori of this Region talk of the legend of Hau, who named each of the main west coast rivers as he chased his errant wife Wairaka down the coast from Taranaki. It was quite a journey it seems, for when he reached the mouth of a river that flows through what we now call Palmerston North, he viewed it with great apprehension for it was so wide - calling it Manawatū (Manawa = heart, tu = standing still).

12. Rivers have always been at the heart of this Region, and our relationship with them is never static - constantly evolving as history and social change has progressed. We have a proud and unique history here, from pre-settlement Māori, through early European settlement in the 1840s until today – with our river catchments sustaining a thriving multi-cultural society based around a strong rural economy.

13. After the air we breathe, water is the most critical natural resource required for our survival. Despite this, the apparent plentiful and inexhaustible supply of this resource in

our moist Region (whether it be rivers, lakes, or groundwater) has led many of us to take it for granted. We assume that it will always be there in the form we want, when we want it, for the purposes we want – no matter what!

14. This sits uneasily with the knowledge that our rivers are used for a multitude of competing activities. They are used to dispose of our waste, vast quantities of water are removed from them to grow our grass and crops, and to keep our towns and industry lubricated and functioning, and they are heavily managed to reduce the risk of flooding. At the same time, these waterways have immense cultural significance to Māori, provide recreational and social opportunities to our Region's people, house many of our precious native fish species, are the source of drinking water for much of the Region's population, and some are internationally significant for their outstanding landscape and recreational values.

15. Such a variety of demands are not always compatible, and it is Horizons' role to find a sustainable balance between each of the competing social, environmental, cultural and economic uses we seek from our Region's water resources.

Driving the Need for Balance – Community Concerns

16. To aid in determining what sort of 'balance of use' the community sought for its waterways, in 2005 Horizons embarked on a lengthy consultation process centred around the One Plan. How this extensive and ongoing community conversation has shaped the evolving policy of the POP was documented in detail in evidence for earlier hearings, but it is important to note Horizons' approach was focused on a mantra of "we'll meet anyone, anywhere, anytime".

17. First steps in the consultation process involved engaging the community in a low-key (ie. simple and non-threatening) fashion with the types of environmental management issues facing the Region. This commenced with a travelling roadshow (*Picture Your Environment*) that visited most of the major centres in the Region over a 3 month period. Members of the public (a mixture of children and adults, and urban and rural people) were invited to prioritise what they believed were the most pressing environmental issues facing the Region. Thus informing Horizons about the public's views on the environment, where the pressure points were, and most importantly where effort/change was required when developing the POP.

18. Whilst priorities varied between centres and even districts, four dominant environmental issues emerged – the threat of hill country erosion, the loss of indigenous biodiversity, degraded water quality and the increasing demand for water. Interestingly, three of these themes relate directly to the Region's water resources, and elements of the fourth (loss of biodiversity) can also be indirectly related to water. Horizons took this to mean the regional community had strong concerns about their water resources, and how they were being used/managed.

19. Between 2005 and 2009 many conversations were held between Horizons and various stakeholder groups regarding water and our evolving policy approaches. In 2009 we felt it was timely to 'check-back-in' with the wider community that the 'water issues are our major concern' message we had received in 2005, was still valid. A phone survey of approximately 700 people was conducted to test the public's perception on the water quality of the Region's rivers (Water Quality Survey, Horizons Regional Council, June 2009). This survey confirmed that many people use our waterways (passively and actively), and there are high levels of concern about the water quality in the rivers, and a reasonably high level of understanding of the causes of poor water quality eg. agricultural and urban waste. There was a strong feeling that respondents were not happy with the current situation and wanted to see the rivers improved. There was a strong message that the regional community is still very concerned about the water resource and its management.

20. Before going on to explore Horizons' response to these community concerns, I would like to provide some context for the 2005 results in terms of what was going on in the Region at the time of the Roadshow, and what has changed since then.

21. At the time of the Roadshow the Region was:

- still feeling the after-effects of the 2004 storm event, with many of the Region's rivers in a very degraded state (and river scheme areas requiring significant repair works), and running dirty for much of time; and
- in the middle of the dairy boom, with existing dairy farms intensifying and dairying expanding into non-traditional areas. This intensification/expansion resulted in greater stock numbers, greater fertiliser use, and an increased demand for water (primarily for irrigation purposes).

22. As would be expected given what was happening in the Region at the time, there was considerable media coverage of, and public interest in, water-related issues. This reassured Horizons that those people participating in the consultation process were well

informed, and their opinions were considered and a true reflection of the wider population. Such a clear mandate gave Horizons both the direction and confidence to proceed with development of the POP.

23. Since 2005, the Region has seen a spotlight further trained on water issues through:

- several dry summers in the Tararua District, and on the coastal Manawatu Plains, which have resulted in seasonal restrictions placed on town water supplies and requirements to cease abstracting for irrigators;
- many District Councils and wet industries in the Region needing to re-apply for discharge-to-water consents to discharge treated sewage and/or industrial waste to waterways (primarily the Manawatu River);
- the formation and/or strengthening of various community advocacy groups such as Forest and Bird, and their vocal opposition to District Council/industrial discharges to water;
- the start of the Whanganui River Treaty of Waitangi claim hearings, and the attention this has focused on the Whanganui catchment;
- increasing community and stakeholder dissatisfaction with the environmental record of the dairy industry, dairying's impact on waterways, the lack of progress with the Dairying and Clean Streams Accord, and dairying's use of a clean and green marketing strategy - particularly from the likes of the Fish and Game Council,
- a generally favourable review of Horizons' existing water management framework by the Office of the Auditor General (2005), which also identified many areas for potential improvement, and
- a growing awareness and focus in Central Government that water is of critical importance to the country and its economy, and that its management needs to be improved.

24. Also in this period, Horizons' innovative mobile community education vehicle, the Green RIG, hit the roads of the Region. There were a number of drivers behind its genesis, a key one being that early POP consultation efforts had identified that the question of "who is Horizons and what do they do" often needed addressing with community groups before conversations could progress to "how will what Horizons is doing affect me". One of the Green RIG's many functions was to raise the profile of Horizons and its work within the regional community, providing another route for the public to engage informally with Horizons' staff and its core environmental management business.

25. Since its launch in mid 2007, almost 50,000 people have engaged with its interactive educational content – all themed around raising awareness of the 'big 4' issues (including water). Although extraordinarily difficult to quantify, this new awareness–raising tool will also have contributed significantly in engaging public opinion around water issues.

One Plan Development Process – Giving Substance to a Vision

26. As a second generation planning document, Horizons wanted the One Plan to deliver in ways the old suite of plans could not hope to.

27. A simple 'vision' of what the One Plan would deliver for the community was defined right at the outset of the One Plan development process, and has underpinned every facet of its evolution since. The original posters outlining these principles were until recently still taped to the corridor wall outside my office and it is useful to reflect briefly on what these were, and how they manifest themselves in the POP today.

28. Our vision stated that the One Plan would:

- reflect what the community wants for the environment (defined through extensive front-end consultation);
- focus on addressing the "Big Four" environmental issues for the Region;
- promote efficient resource use whilst protecting environmental bottom lines;
- target what Horizons can actually achieve in the next 10 years;
- aim to permit day to day resource use activities that have minor adverse effects;
- embrace a more non-regulatory approach (ie. use of the carrot and the stick);
- embody a 'permissive regulatory approach' – through industry self regulation and use of Codes of Practice; and
- provide clarity and certainty for resource users.

29. And would be:

- the "one-stop-shop" for all Horizons environmental policy; and
- written in plain English wherever possible and presented in a user-friendly format.

30. The One Plan development process has extended over more than five years, with a huge amount of work being completed during this time to inform and underpin policy development aiming to deliver on the above vision.

31. By way of a brief summary, the critical areas of work completed to support the vision have included:

i. **Monitoring** – Horizons has developed an extensive water quality and quantity monitoring programme, and these programmes have been integrated so that we have a much better understanding of the current state of our water resources and historical trends;

ii. **Research** – considerable research effort (commissioned and completed) has been channelled into understanding how our water resources work, the cause of problems, and options for developing solutions;

iii. **Defining values and standards** – critical to the water policy development process has been the process of determining what we are actually managing the water resource for ie. the values we want to protect/maintain, and then assigning numerical standards designed to maintain those values eg. minimum flows or water quality standards;

iv. **Defining water management zones** – as not all parts of the water resource are the same, the Region has been divided into water management zones (WMZs) within which different values and standards apply, in recognition of the natural variations and differences in community requirements;

v. **Water allocation** – new, innovative methodologies have been developed that allow fair and equitable allocation of water for abstractors;

vi. **Setting priority of use** – as certain uses of water are more critical, or have greater community benefit than others, an approach for determining priority of use for allocation purposes (for consent renewals) and for imposing restrictions during times of shortage, have been developed;

vii. **Ensuring efficiency of use** – sitting alongside our defined allocation regime is a desire to ensure all water is used as efficiently as possible, so a definition of efficiency and methods for determining efficiency have been developed;

viii. **Developing practical support tools** – a number of innovative tools have been developed to assist water users to better manage their use and/or reduce their impact on the water resource eg. our dairyshed effluent pond size calculator and Watermatters (an online water-use tracking tool);

ix. **Providing assistance** – Horizons has stepped up its provision of advice and financial assistance to landowners to better manage the streams on their properties, and considerable effort has gone into working with industry, sector groups and District Councils to assist them to better manage their use of, or impact upon, the water resource;

x. **Consultation** – considerable time has been invested working alongside individuals, community groups, iwi, sector bodies, non-government organisations,

local government and central government agencies to share information, and test methods, directions and approaches; and

xi. **Stepping up compliance and enforcement** – there has been a significant increase in Horizons' compliance and enforcement effort to reinforce the message that:
    a. Horizons is serious about managing the water resource;
    b. existing rules and conditions must be complied with, and
    c. consistent poor performance will not be tolerated by Horizons or the wider community.

32. It is fair to say that the tenets of the POP have increasingly shaped and driven the environmental management arm of Horizons' business in the past 5 years. We have undergone significant internal restructuring so that the science, policy, consents and compliance teams are now all in the same Group. This restructure was undertaken to better align ourselves with the new way of working and ensure our efforts were focused on delivering on the requirements of the One Plan.

33. Such an increased focus on water has understandably been very resource hungry, and we are thankful to the likes of Envirolink (which has helped fund much of our research effort), the regional community which has supported rates rises to cover the increased costs, and Horizons' Councillors who have strongly supported the community's desire to have a better-managed water resource. The Water chapter of the POP is easily the best resourced and most involved and complicated component of the plan. The result is a truly innovative approach to water management, one that has a strong science foundation, is linked to what the community wants, and is prescriptive in terms of values and standards, with sound policy, tools and methods to support its delivery – one that a small region can be proud of.

34. Despite this, the proposed Water chapter in the POP has its detractors, even amongst those we have been working closely with over the years. It is understandable that some fear exists around the 'new and untested', or fear of the Council and its motives, and maybe even that we have not engaged meaningfully during the lengthy conversations in the POP's development process. We have gone to every length possible and taken every measure we could think of to put such fears to rest prior to formal hearing proceedings, and for those that remain we are now working in this formal hearing process.

35. Some are attempting to discredit the quality of our monitoring and science. But as you will see, our science team is happy to step you through the details of the research undertaken, the exhaustive peer review process we have employed to ensure our work is robust and defendable, and the ongoing monitoring and research projects we have underway to further refine the data we are working from. I can honestly say I have total confidence that our monitoring and research programmes, and the individuals and organisations that have undertaken the research, will stand up to scrutiny.

36. However, I strongly believe that most of the criticism around the Water Chapter of the POP stems from Horizons shifting its focus onto those sectors and individuals who are causing a disproportionate impact on the water resource. These individuals/sectors will claim they are being unfairly singled-out, but as you will see from the remainder of my evidence (and the others that follow me) these individuals/sectors have been given ample warning about upcoming changes, have been reluctant to make the changes required by our existing policy framework or industry-led efforts to lift performance, or they have simply left Horizons with no option but to increase its focus on these areas of concern because of continued poor performance.

3. WATER CHAPTER – KEY THEME SUMMARIES

37. In the following sections I provide more detailed background and context for the water quality, water quantity, and beds of rivers components of the Water Chapter. These sections are presented in decreasing order of pressure on the resource, their perceived level of importance to the regional community, and the level of resourcing each section has received from Horizons.

4. WATER QUALITY

Trends in water quality

Surface Water

38. There is significant variation in water quality across the Region. Streams and rivers emerging from the mountains or areas that have retained their original vegetation cover tend to have very good water quality. The one exception to this is the Whangaehu River which flows from the crater lake on Mt Ruapehu and is naturally acidic and contains high levels of sulphur and heavy metals.

39. As waterways flow towards the sea they pick up sediment, nutrients and bacteria from the surrounding land. As would be expected, water quality in the lower reaches of rivers and streams is lower than in the headwaters. This pattern is repeated in lowland lakes and wetlands. The issue of hill-country erosion and the associated release of sediment (and consequent phosphate load) to waterways is covered in the Land chapter of the POP so will not be discussed further here.

40. Pre-1990 the biggest threats to water quality were municipal (eg. sewage), and industrial (eg. meat works and fellmongers) discharges. I remember when rivers were treated like open sewers, when rivers were commonly red downstream of abattoir discharges, white downstream of milk factories and lumpy downstream of sewage plant and cheese factory discharges. Until the 1980s there was relatively little control exerted over these discharges, many of which received little or no treatment. During this period agriculture was having either a relatively low or a poorly understood impact on water quality. The dairy farms of the time were concentrated in certain areas, and were of a low intensity. Stock had unrestricted access to waterways for stock-watering purposes, but the stocking rates were lower than today. Whilst waterways were visually impacted, surprisingly little is known about the water quality outside of the main rivers. However, it would be safe to assume water quality was degraded to some extent.

41. Post-1990, with the introduction of the Resource Management Act, the formation of Regional Councils, and raised public awareness and involvement, there has been an increased focus on water quality management. This has led to dramatic improvements in the quality of most point source (piped) discharges within the Region. Gross pollution has been removed, and there are varying levels of treatment in place for all major dischargers. Whilst this progress is to be commended, there is still plenty of room for improvement. Many discharges have been removed from rivers all together, with the waste now being discharged to land where there is land treatment of the waste, and nutrients are returned to the soil. Of the original 800 dairyshed discharges to water in the Region, all but 15 are now directed to land.

42. Despite the improvements in point source discharges, water quality in the Region, particularly in lowland river systems, is continuing to decline. Our monitoring and research data is telling us that this is due to intensification within the agricultural sector. Intensification in its simplest form relies on more inputs to generate more outputs. There are many water quality implications with this process:

- increased fertiliser use increases the potential for nutrient loss;

- raising stock numbers increases the quantity of dung and urine produced, and the number of stock accessing waterways;
- the drive to use all available land means wetlands have been drained, paddocks are used when wet/saturated, and sub-surface drainage has been installed (all of which greatly increases the chances for nutrient losses), and
- intensification is occurring over a much larger proportion of the landscape, so more waterways are being impact upon.

43. Non-point (diffuse) nutrient and bacteria runoff from farmland is now the leading contributor of contaminants to waterways. And of the various farming practices, the dairy sector (with its milking units, wintering-off blocks, and feed support blocks) is currently having a significantly disproportionate impact on water quality. The water quality improvements achieved through better management of point source discharges are being undone by intensification within the agricultural sector.

Groundwater

44. Groundwater quality within the Region is variable. Deep groundwater, and groundwater within confined aquifers, is of good quality apart from naturally occurring iron, manganese and other trace elements. In contrast, shallow groundwater is of much lower quality. This is because shallow groundwater has much greater interaction with activities on the land surface and with rivers and streams.

45. The quality of shallow groundwater has been compromised by heavy fertiliser use within the horticultural sector and intensive septic tank use. The main area of horticulture within the Region is in the Horowhenua district near Levin. Extensive use of fertiliser has led to leaching of nitrates and phosphates to shallow groundwater. Rural subdivision within the Horowhenua district, and consequent reliance on septic tank systems, has exacerbated the nitrate/phosphate issue. Given the level of interaction between groundwater and surface water within the Horowhenua district, Lake Horowhenua and many of the streams in the area also have high nitrate and phosphate levels.

State of water quality in the Region

46. The overall state of fresh water quality in the Manawatu-Wanganui Region is as follows:
- the headwaters of most rivers in the Region have very good water quality;

- few rivers and streams in the Region are safe to drink from directly, except those with a largely unmodified catchment;
- the middle and lower reaches of many rivers are unsafe to swim in because of bacterial contamination, or are unpleasant to swim in because of slime (periphyton) growth. Elevated nitrate and phosphate levels promote slime growth. The slime also impacts on fish and instream invertebrate communities;
- cyanobacteria algae growths (toxic to stock, pets and humans) have been recorded at an increasing number of sites in the Region including Lake Horowhenua and the upper Manawatu River;
- the lower reaches of many rivers have high concentrations of bacteria, nitrates, phosphates and sediment, and these concentrations change seasonally;
- there is minimal contamination of surface water from heavy metals, hydrocarbons and other toxic substances;
- nitrate levels are elevated in shallow groundwater in some places, while the quality of deep groundwater remains high, and
- groundwater is free of agrichemicals.

Existing management

47. Water quality has always been a key driver of the Manawatu-Wanganui Regional Council's business, reflecting our legislative responsibilities and the importance the community places upon healthy and safe rivers and lakes. As would be expected, the organisation has taken many steps to protect and maintain water quality through policies contained in the Regional Policy Statement (August 1998), the Manawatu Catchment Water Quality Regional Plan (September 1998), and Land and Water Regional Plan (September 2003), and actions set out in the Lake Horowhenua and Hokio Stream Catchment Management Strategy (May 1998) and Land and Riparian Management Strategy (July 1999).

48. The Regional Policy Statement provided an overall framework for managing water quality, why it was important to do so, and what features/values were to be protected. The Manawatu Catchment Water Quality Regional Plan was a truly innovative document as it was the first policy document in the country to specify water quality standards that were linked to water quality objectives, and then set timeframes by which they were to be achieved. The Land and Water Regional Plan provided a more detailed framework for managing water quality than that provided by the Regional Policy Statement, for areas outside the Manawatu Catchment. The Lake Horowhenua and Hokio Stream Catchment Management and Land and Riparian Management strategies were non-

regulatory documents that set out what actions Council would take to deal with some of the water quality issues in the Lake Horowhenua catchment, and non-point source discharge problems elsewhere in the Region.

49. The regulatory documents have been successful, but have only dealt with part of the water quality problem. These documents were prepared to tackle point source discharges, something they have done well, especially in the Manawatu Catchment, where most dairyshed discharges to water are now directed to land, and the level of treatment of all major discharges has improved. Much of the progress with major discharges has been achieved because of the need to comply with the water quality standards and timeframes.

50. However these standards, whilst ground-breaking at the time, were not linked to particular environmental outcomes (other than improved water quality). That is, the water quality sought was not tied to a value assessment for the given waterway. Outside the Manawatu catchment there were no standards or values; just criteria every discharge must comply with eg. reasonable mixing after a pre-determined distance downstream of the discharge point. The policy framework was also very strong on managing each discharge as a separate entity, rather than managing the cumulative effects of each discharge. Finally, as these documents largely pre-date the dairy boom (the Land and Water Regional Plan excepted) there is only passing acknowledgement of non-point source contamination, and a limited attempt to manage it.

51. The two strategies (Lake Horowhenua and Riparian strategies) have been Horizons' primary mechanisms for addressing non-point source pollution. Under these strategies Horizons has provided landowners with advice and financial assistance to undertake stream retirement works. These strategies have been limited in their effectiveness due to their non-regulatory status. As there is no compulsion upon resource users to retire streams, Horizons has been restricted to working with willing landowners.

52. The recent period of agricultural intensification, led by the dairy boom, and the impact this has had on water quality, has found our existing policy framework wanting because it is so heavily geared towards the control of point source discharges, with only minimal controls in place for non-point source runoff. As water quality was declining, the community, iwi and non-government agencies were becoming increasingly critical of Horizons' management of the water resource, and vocal against those who were causing the problems.

53. To its credit, the agricultural sector and those industries that support it have taken a number of steps to address the impacts they are having on the environment, and water quality specifically. The following is just a small sample of the various initiatives underway:

- The Dairying and Clean Streams Accord – Fonterra-led initiative to raise the environmental performance of its suppliers in relation to resource consent compliance, culverting/bridging of stream crossing points, and stock exclusion from streams and wetlands.
- Meat and Wool monitor farms – industry supported farms that open their doors and books to the wider rural community. These farms draw on a range of experts to improve productivity, efficiency and financial performance. In recent years there has also been an emphasis on environmental performance. There are 5 monitor years at any time operating in the Region, with farms remaining in the programme for approximately 3 years.
- Farm Sure – an industry-led initiative to improve the environmental, financial and animal husbandry performance of meat and wool producers. This initiative has not advanced due to the recent changes within the meat processing industry.
- Risslington Bloodlines – this is a small consortium of sheep/beef producers that supply high quality meat product to the Marks and Spencer's chain of stores in Britain. Suppliers are required to meet high animal husbandry and environmental standards as set out in comprehensive farm plans.
- Fertmark and Spreadmark – standards prepared by the fertiliser industry to improve both the quality and consistency of the fertiliser produced, and the consistency and efficacy of its distribution to land.
- Ballance Farm Environmental Awards – regionally-based national awards that recognise and promote excellent environmental performance within the primary sector.
- Primary Sector Water Partnership – a partnership between major primary sector organisations (eg. Fonterra and Federated Farmers) aimed at achieving sustainable use of freshwater within the primary sector. This partnership is still at a developmental stage, but shows a strong desire within the primary sector to lift its environmental performance.

54. These initiatives have done much to raise awareness about the impacts of non-point source runoff within the primary sector, and mobilised effort to address the problem. However, their impact has been limited, and there are a number of reasons for this; the most influential being:

- most of these initiatives are voluntary, so have suffered low uptake rates just like Horizons' non-regulatory strategies. In general, it is the better performers in the sector that have been the early adopters or joiners of these initiatives, not the poorer performers. This has resulted in the good performers getting better, thereby increasing the gap between the good and poor performers. It is the poor performers that most need to lift their performance, and
- all of these initiatives stress the importance of improved environmental performance, but there are no targets, nor are there any specific environmental outcomes sought (other than improved water quality). And in this way they have similar limitations to Horizons' existing policy framework.

What is proposed in the POP

55. Initial public consultation for the One Plan identified water quality as one of the main environmental concerns for the regional community, with most people indicating they wanted clean water. This view has been confirmed though subsequent consultation and public opinion surveys.

56. The challenge for the One Plan then was to balance the environmental wishes of the community for clean water, against social and economic realities. That is, pristine water quality throughout our waterways would be unrealistic for this Region's towns, and make our industries and primary sector untenable. Most parties however, realise that more can be done to look after our water resource, and the One Plan sets out a framework that I believe achieves a balance between the various parties/sectors that is environmentally, socially, culturally and economically responsible and achievable.

Management Framework

57. The process of developing the new One Plan water quality management framework involved a number of steps, each of which was supported by leading-edge science. These steps included:
    - Values – critical to the success of the water management framework, was agreement around exactly what we are managing our waterways for, or the water they contain, for (values), eg. the ability to go swimming without getting sick, suitability for stock water, trout spawning, or inanga spawning. A total of 21 water-related values were developed.
    - Water quality standards – numerical water quality standards were derived to ensure maintenance/protection of each value eg. how good does the water quality

need to be to prevent people getting sick if they go swimming. These standards set limits for each contaminant relevant to that value eg. bacteria, nitrate, phosphate, pH, clarity. Some values have only one contaminant of relevance, others have multiple contaminants.

- Water management zones – different parts of the Region, and the waterways they contain, have different characteristics, so a one-size-fits-all approach to the application of values and standards will not work. In response, we have developed water management zones, where waterways with similar characteristics are clumped together geographically. Within each zone the waterways contained have the same values and associated water quality standards. A total of 43 water management zones and a further 124 sub-zones have been defined. The same water management zones are used for water allocation (and other) purposes.

58. For the first time Horizons has developed a management framework that is capable of answering the following fundamental questions for the entire Region (not just the Manawatu Catchment), and one that extends across a range of contaminants (not just nitrate and phosphorous as in the Manawatu Catchment Water Quality Regional Plan):
    - What are we managing our waterways for?;
    - How good does our water quality need to be?, and
    - How much improvement is required?

59. In developing this framework I believe the One Plan reflects what the community wants, whilst providing a level of clarity and certainty to resource users.

Policy Framework

60. Research conducted on the upper Manawatu Catchment, and subsequently repeated elsewhere, determined that both point- and non-point sources of pollution were significant contributors to the total contaminant load. Point sources were particularly important during periods of low flow, whereas non-point sources were the most significant contributor of contaminants. Any policy framework needed therefore to tackle both point and non-point sources of pollution.

61. As mentioned previously, the existing policy framework has been successful in dealing with point source discharges. Most former discharges to water are now directed to land (primarily those derived from the agricultural sector eg. dairyshed discharges), and significant improvements have been made to the levels of treatment applied to the

remaining discharges to water. Other than integrating the above management framework, the POP approach to managing point-source discharges really strengthens and streamlines the existing Manawatu Catchment Water Quality Regional Plan policy framework.

62. Easily the most innovative part of the POP is the policy framework relating to management of non-point source pollution. As pointed out previously, the existing policy framework has limited control over non-point source pollution, despite non-point source pollution becoming an increasingly important contributor to the Region's degraded water quality as the agricultural sector intensifies.

63. The POP proposes that intensive landuses (eg. dairying, cropping, and irrigated sheep/beef units) will require a resource consent to continue to operate and discharge contaminants into the environment. Approaches to tackle the non-point source issue have also been developed elsewhere in the country, notably Rotorua and Lake Taupo. The significant point of difference between the POP approach and these earlier approaches, is that the POP intensive landuse resource consent will control outputs (ie. what is lost from a farm), rather than the inputs to the farm (ie. fertiliser application or stocking rates). We believe such an approach is less restrictive, allows for greater innovation around solutions, and links what is being done more closely with the actual environmental outcomes sought.

64. The key elements of this new approach for non-point source pollution management include:

- Resource consent – the resource consent for an intensive farm will set out the conditions by which traditionally regulated activities are to be managed, and in conjunction with the Farmer Applied Resource Management Strategy (FARMS) will set intermediate and long-term nutrient loss reduction targets. Only intensive land uses in priority catchments will be required to apply for a resource consent.
- FARMS – the Farmer Applied Resource Management Strategy is a detailed customised analysis of an intensive farming system (land classes, stock and effluent management, and waterway management) to determine where and how much contaminant loss there is from a farm, and what steps can/will be taken to reduce this loss to achieve the nutrient loss targets. The nutrient loss analysis is based upon OVERSEER®, whereas the loss of other contaminants eg. sediment and bacteria is based on the identification of loss points. Many of the requirements of FARMS are consistent with current resource consent or permitted activity requirements, industry initiatives and/or what is considered best practice.

- Overseer – decision-support software originally developed to assist landowners and rural advisors in making fertiliser type, rate and use decisions to boost/maintain pasture growth. The tool has since been expanded to allow testing of different farming system scenarios, and management of nutrient losses. The model uses input data about the current farming system to calculate the source and rate of nutrient losses. Changing input variables is used to identify the impact of adjusting farming practices on nutrient losses.
- Nutrient loss targets – nutrient loss targets have been set for each priority water management zone. The nutrient loss target is expressed as the amount of contaminant that can be lost per hectare per annum (kg/ha/year), and from this a total farm loss figure can be calculated. Higher losses are permitted from the most productive land classes (Land Use Classes (LUC) 1-3), as these classes contain the most productive parts of our agricultural landscape, are farmed more intensively, and therefore leak the most. This approach to setting targets is a pragmatic approach to allocating the right to pollute across the landscape. The targets as they currently stand will not get us to the water quality standards, but they do get us moving in the right direction.
- Priority water management zones and timeframes – the new framework for managing intensive landuses will not apply to the entire region from day one. Instead it will be rolled-out in priority catchments – the start date for each will be staggered by a year. Priority catchments have been selected on the basis of the level of intensification and the current state of the water quality within the water management zone. Intensive landuses will have a 20 year timeframe in which to achieve the nutrient loss targets for their water management zone. To ensure regular and steady progress towards the 20-year nutrient loss targets 5-yearly intermediate targets have also been included in the framework.

65. I acknowledge there are concerns about the use of Overseer in the FARMS. These concerns stem from the level of accuracy within Overseer, and whether it is precise enough to be used as a compliance tool ie. measuring progress against nutrient loss targets. Our testing has shown that Overseer, whilst not perfect, is fit for purpose at this time, and will only get better as new versions are developed.

66. A range of tools has been developed alongside the policy framework to assist landowners with compliance. These tools include:
    - Pond size calculator - the pond size calculator is used to determine how much dairyshed effluent storage is required given different rainfall, soil type, herd size and shed washdown technique variables. Pond storage is critical in a deferred

effluent irrigation system – the preferred effluent treatment system through the POP. Deferred irrigation requires effluent to be stored until soil conditions allow effluent to be irrigated without the risk of effluent ponding and seepage/runoff to waterways or groundwater.

- Warrant of Fitness (WoF) – a recently developed tool that is used to provide landowners with an assessment of their performance in relation to compliance with consented activities (eg. effluent storage and disposal) and permitted activity standards in the POP, and adoption of industry best practice. The purpose of the WoF is to highlight to landowners where they are performing well, what parts of their operation require attention, and what potential there is for on-farm improvements through adoption of best practice. The WoF will incorporate the standard compliance inspections, and will form the basis for any associated enforcement action.
- WaterMatters – this is a web-based system that allows the general public to view up-to-date water quality information for the Region's rivers from Horizons' State of the Environment monitoring network and for samples collected upstream/ downstream of major discharges. It also allows consent holders and Horizons to check on compliance with resource consent conditions and water quality standards

67. The policy and above tools are in turn supported by an extensive network of river and groundwater quality monitoring sites. This allows the state of, and trends in, the water resource to be monitored and assessed, and policy effectiveness to be determined. A substantial compliance monitoring and enforcement programme also exists to ensure consent holders meet and keep to their consent conditions.

68. The decision to control non-point source pollution using a regulatory approach has not been taken lightly by Horizons. We recognise that it strikes at the very core of traditional use rights – that the act of farming is an existing use and therefore should not be controlled via rules. However, the rate at which water quality is declining, the limited uptake of non-regulatory approaches by Horizons and industry bodies, and the continued poor environmental performance amongst some within the agricultural sector has forced Horizons down this path. We recognise that the approach taken does not meet with universal approval. Critics are suggesting the POP provisions are too harsh, that the standards are too onerous, and timeframes for compliance are unrealistic. Our data indicates that this new approach is both realistic and achievable (except for a small number of extreme cases). There will be costs involved in complying with the new framework, but these costs will not be borne solely by individual landowners. Significant

assistance in the form of advice, tool development, technology transfer and financial assistance will be made available to landowners by Horizons.

Case study – the dairy sector

The dairy sector is a major feature of the farming landscape within the Manawatu-Wanganui Region, and a very high percentage of dairy farmers (c.900) are suppliers to Fonterra. Over the last 10 years the dairy sector within the Region has both expanded (dairying has moved into non-traditional areas) and intensified (with increased herd sizes, stocking rates, and fertiliser and feed inputs). That the dairy sector is having an impact on the region's environment is not in doubt, but there are significant differences of opinion on the extent of that impact.

In response to concerns about the actual and perceived impacts the dairy sector is having, Fonterra has taken many steps to improve the environmental performance of its suppliers, particularly in regard to water quality. These initiatives include:

- the Dairying and Clean Streams Accord;
- sustainable dairying specialists;
- programmes to achieve supplier compliance with regional rules, and
- programmes to assist suppliers to understand best practice.

Overall, the success of these initiatives has been limited. There are still many Accord waterways that are unfenced – it is not uncommon to see dairy cattle in streams. The compliance rate for dairyshed effluent consents during last season was around 70%, against a target of 100%; and this is after five years of the Accord being in place.

There are several reasons for this lack of progress including, poor uptake of what are largely voluntary measures, many of the measures are not seen as a priority either for suppliers or Fonterra, there simply is not enough on-the-ground staff resource to support the number of suppliers. For instance, Fonterra has approximately one full time equivalent sustainability staff member to assist 900 suppliers in our Region. This is against the four fulltime equivalent staff members Horizons employs solely to monitor resource consent compliance within the rural sector.

These results do not mean that all farmers within the dairy industry are poor performers. Quite the contrary, there are many who have done everything that is required of them, and are rightly held up as examples of what the dairy industry is doing well. Unfortunately, Horizons has to spend a large proportion of its time with those at the opposite end of the spectrum, who through ignorance or belligerence have a poor environmental record, and are bringing the industry into disrepute (refer images below from the 2008-09 compliance inspection season). Admittedly, many of these operators have entered the dairy industry late, are having to operate on marginal dairy country, and are under immense financial pressures. However, the wider community, and many within the industry, are becoming increasingly intolerant of poor performance.

All parties recognise that the dairy sector is critical to the Region's economic and social well-being. Unfortunately, the environmental degradation that has occurred is an unintended consequence of the progress made in the last decade. Further, there is potential to double the land area under dairying in this Region. The damage is not irreversible, but action does need to be taken now, particularly if the industry is to live up to its clean and green marketing image. Technology advances and development of best practices means there is plenty of potential for improvement.

Figure 1. Effluent build-up on a fence and surrounding pasture resulting from a broken effluent irrigator. The irrigator had been broken for many days.

Figure 2. Dairyshed effluent allowed to run freely onto a paddock.

Figure 3. Combined effluent runoff from races, hard stand area and dairyshed. The effluent was approximately 10cm thick at this point and running into a nearby drain and then into a waterway.

Figure 4. Stock accessway beneath a road bridge, located alongside a stream. Stock effluent, which naturally accumulates on the low part of the race, is flowing freely into the stream.

Case study – Manawatu District Council sewage discharge to the Oroua River

The Feilding sewage treatment plant is the single largest point source discharge into the Oroua River. Water quality in the river downstream from the outfall is so poor that signs have been erected to warn the public of the dangers of entering the water. The NIWA water quality monitoring site located downstream of the Feilding sewage outfall ranks the worst in the country (77 sites) for DRP (dissolved reactive phosphorous). The treatment plant is old, in spite of a number of refits; the treatment quality is poor and Manawatu District Council' compliance with resource consent conditions has been inconsistent.

The Manawatu Catchment Water Quality Regional Plan has been operative since 1998, with clear standards for acceptable water quality and timeframes within which these standards were to be achieved/complied with. The District Council was granted a short-term consent to allow the community to continue to dispose of its sewage to the river while improvement options were investigated and funding processes completed. While some improvements have been made to the level and consistency of treatment, Manawatu District Council is again in the process of applying for a new consent which cannot meet the MCWQRP standards or the Proposed One Plan's less stringent standards.

Communities in our Region, and throughout the whole country, are deeply interested and concerned about the quality of water in our rivers and stream. Horizons is responding to the wishes of the community in its handling of these types of discharges in general and this consent application in particular. It is interesting therefore that Horizons finds itself under attack from Manawatu District Council for placing an unfair financial burden on Feilding's ratepayers. Particularly as Manawatu District Council has had more than ten years to plan for the necessary improvements to the treatment plant and take action with and on behalf of the Feilding community to fulfil their obligation to clean up the Oroua River.

This case study is presented not to make an example of Manawatu District Council, a Council Horizons works closely with, but rather to highlight the challenges we must face up to as a community if we are to clean up our rivers. The issues Manawatu District Council is facing are not unique; they are repeated at many sewage treatment plants, and by some industrial complexes within the Region. That is, existing treatment facilities are ageing and inadequate and making changes is expensive, particularly when coupled with competing demands for available funding, and that any solution will be heavily reliant on new infrastructure and technologies.

5. WATER QUANTITY

Trends in water use

69. The two largest users of water in the region have traditionally been hydroelectric power generation (with the main operations being the Tongariro Power Scheme and Mangahao Power Scheme), and town water supplies. Up until 20 years ago, water takes for agricultural purposes (eg. dairy shed washdown and irrigation) were relatively minor, largely because abstraction and distribution technology restrictions caused farming operations to be more closely aligned with climatic factors than they are today.

70. Today, hydroelectric power generation remains the largest user of water in the region, with draw-off that occurs all year round. Unlike hydroelectric power schemes elsewhere in the country, the major schemes in this Region are considered to be consumptive users. For much of the rest of the country, hydroelectric power generation is typically

run-of-river, where a dam is used to store and then release water as demand requires, with all of the water eventually passing down the same river. In the case of the Tongariro Power Scheme, water is diverted out of the Region and into the Waikato River system; and in the Mangahao Power Scheme water is diverted from the eastern to the western side of the Tararua Ranges, effectively by-passing the entire Mangahao River, and much of the lower Manawatu River. The diverted water then re-enters the Manawatu River near Shannon (only a short distance from the sea).

71. Our towns continue to be large users of water. Originally, many of these takes were only sourced from rivers, but several District Councils have now supplemented these river-based takes with groundwater takes. This provides much greater certainty of supply, particularly during dry summers when river levels are low, and during extended flood periods when rivers may have high sediment and other undesirable contaminant loads.

72. Where our Region has seen significant change, is in the demand for water from the agricultural sector. This demand has been driven by the dairy boom, technology improvements, and the expansion of dairying into non-traditional dairying areas (eg. coastal Manawatu Plains). Previously such areas were considered too dry for dairying, but with improvements in bore development, along with pump and irrigation technology, these areas could be supplied with the large quantities of water needed to support a conversion to dairying. Over the past 10 years, the demand for water from the agricultural sector has increased several-fold. This increase has been for both surface and ground water sources.

73. The current situation with regards to pressures and allocation of the water resource is as follows:

- The majority of waterways in the Region receive nil or only minor (eg. stock watering) abstraction pressure;
- The Whanganui, Mangahao and Whangaehu Rivers have permanently reduced flows due to hydroelectric power generation;
- Several small waterways in the Region are now considered to be over-allocated (eg. Raparapawai Stream and Tamaki River). All are located in the South Eastern Ruahine area near Dannevirke;
- Several other waterways are nearing full allocation, namely the remaining South Eastern Ruahine Streams and waterways of the upper Manawatu Catchment,
- Several waterways are fully or over-allocated, but only in a technical sense. This means more than the recommended allocable volume has been allocated to

consent holders, but not all of those consents can or will be used at the same time. This situation is typically due to several consents being issued to the same consent holder for the same activity, ie. there is a doubling-up of consents;

- The groundwater resource of the Lake Horowhenua catchment is nearing full allocation;
- The groundwater resource of the area referred to as the coastal Manawatu-Rangitikei Plains is highly developed; and
- The groundwater resource elsewhere in the Region is only lightly-moderately developed.

74. The demand for water exists in most places in the Region, although the demand trends in the agricultural sector have been tempered by the current recession. Demand is likely to climb again once global and regional economic conditions improve.

Existing Management

75. Since its formation in 1989, the Manawatu-Wanganui Regional Council has been very aware that the taking of water from our rivers, streams, lakes and groundwater is a significant issue. Accordingly, the organisation has taken a number of steps to ensure fair, equitable and sustainable management of the water resource through policy contained in the Regional Policy Statement (August 1998), the Oroua Catchment Water Allocation and River Flows Regional Plan (June 1997), and the Land and Water Regional Plan (September 2003).

76. The Regional Policy Statement introduced the concept of maintaining a minimum flow that was sufficient to support instream life, but did not specify what those minimum flows should be. The Oroua Catchment Plan was the first document to specify minimum flows, in response to concerns about the demand for water from the Oroua Catchment. The Land and Water Plan was developed to provide guidance on the allocation of surface and ground water across the Region. The key surface water objective was to support instream life, but again did not specify what flows were needed to protect it. For groundwater, the objective was to minimise the impacts on neighbouring bores and interconnected surface water bodies such as rivers, lakes and wetlands.

77. The Tongariro Power Development resource consent applications (ie. to take water from the upper Whanganui River) were successfully processed under these policy documents. The consent hearings for these applications easily remain the largest and most complicated the Council has been involved with to date.

78. Despite the above, it would be fair to say the existing policy documents have their limitations. Whilst they provide a framework in which to make water allocation decisions, these decisions could only be made on a case-by-case basis - a costly and time-consuming exercise. There was no overall approach to the allocation of water, or scientific definition of minimum flows each river in the Region (except for the Oroua catchment). This approach worked whilst demand for water was relatively low and spread evenly across the Region, but as demand increased, and the pressure on specific parts of the resource grew, the shortcomings of the policy became apparent.

79. The rapid increase in demand for water from the agricultural sector, fuelled by the dairy boom and technology advances, was much greater than had been expected by Horizons. Further, the scale of the takes was unprecedented, with many takes for irrigation easily on a par with the water supply takes of medium-sized towns in the Region. This rapid rise and increase in scale, coupled with our generally non-specific policy, led to a period of uncertainty amongst water users around how the water resource would be managed. This in turn resulted in District Councils and urban communities coming into conflict with rural communities as they applied to renew their town water supply consents. Rural water users were coming into conflict with their neighbours as they applied to renew existing, or develop new, irrigation take consents. Large groundwater users were coming into conflict with small groundwater users, who were being impacted by a loss of artesian pressure (necessitating them having to deepen their bores and purchase pumps). Non-government agencies such as Fish and Game, community groups, and iwi were all became far more vocal around the issue of water use and allocation.

80. Perversely, at the same time as more parties were expressing concerns at how water was being managed, a 'water-rush' was occurring within the rural sector. For many applicants this was not being driven by an immediate, or even a future, need for water, but rather a desire to secure rights to a valuable resource before it was fully allocated.

What is proposed in the POP

81. During the start-up phase of the POP, one of the key objectives agreed was that the POP would provide clarity and certainty for resource users ie. future resource management decisions would be science and fact based. In my opinion, this new approach is best illustrated by the water allocation part of the Water chapter of the POP - where the existing policy framework (which was essentially sound but lacking in detail) has now been underpinned by robust research and credible monitoring data.

82. Horizons is now in a position where it has a very good understanding of the water resource (both surface and ground water); what it is wanting to achieve through management (ie. the values to be protected); what minimum flows allocation limits should apply to protect those values, and has developed a robust monitoring network to check resource user compliance and appraise policy effectiveness. As this knowledge has become available, it has been put to use in resource consent decisions over the last couple of years. Debate still exists regarding some elements of the science, primarily the use of Instream Flow Incremental Methodology (IFIM) to determine minimum flows, but I am comfortable that we have used the best data, most robust methods, and skilled researchers to develop the POP. I note that the majority of the science underpinning the POP is unchallenged through this hearing process.

83. The water allocation policy developed as part of the POP is mostly consistent with existing policy, but has been refined and strengthened considerably. Some significant innovations have been introduced, such as:

- Minimum flows and core allocation limits – these delimit how much water is available (and when) for allocation from each river, reach or management zone in the Region;
- Priority of use criteria – these set out what water uses/users have priority in times of water shortage or as a water resource nears full allocation. Essentially, during times of shortage, certain uses/parts of the community (eg. town water supply) can continue to take water, albeit at lower rates, when lower priority uses (eg. irrigation) have to stop;
- Efficiency of use – efficiency measures and methods of calculation have been developed to ensure wastage is minimised in both urban and rural settings. Ensuring a resource is used to maximum efficiency becomes increasingly important as a resource moves towards full allocation.
- Groundwater allocation – the central theme of previous groundwater allocation policy was the minimisation of impacts on neighbouring groundwater users. In the POP this emphasis has been reduced, to allow greater utilisation of the groundwater resource. The rationale being, why should future groundwater use be restricted by existing shallow bores? This is inefficient and unfair, particularly in situations where there is sufficient water to meet the needs of all users. The new policy allows for a transition period in which existing users are given time to deepen their bores before the new abstractor can build up to their full allocation. This new approach has been successfully defended through the Environment Court as the result of an appeal to a recent resource consent decision on a water

take in the Opiki area. The emphasis in the POP is minimisation of the impact of groundwater takes on surface water bodies such as rivers, lakes and wetlands, and limiting the risk of saltwater intrusion along the coast.

84. These policy innovations/changes have caused considerable consternation amongst water users, but it is these very same changes that will provide the clarity and certainty that has been missing until now. District Councils have been the most vocal opponents of these changes, notably around the efficiency of use criteria, which specifies best practice in terms of how much water is required per head of population (with allowances for industry, future growth, and some network leakage). Most districts believe these calculations are too restrictive in comparison to how much they are currently taking. But current use for many town water supplies is significantly elevated to account for high leakage rates (see case study below).

85. To further reinforce the policy framework, two key tools have been developed to assist Council and resource users to better manage the water resource. These tools include:

- Metering and telemetering – all large takes in the Region (surface and groundwater) and all takes within water management zones where the water resource is at or nearing full allocation, are metered and telemetered. Metering is used to collect information on how much water is being abstracted and at what rate. Telemetering is when the meter data is sent electronically to Horizons at predetermined intervals ranging from instantaneously to daily. This provides Horizons with real-time information on how the water resource is being used, and if users are in breach of their resource consent conditions.
- WaterMatters – this is a web-based system that allows the general public to view water allocation and use from the rivers in the Region, and to check what low flow restrictions are in place. It also allows consent holders to check their own water use records. WaterMatters is coupled with a low flow warning system, where water users are provided with text, email, or phone updates on river level conditions and if restrictions are likely, or are in place.

86. In recognition of its originality and applicability to water users and the wider community, the WaterMatters website received the Ministry for the Environment's Green Ribbon 'Innovative Solutions for the Environment' Award in June 2009. Further, roll-out of the metering/telemetering programme is significantly more advanced in this Region than elsewhere in the country, with many other regions beset by political and technical difficulties. Horizons believes the collection and distribution of water use and

management data is critical to providing users and the wider regional community with a degree of confidence that the resource is being equitably and sustainably managed.

87. The policy and above tools are in turn supported by an extensive network of river and groundwater level monitoring sites, a saltwater intrusion detection network and associated warning system. This allows the state of, and trends in, the water resource to be monitored and assessed, and policy effectiveness to be determined. A substantial compliance monitoring and enforcement programme also exists to ensure consent holders meet and keep to their consent conditions.

Case study – Landcorp Farming Ltd – Moutoa Farm irrigation take

Under the previous policy framework, a dairy farmer wishing to apply to take water to irrigate would have had to make a significant investment of both time and money, with little certainty of a successful outcome. Infrastructure would have had to be installed and testing carried out to assess the impact on neighbouring water users and the water source. There was often considerable opposition from neighbouring water users concerned about the potential impact on their supply; consent applications routinely went to Hearings where they could be declined, or have such restrictive conditions imposed that proceeding was not viable. This process often resulted in lost development opportunities and friction within communities.

The approach through the One Plan provides much greater certainty to that farmer. The applicant can approach Horizons prior to making any investment, to establish if (and how much) water is available, which individuals and groups are likely to be affected, and if, and what type, of restrictions could be imposed. Horizons is in a position to set out what will be required in terms of appropriate infrastructure design and ensuring the water use will be efficient. This approach gives the farmer a much greater understanding of any risks and costs involved in the application, enabling an informed decision on whether or not to proceed.

A recent example of this new approach in action is when Landcorp Farming Ltd applied to abstract almost 35,000 cubic metres of water per day from the lower Manawatu River to irrigate Moutoa Station. There was sufficient water available under the core allocation framework, and Landcorp demonstrated their proposed irrigation system was an efficient use of water. Horizons granted the consent without notifying the application, confident that the instream values would be protected and neighbouring water users would not be affected - a positive outcome for the applicant, local community, river, and economy.

Case study - Tararua District Council and the Dannevirke water supply

In this case study Dannevirke's town water supply is used as an example to illustrate the issues faced by some of this Region's larger water users and the challenges they present to territorial authorities coping with declining populations, ageing infrastructure and the added constraints of an economic recession. Whilst these constraints provide a context for a lack of progress on addressing problems, they do not provide an excuse. Especially as the lack of action is having an environmental as well as an economic impact.

Dannevirke's water supply comes from the upper reaches of the Tamaki River, in a part of the Tararua District frequently affected by summer droughts. During these times of low flow restrictions on water use, especially irrigation, come into effect. The dairy farms in this area benefit greatly from irrigation but with the Tamaki River fully allocated, and with much of the water allocated to the District Council to supply Dannevirke, the ability to extend irrigation, and the economic development of the area, is limited.

The Dannevirke water take is both poorly designed and inefficient. Examples of its shortcomings include:

- the distribution network leaks with anywhere between 30-50% of the water lost before it gets to the end user, depending upon the time of day;
- lack of storage in the system means water has to be abstracted continuously, even during low flows; and
- the town supplies a significant wet industry - an abattoir - without requiring a programme of efficiency gains, or restrictions on use during low flow conditions.

If these problems could be fixed, there would be great benefits to the area and the River, as has been demonstrated through recent improvements to the intake gallery (to allow control of how much water is abstracted), and a programme to fix leaks and encourage water use efficiency amongst residents. Having more water in the Tamaki River would not only protect the River's instream values but would potentially make water available for other uses, allowing opportunities for economic development to be realised.

6. BEDS OF RIVERS

88. Over the years, many of our rivers have been highly modified through flood and erosion control efforts (to allow formerly floodable or swampy areas to be developed as farmland), and by gravel extraction activities (which have supported infrastructure development ie. roads, housing etc). The period of large-scale river modification - straightening, drainage, stopbanking, and erosion control that occurred during the early-middle parts of last century - is now behind us.

89. Most of the river-control works that take place now are either maintenance-related or involve replacement/upgrades/improvements to existing structures or works. Similarly, the demand for gravel from the Region's rivers has dropped significantly from the boom construction period of the 1950s-1970s. There is still strong demand, but extraction is now tied to long-term sustainable rates and/or river management requirements.

90. Present-day activities taking place in/alongside rivers such as bridging, installing culverts, laying of underground cable, and placing of structures tend to have localised, minor, and temporary effects if well planned, placed and constructed. Unfortunately, not all such activities are carried out in this way, and Horizons has had to respond to many illegal activities over the years where individuals and companies have taken it upon themselves to make significant changes to waterways for personal benefit. Accordingly, there remains a need for policy and rules to regulate activities in the beds of rivers (refer case study below).

91. As a consequence of well over a century of human modification, the rivers of today are vastly different to their natural state. There is little desire or justification to turn the clock back because of the investment that has been made in the rivers to date, and the

social/economic benefits that have accrued from these changes. As such, the current state of the region's rivers should be thought of as the new benchmark.

92. The aim of the beds of rivers section of the POP is to prevent further degradation of the physical condition of the Region's rivers, allow existing infrastructure to be maintained, new activities to take place in a well planned and controlled manner, and to identify and capitalise on opportunities to increase naturalness, habitat condition, and public access.

93. This has been achieved through retention of much of the existing policy framework relating to activities in the beds of rivers, refining those parts that we know are not working as intended, and improving those areas where we either have better knowledge or new ways of working.

94. Whilst much of the existing policy framework has been retained, with minor modification, one significant innovation has been introduced - adoption of the River Works Code of Practice (CoP). This document sets our best practice in relation to minor river management works, such as construction of groynes, placement of rip-rap, and live-tree protection works, as carried out in Horizons' river control scheme areas. The document, prepared by the Operations Group of Horizons, in consultation with parties including Fish and Game and the Department of Conservation, sets out how minor activities critical to the functioning and maintenance of scheme assets are to be carried out to minimise environmental impacts. Major works, such as significant river realignments, will still require resource consent.

95. In line with the One Plan's original vision of improved clarity, simplicity for resource users and embodying a more 'permissive regulatory approach', the benefits to the Operations Group is that rules have been prepared to allow those activities covered by the CoP to be carried out without the need for a resource consent, even if the scale of the activity exceeds the permitted activity conditions in the POP. This will ultimately save the Operations Group time and money through not having to get consents, and the delays this can cause. The CoP provides potentially effected parties, notably Fish and Game and the Department of Conservation, a level of certainty that the works covered by the CoP will be carried out to a certain standard, and impacts will be minimised (as is achieved through a resource consent). This will in turn save potentially-affected parties time and money because they will no longer need to get involved in resource consent processes for minor river works, because their concerns will already be taken into account via the CoP.

96. The opportunity to develop CoPs and have these incorporated within the POP to make the carrying out of regular activities with known effects and which can be carried out to a consistent standard, was a cornerstone of the POP development process. This offer has been made to all sectors/industries, but to date only the Forestry industry and Horizons' Operations Group have responded in this way. The offer still stands, and the door is still open to include CoP in the POP into the future.

Case study – illegal channel realignment on the Taringamotu River

An excellent example of why Horizons requires a framework for managing our rivers, and regulation to control activities within/alongside them, is provided by the Taringamotu River, north of Taumarunui. In this example a potential gravel extractor has completely modified approximately 500m of the upper reaches of the Taringamotu River. This disturbance involved straightening the waterway, mainly through the pushing of gravel beaches into the channel, or removing gravel from it. In the process of straightening the river all instream habitat has been destroyed and large quantities of sediment were released. The upper reaches of rivers typically contain the highest instream habitat values.

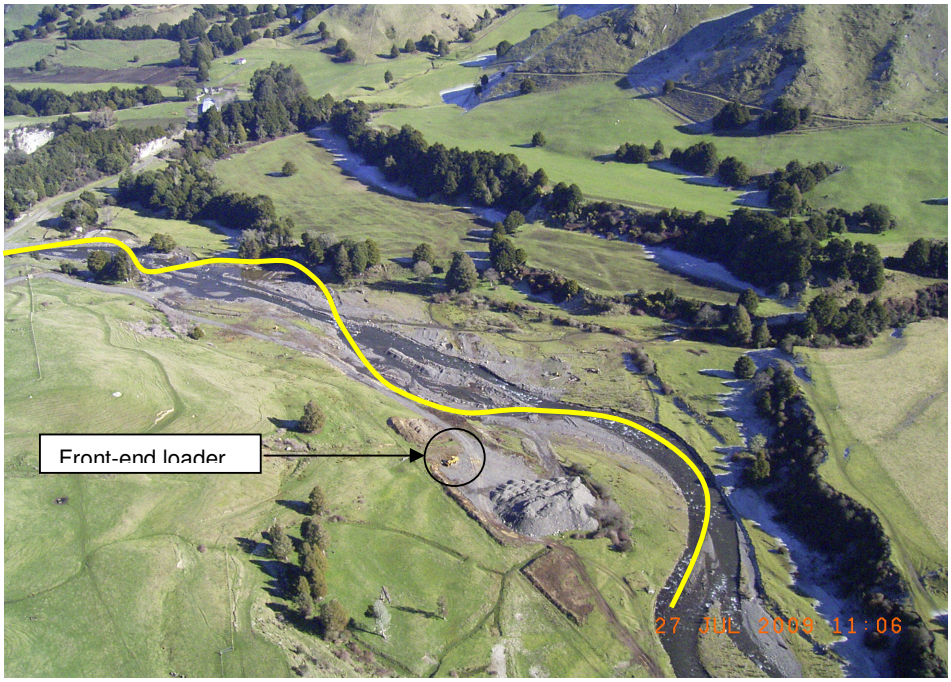

Figure 5. Aerial view of the illegal channel works on the Taringamotu River - viewed looking downstream. A large front-end loader provides a scale for the works. The original channel alignment is marked in yellow. The newly aligned channel is artificially straight, contains little or no habitat values, and is very unstable. The total length of realigned channel is approximately 500m.

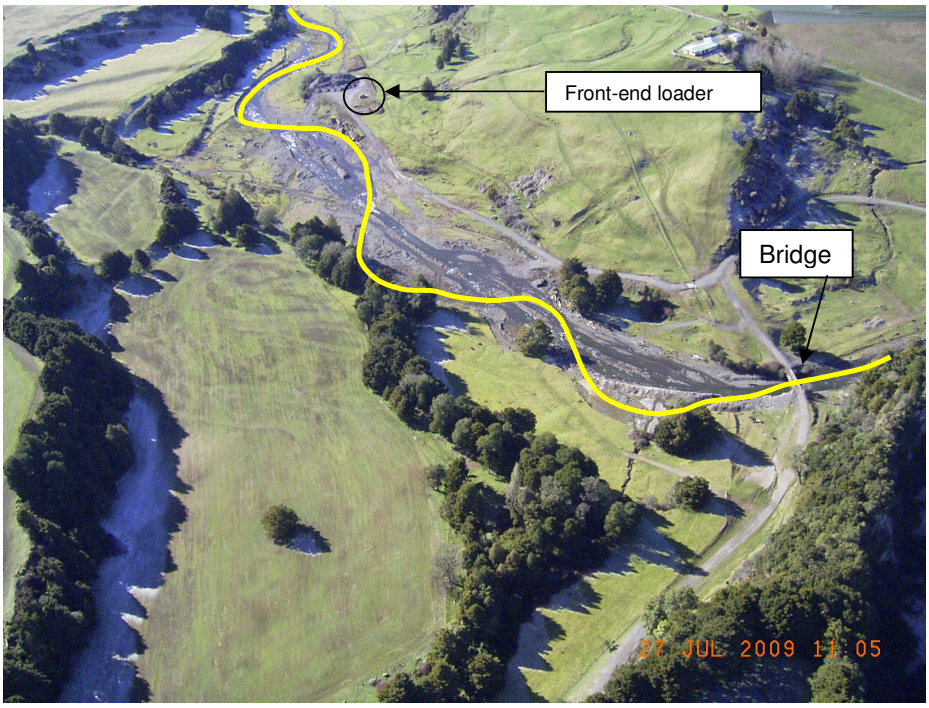

Figure 6. Aerial view of the illegal channel works on the Taringamotu River - viewed looking upstream – showing the bridge which is now at risk from bank erosion. The original channel alignment is shown in yellow.

Figure 7. Ground-based view of the illegal channel works on the Taringamotu River (taken earlier than the aerial views above). This image is taken from the approximate position of the front-end loader in the aerial views above.

While the purpose of the works is not immediately obvious, they have been carried out in an attempt to make it easier to extract gravel. A resource consent application to extract gravel from the disturbed reach was in process with Council. This is a very isolated part of the Region, and the works have been carried out with little regard to the resource consent process or any existing policy framework, simply because the perpetrator thought they could get away with it. Council's Compliance Team is working through enforcement proceedings.

The Taringamotu River case is not an isolated incident, nor the worst example on record, but simply the most recently reported example of this type of activity. Fortunately most operators working in/alongside our waterways treat these waterways with the respect they deserve.

7. SUMMARY

97. From the very start of the One Plan development process Horizons has had a clear steer that water and its sustainable management is a critical issue for the regional community. The use and misuse of water is a contentious issue, and one that will only become more so as demands on the Region's water resource increase. Water is a key driver of the Region's economy, and supports social, cultural and environmental well-being, therefore it is critical we have a fair, equitable and sustainable approach to managing this resource.

98. I believe the water management framework provided by the POP, with its strong science foundation, innovative policy and supporting tools has positioned the Region well to achieve a balance between competing demands now and into the future. The POP sets out:

- what we are managing the Region's water resource for (values);
- numerical standards (water quality standards and minimum flows) to protect/maintain these values;
- how these values and standards are to be applied across the Region; and
- policies, methods and tools to achieve these standards within realistic timeframes.

99. For the water quantity (ground and surface water), beds of rivers, and management of point source discharges sections, the POP represents a refinement and strengthening of existing policy frameworks. The improvements that are incorporated within the framework have been driven by science, monitoring, and organisational experience around what is/is not working. Much of the proposed new framework is already being successfully pressed into service to deal with resource consent applications to take water, discharge to water, or disturb the beds of rivers. That the new framework is already in service and has survived Environment Court challenges, only increases my confidence that we have this part of the Plan about right.

100. A completely innovative approach has been proposed to tackle the non point source pollution issue. Non-point source pollution is the major contributor to degraded water quality (surface and ground water) in our middle and lower catchments. The principle driver of this degradation has been intensification within the agricultural sector, primarily within the dairy sector. Horizons' existing policy framework is inadequate for dealing with the current water quality situation and level of intensification, let alone the enormous potential that exists within our Region for further intensification within the agricultural sector.

101. The water quality issue we are facing at the moment is not a compliance or enforcement issue – there simply are no regional plan rules or resource consent requirements in place to deal with non-point source discharges and their impacts. Existing non-regulatory approaches by Horizons and industry (eg. Fonterra's Dairying and Clean Streams Accord) to address non-point source pollution have met with limited success. The voluntary nature of these initiatives has meant that generally only the better performers have responded. Despite this, Horizons will continue to support its own non-regulatory programmes and those developed by industry.

102. To continue as we have is essentially consigning our waterways to further degradation – something the wider community has indicated it is unwilling to accept. This has left Horizons with no other option but to develop a regulatory response to non-point pollution. The key elements of which are - intensive land uses in priority water management zones will be required to apply for a resource consent, and compliance against nutrient loss reduction targets will be monitored through use of a FARMS farm plan and an Overseer analysis.

103. As mentioned previously, Horizons' decision to take a regulatory approach has not been taken lightly, and has only been taken after thorough research and testing. I firmly believe that the framework presented in the POP for tackling non-point source pollution is a workable solution to the issues being faced today, and those we are likely to encounter into the future. I stress that without major intervention at this point, and a major shift in our management approach, water quality in this Region will continue to decline.

104. Finally, it is a source of great pride that of all of the POP chapters, the Water chapter holds truest to the original One Plan vision, in that it:

- reflects what the community wants for the environment;
- focuses on addressing one of the "Big Four" environmental issues;

- promotes efficient resource use whilst protecting environmental bottom lines;
- targets what can actually be achieved in the next 10 years (much of the water allocation framework and supporting tools are already in use); and
- provides clarity and certainty for resource users.

8. REFERENCE

Horizons Regional Council, 2009. Water Quality Survey. Prepared for Horizons Regional Council by Versus Research.

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