

A Submission on:

**DRAFT CANTERBURY WATER MANAGEMENT STRATEGY
Canterbury Mayoral Forum August 2009**

Prepared on behalf of:

Engineers for Social Responsibility [Inc.], Canterbury Branch Committee

By:

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Preamble

The form of this submission is:

1. This preamble.
2. The 'General Comments' which follow. Most of these are supported by the detailed comments [see 3, immediately following].
3. Detailed comments, corrections and suggested changes marked on excerpts from the Draft Strategy document. Some 'Comments', particularly those in the form of questions, are an invitation to consider the clarity or correctness of what is in the Draft document.
4. A few comments related to the Annexes following the General Comments.

General Comments

1. The Mayoral Forum is to be congratulated for a bold and potentially ground-breaking approach.
2. The emphases on sustainability, environmental bottom lines and collaboration are commendable.
3. However, the present wording of the 'desired outcome' makes subsidiary what is primary – sustainability. A revised wording is suggested as a detailed comment: **“To enable present and future generations to maintain healthy ecosystems while gaining sustainable and appropriate social, economic, recreational and cultural benefits from our water resources.”**
4. Although we have not had time to consider this fully, it does seem to us likely that almost all of the objectives of the strategy **could be** achieved without changing the RMA and without implementing all of the new bureaucratic structures proposed. The case is quite well made, however, that the present arrangements **have not worked well** to date.
5. How the membership of the zonal and regional committees is established is vague. What their authorities are is vague. How they will be financially supported is vague. How they will be bureaucratically supported is not presented until Section 4, although their importance is clear from first mention.
6. The independence and authority of the “semi-autonomous executive arm of Environment Canterbury” is unclear and the issue is significant. It needs to be spelled out.
7. Development of implementation programmes could be complex and time-consuming. It is unclear where the skills and resources are to come from.
8. In many places the document is vague or unclear about significant issues, such as the process of “appointing” members of committees and the provision of finance before there is revenue e.g. for infrastructure development.
9. In many places generalisations are made without justification or reference.
10. Adaptive management could be more explicitly incorporated, particularly for such things as setting environmental limits, for which purpose present information is insufficient.
11. Audited self-management could be effective for much more than just environmental aspects, as the Draft suggests.

12. There are places where it seems the strategy assumes readers are familiar with the Canterbury Strategic Water Study [e.g. the bullet points on p. 14] or with other documents prepared for the Steering Group [e.g. Bidwell *et al.*, not listed].
13. There are some issues which are presently contentious, or about which there are unresolved debates, in relation to which the strategy seemingly accepts one point of view without explanation [e.g. 'red' groundwater zones].
14. There is some unfortunate terminology. Throughout, "restoration" [of ecosystems] is used with the inappropriate connotation of 'to some original state'. "Rehabilitation" would be better. "Rights" should not be used – they are "consents".
15. The needed "paradigm shift" in water management to a more integrated and collaborative approach is accepted. However, it does not follow that this completely replaces an 'effects-based' approach.
16. Cooperation and collaboration will be critically important. It is not certain that this will occur easily. There should be pre-emptive provision for mediation and arbitration between and among parties.
17. Biodiversity should be a 'primary', not a 'supporting', principle.
18. It is a key issue in this strategy, but not very clearly stated, that the amount of water available for economic activity is only that amount remaining after all environmental needs have been met. The latter should also include a safety margin for ignorance.
19. Further research on storage options should be a 'short-term' target, both because of the time it will take and to signal urgency.
20. Some tasks said to be 'national' are really 'regional', provided National Policy Statements and National Environmental Standards are in place.
21. There is a basic conflict of the 'water entity' profiting from water sales while being responsible for efficiency improvement.
22. We have found it quite difficult to meet the 2 October deadline, in view of the complexity of the issues. We find it hard to believe that 5 October to 'late October' will really be sufficient time to adequately consider submissions, respond to them with changes if required, make corrections to errors and prepare the strategy for final publication.

Comment on Annexes

We have not had time to consider the annexes in detail. Here are a few items noted:

1. Figure 9 in Annex C incorrectly repeats a label from Figure 8.
2. Annex C on p. 73 has a note "Insert after ..." at Line 4.
3. There is an erratic \pm symbol on Figures 12 and 13 in Annex C.
4. The datum for depth on p.77 in Annex C should be noted: is it below the land surface or below the water table?
5. It is not clear in Annex C on p. 79 that, since we all drink about the same amount, human health is affected by **concentration** of nitrate. The effects of leaching on human health [and recharge] need to take this into account, rather than just considering nitrate **loading**.
6. Annex G does not take into account that the water we **consume** is a tiny fraction of what we **use** and yet the latter dominates our thinking and actions. There is a need to consider appropriate [even in-home] potable water treatment, recycled water [the 'purple pipe'] and dual reticulation.
7. Better management of nitrogenous fertilisers is important for more reasons than nitrate contamination e.g. carbon-equivalent emissions.

David Painter

Hugh Thorpe

On behalf of Engineers for Social Responsibility, Christchurch Branch Committee

3 October 2009

Detailed Comments

Original typeface: excerpts from the draft strategy.

Italic: our comments or corrections.

Preface

Public Discussion

To be successful it requires all parties to engage with it and to do this they need the opportunity to help shape and define it. This is the purpose of **the next two months**.

ESR1: A short time for consideration of complex issues.

Any comments on this draft strategy should be sent to the address below no later than 2 October 2009. The final strategy will be **published at the end of October 2009**.

ESR2: A very short time from 2 October for serious consideration of submissions then publication.

Executive Summary

Role of the strategy

The status of the strategy

This is a draft strategy for public discussion and debate. A final document, taking account of this feedback, is due for publication in **late October 2009**.

ESR3: A very short time from 2 October for serious consideration of submissions then publication.

How the strategy has been developed

Need for a strategy

Canterbury's water resources are vitally important to the region and to the nation. **Lakes, rivers, streams and aquifers are used** for hydro electricity

*ESR4: They also have crucial **natural** functions in catchment drainage and landscape formation.*

Key challenges

Pressure on aquifer systems

- There are now ten red zones in Canterbury, where water has been fully allocated, and four "yellow zones", where allocation exceeds 80% of the **allocation limit**.

ESR5: Generally so, but both the allocation limits and their scientific bases are contested.

Cultural health of waterways

- The cultural health **of freshwater** in **Te Waipounamu** is moderate to poor.

ESR6: Suggest "much freshwater".

ESR7: Do you really mean Te Waipounamu, the entire South Island?

Water quality impairment issues

- If there are to be substantial increases in land-uses associated with nitrogen leaching, then there must be **a corresponding decrease** in nutrient leaching from existing land.

ESR8: This 'zero sum' might be insufficient; lower leaching from existing and new might be necessary.

- Modelling suggests it will be possible to substantially increase agricultural output while maintaining groundwater quality within acceptable limits as long as **nitrogen inhibiting technologies** are applied across the region.

ESR9: This does not manage phosphorus, microbial and other contamination.

Infrastructure issues

- New ways must be found to harness the knowledge and experience of existing irrigators in conjunction with **external** world class engineering,

ESR10: Why only “external”? Suggest omit. We have world class engineers right here!

financial and management resources to build the next generation of **storage**.

ESR11: Why only “storage”? Suggest “infrastructure, including storage.”

ESR12: Insert missing summary sentence: “So ..., the **role of the strategy** is

The Vision

What would success look like?

The desired outcome of the strategy is:

To enable present and future generations to gain the greatest social, economic, recreational and cultural benefits from our water resources within an environmentally sustainable framework.

ESR13 “To enable present and future generations to gain sustainable and appropriate social, economic, recreational and cultural benefits from our water resources.” The present wording makes subsidiary what is primary – sustainability.

If the strategy is successful, the following features should be evident within 10 years:

- ecosystems, habitats and landscapes will be protected and progressively **restored**, and indigenous biodiversity will show significant improvement

ESR14: Some should and will be rehabilitated, not “restored”.

- opportunities to exercise kaitiakitanga¹ and rangitiratanga² will be operative, and **increasing**

ESR15: “evident within 10 years”, but forever is not sustainable.

- water users will have access to **reliable water**, which will be used efficiently and productively

ESR16: Reliable access implies always adequate. This may not be possible and should be made explicit.

- primary production and employment will be **increasing**, and the net value added by irrigation to the Canterbury economy and the national balance of payments will be **increasing**

ESR17: See comment above about “increasing”.

- understanding and empathy between rural and urban dwellers will be **increasing**

ESR18: See comment above about “increasing”.

Paradigm shift needed in water management

The key changes will be:

- **a shift** from effects-based management of individual consents to **integrated** management based on water management zones

ESR19: We do not see how there can be a complete shift from effects-based assessment of individual applications. The whole is the sum of the parts. “Integrated” could still be, or include, “effects-based”. Having said that, an integrated or synoptic approach is also vital.

- water allocation decisions that **address** sustainable environmental **limits** and climate variability

ESR20: Suggest “satisfy”, as it is more definite. We already attempt this but are unsure as to what these limits are in many cases. So work needs to be done on establishing the limits or else provision made for “claw-back” where limits are found to be exceeded i.e. adaptive management.

Regulatory action to deal with environmental problems will need to be complemented with **incentive mechanisms** that progressively drive efficiency in the use of water and responsible land management practices.

ESR21: Good, but what are they?

The key incentive mechanism to drive these changes will be the availability of reliable water from new storage and distribution infrastructure. However, this **new water must be used in a new way**. It must not be over-allocated for

ESR22: So must the old water.

achieve balanced outcomes. In particular, protection of ecosystems, recreational and customary uses, and environmental conservation can no longer be seen as “add-ons” to development, but **mainstream elements** of a sustainability agenda.

ESR23: Good.

Achieving the vision

Principles that must be met

Fundamental principles have been developed to underpin the strategy.

First order priorities: **environment**, customary use, **community supplies** and stock water.

ESR24: Land-forming, catchment drainage, sediment movement are also priorities – see comment above.

ESR25: How about “ecosystem maintenance” for “environment”, an overused word?

ESR26: “Community supplies” is too vague. Suggest “potable water”. If there is a hierarchy then potable water should rank above customary use.

Second order priorities: **irrigation**, renewable electricity generation, recreation and amenity

ESR27: “irrigation and other industrial”.

Primary principles – sustainable management, regional approach, and **tangata whenua**

ESR28: Suggest “tangata whenua values” – tangata whenua are not “principles”.

Supporting principles – natural character, indigenous biodiversity, access, quality drinking water, recreational opportunities, and **community** and commercial use.

ESR29: Too vague. See also comment about “community” above.

These are designed to ensure that our water resource is **managed sustainably**.

ESR30: Good.

Targets

The strategy will focus on delivering a balanced set of quantified outcome targets by specified dates. The **measurable** outcome targets will be in the **following areas**:

ESR31: Good, but some of these will be hard to measure.

These targets will give the strategy a sense of direction and balance and ensure that all aspects of the solution are advanced in parallel. They will also enable progress with implementing the strategy to be monitored and measured over time.

ESR32: ‘Sustainability’ is an ‘area’ and perhaps not entirely covered by “kaitiakitanga”. It could have “measurable outcome targets”.

Parallel development

- in the short term (0-2 years)
 - setting up **governance and implementation structures**

ESR33: This is critically important. The roles must be clearly defined and separation of function monitored.

Integrated Management

At the locality level **10 water management “zones”** are envisaged. Each is sufficiently large to enable the management of abstraction **from surface** and groundwater systems to be integrated with the management of the irrigated areas where the water is used. On the other hand the zone areas are also small

ESR34: However set, boundaries may lead to inter-zone disputes about access to water from e.g. boundary rivers. There must be a process for negotiating these.

ESR35: Suggest “from related surface and groundwater”.

Implementation programmes

Implementation programmes will be developed for each zone and at the regional

ESR36: This could be a long process for 10 zones. Where are the skills and resources? How many years were necessary to develop regional plans? Time frames?? Zonal plans will have to mesh with existing district, regional and national plans.

ESR37: What executive or other powers will zonal committees have? Will they each have a secretariat?

The **zone implementation programmes** will address **matters such as:**

ESR38: These are complex issues. Unless treated very superficially they need professional input.

- environmental **restoration** and development

ESR39: Some should and will be rehabilitation, not “restoration”. See comment 253.

The **regional implementation programme** will address matters such as:

-
- water **demand and** storage and distribution options that cross zone boundaries

ESR40: Suggest inserting “demand management and”.

- rules to ensure water allocation is managed in the public interest, including levies to fund environmental restoration

ESR41: Some should and will be rehabilitation, not “restoration”. See comment 253.

Water governance structure

At local level a **Zone Water Management Committee** will be established for each zone to **co-ordinate the development** of the zone implementation

ESR42: If the ZWMC “coordinate”s, who does the actual work? If the Water Executive, say so.

programme. Membership of the zone committee will comprise some 10 to 20 locally-based people representing Environment Canterbury, territorial authorities with an interest in the zone, Ngai Tahu, consent-holder representatives and **stakeholders, and respected members of the community. The Chair will be a stakeholder representative** appointed by the Committee. This will be the level at

ESR43: Will community members be elected or appointed?

ESR44: Who other than listed are “stakeholders”? Are conservation/interest groups represented?

which many **decisions affecting water management can be made** efficiently and effectively.

ESR45: With what authority?

A **Regional Water Management Committee** is also proposed to handle issues that are common across the region or cannot be managed satisfactorily at zone level. This committee of between 10 and 20 people will bring together representatives of local government, central government nominees, Ngai Tahu and **stakeholders**. The Chair would be nominated by the Canterbury regional and district councils.

ESR46: Readers still don't know who these "stakeholders" are.

There is also a need for national tripartite forum to address issues that are unlikely to be resolved by the zone and regional committees. These issues

ESR47: Why "tri"? Central, regional, Ngai Tahu? It is unclear.

Water Executive

It is proposed that a semi-autonomous executive arm of Environment Canterbury will take on this executive role.

ESR48: What this means needs to be spelled out.

Water infrastructure and services entity

Consideration is being given to setting up a water entity under the auspices of the Canterbury local authorities. Designing, building, financing and operating the

ESR49: A 'local authority trading enterprise'?

larger elements of the regional water storage and distribution system, this could be a council controlled organisation with a 50/50 joint venture with a private investor. Irrigators already operating in Canterbury would, if they so chose, be

ESR50: Who will initiate?? At 50/50 this seems to be heading towards private ownership, or at least control, of water, which is not legal.

programmes. A levy would be paid by the water entity to the Water Executive to fund environmental restoration programmes, and to meet a significant proportion

ESR51: Some should and will be rehabilitation, not "restoration". See comment 253.

Legislative implications

Implementation blueprint

Ecosystem protection and restoration

ESR52: Some should and will be rehabilitation, not "restoration". See comment 253.

Improved environmental flows and water quality standards together with restoration will be a key part of ecosystem protection. A detailed programme of restoration has been developed and is outlined in the strategy.

ESR53: Some should and will be rehabilitation, not "restoration". See comment 253.

Investment in new infrastructure

The following short-list of options for infrastructure development and other ways of delivering reliable water to the system has been developed. The key shortlisted projects are:

- use of Lake Coleridge for storage
- efficiency improvements in mid Canterbury
- groundwater storage in Central Plains
- Hurunui integrated option
- Lees Valley storage
- Lake Tekapo water for South Canterbury
- extension of Hunter Downs to north.

ESR54: The above bullets should be expanded slightly to make them more understandable. Just a sentence or two.

The detailed hydrological modelling that has been done has demonstrated that it

ESR55: Canterbury Strategic Water Study? If so, say so.

Allocation and use of groundwater

This uncoordinated granting of water consents is damaging the ecosystems of the

surface rivers and streams, and water quality in the aquifers. Farmers in the
ESR56: The strategy should be upfront that any intensification of agricultural activity will degrade groundwater quality somewhat. The issue is to determine by how much and debate how much is acceptable.

storage will be used to solve this problem. This will make it possible to use stored water for irrigation purposes in the upper part of the catchment instead of groundwater, **restoring healthy flows in the lowland streams.**

ESR57: Flows yes, but what about the quality of water in those spring-fed streams?

Water allocation and charging regime

A key issue to be resolved in the implementation programmes will be the charging regime to apply to existing consent holders. Clearly this regime will need to have regard to the value of existing water **"rights"**.

ESR58: We suggest that the word "rights" should not be used as they are "consents" which puts a different slant on the matter.

Land management practices

Water use efficiency

A key part of the strategy is to improve the provision of the necessary signals to consent holders and infrastructure providers. There are three key processes within the strategy aimed at addressing water efficiency improvements:

- linking efficiency requirements to access reliable water from new and, in the medium term, **improved existing infrastructure**

ESR59: Vague! What does this mean?

- zone **implementation** programmes to address water-use efficiency

ESR60: Implementation of what?

- a brokering system that would allow inefficient or unproductive use of water to be "bought out" and the water **reallocated** for environmental purposes, or for more efficient irrigation uses.

ESR61: By whom?

- **localised transfer** of water allocations between consent holders will continue to be possible, subject to safeguards to prevent unintended consequences for the environment or other users.

ESR62: Brokering, trading or local transfer of consents cannot be separated from associated environmental effects.

Auditing and enforcement

Mechanisms will be introduced to improve monitoring performance including:

- **audited self-management programmes** to encourage farmers and others to monitor and improve their own performance, to demonstrate their cumulative environmental effects are within acceptable environmental limits

ESR63: It's hard to imagine a busy farmer having much time to systematically self-manage environmental effects.

Next Steps

The completed version of the strategy is to be published **in late October**. A number of activities will flow on from that point. Next step activities include:

ESR64: A very short time from 2 October for serious consideration of submissions then publication.

- **Zone and regional water management committees** Once endorsement is gained from the councils and Te Runanga o Ngai Tahu the next move would be the appointment of the zone and regional committees and **getting them working**

ESR65: Some members will be presumably ex-officio but some are community reps. Will these also be appointed or elected?

-
- Resolution of national issues national level discussions with the tripartite partners

ESR66: Why “tri”? Central, regional, Ngai Tahu? It is unclear.

Monitoring implementation of the strategy

Section 1 Role of the strategy

Need for a strategy

Along with number of deficiencies in the execution of the Resource Management

ESR67: Insert “a”. Suggest bold “**execution**”.

Act over many years there has been a lack of clear policy and direction in the management of water, largely as a product of the applicant driven approach to implementation of the RMA. There is little (or no) meaningful reflection of kaitiakitanga values in formal decision making processes. In order to implement

ESR68: Hyphenate “decision-making”.

The problems are complex and multi-layered. Ongoing leadership will be required at local, regional and national levels, and the different interest groups will need to cooperate over a sustained period of years to make it happen.

ESR69: This is critically important. It should not be taken as given that this cooperation will occur easily, and provision must be made for early mediation and arbitration of disputes in order to stay out of the formal legal system.

This strategy therefore provides a long-term direction for the management of all water in the region, combining current and contemplated projects and activities. It will integrate infrastructure, environmental flows, water quality, land-use, water allocation, ecosystem protection and restoration, and demand management.

ESR70: The term “restoration” is often used in these contexts but it would be more realistic to use “rehabilitation” as full restoration may well be impossible. See comment 253.

The status of the strategy

Essentially this is a leadership document. Successful water management will be dynamic. Management will be adaptive. This document is intended to set off a programme of activity which will in turn set off further actions with solutions arrived at adaptively and the process ongoing

ESR71: Insert “Management will be adaptive.” Change “and cumulatively a solution will be” by “with solutions arrived at adaptively and the process ongoing.”

With the release of this document we expect further public and stakeholder discussion to take place. We also expect that public bodies such as central government, councils and NGOs will respond to the strategy as a whole, or specific

ESR72: Replace “are also expecting public bodies” by “also expect that”

points in it. A final document, taking account of this feedback, is due for publication in late October 2009.

ESR73: From 2 to end October is a very short time to consider comments and then publish.

The Ministers of Agriculture and Environment have been closely engaged throughout the development of the strategy and have given their support to the strategy development exercise and its general thrust.

ESR74: Delete “the strategy development exercise and”

The strategy will also serve as a guiding document for ongoing collaboration between Ngai Tahu and other key decision makers within the territory. As

ESR75: Insert “document”. Replace “guiding document” by “guide”.

How the strategy has been developed

The Steering Group was chaired by Mayoral Forum member Mayor Bede O'Malley (Ashburton District Council) and included representatives of local and central **Government and tangata** whenua and community group representatives including environmental, farming, industry, and recreational interests. The Steering Group was supported **an** expert Officials Group drawn from central and local government.

ESR76: Replace “and” by a comma. Insert “supported by an”.

This established that to secure community support for new water storage, rigorous scientific and public consideration was required in the following areas:

-
- methods for maintaining or improving flow variability and low flows in **major** rivers

ESR77: What about minor rivers?

Vision - what would success look like?

The desired outcome of the strategy has been agreed by the Mayoral Forum as:

To enable present and future generations to gain the greatest social, economic, recreational and cultural benefits from our water resources within an environmentally sustainable framework

ESR78: “To enable present and future generations to gain sustainable and appropriate social, economic, recreational and cultural benefits from our water resources.”

The present wording makes subsidiary what is primary – sustainability.

If the strategy is successful, the following features should be evident in 10 years time:

- there will be a high level of audited self management, **and compliance** action will be targeted on a minority of non-complying water users

ESR79: Insert “and strengthened compliance”.

- ecosystems, habitats and landscapes will be protected and progressively **restored**, with indigenous biodiversity showing significant improvement

ESR80: See previous comment 70 about restore/rehabilitate.

- water quality will be protected and **starting to return** to within healthy limits for human health and ecosystems

ESR81: Replace “starting to return” by “improving”.

- **Water**, users will have access to **reliable** water,
- which will be used efficiently and productively

ESR82: Replace “water” by “Within the limits of the resource”. “reliable” does not mean it will meet all requirements. The resource will still be limited.

Principles that must be met

Fundamental principles have been developed to underpin the strategy. These are set out in Annex B. They comprise:

- primary principles – sustainable management, regional approach, and tangata whenua
- supporting principles – natural character, indigenous **biodiversity**, access,

ESR83: We suggest this should be a primary principle.

First and foremost our water resource must be **sustainable**. This means water quality and water levels and flows must be maintained for future generations. Both surface and groundwater must be given equal importance.

*ESR84: Insert “sustainable for both ecosystem support and human use.” This means the ecosystem support, land-forming, catchment draining and sediment moving **natural** functions must also be respected.*

Second, the Mayoral Forum has quite deliberately set priorities. So the first order priorities are **environment**, customary use, community supplies and stock water.

ESR85: Good. This is consistent with our comment above about biodiversity.

The principles seek a consistent approach across the region, recognising Ngai Tahu traditional and cultural guardianship **to** all water and lakes, rivers, waterways and wetlands.

ESR86: Replace “to” by “of”.

Section 2 Key challenges

Canterbury’s dependence on water

There are three main types of river (see Figure 1 below). Firstly, there are the alpine rivers with their upper reaches in the Southern Alps/Ka Tiritiri o te Moana, which are **snow-fed and alpine rain-fed**. These have early summer peak flows.

ESR87: Replace “snow-fed and alpine rain-fed” by “largely fed by snow and rain spilling over from the West Coast.”

Secondly, there are the foothill rivers with rain-fed catchments. These have winter peak flows. Thirdly, there are **lowland streams that are spring-fed from groundwater**.

ESR88: Insert “spring-fed” lowland streams and delete “that are spring-fed from groundwater”

Canterbury also has an extensive groundwater system, with aquifers ranging from just below the surface to 300 metres or more deep. These aquifers are recharged from rainfall infiltration with contributions from the alpine and foothill rivers and from other surface water. They eventually discharge into surface water **such as** lowland springs, wetlands, streams, lakes or directly into the sea.

ESR89: Replace “such as” by “via”.

The seven alpine rivers (those named in Figure 1 above) contribute 88% of the flow from Canterbury’s rivers, **and are** much greater in volume than **its** foothill rivers. Lowland streams have even smaller flows.

ESR90: Delete “and are”. Replace “its” by “the”.

Over recent years Canterbury’s agricultural sector has made increasing use of water to increase productivity. **The irrigated** area in Canterbury is 500,000ha⁷,

ESR91: Insert “The presently irrigated”.

which contributed an estimated net \$800 **million at farmgates** (see Table 1 below) to national GDP and \$1.1 billion of exports in 2007/08.

ESR92: Insert “million to national GDP at the farm gate”

The Canterbury region now allocates 58% of total water allocated in New Zealand, **and** has 70% of the country’s irrigated land and 65% of the nation’s

ESR93: Delete “and”.

storage capacity for hydroelectricity. **On a relative basis - as** a proportion of low and average flows **- there is** more **water abstracted** from the foothill rivers and lowland streams than from the larger alpine rivers.

ESR94: Replace “On a relative basis - as a proportion of low and average flows - there is more water abstracted” by “As a proportion of low and average flows, more water is abstracted”.

Key issues

Pressure on river systems

- minimum flushing flows – sufficiently frequent flushing flows (typically about three times the mean flow) are needed to dislodge **algae** and prevent build up of algae

ESR95: Delete “algae”.

- flood flows – sufficiently frequent flood flows (greater than once a year) **are needed** to ensure turnover of gravel in the river bed in order to maintain the braided character of Canterbury’s major rivers.

ESR96: Flood flows are needed in braided rivers for more reasons than just this one and also needed in rivers other than braided.

8 Farmgate GDP is almost the same as the revenue minus costs of production, before the value added in processing etc beyond the **Farmgate**. The \$800m is the sum of the dairy, arable, horticulture and pastoral production in the table, minus the value that would have been produced without irrigation (\$220m) to give a **net** GDP from irrigation.

ESR97: Replace “Farmgate” by “farm gate”. Bold “net”.

Run-of-river takes are near the limit of what can be safely abstracted while maintaining **these** minimum flows. Restrictions are already **widely in use**. Table

ESR98: Delete “these”. Replace “widely in use” by “widespread”.

Pressure on aquifer systems

There are now ten red zones in Canterbury and four “yellow zones”, where effective allocation exceeds 80% of the allocation limit (see Figure 2 below).

ESR99: Replace by “There are 27 groundwater zones in Canterbury of which ten are now “red” and four “yellow”, where effective allocation exceeds 80% of the allocation limit (see Figure 2 below). These red zones are most of the largest and most productive areas on the plains.”

Cumulative effects on ecosystems

- in parts of the hill and high country, accelerating land use change and intensification is threatening the important indigenous **habitat that remains**.

ESR100: Replace “habitat that remains” by “habitats that remain”.

The situation has been exacerbated by a combination of a series of dry winters for the period 2000 to 2005, with low recharge of the aquifers which feed the lowland streams, and increasing **levels of abstraction from groundwater**.

ESR101: Replace “levels of abstraction from groundwater” by “volumes of groundwater abstraction. Over the same period, flows in lowland streams have reduced and become more erratic”

This illustrates the vulnerability of Canterbury’s lowland streams with current **levels of abstraction**.

ESR102: Insert “levels of aquifer recharge and abstraction.”

One of the prime concerns with land use intensification is the potential for **water quality impairment**, in particular nitrate contamination of surface water and groundwater.

ESR103: Virtually all use of water by humans impairs the quality to some extent. What level of impairment will we accept?

Water quality is an important component of freshwater **ecosystem**

ESR104: Replace “ecosystem” by “ecosystems”.

but its quality is also critical for **its** human and stock uses. In 2008/9, 10% of

ESR105: Replace “but its quality” by “and”. Delete “its”.

wells monitored by Environment Canterbury had nitrate levels that exceed the New Zealand Drinking Water Standard. Nitrate concentrations in surface waters are also higher than acceptable **concentrations** based on criteria for toxicity to fish and the avoidance of nuisance plant growths.

ESR106: Delete “concentrations”.

Cultural health of waterways

Major issues influencing this result include intensive catchment modification and land-use and the widespread loss of native riparian vegetation that can provide a buffer against land-use and habitat for valued species. Obvious point and nonpoint source pollution along with a lack of **water quantity** were also noted as issues across the majority of sites.

ESR107: Replace “water quantity” by “surface flows”.

The study established that the greatest issue facing waterways in Te Waipounamu is the protection, restoration and enhancement of native riparian (river bank) vegetation to provide greater habitat for taonga bird and fish species as well as providing a buffer from intensive land-use. Greater awareness of the food gathering **quality** of waterways and the development of a national standard for freshwater food gathering is also important, as well as **achieving a greater focus** on measuring and accounting for cumulative effects of non-point source pollution and water abstraction, particularly from agriculture.

ESR108: Replace “quality” by “values”. Replace “achieving a greater focus” by “focussing”.

Water use efficiency

As water availability **is coming** under pressure, it is important to consider the efficiency of water use from a demand management perspective. Improvements in **the** efficiency of water use would enable existing water allocations to be used to restore river flows and groundwater **recharge**, reducing the extent to which investment is needed in water storage facilities, with their inherent environmental and social impacts and high capital costs.

ESR109: Replace “is coming” by “comes”. Delete “the”. Replace “recharge” by “pressures”.

There are some substantial efficiency gains that can be made by addressing efficiency at property, scheme and catchment scale in an integrated way. The key is to improve the reliability of the supply so that the availability of water can be matched more precisely to the needs of the crop or pasture being irrigated. This in turn encourages greater investment in improving efficiency of water use on farms. Recent development on farms served by the Rangitata Diversion Race has demonstrated **the** benefits.

ESR110: Replace “There are some substantial efficiency gains that” by “Substantial gains”

ESR111: Replace “the” by “such”.

ESR112: Yes. But note the often increased energy use and effects on electricity network operation.

In town or city supplies there is potential to reduce consumption. Christchurch has a relatively high per capita consumption of water, which can be addressed through **supply-side management** (such as **leaking** control) or demand-side management (such as incentives for water-efficient devices)⁹. Stock water systems are another area where there is potential for efficiency improvements, particularly when the design of these delivery systems is incorporated into irrigation infrastructure.

ESR113: Replace “leaking” by “leak”.

ESR114: Also rainwater tanks and recycled water for some uses.

Stage 4 of the Canterbury **Strategy** Water Study illustrated the potential gains

ESR115: Replace “Strategy” by “Strategic”.

Future trends

If current trends are allowed to continue, therefore, the pressures on Canterbury’s water management system will increase. Figure 3 below summarises **what** the worsening future supply and demand situation if current trends continue.

ESR116: Delete “what”.

Legend

Yellow - Supply/demand **ration** in **worse** case year >1. Moderate storage needed. Require river flows outside irrigation season to fully replenish storage.

ESR117: Replace “ration” by “ratio”. Replace “worse” by “worst”.

Orange - Average annual supply/demand **rate** >1. Storage possible but less likely. Large storage required which would not fully replenish every year.

ESR118: Replace “rate” by “ratio”.

Grey - There **is** insufficient data to compare with demand

ESR119: Replace “is” by “are”.

Implications of further land use intensification

Irrigation development has the potential to deliver significant long term economic growth to New Zealand. Primary production accounts for over 70% of New Zealand’s exports. Improved reliability in the supply of water to existing irrigated areas will also lead to an increase in the value added by the regional economy. An additional 350,000 hectares of irrigated land in Canterbury would produce an increase of over \$700 million in value added and around \$350 million in household income¹⁰ each **year**

ESR120: Insert full stop.

Potentially the region has enough water to meet foreseeable irrigation **demands** **and** environmental in-stream flow and groundwater recharge requirements. This could be achieved through much more efficient use of existing water allocations and storage of water from alpine river catchments at times when there are sufficient flows available.

ESR121: Replace “and” by a comma.

Water quality impairment issues

A key concern for this strategy is managing **those sources** of pollution that arise from land use intensification **and are difficult to pinpoint to an individual property or source location**. Of particular concern are nitrate and bacterial contamination of ground and surface water.

ESR122: Insert “those dispersed sources”. Delete “and are difficult to pinpoint to an individual property or source location”.

A recent strategic investigation study (Bidwell et **al**) has investigated the likely

ESR123: Replace “al” by al.” List all references in the final Strategy document.

The groundwater systems have a limit on how much nitrogen (or other contaminants) can go into them before drinking water **standards and** surface water quality is **exceeded**. If there are to be substantial increases in land-uses associated with nitrogen leaching, then there must be a **corresponding decrease** in nutrient leaching from existing land.

ESR124: Insert “standards are breached and”. Replace “exceeded” by “compromised”.

ESR125: The first sentence would be better as: “Groundwater and surface water systems have limits on how much nitrogen (or other contaminants) can go into them before drinking water and water quality standards are exceeded.”

ESR126: The “corresponding decrease” zero sum might be insufficient; lower leaching from existing and new might be necessary.

Figure 6 below shows the modelling results for full intensification of irrigable land assuming a 20% reduction in nitrate discharges is achieved through improved land management practices.

ESR127: This might still entail increased nitrate leaching over the whole plains.

This illustrates a clear **trade off** between intensification of **land-use** and the management of nutrients on all land. Since it is technically and economically feasible to achieve a 20% reduction in nitrate discharge rates, the modelling suggests it will be possible to substantially increase agriculture output while maintaining groundwater quality within acceptable limits as long as nitrogen **inhibiting technologies** are applied across the region.

ESR128: Replace “trade off” by “trade-off”. Replace “land-use” by “land use”. Replace “inhibiting technologies” by “leaching inhibitors”.

Infrastructure issues

With the current inefficiencies in the use of water, a huge investment in infrastructure would be needed to provide enough water to restore minimum flows to surface and groundwater systems, ensure reliable supplies for existing users, and deliver additional water for further land use intensification. Even if resource consents could be obtained for new infrastructure on this scale it would be uneconomic to build. The high costs of financing the investment would price Canterbury's agricultural products out of international markets.

ESR129: Under orthodox, i.e. short horizon economic analysis, this may be so but irrigation systems once functioning are there for the long term. Would the RDR systems ever have got off the ground without massive support from the governments of the day? Possibly, but the highlighted sentences are assertions unsupported by evidence here.

There are 34 irrigation schemes in Canterbury over 500 hectares. Most of them were originally funded with substantial public sector capital assistance. They are relatively small and were established with the needs of particular catchments and

ESR130: The RDR schemes are quite large.

localities in mind. As currently configured their governance and funding structures are not suited to achieving the economies of scale which will be necessary if the infrastructure investment is to be economically viable, nor to providing minimum flows and the other features that will make them environmentally acceptable.

ESR131: This is a bold assertion which needs to be supported by evidence.

To deliver the next generation of irrigation schemes in Canterbury, new ways must be found to harness the knowledge and experience of existing irrigators in conjunction with external world class engineering, financial and management resources.

ESR132: Why only "external"? Suggest omit.

Will the current approach address the problems and deliver the desired outcomes?

While there was a surplus of water available for allocation, this was a reasonable basis for water allocation. However, in Canterbury, where water availability has become rapidly constrained, and cumulative environmental effects are already at unacceptable levels, the current applicant-driven method of allocation is no longer able to deliver satisfactory outcomes. An example of this is the large number of consents granted in recent years to abstract groundwater from aquifers under Canterbury plains, and the knock-on adverse effects these have had on the flows in spring-fed lowland streams.

ESR133: Replace "has become rapidly" by "has recently become severely".

"no longer able" is a bold assertion which needs to be supported by evidence.

ESR134: Replace "knock" by "flow". Delete "flows in."

This is not a problem with the present allocation method 'per se' but of poor management and administration of it.

Regulatory action to deal with these problems in Canterbury has proved ineffective and is imposing high compliance costs on the public and the productive sector. The adverse affects are invariable more than "minor" and therefore under the RMA involve legal proceedings.

ESR135: Replace "invariable" by "invariably".

Increasingly the system is becoming highly adversarial. This, more than anything, is an illustration of the breakdown of trust and confidence between environmental/conservation and farming/irrigation interests in the context of unprecedented pressure on the water resource and the lack of a clear strategic approach to water management. A very important part of this strategy is to improve the collaborative input of stakeholders to the integrated management of Canterbury's water resources.

ESR136: We strongly support this!

The fundamental problem is that the effects-based, first-come/first-served water

allocation process allows existing consent holders to use water resources and to pollute up to the “limit”. There is little incentive for them to “make room” for further development by rationalising their consents and becoming more efficient and responsible in their use of water and land management practices.

ESR137: Other problems are that until recently ECan routinely granted consents for the maximum of 35 years, meaning that the resource is tied up for possibly decades and also the present situation where at the end of a consent the holder has priority in renewal.

Given Canterbury has reached this point, the current legislation **may not allow** for timely delivery of the strategy and therefore could hinder the ability of the **collaborative governance** approaches put forward in this strategy to restore the necessary trust and confidence.

ESR138: “may not allow” is a bold assertion which needs to be supported by evidence.

ESR139: Do not assume that this “collaborative governance” will emerge automatically. It must be planned for carefully.

Paradigm shift needed in water management

It is now widely recognised in Canterbury that there is a need **for new** paradigm in the way water is allocated and managed. There **is** capacity for further development but it will require **existing users** and new users to improve the way they use water.

ESR140: Insert “a”.

The key changes will be:

- management of the cumulative effects of water abstraction and land use intensification

ESR141: Who will be the managers and what powers will they have to change behaviour?

•

The key incentive mechanism to drive these changes will be the availability of **reliable** water from new storage and distribution infrastructure. However, this

ESR142: We make the point again that “reliable” water may not mean a guarantee of supply meeting demands every year. There will always be uncertainty in any climate driven activity. But it should be a lot better!

new water must be used in a new way. It must not be over-allocated for production purposes, as some water resources have been, but instead used to achieve balanced outcomes:

ESR143: So must the old water!

•

- **providing reliability** of supply of **water in** exchange for investment in efficient irrigation systems and improved land management practices

ESR144: Insert “providing improved reliability”. Insert “water (but not guaranteed) in”

- generating revenue to fund environmental **restoration** and ongoing ecological, recreational and cultural development.

ESR145: More likely “rehabilitation” than “restoration”. See comment 253.

In particular, protection of ecosystems, recreational and customary uses, and environmental conservation can no longer be seen as “add-ons” to development, **but mainstream elements of a sustainability agenda**.

ESR146: Good! Insert “but as mainstream”.

What are the risks?

This strategy seeks to integrate the processes of water management, making them more effective and restoring trust between the parties involved. It is imperative stakeholders and the public have confidence that fundamental changes are being made to regulatory and economic mechanisms to ensure the new water:

- protects and repairs the environment

- balances economic growth with social and cultural needs
- makes effective and efficient use of the resources employed.

ESR147: All good!

The key to success will be building public and stakeholder confidence that the various strands of the strategy will be implemented in an integrated manner, in particular:

- influencing the Government's reforms to the Resource Management Act to provide a mandate for integrated management of water in Canterbury and to speed up the implementation of the strategy

ESR148: Phase 2 of the RMA reforms (including fresh water) comes up next year.

- ensuring that environmental protection and restoration will happen

ESR149: Probably "rehabilitation". See comment 253.

- reassuring consent holders that existing water allocations will not be forcibly removed

ESR150: But what about conditions being modified or takes being partially constrained?

- avoiding heavy administrative and compliance costs on water users and general ratepayers.

ESR151: We have a concern that administrative cost may increase with the ten area committees needing considerable support.

The remaining sections of this document explain the options the Mayoral Forum has considered for managing these risks, and the strategic approach that has been adopted to achieve the desired outcomes and meet the fundamental principles.

ESR152: We have just attended the MfE roadshow on RMA changes. It seems apparent that ECan and TLAs will need to modify various plans which could soak up a lot of staff time that might otherwise be available for facilitating these proposals.

Section 3 Achieving the vision

Options considered

The collaborative work done by the Mayoral Forum in developing the Canterbury Water Management Strategy suggests there is now a willingness among stakeholders to work together to deliver a strategic approach.

ESR153: This is significant and positive.

The current emphasis on applicant initiative and regulation of effects under the current Resource Management Act framework will be replaced with a strategic, collaborative approach which will include the following key elements:

ESR154: If it is clear that the "emphasis" will be "replaced", this is OK. But it can be read that the "approach" will be replaced. This would be better as "will be complemented".

- restoration and repair of habitats and ecosystems
- restoration of river flows where they have fallen below acceptable levels as a result of over-allocation

ESR155: Some should and will be rehabilitated, not "restored". See comment 253.

- incentives, transferable permits, brokerage and other economic mechanisms to encourage more efficient and productive use of existing water allocations, improved land management practices, and a better balance in abstraction between surface water and groundwater

ESR156: Yes, but see a previous comment [62] about the environmental effects of permits being site-specific.

- **audited self-management systems** to encourage water consent holders and others to monitor and improve their own performance.

ESR157: A big task which must be done conscientiously.

Strategic options

Option A – Business-as-Usual (the base case)

Option B – Advance environmental protection then infrastructure development

This option would **addressing** degraded environments, waterways under pressure from abstraction and decline in threatened species, before consideration was given to future major infrastructure development.

ESR158: Replace “addressing” by “address”.

In the short-term the focus would be on:

- **setting environmental limits**

ESR159: By whom? How?

- initiating **restoration, recovery and repair** of environmental values

ESR160: Mostly “rehabilitation”, not “restoration”. See comment 253. And who pays?

- **improving efficiency** of water use for existing consents

ESR161: Who audits?

In this option infrastructure development would only happen once agreed environmental values were secure and compliance with **environmental limits** could be demonstrated.

ESR162: Environmental limits are uncertain and this should be acknowledged. Therefore adaptive management will be necessary.

Option C – Reconfigure **consents and infrastructure** to provide further water for irrigation and to improve reliability of supply while looking to protect and enhance the environment.

ESR163: Is “existing” intended?

Unlike strategies A, B and D this strategy would take the opportunity to **reconsider existing consents and operation of infrastructure, and redistribute water** across the region for both surface and groundwater.

ESR164: See previous comment [62] about unacknowledged complications in water redistribution.

Environmental flows, water quality standards, catchment limits for nutrients and sediment, and demand management **would all be advanced** as part of the reconfiguration of consents and infrastructure.

ESR165: OK, as long as all are advanced evenly.

Option D – Advance infrastructure development alongside environmental repair and protection

Difference between the options

Unlike Option A, the three alternative strategic options (B, C and D) would involve a significant degree of coordination and evolution of governance. The differences between Options B, C and D are largely around the priority given to the three elements of an approach. The options can be characterised as Environment **led** (Option B); Efficiency **led** (Option C); and **Storage led** (Option D).

*ESR166: All 3 “led”s yes, but **not** dominated by.*

ESR167: Perhaps it should be “Development led”. Storage is an important tool, but only one among others.

ESR168: Storage is acknowledged by all parties to be critical to sustainable water management in Canterbury, so focus serious research/feasibility studies on a hierarchy of storage possibilities – urgently.

“Coordination” in this context does not mean the elimination of private sector initiative. Instead the aim would be to provide a framework that would **reduce unmanageable risks and uncertainties** for all participants.

ESR169: OK, but significant risk and uncertainty will remain and must be acknowledged.

Sustainability appraisal

The four options were subject to a Sustainability Appraisal by the Steering Group and **officials** Group (technical **Advisors**) using a framework developed by Sadler and Ward (2008)¹¹ to reflect New Zealand institutional arrangements. The framework is founded on four pillars of sustainability (social, economic, environmental and cultural) which correspond to the four **well beings** of the Local Government Act.

ESR170: Replace “officials” by “Officials”. Replace “Advisors” by “advisors”.

ESR171: Replace “well beings” by “well-beings”.

When considered **at the sub-regional level** the workshop participants considered that combinations of Option B, C and D were most likely to achieve sustainability at the sub-regional level.

ESR172: This makes sense given the obvious diversity of the 10 sub-regions. As usual, 1 size will not fit all.

Outcome of consultation

Accordingly the Mayoral Forum has adopted **a revised strategic approach** that will involve:

ESR173: A good response to consultation.

- explicit recognition of **environmental limits**

ESR174: Good, but by whom and how?

- programmes to restore **ecological health and functioning** to sustainable levels

ESR175: Very good.

- development of infrastructure, technologies and practices to **progressively deliver improving** environmental, social, economic, recreational and cultural outcomes for Canterbury

ESR176: Vague.

- **evolution of governance structures** to enable local government to better meet the challenges identified.

ESR177: Critical. It will need good will to go with good structures.

The strategy needs to be holistic in its approach rather than sequential because:

- reliable water can be used to **incentivise** more efficient irrigation and land management practices, and so **improve** river flows and groundwater **recharge**

ESR178: “incentivise” Yuk! Why not “encourage”?

*ESR179: More efficient irrigation will probably **not** improve recharge.*

- no further allocation will be permitted in **“at-risk” areas** and, where there are serious threats to the environment, regulatory action to review consents may have to be taken

ESR180: Does this mean ‘red zones’?

- the degree of success in implementing efficiency and reconfiguration measures will determine how much new infrastructure will be **needed, and** at what cost

ESR181: Insert “needed, when, and”.

Given the inter-dependencies between these factors – and the long lead times for planning of infrastructure – it is vital that water infrastructure planning **proceeds in parallel** with measures to improve water use efficiency, water quality and biodiversity.

ESR182: Agreed.

Strategic approach and targets

To effect a total solution a balanced programme of parallel development is required that will look like this:

- in the **short term** (0-2 years)

ESR183: Yes, but 0-2 years should include researching storage options to signal urgency. Other infrastructure hangs on this.

The strategy will focus on delivering a balanced set of quantified outcome targets by specified dates. The measurable outcome targets will be in the following areas (these are set out in detail in Annex G):

- **kaitiakitanga**

ESR184: Insert “kaitiakitanga discussed and encouraged”

- **natural character of braided rivers**

ESR185: Insert “rivers maintained”.

- **recreational opportunities.**

ESR186: Insert “opportunities improved”.

These targets will give the strategy a sense of direction and balance and ensure that **all aspects of the solution are advanced in parallel**. They will also enable

ESR187: Very important.

progress with implementing the strategy to be monitored and measured over time. The targets have been developed in consultation with environmental, conservation, farming and irrigation interest groups. **Before they are finalised for the October publication of the strategy** these interests will be brought together to **cement an unequivocal commitment to them**.

ESR188: As commented on in the Introduction, there is a short time only for a lot to happen between now and the projected publication date. This “commitment” is very important.

It needs to be stressed that the Mayoral Forum sees these targets as **commitments**, not simply aspirations. It recognises that at times in the past environmental targets have been seen as good intentions rather than committed targets. That is not the intention with the Canterbury Water Management Strategy.

ESR189: Good.

Section 4 Coordination and delivery framework

Implementation drivers

Consultation with the stakeholders and the general public has shown a strong preference for a “mixed economy” approach to implementing the strategy. This will mean developing **a coordination framework that works with the grain of market forces to provide incentives to drive efficiency and innovation within the Resource Management Act’s regulatory framework**. The Mayoral Forum has therefore adopted this approach, which it believes will be far more effective than the alternatives of “laissez faire” reliance on market forces, or heavy handed regulation.

ESR190: This is a laudable response to consultation and a potentially effective approach. However, it is likely that more than “coordination” will be required.

Strategic drivers

Treaty of Waitangi partnership – Ngai Tahu **rights** as protected under the Treaty of Waitangi

ESR191: More than “rights” – “opportunities”.

Operational drivers

Collaboration – implementation to be developed collaboratively by local and central government, Ngai Tahu as tangata whenua, and stakeholder interest groups, with the **general public to be given the opportunity** to influence the development of the programmes

ESR192: Vague. How?

Knowledge – implementation to provide for sharing of knowledge and scientific evidence so that all participants can work off a common factual base

ESR193: How about: “**Education** – to inform the public of progress and results.”

[The public must support the strategy or political blocks and factions will emerge.]

Subsidiarity – individual consent holders, user groups, communities and stakeholders to be **empowered to resolve issues and develop implementation programmes at the lowest practicable level** in the coordination hierarchy

ESR194: A good principle. It must be in accord with the RMA.

Restoration – implementation to actively promote improved ecological health and functioning in degraded and over-allocated catchments

ESR195: We have made this comment all through the Draft Strategy document. Some should and will be rehabilitated, not “restored”. See comment 253.

Confidence – water users, investors, stakeholders and the public to have a high **a** level of confidence that implementation programmes will be delivered in their entirety, and effectively enforced.

ESR196: Delete “a”.

Whilst all of these drivers are important, one stands out and that is collaboration. The public consultation document asked submitters whether they thought such an approach is important – 85% said it was. This same sentiment dominated stakeholder discussions. Stakeholders, whether environment or production driven, repeatedly asked that they be given the opportunity to resolve their differences and find solutions together. They demonstrated a strong sense of confidence that this would be possible. The strategy proposes an approach in which **zone collaborative management is the foundation**.

ESR197: Great principle provided it is carefully established with due allowance for human nature! People will be competing for water. It is well worth a very good try!

Integrated Management

An integrated management framework is needed to guide decision-making, with incentive mechanisms to drive change. Under the proposed approach (more details at Annex H):

- implementation programmes will be developed **to set environmentally sustainable limits and targets** on efficiency and **reconfiguration**

ESR198: This will not be simple. These limits and targets very important.

- activities to restore **ecological health and functioning** will be instituted in accordance with the planned timetable outlined the targets

ESR199: Needs a lot of unpacking.

- **incentives** will be provided to progressively improve the efficiency of water

use, reconfigure allocations in accordance with the relevant implementation programmes, and implement **environmentally responsible land management practices**

ESR200: *What incentives improve this?*

- **localised** transfer of water allocations between consent holders will continue to be possible, **subject to safeguards to prevent unintended consequences** for the environment or other users.

ESR201: *Yes! This is the first acknowledgement of complications.*

- activities and processes to provide for kaitiakitanga will be identified and instituted **in accordance with the targets**

ESR202: *“and in discussion with Ngai Tahu runaka”. Note that there are numerous runaka in Canterbury and each will have a specific contribution to make to the group responsible for their rohe.*

- applications for resource consents under the Resource Management Act that **comply with the relevant implementation programme** will avoid the need to revisit matters that had already been approved in the programme

ESR203: *Who certifies?*

- measures to **address** water quality and the impact on it of land use practices will be implemented

ESR204: *Not just “address” – “manage”.*

- **self-monitoring, auditing and reporting** will ensure a level playing field for the users and suppliers of water within the set environmental limits

ESR205: *Ecosystems can not self-monitor, so who will?*

- a blend of regulatory and voluntary **approaches will** be used.

ESR206: *Insert “approaches with strong monitoring will”.*

This approach has some challenges, notably:

- there will be **a cost in developing the implementation programmes which would have to be recovered from water users and/or ratepayers.**

ESR207: *This is a very significant issue. Many costs would be incurred **before** rates revenues provide some of the income.*

- incentives for existing users to reconfigure water allocations and phase out inefficient systems will, in some cases require **a new revenue stream.**

ESR208: *This is a very significant issue. Many costs would be incurred **before** rates revenues provide some of the income.*

Effective decision making structure

Local water management

Canterbury’s catchments **cannot be managed in an integrated fashion because** groundwater zones can **overlap** catchments. For example, the Culverden

ESR2090: *We do not accept the logic of this. All real systems are ‘open’ systems, with inputs and outputs.*

ESR210: *Replace “overlaps” by “underlie two”.*

groundwater basin **overlaps** the Hurunui and Waiau catchments. There are also

ESR211: *Replace “overlaps” by “underlies parts of”.*

Accordingly **ten water management “zones” have been identified** that are

ESR212: *Notwithstanding comment about logic above, we support the concept of the zones identified.*

Regional water management

These two key controls should provide incentives and constraints for **integrated management at zone level** to work with minimal interference from the region.

ESR213: *Really “management”? This implies ten little zone bureaucracies with offices, vehicles, CEO’s, etc.*

Implementation programmes

The implementation programmes will be developed at zonal and regional levels. Central government, Ngai Tahu as tangata whenua, and all relevant stakeholders will be involved in developing the programmes as well as local government. The general public will also be encouraged to influence the development of the programmes.

ESR214: Vague.

The zone implementation programmes will address matters such as:

ESR215: Who will develop these? Staff? Consultants? Each programme requires a large range of technical and scientific skills. Will existing regional skills be redeployed?

- environmental restoration and development

ESR216: "Rehabilitation" is more likely. See comment 253.

- zone scale infrastructure, and its environmental impact

ESR217: Replace "zone scale" by "zone-scale".

- water brokerage and efficiency improvement

ESR218: Meaning unclear.

The programmes will be reviewed every three years and rolled forward. They will avoid over prescription - for instance telling land owners what type of crops to

ESR219: Replace "over prescription" by "over-prescription".

Water governance structure

At local level a Zone Water Management Committee will be established for

ESR220: How will they be financed? Water charges? How will zones like Banks Peninsula and Kaikoura cope? [Shades of the late BP District Council.]

each zone to co-ordinate the development of the zone implementation programme. Membership of the zone committee will comprise some 10 to 20

ESR221: Appointed, elected, by whom? Who are "stakeholders"?

locally-based people representing Environment Canterbury, territorial authorities with an interest in the zone, Ngai Tahu, consent-holder representatives and

ESR222: I.e. appropriate runaka.

A Regional Water Management Committee is also proposed to handle issues that are common across the region or cannot be managed satisfactorily at zone level. This committee of between 10 and 20 people will bring together

ESR223: Appointed by whom?

There is also a need for national tripartite forum to address issues that are

ESR224: Why "tri-"? What three components?

- the expression of the rights of Ngai Tahu as protected by the Treaty of

ESR225: Why can Ngai Tahu not express these rights themselves?

- integrating the strategy with water conservation orders, national policy statements, national environmental standards

ESR226: Why can these not be done regionally when NPS and NES are finalised?

- other national strategic issues, such as the integration of water allocated for hydro generation and irrigation.

ESR227: Should be "between" as in Section 6?

We therefore propose a national level forum that would involve the relevant Cabinet ministers responsible for the national policy issues together with

ESR228: "or their representatives"

The authority under which the committees and their implementation programmes will operate continues to be **a matter of debate**. Broadly three lines of authority have been considered:

ESR229: It is a significant issue which needs early resolution.

- **authority of the Minister through Order in Council or RMA call-in procedures** - this would involve the zone and regional committees being appointed by the Minister for the Environment on the **recommendation of the Canterbury regional and district councils** and/or the implementation programmes being given authority by the Minister

ESR230: Not “elected”? Would this “recommendation” be acceptable to the other groups represented, especially farmer and conservation groups?

- **Resource Management Act and Local Government Act mechanisms** - this would involve bodies such as the **regional council delegating part of their planning functions** to the committees and that the implementation programmes would be incorporated into existing RMA instruments such as the Regional Policy Statement

ESR231: Planning and policy are not implementation. Also, this would involve zonal staff or contracting out – accountability?

- **special legislation** – this would be **enabling legislation** specifically for the

ESR232: We doubt if the precedent this would set would be acceptable at national level.

Water Executive

As explained above, the water governance structure will not exist as a separate organisation as such, but will comprise committees operating in an integrated fashion at zonal, regional and national levels. It is envisaged that this structure will need **an executive body to manage the implementation programmes** on a day to day basis, in particular:

ESR233: OK, this answers some of our previous questions. Who will do the basic ongoing data collection, processing and archiving?

It is proposed that **a semi-autonomous executive arm of Environment Canterbury will take on this executive role**. With freedom to act within a commission agreed

ESR234: This is fraught with difficulty! The committees have no authority. The commission is set by ECan and LA’s. The “arm” is staffed by ECan employees. So what does “semi-autonomous” really mean? This has not been a clear intent in the draft until now.

Water infrastructure and services entity

The Mayoral Forum considered a Crown entity, a private company and a number of different public/private options. It is proposing consideration of a water entity set up by the Canterbury local authorities under the Companies Acts to take on the role of **designing, building, financing and operating** the larger elements of the regional water storage and distribution system.

ESR235: Shades of the old MWD! These costs need to be included as “costs prior to generating revenue”, as in earlier comments [207, 208].

This could be a **council controlled** organisation with a 50/50 joint venture with a

ESR236: Replace “council controlled” by “council-controlled”. But which council?

private investor. Irrigators already operating in Canterbury would, if they so

ESR237: It could be a worry if one large private investor controlled 50%.

programmes and the fundamental principles. For example, the regional implementation programme **will determine where the new infrastructure is to be built**, and prescribe the rules governing allocation of water for environmental and

ESR238: And commission the water entity to design, build, etc.?

The water entity would have a public service obligation to supply water to
ESR239: There is a basic conflict of the water entity profiting from water sales while responsible for efficiency.

of the operating costs of the Executive. The water entity will also incur costs prior to generating revenue from customers. These costs, which will include
ESR240: This is a significant issue, more general than the costs listed here. See earlier comments [207, 208, 235].

The advantages of such a water entity are:

- it would have substantial public ownership ensuring that the targets and

ESR241: It should be “a controlling public ownership”.

Managing the risks

The approach outlined above is not without risks. These include:

ESR242: Yes! to all of these.

- there are significant issues around the mandate and accountability of the committees

ESR243: There certainly are! And around the formation/appointment/election of them.

there needs to be clarity about the extent to which engagement with the public on implementation programmes will substitute for formal public consultation processes and statutory review under the RMA

ESR244: This is often vague in the draft. Consultation as required under the RMA for significant developments might be a reasonable substitute.

- stakeholder organisations will have to work across all ten zones all of the time, and may not have the resources to do so effectively

ESR245: What are they?

Much of the detail of how to manage these risks has yet to be worked through. The solutions will include the following:

- National Environmental Standards and National Policy Statements will be “givens” – they will set the parameters within which the implementation

ESR246: When we get them!

- the implementation programmes will have no ability to override RMA instruments but the aim will be for them to “smooth the passage” for the approval of RMA instruments by winning public support for a balanced strategic way forward, in contrast to the current reliance on adversarial processes

ESR247: This is laudable. Success of the Strategy will depend on its achievement.

- one of the roles of the regional water management committee will be to guard against parochialism. The adoption of subsidiarity principle will

ESR248: Yes.

Legislative implications

implementation programmes outlined above. Applications for water consents conforming to the relevant implementation programme will be considered under a more enabling set of criteria than applications that do not. There would be a
ESR249: Vague. How do they relate to existing RMA criteria?

public private sector delivery of sustainable development). The Government wants to build consensus around the form of the new legislation and the Minister has announced the establishment of a national Land & Water Forum, which will be
ESR250: Shades of the NWASCA!

concept. These will be established in early 2010 and for the development of the detailed implementation programmes to proceed in advance of the completion of

the Government's national policy work on water management.

ESR251: This sentence apparently tries to say two things at once and so does neither well.

Section 5 Implementation blueprint

Overview

The Water Executive and the Water Infrastructure and Services Entity will work collaboratively with the sector to pro-actively drive the system towards meeting

ESR252: Establishment of the new structure and 'bedding it in' could well take a couple of years.

Ecosystem restoration

ESR253: We have commented throughout the Draft on the use of "restoration". Ecosystems in bad shape can in principle be: reclaimed, recovered, restored, remediated or rehabilitated. In practice, they can very rarely be restored to their 'original' state. Reclamation or remediation is often not enough. Recovery is slow and uncertain. Rehabilitation to a new, desirable state is often the best outcome. "Restoration" has been used throughout the draft, but is not the best 'R' word to choose.

biodiversity in Canterbury continues to decline overall. Halting this decline will be very important to maintaining quality of life, preserving cultural heritage, and ensuring a sustainable future.

ESR254: Yes.

Improved environmental flows and water quality standards will be a key part of ecosystem protection but restoration activities will also contribute through:

ESR255: See comment above on "restoration".

ESR256: Add a bullet "improving quality of stormwater discharges into urban waterways".

- increasing programmes of pest and weed control,
- fencing streams and wetland areas, restoration and reinstatement

ESR257: Another 'R' word! See comment 253 above on "restoration".

Annex I sets out the proposed approach in more detail. The Water Executive will take the lead:

reconfiguration of consents

set out in the implementation programmes

- implementing ongoing biodiversity restoration activities.

ESR258: See comment above on "restoration". See comment 253.

It is envisaged the Water Executive will incur substantial costs in the early years for restoration projects when there will be limited scope to levy charges for new water. These costs will be met in the early stages by ratepayers, but in later years could be funded from the water levy once the water entity is generating revenue.

ESR259: See comment 253 above on "restoration".

ESR260: Levy charges for new water only?

ESR261: See earlier comments [207, 208, 235, 240] on timing of revenue.

It is possible that some funding for restoration may be obtained, for instance

ESR262: See comment 253 above on "restoration".

Investment in new infrastructure

developed. The key short-listed projects are:

- Use of Lake Coleridge for storage
- Efficiency improvements in mid Canterbury

ESR263: Replace "mid Canterbury" by "mid-Canterbury".

- Groundwater storage in Central Plains

ESR264: In what manner?

On-farm storage is within the scope of the strategy in locations where it is an only alternative. However, as a general principle such storage is costly and inefficient, and may drown valuable farm land and make a very limited contribution to irrigation.

ESR265: This sweeping generalisation needs either justification or modification. First sentence ungrammatical.

Allocation and use of groundwater

(not to mention the energy costs of pumping deep water). This in turn is reducing flows into spring-fed streams in the lowland areas, and the problem is being further compounded by surface water abstraction in the lowland areas.

ESR266: Now it is being acknowledged!

Reconfiguration of water consents in conjunction with additional water from

ESR267: This is probably not sufficiently clear to most readers.

aquifers in the lowland areas. This in turn will recharge the aquifers in the lowland areas, allowing groundwater there to be used for irrigating land instead of surface water, and also restoring healthy flows in the lowland streams.

ESR268: "allowing groundwater instead of surface water there to be used for irrigation," [Why irrigate surface water?]

The net result will be much improved environmental flows in lowland streams, allowing water quality and ecosystems to be restored and protected. The groundwater system will also be recharged at a higher rate, diluting contaminants

ESR269: This assumes adequate mixing.

The Water Executive will take the lead in brokering reconfiguration of consents in accordance with the implementation programmes. Financial incentives may be needed to secure agreement from consent holders to change the way they

ESR270: These could be very large; they imply 'ownership' of the water.

abstract water from the system and change the terms and conditions of their resource consents. These incentives would be funded from the levy imposed on the Water Infrastructure and Services Entity.

ESR271: "by"?

Water allocation and charging regime

In addition to this a charging mechanism will also be needed to remunerate the investment in infrastructure and enable supply and demand to be managed in an

ESR272: The initial financing mechanism will present a greater problem than the charging mechanism.

regulatory regime to ration the supply of water in dry years. The former would make the strategy impossible to finance on a commercial basis; the latter would result in inefficient allocation decisions.

ESR273: How? If there is not enough water for all – tough!

- variable priced contracts where users will pay volume based charges – this will provide the Water Infrastructure and Services Entity with price sensitive demand, which will respond to market pricing signals for the

ESR274: Replace "volume based" by "volume-based".

A key issue to be resolved in the implementation programmes will be the

ESR275: It is a key issue in this strategy but not very clearly stated that the amount of water available for economic activity is only that amount remaining after all environmental needs have been met. The latter should also include a safety margin for ignorance.

charging regime to apply to existing consent holders. Clearly this regime will need to have regard to the value of existing water "rights". However, it would be unfair if the charges to existing consent holders did not take into account their

“share” of the costs of environmental **restoration** and the benefits they will derive from “new water”, such as the reliability of supply in dry periods.

ESR276: Yes indeed. Existing water uses have led to the environmental degradation which now needs to be rehabilitated.

ESR277: See comment 253 above on “restoration”.

Land management practices

example, bacterial concentrations in the Pahau River have been reduced to a third of the levels measured 2005/6 by a ‘resource care’ programme which **lead** to changes in irrigation and land practices by farmers in the catchment.

ESR278: Replace “lead” by “led”.

Diffuse discharges of nitrates are highly dependent on water and land management practices and land use. **Bidwell et al** demonstrated that managing

ESR279: Replace “al” by “al.”. The final strategy should have complete references, listed in the document.

agricultural land, not just on newly developed land. There are also likely to be some locations where land-use with **high leaching rates** will be inconsistent with water quality standards.

ESR280: High leaching rates imply poor land/water management.

There are four key processes within the strategy aimed at addressing improvements in land management:

- **defined catchment limits** for nitrate and other contaminants consistent with water quality objectives

ESR281: Very difficult to do.

- zone implementation **programmes** to address land-use working in

ESR282: These will take many years!

Water use efficiency

Addressing irrigation efficiency at property-scale also provides the opportunity to improve the design and management of farm irrigation systems, thus reducing the total amount of nutrient leaching into groundwater. Reduction of nitrate discharge by improving existing practices has the **most** effect on the availability of

ESR283: Replace “most” by “greatest”.

Stage 4 of the Canterbury **Strategy** Water Study illustrated the potential gains

ESR284: Replace “Strategy” by “Strategic”.

from a combination of property, scheme and catchment efficiency measures for **mid- Canterbury**. The study found that if all efficiency gains were realised then

ESR285: Delete space.

the size of storage needed to provide reliable irrigation to **the district** is one-third of that needed if no efficiency gains were made.

*ESR286: Does this mean **all** the irrigable land.*

The scenario modelled included removing some takes from the Ashburton River to restore some flow. Achieving these benefits will require an improvement in the scale and extent of efficiency **than** is currently occurring.

ESR287: Replace “than” by “compared to what”

future. It should be **noted the** scope for making efficiency gains is not evenly distributed across the region.

ESR288: Insert “that”.

Section 6 Next Steps

The completed version of the strategy is to be published in late October. A

ESR289: From 2 October to "late October" seems hardly time to correct and re-format, let alone deal adequately with our and other comments.

Targets

Significant initial work has been done on the targets with interest groups of environmentalists and farmers/irrigators working independently. It is envisaged that these groups of stakeholders will be brought together for further work on the

ESR290: This is the first indication in the draft of what is intended by "stakeholders".

targets and other stakeholders involved where appropriate.

ESR291: But readers still don't know who these ones are.

This additional work will take place throughout the remainder of 2009. It is hoped that these will be completed for the publication of the October completed

ESR292: Does this now need modification?

strategy. If research or information gathering is required to finalise these targets they may spill over till later in the year and will become part of the transition programme.

ESR293: First mention. Maybe "a transition programme" is intended.

Economic assessment

An economic study is being carried out to establish a method of modelling the likely scenarios of water management in Canterbury. When this work is complete in October 2009, it will be possible to evaluate scenarios with different

ESR294: Still true?

The objectives of the study are to:

- estimate the regional economic flow on effects.

ESR295: Insert hyphen.

The study will report on:

- off farm capital costs
- on farm capital costs
- regional economic flow-on impacts from changes to on farm activity

ESR296: Insert hyphens.

Endorsement by District Councils, Environment Canterbury and Te Runanga o Ngai Tahu

An early requirement is to gain the endorsement of the Canterbury regional and district councils, and Te Runanga o Ngai Tahu for the strategy. While there will remain some uncertainties, endorsement of the strategy is essential for it to proceed.

ESR297: Is endorsement of every part of the strategy essential?

Zone and regional water management committees

Once endorsement is gained from the councils and Te Runanga o Ngai the next move in the transition would be the appointment of the zone and regional committees and getting them working on the development of the implementation

ESR298: By whom?

groundwater recharge. These programmes are expected to take at least a year to complete as there is a great deal of detail to work through.

ESR299: Yes!

Water Executive

Resolution of national issues

- **integrating the implementation programmes** with water conservation orders and with national policy statements and national environmental standards

ESR300: When NPS and NES are in place, it is a regional task to implement them.

- other national strategic issues such as the balance in allocating water **between** hydro generation and irrigation.

ESR301: OK, but the word used in Section 4 was “for”.

“Immediate Steps” biodiversity protection and **restoration** programme

ESR302: See previous comment 253 on “restoration”.

Trust and confidence in the strategy is important and vital to that is the introduction of an immediate steps programme. It will:

- **assume** that environmental protection and restoration is a key part of this strategy

ESR303: Replace “assume” by “confirm”.

- provide **action-based activity** on biodiversity and **restoration** that the regional and zone committees can address in the short-term.

ESR304: Delete “action-based”. See previous comment 253 on “restoration”.

Supply-side arrangements

The recommendations in the strategy referring to governance and development on the **supply-side** cannot be implemented without the full participation of all

ESR305: Delete hyphen.

parties – district councils, farmers, irrigation companies and even potential funders. To date, exploratory discussions have taken place to gauge support for the approach and a generally **“interested” response has been forthcoming.**

ESR306: Including potential funders?

In the event that there are early indications either of **lack of interest or a high degree of difficulty** in establishing an entity, then alternative feasibility work would be required on supply management and infrastructure development.

ESR307: !!!

Legislation/regulation

Working through the best process for mandating the zone and regional implementation programmes would be done during 2009/2010 with completion coinciding with the completion of the implementation programmes. Central Government Officials have committed to assisting with this process and a working party has been formed at the request of **the Minister.**

ESR308: Specify which minister.

The water management committees will have to act under the authority of the regional council **in the interim.** Work will be necessary to develop policy around

ESR309: Then under what authority?

consenting for Environment Canterbury in the light of the Canterbury Water Management Strategy.

ESR310: Unclear. Does it mean all consenting, or “consents presently issued by ECan to itself”?

Implementation timetable

Section 7 Monitoring implementation of the strategy

Implementing this strategy **will be challenging**, the solutions will be evolutionary,
ESR311: Yes!

While the overall approach of the strategy will not change – including in particular the vision and fundamental principles – **successful water management will be dynamic**. Tactical decisions will be needed for instance around the extent to which
ESR312: Yes!

Monitoring progress against the strategy's targets will therefore be critical to ensuring that the strategy is **able to adapt to changing circumstances** and new
ESR313: It will need 'adaptive management'.

purposes, or for more efficient irrigation uses. The water entity will work with the Water Executive to reallocate water that is being used **inefficiently**. This will mean environmental and economic objectives will be
ESR314: Judged by whom?

Auditing and enforcement

Mechanisms will be introduced to improve monitoring performance including:

- audited self-management programmes to encourage farmers and others to monitor and improve their own performance, **to demonstrate their cumulative environmental effects are within acceptable environmental limits**

ESR315: Audited self-management can be useful for much more than environmental aspects only.

ESR316: This submission on the Draft Canterbury Water Management Strategy was made by us on behalf of the Canterbury Branch Committee of Engineers for Social Responsibility [Inc.]. It was submitted on 5 October 2009 [a dispensation from the 2 October deadline was allowed]. The submission was made [with approval to adopt this format] as a set of MS Word files showing comments and tracked changes.

On 6 November 2009 the final Canterbury Water Management Strategy was released. In response to a request on 10 November 2009 from NetworkPR, on behalf of the Canterbury Water Management Strategy, we have re-formatted the submitted files into this single .pdf file. No changes other than the re-formatting, numbering the comments and some cross-references have been intentionally introduced.

*David Painter and Hugh Thorpe
19 November 2009*