

## **CANTERBURY STRATEGIC WATER STUDY**

This briefing note sets out the role of the Canterbury Strategic Water Study (CSWS) in the context of water management in Canterbury. It covers the following elements:

- The initial study of water availability issues in Canterbury
- Other water management investigations and planning
- Stage 2 of the Strategic Water Study
- Community engagement in water management
- Stage 3 of the Strategic Water Study
- Stage 4 of the Strategic Water Study
- Scope of community engagement in Stage 4
- Implementation of the CSWS

### **1. Initial Study**

With the increasing demand for water in Canterbury there has been increasing conflict over the allocation of water for abstraction and for the maintenance or improvement of instream values. In addition, there was concern that ad hoc decisions by one group might foreclose on protection or development options that provide greater benefits to the wider community.

This led to the undertaking of the initial study by ECan, MAF and MfE (2002) to provide fundamental information on:

- The potential long-term requirement for water;
- The capacity of the region to meet these requirements;
- The water resources that would come under the most stress;
- The reliability, over the long term, of water supplied from natural systems for abstractive uses.

The scope of the study was limited to water quantity issues.

Among the key findings of CSWS Stage 1 were the following:

- Irrigation is the dominant consumptive use now and for the future, with irrigation representing 89% of future potential peak demand, stock water 5%, municipal supplies 3%, industrial use 2% and plantation forestry 1%.
- Surface water abstraction is placing pressure on the smaller foothill rivers (such as the Waipara, Maerewhenua, Ashburton and Opihi), while the larger alpine rivers (Waitaki, Rakaia and Waimakariri) are generally less pressured.
- Effective management of surface water resources requires abstraction limits and while minimum flows have been specified, the protection of environmental flows (floods and freshes) is also required.
- Managing groundwater resources requires allocation limits and this is likely to be driven by requirements for flows in spring-fed lowland streams.
- Under low flow conditions current peak demand cannot be met by current abstraction methods. However on an annual basis water is available to meet future demand but would require storage.
- Without the development of water storage, the irrigated areas in Canterbury can be expected to plateau well short of potential irrigated areas.
- There are few suitable storage sites and district councils need to work alongside Environment Canterbury to identify possible sites and ensure these sites are not foreclosed for future development by ad-hoc planning.
- The future development of Canterbury's water resources will require strategic integrated water resource management.

### **2. Other Water Management Investigations and Planning**

There are a wide range of other water management investigations and planning activities that have significance for strategic planning of water resources in Canterbury. These include:

- The Natural Resources Regional Plan (NRRP) which in Chapters 4 to 8 sets out the environmental baseline for water and land management for the Canterbury region.
- The programme for reviewing the environmental flow regimes and the allocation blocks for rivers throughout Canterbury.
- The definition of allocation limits for groundwater zones for Canterbury and the effective allocation of the groundwater resource through consents.
- The Integrated Research for Aquifer Protection (IRAP) which is investigating the impact of land use intensification on water quality.
- The development of water measurement technology for water metering, environmental flow management, water use efficiency, water demand management and water quality monitoring.
- The restorative programme for lowland streams to address annual allocation, stream depletion, seasonal limits and water measurement in groundwater zones that support spring-fed streams.

Many of the programmes are the direct responsibility of Environment Canterbury, for example the NRRP, environmental flow and allocation limit specification, with stakeholder involvement. IRAP is a partnership of regional councils and research organisations while the water measurement technology programme requires equipment manufacturers' involvement.

However there is no agency with the mandate for water resource development. Further work on storage involves the economic development and land use responsibilities of territorial authorities and the water management responsibilities of a regional council. With the Local Government Act concepts of partnerships between governments, communities and industries to achieve community outcomes, the Canterbury Mayoral Forum became the sponsor of a second stage of the CSWS to identify storage opportunities in Canterbury.

### **3. Stage 2 of the Strategic Water Study**

As an extension of the initial CSWS, a second stage study was undertaken to determine whether it is practical to meet environmental needs and potential water demands through the use of storage as a core component of integrated management of surface water and groundwater in the Canterbury region. CSWS 2 was also aimed at specifying a suite of practical options for meeting long term water demands in each part of Canterbury including practical methods for sharing water equitably between neighbouring areas.

CSWS 2 not only draws upon the work of CSWS 1 but also draws upon the work for the Natural Resources Regional Plan, particularly in relation to the rules for environmental flow requirements. The environmental flow requirements specify the allocation to instream uses which then enables the estimation of water available for out-of-stream uses.

The key output of CSWS 2 is a suite of water supply options for each part of Canterbury. Each system option comprises the physical components such as water sources, storage and water conveyance facilities and management components such as river allocation rules. Hydrological performance was evaluated by computer

simulating the day-to-day operation of each system option over long periods using historical data to test practicality and determine effects on river flow regimes.

The work of CSWS 2 has been extended by the multi-stakeholder evaluation undertaken for Stage 3. As noted below, CSWS 3 identified additional options and variations on the options analysed for CSWS 2.

#### **4. Community Engagement in Water Management**

Sustainability frameworks recognise the need to consider resource management at multiple levels and multiple time frames that reflect the characteristics of the system being managed (Gunderson and Holling, 2002). For water management issues facing Canterbury, there are four levels that appear to be the most important. These levels and associated issues are as follows:

- The regional level, where the key issues are water availability and land use intensification;
- The catchment level, at which the sustainability levels of water use and its effects, cumulative impacts of water use, and reliability of supply are the main issues;
- The subcatchment (or stream reach) level, where environmental flow requirements in river reaches, and the management of streams and their riparian margins are the most significant issues; and
- The property level, where the land use practices that influence water quantity and quality are defined (Jenkins, 2007).

For effective community engagement in water management, there needs to be appropriate mechanisms in place for involvement to occur at each of these levels. At the property level, this involves direct relationships with the land owner or manager. At the stream reach level, Environment Canterbury has two community engagement mechanisms relating to the key issues at that level. One is the “water user group” which brings together the abstractors from a stream reach that have their takes linked to the same environmental flow monitoring site. The second is the “stream care” group (formed as part of Environment Canterbury’s Living Streams programme) to address the management of water quality and riparian margins in streams through community-based action plans in the stream catchment. At the catchment level, Environment Canterbury has been developing non-statutory catchment management plans through voluntary catchment-based community groups. This has been done to address specific issues such as water quality downstream of Opuha Dam through the South Canterbury Water Enhancement Group, or to guide the agency’s work programme to integrate with others, such as the Avon-Heathcote Ihutai Trust which provides the framework for Environment Canterbury and Christchurch City to work with the community group towards a joint plan.

Community engagement at the regional level presents greater logistical challenges because of the greater number of people and their greater geographical dispersion. It is further complicated by the consideration of storage proposals as this involves the territorial authorities’ land use planning and economic development role and the regional council’s water management and regulatory role being coordinated under the umbrella of the Canterbury Mayoral Forum. For the other geographical levels it is possible to bring people together for regular meetings to discuss their concerns and resolve issues. It is also possible for the engagement process for the water management issues at that geographical level to be coordinated by one agency – the regional council.

One of the key success attributes of the community-based approaches undertaken in Canterbury has been the ability given to the community to devise their own structure and method of working. However at the regional level this is not practical. More structured approaches are required to engage systematically at the regional level.

For regional engagement in Canterbury for the CSWS, it was proposed to try a two stage approach. The first stage was to establish a multi-stakeholder group of about 20 people from the different interest groups and different parts of Canterbury who were known to be knowledgeable in water issues to provide an initial evaluation of storage options in a sustainability framework. This stage was designed to be one where people were free to speak their minds and frankly state their views. It was to be on the basis of “Chatham House” rules that what was said to the group stayed with the group. The intent was to develop trust among the group members so that issues and points of difference could be openly discussed within the group.

If this stage was successful then there would be a transition to a second stage which would be open to all interests to participate and would be in a structured framework so that people could participate in a variety of ways without having to bring all parties together at the same time and place. The intent was to use “Open Strategy” to support the engagement process. This a web-based collaborative governance model that enables communities of stakeholders to participate in decision making in an open and transparent way while retaining control over the information that they provide to the system (Driver and Armstrong, 2004). The work of the multi-stakeholder group would form the starting point for a broader community engagement.

The concept of this approach was that it would combine the advantages of unstructured face-to-face dialogue where participants can determine the direction of the process and explore issues through the multi-stakeholder group while overcoming the limited number involved and more closed nature of the multi-stakeholder group with the open strategy concept which would be open to any stakeholder group to participate in a structured way and without the need to travel long distances to many meetings.

The multi-stakeholder evaluation also identified the key technical issues that warranted more detailed investigation as well as the storage options that warranted more detailed site investigations. This two staged evaluation is based on Etzioni’s concept of “mixed scanning”. For complex problems the volume of information to consider every option in detail is too great but ad hoc decision making is not adequate to systematically address the range of issues. Mixed scanning involves the review of all options based on general assessments, and then from a selection of the more promising options, undertaking more detailed analysis. This more detailed work in relation to storage options formed part of Stage 4 of the CSWS as well as the broader community engagement.

## **5. Stage 3 of the Strategic Water Study**

The CSWS 3 work was undertaken in three phases: (i) formation and work of the regional reference group, (ii) core reference group members joined consecutively by north, south and mid Canterbury representatives in staged meetings of locality-based reference groups to evaluate storage options in their subregion, and (iii) consultation with north, south and mid Canterbury interest groups based on the findings of the reference group evaluations.

In the first phase the multi-stakeholder core reference group was formed and their agreement sought about whether they were willing to work together as well as clarify roles, develop capability and build trust. This phase also involved the development of and agreement to a sustainability framework for evaluating storage options. With the diverse views represented and the adversarial nature of water management issues in Canterbury this phase was essential if the Community Panel was going to be successful in evaluating options and identifying issues for further investigation.

Experience during this first phase indicated that people entered the process with a belief that they were well versed in the issues of water management in Canterbury. What they found was that there were other issues that they were not familiar with. A critical point in the first phase was a two-day workshop covering key issues which provided all participants with a broader perspective on the range of issues to be addressed.

Over 20 options based on 12 storage reservoirs were evaluated in the second phase. The storages evaluated range from Hurunui River in the north to Opihi River in the south. No options were evaluated north of Hurunui River as the CSWS Stage 1 study had shown that potential demand in the Waiau area could be met from Waiau River without storage. South of Opihi River, the proposed Hunter Downs scheme (using water from Waitaki River) was not evaluated as the proposal was in the resource consenting process.

The evaluation of water storage options for Canterbury was done by multi-stakeholder groups of about 15 – 30 people in three pieces – options for Hurunui River in four one-day workshops in September to December 2006, for South Canterbury in four workshops in February to April 2007, and for mid-central Canterbury in five workshops from May to July 2007. In early September 2007 a one-day workshop of participants from all three groups and from the CSWS Mayoral Forum Steering Group explored an integrated option for mid-central Canterbury.

The multi-stakeholder groups included people with a wide range of interests in water in Canterbury – irrigation, angling, farming, environmental concerns, community development, Ngai Tahu, recreation, and conservation. Irrigators and farmers made up more than half of each group. Most of the participants were male. Environmentalists and conservationists made up about a fifth of each group. A core of 8 people was involved in all three groups with an additional four people involved in the evaluations for two areas.

The multi-stakeholder groups provided a very robust evaluation of the water storage options, identifying the key features of each option and the beneficial and adverse impacts. There was generally a range of views with differences understood and respected by others in the group.

One of the features of the Stage 3 process has been the solution-seeking approach taken by the evaluation groups. Participants have suggested ways of overcoming or mitigating concerns. In some cases these suggestions led to new options that were then modelled as variations from the options considered in Stage 2.

Most of the elements of Stage 3 have now been completed. The outstanding elements are a communication plan for the release of the report and the key messages from Stage 3. There will need to be a transition from the Community Panel process to the wider community engagement in Stage 4.

## **6. Stage 4 of the Strategic Water Study**

Based on the issues identified during Stage 3, the Mayoral Forum has agreed an outline of work for Stage 4. To date this programme involves 8 parts.

### *Part 1 – Meeting Canterbury’s long-term water needs through integrated water management*

The series of tasks in Part 1 comprise:

Task 1 – optimise (hydrologically) the integrated management of ground water and surface water allocation and use (Phase 1).

Task 2 – integrate the management of storage-based surface water supply systems across Canterbury Plains catchments from the Ashley to the Orari.

Task 3 – optimise (hydrologically) the integrated management of ground water and surface water allocation and use (Phase 2).

Task 4 – assess the effect of irrigation efficiency gains on the size of key components of the water strategy.

Task 5 – compare the economic output resulting from strategy implementation with status quo output.

Task 6 – communications.

### *Part 2 – Institutional arrangements for integrated water management*

The scope of Part 2 is to identify the appropriate institutional arrangements for integrated water management in Canterbury. Integrated water management is likely to include development of water storage, redesign of existing irrigation infrastructure to improve water delivery efficiency and development of water delivery systems for distribution of water from water-rich to water-poor catchments.

### *Part 3 – Community engagement on findings of strategic water study*

This part involves the development of a community engagement strategy to include broad stakeholder engagement in discussion of the findings, identification of community values and priorities to be considered in formulating an overall strategy for water in Canterbury, and developing a framework for assessing community outcomes for different strategic options for water management. The open strategy model is to be used to support the work in this Part.

### *Part 4 – Strategic management of water quality*

For the major storage options and associated irrigated land provide a strategic assessment of water quality addressing water quality implications, including cumulative impacts, of water storage, changes in river flow regimes, and transfer of water between catchments, standards and monitoring requirements for water quality management, and options for achieving water quality requirements through storage and flow management, land use controls and land use practices.

### *Part 5 – Integration of land use and water management*

This Part involves the identification of land use controls on irrigation and intensification practices to improve productivity and sustainability of land use, land use controls in sensitive catchments (e.g. to protect drinking water supplies), and information needed to assess likely effects of drainage and seepage from irrigation on surface water and groundwater systems.

### *Part 6 – More detailed investigations of specific sites*

Further investigations are needed for specific sites. These are likely to include the Stour, Lake Sumner, Lake Coleridge and Lees Valley.

### *Part 7 – Land use designations*

Potential sites for storage and related infrastructure are to be identified in some way in relevant District Council and Regional Council planning instruments.

### *Part 8 – Biodiversity strategy*

This Part is to ensure that further consideration of water storage in braided rivers, such as the Hurunui and Ashburton Rivers, is done in parallel with development of a biodiversity strategy for these river systems.

## **7. Scope of Community Engagement in Stage 4**

As set out in the scoping paper to the previous Mayoral Forum, the consultation strategy was to include:

- Broad stakeholder engagement in discussion of the findings of earlier stages
- Identification of community values and priorities to be considered in formulation an overall strategy for water in Canterbury
- Developing a framework for assessing community outcomes for different strategic options for water management
- Assessing the strategic options in relation to community outcomes.

A brief was prepared for a community consultation strategy that involved the following components:

- (1) Comparison of broad strategies, including
  - no further storage
  - irrigate as much land as possible (available water is the current constraint on further irrigation development)
  - storage which meets sustainability requirements, meets all environmental flows and limits land use intensification based on water quality.
- (2) Incorporates substrategies to address stakeholder concerns, including
  - water quality
  - biodiversity
  - tangata whenua
  - recreation
  - fishing
- (3) Substrategies for each storage option, including
  - Lake Sumner, Lake Coleridge, Lees Valley, Opuha Dam, Blowing Point, Stour River
  - water to South Canterbury from the upper Waitaki
- (4) Substrategies for different combinations of storages
  - in order to meet some of the broad strategies it is likely that different combination of storage options could be chosen with different impacts to achieve the same irrigated land outcome (e.g. Blowing Point and Stow are possible alternatives, South Canterbury options include water from Tekapo, raising Opuha Dam, bringing water from the Rangitata)
- (5) Identify the actions required for implementation
  - tasks that would be required by the regional council (e.g. water allocation)

- tasks that would be required by territorial authorities (e.g. land use designation)
- tasks that would be required of private sector (e.g. irrigation companies)
- tasks that no one has responsibility for but will be needed (an analysis of institutional requirements is also part of Stage 4)

## **8. Implementation of the CSWS**

The CSWS is a non-statutory process. Its value is in providing a flexible process to enable a degree of agreement to be achieved on the way forward for water management in the Canterbury region. One way of providing statutory backing to the implementation of the CSWS is through revisions to the Regional Policy Statement. The requirements of the Resource Management Act provide some flexibility in the issues that can be considered in a Regional Policy Statement and the Act only becomes prescriptive about process once the statutory process has commenced.

Existing statutory processes for plans (such as the NRRP) and consents (such as Central Plains Water and Northbank Tunnel) continue consistent with RMA requirements.

The approach of discussing issues through a non-statutory process and only moving to a statutory process once agreement has been reached is seen as a more appropriate approach compared to either the traditional, more adversarial way of developing regional policy statements, or reliance on goodwill of participants to implement a non-statutory strategy.

This approach is consistent with the trend of developing strategies for sustainability that have the following characteristics:

- the involvement of stakeholders in decisions through processes that facilitate participant buy-in, have mechanisms for collaboration not conflict and emphasise motivation not regulation;
- the integration of science into decision making as the basis for strategy while recognising the need to manage scientific uncertainty;
- the development of proactive strategies which focus on agreement followed by implementation and are given the necessary statutory backing but are not statutory driven.

Briefing note to Canterbury Mayoral Forum (10 December 2007)

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