A BEST USE SOLUTION FOR NEW ZEALAND’S WATER PROBLEMS

2008

New Zealand Business Council for Sustainable Development
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We have just ten years to effect change... We need to start now. The solution carries a price. It also carries a multi-billion dollar reward over the next decade, while enhancing the environment.
A Best Use Solution to solve
New Zealand’s major water problems

**New Zealand is fast discovering that freshwater is not an unlimited resource.**

While New Zealanders want economic growth, they do not want it at the expense of our environment and quality of life. Each year 500,000 million cubic meters of water fall onto New Zealand as rain or snow, enough to fill Lake Taupo from empty eight times over. Despite this, key areas have major freshwater quality and quantity problems.

The quest to find the best ways to protect our waterways, allocate what is truly available and do it more simply, quicker and at least cost has been subject to extensive desk research and debate within policy-making circles for a number of years. It might be said that the issue of water allocation, and desired reforms in particular, have been acknowledged as being ‘very, very difficult’ given the lack of consensus for a way forward on the issues. It is against this background that the New Zealand Business Council for Sustainable Development commissioned a collaborative research project.

From August 2006, we have been working with 20 (and consulting with a further 14) businesses and organisations with a vital interest in water, including environmental groups, Iwi, regional councils, energy generators, water suppliers and primary producers.

The outcome of this significant collaboration is the Business Council’s Best Use Solution to New Zealand’s water problems.

We believe the project has also delivered widespread agreement that the proposed solution is a good outline of a way which will better address the issues.

This solution offers a new starting point for practical policy improvement. If we don’t act, the current system will see all major catchments fully allocated by 2012. We will see business opportunities evaporate, and the spread of rationing, queuing and disputes over what remains of the resource.

None of this is necessary. We have just ten years to effect change and avert these problems. We need to start now. The solution carries a price. It also carries a multi-billion dollar reward over the next decade, while enhancing the environment. It is the sort of solution the Business Council most likes to find – a practical way to make sure we identify the volumes of water needed to protect everything we regard as precious about our water sources and way of life – while efficiently allocating the amount identified as available for use.

**Nick Main**
Chair
New Zealand Business Council for Sustainable Development
July, 2008
The Problem

The cost if we do not act

By 2012 all the available freshwater resources in our most economically significant regions will be fully allocated to users on what is essentially a first-in, first-served basis. Depending upon how individual Regional Councils use the existing tools in the Resource Management Act, this could lead to a situation where people wanting to secure a right to use water after full allocation has been reached, will only be able to practicably obtain that right by buying land that has an existing water consent. Additionally, water that has been allocated to existing users but which is not needed for use could remain largely unavailable to those who have a need for it. This allocated but unused water ranges between 20-80% of the allocated supply depending on factors such as time of year and crop type. Currently the RMA has limited provision for the voluntary transfer of surplus allocated water. This means that this water is unavailable for productive use. This will have serious consequences constraining New Zealand’s economic development and resulting in increasing conflict between competing demands. Growth in our urban and main agricultural areas is also going to be constrained. Once full allocation is reached, unravelling past mistakes, or putting water aside for future requirements, becomes more challenging as does allocating water for new uses.

Demand is being driven by:

- more intensive land use and irrigation, particularly for agriculture
- a growing population, driving demand for electricity and municipal supplies for human and industrial use.

Growing intensity of use has wide impacts

Most of our water from rain and snowfall flows naturally and unimpeded to the sea. An estimated 11% of this water is used in hydroelectricity generation. In many instances this water is used many times for hydrogenation without abstraction from waterways and is still available to downstream users. Only a very small percentage (about 5%) of New Zealand’s total rain and snow precipitation is abstracted for commercial use, mainly for farming. Greater intensity of use is affecting water quality. Waterways have a limited capacity to assimilate contaminants (nutrients and other discharges such as heavy metals). Waste harms flora and fauna in our waterways. It also means municipal water plants have to provide more treatment – at greater cost – to continue producing safe drinking water. These problems will not correct themselves.

Note: maps represent the consultant’s interpretation of survey results.
Further public concern
New Zealanders are also concerned about the diminishing quality of our natural waterways. They perceive intensive land use (like that associated with the growth of agriculture, especially dairying) is responsible. Some 64% perceive agricultural and horticultural run off as the main cause of freshwater pollution.

68% perceive freshwater quality to be worse or much worse than ten years ago and seven out ten believe there is a water shortage now or will be within five years.

Major local water quality problems
While many parts of the country are managing the increasing demands on water quite well, some areas still face significant water issues relating to quality and quantity.

In Canterbury, Waikato, Rotorua and Taupo areas, the investment by central, and local government and the private sector to resolve these water issues is extensive. Central and Regional Government have promoted initiatives to clean up Lake Taupo and the Rotorua lakes in the central North Island, at the cost to the taxpayer of $83 million and $73 million respectively.

Allocated water not used
In New Zealand water is managed by the Crown on behalf of all citizens.

New Zealand has a first-in, first-served system of allocating water. Some of this water is allocated to those who may not fully use it. But their surplus allocation is not easily made available for others.

It is difficult to transfer rights because the Resource Management Act (RMA) states that resource consents grant a right to use water to the landowner. Regional Councils must also provide for transfer of water rights, through their Plans or through approval of one off applications. Thus those wanting a right to use water may need to buy land to access the water right. Land with access to water is much more valuable, which is reflected in farm prices.

This transfer process is easier for members of established irrigation schemes, as they can transfer, water within the scheme.

The system does not always easily provide a basis for balancing conflicting values for water including:

- environmental needs
- recreational values
- cultural values
- municipal supply for households and urban businesses,
- other economic needs.

When there are water shortages, often the environment pays when the baseline water flows, needed to preserve the environment, are compromised.

The consequences of no change
If the country does not change the way it allocates both surface and ground water then:

- future water users, who can use water in more productive ways, could be required to buy land off a current consent holder in order to get access to water. Future users would then have to pay the costs associated with redistributing the water (secured by land purchase) through applications to the Regional Council for new consents specific to their commercial use. If approved, excess land could be on-sold without the water access.

- new water investment will be blocked
- moratoria will be imposed on granting new consents in some major catchments
- the publicly-funded costs of water quality clean-up will continue to rise.

This will result in:

- a needless and significant drop in potential production and economic growth ($180 to $330 million per year)
  (Source: Aqualinc, 2008)
- water quality continuing to be at risk
- the “gold-rush” of applications for water rights to the remaining available water escalating
- increased litigation and conflict as shortages occur.
The Solution

New Zealand needs an agreed way of managing our freshwater resources so it is used for the greatest benefit in a way that meets and balances the need for:

- enhancing the Resource Management Act’s sustainable management objectives and preserving the environment and ecology
- preserving recreational and cultural use and enjoyment
- preserving current economic uses where feasible
- maintaining municipal water supplies
- allowing economic growth, through higher productivity and delivering improved living standards.

All of this is possible.

The Best Use Solution

**Mixed statutory planning and market framework**

The Business Council proposes a Best Use Solution – to deliver improvements for all users, planners and managers, and the environment.

It involves:

- managing both surface and ground water resources with a mixed statutory-planning and market-based system.

If these improvements are adopted:

The community, through its planning systems, will determine the initial allocation limits and set water quality limits for using our water resources taking into account:

- public interest values
- the aquatic ecosystems
- cultural values
- recreational values
- irrigation and other industry needs
- power generation requirements
- municipal use.

A voluntary market will be used to re-distribute the water allocated for commercial and municipal use while ensuring businesses and municipalities live within the boundaries set by the community in the planning process.

Adopting the Best Use Solution will involve a number of improvements in the law and the process used at Central and Regional Government levels:

**Integrated Catchment Management Planning**

Regional Government in participatory planning processes will set the rules for managing the environmental, recreational, cultural and economic interests in their catchments, with central government guidance through National Policy Statements (NPS) and National Environmental Standards (NES).

**Measuring community needs and values**

We need to accurately measure and gather knowledge about our waterways so we can:

- set environmental and instream flows to have enough water in the waterway for environmental, cultural and recreational use, for humans to consume and for livestock
- decide how much water is needed to maintain or improve quality
- decide how much water will be available for commercial use
- set the limits for contaminants (nutrients and other discharges) and run-off entering our waterways and aquifers.

**Allocating the water available for commercial use and managing quality**

We need to better use and extend the effects management consent tools of the RMA to:

- separately consent the take and use of water
- enable proportional sharing between commercial users of water based on how much water is actually available for commercial use. This way users take on the risk that comes naturally with the climatic variability impact on water supply.
- allow existing users access to water within catchment rules and contaminant limits set by the community
- introduce a mechanism enabling the re-allocation of surplus water on a voluntary basis to the most productive use. In this way, unused water already consented but surplus to requirements can be transferred to other consented uses.
- introduce a “cap and trade” mechanism whereby a limit or cap is put on contaminant discharges that can be made (which can be voluntarily transferred), thus maintaining or improving raw water quality.

If the current contaminant level is too high the ‘cap’ can be a sinking amount that is reducing over time until the desired level of contaminants is reached.
These are New Zealand’s principal water problems, and the solutions which can be delivered by the Best Use Solution arising from Business Council research:

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<th>DEFINITION</th>
<th>PROBLEM</th>
<th>SOLUTION</th>
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<tr>
<td>QUANTITY</td>
<td>Freshwater resources in the populated and</td>
<td>Limited ability to transfer surplus allocated but unused water.</td>
<td>Tools to measure and manage water takes and flows and enable water use transfer.</td>
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<tr>
<td>QUALITY</td>
<td>Declining quality and associated clean-up costs</td>
<td>Cap and trade for contaminant discharges, to operate within the limits of capacity of waterways and groundwater to assimilate them. A benefit for users that reduce contaminant discharge or runoff</td>
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<td>EFFICIENCY</td>
<td>Poor incentives to improve efficiency of use</td>
<td>Pricing through tradable entitlements will provide incentives for more efficient use.</td>
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<td>PLANNING</td>
<td>Politicised process with little Central</td>
<td>Complete policy tools urgently e.g. NPS, NES to provide greater certainty of what is available to take and guidance on various uses. Extend use of Integrated Catchment Management Plans.</td>
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<td>ALLOCATION</td>
<td>Few regional plans have set allocation limits.</td>
<td>Allocation of all water to one of four primary pools. Only one of these pools is for consented use where transfers are allowed. Metering required for all significant takes.</td>
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<td>RISK</td>
<td>Every user wants access to maximum allocation</td>
<td>Improve knowledge of reliability for greater certainty of supply. Require users to take proportional shares in water available for taking. The majority of the risk of changing volumes is then with the users, as a result of variability in availability.</td>
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<td>INVESTMENT</td>
<td>Uncertainty around honouring existing take levels and length of consents affects long-term investment because past “promises” may not be able to be kept. Regional Councils manage uncertainty by keeping consent durations to the minimum.</td>
<td>A 35-year + 35-year-term for access entitlements to water should enable access holders to underwrite long-term investment (irrigation schemes or hydrogeneration).</td>
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<td>LONG-TERM STRATEGY</td>
<td>First-in-first-served gives no opportunity to</td>
<td>Move to a value-based allocation with long-term strategic focus on future demands on a catchment taken by Regional Government with Central Government guidance. Water continues to be used but can be earmarked for future use (new town, new industry.).</td>
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<td>KNOWLEDGE</td>
<td>Limited knowledge about some aspects of water</td>
<td>Ongoing and strategic investment in development of knowledge of water resources, which can be shared, particularly in regions and catchments short of water.</td>
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<td>resources (e.g. who uses how much and where,</td>
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<td>what are assimilative capacity limits) makes</td>
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The Resource: How Do We Use It?

Water helps define our quality of life in New Zealand and supports our economic development and growth.

Freshwater is:
- An essential resource for agriculture, especially for irrigation and livestock: 17% of New Zealand’s GDP is directly or indirectly derived from primary production. *(Source: MAF, 2003)*

- A key input for manufacturing in many industries including meat, dairy, horticulture, seafood, and timber processing. Freshwater is also needed to assimilate the wastes that go back into our natural water system.

- A major energy source. In 2001, hydrogenation produced more than 24,000 gigawatts of electricity, nearly 60% of total generation capacity. Hydrostations along a river (like the Waikato) can use the same water multiple times to generate electricity. Freshwater is also important to other generation forms, like gas and coal-fired stations where it is used for cooling. As New Zealand has a 90% target for generation from renewable source, there will be increasing reliance on hydropower to generate renewable electricity.

- A major part of healthy ecosystems and the New Zealand “100% clean and green” brand that attracts millions of tourists a year, with an economic value of more than $18 billion.

- Iwi, as do most New Zealanders, think of healthy freshwater ecosystems and a healthy coastal environment as part of our cultural identity. For Iwi, water is Taonga, a treasured asset and crucial to supporting traditional food species and habitats.

- New Zealanders rely on good quality freshwater for drinking, washing, cooking, recreational activities and water is essential for firefighting. Ask New Zealanders about the things that make living in New Zealand special and they will include being able to safely take fish, swim and go boating in our lakes, rivers and streams.

- While our rivers, lakes, streams and wetlands are deeply valued natural assets, we often assume these will remain a high quality unlimited resource for generations to come. But freshwater is a limited resource that is now vulnerable to a variety of pressures.

“Ask New Zealanders about the things that make living in New Zealand special and they will include being able to safely take fish, swim and go boating in our lakes, rivers and streams.”
The Resource: How Does the World Use It?

**No water = No business**

Water is a critical input for many production processes. For example, according to the World Business Council for Sustainable Development, it takes:

- **70 LITRES** to grow an apple
- **2,700 LITRES** to make a shirt. (Of this 45% is irrigation water; 41% is rainwater that fell on the cotton field during the growing period; and 14% is water required to dilute the wastewater resulting from fertiliser use in the field and chemicals in the textile industry.)
- **140 LITRES** for a cup of coffee
- **40 LITRES** to produce a slice of bread

Globally, cotton production uses 210 billion cubic meters - and pollutes 50 billion cubic meters - of water a year. The cotton crops use 3.5% of the world’s crop production water.

*Source: WBCSD and Waterfootprint.org, NZBCSD recognises that these are estimates of virtual water, based on certain production systems and does not endorse them as official or necessarily NZ figures.*

**Where Does Our Water Come From?**

New Zealand’s unique freshwater profile

New Zealand’s freshwater bodies are mainly made up of relatively small catchments including rivers and streams with a total length of 425,000 km.

Half of this lies in catchments with natural land cover – bush, alpine rock and tussock.

Some 43% of this river length is in catchments that have been modified by agriculture, 5% by plantation forestry and just 1% by urban settlement.

Of New Zealand’s 50,000 lakes:
- 4,000 are larger than one hectare
- more than 200 have an area greater than 50 hectares
- about 40% are in catchments where agriculture is the major water use.

There are about 200 groundwater bodies or aquifers.

Each year 500,000 million cubic meters of water fall onto New Zealand as rain or snow, enough to fill Lake Taupo from empty eight times over.

Most freshwater from rain and snow each year eventually flows to the sea.

Only about 5% of the annual inflow is extracted for commercial use, mainly for farming: the so-called ‘abstractive’ uses.

**USE OF ABSTRACTED WATER IN NEW ZEALAND**

- **STOCK WATERING** 3%
- **PUBLIC WATER SUPPLY** 9%
- **INDUSTRIAL** 11%
- **IRRIGATION** 77%

*5% ABSTRACTED FOR USE Equates to 25,000 Million Cubic Metres*

Hydrogeneration’s use of water is equivalent to 11% of the total inflow or 52,000 million cubic meters. This water remains in the waterway and is able to be made available to other users, such as recreation on hydrolakes, before and following generation.

Around 95% of the annual inflow remains in the natural water system maintaining ecological health and meeting minor human and stock, firefighting, cultural and recreation needs.

*Source: MfE, 2006, 2007*
Why is there a problem?

New Zealanders are deeply concerned about freshwater. New Zealanders see fresh water as a key to their ‘quality of life’. A national online survey conducted by ShapeNZ in August 2007 for this research project finds:

- significant public concern about diminishing quality. 68% perceive freshwater quality to be worse or much worse than ten years ago.
- a belief that a major cause is intensive agricultural land use. 64% perceive agricultural and horticultural run-off as the main cause of fresh water pollution and,
- seven out of ten believe that the country is suffering a water shortage now, or will be within the next five years.

Quality – a question of ‘management’

Historically, water quality management in New Zealand has focused on the sources of discharges into water (‘point source’ discharges where a farm, factory or town, returns used water through a pipe going into a stream or river). We have encouraged technological improvements to our production processes and greater use of waste treatment plants, as well as developing better understanding of the capacity of our waterways to assimilate discharges (contaminants).

Quality monitoring of ‘point source’ discharges track whether they are within the limits set within a discharger’s consent. However, the effects of discharges from other sources (‘non-point’ discharges such as run-off from land or roads) have also been identified as a serious freshwater management challenge. The largest impact on water quality in our rivers and groundwater (including aquifers) comes from how we use land.

Water quality has been declining in catchments where there is intensification of land use activities such as agriculture and urban sprawl. The decline is showing in higher contaminant level measurements. The Clean Streams Accord, one of a number of voluntary programmes in place has begun to address some of these issues.

Case study 1: The Waikato’s Growing Burden

Recent studies in the Waikato region have indicated increasing levels of phosphorous and nitrogen at several sites on the Waikato river, caused by wastewater and agricultural run-off. (Nitrogen as a nutrient boosts nuisance aquatic plant growth which choking waterways and out-compete native species.)

While environmental pressure from wastewater has not changed much in the study period, farming has continued to intensify as the region continues to grow and develop, putting further pressure on water catchments. Fortunately most of New Zealand’s rivers are not nutrient enriched. However, this does demonstrate an important economic effect: as the river flows to the coast rising pollution levels coincide with areas of higher population density. More pollution also means higher costs to treat raw water.

If the volume of water in the stream reduces because of drought or greater abstraction, the capacity to assimilate contaminants decreases. We therefore have to plan the management of both water quality and quantity together.

Case study 2: Lake Taupo - Nitrate in lower water layers up 100% in 30 years

Well-documented problems with Lake Taupo’s water quality have been caused by nutrients – especially nitrogen from land use around the lake. The amount of nitrogen loading in the lake’s lower water layers has increased 100% over the past 30 years.

The lake’s overall quality is likely to worsen as more nutrients come to the surface in future years.

The local community has established a trust to enhance the long-term health of the lake, primarily by reducing nitrogen pollution. The Trustees are aiming to achieve a 20% reduction in nitrogen entering the lake from both rural and urban sources.

The Trust programme will cost $83 million, being raised jointly over 15 years by Environment Waikato, Taupo District Council and Central Government. The fund will be used to encourage and assist land use change, and to buy land in the Lake Taupo catchment, as well as other initiatives to help landowners to reduce activities which discharge nitrogen into the lake.

A joint committee of these three agencies, along with the Tuwharetoa Maori Trust Board, oversees the Trust’s activities.
Freshwater demand has undergone significant change since the 1980s in particular due to increases in agricultural intensity and the subsequent demand to irrigate pastureland. This can be seen in the high percentages of irrigation-related consents both in terms of number and the volume of water abstracted.

Consented takes issued in New Zealand
About 20,000 individual consented takes have been issued in New Zealand. Irrigation has the highest number for abstractions – 78% of total consented takes. This compares with 11% for industrial uses, 9% for public uses and 2% for stock water use.

The amount and rate at which water is allocated for abstraction is 679 cubic metres per second.

5% of the total annual flow is abstracted from our river systems.

77% of this total volume of water abstracted is for irrigation.

The Canterbury region alone allocates 55% of this national total volume of water.

As a result, many large river systems and groundwater sources, including aquifers, are at or are rapidly reaching a state of full allocation for abstractive use.

This means that no more water can be taken from them without causing environmental harm or affecting existing users’ entitlements to abstract water.

Regional government is managing this situation through a number of ways including:

- rationing, whereby consents are reviewed and adjusted to reduce allocations
- putting would-be new users on waiting lists until water becomes available at a consent expiry date.

(Sources: MfE, 2006)

Climate change: droughts to worsen
Climate change is now also expected to compound problems this century by increasing the risk of drought in all areas that are already drought-prone.

Climate change modelling suggests most eastern areas of New Zealand will become increasingly dry.

Modelling also suggests New Zealand will experience changes in the frequency of droughts, rainfall patterns, and evaporation rates, which are likely to change water flows and aggravate existing problems with water availability.

More water will need to be available in drought-risk areas (through storage and irrigation) to keep pasture growing at its daily potential rate, and prevent production losses.

Effect of 10 year increase in consented abstractions from groundwater in Canterbury: Groundwater levels at monitoring bores 1995-2005.
Trends in allocation and irrigated areas

In New Zealand, total water allocated for abstraction increased by 50% between 1999 and 2006. The increase in abstraction can largely be explained by the increased demand for water for irrigation. During this same period, the amount of consented irrigated land in New Zealand increased by 52%. Canterbury has the majority of irrigated land (66%) followed by Otago (14%).

What is happening in different regions?

Distribution of consents by use, source and region

There are four categories of consented use: irrigation, stock, industrial and household. Irrigation consents by volume of water account for the largest proportion of consents in most regions, apart from Southland and West Coast. In these two regions industrial consents are the largest proportion.

There are three categories of sources for consented use: storage (lake), surface water and groundwater. Groundwater consents predominate in all regions except Otago.

Consented irrigation area increases

This figure shows the consented irrigation area in (ha) for 1999 and 2006 for each region. Most regions recorded an increase in consented irrigated area from 1999 to 2006. Auckland, Northland and Gisborne regions recorded a decrease in consented irrigated area.

(Source: MfE, 2006)

Abbrev Region
ARC Auckland Regional Council
EBOP Environment Bay of Plenty
ECAN Environment Canterbury
ES Environment Southland
EW Environment Waikato
GDC Gisborne District Council
GWRC Greater Wellington Regional Council
HBRC Hawkes Bay Regional Council
HRC Horizons Regional Council
MDC Marlborough District Council
NCC Nelson City Council
NRC Northland Regional Council
ORC Otago Regional Council
TDC Tasman District Council
TRC Taranaki Regional Council
WCRC West Coast Regional Council
Overview of the current framework

The Resource Management Act 1991 (RMA) provides the current framework for freshwater management. Central Government is involved in water management through issuing National Policy Statements and Environmental Standards and by submitting on Regional Councils’ Plans, and Water Conservation Orders (orders that protect the outstanding ‘amenity or intrinsic values’ of a particular water body).

New Zealand law is silent on who owns water, but vests all authority to manage it in the Crown. The Business Council’s Best Use Solution assumes the present position that authority to manage water rests with the Crown.

Allocation and consents to take water

Regional Government
Freshwater is managed by Regional Government, who are responsible for the water bodies within their boundaries, through implementing the RMA.

They manage water allocation and quality issues by means of Regional Policy Statements and Regional Plans (which can specify the amount of water that can be taken from certain water bodies and state how the water is allocated to users) and through the resource consent process, as defined in the RMA.

Applications to take or use water - or to discharge to water - are assessed against the Council’s Regional Plan and Policy Statement. The RMA provides for resource consents to be processed and granted under a first-in, first-served model, with individual applications assessed against the Council’s stated objectives and policies for water allocation and use.

When the amount of water available exceeds likely demand the ‘first-in, first-served’ model works well as one user’s needs do not preclude someone else’s being met.

When granted, consents are site-specific but can be transferred to new owners or occupiers of a site, and sometimes to other sites within the same catchment (if permitted by the Councils).

Benefits of the current system
There are several benefits of the current water management framework and it works well in situations of abundant water supply and low demand pressures. The RMA clearly defines roles for enabling regional plans to be developed. These plans give the community certainty over the goals and methods for freshwater management and aim to minimise adverse local effects on New Zealand’s freshwater environment.

Current Reforms
The Sustainable Water Programme of Action launched in 2003 by Central Government aims to identify priorities for government action to improve freshwater management in New Zealand. In 2007, the development of a National Policy Statement (NPS) on freshwater was approved and is due for release in July, 2008. Two National Environmental Standards (NES) have been drafted covering metering and methods for allocating water to protect aquatic ecosystems. The principles of these NES are consistent with the Best Use Solution.

Full allocation
As some water bodies become fully allocated, there is growing demand to transfer consents, but this normally involves a full consent application which is costly in both time and money.

Regional Government take different approaches to resolving full or over allocation, including:

- defining minimum flows and limiting the amount of water that can be taken from rivers and groundwater sources
- waiting lists – they do not grant any further consents until water becomes available when consents are abandoned or come to the end of their term and are not renewed
- rationing schemes, in which existing consents are reviewed and adjusted to reduce allocations (‘haircuts’). This review process is similarly used during water shortages.

In the past, people have applied for the maximum they are likely to use. As a result:

- rights were therefore allocated to those who did not fully use them
- most of the time, their surplus or unused allocation would not be easily made available for others, as it is currently bundled in a consent to take and use water, when only the use or part of the use needs to be transferred.

The current transfer process is clumsy, difficult to use and costly. It also does not encourage the efficient management of water quantity or water quality.
How the current framework falls short

Freshwater management in New Zealand does not consistently provide:

- adequate protection of environmental and in-stream values
- adequate flexibility for maximising the value derived from water made available for commercial use.

As more freshwater is allocated for various uses, management will become more expensive to administer. We need to better use and extend the consent tools of the RMA to manage when there are more wanting water than there is water available.

The resulting uncertainty makes water related investments, like irrigation or hydrogeneration schemes, more difficult to get off the ground. Planning and decision-making processes for water management also become less robust as pressure on the resource increases.

Allocation a battlefield

Some uses of water can demonstrate higher economic value than others. Some have higher or lower environmental, aesthetic and cultural value but these are not easily managed in the current framework.

This is partly because in-stream values are often aggregated, making it hard to clearly define management goals and the rules to meet those goals. These issues are being addressed at least in part, by the National Environment Standards for Water Metering and for Ecological Flows and Levels. The latter specifically separates ecosystem requirements from those of other uses such as recreation, aesthetic and cultural values.

As a result, challenging allocation limits and environmental minimum flows through Council hearings and the Environment Court, has become the practice of those seeking additional water. A significant amount of water is now locked up. Between 20-80% of the water already allocated may be available for redistribution (transfer) and use depending on seasonal flows and demands under the proposed revised management framework. (Source: MfE, 2006)

Potential new users are not able to access this water, making the system inefficient.

Allocated volumes are maximums and tend to overestimate the amount of water actually abstracted. The reasons for this include:

- allocations are based on peak or near-peak demand
- different users require peak volumes at different times
- not all of the allocated volume is required every year
- some water is not used but is reserved for future use
- natural variations in the weather.

As a result, allocated maximum volumes are generally not a good proxy for actual water abstraction. Hence, New Zealand will face full allocation of water in many catchments by 2012, because of an inefficient allocation system. Within the same total allocation, more water could be made available for best use and production, while not risking the environment and other valued in-stream uses.

Regional level planning needs better tools

Current regional plans lack the specificity of rules and scope needed to provide certainty to all parties about the quantity and reliability of water set aside for taking and to be kept in the water body.

The decision-making processes that develop current water management plans lack robust, water-use-specific quantitative information on the local, regional and national benefit expected from water taken from or retained in the water body.

As a result, it is difficult to establish the underlying value of water where there are multiple potential uses and users. There is difficulty in optimising local, regional and national benefits from water use permitted by the community in balance with ecosystem values.

Planning lacks strategic long-term views and often focuses on short-term pressures. We need to use tools to ensure the community, recreation and environment values are reflected in water management plans.

Stronger national direction required

Nationally, there is little guidance provided for making policy at the catchment level. Regional Councils are often attempting to make allocations and manage the effects of consents in the absence of good planning. While statements of intent for national overview and direction have been voiced, National Policy Statements (NPS) and National Environment Standards (NES) are only now emerging. However the process of development of these types of
How the current framework falls short

Instruments includes a high degree of uncertainty over the outcome. There is similarly no guidance from Central Government for establishing a hierarchy to resolve the water issues confronting water stressed regions.

At a national level, there is also a lack of definition around what is a public benefit (and hence what is justifiably rate funded) and what should be user funded.

For example, key distinctions needing better definition include:

- the monitoring of a river – is that for the public benefit?
- how about metering of takes – should that be user funded (as discharges are now)?

This inability to measure public benefit results from the lack of widely agreed on and accepted tools that work across industrial, recreational and customary uses.

A lack of national direction also creates risk and uncertainty

The current system doesn’t distribute risks across stakeholders, nor does it provide clarity around who carries the risk if the volume of water available changes for uses that are already consented.

A lack of tools affects water quality

The cumulative effects of water takes and contamination of water are not well managed. While land-use controls, such as restrictions on the application rate of fertiliser, are being implemented to reduce the loss of nutrients, such practices do not address directly the key issue of managing non-point discharges, and living within the assimilative capacity limits of waterways and underground water systems.

Non-point discharges filter through the soil, and run off to water tables and aquifers. We often know little about how long they take to end up back in a waterway or aquifer. This can depend on a number of factors including rainfall, soil type, and the irrigation method used. The Best Use Solution includes research and monitoring to deal with this as a critical issue in the most stressed catchments.

‘Bundling’ results in high transaction costs for transfers

Take and use consents are often issued together, rather than separately.

When combined, this can make conditions attached to the consent too complex and unenforceable. It also increases the time and cost involved when trying to transfer part or all of the water associated with the consent.

Most current approaches to managing transfer of take consents involve a process equivalent to a new take consent. This is time consuming, costly and often becomes politicised.

Insufficient monitoring and metering

The current level of monitoring and metering of takes at Regional Council level is insufficient. Water can be allocated as a flow rate or as a volume that can potentially be taken annually, but monitoring how much water is actually taken varies across the country. In order to be able to develop robust water accounts far more monitoring and recording of water is required.

As a result, Regional Government do not have a full understanding of actual pressures on their rivers and groundwater resources. This gives rise to uncertainty about the causes and effects of changes they observe in their waterways. This is also an impediment to water management and establishing transparent and efficient water transfer processes.

We therefore need to better plan and allocate water to keep freshwater quality at acceptable standards and let all New Zealanders benefit from its use.

Specifically, we need a framework that:

- sets an upper limit to the amount of water able to be allocated or extracted from a waterway
- shares the natural risk of water availability
- consistently determines the amount of contaminants or other substances that a water system can assimilate, and
- has a way to transfer water or discharge rights available for use within those limitations.
Who are the stakeholders and how are they affected?

<table>
<thead>
<tr>
<th>Stakeholders</th>
<th>Problems or mix of problems</th>
<th>Key problems with the current framework as perceived by each stakeholder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental interests</td>
<td>The quality of water is not managed adequately, including discharges from non-point sources e.g. run-off. Also the current framework manages water in a way that is often disconnected from community values and priorities. This means that environmental and in-stream values are not always well protected. Defending these values is becoming ever more expensive as the process becomes more litigious. Over allocation at times means river flows are depleted and groundwater levels are reduced. This exacerbates quality problems associated with discharges and concentrations of contaminants in the water.</td>
<td></td>
</tr>
<tr>
<td>Recreation and instream interests</td>
<td>There is no long-term strategy or policy framework to maintain and improve freshwater quality. The current framework fails to appropriately assess the need for community use for recreation and in-stream requirements of water, bundling these together rather than making each of them transparent, resulting in community values sometimes being traded off as environmental needs are compromised. Community in-stream interests are at risk due to the quality and quantity issues arising in some catchments. There is limited guidance on how to address multiple values (e.g. community vs economic) in planning.</td>
<td></td>
</tr>
<tr>
<td>Irrigation interests including storage</td>
<td>There is an inherent risk of water supply, as part of a natural system affected by weather variability. This is not well handled. Because of the uncertainty surrounding the duration of consents and water reliability, irrigators are unwilling to invest in irrigation schemes without a community or Government underwrite. The current framework does not provide for a strategic assessment of future water opportunities and options. Furthermore, security of existing or future supply is difficult to guarantee, which impacts negatively on investment decisions. Consents given under the RMA currently cannot separate access to water from the local effects of ‘take’ and ‘use’. This effectively ‘locks’ up water that could be used through transfer to another user without compromising environmental standards. The time and cost of existing transfer processes are significant, which makes temporary transfers impractical.</td>
<td></td>
</tr>
<tr>
<td>Central and Regional Government</td>
<td>There is insufficient resource and knowledge to strategically assess future water opportunities and options. The ability to do this could avert future water crises. The current situation promotes a generalised approach to water management, which fails to recognise specific water issues at catchment level for each stakeholder. Administration is becoming expensive as we approach full allocation, and as management systems are implemented to address situations of over allocation. Legal challenges are common. There is low knowledge of the actual volumes being abstracted, in part because of insufficient metering of takes which increases the chances of catchments being over allocated. Consents given under the RMA currently cannot separate access to water from the local effects of ‘take’ and ‘use’, which effectively ‘locks’ up water that could be used through transfer to another user without compromising environmental standards. There is limited guidance on how to address multiple values (environmental, economic, cultural, in-stream, national and regional) in planning. A lack of national guidance, together with different pressures across the regions for water has resulted in regional variance of planning effectiveness. Inadequate funding is another constraint preventing councils doing something more or better.</td>
<td></td>
</tr>
<tr>
<td>Stakeholders</td>
<td>Problems or mix of problems</td>
<td>Key problems with the current framework as perceived by each stakeholder</td>
</tr>
<tr>
<td>----------------------------------</td>
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<tr>
<td>Municipal supply</td>
<td>The costs associated with improving raw water quality, when water quality declines, are being met by the user at the downstream point of take, rather than upstream dischargers who create the problem. It is difficult to properly assess future opportunities and options for use of water e.g. security of supply for growing populations in high-demand catchments. There is a need to be able to ‘future-proof’ water supply for increasing populations.</td>
<td></td>
</tr>
<tr>
<td>Iwi</td>
<td>The current framework in many cases has proven to be unable to incorporate customary rights under the Treaty of Waitangi into local water allocation and use. There is a desire for mahinga kai species and habitats to be protected which is difficult under existing arrangements. Iwi rights under the Treaty of Waitangi in respect of freshwater resources have yet to be resolved for many catchments. Iwi have concerns over future access to water in water-short catchments where this may restrict the ability of Iwi to develop their land currently leased out but to be returned after claim settlements. Iwi have concerns over long-term strategic planning and current use of the resource particularly in respect of maintaining and improving quality of the resource where this may restrict the ability of Iwi to develop their land.</td>
<td></td>
</tr>
<tr>
<td>Hydro and other power generators</td>
<td>The current framework does not provide a way to properly assess strategic water opportunities and options across New Zealand or within a catchment. The current framework results in a high level of competition between existing users and new users resulting in expensive litigation. It also fails to provide long-term security of supply and therefore impacts investment security and decisions. There is limited national guidance in respect of national benefits of hydrogeneration relative to other values for local decision making.</td>
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<tr>
<td>Industrial users</td>
<td>It is very costly and impractical to transfer water to higher value uses. Beyond living within resource consent conditions, there are no incentives to improve discharge quality; and no incentives to be more efficient with water consumption.</td>
<td></td>
</tr>
<tr>
<td>New users and potential investors</td>
<td>There is very limited availability for new users who want access to water in water-short catchments. The cost of accessing entitlements from existing land owners is often prohibitive. There is concern that some new allocations are being made that will not be able to be supplied due to over allocation of the resource.</td>
<td></td>
</tr>
<tr>
<td>All stakeholders</td>
<td>The current framework allocates water on the basis of existing traditional uses rather than the best current/future use. There are major concerns about the deterioration of the quality of our water resources despite regional planning and other government interventions. A lack of knowledge about some aspects of our freshwater resource means the assessment of future opportunities and options cannot be carried out. The current framework has no way to assess value, so water doesn’t go to the highest value use. Water allocation is based on effects management of the resource (with limited knowledge of aspects of the resource, particularly regarding quality and limited national guidance) which impedes longer term strategic planning. Many regional plans do not specify allocation limits, so how much resource is available for use is not clear.</td>
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</tbody>
</table>
The Best Use Solution

The Business Council proposes a Best Use Solution using a mixed statutory-planning and market-based approach to manage surface and groundwater resources in each catchment.

This combined solution will provide a sustainable approach to both the quantity and quality of water management. It takes into consideration: public interest values, stock and firefighting needs, the aquatic ecosystem, municipal supply, iwi, recreation, irrigation and other industrial uses, and power generation. It achieves highest value actual use of the water available for commercial use through transferability.

**THE KEY ELEMENTS:**
- Statutory planning
- Management of allocations and effects (unbundling take and use consents, access entitlements)
- Consumptive use shares (not absolute amounts)

- Measuring and monitoring (consistent and timely record keeping and transparent reporting on entitlements, allocations, quality, quantity, transferring, water and contaminant accounting)
- Improved quality management tools
- Voluntary transfer of entitlements.

Best Use Solution: Managing Water Quantity and Quality

**Policy and Planning**
- Central Government
- Regional Council
- Integrated Catchment Management Plan

**Managing Water Access and Environmental Effects**
- Water Access Entitlement
- Resource Consents

**Enabling Transfer**
- Register of Water Access Entitlements
- Register of Consents
- Register of Contaminant Discharge Entitlement

**Monitoring/Metering**
- Water Accounts
- Water Use Monitoring
- Regional Council Monitors Compliance
- Contaminant Accounts
- Contaminant Discharge Monitoring

*Note: see page 26 for a more detailed presentation of The Best Use Solution.*
Structure and features of the Best Use Solution

### Policy and Planning

#### New Integrated Catchment Management Plans

At a regional level, the catchment is the fundamental management unit. Under the Best Use Solution system, Regional Government will be required to prepare Integrated Catchment Management Plans (ICMP) following the National Policy Statement. Management through ICMPs would involve:

- National compliance: complying with national policy statements and/or national environmental standards setting minimum flows, process for setting assimilative capacities, cultural in-stream flows, drinking water quality standards and other factors
- Periodic, whole-of-catchment assessments to ensure compliance, monitor and provide information on the resource
- Balancing community interests: how cultural, economic, social and environmental interests in the resource will be appropriately balanced to achieve the most sustainable method of allocation
- Allocating all the water in the catchment to four ‘pools’ to reflect this balance
- Defining the catchment assimilative capacity

Integrating sustainable management of quality and quantity in a catchment.

An ICMP has been developed for the Motueka Catchment in Tasman covering quantity. Quality cap and trade tools have been developed for Lake Taupo. The Best Use Solution integrates both quality and quantity management.

#### Separation into four primary pools

All water in a catchment will be separated into four primary pools:

- Aquatic Ecosystem Sustainability Pool
- Permitted Activity Pool (e.g. stock drinking water)
- In-stream, Public Use Pool (e.g. recreation)
- Consented Use Pool

#### PRIMARY POOLS

<table>
<thead>
<tr>
<th>Pool Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquatic Ecosystem Sustainability Pool</td>
<td>Sustainable management of aquatic ecosystems.</td>
</tr>
<tr>
<td>Permitted Activity Pool</td>
<td>E.g. stock drinking water</td>
</tr>
<tr>
<td>In-stream, Public Use Pool</td>
<td>E.g. recreation, cultural, public uses</td>
</tr>
<tr>
<td>Consented Use Pool</td>
<td>E.g. irrigation, fish farming</td>
</tr>
</tbody>
</table>

#### CONSSENTED USE POOL

- Municipal Water Supply
- Energy Production (e.g. run of river hydro, storage diversions)
- Other Uses 1 (e.g. irrigation)
- Other Uses 2 (e.g. fish farming)

#### CASE STUDY: ALLOCATION OF CATCHMENT WATER

**CURRENT WATER ALLOCATION**

- Unused Consents to take: Available for transfer
- Unused Consents to take: Difficult to Transfer
- Individual Domestic & Stockwater takes
- Aquatic Ecosystem

**BEST USE SOLUTION WATER ALLOCATION**

- Unused Consents to take: Available for transfer
- Used Consents to take
- Individual Domestic & Stockwater takes
- In-stream - recreation, cultural, public uses
- Aquatic Ecosystem

- Allocation of entire flow regime.
- Identification of water available for transfer.
- Improved protection for in-stream interests and ecological needs.

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Structure and features of the Best Use Solution

Managing Water Access and Environmental Effects

**Defining water access entitlements**
The proposed solution treats access to freshwater separately from its take and use.
This is achieved by ‘unbundling’ the entitlement to access water from the current ‘take and use’ consent. The cumulative quality effects of taking water are managed independently of the localised effects of its abstraction, use and return.

**Key features:**
- The actual physical amount of water to be taken under the current consent structure is ‘unbundled’ from current ‘bundled’ take and use consent framework.
- A right to access water for taking, termed a ‘Water Access Entitlement’, is a secure property right available for a 35-year-term, with rights to renew for 35 years.
- Water access entitlements are transferable. The ICMP would define the terms and conditions by which voluntary transfer of access entitlements could occur.
- The entitlements represent a proportional share of the freshwater resource in a catchment made available for taking in the ICMP, rather than as a ‘guaranteed’ volume or flow rate.
- The entitlements for the amount of water (either volume or flow rate) to be altered in accordance with changes in scientific knowledge, the application of technology, or available water quantities e.g. to take into account different weather patterns and resulting riverflows.
- The granting of water access entitlements would consider reliability of supply.
- Rules would clearly outline voluntary transfers which are permitted activities and those transfers which are restricted discretionary activities.
- An entitlement that is not being used will still be considered ‘used’ if it is required to meet a future need, or another purpose. However, the Best Use Solution allows for the immediate, temporary and voluntary transfer of that entitlement for a defined period.

**Defining water consents**
The ICMP would specify how site-specific effects will be managed through the appropriate consents (to take, dam, discharge, and use water).
The components of the resource consent that deal with take and use are separated, and simplified by narrowing their scope (see figure below).
This is a further extension of the separation specified by Environment Waikato in its Waikato Regional Plan Proposed Variation 6, addressing water management in the Waikato River.

The key features are:
- The water take consent grants permission to build and operate a structure to physically take water.
- The water take consent manages site-specific local effects of the take. These effects are currently managed through conditions contained within consents to take water; and this would continue.
- The water use consent manages site-specific effects of water use. The consent conditions are focussed on managing the downstream effects of water use and encouraging efficient use.
- Neither the take nor use components of the resource consent would specify the actual amount of water which will be taken. This information is now to be held in the water access entitlement.
- Dam and discharge consents are unchanged.
- All significant freshwater extractions and point discharge returns shall be measured.

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<table>
<thead>
<tr>
<th>Key Changes to Resource Consent in Best Use Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current system</strong></td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td><strong>Water Take and Use Consent</strong></td>
</tr>
<tr>
<td>Covers the amount you can take, plus the location you can take it from and how you can use it</td>
</tr>
<tr>
<td><strong>Water Use Consent</strong></td>
</tr>
<tr>
<td>Grants permission to operate a water take structure</td>
</tr>
<tr>
<td><strong>Water Take Consent</strong></td>
</tr>
<tr>
<td>Grants permission to physically dam or discharge</td>
</tr>
</tbody>
</table>

These consents are location-specific Regulatory process required to make changes...
Transferring

Transfers and water accounting
The voluntary transfer system for water access entitlements and assimilative capacity entitlements must be transparent for all users and stakeholders. All voluntary transfers need to be easily verified by an independent third party, as demonstrated by the Opuha dam and registry scheme, in Canterbury. Voluntary transfer of water operates successfully within irrigation schemes at the current time.

Establishing a registry will provide the mechanisms for matching up potential transferrers and transferees, and a transparent method for determining how much water is transferred and to whom, and for how long while ensuring abstraction does not exceed allocation.

Key elements of water record keeping would include:

- Water accounts set up for each registered water access entitlement and assimilative capacity entitlement
- All allocation credits and debits recorded
- Real time update and online access
- Double entry recording system
- Water accounts consolidated to catchment level and balanced annually
- Recording systems for managing transfers of water access entitlements and assimilative capacity entitlements to manage quality.
### The Vision

Structure and features of the Best Use Solution

**Managing water quality**

The mixed-planning and market solution adopts the quality management tools of our current freshwater management system and introduces tools to manage the adverse cumulative effects.

#### Tools for management of effects relating to quality

<table>
<thead>
<tr>
<th>TOOL</th>
<th>MANAGEMENT FOCUS</th>
<th>RELATIONSHIP TO QUALITY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CONSUMPTIVE USE SHARE</strong></td>
<td>Manages cumulative effects of consumptive use from groundwater sources.</td>
<td>Placing a limit on this share i.e. the cap on allowable volume of water removed per year from a catchment – protects groundwater and surface water. A catchment’s assimilative capacity is dependent on the size of this cap so total volume of water has to be defined alongside setting the assimilative capacity limit.</td>
</tr>
<tr>
<td><strong>FLOW RATE SHARE</strong></td>
<td>Manages cumulative effects of takes and damming on the flow regime of rivers and streams.</td>
<td>This share is based on the limit on the total flow rate able to be taken from a river. This is required in order to protect the environmental and in-stream flows.</td>
</tr>
</tbody>
</table>
| **WATER USE CONSENT**                          | Manages effects of use on the water resource that receives drainage water.      | Specific conditions on use can be developed to suit particular circumstances such as:  
  - land use changes  
  - resultant downstream effects on water bodies receiving discharges or drainage.                                                                                                                                     |
| **WATER TAKE CONSENT**                         | Manages site-specific local effects (excluding effects on flow regime).        | This tool specifies conditions relating to effects on adjacent water takers, maximum rates of take, or structure-specific conditions, like fish screen details.                                                                 |
| **DISCHARGE CONSENT**                          | Manages effects of discharge on water bodies that receive the point discharge.  | Specifying the water quality of point discharges is an incentive for higher standards. *(Total discharge limits from point and non point sources in a catchment will be based on assimilative capacity limits.)* |
| **CAP AND TRADE MECHANISM FOR POINT AND NON-POINT SOURCE DISCHARGES** | Manages the cumulative effects of land use on water bodies receiving point and non-point source discharges. | This mechanism specifies:  
  - the target quantity (or limits) of contaminants in the water source  
  - the constraints on discharge or run-off levels as determined by the community.  
  This tool can be used to reduce the overall cap over time to reach a specific goal.                                                                 |
| **LAND USE CONSENTS**                          | Manages how land is used to minimise adverse effects (restrictions on specific land uses or intensification). | Currently the major tool available to manage quality, voluntarily tradeable assimilative capacity limits should enable Regional Government to manage quality with fewer direct restrictions or controls on land use. |
The Best Use Solution requires key improvements at Central and Regional Government level.

Changes to the Resource Management Act
Resource Management Act changes would include an amendment enabling unbundling the water access entitlement, comprising flow rate shares and consumptive use shares, and addressing the following:

- the rights of consent holders to transfer all or part of interests in water
- the circumstances in which the water right can be exercised (with respect to other consent holders and duration)
- protection of the rights of existing resource consent holders (and land owners), by way of a grandparenting system where access entitlements would normally be allocated to the landowner
- a process to assist Regional Councils to effect Integrated Catchment Management Plans which have not been developed within the nominated timeframe.

National Policy Statement
Councils will be required to develop Integrated Catchment Management Plans consistent with NPS and NES provisions as a matter of national significance within a set time for critical catchments.

National Environment Standards
National Environmental Standards required by the proposed solution include:
- default (or “interim”) flow rate(s) set aside for aquatic ecosystem sustainability and in-stream public uses, together with default limits on the amount of water available for taking (flow rate and consumptive use)
- methods for determining how much of a water resource is to be assigned to the aquatic ecosystem, in-stream public use (including recreational and cultural uses), minor individual use and consented use pools and sub-pools
- default (interim) limits on catchment assimilative capacity for contaminants
- default point source discharge standards - minimum or maximum as appropriate (e.g. contaminants)
- methods for determining a catchment’s assimilative capacity for contaminants, and for determining point and non point source discharge standards

exemptions from standards where appropriate
the nature of rights afforded by each entitlement as to duration
the circumstances in which the rights may be exercised (with respect to other shareholders)
protection of the rights of existing resource consent holders, by way of a grandparenting system with provision for a ‘proportional haircut’ where necessary to live within established water constraints where a catchment may be over allocated.

Public Participation
Ongoing access to funding for environmental and other community groups should be available enabling these groups to fully participate in the development of NPS, NES, regional plans, ICMPs and resource consent processes.
Improvements needed to effect the Best Use Solution

**Governance**
We strongly recommend that Government and Iwi develop an agreement on ‘governance’ of New Zealand’s freshwater resources with respect to customary issues with priority for water stressed catchments.

**Integrated Catchment Management Plans**
Initially a few pilot ICMP’s would be developed to provide tools and guidelines for Regional Councils in stressed catchments. The plans would ensure all water resources had periodic assessments to monitor and determine ecosystem health and water quality, verify catchment management outcomes, and measure/monitor consented extractions and returns. ICMPs fall into the regional plan category of the RMA, and as part of this institutional framework, ICMP should undergo a review process initially after ten years and then every 20 years after that.

**Establishment of Shared Services:**
Central Government would fund and establish a national registry and facilitate the development of an expert facility to monitor, report and run a water and contaminant discharge entitlements accounting system, as a shared service with running costs met by the Regional Councils.

**Metering**
Regional Government require improved and increased metering and monitoring of all significant takes and discharges consistent with the NES standard metering.

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**Prioritisation of development of ICMPs**
The prioritisation of catchments requiring development of Integrated Catchment Management Plans would follow the process outlined below:

<table>
<thead>
<tr>
<th>Key</th>
<th>Key</th>
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</thead>
<tbody>
<tr>
<td>Red</td>
<td>High Priority</td>
</tr>
<tr>
<td>Yellow</td>
<td>Medium Priority</td>
</tr>
<tr>
<td>Green</td>
<td>Low Priority</td>
</tr>
<tr>
<td>White</td>
<td>No Change</td>
</tr>
</tbody>
</table>

### Initial Catchment Consented Use Pool (CUP) allocation

- **Areas where CUP is over 100% allocated:**
  - Allocation limits have not been set, high demand for water likely over next five years.
  - Likely to include Canterbury, Waikato, Otago and the Nelson/Marlborough area.
  - Establish or review existing ICMP setting minimum flows, risk bands, zones and assimilative capacity/limits.
  - Proportional “haircut” for all existing CUP users based on new limits if lower than existing allocations for quantity and a ‘sinking lid’ for contaminants for quality.
  - Unbundle consents (consents to take and use from the physical water entitlement).
  - Transfer of water access and contaminant discharge entitlements then allowed on voluntary basis.

- **Areas where CUP is over 70-100% allocated:**
  - Allocation limits are not yet set, and there is high demand for water likely over the next five years.
  - Transition from first-in, first-served approach to substantive evaluation of competing values of applications.
  - Establish or review existing ICMP, setting minimum flows, risk bands, zones and assimilative capacity limits etc.
  - Make decisions on strategic allocation of unallocated water:
    - option to hold, tender or transfer remaining 30% of water (e.g. ‘earmarked’ water for a future new town or planned industry), and decisions made in accordance with rules specified in ICMP.
  - Unbundle consents (consent to take and use from the water access entitlement).
  - Transfer of entitlements allowed on voluntary basis (may include allowing temporary transfer of water held for future strategic uses and assimilative capacity for contaminants).

- **Areas where CUP is under 70% allocated and may reach 70% allocated over next 10 years.**
  - No immediate change: first-in, first-served system. ICMP to be in place prior to the allocation of water available for use approaching 70%.

- **Existing Water Conservation Orders.**
  - No change is proposed.
  - Improved and increased metering and monitoring of all takes, discharges and quality consistent with the NES.
Costs and Risks - Who Pays the Cost? Who Holds the Risk?

The Best Use Solution needs an up-front investment. The alternative is an even higher price in lost economic, social and environmental opportunities.

The Best Use Solution costs are applied, and are appropriate, to those whose responsibility it is to deliver their part of the solution – at national, regional and user level - following the existing pattern of cost distribution as detailed in the table following.

Risk

Entitlement holders bear the risk from the natural variability in supply as a result of climate and/or changing science. Risk will be managed through a reduction in the amount of water available for abstraction through daily setting of flow-rate allocations and annual setting of consumptive use allocation. Risk may be mitigated for users by holding access entitlement classes with high supply reliability. Less reliable water can be combined with storage to manage the risk.

Compensation for water users from major policy and planning changes unforeseen at the time of consent approval would become effective after the first ICMPs have been reviewed probably 10-30 years away.

Compensation would not be paid if a change in allocation pools is the result of a change in scientific knowledge, or discovery of a new contaminant.

Compensation would be paid (by Regional Council) if a change in allocation pools is the result of change in community values (e.g. desire for greater in-stream public use benefits where this change exceeds a threshold).

Compensation would be paid (by Central Government) if a reduction in the quantum of water available for taking, or of its reliability, is due to a new NPS or NES or other Central Government policy change becoming operative.

Compensation could include direct payment, remedial measures, an official apology, or help with developing infrastructure to mitigate a reduction in the Consumption Use Pool.

<table>
<thead>
<tr>
<th>WHO IS RESPONSIBLE AND WHO PAYS?</th>
<th>RESPONSIBILITY</th>
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<tbody>
<tr>
<td>Development of National Policy Statements and National Environment Standards</td>
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<tr>
<td>Costs associated with developing shared service national water accounts and establishment of registry</td>
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<tr>
<td>Development of regional policy statements and mandatory Integrated Catchment Management Plans</td>
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<tr>
<td>Submissions on proposed policies and plans</td>
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<tr>
<td>Applications for water access entitlements and consents</td>
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<tr>
<td>Ongoing compliance metering and monitoring costs</td>
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<tr>
<td>Costs associated with operating water accounts</td>
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<tr>
<td>Costs associated with transfer of water access entitlements</td>
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</tbody>
</table>

The main additional operating cost of the Best Use Solution is the national water accounts.

The costs associated with the development of Integrated Catchment Management Plans have been indicated to be high for some regions, hence the development of shared services and pilot ICMPs and guidelines will help to offset some of these costs.
The Best Use Solution

Central Government:
- Iwi/Government water governance agreement covering customary use and development opportunities by catchment
- National Policy Statement
- National Environmental Standards
- RMA amendments for unbundling of water access entitlement and risk sharing mechanism.

Regional Council:
- Regional Policy Statement
- Regional Plans

Integrated Catchment Management Plan
Defines one or more allocation zones for the catchment. Sets up the Primary Pools – divides up all of the flow regime between the full pools defining water allocation limits.
- Aquatic Ecosystem Sustainability
- Minor Individual Uses
- Public Use In-stream (including customary use)
- Consented Use Pool (CUP)

- Sets up the Consented Use Pool – creates sub-pools based on supply reliability and may reserve a sub-pool for a specific water use (e.g. municipal)
- Key components relating to CUP sub-pools include:
  - consumptive use shares defined and number
  - flow-rate shares defined and number

- Key components relating to contaminant discharge include:
  - catchment assimilative capacity (CAC) defined
  - all sources of contaminant (point and non point discharge) accounted for.

- Defines Rules for:
  - voluntary share transfer (water and contaminant)
  - daily setting of flow-rate available for allocations
  - annual setting of consumptive use available for allocations
  - allocation decisions relating to remaining water - who makes them, and process for value-based decision making
  - ‘holder’ of access entitlements for final 30% of CUP where this is not yet allocated
  - specific water and contaminant accounting procedures

Water Access Entitlement
Consents to legally access water – flow-rate and volume.
- Two separate transferrable entities:
  - consumptive use share (per CUP sub-pool)
  - actual volume allocated to sub-pool determined on annual basis
  - addresses cumulative effects of water use
  - particularly important for groundwater uses.
- Flow-rate share (per CUP sub-pool)
  - actual flow-rate allocated to sub-pool determined on a daily basis
  - reliability of supply managed through this mechanism
  - particularly important for surface water takes.

Resource Consents
Consents to operate a water take structure and to use water.
- Local non-specific aspects of taking and using water are controlled through these mechanisms:
  - Take consent
  - Discharge consent
  - Dam consent
  - Water use consent.

Contaminant Discharge Entitlement
Entitlement to legally discharge contaminants into water.
- Transferable entity.
- Proportional share in total catchment contaminant discharge as established by the catchment assimilative capacity.

- Catchment limits can be set as a reducing cap over set time and reflected in actual limits and the proportion allocated to shares on an annual basis.

Register of Water Access Entitlements
Water Accounts
Water Use Monitoring
Register of Consents
Regional Council Monitors Compliance
Register of Contaminant Discharge Entitlements
Contaminant Accounts
Contaminant Discharge Monitoring
Structure and features of the Best Use Solution

“\nIt is important to note that while the Best Use Solution is a fresh approach to water management, many of the components are a wider application of current practice and tools used in New Zealand and internationally.”

The major improvements proposed in the new model include:

- adopting integrated catchment management plans for water planning at a regional level
- separating the water access entitlement from resource take and use consents so that surplus allocations can be transferred to other users
- proportional shares of the water available for taking in order to manage for different natural variability in water availability
- improving monitoring and metering of takes and assimilative capacity limits
- introducing a new tool to put a cap on point and non-point contaminant discharges into the receiving water body. With other new features, this will allow a “cap and trade” system to manage these non-point or point discharges to live within the assimilative capacity of our waterways
- establishing a registry to facilitate water accounting and quality management and voluntary transfer of water.
- moving to a value-based allocation from the first-in, first-served approach once a specified proportion of the available water has been allocated.
The Best Use Solution

What is Needed to Make it Happen

**National**

These actions are needed at Central Government level:

- Setting a requirement for measuring and monitoring (consistent and timely record keeping and transparent reporting on entitlements, allocations, quality, quantity, transferring, water and contaminant accounting).
- Clear timetable for addressing priority catchments and suspending further first-in, first-served applications for these catchments.
- Clear view from government on value of water for all uses; strategic long-term view, and resource management (National Policy Statements – including transparent, statutory-based catchment management planning, as the basis of water allocation and contaminant management at the operational level).
- Provision of knowledge, systems and tools (National Environment Statements) for effective planning and management (cumulative effects, assimilative capacity standards, environmental base lines, metering and monitoring).
- Clear definition of a secure water access entitlement and its duration.
- Funding all aspects of establishing the shared services required including the national registry.

**Regional**

These actions are needed at Regional Government level for all catchments deemed to be in need of the Best Use Solution:

- Undertake Integrated Catchment Management of surface and groundwater resources – to manage the cumulative effects of water takes and nutrient inputs.
- Set environmental baselines and allocate the remaining water to recreational, stock water, customary, generation and commercial uses.
- Assess the relative value of in-stream use to facilitate allocation decision-making.
- Agree policy settings which encourage water use efficiency and innovation in urban and rural areas.
- Move to a value-based allocation from the first-in, first-served approach, once a specified proportion of the available water has been allocated (say 70%).
- Establish rules which minimise the transactions costs of transferring water permits and enable an efficient, open transfer system to operate, while protecting the statutory provisions made for environmental and other public benefit outcomes.
- Provide water accounting to track who has entitlements and who has taken, used, returned or treated water. This information is needed by the Council and stakeholders for planning, monitoring, trading, environmental management and commercial water-use management.
- Undertake metering and monitoring of takes and discharges to water and common reporting of takes and discharges to water.

**Water users**

These actions are needed by water users:

- Accept greater assignment of risk arising from future changes in the amount of water actually available for existing consented use or changes in our knowledge of the science of water use.
- Use unbundled consents to take and use no more than the amount of water they are granted access to via the proportional water access entitlement.
- Use the enhanced transfer mechanism to access water and assimilative capacity requirements for a commercial activity. This will be the most effective approach as the resource reaches its sustainability limits. The Business Council proposal applies a market-based mechanism to the pool of water made available for taking. The intention is to achieve better sharing of a limited resource among commercial uses, helping ensure water and contaminant discharge entitlements go to the highest value uses.

Taking The Next Step

This project report details the major problems, the concerns of all parties, and a proposed solution which will work best for New Zealand.

The Business Council has enjoyed widespread participation in, and support for, the project and its broad recommendations.

We will now consult with politicians, councillors and their advisors on the Best Use Solution and establish support for the development of a pan-sector agreement on the Best Use Solution for New Zealand’s water problems, including draft legislation and required changes to policy tools.
The Best Use Solution for New Zealand’s Water Problems

<table>
<thead>
<tr>
<th>KEY</th>
<th>DEFINITION</th>
<th>PROBLEM</th>
<th>SOLUTION</th>
<th>BENEFITS</th>
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<tbody>
<tr>
<td>QUANTITY</td>
<td>Freshwater water resources in the populated and intensely farmed areas of NZ will soon be fully “allocated”. Limited ability to transfer surplus allocated but unused water.</td>
<td>Tools to measure and manage water takes and flows and enable water use transfer.</td>
<td>Economic incentives to conserve water, or maximise output per unit of water taken from increased transferability. Improved metering and monitoring will enhance quantity management.</td>
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<tr>
<td>QUALITY</td>
<td>Public concerns over declining quality and clean-up costs. Many water users have concerns about quality (including nitrogen, microbes, algal bloom and mercury levels).</td>
<td>Cap and trade for contaminant discharges, to operate within the limits of capacity of waterways and groundwater to assimilate them. A benefit for users that reduce contaminant discharge or run-off.</td>
<td>Control of the cumulative effects of water takes and contaminant discharges on lowland streams and lakes. Capping and transferability for better management of contaminant impacts. Improved metering and monitoring to provide better information for users and planners.</td>
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<tr>
<td>EFFICIENCY</td>
<td>Poor incentives to improve use or efficiency because users don’t pay for higher reliability and use-it or lose-it rules encourages inefficient use.</td>
<td>Pricing through tradable entitlements will provide incentives for more efficient use.</td>
<td>Efficient transfer of water takes and contaminant limits to the highest value uses. Increased economic benefits from consented but unused water being made available for taking.</td>
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<tr>
<td>PLANNING</td>
<td>Politicised process with little Central Government guidance; lack of tools for setting environmental parameters. Decision-making process increasingly litigious.</td>
<td>Urgently complete policy tools e.g. NPS, NES to provide greater uses, certainty of what is available to take and guidance on various uses. Extend use of Integrated Catchment Management Plans.</td>
<td>Exploit provision for water allocation for public such as iwi, customary and recreational uses. Value-based water allocation planning that takes account of national objectives in addition to regional and local objectives. Public access to current, comprehensive water accounts. In particular, information on under-utilised water access and contaminant discharge entitlements readily accessible.</td>
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<tr>
<td>ALLOCATION</td>
<td>Few regional plans have set allocation limits. Lack of monitoring and metering of resource and use.</td>
<td>Allocation of all water to one of four primary pools. Only one of these pools is for consented use where transfers are allowed. Metering required for all significant takes.</td>
<td>Improved protection of the aquatic ecosystem, through clearly defined allocations to each pool, improved transferability of entitlements which means reduced costs for reallocations.</td>
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<tr>
<td>RISK</td>
<td>Every user wants access to maximum allocation with the highest reliability. In times of shortages, ecological impacts can dramatically increase. The current system does not reflect the natural variability in water flows.</td>
<td>Improve knowledge of reliability for greater certainty of supply. Require users to take proportional shares in water available for taking. The majority of the risk of changing volumes is then with the users, as a result of variability in availability.</td>
<td>Improved management of risks to the environment and to water users through the use of zones, reliability bands and proportional shares. Appropriate compensation for takings after transition to the new framework.</td>
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<tr>
<td>INVESTMENT</td>
<td>Uncertainty around honouring existing take levels and length of consents affects long-term investment because past “promises” may not be able to be kept. Regional Councils manage uncertainty by keeping consent durations to the minimum.</td>
<td>A 35-year-35-year-term for access entitlements to water should enable access holders to underwrite long-term investment (irrigation schemes or hydrogeneration).</td>
<td>Greater certainty about the quantum and reliability of water made available for taking and the duration of entitlements.</td>
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<tr>
<td>LONG-TERM STRATEGY</td>
<td>First-in-first-served gives no opportunity to take a strategic view; current assumption is that clean water will be always available in catchments even once full allocation has occurred.</td>
<td>Move to a value based allocation with long-term strategic focus on future demands on a catchment taken by Regional Government with Central Government guidance. Water continues to be used but can be earmarked for future use (new town, new industry).</td>
<td>Ability to “earmark” water set aside for future requirements without preventing current use of the water. Temporary other uses of this water are possible in the intervening period.</td>
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<tr>
<td>KNOWLEDGE</td>
<td>Limited knowledge about some aspects of water resources (e.g. who uses how much and where, what are the assimilative capacity limits) makes management, decision making and planning difficult.</td>
<td>Ongoing and strategic investment in development of knowledge of water resources which can be shared, particularly in regions and catchments short of water.</td>
<td>Improved knowledge of resource for better sustainable management particularly knowledge of the value of alternative uses and the use and quality of the water in our rivers, streams and aquifers.</td>
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</tbody>
</table>
Your Feedback is Welcome

This project report details the major problems, the concerns of all parties, and a proposed solution which will work best for New Zealand.

We welcome your input and feedback.

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Key Reading and Bibliography

**Government sources on the issues**

Current water allocation issues. MAF
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Freshwater for the future. MfE

Water allocation a strategic overview. MfE
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Sustainable Fresh Water Management - Towards an Improved New Zealand Approach.
Report prepared for NZBCSD by Aqualinc, 2008
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Your Feedback on the Best Use Solution

From your perspective what are the best features of the existing freshwater management framework?

From your perspective what are the worst features of the existing freshwater management framework?

Does the Best Use Solution address most of the deficiencies, from your perspective, in the existing freshwater management framework?

If not, what other suggestions would you make to improve the management of freshwater for yourself and all stakeholders in New Zealand?
DEDICATED TO MAKING A DIFFERENCE

New Zealand Business Council for Sustainable Development