

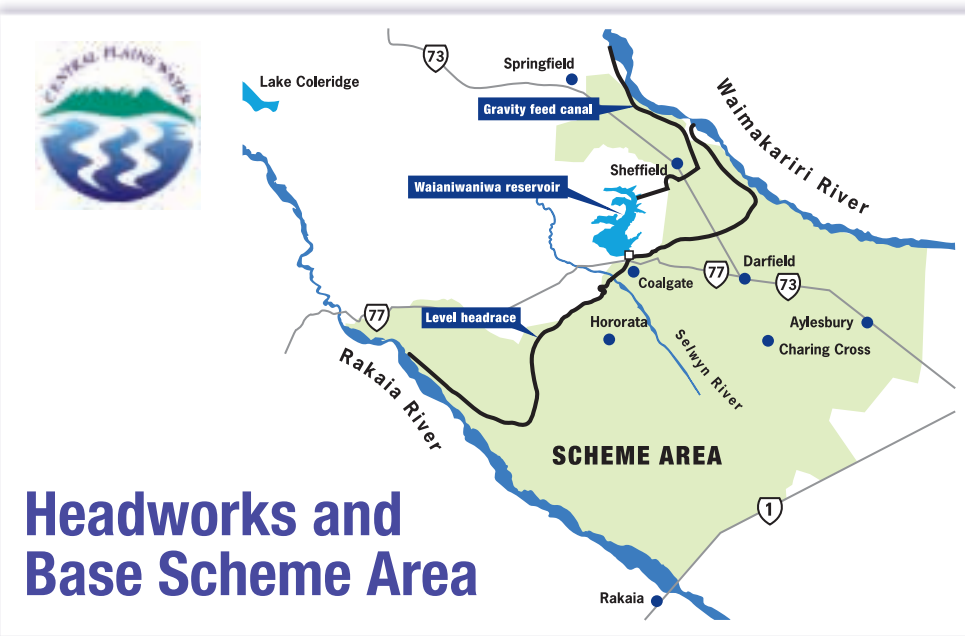
Base scheme

When undertaking preparations for its share offer, Central Plains Water Limited determined a possible scheme on which financial and supply calculations could be based. Referred to as the 'base scheme', this takes into consideration how much water is likely to be available for the scheme, projected level of demand from those able to be supplied from the scheme and the estimated cost of scheme water compared to the cost to drill for and pump groundwater at various localities within the area.

The base scheme was devised to provide the best possible option for irrigators. By using gravity where feasible, the scheme will minimise the risk of increased power costs in the future.

The base scheme is defined as follows:

- A storage reservoir in the Waianiwaniva Valley behind a 35 metre high dam, capable of holding 200,000,000 cubic metres of water, of which 160,000,000 cubic metres of water will be available for irrigation, with the balance left in the reservoir at all times for environmental and recreational uses.
- A level headrace canal at approximately 235 metres above sea level, which will enable water from the Rakaia River to be delivered to properties adjacent to the Waimakariri River and vice versa, when necessary.
- Intakes on both the Rakaia and Waimakariri Rivers, capable of taking a combined total of 45 cubic metres of water per second to feed into the head of the reservoir in the Waianiwaniva valley, using gravity.
- A system of lateral feeder canals to distribute water to farms across the Central Plains in the area defined.
- This will create an annual capacity of 376,000,000 cubic metres of water, which will be sufficient to supply water to approximately 60,000 hectares of land.
- The scheme will have the capacity to pump water to the area around Windwhistle in the south west section of the scheme, and to the Sheffield and Springfield areas in the north west section of the scheme. The cost of pumping water to these areas will be carried by the whole scheme, not solely by those in the areas mentioned.



Headworks and Base Scheme Area

While this base scheme is feasible, a number of factors may eventuate in modifications to it before resource consent applications are lodged and before the scheme is built. These include:

- Analysis of the company's share register to establish whether there are parts of the scheme with insufficient demand to justify supply.
- That resource consents will be granted for enough water to be taken to supply to the levels projected.
- Reaching agreement with a power company, where water from the scheme can be used to

generate electricity as well as irrigation.

- Further analysis of the cost and benefits of piped supply, which could become viable for parts or all of the scheme.
- Reaching agreement with parties to the north or the south of the area, which may wish to use the storage opportunities that the base scheme offers.

While all these factors could change the base scheme, they will only do so if the directors of Central Plains Water Limited can see clear benefit from them for shareholders.

Irrigated hectares worth more

A report completed late last year shows the value of irrigated farmland in Canterbury is between \$5,000 and \$6,000 greater per hectare than dry land.

The report, commissioned by the Ritso Society from Christchurch property valuation consultants Crighton Anderson Limited, details analysis of four years of land sales across seven districts of Canterbury. Irrigation's investment value from increased productivity is well established. Anecdotal evidence also suggests links to a premium value on irrigated farmland. The Crighton Anderson valuation report confirms such a correlation, measuring it between \$5,125

and \$6,035 per hectare for farms across Canterbury. The report also concludes that, as agricultural property values have risen generally, the margin on irrigated land has been maintained.

Along with a number of other reports commissioned by the Ritso Society, the Crighton Anderson study is available on www.ritso.org.nz

The Ritso Society received financial assistance from the Ministry of Agriculture and Forestry Sustainable Farming Fund to provide information to farmers considering the costs and benefits of irrigation.

Cleaning up agriculture

Irrigation leads to intensified land use. This has prompted concerns that irrigating Canterbury and consequent land use intensification risks nitrate contamination of groundwater, which has been linked to environmental degradation and public health problems in Europe and the United States.

Such consequences are unlikely to be replicated when the Central Plains Water proposals proceed. Contamination to the degree experienced overseas is a result of factors that do not occur here. These include higher levels of stocking than would ever be economic in Canterbury, supplementary feed practices irrelevant to New Zealand pastoral farms and a more permissive regulatory environment than ours.

In fact, a community scheme would help protect the quality of Canterbury groundwater.

If a scheme only provides water to irrigators who adhere to best environmental practices on their farms, nitrate levels in groundwater and the adverse effects associated with land use intensification can be effectively controlled. Industry standards already exist to achieve this. Fonterra, for example, has developed standards for dairy farmers that many believe will become compulsory for its suppliers in the near future. International consumer-led demand is likely to exert similar pressure on processors and primary producers in those sectors that have not already taken similar initiatives.

A community water enhancement scheme can put standards of this type into effect by requiring its irrigators to comply or be cut off. It is probable that this concept will be built into any resource consents associated with the Central Plains Water proposals, making them mandatory for irrigators.

Expert advises farmers considering irrigation

Andy MacFarlane is a rural business advisor based in Ashburton. He has helped many dryland farmers take the step to irrigated agriculture. This is what he tells them: "Irrigation developments have a huge impact on local economies. The community benefits more in the short term than individual farmers do.

Anyone who thinks about irrigation as an insurance policy is looking at it the wrong way – it is far too expensive for that.

Be prepared to alter your farm system to generate the best return. I advise my clients to start with a clean sheet of paper, decide what irrigation system will best suit them, then try to re-build the farm around that system.

While irrigation will prompt a change in management, the type of land use is not the most important factor in determining the returns achievable. Of more importance is what you, as manager, enjoy and what you and your farm can do best with that water.

Think through the labour issues – be careful not to trade off capital for increased labour demand.

Unless you are totally committed, converting



Easing groundwater uncertainty

Environment Canterbury's recent decision to implement a 'red zone' across the Selwyn District was made in response to record low groundwater levels. The decision will require applicants to satisfy a higher standard of certainty before they will be granted resource consents to take and use groundwater for irrigation – a development which further strengthens the case for a community water enhancement scheme derived from surface flows.

Findings of low groundwater levels reinforce the conclusions of the Canterbury Strategic Water Study, published in October 2002 by Environment Canterbury and others. The Strategic Water Study contends pressure on the region's groundwater resource is unsustainable. It says continuing to increase abstraction from the ground will have adverse consequences for the aquifers and the lowland spring fed streams connected to them. Environment Canterbury's decision to implement the 'red zone' for resource consents was taken to address this.

The proposed Central Plains Water scheme, where high flows from the glacier fed Rakaia and Waimakariri Rivers would be stored to reduce the pressure of takes from the smaller rivers and the aquifers, will counter record low groundwater levels.

This would occur in two ways –

- First, many groundwater irrigators in the scheme area are expected to stop drawing from their wells and switch to a community scheme in order to reduce their power costs. Reduced takes as a consequence of this will increase groundwater levels.
- Second, increased irrigation over the scheme area on the upper plains will increase the recharge rates, 'topping up' the aquifers to the east of the scheme area, down the plains. The Canterbury Strategic Water Study identifies a potential serious problem, to which Environment Canterbury's 'red zone' is a reaction to check the situation. The proposed Central Plains Water enhancement scheme, providing surface water for community irrigation between the Rakaia and Waimakariri Rivers, would provide a definite solution.



The late Bill Quantock started farming at Anama in 1929 on land that is now farmed by his grandchildren.

The Rangitata Diversion Race was built when things were cheap.

When the scheme was first started, it was to provide employment at the time of the depression and to build an economic future for the district.

Bob Semple was the Minister of Works. He was behind the development of the scheme. I was invited to the afternoon party held to mark the opening of the race. This was a masterpiece of the world. Mr Semple said: "Go home and turn all your power on. You will see the Canterbury Plains waving with golden corn!"

The old boy – we laughed at him for a bit, and it took 20 years to convince all the farmers that it was a good thing, but you live and learn. He knew what he was doing and all this time later he is still right.

I was called on at one stage to help get the pipes to the race. That was after the race caved in and it had to be piped. There were 400 men working on that race and there were still times when farmers like myself were called on to help. This was a tremendous community effort for the benefit of the whole of the district.

Water is our greatest asset. The scheme is essential now to our region. It would be a disaster to interfere with it – a disaster for the whole of Canterbury. If you cut the water, you cut the blood to the county.

PrimePort Timaru witnesses benefits of irrigation

The Opuha scheme in South Canterbury is similar in concept to the water harvesting and storage proposals being developed for the Central Plains. Excess flows are stored and released when required to enhance the summer flows of the Opuha and Opihi Rivers, allowing downstream farmers and recreational users year round benefits of water that would otherwise flow directly out to sea and be wasted.

PrimePort Timaru has experienced notable growth since the Opuha scheme was built as chief executive Jeremy Boys explains: "Since the Opuha scheme was commissioned, economic activity in South

Canterbury has been very favourable – and PrimePort Timaru is an example of a business that has benefited and grown. Developments such as the expansion of Fonterra's Clandyboye plant make a huge contribution to the region. It follows that irrigation gives large companies the confidence to continue to invest.

"Opuha also provides environmental and recreational benefits, with more water in the rivers for these purposes during the summer. It is a fine example of the potential as well as the reality of the way this type of "harvesting" is so positive for communities whose lifeblood is agriculture."



MAF estimates irrigation value

Research undertaken by MAF has found that irrigation currently contributes a significant economic value to New Zealand, and has the potential to further increase gross domestic profit (GDP).

According to the MAF technical paper 'The Economic Value of Irrigation in New Zealand,' published last year, the net contribution of irrigation to GDP in 2002/03 was around \$920 million at the farm gate. The total farm gate contribution of all primary production, excluding forestry, for this period is estimated at \$8.1 billion.

On this basis, irrigation contributed around 11 per cent of farm gate GDP in that year. This from 475,700 ha of irrigated land, or 3.9 per cent of the 12.1 million hectares farmed. According to the MAF paper, assuming all the extra production derived from irrigation is exported, the value of these exports is in the order of \$1.7 billion, or 12 per cent of total agriculture and horticulture exports.

Variations between land uses and regions were analysed as part of the research. Horticulture, including viticulture and vegetables, contributes \$550 million or 60 per cent of the total GDP for irrigated farming, compared to \$270 million from dairy farming, which is 29 per cent of the total. Canterbury has 287,000 ha irrigated, or 60 per cent of the irrigated land, which contributes \$330 million, or 36 per cent of the total. In Canterbury, these figures show that irrigation produced an additional \$1,160, on average, on farm for each hectare irrigated during 2002/03. This compares to Hawke's Bay, which has 18,100 ha of irrigated land, with irrigation contributing on average \$5,500 of farm gate GDP for each hectare irrigated.

Irrigated land uses employ in the order of 5,000 full time equivalents on farms and horticulture units.

Scientific fix for nitrate leaching

Application of recent scientific progress has led to an important new tool to allow farmers to better manage the leaching of nitrate to groundwater – while improving dairy pasture production.

Rivers and aquifers can be put at risk by nitrate leaching associated with intensive pastoral farming. The main cause of this is urine patches – particularly from grazing animals – which can elevate the proportion of nitrogen in a concentrated area far greater than the normal level able to be absorbed by soil or taken up by plants. With the soil unable to accommodate such elevated rates, the nitrate leaches through to shallow aquifers, which, if unchecked, can result in environmental degradation and threats to human health.

Research undertaken by Professor Keith Cameron and Associate Professor HJ Di of Lincoln University's Centre for Soil and Environmental Quality is at the leading edge internationally in this area of science. Examining the nitrate cycle, which governs how ammonium from animal urine reacts in the soil to transform into nitrates, they have identified that applying nitrification inhibitors will slow the process, reducing the leaching

of nitrates by around 60 per cent depending on soil type.

This research has been commercialized by Ravensdown into the product eco-n, which can be sprayed onto pasture in Autumn and Spring, giving annual pasture production increases of 10 to 15 per cent, as well as helping protect rivers and aquifers.

In addition, intervention in the nitrogen cycle through this method has been shown to significantly reduce production of nitrous oxide from pastoral farming. Nitrous oxide makes up 17 per cent of New Zealand's total greenhouse gases and around 33 per cent of all agricultural emissions.



Professor Keith Cameron and Associate Professor HJ Di of Lincoln University's Centre for Soil and Environmental Quality

Share allocation

When the issue closed on 17 December 2004 around 500 applications for Central Plains Water Limited shares had been received – with total applications considerably exceeding the 376,000 shares on offer.

When allotting shares the Central Plains Water Limited board scrutinized all the applications according to the criteria outlined in the company's prospectus and investment statement.

Applicants from outside the scheme area were the first to be excluded. These consisted of non-farmers as well as those on the edge of the scheme area who might eventually have been able to take water from the scheme if

demand for shares had been smaller.

Once these applicants were excluded, numbering approximately 100, the share issue was still over-subscribed from within the scheme area. Further analysis showed that some of the remaining applicants sought to take more water than they would have required to irrigate their own properties. Once these applications were adjusted, the applications matched the number of shares available and shares were allocated accordingly. The company therefore has approximately 400 shareholders, spread evenly across the scheme area.



K Line



Solid Set



Hard Hose Gun



Fixed Boom Soft Hose



Travelling Gun Soft Hose



Border Dykes



Long Lateral

On-Farm Irrigation Costs – source: Aqualinc Ltd

System type	Typical Capital Cost	Range of Capital Costs	Energy costs	Labour costs
Rotary boom	\$1800/ha	\$1700 - 2000/ha	Medium-high	Medium-high
Fixed boom	\$1900/ha	\$1800 – 2100/ha	Very high	Medium-high
Centre-pivot	\$1800/ha	\$1300 – 2300/ha	Low	Lowest
Lateral move	\$1700/ha	\$1500 - 2500/ha	Low-medium	Low-medium
K Line	\$900/ha	\$800 - 1000/ha	Very low	Very high
Long lateral	\$1250/ha	\$1100 - 1500/ha	Medium	Highest
Guns	\$1800/ha	\$1500 - 2000/ha	Highest	Medium
New borders	\$2100/ha	\$1500 - 3000/ha	Lowest	Very low
Renovating borders	\$1800/ha	\$1000 – 2500/ha	Lowest	Very low



Lateral Move

Water Supply Development

Type	Typical	Range
Surface (direct) pumping systems	\$500	\$200 – 800/ha
Wells (submersible pumps)	\$1000	\$500 – 2500/ha
Dams	\$2000	\$500 – 8000/ha
Open channels	\$1000	\$500 – 3000/ha
Long pipelines	\$3500	\$2000 – 5000/ha



The Central Plains Water Trust was set up by Christchurch City and Selwyn District Councils in March 2003 to proceed with development of proposals for a water enhancement scheme between the Rakaia and Waimakariri Rivers in

Central Canterbury. The scheme will provide water for irrigation while enhancing ecological and recreational values. The Trust continues feasibility work undertaken by the Central Plains Water Enhancement Steering Committee, which was established in March 2000.

Central Plains Water Limited was established by the Central Plains Water Trust to carry out work associated with obtaining the resource consents necessary before a scheme can be built.

Requests for further copies, previous issues and all other enquiries about the content of this newsletter should be directed to Central Plains Water Project Manager Eddie Thomas, tel (03) 377 8076.

More information on www.cpw.org.nz and www.cpw.co.nz



Share Issue Over-subscribed

Canterbury farmers have given a vote of confidence to a large water enhancement scheme that will now progress towards resource consent applications following the successful completion of a share issue.

The Central Plains Water Limited share offer closed shortly before Christmas last year, with applications received significantly exceeding the \$4,700,000 sought. A total of 376,000 shares were on offer.

Success of the share issue marks a big step forward for the scheme and for agriculture in Canterbury.

Because of the demand for shares, and in accordance with criteria set out in the company's prospectus and investment statement, preference was given to applicants who own or control land suitable for irrigation within the scheme area. As a consequence, a number of applicants did not receive shares and some received fewer shares than they applied for.

Having secured such a strong mandate from the community, Central Plains Water Limited is now able to prepare applications for resource

consents, which are scheduled to be ready by the end of 2005. It is projected that the consenting process, including appeals, will be completed by the end of 2007 and that the scheme will be fully commissioned in time for the 2012 irrigation season.

Central Plains Water Limited was established as a commercial entity to progress the proposals. With the success of the share issue, farmers have demonstrated that they want a scheme to go ahead.

In order to prepare applications for the necessary resource consents, Central Plains Water Limited will continue to work closely with the Central Plains Water Trust, the Councils and others. The success of the share issue demonstrates that the proposed scheme has solid backing from the community. The wider community will continue to have a role in the development of the proposals.

Selwyn District and Christchurch City Councils have provided the bulk of funding and controlled the project to date through the Central Plains Water Trust.



Dorothy Oakley farms in partnership with her husband Graeme on 69 hectares in Halkett

'Stacking the odds'

The farming community depends on the weather. A farmer can lose thousands in just a few days if the crop does not receive sufficient moisture at the right time. Most farmers will admit that there is an element of gambling in farming. What irrigation offers is to stack the odds a little more in our favour.

In Canterbury we could be the oasis of the New Zealand if we could guarantee a reliable water scheme for the plains.

When Christchurch was first planned, our forebears demonstrated their great foresight by

planning our lovely parks and gardens, and the beautiful features that give us the wonderful city we have today.

Plans to irrigate the Central Plains show just as much progressive attitude as the past generations showed in developing Canterbury into the place we all love so much. This scheme is our opportunity to leave behind something for future generations. It will make a significant difference to their quality of life and serve as a lasting legacy for Christchurch and Canterbury.