

## A Fresh Start for New Zealand's Fresh Water - by Nick Smith

Water is New Zealand's most valuable natural resource. It gives us a competitive advantage over other countries in farming and tourism, and sustains the traditional Kiwi pastimes of swimming, boating, and fishing.

But water quality is deteriorating in parts of the country and we often face water shortages during summer. The Government wants to turn this around. We want to make the most of the economic opportunities that water provides, while protecting our environment.

That's why in May Agriculture Minister David Carter and I as Environment Minister announced our Fresh Water package – Fresh Start for Fresh Water – as an initial response to the Land and Water Forum's report on fresh water management.

It includes a National Policy Statement on fresh water management, significant investment for irrigation projects, and more money to clean up New Zealand's rivers, lakes, and aquifers.

Increased security of supply for irrigation will help build a stronger economy and provide more jobs for New Zealanders. Budget 2011 allocates \$35 million over five years to help irrigation projects get under way.

The Government is proposing to invest up to \$400 million of equity from 2013/14 in the construction of regional-scale irrigation projects.

These initiatives represent a major step in unlocking water's economic potential. NZIER research suggests the fund could support 340,000ha of new irrigation, which could boost exports by \$1.4 billion a year by 2018, rising to \$4 billion a year by 2026.

The top of the South needs to take up these opportunities of Government support for water infrastructure to support growth of our agricultural and

horticultural industries.

I am hugely supportive of the very constructive work the Waimea Water Augmentation Committee (WWAC) has done on developing proposals for water storage in the Lee Valley. This is the best opportunity in a generation to deliver a change in the agricultural and horticultural productive capacity of our region.

The Government is determined that water infrastructure development will be balanced and not at the expense of the environment. Clear rules will be put in place on water quality and minimum. This policy sits well with the WWAC proposals in that the Committee has consistently ensured that environmental considerations are at the forefront of its proposals.

Water storage and irrigation schemes are very long-term projects that require large investments. While the Councils and Government are committed, we also have to convince landowners that they too need to invest to make it happen. I am hopeful that Waimea landowners will see the potential and ensure we take it during this window of opportunity.

I am looking forward to working with the Waimea Water Augmentation Committee on how to best access the Government's water initiatives to make progress in the region.

The final aspect of the Government's water package is the contestable \$15 million Clean-up Fund to help improve the quality of our fresh water. The Clean-up Fund will give better support for existing river and lake clean-ups, and lifts our total clean-up commitment to \$265 million.

By better managing our water, we can help create jobs and raise living standards for all New Zealanders. National is determined to make the most of water's economic potential, while better caring for our precious lakes and rivers.



Newsletter 14 • July 2011

## Waimea Water Augmentation Committee (WWAC)

### Message from the Chairman

Water and the politics of it have certainly found a new gear in the past couple of months. Most significant have been the government's announcements around water management. Both support for future irrigation development through enhancement to the irrigation acceleration fund and support regarding the cleanup and mitigation of polluted water bodies.

Finally acknowledgement that we are in fact a water abundant nation but that more active and cooperative management of water is required.

The other significant development has been the approach taken by various communities in active management and planning of future options. Whilst in early stages, examples include the various zonal groups throughout Canterbury. The collaboration of the whole community is refreshing to see and whilst all may not always agree at least there is a better understanding of the various needs. Ultimately most stakeholders actually want a similar thing i.e. healthy, clean, abundant waterways and aquifers.

This collaborative approach has been the foundation of WWAC from its inception and it is heartening that we are regularly approached by other potential schemes as to how to implement such a structure.

Having said that, we have not yet completed our end goal. "To find a solution

to the Waimea's acute water shortage". Progress continues with detailed design and on site geotechnical investigation for the Lee Dam. Whilst this may appear slow it is nonetheless essential for such a large and long term project.

Many work streams continue behind the scenes and the committee now meets monthly and still on a voluntary basis. We now have a legal entity in place, the Waimea Community Dam Ltd and have developed a draft trust deed for the environmental trust to ensure the protection of environmental and community flows in the river.

A very significant report is now being finalised by the Economic Development Agency (EDA) which shows significant benefit from the Waimea Community Dam to the whole region. Preliminary results show an increase in regional GDP in excess of \$1.2 billion over the first 25 years.

The committee had hoped to come to the community with indicative costing and seeking expression of interest by now. Unfortunately this has been delayed due to the processes required by council to ratify such a project. Consequently we still hope to have a round of community meetings late winter/early spring. In the mean time I can assure you work continues.

**Murray King, Chairman**  
Waimea Water Augmentation Committee

For more information visit:

[www.tasman.govt.nz/index.php?WaterforWaimeaBasin](http://www.tasman.govt.nz/index.php?WaterforWaimeaBasin) or search for "Lee Dam" on Facebook to keep up to date

If you would like to receive your future WWAC newsletters via email please notify Committee Secretary Valerie Gribble - [valerie.gribble@tasman.govt.nz](mailto:valerie.gribble@tasman.govt.nz).

#### This project is funded by:

- Tasman District Council
- Nelson City Council
- Waimea Plains water users and landowners
- Community Irrigation Fund
- Fish and Game New Zealand Nelson Marlborough Region

#### In kind support is received from:

- Iwi
- Department of Conservation



**Community Irrigation Fund**  
Ministry of Agriculture and Forestry  
Te Manatū Ahuwhenua, Ngāherehere

#### WWAC Members

Murray King (Chairman, Lower Confined Aquifer)	03 544 8465
Dennis Cassidy (Delta Zone)	03 544 2852
Kit Maling (Waimea East Irrigation Co)	03 544 0536
Stephen Sutton (Waimea West)	03 544 4026
David Easton (Upper Confined Aquifer)	03 526 6854
Julian Raine (Golden Hills/Hope Aquifer)	03 547 5338
Barney Thomas (Nelson iwi)	03 547 4934
Deputy Mayor Tim King (TDC)	03 542 3849
Peter Thomson (TDC)	03 543 8440
Neil Deans (Fish and Game)	03 544 6382
Martin Heine (DOC)	03 546 9335
Phil Ruffell (NCC)	03 546 0359
Deputy Mayor Ali Boswijk (NCC)	027 482 1462

**WWAC members are available to answer your questions.**

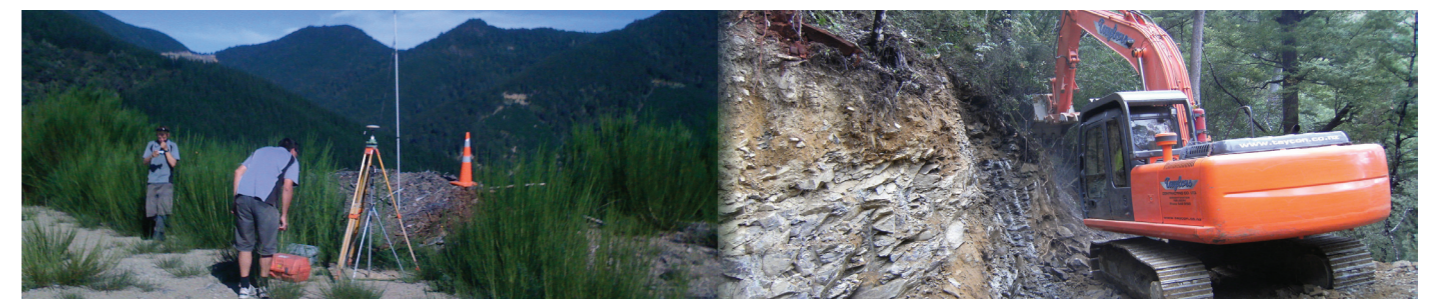
#### Lee/Wairoa Liaison Group

Terry Trembath (Lee Valley)	03 542 3387
Allen and Maree Parsons (Wairoa)	03 541 9637
Wayne Neal (Lee Valley)	03 542 4424
Tony Chivers (Wairoa)	03 541 8810
Bill & Joan O'Neill (Lee Valley)	03 542 3707
G & L O'Meara (Lee Valley)	03 542 4004
Chris Weir (Lee Valley)	03 542 3197
John Kuipers (Wairoa Gorge Rd)	03 542 3425

#### Project Manager – Joseph Thomas

Tasman District Council  
Private Bag 4, Richmond 7050  
Phone: 03 543 8494, fax 03 543 9524 or  
email: [Joseph.Thomas@tasman.govt.nz](mailto:Joseph.Thomas@tasman.govt.nz)  
[www.tasman.govt.nz/index.php?WaterforWaimeaBasin](http://www.tasman.govt.nz/index.php?WaterforWaimeaBasin)

### Waimea Community Dam (Lee Valley) site investigation works update



Engineering consultants Tonkin and Taylor have been working in the Lee Valley on the detailed engineering investigation work for the Waimea Community Dam.

This current phase of work has been financed via the Government's Community Irrigation Fund, which WWAC successfully bid for in 2010.

In February 2011 work started on a series of tracks to provide access to the dam site so that subsurface investigations can be carried out. The works carried out in the first stage of investigations have included undertaking a seismic refraction survey. This involved measuring the speed of seismic waves generated by a small explosion which has enabled the changes in rock quality with depth to be assessed.

They have also undertaken a programme of sampling and testing the river

gravels to assess their suitability for use as construction materials, and have mapped the reservoir margins to identify any areas of slope instability.

The Institute of Geological and Nuclear Sciences has carried out an assessment of active faults that may affect dam design. They have not found any additional evidence of active faults, however, the consultants will continue to review their findings as the site is progressively opened up.

This preliminary data is being reviewed to enable drilling locations to be specified.

A new LiDAR ground survey of the dam site and reservoir area has been completed to provide a higher level of detail of ground features and levels.

Surveyors are also looking at the ground around the dam site and have checked previous survey levels. It is also proposed to use surveys across the whole valley.

# Summary of the Economic Impact Analysis of the Waimea Community Dam - prepared by Nelson Regional EDA

The Nelson Regional Economic Development Agency (EDA) commissioned this economic impact analysis of the proposed water augmentation scheme for 1800 hectares in Waimea Plains/Wairoa/Wai-iti on completion of the Waimea Community Dam (Lee Valley).

The analysis is being undertaken so that stakeholders at regional and national level fully appreciate the economic contribution the facility can potentially make to the region, as well as the cost and disruption to the region's economy of not proceeding with the investment. The potential cost of not proceeding becomes more acute as increasing demand exacerbates the region's recurrent water shortages.

Two main analytical methods have been applied.

**1. Gross Domestic Product (GDP):** In the GDP analysis, benefits are analysed in terms of the impacts on the wider regional economy, including the flow-on effects of increased revenue in the impacted sectors. This methodology identifies a continuing stream of spending (revenues) and the downstream impact of those revenues within the region stimulating further activity and sales.

**2. Cost Benefit Analysis (CBA):** In the CBA, quantifiable benefits and costs are assessed and are then adjusted for the time value of money, so that all flows of benefits and flows of project costs over time (which tend to occur at different points in time) are expressed on a common basis in terms of their current Net Present Value, or NPV. The technique considers the stream of revenues generated into the future to have a lower purchasing power (reduced by the annual discount rate) than revenue available for spending today.

Four areas are analysed:

**1. Production and Processing:** Production and processing includes the improved yields on existing land, and the additional land that will be available for cultivation of apples, kiwifruit, grapes, berries, pastoral land. It also includes the associated processing of those items, such as winemaking or nutraceutical and food preparation extracts.

**2. Non-Augmentation:** We have assessed the cost of doing nothing, or non-augmentation, as a separate component. This is assessed as an averaged NPV figure and also as a revenue stream figure.

**3. Hydro Generation:** The costs and benefits of the proposed hydro generation bonus are considered both as a GDP and an NPV figure.

**4. Additional Land Usage:** The project will have revenues from the additional land which will be converted to more intensive cultivation, and also in terms of additional yield on existing cultivated land. The value and rateable value of this land will also increase as its potential revenues are realised.

The findings in each of these areas are outlined in this executive summary, in terms of both GDP and NPV (where relevant).

## Production and Processing Findings

Production and Processing, from all horticultural areas, form the basis of the study, and are the most important element of the analysis.

An estimate of the GDP generated from increased production has been analysed. The estimate for the annual contribution to GDP is based on production at full maturity. The analysis also considers the multiplier effect of increased production activity on the region's GDP and positive impact on employment and investment opportunities. The production mix on existing irrigated areas (3800ha) will inevitably change over the 25-year timeframe with security of the water supply. The value of this increased production on existing irrigated land will be additional to the revenues generated from newly irrigated areas.

TABLE 1A: ESTIMATES OF GDP GENERATED FROM INCREASED HORTICULTURAL PRODUCTION AND PROCESSING ON NEWLY IRRIGATED LAND

Production and Processing	Annual GDP	25 Year GDP
Total Production Value Added	\$58.0m	\$1,154m
Total Processing Value Added	\$8.5m	\$132m
Total Increased GDP	\$66.5m	\$1,187m

The Regional Economic Development Strategy Review (REDS) undertaken for the Nelson Tasman region during 2010 identified the GDP contribution of the horticultural sector in the 2009 Year at \$351m out of a regional GDP of \$3.7b. The primary sector in its broad definition (which includes processing of primary production) represented 28% of the region's GDP.

The Cost Benefit Analysis (CBA) methodology applied to the Production and Processing of additional production includes the cost of development for conversion to other productive use, the lead time for reaching commercial

production quantities and the revenue stream anticipated to be generated over the 25-year timeframe for the analysis. The additional production potentially generated from the increased irrigated land area represents in the vicinity of \$800,000 in regional GDP per hectare over the 25-year timeframe.

TABLE 1B: NEWLY IRRIGATED YIELD SCENARIO – DEVELOPMENT WITH IMPROVED CULTIVARS

Benefit of Augmentation	NPV
Increased production on currently irrigated land	\$127.6m
Increased production on newly irrigated land	\$89.0m
Total increased production	\$216.6m
Increased value of processing	\$60.2m
Total Increased Net Benefit	\$276.8m

## Impact of Non Augmentation

The cost of not proceeding with the storage dam and providing irrigation to potentially 1800ha of current dryland pasture is significant. Even more significant is the impact on currently irrigated land – where, to achieve the current security of supply (1;10 year drought) and to maintain the desired water flows in the river, water allocations will need to be scaled back by an estimated 70% from that currently allocated.

Security of irrigation water (and water for industrial, commercial and residential properties) is central to the concerns on the Waimea district. Existing production from currently irrigated areas and the foregone production from potentially irrigated dryland pasture are at severe risk from drought events. In a 'worst case' scenario GNS science has estimated a cut in present allocations for irrigation of approximately 70% which based on total water allocation would represent a reduction from the present irrigated 3800ha to a manageable 705ha. Intensive land uses would no longer be viable under this scenario and production on much of the existing irrigated area would, of necessity, have to revert to dryland pasture production.

The cost to the region is substantial. On a strictly revenue stream basis (ie, ignoring analysis of such downstream effects as volumes flowing to processing, loss of production and potential unemployment) the GDP impact of non augmentation would be as follows:

TABLE 1C: COST OF NON AUGMENTATION IN GDP

Cost of Non-Augmentation	Annualised GDP Loss	25-Year GDP Loss
Total lost GDP	\$17.5m	\$440m

The NPV over the 25-year timeframe is also considerable:

TABLE 1D: COST OF NON AUGMENTATION IN NPV

Cost of Non-Augmentation	NPV
Loss to production	\$60m
Loss from power generation	\$3m
Total cost of Non-Augmentation	\$63m



## Hydro Generation Bonus

The potential for additional revenues from hydro generation were also analysed through the model.

TABLE 1E: HYDRO GENERATION GDP

Category	Annual GDP	25 Year GDP
Power supply	\$5.6m	\$140.0m
Dam construction	\$24.6m	\$24.6m
Lines Upgrade	\$0.8m	\$0.8m
Total GDP estimate	\$31.0m	\$165.4m

The hydro unit generates ongoing power revenues over the life of the project. During construction and any upgrade to the transmission lines employment of contractors, material supplies and plant generate revenues within the local economy. The regional GDP impacts from such activity are evaluated as a one-off impact occurring during the construction period. These are significant at more than \$25m in addition to the continuing value-added impacts from power generation itself.

In assessing the NPV from the hydro power generation add-on the revenue streams over the period have been offset by the cost of construction and the annualised discount on future (post tax) earnings.

TABLE 1F: HYDRO POWER GENERATION NPV

Summary Outcome	NPV
Additional Revenue Generation	\$2.7m

There are also long term issues to consider. The security for water availability and distribution from the proposed Lee Valley facility is important within the region. Should an event like an occurrence of an earthquake of the intensity of the Christchurch quakes, Nelson's water supply would be under severe stress. A rupture in the pipeline feeding Nelson city could have disastrous consequences for Nelson industry and residences. The potential of alternative backup supply would mitigate the impacts from such an event.

## Tax Benefits

Income tax benefits have been estimated from the revenue streams generated over the 25-year timeframe for each of the main horticultural crops and the hydro power add-on. These have been assessed on the basis of per hectare revenue streams adjusted for the area of land that would be converted to each crop type. Development costs have been amortised over the 25-year period and operational costs have been set against annual revenue estimates. The level of income tax benefit to potentially accrue over the 25-year period is estimated at \$33.5m in the conservative benchmark case and significantly higher for average prices realised in the "High" and "Best Case" scenarios outlined in the Technical Appendix.

The potential income tax benefits potentially derived from hydro power generation are estimated at \$2.4m.

TABLE 1G: POTENTIAL TAX BENEFIT ESTIMATE

Tax Category	Tax Benefit
Income Tax – Increased Production	\$33.5m
Income Tax - Processing	\$8.6m
Wine Excise Tax	\$36.3m
Hydro Generation Income Tax	\$2.4m
Total Tax Benefit estimate	\$80.8m

## Land Productivity Findings

In addition to improving the productivity of existing cultivated land, and therefore raising the potential of improved yields, the project assesses the additional land which would become available for cultivation through irrigation. The estimated land value premium for land with water permits is in the range of \$15,000 to \$20,000 per hectare (ha).

TABLE 1H: HECTARES AVAILABLE FOR CULTIVATION

Crop Production	2008 ha	Additional ha
Pasture	1,450	300
Apples	1,650	860
Kiwifruit	80	90
Grapes	550	400
Berries	70	150
Total	3,800	1,800

Source: Agfirst Land Use Profile, Northington Partners Report, January 2010

## Comparison with Opuha Irrigation Scheme

The Opuha Irrigation scheme completed in 1999 is a larger facility than that proposed for Lee Valley, but provides a useful comparison of the relative contribution that the Lee Valley dam could potentially deliver.

The Waimea Plains has the advantage of a climate that is conducive to intensive horticultural development, an option that cannot be replicated in South Canterbury where conversion to intensive pastoral activity, forage crops and vegetable growing for processing have been the options for newly irrigated areas. As outlined in Appendix 1 the increased revenues (output) on the Waimea Plains is potentially more than 10-fold that achieved in the Opuha district. The impacts from increased horticultural production to downstream processing revenues is equally dramatic with potential revenues per hectare close to 15-fold those achievable from pastoral operations (due to increased production for processing).

## Additional Considerations Not Analysed

As part of the feasibility studies for the Waimea Community Dam, environmental flow requirement assessment for the Waimea River was carried out. The Waimea Water Augmentation Committee (WWAC) decided on a provision of a minimum flow of 1100 l/s in the lower Waimea River. This flow ("environmental flow") provides habitat protection for the aquatic ecosystem, reduces the prospect of saltwater incursions and provides for amenity, community recreation, and aesthetic impact of the river. The increase in water availability over summer months also protects the demand for water from expanding industry and residential activity and ensures that drastic reductions in water allocations for all users (and associated reductions in revenues and incomes within the region) will not be required in drier years. These considerations (amenity, recreation, and aesthetics), while relevant, are subjective and have therefore not been included in the economic analysis.

## Conclusion

The economic analysis findings can be summarised as follows:

TABLE 1I: SUMMARY OF TOTAL ECONOMIC ANALYSIS FINDINGS

Area of calculation	Annual GDP	25-Year GDP	NPV	IRR
Increased Production and Processing	\$66.5m	\$1,187m	\$276.8m	25%
Cost of Non-Augmentation	\$17.5m	\$440m	\$63.0m	
Hydro Generation Bonus	\$5.6m	\$140m	\$2.7m	10%
Total findings	\$89.6m	\$1,767m	\$342.5m	

An essential component of the Cost Benefit Analysis of the project was the evaluation of Sensitivity Analysis and calculation of Internal Rate of Return (IRR) factors. These two measures are detailed in the Technical Appendix along with CBA factors and multiplier analysis profiled by worst and best case scenarios in addition to the Benchmark scenario summarised above.

The IRR measure Benchmark scenario reflects the strong productivity potential that could be achieved from the irrigation of dryland pasture for intensive horticultural crops in the Waimea Plains. These are significantly higher than those recorded from the establishment of the Opuha Dam.

The study indicates a very positive outcome from proceeding with the storage dam project which would provide significant economic benefits to the region, given the cost of dam construction and associated infrastructure costs.