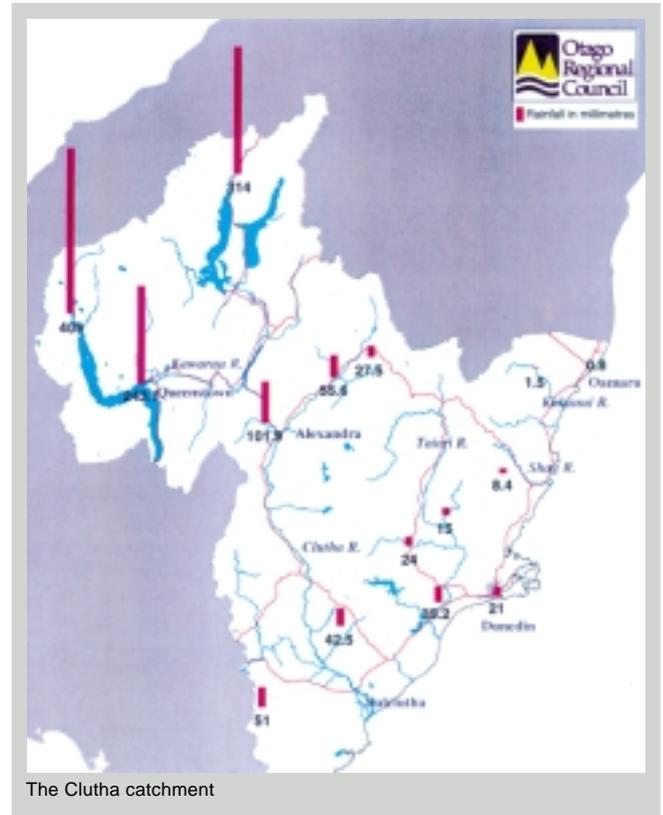


# Alexandra:

## A practical solution for managing flood risk

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### BACKGROUND

In November 1999, the Southland and Otago regions experienced their worst floods in over 100 years. While not on the same scale as recent flooding in Europe, it was a time of intense emergency management activity as people and property were constantly monitored for their safety, river flows monitored and managed through hydro dam controls and stopbanks constantly monitored for their integrity. Civil Defence and emergency services quickly sprang into action. Through sound civil defence practice, no lives were lost, but there was extensive damage to property.

November 1999 was also just one month out from New Zealand general elections and the floods in Southland and Otago received a level of political interest.

### THE PHYSICAL DIMENSIONS

During 15-18 November 1999, a record-breaking northwesterly storm hit the southwest of the South Island bringing torrential rain to Fiordland, south Westland, and the catchments of the Clutha River, resulting in flooding and disruption in Otago and parts of Southland. Businesses and homes were inundated in numerous towns, notably Queenstown, Wanaka, Alexandra, Balclutha, Kaitangata and Mataura. Power supplies were cut over much of Otago for a number of days and many roads were closed, including State highways.

Lake Wakatipu reached 312.7m above sea level on 18 November 1999, up half a metre on its 1878 record, and flooded about a third of downtown Queenstown. The lower business section of the town remained flooded by the Lake for about a week



following this peak. Numerous people were evacuated, including those from 30 homes threatened by a potential landslide in Frankton.

At Alexandra, where a state of emergency was declared on the 17th, the Clutha River peaked at 142.5m early on the 18th, 7.5m above normal flow. About 200 businesses and homes were evacuated due to flooding, and water and sewerage systems were disabled. At the mouth of the Clutha River, in Kaitangata, 30 people were evacuated, and at Balclutha, where a state of emergency was declared, 100 people had to leave their homes, as a precautionary measure.

Also affected by the storm were 400 crew and cast filming the "Lord Of The Rings" trilogy - they lost a complete film set, washed away by flood waters. 'Middle Earth' had never been so destructive!

### GOVERNMENT RESPONSE

The normal business of many government departments and agencies includes a role in emergency response and recovery. During and after the floods, Transit New Zealand worked 24 hours a day to reopen highways, deal with slips, and to replace the bridge over the Haast River. Other agencies with enhanced levels of activity throughout the response phase included Police, Fire Service, Department of Conservation, Search and Rescue, Health, and Work and Income. The Earthquake Commission was on location dealing with claims for slips, particularly in the Queenstown area. Ministry of Agriculture and Forestry specialists were deployed to the rural areas to monitor and provide advice to farmers and orchardists. Staff of the Ministry of Civil Defence and Emergency Management liaised with local civil defence personnel. The Department of Prime Minister and Cabinet and the Ministry of Civil Defence and Emergency Management were in close contact with the affected local authorities to ascertain their needs for government assistance.

In the midst of this activity, as affected communities began to focus on recovery from the effects of the floods, a Clutha Solutions Coordinator was appointed.

### CLUTHA SOLUTIONS COORDINATOR

Following the flooding, the government was asked by affected local authorities (Queenstown Lakes District Council, Central Otago District Council, Clutha District Council and Otago Regional Council) to assist with finding long term solutions to the Clutha River flooding issues and the Ministry of Civil Defence and Emergency Management was tasked with coordinating this activity. Following discussions with the local authorities concerned, the then Prime Minister, Rt.

Hon. Jenny Shipley, appointed Alex Adams as the Clutha Solutions Coordinator. Mr Adams would work with stakeholders to find ways to reduce the likelihood of future flooding along the river. While the primary focus of the Clutha Solutions Coordinator's work was to be on urban areas, he would take into account issues along the length of the Clutha catchment.

The Clutha Solutions Coordinator's Terms of Reference set out his key tasks:

- Identifying the issues relating to flood management of the Kawarau and Clutha Rivers;
- Helping the communities affected to pull together the necessary information so that the principal causes of flooding can be understood and analysed;
- Being a single point of contact and liaison between the communities, the district councils, the Otago Regional Council and Contact Energy Limited;
- Facilitating processes to identify practicable options for mitigating the risks;
- Examining the specific issues of siltation of the hydro lakes and the repeating flooding at Alexandra;
- Providing informed context to allow communities to debate long term solutions to reduce social and economic disruption from flooding of these rivers.

The appointment of the Clutha Solutions Coordinator was supported by the affected local authorities. During the ensuing months, Mr Adams regularly met with the local authorities and reported to John Norton, Director of the Ministry of Civil Defence and Emergency Management.

The Clutha Solutions Coordinator produced an interim report on the Clutha flooding issues in February 2000. This report was publicly circulated and created substantial discussion among the Otago communities. While Mr Adams was researching and talking with the communities, the Alexandra Community Board commissioned Optimx Consultants to examine flood protection options specifically for Alexandra township.

Optimx produced a discussion document for the Alexandra Community Board. Following a period of community consultation, a strategy was proposed and endorsed by the Central Otago District Council (*Future Directions for Alexandra Strategy Study - Strategy Proposal*, June 2000). The strategy contained a number of recommendations for flood protection options for Alexandra and further investigations into flood-related issues.

### THE RECOVERY PLAN

Government policy on providing assistance for recovery of areas affected by emergency events is set out in the Recovery Plan (*Recovery Plan: Natural Disasters*





**CLYDE DAM SPILLING**

Note the four spillway gates well open and high water levels on the administration building island. (Photo: ODT)

and Emergencies within New Zealand). Previously administered by the Department of Prime Minister and Cabinet, the Plan is now administered by the Ministry of Civil Defence and Emergency Management.

The Recovery Plan takes the approach that local risks and emergency events can generally be managed locally. However, where a community is overwhelmed by an emergency event, the government may share the implementation of recovery outcomes. If the effects of an emergency are of such substantial effect and existing policies are insufficient to assist with recovery the government considers to what degree it might further assist the local community to recover, having regard for factors such as:

- continued risk to life
- magnitude of impact on the community

- sustainable, long-term solutions to reduce risks
- community ownership of the recovery solutions proposed.

**ALEXANDRA: A UNIQUE CASE**

The Clutha Solutions Coordinator delved into the causes of flooding along the Clutha River and options for reducing the flood risk. He found that flooding in the Queenstown Lakes and Clutha Districts was caused by natural processes and any measures to reduce the flood risk were the responsibility of the local authorities concerned. In these areas, community discussion was generated around a number of options. For example, a flood bank to protect Queenstown Bay, minor landscape works for Wanaka, and reviewing land uses in the Barnego area, Clutha District. In these

areas it was however determined that it was the responsibility of the respective local authorities in consultation with their communities to develop and implement the most appropriate solution.

The situation in Alexandra was however found to be entirely different. The Clutha Solutions Coordinator found that Alexandra had suffered substantial problems as a result of a series of floods in 1994, 1995 and 1999. The 1999 flood resulted in the second highest flow on record with a considerably higher water level than the historical 1878 flood.

The increased flood level at Alexandra was found to be the result of sediment settling in Lake Roxburgh, raising the bed of the Clutha River. This process had been ongoing following construction of the Roxburgh hydroelectric dam in 1956 by the New Zealand Electricity Department. The rate of river bed

elevation had however decreased since construction of the Clyde Dam upstream of Alexandra.

The issue of the impact of sedimentation build-up caused by hydro dam construction on flooding in the area had been recognised in the past. However with the transformation of the New Zealand Electricity Department into the State Owned Enterprise, Electricity Corporation of New Zealand and the subsequent selling of the Roxburgh and Clutha dams to Contact Energy Limited, confusion surrounded who should pay for the management of the flood risks which Alexandra now faced. Recognising Alexandra's unique circumstances, extensive discussions took place between officials from the Ministry of Civil Defence and Emergency Management, The Treasury, Department of Prime Minister and Cabinet, Ministry of Agriculture and Forestry, Ministry for the



Roxburgh Dam spilling with a massive flow in the Clutha River. (Photo: ODT)

Environment, Ministry of Economic Development, Land Information New Zealand, Central Otago District Council and Otago Regional Council representatives, technical specialists and Contact Energy.

Comprehensive consultation was facilitated by Clutha Solutions Coordinator and Optimx investigations throughout the Alexandra community.

#### **FLOOD PROTECTION PACKAGE**

Following consideration of the Clutha Solutions Coordinator's recommendations, as well as those in the

future flooding by the Clutha River. The package, intended to provide 100–150 year flood protection, has two principal components; physical works and property purchase, and amenity enhancement.

#### **PHYSICAL WORKS AND PROPERTY**

Physical flood protection works to protect against future risks of flooding, including:

- building new stopbanks that will be one metre higher (143.3 metres above sea level) than flood levels from November 1999;



A spectacular view of the Clyde Dam looking towards the Clyde township. (Photo: ODT)

Optimx report, on 7 September 2000 the government and Contact Energy announced the signing of a Deed to formalise joint contributions to address flood problems in Alexandra.

The Minister of Civil Defence, George Hawkins, the Deputy Prime Minister, Jim Anderton and Paul Anthony, chief executive of Contact Energy, said of the Deed:

*"We are pleased to be able to provide this assistance to the people of Alexandra. The package is designed to provide Alexandra with a high standard of flood protection for the future, and will also offer help to those who were most seriously affected by past flooding."*

On 12 September 2000, the government announced a package totalling \$21.58 million (including GST) to protect the town of Alexandra from

- infrastructural alterations to water, waste and storm water, roading, telecommunications and power systems arising from the stopbank's construction;
- property issues including the purchase of property that will be needed for constructing the new stopbank.

The location and design of the flood protection works would be based on recommendations by the Otago Regional Council's independent engineers, set out in the Alexandra Flood Protection report released in August by the Otago Regional Council.

#### **AMENITY ENHANCEMENT**

Townscape and facility enhancement, which includes landscaping, roading, and restoration of facilities such as the swimming pool owned by the Central Otago District Council.

## IMPLEMENTATION

The Ministry for the Environment and Land Information New Zealand have been tasked with administering the government's flood protection package for Alexandra, with financial oversight by the Treasury. The affected local authorities, Central Otago District Council and Otago Regional Council, will implement the flood protection and amenity measures through normal resource management processes.

In addition, all the local authorities affected by the November 1999 flooding are encouraged by the Ministry of Civil Defence and Emergency Management to continue testing and improving their civil defence emergency management systems.

## CONCLUSION

Although 'Middle Earth' had demonstrated her powers, the waters subsided, the sun came up, the community gathered together and their focus turned to what they could do, rather than what they could not. Although government played a more prominent role than usual in this particular event because of the hydro

dam issues, the process by which Alexandra came together to address its flood risk and determine appropriate long term solutions for ensuring their townships viability, is one which should be encouraged as a sound approach to identifying and implementing long term sustainable recovery solutions.

## REFERENCES

*The Project Seeking Practicable Solutions for Clutha River System Flooding* (Alex Adams, Clutha Solutions Coordinator, June 2000).

Final Report to the Ministry of Civil Defence and Emergency Management. The report can be viewed on the Ministry's website at [www.mcdem.govt.nz/publications](http://www.mcdem.govt.nz/publications).

*Future Directions for Alexandra Strategy Study Strategy Proposal* (Alexandra Community Board, June 2000)

*The Impact of Sedimentation in Lake Roxburgh on Flood Levels at Alexandra. A Review following the November 1999 Flood.* February 2000. Otago Regional Council.

*Clutha River Catchment Updated Flood Frequency Analyses Following the November 1999 Flood Event.* March 2000 Otago Regional Council.

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