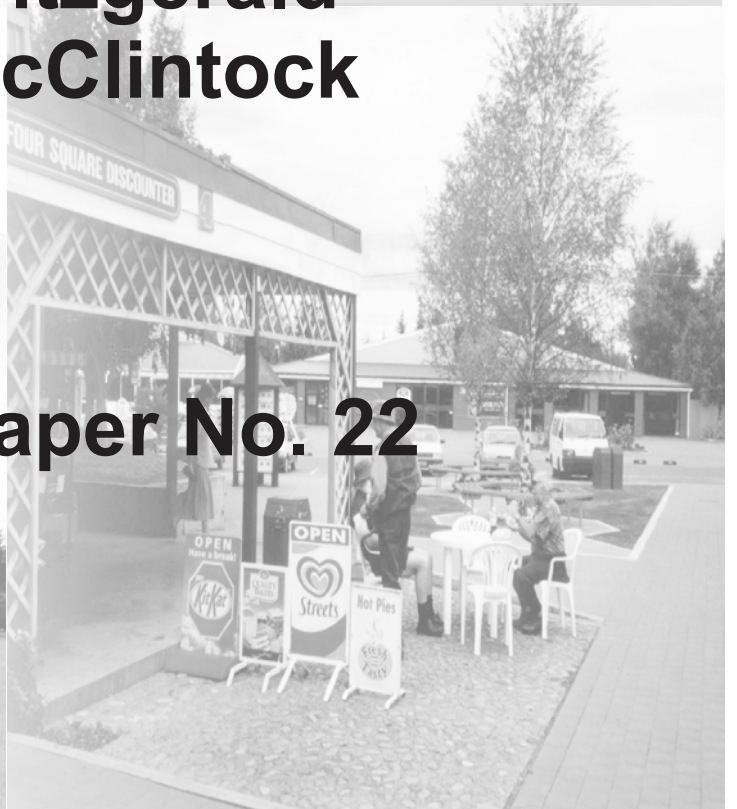


Resource Community Formation and Change

A Case Study of Twizel

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Working Paper No. 22



TAYLOR BAINES

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TWIZEL

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INTRODUCTION

This paper reports the findings of a case study of Twizel. It is one of a series of three case studies of energy communities in New Zealand that are part of a project entitled “Resource Community Formation and Change” which has been funded by the Foundation for Research, Science and Technology¹. The other case studies of energy communities in this series are Opunake (WP 23) and Manapouri (WP 21).

A variety of research methods were used in this case study which focuses on the history of Twizel since its foundation in the early 1970's. These methods included an analysis of census statistics, a review of published documents about the town and energy sector, and three days of interviews by two interviewers in Twizel and Fairlie during February 2000. Interview data is only referenced in the text where necessary.

The work provides a stronger conceptual and empirical basis for social assessment and resource planning in New Zealand, especially in rural communities that depend directly on the primary production or processing of natural resources. The findings from the analysis of the three communities in the energy sector will be added to those from communities based on the forestry, mining, agriculture, fishing and tourism sectors, to develop an improved understanding of the processes of community formation and change in these types of communities.

THE HYDRO ELECTRICITY DEVELOPMENT OF THE WAITAKI CATCHMENT

The Waitaki River, with an average flow of approximately 320 cumecs (cubic metres per second) represents one of New Zealand's largest rivers and resource for hydroelectricity generation. The Waitaki drains a catchment of approximately 12,000 sq. km, being fed mainly by lakes Tekapo, Pukaki and Ohau in the Mackenzie Country and the Ahuriri River, and various adjacent rivers and streams. Since the 1930's, the fortunes of the Waitaki Valley and Mackenzie Country have been strongly influenced, and at times dominated, by the state's efforts at (almost) fully capturing and exploiting this natural flow of water for electricity generation. There have been two large players in this hydroelectric development: the Ministry of Works and Development (MWD, previously the Public Works Department), which assembled the large resident workforces and undertook the construction of the power schemes - and its client, the state's New Zealand Electricity Department (NZED) which later become the Electricity Corporation of New Zealand (ECNZ). In the process of this development, the physical and social landscape of the Waitaki Valley and the Mackenzie Basin have been considerably altered.

Early development

The first proposals for hydro power development on the Waitaki were advanced by the Public Works Department in 1904, though investigations did not begin until the 1920's. Development began in 1928 in the depression years with the construction by the Public Work's Department of the Waitaki Dam, located 8km upstream from Kurow. This 37 metre high concrete structure was formally opened in 1934 with a generating capacity of 30 megawatts (MW), though additional generators were installed in the 1940's, bringing the total capacity to 105 MW by 1954. Nordmeyer notes that “the great bulk of this construction was done by manual labour. Pick, shovel and wheelbarrow were the common tools employed” (1981, p10). Working conditions were considered miserable and dangerous - with a high number of accidents (and 11 deaths) occurring.

Construction of a small power station of 25 MW on the outlet to Lake Tekapo was commenced in 1938, and after delays due to the outbreak of World War II, was finally commissioned in 1951. This was followed in 1954 with a control structure which enabled the height of the lake to be raised and flows downstream to the Waitaki Dam to be managed. At the same time similar control gates were built on the outlet to Lake Pukaki

¹ Contract TBA 801. For further information on the research project contact Taylor Baines & Associates (PO Box 8620, Christchurch or by email: n_taylor@tba.co.nz).

enabling it to be raised. Further investigations of hydro development of the power potential of the Upper Waitaki's lakes followed.

In the 1950's, development of a dam just above the junction with the Ahuriri River was considered, but abandoned in favour of the Benmore Dam, a massive earth dam located about 6km upstream of the junction with the Otematata River. Construction by the Ministry of Works on behalf of the NZED was begun in 1956 and the dam was commissioned in 1965, with a generating capacity of 540 MW - second only in capacity to the 585 MW Manapouri power scheme (Nordmeyer, 1981). The Benmore Dam is an impressive structure, standing 110 metres high, 823 metres wide, and 488 metres thick at the base tapering to 11 metres at the crest, and containing 28 million tonnes of earth and rock. Behind it is an 8,000 ha hydro lake which has become a significant recreational facility for the people of North Otago and South Canterbury in particular. The completion of the Benmore Dam coincided with the construction of the 640 km DC cable link between Benmore and the North Island (including 25km under Cook Strait), enabling up to 300 MW of Waitaki power to be fed to North Island consumers, and the integration of South Island power generation into a national supply grid.

To house the Benmore Dam workers, a hydrotown with a proposed life of 15 years - Otematata - was constructed about 7km from the damsite between Omarama and Kurow. This also served as the base for the workforce which moved immediately onto the construction of the Aviemore Dam, some 18km downstream of Benmore and just upstream from the head of the lake formed by the Waitaki Dam. Construction of Aviemore, a combination earth and concrete dam and separate powerhouse, was begun in 1962 and commissioned in 1968 with a generating capacity of 220 MW - somewhat less than Benmore due to the reduced "head" at the site. This dam also created a lake of approximately 2,900 ha which reaches almost to Benmore and is used for public recreation (Nordmeyer, 1981).

At its peak in 1964-65, Otematata had a population of over 4,000 and a hydro construction workforce of around 1,500. The workforce was made up of about 1,000 Ministry of Works wage workers and 300 staff, and 200 contractors and NZED staff. According to Sheridan (1995), there were some 900 houses, 80 clubs and organisations, two schools, a cinema, shopping centre, and numerous other services and facilities established by the MWD. The layout of the town was patterned on a Scandinavian design previously used for the North Island hydrotown Mangakino with most of the prefabricated houses having been previously used at the Roxburgh Hydro, Hawea, and even Tekapo (Bendien, 1983).

The Upper Waitaki Scheme

With the completion of the Waitaki, Tekapo, Benmore and Aviemore schemes, the potential for further conventional dam-based hydroelectricity development on the Waitaki was almost exhausted. However the potential for exploiting the differences in levels of Lakes Tekapo, Pukaki, and Ohau in the Upper Waitaki for hydroelectricity generation had been recognised during earlier investigations. The proposal involved constructing a canal to take the water from Lake Tekapo and discharge it through a power station at Lake Pukaki, raising the level of Lake Pukaki using a new control structure, taking the discharge from Pukaki down a further canal to join with a canal carrying the discharge from Lake Ohau, and then using the combined flow to operate a series of power stations just before discharge into Lake Benmore (Nordmeyer). The whole scheme was planned to add nearly 850 MW of generating capacity and to increase the operating efficiency of the power stations downstream in the Waitaki Valley.

Construction of the Upper Waitaki Scheme began in 1968, with the assembling in the Mackenzie Basin of the largest ever New Zealand fleet of earthmoving equipment. Prior to the completion of a new hydro construction town, Twizel, to be located on State Highway 8 (SH8) between Pukaki and Omarama, workers travelled daily to and from Otematata. As the project scaled up, 550 houses constructed in MWD workshops in Otematata to meet the more rigorous climate of Mackenzie Basin, and to last the 12-15 year construction period, were moved onto the new town site. Single men's camps, the town infrastructure, and an industrial complex were established (Bendien, 1983).

Some 600 families and single workers were transferred from Otematata to Twizel over the next 4-5 years, leaving only about 1,300 residents around a core of NZED operations staff at Otematata. While Otematata was intended to only continue to house NZED workers, there was sufficient demand for property that Waitaki County Council took over the town and the 240 houses the MWD agreed to leave in place. Most of these houses were snapped up by people wanting holiday homes close to Lakes Benmore and Aviemore, though some were acquired by contractors working on the Upper Waitaki Scheme. By the time of the 1976 Census, the resident population of Otematata was down to 677, made up of NZED workers, retired people, and various government and council employees.

Over the early 1970's the Upper Waitaki Scheme and the town of Twizel grew dramatically. At the peak of construction in around 1976 there were 1,224 family homes and approximately 800 single men's cabins in Twizel - most of which belonged to the MWD and occupied by its 1,900 employees - and the total population was around 5,000 (Bendien, 1983).

The power scheme proceeded as envisaged, and incorporated:

- an upgrade of the existing Tekapo station ("Tekapo A", 25 MW),
- a 26.5km canal to the 160 MW "Tekapo B" station situated on Lake Pukaki,
- a high earth dam on the Lake Pukaki outlet which raised the lake by 37 metres above its previous level, doubling its storage capacity and increasing the area of the lake to 17,680 ha,
- a 12km canal from Lake Pukaki joining a canal carrying the outflow of Lake Ohau and feeding the 264 MW "Ohau A" station,
- the 36 metre high Ruataniwha earth dam across the Ohau River, creating the 3,400 ha Lake Ruataniwha, near Twizel township,
- a canal from Lake Ruataniwha to the 212 MW "Ohau B" station,
- a canal from "Ohau B" to the 212 MW "Ohau C" station located on the shore of Lake Benmore, and
- the Twizel control centre to run the whole of the Upper Waitaki Scheme using remote controls.

(Nordmeyer, 1981)

As might be expected, a considerable number of the high country sheep runs in the Mackenzie Basin were impacted by the development, both during construction and in the long term. In many cases, the properties became bisected by canals, making farm management difficult, while others lost considerable tracts of their best land to the raising of Lake Pukaki. In some cases farm houses, buildings and access roads had to be relocated. In most cases, the MWD took the land (largely held under Crown lease) without compensation for loss of land, providing only replacement of lost fencing and other structures, and limited consideration for physical disruption during construction (Cain, 1994).

The Upper Waitaki project was completed in stages and began winding down from 1981 on, finally ending in 1986. Since the early 1970's there was a possibility that government would proceed with further hydro development on the Lower Waitaki, below the Waitaki dam, and that workers might be either transferred there or to Cromwell to work on the Clyde dam and the proposed Upper Clutha (Luggate and Queensbury) scheme. However in the early 1980's the government of the day decided to not proceed with the Upper Clutha or the Lower Waitaki projects. Government also decided to contract out the construction of the Clutha high dam to the private sector - thus making the Upper Waitaki scheme the last of the state constructed hydro projects. However some workers did move onto the Clyde dam - which had an MWD component (Taylor and Beltesworth, 1983). In the mid 1980's the MWD was corporatised, then privatised, and the large standing hydro construction workforce was dissipated. In addition in the mid 1980's, the NZED was corporatised, becoming the ECNZ. This was subsequently broken up into three competing state-owned power generation corporations. One of these, Meridian Energy, was allocated all eight of the hydropower stations on the Waitaki which have a combined generating capacity of 1,738 MW, and produce approximately one third of New Zealand's total generated electricity (Meridian Energy, 1999).

Like Otematata before it, Twizel continued to live on, becoming the base for some of the ECNZ/Meridian operations workforce, a holiday and tourism town, and the place of retirement for former hydro construction workers. Over the late 1980's and 1990's, the ECNZ reduced its operating workforce in the Waitaki, and sold off most of staff housing in the Waitaki Valley. In 1999 its successor, Meridian Energy, moved its operations headquarters from Twizel to Christchurch.

TWIZEL AND ITS DEVELOPMENT

Twizel is located in the Mackenzie basin, some 160km north-west of its “parent” former hydro town, Otematata, and about 150km inland from both Timaru and Oamaru. It lies on State Highway 8 - the inland route from Canterbury to Otago, and just south of the State Highway 80 turnoff to Mount Cook (Aoraki), one of New Zealand’s foremost tourist destinations. The small lakeside settlement of Tekapo lies to the north, and Omarama to the south. It is also surrounded by the mountains and alpine plain that make up the unique landscape of the open and sometimes climatically harsh Mackenzie Country.

As noted above, the town began as a “green fields” MWD hydro construction town in 1970. It was named Twizel after the nearby river, which was itself named by John Turnbull Thompson, the first surveyor general of New Zealand who felt the area reminded him of his Northumberland birthplace (Bendien, 1983). While the town was intended to serve as a home for the Upper Waitaki construction workforce for 12 to 15 years, the retention of a scaled down Otematata after the completion of the Benmore and Aviemore dams meant that Twizel’s long term destiny was not certain. Indeed, in a 1974 publicity brochure, the MWD envisaged the town might survive in the long term as a base for the power scheme’s operating workforce, and as a possible tourist resort (MWD). Despite arguments by government ministers that the town was always intended to be removed, its residents fought and won the battle for its continued life beyond that of a construction camp. Ironically, the retention of the town was partly the result of the end of state involvement on hydro construction and the disbanding of the MWD, which meant some workers wanted to retire there.

The founding population was the 600 MWD hydro construction workers and their families who began transferring from Otematata in 1970. This followed a period of uncertainty for Otematata workers over the future of state hydro construction and the continuation of their employment, and a subsequent union ban on transfers to Twizel until the ministry had resolved worker’s concerns over the quality of housing to be provided. Construction of the town was co-ordinated from Otematata where MWD carpenters produced relocatable houses which were transported to Twizel and prepared for occupation. In 1970, As Otematata wound down, Twizel rapidly took shape, with 125 houses, 200 single men’s quarters and facilities in position at the beginning of 1970, rising to 620 family homes and 300 single men’s cabins, and a population over 3,000, by late 1971 (Bendien, 1983). The first shops were completed by contractors by the beginning of 1971. As labour requirements rose the town expanded, and by the peak of the Upper Waitaki Scheme’s construction in 1976, there were around 1200 family homes, and 800 single men’s huts. It also had a full range of commercial, recreational and social services, including a large primary school, secondary school, community centre complex, shopping centre, and around 100 clubs and societies. This made Twizel the second biggest settlement in South Canterbury after Timaru, and as some locals noted, it already had “*an air of permanence*”.

While the town and its amenities belonged to the MWD and the project engineer had ultimate control, its social life and facilities were managed by the Twizel Community Council (an incorporated society modelled on the welfare committee set up in Otematata). Anticipating the eventual winddown of the construction project and the town, many having been through the experience in previous construction towns, the community council surveyed the residents to assess the feasibility of retaining the town in the longer term. The community council and the MWD project managers felt that the town had a future in tourism, holiday making and servicing. Government had earlier indicated it intended to establish a new Pukaki Village near the lake, considering it was a better location for tourism development, but in 1977 it decided to not proceed with this development. At the same time the Mackenzie County Council (MCC) had “strong reservations”

about retaining the town, seeing it as a potential liability, even though 400 of the residents had indicated to it that they would buy properties at the end of the project. Federated Farmers argued that Twizel would not develop as a rural service centre in the long term, and would only be used by the farming population for shopping and medical services. So as the project began to wind down, there appeared little support, apart from the project engineer and local residents, for the retention of Twizel (Sheridan, 1995).

Anxieties about the future of the town and its workers became more pronounced in the late 1970's as contractors completed their work and their employees left town. With work running out and no guarantees over future hydro construction, government believed that the MWD workforce would be absorbed into the private sector construction industry working on "think big" projects elsewhere in the county. People began leaving in search of work. Three quarters of the workforce that remained were married, and believed that the private sector would only be interested in recruiting single men. The Workers' Union, representing MWD wage workers, went on strike for the first time in 25 years in protest at the government's decision to let out future construction work to the private sector and to disband the MWD standing workforce (Sheridan, 1995).

Following an election, in 1981 the MCC changed its position on the future of the town and began a campaign to acquire the infrastructure, facilities and remaining properties from the government. Several overseas entrepreneurs were offering to buy Twizel and develop it as a tourist resort, with one proposing it become a Las Vegas-style casino town. The population had also fallen to around 4,000, and the workforce had dropped to about 1,000 (Ny, 1987). The National Government of the day continued to argue the town should be completely removed, seeing it as a potential long term financial liability. By October that year the signs of decline were evident, with 170 vacant houses and 100 more reserved for removal to Aromoana, near Dunedin, in anticipation of the construction of an aluminium smelter there. When the MWD redundancies began in mid 1982, the population had fallen to around 3,500. In early 1983 the project engineer, Max Smith, entered the debate over the future of the MWD workers and Twizel. His public criticisms of Government's decision to disperse the workforce (which he described as "political madness") and attempts to secure penstock fabrication contracts on the Clyde dam for his workers were met with political censure and forced early retirement (Timaru Herald, referenced in Bendien, 1983).

At the same time, the NZED had proposed to establish a new 60 house village for their operations workers at Omarama rather than Twizel. This was seen locally as a further attempt to put a nail in the coffin of Twizel's future, and led to an internal dispute among the NZED workers themselves over their future residence. This resulted in a strike by PSA members and a retaliatory threat by government to de-register the union.

The MWD began selling off houses and garages by tender and several hundreds were removed during 1983. However, recognising that the cost of complete removal of the township would be an expensive exercise, Government eventually offered to relinquish the infrastructure, community facilities, 325 houses and 100 sections in favour of the Mackenzie County Council, and make a one-off cash grant to assist with Council expenses. In mid 1983 the Council invited people to register their interest in purchasing the properties, receiving nearly 1,100 applications by October. A followup survey indicated about a quarter of the applicants intended to live permanently in the town and nearly three quarters intended to be semi-permanent or holiday residents (Bendien, 1983). Government then placed a moratorium on the removal of any more houses or sales by tender in the meantime. With such huge interest, the MCC indicated it would proceed with taking over the town, and an agreement to take over (free of charge) 540 houses, over 100 vacant serviced sections, the community centre complex, and 14 shops, - along with receipt of a \$152,000 establishment grant - was finally struck with Government in early 1984 (Sheridan, 1983). By then a residual workforce of about 350 remained on the MWD's books. Other facilities, such as the MWD single men's hostel and maternity hospital were eventually sold by tender to private investors and later developed as tourist accommodation or other ventures.

Twizel was declared a county town in 1984 and over the next few years the MCC surveyed the properties and sold off the houses and shops by ballot - according to locals, with an accompanying controversy over title

documents and sales procedures. The sales raised over \$3 million which was retained in a special fund to cover the costs of maintaining the town. Under local government reorganisation in 1989 the town's self-styled community council was replaced by the Twizel Community Board within the new Mackenzie District Council.

In the years following the construction of the Upper Waitaki Scheme most of the original residents moved away, leaving behind a largely hydro operations, service focussed, retired, or unemployed core population. Many of the former community organisations and local services ceased to operate, and those that remained scaled down. During the late 1980's retired people and beneficiaries moved in to take advantage of the cheap housing and the excellent community facilities, along with a handful of business people and tourism entrepreneurs. Residents noted in interviews that in this post hydro construction period the town encountered increasing social problems and a resource centre was set up to assist in placing people in employment and provide better access to social services. Since the early 1990's the permanent population has hovered around 1,200 with just over half the 1,100 or so properties belonging to non residents.

A promotions association and business group were established in the early 1990's and tourism developed slowly with an increase in the number of hotels, motels and B&Bs, along with businesses providing visitor activities. Fieldwork revealed that the largest employers today are Meridian Energy, the Department of Conservation, and the Twizel Area School. The economy has slowly diversified, notably the advent of salmon farming and alternative land uses on farms in the McKenzie basin, but while it has managed to retain its community facilities and most of its shops, as predicted, the town has not developed as the main farming service centre for the Basin.

DEMOGRAPHIC CHARACTERISTICS

The population of Twizel over the 30 years since its establishment has had rapid rises and falls similar to those of other purpose built NZ hydrotowns (Table 1). These have corresponded to the establishment, settlement and eventual departure of the construction workforce and their families, and the transition to a more stable resident population. From a zero population in 1969 Twizel grew dramatically to over 5,000 in 1976 (i.e. an average growth of 36% per year), and reached a peak in 1977 of nearly 6,000. However, within 10 years the population dropped to a fifth of its peak population where it has remained for the last 15 years. The available census statistics did not capture the peak (eg. in 1977-78) and the rapid fall in population - for example between 1981 and 1983 the population fell to around 2,500. With the recent departure of a handful of Meridian Energy employees and their families, it is believed by community representatives that the population at the beginning of the new century stood at under 1,100. The census statistics also do not capture the seasonal population peaks - for example, the town's population is estimated by locals to rise to over 5,000 over the Christmas - New Year period when holiday home owners are in residence and local camping grounds and other accommodation are full with holiday makers.

Table 1 Twizel - changes in the usually resident population 1971-1996

Census Year	No. of Persons	% change in Twizel pop.	% change in NZ pop.
1971	1,820	-	
1976	5,184	180.5	
1981	4,199	-19.0	1.4
1986	1,179	-71.9	3.8
1991	1,017	-13.7	3.4
1996	1,179	15.9	7.2

Source: New Zealand Census's 1971-1996

Just under half of Twizel's residents in 1996 reported that they had been living in the town in 1991, while just under a third had come to live there from elsewhere in Canterbury (Table 2) in the intervening period. This indicates that there has been a considerable amount of inward and outward movement from the town (and possible social change) since its days as a hydrotown.

Table 2 Place of residence of Usually Resident Population of Twizel - five years before 1996

Place of residence	Twizel % of population
Same usual address	41.3
Same territorial authority	13.3
Same regional council, different territorial authority	16.9
Different regional council, same Island	12.5
Different regional council, different Island	4.7
Not specified - New Zealand	4.1
Overseas	7.2
Total number of Persons	1,083

Source: New Zealand Census 1996

The age-sex structure of Twizel's population in 1996 (Table 3) was not particularly different from that of the national population, and it had a similar dependency ratio (0.51 compared with 0.53). The balance between males and females in the population was slightly in favour of males, though this was more pronounced in the elderly group. This situation represents a considerable change from the 1976 population described by Taylor and Bettesworth (1983), which indicated the "classic ... modern boomtown" age/sex structure of a high proportion of males, very few elderly people, and a considerable number of children. The subsequent "normalisation" of the population age structure also indicates that the town has not taken on the characteristics of a declining rural community (i.e. few young people, and high proportions of elderly).

Table 3 Age-sex structure of the population of Twizel 1996

	Twizel		New Zealand	
	Male	Female	Male	Female
% 0 - 14 years	24.0	22.8	24.1	22.0
% 15 - 64 years	63.7	69.3	65.7	65.0
% 65 years & over	12.3	7.9	10.3	13.1
Total Number of Persons	612	567	1,777,464	1,840,839

Source: New Zealand Census 1996

Social characteristics

In 1996 Maori made up 11.2 per cent of the population of Twizel, compared with 14.5 per cent for New Zealand as a whole. This represents a growth in the Maori population since the hydro construction days, when the percentage of Maori went from 5.7 per cent to 8.3 per cent to 9.4 per cent between 1971, 1981, and 1986.

Census statistics indicate that in 1996 Twizel's families were quite similar in size and type to New Zealand as a whole. Families had, on average, 3.64 persons (cf 3.81 for NZ), with comparatively slightly fewer single and two parent families, and proportionately more couples without children (see Table 4). During the

construction years, Twizel was notable for its high number of births and young families, and, like other construction towns, the high number of single unmarried males.

Table 4 Family Types in Twizel 1996

Family Type	% of Twizel families	% of NZ families
One parent family	14.8	17.7
Two parent family	42.6	44.9
Couple only	42.6	37.3
Total number of families	324	949,497

Source: New Zealand Census 1996

Twizel residents aged 15 years and over had similar levels of education as the national population in 1996 (see Table 5).

Table 5 Highest educational qualifications held by the residents of Twizel 1996

Highest educational qualification	% of Twizel residents	% of NZ residents
University & other tertiary	26.3	25.8
Secondary	24.0	26.5
No qualifications	35.7	32.2

Source: New Zealand Census 1996

INDUSTRY, WORK AND OCCUPATIONS

Phases of development

As outlined previously, the hydroelectricity industry has gone through cycles of development in the Waitaki catchment, largely in response to growth in the national industrial, commercial, and domestic demand. This growth was dramatic in the 1930's, and again in the 1950's and 1960's as shifts occurred in the type of energy demanded. As electricity became increasingly favoured, the coal industry went into decline.

The construction of the Waitaki station by the Public Works Department during the depression years, and its commissioning in 1934, marked the beginning of development of the Waitaki Catchment. Efforts to enhance of the Waitaki dam's performance lead to the fitting of new generators, the construction of a control structures on Lakes Tekapo and Pukaki in the 1940's, and the subsequent inclusion of generating capacity at Lake Tekapo (Nordmeyer, 1981).

A second phase of development began in the late 1950's with the construction of the Benmore Dam and the supply cable to the North Island, and continued with the construction of the Aviemore Dam and the Upper Waitaki Project - with its enhanced lake control structures, canals, and four power stations. Over the 1970's and early 80's investigations were also made for dam development on the lower Waitaki, but this project never eventuated. This main phase of hydro construction, which saw the MWD assembling a large workforce and establishing two purpose built hydrotowns, ended in the 1980's, when all stations in the system were completed and producing electricity for the national grid.

Early in this production phase, government corporatised the state electricity sector, and the ECNZ (the owners and operators of the network of power stations) itself restructured its operations several times. This involved the establishment of a production workforce settlement at Omarama and the progressive consolidation of operations at the Twizel control centre. Major changes have included the scaling down and withdrawal of permanent workforces from Waitaki, Aviemore and Benmore, and the contracting out of station operations and maintenance.

In the mid 1990's, once again seeking greater efficiencies from the Waitaki system, the ECNZ (and its successor Meridian) embarked on a programme ("ARC") of fitting equipment for automating and remote controlling all its stations, and upgrading some generators. This programme is due to be completed in early 2000 and, according to an industry informant, is likely to have a final cost of around \$60 million. The work has been undertaken by overseas contractors, has generated little in the way of local employment, and has been largely done out of sight.

The role of the state

Government has been almost entirely responsible for the whole of the Waitaki catchment power development, including the Upper Waitaki hydro scheme. The Ministry of Works (and Development) Power Division was responsible for the design and construction of the schemes on behalf of the NZED. The MWD was essentially a large contracting organisation providing a range of civil engineering services to government departments, and by the 1970's had established an impressive record in hydroelectric, thermal and geothermal power construction, and had built an expert and loyal standing workforce which had come to expect ongoing employment, such that it was affectionately known as "Uncle MOW". In 1972, when the Upper Waitaki construction was in its early days, the Ministry had a total staff of just over 7,000, with power development accounting for 20.6 per cent of its \$324 million expenditure that year (Sheridan, 1995).

When the Upper Waitaki Scheme was approved in 1968, it was estimated it would cost \$168 million. However the cost escalated through the 1970's, and by 1974 had reached \$170 million. In the 1975-76 year, just before the height of the construction, \$52 million was spent - with 1,052 wage workers, 360 MWD staff, 400 contractors employees, and 200 service people engaged on the project. The daily wage bill was around \$33,000 - most of which was going into the local community. By mid 1980, the project had cost the tax payer \$380 million, rising to \$581 million by the end of the project in 1986/87 (Ministry of Energy, 1987). The final cost included \$10.5 million for the Twizel control station and \$4 million for the NZED housing at Omarama (unreferenced MWD reports cited in Sheridan, 1995).

As part of the scheme's construction, Government spent over \$22 million on the establishment and maintenance of the town of Twizel (Sheridan). As with its previous "company" hydro construction towns, the MWD was responsible for all aspects of Twizel's establishment and maintenance - including utilities and other infrastructure, housing for families and single workers, and community and recreation facilities - sufficient for a population of over 5,000. It also directly supported the establishment of social services provided by other agencies - such as health services, a maternity hospital, two schools, and police. Through the project engineer and his staff, "Uncle MOW" was the town's owner, de-facto ruler, and provider of most public community needs. Consequently, people enjoyed a good quality of life, with most services available locally and cheaply.

The completion of the Upper Waitaki Scheme coincided with the end of the National Government administration under Robert Muldoon and the era of government "think big" projects. In the early 1980's, bowing to pressure from the private construction sector which argued that it could complete such work more efficiently, the government turned a significant proportion of the work on the last of its major hydro projects - the Clyde Dam - to private contractors, with the public sector playing a less important role. With the proposed Lower Waitaki and Upper Clutha hydro schemes abandoned, there were no forthcoming projects for the Twizel

workers, and the death knell for the Ministry of Works & Development's Power Division was being sounded. Twizel residents recognised this, and from the late 1970's lobbied hard, against strong government resistance, to keep the town alive. The government ministers finally relented, and signed over the town and its public facilities to the Mackenzie County Council, but not before a significant proportion of the town's houses had been sold of and moved.

The incoming 1984 Lange/Douglas Labour government hardened the line on government non-involvement in industry across the board. This included restructuring the MWD in 1988 into five state owned enterprises (SOEs), which were eventually privatised. By the time of this restructuring, there were only a dozen or so MWD workers left in Twizel. With the demise of the MWD, according to one social service provider interviewed, "*the town went into a deep state of grief*", and despite winning the battle to keep the town, local people remained angry with government for some time after.

As noted, in 1987 the NZED was disbanded and replaced by the ECNZ (owning most of New Zealand's generating capacity and monopolising wholesale electricity supply). It was expected to operate as a private company and return a dividend to its owner - the state. This restructuring meant considerable job losses - in late 1987, 800 staff were made redundant out of a national workforce of about 6,000 (Sheridan, 1995; Ministry of Energy, 1986). Management of the ECNZ also anticipated that within 10 years, all the stations in the Waitaki system would operate unmanned via remote control - foreshadowing ongoing job losses. Under its new management, between 1988 and 1991, the ECNZ increased its profit from \$196 million to \$404 million (Kelsey, 1997). It also closed down and sold off, the Aviemore and Waitaki hydro operations villages which had been earlier established to house power station staff. Staff were shifted to Kurow and Otematata. Further restructuring took place in 1992, as a result of which a wide range of services (such as plant operations and maintenance) were contracted out, in some cases to former employees who were encouraged to form businesses of their own. Kelsey (1997) notes that by 1993 the ECNZ had laid off almost 3,000 staff through its restructuring. Census statistics also reveal that between 1986 and 1996 total employment in the electricity supply sector, which included supply authorities, decreased from 14,466 to 7,038.

The restructuring of the state sector and the move towards a market model was relevant to the Upper Waitaki and Twizel, in that both the MWD and the NZED, the town's progenitors, both ceased to exist soon after the hydro construction ended. Most of those workers who did not choose to retire moved away to find work on other projects or become unemployed elsewhere. The ECNZ workers went through several rounds of socially disruptive restructuring, with only a proportion of those made redundant joining firms contracting back to the corporation. Census data indicates that by 1991 there were approximately 33 of Twizel's residents engaged in the electricity sector, down considerably from the 270 in 1986. However, by 1996 the sector workforce had risen to 87 possibly due to transfers from the Waitaki Valley settlements.

In 1992, the National government passed legislation to corporatise the 48 energy distribution companies and electric power boards (statutory local authorities), with the clear intention of eventually achieving privatisation. Transformation into public companies soon followed, with Canadian and American companies involved in various take-overs (Kelsey, 1997). In 1994, government created a further SOE, Transpower, to run the power supply network, formerly done by the ECNZ. In 1995 it also split off from the ECNZ a competing production company, Contact Energy, which acquired 27 per cent of NZ's generating capacity, including the Roxburgh and Clyde Dams and many North Island facilities. In 1996 a market was created for the wholesaling of electricity, with ECNZ and Contact Energy in competition. Two years later, government required local retail power companies to separate the ownership of their network (line) and retail functions, and decided to sell off Contact Energy to the private sector. In 1999, the remaining power production assets of ECNZ were split between three new state owned corporations, Meridian Energy, Genesis Power, and Mighty River Power. Meridian became the owner and operator of the eight power stations of the Waitaki Catchment, including the Upper Waitaki Scheme.

Ownership and operation of the Upper Waitaki Scheme

Meridian Energy, is the largest of the three state-owned enterprises formed by dividing up the remaining assets of the ECNZ on 31 March, 1999. It is a wholly government-owned limited liability company (or SOE) with the shareholding held equally by the Minister of Finance and the Minister of State Owned Enterprises on behalf of the Crown. As well as the hydro power stations on the Waitaki River, related infrastructure and water rights. It also acquired the Manapouri power station, the Cobb dam in Golden Bay (which was subsequently sold), the ECNZ's interests in other South Island hydro development opportunities, and various high technology and wind generation research and development efforts. In late 1999, it also owned four power retail companies, including Waitaki Power (the former Waitaki Electric Power Board). The total value of the assets acquired by Meridian from the ECNZ had a book value of approximately \$2,073 million, of which about three quarters was made up of generation plant (Meridian Energy, 1999). The purchase was financed (in a "book" exercise) by a share capital input from Government of \$1,600 million (Ministry of Commerce, 1998).

The Upper Waitaki Hydro scheme operates as part of the whole Waitaki system and was specifically designed to be run centrally, using radio operated remote controls, from the ECNZ Twizel Control Centre, which is located just south of the township. From this centre Meridian operates the various power stations and control structures based on requirements of "system control" (located at Islington in Christchurch) according to real-time electricity grid demand, the need to optimise the whole of the Waitaki power generation system, and within its resource consent conditions and agreements on lake levels and water abstractions. According to interviewees the actual controllers receive information on each station's equipment and performance, and manage the necessary switching, via computers. This means that the newer stations in the Upper Waitaki scheme have not required on-site operators, unlike the older stations in the rest of the system.

Meridian acquired the ECNZ's 63 water rights (resource consents) for the Waitaki Hydro Scheme. These were granted in 1991 to the ECNZ by the Canterbury Regional Council, with 22 accompanying conditions, and expire in April 2025. These rights were "granted virtually by consensus, as a result of the extensive consultation undertaken between ECNZ, and the Waitaki Working Party (a group comprising key stakeholders)" (Ministry of Commerce, 1998). In the process of gaining its water rights, the ECNZ entered into agreements with various affected parties, including Maori, and farmer, recreation, and conservation groups. The conditions and agreements governing lake levels and river flows etc. determine the parameters for the management of the water resource, and thus the operation of the power generation system.

Meridian operates with a combination of contractors and staff. Its "organisational design is based on outsourcing of all non-core functions" (Meridian Energy, 1999a, p6). The finance and accounts functions are contracted out to KPMG, an international accounting firm who have engaged former ECNZ staff. The electrical and mechanical maintenance work is contracted out to the Dutch multinational power technology company ABB Alstom - itself a joint venture between the Swedish firm ABB (Asea Brown, Boveri) and the French technology company Alstom. Its New Zealand field staff are also mainly former ECNZ employees. Plant cleaning and repairs are carried out by the Alexandra-based company Zelco, which was formed by former ECNZ personnel. They also have the contract to run the visitor centre and tours of the Benmore Dam, reported to be the only power station in the Waitaki system now open for public visiting.

According to its annual report, in 1999 Meridian Energy employed 118 people, located in Christchurch, Twizel and Wellington. Approximately 50 of these were located at Twizel. During 1999 the company announced it would relocate some of its generation staff from Twizel to Christchurch claiming it "could not attract and retain the necessary skills at its Twizel base", and further, that this would "allow closer contact with the Canterbury University Engineering School and local energy sector industry support" (Meridian Energy, 1999, p11). This shift has meant that upwards of 20 people left the district as a result of redundancies and transfers, and "*this has created a strong negative feeling in the community at the moment*

(i.e. February 2000) and a loss of confidence” due to the effects on businesses and local services and clubs of the loss of population. In practise, according to a local industry respondent “*about 17 staff went out on severance or transfer, of which about half were residents of Omarama. About a dozen were given severance*”. This included “*old-style engineering staff*” (who came through the NZED/ECNZ ranks), some of whom were replaced with new graduates with the engineering skills necessary for the new technology environment. Some staff now travel regularly from Christchurch to Twizel to carry out their duties, staying at local motels. The major contractors are also reported to have reduced their local staff in the past year.

Technology and work

Construction

In contrast to the construction of the Waitaki Dam in the 1930's, the Upper Waitaki hydro scheme was built using a huge array of specialised mechanical equipment - for construction, fabrication and earthmoving. Indeed, as Sheridan notes, the project involved the largest fleet of earthmoving equipment ever assembled for a project in New Zealand (approximately 300 machines in 1974) moving over 120 million cu/m of material for the construction of the network of canals alone. This included “the biggest dump trucks and loaders in the country” specifically imported for the project, along with mechanical shovels, motor scrapers, bulldozers, graders, construction cranes, tractors, rollers and a fleet of trucks (op cit). One parade through the town boasted 210 rubber tired earthmoving vehicles. The human capital involved in the project was mainly in machinery and plant operation, a wide range of trades, professional and technical engineering, and various supporting services. The core workforce and skills came from within the long-established ranks of the MWD's Power Division.

To undertake the construction and necessary fabrication work, the MWD established an industrial complex in the town, supported by a number of smaller temporary facilities located close to the main construction sites. The project office complex, and a quality control laboratory were located near the entrance to the town, and a large multi-function industrial area, employing up to 400 tradesmen and workers, was located on the southern boundary. Along with the MWD personnel, approximately 20 earthmoving, transport and construction firms from around New Zealand were engaged at some time in the project, and employed a total of 500 personnel at peak. The contractors tended to supply their own plant, servicing facilities, personnel, site offices, and, in some cases, accommodation (MWD records cited in Sheridan, 1995).

Dominating the local skyline was an eight-story high, semi-automated, concrete batching plant which had been used during the construction of Roxburgh, and the previous dams in the Waitaki Valley. This made concrete continuously, supported by a fleet of trucks, and over the life of the project produced about 900,000 cu/m of concrete used in the construction of the various dams, powerhouses, and canals (Sheriden, 1995).

According to a former staff worker the project was run out of the MWD project office, and was under the control of the project engineer, who answered to the MWD Power Division head office in Wellington. Below the project engineer were a serious of professionals in charge of various aspects of the project, including the construction engineer, mechanical engineer, civil engineer, a resident engineer, and project accountant, along with various technical and administrative assistants. At the next level were various supervisors and inspectors and a town clerk, then senior clerical staff and officers in charge of particular project and administrative functions, then staff workers, and at the lowest level, non-staff, wage workers. Workers were assigned tasks and supervisory functions according to trade/skill seniority. Over the life of the project approximately 250 apprentices and cadets were also engaged alongside skilled tradespersons.

As might be expected the workforce was dominated by workers engaged in operating earthmoving equipment and other machinery, design and engineering work, and a host of support activities. This can be seen in the census status for the time, eg., in 1981 approximately 83 per cent of the then full-time male workforce of

1,446 were workers in production, transport operation and labouring. Of the 282 women in the Twizel workforce, 70 per cent were clerical, sales or service workers. As might be expected the bulk of the workforce (73%) was recorded as being in the construction sector (Taylor and Bettesworth, 1983).

According to Sheridan, between 1968 and 1984 approximately 66,000 people applied for work on the Upper Waitaki project, of whom 12,500 were given jobs. With the project construction proceeding around the clock, a large proportion of the workforce was on shift work. Because of the extremes of climate in the Mackenzie Country, working conditions were also often difficult - including heat and dust in the summer, and severe frosts (up to -16 degrees Celsius) in the winter. In addition, much of the dam and powerhouse construction work was arduous and dangerous. The core of workers (which Sheridan refers to as “the dam dwellers”) including the local young people who entered the workforce, had come from previous hydro construction projects in the Waitaki Valley and Roxburgh, and were therefore familiar with such site working conditions, long hours and shift work. Newcomers, however, were less used to the conditions, and there were reportedly periods of high turnover, with accompanying workforce recruitment drives. The workers lived in Twizel and commuted to and from their particular work sites by bus. Each site had its own temporary office and array of “crib sheds” for tea and meal breaks. Those who worked in the town industrial complex were able to go home for their lunches. A working week was generally considered to be 48 hours.

Operations

Prior to 1988, the dams and power stations of the Waitaki system were mainly operated by on-site staff actively controlling the facilities in real time. Each station had 3 operators. However the Upper Waitaki Scheme was designed to be operated from a central location via radio link. In the late 1980's ECNZ's management had seen remote control at work in Scandinavia, and saw it as a means of making efficiency gains and saving money in its New Zealand generation operations. Under the ARC (automatic remote control) program - started in the mid 1990's, carried on by Meridian since its take-over from ECNZ, and due to be completed in early 2000 - the various stations and control structures have been fitted with programmable controls, switches, and monitoring sensors, which are linked by fibre optic cable to the Twizel control centre and to the expanded Christchurch office. The nature of the adaptations has depended on the age of the plant involved. The Manapouri Power Station is also being fitted for remote control, and will be operated from within the same system. As noted in Meridian's company profile:

“ARC replaces 1970's control and protection equipment with modern computer controls to make the generating plant more responsive and its use in the market more flexible. It enables the generating plant to run unattended, avoiding the need for shift and operating staff. The technology of ARC also captures a wide range of data for recording and monitoring plant performance. This provides a platform for reliability centred maintenance techniques and condition monitoring, rather than time-based maintenance. It also supports electronic dispatch and automated optimisation of river chain generation that will result in higher efficiency.”
(1999, p9)

In effect, the new technology removes the work of on-site operations and maintenance staff (with the attendant job losses and relocation of staff), and replaces it with centralised computer-based decision and support, and switching. Maintenance will be done by contractors according to need, rather than according to set schedule, with maintenance decisions based on observed changes in plant performance combined with risk assessment.

According to an industry informant, the ARC project was anticipated to cost in the order of \$50 million, but is likely to eventually cost around \$60 million. The work has been carried out under a separate contract. The implementation of remote control has already resulted in job losses in the Waitaki hydro system and changes in the nature of electricity generation work.

The industry's relationship with the community

The presence of the electricity generation industry in the Mackenzie Basin is plainly evident through the canals, lake control structures, power houses, and transmission cables which feature in the landscape and which are encountered by those travelling to and from the district. Meridian's Twizel Control Centre and offices, and the structures associated with the man-made Lake Ruataniwha are located near the State Highway in the immediate vicinity of Twizel.

During the construction of the Upper Waitaki Scheme the two main government agencies involved, the MWD and NZED, were essentially inseparable from the life of the community. At Twizel, the MWD provided the housing, physical infrastructure and community facilities and support services which enabled a community to develop and grow, and the rhythm of project activities generally set the pattern for community life. The wellbeing of the town and many of its activities were fundamentally connected to the MWD and the projects. As one long term resident put it "*work and community weren't separable, and one couldn't escape work or work situations*".

The winddown of the construction and the transformation of Twizel into a county town meant that many of the community facilities established and owned by the MWD and NZED were passed by government to the county council and its new ratepayers. After the project ended, the ECNZ continued to be closely associated with the community - not only through its resident workers and their particular involvements in community activities, but also through its material support for community organisations such as the school, community marae, and sports clubs. It also became the major sponsor of NZ Rowing - the beneficiary of an MWD-constructed rowing centre and course at Lake Ruataniwha. This support, and the availability of world class facilities provided ongoing economic benefit to the town through the regular national and regional rowing regattas held at Lake Ruataniwha. In the private sector, the ECNZ helped establish a new industry by allowing two salmon farms to operate in its canals. As a means of liaising with the community over its use of the lakes and waters of the Waitaki, the ECNZ set up a Waitaki Working Party, which included Fish & Game, the Ngai Tahu Trust Board, the Canoe Association, the Anglers Association, various farmer irrigation companies and government authorities. Agreements were struck with the interest groups, and in some cases this included provision of funds or facilities (Ministry of Commerce, 1998).

In 1999, the ECNZ's Waitaki assets passed to Meridian Energy. It indicated in its 1999 Annual Report it "*will continue to contribute to the community at the local, regional and national levels both in support of its business objective and as part of its responsibilities as a good corporate citizen*" (p26). In its 1999 Statement of Corporate Intent Meridian also notes that one of its objectives is to "*display a sense of social responsibility by having regard to the interests of communities that it operates in and by endeavouring to accommodate or encourage these interests when able to do so*" (p5). The details of such support and accommodation since April 1999 are not available, however.

Locals perceive that the company has reduced its involvement in the Twizel community compared to the position they inherited from ECNZ. Most often noted is their withdrawal from sponsorship of NZ Rowing and local organisations, and a shift to supporting the arts at a national level. Some long term residents compared unfavourably Meridian's and the former ECNZ's relationship with the community, as seen in the following statements:

"ECNZ always gave to the community. They had a sense of social responsibility, providing a computer room and computers to the school, sports club funding, a mini-bus for the school, in return for use of local resources. But Meridian don't have the same sense of responsibility".

“[Meridian Energy] is not contributing much to the community overall - especially in terms of social contribution and membership of societies etc.”

“It has stopped sponsoring community activities and has become a shut shop. Senior management are not approachable, although they claim they are community oriented.”

One long-term industry employee confirmed this noting that the company had tried to pull back on involvement in community projects, and that they were not as generous as the ECNZ. Local businesses are reportedly not given any special consideration when it comes to tendering for Meridian work.

Despite resident Meridian staff involvement in community organisations, others reported that the company does not seem to have a proactive liaison or relations with the Twizel community. For example, that *“cheaper power for Twizel consumers was never offered as promised ... lots of locals buy their power from Contact Energy, rather than Meridian’s own retail company, and they have never really promoted their retail services. Its not like ECNZ”*. As a result of the company’s recent staff layoffs and relocations, the general mood of the town in early 2000 was low, as observed by a local informant: *“the net loss of families has had a negative psychic effect on locals. There is a lot of negative feeling at the moment.”*

However Meridian remains the biggest ratepayer in the Mackenzie District, it has sponsored community events (such as the launching of the Seven Peaks College) in recent times, and is assisting in the establishment of a visitor centre service at the Lake Pukaki lookout site. Some also feel that there is no detectable change in the company’s attitude to the community.

From interviews it seemed that despite the employment provided, and the physical presence of the power scheme, the role of the electricity generation industry in the life of the community is reducing, and its future role is uncertain. This explains the common perception that Twizel is actually more of a holiday, retirement and tourism town now, rather than an energy town, and that its future lies in tourism and other forms of development.

ECONOMY AND ENVIRONMENT

Local economic impacts of the Upper Waitaki Hydro

The development of the Upper Waitaki Hydro scheme between 1968 and 1983 essentially created a new “economy” in the Mackenzie Basin, based on the expenditure of public money. Since the \$581 million development was paid for by the New Zealand taxpayer (including the \$22 million to build Twizel) it was clear that the project was also of national importance both in terms of the huge public investment (from international loans) and the direct and induced employment and economic benefits for the region and the nation. This project was “think big” at work.

The project’s economic impact also extended around the globe since a considerable proportion of the expenditure went on the purchase of equipment and supplies from overseas for, among other things, earthmovers and other heavy machinery, turbines and generators, steel and fabrication equipment, vehicles, fuels, and parts. Equipment was supplied from the UK, USA, Canada, Japan, Yugoslavia, Italy, Sweden, France, Switzerland, India, and Australia, and well as New Zealand (Sheridan, 1995).

In terms of employment, an estimated 12,500 people found work on the project at some time, and at its peak the workforce was over 1,900 strong (Sheridan, 1995). The daily wage bill of the MWD rose as high as \$33,000 (in 1976 dollars), and since almost all the workers were living locally, this went into the local and regional economy. The core of those employed by the MWD had come from Otematata, and were wedded

to the state construction industry. Others were transferred or recruited in various capacities from around the country and overseas, and the MWD provided work opportunities for local and regional school leavers.

Construction, earthmoving and transport contracting firms from around New Zealand were also used on the construction. The majority were Canterbury and Otago firms, including from Twizel, Omarama, Queenstown, Christchurch, Ashburton, Oamaru, while others came from the Waikato, and Auckland (The Press: 25/1/79). These firms generally brought in their core staff, and recruited workers from throughout the country as necessary. According to Sheridan, an estimated 66,000 people sought work at Twizel during the life of the project, often attracted by the possibility of making “big money”, as also noted by Ny (1987).

Most of the daily needs of the construction residents of Twizel were obtained from shops located in “Market Square”, though regular shopping trips to Timaru or Oamaru to take advantage of the lower prices there, were common. These were aided by a regular bus service, sometimes provided free to shoppers by the city retailers. A proportion of the wages entering the local economy were therefore expended directly outside of Twizel, or indirectly through Twizel businesses making wholesale purchases from suppliers in Timaru. Business in the town flourished and the local economy reaped the benefit of a prosperous community” (Ny, 1987). Interviewees in our study reported that because the MWD built and leased commercial premises and had control over the town, Twizel’s businesses had comparatively high numbers of “captive” patrons yet didn’t have the competition typical of “open” towns. The expectation of good returns from a business at Twizel must have been high, since, more than a year before the first block of the eventual 12 shops were completed,

“the MOW had received over a hundred applications for occupancy from all over Zealand. Among the applications were some from shopkeepers who formerly had premises in Otematata and were known to have done extremely well during the construction of the Benmore and Aviemore projects. Successful applicants could expect occupancy for ten years at least and a regular patronage from around 5,000 residents” (Bendien, 1983, p12).

As noted earlier, the project construction attracted site-seeing visitors: the Twizel Information Centre became a stopping place for the growing number of coach tours, and later camper vans, passing through the district. Sheridan reports that over 500,000 people went through the Centre, though it seems that the town may have received little in the way of income from these tourists.

As the Upper Waitaki Project wound down in the early 1980's, most of the construction workers left the district, though some found work on the Clyde dam construction and travelled home on weekends. Anticipating the economic downturn, many retailers sold out to those who had decided to stay on. By 1984, when the town was handed over to the MCC, there were about 400 project workers left, most of the MWD plant and surplus buildings had been disposed of through tender or large “garage sales”, and services were contracting or disappearing (Sheridan, 1995). Most workers who were made redundant left town, taking their settlement money with them, while those who remained purchased their houses from the Council - at prices from \$11,000 up. The selling off of vacant sections and remaining houses raised over \$3 million for the Council, on top of the cash grant received from government. These funds were set aside to maintain the town and its facilities.

Ny (1987) notes that between 1981 and 1986, the “dramatic decline” in Twizel’s population had a “significant impact” on the maintenance of basic community services, and since it coincided with a national economic downturn, especially in the rural sector, the whole district experienced increased unemployment and a depressed economy. For the first time Twizel had unemployment. However the electricity industry continued to be the main contributor to the local economy through the wages and salaries of the several hundred ECNZ employees that remained in the district, while the tourism/visitor industry grew slowly, with entrepreneurs drawn to the area because of its proximity to the lakes and mountains, the town’s facilities, and

its cheap housing. The rowing facilities established by the MWD also assisted in sustaining the local economy.

As noted earlier, the hydro scheme enabled the development of the local salmon farming industry, with the two farms acquiring resource consents allowing for up to 4,500 tonnes of fish to be produced annually in the canals. Total production in 1999 was about 45 tonnes but both farms were in the process of expanding considerably.

Environmental impacts

The scale and nature of the Upper Waitaki project meant that it had a huge impact on the natural character of rivers, local farms, and indeed the whole landscape.

The construction of a 61 metre high earth dam at the outlet of Lake Pukaki to double the lake's storage capacity for electricity generation meant that its level was raised by 37 metres (Cain, 1994). This was on top of the 9m raising caused by the construction of the 1952 dam, which had caused considerable loss of valuable farmland, including fertile river and lakeside flats. The new dam increased the lake's surface area by 17,680 ha, thus inundating considerably more surrounding land, including good farmland and homestead sites. Today the effects of raising of the lake are still evident in the erosion scars caused by wave action on the lake edge.

Cain, in a survey of the losses incurred by 18 Mackenzie Basin farms due to the development of the Upper Waitaki Scheme, observes that

“the vast majority of the land placed under water [by the raising of Lake Pukaki] was the better farming land available in the district; land which grew crops of barley and oats, as well as grasses suitable to hay making. This latter farming practice being of very great importance for winter feed in areas subject to winter snows and frozen ground. Cattle grazing was also common on the lakeshore flats.” (1994:5)

Cain quotes one property owner who reported he “lost 5,000 acres, sufficient to carry 300 head of cattle, along the lakeshore flats; it was highly productive country ... The station has not run cattle since the lake was raised” (ibid). Not only was the lake raised, but most of the water that flowed naturally out of the lake down the braided Pukaki River was diverted down a canal to the Ohau A power station.

The construction of the 58km of canals, which carry almost all the natural water flow out of the lakes via the original rivers, were made by cutting and filling some 45 million cubic metres of earth and rock (Sheridan, 1995). Despite considerable efforts by the MWD to blend the canal embankments in with the landscape and to repair earthmoving scars with massive planting of tussocks, trees, and other local species, the canals remain features in the landscape. Furthermore, these canals and their construction covered or disturbed large areas of farmland. Of this, Cain notes that

“The years of construction caused many family and stock problems from the noise and the dust, and created farming difficulties with the shifting of stock both then and into the future. One favourable asset created by the canals has been the installation of an effective rabbit barrier in a very rabbit-prone country.” (1994:5)

Farms were bisected, necessitating construction of stock and access bridges. Some farm homesteads and buildings had to be rebuilt or moved to new locations. Stock water supplies were disturbed and had to be replaced.

The main impacts reported by farmers were:

- loss of their best and most developed farming land,
- family stress (from coping with the changes, uncertainty, and negotiation with officials etc),
- inconvenience of construction activities occurring on a working farm,
- difficulties of moving and managing stock on a construction site, and later around the canals,
- reduction in income due to reduced stock carrying capacity,
- lowered water table levels due to construction pits and the closure of rivers,
- replacement land that was provided was inferior,
- loss of farm buildings, yards and homesteads,
- costs of developing new, and often inferior blocks of land to replace the better land

(Cain, 1995).

The 340ha Lake Ruataniwha was created by locating a dam in a natural gorge cut by the Ohau River, diverting most of the river's flow into an impoundment. The lake also covers former gravel pits located adjacent to the State Highway. In order to develop Twizel township, the lake, and associated canals, government purchased the 5,445 ha Ruataniwha Station (Sheridan, 1995). Government ran 2,400 ha of the property as a farm until 1991, when it was leased out. The remaining area of Ruataniwha Station was sold recently to a local tourism and property developer who has begun subdividing the property for life-style and holiday blocks.

Most of the land required for the project was acquired compulsorily by the MWD under the Public Works Act, 1928. The legislation gave the MWD the right to enter properties without having to seek permission and to take required land without prior notice or right of objection. However in all but one case, the land for the power scheme was actually taken by agreement (Cain, 1997). Almost all of the land affected was crown leasehold land, which meant that the landholder was relatively disadvantaged when it came to negotiating compensation. Technically the property holder owned only the crops or improvements in place on the land, and compensation only had to be paid for these. For compensation, the affected land holders took cash payments (at a rate of about \$200/ha) and/or replacement land. Where fences and other structures were disturbed, they were replaced by the MWD. To enable compensation by way of replacement land, the MWD purchased one of the project-affected properties and allocated the land to the adjacent affected land holder.

In Cain's survey half of the respondents reported they were unsatisfied with the final outcome of their compensation negotiations, and 80 per cent felt that the loss of land had impacted negatively on their long term farm management and their families. He also notes (1995:18) that "many landowners felt they were being seen as an impediment to construction and were treated accordingly", which may account for the slow acceptance of Twizel by them.

The construction of the project is believed to have contributed to the near extinction of the NZ black stilt (or kaki - *Himantopus novaezealandiae*), a wading bird which is found only in the Mackenzie Basin and relies on the local wetlands and riverbanks. These habitats were subject to disturbance from construction activities, which added to problems of loss of habitat from agriculture and direct loss from prey switching by rabbit predators, such as ferrets and wild cats (Department of Conservation, n.d.). Despite the creation of wetland areas to off-set the loss of flow in the three main braided rivers, bird life was affected. By the early 1980's it was recognised that the black stilt had become one of the rarest wading birds in the world. This prompted an ongoing effort by the government conservation agencies to save the species, in particular predator

trapping, fencing of breeding areas, captive breeding, and protection and re-establishment of wetland habitat. The programme has been slowly rebuilding the population of black stilt, though it is still considered “critically endangered” (Twizel Times, December 1999). In recent years DOC’s captive breeding aviary has become a tourist attraction. The black stilt conservation effort has been aided financially by the ECNZ and Meridian Energy as a compensation for loss of a 4 cumec flow in the Pukaki River (Ministry of Commerce, 1998).

The current operations of the Upper Waitaki Scheme are constrained by the conditions of resource consents and previous agreements entered into by the ECNZ. The current environmental issues in the management of the scheme appear to be:

- the maintenance of minimum flows and protection of the beds of Tekapo, Pukaki and Upper and Lower Ohau Rivers in order to conserve and enhance the habitat of wading birds, especially the Black Stilt; and
- the levels within which Lakes Tekapo and Pukaki operate. Tekapo residents and visitors experience dust and lake access problems if the lake is allowed to fall too low, while the shoreline of Lake Pukaki is subject to erosion if it is too high. Meridian Energy is required to carry out remedial work on erosion damage (Ministry of Commerce, 1998).

Locals reported that a controversy recently emerged in relation to a private sector proposal to use a former MWD industrial landfill area, located in the rural zone on the south side of Twizel township, for waste disposal. However, contaminants and chemicals from this site have shown up in ground water and locals objected to further development, demanding that the site be cleaned up. However the extent and exact location of the MWD’s toxic land fill and the contamination are unknown. The district council has asked government to identify the contamination and the land involved. There are local fears that the presence of this toxic waste site could undermine Twizel’s development as a holiday and tourism centre.

The district economy

Farming

Prior to the construction of the Upper Waitaki project, the economy of the Mackenzie Basin was dominated by pastoral farming and to a lesser extent, tourism, which was mainly based around the Mt Cook National Park, and the Tekapo village.

Farming in the Mackenzie has traditionally focussed on the production of fine wools on large properties with a high proportion of crown leasehold land. Many of the properties had been in the same family for several generations. These properties were relatively isolated, with Fairlie and Kurow being the closest rural servicing centres. Fine wool farming in the Mackenzie had traditionally been a lucrative activity, and enjoyed particularly good times in the 1950's. Consequently there seems to have been a relatively high proportion of debt-free properties, and those with off farm investments, compared with other areas. However farming in these semi-arid high country lands has been made difficult by high rabbit numbers, climatic extremes, and physical isolation.

In the 1980's, farm subsidies were removed by government, and pest destruction boards ceased to receive government financial support. Consequently rabbit numbers exploded - along with attendant rabbit control costs, which by the end of the decade fell to the farmer. This pest problem coincided with a period of drought, the increasing spread of the weed Hieracium, rising farm costs, and falling product prices. Stock numbers fell, and many properties reduced or ceased employing farm labour. With the heavy dependence on farming, the overall economic situation in South Canterbury and North Otago, and their main settlements of Timaru and Oamaru, also deteriorated. By 1990, the high country farming community in particular was

facing an ecological, economic and social crisis. Government stepped in with a special 5-year package of assistance under the banner of the Rabbit and Land Management Programme, which was intended to both kill rabbits, and help farmers develop new farm management practises and where necessary, to change land uses (Baines and Taylor, 1993). However the range of land use options available to farmers was constrained by the terms of their crown leases. This led to a review of the high country tenure situation, and the initiation of a process for relinquishing lands of conservation value and obtaining freehold title.

To cope with the continuing situation of low farm prices through the 1990's, some attempted to diversify their farming into lamb production, deer, some forestry, and more recently, horticulture. Non agricultural enterprises also emerged such as small-scale tourism and home stays. Off farm employment, especially of women, became increasingly important for farm viability or even survival. Some farm properties also changed ownership (Baines and Taylor, 1993).

Today pastoral farming still underpins the local economy. Greater diversity of land use is emerging, such as rural residential subdivision (on Ruataniwha and Ben Ohau stations), plantation forestry, and even some horticulture. Over the past year two South African entrepreneurs have moved into the district and are attempting to establish a sweet briar (rosehip) growing industry, and then a report that a number of farmers have already established plantings of sweet briar. Such diversification is being aided by the prospect of crown leaseholders being able to freehold their properties under the High Country Tenure Review process, as well as the relatively relaxed subdivision provisions in the Mackenzie District Plan.

Tourism

Aoraki (Mt Cook), the highest mountain in New Zealand, and located in the Southern Alps beyond the head waters of Lake Pukaki, has always been the main attraction in this area for international visitors. The Mt Cook National Park and adjacent area has long provided opportunities for climbing, tramping, nature walking, hunting, skiing, and sightseeing, which have been progressively enhanced with the addition of tracks and huts, guiding, helicopter and skiplane flights, and high class accommodation. In 1996, for instance, the Mt Cook National Park received over 90,000 international visitors, that is, 7 per cent of all international visitors (Ohrtmann and O'Neill, 1999).

Prior to the hydro development, the lakes, especially Lake Tekapo, tended to be regional holiday and camping centres, mainly for those involved in recreational boating and fishing. There were small settlements at Lakes Pukaki, Ohau and Tekapo, pubs at Tekapo and Pukaki, and a ski lodge at Ohau. In the 1960's and 70's, as the roads of the Mackenzie country improved and became state highways, the area attracted increasing numbers of independent and group tourists. Most simply passed through on their way from Christchurch to Mt Cook and/or Central Otago and Queenstown, while taking in the unique scenery of the high country lakes, mountains, and Mackenzie Basin. Around 70,000 to 80,000 visitors per year made a short stop-off at the MWD's Upper Waitaki Project information centre at Twizel (Sheridan, 1995).

Through the 1980's, tourism in the Mackenzie continued to grow, with new accommodation facilities being built at the Mt Cook Village, Tekapo, Twizel, Ohau and Omarama to capture the growing trade. In addition, the artificial lakes of the Waitaki Valley, particularly Lake Benmore and later Lake Ruataniwha, became important regional recreational facilities, attracting many thousands of campers and holiday makers to the district over the summer months.

Most of Twizel's stopover visitors are domestic tourists, and with its high number of holiday houses, the town is best considered a domestic "resort". The season is largely confined to the warmer months between Labour weekend (October) and the end of April. According to a long term local "*Twizel's tourism really only began with the construction of the Mackenzie Country Inn. Prior to that tourism was just sight-seeing people passing through*". Today there are three hotels and a handful of bed and breakfast houses and farm stays.

The Mackenzie tourism promotion officer estimated that there are 300 rooms and 500 visitor beds now available in Twizel, although there are lower than average occupancy rate.

There is no clear indication from the available research as to the total number of visitors that Twizel receives each year. About two thirds of all of Mackenzie District tourism occurs between November and March, with visitors staying an average of just under 2 days. According to traffic data, at the peak of the summer over 11,000 vehicles per week travel on SH8, with 65 per cent of road movements being from north to south. About half of the traffic is associated with tourism and the majority of visitors reportedly travel by car or camper van. About 10 per cent of visitors to the district find accommodation in Twizel, considerably fewer than at Tekapo and Mt Cook. Of those who visit Twizel, about 50 per cent are international free independent travellers (FITs), 20 per cent are international group tour members, 20 per cent are domestic FITs, and 9 per cent are domestic travellers on a fixed itinerary (Ohrtmann and O'Neill, 1999). This predominance of FITs is typical of the whole Mackenzie District. In 1999, Twizel's tourism operators reported an 8 per cent increase in visitors and a 6 per cent increase in profit compared with the previous year.

Specific local attractions include the DOC "Black Stilt" recovery project (listed in the "Lonely Planet" and "AA" guides), which gets about 1,000 paying visitors annually to its aviary. There are various recreation-based activities offered close by, such as fishing, boating, hunting, heli-mountain biking, and water and snow skiing. The fishing is reported to be attracting increasing numbers of overseas anglers, while skiing at Ohau is reported to be in decline after strong growth in the 1980's. Rowing regattas are also an important aspect of Twizel's "tourism" - with all available local accommodation taken up during big annual events. The rowers and summer renters were described by one interviewee as "*the bread and butter of Twizel*". At present there is little winter tourism, and the viability of local businesses is heavily dependent on the summer trade.

Salmon farming is a small but growing industry, with two farms operating in the power scheme canals. Fresh harvested salmon are trucked out to Christchurch, as well as sold onsite to visitors. Both operations are due to undergo considerable expansion.

The Economy of Twizel

The winddown of the hydro construction at Twizel coincided with national economic, and state sector restructuring. Consequently the local community was doubly affected - by reductions in government spending accompanied by increased levels of unemployment in the district and region, as well as the changes induced by the dramatic loss of population, local spending power, and services at the end of the project.

Most development efforts since then have been around the building of a tourism industry, with Twizel as the centre for a range of activities in the Mackenzie basin. Tourism is aided by the presence of a sound infrastructure, new roads and the unique environment. The electricity generation industry has been through a series of restructurings resulting in local job losses, which have been partly offset by tourism development. Recent layoffs by Meridian Energy have created a degree of despondency about the town's prospects. Today Twizel's economy is based on its role as a residential centre - with the main activities being government and private sector service provision, retailing, retirement housing, electricity generation, and tourism. There is little in the way of light industry.

Development and Promotion

Twizel has a number of groups attempting to promote the development of the town and to market what it has to offer. These include:

- the Twizel Development and Promotions Association (TDPA), which has an information centre and booking agency in Market Square. This information centre operates in direct competition with the privately operated “Where What Why Information Centre” located in the old MWD information centre adjacent to the DOC office near SH8. The TDPA also receives support of \$15,000 annually from the Twizel Community Board. At the time of this study, the TDPA was experiencing difficulties sustaining its support base.
- The Twizel Business Group, is a 50 or so strong voluntary association which was set up “*to identify needs, generate ideas, and foster them*” because (according to comments made) the Promotions Association was not fulfilling their needs. At the time of our study this very active group was 6 months into its second incarnation, its revival having been facilitated by the Mackenzie Tourism and Development Board. It has been working with the resource centre to plan events to draw attention to the town, to capture some of the possible trade from visiting film production companies working on location in the area, and to provide facilities and local activities for visitors (such as a skateboard park, a bmx track, a mini golf course, and a golf driving range). The Business Group recently arranged for a large promotion in a national newspaper.
- The Mackenzie Tourism and Development Board (MTDB) was set up as a committee of the Mackenzie District Council in 1994 with the aim of facilitating the promotion and development of business within the wider Mackenzie District (MTDB, 1996). Prior to this, the Council relied on promotional groups based in Timaru. In Twizel the MTDB has an office in the former MDC service centre in Market Square, and has a locally-based manager who operates as “facilitator” of development efforts. The MTDB’s main goals since 1996 have been: the development of existing and new businesses, supporting the agricultural base of the economy, promoting the Mackenzie as a visitor location, and promoting tourism development opportunities. The MTDB has been behind the development of the Pukaki Visitor Centre, using the existing Mt Cook lookout facilities about 12 km north of Twizel. It also publishes a “Mt Cook/Mackenzie Visitor Guide”, which covers Twizel - regarded as “the gateway to Mt Cook”.
- The Twizel Resource Centre was started by the Community Care Trust in about 1988 to fill a gap in social support services, and to help create local employment. The Trust made use of available public funding to employ a community worker, and establish work programmes. The current community worker organises and promotes local events designed to draw people into the town and create a stronger sense of community, along with developing a database of services available to the international film industry.

Interviews revealed that there has been poor co-ordination of business development and promotional efforts, with the various efforts described by informants as “*small and fluctuating in membership*”, “*subject to small town politics*”, “*not working well together*”, and “*a bit of a shambles*”. At the time of this study, moves were underway to bring the groups together to achieve greater co-ordination.

It was clear from our community interviews that there has been a long list of development proposals for Twizel, some of which are now underway:

- Development of activities around or near Lake Ruataniwha, including a national rowing academy, holiday housing, paragliding, boat and jet ski hire, and walking tours.

- A new community centre and recreational area adjacent to the existing swimming pool, and funded out of the community fund set up when the MWD housing etc was sold off by the county council. The development is expected to cost upwards of \$3 million. This community centre proposal appears to be controversial, with various informants indicating that its too expensive, and would absorb all of the community fund.
- Construction of a large statue of a Black Stilt near the entrance to the town to give it a higher profile to passing traffic and to provide the town with a clear “emblem” - rather than being seen as a residual hydro construction camp.
- Landscaping of the strip between the main road and the township, open up views of the town.
- Development of the Pukaki airport to take larger planes. This will be possible with the freeholding of surrounding land under the High Country Tenure Review, and the immanent expiry of Mt Cook Airlines licence to operate the airstrip.
- Organising a range of local activities which might attract groups from around the region, such as a motorcycle run, hotrod car gatherings, and dirt track racing.
- Organising tourism training courses, such as “kiwi host”, for local business operators.
- Development of a database of services and facilities and manual for the film industry, which can be used to facilitate use of the Mackenzie Basin as a movie location.
- The introduction of new agricultural crops and land uses, eg. sweet briar berries, and forestry.
- Development of a skifield on the Duncan Range near Twizel. This has been proposed several times by various developers and feasibility studies have been done, but the project has yet to make significant progress. Locals are keen on this ideas as it would provide a winter visitor trade.
- Provision of accommodation for Mt Cook Village and Hermitage workers being displaced by the latter’s redevelopment and the lack of space in the Village.
- Development of the community marae for accommodation and cultural tourism. Feasibility work has been supported by the Community Employment Group, but little progress seems to have been made.

One of the key strategies for promoting tourism in the district has been the proposed Pukaki Visitor Centre. This has been championed by the MTDB, and is intended to be a self-supporting commercial service providing information about the wider district’s attractions (and taking bookings) - including Mt Cook and other locations. Tourism industry interests, such as the Hermitage, are directly involved in developing the Centre, and the site (where one of the nations’ “icons” - the mountain can be viewed across Lake Pukaki) has been provided by Meridian Energy. The development is likely to also include a shop. The MDC reportedly undertook extensive consultation over the proposal, and believes it has a lot of local support. It argues that Twizel suffers from its hydro camp design and layout in that travellers are discouraged from turning off the highway into the town. At the Pukaki Visitor Centre, southbound travellers will receive information about Twizel and its facilities prior to arrival. However, Twizel informants indicated the general feeling locally was that this centre was not wanted, that it would compete directly with similar services in Twizel, and that *“the travelling public will just drive straight past Twizel”*. Some also reported that the district council’s consultations took the form of “informing” local people and that the development of the new visitor centre was *“treated as a fait accompli”*. While the development will provide opportunities for Twizel businesses to promote their services, this will involve additional costs, and many believe that the town of Twizel will be the loser.

Table 6 *Business firms Based in Twizel - 1999*

Category	Number of Firms
Food retailers, restaurants, cafes & bars	9
Other retailers	8
Personal/health services	4
Accommodation/liquor/licensed clubs	13
Tour operators etc	7
Newspapers/radio stations	2
Professional & business services	10
Banks	1
Service stations & motor vehicle services	3
Transport & storage services	3
Builders/carpenters/building supplies	4
General contractors	2
Painters	-
Plumber & drain layer	1
Electrical repairs/electrical contracting	1
Carpet laying	1
Engineering	4
Wood supplier	1
Salmon farms	2
Electricity generation	1
TOTAL	70

Source: Estimate based on observation, telephone listings, information brochures, and advertising. Excludes services provided from elsewhere.

Local Businesses

The Yellow Pages directory contains 60 listings for Twizel. However there appears to be at least 70 enterprises of various kinds based in the town (Table 6). The high proportion of tourism-related services indicates the role of the town as a minor tourism centre. A number of businesses provide multiple services or act as agencies for services provided from elsewhere, for example, the visitor information offices also provide internet and secretarial services, and the news agent acts as a travel, postal, and lotto agency. Most of the businesses in Twizel have only a few employees.

The business situation at the time of the fieldwork was fluid and confidence was not high among retailers, with rumours of a possible closure of the only bank in the town. Recent business closures have included a fruit and vegetable shop, a second hand store, gift shop, and a pottery business. The newer business tend to be related to tourism, such as accommodation (B&B's), helicopter operations, and sport fishing. One local respondent reported "*Twizel is not an easy place to run a business ... there is a stigma attached to Twizel as a 'working class' town*".

Employment and occupational status

In the 1996 census Twizel was recorded as having a total workforce of 510 persons, 60 per cent of whom were actually employed in the town. The majority of those in the wholesale/retail/hospitality, construction, and community services sectors worked in the town itself, with others coming into the town to work, while those in the primary, electricity, transport, and financial business sectors worked in the adjacent districts. The industry profile shows higher than average numbers involved in wholesaling, retailing, accommodation, and electricity supply compared with the New Zealand population as a whole.

Table 7 *Sectoral distribution of the workforce of Twizel - 1996*

Sector	Residents of Twizel %	Persons whose workplace is at Twizel %	NZ Workforce %
Agriculture, forestry & fishing	4.1	3.8	9.2
Mining	-	-	0.3
Manufacturing	3.5	2.9	14.3
Electricity/gas/water supply	8.8	4.8	0.5
Construction	7.7	9.5	5.8
Wholesale/retail/hospitality	31.8	40.9	22.3
Transport/communications	6.5	1.0	5.3
Financial/business	10.0	5.7	13.1
Community/social/personal	20.6	24.9	23.0
Total number of persons	510	315	1,630,812

Source: New Zealand Census 1996

Figure 1 presents the relative distribution of the workforce amongst the various sectors for 1981 (during the project construction), 1986 (after the construction ended) and 1996. The workforces for each of these years was, respectively, 1,728, 1,686, and 510. There has been considerable adjustment in the structure of the economy since the hydro construction years.

In 1996, Twizel's residents had a slightly lower rate of participation in the labour force than New Zealanders as a whole (57% cf. 59%), and the rate of unemployment was slightly higher than the rest of the country (Table 8). At the time of our fieldwork, the Twizel Resource Centre had approximately 26 unemployed residents on their books (or about 5% of the workforce).

Ny (1987) notes that the official level of unemployment in the immediate post hydro-construction period (1986/87) was 7 per cent, but her own survey of the residents found levels of around 12 per cent. By 1991 the level of unemployment recorded in the census had risen to 16 per cent (compared with 6.3% for the whole country). This may have been due to the reported influx of unemployed people from elsewhere in the region in the late 1980's, and partly due to the contraction in government services that took place in the post-construction phase.

Figure 1 Sectoral Distribution of the Twizel Workforce, 1981, 1986, 1996

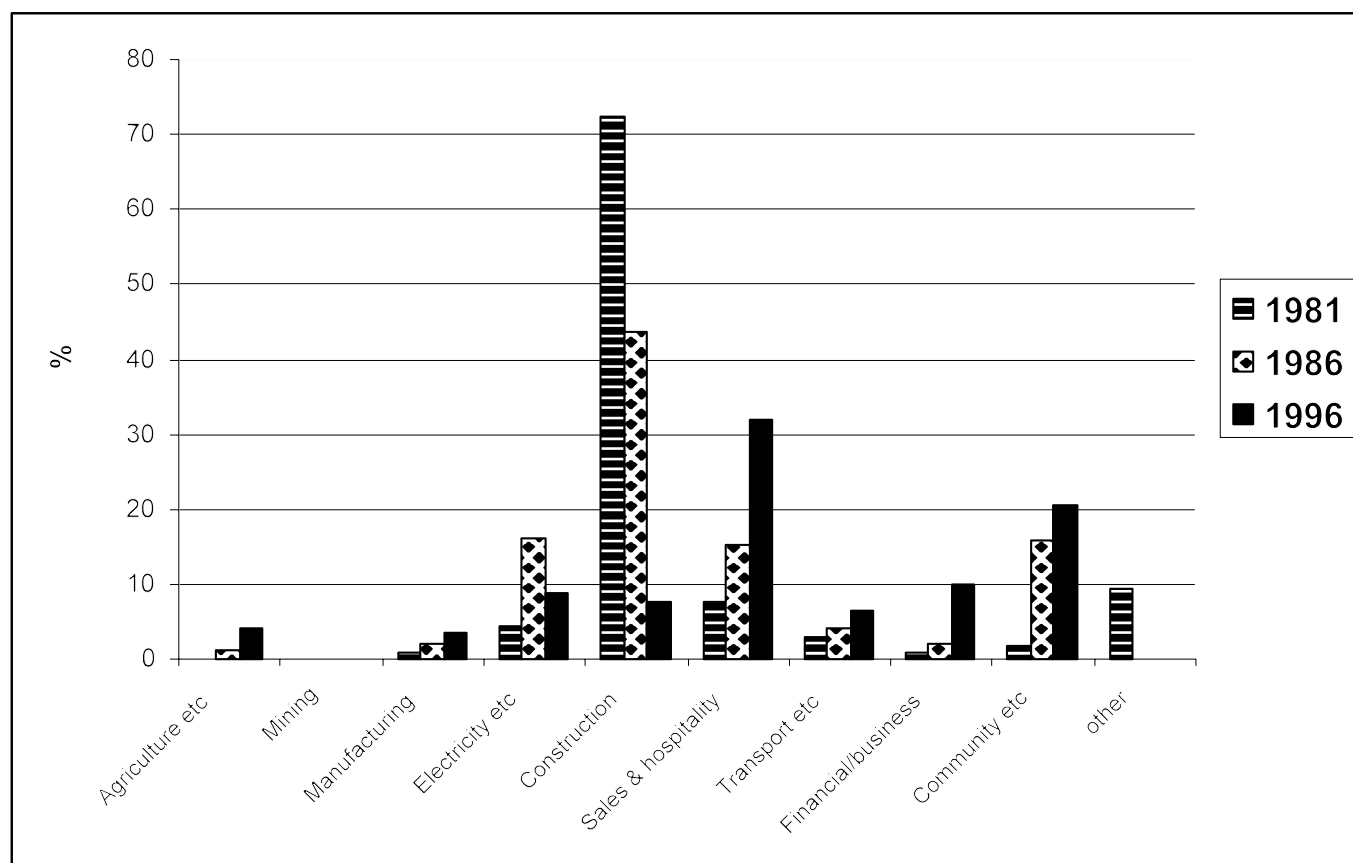


Table 8 Employment status of the residents of Twizel 1996

	Wages & Salary %	Self Employed & Employer %	Unemployed %	Full-time %	Part-time %
Twizel	44.9	8.6	6.0	41.5	15.3
New Zealand	43.5	11.0	4.9	45.0	13.6

Source: New Zealand Census 1996

As can be seen from Table 8, the overall employment characteristics of the local labour force tend to be quite similar to the national labour force.

Taylor and Bettsworth (1983) noted that during the hydro construction phase, Twizel had a very high proportion of workers in the production, transport and labouring occupations, and relatively low proportions in the administrative, sales and service occupations and in agricultural and forestry work. This pattern persisted until after the construction was completed. Table 9 broadly indicates that Twizel has gone from a construction oriented town to a service centre, in particular, the construction-related workforce halved between 1986 and 1996, and by 1996 was similar to the rest of New Zealand. Likewise the proportion of the workforce engaged in white and pink collar (clerical, sales and service) occupations increased.

Table 9 Occupational status of the full-time workforce of Twizel - 1986 & 1996

Occupational category	% 1986 Twizel workforce	% 1996 Twizel workforce	% 1996 NZ workforce
administrators/managers	0.7	11.7	11.6
professionals and technicians	16.0	22.2	22.6
clerks	11.3	9.4	13.8
service/sales	16.7	24.0	16.3
agriculture and fisheries workers	2.0	4.7	9.4
trades workers, machine operators and elementary occupations	50.7	22.8	24.3
not specified	1.3	4.1	5.0
Total Number of Persons	450	513	1,630,812

Source: New Zealand Census 1986 & 1996

Household incomes and welfare benefits

During the hydro construction years Twizel was notable for the very high proportion of residents in the higher income brackets (Taylor and Bettesworth, 1983). However, in 1996 the household incomes of Twizel's residents were relatively low by national standards (Table 10), with a much higher proportion of households on low incomes and a corresponding lower proportion on high incomes.

Table 10 Distribution of Household Incomes in Twizel - 1996

Household income range	% of Twizel households	% of NZ households
\$20,000 & under	31.4	22.9
\$20,001 - \$50,000	35.0	32.9
\$50,001 & over	14.7	27.1

Source: New Zealand Census 1996

The apparent lower incomes recorded in the 1996 census can be accounted for partly by the higher than average dependence on social welfare payments, especially unemployment benefits. The data indicates that 41 per cent (or about 370) of the residents aged 15 years and over were in receipt of at least one form of income support (cf. 35% for NZ). The main forms of income support received were national superannuation (38% of total benefits cf. 40% for NZ), the unemployment benefit (31% of total benefits cf. 20% for NZ) and domestic purposes benefit (10% of benefits cf. 9 % for NZ).

A community worker reported that there was “an influx of beneficiaries a few years after the end of the construction”, and that Twizel became “a beneficiary town”. However this was not so much the case at the time of our fieldwork. Current (early 2000) data indicates that approximately 200 were receiving national superannuation, 51 were on the “community wage” (includes sickness, invalids and unemployment benefits), and 10 were in receipt of a domestic purposes benefit. While these data may be incomplete, it's possible that welfare dependency may have declined in Twizel since the last census.

GOVERNANCE, INFRASTRUCTURE, AND SERVICES

Local government

Twizel began its life as a temporary single industry town in 1969. Until 1983 it was owned and administered by the Ministry of Works & Development. As with its parent community, Otematata, and other hydrotowns, Twizel's residents set up a "welfare association" - the Twizel Community Council (incorporated in 1971). This 18-member elected council focussed on the running of community facilities, and organising and co-ordinating recreational and cultural activities independent of the MWD (Sheridan, 1995). The town became a separate riding of Mackenzie County in 1977, giving local residents representation on the county council.

Twizel became a county town within the former Mackenzie County on 1 June 1984, during the period of the construction winddown. This came soon after Government's handing over of its remaining interests in houses and community facilities to the County Council. The realisation of Twizel's status as a permanent settlement followed five years of intense debate in the community, the county council, and central government over the long term future of the town.

Following an election in late 1984, a new Community Council was formed and operated as a committee of the Mackenzie County Council. With the local government reforms of 1989, the Mackenzie District Council replaced the county council, with its main offices in Fairlie. A new Twizel Community Board was also formed to replace the community council. The local government reform process saw the Mackenzie Basin split between Mackenzie District and Waitaki District, and the creation of the Canterbury and Otago Regional Councils.

Around the same time, the Mackenzie Council built a local office in Market Square, and became the base for the Community Board and other local government services. This office was closed in 1999 as part of a MDC cost cutting programme, and since then it has been operated under contract as a service agency. This agency handles routine administrative functions, but resource consent matters are all referred to the Fairlie council office. MDC services to the town are largely provided by outside contractors: road maintenance is done by Mackenzie Contracting Services, a subsidiary of Whitestone Roding Ltd., which is owned by the Waitaki District Council; reserves and town maintenance is carried out by a Timaru-based contracting company owned jointly by the Timaru District and Selwyn District councils (MDC, 2000).

The Twizel Community Board has seven members, two of whom also sit on the District Council. The Community Board is mandated to deal with mainly township infrastructure matters, including water supply, sewerage, roads, refuse collection, works and services, halls, parks and community recreational facilities.

District planning

The MDC has a Proposed District Plan covering the Twizel area and the rest of the district. According to the Council's planner, the hydroelectricity generation industry has sites designated for it in the district plan, and Meridian Energy, like its predecessor, is given a "claytons designation authority", that is, the company can continue their existing activities as required without reference to the council, though any new activities must run through the planning process. These activities were begun when the Upper Waitaki hydro scheme was constructed and commissioned. The water rights (resource consent) situation is outlined above.

During district plan consultations in Twizel, locals indicated they wanted to preserve heritage buildings, vistas and treed areas. This resulted in provisions for water supply protection, and view corridors in the plan.

The council also made liberal provision for residential development, placing virtually no restrictions on rural/lifestyle subdivision. Substantial industrial and tourism zones are also provided for in the town plan.

Since the end of the hydro construction, the District Council (and Transit NZ) has been unsuccessfully lobbied by locals to breakdown Twizel's "private town" design created by the MWD. Over the years there seems to have been three key problems which local business people feel are hampering the development of the town: the limited number of entrances to the town; the invisibility of the town to travellers moving at open road speeds on SH8 - due to the MWD's tree plantings which screen the town, and the lack of signage; and the lack of easy access to bypassing travellers. All of these are believed to act as a hindrance to Twizel capturing passing trade. Various proposals put to the council have included a series of roadside billboards and signage, subdivision and development on the east side of SH8 rather than just the west (where the town is totally located), removal or trimming of the screening trees, and development of a commercial/service strip immediately beside the highway. None of these proposals appear acceptable to the Council or Transit NZ because of the potential disruption and danger to traffic, and the potential negative aesthetic impacts. This has brought considerable local criticism that the MDC is against the development of Twizel, and some believe that the town receives a bad deal relative to other towns in the district.

Some tree trimming has occurred, but this was halted due to an increase in road noise experienced by those living close to the highway. The proposed district scheme provides for limited development of tourism-related facilities, including a service station, immediately within the perimeter of the town adjacent to SH8. This aspect of the plan is being appealed by the operators of the existing service station. In terms of capturing tourism trade, the MDC believes that the development of the Pukaki Visitor Centre will help raise the profile of Twizel for the travelling public. Some locals also believe that the erection of a large statue of a black stilt near the northern entrance to the town will attract attention from travellers. These matters bear directly on the long term development of the town, and are contentious.

Infrastructure and funding

Prior to the construction of the Upper Waitaki Project, roading and electricity reticulation were the only services in the area outside of the established settlements. When Twizel was built, the MWD put in place all the necessary services to support a population of up to 7,000. This included 24km of sealed roads, street lighting, 1,300 sections serviced for water, sewage and electricity, and a range of civic facilities including primary and secondary schools, a medical centre, a maternity hospital, a community centre, a halls complex, a swimming pool, a sports field, shopping centre, and public toilets. Altogether, over \$10 million was spent at the time on the provision of infrastructure, and the construction standards applied were those of a permanent settlement (Bendien, 1983). Various government departments provided services using buildings provided by the MWD, and the private sector provided regular transport and other commercial services. In addition, the MWD realigned and upgraded SH8. So when the town was turned over to the Mackenzie County Council in 1984, there was already a substantial infrastructure in place. The removal of a significant proportion of the houses also meant that there were hundreds of vacant, but serviced sections available for future expansion, many of which are still vacant.

Twizel's rates for the current year were set at \$632 for a \$50,000 property - similar to those of Fairlie. In 1999, 19 per cent of the MDC's income was derived from capital value-based rates. It was noted that the town has about 1,000 ratepayers, and that "*the District Council gets about 30 per cent of its rate income from Twizel*".

Community board members reported that the Council maintains a \$1.6m investment account containing funds from the sale of the Twizel properties transferred to it by Government in 1984. Half of the investment interest is typically provided to the community for local projects. This means that the Council has not had to rate for capital works and upgrading. However, while it has been depreciating the strategic assets (water

and sewage systems), other assets such as community facilities have not been managed in this way (MDC, 2000). The required refurbishment or replacement of the Twizel halls complex has therefore not been provided for. Current maintenance on the complex costs around \$90,000 per annum, and at the time of our study, locals were debating the merits of building a new sports and community centre complex at a cost of over \$3 million, and using the community fund to pay for it.

Since the Mackenzie Council took over the town, three pensioner housing units and a cemetery have been established, and recreational facilities have been enhanced. Potential further infrastructure development includes the Pukaki airstrip, which some want to see expanded into a regional airport. This might include moving current helicopter operators facilities in the town to the airstrip.

During the construction years, Twizel had daily public transport and freight services to Timaru and the Waitaki Valley. Today three shuttle companies operate combinations of connecting services to and from Mt Cook, Queenstown, Wanaka, and Christchurch (totalling about 24 shuttles per week). However there is now only a weekly service to Timaru, and no service to Oamaru.

Housing

As described above, the MWD provided the housing for those who moved to Twizel for the construction of the Upper Waitaki Project. This consisted of family homes, and cabins and hostels for single or unaccompanied workers. By the late 1970's there were 1,224 family homes (of which 1,129 belonged to the MWD) and 708 single men's cabins in the 300 ha residential section of the town (Bendien, 1983). Many of the houses were prefabricated at Otematata and moved to the site, and were equipped with coal burning stoves and extra insulation to cope with the harsh climate. Fifteen of the houses belonged to various government departments, and 80 belonged to private contractors. MWD staff housing was segregated from that of the wage-workers, and single men were required to live in the segregated camps and hostels, rather than flat in houses (ibid).

MWD workers were allocated houses of different quality and size according to occupational status ("staff" or "worker") and family size (Bendien, 1983). The "Regular 130" wooden houses were for waged workers. Several locals described these houses in detail. The "Reg 130" houses were generally identical in layout and design, 730 sq.ft. in size (compared with the 580 sq.ft. standard house at Otematata), had 6 or 7 rooms depending on whether there were 2 or 3 bedrooms, no interior passage, an electric cooker, and a "Warmrite" coal stove for space heating. The rent for these houses was around \$7/week, and all maintenance was done by the MWD. Staff houses were larger (860 sq.ft. or over 1,000 sq.ft.) had up to 5 bedrooms, were more varied in terms of interior layout and style, had gibraltar board linings (and were therefore warmer and more fireproof), "Juno" solid fuel heaters, and a passage way which afforded greater privacy. The rent for one of these houses was around \$12.50 per week. Interviews reported that social and employment status could be discerned by type of house, and when a worker moved into the ranks of permanent MWD staff, his family moved into "staff" housing.

Around the time the project began to be commissioned, the NZED decided to establish a permanent power station operators village at Omarama, which was considered a more central location, and would allow its staff to purchase better quality houses. The settlement was to be a residential subdivision created jointly by the NZED and the Waitaki County Council, and containing 57 NZED properties and 28 sections for public purchase. This development was expected to cost around \$3 million, or \$50,000 per house (Sheridan, 1995). However, many of the NZED staff had developed an attachment to Twizel and the workforce was split on the issue of relocating to Omarama. Various government ministers, including the Prime Minister got involved in the issue. After experimenting with refurbishing relocated houses from Twizel, the NZED constructed 35 new houses, and NZED personnel were given the option of living in Twizel or Omarama.

During the winddown of the Upper Waitaki project, and the fight to retain Twizel as a permanent settlement, MWD houses were removed from the town, some being relocated at Cromwell for the Clutha Dam construction workforce. In 1983, the County invited expressions of interest for those wanting to purchase property in Twizel, indicating potential prices of \$11,000 - \$13,000 for a typical “Reg 130” house, \$13,000 - \$17,000 for staff houses (860-1,037 sq.ft.), and \$2,000 for vacant serviced sections. There were 1,108 applicants, of whom 319 (29%) indicated they wanted to live permanently in the town, though only about 90 appear to have actually been resident in the town at the time (Timaru Herald, 5/11/83). As noted elsewhere the MCC actually acquired some 800 houses from the government, and these were gradually sold off by tender amid controversies over sale procedures and the delayed provision of title documents. One local noted that “*a lot of houses were bought for investment only, and a few MWD staff bought their own and other houses for financial gain, and moved elsewhere*”.

Since then, the new owners have made alterations to their homes creating a greater diversity in the residential area. In addition, about 200 new homes have been built in Twizel since it became a county town, and a subdivision on “Northwest Arch” has opened up on the western side of the town with higher quality homes on larger sections. This area was known locally as “ECNZ Drive” because of the number of houses owned privately by ECNZ professional staff.

An open market for property sales began in 1987 and tender sales of MWD houses finished in 1988. During the late 1980's and early 1990's there were typically about 80 houses on the market at any one time. The market remained fairly steady up until 1992, when prices began to trend upwards under steady demand, with one long term agent in the town noting that “*3 or 4 years ago we were lucky to have more than 20 properties listed at any one time*”. However since 1998, the market slowed considerably, and at the time of the fieldwork for this study in early 2000, there were 104 houses on the market, along with 4 businesses. Many of the houses on the market were “sitting empty”. There were indications also that house prices were dropping - to below official government valuations. Listed prices ranged from \$40,000 to \$90,000 for former MWD houses depending on the size and extent of refurbishment, and \$125,000 to \$250,000 for newer homes. Vacant sections of around 650 sq.m. were listed at \$14,000 to \$20,000.

At the time of the last census (1996), there were 895 private dwellings in Twizel. Fifty five percent of these were occupied at the time and 45 per cent were unoccupied - considerably more than typical New Zealand rural centres. Of the occupied dwellings, about two thirds (64%) were owned by their occupiers - about average for the nation. The remainder were rented out or provided rent free.

Table 11 Occupied and Unoccupied Private Dwellings in Twizel - 1996

	Number of Occupied Private Dwellings	Number of Unoccupied Private Dwellings	Total Private Dwellings	Unoccupied Dwellings as per cent of Total Private Dwellings
Twizel	492	403	895	45
All Rural Centres	29,349	6,275	35,624	17.6

Source: New Zealand Census 1996

Table 12 Tenure of Permanently Occupied Private Dwellings in Twizel - 1996

Form of Tenure	% of dwellings Twizel	% of dwellings New Zealand
Provided rent free	4.3	3.7
Rented	26.2	22.9
Owned with a mortgage	34.2	35.2
Owned without a mortgage	29.9	31.1
Total number of dwellings	492	1,276,332

Source: New Zealand Census 1996

Early this year there was considerable pessimism over the future of Twizel and the state of the property market. Some locals blamed the situation on Meridian Energy's relocating of staff to Christchurch, while others felt it reflected a general lack of money for spending on holiday homes. Table 13 clearly shows that the volume of sales has trended downwards the last 6 years, while the value of the houses sold has increased - reflecting the improving quality of the houses on offer. Generally it seems that the Twizel market follows national economic trends, which dictate the spending on holiday homes.

Table 13 Recent Twizel Housing Market Trends

	Total Twizel sales	Average price
1994-95	82	\$27,000
1995-96	79	\$43,600
1996-97	60	\$44,600
1997-98	58	\$48,900
1998-99	31	\$62,800
1999-2000	32	\$64,000

Source: Real estate agent.

The majority of buyers are new comers or outsiders from elsewhere in Canterbury, and 80 per cent of sales are of holiday homes. Only a small percentage are sales to people already resident in the town.

A local real estate agent reported that in recent years the rental accommodation situation has gone from a shortage to a 20 per cent vacancy rate in 1999-2000. Lower quality properties rent for \$60-80/week, and better quality for \$80-\$120. The better quality properties tended to be rented out longer term to Meridian Energy personnel and others based in the town for an extended period. Another local interviewee believed that with the closing of staff accommodation at the Mt Cook Hermitage, there is likely to be a big demand soon for rental accommodation in Twizel.

Health services

During the hydro construction years the MWD established a medical centre and two doctor's residences, and granted rights of practise to GPs, with the facilities and residences provided to the doctors at a low rental. The medical centre had an attached emergency room since there was no local general hospital. Initially only one doctor served the whole of the Mackenzie and Upper Waitaki area, having transferred to Twizel from Otematata. As the population of Twizel grew, the practise expanded to two doctors, between 1971 and 1983 (although often with recruitment difficulties and with a series of different doctors). A dentist also set up in practise in 1972 (Sheridan, 1995).

The MWD also relocated the former Otematata Maternity Hospital to Twizel and leased it for a peppercorn rental to the South Canterbury Hospital Board (SCHB) to enable a local maternity service to be established. This hospital had a peak staff of 15, with 5 registered nurses from elsewhere in South Canterbury, and the nurse aides, cooks and domestic help recruited from among the town's womenfolk. Between 1971 and 1984, when the service was ceased due to lack of demand, over 1,200 babies were born in the Twizel Maternity Hospital (Sheridan, 1995).

With the withdrawal of the MWD and the winddown of the construction, the MCC acquired the medical centre building and the two doctor's residences. The loss of population also meant that only one doctor and a part time dentist were required. By early 1984, the dramatic drop in the population also meant that there was little call for a maternity hospital and the SCHB moved to close it permanently. However locals were strongly in favour of retaining the facility as a cottage hospital - especially since it was by then evident that Twizel would remain as a permanent town of up to 1,500 people, and the nearest facility would be Fairlie. Considering the proposal too expensive, the hospital board closed the facility in late 1984, laid off its staff, and returned the building to the MWD. In its stead, the SCHB established a district nursing service and committed itself to maintaining an efficient ambulance service. However a rearguard battle to retain a hospital continued for another 12 months. Various proposals were subsequently put forward for use of the building, but it sat empty until 1989 when it was sold and turned into a potter's studio. The building is now used as a backpacker lodge and the base for a fishing safari operator.

A new doctor took over the Twizel practise in 1984, and stayed for 3 years. Various combinations of full time doctors and locums then operated the practise (with a subsidy from the Ministry of Health) until 1989, though the town managed to retain the same GP continuously from 1989 until 1999 - despite "*the expectation of a 7 day a week, 24 hour a day service*", as a local interviewee commented. The District Council then purchased the practise and its medical records (it already owned the buildings and residence) and set up an interim community medical trust to work towards finding replacement GPs. It also managed to secure funds from the Health Funding Authority and agreement to underwrite salaries for 2 GPs. According to recent Council advertisements, the Twizel medical practise has 1,857 patients drawn from the Mackenzie Basin and Waitaki Valley, and in 1999 there were just under 5,000 patient visits, many by summer holiday makers (MDC, 2000). The nearest other medical practitioners are in Fairlie and Kurow.

At the time of our fieldwork, local health services consisted of:

- one full-time GP on a 6 month contract (or "extended locum"), assisted by 2 part-time practise nurses and a receptionist;
- a physiotherapy clinic provided 3 days a week by a Waimate practitioner;
- a weekly dental clinic provide by a dentist from Geraldine;
- a resident part-time district nurse who provides post-hospital, ongoing medical/surgical, and palliative care;
- a resident part time community mental health nurse, and 15 volunteers who help with elderly care work;
- a weekly Plunket clinic;
- public health nurse who visits from Timaru;
- a chemist shop; and
- an active and well equipped St John's Ambulance Service, with one ambulance and a first response vehicle.

Despite the apparent good range of health services, the town's ageing population is reportedly creating an increasing demand on local health services arising from their previous and current lifestyles.

The main local mental health issues are reported to be alcoholism, depression caused by isolation, and psychological disorders. There is also a reported lack of emergency and backup service, and no visiting

psychological or psychiatric specialists. Several local health workers reported that local health services are in transition, and that until recently, there has been little co-ordination of the various services.

Education

Nowhere is the “boom and bust” of Twizel as a construction town more evident than in the provision of primary and secondary school services. The responsibility for the provision of educational facilities and staff fell to the Canterbury Education Board, though the MWD advised on building design and made housing available for staff.

The Twizel Primary School opened for business in February 1970 with 8 relocatable classrooms, five teachers and 130 pupils (Sheridan, 1995). By the beginning of 1971 there were 300 students, and by the end of the year, when it was officially opened, the school had 26 classrooms and around 500 students. The Upper Waitaki Project engineer served as the first chairman of the school committee. The school continued to expand over the next few years with more staff and the addition of relocatable rooms, and various services, so that by the beginning of 1975 there were 35 teachers and 800 children. The roll eventually peaked, in 1979, at around 1,030 pupils - by then the biggest primary school in New Zealand. The school boasted two dental clinics, a library, and a full range of local and visiting support services, its own bus, and a special needs class and teacher. The decline in roll which soon followed was equally dramatic - the school opened with 760 pupils at the beginning of 1981 and when it closed at the end of 1985 - to become part of an Area School - there were 180 primary pupils. Most of the buildings were moved to Wanaka, though some were retained as part of the Area School and as rooms for an outpost of the South Canterbury Community College (Aoraki Polytechnic).

Twizel High School opened its doors in February 1971 with 12 teachers and 200 Form I to Form VI students. Prior to then, secondary school students travelled to and from Otematata by school bus. The first premises were 14 rough “prefabs”, plus five utility rooms in the primary school, which were used for over a year while the permanent school was being built. The “permanent” school facility opened in May 1972, with the MWD project engineer also being the first chairman of the Board of Control. As with the primary school, the rolls grew rapidly, and by 1975, when a Form VII class started, there were 402 students, and 22 full-time staff. The roll peaked in 1978 at over 550 students and about 30 teachers (Sheridan, 1995). In 1978 an outdoor education centre (Huxley Lodge) was established near Lake Ohau with the donation of buildings from a road construction company and the MWD, and assistance from the NZ Forest Service, the NZED and private industry. This camp continues as an outdoor education facility for schools in South Canterbury.

Through the mid 1970's the High School experienced difficulties in recruiting staff due to a shortage of suitable accommodation for single teachers and the refusal of the Department of Education to grant teachers the site and accommodation allowances enjoyed by the project construction workers. The situation was only resolved when teacher housing was built after direct lobbying to the Minister of Education. In the late 1970's, New Zealand experienced a shortage of secondary teachers. Teacher recruitment was particularly problematic for Twizel because of the town's isolation, higher living costs, lack of accommodation and other allowances, and lack of guarantee of future employment for teachers when the school closed at the end of the construction project. So in 1980, the high school found itself seriously understaffed, and teachers and community became locked in an ongoing battle with the Department of Education over the management of the winddown of educational services. This resulted in a two month black ban by the NZ Post Primary Teachers Association on the filling of Twizel High School staff vacancies. For a period, it looked as if the school would be forced to close. Eventually the necessary assurances were received and the school was fully staffed though until the formation of an Area School in 1985.

In 1984 at a public meeting with the Canterbury and Otago Education Boards, the primary and secondary school committees, the community decided to form an area school, concentrated on the high school complex, with the High School closing in December 1985. It was also proposed that Omarama students should travel to Twizel rather than Kurow in order to maintain the secondary roll. The Department of Education accepted

this proposal and after a building programme to convert various facilities and the pooling of equipment, the permanent Twizel Area School with 370 students, split more or less evenly between primary and secondary, opened in February 1986.

During the construction years, there were plenty of job opportunities for school leavers on the hydro construction project, and young people typically left school in Form V. The high school therefore tended to have relatively few sixth and seventh formers. Taylor and Bettesworth (1983) noted that the “high school apparently did not have high academic expectations of its students”, and according to one senior teacher during the MWD years, “*the key thing by parents was to get their kids into ‘a good job’ rather than go onto higher education*”. In the intervening years, expectations have changed, such that in 1999, there were over 20 students in the sixth and seventh form (out of 75 secondary students) - more than when there was a separate high school with over 500 students. Staff attribute this change to the labour market and the increased pressure to have better qualifications.

Following the end of the Upper Waitaki Project, the Area School roll slowly drifted downwards, and by the mid 1990's had stabilised at around 220. However the roll took a fall in 1999, and the opening day roll in February 2000 stood at only 151, with just under 14 full-time teacher equivalents plus support staff. This recent drop in the school roll has been attributed by some to the reduction in local Meridian Energy staffing, however, the school believes that only 5-6 of the losses were directly associated with this. With “natural population dynamics”, the school has a normal annual turnover of 20-30 students, which is relatively high compared with similar towns in the South Island (eg. Roxburgh). In the past year, however, this “turnover” group was not replaced. About 20 of the current students are associated with the staff of the Department of Conservation. Farming families send their primary aged children to the Twizel Area School, while their secondary school aged children tend to go to boarding schools in Timaru, Oamaru or Christchurch.

The Twizel Area School is rated as “decile 5” (socio-economically average). It is bulk funded, that is, the school administers its whole budget, including staffing. At the beginning of 2000 the total budget stood at \$840,000, 83 per cent of which was allocated to staffing. Since the Ministry of Education removed the staffing advantage for rural schools, the staffing level is considered too low by the present school administration, and it obtains the additional staff using its bulk fund. Library facilities are shared with the community library. The ECNZ has supported the school in the past with the donation of computers and a mini van. In an attempt to attract fee-paying students, the Area School recently launched “Seven Peaks College”. This “academy” aims to provide personalised outdoor education-focussed programmes for up to 16 senior students at a cost of \$8,500 for the year, including accommodation, and drawing on the outdoor and adventure skills and facilities available in the Mackenzie Basin.

In the mid-late 1980's the Timaru Community College (now Aoraki Polytechnic) set up an office and teaching facilities in Twizel, using some of the former primary school buildings. The training courses offered were not well supported and the service could not be sustained. Today Tai Poutini Polytechnic, based in Greymouth, has a Twizel “campus” - the “Mountain Education Centre of New Zealand” - with a classroom and office adjacent to the Twizel Area School, and one full-time permanent and two part-time staff. It also makes use of the Ohau snowfield and local experts for its two locally run programmes - a 27 week certificate training course in ski patrolling, and 12 week course in mountain skills.

Sheridan (1995) records that the Twizel kindergarten was established in 1973, using the former Otematata Play Centre building which was transported to Twizel and refurbished. The kindergarten catered for 120 children and was under the control of the Timaru Free Kindergarten Association and the Department of Education. In 1974 a second kindergarten (the Ohau Kindergarten) was created to meet the increasing demand for pre-school education. Both facilities operated until 1984, when population loss at the end of the hydro project construction forced closure of the Ohau Kindergarten. Consolidation of the pre-school services by the Department of Education took until 1989, when the kindergarten building was relocated onto its present site near the Area School. The two-teacher kindergarten currently has 35 children in its morning session with 10 on the waiting list. A committee member noted that “*70 per cent of parents don't pay the*

parent contribution, forcing the kindergarten to run fund raisings in the community". The failure to contribute was considered a social legacy of the "uncle MOW" days when everything was laid on for the residents. A creche is also located near the school.

Agencies

The Twizel Post Office (and Post Bank) was opened in March 1972 after operating from temporary premises for two years (Sheridan, 1995). As with other services it expanded rapidly to meet the demands of the construction population, and with a staff of 12 operated out of a building in the shopping centre. However, in 1990 government announced as part of the restructuring of NZPO (creating the two SOE's, NZ Post and PostBank) the offices at Twizel, Fairlie and Pleasant Point would close, leaving no facility within 160km of Twizel. Sheridan notes that for 18 years the "post office remained a focal point in the community ... its presentation was one of security and permanence" (op cit., p271). The loss of the service and the 10 local full-time and one part time jobs was met with wide-spread community anger, and a campaign began to save the service - as occurred in small towns throughout New Zealand at the time. Despite a local petition, submissions to government ministers, and District and Community Council protests and lobbying, the closure went ahead. In its place NZ Post proposed to establish a postal agency at the local service station but offering no banking service. The majority of the community argued the agency was poorly sited, and the District Council turned down the proposal on town planning grounds. This decision was contested in the Planning Tribunal by the service station owner, and the agency was eventually set up at the proposed site, where it remains today. Daily postal delivery continued, and the old post office building became a second hand store.

The only bank in the town since its establishment, apart from the NZPO bank, was the National Bank of NZ. This remains as a branch in its own right, though at the time of our fieldwork in early 2000, there were rumours of a possible closure.

Twizel has two police officers who cover the area from the Waitaki District boundary to the Tekapo Army Camp, including the Mt Cook National Park. They are assisted by a small group of office volunteers. The Twizel station is responsible for local policing work and search and rescue situations, and links with ambulance, fire and mental health services. It is also involved in a government "strengthening families" programme. Most of the police work is "*ordinary town crime - damage, disorder, accidents and search and rescue*". There are about 30 search and rescue cases per year, some of these being high alpine rescues, which are carried out with DOC staff at Mt Cook. About 80 per cent of local crime is solved, and because Twizel is a small community, and trouble makers are obvious, there is a high level of informal local social control. Local crime has been trending down over the past few years, with 46 arrests in 1997, 29 in 1998, and 16 in 1999. This was been attributed by local police to the departure of a number of younger beneficiaries, and the reduction of the number of full-time unemployed people as a result of changes in government policies and programmes. A number of local interviewees noted that at present, Twizel is effectively "crime free". Police report there is some "*social use of cannabis - with some cultivation*".

Police staffing has halved since the hydro construction days. Sheridan notes that in the hydro towns of Otematata and Twizel policing was considerably aided by the fact that they were both MWD controlled towns - with the Project engineer having final authority over the conduct and residence of workers and their families. However in practise, the MWD administration did not get involved in other than extreme cases, with community well-being and stability issues (including domestic violence, alcohol abuse, and youth crime) falling to a community care group made up of the police, clergy, GPs, school and other agencies (Christchurch Star, 10/12/77). Sheridan reports that one long standing officer noted that during the Ministry of Works era:

"graffiti and wilful damage were major problems in those days. People didn't seem to care and the general attitude was 'Uncle MOW will fix it'. Even after Twizel became a county town the attitude prevailed and it took a long time for some people to realise that they were responsible, that the cost of repair wouldn't be borne by the government" (1995:269).

The Department of Conservation has an office at Twizel with 19 permanent staff, all but one of whom are Twizel residents. The local office is part of the Canterbury Conservancy and it has responsibility for conservation issues in the Mackenzie Basin, Burkes Pass, and the Waitaki Valley as far as Hakataramea. The Mt Cook National Park has its own office and staff, and some of these reside in Twizel. The Department also employs about 15 workers over the summer season, running various holiday programmes. As noted earlier, the Black Stilt recovery programme has an aviary near the Ohau River which is open for visitors. Their visitor project attracts about 1,000 people annually, and is self funding. DOC is also involved in the High Country Tenure Review of a number of local farms.

Work and Income New Zealand (WINZ) officers visit Twizel fortnightly to conduct interviews with work seekers and beneficiaries. The Twizel Resource Centre has contracts with WINZ (to deliver the “work for the benefit” service and advice on other services) and the Corrections Service. The Resource Centre is manned by a part-time paid community worker, and gets funding support from the MDC and Internal Affairs’ COGS scheme. The Centre is currently running a community organic garden project to provide work for unemployed people.

During the hydro construction years, there was no social worker or counselling service available to the Twizel community, other than the support offered by medical practitioners and clergy. However in the late 1970's, the MWD was subject to criticism for its apparent lack of involvement in community welfare. At the time social service providers were concerned at the levels of family stress, social isolation, marital difficulties, youth boredom, and alcohol abuse - aggravated by the absence of family support networks, shift work, and long working hours. The MWD project engineer argued that there was no need for a full-time social worker, and the general attitude seemed to be that local people had all their physical needs well provided for by the MWD, and that they could “help each other without looking for assistance ‘from above’” In response a “Community Care” organisation was formed to provide access to budget advice, household help, welfare, and crisis counselling, including marriage guidance. This organisation was supported, until 1985, by weekly visits from a Timaru Department of Social Welfare officer (Christchurch Star, 10/12/77).

According to interviewees the Community Care Trust started the Twizel Resource Centre in about 1988 to fill a gap in social support services, and to help create employment for those who remained behind after the hydro construction or who were attracted to the town for the low cost housing. Some of the demand for support at the time came from an influx of beneficiaries, including solo parents, and unemployed people who were apparently encouraged by government agencies to leave the cities and move to where there was surplus and cheap housing

The Twizel Fire Brigade was created in 1970 in the transfer of the hydro construction workers from Otematata to Twizel. The brigade was run by the MWD, which provided the station, machines and equipment, and appointed the full-time chief fire officer in charge of a large group of volunteers (Sheridan, 1995). One feature of the town was its network of 48 street alarms, which were removed after a dial up system was installed in the mid 1980's. After the end of the Upper Waitaki Project, the Fire Brigade became a fully volunteer service under the Fire Services Commission, and continues to operate today.

COMMUNITY LIFE

Leadership and organisations

In 1964, Otematata, the parent community for Twizel, boasted about 23 sports clubs, 12 arts and culture groups, about 10 interest or hobby groups, and 33 church, social and community organisations (Sheridan, 1995). So when the hydro construction workers and those in support services moved from Otematata to Twizel, they brought with them a broad range of clubs and organisations (often with their assets). Most importantly, they brought the experience of setting up and running community groups and events, and the necessary leadership and administrative skills available in an organisation like the Ministry of Works.

From Sheridan's list of clubs in the peak hydro construction years, there were about 105 clubs, societies and other organisations catering to a wide variety of interests and needs, and most people belonged to several groups. Many of these were directly supported by the MWD in terms of the provision of facilities and contributions to particular events, and through service of staff on committees and boards. Interviewees recalled the main organisations as being the Community Council, the Workers Union and PSA, the service clubs (RSA, Combined Services), the key sports clubs, and boy scouts and girl guides. Males tended to socialise in the licensed clubs and the pub, and, according to one long-time hydro worker, Twizel had a strong "*macho drinking culture*". Sheridan notes that the local pub (the Twizel Inn), which at the height of the hydro construction had 50 staff,

“... had the highest liquor turnover in the Tourist Hotel Corporation business ... In the large public bar raffles were run each night by local clubs to raise funds. In the same building a bottle store remained open for a similar length of time, 11am to 10pm. All prices were wholesale.” (op cit., p263).

With the rapid depopulation at the end of the hydro construction, most of the clubs came to an end. This had a strong impact on the sense of community, and as one informant reported "*the atmosphere just went out of the village*". Sheridan records that 10 years on (1995), there were about 40 remaining community organisations in Twizel, including formal service providers. Some of the clubs and societies that had gone into recess at the time of the project winddown had re-emerged, yet others were new, such as the Grey Power group representing the concerns of the older population. Sheridan lists for 1995 approximately 13 sports clubs, 18 church, business, social, welfare and community groups; three service clubs, and a small handful of hobby and interest groups. Among these groups is a community radio station.

As with small towns throughout New Zealand, Twizel's clubs and societies reportedly start, flourish, languish and disappear according to the enthusiasm of particular individuals. With a shrinking population, clubs can quickly lose their viability and become a serious liability for older and less active members remaining. Unfortunately, a town can be left with under-utilised facilities that are expensive to maintain, such as halls and club rooms, or is left with insufficient people-power to run the more demanding or complex organisations. To some extent Twizel has suffered such problems, with apparent under use of the halls complex, the Te Whare Mahana Marae, and the service clubs. Despite this, there are proposals for the construction of a new community centre and sports complex. One locally active person reported that

“Twizel is not doing as well as other communities of similar size might do; the sense of active community is not strong, which means, for example, that the school has difficulty in getting members for the Board of Trustees. The success of groups depends on individuals”.

This experience was confirmed by various active long term residents, for example:

“I tried to get the whole community to work together, but it is too fragmented”.

“Every group in town is struggling at the moment ... a hard core is keeping things going, for example, the St John's Ambulance”

“Tug-o-wars between different groups has been evident in recent years ... it's a caring and safe community, and the antagonisms arise out of insecurity over employment and the future”.

Downsizing of the ECNZ, and the more recent transfers of Meridian Energy staff to Christchurch were reported by a number of local interviewees to have reduced the leadership core of local organisations. According to a local community worker "*this impacted as a brain drain of middle management, affecting the clubs and societies, eg. school parents association and board of trustees, creche, kindergarten etc*". At the time of our study, two Meridian Energy employees were serving on the Twizel Community Board.

The main sports today are reported to be golf, bowls, indoor basketball, and netball. Socially the town is reported to be great for young families, and that "*most social circles involve couples and families. But there*

is a big gap with the 20's to 30's age group, so single males find it difficult". The established church groups continue mainly under the guidance of visiting clergy and tend to band together in the use of the local church. Several people reported that there is a new Christian pentecostal group active in the town.

Social problems

In addition to having to cope through the 1980's with dramatic change in its size, structure, status and economy, Twizel, like other rural communities, had to cope with the effects of government economic restructuring. Ny's (1987) study of community change and social services involved a survey of residents, and found particular concerns relating to:

- the high level of unemployment (particularly among youth and younger adults),
- a lack of locally-provided training opportunities;
- high levels of dependence on social welfare benefits;
- the related low levels of family incomes, and consequent inability to pay for community health and welfare services, or to pay the cost of travel to Timaru to access them;
- family stress arising from workers having to commute to work away from Twizel (eg. the Clyde Dam site);
- poor level of support services by the Social Welfare Department (benefits) and Labour Department (employment services);
- general loss or downgrading of other services;
- lack of entertainment and activities for youth.

As noted previously, the arrival of newcomers, especially beneficiaries, to take up cheap housing opportunities in the late 1980's and early 1990's exacerbated some of these concerns. Many of our interviewees noted that petty crime rose - associated with youth, unemployed, and transient residents. A town patrol group operated for a period in an effort to reduce property crime (Sheridan, op cit). Marijuana use also became a concern. Such problems are reported to have reduced considerably in recent years as a result of pressures from government agencies for unemployed and solo-parent beneficiaries to take up employment - with those using the isolation of Twizel to avoid work and employment-related training moving away. However unemployment, and the lack of locally-provided training for job seekers has continued as an issue, despite the slow growth in jobs in new industries such as tourism.

Maori

Maori, like other workers, were attracted to Twizel from around the country for the work prospects on the Upper Waitaki project. In 1981, just after the peak of the project construction, there were approximately 350 Maori living in Twizel. At 8.3 per cent of the population, Maori were a higher proportion of the population than average for the South Island at the time (Taylor and Bettesworth, 1983).

With a significant Maori population, early in the town's life a Maori culture group (Nga Wai E Wha), a Maori Council Committee - under the supervision of the Arowhenua Maori Committee (Ngai Tahu) - and a branch of the Te Reo Aorangi Maori Women's Welfare League (MWWL), were formed. A local Kohanga Reo was also started. However neither the Council nor the culture group were able to sustain themselves for long, though the MWWL branch continued to operate until 1984, with the Kohanga Reo going into recess a year earlier (Sheridan, op cit).

During the winddown of the hydro construction in 1984, a new organisation, the Twizel Maori Committee, was formed with the aim of establishing a multi-cultural community marae - using the soon to be redundant maternity hospital - and serving people from the whole of the Mackenzie Basin and upper Waitaki Valley. The plan was to run a drop in centre, and provide employment-related training for the wider community. This proposal failed as the community could not raise the \$92,000 being asked by the NZED for the building.

An alternative building was eventually acquired in 1987 in the residential part of the town and a marae established. The marae started a 40 week Maori Access (employment and training) course, and Kohanga Reo got going again. Around this time, the Maori population (i.e. “persons of NZ Maori Origin” recorded in the census) of Twizel stood at 114, or 9.4 per cent of the total population.

In 1989, in a property swap with the MCC, in which the marae acquired and the council relocated the former library building and surplus works depot buildings, the marae moved onto its present site on the edge of the town. The new marae opened in 1990, and in 1991 the ECNZ donated a further building as a Kohanga Reo centre and administration block. The complex was refurbished with voluntary labour, and dedicated as Te Whare Mahana Marae in 1993. It should be noted that by this time the Maori proportion of the population had risen to 12.4 per cent (ie 126 persons) at a time when the overall population was declining (1991 Census). Over the intervening years a number of active local families had moved away in search of work, and newcomers were often benefit-dependent and looked to the marae for support.

Despite the success of this period, and the support of Te Puni Kokiri and other development agencies of government, the community lost active members and volunteers and it found its support base declining. The Kohanga Reo operated until about 1997, but closed following the departure of several participating families and a qualified teacher of Te Reo. The marae also hosted a youth group, however this also wound up in the mid 1990's. Employment training courses also ceased, reportedly because the marae providers could not meet the increasing demands of government funding agencies.

Finding work has been a big issue for local Maori, with opportunities limited to seasonal shearing and tourism work. Many active Maori families have reportedly left in search of work over the last 10 years or so, however, at the time of the last census (1996) there were still approximately 132 Twizel residents identifying themselves as Maori (i.e. 11.2% of the population).

Over recent years several tourism-related and commercial projects, such as a bus service, were proposed but failed to get off the ground. The most recent development proposal was for the provision of cultural tourism, based at Te Whare Mahana. Feasibility and planning work received seed funding from the Community Employment Group (of WINZ), but the proposals have not yet been implemented, reportedly due to the need to meet occupational health and safety (OSH) requirements at Te Whare Mahana, and a shortage of skills.

At the time of this study, the Twizel marae was struggling to keep going. A representative of the Marae Committee noted that the number of Maori families involved with the marae “*can be counted on one hand. At the time of the marae development there were enough Maori to justify a community centre - but now you would be pushing uphill to justify it ... Things are on a long down turn now*”. This was confirmed by local social service providers. Several community workers who have been associated with the marae felt that this is because “*the marae committee is not currently representative of the Maori community. It is not being supported by most of the Maori residents*”, and “*the group has never had a strong iwi structure. It fell out early with the Arowhenua marae in Temuka. Now its struggling*”.

Women youth and elderly

Women

Because of the number of single working men in their 20's and 30's, women were outnumbered by men in the population during the hydro construction years. Apart from those professionals engaged in provision of social services, administrative work the MWD etc, or in local shops, there were few opportunities for women to gain paid employment. In 1971 women made up only 9 per cent of those in full time employment in Twizel, though this rose in the next 10 years to 16 per cent, though largely confined to the occupations noted above. Social isolation caused by separation from family support networks and maintaining young families while the men worked long hours on the construction project and socialising the pubs and clubs, put considerable strain on hydro-construction wives, and their marriages. Yet formal organised social support systems were slow to develop. Those who had moved to Twizel from Otematata may have fared better, or

at least recognised some of the challenges - they very quickly organised the Society of Twizel Women which ran a “wagon wheel” project to welcome newcomers into the community, and surveyed women to assess their employment aspirations. This resulted in the establishment of a clothing factory in the town employing 10 women. Until 1985 Twizel also had its own branch of the Country Women’s Institute (CWI), separate from the already extant Lake Pukaki CWI which was made up of women from the farming community. The Lake Pukaki CWI continues today.

As in other rural towns, many of the community activists and leaders are women, particularly professionals, and women are well represented on the Community Board and other local organisations. During our study, some women reported that most socialising is male-oriented and around the pubs and clubs, and there is little for women who are not interested in outdoor pursuits. One local community worker noted that with few local career opportunities, young women either take up marriage and child rearing as their main option in life, or they leave the district.

Youth

Sheridan notes that “entertainment for youth was sadly lacking” in Twizel during the construction years. While youth clubs and school and church-based activities were organised, weekend partying and drinking were common - leading to vandalism, and a degree of concern in the local community. However work for school leavers on the construction project was plentiful, with young people tending to leave school at the end of the fifth form, rather than go onto higher education. This situation persisted until the 1990’s. Since the hydro days, organised youth activities have tended to come and go, and the town’s leaders have recently initiated various projects, such as a skateboard park, to relieve the situation. After high school, young people nowadays tend to find work at the hotels at Mt Cook, or move to regional centres or further afield to find work or pursue training opportunities.

Elderly

During the construction years, Twizel’s population displayed the typical hydro boomtown feature of relatively few older residents - with only 1 per cent over the age of 60 in 1976. This meant that the families of the town had no older members to provide the social support that might otherwise be available.

When the hydro construction project ended, many older workers who had lived in the town for 15 years or so and who were approaching the end of their working lives took redundancy and chose to retire in the town, purchasing their former MWD homes. This meant that whereas in 1981 there were 159 persons (out of 4,119) aged 55 and over, in 1986 there were 165 (out of 1,212) in this age group. In addition to the former hydro workers, older people have moved into the town to retire, taking advantage of cheaper housing the town has offered. So by 1996, the permanently resident retirement group (i.e. 65 years and over) numbered 120 or about 10 per cent of the population. A number of interviewees in our study noted that Twizel was “*a retirement town*”, or “*a town of older people*”. But this impression is a relative one - based on the “artificial” experience of the town during the construction years - since the proportion of elderly people is now fairly typical for a New Zealand town. However, Twizel’s elderly are a little different from other centres, in that, in the 1996 census, nearly two thirds were males, and elderly women were under represented in the population compared with other NZ towns. This helps explain some the comments of community and health workers about the persistence of the “Uncle MOW mindset” of dependence and lack of self responsibility in health and other matters. It perhaps also helps explain a common perception that the older section of the population are not keen on the town investing in tourism-related development.

At present there are three MDC pensioner flats in Twizel, but the town has a reported increasing need for home help services, and assistance with assessment for and provision of age related care. These Timaru-based service providers, however, do not visit Twizel at present. Generally older residents are considered to be well catered for in terms of health services. Several interviewees felt that Twizel was a great, and “undiscovered”, place to retire, with plenty of activities for older people - including the “Grey Power” movement, noted as being active in recent years.

CONCLUSION

Twizel can legitimately be described as “a residual hydrotown”. It was created by the Ministry of Works as the 15 year home for workers building the Upper Waitaki Hydro Scheme. However the residents fought central and local government to keep the town, both as a place to settle down permanently after the government withdrew from direct involvement in hydroelectric project construction and dispensed with the Ministry of Works and Development, and as a local residence for those employed in the electricity production industry. They succeeded. They were fortunate in inheriting a substantial civil infrastructure and being able to establish a community fund from the sale of the former construction housing, both of which improved the viability of the community in the long term.

The relationship with the electricity industry continued over the years with many of the scheme’s operations workforce being based in Twizel. However, with government’s progressive restructuring of the state and the electricity production sector, this relationship meant ongoing social and economic uncertainty. The recent integration of the network of Waitaki hydroelectricity generating stations using new computer and communications technologies, thereby largely eliminating the need for an onsite workforce, has meant that Meridian Energy (and its predecessor, the ECNZ) have effectively broken the mutually dependent relationship between the community and the industry.

After making the politically and socially difficult transition from a company construction community to a self administered and self-funding rural town, Twizel’s residents now see their future in the development of the abundant natural assets of the Mackenzie Basin for outdoor recreation, tourism, fish farming and new forms of land use and agriculture. Transforming the economy is proving socially and culturally challenging - with efforts to change New Zealanders’ perceptions of the town, raise its profile, and promote what the district has to offer often uncoordinated and unsupported. There is no doubt that the Twizel’s “enclave” design, and less than optimal location have hampered new development, however it seems that the town’s future now depends on its ability to attract the “new blood” of entrepreneurs and investors to replace the aging “dam dwellers” and their way of life.

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