



Resource Community Formation and Change

A Case Study of Manapouri



Gerard Fitzgerald



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TAYLOR BAINES

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MANAPOURI

By
Gerard Fitzgerald

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INTRODUCTION

This paper reports the findings of a case study of the small township of Manapouri, located in Western Southland adjacent to the Fiordland National Park. 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. Manapouri’s history has been associated with the development of hydroelectric power generation, based on harnessing the combined water storage of Lakes Manapouri and Te Anau. The other case studies of energy communities in this series are Twizel (WP 22) and Opunake (WP 23). This study also relates closely with that of Te Anau (WP 27), one of three case studies of tourism communities in New Zealand.

A variety of research methods were used in this case study which primarily focuses on the history of Manapouri’s development since over the past 30 years. These methods included an analysis of census statistics, a review of published documents and reports about the town and energy sector, and four days of interviews by two researchers in Manapouri and Te Anau during November 1999. This study was also undertaken at an interesting time in that both construction and long-established production operations were coincident at Manapouri, new automated control technologies were being introduced, and the ownership of the power station had recently changed.

The research project seeks to provide 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.

BROAD HISTORY OF HYDRO ELECTRICITY DEVELOPMENT

Lake Manapouri was named by the pioneer survey James McKerrow in 1862. It is described in the AA Guide to New Zealand as “New Zealand’s most scenic lake” (1981: 273). “Manapouri” is actually a corruption of Manawapore or Manawapouri, interpreted as lake of “sorrowful or anxious heart” (Peat, 1994; Ministry of Works, 1968). The name of the adjacent 352 sq km Lake Te Anau is believed to be a variation on Te Ana-au (“cave of swirling water”) - possibly a reference to the caves which occur on the shores of the lake. In terms of area, Te Anau is New Zealand’s second largest lake, and Manapouri is the fifth largest. The comparative dimensions of these two deep glacial lakes are presented in Table 1. Water from Lake Te Anau flows into Lake Manapouri via the 18 kilometre Upper Waiau River. Prior to the development of the Manapouri hydro scheme the Waiau River carried all of the natural outflow of Lake Manapouri south through Western Southland to the coast, and in terms of flow (approximately 400 cumecs), was New Zealand largest river. Today the river’s flow is considerably reduced since most of the discharge from Lake Manapouri flows through a man-made outlet at Lake Manapouri’s West Arm, through the Manapouri power station and tail race tunnel, and into the sea at Doubtful Sound, some 178 metres below the lake’s level.

Both lakes are bordered on the west and northwest by the rugged and forested mountains of the Fiordland National Park, and mark the western boundary of the Te Anau Basin, which today is largely farmland. The town of Manapouri lies on the shores of the lake adjacent to the Waiau River outlet, while the larger town of Te Anau lies some 21 kilometres north on the southern shore of Lake Te Anau.

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).

Table 1: Dimensions of Lakes Manapouri and Te Anau

Dimension	Manapouri	Te Anau
Area	142 sq km	352 sq km
Shoreline length	170 km	517 km
Catchment	1,388 sq km	2,095 sq km
Maximum depth	444 m	417 m
Long axis	28 km	60 km
Natural mean height above sea level	177.8 m	202.2 m
Natural variation in levels	4.8 m	3.5 m

Source: Peat, 1994: 4-5

The Manapouri Power Scheme

Various opportunities for utilising the “head” (178 metre height difference) between Lake Manapouri and Doubtful Sound for hydroelectricity production were recognised by the Public Works Department engineer, P.S. Hay, in 1904. (Martin, 1998). However it was over 50 years before a project design was developed which could overcome the challenges of the difficult terrain and climate. Several unrealised ideas for development were floated in the intervening years: one in the 1920's proposed establishing a hydropower plant to generate energy for the manufacture of fertiliser from atmospheric nitrogen, and went as far as acquiring water rights under the name of New Zealand Sounds Hydro-electric Concessions Ltd. (Martin, 1998). Others in the 1940's proposed commercial power production, primarily for aluminium smelting. In the early 1950's the Ministry of Works (MOW) started investigating the feasibility of a power scheme, and their preliminary ideas for the Manapouri hydroelectric development which would generate electricity for an industrial development were aired publicly to the Southland Progress League in 1956 (Peat, 1994). The MOW's concept involved putting a control structure on the outlet to Lake Manapouri, building an underground power station at West Arm through which the outflow of the lake would be diverted, and digging a tail race tunnel which would discharge the water from the power station into Deep Cove in Doubtful Sound (Martin, 1998).

In the same year (1956) Consolidated Zinc Pty. Ltd. of Australia, a subsidiary of the multinational mining corporation RTZ Corporation, expressed interest to government in using Manapouri hydro power for smelting of alumina produced at its Gladstone refinery using bauxite mined at Weipa in Northern Queensland (Moody, 1991). In January 1960, the government of the day agreed to give Consolidated Zinc, through its assignee Comalco Industries Pty. Ltd., an exclusive 99 year right to develop the power resources of Lakes Te Anau and Manapouri and the Waiau and Mararoa Rivers with the power station developed along the lines suggested earlier by the MOW, including the raising of Lake Manapouri.

When Comalco indicated it could not raise the necessary project finance in 1963, government undertook to carry out and pay for the construction of the power project while guaranteeing power supply to the smelter. In return the company agreed to sell its engineering feasibility studies and designs, and to surrender its water rights to the Crown. This allowed government to enlarge the scheme's proposed generating capacity to supply electricity to the national grid, while retaining Comalco as a guaranteed customer for most of Manapouri's power.

The government's decision to build the power station was based on the belief that the electricity produced would be cheap enough “to support a metallurgical industry” and that New Zealand could miss the opportunity of having such a large-scale enterprise established here (Shand, 1967: 4). It agreed to give Comalco guaranteed 500 MW of electricity supply for 99 years to the company's proposed Tiwai Point aluminium smelter at Bluff, while taking 200 megawatts for the nation's use.

In February 1963, the government awarded the design and supervision contract to the Bechtel Pacific Corporation (Comalco's consultants). Later the same year a construction joint venture was established between the Utah Construction & Mining Company of the United States, and two New Zealand companies - Williamson Construction and Burnetts. Utah Construction secured the contract to excavate and line the powerhouse (machine hall), some 220 metres underground at West Arm, together with the sinking of 14 other shafts for access, power cables, penstocks and water intakes - at a cost of, 14.5 million. The Utah/Williamson/Burnett joint venture was awarded the contract to bore and line the tail race tunnel from the underground West Arm power house to Deep Cove, and to build a 20 kilometre road over the Wilmot Pass. Another New Zealand consortium (Morrison-Downer-Fletcher) was contracted to construct an access tunnel road to the underground powerhouse at West Arm (Martin, 1998).

The tail race tunnel was driven "full face" from Deep Cove using a 45 tonne, three-tiered drilling platform (or "jumbo") that bored the holes for blasting, supported by mucking machines that removed and loaded the spoil onto electric trains running on rails mounted on the floor (Martin, 1998). This was thought to be the biggest of its kind in the world at the time (MOW, 1968). A feature of the work was the use of a hydraulically operated sliding floor that moved forward according to the progress of the tunnel. However the tunnel boring proved far more difficult, slow, and expensive than anticipated due to the large amounts of water that poured from the surrounding rock into the tunnel, and the broken nature of the rock that required considerably more support work than expected. The contract was extended to January 1968, and the terms of payment renegotiated when Utah Construction threatened to withdraw from the project. The tunnel was finally holed in October 1968 and the lining completed 10 months later. The same kinds of physical problems also dogged the construction of the machine hall road access tunnel at West Arm, with considerable cost overruns.

The machine hall construction, begun in 1966, involved excavating a underground cavern out of solid rock using traditional drill and blast techniques, and was completed in early 1968. The West Arm control building, on the surface, was completed the following year. This was followed by the installation of four generators, with the first power generated in September 1969. A further three generators were commissioned two years later.

While the power station construction proceeded NZED crews built 160 kilometres of high tension power lines between West Arm and Bluff to carry the power to the smelter. Construction of the aluminium smelter at Tiwai Point began in 1969, with the first aluminium produced in April 1971 (Martin, 1998).

The last stage of the Manapouri project involved building two dams. One was on the outlet of Lake Te Anau, and the other was 13 kilometres down the Waiau River, just below the junction with the Mararoa River. These dams were built by the MOW's own workforce. The Te Anau structure was completed in 1975 and Mararoa the following year.

The Manapouri construction represented a huge commitment of personnel and resources. Tunnellers, miners and construction workers were brought in for the project from around the world. At the height of the construction period there were 1,800 workers on the two major sites of the project - 670 at Deep Cove, and about 1,100 at West Arm. Those working from Deep Cove were accommodated at a staff hostel in Deep Cove, and on the "Wanganella", a former passenger liner brought in and anchored to serve as a floating workers accommodation. Some 850 others were accommodated at single men's quarters and staff hostels built at West Arm. This camp was expanded in 1966 with the addition of three hundred extra huts along with a larger mess hall and a recreation hall (Howard, 1969). Houses were also provided for married workers, and MOW personnel working on the control structures, in the specially built Manapouri "hydrotown" village adjacent to Supply Bay, about seven kilometres from Manapouri township. This town, complete with shops, school, and other facilities and services, was completely dismantled in the mid 1970's, and when the station was turned over to the NZED, the operations staff were accommodated at a newly-constructed permanent NZED housing enclave in Manapouri township, with the station office located at West Arm.

The hydro construction project was a big stimulus for tourism development at Manapouri and the district with tours of the construction project and trips over Wilmot Pass to Doubtful Sound beginning in 1966, and launch cruises on the Sound itself.

The Second Manapouri Tail Race Tunnel

The Manapouri tail race tunnel was formed using drill and blast methods that created a very rough and uneven tunnel surface which required 17,640 m³ of concrete to smooth it out. Soon after the commissioning of the station it was found that the tunnel lining was not as efficient as intended, and the station was capable of generating only 590 MW instead of the expected 700 MW. In the early 1990's the Electricity Corporation of New Zealand (ECNZ) decided in 1994 to commission construction of a second tail race tunnel running parallel to the first tunnel. This new tunnel was intended to be a second “exhaust pipe”, enabling the power station to run at its full design capacity and the first tunnel to be shut down and serviced as necessary. The ECNZ specified that the new tunnel should be excavated full face by a tunnel boring machine (TBM), which leaves a very smooth surface (ECNZ, 1997). The TBM technology, new to New Zealand, was also considered to be a much quicker and safer method of excavating rock than the methods used for the earlier development.

MANAPOURI & ITS DEVELOPMENT

Manapouri is located in Western Southland on the eastern shore of Lake Manapouri near the Fiordland National Park. It is 21 kilometres south of Te Anau township and State Highway 94, and some 157 kilometres by road northwest of Invercargill. The nearest other Western Southland towns are Mossburn and Lumsden (on SH94) and Ohai/Nightcaps and Tuatapere (both on SH96). Smaller rural settlements in the Te Anau basin which “look to” Te Anau include The Key, and Blackmount.

The first Europeans reached Lake Manapouri in 1852, and the first sheep run holder (Freeman Jackson) took up 50,000 acres at Manapouri in the late 1850's (Miller, 1975). The first permanent residents of the settlement of Manapouri didn't arrive until the 1880's. Amongst them were the Dorens, who operated the first tourist vessel on the lake in the 1890's, and the Murrells who established the first tourist accommodation - the Grandview Guest House at Manapouri. Robert Murrell also discovered the pass between West Arm and Doubtful Sound, and became the chief guide on the Milford Track which had begun to attract increasing numbers of users from 1890 (Peat, 1994). Around the same time vessels began to operate on Lake Te Anau, taking sightseers to the glow worm caves and to the beginning of what became the Milford Track. As with Manapouri, a small settlement grew up at Te Anau as a base for tourism, with some Southlanders establishing bachs locally.

A long term resident interviewed for the study noted that, in 1946

“there was the Grandview Guest House and Murrell family house, a store and petrol station. Was no road down to Pearl Harbour. There were shingle roads, and buses went 3 days a week to Lumsden. There was a camping ground for holiday makers. One launch operated on the Lake. In the 1950's, before sections were surveyed off for holiday makers from Department of Lands & Survey land, the town was comprised of Home St, and View St. The Crown land sections were sold by ballot. This opened up the area. Batches began to be built, which became houses. There was no power, each house had their own tank rain water. There were no bores. Then we got our supply from the river. Not many had water pumps - weekenders and cribs only. The next big change came when the power supply came in, then sealed roads from Lumsden, Mossburn, and Te Anau. Eventually the Manapouri - Te Anau road was sealed and this brought more visitors and growth. The infrastructure development meant growth in everything relating to ones life.”

The development of Te Anau accelerated after the completion of the Homer Tunnel, the opening of the road to Milford Sound, and the releasing of Crown lands for residential development. However, as noted by our informant, Manapouri's development was constrained by an ongoing shortage of land for residential subdivision and a lack of infrastructure, and it was soon overshadowed by Te Anau. Throughout the 1960's the Department of Lands and Survey withheld land around Manapouri for sale in expectation of the lake being raised as part of the hydro development. Tourism had begun to develop in the 1950's with the establishment of what became Fiordland Travel.

In the 1960's Lands and Survey began large scale land development and subdivision of Crown land in the Te Anau Basin for farming, adding to the local population and making the limited local services more viable. According to our long term resident informant *"in the 1960's there were 53 local residents. Commercial ventures arrived in the 1960's making a big difference to population. Baches attracted people doing hunting and fishing, etc and they were middle class people - mainly Southlanders enjoying the flush economy"*.

The Public Works Department established a hydro-construction village in 1964 near Supply Bay on the Te Anau road. The small Manapouri community received a boost with the development of this village and its facilities. At this time *"people were 'pouring in'. Houses were coming in daily. We also got a large shop, garage with pumps, a hall, area school, doctor, post office, bus depot, and takeaway shop"*. According to a construction worker at the time, *"at the height of the Manapouri construction, the hydro village had 200 houses - maybe 800 people."* When construction of the Lake Te Anau and the Mararoa control structures was completed in the mid 1970's, the workforce moved away to other hydro construction projects. The town was completely dismantled apart from the water supply. Some of the main buildings were relocated, including the hall, which was re-established at the Manapouri township. Some construction families stayed on in the district, though the local population dropped to around 400 (see Table 1a below). The old village site is farmed, and periodically used for Boy Scout jamborees.

The construction of the Manapouri hydro scheme in the mid-late 1960's also brought a wider range of services and tourism experiences. As Peat notes

"from late 1966, visitors began going over the Wilmot Pass to Doubtful Sound by bus, courtesy of the newly-built power scheme road. More than 4,000 visitors made the trip in the first year. Later, they would be able to inspect the powerhouse, 220m underground." (1994, p.7).

Tours of Doubtful Sound and beyond by the Doubtful Sound Tourist Company followed.

At the end of the hydro construction, the NZED established a company housing estate/enclave adjacent to the existing Manapouri township. This became known as the "NZED village", with some 60 houses for the Manapouri Scheme's operating workforce and staff. This "village" was run by the NZED, and the Manapouri power station superintendent was in charge of the NZED "community". According to local informants, a clear division existed between the NZED villagers and the rest of the residents, with the former generally enjoying better services and housing - supplied by their employers. However the NZED made contributions to the local community putting in a swimming pool and tennis courts as well as providing the community hall.

In the mid 1980's, the NZED was corporatised, becoming the ECNZ, and by the early 1990's, the ECNZ started selling off its houses to its staff and others as part of its rationalisation and downsizing. Many of the NZED/ECNZ properties were acquired as holiday houses.

Since the 1970's Manapouri has developed as a regional domestic "resort", a casting off point and base for tourism focussed on Lake Manapouri, Doubtful Sound and the southern fiords, as well as a minor service centre for the district's farmers and local residents. With the development of larger cruises of Doubtful Sound and tours of the power station under the banner of Fiordland Travel, and the huge expansion in Milford

Sound and Milford Track - based tourism, the control over tourism in the district moved to Te Anau and Queenstown. As a result, the growth of Te Anau has almost completely overshadowed that of Manapouri. Today, tourist enterprises based in Manapouri tend to be more niche operations, such as longer specialist cruises, and adventure and ecotourism activities.

DEMOGRAPHIC CHARACTERISTICS

Unlike Te Anau, Manapouri has had rapidly falling resident population since 1981. For at least 10 years before 1981 its population was artificially inflated by the presence of the hydro construction workforce. The population effect of the hydro construction is revealed by the census figures for Fiord County and Manapouri during the 1970's (Table 1a). In 1966, Fiord County had a population of 697, based mainly at the West Arm camp at the site of the Manapouri powerhouse and at Deep Cove in Doubtful Sound. Five years later, in 1971, when most of the work on the power house and tail race were complete, the population of Fiord had fallen to 135. The population of Manapouri in 1971 and 1976 (respectively 620 and 796), included the residents of the MOW hydro construction village who were largely engaged in building the Te Anau and Mararoa control structures.

The Southland region (including Southland district) generally has suffered from a declining population for at least 10 years, with a drop of 2.9% (the largest decrease for any region) between 1991 and 1996. Table 1b indicates that Manapouri has had somewhat more severe rate of population loss than both the district and the region.

Table 1a: Total Populations for Manapouri and Selected Communities, 1971-1996

	1971	1976	1981	1986	1991	1996
Te Anau community						
CN*	1,642	2,384	2,610	2,818	2,604	2,085
UR*		1,385	1,560	1,953	1,637	1,785
Manapouri						
CN	620	796	426	442	309	249
UR				306	255	216
West Arm locality						
CN	86	16	11			
Deep Cove locality						
CN	-	45	2			
Wallace County						
CN	12,972	13,451	13,281			
UR		12,503	12,054	13,674	-	-
Fiord County[@]						
CN	135	78	29			
UR		37	21	-	-	-
Southland District						
CN				34,589 ⁺	33,681	33,085
UR					30,705	30,561

Notes: * CN = census night population totals (includes visitors). UR = usually resident population

[@] Fiord County was absorbed into Wallace County in 1982.

⁺ Southland District did not exist until 1989 - figure was derived using new boundaries

Table 1b: Manapouri - recent changes in the usually resident population

Census Year	No. of Persons	% change in Manapouri pop.	% change in NZ pop
1986	306		
1991	255	- 16.7	3.4
1996	216	- 15.3	7.2

Source: New Zealand Census's 1986-1996

In addition to the absolute reduction in population, the town also appears to have had a high rate of population turnover: of those resident in 1996, 56% had resided elsewhere five years previously and just under half of these newer residents had come from outside of Southland (Table 2).

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

Place of residence	Manapouri % of Population
Same usual address	44.1
Same territorial authority	26.5
Same regional council, different territorial authority	4.4
Different regional council, same Island	7.4
Different regional council, different Island	2.9
Not specified - New Zealand	4.4
Overseas	10.3
Total number of Persons	216

The age-sex structure of Manapouri's population in 1996 shows a high proportion of working age people (15-64 years) and relatively fewer young people and elderly, when compared with the NZ population (Table 3). This means there is a relatively low dependence ratio in the local population. Males outnumbered females at the rate of 1.35 males to 1 female in 1996.

Table 3: Age-sex structure of the population of Manapouri 1996.

	Manapouri		New Zealand	
	Male	Female	Male	Female
% 0 - 14 years	19.1	16.1	24.1	22.0
% 15 - 64 years	73.8	74.2	65.7	65.0
% 65 years & over	7.1	9.7	10.3	13.1
Total Number of Persons	126	93	1,777,464	1,840,839

Social characteristics

Manapouri, like the rest of Southland, had relatively low proportion of Maori in 1996, i.e. 11.1% compared with 14.5 % for NZ. In 1996 the town's families were, on average, slightly smaller than the nation's families (3.6 members c.f. 3.8 for New Zealand. See Table 4). Manapouri is relatively distinctive as it had a very high proportion of couples without children and a low proportion of solo parent families and traditional nuclear families. This is a similar pattern to Te Anau, although it differs from the whole of Southland District which had a relatively higher proportion of two parent families (52.6%).

Table 4: *Family Types in Manapouri - 1996*

Family Type	% of families Manapouri	% of families New Zealand
One parent family	10.0	17.7
Two parent family	35.0	44.9
Couple only	55.0	37.3
Total number of families	60	949,497

In 1996 the residents of Manapouri aged 15 and over had a slightly lower level of educational attainment compared with the rest of the nation (see Table 5).

Table 5: *Highest educational qualifications held by the residents of Manapouri- 1996*

Highest educational qualification	% of residents	
	Manapouri	New Zealand
University & other tertiary	27.9	25.8
Secondary school	19.7	26.5
No qualifications	36.1	32.2

Source: New Zealand Census 1996

INDUSTRY, WORK AND OCCUPATIONS

Phases of development

As outlined previously, the hydroelectricity industry has gone through several cycles of development at Manapouri including:

- a long period of early investigations for the development of the hydro-electric potential of Lakes Manapouri and Te Anau (1900-1963);
- the intense period of construction of the Manapouri Scheme by the state in tandem with the development of an overseas-owned aluminium smelting industry (1964-1974);
- a 20 year operating phase during which the power station functioned at less than optimal efficiency providing power to the Tiwai smelter and to the national grid (1970- 1999);
- a phase of local and sector restructuring (and ownership) to reduce the costs of production and improve competitiveness, including reductions in staffing levels, and contracting out of various functions (1989-1999); and
- a new round of construction (the second tail race tunnel) and retrofitting of new remote control and decision support technologies in order to increase the level of production and physical operating efficiency of the scheme (1998 to 2003 or so).

Each of these phases has been reflected to a greater or lesser extent in the social and economic development of Manapouri, Te Anau and the surrounding district. They have also overlapped and blended with other developments, such as local physical infrastructure, farming, tourism and fishing.

The role of the state

Government has been almost entirely responsible for power development in New Zealand, including the Manapouri Scheme. The Power Division of the Ministry of Works was responsible for the design and construction of the schemes on behalf of the NZED. The MOW was essentially a large contracting organisation providing a range of civil engineering services to government departments. Following World

War II, it established an impressive record in hydroelectric, thermal and geothermal power construction. It built an expert and loyal standing workforce which came to expect ongoing employment such that it was affectionately known as “Uncle MOW”. In 1972, when large-scale power development was at its height, the Ministry had a total staff of just over 7,000, with power development accounting for 20.6 % of its \$324 million expenditure that year (Sheridian, 1995).

When the Manapouri Scheme was approved in 1960 under the Manapouri-Te Anau Development Act, it was envisaged it would be built by the private sector. When Consolidated Zinc and its partners failed to raise the necessary capital to construct the Scheme, the government agreed to finance it in the interests of national economic development. In return for a guaranteed market for the power (at apparently very low prices), it also gained the right to produce surplus electricity for supply to the national grid. The new agreement, with the MOW taking overall responsibility for the project but using the consultants engaged by Consolidated Zinc, was legalised in the 1963 Manapouri-Te Anau Development Act.

In 1965 it was estimated that the Manapouri power scheme would cost \$49 million or \$24.5 million at the time (Howard, 1969). The final cost was \$138 million (Ministry of Energy, 1979), 85% of which was for the construction of the power station and the balance for the Mararoa and Te Anau control structures. In terms of output Manapouri was the biggest single hydro-electric generating station in the country, and remains so today.

Restructuring of the electricity sector

In 1987, as part of its programme of state sector restructuring, government disbanded the NZED and replaced it with the Electricity Corporation of New Zealand. As a state owned corporation it owned most of New Zealand’s generating capacity and monopolised wholesale electricity supply. It was expected to operate as a commercial company returning a dividend to the government. This restructuring meant considerable job losses, with 800 staff in 1987 being made redundant out of a national workforce of approximately 6000 (Sheridan 1995; Ministry of Energy, 1986). Management of ECNZ also anticipated that within 10 years, Manapouri, and other stations in the network would operate unmanned via remote control thus foreshadowing ongoing job losses. Under its new management ECNZ increased its profit from \$196 million to \$404 million between 1988 and 1991 (Kelsey, 1997). Further restructuring took place in 1992, resulting in a wide range of services (such as plant operations and maintenance) being contracted out. In some cases these contracts were awarded to former employees who were encouraged to form their own businesses. Kelsey notes that by 1993, ECNZ had laid off almost 3,000 staff through its various rounds of restructuring. Census statistics also reveal that between 1986 and 1996, total employment in the New Zealand electricity supply sector (including supply authorities) decreased from 14,466 to 7,038.

ECNZ workers at Manapouri were made redundant, operations and maintenance activities were contracted out (with some staff hired back by contractors), and the ECNZ houses in Manapouri township were sold off to staff and other purchasers. According to the 1991 census approximately 36 of Manapouri’s (and 12 of Te Anau’s) residents were engaged in the electricity sector, down considerably from around 100 five years earlier. The 1996 census indicated the local electricity sector workforce in the township was approximately 21.

While ECNZ was internally restructuring, the National government in 1992 introduced competition in the NZ energy sector passing legislation to corporatise 48 energy distribution companies and electric power boards (statutory local authorities). Transformation into public companies soon followed, with Canadian and American corporations involved in several take-overs (Kelsey, 1997). Two years later government created a further SOE, Transpower, to take over the running of the power supply network from the ECNZ. The following year it split off from the ECNZ a competing production company, Contact Energy, which acquired 27% 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 Manapouri Scheme (including the second tail race tunnel project), and the eight power stations in the Waitaki Catchment. The ECNZ was then disestablished.

Ownership and operation of the Manapouri Scheme

Meridian Energy, the new owner of the Manapouri Scheme, is the largest of the three new power production SOEs. The total value of the assets acquired by Meridian 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 capital injection from government of \$1,600 million. Meridian Energy’s power production facilities have a combined generating capacity of 1,738 MW, and produce about a third of New Zealand’s electricity. Comalco’s aluminium smelter at Tiwai Point continues to be the principal consumer of electricity from Manapouri, with its consumption representing 40% of all Meridian Energy’s power production.

At the time of this study, the conversion to remote control of the Waitaki system of stations had been completed, while the Manapouri Scheme was in the last stages of being converted. Thus Meridian’s generation facilities are operated centrally, via remote controls, from Meridian Energy’s Twizel Control Centre². This centre has increasingly served as the control base for Meridian’s power stations and structures. The Manapouri power generation system is particularly sensitive since it must be operated under the Manapouri Te Anau Development Act, and comply with the conditions of the resource consent, the agreements relating to lake levels and water abstractions, and the supply contracts with Comalco.

The water rights (resource consents) for the Manapouri Scheme were inherited from the ECNZ which in 1996 received six 35-year conditional consents. These are due to expire in 2031 (Electricity Reform Transition Unit, 1998). The conditions on the consents required compliance with the 1993 “Gazetted Guidelines” for operating Lakes Manapouri and Te Anau which aimed to protect the “natural patterns, ecological stability and recreational values of the vulnerable shorelines” of the lakes (*ibid.*). The operating parameters were established in consultation with the Guardians of the lakes, Ngai Tahu, DOC, and the Waiau Working Party, which was made up of representatives of local authorities and other sections of the Western Southland community.

Meridian Energy operates with a combination of contractors and staff. According to its annual report, Meridian Energy employed 118 people 1999. They were located in Christchurch, Twizel and Wellington. Five of its employees were located at Manapouri/Te Anau. Its “organisational design is based on outsourcing of all non-core functions” (Meridian Energy, 1999a: 6). The finance and accounts functions are contracted out to KPMG, an international accounting firm which has engaged former ECNZ staff. The electrical and mechanical maintenance work for Manapouri and elsewhere is contracted out to the 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. According to an industry informant, ABB Alstom have 10 or so operator-maintainers permanently on site at Manapouri. Since 1998 the round the clock operation of the Manapouri Scheme has been carried out by Hycon Tech Ltd, a local company made up of four former ECNZ operators who were encouraged to join together to operate the station. Hycon Tech’s contract with Meridian Energy was due to expire in March 2000 once the computerised remote controls were commissioned. At the time of this study, the Manapouri power scheme was being run by 18 people.

²

Meridian Energy moved its operations control headquarters from Twizel to Christchurch in 1999.

Work & Technology

Original Construction

Work on the first construction project in the 1960's and 1970's proceeded around the clock in eight hour shifts. The skilled workforce for tunnelling and other work was drawn from around NZ and overseas by the joint venture contractors, and for the subsidiary control structures (Mararoa & Te Anau) from within the ranks of the Ministry of Works' hydro construction workforce. The creation of an underground powerhouse and a tail race tunnel presented new challenges to New Zealand engineers and construction workers. Thus professional and trades expertise, especially for the hard rock excavation, was sought from throughout the world. Hubbard (1994) recalled men from over 40 nationalities, including Italians, Greeks, Yugoslavs, Americans, Spaniards, Irishmen, Scots and New Zealanders, working together at Deep Cove. The excavation of the tail race tunnel involved the use of a new technology - a three-tiered drilling platform with its own hydraulically operated sliding floor.

Under the difficult working conditions noted earlier, labour turnover was high. The climate seemed to present a particular challenge for workers, with the annual rainfall at Deep Cove being around 6,200 mm over an average of 183 rainy days per year (Bamford, 1984). As Howard (1969) recalled, sand flies were also a major irritant, and keas attacked the equipment. Tunnellers were guaranteed a wage of £42 per week (and actually earned up to £60), tradesmen £33, and labourers £30, with Hubbard (1994) noting that a storeman might be paid £40 per week, or four times the normal storeman's wage at the time. On top of the wages were various allowances, free food and accommodation at the West Arm camp or at Deep Cove on the floating hostel, *Wanganella*. Free travel between Deep Cove, West Arm and Invercargill was provided for workers commuting to and from the project during their time off.

Eighteen men died on the construction of the Manapouri power project, and in 1967, when there were over 1,000 working onsite, there were "84 serious accidents at Deep Cove, 123 at West Arm, and sixteen on the transmission line roads" (Martin, 1998: 214). Tunnelling work was particularly dangerous, with rock falls, drilling accidents, and the possibility of being struck by the trains which moved materials in and out of the tunnel. Serious injury cases had to be evacuated by air to Invercargill. According to Hubbard (1994), whenever a man was killed at Deep Cove, work would stop for 24 hours and a "serious drinking bout" would begin on the *Wanganella*. The project was also subject to considerable industrial unrest, including conflicts over redundancy provisions, allowances, pay rates, and union coverage.

Second Tail race Tunnel

The contract to make the new tail race tunnel was awarded to an overseas/New Zealand joint venture collectively known as FDI: Fletcher Construction (a NZ company), Dillingham Construction of the USA, and Ilbau from Austria. The work began in September 1997 and was due to be completed in September 2000. At the time of this study, the \$200 million project was running nine months behind schedule, with FDI anticipating it would complete the work about 17 months late (or the first quarter of 2003). In January 2000, average progress on the tunnel had been 185 metres per month, and only 3.8 of the 9.6 kilometre tunnel had been bored (Meridian Energy, 2000).

The 1,500 tonne electric American Atlas Copco-Robbins TBM was built especially for the job in the United Kingdom. It has a cutting head of 10 metres with 68 cutters, its own power supply, mucking out machinery, and support equipment. The second tunnel construction has encountered similar difficulties to the first tunnel, with large amounts of water intrusion and highly fractured rock causing the TBM to give less than optimal performance. Moreover, the cutters on the TBM have been wearing out at a much faster rate than expected, requiring considerable maintenance.

The use of the TBM technology was originally specified by the ECNZ, and according to a local informant, was instrumental in ECNZ being granted the necessary resource consents for the project. The machine is the "centre of activity", with each eight hour shift having over 20 workers. One project supervisor indicated that "if the project had been done by drill and blast method, as in the past, they would have needed a lot more

workers per shift. ... *The workers, who were all drill and blast tunnellers, were suspicious of the technology at first and had to learn new methods*". One of the TBM operators (featured on the project's website) had been a construction worker on the Clyde Dam and Cromwell Gorge stabilisation tunnels, and is new to driving TBMs: "the job comes with quite a bit of responsibilities [*sic*] - he is responsible for operating all of the systems connected to the TBM, and is involved in the inspection and changing of the cutters" (Meridian Energy, 2000). The TBM operator works in an enclosed cabin equipped with remote controls, video and computer monitors.

On the second tail race project there are over 150 workers. The FDI joint venture has 28 "staff", about 110 employees, and 20 or so subcontractors involved in site rehabilitation, hostel management, concrete batching, materials testing, electrical engineering, welding, and other engineering services. According to the Engineer's Union records, their members on the project originate from Cromwell, Alexandra, Clyde, Arrowtown, Queenstown, Dunedin, Christchurch, Twizel, Greymouth, Picton, Wellington, Huntly, and Turangi, as well as some from Invercargill, Bluff, Riverton, Te Anau and Manapouri. The majority are Southland or Otago residents, and from ex-construction sites. Experienced tunnellers recruited for the project had worked on the Mt Davey coal mine development (on the West Coast), the Clyde Dam stabilisation work, and the Turangi hydro development. Some of the trades people had left jobs in Invercargill to work on the project.

Meridian Energy has 15 staff to provide oversight of the performance of the contract. Meridian's project staff operate from an office in the Manapouri township, and work on a 10 days on/4 days off roster, staying at the West Arm camp while in the field. The Meridian team is headed by a project engineer contracted from the USA. Other staff are mostly from the South Island, including Cromwell where they worked on the Clyde Dam. Four are reportedly former MWD employees. At the time of this study five of the Meridian staff were living in Manapouri, five in Te Anau, and the remainder were living in the staff hostel at West Arm, commuting out on their days off.

Construction of the second tail race tunnel is continuous, with the FDI and associated crews working 8 hour shifts on a 15 days on/5 days off roster. Extra travel time is allowed between West Arm and Deep Cove. The shifts rotate, and extended working hours, to cover absenteeism, are not uncommon. Working conditions were described by a local informant as "*shocking ... the tunnel is wet and cold ... workers commonly experience foot problems from gumboots, and ear problems. There have been lung problems from fumes from welding repairs to the TBM.*" The latter problem has resulted in industrial action on the site. Another interviewee indicated that there were also concerns over the physical health effects of working in cold water, and, for TBM operators, of vibration from the machine. According to Meridian Energy (2000), groundwater inflow in the tunnel reached as much as 1,000 litres/second at temperatures of 6-12 degrees centigrade in 1999.

During their days onsite, workers live in the refurbished 180 bed West Arm Hostel. One interviewee indicated that such long continuous periods on the job mean the workers are virtually "*prisoners of the company*", and by the end of their 15 day stretch, "*are zombies, and spend their five days off recovering*". Travel to and from West Arm is free on the FDI launches and accommodation at the West Arm camp is free. This accommodation was described by one project informant as "*quite good*" - with small single rooms, a 24 hour cook shop, a bar, lounges etc. Some workers go recreational hunting and fishing in the National Park during their time off. Isolation can be a problem, and some workers and their families have reportedly encountered problems with the shift work arrangements. The basic wage rate is reported to be around \$20/hr, and with allowances, earnings are up to \$60,000 per annum. The project has had difficulties over union coverage of the workers; with the Engineers Union claiming the right to act as bargaining agent of workers (at their request), rather than the Carpenter's Union.

Power Station Operations

ECNZ embarked on its ARC (automatic remote control) programme during the mid 1990's by retrofitting new controls to Manapouri and other power stations, linking them via fibre optic data cables, and upgrading some

generators. This programme was due to be completed in early 2000. The ARC work has been undertaken for the ECNZ and Meridian Energy by overseas contractors and appears to have generated little in the way of local employment at Manapouri or in the Waitaki Valley. Automatic remote control will further reduce the number of personnel engaged in power production operations.

The introduction of remote control of machines and control structures represents a significant technological change in the power generation sector. Under the automation programme the Manapouri power station has been fitted with computerised controls, switches, and monitoring sensors, which are linked by fibre optic cable to Meridian Energy's control centre at Twizel and to its Christchurch office. Meridian's company profile describes the programme:

“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: 9).

Automation allows increases in productivity to be achieved (energy per head and flow) through improved monitoring, and reduced maintenance costs. Maintenance is done by contractors according to need, rather than by a schedule, while maintenance decisions are based on observed changes in plant performance and risk assessment. According to several industry informants, the ARC project was anticipated to cost in the order of \$50 million, but is likely to eventually cost around \$60 million. One long term local industry worker admitted being “*a bit scared of remote control, especially the loss of local knowledge about the operation of the scheme and system*”. The contracted station operators, Hycon Tech, reported that they were investigating overseas work, and once the automated controls are commissioned their whole team was likely to move away from Manapouri.

Automation by the ECNZ and Meridian Energy, and the contracting out of “non core” services (including station operation and maintenance), has led to an overall reduction in the number of staff and workers, and a change in the nature of operations work. Prior to 2000, the Manapouri Scheme was operated by on-site staff actively controlling the facilities in real time. An informant indicated that “*in the early days of operations, the station had seven sparkies [electricians], seven fitters, seven ‘outside’, two supervisors, plus two ‘upstairs’ [control room] operators on each shift*”. A former worker recalled that 21 years ago there were 66 local NZED workers, with 18 per eight hour shift. The station operated on a seven day roster of three shifts, each of 10 hours, which included two hours travelling time. At the end of each week workers got two days off, then four days off when they came off doing the midnight shift. Twelve hour shifts were introduced by the ECNZ in the mid 1990's.

Station operators, whose job it was to monitor the operation of the whole station and do the necessary switching (including the remote control of the Mararoa and Te Anau control structures via radio link), were generally drawn from the ranks of electrical tradespeople who had worked in power stations and were considered to have the necessary aptitude. A former station operator noted that “*nowadays a half a dozen can run the whole station; the work is more technical now; better educated operators are required than in the past*”. A current station operator outlined his career in the industry: “*I was a fitter for 3-4 years, then a fitter-maintainer, then maintainer-operator, then a roving operator, then station operator, then a contractor*”. From the late 1980's to the mid 1990's under the ECNZ operators had “*seven different job titles - for example, ‘resource controller’ and ‘production controller’*” - each of the job titles reflecting different approaches to management in the ECNZ at the time.

Aptitude, including technical skill and personality, is crucial in a station controller:

“Everything in an operator’s job is regimented, under an operating order, and abrupt, because work is done on the phone in communication with system/grid controllers. You become very regimented, and you are audited in your performance. So you need to have the right kind of character to do the operator’s job and the shift work, and probably have to cope with being anti-social. You have to be dogmatic, thorough, and can’t be flippant. It’s a mentally and socially strenuous job, and you are usually located in an isolated area. At Manapouri, you also work underground, and the station could be flooded if a serious problem occurred e.g. a tail race blockage. In the event of a power station failure then the Tiwai smelter would fail, which would mean the collapse of Invercargill’s economy.”

Occupational structure and class

There was a definite association between a worker’s place in the occupational hierarchy of the NZED/ECNZ workforce and his/her social status in the community. At the top of the local hierarchy was the station superintendent, then the station operators, then various specialists and trades persons, with the maintenance labourers at the bottom.

“Social groupings were based on job, and it applied to wives as well. Status and leadership were according to job designation. ... Social control etc. took place at the pub - you could tell people’s status by the way people related to each other. One was always known by one’s job/position in ECNZ and station. This flowed through into clubs etc. There was a village committee to do dispute resolution etc. but ultimately the superintendent made the decisions. He was the authority. It’s much easier to live there now - it’s more like a ‘normal town’, and people aren’t with each other all the time.” (former Manapouri worker).

One informant recalled that in the early days *“the station superintendent and his wife were fathers to the men, mothers to the wives, and grandparents to the children, and it was the same in NZED villages everywhere. In later years - the 1980’s - the substation supers had a different attitude. They tended to stay out of the workers’ lives”*. Another noted that *“the ECNZ village life was very incestuous - people lived closely together. It was a close knit community. A lot of ECNZ people shifted into Te Anau as they woke up to the need to get into the wider community”*.

Under Meridian Energy and the new technologies, power generation work is increasingly becoming the job of white collar engineering graduates, computer programmers and technicians, and marketing specialists. Along with this, the very close relationship between work, residence, and way of life that was a feature of the NZED has largely gone.

The industry’s relationship with the community

The development of the hydroelectric scheme brought the village of Manapouri and the developing town of Te Anau into direct contact with the NZED, the Ministry of Works, international companies, and the power and resources of the state. This contact brought both opportunity and threat. On the one hand the project meant employment and opportunities to supply goods and services to the power scheme, new local infrastructure and services, and new tourism opportunities. On the other hand, it meant the threat of lake raising and the despoilment of the natural values of the unique environment that attracted residents and visitors to the area.

In the 1960’s and 1970’s the relationship between the industry (represented by the NZED) and the wider community was characterised by conflict over proposals to raise the lakes. Concerns over the potential destruction of the scenic values of the area and distrust of Government’s and the NZED’s plans were particularly high among tourism operators, conservationists and recreationalists throughout the 1960’s. The key government departments involved were also seen as having little interest in the environmental impacts

of their activities. These concerns spread through Southland and beyond, becoming a national campaign of protest under the banner of “Save Manapouri”. In 1970 the NZED and Comalco found themselves facing off against conservation organisations in a Commission of Inquiry over the issue of raising the lake, and by 1972 the public protest escalated at Te Anau into threats of bombings and violence (Peat, 1994). The lakes environmental issue became central to the 1972 general election, and contributed to the election of a Labour government, which quickly established the Guardians of the Lake and guaranteed that the lakes would be managed within natural levels. It also led to the creation of the Commission for the Environment, and the development of the Environment Enhancement and Protection Procedures governing large development projects.

At the local level, the establishment of a temporary project construction town near Supply Bay brought additional population, better public transport and freight services to the Manapouri area, improved roading, an area school, shopping facilities, medical services, and clubs and societies. As with its previous hydro construction towns, “uncle MOW” was responsible for all aspects its establishment and maintenance. This included utilities and other infrastructure, housing for staff and married workers, and community and recreation facilities, and the Ministry directly supported the establishment of social services provided by other agencies, such as a health centre and school. Consequently, people in the village enjoyed a relatively good quality of life, with most services available locally and cheaply. When the town was dismantled in the 1970's, remaining services were transferred to Te Anau. The project construction also meant rapid development of lake transport. The construction site itself became a tourism attraction, and the completion of the Wilmot Pass road opened up Doubtful Sound to tourism development by local interests. Road access to the South Arm of Lake Manapouri also became available.

At Manapouri, the NZED “attached” their workers’ housing to the existing settlement. However, it stood apart from the rest of the village because of its typical hydro-village design, uniformity of housing style, separate infrastructure, administration, and unique social organisation. While the NZED provided facilities (e.g. the local hall, swimming pool, and jetty) for the wider population, it tended not to be seen as part of the community and this continued through to the ECNZ era. According to locals, the layoffs and downsizing which followed the restructuring of the NZED caused considerable bitterness in the district, and with proposals to sell part of the Manapouri Scheme to Comalco, distrust in the industry lingered. In 1997, according to an ECNZ publicity brochure on the Manapouri Scheme, the Corporation contributed financially to the local community through a scholarship at Fiordland College, and sponsorship of the Deep Cove Hostel Trust (which runs the outdoor education centre at Deep Cove) and the annual Tuatapere Challenge - a “mountain-man” sports event.

Meridian Energy indicated in its 1999 Annual Report it would “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” (p.26). Meridian also noted 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” (1999 Statement of Corporate Intent, p.5). During our research we did not learn anything of such support and accommodation in the study area.

Meridian, and particularly the ECNZ before it, has been involved with the wider community in water resource planning, and the management of environmental effects of its operations. In addition to the ongoing relationship with the Guardians of the Lakes, the ECNZ set up the Waiau River Working Party as a means of consulting with the community over water rights (resource consents) and the management of flows in the Waiau River. This working party, which included representatives from 22 organisations and communities, met for a number of years and struck a series of agreements with the ECNZ over use of the resource, minimum river flows, and management of downstream effects. In four cases this included provision of funds - for mitigation, environmental enhancement, and facilities. Some informants believed that this consultation process improved the industry’s standing in the community and assisted the ECNZ to obtain resource consents under the RMA in 1996.

From fieldwork interviews it seemed that despite the limited local employment and the physical presence of the power scheme, the role of the electricity generation industry in the local community is considerably less than in the past, and it seems to figure little in local people's daily lives. The power station and other structures are seen only by visitors to the remote West Arm and Doubtful Sound, and there are no obvious signs left of the former hydro construction village. Other than the power lines and pylons that traverse Western Southland, and the former NZED/ECNZ housing enclave at Manapouri, the presence of the industry is therefore not immediately obvious.

ECONOMY & ENVIRONMENT

The economic impacts of the Manapouri Scheme

The \$138 million Manapouri development was paid for by the New Zealand taxpayer, and was justified in terms of its national importance for job creation and economic development for the region and the nation. Specifically, it was seen as the means of attracting a new industry, aluminium smelting, to New Zealand.

The overall local economic impacts of the construction of the Manapouri Scheme have not been documented, though some of the more obvious benefits included:

- up to 1000 jobs over about 8-10 years during construction which involved NZ companies and the Ministry of Works, and the establishment of support facilities and accommodation;
- 70 or so station long-term station operations jobs (reducing to less than a dozen by the late 1990's), with attendant local spending by workers and their families;
- a purpose built serviced housing subdivision at Manapouri; and
- contracts for lake transport which have operated under various arrangements providing employment for locals since the original construction.

The project's direct economic impact extended internationally since a considerable proportion of the expenditure went on the purchase of heavy equipment from overseas.

Other benefits also included:

- employment and contracts on the original construction of the Tiwai aluminium smelter, and its \$465 million upgrade during the 1990's;
- ongoing employment at the smelter for about 900 people, and employment in flow-on industries (NZ Aluminium Smelters, 1999); and
- ongoing employment in, and return from, tourism focussed on Doubtful Sound such as cruises, kayaking, and nature/ecotourism, some of which operate year-round.

The Tiwai Smelter is owned and operated by New Zealand Aluminium Smelters Ltd (NZAS), a one billion dollar company which is 20.6% owned by the Sumitomo Chemical Company Ltd and 79.4% by Comalco NZ Ltd. Comalco NZ is a wholly owned subsidiary of Comalco Ltd, Australia. In the 1997-98 year, the smelter produced approximately 250,000 tonnes of aluminium from imported alumina that year, over 90% of which was exported, (mainly to Japan and Korea). It also made an after tax a profit of \$47.8 million (NZ Aluminium Smelters Ltd, 1999).

The current second tail race tunnel construction appears to have had relatively little economic impact on the district. The startup of the project coincided with the wind down of the Tiwai smelter expansion construction which involved up to 1,100 workers. An industry informant reported that the second tail race construction helped absorb some of these workers. A small number of workers have taken up residence in Manapouri and Te Anau, while a dozen or so FDI project staff and their families rent houses in Te Anau. Little in the way of contracts, direct business, or supply (for the workers hostel) has gone to local firms. West Arm Services, which runs passenger ferries and a barge service, transports equipment and materials to West Arm, the local water taxi gets some passenger ferrying work, and a local nursery is involved in some of the site rehabilitation

at Deep Cove. The most significant ongoing economic benefit of the second tail race tunnel project is in the few jobs that went to locals, and the flow on effect of having project staff reside in the area.

Environmental impacts

From the first conception of Manapouri hydro scheme in the 1950's, through the construction and early operations phases in the 1960's, to 1972 and the general election, the design engineers called for the raising of both Lake Manapouri and Te Anau. The amount by which Manapouri was to be raised changed over time - from the 25 metres as proposed in 1960, to the more modest eight metres (with two lake control structures) advocated during most of the period of development. As Peat notes:

“whether Manapouri was to be raised 8m. or three times that amount, a raise was a raise, and in political terms, a devil of a thing to explain away or excuse. Although officials worked hard to create an impression of minimum impact, some politicians admitted the possibility of serious damage to the shoreline” (1994, p 21).

The proposals to raise the lakes drew a storm of protest which grew into a popular national movement of opposition. Opponents were particularly concerned about the destruction of the fringing forest and endangerment of at least five plant species, major destruction of the scenic values of the lake and shoreline (in the National Park), inundation of parts of the two townships, and loss of natural features of interest to tourists. They pointed to the persistent eyesore of dead and dying trees in Lake Monowai, which had been raised in the 1920's for power development. Proposals to clear the lake margins of vegetation prior to raising were shown to be unviable, and opponents' experts produced studies showing that Government could meet its obligations to Comalco without having to raise the lakes. The opponents eventually won the day, and the Guardians of Lakes Manapouri, Te Anau and Monowai was created, with the power to set lake operating levels within the natural range and to protect the environment. Even then, problems were encountered with high lake levels in times of flood, backwash to Lake Manapouri from the damming of the Mararoa River, and low flows in the Waiau River which impacted on fisheries and community water supplies. Over time the operation of the lakes and rivers for power production has been well worked out, regulations gazetted, and agreements struck by the scheme owners with various stakeholder groups through the Waiau Working Party.

The development of the second tail race tunnel was approved by the Guardians and went through the resource consents process with little apparent difficulty. One informant reported that the proposed use of a TBM helped secure the consents (by reducing construction noise). Meridian Energy is carrying out required rehabilitation planting of the tunnel spoil dump area at Deep Cove.

The regional and district and economy

Regional economy

Rural Southland has experienced major impacts from changes in government economic policy over the past decade that have been reflected in changing patterns of land use. Of the 30,753 square kilometres making up Southland District, 11,800 is in primary production - of which 95% is taken up by pastoral uses, 4% in forestry, and the balance in broadacre crops and horticultural production. There has been a shift away from traditional pastoral farming, with an expansion of dairy production in central and eastern districts of the region. Southland's dairy herd increased by 34% between 1990 and 1995, while sheep numbers decreased by 12% (Southland District Council, 1997).

In the forest industry the opening of more processing plants and the increased planting of exotic forests (often on land formerly used for pastoral farming) has expanded employment. The area in forest in Southland increased 8% between 1990 and 1995 (Southland District Council, 1997).

Tourism, which largely focuses on the Fiordland National Park, and Stewart Island, is also an increasingly important component of Southland's economy, perhaps accounting for 10% of employment in the region (Butcher, 1996). In 1995/96 just under a quarter of a million international visitors went to Southland.

Invercargill city is the regional base for heavy engineering, manufacturing, stock firms, commercial and business services, wholesale and retail trade, government departments, local authorities and tertiary education and training. Bluff is a major sea transport centre, fishing base, and home of the Tiwai aluminium smelter.

District Economy

Manapouri is located within the Te Anau Basin in the lakes area of Western Southland. This area is a significant pastoral farming area, particularly deer farming, largely created through subdivision of sheep runs. However, agriculture does not really figure in the economy of Manapouri, with Te Anau acting as the main rural servicing centre, and to a lesser extent, Tuatapere and Lumsden. At the time of our fieldwork there was some uncertainty in the district's farming sector, due to delays in Ngai Tahu's decision about taking up purchasing options on state owned farmland. According to a farmer interviewed for this study, this was causing farm managers and leasees to put off farm development and maintenance work.

Tourism is largely centred on Te Anau with its 25 or so hotels and motels, bed and breakfast houses, home stays and backpacker hostels, restaurants and cafes, and shops. Manapouri tends to be the base for tourism focussed on Doubtful Sound, though as one local interviewee noted, "*Manapouri tends to hang off Te Anau*". Te Anau has the advantage of being the main point of access for Milford Sound, which is on the itineraries of international package tours. However the whole district's tourism itself tends to "hang off" the Queenstown industry where the major in-bound tour companies and hotel chains are located.

The district has a significant fishing industry. According to a local industry informant, there are about 16 crews based in the district with the fleet operating out of Milford Sound. Lobster (crayfish) fishing, which takes place between August and February, makes up about 90% of their business, and albacore tuna fishing makes up 10%. An onshore processing and packing plant, which has holding facilities for the export of live lobster, is located at Te Anau. This plant employs about three permanent staff as well as seasonal workers. In the past it had up to 120 boats supplying it, though in the past five years a lot of fishers have quit the industry and left the district due to reductions in the total allowable catch and individual quotas for lobster.

Electricity production is not a major player in the district economy, even though it is a multi-million dollar industry of national significance. With the long distance commuting of workers, Manapouri and Te Anau appear to be gaining little direct economic benefit from the new round of construction, other than provision of contracted water transport services, some supply services, and limited amounts of house letting. Several firms have obtained contracts for servicing and site rehabilitation, while some locals are working on the project construction and at the workers hostel.

Over the past 15 years or so there have been several private sector proposals to export fresh water abstracted from the Deep Cove tail race. None of these, however, have proceeded beyond feasibility and environmental studies.

The Economy of Manapouri

Tourist trips to Deep Cove, Doubtful Sound and the other fiords were initially developed by Manapouri-resident entrepreneurs. Combinations of adventure and nature/eco-tourism, such as sea kayaking, guided tramping, along with hunting and fishing, have developed in Doubtful Sound and the Fiordland National Park, with several Manapouri operators involved. Pleasure launches operate from Pearl Harbour where Fiordland Travel also has an office. According to local small tourism operators, Fiordland Travel dominates the industry and vigorously protects its interests, for example, by objecting to applications for resource consents and DOC concessions. These operators reported feeling "squeezed" by apparent anti-competitive practices by the bigger players, and a lack of market visibility for their products at visitor centres and local

hotels. Local informants reported that international tourists to the area are mainly Europeans, and most are independent travellers staying in backpackers hostels, at the motor camp, or in campervans. The main visitors in the Christmas/New Year holiday period, estimated to number around 600 in 1996, come from Otago and Southland (Southland district Council, 1999). Locals view Manapouri as a “*boat-oriented lake, with beaches all around it, good fishing - its an outdoors place ... The visitor season generally begins when the Milford Track opens and ends when the track shuts*”.

As mentioned previously, at the time of our study several local residents were still involved in power station operations, while a small handful were working on the second tail race tunnel. Some of their income gets expended in the local shop (attached to the Cathedral Café), the hotel and garage. Most people, though, do their main weekly shopping in Te Anau, and occasionally travel to Invercargill for big purchases and “shop-ups”. Local businesses are largely reliant on the tourist season trade (October to April) and summer holiday visitors to see them through the rest of the year.

Local Businesses

The Yellow Pages directory contains 15 business listings for Manapouri, although there seems to be about 24 businesses operating from or based in the town (Table 6). A high proportion are tourism-related enterprises, including accommodation and tour operators. Accommodation includes a hotel, several motels, an historic guest house, camping ground and a backpackers.

As noted above, the residents of Manapouri rely heavily on the wide range of retail, business, social and personal services in Te Anau.

Table 6: Businesses based in Manapouri - 1999

Category	Number of businesses
Food retailers, restaurants, cafés	3
Craft shops	1
Plant nurseries/landscapers	1
Accommodation providers/liquor/licensed clubs	6
Tour operators etc.	5
Professional & business services	2
Service stations & motor vehicle services	1
Painters & decorators	1
Electrical repairs/electrical contracting	1
Electricity generation/contracting	2
TOTAL	24

Note: Based on observation, telephone listings, information brochures and advertising.

Development & Promotion

During 1999 the Southland District Council undertook a consultative “concept” planning process for Te Anau-Fiordland which included a separate exercise for Manapouri. A draft plan was published in October 1999. It addressed local planning and development issues and proposals, including landscape matters. The plan is intended “to guide and assist in the co-ordinated development of the area” (Southland District Council, 1999: 4). It attempts to balance development with retention of the character of the local environment; and articulates a community vision for Manapouri that has several elements:

- an appealing township with a tranquil atmosphere;
- a haven for residents, family holiday makers and visitors desiring to experience nature;
- a mix of passive, low impact tourism and cottage industry, forming a strong local economy; and

- a district community of 600 permanent residents which is complementary to Te Anau and the “Fiordland Experience” (Southland District Council, 1999).

Proposals examined in the plan included upgrading of the Pearl Harbour vessel and parking facilities to enable commercial expansion, a pedestrian bridge over the Waiau River to provide easier access to the Fiordland National Park, a local walking track, a fitness trail, a mountain bike track, and ideas for landscaping the “town centre”.

Our fieldwork interviews revealed that there is internal discord in the local community over the extent of residential, business and other development in the township and along the lakefront road. New housing development was occurring along the lakefront road at the time of our fieldwork. According to local informants, bitter conflicts were reported to have broken out around the preparation of the Concept Plan. Some have concerns about what they see as environmentally inappropriate development of walking tracks, tourism infrastructure and facilities, signage, buildings and landscaping in the town and have objected to some proposals through the resource consent process. Others feel that such development is necessary for Manapouri to progress beyond a sleepy tourist backwater. The management of lakefront bush reserve regrowth (affecting some residents’ vistas) seems to be a focal issue. Such conflicts were reported by Bamford & Associates as being in evidence in the 1984, though not so intense as at present, and seem to constitute a “cultural” cleavage in local society.

Tourism promotion is done at various levels. Individual businesses all seem to have their own advertising brochures which are distributed around information centres, booking agents etc in Te Anau, Queenstown and even Christchurch, while a number have promotional internet sites. At the district level there is a Fiordland Travel-owned visitor centre in Te Anau and the larger operators have agencies and offices in other centres. In 1999, the Fiordland Promotions Association (with Fiordland Travel the most influential player) and the Southland District Council initiated a joint promotional effort (“Destination Fiordland”) to raise the visibility of Te Anau and Manapouri in the tourism marketplace. Among some of the priorities suggested for the programme was an independent VIN centre for Te Anau. The Southland District Council is itself very active in promoting tourism through the “Tourism Southland” programme. National-level tourism promotion tends to feature the scenic values of Fiordland, especially Milford Sound.

Employment and occupational status

At the 1996 census Manapouri had a total workforce of 135 persons, 70% of whom were employed full-time and 30% part-time. Between 1986 and 1996, the overall size of workforce declined by 16%, with the number working full-time decreasing by 29%. During this period the number of part-time workers actually increased by 53% indicating the casualisation of work that occurred with the implementing of the Employment Contracts Act. Two-thirds of the 1996 workforce worked in the town itself (Table 7).

Manapouri’s role as a base for electricity production and for tourism is illustrated by the 1996 sectoral distribution of the workforce (Table 7), with 16% (or approximately 21 persons) engaged in electricity supply, 38% (51 persons) in the wholesale/retail/hospitality sector, and 11% (15 persons) in transport and communications. There was a complete absence of local work in the community/social/personal services sector - whereas the data for Te Anau indicates an active, but slightly smaller than average, social service sector. Sixteen percent (21 persons) of the 1996 Manapouri workforce was engaged in primary production.

Table 7: Sectoral distribution of the resident workforce of Manapouri - 1996

Sector	Residents of Manapouri	Persons whose workplace is at Manapouri	Te Anau Workforce	New Zealand Workforce
Agriculture, forestry & fishing	15.6	6.7	8.8	9.2
Mining	-	-	0.3	0.3
Manufacturing	2.2	-	2.8	14.3
Electricity/gas/water supply	15.6	26.7	1.1	0.5
Construction	4.4	3.3	6.0	5.8
Wholesale/retail/hospitality	37.8	40.0	46.5	22.3
Transport/communications	11.1	6.7	10.5	5.3
Financial/business	4.4	6.7	5.7	13.1
Community/social/personal	4.4	-	15.0	23.0
Total number of persons	135	90	1,059	1,630,812

In 1996, Manapouri's residents had a much higher rate of participation in the labour force than New Zealanders as a whole (76% cf. 59%), and a noticeably lower level of unemployment than the rest of the country (Table 8). They also had a higher than average level of self employment.

Table 8: Employment status of the residents of Manapouri 1996

	Wages & Salary %	Self Employed & Employer of others %	Unemployed %	Not engaged in workforce %
Manapouri	55.9	18.6	1.7	23.8
New Zealand (TLA)	43.5	11.0	4.9	40.6

Table 9 broadly indicates that in 1996, Manapouri's working residents tended to be concentrated in the skilled and unskilled blue collar occupations and in sales and service jobs, while relatively very few were in white collar occupations. This reflects the sectoral distribution of the workforce.

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

Occupational category	% 1996 Manapouri workforce	% 1996 NZ workforce
administrators/managers	13.0	11.6
professionals & technicians	6.5	22.6
clerks	4.3	13.8
service/sales	26.0	16.3
agriculture & fisheries workers	13.0	9.4
trades workers, machine operators & elementary occupations	32.6	24.3
not specified	4.3	5.0
Total Number of Persons	135	1,630,812

Source: New Zealand Census 1986 & 1996

Household incomes and welfare benefits

The 1996 residents of Manapouri (aged 15 years & over) were slightly less dependent on benefit than the nation as a whole, with 32% receiving at least one form of income support (cf. 35% for NZ). The main forms of income support were the unemployment benefit (38% of total benefits cf. 20% for NZ), national superannuation (29% of total benefits cf. 40% for NZ), and the domestic purposes benefit (9% of total benefits - the same as for the rest of NZ). The relative balance of types of benefits reflects the age structure of the population.

The annual incomes for Manapouri households in 1996 were generally lower than the national and regional patterns, with relatively more households in the under \$50,000 bracket (64.7% cf. 55.8% for NZ) and fewer in the higher income bracket (Table 10).

Table 10: Distribution of Household Incomes in Manapouri - 1996

Household income range	% of households	
	Manapouri	New Zealand
\$20,000 & under	25.9	22.9
\$20,001 - \$50,000	38.8	32.9
\$50,001 & over	12.9	27.1

Source: New Zealand Census 1996

GOVERNANCE, INFRASTRUCTURE, AND SERVICES

Local government

Manapouri is under the jurisdiction of the Southland District Council, created in 1989 by the amalgamation of Southland, Wallace Stewart Island Counties and Winton Borough, with Manapouri and Te Anau originally being part of Wallace County. The Wallace County Council came into existence in 1876, with its headquarters in Otautau (Miller, 1975). The Southland District Council's main offices are in Invercargill, with a local office in Te Anau. The mayor of the District Council resides in Te Anau.

At the local level, Manapouri comes under the Te Anau Community Board. Manapouri is a community development area (CDA) with its own elected CDA Committee. The community board is mandated to deal with mainly ward infrastructure matters, including water supply, sewerage, roads, refuse collection, works and services, halls, parks and community recreational facilities, and to set priorities for local rates expenditure (Southland District Council, 2000). The CDA committee advises the community board and has some control over rates expenditure but does not set rates. It also manages some community facilities. Manapouri also has a district ratepayers association, which, according to local interviewees, was set up to fight the transfer of the MOW hydro village hall to the town.

Until the 1990's the NZED/ECNZ village operated as an semi-autonomous settlement, but when the properties were sold off and the infrastructure turned over to the district council, it came under the district's council administration.

District planning

The Southland District Council's District Plan covers the Manapouri area. Building and resource consent applications and planning matters are channelled through the Te Anau office, but handled at Invercargill.

Recent tourism-related development proposals which required resource consents included an application by locally based Fiordland Cruises to develop wharf facilities at Pearl Harbour. This attracted objections from

locals and Fiordland Travel who were concerned about the environment impact and effects on vessel movement and mooring, and the consents were not granted. The local objectors were seen by some as obstructing development and a subsequent resource consent application by the some of the harbour development objectors attracted retaliatory objections. The RMA process has become a vehicle for conflicts over development directions to be expressed and has served to escalate tensions within the community.

The Manapouri Scheme operates under its own legislation, gazetted lake operating levels, and the resource consents granted to the ECNZ in the mid 1990's which have been transferred to Meridian Energy. These 30 year consents set the minimum flows required in the Waiau River, and were arrived at after a proactive round of consultations with the key stakeholders, including downstream users. The construction of the second tail race tunnel also required consents for the various site buildings and deposition of tunnel spoil on the tail race outlet site at Deep Cove which are to be rehabilitated with extensive native plantings.

Infrastructure

Manapouri township has a reticulated water supply which is drawn from the lake to storage tanks behind the town. The town was reticulated for sewerage in the 1980's. The NZED enclave was constructed with its own water supply, drainage and sewage system. There is a community centre complex consisting of public hall (with attached library), swimming pool tennis court, and sport ground. The complex was donated by the NZED at the closure of the hydro construction village, but because of local concerns over ongoing costs to ratepayers at the time, the NZED agreed to pay the rates and for maintenance. This support has since ended. There are boat mooring, ramp, wharf, and fuelling facilities at Pearl Harbour. The town also has a wheelie-bin rubbish collection service provided by North Southland Transport, and a local rubbish dump. Local road maintenance is carried out by Southland District Roding Ltd, a former Southland District Council trading enterprise.

A local CDAC member reported that annual rates are around \$900 per property based on land value, though some commented that Manapouri's rates are higher than Te Anau's.

Local businesses report a very good freight and courier service, with six companies providing through services to and from Invercargill. Daily public passenger services to Invercargill are provided by two mini-van type bus operators. During our fieldwork interviews residents reported that transport to and from Te Anau is a problem, especially for those without cars.

Housing

At the time of the last census (1996), there were 184 private dwellings in Manapouri, 49% of which were occupied at the time and 51% were unoccupied - considerably more than typically found in New Zealand rural centres. The level of occupancy indicates a holiday settlement with a large proportion of baches/holiday homes (Table 11). The 1996 data on dwellings also indicates there was a high level of use of temporary dwellings (tents, caravans, boats etc) as long term residences. This possibly indicates the presence of disadvantaged and/or "alternative lifestyle" groups in the community at the time, though this was not evident during fieldwork. Of the occupied dwellings, about 70% were owned by their occupiers which is about average for New Zealand as a whole (Table 12). The remainder were rented out or provided rent free.

Table 11: Occupancy of Private Dwellings - 1996

	Number of Occupied Private Dwellings	Number of Unoccupied Private Dwellings	Total Private Dwellings	Temporary Dwellings as % of Occupied Private Dwellings	Unoccupied Dwellings as % of all Private Dwellings
Manapouri	90	94	184	26.7	51.1
All Rural Centres	29,349	6,275	35,624	3.1	17.6

Table 12: *Tenure of Occupied Private Dwellings - 1996*

Form of Tenure	% of Manapouri Dwellings	% of New Zealand Dwellings
Provided rent free	6.5	3.7
Rented	12.9	22.9
Owned with a mortgage	35.5	35.2
Owned without a mortgage	35.5	31.1
Total number of occupied private dwellings	93	1,276,332

The NZED “village” enclave was established at Manapouri, rather than West Arm as originally proposed, to entice people to come to the area to work, and according to a former worker “*various allowances kept people there*”. Rents were “*nominal*” and houses were allocated on the basis of family size and job seniority. The worker population appeared “*very transient*”, with “*24 moving through in the first year*” according to one long term resident. Originally the village was self-administered - a village within a village. The station superintendent had overall control, aided by a village committee, and the NZED maintained the 50 or so houses, infrastructure, and the immediate environment. A long term resident noted that “*originally Manapouri was two communities, and its still like that, because the village is in its own physical area*”. At the time of our fieldwork just over half of the 50 houses were permanently occupied, and included nine or so retired or redundant ECNZ workers and their families (some of whom operate their own businesses), three currently employed in power generation, and seven staff or workers on the tail race tunnel. The remainder were engaged in various forms of work in the district, or unemployed. Just under half the houses were holiday homes. One resident marvelled that his former NZED house which had cost him \$28,000 in 1978, now had a 1999 valuation of \$120,000. The general sell-off of the houses by the ECNZ in the 1990's was done in small lots to avoid upsetting the local market.

According to a resident, the construction village near Supply Bay was typical of MOW hydro town houses, i.e. a mixture of larger weatherboard “staff” and “regular 130” (650-700 sq ft) houses, with internal social segregation maintained by grouping the staff houses together. At the end of the construction (around 1976), almost all these houses were sold to private buyers and moved away, and the site was cleared.

Informants indicated that sales at Manapouri, especially the former NZED enclave, had slowed in recent times due to subdivisions on the lake front and at Te Anau. Three new homes have been built on the lakefront in the past year, reportedly at around \$200,000 each or more. Property values reportedly peaked in 1996-97. Some communities of Western Southland which had a population loss due to government restructuring of their resource industries in the 1980's experienced an influx of beneficiaries to take up the cheap housing created by a depressed market. However, this did not occur at Manapouri since the ECNZ houses were mostly purchased by former staff, and prices remained high.

Interviewees generally concurred that rental housing in Te Anau and Manapouri is hard to find and expensive. The tail race tunnel project staff were mostly renting the better quality houses in Te Anau, though rents have apparently not risen as a result of these new arrivals.

Health services

Prior to the construction of the Manapouri Scheme, residents of the district had to travel to Lumsden to consult a doctor. With the establishment of the hydro village the district got its first resident GP who relocated to Te Anau when the construction ended in the mid 1970's. There is no medical practice or facility in Manapouri and residents have to travel to Te Anau. There is a paramedic service at the tail race tunnel construction site, which is supplied through St John's in Dunedin. More serious accident cases are flown out direct to Kew Hospital in Invercargill. The main occupational health issues for construction staff are reported

to be strains, chemical burns, and chest infections and feet problems caused by constantly wet working conditions.

The Te Anau medical centre is owned by a community trust, serves as the base for the privately owned Fiordland Medical Practice. Personnel and services available in the district include:

- three resident full-time doctors and one part-timer;
- four resident part-time practise nurses;
- a resident public health nurse;
- a resident district nurse;
- a Plunket nurse;
- a midwife;
- several visiting specialists;
- two physiotherapists, who cover Western Southland;
- a visiting dentist, and dental clinic at the medical centre;
- a school dental clinic;
- a pharmacy;
- an ambulance service; and
- an overnight care facility at the medical centre.

In recent years the community struggled to retain control of the medical centre after it was put up for sale by the owning crown health enterprise. Ngai Tahu Developments attempted to purchase it, and the community trust was set up to find the \$90,000 and acquire ownership of the premises. Limited finances are an ongoing challenge to the trust. Health Services Community Consultation provides a forum for co-ordination of health services and action on issues. With a local emergency helicopter service and experienced operators, the district is well served for emergencies, especially within the rugged Fiordland National Park.³

Education

As with the medical service, prior to the hydro construction there was no local school at Manapouri. Younger children either went by school bus to Te Anau (or The Key) and older children went to boarding school or travelled to Lumsden. In 1966 an area and district high school opened at the hydro construction village about 8 kilometres away, catering for both primary and secondary students. When it closed in 1976, Fiordland College was established to serve the needs of the wider district. According to Manapouri residents we interviewed, the level of education in the district is high, with Fiordland College enjoying high status. However census data (Table 5) indicates that in 1996 the educational attainment of local residents was below average.

Te Anau Primary School is rated as decile 8, i.e. located in a relatively wealthy community. It had a roll of 240, with 11 teachers and teacher aids, in late 1999. Four school buses come into Te Anau, including one from Manapouri. According to the school, the tail race project brought in about 20 families, 12 families of whom had school aged children. The arrival of the 12-15 extra children in 1997 helped arrest a decline in the school roll, which had peaked at 265. The roll has since dropped, reportedly due to demographic change, rather than any particular event, however it remains “*quite cosmopolitan*”. It is also well resourced, and supported by the local community and businesses, with particular contributions from “pub charities” and Telecom.

Fiordland College takes Form 1-7 students from a catchment which includes The Key, Mararoa, Manapouri, Te Anau and Milford. According to the college, half of the 270 students in late 1999 travelled to school by bus. The roll increased at the startup of the Manapouri tail race project and the arrival of FDI staff, but has

³

District health services are discussed in more detail in the Te Anau case study (Warren et al; 2000).

been generally stable at around 260-270 for some years, though with a high turnover due to the nature of the local economy and industries. At the time of our study there were 20 teachers, 10 fee-paying students, and some Polytech and correspondence courses were being offered through the college.

College informants reported that most secondary school students have part-time and seasonal jobs, and develop good social skills because they are exposed to a wide range of people through their work. Senior students are also relatively well-off. The more able school leavers leave the district to attend university or teachers college in Dunedin, or Polytech. Others tend to obtain seasonal work in the town or district, but have employment problems in winter.

As noted previously, the college offers some vocational training. However there are no tertiary or adult training providers in the district. Frontline Training from Invercargill ran some computer training courses through the Te Anau Employment Centre. WINZ reports that some local employers use their "Jobs Plus" scheme to engage and train the longer term unemployed. The Polytech unsuccessfully attempted to set up its own courses in Te Anau. The Southland REAP service, and the Community Employment Group periodically offer adult education and enterprise management short courses and seminars. Generally the hotels of the area undertake their own hospitality and cooking training. Both Manapouri and district residents must therefore move at least to Invercargill to get access to tertiary education.

There are a kindergarten, a playcentre and child care centres in Te Anau.

Agencies

As outlined earlier, Manapouri has little in the way of services, relying on the agencies in Te Anau and Invercargill. The local shop acts as a NZ Post agency. There is no local bank or bank machine, so the Eftpos machines at the garage and shop tend to be used for getting cash. Both act as agents for courier and freight services.

The town has a fire station and volunteer fire brigade which is called on to deal with emergencies. Te Anau's large volunteer ambulance service cover Manapouri. The Te Anau Police Station also serves Manapouri and Milford. It has three police officers, a receptionist and a part-time civilian volunteer who deals with firearms licensing. The station also covers for Lumsden as required. Local police work involves dealing with searches and rescues in and around the National Park. Most local offending related to property theft and damage, and disorderly behaviour due to alcohol. Manapouri is considered by local police to be "*a quiet little town, especially before the tail race tunnel project*", though is reported to have an increase in property crime, especially theft from workers cars parked unattended for long periods of time at Pearl Harbour.

The only other government service is the Department of Conservation local area office and visitor centre, though Landcorp has a farm management office at The Key. Work and Income NZ (WINZ) provides a visiting employment and benefits service through the Employment Centre. Essentially residents of Manapouri generally have to travel to Invercargill to get access to most government services.

In the absence of services in the district, various community social service groups have developed including, the Fiordland Community Organisation (FCO), which acts as a coordinating agency for a range of groups and services and has a community workers and a resource centre in Te Anau; the Employment Centre which acts as a contact point for WINZ services and as a job agency and is partly funded by various government grants; a Citizen Advice Bureau; and the Medical Centre Trust. The FCO employs a full-time coordinator using various government grants.

There is also a relatively high number of volunteer-based social and support groups services, some of which receive funding support from the Southland Community Trust. These include, among others, Accident Rehabilitation, AA, Al-Alon, Cancer Society, CCS, Budget Advice, Add Parent Support Group, Life Education, Multiple Sclerosis Support, Neighbourhood Support, Parenting Courses, Special Needs Children

Support, and Weight Watchers. These are in addition to the pastoral support services of locally-based or visiting clergy. Some Manapouri residents are active in such groups. Family counselling services are provided by a visiting specialist.

COMMUNITY

Community identity and values

As a community, Manapouri is not really separable from Te Anau. The older, long term residents form an identifiable group who are often keen to see the town develop, and have been historically active in local issues. They also show a frontier-settler attitude to life and have tended to be entrepreneurial. Their desire for improvement has often conflicted with the reluctance of bach owners to have to contribute to services and amenities (such as water and sewerage reticulation).

Blended in with these residents are the former (and a few current) electricity production workers who purchased their former NZED/ECNZ homes and settled permanently in the town. Local people interviewed during our fieldwork noted that in the past the electricity workers, like government sector workers elsewhere, were fairly transient, (moving often within the NZED/ECNZ structure), were inward looking as a community, and, because of shift work, not so involved in local affairs. The social and physical separation of the NZED worker families was often raised during our fieldwork interviews with both workers and others: *“they tended to talk work and shop”, “the wives were at a loose end and consequently there were affairs and a high rate of relationship breakup”; “life in the ‘village’ was very incestuous”; “it was hard to get the NZED people involved in community activities and it was something that came from the type of work and the jobs - whereas other Manapouri residents were used to ‘making things happen themselves’”.*

Some interviewees recognised that the formation and development of Manapouri was seriously inhibited by the decision of the MOW to place the hydro construction village on its own site at Supply Bay, rather than closer to the existing settlement, and the subsequent decision of the NZED to build a self-contained workers’ *“ghetto”* attached to the edge of the town, rather than spread the housing through the existing village. The social separation this engendered caused problems for the workers families, which required intervention by social workers. Some families also chose to live out of the village. One informant concerned about local development also claimed that *“the original settlers here were conservationists, but the area changed when the NZED arrived. The power workers brought a particular attitude with them ... they came here because this was where their job was ... they were urban people and so the place became urbanised”*. As outlined, over the past 5-10 years with the selling off of the workers housing, the large reduction in the number of workers, and the reduced corporate profile of the industry, the social distinctions between the electricity workers and others have broken down somewhat. As old time resident put it *“the ex-NZED people have become part of the area”*.

The more recent settlers include out-doors and alternative life-style oriented people, and retirees from around Southland who are drawn the lake environment, the tranquillity, and the proximity of the National Park. Some of them are also the new tourism entrepreneurs. The non-resident holiday home owners are not very evident except in summer, tend to focus on the quality of the recreational environment, and generally only get drawn into issues of local government rates and services. They are said to be typically against change.

Organisations and leadership

With Te Anau so close Manapouri’s residents tend to band together into groups to represent their particular interests within the district. For example, the Te Anau district telephone book lists a small handful of community groups for Manapouri, including the CDA committee, Community Library, Ratepayers Association, Fire Brigade, and the Manapouri Boating Club. Local leaders tend to be longer term residents

and/or business operators. In addition to the support groups and agencies outlined above, Manapouri residents participate in (and sometime lead) Te Anau groups, among which there are:

- 4 service and chartered clubs (including Lions, Rotary and the Te Anau Club);
- 8 churches or church-based organisations;
- 29 sports clubs, and;
- 28 hobby, interest, cultural and arts groups or societies.

As occurs in smaller towns throughout New Zealand, clubs and societies tend to come and go depending on the presence and enthusiasm of individuals, and with a relatively transient population the district struggles at times to sustain its groups. According to community workers and residents, some of the families that arrived to work on the second tail race construction have become involved with the community and active in leadership roles in clubs and societies, and at the end of the project, their contribution will be sorely missed.

Social problems

Community workers report that with its emphasis on tourism and seasonal work, Te Anau is a “*party-style town*” and a “*men’s town*” with macho attitudes to drinking and relationships evident. Consequently alcohol/drug, and relationship services are “*overloaded*”. Also young people have access to money through the abundant part-time work, and the “*bad habits*” of itinerant seasonal workers rub off on to them. Other problems relate to the relative transience of the population, and a lack of extended family support to fall back on.

However these sorts of drug and alcohol problems were not reported by Manapouri residents, though during fieldwork, the “*die hard, do-it-yourself, frontier*” attitude and approach to life noted by one community worker (and during social impact studies in the 1980’s) was in evidence. According to local residents interviewed during this study, the social problems in Manapouri tend to arise from the transient population and in unemployed families. The limited petty crime is attributed to recently arrived children and youth.

Maori

The 1996 census recorded approximately 24 (or 11%) of Manapouri’s residents were Maori, and that generally the Maori population of the wider district was growing. This was attributed by community workers to the arrival of Maori to do tree planting in the district, to work on the tail race tunnel project, and for seasonal shearing. Maori families “*come and go ... there is no marae or community centre for them*”.

At the time of our fieldwork some informants reported a degree of “*stress and resentment*” in the district due to the lack of resolution of Ngai Tahu’s interest in purchasing Landcorp farmland, which was being held for treaty settlement. This included the ‘Stuart Block’. The lack of information and uncertainty was reportedly putting farm workers and agricultural contractors in limbo over their futures. Ngai Tahu’s subdivision proposals, involving 2,000 hectares of land near the town, includes a golf course (which received a resource consent in August 1999), and 15 lakefront lots which could be further subdivided. The plans and associated infrastructure and servicing issues were outlined in the Te Anau Concept Plan.

Women, Youth & Elderly

Women

Women are very active in the economy of Manapouri and the wider district. The tourism industry especially generates large numbers of part-time and seasonal jobs, and women are in evidence running tourism and accommodation businesses in both towns. As a result, a child care centre has developed in Te Anau providing daytime care for up to 30 children. As in rural communities elsewhere in Southland women are very involved in leadership roles in local government and local affairs, and, from the listings of contacts for

community groups, they tend to be the backbone of community health and welfare organisations and clubs. Specific to women of the district are two church women's groups, a Fiordland Women's Club, the Women's Division of Federated Farmers, a women's golf club, and various hobby groups.

Youth

Some residents noted during our interviews that there were "*lots of unemployed youth in Manapouri*". Young people who want to have a career or go onto higher education leave the area, while those who stay on after high school encounter employment problems due to the seasonality of jobs. As noted previously, the district faces problems of alcohol and marijuana abuse among youth, which is not uncommon in small towns throughout Southland. The district has social workers specifically focussed on youth, and police organise youth events, e.g. trips to "Blue Light Discos" in Invercargill.

The "youth problems" noted by Manapouri residents are described as "*ongoing mischief - petty theft, petrol siphoning, trespassing*" and attributed to idleness due to unemployment.

Elderly

The most recent census data indicates that Manapouri, like Te Anau, has a lower than average proportion of those aged 60 and over. According to a local services worker, the elderly are not really able to stay in the area once they become dependent because of a lack of pensioner housing, retirement homes, a hospital and other social and health services. The Te Anau area is "*a young person's place with people here for the money rather than community life*" and "*lacks social support for the elderly*".

CONCLUSION

Until the 1990's, Manapouri could be considered, at least in part, an energy production-based community. The restructuring of the NZED and ECNZ over the past 12 years, with its major reduction in the number of Manapouri hydroelectricity production workers combined with the sell off of the ECNZ worker housing, effectively broke the economic and social link between the community and the power production sector. Socially, the few remaining power workers are now largely indistinct from the rest of the community, unlike in the past. Furthermore, while there has been a new round of expensive hydro construction, in the form of excavating a second tail race for the Manapouri Power Station, it has had relatively little social and economic impact (positive and negative) on the town.

During the 1980's and 1990's, the number of locally-based tourism business has increased, and there has been an expansion of tourism business in general. The tourism sector has therefore become the main employer in Manapouri. Some in the community see the industry, which relies on the scenic and natural qualities of the local environment and the Sounds of Fiordland, as presenting a threat to that environment, especially if carried to excess. Others believe that without tourism-related development, and town growth, Manapouri will be condemned to being a backwater in the economy and society of the Te Anau area. The tension between these two perspectives is plainly evident at the turn of the century.

Manapouri developed as a holiday and retirement settlement for the people of Southland, and remains so today. Alongside this, the development of local roads and communications has also made the town a dormitory suburb of Te Anau, with the permanent community struggling to retain a separate identity. From our study, it was clear that Manapouri exists, socially and economically, in the shadow of Te Anau, and is today closely dependent on Te Anau's fortunes, which are themselves largely tied to the resource-dependent industry of tourism.

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