

NGAI TAHU CLAIM - WAI-27

MAHINGA KAI

EVIDENCE FROM THE WAIHORA AREA

NGAI15/B7

Mahinga Kai, evidence from the Waihora area,  
including the submissions of

James Peter McAloon,  
Mere Kopupu Elizabeth Teihoka (Hamilton),  
Catherine Elizabeth Brown,  
Morris Tewhiti Love,  
Rewi Brown,  
Donald Robert Brown.

I N D E X

Evidence from the Waihora Area

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NGAI TAHU CLAIM (WAI-27)

EVIDENCE OF JAMES PETER MCALDON

LEGISLATION AFFECTING WAIHORA (LAKE ELLESMERE)

I, JAMES PETER MCALODN, state that my qualifications are as previously given to this Honourable Tribunal, but that since February 29, 1988, I have been employed full time by the Ngai Tahu Maori Trust Board to assist with the work of this Claim.

In this submission to the Tribunal, my intention is to present a brief outline of the legislation affecting the mahinga kai and the lands around Waihora of Lake Ellesmere.

1. Mr Evison has already presented evidence on the purchase of Kemp's Block in 1848. For our purposes it is most important to recall two points:

i) Kemp was presented with some resistance by Ngai Tahu to his price of £2000. The terms on which that price would be accepted were expressed by Tikao as follows: "If I accept your offer, I expect to have returned to me the eel weirs, the mahinga kai, the places of settlement, the burial places, and also additional reserves out of the land." After a full day of argument, Kemp agreed to this.

ii) The Ngai Tahu understanding of the boundary of Kemp's Purchase was that it ran, in part from Kaiapoi pa to Otumata (the spur near modern Halswell) and thence to Taumutu. Thus most of Waihora and all of Kaitorete Spit, as well as some lands on the shore of Waihora, were never sold to the Crown.

In light of this evidence, the Crown has under the Treaty of Waitangi no right to commit any action that would prejudice the mahinga kai of the Waihora region. The Ngai Tahu claim

to mahinga kai of the lands east of the boundary to which Mr Evison has referred rests on Kemp's promise and on the fact that they never sold it.

2. In this regard, legislative breaches of the Treaty of Waitangi and of Kemp's promise begin in 1848-49 when Walter Mantell was sent to mark out the reserves agreed to by Kemp. Mr Evison has already discussed the fact that Mantell was ordered to keep those reserves as small as possible, and to ignore mahinga kai. He has also told you of the 1868 sitting of the Native Land Court which failed to provide satisfaction for Ngai Tahu.

In 1876 Parliament passed the Ellesmere and Forsyth Reclamation and Akaroa Railway Trust Act. The preamble to this Act stated its intention :

Whereas great public benefit and convenience would arise from the drainage of Lakes Ellesmere and Forsyth, in the Middle Island of New Zealand, and from the reclamation of land from the said lakes, and the formation of a line of railway to Akaroa Harbour in the said island...

The Act went on to establish the Ellesmere and Forsyth Reclamation and Akaroa Railway Trust. This was to be funded out of the proceeds of the sale of Crown lands in Akaroa and Wainui and the Little River Road Board Districts. I have not been able to identify these lands but I would suggest that it is likely that they include some of the lands on the Peninsula that Ngai Tahu did not wish to sell.

The matter of draining the lake had been an issue in Canterbury provincial politics for some years before 1876. There are three references in the Journals of the Canterbury

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Provincial Council to the matter, and in 1870 temporary reservation of the land within the highest flood lines of both Waihora and Wairewa (Lake Forsyth) were made by the Provincial Council. The debate in Parliament in 1876 also showed that there was a considerable amount of pressure for drainage of Waihora. Although the 1876 Act referred simply to the draining of the lake, the debate showed that what was envisaged was a partial draining of the lake to its lowest level. This would leave about 15 000 acres of the lake's 70 000 acres drained.

3. For some reason, the 1876 Act was effectively repealed by the Railways Construction Act 1878. This provided that all money received by the Trust established in 1876 should go to the Public Account for the railways to Little River and Akaroa, and from Amberley to Waitaki. Handard does not show why this occurred but I would suggest that the economic climate had made large drainage works unpalatable to the Government. This, after all, was the beginning of the 'Long Depression'. The 1878 Act also declared extensive lands around the side of Waihora to be 'Crown lands of special value' and provided that the proceeds of their sale should be applied in the same way as the other money mentioned.
4. In 1888, the Ellesmere Lake Lands Act provided that protective works to keep lake overflows from affecting the lands referred to in the 1878 Act should be constructed. This Act also provided that any of the rivers flowing into Waihora could be diverted or stopbanked. The sale of the lands referred to was to pay for the work. The lands included in the Taumutu Commonage (to which I shall refer later) were exempt from this Act.

5. In 1893, with the return of economic prosperity, the draining of Waihora was again the subject of legislation. The Halswell River Drainage District Act vested 2281 acres in the Selwyn County as an endowment 'to provide funds for the purpose of removing any obstruction to the flow of the Halswell River through Lake Ellesmere to the sea.' This meant maintaining the opening of the lake in a permanent state, which would have, I suspect, caused a significant lowering of the lake level.
6. In 1894 the Lake Forsyth Drainage Act vested 1019 acres in the Akaroa County as an endowment for 'the purpose of letting out Lake Forsyth into the sea in times of flood.'
7. In 1905 the Ellesmere Lands Drainage Act vested further land, to the amount of 205 acres, in the Selwyn County as an endowment for drainage of Waihora.
8. In 1912 the Ellesmere Lands Drainage Amendment Act vested the Ahuriri Lagoon in the Ellesmere Lands Drainage Board, and gave the Board authority to drain the lagoon, to lease land gained by this method, and to apply the revenue so gained for further draining of Waihora.
9. There was, however, a problem with the 1912 Act: in 1895 the Reserves Disposal and Exchange Act had vested the 166 acres on the south bank of the lagoon in Ngai Tahu for fishing and other purposes. The 1912 Act said that nothing in the Act would prejudice Ngai Tahu fishing rights 'which may exist...with respect to any part of the Ahuriri Lagoon which for the time being is not...drained and reclaimed'. Yet the effect of the



1912 Act was to place Ngai Tahu fishing rights over the lagoon at the discretion of the Ellesmere Lands Drainage Board. This was noticed by Ngai Tahu's Parliamentary representatives, Taare Parata in the House of Representatives and Tame Parata in the Legislative Council. These two waged a vigorous though unsuccessful fight to have the Bill dropped or modified.

10. In 1917 the Reserves and Other Lands Disposal Act placed the lands with which the Ellesmere Lands Drainage Board had been endowed in 1905 under the control of the Ellesmere County Council.

11. In 1924, section 383 of the Land Act placed all the lands described under the 1876 Ellesmere and Forsyth Reclamation Act and the 1878 Railway Construction Act that had not already been disposed of under perpetual lease as Crown lands. The revenue was to repay costs of survey, drainage, and railways.

12. I turn now to the Taumutu Commonage. This area of Maori land was set aside for Ngai Tahu in 1883 out of some of the lands first set aside for the 1878 Railways Construction Act. The area was 770 acres, and the land was granted to Ngai Tahu as a lease in perpetuity free of rent or other cost. The Act allowed the Crown to regain any of the lands which it needed for public works.

13. In 1906 the Taumutu Native Commonage Act vested the land in the Public Trustee 'for the use and benefit of such Natives as the Native Land Court...determines.' Although this Act gave the land the status of Maori land, which had been lacking in the 1883 Act, the Trustee was given discretion to lease

'any portion of the said lands not needed for the use or occupation of the Natives, for any term not exceeding twenty-one years, in such manner and subject to such conditions as he thinks fit.' As was usual, the rents were to be applied by the Trustee for the benefit of the owners. This lease, it should be noted, was not a lease in perpetuity.

14. The 1955 Maori Reserved Land Act, in section 8, gave the Maori Trustee (who had replaced the Public Trustee) 'authority to do all such things as he considers necessary for the due administration thereof, and which are, in his opinion, in the interest of the beneficiaries on whose behalf the land is administered.' This included, in 8(2)(e), issue leases on any terms thought fit. Section 27(2) gave lessees the right to buy a lease in perpetuity by paying the reversionary interest of the Trustee. Thus, by the Act, leases in perpetuity could be gained over the Taumutu Commonage, there being no duty on the part of the Maori Trustee to consult with the owners.

15. From evidence in the files of the Maori Land Court and the Maori Trustee, Christchurch, whose help I acknowledge, this seems to have happened in the mid 1960s. One perpetually renewable lease is shown as commencing in 1966.

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MAHINGA KAI  
(Waihora)

EVIDENCE OF MERE KOPUPU ELIZABETH TEIHOKA (HAMILTON)

MERE KOKUPU ELIZABETH TEIHOKA (HAMILTON) states:

My tribes are Waitaha, Ngati Mamoe and Ngai Tahu. My ancestors include Te Ruahikihiki and have lived at Taumutu all of my life. As a child I lived with my family here next to the marae - just across the creek. We used to eat food that was gathered around here - puha, watercress, eels, herring, flounders, inaka, smelts, whitebait. Everyone who lived here used to eat the same kinds of food.

My dad and my granddad both were fishermen. We had a batch down at the lake and used to go and stay there for weekends.

There used to be a large pipi bed in the lake - we used to have a feed of pipis regularly. I don't remember when they disappeared - perhaps when I was at school.

When I was a child the lake was very different from what it is now. It was much higher, was clear and had a shingle bottom. This didn't change until after I was married in 1936.

We used to gather our eels from the Koru. The creek below the church - from the creek that feeds the lake. The best eels were from Muruwai (Coopers Lagoon). These eels were thinner skinned. We used to split, salt and pepper, dry and then boil them. Pawhara them and store them for the winter. The time to catch them was March-April. The last moon in April I think it was.

We didn't catch the eels in the lake and not when they were migrating. They did this in February/March when the sea,

the waves, were coming over. The beach was black with them. They used to tumble and twist. You could have walked across them. When they came back - mostly when the lake's open - people catch them while they're whitebaiting. They are rolled up in balls - lots of them - like golf balls - they call them glass eels. I didn't believe they were eels when I first saw them and was told they were eels. I wouldn't believe them.

I was once told that when they used to open the lake they used sticks (flax sticks) and shovels, and then later horses with scoops. Of course the lake was much higher then.

There used to be plenty of eels for everyone - now there's nothing in the creeks and you can't even get down to it. Its slimy and there are 'Trespassers will be Prosecuted' notices!

When they first started eeling commercially they used to bury the small eels. They didn't put them back in the lake. They used to get Giltrap with his front end loader to dig big pits to bury the small eels. Tons of them, hundreds of tons of them. There's one hole still there yet.

We all used to use the lake. Pakehas as well as us. We used to swim. There was a wharf. We used to dive from it. We also used to have cricket and football down on the commonage. We went to the commonage because it was too small where the wharf and aquatic club was.

The aquatic club and public subscription paid for the artesian well being put in at the commonage. Before that people from the Point (the Fisherman's Point - a landing reserve - on Commonage land Block ) came up to the pa for their water. The council later rigged up a ram to fill a tank at the point for water. We had a communal pump for everyone to use. The water was beautiful.

We got the power about 1954. I'm sure it was October 1954 and we're still paying for the thing. It was supposed to be done in ten years.

The lake has deteriorated so much. It was 1933 when my future husband Roy Hamilton bought my granddad's house and came here to fish. When I had a young family I can remember the black flounders were so big that only 21 would fit in a case that now 5-6 dozen fit in. Old Bob Wallace used to sit on the case and I had to nail it down for him.

One flounder would give Roy and I and the 3 kids two meals. They (the kids) wouldn't eat their flounder unless it was 'caked' - battered. The fish were so thick they had to be sliced so they would cook through. Now the flounders are so poor.

During my granddad's time Taumutu was a refuge for many people of different nationalities. One didn't need a licence for fishing. There were never many Maori fishermen. The pakehas have always been the commercial fishermen. Our people fished when they wanted food.

When we went eeling some of the pakeha families - The Gullivers, Jock Patterson and Ron Morton used to go with us. Three families, us, the Nutiras and the Martins used to go out together. Jack Te Koa (New Zealand, Nutira) had so many whatas over there, dad here and old Peti over there. The three families used to work together to pawhara them. They were left to dry - covered at night - the moon mustn't get on them at all. Beautiful - they were beautiful.

When I married Roy I shifted to live at the point. Today there are 13 households at the Point including me. I am the only Maori the other 12 are all pakeha. According to the Council I am a 'squatter'.

Of the 12 households ten are involved in fishing or get their income from the lake. Those households are living

rent free, rate free on our land and getting their living from our lake and I am called a 'BLOODY SQUATTER'.

I think they have been there long enough.

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MAHINGA KAI

EVIDENCE OF CATHERINE ELIZABETH BROWN

Waihora(Ellesmere)



My name is CATHERINE ELIZABETH BROWN. I am a lecturer at Christchurch Teachers' College where I am Head of the Art Department. I am a descendant of Te Ruahikihiki whose pa Orariki is the site of our Maori church here at Taumutu. At present I am chairperson of the Taumutu Runanga and the Mid-Canterbury Maori Committee, a Justice of the Peace, a member of the Te Waipounamu District Maori Council, and the Aotearoa Te Moana Nui a Kiwa weavers.

I am voicing the concerns of the Taumutu Runanga as well as my own. Our concern is about the land immediately around Waihora. I intend mentioning three areas in particular.

1. The Taumutu Commonage. Blocks 1 to 4 of this land are under lease in perpetuity and are administered by the Maori Trustee.

The owners have resolved that they do not want these leases renewed when they expire.

With the rent set at 5% of the unimproved value and only adjusted at the end of each 21 year period the owners are receiving nothing for their land. We feel that we are the poor relations of the lessees and are actually subsidising their farming.

We would like to see our rents set at a realistic level with the right of review every five years (tied in with valuation).

Because some of the blocks fall due for renewal or transfer

soon, we, the owners, do not wish the 21 year clause to be retained.

As an alternative to the present situation of administration we wish to administer our own land under either a Trust or Incorporation.

In 1985 we made our views known to the Maori Trustee and were told that under the Maori Reserved Land Act 1955 there was little we could do except buy out the current lessees, assuming they were willing to sell. As we were told, 'Leases of this type command sale prices very close to those for freehold land.' We were also told that the Department of Maori Affairs and the Maori Trustee would be sympathetic to requests for loan assistance to do this, but of course we would still have to pay such a loan back.

2. Ellesmere Landing Reserve. This reserve of 5 acres at Fishermen's Point was originally part of a 70 acre block set aside in 1867 for a landing reserve. In 1883 the Taumutu Commonage Act included the 70 acres in the Commonage, which was set aside for ourselves. In 1905 the Commonage was vested in the Public Trustee, who had the right to lease the land for our benefit. However the 5 acres were exempt from this Act of 1905. In 1920 the Government by Order in Council vested the control of the 5 acres in the Ellesmere County Council.

In 1972 our kaumatua Riki Ellison applied to the Maori Land Court to determine ownership. The Court stated that it was 'quite clear that only control of the reserve was vested in the Ellesmere County Council. The land remains Maori land.' It was suggested by the Court that the land ought to become Maori Reserved Land and the matter was adjourned for Departmental

action, 'if thought fit.'

However, the Department of Lands and Survey refused to allow this to happen. It was argued that the 1883 Act had kept the 5 acres as landing reserve and not as part of the Commonage. Because of this and because of the general public using the land as access to the lake and for baches, we did not get that 5 acres as a reserve. We however regard the landing reserve as part of the Commonage which belongs to us.

3. Kaitorete Spit. This area needs to be protected for its historical importance, its archaeological sites, and most of all for the pingao. Sand mining should not be allowed to continue. We have made representations on this in the past

Joe Karetai, the late chairman of the Te Waipounamu District Maori Council, told the Planning Tribunal, in hearing an application for sand mining, that Kaitorete was

strong in ancient Maori history; [there are] recent findings of Maori earth oven sites and carbon dating which suggest the occupation by Maoris of almost a thousand years ago. In this area and stretching far beyond are not only evidence of cooking sites, but plant life as well which served the culture of the Maori.

For centuries the Kaitorete Spit has been a north-south route for travellers along the East Coast of the South Island.... Kaitorete is no less important to the Maori people today. Respected Maori elders of the past said that the sand dunes probably contain many burial sites but there

is much uncertainty on the location of these. Palmer in his report on "The Kaitorete Dunes" stated "Discussions with the plant operator and observation of the debris piles reveal that archaeological sites are being uncovered and destroyed from time to time. At least one burial has also been excavated." Destruction of such sites and urupa should not be allowed as has happened in the past.

One important plant is ...Pingao. It is essential that historic areas growing plants like pingao should be reserved as cultural assets or resources to the nation.

....Supply of another white trailing plant closely associated with pingao art work is confined mainly to forest areas. This is kiekie, and our Maori people in the Canterbury region have to travel to the West Coast to obtain this plant.

Te Aue Davis in a submission to the Planning Tribunal in the same case said that

Pingao is used extensively all over the country for weaving. The demand for it is greater now than ever before. It is used for weaving kete, whariki, and tuku panels. The decorative tukutuku panels are woven with pingao and kiekie. When used in tukutuku panels it acquires a spiritual dimension, the patterns it fashions tell of the tribal history and legends of the area and its people....

Kaitorete has the largest continuous pingao plantation in the country. Apart from Kaitorete, Te Waipounamu has very little pingao.

Riki Ellison, in a report on the Ellesmere Coastal Area, prepared in response to a Department of Lands and Survey investigation of the area, pointed out that pingao is now very scarce in the North Island. Thus Kaitorete is a source of national importance.

Conclusion. With regard to the Taumutu Commonage. we know that the Trustee is now charging a more realistic rent. We would like to be able to administer the land and to eventually gain back control and right of use. We have in our whanau some young people who would like to farm and have emotional ties with the area, but cannot afford to buy their own land.

As far as the landing reserve is concerned it is part of the Commonage and as such should be returned to us.

Kaitorete needs to be protected for its historical significance, its urupa, and most of all because of the pingao.

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MAHINGA KAI

(Waihora)

EVIDENCE OF MORRIS TE WHITI LOVE

My names are MORRIS TE WHITI LOVE and I am an Investigating Officer, Surface Hydrology, Employed by the North Canterbury Catchment and Regional Water Board (NCCB). I have an Agricultural Engineering degree from Canterbury University.

I was asked to prepare this evidence by Mr Marsh and the people of Taumutu because I am Maori although not Ngai Tahu, and because of my background in water quality work. I wish to make it clear that I am giving this evidence in my personal capacity and not as an employee of the Board. The Board is aware that I am giving this evidence and it has made information available to me for inclusion in my paper; nevertheless, unless otherwise stated, the views given are my own and not those of the Board.

#### Maori Perspectives

My Evidence aims to put Waihora (Lake Ellesmere) in an historical perspective, from a Maori point of view and developing from this, the values the Lake and catchment have for the Maori today. This will be developed to indicate what a 'Maori' management regime of the Lake would be like.

#### Introduction

In Maori tradition Waihora (meaning 'water spread out') has also been called Te kete ika a Rakaihautu. Rakaihautu is the ancestor who brought to Aotearoa the Waitaha people in a canoe called Uruao about 850 A.D. This name means, the fishing basket of Rakaihautu and it points up the significance of the lake as a food source from the earliest times.

The lake margins were closely settled from early times with many small kainga (villages) living on the resource of the Lake, and the surrounding area. Throughout Aotearoa this food resource called Waihora was known especially for: tuna (eels); patiki (flounder); piharau (lamprey); aua (yellow-eyed mullet) and inanga (whitebait). Many other fish species are known as visitors to the Lake.

The Lake was opened to the sea by the Maori by digging a channel through the shingles of the spit to the sea in much the same way as it is today (except the location of the cut was probably different, and machines are used today). The Lake was left to fill to a higher level. One of the reasons for opening the lake was to effect drainage and prevent inundation of the area around Taumutu. The Lake was opened for fisheries purposes as well.

The importance of Te Waihora (Ellesmere) as a mahinga kai or food gathering area in the past is reflected by its continuing importance today as a commercial fishery. It is with concern that indications show the lake is declining as a food source with tuna (eel), patiki (flounder) and aua (mullet) declining in quantity and quality (Town 1985). It should also be noted that the Maori used the area for birding when water birds were gathered in great drives when they were moulting and unable to fly. Many of the foods were dried and stored for winter, including inanga, uaua (whitebait), kanakana or piharau (lamprey) and koura (fresh water crayfish).

Besides the resources of food, raupo, wiwi (rushes) and harakeke (flax) grew in abundance in the swamps on the lake margin and on the sandy spit were large areas of pingao, a native sedge used for traditional crafts. Today with the revival of traditional crafts the demand for these materials has increased but many of the areas where they grew have been changed by stock or other developments. The management of the lake may need to take these plants into consideration.



A lake, as important for its food and other resources as Te Waihora, had to have a guardian. Te Waihora's was Tuterakihaunoa, who lived in a cave at Whakamatakiuru (Fishermen's Point), Taumutu. Tuterakihaunoa was a protective taniwha who preserved the lake as a source of food and any breach of respect by any of the tribes occupying land around the lake was fatal (Tu Tangata - 1987).

It is difficult to determine the traditional use of the lake when lakes levels were much higher (up to two metres above present levels) and the lake was opened by the Maori people probably about once a year allowing the lake to fill to a high level. This had meant travel in the area was restricted as high water levels make large areas of wetland and the Kai-torete spit was the main path for north-south travel.

Modern management from a fisheries point of view could mean less openings, which would mean a higher lake level. The variation in level could help in eel feeding and feeding for water birds.

#### Waihora as a 'Fish-Farm'

For the Maori, Waihora was of prime importance as an eel (tuna) fishery. This has been recognised by the Pakeha in recent times with 847 tonnes of eels being taken in 1976, being 56% of the national total. This catch rate was not sustainable and catch rates declined markedly until allowable catch quotas were introduced.

Flounder (patiki) were and are an 'off-season' catch. When eel activity reduces in May, fishermen now (as did the Maori in the past) switch to catching flounder. The Maori dried eels and flounder as a means of preservation, sometimes doing this over a fire, effectively smoking the fish. Yellow-eyed mullet (aua) or herrings are also resident in

the Lake but are of lesser importance, as are whitebait (Inanga, kokopu), lamprey (piharau), and smelt (tikihemi).

It is felt at the present time, fishing in the Lake by Maori people for their own use is not productive, as the catches are so poor. In the future it is foreseen that the resources is managed by both the tangata whenua (local Maori people) and the Ministry of Agriculture and Fisheries, to meet both traditional and commercial demands.

#### Lake Water Quality

Water quality has traditionally been a serious concern of the Maori, and the declining quality of water in Lake Waihora is of particular concern because of the many Maori values which are sustained by the lake. From the mid-1970s onwards a considerable amount of research has been carried out with the aim of identifying the causes of this problem. Scientific understanding of the processes which have lead to deterioration of the water quality have now reached the stage where the North Canterbury Catchment Board (NCCB) has started to prepare "the Lake Ellesmere Resource Investigation Report".

The lake is now highly eutrophic i.e. nutrients have got into the water; these have provided food for various kinds of water plants and algae which have flourished on them and have in turn, absorbed some of the oxygen in the water, thus making it less able to support fish and the micro-organisms on which they feed. Eutrophication is a natural process with lakes and, to that extent, it is irreversible. What is of concern in this case is that the process has been greatly speeded up by the land management practices prevailing in the Lake's catchment area. At this point in time there is no evidence, because there is almost no research, on whether the eutrophication process is or is not harming the fish life of the lake. What is clear is that if eutrophication gets worse then the first thing that will happen is that the oxygen demanding fish i.e. trout and

flounder will be replaced by fish with lower oxygen demands e.g. perch. Carried to its extreme the process could mean an almost total loss of oxygen from the waters of the lake and thus a total inability to support fish life.

The Waihora catchment covers approximately 285,800 hectares running from Springfield in the West, the Rakaia River in the South, the Waimakariri River in the North and part of Banks Peninsula in the East. In the western catchment, which includes the foothills of the main divide, the Hawkins, Hororata, Waianiwaniwa and Selwyn Rivers all have their origins. Lower down these four become one river, the Selwyn, which flows into Lake Waihora. Nearer the lake, both on the lower plains and on part of Banks Peninsula, a number of small rivers and streams rise and flow into the lake. At most times, but especially in flood, all these rivers and streams carry soil sediments to the lake. Those sediments contain nutrients, particularly phosphorus and nitrogen, which are accelerating the process of eutrophication.

Phosphorus occurs naturally in soils but when those soils are managed by man for grazing or cropping the use of fertiliser, especially super-phosphate, increases the quantity of phosphorus and nitrogen in them. These farming practices also tend to produce accelerated soil erosion. The consequence is that with accelerated erosion more sediment, and therefore more phosphorus and nitrogen, get into the rivers and therefore into the lake. An unpublished report prepared for the NCCB in 1987 concludes that, on average, the annual phosphorus load on Lake Waihora has reached 94.2 tonnes. Of that figure about one-half i.e. 49.76 tonnes comes from the upper catchment in the foothills, and about one-quarter i.e. 18.92 tonnes comes from Banks Peninsula.

The significance of the figures coming from the foothills and Banks Peninsula is that these are areas of relatively steep hill country which has been largely cleared of its

native bush cover, and where extensive grazing is the principle land use. This combination of circumstances has been recognised in Canterbury as a recipe for accelerated soil erosion. Further, the removal of the original bush cover and its replacement with grasses means that heavy rain is not well absorbed, neither is its immediate force deflected by vegetation, and the result is accelerated scouring of the banks of river and streams. That this process is occurring, can be illustrated by the fact that these parts of the catchment contribute approximately 70% of the phosphorous load in Waihora, but comprise only approximately one-third of its catchment; the remaining two-thirds being the Canterbury Plains.

Phosphorus is not the only nutrient which produces eutrophication; nitrogen is just as important but it is not subject to as much research as phosphorus because its sources are so diffuse and, for this reason it is generally accepted that elimination of nitrogen concentrations is nearly impossible. As with phosphorus, nitrogen is normally present in most soils and is added to them in modern farming practice. Reduction of nitrogen loadings could only be achieved at the cost of a significant change in farming and land use practices throughout the whole catchment of the lake.

The cure for the declining water quality of Lake Waihora can be simply stated; the removal of the phosphorus, nitrogen and other nutrients. In practice it seems unlikely that any significant reduction in the annual loadings of these nutrients can be achieved at an acceptable cost. As noted earlier, the NCCB is preparing a report on the lake and I believe that this will include some recommendations designed to ensure that the nutrient loadings do not increase above present levels; any improvement is likely to be judged as financially impracticable.

My evidence is about Lake Waihora but in order to understand the significance of declining water quality in that lake, it is important to look at Lake Forsyth. The Tribunal will

have seen this lake when it went to Banks Peninsula. Like Waihora, Lake Forsyth is subject to occasional opening to the sea, although the timing of the opening is decided by the local Council and the NCCB has no say in that regime.

Lake Forsyth is now completely eutrophic with high phosphorus and nitrogen loadings and at some times its water is lethal to stock and humans. The problem is caused by a blue green algae, *Nodularia Spumigena*, which appears to flourish in water that is slightly saline as is the case with both Lakes Forsyth and Waihora. This algae flourishes at times of calm weather, especially during summer, and it tends to retreat when there are strong winds stirring up the lake surface.

Almost no studies have been carried out into the water quality problem at Lake Forsyth and it is not certain how the algae kill stock. There are two theories. The first is that if stock drink water containing the algae, then they are poisoned by the algae themselves. Alternatively, the algae may release toxins into the water so that it becomes the lethal agent. In either event, stock have died after drinking water from the lake, and the Board now sends out warnings to farmers when the climatic conditions are favourable to algae. The farmers are told to remove all stock from places where they can get access to the lake water. On average, these warnings are given every two or three years and may be in place for up to two months at a time.

I have already noted that there has been very little research done on Lake Forsyth. Having said that, it is recognised that it appears to have strong similarities to Lake Waihora and the NCCB scientists are concerned in case the latter goes the way of the former. That concern is serious enough for the Board to send staff to Waihora to look for *Nodularia Spumigena* whenever the algae is flourishing at Lake Forsyth. Examples of the algae have been found at Waihora but, at present, it is not possible to

say to what extent it will become a problem in the immediate future. It may be that it will never become a problem because of some as yet not understood difference in the characteristics of the two lakes. As an example, it could be that the surface of Waihora is subject to more wind exposure, thus making the environment less acceptable to algae. At the moment the scientists do not know enough to be able to predict if Waihora will go the same way as Forsyth, but they believe it might and are keeping a watch for any signs that it will.

Apart from problems with the quality of the water in the lake, there is a further difficulty in that the weed-beds in the lake were badly damaged in the Wahine storm of 1968. The evidence suggests that these beds are not recovering. This is a matter of some importance because these weeds are vital to the eel habitat in the lake, and because the current catch limits set by the Minister of Agriculture & Fisheries are related to past catches of eels in the lake. Unless the weed-beds recover it may well be that the catch limits imposed by MAF are unrealistically high and may have to be reduced in order to take account of the reduction in the sustaining resource.

It is difficult to see the condition of the lake improving. At best it seems likely that a wise management regime could only hold nutrient inputs at their current levels. To achieve any improvement at all would involve controls on the use of fertiliser over virtually the entire catchment area of the lake, and could involve stop banking a number of streams and rivers and afforestation of a considerable area of land. It seems unlikely that such wholesale changes in current land use patterns would be acceptable to the landowners involved.

#### Maori Input to Water Resource Planning

The Water and Soil Conservation Act 1967 has had a dramatic effect upon the control and management of water resources in

New Zealand. The Act vests the ownership of all "natural water" in the Crown and prohibits the extraction of such water or the discharge of effluent into it. These things can only be done if a "water right" is granted to permit them.

Since 1967, hearings for applications to take water, or to discharge effluent into it, have become more and more complex as the cost of not getting such rights has risen. Farmers seek rights to take water for irrigation and local authorities seek them to provide potable water supplies for rate payers. It is now realised that the water in our rivers and aquifers is a finite resource and the competition for that resource is becoming intense.

Rivers have always been used to carry away industrial effluent and human sewage. The right to use them for these purposes is very valuable since it reduces the cost of treating the effluent at the site where it is created. The granting of such rights involves an obvious conflict between the need of people to have pure drinking water and the need to get rid of the noxious by-products of a modern industrial society.

Over the years, the hearings of applications for rights to take water or to discharge effluent into it have become lengthy and increasingly complex, with much scientific evidence given for and against any major proposal. A good example is the hearing of the application by the Canterbury Frozen Meat Company Limited to discharge effluent into the lower Waimakiriri near Belfast. That hearing took place in 1983 and the special Tribunal which dealt with it was chaired by the late Honourable P.T. Mahon Q.C. The hearing took 3 weeks and nearly all of the evidence was given by scientists whose evidence would have been unintelligible to most laymen. Not counting the appendices, the Tribunal's report covered 67 pages of which 5 alone were required to spell out the terms of the right which the Tribunal recommended. Those pages (58-64 of the report) are annexed. Pages 58, 60, and 62 illustrate the complexity of the

chemistry and hydrology involved in such hearings, again, well beyond the understanding of most laymen. The economic imperatives for the applicants in that case are illustrated by the fact that, in order to get its effluent to the standard required by the water right, C.F.M. had to spend over \$5M in on site treatment.

The Water and Soil Conservation Act does not provide any specific recognition of Maori interests, unlike the Town & Country Planning Act 1977 which does. That is one of the reasons why there was no Maori input into the C.F.M. hearing.

Another reason for lack of Maori input at such hearings is the sheer cost of becoming involved. Most objectors to water right applications are represented by lawyers and call scientists to give evidence in support of their cases. They have to do that because the applicants have lawyers and call scientific evidence, which must be rebutted or the objection will necessarily fail. Very few Maori can afford to become involved in such exercises, especially because the Legal Aid Act does not recognise Maori Iwi or Hapu as recipients of legal aid.

These water right hearings are going on all the time. The applications range from the case of a dairy farming wanting to put his cow shed sweepings into a local stream, up through local authorities wanting to discharge partly treated sewage into a stream or estuary, to the C.F.M. situation. If Maori values are to become one of the matters to be considered in water resource planning, then Maori should be represented at these hearings.

Reluctantly, and only for the moment, I accept that Maori cannot afford to become involved in these hearings. For that reason I believe that the Water & Soil Conservation Act should be amended to provide that Maori values should be recognised and put into the balance at all water right hearings and in all catchment plans. Further, I believe



that when the Water Board experts are preparing their reports for water right hearings, they should be required to consult with relevant Maori interests and supply their reports to the relevant Tribal Authorities well in advance of the hearing. That would at least give a chance for the Maori to have an informed knowledge of what is going on and to make a balanced decision as to whether or not to become involved in any particular hearing.

The situation of the lower Waimakariri is of considerable significance and importance to the tangata whenua as it is through the lower Waimakariri that the small tributary streams are restocked especially by tuna (eel), inanga, pirarau (lamprey) and kokopu. If a full objection had been mounted to the C.F.M. application the expense and expertise required would have been considerable. Had there been some statutory obligation to consider Maori values this would have gone a long way to achieving what could be gained by a formal objection.

#### Maori Values

Maori spiritual values to do with Waihora are not easy to define fully. The Lake is seen by the Maori as in the form of the Patiki - the flounder with its mouth where the eels are said to enter the Lake (Selwyn River) in the early morning, with the outlet at the pito (navel) which is seen traditionally as being somewhere nearer the middle of Kai Torete Spit, as opposed to the present outlet to the south-west of the Lake near Taumutu. In the past lake levels were much higher and the spit development may have meant the lake could be opened at a different place than is presently the case. The area around the present mouth has been eroding. Adjacent to the burial grounds (Urupa) at Taumutu approximately two-thirds of the area has been eroded away since 1886 whereas further north the area has been steadily building up.

Management of the Lake from a Maori viewpoint would involve: opening the Lake to enhance the fishery; promotion of the regeneration of the weed-beds; any action that could improve the water quality of the Lake; including the control of bird numbers; control of the land use of the Lake margins and control of the use of the lake or inflow streams as a place to discharge sewage.

Maori people would like a direct say in the management of the lake with regards to the resources within the Lake.

NGAI9/C.

9. RECOMMENDATIONS

That the Board grant to Canterbury Frozen Meat Co. Ltd the following rights subject to the conditions recommended:

- (1) A right, pursuant to Section 21 3(B) of the Water and Soil Conservation Act 1967 with the consent of the Water Resources Council, to discharge up to 17,600 cubic metres per day of partially treated and mixed meat- woolscour fellmongery and pelt processing wastes at a maximum discharge rate of 500 litres per second to the South Branch of the Waimakariri River via existing 450 mm and 600 mm pipe outfalls located downstream of Dickeys Road Bridge. Expiry date: 31 May 1985.

Conditions

- (a) The concentrations in the effluent from all contributory sources for the following parameters shall not exceed the following respective maximum daily values and average values taken over any four consecutive weeks based on composite samples over 24 hours, one working day per week, days at random.

BOD <sub>5</sub>	Maximum value	17,700 kg d <sup>-1</sup>
	Average value	15,500 kg d <sup>-1</sup>
Suspended Solids	Maximum value	11,500 kg d <sup>-1</sup>
	Average value	9,500 kg d <sup>-1</sup>
Total Grease	Maximum value	5,000 kg d <sup>-1</sup>
	Average value	N/A
Sulphide	Maximum value	35 kg d <sup>-1</sup>
	Average value	24 kg d <sup>-1</sup>

- (b) The grantee shall carry out sampling of the effluent inclusive of the discharge from all contributory sources and shall supply the Regional Water Board each month the results of analyses of samples for the parameters in condition (a) together with measurements

of the volume of effluent discharged daily. All sampling shall be to the satisfaction of the Regional Water Board.

- (c) At such time as the grantee completes the relocation of its pelt processing operations and by not later than 31 October 1984 the maximum value of sulphide in the effluent shall not exceed  $20 \text{ kg d}^{-1}$ .
  - (d) Within the term of the right the grantee shall advise the Regional Water Board in writing within two weeks of the date on which the pelt processing operations effluent is removed from the discharge and of the date on which the new treatment plant was commissioned and discharging.
- (2) A right, pursuant to Section 21 3(B) of the Water and Soil Conservation Act 1967 with the consent of the Water Resources Council, to discharge up to 20,000 cubic metres per day of treated and mixed meat works wastes, woolscour and fellmongery wastes, to the South Branch of the Waimakariri via existing 450 mm and 600 mm pipe outfalls located downstream of Dickeys Road Bridge.

#### Conditions

- (a) the right shall issue from the date of commissioning by the grantee of its new chemical treatment plant and ancillary works programmed to effect an effluent quality commensurate with the parameters imposed for the discharge of treated wastes to the Waimakariri River by diffuser outfalls at the Old Highway Bridge;
- (b) the right shall expire not later than six months from the date of issue and during the term of the right the grantee shall provide a written monthly report to the Regional Water Board on the plant performance in terms of the effluent quality parameters imposed for the discharge of treated wastes to the Waimakariri River.

- (c) the concentrations in the effluent discharged pursuant to this right shall not exceed the following values:

BOD <sub>5</sub>	Maximum value	17,700 kg d <sup>-1</sup>
	Average value	15,500 kg d <sup>-1</sup>
Suspended Solids	Maximum value	11,500 kg d <sup>-1</sup>
	Average value	9,500 kg d <sup>-1</sup>
Total Grease	Maximum value	5,000 kg d <sup>-1</sup>
	Average value	N/A
Sulphide	Maximum value	20 kg d <sup>-1</sup>

- (d) the grantee shall carry out sufficient sampling of the effluent to reflect the performance of the plant towards compliance with the standards imposed for the discharge to the Waimakariri River and shall supply the results of analyses monthly to the Regional Water Board.

Results to include -

- (i) total daily discharge kg d<sup>-1</sup> for BOD<sub>5</sub>, suspended solids, sulphide, ammoniacal nitrogen, total fat and grease;
- (ii) maximum concentrations g m<sup>-3</sup> for suspended solids, sulphide, ammoniacal nitrogen, total fat and grease and floatable grease;
- (iii) average daily concentrations for BOD<sub>5</sub> and ammoniacal nitrogen;
- (iv) median value for faecal coliforms based on not fewer than 5 samples taken within a 7 day period; and
- (v) total daily volume of effluent discharged and maximum rate of discharge.

The frequency of sampling will be such as to indicate the day-to-day performance of the plant for the above parameters and all sampling shall be to the satisfaction of the Regional Water Board.

Sampling for sulphide analysis shall be in accordance with the method prescribed by the Meat Industry Research Institute of New Zealand Inc. (M.I.R.I.N.Z. 691).

- (3) A right, pursuant to Section 21 (3) of the Water and Soil Conservation Act 1967 to discharge up to 20,000 cubic metres per day of treated and mixed meatworks wastes, woolscour and fellmongery wastes to the Waimakariri River via a pipeline and diffuser outlets in the vicinity of the Old Highway Bridge. Expiry date: 31 May 1995.

#### Conditions

- (a) the right shall issue from the date of the commissioning of the new plant;
- (b) the maximum rate of discharge shall not exceed  $300 \text{ l s}^{-1}$ ;
- (c) when the flow in the river at the point of discharge is less than  $30 \text{ m}^3 \text{ s}^{-1}$  the grantee shall reduce the quantity of the pollutants in the discharge so that the ratio of any pollutant in condition (d) below, to the actual river flow, does not exceed the ratio of the maximum quantity of that pollutant as in (d) to a flow of  $30 \text{ m}^3 \text{ s}^{-1}$ . The Regional Water Board shall inform the grantee when the river flow is  $35 \text{ m}^3 \text{ s}^{-1}$  as advance notice of the possibility of flows falling below  $30 \text{ m}^3 \text{ s}^{-1}$ , and the grantee shall thereafter at weekly intervals obtain from the Regional Water Board advice of actual river flows for the purpose of reducing the quantity of the pollutants in the discharge when flows are less than  $30 \text{ m}^3 \text{ s}^{-1}$ ;

- (d) the quantities in the effluent discharged shall not exceed the following values:

BOD<sub>5</sub>: total 6 200 kg d<sup>-1</sup> at an average concentration of 310 g m<sup>-3</sup> at an average flow rate of 231 l s<sup>-1</sup> and at a maximum rate of 300 l s<sup>-1</sup> of effluent.

Suspended Solids: total 3 500 kg d<sup>-1</sup> at a maximum concentration of 175 g m<sup>-3</sup>.

Sulphide: total 11 kg d<sup>-1</sup> at a maximum concentration of 0.55 g m<sup>-3</sup>.

Ammoniacal Nitrogen: total 1200 kg d<sup>-1</sup> at an average concentration of 60 g m<sup>-3</sup> and a maximum concentration of 90 g m<sup>-3</sup>.

Fat, Oil and Grease: total discharge not to exceed 1 600 kg d<sup>-1</sup> at a maximum rate of 80 g m<sup>-3</sup>.

Floatable fat not to exceed 2 g m<sup>-3</sup> and that emulsified fat shall stay in suspension.

Faecal Coliforms: the median faecal coliform content of the effluent from 5 samples taken over each 7 day period shall not exceed  $2.8 \times 10^5$ /100 ml and the effluent shall not contain human waste.

Colour and Odour: the natural colour and clarity of the receiving waters shall not be changed to a conspicuous extent and shall not emit objectionable odours by reason of the discharge.

pH and Dissolved Oxygen: the acidity or alkalinity of the receiving waters as measured by the pH shall be kept within the range of 6 to 8.5 and the dissolved oxygen level of the receiving waters shall not be reduced below 6 g m<sup>-3</sup>.

- (e) the grantee shall carry out the following sampling for water quality analyses of the effluent from a sampling point to be established in the discharge pipeline below the last point of entry of all contributory sources of effluent. Sampling facilities shall be readily accessible at all times for sampling purposes by the Regional Water Board or its agents. All sampling shall be to the satisfaction of the Regional Water Board.

BOD<sub>5</sub>, Suspended Solids, Total Grease, Floatable Grease, Ammoniacal Nitrogen, Sulphide, pH and Temperature: composite samples taken over 24 hours on one day per week, days at random save that once every 14 days sampling shall include a weekend day.

Faecal Coliforms: 5 samples taken over each 7 days, days at random but not including more than one weekend day in any 7 day period.

Total and Soluble Phosphorus and Nitrate Nitrogen: random samples one day per week.

Heavy Metals: random samples, once monthly for arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver and zinc. Sampling for sulphide analysis shall be in accordance with the method prescribed by the Meat Industry Research Institute of New Zealand Inc. (M.I.R.I.N.Z. 691).

- (f) the grantee shall maintain a record of the daily quantities of the effluent discharged and the rates of discharge and the results of sampling shall be recorded separately for each day on which samples are taken; the results of analyses to be supplied monthly to the Regional Water Board;