

AWANUI RIVER FLOOD MANAGEMENT PLAN



Commerce Street, Kaitia, in 1958.

Acceptance and Amendment History

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AWANUI RIVER FLOOD MANAGEMENT PLAN

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1. INTRODUCTION

1.1 Purpose

The objective of this report is to set out in one, easily accessible public document:

- a description of the flood management issues affecting the catchment of the Awanui River;
- the measures that are being used and are being considered to reduce the risks of flood damage;
- the planned levels of protection;
- a programme for upgrading and introducing improvements to the scheme;
- a programme of maintenance and maintenance standards;
- the legal mandate for the scheme;
- the duties and responsibilities of the various stakeholders;
- provisions for minimising any adverse environmental impacts;
- how the scheme and its maintenance will be funded; and
- the process for completing the Plan including public and iwi consultation.

1.2 Need for the Plan

Flooding, both from the Awanui River system and from Rangaunu Harbour, has been a problem since the area was first settled well over 100 years ago. The urban areas of Kaitaia and Awanui are located on the floodplain of the Awanui River with the whole of the business district of Kaitaia, over half of the town, sited on a very active section of the floodplain. Were it not for the existing flood control scheme, floodwaters would frequently overflow the banks of the Awanui River and flow westward across the town to the Tarawhataroa Stream. In 1958, prior to the construction of a stopbank across the southern end of Kaitaia, floodwaters flowed over one metre deep down Commerce Street. Not only would a flood such as this cause considerable damage and economic loss, but it would also put lives at risk.

Various schemes have been implemented and structures built to reduce the frequency of flooding. Few people are aware of the scope of these works and how the various components of the scheme relate to each other. Changes have been made to the original works to increase the level of protection and while most of these have been undertaken by either a Government Department or local authority, and have been authorised under whatever statutory controls existed at the time, some works have not been authorised.

Policy 3 of Chapter 11 of the operative Regional Water and Soil Plan for Northland (RWSP) is:

To avoid, remedy or mitigate adverse environmental effects resulting from the maintenance of existing land drainage and flood control schemes, and any new works associated with those existing schemes.

Rule 27.02.01 makes land drainage and flood control schemes managed by local authorities controlled activities and requires such schemes to be managed in accordance with a management plan as set out in Appendix 17 to the RWSP.

The Civil Defence Emergency Management Act 2002 requires local authorities to take a comprehensive approach to hazard management and risk reduction. The Plan incorporates hazard identification and risk analysis using surveys and a computer model, and risk reduction using scheme works. Controls over land use in flood-prone areas, and emergency warning and evacuation procedures are matters covered by the Far North District Council in its District Plan and building consents procedures and in its community emergency response plan, respectively.

To enable the various stakeholders to understand how the scheme works, what benefits it provides and what responsibilities the stakeholders have, and to comply with the requirements of the Regional Water and Soil Plan for Northland, it has been decided to prepare the Awanui River Flood Management Plan. This Plan sets out what comprises the current Awanui River Flood Management Scheme and identifies some options for making improvements to that scheme. The Plan, together with any resource consents issued under the Plan and the benefit-exacerbator rating system by which the flood management scheme will be funded provide the baselines against which any changes can be assessed.

1.3 Scope

The Awanui River Flood Management Plan incorporates:

- the management of flooding within the catchment of the Awanui River and its tributaries;
- maintenance of the channels of the Awanui River, its tributaries, the Waipapakauri and Puckey's Outfalls and the Whangatane Channel in a manner that ensures the free flow of water;
- control of streambank erosion and other major sources of sediment that, on being carried down the Awanui River, increase the costs of maintaining the channels; and
- maintenance of stopbanks along the Awanui River, Tarawhataroa Stream and the Whangatane Channel, the Waihoe Stopbank, the stopbanks around the shores of the Rangaunu Harbour, including the Pairatahi River and Waipapakauri Creek, and the floodgates through these structures.

1.4 Management of the Scheme

As from July 2005, the Awanui River Flood Management Scheme has been directly managed by the Northland Regional Council within the Awanui River Flood Management Plan. The Far North District Council will continue to manage the Kaitaia Drainage Area and the land drainage assets associated with the area, and will manage stormwater within the urban areas of Kaitaia and Awanui under comprehensive stormwater and asset management plans. All these schemes will be complementary, with the effectiveness of each very much dependent on the others.

1.5 Relationship to Urban Stormwater and Rural Land Drainage Schemes

The Awanui River Flood Management Plan includes the management of the channels of the Awanui River and the Tarawhataroa Stream through Kaitaia and the Awanui River through Awanui. These channels are, to a greater or lesser extent, stopbanked to stop the Awanui River overflowing its banks and spreading through Kaitaia and into the Tarawhataroa Stream. There is also a major

stopbank across the southern end of Kaitaia to prevent floodwaters from spreading down the floodplain and into Kaitaia. Various drains discharge through the stopbanks and because the effectiveness of the urban stormwater management system is so dependent on these floodgates remaining operative, the maintenance of the floodgates is included as part of the urban stormwater management scheme.

All stormwater generated by rain falling within the urban (residential, commercial and industrial) areas of Kaitaia and Awanui will be managed according to the Far North District Council's urban stormwater management plans, which will support applications for resource consents during 2005/06.

Puckey's Outfall, Tangonge Drain, Pukepoto Main Outfall, Waihoe Channel and Waipapakauri Outfall, while also providing land drainage, are major flood overflow channels, collecting floodwater and helping to clear it from the land before it kills pastures. These major channels are also part of the Awanui River Flood Management Scheme. All other drains downstream of Kaitaia and some drains between Larmer Road and Kaitaia are managed by the Far North District Council under the Kaitaia Drainage Area.

1.6 Plan Preparation Process

While there is no prescribed process for the preparation of a flood management plan, the plan and various components and outcomes of the plan do follow or are the culmination of statutory processes. Under the Soil Conservation and Rivers Control Act 1941 (SC&RC Act), the Regional Council, as the catchment board for Northland, has a responsibility to minimise and prevent damage by flooding and erosion. The SC&RC Act encourages integrated management of flood control, drainage and soil conservation within a river catchment. In the case of the Awanui River catchment, the proposed management plan will integrate the efforts of:

- landholders, roading authorities and developers to reduce the loss of sediment from the land;
- landholders and the Northland Regional Council to manage streambank erosion;
- the Northland Regional Council to reduce the frequency, depth and duration of flooding of farmland and the urban areas of Kaitaia and Awanui;
- the drainage of rural land within the Kaitaia Drainage Area as managed by the Far North District Council; and
- the management of urban stormwater within Kaitaia and Awanui under a comprehensive stormwater management plan prepared by the Far North District Council.

A consultative procedure is being followed which has involved and will include:

- a review of previous reports and investigations into flood management within the Awanui River catchment (early 2003 to September 2004);

- informal consultation with stakeholders, individual landholders and residents to gain an understanding of the aspirations in respect of flood management (continuing);
- the Northland Regional Council approving the Proposed Awanui River Flood Management Plan as a consultative document (September 2004);
- consulting iwi on the transfer of the management of a waterbody from one local authority to another, as required under the Local Government Act 2002;
- discussing the Proposed Management Plan with stakeholders (October to December 2004);
- publicly notifying the Proposed Management Plan (9 November 2004) and written comments by 17 December 2004;
- from when submissions closed on the Proposed Management Plan on 17 December 2004, seeking to resolve any misunderstandings, conflicts or submissions opposing any parts of the management plan; and
- applying to the Northland Regional Council and Far North District Council for resource consents at the end of May 2005;
- including the proposed differential rating policy in proposed amendments to the Northland Regional Council's Long Term Community Consultation Plan and advising each ratepayer by letter as to how the distribution of differential rating will affect their properties;
- following appropriate review, reference and dispute resolution procedures to ensure the adoption of an approved Management Plan, and adoption of a rating policy before 1 July 2005. The application for resource consent was publicly notified in August 2005.

During this same period, the Northland Regional Council and the Far North District Council have negotiated and adopted a Memorandum of Understanding on the transfer of the Awanui River Flood Management Scheme from the District Council to the Regional Council, and on the ongoing relationship between the two Councils in respect of flood management, soil conservation and drainage within the Awanui River catchment.

2. DESCRIPTION OF THE AWANUI RIVER FLOOD MANAGEMENT AREA

2.1 Physical Description

The Awanui River and its major tributaries, Te Puhi Stream, Victoria River and Takahue River, with a combined catchment area above Double Crossing of some 20,000 hectares, have their headwaters on the northern slopes of the Maungataniwha Range, south of Kaitaia. These rivers flow on narrow floodplains towards the northwest, through a narrow gap or gorge between two low ridges at Kaitaia before spreading out onto an extensive floodplain between Kaitaia and where the river discharges to the sea in Rangaunu Harbour. (Map in Appendix A)

The Maungataniwha Range and the range of hills behind Pukepoto, due south of Kaitaia, are formed from Tangihua volcanics, a complex of several basic volcanic rocks of submarine origin, and accompanying sedimentary material carried into Northland in the Northland allochthon. The highest points on this steep, mainly bush-covered volcanic country are Tamatamahoe at 558 metres, Ratea 744m and Maungataureia 507m.

Major tributary rivers draining these ranges, the Takahue and Victoria Rivers and Te Puhi and Mangatoetoe Streams, which join to form the Karemuhako Stream, each have long narrow floodplains with one or two terraces above the lowest floodplain level. In major floods, the faster flowing Takahue and Victoria Rivers can flood up onto the first terrace level. These rivers also carry gravel and, as is normal in gravel rivers, erode their banks as they migrate around deposited gravel.

Sediment carried by the Takahue and Victoria Rivers has been deposited on the floodplain of the Awanui River downstream of Pamapurua, effectively damming the Karemuhako Stream floodplain above Double Crossing/Clough Road and creating extensive swampy flats back along Fairburn Road.

The eastern catchment boundary runs west-northwest along a lower (165m to 315m) sandstone and limestone ridge towards the Rangaunu Harbour. This broken sandstone and limestone hill country extends westwards to the edge of the Awanui Flats, between Kaitaia and the Rangaunu Harbour. Similar sandstone and shale rocks are found immediately north of the Maungataniwha Range, and across to Kaitaia, including the Takahue Valley. Between Kareponia and Kaingaroa, as far south as Donald Road and in the Okahu Road area, the lower northern end of the sandstone and shale ridge is capped with sand laid down during a period when the sea level was some 20 to 40metres higher than its present level. This capping has formed flat-topped ridges on which kauri forests have formed impermeable podzolised (gumland) soils.

As the Awanui River has emerged from the narrow gap in the hills at Kaitaia, it has deposited sediment, causing it to meander and build an alluvial fan that extends north and west from the middle of the town. The river has occupied a number of different channels as it built up sediment to such a level that the river was perched well above the surrounding land, and then cut a new channel away from the built up land. It has migrated from the foot of the hills, along the line of

the Whangatane Channel but due north through Awanui, around to its present position, leaving behind a number of abandoned channels which provide drainage outfalls for, in particular, the industrial area north of Kaitaia.

Sediment carried by the Awanui River has been deposited along and outwards from the banks of the river to form natural levees. The land slopes away from the riverbanks towards lower land to the east and the west of the Awanui Flats. In major floods, and before any river control works were constructed, floodwaters would have spilled over the banks of the Awanui River, spread out into these lower areas and drained out to the harbour via the Pairatahi River, to the east, and the Waipapakauri Creek to the west.

Successive lines of sand dunes along Ninety Mile Beach, forming the western edge of the Aupouri tombola, have prevented the river from flowing to the west coast, instead forcing it northwards into Rangaunu Harbour. A large peat basin has developed between the river and the dunes and Lake Tangonge occupies the lowest part of the basin.

The mapped soil types around the southern shores of Rangaunu Harbour record a gradual infilling of this shallow harbour by the Awanui River. There is a fringe of farmland that, if it were not for the stopbanks around the harbour's edge, would be subject to periodic tidal inundation, either by spring tides or by storm surge, or a combination of both.

2.2 Climate

The Far North's climate is characterised by mild temperatures and often high humidity, with the coastal areas being subjected to desiccating winds. The annual average rainfall measured at Kaitaia Airport is 1429mm, rising to approximately 2,000mm on the Mangamuka Range. While 30 to 40% of the annual rainfall occurs during winter, this distribution can be altered considerably by subtropical weather systems from the northeast. The area, as with much of Northland is susceptible to short duration, extremely high intensity rainfall over generally small geographic areas, during which over 350mm of rain may fall in two hours. Fortunately, these systems cut a narrow path across the area, usually affecting only one or two of the Awanui River tributaries in any one event.

Prolonged periods of northeasterly weather systems bringing warm and wet conditions can result in waterlogged soils. If a high intensity burst of rain should fall following such an extended period of wet weather, and the climatic conditions do favour such events, even greater erosion, runoff and flooding can result.

2.3 Land Use

Fortunately, much of the steeper upper catchment of the Victoria and Takahue Rivers on the northern slopes of the Maungataniwha Range is still clothed in native bush, providing protection against soil erosion and slowing down the rate of runoff. Some of this steeper, Tangihua volcanic hill country has been cleared for farming, as has much of the lower sandstone and limestone. The district has a high proportion of beef cattle, as has most of Northland, when compared with hill country further south in the North Island.

The floodplain of the Awanui River and its tributaries upstream of Kaitaia are generally farmed in a manner that maximises their potential within the limits imposed by their susceptibility to flooding. That is, the landholders are aware of the risk of flooding and have developed farming systems to take advantage of the natural fertility of the alluvial soils and minimise the losses that can occur when the land does flood. Improved soil drainage will ensure that pasture growth resumes as soon as floodwaters have receded.

The floodplain downstream of Kaitaia does however offer potential for increased pastoral and arable farming. For a period in the 1980s and 1990s, dairy farms were converted to beef units, either because of the age of the landholder or because the units were no longer considered economic. This trend now appears to be reversing, with amalgamation of properties to create large dairy units and the conversion of much of the Sweetwaters Landcorp property to dairying. Even on the beef units, there is potential for much more intensive production, given improved in-farm drainage, improved pastures and adequate topdressing.

The floodplain between Kaitaia and the Rangaunu Harbour also has the potential for more intensive cropping, being capable of growing maize or corn, squash, kumera and a range of other vegetable and field crops. Kaitaia's more northerly latitude assists crops to mature four to six weeks ahead of Auckland, enabling the area to supply products to the Auckland markets before other producers of these crops. The floodplain of the Awanui River has great potential as an early or out-of-season producer of vegetable and field crops, and is capable of much more intensive pastoral farming, providing flooding is kept under control.

2.4 Significant Ecological Features

A large proportion of the Maungataniwha Range is in broadleaf and podocarp indigenous forest with patches of kauri. Bush in the upper Victoria and Takahue Rivers has previously been selectively logged but where stock have been excluded, has regenerated well. Land around the fringes of the forest, previously cleared for farming, is also reverting to forest, providing a wide range of forest and scrub types. Not only does this forest perform a significant soil conservation and watershed protection function but it is also a significant natural area.

The remnant forest on the sandstone and limestone hill country east of Kaitaia reflects the particular rock-type on which it grows. The forest on the limestone is predominantly broadleaf species while that on the sandstone is predominantly podocarp. There are also large blocks of kanuka regeneration which, because there are seed sources of forest trees available, is reverting quickly to forest.

Much of the peatland scrub and wetland vegetation has already been cleared and the land drained for farming. A considerable area of swamp vegetation remains around the fringes of Lake Tangonge and is worthy of protection both for the sake of the ecosystem and because the lake and wetland is an important flood storage area within the scheme. This area is known to contain threatened fauna as well as flora.

There is a small remnant wetland forest, protected by a QEII National Trust covenant, within the Puckey's Outfall ponding area. As with the Lake Tangonge and adjacent peat wetlands, management of water levels is very important,

avoiding both over-draining and lowering of the wetland and ponding floodwaters too deep for too long.

2.5 Effects of Flooding

Pre-1900, floodwaters brought down by the Awanui River and seawater from the Rangaunu Harbour severely limited farming of any sort on the floodplain of the Awanui River downstream of Kaitaia. Prior to the construction of stopbanks around the shores of Rangaunu Harbour, high tides and storm surge caused frequent sea water flooding across extensive area between Awanui and the harbour. This rendered the land totally unsuitable for pastoral farming, except for occasional grazing of salt-tolerant native species.

Floodwaters from the Awanui River flowed into large basins either side of the river between Kaitaia and Awanui. The water would lie in these areas for weeks at a time, killing both native and introduced plant species. Peat has formed in the deeper basins while heavy, gleyed soils developed on the surrounding land. Much of this land was either totally unproductive or only supported rough grazing in summer.

While subject to periodic flooding, the river valleys upstream of Kaitaia were free of water for long enough to enable pastoral farming to develop.

Kaitaia was built on the banks of the Awanui River at the extreme limit of navigation by scow. The land would have been high enough along the immediate banks of the river to be flood-free, except in extreme events. The water would have cleared quickly from what is now the urban area, although it would have ponded in lower areas between the Awanui River and the Tarawhataroa Stream.

The landholders in the upper Awanui River catchment, upstream of Kaitaia, have developed farming systems that are generally able to cope with flooding, providing floodwaters are not held back by obstructions in the river channel between Pampurua and Kaitaia, and/or restrictions within Kaitaia, and pond on the land, killing grass. Downstream of Kaitaia, however, land development has been totally dependent on the flood management scheme. There are a number of lower lying basins in which, were it not for the scheme, floodwaters would pond for several weeks after the river levels had dropped and pasture would be lost. Without the scheme and without the confidence the scheme provides, agricultural development would be severely restricted on the Awanui Flats. As noted in section 2.3, there is considerable potential for more intensive pastoral farming and for arable farming on these highly fertile alluvial and peat soils, given adequate protection.

The central business district of Kaitaia and over half of the residential area, as well as all of Awanui, are built on the floodplain of the Awanui River and are at risk of serious flooding. With the Tarawhataroa Stream works providing protection from only a 1:30 year flood, the protection provided to Kaitaia is well below what is expected under the Building Act. Should there be a flood of greater than 1:30 years, floodwaters would again flow down Commerce Street, causing much greater damage than they did in 1958. Human life is also at risk because of the density of residential development on the floodplain. There are probably over 3,000 people living in the flood-susceptible part of Kaitaia.

When the urban area is flooded, either by river water overflowing into the town or from stormwater trapped behind floodgated outfalls, the water enters the sewerage system. This infiltration causes the sewer to overflow within the town and overloads the sewage treatment plant in Bonnett Road, resulting in contaminated discharges to the Waihoe Channel and to the Awanui River.

The industrial area on the northern edge of Kaitaia is a rapidly developing wood processing site, along with a wide range of support industries. Further processing of wood and of other forms of primary produce are likely to be established in the future. The land on the Awanui Flats is well suited to the growing of field crops such as squash, kumera and green vegetables. The area has a mild winter climate with a growing season that is over one month ahead of Auckland, enabling it to supply fresh and processed fruit and vegetables to the Auckland market or to get premium, off-season prices for export products. The confidence to invest in such industries is in part dependent on the area remaining free from flooding. A number of old Awanui River channels cross the area and management of both stormwater and floodwater are important requirements for further development.

Not only does flooding cause serious personal and economic loss, it also reduces investor confidence in an area. Should an event similar to the Manawatu-Wanganui floods or the Bay of Plenty floods of 2004 strike the Awanui River catchment, the image of not just the flooded area but also the wider district and even the region can be affected. It is because of this wider effect and the potential regional benefit that the Northland Regional Council is funding the investigations, modelling and management plan preparation from Regional Rate funding.

3. PREVIOUS FLOOD MANAGEMENT SCHEMES

3.1 Historic Situation

The flood control and drainage works within the Awanui River catchment have been built over a period of time under a number of separate works schemes. Capital works within the Kaitaia Drainage Area, established in 1916, were carried out by the Department of Lands and Survey. These works were to provide protection from high tides and to enable the development of farmland downstream of Kaitaia. These included:

- removing obstructions from the Awanui River;
- reducing the extent of the meanders in the lower, tidal reaches by cut-off channels across the loops; and
- stopbanking the tidal reaches of the river downstream of Awanui. This was later followed by:
 - stopbanking the foreshore and the lower portion of the Pairatahi River.
 - in 1936, reconstructing and enlarging the Waipapakauri Outfall, the lower portion of which had been infilled to enable the construction of an aerodrome during World War II.

Both river and foreshore stopbanks have been raised from time to time. A flood relief channel, the Whangatane Channel, was constructed in the 1920s from a bend near the Waikuruki (State Highway 1) Bridge to the Pairatahi River and Rangaunu Harbour, a distance of just over 14 kilometres.

Between 1955 and 1958 the Ministry of Works:

- reconditioned the Whangatane Channel;
- constructed main drains to dispose of internal water from the swamp areas either side of the river; and
- installed a large number of flood gates;
- made improvements to the main drainage channels, including the Tarawhataroa Stream and Awanui River: and

All of this work reduced the frequency of overflows from the Awanui River downstream of Kaitaia, allowing more land to be used for farming.

Following a major flood in 1958, during which floodwaters flowed over 1 metre deep down the main street of Kaitaia, further improvements were made to the scheme to provide protection for the Kaitaia urban area. These works included:

- straightening the Awanui River and Tarawhataroa Stream through the urban area, cutting off meanders, and protecting sections of the Awanui River banks with rockwork;
- constructing stopbanks across the southern end of Kaitaia to prevent floodwaters flowing down the floodplain, following the State Highway and an old river channel into the middle of town; and

- establishing overflow levels across the State Highway at several points from near the intersection with Larmer's Road to the Kaitaia stopbanks to ensure flood flows are allocated proportionally between the Awanui River and the Tarawhataroa Stream.

From an early stage in the management of flooding on the Awanui River, willows were used to slow down the flow of floodwaters in the Victoria River upstream of Pamapurua. The trees were planted and maintained in the section of Victoria River immediately upstream of SH1, near the Takahue Road intersection, and in the Karemuhako Stream. They have helped to slow the flow of floodwaters from these tributaries, allowing the peak flow of flooding in the Takahue River to pass before water from the Victoria River and Karemuhako Stream add to flood levels.

3.2 Effects of Current Scheme

The Victoria River has been straightened where it flows out of the Maungataniwha Range to facilitate the construction of State Highway 1. Rock drop structures were constructed and sections of the riverbank were armoured with boulders to control scour of the bed of the shortened channel and to prevent streambank erosion. There is evidence that the river was straightened and the channel shortened, increasing the grade of the bed and causing accelerated erosion of the bed and streambanks. To reduce the incidence of streambank erosion, bank protection needs to be installed and gravel needs to be managed, including harvesting, in this area.

Willows have been cleared from the very flat-graded section of Te Puhi Stream and the Karemuhako Stream, between Fairburn and Dodds Road, to prevent prolonged flooding of roads and farmland. The Victoria and Takahue Rivers flow on narrow floodplains with distinct terraces, the lower of which flood frequently. Immediately upstream of Pamapurua these two rivers join and are, in turn, joined by the Karemuhako Stream immediately downstream of Pamapurua. Floodwaters pond in the vicinity of Clough Road ("Double Crossing"), flow back up the Karemuhako Stream and then spread on down the floodplain towards Kaitaia.

Between the intersection of Larmer Road and the stopbank at the southern end of Kaitaia, floodwaters spill across SH1 in several places, causing the flow above this level to be shared between the Tarawhataroa Stream and Awanui River, flowing either side of the commercial centre of Kaitaia. The stopbank across the southern end of the town diverts the flow to either side of the town where it is confined to the two channels by stopbanks. Were it not for the stopbank system, floodwaters would overflow the natural banks of the Awanui River at several places through Kaitaia and flood through the town and into the Tarawhataroa Stream.

The Awanui River overflows its right (eastern) bank and through culverts downstream of School Road, spilling back and ponding in the Church Road valley, upstream of Arnold Rae Park. The flow is confined between the stopbank and the foot of Bell's Hill, and then between stopbanks on both banks down to Donald Road. At this point, floodwaters spill over a weir on the right bank and down the Whangatane Channel. The 14 km channel flows directly to the lower Pairatahi Stream and into Rangaunu Harbour, compared to flowing 24 km on

down the Awanui River to the harbour at Unahi. The reduced flow remaining in the Awanui River flows northwestwards under SH1 through a section of river that has been purposely left clogged with trees to reduce the flow, forcing more to spill down the Whangatane Channel.

Floodwaters that spill across SH1 between Larmer's Road and Kaitaia join with water flowing down the Tarawhataroa and Okahu Streams to flow in the Tarawhataroa around the western side of the commercial centre of Kaitaia and out in the Tangonge Drain to Lake Tangonge. Lake Tangonge also receives water from the Pukepoto and Waipapa Streams and from numerous other small streams draining the northern slopes of Maungaheremona. Floodwaters are stored in Lake Tangonge and are discharged back into the Awanui River via the Waihoe Canal and the Waihoe Floodgates as soon as the river level has dropped sufficiently to allow the water to flow through the gates. The Waihoe Stopbank extends westwards from the banks of the Awanui River to prevent the water stored in Lake Tangonge from spreading down the developed peat land along the Waipapakauri Outfall.

Any floodwaters spilling over the banks, low stopbanks and Gill's Road on the left (west) bank of the Awanui River between the Waihoe Stopbank and Gill Road and West Road is collected by the Waipapakauri Outfall and carried through to the harbour. Overflows on the right (east) bank downstream of SH1 and Awanui, plus runoff from the surrounding land pond in a basin between the river and the State Highway, and are collected and discharged back to the river just upstream of Awanui via Puckey's Outfall and the floodgates on this canal. Between Awanui and the Rangaunu Harbour at Unahi, the Awanui River flows in a modified channel and is confined between stopbanks.

Stopbanks extend right around the southern shores of Rangaunu Harbour and up each tributary stream to prevent spring tides and tidal surges from extending inland. There are floodgated drainage outfalls through these stopbanks and through the stopbanks along the Awanui River, Tarawhataroa Stream and the Whangatane Channel. These gates allow water to drain out, but they close as the tide and floodwaters rise in each of these major channels, preventing the floodwaters from spilling back up the drains.

3.3 Apportionment of Flood Flows

A feature of the scheme is the apportionment of flood flows between the Whangatane Channel, the Awanui River, and across State Highway 1 into the catchment of the Tarawhataroa Stream south of Kaitaia. As the river rises, it overflows into the Whangatane Channel. The higher it rises, the greater the proportion that is diverted into Whangatane Channel. As floodwaters rise even higher, they overflow the State Highway into the upper catchment of the Tarawhataroa Stream and on into Lake Tangonge.

Flow into the Whangatane Channel is controlled by a broad weir at Donald Road and discharges into the Rangaunu Harbour via the Pairatahi Stream.

The rough proportions of flow diversion during a 1 in 30 year event are given in Table 1.0 below.

Table 1.0 Proportions of flow diversion in a 1 in 30 event

Awanui above Larmer Rd	Tarawhataroa	Whangatane Channel	Awanui downstream of Kaitaia
100%	31%	47%	22%

The present behaviour of the control structures at both diversions has changed from their as-built details. Resurfacing of State Highway One south of Kaitaia has raised the level of the road by about 200mm. Further engineering in the 1970s changed the shape of the channel weir from a V to a broad crest, causing the channel to operate only at higher flood levels.

3.4 Role of Willows above Pampurua

The Victoria River upstream of the SH1 Bridge near the intersection of SH1 and Takahue Road currently has a reduced capacity due to willows and other channel restrictions. The willows have been planted both on stream banks and in the channel to purposely choke flood flows. This reduction in capacity increases the amount of water stored “offline,” in surface flooding of rural land. The diversion of some of the runoff into storage reduces the peak levels in the protection scheme downstream by delaying some of the floodwater until after the peak from other rivers, in particular the Takahue River, has passed.

3.5 Stopbanking and Floodgates

In addition to the Whangatane Channel, the other major work of the original flood protection scheme was the network of stopbanks that protect much of the rural and central urban land from Kaitaia to Rangaunu Harbour. The stopbanks south of Kaitaia and along the Awanui River within the town and the overflows across SH1 and into the Tarawhataroa Stream, protect Kaitaia

Since the initial scheme was built, other stopbanks have also developed, mostly either through the accumulation of spoil heaps from channel maintenance, or through intentional construction.

There are some 200 known floodgates in the scheme. About 80 of these are 600mm diameter or larger, and about 35 of the total service urban areas. Surface flooding occurs in some areas when excess stormwater is unable to drain because floodgates have closed. Prior to the scheme, the land around the Rangaunu Harbour now protected by stopbanks and floodgates was flooded by seawater and pasture was killed each Spring Tide.

3.6 Storage in Lake Tangonge

Unlike the Whangatane Channel, which discharges into a tidal stream, the Tarawhataroa Stream discharges into a storage area, Lake Tangonge, before draining back into the Awanui River. What was once a lakebed is now, due to drainage of surrounding land, a flat peat area of about 300-500 hectares that dries out when there is sufficient time between events, but it can be inundated for extended periods. There is a further transition area around the lakebed, where some production is achieved, but periodic flooding is expected.

Lake Tangonge provides a significant volume of off-line storage, allowing some of the peak flow to bypass urban Kaitaia in the Tarawhataroa Stream and stay out of the Awanui River until levels have dropped. The lake also stores runoff from the catchments that drain directly into the lake. These catchments have an area of about 7,000 hectares, which is a significant area when compared to the 21,000-hectare catchment area of the Awanui River upstream of Kaitaia.

3.7 Puckey's Outfall and Waipapakauri Outfall

Puckey's Outfall drains the catchment that lies between the eastern bank of the Awanui River and State Highway One, from the northern side of Kaitaia to just north of Brott Rd. It also collects any right bank overflow from the Awanui River between Kaitaia and Brott Road. Once the Awanui River begins to rise, discharge from this catchment into the river via Puckey's Outfall does not occur until the level in the Awanui River has dropped sufficiently for the floodgates to open again. A third floodgate was installed in recent years and this has reduced the time taken to drain the surface flooding.

The Waipapakauri Outfall (or Cut) drains the catchment west of the Awanui River and north of Lake Tangonge. This catchment and drain are largely independent of the rest of the flood protection scheme, except in very peak conditions, when the Awanui River overtops some of its banks along Gills Road, discharging into the upper reaches of the Waipapakauri Outfall. The stopbank between Lake Tangonge and the Waipapakauri Outfall prevents water stored in Lake Tangonge from entering the Waipapakauri Outfall.

4. INADEQUACIES WITH THE EXISTING SCHEME

4.1 Awanui River Channel

Over the last five years, the Awanui River has been cleared of blockages and some of the accumulated sediment and gravel as far upstream as the confluence with the Waihoe Canal. Because there is inadequate space between the river and Gills Road, most cleanings have been placed on the right (eastern) bank. While the scheme provides for stopbanks for part of this distance, spoil extracted from the river has effectively formed banks much further upstream or at a higher level than originally provided for in the scheme. Rather than spilling evenly over both banks when the flow exceeds the bank-full stage, water is now only able to spill over at low spots in the spoil banks and these tend to be on the Gills Road side of the river. If this stretch of river is to be stopbanked, the banks need to be of an even height and the same height on each side of the river. To reduce the risk of the banks collapsing during a flood, the banks will also need to be constructed to acceptable standards.

4.2 Tarawhataroa Stream

The section of the Tarawhataroa Stream through farmland is generally well maintained and vegetation kept under control. While obstructions have been removed from the Tarawhataroa Stream, the channel is in need of more extensive maintenance to restore it to its as-built (1962) state. Through the town, however, weeds growing on the banks are obstructing flows. Investigations into floods over the last 20 years suggest that while the channel of the Awanui River, when cleared of obstructions, and its associated stopbanks provide protection for up to a 1:100-year flood, the Tarawhataroa Stream can safely carry only a 1:30-year flood. Three or four dwellings have been sited in flood-prone areas along the floodway or too close to the banks of the floodway. A whole of government approach will be needed to raise these buildings above flood level and/or have them moved back from the stream banks.

The Proposed Management Plan provides for clearing vegetation along the urban section of the Tarawhataroa Stream, but options that will be investigated at a later stage to provide a higher level of protection include:

- Raising the overflow level on SH1 near Larmer Road so that a greater proportion of the flow remains in the Awanui River. This would be dependent on more effective use of the Whangatane Channel and an upgrade of the stopbanks through Kaitaia.
- Enlarging the Tarawhataroa Stream, constructing stopbanks and lifting some at risk buildings.
- Increasing the rate at which local (Tarawhataroa Stream catchment) water is drained from the catchment so that it has gone before any overflow occurs across SH1.

4.3 Lake Tangonge Storage

The Waihoe Channel flows from Lake Tangonge, through the Waihoe Floodgates and into the Awanui River. Landowners around the lake are concerned that floodwaters are extending further onto the surrounding land and are lying on the

land for longer than they have in the past. Reasons for this extended ponding of floodwaters could include:

- Greater volumes of water entering the ponding area, either Awanui River overflows via the Tarawhataroa Stream, increased runoff from the lake's immediate catchment, or a combination of these sources;
- The Waihoe Floodgates not operating efficiently once the river level drops and the gates are open;
- The Waihoe Channel requires maintenance, enlarging, or realigning from the gates to the river. (The canal enters the Awanui River at an oblique angle, discharging almost upstream against the flow.)
- The peat land around the lake has settled as a result of land drainage.

4.4 Awanui River – Whangatane Weir To Waihoe Confluence

The 1962 scheme did not enlarge the river channel or remove obstructions so as to throttle the flow in the Awanui River between SH1 and the confluence with the Waihoe Canal. This allows the Waihoe Floodgates to be opened earlier and forces more water down the Whangatane Channel. Poplars planted to stabilise the riverbanks have grown too large and, along with other streamside vegetation, including bamboo, giant reed (*Arundo donax*) and coral tree (*Erythrina x sykesii*) are in need of trimming and/or removal. The river is eroding its banks both upstream and downstream of the SH1 Bridge, threatening buildings in both areas. Trees, both indigenous and exotic, have fallen into the channel and are obstructing the flow. Because the rate of flow through this section has been restricted, there is insufficient force of water to dislodge these obstructions.

4.5 Whangatane Channel

In the 1960s the weir over which floodwaters must overflow to enter the Whangatane Channel was altered from a v-notch weir to a broad-crested weir. The reason for this change is uncertain but it had the effect of delaying the flow of water into the channel but allowing greater volumes to enter once the water reached the higher crest level. This has resulted in water flowing for a shorter time in the channel but at greater volumes while flowing. It is claimed that while the modifications to the weir reduced the duration of flow in the channel and the disruption to farm access across the waterway, it kept the lower Awanui River at higher levels for longer. This in turn kept the floodgates on the Waihoe Channel and Puckey's Outfall closed for longer than previously.

Apart from the clearance of sediment upstream of the weir, little maintenance has been carried out on the upper reaches of the channel and, with sediment being trapped by rank grass through this stretch, the capacity of the channel has been reduced. The accumulated sediment needs to be removed and grass in the upper channel to be kept short by grazing or by mowing. The removal of some of the sediment from the channel between the river and the weir has had a significant impact on flow into the channel. Overflows into the channel are occurring at much lower Awanui River flows, suggesting that it has been the accumulated sediment and not the height or shape of the weir that has been regulating channel flows.

Replacing the broad-crested weir with a v-notch weir (or a combined v-notch and broad-crested weir) that allows floodwaters to enter the Channel earlier and allows the same maximum flow, but for a longer period, would allow a greater volume of water to flow through the Awanui River on the eastern side of the town. This would help to take the pressure off both the Awanui River upstream of Kaitaia, the town's stopbanks and the Tarawhataroa Stream, helping to clear floodwaters more quickly.

Changes to the operation of the Whangatane Channel have been considered but at this stage the channel will simply be restored to its as-built state. Warnings will be issued to landholders with land on both sides of the channel to enable them to move stock before the overflow comes into operation.

Alternative or modified outfalls would need to be developed for those drains that discharge through floodgates in the Whangatane Channel stopbanks. With the existing floodgates held shut for longer periods due to the flow in the channel being held at high levels for longer, stormwater will not be able to be drained from the industrial area on the northern edge of town through gravity outfalls. These are matters that will be provided for in the comprehensive urban stormwater plan being prepared by the Far North District Council. Stormwater systems installed for industrial development within this area within the last ten years have included extensive storage to hold stormwater until the levels in the channel drop.

4.6 Awanui River Through Kaitaia

The Awanui River channel between the southern boundary of the town, near Weber's Bridge, and the Whangatane Channel weir has become overgrown with willows, woody weeds, garden escapes and rank grass. Sections of the riverbanks have collapsed and the stopbank on the left (western) bank has sunk where it crosses old river loops. Some of the worst of the obstructions were cleared in June and July 2004 but considerably more work is required to restore the channel to its as-built (1962) state. To achieve optimum hydraulic efficiency, the channel needs restoring to its as-built dimensions and kept mown as lawns, right down to water level. The stopbanks, berm areas and riverbanks could become part of an elongated park providing streamside access right through the town.

The Awanui River flows very close to the foot of the hill opposite and above Empire Street. Due possibly to a scour working its way up river through the town, the bed has been lowered and some of the support for the adjoining, right-bank hillside has been removed. The Bell's Hill slip was for a period monitored by the Far North District Council but has not been re-surveyed in recent years. Given that if this slip should fall and block the river, flood flows would be forced through its left (western) stopbank and into the town, there is a need to very carefully monitor this earth movement. Further channel work may be required to keep the river away from its right bank, to create an overflow path should the slip move and block the channel and, if necessary, to control erosion of the bed of the river.

Flooding of properties between the river and Allen Bell Drive is caused by a combination of low spots in the riverside stopbank and stormwater running of the farmland to the east. The stopbanks need improvement and such work is included as part of the Awanui River Flood Management Plan. Any work to

manage runoff from the adjoining hillside will be included in the Far North District Council's stormwater management plan.

A number of houses have been sited on low land in Rongopai Place, in the floodway of the Awanui River as it enters the southern end of Kaitaia. A low stopbank has been constructed but this provides only very limited protection. Floodwaters spilling over the right bank of the river immediately downstream of Weber's Bridge flow across the floodplain towards Rongopai Place and amongst the houses, behind the stopbank. Any increase in the height of the stopbank around this street reduces the capacity of the floodway and threatens to force the water over the stopbank and into the central business area and/or force more water into the Tarawhataroa Stream.

4.7 Flood and Sediment Storage

The willow blockages on the Victoria River upstream of Pamapurua help to spread the time of concentration of floodwaters in the Awanui River. There is potential for flood storage in existing wetlands in the Fairburn area and it would be possible to create other flood storage areas in this part of the river system. There is a need for an improved water supply in the Kaitaia area, both to support agriculture and industry, and the potential for a water supply-flood storage reservoir is worthy of further investigation. If sited high enough in the catchment, there may also be potential to generate electricity.

The greatest and most costly single maintenance activity under the Awanui River Flood Management Plan is the removal of accumulated sediment from the bed and banks of channels, and from the berms between riverbanks and stopbanks downstream of Kaitaia. A river naturally manages its sediment load by depositing it on its berms and the floodplain beyond as it overflows in flood or, in the lower reaches, by depositing the sediment on the inside of bends, causing the stream to move and erode the outside of the bends. This increases the meander pattern of the river. By confining a river to a fixed channel and by constructing stopbanks and so preventing it from overflowing its banks, the river is deprived of its natural mechanisms for managing sediment. The sediment will build up in the channel and amongst the vegetation on the riverbanks, quickly reducing the capacity of the channel and increasing the frequency of flooding.

While every effort should be made to prevent soil erosion and to reduce the sediment load in the river, floodwaters will still carry sediment, even in fully bush-clad catchments. To maintain the ability of the channel to carry water, sediment needs to be removed from the channel at regular intervals and/or mechanisms need to be installed to trap sediment in the upper catchment before it reaches the managed sections of the river. Investigations will be made into sites where floodwaters can be spilled into ponding areas to drop their sediment load before returning to the river channel.

4.8 Soil Conservation and Management of Streambank Erosion

Streambank erosion is a serious problem and a significant source of sediment in the Victoria Valley area. The Victoria River is a swift flowing gravel river and carries a significant natural gravel load. River realignment associated with the construction of the State Highway from the north side of the Mangamuka Range has shortened and steepened the bed of the river, causing it to erode. Gravel

eroded from the bed has been carried downstream and deposited on the inside of bends, causing the river to meander and erode its banks on the outside of the bends. Other forms of erosion, such as landslides and gully erosion in close proximity to streams and rivers, are also contributing sediment directly into the river channels.

Under the Plan, Regional Council staff will work with landholders in the upper catchment areas to develop methods of controlling soil erosion. Council officers will visit properties adjoining the Takahue and Victoria Rivers during the summer of 2005-2006 and will explain to landholders the problems caused by the erosion, both onsite and offsite. Where landholders wish to undertake remedial action, the Council officers will advise on measures available and will help design any works required. Subject to an agreement by the landholder to maintain the erosion control works, the Council will meet up to 50% of the cost of these works from Awanui River Flood Management Scheme funds. Depending on the process that is occurring, the measures may include gravel management, armouring of riverbanks with brush, timber or rock, construction of grade control structures in the stream, planting of suitable tree or shrub species in the streambed or on the banks, and may involve fencing to exclude stock. This work will be ongoing and will be promoted by the Regional Council, along with the promotion of soil conservation generally with the Awanui River catchment.

5. AWANUI RIVER FLOOD MANAGEMENT PLAN

5.1 Objectives

- To reduce the risk of flooding in Kaitaia and Awanui from the Awanui River and its tributaries, providing protection from floods of up to a 1:100-year floods for the buildings and people within the urban areas.
- To reduce the incidence of flooding that results in the loss of agricultural production on the floodplain of the Awanui River and its tributaries, that is, reduce the frequency of pasture-damaging floods (which is no more than 3 days in summer) to no more than once in 20 years.
- To reduce the incidence of flooding by sea water on low-lying and reclaimed land around the southern shores of Rangaunu Harbour to no more than once in 20 years.
- To reduce the volume of sediment being carried by the Awanui River and discharged into the Rangaunu Harbour.

Note: The Regional Council will increase these levels of protection providing it be done within the resource consents for the plan, within the existing formula for flow apportioning between the Whangatane Channel, the Awanui River, and the Tarawhataroa Stream overflows, and within existing budgets.

5.2 Responsibilities

Under the Awanui River Flood Management Plan the Northland Regional Council will take over the management of the Awanui River Flood Management Scheme from 1 July 2005. The following matters are the subject of a Memorandum of Understanding between the Northland Regional Council and the Far North District Council. Some of the landholder responsibilities will be contained within the Far North District Council Bylaw for the Protection of Watercourses and Defences Against Water (2005) while others are contained with the Regional Water and Soil Plan for Northland.

The Regional Council will:

- promote the achievement of the objectives of the Management Plan;
- clearly identify land within the Awanui River catchment that is susceptible to flooding, assessing the level of risk and conveying this information to the Far North District Council;
- maintain an effective flood warning system for the Awanui River catchment;
- undertake works, both new works and ongoing maintenance of the existing scheme and any new works;
- work with the Northern Community Board, to shape and regrass the banks and bermland along the Awanui River and Tarawhataroa Stream within the urban area of Kaitaia in such a manner that they can be mowed and managed as a park or open space;

- own and maintain any assets belonging to the scheme, including those currently owned by the Far North District Council and any new assets acquired or constructed under the scheme;
- enforce any rules or bylaws required to ensure the management, maintenance, protection and efficient operation of the flood management plan;
- administer the Management Plan;
- administer and enforce the Far North District Council Bylaw for the Protection of Watercourses and Defences Against Water.
- manage the scheme finances, including raising loans and striking rates; and
- monitor, regularly review and promote improvements to the scheme.
- work with the Far North District Council and appropriate Government departments to investigate options for reducing the flood risk to houses in Rongopai Place and other areas within Kaitaia, including relocating the flood-affected houses out of the floodway or raising them above flood level.

The Far North District Council will:

- manage the Kaitaia Drainage Area and the associated land drainage scheme in a manner that optimises rural production but reduces the incidence of land settlement due to the over-drainage of peat, so optimising the flood management scheme benefits;
- use the Far North District Plan and other mechanisms to encourage the retention and enhancement of biodiversity and watershed protection within the catchment of the Awanui River;
- train appropriate personnel and as required implement an effective emergency first response plan for Kaitaia and Awanui;
- collect the rates struck by the Northland Regional Council;
- ensure that the hazard data supplied by the Regional Council is defined on a publicly accessible hazards database;
- use the Building Act 2004, the District Plan, the Resource Management Act 1991, the Local Government Act 2002 and any other relevant statutes, rules, bylaws and Regulations to ensure that new buildings, industries and developments within the Awanui River catchment are not placed at risk from flooding;
- advise the Northland Regional Council of any known risks, claims or liabilities associated with management of flooding within the Awanui River catchment and indemnify the Regional Council against any risks, claims, omissions, liabilities or claims of negligence which may arise in the future as a result of the previous management of the scheme by Mangonui County Council, Kaitaia Borough Council or the Far North District Council;
- promote the relocation or raising of buildings at risk from flooding; and

- work with the Northland Regional Council, to investigate options for reducing the flood risk to houses in Rongopai Place, including relocating the flood-affected houses out of the floodway or raising them above flood level.

Landholders within the catchment of the Awanui River will:

- manage land in a manner that reduces the risk of erosion and subsequent transport of sediment into the Awanui River system;
- not overstock, drive machinery over or otherwise damage stopbanks, canals or other flood management structures;
- control pest plants and other weeds on stream and riverbanks, stopbanks and other land integral to the scheme but not owned or directly managed by the Northland Regional Council;
- remove obstructions and control streambank erosion in river and stream channels adjoining their land that are not managed under the Flood Management Scheme;
- collect and safely dispose of debris and detritus deposited on their land by floodwaters;
- retain and enhance the health and vigour of indigenous forests and wetlands within the catchment of the Awanui River to reduce the rate of runoff and to control the movement of sediment; and
- exclude stock from the channels and banks of rivers and streams flowing through or adjoining their land.

5.3 River Flow Model

To assist in better understanding the flow regimes of the various Awanui River tributaries and how the scheme influences the distribution of floodwaters, the Regional Council has carried out extensive surveying of the floodplain of the river system, the channels and the southern part of Rangaunu Harbour. This data, along with previous flood data, has been used to compile a computer model of the flood flows through the system. Sites have been identified and procedures put in place to capture further data, including flood flows and depths of flooding, next time there is an event within the system, so enabling the model to be calibrated and the reliability improved.

The model will not only enable more accurate flood forecasting and the issuing of flood warnings, but it will help to define minimum floor levels for new buildings and areas of benefit from the scheme, and it will be invaluable when comparing various options for improvements to the scheme. Periodic re-surveys of channels and regular updating of the model against real flood events will increase the level of confidence in the model.

5.4 Flood Warning System

The Northland Regional Council has established and will continue to operate two automatic rainfall stations, one on the Maungataniwha Range in the upper Victoria River catchment and the other in the upper catchment of the Takahue River. It has also established flow-recording stations on the tributary streams in the vicinity of Pampurua. All these stations are telemetered to the Council's

systems, enabling flood warnings to be issued, first as an alert based on the rate at which rain is falling and then a warning based on actual stream flow.

This warning system enables warnings to be issued to the Far North District Council and to the Emergency Services and, should the severity of flooding be such that dwellings in flood susceptible areas need to be evacuated, the District Council's Civil Defence Emergency Management Response Plan for the area can be implemented. With further refinement of the river flow models and flood flow paths more clearly identified, the warning system can be further refined to enable warnings to be issued to farmers to move stock from flood-prone areas.

Warning will also be issued to landholders along the Whangatane Channel to enable them to move stock before the channel fills with floodwater.

5.5 Proposed River Works to restore the Scheme to its As-Built Condition

The following costings are estimates and are based on similar work already undertaken on the Awanui River by the Far North District Council, Northland Regional Council work on the Kaeo River, Kaipara District Council work on the Kaihu River, advice from river engineers around New Zealand and field assessments by Council officers.

Over the last four years, the Awanui River channel has been cleaned by FNDC from the confluence of the Waihoe Channel to the Rangaunu Harbour and some vegetation has been cleared from the channel through Kaitaia. Further maintenance is required on the channel, material extracted from the channel and placed on the berms needs to be removed and the berms cleared of weeds, leaving it in a state that they can be mowed or occasionally grazed.

COST ESTIMATES FOR CAPITAL WORKS – Stage 1

a.	Awanui town to harbour Remove spoil, clear floodway and minor cleaning on the channel	\$163,000
b.	Waihoe Channel to Awanui Town Shape banks, top up stopbanks.	\$325,000
c.	Waihoe Channel to Whangatane Channel Remove fallen or about to fall trees and other debris in river	\$43,500
d.	Whangatane Channel Clean up vegetation from channel, remove accumulated sediment, top up stopbanks.	\$33,100
e.	Modify Whangatane Channel weir	\$6,700
f.	Awanui River channel through Kaitaia Remove trees and shape banks, top up stopbanks	\$129,300
g.	Awanui River Remove fallen trees Kaitaia to Double Crossing	\$28,000
h.	Tarawhataroa Stream Clear vegetation and shape banks ready for mowing	\$12,000
i.	Drain and canal cleaning, including Tangonge Drain	\$18,500
j.	Upgrade Waihoe Floodgates	\$51,000
k.	Remove Willows and reconstruct Mangatakawero Stream channel.	\$10,000
	Contingencies	\$89,900
	Total	\$910,000

The Regional Council considered the following two options for funding the scheme:

- (a) Raising a loan of \$1,617,000 to undertake the capital works and buy land (in the Whangatane Channel), half in year 1 and half in year 2, to undertake the works and to buy land, at an interest rate of 7.5% and repaid over 10 years: or
- (b) Undertaking the work out of rating revenue alone, but extending the work programme over five years.

The Council decided on option (b), to fund the work out of rates.

5.6 Timetable for Restoration work

Year 1 Objective – Reduce Threat to Kaitaia

Clear Awanui River channel through Kaitaia – “first cut”	\$70,000
Improve Tarawhataroa Stream channel through Kaitaia	\$12,000
Awanui River: Whangatane Channel to Waihoe Channel	\$38,500
Remove spoil from berms downstream of Awanui	\$20,000
Clear willows and improve the Mangatakawero Stream channel at Kareponia	\$10,000
½ of sum identified for drain cleaning (to cover Tangonge Drain)	\$9,250
Contingencies	\$15,975
Total	\$175,725

Year 2 Objective – To reduce the risk of an overflow from the Whangatane Channel and reduce the incidence of ponding around Lake Tangonge

Clear Awanui River channel through Kaitaia – “second cut”	\$59,300
Clear Whangatane Channel	\$33,100
Upgrade Waihoe Floodgates	\$51,000
Remove Spoil from Awanui River berms downstream of Awanui	\$20,000
Contingencies	\$14,330
Total	\$177,730

Year 3 Objective – Reduce the risk of an overflow from Awanui River, between Waihoe Channel and Awanui

Awanui River channel from Waihoe to Awanui town – first cut	\$165,000
Contingencies	\$16,500
Total	\$181,500

Year 4 Objective – Improve lower river channel

Awanui River – Awanui town to harbour	\$163,000
Contingencies	\$16,300
Total	\$179,300

Year 5 Objective – Awanui River from Waihoe to Awanui and from Pamapurua to Kaitaia

Awanui River channel from Waihoe to Awanui – second cut	\$120,000
Awanui River from Double Crossing to Kaitaia – clear fallen trees	\$28,000
Awanui River from Whangatane Channel to Waihoe Channel	\$5,000
Balance of drain cleaning	\$9,250
Contingencies	\$16,225
Total	\$178,475

Year 6 Objective – If required, modify Whangatane Channel weir

Modify Whangatane Channel weir to achieve right balance between Awanui River, Tarawhataroa, and Whangatane Channel flows	\$6,700
Contingencies	\$670
Total	\$7,370

Total Years 1 to 5 \$902,100

5.7 Scheme Costs

The following two tables summarise the expected costs over the next six years to operate, maintain, and upgrade the Scheme.

Years 1 – 3

	Year 1	Year 2	Year 3
Staff, contract supervision, field inspections	\$53,000	\$53,000	\$53,000
Consultants, legal fees, promotion, etc	\$18,000	\$15,000	\$15,000
Rates collection and management	\$69,784	\$56,430	\$56,430
Repairs and maintenance on scheme	\$100,000	\$100,000	\$100,000
Restoration Works	\$175,725	\$179,630	\$181,500
Total	\$416,509	\$404,060	\$405,930

Years 4 – 6

	Year 4	Year 5	Year 6
Staff, contract supervision, field inspections	\$53,000	\$53,000	\$43,000
Consultants, legal fees, promotion, etc	\$15,000	\$15,000	\$15,000
Rates collection and management	\$73,930	\$56,430	\$56,430
Repairs and maintenance on scheme	\$100,000	\$100,000	\$150,000
Restoration Works	\$179,300	\$172,975	\$7,370
Total	\$421,230	\$397,405	\$271,800

5.8 Future Improvements

Once the Awanui River Flood Management Scheme is restored to its as-built standard, there will be an opportunity to consider future improvements to the scheme. These may include:

- i. The stopbanks along the Awanui River have been constructed at different times and to different standards, with some perhaps unauthorised. The effect of these banks on the scheme and their effectiveness in reducing flooding will be reviewed and, as necessary, they will be modified or removed.
- ii. Considering options for making greater use of the Whangatane Channel to reduce:
 - The depth, duration and frequency of flood overflows across SH1N between Larmer Road and Kaitaia;
 - The risk of flooding in Kaitaia;
 - The proportion of floodwaters diverted via the Tarawhataroa Stream;
 - The area subject to ponding in around Lake Tangonge;
 - The risk of flooding in Awanui. (If volume and velocity of flow in the Awanui River downstream of Kaitaia is reduced, there may be a significant increase in the volume of sediment deposited in the Awanui River channel between Kaitaia and the Rangaunu Harbour, necessitating more frequent dredging. This investigation would also need to consider access across the Whangatane Channel and modifications to floodgated outfalls into the channel so that stormwater can continue to be discharged during bank-full conditions.)
- iii. In some cases, raising and/or relocating flood-susceptible houses in Kaitaia. [NB. Buildings in Kaitaia are prone to flooding from two sources, the river and from stormwater generated by rain falling within the urban area. The Awanui River Flood Management Plan only deals with the former while the latter is dealt with by the Far North District Council's urban stormwater management plan.]
- iv. Improving the Waihoe Channel and floodgates to more quickly drain ponded water from farmland around Lake Tangonge.

- v. Collecting stream flow from the Pukepoto area and channelling it directly to the Awanui River, bypassing Lake Tangonge during floods.
- vi. Reviewing the role of the Waihoe Stopbank and the Waipapakauri Outfall to more quickly drain ponded water from farmland around Lake Tangonge.
- vii. Investigating pumping to control the area/length of time that floodwaters are ponded on farmland around Lake Tangonge and in the Puckey's Outfall area.
- viii. Considering the options of flood retention in the upper catchment by planting trees to restrict channel capacity, or by creating overflows into specially developed ponding areas.
- ix. Considering the option of reducing the sediment load in the river by diverting upper catchment flood flows into ponding areas to encourage the deposition of silt.
- x. Investigating the potential for multi-purpose water storage dams in the Awanui River catchment, to reduce peak flood flows, provide a water supply for irrigation and public water supplies, and to generate electricity.
- xi. Reviewing proposals for a direct discharge of flood flows to the west coast.

5.9 Consultation with Iwi

The transfer of the management of a river, stream or waterbody from one local authority to another is a matter identified by the Local Government Act 2002 as requiring consultation with iwi. Preliminary discussions have already taken place with Maori landholders with an interest in Lake Tangonge and these discussions will continue. Te Rarawa, Ngai Takato and Ngati Kahu Runanga were also consulted in early December 2004 and will be consulted on specific matters relating to river works before any work commences on the scheme.

5.10 Management of the Scheme

The transfer of the management of the Awanui Flood Control Scheme has been overseen to date by a small steering committee of councillors and executive officers from the Far North District Council and the Northland Regional Council. Should it be considered necessary, other people representing stakeholders could be added to this committee to advise the Northland Regional Council on the implementation of the Awanui River Flood Management Plan.

6. FUNDING OF THE AWANUI RIVER MANAGEMENT PLAN

6.1 Background

The original flood control works within the Kaitaia Drainage District were undertaken by Government Departments, firstly the Department of Lands and Survey and later the Ministry of Works, with the development costs met initially by the Government. The Drainage District covers the river, land drainage catchment and contributing hill country catchments downstream of Pamapurua. The cost of this work, along with annual maintenance costs, was then recovered from the beneficiaries of the work by way of a three-class, differential benefit rate, two classes on the flat land that are rateable and one on the adjoining hill country that is non-rateable.

In the early 1960s, and in response to a major flood in Kaitaia in 1958, additional work was carried out in and around Kaitaia, including channel reconstruction and stopbanking on the Tarawhataroa Stream and the Awanui River within the Kaitaia urban area and modifications to the Whangatane Channel. This work, which provided additional protection primarily for the urban area of Kaitaia, was funded by way of a 70% Government subsidy, the local share being recovered and maintenance costs met by a special rate struck over the urban area. Maintenance costs for the balance of the flood management scheme and the drainage works were funded by the earlier drainage district rate. In 1986, a fresh classification was completed over rural land within the rating area and became operative in July 1986.

When management of the Drainage District was transferred to the Mangonui County Council in 1968, the County Council was able to continue rating via the Kaitaia Borough Council and for a period continued to strike and collect a rate from the urban area. This later changed to a lump sum payment from the Borough to the County Council. This contribution continued for a short time after the restructuring of local government in 1989, but then ceased. From that time until 2001, work on the scheme was funded by the rates on rural land on the floodplain downstream of Pamapurua.

In recognition of the wider benefit of reducing the risk of flooding in the Far North, the Far North District Council introduced a uniform annual (Northern Flood Protection) charge in 2001-2002 on all rateable properties within the Northern Community Board area. The revenue from this charge was used to supplement the Kaitaia Drainage District rates until 2003-2004 when the Council separated the costs of land drainage from river management within the Kaitaia Drainage District. From then, the Drainage District rate has funded only land drainage activities and the uniform annual charge of \$10 per property has funded work on the Awanui River.

6.2 Regional Benefits Of Flood Reduction

Under the Northland River Management Policy, ratified in 2000 by all four Northland councils, benefit is recognised at landholder or community level, at

District Level and Regional Level. In recognition of the regional benefit of reducing the threat of flooding to human life and to property, the Northland Regional Council has agreed to undertake and meet the costs of surveys and investigations, modelling and design, management plan preparation, gaining any necessary resource consents and establishing practical and equitable funding mechanisms. The policy requires that the costs of doing works or associated with doing works and any maintenance costs be met by the beneficiaries of the work and from those who increase the need for such work.

In respect of flood management within the Awanui River catchment, the Regional Council has agreed to meet the cost of surveying the floodplain and channels, modelling flood flows, preparing a management plan, gaining resource consents and establishing a funding system without striking a special rate.

6.3 Proposed Scheme Funding Mechanism

It was proposed to raise a loan to restore the Awanui River Flood Management Scheme to its as-built dimensions, clear accumulated sediment, weeds and fallen trees from channels, stabilise slipped riverbanks and restore stopbanks. However, following submissions received on the 2005/06 Annual Plan, the decision was made to fund this work from rates. This change delays achieving the full benefit of capital for by several years, but ratepayers felt that the cost savings that would be achieved justified this.

Annual maintenance costs and scheme management costs will be funded by way of a targeted differential rate, struck on a Land Area basis across all rural land within the catchment of the Awanui River and the adjoining Waipapakauri Creek and Pairatahi River. The differential will be determined according to the benefit that that property derives from the scheme or the extent that the use of land within the catchment increases the need for the scheme, that is as an exacerbator. The rural rate comprises four direct benefit classes with Class A land gaining maximum benefit and Class C gaining the least benefit. Land that is with defined ponding areas and which is flooded to benefit other land within the Management Plan area has been classified as Class E and will be subject to a nil rate. The remaining rateable land within the catchment rating area has been identified as Class F. Where the land is in indigenous forest, it will be subject to a nil rate. Where it is any other form of land use, either pastoral farming or exotic forestry, it is subject of an exacerbator or de-afforestation rate.

Within the urban areas of Kaitaia and Awanui each rateable unit on the floodplain of the Awanui River will pay, instead of a Land Area or Capital Value Rate, a Uniform Annual Charge (UAC) of \$100 per rateable unit. Properties on the hills or above the floodplain in Kaitaia will pay a UAC of \$10 per rateable unit.

As well, a UAC of \$10 per property will be struck across all rateable units, both urban and rural, within the rating area. This is an indirect benefit rate. Each rural rateable unit over 1.0 hectares in area will therefore be paying both a UAC of \$10 plus targeted differential rates, depending on the area of each class on that on the property. Properties on the floodplain in Kaitaia will pay \$110 (\$100 plus \$10), while those on the hills will pay \$20 (\$10 plus \$10).

Any future improvements to the scheme, including modifications to the Whangatane Channel, the Waihoe Canal, the Waihoe Floodgate, the Waipapakauri Cut, the Awanui River channel through Kaitaia, and the construction of any new overflow channels or canals and possibly flood storage structures may be funded by way of loans. As improvements to the scheme may alter the distribution of benefit or may benefit only part of the rating area, the rating classification will be regularly reviewed and particularly when considering improvements.

6.4 Rating Classes

The following classification sets out the concept of benefit rating. As there have been no floods against which the flood model could be calibrated and classification boundaries accurately defined, the first year's rating will be based on an Interim Classification. Photographs, recorded flood levels and records of the depth and duration of flooding will be used to refine the classification for future years.

Rural Benefit-Exacerbator Classes

Appendix C is a map showing the targeted differential rating classes.

Assumptions

Should floodwaters lie on land for more than three days in summer, water temperatures rise and oxygen levels drop to such an extent that the grass is cooked and dies. The objective of the scheme is to reduce events during which water will pond in these areas to less frequently than once in 20 years and when water does pond, it is cleared in less than three days in summer.

Other low-lying land around the southern shores of Rangaunu Harbour is at risk from inundation by spring tides and storm surge. Were it not for the stopbank and floodgate system around this land, it would be periodically flooded with salt water and would quickly be lost to agricultural production.

Land on either side of the Awanui River downstream of Kaitaia is flooded by silt-laden water overflowing the banks of the Awanui River. Not only does this fast-flowing water damage fences and erode cultivated land but it also coats pasture with fine sediment, making it unpalatable to stock until the silt is washed off by heavy rain.

By maintaining the Awanui River channel downstream of Papanui free of willow trees and other obstructions, floodwaters will overflow less often, so reducing the frequency of damage to fences, to crops and to pasture.

The level of rating in the following benefit rating classes have been determined as a percentage of the Class A rate. Class A land receives maximum benefit from the scheme while each of the other classes receives a relatively lesser benefit in the form of less flood damage or increased agricultural production.

Class A1 and A2 Maximum Benefit (100% of rate/hectare)

Class A1 includes peat basins and lower areas of silt loam and gleyed soils where, were it not for the scheme, water would pond after the flood peak had dropped. As a result of the scheme, water overflows into these areas less frequently and what water does pond is drained away more quickly.

Class A2 includes areas of soil derived from marine deposits and reclaimed land around the shores of Rangaunu Harbour and Pairatahi Stream which are less than 1.5 metres above mean high sea level and are protected from tidal flooding by the stopbanks around the foreshore. While not as susceptible to as frequent flooding from the river, this land is at risk from frequent and damaging tidal flooding by salt water if it were not for the stopbanks and floodgate system.

Class B1 and B2 High Benefit (75% of Class A rate)

Class B1 includes land across which floodwater flows but does not pond and other areas where water ponds for short periods. Because the land is at less risk from flooding, the relief provided by the scheme is less. Also included in Class B is land that is derived from peat and is settling, increasing its risk of flooding, and land that is subject to more frequent flooding or where water ponds longer but because of its location or because more relief cannot be provided, it receives less benefit from the scheme than does Class A. Class B2 is land derived from marine deposits but more than 1.5 metres above sea level so at less risk from tidal flooding than A2, but is still at risk from storm surge.

Class C Moderate Benefit (50% of Class A rate)

Land at higher levels which flood less frequently or from which water clears quickly with little impact on grazing or cropping. Also included is land upstream of Kaitaia, between Pampurua and Kaitaia, across which floodwaters frequently flow. This land will receive some relief, with flood levels being lowered, as a result of the Awanui River channel through Kaitaia to the Whangatane Channel being restored to its 1962 as-built dimensions and maintained in this state. Improvements to the capacity of the scheme through urban Kaitaia will also help to lower flood peaks for some distance upstream of Kaitaia.

Also included in Class C is flood land with the Pairatahi Stream Catchment east of Kumi Rd. In this area is land that, were it not for the scheme, would be subject to flooding with freshwater from the Pairatahi Stream or the former Whangatane Stream. Elsewhere within the rating area it would be Class B1, or Class B2 where it is at risk of storm surge.

Because the Whangatane Channel discharges floodwaters into the Pairatahi Stream, when the channel is operating the water level is held near high tide level and floodgates are held shut for longer than would be the case if the Whangatane Channel did not discharge into the Pairatahi Stream. The benefits provided by the stopbanks and floodgates around the shores of the Pairatahi Stream are reduced by the high water levels in the stream and so the land has been reduced from Class A or B to Class C.

Class E Nil Rate Approx 11,000 hectares

Class E includes land that, because of the way it is managed, benefits the scheme:

- land that has been retained in indigenous forest, particularly within the stepper upper catchment area, and therefore performs a watershed protection role; and
- land in floodways and ponding areas, which does not receive benefit and may even be detrimentally affected by the scheme.

Class F Hill Country (2.9% of Class A) 20,100 hectares

This Class contributes runoff to the rivers and, depending on the land use, can exacerbate the flooding problems. Water runs quickly off hard grazed land, less quickly off exotic forestry during most of the rotation and at the slowest rate from dense and mature indigenous forest. The rating legislation provides for both indirect benefit rate and an exacerbator rate, popularly referred to as a “rainfall tax”. In respect of the Awanui River catchment, a more correct term would be “de-afforestation rate”.

Indirect benefit in the form of improved access to Kaitaia and inconvenience caused by flooding tend to be benefits to households almost regardless of the area of a property. It is therefore proposed that a Uniform Annual Charge be made on all rateable units within the Awanui River Flood Management Rating Area, both rural and urban.

Proposed Urban Benefit-Exacerbator Classes

As the greatest risk within the urban areas is damage to buildings and the contents of those buildings, a Capital Value-based rated, or alternatively an annual charge as described below, best recognises the benefit provided by the scheme.

Urban Class A

Land on the floodplain within Kaitaia and the whole of Awanui township. Buildings and the occupants of buildings on the floodplain are protected from up to a 1:100-year flood. It has been argued that the greatest damage that would result from flooding, and therefore the area for which the greatest benefit is provided by the scheme, is the urban area on the floodplain. There is therefore a strong case for increasing the proportion of the total scheme rate met by the urban area to equal that met by rural landholders. It is proposed to strike a Uniform Annual Charge of \$100 per rateable unit.

Urban Class F

Land on the hills and higher terraces above flood level within the urban area of Kaitaia. Runoff from this land contributes to the flooding of land on the flats and increases the need for flood control measures. Each rateable unit will be charged a UAC of \$10.

Indirect Benefit

All landholders and residents within the Management Plan area, both urban and rural, benefit indirectly from the Scheme. Indirect benefit includes reduced road closures due to flooding, savings in not having to detour for long distances around

flooded roads, lowered roading costs when roads are not damaged by floodwaters, and increased land values when the flood-prone image of the area is reduced. It is therefore proposed to charge an additional uniform annual charge of \$10 on the 4,400 rateable units within the Awanui River Flood Management Rating Area.

A detailed breakdown of these rates is provided in Appendix E.

NB. The rural and urban rating proposal described above is to fund capital works, contract management, administrative costs, a share of works within the catchment that will reduce erosion and maintenance of scheme works, related to the management of flooding from the Awanui River and its tributaries and tidal and/or storm generated flooding from Rangaunu Harbour. Management of land drainage and the funding of that activity is outside of the scope of this management plan, but is included within the Kaitaia Drainage Area Management Plan for the rural area and the Kaitaia Urban Stormwater Management Plan for Kaitaia urban area.

7. ASSET MANAGEMENT

7.1 Ownership of Scheme Assets (see Appendix B)

The Regional Council is currently working with the Far North District Council to identify those assets, including stopbanks, channels and floodgates that are owned by the District Council on behalf of the scheme and those that are on private land. Discussions are continuing between the two Councils as to whether these assets will be transferred to the Regional Council or whether they will be managed by the Regional Council on behalf of the District Council. The decisions reached will form part of a Memorandum of Understanding between the two Councils, with the details set out in an asset management plan.

7.2 Access to Carry Out Works

While the Far North District Council has a bylaw under which it has the right of entry to maintain scheme works and may also do so under the Public Works Act and under the Land Drainage Act, these powers are not set out in any readily available document. Instead, there has been an “understanding” that the Council is able to enter land to undertake works.

7.3 Watercourse Bylaw

With the adoption of the Regional Water and Soil Plan for Northland, the Regional Council’s Watercourse Bylaw, which had become a Transitional Regional Rule under the Resource Management Act 1991, has lapsed. The Regional Council is only able to adopt a watercourse bylaw to manage activities on that part of the scheme that the council owns and directly manages. It cannot make a bylaw to protect the integrity of these features of the scheme. The Far North District Council is, however, able to make such a bylaw. It currently has a land drainage bylaw which includes some of the requirements of the water course bylaw. The Regional Council will assist the District Council to make amendments to the bylaw and the District Council will, in turn, authorise the Regional Council officers to implement and enforce the by-law.

8. CONCLUSION

The Awanui River Flood Management Plan is a comprehensive document that seeks to link the flood management scheme on the Awanui River with wider catchment management, with land use planning under the Far North District Plan, with controls under the Building Act, with Civil Defence Emergency Management procedures in the area, with the management of stormwater in Kaitaia and with the management of rural land drainage on the Awanui Flats.

Some two-thirds of Kaitaia and about 3,000 people sited on the floodplain of the Awanui River are at serious risk from flooding. The successful management of the Awanui River Flood Management Scheme is the focus of the Management Plan and is one of the most important hazard management issues in Northland.

While the Awanui River Flood Management Plan itself is not a statutory document, components of it are subject to resource consent, building consent and land use planning procedures. The establishment of a funding mechanism based on targeted benefit-exacerbator differential rating must also follow statutory processes, as must the transfer of a water body from one local authority to another.

The objective of the Management Plan is to set out these various components of the wider flood management activities in one comprehensive and readily available document. Future improvements and change can then be assessed against this document.

APPENDIX A: Schematic Map of Awanui River Flood Protection Scheme

Awanui River Flood Management Scheme

Schematic

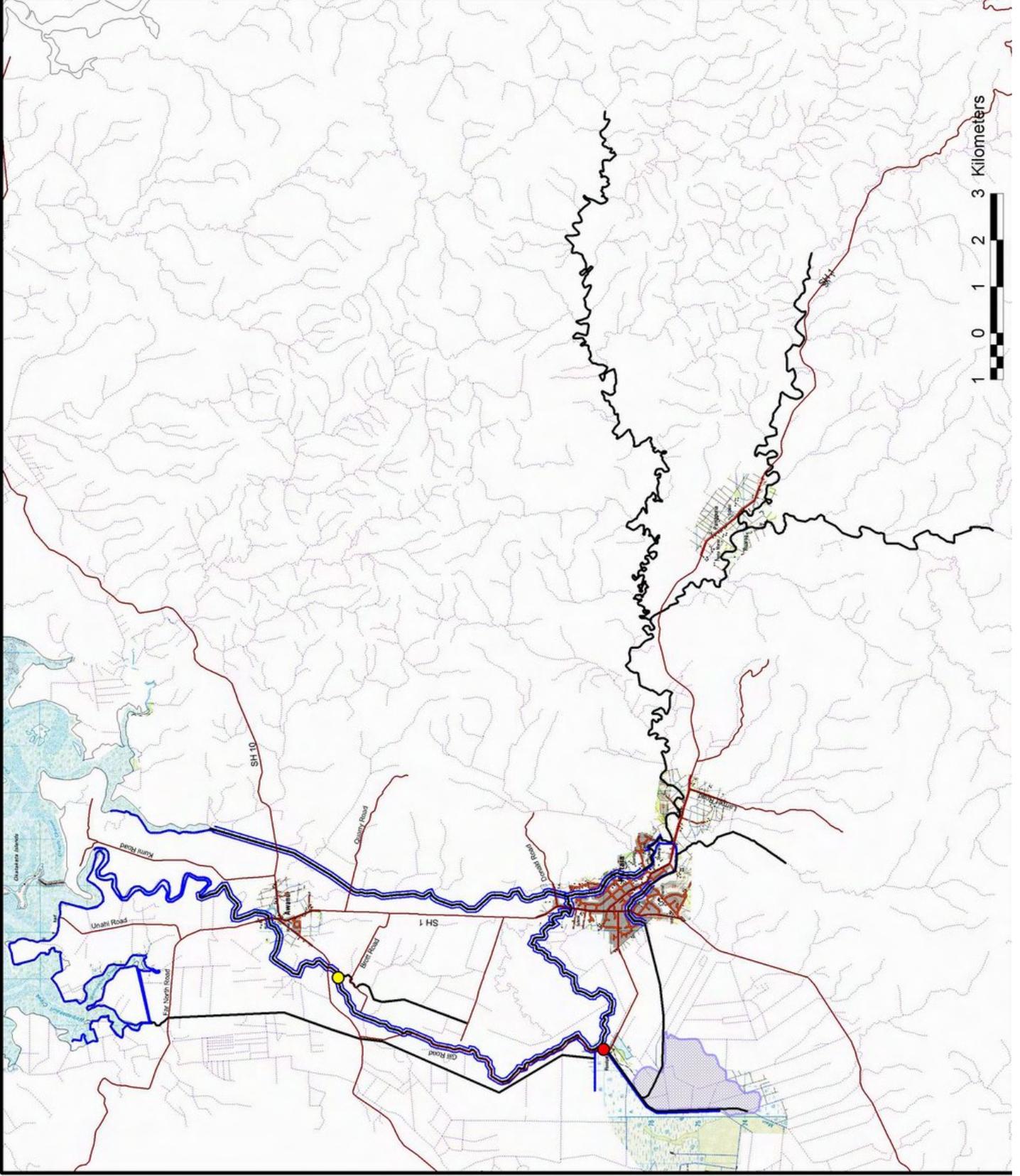
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Legend

- Stopbanks
- Roads
- Flood Channels
- Streams and Drains
- Lake Tangonge
- Floodgates
- Puckey's Outfall
- Waihoie Channel



APPENDIX B: Schedule of Scheme Assets

SUMMARY OF FLOOD PROTECTION ASSETS SCHEDULE

Channels, Rivers

- Awanui River in its entirety
- Whangatane Channel in its entirety
- Tarawhataroa Stream through urban area
- Tangonge Drain from urban boundary to Waihou Channel
- Waihoe Channel (approx 1,560 metres from Awanui River confluence)
- Waipapakauri Outfall from harbour outlet to Government Drain confluence (approx 6,500 metres) the remaining 5,000 metres to be maintained by the Far North District Council as part of the Kaitaia Land Drainage Scheme.
- Puckey's Outfall from Awanui River to Bell Road (approximately 2,500 metres), the remaining 3,233 metres maintained by the Far North District Council as part of the Kaitaia Land Drainage Scheme.

Stopbanks

All the stopbanks, both those within the urban areas and those in the rural area, will be controlled by the Regional Council under the Awanui River Flood Management Plan.

- Awanui River 43,374 metres approximately
- Whangatane Channel 19,306 metres approximately
- Waihoe Stopbank 1,500 metres
- Puckey's Outfall 3,000 metres approximately
- Tarawhataroa Stream 2,400 metres approximately
- Waipapakauri Outfall 6,000 metres approximately
- All seaward stopbanks 14,256 metres approximately

Floodgates

The 40 or so floodgates within the urban areas of Kaitaia and Awanui are assets of the urban stormwater network and will continue to be managed by the Far North District Council. The 165 floodgates in the rural area and contained in the following schedule are assets of the Awanui River Flood Management Scheme and will be managed by the Northland Regional Council.

APPENDIX C: Map of Targeted Differential Rate Classes

Awanui River Flood Management Scheme

Scheme Rating District

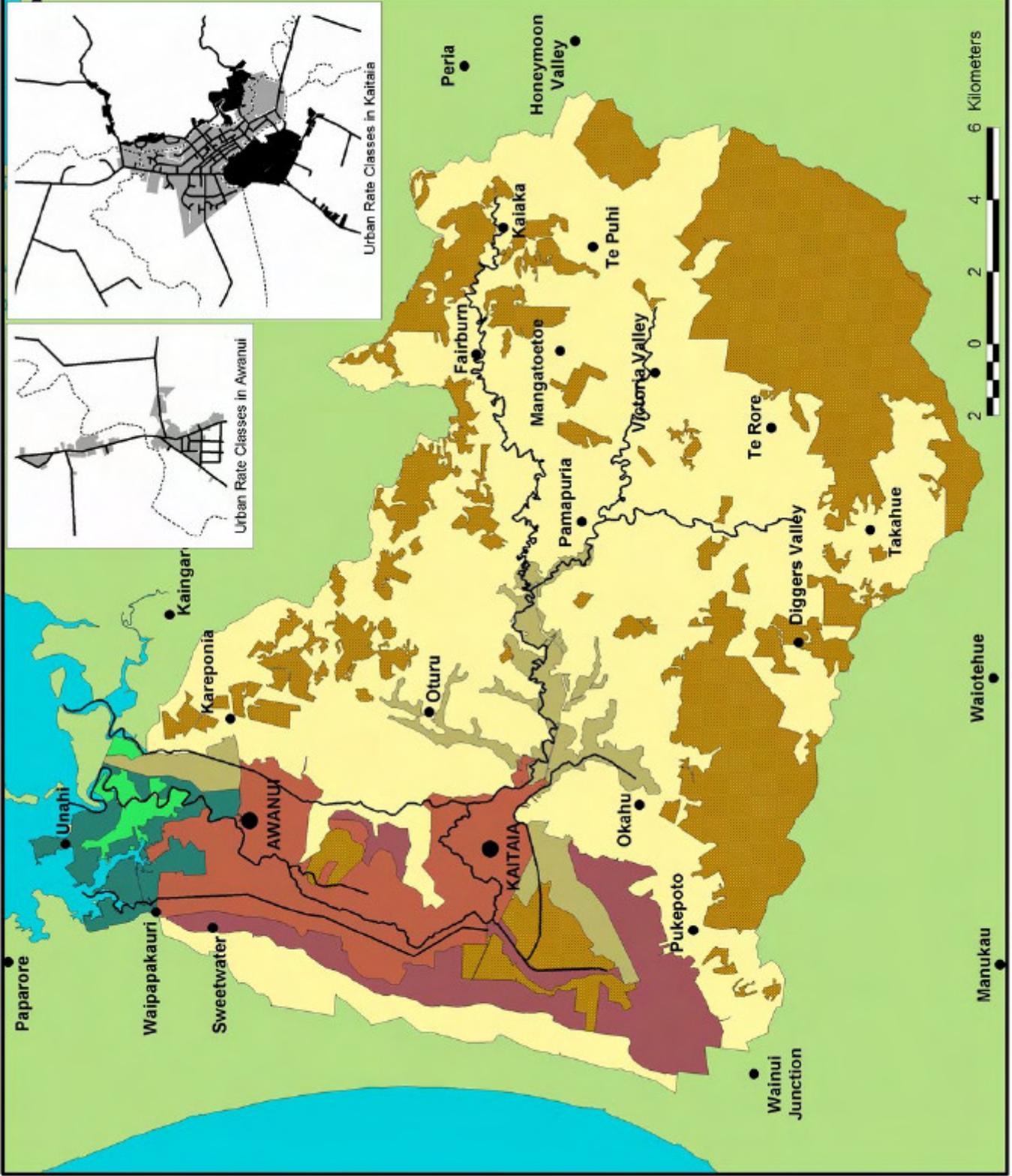
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Legend

- Major Rivers and Channels
- Urban Rate Classes**
 - UR - Property on flood plain
 - UF - Property not on flood plain
- Rural Rate Classes**
 - K1
 - B1
 - A2
 - B2
 - C
 - D
 - E
 - F



APPENDIX D: Memorandum of Understanding between the Northland Regional Council and the Far North District Council over the management of the Awanui River Flood Management Scheme.

APPENDIX E: Funding Schedule for 2005/06 to 2015/16

AWANUI RIVER MANAGEMENT PLAN - FUNDING SCHEDULE

Account Expense	Yr 1 2005/06	Yr 2 2006/07	Yr 3 2007/08	Yr 4 2008/09	Yr 5 2009/10	Yr 6 2010/11	
OPERATIONS							
1101 Salaries	30,000	30,000	30,000	30,000	30,000	20,000	
2123 Legal Fees	10,000	7,000	7,000	7,000	7,000	7,000	
2047 Consultants	5,000	5,000	5,000	5,000	5,000	5,000	
3727 Publicity/Promotions	3,000	3,000	3,000	3,000	3,000	3,000	
2049 Contract Staff (Supervision)	20,000	20,000	20,000	20,000	20,000	20,000	
3456 Field Inspections	3,000	3,000	3,000	3,000	3,000	3,000	
4290 Stop banks/river sch maintenance	100,000	100,000	100,000	100,000	100,000	150,000	
5228 TLA collection commission	20,758	22,680	22,680	22,680	22,680	22,680	
5228 TLA special RID DB costs added*	25,000	7,500	7,500	25,000	7,500	7,500	
5239 Doubtful-Bad Debts (uncoll rates)	19,221	21,000	21,000	21,000	21,000	21,000	
5521 FNDC rates discount	4,805	5,250	5,250	5,250	5,250	5,250	
Total Operating Costs	240,784	224,430	224,430	241,930	224,430	264,430	1,420,434
CAPITAL							
Capital plant or contingencies							
Capital works per plan, Stg 1	175,725	179,630	181,500	179,300	172,975	7,370	896,500
Total Capital Costs	175,725	179,630	181,500	179,300	172,975	7,370	896,500
* Based on subdivision activity etc							
TOTAL COSTS PER YEAR	416,509	404,060	405,930	421,230	397,405	271,800	2,316,934
FUNDING OF SCHEME							
Awanui River Plan - Urban rate							
Awanui River Plan - Rural rate	384,413	420,000	420,000	420,000	420,000	420,000	
Loan funding							
TOTAL FUNDING	384,413	420,000	420,000	420,000	420,000	420,000	
NET SURPLUS/(DEFICIT) FOR YEAR	- 32,096	15,940	14,070	-1,230	22,595	148,200	
AWANUI RIVER PLAN FUND BALANCE							
IN FUNDS OR(DEFICIT)	-32,096	-16,156	-2,086	-3,316	19,279	167,479	

NEW CLASSIFICATIONS AFTER SUBMISSIONS

Rural					Including GST		
	Old Area (Ha)	Revised Area (Ha)	Multiplier	Rate	Total	Total Class	
A1	3374.5	2691.0	1.00	\$25.00	\$67,275	75,684	
B1	2642.1	2224.0	0.75	\$18.75	\$41,700	46,913	
A2	262.2	283.0	1.00	\$25.00	\$7,074	7,959	83,643
B2	1312.3	827.4	0.75	\$18.75	\$15,514	17,453	64,366
C	1435.8	1763.0	0.50	\$12.50	\$22,038	24,792	24,792
E	10990	11320.0	0.00	\$-	\$-	-	
F	20100	20541.7	0.04	\$1.00	\$20,542	23,109	23,109
					\$174,143	\$195,910	195,910
Indirect Benefit							
Class	Old Count	Revised Count		Rate			
All	4400	4222	3775	\$10	\$42,220	47,498	RuralIndirect
				Indirect	\$42,220	\$47,498	21,454
Urban							
Class	Old Count	Revised Count		Rate			
UA	1710	1610	1530	100	\$161,000	181,125	199,238
UF	717	705	658	10	\$7,050	7,931	15,863
UCom	-						
	2427	2315	2188	Urban	\$168,050	\$189,056	215,100
123.75							
22.5	Rural#	1907		TOTAL	\$384,413	\$432,464	432,464