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Waipa Zone Management Plan

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Waikato
REGIONAL COUNCIL
Te Kaunihera ā Rohe o Waikato

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Purpose of this plan
This plan is the primary tool for the implementation of all river and catchment management activities within the Waipa Zone

The purpose of this plan is to set the strategic direction for river and catchment management within the zone. This plan provides an overview of the zone and a description of management activities to achieve the strategic direction, including levels of service, risk management and financial management. This plan contributes to Waikato Regional Council's (WRC's) vision and mission via the first flagship goal:

> *"the values of land and water resources are sustained across the Waikato Region."*

The Waipa Zone
The Waipa Zone is one of five zones within the greater Waikato River catchment, and one of eight within the Waikato region. The zone has around 12% of the total land area within the Waikato region, 17% of the region's population and contains around 20% of the region's native vegetation.

The zone is dominated by the Waipa River channel and tributaries, and is the single largest tributary to the Waikato River catchment. The nature of the zone is upper catchment, with most of the services being non asset-based, such as soil conservation, river management and pest management. The Waipa zone is a biodiversity stronghold, with a variety of ecosystems, including rivers and streams, lakes, terrestrial, wetlands, and karst.

There have been significant changes in land use within the zone since 1840, with almost all of the native vegetation in the low-lying valleys having been converted to pasture and put into agricultural use – primarily to support dairy production. Land-use change is largely related to European settlement in the zone during the 19th century, following the Kingitanga movement, Raupatu and post war settlement.

River and catchment management
River and catchment management via the Lower Waikato Waipa Control Scheme began in the early 1960's, with stopbank construction in Otorohanga and river channel management works, including Te Kuiti town. Historical catchment management included farm plans under land improvement agreements throughout the 1970's and 1980's, and the Waitomo Scheme carried out from 1984 - 1996.

River and catchment management activities within the zone include catchment oversight, information and advice, catchment works programmes, river management and flood protection. Work is directed towards priority catchments based on key considerations including water quality, erosion potential, biodiversity values, community usage, economic importance and flood risk mitigation. River and catchment management activities are coordinated under "whole of catchment management", which means that on-going efforts are made to identify and establish linkages between all issues and activities that contribute to successful catchment management.

Vision and goals
The Waipa zone vision is:

> *"To revitalise the waters of the Waipa River and its tributaries by 2050".*

We will achieve this by working collaboratively towards the sustainable use and health of the Waipa Zone's land and water, while recognising economic realities and community needs, now and into the future."

The goals in support of the vision are:

- *Goal 1: The zone's soils remain productive for future generations and contribute to healthy waterways*
- *Goal 2: Water quality and the availability of water support recreational, environmental and infrastructural needs*
- *Goal 3: Waterways and land-based ecological corridors allow indigenous biodiversity to thrive*
- *Goal 4: People, property and services are protected from floods.*
- *Goal 5: Zone management acknowledges the economic aspirations of the community and historical, cultural and spiritual connections with the river*

Trends and issues
A number of trends and issues have been identified as being of particular importance within the zone. These include land use change, erosion and the effects of sedimentation, water quality and supply,

protection and enhancement of biodiversity, increasing expectations for flood protection, Co-management, emergency preparedness and community engagement. A range of management options are outlined to address each issue.

Stakeholders
Key stakeholders within the zone include ratepayers, territorial authorities, central Government agencies (particularly DOC), the Waipa Liaison Subcommittee, landowners with Land Improvement Agreements, Fish and Game, Mighty River Power, industry and education, tourism and conservation groups.

Relationships with iwi
Tangata whenua are key partners in river and catchment management, and WRC recognises the need to work closely with iwi in river and catchment management. The Waipa Zone covers the rohe of three of the four principal tribes that comprise the Tainui waka, being Waikato Tainui, Ngaati Maniapoto and Raukawa. WRC will work within the framework set out within the Deeds of Co-management in partnership with the Waikato River Authority.

River and catchment management assets
The physical scheme assets within the zone are limited, and comprise 4.6 km of stopbanks, three pump stations, five weirs, one bank revetment and 712 km of managed natural river and stream channels. The stopbanks, pump stations and one river weir are owned and managed by Otorohanga District Council (ODC), while four lake weirs and one bank revetment are owned and managed by WRC. The total Optimised Replacement Value of the WRC-owned scheme assets is approximately $86,000. The WRC-owned weirs are the youngest assets, while some of the ODC-owned pump station components are beyond their useful operating lives. 89% of the ODC-owned stopbanks exceed the design flood level.

In addition to the above scheme assets, river and catchment management works and services are undertaken on approximately 3,300 ha of soil conservation and Clean Streams catchment works on private land and 1,334 ha of soil conservation works on private land that is subject to Land Improvement Agreements.

Levels of service
The following levels of service have been confirmed:

- **Flood protection:** river and flood protection schemes provide the standard of flood protection agreed with communities
- **River management:** management of identified priority rivers and streams to achieve a balance between maintaining channel capacity, channel stability and environmental values
- **Environmental enhancement:** to provide land and catchment management services to enhance water quality, biodiversity and promote the sustainable use of land and soil; to complete new riparian and land protection measures within the zone according to the established priorities and within budget estimates
- **Community engagement:** work with all stakeholders to achieve mutual objectives; work in partnership with iwi to sustain the Mauri of the Waipa zone; Co-management arrangements are incorporated within river and catchment management decision-making; decision-making processes are transparent and easily understood
- **Reliability and responsiveness:** response to events, requests and complaints is timely, and appropriate solutions are provided; services are provided and performed to agreed levels and standards
- **Affordability:** costs for services are distributed equitably; services are managed for the benefit of current and future generations

Risk management
The primary risks to river and catchment activities within the zone are:

- Service level agreements not met or non-existent
- Natural hazards resulting in damage to zone assets
- Stopbank failure
- Pump station failure
- Land-use change and regional intensification and development
- The impacts of animal pests
- Poor stocking practices and management.

The above risks are drawn from a risk register, which identifies all risks within the zone. The above risks are addressed by a draft Risk Action Plan, which identifies

current practice and specific management actions.

Financial management

The Waipa zone services are provided on an annualised maintenance cost basis. While there are activities on specific types of assets that are not carried out each year, the work is spread as evenly as possible across each year.

Historical maintenance costs from 2006/07 – 2010/11 indicates a steady trend at around $1.25 million, and planned maintenance cost for 2012/13 onwards remains at a similar, although slightly increased level – around $1.4 million annually.

Historical capital expenditure indicates a steady trend during the period 2006/07 – 2010/11, with emphasis on renewals. Future capital expenditure planned for the Waipa zone starting in 2012/13 is a combination of new works and renewals, and remains at historical annual levels – around $125,000.

Total revenue for 2012/13 is $1.45 million, with 100% of this sourced by general rates and targeted rates. The reserve balance for the Waipa zone remains negative but steadily declining throughout the planning period.

Improvement Planning

The on-going development and improvement of Zone Management Plans is integral to WRC's implementation of improvements to business processes and practices. The draft improvement plan identifies the key areas for development and improvement, and sets a plan in place to achieve improvements over time.

The following improvement actions are considered to be the highest priority:

- Development of a monitoring and reporting programme
- Improvement of asset data on completeness, condition and performance
- Completion of the Risk Action Plan
- Resolution of financial issues, including valuation of assets and depreciation
- Completion of the Zone Improvement Plan.

1 Introduction and purpose

1.1 Overview

The Waipa zone forms a part of the Waikato River catchment situated along the western side of the catchment, and covers an area of 306,569 hectares. The zone represents around 22% of the total Waikato River catchment area.

The Waipa zone is dominated by the Waipa River channel and associated rivers, streams and lakes. The Waipa River is the single largest tributary to the Waikato River, and the only part of the Waikato catchment area that is not unduly affected by hydro-electric power generation activities.

The Waikato region has more than 16,000 kilometres of rivers and streams. It is important that our waterways and catchments are managed in a way that minimises erosion and flooding and their associated damage. Sound river and catchment management assists to reduce natural risks and maintain stable rivers, streams and drainage systems. Beneficial river and catchment management objectives can only be achieved where there is recognition of the impacts and interdependencies across the entire catchment.

Environmental benefits of river and catchment management works include reduction in sediment entering waterways and the protection and enhancement of native vegetation and wetlands. Other issues such as recreational and cultural use of rivers and their environs, the enhancement of biodiversity and overall aesthetic improvement are all important for the community and region as a whole.

1.2 Purpose

This plan is the primary tool for the implementation of all river and catchment management activities within the Waipa zone, and includes:

- A vision for the zone
- A strategy to achieve that vision
- Activities to implement the strategy
- A set of service levels and performance standards for the activities.

A key component of this plan is provision of detail on the long-term management of river and catchment management assets. This plan is intended to fulfil asset management planning requirements for river and catchment management assets in the Waipa zone.

In summary, the purpose of this plan is to:

- Provide a document that sets out the long-term strategic direction for river and catchment management within the zone
- Provide an overview of the zone generally, with specific focus on the work programmes and associated activities within the zone
- Provide a communication tool for staff, Council committees and subcommittees, iwi, and key stakeholders, including the general public
- Improve understanding of service level standards, options and costs to smooth peak funding demands, while improving customer satisfaction
- Manage the environmental, service delivery and financial risks of asset failure
- Identify lifecycle costs to provide agreed levels of service over the long term
- Explain how the long term works programmes have been developed and how they will be funded
- Provide a management tool that is live and adaptable, and that can address changing needs over time.

1.3 Relationship to Waikato Regional Council Vision, Mission and Flagship Goals

WRC has established its strategic direction over the council triennium – from 2010 to 2013. The "strategy"[1] sets out what we do, why we do it and the value provided to the community. The strategy identifies WRC's vision, mission and flagship goals as follows:

Vision for the Waikato region
"Competing globally, caring locally"

Mission
"To provide regional leadership to balance economic and environmental outcomes to

[1] *"Strategic direction for the Waikato Regional Council 2010-2013"*, Waikato Regional Council.

enable the social, economic, environmental and cultural wellbeing of current and future generations"

Flagship goals

1. *The values of land and water resources are sustained across the Waikato region.*
2. *The people of the region collaborate to achieve a shared vision of the Waikato competing globally, caring locally.*
3. *The Waikato Regional Council meets its legislative co-governance requirements by working together in good faith and a spirit of cooperation.*

Council's first flagship goal is of most relevance to this plan. The strategy guides how rivers and catchments will be managed, and recognises the importance of Zone Plans in relationship to the first flagship goal as follows:

Flagship Goal – *"the values of land and water resources are sustained across the Waikato Region"*

- **To achieve this goal we will**
  - Manage rivers and catchments within a framework that recognises:
  - community and cultural needs and aspirations
  - natural risks
  - economic and environmental sustainability.
- **This goal will be measured by making sure**
  - Integrated catchment management services are managed to the performance standards agreed with communities and as set out in zone plans.

WRC's strategy provides the framework within which to develop a zone specific vision. The zone vision will be implemented through specific objectives and goals, as outlined in section 3.1.

1.4 Relationship to overview of river and catchment management in the Waikato region

This plan is one of eight zone management plans that will cover the management of river and catchment activities across the Waikato region. This plan is supported by an overview document titled "*Overview of River and Catchment Services – Waikato region*" (Doc# 1717271).

The "*Overview of River and Catchment Services – Waikato region*" document provides an overview of:

- The nature of the region and the key issues we face in the future
- How river and catchment activities are managed across the region
- Responsibilities for river and catchment management
- How river and catchment management relates to other activities
- The legislative and policy requirements for river and catchment management
- How links with the community are developed and maintained.

This plan complements the overview document by providing zone-specific detail on river and catchment management within the Waipa zone.

2 The Waipa zone

2.1 Regional context

The Waipa zone represents around 12% of the total land area within the Waikato region. It has about 17% of the region's population and contains around 20% of the region's native vegetation.

For the purposes of river and catchment management, the Waikato region comprises four primary catchment groups being:

- Waikato River catchments
- Waihou-Piako catchments
- Coromandel catchments
- West Coast catchments

While the Waihou-Piako, Coromandel and West Coast catchments are also zones, the Waikato River catchment is divided into five separate management zones as follows:

- Lake Taupo
- Upper Waikato
- Waipa
- Central Waikato
- Lower Waikato

The location of the Waipa zone in relationship to the other management zones within the Waikato region is shown in Figure 1.

2.2 Overview

Per Figure 1, the Waipa zone covers an area bordered by the catchment divides with the:

- Upper Waikato zone in the east - from the Rangitoto Ranges to Mount Maungatautari
- West Coast zone in the west - from the Hakarimata Ranges to a point south-east of the Waitomo stream catchment, via Mount Pirongia
- Central Waikato zone in the north – along a NE-SW line from the Hakarimata Ranges to Mount Maungatautari, and to the south of Ngaruawahia, Hamilton and Cambridge; and
- West Coast zone in the south – from a point SE of the Waitomo Stream catchment to the Rangitoto Ranges, south of Te Kuiti.

The Hakarimata ranges define the northern boundary of the zone. The volcanic cones of Pirongia and Maungatautari dominate the landscape from west to east.

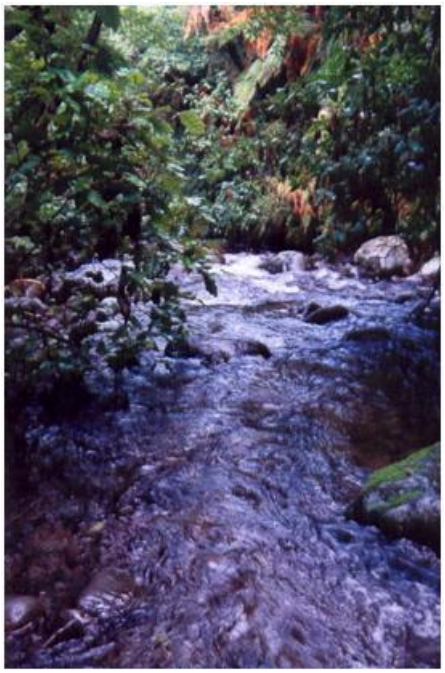
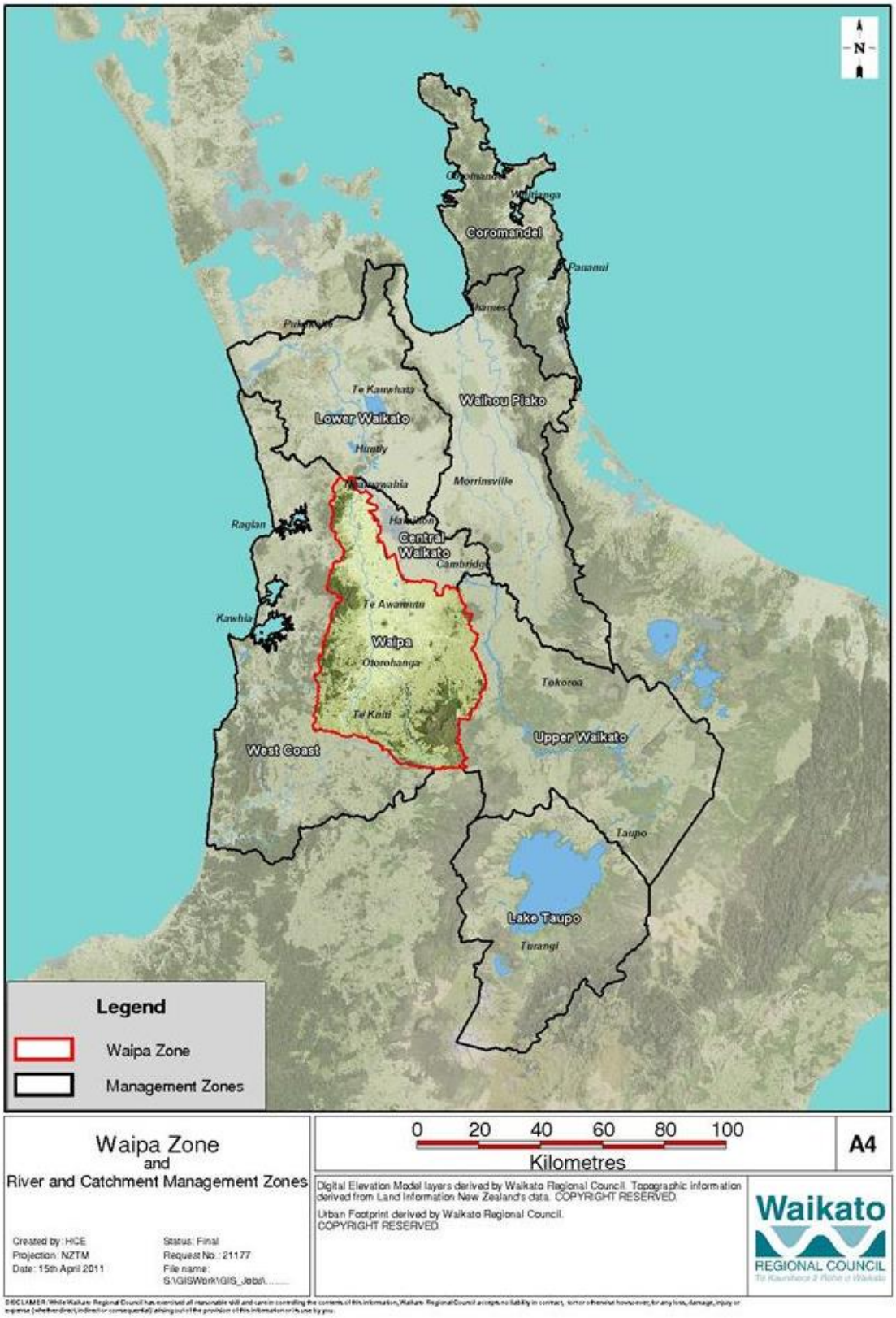


Photo 1 Mangakara Stream, Mt Pirongia

Figure 1 Relationship of Waipa zone to other management zones



The underlying geology of the Waipa zone is similar to many regions of New Zealand, being built upon a basement of greywacke rocks, which form many of the hills. Much of the land within the zone has been covered by limestone and sandstone, forming bluffs and a karst landscape. The predominant geology of the area is volcanic material including tephra, which accounts for 65 percent of the zone, while alluvial and unconsolidated sediments make up a further 18 percent. Greywacke or Argillite makes up six percent, sandstone,

mudstone and limestone five percent, and Taupo pumice three percent.
The geology of the catchment to the southwest consists of ignimbrite overlying greywacke, which forms high flat to rolling hills separated by narrow, steep valleys. As the ignimbrite thins to the east, steep greywacke hills take precedence, separated by valleys with alluvial flats[2].

Steep hills consisting of calcareous sandstone, limestone and mudstone are common in the west with alluvial valley flats separating the hills. In the north the alluvial flats dominate, interspersed with occasional undulating and rolling hills formed from thick tephra (volcanic ash) beds and ignimbrite[3].

Throughout the catchment tephra mantles most areas, the thicker beds contributing to the rolling topography. In the eastern areas of the zone, the land has been covered with ignimbrite deposits and large amounts of pumice from the Taupo volcanic zone.

Recent volcanic activity has included:

- Karioi and Pirongia stratovolcanos, composed of andecite and basalt that erupted around 2.5 million years ago. Other volcanoes in this group include Kakepuku, Te Kawa, and Tokanui.
- Maungatautari, composed of andesite and dacite, that erupted around 1.8 million years ago
- Pyroclastic flows from the Taupo volcanic zone have deposited ignimbrites over the eastern area of the zone over the past 2 million years. Some of the largest deposits are from the Whakamaru eruption, north of Taupo, around 330,000 years ago. The ignimbrite deposits from the Oruanui eruption 26,500 years ago, and the Taupo eruption, 1800 years ago are also major deposits.

Allophanic Soils[4] (those dominated by allophone minerals, that are greasy, porous and have low natural fertility) are the most common soils in the Waipa catchment. Podzols (leached soil) are present in the southeast under higher rainfall, altitude and where Taupo tephra mantles the topography, while Gley (poorly drained soils), Recent Soils and Organic Soils occupy the alluvial flats throughout the catchment.[5]

The total area covered by the zone is 306,569ha. In terms of vegetative cover, 78 percent of the zone area is in pasture, 21 percent is native vegetation, scrub and other land uses, and one percent is production forestry.

The Waipa zone is dominated by the Waipa River channel and associated rivers, streams and lakes. The Waipa River is the single largest tributary to the Waikato River.

The Waipa zone contains 4,825 km of mapped stream and river channels, or around 11% of the total length of waterways within the region. Almost three-quarters of this stream length consists of small first and second order channels, draining primarily pastoral land dominated by dairy and sheep farming. Erosion-prone soils and areas of instability deliver high loads of sediment to some tributary streams and the main channel of the Waipa River.

The Waikato region's shallow lakes are the largest remaining collection of their type in New Zealand. The Waipa zone contains numerous peat lakes, the largest of which are Lake Ngaroto and Lake Rotokauri. The peat lakes within the zone are valued for their unique genetic diversity, scientific interest and recreational opportunities. They are also valued for their cultural and spiritual values. Peat lakes are a valuable habitat for many unique animals and plants, but are under threat due to drainage, nutrients and plant and animal pests. WRC plays an active peat lakes management role by working with landowners and other stakeholders to address these issues.

Invertebrate monitoring indicates that the habitat quality of streams in the Waipa zone is below average regionally, while ecological health is around the regional average. Habitat quality and ecological health in streams ranges from poor to excellent across the zone, depending in part upon the upstream land use and activities next to the stream.

The Waipa zone is a biodiversity stronghold, with a variety of ecosystems, including rivers and streams, lakes, terrestrial, wetlands, and karst. These ecosystems provide critical habitats for indigenous fauna, flora and micro organisms. They also provide a range of fundamental ecological functions, such as

[2] Hill, R (2004)
[3] Hill, R. (2004)
[4] Hewitt, 2003
[5] Hill, 2004; Collier et al. 2010

acting as fundamental buffer zones for other ecosystems in the region, reducing erosion and downstream sedimentation, nutrient storage and recycling and break down and absorption of pollutants.

The Waipa zone spans the boundaries of four district councils – Waikato, Waipa, Otorohanga and Waitomo. Total population of the zone is estimated at 67,000[6]. While there are no major cities within the zone, the zone has four primary population centres[7]:

- Te Awamutu (14,457)
- Te Kuiti (4,419)
- Otorohanga (2,589)
- Pirongia (1,335)

Te Awamutu, Otorohanga and Te Kuiti are connected by State Highway 3, which runs through the zone from north to south. Other main access roads that connect the smaller settlements across the zone include:

- State Highway 39, which runs from Otorohanga north to Ngaruawahia via Pirongia
- State Highway 31, which connects Otorohanga to Kawhia
- State Highway 30, which connects Te Kuiti to Mangakino via the Pureora Forest.

The total number of ratepayers within the zone is around 19,000, and a substantial number of these are rural dwellers. The main economic activities are centred on primary production – particularly dairy farming.

The boundaries of the zone and key features are shown in Figure 2 below.

2.3 Background

2.3.1 History[8]

The Waipa zone occupies the "central-west" area of the greater Waikato catchment, and has a long history of human occupation. The history of the Waipa zone is intimately tied to the history of the Waikato region.

Maori settlement

Early Maori settlement came from tribes descended from the arrival of the Tainui waka at Kawhia in the 13th century. The Tainui people explored the area around Kāwhia and settled there first, before spreading to the north, east and south, absorbing other tribes already in occupation. In later generations, Tainui ancestors founded tribes which spread throughout and beyond the Waikato region.

For the Tainui tribes, the harbours, rivers and swamps of Waikato provided food and other resources, and its mountains and ranges were strongholds. These places became identified with ancestors, and were celebrated in sayings and songs. Settlements sprang up throughout the region, usually on hilltops or beside lakes. Whāingaroa and Aotea harbours were traditional centres of population, as were mountains such as Maungatautari. As waka traffic increased along the rivers in the 19th century, the number of riverbank settlements multiplied. Major settlements on the Waikato River, for example, included Kirikiriroa (now Hamilton), Kaitotehe pā at Taupiri, and Ngāruawāhia.

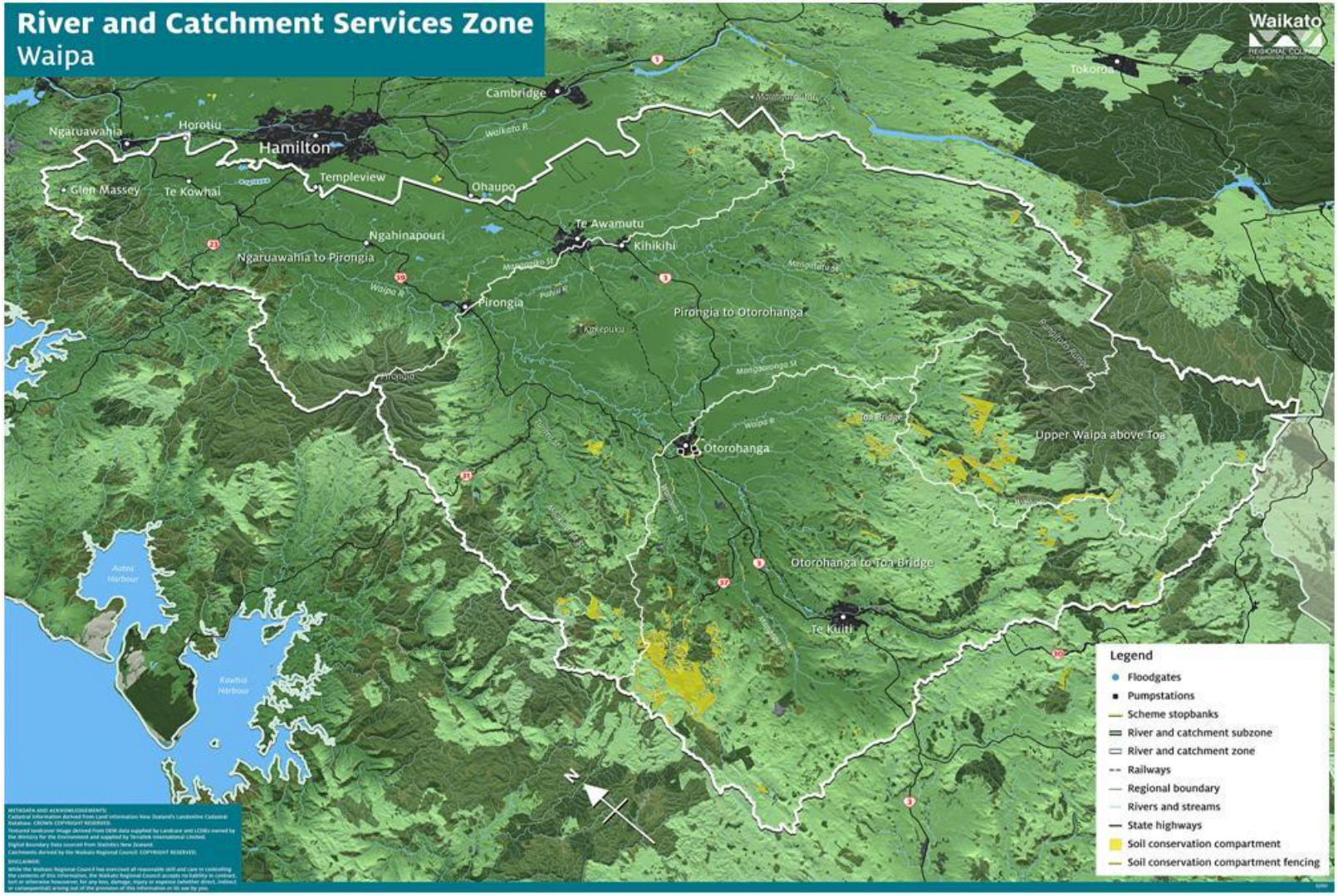
Photo 2 **Native forest inventory on Tiroa Station - upper Waipa Catchment**

[6] Based on 2006 mesh-block estimates, noting that the zone does not align with mesh blocks or District boundaries.

[7] Population figures from 2006 census.

[8] Adapted from http://www.teara.govt.nz/en/waikato-region/

Figure 2 Waipa zone features



From the late 18th century, Ngāti Toa and Ngāti Raukawa began a struggle with Waikato tribes for control of lands around Kāwhia. Ngāti Toa were defeated by Waikato tribes in the battle of Hingakākā, which took place near Lake Ngāroto about 1780, but warfare continued periodically. In the early 1820s, a combined Waikato and Ngāti Maniapoto force expelled Ngāti Toa from Kāwhia, and they migrated south via Taranaki to the Kapiti coast. Once there, they invited their Ngāti Raukawa relatives to join them, and this led to further migrations south.

Contact with Europeans from the early 19th century gave some tribes access to firearms, which changed the nature of warfare. The Ngāpuhi confederation of Northland, one of the first tribes to obtain muskets, made raids on Hauraki and Waikato in 1822, overwhelming the Marutūahu tribe of Ngāti Maru at Te Tōtara pā near present day Thames, and Waikato tribes at Mātakitaki pā, east of Pirongia mountain. Waikato tribes temporarily retreated south into Ngāti Maniapoto territory, while Ngāti Maru moved south to Maungatautari.

Early European settlement

The first Europeans to enter Waikato were welcomed by Māori because of the resources they offered. From the late 1820s, traders and adventurers arrived, bringing guns and skills in building, farming and commerce. Some married Māori women, becoming Pākehā-Māori (Europeans who lived within Māori tribes).

Missionaries spread Christianity and taught reading, writing and agricultural techniques. Missions begun by the Anglican Church Missionary Society throughout the Waikato region had varying levels of success. After establishing a mission at Kāwhia in 1835, the Wesleyans started more missions at Raglan (1839), Aotea Harbour (1840) and Te Kōpua (1841). A Roman Catholic mission, begun at Matamata in 1841, shifted to Rangiaowhia, east of Te Awamutu, in 1844. A church, school, flour mill and roads were built there, and Māori-owned ships took farm produce to markets in Auckland, Sydney and California.

The Kīngitanga movement and war in the Waikato

After signing the Treaty of Waitangi in 1840, Māori tribes became concerned about pressure to sell their land to the Crown for Pākehā settlement. Their traditional system of collective ownership was often ignored by Pākehā, who made deals with individuals.

Some chiefs realised that Māori would have to unite to keep their land, customs and mana. After discussions, tribes from Waikato, Taupō and the North Island's east coast proclaimed Waikato chief Pōtatau Te Wherowhero the first Māori king at Ngāruawāhia in 1858. Following his death in 1860, he was succeeded by his son Tāwhiao.

Tribal councils were set up to administer Māori laws protecting property and rights. Some of the king's followers were separatist, but most considered themselves loyal subjects of Queen Victoria, and believed Māori and British laws could co-exist. The government disagreed, and opposed the King movement.

When a disputed land sale led to war in Taranaki in 1860–61, and again in early 1863, some of the Māori king's followers from Waikato supported Taranaki tribes. The government then planned an invasion of the Waikato region to punish the so-called 'rebels' and obtain more land for settlement.

From 1861 military posts were constructed in South Auckland and along the lower Waikato River. The Great South Road was extended from Auckland to Pōkeno, where a huge fort, bluntly called Queen's Redoubt, was built. On 11 July 1863 Governor George Grey announced his intention to send troops into Waikato. He accused Waikato chiefs of disloyalty and planning to invade Auckland.

On 12 July 1863 British soldiers, supported by colonial troops, crossed the boundary set by Waikato tribes – the Mangatāwhiri River. Māori raids north of the Mangatāwhiri prevented further movement until late October, when Meremere pā was outflanked (bypassed) by troops carried up the Waikato River in gunboats. After a fierce battle at Rangiriri in late November, troops marched to Ngāruawāhia, which had been abandoned, and then to Whatawhata, Tuhikaramea and Te Rore on the Waipā River.

Māori ambushed soldiers at Waiari near the Mangapiko Stream in early February 1864, but this failed to stall the British advance. Skirting the massive Pāterangi pā, troops attacked the Māori supply base at Rangiaowhia on 21 February, killing old men, women and children, and the next day

overcame resistance at Hairini. In late March and early April about 300 King movement supporters made a final stand at Ōrākau, but were defeated and driven into exile south of the Pūniu River, in territory which became known as the King Country.

Raupatu
After the war most Māori-owned land in western and central Waikato was confiscated under the New Zealand Settlements Act 1863. Some was later returned, but the rest was sold or given to Pākehā settlers.

Post-war settlement
Before the war was over, the government planned to confiscate Waikato lands and establish defended townships to deter Māori from reoccupying their territory. The chosen settlers were the Waikato militia – four regiments recruited in Otago and Australia in late 1863 with the promise of land grants and military pay after the war.

From mid-1864 towns were surveyed at Alexandra (now Pirongia), Cambridge and the former Māori villages of Kihikihi and Kirikiriroa (renamed Hamilton). They were occupied by militiamen and their families, who were allocated sections in the adjacent countryside. Settlers also moved into former military outposts: Te Awamutu, Ōhaupō, Whatawhata, Rāhui Pōkeka (Huntly) and Ngāruawāhia.

British troops were withdrawn in 1865–66, and in 1867 the militia was replaced by a professional armed constabulary force charged with guarding the confiscation line. Discovering that their land was inaccessible and swampy, many militia settlers departed.

The development of transport links assisted settlement, and helped agriculture and industry develop within the Waipa zone. The Waipā River was navigable to Pirongia, with paddle steamers and barges carrying freight, passengers, livestock and mail. The Waipa River system was used for freight until after the Second World War. After 1864 some Māori trails were developed for horse transport, and many of the roads in the Waipa zone were constructed starting in the 1870s and 1880s. The main trunk railway line reached as far south as Ohaupo in June 1878. Construction of the final section of the main trunk line through the King Country was completed in 1908.

Farming
In the 1860s and 1870s, most Waikato farmers raised cattle and sheep, and grew root and grain crops. From 1882, refrigerated shipping allowed perishable goods to be sent to Britain, where there was an expanding market for butter and cheese. Would-be dairy farmers snapped up land within the Waipa zone because it was ideal for cows – flat or rolling, with high rainfall and sunshine hours, and mild winter temperatures that allowed grass to grow nearly all year round.

Many wetlands had been drained by land companies in the 1800s, but drainage schemes continued into the 1900s. Topdressing of peat and alluvial soils with superphosphate and lime slowly improved pasture. The replacement of Shorthorn cattle by Ayrshire, Jersey, Holstein and Friesian breeds lifted the quality of dairy herds.

Throughout the early 1900's, the amalgamation of small dairy companies, mechanisation of dairy farms and improvements in milk collection lead to on-going growth in the dairy industry – growth that has continued until today.

2.3.2 Population

Waikato region
The population of the Waikato region at the time of the last census (2006) stood at 395,100. Statistics New Zealand estimates the current population of the region to be 416,600, and project more than 50,000 additional people (to 468,200) by 2031. The population in the Waikato region is most densely clustered around the Hamilton urban area. There are small pockets of density around other town centres, but most of the region is relatively sparsely populated, with less than 10 residents per square kilometre.

Those parts of the region that are more densely populated all tend to be the fastest growing. The most rapid growth projected by Statistics New Zealand[9] is expected to occur in Hamilton City (an annual average growth rate of 1.2% between 2006 and 2031), the former Franklin District (1.4%) and the Waikato District (1%).

Waipa zone
The population of the Waipa zone is estimated to be 67,000. Population density within the zone is highest in the north, and particularly within the Waipa District in the area around Te Awamutu, and in the Waikato District to the north and west of Hamilton City. Population density is lowest

[9] The projections described here are based on Statistics New Zealand's "medium" assumptions of fertility, mortality and migration

in the south-west part of the zone, to the west of Otorohanga and Te Kuiti townships.

The areas of highest population density are also the areas of highest population growth – particularly within the Waipa District, which has the second highest growth rate in the region behind Hamilton City[10]. The areas of lowest population density are also the areas of lowest population growth. The population growth projections of those districts that comprise the Waipa zone are split between Waikato and Waipa districts, which are projected to continue strong growth, and Otorohanga and Waitomo districts, which are projected to grow very slowly.

2.3.3 Economy

Waikato region

The Waikato region comprises the fourth largest regional economy in New Zealand, with the latest official estimates showing a gross regional product of $15.6 billion in 2007. In recent years, the factors driving the national economy (such as the availability of credit, and weaker international commodity markets) have also been key for the Waikato economy. The National Bank's Regional Trends report shows activity in the Waikato has followed a similar pattern to New Zealand as a whole through the recession of 2008-09 and subsequent recovery.

The Waikato economy has traditionally been highly reliant on agriculture. Dairy farming is the largest industry in the Waikato, comprising 9 per cent of gross regional product (adding dairy manufacturing brings the wider dairy sector up to 13 per cent of gross regional product). The most recent available data indicates the business services is the next largest contributor to gross regional product (8 per cent), followed by the real estate and construction sectors (although these two sectors have been particularly hard hit by the recession, and may have declined in terms of their contribution in recent times). The next largest industries in the Waikato are the wholesale and retail trade, health and community services and education sectors.

Waipa zone

The economy within the Waipa zone is dominated by agriculture, which is the single largest employment sector in the zone. Within the agricultural sector, dairy farming is the largest income earner, followed by drystock. In Otorohanga District for example, it is estimated that up to 70% of the economic activity is closely associated with the agricultural sector.

Other sectors that have a significant contribution to the economy within the Waipa zone are retail and wholesale, manufacturing and tourism.

2.3.4 Land use

There have been significant changes in land use within the zone since 1840. Pre-European vegetation cover was dominated almost entirely by native forest (both virgin and forest modified by fire), scrub and tussock. There were also significant wetland areas in the northern part of the zone – to the west and south of Hamilton (Rukuhia), to the north-east of Te Awamutu (Moanatuatua) and in the Te Kawa area.

Since 1840, almost all of the native vegetation in the low-lying valleys has been converted to pasture and put into agricultural use – primarily to support dairy production. This includes almost all of the significant wetland areas, which have been drained, leaving behind only remnant pockets of wetlands and shallow peat lakes. Much of the steeper hill country has also been converted to pasture to support drystock farming – refer to Figures 3 and 4.

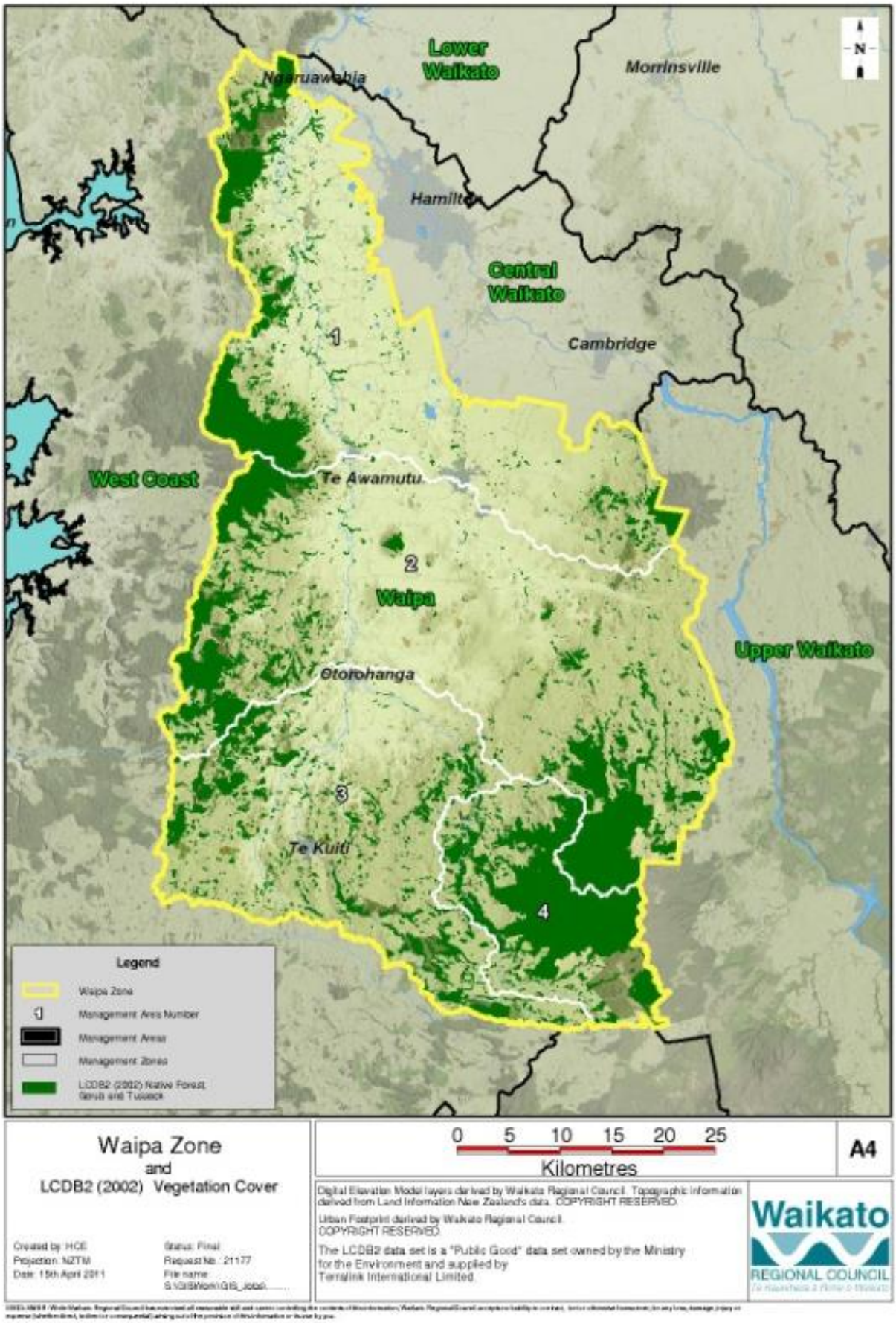
Recent land figures indicate a trend towards bringing steeper land into dairy production, and intensification of stocking rates on existing dairy farms. Urban land-use has increased over time – particularly around Te Awamutu, and there is an on-going trend towards a greater number of rural lifestyle properties in the northern part of the zone.

Photo 3 Drystock farming - Otorohanga

[10] Statistics New Zealand population growth figures 2001-2006.

Figure 3 Waipa zone land-use in 1840

Figure 4 Waipa zone land-use in 2002



2.4 River and catchment management

This section provides an overview of how river and catchment management activities have evolved within the Waipa zone by outlining the:

- Historical background that led to the introduction of the Lower Waikato Waipa Control Scheme (LWWCS).
- River management and flood protection activities that were completed as a result of the LWWCS.
- Historical catchment works.
- Project Watershed.

The above activities ultimately led to the development of Project Watershed and the current river and catchment management arrangements within the Waipa zone

2.4.1 Historical background

Historically, the floodplains of the Waipa River were poorly drained, and comprised natural wetlands and lakes. European settlement resulted in much of this land being drained and developed for agricultural purposes. The largest flood event recorded on the Waipa River was recorded in 1875, followed by floods in 1910 (second largest) and 1958 (third largest).

As early as 1911, the first authority charged with controlling the river for both navigation and flood control purposes was set up in the Lower Waikato zone. The Waikato River Board met with limited success in its activities, and the effects of river training works carried out by the Board were subject to a commission of inquiry in 1917. Until the 1950s, there was no single body responsible for management or control of the Waikato River catchment, although the Public Works Department carried out a number of surveys and investigations related to flood control and drainage.

During the 1950s, the low level of natural protection against flooding was clearly demonstrated by floods in 1952, 1956 and 1958. The greatest of these occurred in 1958. In addition to inundating rural agricultural land for long periods, this flood caused severe damage within the boroughs of Te Kuiti, Otorohanga and Huntly.

The former Waikato Valley Authority (WVA) was created in 1956 in an atmosphere of urgency, with the specific objective of controlling flooding in the Lower Waikato and Waipa Catchments. The wealth of hydrological data collected during the 1958 flood allowed the WVA to produce a comprehensive proposal for a flood control scheme for the Lower Waikato and Waipa catchments (the Lower Waikato Waipa Control Scheme or LWWCS). These proposals were set out in a report to the Authority in October 1959. They included a detailed strategy for stopbanking, channel improvements and control of natural storage to protect flood prone land in the lower Waikato. In addition, the proposal called for individual protection for the townships of Te Kuiti, Otorohanga and Huntly, and outlined proposals for channel improvements to the Waipa River. After obtaining government approval, the Lower Waikato Waipa Control Scheme (LWWCS) began in 1961, and was completed in 1982.

In 1989, reorganisation of local government resulted in the Waikato Catchment Board (the successor to the Waikato Valley Authority) being amalgamated with the Hauraki Catchment Board, all drainage boards in the Waikato Region, and numerous other small local bodies to form the Waikato Regional Council. Overall responsibility of the Lower Waikato Waipa Control Scheme transferred to this new body.

In the late 1980s and early 1990s, concerns regarding the level of maintenance of the Scheme and its ability to perform to design standards began to emerge. In 1990, the Waikato Regional Council conducted an audit of the structural condition of the Scheme works, which confirmed that deficiencies existed.

2.4.2 River and catchment management under the Lower Waikato Waipa Control Scheme

Initial development

A comprehensive flood protection scheme referred to as the Lower Waikato Waipa Control Scheme (LWWCS) has been in place since the early 1960s. After obtaining government approval, the LWWCS began in 1961.

The LWWCS was commenced under a deed of agreement signed by the WVA, the constituent Counties and Drainage Boards, and the Crown. The scheme was designed to provide flood protection and drainage improvements within the flood plains of the lower Waikato and Waipa rivers. The works consist of stop banks, pump stations, floodgates and main river channel improvements.

Scheme objectives

The objectives of the LWWCS specifically related to the Waipa zone are to provide flood protection to rural agricultural land in the Waipa Valley[11], and to provide flood protection for the Te Kuiti and Otorohanga urban areas.

The original objectives for the Waipa zone under the LWWCS were to be achieved by:

- Stopbanks providing direct protection to the Otorohanga urban area, including floodgates and pump stations for evacuating water from behind stopbanks.
- Willow clearing and channel management along river and stream channels where infestation severely restricted flood capacity – primarily in rural areas, but also in the Te Kuiti urban area.

Flood protection and river management works for the Waipa zone under the LWWCS were previously divided into "sections":

- "Section A" covering urban works comprising protection for Te Kuiti and Otorohanga,
- "Section C", covering rural river management works within the Waipa Catchment, involving the former Counties of Raglan, Otorohanga, and Waipa and also the former Mangapu Drainage Board.

Flood protection

Otorohanga

The flood plain of the Waipa River at Otorohanga and Te Kuiti was completely inundated during the 1958 flood. Some houses within the town were flooded almost to eaves level, and evacuation efforts were required to prevent loss of life.

Flood protection for Otorohanga consisted of stopbanks with extensive channel realignment. In addition, flood pumps designed to operate in conjunction with ponding areas were provided to control internal runoff from the catchment behind the stopbanks.

Extensive alterations were made to the North Island main trunk railway, State Highway 3 and State Highway 31 to facilitate stopbank construction. The design capacity for the works was to protect against the 1% AEP flood.

In 1983, the LWWCS review confirmed the capacity of the channel and stopbanks to contain the original design discharges, and indicated that these design discharges appeared to be somewhat conservative.

River management

Rural

By 1958, the Waipa River, once navigable from Ngaruawahia to Otorohanga, had become infested with crack willows. These willows had proliferated unchecked since European settlement, limiting the hydraulic efficiency of the river by obstructing the movement of floodwaters.

Maintenance and management of the river works in the Waipa zone was originally the responsibility of the former drainage boards and County/Borough Councils. Much of this work was funded through government subsidies via the minor works programme, with on-the-ground work being undertaken by local councils, while the overall programmes were managed by the former Waikato Valley Authority. These responsibilities passed on to the District Councils under the overall direction of the Waikato Valley Authority, and subsequently on to the Waikato Regional Council.

Under Section C of the LWWCS, much of the river works focused on clearing and maintaining the Waipa River channel from Ngaruawahia to Otorohanga and part of the Mangaokewa up as far as the Mangapu confluence, which is now part of the current river management works.

The works undertaken included channel improvements through enlargement and diversion, and maintenance of vegetation. Maintenance of vegetation included the removal of willows, removal of log blockages, islands and in-stream obstructions, and maintenance of aquatic weeds in channels and floodways.

Te Kuiti

In February 1958, Te Kuiti suffered flooding with water up to 1.25m deep on the flood plain.

The provision of flood protection within Te Kuiti was made difficult by the fact that the North Island main trunk railway, and both commercial and residential properties as well as a school, occupied almost the whole Mangaokewa Stream flood plain. There was insufficient room for stopbank construction without excessive disturbance

[11] A generic term used by the LWWCS referring to agricultural land in the vicinity of the Waipa River main channel and tributaries.

and cost. The protection work consisted of channel clearing, enlargement and straightening to pass a 113 m³/s flood flow below bank full level. This represented approximately a 50% increase in the pre-scheme bank full capacity of the stream.

Clearing of the sloping banks above the channel, which now constitute the esplanade reserve, particularly on the inside of bends, was undertaken. Full scale diversions of the Mangaokewa Stream were instituted at the southern end of the Borough. At the time of the original design, it was envisaged that the design 1% AEP discharge of 244 m³/s would be passed largely within the confines of the esplanade reserve without significant damage.

The 1983 scheme review confirmed that the intent of the original design had been achieved, and indicated that the originally assessed 1% AEP discharge for the Mangaokewa was somewhat conservative.

The Mangaokewa upgrade was a part of Section A of the LWWCS, and is also managed by the current river management works programme.

Review and completion

A major review of the Scheme, its scope and financing arrangements was undertaken in 1976 and 1977 at which time final decisions were made on those works to be included in the Scheme and those to be deleted. At this time new deeds were signed which superseded the previous deed. All the agreed works were substantially complete by 1982. The total replacement cost of the Scheme (including all assets in the Lower Waikato and Waipa zones) in today's values is approximately $135 million.
At the time of the Scheme completion in 1983, a major review was undertaken which validated the hydrological and hydraulic performance of the Scheme and confirmed the economic justification for the works.

The construction of the Lower Waikato Waipa Flood Protection Scheme was a historically significant milestone for the zone. Regular and chronic flooding had been a major difficulty for early settlers and posed significant constraints on economic development in the area.

2.4.3 Catchment management

The Waipa zone is characterised by the limited extent of historic soil conservation schemes - except for isolated farm plans and the Waitomo Catchment Scheme.

Historical farm plans

These works involve fencing, riparian planting, hillside plantings, and retirement of land. A total of 45 isolated farm plans exist in the Waipa zone outside of the Waitomo Scheme, with 33 of them being formally protected by Land Improvement Agreements (LIA's).

Photo 4 Soil slip erosion Waitomo Catchment

Land prone to erosion was set aside under LIA's from 1975 into the1980s, and the agreements were registered on the properties land title for a period of 99 years. LIA works generally consisted of retirement of eroded land and/or land identified with high erosion potential. Often these areas were native bush blocks left intact after earlier land settlement and development that were deemed worthy of protection by landowners.

LIA's are registered on property titles, and set out expectations for maintenance requirements on landowners. LIA's are legally binding agreements under section 30A of the Soil Conservation and Rivers Control Act 1941, between WRC's predecessor the Waikato Valley Authority, and landowners.

Many LIA compartments are between one and five hectares, however some are up to 50 hectares or larger.

Waitomo scheme

The Waitomo Catchment Control Scheme is located within Waitomo District. The scheme covers the watershed of the upper Waitomo Stream catchment, and covers an area of 4,800 hectares. The upper Waitomo Stream flows into the Waitomo Glow-worm caves before flowing north and entering the Waipa River at Otorohanga.

This scheme was carried out between 1984 and 1996. Like most of the earlier schemes, the scheme was funded by the property owners and central government. On-going

management and maintenance now rests with the property owners and WRC. The management requirements are set out in LIA's which are registered upon property titles.

The objective of the scheme is to protect the Waitomo caves system from sedimentation, and to encourage sustainable land management practices throughout the catchment. The scheme includes 50 km of fencing and 392 hectares of land retired from grazing on 17 properties.

While this scheme forms the historic basis of catchment activity in the zone, the focus in more recent times has shifted to a 'whole of catchment' approach, with the management of individual schemes being of less significance. This is particularly the case since the adoption of Project Watershed (Waikato River Catchment Services Project) in 2002.

2.5 Project Watershed

2.5.1 Overview

Waikato Regional Council has increasingly sought to address catchment based issues within a whole of catchment management framework. In the past, works related activities associated with land and rivers were often dealt with in isolation to related issues such as management of natural hazards and risks, water quality management and regional and district planning.

A significant step toward the whole of catchment approach occurred with the adoption of the Waikato River Catchment Services Project – also known as "Project Watershed" in 2002. Project Watershed seeks to integrate the range of activities that need to be considered in managing river and stream catchments in a sustainable way.

Formal work on Project Watershed began in 1999. It involved consideration of the whole catchment rather than the previous focus on separate historic catchment and river control schemes which differed widely in terms of levels of service, management and funding. Extensive consultation was undertaken across the entire catchment and the adoption of Project Watershed in 2002 resulted in a whole of catchment funding policy[12].

Since adoption in 2002, Project Watershed has provided the funding framework for all river and catchment works across the Waikato River catchment. For the Waipa zone all work programmes since 2002 have been undertaken within the funding arrangements applying to the zone (refer to Appendix 1). Project Watershed funding policies reflect all legislative requirements regarding beneficiaries of and contributors to services.

The land area covered by Project Watershed is geographically diverse. It comprises a range of geologies, soil types and unique features and includes geothermal areas, wetlands, hydro power generation infrastructure and peat lakes. Activities in one area of the catchment can directly impact another. For example, soil erosion in the Waipa catchment can contribute to sedimentation in the Waikato River and flooding in the Lower Waikato zone.

The catchment covered by Project Watershed includes the Waikato and Waipa Rivers as well as smaller rivers and streams in the Waipa zone such as the Mangapu, Waitomo, Mangapiko, Pirongia, Puniu and Mangatutu. Project Watershed incorporates the existing Lower Waikato-Waipa Control Scheme, the Lake Taupo, Reporoa, Paeroa Range, Waitomo and Karapiro/Arapuni Catchment schemes.

The primary focus within the Waipa zone is river management activities along the main channel of the Waipa River, the management of catchment protection works (soil conservation projects) and the management of tributary streams and associated riparian areas. In addition to river management and catchment management activities, there is also a focus on management of the Otorohanga flood protection works.

In summary, Project Watershed has ensured continuity of maintenance and enhancement of river management and flood protection works developed under the LWWCS. Project Watershed has also provided for additional catchment management works such as the Tunawaea slip, treatment of eroding hill country and riparian protection within the Waipa main channel and tributaries.

2.5.2 Project Watershed goals

The goals of Project Watershed are:

- Prevent deterioration of established flood protection assets so as to

[12] Refer to excerpts within Appendix 1

avoid loss of land productivity and a reduced level of flood protection.

- Ensure within the limits of efficiency and fairness, that rating for flood protection within the Waikato/Waipa river catchment recognises all beneficiaries and all those whose actions or inactions contribute to the need for expenditure on flood protection systems.
- Maximise the effectiveness and efficiency of water quality, soil conservation, flood control and land drainage activities within the Waikato and Waipa River catchments, and minimise inefficiencies caused by inappropriate actions or inaction. Project Watershed's primary objective is the management of sediment. However some activities will also contribute to improvements in water quality across the catchment.
- Provide a consistent framework for landowners and communities to be protected from flood damage in the flood plains of the major rivers, to a cost-effective standard agreed with the affected communities of the Waikato/Waipa catchment.
- Achieve and maintain stable river and stream channels and banks and ensure that inappropriate drainage or tributary management activities do not compromise scheme standards.
- Ensure effective control of accelerated erosion within the Waikato River catchment.
- Ensure that where there are significant contributors and beneficiaries elsewhere in the catchment, Project Watershed activity is not hindered by an inequitable financial burden on individual landowners.

Photo 5 Waipa slip February 2004

2.6 Management areas

The Waipa zone is split into four management areas for the purposes of river and catchment management. The management areas are:

1. Ngaruawahia to Pirongia
2. Pirongia to Otorohanga
3. Otorohanga to Toa Bridge
4. Upper Waipa above Toa.

The management areas are shown in Figure 2.

3 River and catchment objectives in the Waipa zone

3.1 Waipa zone vision, goals and objectives

3.1.1 Vision

The Waipa zone vision (est. 2011) is:

> To revitalise the waters of the Waipa River and its tributaries by 2050.

We will achieve this by working collaboratively towards the sustainable use and health of the Waipa zone's land and water, while recognising economic realities and community needs, now and into the future.

3.1.2 Goals and objectives

The Waipa zone goals and objectives are:

Goal 1: The zone's soils remain productive for future generations and contribute to healthy waterways.

We will achieve this by:

- Identifying river/stream bank erosion and resolving problems through bank stabilisation works, removal of obstructions and river training/improvement works, as appropriate.
- Minimising hill country erosion through the promotion of sustainable land management practices including retirement and tree planting.
- Working with local councils to protect value soils through land use plans and consents.

Goal 2: Water quality and the availability of water support recreational, environmental and infrastructural needs.

We will achieve this by:

- Promoting farm management practices that support water quality by preventing sediment and nutrients from entering waterways.
- Support water allocations being consistent with zone goals and priorities, and managed in a fair and transparent way.
- Promote the practice of maintaining adequate water storage within the zone.

Goal 3: Waterways and land-based ecological corridors allow indigenous biodiversity to thrive.

We will achieve this by:

- Managing pest plants and animals that are a threat to indigenous species and habitats, using current best practice management techniques.
- Looking for opportunities to enhance indigenous biodiversity through other zone management activities e.g.
  - Allowing for fish passage in any river training/improvement works.
  - Prioritising land retirement projects where they help create ecological corridors throughout the zone.
  - Prioritising riparian fencing and planting programmes where water temperatures are rising.
- Protecting threatened and special habitats such as shallow lakes, wetlands and limestone geology.

Goal 4: People, property and services are protected from floods.

We will achieve this by:

- Ensuring flood protection is based on accurate information and reasonable forecasts.
- Establishing realistic community expectations about flood protection and working with district councils to ensure plans support these expectations.
- Identifying and retaining natural flood storage and supplementing this with man-made control mechanisms as required.

Goal 5: Zone management acknowledges the economic aspirations of the community and historical, cultural and spiritual connections with the river.

We will achieve this by:

- Recognising mana whenua and mana whakahaere and working closely with iwi on all aspects of zone management.
- Allowing continued access to the river for recreational activity.
- Identifying where zone management can support economic development e.g. by creating/enhancing potential eco-tourism opportunities.
- Balancing the need for people to make a living from the zone with the need to preserve its land and water quality for future generations.

3.1.3 Catchment priorities, targets and objectives priority catchments

Current priority catchments, targets and objectives

Some tributary streams and sub catchments within the Waipa zone have been historically assigned priority for river and catchment purposes based on the nature of the issue, and its severity and impact including downstream consequences. To date, high priority has normally been given to catchments where there are high levels of soil erosion, land loss, river instability or high downstream effects including sedimentation and water quality deterioration.[13]

A range of river and catchment issues are to be addressed within the Waipa zone, these having been identified in the development of Project Watershed and subsequently, through the on-going activities of the Waipa Zone Subcommittee. Historically, the zone has had little river and catchment work undertaken when compared to other zones.

A number of river and catchment management services are being provided now, and provision has been made within Waikato Regional Council's LTP for an on-going programme over the next 10 years. As time goes on, other river and catchment issues are being identified, and there is a need to assess these projects against present priorities and make future funding provision as appropriate.

The focus of current activities is:

- Maintenance and management of existing works schemes, including the Waitomo Catchment Scheme
- Dealing with routine river management issues including channel obstructions (willow growth), bank erosion etc.
- Promotion of new river and catchment works in areas of high erosion risk including addressing the instability problems in the upper Waipa River resulting from the Tunawaea landslide.
- Promoting flood protection measures in identified areas usually in association with the relevant District Councils.

Table 1 sets out the priority catchments that have been identified within the Waipa zone, and outlines both the issues on a sub-catchment basis, and activities to address these issues. Table 2 outlines the river and catchment works programme objectives and targets.

The current information within tables 1 and 2 assists in determining where future efforts are to be targeted.

Framework for identifying future priority catchments

As a part of developing the zone vision, the Waipa Zone Subcommittee has developed a new framework for determining future priority catchments. The framework recognises the importance of social, cultural and economic considerations and opportunities in river and catchment management, in addition to environmental considerations.

The new framework brings in social, cultural and economic considerations as explicit parts of priority catchment evaluation. This approach improves the existing approach, which has had a strong emphasis on site-specific works to address environmental considerations.

While the framework for evaluating priority catchments is not yet complete, the Waipa Zone Subcommittee has identified the following factors as key considerations within the new framework:

1. Water quality, and relationship to erosion (geology/soils)
2. Biodiversity
3. Community use
4. Economic activity/contribution - such as tourism)
5. Quality of life – happiness, recreation
6. Flooding/risk management/mitigation

[13] Note that this may change with the development of a new priority catchment framework outlined in 3.2.3.2.

7. Water quantity and allocation
8. Contribution of sub-catchments – such as those with wetlands
9. Political considerations (related to point 3 above)
10. Healthy ecosystems (related to points 1, 2, 7 and 8 above)
11. Cultural values (related to point 5 above)
12. Cost and affordability
13. Use of best-practice catchment management examples

Development of the new framework has been identified as an action within the zone improvement plan – refer to Section 10.

Photo 6 Lake Ngaroto

Table 1 Waipa zone priority catchments

Priority catchment	Type of issue	Description of issues	Activities to address issues
Shallow lake catchments	Lake	Very poor water quality. Stock access. Drainage and peat subsidence. Lowering of levels.	Catchment/soil conservations works • fencing and planting • promotion of best practice
Moakurarua	River and catchment Issues	This catchment produces high sediment loads in the stream during rainfall events. A high proportion of this catchment is classed as having a high risk of erosion. Stream and river bank erosion is also prevalent. Areas of high biodiversity also exist within the catchment.	Catchment/soil conservations works • fencing and planting of hill-slopes Willow congestion and obstruction removal River training works • erosion protection works • gravel management Bank stabilisation works • fencing and planting.
Pirongia Stream	Stream and catchment Issues	This is a series of small stream catchments which drain the eastern side of Mt Pirongia. The upper reaches of these catchments are predominantly in DOC administered native forest. The water flowing from these forested catchments is generally of good quality however a significant proportion of these catchments are classed as having a high risk of erosion which is of particular concerned where native cover has been removed. Sections of these streams are also unfenced and allow stock entry. There are also remnants of native forest which are un protected.	Catchment/soil conservations works • fencing and planting of hill-slopes Stream bank stabilisation works • fencing and planting.
Waitomo	River and catchment Issues	Soil conservation works have been undertaken in the catchment over a number of years and considerable benefits in terms of stability of land in the upper catchment (above the Waitomo caves) and reduced sedimentation in	Maintenance of existing Land Improvement Agreements Promotion of and completion of new soil conservation/ catchment works

Priority catchment	Type of issue	Description of issues	Activities to address issues
		the caves system are now evident and documented. These works need to be managed and maintained and on-going new works programmes need to continue to be negotiated with property owners. Below the caves little work has been undertaken and both catchment and river erosion issues are prevalent.	• retirement of land for erosion control/conservation purposes River issues in lower catchment include flooding and channel stability.
Mangapu	River and catchment issues	Measures are needed in this catchment to address soil erosion and channel obstructions. An investigation into flooding in the Mangapu has shown that it is not economic to provide flood protection.	Maintenance of existing Land Improvement Agreements Promotion of and completion of new soil conservation/catchment works • retirement of land for erosion control/conservation purposes Support for Troopers Rd landcare group River issues in lower catchment include flooding and channel stability • obstruction removal • minor erosion protection works

Waipa River main channel	River and catchment issues	Issues in this part of the zone involve addressing the large scale river instability.	River improvement capital works
			• river training works
			  ○ gravel management
			  ○ erosion protection works
			  ○ bank stabilisation works
			  ○ fencing and planting
			Waipa River Improvement river works – Otorohanga to Toa Bridge.
			Waipa River Improvement river works – Otorohanga to Pirongia.

Mangatutu	River and catchment issues	A range of both river and catchment related issues are present in the catchment	Willow congestion and obstruction removal. River training works • gravel maintenance

Priority catchment	Type of issue	Description of issues	Activities to address issues
			• erosion protection works Bank stabilisation works fencing and planting Catchment wide environmental monitoring programme established.
Puniu	River and catchment issues	This river carries high sediment loads due to erosion within the river channel and instability in the upper catchment.	New soil conservation works Willow obstruction removal River training works • erosion protection works Bank stabilisation works • fencing and planting.
Mangapiko	River and catchment issues	A range of both river and catchment related issues are present in the catchment	Maintenance of historic stream works Willow congestion New soil conservation works River training works • erosion protection works Bank stabilisation works • fencing and planting Flooding within Te Awamutu.
Tunawaea	River, catchment and pest management issues	Issues in this part of the zone involve addressing the large scale land instability in the Tunawaea catchment and on-going channel instability and associated river management within the Waipa River itself.	Tunawaea capital works (Waipa River above Toa Bridge) • animal control • river training works • gravel management • erosion protection works • bank stabilisation works • fencing and planting of valley floors.
Otorohanga	Flood protection	The flood plain of the Waipa River at Otorohanga was	Ensure service level agreement is in place to service

Priority catchment	Type of issue	Description of issues	Activities to address issues
		completely inundated during the 1958 flood. Some houses within the town were flooded almost to eaves level and evacuation efforts were required to prevent loss of life. The protection for Otorohanga consisted of stop banking with extensive channel realignment. In addition, flood pumps designed to operate in conjunction with ponding areas were provided to control internal runoff from the catchment behind the stopbanks. Extensive alterations were made to the North Island Main Trunk railway, State Highway 3 and State Highway 31 to facilitate stopbank construction. The design capacity for the works was to protect against the 1% AEP flood. The 1983 Scheme review confirmed the capacity of the channel and stopbanks to contain the original design discharges and indicated that these design discharges appeared to be somewhat conservative. These need to be maintained and refurbished to ensure protection of Otorohanga up to the confirmed level of service – refer to Table 27 in Section 7.10 for a description of works done to ensure maintenance is completed. **Kawa stopbanks** Stop banking including floodgates was constructed along the Mangawhero as an historic minor work and requires maintenance to ensure it perform as designed.	assets. Ensure required works are undertaken. Ensure service levels are maintained or modified as required. Services levels • 1 in 100 year (1% AEP) level of flood protection for the Otorohanga urban area. • 1 in 50 year (2% AEP) level of protection for Te Kuiti urban area. • Annual maintenance works undertaken as required for the Kawa drainage scheme, including weed spraying. • Condition and performance report produced annually.

Table 2 Waipa River and catchment works programme objectives and targets

Activity	Objectives / priorities	Targets
Catchment oversight	Complete zone plan in 2011. Effective management and delivery of programmes in consultation with zone representatives and stakeholders. Management of all zone based activities, resources, assets and finances. The purpose of catchment oversight is to provide the overall management, oversight and direction to the zone programmes. It includes zone planning, management of zone staff, financial management, servicing of the catchment liaison subcommittee and stakeholder and political liaison. The objectives are to ensure the delivery of the zone programmes and activities as set out in the Annual Plan/LTCCP.	Audit NZ requirements as to asset planning are met. Implementation of zone plan. Progressive improvement and development of the plan Integration of work programmes across Waikato Regional Council activities. Clear connections and partnerships with other agencies. Three liaison subcommittee meetings held each year and additional targeted meetings/workshops as necessary. Liaison subcommittees satisfied with the level of reporting and works programmes undertaken. Key stakeholders engaged and satisfied with the outcomes of the zone programmes.
Information and advice	To provide a timely and responsive service to the community in terms of river and catchment enquiries. In regard to environmental monitoring, demonstrate value for money in terms of ratepayer investment in river and catchment work programmes. Maintain a database of zone assets, new assets recorded and able to be reported on. Waikato Regional Council receives requests for information and advice on river and catchment issues within each zone. The information and advice activity provides the ability to respond to these requests. The community has also requested that environmental monitoring programmes be put in place to measure the impacts of the work being undertaken in each zone. This activity provides this monitoring and the reporting of the findings to the community via the catchment liaison subcommittees and Council.	Respond to zone enquiries. To undertake an environmental monitoring programme to measure the impacts of the work being undertaken in each zone. Record and maintain an asset register of all zone works (Conquest-Geomedia).
Catchment maintenance	Ensure catchment works are maintained to a level that ensures the 'works' perform as designed. Demonstrate best management practices. Contribute to the integrated management of catchments. Implement annual inspection programme. Carry out works on a priority basis as needed with priority given to the Waitomo Scheme, follow by Historic works protected by Land Improvement Agreement and recent works	Follow up of the property inspections made in terms of maintenance works programmes. Condition and performance report produced annually Substandard soil conservation assets identified and maintained within the budgets. Agreements with landowners reached and new works implemented

Activity	Objectives / priorities	Targets
	funded by PWS.	Catchment management plans implemented.
Catchment new works	Control active soil erosion and promote soil conservation by riparian planting and retirement of erosion prone areas (including carbon farming). Encourage the sustainable management of land resources through the provision of advisory services and financial grants including the protection and enhancement of biodiversity. Demonstrate best management practices. Contribute to the integrated management of catchments. Promote works in priority catchments – refer to Table 1.	Promote and Complete works in priority catchments. Promote margin fencing and planting around unfenced river /stream areas, lakes, wetlands and bush fragments as agreed with property owners. Promote community awareness through initiatives such as newsletters, media releases, community networks and field
River management	Promote and implement programmes that address the adverse effects of rivers and streams where appropriate or feasible. Encourage the sustainable management of our river and stream resources through the provision of services including information, advice, works design, implementation and financial incentives. Demonstrate best management practice in relation to river and stream management. Contribute to the integrated management of river catchments including the provision of flood response, advisory services in relation to enquiries regarding river and stream management across the zone and the promotion of works in priority catchments. Promote works in priority catchments – refer to Table 1.	Reduce risks of localised flooding in priority catchments through removal of willow congestion and blockages Provide long term environmental benefits through improved water quality, keeping stock out of streams and fencing and planting of waterway banks and the construction of minor erosion control structures to reduce bank erosion. Provide a facilitative approach and coordination where works are needed across multiple properties. Provide a flood response as and when required. Condition and performance report produced annually.
Flood protection	Ensure a 1 in 100 year level of flood protection for the Otorohanga urban area is maintained. Currently managed via a service level agreement with Otorohanga district Council who own the assets. The total number of flood protection assets within the Waipa are: • km's of stopbanks • pump stations • screens • pumps • 3 control gates • 6.8km of channel improvements. 1 in 50 year (2% AEP) level of protection for Te Kuiti urban area.	Ensure service Level Agreement is in place to service assets. Ensure required works are undertaken. Ensure service levels are maintained or modified as required. 1 in 100 year (1% AEP) level of flood protection for the Otorohanga urban area. 1 in 50 year (2% AEP) level of protection for Te Kuiti urban area. Annual maintenance works undertaken as required for the Kawa Drainage scheme. Condition and performance report produced annually.

Activity	Objectives / priorities	Targets
	Maintain the drainage improvements within the Kawa drainage area south of Kakepuku.	
River improvement capital works	Promote and implement programmes that address the adverse effects on sections of streams and rivers within the zone where appropriate or feasible. Works are intended to bring the particular river or stream channel to the same standard as the remainder of the river system. Encourage the sustainable management of our river and stream resources through the provision of services including information, advice, works design, implementation and financial incentives. Demonstrate best management practices in relation to river and stream management. Contribute to the integrated management of river catchments – refer to Table 1.	Undertake capital works on reaches of rivers and streams as required to reinstate the channel to the same standard as the remainder of the system (excludes the reach of the Waipa River between Toa bridge and the Tunawaea Stream and Waipa River confluence). Works are mainly larger scale channel training and erosion control works. Sites are prioritised on annual basis. Works are mainly focused on the Waipa River main channel however some capital work is undertaken on the zones larger tributaries.
River improvement maintenance works	Promote and implement programmes where appropriate or feasible to maintain existing capital works. Encourage the sustainable management of our river and stream resources through the provision of services including information, advice, works design, implementation and financial incentives. Demonstrate best management practice in relation to river and stream management. Contribute to the integrated management of river catchments. This programme provides for the maintenance of the capital works. Many of these works utilise hybrid Matsudana willow poles and willow groynes. These require time to mature and establish their root systems to bind the soil along the banks and margins for stability, other structure also require maintenance particularly after large events. Maintenance of these is critical to the long term success of the works. This programme is also very important in our highly dynamic streams and rivers such as the Waipa above Otorohanga where bed load transportation ie gravel is very high.	Undertake maintenance works on and around existing capital works to ensure they are maintained in operative state and perform as designed (excludes the reach of the Waipa River between Toa bridge and the Tunawaea Stream and Waipa River confluence). Sites are prioritised on an annually. Works are mainly focused on the Waipa River main channel however some maintenance of capital work is undertaken on the zones larger tributaries.
Tunawaea capital works	Promote and implement programmes where appropriate or feasible to maintain existing Tunawaea capital works. Encourage the sustainable management of our river and stream resources through the provision of services including information, advice, works design, implementation and financial incentives. Demonstrate best management practice in relation to river and stream management. Contribute to the integrated management of river catchments.	Undertake capital works on the reach of the Waipa River between Toa's bridge and the Tunawaea Stream and Waipa River Confluence works are required to reinstate the channel to the standard as the remainder of the system. Works are mainly larger scale channel training and erosion control works. Works are prioritised on an annually and have been undertaken on the basis of stabilising from the upstream down.

4 Managing the zone

4.1 Overview of river and catchment management activities

Waikato Regional Council's river and catchment management activities include physical works and services, and advice and information provided to landowners and the wider community. The aims of river and catchment management activities are to:

- Manage issues on a 'whole of catchment' basis
- Manage hazards and effects associated with soil erosion and flooding
- Reduce sediment entering waterways
- Improve water quality
- Improve river stability
- Improve river environments by creating better habitats for a wider variety of plants and animals
- Maintain and manage existing river and catchment assets.

In the Waipa zone, river and catchment management activities include:

4.1.1 Catchment oversight

This involves the overall management and coordination of zone activities and programmes including implementation of the zone plan. Annual and forward programmes are considered by community representatives in the form of the zone catchment liaison subcommittee and reported to the wider community and the Council.

Catchment oversight also includes the maintenance of partnerships and relationships with key stakeholders across the zone.

4.1.2 Information and advice

This activity enables response to enquiries and provision of advice and information on river and catchment management in each zone. It also includes monitoring programmes to assess the environmental changes resulting from the activities undertaken.

4.1.3 Catchment works programmes (maintenance and new works)

Land throughout the Waikato region is susceptible to soil erosion. Services and programmes promoted by Waikato Regional Council in relation to the stability and use of land include:

- Liaison with property owners as to land instability issues.
- Preparation of land protection plans.
- Management of existing protection schemes/assets.
- Promotion of retirement from grazing and conservation planting of erosion prone land.
- Protection of indigenous vegetation in upper catchment areas.
- Installation of structures to control sediment and water runoff.
- Condition and monitoring programmes.

Catchment new works may involve the design, supervision and completion of soil conservation, erosion control and other catchment management measures. Assets associated with these programmes are usually under the ownership of individual property owners. However, Waikato Regional Council often has a role in their management due to the presence of registered agreements or covenants. All works on private land are subject to negotiation and agreement with the property owner.

Where existing catchment schemes are in place, programmes to maintain and manage these schemes are agreed with the owners. Community feedback indicates high value being placed on ensuring the existing protection measures are maintained to ensure that the benefits they provide continue into the future.

Photo 7 Mt Pirongia

4.1.4 River management

This involves the achievement of:

- Sustainable, stable and healthy rivers
- Integrated catchment management
- Management of flood waters

- Enhancement of the environmental values of river systems
- Liaison and integration with other Waikato Regional Council activities and programmes.

Typical river management works include:

- Removing blockages and obstructions
- Controlling bank erosion (by planting and fencing off river banks, construction of rock or other bank revetment works or construction of groynes)
- River training works (ensuring the flow paths of rivers are stable and optimum channel widths are maintained)
- Gravel and sand management.

4.1.5 Flood protection

This involves:

- Management of flood risks and hazards associated with rivers.
- Specific protection works as agreed with communities.

Waikato Regional Council is responsible for the maintenance of a number of major flood schemes throughout the Waikato region. Some schemes are managed in conjunction with district councils.

Typical flood protection works include:

- Stopbanks and floodways
- Pumpstations
- Floodgates
- Detention dams.

4.1.6 Related activities

Land drainage

Land drainage is not covered in this zone plan as the intention is to develop separate plans for this activity. However, land drainage is closely linked with river and catchment management and cannot be considered in isolation.

WRC is responsible for the maintenance of a number of land drainage areas. Typical activities include:

- Spraying
- Desilting
- Erosion control
- Removal of blockages

Activities are aimed at ensuring efficient and stable drainage systems, to effectively maintain optimum groundwater levels and drain surface runoff. In this way, the productivity of land is maximised.

Emerging practices

In order for WRC to manage the zone in an integrated manner other management practices are needed including:

- Continuing to improve linkages and relationships with other WRC functions including policy development and implementation, hazard management, resource use and resource information.
- Establishing and maintaining awareness of other influences within the zone including activities of utility providers, developers and territorial authorities or government agencies.
- Establishing a culture that ensures strategic thinking and planning of zone activities.
- Identification of linkages and impacts of other community or agency based groups within the zone, and establishing ways of working together to achieve objectives.

4.2 Whole of catchment management

4.2.1 Overview

In recent years, there has been increasing recognition of the range of issues which need to be connected in order to improve river and catchment management, including:

- Catchment processes are strongly interlinked
- Catchment activities impact upon other activities and values, whether these are cultural, economic, recreational or environmental
- Traditional approaches to river and catchment management did not always recognise the inter-relatedness of the environment's components, and problems may be created by managing resources in isolation from other uses
- Catchments as a whole provide a useful and functional unit for managing natural resources in a holistic way
- The transition from the traditional approach to the integrated, whole of catchment approach can often be challenging due to diverse and

incompatible interests, activities and demands upon resources.

Waikato Regional Council has developed some key principles for whole of catchment management and identified the range of issues that need to be considered as a part of successful whole of catchment management. These principles and issues are outlined within the overview document "*Overview of River and Catchment Services – Waikato region*".

4.2.2 What this means for the Waipa zone

For the Waipa zone, whole of catchment management means a continuation of efforts to identify and establish linkages between all issues and activities that contribute to successful catchment management. This approach is driven by the Subcommittee in order to achieve the vision and goals stated in Section 3.2.

Some of the more important whole of catchment considerations are:

- An on-going focus on linking upper catchment activities such as pest control with river and catchment management
- Maintaining clear channels to allow flood flows to pass through the system
- Monitoring the impacts of land use changes – both pasture to pine and intensification
- Impacts of future treaty settlements
- Climate change, which may lead to increased rainfall frequency and intensity
- Minimising sediment impacts to the Lower Waikato zone.

4.2.3 Biodiversity and biosecurity

Introduction

Biosecurity and biodiversity are two key activities undertaken by the Council. Managing pests and protecting natural biodiversity values have strong connections to the 'whole of catchment' management. For example, by removing pampas grass (which is exotic and shallow rooted) and planting native species (with deeper root systems) river bank stability can be greatly enhanced. There would be some net reduction expected in erosion and sedimentation at such sites.

Biosecurity in the Waikato region has four components:

- Managing public health threats
- Managing production threats
- Managing environmental (biodiversity and catchment) threats
- Managing potential pest threats.

The objective of the programme is to minimise the adverse effects associated with pests and increase pest management understanding through regionally co-ordinated responses. The goals are set out in the Operative Waikato Regional Pest Management Strategy (RPMS) developed under the Biosecurity Act 1993. Activities carried out to achieve these goals include:

- Enforcement of pest plant control rules
- Monitoring control work and property inspections
- Surveillance for potential pest plants
- Releasing biological control agents
- Facilitating and undertaking direct control of high threat pests
- Providing practical advice for controlling plant pests
- Promoting education and awareness, and
- Coordinating community initiatives.

Development of pest control rules, leverage of funding mechanisms and the ability to access land to carry out control work comes from powers available under the Biosecurity Act.

Biodiversity management seeks to identify and work to protect and enhance significant indigenous habitats and vegetation (e.g. wetlands, geothermal, terrestrial forest remnants, dune lands and limestone areas). The Resource Management Act (section 6(c)) requires regional and district councils, as a matter of national importance, to recognise and provide for the protection of these significant natural areas (SNA's).

For many landowners having an SNA will serve mainly to confirm the ecological value of their property. Over time rate relief or restoration assistance from the councils may be offered. SNA identification helps the Councils with policy planning and operations. It will help guide the regional council where it should target resources – from building drainage structures to doing pest control. Knowing where SNA's are and the threats to them will assist in the whole of catchment management approach.

Summary of Biosecurity/Biodiversity work carried out in the Waipa zone

Biosecurity

- Possum control – part of region wide programme to keep possums below a five percent residual trap catch density. Areas include: Waipa-Puniu, Arohena, Mt Pirongia buffers, Oparau, Ngutunui and Honikiwi
- Individual pest plant species control (the goal is eventual eradication):
  - alligator weed (Te Rore wetland, Kihikihi, Ohaupo) – including in farmland
  - climbing vines (old man's beard, cathedral bells)
  - climbing spindleberry (Troopers Road and other north King Country sites)
- Compliance monitoring (RPMS rules):
  - privet (subject to valid complaints received)
  - active privet initiatives in Kihikihi, Otorohanga, Te Kuiti, Pirongia and Whatawhata
  - tutsan – new infestations – Te Pahu
  - woolly nightshade
  - ragwort/nodding thistles/gorse
  - pampas
  - general road/rail side compliance – esp. KiwiRail, NZ Transport Authority (State highways)

Biodiversity/SNA work

- Hamilton Halo project – bringing tui back to Hamilton City through intensive rat control at breeding sites within a 20km radius (Maungatautari, Old Mountain Road/Hopes Bush, Tirohanga Road, Kakepuku, Maungakawa and Te Miro).
- Completed SNA inventory in 2011.
- Waipa DC currently preparing district plan and are completing consultation with landowners who have SNAs on their properties.
- Maungatautari Ecological Island – WRC provides funding support and ecological expertise to this project.
- Waipa Peat Lakes – e.g. Lakes Cameron, Koromatua, Serpentine, Maratoto, Mangahia, Mangakaware, on-going joint work under Waipa Peat Lakes Accord with DOC, Fish & Game, WRC and Waipa DC (weirs, sediment traps, planting, weed control etc.) – see #2006273 Summary Table at end of document.
- A number of streamcare and landcare groups are involved in planting up river margins (e.g. Mangapiko Streamcare Group, Te Pahu Landcare Group) and WRC supports these groups with financial and technical assistance.

Photo 8 Torrentfish (*Cheimarrichthys fosteri)*

4.3 Issues and trends of significance to the zone

A number of regionally significant issues and trends have been identified for river and catchment management activities[14] including:

- Climate change
- Growth
- Treaty of Waitangi settlements
- Land use change
- Potential local government restructuring
- Infrastructure development and management
- Regional environmental issues.

The table below provides a summary of the key issues considered relevant to the Waipa, the implications of these issues for river and catchment management and response that may be appropriate. The issues, implications and potential response within Table 3 are the result of a workshop held with Liaison Subcommittee members and community participants in March 2011.

[14] Refer to "*River and catchment management in the Waikato region*" document.

Table 3 Waipa zone issues and trends

Issue	Description of issue	Implications	Potential response
Soil and land use	Land use change Global population growth will increase demand for primary products and drive further intensification of NZ's dairy industry. Local population growth will drive expansion of town centres. The economics of dairying will continue to drive intensification on existing pastoral land. Erosion (and sediment production) will occur naturally on all Land Use Classes (LUC), under any vegetation but woody vegetation on erosion prone land is more protective than pasture. From 2002-08, 1000 ha of zone land was converted from plantation to pasture, 60% on erosion-prone LUC 6e, 7 and 8 land. From 2001-08 intensification occurred on 31% of pastoral land in the zone, 32% of which was on LUC 6e, 7 and 8 land. The zone's peat soils are also vulnerable to land use change and intensification, becoming prone to loss through over-drainage, which allows oxidation to break peat soils down, and losing quality/function if pugged by livestock. Cropping activities can also lead to peat degradation. Increased demand for pastoral land in conjunction with expansion of town centres could result in further land use change. Re-building programmes resulting from recent earthquakes and tsunamis and earthquakes may increase demand for wood and drive removal of existing forest.	Productive soils threatened by intensification and rural development. Agricultural activities pushed to less-productive soils, requiring increased inputs (water; fertiliser) and increasing adverse environmental effects. Higher stocking rates affect soil's capacity to filter excess nutrients, resulting in a further decline in water quality. Land use change from plantation to pasture, particularly on LUC 6-8 soils, will exacerbate erosion, increasing sedimentation and nutrient loads in the river and its tributaries. Increased demand for water. Continued/increased use of current fertilisers will result in accumulation of Cd and F in soils. Ribbon development extending from town centres along rural roads will affect availability of high-class pastoral land. Increased community expectations re: infrastructure, water supply, flood protection and recreational access to the river and its tributaries. Potential negative effects overall on indigenous biodiversity, river recreation and flood risks, as well as future pastoral productivity and community prosperity.	Work with councils to find solutions for growth (space for housing/recreation) that protect high-class soils from development. Appropriate enforcement of current regulations. Work with councils and land managers to develop best future policy/ regulation/ education/incentive mix to prevent degradation of LUC 6-8 soils and erosion e.g. • promote soil conservation programme; encourage retirement/planting; explore potential for carbon credits • require consent for forestry removal • education and/or policy/regulation to address impact of winter grazing, stock loading, inappropriate stock type and long-rotation cropping • make farm plans mandatory in problem tributaries • promote efficient fertiliser use • use aerial photos to demonstrate issues Continue riparian fencing and planting programme. Focus on erosion hotspots (as per Horizons RC). Risk assessment, funding and management of Tunawaea slip. Manage the erosion and sedimentation effects of pine tree harvesting – ensure this is done sustainably.
Soil and land use	Erosion/sedimentation. The Waipa River has a high sediment load at high flows, from a couple of key sources (which have been tackled with soil conservation and river training/improvement works) and cumulative streambank erosion. Streambank erosion is addressed through river training/improvement works and riparian fencing/planting. From 2002-07 riparian fencing increased from an estimated 24% to 40% of total waterway bank length, with 25% of waterway length fenced on both sides. Regional averages are 45% and 33% respectively. A high % of banks remain unprotected.	Loss of natural soil resource that takes 100s of years to create and associated loss of productivity and land use options. Potential negative effects overall on indigenous biodiversity, river recreation and flood risks, as well as future pastoral productivity and community prosperity. Tunawaea slip is a natural hazard and a risk to people and property if not managed.	

Issue	Description of issue	Implications	Potential response
	Land use change and intensification are expected to exacerbate erosion/sedimentation issues. Climate change impacts could include more heavy rainfall events, creating more runoff from unprotected/inappropriately planted LUC 6-8 land. Tunawaea slip in the south of the catchment is a specific erosion issue requiring long-term priority management.	Aggradation of main channel.	
Water	Water quality Erosion-prone soils and unstable areas deliver high loads of sediment to the main stem of the Waipa River and some tributaries. Almost 75% of the zone's stream length consists of small channels draining from pastoral land. Only 40% of this length is fenced off and planted with woody vegetation, which helps reduce water temperature and filter nutrient run-off. Increased sedimentation, nutrient loads and temperature have a negative impact on water quality. Intensification, land use change and climate change all have potential to exacerbate these problems. Achieving NPS and Waikato River Authority outcomes is of high priority, and will require significant investment and land management changes in the zone, and in the region. Soil stability and water availability are key issues for the upper catchment, while water quality is more of an issue in the downstream areas. Water quality in the zone's shallow lakes is also an issue, affected by peat subsidence, nutrient and sediment loading resulting from drainage, cropping and development of surrounding land.	Healthy lakes and waterways are important to support indigenous biodiversity, cultural values and food sources and recreational activity. Failure to address issues could result in: • Loss of some migratory fish populations, due to high turbidity of lower parts of the Waipa River. • Loss of sensitive and rare fish species which currently live in cool, forested, headwater habitats. • Proliferation of stream plants and algae in open, low-gradient channels. • Loss of condition of ecologically-significant limestone springs and seepages. • Loss of submerged plant communities which help maintain a clear-water state in lakes. • Increased prevalence of algal blooms in lakes (this can happen very rapidly and is difficult to reverse). • Management problems in farmland as a result of lakes becoming perched. • Reduced recreational enjoyment and eco-tourism opportunities.	Work with land managers to encourage planting of trees in steep headwaters and continued retirement and planting of riparian margins.[15] Explore potential for carbon credits, and land use changes for water quality outcomes. Educate re impact of drainage and enforce related rules. Install and maintain water control structures to establish minimum lake levels.[16] Encourage uptake of farm management systems to reduce nutrient and sediment loss. Support continuing research into effective techniques for cost-effective removal of nutrient and sediments from lake inlets; whole lake system restoration techniques and hydrological requirements of lakes (including peat maintenance/deposition). Work with councils and landowners to extend and enhance buffers around lakes (within a whole-of-catchment approach). Support the Waipa Peat Lakes and Wetlands Accord.
Water	Water supply Population growth and a continuation of the trend towards	Exacerbation of water quality problems and loss of habitat associated with low-flows and high-	Apply a fair, transparent and sustainable system of water allocation and a reasonable (not-for-

[7] Most of the lakes within the zone are fully-fenced (stock-proof). Three are partially fenced and three are mostly or entirely unfenced. 60% of stream length remains unfenced.
[16] Control structures have already been installed at 6 of the Zone's 15 lakes to implement the requirements of the Waikato Regional Plan (3.2.4.6 and 3.7.4.5)

Issue	Description of issue	Implications	Potential response
	intensive dairy farming will increase demand for water. Climate change is predicted to increase rainfall across the zone but may increase potential for drought in the southwest.	temperatures. Impact on ecologically-significant limestone springs and seepages. Impact on shallow lakes if water control structures not in place. Impact on the mauri of zone waterways Impact on power generation potential.	profit) charging system if required. Educate/inform community (via fit-for-purpose methods) about value and availability/limitations of water resource. Plan for water storage. Liaise with dairy companies re sustainable dairy growth in the zone (potentially restrict dairy water use if growth unsustainable).
Biodiversity	The Waipa zone contains a variety of regionally significant ecosystems[17]. These provide critical habitats for indigenous plants, animals and micro-organisms and also help to: • regulate atmospheric carbon and temperature • reduce erosion and sedimentation • store and recycle nutrients • break down pollutants • recover from natural events. Large areas of these systems are threatened by plant and animal pests, intensification of agriculture, land use change and rural development. River training works/improvements can also affect biodiversity by preventing fish passage.[18] Climate change will also have an impact on zone biodiversity.	Without further intervention it is likely all lakes in the zone will be devoid of submerged plant communities by 2020 due to water quality decline, the impact of pest fish such as koi carp, catfish and rudd and deteriorating seed banks. Once habitat is lost and/or species decline to a critical level, recovery is difficult if not impossible, expensive and takes an extremely long time. Loss of biodiversity has a negative impact on erosion/sedimentation, water quality and flood management and therefore all the implications detailed in those sections are relevant here. It also results in: • loss of cultural values and food sources • loss of amenity values and recreational opportunity • loss of economic opportunity. In this respect prevention of biodiversity loss is a nationally significant issue. A 1997 study by Massey University economists suggested that the total annual value provided by New Zealand's native biodiversity to the country's economy could be more than twice the value of our gross domestic product.[19]	Implement pest management strategy using current best practice methods and technology. Inform/engage the community re importance and value of pest management programmes. Apply outcomes of WRC's "Prioritising Significant Natural Areas for Biodiversity Management" project which will quantify biodiversity goals and develop criteria for multi-ecosystem prioritisation to target funding for management actions. Work with community streamcare and conservation groups to enhance project results and share/build on successes (e.g. Mangapiko Streamcare Group). Include cost-effective systems to assist fish passage in river training/improvement works, as required. Responding to water quality, soil and land use change issues will also help address biodiversity issues.
Flood protection	Design assumptions for the zone's flood protection scheme are based on 1960s data and may not reflect current reality or	Damage to scheme assets (structures, riverbanks and plantings) and more widespread damage to	Review design assumptions. Evaluate and consider financial and management implications

[17] A recent WRC analysis of stream and river Significant Natural Areas (SNAs) identified that 16 of the top 20% of regionally significant stream and river SNAs were in the Waipa Zone with two in the top 5%. The Regional Ecological Monitoring of Streams (REMS) programme indicated that stream health in the zone is below the regional average. The Waipa peat lakes (as a complex) are recognized as being of national and international significance. Large areas of the Waipa Zone have been identified as "national priority one" threatened environments, i.e. containing less than 10 to 20% indigenous vegetation cover. The Zone's karst habitats (such as limestone caves and seepages) can harbour unusual and diverse aquatic invertebrates and rare snail species. Notable land-based populations in the Zone include bats (in the south) and Kakepu falcons (south of Otorohanga).

[18] WRC culvert surveys suggest 40% of assessed culverts in the Zone are likely to impede fish passage at some flows.

[19] https://www.biodiversity.govt.nz/picture/biodiversity/why.html

Issue	Description of issue	Implications	Potential response
	provide sufficient “status quo” protection if: • climate change results in higher rainfall and more extreme weather events in the zone. • other zone issues which exacerbate the potential for flooding are not addressed. Intensification (and the related increase in investment) is leading to higher expectations of flood protection. Rural development is also increasing expectations of the flood protection scheme. Despite these trends, public opinion about control structures (particularly dams) is ambivalent. The level of community understanding about the presence, value and benefits of scheme protection declines over time. Some elements of the scheme are not meeting current needs due to erosion and/or (pest) plant incursions (e.g. vegetation constriction along main channel north of Te Awamutu).	property and infrastructure. Related economic, social and environmental cost and disruption. Danger to people. Damage to reputations of organisations involved in flood protection. Loss of support from community and potential objections to rates payment for scheme. Increase in cost for scheme if it is tailored to meet higher expectations.	of increased (or changed) levels of service to meet demand or accommodate climate change impacts. Plan for success in addressing other identified issues which have an impact on flood protection. Maintain existing scheme elements so they function at optimum levels. Identify and retain natural flood storage. Continue to mine gravel resource where it supports flood protection (physically and economically). Liaise with district council to control subdivision on flood prone land. Provide regular information to community about scheme features, benefits and limitations. Review funding mechanisms for affordability and appropriateness (consistency of funding each year (creates certainty); apply rate money for river management/improvement program where it is needed rather than where 'local share' contribution can be afforded).
People	Co-management Waipa zone management needs to give “legs” to the Waikato River Strategy/Vision at a local operational level. There is an expectation that mana whenua and mana whakahare will be respected. However, there is still a lack of clarity about the practical implications.	Need to clarify expectations and agree on roles, responsibilities and processes to ensure zone management proceeds in a culturally acceptable, technically appropriate, timely and cost-effective manner.	Liaise with iwi authorities to develop and implement co-management arrangements.
	Civil defence The zone needs to be prepared for a natural disaster including the possibility and impact of a volcanic ash cloud, earthquakes, tsunami coming up Waikato Channel, floods, cyclones and giant slips. Climate change may have an impact on the frequency and extremity of certain events.	Damage to scheme assets (structures, riverbanks and plantings) and more widespread damage to property and infrastructure. Related economic, social and environmental cost and disruption. Danger to people.	Review design assumptions. Evaluate and consider financial and management implications of increased (or changed) levels of service to meet demand or accommodate climate change impacts or the risk of other natural hazards. Raise community awareness regarding emergency procedures and response.
	Engagement Many of the strategies required to meet the zone vision have an impact on people’s choices: where they live; how they farm etc. Business drives communities and a healthy local economy is important.	Unless there are tangible win-win solutions available, the vision will not be achieved. If the vision is not achieved, future prosperity of the zone will be affected.	Promote the financial as well as environmental benefits of sustainable farm management practices required to address zone issues. Establish a way for farmers – particularly those

Issue	Description of issue	Implications	Potential response
	The zone is becoming an entry-level area for dairy farming, where people learn, build resources and then move out of the zone. This can impact on management practice and willingness to consider long-term issues. Other factors such as overseas ownership and the values of overseas owners can also have an impact in this regard.		new to the district – to learn from successful local role models. Cultivate sustainable values in schools with practical field exercises. Educate the current generation while educating the next. Work with local tourism businesses to see where zone management can support eco-tourism/recreation. Consider/accommodate other economic river uses.

4.4 Legislative and policy requirements

Waikato Regional Council has responsibilities for river and catchment management under various statutes the most important of which are:

- Local Government Act 2002
- Local Government (Rating) Act 2002
- Resource Management Act 1991 (RMA)
- Resource Management (Energy and Climate Change) Amendment Act 2004
- Soil Conservation and Rivers Control Act 1941
- Civil Defence Emergency Management Act 2002.

An overview of the requirements under each Act is given within the overview document "*River and Catchment Management in the Waikato region*".

There are three key requirements for asset management planning under the Local Government Act 2002, being:

1. Compliance with Schedule 10 requirements
2. Compliance with the Office of the Auditor General criteria for assessing the level of asset management
3. LGA 2002 Significance Policy.

Details of these requirements are outlined below.

4.4.1 Compliance with LGA 2002 Schedule 10 requirements

The Local Government Act 2002 (LGA 2002) has prescribed that levels of service must in future be developed from a community perspective. This is a fundamental change in the traditional approach.

Historically, levels of service have been expressed in a technical way that describes what Council has expected from its internal or external service providers (e.g. contractors). These need to be presented to the community in a clear, informed way as 'customer levels of service', and consultation used to obtain the 'community perspective'.

Specifically the LGA 2002 requirements for planning; decision-making, consultation and accountability which is inclusive of WRC's levels of service and asset management planning;

- The LGA 2002 requires local authorities to consult their communities about funding and financial policies. It also requires consultation on the types and levels of services councils propose and how they will be paid for, and requires councils to explain to their communities the relationship between costs and levels of service provision.
- When a local authority undertakes public consultation, it must do so in accordance with the principles of consultation set out in Part 6, section 82. In brief, these principles require councils to –
    - provide easy-to-understand summaries of proposals and plans
    - identify who will be affected by decisions and encourage them to make their views known to the council - councils also must give reasons for their decisions
    - find out what all the practical options are for dealing with issues and carefully assess them.

Council's service delivery activities must meet the requirements of Schedule 10 of the Local Government Act 2002 Appendix 2a sets out a list of the Schedule 10 requirements, including significant negative effects, and includes references to the section in this document where these requirements are addressed.

4.4.2 Office of the Auditor General criteria for asset management

The office of the Auditor General (OAG) has established a set of criteria for assessing conformity to "Core" and "Advanced" levels of asset management (NAMS, 2006). The "Core" AM planning criteria is recognised as a minimum standard for compliance with activity provisions in the Local Government Act 2002. The advanced criteria describe OAG expectations for the management of

complex and high value infrastructure with high associated risks.

The assessed compliance of the provisions in this plan with the OAG "Core" and "Advanced" criteria is set out in Appendix 2b. Council currently achieves "Core" requirements plus a significant part of the "Advanced" criteria. Appendix 2b also sets out the steps needed to address the current gaps between existing practice and "Advanced" management planning. With adhering to the OAG criteria the ZMP takes a wider catchment view than the AMP, in doing so Asset Management is embedded in the newly formed ZMP document. Where gaps between the current and desired plan exists these gaps will be identified and addressed as the ZMP moves from an intermediate to an advanced level plan.

4.4.3 LGA 2002 Significance Policy

Section 90 of the Local Government Act 2002 requires each Council to adopt a policy on significance, which:

- Sets out that Council's general approach to determining the significance of proposals and decisions in relation to issues, assets or other matters.
- Sets out any thresholds, criteria, or procedures that are to be used by the Council in assessing the extent to which issues, proposals, decisions or other matters are significant.
- Lists the assets considered by the local authority to be strategic assets.

Section 97 of the Local Government Act 2002 requires that the significance policy shall identify all of the assets the Council considers to be strategic, as defined in Section 5 of the Local Government Act 2002.

Waikato Regional Council has determined the River and Catchment Services assets to be strategic in nature.

Any decision to transfer ownership or control of a strategic asset or a decision to construct, replace or abandon a strategic asset cannot be made unless it has first been included in the LTP (and in a statement of proposal relating to the LTP).

All such actions relating to a strategic asset are automatically significant and must meet the requirements relating to significant decisions with the LGA, specifically Part 6, section 90.

4.4.4 Statutory documents

Waikato Regional Council must fulfil its statutory requirements under the following statutory documents:

Long Term Plan (LTP)

The LTP 2009-2019 sets out a number of priorities for the region of direct relevance to river and catchment management. These priorities are:

- Financial stability
- Sustainable agriculture
- Climate change
- Co-management of the Waikato River

The LTP sets out four Groups of Activities. River and catchment services fall within the 'Safe and Resilient Communities' group which includes the sub activities of 'Catchment Management', 'Resilient Development' and 'Community Safety'. Community outcomes identified in relation to these services include:

- Land management practices that protect and sustain soil and land.
- Encourage planning and practices that protect and sustain productive resources.
- Hazards identified and managed.

Regional Policy Statement (RPS)

The RPS sets the direction for the Council in terms of promoting sustainable development and managing the regions natural resources. It provides an overview of the resource management issues in the region with policies and methods to achieve integrated management.

In terms of river and catchment services, the key polices of the operative RPS are:

- Reducing the effects of accelerated erosion and avoiding these effects where possible.
- Avoiding the discharge of contaminants onto land that may

adversely affect the condition of the soil.

- Protecting productive soils through moisture management.
- Reduction in the adverse effects of river and lake bed instability on a catchment basis.
- Managing extractions, structures, water level fluctuations and surface water activities.
- Improvement of water quality through riparian management.
- Protecting significant flow regimes and modifying flow regimes where necessary.
- Protecting the mauri of water by minimising contaminants.

Waikato Regional Plan (WRP)

The Waikato Regional Plan contains policies and rules that enable the Council to meet its resource management objectives. The regional plan must be in accordance with the RPS and therefore contains similar policies.

The plan contains modules covering Matters of Significance to Maori, Water, River and Lake Beds, Land and Soil, Air, and Geothermal Resources. Those of particular relevance to river and catchment management are Water, River and Lake Beds and Land and Soil. Matters of Significance to Maori are also important.

The objectives identified in the relevant chapters of the WRP that have implications for river and catchment management include those relating to preserving the natural character of lakes, rivers and their margins, controlling the damming or diverting of water, erecting and maintaining structures in water bodies, disturbing the beds of lakes and rivers and managing erosion.

The rules within the WRP can also assist in the effective delivery of river and catchment services. These works and services need to be aligned with regional policy in order to apply rules to reduce soil erosion and avoid discharges of contaminants to watercourses. The rules may also permit activities that help to provide flood protection services and manage emergencies.

District plans

Waikato Regional Council must also comply with any relevant rules in district plans for each local authority when delivering their services. Applications may be required for resource consents for structures, earthworks or other activities.

4.4.5 Bylaws

Waikato Regional Council has the power to make bylaws under Section 145 of the Local Government Act. Bylaws are rules or regulations made by the Council to protect the public from nuisance, protect, promote and maintain public health and safety and to minimise the potential for offensive behaviour in public places. The majority of river and catchment services are governed by legislation, as set out in the previous section. However, the Navigation Safety bylaw and relevant District bylaws have implications for these services.

Bylaws protect river and catchment management assets by restricting people from damaging structures or accidentally or deliberately blocking drainage channels, indirectly assisting Waikato Regional Council in the efficient delivery of river and catchment services.

4.4.6 Consents

An important requirement of the Resource Management Act 1991 is the duty upon Waikato Regional Council as a service provider to avoid, remedy and mitigate the adverse effects of its activities on the environment. This duty applies to all works and services, including river and catchment activities. In order to fulfil these obligations, Waikato Regional Council obtains resource consents for certain works and services activities as required under regional and district plans.

A Table showing the resource consents that are currently held by WRC in relation to river and catchment management activities in the Waipa zone is shown in Appendix 2c. Resource consents stipulate a number of conditions, particularly those relating to monitoring and often the consent holder is required to report on compliance with those conditions.

4.4.7 Standards and guidelines

In addition to the legislative requirements, there are also a number of standards and guidelines that impact on how river and catchment services are delivered in the zone. Some of these standards are already used as part of the existing service delivery, while others provide a benchmark for future

service delivery in the Council. These standards and guidelines are set out in Appendix 2d.

4.5 Key stakeholders/partners

The key external stakeholders with an interest in river and catchment management activities in the Waipa zone are as follows.

4.5.1 Central Government agencies

There is a need to ensure that delivery of zone related works is consistent with central government legislation and policy. Central Government also plays a direct role in activities that both influence and are influenced by river and catchment management. Changes in Government policy such as climate change should be incorporated into the decision making process to ensure future proofing of flood protection schemes and related programmes.

The Waipa zone programme works closely with the Department of Conservation and other Government departments as outlined below.

Department of Conservation

The DOC administers conservation land such as parks, reserves and stewardship land on behalf of the Crown. The conservation land network administered by DOC in the Waipa catchment includes wetlands, marginal strips along some rivers and streams and the forest parks. Public conservation land is typically managed by DOC for a mix of biodiversity, historic and recreational values. Management activities on conservation land include the control of pest plants and animals, fencing and planting, as well as the control of water levels for some wetlands and lakes on public conservation land.

As part of its responsibility to manage for the benefit and enjoyment of the public, DOC develops recreational and educational opportunities and maintains access to public conservation land. The Department also monitors the condition of some lakes and wetlands as well as some of the threatened species that they support. Threatened species recovery work is often focused on conservation land because these areas have a greater level of protection and on-going security for these species is therefore more assured. Other activities DOC has management of include:

- Management of the whitebait fishery
- Managing threatened and alien invasive species
- Permits, concessions and advocacy.

Aside from DOC'S management responsibilities and roles within the Waipa zone, staff sit on the Waipa Liaison Subcommittee and are part of the decision making process within the zone. This enables synergies and alignment between both WRC and DOC in regard to respective responsibilities in sustaining the environment within the zone, particularly the management of the wetlands and forest parks.

Staff work closely with DOC in terms of resource consent requirements, both as an affected party but also in discussion around the comprehensive consent process.

New Zealand Transport Agency

The role of the New Zealand Transport Agency (NZTA) is to help New Zealanders travel reliably and safely, and to grow the country's economy by investing in moving people and freight. NZTA:

- Plans and delivers national transport networks
- Supports the development of local networks
- Works to make public transport and freight networks more effective
- Improves road safety.

WRC works closely with NZTA in a partnership role on specific projects related to river management, on future infrastructure works where resource consents are required, and to ensure that road works do not impede or impact on the performance of local flood protection schemes.

As part of an agreement, WRC manages bank stabilisation works adjacent to highways and charges NZTA for the cost to maintain those works on an annual basis.

Ministry of Fisheries

The primary role of the Ministry of Fisheries (MFish) is to ensure that fisheries resources are used in a sustainable way while maintaining aquatic ecosystem health. This is achieved through education, research and enforcement. Managing fisheries resources includes managing activities related to (i) customary,

recreational or commercial purposes including land-based aquaculture; (ii) special permits; and (iii) aquatic transfers.

The Fisheries Act 1996 provides the framework for managing aquatic life which includes any species of plant or animal life that inhabits water in any stage of its life history. The purpose of the Act is to provide for the utilisation of fisheries resources while ensuring sustainability. MFish does not directly manage sports fish, whitebait or unwanted organisms, but does manage tune (eels).

Photo 9 **Banded kokopu (*Galaxias fasciatus*)**

Ministry for the Environment

The Ministry is the Government's principal adviser on the environment in New Zealand and on international matters that affect the environment.

As the Ministry for the Environment is not involved in day-to-day environmental management, MfE focuses on providing:

- Environmental management systems, including laws, regulations and national environmental standards
- National direction through national policy statements and strategies
- Guidance and training on best practice
- Information about the health of the environment.

The outcomes MFE are working towards are that:

- New Zealand's air, water, land and built communities are healthy
- New Zealand is able to capitalise on its natural environmental advantages
- New Zealand's natural resources are managed effectively and New Zealanders use resources sustainably
- Risks to people, the economy and the environment from pollution, contamination and other environmental hazards are minimised.

Ministry of Agriculture and Forestry (MAF)

MAF's focus is on enhancing the integrity and performance of the biological value chain. The biological value chain covers animals, plants, food and related sectors, and their contribution to New Zealand's economy and social well-being.

New Zealand's environmental and social well-being is built around the biological value chain, too. This includes the sustainable use of land and water; having access to safe and suitable food; protecting unique land and marine environments; respecting resources of cultural value to Māori; and ensuring animal welfare practices consistent with New Zealanders' values.

Ministry of Science and Innovation (MSI)

The MSI, established on 1 February 2011, is part of a broader Government focus to boost the science and innovation sector’s contribution to economic growth.

MSI was created from merging two other agencies - the Foundation for Research, Science and Technology and the Ministry of Research, Science and Technology. It is responsible for the policy and investment functions of both those agencies.

MSI has some key roles and functions such as advising the Government on New Zealand’s science and innovation system, overseeing science and innovation investment and supporting infrastructure and fostering commercialisation, enhancing productivity and achieving wider benefits for NZ through the application of research results.

4.5.2 The community

There are approximately 19,000 ratepayers in the Waipa zone. Waikato Regional Council works closely with the community, providing opportunity for involvement in local decision making processes.

The information gathered from local communities assists WRC in developing a range of planning and decision making tools and in ensuring the community is engaged in decision making. The catchment liaison subcommittee has an important role in this process.

Agency/community partnerships are key to the way in which Waikato Regional Council engages with communities, being important mechanisms for information sharing, funding support and achievement of outcomes on the ground.

Community stakeholders of particular importance to helping achieve the vision and outcomes of the zone are farmers, and land care and river/stream care groups.

4.5.3 Catchment liaison subcommittee

The first liaison subcommittee in the region (the Lower Waikato Waipa Liaison Subcommittee) was set up in 1999 to provide linkages between the community and WRC's river and catchment management work programmes. Subcommittees for the Upper Waipa and Middle Waipa were formed as a part of Project Watershed in August/September 2000 respectively. The Upper Waipa and Middle Waipa committees were merged to form the Waipa Liaison Subcommittee in February 2002, and this committee is still in existence today.

The primary purposes of the catchment liaison subcommittees are:

- To provide advice to WRC on river and catchment related activities, and in particular
    - to provide input and feedback in relation to WRC programmes and activities
    - to assist WRC in project prioritisation and evaluating priority catchments
    - to assist with the exchange of information between WRC and the community
    - to develop the vision for the Waipa zone and champion the implementation of the vision

Waikato Regional Council has an adopted Terms of Reference for all subcommittees. Appointments are made on a three yearly cycle following the council's triennial elections. Subcommittee membership includes WRC constituent councillors, district councillors, and representatives from iwi, Department of Conservation, forestry, community groups and property owners.

4.5.4 Tangata whenua

As set out elsewhere in this document, the relationship between tangata whenua, WRC and the Liaison Subcommittee is an important one, and is expected to develop and change as part of co-management and Treaty Settlement processes. WRC recognises the importance of the Waikato River Authority and similar authorities arising from the Maniapoto Co-Governance Deed and settlement in river and catchment management within the zone.

WRC has made a commitment to work with tangata whenua within the Waipa zone to ensure the mauri of the zone is sustained. WRC will continue to work with local iwi to ensure the traditional role of iwi and hapu as kaitiaki is respected and reflected in the implementation of work programmes.

4.5.5 Territorial authorities

Territorial authorities with boundaries in the Waipa zone are Waikato, Waipa, Otorohanga and Waitomo district councils.

Staff work with the district councils in relation to the following:

- Obtaining district council resource consents where required, to maintain local flood protections works.
- Through service level agreements, maintaining and managing networks associated with local flood protection schemes.
- Mitigating flood risk and planning.
- Representation on catchment liaison subcommittee.
- WRC may be an affected party in terms of resource consents.

- Input to local district planning processes.
- Community Boards in relation to local issues and initiatives.
- On joint projects, such as Futureproof.
- Interface between zone and local roads alongside rivers and streams.

4.5.6 Landowners with Land Improvement Agreements

Land Improvement Agreements typically involve works such as fencing, riparian planting, hillside plantings, and retirement of land. A total of 45 isolated farm plans exist in the Waipa zone (outside of the Waitomo Scheme), with 33 of them being formally protected by Land Improvement Agreements which are registered on property titles and set out maintenance requirements. The value of these existing isolated farm plans totals approximately $600,000.

LIA's are legally binding agreements (under section 30A of the Soil Conservation and Rivers Control Act 1941) between WRC's predecessor (the Waikato Valley Authority) and specific landowners. Land prone to erosion was set aside under these agreements from 1975 into the1980's and the agreements were registered on the properties land title for a period of 99 years. LIA works generally consisted of retirement of eroded land and or land identified with high erosion potential.

Often these areas were native bush blocks left intact after earlier land settlement/development and deemed worthy of protection. Many LIA compartments are approximately 1-5 hectares, however some are up to 50 hectares or larger.

4.5.7 Fish and Game New Zealand

Regional Fish and Game Councils manage sports fish and game birds. They have statutory responsibility *"to manage, maintain and enhance the sports fish and game bird resource in the recreational interests of anglers and hunters"* (Conservation Act 1987).

Fish and Game Councils are responsible to the Minister of Conservation, but are independent from central Government with funding solely from the sale of hunting and fishing licences. Councillors are elected every three years with voting rights restricted to adult licence holders. The Waipa zone falls within the Auckland/Waikato region. Much of Fish and Game's management activities are focused on advocacy, at both national and regional levels, to prevent deterioration of water quality.

Staff work closely with Fish and Game in regard to resource consent requirements, both as an affected party, but also in discussion around the comprehensive consent process.

4.5.8 Mighty River Power

Mighty River Power is an electricity generation and retailing State Owned Enterprise. The company owns and operates the hydroelectric generating stations on the Waikato River as well as geothermal and combined cycle plants.

Council has long standing relationships with Mighty River Power as a result of needing to work closely on implementing the High Flow Management Plan during times of flooding. The level of the Waikato River main channel influences flood durations in the lower Waipa River.

Staff provide input into resource consent processes involving Mighty River Power. Mighty River Power have representation on the Waipa Liaison Subcommittee, and are involved in zone decision making processes.

4.5.9 Other stakeholders

Industry

Some industries have a fundamental role to play in primary production, and may be key influencers to activities that support achieving the zone vision and outcomes. Dairy companies can play a role in encouraging farmers to undertake fencing and planting activities, while other industries can support local initiatives by way of financial or in-kind support.

Education

The education sector is a stakeholder helping to achieve the zone vision and outcomes. The education sector includes the Ministry of Education and schools, which can encourage involvement of students in soil conservation activities and raise awareness. Participation of tertiary institutions in research programmes can also assist in understanding trends and in raising awareness.

Tourism

The tourism sector is a stakeholder due to the strong links between soil conservation efforts and tourism in catchments such as Waitomo. Improving water quality may also enhance the attractiveness of the zone as a recreational area for both overseas and New Zealand tourists.

Conservation groups

Conservation groups such as the New Zealand Native Forest Restoration Trust, the Mangapiko Streamcare group and the Pirongia te Aroaro o Kahu Restoration Society are considered to be key stakeholders in terms of potential synergies for catchment restoration, enhancing environmental quality and possible funding opportunities.

4.5.10 Management of stakeholder/ partner relationships

While the key stakeholders/partners have been identified, WRC recognises the need to identify the specific river and catchment activities of most relevance to each stakeholder/partner, the anticipated level of involvement and importance of each stakeholder/partner to the zone and state how the relationships between WRC and the stakeholders/partners will be developed and maintained. Some examples of this include:

- The interaction of forestry and agriculture within the zone – particularly in relationship to the Ministry of Agriculture and Forestry and forestry companies, such as the guidance on buffer requirements for riparian planting in relation to carbon credits
- Better definition of how co-management will relate to zone activities
- How the liaison subcommittee can facilitate relationships between stakeholders/partners
- Improved shared use of the collective capacity and resources of all stakeholders/partners.

Work to define key stakeholder/partner relationships and how these will be managed has been identified as an action within the zone improvement plan – refer to Section 10.

4.6 Business processes

4.6.1 Business systems

Conquest II – business functionality

WRC uses the Conquest II Asset Management System as the primary asset management information tool. Conquest is a hierarchical system that holds information on all assets and their components. Data held includes asset attributes, age, condition, values, estimated remaining life and expiry dates etc. Categorisation of assets into types is also hierarchical and fully customisable, including attribute fields.

Both the quality and quantity of information has improved significantly since the first Asset Management Plan was adopted in 1997. Generally, the inventory of assets contains good quality data and all assets are identified.

The weakest area of information currently is historic maintenance costs. While gross maintenance costs are recorded, the degree of breakdown for different activities and different types of assets is insufficient to allow accurate identification of historic activity/asset unit costs at this stage.

WRC currently uses the following business systems for the management of the Waipa zone. Appendix 3a identifies the cornerstone applications by product and business function.

WRC has developed its IT infrastructure around a number of key products that provide a platform for all IT applications. Table 4 below sets out the IT applications used by WRC.

The quality of management of a zone and improvement of asset management practices/plans is dependent on the accuracy of the underlying data used and the resulting assumptions.

Data quality

Table 4 Information quality of WRC applications

Data	Information source	Data quality
Asset attributes (size capacity, age etc.)	Conquest II	Good
Asset location	Conquest II/GIS	Excellent
Condition data and history	Conquest II	Excellent
Performance data and history	Conquest II	Good
Asset valuation information (ORC, ODRC, depreciation etc.)	Conquest II*	Excellent
Historic maintenance activities	Manual records	Fair-Good
Historic maintenance costs	Financials	Fair

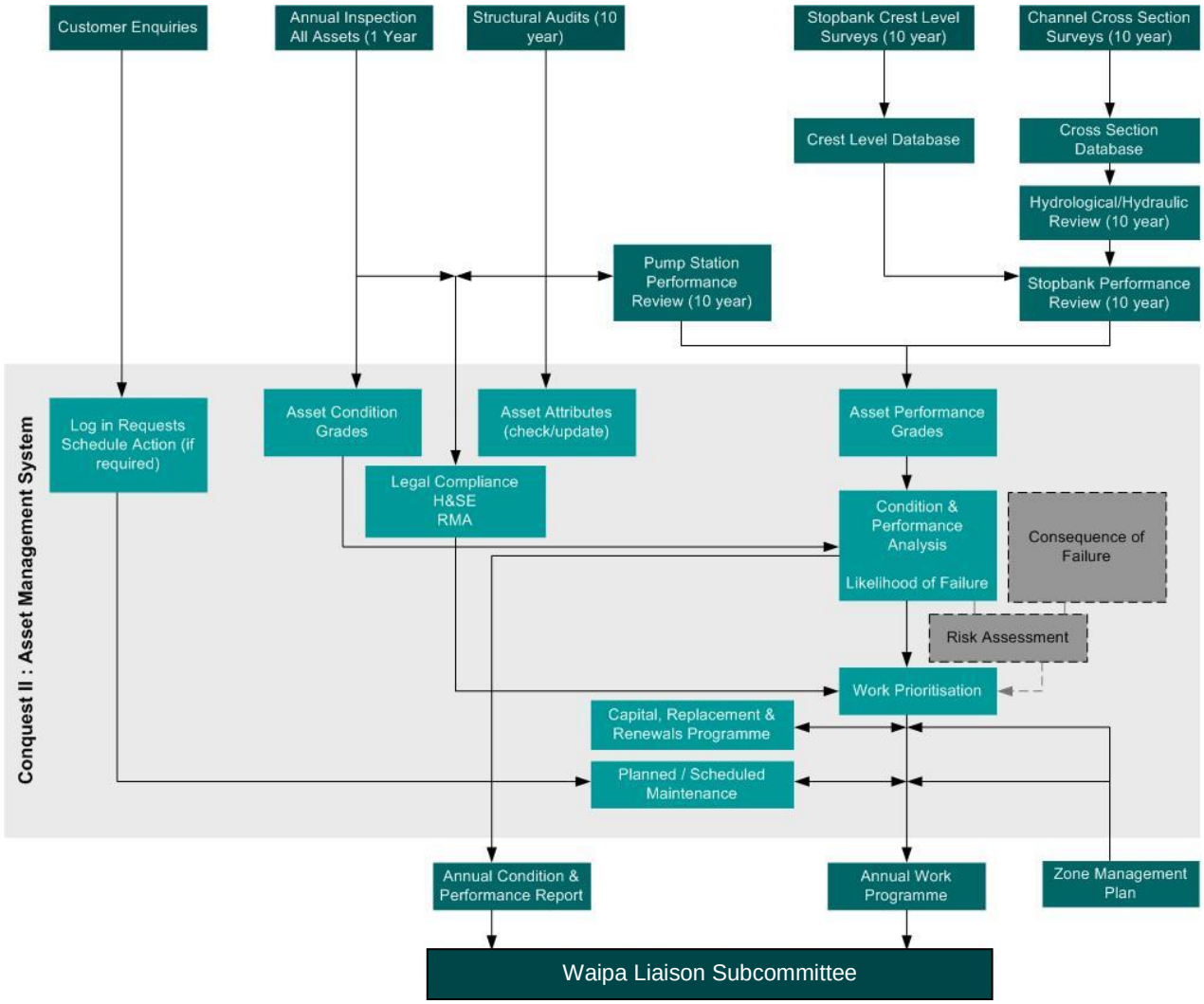
4.6.2 Asset hierarchy

WRC uses the Conquest II Asset Management System which is a hierarchical system that holds information on all assets and their components. Data held includes asset attributes, age, condition, values, estimated remaining life and expiry dates etc. Categorisation of assets into types is also hierarchical and fully customisable, with customisable attribute fields. The asset type hierarchy developed by WRC for flood protection assets is shown in Appendix 3b.

Zone and asset data and knowledge processes

The business functions currently and potentially supported by the Conquest II system are set out in Figure 5. It should be noted that the information flows and processes within Figure 5 are generic to the management of all zones, and not all of these processes apply to activities within the Waipa Zone.

Figure 5 Basic information flows and processes



4.6.3 Asset life cycle and maintenance

Maintenance plans have been developed for each of the zones operated by WRC. These plans outline the maintenance activities that are required to ensure the agreed levels of service for each scheme are met and to meet the requirements for typical river flows.

Due to the nature of these assets and their main purpose during periods of high flow or flooding, additional works may be required.

Lifecycle activity summary

A breakdown of all the major lifecycle management activities is shown in Table 5.

Table 5 Waipa zone lifecycle management activities

Category	Activity	Description	Frequency
System monitoring	Condition assessment	Inspection of all catchment, river system and assets, and assessment of the its overall condition and maintenance needs	1 year
	Cross section surveys	Survey of main river channel cross sections where flood protection works are in place	10 years
	System hydrological/hydraulic Performance Review	Technical review of the river system and associated stopbanks ability to convey the design floods to the levels of service	10 years
	Crest level surveys	Survey of the actual stopbanks crest levels and assessment of settlement and deterioration:	10 years

Category	Activity	Description	Frequency
River and stream maintenance	Blockage and debris removal	Removal of debris and blockages in rivers and streams	As required
	Erosion control	Planting and layering of erosion protection vegetation along eroded sections of rivers and streams	As required
	Groynes and training lines maintenance	Maintenance of damaged groynes and training lines	As required
	Weed control	Spraying of pest plants along river and stream channels	Annual
Structures maintenance	Stopbanks and timber floodwalls		
	General maintenance	Minor repairs and upkeep	As required
	Renewal	Reconstruction and topping of banks due to settlement and other major damages	15 -30 years
	Consents compliance works	Environmental monitoring, surveys, catchment works and reporting on system performance as required by consents conditions	1 year
	Pump stations		
	Routine operational inspections	Inspection and minor maintenance ensuring that pump stations are in a state of operational readiness	1-2 months
	Routine maintenance	Minor maintenance works including adjustments, lubrication, bird proofing, weed spray and pest control of pump station structures and components	As required
	Electric check	Check electrical circuits and safety compliance	1 year
	Ultrasonic check	Check pumps for vibration	2 years
	Refurbishment	Overhaul of pumps	8-10 years
	Replacement of components	Replacement of flaps, screens, switchboard, lifting gear, steel pipes and other components	20 -30 years
	Replacement of pumps	Replacement of pumps, motors, wing walls	50 – 80 years
	Replacement of structures	Replacement of concrete and steel structures, such as walls, sumps and buildings	80 – 100 year
Other assets such as weirs	Overview	Inspection of structures and identification of maintenance needs	1 year
	Routine maintenance	Minor maintenance works to ensure operational readiness	As required
	Replacement	Replacement and reconstruction for settlement and asset deterioration	30-60 years
Flood management	Flood response	Undertake continuous system monitoring during all flood and extreme weather events	On-going
	Urgent maintenance	Undertake works to control seepage and reduce risk of asset failures Undertake urgent maintenance works in response to failures during significant flood events	As required
	System review	Following floods, compile information, review asset performance and update the maintenance works programmes	As required
Risk management	Insurance	Council is a member of the Local Authorities Protection Plan (LAPP) insurance. All valued assets are insured above a minimum excess, for events exceeding 100 yr. (1% AEP).	1 year
	Disaster recovery fund	Council maintains a disaster fund to support system and assets maintenance in events exceeding 20-	1 year

Category	Activity	Description	Frequency
		year (5% AEP).	

Maintenance plans

Maintenance plans have been developed for the zone; these plans outline the maintenance activities that are required to ensure the agreed service levels are met. Table 6 summarises these.

Table 6 Maintenance plans

Assets	Actions	Frequency	Average annual cost[20]
Embankments	Condition survey	Yearly	
	Crest level survey	5 - 10 yrs.	
	General maintenance	10 yrs.	
River channels	Condition survey	Yearly	
	Cross-section survey	10 yrs.	
	General maintenance	On-going	
Catchment services	Catchment management	On-going	
	Catchment maintenance	" "	
	Catchment new works	" "	
Pump stations	Condition survey	Yearly	
	Structures audit	10 Years	
	Operational inspection	4 Months	
	General maintenance	Yearly	
	Ultrasonic check	2 Years	
	Submerged parts inspection	5 Years	
	Outlet channel desilting	5 Years	
	Power charges	Continual	
Scheme management	General management and planning	On-going	
	Customer services	" "	
	Liaison subcommittee reporting	" "	
	Catchment Services Committee reporting	" "	
	Data maintenance	" "	
	Condition and performance reports	" "	
	Investigations and design	" "	
	ZMP reviews	" "	
	Asset valuations	" "	
	AM development	" "	
	Others (accommodation, communications & electronic documentation)	" "	
	Rates collection	" "	

[20] Note that costs were unavailable at the time of writing, but have been flagged for addition as part of the improvement plan in Section 10.

4.6.4 Business continuity

To achieve sound business continuance planning, WRC is in the process of developing a Business Services Continuity Plan. This will provide a tool to effectively react and respond to a crisis in a manner that ensures that its activities, provision of services and staff well-being are not unduly affected. Sound business continuity arrangements are of major importance to on-going river and catchment operations.

This Plan will be prepared to ensure the viability of WRC in the event of an emergency or other event that significantly affects council's ability to deliver effective services to stakeholders.

The key areas to be covered by the continuity plan include emergency management response for:

- Information Services including Customer Services and Records
- Databases and Internet
- GIS
- Human Resources
- Property & Procurement
- Governance Services
- IT Operations.

4.6.5 Zone plan review and monitoring

To ensure WRC's zone plan remains useful and relevant the following on-going process of monitoring and review will be undertaken to ensure flexibility and responsiveness to strategic and operational needs. A process for monitoring the implementation of the plan and the achievement of planned improvements is also required:

- Formal adoption of the plan by subcommittee and council,
- Review and report on the Improvement Plan annually, at year-end
- Review and formally adopt levels of service to comply with community outcomes,
- Revise plan three yearly prior to ten year Long Term Plan to incorporate and document changes to works programmes, outcome of service level reviews and new knowledge resulting from the zone plan improvement programme,
- Quality assurance audits of asset related information to ensure the integrity and cost effectiveness of data collected,
- Peer review and audits to assess the effectiveness with which this plan meets corporate objectives. Periodic audits to assess the adequacy of asset management processes, systems and data and external audits will be undertaken to measure asset management performance against 'best practice'.

Table 7 outlines the procedures and timetables adopted to achieve these objectives and community outcomes.

Table 7 ZMP and AMP monitoring and review procedures

Process	Time	Action	Responsibility
Waipa ZMP preparation	2011/ 2012	ZMP development Adoption by liaison subcommittee (LSC) Adoption by Council	Division manager Waipa LSC Council
Zone programme planning and review	Annually	EOY confirmation that planned improvements achieved.	Zone Manager
Zone management plan review	Annually 3 yearly	Annual revision and update Explicit sign off on Improvement Plan targets Review Improvement Plan	Review author
Asset management team	Annually	Conquest II data quality assurance programme Data collection programme	Asset management programme manager

		Implement process improvements Condition and performance monitoring and data entry EOY reporting on data completeness and accuracy Conquest II process improvements	Asset Management Programme Manager

4.6.6 Future demand

Demand forecast

The current levels of service are assessed as generally appropriate and largely meet the current needs of the beneficiaries of the zone services. However, there may be demand for upgrading the level of service in some areas and providing new works in other areas. These will be managed in accordance with the demand management plan for the zone when it is developed, and in consultation with key stakeholders and the zone liaison subcommittee.

The key demand drivers which could potentially place additional demands on the Waipa are:

- Environmental factors
- Community expectations and perception of risk
- Legislation changes
- Increased awareness of flood risks and rising expectations of the need for flood protection.

The changes in demand are expected to impact on asset utilisation and on the way assets are managed. This includes more frequent maintenance, refurbishment/renewal and upgrades of the scheme assets, as beneficiaries are expected to have less tolerance to damage from floods. Future demands will be influenced by priorities identified during the priority catchment framework. This may require increased levels of funding by the community.

Environmental factors

Environmental factors which could impact on the levels of service include:

- Catchment land use change and changes in flood runoff patterns
- Climate change, increased heavy rainfall and rising sea levels.
- Economic effects of climate change (carbon management etc.)
- Wetland and stream restoration
- Biodiversity
- Natural hazard events
- Demand to halt the decline in water quality, then improve water quality.

Community expectations and perceptions of risk

Pressures can be expected to develop from a wide range of stakeholders with varying interests. In the longer term it is expected that the demands for services are likely to increase as use of land protected by flood defences intensifies

- Changing economic returns from land driving demand for changes in land use and changes in LOS.
- Increasing demand from the community and environmental stakeholders for environmental mitigation.
- Increased demand to maintain or increase access to wetlands, rivers and lakes.
- Community perceptions of the risks associated with climate change and other environmental risks will be a key determinant of the degree of future proofing adopted to deal with these contingencies.
- Increased community expectations driving a holistic approach to catchment management.

Legislation

Changes in legislation can have significant impacts on zone levels of service and the costs associated with these. In recent years the Resource Management Act, the Health and Safety in Employment Act and the Local Government Act have enhanced the Level of

Service of the Scheme but have also added significant additional compliance costs.

It is not possible to envisage what additional legislative changes may occur over the life of this plan, but it is likely that the bar will continue to be raised.

Increased awareness

There is now increased awareness of the river and catchment management issues within the zone due to the initial asset management plan development, the 1998 flood, and the Project Watershed funding review. This increase in public profile for the zone services has resulted in higher expectations from the community of the level of service, and it is expected that this trend will continue.

Changes in technology

Future changes in technology are expected to lower the costs of service delivery and to enable improvements in monitoring and decision-making processes. These changes may include the following:

- Increased efficiency and reduced costs of earthmoving machinery resulting in reduced costs for capital, renewal, and maintenance activities. Increased fuel costs and health and safety costs may however to some extent offset these cost reductions.
- Use of computerised data loggers/ and or telemetry for collecting monitoring information.
- Remote sensing of land and/or water related data. For example the use of LIDAR to obtain detailed ground level information.
- Improved use of computer modelling for hydraulic assessments and flood forecasting.
- Greater coverage of rainfall gauges and improved flow information as measurement technology becomes cheaper.
- Improved understanding of the effects of climate change and the Southern Oscillation that affects La Niña and El Niño climate patterns.
- Electronic equipment and telemetry for pump stations and floodgate monitoring allowing improved responsiveness to equipment malfunctions, and improved procedures for identifying and prioritising maintenance.

Advances in technology may therefore increase the reliability of assets, improve responsiveness to malfunctions and increase the cost effectiveness of maintenance and scheme management.

Demand management plan

The objective of demand management planning is to modify customer demand for services so as to maximise the use of existing assets and to avoid or defer the need for new assets or services. Community demand for catchment services is largely driven by economics, environmental considerations and changes in internal and external factors.

- As intensity of land use and the economic returns from protected land increases, the tolerance for flooding reduces, and there is therefore a demand for increased services.
- Environmental considerations and the resource management act place constraints on the ability to develop new services (i.e. develop unprotected land) and to increase the level of service for existing protected land.
- Internal factors - there may be internal change (for example peat subsidence or climate change) which results in demand for increased levels of service.
- External factors which may drive demand include changes in weather patterns (e.g. climate change), and changes in land use throughout the catchment which may result in increased runoff and flooding.

Non-asset solutions can include insurance and change of land use. It considered that the most effective way of managing future demand for both new services and increased levels of service is via a multi faceted approach as set out in the following table.

Table 8 Demand management instruments

Component	Tool	Description
Legislation and regulation	Resource Management Act 1991	Land use planning. Discourage/prevent development of flood and erosion prone areas. Control types of development within existing protected areas.
	Resource Management Act 1991	Discourage/prevent environmentally unsustainable development
Financial and economic	Funding policy	Costs of the works and services are borne by the beneficiaries in proportion to the degree of benefit received. Directly benefiting landowners required to fund 75% of the capital cost of new or upgrade works Require new works to be economically and technically sustainable
Education	Liaison subcommittee Customer service	Educate community in order to manage expectations for new or upgrade works. Encourage less intense land uses in some areas and/or improve land-use practices/performance

4.6.7 Flood management

Waikato Regional Council has responsibilities for flood management across the region. River and catchment management has strong links with flood management in the Waipa zone due to the location of the zone. WRC is responsible for two interrelated flood management functions within the Waipa zone as outlined below.

Maintenance of the flood warning and telemetry system

The flood warning and telemetry system continuously monitors river levels and rainfall at over 50 automated recording sites throughout the region. Information from the system is used to warn landowners and communities about floods, collect data to improve the accuracy of flood prediction, co-ordinate flood response, and maintain flood protection works.

There are 12 flood warning and telemetry sites within the Waipa zone – six river level sites and six rainfall sites. The relatively high number of flood warning and telemetry sites highlights the susceptibility of the zone to large flood events.

Flood response

During flood events, WRC staff undertake a series of activities in response to the event. These include monitoring of flood levels, forecasting river flows and levels and providing information to the general public and key stakeholders. To do this WRC provides regular updates of river levels, flow and rainfall measurements on the WRC website.

On the ground, staff undertake inspections of the stopbanks and structures throughout the event. Performance of the assets is recorded, and actions to reduce risks of failure are carried out, which include sand bagging seepage areas and low spots in stopbanks, and ensuring that pump stations are operating to remove local catchment runoff from protected areas.

Daily reports on the scheme performance, remedial actions and response to inquiries are documented. Key stakeholders are kept informed of all the operations and risks at all times from the early stages of the floods. The Emergency Management Officer (EMO) then acts according to a set of procedures as defined within WRC's Flood Warning Procedures Manual. This includes providing warnings to district councils, land owners and key recipients' by telemetry radio links and supported by media releases to the public.

4.6.8 Emergency management

Civil defence emergency management

WRC and Territorial Authorities have responsibilities for planning and response to emergencies as members of the Waikato Civil Defence Emergency Management (CDEM) Group. WRC plays a coordinating role by managing the CDEM Group Emergency Management Office and Group

Emergency Coordination Centre. In the event of a large, on-going flood event, WRC has CDEM coordination responsibilities as well as flood management responsibilities

Lifelines utilities

Lifelines include services such as water, power, telecommunication and transportation networks. Plans need to be put in place to ensure damaged lifelines are restored quickly following unexpected emergency or natural hazard events.

Lifelines are the essential 'utility' services, which support the life of the community. These services include water, wastewater, stormwater, power, gas, telecommunications and transportation networks.

Flood protection and river management measures help to avoid damage to roads and closure that may isolate certain areas. They also help to avoid damage to other essential services such as power, gas and telecommunications supply that can be affected by flooding.

Photo 10 Waitomo Stream, Waitomo

5 Relationships with Iwi

5.1 Overview

WRC acknowledges the special position of tangata whenua within the region, and recognises the need to work with Iwi, and hapu as appropriate in river and catchment management. WRC has undertaken and continues to undertake a number of processes aimed at recognising the role of tangata whenua in river and catchment management within the region.

A summary of how WRC works with tangata whenua in river and catchment management across the region is provided within the overview document "*Overview of River and Catchment Services – Waikato region*".

5.2 Iwi and the Waipa Zone

Tainui was the name of an infant who did not survive childbirth. At the child's burial site grew a great tree. This tree was used to build the voyaging waka (canoe), Tainui. Led by the chief Hoturoa, the Tainui waka was one of the migratory canoes that voyaged from Hawaiiki across the Pacific Ocean to Aotearoa over 800 years ago.[21]

The Waipa Zone covers the rohe of three of the four principal tribes that comprise the Tainui waka, being Waikato Tainui, Ngaati Maniapoto and Raukawa. A brief overview of each is provided below.

5.2.1 Waikato Tainui

Waikato-Tainui descend from the Tainui waka. Waikato-Tainui occupy the north east area of the Tainui waka rohe. The extensive tribal estate spans from Auckland in the north to Rohe Potae (King Country) in the south, from the west coast to the mountain ranges of Hapuakohe and Kaimai in the east. Significant land marks within the rohe of Waikato include the Waikato and Waipa Rivers, the sacred mountains of Taupiri, Karioi, Pirongia and Maungatautari, and the west coast of Whaiangaroa (Raglan), Manukau, and Aotea.[22]

In relation to the Waipa Zone boundaries, the lower extent of the Waikato-Tainui rohe lies along a line around the junction of the Waipa and Puniu Rivers and to the West and South-east of Te Awamutu. This is the same line that defines the boundary of the Lower Waipa River within the Waikato-Tainui and Maniapoto Deeds of Settlement for the Waikato and Waipa Rivers.

Figure 6 shows the catchment area of the Waikato River Authority alongside four of the WRC river and catchment management zones. Area A represents the primary area of interest for Waikato Tainui – the area in which Waikato-Tainui has Co-management and customary rights under the Deed of Settlement in relation to the Waikato River. The intersection of the Waipa Zone and Area A is shown below.

Photo 11 Mangakara Stream, Mt Pirongia

[21] http://www.tainui.co.nz/main.html

[22] Waikato Regional Plan (2007), s. 2.2.3 Waikato-Tainui

Figure 6 Waipa River and Waikato River co-governance areas and River and Catchment zones

The Waikato River is the tupuna (ancestor) of the Waikato tribe from which they derive their name. The following whakataukii (proverb) expresses this relationship:

Ko Waikato te awa	Waikato is the river
Ko Te Wherowhero te tangata	Te Wherowhero is the man
Waikato Taniwharau	Waikato of a hundred chiefs
He piko he taniwha, he piko he taniwha	At every bend there is a chief

The whakataukii refers to the prominent landmarks within the Waikato tribal territory and the authority of the paramount Chief and first Maori King Pootatau Te Wherowhero. Reference is also made to the number of powerful Chiefs who reside at each bend of the Waikato River, all of whom acknowledged the authority of Te Wherowhero.[23]

The Waikato-Tainui objectives for the Waikato River are[24]:

- The restoration and protection of the health and wellbeing of the Waikato River;
- The restoration and protection of the relationship of Waikato-Tainui with the Waikato River, including their economic, social, cultural, and spiritual relationships;
- The integrated, holistic and co-ordinated approach to management of the natural, physical, cultural and historic resources of the Waikato River;
- The adoption of a precautionary approach towards decisions that may result in significant adverse effects on the Waikato River, and in particular those effects that threaten serious or irreversible damage to the River;
- The recognition and avoidance of adverse cumulative effects, and potential cumulative effects, of activities undertaken both on the Waikato River and within its catchment on the health and wellbeing of the River;
- The recognition that the Waikato River is degraded and should not be required to absorb further degradation as a result of human activities;
- The protection and enhancement of significant sites, fisheries, flora and fauna; and
- The application to the above of both maatauranga Maaori and the latest available scientific methods.

5.2.2 Ngati Maniapoto

Maniapoto is an iwi of the Tainui confederation. The Tainui canoe, captained by Hoturoa, voyaged from Hawaiiki to the land of Te Ika ā Māui bringing the ancestors of the Tainui tribes. After extensive exploration of the new found land the Tainui canoe made landfall at Kāwhia where she was hauled ashore at Maketū, her final resting place.[25]

Maniapoto occupies the southern region of the territory of the Tainui tribes. The Maniapoto rohe covers the northern sector of what is commonly known as the King Country or Te Rohe Potae. The extent of the Tainui tribal boundaries is best epitomised by the following whakataukī (proverb):[26]

Ko Mōkau ki runga	From Mōkau in the south (Mōkau River)
Ko Tāmaki ki raro	To Tāmaki in the north (Manukau harbour and Tāmaki)
Ko Pare Hauraki, ko Pare Waikato	With Hauraki to one side, Waikato to the other
Ko Mangatoatoa ki Waenganui	Mangatoatoa in the middle (Waipa valley, west of Te Awamutu)

In relation to the Waipa Zone boundaries, the upper extent of the Maniapoto rohe lies along a line around the junction of the Puniu River and to the West of Te Awamutu[27] – the same line that defines the boundary of the Lower Waipa River within the Waikato-Tainui Deed of Settlement in relation to the Waikato River and Maniapoto Deed in relation to Co-governance and Co-

[23] Waikato Regional Plan (2007), s. 2.2.3 Waikato-Tainui

[24] Waikato-Tainui Deed of Settlement in relation to the Waikato River (2009), section 5.1, p. 25

[25] Kowhai Consulting Limited (2007): "*He Mahere Taiao The Maniapoto Iwi Environmental Management Plan*" p. 15. Maniapoto Maori Trust Board, Te Kuiti.

[26] He Mahere Taiao, p. 15.

[27] Taitoko, W. (1990): "Maniapoto Maori Trust Board A Tribal History". Centre for Maaori Studies and Research, University of Waikato, Hamilton.

management of the Waipa River. The Hauhungaroa range features predominantly as an eastern boundary between Ngati Maniapoto and Tuuwharetoa[28].

Therefore, the area of the Maniapoto rohe within the zone is approximately within Area C on Figure 6. It should be noted however that the Maniapoto rohe is much larger than the Waipa Zone, extending to the West and South of the Waipa Zone.

Maniapoto holds a unique status as tangata whenua of the Maniapoto district. The environment is of vital importance to the iwi and hapū of Maniapoto. There are many activities within the Maniapoto territory that give cause for concern about the welfare of the environment.[29]

The key environmental concerns[30] identified by Maniapoto are:

- The rapid decline in water quality and quantity in the region.
- Continued decline of native flora and fauna.
- Waste management – reduction of quantity and better disposal practices.
- Land development continuing to create long-term impacts including erosion.
- Loss of transfer of traditional knowledge.
- Poor agricultural practices leading to pollution of waterways.

The key future environmental aspirations[31] identified by Maniapoto are:

- A return to having pristine waterways and rivers.
- To retain and pass on traditional environmental knowledge between generations in order to preserve cultural heritage and a pristine environment.
- Better waste management systems on farms and in the wider community especially with regards to settling ponds, stock disposal and waste.
- More monitoring of environmental impacts and severe penalties for polluting the environment.
- An improvement in the consultation process and in decision making with hapū and iwi when it comes to environmental impacts, tribal knowledge, traditional rights and issues.
- An improvement in farming practices and regular monitoring of these by Waikato Regional Council and local government.

5.2.3 Raukawa

Raukawa derive their identity from the eponymous ancestor, Raukawa, who descends from the Tainui waka through his father Tūrongo, a descendent of Hoturoa. Through his mother, Mahinaārangi, Raukawa also descends from the Takitimu waka and ancestor Tamatea-ariki-nui.

Raukawa is a large iwi that covers a large area rich in cultural heritage. Raukawa have profound respect for their whenua particularly wāhi tapu significant sites including caves, ceremonial sites, cemeteries, pā sites, mahinga kai and houses of learning. Raukawa divide their rohe into four Pou Whenua referred to as:

- Raukawa ki Maungatautari in the north (Karapiro, south to Puniu River, east to Arapuni, west to Te Awamutu.
- Raukawa ki Te Pae o Raukawa in the south (Whakamaru, south of Lake Taupō, east to Reporoa, west to Mangakino).
- Raukawa ki Te Kaokaoroa o Pātetere in the east (Matamata, south to Whakamaru east of Ngongotaha, west to Arapuni).
- Raukawa ki Wharepūhunga to the west (Arapuni, south to Rangitoto range, east to Mangakino, west to Te Awamutu).

Raukawa have interests in the Waipa River catchment - predominantly in the Wharepuhunga block. Raukawa have four marae (Aotearoa, Rawhitiroa/Owairaka, Whakamarama and Parawera) and landholdings within Area C. In relation to the Waipa Zone boundaries, the Raukawa rohe covers the area to the North-west of the

[28] Taitoko, W (1990).
[29] He Mahere Taiao, p. 15.
[30] Adapted from He Mahere Taiao, p. 15.
[31] He Mahere Taiao, p. 14.

zone - west of Te Awamutu towards Maungatautari, and along the Eastern side of the zone bordering the Maniapoto rohe.

The Māori world view of Raukawa is defined by Raukawatanga – the Raukawa way, and is focused on the wellbeing of ngā uri o Raukawa. Its strategic vision, "the total achievement and development of Raukawa", aims to uphold and enhance the tikanga, kawa and mana of the whānau and hapū of Raukawa which is embodied in the following:

Mai te Wairere
Ki Horohoro
Ki Nukuhau
Ki Hurakia
Ki runga a Hauhungaroa
Ki Titiraupenga
Ki Te Pae o Raukawa
Ki Pohaturoa
Ki te tupuna ko Whāita
Ki Te Kaokaoroa o Pātetere
ki Te Wairere
Te taumata tirohanga ki Maungatautari
Whiti atu ki Wharepūhunga
Ko Hoturoa, Ko Pārāwera
Koinei te manawa o Ngāti Raukawa e.

The tauparapara refers to the prominent landmarks within the Raukawa rohe which begins from Te Wairere, Horohoro, Nukuhau, Hurakia on the Hauhungaroa range, to Titiraupenga mountain the horizon is the boundary of the district of Raukawa. Te Pae o Raukawa in the south, Pohaturoa, to the house of the ancestor Whāita, Te Kaokaoroa o Pātetere in the east to the tranquil waterfall of Te Wairere. To the picturesque views of Maungatautari, crossing into Wharepūhunga the standing place of Hoturoa and the marae at Pārāwera, this is the heart of the Raukawa boundary.

5.3 Co-management legislation

5.3.1 Co-management legislation

There are two key pieces of legislation of relevance to the zone:

1. **The Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act 2010**: this Act has brought into force a new era of co-management of the river between Waikato-Tainui and Waikato Regional Council, and work on this between the Iwi and the council has been underway for some time. The Act covers the river and its catchment from Karāpiro to Te Pūaha o Waikato (Port Waikato). It also covers the lower Waipā River up to the Puniu River.
2. **Ngati Tuwharetoa, Raukawa, and Te Arawa River Iwi Waikato River Act 2010**: this Act covers Raukawa, Ngāti Tūwharetoa and the Te Arawa River Iwi (specifically the hapū Ngāti Tahu - Ngāti Whaoa, Ngāti Kearoa - Ngāti Tuara and Tuhourangi - Ngati Wahiao). The co-management arrangements with this latter grouping of Iwi covers the Waikato River from a point known to Ngāti Tūwharetoa as Te Toka a Tia through to Karāpiro.

The overarching purpose of both Acts above is to restore and protect the health and wellbeing of the Waikato River for future generations (Waikato-Tainui) and for present and future generations (Ngati Tuwharetoa, Raukawa and Te Arawa River Iwi). The common purposes of both Acts are to:

- Recognise the significance of the Waikato River to Waikato-Tainui, Ngati Tuwharetoa, Raukawa, and Te Arawa.
- Recognise the vision and strategy for the Waikato River.
- Establish and grant functions and powers to the Waikato River Authority.
- Establish the Waikato River Clean-up Trust.
- Recognise certain customary activities of Waikato-Tainui, Ngati Tuwharetoa, Raukawa, and Te Arawa.
- Provide co-management arrangements for the Waikato River.

The settlement legislation gives effect to the Deeds of Co-management with Waikato-Tainui and Raukawa – both of which were entered into in December 2009.

At the time of writing, another piece of legislation is in development - the **Nga Wai o Maniapoto (Waipa River) Bill 231-2 (2010**). The aim of the Bill is to give effect to the Deed in relation to Co-governance and Co-management of the Waipa River entered into between the Crown and Maniapoto in

September 2010, by which the Crown and Maniapoto agreed to:

- "extend a co-governance framework over the whole of the Waipa River and provide for Maniapoto to participate in the framework"; and
- "establish co-management and related arrangements with Maniapoto in relation to the Waipa River".

The proposed overarching purpose of the new Act will be to restore and maintain the quality and integrity of the waters that flow into and form part of the Waipa River for present and future generations and the care and protection of the mana tuku iho o Waiwaia.

5.3.2 Co-governance/Co-management

Vision and Strategy

Through the Treaty Settlement process between Waikato-Tainui and the Crown, the Guardians Establishment Committee was formed with the support of other Waikato River Iwi. In 2009 the Guardians Establishment Committee finalised its Vision and Strategy for the Waikato River. The Vision and Strategy to restore and protect the health and wellbeing of the Waikato River has been incorporated in the co-management legislation.[32]

The Vision and Strategy is the primary direction-setting document for the Waikato River.

The vision for the Waikato River is:

> "***Tooku awa koiora me oona pikonga he kura tangihia o te maataamuri***
> *The river of life, each curve more beautiful than the last*
>
> ***Our Vision is for a future where a healthy Waikato River sustains abundant life and prosperous communities who, in turn, are all responsible for restoring and protecting the health and wellbeing of the Waikato River, and all it embraces, for generations to come***".[33]

The vision and strategy must be inserted into the Policy Statement without using the process in Schedule 1 of the RMA. The vision and strategy will prevail over any inconsistent provision in national policy statements that affect the Waikato River, as well as the New Zealand Coastal Policy Statement. In addition, if the vision and strategy is more stringent than National Environmental Standards or Water Conservation Orders it will also prevail.[34]

Waikato River Authority

The settlement legislation above has established the Waikato River Authority (WRA), and the Nga Wai o Maniapoto Bill will extend the governance framework over the whole of the Waipa River. The WRA is the primary statutory body that oversees the management of the greater Waikato River (including the Waipa catchment).

The purpose of the WRA is:

- Set the primary direction through the Vision and Strategy to achieve the restoration and protection of the health and wellbeing of the Waikato River for future generations
- Promote an integrated, holistic, and co-ordinated approach to the implementation of the Vision and Strategy and the management of the Waikato River
- Fund rehabilitation initiatives for the Waikato River in its role as trustee for the Waikato River Clean-up Trust.

The WRA has ten members who are appointed by the river Iwi and Ministers of the Crown. The WRA is the sole Trustee of the Waikato River Clean-up Trust whose role is to fund projects which meet the purpose of the WRA.

Co-management

As set out in the Deeds of Co-management, the agreements between the Crown and Waikato-Tainui, Raukawa and Ngati Maniapoto reflects a commitment by the parties to enter "a new era of co-management over the Waikato River" for the overarching purpose of restoring and protecting its health and wellbeing for future generations.

[32] Adapted from http://www.waikatoriver.org/about-the-waikato-river/history/

[33] http://www.waikatoriver.org/wp-content/uploads/2011/07/Vision-and-Strategy.pdf

[34] http://www.rmaguide.org.nz/regional-legislation/waikato-tainui.cfm

This recognises the fact that for Waikato-Tainui, Raukawa and Ngati Maniapoto, the river has its own life force, spiritual authority, protective power and prestige. Waikato-Tainui, Raukawa and Ngati Maniapoto have the authority within their rohe to exercise control and management of the river in accordance with their values, ethics and norms. The focus of the agreement is on the health and wellbeing of the river, which aligns with WRC's responsibilities to protect and sustainably manage the region's natural resources.

Co-management requires more than just consultation, and the Deeds of Co-management signal a new approach. This includes:

- The highest level of good faith engagement.
- Consensus decision making as a general rule.
- A range of management agencies, bodies and authorities working at a number of different levels.
- Processes for granting, transferring, varying and renewing consents, licences, permits and other authorisations for all activities that may impact on the health and wellbeing of the river.
- Development, amendment and implementation of strategies, policy, legislation and regulations that may impact on the health and wellbeing of the river.

The co-management arrangements set out in the Deeds provide a foundation for relationships between Waikato-Tainui, Raukawa and Ngati Maniapoto the Crown, local authorities and other agencies but do not prevent the parties from entering into agreements beyond this scope.

5.4 Implications of settlements and our relationship with Iwi in the Waipa zone

All of the settlements, negotiations and claims have changed and will continue to change the way that Waikato Regional Council consults and engages with Iwi over time.

The key implications of co-management arrangements for WRC and the Waipa Zone are:

- The need to deliver on the requirements of the partnership agreement between the WRA and WRC. The partnership agreement provides opportunities for the WRA to contribute to Waikato Regional Council decision making processes on river-related issues, and also for shared service arrangements aimed at reducing administration costs associated with restoring the health of the river
- The development and on-going operation of joint management agreements between WRC and Iwi.
- Opportunities to apply for funds from the Clean Up Trust to enhance work being undertaken by RC.
- The Vision & Strategy guiding policy direction for the Waikato River catchment (including the Waipa Zone).
- Commissioners with experience and expertise in tikanga and/or maori resource management to sit on consent hearings for RCS works.
- The development and operation of Waipa River integrated river management plans. These plans will include a conservation component, a fisheries component, and a regional council component, with provision for further components to be added in future.
- A need to be aware of provisions relating to customary activities, cultural harvest of flora, regulations for the management of aquatic life, habitats, and natural resources managed under conservation legislation and customary fishing regulations and fishing bylaws for the greater Waikato River catchment (including the Waipa Zone).

WRC needs to work within the framework set out in the Deeds of Co-management in relation to the management of the Waikato River. The establishment of the Waikato River Authority means that there is a new governance structure. It also means that there is additional funding from the Crown which may impact on the activities that WRC

undertakes, and the use of rates within the Waipa zone.

Planning documents prepared under the Resource Management Act, such as the Regional Policy Statement and Regional Plan must have regard to Iwi Environmental Plans. All plans, including this zone management plan, must therefore reflect the goals and objectives of the environmental plans and incorporate actions that will contribute to achieving these aims.

Other considerations include:

- River enhancement education and training programmes are envisaged to roll out at marae clusters. Requests from marae clusters to RCS seeking advice and support may be expected.
- During the implementation phase of co-management, the river and catchment services group could potentially undertake work with marae's and other agencies who wish to contribute towards the Vision and Strategy of the Waikato River as Kaitiaki to identify expectations and aspirations and to contribute to a planned and coordinated approach to works on the River.
- Maniapoto has also developed three new objectives which will form the basis for the WRA Vision and Strategy in terms of the Waipa River[35]
    1. Inclusive and valued relationships between all key stakeholders
    2. Maniapoto ancestral relationship is revitalised and recognised
    3. Partner / River relationships are clear, maintained and focussed.
- Raukawa are currently developing the Raukawa Environmental Management Plan, Fisheries Plan and objectives for the Waikato River under the Deed in relation to a Co-management Framework for the Waikato River.

Photo 12 Waitomo Catchment 2004 Flood event

[35] Note that at the time of writing this was not final, and was still going through an endorsement process.

6 Waipa zone assets

6.1 Introduction

Due to the upper-catchment nature of the Waipa zone, the majority of services provided are non-asset related – such as river channel maintenance and soil conservation. Despite this, some of the services included under this zone plan are based around infrastructural assets.

Managing and maintaining these assets is a key component of river and catchment services. This section presents the lifecycle management plan for zone assets and includes:

- A description of the assets in physical and financial terms
- Key issues with asset management in the zone
- Operations, maintenance, and renewal and development strategies.

The asset categories of relevance to the Waipa zone are:

- Embankments
- Structures
- In-river structures
- Channels
- Soil conservation/Clean Streams.

In general the scheme assets are limited, and comprise:

- 4.6 km of stopbanks
- 3 pump stations
- 5 weirs
- 1 bank revetment.

In addition to the above scheme assets, river and catchment management works and services are undertaken on:

- 712 km of managed natural river and stream channels
- Approximately 3,300 ha of soil conservation and Clean Streams catchment works on private land
- 1,334 ha of soil conservation works on private land that is subject to Land Improvement Agreements.

6.2 Work category definitions

Expenditure on infrastructure assets can be categorised into key areas, which are:

Operations and maintenance

Operations and Maintenance expenditure is that required for the day-to-day operation of the zone whilst maintaining the current levels of service.

Renewals

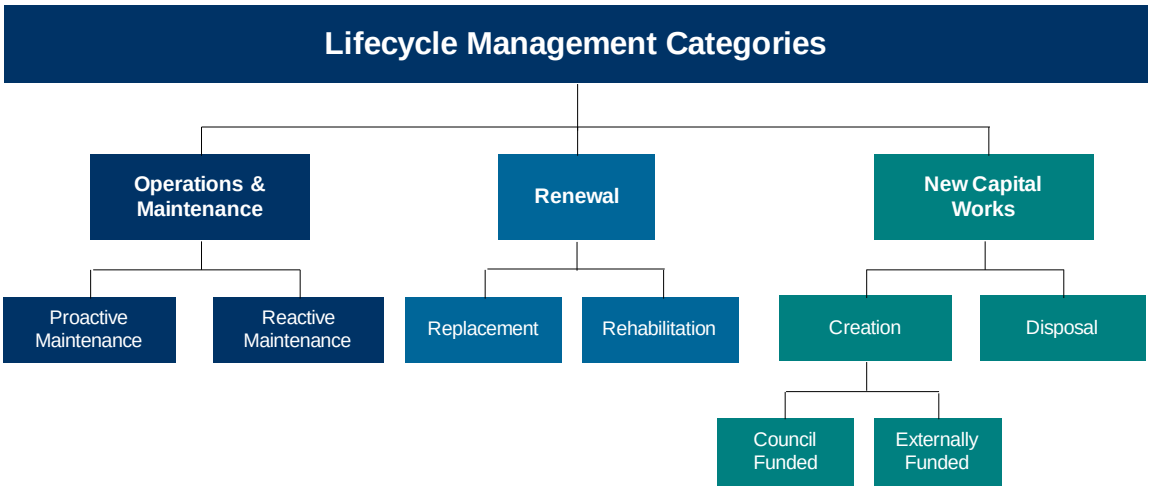
Renewal expenditure includes rehabilitation and replacement of assets. The objective is to restore an asset to its original level of service - as measured by for example, capacity or another required condition. Renewals expenditure forecasts cover the cost of asset renewal through its whole lifecycle through to disposal of the asset.

New capital works

New capital works involves the creation of new assets, or works, which upgrade or improve an existing asset beyond its current capacity or performance in response to changes in usage or customer expectations. The figure below illustrates the components of lifecycle management categories.

Photo 13 Waitomo Caves, Waitomo

Figure 7 Lifecycle management categories



6.3 Overview of assets

6.3.1 Asset ownership, service agreement and consideration of assets in this plan

Asset ownership

Unlike other zones within the region, the majority of river and catchment assets within the Waipa zone are owned by parties other than WRC. The vast majority of asset values within the zone lie in the stopbanks and pumpstations assets in and around Otorohanga town. These assets are owned and maintained by Otorohanga District Council (ODC). ODC also owns the steel sheetpile river weir in the main channel of the Waipa River.

By contrast to ODC, WRC owns very few assets within the zone – limited to four lake weirs and a bank revetment structure. These assets have a very limited value when compared with the ODC assets.

Otorohanga District Council service agreement

The management of ODC-owned assets falls under a service agreement between WRC and ODC. Under this agreement, the following points are confirmed:

1. ODC has present ownership, control and management responsibilities of certain flood protection assets that protect the urban areas of Otorohanga from flooding.
2. Pursuant to the Soil Conservation and Rivers Control Act 1941 one of the functions and responsibility of WRC is flood protection and river management within its region including the Waipa catchment area.
3. The WRC has introduced "Project Watershed" which provides for the funding of the flood protection, soil conservation and river management works within the greater Waikato catchment including the Waipa catchment area.
4. As part of Project Watershed, the WRC has agreed to fund the required work on the flood protection assets that protect the urban areas of Otorohanga. The ODC will retain ownership of the assets.

Maintenance of ODC assets is undertaken on an annual basis per agreement with WRC prior to the start of the financial year, and an annual summary report of the previous year's work, including expenditure, is provided by ODC annually. The service agreement is updated every three years.

Consideration of assets within this plan

For the purposes of this plan, only the WRC-owned assets are considered within this section in terms of valuation, depreciation, data confidence, age, condition assessment and reliability/capacity. This is because WRC does not directly own or manage ODC assets, or assets within private ownership, such as soil conservation works on private land.

Despite this, WRC maintains responsibilities for monitoring and overseeing the management of ODC's assets, and Council has on-going obligations for monitoring and managing catchment management works under the terms of the agreements with private landowners.

Because of these responsibilities, some information on catchment management works is provided within this section, while limited information on ODC's asset is provided for reference within Appendix 4.

6.3.2 Asset summary

All the assets associated with river and catchment services in the Waipa zone can be grouped under two service type categories:

1. River management and flood protection
2. Catchment management.

The following tables provide a summary of the asset types and categories,

Table 9 Asset categories and types

Service type	Asset category	Asset type
River management and flood protection	Embankments	Stopbanks
	Structures	Pump stations
	In river structures	Weir – river gradient
		Weirs – lake control
		Bank revetment
	Channels	Rivers and streams
Catchment management	Soil conservation/Clean Streams	Fencing
		Planting/retirement

An overview of the asset inventory within the Waipa zone is provided in the table below.

Table 10 Waipa zone asset inventory

Service type	Asset type	Qty	Unit	Optimised replacement value (ORC)	Optimised depreciated replacement value (ODRC)	Annual depreciation (AD)
ODC-owned assets						
River management and flood protection	Stopbanks	4,637	m	-[36]	-	-
	Pump stations	3	ea	-	-	-
	Weir – river	1	ea	-	-	-
WRC-owned assets						
River management and flood protection	Weirs – lake	4	ea	51,662	53,172	532
	Bank revetment	1	ea	34,373	36,960	369
Other works and services						
River management and flood protection	Rivers and stream channels	712	km	0	0	0
Catchment Management	Soil conservation[37]	N/A	N/A	0	0	0
Total				**86,035**	**90,132**	**901**

[36] Non-WRC assets, hence no value ascribed. Refer to Appendix 3 for ODC valuation and depreciation figures.
[37] Refer to Table 12 for a full list of catchment management works

It is important to note that the WRC-owned assets inventory above may not be a complete asset inventory. A number of potential assets have been identified within the zone, including:

- Bank revetments, groynes and training lines
- Access tracks
- Fencing
- River stability plantings.

The RCS Group is currently undertaking a process to confirm whether there are any additional assets, and if so, record these within the asset management system so that valuation and depreciation can be completed. This action has been noted within the improvement plan actions in Appendix 7.

6.3.3 Asset description and key issues

Embankments

Stopbanks are the only type of embankments that are classified as assets within the zone. All embankments in the zone are owned and managed by ODC.

Stopbanks are compacted earth embankments built alongside rivers to provide protection to the bordering land from flooding.

Key issues

- Stock damage.
- Stopbank alignment being too close to the river channel increasing the risk of undermining.
- Stopbank narrowness in some rural locations.
- Settlement of stopbanks and dams requiring top-up.
- Keeping up with changes in stopbank height (ie channel capacity) to maintain existing levels of service and taking into account silting and/or aggradation of river beds, climate change and increased rainfall intensity.
- Toe erosion and old, large trees compromising structural integrity.
- Foundation stability due to geotechnical conditions.
- Land ownership and access issues.

Stopbanks are the most significant river and catchment infrastructural assets within the zone. Asset condition is monitored by visual inspections, physical surveys and scheme reviews.

Structures

The structure assets in the zone are limited to pump stations. All pump stations in the zone are owned and managed by ODC.

Pump stations are designed to remove water from behind stopbanks that is no longer able to drain into river channels. The size and capacity of pump stations is related to the catchment area behind the stopbanks. Pump stations are most commonly used during high rainfall and flood events, and must be maintained to allow levels of service to be maintained within flood protection compartments.

Structures assets undergo a programme of regular maintenance with asset condition monitored by regular inspection.

Key issues

- Blockages due to debris in floodgates etc and consequential backflow.
- Vandalism.
- Earthquake damage to structures.
- Electricity supply failures to pump stations.
- Pump station mechanical failures.
- Insufficient capacity due to increasing required performance standards e.g. community expectations, climate change.
- Weed control – causing pumps to not run to capacity.
- Land ownership and access issues.

In river structures

The in-river structures that exist within the river channel in the zone are weirs and bank revetments. The river weir is owned and managed by ODC, while the bank revetment and lake weirs are owned and managed by WRC.

The two types of weirs in the zone are:

1. River: these are structures placed across watercourses, and are designed

to control the gradient of rivers or streams

2. Lake: these regulate the level of water within lakes by controlling the natural lake outflows.

Bank revetments are structures made from various materials (such as railway irons) built into the channel to protect the foot of river banks from erosion.

Key issues

- Damage from high river flows.
- Pest infestation.

Channels

Within the Waipa zone, channels include the natural rivers and streams. The condition of the waterway channels is generally monitored by visual inspections and physical surveys.

Key issues

- Excessive weed growth.
- Bank erosion.
- Environmental issues such as sedimentation and pollution from contaminated sites.
- Pest and weed control e.g. invasive exotic species.
- Regular maintenance is required to ensure design capacity is maintained.

Natural channels are not valued as assets in financial terms for the purposes of asset management planning.

Soil conservation

Soil conservation assets can be grouped in three main categories of ownership:

- Assets on scheme land owned by Council
- Assets on private land and covered by a Land Improvement Agreement (LIA)
- Assets on private land without a LIA.

For valuation purposes and for the purpose of recording the asset in the Council's Fixed Asset Register, only the first category of assets are valued. These assets are considered to be owned, managed and therefore controlled by Council. There are no Council-owned soil conservation assets on Council owned land within the zone.

Assets covered by LIAs have been excluded from the valuation, as they are not under the control of Council. The costs of routine maintenance, and condition and performance monitoring are considered to be of a maintenance nature rather than capital/renewal.

The assets that have been constructed on private land, with no LIA, are considered by Council to be owned and controlled by the private landowner. No legal ruling has been established on this yet, however all future maintenance and management requirements rest with the landowner. Therefore, by default, ownership and control also passes to the landowner. These assets have therefore not been valued by Council.

Council contributes funding towards a number of catchment management assets that contribute to soil conservation through the catchment management activity. A part of these assets are not owned by Council. The following table provides a summary of these assets for the Waipa zone.

Key issues

- Landowner change.
- Property subdivision.
- Changed land use.

Table 11 Soil conservation/catchment works and Clean Streams summary – Waipa zone

Compartment type	No. of compart-ments	Area (ha)	Fence length (m)	Stream-bank retired (m)	Average fence age (yrs)	Area planted (ha)	Average planting age (yrs)
Soil Conservation/catchment works							
Indigenous	152	1,801	165,574	28,364	-	921	-

retirement							
Production protection plantings	52	818	60,753	2,886	-	785	-
Riparian retirement	116	176	112,854	77,526	4	54	4
Space planting	16	92	7,850	501	-	9	-
Stream bank erosion control plantings	6	12	2,150	1,580	7	6	7
Wetland	10	11	7,807	5,049	5	3	3
Sub-total	**352**	**2,911**	**356,988**	**115,906**		**1,777**	
Clean Streams							
Indigenous retirement	13	56	14,471	6,726	6	2	6
Riparian retirement	126	300	99,202	72,457	6	19	6
Stream bank erosion control plantings	1	1	400	-	8		8
Wetland	7	8	5,246	5,280	7	2	7
Subtotal	**147**	**365**	**119,319**	**84,463**		**24**	
Total	**499**	**3,276**	**476,307**	**200,369**		**1,800**	

6.3.4 Data confidence and reliability

The table below provides the confidence framework from the National Asset Management Group's International Infrastructure Management Manual (NAMS IIMM) used to determine the confidence in the asset data used in this ZMP.

Table 12 Data confidence and reliability

Confidence grade	General meaning
Highly reliable	Data based on sound records, procedure, investigations and analysis, documented properly and recognised as the best method of assessment.
Reliable	Data based on sound records, procedures, investigations and analysis, documented properly but has minor shortcomings, for example the data is old, some documentation is missing, and reliance is placed on unconfirmed reports or some extrapolation.
Uncertain	Data based on sound records, procedures, investigations and analysis which is incomplete or unsupported, or extrapolated from a limited sample for which grade highly reliable or reliable data is available.
Very uncertain	Data based on unconfirmed verbal reports and/or cursory inspection and analysis.

The tables below reflect the confidence in the asset data for the assets within the Waipa zone. Data confidence is not applicable to embankments and structures assets, as these are owned by ODC. Improving data confidence, completeness and condition and performance has been identified as an improvement action within the Improvement Plan in Appendix 7.

Table 13 Overall confidence data –accuracy

Asset group	Highly reliable	Reliable	Uncertain	Very uncertain
In river structures			✓	
Channels			✓	
Soil conservation/Clean streams		✓		

Table 14 Overall data completeness

Asset group	<50%	60%	70%	80%	90%	100%
In river structures	✓					
Channels					✓	
Soil conservation/ Clean streams					✓	

Table 15 Condition & performance for critical and non critical assets

Asset type	Highly reliable	Reliable	Uncertain	Very uncertain
In river structures			✓	
Channels			✓	
Soil conservation/Clean streams		✓		

6.3.5 Asset condition

Council has an asset register for all WRC-owned assets that contains:

- A definition of all assets including description and location
- Physical dimensions and capacity
- Age and replacement costs
- An assessment of asset condition.

The development and continued use of condition assessment data will allow preparation of verifiable predictive decay curves for particular asset types and hence permit informed prediction of remaining life.

Condition assessment & results
The condition assessment model in the following table should be the basis of assessing the condition of WRC's assets in the Waipa zone.

Table 16 Typical condition rating model

Grade	Condition	Description of condition
1	Very good	Sound physical condition. Asset likely to perform adequately without major work for 25 years or more.
2	Good	Acceptable physical condition; minimal short-term failure risk but potential for deterioration in long-term (15 years plus). Minor work required
3	Fair	Significant deterioration evident; failure likely within the next 5 years but further deterioration likely and major replacement likely within next 15 years, Minor components or isolated sections of the asset need replacement or repair now but asset still functions safely at adequate level of service.
4	Poor	Failure likely in short-term. Likely need to replace most or all of assets within 5 years. No immediate risk to health or safety but works required within 3 years ensuring asset remains safe. Substantial work required in short-term, asset barely serviceable
5	Very poor	Failed or failure imminent. Immediate need to replace most or all of asset. Health and safety hazards exist which present a possible risk to public safety or asset cannot be serviced/operated without risk to personnel. Major work or replacement required urgently

6.3.6 Risk summary

Risk management is a key component of lifecycle management strategies. The primary risks to assets within the Waipa zone are:

- Service level agreements not met or non-existent
- Natural hazards resulting in damage to zone assets
- Stopbank failure
- Pump station failure
- Land-use change and regional intensification and development
- The impacts of animal pests
- Poor stocking practices and management.

These risks have been identified as remaining high after treatment measures have been applied, and form the core components of the Risk Action Plan.

The details of all the risks to assets within the zone and risk management strategies are outlined within Section 8 and Appendix 5.

6.3.7 Asset valuation (2011)

The following table shows the WRC-owned asset valuation details by asset type. ODC values by asset type are outlined within Appendix 4.

Table 17 WRC-owned asset valuation details by asset type

Asset type	Optimised replacement cost (ORC)	Optimised depreciated replacement cost (ODRC)	Annual depreciation costs
In-river structures			
Weirs			
Concrete	1,427	1,568	16
Rock	4,122	4,480	45
Timber	46,113	47,124	471
Bank revetment			
Willow/cable/rail	34,373	36,960	369
Subtotal	**86,035**	**90,132**	**901**
Channels	0	0	0
Soil conservation	0	0	0
Total	**86,035**	**90,132**	**901**

The WRC-owned assets within the Waipa zone have a total replacement value of $86,035 depreciated replacement cost of $90,132 and an annual depreciation of $901 as of 1 July 2011.

Refer to section 9.7 Asset Valuation for the valuation methodology for WRC-owned assets.

6.3.8 Age of WRC-owned assets

The table below shows a comparison between the average age of the asset groups and the remaining useful life (RUL) for the WRC-owned assets. WRC's in-river structures are generally new, and have considerable estimated lives remaining, considering their base lives. The age of ODC-owned assets is provided in Appendix 4.

Table 18 Age of WRC-owned assets – base life, average age and remaining useful life

Asset category	Asset type	Base life (yrs)	Average age (yrs)	Remaining useful life (yrs)
In-river structures	Bank revetment: willow/cable/railway iron	100	8	92
	Weir: concrete	100	10	90
	Weir: rock	100	9	91
	Weir: timber	100	3	97

6.3.9 WRC-owned asset condition assessment and results

The table below shows the average condition grade for WRC-owned assets in the Waipa zone. The willow/cable/railway iron bank revetment has the lowest condition grading of 3.0, while the lake weirs have an average grading of 2.0.

The condition assessment results of ODC-owned assets is provided in Appendix 4.

Table 19 WRC-owned asset average condition grades

Asset category	Asset type	Average condition
In-river structures	Bank revetment: willow/cable/railway iron	3.0
	Weir: concrete	2.0
	Weir: rock	2.0
	Weir: timber	2.0

6.3.10 Asset capacity and reliability

Capacity
The following table outlines the different design capacities (where applicable) of the river and catchment assets within the Waipa zone.

Table 20 Asset capacity

Asset group	Waipa zone
Embankments	Maintained to the design crest level (flood protect + freeboard) Allowable settlement of 50% of the freeboard before reconstruction is required
Structures	Maintained to capacity as designed
In river structures	Maintained to ensure they are functioning as designed
Channels	Maintained in order to achieve objectives
Soil conservation	Maintained in order to achieve objectives

Reliability (performance)
A small asset failure in WRC's erosion protection assets can lead to substantial erosion, resulting in disproportionate damage when compared to the initial failure.

WRC's erosion protection assets can be subject to substantial damage themselves from flows less than design level. Reactive maintenance is expended on repairing flood damage resulting from moderate sized floods.

Preventative maintenance, regular inspection, monitoring and hydraulic modelling all contribute to ensuring service reliability standards are met.

The reliability and capacity of ODC-owned assets is outlined within Appendix 4.

7 Levels of service

7.1 Overview

"Levels of service" refers to measurable quantities or attributes in relation to an activity. When combined with performance measures and targets, levels of service represent the value the community receives for river and catchment management activities in return for their money.

Asset management (AM) planning enables the relationship between levels of service and the cost of the service (the price/quality relationship) to be determined. This relationship is then evaluated in consultation with the community to determine the levels of service they are prepared to pay for.

Defined levels of service can then be used to:

- Inform customers of the proposed levels of service
- Develop AM strategies to deliver levels of service
- Measure performance against defined levels of service
- Identify the costs and benefits of services offered
- Enable customers to assess core values such as accessibility, quality, safety, and sustainability.

In this context, levels of service define the quality of delivery for a particular activity or service against which service performance can be measured.

7.2 Linking levels of service to community outcomes

Council outcomes

As a result of the 2010 amendment to the LGA 2002, a new definition of community outcomes is now in place. The amendment shifted the previous focus upon 'multi agency community visioning' to a focus upon the specific aims of the respective local authority.

The community outcomes definition under the LGA 2002 Amendment Act 2010 is:

'the outcomes that a local authority aims to achieve in order to promote the social, economic, environmental and cultural well being of its district or region, in the present and for the future.'

However, the community outcomes developed in consultation with the regional community through the Choosing Futures Waikato (2005) process continue to be relevant in providing guidance in developing the aims of WRC. The outcomes identified through Choosing Futures Waikato were:

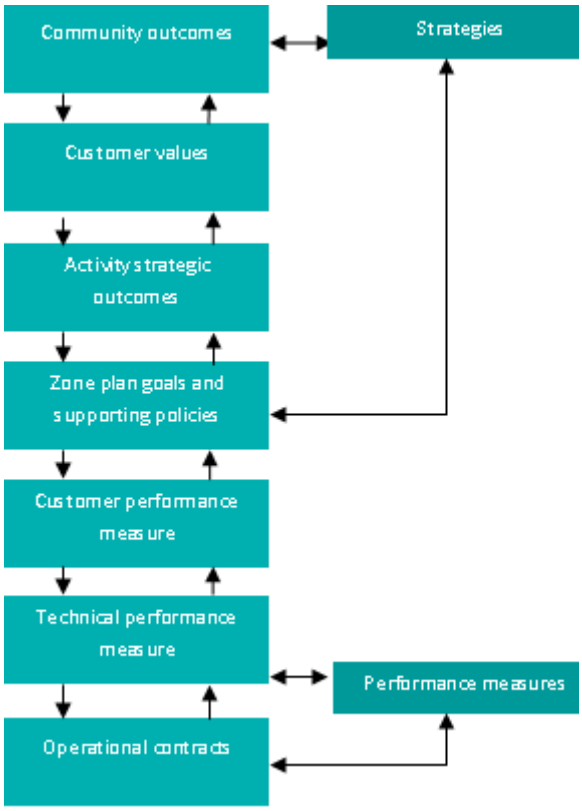
- **Sustainable environment** - the Waikato region values and protects its diverse, interconnected natural environments.
- **Quality of life** - the Waikato region is a great place to live, providing the services and opportunities we need to live well.
- **Sustainable economy** - the Waikato region balances a thriving economy with looking after its people, places and environment.
- **Culture and identity** - the Waikato region identifies with and values its land, air, rivers and waterways, mountains, flora and fauna, and its people
- **Participation and equity** - the Waikato region builds strong informed communities and has a culture that encourages people and communities to play their part.

The outcomes sought by WRC within the definition of the LGA 2002 Amendment Act 2010 are:

- **Community partnerships**
- **Environmental quality**
- **Regional economy**
- **Safe and resilient communities.**

WRC's River and Catchment Services Group (RCS) contributes to all of these outcomes. The way in which the community outcomes link to levels of service is shown in the figure below.

Figure 8 Levels of service linkages



7.3 Levels of service delivery process

WRC has a number of key service providers for the delivery of the River and Catchment Services, they are:

- Internal staff
- External contractors (eg earthworks, electrical)
- Internal sections (eg information and technology services)
- Various consultants
- Government and other agencies (eg DOC, NIWA, Fish and Game).

7.4 Levels of service development process

WRC's levels of service are reviewed on a three yearly cycle as part of LTP development. As zone plans are progressively developed, the levels of service contained in these plans will be reflected in the LTP. This is expected to apply from the 2012-22 LTP onwards.

7.5 Who are our customers?

7.5.1 Customer groups and their needs and wants

Zone services provide benefits to a wide range of customers at varying levels. Table 21 shows the breakdown of customer groups and their interests in zone services.

Table 21 Customer values

Category	Group	Specific needs/wants
Urban	Householders	No interior flooding of homes, basements and garages. Infrequent flooding of sections Access maintained No flood risks identified in LIMS
	Potential buyers	No flood risks identified in LIMS
	Users of rivers and streams	A clean and healthy environment Access to, use and enjoyment of natural rivers, streams and wetlands
	Road users	No road flooding which limits access to homes or businesses
Rural	Farmers	No significant loss of production or damage due to flooding Access maintained Productive capacity of farmland is maintained by reducing soil erosion Soil and contaminant runoff to waterways from pasture is minimised.
	Property owners most affected by flooding	Recognition of problems Consultation about solutions

		Economic justification for proposals
	Recognised community groups	Consultation Commitment to achieving agreed outcomes
Businesses	Commercial users (shops/offices)	Reasonable and equitable charges No flooding of premises Access maintained
	Industrial users	Reasonable and equitable charges No impact from flooding Maximum use of site or premises
Key stakeholders	Liaison subcommittee	Community engagement Responsiveness
	Special ratepayers	Community engagement Responsiveness Reasonable and equitable charges
	Other authorities	Appropriate risk management
	Central Govt	Minimum impact on state highway network from flooding
	LTNZ	Cooperation in mutually beneficial projects
	DOC	Water quality in streams and rivers maintained and enhanced
	Environmental groups	Minimum impact on the environment Water quality in streams and rivers maintained and enhanced Consultation about activities with environmental impact
	Tangata whenua	Recognition of co-management status and involvement in decision-making Consultation regarding cultural and environmental issues and impacts

7.5.2 Consultation

Maintaining an understanding of changing customer expectations is an on-going process and is carried out through formal and informal consultation with customers. To achieve the former, Council decided to establish permanent liaison subcommittees within each of the eight zones within the region where river and catchment management services are provided.

The Waipa Liaison Subcommittee was formed in 2002 following the merger of the former Upper and Middle Waipa Subcommittee's (refer to section 4.5.3). This sub-committee meets three times per year with the objective of reviewing the maintenance and capital works programmes and providing an overview of the management of service delivery. The zone subcommittee reports to, and makes recommendations to Council's Catchment Services Committee. Additionally, all customers have access to the annual plan and LTP process, where they can lodge submissions on the scheme works programmes or raise issues of concern.

Informal customer liaison is also undertaken by operations field staff, working closely with landowners in regard to specific works and maintenance issues.

7.6 Establishing core values

The "*Developing Levels of Service and Performance Measures*" Manual describes Customer (Core) Values for Council activities. It is important for the customers and the Council to consider which of these are most important as the priorities flow into the final required levels of service.

Core Values provide the cornerstone to the development of levels of service from both a customer and technical point of view. The core values are:

- Affordability
- Quality
- Community engagement
- Safety
- Sustainability (Whole of community benefits)

- Reliability/responsiveness.

7.7 Linking customer values to community outcomes

The matrix shown in the following table has been developed to demonstrate how the customer values link to the community outcomes.

Table 22 Linkage of community outcomes & customer values

WRC Community outcome	Customer value				
	Affordability & quality	**Safety**	**Sustain ability**	**Community engagement**	**Reliability/ responsiveness**
Environmental quality	✓		✓		✓
Safe and resilient communities	✓	✓	✓	✓	
Regional economy	✓		✓		✓
Community partnerships		✓		✓	

7.8 Activity levels of service outcomes

As part of this zone management plan, further work has been undertaken to develop Activity levels of service outcomes for the RCS activity. These are described in the table below and are aligned with the customer values.

The core values considered to be important for the RCS in activities are as follows:

Table 23 RCS customer values (NAMS) and activity levels of service outcomes

Customer value	Activity levels of service outcomes
Affordability quality	• Costs for services are distributed equitably • Services provided perform to agreed levels and standards • Statutory requirements and legal obligations are met
Safety	• People and property are safe from hazards associated with flooding and erosion
Sustainability (whole community benefits)	• The net outcome of provision of RCS services is an enhancement of the environment • Services are managed for the social, cultural, economic and environmental well being of current and future generations
Community engagement	• Decision-making processes are transparent and easily understood • Work with stakeholders to achieve mutual objectives • We will work in partnership with all relevant iwi to sustain the mauri of the Waipa River system, and particularly in regard to the implementation of Treaty settlements and co-management arrangements
Reliability/ responsiveness	• Response to requests, complaints and events is timely, and appropriate solutions are provided

7.9 Levels of service

The levels of service provided for the Waipa zone were initially established when Project Watershed was established in 2002. The current service levels were confirmed through an extensive consultation process initially undertaken in 2001/02, and subsequently updated by the LTP processes in 2004, 2006 and 2009. The next review of service levels is scheduled to be completed in 2012, during development of the 2012-22 LTP.

The existing and proposed levels of service for the zone are outlined in the following tables. These align with the community

outcomes detailed in the LTP, the vision and goals for the Waipa zone outlined within section 3, and the customer values and activity strategic outcomes in Table 23.

Each level of service statement is accompanied by one or more performance measures. The proposed levels of service and the accompanying performance measures are largely derived from a more formal definition of existing practice. This will provide enhanced ability for measuring performance and thus increase both the accountability and transparency of service delivery. Performance of zone assets against the agreed levels of service will form part of the annual reporting annual and/or LTP reporting process.

7.10 Levels of service, performance measures and reporting

Identifying and linking customer and technical levels of service

It is critical that from community outcomes right down to operational contracts, that the linkages are made clear.

The following tables are based on the NZ NAMS "*Developing Levels of Service and Performance Measures*" Manual. They have been developed to be presented for further community consultation. They group all the levels of service measures under the six main service levels, namely:

- Flood protection levels of service
- River management levels of service
- Environmental enhancement levels of service
- Community engagement levels of service
- Reliability and responsiveness levels of service
- Affordability levels of service.

Each table provides the following:

- Definition of the level of service
- Linkage to community outcomes
- The customer value the service level aims to provide
- Customer measure (with targets if applicable)
- Technical measure (with targets if applicable)
- Description of how the service level will be achieved
- Description of how achievement of the service level will be measured.

Photo 14 **Crans bully** ***(Gobiomorphus basalis)***

Table 24 Flood protection levels of service

Level of service	**River and flood protection schemes provide the standard of flood protection agreed with communities.**				
Links to community outcomes	Community partnerships ✓	Environmental quality	Regional economy ✓	Safe & resilient communities ✓	
Customer values	The core customer values this service aims to provide are affordability, quality and safety				
Customer measure	Flood protection for people, property and essential services is maintained over time; people and property have improved safety from flooding and erosion hazards.				
Technical measures	Stopbanks are maintained to the design standard and above design flood heights, and operate to design levels during flood events. Pump stations maintained to operational standards.				
Targets[38]	Current performance	Year 1 target 2012/13	Year 2 target 2013/14	Year 3 target 2014/15	Years 4-10 target 2015-2022
The percentage of stopbanks (length) maintained to the design standard[39]	89%	100%	100%	100%	To be reviewed under next LTP
Percentage of failed pump stations or floodgates diagnosed within 24 hours and remedied within 3 days[40]	New measure	100%	100%	100%	100%
Prepare an annual report to catchment liaison subcommittees and Catchment Services Committee on the achievement of performance measures set out in zone plans.	New measure	Achieved	Achieved	Achieved	Achieved
How we will achieve this level of service	We will achieve these service levels by: • Maintaining stopbanks to the design heights, achieving performance grade 3 or better. • Maintaining continuous operational readiness of all pump stations and flood gates. • Diagnosing failed pump stations or flood gates and fixing them • Responding to flood events by alerting communities prior to events, continuously monitoring river systems, undertaking emergency remedial works and reviewing system performance and maintenance requirements following flood events. • Undertaking one annual visual inspection of all flood protection structures • Reporting annually to the Subcommittee and Catchment Services Committee on flood protection performance measures • Undertaking flood protection works within consent conditions • Being transparent about residual flood risks • Conducting all flood protection work in accordance with Council Health and Safety Policies, residual flood risks				

[38] Subject to agreement and approval by Otorohanga District Council.
[39] Refer to zone maps which identify protection schemes and specified design levels.
[40] Should the pump station or floodgate failure be such that immediate action is not possible (as a result of inability to gain access, unavailability of suitable component parts, equipment or contractors) actions will be taken as soon as conditions permit.

	• Conduct all flood protection work in accordance with Council Health and Safety Policies • Working with Otorohanga District Council to achieve the items listed above for the flood protection assets at Otorohanga
How we will measure if target is achieved	The following procedures will measure whether performance targets are achieved: • 5-10 yearly crest level surveys • Annual performance and condition inspections • Yearly performance measures reports to Subcommittee and Catchment Services Committee • Monthly operational inspections and failure reports • Undertake 10 yearly capacity audits • Undertake design flood level reviews • Annual health & safety audits

Table 25 River management levels of service

Level of service	**To provide river management services to maintain priority river/stream channel capacity and stability while enhancing water quality, biodiversity and promoting the sustainable use of land and water.**[41]				
Links to community outcomes	Community partnerships ✓	Environmental quality ✓	Regional economy ✓	Safe & resilient communities ✓	
Customer values	The core customer values this service aims to provide are affordability, quality, sustainability and safety				
Customer measure	That river management works result in; • Priority river/stream channel capacity are maintained • Channel stability increased • Water quality and biodiversity is enhanced While promoting the sustainable use of land and water.				
Technical measures	River and stream channels maintained to specific channel design capacities (where applicable) on an on-going basis.				
Targets	Current performance	Year 1 target 2012/13	Year 2 target 2013/14	Year 3 target 2014/15	Years 4-10 target 2015-2022
Percentage of river instability enquiries responded to within three days and appropriate actions taken on a prioritised basis	New measure	95%	95%	95%	95%
How we will achieve this level of service	We will achieve these service levels by: • Continuously monitoring river and stream channels to identify blockages and erosion issues • Completing maintenance work – clearing debris maintaining channels free of obstructions or significant blockages and, addressing river and stream bank erosion on a prioritised basis where practicable • Recognising and allowing for catchment changes over time – such as vegetation cover and rainfall frequency and intensity • Managing pest plants where they may impact upon capacity and flow on a prioritised basis • Continually seeking opportunities for environmental enhancement of river and stream environments. • Completing all river management works within required consent conditions • Making landowners aware of their responsibilities for maintaining river and stream channels under the Soil Conservation and Rivers Control Act 1941 • Undertaking river management works to achieve best practice outcomes – such as preservation of shade and woody vegetation • River management and drainage works undertaken in accordance with the Environmental Guidelines (Environment Waikato, 2003 • Conducting all river management work in accordance with Council Health and Safety Policies.				
How we will measure if target is achieved	The following procedures will measure whether performance targets are achieved: • Annual performance and condition inspections are undertaken				

[41] Priority streams and catchments have been identified within Section 3.2.3. Note that these priorities need to revisited, as noted in Section 3.2.3.2.

	• Complaints reporting • River margin catchment condition surveys are conducted in priority catchments • Community river management issues and requests are resolved where practicable • Annual health & safety audits

Table 26 Environmental enhancement levels of service

Levels of service	**To provide land and catchment management services to enhance water quality, biodiversity and promote the sustainable use of land and soil by:** • **Undertaking and promoting new riparian and land protection measures within the zone according to the established priorities and within budget estimates.** • **Undertaking and promoting the maintenance of existing riparian and land protection measures within the zone according to the established priorities and within budget estimates.**				
Links to community Outcomes	Community partnerships ✓	Environmental quality ✓	Regional economy ✓	Safe & resilient communities ✓	
Customer value	The core customer values this service aims to provide are **sustainability**, **community engagement** and **safety**				
Customer measure	Catchments are improving in terms of stability, sediment reduction, water quality and biodiversity.				
Targets	Current performance	Year 1 target 2012/13	Year 2 target 2013/14	Year 3 target 2014/15	Years 4-10 target 2015-2022
Percentage of sampled catchment scheme works maintained in effective condition to the standards set out in zone plans[42]	77%	80%	85%	90%	90%
Kilometres of new fencing (to exclude stock) in priority catchments and significant natural areas.	Annual average over past 10 year 20km	≥10 km	≥10 km	≥10 km	≥10 km
Prepare an annual progress report that details protection measures that have commenced in the preceding 12 months.	2010/11 - Achieved	Achieved	Achieved	Achieved	Achieved
Technical measure	Environmental enhancement is promoted. Environmental enhancement opportunities are identified and actioned. Partnerships with other stakeholders and agencies are established to undertake collaborative projects. Best practice guidelines are followed in service provision.				
How we will achieve this level of service	We will achieve these service levels by: • Identifying and enhancing priority catchments/significant natural areas as a first priority, by implementing the full suite of catchment management and enhancement tools where possible – such as farm planning • Identifying other catchments (outside of priority catchments) where catchment work would be beneficial, engaging with the community and implementing fundamental catchment works – such as fencing waterways • Managing pest animals and plants where they may impact upon desired catchment outcomes • Maintaining riparian margins (of Council owned land) by planting, stock exclusion and/or erosion protection				

[42] Note that these targets are for all catchment schemes in the region, and that zone-specific targets will be developed, as identified within the Levels of Service component of the Improvement Plan in Section 10. A rotating sample of approximately 60 properties across the region (10% of all catchment scheme works) are selected and inspected to assess scheme condition every year. Works include fencing, planting and erosion control structures

	• Agreeing priorities in consultation with the Waipa liaison subcommittee • Maintaining existing catchment works and services to specified standards that are agreed with community groups and stakeholders • Process for follow-up any non-compliance with Land Improvement Agreements mapped, accessible and known to staff • Planning and implementing annual work programmes as set out within the Annual Plan.
How we will measure if target is achieved	The following procedures will measure whether performance targets are achieved: • Conducting environmental surveys in targeted catchments • Conducting monitoring in priority areas • Environmental reporting to Council – such as sedimentation, water quality, pest management, biodiversity, lengths of streams in riparian planting, hectares of wetlands and shallow lakes retired • By increasing targeted river quality monitoring and sediment sampling • By monitoring the level of catchment vegetation coverage in LUC 6, 7 & 8 land, and the reduction in active erosion scars via aerial photography monitoring over time • Annual performance reporting to the Waipa liaison subcommittee and Council • Auditing of environmental performance

Table 27 Community engagement levels of service

Levels of service	**Work with all stakeholders to achieve mutual objectives** **Work in partnership with iwi to sustain the Mauri of the Waipa zone; co-management arrangements are incorporated within river and catchment management decision-making** **Decision-making processes are transparent and easily understood**			
Links to community outcomes	Community partnerships ✓	Environmental quality ✓	Regional economy	Safe & resilient communities ✓
Customer values	The core customer values this service aims to provide are community engagement, sustainability and safety			
Customer measures	Opportunity to provide input to and work alongside Council objectives through a process that is clear and easily understood. Awareness of the need for river and catchment management and the benefits it provides.			
Technical measures	Key stakeholders and the wider community are engaged by various means. Submissions on the Annual Plan and Long Term Plan are analysed, and written feedback is provided to submitters			
How we will achieve this level of service	We will achieve these service levels by: • Producing one newsletter per year or when needed • Publishing information on the website and keeping the website up-to-date • Maintaining a consultation register, including public meetings and submissions • Publishing decisions annually • Subcommittee reporting 3 times per year • Subcommittee and other stakeholder meetings as required • Ensuring Co management requirements are fully agreed and implemented • Providing iwi with proactive opportunities to be represented in decision-making • Regular reviews of and consultation levels of service			
How we will measure if target is achieved	The following procedures will measure whether performance targets are achieved: • Levels of community awareness of river and catchment management issues and outcomes • Regular informal feedback from stakeholders and community members • Zone Management Plan, Long Term Plan and Annual Plan review process			

Table 28 Reliability and responsiveness levels of service

Levels of service	**Response to events, requests and complaints is timely, and appropriate solutions are provided. Services are provided and performed to agreed levels and standards**				
Links to community outcomes	Community partnerships ✓	Environmental quality	Regional economy	Safe and resilient communities ✓	
Customer values	The core customer values this service aims to provide are reliability/responsiveness and safety				
Customer measure	Effective response to flood and severe weather events where practicable, and enquiries and complaints dealt with promptly				
Targets	Current performance	Year 1 target 2012/13	Year 2 target 2013/14	Year 3 target 2014/15	Years 4-10 target 2015-2022
Maintain on-going operational flood readiness and response capability	100%	100%	100%	100%	100%
Technical measures	Response to flood events in accordance with operational best-practice and RCS standards/procedures				
How we will achieve this level of service	We will achieve these service levels by: • Receiving weather watches and warnings • Alerting and mobilising operations staff as required • Maintaining an on-going readiness to respond to flood events • Mobilising responses to flood events where practicable • Complying with the Customer Service Charter				
How we will measure if target is achieved	The following procedures will measure whether performance targets are achieved by: • Ensuring that pre-event arrangements are developed and maintained – including staff training • Taking a risk-based to flood response • Reporting on flood response actions following flood events • Maintaining records of customer enquiries and complaints				

Table 29 Affordability levels of service

Levels of service	**Costs for services are distributed equitably** **Services are managed for the benefit of current and future generations**			
Links to community outcomes	Community partnerships ✓	Environmental quality	Regional economy ✓	Safe and resilient communities ✓
Customer value	The core customer value this service aims to provide is affordability			
Customer measure	Customers are satisfied that charges for rivers and catchment management services are fair and equitable, and deliver the required level of service			
Technical measure	All projects achieve a positive cost benefit ratio			
How we will achieve this level of service	We will achieve these service levels by: • Undertaking an assessment of the benefits provided in the zone from river and catchment services (over a 20 year cycle) • Developing a rolling programme to review zone and local protection areas (benefit received) • Ensuring intergenerational equity by accounting for loss of service potential when it occurs (depreciation) • Allocating costs according to the funding policy • Reviewing zone funding policy in relation to benefit allocation			
How we will measure if target is achieved	The following procedures will measure whether performance targets are achieved: • Contract records and documentation • Zone funding policy • Annual reporting of customer submissions to Council • Auditing of depreciation • Maintaining competitive and fair full-cost pricing of zone maintenance and works, compliant with the Council Contracts Manual			

7.11 Future levels of service improvement

Council is progressively working through a "levels of service development and community agreement" process as outlined and flow-charted earlier in this section. Below are the key tasks and timeline for development of levels of service.

Currently identified improvements relating to levels of service include:

- Identify, review, develop, define river, flood and catchment performance levels.
- Introduce regional channel capacity guidelines.
- Identify Best Management Practice Document for compliance with Resource Management Act 1991, Regional Plan and the Environmental Guidelines.
- Continued development of process to ensure full compliance including reporting, ISO accreditation.
- Develop formal procedure to assess, prioritise and implement capitalising on significant opportunities to work with other agencies or community groups on projects that align with zone outcomes.
- Develop optimised renewals and replacements decision making prioritisation process.
- Adopt from 2012/2013.

Photo 15 Native planting, Upper Waipa River Gorge

8 Risk management

8.1 Overview

Waikato Regional Council's river and catchment services risk management planning will provide the basis for future risk analysis and improvement planning.

This section covers the risk management implemented by WRC and how this applies to current and future river and catchment services activities. In addition, an overview of risk management is provided along with suggested improvements to current practices.

The objective of risk management is to identify the specific business risks, together with any possible risks associated with the ownership and management of the river and catchment services assets and provision of services. This can be used to determine the direct and indirect costs associated with these risks, and form a priority-based action plan to address them.

Putting the risks into perspective
Council policy and operation cannot influence all the factors contributing to these events. However, WRC has a responsibility to assess the risks in order to best manage the activity with the resources available to avoid and mitigate the effects of any event.

WRC has highlighted a number of priority risk areas across the activity including:

- Natural hazard events and the resulting impacts on zone assets
- Riverbank erosion
- Stop bank/flood wall failure
- Zone land use change and regional intensification and development
- Animal pests.

These and other risks are discussed in further detail in the Risk Register (Appendix 5) and the Risk Action Plan contained in this section.

Level of risk

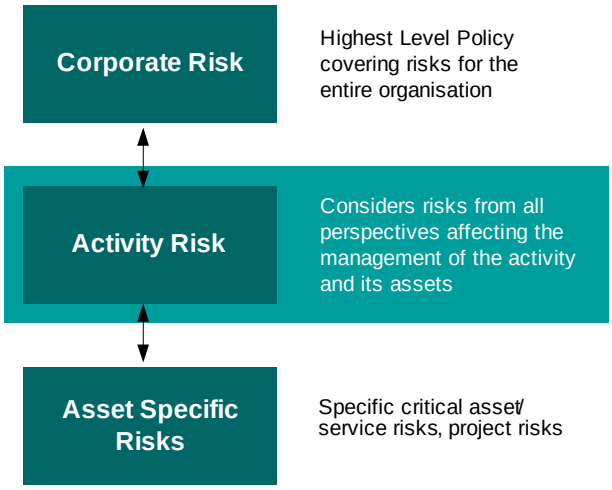
The purpose of the risk plan is to identify the risks associated with river and catchment services activities and assets. This requires approaching the risks from many perspectives - financial, operational and public health and safety.

These risks are pertinent to both a higher, corporate level, and to a more detailed asset –specific level, but do not substitute for more specific risk analysis at those levels (see diagram).

The next step beyond this risk analysis is to develop more detailed risk plans where the criticality of specific assets is assessed and an action plan developed as appropriate.

The following figure shows the levels of risk.

Figure 9 Levels of risk



8.2 Current situation

Corporate policy
WRC is currently in the process of developing a corporate risk policy and a Risk and Assurance team, which has an overview of all risk exposures within the organisation including corporate, financial, customer and assets. Infrastructure Services staff contribute regularly to the work of this group. Each risk identified in this plan is entered into the corporate risk register.

8.3 Risk management process

The following sections expand upon the risk management process as identified in Figure 9. The risk assessment process has been generally based upon the Australian New Zealand Risk Management Standard 4360:2004 to establish a Risk Matrix as shown in Table 34.

While it is noted that AS/NZS 4360:2004 has recently been superseded by ISO 31000, the process and outputs undertaken under AS/NZS 4360 align fully with ISO 31000. This matrix provides a tool to quantify a risk by identifying the likelihood of the risk occurring and the outcomes, or consequences should the risk occur. The first step in the process is to identify all possible risks.

Identify possible activity risks

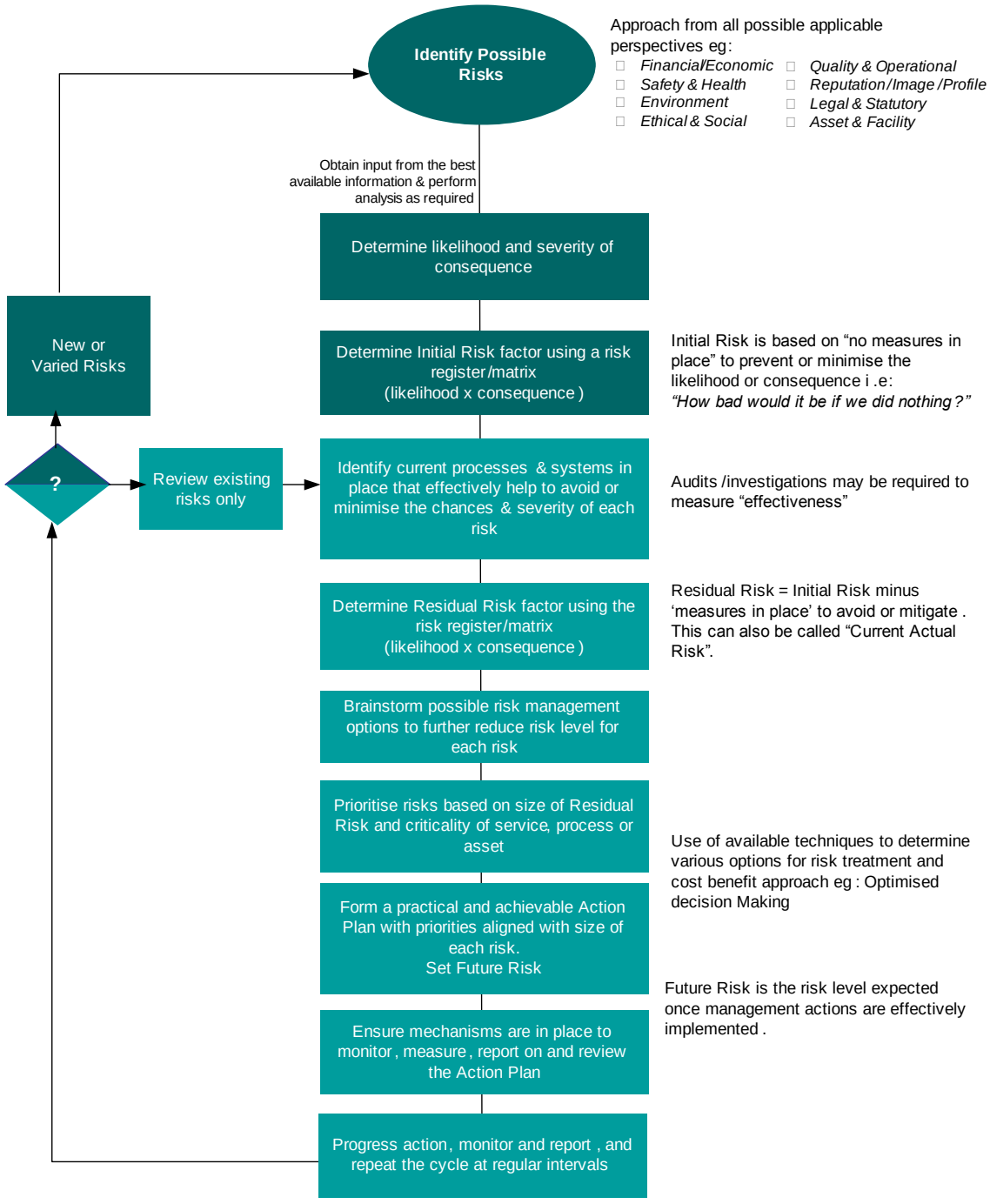
All possible risks affecting the River and Catchment Services activity need to be identified. Risks can include financial, environmental, social, operational and health and safety considerations. Once identified, risks are entered into the risk register (see Appendix 5). The register is used to record and summarise each risk and to outline current mitigation measures and potential future management options.

Potential consequences of risk are wide-ranging in relation to activities. Those relevant to the river and catchment services activity are:

Financial	Operational
Economic	Reputation / image
Health and safety	Environment
Legal	Ethical / social

Figure 10 and text details the key elements of the risk management process undertaken.

Figure 10 Risk management process



Determine likelihood and consequence for initial risk factor

The following tables demonstrate the scales used to determine the likelihood and consequence levels, which are input into the risk calculation to consider the effect of a risk event.
The likelihood of occurrence and severity of consequences should be based on as much real data as possible, for example local knowledge or recorded events such as maintenance records, weather events etc. Some analysis may be required for verification.

The likelihood scales identify how likely, or often, a particular event is expected to occur, these are shown in the table below.

Table 30 Risk probability ratings table

Likelihood	Descriptor	Probability
Rare	May occur only in exceptional circumstances e.g. once in 10 years	1
Unlikely	Could occur only very occasionally e.g. 2-3 out of every 10 years	2
Moderate	Might occur from time to time e.g. 5 out of every 10 years	3
Likely	Will probably occur often e.g. 7 out of every 10 years	4
Almost certain	Is expected to occur in almost all circumstances e.g. 9 out of every 10 years	5

The consequence descriptors in the following table indicates the level of possible consequences for a risk.

Table 31 Risk consequence ratings table for WRC

Factor	Catastrophic	Major	Moderate	Minor	Insignificant
Score	**5**	**4**	**3**	**2**	**1**
Financial	Loss of $10 million or greater	Loss between $250,000 and $10 million	Loss between $100,000 and $250,000	Loss between $20,000 to $100,000	Loss less than $20,000
Public and staff	Loss of life or Permanent staff turnover exceeds 30% p.a.	Injury with 3+ months time-off or Permanent staff turnover 20% to 30% p.a.	Injury with 2 weeks to 3 months time-off or Permanent staff turnover 15% to 20% p.a.	Injury with less than 2 weeks time-off or Permanent staff turnover 10% to 15% p.a.	Nil or Permanent staff turnover 0% to 10% p.a.
Legal	Litigation / Significant prosecution	Minor Litigation	Enforcement Notice	Non compliance	Minor issues with non compliance
Political	Nation-wide one week adverse political comment	Nation-wide several days adverse political comment	Regional several days adverse political comment	Local 1 week adverse political comment	Local one day adverse political comment
Image	Significant stakeholder disruption with financial implications and/or nationwide negative media coverage for up to 2 weeks	Stakeholder disruption/ frustration and/or nationwide negative media coverage for a few days	Some stakeholder disruption/ frustration and/or regional negative media coverage for up to 1 week	Minor stakeholder disruption/ frustration and/or regional negative media coverage for 1-2 days	No stakeholder disruption/ frustration and no negative regional media coverage
Operational	Serious loss of operational capability for over 4 weeks and serious disruption to service levels	Serious loss of operational capability for over 2 weeks and major disruption to service levels	Serious loss of operational capability for over 1 week and disruption to service levels	Loss of operational capability in some areas and some disruption to service levels	No loss of operational capability or negative disruption to service levels

After the likelihood and consequence factors have been determined, the level of risk is calculated by multiplying the Likelihood of Occurrence (Table 30) and Consequence Rating (Table 31) together. Risk = the likelihood of an event occurring times the consequence of such an event.

The final outcome is a risk rating. The risk rating enables definition between those risks that are significant and those that are of a lesser nature. Having established the comparative risk level applicable to individual risks, it is possible to rank those risks. Five risk categories have been used: Extreme, High, Moderate, Low and Insignificant (see Tables 35 & 36).

Table 32 Risk assessment matrix

	Consequence				
Likelihood	**Insignificant (1)**	**Minor (2)**	**Moderate (3)**	**Major (4)**	**Catastrophic (5)**
Rare (1)	I	I	L	L	M
Unlikely (2)	I	L	M	M	M
Moderate (3)	L	M	M	H	H
Likely (4)	L	M	H	H	E
Almost certain (5)	M	M	H	E	E

Once the impact has been ranked according to the relative risk level it poses, it is then possible to target the treatment of the risk exposure, by beginning with the highest risks and identifying the potential mitigation measures.

Table 33 Comparative levels of risk

I	Insignificant risk	Examine where un-needed action can be reduced
L	Low risk	Managed by routine procedures
M	Medium risk	Management responsibility must be specified and risk controls reviewed through AMP
H	High risk	Senior management attention to manage risk
E	Extreme risk	Immediate action required to reduce risk

In the first instance, the Initial risk needs to be calculated, so likelihood and consequences need to be considered as if there were no measures in place to prevent or mitigate the risk occurrence. Essentially Initial risk is an exercise to determine "What is the worst that could happen?" Once the Initial risk is determined, it is possible to investigate the current systems and processes to identify the Residual risk and then formulate an action plan to further reduce the likelihood or consequences of identified risks occurring.

Identify current systems and processes, and their effectiveness

Current systems and processes are identified, and as far as resources allow, their effectiveness measured. It is often practical to identify these processes and systems initially, and rank the effectiveness conservatively until the audits and actual practice proves otherwise. Audits can be identified as part of the improvement process.

Effectiveness of existing systems and processes is expressed in the following categories:

Excellent	Fulfils requirements thoroughly, very robust and positive measurable effects
Very good	Fulfils requirements, robust and measurable, room for improvement
Good	Barely fulfils requirements, effects hard to measure (or haven't been audited or measured), improvement required
In-adequate	Not fulfilling requirements, little measurement or effect on overall risk
Unsatis-factory	Totally ineffective in avoiding or mitigating associated risk events

Determine residual risk

The Residual risk is the actual risk that exists considering the effective measures implemented. The measures in place reduce either, or both, the consequence and the likelihood of a risk occurrence. The revised factors are input into the same risk matrix to obtain the Residual Risk Factor.

Prioritise residual risks and formulate action plan for risk management

A priority order of issues to be addressed is obtained by sorting Residual Risk Factors by risk level. The most suitable actions are

determined considering available options and resources. The costs and benefits of these actions need to be analysed. The best available techniques are required to analyse the options e.g. optimised decision-making (ODM).

Application of ODM applies a 'value chain' to the proposed actions rather than just working from the highest risk down regardless of cost, for example:

- A high risk may have to remain due to the inhibitive costs associated with avoidance or mitigation
- A medium risk event could be easily and cost-effectively avoided within resources available.

Do nothing	Accept the risk
Management strategies	Implement enhanced strategies for demand management, contingency planning, quality processes, staff training, data analysis and reporting, reduce the target service standard, etc
Operational strategies	Actions to reduce peak demand or stresses on the asset, operator training, documentation of operational procedures, etc
Maintenance strategies	Modify the maintenance regime to make the asset more reliable or to extend its life
Asset renewal strategies	Rehabilitation or replace assets to maintain service levels
Development strategies	Investment to create a new asset or augment an existing asset
Asset disposal/ rationalisation	Divestment of assets surplus to needs because a service is determined to be a non-core activity or assets can be reconfigured to better meet needs

Monitor, measure, report, review plan and actions

The management structure needs to be in place to ensure that actions are monitored, reported on and reviewed regularly. It is important to identify and constantly review the following:

Respon-sibility	Nominated person responsible for ensuring the risks are managed and improvements carried out in accordance with the programme
Best appropriate practice	The practices that should ideally be carried out to manage risks to an acceptable level
Audit trail	Date of entries and revisions, target date for actions to be taken and actual task completion dates

Respon-sibility	Nominated person responsible for ensuring the risks are managed and improvements carried out in accordance with the programme

In addition, management options should be ranked via benefit / cost analysis using Residual Present Value (NPV) calculations. The inputs considered in the NPV calculation are;

- Capital investment costs.
- Changes in operating and maintenance costs.
- Reduction in business risk exposure.
- Increase in effective asset life / value.
- Increase in level of service.

All capital development projects should be ranked corporately for inclusion in the LTP/ Annual Plan consultation process using benefit / cost analysis plus the following additional criteria:

- Contribution to Council's LTP community outcomes
- Contribution to Council's business objectives.
- Level of project commitment (contractual and legal issues).

The resulting action plan for risk treatment needs to be practical and achievable such that the necessary resources and time frames are realistically met. The actions also need to be able to be monitored and measured. Table 35 provides more detail with regard to future actions/tasks required for future stages of risk management, which include the ranking outlined above.

Review risks

Most of the time, the risks identified will remain the same and reviews will occur in the context of these risks. However, it will be important to recognise when a new risk arises, or an existing risk changes in nature. In the latter case, the initial risk also needs to be re-evaluated.

8.4 Risk register

The risk register in Appendix 5 has been developed in consultation with WRC staff and the Waipa Liaison Subcommittee. The risk register identifies all possible risks to the Waipa zone and provides an assessment of both initial and residual risk.

A summary of the risk rankings within the risk register is provided in the following table.

Table 34 Summary of risk register initial and residual risk rankings

Risk #	Risk descriptor	Initial risk			Current practice	Residual risk		
		Consequence	Likelihood	Risk rating	Effectiveness	Consequence	Likelihood	Risk rating
General risks								
5.1	Lack of staff resources	4	4	H	Very Good	2	3	M
5.2	Lack of financial resources	3	4	H	Very Good	2	2	L
5.3	Inefficient use of resources	4	4	H	Very Good	3	2	M
5.4	Loss of knowledge (information)	4	4	H	Good	2	2	L
5.5	Failure to identify opportunities and developments – best practice and technology advances	3	3	M	Very Good	2	2	L
5.6	Service level agreements not met or non-existent – between River and Catchment Services and other parties internal or external (including drainage)	4	4	H	Good	4	3	H
5.7	Inadequate Contract Management (Service/ Maintenance/ Capital)	4	5	E	Very Good	3	2	M
5.8	Inappropriate/inadequate Procurement	3	4	H	Very Good	3	2	M
5.9	Inadequate Asset Management – not up to date, or insufficient quality of process and output.	5	5	E	Good	3	2	M
5.10	Natural hazards and resulting impact on zone assets	4	4	H	Very good	3	4	H
5.11	Non-compliance with legislation and legal requirements	5	2	M	Good	2	2	L
5.12	Ineffective governance or inability of elected members to fulfil roles and responsibilities or disregard for community/staff views.	4	4	H	Very Good	2	2	L
5.13	External economic influences	3	5	H	Good	2	5	M
5.14	Inability to utilise funding options – Both internal and external, including failure to acquire external subsidies and people not applying for funding on time or not identifying potential areas where funding is required.	4	5	E	Very Good	3	2	M
5.15	Health and safety	5	3	H	Very Good	2	2	L
5.16	Ineffective strategic planning (internal WRC) Inability to plan for and provide for change	4	3	H	Very Good	2	2	L
5.17	Inadequate business continuity planning	3	2	M	Very Good	2	2	L
5.18	Inadequate communications and PR management - poor communications with stakeholders (internal and external)	4	4	H	Very Good	2	2	L
5.19	Uncertainty of the implications of co management on the zone	4	4	H	Very Good	2	3	M
5.20	Local Government reform	4	4	H	Good	3	3	M
5.21	Climate change	3	3	M	Good	2	2	L
River management risks								
6.1	Increased adverse river behaviour	5	5	E	Very Good	3	3	M

Risk #	Risk descriptor	Initial risk			Current practice	Residual risk		
		Consequence	Likelihood	Risk rating	Effectiveness	Consequence	Likelihood	Risk rating
6.2	Rise in sea level and storm surges– (see similar Flood Management Risk)	3	3	M	Very Good	1	3	L
6.3	Riverbank Erosion	4	5	E	Excellent	3	3	M
6.4	Sand and Gravel Management	3	4	H	Very Good	2	4	M
Flood management risks								
7.1	Stop bank failure	5	4	E	Very Good	4	3	H
7.2	Structural failure –pump stations	4	3	H	Good	4	3	H
7.3	Conflicting objectives/ aspirations (external)	4	5	E	Good	3	3	M
Catchment management risks								
8.1	Zone land use change and regional intensification and development	4	4	H	Very Good	3	4	H
8.2	Landowner failure to manage soil conservation	3	4	H	Good	3	2	L
8.3	Animal pests	4	4	H	Good	3	4	H
8.4	Loss of productive land capacity	3	3	M	Good	3	2	M
8.5	Loss of major wetlands	3	4	H	Good	3	3	M
8.6	Poor stocking practices and management	4	4	H	Poor	4	3	H

8.5 Risk action plan

The following table is compiled from the Risk Register and highlights the most significant residual risks faced by river and catchment services within the Waipa zone. Criteria for inclusion within the Risk Action Plan is that the risks listed are all rated high in terms of residual risk.

Actions that are required to achieve the desired improvements are indicated along with how progress on these actions will be monitored and reported. Where applicable, Action tasks will detail timeframes for achievement, and responsibility for these actions.

Monitor, measure, report, review plan and actions

Management options listed in the risk tables have been refined into actions for each risk listed. These are the actions that are required to cost-effectively reduce the Residual risk by increasing Council's ability to minimise the chances of the risk event occurring, or minimising the consequences should it occur.

Actions should consider the overall management of the asset, not just the minimisation of risk. If possible, proposed actions should align with other initiatives to:

- Reduce capital investment costs.
- Reduce operating and maintenance costs.
- Reduce business risk exposure.
- Increase effective asset life / value.
- Increase level of service.

The resulting action plan for risk treatment needs to be practical and achievable such that the necessary resources and time frames are realistically met. The actions also need to be able to be monitored and measured.

The monitoring/reporting column of the Risk Action Table specifies:

- Responsibility: Nominated person responsible for ensuring the risks are managed and that improvements are carried out in accordance with the programme.
- Timeframe: Achievable target date to be monitored and reported against; and
- Method and Frequency of Monitoring: This entire Action Table will be monitored by the Asset Manager, but there will be certain actions that are being monitored and reported in other forums. These forums are to be specified and the frequency with which these actions will be reviewed.

The actions listed will be reported, monitored and reviewed regularly by the asset manager.

As necessary, the asset manager will need to revise timeframes, responsibility, and even the appropriateness of continuing with the proposed action, or adding new actions.

As actions are completed, the residual risk should reduce in most cases. The risk tables will need to be reviewed against these and updated to reflect these improvements.

Photo 16 Fuchsia Tree upper Waipa River

Table 35 Waipa zone management risk action plan – River and Catchment Services

Risk number	Risk descriptor	Nature of risk	Initial risk	Residual risk	Current practice/ Management options available	Risk owner (name and title)	Risk appetite *Accept = Current Practice, P1 = Urgent, P2 = Routine*	Pinpoint management actions	Monitoring / reporting	Time frame	Costs / resources	Future risk
5.6	**Service Level Agreements not met or non-existent – between River and Catchment Services and other parties internal or external (including drainage)** **Caused by:** Lack of process Lack of monitoring of the SLA's Budget Political change Lack of expertise Lack of knowledge' Pressure of deadlines Lack of resource **Consequences:** Affects timing and quality of delivery of services Costs for work done on behalf of others not recovered Legal consequences Non-delivery of service Community expectations not met Loss of reputation	Financial Operational Political Reputation / Image	H	H	**Current practice:** Current SLA's in place Regular meetings with other Councils and agencies Monitoring and Reporting **Management options:** Maintain and develop relationships with stakeholders Review if additional SLA's are required Improved monitoring and management of Service Level Agreements Need to develop and implement internal SLA's between zone and RCS programmes Develop and implement an external SLA with key stakeholders as appropriate In some cases, need to clarify roles	Zone Manager	Accept	TBC	TBC	TBC	TBC	M

Risk number	Risk descriptor	Nature of risk	Initial risk	Residual risk	Current practice/ Management options available	Risk owner (name and title)	Risk appetite *Accept = Current Practice,* *P1 = Urgent,* *P2 = Routine*	Pinpoint management actions	Monitoring / reporting	Time frame	Costs / resources	Future risk
5.10	**Natural Hazards and resulting impact on zone assets** **Caused By:** Extreme weather event Earthquakes Volcanic eruptions Land instability **Consequences:** Potential injury, sickness or loss of life Damage to Council-controlled/ owned land e.g. Slips, loss of land Liability / Claims against Council Loss of amenity value Negative Council image (perceived as Councils problem) Increased costs e.g. clean up Adverse environmental effects Damage to private / neighbouring property Financial cost through damage to assets Debris trapped on bridges resulting in increased bank erosion	Financial Operational Economic Reputation / Image Health and Safety Environment Legal	E	H	**Current practice:** Reactive/Proactive approach to events Post event inspection/structural audit (as required) and renewals Engineering Code of Practice Communications strategy (flood warning system) Emergency/Hazard procedures manual Regional hazard mapping and identification Community feedback via EMO's Connections made with Civil Defence (Lifelines) Communications plan LAPP scheme Disaster recovery policy (WRC) **Management options:** Public education / Communication plan strategy Continue, improve, monitor current process Improve understanding of hazard events	Divisional Manager CDEM Asset Manager	Accept	TBC	TBC	TBC	TBC	H
7.1	**Stop bank/flood wall Failure** **Caused by:** Settlement Deterioration, weakness Undermined foundations Erosion Adjacent disturbance (i.e. building road, digging a drain, etc.)	Financial Operational Reputation / Image Health and Safety	E	H	**Current practice:** Regular condition reviews Visual inspections, physical surveys Scheme reviews, hydraulic capacity modelling Use of internal / external specialists e.g. geotechnical where appropriate	Programme Manager, TS Zone Manger	Accept	TBC	TBC	TBC	TBC	H

Risk number	Risk descriptor	Nature of risk	Initial risk	Residual risk	Current practice/ Management options available	Risk owner (name and title)	Risk appetite *Accept = Current Practice, P1 = Urgent, P2 = Routine*	Pinpoint management actions	Monitoring / reporting	Time frame	Costs / resources	Future risk
	Poor construction Overtopping **Consequences:** Ineffective flood control Flooding Legal claims				Renewal / upgrade programmes Maintenance regime Floodway and drainage bylaws Failure Response Processes Linkages between RPS and District Plan policies to drive lowering and/or restricting increase in the level of residual risk over time. **Management options:** Advocate limiting development behind stop banks Increased awareness and education Improved failure response procedures (i.e. warning systems, etc.)							
7.2	**Structural Failure –Pump Stations** **Caused by:** Lack of maintenance Asset deterioration Poor design or installation Loss of power **Consequences:** Flooding Inability to function Unexpected costs and resources Negative Council image Increased costs Health and safety Legal claims	Financial Operational Reputation / Image Health and Safety	H	H	**Current practice:** Regular inspections Condition monitoring Renewal / upgrade programmes Maintenance regime – internal staff (dedicated custodian) Operations manuals Emergency backup pumps, connections for generators, mobile pumps Experienced staff – on-going training Key stations have telemetry / alarms Feedback from landowners **Management options:**	Zone manager Programme Manager TS						M

Risk number	Risk descriptor	Nature of risk	Initial risk	Residual risk	Current practice/ Management options available	Risk owner (name and title)	Risk appetite *Accept = Current Practice,* *P1 = Urgent,* *P2 = Routine*	Pinpoint management actions	Monitoring / reporting	Time frame	Costs / resources	Future risk
					As per current practice Review inspection programme Improved prediction procedures (Telemetry / monitoring / alarms) On-going improvements in Design, Construction, Monitoring, and Maintenance							
8.1	**Zone Land Use Change and Regional Intensification and Development** **Caused by:** Conversion of forest to pasture Increased grazing pressure due to intensification of land use – particularly dairy farming Increased need for Roading and Rail Developments and Improvements Need for utility and infrastructure network developments Increased expectations for a higher level of service **Consequences:** Higher risk of impacts on existing assets Conflicting objectives Need for balance of objectives	Financial Operational Economic Environment	H	H	Current practice: Technical reviews of resource consent applications Submissions to District Plans Inter-regional planning and strategy development Liaison between TAs Liaison with Infrastructure networks owners Future Proof **Management options:** As per current practice	Group Manager, Policy Zone Manager	Accept	TBC	TBC	TBC	TBC	H

Risk number	Risk descriptor	Nature of risk	Initial risk	Residual risk	Current practice/ Management options available	Risk owner (name and title)	Risk appetite *Accept = Current Practice, P1 = Urgent, P2 = Routine*	Pinpoint management actions	Monitoring / reporting	Time frame	Costs / resources	Future risk
8.3	**Animal pests** **Caused by:** Proliferation of catchment pests On-going issues with the use of 1080 poison **Consequences:** Blockage of Channels Poor Drainage Sediment disturbance Erosion Water quality degradation Increased costs and resource requirements Adverse effects on levels of service	Financial Operational Reputation / Image Environmental	H	H	**Current practice:** Animal pest control programmes Monitoring programmes **Management options:** More Monitoring and research programmes Improved control programmes and methods (environmentally acceptable methods)	Group Manager, BS&NH Zone Manager	P2	TBC	TBC	TBC	TBC	H
8.6	**Poor stocking practices and management** **Caused by:** Overstocking Increased use of LUC 6e, 7 and 8 land Increased use of lower productivity land requiring greater fertiliser inputs **Consequences:** Increased erosion/sedimentation Decreased water quality Soil pugging Soil compaction	Operational Reputation / Image Environment	H	H	Work with TA's to protect high class soils Enforce regulations Strengthen policy/ regulation/ education incentives to prevent degradation: Increased promotion of soil conservation/carbon credits Farm plans Efficient fertiliser usage Increased riparian fencing Stronger regulations	Zone Manager	P2	TBC	TBC	TBC	TBC	H

9 Financial management

9.1 Overview

9.1.1 Introduction

In order to undertake a sustainable, long-term approach to the management of infrastructure assets within the catchment zones it is essential to prepare long-term financial forecasts. This allows a long term view of how assets will be managed, the associated costs and when additional funding may be required to meet expected service levels. These financial forecasts are a culmination of the previously discussed aspects of the zone plan such as:

- Community engagement and consultation.
- Levels of service.
- Demand management.
- Lifecycle management.
- Condition assessments.
- Asset lives.
- Asset valuation.

The above forms the basis of the long-term operations, maintenance and capital requirements. Funding requirements have also been included in the financial statements.

Office of the Auditor General (OAG) criteria requires that asset management planning should translate the physical aspects of planned maintenance, renewal and new work into financial terms for at least the ensuing 10 years and in a manner that is fair, consistent and transparent.

The forecasts should include sufficient information to enable the decline in service potential (depreciation) of an asset to be measured. (Guidance on depreciation is included in the NZ Valuation and Depreciation Guidelines).

Planning should translate the physical aspects of planned operational, maintenance, renewal and new works into financial terms:

- Generally over the timeframe in which the asset must deliver services.
- In more specific terms, over the period for which the organisation has a strategic plan.
- The assumptions underpinning financial forecasts should be disclosed in the organisations strategic plans and the asset management plans.
- The compilation of financial forecasts should be consistent, reliable and provable.

The confidence in the underlying data upon which the financial forecasts are based is discussed in section 6.3.4.

9.2 Expenditure

All costs incurred through the ownership of infrastructural assets and that directly relates to the running of those assets falls into two categories - capital/renewal expenditure or maintenance expenditure. Under the generally accepted accounting practice (GAAP) the following definitions need to be applied to the treatment of costs against infrastructure assets.

9.2.1 Operations and maintenance expenditure

Expenditure - “Costs which are repairs and maintenance should be expensed.”

Maintenance costs are generally subdivided into 3 groups; these are described in the following table.

Table 36 Maintenance types

Maintenance type	General meaning
Routine	Day to day maintenance which is required on an on-going basis and is budgeted for
Planned (proactive)	Non day-to-day maintenance which is identified in advance and is incorporated into a maintenance budget for a certain time period
Reactive	Maintenance that is unexpected and necessary to attend to immediately to continue operation of the service

All maintenance costs are written off in the year of expenditure.

9.2.2 Replacement/ renewal expenditure

“Costs which restore and sustain the intended service potential of the network is renewal expenditure and should be capitalised.” An example of this work is the topping up of stopbanks to return them to the design standard.

Renewal expenditure is treated in the same way as capital expenditure. For accounting purposes, any work performed on an asset that has previously been classified as renewal costs will be subject to these guidelines and now be classified as capital expenditure.

9.2.3 Capital (new works) expenditure

"Costs which add to the service potential of the network as a whole". These expenses should be capitalised and depreciated.

For new capital works, the scheme contributes 25% of the total capital works costs, while the direct and indirect beneficiaries contribute the remaining 75% of the cost.

9.2.4 Zone management assumptions

The financial summary presented within this plan is based on the draft 2012/22 Long Term Plan (at March 2012). As a part of the 2012/22 LTP, a review of the key financial management principles to be applied to the zone has been completed, including:

- Definition of a zone reserving policy.
- Capital funding mechanisms.
- Insurance framework for zone assets.

This zone plan has been prepared subject to the following limitations and assumptions:

- The plan is based on currently available information and data.
- Effects of climate change are considered based on the Ministry for the Environment Guidelines.
- Financial forecasts are limited to 10 years.
- Financial estimates are to be updated following adoption of the 2012/22 LTP.
- Land use within the protected compartments will remain the same.
- Existing levels of service are to be maintained.
- Consultation with the community has been on-going since the adoption of Project Watershed in 2002. Targeted consultation in the development of this plan has been focused on input from community representatives associated with the catchment liaison subcommittee.
- There will be minimal change in applicable standards and technologies over the life of the plan.
- This plan has not considered future budget constraints.
- This plan has not considered changes to the Resource Management Act and the influence this will have in this activity area.
- The plan has not made any specific provision for management and governance changes that may result from any future co-management arrangements.

9.3 Summary financial forecast

The Waipa zone services are provided on an annualised maintenance cost basis. While there are activities on specific types of assets that are not carried out each year, the work is spread as evenly as possible across each year.

The following table and figure below provide a summary of the 10 Year financial forecast for Waipa zone.

Historical maintenance costs from 2006/07 – 2010/11 indicates a steady trend at around $1.25 million, and planned maintenance cost for 2012/13 onwards remains at a similar, although slightly increased level – around $1.4 million annually.

Historical capital expenditure indicates a steady trend during the period 2006/07 – 2010/11, with emphasis on renewals. Future capital expenditure planned for the Waipa zone starting in 2012/13 is a combination of new works and renewals, and remains at historical annual levels – around $125,000.

Total revenue for 2012/13 is $1.7 million, with 100% of this sourced by general rates and targeted rates.

The reserve balance for Waipa catchment remains negative but steadily declining throughout the planning period.

Photo 17 Upper Waipa River, Waipa Gorge

Table 37 10 year financial forecast (draft 2012/22 LTP, March 2012)

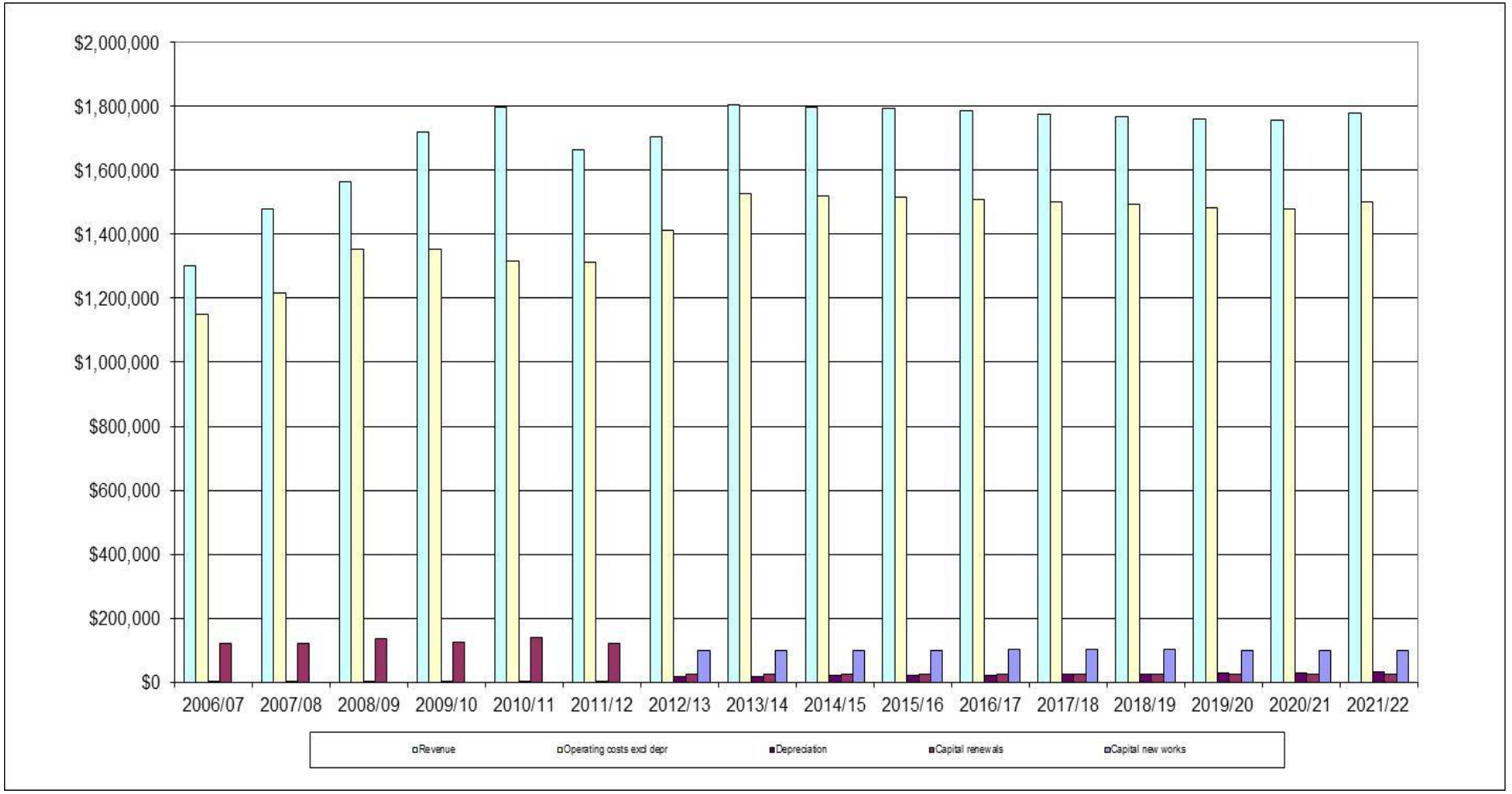
	Historical figures					Budget figures										
	2006/07	**2007/08**	**2008/09**	**2009/10**	**2010/11**	**2011/12**	**2012/13**	**2013/14**	**2014/15**	**2015/16**	**2016/17**	**2017/18**	**2018/19**	**2019/20**	**2020/21**	**2021/22**
		Actual	Actual	Actual	Actual	AP	LTP	LTP	LTP	LTP	LTP	LTP	LTP	LTP	LTP	LTP
Maintenance																
Catchment oversight	118,827	96,552	135,891	131,588	158,868	187,730	196,135	214,661	212,440	213,038	213,268	211,646	212,021	210,847	210,131	213,149
Information, advice & monitoring	50,068	39,533	84,966	91,087	84,633	102,948	142,868	160,290	157,759	158,273	155,749	148,840	149,904	149,097	148,811	150,452
Catchment maintenance	74,932	37,652	73,738	126,397	87,536	75,344	84,920	95,874	95,837	96,007	96,081	95,386	95,952	95,334	95,120	95,850
Catchment new works	267,655	306,092	275,577	315,138	341,271	181,459	216,898	263,305	262,910	263,498	263,808	261,923	263,344	261,754	261,144	263,225
Pest Control	320,416	504,581	442,148	421,002	381,921	427,225	462,137	484,274	489,566	485,675	479,279	488,015	479,797	476,534	475,832	488,342
River management	30,618	20,356	52,078	47,598	39,338	54,606	55,640	58,443	58,380	58,557	58,590	58,303	58,507	58,230	58,141	58,455
River improvement	58,502	55,111	66,784	63,596	62,078	91,546	99,913	100,865	100,898	103,179	105,428	105,233	105,472	105,181	104,984	105,337
Flood protection	87,387	65,498	126,914	104,539	100,680	116,848	122,113	122,828	122,867	125,134	127,381	127,164	127,473	127,121	127,049	127,339
Total maintenance	**1,008,406**	**1,125,375**	**1,258,095**	**1,300,944**	**1,256,325**	**1,237,706**	**1,380,624**	**1,500,540**	**1,500,657**	**1,503,361**	**1,499,584**	**1,496,510**	**1,492,470**	**1,484,098**	**1,481,212**	**1,502,149**
Depreciation [1]	3,029	3,648	260	686	977	686	15,187	16,941	18,694	20,447	22,201	23,954	25,707	27,460	29,214	30,967
Interest expense on reserve balance [2]	88,932	42,259	47,894	26,683	41,698	65,077	32,140	26,000	21,000	15,000	10,000	4,000	1,000	-	-	-
Total Operating Expenditure	**1,100,367**	**1,171,281**	**1,306,250**	**1,328,313**	**1,299,000**	**1,303,469**	**1,427,951**	**1,543,481**	**1,540,351**	**1,538,808**	**1,531,785**	**1,524,464**	**1,519,177**	**1,511,558**	**1,510,426**	**1,533,116**
Funded by																
General rate	183,804	203,359	209,622	275,718	306,843	326,844	342,102	381,651	379,530	379,658	378,695	374,380	374,796	371,752	370,198	372,763
Targeted rate	945,232	1,125,976	1,085,658	1,236,300	1,294,678	1,329,119	1,362,050	1,422,382	1,419,526	1,416,054	1,408,031	1,403,053	1,395,437	1,383,880	1,378,513	1,392,567
Less debt funding	(104,729)	(104,729)	(174,729)	(174,729)	(174,729)	(174,729)	(16,476)									
Less capital funding							(40,000)	(40,000)	(40,000)	(40,000)	(40,000)	(40,000)	(40,000)	(40,000)	(40,000)	(40,000)
Fees and Charges	173,140	149,526	270,069	208,550	197,845	5,000										
Interest income on														5,000	9,000	14,000

	Historical figures					Budget figures										
	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
reserve balance [2]																
	1,197,447	**1,374,132**	**1,390,619**	**1,545,839**	**1,624,638**	**1,486,234**	**1,647,676**	**1,764,033**	**1,759,056**	**1,755,712**	**1,746,726**	**1,737,433**	**1,730,233**	**1,720,632**	**1,717,711**	**1,739,330**
Capital																
New Works	119,956	119,738	135,229	122,666	139,928	121,259	97,761	98,886	99,286	99,786	100,086	100,586	100,986	99,186	99,086	98,986
Renewals							23,400	23,490	23,590	23,590	23,690	23,690	23,790	23,490	23,490	23,490
Interest expense on reserve balance [2]																
Total capital	**119,956**	**119,738**	**135,229**	**122,666**	**139,928**	**121,259**	**121,161**	**122,376**	**122,876**	**123,376**	**123,776**	**124,276**	**124,776**	**122,676**	**122,576**	**122,476**
Funded by																
Targeted rate							40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000
Total revenue	**-**	**-**	**-**	**-**	**-**	**-**	**40,000**	**40,000**	**40,000**	**40,000**	**40,000**	**40,000**	**40,000**	**40,000**	**40,000**	**40,000**
Operating reserve balance																
Opening balance	(739,202)	(689,471)	(554,151)	(557,210)	(379,482)	(97,048)	40,131	216,992	391,239	563,733	734,473	903,460	1,070,695	1,236,175	1,399,902	1,561,874
Plus revenue	1,197,447	1,374,132	1,390,619	1,545,839	1,624,638	1,486,234	1,647,676	1,764,033	1,759,056	1,755,712	1,746,726	1,737,433	1,730,233	1,720,632	1,717,711	1,739,330
Less Operating expenditure	(1,100,367)	(1,171,281)	(1,306,250)	(1,328,313)	(1,299,000)	(1,303,469)	(1,427,951)	(1,543,481)	(1,540,351)	(1,538,808)	(1,531,785)	(1,524,464)	(1,519,177)	(1,511,558)	(1,510,426)	(1,533,116)
Transfer to disaster reserve [3]	(31,284)	(35,882)	(35,663)	(40,873)	(43,323)	(45,586)	(42,864)	(46,305)	(46,211)	(46,164)	(45,954)	(45,734)	(45,576)	(45,347)	(45,313)	(45,993)
Plus non cash item	-	-	-	389	-	-	-	-	-	-	-	-	-	-	-	-
Plus depreciation added back	3,029	3,648	260	686	977	686	15,187	16,941	18,694	20,447	22,201	23,954	25,707	27,460	29,214	30,967
Less budgeted depreciation funding tfrd to capital reserve	(19,093)	(35,297)	(52,026)	-	(857)	(686)	(15,187)	(16,941)	(18,694)	(20,447)	(22,201)	(23,954)	(25,707)	(27,460)	(29,214)	(30,967)
Closing balance / (deficit)	**(689,471)**	**(554,151)**	**(557,210)**	**(379,482)**	**(97,048)**	**40,131**	**216,992**	**391,239**	**563,733**	**734,473**	**903,460**	**1,070,695**	**1,236,175**	**1,399,902**	**1,561,874**	**1,722,095**
Zone establishment loan																
Opening balance	(718,867)	(668,053)	(613,428)	(484,706)	(336,636)	(180,422)	(15,616)	-	-	-	-	-	-	-	-	-

	Historical figures					Budget figures										
	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Plus loan repayment funded	104,729	104,729	174,729	174,729	174,729	174,729	16,476									
Less interest charged	(53,915)	(50,104)	(46,007)	(26,659)	(18,515)	(9,923)	(860)									
Closing balance / (deficit)	**(668,053)**	**(613,428)**	**(484,706)**	**(336,636)**	**(180,422)**	**(15,616)**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Capital reserve balance																
Opening balance	(531,356)	(632,219)	(716,660)	(799,863)	(922,529)	(1,061,600)	(1,182,173)	(1,248,147)	(1,313,582)	(1,377,764)	(1,440,693)	(1,502,268)	(1,562,590)	(1,621,659)	(1,676,875)	(1,730,237)
Plus revenue	-	-	-	-	-	-	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000
Less Capital expenditure	(119,956)	(119,738)	(135,229)	(122,666)	(139,928)	(121,259)	(121,161)	(122,376)	(122,876)	(123,376)	(123,776)	(124,276)	(124,776)	(122,676)	(122,576)	(122,476)
Plus budgeted depreciation funded	19,093	35,297	52,026	-	857	686	15,187	16,941	18,694	20,447	22,201	23,954	25,707	27,460	29,214	30,967
Closing balance / (deficit)	**(632,219)**	**(716,660)**	**(799,863)**	**(922,529)**	**(1,061,600)**	**(1,182,173)**	**(1,248,147)**	**(1,313,582)**	**(1,377,764)**	**(1,440,693)**	**(1,502,268)**	**(1,562,590)**	**(1,621,659)**	**(1,676,875)**	**(1,730,237)**	**(1,781,746)**
Total zone reserve balance																
Opening balance	(1,989,425)	(1,989,743)	(1,884,239)	(1,841,779)	(1,638,647)	(1,339,070)	(1,157,658)	(1,031,155)	(922,343)	(814,031)	(706,220)	(598,808)	(491,895)	(385,484)	(276,973)	(168,363)
Plus revenue	1,302,176	1,478,861	1,565,348	1,720,568	1,799,367	1,660,963	1,704,152	1,804,033	1,799,056	1,795,712	1,786,726	1,777,433	1,770,233	1,760,632	1,757,711	1,779,330
Less Operating expenditure	(1,100,367)	(1,171,281)	(1,306,250)	(1,328,313)	(1,299,000)	(1,303,469)	(1,427,951)	(1,543,481)	(1,540,351)	(1,538,808)	(1,531,785)	(1,524,464)	(1,519,177)	(1,511,558)	(1,510,426)	(1,533,116)
Less Capital expenditure	(119,956)	(119,738)	(135,229)	(122,666)	(139,928)	(121,259)	(121,161)	(122,376)	(122,876)	(123,376)	(123,776)	(124,276)	(124,776)	(122,676)	(122,576)	(122,476)
Less interest on internal loan	(53,915)	(50,104)	(46,007)	(26,659)	(18,515)	(9,923)	(860)	-	-	-	-	-	-	-	-	-
Transfer to disaster reserve [3]	(31,284)	(35,882)	(35,663)	(40,873)	(43,323)	(45,586)	(42,864)	(46,305)	(46,211)	(46,164)	(45,954)	(45,734)	(45,576)	(45,347)	(45,313)	(45,993)
Plus non cash item	-	-	-	389	-	-	-	-	-	-	-	-	-	-	-	-
Plus depreciation added back	3,029	3,648	260	686	977	686	15,187	16,941	18,694	20,447	22,201	23,954	25,707	27,460	29,214	30,967
Closing balance / (deficit)	**(1,989,743)**	**(1,884,239)**	**(1,841,779)**	**(1,638,647)**	**(1,339,070)**	**(1,157,658)**	**(1,031,155)**	**(922,343)**	**(814,031)**	**(706,220)**	**(598,808)**	**(491,895)**	**(385,484)**	**(276,973)**	**(168,363)**	**(59,651)**

Notes:
1. Depreciation costs do not include the impact of revaluations. The impact on depreciation of new works has not been included as they are considered to be minor.
2. The Waipa Zone has a negative balance in the early years resulting in interest expense and a positive balance in the later years resulting in interest income.
3. Funding is put aside each year from the zone into a regional disaster recovery fund.
Refer to Section 9.8.6 for further detail on the Zone Reserving Policy.

Figure 11 Financial forecast – Waipa zone



9.4 Operations and maintenance planning

9.4.1 Introduction

The maintenance strategies cover the policies that will determine how the RCS activities will be operated and maintained on a day-to-day basis to consistently achieve the optimum use of the asset. The work categories are defined as follows:

9.4.2 Routine (general) maintenance

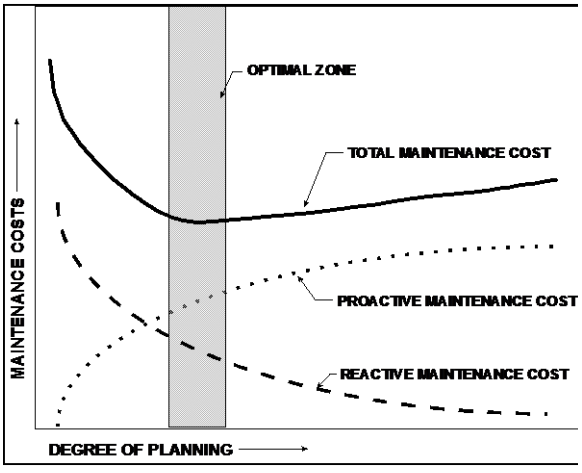
Routine maintenance is the regular on-going day-to-day work that is necessary to keep assets operating, including instances where portions of the asset fail and need immediate repair to make the asset operational again. This work falls into two broad categories as follows:

Planned (proactive) - Proactive inspection and maintenance works planned to prevent asset failure.

Reactive - Reactive action to correct asset malfunctions and failures on an as required basis.

A key element of asset management planning is determining the most cost-effective blend of planned and unplanned maintenance as illustrated in the following figure.

Figure 12 Balancing proactive & reactive maintenance



The short-term maintenance strategy is intended to maintain the current levels of service standards. The long-term maintenance strategy will be modified to reflect the following factors:

- **Risk of failure** - The risk associated with failure of critical assets.
- **Levels of service** - Changes in the current or agreed level of service.
- **Economic efficiency** - Asset condition assessment.
- **Extend the life of the asset component** - Asset improvements and development programme.
- **Legislative compliance** – such as requirements of LGA 2002.

9.4.3 Operations and maintenance programme

The annual maintenance programme includes provision for:

- The standard monitoring and maintenance works necessary to ensure that the assets are operational at all times. Such works include monitoring inspections, audits and surveys, removal of blockages from channels, lubrication of mechanical components and weed spraying.
- Planned maintenance works are undertaken on a cyclic basis, or through the annual condition survey, crest level surveys, cross section surveys and structures audit reports. Prioritisation is based on the risks of failure.
- Unplanned maintenance is urgent maintenance work identified during routine inspections, or through customer feedback. These are investigated and assessed, and if the risks of failure warrant it, then works are added to the current annual maintenance programme. Maintenance activities and frequencies are summarised in the table below.

The process of maintaining assets is described further in Section 6.

Table 38 Maintenance activity and frequency

Activity	Maintenance	Estimated frequency
River channel works and assets		
Condition assessment	Inspection and assessment of river channel conditions and reporting	Annually
Reliability inspections	Regular inspection for changes especially after floods	Biannually
Surveys	Cross section survey	Biannually and following flood events
Vegetative management	Clearance, spraying, removal of vegetation where causing erosion or obstruction	Annually
Rock work	Repositioning or replacement of rock work	As required
Gravel management	Survey to assess management requirements. Agreement reached with owners	As required
Overview of weirs/ groynes	Inspection of structures and identification of maintenance needs	1 year
Routine maintenance of weirs/ groynes	Minor maintenance works to ensure operational readiness	As required
Replacement of weirs/ groynes	Replacement and reconstruction for settlement and asset deterioration	30-60 years
Stopbanks/flood walls		
Condition assessment	Survey to assess management requirements.	Annually
Crest level survey	Survey of stopbanks /floodwall crest levels	10 Yearly
Renewal works	Topping up of stopbanks and raising floodwalls when settlement occurs	10-25 Yearly
Pump stations		
Routine operational inspections	Inspection and minor maintenance ensuring that pump stations are in a state of operational readiness	1-2 months
Routine maintenance	Minor maintenance works including adjustments, lubrication, bird proofing, weed spray and pest control of pump station structures and components	As required
Electric check	Check electrical circuits and safety compliance	1 year
Ultrasonic check	Check pumps for vibration	2 years
Refurbishment	Overhaul of pumps	8-10 years
Replacement of components	Replacement of flaps, screens, switchboard, lifting gear, steel pipes and other components	20 -30 years
Replacement of pumps	Replacement of pumps, motors, wing walls	50 – 80 years
Replacement of structures	Replacement of concrete and steel structures, such as walls, sumps and buildings	80 – 100 year

9.5 Capital and renewal planning

9.5.1 Renewal works

Renewal expenditure is work that restores an existing asset to its original level of service – either capacity or the required condition. These broadly fit into the following work categories as follows:

Rehabilitation: involves the repair of an existing asset, or asset component. Rehabilitation doesn't provide for a planned increase in the operating capacity or design loading. It is intended to enable the asset to

continue to be operated to meet the current levels of service.

Replacement: does not provide for a planned increase to the operating capacity or design loading. Some minor increase in capacity may result from the process of replacement, but a substantial improvement is needed before asset development is considered to have occurred.

9.5.2 Renewal strategy

Renewal strategies provide for the progressive replacement or rehabilitation of individual assets that have reached the end of their useful life. This is managed at a rate that maintains the standard and value of the assets as a whole. This programme must be maintained at adequate levels to maintain current levels of service and the overall quality of infrastructure assets.

The general renewal strategy is to rehabilitate or replace assets when justified by:-

Asset performance

Assets are renewed where they fail to meet the required level of service. The monitoring of asset reliability, capacity and efficiency during planned maintenance inspections and operational activity identifies non-performing assets. Indicators of non-performing assets include:

- Structural failure
- Repeated asset failure (breaks, faults)
- Ineffective and/or uneconomic operation
- Unsafe conditions for the public.

Economics

From an economic perspective, an asset may be considered no longer economic to continue repairing when the annual cost of repairs exceeds the annualised cost of its renewal. An economic consideration is the co-ordination of renewal works with other planned works such as road reconstruction. Council actively researches the effectiveness of new technology, which may reduce the direct and social costs of repair works.

Risk

The risk of failure and associated environmental, public health, financial or social impact justifies proactive action (e.g. probable extent of flooding damage, health and safety risk). Where such assets are identified (critical assets), proactive inspection is undertaken to determine asset condition at a frequency appropriate to the risk and rate of asset decay.

9.5.3 Life cycle

The current lifecycle expectations (projected asset lives) for the river and catchment assets within the Waipa zone are shown within the following table.

Table 39 Projected asset lives

Asset category	Asset type	Base life (yrs)
Embankments - Stopbank	Clay foundation	100
Structures – Pumpstations	Building: concrete block	60
	Inlet structure	80
	Motors	25
	Outlet structure	80
	Power supplies	30
	Pump: Axial Vertical Shaft	25
	Screen: Grille	20
	Sump: Reinforced Concrete	80
	Switchboard and Controls	30
	Valve: Sluice Gate	50
In-river structures	Weir: Steel Sheetpile	100
	Bank Revetment: Willow/Cable/Railway Iron	100
	Weir: Concrete	100
	Weir: Rock	100
	Weir: Timber	100

9.5.4 Replacement (renewal) works summary

While many of the smaller replacement (renewal) items are undertaken within maintenance, all major works are programmed as replacement items and are managed in a similar way to new capital works.

On-going renewals and replacements are anticipated within the Waipa zone in the next 10 years. Additional renewals or replacements will be required in the event of storm and/or flood damage.

In the future, WRC will consider the financial and customer risks of having sufficient funds to deal with renewal demands, consideration of detailed assessments, implementing proactive renewals and recognising the increasing maintenance and operational requirements within the Waipa zone.

Table 44 contains information on planned renewals within the zone.

9.5.5 New works

New works are the creation of new assets or works, which upgrade or improve an existing asset beyond its existing capacity or performance in response to changes in usage or customer expectations. Council recognises that asset development and asset renewal can occur simultaneously.

Asset renewal is maintaining the condition of the assets and current service levels.

Asset development is providing service improvements, measured by asset performance.

Table 44 contains information on new capital works within the zone.

9.5.6 Development planning categories

New works fall into four separate categories as shown in the table below.

Table 40 Development planning categories

Category	Detail
Growth	Any asset development (council funded or externally funded) that is required as a result of growth
Level of service	Any asset development that is required as a result of an increase in levels of service.
Legislative	Any asset developed to meet legislative requirements
Vested	Any assets vested (gifted) with Council. As required by schedule 10 of the LGA 2002, with respect to Council funded development work, this plan also identifies and differentiates requirements of additional asset capacity in terms of increased demand (e.g. growth) or increase in service provision levels and standards.

9.5.7 Selection criteria

Council carries out a prioritisation process of all necessary renewal or development works. The priority list is used to assign funds when preparing the financial plans. It is important that the process be regularly reviewed and that the cost estimates are reviewed at detailed design stage and/or purchase.

9.5.8 Creation/acquisition/ augmentation plan, and capital works

While the zone levels of service are currently assessed as appropriate and meet the needs of the stakeholders of the works, there is demand for upgrading the level of service in some areas and providing new works in other areas. These issues are being managed in accordance with the demand management plan for the zone in consultation with key stakeholders and the zone liaison subcommittee.

Future new works within the next three years include the erosion protection works on the Main Waipa River Channel around and above Otorohanga. Works are also required on the Mangatutu, Moakurarua and a number of other tributaries of the Waipa River.

Council proposes to continue to utilise internal borrowing to fund work programmes of a long term nature.

The capital works plans shown in the tables below sets out the programme for new works and renewing or replacing existing assets as they wear out or become uneconomic to maintain. The programme is set and prioritised based on current condition estimated remaining life, and the risks associated with failure.

One example of possible new capital works relates to additional flood protection in the Lower Waipa River, and this issue has been flagged for further investigation by the Liaison Subcommittee.

Table 41 River improvement and Tunawaea capital works summary

		Expenditure forecast									
	Capital	**2012/13 ($)**	**2013/14 ($)**	**2014/15 ($)**	**2015/16 ($)**	**2016/17 ($)**	**2017/18 ($)**	**2018/19 ($)**	**2019/20 ($)**	**2020/21 ($)**	**2021/22 ($)**
River improvement new capital works											
Erosion protection groynes Mangatutu, Moakurarua and various tributaries	Capital	26,316	26,271	26,316	26,406	26,451	26,541	26,586	26,316	26,316	26,271
Erosion protection groynes Waipa River Otorohanga to Toa's Bridge	Capital	26,316	26,271	26,316	26,406	26,451	26,541	26,586	26,316	26,316	26,271
Training lines Waipa River Otorohanga to Toa's Bridge	Capital	5,848	5,838	5,848	5,868	5,878	5,898	5,908	5,848	5,848	5,838
Total		**58,480**	**58,380**	**58,480**	**58,680**	**58,780**	**58,980**	**59,080**	**58,480**	**58,480**	**58,380**
River improvement capital renewals WORKS											
Erosion protection groynes	Renewals	19,662	19,662	19,662	19,662	19,752	19,752	19,752	19,662	19,662	19,662
Training lines	Renewals	2,185	2,185	2,185	2,185	2,195	2,195	2,195	2,185	2,185	2,185
Total		**21,847**	**21,847**	**21,847**	**21,847**	**21,947**	**21,947**	**21,947**	**21,847**	**21,847**	**21,847**
Tunawaea new capital WORKS											
Erosion protection groynes	Capital	26,897	26,627	26,897	27,167	27,347	27,617	27,887	26,807	26,717	26,717
Training lines	Capital	2,989	2,959	2,989	3,019	3,039	3,069	3,099	2,979	2,969	2,969
Total		**29,886**	**29,586**	**29,886**	**30,186**	**30,386**	**30,686**	**30,986**	**29,786**	**29,686**	**29,686**
Tunawaea capital renewals works											
Erosion protection groynes	Renewals	13,448	13,358	13,448	13,448	13,448	13,448	13,538	13,358	13,358	13,358
Training lines	Renewals	1,494	1,484	1,494	1,494	1,494	1,494	1,504	1,484	1,484	1,484
Total		**14,942**	**14,842**	**14,942**	**14,942**	**14,942**	**14,942**	**15,042**	**14,842**	**14,842**	**14,842**
Grand total		**125,155**	**124,655**	**125,155**	**125,655**	**126,055**	**126,555**	**127,055**	**124,955**	**124,855**	**124,755**

9.6 Disposals

As part of the life cycle management of assets it is vital to consider the costs of asset disposal in the long-term financial forecasts for an asset. The cost of asset disposal is expected to be incorporated within the capital cost of new works, or asset renewals.

Disposal is the retirement or sale of assets whether surplus or superseded by new or improved systems. Assets may become surplus to requirements for any of the following reasons:

- Under utilisation
- Obsolescence
- Provision exceeds required level of service
- Assets replaced before its predicted economic life
- Uneconomic to upgrade or operate
- Policy changes
- Service provided by other means (e.g. private sector involvement)
- Potential risk of ownership (financial, environmental, legal, social,).

The formal process for disposal of zone assets is as follows:

- Asset identified as obsolete due to change in technology, change in site conditions, change in community demand, or failure of the asset to provide the service.
- Disposal options considered and a cost /benefit analysis carried out. The most cost-effective option to dispose of the asset will be undertaken:
    - input sought from liaison subcommittee as appropriate
    - Council approval sought according to Delegations Manual
    - disposal is undertaken including obtaining any consent for disposal works.

Gains and losses on disposals are determined by comparing the proceeds with the carrying amount of the asset. Gains and losses on disposals are included in the statement of financial performance. When revalued assets are sold, the amounts included in asset revaluation reserves in respect of those assets are transferred to retained earnings.

this time Council has no plans to dispose of any of its river and catchment services assets, however planned replacement of some components will be undertaken as per the replacement/renewal plan. Salvage values of replaced assets are unlikely to be significant, and are therefore (conservatively) not included in financial forecasts

9.7 Asset valuation

9.7.1 Introduction

Council values its assets in accordance with the procedures and methods set out in the New Zealand Infrastructure Asset Valuation and Depreciation Guidelines Edition 2 and New Zealand Equivalent to International Accounting Standard 16; Property, Plant and Equipment (NZ IAS 16) and the NZ local authority asset management practice (NZ Flood Protection Asset Valuation and Depreciation Guidelines.

An asset valuation is to be used for asset management (calculating long-term asset renewal projections), identifying loss of service potential (depreciation) and for financial reporting purposes.

Revaluations are undertaken every three years on the basis of Depreciated Replacement Cost (DRC). The initial valuation was done as at 1 July 1998.

An asset valuation is undertaken on behalf of the Council every three years. Key outputs from the report are:

- Optimised Replacement Cost (ORC)
- Optimised Depreciated Replacement Cost (ODRC)
- Assessment of Remaining Economic Life (REL)

While all the Council-owned assets are fully maintained and depreciated, changes to the valuations are expected due to the recent timing of construction and timing of data entry into the asset management system in relation to the 2011 valuation. There are also a number of limitations to the current valuation information, and these are discussed in section 6.3.7.

9.7.2 Accounting standard

The New Zealand International Accounting Standard 16 (NZIAS16) "Accounting for Property, Plants and Equipment" is adhered to as this applies to relevant infrastructure assets considered in the scope of Council valuations for the general purpose of financial reports.

9.7.3 Industry guidelines

Infrastructure assets should be valued in accordance with the rules and methodology as prescribed in the New Zealand Infrastructure Asset Valuation & Depreciation Guidelines Manual Edition 1.0 April 2001 (NZIAV) and in reference to earlier versions of these rules.

In addition the NAMS New Zealand Infrastructure Asset and Depreciation Guidelines, Edition 2.0. 2006 (NZIAVDG) and NZ Flood Protection Asset Valuation and Deprecation Guidelines are used regularly throughout local government and nationally as industry guidelines.

9.7.4 Valuation methodology

Council's latest revaluation of all infrastructural assets was undertaken in 2010 (AECOM NZ Ltd, 2010). The valuation process was performed in accordance with generally accepted accounting standards (NZ IAS 16) and with the NZ Flood Protection Asset Valuation and Depreciation Guidelines (NAMS, 2006b).

An internal review of the 2010 valuation was undertaken in June 2011, and it is Councils intention to conduct internal peer reviews of all future independent valuations.

Replacement values are generally calculated from a number of sources including:

- Recent contracts
- Consultant database
- Previous valuations adjusted using Capital Goods Index
- Rawlinsons
- Contractors, manufactures and suppliers

The unit rates used include the actual purchase and construction costs as well as establishment. These rates have been increased to account for professional fees such as planning, investigation and design.

The replacement value for the stopbanks was based on an equivalent component cost and included earthworks, topsoiling, fencing, royalties to landowners, design and construction supervision and administration.

From the asset optimised replacement value (ORC), the optimised depreciated replacement cost (ODRC) is obtained as follows.

$$ODRC = \frac{\text{Remaining Life (Years)}}{\text{Economic Life (Years)}} * \text{Replacement Value}$$

A detailed description of typical unit rates used across the different asset groups and the associated assumptions can be found in the Summary of Methodology and Assumptions for Infrastructure Assets section of the 2010 Valuation of Flood Protection Assets, Waikato Regional Council, Asset Valuation Report (AECOM NZ Ltd, 2010)

9.7.5 Base life assessments

Base life for the components within the pumping stations were originally based on the recommendations within the NZIAMM. The base life for asset components are modified during the three yearly asset valuations based on historical condition monitoring and replacement frequencies.

Historical records of top up frequencies were used for the assessment of the stopbank base life. The frequency of the need to top up the crest level of a stopbank depends on the foundation material. For clay, the stopbank settles at a slower rate and requires less frequent top up. Therefore the base life of stopbanks is a function of stopbank height and the rate of settlement. All stopbanks within the Waipa zone have a clay foundation.

9.7.6 Remaining life

In all instances with the exception of drains, planting and vegetation, the remaining life of the asset has been calculated from the condition rating.

9.7.7 Valuation overview

The valued assets of the zone, comprising the flood protection works, have a total replacement value of $4,579,984, a current book value of $551,929 and an annual depreciation of $14,054 as of 1 July 2010[43].

[43] Refer to Section 6.3.7 for a discussion on the issues with the current valuation figures.

The soil conservation assets within the zone are not valued because they are not owned by Council. Council does however have on-going obligations for monitoring and managing these works under the terms of the agreements with landowners. Because of these commitments, the assets have been included under this plan. The breakdown of assets is shown in Table 10.

9.7.8 Funding strategy

The funding for river and catchment works, and flood protection works in the Waipa zone is set out in the 2009/19 LTP Section 3 'The Finances'. The zone management programme provides both asset and non-asset related river and catchment services. The main services and costs are non-asset management related.

A Waikato catchment wide funding system (Project Watershed) provides the mechanism for funding all river and catchment works and services within the zone.

The costs of Council services are funded through a combination of income sources including:

- Scheme lease income
- Participating landowners.
- Ratepayers.
- Internal borrowing.
- Rental income from council owned buildings.
- Investment income.

Under the 2009/19 LTP, the cost of Council's entire work programmes (for all activities) is projected to increase from $95.633 million in 2009/10 to $138.907 million (including inflation) in 2018/19. Rate revenue will fund 67-71 per cent of this expenditure. This amount varies as a result of the forecast revenue from passenger transport fares. At the time of writing, the 2012/22 LTP is in development, and will update and replace the 2009/19 LTP.

Over the period of the 2009/19 LTP, projected rate increases to existing ratepayers are between 2.2 per cent and 4.3 per cent after allowing for inflation.

The council's investment fund, like others of its kind, has been affected by the financial crisis that impacted world markets over the past three years.

In response to this, the council has amended its investment strategy by increasing the asset allocation of fixed interest investments compared to equities to help ensure a reliable income from the fund is available to offset rates requirements.

For the first three years of this plan, Council is only budgeting on a return from the fixed interest investments that council will hold. During this period Council expect the value of their equity holdings will start to recover some of the valuation losses of the last two years, however the timing of this is uncertain. A direct impact of this is that some programmes previously funded by income from the investment fund, such as Clean Streams, will be funded through rates. The budgeted income from the investment fund is treated as an offset to general rate and does not directly fund any work programme. This plan sees use of internal borrowing programmes in relation to river and catchment management zones. The cost of establishing the scheme works programmes was initially advanced from general council funds.

Specific debt repayment plans are in place with each affected catchment zone, funded from targeted rates, to ensure that this debt is repaid over an agreed time period (generally 10 years from the start of the programme). Funds generated from the internal debt repayment will be added into the council's investment fund.

Council's infrastructural capital expenditure programme of $52.356 million over the 10 years of the 2009/10 LTP is funded by way of depreciation and capital rates. Internal borrowing is utilised to provide the initial capital financing. Capital rate revenue is then applied to the payment of interest and principle. These funding tools have been selected to ensure that the costs of these long term capital projects are spread over time to take account of intergenerational equity considerations. Operational capital expenditure is funded through depreciation.

The council is participating along with a number of other councils in a jointly developed computer software system. Council's contribution to that project will be funded from internal borrowings and be repaid over five years.

9.7.9 Financial statements and projections

Financial projections for the zone are made over a ten year horizon commencing from the 2012/13 financial year. While this long term forecast is necessarily uncertain, more detailed projections are made for the immediate 3 year period (yearly projections until 2014/15). The projections made here are consistent with those in Councils draft 2012/22 LTP (dated March 2012).

An Annual Plan is prepared every year. This is developed within the LTP framework that is reviewed every three years. Both of these planning mechanisms are conducted within the legal requirements of the Local Government Act and after consultation with the wider community.

The Annual Plan ensures financial resources are available for the projects laid out for the coming period. The expenditure estimates are designed to include as detailed an estimate as possible with regards to future expenditure requirements for maintenance and depreciation. These costs are both fully expensed in the income statement for the period concerned.

Depreciation, a non-cash transaction, is transferred to a Depreciation Reserve which in turn is used to fund Fixed Asset replacements.

9.8 Policies

9.8.1 Policy introduction

Council has four policies that provide guidelines and procedures for dealing with treasury management activities; the determination of the significance of an issue, proposal, decision or other matter; how to perform in partnerships between council and the private sector and the treatment of infrastructural assets. An overview of these four policies is provided below.

An overview of the Zone Reserving Policy is also provided. This policy is in development as a part of the 2012/22 LTP.

9.8.2 Treasury risk management policy

The purpose of the Treasury Risk Management Policy is to outline approved policies and procedures in respect of all treasury activity to be undertaken by Council. The formalisation of such policies and procedures will enable treasury risks within Council to be prudently managed.

The objective of the Treasury Risk Management Policy is to control and manage costs and investment returns that can influence operational budgets and public equity. Specifically, all borrowing, investments and incidental financial arrangements (such as use of interest rate hedging financial instruments) will meet requirements of the Local Government Act 2002 and incorporate the Liability Management Policy and Investment Policy.

Photo 18 Longfin eel

9.8.3 Policy on significance

'Significant' is defined within the Local Government Act 2002 as:

> "**Significant**, in relation to any issue, proposal, decision, or other matter, means that the issue, proposal, decision, or other matter has a high degree of significance."

Section 90 of the Local Government Act 2002 ('the Act') requires all council to have a policy on significance which sets out:

- The council's general approach to determining the significance of proposals and decisions in relation to issues, proposals, decisions or other matters.
- Any thresholds, criteria or procedures that are to be used by the council in assessing the extent to which issues, proposals, decisions or other matters are significant.
- The assets considered by the council to be strategic assets.

- The significance of a decision helps to determine how rigorously the act's decision making requirements will be followed.

9.8.4 Partnership and private sector policy

Pursuant to Section 102(4) (e) of the Local Government Act 2002 (LGA 2002), the Waikato Regional Council, ('the council'), must adopt a policy in respect of the commitment of council resources to partnerships between council and the private sector ('public private sector partnerships'). This policy must be established in accordance with Section 107 of the LGA 2002.

The purpose of this policy is to ensure that when the council enters into partnerships of a business nature with the private sector that it acts prudently to ensure the council's interests are protected and the desired outcomes are consistent with the council's strategic objectives. These partnerships can be quite diverse in nature and for this reason this policy is broadly based.

Council may consider partnership arrangements with the private sector for the provision of infrastructure and services, where such a partnership is likely to deliver better value for money based on cost, time and financial arrangements than traditional delivery methods.

The council will consider partnerships with the private sector where:

- The partnership will contribute to the achievement of community outcomes in the council's LTP.
- It will promote the social, economic, environmental or cultural wellbeing of the region in the present and in the future.
- It is a prudent, efficient and effective use of the council's resources.
- A need has been defined in measurable output terms.
- Outcomes for the community, measured on cost, quality and timeliness exceed any other provision.
- The project is structured to optimise risk allocation in order to generate the incentives for cost effective, high quality services.
- There is an identifiable market of bidders prepared to compete for the opportunity to undertake the project.
- There is scope for the private sector to demonstrate particular skills and/or innovative capacity.
- The project size justifies the transaction and on-going management costs.
- The financial management of assets in the Waipa zone must be consistent with these policies. The significance of RCS assets has been assessed in Part I and the financing of activities has been discussed earlier in this section. No RCS activities are currently carried out in partnership with the public sector though the policy demonstrates how this can be achieved.

9.8.5 Infrastructure assets – accounting policies / guidelines

The treatment of infrastructure assets is outlined in the Council document Infrastructure Assets:

- Accounting policies / guidelines. The document is reviewed every year as part of the year end financial report preparation.
- The scheme will be valued in accordance with the procedures and methods set out in the New Zealand Infrastructure Asset Management Manual. The Scheme will be revalued every three years and this will be based on the Optimised Depreciation Replacement Cost method.
- The Optimised Replacement Cost model considers technology changes, over-design, redundancy and system configuration to identify a benchmark alternative asset that efficiently replicates the current asset, while providing the same level of service. ODRC equals this replacement cost, after deducting an allowance for wear/consumption to reflect the remaining economic cost.

Currently the financial/accounting system is run within the Finance Group of Council. Manual linkages exist between the Conquest Asset Management system and the financial management system. This is currently being automated.

9.8.6 Zone reserving policy

Council operates cash reserves in relation to each management zone. Currently, this reserve is represented by a single balance, which is included in reporting to the relevant subcommittees.

Work has been undertaken to break the current cash reserve balances down into a series of component parts as a part of the 2012/22 LTP development. This will enable to better tracking and management of zone funding, and better alignment of decisions to the drivers of reserve movements and balances. This work will result in the development of a zone reserving policy. Fundamental aspects of the policy will apply to all zones, however some elements will need to be zone-specific.

From the 2012/13 financial year onwards, it is proposed that the zone reserves are reported with the following components:

Operating reserve
This reserve should reflect the difference between the actual and budgeted maintenance programme for each zone. Where these two are well-aligned, the balance in this reserve should be close to zero. Funds held in this reserve should reflect work programmes that have either been deferred, not completed, completed for less cost than budgeted, or that have attracted additional revenue. It is proposed that a zone-specific reserve limit (upper and lower) would be defined to guide the management of the reserve balance.

Capital expenditure reserve
This reserve should track the way in which capital works are funded. Funding should match the period over which the benefit arising from that expenditure is expected to accrue - capital expenditure should be matched by long-term funding. The policy will consider two categories of capital works, being renewals and new capital works. As a consequence of the way that capital expenditure is funded, it is expected that the capital expenditure portion of the zone reserve will reflect a deficit in the long-term. This should be viewed in a positive way, as it recognises the long-term nature of this expenditure.

Disaster recovery reserve
The need to review the overall insurance framework in relation to council's infrastructural assets has arisen as a result of the Christchurch earthquakes and the resulting impact on council's current insurance provider, Local Authority Protection Programme (LAPP). From 1 July 2011, LAPP premiums have increased four-fold, and the deductible has increased to approximately $2.0 million. Currently, disaster recovery provisions are addressed in a number of ways. In addition to these explicit insurance provisions, an allowance for event response and recovery is provided for in zone budgets each year. Work is in progress to define limits for each level of reserving, and guidelines for the point at which funding can be accessed from the regional disaster recovery reserve

Zone establishment loan
The establishment costs for Project Watershed, including the Waipa Zone, have been recognised against the zone reserves as an opening deficit in the reserve. In the case of Project Watershed, an explicit loan repayment amount was agreed that would result in this zone establishment cost being recouped over a ten-year period. The status of the repayment of these establishment costs will be reported separately from other reserving drivers.

9.9 Risk to significant forecasting assumptions

There are risks and uncertainties associated with future cost forecasts because it is not always possible to accurately predict the level of reactive maintenance required. Reactive maintenance is subject to a range of influences including the weather and river flows etc. Major disaster (floods and earthquake) risks are however provided for through self reserving and membership of the LAPP mutual disaster damage fund (refer to Appendix 6).

10 Improvement plan

10.1 Improvement process overview

Council is adopting a strategic management approach to improvement planning, continually developing zone management plans (ZMPs), and implementing improvement processes and practices. The improvement plan is integral to this approach, quantifying current business practice and measuring progress toward an identified future position.

The purpose of an improvement plan is to identify and develop implementation of ZMP processes. This includes:

- The cycle of ZMP monitoring, review, revision and audit to improve the effectiveness of ZMP outputs and compliance with audit criteria, legislative requirements and best appropriate practice.
- The definition of service standards reflecting community outcomes through public consultation. The ZMP is used to identify service level options and costs, and the delivery of services is a key objective of zone management planning.
- Identify and prioritise ways to cost-effectively improve the quality of the ZMP, and therefore decision making and service delivery.
- Identify indicative time-scales, priorities, human and financial resources required to achieve zone management planning objectives.

The development of this ZMP is based on existing levels of service, the best available current information and the knowledge of Council staff. It is intended that the development of this plan is part of an on-going process and that the document will be reviewed and updated regularly. This review process involves using improved knowledge of customer expectations (community consultation) and information from Asset Management Systems and databases. This will enable Council to optimise decision-making, review outputs, develop strategies, improve risk management and extend the planning horizon.

10.2 Improvement plan

The improvement plan has eight improvement areas, that collectively cover all of the improvement actions required:

1. Monitoring and review
2. Lifecycle management strategies
3. Partners and stakeholders
4. Asset information
5. Levels of service
6. Risk management
7. Financial management
8. Improvement planning.

The eight improvement areas cover improvement actions required to meet the OAG criteria for asset management, and pick up recommendations from the October 2010 Audit New Zealand review of the draft Lower Waikato Zone Plan. The improvement areas also cover any actions identified within the text of this plan that are not otherwise captured.

The following table is based on the draft Waipa zone improvement plan, which is currently in development, and shows a brief schedule of improvement actions for the next three years. Further detail on the improvement actions is provided within Appendix 7.

It is noted that completion and approval of an improvement plan is one of the highest priority actions within the following table.

It is also noted that many of the improvement actions relate to areas that are common across river and catchment management zones – such as asset information. Where cross-zone actions are identified, these will be combined with the improvement actions of other zones.

Table 42 Summary of improvement plan actions 2012/13 – 2014/15

Timing	Improvement area	Action	Responsible	Rationale
11/12 FY on-going	Asset Info.	Improve asset data completeness, condition and performance	**Asset Mgr.** Zone Mgr.	OAG core*
12/13 FY (by Sept 12)	Mon/review; Lifecycle. mgmt.; Risk mgmt.; Fin mgmt.	Scope priority actions and dependencies – confirm detailed actions required for four improvement areas identified, and dependencies upon each other	**Zone Mgr.** Asset Mgr. Fin Mgr. Div. Mgr.	Improvement Plan to be realistic & achievable
12/13 FY	Mon./review	Develop and implement monitoring and reporting programme	**Zone Mgr.**	OAG core ANZ rec**
12/13 FY	Risk mgmt.	Identification and risk management strategies for critical assets	**Zone Mgr.**	Helps to define priorities
12/13 FY	Fin. mgmt.	Define gaps and develop plan to address	**Zone Mgr.** Fin Mgr.	OAG core
12/13 FY	Improvement planning	Fully develop improvement plan and seek endorsement from senior management and Council	**Zone Mgr.**	OAG core
12/13 FY on-going	Mon./review	Complete annual ZP revisions	**Zone Mgr.**	OAG core
12/13 FY	Levels of service	Develop measurement and reporting arrangements	**Zone Mgr.**	OAG advanced
13/14 FY	Partners & stakeholders	Develop and implement communications strategy	**Zone Mgr.**	-
13/14 FY	Lifecycle mgmt.	Develop optimised decision-making process	**Zone Mgr.**	OAG core ANZ rec
13/14 FY	Fin. mgmt.	Implement financial improvement plan	**Zone Mgr.** Fin Mgr.	OAG core
13/14 FY	Improvement planning	Implement improvement plan	**Zone Mgr.**	OAG core
13/14 FY	Lifecycle mgmt.	Develop demand strategy/plan	**Zone Mgr.** Div. Mgr.	OAG core ANZ rec
13/14 FY/ on-going	Risk mgmt.	Develop and implement risk management plan	**Zone Mgr.**	ANZ rec
14/15 FY	Mon./review	Three-yearly review	**Zone Mgr.**	OAG core ANZ rec
14/15 FY	Asset Info.	Develop confidence measures for expenditure forecasts	**Zone Mgr.**	OAG core
14/15 FY	Lifecycle mgmt.	Implement demand strategy/plan	**Zone Mgr.** Div. Mgr.	OAG core ANZ rec

* Action will help achieve Office of the Auditor General (OAG) Core criteria
** Action helps to address Audit New Zealand (ANZ) October 2010 high priority recommendations

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Glossary of terms

Annual Plan (AP)	The Annual Plan provides a statement of the direction of Council and ensures consistency and coordination in both making policies and decisions concerning the use of Council resources. It is a reference document for monitoring and measuring performance for the community as well as the Council itself.
Aggradation	The accumulation of sediment in rivers and waterways due to sediment supply exceeding the waterways ability to transport sediment.
Asset Management (AM)	The combination of management, financial, economic, engineering and other practices applied to physical assets with the objective of providing the required level of service in the most cost effective manner.
Asset Management System (AMS)	A system (usually computerised) for collecting, analysing and reporting data on the utilisation, performance, lifecycle management and funding of existing assets.
Asset register	A record of asset information considered worthy of separate identification including inventory, historical, financial, condition, construction, technical and financial information about each.
Asset renewal	Major work, which restores an existing asset to its original capacity or the required condition (stopbank top-up etc)
Auditor General	The Auditor General of the New Zealand Audit Office.
Benefit cost ratio (BCR)	A ratio which compares the benefits accruing to customers and the wider community from constructing a project with at projects costs.
Capital expenditure (CAPEX)	Expenditure used to create new assets or to increase the capacity of existing assets beyond their original design capacity or service potential. CAPEX increases the value of an asset.
Climate change	A long term significant change in the average weather.
Community outcomes	Outcomes developed with the community, which outline the community's vision.
Components	Specific parts of an asset having independent physical or functional identity and having specific attributes such as different life expectancy, maintenance regimes, risk or criticality.
Condition monitoring	Continuous or periodic inspection, assessment, measurement and interpretation of resulting data, to indicate the condition of a specific component so as to determine the need for some preventative or remedial action
Condition rating survey	Survey carried out to assess the condition of assets.
Critical assets	Assets for which the financial, business or service level consequences of failure are sufficiently severe to justify proactive inspection and rehabilitation. Critical assets have a lower threshold for action than non critical assets.
Current replacement cost	The cost of replacing the service potential of an existing asset, by reference to some measure of capacity, with an appropriate modern equivalent asset.
Deferred maintenance	The shortfall in rehabilitation work required to maintain the service potential of an asset.
Depreciated replacement cost (DRC)	The replacement cost of an asset spread over the expected lifetime of the asset.
Depreciation	The wearing out, consumption or other loss of value of an asset whether arising from use, passing of time or obsolescence through technological and market changes. It is accounted for the by historical cost (or re-valued amount) of the asset less its residual value over its useful life.
Disposal	Activities necessary to dispose of decommissioned assets.

Edge protection	Rockwork or planting to help maintain the integrity of stop banks or other flood defences structures.
Emergency work	The restoration work required to restore an asset damaged by a sudden and unexpected event (eg storm event) to its previous condition.
Esplanade reserve	Statutory mechanisms to protect riparian and coastal margins
Geographic Information System (GIS)	Software which provides a means of spatially viewing, searching, manipulating, and analysing an electronic database.
Life cycle management	A process of managing an asset from initial construction through to disposal.
Long Term Plan (LTP)	Council's 10-year programme setting out the community outcomes sought, key activities, levels of service, performance measures and funding.
Mana whakahaere	Autonomy
Mana whenua	Customary authority exercised by an iwi or hapu in an identified area
Net Present Value (NPV)	The value of an asset to the organisation, derived from the continued use and subsequent disposal in present monetary values. It is the new amount of discounted total cash inflows arising from the continued use and subsequent disposal of the asset after deducting the value of the discounted total cast outflows.
Non-structural measures	Flood mitigation measures to separate the community from floodwaters.
Optimised renewal decision making (ODM)	An optimisation process for considering and prioritising all options to rectify performance failures of assets. The process encompasses NPV analysis and risk assessment.
Reach	A defined section of a river, used for management purposes
Remaining useful life (RUL)	Remaining Useful Life of an asset or asset component. (Generally Useful or Effective life less age).
Stakeholder	A person or organisation who has a legitimate interest in an activity e.g. community, Iwi, etc.
Stopbank	An embankment adjacent to a river or watercourse, which retains floodwaters from flowing onto a floodplain.
Structural measures	Structures or physical works constructed to keep floodwaters away from existing development e.g. stopbanks.
Sustainability	The process of meeting the needs of the present community without compromising the ability of future generations to meet their own needs.

Acronyms

AEE	Assessment of environmental effects
AM	Asset management
AMIS	Asset management information system
AMP	Asset management plan
AP	Annual Plan
ARI	Average recurrence interval
AS/NZS	Australia and New Zealand Standards
BAP	Best appropriate practice
BRE	Business risk exposure
CDEM	Civil Defence Emergency Management
CE	Chief Executive
DOC	Department of Conservation
WRC	Waikato Regional Council
GIS	Geographic Information System
GRC	Gross replacement cost
H&S	Health and safety
IIMM	International Infrastructure Management Manual
IMP	Iwi Management Plan
IPCC	Intergovernmental Panel on Climate Change
IT	Information technology
KPI	Key performance indicator
LCM	Life cycle management
LGA 2002	Local Government Act 2002
LIA	Land Improvement Agreement
LoS	Levels of Service
LTP	Long Term Plan
LWWCS	Lower Waikato Waipa Catchment Scheme
MFE	Ministry for the Environment
MFish	Ministry of Fisheries
NAMS	National Asset Management Steering (Group)
NIWA	National Institute of Water and Atmospheric Research
NPV	Net present value
NZIAS16	New Zealand International Accounting Standard
NZTA	New Zealand Transport Agency
OAG	Office of the Auditor General
ODM	Optimised decision making
ORC	Optimised replacement cost
ODRC	Optimised depreciated replacement cost
ORDM	Optimised renewal decision making
O&M	Operations and maintenance
QA	Quality assurance
RAMSAR	Ramsar Convention
RCS	River & Catchment Services Group
RIG	Resource Information Group
RMA	Resource Management Act 1991
RPS	Regional Policy Statement
RUG	Resource Use Group
RUL	Remaining useful life
SLA	Service Level Agreements
SNZ HB	Standards New Zealand Handbook (Risk)
TRW	Tai-ranga Whenua (WRC's Iwi Liaison Unit)
WRP	Waikato Regional Plan
WVA	Waikato Valley Authority
ZMP	Zone Management Plan

Appendices

Appendix 1 Project Watershed Funding Policy excerpts – Waipa Zone

Note: the full Project Watershed funding policy[44] is available at:
http://www.waikatoregion.govt.nz/PageFiles/2919/finalfundingpolicy.pdf

Funding policies by zone and activity (pp. 96-97)

Waipa Zone

- **Soil conservation works**
  From the general rate on a capital value basis; a benefit works and services differential over the greater Waikato catchment on a capital value basis; a benefit works and services differential over the Waipa Management Zone on a capital value basis; direct charges on landowners and a contributor works and services differential over the greater Waikato catchment on a land value basis; in the proportions shown.

- **River management**
  From the general rate on a capital value basis; a benefit works and services differential over the greater Waikato catchment on a capital value basis; a benefit works and services differential over the Waipa Management Zone on a capital value basis and a contributor works and services differential over the greater Waikato catchment on a land value basis; in the proportions shown.

- **River improvements (excluding Tunawaea to Toa Bridge)**
  From the general rate on a capital value basis; a benefit works and services differential over the greater Waikato catchment on a capital value basis; a benefit works and services differential over the Waipa Management Zone on a capital value basis; a charge on landowners and a contributor works and services differential over the greater Waikato catchment on a land value basis; in the proportions shown.

- **Tunawaea landslide and river improvement to Toa Bridge**
  From the general rate on a capital value basis; a benefit works and services differential over the greater Waikato catchment on a capital value basis; a benefit works and services differential over the Waipa Management Zone on a capital value basis; a charge on landowners and a contributor works and services differential over the greater Waikato catchment on a land value basis; in the proportions shown.

- **Flood protection**; net of lease rentals
  From the general rate on a capital value basis; a benefit works and services differential over the greater Waikato catchment on a capital value basis; a benefit works and services differential over the Waipa Management Zone on a capital value basis; a charge on the Otorohanga district for the river management and flood protection direct benefit allocation (to be replaced by a uniform targeted rate from 1 July 2003) and a contributor works and services differential over the greater Waikato catchment on a land value basis; in the proportions shown.

- **Flood protection (Mangapu investigations)**
  From the general rate on a capital value basis; a benefit works and services differential over the greater Waikato catchment on a capital value basis; a benefit works and services differential over the Waipa Management Zone on a capital value basis and a contributor works and services differential over the greater Waikato catchment on a land value basis; in the proportions shown.

- **Catchment oversight**
  From the general rate on a capital value basis; a benefit works and services differential over the greater Waikato catchment on a capital value basis; a benefit works and services differential over the Waipa Management Zone on a capital value basis and a contributor works and services differential over the greater Waikato catchment on a land value basis; in the proportions shown.

[44] Environment Waikato (2002): "*Waikato River Catchment Services "Project Watershed" Level of Service & Funding Policy*". Hamilton.

Beneficiaries and Contributors – Waipa Zone (p 92)

	Beneficiary percent							Contributor percent			
	Regional	Catchment	Zone	Landowner	Hydro	Utility	River Management & Flood Protection (Direct Benefit)	Hydro	Urban/Industrial/ Roading	Sand Mining	Pastoral
Waipa											
Soil Conservation Scheme (Direct)	7.5	12	9.5	65					3		3
Soil Conservation Waitomo Caves Scheme (Direct)	13	13	13	55					3		3
Soil Conservation Scheme (Indirect)	75	5	14						3		3
Soil Conservation Farm Plan (Direct)	7.5	12	9.5	65					3		3
Soil Conservation Farm Plan (Indirect)	75	5	14						3		3
River Management	5	15	60						4		16
River Improvements (excluding Tunawaea to Toa Bridge)	5	14	37	24					4		16
Flood Protection	16	11	15				40		3		15
Tunawaea Landslide and River Improvement to Toa Bridge	22	24	32	7					3		12
Flood Protection (Mangapu investigations)	16	11	55						3		15
Catchment Oversight	26	28	28						4		14

Appendix 2 Legislative & policy requirements

Appendix 2aLGA 2002 Schedule 10 requirements

LGA 2002 Schedule 10 requirement	LGA 2002 references	Section covered
Identify the rationale for delivery of the group of activities (including the community outcomes to which the group of activities primarily contributes)	LGA 2002 Schedule 10 – 2 (1) (b)	Overview document Sec 3.3.2.2
Outline any significant negative effects that any activity within the group of activities may have on social, economic, environmental or cultural well-being of the local community	LGA 2002 Schedule 10 – 2 (1) (c)	Zone plan Appendix 2a
Identify the assets or groups of assets required by the group of activities and identify, in relation to those assets or groups of assets,---	LGA 2002 Schedule 10 – 2 (1) (d)	Zone plan section 6
How the local authority will assess and manage the asset management implications of changes to demand for, or consumption of, relevant services;	LGA 2002 Schedule 10 – 2 (1) (d) (i) (A)	Zone plan sections 6 & 7
How the local authority will assess and manage the asset management implications of changes to service provision levels and standards	LGA 2002 Schedule 10 – 2 (1) (d) (i) (B)	Zone plan sections 7 - 9
What additional asset capacity is estimated to be required in respect of changes to each of the matters described in subparagraph (i):	LGA 2002 Schedule 10 – 2 (1) (d) (ii)	Zone plan section 9
What additional asset capacity is estimated to be required in respect of changes to each of the matters described in subparagraph (i):	LGA 2002 Schedule 10 – 2 (1) (d) (ii)	Zone plan section 9
How the provision of additional asset capacity will be undertaken:	LGA 2002 Schedule 10 – 2 (1) (d) (iii)	Zone plan section 9
The estimated costs of the provision of additional asset capacity identified under subparagraph (ii), and the division of those costs between each of the matters in respect of which additional capacity is required:	LGA 2002 Schedule 10 – 2 (1) (d) (iv)	Zone plan section 9
How the costs of the provision of additional asset capacity will be met:	LGA 2002 Schedule 10 – 2 (1) (d) (v)	Zone plan section 9
How the maintenance, renewal, and replacement of assets will be undertaken:	LGA 2002 Schedule 10 – 2 (1) (d) (vi)	Zone plan section 9
How the costs of maintenance, renewal, and replacement of assets will be met:	LGA 2002 Schedule 10 – 2 (1) (d) (vii)	Zone plan section 9
A statement of the intended levels of service provision for the group of activities, including the performance of targets and other measures by which actual levels of service provision may meaningfully be assessed: and (i) in detail in relation to each of the first three (1-3) financial years covered by the plan; and (ii) in outline in relation to each of the subsequent financial years covered by the plan (4-10).	LGA 2002 Schedule 10 – 2 (2) (a) and 2 (1) (e)	Zone plan section 7
The estimated expenses of achieving and maintaining the identified levels of service provision, including the estimated expenses associated with maintaining the service capacity and integrity of assets: and (i) in detail in relation to each of the first three (1-3) financial years covered by the plan; and (ii) in outline in relation to each of the subsequent financial years covered by the plan (4-10).	LGA 2002 Schedule 10 – 2 (2) (b) and 2 (1) (e)	Zone plan section 9
A statement of how the expenses are to be met; and (i) in detail in relation to each of the first three (1-3) financial years covered by the plan; and (ii) in outline in relation to each of the subsequent financial years covered by the plan (4-10)..	LGA 2002 Schedule 10 – 2 (2) (c) and 2 (1) (e)	Zone plan section 9

LGA 2002 Schedule 10 requirement	LGA 2002 references	Section covered
A statement of the estimated revenue levels, the other sources of funds, and the rationale for their selection in terms of section 101 (3). And (i) in detail in relation to each of the first three (1-3) financial years covered by the plan; and (ii) in outline in relation to each of the subsequent financial years covered by the plan (4-10).	LGA 2002 Schedule 10 – 2 (2) (d) and 2 (1) (e)	Zone plan section 9

Significant negative effects of this activity

Schedule 10 of the Local Government Act covers the information required to be included in the LTP. Part 2 (1) (c) states that a LTP must, in relation to each group of activities of the local authority:

> *(c) Outline any significant negative effects that any activity within the group of activities may have on the social, economic, environmental, or cultural well being of the local community*

This sub-section provides information in accordance with this legislative requirement. The purpose of identifying significant negative effects is to ensure that Council activities are conducted in accordance with the principles of sustainability. RCS activities have the potential to have negative effects on community well being. The possible negative effects are outlined in the table below.

Significant negative effect	Cultural	Social	Economic	Environmental	Mitigation of negative effects	Addressed in…
Some in-stream works may have minor negative effects on water quality and ecological values				✓	Compliance with consent conditions Compliance with Council's Engineering Code of Practice and Guidelines.	Zone plan section 4 Legislative and policy requirements and Appendices 1c and 1d
Increasing rates to fund works may create economic pressures for communities			✓		Consult with community on all costs and options for Levels of service through the LTP process	Overview document section 6 Consultation and engagement Zone Plan section 7 Levels of service
Aesthetic values may be impacted, for example losing river views because of stopbanks		✓			Consult with community on all costs and options for Levels of service through the LTP process	Overview document section 6 Consultation and engagement
Removal / relocation of properties in high hazard risk areas may effect individuals and communities		✓			Consult with community on all costs and options for Levels of service through the LTP process	Overview document section 6 Consultation and engagement
Previous identified sites containing taonga (artefacts) or koiwi (bones) may be disturbed in the process of works	✓				Consult with iwi regarding sites of significance during the works planning process	Overview document section 6 Consultation and engagement Overview document section 7 Relationships with iwi Zone plan section4 4 Managing the zone and 5 Relationships with iwi

Significant negative effect	Cultural	Social	Economic	Environmental	Mitigation of negative effects	Addressed in…
Inadequacy of existing assets to cope with large rainfall events causing flooding, which could result in social and economic hardship.		✓	✓	✓	Compliance with consent conditions Compliance with Council's Engineering Code of Practice and Guidelines.	Overview document section 5 Legislative and policy requirements Zone plan section 4 Managing the zone Zone plan section 8 Risks Zone plan Appendices 1c and 1d
Health and safety risks associated with the operation, maintenance, or construction of infrastructure		✓	✓		Ensure compliance with legislation and Health & Safety Management Plans. Maintain an Incidents Register.	Zone plan section 8 Risks
Potential impacts on customer satisfaction due to service failure /delays /responsiveness		✓	✓		Monitor and report on Levels of Service and in Service provider contracts. Seek to resolve customer complaints "close the loop"	Zone plan section 7 Levels of service Zone plan section 10 Improvement Plan
Access to waterways		✓	✓		Monitor requirements for access and liaise with the community as appropriate	Zone plan section 7 Levels of service
Disruption to wildlife				✓	Programme works to minimise wildlife disruption avoiding fish spawning and bird nesting seasons	Zone plan section 4 Managing the zone Zone plan Appendices 1c and 1d
Gravel and/or sand extraction			✓	✓	Cross-section monitoring process	Zone plan section 4 Managing the zone Zone plan Appendices 1c and 1d

The significant negative effects identified above can be managed and/or mitigated by effective risk management, options assessments, asset management and operational procedures.

Appendix 2b Office of the Auditor General Criteria for core and advanced asset management

Key AMP criteria	Key points for achieving "Core" criteria	Key points for achieving "Advanced" Criteria	Covered In ZMP section	In Development	Basic	Intermediate	Advanced	Comments
Levels of service	Asset Management (AM) Planning should define the level of service or performance required of the asset, linked to the strategic/community outcomes of the organisation. The significant services (for which service levels should be subject to consultation and agreement) should be stated.	Community outcomes linked to LoS and customer and technical performance measures	Section 7 Levels of service		✓			Customer charter yet to be prepared
		Evaluating LoS Options & Costs	Section 7 Levels of service	✓				
		For each of those significant services; Undertaking consultation with the community and other relevant stakeholders, using consultation processes which meet industry recognised standards.	Section 4 managing the zone			✓		
		Adoption by the Council or governing body of the levels of service and standards after consultation has taken place.	Section 7 Levels of service		✓			
		Public communications of the levels of service and standards in a 'Customer Charter' or equivalent public document.	Section 7 Levels of service	✓				
		Regular monitoring and public reporting of the organisations adherence to agreed levels of services and standards.	Section 4 managing the zone		✓			
		Ensuring the AM plans of each significant service reflect and are based on the agreed levels of service, including technical performance	Section 7 Levels of service		✓			

Key AMP criteria	Key points for achieving "Core" criteria	Key points for achieving "Advanced" Criteria	Covered In ZMP section	In Development	Basic	Intermediate	Advanced	Comments
		targets and measures which underpin the customer-agreed levels of service and standards.						
Description of assets	An adequate description of the asset, both physically and in financial terms, with the ability to aggregate and disaggregate information. State the remaining useful lives of assets. A financial description of the assets that is linked to the physical description and meets the requirements of: Financial Reporting Standards Valuation Standards augmented by the NZ Depreciation and Valuation Guidelines A financial description of the assets that is linked to the physical description and meets the requirements of NZIAS 16. Augmented by the NZ Depreciation and Valuation Guidelines	A reliable physical inventory of assets at both an individual asset level and at a network level. This would include: Physical attributes such as location, material, age etc. Systematic monitoring and analysis of physical condition. Systematic measurement of asset performance (including utilisation / capacity).	Section 6 Zone assets		✓			
Financial forecasts / recognise depreciation (Loss of service potential)	AM Planning should translate the physical aspects of planned maintenance, renewal and new work into financial terms for at least the ensuing 10 years and in a manner that is fair, consistent and transparent. The forecasts should include sufficient information to enable decline in service potential (depreciation) of an asset to be measured. Guidance on depreciation is	AM Planning should translate the physical aspects of planned operational, maintenance, renewal and new works into financial terms. Generally over the timeframe in which the asset network must deliver services. In more specific terms, over the period for which the organisation has a strategic plan.	Section 9 Financial management		✓			

Key AMP criteria	Key points for achieving "Core" criteria	Key points for achieving "Advanced" Criteria	Covered In ZMP section	In Development	Basic	Intermediate	Advanced	Comments
	included in the NZ Valuation and Depreciation Guidelines.	The assumptions underpinning financial forecasts should be disclosed in the organisations strategic plans and AM plans. The compilation of financial forecasts should be consistent, reliable and provable.						
Planning assumptions & confidence levels	AM planning should: List all assumptions and provisos under which the plan and financial forecasts are prepared. Indicate the degree of confidence of the reliability of data underpinning the AM Plan, particularly: Data on asset condition Data on asset performance Accuracy of asset inventory Demand/growth forecasts On the basis of the preceding assumptions and confidence of underlying data, provide a level of precision or confidence on the expenditure forecasts for the asset network	As for 'core' plus: List all the assumptions and provisos in the AM Plans, and note key assumptions regarding AM Planning in the organisations strategic plans. Have degrees of confidence on the reliability of data as follows: Inventory data Grade 1 (critical assets) Grade 2 (non critical assets)	Section 6 Zone assets Section 6 Zone assets	 ✓	✓			Further work needed
		Condition data Grade 1 or 2 (critical assets) Grade 1, 2 or 3 (non critical assets) Performance data Grade 1 or 2 (critical assets) Grade 1, 2 or 3 (non critical assets)						
Outline improvement programmes	AM Planning should state what needs to be done to improve AM processes and techniques Improvement programmes should outline: The weak areas and how these will be	As for 'core' plus: Improvement programmes should outline key performance indicators (KPIs) for monitoring AM improvement.	Section 10 Improvement plan	✓				

Key AMP criteria	Key points for achieving "Core" criteria	Key points for achieving "Advanced" Criteria	Covered In ZMP section	In Development	Basic	Intermediate	Advanced	Comments
	addressed The timeframe over which the improvements will occur and The resources (human and financial) needed	The improvement plan should comment generally on achievements against the previous plan, and formally report against KPIs. As for 'core' AM Plan criteria.						
Planning by qualified persons	AM Planning must be undertaken by a suitably qualified person. A suitable qualification would be a Level 6 (Tactical) or Level 7 (Strategic) National Diploma in Asset Management or equivalent skill level. If plans are prepared by persons not suitably qualified, the plans should be independently assessed by a qualified person. The planning process should be peer reviewed.	As for 'core' AM Plan criteria. As for 'core' AM Plan criteria. As for 'core' AM Plan criteria.	Section 6 Zone assets Section 10 Improvement plan	✓	✓			
Commitment	The Asset AM Plan must be approved and adopted by the governing body, Board or Council. This includes approval of the improvement element of the plan. AM Plans must be seen as the key planning tool for infrastructure assets and/or significant physical assets which provide the inputs for Council's strategic plans (LTP).	As for 'core' AM Plan criteria. As for 'core' plus: The organisation must demonstrate that AM plan requirements are being implemented through operational plans and formally report discrepancies	Section 4.6.5 ZMP Review and Monitoring		✓			
Updating	AM plans must be regularly updated to reflect the most current future plans for	AM Planning is seen as a constantly evolving process, with underpinning	Section 4.6.5 ZMP Review		✓			

Key AMP criteria	Key points for achieving "Core" criteria	Key points for achieving "Advanced" Criteria	Covered In ZMP section	In Development	Basic	Intermediate	Advanced	Comments
	the assets (it is expected that 'core' AM planning will be significantly revised in the light of action under improvement programme. In the first few years annual revisions of AM plans are likely).	AM systems constantly providing better information. It is expected that formal asset management plans and overarching asset management strategies will be formally revised every three years, with the timing of revisions linked to the organisation's strategic planning cycles.	and Monitoring					
Risk management	Risk management to identify critical assets and associated risks and risk management strategies.	Management of assets must include recognition and application of the principles of integrated risk management. Specifically; Risk management should be consistent with AS/NZS4360, and industry good practice such as the NZ Local Government Handbook for risk management. Risk management for assets should be integrated with other corporate risk management processes. Asset risk management should encompass: Identification and risk management strategies for critical assets The link to maintenance and replacement strategies. Engineering lifelines based risk assessments and mitigation plans including reference to the organisations disaster recovery and	Section 8 Risk management		✓			

Key AMP criteria	Key points for achieving "Core" criteria	Key points for achieving "Advanced" Criteria	Covered In ZMP section	In Development	Basic	Intermediate	Advanced	Comments
		business continuity plans						
Lifecycle (Optimised) decision-Making	Identify gaps between current service capability and the required service capability to meet future demand and target service levels and reflect these gaps in an asset development programme. Evaluation and ranking based on suitable criteria of options for significant capital investment decisions.	The ability to predict robust and defensible options for asset treatments that can assist in achieving optimal costs over the life cycle of the asset or network including: Applying appropriate economic evaluation tools (or other organisation endorsed prioritisation systems) in developing short term project lists. Using predictive modelling techniques to provide defensible long term financial forecasts.	Section 9 Financial management Section 4.6 Business processes	✓				
Managing growth	Demand forecasts for each network or facility for a 10 year period are based on latest growth forecasts. Demand management strategies and demand drivers are understood and documented	Demand forecasts include analysis of the different factors that comprise demand. The sensitivity of asset development (capital works) programmes to demand changes is understood.	Section 9 Financial management	✓				

Appendix 2cWaipa zone consents

Consent No	Location	Description	Expiry date
104660	Lake Mangahia	Construct a weir in the outlet drain from Lake Mangahia to maintain minimum summer lake levels	31/03/2036
108980	Tunawaea slip to Toa Bridge	To place structures in the bed of the Upper Waipa River between Tunawaea Slip and Toa Bridge in association with erosion control and river improvement works	30/07/2014
111051	Pirongia to Toa Bridge	Construct erosion control structures and channel training structures in the bed of the Waipa River between Pirongia & Toa Bridge, Otewa for erosion protection purposes	30/04/2015
111052	Pirongia to Toa Bridge	To undertake gravel disturbance operations in the bed of the Waipa River, and the associated diversion of water, between Pirongia & Toa Bridge Otewa for river stabilisation purposes	30/04/2015
118380	Lake Serpentine (Rotopiko)	Construct, use and maintain a weir structure in the bed of Lake Serpentine (Rotopiko) outlet drain and dam water, for lake and wetland level control purposes	2/02/2044
111983	Mangatutu Stream	Undertake disturbance and gravel extraction from the bed of the Mangatutu Stream, along with the associated diversion of water, for stream stabilisation purposes	31/05/2015
111982	Mangatutu Stream	Construct erosion control and channel training structures in the bed and banks of the Mangatutu Stream for stream stabilisation purposes	31/05/2015
120860	Lake Rotokauri	To use and maintain a weir in the bed of the Ohote Stream and associated impoundment of water for Lake Rotokauri control purposes	31/01/2045
108979	Tunawaea slip to Toa Bridge	Undertake works in the bed of the Upper Waipa River between Tunawaea Slip & Toa Bridge in association with erosion control & river improvement works	30/07/2014
3 Zones Comprehensive Consents (Central, Waipa & Lower Waikato Zones)			
119807	Waipa Zone	Construct training lines & groynes up to 200m in length per kilometre of river bank, and associated bed disturbance & sediment discharge during the construction works.	6/11/2039
119808	Waipa Zone	Construct erosion control structures up to 200m in length per kilometre of river bank, and associated bed disturbance & sediment discharge during the construction works.	6/11/2039

Appendix 2d Standards and guidelines

Standard or guideline	Description/use
International Infrastructure Management Manual (NAMS, 2006a)	General asset management
Environment Waikato: Stopbank Management Guidelines. (Environment Waikato, 1995)	Generic management of stopbanks
Environment Waikato: Floodgate Management Guidelines. (Environment Waikato, 1997a)	Generic management of floodgates
Environment Waikato: Pump Station Management Guidelines. (Environment Waikato, 1997b)	Generic management of pump stations
Environment Waikato: Environmental Guidelines. (Environment Waikato, 2003)	Guidelines for undertaking asset management activities to avoid/minimise environmental effects.
Environment Waikato: Infrastructure Assets Accounting Policies / Guidelines. (Environment Waikato, 2008a)	Policies/guidelines for accounting for infrastructure assets within Environment Waikato
Environment Waikato: Infrastructure Assets Disaster Damage and Risk Management Policy (Environment Waikato 2004)	Risk financing for disaster damage to schemes
NZS 3910, Conditions of Contract for Building and Civil Engineering Construction NZS 3915, Conditions of Contract for Building and Civil Engineering Construction (where no person is appointed to act as engineer to the contract)	Standard conditions of contract for construction/maintenance work
AU/NZS 4360. Australian/New Zealand Standard for Risk Management.	Risk management framework.
Vegetation Management and Instream Works (Environment Waikato, 2007)	Best practice guidelines
Waterway Crossings (Environment Waikato, 2006)	Best practice guidelines
Land Drainage (Environment Waikato, 2006)	Best practice guidelines
Oil Spill Contingency Guidelines (Environment Waikato, 2006)	Operational guidelines
Erosion and Sediment Control Guidelines for Soil Disturbing Activities (Environment Waikato, 2002)	Operational guidelines
Environment Waikato Freshwater Fish Calendar (Environment Waikato, 2007)	Operational guidelines
Consent Requirements for Vegetation Removal (Environment Waikato, 2006)	Operational guidelines
National Policy Statement for Flood Risk Management (proposed)	National standard
Managing Flood Risk – A process Standard, NZS9401: 2008	National standard
River Flood Risk Management Strategy 2009	Environment Waikato regional strategy

Appendix 3 Business process

Appendix 3a Business functionality supported by Conquest II

Product/module	Business function	Comment	EW status
Conquest II Asset register	Records information about the nature (type, material, dimensions, quantity and age) of assets Records information about the location of assets. Records information about the design capacity of assets and the areas serviced by assets. Fully customisable type hierarchy and user defined attributes	Data not regularly updated unless errors are found.	Fully Implemented
Conquest II Valuation	Records ODRC, and ORC information. Estimated remaining lives and expected expiry date Depreciation tracking	Valuations updated every 3 years. Valuation history is retained.	Fully Implemented
Conquest II Inspections and performance	Records annual inspection and condition information. Performance grade	Condition information updated annually Inspection history is retained	Fully Implemented
Conquest II Requests	Customer requests recorded Actions can be loaded and programmed Provides audit trail of response times and actions.		Partially implemented
Conquest II Maintenance Management	Planned maintenance (standard actions/ actions) Unplanned maintenance ((standard actions/ actions) Standard procedures Works completion sign off Forward planning		Partially implemented
Conquest II Risk Management	Condition Performance Consequence of failure Probability of failure	Quantification of failure risk for prioritising maintenance works.	Not yet implemented

Appendix 3b Asset hierarchy

Level 1	Type code	Level 2	Type code	Level 3	Type code
Assets	04.02	Barge	04.02.20	Barge: steel	04.02.20.01
		Building	04.02.03	Building: aluminium clad	04.02.03.06
				Building: brick/timber framed	04.02.03.01
				Building: colour steel timber frame	04.02.03.05
				Building: concrete block	04.02.03.07
				Building: corrugated iron	04.02.03.03
				Building: kitset/concrete pad	04.02.03.02
		Channel	04.02.08	Channel: artificial	04.02.08.01
				Channel: natural	04.02.08.02
		Civil structure	04.02.07	Barrels	04.02.07.01
				Chambers	04.02.07.05
				Inlet/outlet structures	04.02.07.02
				Screens	04.02.07.03
				Stilling basin	04.02.07.06
				Sumps	04.02.07.04
				Bridge	04.02.18.02
				Culverts	04.02.18.03
				Ford crossing	04.02.18.01
				2008 valuation foundation asset	04.02.09.13
				Bunds	04.02.09.07
				Detention dam	04.02.09.02
				Floodwall	04.02.09.12
				Spillway	04.02.09.03
				Stopbank	04.02.09.04
				Debris dams	04.02.13.12
				Detention bunds	04.02.13.02
				Diversion banks	04.02.13.11
				Drop structures	04.02.13.03
				Flumes	04.02.13.10
				Gradient control structure	04.02.13.05
				Inlet channel protection works	04.02.13.14
				Outlet channel protection works	04.02.13.15
				Pipe drop structures	04.02.13.09
				Rip-rap	04.02.13.08
				Sediment dams	04.02.13.07
				Sinkholes	04.02.13.06
				Water supply	04.02.13.13
				Fence: conventional	04.02.05.01
				Fence: deer	04.02.05.03
				Fence: electric	04.02.05.04

Level 1	Type code	Level 2	Type code	Level 3	Type code
				Fence: sheep netting	04.02.05.02
				Floodgate: box	04.02.10.01
				Floodgate: conventional	04.02.10.02
				Floodgate: diaphragm	04.02.10.03
				Diesel generator	04.02.06.11
				Diesel storage tank and system	04.02.06.13
				Lifting gear	04.02.06.05
				Motors	04.02.06.07
				Pipework	04.02.06.03
				Power supplies	04.02.06.10
				Pumps	04.02.06.06
				Switchboard and controls	04.02.06.12
				Telemetry/scada	04.02.06.04
				Valves	04.02.06.08
				Exotic plantings	04.02.14.18
				Native plantings	04.02.14.19
				Pumpstation: Archimedes	04.02.11.04
				Pumpstation: gravity outlet	04.02.11.01
				Pumpstation: siphon flood	04.02.11.05
				Pumpstation: through bank	04.02.11.03
				Bank revetment	04.02.12.01
				Boat ramp	04.02.12.02
				Debris traps	04.02.12.06
				Fish pass	04.02.12.08
				Groynes	04.02.12.07
				Sediment ponds	04.02.12.03
				Training lines	04.02.12.05
				Weirs	04.02.12.04

Appendix 4 Otorohanga District Council (ODC) asset information

Table A – ODC-owned assets inventory and summary valuation/depreciation

Service type	Asset type	Qty	Unit	Optimised replacement value (ORC)	Optimised depreciated replacement value (ODRC)	Annual depreciation (AD)
ODC-owned assets						
River management and flood protection	Stopbanks	4,637	m	3,856,238	-	-
	Pump stations	3	ea	637,711	461,797	13,154
	Weir – river	1	ea	-	-	-

Table B: ODC-owned asset valuation details by asset type

Asset type	Optimised replacement cost (ORC)	Optimised depreciated replacement cost (ODRC)	Annual depreciation costs
Embankments			
Stopbanks	**3,856,238**	**-**	**-**
Structures			
Pumpstations			
Pumphouses	93,354	75,504	1,436
Pump chambers	133,360	100,533	2,052
Lift pumps	272,702	227,969	4,545
Electrical switch boards	82,288	28,838	3,089
Electrical supply	44,836	26,718	1,288
Telemetry	11,172	2,234	745
Subtotal	**637,711**	**461,797**	**13,154**
In-river structures			
Weirs			
Steel sheetpile	-	-	-
Subtotal	**-**	**-**	**-**
Total	**4,493,949**	**461,797**	**13,154**

ODC asset age

The table below shows a comparison between the average age of the asset groups and the remaining useful life (RUL) for the ODC asset groups. The following table indicates that some components of pumpstations, namely motors, power supplies and assets are, on average, operating beyond their estimated average useful lives, while other components such as sluice gates are nearing the end of their useful life. By contrast, in-river structures and stopbanks are nearing half their useful lives, but have considerable estimated lives remaining, considering their base lives.

Table C: ODC asset age – base life, average age and remaining useful life

Asset category	Asset type	Base life (yrs)	Average age (yrs)	Remaining useful life (yrs)
Embankments - stopbank	Clay foundation	100	49	51
Structures – pumpstations	Building: concrete block	60	49	11
	Inlet structure	80	49	31
	Motors	25	35	-10
	Outlet structure	80	49	31
	Power supplies	30	49	-19
	Pump: axial vertical shaft	25	35	-10
	Screen: grille	20	49	-29
	Sump: reinforced concrete	80	49	31
	Switchboard and controls	30	-	-
	Valve: sluice gate	50	49	1
In-river structures	Weir: steel sheetpile	100	46	54

ODC-owned asset condition and assessment results

The table below shows the average condition grade for ODC-owned assets. The steel sheetpile weir has the lowest condition grading of 4.0. It should be noted however that this asset represents a very small percentage of the overall replacement value of assets.

The average condition of the stopbanks is 2.0. 4,437m of stopbanks are graded at 2, while 200m are graded at 3, meaning the average is 2.0. The pump station buildings have the lowest average grade, while the power supplies and switchboard controls are in very good condition.

Table D: ODC-owned assets average condition grades

Asset category	Asset type	Average condition
Embankments - stopbank	Clay foundation	2.0
Structures – pumpstations	Building: concrete block	2.7
	Inlet structure	2.0
	Motors	2.4
	Outlet structure	2.0
	Power supplies	1.7
	Pump: axial vertical shaft	2.5
	Screen: grille	2.3
	Sump: reinforced concrete	2.0
	Switchboard and controls	1.7
	Valve: sluice gate	2.0
In-river structures	Weir: steel sheetpile	4.0

ODC-owned assets reliability, capacity and performance

Reliability (performance)
A small asset failure (namely in the stopbanks or pump stations) can lead to inundation of a large area of the flood plain, resulting in disproportionate damage when compared to the initial failure.

Preventative maintenance, regular inspection, monitoring and hydraulic modelling all contribute to ensuring service reliability standards are met.

Performance of stopbanks
The performance of an earth structure (stopbank and detention dam) is technically assessed on the basis of the crest level compared to the design crest level and the probability of failure of the structure. Probability of failure is based on the likelihood of failure of a stopbank in an earthquake event, which might occur in 250 years. This figure combines the structural details (geometry, type of soil or construction material, location and condition) and modes of failure.

The highest grade found from the above two criteria is used as the performance measure for a particular asset.

Crest levels of the stopbanks are surveyed every five to ten years, depending on the foundation material. Within the Waipa zone, the ten yearly cycle is used, since all the stopbanks are on clay foundations.

The table below shows the length of stopbanks below and above design flood level within the zone. The target levels of service, performance measures and reporting and measures and outlined within section 7.10.

Table E: Stopbank crest levels

Zone	Total stopbank length (m)	Length below design flood level (m)	Length above design flood level (m)
Waipa	4,637	498 (11%)	4,139 (89%)

The survey of stopbanks was undertaken in 2001 and 2002. Most of the length under design crest level is on the right bank below the Te Kanawa Street bridge.

The tables below show capacity and performance of stopbanks and pump stations. It should be noted that the tables are incomplete, and have been identified as an improvement action within the improvement plan.

Table F: ODC stopbank capacity and performance

Defence Name	Protected area (ha)	Stopbanks				
		Length (m)	Design information		Actual information	
			Design standard (AEP)	Design freeboard (m)	Performance grade	Average condition Grade
Otorohanga		4,637	1%			2.0

Table G: Pump stations capacity and performance

Pump stations									
Name	Design information						Actual information		
	Approx design AEP	Hill catch-ment (ha)	Flat catch-ment (ha)	Design hill runoff (mm)	Design flat runoff (mm)	Design capacity (m3/s)	Actual capacity (m3/s)	Approx actual ARI (yrs)	Average condition Grade
Huiputea									1.9
Otewa Road									2.3
Te Kawa St.									2.4

Appendix 5 Risk register

The risk registers provided in the following tables for the current and future River and Catchment Services activities of Environment Waikato and have been developed in consultation with key staff.

Appendix 5a General risks

Risk number	Risk descriptor	Risk type	Initial risk			Current practices/strategies		Residual risk			Risk owner (name and title)	Management options available
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor		
5.1	**Lack of staff resources** **Caused by:** Inability to attract key staff Inability to retain skilled staff Labour market Shortage of appropriately skilled staff Staff turnover Inadequate organisation structure / mix of skill levels **Consequences:** High cost of recruitment and training of new staff Increased staff stress Decreased productivity Limited skilled staff/ mainly unskilled staff appointed Decreased operational capacity Loss of knowledge Increased staff turnover Reduction in levels of service	Operational Financial Reputation / image Health and Safety	4	4	H	Dedicated HR staff, policies and guidelines Use of recruitment consultancies Monitor staff satisfaction, surveys Personal development plans Strategic planning (staff and organisation) Internal promotions/ career management Training & development processes Shared resourcing with other TLA's Secondment strategies with other organisations Study grants for staff Benchmarked salary levels / regular remuneration review Promoting positive work environment – social, team building Good office accommodation/layout	Very Good	2	3	M	Group Manager	Continue current practice Succession planning Cadetships Development training Mentorship programmes Group business plan including resource planning Targeted recruiting

Risk number	Risk descriptor	Risk type	Initial risk			Current practices/strategies		Residual risk			Risk owner (name and title)	Management options available
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor		
						Flexible working hours						
5.2	**Lack of Financial Resources** **Caused by:** Economic climate Political climate/cycle Operational tempo Inadequate forward planning **Consequences:** Inability to deliver aspects of a programme of work Not meeting stakeholder expectations Political Level of Service	Operational Financial Reputation / Image Health and Safety	3	4	H	Financial Planning (6 monthly review, monthly basis zone programme level) Prioritised schedule of work Financial reserves Credit facilities Monitoring and reporting of economic climate	Very Good	2	2	L	Group Manager	Continue current practice Continue to train staff on financial management Improve financial forecasting
5.3	**Inefficient use of resources** **Caused By**: Inadequate project, programme and portfolio management Lack of training or qualified staff Lack of project planning or systems Projects, programmes and activities inadequately scoped, budgeted, managed and documented, and reviewed Inadequate consultation Inefficient consent process due to stakeholder objections Unrealistic expectations Lack of resources Lack of ownership Inadequate systems and processes Inadequate business planning	Financial Operational Reputation / Image	4	4	H	Project Management training for key staff Reporting / monitoring processes Use of trained external resource Have access to internal specialists Appropriate resources (e.g. software/information systems) Dedicated Project / Programme management staff/team Development and implementation of business and zone plans	Very Good	3	2	M	Divisional Manager Zone Manager CFO	Ensure on-going adequate (quality) training for key staff Project Closure/Reviews improved Reporting / monitoring processes Improved Project Management (process and skills) Improved Financial Capability

Risk number	Risk descriptor	Risk type	Initial risk			Current practices/strategies		Residual risk			Risk owner (name and title)	Management options available
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor		
	Lack of an overall strategy or plan **Consequences:** Time & cost blowouts Lack of quality outcomes Loss of image Impact on staff morale Over/under spending of budgets Failure to deliver on commitments e.g. LTP Deferring of projects											
5.4	**Loss of Knowledge (information)** **Caused by:** Inability to retain knowledge Insufficient systems in place to manage data/information, especially regarding asset performance and condition Loss of institutional knowledge IT failure and systems performance Inadequate transfer of knowledge (knowledge management) Lack of continuity (political process) **Consequences:** Operational loss Financial costs Loss of institutional knowledge Loss of image and credibility Reduced Levels of Service Poor planning Breakdown in stakeholder relationships Breakdown in political relationships	Financial Operational Reputation / Image Political	4	4	H	Small number of assets in zone Assets recently identified, confirmed, updated and re-valued Information systems and knowledge management improving rapidly Asset changes/updates – Information currently updated in conquest IT practices (backup, virus, security etc)	Good	2	2	L	Divisional Manager Group Manager	Improve processes to ensure that asset knowledge is transferred, stored and accessible and audited (externally), including maintenance information. Define mentors/coaches and successors On-going training for staff Improve asset data collection processes, data management skills and resources On-going review and improvement of systems Implement quality assurance programme for asset and zone information

Risk number	Risk descriptor	Risk type	Initial risk			Current practices/strategies		Residual risk			Risk owner (name and title)	Management options available
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor		
5.5	**Failure to identify opportunities and developments – Best Practice and Technology advances** **Caused by:** Lack of staff awareness and training Insufficient resources to implement Lack of networking Lack of personal development Lack of research Lack of process to capture/ manage opportunities **Consequences:** Missed opportunity to gain efficiencies, reduce costs and maintain service levels Lack of increased knowledge Increased costs Lost productivity	Financial Operational Reputation / Image Political	3	3	M	Local government networking e.g. national forums, conferences Access experienced staff and contractors Staff development and training Use of external advice/resources Liaison with groups doing research Regular updates and attendance through NAMS Environment best practice development Exchange of information between regional council through working groups	Very Good	2	2	L	Group Manager	Continue and develop current practices Maintain awareness of current industry developments and research Liaison with groups doing research Monitoring international best practice and research Improving capability/process to evaluate and implement recognised opportunities Internally develop best practice
5.6	**Service Level Agreements not met or non-existent – between River and Catchment Services and other parties internal or external (including drainage)** **Caused by:** Lack of process Lack of monitoring of the SLA's Budget Political change Lack of expertise Lack of knowledge' Pressure of deadlines Lack of resource	Financial Operational Political Reputation / Image	4	4	H	Current SLA's in place Regular meetings with other Councils and agencies Monitoring and Reporting	Good	4	3	H	Zone Manager	Maintain and develop relationships with stakeholders Review if additional SLA's are required Improved monitoring and management of Service Level Agreements Need to develop and implement internal SLA's between zone and RCS programmes Develop and implement an external SLA with key

Risk number	Risk descriptor	Risk type	Initial risk			Current practices/strategies		Residual risk			Risk owner (name and title)	Management options available
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor		
	Consequences: Affects timing and quality of delivery of services Costs for work done on behalf of others not recovered Legal consequences Non-delivery of service Community expectations not met Loss of reputation											stakeholders as appropriate In some cases, need to clarify roles
5.7	**Inadequate Contract Management (Service/ Maintenance/ Capital)** **Caused by:** Inadequate documents Inadequate management of contractors Poor contractor selection/ monitoring Resourcing Competition Exit from industry Poor performance Economic environment Lack of funding Inadequate knowledge of skilled staff Lack of process e.g. contract templates Lack of corporate commitment to the formal processes Lack of skilled contractors **Consequences:** Poor Contractor performance Unnecessary or excessive costs Insufficient output or quality	Financial Operational Economic Reputation / Image Health and Safety Environment Legal	4	5	E	Good contract management skills in place Contract conditions and specifications clear Financial and Performance reporting Corporate and zone objectives Limited procurement procedures / manual Developing H&S monitoring/ auditing Project management and contract documentation training Internal contract performance review Audit of contract processes Staff financial delegation process and tender assessment process Centralised filing management system for contracts Probity process	Very Good	3	2	M	Divisional Manager Zone Manager Asset Manager	Further improvements to existing contract processes and procedures Improve contract management skills Improve procurement procedures / manual Contract management monitoring system Develop and implement improved H&S monitoring/ auditing Improve template specifications and contracts Develop and implement formal contract close out process

Risk number	Risk descriptor	Risk type	Initial risk			Current practices/strategies		Residual risk			Risk owner (name and title)	Management options available
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor		
	Loss of key contractors Negative Council Image and adverse media coverage Increased costs Legal liability Reduced Health and Safety Temporary loss of amenity Loss of operational capability Inefficient use of resources Injury to members of the public Loss of amenity value Loss of information (where contract terminated)											
5.8	**Inappropriate/inadequate Procurement** **Caused by:** Lack of adequate policy and processes Lack of competitors in the market place **Consequences:** Cost inefficiencies Failure to meet levels of service Continuity of supplier	Financial Operational Economic Reputation / Image Health and Safety Environment Legal	3	4	H	Procurement policy is in place Financial delegation levels in place Contract / Tender process including tenders board in place Probity process in place Financial Policy Annual audit	Very Good	3	2	M	Divisional Manager Zone Manager	Continue current practice Regular review Continue to develop and refine in line with best practice
5.9	**Inadequate Asset Management – not up to date, or insufficient quality of process and output.** **Caused by:** Lack of AM knowledge and practice Lack of staff knowledge and training Lack of resources Poor maintenance	Financial Operational Economic Reputation / Image Health and Safety Environment	5	5	E	Asset Management processes and practices Asset Management System (Conquest II) GIS - Geo Media is linked to Conquest II Developing zone management plans Limited non-ring fenced	Good	3	2	M	Divisional Manager Asset Manager	Progressive development of zone management plans incorporating Asset management Continuing Staff Development Reporting process for zone management performance

Risk number	Risk descriptor	Risk type	Initial risk			Current practices/strategies		Residual risk			Risk owner (name and title)	Management options available
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor		
	Inadequate data collection Poor data quality/ accuracy and reporting Inadequate assessment and performance monitoring **Consequences:** Deterioration of assets Reduced level of service and loss of operational capacity Inadequate accuracy of asset and planning data for renewals/replacements and valuations Negative Council image Increased costs, Financial implications Under-utilisation of system Low confidence in accuracy of asset register Cross-functional access to data is limited Inadequate application and uptake of available tools/ information Insufficient information for informed decision making Serious injury / Loss of life Political risk Stakeholder expectations Communities/Towns expectations	Legal				resource for Asset Management Condition surveys and assessments, revaluations, structural audits (internal and external) Separation of the asset management programme (formerly part of technical services)						measures Dedicated asset management staff On-going external audit and review (OAG) and process for post review action Establish Asset Management steering group
5.10	**Natural Hazards and resulting impact on zone assets** **Caused By:** Extreme weather event Earthquakes	Financial Operational Economic Reputation / Image Health and	4	4	H	Reactive/Proactive approach to events Post event inspection/structural audit (as required) and renewals Engineering Code of Practice	Very good	3	4	H	Divisional Manager CDEM Asset Manager	Public education / Communication plan strategy Continue, improve, monitor current process

Risk number	Risk descriptor	Risk type	Initial risk			Current practices/strategies		Residual risk			Risk owner (name and title)	Management options available
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor		
	Volcanic eruptions Land instability **Consequences:** Potential injury, sickness or loss of life Damage to Council-controlled/ owned land e.g. Slips, loss of land Liability / Claims against Council Loss of amenity value Negative Council image (perceived as Councils problem) Increased costs e.g. clean up Adverse environmental effects Damage to private / neighbouring property Financial cost through damage to assets Debris trapped on bridges resulting in increased bank erosion	Safety Environment Legal				Communications strategy (flood warning system) Emergency/Hazard procedures manual Regional hazard mapping and identification Community feedback via EMO's Connections made with Civil Defence (Lifelines) Communications plan LAPP scheme Disaster recovery policy (WRC)						Improve understanding of hazard events
5.11	**Non-Compliance with Legislation and legal requirements** **Caused By:** Inability or failure to comply with statutory and regulatory requirements, lack of awareness Legislative changes increases statutory obligations to a level where they are unable to be met with existing resources Impending changes in policy or legislation not identified Inadequate training Inadequate staff performance **Consequences:** Compromised health, safety and	Financial Reputation / Image Health and Safety Environment Legal	5	2	M	Local government networking e.g. National forums, conferences Standard processes in place with templates Asset management plan/ steering group Legal advice requested as required Asset Management reporting Training/ education programme for staff incl seminars/ conferences/ legislative education RMA updates	Good	2	2	L	Group Manager	On-going training - key staff to keep updated on current legislation Regular communications to staff Continued review of Council procedures Communicating effects of legislative change to Council/ LTP process Improved communication of changes to legislation

Risk number	Risk descriptor	Risk type	Initial risk			Current practices/strategies		Residual risk			Risk owner (name and title)	Management options available
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor		
	protection Legal implications and resulting in increased costs and claims for Council Negative Council image/reputation Financial implications Political consequences Prosecution Injury/death					Inter-departmental communication Conformance with industry standards and practices						
5.12	**Ineffective Governance or inability of elected members to fulfil roles and responsibilities or disregard for community/staff views.** **Caused by:** Lack of communication with elected members Lack of understanding from elected members Poor planning and foresight Elections (Political cycles) Poor training of elected officials **Consequences:** Essential services under-resourced Decisions made on political grounds ahead of defensible decision making Ineffective leadership and decision making A lack of continuity of direction Operational inefficiencies	Financial Operational Economic Reputation / Image Health and Safety Environment Legal	4	4	H	Councillors roles well defined and implemented Legislative requirements/ LTP process Procedures in place to ensure items presented to Council meet legislative requirements Clear, well prepared reports are presented to Council and Community boards to enable sound decision making Councillor induction/ handbook Councillor briefings / workshops CEO giving advice to Councillors	Very Good	2	2	L	CEO	Continue to manage process through CEO / workshops
5.13	**External economic influences** **Caused by:** Cost Escalations (e.g. due to oil price	Financial Operational Economic	3	5	H	Local government networking Responding to national directives Monitoring world events and	Good	2	5	M	Divisional Manager	Track national and global trends. Monitor key economic developments and

Risk number	Risk descriptor	Risk type	Initial risk			Current practices/strategies		Residual risk			Risk owner (name and title)	Management options available
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor		
	increases, economic failures). Uncontrollable movements in economy e.g. exchange rates, price of oil, steel and bitumen Fluctuation in land values Monetary and fiscal policy **Consequences:** Financial impact cost of services Inability to provide services, maintain service levels or achieve community outcomes					reacting						liaise with central government Track innovations in sustainable practice
5.14	**Inability to utilise funding options – Both internal and external, including failure to acquire external subsidies and people not applying for funding on time or not identifying potential areas where funding is required.** **Caused by:** Lack of staff training Lack of awareness of funding sources Organisational or process deficiencies Lack of clearly defined levels of service Change in legislation **Consequences:** Funding not realised Loss of service levels Existing ratepayers fund growth	Financial Operational Reputation / Image	4	5	E	Asset management process Prioritising projects/ LTP and Annual Plan process Experienced staff submitting external applications and reporting internally to Council. Working closely with regional groups Staff knowledge and awareness Established robust levels of service Forecast likely scenarios regarding effects of budget changes including deferments	Very Good	3	2	M	CFO Divisional Manager	Continued review of service levels Continue to utilise sustainable asset management practices On-going staff awareness of funding process, and changes
5.15	**Health and Safety** **Caused by:** Poorly designed, built or maintained assets Lack of staff training	Financial Operational Reputation / Image Health and	5	3	H	Inspection, contract management, hazard identification Complaints Structure safety checks and	Very Good	2	2	L	Group Manager H&S Coordinator Zone Manager	Continue current practice Improved systems and process (training, hazard id, etc)

Risk number	Risk descriptor	Risk type	Initial risk			Current practices/strategies		Residual risk			Risk owner (name and title)	Management options available
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor		
	Lack of staff support and systems Lack of preparedness Lack of formal processes Vandalism Accidental damage **Consequences:** Injury to residents / visitors / staff Damage to property Legal claims Loss of reputation Increased costs	Safety Legal				audits Building code/standards / guidelines Specialised standards (e.g. Agrichemical) Condition assessments Programmes in place to identify areas, issues, risks that may impact on assets Fencing Signage ACC / Indemnity insurance Health and Safety Representative Corporate Auditing of Health and Safety Approved Contractor Health and Safety Plans Emergency response Training / Staff induction / manuals / Personal Protective Equipment / Incident Register (HR) Contractor inductions						
5.16	**Ineffective strategic planning (internal WRC) Inability to plan for and provide for change** **Caused by:** Lack of integration between the different arms of Council pursuing objectives that are at odds with each other Lack of resources dedicated to planning Inability to forecast future trends and	Financial Operational Economic Reputation / Image Health and Safety Environment	4	3	H	Communication with Corporate Planning. Consultation within organisation on long term planning LTP process Asset Management process and updating Liaison with Community via sub committees	Very Good	2	2	L	Group Manager, RCS Divisional Manager Group Manager, Policy	Zone Plan Strategic Alignment with other corporate planning processes Improvement plan process Continue current practices Increased planning

Risk number	Risk descriptor	Risk type	Initial risk			Current practices/strategies		Residual risk			Risk owner (name and title)	Management options available
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor		
	developments **Consequences:** Funding loss Loss of operational capability Decreased levels of service Negative Council image The councils strategic objectives, e.g. social, environmental & political not met Business Plan objectives not met Poor alignment of KPIs to objectives Failure to respond to change in demand in a timely manner Lack of optimised decision making Increased costs Inability to meet needs of community	Legal				Political Liaison Organisational wide input to district plan review Liaison with key stakeholders Strategic planning documents Increased liaison with Policy group Consideration to National forecasts, policies, standards, etc.						resources Upskilling staff
5.17	**Inadequate business continuity planning** **Caused by:** Infrastructure (communications, power, etc.) Essential Services (Transport, etc.) Fire Damage, Water Damage, etc. **Consequences:** Serious loss in public confidence Reduced public/ staff health and safety Damage to WRC infrastructure Damage to WRC property Loss of service Loss of information	Financial Operational Economic Reputation / Image Health and Safety	3	2	M	Manual work-around e.g. cell-phones, laptops Back -up systems Managers have staff/ contractors/other contacts contact numbers Asset / Facility Management plans Communications Plan – e.g. contact numbers for staff and key contractors Insurances (PI, PL, H&S, etc)	Very Good	2	2	L	Group Manager RCS EMT	Maintain/develop business continuity plans
5.18	**Inadequate Communications and PR Management - Poor communications**	Operational	4	4	H	Dedicated Communication	Very	2	2	L	Group	More communication/PR

Risk number	Risk descriptor	Risk type	Initial risk			Current practices/strategies		Residual risk			Risk owner (name and title)	Management options available
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor		
	with stakeholders (internal and external) **Caused by:** Increasing stakeholder expectations for information provided (both quality & quantity) Poor resourcing Lack of commitment Inadequate stakeholder comms and engagement strategies **Consequences:** Inefficient use of resources Political dissatisfaction with level of service Lack of political support Negative Council image Lack of buy-in Lack of community support and poor understanding	Reputation / Image Legal				team Improved electronic communications/ surveys/ displays Customer Service Call Centre & Charter Analysis of submissions on LTP and annual plan processes Management plans Community input/ Consultation/ Feedback from sub committees Meeting statutory requirements & guidelines Improved internal communication Iwi relations Improved customer relations Media updates Communications plans for projects Customer surveys	Good				Manager, RCS Manager, Comms Zone Manager	involvement at earlier stage of projects/ major events (i.e. adoption of plans and strategies, funding policies, etc.) Early internal liaison and with stakeholders Include communications/ customer service component in project brief and debrief process Learning from experience/ capture learning's Celebrate success / making known, demonstrating achievements Record and measure customer response/ inquiry database monitor and analysis
5.19	**Uncertainty of the implications of Co Management on the zone** **Caused by:** The pending Crown Treaty settlement with Maniapoto, Raukawa and Tainui Iwi incorporates a new co-management structure for the zone. **Consequences:** Potentially transfers powers for the management of some services within the	Financial Operational Reputation / Image Environment Legal	4	4	H	Seeking to be informed as to any developments on the treaty process Maintaining contacts with Maniapoto, Raukawa and Tainui Iwi as active participants in the settlement process. Actively seeking input in the development of the zone plan	Very Good	2	3	M	Deputy CEO Group Manager RCS	Continue current practice Develop practice as the details of the settlement become known

Risk number	Risk descriptor	Risk type	Initial risk			Current practices/strategies		Residual risk			Risk owner (name and title)	Management options available
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor		
	zone. Details of settlement and its effects are still emerging											
5.20	**Local Government Reform** **Caused by:** Restructure of local and regional government in the Waikato Region **Consequences** Transferral of responsibilities and powers Reconfiguration of boundaries which may impact upon work programmes, costs and funding Loss of institution knowledge relating to the zone Loss of continuity, consistence Loss of momentum Change in political direct Change in community support	Financial Operational Reputation / Image Legal	4	4	H	Political liaison within and with adjacent councils Contact maintained with Central government	Good	3	3	M	CEO	Continue current practice
5.21	**Climate change** **Caused by:** Changes to global climate **Consequences:** Sea level rise and more frequent and severe storms Requirement to replace assets earlier and / or more frequently Community expectation that service levels will be maintained Higher funding requirements Ability to pay Adverse environmental impact	Financial Operational Environment Health and Safety	3	3	M	Condition survey Annual structural inspections Monitor national climate forecasts (MFE) Review service levels and design standards Incorporating MFE information in service level reviews	Good	2	2	L	Divisional Manager Group Manager	Continue current practice Upgrade assets to off set climate change effects

Risk number	Risk descriptor	Risk type	Initial risk			Current practices/strategies		Residual risk			Risk owner (name and title)	Management options available
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor		
	Higher risk of asset failure Reduced land use opportunities Disruption of community infrastructure’											

Appendix 5b River management

Risk number	Risk descriptor	Risk type	Initial risk			Current practices/strategies		Residual risk			Risk owner (name and title)	Management options available
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor		
6.1	**Increased Adverse River Behaviour** **Caused by:** Climate change Land use change Sedimentation and erosion **Consequences:** Inability to effectively manage rivers Drainage schemes unsustainable Damage to property Damage to environment Health and safety incidents Increased costs to community Increased Flood Risks	Financial Operational Economic Health and Safety Environment	5	5	E	Flood protection measures River Management programmes Informing compliance with regulations, district plans, regional plans, etc. Flood monitoring and warning systems Education and emergency preparedness (output to Civil Defence) Sediment Management Plan Civil Defence Hydraulic modelling Inundation studies Flood manual – guideline to staff (warning levels etc.) Consideration of IPCC recommendations Monitor river conditions	Very Good	3	3	M	Divisional Manager Zone Manager Programme Manager, TS	Continue and monitor current practices Catchment monitoring and modelling (land use changes etc.) Consideration of options including possible retreat of at-risk dwellings and industry Consideration of Reduction in Standards/ Service Levels New capital works Increased awareness and education of river systems
6.2	**Rise in Sea Level and Storm Surges– (see similar Flood Management Risk)** **Caused by:** Climate change **Consequences:** Inability to effectively manage rivers Increased aggradation, degradation and morphological change Damage to property	Financial Operational Economic Health and Safety Environment	3	3	M	Flood protection measures River Management programmes Informing compliance with regulations, district plans, regional plans, etc. Flood monitoring and warning systems Education and emergency preparedness (output to Civil	Very Good	1	3	L	Divisional Manager Zone Manager Programme Manager, TS Programme Manager, NH	Input into regional and district planning processes Increased awareness and education of coastal flood hazards

Risk number	Risk descriptor	Risk type	Initial risk			Current practices/strategies		Residual risk			Risk owner (name and title)	Management options available
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor		
	Damage to environment Health and safety incidents Increased costs to community Effects on Coastal settlements and services					Defence) Sediment Management Plan Civil Defence Hydraulic modelling Inundation studies Flood manual – guideline to staff (warning levels etc.) Consideration of IPCC recommendations and inclusion of MFE recommendations in designs. Monitor river conditions and regularly review flood protection standards. Coastal planning and regulation						
6.3	**Riverbank Erosion** **Caused by:** Natural events / soil types and qualities Instability Land use change Inappropriate vegetation Debris trapped under bridges **Consequences:** Increased flooding Loss of land Increased risk of breach and/or course change Increased sedimentation Threat to property and infrastructure	Financial Operational Reputation / Image Legal Environmental	4	5	E	Edge Protection, vegetation, structural, rip rap, gabion walls Buffer zones, fenced Financial Grants for riparian protection Renewal / upgrade programmes Maintenance regime Regular inspections Sediment Management Plan Riverbank trial protection works Trial native planting Willow protection research group contribution	Excellent	3	3	M	Divisional Manager, CM Zone Manager	As per current practice

Risk number	Risk descriptor	Risk type	Initial risk			Current practices/strategies		Residual risk			Risk owner (name and title)	Management options available
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor		
	Increased risk to existing assets					Environmental code of practice Debris management						
6.4	**Sand and Gravel Management** **Caused by:** Accumulation of Sand and Gravel Upstream land use practice Erosion / degradation Natural processes **Consequences:** Loss of capacity Adverse impact on Service levels River instability	Financial Operational Environmental	3	4	H	Management of Sand and Gravel extraction Monitoring programmes Resource Consent processes	Very Good	2	4	M	Zone Manager Programme Manager, TS	Develop a stand alone river management plan Current practices Examine relevance of financial contributions Sediment management plans (currently in development)

Appendix 5cFlood management

Risk number	Risk descriptor	Risk type	Initial risk			Current practices/strategies		Residual risk			Risk owner (name and title)	Management options available
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor		
7.1	**Stop bank Failure** **Caused by:** Settlement Deterioration, weakness Undermined foundations Erosion Adjacent disturbance (i.e. building road, digging a drain, etc.) Poor construction Overtopping **Consequences:** Ineffective flood control Flooding Legal claims	Financial Operational Reputation / Image Health and Safety	5	4	E	Regular condition reviews Visual inspections, physical surveys Scheme reviews, hydraulic capacity modelling Use of internal / external specialists e.g. geotechnical where appropriate Renewal / upgrade programmes Maintenance regime Floodway and drainage bylaws Failure Response Processes Linkages between RPS and District Plan policies to drive lowering and/or restricting increase in the level of residual risk over time Advocate limiting development behind stop banks Increased awareness and education Improved failure response procedures (i.e. warning systems, etc.)	Very Good	4	3	H	Programme Manager, TS Zone Manger	As per current practice Advocate limiting and/or control increased development behind stop banks Increased awareness and education Improved failure response procedures (i.e. warning systems, etc.)

Risk number	Risk descriptor	Risk type	Initial risk			Current practices/strategies		Residual risk			Risk owner (name and title)	Management options available
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor		
7.2	**Structural Failure –Pump Stations** **Caused by:** Lack of maintenance Asset deterioration Poor design or installation Loss of power **Consequences:** Flooding Inability to function Unexpected costs and resources Negative Council image Increased costs Health and safety Legal claims	Financial Operational Reputation / Image Health and Safety	4	3	H	Regular inspections Condition monitoring Renewal / upgrade programmes Maintenance regime – internal staff (dedicated custodian) Operations manuals Emergency backup pumps, connections for generators, mobile pumps Experienced staff – on-going training Key stations have telemetry / alarms Feedback from landowners	Good	4	3	H	Zone Manager Programme Manager, TS	As per current practice Review inspection programme Improved prediction procedures (Telemetry / monitoring / alarms) On-going improvements in Design, Construction, Monitoring, and Maintenance
7.3	**Conflicting Objectives/ Aspirations (External)** **Caused by:** Increasing environmental standards Treaty Settlements Environmental restoration projects **Consequences:** Difficulty in renewing resource consents Increased maintenance costs Services not sustainable	Financial Operational Economic Reputation / Image Environment Legal	4	5	E	Environmental Management Programme Stakeholder Engagement Plans Consultation Joint projects with Stakeholders Integrated planning Political input	Good	3	3	M	Group Manager, RCS Divisional Manger Zone Manager	Better understanding of process, inter-connections, and benefits Mutually beneficial projects (win-win) Facilitation and agreement, mutually agreed outcomes Negotiated solutions

Appendix 5d Catchment management

Risk Number	Risk descriptor	Risk type	Initial risk			Current practices/strategies		Residual risk			Risk owner (Name and title)	Management options available
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor		
8.1	**Zone Land Use Change and Regional Intensification and Development** **Caused by:** Conversion of forest to pasture Increased grazing pressure due to intensification of land use – particularly dairy farming Increased need for Roading and Rail Developments and Improvements Need for utility and infrastructure network developments Increased expectations for a higher level of service **Consequences:** Higher risk of impacts on existing assets Conflicting objectives Need for balance of objectives	Financial Operational Economic Environment	4	4	H	Technical reviews of resource consent applications Submissions to District Plans Inter-regional planning and strategy development Liaison between TAs Liaison with Infrastructure networks owners Future Proof	Very Good	3	4	H	Group Manager, Policy Zone Manager	As per current practice
8.2	**Landowner failure to manage soil conservation** **Caused by:** Economic climate Lack of Interest Conflicting objectives Land use change **Consequences:** Deterioration of assets and levels of protection Soil erosion and land deterioration Non compliance with Land Improvement	Financial Operational Economic Reputation / Image Environment Legal	3	4	H	Property Inspections and Monitoring Liaison with landowners	Good	3	2	L	Divisional Manager - Catchment Management Zone Manager	More intensive inspection programme More regular land owner contact Greater application of enforcement Regulatory processes

Risk Number	Risk descriptor	Risk type	Initial risk			Current practices/strategies		Residual risk			Risk owner (Name and title)	Management options available
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor		
	Agreements											
8.3	**Animal pests** **Caused by:** Proliferation of catchment pests – particularly goats in the upper Waipa River On-going issues with the use of 1080 poison **Consequences:** Blockage of Channels Poor Drainage Sediment disturbance – possibly large landslides such as Tunawaea Erosion Water quality degradation Increased costs and resource requirements Adverse effects on levels of service Risk to biodiversity	Financial Operational Reputation / Image Environmental	4	4	H	Animal pest control programmes Monitoring programmes	Good	3	4	H	Group Manager, BS&NH Zone Manager	More Monitoring and research programmes Improved control programmes and methods (environmentally acceptable methods)
8.4	**Loss of productive land capacity** **Caused by:** Erosion Overgrazing and poor land management practices Use of steep land for inappropriate purposes Proliferation of catchment pests **Consequences:** Low returns on land usage	Financial Environmental	3	3	M	Education and advice Promotion of alternate land uses via soil conservation	Good	3	2	M	Divisional Manager - Catchment Management	Incentive schemes for alternate land uses such as carbon credits

Risk Number	Risk descriptor	Risk type	Initial risk			Current practices/strategies		Residual risk			Risk owner (Name and title)	Management options available
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor		
	Loss of land value											
8.5	**Loss of major wetlands** **Caused by:** Drainage and lowering of water tables Overgrazing and poor land management practices around the margins Proliferation of pests and invasive species On-going conversion of marginal areas into agricultural land **Consequences:** Loss of biodiversity Loss of water retention	Reputation / Image Environment	3	4	H	Education Modelling and prioritisation	Good	3	3	M	Group Manager, BS&NH Zone Manager	Incentives Enhanced policy rules for protection
8.6	**Poor stocking practices and management** **Caused by:** Overstocking Increased use of LUC 6e, 7 and 8 land Increased use of lower productivity land requiring greater fertiliser inputs **Consequences:** Increased erosion/sedimentation Decreased water quality Soil pugging Soil compaction	Operational Reputation / Image Environment	4	4	H	Advice and assistance Education	Poor	4	3	H	Zone Manager	Work with TA's to protect high class soils Enforce regulations Strengthen policy/ regulation/ education incentives to prevent degradation: Increased promotion of soil conservation/carbon credits Farm plans Efficient fertiliser usage Increased riparian fencing Stronger regulations

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Appendix 6 Risk to forecasting assumptions

Forecasting assumption	Risk	Likelihood of occurrence	Financial materiality	Reasons and financial effect of uncertainty
Projected price change factors Forecast financial information contained in this plan contains a provision for inflation. Council has used the price level change factors supplied by Business and Economic Research Ltd (BERL) in order to calculate the amount of inflation to include. Where expenditure is subject to inflation, the following cumulative rates have been applied. For 2009/10, the cost of inflation in relation to all costs except labour and passenger transport contracts has been absorbed into existing work programme budgets.	That actual price changes levels will vary significantly from the levels assumed.	Medium	Low (2009/10 – 2010/11) Medium (2011/12 – 2018/19)	Inflation is affected by external economic factors that are outside the control of council. Given the current economic climate, the actual inflation rates for both the short and long term are uncertain. While council believes it has taken a conservative approach by applying the rates supplied to the local government sector by BERL, it acknowledges that actual inflation rates may vary from these in any year of the plan.
Useful lives of significant assets The useful lives of council's significant assets are as disclosed in the notes to the accounts.	The actual life of an asset is shorter than that assumed. This may be the result of a significant weather event.	Low	Low	Council's most significant assets are its infrastructural assets comprising of flood protection works. The useful lives of these assets have been assessed by engineers and valuers.
Revaluation of non-current assets Provision has been made for a 3 yearly cycle of revaluations in relation to council's infrastructural assets. Estimates of changes in value have been based on the projected price change factors supplied by BERL.	That actual revaluation changes vary significantly from those forecast.	Low	Low	Council undertook revaluations of those property, plant and equipment assets that are subject to revaluation in June 2008. Council's accounting policies state that these assets should be re valued at least every 5 years, with an annual assessment of values carried out annually. Any change in value will impact the forecast financial statements through the funding of depreciation. No adjustment to the provision for depreciation has been made based on the value changes forecast. Because of the relatively long useful life of council's infrastructural assets which comprise the majority of its property, plant and equipment, this impact is thought to be minimal.

Forecasting assumption	Risk	Likelihood of occurrence	Financial materiality	Reasons and financial effect of uncertainty
Depreciation rates on planned asset acquisitions New capital expenditure will be depreciated in line with the depreciation rates set out in council's accounting policies.	That further review of the nature of capital expenditure may alter the depreciation expense incurred.	Low	Low	Significant capital works are based on detailed asset management plans which specify the nature and timing of capital works. Due to the long-term nature of these capital works, any impact on depreciation will be minimal.
Emission Trading Scheme Due to the high level of uncertainty, no provision has been made for the cost of the government's Emission Trading Scheme (ETS).	That the implementation of this scheme impacts on the costs of council undertaking its business.	Medium	Low	The council expects that there will be rising costs through the ETS but that these costs cannot yet be quantified or budgeted for. The council believes that these cost increases will not be significant and are not expected to be material.
Regional growth Increases in the number of properties will be at a lower level than experienced over the last 3 to 5 years. Council has estimated that there will be 2,000 new properties in the region each year.	That growth will not be sustained at the level anticipated.	Low	Low	This growth assumption has only been used to project likely future revenue for those rates set on a per property charge (such as Natural Heritage). Council has the ability to re-size these work programmes based on actual revenue levels achieved.
Forecast return on investments Council's investment fund will achieve an average return of 5% per annum. In years 1 to 3, council has assumed a return will come from the fixed interest portion of the fund only. From 2012/13 onwards, council has assumed that its equity investments will start to make a return, with the whole fund achieving a 5% return by 2014/15.	That actual returns achieved by the fund will be lower than this average return.	Low	Low	Following a review of the investment fund and treasury policy, council is moving to a more conservative asset allocation mix aimed at achieving a consistent return on the funds invested. If returns do not achieve the budgeted level, the level of work projected to be undertaken will be reviewed.
Expected interest rates on borrowing Council will utilise the funds held in its investment fund for the purposes of internal borrowing. The interest rate applied to funds internally borrowed is 5.9%. This rate is based on the weighted average return on investments, plus a 1% borrowing margin. The interest rate applied to funds internally loaned is 4.9%. This rate is based on the weighted average return on investments.	That funds will not be available from the investment fund, resulting in council having to seek external borrowing at higher interest rates.	Low	Low	Internal borrowing from the investment fund is specifically provided for in council's treasury policy. Council's investment fund is valued at approximately $51.6 million (December 2008), which allows for significant borrowing levels to be met.

Forecasting assumption	Risk	Likelihood of occurrence	Financial materiality	Reasons and financial effect of uncertainty
Council's share in associates Council includes a 33.3% equity share in the Lake Taupo Protection Trust in its financial statements. Because the timing and extent of activities undertaken by the trust are not determined by council, EW has not projected any change in the value of this investment over the period of this plan.	That the value of council's equity shares in the Lake Taupo Protection Trust either increases or decreases significantly from the current level of investment.	Medium	Low	The Lake Taupo Protection Trust has been established with the aim of reducing the Nitrogen levels in the soil and water of the Lake Taupo Catchment. It proposes to achieve this through the purchase of land, implementation of methods to retire the nitrogen from the land, and subsequent land sale. The funding for this is provided by the three trust partners: Environment Waikato, Taupo District Council and the Crown. If in undertaking these actions the value of the land decreases, this will lead to the Trust writing down the value of its assets and showing a book loss – a share of which would be reflected through Environment Waikato's accounts. The financial consequence of this to council is low, as council's own financial plans are not influenced by the financial performance or position of the Trust and any book loss will not require further funding to the Trust from the partners. Trust agreements are in place that stipulates the contribution that council will make to the Trust.

Appendix 7 Improvement Plan actions

Improvement area/actions	Priority	Owner / responsibility	Timing	Resource time (hours)		Costs	Where addressed	Comments
				Internal	External			
Monitoring and review								
Review and develop monitoring and reporting programme	Very high	Div Mgr & Zone Mgrs	12/13 FY	10	20	$4K	RCS	Review and development involves: * developing project brief * reviewing text & intentions in zone plan * confirming what we will monitor and how * reporting cycle – Zone mgrs, Project Control Group, Sub-committee, Catchment Services Committee, Audit NZ * links to Communications strategy
Conduct annual revision and update of zone plan, monitor improvements and yearly report on achievements	Very high	Zone Mgr	Starting 12/13 FY and on-going there-after	10	25	$5K?	RCS	Important action required to meet OAG criteria, and to keep zone plans current and useful. Will also greatly decrease length and extent of zone plan reviews.
Three-yearly formal review of zone plans	High	Div & Zone Mgrs	14/15 FY and every 3 years there-after	20	50	$10K	RCS	Formal review leading into LTP process
Review, update and sign-off of improvement plans	High	" "	" "	10	10	$2.5K	RCS	Not a big task, because Improvement Plan is constantly monitored, updated and developed via continuous annual monitoring above
Lifecycle management strategies								
Develop and implement demand strategy/plan	Very high	Zone Mgr	13/14 develop. 14/15 impl.	15	25	$5K	RCS	Development involves: * development of project brief * clarification of what it covers, key drivers, renewals vs. new works * engagement of community and economy programme. Note that draft strategy and plan will be able to draw on template from Lower Waikato and Waihou-Piako zones

Improvement area/actions	Priority	Owner / responsibility	Timing	Resource time (hours)		Costs	Where addressed	Comments
				Internal	External			
Develop optimised decision-making process	Very high	Div Mgr.?	13/14 FY	-	-	-	RCS	Will be completed by Lower Waikato and Waihou-Piako zones first, hence limited development cost. Development involves project brief, scoping, clarifying what we do now, gaps analysis and establishing linkages to related work
Partners and stakeholders								
Develop and implement Communications Strategy	Very high	Div Mgr	13/14 for devel., 13/14 onwards for impl.	5	-	$1K	RCS	Communications have budget to support this during 12/13. Aim for agreed strategy by end of FY. Development will involve scoping, identifying audience (internal/external) and developing draft, review and sign-off
Improve community engagement and awareness	High	Zone Mgr, Comms Officer	12/13 onwards	50	100	$20K?	RCS/ Zone	Engagement and awareness improved via information provision, via regular media releases, promotion of achievements, three-yearly open days, website development and community newsletters
Improve relationships with tangata whenua by actively pursuing joint initiatives with mutually beneficial outcomes	High	Zone Mgr; TRW Mgr	" "	10	-	$1.5K	Zone	Links to communications strategy. Will involve meeting Iwi groups, exploring goals, objectives and synergies and agreement on actions needed
Identify opportunities to work with other stakeholders/agencies	Med	Zone Mgr	" "	10	-	$1.5K	Zone	Align with communications strategy. Includes both internal and external stakeholders. Includes management of pest animals, and conservation activities such as protecting whio (Blue Duck).
Asset information								
Improve asset data in terms of data completeness, asset condition and asset performance	Very high	Asset Mgr	12/13-14-15	-	-	-	RCS	Actions in progress as part of on-going programme, costs borne as part of asset management programme. Includes identification of possible additional assets – per Section 6.3.2.
Develop measurement of confidence for expenditure forecasts	Med	Asset Mgr	14/15	-	-	-	RCS Fin.	Note – this addresses advanced OAG criteria

Improvement area/actions	Priority	Owner / responsibility	Timing	Resource time (hours)		Costs	Where addressed	Comments
				Internal	External			
Complete condition, performance and completeness tables	High	Asset Mgr	End of 14/15 FY	-	-	-	Zone	Update within zone plans to the extent possible from 12/13 onwards. Costs will be a part of the annual revision costs, per monitoring and review actions
Link asset ratings to risk assessment	Med	Zone Mgr	15/16 onwards	-	-	-	Zone	Dependent upon asset data reliability. Goal is for condition assessment and reliability data to drive risk management
Levels of service								
Develop measurement and reporting arrangements	High	Div Mgr	12/13	5	20	$3K	RCS	Will require scoping and project brief prior to developing. Timing could be deferred, as the core OAG requirements are currently being met.
Develop new framework for identifying priority catchments	Med	Zone Mgr	12/13	TBC	TBC	TBC	Zone	Preliminary work completed by Liaison Subcommittee meeting in 2011
Update LOS tables to reflect zone-specific levels of service	Med	Zone Mgr	12/13	-	-	-	Zone	Including monitoring catchment schemes in Table 29.
Risk management								
Risk Action Plan - review, update and complete Note – includes risk assessment criteria and framework	High	Zone Mgr	13/14	5	25	$4K	Zone	Audit NZ recommendation. Need to ensure plan is practical and achievable. Development needs to include: * review of current approach * confirmation/prioritisation of risks * drafting/completion of plan
Implement risk action plan	" "	" "	13/14 onwards	10	-	$1.5K	Zone	Oversight and project management role for implementing risk mitigation
Develop risk management monitoring and review process and implement.	Med	" "	13/14	-5	-	$1K	RCS	Audit NZ opportunity. Internal action within existing management budgets
Identification and risk management strategies for critical assets Implementation	Very high	" "	Dec 11-Mar 12 13/14 onwards	15	50	$8.5K	Zone	Important to establish understanding and awareness of risks associated with AEP and level of service. Need to gain an understanding of highest risks now. Implementation assumes two risk management strategies per year on an on-going basis

Improvement area/actions	Priority	Owner / responsibility	Timing	Resource time (hours)		Costs	Where addressed	Comments
				Internal	External			
Financial management								
Work toward achieving Core OAG criteria - define gaps between current practice and core requirements	Very high	Zone Mgr; Asset Mgr & Fin. Mgr	12/13 FY	-	-	-	RCS	Need to confirm if we are meeting core criteria first – this is unclear at present. Note that Lower Waikato/Waihou-Piako zones will do this anyway, so costs should be part of routine management budgets.
Clarify tasks and timing and develop and implement plan to address meeting Core OAG requirements	" "	Zone Mgr, Fin Mgr	11/12 FY devel., 13/14 impl.	-	-	-	RCS	Simple plan of action and tasks required. See above comments regarding other zones work and costs.
Resolve valuation discrepancies between ODC-owned and WRC-owned assets	High	Zone Mgr, Fin Mgr	12/13 FY	-	-	-	Zone	Valuations are done on a different basis and at different times. ODC does not currently depreciate stopbanks or in-river structures
Make updates to plan text in Sections 6 and 9 reflecting changes in the 2012/22 LTP:	High	Zone Mgr	12/13 FY	-	-	-	Zone	Aligned with 12/13 LTP ZP revision, and is already budgeted for under the monitoring and review actions. Includes update to Table 6.
Improvement planning								
Zone Improvement Plan: Review, update and complete; add resources, costs and timing; ensure draft plan is practical and achievable	Very High	Zone Mgr	12/13	3	20	$3K	Zone; Group	Requirement of Audit NZ review and OAG Core criteria. Note that Lower Waikato and Waihou-Piako zone improvement plan template will greatly assist development
Seek commitment to final improvement plan from senior management and Council	Very High	Zone Mgr	12/13	5	-	$1K	Zone; Group	See above comments
Implement and monitor improvement plan	High	Zone Mgr.	13/14 onwards	2	10	$2K	Zone	See above comments