Flood Protection and Control Works

Activity Management Plan

Long Term Plan 2015–2025

As amended through the Annual Plan 2016/17

1 July 2016

TRIM 14/828084

Christchurch City Council

Quality Assurance Statement

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	Status	**Final**
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	Finance Manager: Michael Day

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1 Key Issues for the Flood Protection and Control Works Activity

Flood protection and control works are carried out to protect the community from and to respond to significant flooding events. The activity involves the management of waterways and associated structures and systems such as stopbanks, floodgates pumping stations and the hydrometric network (rain and water level monitoring). The activity is closely linked to the Stormwater Drainage Activity. The management approach for flood hazard is to reduce the risk of occurrence and improving readiness, response and recovery. This is accomplished through civil defence and emergency management, land-use planning controls and stormwater management. Implementation of the CCC Surface Water Strategy 2009-2039 has resulted in Stormwater Management Plans (SMPs) being developed and implemented across the District. The SMPs are integrated catchment management plans aiming to address and improve the six values for waterways, which will contribute to managing flood risk.

Post earthquakes, the Land Drainage Recovery Programme 2012-2016 is assessing damage to waterways and where necessary reinstating the flood carrying capacity of waterways.

1.1 Community Outcomes

Everything that the Council does in its day-to-day work is focused on achieving community outcomes. All activities outlined in this plan aim to deliver the results required to achieve these outcomes, contribute to Council strategies and meet legislative requirements. Likewise, all Council capital and operating expenditure is directed towards a level of service that moves the community closer to these outcomes now or at some future point.

The effective management of Flood Protection and Control Works for Christchurch and Banks Peninsula means achieving the following community outcomes:

- Water quality in rivers, streams, lakes and wetlands is improved
- Stream and river flows are maintained
- Existing ecosystems and indigenous biodiversity are protected
- A range of indigenous habitats and species is enhanced
- Injuries and risks to public health are minimised
- Risks from flooding are minimised

Section 4 shows how these outcomes flow down into and influence the Council's activities and levels of service in relation to Flood Protection and Control Works.

1.2 Effects of growth, demand and sustainability

Population Growth and Demand

Planning controls related to flood protection are in place to manage the development demands resulting from population growth and demand for more housing. The controls aim to limit development in ponding areas and to increase minimum floor levels for buildings in Flood Management Areas.

Post earthquakes Christchurch's population distribution has seen a shift from eastern suburbs in the residential red zone to newly built subdivisions in the west, subdivisions which have integrated and constructed stormwater infrastructure to accommodate the increased surface water run-off from the area.

In addition to subdivision development, the rate of infill housing is increasing. Due to limitation of space, this type of development does not lend itself to improved stormwater management. This can have consequential impacts on the standard of flood protection.

Rebuild across the city, if not managed well, will result in greater risk of sediment discharges in to the waterways via dewatering or erosion run-off during storm events. This will compromise the flood carrying capacity of many of the City's waterways and drains.

Demand for flood protection will increase as a direct result of climate change and sea level rise. Council will need to develop long term strategies to deal with these effects.

Sustainability

The Local Government Act 2002 places a legal imperative onto Council to adopt a 'sustainable approach". Council recognises that sustainability is a journey, not a destination. It is not a point that is reached, but a

process of continual improvement, where the community adapts and responds to changes over time. The sustainable approach is embraced in Council's Vision, Mission and Objectives, and shapes the community outcomes. The levels of service and the performance measures that flow from the Council's Vision lead to sustainable outcomes as defined by:

- The Christchurch City Council Sustainability Policy
- Christchurch City Council Biodiversity Strategy 2008-2035;
- Christchurch City Council Sustainable Energy Strategy 2008-2018
- Christchurch City Council Surface Water Strategy 2009-2039

1.3 Key Challenges and Opportunities for Flood Protection and Control Works

In working towards the community outcomes, and influenced by population growth and demand, Council faces the challenge of making decisions that prioritise resources to deliver the best mix of services at the right level and in a sustainable way. The key challenges and opportunities that have been prioritised by Council are below in Table 1-1.

Table 1-1 Key Issues

Key Issue	Discussion
Earthquake Rebuild	Long term decisions about the Residential Red Zone still need to be made. The Avon River stop banks are temporary measures to protect the area, which depending on the development plan for the area could be abandoned, raised or rebuilt elsewhere. The Residential Red Zone has the potential to revert back to a native wetland, providing stormwater and flood management opportunities. The Land Drainage Recovery Programme is assessing level of damage and flood carrying capacity of waterways and the stormwater networks. Remedial work required is being prioritised and implemented. Land settlement has exposed new areas to flood risk and increased risks in some existing areas.
Climate Change and Sea Level Rise	The most likely scenario relating to climate change is that Christchurch will experience more frequent intense rain storms resulting in a greater number of flood events. Christchurch will experience sea level rise, as much as 1m by the end of the century*. This will expose larger areas to the risk of coastal and tidal flooding * Latest prediction from the 5th IPCC Assessment Report
Funding	There is an urgent need for improvements to flood protection assets and to build new flood protection measures across the City versus the need to make substantial savings. The Flood Taskforce has identified a number of short term measures to address flood risk to the most vulnerable households in Christchurch, however longer term mitigation measures need to be developed to address the extreme flooding which will result through climate change and sea level rise.

2 Proposed changes to activity

Table 2-1 summarises the proposed changes for the management of the Flood Protection and Control Works activity since the Three Year Plan 2013-16 Activity Management Plan.

Table 2-1 Proposed changes to activity

Key Change	Reason	Level of significance? What investigations are needed?	Options for consultation and engagement
The future use of residential red zones along the Avon river and opportunities for flood management and water quality treatment	Earthquake damage	Formulation and implementation of a plan for addressing surface water management in the Avon Catchment residential red zones as part of land use considerations	Plenty
Mitigating the increased flooding vulnerability of residential properties	Earthquake effects - particularly due to subsidence of land	Investigation of flood risk mitigation schemes including : Consideration of stopbanking or dredging in the Lower Heathcote River Increased channel capacity and pumping investigations in Flockton and other areas Permanent repair of earthquake damaged stopbanks and outlets to the river particularly in the Lower Avon Area	Plenty
Changes to maintenance and renewal planning and delivery to align with the outcomes of the Mayoral Flood Taskforce	The Flood Taskforce identified a number of areas across the City where flooding is more of a problem post earthquakes	The Taskforce outcomes will deliver short term measures to the most vulnerable residents in the City. Further long term strategies to be investigated and developed as part of the Surface Water Strategy	Engage local communities affected by flooding

3 Activity description

3.1 Focusing on what we want to achieve

Council undertakes activities in order to deliver on the community outcomes for Christchurch and Banks Peninsula. The outcomes that relate most directly to the management of the Flood Protection and Control Works network are that:

- Stream and river flows are maintained
- Injuries and risks to public health are minimised
- Risks from flooding are minimised

3.2 How we will know we are achieving the outcomes

We will know we are achieving the above outcomes when we see the following results:

- The community is prepared for significant flood events.
- Harmful flooding is reduced and results from extreme events, not system malfunctions.
- There are well-maintained flood protection systems that safeguard public health and property.
- Waterway levels are maintained in a way that safeguard property
- The flood protection systems are safe and reliable and reduce the risk of flooding

The activities that follow in section 4 and the levels of service within them are all linked to the above results to ensure Councils stays focused on moving towards the community outcomes. This link aims to confirm why we are doing the activities – that they will realistically move us closer to our goals – and that service delivery remains relevant to strategic direction.

3.3 What services we provide

This activity includes the following services:

- Maintaining the natural waterways and associated structures and systems
    - The provision and management of infrastructure to protect the community from and to respond to significant flooding events.
    - Protecting the community from flooding during normal to extreme events
    - The Six Values approach addressing drainage, ecology, landscape, recreation, culture and heritage is taken to enhance waterways and protect water quality.

The activity involves the management of waterways and associated structures and systems such as stopbanks, floodgates, pump stations and the hydrometric network (rain and water level monitoring). The activity is intrinsically linked to the Stormwater Drainage Activity

In delivering this service the Council provides a balanced mix of maintenance and renewals to preserve the levels of service as well as capital investment to respond to increasing demands.

3.4 Benefits and Funding Sources

3.4.1 Who benefits

Who benefits	
Individual	
Identifiable part of the community	
Whole community	Full

Key:
Full
Majority
Some

Explanatory Comments:

The entire community benefits from this activity.

There are health and environmental benefits from flood protection systems for the whole community.

3.4.2 Who pays

Funding - Fees / User Charges	Other revenue Grants & Subsidies	General rate	Targeted rate
0%	0%	0%	100%
			Full

Note, Funding Split % is derived from the 'Summary of Cost for Activity' (section 13).

Key:		*Typically*
Full	*All or almost all the cost is funded from that source. If the comment is made in the general or targeted rate columns it does not preclude making minor charges for the service but indicates that the charges are a negligible part of the fund.*	*95%+*
Majority	*The majority of the activity is funded from this source.*	*50%+*
Some	*Some revenue is derived from this source.*	*<50%*

Does this Activity generate surplus funds that can be applied to other areas? **No**

Explanatory Comments:

The cost of this service is covered by Targeted Rate.

3.5 Key legislation and Council strategies

Resource Management Act 1991; Local Government Act 1974 & 2002; Building Act 1991; Christchurch District Drainage Act 1951, and Land Drainage Act 1908; Waterways and Wetlands Natural Asset Management Strategy, 1999; Surface Water Strategy 2009, Water Related Services By-Law 2008 ; Public Open Space Strategy; Biodiversity Strategy; Land and Water Regional Plan 2014.

4 Levels of service and performance measures

Table 4-1 summarises the levels of service and performance measures for the Flood Protection and Control Works activity. Shaded rows are the levels of service and performance measures to be included in the Long Term Plan. Non-shaded rows are non-LTP management level measures, agreed with and reported to Council but not included as part of the community consulted document.

Table 4-1 Levels of Service

Performance Standards Levels of Service (we provide)		Results (Activities will contribute to these results, strategies and legislation)	Method of Measurement (We will know we are meeting the level of service if…..)	Current Performance	Benchmarks	Future Performance (targets)			Future Performance (targets) by Year 10
						Year 1 2015/16	Year 2 2016/17	Year 3 2017/18	2024/25
Maintaining the natural waterways and associated structures and systems									
14.1.3 .	Major flood protection and control works are maintained, repaired and renewed to key standards *Flood Protection & Control Works mandatory performance measure 1.*	Periodic land surveys to determine maintenance regimes	*Major flood protection and control works are maintained, repaired and renewed to the key standards defined in the local authority's relevant planning documents (such as its activity management plan, asset management plan, annual works programme or long term plan).*	New national performance measure	New national performance measure	14.1.3.1 Stopbank crest surveys are carried out - Annually 14.1.3.2 Cross sectional surveys of selective waterways are carried out - 2-5 yearly or as required	14.1.3.1 Stopbank crest surveys are carried out - Annually 14.1.3.2 Cross sectional surveys of selective waterways are carried out - 2-5 yearly or as required	14.1.3.1 Stopbank crest surveys are carried out - Annually 14.1.3.2 Cross sectional surveys of selective waterways are carried out - 2-5 yearly or as required	14.1.3.1 Stopbank crest surveys are carried out - Annually 14.1.3.2 Cross sectional surveys of selective waterways are carried out - 2-5 yearly or as required

Performance Standards Levels of Service (we provide)		Results (Activities will contribute to these results, strategies and legislation)	Method of Measurement (We will know we are meeting the level of service if…..)	Current Performance	Benchmarks	Future Performance (targets)			Future Performance (targets) by Year 10
						Year 1	Year 2	Year 3	
						2015/16	2016/17	2017/18	2024/25
14.1.1	Ensure dwellings are safe from flooding during extreme rain events		*Reported as CSR via Council's call centre*	**Mayoral Flooding Taskforce Report May 2014*** Above Floor – 77 Below Floor – 427 Access – 948 * Two or more flood events since the earthquake 2013/14: 100% 2012/13: new measure	Hamilton City Council: Less than 5 buildings flooded per year Palmerston North City Council: >98% of properties are protected from a 1 in 100 year flood event	14.1.1.1: Reported number of dwellings flooded in a 1 in 50 year event: 30% reduction on 2014 "Above Floor" number 14.1.1.2: Percentage of minimum specified floor levels for new dwelling consent applications which meet Building Act & District Plan requirements: 100%	14.1.1.1: Reported number of dwellings flooded in a 1 in 50 year event: Additional 30% reduction on 2014 "Above Floor" number 14.1.1.2: Percentage of minimum specified floor levels for new dwelling consent applications which meet Building Act & District Plan requirements: 100%	14.1.1.1: Reported number of dwellings flooded in a 1 in 50 year event: Additional 20% reduction on 2014 "Above Floor" number. 14.1.1.2: Percentage of minimum specified floor levels for new dwelling consent applications which meet Building Act & District Plan requirements: 100%	14.1.1.1: Reported number of dwellings flooded in a 1 in 50 year event: 10% reduction 14.1.1.2: Percentage of minimum specified floor levels for new dwelling consent applications which meet Building Act & District Plan requirements: 100%

Performance Standards Levels of Service (we provide)		Results (Activities will contribute to these results, strategies and legislation)	Method of Measurement (We will know we are meeting the level of service if.....)	Current Performance	Benchmarks	Future Performance (targets)			Future Performance (targets) by Year 10
						Year 1	Year 2	Year 3	
						2015/16	2016/17	2017/18	2024/25
14.1.4	Implement the Mayoral Flood Taskforce work programme	A flood protection system safeguards people and property	Monitoring against prioritised programme of works.	2014/15 started projects:	New Measure	Complete Operational works, which includes:- - Silt removal and regrading - Civil works - Waterway Repairs - Pipe Network Repairs - Pipe silt removal	-	-	-

Performance Standards Levels of Service (we provide)		Results (Activities will contribute to these results, strategies and legislation)	Method of Measurement (We will know we are meeting the level of service if.....)	Current Performance	Benchmarks	Future Performance (targets)			Future Performance (targets) by Year 10
						Year 1	Year 2	Year 3	
						2015/16	2016/17	2017/18	2024/25
14.1.5	Implement Land Drainage Recovery Programme works to reduce flooding	A flood protection system safeguards people and property	Measured through Council's capital reporting system		New Measure	14.1.5.1 Start construction of Flockton/Dudley Creek Scheme	14.1.5.1 Complete construction of Flockton/Dudley Creek Scheme	-	14.1.5.1 Implement future stages of the Land Drainage Recovery Plan as approved through Annual Plan
						14.1.5.2 Complete design of Heathcote Scheme	14.1.5.2 Start construction of Heathcote Scheme	14.1.5.2 Complete construction of the Heathcote Scheme	14.1.5.2 Implement future stages of the Land Drainage Recovery Plan as approved through Annual Plan
						14.1.5.3 Identify scope of other works packages	-	-	-

5 Review of cost effectiveness - regulatory functions and service delivery

The Local Government Act requires local authorities to review the cost effectiveness of current arrangements for delivering its services and regulatory functions. The review below is in regard to operational expenditure (OPEX).

The majority of service delivery for the Stormwater Drainage Activity is carried out through the maintenance contracts. Council maintains a wide range of assets for stormwater drainage purposes and has (several??) maintenance contracts in place to ensure these assets are maintained to the appropriate level.

Council uses the New Engineering Contract (NEC) form of contract which requires a collaborative working environment with the contractor, promoting the best for asset approach to maintenance, while working within closely monitored budgets.

The following table shows the types of contracts that the Council is currently engaged in, the assets maintained through those contracts and the approximate annual operational expenditure associated with the contracts.

Table 5-1 Operational Contracts

Contract Type	Term of Contract	Asset Maintained	Annual Operational Expenditure
Waterways & Land Drainage Maintenance – covers Stormwater Drainage and Flood Protection Activities	One year rolling	Rivers Tributary & Utility Waterways Grills, grates, energy dissipaters & silt traps Stormwater Reticulation Back Control Valves Detention & Treatment Facilities	$7,600,000
Pump Station Maintenance	Two years	Pump stations and associated attributes	$225,000
NIWA	Two years	Hydrometric infrastructure and data recording	$305,000

6 Long Term Infrastructure Strategy

6.1 Issues, principles and implications

Changes to the Local Government Act now require local authorities to consider their strategy and planning for infrastructure and assets over a 30-year timeframe. The strategy describes how the assets will be managed, taking into account growth, renewals, changes in levels of service and resilience in terms of natural hazards.

6.1.1 Significant Infrastructure Issues

Earthquake legacy & subsidence

The most significant result of the earthquakes has been the changes in land levels, with areas of settlement and areas of land rising. Where the Avon discharges into the estuary, the land has subsided by 0.2 – 0.5m increasing the risk of flooding and coastal erosion. Conversely the lower reaches of the Heathcote River as it discharges into the estuary has risen by 0.3 – 0.5m, which has flattened out the gradient. This has resulted in increased siltation and reduced channel capacity. Capacity across the land drainage network has been reduced due to the large volumes of liquefaction material contained in the open channels.

The Land Drainage Recovery Programme (LDRP) was initiated in 2012 to investigate the effects of the earthquakes on the land drainage network. The programme is made up of 62 individual pieces of work, 10 of which have been completed or are near completion.

The stopbanks along the Avon River have been temporarily repaired and could potentially be relocated to more stable land further away from the river's edge. This will necessitate a change to the outlets which run through the stopbanks.

In addition to earthquake damage and resulting increases in flooding vulnerability, the flooding events of March 2014 have highlighted the need to re-consider river maintenance regimes such as dredging in addition to the present practice of weed harvesting. Again there is a need to consider the long term strategies and whether it is best to reduce the river flood levels or protect the vulnerable properties and various combinations of such strategies.

Sea level rise

Christchurch will experience sea level rise, by as much as 1m by 2115. This will increase the area at risk of coastal and tidal flooding. The earthquakes have accelerated the need for Christchurch to develop a longer term plan for dealing with the effects of sea level rise. The investment in major flood protection infrastructure repair required in the short term needs to be compatible with the long term strategy for dealing with sea level rise and possible increases in rainfall intensity.

Climate change

Climate change predictions indicate a warmer and drier climate but with increased frequency of intense rain storms resulting in a greater number of flood events. The current stormwater pipe network is designed to deal with a 1 in 5 year Annual Recurrence Interval rainfall event; any event beyond this scale results in the activation of secondary flow paths including flooding on roads.

Sea level rise combined with extreme storm events will increase the likelihood of the Avon and Heathcote Rivers overtopping their banks. Christchurch is also within the limits of the Waimakariri River floodplain. Predicted increases in rainfall volumes at the headwaters will increase flows but the risk of increased flooding is considered to be low because of the secondary stopbank system along the river.

Residential Red Zone Stopbanks

The earthquakes have damaged the Avon stopbanks which are a major flood protection system. These have been temporarily repaired and their long term future has yet to be decided. The Lower Avon residential red zone provides opportunities to re-think how this area is managed and how flood protection is organised in the future.

6.1.2 Significant Projects

- May 2014 Mayoral Flood Taskforce Report outcomes
- Land Drainage Recovery Programme
- Rebuilding and/or relocation of the Avon stopbanks
- Raising the Heathcote stopbanks
- Retrofitting flood protection schemes in Flockton and Bells Creek

7 Review of cost-effectiveness - infrastructure delivery

The Local Government Act requires local authorities to review the cost effectiveness of current arrangements for delivering its services and regulatory functions. The review below is in regard to Capital expenditure (CAPEX).

The capital renewal of assets and new capital projects are primarily undertaken through competitively tendered contracts, thereby ensuring cost effectiveness of infrastructure delivery. The timing of these works is driven by the Capital Programme and the tender process follows Councils procurement policy to ensure rigour and cost effectiveness.

8 Significant Effects

Clause 2(1)(c) of Schedule 10 to the Local Government Act 2002 requires that each Long Term Plan in relation to each group of activities of the local authority must:

"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."

The Council recognises the following negative and positive effects of providing, operating and managing Flood Protection assets.

Table 8-1 Significant Negative Effects

Effect	Council's Mitigation Measure
Raised expectations within the community	Consultation with the community
False sense of security	Key messages to the community about flood risk – through campaigning and education Making hazard maps readily available to the public
Landscape changes	Liaise with affected residents
Environmental degradation	Working within the conditions of resource consents, Limiting damage through sensitive maintenance and operations. Monitoring the health of water environments and discharges to waterways
Not all properties will be protected	Protect new future properties by setting floor levels above the 1:50 year flood level. Excellent communication with affected property owners.

Table 8-2 Significant Positive Effects

Effect	Description
Public Health & Safety	The provision of flood protection safeguards those communities at risk of extreme flooding.
Economic Development	The provision of flood protection through development control allows considered urban growth and associated economic growth and prosperity.
Recreation & Amenity	Provision of clean, tidy and accessible waterways, ponds and wetlands enables the community to partake in water related recreational activities and to enjoy water amenities
Image	The provision of well maintained waterways enhances the Garden City profile

8.1 Assumptions

Council has made a number of assumptions in preparing the Activity Management Plan. Table 8-3 lists the most significant assumptions and uncertainties that underline the approach taken for this activity.

Table 8-3 Major Assumptions

Assumption Type	Assumption	Discussion
Financial assumptions	That all expenditure has been stated in 1 July 2014 dollar values and no allowance has been made for inflation.	The LTP will incorporate inflation factors. This could have a significant impact on the affordability of the plans if inflation is higher than allowed for.
Asset data knowledge	That Council has adequate knowledge of the assets and their condition so that the planned renewal works will allow Council to meet the proposed levels of service.	There are several areas where Council needs to improve its knowledge and assessments but there is a low risk that the improved knowledge will cause a significant change to the level of expenditure required.
Growth forecasts	That the district will grow as forecast in the Greater Christchurch UDS and the LURP.	If the growth is very different it will have a moderate impact. If higher, Council may need to advance capital projects. If it is lower, Council may have to defer planned works.
Climate Change	That the climate will change as reported in the latest IPCC report, sea level rise of 1m by 2015.	Climate change has been factored into design of flood protection schemes. Should the change scenarios deviate from those reported changes to planned works could be required.
Emergency funding	That the Council annual budget is adequate to cover response costs associated with an emergency event.	Traditionally Council manage such risks through the entire Annual Plan budget. The risk of requiring additional funding is moderate and may have an effect on planned works due to reprioritisation of funds.
Timing of capital projects	That capital projects will be undertaken when planned.	The risk of the timing of projects changing is high due to factors like resource consents, funding and land purchase. Council tries to mitigate these issues by undertaking the consultation, investigation and design phases sufficiently in advance of the construction phase. If delays are to occur, it could have significant effects on the level of service.
Accuracy of capital project cost estimates	That the capital project cost estimates are sufficiently accurate enough to determine the required funding level.	The risk of large under estimation is low. However the importance is moderate as Council may not be able to afford the true cost of the projects should the cost estimate be too low. Council tries to reduce the risk by including a standard contingency based on the projects lifecycle and updates the costs at each major phase of each project.
Changes in legislation and policy, and financial assistance	That there will be no major changes in legislation or policy.	The risk of major change is high due to the changing nature of the government and politics. If major changes occur it is likely to have an impact on the required expenditure. Council has made no allowance for such changes.

9 Risk Management

All operational and organisational risks have been identified and recorded in the Stormwater Risk Register. The risks listed below in Table 9-1 have been identified as the most critical risks to the Flood Protection activity.

Table 9-1 Significant Risks and Treatment Measures

Risk	Impact	Priority	Risk Strategy	Risk Response
Increased rainfall intensities as a result of climate change	Heavier storms, increased likelihood of flooding, reduced LoS	Extreme	Mitigate	Plan, design and build new assets to deal with Climate Change; model existing network to identify weaknesses at various sized storm events
Land settlement-discharge points no longer functional	Reduced ability to discharge, pooling/backing up of stormwater leading to increased flood risk and reduced LoS.	Very High	Accept	Carry out assessment of land changes, identify critical discharge points and prioritise renewal
Reduced funding	LoS falls or short term strategies are adopted that lead to increased cost in the future	Very High	Mitigate	Investigate alternative contract or management arrangements; review priorities and identify efficiencies; reduce LoS
SCIRT fail to deliver SW pipe repairs within time or budget	CCC left with significant cost to restore LoS	Very High	Mitigate	Ensure SCIRT programme for SW repairs is transparent and receives the appropriate priority. Discuss cost share agreement and review outcome with Government
EQ resulting in changes to long term plans	Loss of key subdivision developments. Land drainage works still need to be undertaken but developer contributions are not available. Funding shortfall to be sought	Very High	Accept	Seek alternative funding streams. Assess the validity of plans post quake and prioritise projects
Future earthquake - Liquefaction filling waterway channels and blocking pipes	Waterways and drains become blocked, reduced LoS, asset failure, increased flood risk	High	Accept	Identify liquefaction risk areas and critical assets to develop a response plan
Incomplete asset register for all stormwater assets owned, operated and maintained by Council	Inspection, maintenance and renewals planning incomplete and budgets therefore inadequate to maintain LoS	High	Mitigate	Complete asset register and condition assessment of all CCC owned, operated and maintained assets; actively review the register to maintain as current

Risk	Impact	Priority	Risk Strategy	Risk Response
Mayoral Flooding Taskforce programme not delivered to time	At risk properties flooded in next large wet weather event, damage to Council's reputation	High	Mitigate	Programme reporting, early warning of delays, re-prioritisation of works to achieve delivery

10 Improvement Plan

This document is part of a new approach to developing the 2015-25 Long Term Plan and is expected to require an improvement plan. To date this document has not been reviewed however a review for compliance with the requirements of the relevant legislation, especially the LGA 2002 should be a primary improvement item. The findings and suggestions from the review will be assessed and prioritised, to either be implemented for the final version of this document or added to the Improvement Plan. It is intended that the Improvement Plan will be a live document which is continually monitored and updated.

City Water and Waste have developed a Contract Management Improvement Plan. Version 1.0 dated May 2014 is saved in TRIM, 14/995771.

The Land Drainage Asset Management Plan includes an Improvement Plan to address stormwater asset management issues in time for the next plan review in 2017-18.

The Surface Water Strategy strives to improve how surface water resources are managed for future generations by delivering nine goals. The Flood Protection and Control Works Activity contribute to these goals.

11 Operations, Maintenance and Renewals Strategy

11.1 Operations and Maintenance

Maintenance activities are carried out across the Land Drainage asset portfolio which includes both flood protection and stormwater drainage assets. These activities include aquatic weed harvesting, vegetation control, rubbish/debris collection and disposal and patch repairs to structures, pump stations and drain linings.

Maintenance is approached in two ways, either through the planned programme or through reactive response and delivered through the contracts as discussed in Section 5. Performance measures from the Activity Management Plans and Council specifications define the outcomes the contractors are required to achieve. The contractor prepares monthly, quarterly and annual programmes of work, which are reviewed and approved by Council contract managers.

Budget restrictions in future years are likely to lead to changes in the levels of service currently provided. The frequency at which some maintenance tasks are carried out may have to reduce. A drive for more planned maintenance should reduce reactive maintenance and help maintain Levels of Service at a lower cost.

11.2 Renewals

Assets are considered for renewal as they near the end of their effective working life, where the cost of maintenance becomes uneconomical, or when the risk of failure of critical assets is sufficiently high.

Currently the stormwater and land drainage renewals programme is based on information and evidence from staff involved in the day to day management of the assets, rather than asset condition data. A working group approach has been taken to decide which projects should be included into the programme.

Over the course of the next two years, the asset management information system (AMIS) will be sufficiently populated to allow for renewals modelling to be undertaken as part of the renewals planning process. During this time all assets related to stormwater drainage will be condition assessed to better inform the renewals programme. The use of condition assessment data, expected life and engineering judgement will enhance the renewals programme moving it away from a reactive to a planned approach.

The river stopbanks, in particular along the Avon were repaired to provide short term protection immediately after the earthquakes. Longer term renewal is planned in order to ensure they are at the correct height to meet the requirements of climate change. This will be dependent on any decisions made regarding the Residential Red Zone.

Due to the age of some of the detention basins, the renewal of their linings is now required. For many this will be the first time this has occurred and is likely to be an extensive programme of renewals as many were built over the same time period.

The renewals related to the Stormwater Drainage Activity will have a positive effect on flood protection as the two activities are intrinsically linked. This includes the work that SCIRT is undertaking to repair and replace damaged stormwater infrastructure such as the pipe network and pump stations.

12 Key Projects

Table 12-1 details the key capital and renewal work programmed for years 2015 to 2025.

Table 12-1 Key Projects

Project Name	Description	Year 1 ($)	Year 2($)	Year 3($)	Years 4-10 ($)	Project Driver
	For details of the capital works relating to this activity refer to the draft Capital Programme, draft Long Term Plan, volume 1					

Note: G = Growth, LoS = Levels of Service, R = Renewal

13 Summary of Cost for Activity

Figure 13-1 Operational Budget Breakdown

FLOOD PROTECTION AND CONTROL WORKS - NATURAL WATERWAYS, STRUCTURES & SYSTEMS		Funding Caps in 2015/16 Dollars				*Funding splits exclude EQ Costs from all calculations*					
	2014/15 Annual Plan	2015/16	2016/17	2017/18		Funding - User Charges	Other revenue	General rate	Targeted rate	Period of Benefit (years)	Comments
	000's										
Operational Budget											
Flood Protection	346	346	340	334							
Activity Costs before Overheads	346	346	340	334							
Earthquake Response Costs	-	-	-	-							
Corporate Overhead	18	18	17	16							
Depreciation	-	0	1	1							
Interest	-	-	-	-							
Total Activity Cost	**365**	**364**	**358**	**351**		0%	0%	0%	100% Full		
Funded By:											
Fees and Charges	-	-	-	-							
Grants and Subsidies	-	-	-	-							
Earthquake Recoveries	-	-	-	-							
Total Operational Revenue	**-**	**-**	**-**	**-**							
Net Cost of Service	**365**	**364**	**358**	**351**							
Funded by:											
Rates	**365**	**364**	**358**	**351**							
Earthquake Borrowing	**-**	**-**	**-**	**-**							
	365	**364**	**358**	**351**							
Capital Expenditure											
Earthquake Rebuild											
Renewals and Replacements											
Improved Levels of Service											
Additional Demand											

Figure 13-2 Operational Costs

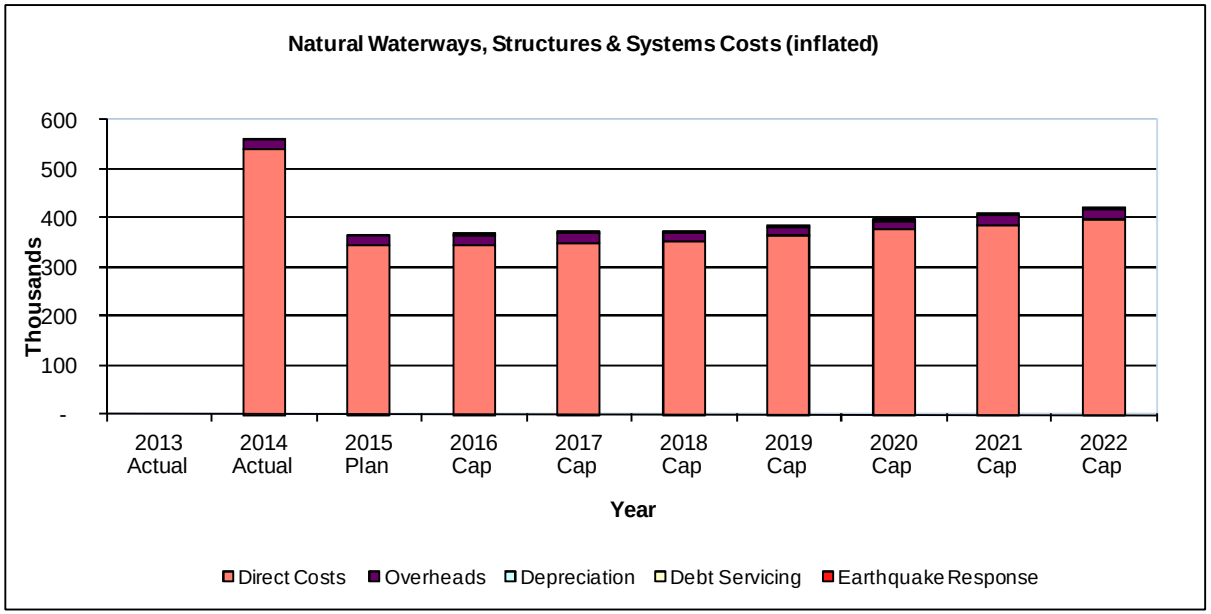


Figure 13-3 Total Expenditure

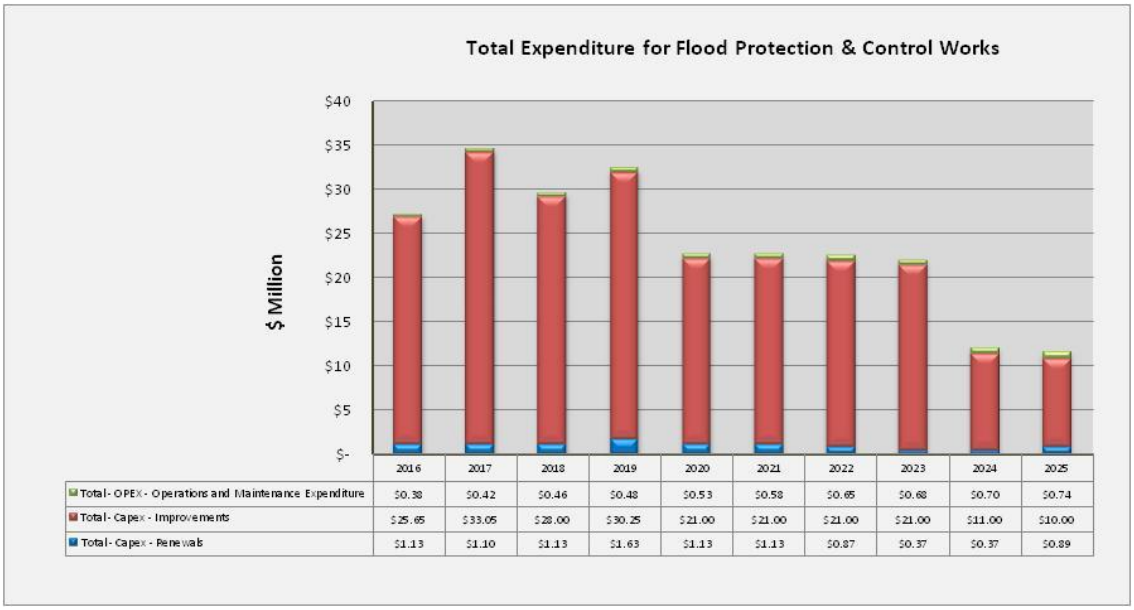


Figure 13-4 Operating Expenditure

NOTE - not including related overheads

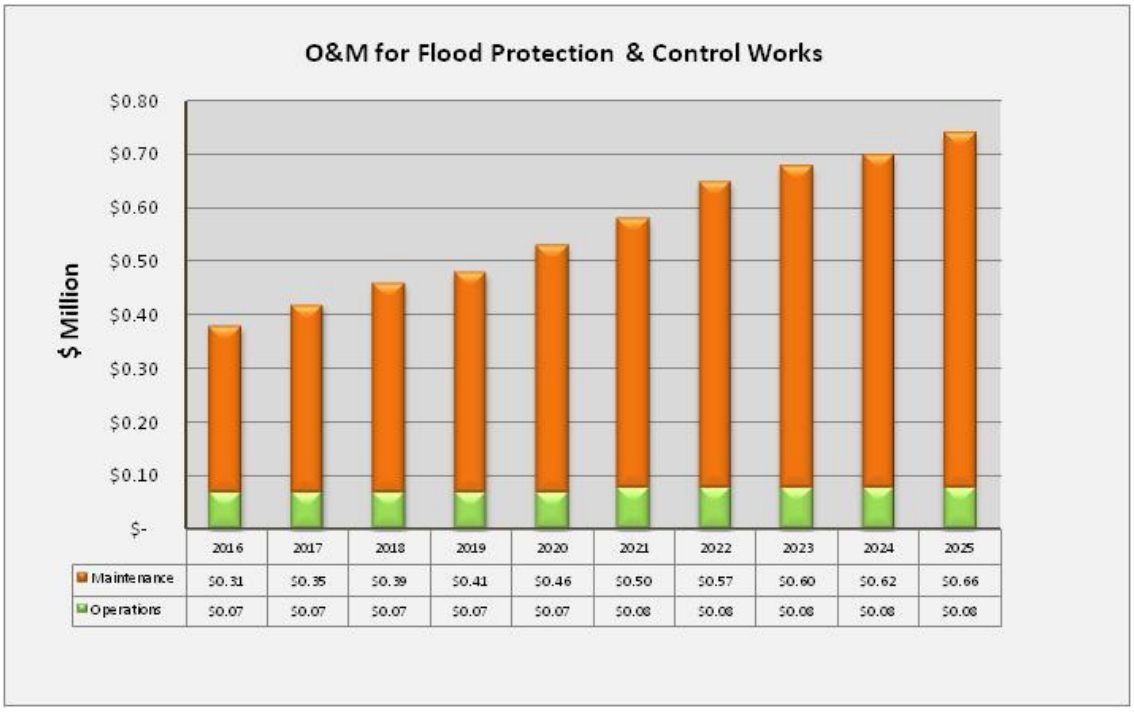
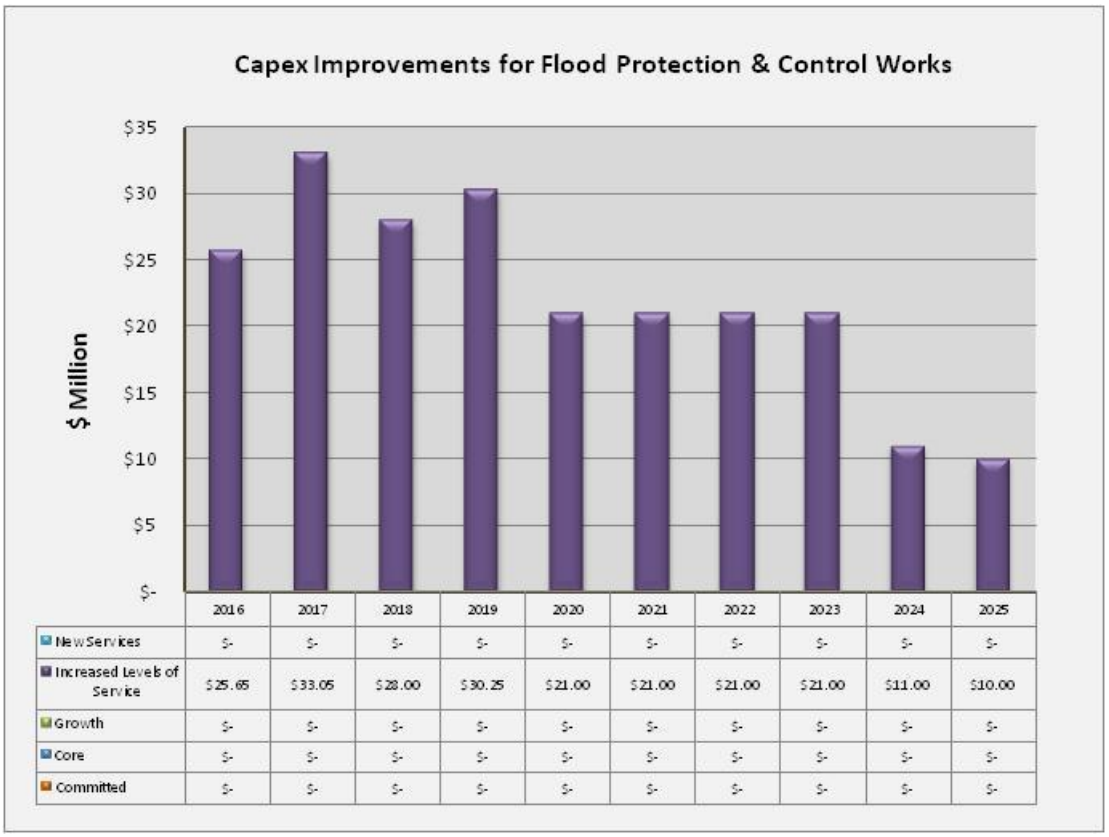
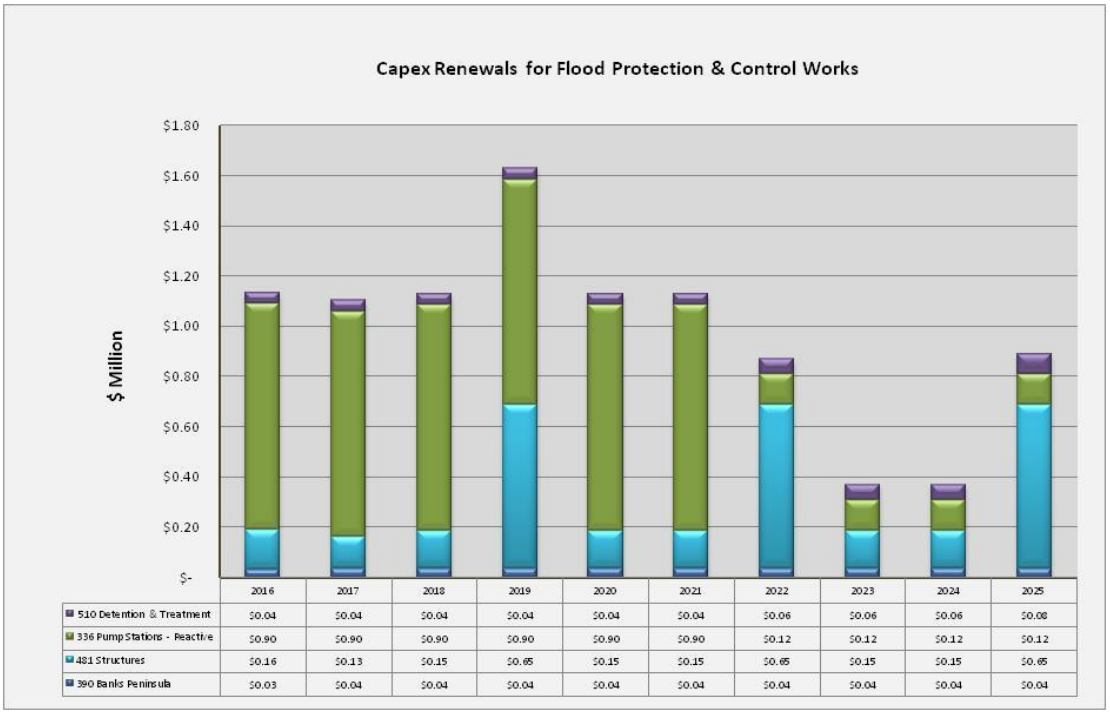


Figure 13-5 Capital Expenditure



	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
New Services	$-	$-	$-	$-	$-	$-	$-	$-	$-	$-
Increased Levels of Service	$25.65	$33.05	$28.00	$30.25	$21.00	$21.00	$21.00	$21.00	$11.00	$10.00
Growth	$-	$-	$-	$-	$-	$-	$-	$-	$-	$-
Core	$-	$-	$-	$-	$-	$-	$-	$-	$-	$-
Committed	$-	$-	$-	$-	$-	$-	$-	$-	$-	$-

Figure 13-6 Renewals Expenditure



	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
510 Detention & Treatment	$0.04	$0.04	$0.04	$0.04	$0.04	$0.04	$0.06	$0.06	$0.06	$0.08
336 Pump Stations - Reactive	$0.90	$0.90	$0.90	$0.90	$0.90	$0.90	$0.12	$0.12	$0.12	$0.12
481 Structures	$0.16	$0.13	$0.15	$0.65	$0.15	$0.15	$0.65	$0.15	$0.15	$0.65
390 Banks Peninsula	$0.03	$0.04	$0.04	$0.04	$0.04	$0.04	$0.04	$0.04	$0.04	$0.04